



EMC TEST REPORT

For

Mid Ocean Brands B.V.

WIRELESS SPEAKER

Test Model: MO9506

Prepared for : Mid Ocean Brands B.V.
Address : Unit 711 716, 7/F., Tower A, 83 King Lam Street, Cheung
Sha Wan, Kowloon, Hong Kong

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : October 29, 2025
Number of tested samples : 2
Sample No. : A251029012-1, A251029012-2
Serial number : Prototype
Date of Test : October 29, 2025 ~ November 07, 2025
Date of Report : November 10, 2025



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EMC TEST REPORT ETSI EN 301 489-1 V2.2.3 (2019-11) & ETSI EN 301 489-17 V3.3.1 (2024-09)	
Report Reference No.	LCSA10295042EA
Date Of Issue	November 10, 2025
Testing Laboratory Name	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	Room 101/201, Building A, and Room 101/301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	Full application of Harmonised standards■ Partial application of Harmonised standards□ Other standard testing method□
Applicant's Name	Mid Ocean Brands B.V.
Address	Unit 711 716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Test Specification	
Standard	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-17 V3.3.1 (2024-09)
Test Report Form No.	TRF-4-E-132 A/0
TRF Originator	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	Dated 2017-06
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Test Item Description	WIRELESS SPEAKER
Trade Mark	N/A
Test Model	MO9506
Ratings	Please Refer to Page 6
Result	PASS

Compiled by:

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EMC -- TEST REPORT

Test Report No. : LCSA10295042EA	<u>November 10, 2025</u> Date of issue
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Test Model.....	: MO9506
EUT.....	: WIRELESS SPEAKER
Applicant	: Mid Ocean Brands B.V.
Address.....	: Unit 711 716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Telephone.....	: /
Fax.....	: /
Manufacturer	: Mid Ocean Brands B.V.
Address.....	: Unit 711 716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Telephone.....	: /
Fax.....	: /
Factory	: /
Address.....	: /
Telephone.....	: /
Fax.....	: /

Test Result	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.





Revision History

Report Version	Issue Date	Revision Content	Revised By
000	November 10, 2025	Initial Issue	---





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1. GENERAL INFORMATION

1.1. Product Description for Equipment Under Test (EUT)

EUT	: WIRELESS SPEAKER
Test Model	: MO9506
Vendor code	: 103221
Ratings	: Input: DC 5V, 0.5A DC 3.7V by Li-ion Battery(180mAh)
Hardware Version	: V1.1
Software Version	: V170
Bluetooth	:
Frequency Range	: 2402MHz~2480MHz
Channel Number	: 79 channels for Bluetooth V5.3 (BDR/EDR)
Channel Spacing	: 1MHz for Bluetooth V5.3 (BDR/EDR)
Modulation Type	: GFSK, $\pi/4$ -DQPSK for Bluetooth V5.3 (BDR/EDR)
Bluetooth Version	: V5.3
Antenna Description	: PCB Antenna, 2.5dBi(max.)



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1.2. Objective

ETSI EN 301 489-1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility
ETSI EN 301 489-17	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband and Wideband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility

The objective is to determine compliance with ETSI EN 301 489-1 V2.2.3 (2019-11), ETSI EN 301 489-17 V3.3.1 (2024-09).

1.3. Related Submittal(s)/Grant(s)

No Related Submittals.

1.4. Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 489-1 V2.2.3 (2019-11), ETSI EN 301 489-17 V3.3.1 (2024-09).

1.5. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

1.6. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
SHENZHEN TIANYIN ELECTRONICS CO., LTD	Power Adapter	TPA-46050200 UU	---	CE

Note: Auxiliary equipment is provided by the laboratory.

1.7. External I/O

I/O Port Description	Quantity	Cable
Type-C Port	1	N/A



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1.8. Measurement Uncertainty

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	0.01ppm	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2°C	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

1.9. Description of Test Modes

There was 2 test Modes. TM1 to TM2 were shown below:

TM1 : Operate in Bluetooth mode

TM2 : Idle mode

***Note:

1. All test modes were tested, but we only recorded the worst case in this report.



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2. SUMMARY OF TEST RESULTS

Rule	Description of Test Items	Result
§7.1	Reference to clause 8.4 of ETSI EN 301 489-1 Conducted Emission (AC mains input/output port)	Compliant
§7.1	Reference to clause 8.3 of ETSI EN 301 489-1 Conducted Emission (DC power input/output port)	N/A*
§7.1	Reference to clause 8.7 of ETSI EN 301 489-1 Conducted Emission (Wired network port)	N/A*
§7.1	Reference to clause 8.2 of ETSI EN 301 489-1 Radiated Emission (Enclosure of ancillary equipment)	Compliant
§7.1	Reference to clause 8.5 of ETSI EN 301 489-1 Harmonic current emissions (AC mains input port)	N/A*
§7.1	Reference to clause 8.6 of ETSI EN 301 489-1 Voltage fluctuations and flicker (AC mains input port)	Compliant
§7.2	Reference to clause 9.3 of ETSI EN 301 489-1 Electrostatic discharge (Enclosure port) (EN 61000-4-2)	Compliant
§7.2	Reference to clause 9.2 of ETSI EN 301 489-1 RF electromagnetic field (80MHz to 6000MHz) (Enclosure port) (EN 61000-4-3)	Compliant
§7.2	Reference to clause 9.4 of ETSI EN 301 489-1 Fast transients common mode (signal, wired network and control ports, DC and AC power ports) (EN 61000-4-4)	Compliant
§7.2	Reference to clause 9.8 of ETSI EN 301 489-1 Surges, line to line and line to ground (AC mains power input ports, wired network ports) (EN 61000-4-5)	Compliant
§7.2	Reference to clause 9.5 of ETSI EN 301 489-1 RF common mode 0.15MHz to 80MHz (signal, wired network and control ports, DC and AC power ports) (EN 61000-4-6)	Compliant
§7.2	Reference to clause 9.6 of ETSI EN 301 489-1 Transients and surges in the vehicular environment (ISO 7637-2)	N/A*
§7.2	Reference to clause 9.7 of ETSI EN 301 489-1 Voltage dips and interruptions (AC mains power input ports) (EN 61000-4-11)	Compliant



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3. TEST RESULTS

3.1. Line Conducted Emission

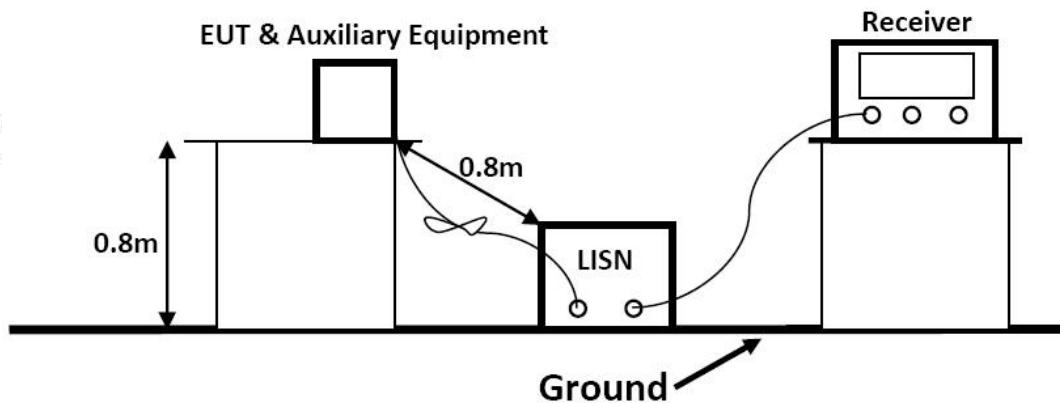
3.1.1 Conducted Emission Limit

Relevant Standard(s): ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 55032:2015/A11:2020
Class B

Limits for Line Conducted Emission		
Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.
NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

3.1.2 Test Configuration



The setup of EUT is according with per ETSI EN 301 489-1 measurement procedure. The specification used was with the ETSI EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The EUT received charging power from the charger which received power through a LISN supplying power of AC 230V/50Hz.





3.1.3 EMI Test Receiver Setup

During the conducted emission test, the EMI test receiver was set with the following configurations:

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	150KHz ~ 30MHz
(IF)RBW	9kHz

All data was recorded in the Quasi-peak and average detection mode.

3.1.4 Test Procedure

Power on the EUT, the EUT begins to work. Make sure the EUT operates normally during the test.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

3.1.5 Test Results

PASS

Please refer to Appendix A.1 for Emission and Immunity test results.





3.2. Conducted Emission (Wired Network Port)

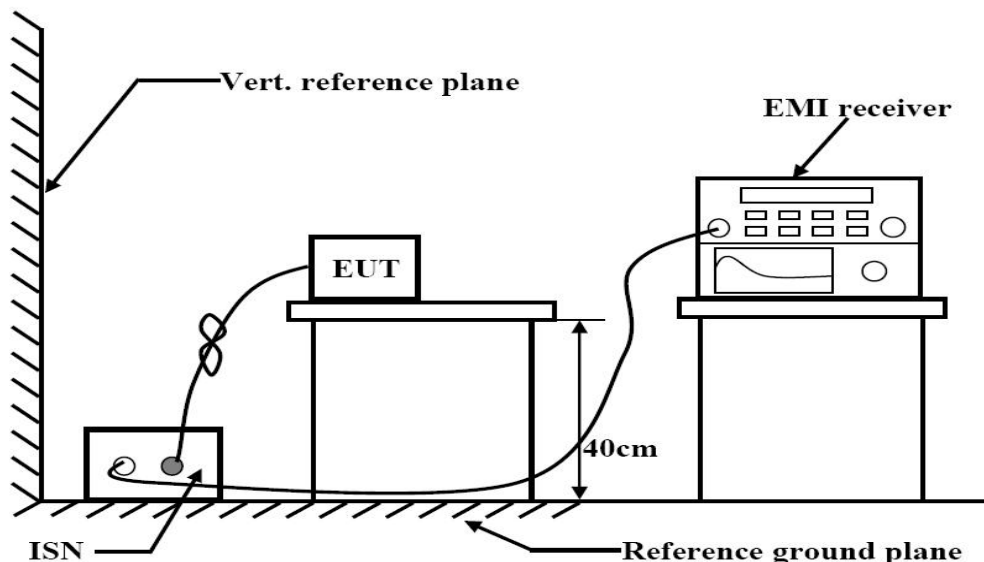
3.2.1 Conducted Emission Limit(Wired Network Port)

Limits for asymmetric mode conducted emissions				
Frequency (MHz)	Class B voltage limits (dB μ V)		Class B current limits (dB μ A)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	84.0~74.0	74.0~64.0	40.0~30.0	30.0~20.0
0.50 ~ 30.00	74.0	64.0	30.0	20.0

NOTE 1-The limits decrease linearly with the logarithm of the frequency in the range 0,15 MHz to 0,5 MHz.

NOTE 2-The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is $20 \log_{10} 150 / I = 44 \text{ dB}$).

3.2.2 Test Configuration



3.2.3 EMI Test Receiver Setup

During the conducted emission test, the EMI test receiver was set with the following configurations:

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	150KHz ~ 30MHz
(IF)RBW	9kHz

All data was recorded in the Quasi-peak and average detection mode.

3.2.4 Test Procedure

Please refer to ETSI EN 301 489-1 Clause 8.7.2 and EN 55032 Clause 6 for the measurement methods.

3.2.5 Test Results

Not applicable.





3.3. Radiated Disturbance

3.3.1 Radiated Emission Limit

Relevant Standard(s): ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 55032:2015/A11:2020
Class B

Limits for Radiated Disturbance Below 1GHz			
Frequency (MHz)	Facility	Distance (Meters)	Field Strengths Limit (dB μ V/m)
30 ~ 230	SAC	3	40
230 ~ 1000	SAC	3	47
***Note: (1) The smaller limit shall apply at the combination point between two frequency bands. (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.			
Limits for Radiated Disturbance Above 1GHz			
Frequency (MHz)	Distance (Meters)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)
1000 ~ 3000	3	70	50
3000 ~ 6000	3	74	54
***Note: The lower limit applies at the transition frequency.			

Limits for Radiated Disturbance Below 1GHz (For FM Receivers)			
Frequency (MHz)	Distance (Meters)	Class B Limit (dBμV/m)	
		Fundamental	Harmonics
30 ~ 230	3	60	52
230 ~ 300	3		52
300 ~ 1000	3		56
***Note: These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the LO. Signals at all other frequencies shall be compliant with the limits given in above Table.			
Limits for Radiated Disturbance Above 1GHz (For FM Receivers)			
Frequency (MHz)	Distance (Meters)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)
1000 ~ 3000	3	70	50
3000 ~ 6000	3	74	54
***Note: The lower limit applies at the transition frequency.			





3.3.2 Test Configuration

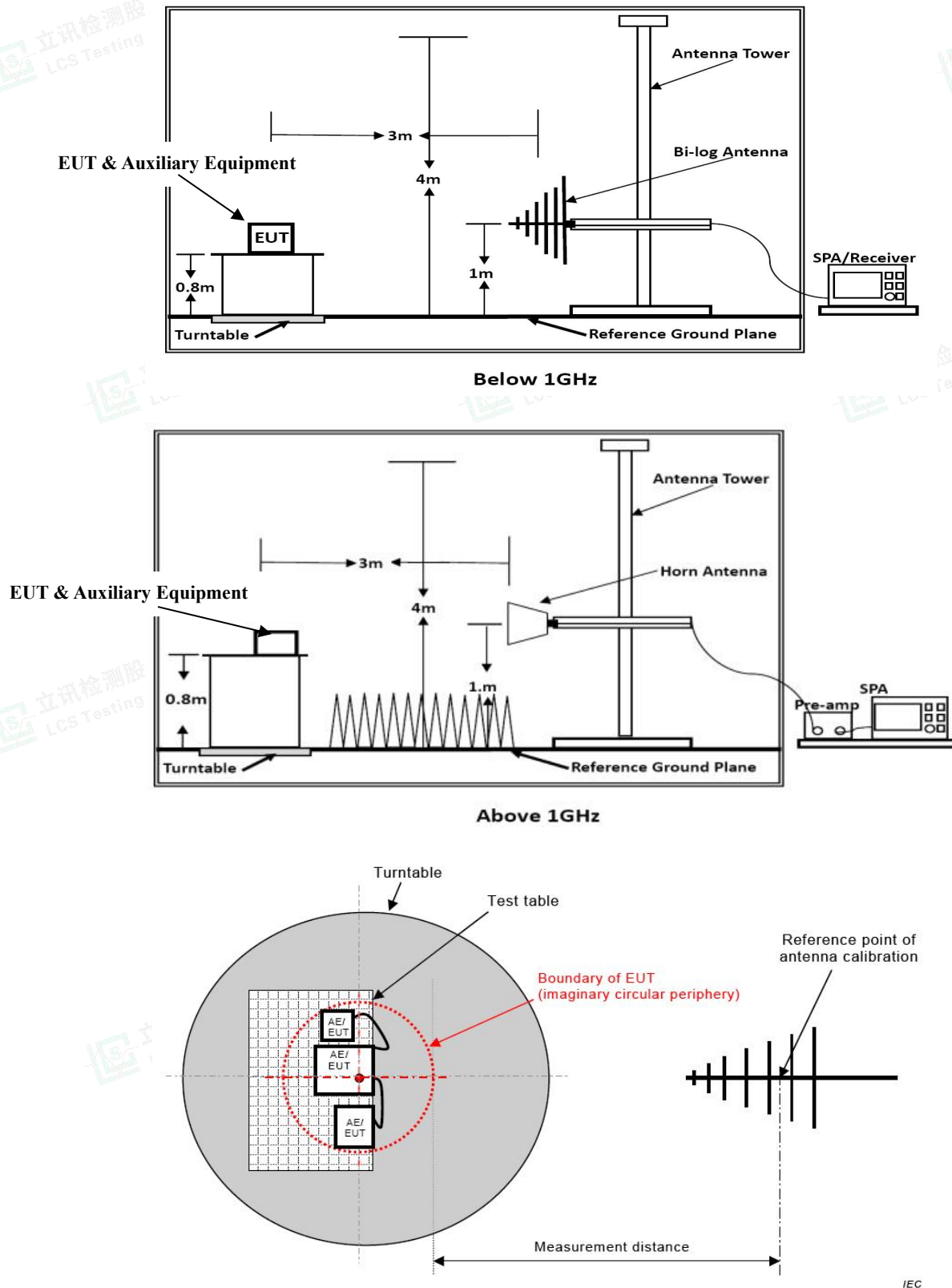


Figure C.1 – Measurement distance

Test Setup for FM Receiver



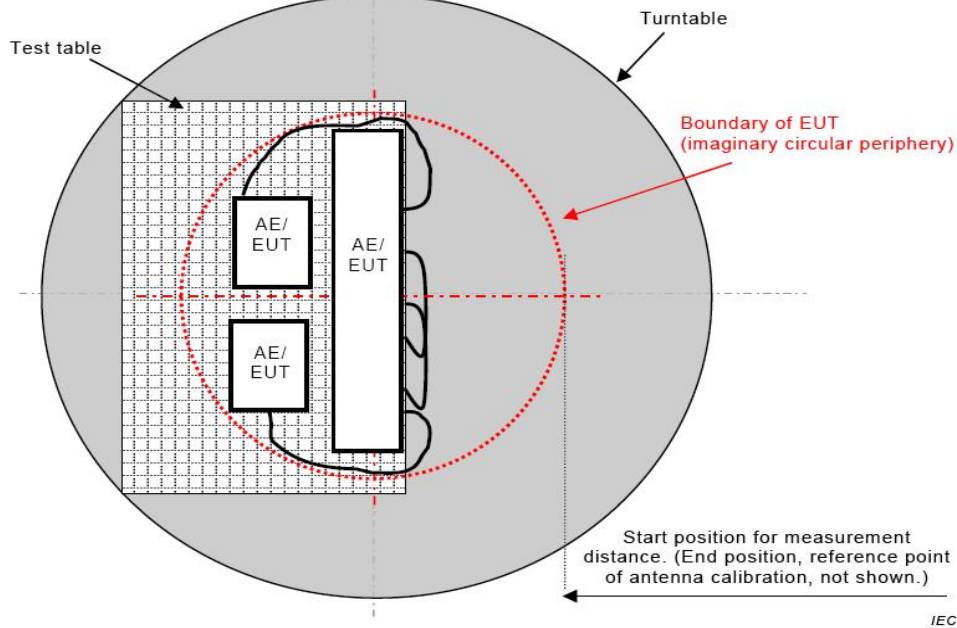


Figure C.2 – Boundary of EUT, Local AE and associated cabling

Test Setup for FM Receiver

3.3.3 Test Procedure

The test method shall be in accordance with CENELEC EN 55032 [1], annex A.3.

3.3.4 Test Results

PASS

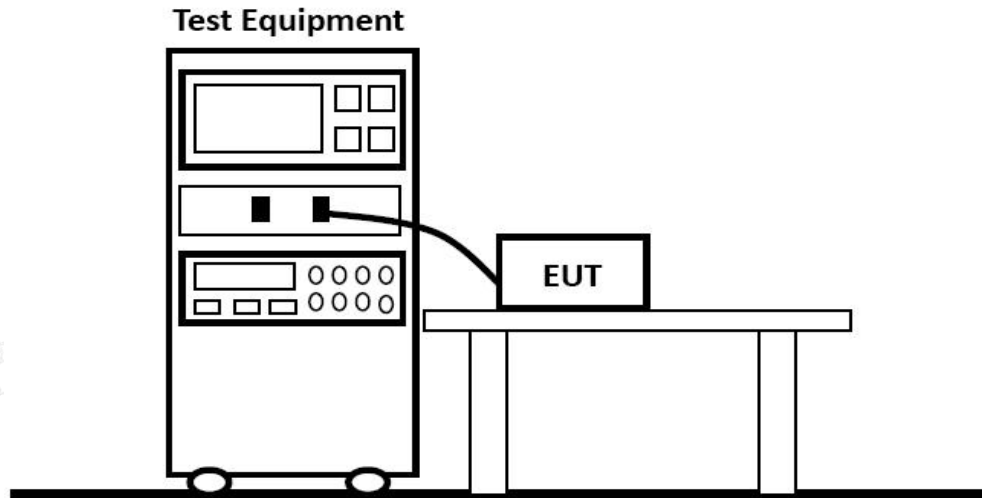
The worst test mode of the EUT was TM1, and its test data please refer to Appendix A.3 for Emission and Immunity test results.





3.4. Harmonic Current Emissions

3.4.1 Test Configuration



3.4.2 Test Standard

According to ETSI EN 301 489-1 V2.2.3 (2019-11) & EN 61000-3-2: 2014

3.4.3 Test Results

N/A

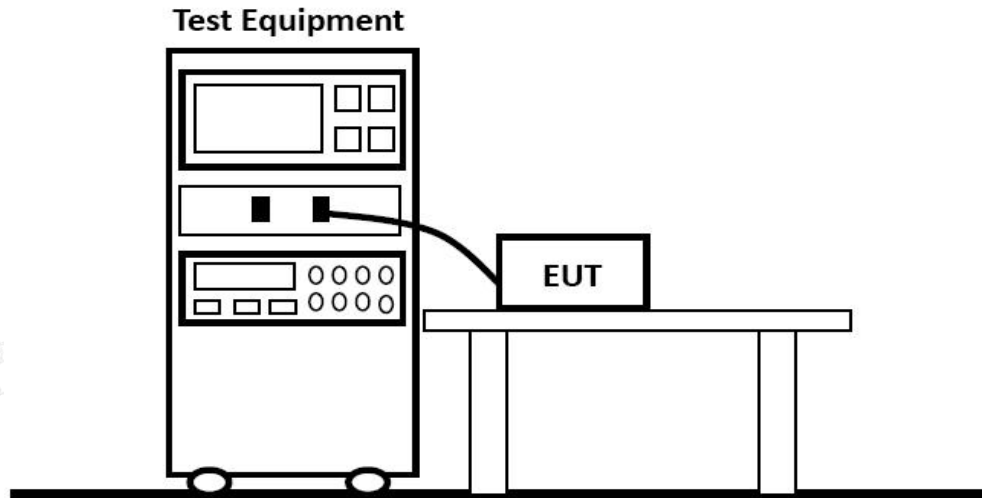
Please refer to Appendix A.4 for Emission and Immunity test results.





3.5. Voltage Fluctuation and Flicker

3.5.1 Test Configuration



3.5.2 Test Standard

According to ETSI EN 301 489-1 V2.2.3 (2019-11) & EN 61000-3-3: 2013

3.5.3 Test Results

PASS

Please refer to Appendix A.5 for Emission and Immunity test results.



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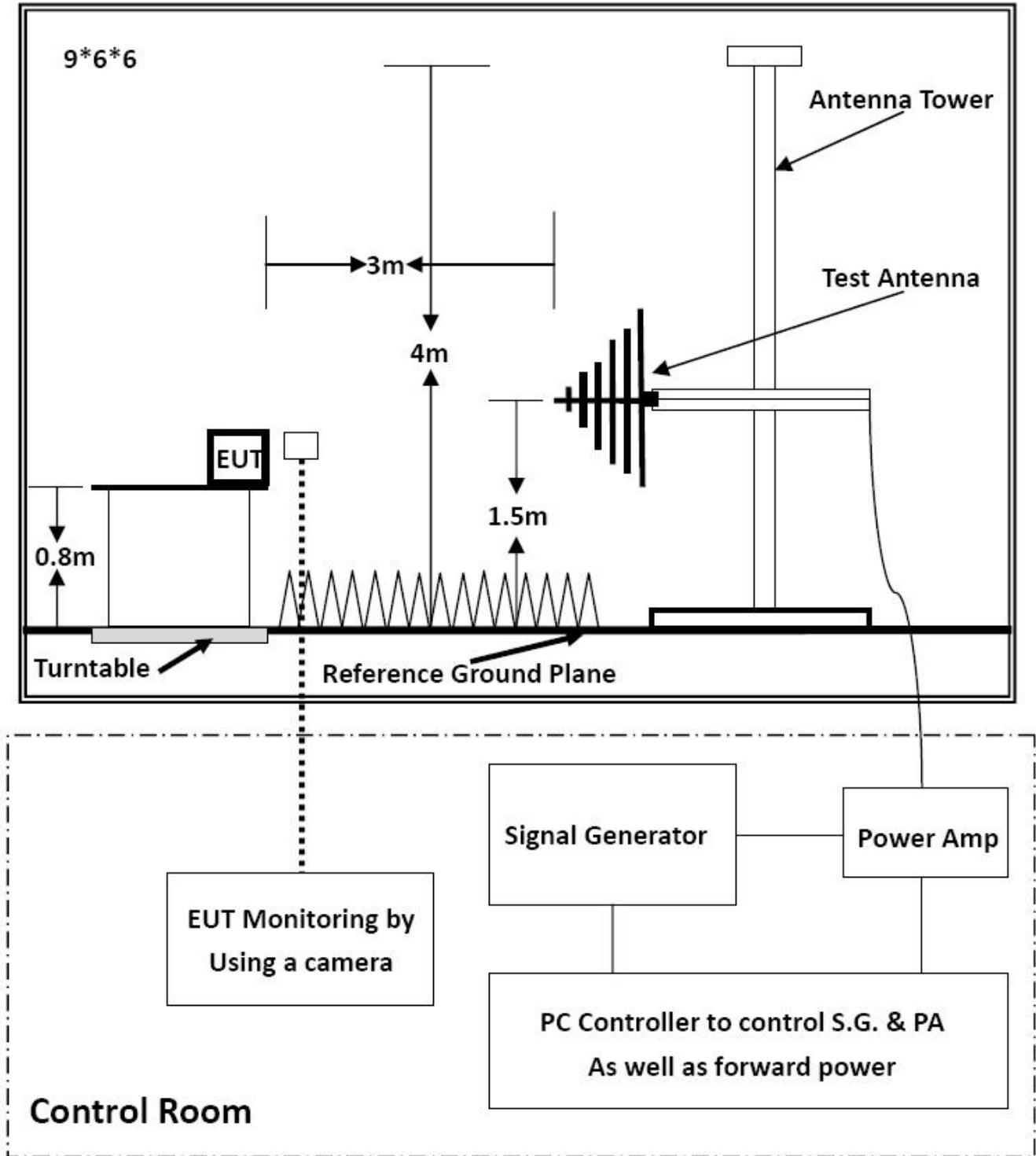
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3.6. RF Electromagnetic Field (80 MHz - 6000 MHz)

3.6.1 Test Configuration



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3.6.2 Test Standard

ETSI EN 301 489-1, ETSI EN 301 489-17 (EN 61000-4-3: 2006+A2: 2010)

Test level 2 at 3V/m.

3.6.3 Severity Level

Level	Field Strength (V/m)
1	1
2	3
3	10
X	Special
Performance Criterion: A	

3.6.4 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen. All the scanning conditions are as follows:

Condition of Test	Remark
Fielded Strength	3 V/m (Severity Level 2)
Radiated Signal	Unmodulated
Scanning Frequency	80-6000MHz
Dwell time of radiated	0.0015 decade/s
Waiting Time	3 Sec.

3.6.5 Test Results

PASS

Please refer to Appendix A.6 for Emission and Immunity test results.



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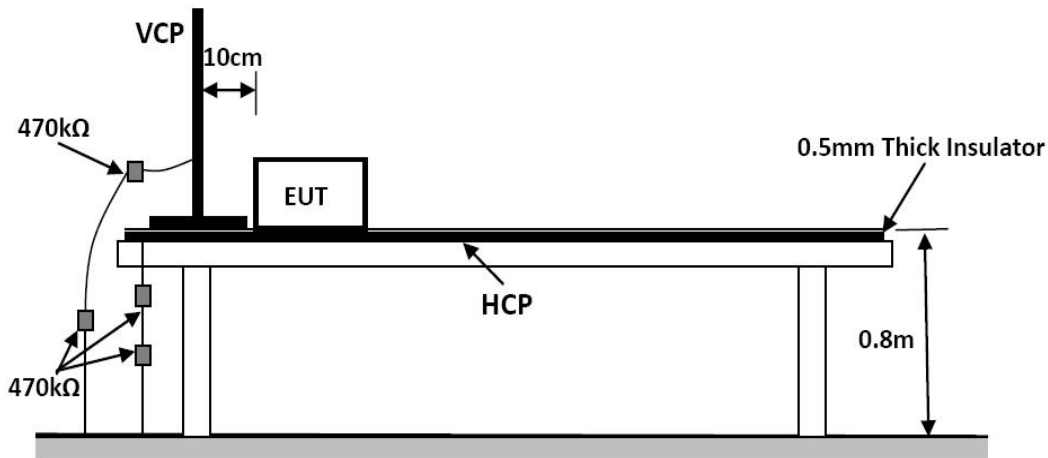
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3.7. Electrostatic Discharge

3.7.1 Test Configuration



EN 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.5 by 1.0-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

3.7.2 Test Procedure

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-2: 2009

Test level 3 for Air Discharge at ± 8 kV

Test level 2 for Contact Discharge at ± 4 kV

3.7.2.1 Air Discharge

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

3.7.2.2 Contact Discharge

All the procedure shall be same as Section 3.7.2.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

3.7.2.3 Indirect Discharge For Horizontal Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.



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3.7.2.4 Indirect Discharge For Vertical Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

3.7.3 Test Results

PASS

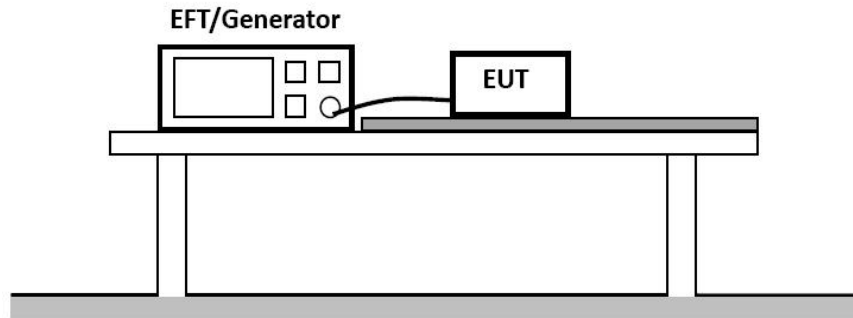
Please refer to Appendix A.7 for Emission and Immunity test results.





3.8. Electrical Fast Transient Immunity

3.8.1 Test Configuration



3.8.2 Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11)/ EN61000-4-4: 2012

Test level 2 at 1 kV

Test Level		
Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special
Performance Criterion: B		

3.8.3 Test Procedure

The EUT is put on the table, which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

3.8.3.1 For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device, which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 minutes.

3.8.3.2 For signal lines and control lines ports: No I/O ports. It's unnecessary to test.

3.8.3.3 For DC output line ports: It's unnecessary to test.

3.8.4 Test Results

PASS

Please refer to Appendix A.8 for Emission and Immunity test results.



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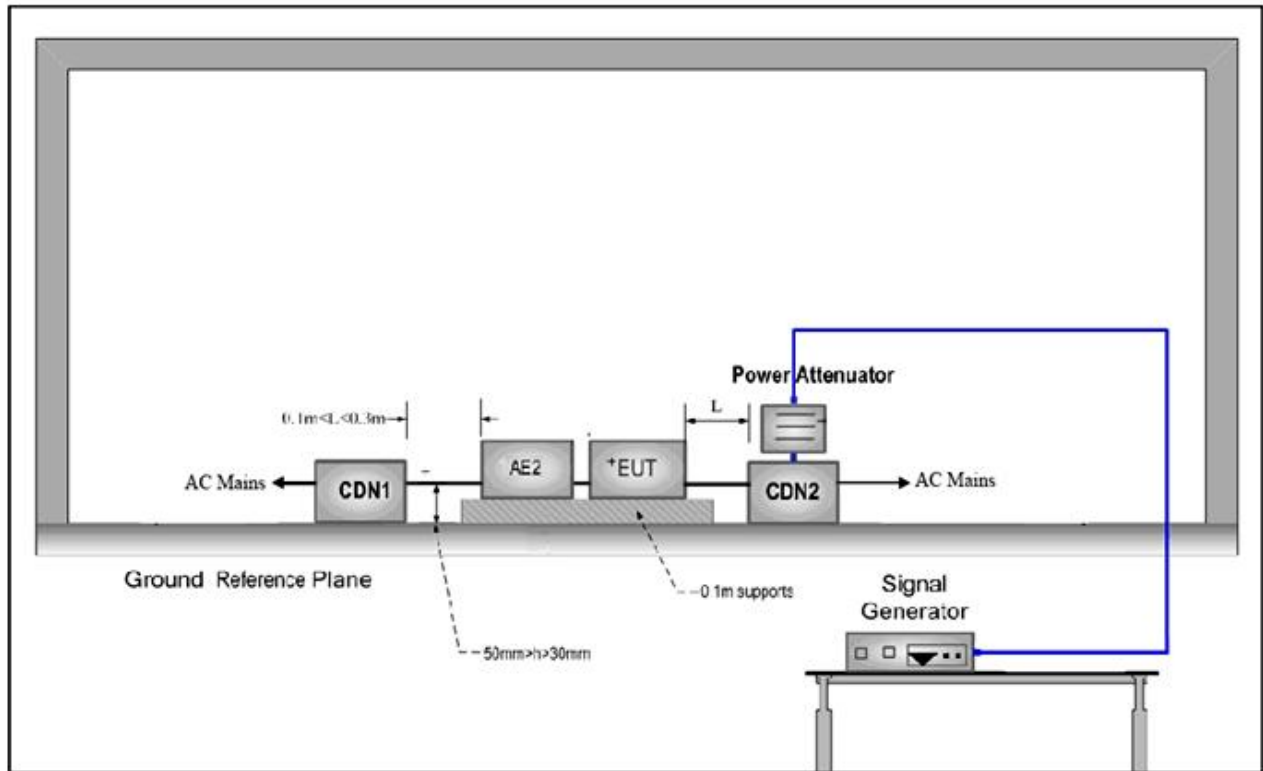
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3.9. RF Common Mode

3.9.1 Test Configuration



3.9.2 Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11)/ EN 61000-4-6: 2014

Test level: 3V (r.m.s.) for 0.15MHz ~ 10MHz; 3V (r.m.s.) to 1V (r.m.s.) for 10MHz ~ 30MHz;

1V (r.m.s.) for 30MHz ~ 80MHz

Modulation type: AM

Modulation depth: 80%

Modulation signal: 1 kHz

Test Level	
Level	Voltage Level (r.m.s.) (V)
1	1
2	3
3	10
X	Special
Performance Criterion: A	



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3.9.3 Test Procedure

3.9.3.1 Let the EUT work in test mode and test it.

3.9.3.2 The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50mm (where possible).

3.9.3.3 The disturbance signal described below is injected to EUT through CDN.

3.9.3.4 The EUT operates within its operational mode(s) under intended climatic conditions after power on.

3.9.3.5 The frequency range is swept from 150kHz to 10MHz using 3V signal level, 10MHz to 30MHz using 3V to 1V signal level, 30MHz to 80MHz using 1V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.

3.9.3.6 The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

3.9.3.7 Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

3.9.4 Test Results

PASS

Please refer to Appendix A.9 for Emission and Immunity test results.



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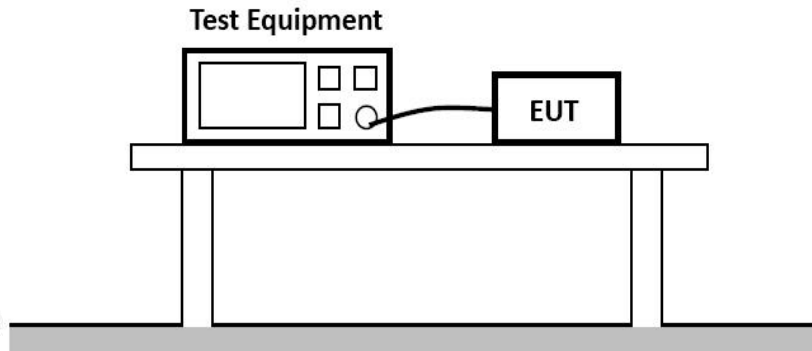
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3.10. Surges, Line to Line and Line to Ground

3.10.1 Test Configuration



3.10.2 Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-5: 2014+A1:2017

L-N: Test level 2 at 1 kV

L-PE, N-PE Test Level 3 at 2kV

Test Level		
Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special
Performance Criterion: B		

3.10.3 Test Procedure

3.10.3.1 For line to line coupling mode, provide a 0.5 kV 1.2/50us voltage surge (at open-circuit condition).

3.10.3.2 At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

3.10.3.3 Different phase angles are done individually.

3.10.3.4 Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

3.10.4 Test Results

PASS

Please refer to Appendix A.10 for Emission and Immunity test results.



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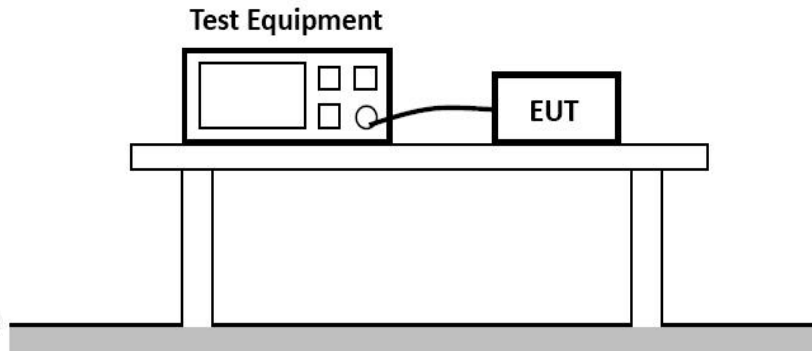
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3.11. Voltage Dips/Interruptions Immunity Test

3.11.1 Test Configuration



3.11.2 Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11)/ EN 61000-4-11: 2004

Test levels and Performance Criterion

Test Level		
Voltage Reduction %U _T	Voltage Dips %U _T	Duration (in Period)
100	0	0.5
100	0	1
30	70	5
Voltage Reduction %U _T	Voltage Dips %U _T	Duration (in Period)
100	0	250
Performance Criterion: B&C		

3.11.3 Test Procedure

3.11.3.1 The interruption is introduced at selected phase angles with specified duration.

3.11.3.2 Record any degradation of performance.

3.11.4 Test Results

PASS

Please refer to Appendix A.11 for Emission and Immunity test results.



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4. GENERAL PERFORMANCE CRITERIA FOR IMMUNITY TEST

4.1. Performance criteria for Continuous phenomena applied to Transmitter (CT)

For equipment of type II or type III that requires a communication link that is maintained during the test, it shall be verified by appropriate means supplied by the manufacturer that the communication link is maintained during each individual exposure in the test sequence. Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

4.2. Performance criteria for Transient phenomena applied to Transmitter (TT)

For equipment of type II or type III that requires a communication link that is maintained during the test, this shall be verified by appropriate means supplied by the manufacturer during each individual exposure in the test sequence. Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

4.3. Performance criteria for Continuous phenomena applied to Receiver (CR)

For equipment of type II or III that requires a communication link that is maintained during the test, it shall be verified by appropriate means supplied by the manufacturer that the communication link is maintained during each individual exposure in the test sequence. Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.

4.4. Performance criteria for Transient phenomena applied to Receiver (TR)

For equipment of type II or type III that requires a communication link that is maintained during the test, this shall be verified by appropriate means supplied by the manufacturer during each individual exposure in the test sequence. Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.



**Performance criteria for ETSI EN 301 489-17 V3.3.1 (2024-09)**

Criteria	During test	After test (i.e. as a result of the application of the test)
A	Shall operate as intended. (See note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.
NOTE: Operate as intended during the test shall be considered as: • For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %. • For equipment that does not support a PER or a FER, (e.g. audio equipment and equipment transmitting sporadic messages) the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.		





5. LIST OF MEASURING EQUIPMENT

LINE CONDUCTED EMISSION

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESR3	102312	2025-03-06	2026-03-05
3	Artificial Mains	R&S	ENV216	101479	2025-05-23	2026-05-22
4	Pulse Limiter	R&S	ESH3-Z2	102750	2025-05-23	2026-05-22
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2025-09-27	2026-09-26
6	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2025-05-22	2026-05-21

RADIATED DISTURBANCE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	3m Semi Anechoic Chamber	MRDIANZI	966	MR009	2025-08-16	2028-08-15
3	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
4	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2024-08-03	2027-08-02
5	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2024-07-13	2027-07-12
6	EMI Test Receiver	R&S	ESPI	101940	2025-05-22	2026-05-21
7	Low-frequency amplifier	SchwarzZBECK	BBV9745	00253	2025-09-27	2026-09-26
8	High-frequency amplifier	JS Denki Pte	PA0118-43	JSPA21009	2025-09-27	2026-09-26
9	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2025-09-27	2026-09-26
10	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2025-05-22	2026-05-21
11	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2025-05-22	2026-05-21

VOLTAGE FLUCTUATION AND FLICKER/HARMONIC CURRENT EMISSIONS

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	HARMONICS&FLICKER MEASUREMENT SYSTEM	EVERFINE	HFM-3000	P630850CD1411116	2025-03-06	2026-03-05
2	HARMONICS&FLICKER TESTING POWER SOURCE	EVERFINE	HFS-4000	P624486CD1411124	2025-03-06	2026-03-05
3	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2025-05-22	2026-05-21

RF ELECTROMAGNETIC FIELD

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	RS Test Software	Tonscend	/	/	N/A	N/A
2	MXG Vector Signal Generator	Agilent	E4438C	MY42081396 (6G)	2025-09-27	2026-09-26
3	3m Semi Anechoic Chamber	MRDIANZI	966	MR009	2025-08-16	2028-08-15
4	RF POWER AMPLIFIER	OPHIR	5225R	1052	2025-05-23	2026-05-22
5	RF POWER AMPLIFIER	OPHIR	5273F	1019	2025-05-23	2026-05-22
6	RF POWER AMPLIFIER	SKET	HAP_0306G-50W	/	2025-05-23	2026-05-22
7	Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	2023-07-14	2026-07-13
8	Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-482	2024-07-20	2027-07-19
9	RS Electric field probe	narda	EP601	611WX80208	2025-05-28	2026-05-27
10	Sound Level meter	BK Precision	735	73500873100 10020	2025-05-22	2026-05-21
11	Audio Analyzer	R&S	UPV	1146.2003K0 2-101721-U	2025-09-27	2026-09-26



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Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
				W		
12	Mouse Simulation	Bruel & Kjaer	4227	A0304216	2025-05-22	2026-05-21
13	Ear Simulation and supply	Bruel & Kjaer	2669.4182.59 35	A0305284	2025-05-22	2026-05-21
14	Acoustical Calibrators	Bruel & Kjaer	4231	A0304215	2025-05-22	2026-05-21
15	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2025-05-22	2026-05-21

ELECTROSTATIC DISCHARGE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	emtest/AMETEK	esd NX30.1	P2411285438	2025-05-26	2026-05-25
2	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2025-05-22	2026-05-21

ELECTRICAL FAST TRANSIENT IMMUNITY

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M	0101-34	2025-05-23	2026-05-22
2	Capacitive coupling clamp	3CTEST	EFTC	EC0441098	2025-05-23	2026-05-22
3	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2025-05-22	2026-05-21

RF COMMON MODE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Simulator	FRANKONIA	CIT-10/75	A126A1195	2025-05-23	2026-05-22
2	CDN	FRANKONIA	CDN-M2+M3	A2210177	2025-05-23	2026-05-22
3	6dB Attenuator	FRANKONIA	DAM25W	1172040	2025-05-23	2026-05-22
4	Electromagnetic coupling injection clamp	ZHINAN	ZN23203	14017	2025-05-23	2026-05-22
5	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2025-05-22	2026-05-21

SURGES, LINE TO LINE AND LINE TO GROUND

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M	0101-34	2025-05-23	2026-05-22
2	Communication wave lightning generator	HTEC	HTSG 70	181701	2025-10-11	2026-10-10
3	Symmetrical data line coupling network	HTEC	HCN 8	182701	2025-10-11	2026-10-10
4	Data line decoupling network	HTEC	HDEC 8	182702	2025-10-11	2026-10-10
5	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2025-05-22	2026-05-21

VOLTAGE DIPS/INTERRUPTIONS IMMUNITY TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Three phase power supply fault simulator	HTEC	HPFS 2003P	234711	2025-01-07	2026-01-06
2	Programmable AC fault power supply	HTEC	HV3P200T	234710	2025-01-07	2026-01-06
3	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2025-05-22	2026-05-21

Note: N/A means no calibration requirement



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6. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files Appendix B for Photographs of Test Setup_EMC

7. PHOTOGRAPHS OF THE EUT

Please refer to separated files Appendix C for Photographs of The EUT.

-----THE END OF REPORT-----





EMC TEST REPORT

For

Mid Ocean Brands B.V.

WIRELESS SPEAKER

Test Model: MO9506

Prepared for : Mid Ocean Brands B.V.
Address : Unit 711 716, 7/F., Tower A, 83 King Lam Street,
Cheung Sha Wan, Kowloon, Hong Kong

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : Room 101/201, Building A, and Room 101/301, Building
C, Juji Industrial Park, Yabianxueziwei, Shajing
Subdistrict, Bao'an District, Shenzhen, Guangdong,
China

Tel : (+86)755-82591330
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Web : www.LCS-cert.com
Mail : webmaster@LCS-cert.com

Date of receipt of test sample : October 29, 2025
Number of tested samples : 2
Sample No. : A251029012-1, A251029012-2
Serial number : Prototype
Date of Test : October 29, 2025 ~ November 07, 2025
Date of Report : November 10, 2025



**EMC TEST REPORT**
EN 55032:2015/A1:2020

Electromagnetic compatibility of multimedia equipment - Emission Requirements

EN 55035:2017/A11:2020

Electromagnetic compatibility of multimedia equipment – Immunity requirements

Report Reference No. : LCSA10295042ED**Date of Issue..... : November 10, 2025****Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.****Address..... : Room 101/201, Building A, and Room 101/301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Subdistrict, Bao'an District, Shenzhen, Guangdong, China****Testing Location/ Procedure.... : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □****Applicant's Name..... : Mid Ocean Brands B.V.****Address..... : Unit 711 716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong****Test Specification****Standard..... : EN 55032:2015/A1:2020
EN 55035:2017/A11:2020
EN IEC 61000-3-2:2019/A2:2024
EN 61000-3-3:2013/A2:2021/AC:2022****Test Report Form No..... : TRF-4-E-006****TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.****Master TRF..... : Dated 2011-03****Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.**

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Test Item Description..... : WIRELESS SPEAKER**Trade Mark..... : N/A****Test Model..... : MO9506****Ratings..... : Please Refer to Page 9****Result : PASS****Compiled by:**

Martin Lee/ Administrators

Supervised by:

Kevin Huang/ RF Manager

Approved by:

Gavin Liang/ Manager



Shenzhen LCS Compliance Testing Laboratory Ltd.

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EMC -- TEST REPORT

Test Report No. : LCSA10295042ED	<u>November 10, 2025</u> Date of issue
---	---

Test Model.....	: MO9506
EUT.....	: WIRELESS SPEAKER
Applicant.....	: Mid Ocean Brands B.V.
Address.....	: Unit 711 716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: Mid Ocean Brands B.V.
Address.....	: Unit 711 716, 7/F., Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Telephone.....	: /
Fax.....	: /
Factory.....	: /
Address.....	: /
Telephone.....	: /
Fax.....	: /

Test Result	PASS
--------------------	-------------

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.





Revision History

Report Version	Issue Date	Revision Content	Revised By
000	November 10, 2025	Initial Issue	--





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1. TEST STANDARDS

The tests were performed according to following standards:

EN 55032:2015/A1:2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements

EN 55035:2017/A11:2020 Electromagnetic compatibility of multimedia equipment - Immunity requirements

EN IEC 61000-3-2:2019/A2:2024 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

EN 61000-3-3:2013/A2:2021/AC:2022 Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection



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2.SUMMARY OF STANDARDS AND RESULTS

2.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

Emission (EN 55032:2015/A1:2020)			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN 55032:2015/A1:2020	Class B	PASS
Conducted disturbance at telecommunication port	EN 55032:2015/A1:2020	Class B	N/A
Radiated disturbance	EN 55032:2015/A1:2020	Class B	PASS
Harmonic current emissions	EN IEC 61000-3-2:2019/A2:2024	Class A	N/A
Voltage fluctuations & flicker	EN 61000-3-3:2013/A2:2021/AC:2022	-----	PASS
Immunity (EN 55035:2017/A11:2020)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	EN 61000-4-2	B	PASS
Radio-frequency, Continuous radiated disturbance	EN IEC 61000-4-3	A	PASS
Electrical fast transient (EFT)	EN 61000-4-4	B	PASS
Surge (Input a.c. power ports)	EN 61000-4-5	B	PASS
Surge (Telecommunication ports)		B	N/A
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6	A	PASS
Power frequency magnetic field	EN 61000-4-8	A	PASS
Voltage dips, >95% reduction	EN IEC 61000-4-11	B	PASS
Voltage dips, 30% reduction		C	PASS
Voltage interruptions		C	PASS

***Note: N/A is an abbreviation for Not Applicable.

Test mode:		
Mode 1	Charging mode	Record





2.2. Description of Performance Criteria

General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;

2.2.1. Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. 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 by what the user may reasonably expect from the equipment if used as intended.

2.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

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 by what the user may reasonably expect from the equipment if used as intended.

2.2.3. Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacture's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.



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3. GENERAL INFORMATION

3.1. Description of Device (EUT)

EUT : WIRELESS SPEAKER

Test Model : MO9506

Vendor code : 103221

Ratings : Input: DC 5V, 0.5A
DC 3.7V by Li-ion Battery(180mAh)

Highest internal frequency (Fx)	Highest measured frequency
$F_x \leq 108 \text{ MHz}$ $108 \text{ MHz} < F_x \leq 500 \text{ MHz}$ $500 \text{ MHz} < F_x \leq 1 \text{ GHz}$ $F_x > 1 \text{ GHz}$	1 GHz 2 GHz 5 GHz $5 \times F_x$ up to a maximum of 6 GHz
NOTE 1 For FM and TV broadcast receivers, F_x is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies. NOTE 2 F_x is defined in EN 55032 Section 3.1.19. Where F_x is unknown, the radiated emission measurements shall be performed up to 6 GHz	





3.2. Description of Test Facility

NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.

3.3. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
SHENZHEN TIANYIN ELECTRONICS CO., LTD	Power Adapter	TPA-46050200 UU	---	CE

Note: Auxiliary equipment is provided by the laboratory.

3.4. External I/O

I/O Port Description	Quantity	Cable
Type-C Port	1	N/A

3.5. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.





3.6. Measurement Uncertainty

Test	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{cisp})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Power Disturbance	Level accuracy (30MHz to 300MHz)	± 2.90 dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.60 dB	± 3.3 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB
Mains Harmonic	Voltage	$\pm 0.510\%$	N/A
Voltage Fluctuations & Flicker	Voltage	$\pm 0.510\%$	N/A
1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus. 2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.			





4. MEASURING DEVICES AND TEST EQUIPMENT

Test Item: Conducted Disturbance

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESR3	102312	2025-03-06	2026-03-05
3	Artificial Mains	R&S	ENV216	101479	2025-05-23	2026-05-22
4	Pulse Limiter	R&S	ESH3-Z2	102750	2025-05-23	2026-05-22
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2025-09-27	2026-09-26

Test Item: Radiated Disturbance (Electric Field)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	3m Semi Anechoic Chamber	MRDIANZI	966	MR009	2025-08-16	2028-08-15
3	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
4	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2024-08-03	2027-08-02
5	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2024-07-13	2027-07-12
6	EMI Test Receiver	R&S	ESPI	101940	2025-05-22	2026-05-21
7	Low-frequency amplifier	SchwarzZBECK	BBV9745	00253	2025-09-27	2026-09-26
8	High-frequency amplifier	JS Denki Pte	PA0118-43	JSPA21009	2025-09-27	2026-09-26
9	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2025-09-27	2026-09-26

Test Item: Harmonic Current

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	HARMONICS&FLICKER MEASUREMENT SYSTEM	EVERFINE	HFM-3000	P630850CD1411116	2025-03-06	2026-03-05
2	HARMONICS&FLICKER TESTING POWER SOURCE	EVERFINE	HFS-4000	P624486CD1411124	2025-03-06	2026-03-05

Test Item: Voltage fluctuation and Flicker

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	HARMONICS&FLICKER MEASUREMENT SYSTEM	EVERFINE	HFM-3000	P630850CD1411116	2025-03-06	2026-03-05
2	HARMONICS&FLICKER TESTING POWER SOURCE	EVERFINE	HFS-4000	P624486CD1411124	2025-03-06	2026-03-05



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**Test Item: Electrostatic Discharge**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	emtest/AMETEK	esd NX30.1	P2411285438	2025-05-26	2026-05-25

Test Item: RF Field Strength Susceptibility

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	RS Test Software	Tonscend	/	/	N/A	N/A
2	MXG Vector Signal Generator	Agilent	E4438C	MY42081396(6G)	2025-09-27	2026-09-26
3	3m Semi Anechoic Chamber	MRDIANZI	966	MR009	2025-08-16	2028-08-15
4	RF POWER AMPLIFIER	OPHIR	5225R	1052	2025-05-23	2026-05-22
5	RF POWER AMPLIFIER	OPHIR	5273F	1019	2025-05-23	2026-05-22
6	RF POWER AMPLIFIER	SKET	HAP_0306G-50 W	/	2025-05-23	2026-05-22
7	Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	2023-07-14	2026-07-13
8	Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-482	2024-07-20	2027-07-19
9	RS Electric field probe	narda	EP601	611WX80208	2025-05-28	2026-05-27

Test Item: Electrical Fast Transient/Burst

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M	0101-34	2025-05-23	2026-05-22
2	Capacitive coupling clamp	3CTEST	EFTC	EC0441098	2025-05-23	2026-05-22

Test Item: Surge

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M	0101-34	2025-05-23	2026-05-22
2	Communication wave lightning generator	HTEC	HTSG 70	181701	2025-10-11	2026-10-10
3	Symmetrical data line coupling network	HTEC	HCN 8	182701	2025-10-11	2026-10-10
4	Data line decoupling network	HTEC	HDEC 8	182702	2025-10-11	2026-10-10

Test Item: Conducted Susceptibility

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Simulator	FRANKONIA	CIT-10/75	A126A1195	2025-05-23	2026-05-22
2	CDN	FRANKONIA	CDN-M2+M3	A2210177	2025-05-23	2026-05-22
3	6dB Attenuator	FRANKONIA	DAM25W	1172040	2025-05-23	2026-05-22
4	Electromagnetic coupling injection clamp	ZHINAN	ZN23203	14017	2025-05-23	2026-05-22



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Test Item: Power Frequency Magnetic Field Susceptibility						
Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power frequency mag-field generator System	EVERFINE	EMS61000-8K	906003	2025-05-23	2026-05-22

Test Item: Voltage Dips						
Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Three phase power supply fault simulator	HTEC	HPFS 2003P	234711	2025-01-07	2026-01-06
2	Programmable AC fault power supply	HTEC	HV3P200T	234710	2025-01-07	2026-01-06

Test Item: Voltage Short Interruptions						
Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Three phase power supply fault simulator	HTEC	HPFS 2003P	234711	2025-01-07	2026-01-06
2	Programmable AC fault power supply	HTEC	HV3P200T	234710	2025-01-07	2026-01-06

Note: N/A means no calibration requirement

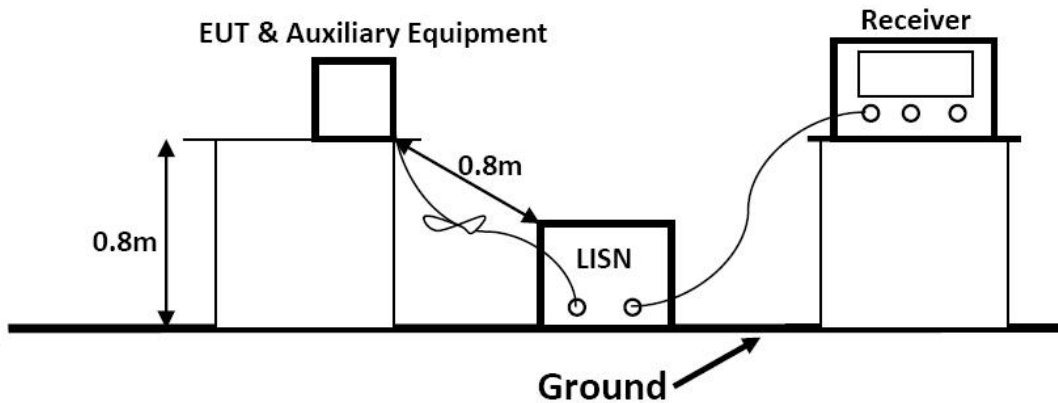




5. TEST RESULTS

5.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

5.1.1. Block Diagram of Test Setup



5.1.2. Test Standard

EN 55032:2015/A1:2020 Class B

Power Line Conducted Emission Limits (Class B)		
Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.
NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

5.1.3. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the EN 55032 requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

5.1.4. Operating Condition of EUT

5.1.4.1. Setup the EUT as shown on Section 5.1.1

5.1.4.2. Turn on the power of all equipments.

5.1.4.3. Let the EUT work in measuring mode(1) and measure it.



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5.1.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided 50-ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55032 regulations during conducted emission measurement.

The bandwidth of the field strength meter is set at 9kHz in 150kHz~30MHz.

The frequency range from 150kHz to 30MHz is investigated.

5.1.6. Test Results

PASS.

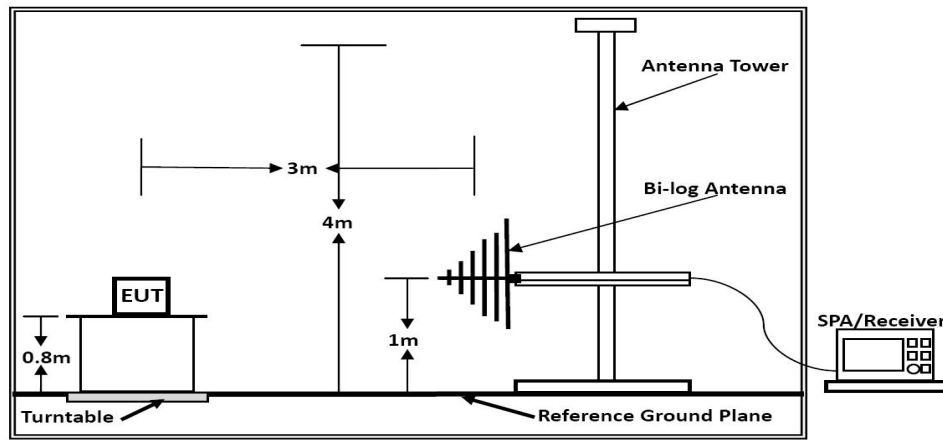
Refer to attached Annexe B.1



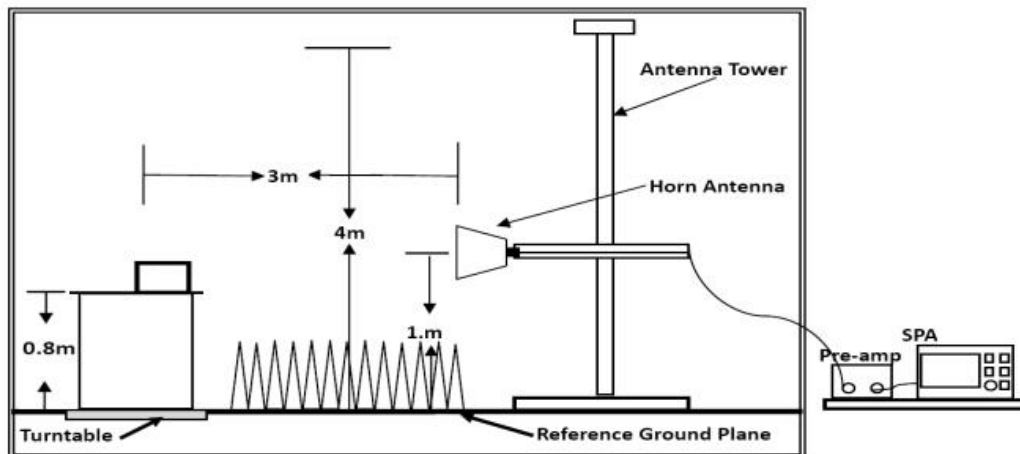


5.2. RADIATED EMISSION MEASUREMENT

5.2.1. Block Diagram of Test Setup



Below 1GHz



Above 1GHz





5.2.2. Test Standard

EN 55032:2015/A1:2020 Class B

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Limits for Radiated Emission Below 1GHz			
Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dBμV/m)	
30 ~ 230	3	40	
230 ~ 1000	3	47	
***Note: (1) The smaller limit shall apply at the combination point between two frequency bands. (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.			
Limits for Radiated Emission Above 1GHz			
Frequency (MHz)	Distance (Meters)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)
1000 ~ 6000	3	74	54
***Note: The lower limit applies at the transition frequency.			

5.2.3. EUT Configuration on Test

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

5.2.4. Operating Condition of EUT

5.2.4.1. Turn on the power.

5.2.4.2. Let the EUT work in the test mode(1) and measure it.

5.2.5. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the EMI test receiver is set at RBW/VBW=120kHz/300kHz.

The frequency range from 30MHz to 1000MHz is checked.

The bandwidth of the Spectrum analyzer is set at RBW/VBW=1MHz/3MHz.

The frequency range from 1GHz to the frequency which about 5th carrier harmonic or 6GHz is checked.

5.2.6. Test Results

PASS.

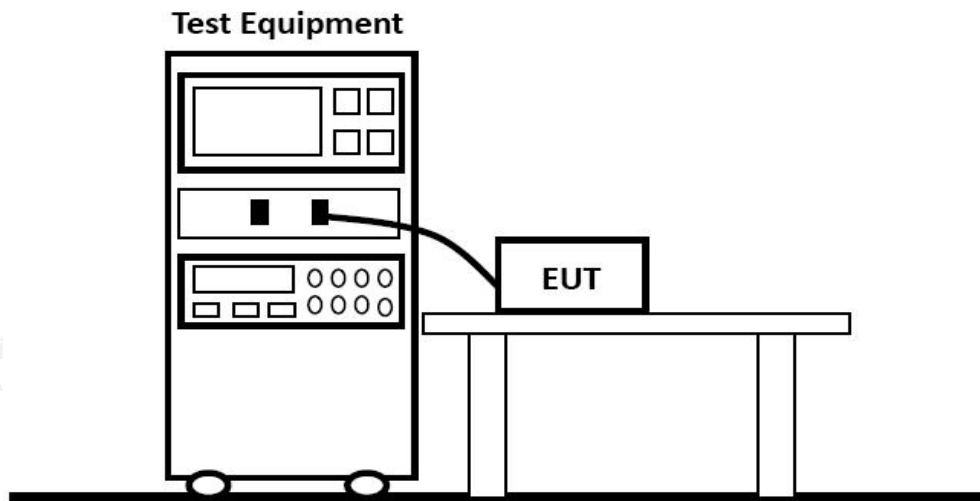
Refer to attached Annexe B.2





5.3. HARMONIC CURRENT EMISSION MEASUREMENT

5.3.1. Block Diagram of Test Setup



5.3.2. Test Standard

EN IEC 61000-3-2:2019/A2:2024

5.3.3. Operating Condition of EUT

Same as Section 5.2.4, except the test setup replaced as Section 5.3.1.

5.3.4. Test Results

N/A.

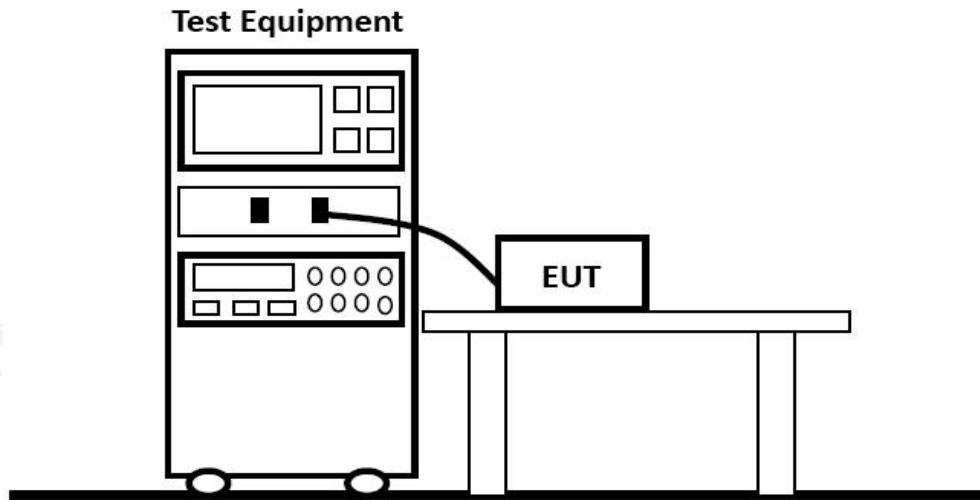
Refer to attached Annexe B.3





5.4. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

5.4.1. Block Diagram of Test Setup



5.4.2. Test Standard

EN 61000-3-3:2013/A2:2021/AC:2022

5.4.3. Operating Condition of EUT

Same as Section 5.2.4, except the test setup replaced as Section 5.4.1.

5.4.4. Test Results

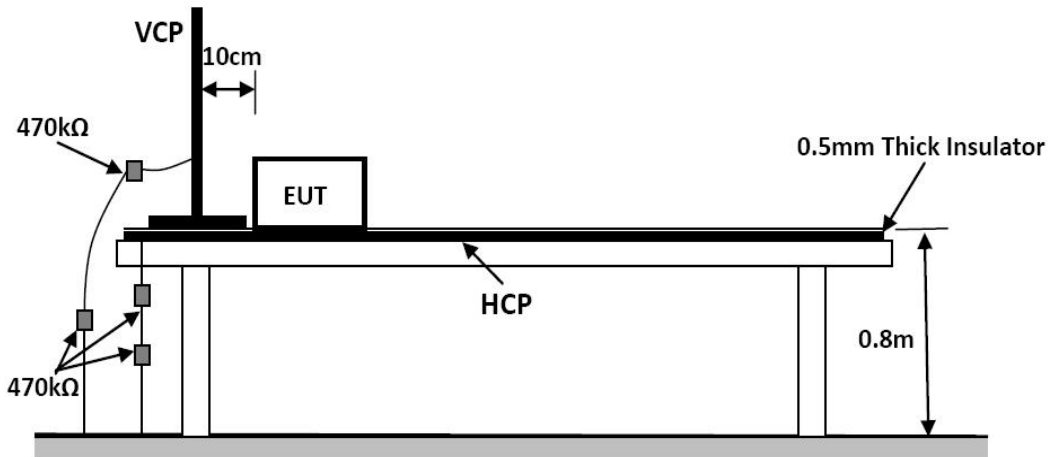
PASS.

Refer to attached Annexe B.4



5.5. ELECTROSTATIC DISCHARGE IMMUNITY TEST

5.5.1. Block Diagram of Test Setup



5.5.2. Test Standard

EN 55035:2017/A11:2020 (EN 61000-4-2, Severity Level: 3 / Air Discharge: $\pm 8\text{KV}$, Level: 2 / Contact Discharge: $\pm 4\text{KV}$)

5.5.3. Severity Levels and Performance Criterion

5.5.3.1. Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	± 2	± 2
2	± 4	± 4
3	± 6	± 8
4	± 8	± 15
X	Special	Special

5.5.3.2. Performance Criterion

Performance Criterion: B

5.5.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.5.1.

5.5.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 5.1.4. Except the test set up replaced by Section 5.5.1.





5.5.6. Test Procedure

5.5.6.1. Air Discharge

This test is done on a non-conductive surfaces. The round discharge tip of the Electrostatic Discharge simulator shall be approached as fast as possible then to touch the EUT. After each discharge, the simulator shall be removed from the EUT. The simulator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

5.5.6.2. Contact Discharge

All the procedure shall be same as air discharge, except using the acute discharge tip. The top end of the Electrostatic Discharge simulator is touch the EUT all the time when the simulator is re-triggered for a new single discharge and repeated 10 times for each pre-selected test point.

5.5.6.3. Indirect Discharge For Horizontal Coupling Plane

The vertical coupling plane(VCP) is placed 0.1m away from EUT. The top end of Electrostatic Discharge simulator should aim at the center of one border of the VCP for at least 25 times discharge.

5.5.6.4. Indirect Discharge For Vertical Coupling Plane

The top end of Electrostatic Discharge simulator should place at the point 0.1m away from EUT on the horizontal coupling plane(HCP). At least 25 times discharge should be done for every pre-selected point around EUT.

Record any performance degradation of the EUT during the test and judge the test result according to ce criterion.

5.5.7. Test Results

PASS.

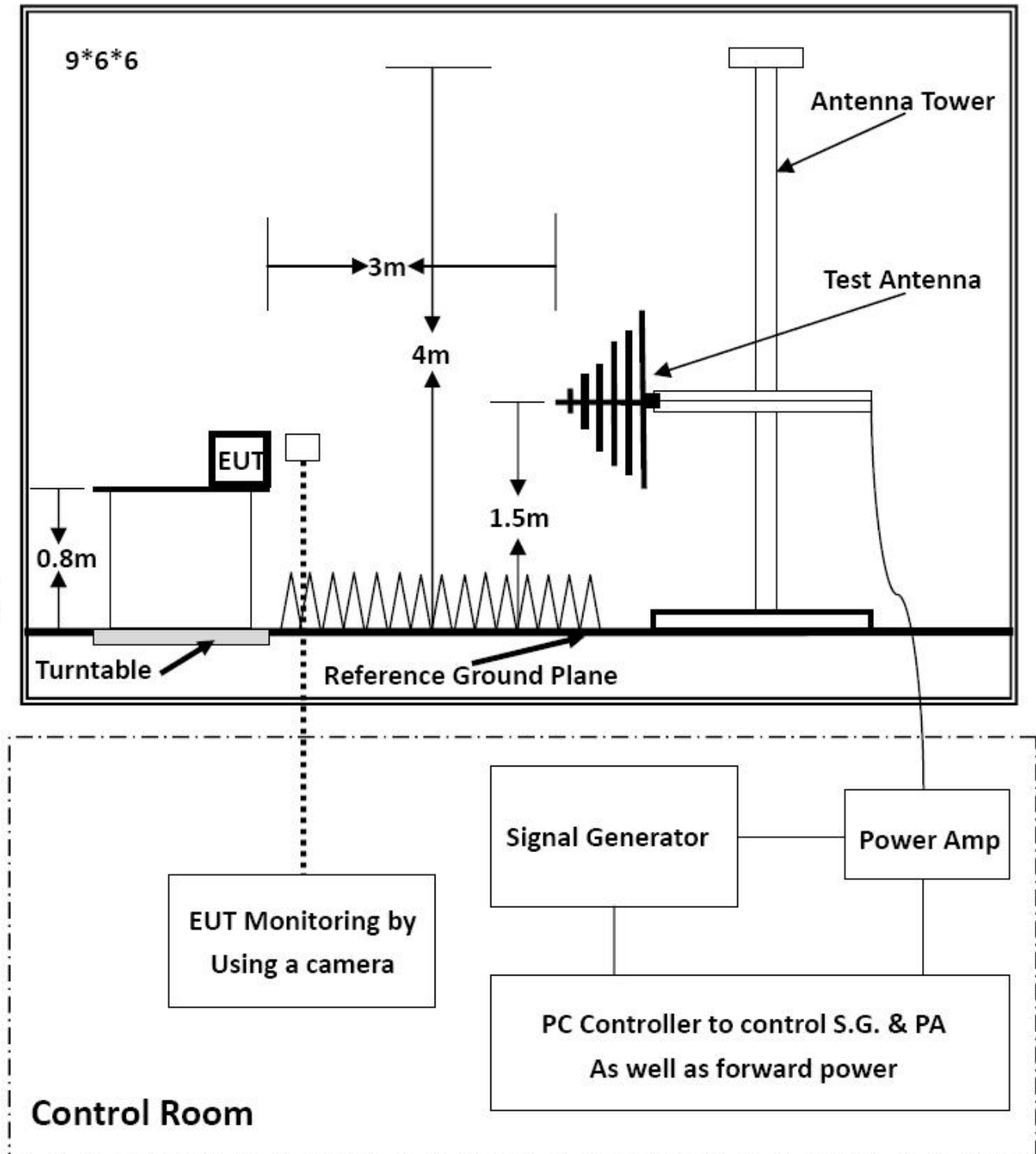
Refer to attached Annexe B.5





5.6. RF FIELD STRENGTH SUSCEPTIBILITY TEST

5.6.1. Block Diagram of Test Setup





5.6.2. Test Standard

EN 55035:2017/A11:2020 (EN 61000-4-3 Severity Level: 2, 3V/m)

5.6.3. Severity Levels and Performance Criterion

5.6.3.1. Severity level

Level	Field Strength (V/m)
1	1
2	3
3	10
X	1

5.6.3.2. Performance Criterion

Performance Criterion: A

5.6.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.6.1.

5.6.5. Operating Condition of EUT

Same as radiated emission measurement, which is listed in Section 5.2.4, except the test setup replaced as Section 5.6.1.

5.6.6. Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD Recording is used to monitor its screen. All the scanning conditions are as following:

Condition of Test	Remark
Fielded Strength	3 V/m (Severity Level 2)
Radiated Signal	Unmodulated
Test Frequency Range (swept test)	80-1000MHz
Test Frequency (spot test)	1800MHz, 2600MHz, 3500MHz, 5000MHz
Dwell time of radiated	0.0015 decade/s
Waiting Time	3 Sec.

5.6.7. Test Results

PASS.

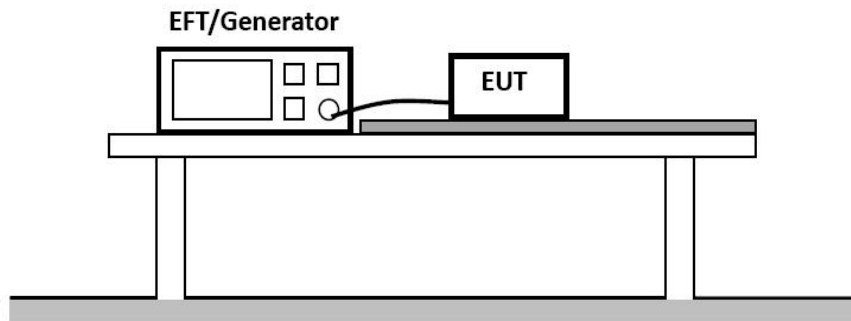
Refer to attached Annexe B.6





5.7. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

5.7.1. Block Diagram of Test Setup



5.7.2. Test Standard

EN 55035:2017/A11:2020 (EN 61000-4-4, Severity Level, Level 2: 1KV)

5.7.3. Severity Levels and Performance Criterion

5.7.3.1. Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 KV	0.25 KV
2	1 KV	0.5 KV
3	2 KV	1 KV
4	4 KV	2 KV
X	Special	Special

5.7.3.2. Performance Criterion

Performance Criterion: B

5.7.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.7.1.

5.7.5. Operating Condition of EUT

5.7.5.1. Setup the EUT as shown in Section 5.7.1.

5.7.5.2. Turn on the power of all equipments.

5.7.5.3. Let the EUT work in test mode(1) and measure it.





5.7.6. Test Procedure

The EUT is put on the table, which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

5.7.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device, which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 mins.

5.7.6.2. For signal lines and control lines ports:

It's unnecessary to test.

5.7.6.3. For DC output line ports:

It's unnecessary to test.

5.7.7. Test Results

PASS.

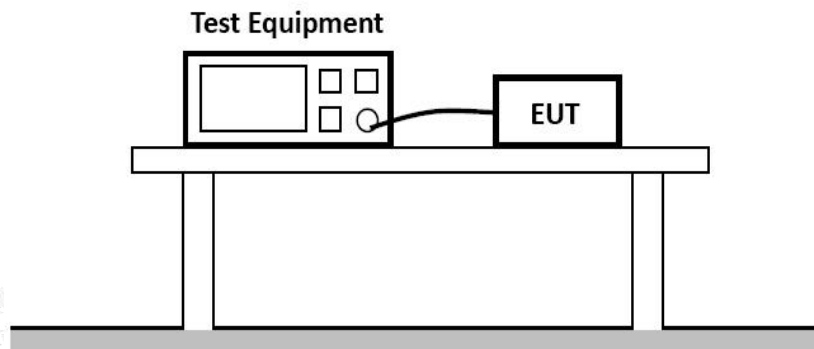
Refer to attached Annexe B.7





5.8. SURGE IMMUNITY TEST

5.8.1. Block Diagram of Test Setup



5.8.2. Test Standard

EN 55035:2017/A11:2020 (EN 61000-4-5, Severity Level: Line to Line: Level 2, 1.0KV, Line to Earth: Level 3, 2.0KV)

5.8.3. Severity Levels and Performance Criterion

5.8.3.1. Severity level

Severity Level	Open-Circuit Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

5.8.3.2. Performance Criterion

Performance Criterion: B

5.8.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.8.1.

5.8.5. Operating Condition of EUT

5.8.5.1. Setup the EUT as shown in Section 5.8.1.

5.8.5.1. Turn on the power of all equipments.

5.8.5.1. Let the EUT work in test mode (1) and measure it.





5.8.6. Test Procedure

5.8.6.1. Set up the EUT and test generator as shown on Section 5.8.1.

5.8.6.2. For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.

5.8.6.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

5.8.6.4. Different phase angles are done individually.

5.8.6.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

5.8.7. Test Results

PASS.

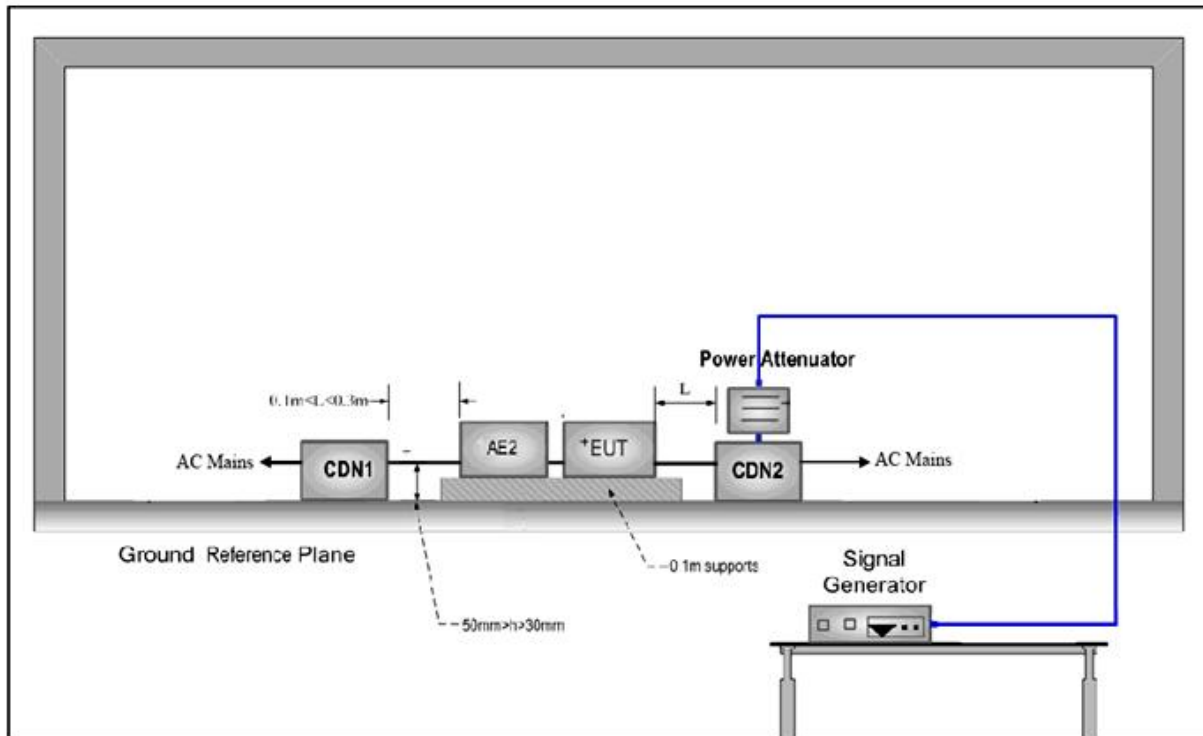
Refer to attached Annexe B.8





5.9. INJECTED CURRENTS SUSCEPTIBILITY TEST

5.9.1. Block Diagram of Test Setup



5.9.2. Test Standard

EN 55035:2017/A11:2020(EN 61000-4-6, Severity Level: Level 2, (0.15MHz ~ 80MHz))

5.9.3. Severity Levels and Performance Criterion

5.9.3.1. Severity level

Level	Field Strength (V)
1	1
2	3
3	10
X	Special

5.9.3.2. Performance Criterion

Performance Criterion: A

5.9.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.9.1.

5.9.5. Operating Condition of EUT

5.9.5.1. Setup the EUT as shown in Section 5.9.1.

5.9.5.2. Turn on the power of all equipments.

5.9.5.3. Let the EUT work in test mode(1) and measure it.



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5.9.6. Test Procedure

- 5.9.6.1. Set up the EUT, CDN and test generators as shown on Section 5.9.1.
- 5.9.6.2. Let the EUT work in test mode and measure it.
- 5.9.6.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 5.9.6.4. The disturbance signal described below is injected to EUT through CDN.
- 5.9.6.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5.9.6.6. The frequency range is swept from 150kHz to 10MHz using 3V signal level, 10MHz to 30MHz using 3V to 1V signal level, 30MHz to 80MHz using 1V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 5.9.6.7. The rate of sweep shall not exceed 1.5×10^{-3} decades/s. where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 5.9.6.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

5.9.7. Test Results

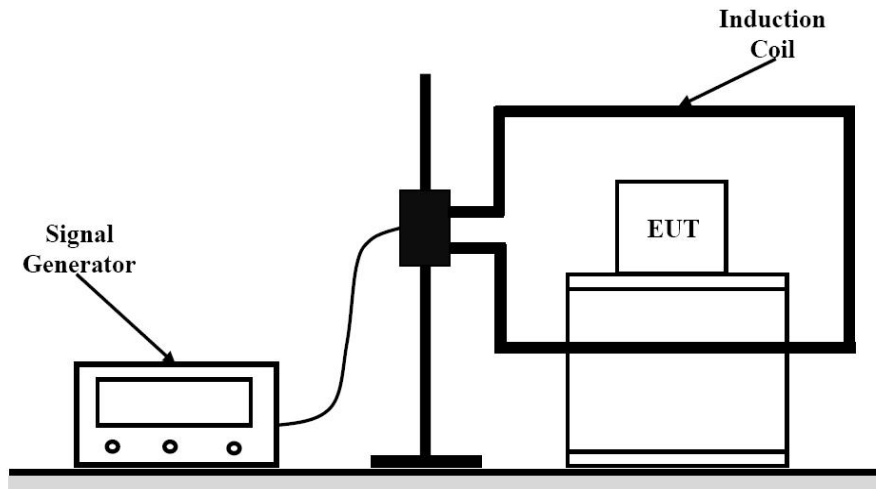
PASS.

Refer to attached Annexe B.9



5.10. MAGNETIC FIELD SUSCEPTIBILITY TEST

5.10.1. Block Diagram of Test Setup



5.10.2. Test Standard

EN 55035:2017/A11:2020 (EN 61000-4-8, Severity Level: Level 1, 1A/m)

5.10.3. Severity Levels and Performance Criterion

5.10.3.1. Severity level

Level	Field Strength (A/m)
1	1
2	3
3	10
4	30
5	100
X	Special

5.10.3.2. Performance Criterion

Performance Criterion: A

5.10.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.10.1.

5.10.5. Test Procedure

EUT is placed on an insulating support of 0.1m high above a table of 0.8m high. There is a minimum 1m*1m ground metallic plane put on this table. EUT is put in the center of the magnetic coil then two orientations of the magnetic coil, horizontal and vertical, shall be rotated in order to expose the EUT to the difference polarization magnetic field. Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

5.10.6. Test Results

PASS.

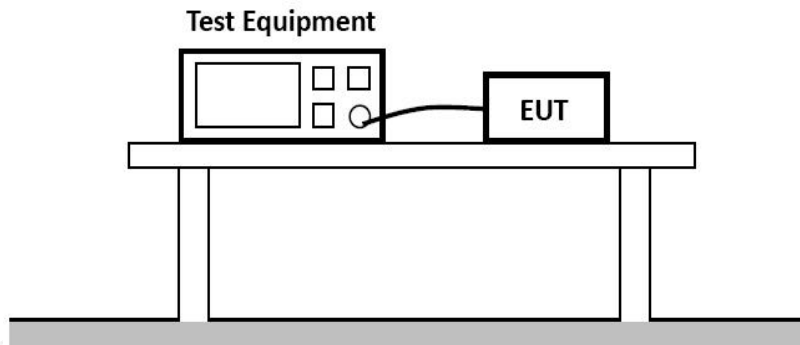
Refer to attached Annexe B.10





5.11. VOLTAGE DIPS AND INTERRUPTIONS TEST

5.11.1. Block Diagram of Test Setup



5.11.2. Test Standard

EN 55035:2017/A11:2020 (EN IEC 61000-4-11)

5.11.3. Severity Levels and Performance Criterion

5.11.3.1. Severity level

Test Level		
Voltage Reduction $\%U_T$	Voltage Dips $\%U_T$	Duration (in Period)
100	0	0.5
100	0	1
30	70	5
Voltage Reduction $\%U_T$	Voltage Dips $\%U_T$	Duration (in Period)
100	0	250

5.11.3.2. Performance Criterion

Performance Criterion: B&C

5.11.4. EUT Configuration on Test

The configuration of EUT is listed in Section 5.11.1.

5.11.5. Operating Condition of EUT

5.11.5.1. Setup the EUT as shown in Section 5.11.1.

5.11.5.2. Turn on the power of all equipments.

5.11.5.3. Let the EUT work in test mode (1) and measure it.

5.11.6. Test Procedure

5.11.6.1. Set up the EUT and test generator as shown on Section 5.11.1.

5.11.6.2. The interruptions are introduced at selected phase angles with specified duration.

5.11.6.3. Record any degradation of performance.

5.11.7. Test Results

PASS.

Refer to attached Annexe B.11

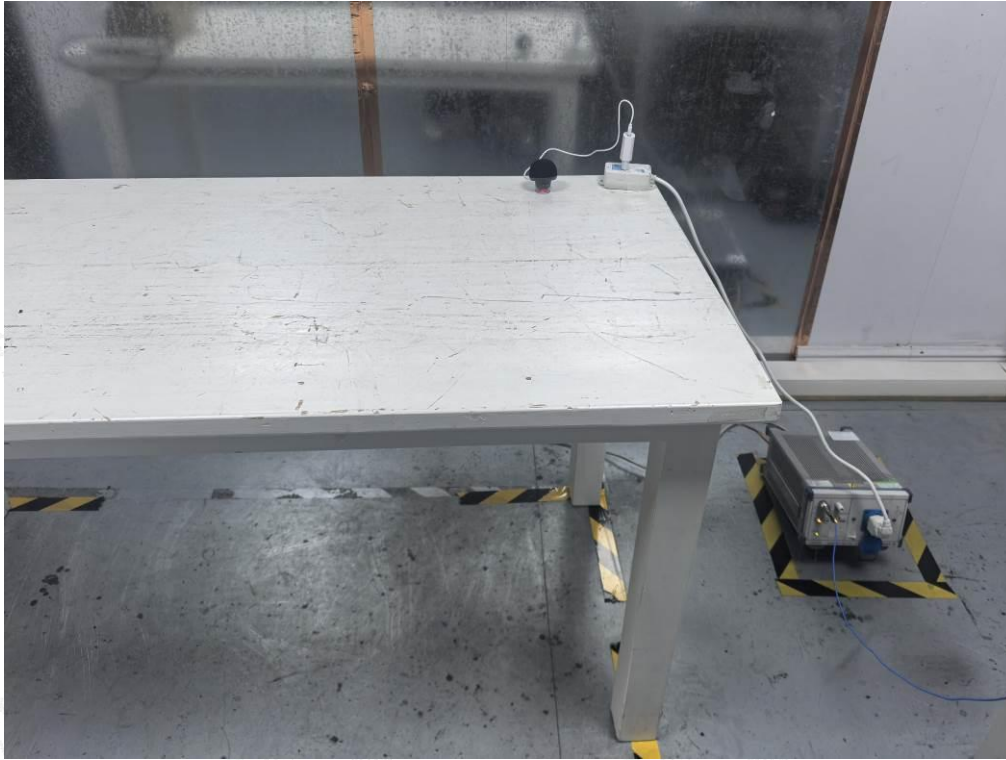




ANNEXE A

(Test photograph)

A.1 Test Setup Photo of Power Line Conducted Measurement

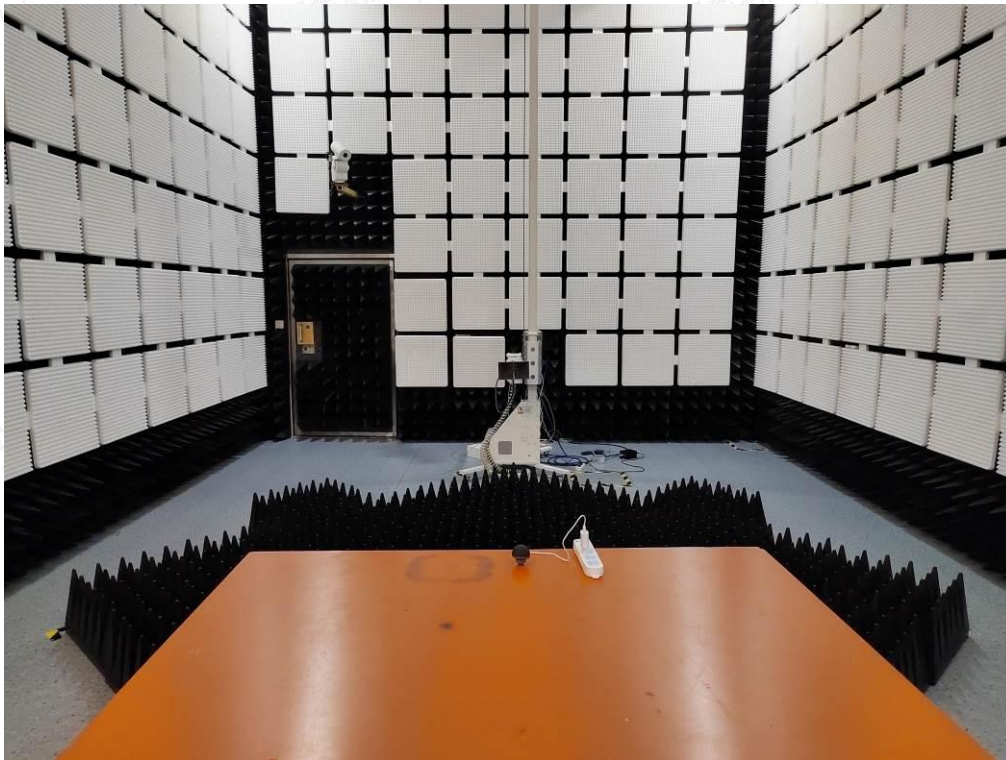


A.2 Test Setup Photo of Radiated Measurement (Below 1 GHz)

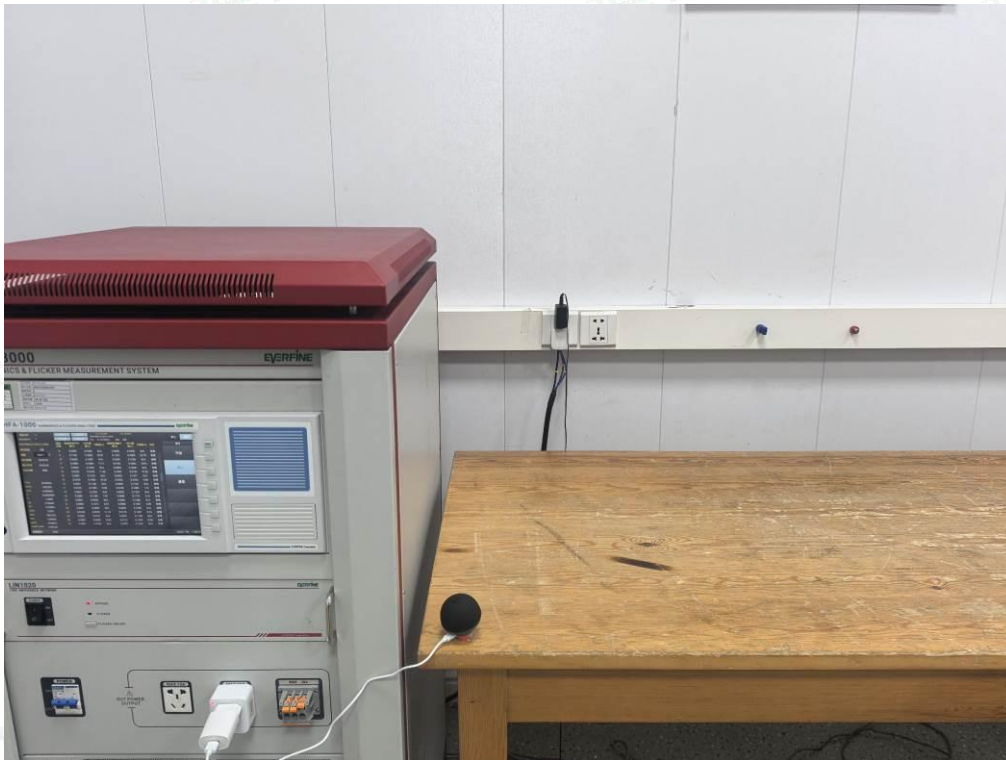




Test Setup Photo of Radiated Measurement (Above 1 GHz)



A.3 Test Setup Photo of Harmonic & Flicker Measurement

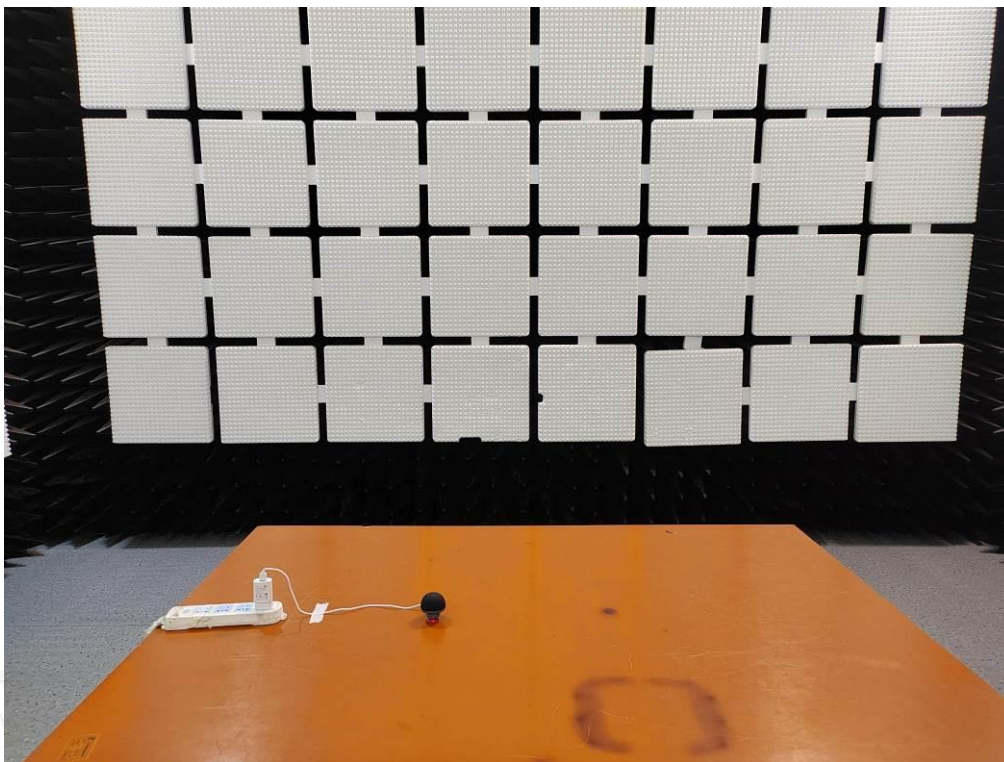




A.4 Test Setup Photo of Electrostatic Discharge Test



A.5 Test Setup Photo of RF Electromagnetic Field Measurement





A.6 Photo of Electrical Fast Transient/Burst Test & Surge Immunity Test



A.7 Test Setup Photo of Injected Currents Susceptibility Test





A.8 Test Setup Photo of Magnetic Field Immunity Test



A.9 Test Setup Photo of Voltage Dips and Interruptions Test



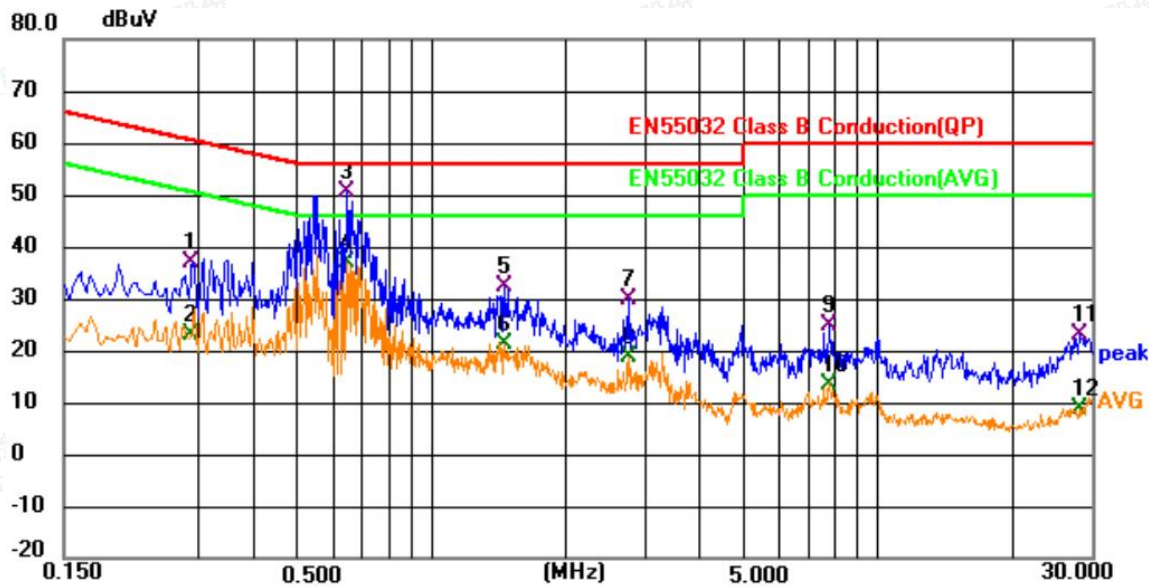
**ANNEXE B**

(Emission and Immunity test results)

B.1 POWER LINE CONDUCTED EMISSION MEASUREMENT

Environmental Conditions:	24.6°C, 56.8% RH
Test Voltage:	AC 230V, 50Hz
Test Model:	MO9506
Test Mode:	Mode 1
Test Engineer:	Jerry Chu
Pol:	Line

Detailed results are shown below



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.289	17.05	19.80	36.85	60.55	-23.70	QP	
2		0.289	3.32	19.80	23.12	50.55	-27.43	AVG	
3	*	0.649	31.18	19.38	50.56	56.00	-5.44	QP	
4		0.649	17.59	19.38	36.97	46.00	-9.03	AVG	
5		1.455	13.09	19.06	32.15	56.00	-23.85	QP	
6		1.455	2.33	19.06	21.39	46.00	-24.61	AVG	
7		2.756	10.78	19.17	29.95	56.00	-26.05	QP	
8		2.756	-0.28	19.17	18.89	46.00	-27.11	AVG	
9		7.787	5.29	19.64	24.93	60.00	-35.07	QP	
10		7.787	-6.37	19.64	13.27	50.00	-36.73	AVG	
11		28.320	3.98	19.01	22.99	60.00	-37.01	QP	
12		28.320	-10.12	19.01	8.89	50.00	-41.11	AVG	



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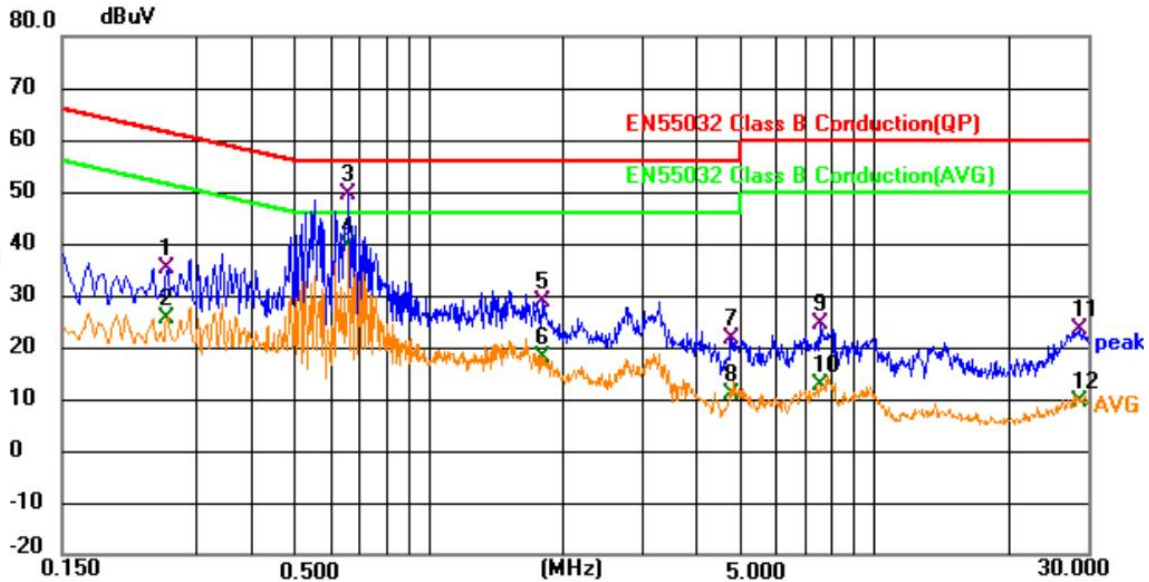
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Environmental Conditions:	24.6°C, 56.8% RH
Test Voltage:	AC 230V, 50Hz
Test Model:	MO9506
Test Mode:	Mode 1
Test Engineer:	Jerry Chu
Pol:	Neutral

Detailed results are shown below



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.258	15.34	19.78	35.12	61.50	-26.38	QP	
2		0.258	5.63	19.78	25.41	51.50	-26.09	AVG	
3		0.658	29.89	19.49	49.38	56.00	-6.62	QP	
4	*	0.658	19.97	19.49	39.46	46.00	-6.54	AVG	
5		1.792	9.66	19.08	28.74	56.00	-27.26	QP	
6		1.792	-1.19	19.08	17.89	46.00	-28.11	AVG	
7		4.780	2.66	18.86	21.52	56.00	-34.48	QP	
8		4.780	-8.07	18.86	10.79	46.00	-35.21	AVG	
9		7.535	4.62	19.78	24.40	60.00	-35.60	QP	
10		7.535	-7.17	19.78	12.61	50.00	-37.39	AVG	
11		28.703	4.42	18.84	23.26	60.00	-36.74	QP	
12		28.703	-9.45	18.84	9.39	50.00	-40.61	AVG	



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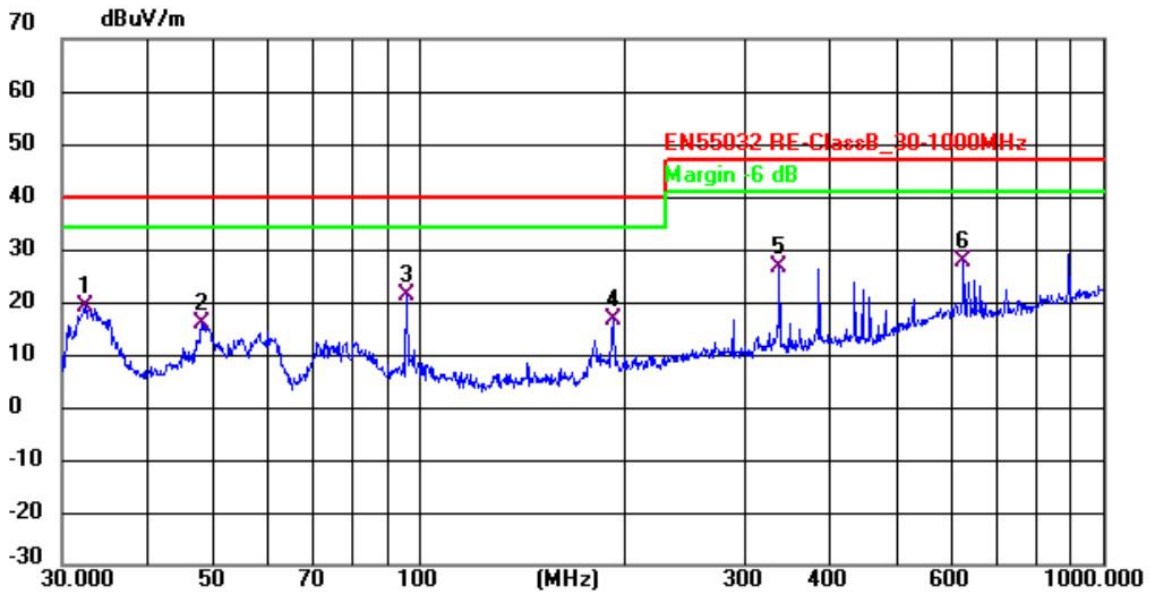
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**B.2 Radiated Disturbance Test Results (30MHz to 1000MHz)**

Environmental Conditions:	23.8°C, 52.3% RH
Test Voltage:	AC 230V, 50Hz
Test Model:	MO9506
Test Mode:	Mode 1
Test Engineer:	Jerry Chu
Pol:	Horizontal

Detailed results are shown below

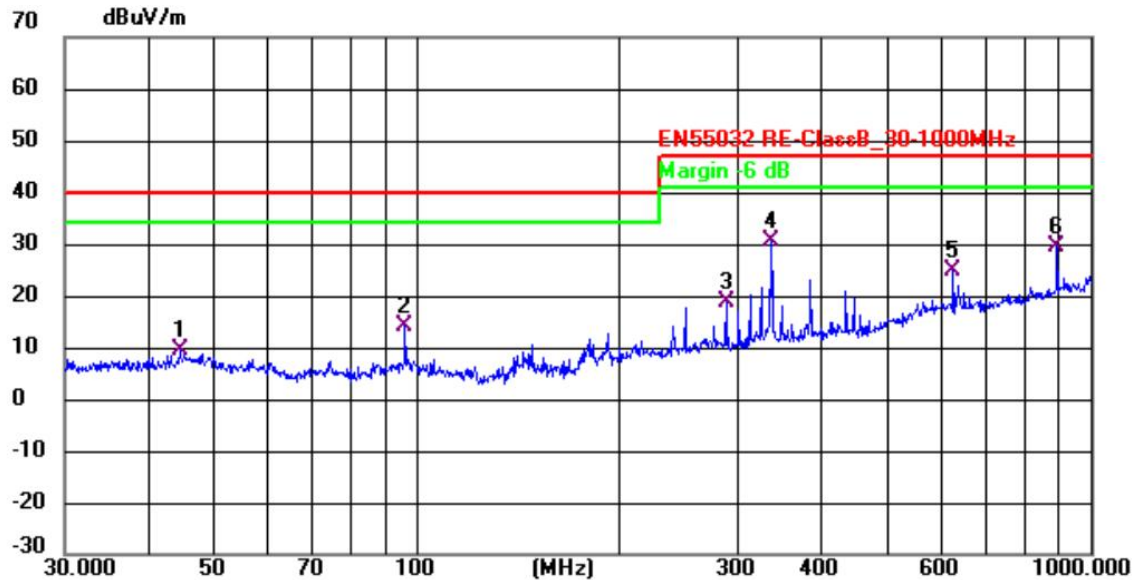


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		32.4060	38.50	-19.33	19.17	40.00	-20.83	QP	
2		47.9940	34.19	-18.19	16.00	40.00	-24.00	QP	
3	*	95.7622	41.07	-19.80	21.27	40.00	-18.73	QP	
4		191.7450	35.71	-19.19	16.52	40.00	-23.48	QP	
5		336.0351	41.51	-14.95	26.56	47.00	-20.44	QP	
6		625.0780	38.03	-10.23	27.80	47.00	-19.20	QP	





Environmental Conditions:	23.8°C, 52.3% RH
Test Voltage:	AC 230V, 50Hz
Test Model:	MO9506
Test Mode:	Mode 1
Test Engineer:	Jerry Chu
Pol:	Vertical
Detailed results are shown below	

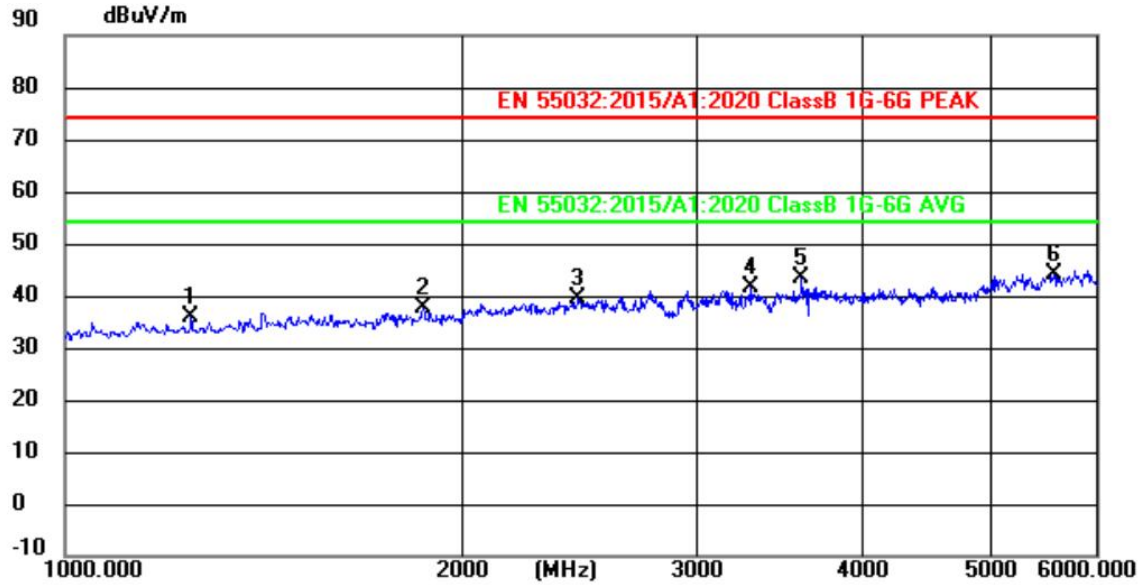


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		44.4307	27.50	-18.16	9.34	40.00	-30.66	QP	
2		96.0985	33.83	-19.77	14.06	40.00	-25.94	QP	
3		287.9904	35.04	-16.24	18.80	47.00	-28.20	QP	
4	*	336.0351	45.62	-14.95	30.67	47.00	-16.33	QP	
5		625.0780	34.95	-10.23	24.72	47.00	-22.28	QP	
6		890.7277	36.33	-7.02	29.31	47.00	-17.69	QP	





Test Model	MO9506	Test Mode	Mode 1
Environmental Conditions	23.8°C, 52.3% RH	Test Engineer	Jerry Chu
Pol.	Horizontal	Detector Function	Peak+Average
Distance	3m	Test Voltage	AC 230V/50Hz

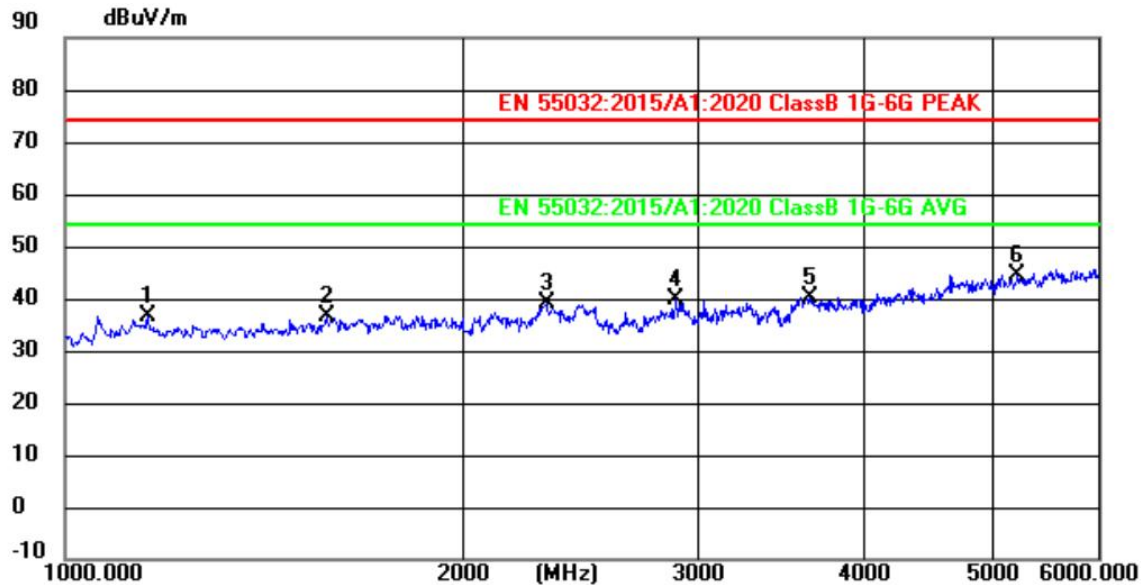


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		1245.0000	48.72	-12.65	36.07	74.00	-37.93	peak	
2		1865.0000	49.27	-11.56	37.71	74.00	-36.29	peak	
3		2445.0000	48.14	-8.84	39.30	74.00	-34.70	peak	
4		3300.0000	49.08	-7.36	41.72	74.00	-32.28	peak	
5		3600.0000	50.27	-6.91	43.36	74.00	-30.64	peak	
6	*	5585.0000	45.53	-1.33	44.20	74.00	-29.80	peak	





Test Model	MO9506	Test Mode	Mode 1
Environmental Conditions	23.8°C, 52.3% RH	Test Engineer	Jerry Chu
Pol.	Vertical	Detector Function	Peak+Average
Distance	3m	Test Voltage	AC 230V/50Hz



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1155.0000	49.28	-12.50	36.78	74.00	-37.22	peak	
2		1575.0000	48.87	-12.19	36.68	74.00	-37.32	peak	
3		2305.0000	47.68	-8.59	39.09	74.00	-34.91	peak	
4		2890.0000	48.31	-8.37	39.94	74.00	-34.06	peak	
5		3640.0000	47.33	-7.00	40.33	74.00	-33.67	peak	
6	*	5225.0000	46.29	-1.78	44.51	74.00	-29.49	peak	

Note:

- Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- Measurements above show only up to 6 maximum emissions noted.
- Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- Factor = Antenna Factor + Cable Loss + Amplifier Factor
Emission Level = Reading level + Factor
Margin = Emission Level - Limit



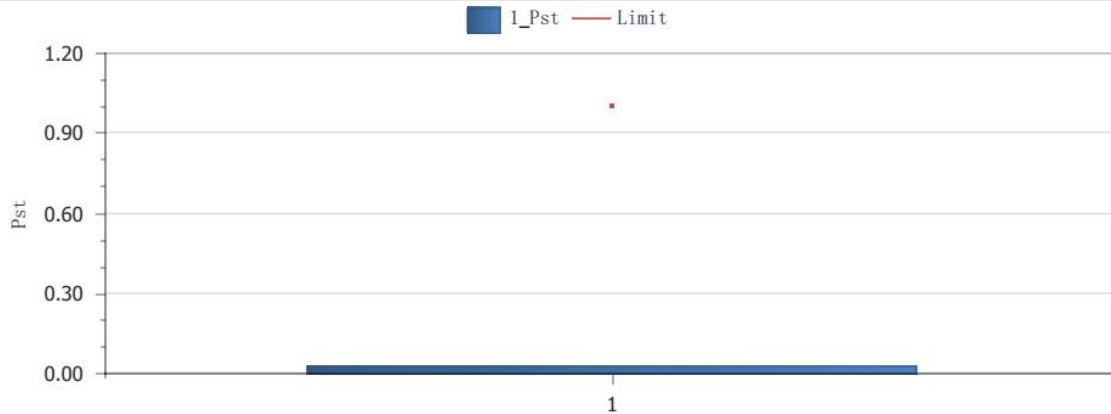


B.3 HARMONIC CURRENT EMISSION MEASUREMENT

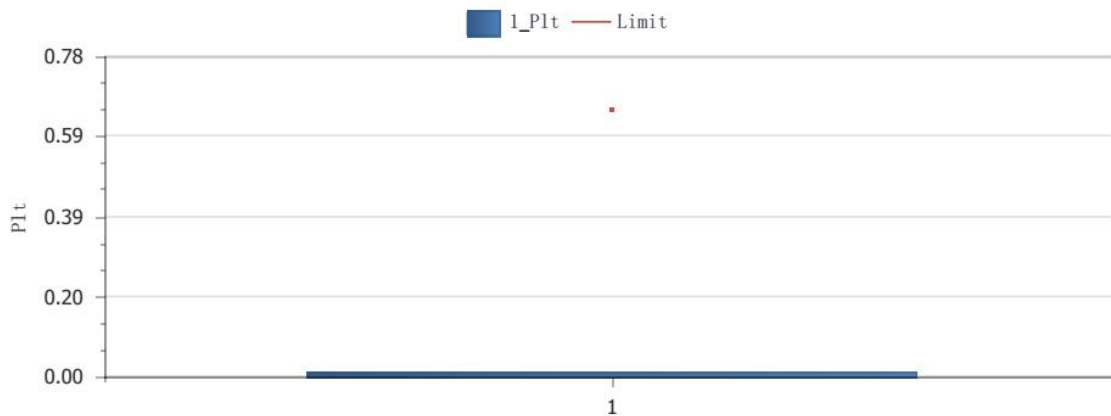
Because power of EUT less than 75W, According standard EN 61000-3-2, Harmonic current unnecessary to test.

B.4 VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

Test Model	MO9506	Test Engineer	Jerry Chu
Environmental Conditions	24.5°C, 55.4% RH	Test Voltage	AC 230V/50Hz



Plt and Limit



Relevant Parameter and Judgment During Test Period

Voltage at end of test	230.135V		
Voltage Fluctuation and Flicker	Test Value	Test Limit	Result
Tmax	0ms	500ms	Pass
dc	0.00%	3.30%	Pass
dmax	0.00%	4.00%	Pass
Pst	0.026	1.000	Pass
Plt	0.011	0.650	Pass

Elem1 Test Parameters

Count	dc (%)	dmax (%)	Tmax (ms)	Pst	Plt
1	0.00	0.00	0.00	0.026	0.011



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**B.5 ELECTROSTATIC DISCHARGE IMMUNITY TEST**

Electrostatic Discharge Test Results			
Standard	☐ IEC 61000-4-2 ☒ EN 61000-4-2		
Applicant	Mid Ocean Brands B.V.		
EUT	WIRELESS SPEAKER	Temperature	22.3°C
M/N	MO9506	Humidity	52.4%
Criterion	B	Pressure	1021mbar
Test Mode	Mode 1	Test Engineer	Jerry Chu

Air Discharge							
Test Points	Test Levels			Results			
	± 2kV	± 4kV	± 8kV	Passed	Fail	Performance Criterion	
Front	☒	☒	☒	☒	☐	☐ A	☒ B
Back	☒	☒	☒	☒	☐	☐ A	☒ B
Left	☒	☒	☒	☒	☐	☐ A	☒ B
Right	☒	☒	☒	☒	☐	☐ A	☒ B
Top	☒	☒	☒	☒	☐	☐ A	☒ B
Bottom	☒	☒	☒	☒	☐	☐ A	☒ B
Contact Discharge							
Test Points	Test Levels			Results			
	± 2 kV	±4 kV		Passed	Fail	Performance Criterion	
Front	☒	☒		☒	☐	☐ A	☒ B
Back	☒	☒		☒	☐	☐ A	☒ B
Left	☒	☒		☒	☐	☐ A	☒ B
Right	☒	☒		☒	☐	☐ A	☒ B
Top	☒	☒		☒	☐	☐ A	☒ B
Bottom	☒	☒		☒	☐	☐ A	☒ B
Discharge To Horizontal Coupling Plane							
Side of EUT	Test Levels			Results			
	± 2 kV	± 4 kV		Passed	Fail	Performance Criterion	
Front	☒	☒		☒	☐	☐ A	☒ B
Back	☒	☒		☒	☐	☐ A	☒ B
Left	☒	☒		☒	☐	☐ A	☒ B
Right	☒	☒		☒	☐	☐ A	☒ B
Discharge To Vertical Coupling Plane							
Side of EUT	Test Levels			Results			
	± 2 kV	± 4 kV		Passed	Fail	Performance Criterion	
Front	☒	☒		☒	☐	☐ A	☒ B
Back	☒	☒		☒	☐	☐ A	☒ B
Left	☒	☒		☒	☐	☐ A	☒ B
Right	☒	☒		☒	☐	☐ A	☒ B



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**B.6 RF FIELD STRENGTH SUSCEPTIBILITY TEST****RF Field Strength Susceptibility Test Results**

Standard	☐ IEC 61000-4-3 ☒ EN 61000-4-3		
Applicant	Mid Ocean Brands B.V.		
EUT	WIRELESS SPEAKER	Temperature	23.2°C
M/N	MO9506	Humidity	53.9%
Field Strength	3 V/m	Criterion	A
Test Mode	Mode 1	Test Engineer	Jerry Chu
Test Frequency	80MHz to 1000MHz (swept test) 1800MHz, 2600MHz, 3500MHz, 5000MHz (spot test)		
Modulation	☐ None ☐ Pulse ☒ AM 1KHz 80%		
Steps	1%		

	Horizontal	Vertical
Front	PASS	PASS
Right	PASS	PASS
Rear	PASS	PASS
Left	PASS	PASS

Test Equipment:

1. Signal Generator: 2031 (MARCONI)

Note:



**B.7 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST****Electrical Fast Transient/Burst Test Results**

Standard	☐ IEC 61000-4-4 ☒ EN 61000-4-4		
Applicant	Mid Ocean Brands B.V.		
EUT	WIRELESS SPEAKER	Temperature	22.5°C
M/N	MO9506	Humidity	52.4%
Test Mode	Mode 1	Criterion	B
Test Engineer	Jerry Chu		

Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
L-N	1KV	PASS	PASS
L-PE			
N-PE			
L-N-PE			
Signal Line			
I/O Cable			

Note:



**B.8 SURGE IMMUNITY TEST**

Surge Immunity Test Result			
Standard	☐ IEC 61000-4-5 ☒ EN 61000-4-5		
Applicant	Mid Ocean Brands B.V.		
EUT	WIRELESS SPEAKER	Temperature	23.8℃
M/N	MO9506	Humidity	53.4%
Test Mode	Mode 1	Criterion	B
Test Engineer	Jerry Chu		

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
L-N	+	90°	5	1.0	PASS
	-	270°	5	1.0	PASS
L-PE					
N-PE					
Signal Line					
Note					



**B.9 INJECTED CURRENTS SUSCEPTIBILITY TEST**

Injected Currents Susceptibility Test Results			
Standard	☐ IEC 61000-4-6 ☒ EN 61000-4-6		
Applicant	Mid Ocean Brands B.V.		
EUT	WIRELESS SPEAKER	Temperature	22.3°C
M/N	MO9506	Humidity	53.6%
Test Mode	Mode 1	Criterion	A
Test Engineer	Jerry Chu		

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 10	AC Mains	3V	A	PASS
10 ~ 30		3V ~ 1V		
30 ~ 80		1V		

Remark:

1. Modulation Signal:1kHz 80% AM

Note:





B.10 MAGNETIC FIELD SUSCEPTIBILITY TEST

Magnetic Field Immunity Test Result			
Standard	☐ IEC 61000-4-8 ☒ EN 61000-4-8		
Applicant	Mid Ocean Brands B.V.		
EUT	WIRELESS SPEAKER	Temperature	23.2℃
M/N	MO9506	Humidity	53.7%
Test Mode	Mode 1	Criterion	A
Test Engineer	Jerry Chu		

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
1	5 mins	X	A	PASS
1	5 mins	Y	A	PASS
1	5 mins	Z	A	PASS

Note:



**B.11 VOLTAGE DIPS AND INTERRUPTIONS TEST**

Voltage Dips And Interruptions Test Results

Standard	☐ IEC 61000-4-11 ☒ EN 61000-4-11		
Applicant	Mid Ocean Brands B.V.		
EUT	WIRELESS SPEAKER	Temperature	22.6°C
M/N	MO9506	Humidity	54.1%
Test Mode	Mode 1	Criterion	B&C
Test Engineer	Jerry Chu		

Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Criterion	Result
0	100	0.5P	B	PASS
70	30	25P	C	PASS
0	100	250P	C	PASS

Note:





ANNEXE C

(External and internal photos of the EUT)

Please refer to separated files Appendix C for Photographs of The EUT.

----- THE END OF TEST REPORT -----

