TEST REPORT

MANUFACTURER	:	Innovative Eyewear, Inc.
PRODUCT NAME	:	Active noise cancelling stereo Bluetooth headphone
MODEL NAME	:	LCD00X
BRAND NAME	:	Lucyd, Nautica, Eddie Bauer, Reebok
STANDARD(S)	:	ETSI EN 301 489-1 V2.2.3 (2019-11) Draft ETSI EN 301 489-17 V3.2.6 (2023-06) EN 55032:2015+A11:2020 EN 55035:2017+A11:2020
RECEIPT DATE	:	2023-06-29
TEST DATE	:	2023-07-04 to 2023-07-17
ISSUE DATE	:	2023-09-21

Edited by: Chen Bilian(Rapporteur)

Approved by: Xiao Xiong(Supervisor)

MORLAB
Shenzhen Morlab Communications Technology Co., Ltd.
FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen ,GuangDong Province, P. R. China
Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

DIRECTORY

1. Technical Information 3
1.1. Manufacturer and Factory Information 3
1.2. Equipment Under Test (EUT) Description 3
2. Test Results 5
2.1. Applied Reference Documents 5
2.2. EUT Setup and Operating Conditions 7
3. Emission Tests 8
3.1. Radiated Emission 8
3.2. Conducted Emission- AC Port 15
4. Immunity Tests 19
4.1. EUT Operation and Performance Criteria 19
4.2. Electrostatic Discharge Immunity 21
4.3. Radiated Immunity 25
4.4. Electrical Fast Transient / Burst Immunity 27
4.5. Surge Immunity 29
4.6. Conducted Immunity 31
4.7. Voltage Dips and Interruptions Immunity 33
Annex A Photographs of Test Setup 35
Annex B Test Uncertainty 40
Annex C Testing Laboratory Information 42

Change History		
Version	Date	Reason for change
1.0	2023-09-21	First edition

1. Technical Information

Note: Provide by manufacturer.

1.1. Manufacturer and Factory Information

Manufacturer:	Innovative Eyewear, Inc.
Manufacturer Address:	11900 Biscayne Bl, Suite 630, North Miami, FL 33181-2743, United States
Factory:	Hotus Technology (Shenzhen) Co., Ltd.
Factory Address:	Room 401, Building 2, No. 7, Yongtai East Road, East District, Baishixia Community, Fuyong Street, Baoan District, Shenzhen

1.2. Equipment Under Test (EUT) Description

Product Name:	Active noise cancelling stereo Bluetooth headphone	
EUT No.:	1#	
Hardware Version:	HT-LCD006-V02	
Software Version:	Lucyd Lyte-1735-b4f52dd3	
Frequency Range:	Bluetooth: 2402 MHz ~ 2480 MHz	
Accessory:	**AC Adapter**	
	Brand Name:	Dongguan XieYang Electronics co., Ltd
	Model No.:	XY-00340501000
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V~50-60Hz, 0.15A
	Rated Output:	5V⎓1A
	Manufacturer:	Dongguan XieYang Electronics co., Ltd
	Battery	
	Brand Name:	N/A
	Model No.:	UTG PL450833
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	100mAh
	Rated Voltage:	3.7V
	Charge Limit:	4.2V
	Manufacturer:	ShenZhen Yotoga Technology Co.,Ltd

Note:

1. According to the certificate holder, they declared that the product name: Active noise cancelling stereo Bluetooth headphone, with model name: LCD00X has multiple brands, only different for brand name, the others are the same.

2. For a more detailed description, please refer to specification or user's manual supplied by the applicant and/or manufacturer.

2. Test Results

2.1. Applied Reference Documents

The objective of the report is to perform testing according to following standards for CE marking:

No.	Identity	Document Title
1	ETSI EN 301 489-1 V2.2.3 (2019-11)	ElectroMagnetic Compatibility (EMC)standard for radio equipment and services;Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility
2	Draft ETSI EN 301 489-17 V3.2.6 (2023-06)	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
3	EN 55032:2015+A11 :2020	Electromagnetic compatibility of multimedia equipment - Emission requirements
4	EN 55035:2017+A11 :2020	Electromagnetic compatibility of multimedia equipment - Immunity requirements
5	EN 61000-3-3:2013	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
6	EN 61000-3-2:2014	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

Test detailed items required and results are listed as below (the latest versions of basic standards are applied):

No.	Base Standard	Test Type	Test Engineer	Result	Method Determination Remark
Emission					
1	EN 55032	Radiated Emission	Lin Jiayong	PASS	No deviation
2	EN 55032	Conducted Emission-AC Port	Fan Zehang	PASS	No deviation
3	EN 55032	Conducted Emission-	N/A	N/A[Note 1]	No deviation

		DC Port			
4	EN 55032	Conducted Emission - Wired Network Port	N/A	N/A[Note 1]	No deviation
5	EN 61000-3-2	Harmonic Current Emissions	N/A	N/A[Note 1]	No deviation
6	EN 61000-3-3	Voltage Fluctuations and Flicker	N/A	N/A[Note 1]	No deviation
Immunity					
7	EN 61000-4-2	Electrostatic Discharge Immunity	Fan Zehang	PASS	No deviation
8	EN 61000-4-3	Radiated Immunity	Zhang Bangyi	PASS	No deviation
9	EN 61000-4-4	Electrical Fast Transient/Burst Immunity	Wang Deyong	PASS	No deviation
10	ISO 7637-1, -2	Transients and Surges, DC Ports	N/A	N/A[Note 1]	No deviation
11	EN 61000-4-5	Surge Immunity	Wang Deyong	PASS	No deviation
12	EN 61000-4-6	Conducted Immunity	Zhang Bangyi	PASS	No deviation
13	EN 61000-4-11	Voltage Dips and Interruptions Immunity	Wang Deyong	PASS	No deviation

Note 1: The test item is not applicable.

Note 2: Additions to, deviation, or exclusions from the method shall be judged in the"method determination" column of add,deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 3: When the test result is a critical value,we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

2.2. EUT Setup and Operating Conditions

Test Item	
Radiated Emission	
Mode 1 :	**EUT + Bluetooth Idle + USB Cable + AC Adapter + Battery + Charging Mode**
Mode 2 :	EUT + Bluetooth Link + Battery + Mobile Phone + Play Music Mode
Conducted Emission	
Mode 1 :	**EUT + Bluetooth Idle + USB Cable + AC Adapter + Battery + Charging Mode**
RS Test	
Mode 1 :	EUT + Bluetooth Idle + USB Cable + AC Adapter + Battery + Charging Mode
Mode 2 :	EUT + Bluetooth Link + Battery + Mobile Phone + Play Music Mode
ESD Test	
Mode 1 :	EUT + Bluetooth Idle + USB Cable + AC Adapter + Battery + Charging Mode
Mode 2 :	EUT + Bluetooth Link + Battery + Mobile Phone + Play Music Mode
CS Test	
Mode 1 :	EUT + Bluetooth Idle + USB Cable + AC Adapter + Battery + Charging Mode
EMS Test (EFT, Surge, Dip)	
Mode 1 :	EUT + Bluetooth Idle + USB Cable + AC Adapter + Battery + Charging Mode
Remark: The above test mode in boldface (Mode 1) was the worst case of conducted emission test, only the test data of these modes were reported. The above test mode in boldface (Mode 1) was the worst case of radiated emission test, only the test data of these modes were reported.	

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 - 106

During the Electrostatic Discharge Immunity measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	22
Relative Humidity (%):	51
Atmospheric Pressure (kPa):	101

3. Emission Tests

3.1. Radiated Emission

3.1.1. Limits of Radiated Emission

Frequency Range (MHz)	Quasi-Peak Limit (dBμV/m)	--
30 – 230	40	--
230 – 1000	47	--
Frequency Range (MHz)	**Peak Limit (dBμV/m)**	**Average Limit (dBμV/m)**
1000-3000	70	50
3000-6000	74	54

Note:

1. The limit is applicable to 3m measurement distance.
2. The lower limit shall apply at the transition frequency.
3. Additional provisions may be required for cases where interference occurs.

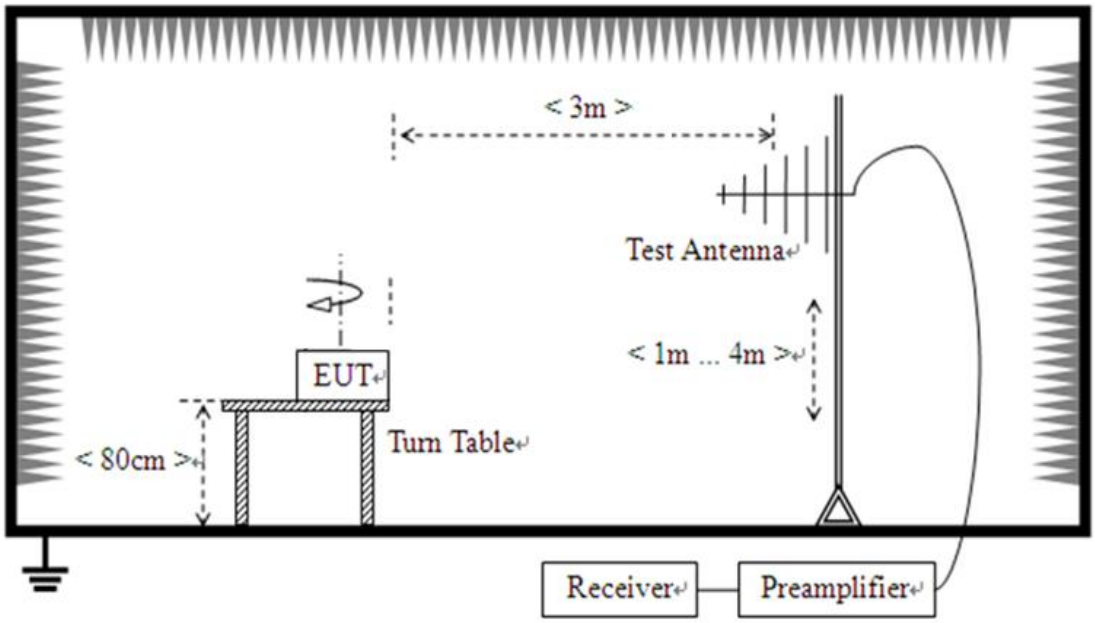
3.1.2. Test Procedure

1. The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.
2. For each suspected emission, the EUT is arranged to its worst case and then the Test Antenna is tuned to the heights from 1 to 4m and the Turn Table is tuned from 0 to 360 degrees to find the maximum reading.
3. The Test Antenna height is varied from 1 to 4m above the ground to determine the maximum value of the field strength. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests.
4. The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with QP and AV detectors.

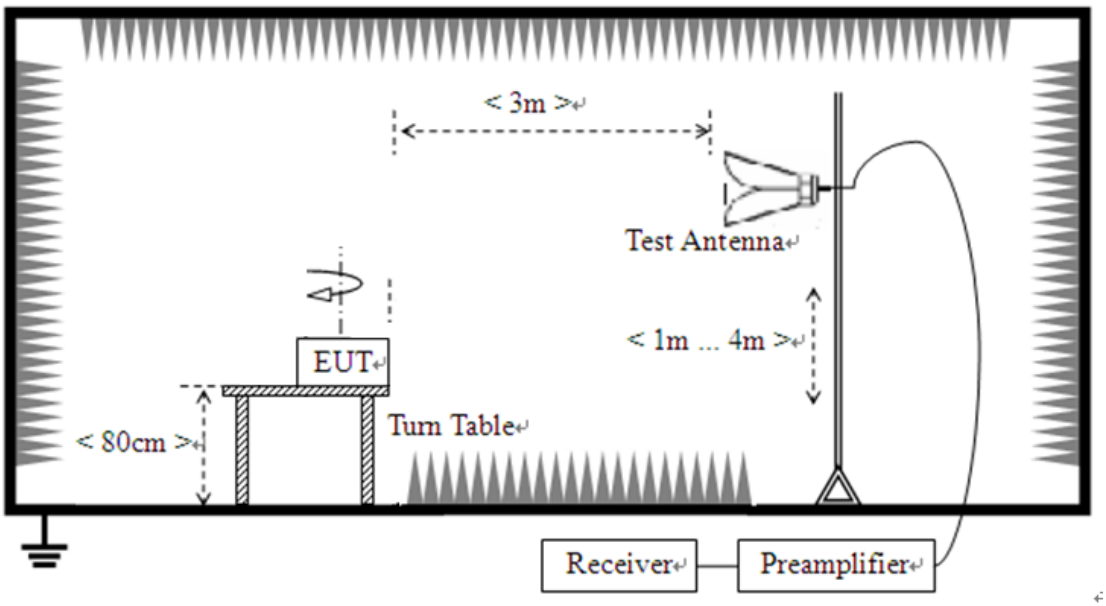
3.1.3. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.

1) For radiated emissions from 30MHz to1GHz



2) For radiated emissions above 1GHz



The measurement results are obtained as below:

$E\ [dB\mu V/m] = U_R\ [dB\mu V] + A_T[dB] + A_{Factor}\ [dB]$; $A_T = L_{Cable\ loss}\ [dB] - G_{preamp}\ [dB]$

A_T: Total correction Factor except Antenna

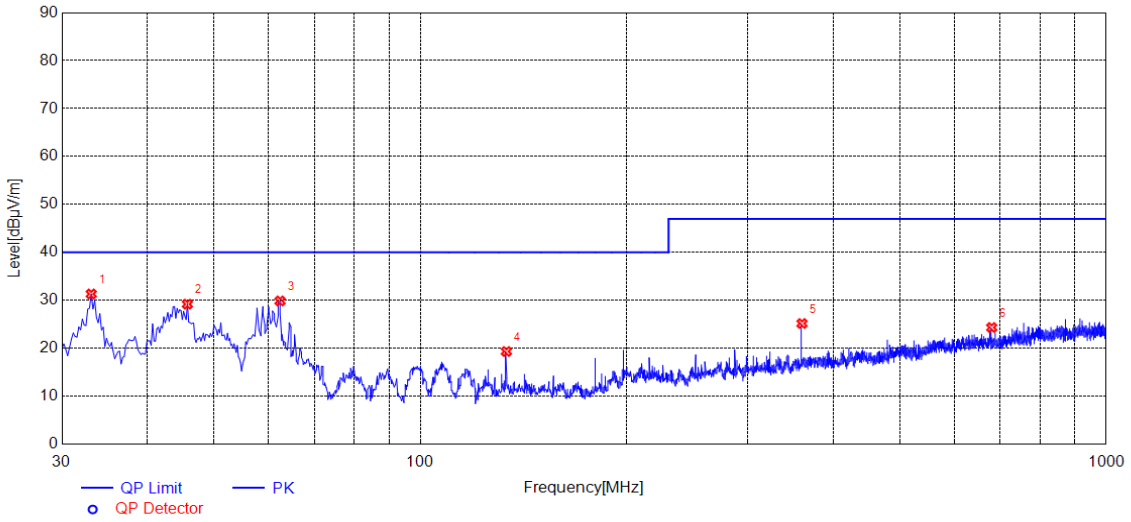
U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

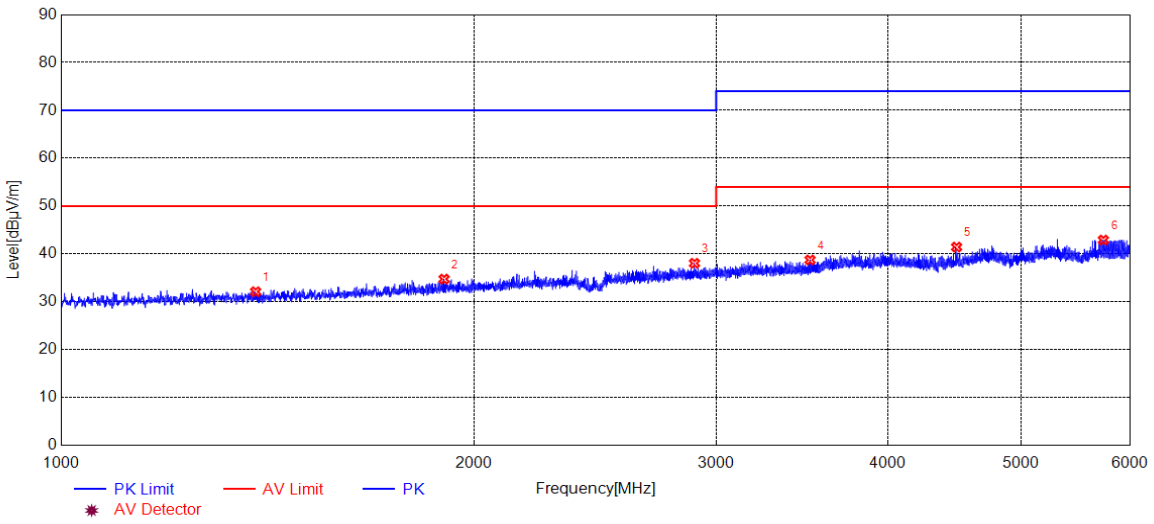
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

3.1.4. Test Result



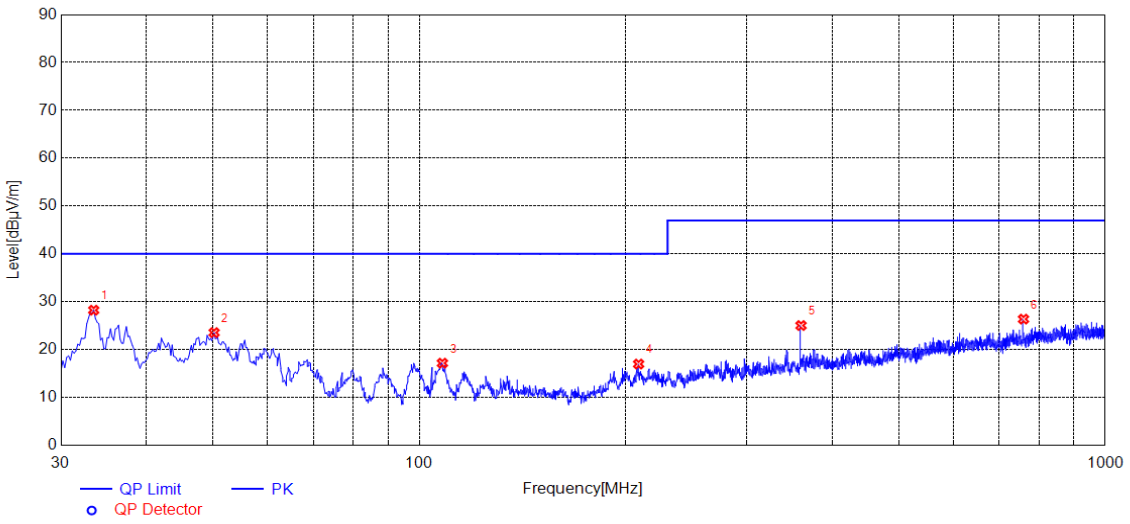
(Plot A: ANT-Vertical,30MHz - 1GHz)

No.	Fre. MHz	PK dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	33.1046	31.33	N.A.	N.A.	N.A.	40.00	N.A.	V	PASS
2	45.7171	29.20	N.A.	N.A.	N.A.	40.00	N.A.	V	PASS
3	62.4045	29.87	N.A.	N.A.	N.A.	40.00	N.A.	V	PASS
4	133.4227	19.33	N.A.	N.A.	N.A.	40.00	N.A.	V	PASS
5	360.0600	25.17	N.A.	N.A.	N.A.	47.00	N.A.	V	PASS
6	680.8062	24.33	N.A.	N.A.	N.A.	47.00	N.A.	V	PASS



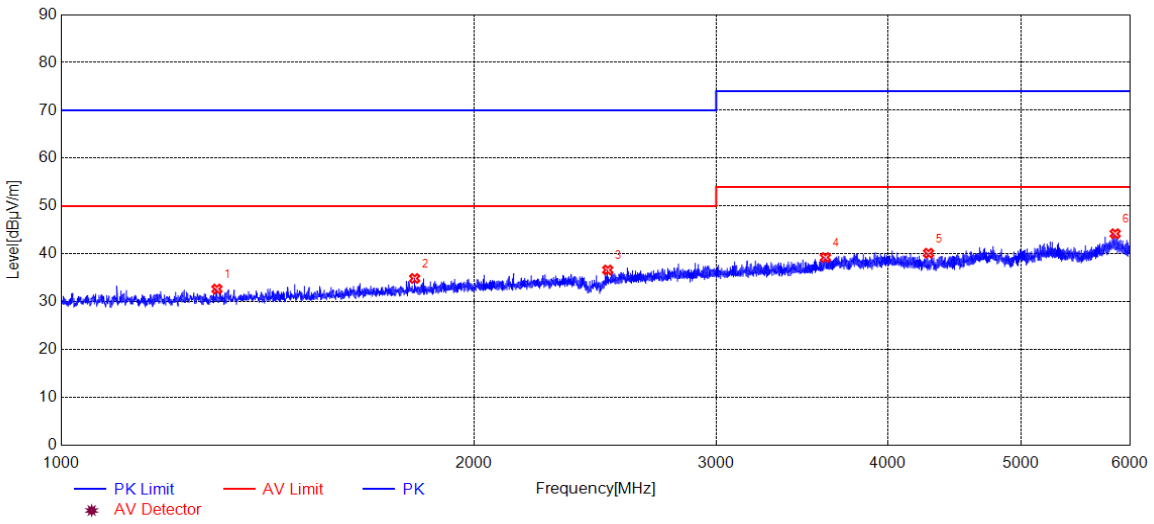
(Plot B: ANT-Vertical,1GHz - 6GHz)

No.	Fre. MHz	PK dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	1386.0386	32.10	N.A.	N.A.	70.00	N.A.	50.00	V	PASS
2	1901.0901	34.74	N.A.	N.A.	70.00	N.A.	50.00	V	PASS
3	2892.6893	38.05	N.A.	N.A.	70.00	N.A.	50.00	V	PASS
4	3511.2511	38.74	N.A.	N.A.	74.00	N.A.	54.00	V	PASS
5	4488.8489	41.43	N.A.	N.A.	74.00	N.A.	54.00	V	PASS
6	5741.4741	42.90	N.A.	N.A.	74.00	N.A.	54.00	V	PASS



(Plot C:ANT- Horizontal, 30MHz - 1GHz)

No.	Fre. MHz	PK dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	33.4927	28.24	N.A.	N.A.	N.A.	40.00	N.A.	H	PASS
2	50.1800	23.55	N.A.	N.A.	N.A.	40.00	N.A.	H	PASS
3	108.0036	17.17	N.A.	N.A.	N.A.	40.00	N.A.	H	PASS
4	208.7097	16.98	N.A.	N.A.	N.A.	40.00	N.A.	H	PASS
5	360.0600	25.03	N.A.	N.A.	N.A.	47.00	N.A.	H	PASS
6	759.9740	26.37	N.A.	N.A.	N.A.	47.00	N.A.	H	PASS



(Plot D:ANT- Horizontal, 1GHz - 6GHz)

No.	Fre. MHz	PK dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	1299.0299	32.66	N.A.	N.A.	70.00	N.A.	50.00	H	PASS
2	1809.5810	34.87	N.A.	N.A.	70.00	N.A.	50.00	H	PASS
3	2501.1501	36.64	N.A.	N.A.	70.00	N.A.	50.00	H	PASS
4	3602.7603	39.25	N.A.	N.A.	74.00	N.A.	54.00	H	PASS
5	4282.3282	40.15	N.A.	N.A.	74.00	N.A.	54.00	H	PASS
6	5855.9856	44.22	N.A.	N.A.	74.00	N.A.	54.00	H	PASS

3.2. Conducted Emission- AC Port

3.2.1. Limits of Conducted Emission-AC Port

Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.50	66 to 56	56 to 46
0.50 – 5	56	46
5 – 30	60	50

Note:

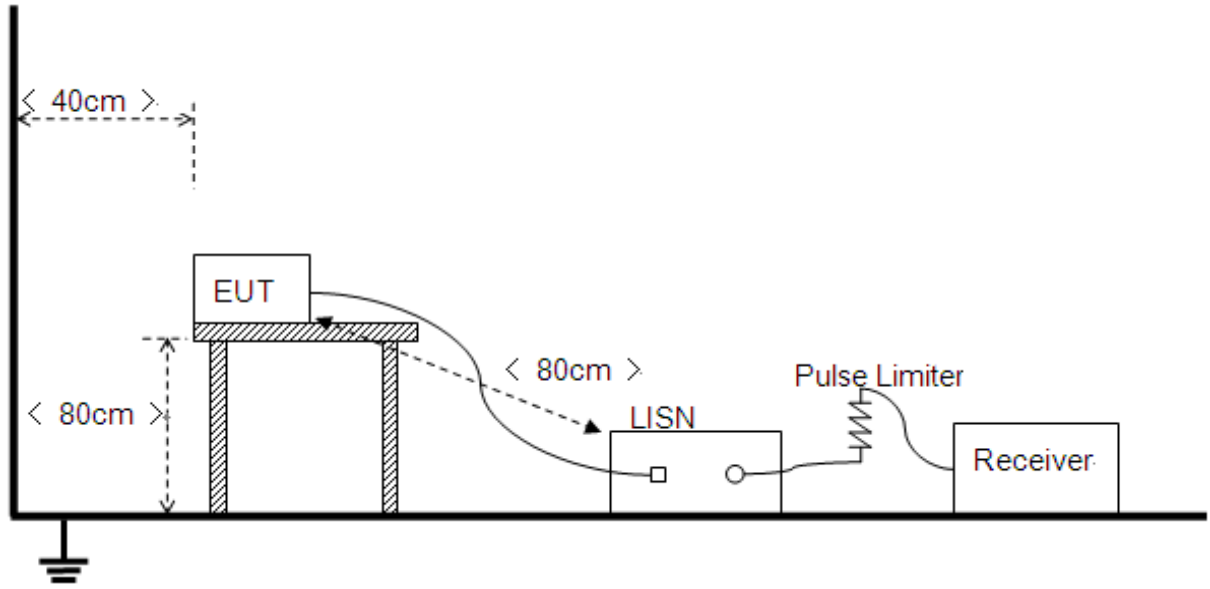
1. The lower limit shall apply at the band edges.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 – 0.50MHz.

3.2.2. Test Procedure

1. The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument.
2. The test frequency range is from 150kHz to 30MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors.
3. Tests for both Line and Neutral lines of the power mains connected to the EUT are performed.

3.2.3. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.



The measurement results are obtained as below:

$E\ [dB\mu V] = U_R[dB\mu V] + L_{Cable\ loss}\ [dB] + A_{Factor}\ [dB]$

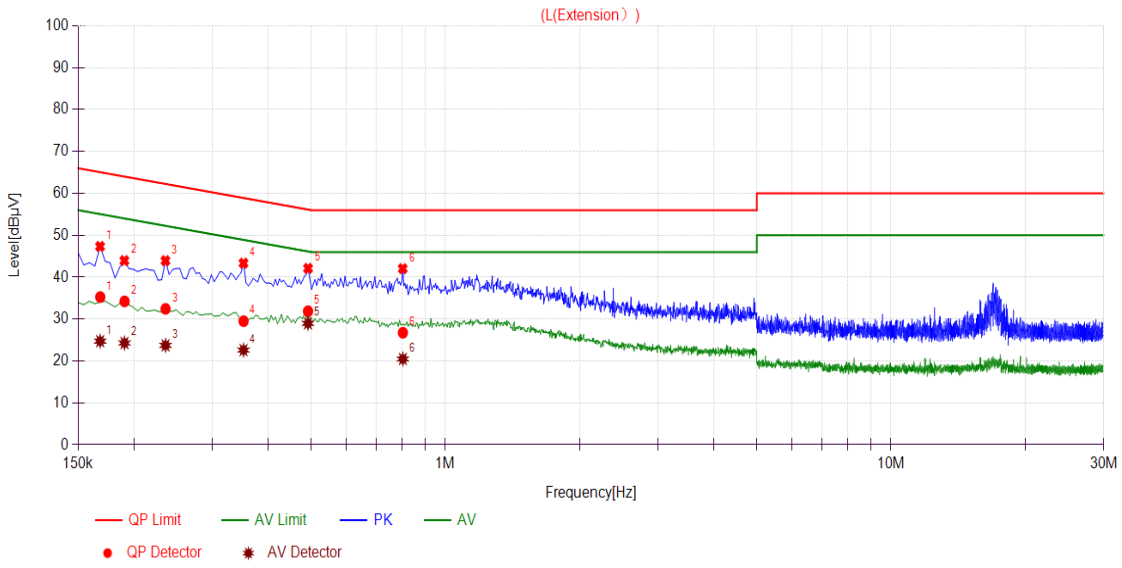
U_R: Receiver Reading

A_{Factor}: Voltage Division Factor of LISN

$L_{Cable\ loss}$: Correction Factor Contains Pulse Limiter and Cable

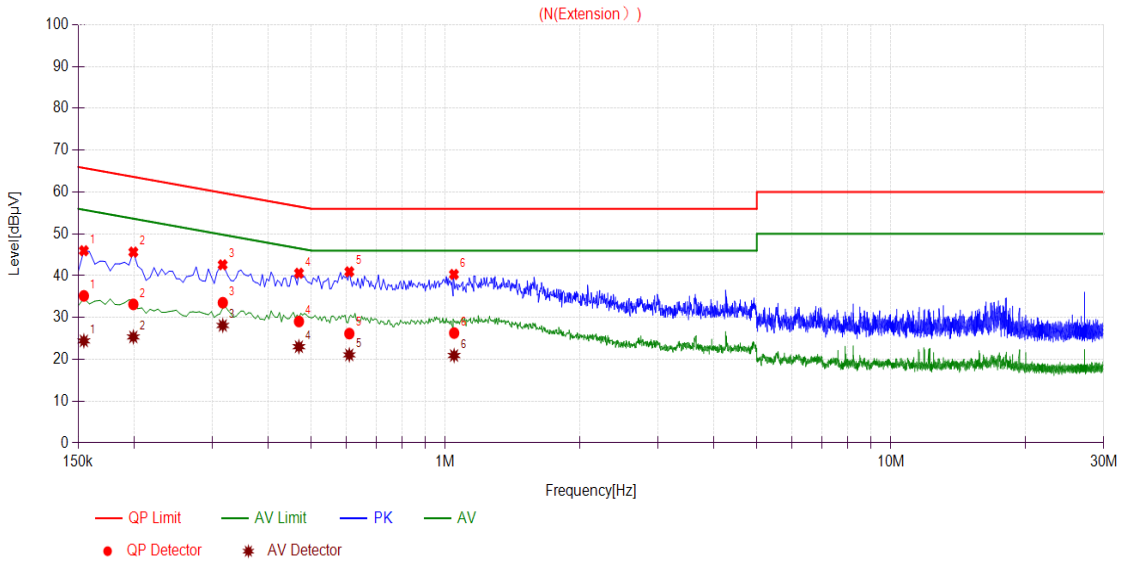
During the test, the total correction Factor $L_{Cable\ loss}$ and A_{Factor} were built in test software.

3.2.4. Test Result



(Plot A:L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quasi-peak	Average	Quasi-peak	Average		
1	0.1681	35.26	24.73	65.05	55.05	Line	PASS
2	0.1906	34.22	24.29	64.01	54.01		PASS
3	0.2356	32.44	23.72	62.25	52.25		PASS
4	0.3525	29.50	22.60	58.90	48.90		PASS
5	0.4918	31.87	28.97	56.14	46.14		PASS
6	0.8030	26.74	20.48	56.00	46.00		PASS



(Plot B: N Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quasi-peak	Average	Quasi-peak	Average		
1	0.1545	35.18	24.41	65.75	55.75	Neutral	PASS
2	0.1995	33.14	25.35	63.63	53.63		PASS
3	0.3167	33.54	28.10	59.79	49.79		PASS
4	0.4693	29.05	23.02	56.53	46.53		PASS
5	0.6088	26.16	21.07	56.00	46.00		PASS
6	1.0462	26.29	20.91	56.00	46.00		PASS

4. Immunity Tests

4.1. EUT Operation and Performance Criteria

4.1.1. Performance Criteria for Broadband and Wideband Data Transmission Systems

A. General Performance Criteria:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

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 allows a level of degradation in accordance with the follow: Minimum performance level For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to10 %. For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.		

B. Performance criteria for Continuous phenomena

The performance criteria A shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.
Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.

C. Performance criteria for Transient phenomena

The performance criteria B shall apply for transient phenomena, except for voltage dips greater than or equal to 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur as a result of the application of the test.
Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur as a result of the application of the test.

4.1.2. Performance Criteria for EN 55035:2017+A11:2020

Type	Description
Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer 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.
Criterion B	During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test. After the test, 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 manufacturer, 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), or recovery time, 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.
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 manufacturer's instructions. A reboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

4.2. Electrostatic Discharge Immunity

4.2.1. Test Specification

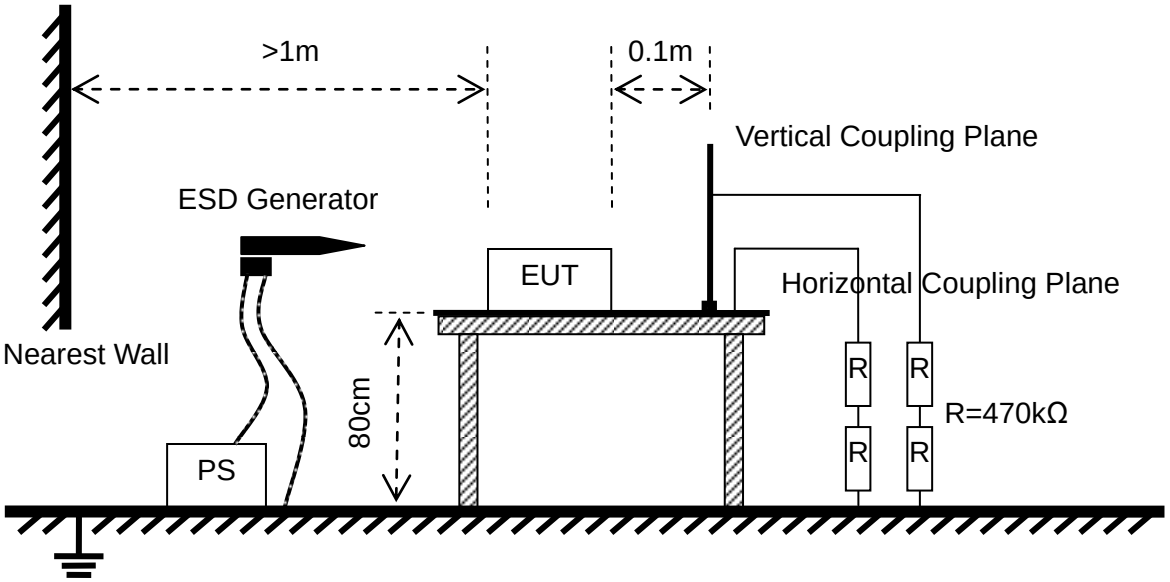
Specification	Value
Basic Standard	EN 61000-4-2:2009
Discharge Impedance	330Ohm / 150pF
Discharge Voltage	Air Discharge: 8kV; Contact Discharge: 4kV
Polarity	Positive / Negative
Number of Discharge	Minimum 10 times at each test point
Discharge Mode	Single discharge
Discharge Period	1 second minimum

4.2.2. Test Procedure

1. Electrostatic discharges are applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
2. The test is performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
3. The time interval between two successive single discharges is at least 1 second.
4. The ESD generator is held perpendicularly to the surface to which the discharge is applied and the return cable is at least 0.2 meters from the EUT.
5. Contact discharges are applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
6. Air discharges are applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator is removed from the EUT and re-triggered for a new single discharge. The test is repeated until all discharges were completed.
7. At least ten single discharges (in the most sensitive polarity) are applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator is positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
8. At least ten single discharges (in the most sensitive polarity) are applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m*0.5m) is placed vertically to and 0.1 meters from the EUT.

4.2.3. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.



4.2.4. Test Result

Performances of all test modes of the EUT should comply with the performance criteria for Criterion B. All test modes have the same test results, and only one result is recorded in this report.

Test Points	Discharge Level (kV)	Discharge Mode	Number of Discharge	Test Mode	Observation	Verdict
HCP	±4	Indirect	10	See section 2.2	A	PASS
VCP	±4	Indirect	10		A	PASS
Please refer to the blue arrow	±4	Contact	10		A	PASS
Please refer to the red arrow	±2,±4,±8	Air	10		A	PASS

4.2.5. The ESD test points

Represent air discharge

Represents contact discharge

4.3. Radiated Immunity

4.3.1. Test Specification

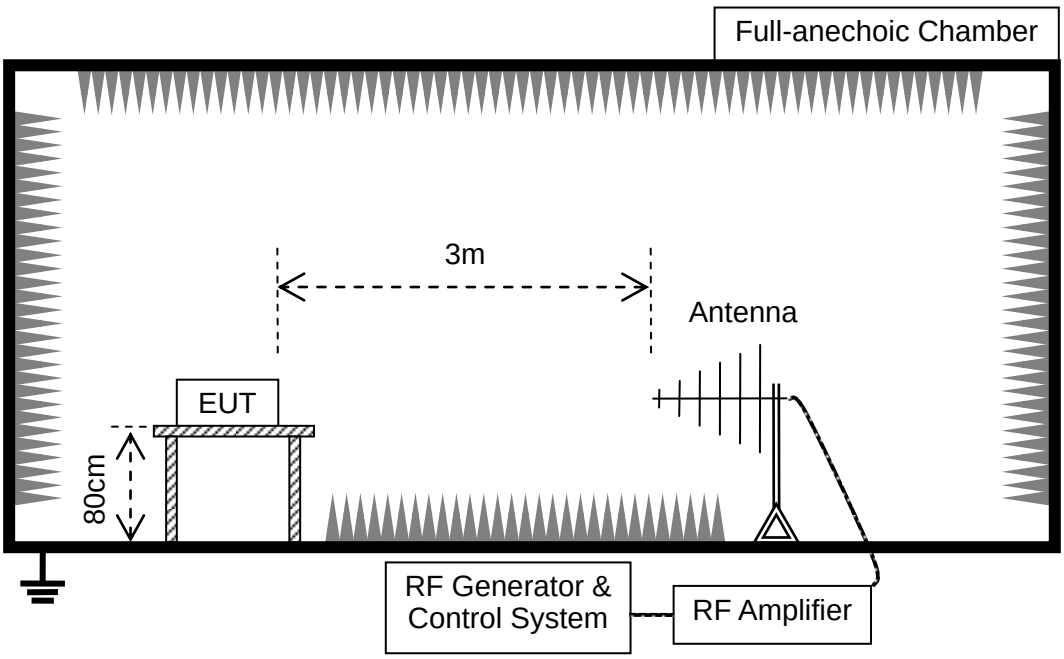
Basic Standard:	EN 61000-4-3:2006+A1:2008+A2:2010
Frequency Range:	80 MHz – 6000MHz
Field Strength:	3V/m
Modulation:	1 kHz sine wave, 80%, AM modulation
Frequency Step:	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance:	3m
Antenna Height:	1.5m
Dwell Time:	3 seconds

4.3.2. Test Procedure

The test procedure was in accordance with EN 61000-4-3:2006+A1:2008+A2:2010.

1. The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
2. The test signal was 80% amplitude modulated with a 1 kHz sine wave.
3. The frequency range was swept from 80 MHz to 6000MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
4. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
5. The field strength level was 3V/m.
6. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.3.3. Test Setup



For the actual test configuration refer to Annex A for the photographs of the Test Configuration.

4.3.4. Test Result

Performances of all test modes of the EUT should comply with the performance criteria for CT/CR or Criterion A. All test modes have the same test results, and only one result is recorded in this report.

Operating Mode	Field Strength	Frequency (MHz)	Modulation	EUT Face	Observation	Verdict
See Section 2.2	3 V/m	80-6000	1KHz, 80% Amp. Mod, 1% increment	Front	A	PASS
				Rear	A	PASS
				Left	A	PASS
				Right	A	PASS
				Top	A	PASS
				Bottom	A	PASS

Note 1: For BR + EDR, EUT establishes a communication link with R&S CMW500, and measures the PER in EUT receiver mode via R&S CMW500, the PER values were less than 10% in the entire test sequence.

4.4. Electrical Fast Transient / Burst Immunity

4.4.1. Test Specification

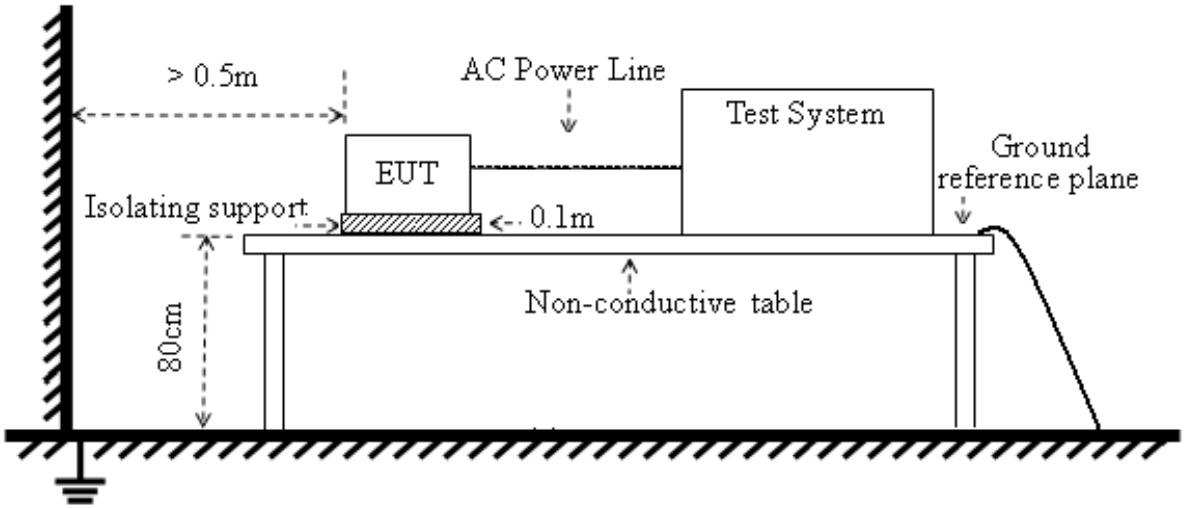
Specification	Value
Basic Standard	EN 61000-4-4:2012
Test Voltage	AC Power Port: 1kV
Polarity	Positive / Negative
Impulse Frequency	5kHz
Impulse Wave Shape	5/50ns
Burst Duration	15ms
Burst Period	300ms
Test Duration	≥ 2min

4.4.2. Test Procedure

1. The EUT is tested with 1000V discharges to the AC power input leads.
2. Both positive and negative polarity discharges are applied.
3. The length of the "hot wire" from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1m.
4. The duration time of each test sequential is 2min.
5. The transient / burst waveform is in accordance with EN 61000-4-4:2012, 5/50ns.

4.4.3. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.



4.4.4. Test Result

Performances of all test modes of the EUT should comply with the performance criteria for TT/TR or Criterion B. All test modes have the same test results, and only one result is recorded in this report.

EUT Operating Mode	Test Point	Polarity	Test Level (kV)	Observation	Verdict
See section 2.2	AC Port, L	+ / -	1	A	PASS
	AC Port, N	+ / -	1	A	PASS
	AC Port, L-N	+ / -	1	A	PASS

4.5. Surge Immunity

4.5.1. Test Specification

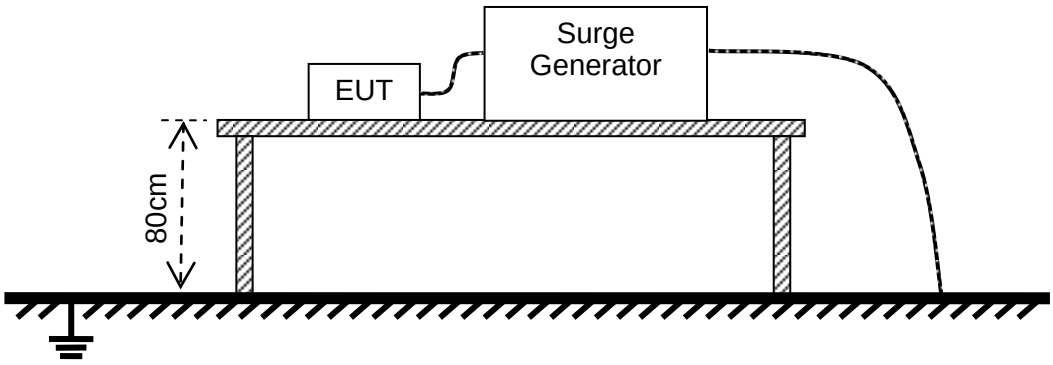
Specification	Value
Basic Standard	EN 61000-4-5:2014+A1:2017
Waveform	Voltage: 1.2/50μs; Current: 8/20μs
Test Voltage	AC Power Port: line to ground 2kV, line to line 1kV
Polarity	Positive / Negative
Phase Angle	0°, 90°, 180°, 270°
Repetition Rate	60 seconds
Times	5 times per condition

4.5.2. Test Procedure

1. The EUT and the auxiliary equipment are placed on a table of 0.8m heights above a metal ground reference plane. The size of ground plane is greater than 1m*1m and project beyond the EUT by at least 0.1m on all sides. The ground plane is connected to the protective earth. The length of power cord between the coupling device and the EUT is less than 2 meters (provided by the manufacturer).
2. The EUT is connected to the power mains through a coupling device that directly couples the surge interference signal. The surge noise is applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave (positive and negative).
3. The surges are applied line to line and line(s) to earth. When testing line to earth the test voltage is applied successively between each of the lines and earth. Steps up to the test level specified increased the test voltage. All lower levels including the selected test level are tested. The polarity of each surge level included positive and negative test pulses.

4.5.3. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.



4.5.4. Test Result

Performances of all test modes of the EUT should comply with the performance criteria for TT/TR or Criterion B. All test modes have the same test results, and only one result is recorded in this report.

EUT Operating Mode	Coupling Line	Polarity	Voltage (kV)	Observation	Verdict
See section 2.2	AC Port, L-N	+ / -	0.5	A	PASS
			1	A	PASS

4.6. Conducted Immunity

4.6.1. Test Specification

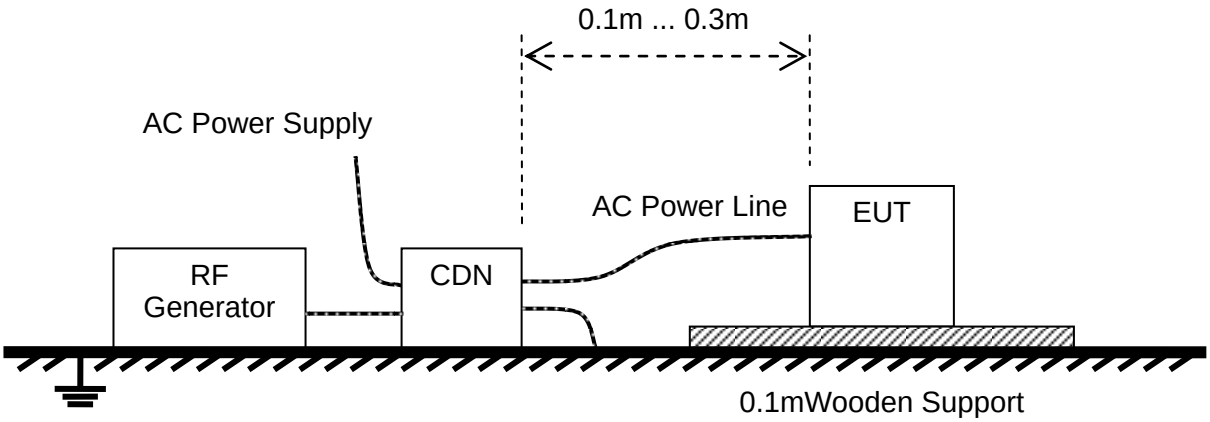
Specification	Value
Basic Standard	EN 61000-4-6:2014
Frequency Range	0.15MHz - 80MHz
Field Strength	3Vrms
Modulation	1kHz sine wave, 80% AM
Frequency Step	1% of fundamental
Coupled Cable	AC Power Line
Coupling Device	CDN-M2

4.6.2. Test Procedure

1. The EUT shall be tested within its intended operating and climatic conditions.
2. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50Ohm load resistor.
3. The test signal is 80% amplitude modulated with a 1kHz sine wave.
4. The frequency range is swept from 150kHz to 80MHz, using the signal level established during the setting process and with a disturbance signal of 80% amplitude. The sweep rate shall not exceed 1.5*10-3 decades/s. The step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value where the frequency is swept incrementally.
5. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequencies and harmonics or frequencies of dominant interest, shall be analyzed separately.
6. Attempts should be made to fully exercise the EUT during test, and to fully interrogate all exercise modes selected for susceptibility.

4.6.3. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.



4.6.4. Test Result

Performances of all test modes of the EUT should comply with the performance criteria for CT/CR or Criterion A. All test modes have the same test results, and only one result is recorded in this report.

EUT Operating Mode	Test Point	Frequency (MHz)	Voltage level (V)	Observation	Verdict
See section 2.2	AC Port	0.15 - 80	3	A	PASS

4.7. Voltage Dips and Interruptions Immunity

4.7.1. Test Specification

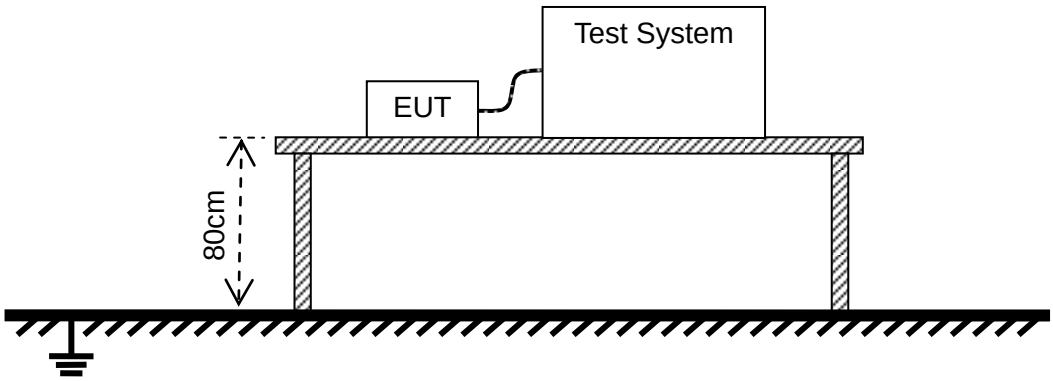
Specification	Value
Basic Standard	EN 61000-4-11:2004
Voltage Dips	100% reduction: 0.5 cycle; 100% reduction: 1 cycle; 30% reduction: 25 cycles
Voltage Interruptions	100% reduction: 250 cycles
Voltage Phase Angle	0°&180°

4.7.2. Test Procedure

1. The power cord is used as supplied by the manufacturer. The EUT was connected to the line output of the Voltage Dips and Interruption Generator.
2. The EUT is tested for a) 100% voltage dip of supplied voltage with duration of 0.5 cycle; b) 100% voltage dip of supplied voltage with duration of 1 cycle; c) 30% voltage dip of supplied voltage and duration 25 cycles. Both of the dip tests are carried out for a sequence of three voltage dips with intervals of 10 seconds.
3. 100% voltage interruption of supplied voltage with duration of 250 cycles is followed, which is a sequence of three voltage interruptions with intervals of 10 seconds.
4. Voltage reductions occur at 0 degrees crossover point of the voltage waveform. The performance of the EUT is checked after the voltage dip or interruption.

4.7.3. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.



4.7.4. Test Result

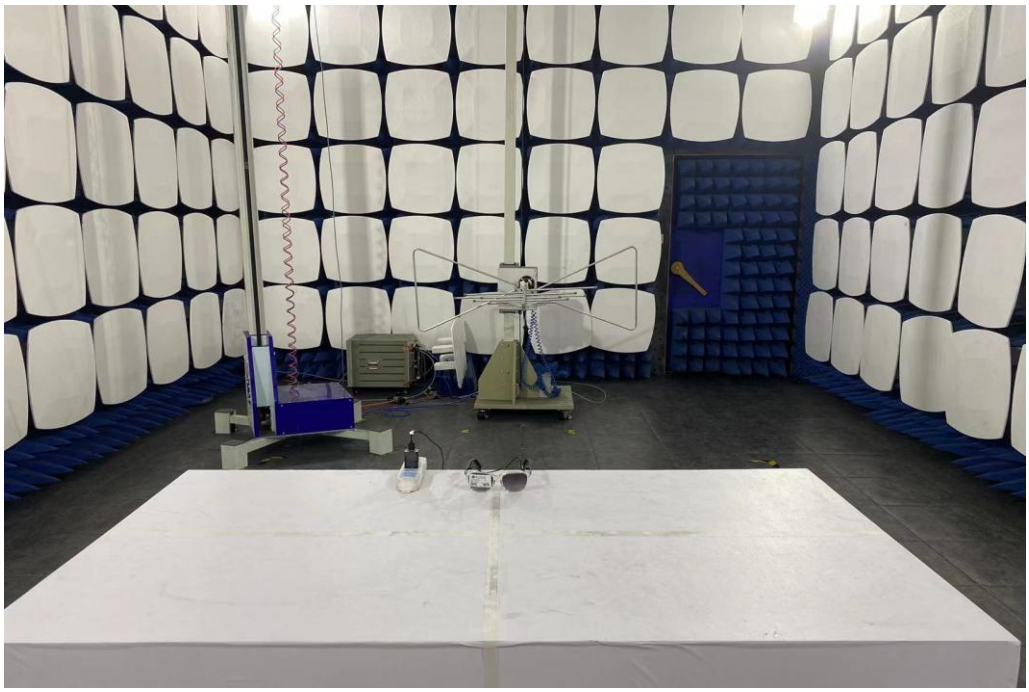
The performance criteria B shall apply except 30% voltage dips and voltage interruption tests. All test modes have the same test results, only one result is recorded in this report.

EUT Operating Mode	Test Mode	Voltage Reduction	Cycle(s)	Times	Interval (sec)	Observation	Verdict
See section 2.2	Voltage Dips	100%	0.5	3	10	A	PASS
		100%	1	3	10	A	PASS
		30%	25	3	10	A	PASS
	Voltage Interruptions	100%	250	3	10	B[Note 1]	PASS

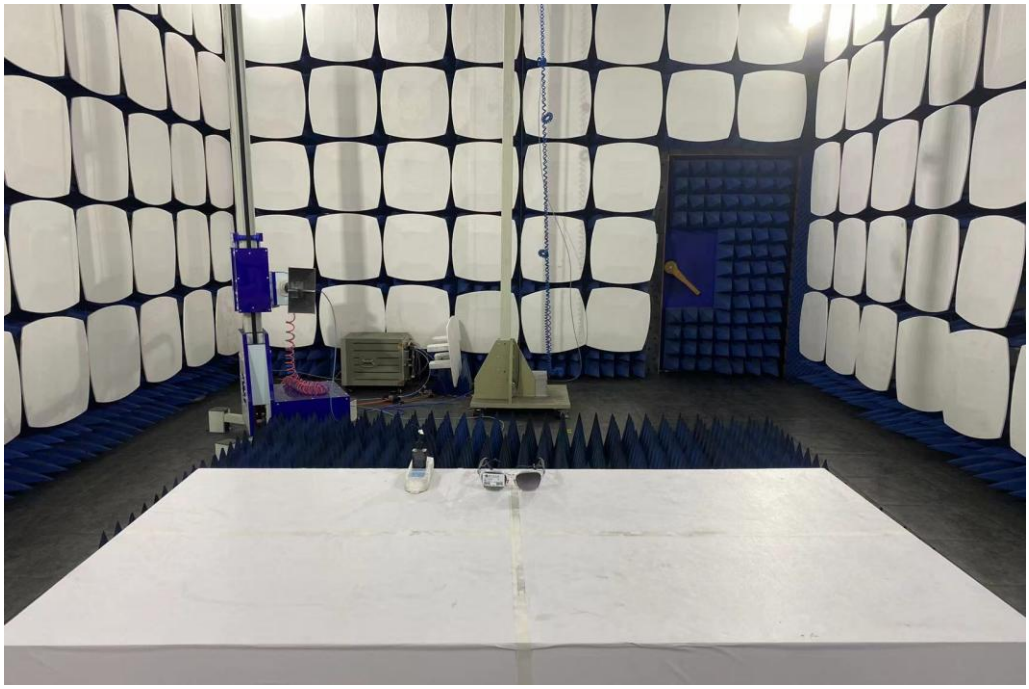
Note 1: During the test, the EUT stopped charging. After the test, the EUT was charged normally and the wireless connection was normal.

Annex A Photographs of Test Setup

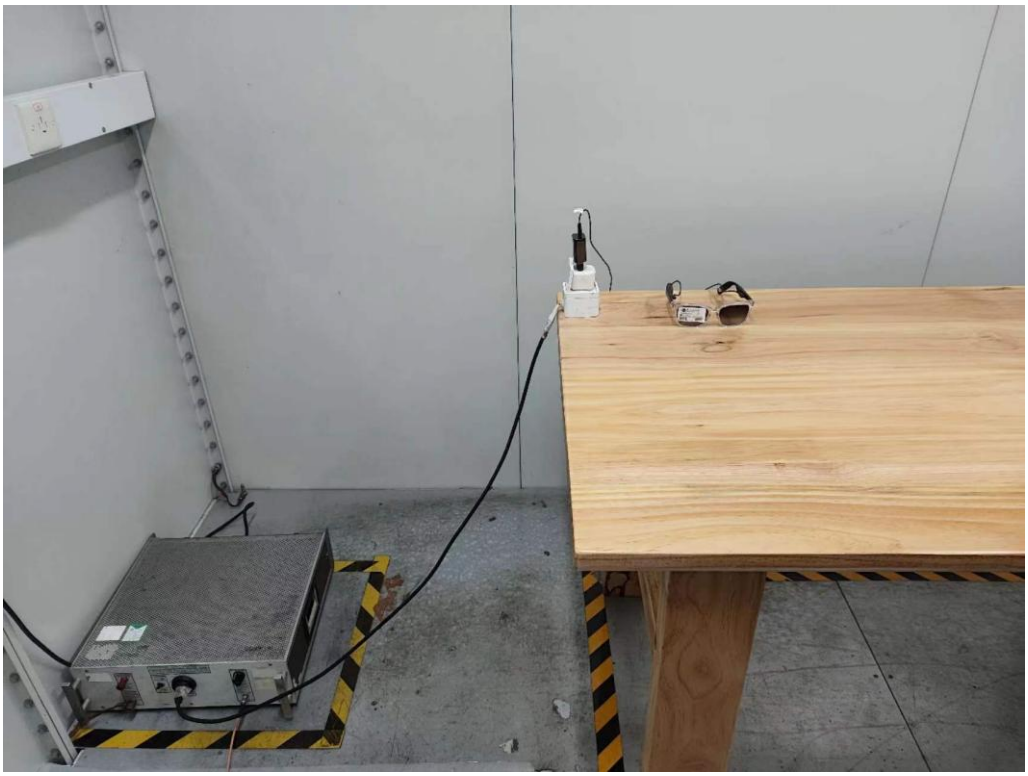
1. Radiated Emission (30MHz-1GHz)



2. Radiated Emission (above 1GHz)

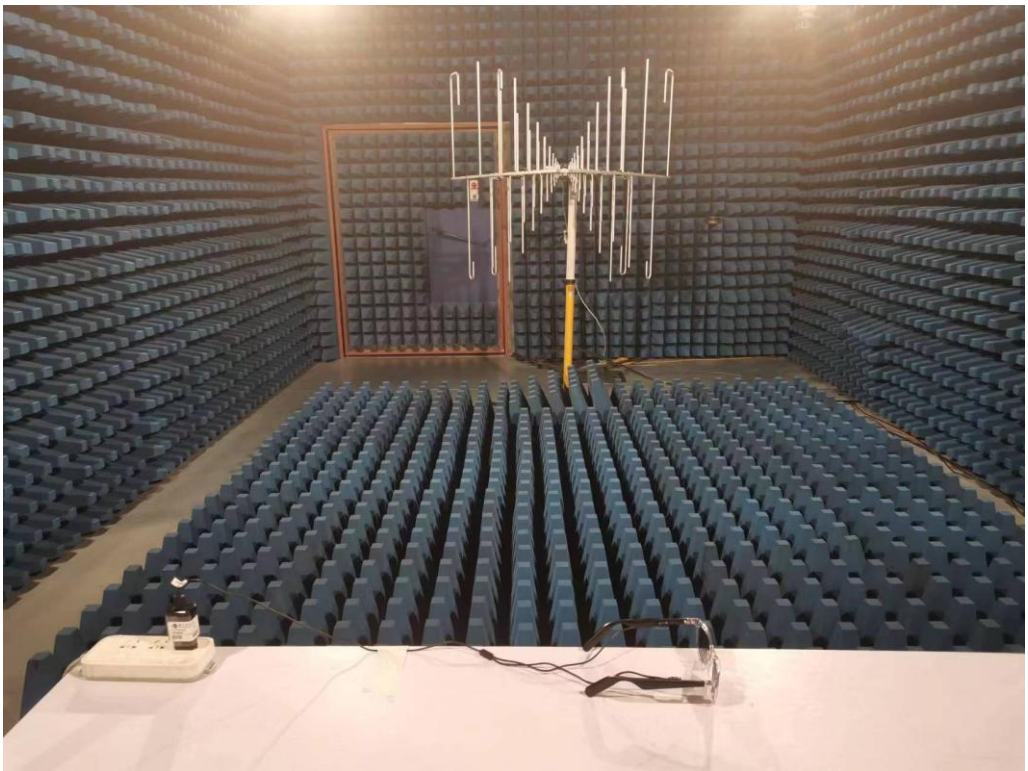


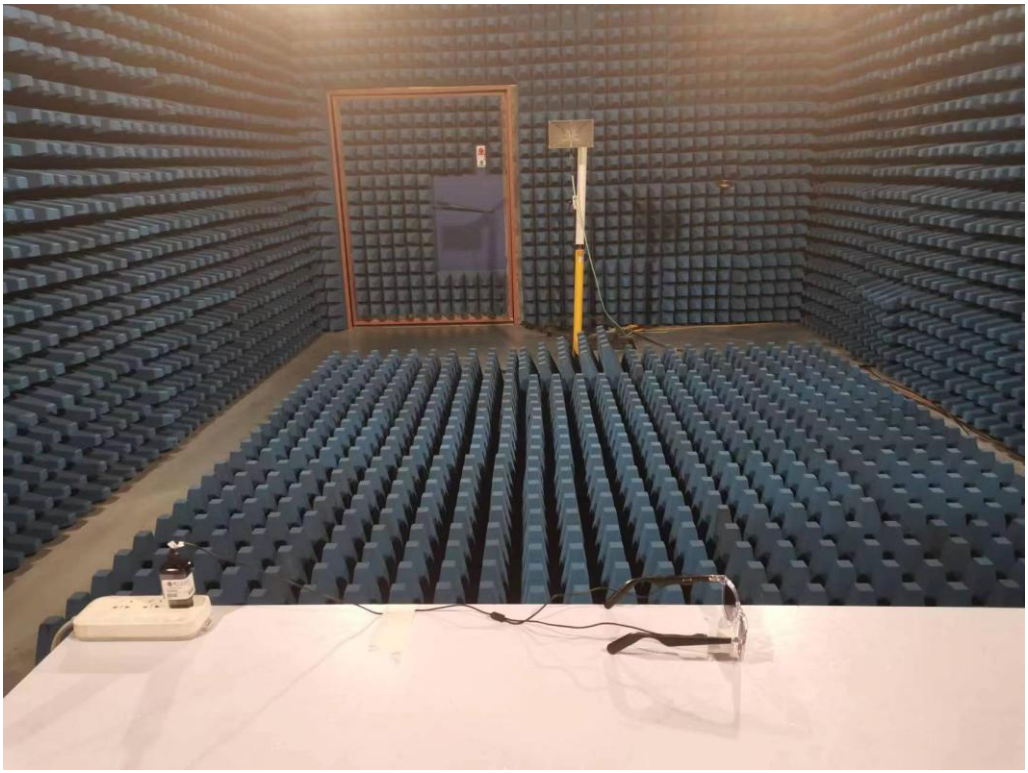
3. Conducted Emission - AC Port



4. Electrostatic Discharge Immunity

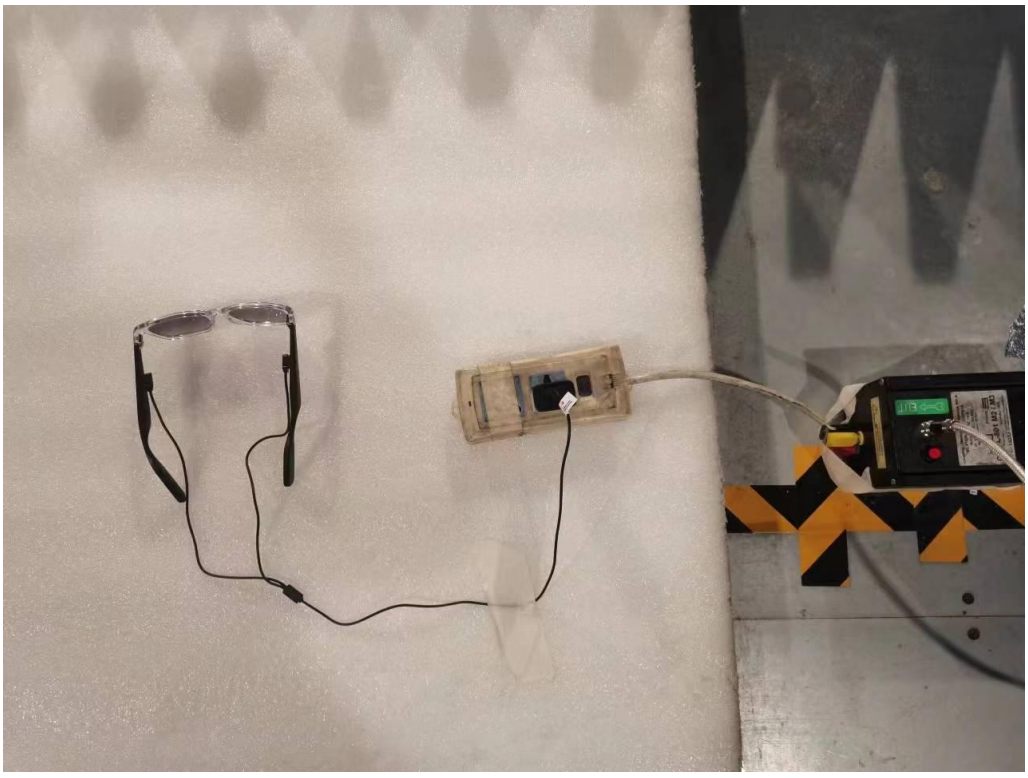
5. Radiated Immunity





6. Electrical Fast Transient/Burst Immunity Test

7. Conducted Immunity



8. Voltage Dips and Short Interruptions Immunity, Surge Immunity Test

Annex B Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	9kHz-150kHz	±3.3dB
	150kHz-30MHz	±2.8dB

Uncertainty of Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	30MHz-200MHz	±5.06dB
	200MHz-1000MHz	±5.04dB
	1GHz-6GHz	±5.18dB
	6GHz-18GHz	±5.48dB

Uncertainty of Radiated Susceptibility Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	80MHz-6GHz	±1.78dB

Uncertainty of Conducted Susceptibility Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	150kHz-80MHz	±1.96dB

Uncertainty of Electrostatic Discharge Measurement

	Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))
Electrostatic Discharge – Rise Time	11.0%
Electrostatic Discharge – Peak Current	8.0%
Electrostatic Discharge – 30ns Current	8.0%
Electrostatic Discharge – 60ns Current	8.0%

Uncertainty of SURGE Measurement

	Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))
Open-circuit Peak Voltage	10.0%

Short-circuit Peak Current	8.0%
Front Time	8.3%
Duration	4.0%

Uncertainty of EFT/B Measurement

	Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))
Peak Voltage	4.0%
Repetition frequency	0.0%
Burst Duration	2.6%
Burst period	0.0%
Rise Time	22%
Pulse Width	23%

Uncertainty of DIP Measurement

	Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))
Voltage Variations	0.9%
Voltage Rising/Fall Time	0.0%
Phase	5.7%

Annex C Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

3. Test Software Utilized

Model	Version Number	Producer
TS+ -[JS32-RE]	Version 2.5.0.6	Tonscend
TS+ -[JS32-CE]	Version 2.5.0.0	Tonscend
TS+ -[JS35-CS]	Version 4.0.0.0	Tonscend
TS+ -[JS35-RS]	Version 4.0.0.0	Tonscend

4. Test Equipments Utilized

Description	Model	Serial No.	Manufacturer	Cal. Date	Due. Date
Bi-Log Antenna	VULB 9163	9163-274	SCHWARZBECK	2022/11/7	2025/11/6
Bi-Log Antenna	VULB 9163	9163-519	SCHWARZBECK	2022/5/25	2025/5/24
Horn Antenna	BBHA 9120D	9120D-963	SCHWARZBECK	2022/5/25	2025/5/24
Horn Antenna	BBHA 9120D	01774	SCHWARZBECK	2022/7/13	2025/7/12
Receiver	N9038A	MY54130016	Agilent	2023/6/21	2024/6/20
Receiver	N9038A	MY56400093	KEYSIGHT	2023/2/9	2024/2/8
6db Attenuator	BW-N6W5+	E191001	Mini-circuits	2022/10/11	2023/10/10
Preamplifier	S020180L3203	61171/61172	LUCIX CORP.	2023/6/27	2024/6/26
Preamplifier	S10M100L3802	46732	LUCIX CORP.	2023/6/27	2024/6/26
RF Coaxial Cable	PE330	MRE001	Pasternack	N/A	N/A
RF Coaxial Cable	CLU18	MRE002	Pasternack	N/A	N/A
RF Coaxial Cable	CLU18	MRE003	Pasternack	N/A	N/A
RF Coaxial Cable	QA360-40-KK-0.5	22290045	Qualwave	N/A	N/A
RF Coaxial Cable	QA360-40-KKF-2	22290046	Qualwave	N/A	N/A
RF Coaxial Cable	QA500-18-NN-5	22120181	Qualwave	N/A	N/A
RF Coaxial Cable	BNC	MRE04	Qualwave	N/A	N/A
Receiver	ESPI	101052	R&S	2023/6/21	2024/6/20
LISN	NSLK 8127	8127449	Schwarzbeck	2023/2/21	2024/2/20
10dB Pulse Limiter	VTSD 9561-F	VTSD 9561 F-B #206	SCHWARZBECK	2023/6/27	2024/6/26
ESD Simulator	SKS-0220SE	020312009 E 327	SANKI	2022/7/12	2023/7/11
ESD Simulator	SKS-0220SE	020312009 E 327	SANKI	2023/7/12	2024/7/11
Signal Generator	N5181A	MY50141911	Agilent	2023/2/9	2024/2/8

Power Amplifier	NTWPAS-00 810200	17033067	rflight communication	2023/2/9	2024/2/8
Power Amplifier	NTWPAS-10 25100	17033064	rflight communication	2023/2/9	2024/2/8
Power Amplifier	NTWPAS-25 60100	17043104	rflight communication	2023/2/9	2024/2/8
Power Amplifier	AP32 DR180	908-961	Prana	2023/2/9	2024/2/8
Stacked double Log.-Per. Antenna	STLP 9128D	9128DS02	SCHWARZBECK	2022/11/5	2025/11/4
Horn Antenna	BBHA 9120D	02123	SCHWARZBECK	2022/8/17	2025/8/16
Power Meter	E4419B/E93 04A	MY4510449 6/MZ55040 004/MZ544 10028	Agilent	2022/10/10	2023/10/9
EFT/Surge/DIP Testing System	HCOMPACT 7	160701	HTEC	2023/6/21	2024/6/20
CDN	CDNL-801 M2/M3	2575	Luthi	2023/3/9	2024/3/8
System Simulator	CMW500	152038	R&S	2022/10/11	2023/10/10

5. Ancillary Equipment Utilized

Description	Manufacturer	Model	Serial No.
Mobile Phone	realme	RMX3193	VGSKUKT85TLFBMPJ

END OF REPORT