RED-EMC
TEST REPORT

Client Name	:	SHENZHEN NEWBIT INFO TECHNOLOGY CO.,LTD.
Address	:	Room1612- Room 1616, Global Logistics Center Building, Longgang Dist, Shenzhen
Product Name	:	BLE Transmission Modules
Test Model No.	:	MX-01P
Report No.	:	CCTI-2025051516-2E
Issued Date	:	May. 21, 2025
Prepared By	:	Shenzhen CCTI Technology Co., Ltd.
Address	:	102, 1/F, Block A, Building E, Yongwei Industrial Park, No. 118, Yongfu Road, Qiaotou, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
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Scan code for report

TEST REPORT VERIFICATION

Applicant	:	SHENZHEN NEWBIT INFO TECHNOLOGY CO.,LTD.
Address	:	Room1612- Room 1616, Global Logistics Center Building, Longgang Dist, Shenzhen
Manufacturer	:	SHENZHEN NEWBIT INFO TECHNOLOGY CO.,LTD.
Address	:	Room1612- Room 1616, Global Logistics Center Building, Longgang Dist, Shenzhen
Product Name	:	BLE Transmission Modules
Model No.	:	MX-01P
Series No.	:	MX-35A, MX-02P
Trade Mark	:	N/A
Rating(s)	:	Input: 1.8V~3.3V d.c., Class III
Test Date	:	May. 14, 2025 to May. 21, 2025
Test 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+A1:2020+A11:2020, EN 55035:2017+A11:2020** **EN IEC 61000-3-2:2019+A1:2021+A2:2024** **EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022-01**
Test Result	:	**PASS**

This device described above has been tested by CCTI, and the test results show that the equipment under test (EUT) is in compliance with the 2014/53/EU RED Directive Art.3.1(b) requirements. The results shown in this test report refer only to the sample(s) tested unless other wise stated and the sample(s) are retained for 30 days only.

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Producer By : Betty Liang (Betty Liang / Engineer) **Date** : May. 21, 2025

Authorized Signer : (Corey Mao / Manager) **Date** : May. 21, 2025

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1. TEST STANDARDS

The tests were performed according to following standards:

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 covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU

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 Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility

EN 55032:2015+A1:2020+A11:2020 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+A1:2021+A2:2024 Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022-01 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.

CCTI TESTING

1.1 TEST FACILITY

Shenzhen CCTI Technology Co., Ltd.
102, 1/F, Block A, Building E, Yongwei Industrial Park, No. 118, Yongfu Road, Qiaotou, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

1.2 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 Shenzhen CCTI Technology Co., Ltd. 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.

Hereafter the best measurement capability for Shenzhen CCTI Technology Co., Ltd. is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	3.90dB	(1)
Radiated Emission	1~18GHz	4.28dB	(1)
Radiated Emission	18-40GHz	5.54dB	(1)
Conducted Disturbance	0.15~30MHz	2.71dB	(1)

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

1.3 TEST DESCRIPTION

Emission Measurement		
Test Item	**Standard**	**Judgment**
Conducted Emission (AC Mains)	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1 EN 55032:2015+A1:2020+A11:2020 Annex A.3	N/A
Radiated Emission		PASS
Harmonic Current Emission	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1 EN IEC 61000-3-2:2019+A1:2021+A2:2024	N/A
Voltage Fluctuations & Flicker	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1 EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022-01	N/A
Immunity Measurement		
Test Item	**Standard**	**Judgment**
Electrostatic Discharge	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	PASS
RF Electromagnetic Field	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	PASS
Fast Transients Common Mode	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	N/A
Surges, Line to Line and Line to Ground	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	N/A
RF Common Mode 0,15 MHz to 80 MHz	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	N/A
Transients and Surges	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	N/A
Voltage Dips and Interruptions	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	N/A

Remark: The measurement uncertainty is not included in the test result.

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

EUT Name	:	BLE Transmission Modules
Model No.	:	MX-01P
Series No.	:	MX-35A, MX-02P
Model Difference	:	The model name and appearance of the product are different.
Trademark	:	N/A
Power supply	:	Input: 1.8V~3.3V d.c., Class III
Operation frequency	:	BT BLE: 2400MHz-2483.5MHz
Modulation	:	BT BLE: GFSK
Antenna Type	:	Internal Antenna
Intend use environment	:	Residential, commercial and light industrial environment

Remark:

(1) MX-01P was selected as the test model and the datas have been recorded in this report.

(2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

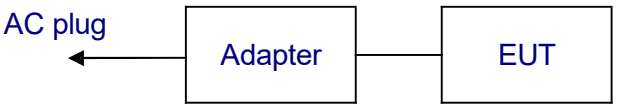
2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Charging Mode
Mode 2	Working Mode

Fig. 2-1 Configuration of Tested System

Mode 1:



Mode 2:

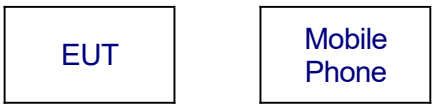


Table 2-1 Equipment Used in Tested System

No.	Product	Manufacturer	Model No.	FCC ID
1	Adapter	HUAWEI	HW-051000CHQ	/
2	Mobile Phone	MI	MI 11	/

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2.3 MEASUREMENT INSTRUMENTS

2.3.1 CONDUCTED EMISSION

No.	Equipment	Manufacturer	Type No.	Serial No.	Last Cal.	Next Cal.
1	LISN	R&S	ENV216	101313	Mar. 09, 2025	Mar. 08, 2026
2	LISN	EMCO	3816/2	00042990	Mar. 09, 2025	Mar. 08, 2026
3	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Mar. 09, 2025	Mar. 08, 2026
4	Test Cable	N/A	C01	N/A	Mar. 09, 2025	Mar. 08, 2026
5	Test Cable	N/A	C02	N/A	Mar. 09, 2025	Mar. 08, 2026
6	Test Cable	N/A	C03	N/A	Mar. 09, 2025	Mar. 08, 2026
7	EMI Test Receiver	R&S	ESCI	101160	Mar. 09, 2025	Mar. 08, 2026
8	Passive Voltage Probe	ESH2-Z3	R&S	100196	Mar. 09, 2025	Mar. 08, 2026
9	Triple-Loop Antenna	EVERFINE	LIA-2	11020003	Mar. 09, 2025	Mar. 08, 2026
10	Absorbing Clamp	R&S	MDS-21	100423	Mar. 09, 2025	Mar. 08, 2026
11	Coupling/ Decoupling Network	FRANKONIA	A3011081	BC01-05	Mar. 09, 2025	Mar. 08, 2026

2.3.2 RADIATED TEST SITE

No.	Equipment	Manufacturer	Type No.	Serial No.	Last Cal.	Next Cal.
1	Bilog Antenna	TESEQ	CBL6111D	31216	Mar. 09, 2025	Mar. 08, 2026
2	Test Cable	N/A	R-01	N/A	Mar. 09, 2025	Mar. 08, 2026
3	Test Cable	N/A	R-02	N/A	Mar. 09, 2025	Mar. 08, 2026
4	EMI Test Receiver	R&S	ESCI-7	101318	Mar. 09, 2025	Mar. 08, 2026
5	Antenna Mast	EM	SC100_1	N/A	Mar. 09, 2025	Mar. 08, 2026
6	Turn Table	EM	SC100	060531	Mar. 09, 2025	Mar. 08, 2026
7	50Ω Switch	Anritsu Corp	MP59B	6200983705	Mar. 09, 2025	Mar. 08, 2026
8	Spectrum Analyzer	Aglient	E4407B	MY45108040	Mar. 09, 2025	Mar. 08, 2026
9	Horn Antenna	EM	EM-AH-10180	2011071402	Mar. 09, 2025	Mar. 08, 2026
10	Amplifier	EM	EM-30180	060538	Mar. 09, 2025	Mar. 08, 2026

2.3.3 HARMONICS AND FILCK

No.	Equipment	Manufacturer	Type No.	Serial No.	Last Cal.	Next Cal.
1	Harmonic & Flicker	EM TEST	DPA500	0303-04	Mar. 09, 2025	Mar. 08, 2026
2	AC Power Source	EM TEST	ACS500	0203-01	Mar. 09, 2025	Mar. 08, 2026

2.3.4 ESD

No.	Equipment	Manufacturer	Type No.	Serial No.	Last Cal.	Next Cal.
1	ESD TEST GENERATOR	EVERFINE	EMS61000-2 A-V200	11040001T	Mar. 09, 2025	Mar. 08, 2026

2.3.5 RS (SMQ)

No.	Equipment	Manufacturer	Type No.	Serial No.	Last Cal.	Next Cal.
1	Signal Generator	R&S	SMT 06	832080/007	Mar. 09, 2025	Mar. 08, 2026
2	Log-Bicon Antenna	Schwarzbeck	VULB9161	4022	Mar. 09, 2025	Mar. 08, 2026
3	Power Amplifier	AR	150W1000M1	320946	Mar. 09, 2025	Mar. 08, 2026
4	Microwave Horn Antenna	AR	AT4002A	321467	Mar. 09, 2025	Mar. 08, 2026
5	Power Amplifier	AR	25S1G4A	308598	Mar. 09, 2025	Mar. 08, 2026

2.3.6 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

No.	Equipment	Manufacturer	Type No.	Serial No.	Last Cal.	Next Cal.
1	Surge Generator	EVERFINE	EMS61000-5A	1101002	Mar. 09, 2025	Mar. 08, 2026
2	DIPS Generator	EVERFINE	EMS61000-1 1K	1011002	Mar. 09, 2025	Mar. 08, 2026
3	EFT/B Generator	EVERFINE	EMS61000-4 A-V2	1012005	Mar. 09, 2025	Mar. 08, 2026

2.3.7 INJECTION CURRENT

No.	Equipment	Manufacturer	Type No.	Serial No.	Last Cal.	Next Cal.
1	Signal Generator	IFR	2023A	202301/368	Mar. 09, 2025	Mar. 08, 2026
2	Power Amplifier	AR	75A250AM1	0320709	Mar. 09, 2025	Mar. 08, 2026
3	CDN	FCC	FCC-801-M2	06043	Mar. 09, 2025	Mar. 08, 2026
4	EM Clamp	FCC	F-203I-23MM	504	Mar. 09, 2025	Mar. 08, 2026

2.3.8 MF

No.	Equipment	Manufacturer	Type No.	Serial No.	Last Cal.	Next Cal.
1	Generator	EVERFINE	EMS61000-8K	1007001	Mar. 09, 2025	Mar. 08, 2026

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT (AC MAINS)

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

Please refer to ETSI EN 301 489-1 Clause 8.4.3

The equipment shall meet the class B limits given in CENELEC EN 55032 [1], annex A table A.10.

Alternatively, for equipment intended to be used in an industrial environment or a telecommunication centre, the class A limits given in CENELEC EN 55032 [1], annex A table A.9 can be used.

If EUT is also a FM Receiver, it shall meet CENELEC EN 55032 [3], annex A tables A.13

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

(1)The tighter limit applies at the band edges.

(2)The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

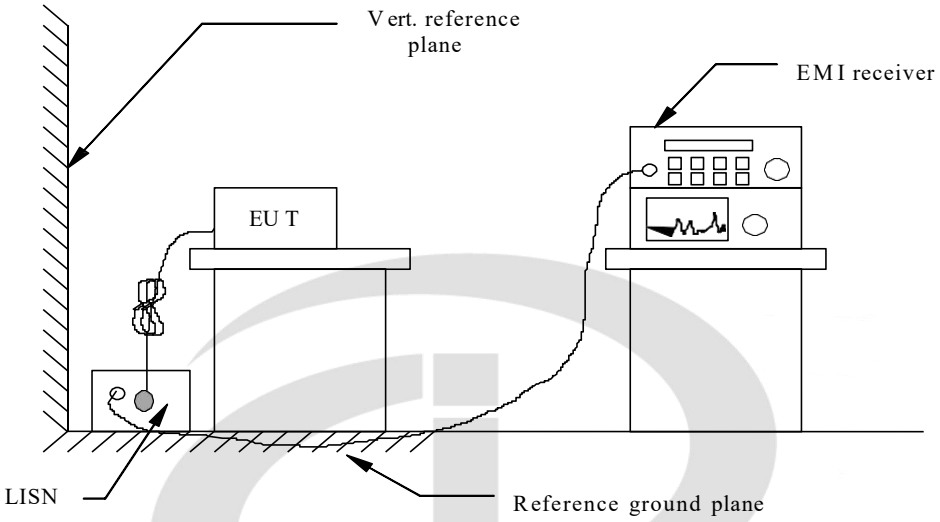
d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.4 TEST SETUP



3.1.5 TEST RESULTS

The EUT is test by DC power supply, so it is not applicable.

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3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

Please refer to ETSI EN 301 489-1 Clause 8.2.3

The ancillary equipment shall meet the class B limits given in CENELEC EN 55032 [1], annex A tables A.4 and A.5.

Alternatively, for ancillary equipment intended to be used exclusively in an industrial environment or telecommunication centres, the class A limits given in CENELEC EN 55032 [1], annex A tables A.2 and A.3 may be used.

If EUT is also a FM Receiver, it shall meet CENELEC EN 55032 [3], annex A tables A.6

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 – 230	40	30
230 – 1000	47	37

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (at 10m) dBuV/m		Class B (at 10m) dBuV/m	
	Peak	Avg	Peak	Avg
1000 – 3000	76	56	70	50
3000 – 6000	80	60	74	54

Notes:

(1) The limit for radiated test was performed according to as following: CISPR 22/ FCC PART 15B /ICES-003.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

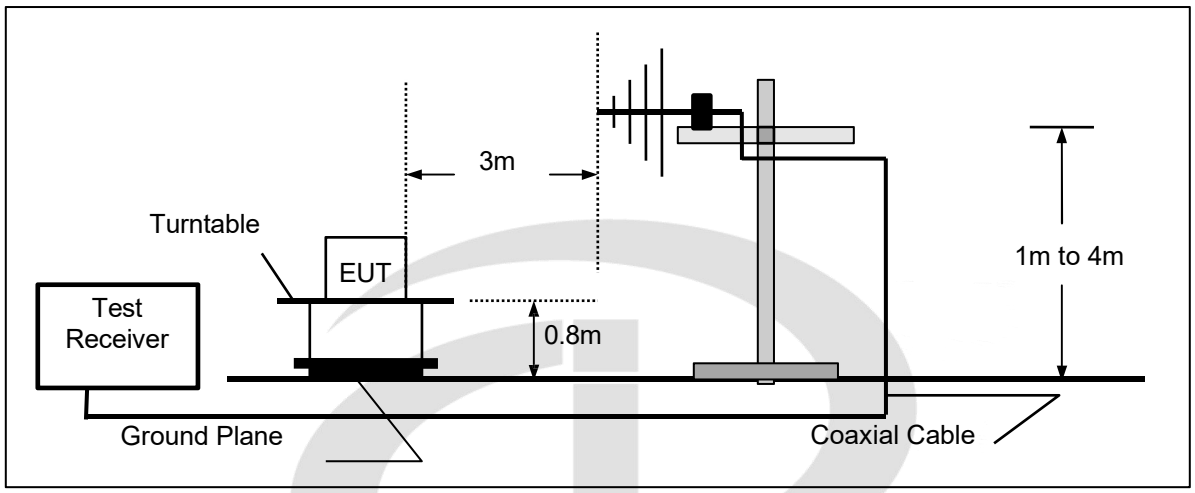
f. For the actual test configuration, please refer to the related Item – EUT Test Photos.

3.2.3 EUT OPERATING CONDITIONS

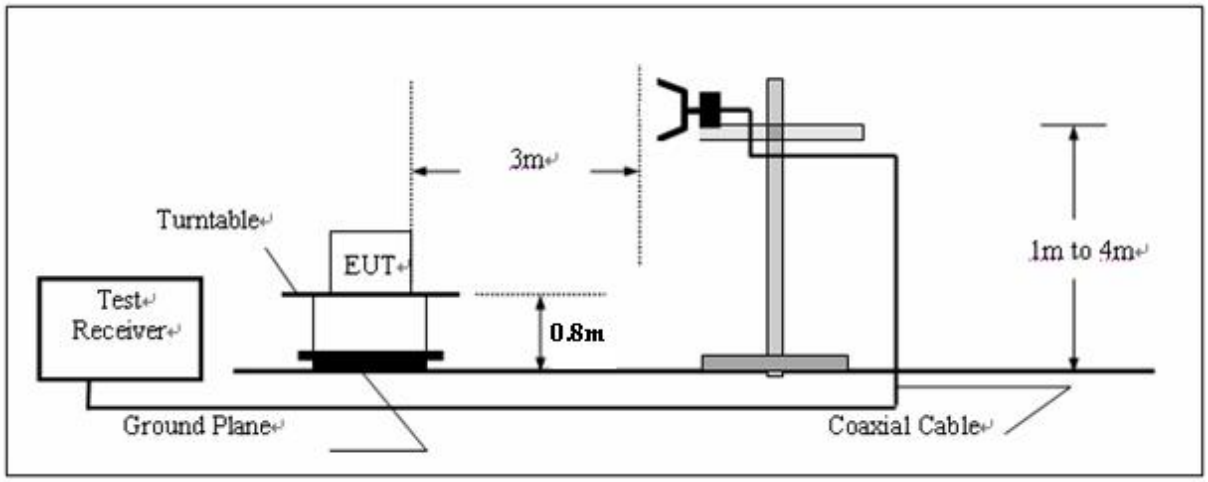
The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.4 TEST SETUP

(A) Radiated Emission Test Set-UP, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP, Frequency Above 1000MHz



3.2.5 TEST RESULTS (30-1000MHz)

PASS

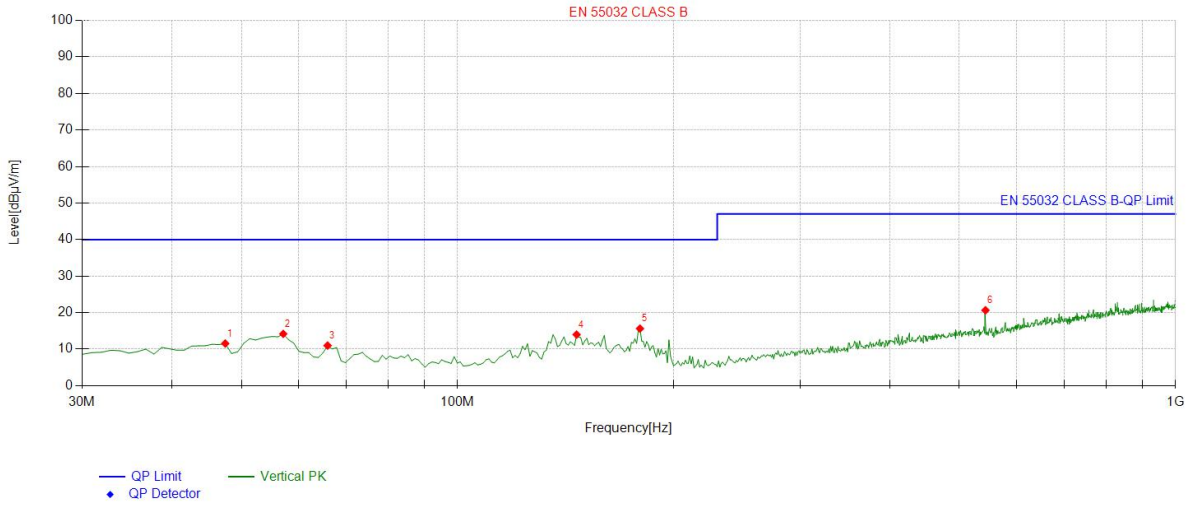
Please refer to the following page.

EUT:	BLE Transmission Modules	Model Name :	MX-01P
Temperature:	24 ℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Horizontal
Test Voltage :	Test power supply	Test Mode:	Working



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	32.912913	-17.94	26.50	8.56	40.00	31.44	100	360	Horizontal
2	59.129129	-18.18	27.73	9.55	40.00	30.45	100	211	Horizontal
3	172.73273	-17.62	31.44	13.82	40.00	26.18	100	158	Horizontal
4	196.03603	-20.38	32.47	12.09	40.00	27.91	100	358	Horizontal
5	287.30730	-17.67	27.97	10.30	47.00	36.70	100	341	Horizontal
6	395.08508	-15.20	33.17	17.97	47.00	29.03	100	209	Horizontal

EUT:	BLE Transmission Modules	Model Name :	MX-01P
Temperature:	24 ℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Vertical
Test Voltage :	Test power supply	Test Mode:	Working



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	47.477477	-17.23	28.76	11.53	40.00	28.47	100	162	Vertical
2	57.187187	-17.96	32.13	14.17	40.00	25.83	100	11	Vertical
3	65.925926	-19.02	30.00	10.98	40.00	29.02	100	351	Vertical
4	146.51651	-17.58	31.55	13.97	40.00	26.03	100	210	Vertical
5	179.52953	-18.95	34.57	15.62	40.00	24.38	100	351	Vertical
6	543.64364	-12.74	33.38	20.64	47.00	26.36	100	317	Vertical

3.3 HARMONIC CURRENT EMISSION

3.3.1 LIMITS OF HARMONIC CURRENT EMISSION

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)
Non Portable Tools or TV Receivers	Odd Harmonics		TV Receivers	Odd Harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
	Even Harmonics			Even Harmonics	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
	8≤n≤40	0.23 · 8/n		DC	0.05

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in A)	(mA/w)
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13≤n≤39	see Table I	3.85/n
			only odd harmonics required		

3.3.2 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.

b. The classification of EUT is according to section 5 of EN IEC 61000-3-2:2019+A1:2021+A2:2024.The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.

c. The correspondent test program of test instrument to measure the current harmonics

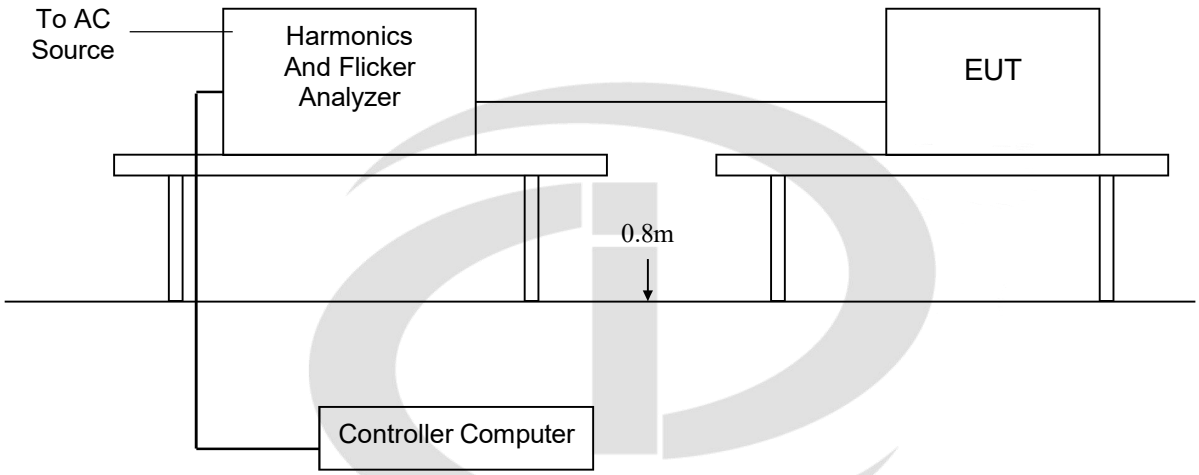
emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

d. For the actual test configuration, please refer to the related item – EUT Test Photos.

3.3.3 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.4 TEST SETUP



3.3.5 TEST RESULTS

The EUT is test by DC power supply, so it is not applicable.

CCTI TESTING

3.4 VOLTAGE FLUCTUATION AND FLICKERS

3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Tests	Limits		Descriptions
	IEC555-3	IEC/EN 61000-3-3	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3%	≤ 3.3%	Relative Steady-State V-Chang
dmax	≤ 4%	≤ 4%	Maximum Relative V-change
d (t)	N/A	≤ 3.3% for > 500 ms	Relative V-change characteristic

3.4.2 TEST PROCEDURE

a. Harmonic Current Test:
Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

b. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

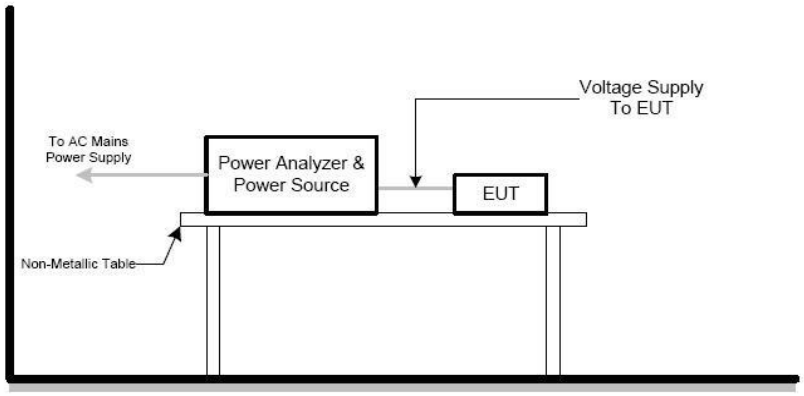
c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.4.3 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.4 TEST SETUP



3.4.5 TEST RESULTS

The EUT is test by DC power supply, so it is not applicable.

4. EMC IMMUNITY TEST

4.1 GENERAL PERFORMANCE CRITERIA

4.1.1 PERFORMANCE CRITERIA

According To **EN 301489-17** standard, The General Performance Criteria As Following:

Criteria	During the test	After the test
A	Shall operate as intended May show degradation of performance (see note 1) Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended Shall be no degradation of performance (see note 2) Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance (see note 1) No unintentional transmissions	Functions shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance (see note 2) Shall be no loss of stored data or user programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be no degradation of performance (see note 2)

NOTE 1: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: no degradation of performance after the test is understood as any degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

PERFORMANCE FOR TT

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

PERFORMANCE FOR TR

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test.
In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

PERFORMANCE FOR CT

The performance criteria A shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an Acknowledgement (ACK) or Not Acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

PERFORMANCE FOR CR

The performance criteria A shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

4.1.2 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

4.2 ELECTROSTATIC DISCHARGE TESTING

4.2.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Mode 1 Impedance:	330 ohm / 150 pF
Required Performance	B
Mode 1 Voltage:	Air Mode 1:2kV/4kV/8kV (Direct) Contact Mode 1:2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Mode 1:	Air Mode 1: min. 20 times at each test point Contact Mode 1: min. 200 times in total
Mode 1 Mode:	Mode 1
Mode 1 Period:	1 second minimum

4.2.2 TEST PROCEDURE

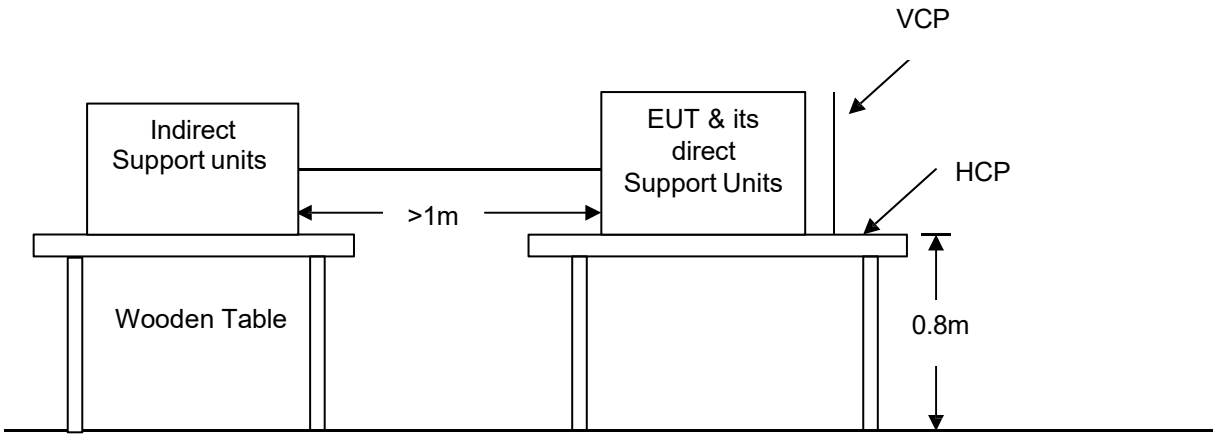
The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.
During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.
If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.
Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Mode 1 Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge. Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Mode 1 Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

c. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 TEST SETUP



Ground Reference Plane

Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC
/EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

4.2.4 TEST RESULTS

EUT:	BLE Transmission Modules	Model Name :	MX-01P
Temperature:	25 ℃	Relative Humidity:	45%
Pressure:	1010 hPa	Test Power:	Test power supply
Test Mode:	Mode 1		

Direct discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
Contact discharge	±2	No degradation in performance of the EUT was observed (A)	B	Pass
	±4	A	B	
Air discharge	±2	A	B	
	±4	A	B	
	±8	A	B	
Indirect discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
HCP (6 sides)	±2	A	B	Pass
	±4	A	B	
VCP (4 sides)	±2	A	B	
	±4	A	B	

Note:

(1) P/N denotes the Positive/Negative polarity of the output voltage.

(2) Test condition:

Direct / Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point.

Air discharges: Minimum 10 times (Positive/Negative) at each point.

(3) N/A - denotes test is not applicable in this test report

(4) There was not any unintentional transmission in standby mode

4.3 RF ELECTROMAGNETIC FIELD TEST

4.3.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz ,1400MHz-2700MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds
Test site:	SMQ RS test room

4.3.2 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.
The testing distance from antenna to the EUT was 3 meters. The other condition as following manner:

a. The field strength level was 3V/m.

b. The frequency range is swept from 80 MHz to 1000 MHz, & 1400MHz - 2700MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.

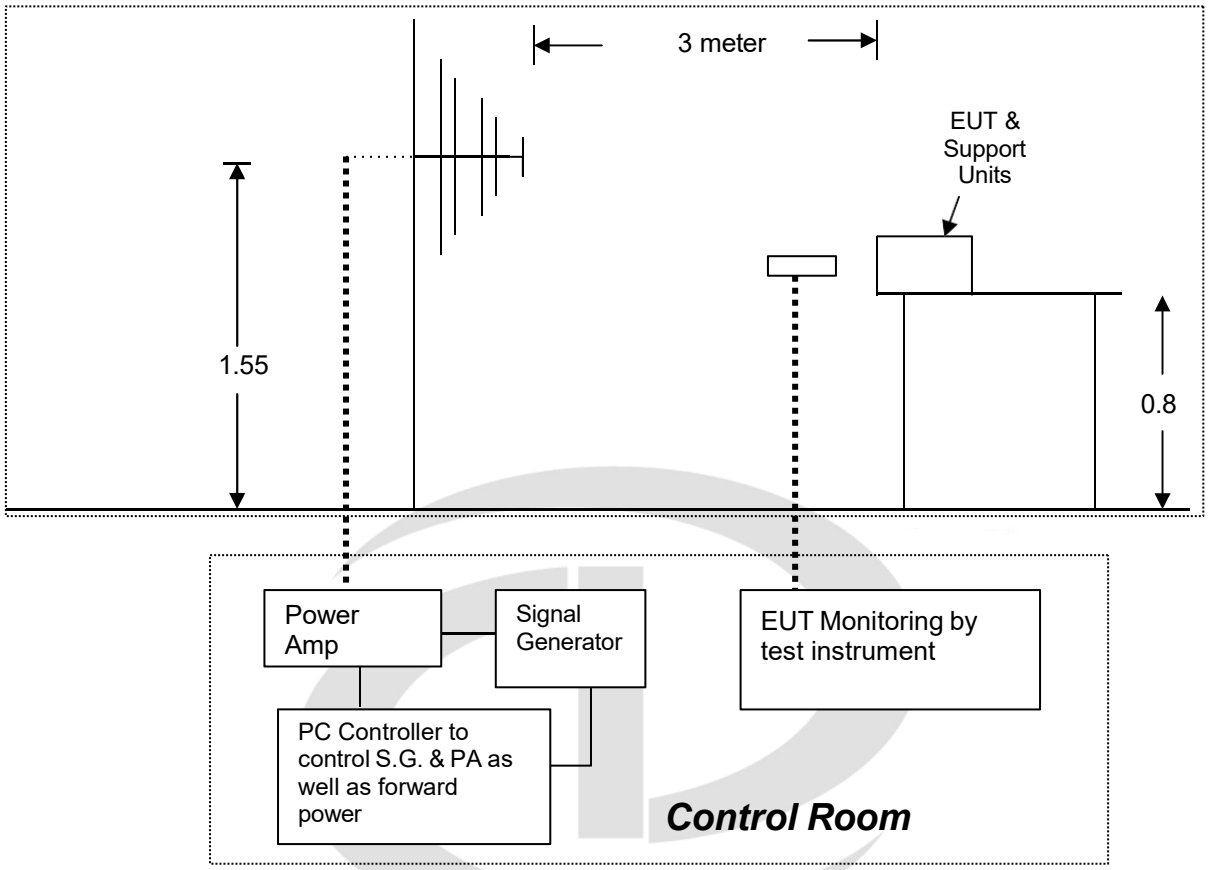
c. Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz (if applicable)

d. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

f. For the actual test configuration, please refer to the related Item – EUT Test Photos.

4.3.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

4.3.4 TEST RESULTS

EUT:	BLE Transmission Modules	Model Name :	MX-01P
Temperature:	25 ℃	Relative Humidity:	45%
Pressure:	1010 hPa	Test Power:	Test power supply
Test Mode:	Mode 1		

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)	Result
80MHz-6GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A	PASS
			H		A	PASS
			V	Rear	A	PASS
			H		A	PASS
			V	Left	A	PASS
			H		A	PASS
			V	Right	A	PASS
			H		A	PASS
			V	Top	A	PASS
			H		A	PASS
			V	Bottom	A	PASS
			H		A	PASS

Note:

(1) P/N denotes the Positive/Negative polarity of the output voltage.

(2) N/A - denotes test is not applicable in this test report.

(3) There was no change operated with initial operating during the test.

(4) There was not any unintentional transmission in standby mode

4.4 FAST TRANSIENTS COMMON MODE TESTING

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line:1 kV Signal/Control Line:0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

4.4.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

The other condition as following manner:

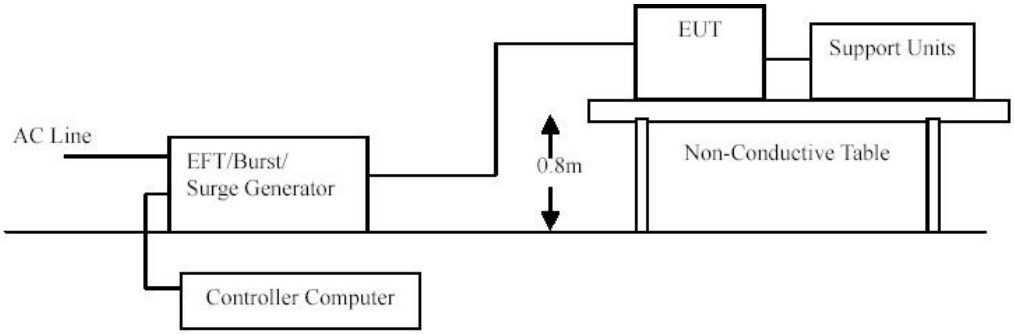
a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.

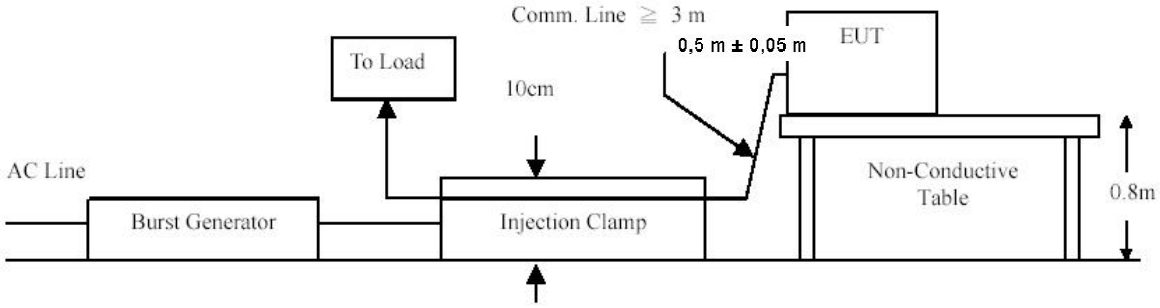
b. Both positive and negative polarity discharges were applied.

c. The duration time of each test sequential was 1 minute.

d. For the actual test configuration, please refer to the related Item – EUT Test Photos.

4.4.3 TEST SETUP





Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

4.4.4 TEST RESULTS

The EUT is test by DC power supply, so it is not applicable.

4.5 SURGE TESTING

4.5.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance:	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line:0.5 kV, 1 kV, 2 kV
Surge Input/Output:	L1-L2, L1-PE, L2-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0 /90/180/270
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

4.5.2 TEST PROCEDURE

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

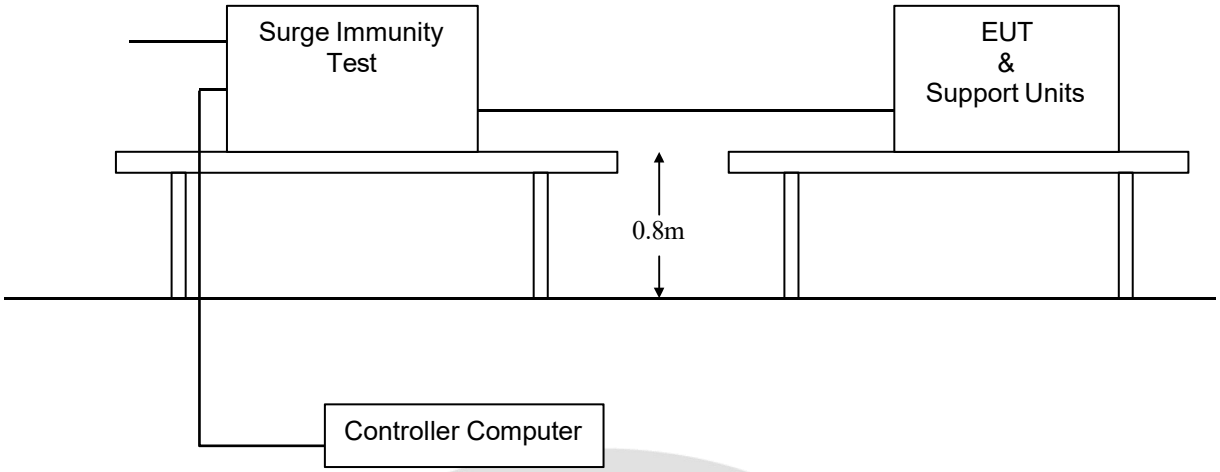
b. For test applied to unshielded asymmetrical operated interconnection lines of EUT: The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

The surge is applied to the lines via gas arrester coupling. Test levels below the ignition point of the coupling arrester cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.5.3 TEST SETUP



4.5.4 TEST RESULTS

The EUT is test by DC power supply, so it is not applicable.

CCTI TESTING

4.6 RF-COMMON MODE 0.15MHz TO 80MHz TESTING

4.6.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

4.6.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

a. The other condition as following manner:

b. The field strength level was 3V.

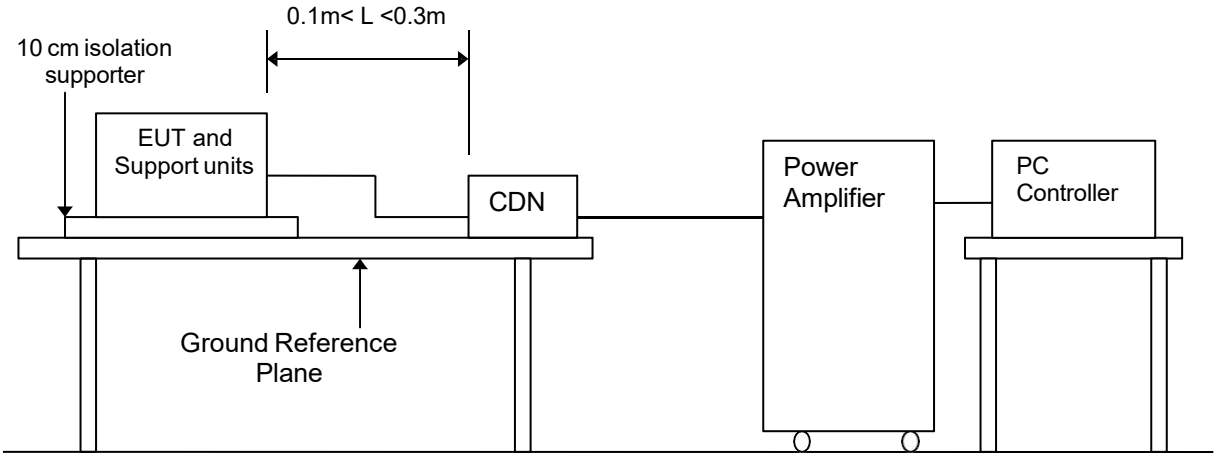
c. The frequency range is swept from 150 KHz to 80 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.

d. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

e. For the actual test configuration, please refer to the related Item – EUT Test Photos.

CCTI TESTING

4.6.3 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

4.6.4 TEST RESULTS

The EUT is test by DC power supply, so it is not applicable.

4.7 VOLTAGE INTERRUPTION/DIPS TESTING

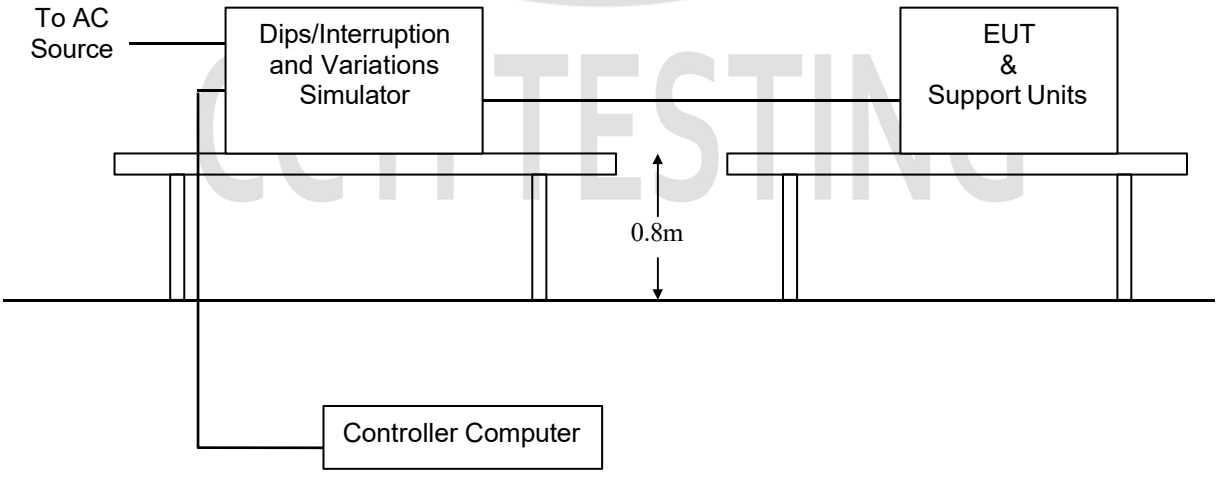
4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance	100% reduction, 0.5 Cycle 100% reduction, 1.0 Cycle 30% reduction, 25 Cycles
Voltage Interruptions:	100% reduction, 250 Cycles
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

4.7.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.7.3 TEST SETUP

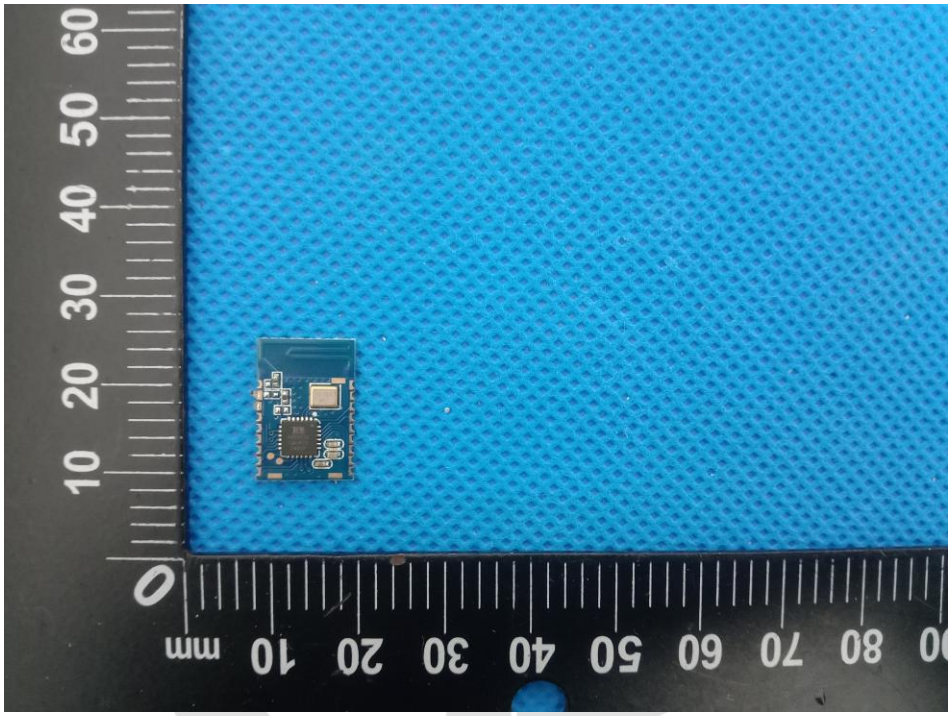


For the actual test configuration, please refer to the related Item –EUT Test Photos.

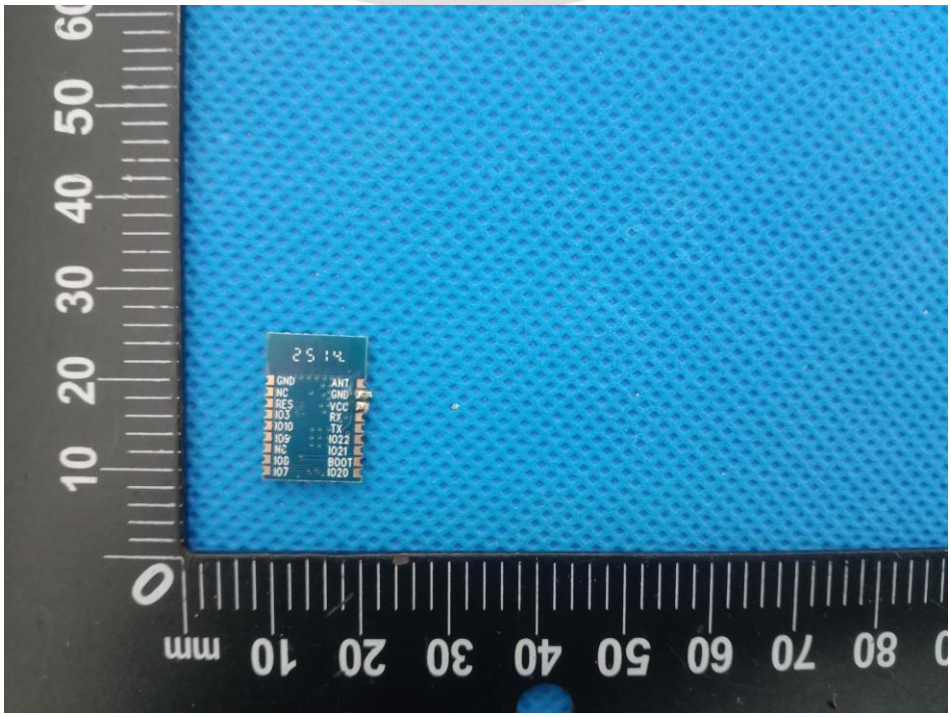
4.7.4 TEST RESULTS

The EUT is test by DC power supply, so it is not applicable.

APPENDIX I -- EUT PHOTOGRAPHS

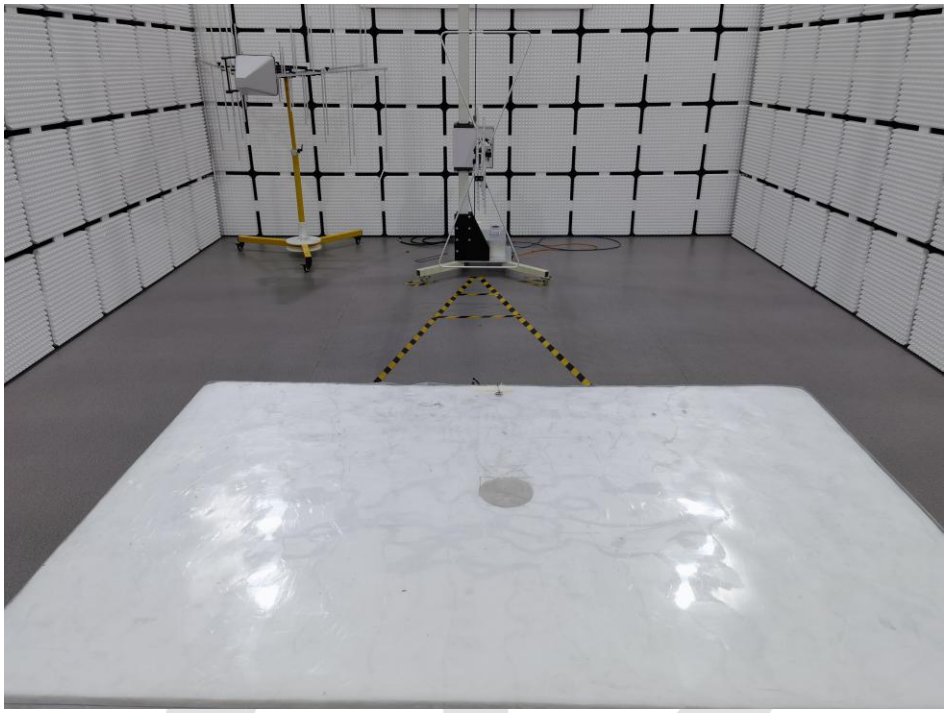


EUT Photo 1



EUT Photo 2

APPENDIX II -- EUT TEST PHOTOGRAPHS



Test Photo RE

※※※※※ **END OF REPORT** ※※※※※

CCTI TESTING