TEST REPORT

Applicant	:	Shenzhen MP LED Technology Co., Ltd
Address	:	B501-502,B601-602,Building 10.Huafeng Industrial Zone, Fengtang Avenue, Tangwei Community, Fuhai.Bao'an District, Shenzhen, Guangdong
Manufacturer	:	Shenzhen MP LED Technology Co., Ltd
Address	:	B501-502,B601-602,Building 10.Huafeng Industrial Zone, Fengtang Avenue, Tangwei Community, Fuhai.Bao'an District, Shenzhen, Guangdong
Product Name	:	LED Display
Model Number	:	P3.91, P0.78, P0.93, P1.25, P1.53, P1.56, P1.86, P1.875, P2, P2.5, P3.07, P4, P4.4, P5, P5.7, P6.25, P6.67, P7.81, P8, P10
Trademark	:	N/A
Date of Receipt	:	Jul. 23, 2026
Test Date	:	Jul. 23, 2026 - Jul. 31, 2026
Date of Report	:	Aug. 04, 2026
Test Result	:	The equipment under test was found to be compliance with the requirements of the standards applied.

Test Procedure Used:

Standards	:	EN 55032:2015+A11:2020+A1:2020
		EN IEC 61000-3-2:2019+A1:2021+A2:2024
		EN 61000-3-3:2013+A1:2019+A2:2021
		EN 55035:2017+A11:2020

Prepared by(Test Engineer):
Sten Huang

Approved(Manager):
Casey Wang

Approved(Manager):
Jerry Liao

TABLE OF CONTENT

Test Report Declaration Page

1. GENERAL INFORMATION 5
1.1. Description of Device (EUT) 5
1.2. Independent Operation Mode 5
1.3. TEST SUMMARY 6
1.4. Special Accessories and Auxiliary Equipment 7
1.5. Test Uncertainty 7
1.6. Test Facility 7
2. TEST INSTRUMENT USED 8
3. CONDUCTED EMISSION AT THE MAINS TERMINALS TEST 10
3.1. Block Diagram Of Test Setup 10
3.2. Test Standard 10
3.3. Power Line Conducted Emission Limit 10
3.4. EUT Configuration on Test 10
3.5. Operating Condition of EUT 10
3.6. Test Procedure 11
3.7. Test Result 11
4. RADIATION EMISSION TEST 14
4.1. Block Diagram of Test Setup 14
4.2. Test Standard 14
4.3. Radiation Limit 15
4.4. EUT Configuration on Test 15
4.5. Operating Condition of EUT 15
4.6. Test Procedure 15
4.7. Test Result 15
5. HARMONIC CURRENT EMISSION TEST 18
5.1. Block Diagram of Test Setup 18
5.2. Test Standard 18
5.3. Operating Condition of EUT 18
5.4. Test Procedure 18
5.5. Test Results 18
6. VOLTAGE FLUCTUATIONS & FLICKER TEST 20
6.1. Block Diagram of Test Setup 20
6.2. Test Standard 20
6.3. Operating Condition of EUT 20
6.4. Test Procedure 20
6.5. Test Results 21
7. ELECTROSTATIC DISCHARGE IMMUNITY TEST 22
7.1. Block Diagram of Test Setup 22
7.2. Test Standard 22
7.3. Severity Levels and Performance Criterion 22
7.4. EUT Configuration 23
7.5. Operating Condition of EUT 23
7.6. Test Procedure 23
7.7. Test Results 24
8. RF FIELD STRENGTH SUSCEPTIBILITY TEST 25
8.1. Block Diagram of Test Setup 25
8.2. Test Standard 26
8.3. Severity Levels and Performance Criterion 26
8.4. EUT Configuration on Test 26
8.5. Operating Condition of EUT 26

8.6. Test Procedure 27
8.7. Test Results 27
9. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST 28
9.1. Block Diagram of EUT Test Setup 28
9.2. Test Standard 28
9.3. Severity Levels and Performance Criterion 28
9.4. EUT Configuration on Test 29
9.5. Operating Condition of EUT 29
9.6. Test Procedure 29
9.7. Test Results 29
10. SURGE TEST 31
10.1. Block Diagram of EUT Test Setup 31
10.2. Test Standard 31
10.3. Severity Levels and Performance Criterion 31
10.4. EUT Configuration on Test 32
10.5. Operating Condition of EUT 32
10.6. Test Procedure 32
10.7. Test Result 32
11. INJECTED CURRENTS SUSCEPTIBILITY TEST 34
11.1. Block Diagram of EUT Test Setup 34
11.2. Test Standard 34
11.3. Severity Levels and Performance Criterion 34
11.4. EUT Configuration on Test 35
11.5. Operating Condition of EUT 35
11.6. Test Procedure 35
11.7. Test Result 35
12. MAGNETIC FIELD IMMUNITY TEST 37
12.1. Block Diagram of Test Setup 37
12.2. Test Standard 37
12.3. Severity Levels and Performance Criterion 37
12.4. EUT Configuration on Test 38
12.5. Operating Condition of EUT 38
12.6. Test Procedure 38
12.7. Test Results 38
13. VOLTAGE DIPS AND INTERRUPTIONS TEST 39
13.1. Block Diagram of EUT Test Setup 39
13.2. Test Standard 39
13.3. Severity Levels and Performance Criterion 39
13.4. EUT Configuration on Test 40
13.5. Operating Condition of EUT 40
13.6. Test Procedure 40
13.7. Test Result 40
14. EUT TEST PHOTO 42
15. PHOTOGRAPHS 45

Revision History of This Test Report		
Report Number	Description	Issued Date
BKC26074504GE	Initial Issue	2026-08-04

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	LED Display
Trademark	:	MPLED® Make LED Display Simple
Model Number	:	P3.91, P0.78, P0.93, P1.25, P1.53, P1.56, P1.86, P1.875, P2, P2.5, P3.07, P4, P4.4, P5, P5.7, P6.25, P6.67, P7.81, P8, P10
Model Difference	:	The product is different for model name.
Power Supply	:	Input:200-240V～50/60Hz 320W
Work Frequency	:	Below 108MHz

Note:
1) EUT: Equipment under test
2) P3.91 was selected as the test model and the datas have been recorded in this report.

1.2. Independent Operation Mode

Test Voltage: AC 230V/50Hz

Test Mode A: On Mode

Remark: The test data of the worst case condition(s) was reported on the following page.

1.3. TEST SUMMARY

Test Procedures According To The Technical Standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55032:2015 +A11:2020 +A1:2020	AC Port Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	
	Asymmetric Mode Conducted Emissions	Class B	N/A	
	Conducted Differential Voltage Emissions	Class B	N/A	
EN IEC 61000-3-2:2019 +A1:2021+A2:2024	Harmonic Current Emission	Class A or D NOTE (2)	N/A	
EN 61000-3-3:2013+ A2:2021	Voltage Fluctuations & Flicker	------	PASS	
EMC Immunity				
Standard EN 55035:2017+ A11:2020	Test Item	Performance Criteria	Judgment	Remark
IEC 61000-4-2:2008	Electrostatic Discharge	B	PASS	
IEC 61000-4-3: 2020	RF electromagnetic field	A	PASS	
IEC 61000-4-4:2012	Fast transients	A	PASS	
IEC 61000-4-5:2014+ A1:2017	Surges	B	PASS	
IEC 61000-4-6:2013	Injected Current	A	PASS	
IEC 61000-4-8:2009	Power Frequency Magnetic Field	A	N/A	Note(3)
IEC 61000-4-11:2020	Volt. Interruptions Volt. Dips	B / C / C NOTE (4)	PASS	

NOTE:

(1)"N/A" denotes test is not applicable in this Test Report

(2) The power consumption of EUT is less than 75W and no limits apply.

(3) The EUT don't containing magnetic field sensitive components.

(4) Voltage dip: 100% reduction – Performance Criteria B

Voltage dip: 30% reduction – Performance Criteria C

Voltage Interruption: 100% Interruption – Performance Criteria C

(5) For client's request and manual description, the test will not be executed.

1.4. Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.	Serial No.

1.5. Test Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

A. Conducted Measurement :

Method	Measurement Frequency Range	U,(dB)	NOTE
CISPR 16-4-2:2018	150 KHz ~ 30MHz	2.54	

B. Radiated Measurement :

Method	Measurement Frequency Range	U,(dB)	NOTE
CISPR 16-4-2:2018	30MHz ~ 1000MHz	4.25	
	1GHz ~6GHz	3.9	

1.6. Test Facility

Site Description

Name of Firm : Shenzhen BKC Testing Co., Ltd.

Site Location : Room103, 1/F, Huaya Building, Huaya Industrial Park, Yousong Community, Longhua Subdistrict, Longhua District, Shenzhen, Guangdong, China

2. TEST INSTRUMENT USED

2.1 CONDUCTED TEST SITE

1	LISN	R&S	ENV216	102762	Mar. 11. 2026	Mar. 10. 2027
2	EMI Test Receiver	R&S	ESCI	101424	Mar. 11. 2026	Mar. 10. 2027
3	Rf cables	HTEC	HCE 2M-CE	N/A	Mar. 11. 2026	Mar. 10. 2027
4	Coupling/ Decoupling Network	Diamond	CX210	N/A	Mar. 11. 2026	Mar. 10. 2027
5	CE Testing software	EZ	EZ-EMC	/	/	/

2.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Antenna	Schwarzbeck	VULB 9168	01321	Mar. 20. 2025	Mar. 19. 2028
2	EMI Test Receiver	R&S	ESRP	101478	Mar. 11. 2026	Mar. 10. 2027
3	Preamplifier	HP	8447D	2727A05345	Mar. 11. 2026	Mar. 10. 2027
4	Rf cables	HUBER+SUHNER	8M-RE	N/A	Mar. 11. 2026	Mar. 10. 2027
5	Rf cables	HUBER+SUHNER	1.5M-RE	N/A	Mar. 11. 2026	Mar. 10. 2027
6	Rf cables	HUBER+SUHNER	1.5M-AP-RE	N/A	Mar. 11. 2026	Mar. 10. 2027
7	RE Testing software	EZ	EZ-EMC	/		/

2.3 HARMONICS AND FLICKER

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Harmonic & Flicker	Laplace	AC2000A	550507	Mar. 11. 2026	Mar. 10. 2027
2	AC Power Source	Laplace	HPHF4010	N/A	Mar. 11. 2026	Mar. 10. 2027

2.4 Electrostatic Discharge

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	ESD TEST GENERATOR	HTEC	HESD16	N/A	Nov. 12. 2025	Nov. 11. 2026

2.5 RS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Signal Generator	R&S	SMT 06	832080/007	Mar. 11. 2026	Mar. 10. 2027
2	Log-Bicon Antenna	Schwarzbeck	VULB9161	4022	Mar. 11. 2026	Mar. 10. 2027
3	Power Amplifier	AR	150W1000M1	320946	Mar. 11. 2026	Mar. 10. 2027
4	Microwave Horn Antenna	AR	AT4002A	321467	Mar. 11. 2026	Mar. 10. 2027
	Power Amplifier	AR	25S1G4A	308598	Mar. 11. 2026	Mar. 10. 2027

2.6 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Surge /DIPS /EFT Generator	HTEC	ECOMPACT5	216201	Mar. 11. 2026	Mar. 10. 2027
2	Programmable AC power supply	HTEC	HV1P16T	204102	Mar. 11. 2026	Mar. 10. 2027
3	Capacitive coupling pliers	HTEC	H3C	213602	Mar. 11. 2026	Mar. 10. 2027
4	Single phase isolating transformer	HTEC	BK-5KVA	N/A	Mar. 11. 2026	Mar. 10. 2027

2.7 INJECTION CURRENT

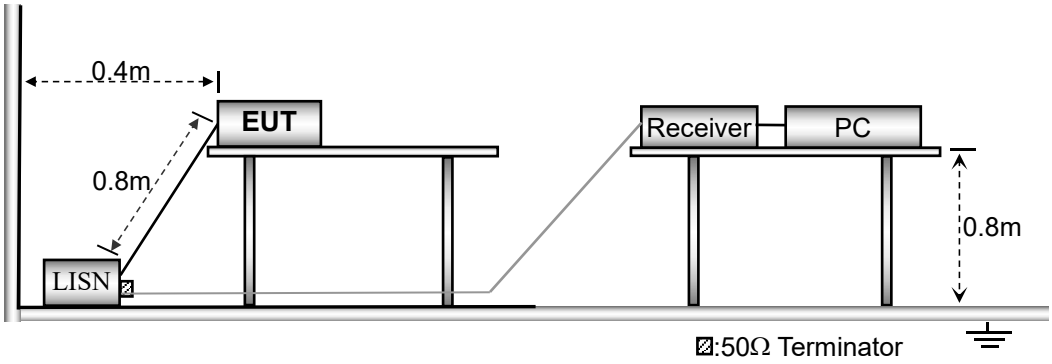
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Signal Generator	HTEC	HCS 75+	232002	Mar. 11. 2026	Mar. 10. 2027
2	CDN	HTEC	CDN-M2+3	231002	Mar. 11. 2026	Mar. 10. 2027
3	Attenuator	HTEC	CDG7006-100 W+	220308033	Mar. 11. 2026	Mar. 10. 2027
4	CS Testing software	HTEC	CS5045	/	/	/

Test software

Software name	RF Testing software
Software version	2.0.0.0
Software name	RE Testing software
Software version	EMEC-03A2 RE+
Software name	CE Testing software
Software version	EMEC-3A1+
Software name	CS Testing software
Software version	2.01

3. CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

3.1. Block Diagram Of Test Setup



3.2. Test Standard

EN 55032:2015+A11:2020+A1:2020

3.3. Power Line Conducted Emission Limit

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50
0.15 ~ 0.50	79	73
0.50 ~ 30.00	66	60

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.4. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet EN 55032 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

3.5. Operating Condition of EUT

3.5.1 Setup the EUT and simulators as shown in Section 3.1.
3.5.2 Turn on the power of all equipments.
3.5.3 Let the EUT work in test modes and test it.

3.6. Test Procedure

The EUT is put on the ground and connected to the AC mains through a Artificial Mains Network (AMN). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the **EN 55032** regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESCI) is set at 9KHz.

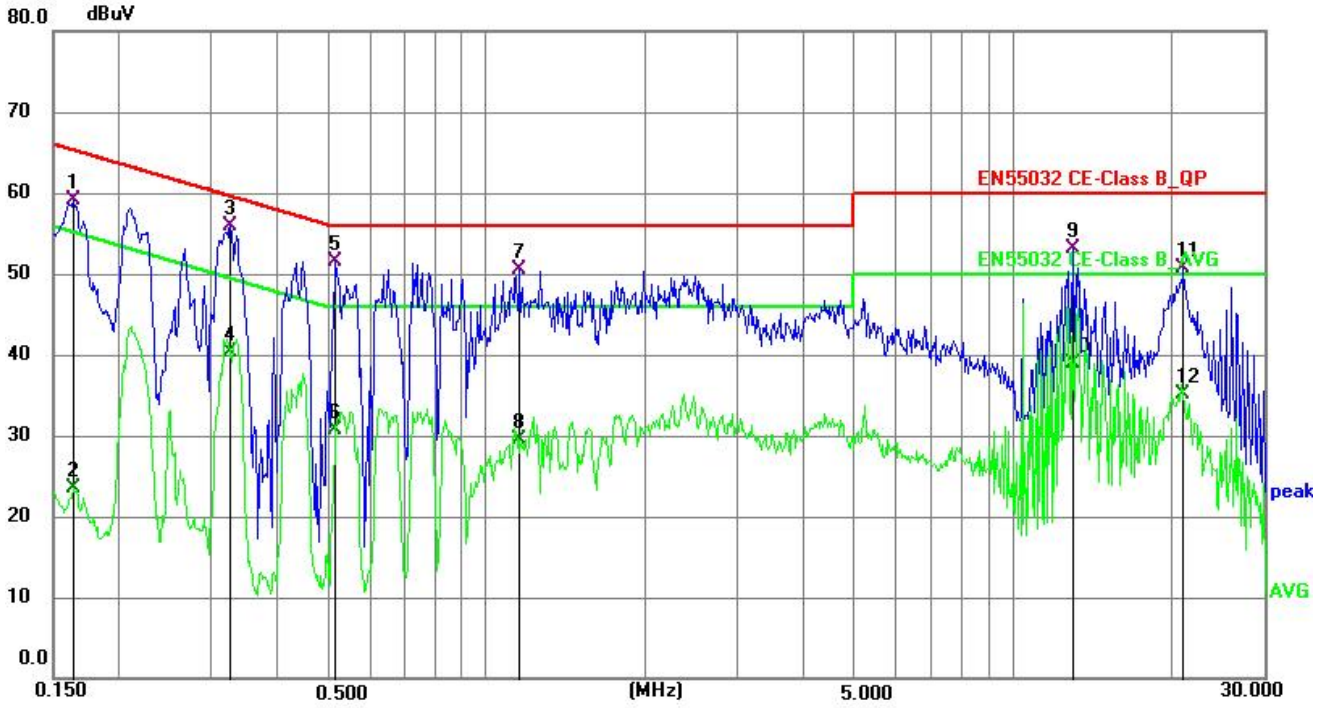
The frequency range from 150 KHz to 30 MHz is investigated.

3.7. Test Result

PASS

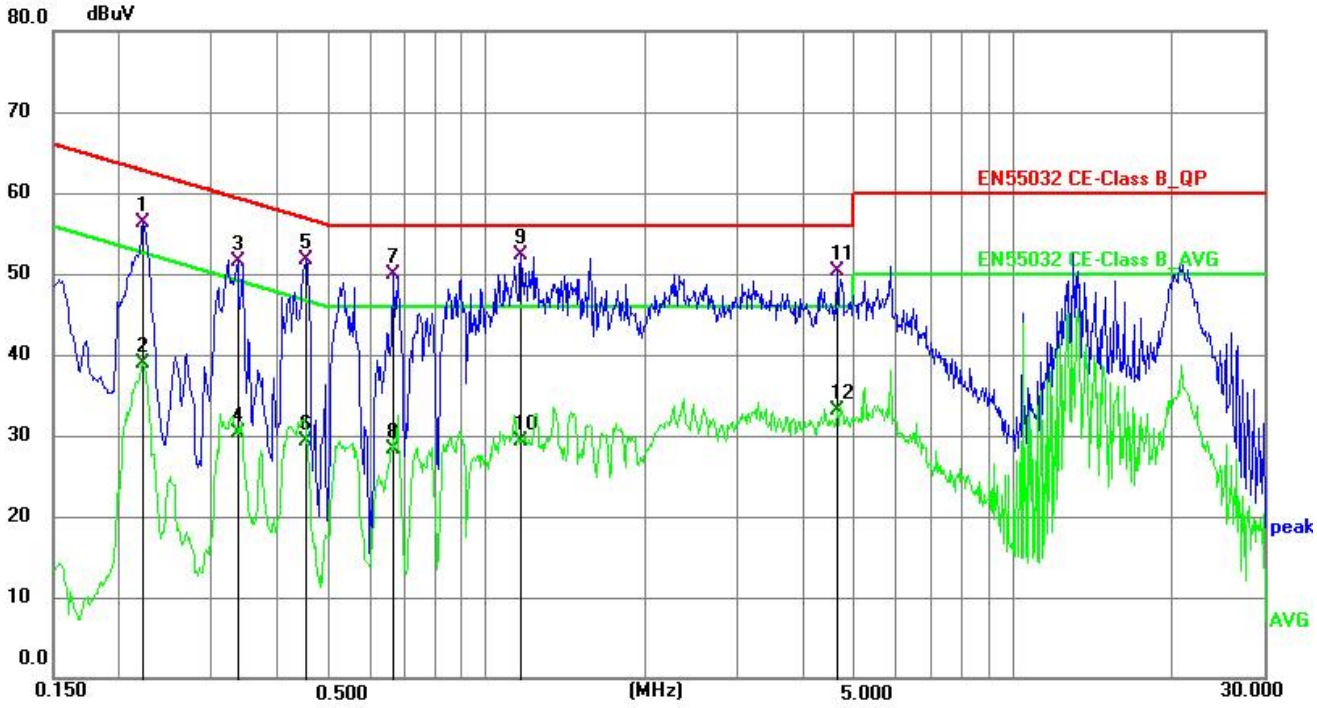
Please refer to the following page.

Conducted Emission At The Mains Terminals Test Data			
Temperature:	25.1℃	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Line
Test Voltage :	AC 230V/50Hz	Test Mode:	On Mode



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1632	49.39	9.78	59.17	65.30	-6.13	QP	P	
2	0.1632	13.69	9.78	23.47	55.30	-31.83	AVG	P	
3 *	0.3251	46.13	9.77	55.90	59.58	-3.68	QP	P	
4	0.3251	30.44	9.77	40.21	49.58	-9.37	AVG	P	
5	0.5143	41.67	9.77	51.44	56.00	-4.56	QP	P	
6	0.5143	20.90	9.77	30.67	46.00	-15.33	AVG	P	
7	1.1578	40.84	9.74	50.58	56.00	-5.42	QP	P	
8	1.1578	19.82	9.74	29.56	46.00	-16.44	AVG	P	
9	13.0243	43.28	9.74	53.02	60.00	-6.98	QP	P	
10	13.0243	29.13	9.74	38.87	50.00	-11.13	AVG	P	
11	21.0793	40.86	9.81	50.67	60.00	-9.33	QP	P	
12	21.0793	25.39	9.81	35.20	50.00	-14.80	AVG	P	

Conducted Emission At The Mains Terminals Test Data			
Temperature:	25.1℃	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Neutral
Test Voltage :	AC 230V/50Hz	Test Mode:	On Mode

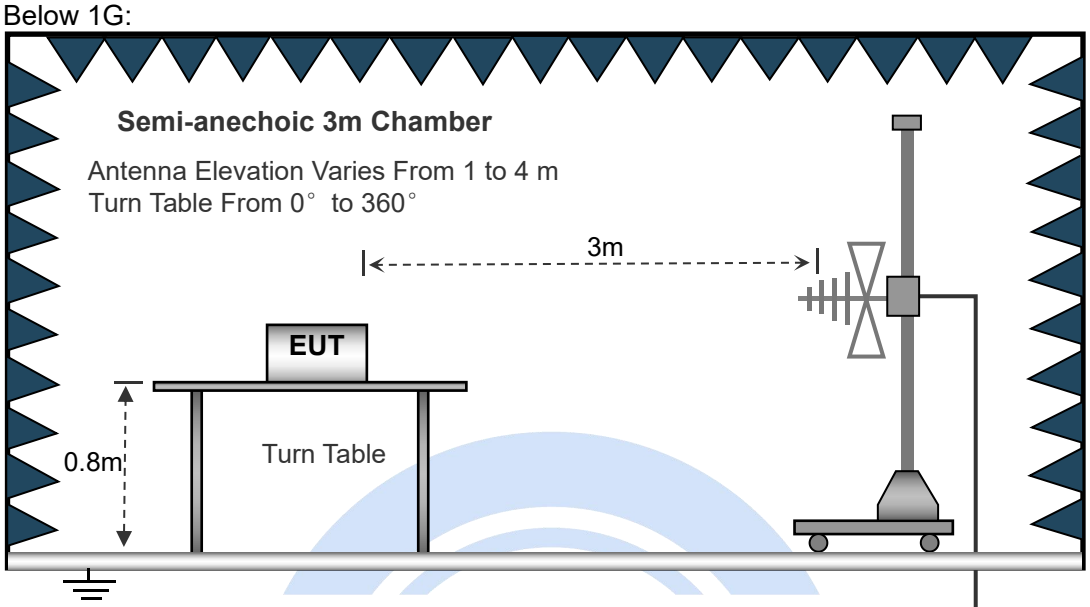


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2220	46.56	9.71	56.27	62.74	-6.47	QP	P	
2	0.2220	29.18	9.71	38.89	52.74	-13.85	AVG	P	
3	0.3345	41.71	9.70	51.41	59.34	-7.93	QP	P	
4	0.3345	20.54	9.70	30.24	49.34	-19.10	AVG	P	
5	0.4539	42.03	9.70	51.73	56.80	-5.07	QP	P	
6	0.4539	19.58	9.70	29.28	46.80	-17.52	AVG	P	
7	0.6630	40.25	9.69	49.94	56.00	-6.06	QP	P	
8	0.6630	18.67	9.69	28.36	46.00	-17.64	AVG	P	
9 *	1.1625	42.59	9.68	52.27	56.00	-3.73	QP	P	
10	1.1625	19.61	9.68	29.29	46.00	-16.71	AVG	P	
11	4.6319	40.65	9.72	50.37	56.00	-5.63	QP	P	
12	4.6319	23.34	9.72	33.06	46.00	-12.94	AVG	P	

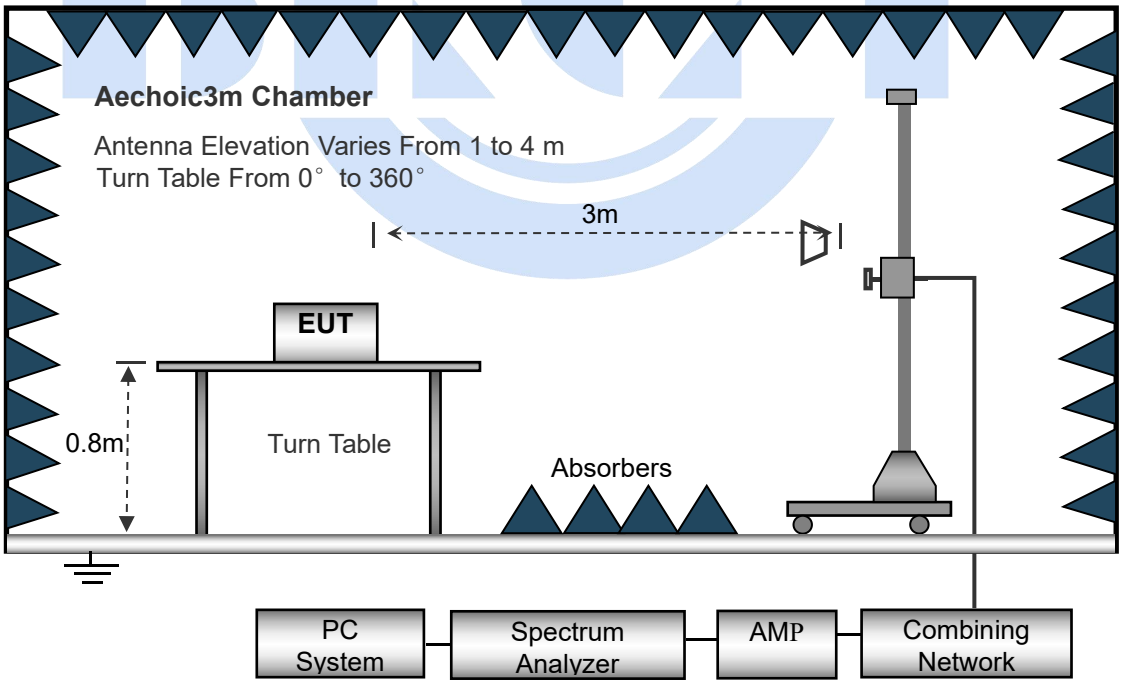
4. RADIATION EMISSION TEST

4.1. Block Diagram of Test Setup

Below 1G:



Above 1G:



4.2. Test Standard

EN 55032:2015+A11:2020+A1:2020

4.3. Radiation Limit

Frequency MHz	Distance (Meters)	Field Strengths Limits dB(μV)/m	Detector
30 ～ 230	3	40.0	QP
230 ～ 1000	3	47.0	QP
1000 ～ 3000	3	76.0	PEAK
1000 ～ 3000	3	56.0	AVERAGE
3000 ～ 6000	3	80.0	PEAK
3000 ～ 6000	3	60.0	AVERAGE

Remark:

(1) Emission level (dB(μV)/m) = 20 log Emission level (μV/m)

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance refers to the distance in meters between the measuring instrument, antenna and the closed point of any part of the device or system.

4.4. EUT Configuration on Test

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission test.
The configuration of EUT is the same as used in conducted emission test. Please refer to Section 3.4.

4.5. Operating Condition of EUT

Same as conducted emission test, which is listed in Section 3.4 except the test set up replaced as Section 4.1.

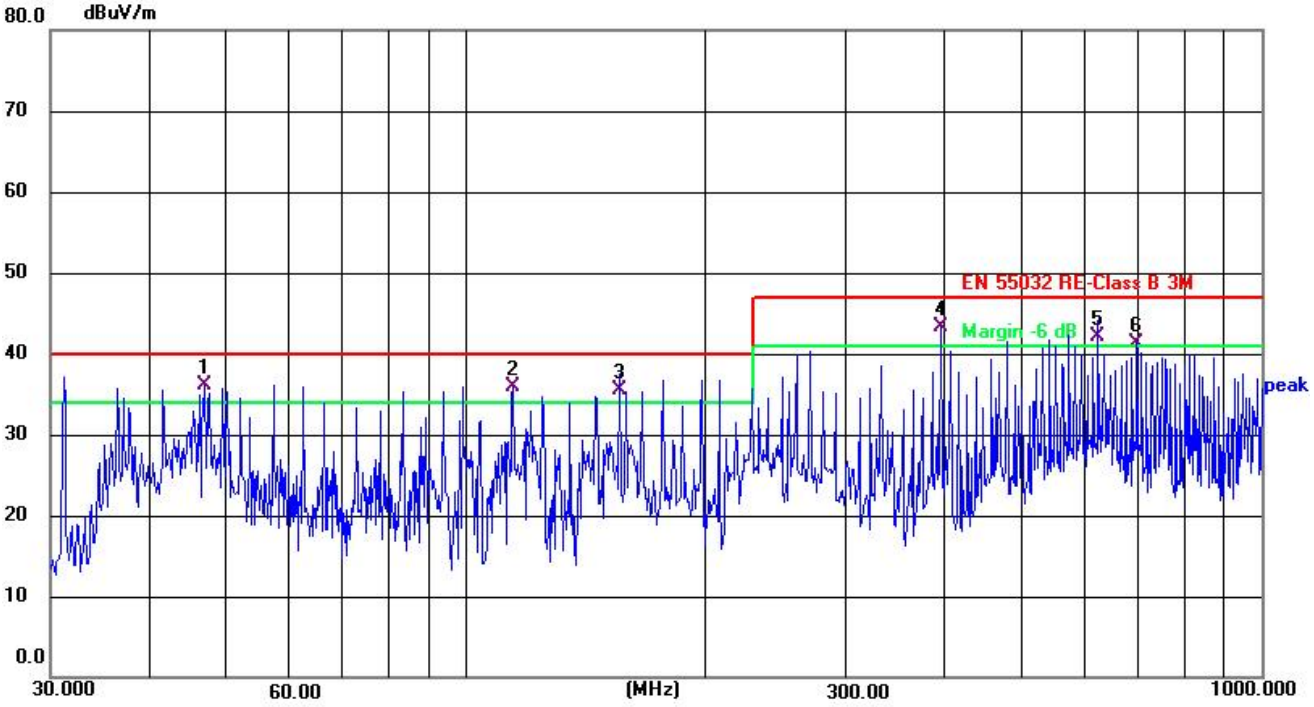
4.6. Test Procedure

The EUT and its simulators are placed on a turned table that is 0.8 meter above the ground. The turned table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on the antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. In order to find the maximum emission levels, the interface cable must be manipulated according to EN 55032 on radiated emission test.
The bandwidth setting on the field strength meter is set at 120KHz below 1GHz, set at 1MHz above 1GHz

4.7. Test Result

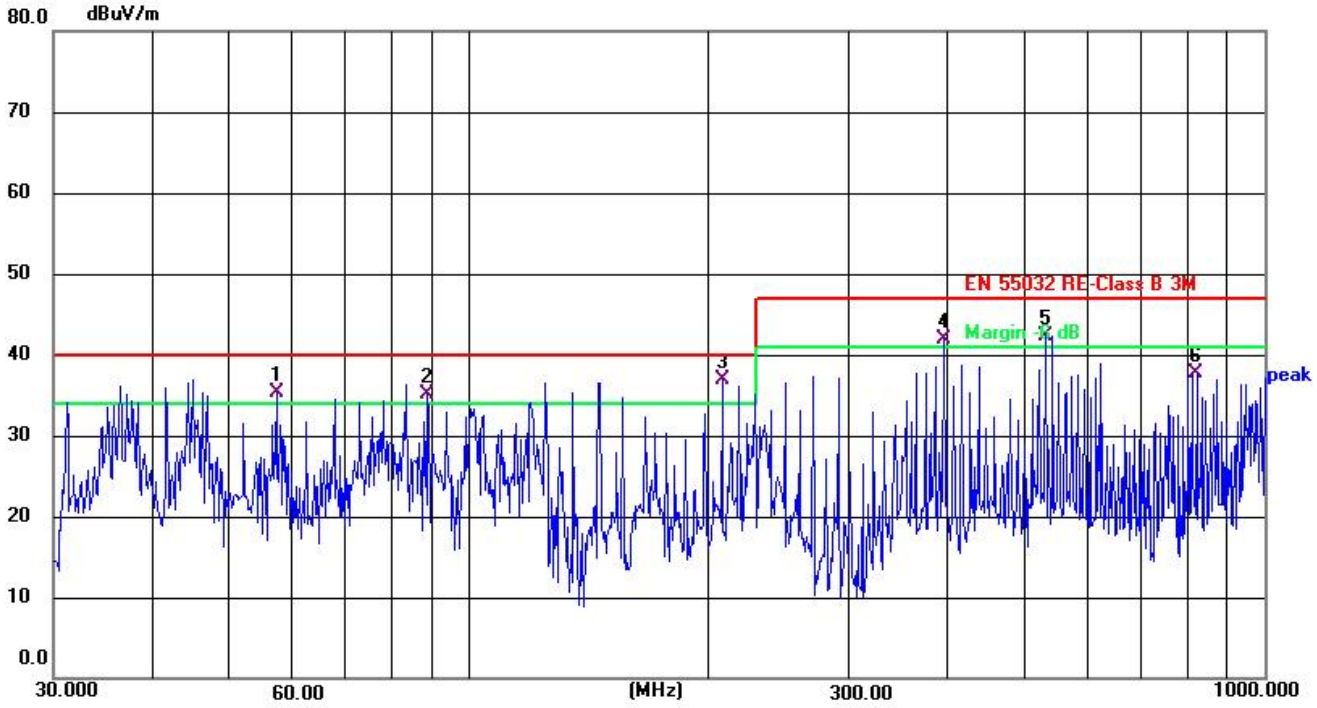
PASS
Please refer to the following page.

Radiation Emission Test Data			
Temperature:	25.1℃	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Horizontal
Test Voltage :	AC 230V/50Hz	Test Mode:	On Mode



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	46.8302	52.36	-16.20	36.16	40.00	-3.84	QP	100	349	P	
2 !	114.5146	53.71	-17.76	35.95	40.00	-4.05	QP	100	201	P	
3 !	155.9101	50.44	-14.94	35.50	40.00	-4.50	QP	100	138	P	
4 *	394.8545	56.71	-13.31	43.40	47.00	-3.60	QP	100	355	P	
5 !	622.8900	51.37	-9.27	42.10	47.00	-4.90	QP	100	290	P	
6 !	696.8567	49.45	-8.22	41.23	47.00	-5.77	QP	100	112	P	

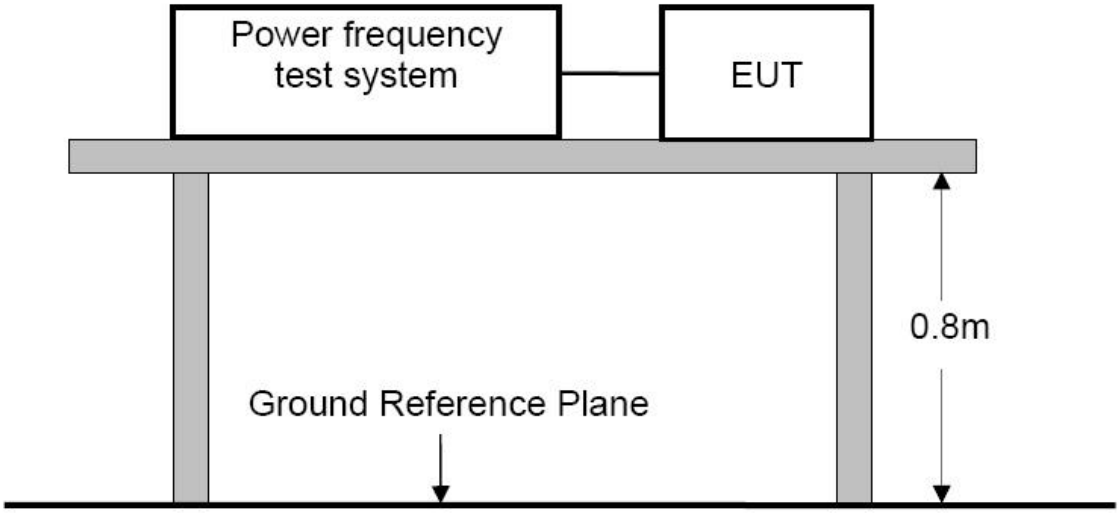
Radiation Emission Test Data			
Temperature:	25.1℃	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Vertical
Test Voltage :	AC 230V/50Hz	Test Mode:	On Mode



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	57.1914	52.05	-16.81	35.24	40.00	-4.76	QP	100	297	P	
2 !	88.3421	55.16	-20.15	35.01	40.00	-4.99	QP	100	334	P	
3 *	207.8500	55.32	-18.47	36.85	40.00	-3.15	QP	100	169	P	
4 !	394.8544	55.25	-13.31	41.94	47.00	-5.06	QP	100	284	P	
5 !	530.1013	53.46	-11.06	42.40	47.00	-4.60	QP	100	347	P	
6	821.7103	44.15	-6.37	37.78	47.00	-9.22	QP	100	131	P	

5. HARMONIC CURRENT EMISSION TEST

5.1. Block Diagram of Test Setup



5.2. Test Standard

EN IEC 61000-3-2:2019+A1:2021+A2:2024

5.3. Operating Condition of EUT

5.3.1 Setup the EUT as shown in Section 5.1.

5.3.2 Turn on the power of all equipments.

5.3.3 Let the EUT work in test mode (ON) and test it.

5.4. Test Procedure

The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test the harmonic current level.

5.5. Test Results

PASS

Please refer to the following page.

Harmonics Test Summary

Test category: EN IEC 61000-3-2:2019+A1:2021 Class A **Model/Type:**
Measurement standard: IEC 61000-4-7 Ed2:1:2009 **Serial number:**
Test date:2026-07-31 **Start time: 13:56:00** **End time: 13:58:36**
Test duration (sec):150
Describe:
Test Result: Pass **Source qualification(Power Off Load): Idle - Pass**

THC(mA): 206.400 **I - THD(%): 13.1** **POHC(mA):31.200** **POHC Limit(mA):251.353**

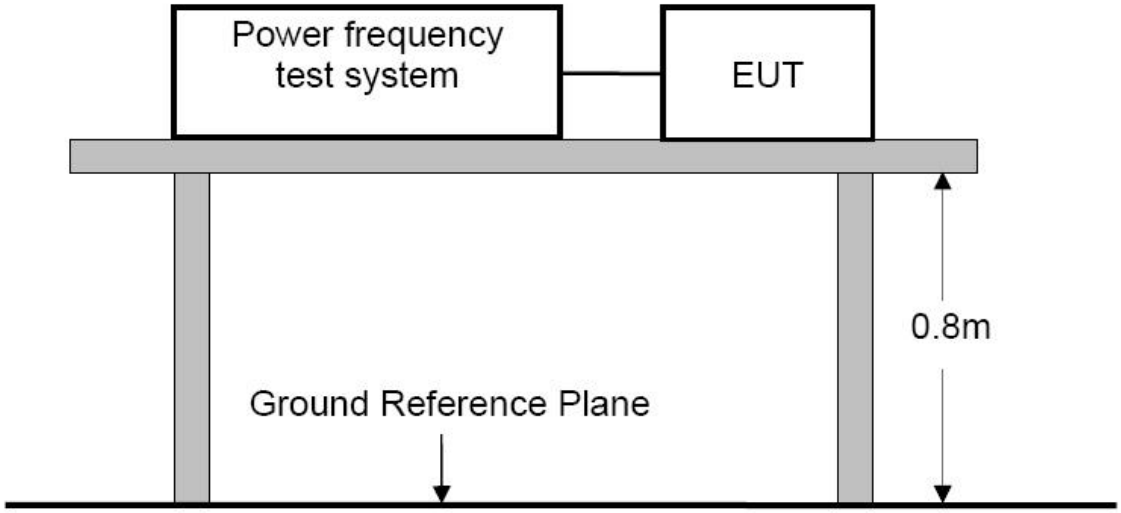
Parameter values during test:

V_RMS (Volts):	226.6	Frequency(Hz):	50.0
I_RMS(mA):	1598.3	Crest Factor:	1.581
Power (Watts):	315.7	Power Factor:	0.982

Harm#	Harms(filtered) (mA)	Limit (mA)	Harms(avg) (mA)	100%Limit	Harms(max) (mA)	150%Limit	Status
I_Fund	1581.400						
2	0.700	1080.000	0.800	0.074	0.900	0.056	Pass
3	197.200	2300.000	196.900	8.561	197.200	5.716	Pass
4	0.800	430.000	0.800	0.186	1.100	0.171	Pass
5	19.300	1140.000	19.600	1.719	19.800	1.158	Pass
6	0.900	300.000	0.700	0.233	1.000	0.222	Pass
7	43.400	770.000	43.400	5.636	43.600	3.775	Pass
8	0.200	230.000	0.500	0.217	0.800	0.232	Pass
9	10.200	400.000	10.300	2.575	10.300	1.717	Pass
10	0.600	184.000	0.500	0.272	0.900	0.326	Pass
11	6.100	330.000	6.200	1.879	6.200	1.253	Pass
12	0.500	153.300	0.400	0.261	0.700	0.304	Pass
13	12.300	210.000	12.500	5.952	12.700	4.032	Pass
14	0.100	131.400	0.300	0.228	0.400	0.203	Pass
15	11.500	150.000	11.900	7.933	12.200	5.422	Pass
16	0.200	115.000	0.300	0.261	0.500	0.290	Pass
17	9.500	132.400	9.400	7.100	9.600	4.834	Pass
18	0.400	102.200	0.300	0.294	0.400	0.261	Pass
19	5.200	118.400	4.800	4.054	5.300	2.984	Pass
20	0.300	92.000	0.400	0.435	0.500	0.362	Pass
21	6.800	107.100	6.600	6.162	6.800	4.233	Pass
22	0.400	83.600	0.400	0.478	0.500	0.399	Pass
23	5.900	97.800	5.900	6.033	6.000	4.090	Pass
24	0.300	76.700	0.400	0.522	0.600	0.522	Pass
25	4.500	90.000	4.800	5.333	5.100	3.778	Pass
26	0.200	70.800	0.200	0.282	0.300	0.282	Pass
27	9.000	83.300	9.500	11.405	9.900	7.923	Pass
28	0.500	65.700	0.500	0.761	0.600	0.609	Pass
29	13.300	77.600	13.900	17.912	14.300	12.285	Pass
30	0.400	61.300	0.400	0.653	0.600	0.653	Pass
31	11.700	72.600	11.800	16.253	11.800	10.836	Pass
32	0.400	57.500	0.400	0.696	0.500	0.580	Pass
33	7.000	68.200	6.300	9.238	7.000	6.843	Pass
34	0.500	54.100	0.600	1.109	0.700	0.863	Pass
35	3.300	64.300	3.100	4.821	3.300	3.421	Pass
36	0.500	51.100	0.500	0.978	0.800	1.044	Pass
37	9.700	60.800	10.500	17.270	11.500	12.610	Pass
38	0.500	48.400	0.600	1.240	0.800	1.102	Pass
39	15.600	57.700	15.900	27.556	16.100	18.602	Pass
40	0.900	46.000	1.200	2.609	1.400	2.029	Pass

6. VOLTAGE FLUCTUATIONS & FLICKER TEST

6.1. Block Diagram of Test Setup



6.2. Test Standard

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

6.3. Operating Condition of EUT

Same as Section 5.3. The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test the harmonic current level.

Flicker Test Limit

Test items	Limits
Pst	1.0
dc	3.3%
dmax	4.0%
dt	Not exceed 3.3% for 500ms

6.4. Test Procedure

The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test the harmonic current level.

6.5. Test Results

PASS

Note:

The EUT does not contain any automatic switching component and the power consumption is low.

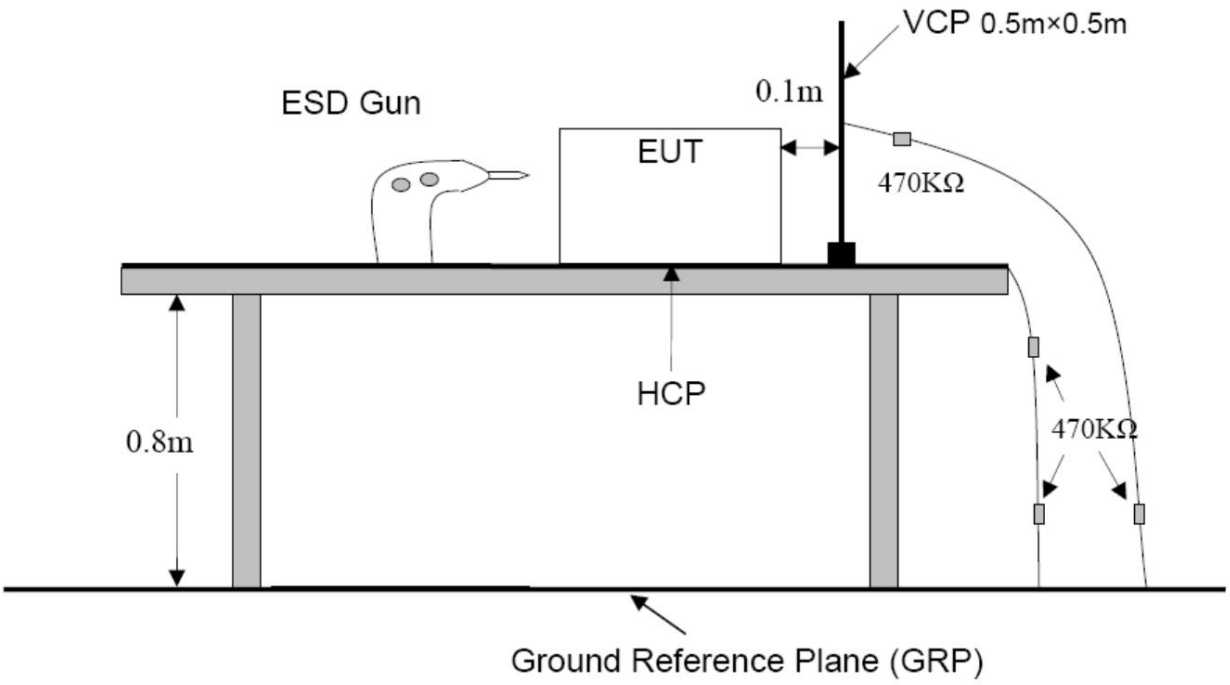
According to the electrical construction, the EUT does not produce inrush current, which may exceed 20A. The supply current will not fluctuate more than 1.5A either.

According to EN 61000-3-3:2013+A2:2021+AC:2022-01, clause 6.1*, the EUT deems to fulfil the requirement without further testing.

*) EN 61000-3-3:2013+A2:2021+AC:2022-01, clause 6.1: “For voltage changes caused by manual switching, equipment is deemed to comply without further testing if the maximum r.m.s. input current evaluated over each 10ms half-period between zero-crossings does not exceed 20A, and the supply current after inrush is within a variation band of 1,5A.”

7. ELECTROSTATIC DISCHARGE IMMUNITY TEST

7.1. Block Diagram of Test Setup



7.2. Test Standard

EN 55035:2017+A11:2020, IEC 61000-4-2:2008

Severity Level: 3 / Air Discharge:±8KV
Level: 2 / Contact Discharge:±4KV

7.3. Severity Levels and Performance Criterion

7.3.1 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

7.3.2 Performance criterion : B

A. The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

B. The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

C. Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

7.4. EUT Configuration

The following equipments are installed on Electrostatic Discharge Immunity test to meet EN 55035:2017+A11:2020, IEC 61000-4-2:2008, requirement and operating in a manner which tends to maximize its emission characteristics in a normal application. The configuration of EUT is the same as used in conducted emission test.
Please refer to Section 3.4

7.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 3.5 except the test setup replaced by Section 7.1

7.6. Test Procedure

7.6.1 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.

7.6.2 Contact Discharge**:**

All the procedure shall be same as Section 7.6.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

7.6.3 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.

7.6.4 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 complete illuminated.

7.7.Test Results

PASS

Please refer to the following page.

ESD Test Data			
Temperature:	25.1℃	Humidity:	54%
Power Supply :	AC 230V/50Hz	Test Mode:	On Mode

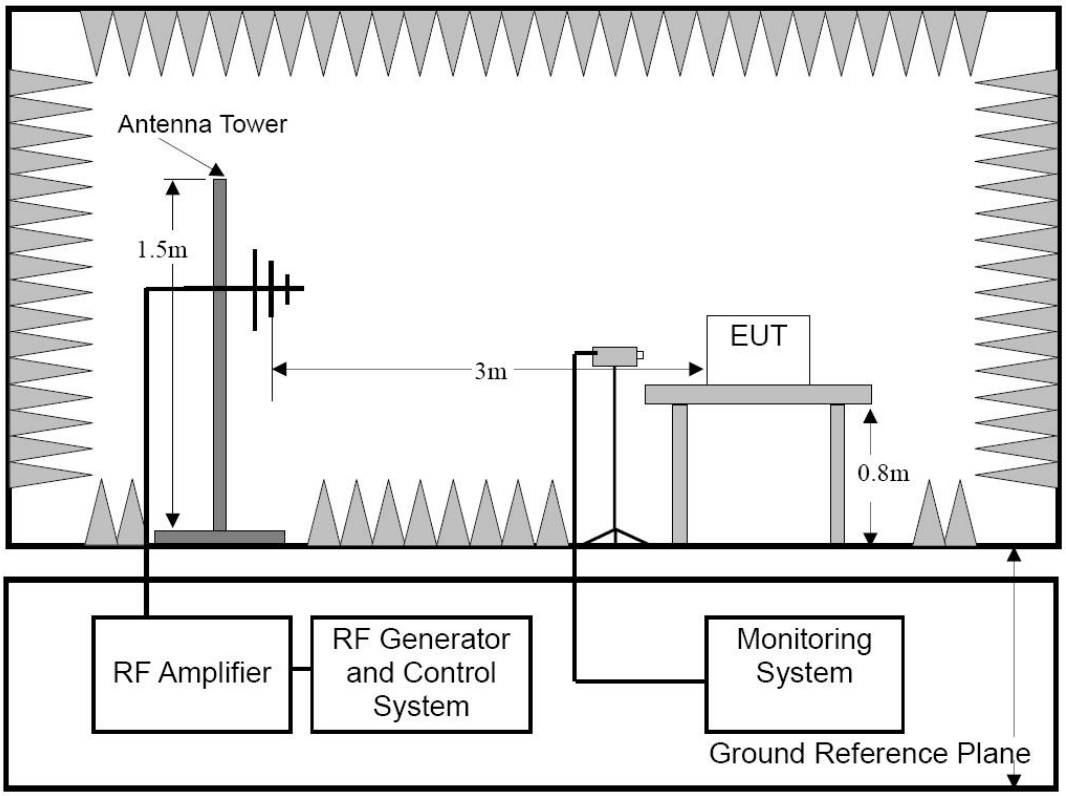
Air Discharge: ± 8KV
Contact Discharge: ± 4KV
For each point positive 10 times and negative 10 times discharge

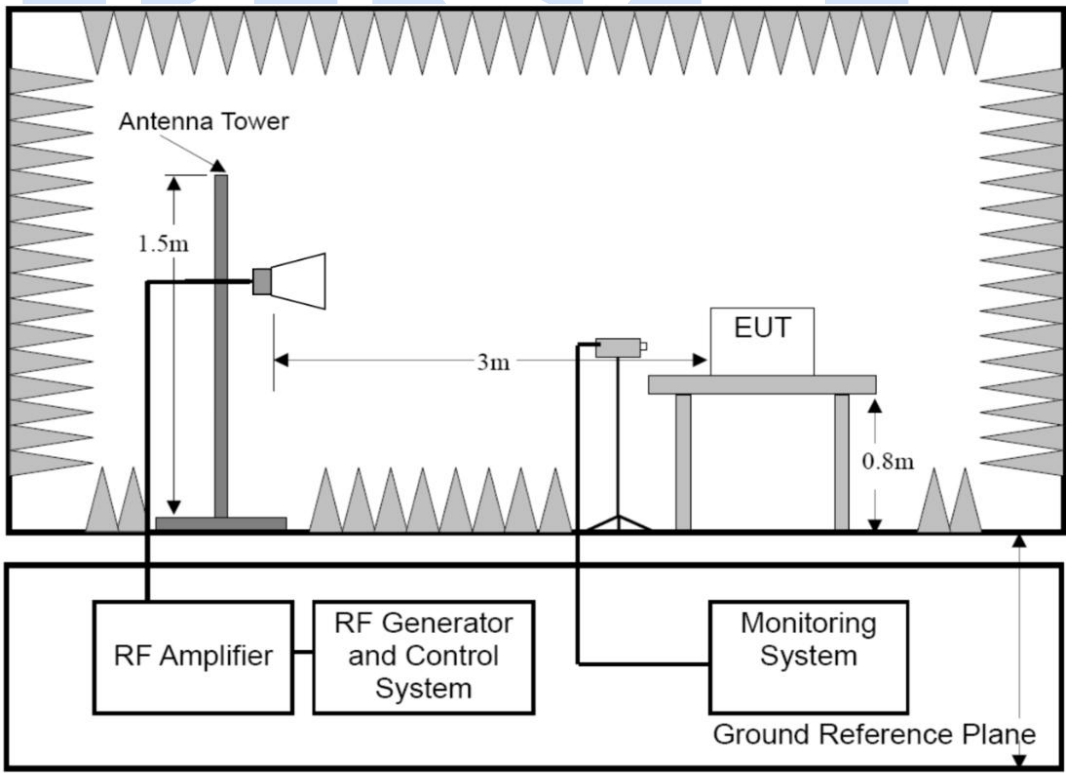
Test Points	Air Discharge	Contact Discharge	Performance Criterion	Result
Enclosure	N/A	±4 KV	B	PASS
Port	N/A	±4 KV	B	PASS
VCP	N/A	±4 KV	B	PASS
HCP	N/A	±4 KV	B	PASS

Note: N/A

8. RF FIELD STRENGTH SUSCEPTIBILITY TEST

8.1. Block Diagram of Test Setup





8.2. Test Standard

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

8.3. Severity Levels and Performance Criterion

8.3.1. Severity level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

8.3.2. **Performance criterion: A**

A、 The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

B、 The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

C、 Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

8.4. EUT Configuration on Test

The following equipments are installed on Electrical Fast Transient/Burst Immunity test to meet IEC 61000-4-3:2020, requirement and operating in a manner which tends to maximize its emission characteristics in a normal application. The configuration of EUT is the same as used in conducted emission test.Please refer to Section 3.4.

8.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 2.5 except the test setup replaced by Section 8.1.

8.6. 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.

All the scanning conditions are as follows :

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 – 1000 MHz,1800MHz, 2600MHz,3500MHz, 5000MHz
4. Dwell time of radiated	0.0015 decade/s
5. Waiting Time	1 Sec.

8.7. Test Results

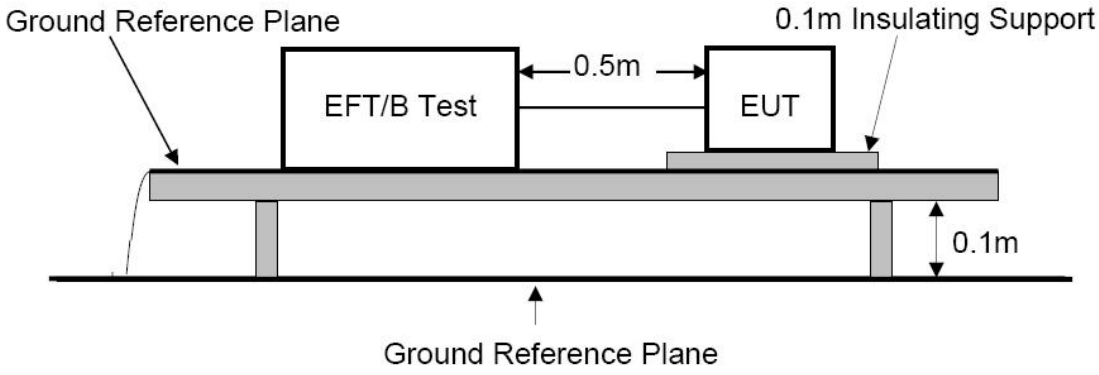
PASS

Please refer to the following page.

R/S Test Data			
Temperature : 25.1℃		Humidity : 53%	
Field Strength: 3 V/m		Criterion: A	
Power Supply: AC 230V/50Hz		Frequency Range: 80 MHz to 1000 MHz,1800MHz,2600MHz,3500MHz, 5000MHz	
Modulation: ☑ AM ☐ Pulse ☐none 1 KHz 80%			
Test Mode : On Mode			
	Frequency Range : 80-1000MHz,1800MHz,2600MHz,3500MHz, 5000MHz		
Steps	1 %		
	Horizontal	Vertical	Result
Front	A	A	Pass
Right	A	A	Pass
Rear	A	A	Pass
Left	A	A	Pass
Note: N/A			

9. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

9.1. Block Diagram of EUT Test Setup



9.2. Test Standard

EN 55035:2017+A11:2020, IEC 61000-4-4:2012

9.3. Severity Levels and Performance Criterion

Severity Level 2 at 1KV, Pulse Rise time & Duration: 5 nS / 50 nS
Severity Level:

Open Circuit Output Test Voltage ±10%		
Level	On power ports	On I/O(Input/Output) Signal data and control ports
1.	0.5KV	0.25KV
2.	1KV	0.5KV
3.	2KV	1KV
4.	4KV	2KV
X.	Special	Special

Performance criterion: B

A. The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

B. The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

C. Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

9.4. EUT Configuration on Test

The following equipments are installed on Electrical Fast Transient/Burst Immunity test to meet EN 55035:2017+A11:2020, IEC 61000-4-4:2012, requirement and operating in a manner which tends to maximize its emission characteristics in a normal application. The configuration of EUT is the same as used in conducted emission test.
Please refer to Section 3.4.

9.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 3.5 except the test setup replaced by Section 9.1.

9.6. Test Procedure

EUT shall be placed 0.8m high above the ground reference plane which is a min.1m*1m metallic sheet with 0.65mm minimum thickness. 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

9.6.1. 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 2 minutes.

9.7. Test Results

PASS

Please refer to the following page.

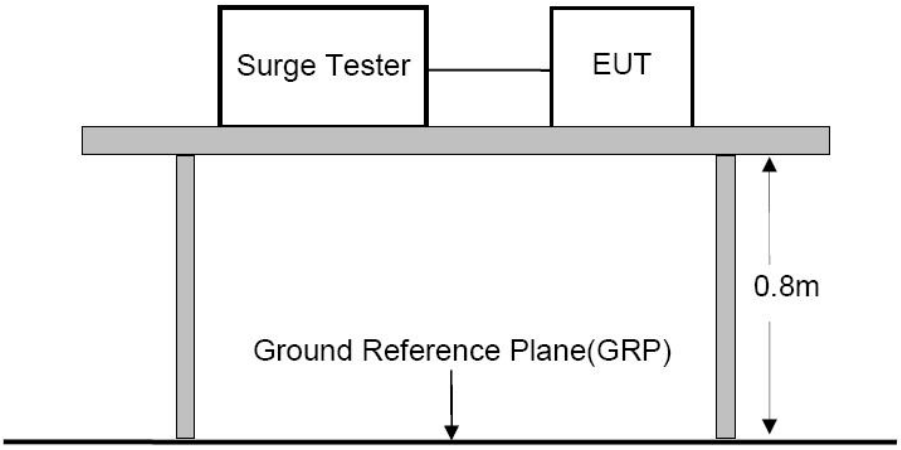
EFT Test Data			
Temperature:	24.5℃	Humidity:	53%
Power Supply :	AC 230V/50Hz	Test Mode:	On Mode

Coupling Line	Test Voltage	Performance Criterion	Result
L	±1kV	B	PASS
N	±1kV	B	PASS
L-N	±1kV	B	PASS
PE	±1kV	B	N/A
L-PE	±1kV	B	N/A
N-PE	±1kV	B	N/A
L-N-PE	±1kV	B	N/A
DC Line*	0.5KV	B	N/A
Signal line*	0.5KV	B	N/A

Note: '*' Applicable only to cables which according to the manufacturer's specification supports communication on cable lengths greater than 3 m.

10. SURGE TEST

10.1. Block Diagram of EUT Test Setup



10.2. Test Standard

EN 55035:2017+A11:2020, IEC 61000-4-5:2014+A1:2017

10.3. Severity Levels and Performance Criterion

Severity Level: Line to Line, Level 2 at 1KV;
Severity Level: Line to Earth, Level 3 at 2KV.

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

Performance criterion: B

A. The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

B. The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

C. Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

10.4. EUT Configuration on Test

The following equipments are installed on Electrical Fast Transient/Burst Immunity test to meet EN 55035:2017+A11:2020, IEC 61000-4-5:2014+A1:2017 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application

The configuration of EUT is the same as used in conducted emission test. Please refer to Section 3.4.

10.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 3.5 except the test setup replaced by Section 10.1.

10.6. Test Procedure

1) Set up the EUT and test generator as shown on section 10.1
2) For line to line coupling mode, provide a 1KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
4) Different phase angles are done individually.
5) Repeat procedure 2) to 4) except the open-circuit test voltage change from 1KV to 2KV for line to earth coupling mode test.
6) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

10.7. Test Result

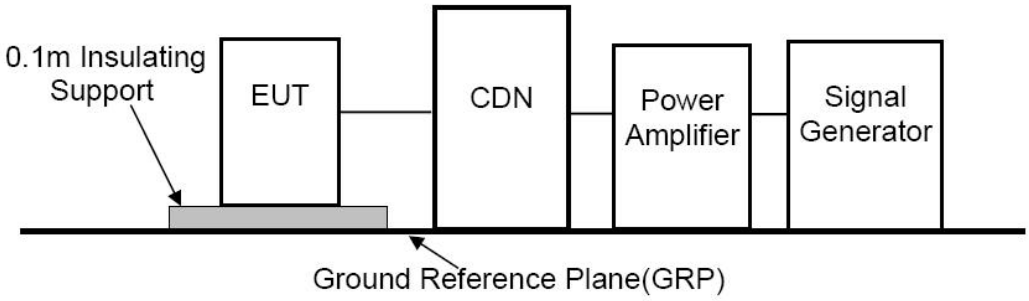
PASS

Please refer to the following page.

Surge Test Data						
Temperature:	24.5℃		Humidity:	53%		
Power Supply :	AC 230V/50Hz		Test Mode:	On Mode		
Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (KV)	Performance Criterion	Result
L-N	+	90	5	1	A	PASS
	-	270	5	1		PASS
L-PE	+	90	5	2		N/A
	-	270	5	2		N/A
N-PE	-	90	5	2		N/A
	+	270	5	2		N/A
DC Line*	-	90	5	0.5		N/A
	+	270	5	0.5		
Signal Line*	-	90	5	0.5		N/A
	+	270	5	0.5		
Note1: '*' Applicable only to cables which according to the manufacturer's specification supports communication on cable lengths greater than 3 m. Note2 :Actual test performance level:A						

11. INJECTED CURRENTS SUSCEPTIBILITY TEST

11.1. Block Diagram of EUT Test Setup



11.2. Test Standard

EN 55035:2017+A11:2020, IEC 61000-4-6:2013

11.3. Severity Levels and Performance Criterion

Severity Level 2: 3V(rms), 150KHz ～ 80MHz
Severity Level:

Level	Field Strength V
1.	1
2.	3
3.	10
X.	Special

Performance criterion: A

A. The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

B. The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

C. Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

11.4. EUT Configuration on Test

The configuration of EUT is the same as used in conducted emission test. Please refer to Section 3.4.

11.5. Operating Condition of EUT

Same as conducted emission test, which is listed in Section 3.5 except the test set up replaced as Section 11.1.

11.6. Test Procedure

1) Set up the EUT, CDN and test generator as shown on section 11.1

2) Let EUT work in test mode and measure.

3) The EUT and supporting equipments 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 at above 0.1-0.3m 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).

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

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

6) The frequency range is swept from 150KHz to 10MHz using 3V signal level, 10-30MHz Using 3V to 1V signal level(Where the amplitude of a test level varies over a given frequency range, it changes linearly with respect to the logarithm of the frequency),30-80Mhz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave

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.

8) Recording the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.7. Test Result

PASS

Please refer to the following page.

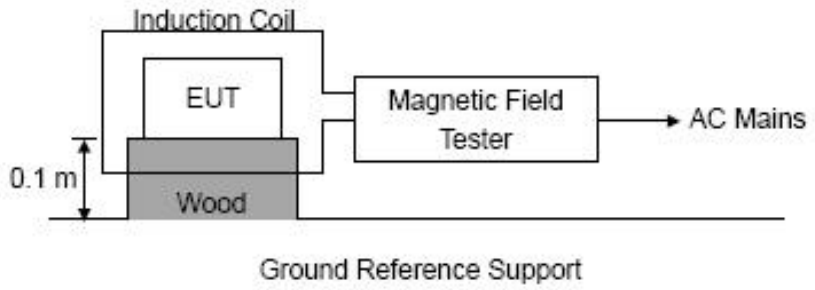
CS Test Data			
Temperature:	24.5℃	Humidity:	53%
Power Supply :	AC 230V/50Hz	Test Mode:	On Mode

Frequency Range(MHz)	Injected Position	Strength	Modulation Signal	Freq. Step	Performance Criterion	Result
0.15~10	AC Line	3V(rms), Unmodulated	AM 80%, 1kHz sine wave	1%	A	Pass
10~30	AC Line	3V to 1V(rms), Unmodulated	AM 80%, 1kHz sine wave	1%	A	Pass
30~80	AC Line	1V(rms) Unmodulated	AM 80%, 1kHz sine wave	1%	A	Pass
0.15~10	DC Line*	3V(rms), Unmodulated	AM 80%, 1kHz sine wave	1%	A	N/A
10~30	DC Line*	3V to 1V(rms), Unmodulated	AM 80%, 1kHz sine wave	1%	A	N/A
30~80	DC Line*	1V(rms) Unmodulated	AM 80%, 1kHz sine wave	1%	A	N/A
0.15~10	Signal Line*	3V(rms), Unmodulated	AM 80%, 1kHz sine wave	1%	A	N/A
10~30	Signal Line*	3V to 1V(rms), Unmodulated	AM 80%, 1kHz sine wave	1%	A	N/A
30~80	Signal Line*	1V(rms) Unmodulated	AM 80%, 1kHz sine wave	1%	A	N/A

Note: '*' Applicable only to cables which according to the manufacturer's specification supports communication on cable lengths greater than 3 m.

12. MAGNETIC FIELD IMMUNITY TEST

12.1. Block Diagram of Test Setup



12.2. Test Standard

EN 55035:2017+A11:2020, IEC 61000-4-8:2009
Severity Level 1 at 1A/m

12.3. Severity Levels and Performance Criterion

11.3.1 Severity level

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

11.3.2 Performance criterion: B

A. The apparatus shall continue to operate as intended during and after the test.
B. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
C. The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

D. Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

12.4. EUT Configuration on Test

The configuration of EUT is listed in Section 3.4.

12.5. Operating Condition of EUT

Same as conducted emission test, which is listed in Section 3.5 except the test set up replaced as Section 12.1.

12.6. Test Procedure

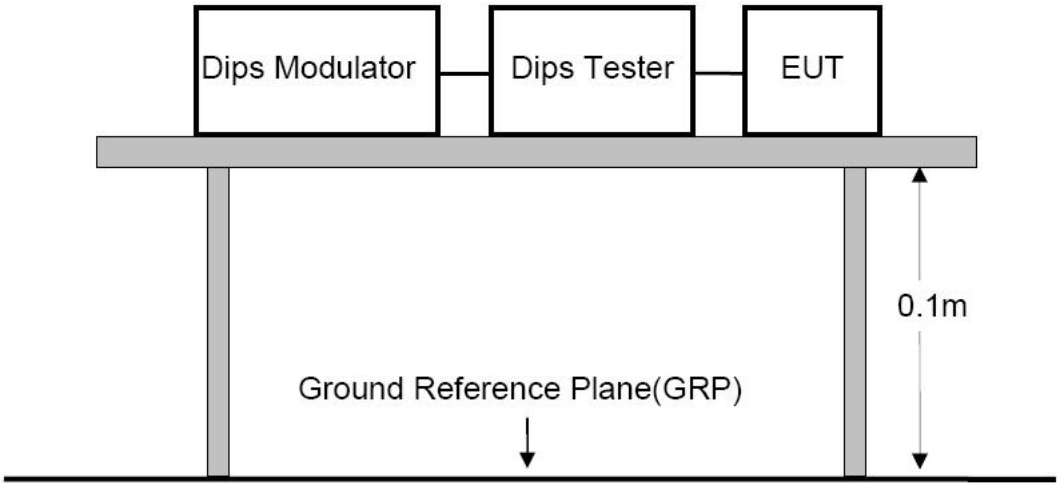
The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 12.1. The induction coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

12.7. Test Results

The EUT don't containing magnetic field sensitive components.

13. VOLTAGE DIPS AND INTERRUPTIONS TEST

13.1. Block Diagram of EUT Test Setup



13.2. Test Standard

EN 55035:2017+A11:2020, IEC 61000-4-11:2020

13.3. Severity Levels and Performance Criterion

Severity Level:

Input and Output AC Power Ports.

☑ Voltage Dips.

☑ Voltage Interruptions.

Environmental Phenomena	Test Specification	Units	Performance Criterion
Voltage Dips	>95 0.5	% Reduction period	B
	30 25	% Reduction period	C
Voltage Interruptions	>95 250	% Reduction period	C

Performance criterion: B, C, C

A. The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

B. The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

C. Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

13.4. EUT Configuration on Test

The configuration of EUT is the same as used in conducted emission test. Please refer to Section 3.4.

13.5. Operating Condition of EUT

Same as conducted emission test, which is listed in Section 3.5 except the test set up replaced as Section 13.1.

13.6. Test Procedure

1) Set up the EUT and test generator as shown on section 13.1
2) The interruption is introduced at selected phase angles with specified duration. There is a 3mins minimum interval between each test event.
3) After each test a full functional check is performed before the next test.
4) Repeat procedures 2 & 3 for voltage dips, only the level and duration is changed.
5) Record any degradation of performance.

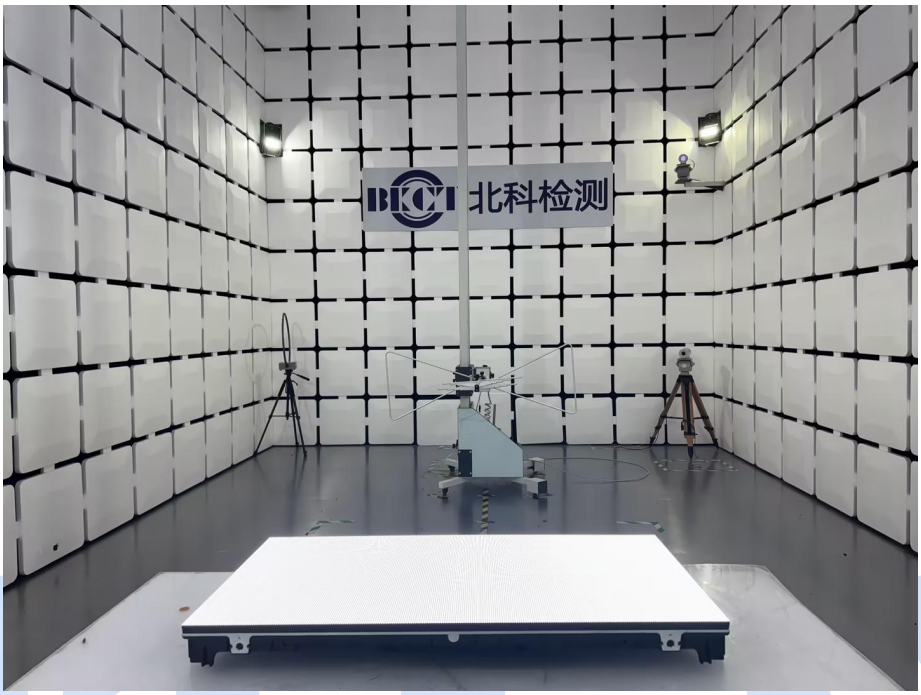
13.7. Test Result

PASS

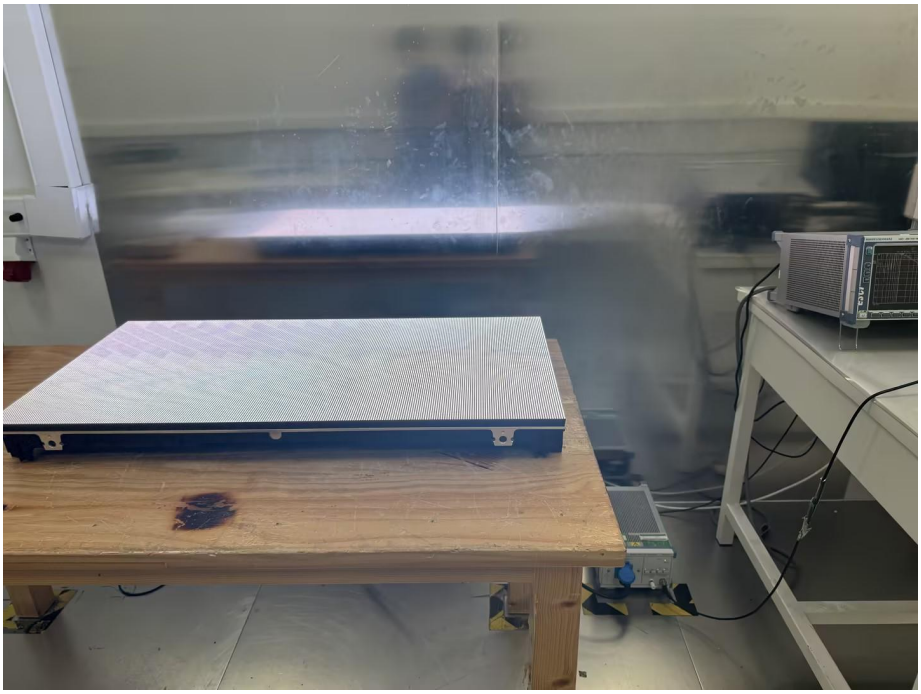
Please refer to the following page.

DIPS Test Data			
Temperature:	24.5℃	Humidity:	53%
Power Supply :	AC 230V/50Hz AC 230V/60Hz	Test Mode:	On Mode
Environmental Phenomena	Test Specification	Units	Performance Criterion
Voltage Dips	>95 0.5	% Reduction period	B
	30 25/30	% Reduction period	C
Voltage Interruptions	>95 250/300	% Reduction period	C

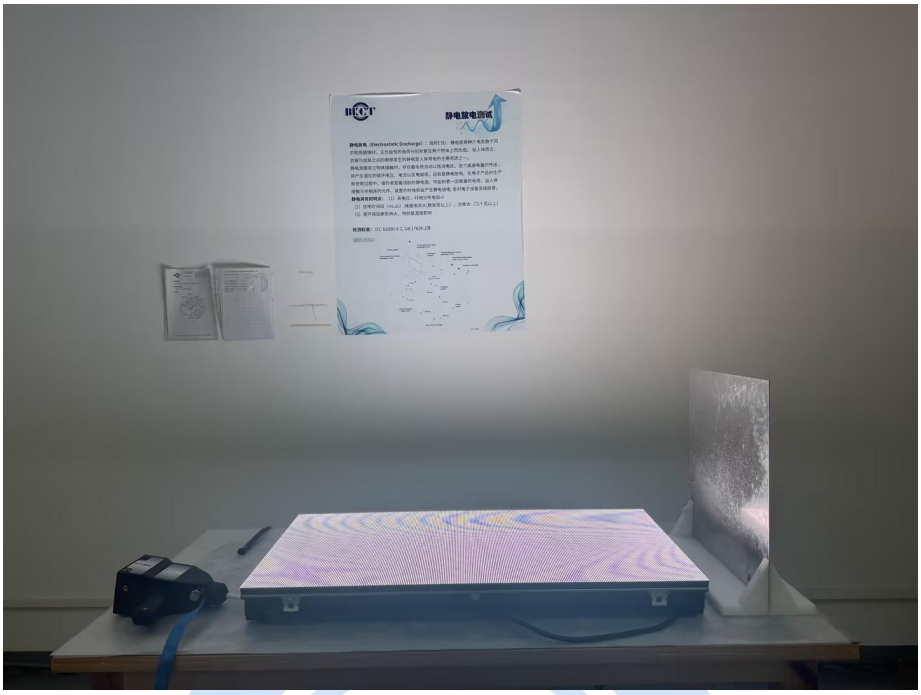
14. EUT TEST PHOTO



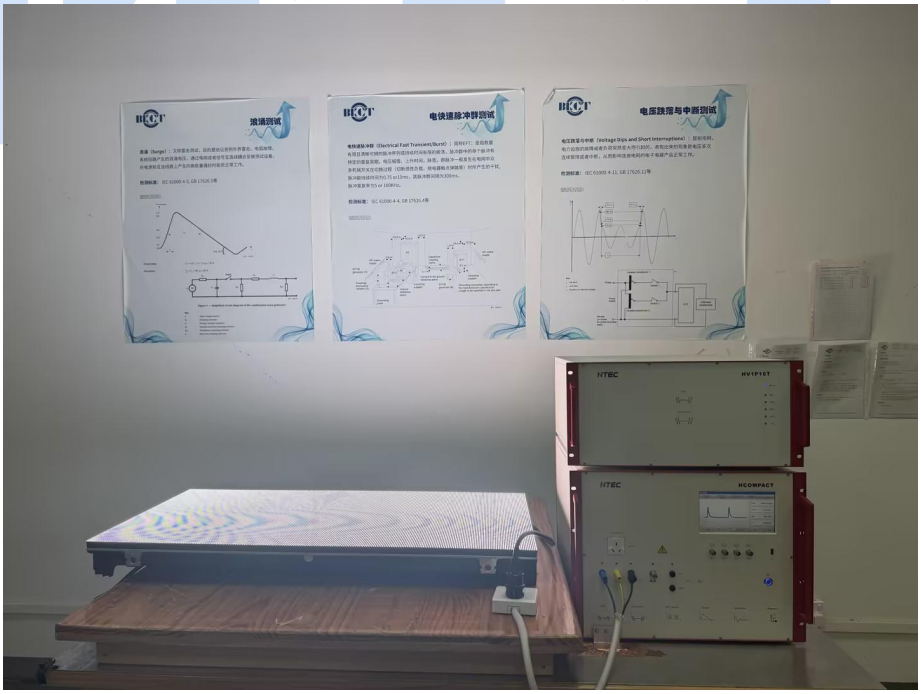
Radiated Emission Test(Below 1G)



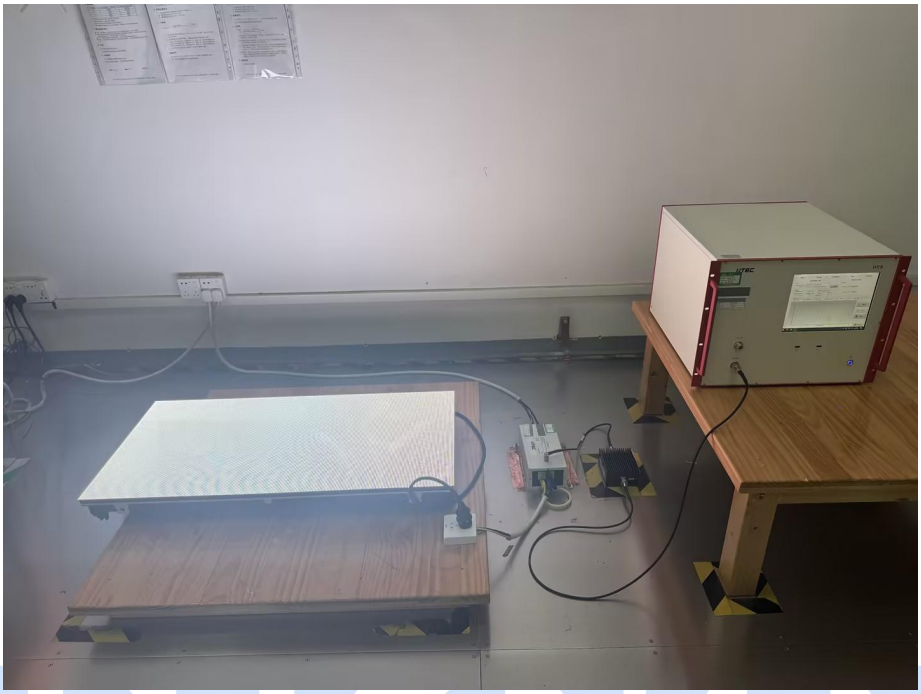
Conduction Emission Test



ESD Immunity Test



EFT&Surges&Dips Immunity AC Mains Test



Conducted Immunity(C/S)



Harmonics&Voltage Fluctuation and Flicker Test

15. PHOTOGRAPHS

Photo 1

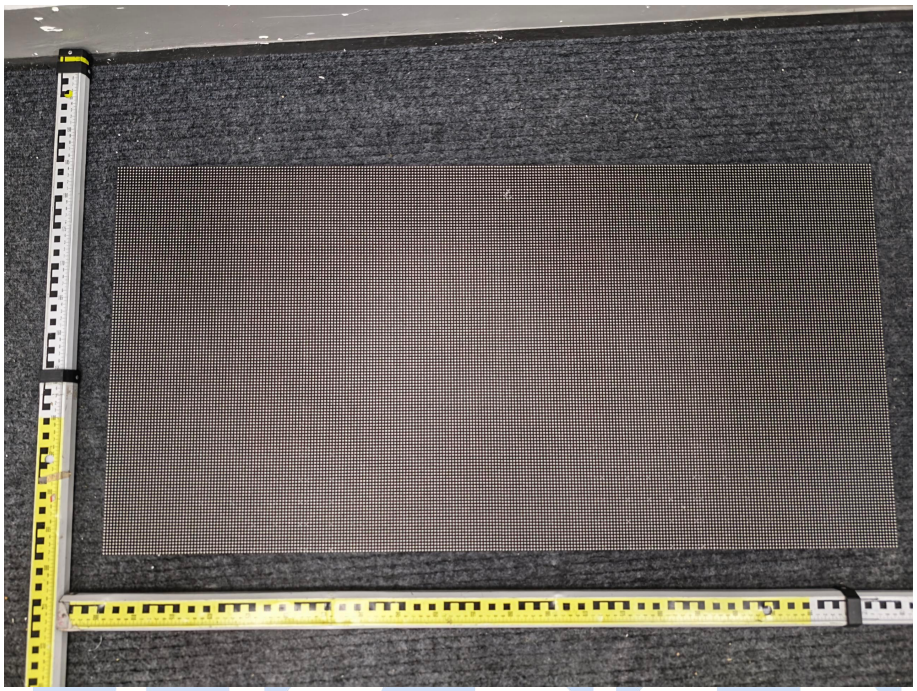


Photo 2



Photo 3



※※※※※ **END OF REPORT** ※※※※※