EMC Test Report

Applicant	:	Shenzhen Techtion Smart Electronics Co., Ltd
Address	:	Room 902, 8th Floor, Unit 1, Building No. 2, Xintianxia Chengyun Factory District, Vanke City Community, Bantian Street, Longgang District, Shenzhen
Product Name	:	Stretched Bar Display
Report Date	:	Nov. 12, 2024

Shenzhen Anbotek Compliance Laboratory Limited * Approved *

Shenzhen Anbotek Compliance Laboratory Limited

Contents

TEST REPORT

Applicant	:	Shenzhen Techtion Smart Electronics Co., Ltd
Manufacturer	:	Shenzhen Techtion Smart Electronics Co., Ltd
Product Name	:	Stretched Bar Display
Model No.	:	TS-286THD, TS-XXXTHD/TS-XXXPHD ("X" stands for a-z or number or empty, or - or #; Different combinations of products represent different sales channels and customers; Does not affect product safety and electromagnetic compatibility.)
Trade Mark	:	
Rating(s)	:	DC12V
Test Standard(s)	:	**EN 50121-3-2:2016+A1:2019; (IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4; IEC 61000-4-5; IEC 61000-4-6)**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN 50121-3-2 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt: Oct. 15, 2024

Date of Test: Oct. 15~Oct. 24, 2024

Prepared By: (Yee Huang)

Approved & Authorized Signer: (KingKong Jin)

1. General Information

1.1. Client Information

Applicant	:	Shenzhen Techtion Smart Electronics Co., Ltd
Address	:	Room 902, 8th Floor, Unit 1, Building No. 2, Xintianxia Chengyun Factory District, Vanke City Community, Bantian Street, Longgang District, Shenzhen
Manufacturer	:	Shenzhen Techtion Smart Electronics Co., Ltd
Address	:	Room 902, 8th Floor, Unit 1, Building No. 2, Xintianxia Chengyun Factory District, Vanke City Community, Bantian Street, Longgang District, Shenzhen
Factory	:	Shenzhen Techtion Smart Electronics Co., Ltd
Address	:	Room 902, 8th Floor, Unit 1, Building No. 2, Xintianxia Chengyun Factory District, Vanke City Community, Bantian Street, Longgang District, Shenzhen

1.2. Description of Device (EUT)

Product Name	:	Stretched Bar Display
Model No.	:	TS-286THD, TS-XXXTHD/TS-XXXPHD ("X" stands for a-z or number or empty, or - or #; Different combinations of products represent different sales channels and customers; Does not affect product safety and electromagnetic compatibility.)
Trade Mark	:	N.A.
Test Power Supply	:	AC 230V, 50Hz
Test Sample No.	:	1-1-1
Product Description	:	AC ADAPTOR Model: KT60W120500B3 Input: 100-240V~50/60Hz 1.5A Output: 12.0V⎓5.0A 60.0W
Remark: (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. (2) All samples are the same except the model number and dimension, so we prepare "TS-286THD" for test only. (3) The test report 1819C40062512601-M1 supersedes the test report 1819C40062512601 which is withdrawn.		

1.3. Auxiliary Equipment Used During Test

N/A		

1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	On

For Mode 1 Block Diagram of Test Setup

1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test	Mode 1	P
Radiated Emission Test (Below 1 GHz)	Mode 1	P
Electrostatic Discharge Immunity Test	Mode 1	P
RF Field Strength Immunity Test	Mode 1	P
Electrical Fast Transient/Burst Immunity Test	Mode 1	P
Surge Immunity Test	Mode 1	P
Injected Currents Susceptibility Test	Mode 1	P
DC Power Supply Test	Mode 1	P
P) Indicates “PASS”. F) Indicates “Fail”. N) Indicates “Not applicable”.		

1.6. Test Equipment List

☒ Power Line Conducted Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Sept. 09 2024	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jan. 17, 2024	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI3	100926	Sept. 09, 2024	1 Year
4.	Software Name EZ-EMC	Farad Technology	ANB-03A	N/A	N/A	N/A

☒ Radiated Emission Test (Below 1 GHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Jan. 17, 2024	1 Year
2.	Pre-amplifier	Schwarzbeck	BBV-9745	9745-075	Jan. 17, 2024	1 Year
3.	Bilog Broadband Antenna	SCHWARZBECK	VULB 9163	01109	Oct. 16, 2022	3 Year
4.	Software Name EZ-EMC	Farad Technology	EMEC-3A1	N/A	N/A	N/A

☒ Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Simulators	emtest	ESD NX30.1	11936	Mar. 11, 2024	1 Year

☒ RF Field Strength Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Agilent	N5181A	MY50143107	Jan. 23, 2024	1 Year
2.	Power Meter	Agilent	E4417A	MY45101384	Jan. 23, 2024	1 Year
3.	Amplifier	Micotop	MPA-80-1000-600	MPA2110318	Jan. 17, 2024	1 Year
4.	Amplifier	Micotop	MPA-1000-6000-100	MPA2110327	Jan. 17, 2024	1 Year
5.	Log.-Per.-Antenna	Schwarzbeck	VULP 9118E	01012	N/A	N/A
6.	Microwave Log.-Per. Antenna	Schwarzbeck	STLP 9149	00788	N/A	N/A
7.	Power Sensor	KEYSIGHT	E9323A	US40410647	Jan. 23, 2024	1 Year
8.	Power Sensor	KEYSIGHT	E9323A	MY53100007	Jan. 23, 2024	1 Year
9.	Electric field Probe	Narda S.T.S /PMM	EP 601	811ZX10351	Jan. 19, 2024	1 Year
10.	Software	EMtrace	EM 3	/	N/A	N/A

☒ Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Generator	TESEQ	NSG 3060	1480	Jan. 18, 2024	1 Year
2.	CDN	TESEQ	CDN 3061	1408	Jan. 18, 2024	1 Year
3.	EFT-Clamp	PRIMA	EFT61004B	PR10114282	Jan. 17, 2024	1 Year

☒ Surge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Combined Wave Lightning Surge Simulator	3Ctest	CCS600	ES3771702	Jan. 17, 2024	1 Year
2.	Three Phase Power Coupling Network	3Ctest	SEPN69100T	ES0801757	Jan. 17, 2024	1 Year
3.	Telecom port surge generator	PMI	TW101	190411	Jan. 18, 2024	1 Year

☒ Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	R&S	SMC100A	104424	Feb. 04, 2024	1 Year
2.	CDN	FRANKONIA	CDN - M2+ M3	A2210178/2012	Jan. 17, 2024	1 Year
3.	6dB Attenuator	FRANKONIA	DAM 26W	1172202	Sept. 09, 2024	1 Year
4.	Software	EMtrace	EM 6	/	N/A	N/A
5.	EM-Clamp	FRANKONIA	EMCL-20	18101728-0103	Jan. 17, 2024	1 Year
6.	Power Meter	Agilent	E4419B	GB43312730	Feb. 04, 2024	1 Year
7.	Amplifier	Micotop	MPA-0.15-230-110	MPA2110317	Feb. 04, 2024	1 Year
8.	Power Sensor	Agilent	E9304	/	Feb. 04, 2024	1 Year
9.	Power Sensor	Agilent	E9304	MY41498663	Feb. 04, 2024	1 Year
10.	CDN	TESEQ	CDN M432-3LN	33659	Jan. 17, 2024	1 Year

1.7. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 434132

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 434132.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

Sogood Industrial Zone Laboratory & 1/F. of Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Subdistrict, Bao'an District, Shenzhen, Guangdong, China.

1.8. EMS Performance Criteria

Performance criterion A

The EUT 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 EUT is used as intended. If the performance level is not specified by the manufacturer. this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Performance criterion B

The EUT 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 EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However. during the test degradation of performance is allowed but no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer. either of these may be derived from the product description and and what the user may reasonably expect from the equipment if used as intended.

Performance criterion C

Ternporary loss of function is allowed during the test. provided the function is self-recoverable or can be restored by the operation of the controls.

If. as a result of the application of the tests defined in this standard. the EUT becomes dangerous or unsafe. it shall be deemed to have failed the test.

2. Power Line Conducted Emission Test

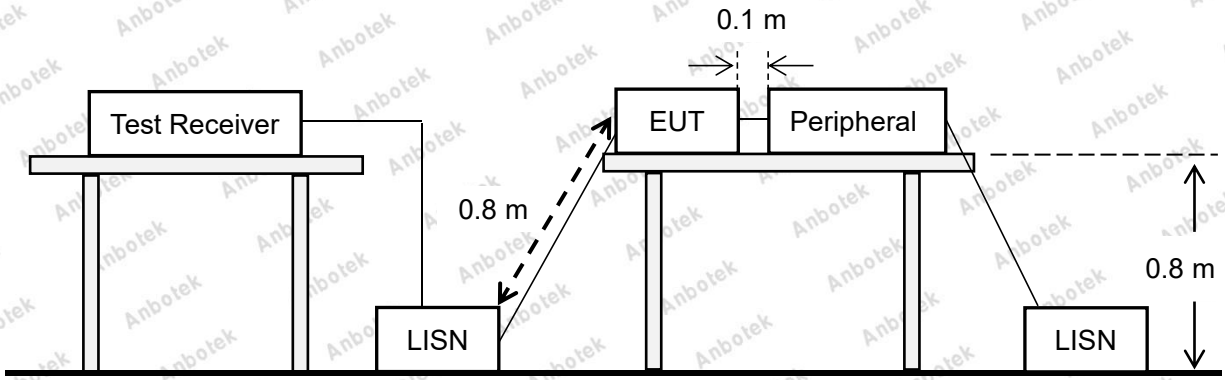
2.1. Test Standard and Limit

Test Standard:	EN 50121-3-2

☒ **Limits for conducted emission at the AC or DC mains power ports**

Frequency (MHz)	Limits (dBμV)
	Quasi-peak Level
0.15 ~ 0.50	99.0
0.50 ~ 30.00	93.0
Remark: The lower limit shall apply at the transition frequencies.	

2.2. Test Setup



2.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane, and the back of the EUT is 0.4 m away from the vertical ground reference plane, and at least 0.8 m from any other metal surface or ground plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plate, at least 0.8 m away from other metal objects.

Connect EUT to the power mains through an LISN. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the center into a bundle no longer than 0.4 m, so that its length is shortened to 1 m. All the peripherals are connecting to the other LISN.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest disturbance with respect to the limit was found by investigating disturbances at a number of significant frequencies. The probable frequency of maximum disturbance had been found and that the associated cable and EUT configuration and mode of operation had been identified.

Set the test-receiver to quasi peak detect function and average detect function, and to measure the conducted emissions values.

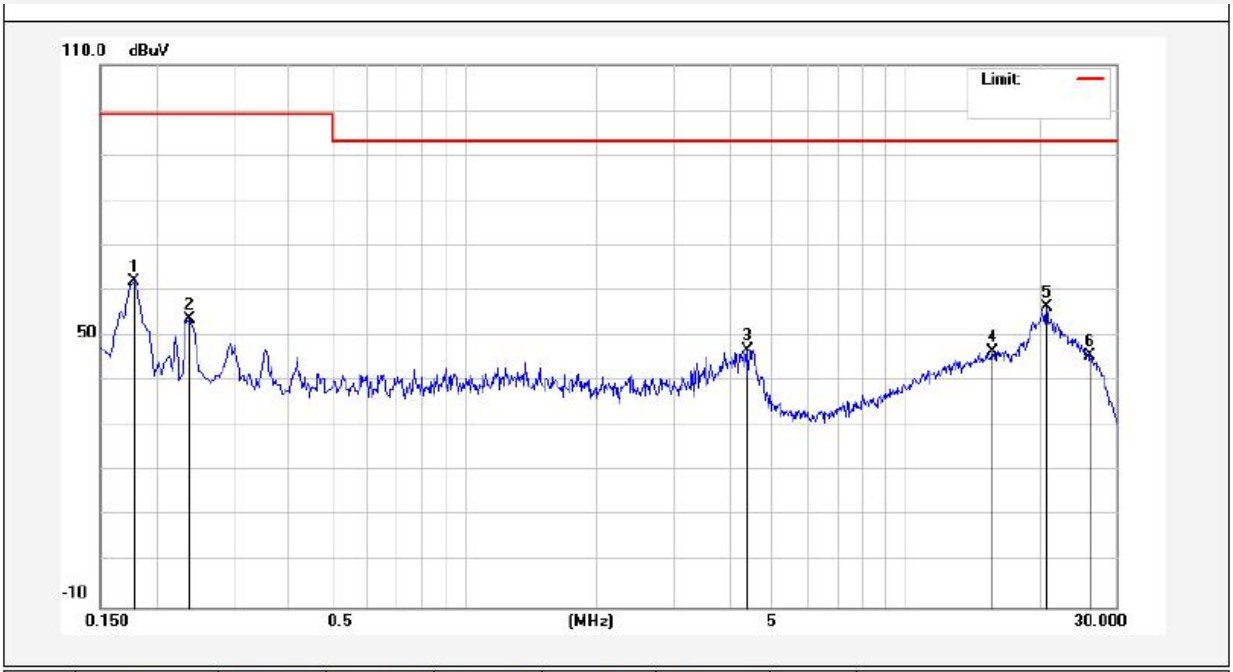
2.4. Test Results

PASS

The test curves are shown in the following pages.

Power Line Conducted Test Data

Test Site:	Shielded Room
Test Specification:	AC 230V, 50Hz
Comment:	Live Line
	Temp.: 23.9℃ Hum.: 50%

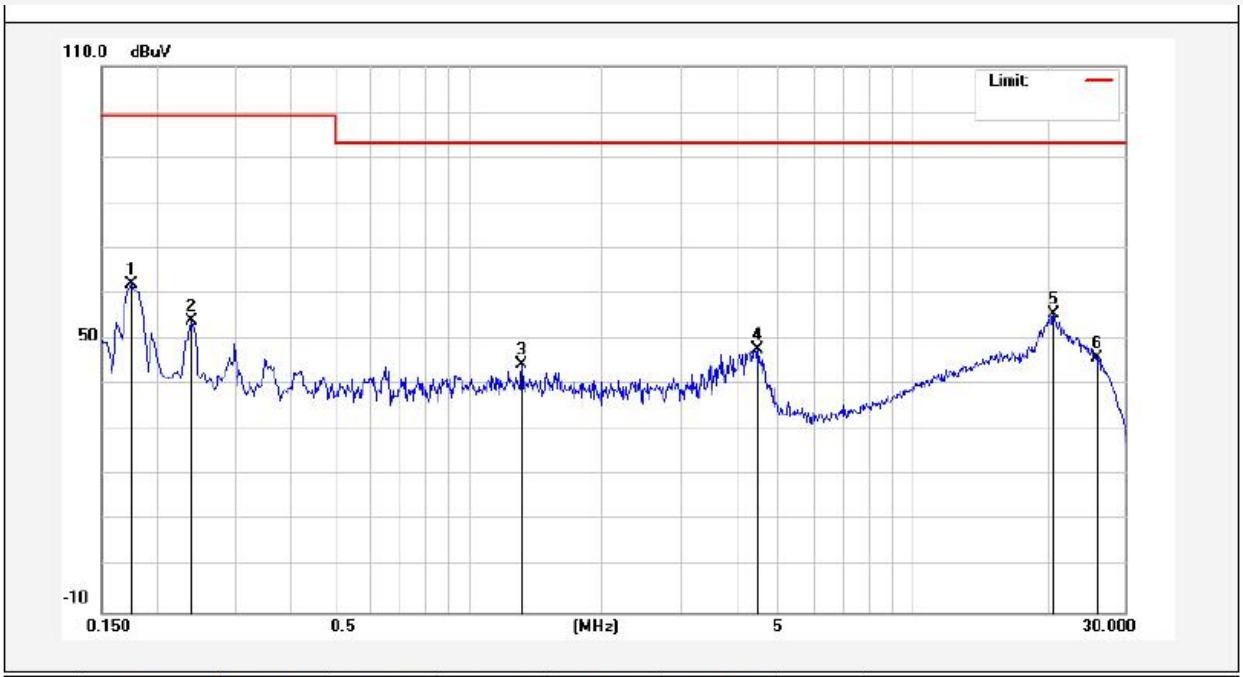


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1777	44.20	17.82	62.02	99.00	-36.98	QP	
2	0.2378	36.01	17.82	53.83	99.00	-45.17	QP	
3	4.3606	29.07	17.85	46.92	93.00	-46.08	QP	
4	15.7179	28.48	18.16	46.64	93.00	-46.36	QP	
5	20.8137	38.04	18.32	56.36	93.00	-36.64	QP	
6	26.1393	26.98	18.55	45.53	93.00	-47.47	QP	

Note: Result = Reading + Factor Over Limit = Result - Limit

Power Line Conducted Test Data

Test Site:	Shielded Room
Test Specification:	AC 230V, 50Hz
Comment:	Neutral Line
	Temp.: 23.9℃ Hum.: 50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1739	44.47	17.83	62.30	99.00	-36.70	QP	
2	0.2378	36.12	17.82	53.94	99.00	-45.06	QP	
3	1.3167	26.54	17.86	44.40	93.00	-48.60	QP	
4	4.4775	29.78	17.85	47.63	93.00	-45.37	QP	
5	20.7038	37.33	18.31	55.64	93.00	-37.36	QP	
6	25.8638	27.49	18.53	46.02	93.00	-46.98	QP	

Note: Result = Reading + Factor Over Limit = Result - Limit

3. Radiated Emission Test (Below 1 GHz)

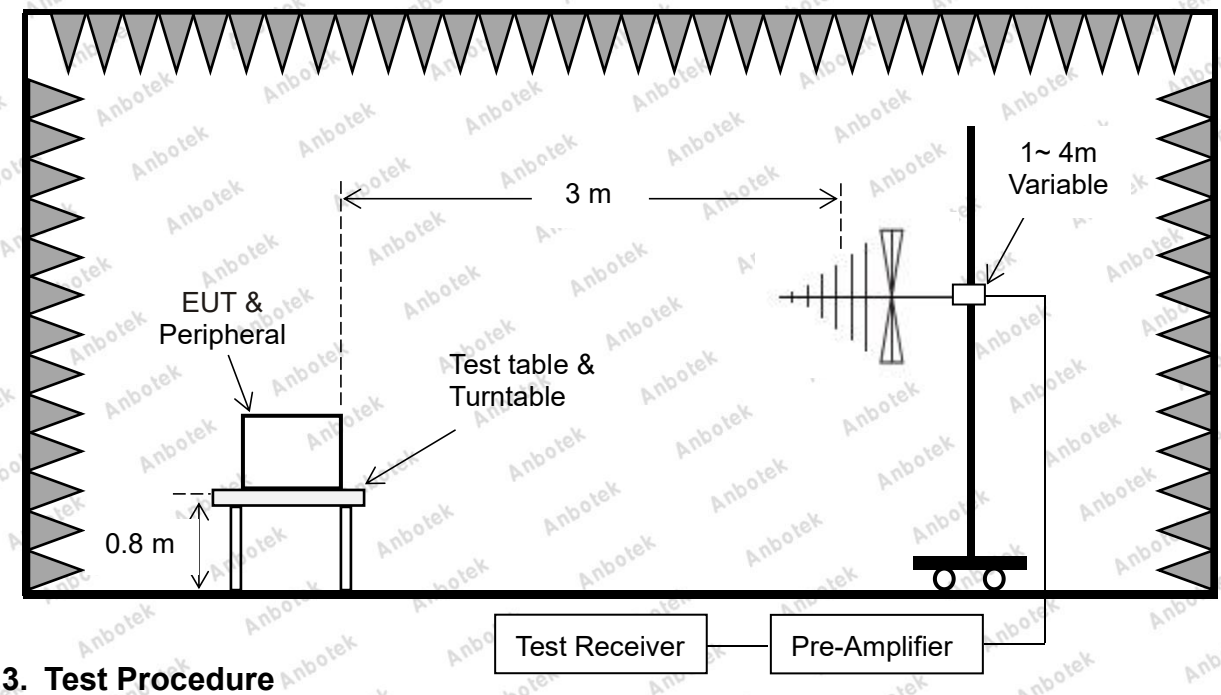
3.1. Test Standard and Limit

Test Standard	EN 50121-3-2

Limit for radiated emissions at frequencies up to 1 GHz

Frequency (MHz)	Distance (Meters)	Field Strengths Limit (dBμV/m)
30 ~ 230	3	50
230 ~ 1000	3	57
Remark: The lower limit shall apply at the transition frequencies.		

3.2. Test Setup



3.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plane.

The EUT was set 3 m away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 m to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

3.4. Test Results

PASS

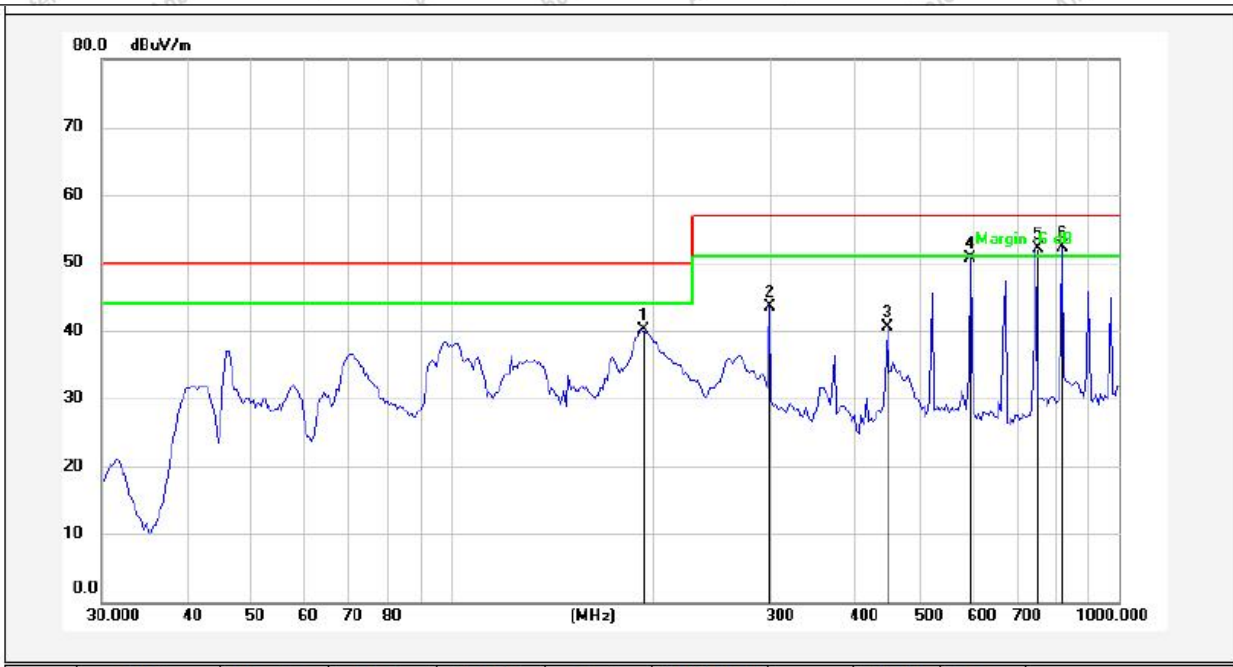
The test curves are shown in the following pages.

Test item:	Radiation Test	Polarization:	Horizontal
Standard:	(RE)EN 50121-3-2	Power Source:	AC 230V, 50Hz
Frequency Range:	30MHz ~ 1000MHz	Temp.(℃)/Hum.(%RH):	25.1(℃)/51%RH
Distance:	3m		

No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	299.3158	59.67	-15.52	44.15	57.00	-12.85	QP			
2	449.5558	52.09	-11.61	40.48	57.00	-16.52	QP			
3	599.3212	56.11	-8.41	47.70	57.00	-9.30	QP			
4	750.1083	54.68	-7.10	47.58	57.00	-9.42	QP			
5	820.3504	60.85	-6.13	54.72	57.00	-2.28	QP			
6	900.1474	55.93	-5.05	50.88	57.00	-6.12	QP			

Note: Result= Reading + Factor Over Limit=Result-Limit

Test item:	Radiation Test	Polarization:	Vertical
Standard:	(RE)EN 50121-3-2	Power Source:	AC 230V, 50Hz
Frequency Range:	30MHz ~ 1000MHz	Temp.(℃)/Hum.(%RH):	25.1(℃)/51%RH
Distance:	3m		



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	192.4186	59.15	-19.13	40.02	50.00	-9.98	QP			
2	299.3158	59.02	-15.52	43.50	57.00	-13.50	QP			
3	449.5558	52.19	-11.61	40.58	57.00	-16.42	QP			
4	599.3212	59.08	-8.41	50.67	57.00	-6.33	QP			
5	750.1083	59.26	-7.10	52.16	57.00	-4.84	QP			
6	821.7103	58.39	-6.11	52.28	57.00	-4.72	QP			

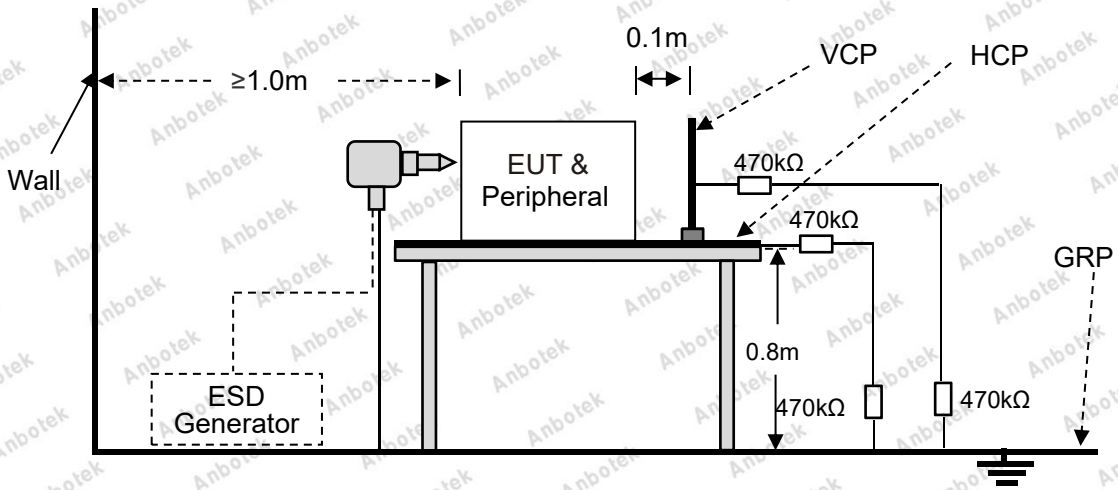
Note: Result= Reading + Factor Over Limit=Result-Limit

4. Electrostatic Discharge Immunity Test

4.1. Test Specification

Test Standard :	EN 50121-3-2	
Basic standard :	IEC 61000-4-2: 2008	
Performance criteria:	B	
Test Level :	± 8kV (Air Discharge)	± 6kV (Contact Discharge)

4.2. Test Setup



4.3. Test Procedure

a. In the case of air discharge testing, the climatic conditions shall be within the following ranges:
- Ambient temperature: 15°C to 35°C;
- Relative humidity: 30% to 60%;
- Atmospheric pressure: 86 kPa (860 mbar) to 106 kPa (1060 mbar)

b. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

c. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted: - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate. - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge. - The contact discharge test shall not be applied to such surfaces.

d. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered

for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

e. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final test level should not exceed the product specification value in order to avoid damage to the equipment.

f. The test shall be performed with both air discharge and contact discharge. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied. For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

g. Ensure that the applied charge on the EUT has been dis-charged before next ESD pulse.

4.4. Test Results

PASS

Please refer to the following page.

Electrostatic Discharge Test Results

Test Result:	☒ Pass ☐ Fail	Temperature:	23.5℃
Power Supply:	AC 230V, 50Hz	Humidity:	53%

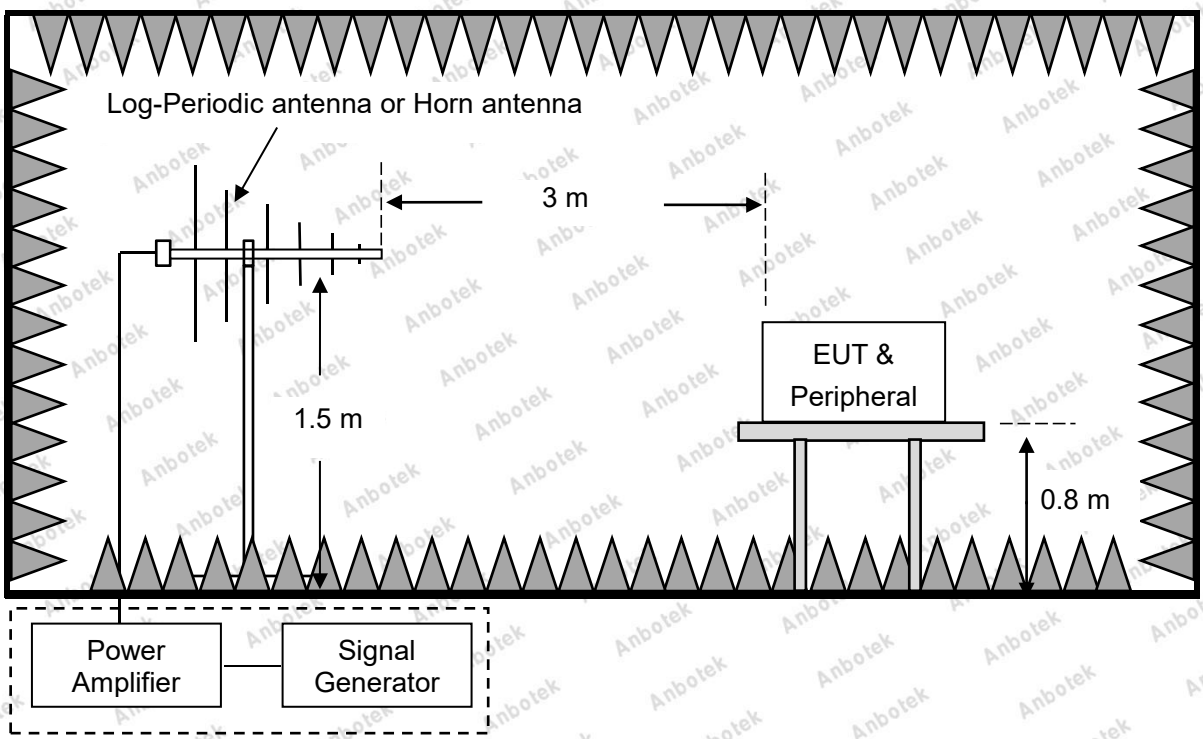
Location		Kind A-Air Discharge C-Contact Discharge	Result
Air discharge: ±2.0 kV, ±4.0 kV, ±8.0 kV		Contact discharge: ±6.0 kV	
Screen	4 points	A	☒A ☐B ☐C
Slot	4 points	A	☒A ☐B ☐C
Metal	4 points	C	☒A ☐B ☐C
HCP	4 points	C	☒A ☐B ☐C
VCP of the front	4 points	C	☒A ☐B ☐C
VCP of the rear	4 points	C	☒A ☐B ☐C
VCP of the left	4 points	C	☒A ☐B ☐C
VCP of the right	4 points	C	☒A ☐B ☐C
Note: N/A.			

5. RF Field Strength Immunity Test

5.1. Test Specification

Test Standard:	EN 50121-3-2				
Basic standard:	IEC 61000-4-3: 2020				
Performance criteria:	A	A	A	A	A
Frequency Range:	80MHz to 800MHz	800MHz to 1GHz	1.4GHz to 2GHz	2GHz to 2.7GHz	5.1GHz to 6GHz
Test level:	20 V/m	20 V/m	10 V/m	5 V/m	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation				
Frequency Step:	1 % of preceding frequency value				
Polarity of Antenna:	Horizontal and Vertical				
Test Distance:	3 m				
Antenna Height:	1.5 m				
Dwell Time:	at least 0.5s				

5.2. Test Setup



5.3. Test Procedure

The procedure defined in this part requires the generation of electromagnetic fields within which the test

sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.

a. The antenna is placed 3 m from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the antenna.

b. The test shall normally be performed with the generating antenna facing each side of the EUT. When equipment can be used in different orientations (i.e. vertical or horizontal) all sides shall be exposed to the field during the test. When technically justified, some EUTs can be tested by exposing fewer faces to the generating antenna. In other cases, as determined for example by the type and size of EUT or the frequencies of test, more than four azimuths may need to be exposed.

c. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.

d. The step size of the frequency is set to 1%. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond. However, the dwell time should not exceed 5 s at each of the frequencies during the scan.

5.4. Test Results

PASS

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Test Result:	☒ Pass ☐ Fail	Temperature:	23.3℃
Power Supply:	AC 230V, 50Hz	Humidity:	51%

Frequency Range	Antenna Polarity	R.F. Field Strength	Dwell Time	Azimuth	Result
80 MHz ~ 800 MHz	H / V	20 V/m	1s	Front Rear Left Right	☒ A ☐ B ☐ C
800 MHz ~ 1GHz	H / V	20 V/m	1s	Front Rear Left Right	☒ A ☐ B ☐ C
1.4GHz ~ 2GHz	H / V	10 V/m	1s	Front Rear Left Right	☒ A ☐ B ☐ C
2GHz ~ 2.7GHz	H / V	5 V/m	1s	Front Rear Left Right	☒ A ☐ B ☐ C
5.1GHz ~ 6GHz	H / V	3 V/m	1s	Front Rear Left Right	☒ A ☐ B ☐ C

Note: N/A

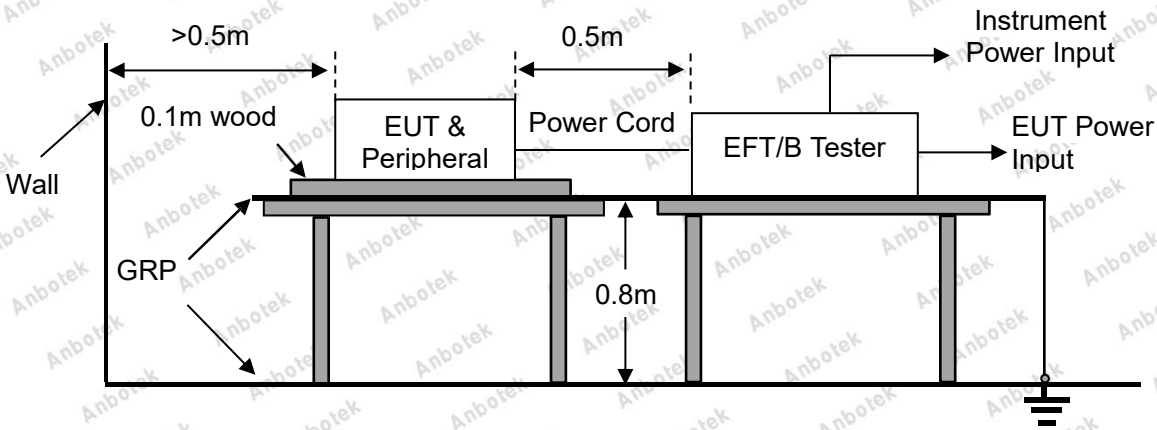
6. Electrical Fast Transient/Burst Immunity Test

6.1. Test Specification

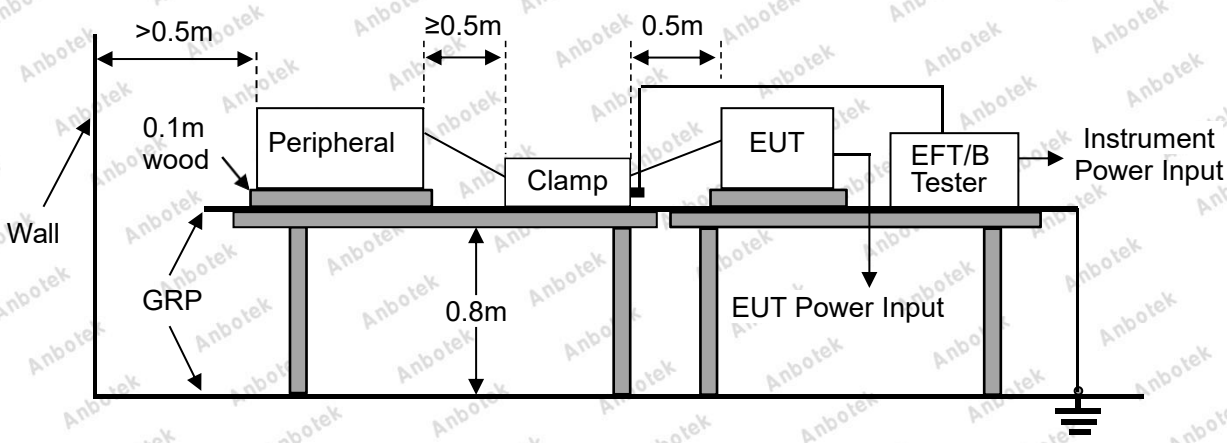
Test Standard:	EN 50121-3-2
Basic standard:	IEC 61000-4-4: 2012
Performance criteria:	A
Test Level:	☒ 2 kV, AC mains power ports
	☐ 2 kV, DC network power ports
	☐ 2 kV, Signal/Control ports

6.2. Test Setup

AC mains power ports and DC network power ports:



Analogue/digital data ports:



6.3. Test Procedure

The table-top EUT is placed on a table that is 0.8 m height, a ground reference plane is placed on the table, and uses 0.1 m insulation between the EUT and ground reference plane. The floor-standing EUT is placed on a ground reference plane and insulated from it by an insulating support with a thickness of 0.1 m. This reference ground plane shall project beyond the EUT by at least 0.1 m 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 0.5 m.

All cables to the EUT shall be placed on the insulation support 0.1 m above the ground reference plane. Cables not subject to electrical fast transients shall be routed as far as possible from the cable under test to minimize the coupling between the cables.

6.4. Test Results

PASS

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

Test Result:	☒ Pass ☐ Fail	Temperature:	24.4℃
Power Supply:	AC 230V, 50Hz	Humidity:	54%

Ports	Polarity	Inject Time(s)	Repetition Frequency（kHz）	Test Voltage (kV)	Result
☒ AC mains power ports	±	120 s	☒ 5 ☐ 100	2.0 kV	☒A ☐B ☐C
☐ DC network power ports	±	120 s	☒ 5 ☐ 100	2.0 kV	☐A ☐B ☐C
☐ Signal/Control ports	±	120 s	☒ 5 ☐ 100	2.0 kV	☐A ☐B ☐C

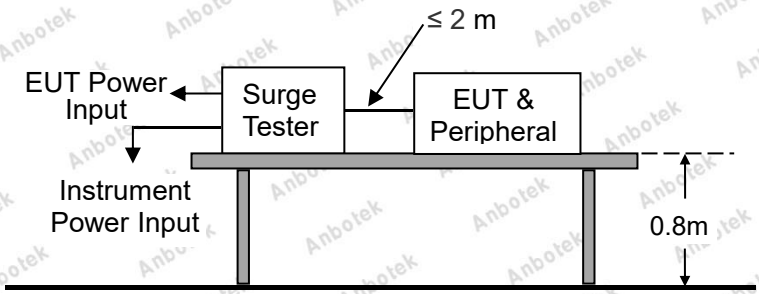
Note: N/A

7. Surge Immunity Test

7.1. Test Specification

Test Standard:		EN 50121-3-2
Basic standard:		IEC 61000-4-5: 2014+A1:2017
Test level	AC power port:	☒ 1 kV, Line to Line, Criterion B
		☒ 2 kV, Line to Ground, Criterion B
	DC network power port:	☐ 1 kV, Line to Line, Criterion B
		☐ 2 kV, Line to Ground, Criterion B
Number of surges		5 (for each combination of parameters)
Repetition rate		1 minute / time
Polarity:		Positive / Negative
Phase angle:		0°, 90°, 180°, 270° (Only AC mains power ports)

7.2. Test Setup



7.3. Test Procedure

Table-top EUT is placed on a table of 0.8 m heights above a metal ground reference plane. Floor standing EUT is placed on a ground reference plane and insulated from it by an insulating support with a thickness of 0.1 m. The length of the power cord between the EUT and the coupling/decoupling network is not more than 2 m, and the length of the interconnection line between the EUT and the coupling/decoupling network is not more than 2 m. The tests were done at repetition rate 1 per minute.

7.4. Test Results

PASS

Please refer to the following page.

Surge Immunity Test Results

Test Result:	☒ Pass ☐ Fail	Temperature :	24.4℃
Power Supply :	AC 230V, 50Hz	Humidity :	54%

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
☒ AC power port (Waveform: 1.2 us / 50 us (8 us / 20us))					
L-N	+	☒0° ☒90° ☒180° ☒270°	5	1 kV	☒A ☐B ☐C
	-	☒0° ☒90° ☒180° ☒270°	5	1 kV	☒A ☐B ☐C
L-GND	+	☒0° ☒90° ☒180° ☒270°	5	2 kV	☒A ☐B ☐C
	-	☒0° ☒90° ☒180° ☒270°	5	2 kV	☒A ☐B ☐C
N-GND	+	☒0° ☒90° ☒180° ☒270°	5	2 kV	☒A ☐B ☐C
	-	☒0° ☒90° ☒180° ☒270°	5	2 kV	☒A ☐B ☐C
☐ DC network power ports (Waveform: 1.2 us / 50 us (8 us / 20us))					
P to N	+	/	5	1 kV	☐A ☐B ☐C
	-	/	5	1 kV	☐A ☐B ☐C
P to GND	+	/	5	2 kV	☐A ☐B ☐C
	-	/	5	2 kV	☐A ☐B ☐C
N to GND	+	/	5	2 kV	☐A ☐B ☐C
	-	/	5	2 kV	☐A ☐B ☐C
Note: N/A					

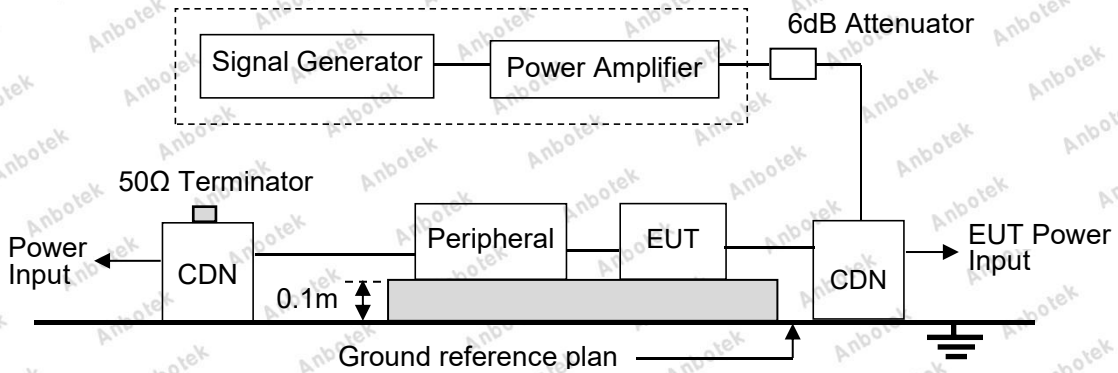
8. Injected Currents Susceptibility Test

8.1. Test Specification

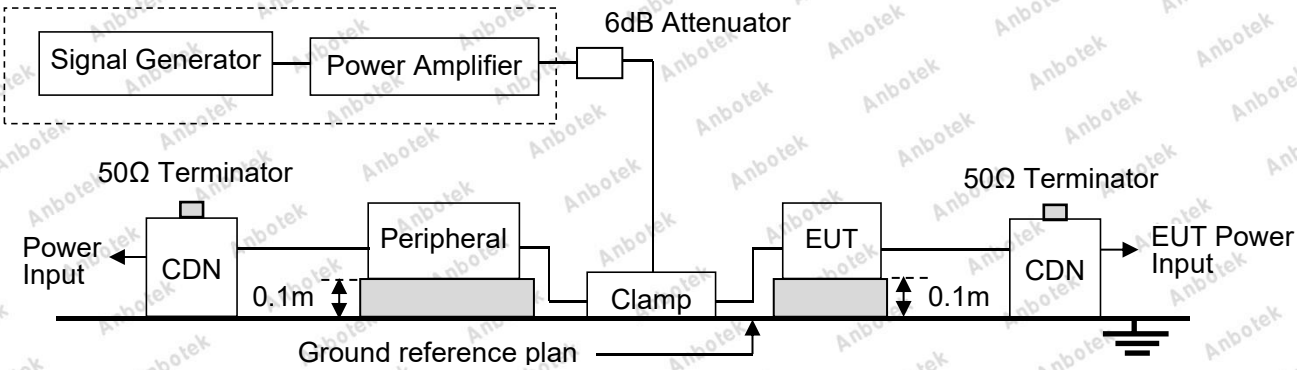
Test Standard:	EN 50121-3-2
Basic standard:	IEC 61000-4-6: 2013
Performance criteria:	A
Frequency range:	0.15MHz to 80MHz
Test level:	10V
Modulation:	AM 80%, 1kHz sine-wave
Frequency Step:	1% of fundamental

8.2. Test Setup

CDN injection:



Clamp injection:



8.3. Test Procedure

a. The EUT and peripheral are placed on an insulating support of 0.1 m height above a ground reference plan. The distance between EUT and CDN is 0.1 m to 0.3 m. All cables exiting the EUT are supported at a height of at least 30 mm above the ground reference plan.

b. The frequency range is swept from 150 kHz to 80MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. The frequency range is swept incrementally. The step size was 1% of fundamental from 0.15MHz to 80MHz.

c. The dwell time at each frequency isn't less than the time necessary for the EUT to be able to respond.

8.4. Test Results

PASS

Please refer to the following page.

Injected Currents Susceptibility Test Results

Test Result:	☒ Pass ☐ Fail	Temperature:	24.4℃
Power Supply:	AC 230V, 50Hz	Humidity:	54%
Frequency Range (MHz)	Injected Position	Strength (Un-modulated)	Result
0.15 ~ 80	☒ AC Mains	10V	☒ A ☐ B ☐ C
0.15 ~ 80	☐ DC Line	10V	☐ A ☐ B ☐ C
0.15 ~ 80	☐ Signal Line	10V	☐ A ☒ B ☐ C
Note: N/A			

APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Power Line Conducted Emission Test

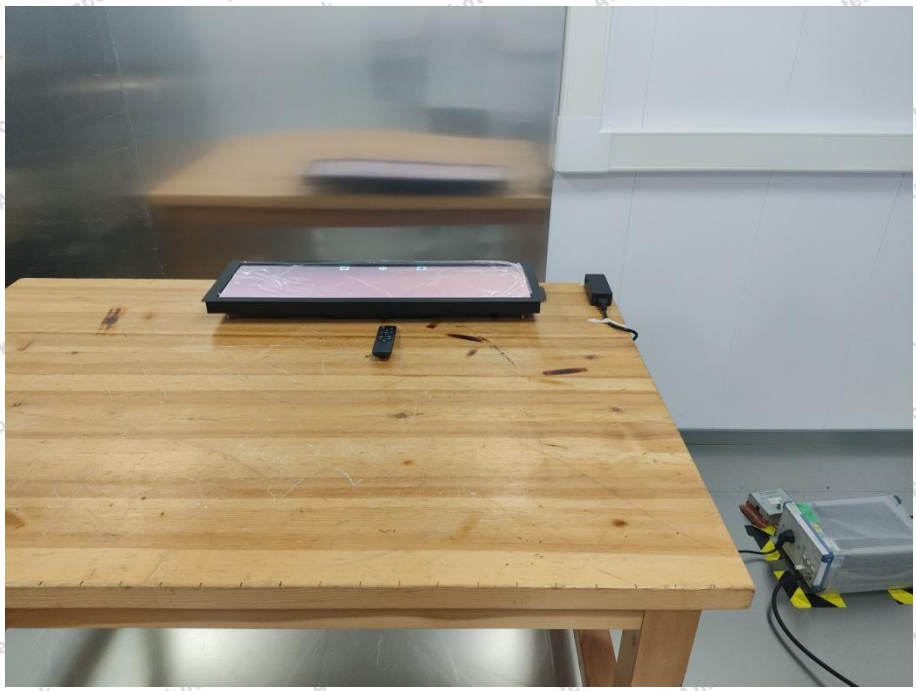


Photo of Radiated Emission Test (Below 1 GHz)

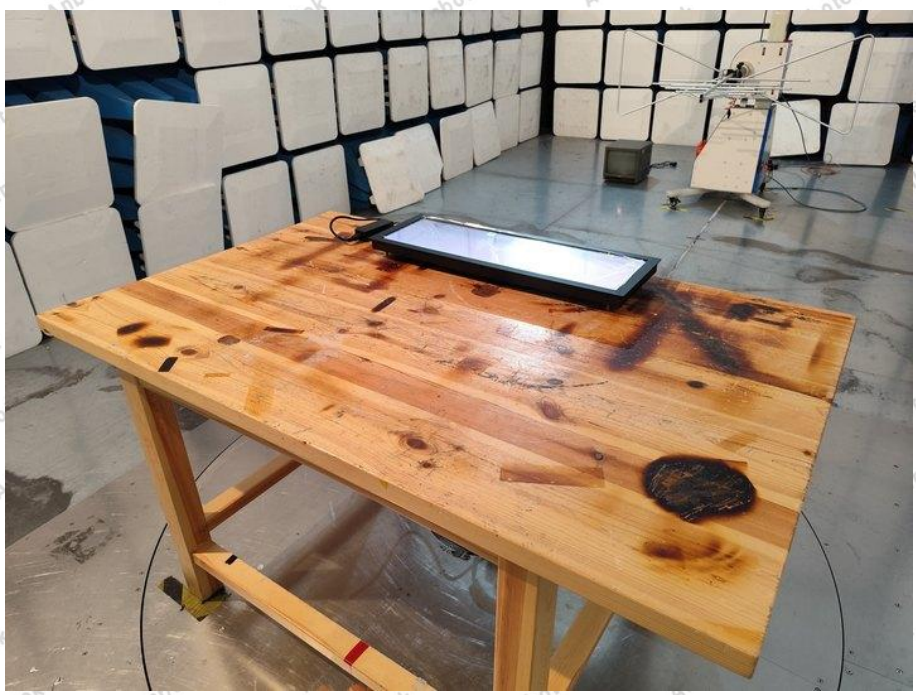


Photo of Electrostatic Discharge Immunity Test

Photo of RF Field Strength Immunity Test

Photo of Electrical Fast Transient/Burst Immunity Test

Photo of Surge Immunity Test

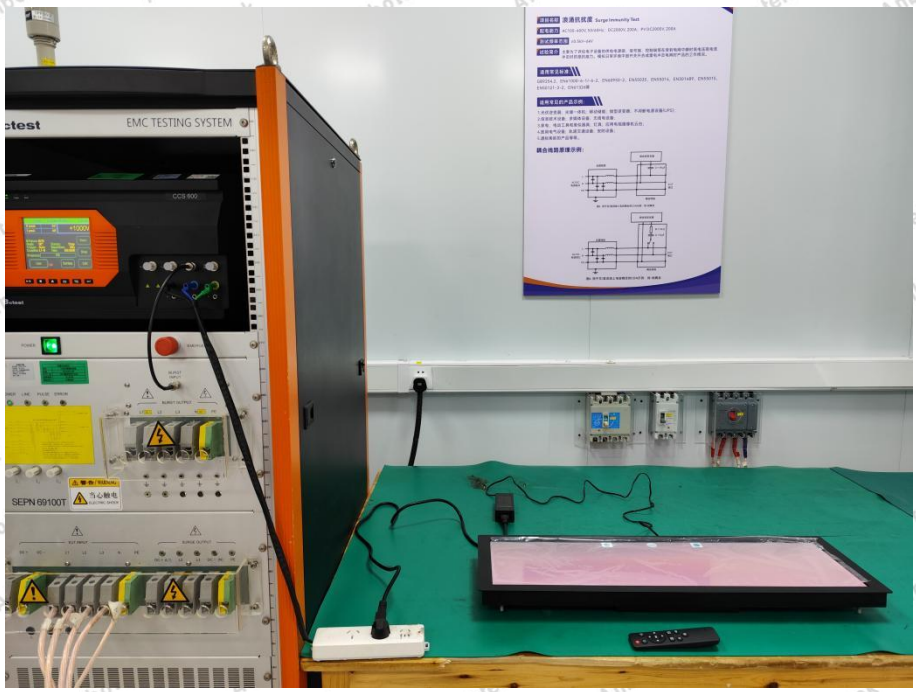


Photo of Injected Currents Susceptibility Test

APPENDIX II -- Photo documentation


KUANTEN
0cm1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Anbotek 安博检测


KUANTEN
AC ADAPTOR/电源适配器
Model/型号:KT60W120500B3
Input/输入:100-240V~50/60Hz 1.5A
Output/输出:12.0V⎓5.0A 60.0W
E323418
3TWV
LISTED
I.T.E. POWER SUPPLY
SHENZHEN KUANTEN LIMITED
Address:8D,Building 2,7th Industrial Zone,
Heshuikou Community,MatianStreet,Guangming
New District,Shenzhen,Guangdong,China
深圳市鑫冠诚科技有限公司 中国制造
MADE IN CHINA S/N:2415

CE Label

1. The CE conformity marking must consist of the initials 'CE' taking the following form:
   If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.
2. The CE marking must have a height of at least 5 mm except where this is not possible on account of the nature of the apparatus.
3. The CE marking must be affixed to the product or to its data plate. Additionally it must be affixed to the packaging, if any, and to the accompanying documents.
4. The CE marking must be affixed visibly, legibly and indelibly.
   It must have the same height as the initials 'CE'.

---------- End of Report ----------