

**EMC TEST REPORT**

For

**CHROMATEQ SARL****TOUCH**

Test Model: TOUCH 512

Additional Model No.: Please Refer to Page 9

Prepared for : CHROMATEQ SARL  
Address : 191 Allee de Lauzard – Bat B, Rdc 1, 34980 St Gely du Fesc

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

Tel : +(86) 0755-82591330  
Fax : +(86) 0755-82591332  
Web : www.lcs-cert.com  
Mail : webmaster@lcs-cert.com

Date of receipt of test sample : December 8, 2023  
Number of tested samples : 1  
Serial number : Prototype  
Date of Test : December 8, 2023 to December 14, 2023  
Date of Report : December 14, 2023





### TEST REPORT

<b>Report No.</b> .....	: <b>LCSA12073086E</b>
<b>Date of Issue</b> .....	: December 14, 2023
<b>Testing Laboratory Name</b> .....	: <b>Shenzhen LCS Compliance Testing Laboratory Ltd.</b>
<b>Address</b> .....	: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
<b>Testing Location/ Procedure</b> .....	: Full application of Harmonised standards <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing method <input type="checkbox"/>
<b>Applicant's Name</b> .....	: <b>CHROMATEQ SARL</b>
<b>Address</b> .....	: 191 Allee de Lauzard – Bat B, Rdc 1, 34980 St Gely du Fesc
<b>Test Specification</b>	
<b>Standard</b> .....	: EN 55032:2015/A1:2020 EN IEC 61000-3-2:2019/A1:2021 EN 61000-3-3:2013/A2:2021 EN 55035:2017/A11:2020
<b>Test Report Form No.</b> .....	: LCSEMC-1.0
<b>TRF Originator</b> .....	: Shenzhen LCS Compliance Testing Laboratory Ltd.
<b>Master TRF</b> .....	: Dated 2011-03
<b>Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.</b>	
This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.	
<b>Test Item Description.</b> .....	: <b>TOUCH</b>
<b>Trade Mark</b> .....	: N/A
<b>Test Model</b> .....	: TOUCH 512
<b>Result</b> .....	: <b>Positive</b>

Compiled by:

Jelly Li / File Administrator

Supervised by:

Baron Wen / Technique principal

Approved by:

Gavin Liang / Manager





# TEST REPORT

<b>Test Report No.:</b> LCSA12073086E	<u>December 14, 2023</u> Date of issue
---------------------------------------	---

<b>Test Model</b> .....	: TOUCH 512
<b>EUT</b> .....	: TOUCH
<b>Applicant</b> .....	: CHROMATEQ SARL
<b>Address</b> .....	: 191 Allee de Lauzard – Bat B, Rdc 1, 34980 St Gely du Fesc
<b>Telephone</b> .....	: /
<b>Fax</b> .....	: /
<b>Manufacturer</b> .....	: CHROMATEQ SARL
<b>Address</b> .....	: 191 Allee de Lauzard – Bat B, Rdc 1, 34980 St Gely du Fesc
<b>Telephone</b> .....	: /
<b>Fax</b> .....	: /
<b>Factory</b> .....	: CHROMATEQ SARL
<b>Address</b> .....	: 191 Allee de Lauzard – Bat B, Rdc 1, 34980 St Gely du Fesc
<b>Telephone</b> .....	: /
<b>Fax</b> .....	: /

<b>Test Result</b>	<b>Positive</b>
--------------------	-----------------

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





# Revision History

Report Version	Issue Date	Revision Content	Revised By
000	December 14, 2023	Initial Issue	/





# TABLE OF CONTENTS

Test Report Description	Page
<b>1. TEST STANDARDS</b> .....	<b>6</b>
<b>2. SUMMARY OF STANDARDS AND RESULTS</b> .....	<b>7</b>
2.1 Description of Standards and Results.....	7
2.2 Description of Test Modes.....	8
2.3 Description of Performance Criteria.....	8
<b>3. GENERAL INFORMATION</b> .....	<b>9</b>
3.1 Description of Device (EUT).....	9
3.2 Support equipment List.....	9
3.3 Description of Test Facility.....	9
3.4 Measurement Uncertainty.....	9
<b>4. MEASURING DEVICES AND TEST EQUIPMENT</b> .....	<b>10</b>
<b>5. EVALUATION RESULTS (EVALUATION)</b> .....	<b>12</b>
5.1 Harmonic current emission.....	12
<b>6. EMISSION TEST RESULTS (EMI)</b> .....	<b>13</b>
6.1 Conducted emissions from AC mains power ports (150kHz-30MHz).....	13
6.2 Radiated emissions (30MHz-1GHz).....	16
6.3 Voltage fluctuations and flicker.....	19
<b>7. IMMUNITY TEST RESULTS (EMS)</b> .....	<b>21</b>
7.1 Electrostatic discharges.....	21
7.2 RF electromagnetic field disturbances.....	23
7.3 Electrical fast transients / burst for AC mains power ports.....	25
7.4 Surges for AC mains power ports.....	27
7.5 Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz).....	29
7.6 Voltage dips and interruptions.....	31
<b>8. TEST SETUP PHOTOS</b> .....	<b>33</b>
<b>9. EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)</b> .....	<b>37</b>





## 1. TEST STANDARDS

The tests were performed according to following standards:

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

**EN IEC 61000-3-2:2019/A1:2021:** Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16A per phase)

**EN 61000-3-3:2013/A2:2021:** 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  $\leq 16A$  per phase and not subject to conditional connection

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





## 2. SUMMARY OF STANDARDS AND RESULTS

### 2.1 Description of Standards and Results

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

Description of Test Item	Standard	Limits	Result
Conducted emissions from AC mains power ports (150kHz-30MHz)	EN 55032:2015/A1:2020	Class B	Pass
Radiated emissions (30MHz-1GHz)	EN 55032:2015/A1:2020	Class B	Pass
Harmonic current emission	EN IEC 61000-3-2:2019/A1:2021	Class A	N/A
Voltage fluctuations and flicker	EN 61000-3-3:2013/A2:2021	EN 61000-3-3, Clause 4	Pass
Electrostatic discharges	EN 55035:2017/A11:2020	Contact Discharge: +/- 4kV Air Discharge: +/- 8kV	Pass
RF electromagnetic field disturbances	EN 55035:2017/A11:2020	3V/m, 80%, 1kHz Amp. Mod.	Pass
Electrical fast transients / burst for AC mains power ports	EN 55035:2017/A11:2020	1kV; 5/50ns Tr/Th; 5kHz Repetition Frequency	Pass
Surges for AC mains power ports	EN 55035:2017/A11:2020	1.2/50µs Tr/Td; 1kV Line to Line	Pass
Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)	EN 55035:2017/A11:2020	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%, 1kHz Amp. Mod.	Pass
Voltage dips and interruptions	EN 55035:2017/A11:2020	<5% residual voltage for 0.5 periods: B, 70% residual voltage for 25 periods: C, <5% residual voltage for 250 periods: C	Pass





## 2.2 Description of Test Modes

No	Title	Description
TM1	Working (DC 5V From USB Host Unit)	Record

## 2.3 Description of Performance Criteria

### General Performance Criteria

#### Performance Criteria A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### Performance Criteria B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance.

If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### Performance Criteria C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.







### 3. GENERAL INFORMATION

#### 3.1 Description of Device (EUT)

EUT	: TOUCH
Test Model	: TOUCH 512
Additional Model No.	: TOUCH 1024
Model Declaration	: PCB board, structure and internal of these model(s) are the same, : So no additional models were tested
Power Supply	: INPUT:DC5-24V/0.2A
Highest Internal Frequency	: $f \leq 108\text{MHz}$
Classification of Equipment	: Class B

#### 3.2 Support equipment List

The EUT was tested as an independent device.

#### 3.3 Description of Test Facility

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

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

#### 3.4 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emission (150kHz to 30MHz)	$\pm 2.35 \text{ dB}$
Radiated Emission (30MHz to 1000MHz)	$\pm 3.48 \text{ dB}$
Voltage Fluctuations & Flicker	$\pm 0.510\%$
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$ .	





#### 4. MEASURING DEVICES AND TEST EQUIPMENT

Conducted emissions from AC mains power ports (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Due Date
EMI Test Software	Farad	EZ	/	/	/
Artificial Mains	R&S	ENV216	101288	2023-06-09	2024-06-08
Pulse Limiter	R&S	ESH3-Z2	102750-NB	2023-08-15	2024-08-14
EMI Test Receiver	R&S	ESR3	102312	2023-02-25	2024-02-24

Radiated emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Due Date
EMI Test Software	Farad	EZ	/	/	/
EMI Test Software	AUDIX	E3	/	/	/
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
EMI Test Receiver	R&S	ESR3	102311	2023-08-15	2024-08-14
Broadband Pre-amplifier	/	BP-01M18G	P190501	2023-06-09	2024-06-08
EMI Test Receiver	R&S	ESCI7	101173	2023-10-25	2024-10-24
By-log Antenna	SchwarzZBECK	VULB9163	01428	2023-09-05	2024-09-04

Voltage fluctuations and flicker					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Due Date
HARMONICS&FLICKER MEASUREMENT SYSTEM	EVERFINE	HFM-3000	P630850CD14 11116	2023-02-25	2024-02-24
HARMONICS&FLICKER TESTING POWER SOURCE	EVERFINE	HFS-4000	P624486CD14 111124	2023-02-25	2024-02-24

Electrostatic discharges					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Due Date
ESD Simulator	SCHLODER	SESD 230	604035	2023-07-17	2024-07-16





RF electromagnetic field disturbances					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Due Date
MXG Vector Signal Generator	Agilent	E4438C	MY42081396(6G)	2023-06-09	2024-06-08
RF POWER AMPLIFIER	SKET	HAP_0306G-50W	/	2023-06-09	2024-06-08
RF POWER AMPLIFIER	OPHIR	5225R	1052	2023-06-09	2024-06-08
RF POWER AMPLIFIER	OPHIR	5273F	1019	2023-06-09	2024-06-08
Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	/	/
Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-484	/	/
RS Electric field probe	narda	EP601	611WX80208	2023-06-09	2024-06-08

Electrical fast transients / burst for AC mains power ports					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Due Date
Electric fast pulse group generator	3ctest	EFT-4001G	EC0461044	2023-10-18	2024-10-17
Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2023-08-15	2024-08-14

Surges for AC mains power ports					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Due Date
Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2023-08-15	2024-08-14

Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Due Date
Simulator	FRANKONIA	CIT-10/75	A126A1195	2023-08-15	2024-08-14
CDN	FRANKONIA	CDN-M2+M3	A2210177	2023-06-09	2024-06-08
6dB Attenuator	FRANKONIA	DAM25W	1172040	2023-06-09	2024-06-08

Voltage dips and interruptions					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Due Date
Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2023-06-09	2024-06-08





## 5. EVALUATION RESULTS (EVALUATION)

### 5.1 Harmonic current emission

Test Requirement:	Class A
Test Limit:	Not specified
Test Method:	EN IEC 61000-3-2:2019+A1:2021

#### 5.1.1 Conclusion:

Refer to EN IEC 61000-3-2 clause 7.1:

"For the following categories of equipment, limits are not specified in this document:

- lighting equipment with a rated power less than but not equal to 5 W;
- equipment with a rated power of 75 W or less, other than lighting equipment;"

Since the rated power of the EUT is less than above described, it is deemed to comply with the requirement.





## 6. EMISSION TEST RESULTS (EMI)

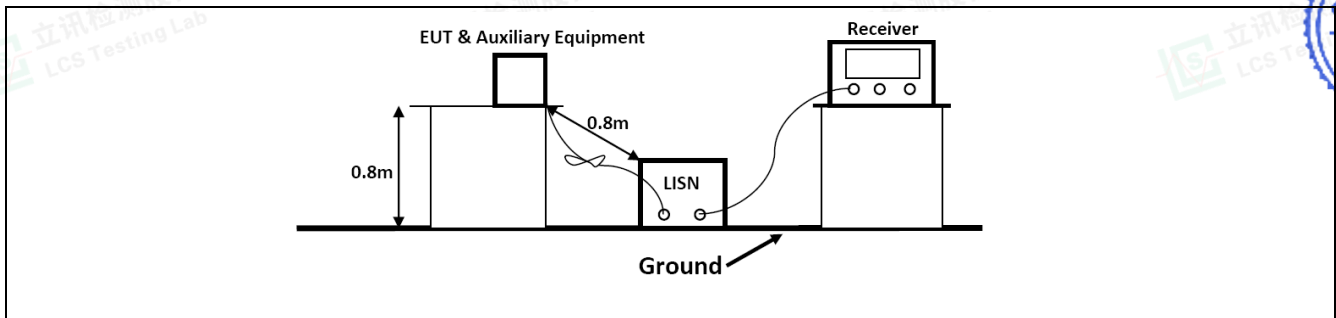
### 6.1 Conducted emissions from AC mains power ports (150kHz-30MHz)

Test Requirement:	Class B		
Test Limit:	<b>Frequency Range</b>	<b>Limit (Quasi-Peak)</b>	<b>Limit (Average)</b>
	0.15MHz to 0.5MHz	66dB(μV) to 56dB(μV)	56dB(μV) to 46dB(μV)
	0.5MHz to 5MHz	56dB(μV)	46dB(μV)
	5MHz to 30MHz	60dB(μV)	50dB(μV)
	Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz	
Test Method:	Clause 7 of CISPR 16-2-1:2014/AMD1:2017		
Procedure:	An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. Remark: Level= Read Level+ Cable Loss+ LISN Factor		

#### 6.1.1 E.U.T. Operation:

Operating Environment:			
Temperature:	23.5 °C	Humidity:	53.6 %
Pre test mode:	TM1		
Final test mode:	TM1		

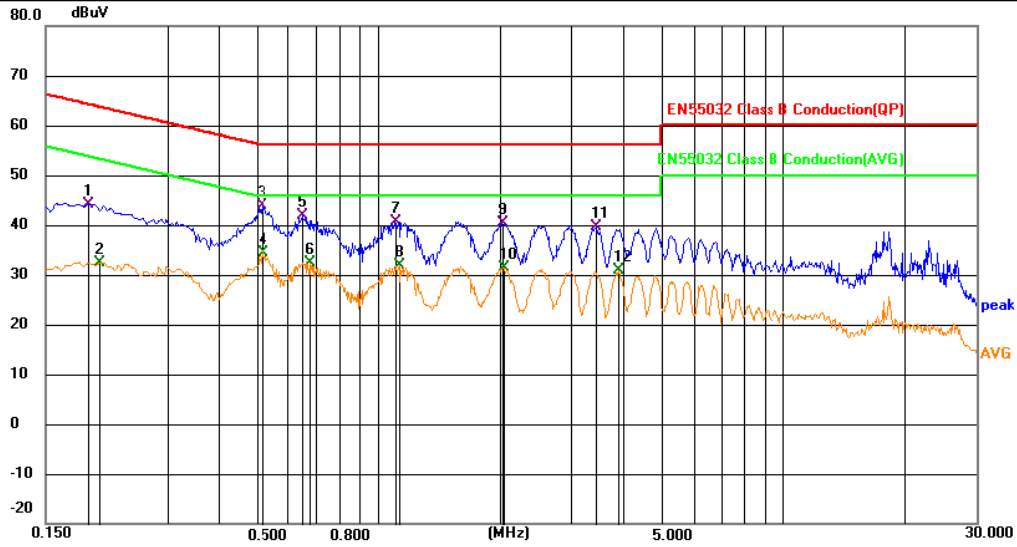
#### 6.1.2 Test Setup Diagram:





### 6.1.3 Test Data:

TM1 / Line: Line

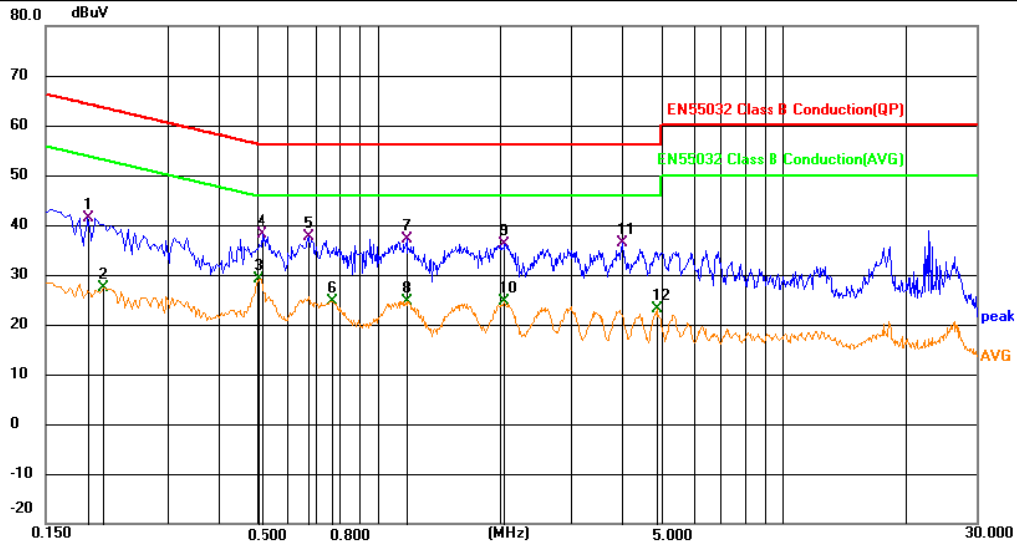


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1906	23.92	20.18	44.10	64.01	-19.91	QP	
2		0.2041	12.33	20.16	32.49	53.44	-20.95	AVG	
3		0.5146	23.62	20.20	43.82	56.00	-12.18	QP	
4	*	0.5155	14.22	20.20	34.42	46.00	-11.58	AVG	
5		0.6495	21.67	20.09	41.76	56.00	-14.24	QP	
6		0.6765	12.34	20.08	32.42	46.00	-13.58	AVG	
7		1.0995	20.60	20.14	40.74	56.00	-15.26	QP	
8		1.1265	11.82	20.14	31.96	46.00	-14.04	AVG	
9		2.0220	20.07	20.19	40.26	56.00	-15.74	QP	
10		2.0400	11.27	20.20	31.47	46.00	-14.53	AVG	
11		3.4441	19.33	20.24	39.57	56.00	-16.43	QP	
12		3.9121	10.71	20.12	30.83	46.00	-15.17	AVG	





TM1 / Line: Neutral



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.1906	21.39	20.04	41.43	64.01	-22.58	QP	
2	0.2086	7.23	20.06	27.29	53.26	-25.97	AVG	
3 *	0.5056	9.29	19.74	29.03	46.00	-16.97	AVG	
4	0.5146	18.28	19.77	38.05	56.00	-17.95	QP	
5	0.6720	17.36	20.33	37.69	56.00	-18.31	QP	
6	0.7665	4.34	20.35	24.69	46.00	-21.31	AVG	
7	1.1760	17.05	20.12	37.17	56.00	-18.83	QP	
8	1.1760	4.53	20.12	24.65	46.00	-21.35	AVG	
9	2.0445	15.84	20.25	36.09	56.00	-19.91	QP	
10	2.0445	4.29	20.25	24.54	46.00	-21.46	AVG	
11	4.0021	16.32	20.03	36.35	56.00	-19.65	QP	
12	4.8616	3.09	19.93	23.02	46.00	-22.98	AVG	





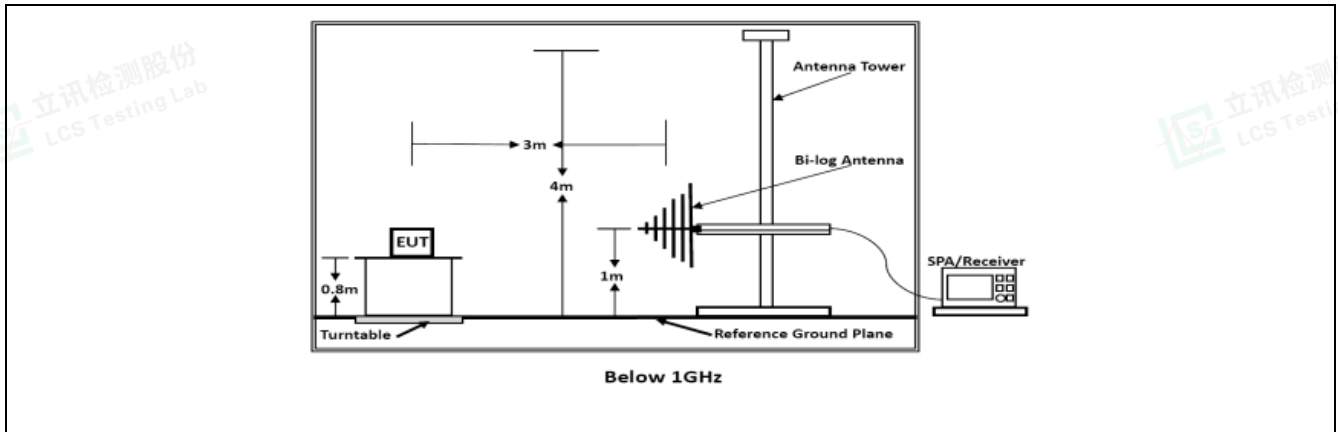
### 6.2 Radiated emissions (30MHz-1GHz)

Test Requirement:	Class B		
Test Limit:	<b>Frequency (MHz)</b>	<b>Limit [dB(uV/m) at 10m]</b>	<b>Limit [dB(uV/m) at 3m]</b>
	30 to 230	30	40
	230 to 1000	37	47
	Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz	
Test Method:	Clause 7.3 of CISPR 16-2-3:2016		
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor		

#### 6.2.1 E.U.T. Operation:

Operating Environment:			
Temperature:	26.4 °C	Humidity:	54.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

#### 6.2.2 Test Setup Diagram:

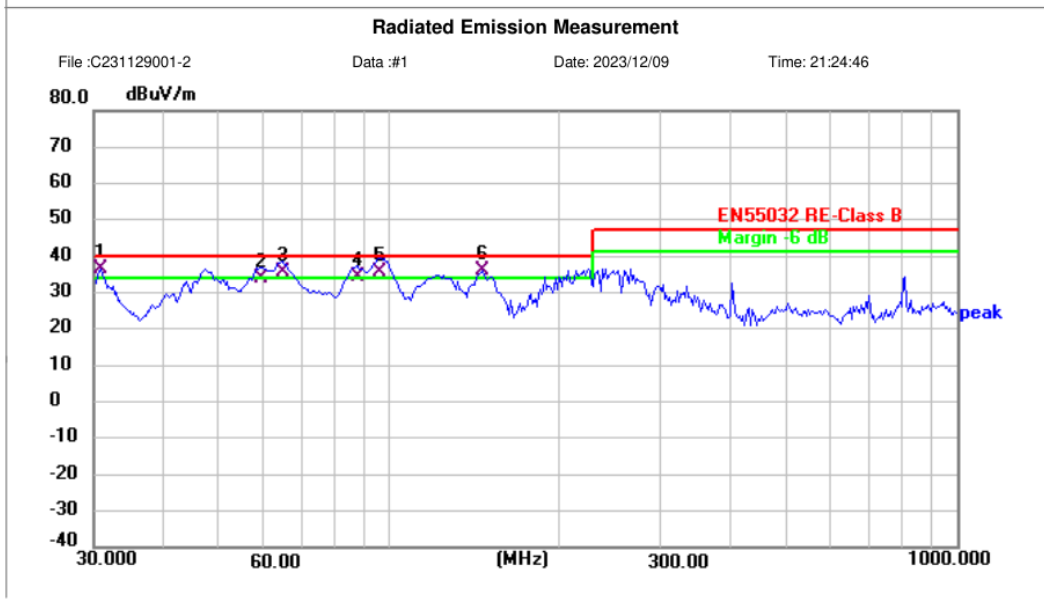






### 6.2.3 Test Data:

TM1 / Polarization: Horizontal

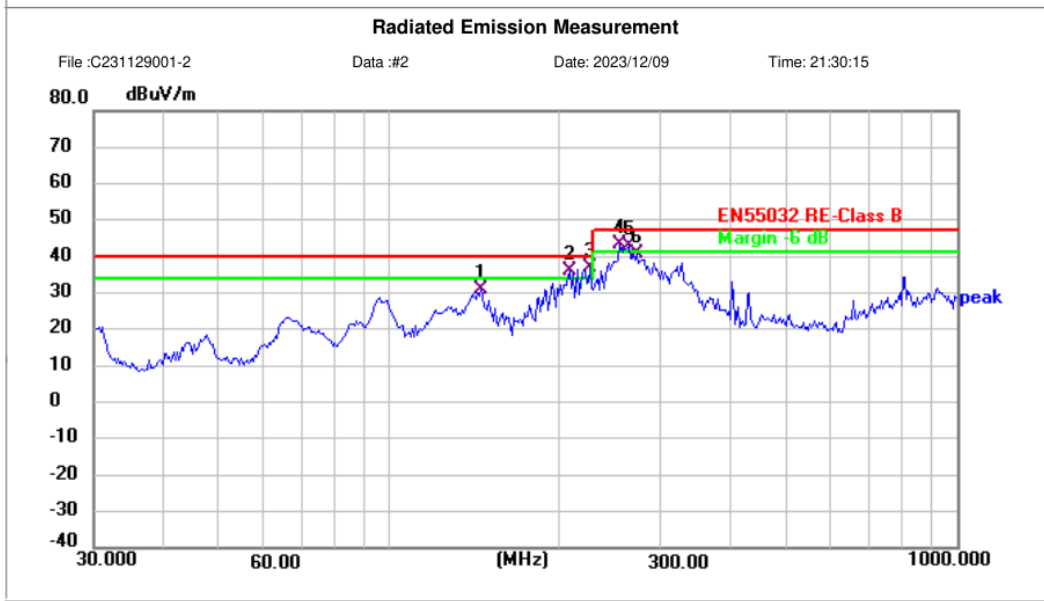


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	30.8552	55.63	-19.04	36.59	40.00	-3.41	QP			P	
2 !	59.3132	51.56	-17.50	34.06	40.00	-5.94	QP			P	
3 !	64.5319	54.34	-18.71	35.63	40.00	-4.37	QP			P	
4 !	87.9135	54.85	-20.37	34.48	40.00	-5.52	QP			P	
5 !	95.6485	54.76	-18.96	35.80	40.00	-4.20	QP			P	
6 !	145.8110	57.59	-21.66	35.93	40.00	-4.07	QP			P	





TM1 / Polarization: Vertical



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	144.7899	52.69	-21.70	30.99	40.00	-9.01	QP			P	
2 !	207.1968	53.88	-17.73	36.15	40.00	-3.85	QP			P	
3 *	225.4267	54.00	-17.28	36.72	40.00	-3.28	QP			P	
4 !	254.0312	60.13	-16.57	43.56	47.00	-3.44	QP			P	
5 !	263.1155	59.23	-16.39	42.84	47.00	-4.16	QP			P	
6	272.5246	56.82	-16.19	40.63	47.00	-6.37	QP			P	





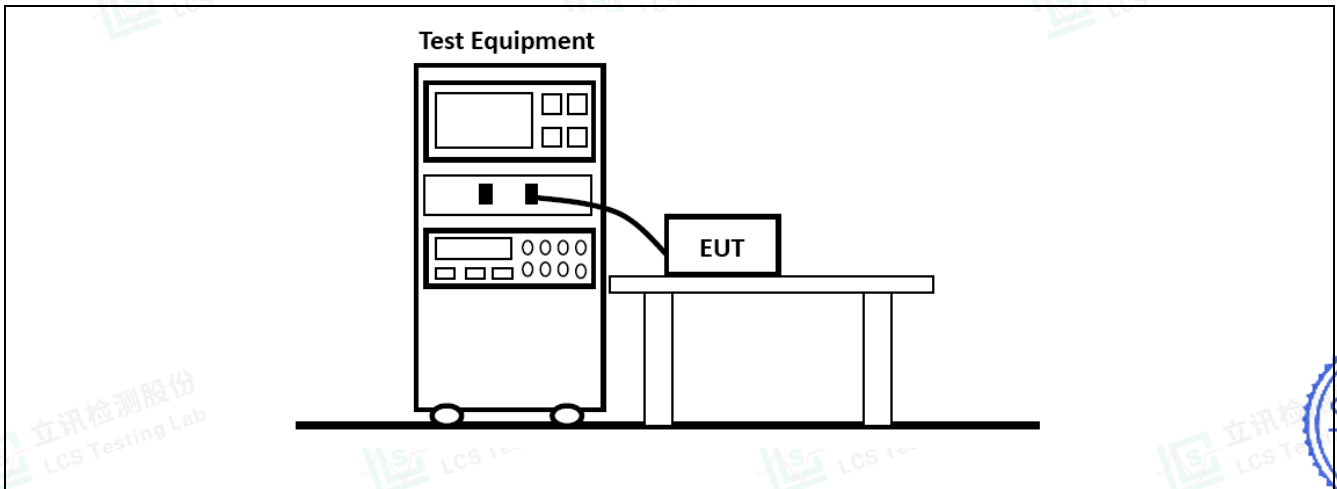
### 6.3 Voltage fluctuations and flicker

Test Requirement:	EN 61000-3-3, Clause 4
Test Limit:	EN 61000-3-3, Clause 5
Test Method:	EN 61000-3-3:2013+A2:2021

#### 6.3.1 E.U.T. Operation:

Operating Environment:			
Temperature:	25 °C	Humidity:	55 %
Pre test mode:	TM1		
Final test mode:	TM1		

#### 6.3.2 Test Setup Diagram:



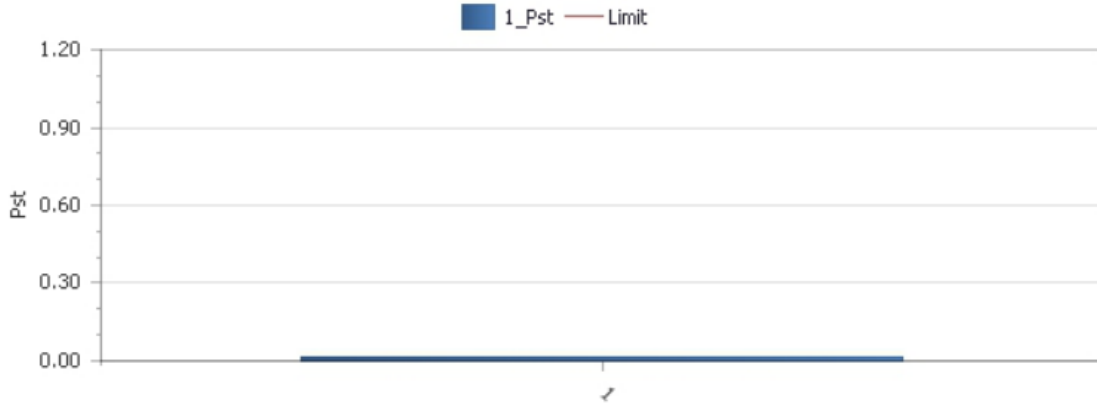


### 6.3.3 Test Data:

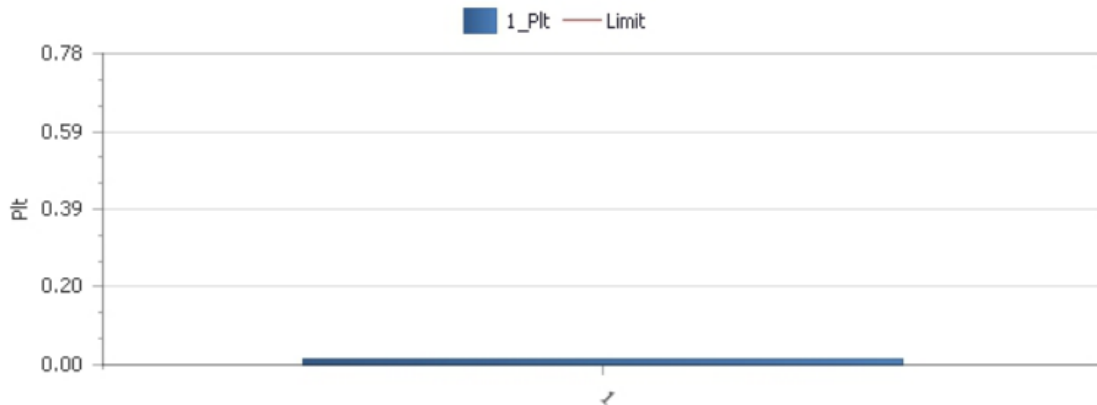
TM1

Customer : Result : PASS

Pst and Limit



Plt and Limit



#### Relevant Parameter and Judgement During Test Period

Vrms at the end of test (V)	219.56			
Error Max (%)		Test Limit (%)		
T-max (ms)	0.00	Test Limit (ms)	500	Pass
dc (%)	0.00	Test Limit (%)	3.30	Pass
dmax (%)	0.00	Test Limit (%)	4.00	Pass
Pst	0.016	Test Limit	1.000	Pass
Plt	0.016	Test Limit	0.650	Pass





## 7. IMMUNITY TEST RESULTS (EMS)

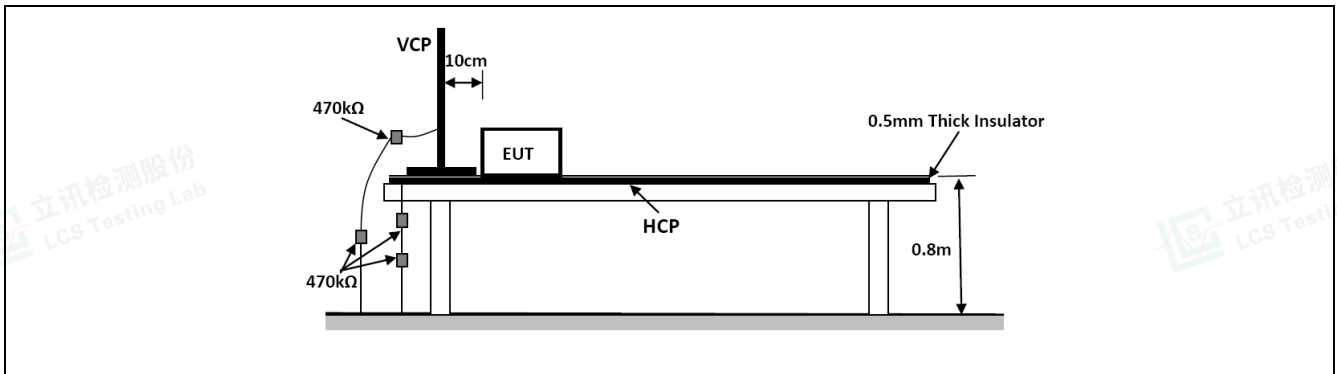
### 7.1 Electrostatic discharges

Test Requirement:	Contact Discharge: +/- 4kV Air Discharge: +/- 8kV
Test Method:	EN 61000-4-2: 2009
Procedure:	Discharge Impedance: 330Ω/150pF Number of Discharge: Minimum 10 times at each test point Discharge Mode: Single Discharge Discharge Period: 1 second minimum
Performance Criteria:	B

#### 7.1.1 E.U.T. Operation:

Operating Environment:			
Temperature:	23.1 °C	Humidity:	52.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

#### 7.1.2 Test Setup Diagram:





7.1.3 Test Data:

Discharge type	Volt (kV)	Polarity	Test Point	Result/ Observations
Air discharge	2,4,8	+	10	B
Air discharge	2,4,8	-	10	B
Contact discharge	4	+	10	B
Contact discharge	4	-	10	B
Horizontal Coupling	4	+	10	B
Horizontal Coupling	4	-	10	B
Vertical Coupling	4	+	10	B
Vertical Coupling	4	-	10	B

A: No degradation in the performance of the EUT was observed.





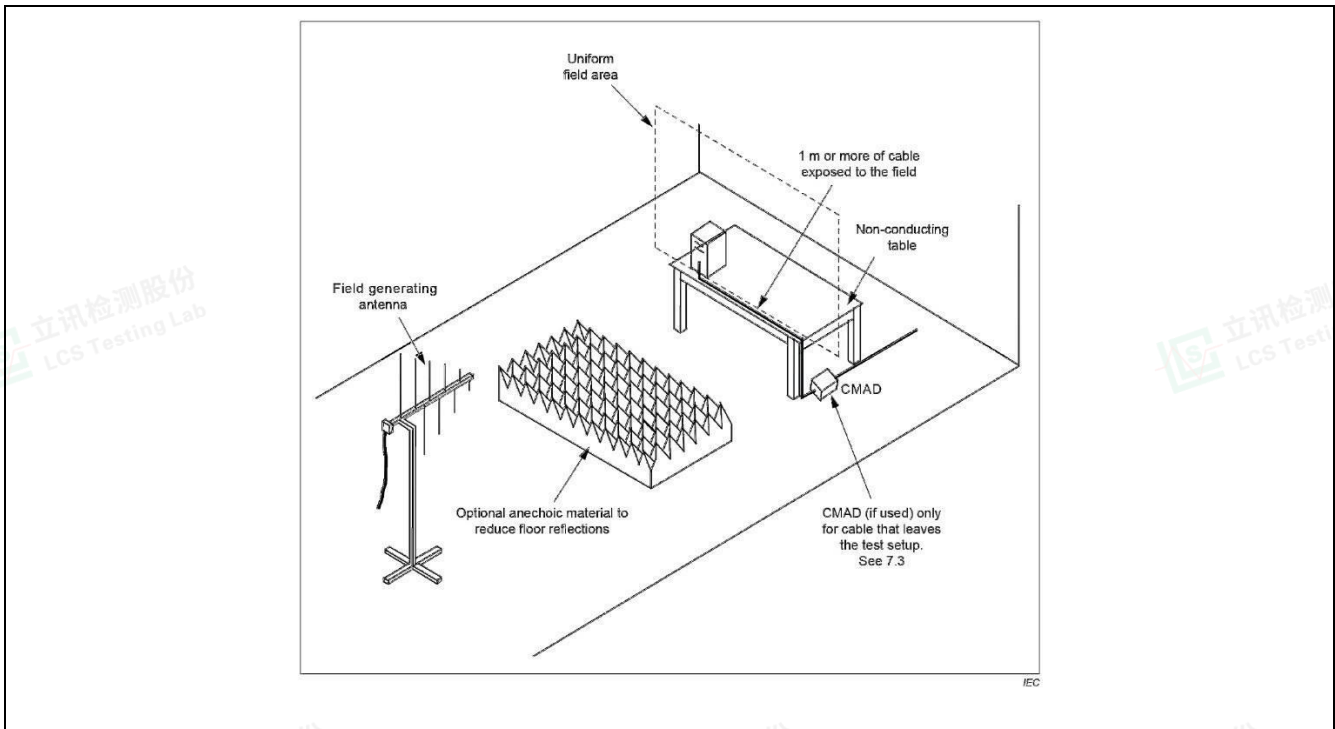
### 7.2 RF electromagnetic field disturbances

Test Requirement:	3V/m, 80%, 1kHz Amp. Mod.
Test Method:	EN IEC 61000-4-3: 2020
Procedure:	Frequency Range: 80MHz to 1GHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz Antenna Polarisation: Vertical and Horizontal Modulation: 1kHz,80% Amp. Mod,1% increment
Performance Criteria:	A

#### 7.2.1 E.U.T. Operation:

Operating Environment:			
Temperature:	23.1 °C	Humidity:	52.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

#### 7.2.2 Test Setup Diagram:





7.2.3 Test Data:

Frequency	Field Strength (V/m)	EUT face	Dwell time	Result/ Observations
80MHz-1GHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
1800MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
2600MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
3500MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
5000MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A

A: No degradation in the performance of the EUT was observed.







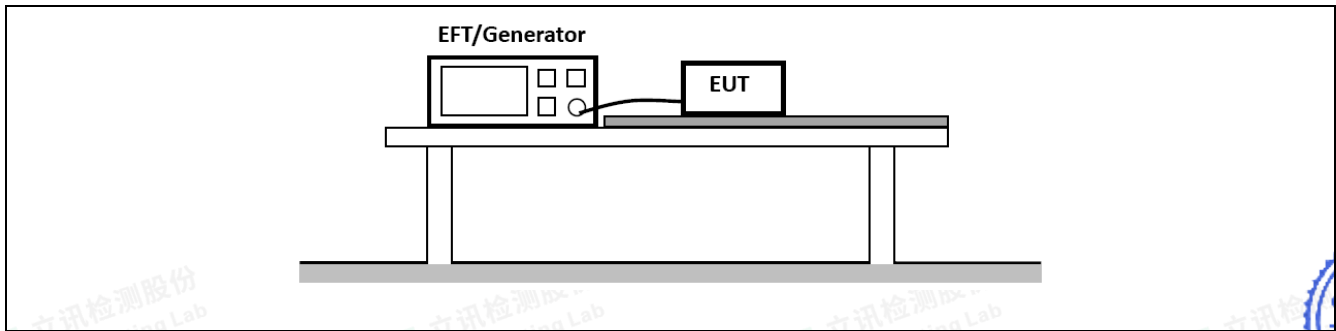
### 7.3 Electrical fast transients / burst for AC mains power ports

Test Requirement:	1kV; 5/50ns Tr/Th; 5kHz Repetition Frequency
Test Method:	EN 61000-4-4: 2012
Procedure:	Repetition Frequency: 5kHz Burst Period: 300ms Test Duration: 2 minute per level & polarity
Performance Criteria:	B

#### 7.3.1 E.U.T. Operation:

Operating Environment:			
Temperature:	23.1 °C	Humidity:	52.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

#### 7.3.2 Test Setup Diagram:





7.3.3 Test Data:

Port	Volt (kV)	Polarity	CDN/ Clamp	Result/ Observations
AC power port	1	+	CDN	B
AC power port	1	-	CDN	B

A: No degradation in the performance of the EUT was observed.





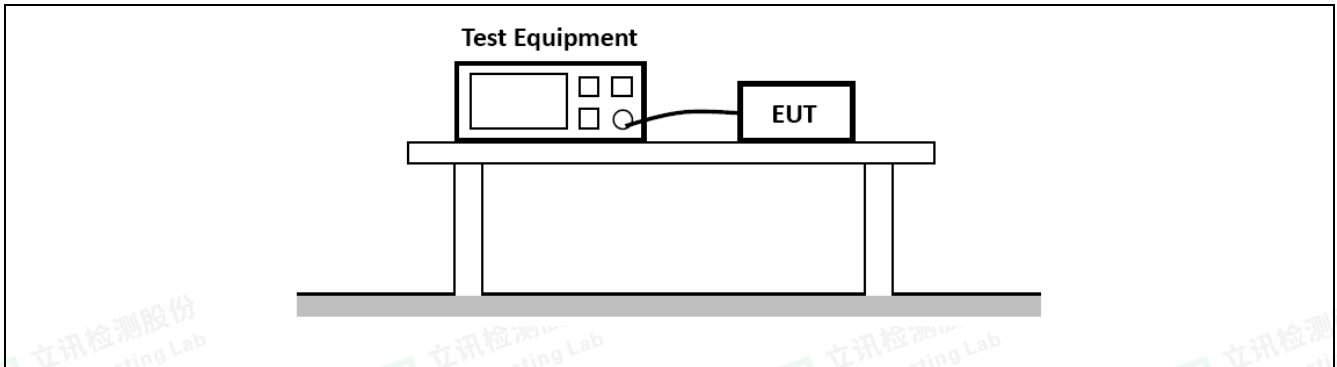
### 7.4 Surges for AC mains power ports

Test Requirement:	1.2/50 $\mu$ s Tr/Td; 1kV Line to Line
Test Method:	EN 61000-4-5: 2014 +A1: 2017
Procedure:	Interval: 60s between each surge No. of surges: 5 positive, 5 negative at 90°, 270°
Performance Criteria:	B

#### 7.4.1 E.U.T. Operation:

Operating Environment:			
Temperature:	23.1 °C	Humidity:	52.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

#### 7.4.2 Test Setup Diagram:





7.4.3 Test Data:

Port	Volt (kV)	Polarity	Phase(degree)	Result/ Observations
L-N	1	+	90°	B
L-N	1	-	270°	B

A: No degradation in the performance of the EUT was observed.





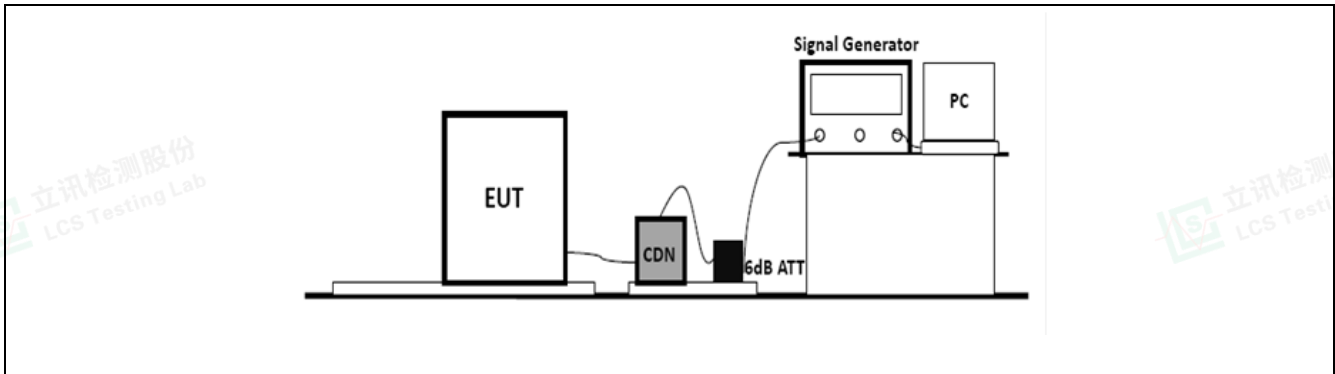
### 7.5 Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)

Test Requirement:	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%,1kHz Amp. Mod.
Test Method:	EN 61000-4-6: 2014
Procedure:	Frequency Range: 0.15MHz to 80MHz Modulation: 80%, 1kHz Amplitude Modulation Step Size: 1%
Performance Criteria:	A

#### 7.5.1 E.U.T. Operation:

Operating Environment:			
Temperature:	23.1 °C	Humidity:	52.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

#### 7.5.2 Test Setup Diagram:





7.5.3 Test Data:

Port	Strength (Vrms)	CDN/Clamp	Dwell time	Result/ Observations
AC power port	3(0.15MHz-10MHz)	CDN	3s	A
AC power port	3 to 1(10MHz-30MHz, Lines)	CDN	3s	A
AC power port	1(30MHz-80MHz)	CDN	3s	A

A: No degradation in the performance of the EUT was observed.





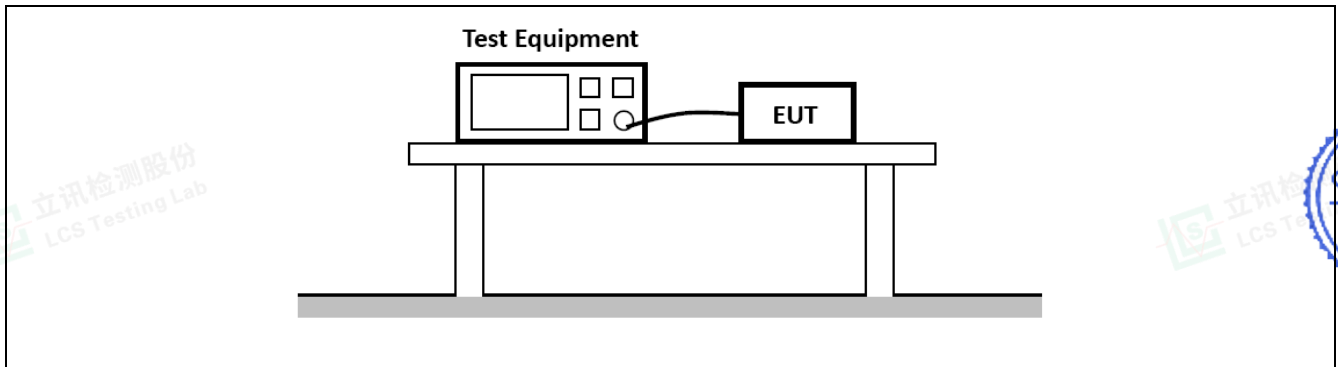
### 7.6 Voltage dips and interruptions

Test Requirement:	<5% residual voltage for 0.5 periods 70% residual voltage for 25 periods <5% residual voltage for 250 periods
Test Method:	EN IEC 61000-4-11:2020
Procedure:	<5% residual voltage for 0.5 period 70% residual voltage for 25 period <5% residual voltage for 250 period No. of Dips / Interruptions: 3 per Level Time between dropout: 10s
Performance Criteria:	B, C

#### 7.6.1 E.U.T. Operation:

Operating Environment:			
Temperature:	23.1 °C	Humidity:	52.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

#### 7.6.2 Test Setup Diagram:





7.6.3 Test Data:

Level %UT	Phase (degree)	Duration	No. of Dips/ Interruptions	Result/ Observations
0	0°	0.5 Cycles	3	B
0	0°	250 Cycles	3	B
70	0°	25 Cycles	3	C
0	0°	0.5 Cycles	3	C
0	0°	300 Cycles	3	C
70	0°	30 Cycles	3	C

A: No degradation in the performance of the EUT was observed.





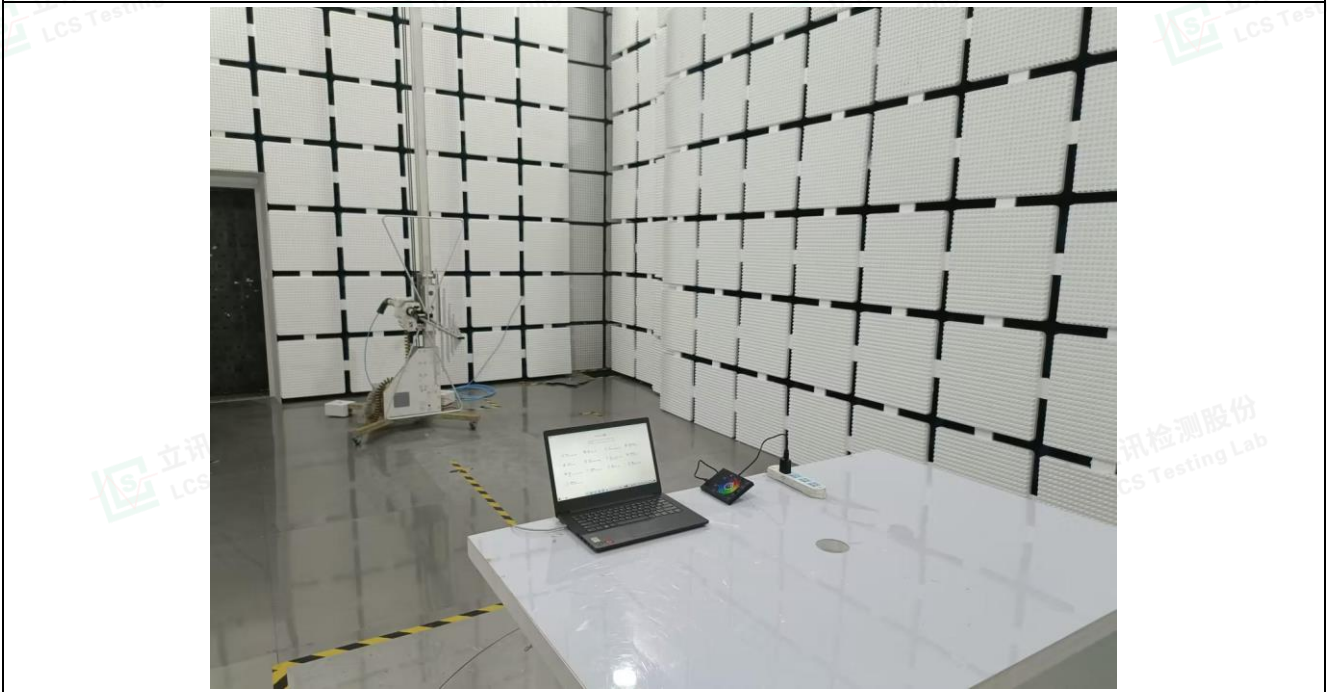


## 8. TEST SETUP PHOTOS

**Conducted emissions from AC mains power ports (150kHz-30MHz)**



**Radiated emissions (30MHz-1GHz)**

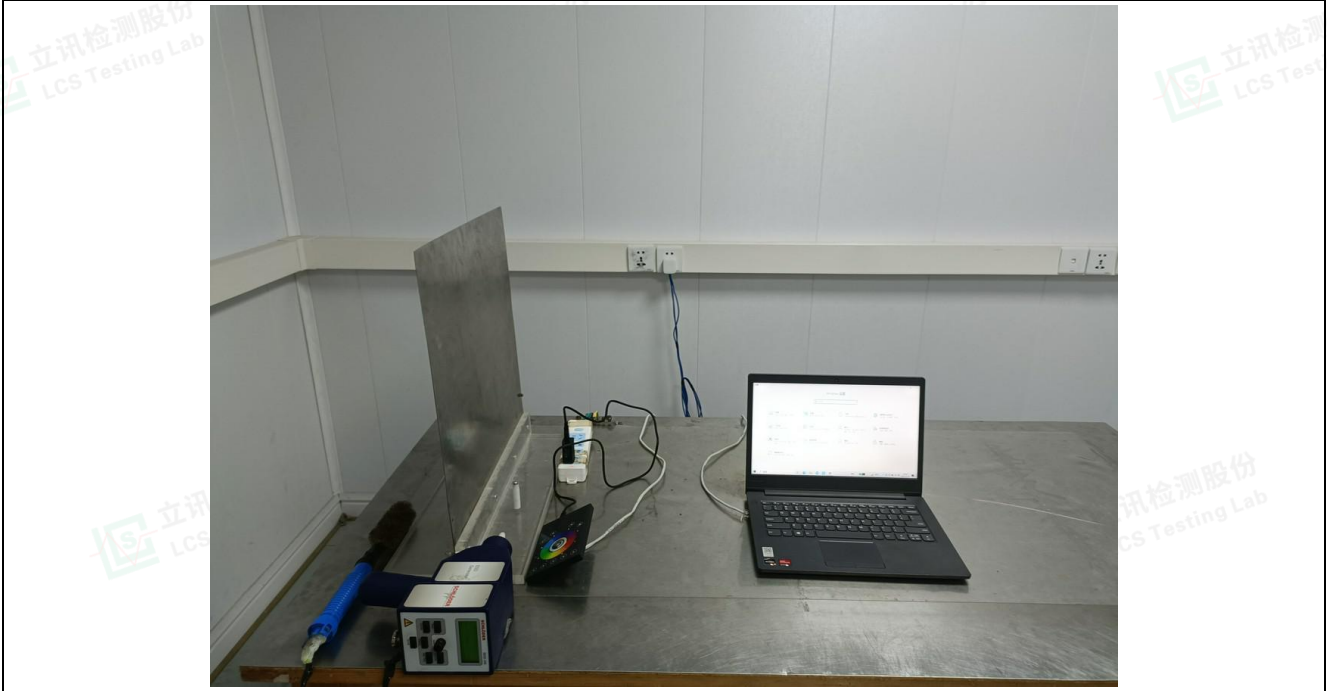




### Voltage fluctuations and flicker



### Electrostatic discharges





### RF electromagnetic field disturbances

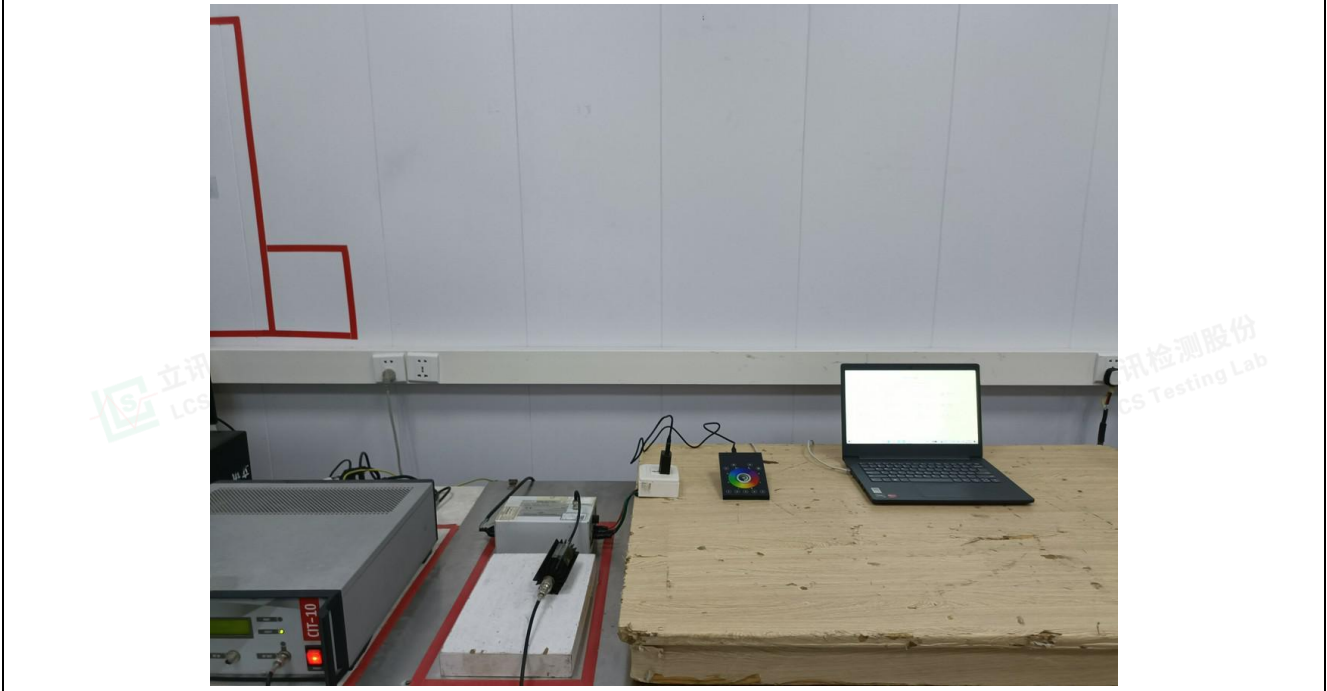


### Electrical fast transients / burst for AC mains power ports Surges for AC mains power ports

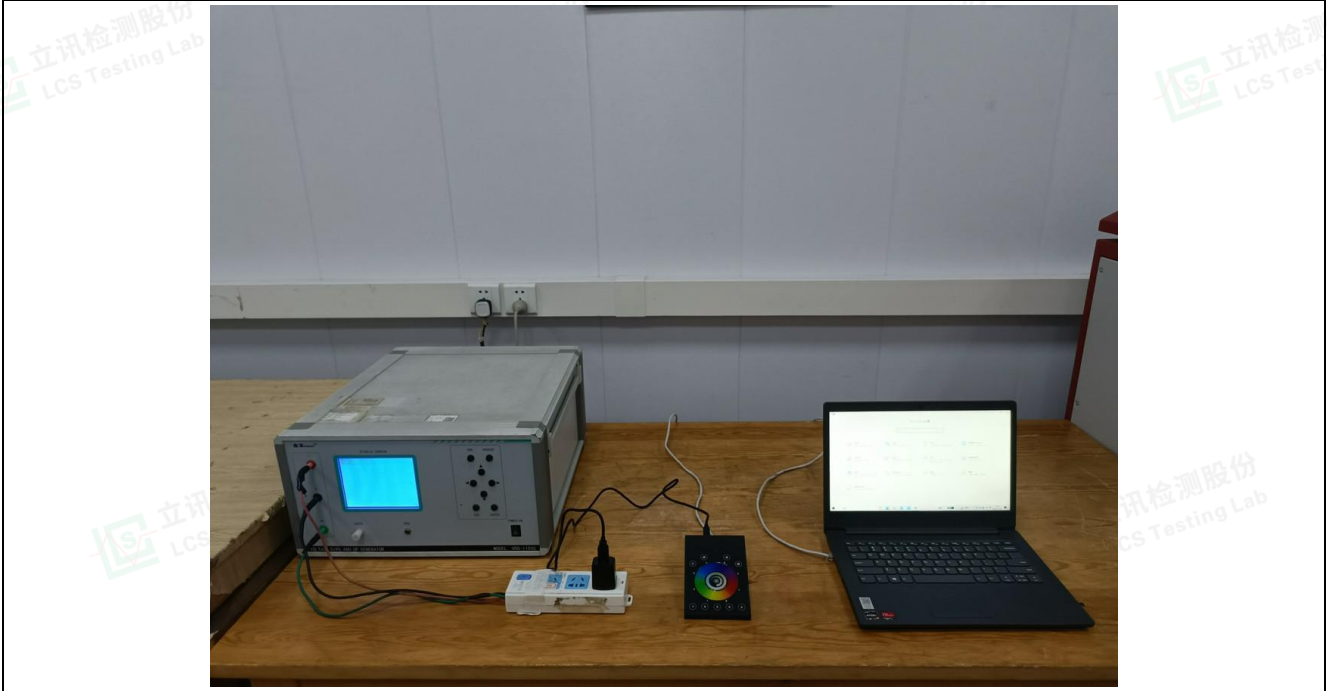




**Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)**



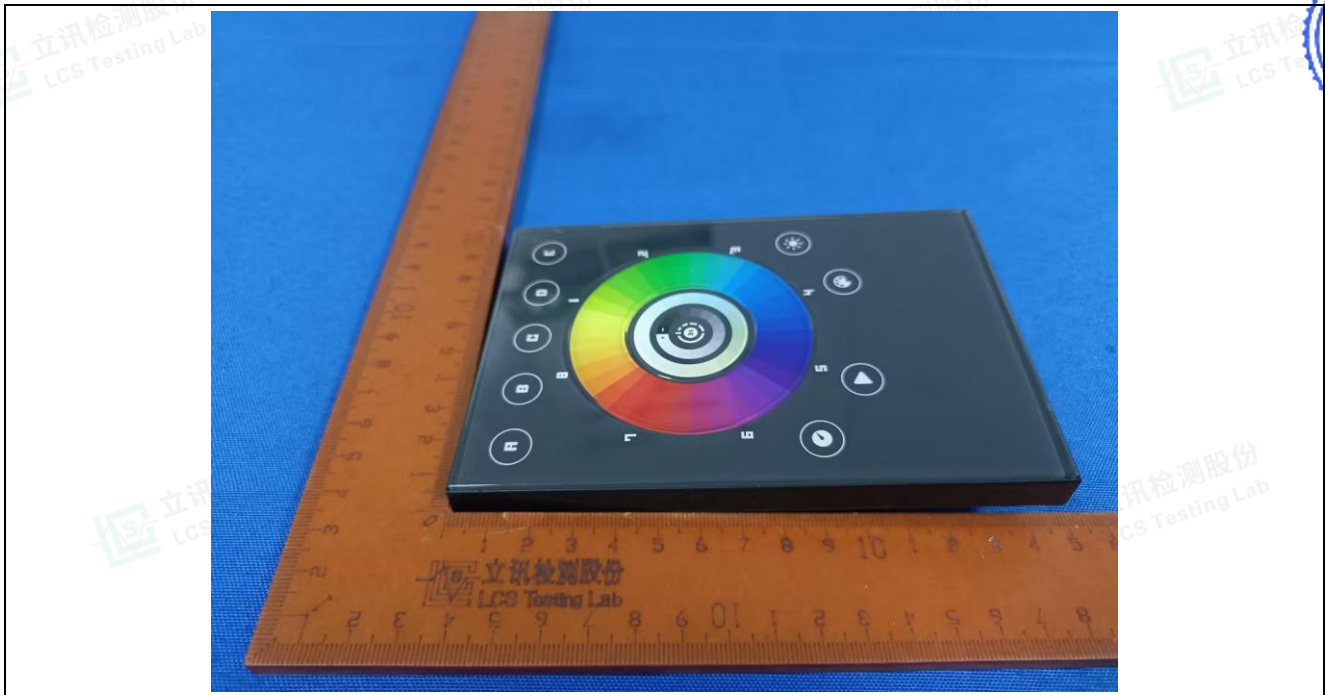
**Voltage dips and interruptions**

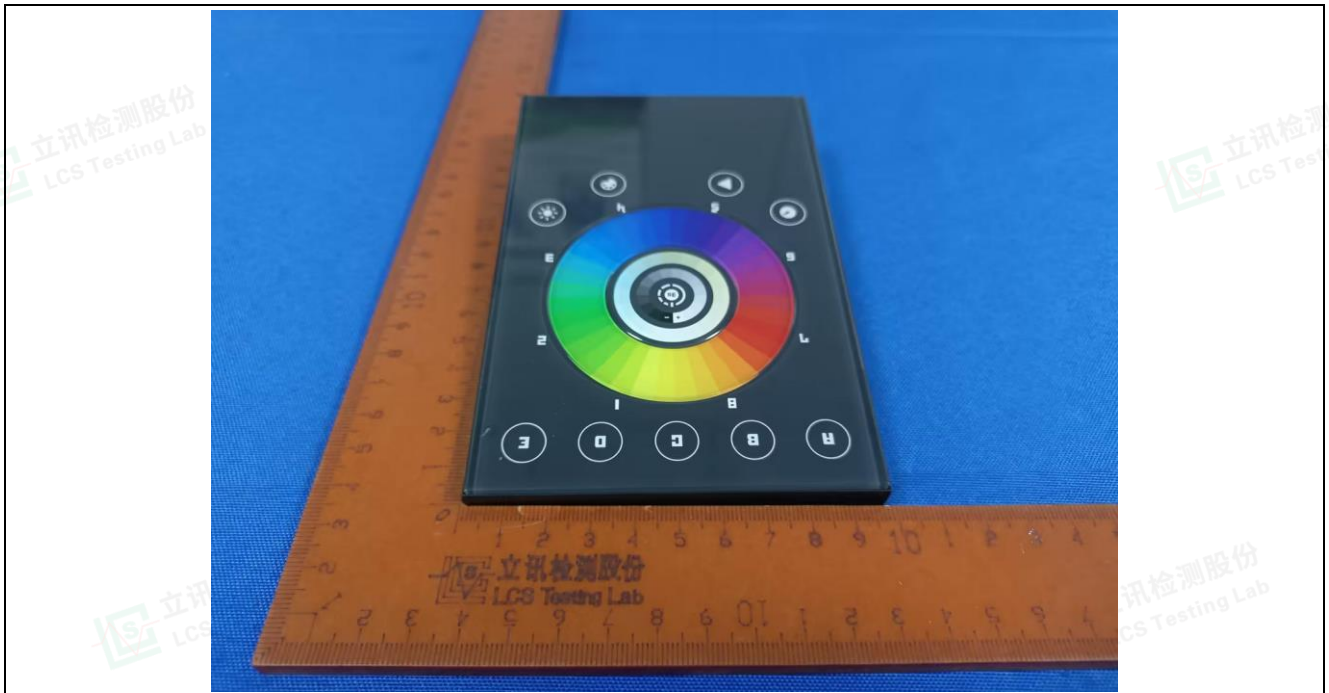
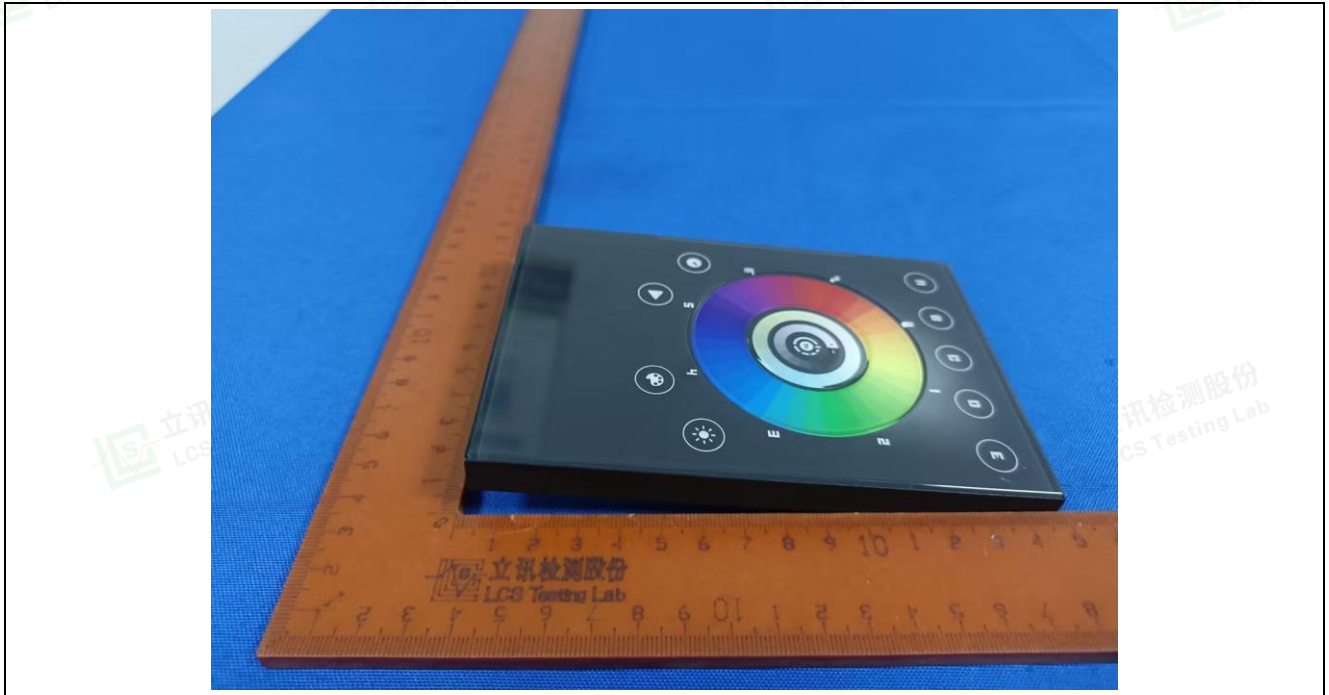


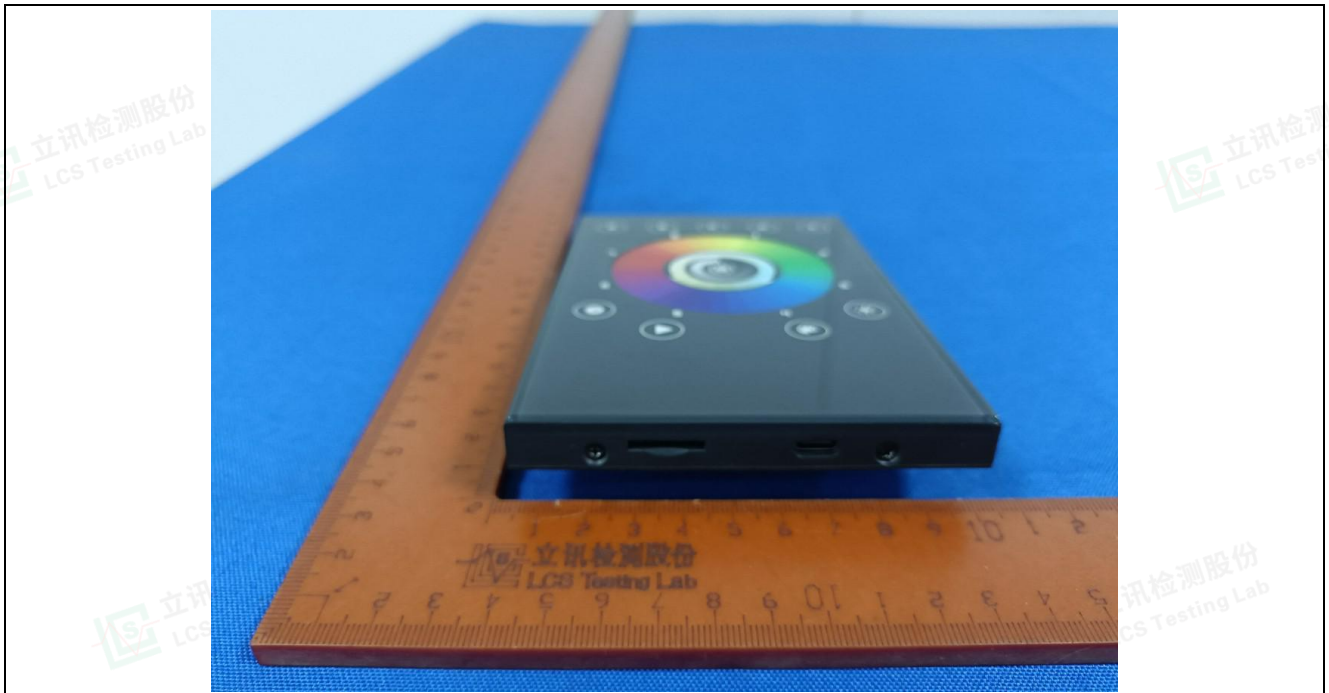
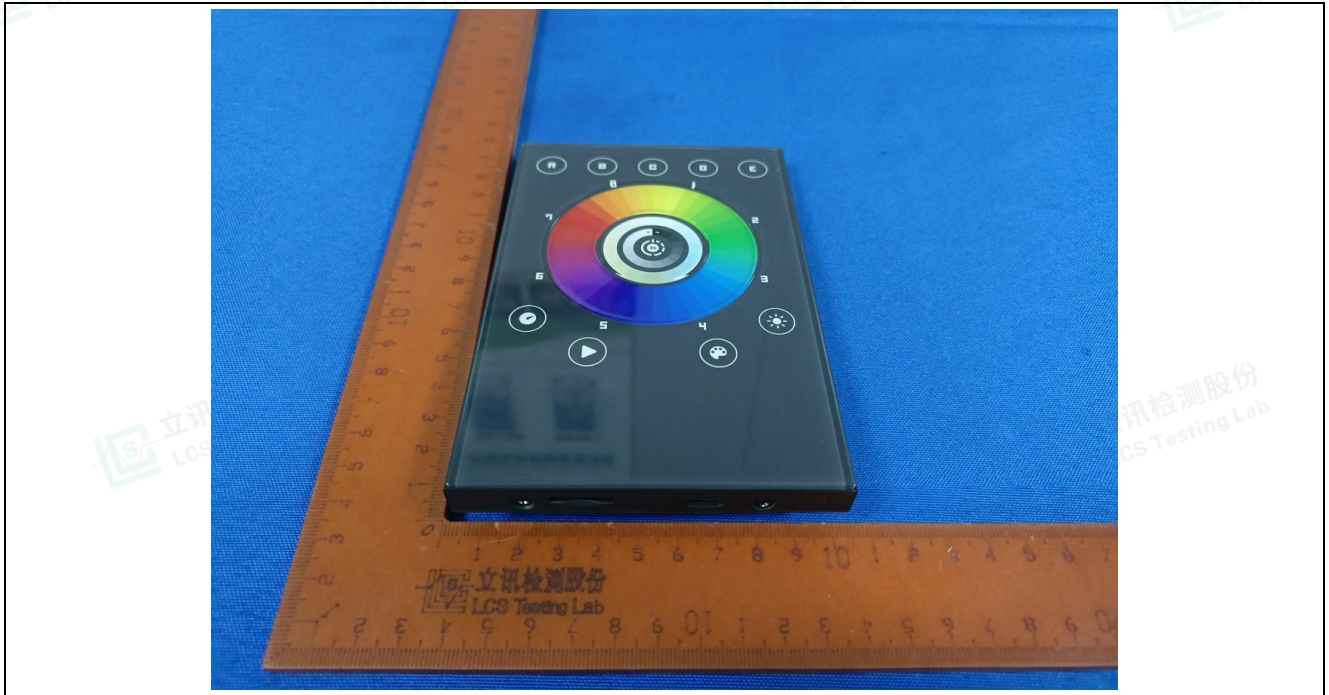


### 9. EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)

External









--- End of Report ---

