

CE/EMC COMPLIANCE REPORT

for

CHIPSEE CO., LIMITED.

Embedded Industrial Computer

Prepared for : CHIPSEE CO., LIMITED.

Address : Xinyuan Science Park B406, 97 Changping Road,
Changping District, Beijing, 102206, China

Prepared by : EST Technology Co., Ltd.

Address : Chilingxiang, Qishantou, Santun, Houjie, Dongguan,
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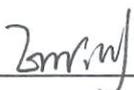
Report Number : ESTE-E2308040

Date of Report : Aug. 12, 2023

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EST Technology Co., Ltd.

Applicant:	CHIPSEE CO., LIMITED.		
Address:	Xinyuan Science Park B406, 97 Changping Road, Changping District, Beijing, 102206, China		
Manufacturer:	CHIPSEE CO., LIMITED.		
Address:	Xinyuan Science Park B406, 97 Changping Road, Changping District, Beijing, 102206, China		
Factory:	CHIPSEE CO., LIMITED.		
Address:	Xinyuan Science Park B406, 97 Changping Road, Changping District, Beijing, 102206, China		
E.U.T:	Embedded Industrial Computer		
Model Number:	CS10768RA4121P, CS19108RA4133P, CS10768RA4150P, CS19108RA4156P		
Trade Name:	-----	Serial No:	-----
Date of Receipt:	Apr. 27, 2023	Date of Test:	Aug. 08-10, 2023
Test Specification:	EN 55032:2015+A1:2020 EN 55035:2017+A11:2020		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied.		
		Issue Date:	Aug. 12, 2023
Prepared by:	Reviewed by:	Approved by:	
 _____ Emily / Assistant	 _____ Sean / Engineer	 _____ Iceman Hu / Manager	
Other Aspects:	None.		
<i>Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested</i>			
<i>This test report is based on a single evaluation of one sample of above mentioned products .It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd. The statement of compliance in this report is based on the limit in the test standard, the measurement uncertainty is not considered.</i>			

1. GENERAL PRODUCT INFORMATION

1.1. Product Function

Refer to Technical Construction Form and User Manual.

1.2. Description of Device (EUT)

Description	:	Embedded Industrial Computer
Model No.	:	CS19108RA4156P
System Input Voltage	:	DC 24V
AUX Line	:	Unshielded, Detachable 1.2m
LAN Line	:	Unshielded, Detachable 1.5m
DC Line	:	Unshielded, Detachable 0.8m

1.3. Difference between Model Numbers

Note: 121 represents 12.1 inches, 133 represents 13.3 inches, 150 represents 15.0 inches, and 156 represents 15.6 inches
10768 stands for 1024*768 resolution, 19108 stands for 1920*1080 resolution.

1.4. Independent Operation Modes

The basic operation modes are:

1.4.1. USB Play

1.4.2. TF Mode

1.4.3. LAN

1.4.4. Bluetooth Mode

1.4.5. Wi-Fi

1.5. Test Supporting System



2. TEST SITES

2.1. Description of Standards and Results

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

EMISSION(EN 55032:2015+A1:2020)				
Description of Test Item	Standard	Limits	Results	
Conducted emissions (AC mains power ports)	EN 55032:2015+A1:2020	-----	N/A	
		Minimum passing margin is ***dB at ***MHz		
Asymmetric mode conducted emissions	EN 55032:2015+A1:2020	Class A	PASS	
		Minimum passing margin is 20.41dB at 0.41MHz		
Conducted differential voltage emissions	EN 55032:2015+A1:2020	-----	N/A	
		More than *** dB below the limit line.		
Radiated Emission	EN 55032:2015+A1:2020	Class A	PASS	
		Minimum passing margin is 3.91dB at 668.26MHz		
Radiated Emission Test (above 1GHz)	EN 55032:2015+A1:2020	Class A	PASS	
		Minimum passing margin is 5.38dB at 2375.00MHz		
Harmonic current emissions	EN IEC 61000-3-2:2019+ A1:2021	-----	N/A	
Voltage fluctuations & flicker	EN 61000-3-3:2013+A1:2019 +A2:2021	-----	N/A	
IMMUNITY (EN 55035:2017+A11:2020)				
Description of Test Item	Basic Standard	Performance Criteria	Observation Criteria	Results
Electrostatic discharge (ESD)	EN 61000-4-2:2009	B	B	PASS
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3:2006+A1:2008+A2:2010	A	A	PASS
Electrical fast transient (EFT)	EN 61000-4-4:2012	B	B	PASS
Surge (Input a.c. power port)	EN 61000-4-5:2014	B	B	PASS
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6:2014	A	A	PASS
Power frequency magnetic field	EN 61000-4-8:2010	A	A	PASS
Voltage dips, >95% reduction	EN 61000-4-11:2004	B	*	N/A
Voltage dips, 30% reduction		C	*	N/A
Voltage interruptions		C	*	N/A
N/A is an abbreviation for Not Applicable.				

2.2. Test Facilities

EMC Lab : Certificated by CNAS, CHINA
Registration No.: L5288
This Certificate is valid until: November 12, 2023

Certificated by FCC, USA
Designation Number: CN1215
This Certificate is valid until: January 31, 2024

Certificated by A2LA, USA
Registration No.: 4366.01
This Certificate is valid until: January 31, 2024

Certificated by Industry Canada
CAB identifier No.: CN0035
This Certificate is valid until: January 31, 2024

Certificated by VCCI, Japan
Registration No.: C-14103; T-20073; R-13663;
R-20103; G-20097
Date of registration: Apr. 20, 2020
This Certificate is valid until: Apr. 19, 2026

Certificated by TUV Rheinland, Germany
Registration No.: UA 50413872 0001
Date of registration: July 31, 2018

Certificated by Intertek
Registration No.: 2011-RTL-L2-64
Date of registration: November 08, 2018

Name of Firm : EST Technology Co., Ltd.

Site Location : Chilingxiang, Qishantou, Santun, Houjie, Dongguan,
Guangdong, China

2.3.List of Test and Measurement Instruments

2.3.1. For asymmetric mode conducted emissions test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESRP3	EST-E070	June 12,23	1 Year
ISN	Teseq	T8	EST-E041	June 12,23	1 Year
Current Transformer	SCHWARZBECK	SW9605	EST-E045	June 12,23	1 Year
Voltage Probe	SCHWARZBECK	TK9420	EST-E046	June 12,23	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A

2.3.2. For radiated emission test (2# 966 radiation)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESPI3	EST-E004	June 12,23	1 Year
Bilog Antenna	Teseq	CBL 6111D	EST-E076	June 12,23	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A

2.3.3. For radiated emission test (above 1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	June 12,23	1 Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	EST-E031	June 12,23	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A

2.3.4. For electrostatic discharge immunity test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
ESD Generator	Teseq	NSG437	EST-E073	June 12,23	1 Year

2.3.5. For electrical fast transient/burst immunity test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EFT Generator	EMC PARTNER	TRANSIENT 2000	EST-E074	June 12,23	1 Year
Capacitive Coupling Clamp	HAEFELY	IP4A	EST-E040	June 12,23	1 Year

2.3.6. Radio Frequency Electromagnetic Field Immunity (R/S) Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Signal Generator	Agilent	N5181A	EST-E060	June 12,23	1 Year
Power Amplifier	SKET	HAP801000M-250W	EST-E061	N/A	N/A
Power Amplifier	SKET	HAP0103G-75W	EST-E062	N/A	N/A
Power Amplifier	SKET	HAP0306G-50W	EST-E063	N/A	N/A
Power Meter	Agilent	E4419B	EST-E064	June 12,23	1 Year
Power sensor	Agilent	E9301A	EST-E065	June 12,23	1 Year
Power sensor	HP	E9301A	EST-E066	June 12,23	1 Year
Antenna	Schwarzbeck	STLP 9129	EST-E059	N/A	N/A
E-Field Probe	Narda	EP-601	EST-E067	June 12,23	1 Year
Audio Analyzer	Rohde &Schwarz	UPV	EST-E024	June 12,23	1 Year
Test Software	SKET	EMC-S	V1.2.0.48	N/A	N/A

2.3.7. For surge immunity test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Surge Controller	HAEFELY	PSURGE8000	EST-E015	June 12,23	1 Year
Surge Impulse Module	HAEFELY	PIM100	EST-E016	June 12,23	1 Year
Surge Coupling Network	HAEFELY	PCD100	EST-E017	June 12,23	1 Year

2.3.8. For injected currents susceptibility test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Signal Generator	Rohde &Schwarz	SMB100A	EST-E025	June 12,23	1 Year
Power Amplifier	FRANKONIA	CIT-10	EST-E021	N/A	N/A
Power Meter	Rohde &Schwarz	NRVS	EST-E027	June 12,23	1 Year
Audio Analyzer	Rohde &Schwarz	UPV	EST-E024	June 12,23	1 Year
CDN	FRANKONIA	CDN-M2+M3	EST-E022	June 12,23	1 Year
EM-Clamp	FRANKONIA	EMCL-20	EST-E042	June 12,23	1 Year
Test Software	SKET	EMC-S	V1.2.0.80	N/A	N/A

2.3.9. For power frequency magnetic field immunity test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Magnetic Field Tester	HAEFELY	MFS 100	EST-E018	June 12,23	1 Year

Note: All calibration reports of the equipment were provided by LiSai calibration and Testing

3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

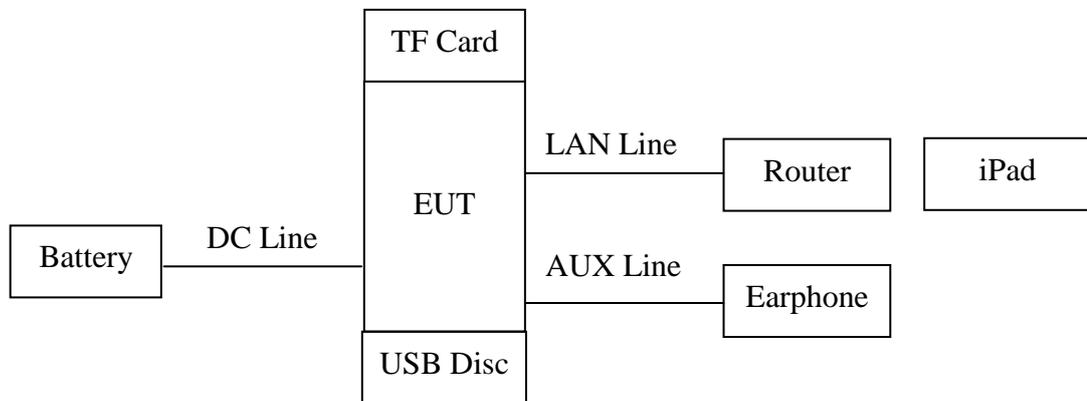
Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

Immunity: The equipment under test (EUT) was configured to the representative operating mode and conditions.

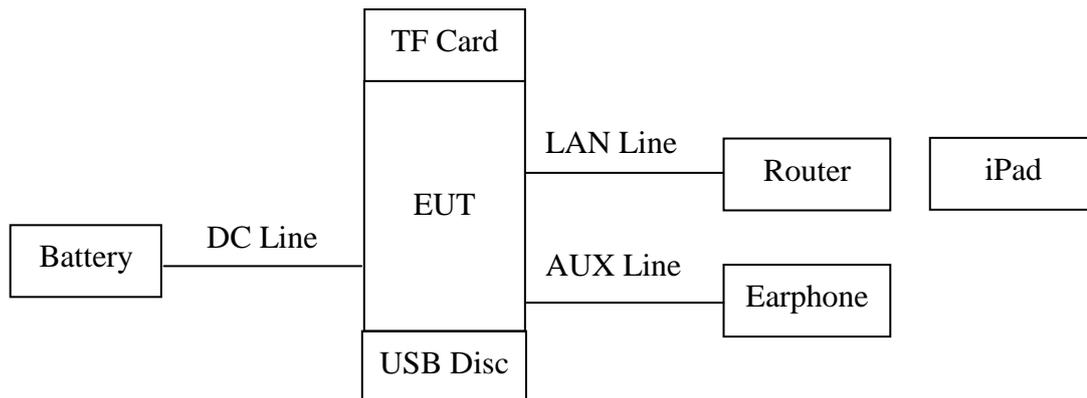
3.2. Block Diagram of Test Set-up

System Diagram of Connections Between EUT and Simulators

3.2.1. For emission test



3.2.2. For immunity test



(EUT: Embedded Industrial Computer)

3.3. Test Operation Mode and Test Software

Refer to Test Setup in clause 4 & 5.

3.4. Special Accessories and Auxiliary Equipment

3.4.1.Router

M / N : RT-AC66U
S / N : G1ICGG000260
Manufacturer : ASUS
Ethernet Line : Shielded, Detachable 1.5m

3.4.2.U Disc

M / N : SDCZ7-4096
S / N : BH0701AGOB
Manufacturer : SanDisk

3.4.3.TF Card

M / N : SDSQUNC-032G-ZN6MA
Manufacturer : SanDisk

3.4.4.Earphone

M / N : KDM-430
Manufacturer : KEENION
Data Cable : Unshielded, Undetachable, 1.6m

3.4.5.iPad

M / N : A1893
S / N : DMPY3KL5JF8K
Manufacturer : Apple

3.5. Countermeasures to Achieve EMC Compliance

None.

4. EMISSION TEST RESULTS

4.1. Asymmetric Mode Conducted Emissions Test

RESULT : **Pass**
Test procedure : EN 55032:2015+A1:2020
Frequency range : 0.15~30MHz
Test Site : Shielded Room
Limits : EN 55032:2015+A1:2020

Test Setup

Date of test : Aug. 09, 2023
Model No. : CS19108RA4156P
Input Voltage : DC 24V
Operation Mode : LAN

The frequency range from 150 kHz to 30 MHz was investigated.

The bandwidth of the test receiver was set at 9 kHz.

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

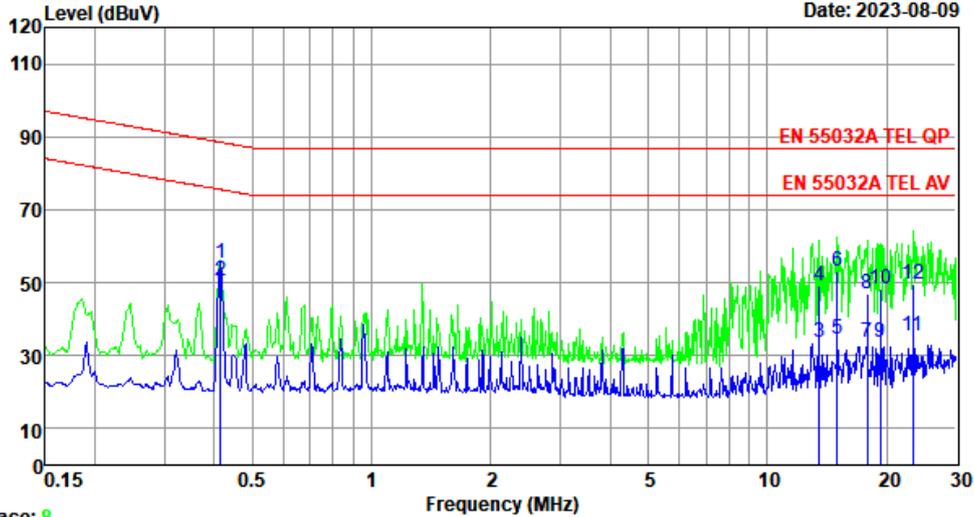
Note: Test uncertainty: $\pm 4.32\text{dB}$ at a level of confidence of 95%.

Test Data

EST Technology

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Fax:+86-769-83081878

Data: 9 File: \EMC-CE-2\Test Data\2023\Xin pu si -.EM6 (9) Date: 2023-08-09



Trace: 8
 Site no : 2#CE Shield Room Data no. : 9
 Env. / Ins. : Temp:22.8°C Humi:58% Press:101.30kPa LINE Phase :
 Limit : EN 55032A TEL QP
 Engineer : ZSX
 EUT : Embedded Industrial Computer
 Power : DC 24V
 M/N : CS19108RA4156P
 Test Mode : LAN

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.41	10.26	9.92	34.96	55.14	75.55	20.41	Average
2	0.41	10.26	9.92	30.32	50.50	88.55	38.05	QP
3	13.55	10.02	10.04	13.52	33.58	74.00	40.42	Average
4	13.55	10.02	10.04	29.25	49.31	87.00	37.69	QP
5	14.99	10.01	10.05	14.68	34.74	74.00	39.26	Average
6	14.99	10.01	10.05	33.16	53.22	87.00	33.78	QP
7	17.85	9.99	10.19	13.49	33.67	74.00	40.33	Average
8	17.85	9.99	10.19	26.96	47.14	87.00	39.86	QP
9	19.33	9.98	10.27	13.39	33.64	74.00	40.36	Average
10	19.33	9.98	10.27	27.95	48.20	87.00	38.80	QP
11	23.26	10.03	10.34	15.15	35.52	74.00	38.48	Average
12	23.26	10.03	10.34	29.29	49.66	87.00	37.34	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

4.2. Radiated Emission Test

RESULT : **Pass**
Test procedure : EN 55032:2015+A1:2020
Frequency range : 30~1000MHz
Test Site : 2#966 Chamber
Limits : EN 55032:2015+A1:2020 Class A

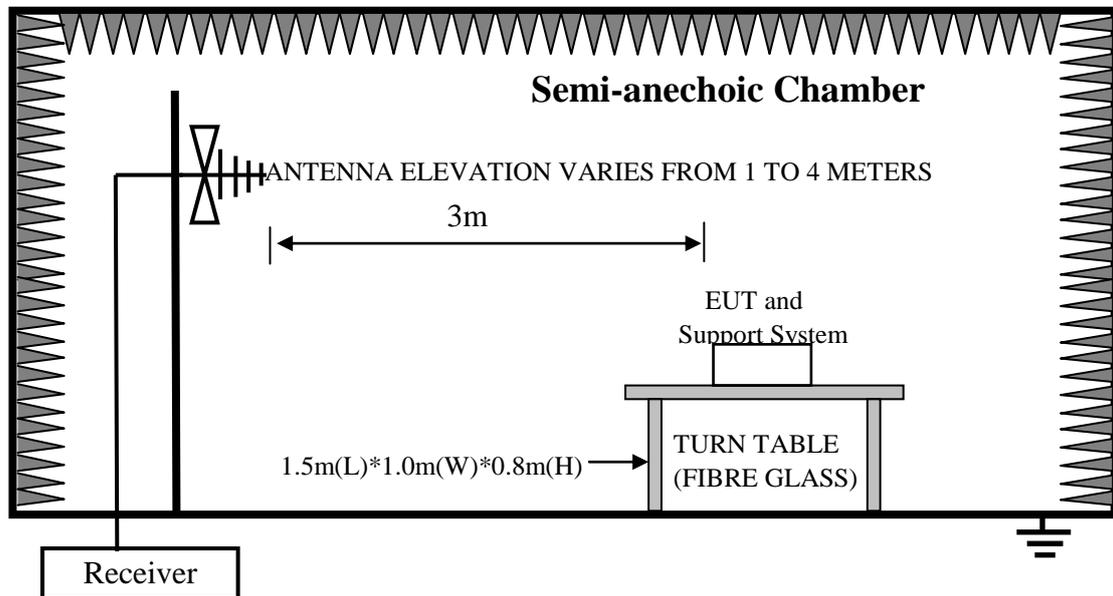
Test Setup

Date of test : Aug. 08, 2023
Model No. : CS19108RA4156P
Input Voltage : DC 24V
Operation Mode : TF Mode, Wi-Fi, USB Play, Bluetooth Mode, LAN

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth setting on the test receiver was 120 kHz.



Note:

Test uncertainty: ± 4.26 dB (H); ± 4.84 dB (V) at a level of confidence of 95%.(2#966)

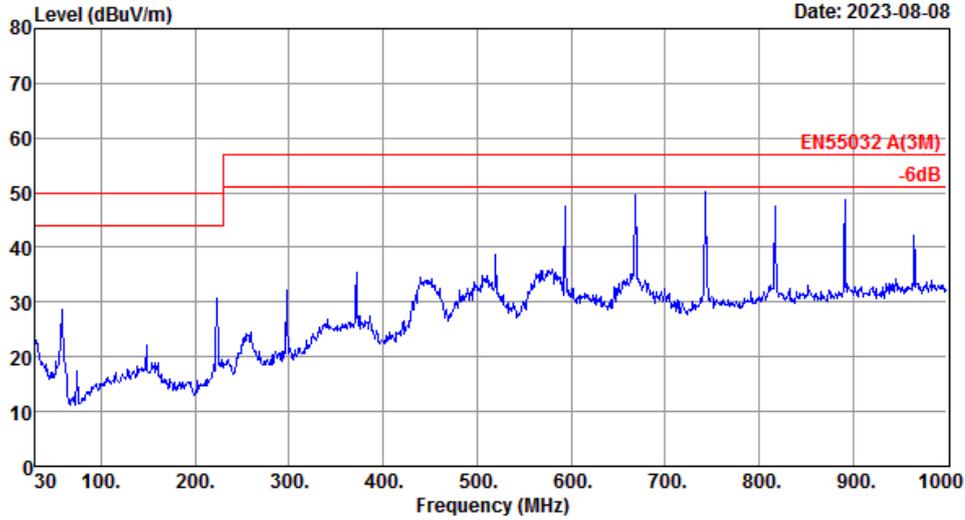
Test Data

EST Technology

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Data: 168 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

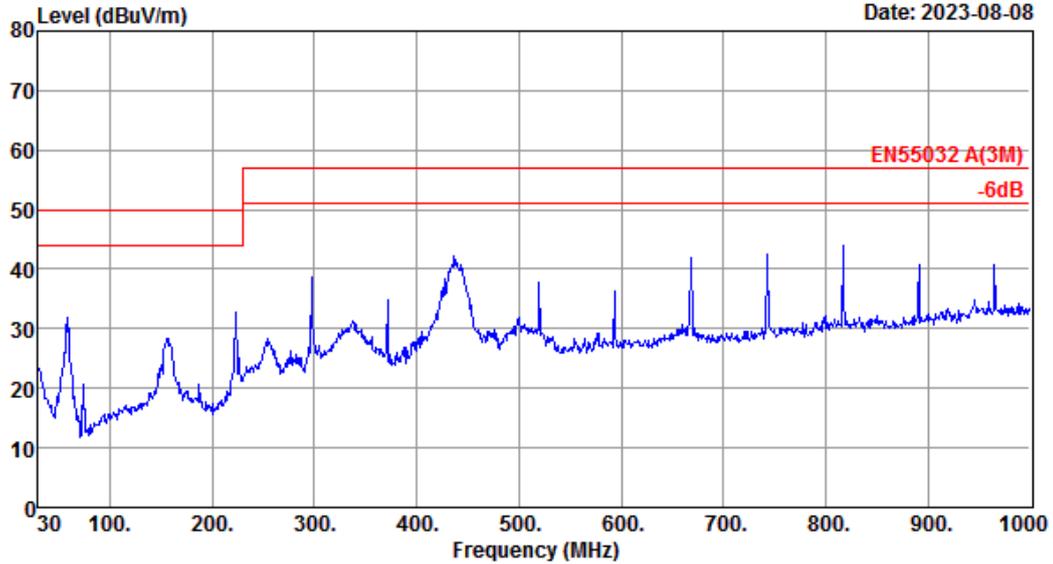
Date: 2023-08-08



Site no. : 3# 966 Chamber Data no. : 168
Dis. / Ant. : 3m 31218 Ant. pol. : VERTICAL
Limit : EN55032 A(3M)
Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
Engineer : JBR
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : USB Mode

Data: 169 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

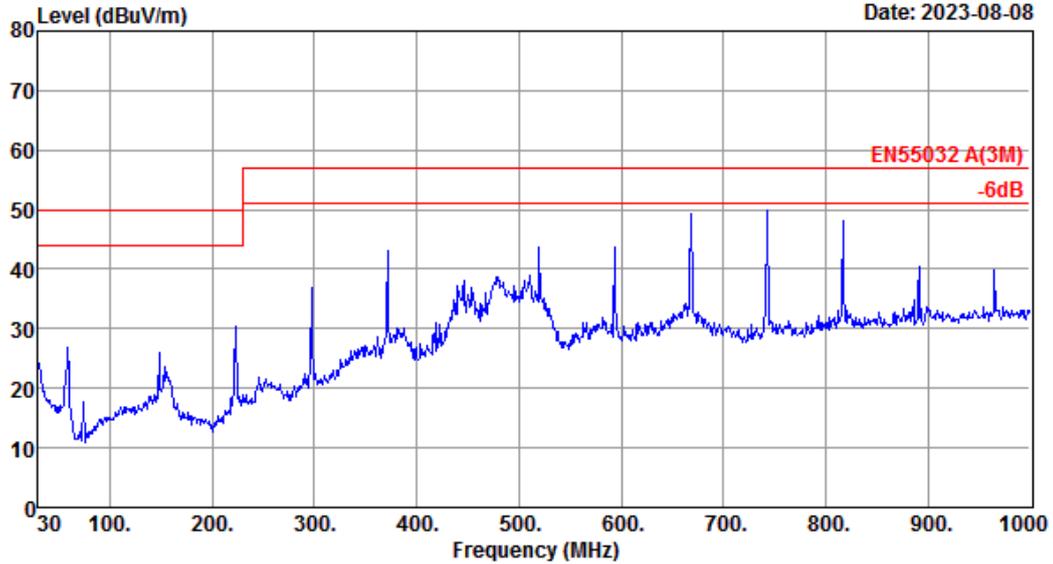
Date: 2023-08-08



Site no. : 3# 966 Chamber Data no. : 169
Dis. / Ant. : 3m 31218 Ant. pol. : HORIZONTAL
Limit : EN55032 A(3M)
Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
Engineer : JBR
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : USB Mode

Data: 170 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

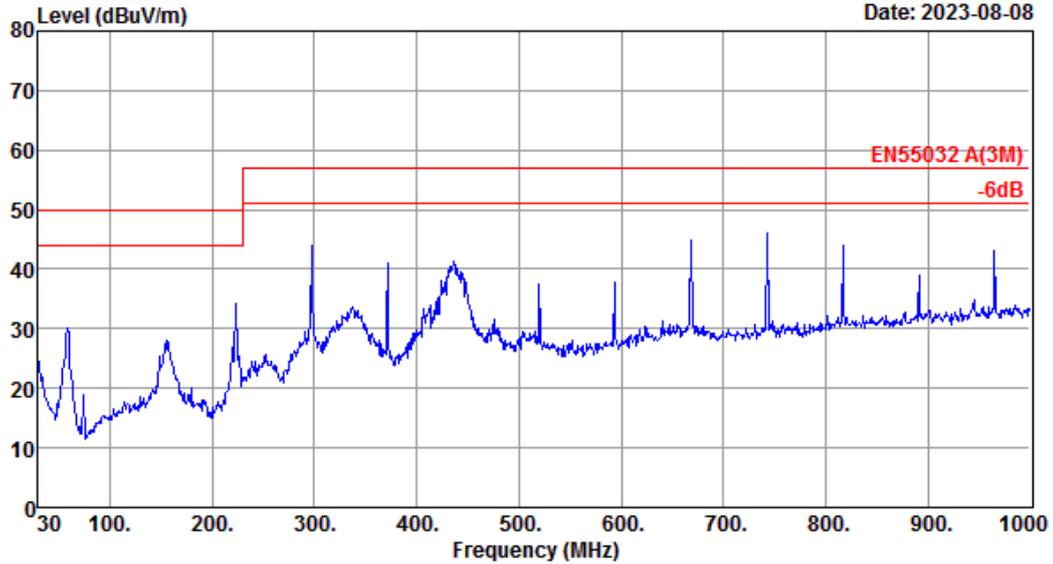
Date: 2023-08-08



Site no. : 3# 966 Chamber Data no. : 170
Dis. / Ant. : 3m 31218 Ant. pol. : VERTICAL
Limit : EN55032 A(3M)
Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
Engineer : JBR
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : Bluetooth Mode

Data: 171 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

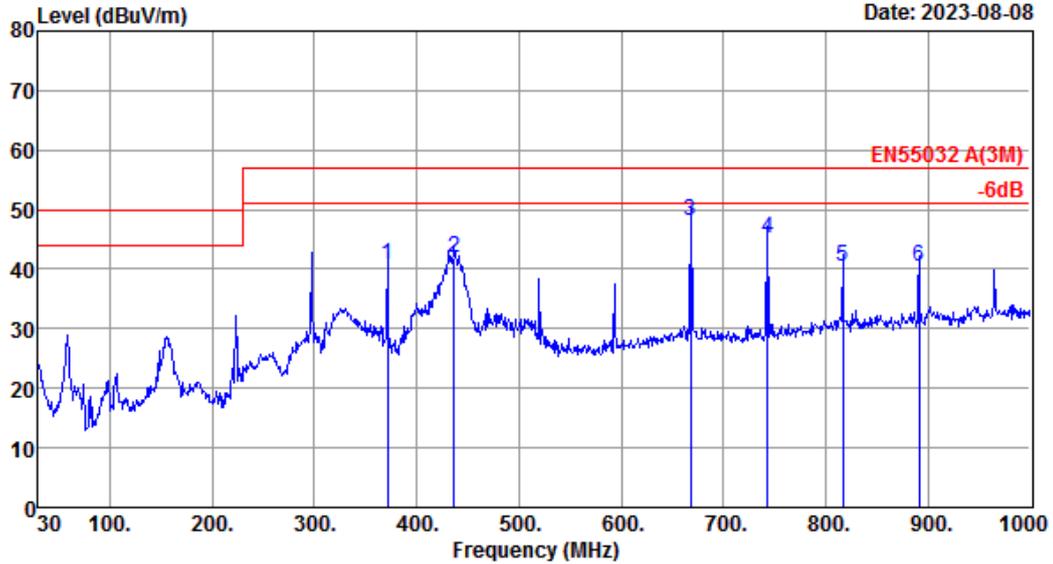
Date: 2023-08-08



Site no. : 3# 966 Chamber Data no. : 171
Dis. / Ant. : 3m 31218 Ant. pol. : HORIZONTAL
Limit : EN55032 A(3M)
Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
Engineer : JBR
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : Bluetooth Mode

Data: 172 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

Date: 2023-08-08



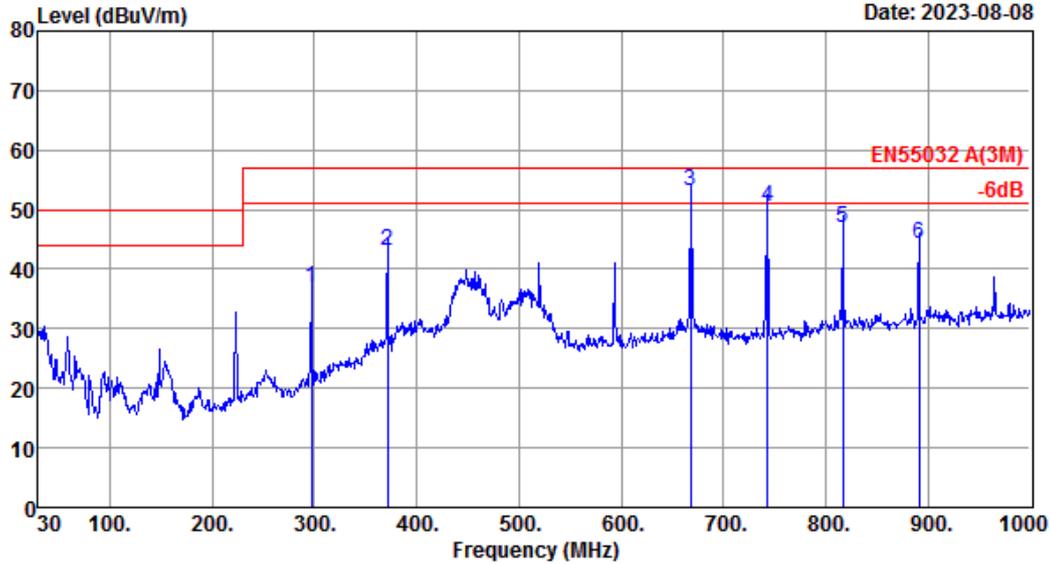
Site no. : 3# 966 Chamber Data no. : 172
 Dis. / Ant. : 3m 31218 Ant. pol. : HORIZONTAL
 Limit : EN55032 A(3M)
 Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
 Engineer : JBR
 EUT : Embedded Industrial Computer
 Power : DC 24V
 M/N : CS19108RA4156P
 Test Mode : LAN Mode

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	371.44	15.34	1.87	23.62	40.83	57.00	16.17	QP
2	436.43	17.42	2.04	22.45	41.91	57.00	15.09	QP
3	668.26	21.48	2.75	23.86	48.09	57.00	8.91	QP
4	742.95	21.83	3.13	20.26	45.22	57.00	11.78	QP
5	816.67	23.47	3.15	13.88	40.50	57.00	16.50	QP
6	891.36	23.54	3.31	13.51	40.36	57.00	16.64	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

Data: 173 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

Date: 2023-08-08



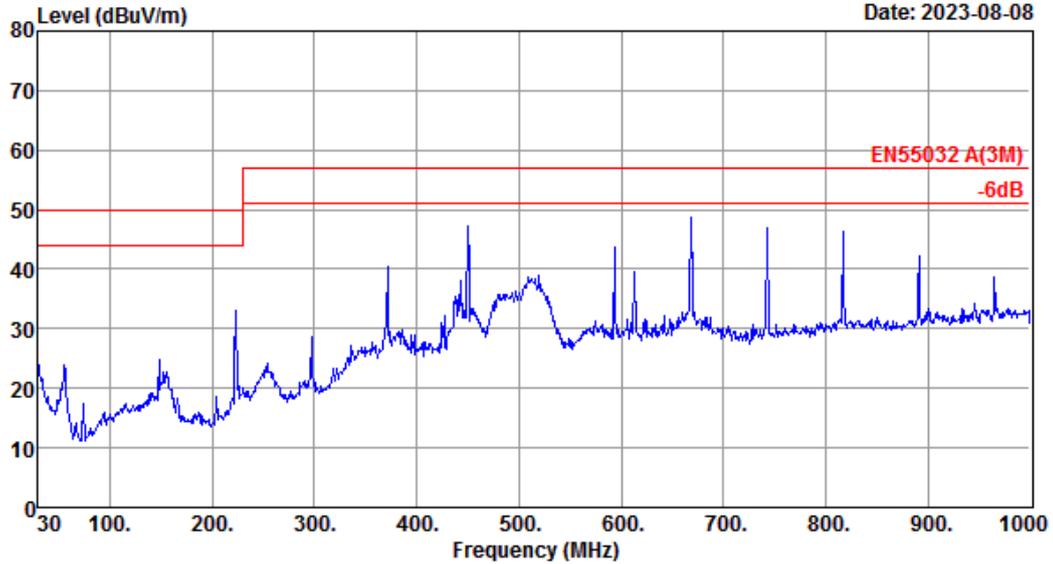
Site no. : 3# 966 Chamber Data no. : 173
 Dis. / Ant. : 3m 31218 Ant. pol. : VERTICAL
 Limit : EN55032 A(3M)
 Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
 Engineer : JBR
 EUT : Embedded Industrial Computer
 Power : DC 24V
 M/N : CS19108RA4156P
 Test Mode : LAN Mode

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	296.75	13.64	1.60	21.78	37.02	57.00	19.98	QP
2	371.44	15.34	1.87	25.88	43.09	57.00	13.91	QP
3	668.26	21.48	2.81	28.80	53.09	57.00	3.91	QP
4	742.95	21.83	3.13	25.45	50.41	57.00	6.59	QP
5	816.67	23.47	3.15	20.38	47.00	57.00	10.00	QP
6	891.36	23.54	3.31	17.29	44.14	57.00	12.86	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

Data: 174 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

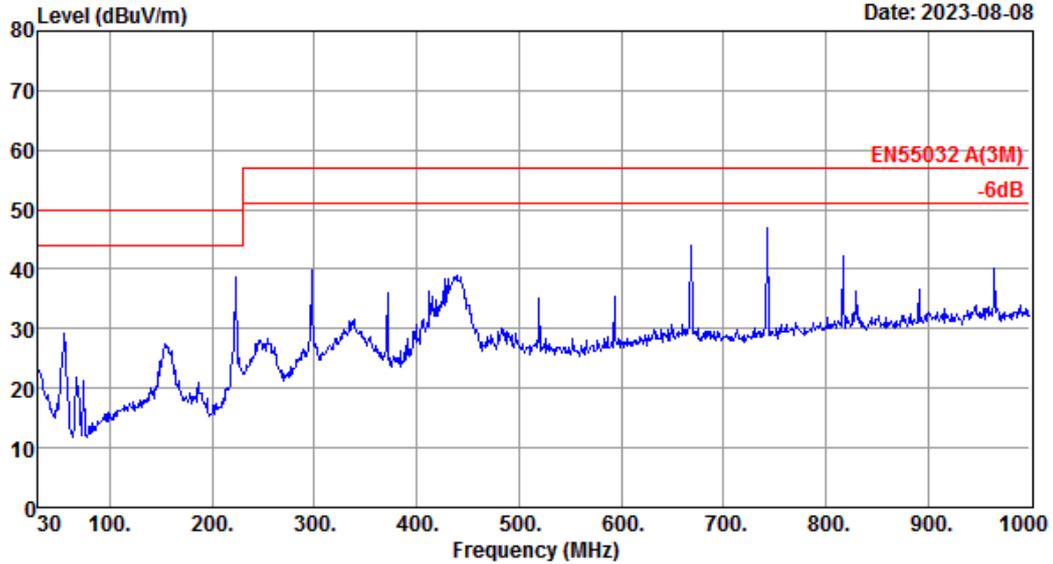
Date: 2023-08-08



Site no. : 3# 966 Chamber Data no. : 174
Dis. / Ant. : 3m 31218 Ant. pol. : VERTICAL
Limit : EN55032 A(3M)
Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
Engineer : JBR
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : TF Mode

Data: 175 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

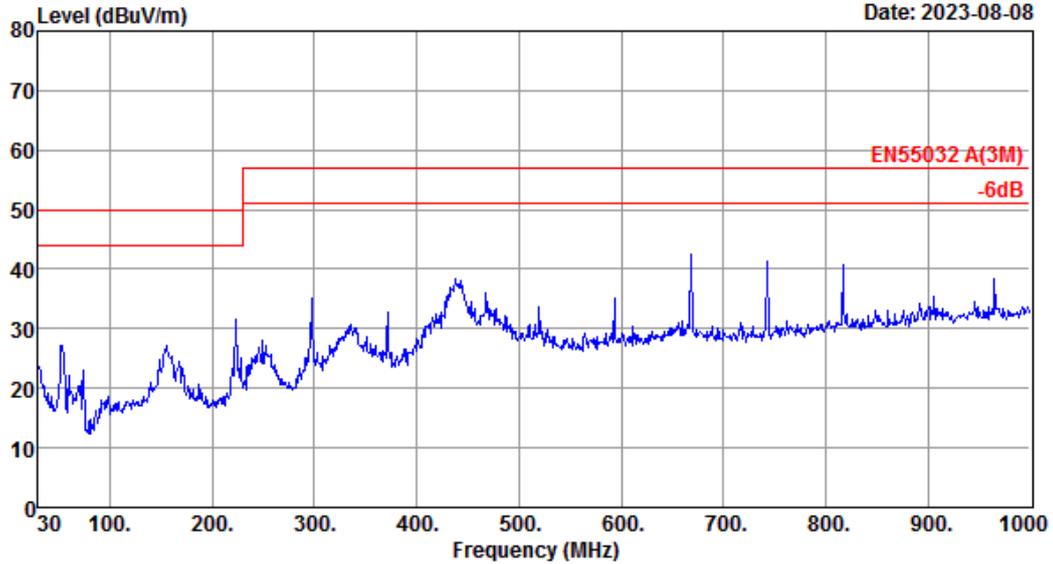
Date: 2023-08-08



Site no. : 3# 966 Chamber Data no. : 175
Dis. / Ant. : 3m 31218 Ant. pol. : HORIZONTAL
Limit : EN55032 A(3M)
Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
Engineer : JBR
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : TF Mode

Data: 176 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

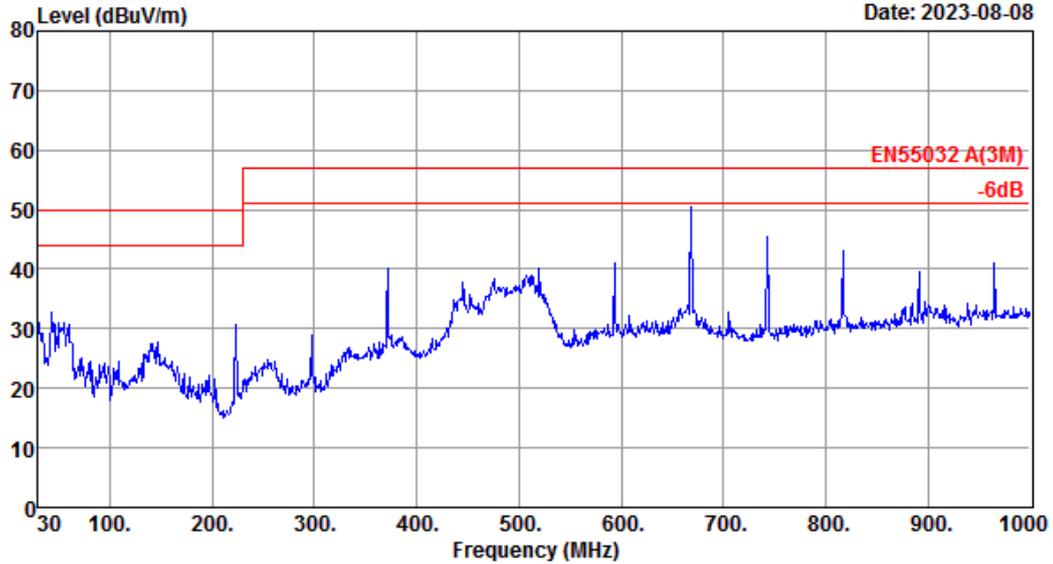
Date: 2023-08-08



Site no. : 3# 966 Chamber Data no. : 176
Dis. / Ant. : 3m 31218 Ant. pol. : HORIZONTAL
Limit : EN55032 A(3M)
Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
Engineer : JBR
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : Wi-Fi Mode

Data: 177 File: \\Emc-966-3\test data\2023\X\Xin Pu Si.EM6 (177)

Date: 2023-08-08



Site no. : 3# 966 Chamber Data no. : 177
Dis. / Ant. : 3m 31218 Ant. pol. : VERTICAL
Limit : EN55032 A(3M)
Env. / Ins. : Temp:21.6°C;Humi:56%;Press:101.52kPa
Engineer : JBR
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : Wi-Fi Mode

4.3. Radiated Emission Test (above 1GHz)

RESULT : **Pass**
Test procedure : EN 55032:2015+A1:2020
Frequency range : 1GHz-6GHz
Test Site : 966 Chamber
Limits : EN 55032:2015+A1:2020 Class A

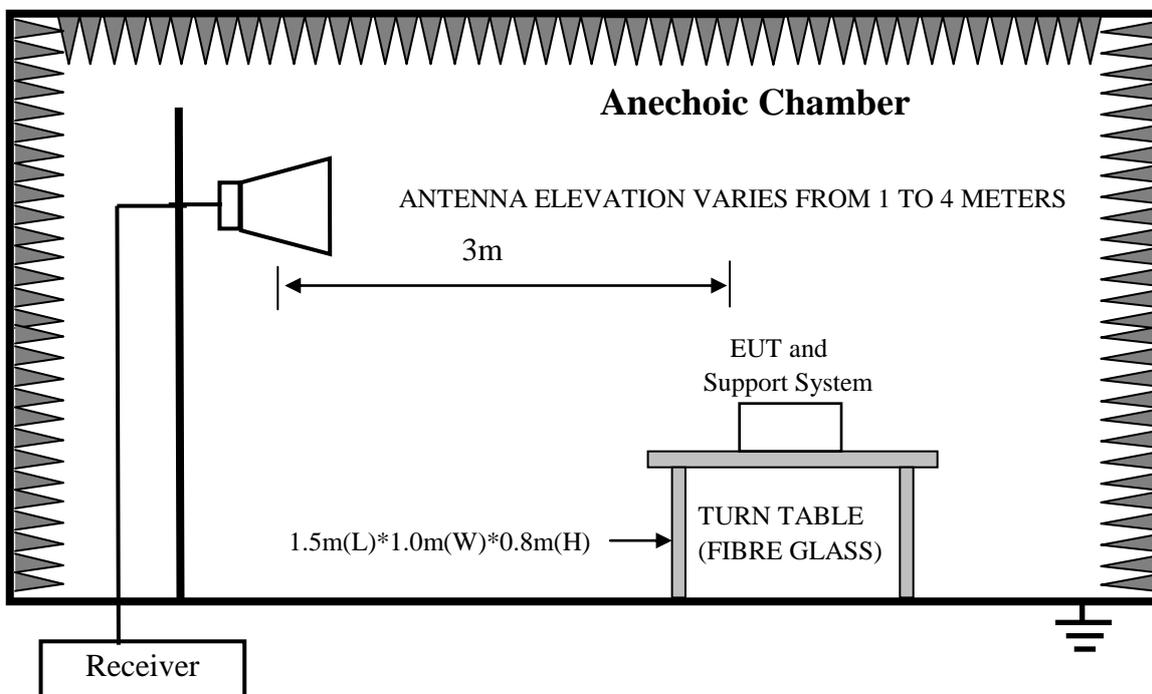
Test Setup

Date of test : Aug. 09, 2023
Model No. : CS19108RA4156P
Input Voltage : DC 24V
Operation Mode : TF Mode, Wi-Fi, USB Play, Bluetooth Mode, LAN

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector and Average detector from the spectrum, and all the final readings from the test receiver were measured with the Peak detector and Average detector.

The bandwidth setting on the test receiver was 1MHz(above 1GHz).



Note: Test uncertainty: $\pm 4.72\text{dB}$ at a level of confidence of 95%.

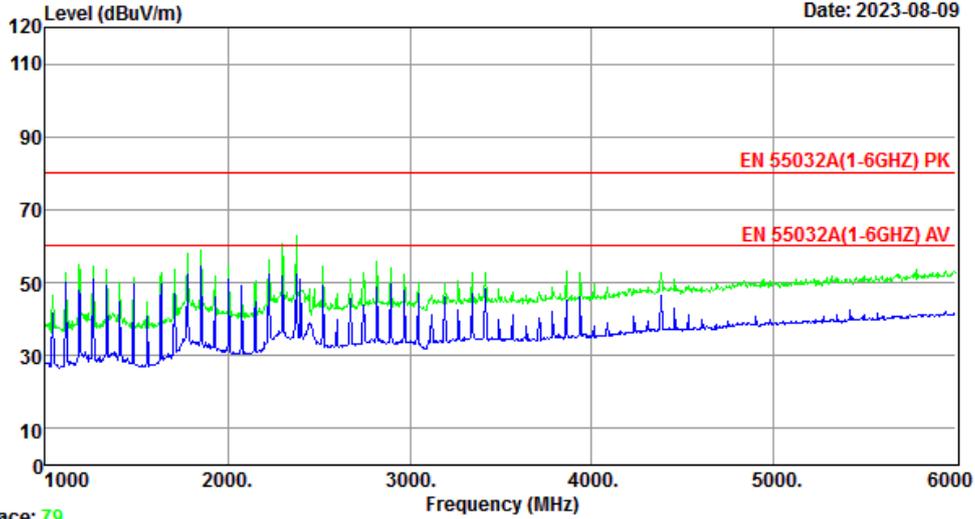
Test Data

EST Technology

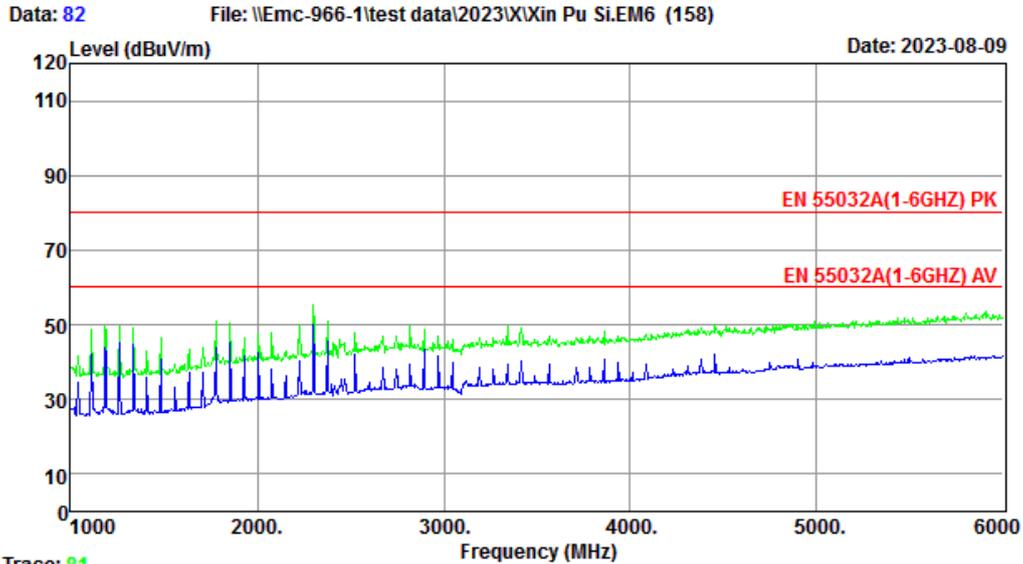
Chilingxiang, Qishantou, Santun,
Houjie, Dongguan, Guangdong, China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 80 File: \\Emc-966-1\test data\2023\X\Xin Pu Si.EM6 (158)

Date: 2023-08-09



Trace: 79
Site no. : 1# 966 Chamber Data no. : 80
Dis. / Ant. : 3m 9120D 1-18G Ant. pol. : VERTICAL
Limit : EN 55032A(1-6GHZ) PK
Env. / Ins. : Temp:24.6°C;Humi:52.6%;Press:101.82kPa
Engineer : ZQL
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : Bluetooth Mode

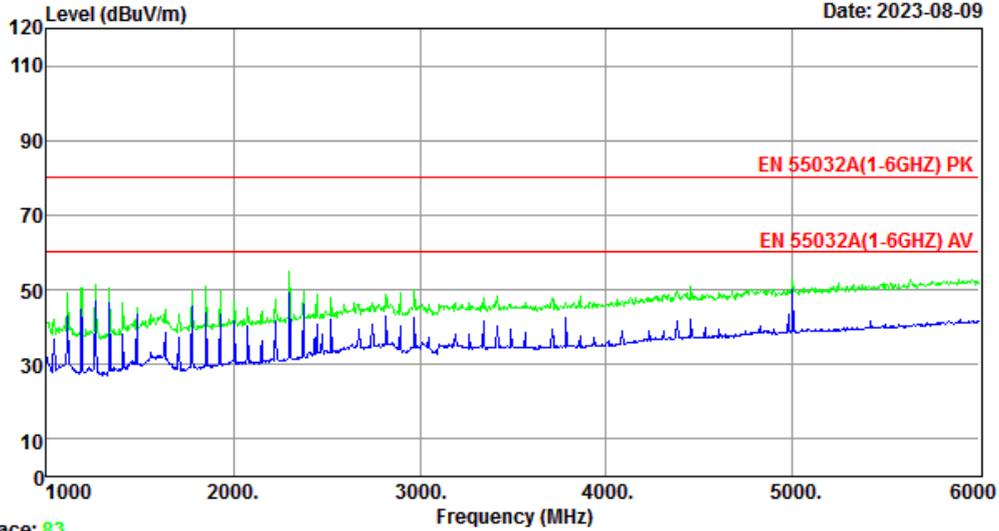


Trace: 81

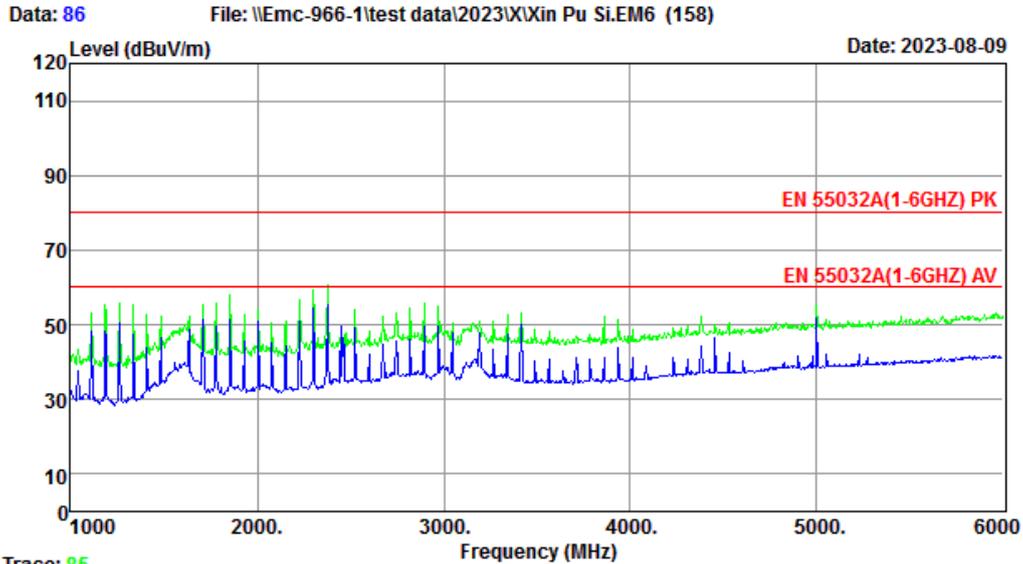
Site no.	: 1# 966 Chamber	Data no.	: 82
Dis. / Ant.	: 3m 9120D 1-18G	Ant. pol.	: HORIZONTAL
Limit	: EN 55032A(1-6GHZ) PK		
Env. / Ins.	: Temp:24.6°C;Humi:52.6%;Press:101.82kPa		
Engineer	: ZQL		
EUT	: Embedded Industrial Computer		
Power	: DC 24V		
M/N	: CS19108RA4156P		
Test Mode	: Bluetooth Mode		

Data: 84 File: \\Emc-966-1\test data\2023\Xin Pu Si.EM6 (158)

Date: 2023-08-09



Trace: 83
Site no. : 1# 966 Chamber Data no. : 84
Dis. / Ant. : 3m 9120D 1-18G Ant. pol. : HORIZONTAL
Limit : EN 55032A(1-6GHZ) PK
Env. / Ins. : Temp:24.6°C;Humi:52.6%;Press:101.82kPa
Engineer : ZQL
EUT : Embedded Industrial Computer
Power : DC 24V
M/N : CS19108RA4156P
Test Mode : USB Play

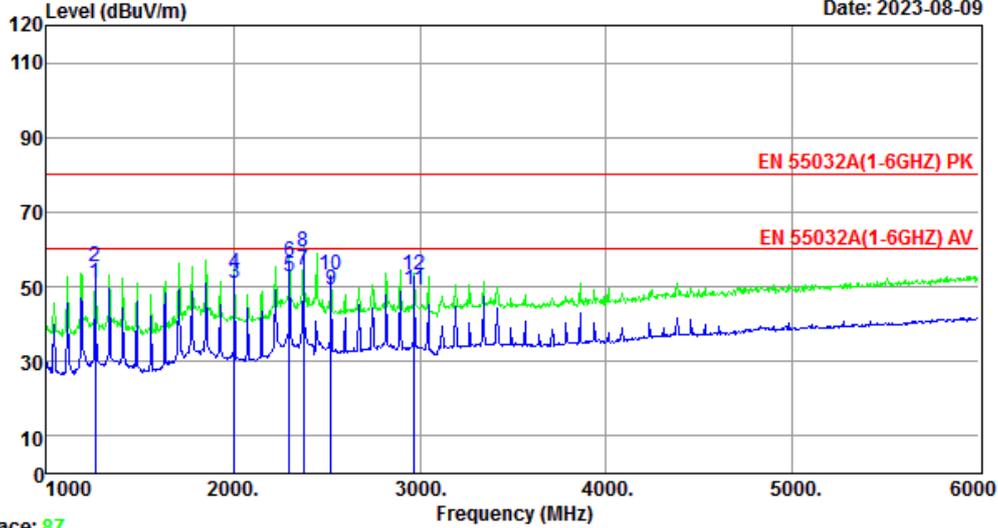


Trace: 85

Site no.	: 1# 966 Chamber	Data no.	: 86
Dis. / Ant.	: 3m 9120D 1-18G	Ant. pol.	: VERTICAL
Limit	: EN 55032A(1-6GHZ) PK		
Env. / Ins.	: Temp:24.6°C;Humi:52.6%;Press:101.82kPa		
Engineer	: ZQL		
EUT	: Embedded Industrial Computer		
Power	: DC 24V		
M/N	: CS19108RA4156P		
Test Mode	: USB Play		

Data: 88 File: \\Emc-966-1\test data\2023\Xin Pu Si.EM6 (158)

Date: 2023-08-09



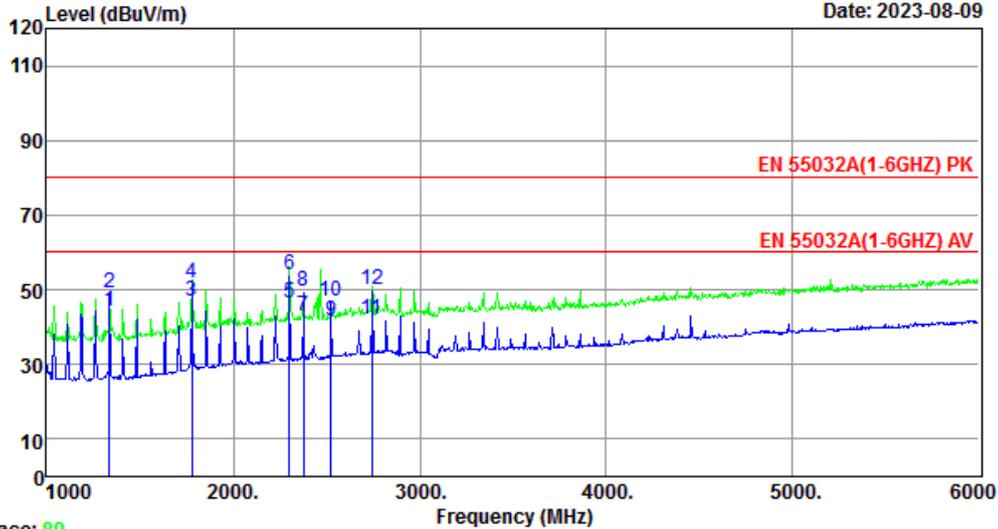
Trace: 87
 Site no. : 1# 966 Chamber Data no. : 88
 Dis. / Ant. : 3m 9120D 1-18G Ant. pol. : VERTICAL
 Limit : EN 55032A(1-6GHZ) PK
 Env. / Ins. : Temp:24.6°C;Humi:52.6%;Press:101.82kPa
 Engineer : ZQL
 EUT : Embedded Industrial Computer
 Power : DC 24V
 M/N : CS19108RA4156P
 Test Mode : LAN Mode

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1260.00	24.23	2.40	24.34	50.97	60.00	9.03	Average
2	1260.00	24.23	2.40	28.61	55.24	80.00	24.76	Peak
3	2005.00	26.80	3.30	20.75	50.85	60.00	9.15	Average
4	2005.00	26.80	3.30	23.62	53.72	80.00	26.28	Peak
5	2300.00	27.21	3.43	22.00	52.64	60.00	7.36	Average
6	2300.00	27.21	3.43	26.20	56.84	80.00	23.16	Peak
7	2375.00	27.33	3.47	23.82	54.62	60.00	5.38	Average
8	2375.00	27.33	3.47	28.62	59.42	80.00	20.58	Peak
9	2525.00	27.61	3.54	18.21	49.36	60.00	10.64	Average
10	2525.00	27.61	3.54	21.95	53.10	80.00	26.90	Peak
11	2970.00	28.99	3.82	16.26	49.07	60.00	10.93	Average
12	2970.00	28.99	3.82	20.32	53.13	80.00	26.87	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

Data: 90 File: \\Emc-966-1\test data\2023\Xin Pu Si.EM6 (158)

Date: 2023-08-09

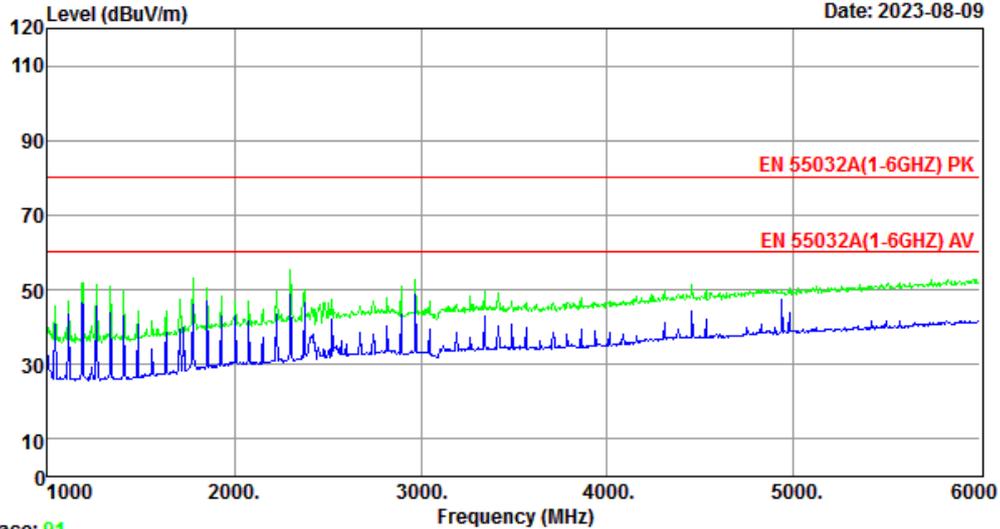


Trace: 89
 Site no. : 1# 966 Chamber Data no. : 90
 Dis. / Ant. : 3m 9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : EN 55032A(1-6GHZ) PK
 Env. / Ins. : Temp:24.6℃;Humi:52.6%;Press:101.82kPa
 Engineer : ZQL
 EUT : Embedded Industrial Computer
 Power : DC 24V
 M/N : CS19108RA4156P
 Test Mode : LAN Mode

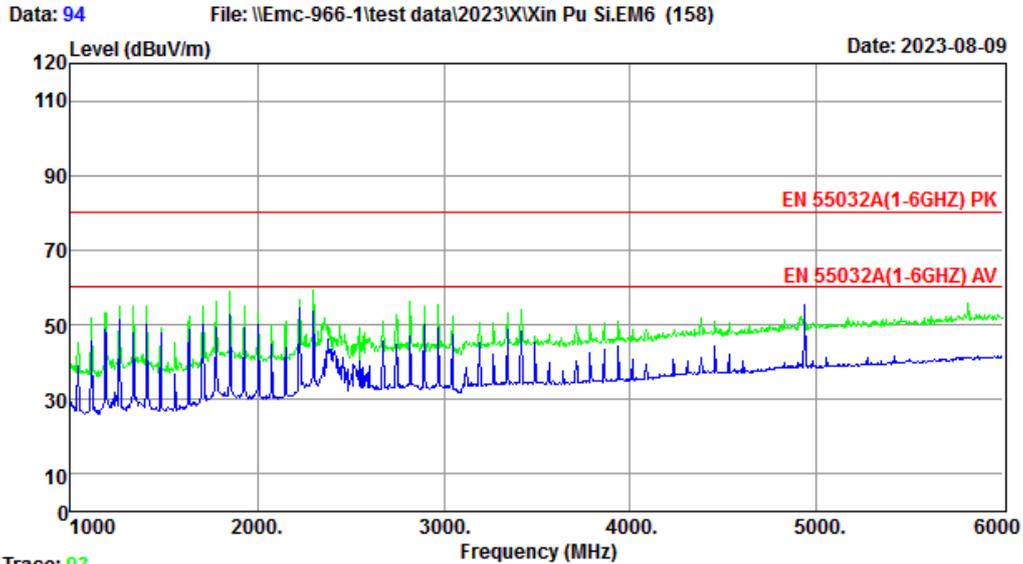
	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1335.00	24.27	2.50	17.35	44.12	60.00	15.88	Average
2	1335.00	24.27	2.50	22.18	48.95	80.00	31.05	Peak
3	1780.00	25.38	3.03	18.60	47.01	60.00	12.99	Average
4	1780.00	25.38	3.03	23.22	51.63	80.00	28.37	Peak
5	2300.00	27.21	3.43	15.91	46.55	60.00	13.45	Average
6	2300.00	27.21	3.43	23.23	53.87	80.00	26.13	Peak
7	2375.00	27.33	3.47	12.11	42.91	60.00	17.09	Average
8	2375.00	27.33	3.47	18.60	49.40	80.00	30.60	Peak
9	2525.00	27.61	3.54	10.48	41.63	60.00	18.37	Average
10	2525.00	27.61	3.54	15.98	47.13	80.00	32.87	Peak
11	2745.00	28.30	3.68	9.93	41.91	60.00	18.09	Average
12	2745.00	28.30	3.68	18.16	50.14	80.00	29.86	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

Data: 92 File: \\Emc-966-1\test data\2023\Xin Pu Si.EM6 (158) Date: 2023-08-09

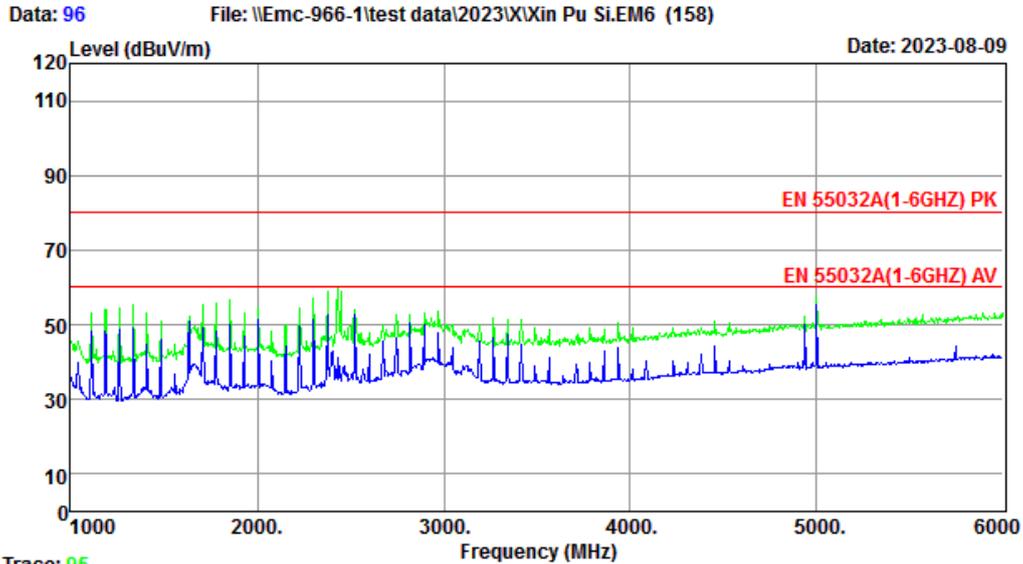


Trace: 91
 Site no. : 1# 966 Chamber Data no. : 92
 Dis. / Ant. : 3m 9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : EN 55032A(1-6GHZ) PK
 Env. / Ins. : Temp:24.6°C;Humi:52.6%;Press:101.82kPa
 Engineer : ZQL
 EUT : Embedded Industrial Computer
 Power : DC 24V
 M/N : CS19108RA4156P
 Test Mode : Wi-Fi Mode

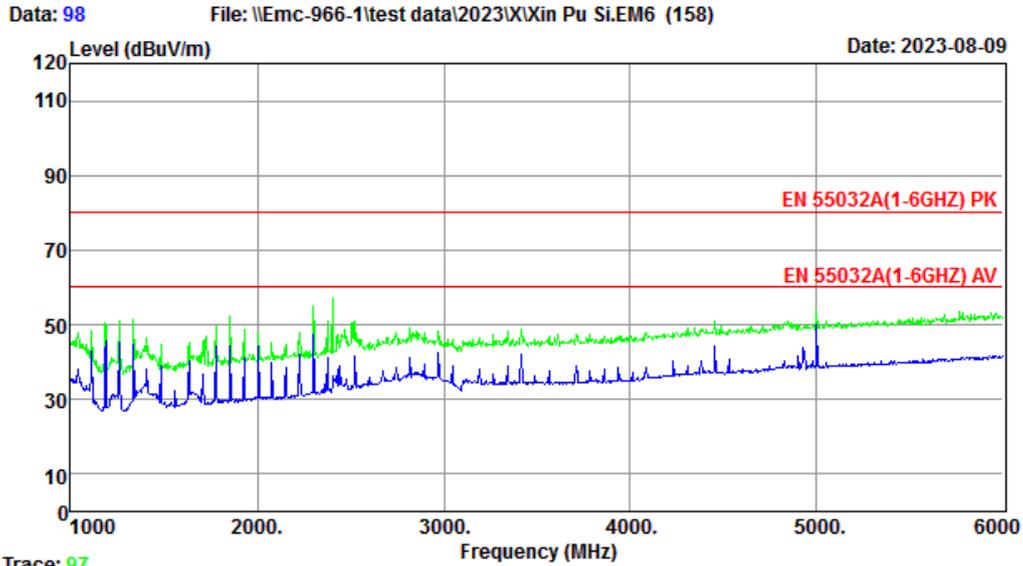


Trace: 93

Site no.	: 1# 966 Chamber	Data no.	: 94
Dis. / Ant.	: 3m 9120D 1-18G	Ant. pol.	: VERTICAL
Limit	: EN 55032A(1-6GHZ) PK		
Env. / Ins.	: Temp:24.6°C;Humi:52.6%;Press:101.82kPa		
Engineer	: ZQL		
EUT	: Embedded Industrial Computer		
Power	: DC 24V		
M/N	: CS19108RA4156P		
Test Mode	: Wi-Fi Mode		



Trace: 95
 Site no. : 1# 966 Chamber Data no. : 96
 Dis. / Ant. : 3m 9120D 1-18G Ant. pol. : VERTICAL
 Limit : EN 55032A(1-6GHZ) PK
 Env. / Ins. : Temp:24.6°C;Humi:52.6%;Press:101.82kPa
 Engineer : ZQL
 EUT : Embedded Industrial Computer
 Power : DC 24V
 M/N : CS19108RA4156P
 Test Mode : TF Mode



Trace: 97

Site no.	: 1# 966 Chamber	Data no.	: 98
Dis. / Ant.	: 3m 9120D 1-18G	Ant. pol.	: HORIZONTAL
Limit	: EN 55032A(1-6GHZ) PK		
Env. / Ins.	: Temp:24.6°C;Humi:52.6%;Press:101.82kPa		
Engineer	: ZQL		
EUT	: Embedded Industrial Computer		
Power	: DC 24V		
M/N	: CS19108RA4156P		
Test Mode	: TF Mode		

5. IMMUNITY TEST RESULT

5.1. Description of 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.

For audio output device: The measured acoustic interference ratio and/or the measured electrical interference during the test shall be -20dB or better(see note1)

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.

Note 1: This performance criterion only using for Continuous inducted RF disturbances and Continuous RF electromagnetic field disturbances item.

5.2. Electrostatic Discharge Immunity Test

RESULT	: Pass
Test procedure	: EN 55035:2017+A11:2020
Basic standard	: EN 61000-4-2:2009
Test specification	: +/-4.0kV(Contact discharge) +/-8.0kV(Air discharge)
Number of discharges	: ≥ 10 (Air discharge for single polarity discharge) ≥ 10 (Contact discharge for single polarity discharge)
Polarity	: Positive/Negative
Performance criterion	: B

Test Setup

Date of test	: Aug. 10, 2023
Model No.	: CS19108RA4156P
Input Voltage	: DC 24V
Operation Mode	: TF Mode, Wi-Fi, USB Play, Bluetooth Mode, LAN
Temperature	: 24.6°C
Humidity	: 47%
Pressure	: 101.10kPa

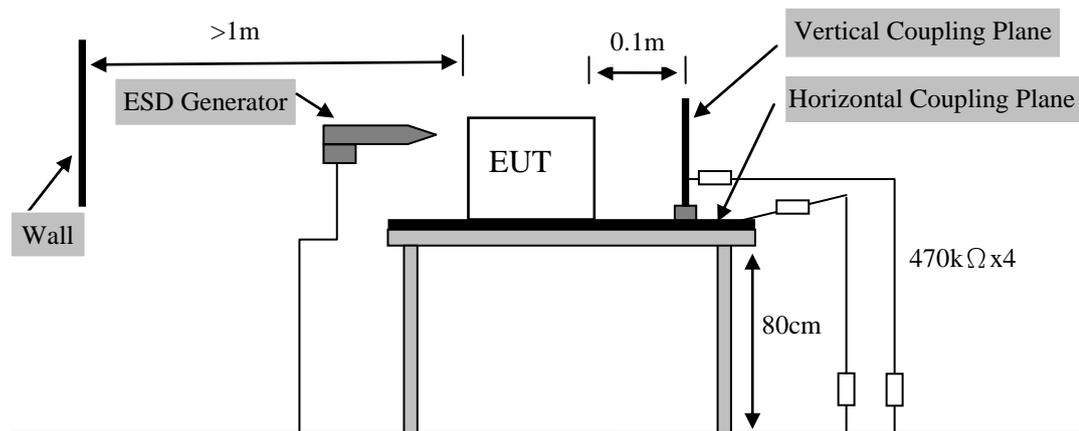


Table 1: Electrostatic Discharge Immunity Test Result

Discharge Location		Type of discharge	Result
HCP	4 points	Contact	Pass
VCP	4 points	Contact	Pass
USB	2 points	Contact	Pass
LAN	1 point	Contact	Pass
TYPE-C	1 point	Contact	Pass
AUX	1 point	Air	Pass
Screw	8 points	Contact	Pass
Metal	4 points	Contact	Pass
Screen	1 point	Air	Pass
SD	1 point	Contact	Pass

*Remark: 1. The screen was flashing during the test, but self-recoverable after the test
2. Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).*

5.3. Radio Frequency Electromagnetic Field Immunity(R/S) Test

RESULT : **Pass**
Test procedure : EN 55035:2017+A11:2020
Basic standard : EN 61000-4-3:2006+A1:2008+A2:2010
Frequency Range : 80-1000MHz,1800MHz, 2600MHz, 3500MHz, 5000MHz
Performance criterion : A
Test site : 866 Chamber

Test Setup

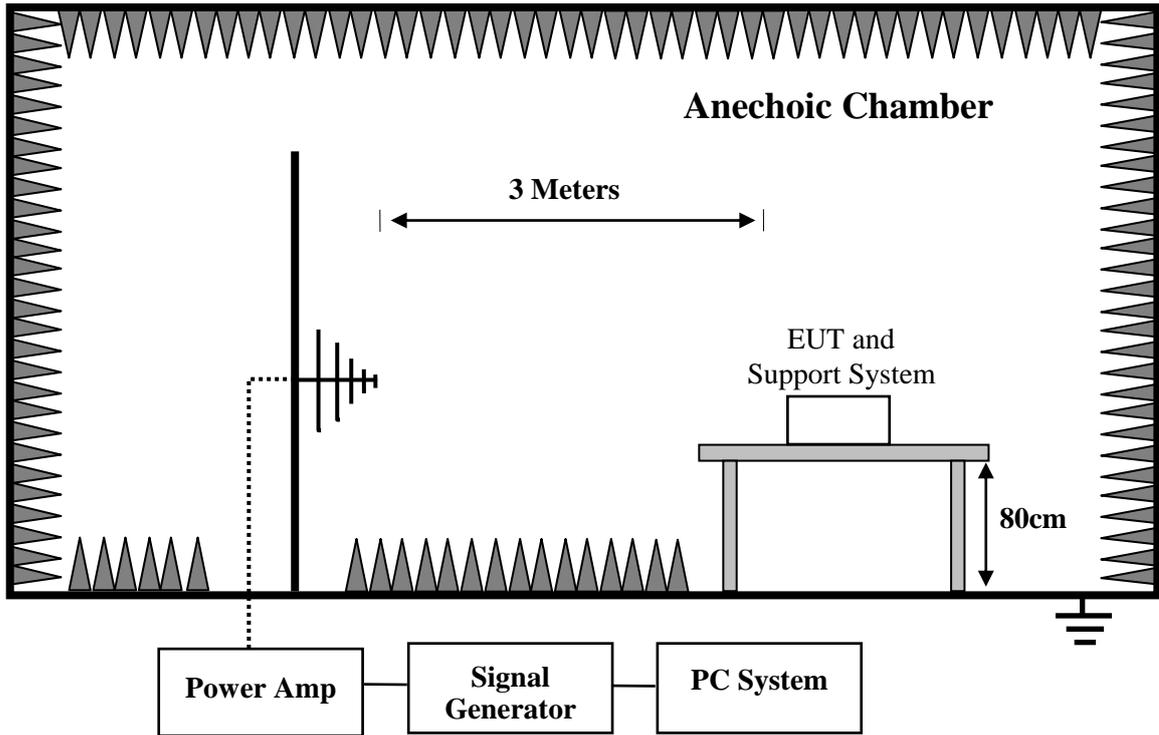
Date of test : Aug. 10, 2023
Model No. : CS19108RA4156P
Input Voltage : DC 24V
Operation Mode : TF Mode, Wi-Fi, USB Play, Bluetooth Mode, LAN
Temperature : 25.5°C
Humidity : 48%
Pressure : 101.20kPa

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The EUT was set 3 m away from the transmitting antenna which was mounted on an antenna tower. Both horizontal and vertical polarization of the antenna were set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera was used to monitor EUT screen.

All the scanning conditions were as follows:

Condition of Test	Remarks
1. Field Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 - 1000 MHz
4. Sweeping time of radiated	0.0015 decade/s
5. Dwell Time	at least 3 seconds



Condition of Test	Remarks
6. Field Strength	3 V/m (Severity Level 2)
7. Radiated Signal	Modulated
8. Scanning Frequency	1800MHz,2600MHz,3500MHz,5000MHz
9. Sweeping time of radiated	0.0015 decade/s
10. Dwell Time	at least 3 seconds

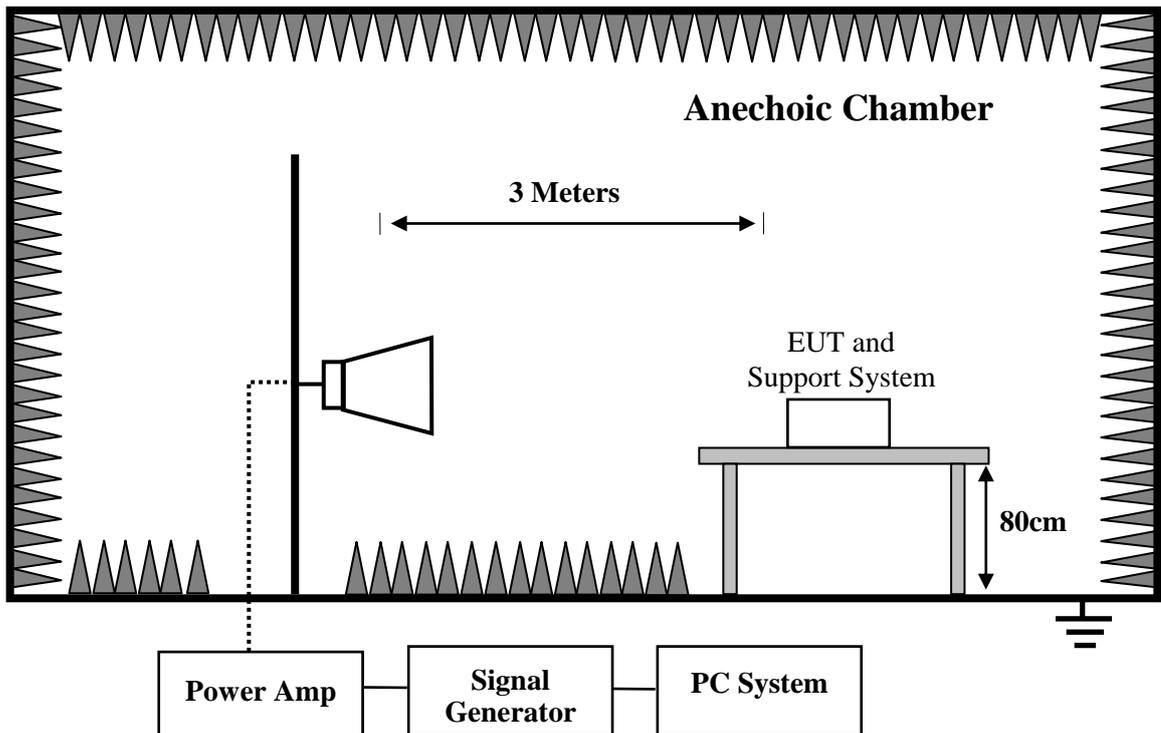


Table 2: Radio Frequency Electromagnetic Field Immunity Test Result

Field Strength (V/m)	Test Frequency (MHz)	Test mode	Polarization of antenna	Reference Level	Audio output	Limit	Interference Ratio (worst case)
3	80-1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz	LAN	H	75dB SPL	Integral Speaker	≤ -20dB	-58.7 dB
			V	75dB SPL	Integral Speaker		-65.3 dB

5.4. Electrical Fast Transient/Burst Immunity Test

RESULT	: Pass
Test procedure	: EN 55035:2017+A11:2020
Basic standard	: EN 61000-4-4:2012
Pulseform	: Tr/Th = 5/50ns
Repetition Frequency	: 5 kHz ; (100 kHz : only for single lines of xDSL equipment)
Test Duration	: 120s
Performance criterion	: B

Test Setup

Date of test	: Aug. 10, 2023
Model No.	: CS19108RA4156P
Input Voltage	: DC 24V
Operation Mode	: LAN
Temperature	: 23.8°C
Humidity	: 47%
Pressure	: 101.20kPa

The EUT and its simulators were placed 0.1 m high above the ground reference plane which was a minimum 2m*2m metallic sheet with 0.65mm minimum thickness. 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 0.5m.

1. For power input port:

The EUT was connected to the power mains by using a coupling device which coupled the EFT interference signal to AC power lines. Both polarities of the test voltage were applied during compliance test and the duration of the test were 2mins.

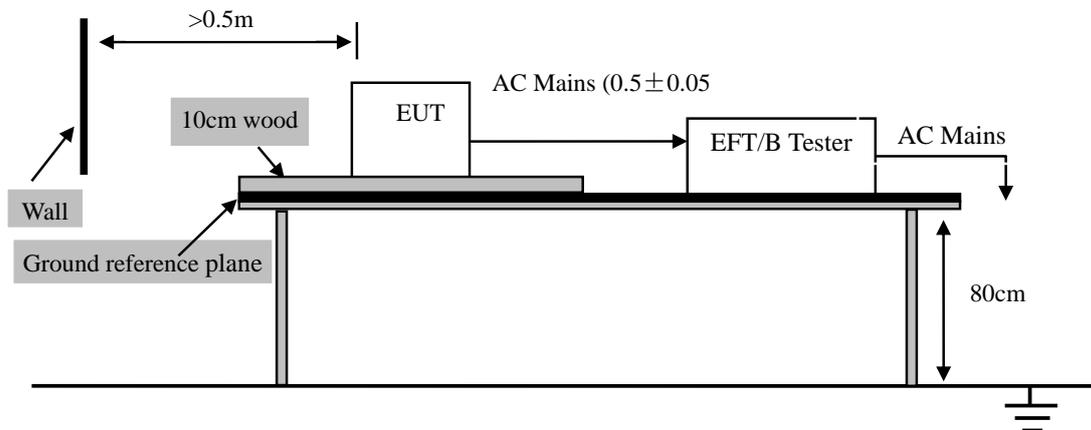


Table 5: Electrical Fast Transient/Burst Immunity Test Result

Coupling Ports	Coupling Voltage	Inject Method	Result
Signal Line	± 0.5 kV	Direct	Pass

Remark: The screen was flashing during the test, but self-recoverable after the test

5.5. Surge Immunity Test

RESULT : **Pass**
Test procedure : EN 55035:2017+A11:2020
Basic standard : EN 61000-4-5:2014
Pulse form : Tr/Td = 1.2/50us
Test Duration : 60s
Performance criterion : B

Test Setup

Date of test : Aug. 10, 2023
Model No. : CS19108RA4156P
Input Voltage : DC 24V
Operation Mode : LAN
Temperature : 22.9°C
Humidity : 52%
Pressure : 101.10kPa

2 Ω effective output impedance of the generator was used for L-N test. 12 Ω effective output impedance of the generator was used for L-PE, N-PE test.

5 positive and 5 negative (polarity) tests were applied successively synchronized to the voltage phase 90°, 270° to L-N respectively. The repetition rate was 1 per minute during test.

1. For input and AC power ports:

The EUT was connected to the power mains by using a coupling device which coupled the surge interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration was 1 minute.

2. For signal lines and control lines ports:

None.

3. For DC input and DC output power ports:

None.

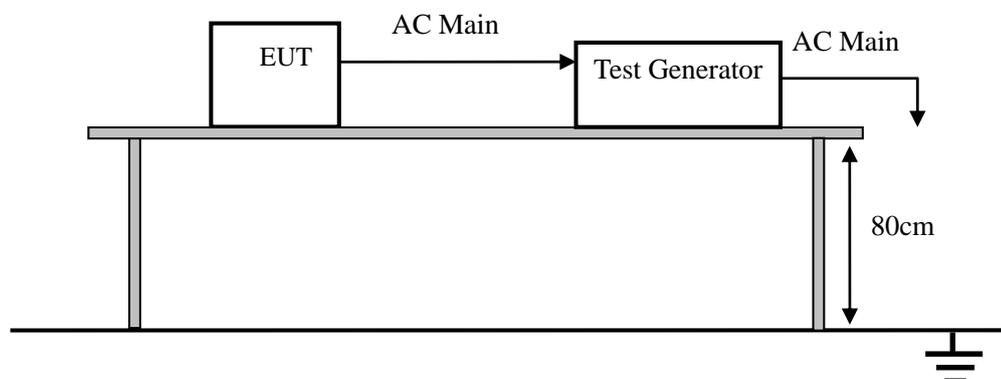


Table 4: Surge Immunity Test Result

Coupling Ports		Coupling Voltage	Coupling Phase / Result			
			0°	90°	180°	270°
AC power ports	Signal -PE	+/-0.5kV Direct	Pass			

Remark: The screen was flashing during the test, but self-recoverable after the test

5.6. Injected Currents Susceptibility Test

RESULT	: Pass
Test procedure	: EN 55035:2017+A11:2020
Basic standard	: EN 61000-4-6:2014
Test specification	: 3 Vr.m.s, 3 Vr.m.s - 1Vr.m.s, 1Vr.m.s, AM 80%, 0.15 MHz - 10 MHz, 10 MHz – 30 MHz, 30 MHz – 80MHz
Performance criterion	: A

Test Setup

Date of test	: Aug. 10, 2023
Model No.	: CS19108RA4156P
Input Voltage	: DC 24V
Operation Mode	: TF Mode, Wi-Fi, USB Play, Bluetooth Mode, LAN
Temperature	: 23.9°C
Humidity	: 49%
Pressure	: 101.20kPa

The EUT were placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) was placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT were as short as possible, and their height above the ground reference plane were between 30 and 50 mm (where possible).

The frequency range was swept from 0.15 MHz - 10 MHz, 10 MHz – 30 MHz and 30 MHz – 80MHz using 3V, 3 V - 1V, 1V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.

The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency was swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

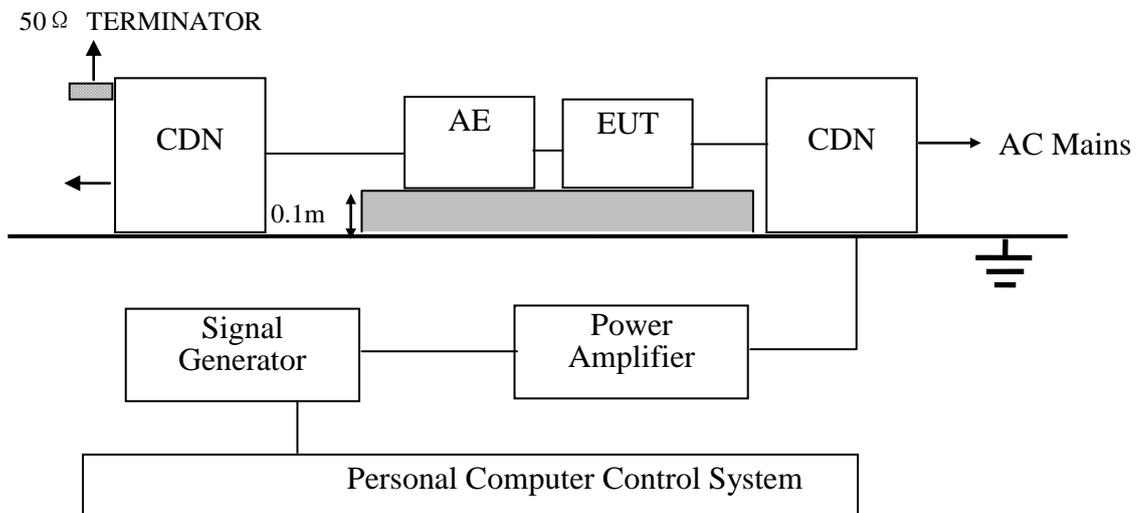


Table 5: Injected Currents Susceptibility Test Result

Voltage (V)	Test Frequency (MHz)	Test mode	Injection Method	Reference Level	Audio output	Limit	Interference Ratio (worst case)
3	0.15 –10 MHz	LAN	CDN-M2	75dBSPL	Speaker	≤ -20dB	-59.6 dB
3 -1	10 –30 MHz						-47.2 dB
1	30 –80 MHz						-53.7 dB

5.7. Power Frequency Magnetic Field Immunity Test

RESULT : **Pass**
 Test procedure : EN 55035:2017+A11:2020
 Basic standard : EN 61000-4-8:2010
 Test specification : 1 A/m
 Performance criterion : A

Test Setup

Date of test : Aug. 10, 2023
 Model No. : CS19108RA4156P
 Input Voltage : DC 24V
 Operation Mode : TF Mode, Wi-Fi, USB Play, Bluetooth Mode, LAN
 Temperature : 23.9°C
 Humidity : 48%
 Pressure : 101.20kPa

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

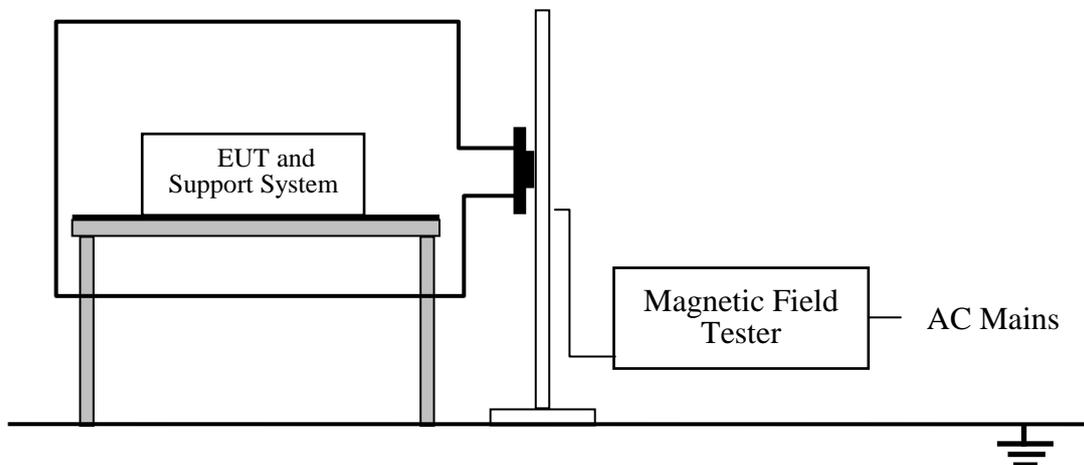


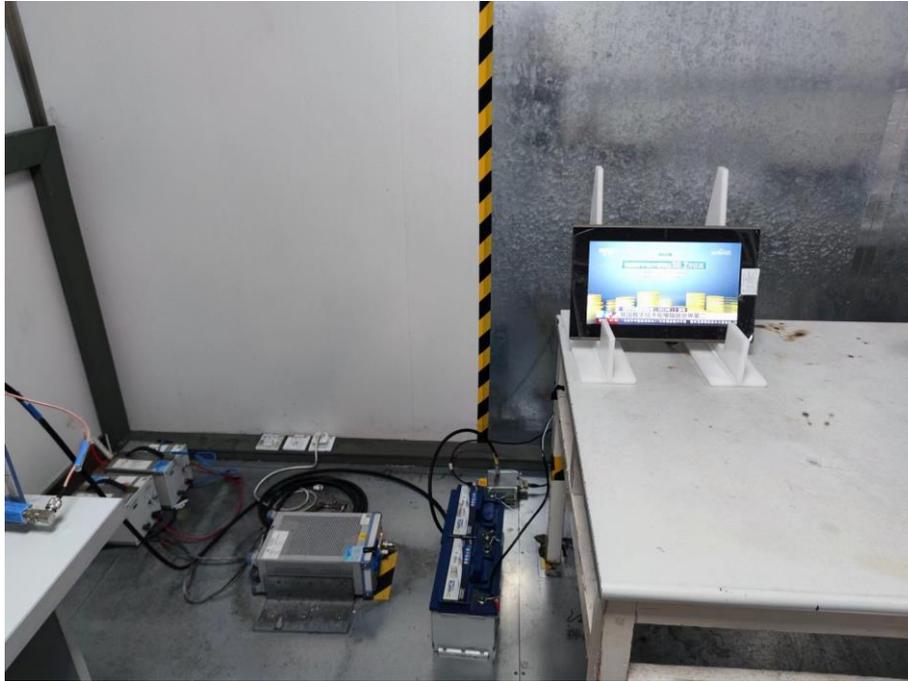
Table 6: Power Frequency Magnetic Field Immunity Test Result

Test Level	Testing Duration	Coil Orientation	Criterion	Result
1A/m	5 mins	X	A	Pass
1A/m	5 mins	Y	A	Pass
1A/m	5 mins	Z	A	Pass

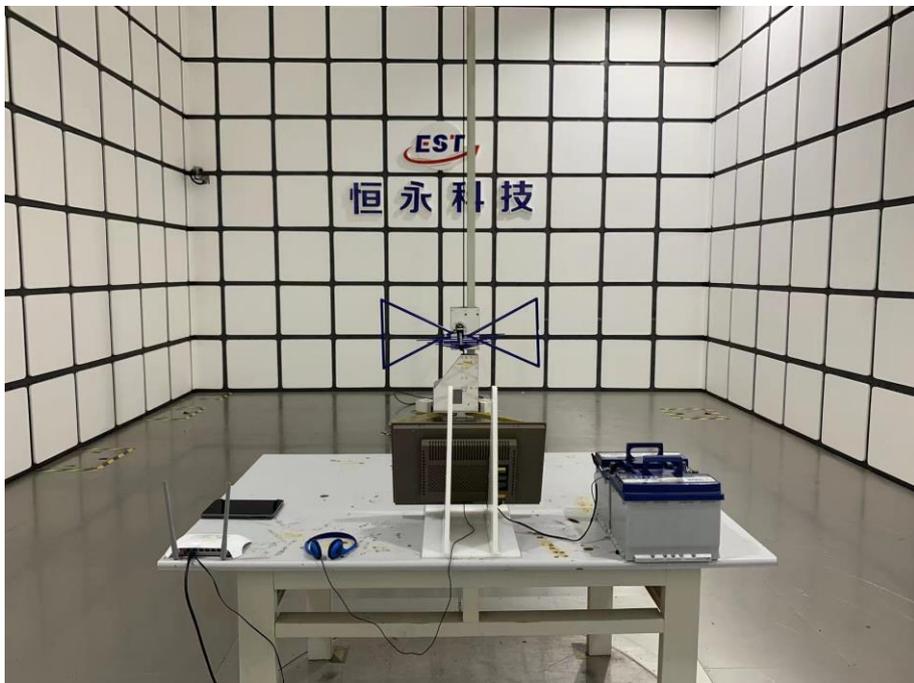
Remark: There was no change compared with initial operation during the test

6. PHOTOGRAPHS OF TEST SET-UP

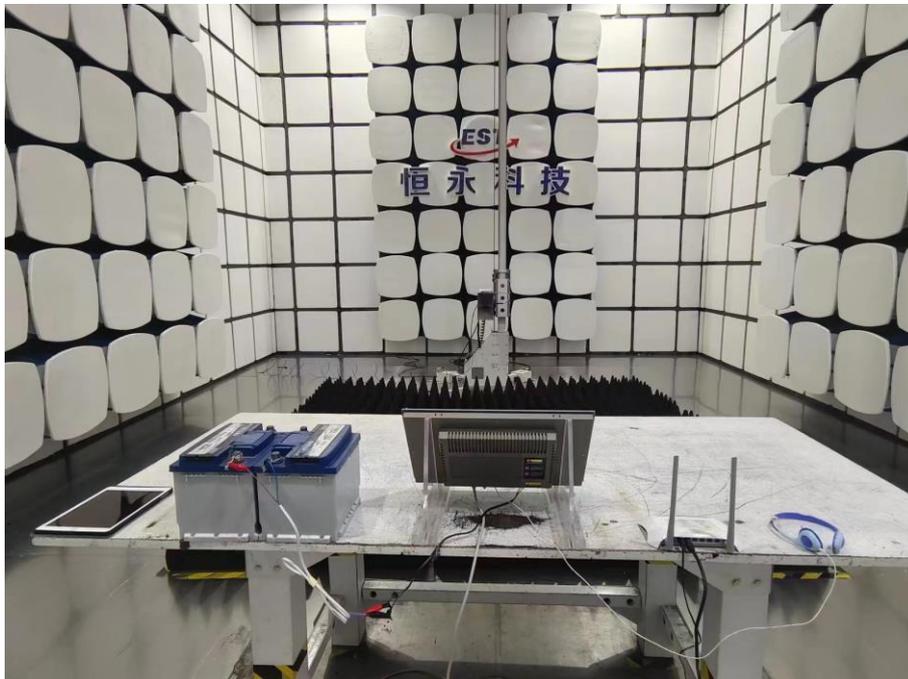
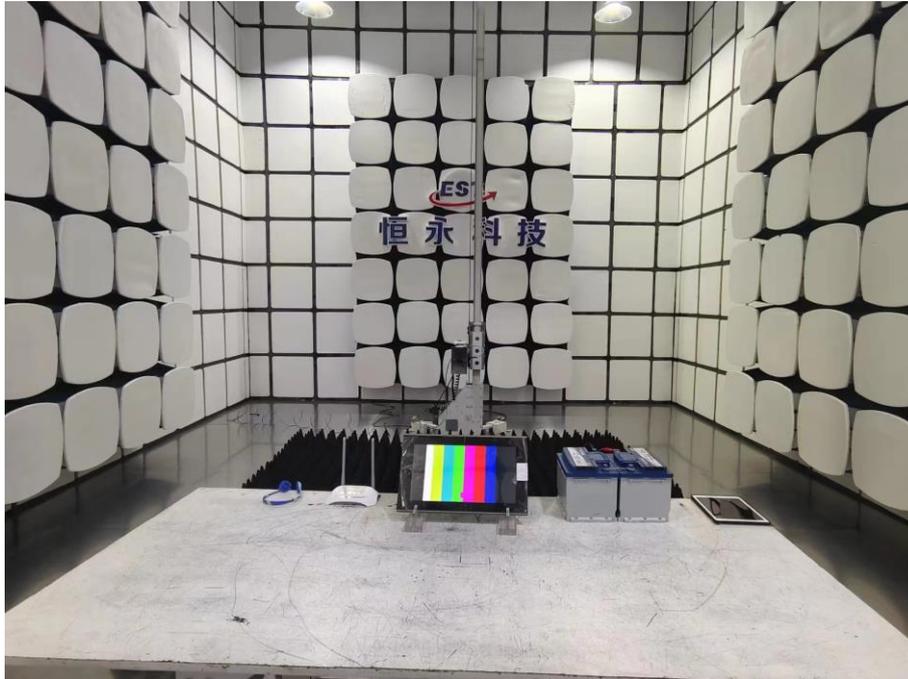
6.1. Set-up for Asymmetric Mode Conducted Emissions Test



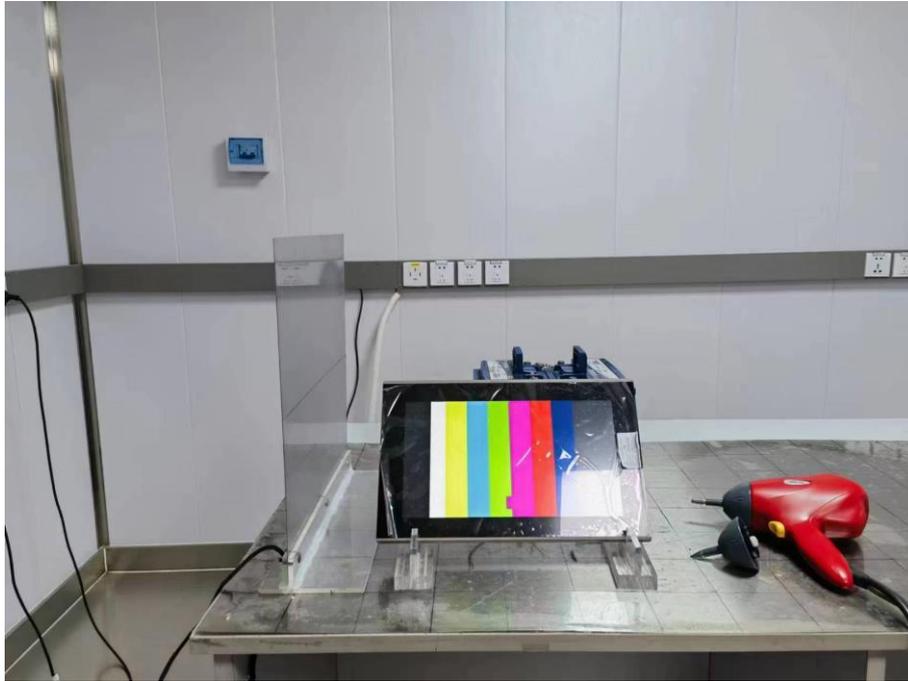
6.2. Set-up for Radiated Emission Test



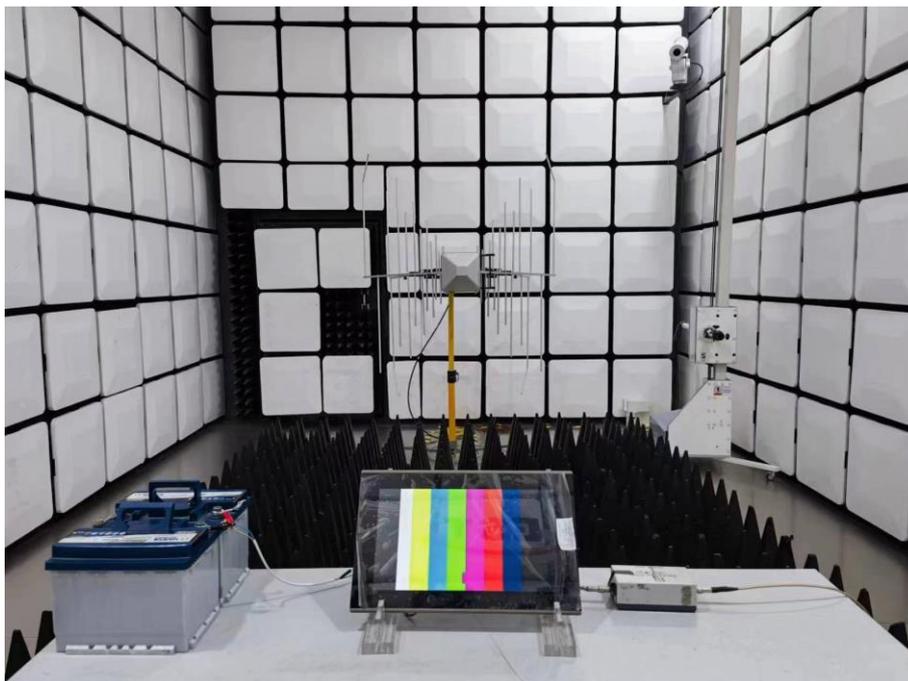
6.3.Set-up for Radiated Emission Test(above 1GHz)



6.4. Set-up for Electrostatic Discharge Immunity Test



6.5. Set-up for Radio Frequency Electromagnetic Field Immunity (R/S) Test



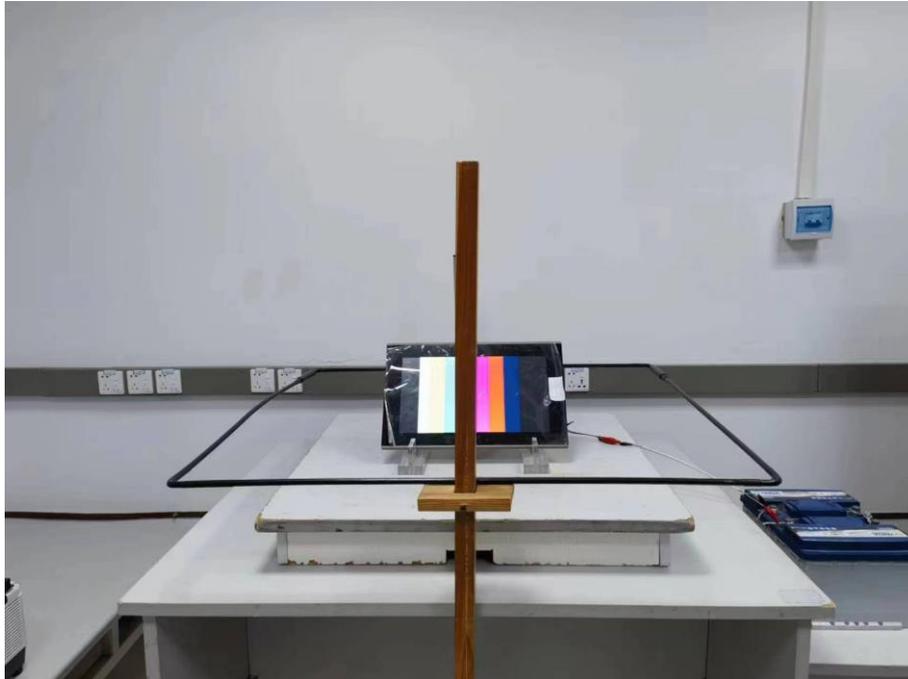
6.6. Set-up for Electrical Fast Transient/Burst Immunity Test



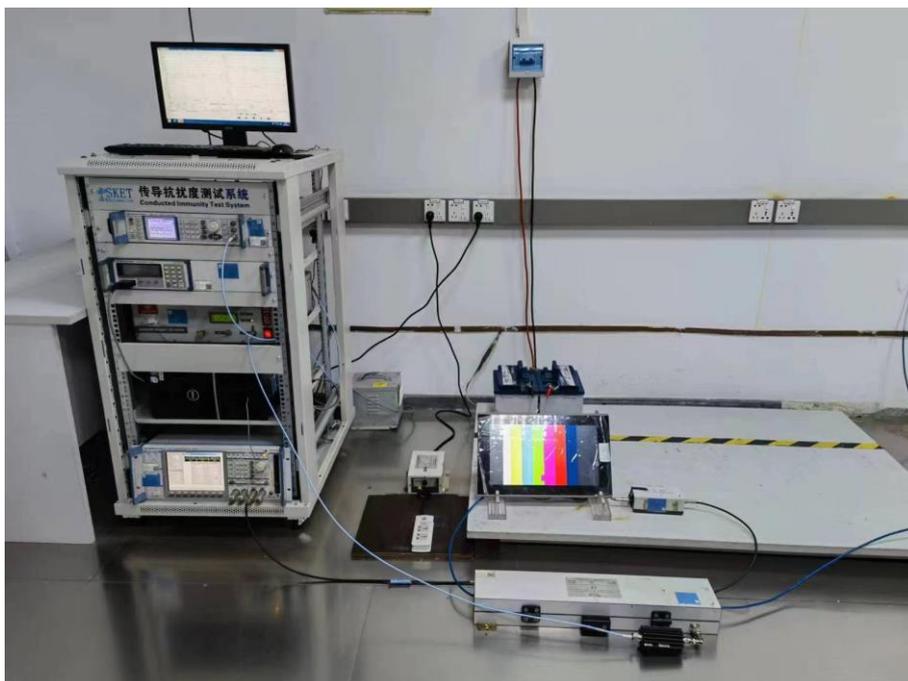
6.7. Set-up for Surge Immunity Test



6.8. Set-up for Power Frequency Magnetic Field Immunity Test



6.9. Set-up for Injected Currents Susceptibility Test



7. PHOTOGRAPHS OF THE EUT

Figure 1
General Appearance of the EUT

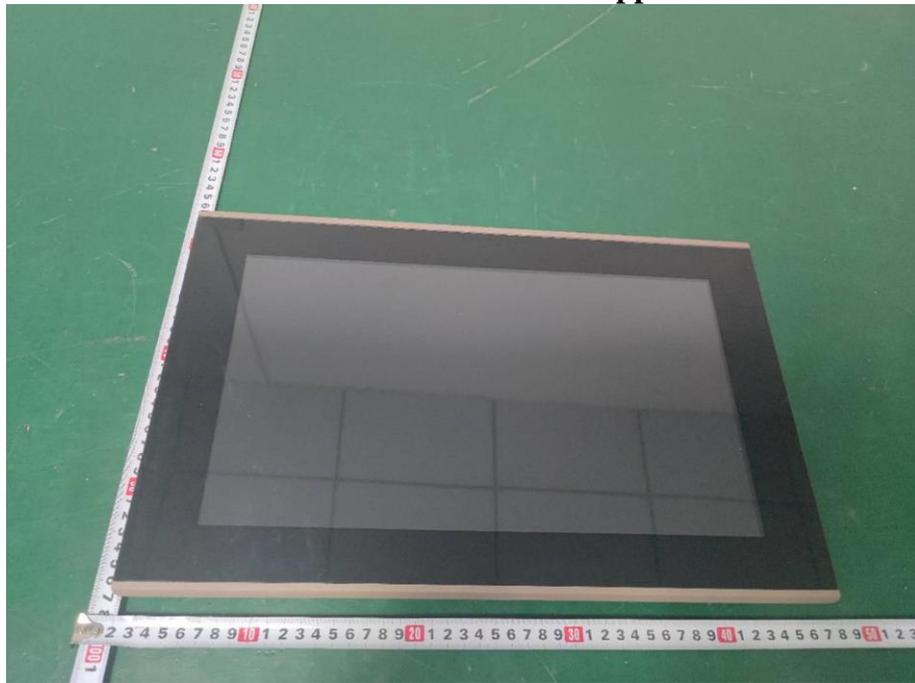


Figure 2
General Appearance of the EUT



Figure 3
General Appearance of the EUT



Figure 4
Inside View of the EUT

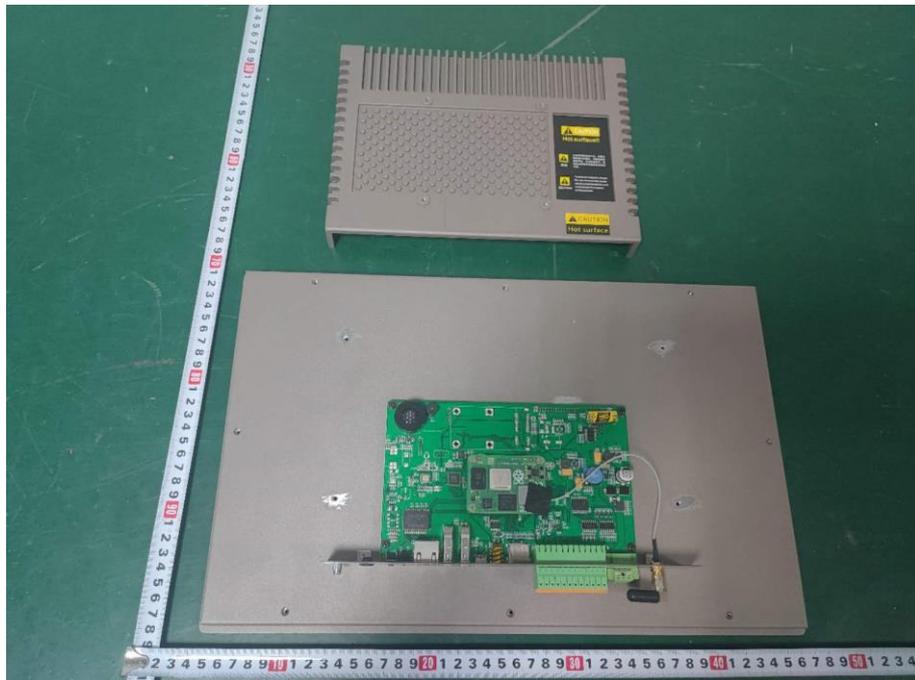


Figure 5
Inside View of the EUT



Figure 6
Inside View of the EUT



Figure 7
Inside View of the EUT

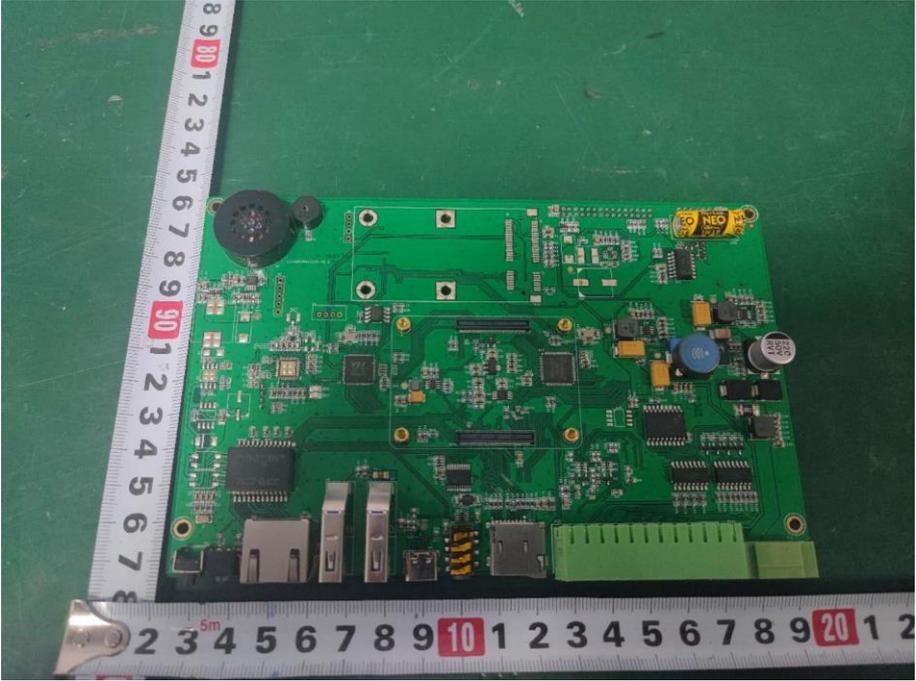


Figure 8
Inside View of the EUT



