



Shenzhen CTL Testing Technology Co., Ltd.
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Test Report

EN 55032 Electromagnetic compatibility of multimedia equipment - Emission
Requirements

EN 55035 Electromagnetic compatibility of multimedia equipment - Immunity
requirements

Report Reference No.....

CTL2307143013-E

Compiled by

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Technique principal Ivan Xie

Approved by

(position+printed name+signature)...

Manager Tracy Qi

Date of issue.....

Aug. 15, 2023

Testing Laboratory Name.....

Shenzhen CTL Testing Technology Co., Ltd.

Address.....

Floor 1-A, Baisha Technology Park, No.3011, Shaheji Road, Nanshan District, Shenzhen, China 518055

Web.....

www.ctl-lab.com

Testing location/ procedure.....

Full application of Harmonised standards ☒

Partial application of Harmonised standards ☐

Other standard testing methods ☐

Applicant's name.....

Shanghai Sunfull Automation Co., LTD

Address.....

Room603, Building25, Lane8633, Zhongchun Road, Qibao Town, Minhang District, Shanghai, China

Test specification:

Standard.....

EN 55032: 2015/A11: 2020

EN 55035: 2017/A11: 2020

Non-standard test method.....

/

Test Report Form No.....

TRF Originator.....

Shenzhen CTL Testing Technology Co., Ltd

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Test item description.....: WEB Configuration Gateway

Trade Mark.....: 迅饶

Test voltage.....: DC 24V

Result.....: Pass

EMC -- Test Report

Test Report No. :**CTL2307143013-E**

Aug. 15, 2023

Date of issue

Equipment under Test : WEB Configuration Gateway

Type / Model : IOM12684

Listed Models : IOM12682, IOM16800, IOM16000, IOM12600, IOM12680, IOM8400, IOM8442, IOM01200, IOM8600, IOM0080, IOM0080T, IOM0042, IOM0084, N12684, N8442, N6442, N8400, N16800, LCM9800, LCM5400, PLC6442, XR1005-MBUS, HBS1001

Applicant : **Shanghai Sunfull Automation Co., LTD**

Address : Room603, Building25, Lane8633, Zhongchun Road, Qibao Town, Minhang District, Shanghai, China

Manufacturer : **Shanghai Sunfull Automation Co., LTD**

Address : Room603, Building25, Lane8633, Zhongchun Road, Qibao Town, Minhang District, Shanghai, China

Test Result	Pass
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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.

History of this test report

Report No.	Version	Description	Issued Date
CTL2307143013-E	V1.0	Initial Issued Report	Aug. 15, 2023

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1. TEST STANDARDS

The tests were performed according to following standards:

EN 55032: 2015/A11: 2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements
EN 55035: 2017/A11: 2020 Electromagnetic compatibility of multimedia equipment - Immunity requirements

2. SUMMARY

2.1. General Remarks:

Date of receipt of test sample : Jul. 21, 2023

Sampling and Testing commenced on : Jul. 21, 2023

Testing concluded on : Aug. 14, 2023

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : ☐ 230V / 50 Hz ☐ 230V / 60Hz
☐ 3 V DC ☒ 24 V DC
☐ Other (specified in blank below)

2.3. Description of test modes

The EUT were tested under the following modes, the final worst mode was marked in bold face and recorded in this report.

EMISSION TEST:

Description of Test Mode	Test Voltage
WORKING	DC 24V

IMMUNITY TESTS:

Description of Test Mode	Test Voltage
WORKING	DC 24V

Emissions tests.....: According to EN 55032, searching for the highest disturbance.

Immunity tests: According to EN 55035, searching for the highest susceptibility.

Note:

For the test results, the EUT had been tested with all conditions. But only the worst case was showed in test report.

2.4. Short description of the Equipment under Test (EUT)

The EUT is a WEB Configuration Gateway

2.5. Description of Support units

The EUT has been tested as a dependent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

■ - supplied by the manufacturer

○ - supplied by the lab

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.

2.6. Performance Criteria

Definition related to the performance level:

- ☒ based on the used product standard
☐ based on the declaration of the manufacturer, requestor or purchaser

Criterion A:

Definition: normal performance within limits specified by the manufacturer, requestor or purchaser:

The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. 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 from what the user may reasonably expect from the apparatus if used as intended.

Criterion B:

Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention:

The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however. 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, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Criterion C:

Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention:

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

3.2. Test Facility

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

Certificated by CNAS

Registration No.:CNAS L7497

Date of issue:Oct. 24, 2019

Valid until:Feb. 14, 2024

Certificated by A2LA, USA

Registration No.:4343.01

Date of registration: December 27, 2017

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 399832

Shenzhen CTL Testing Technology Co., Ltd. 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 399832, December 08, 2017.

3.3. Test Description

Emission Measurement		
Radiated Emission	EN 55032: 2015/A11: 2020	PASS
Immunity Measurement		
Electrostatic Discharge	EN 55035: 2017/A11: 2020 IEC 61000-4-2: 2008	PASS
RF Field Strength Susceptibility	EN 55035: 2017/A11: 2020 IEC 61000-4-3: 2020	PASS
Power Frequency Magnetic Field Susceptibility Test	EN 55035: 2017/A11: 2020 IEC 61000-4-8: 2009	PASS

Remark:

1. The test result PASS and /or FAIL has no relationship with the measurement uncertainty.

3.4. Statement of the measurement uncertainty

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

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission(chamber 1)	30~1000MHz	$\pm 4.10\text{dB}$	(1)
Radiated Emission(chamber 2)	30~1000MHz	$\pm 4.10\text{dB}$	(1)
Radiated Emission(chamber 2)	Above 1GHz	$\pm 4.32\text{dB}$	(1)
Conducted Emission	0.15~30MHz	$\pm 3.20\text{dB}$	(1)
Conducted Emission (signal terminal)	0.15~30MHz	$\pm 2.96\text{dB}$	(1)
Disturbance Power	30~300MHz	$\pm 2.90\text{dB}$	(1)

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

3.5. Equipments Used during the Test

Radiated Emission(chamber 1)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ULTRA-BROADBAND ANTENNA	Sunol Sciences Corp.	JB1 Antenna	A061713	2023/02/13	2026/02/12
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2023/05/04	2024/05/03
Software:						
Name of Software:				Version:		
EZ_EMG(Below 1GHz)				V1.1.4.2		

Electrostatic Discharge						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ESD Simulator	TESEQ AG	NSG 437	1058	2023/08/05	2024/08/04

Power Frequency Magnetic Field Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Ultra Compact Simulator	HTEC Instruments Ltd.	HPFMF	154402	2023/05/04	2024/05/03

RF Field Strength Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	SIGNAL GENERATOR	Agilent	N5181A	MY49060125	2023/05/04	2024/05/03
2	Power Amplifier	MicoTop	MPA-80-1000-250	MPA1905162	2023/05/04	2024/05/03
3	Power Amplifier	MicoTop	MPA-1000-6000-100	MPA1906282	2023/05/04	2024/05/03
4	Power Meter	Agilent	E4419B	GB43317877	2023/08/02	2024/08/01
5	Test Antenna-Bi-Log	Schwarzbeck	VULB 9118 E	N/A	2021/08/24	2024/08/23
6	Horn Antenna	Sunol Sciences Corp	DRH-118	A062013	2021/12/23	2024/12/22
7	Power transmitter	HP	8481A	2349A43969	2023/08/02	2024/08/01
8	Power transmitter	Agilent	E9301A	MQ/2217182-2	2023/08/02	2024/08/01
Software:						
Name of Software:				Version:		
EM 3				V1.1.7		

Remark:

1. The test result PASS and /or FAIL has no relationship with the measurement uncertainty.

4. TEST CONDITIONS AND RESULTS

4.1. Radiated Emission

For test instruments and accessories used see section 3.5.

4.1.1. Description of the test location

Test location: Radiation Lab

4.1.2. Limits of disturbance

For frequency below 1000MHz

Frequency (MHz)	Class A(at 3m)	Class B(at 3m)
	Quasi-Peak dB μ V/m	Quasi-Peak dB μ V/m
30 ~ 230	50	40
230 ~ 1000	57	47

NOTE: 1.The tighter limit shall apply at the edge between two frequency bands.

2.Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

Frequency range of radiated measurement

Highest internal frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes(MHz)	Range(MHz)
Below 108	1000
108-500	2000
500-1000	5000
Above 1000	Up to 5 times of the highest frequency or 6GHz, whichever is less

For frequency above 1000MHz

Frequency (GHz)	Class A(dB μ V/m)(at 3m)		Class B(dB μ V/m)(at 3m)	
	Peak	Average	Peak	Average
1.0-3.0	76	56	70	50
3.0-6.0	80	60	74	54

NOTE: 1.The lower limit shall apply at transition frequencies.

2.Emission level(dB μ V/m) = 20 log Emission level(μ V/m)

3.All emanation from a class A/B digital device or system, including any net work of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



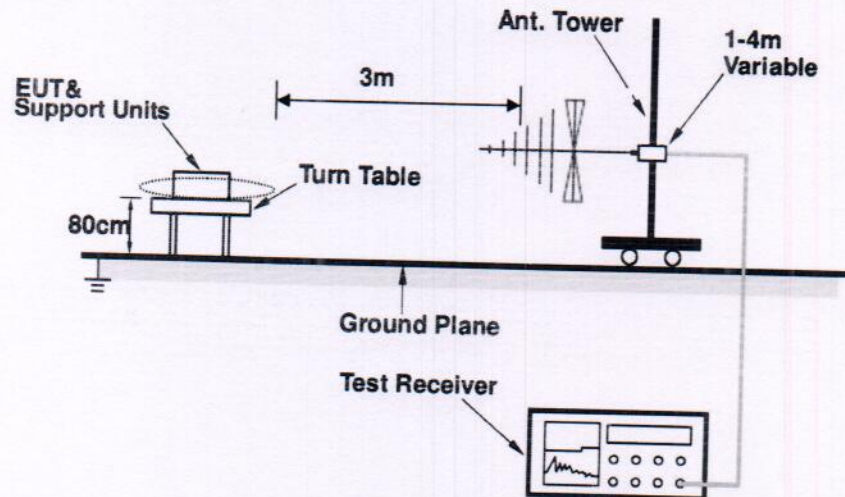
4.1.3. Description of the test set-up

4.1.3.1. Operating Condition

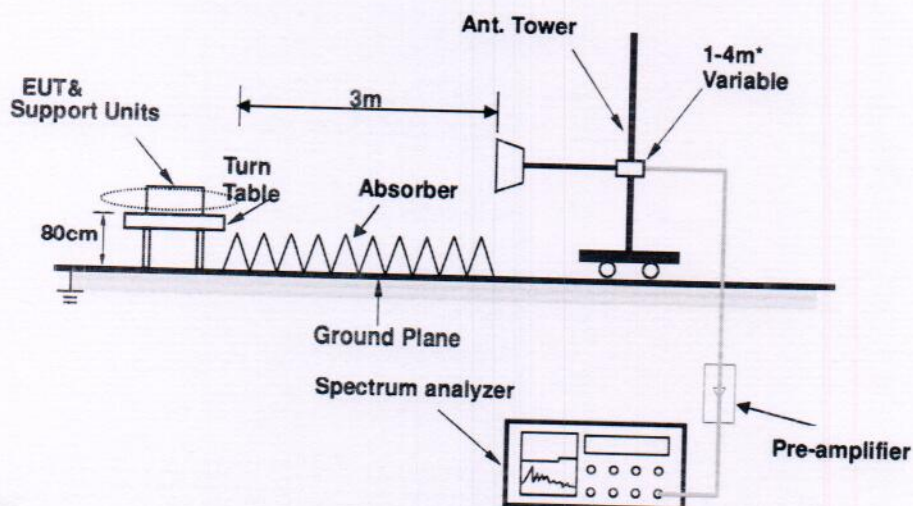
The EUT shall operate in the mode of operation described in Section 2.3, and the maximum emanating results are recorded.

4.1.3.2. Test setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



4.1.4. Test result

Frequency range	30-1000MHz
Detector function & Resolution bandwidth	Quasi-Peak, 100kHz

The requirements are **Fulfilled**

Remarks: The limits are kept. For detailed results, please see the following page(s).

Radiated Emission Measurement

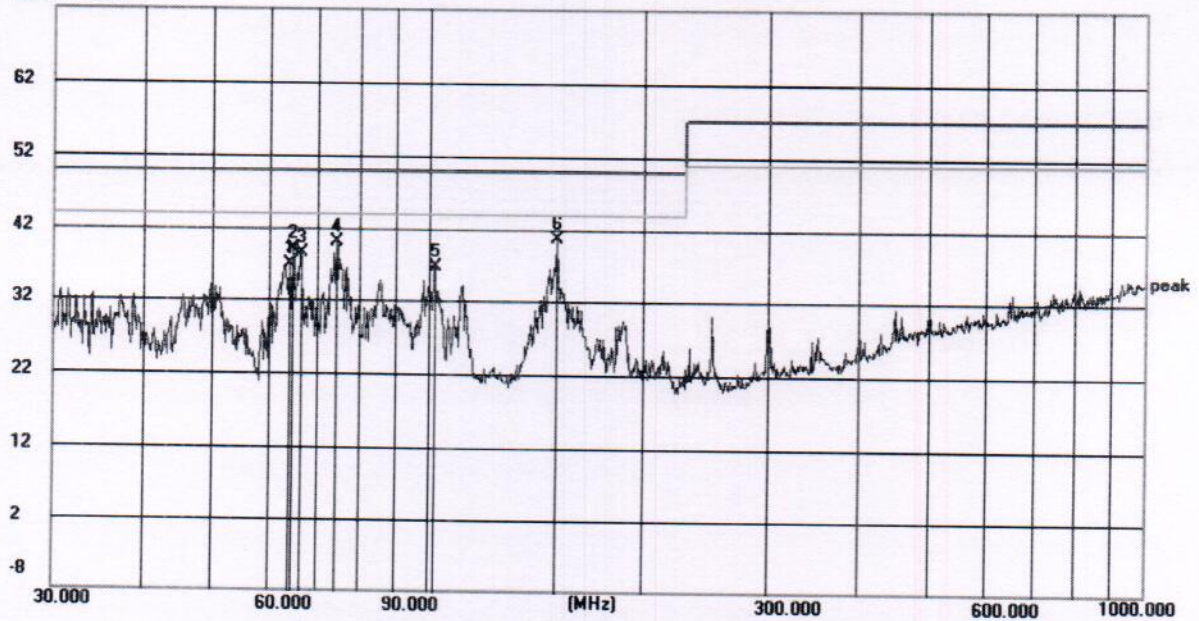
File :CTL-2

Data :#6751

Date: 2023/08/14

Time: 9:04:25

72.0 dBuV/m



Site LAB Chamber 1

Limit: EN55032 RE-Class A 30-1000MHz

EUT: /

M/N: IOM12684

Mode: WORKING

Note: /

/

Polarization: **Vertical**

Power: DC 24V

Distance: 3m

Temperature: 25(C)

Humidity: 50 %

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	63.9828	27.38	9.58	36.96	50.00	13.04	peak	100	332	P	
2	64.6594	29.43	9.59	39.02	50.00	10.98	peak	100	318	P	
3	66.2662	28.82	9.73	38.55	50.00	11.45	peak	100	11	P	
4	74.3955	30.39	9.81	40.20	50.00	9.80	peak	100	325	P	
5	102.0014	24.95	11.81	36.76	50.00	13.24	peak	100	11	P	
6	151.5972	23.74	16.94	40.68	50.00	9.32	peak	100	88	P	

Radiated Emission Measurement

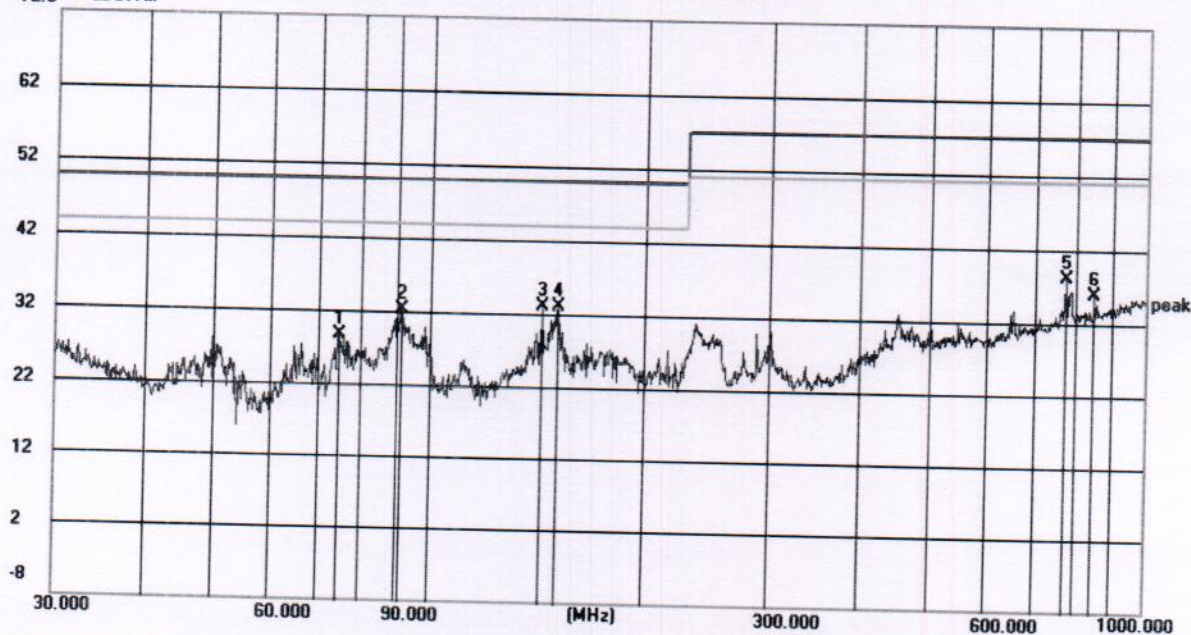
File :CTL-2

Data :#6752

Date: 2023/08/14

Time: 9:07:32

72.0 dBuV/m



Site LAB Chamber 1

Limit: EN55032 RE-Class A 30-1000MHz

EUT: /

M/N: IOM12684

Mode: WORKING

Note: /

/

Polarization: **Horizontal**

Power: DC 24V

Distance: 3m

Temperature: 25(C)

Humidity: 50 %

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	74.6569	18.88	9.78	28.66	50.00	21.34	peak	200	226	P	
2	91.1746	21.55	10.77	32.32	50.00	17.68	peak	200	11	P	
3	143.8295	17.04	16.02	33.06	50.00	16.94	peak	200	185	P	
4	151.5972	16.19	16.94	33.13	50.00	16.87	peak	200	192	P	
5	774.1584	12.27	25.82	38.09	57.00	18.91	peak	100	335	P	
6	848.0563	9.41	26.44	35.85	57.00	21.15	peak	100	342	P	

4.2. Electrostatic discharge

For test instruments and accessories used see section 3.5.

4.2.1. Description of the test location and date

Test location: 1# EMC Test Room

Date of test: Aug. 11, 2023

Operator: Wei

4.2.2. Severity levels of electrostatic discharge

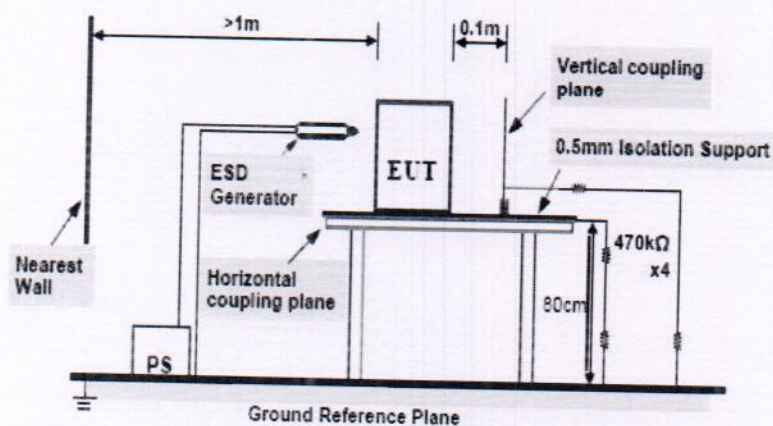
Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

4.2.3. Description of the test set-up

4.2.3.1. Operating Condition

The EUT shall operate in the mode of operation described in Section 2.3, and the results of the maximum susceptible results are recorded.

4.2.3.2. Test setup



4.2.4. Test specification:Contact discharge voltage:☒ 2 kV ☒ 4 kVAir discharge voltage:☒ 2 kV ☒ 4 kV ☒ 8 kVNumber of discharges:☒ ≥ 10 ☐ ≥ 25 Type of discharge:

Direct discharge ☒ Air discharge
Indirect discharge ☒ Contact discharge
☒ Contact discharge

Polarity:☒ Positive ☒ NegativeDischarge location:

- ☒ see photo documentation of the test set-up
- ☒ all external locations accessible by hand
- ☒ horizontal plate (HCP)
- ☒ vertical coupling plate (VCP)

4.2.5. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.3. Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 3.5.

4.3.1. Description of the test location and date

Test location: Chamber 2

Date of test: Aug. 11, 2023

Operator: Wei

4.3.2. Severity levels of radiated, radio-frequency, electromagnetic field

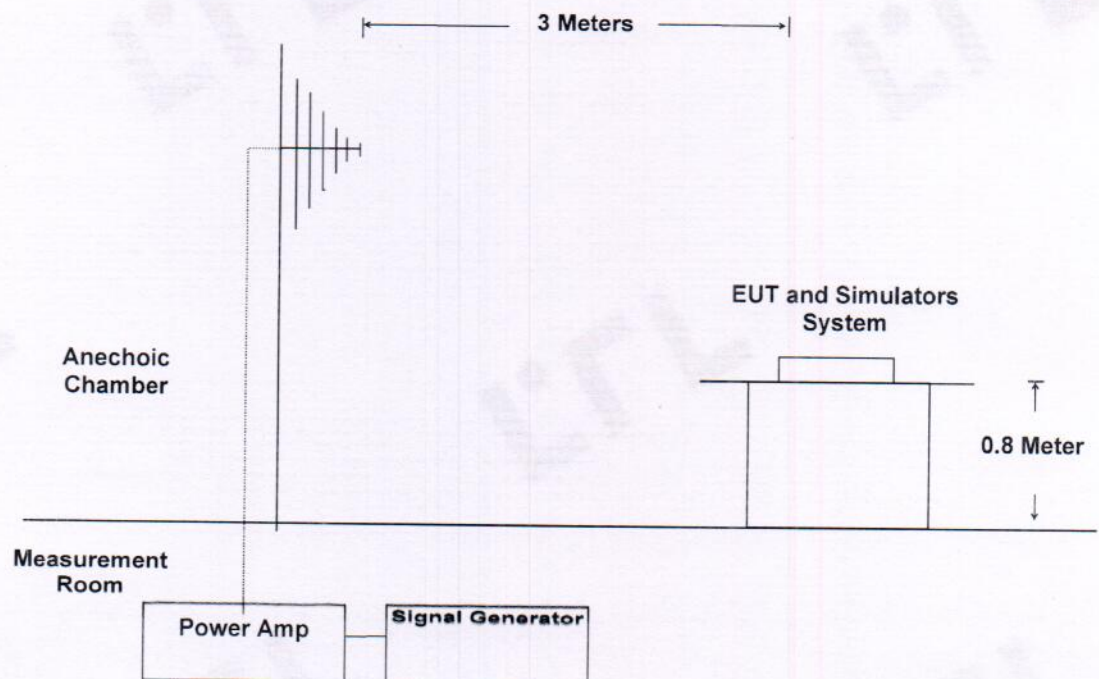
Level	Field Strength (V/m)
1.	1
2.	3
3.	10
X	Special

4.3.3. Description of the test set-up

4.3.3.1. Operating Condition

The EUT is set to work shall be carried out normal working mode during the test, and the results of the maximum susceptible results are recorded.

4.3.3.2. Test setup



4.3.4. Test specification:Frequency range:

■ 80 MHz to 1000 MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz

Field strength:

■ 3 V/m

EUT - antenna separation:

■ 3 m

Modulation:■ AM: 80 %
■ sinusoidal 1000HzFrequency step:

■ 1 % with 3 s dwell time

Antenna polarisation:

■ horizontal ■ vertical

4.3.5. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

The requirements are **Fulfilled**Performance Criterion: **A****Remarks:**During the test no deviation was detected to the selected operation mode(s).

4.4. Magnetic Field Immunity

For test instruments and accessories used see section 3.5.

4.4.1. Description of the test location

Test location: EMC Test Room

Date of test: Aug. 11, 2023

Operator: Wei

4.4.2. Severity levels of magnetic field immunity

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

4.4.3. Description of the test set-up

4.4.3.1. Operating Condition

The EUT shall operate in the mode of operation described in Section 2.3, and the results of the maximum susceptible results are recorded.

4.4.4. Test specification:

Test frequency: ☒ 50 Hz

Continuous field: ☒ 1 A/m

Test duration: ☒ 5 m

Antenna factor: 0.917 A/m

Axis: ☒ x-axis ☒ y-axis ☒ z-axis

4.4.5. Test result

Environmental conditions	Temperature	25°C
	Humidity	55.0%RH

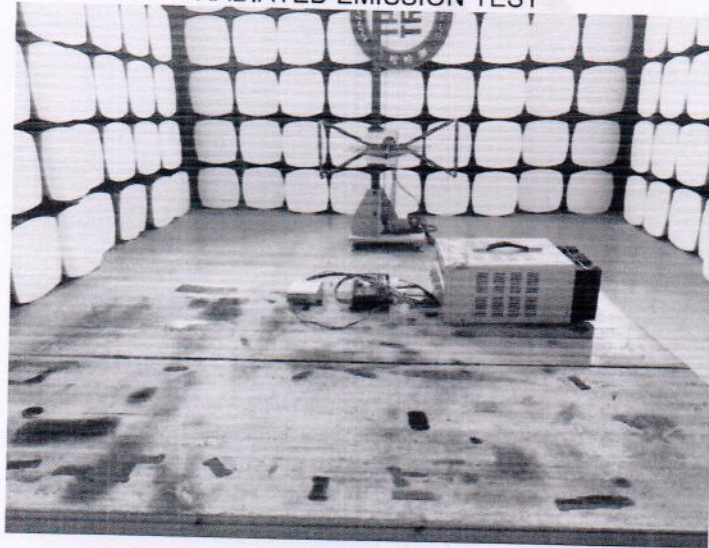
The requirements are **Fulfilled**

Performance Criterion: **A**

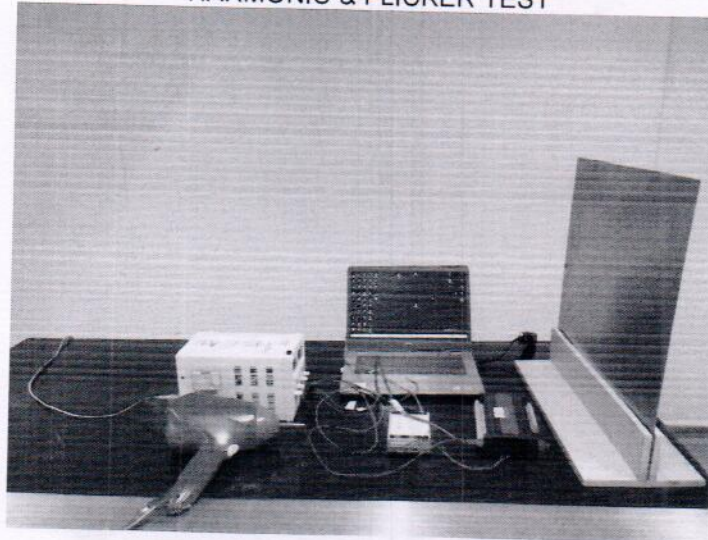
Remarks: During the test no deviation was detected to the selected operation mode(s).

5. Test Setup Photos

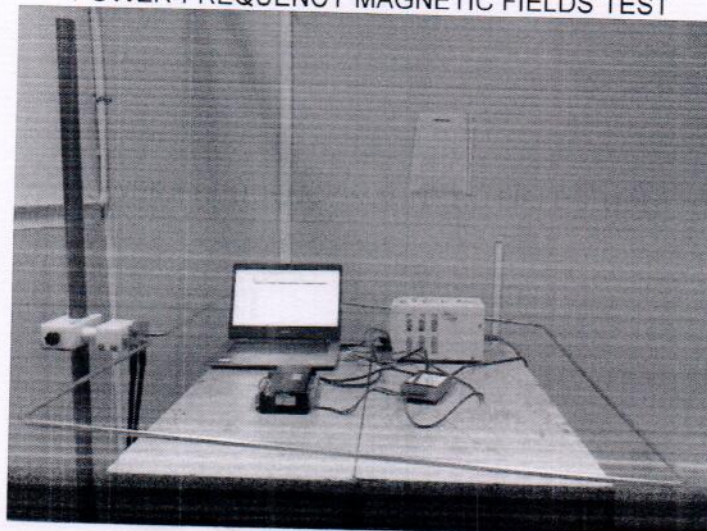
RADIATED EMISSION TEST



HARMONIC & FLICKER TEST



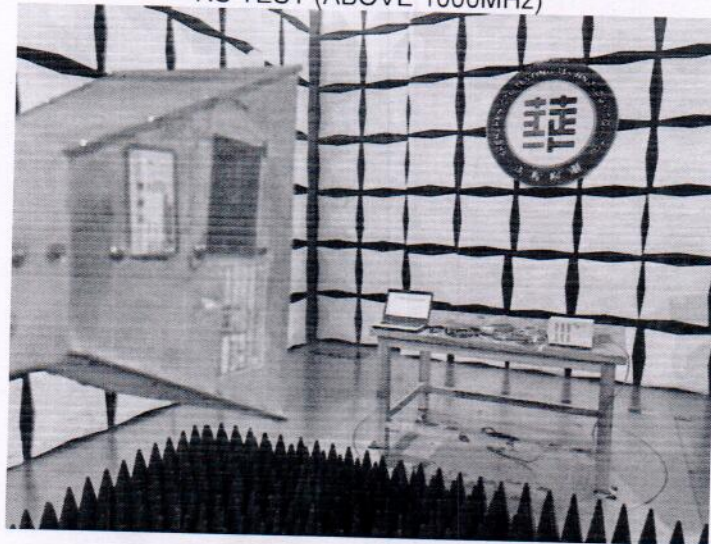
POWER-FREQUENCY MAGNETIC FIELDS TEST



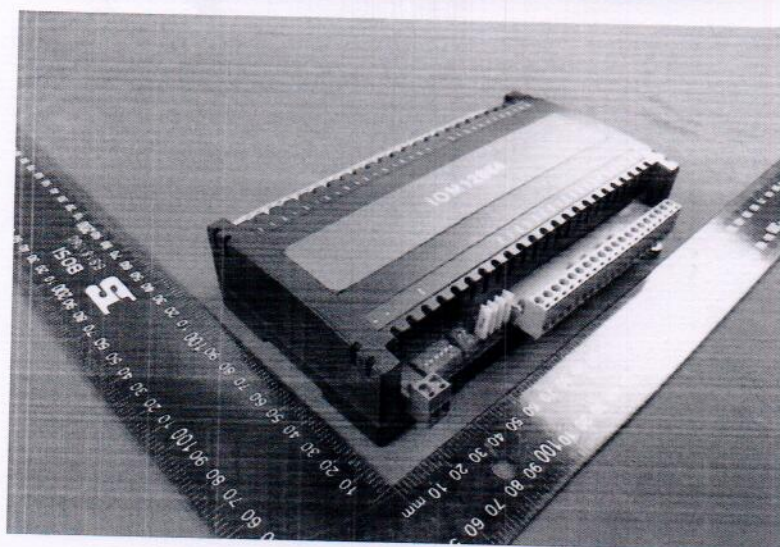
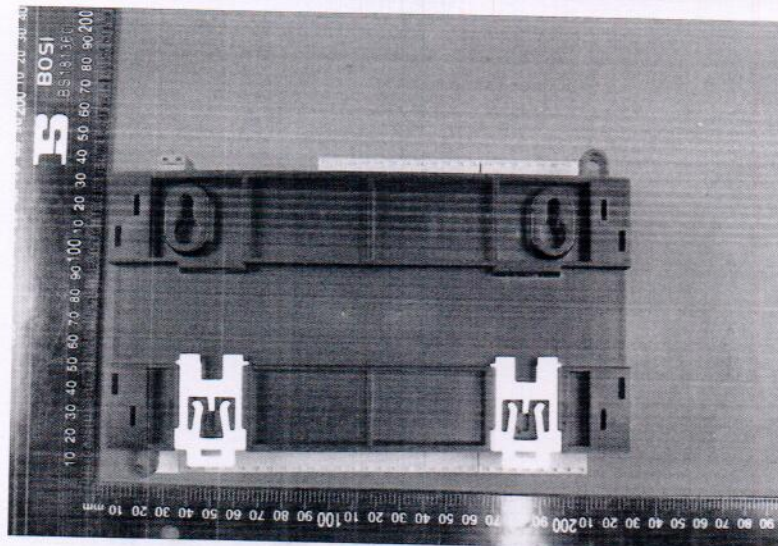
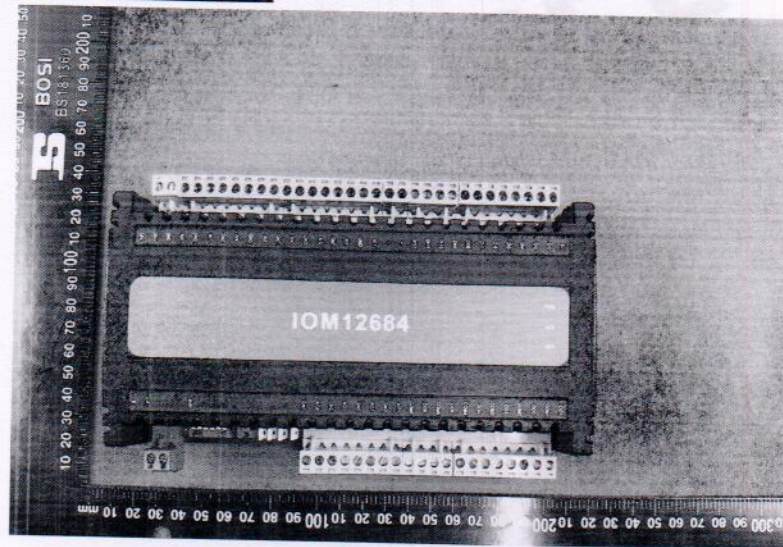
RS TEST (80MHz-1000MHz)

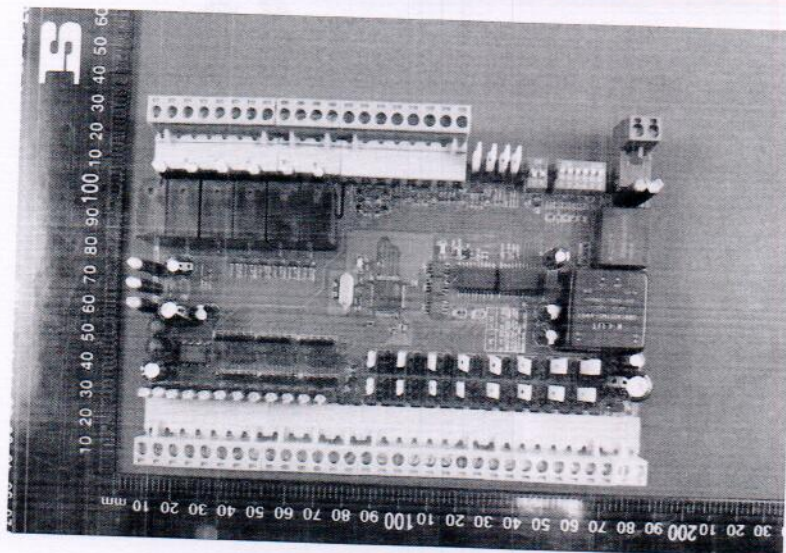
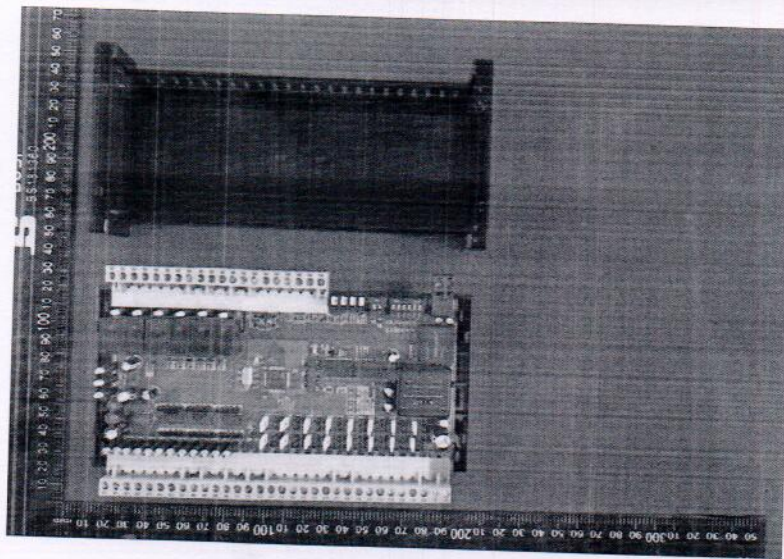
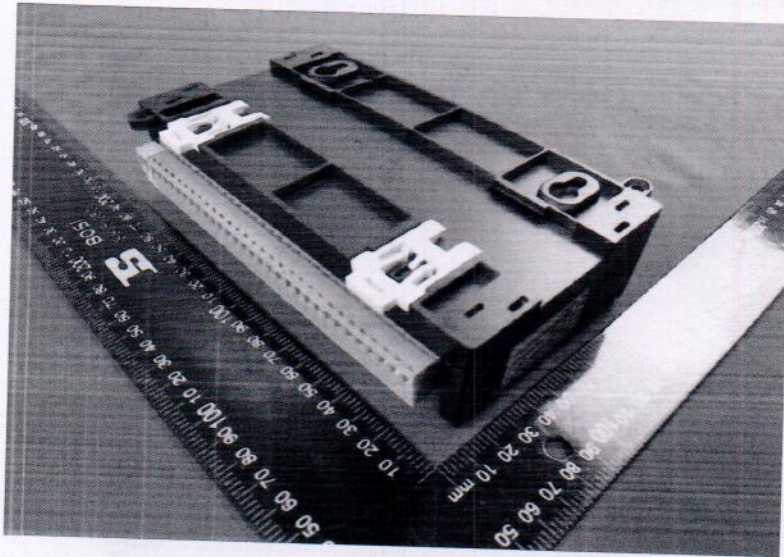


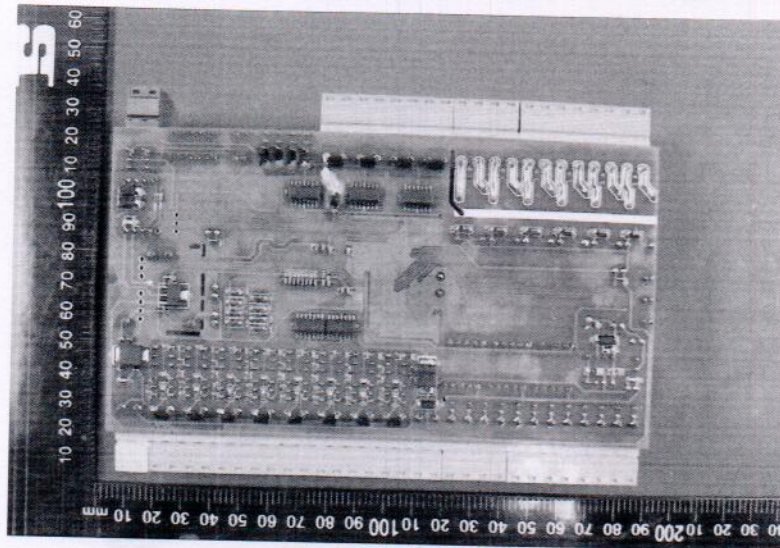
RS TEST (ABOVE 1000MHz)



6. Photos of the EUT







.....End of Report.....