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中国认可
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检测
TESTING
CNAS L7497

TEST REPORT

EN IEC 61000-6-4
Generic standards - Emission standard for industrial environments
EN IEC 61000-6-2
Generic standards - Immunity for industrial environments

Report Reference No.....:	**CTL2407027052-E**
Compiled by (position+printed name+signature)..:	File administrators Hamia Huang
Supervised by (position+printed name+signature)..:	Technique principal Ivan Xie
Approved by (position+printed name+signature)..:	Manager Tracy Qi
Date of issue.....:	Aug. 08, 2024
Testing Laboratory Name.....:	**Shenzhen CTL Testing Technology Co., Ltd.**
Address.....:	Zone A, 1st Floor, Warehouse 2, Baisha Logistics Company, No. 3011 Shahe West Road, Nanshan District, Shenzhen, Guangdong, China
Testing location/ procedure.....:	Full application of Harmonised standards ☒ Partial application of Harmonised standards ☐ Other standard testing methods ☐
Applicant's name.....:	**3onedata Co., Ltd.**
Address.....:	3/B, Zone 1, Baiwangxin High Technology Industrial park, Song Bai Road, Nanshan District, Shenzhen, 518108, China
Test specification:	
Standard.....:	**EN IEC 61000-6-4:2019** **EN IEC 61000-6-2:2019** **EN IEC 61000-3-2: 2019/A1: 2021** **EN 61000-3-3: 2013/A1: 2019/A2: 2021**
Non-standard test method.....:	/
TRF Originator.....:	Shenzhen CTL Testing Technology Co., Ltd.

Test item description.....:	**Industrial Ethernet Switch**
Trade Mark.....:	3onedata
Test voltage.....:	AC 230V/50Hz
Result.....:	**Pass**

EMC -- T E S T R E P O R T

Test Report No. :	**CTL2407027052-E**	Aug. 08, 2024 Date of issue

Equipment under Test	:	Industrial Ethernet Switch
Model /Type	:	ICS5400-24GT16GS4XS-2HV
Listed Models	:	ICS1000, ICS2000, ICS3000, ICS4000, ICS5000, ICS6000, ICS7000, ICS8000, ICS9000, MES1000, MES2000, MES3000, MES4000, MES5000, MES6000, MES7000, MES8000, MES9000, MAS1000, MAS2000, MAS3000, MAS4000, MAS5000, MAS6000, MAS7000, MAS8000, MAS9000, TNS1000, TNS2000, TNS3000, TNS4000, TNS5000, TNS6000, TNS7000, TNS8000, TNS9000, ICS5556, ICS5530, ICS5428, ICS5400, ICS5400SL, ICS5028G, ICS5000C, ICS5000SL, ICS6000SL, ICS6400SL, ICS6400C, ICS6424, ICS6400, MES5600, MES5000, MES600, MAS6400, MAS7110-3GS, MAS7110-2GS, MAS7010-3GS, MAS618, MAS6105, MAS208G, MAS2305, MAS215C, MAS208, MAS215, MAS205, MAS203, TNS5500, TNS5800, TNS5500D, TNS5800D, TNS5000D Note: PCB board, structure and internal of these model(s) are the same, So so we choose ICS5400-24GT16GS4XS-2HV to test.
Applicant	:	**3onedata Co., Ltd.**
Address	:	3/B, Zone 1, Baiwangxin High Technology Industrial park, Song Bai Road, Nanshan District, Shenzhen, 518108, China
Manufacturer	:	**3onedata Co., Ltd.**
Address	:	3/B, Zone 1, Baiwangxin High Technology Industrial park, Song Bai Road, Nanshan District, Shenzhen, 518108, China

Test Result	**Pass**

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
CTL2407027052-E	V1.0	Initial Issued Report	Aug. 08, 2024

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

EN IEC 61000-6-4:2019 Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments(IEC 61000-6-4: 2018)
EN IEC 61000-6-2:2019 Electromagnetic compatibility (EMC) -- Part 6-2: Generic standards - Immunity for industrial environments
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 16 A per phase)
EN 61000-3-3: 2013/A1: 2019/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 ⩽ 16 A per phase and not subject to conditional connection

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample : Jul. 11, 2024

Sampling and Testing commenced on : Jul. 11, 2024

Testing concluded on : Jul. 25, 2024

2.2 Equipment Under Test

Power supply system utilised

Power supply voltage : ■ 230V / 50 Hz o 115V / 60Hz
o 5 V DC o 24 V DC
o 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	**AC 230V/50Hz**

IMMUNITY TESTS:

Description of Test Mode	Test Voltage
WORKING	**AC 230V/50Hz**

EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

Test program (customer specific)

Emissions tests…….: According to EN IEC 61000-6-4, searching for the highest disturbance.

Immunity tests ……..: According to EN IEC 61000-6-2, searching for the highest susceptivity.

Harmonic current……. : According to EN IEC 61000-3-2, searching for the highest disturbance.

Voltage fluctuation……. : According to EN 61000-3-3, searching for the highest disturbance.

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 Industrial Ethernet Switch.

EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

■ - supplied by the manufacturer

o - supplied by the lab

2.5 Performance level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level defined by its manufacturer or the requestor of the test, or agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

■ based on the used product standard
o 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.
Zone A, 1st Floor, Warehouse 2, Baisha Logistics Company, No. 3011 Shahe West Road, Nanshan District, Shenzhen, Guangdong, China

3.2 Test Facility

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

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 .

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

Certificated by CNAS
Registration No.:CNAS L7497
Date of issue:Feb. 15, 2024
Valid until:Feb. 14, 2030

Certificated by A2LA, USA
Registration No.:4343.01
Date of issue:Mar.12, 2024
Valid until:Feb. 28, 2026

3.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4 Test Description

Emission Measurement		
Radiated Emission	EN IEC 61000-6-4:2019	PASS
Conducted Disturbance	EN IEC 61000-6-4:2019	PASS
Immunity Measurement		
Electrostatic Discharge	EN IEC 61000-6-2:2019 IEC 61000-4-2: 2008	PASS
RF Field Strength Susceptibility	EN IEC 61000-6-2:2019 IEC 61000-4-3: 2020	PASS
Electrical Fast Transient/Burst Test	EN IEC 61000-6-2:2019 IEC 61000-4-4: 2012	PASS
Surge Test	EN IEC 61000-6-2:2019 IEC 61000-4-5: 2014/A1: 2017	PASS
Conducted Susceptibility Test	EN IEC 61000-6-2:2019 IEC 61000-4-6:2023	PASS
Power Frequency Magnetic Field Susceptibility Test	EN IEC 61000-6-2:2019 IEC 61000-4-8: 2009	PASS
Voltage Dips and Interruptions Test	EN IEC 61000-6-2:2019 IEC 61000-4-11: 2020	PASS

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

3.5 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	±4.10dB	(1)
Radiated Emission(chamber 2)	30~1000MHz	±4.08dB	(1)
Radiated Emission(chamber 2)	Above 1GHz	±4.32dB	(1)
Conducted Emission	0.15~30MHz	±3.20dB	(1)
Conducted Emission (signal terminal)	0.15~30MHz	±2.96dB	(1)
Disturbance Power	30~300MHz	±2.90dB	(1)

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

3.6 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	2024/04/30	2025/04/29
Software:						
Name of Software:			Version:			
EZ_EMC			V1.1.4.2			

Radiated Emission(chamber 2)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2024/04/30	2025/04/29
2	Horn Antenna	Sunol Sciences Corp	DRH-118	A062013	2021/12/23	2024/12/22
3	Pre-amplifier	Agilent	8449B	3008A02306	2024/04/30	2025/04/29
Software:						
Name of Software:			Version:			
EZ_EMC			V1.1.4.2			

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2024/04/30	2025/04/29
2	LISN	ROHDE & SCHWARZ	ESH2-Z5	860014/010	2024/04/30	2025/04/29
3	Limitator	ROHDE & SCHWARZ	ESH3-Z2	100408	2024/04/30	2025/04/29
Software:						
Name of Software:			Version:			
ES-K1			V1.71			

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

Electrical Fast Transient/Surge/Dips						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Ultra Compact Simulator	HAEFELY	ECOMPACT4	174887	2023/08/02	2024/08/01

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	2024/04/30	2025/04/29

Conducted Susceptibility（CS）:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Conducted Disturbances test system	SCHLODER	CDG 6000	N/A	2024/04/30	2025/04/29
2	Attenuator	SCHLODER	4N100W-6DB	N/A	2024/04/30	2025/04/29
3	CDN	SCHLODER	CDN M2+M3	A2210225/2013	2024/04/30	2025/04/29
4	Electromagnetic forceps	SCHLODER	EMCL-20 EM-CLAMP	132A1223/2015	2024/04/30	2025/04/29

Software:	
Name of Software:	Version:
IEC/EN61000-4-6 Application software 10KHz Version	1.2.0(25.03.2013)

RF Field Strength Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	SIGNAL GENERATOR	Agilent	N5181A	MY49060125	2024/04/30	2025/04/29
2	Power Amplifier	MicoTop	MPA-80-1000-250	MPA1905162	2024/04/30	2025/04/29
3	Power Amplifier	MicoTop	MPA-1000-6000-100	MPA1906282	2024/04/30	2025/04/29
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 Conducted disturbance

For test instruments and accessories used see section 3.6.

4.1.1 Description of the test location

Test location: Conduction Lab

4.1.2 Limits of disturbance

Limit of disturbance voltage at the mains terminals

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	79	66
0.500～5.000	79-73	66-60
5.000～30.00	73	60

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

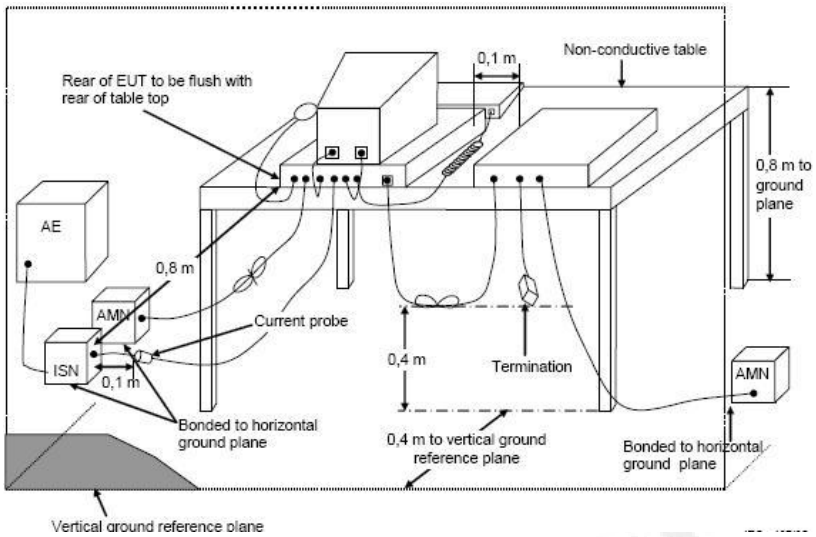
4.1.3 Description of the test set-up

4.1.3.1 Operating Condition

The EUT is set to work shall be carried out full load mode during the test, and the maximum emanating results are recorded.

4.1.3.2 Configuration of test setup

Mains terminals:



4.1.4 Test result

The requirements are **Fulfilled**

Frequency range	0.15-30MHz	Environmental conditions	Temperature	25℃
Resolution bandwidth	9kHz		Humidity	55.0%RH

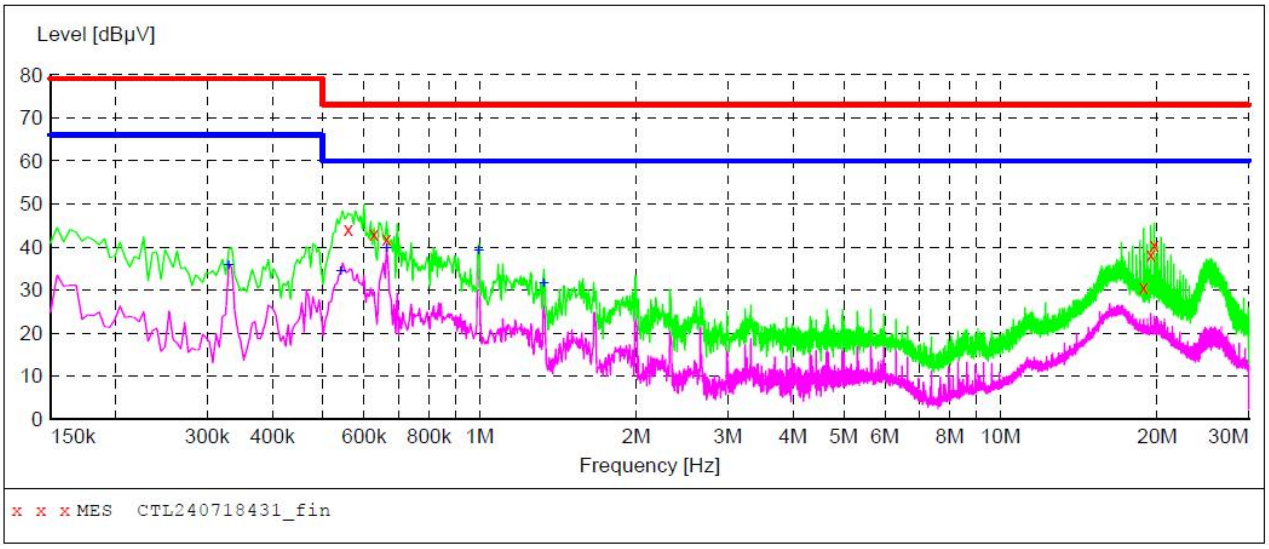
Remarks: The limits are kept. For detailed results, please see the following page(s).

Shenzhen CTL Testing Technology Co., Ltd.

Voltage Mains Test EN IEC 61000-6-4:2019

EUT: ICS5400-24GT16GS4XS-2HV
Manufacturer: /
Operating Condition: WORKING
Test Site: /
Operator: ZLL
Test Specification: AC 230V/50Hz
Comment: /
Start of Test: 7/18/2024 / 4:01:08PM

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL240718431_fin"

7/18/2024 4:03PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.559500	44.20	10.0	73	28.8	QP	N	GND
0.627000	43.00	10.0	73	30.0	QP	N	GND
0.663000	42.00	10.0	73	31.0	QP	N	GND
18.852000	30.60	11.2	73	42.4	QP	N	GND
19.446000	38.20	11.2	73	34.8	QP	N	GND
19.743000	40.40	11.2	73	32.6	QP	N	GND

MEASUREMENT RESULT: "CTL240718431_fin2"

7/18/2024 4:03PM

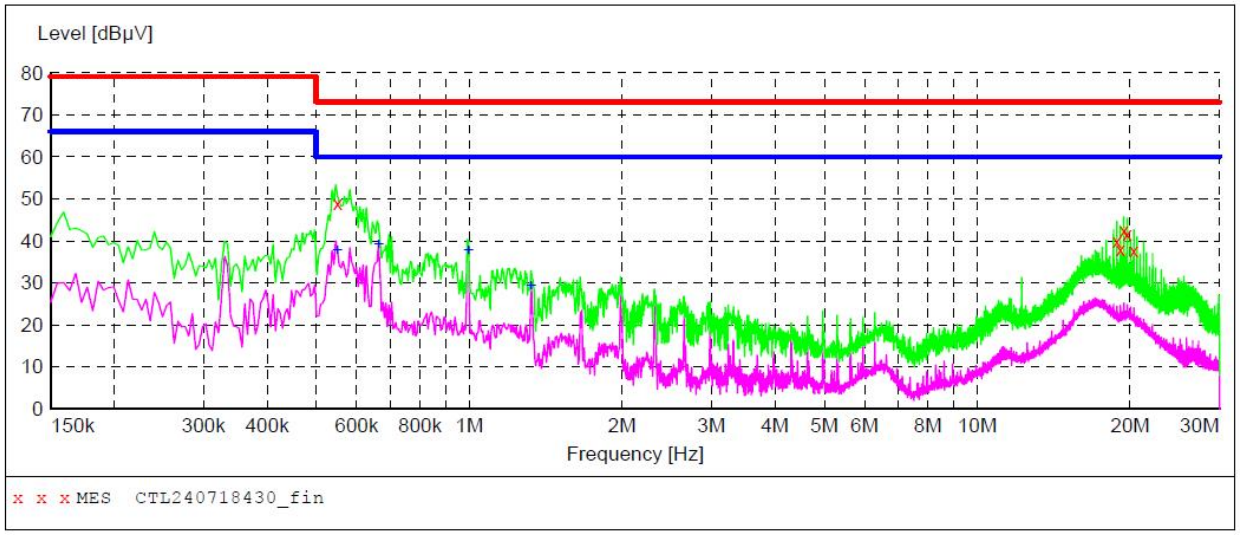
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.330000	35.70	10.0	66	30.3	AV	N	GND
0.541500	34.20	10.0	60	25.8	AV	N	GND
0.663000	39.50	10.0	60	20.5	AV	N	GND
0.996000	39.00	10.1	60	21.0	AV	N	GND
1.329000	31.40	10.1	60	28.6	AV	N	GND

Shenzhen CTL Testing Technology Co., Ltd.

Voltage Mains Test EN IEC 61000-6-4:2019

EUT: ICS5400-24GT16GS4XS-2HV
Manufacturer: /
Operating Condition: WORKING
Test Site: /
Operator: ZLL
Test Specification: AC 230V/50Hz
Comment: /
Start of Test: 7/18/2024 / 3:58:18PM

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL240718430_fin"

7/18/2024 4:00PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.550500	49.00	10.0	73	24.0	QP	L1	GND
18.847500	40.00	11.2	73	33.0	QP	L1	GND
19.135500	37.90	11.2	73	35.1	QP	L1	GND
19.446000	42.60	11.2	73	30.4	QP	L1	GND
19.743000	41.70	11.2	73	31.3	QP	L1	GND
20.341500	37.70	11.1	73	35.3	QP	L1	GND

MEASUREMENT RESULT: "CTL240718430_fin2"

7/18/2024 4:00PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.550500	37.60	10.0	60	22.4	AV	L1	GND
0.663000	39.10	10.0	60	20.9	AV	L1	GND
0.996000	37.70	10.1	60	22.3	AV	L1	GND
1.324500	29.20	10.1	60	30.8	AV	L1	GND

Communication terminal:

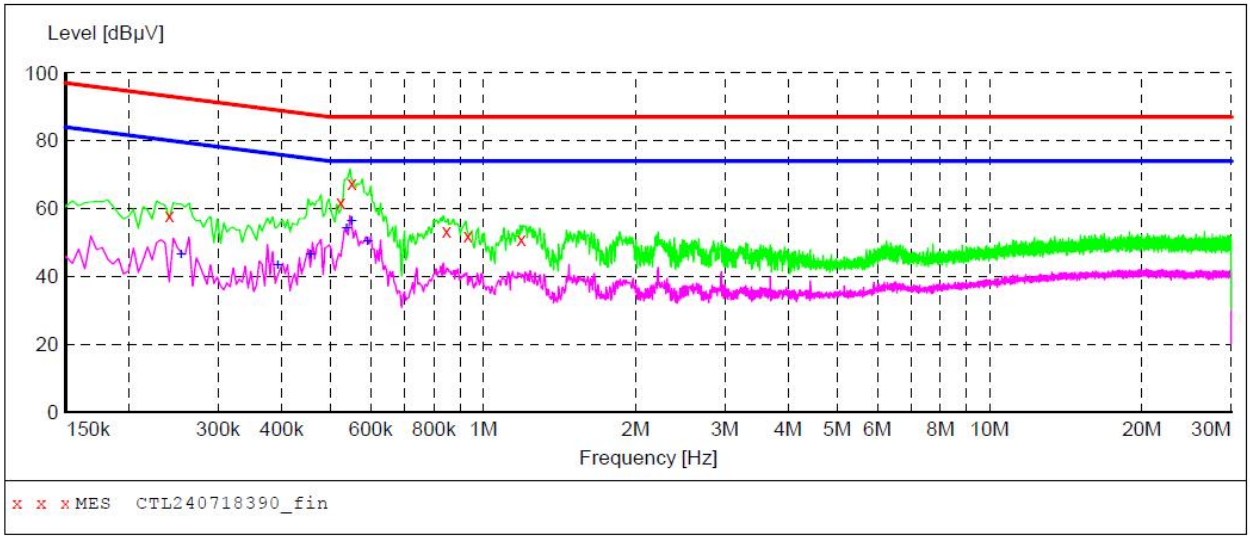
Shenzhen CTL Testing Technology Co., Ltd.

Voltage Mains Test EN IEC 61000-6-4:2019 NET

```
EUT:                 ICS5400-24GT16GS4XS-2HV
Manufacturer:        /
Operating Condition: WORKING
Test Site:           /
Operator:            DENG CHAO
Test Specification:  AC 230V/50Hz
Comment:             LAN
Start of Test:       7/18/2024 / 4:40:18PM
```

SCAN TABLE: "Voltage (9K-30M)NFIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL240718390_fin"

7/18/2024 4:43PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.240000	58.00	19.3	93	35.1	QP	NET	GND
0.523500	61.70	19.3	87	25.3	QP	NET	GND
0.550500	67.40	19.3	87	19.6	QP	NET	GND
0.847500	53.30	19.4	87	33.7	QP	NET	GND
0.933000	52.00	19.4	87	35.0	QP	NET	GND
1.189500	50.80	19.5	87	36.2	QP	NET	GND

MEASUREMENT RESULT: "CTL240718390_fin2"

7/18/2024 4:43PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.253500	46.30	19.3	80	33.3	AV	NET	GND
0.393000	43.10	19.3	76	32.9	AV	NET	GND
0.456000	46.40	19.3	75	28.4	AV	NET	GND
0.537000	54.30	19.3	74	19.7	AV	NET	GND
0.550500	56.10	19.3	74	17.9	AV	NET	GND
0.591000	50.30	19.3	74	23.7	AV	NET	GND

4.2 Radiated Emission

For test instruments and accessories used see section 3.6.

4.2.1 Description of the test location

Test location: Radiation chamber 1#

4.2.2 Limits of disturbance

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)
30 ~ 230	3	50
230 ~ 1000	3	57

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.

4.2.3 Description of the test set-up

4.2.3.1 Operating Condition

The EUT is Charging during the test, and the results of the maximum emanation are recorded.

4.2.3.2 Test Configuration and Procedure

EUT is tested in Semi-Anechoic Chamber. EUT is placed on a nonmetal table which is 0.8 meter above a grounded turntable. The turntable can rotate 360 degrees to determine the azimuth of the maximum emission level. EUT is set 3 meters away from the center of receiving antenna. The antenna can move up and down from 1 to 4 meter to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna are set on the test.

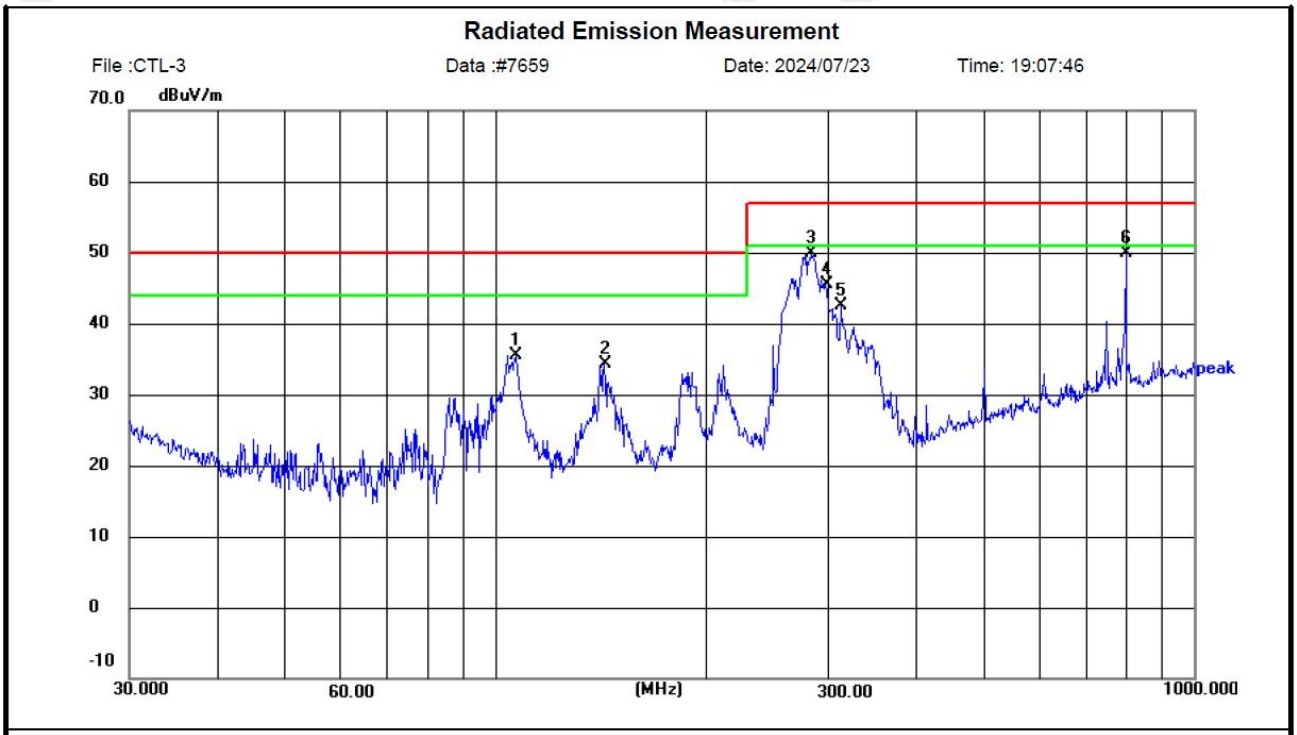
4.2.4 Test result

The requirements are **Fulfilled**

Frequency range	30-1000MHz	Environmental conditions	Temperature	25℃
Detector function& Resolution bandwidth	Quasi-Peak, 100kHz		Humidity	55.0%RH

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

30-1000MHz

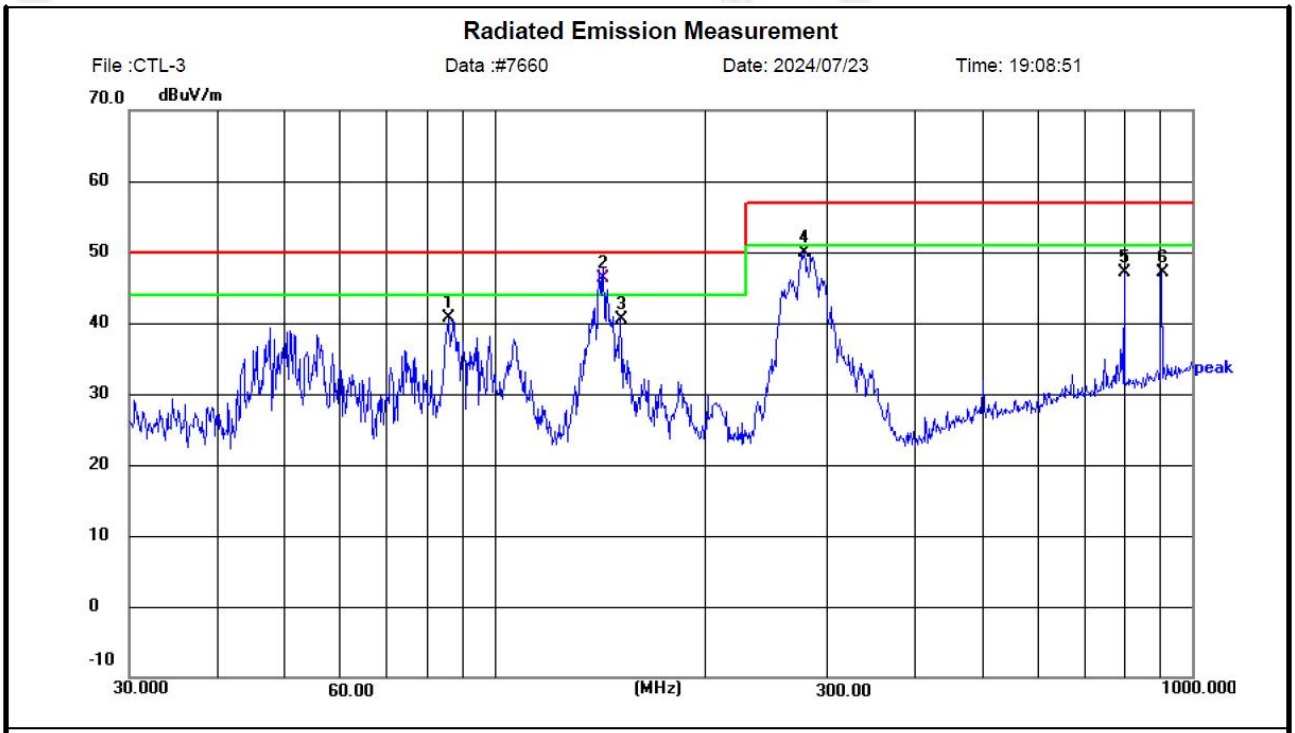


Site LAB Chamber 1
Limit: EN IEC 61000-6-4:2019
EUT: /
M/N: ICS5400-24GT16GS4XS-2HV
Mode: WORKING
Note: 接屏蔽网线

Polarization: *Horizontal*
Power: AC 230V/50Hz
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	107.1337	23.27	12.23	35.50	50.00	14.50	peak	100	349	P	
2	143.3260	18.34	15.87	34.21	50.00	15.79	peak	100	349	P	
3	283.9791	34.45	15.36	49.81	57.00	7.19	peak	100	305	P	
4	297.2240	29.45	16.02	45.47	57.00	11.53	peak	100	66	P	
5	312.1794	26.16	16.29	42.45	57.00	14.55	peak	100	78	P	
6	798.9797	23.82	26.10	49.92	57.00	7.08	peak	100	323	P	



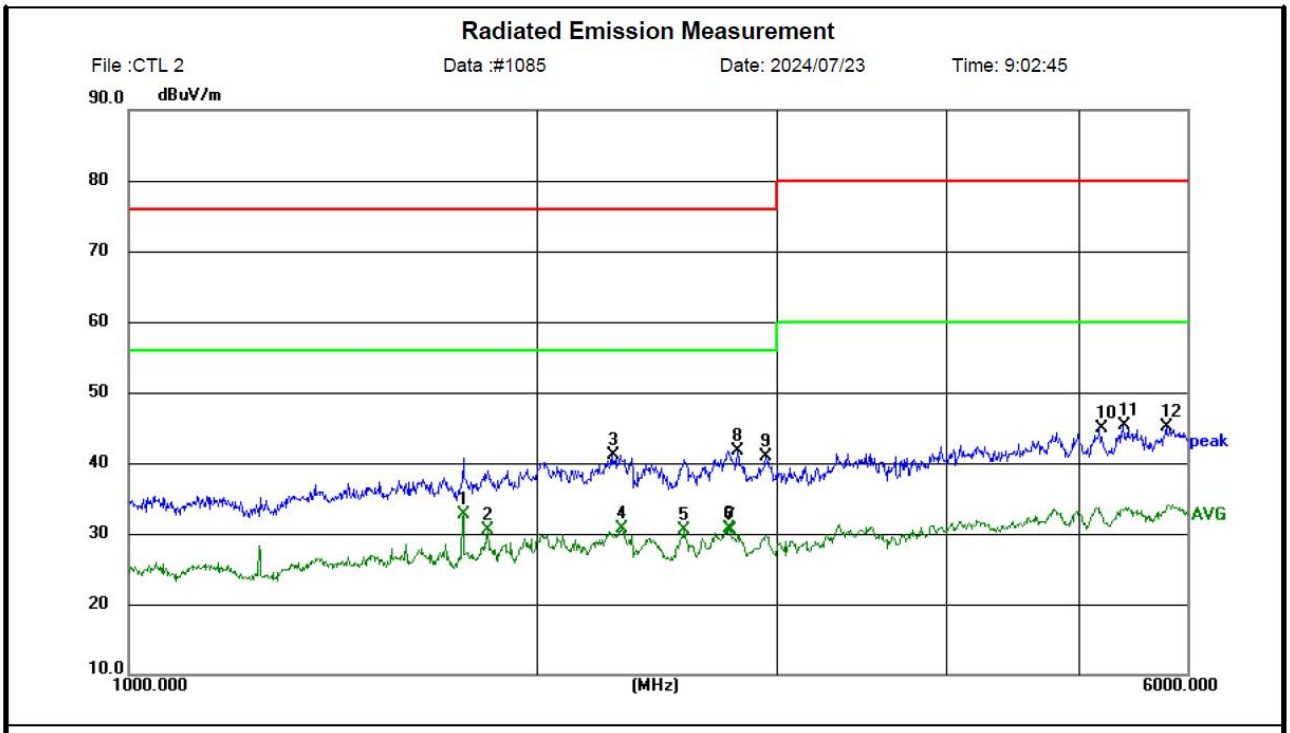
Site LAB Chamber 1
Limit: EN IEC 61000-6-4:2019
EUT: /
M/N: ICS5400-24GT16GS4XS-2HV
Mode: WORKING
Note: 接屏蔽网线

Polarization: *Vertical*
Power: AC 230V/50Hz
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	85.8984	30.32	10.41	40.73	50.00	9.27	peak	100	303	P	
2	143.3061	30.50	15.87	46.37	50.00	3.63	QP	100	0	P	
3	151.5972	23.81	16.79	40.60	50.00	9.40	peak	100	296	P	
4	278.0668	34.90	14.97	49.87	57.00	7.13	peak	100	226	P	
5	798.9797	21.03	26.10	47.13	57.00	9.87	peak	100	219	P	
6	903.3094	19.91	27.18	47.09	57.00	9.91	peak	100	60	P	

Above 1000MHz

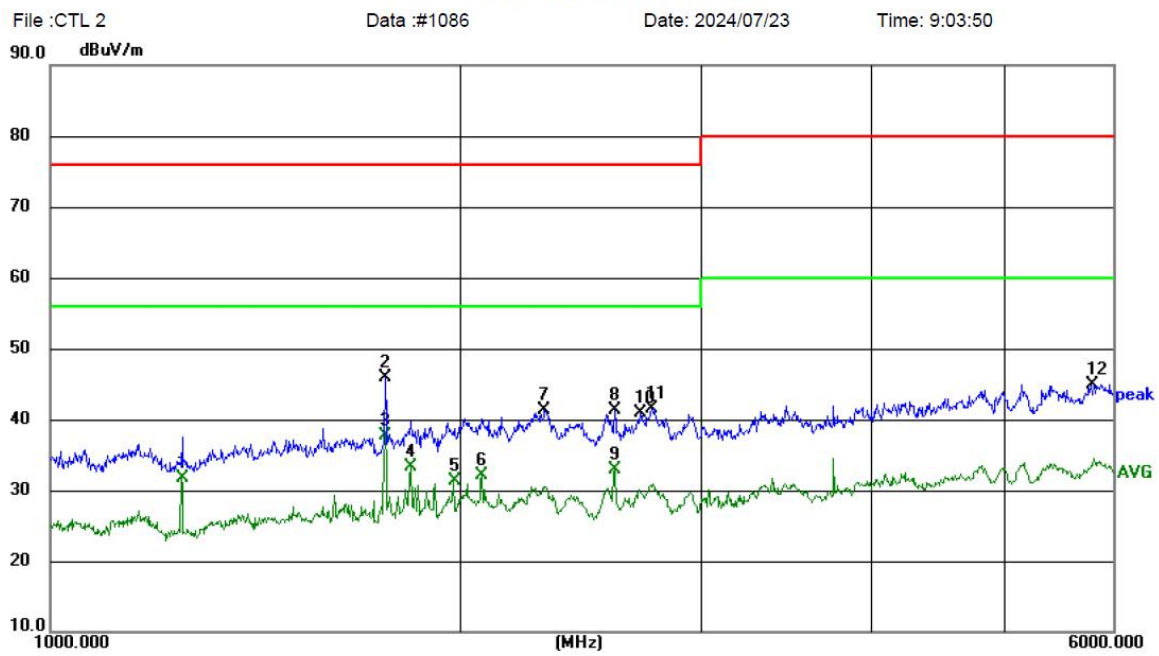


Site LAB Chamber 2
Limit: EN IEC 61000-6-4:2019
EUT: /
M/N: ICS5400-24GT16GS4XS-2HV
Mode: WORKING
Note: /
/

Polarization: ***Horizontal***
Power: AC 230V/50Hz
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	1762.342	36.71	-3.99	32.72	56.00	23.28	AVG	100	36	P	
2	1836.075	33.94	-3.39	30.55	56.00	25.45	AVG	100	52	P	
3	2269.378	42.42	-1.34	41.08	76.00	34.92	peak	100	67	P	
4	2308.338	31.92	-1.29	30.63	56.00	25.37	AVG	100	131	P	
5	2559.986	31.64	-1.15	30.49	56.00	25.51	AVG	100	83	P	
6	2758.215	31.47	-0.73	30.74	56.00	25.26	AVG	100	4	P	
7	2768.117	31.21	-0.73	30.48	56.00	25.52	AVG	100	4	P	
8	2806.195	42.45	-0.73	41.72	76.00	34.28	peak	100	241	P	
9	2941.993	41.46	-0.50	40.96	76.00	35.04	peak	100	0	P	
10	5181.316	38.18	6.68	44.86	80.00	35.14	peak	100	304	P	
11	5390.843	38.13	7.09	45.22	80.00	34.78	peak	100	36	P	
12	5793.984	37.31	7.80	45.11	80.00	34.89	peak	100	179	P	



Site LAB Chamber 2
Limit: EN IEC 61000-6-4:2019
EUT: /
M/N: ICS5400-24GT16GS4XS-2HV
Mode: WORKING
Note: /
/

Polarization: *Vertical*
Power: AC 230V/50Hz
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	1249.913	39.08	-7.33	31.75	56.00	24.25	AVG	100	120	P	
2	1759.582	49.97	-4.01	45.96	76.00	30.04	peak	100	246	P	
3	1759.582	41.72	-4.01	37.71	56.00	18.29	AVG	100	246	P	
4	1836.076	36.63	-3.39	33.24	56.00	22.76	AVG	100	357	P	
5	1976.478	33.71	-2.36	31.35	56.00	24.65	AVG	100	199	P	
6	2070.732	34.05	-1.88	32.17	56.00	23.83	AVG	100	326	P	
7	2304.206	42.63	-1.30	41.33	76.00	34.67	peak	100	9	P	
8	2591.716	42.33	-1.10	41.23	76.00	34.77	peak	100	278	P	
9	2591.716	33.98	-1.10	32.88	56.00	23.12	AVG	100	278	P	
10	2705.596	41.78	-0.80	40.98	76.00	35.02	peak	100	9	P	
11	2760.069	42.22	-0.73	41.49	76.00	34.51	peak	100	357	P	
12	5788.796	37.17	7.81	44.98	80.00	35.02	peak	100	120	P	

4.3 Electrostatic discharge

For test instruments and accessories used see section 3.6.

4.3.1 Description of the test location and date

Test location: 1# EMC Test Room

Date of test: Jul. 23, 2024

Operator: HONG

4.3.2 Severity levels of electrostatic discharge

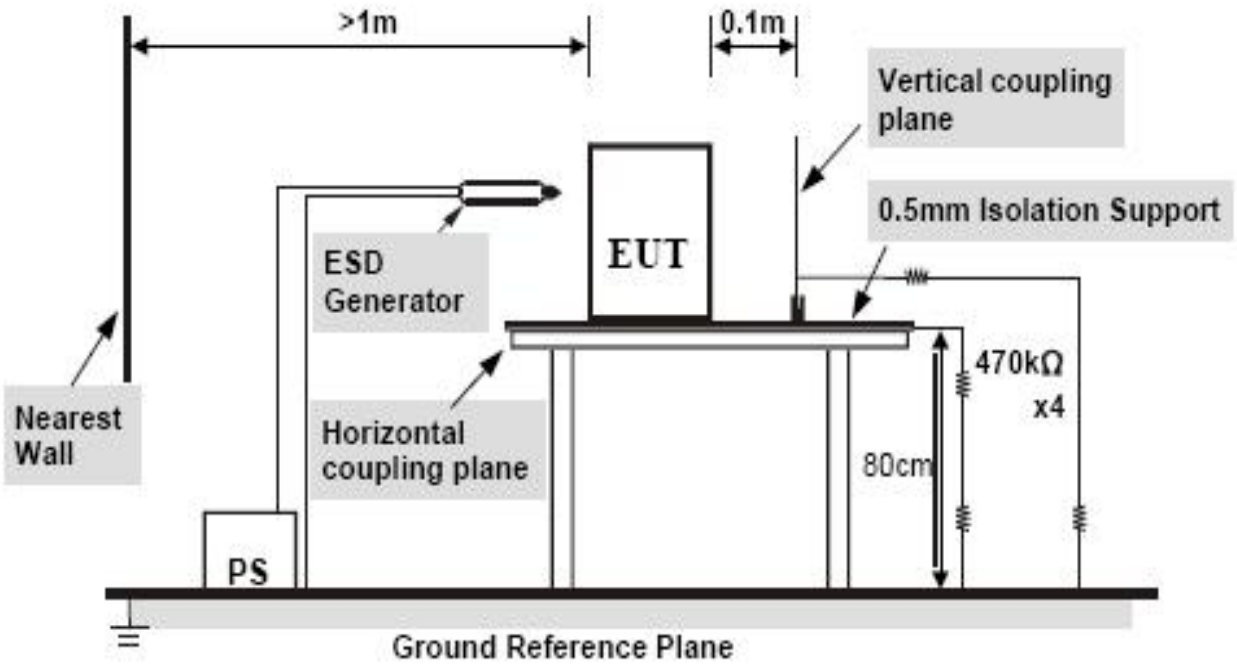
Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

4.3.3 Description of the test set-up

4.3.3.1 Operating Condition

The EUT is Charging during the test, and the results of the maximum susceptivity are recorded.

4.3.3.2 Configuration of test setup:



4.3.4 Test specification:

Contact discharge voltage:	■ 2 kV	■ 4 kV	
Air discharge voltage:	■ 2 kV	■ 4 kV	■ 8 kV
Number of discharges:	■ ≥ 10	☐ ≥ 25	
Type of discharge:	Direct discharge	■ Air discharge ■ Contact discharge	
	Indirect discharge	■ Contact discharge	
Polarity:	■ Positive	■ Negative	
Discharge location:	■ see photo documentation of the test set-up		
	■ all external locations accessible by hand		
	■ horizontal plate (HCP)		
	■ vertical coupling plate (VCP)		

4.3.5 Test result

Environmental conditions	**Temperature**	25℃
	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).

4.4 Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 3.6.

4.4.1 Description of the test location and date

Test location: Chamber 2

Date of test: Jul. 23, 2024

Operator: HONG

4.4.2 Severity levels of radiated, radio-frequency, electromagnetic field

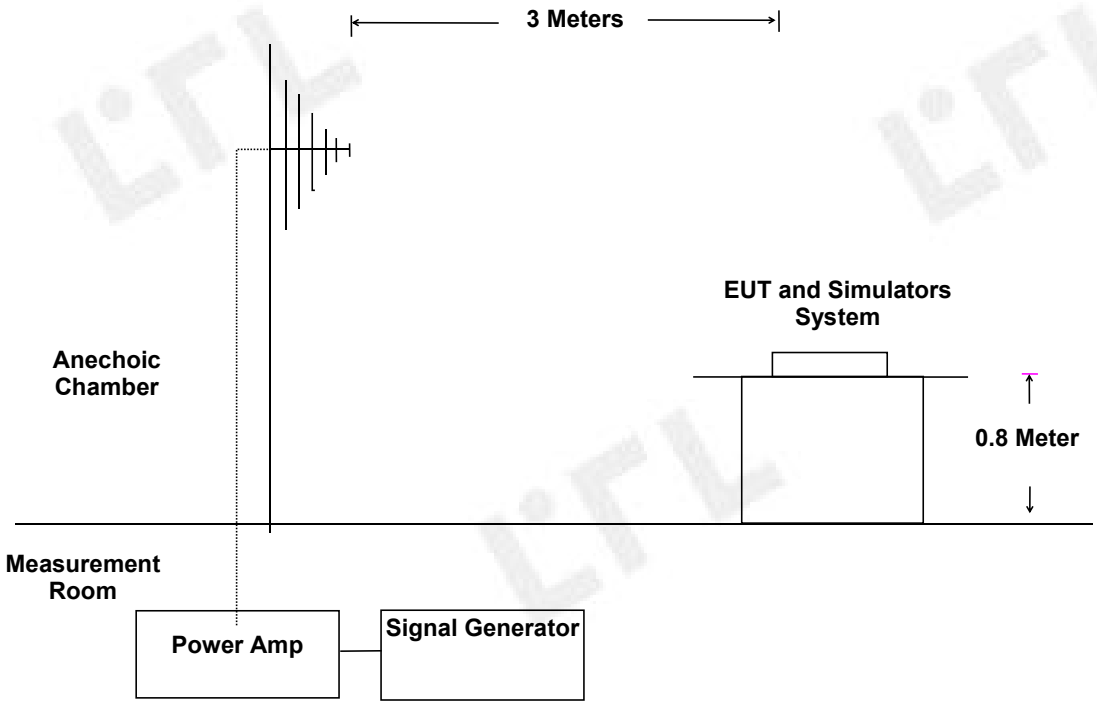
Level	Field Strength (V/m)
1.	1
2.	3
3.	10
X	Special

4.4.3 Description of the test set-up

4.4.3.1 Operating Condition

The EUT is put on the test table, and the results of the maximum susceptive results are recorded.

4.4.3.2 Test Configuration and Procedure



4.4.4 Test specification:

Frequency range: ■ 80 MHz to 1000 MHz
■ 1400 MHz to 6000 MHz

Field strength: ■ 10 V/m
■ 3 V/m

EUT - antenna separation: ■ 3 m

Modulation: ■ AM: 80 %
■ sinusoidal 1000Hz

Frequency step: ■ 1 % with 1 s dwell time

Antenna polarisation: ■ horizontal ■ vertical

4.4.5 Test result

Environmental conditions	Temperature	25℃
	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).

4.5 Electrical fast transients / Burst

For test instruments and accessories used see section 3.6.

4.5.1 Description of the test location and date

Test location: 2# EMC Test Room

Date of test: Jul. 23, 2024

Operator: HONG

4.5.2 Severity levels of electrical fast transients / Burst

Open circuit output test voltage and repetition rate of the impulses		
Level	**On power port, PE**	
	V peak(KV)	**Repetition rate (KHz)**
	0.5	5 or 100
	1	5 or 100
	2	5 or 100
	4	5 or 100
X	Special	Special

4.5.3 Description of the test set-up

4.5.3.1 Operating Condition

The EUT is ON during the test, and the results of the maximum susceptive results are recorded.

4.5.3.2 Test Configuration and Procedure

For AC power input ports:The EUT is connected to coupling/decoupling network which couples the EFT signal to power input lines. During the test, both polarities of the test voltage should be applied and the duration of the test can't be less than 1mins.

Without signal / control lines and DC power lines, The EUT is unnecessary to test on these mentioned ports.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.5.4 Test specification:

Coupling network: ■ 0.5 kV ■ 1 kV ■ 2 kV

Coupling clamp: ■ 0.5 kV ■ 1 kV □ 2 kV

Burst frequency: ■ 5.0 kHz ■ 100 kHz

Coupling duration: ■ 60 s

Polarity: ■ positive ■ negative

4.5.5 Coupling points

Cable description: AC power line : L, N, PE, L+N, L+PE, N+PE, L+N+PE, Signal line

Screening:	o screened	■ unscreened
Status:	o passive	■ active
Signal transmission:	■ analogue	o digital
Length:	■ 0.8 m	

4.5.6 Test result

Environmental conditions	**Temperature**	25℃
	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).

4.6 Surge

For test instruments and accessories used see section 3.6.

4.6.1 Description of the test location and date

Test location: 2# EMC Test Room

Date of test: Jul. 23, 2024

Operator: HONG

4.6.2 Severity levels of surge

Level	Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

4.6.3 Description of the test set-up

4.6.3.1 Operating Condition

The EUT is ON during the test, and the results of the maximum susceptive results are recorded.

4.6.3.2 Test Configuration and Procedure

In this test, the 1.2/50us& 8/20us surge generator must be used for AC power ports. The voltage for line to earth coupling mode is 1 time more than that for line to line. At least 5 positive and 5 negative (polarity) surge signal with a maximum 1/min repetition rate are injected to AC power lines from 4 different phase angle(0°,90°,180°,270°) during the test.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.6.4 Test specification:

Pulse amplitude-Power line sym.: ■ 0.5 kV ■ 1 kV □ 2 kV □ 4 kV
Source impedance: 2 Ω

Pulse amplitude-Power line unsym: ■ 0.5 kV ■ 1 kV ■ 2 kV □ 4 kV
Source impedance: 12 Ω

Number of surges: ■ 5 Surges/Phase angle

Phase angle: ■ 0 ° ■ 90 ° ■ 180 ° ■ 270 °

Repetition rate: ■ 60 s

Polarity: ■ positive ■ negative

4.6.5 Coupling points

Cable description: AC power line: L-PE, L-N, N-PE

Screening:	o screened	■ unscreened
Status:	o passive	■ active
Signal transmission:	■ analogue	o digital
Length:	■ 0.8 m	

4.6.6 Test result

Environmental conditions	**Temperature**	25℃
	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).

4.7 Conducted disturbances induced by radio-frequency fields

For test instruments and accessories used see section 3.6.

4.7.1 Description of the test location date

Test location: 3# EMC Test Room

Date of test: Jul. 23, 2024

Operator: HONG

4.7.2 Severity levels of conducted disturbances induced by radio-frequency fields

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

4.7.3 Description of the test set-up

4.7.3.1 Operating Condition

The EUT is ON during the test, and the results of the maximum susceptive results are recorded.

4.7.3.2 Test Configuration and Procedure

EUT is placed on an insulating support of 0.1m high above a ground reference plane. It must be 0.3m away the CDN (coupling and decoupling network) of which the bottom is made of metallic material and placed directly on the ground plane. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible). The disturbance signal amplified by amplifier is injected to EUT through CDN.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.7.4 Test specification:

Frequency range: ■ 0.15 MHz to 80 MHz

Test voltage: ■ 10 V

Modulation: ■ AM: 80 %
■ sinusoidal 1000Hz

Frequency step: ■ 1 % with 1 s dwell time

4.7.5 Coupling points

Cable description (Port1): AC power line, Signal line

Screening:	o screened	■ unscreened
Status:	o passive	■ active
Signal transmission:	■ analogue	o digital
Length:	■ 0.8 m	

4.7.6 Test result

Environmental conditions	**Temperature**	25℃
	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).

4.8 Magnetic Field Immunity

For test instruments and accessories used see section 3.6.

4.8.1 Description of the test location and date

Test location: 3# EMC Test Room

Date of test: Jul. 23, 2024

Operator: HONG

4.8.2 Severity levels of magnetic field immunity

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

4.8.3 Description of the test set-up

4.8.3.1 Operating Condition

The EUT is ON during the test, and the results of the maximum susceptive results are recorded.

4.8.3.2 Test Configuration and Procedure:

EUT is placed on an insulating support of 0.1m high above a table of 0.8m high. There is a minimum 1m*1m ground metallic plane put on this table. EUT is put in the center of the magnetic coil then two orientations of the magnetic coil, horizontal and vertical, shall be rotated in order to expose the EUT to the difference polarization magnetic field.

Record any performance degradation of the EUT during the test and judge the test result according to performance criterion.

4.8.4 Test specification:

Test frequency: ■ 50 Hz

Continuous field: ■ 30 A/m

Test duration: ■ 5 m

Antenna factor: 0.917 A/m

Axis: ■ x-axis ■ y-axis ■ z-axis

4.8.5 Test result

Environmental conditions	Temperature	25℃
	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).

4.9 Voltage dips and short interruptions

For test instruments and accessories used see section 3.6.

4.9.1 Description of the test location and date

Test location: 2# EMC Test Room

Date of test: Jul. 23, 2024

Operator: HONG

4.9.2 Severity levels of voltage Dips and Interruptions

Test Level (%Ut)	Voltage Dip And Short Interruptions (%Ut)	Performance Criterion	Duration (In Period)
0	100	B	1
40	60	C	10
70	30	C	25
0	100	C	250

4.9.3 Description of the test set-up

4.9.3.1 Operating Condition

The EUT is ON during the test, and the results of the maximum susceptive results are recorded.

4.9.3.2 Test Configuration and Procedure

EUT is connected to the simulator according to the setup outline of 12.3. When conducting the test level of 0.5 period duration, make sure that it shall start at the phase angle of 0° and 180°

4.9.4 Test specification:

Nominal Mains Voltage (V_N): ■ 230 V AC

Number of voltage fluctuations: ■ 3

Level of reduction(dip) / duration: ■ 100 % / 20ms ■ 40 % / 200ms ■ 30 % / 500ms

Nominal Mains Voltage (V_N): ■ 230 V AC

Number of Interruptions: ■ 3

Duration of the Interruption: ■ 100 % /5000 ms

4.9.5 Test result

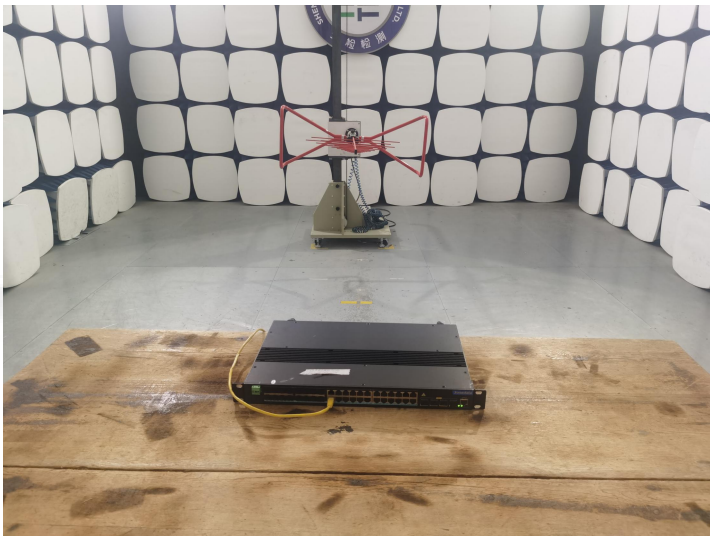
Environmental conditions	Temperature	25℃
	Humidity	55.0%RH

The requirements are **Fulfilled**
Performance Criterion **See section 4.11.2**

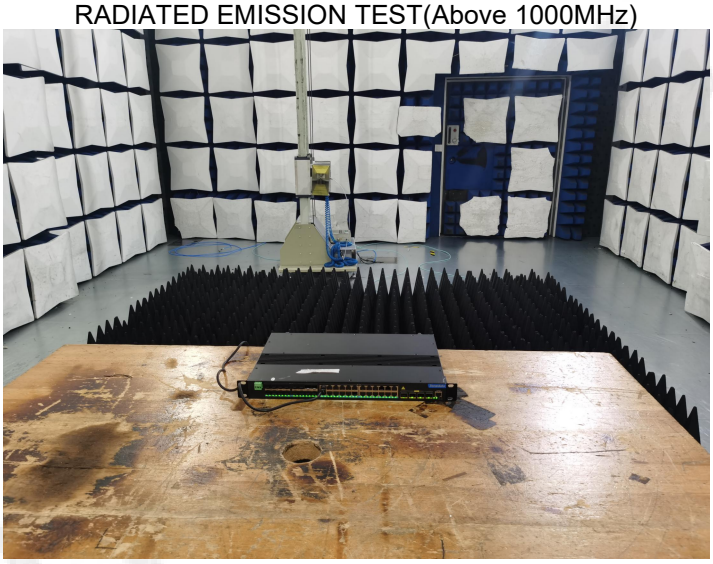
Remarks: During the test no deviation was detected to the selected operation mode(s).

5 Test Setup Photos

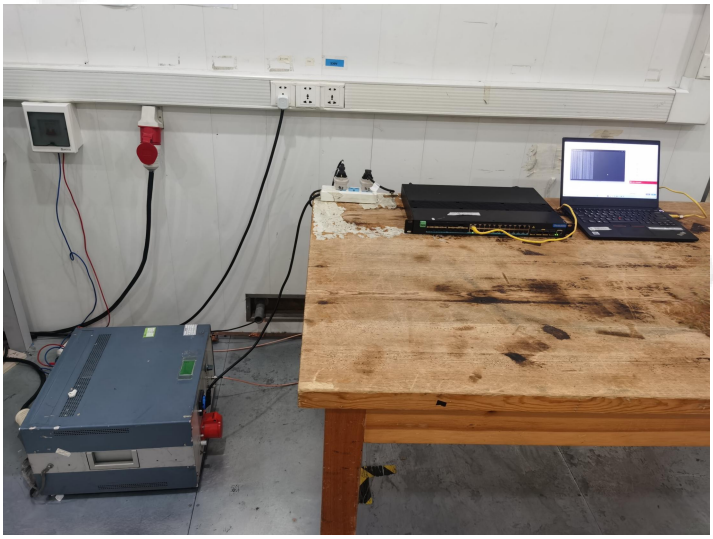
RADIATED EMISSION TEST（30-1000MHz）



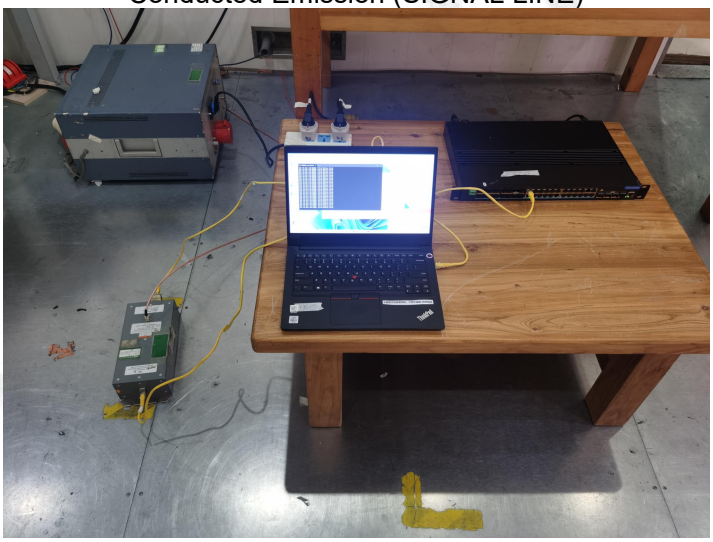
RADIATED EMISSION TEST(Above 1000MHz)



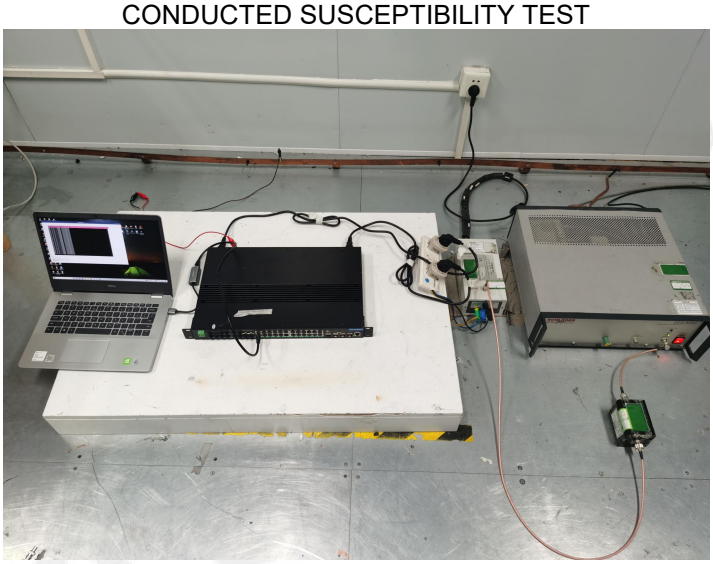
CONDUCTION EMISSION TEST



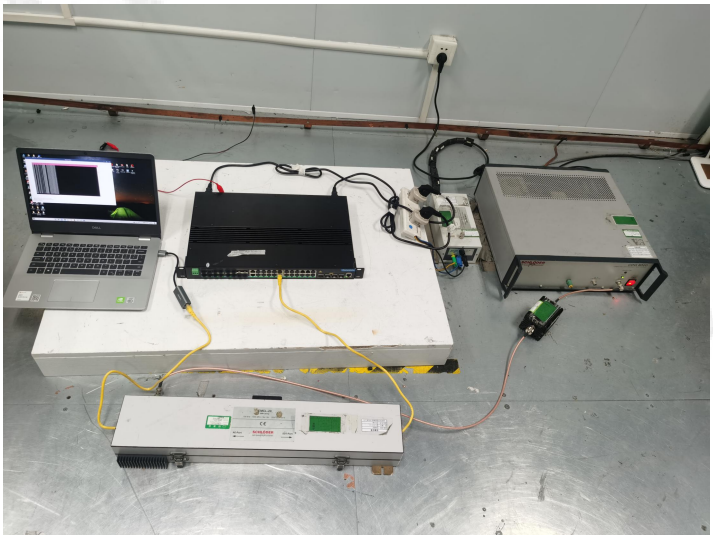
Conducted Emission (SIGNAL LINE)



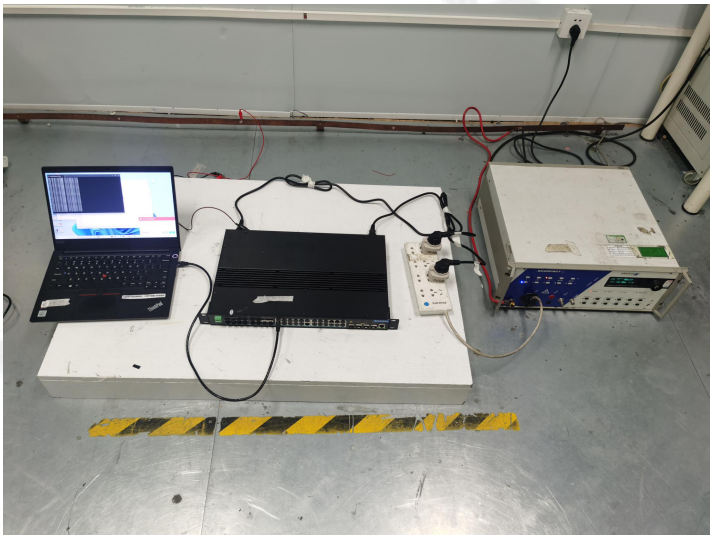
CONDUCTED SUSCEPTIBILITY TEST



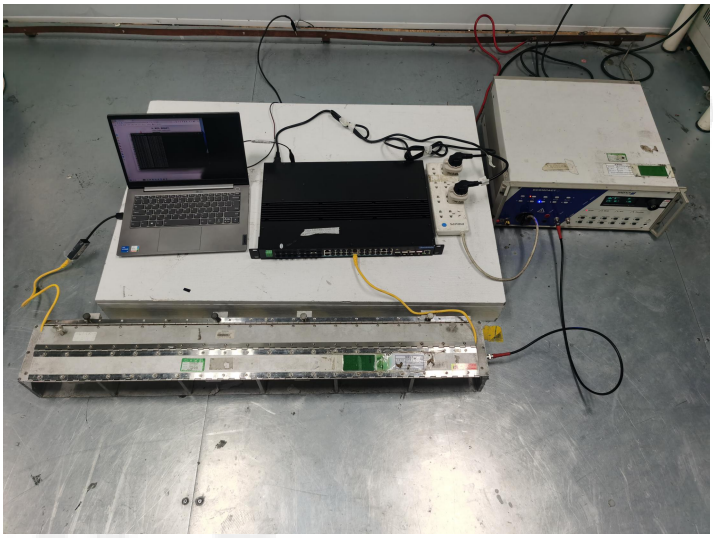
CONDUCTED SUSCEPTIBILITY SIGNAL LINE TEST



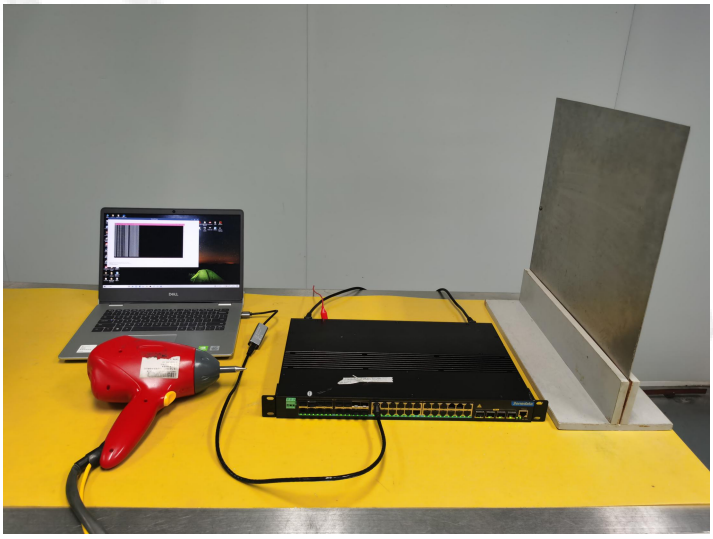
EFT/B TEST&SURGE TEST&VOLTAGE DIPS AND INTERRUPTIONS TEST



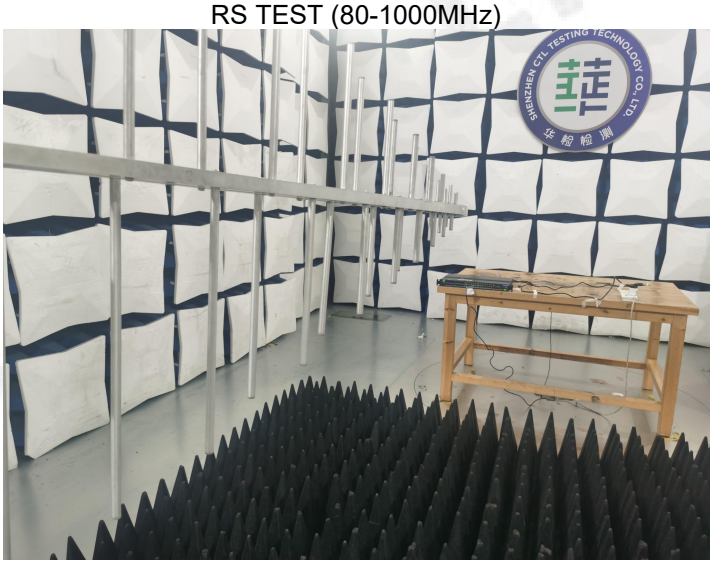
EFT/B SIGNAL LINE TEST



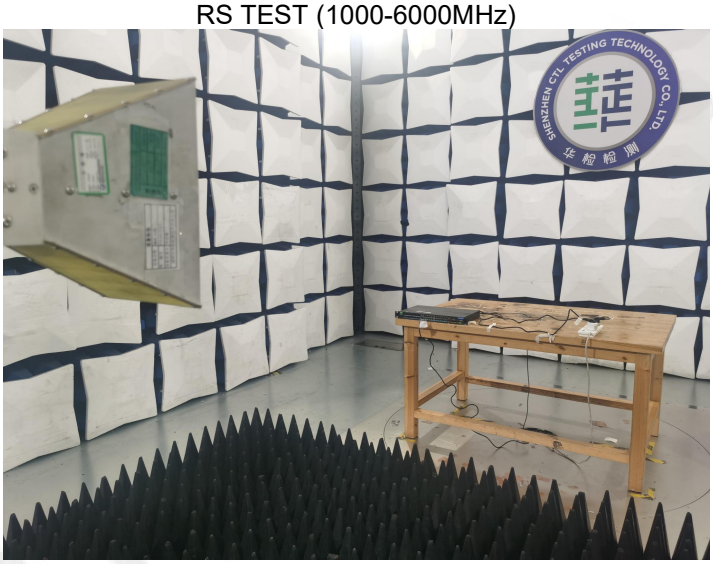
ESD TEST



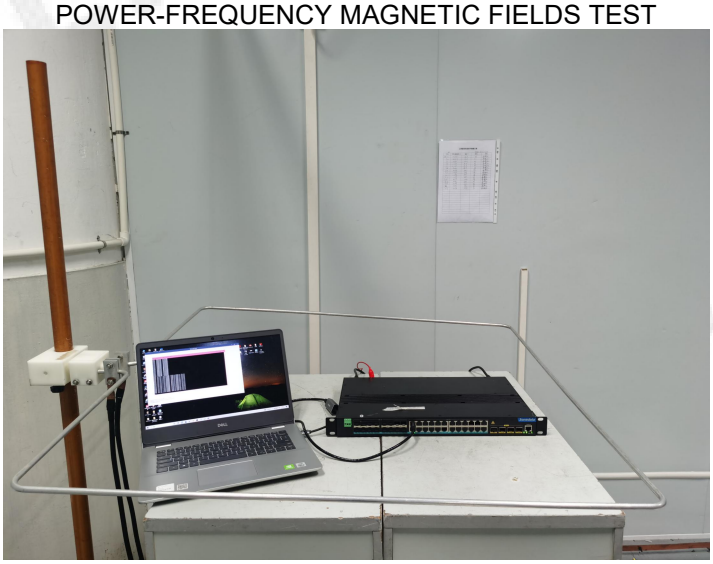
RS TEST (80-1000MHz)



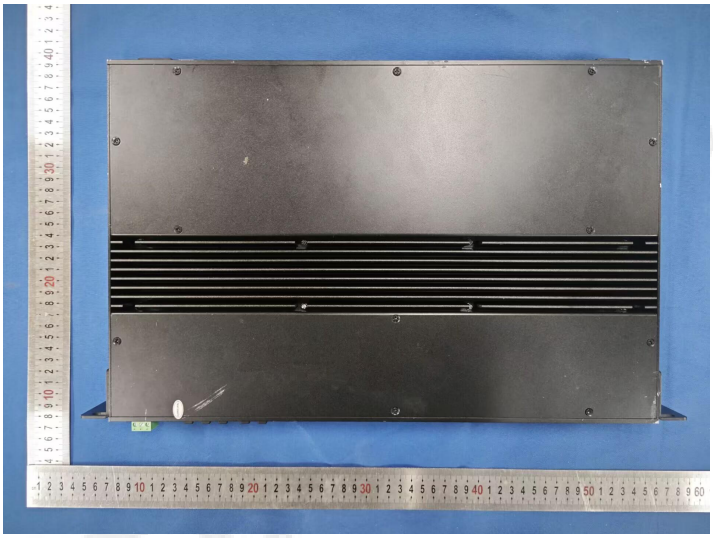
RS TEST (1000-6000MHz)

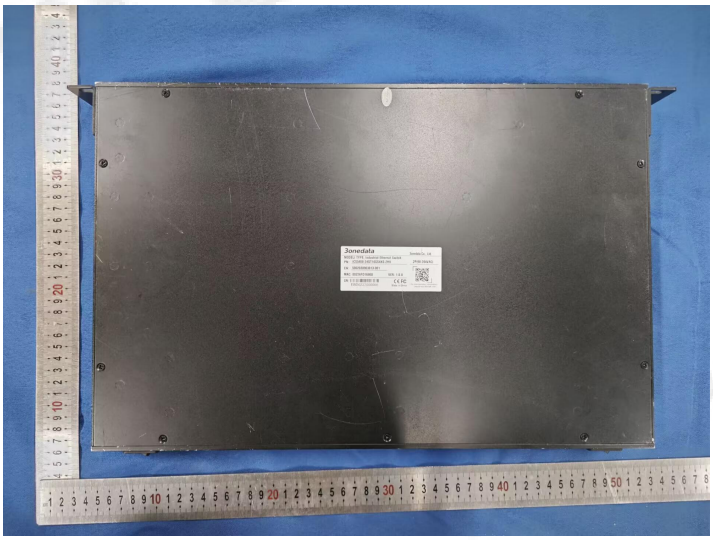


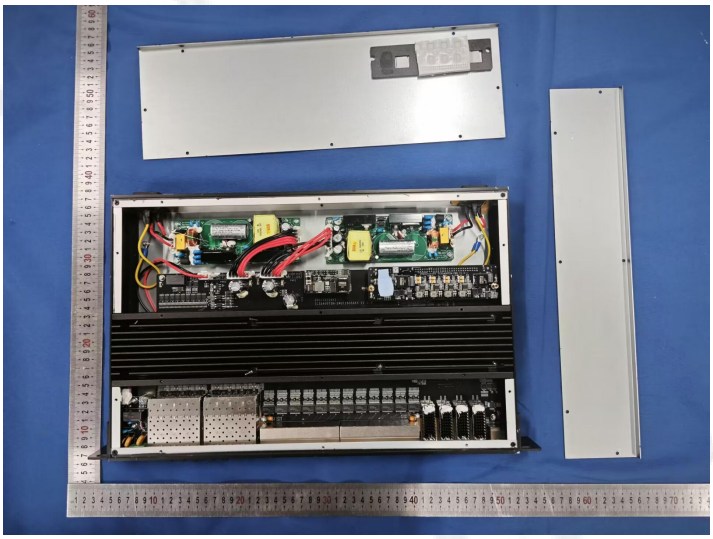
POWER-FREQUENCY MAGNETIC FIELDS TEST

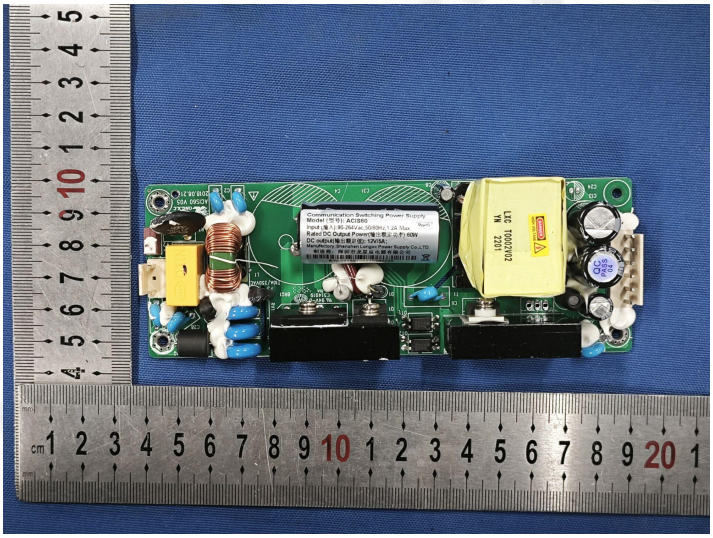


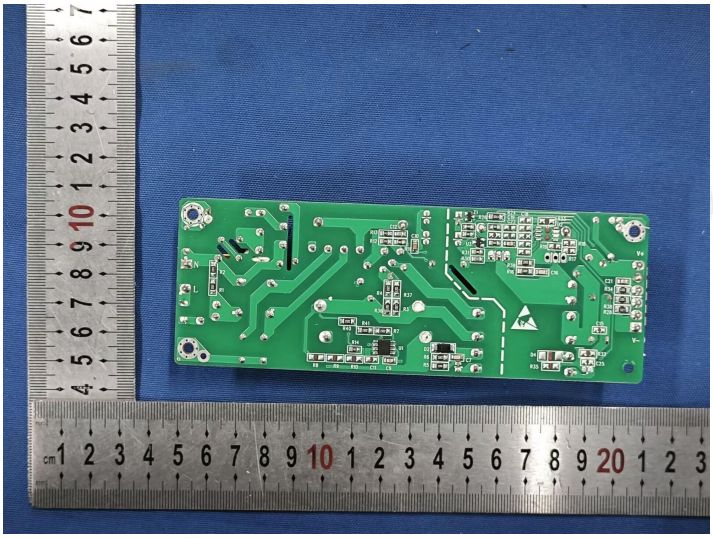
6 External and Internal Photos of the EUT

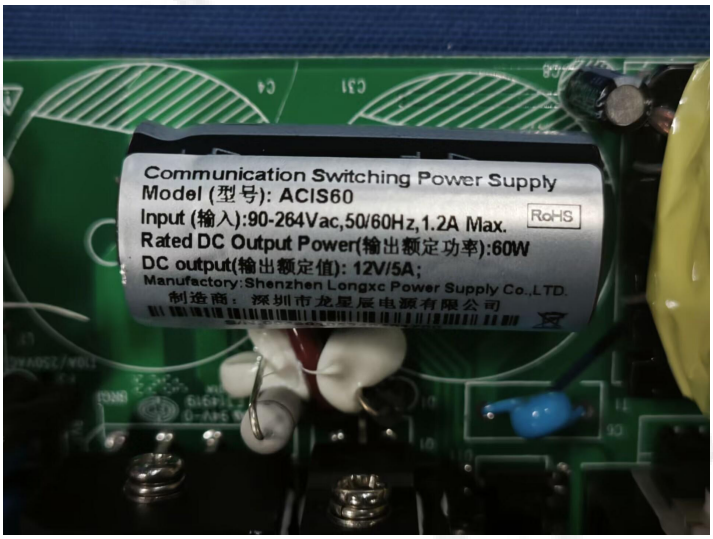


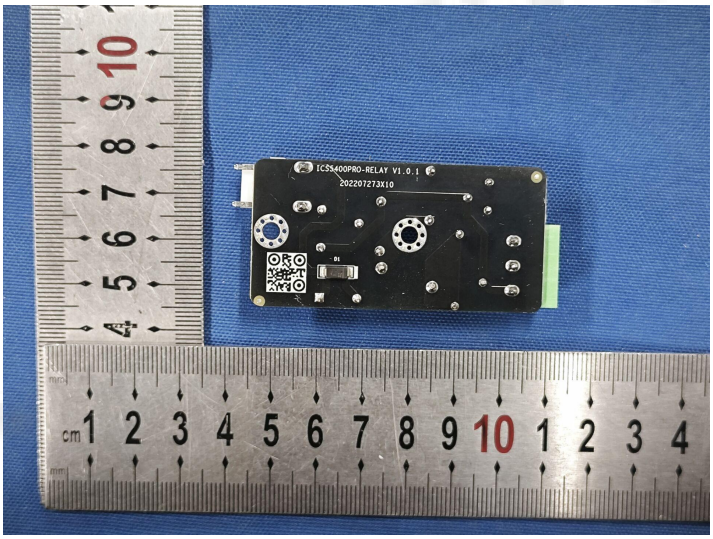









Communication Switching Power Supply
Model (型号): ACIS60
Input (输入):90-264Vac,50/60Hz,1.2A Max.
RoHS
Rated DC Output Power(输出额定功率):60W
DC output(输出额定值): 12V/5A;
Manufactory:Shenzhen Longxc Power Supply Co.,LTD.
制造商：深圳市龙星辰电源有限公司


ICS5400PRO-RELAY V1.0.1
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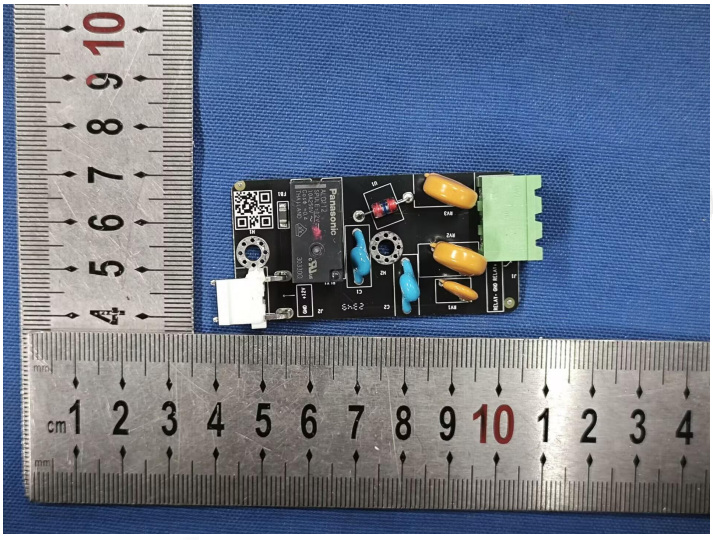
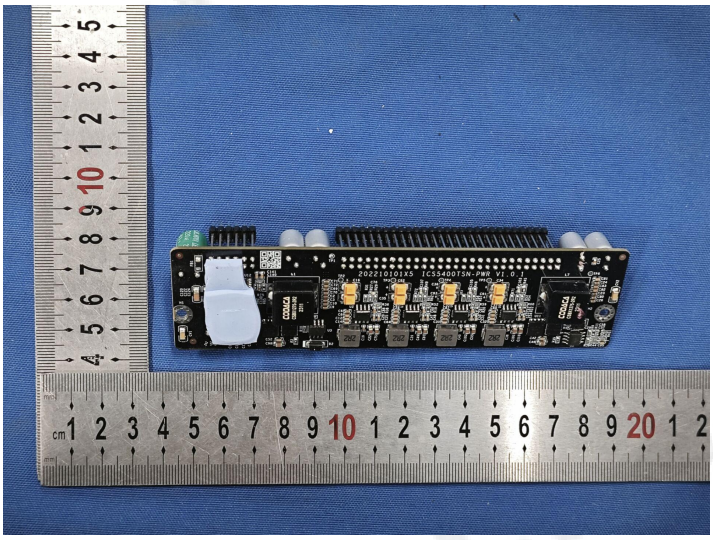

Panasonic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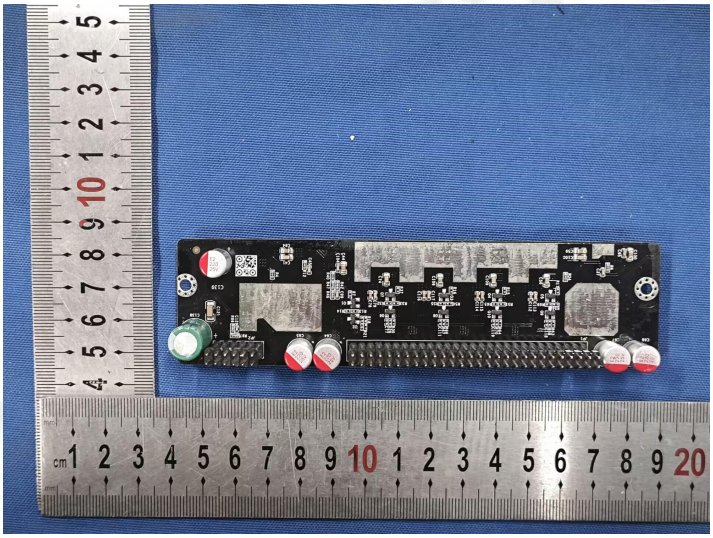

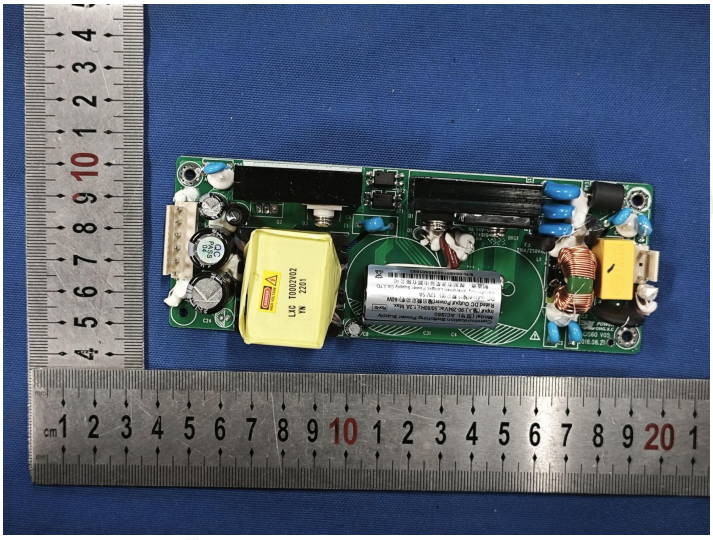

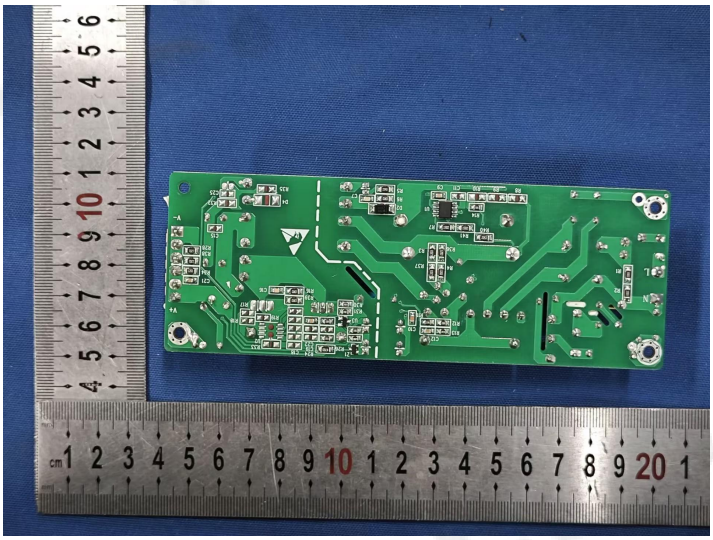

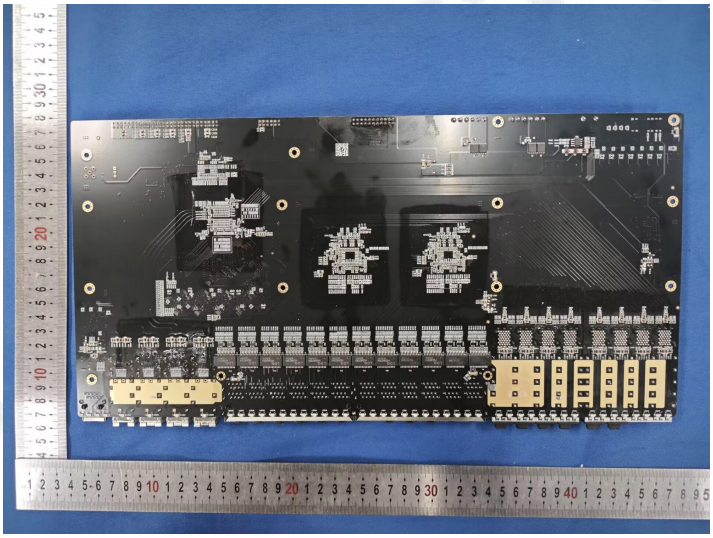

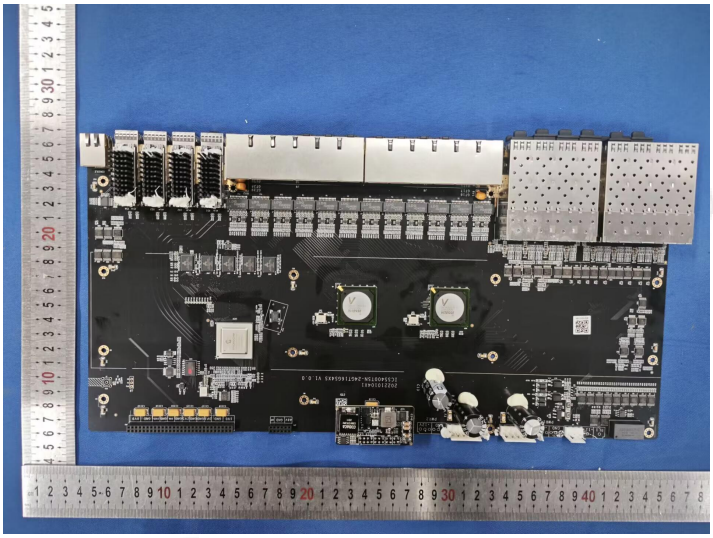

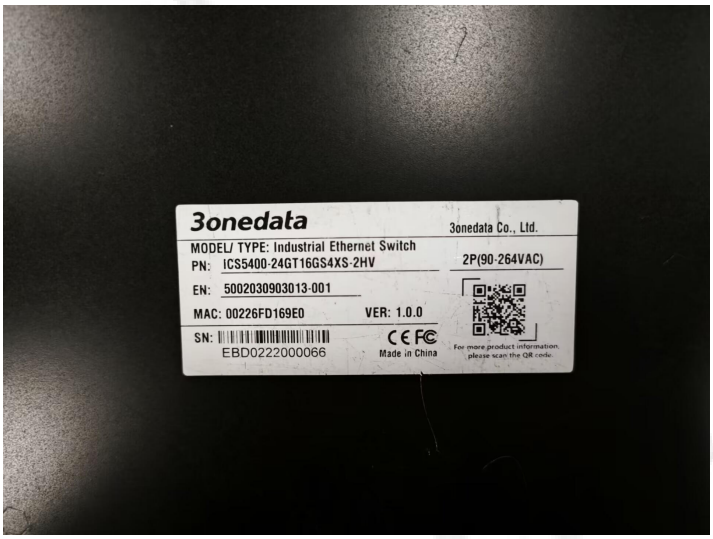

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