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CNAS L7497

Shenzhen CTL Testing Technology Co., Ltd.
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FCC SDoC Test Report

FCC PART 15 Subpart B

Report Reference No.....:	**CTL2407027052-F**
Compiled by (position+printed name+signature)..:	File administrators Hamia Huang
Name of the organization performing the tests (position+printed name+signature)..:	Technique principal Ivan Xie
Approved by (position+printed name+signature)..:	Manager Tracy Qi
Date of issue.....:	Aug. 08, 2024
Representative 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
Web.....:	www.ctl-lab.com
Test Firm.....:	**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
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.....:	**FCC PART 15 Subpart B**
TRF Originator.....:	Shenzhen CTL Testing Technology Co., Ltd.

Test item description.....:	**Industrial Ethernet Switch**
Trade Mark .....:	3onedata
Test voltage..... :	AC 120V/60Hz
Result.....:	**Pass**

FCC Test Report

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

Equipment under Test	:	Industrial Ethernet Switch
Type / Model	:	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-F	V1.0	Initial Issued Report	Aug. 08, 2024

Content

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15 Subpart B - Unintentional Radiators

ANSI C63.4-2014

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 : o 120V / 60 Hz o 115V / 60Hz
o 3.7 V DC o 5 V DC
■ Other (specified in blank below)

AC 120V/60Hz

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

Industrial Ethernet Switch.

For more details, refer to the user's manual of the EUT.

2.4. EUT operation mode

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

EMISSION TESTS: Radiation Emission

Description of Test Mode	Test Voltage
WORKING	**AC 120V/60Hz**

EMISSION TESTS: Conducted Disturbance

Description of Test Mode	Test Voltage
WORKING	**AC 120V/60Hz**

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

2.5. EUT configuration

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

- ● - supplied by the manufacturer
- o - supplied by the lab

2.7. Related Submittal(s) / Grant (s)

This test report is intended for High Speed Jet Fan filing to comply with the FCC Part 15, Subpart B Rules.

2.8. Modifications

No modifications were implemented to meet testing criteria.

2.9. Test Result Summary

Test Item	Test Requirement	Standard Paragrph	Result
Radiated Emission	FCC PART 15 Subpart B	Section 15.109	PASS
Conducted Emission	FCC PART 15 Subpart B	Section 15.107	PASS

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

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

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: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

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.

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. 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	Above 1GHz	±4.32dB	(1)
Conducted Emission	0.15~30MHz	±3.20dB	(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.

3.5. 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	2024/04/30	2025/04/29
Software:						
Name of Software:			Version:			
EZ_EMC(Below 1GHz)			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

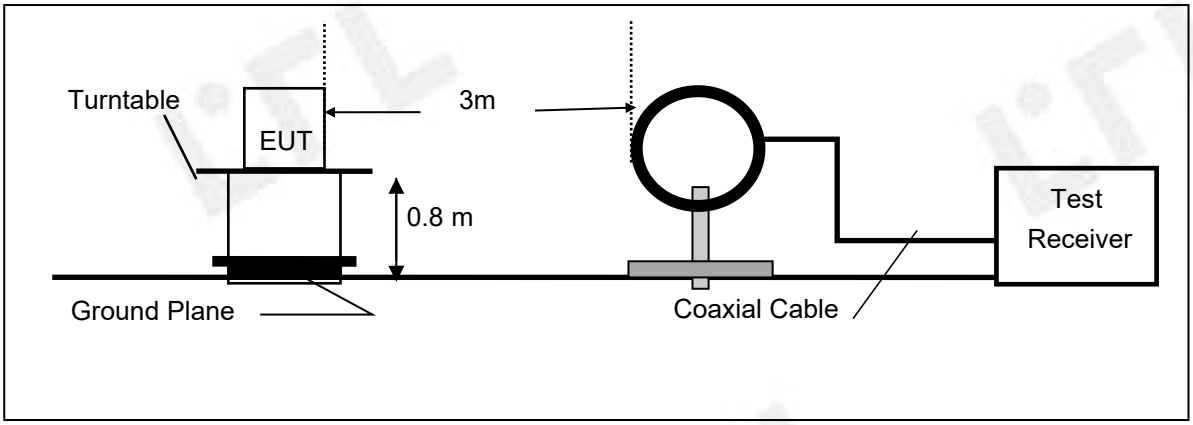
Software:	
Name of Software:	Version:
ES-K1	V1.71

4 TEST CONDITIONS AND RESULTS

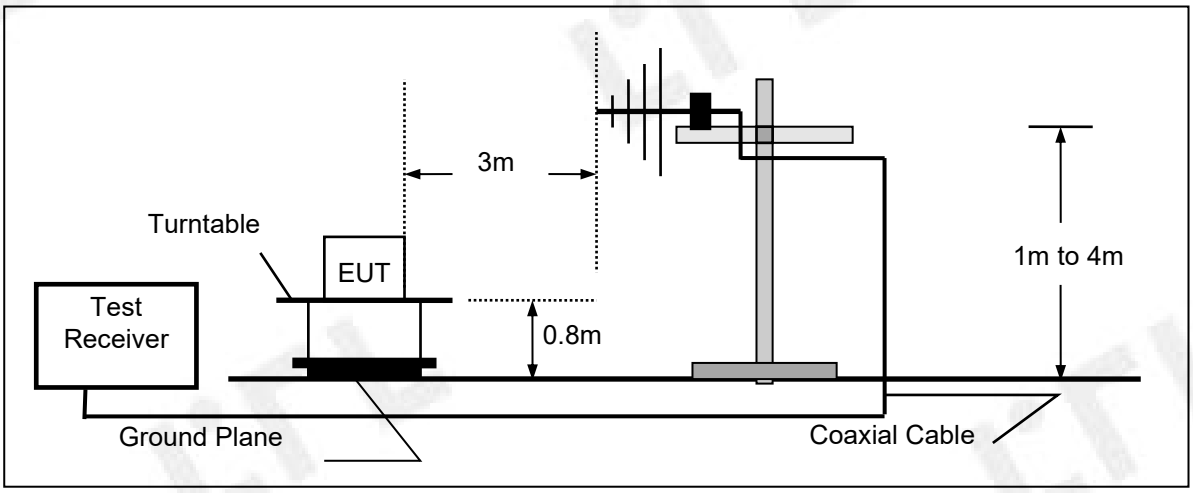
4.1. Radiated Emission Test

TEST CONFIGURATION

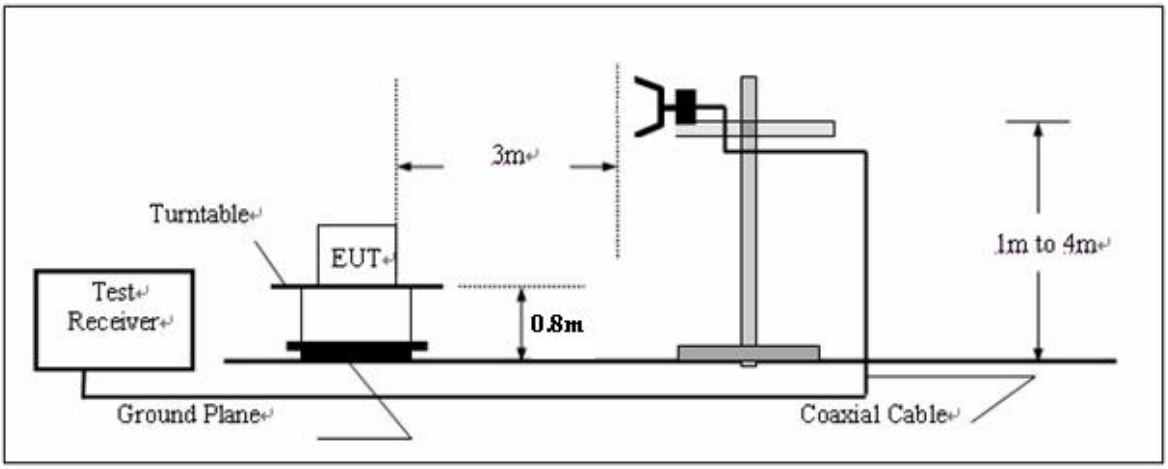
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

RADIATION LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
960-1000	3	54.0	500

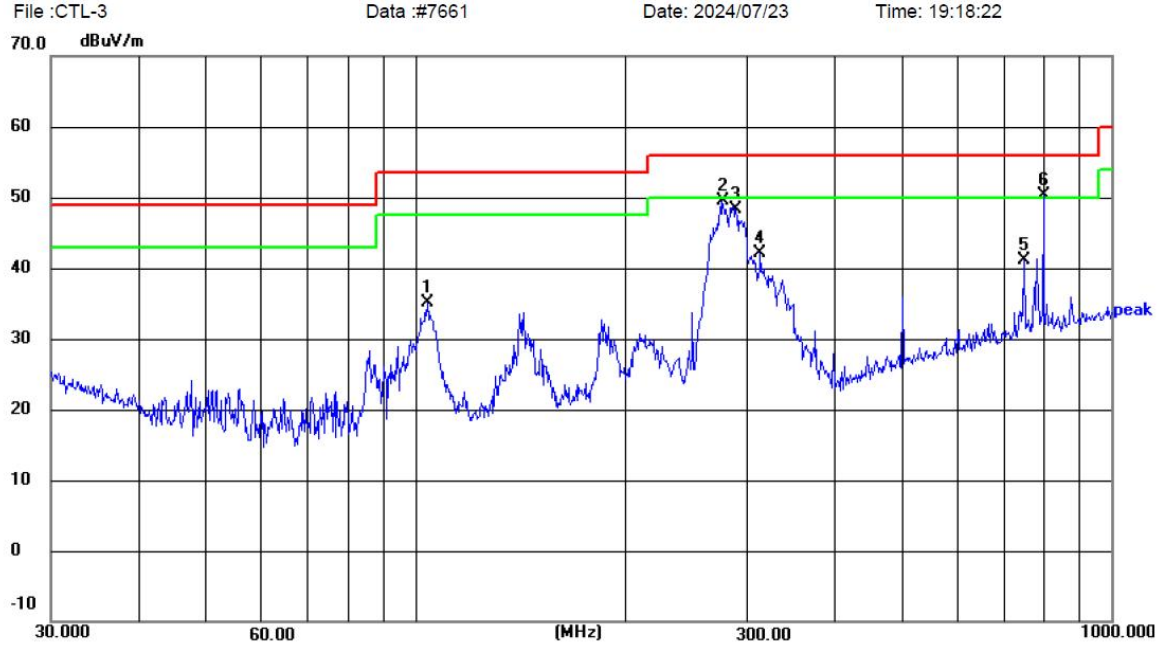
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

Radiation Test Results

Radiated Emission Measurement

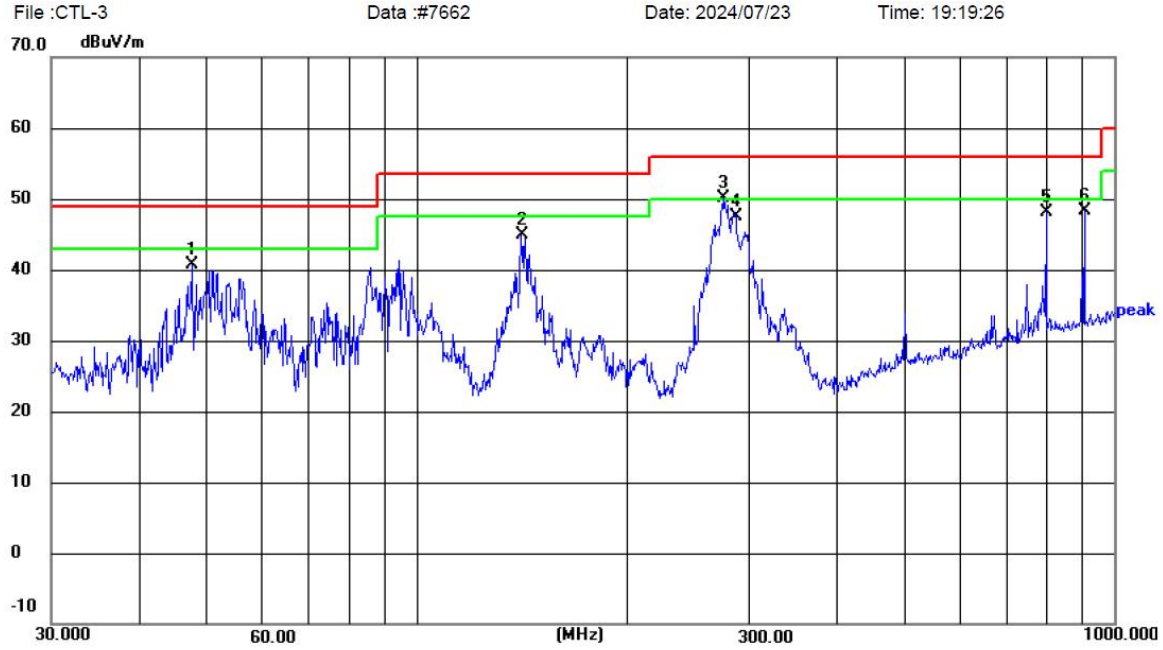


Site LAB Chamber 1
Limit: FCC PART 15 Subpart B Class A
EUT: /
M/N: ICS5400-24GT16GS4XS-2HV
Mode: WORKING
Note: /

Polarization: *Horizontal*
Power: AC 120V/60Hz
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	104.1701	23.16	11.94	35.10	53.50	18.40	peak	100	360	P	
2	276.1235	34.52	14.92	49.44	56.00	6.56	peak	100	309	P	
3	289.0020	32.76	15.62	48.38	56.00	7.62	peak	100	39	P	
4	313.2760	25.76	16.32	42.08	56.00	13.92	peak	100	67	P	
5	750.1082	15.66	25.45	41.11	56.00	14.89	peak	100	309	P	
6	798.9797	24.21	26.10	50.31	56.00	5.69	peak	100	330	P	



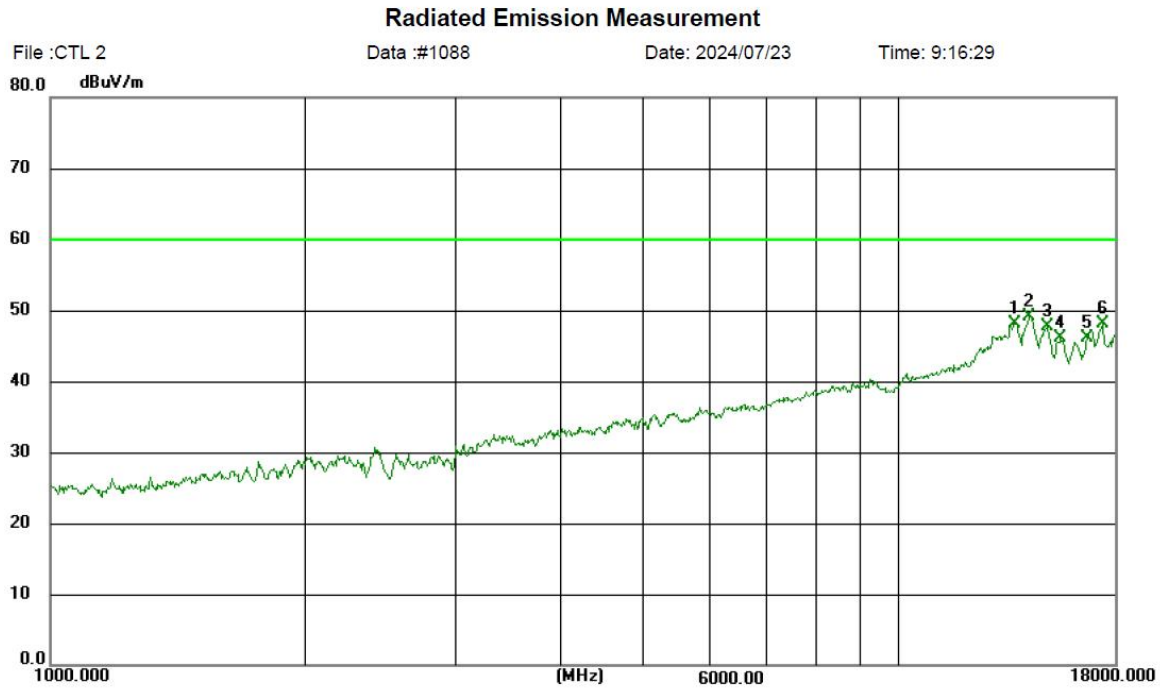
Site LAB Chamber 1
Limit: FCC PART 15 Subpart B Class A
EUT: /
M/N: ICS5400-24GT16GS4XS-2HV
Mode: WORKING
Note: /

Polarization: *Vertical*
Power: AC 120V/60Hz
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	47.6586	29.83	10.90	40.73	49.00	8.27	peak	100	328	P	
2	141.3298	29.29	15.60	44.89	53.50	8.61	peak	100	321	P	
3	276.1235	35.22	14.92	50.14	56.00	5.86	peak	100	230	P	
4	286.9823	32.01	15.53	47.54	56.00	8.46	peak	100	216	P	
5	798.9797	21.96	26.10	48.06	56.00	7.94	peak	100	188	P	
6	906.4824	21.05	27.21	48.26	56.00	7.74	peak	100	8	P	

1-18G



Site LAB Chamber 2
Limit: FCC PART 15 Subpart B Class A
EUT: /
M/N: ICS5400-24GT16GS4XS-2HV
Mode: WORKING
Note: /
/

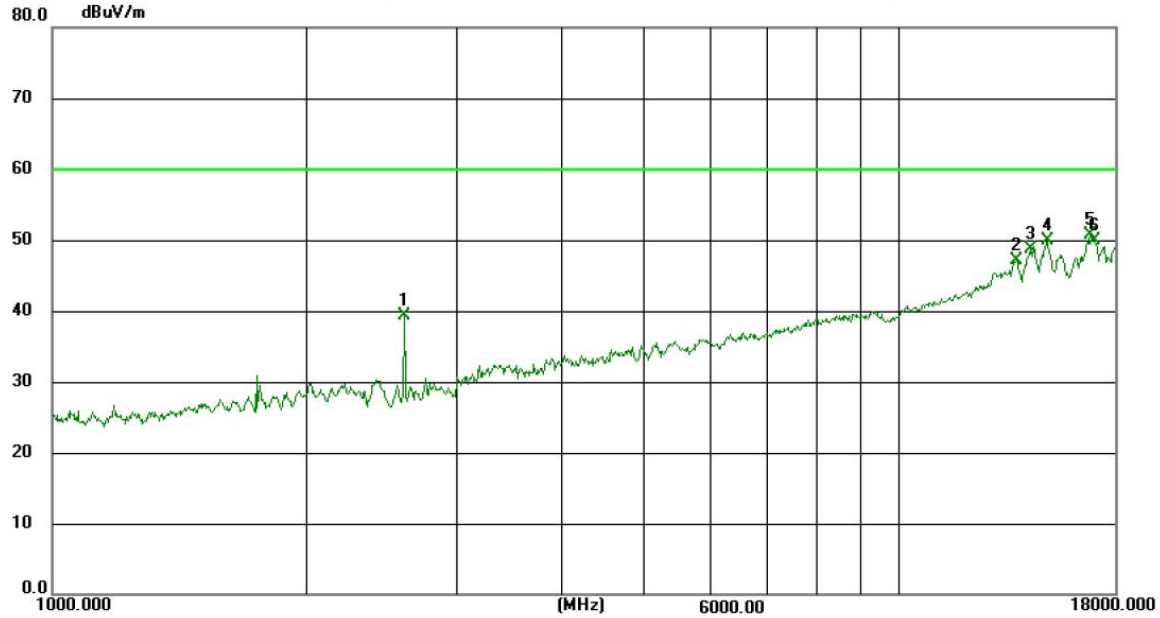
Polarization: *Horizontal*
Power: AC 120V/60Hz
Distance: 3m

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	13717.561	27.54	20.56	48.10	60.00	11.90	AVG	100	56	P	
2	14278.869	28.69	20.37	49.06	60.00	10.94	AVG	100	250	P	
3	14965.525	28.75	18.93	47.68	60.00	12.32	AVG	100	252	P	
4	15561.023	28.16	17.85	46.01	60.00	13.99	AVG	100	151	P	
5	16727.073	25.77	20.33	46.10	60.00	13.90	AVG	100	11	P	
6	17417.819	25.05	22.98	48.03	60.00	11.97	AVG	100	15	P	

Radiated Emission Measurement

File :CTL 2 Data :#1087 Date: 2024/07/23 Time: 9:15:30



Site LAB Chamber 2
Limit: FCC PART 15 Subpart B Class A
EUT: /
M/N: ICS5400-24GT16GS4XS-2HV
Mode: WORKING
Note: /
/

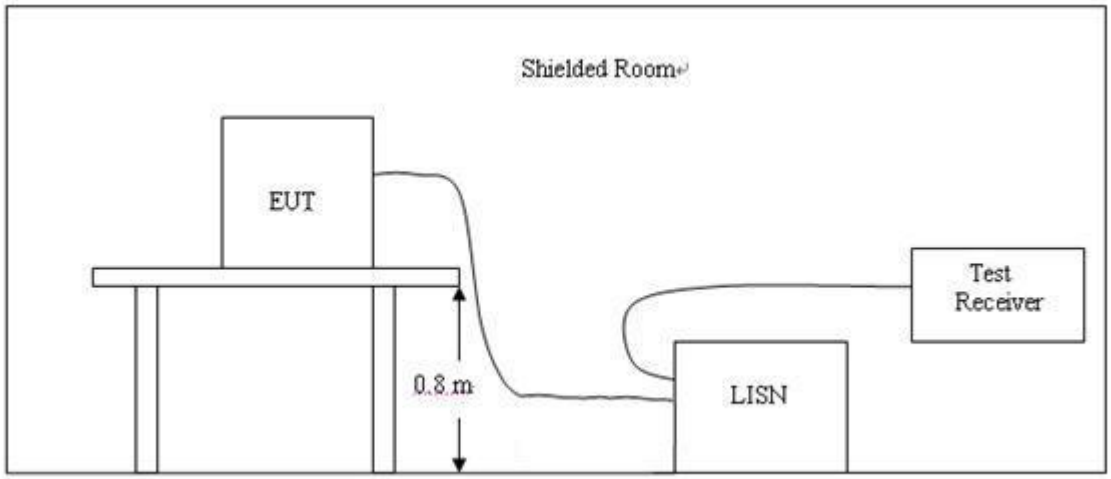
Polarization: *Vertical*
Power: AC 120V/60Hz
Distance: 3m

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	2609.718	40.41	-1.04	39.37	60.00	20.63	AVG	100	255	P	
2	13767.211	26.59	20.60	47.19	60.00	12.81	AVG	100	17	P	
3	14309.855	28.46	20.31	48.77	60.00	11.23	AVG	100	17	P	
4	14981.755	30.95	18.89	49.84	60.00	10.16	AVG	100	255	P	
5	16811.896	30.09	20.64	50.73	60.00	9.27	AVG	100	320	P	
6	17044.303	28.51	21.48	49.99	60.00	10.01	AVG	100	121	P	

4.2. Conducted Emissions Test

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
2 Support equipment, if needed, was placed as per ANSI C63.4.
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4 The EUT received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

Conducted Power Line Emission Limit

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following:

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

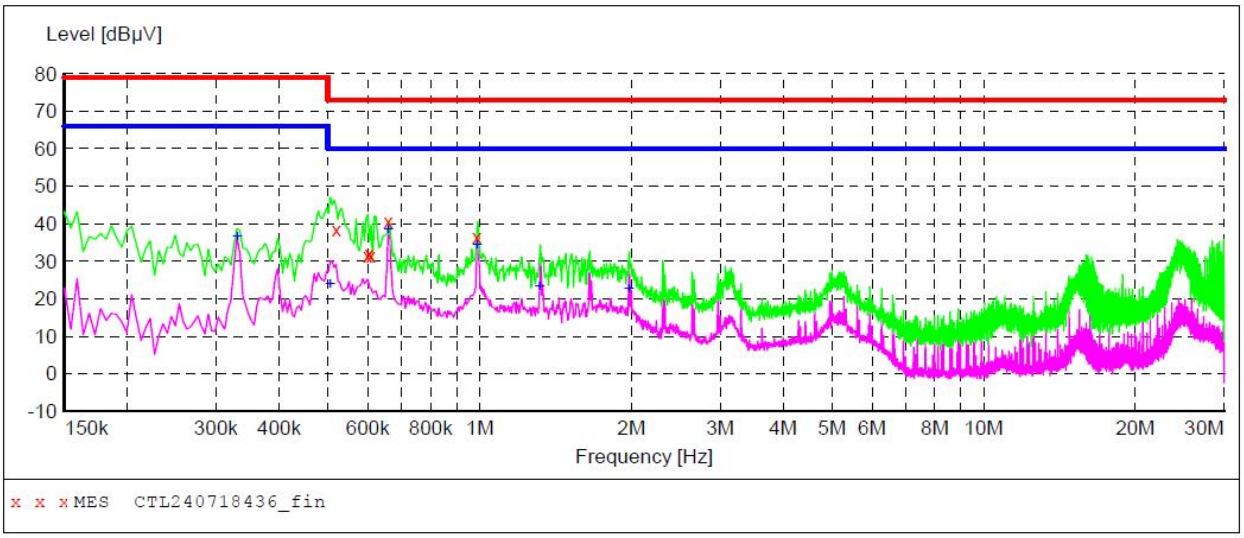
TEST RESULTS

Shenzhen CTL Testing Technology Co., Ltd.

Voltage Mains Test FCC PART 15 Subpart B

EUT: ICS5400-24GT16GS4XS-2HV
Manufacturer: /
Operating Condition: WORKING
Test Site: /
Operator: DENG CHAO
Test Specification: AC 120V/60Hz
Comment: /
Start of Test: 7/18/2024 / 4:45:22PM

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



MEASUREMENT RESULT: "CTL240718436_fin"

7/18/2024 4:47PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.519000	38.30	10.0	73	34.7	QP	N	GND
0.600000	31.50	10.0	73	41.5	QP	N	GND
0.604500	32.00	10.0	73	41.0	QP	N	GND
0.609000	31.40	10.0	73	41.6	QP	N	GND
0.658500	40.50	10.0	73	32.5	QP	N	GND
0.987000	36.40	10.1	73	36.6	QP	N	GND

MEASUREMENT RESULT: "CTL240718436_fin2"

7/18/2024 4:47PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.330000	36.60	10.0	66	29.4	AV	N	GND
0.505500	23.70	10.0	60	36.3	AV	N	GND
0.658500	38.50	10.0	60	21.5	AV	N	GND
0.987000	34.30	10.1	60	25.7	AV	N	GND
1.315500	23.10	10.1	60	36.9	AV	N	GND
1.977000	22.50	10.1	60	37.5	AV	N	GND

Shenzhen CTL Testing Technology Co., Ltd.

Voltage Mains Test FCC PART 15 Subpart B

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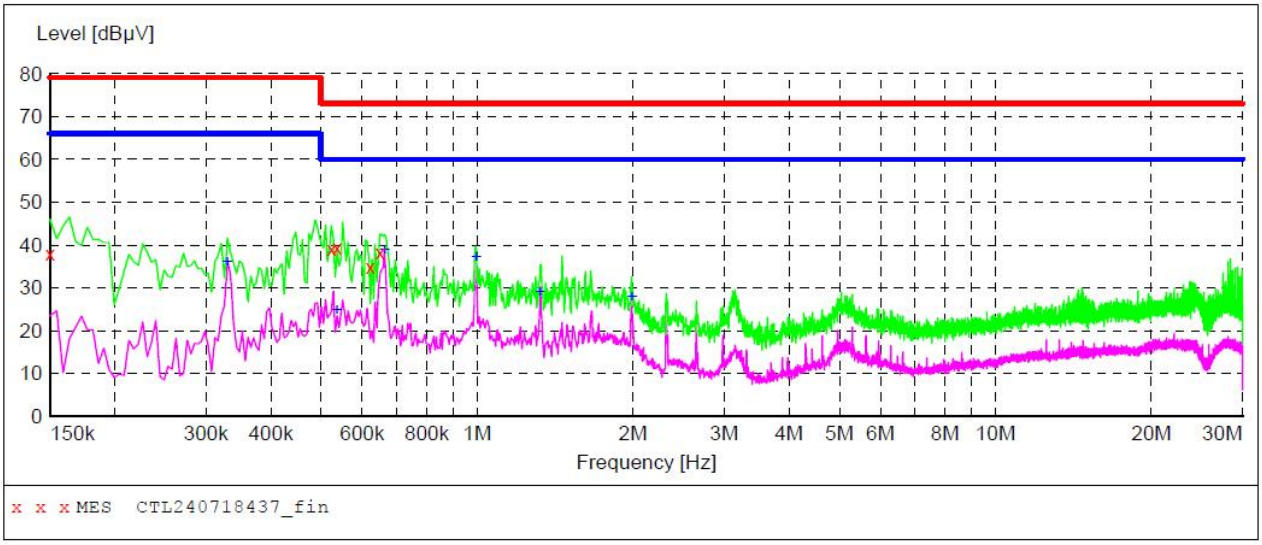
EUT:                  ICS5400-24GT16GS4XS-2HV
Manufacturer:         /
Operating Condition:  WORKING
Test Site:            /
Operator:             DENG CHAO
Test Specification:   AC 120V/60Hz
Comment:              /
Start of Test:        7/18/2024 / 4:48:13PM
```

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL240718437_fin"

7/18/2024 4:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	38.00	10.0	79	41.0	QP	L1	GND
0.523500	39.20	10.0	73	33.8	QP	L1	GND
0.537000	39.40	10.0	73	33.6	QP	L1	GND
0.622500	34.90	10.0	73	38.1	QP	L1	GND
0.649500	38.30	10.0	73	34.7	QP	L1	GND

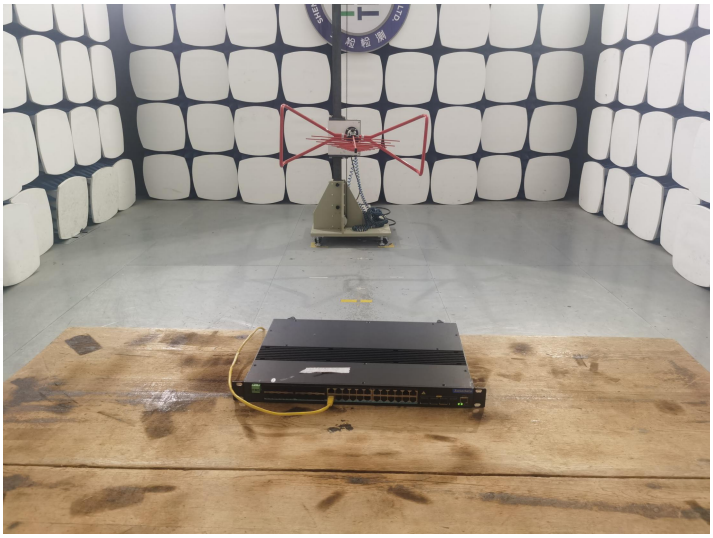
MEASUREMENT RESULT: "CTL240718437_fin2"

7/18/2024 4:50PM

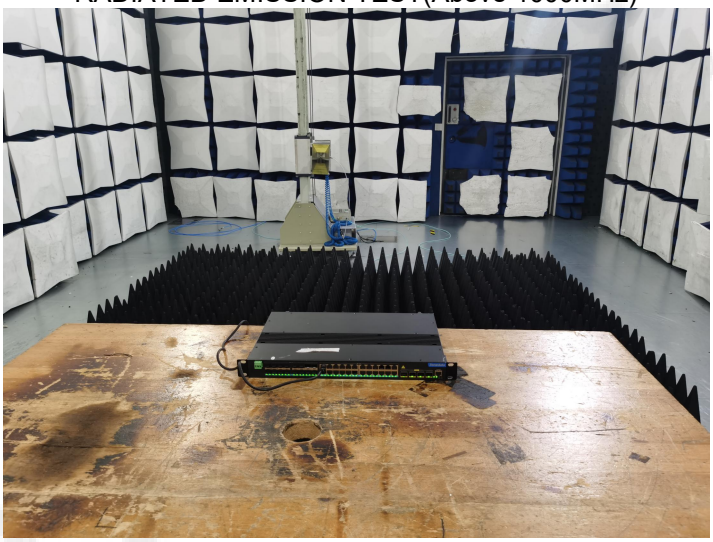
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.330000	35.90	10.0	66	30.1	AV	L1	GND
0.537000	24.70	10.0	60	35.3	AV	L1	GND
0.663000	38.70	10.0	60	21.3	AV	L1	GND
0.996000	37.20	10.1	60	22.8	AV	L1	GND
1.324500	28.90	10.1	60	31.1	AV	L1	GND
1.990500	27.90	10.1	60	32.1	AV	L1	GND

5. Test Setup Photos of the EUT

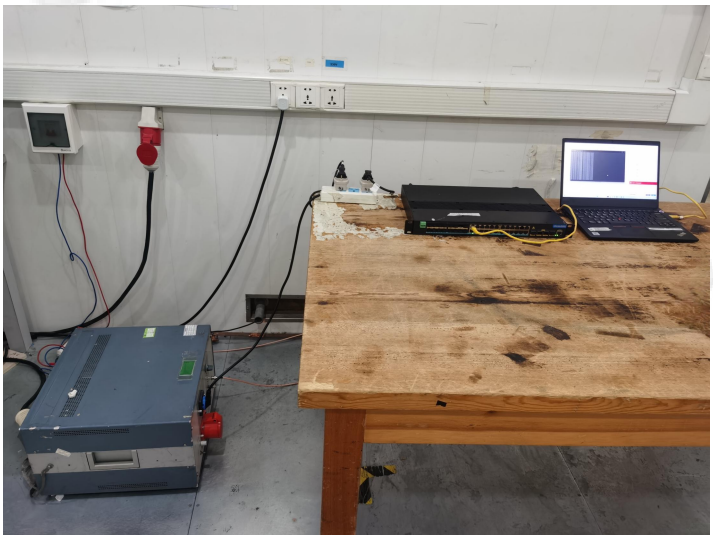
RADIATED EMISSION TEST（30-1000MHz）



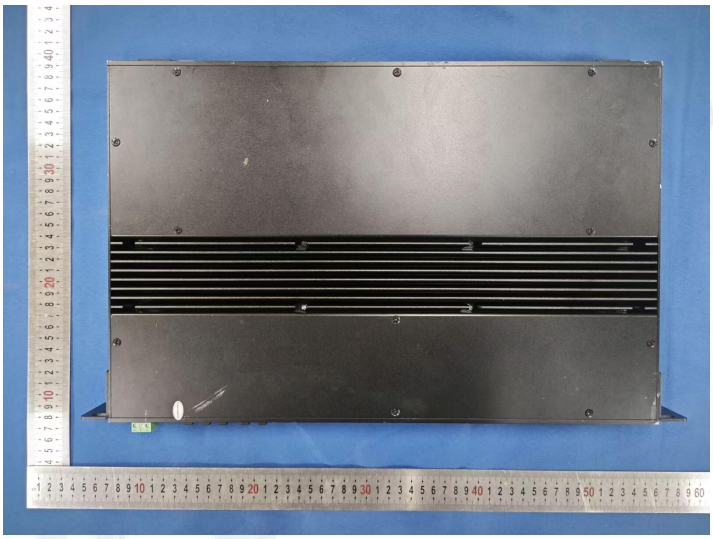
RADIATED EMISSION TEST(Above 1000MHz)

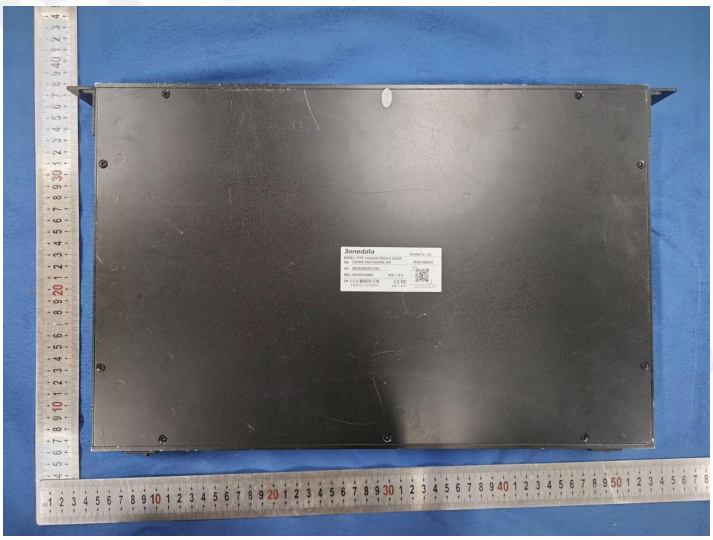


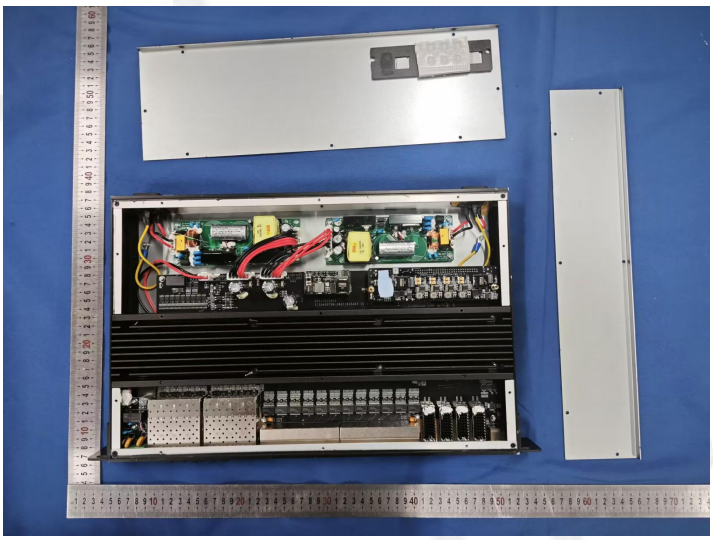
CONDUCTION EMISSION TEST

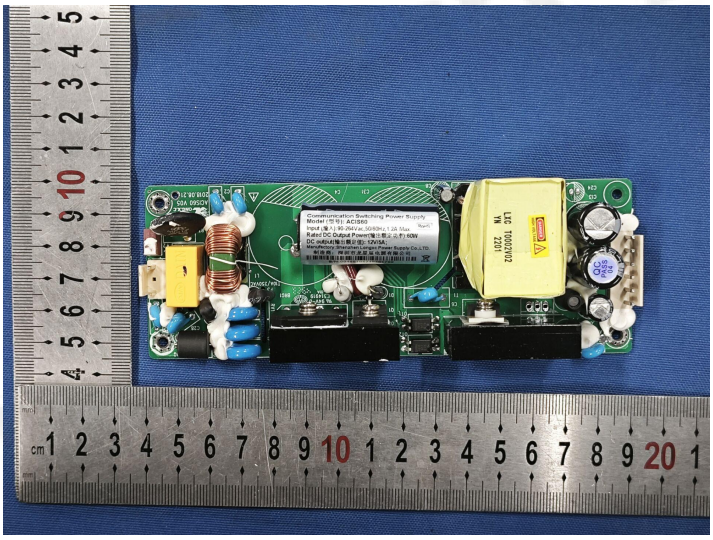


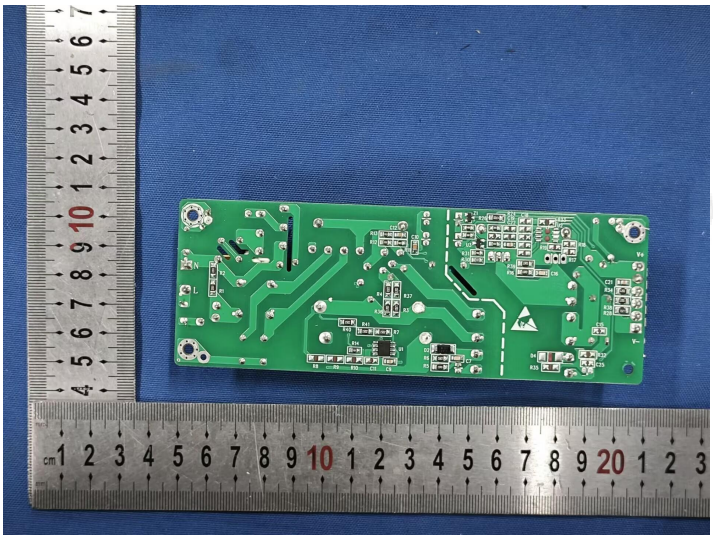
6. Photos of the EUT

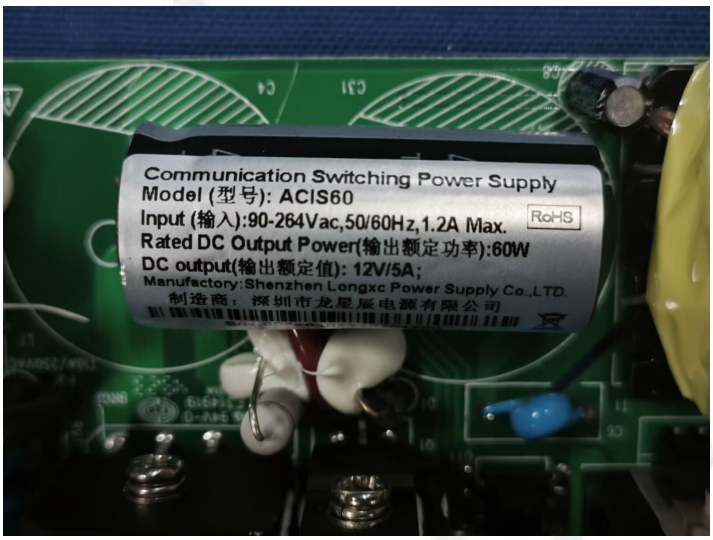


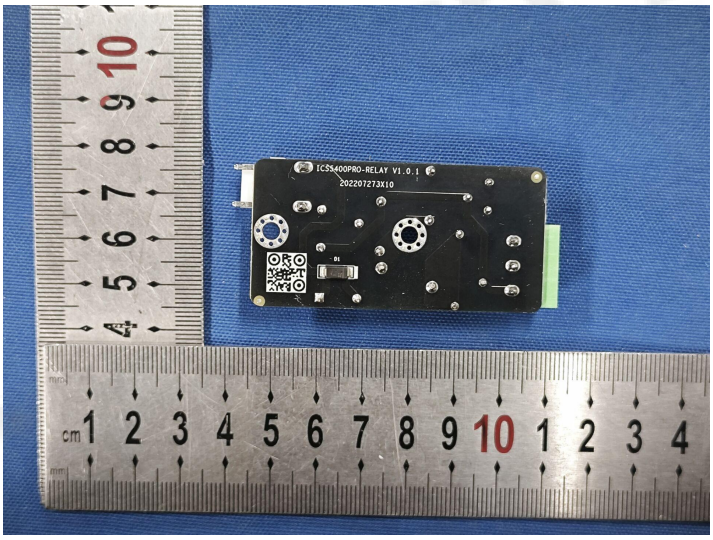


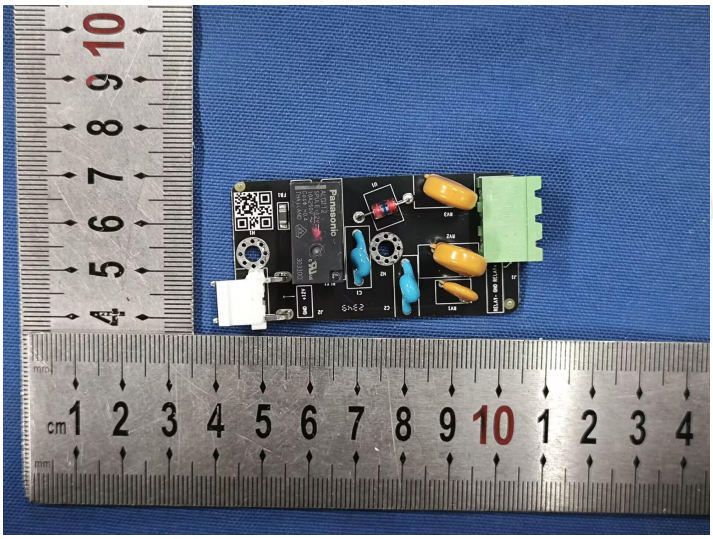


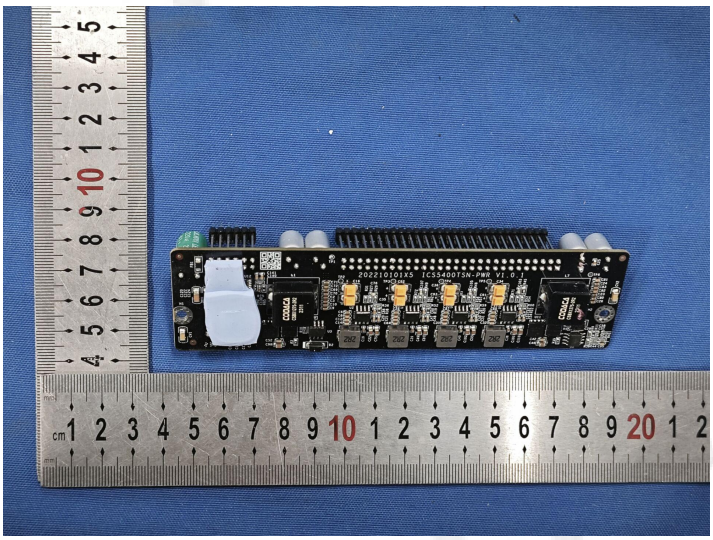


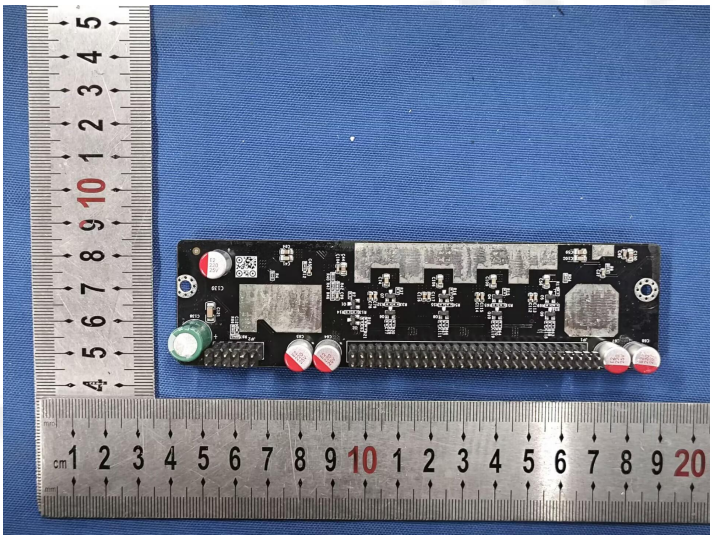


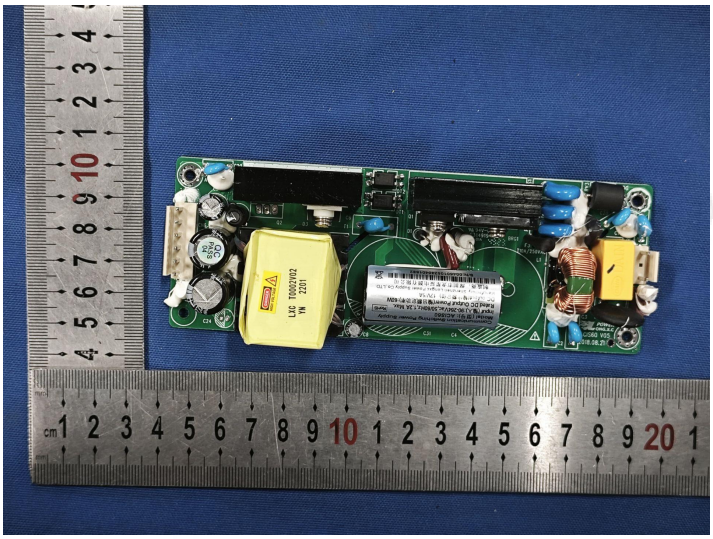

Communication Switching Power Supply
Model (型号): ACIS60
Input (输入):90-264Vac,50/60Hz,1.2A Max.
RoHS
Rated DC Output Power(输出额定功率):60W
DC output(输出额定值): 12V/5A;
Manufactory:Shenzhen Longxc Power Supply Co.,LTD.
制造商：深圳市龙星辰电源有限公司

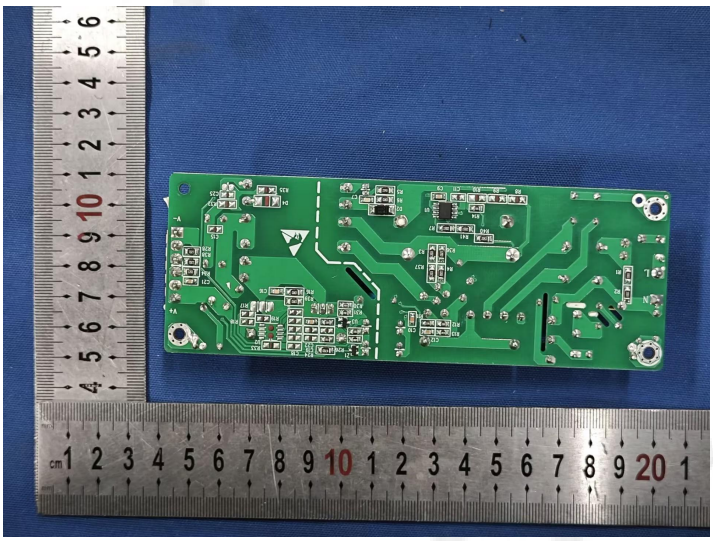

ICS5400PRO-RELAY V1.0.1
2022072731X10

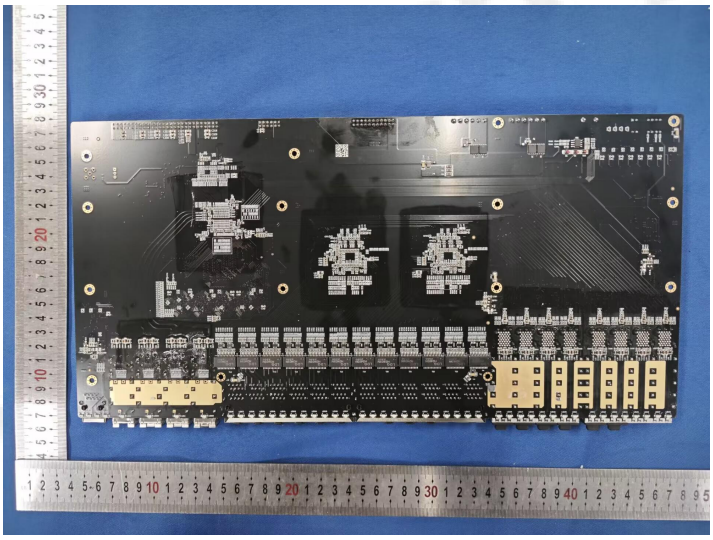

Panasonic

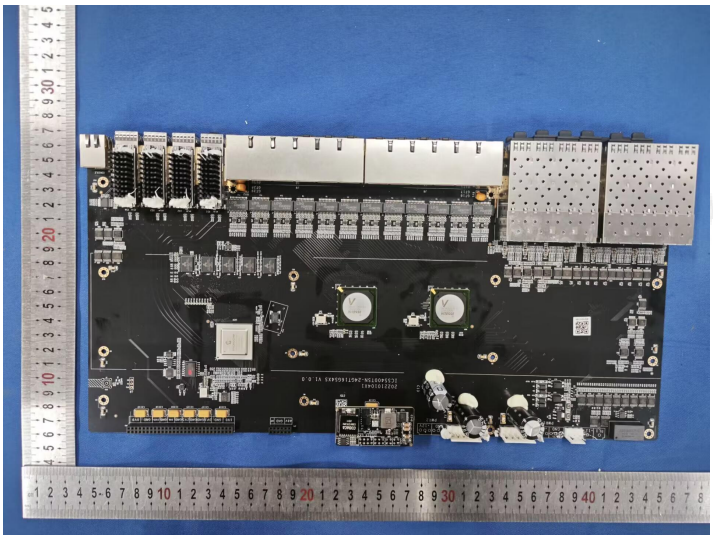


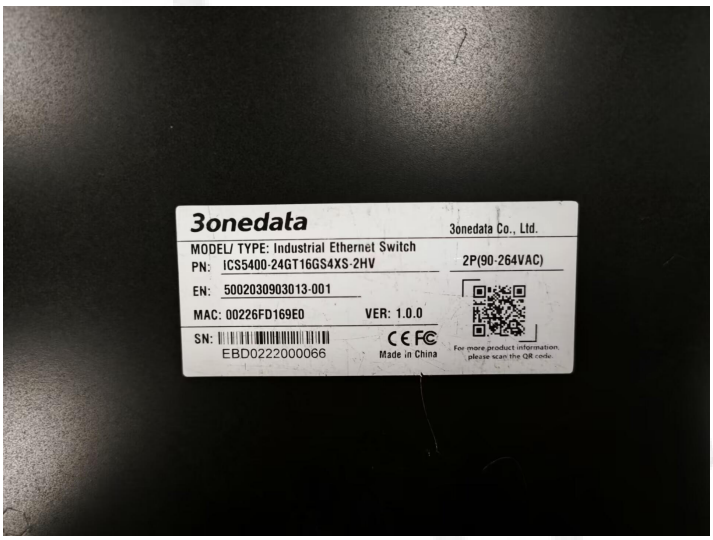












.....End of Report.....