



ZHONGHAN

TEST REPORT

EN 61800-5-1

Adjustable speed electrical power drive systems

Report Reference No..... : ZHT-240529043S

Date of issue : May 29, 2024

Total number of pages..... : 24

Testing Laboratory name..... : **Guangdong Zhonghan Testing Technology Co., Ltd.**

Address : Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Applicant's name

Name..... : **Wuxi Xinje Electric Co., Ltd.**

Address..... : No.816, Jianzhu West Road, Binhu District, Wuxi City, Jiangsu Province, China

Test specification:

Standard..... : EN IEC 61800-1:2021;
EN 61800-5-1:2007+A1:2017+A11:2021

Test procedure : Compliance with EN IEC 61800-1:2021 and EN 61800-5-1:2007+A1:2017+A11:2021

Non-standard test method : N/A

Test Report Form No..... : EN61800_5_1A

Master TRF..... : dated 2007-10

Test item description..... : Programmable Logic Controller

Trade Mark..... : **XINJE**

Manufacturer..... : Wuxi Xinje Electric Co., Ltd.

Address..... : No.816, Jianzhu West Road, Binhu District, Wuxi City, Jiangsu Province, China

Model/Type reference..... : XSDH-60A32-C

XSDH-60PA32-C, XSDH-60A32L-C, XSDH-60PA32L-C, XSLH-30A32, XSLH-30A32L, XSLH-24A16, XSLH-24A16L, XSLH-24A8, XSA330-W, XSA530-W, XSA520-W, XSA330-L, XSAP-330-W, XA330-L, XA330-W, XA530-L, XA530-W, XAP-330-W, LP3-AP, XL5H-24A8L, XL5H-24A8, LC5E-32T4, XL3-16T4, XL5-16T4, XLME-16T4, ZP2-18RT, ZP2-18R, ZP3-18R, ZP3-18RT, ZP1-18T, ZP1-18R, XD-1TC-ED, XL-E1WT-D, XL-E2WT-D, XL-E4WT-D, XL-E8AD-A-S, XL-E8AD-V-S, XD-E4DA-H, XD-4PT-ED, XL-E32X-A, XL-E32PX-A, XL-E32YT-A, XL-E16X16YT-A, XL-E16PX16YT-A, XD-E4AD, XL-E8AD-V-S, XL-E8AD-A-S, XD-E6TC-P-H, XL-E4PT3-P-H, AP-BOX-A, AP-BOX-C, R-BOX, XSF-A32, XF-E8NX8YT, XF-E16X, XF-E16YT, XF-E4AD, XF-E4DA, XF-E2COM24, LFC3-AP, LFP3-AP, AS-C6, XD3E-30PR-C, XD3E-30PT-C, XD3E-48PR-C, XD3E-60PT-C, XD5E-60PT-C, XD5E-60T4-C, XD5E-30PR-C, XD5E-30R-C, XD5E-60R-C, XD5E-48PR-C, XL5N-32PT, XLME-64T10, XD-NE-BD, XD5-60PT-C, XL3-32R, XL-E16PX16PYT, XL-E4AD, XA310, ZGM-30PT4-7, XSLH-24A16, XSLH-24A8, XL5H-24A8, XL5H-24A8L, XLME-16T4, XDH-30PA16L-C, XDH-60PT4-C, XDH-30A16L-C, XLH-30A32L, XLH-30PA32, XLH-24PA16L, XLH-24PA16, S-BOX-HT, Z-4TC-BD, Z-4PT3-BD, XLQ7-24A16, XLQ7-30A32, XSA550-W, XSA520-L, XSA530-L, XSA550-L, XSF5-A32, XSF5-A64, XSF3-A8, XSF3-A16, XF3-A8, XF3-A16, LL-E16X, LL-



E16YT, LL-E16YR, LL-E8X8YT, LL-E32X, LL-32YT, LL-E16X16YT,
XF-E16PYT, XF-E1HSC, XF-E4RTD, XF-E4TC, XF-E4HSP

Ratings.....: DC 24V

Note: This testing report has added model name on the basis of ZHT-230307002S. Adding model name will not affect the test results. No further testing of EUT is required. All test data is based on the original report ZHT-230307002S.



Testing procedure and testing location:

Testing Laboratory.....: Guangdong Zhonghan Testing Technology Co., Ltd.

Address.....: Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Date of Test.....: Mar. 05, 2023 to Mar. 14, 2023

Tested by (name + signature).....: Laney Xie

Reviewed by (name + signature).....: Summer Yang

Approved by (name + signature).....: Levi Lee





Brief description of the test sample:

The equipment is a Programmable Logic Controller for general use.

All models are same as XSDH-60A32-C except model name. All tests are carried out on XSDH-60A32-C.

Artwork of marking plate and summary of test results (information/comments):

Programmable Logic Controller

Model: XSDH-60A32-C

Input: 24VDC



S/N: XXXXXX

Importer: XXXXXX

Address: XXXXXX

Manufacturer: Wuxi Xinje Electric Co., Ltd.

Address: No.816, Jianzhu West Road, Binhu District, Wuxi City,
Jiangsu Province, China

Made in China



Test items particulars:

Equipment mobility	Movable
Tested for IT power systems	No
IT testing, phase-phase voltage (V)	N/A
Class of equipment.....	Class III
Protection against ingress of water	IP20

Possible test case verdicts:

-test case does not apply to the test object: N (Not Applicable)
 -test object does meet the requirement.....: P (Pass)
 -test object does not meet the requirement: F (Fail)

Testing

Date of receipt of test item

Mar. 05, 2023

Date(s) of performance of tests

Mar. 05, 2023 to Mar. 14, 2023

General remarks:

The test results presented in this report relate only to the object tested.
 This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.
 "(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal separator.



EN 61800-5-1			
Clause	Requirement – Test	Result – Remark	Verdict
4	PROTECTION AGAINST ELECTRIC SHOCK, THERMAL, AND ENERGY HAZARDS		P
4.1	General		P
4.2	Fault conditions		P
4.3	Protection against electric shock		P
4.3.1	Decisive voltage classification		P
4.3.1.1	Use of decisive voltage class	Class C	P
4.3.1.2	Limits of DVC		P
4.3.1.3	Requirements for protection		P
4.3.1.4	Circuit evaluation		P
4.3.1.4.1	General		P
4.3.1.4.2	AC working voltage		P
4.3.1.4.3	DC working voltage		N
4.3.1.4.4	Pulsating working voltage		P
4.3.2	Protective Separation		P
4.3.3	Protection against direct contact		P
4.3.3.1	General		P
4.3.3.2	Protection by means of insulation of live parts		P
4.3.3.3	Protection by means of enclosures and barriers		N
4.3.4	Protection in case of direct contact		P
4.3.4.1	General		P
4.3.4.2	Protection using DVC A		N
4.3.4.3	Protection by means of protective impedance		P
4.3.4.4	Protection by means of using limited voltage		N
4.3.5	Protection against indirect contact		P
4.3.5.1	General		P
4.3.5.2	Insulation between live parts and exposed conductive parts		N
4.3.5.3	Protective bonding circuit		N
4.3.5.3.1	General		N
4.3.5.3.2	Rating of protective bonding		N
4.3.5.3.3	Protective bonding impedance		N
4.3.5.4	Protective earthing conductor		N



EN 61800-5-1			
Clause	Requirement – Test	Result – Remark	Verdict
4.3.5.5	Means of connection for the protective earthing conductor		N
4.3.5.5.1	General		N
4.3.5.5.2	Touch current in case of failure of protective earthing conductor		N
4.3.5.6	Special features in equipment for protection class II		N
4.3.6	Insulation		P
4.3.6.1	General		P
4.3.6.1.1	Influencing factors		P
4.3.6.1.2	Pollution degree	Pollution degree 2	P
4.3.6.1.3	Overvoltage Category		P
4.3.6.1.4	Supply earthing systems		N
4.3.6.1.5	Insulation voltages		P
4.3.6.2	Insulation to the surroundings		P
4.3.6.2.1	General		P
4.3.6.2.2	Circuits connected directly to the supply mains		P
4.3.6.2.3	Circuits not connected directly to the supply mains		N
4.3.6.2.4	Insulation between circuits		P
4.3.6.3	Functional insulation		P
4.3.6.4	Clearance distances		P
4.3.6.4.1	Determination		P
4.3.6.4.2	Electric field homogeneity		P
4.3.6.4.3	Clearance to conductive enclosures		P
4.3.6.5	Creepage distance		P
4.3.6.5.1	General		P
4.3.6.5.2	Materials		P
4.3.6.6	Coating		P
4.3.6.7	PWB spacings for functional insulation		P
4.3.6.8	Solid insulation		P
4.3.6.8.1	General		P
4.3.6.8.2	Requirements for electrical withstand capability		P
4.3.6.8.2.1	Basic- and Supplementary Insulation		P
4.3.6.8.2.2	Double- and Reinforced Insulation		N
4.3.6.8.2.3	Functional insulation		P
4.3.6.8.3	Thin sheet or tape material		P



EN 61800-5-1			
Clause	Requirement – Test	Result – Remark	Verdict
4.3.6.8.3.1	General		P
4.3.6.8.3.2	Material thickness not less than 0,2 mm		P
4.3.6.8.3.3	Material thickness less than 0,2 mm		N
4.3.6.8.3.4	Compliance		P
4.3.6.8.4	Printed wiring boards (PWBs)		P
4.3.6.8.4.1	General		P
4.3.6.8.4.2	Use of coating materials		P
4.3.6.8.5	Wound components		P
4.3.6.8.6	Potting materials		N
4.3.6.9	Insulation requirements above 30 kHz		N
4.3.7	Enclosures		P
4.3.7.1	General		P
4.3.7.2	Cast metal		N
4.3.7.3	Sheet metal		N
4.3.8	Wiring and Connections		P
4.3.8.1	General		P
4.3.8.2	Routing		N
4.3.8.3	Color coding		P
4.3.8.4	Splices and connections		P
4.3.8.5	Accessible connections		N
4.3.8.6	Interconnections between parts of the PDS		P
4.3.8.7	Supply connections		P
4.3.8.8	Terminals		P
4.3.8.8.1	Construction requirements		P
4.3.8.8.2	Connecting capacity		P
4.3.8.8.3	Connection		P
4.3.8.8.4	Wire bending space for wires 10 mm ² and greater		P
4.3.9	Short Circuit Requirements		P
4.3.10	Residual current-operated protective (RCD) or monitoring (RCM) device compatibility		P
4.3.11	Capacitor Discharge		P
4.3.12	Access conditions for high-voltage PDS		P
4.4	Protection against thermal hazards		P
4.4.1	Minimizing the risk of ignition		P



EN 61800-5-1			
Clause	Requirement – Test	Result – Remark	Verdict
4.4.2	Insulation Materials	Complied	P
4.4.2.1	General		P
4.4.2.2	Material requirements		P
4.4.3	Flammability of enclosure materials		P
4.4.4	Temperature limits		P
4.4.4.1	Internal parts		P
4.4.4.2	External parts of CDM		P
4.4.5	Specific requirements for liquid cooled PDS		N
4.4.5.1	Coolant	No coolant	N
4.4.5.2	Design requirements		N
4.4.5.2.1	Corrosion resistance		N
4.4.5.2.2	Tubing, joints and seals		N
4.4.5.2.3	Provision for condensation		N
4.4.5.2.4	Leakage of coolant		N
4.4.5.2.5	Loss of coolant		N
4.4.5.2.6	Conductivity of coolant		N
4.4.5.2.7	Insulation requirements for coolant hoses		N
4.5	Protection against energy hazards		P
4.5.1	Electrical energy hazards	Complied	P
4.5.2	Mechanical energy hazards	Complied	P
4.5.2.1	General		P
4.5.2.2	Critical torsional speed		N
4.5.2.3	Transient torque analysis		N
4.5.3	Acoustic noise emission	Under consideration	N
4.5.6	Protection against environmental stresses	Complied	P
5	TEST REQUIREMENTS		P
5.1	General		P
5.1.1	Test objectives and classification	Type test	P
5.1.2	Selection of test samples		P
5.1.3	Sequence of tests	No required	N
5.1.4	Earthing Conditions		P
5.1.5	Compliance		P
5.1.6	Test Overview		P



5.2	Test specifications		P
5.2.1	Visual Inspections (type test, sample test and routine test)	Type test	P
5.2.2	Mechanical tests		P
5.2.2.1	Clearance and creepage distance (type test)		N
5.2.2.2	PWB short-circuit test (type test)		P
5.2.2.3	Non -accessibility test (type test)		N
5.2.2.4	Enclosure integrity test (type test)		N
5.2.2.5	Deformation tests		P
5.2.2.5.1	General		P
5.2.2.5.2	Deflection test (type test)		P
5.2.2.5.3	Impact test (type test)	250N applied for 5s	P
5.2.3	Electrical tests		P
5.2.3.1	Impulse voltage test (type test and sample test)		P
5.2.3.2	AC or DC voltage test (type and routine test)		P
5.2.3.2.1	Purpose of test		P
5.2.3.2.2	Value and type of test voltage		P
5.2.3.2.3	Performing the voltage test		P
5.2.3.2.4	Duration of the AC or DC voltage test		P
5.2.3.2.5	Verification of the AC or DC voltage test		P
5.2.3.3	Partial Discharge Test (type test, sample test)		P
5.2.3.4	Protective impedance (type test and routine test)		P
5.2.3.5	Touch current measurement (type test)		P
5.2.3.6	Short-circuit test and Breakdown of components test (type tests)		P
5.2.3.6.1	General		P
5.2.3.6.2	Test configuration		P
5.2.3.6.2.1	Supply voltage and current		P
5.2.3.6.3	Short-circuit test		P
5.2.3.6.3.1	Load conditions		P
5.2.3.6.3.2	Location of short-circuit		P
5.2.3.6.4	Breakdown of components test		P
5.2.3.6.4.1	Load conditions		P
5.2.3.6.4.2	Application of short-circuit or open-circuit		P
5.2.3.6.5	Test sequence		N
5.2.3.6.6	Pass criteria		P
5.2.3.7	Capacitor discharge (type test)		P



EN 61800-5-1			
Clause	Requirement – Test	Result – Remark	Verdict
5.2.3.8	Temperature rise test (type test)		P
5.2.3.9	Protective bounding (type test and routine test)		P
5.2.4	Abnormal operation tests		P
5.2.4.1	General		P
5.2.4.2	Test duration		P
5.2.4.3	Pass criteria		P
5.2.4.4	Loss of phase (type test)		N
5.2.4.5	Cooling failure tests (type tests)		N
5.2.4.5.1	General		N
5.2.4.5.2	Inoperative blower motor		N
5.2.4.5.3	Clogged filter		N
5.2.4.5.4	Loss of coolant		N
5.2.5	Material tests		P
5.2.5.1	High current arcing ignition test (type test)		P
5.2.5.2	Glow-wire test (type test)		P
5.2.5.3	Hot wire ignition test (type test - alternative to glow-wire test)		N
5.2.5.4	Flammability test (type test)		P
5.2.6	Environmental tests (type tests)		N
5.2.6.1	General		N
5.2.6.2	Acceptance criteria		N
5.2.6.3	Climatic tests		N
5.2.6.3.1	Dry heat test (steady state)		N
5.2.6.3.2	Damp heat test (steady state)		N
5.2.6.4	Vibration test (type test)		N
5.2.7	Hydrostatic pressure (type test and routine test)		N

6	Information and marking requirements		P
6.1	General		P

6.2	Information for selection		P
	Name of manufacturer, supplier or importer	See the marking plate	P
	Catalogue number or equivalent	See the marking plate	P
	input and output voltage range, current, and power rating information	See the marking plate	P



EN 61800-5-1			
Clause	Requirement – Test	Result – Remark	Verdict
	protective class		P
	the type of electrical supply system to which the PDS/CDM/BDM		P
	prospective short-circuit current rating(s) and protective device characteristics		P
	field supply requirements		N
	coolant type and design pressure for liquid cooled product		N
	IP rating		N
	Operating and storage environment		P
	Reverence to relevant standards		P
	date code, or serial number from which the date of manufacture can be determined		P
	Reverence to instructions for installation, use and maintenance		P

6.3	Information for installing and commissioning		P
6.3.1	General		P
6.3.2	Mechanical considerations		P
6.3.3	Environment		P
6.3.4	Handling and mounting		P
6.3.5	Motor and driven equipment		N
6.3.5.1	Motor selection		N
6.3.5.2	Motor integrated sensors		N
6.3.5.3	Critical torsional speeds		N
6.3.5.4	Transient torque analysis		N
6.3.6	Connections		P
6.3.6.1	General		P
6.3.6.2	Interconnection and wiring diagrams		P
6.3.6.3	Conductor (cable) selection		P
6.3.6.4	Terminal capacity and identification		P
6.3.6.5	Protection requirements		P
6.3.6.6	Earthing		P
6.3.6.7	Protective earthing conductor current		P
6.3.6.8	Special requirements		P



EN 61800-5-1			
Clause	Requirement – Test	Result – Remark	Verdict

6.3.7	Overcurrent or short-circuit protection		P
6.3.8	Motor overload protection		N
6.3.9	Commissioning		N

6.4	Information for use		P
6.4.1	General		P
6.4.2	Adjustment		P
6.4.3	Labels, signs and signals		P
6.4.3.1	General		P
6.4.3.2	Isolators		P
6.4.3.3	Visual and audible signals		P
6.4.3.4	Hot surface		N
6.4.3.5	Equipment marking		P

6.5	Information for maintenance		N
6.5.1	General		N
6.5.2	Capacitor discharge		N
6.5.3	Auto restart/bypass connection		N
6.5.4	PT/CT connections		N
6.5.5	Other hazards		N

Annex A	Examples of protection in case of direct contact	Considered	P
Annex B	Examples of overvoltage category reduction	Considered	P
Annex C	Measurement of clearance and creepage distances	Considered	P
Annex D	Altitude correction for clearances	Considered	P
Annex E	Clearance and creepage distance determination for frequencies greater than 30 kHz	Considered	P
Annex F	Cross sections of round conductors	Considered	P
Annex G	Guidelines for RCD compatibility	Considered	P
Annex H	Symbols referred to in this part of IEC 61800	Considered	P



5.2.3.8	Temperature rise test (type test)				P
	test voltage (V)	24V			—
	t1 (°C).....	24.7			—
	t2 (°C)	24.9			—
temperature rise dT of part/at:		dT (K)	permitted dT (K)		
Enclosure inside		11.2	70		
Enclosure outside		10.9	70		
Terminal block		16.3	100		
L1 coil		28.7	85		
L1 core		24.2	Ref		
L3 coil		31.5	85		
L3 core		30.8	Ref		
K1 body		38.6	60		
PCB near IC1		23.9	105		
PCB near Q1		29.7	105		
PCB near U4		30.2	105		
Internal wire		12.5	55		
C26 body		26.1	80		
temperature rise dT of winding:		R ₁ (Ω)	R ₂ (Ω)	dT (K)	permitted dT (K)
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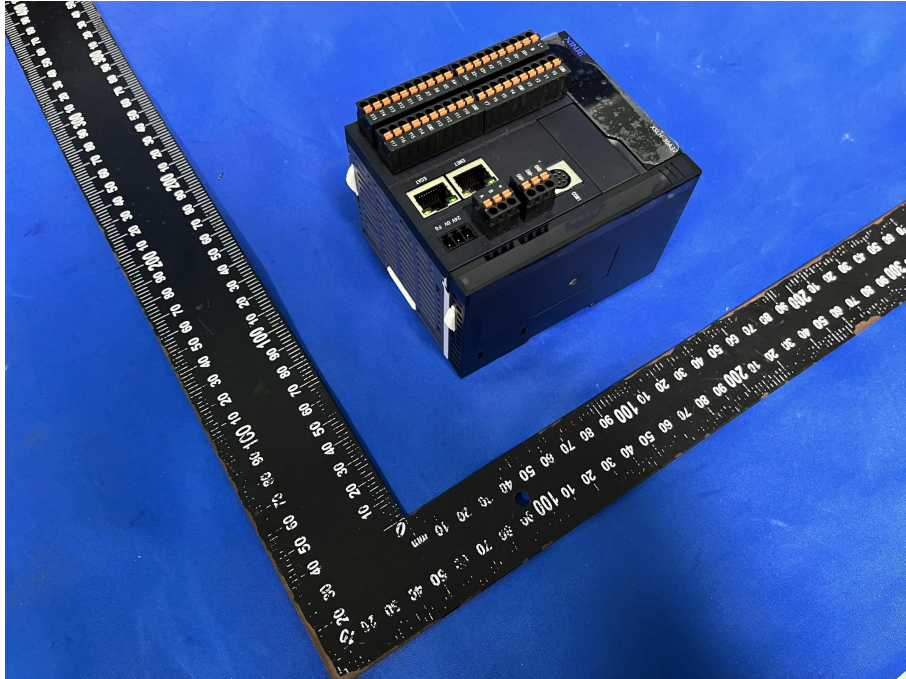
4.3.6.8	TABLE: list of critical components					P
4.3.8.7						
4.4						
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
Enclosure	KINGFA SCI & TECH CO LTD	JH960 6200	V-0 or Better, 105°C, min. 2.5mm	UL 94	UL	
PCB	Interchangeable	Interchangeable	94V-0, 130°C	UL94	UL	
Terminal block	Heavy power co.. ltd	DP952	10A/300V	UL1059	UL	
Internal wire	Shenzhen Zhengerya Cabe Co.,Ltd.	2648	22AWG, 80°C, 300V	UL 758	UL	
Heat shrinkable tube	Dongguan Liaobu Sanlian Plastic Co.,Ltd.	SALIPT S-901	125°C, 600V	UL 224	UL	



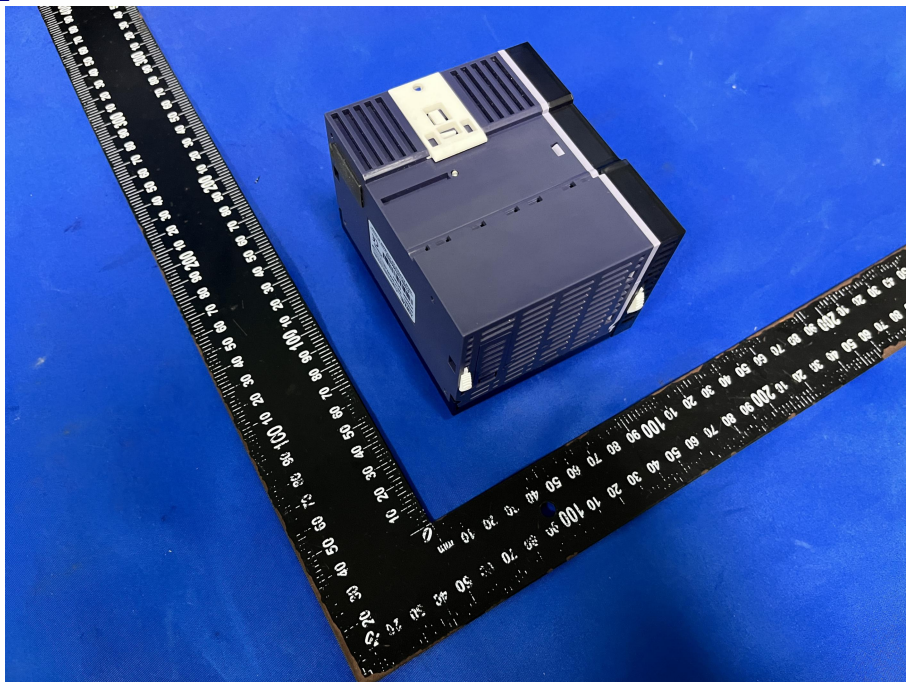
4.3.6.8 4.3.8.7 4.4	TABLE: list of critical components					P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
DC fan	Interchangeable	Interchangeable e	Class B	--	CE	
1) an asterisk indicates a mark which assures the agreed level of surveillance						

ANNEX A: Photo-documentation

EUT Photo 1



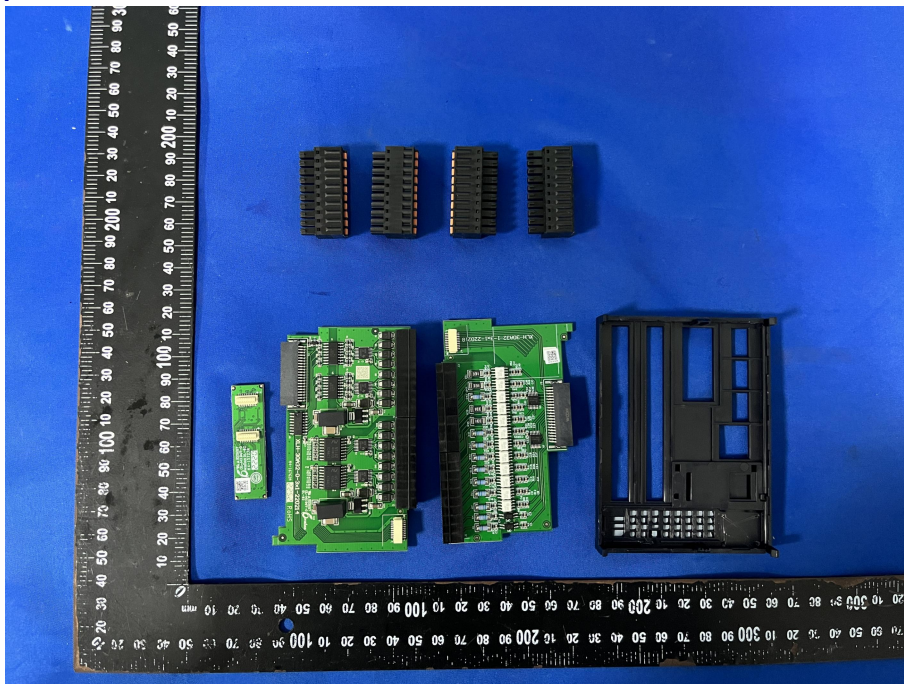
EUT Photo 2



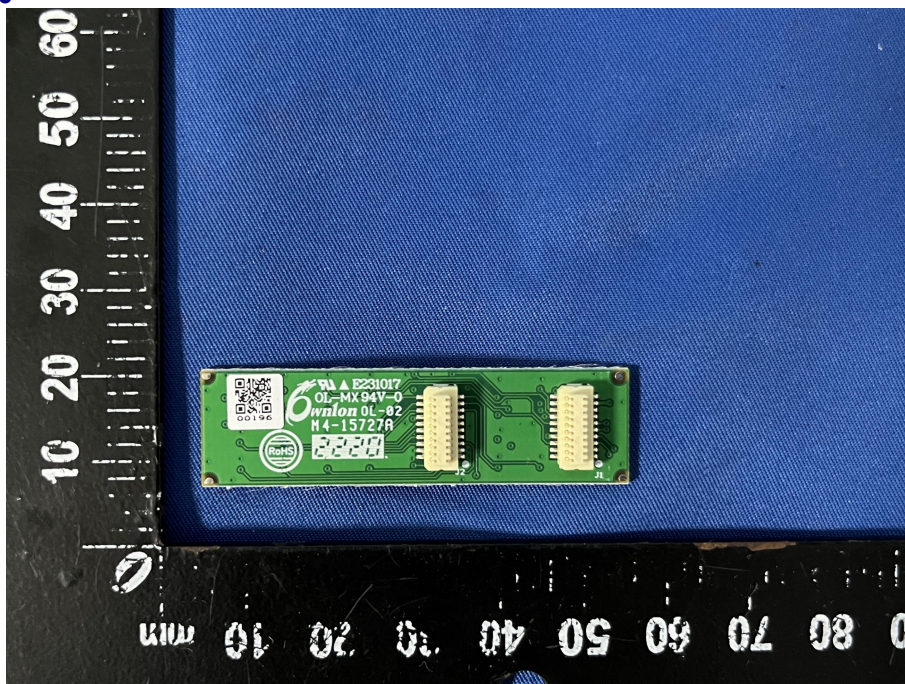
EUT Photo 3



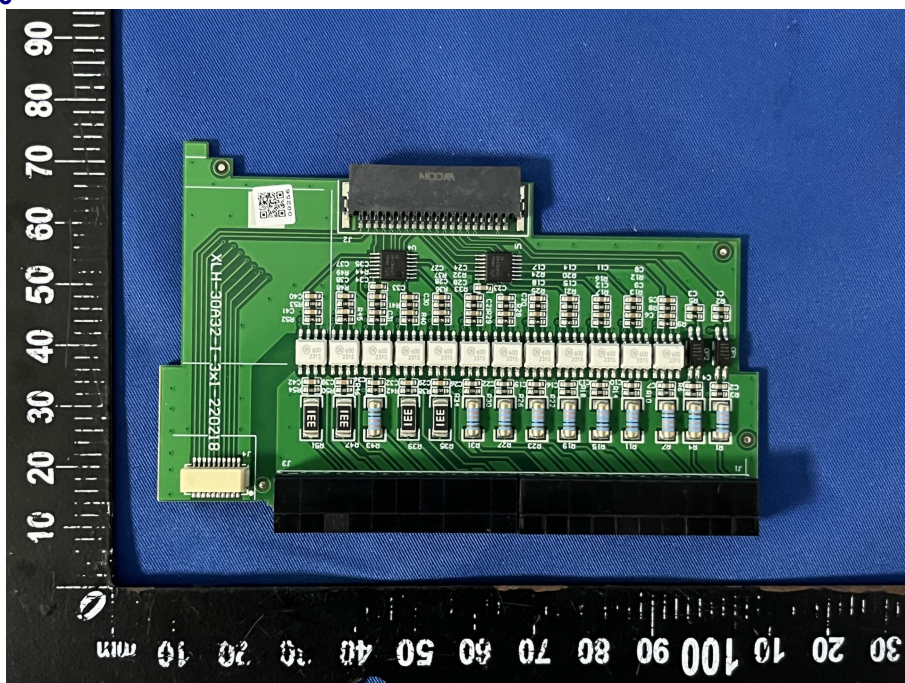
EUT Photo 4



EUT Photo 5

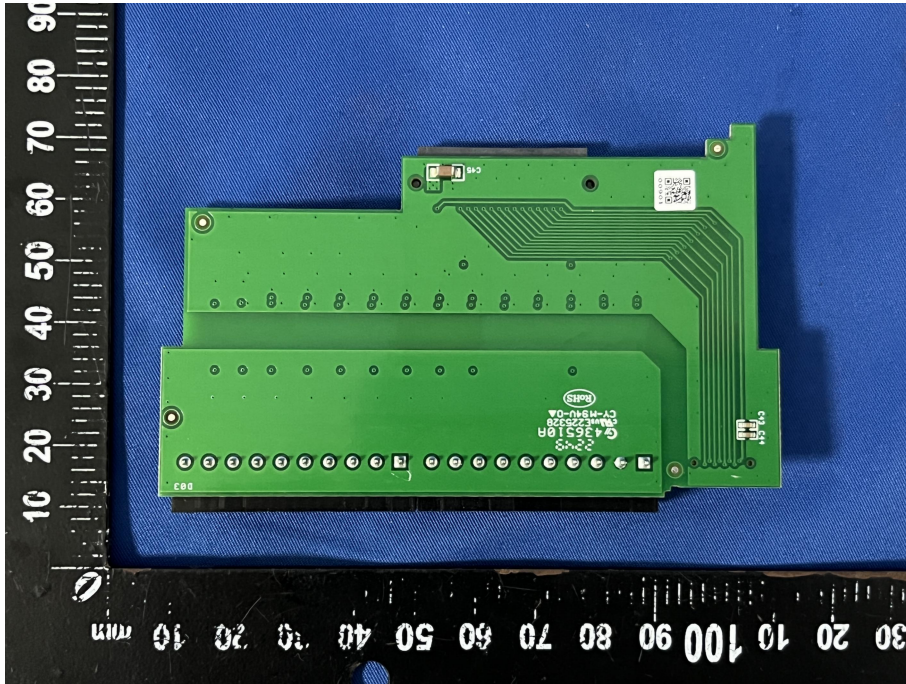


EUT Photo 6

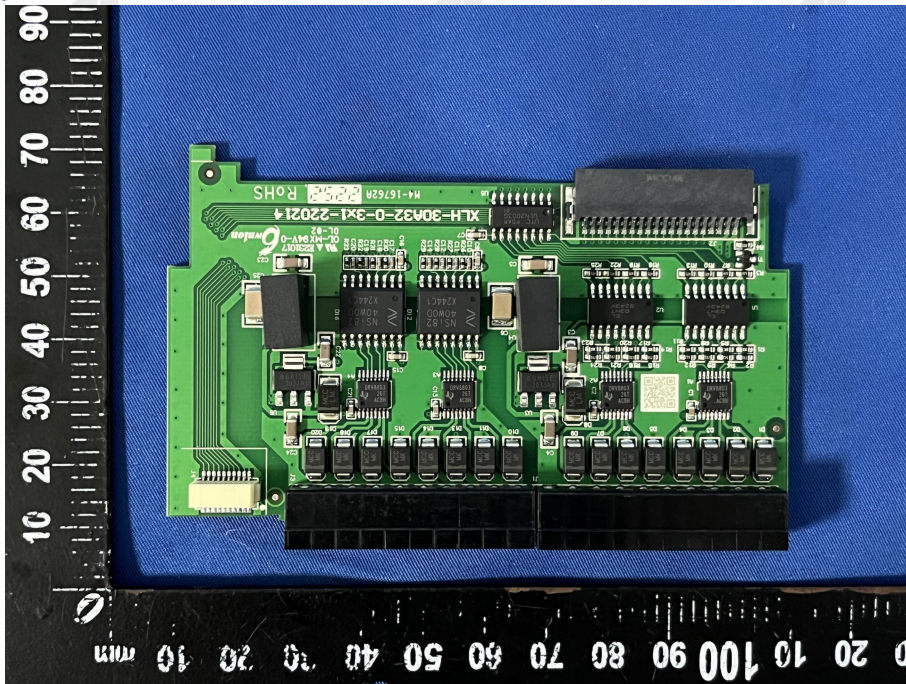




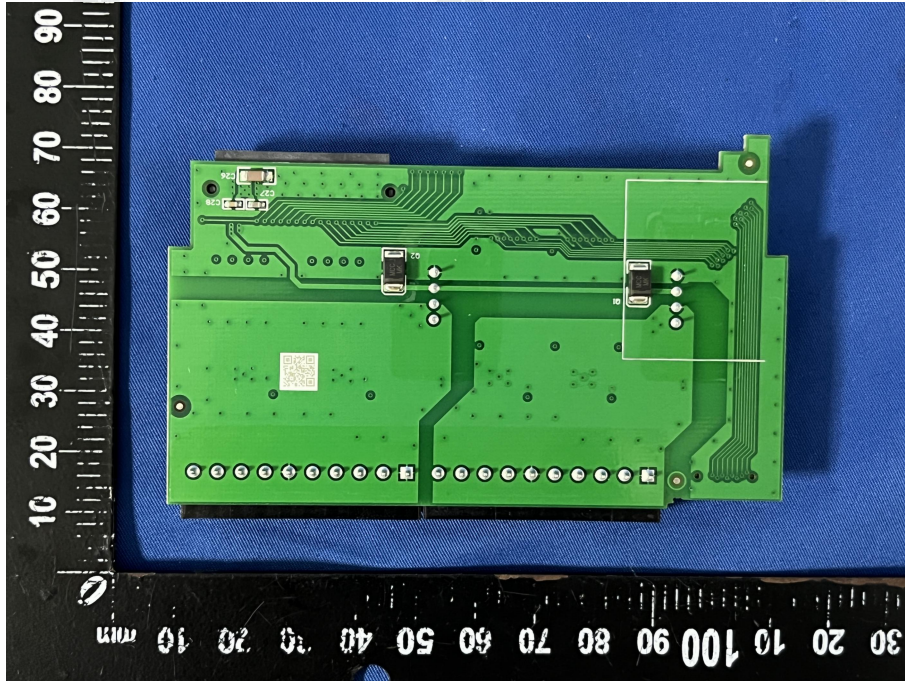
EUT Photo 7



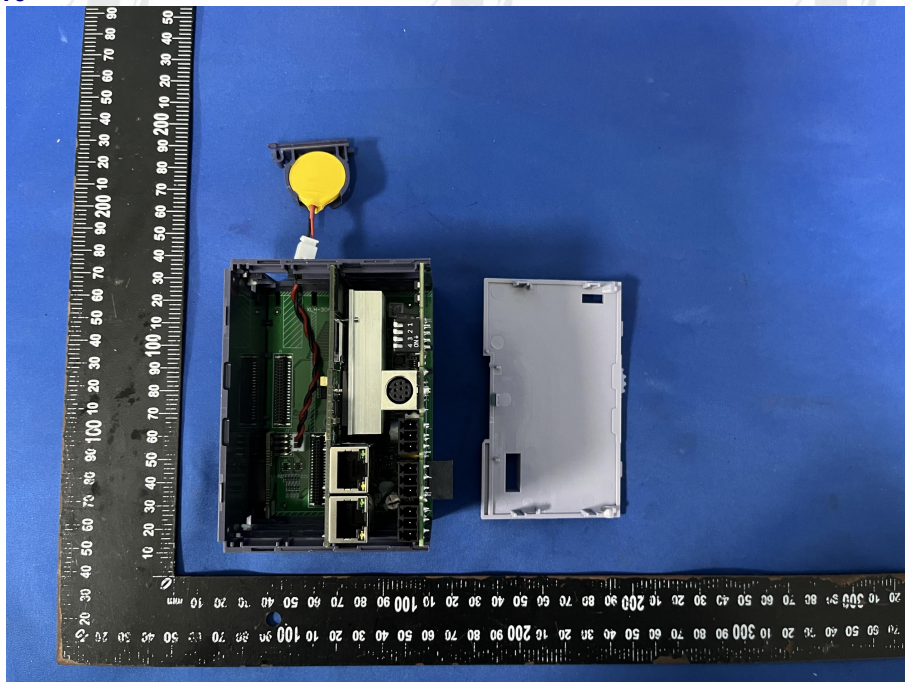
EUT Photo 8



EUT Photo 9



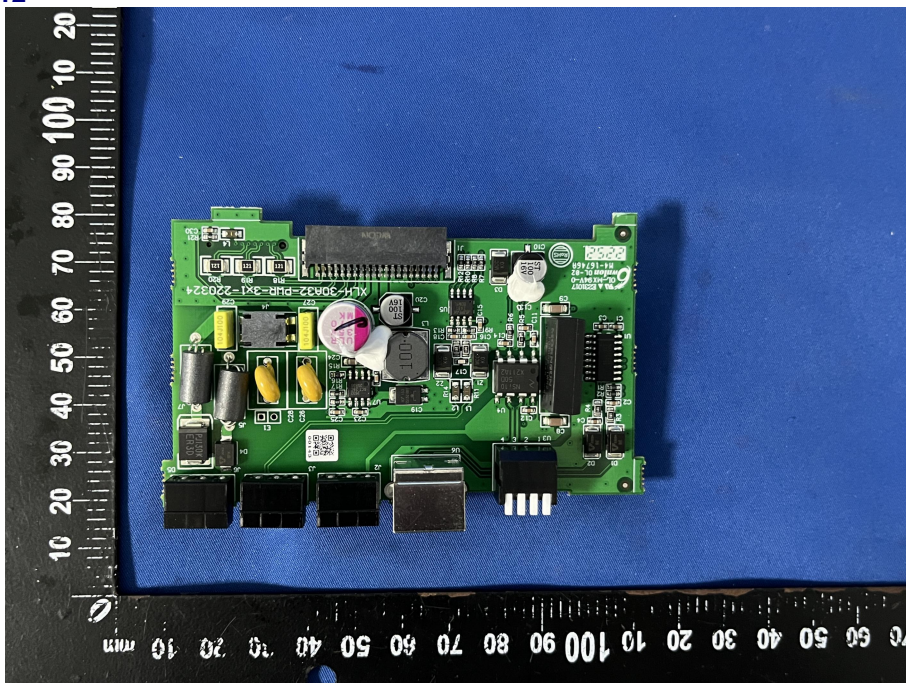
EUT Photo 10



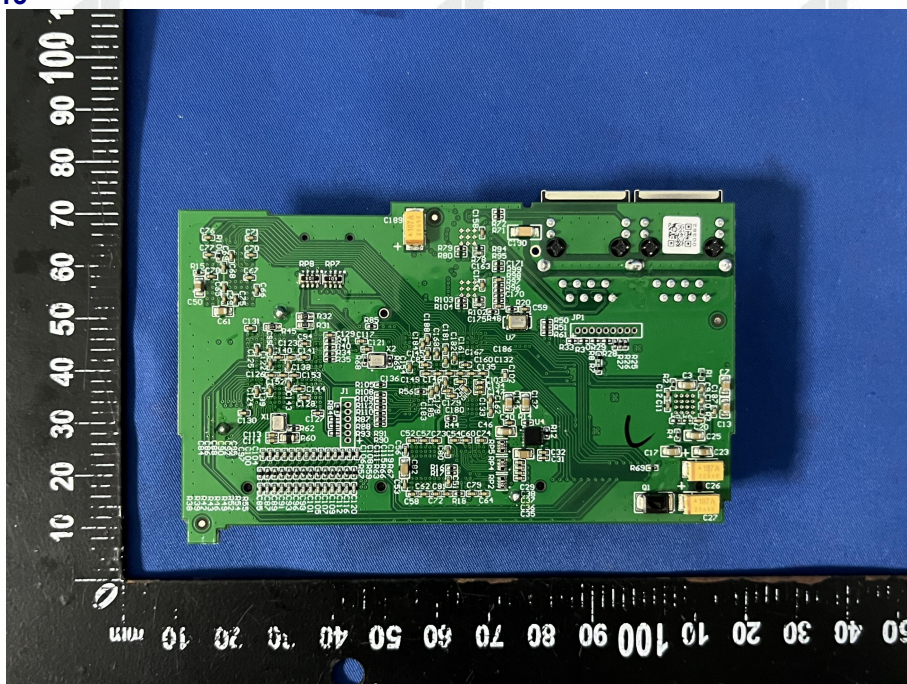
EUT Photo 11



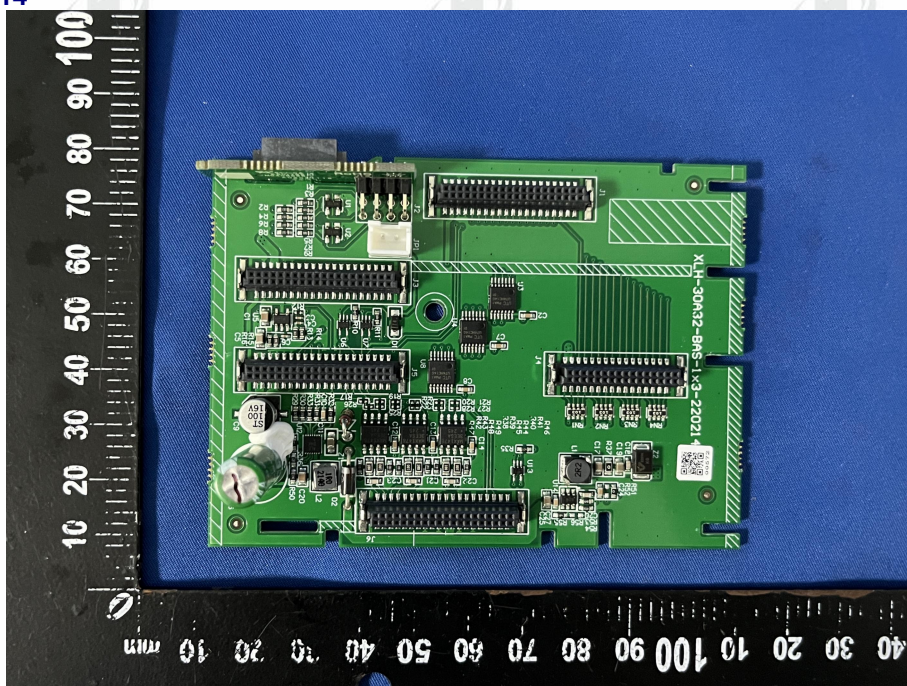
EUT Photo 12



EUT Photo 13

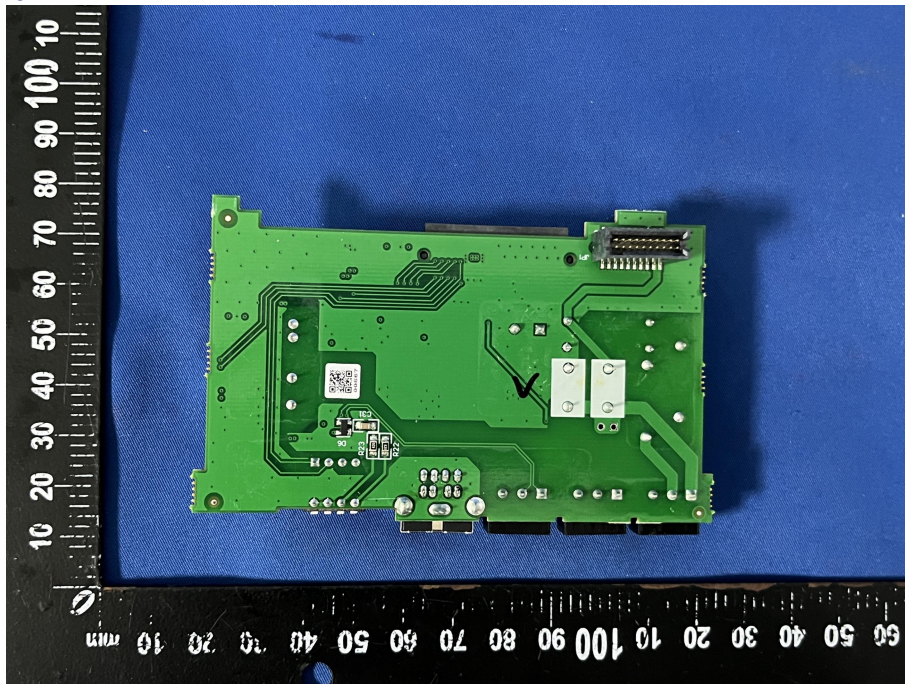


EUT Photo 14

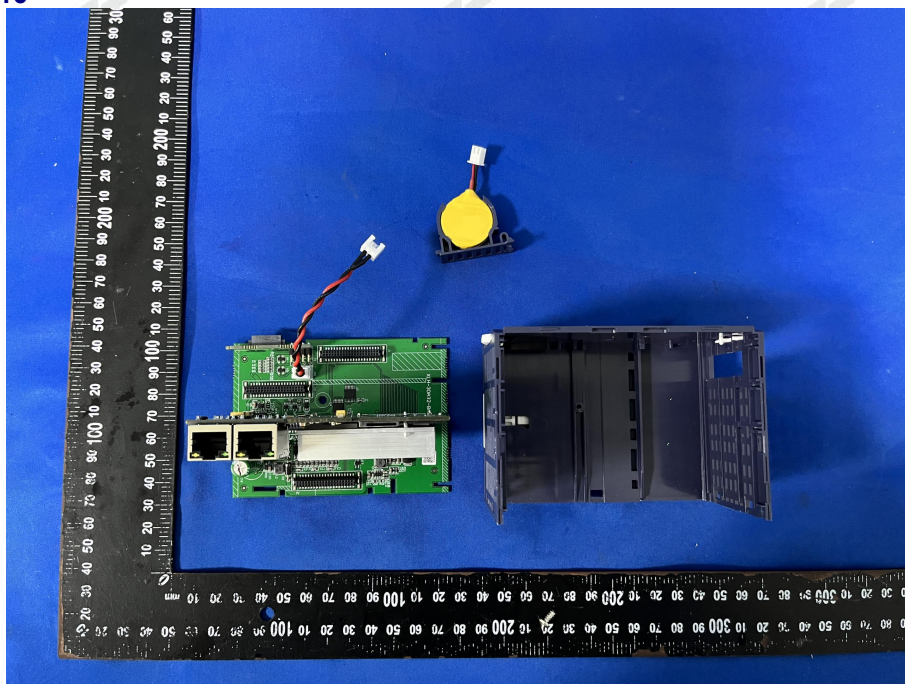




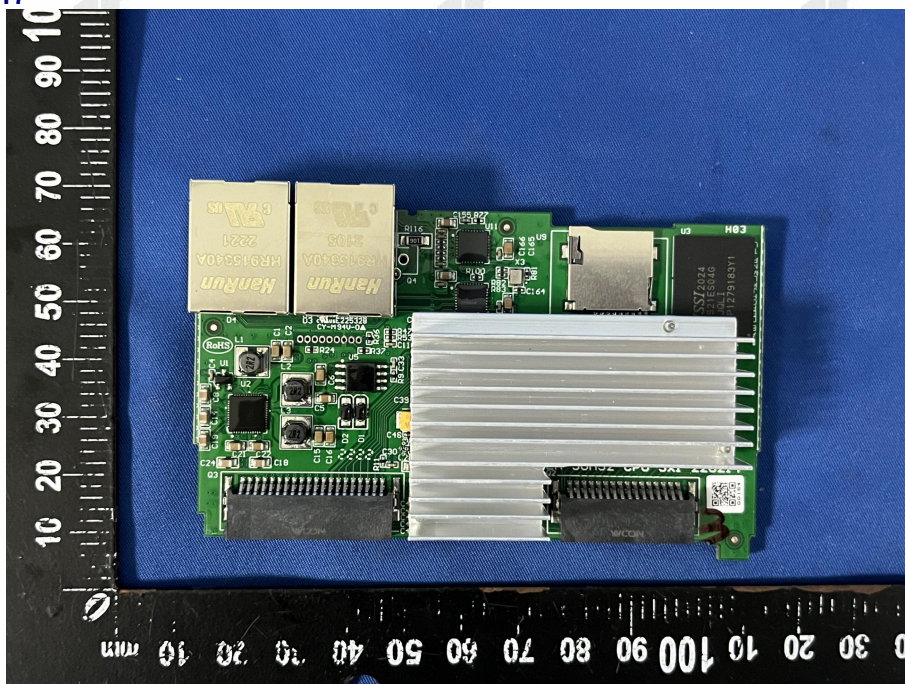
EUT Photo 15



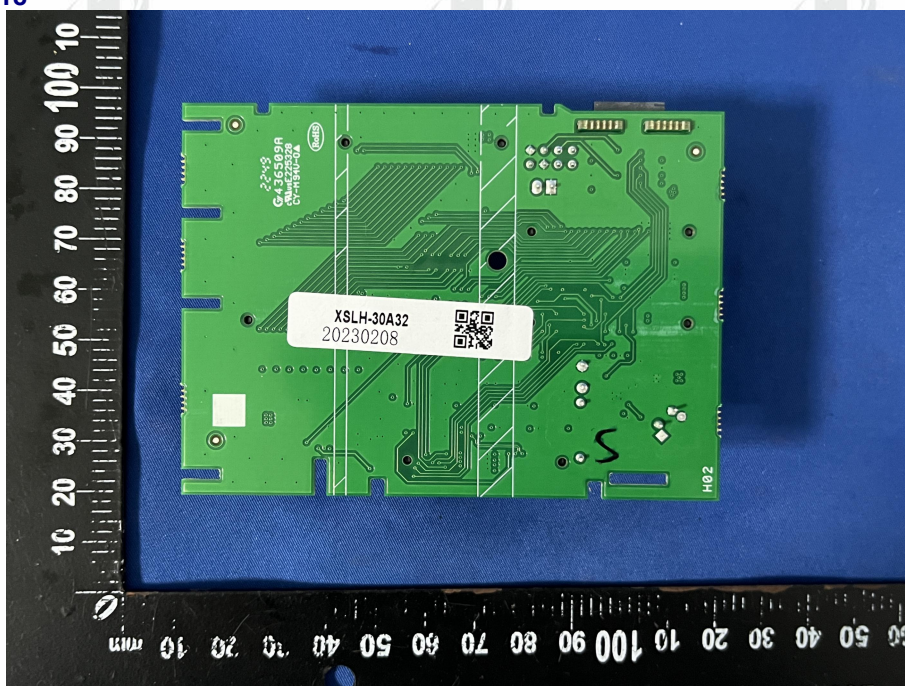
EUT Photo 16



EUT Photo 17



EUT Photo 18



***** END OF REPORT *****