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## TEST REPORT

### IEC/EN 61800-5-1

#### Adjustable speed electrical power drive systems – Part 5-1: Safety requirements – Electrical, thermal and energy

Report Number.....: CHTE24050159



Date of issue.....: 2024-05-27

Tested by  
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*Vince Peng*

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(name + signature).....: Tom Tan

*Tom Tan*

Approved by  
(name + signature).....: Caroline Li

*Caroline Li*

**Testing Laboratory.....: Shenzhen Huatongwei International Inspection Co., Ltd.**

Testing location/ address.....: Building 7, Baiwang Idea Factory, No.1051, Songbai Road,  
Yangguang Community, Xili Subdistrict, Nanshan District,  
Shenzhen, Guangdong, China.

**Applicant's name.....: China Leadshine Technology Co.,Ltd.**

Address.....: 15-20/F, Block B, Nanshan I Valley, No.3157, Shahe West Road,  
Nanshan District, Shenzhen

**Manufacturer's name.....: China Leadshine Technology Co.,Ltd.**

Address.....: 15-20/F, Block B, Nanshan I Valley, No.3157, Shahe West Road,  
Nanshan District, Shenzhen

#### Test specification:

Standard.....: ☐ IEC 61800-5-1:2007/AMD1:2016  
☒ EN 61800-5-1:2007/A11:2021

Test procedure .....: Type test

Non-standard test method.....: N/A

Test Report Form No. ....: IEC61800\_5\_1C

Test Report Form(s) Originator.....: SGS Fimko Ltd.

Master TRF.....: Dated 2018-05-18


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#### General disclaimer:

The test results presented in this report relate only to the object tested.

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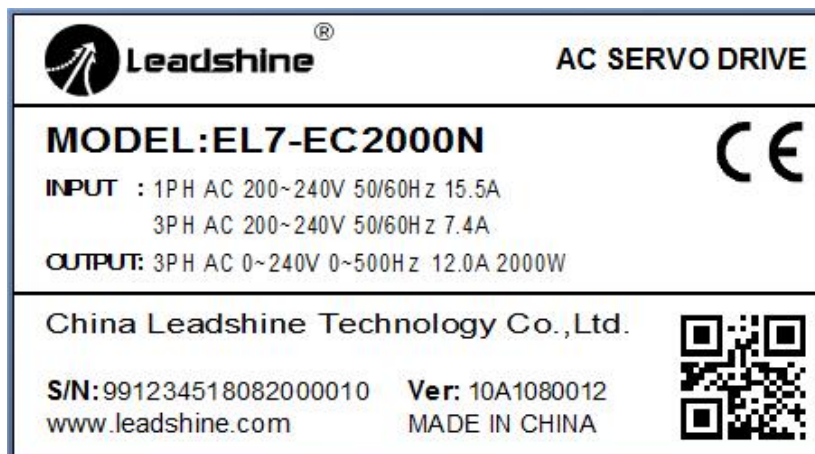
<b>Test item description</b> .....	AC Servo Drives
<b>Manufacturer</b> .....	China Leadshine Technology Co.,Ltd.
<b>Address</b> .....	15-20/F, Block B, Nanshan I Valley, No.3157, Shahe West Road, Nanshan District, Shenzhen
<b>Trademark</b> .....	 EL7-EC2000N, L7N-(a)1500(b), L6N-(a)1500(b), EL7-EC1500(a), EL6-EC1500(a), L7N-(a)2000(b), L6N-(a)2000(b), EL7-EC2000(a), EL6-EC2000(a).
<b>Model/Type No.</b> .....	(a)(b):The model number may include a suffix "XXXXXXXXXX", W here "XXXXXXXXXX" can be blank or combination of any alphanu meric and/or symbols that represents customer identity.
<b>Rating(s)</b> .....	See page 4 for details

**Summary of testing:****Tests performed (name of test and test clause):**

The submitted samples were found to comply with the  
requirements of:  
- EN 61800-5-1:2007/A11:2021

**Testing location:**

Shenzhen Huatongwei International Inspection  
Co., Ltd.  
Building 7, Baiwang Idea Factory, No.1051,  
Songbai Road, Yangguang Community, Xili  
Subdistrict, Nanshan District, Shenzhen,  
Guangdong, China.

**Copy of marking plate:****Remark:**

The marking fo other models is the same as above, except for model designation and rated value.

<b>Test item particulars:</b>		
Equipment under test .....	<input type="checkbox"/> PDS <input type="checkbox"/> CDM <input checked="" type="checkbox"/> BDM <input type="checkbox"/> Other:	
Intended equipment location .....	<input type="checkbox"/> stand alone <input checked="" type="checkbox"/> for building-in	
Mains supply overvoltage category (OVC) .....	<input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input checked="" type="checkbox"/> OVC III <input type="checkbox"/> OVC IV	
Reduction of OVC for basic insulation used .....	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, by:	
Supply earthing systems and system voltage (V) .....	Supply earthing system	System voltage
	<input checked="" type="checkbox"/> TN-S, TN-C, TN-CS, TT (not corner earthed)	300
	<input type="checkbox"/> TN-C (middle point earthed)	
	<input type="checkbox"/> TN-S, TT (corner earthed)	
	<input type="checkbox"/> IT (not corner earthed)	
	<input type="checkbox"/> IT (corner earthed)	
	<input type="checkbox"/> other:	
DVC D circuits/terminals (other than mains) .....	N/A	
DVC C circuits/terminals (other than mains) .....	Output terminal U, V, W; All primary circuits directly connected to input/output terminals	
DVC B circuits/terminals .....	N/A	
DVC A circuits/terminals .....	All accessible terminals on control board	
Potential free circuits/terminals (voltage, OVC) .....	OVC III	
Class of equipment .....	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class 0 <input type="checkbox"/> Class III	
Pollution degree .....	<input type="checkbox"/> PD 1: <input checked="" type="checkbox"/> PD 2: <input type="checkbox"/> PD 3: <input type="checkbox"/> PD 4:	
IP protection classes .....	IPX0	
Ambient temperature during operation (°C) with/without derating .....	55	
Liquid cooling temperature during operation (°C) with/without derating .....	N/A	
Max. operation altitude (m) .....	2000m	
Altitude of test laboratory (m) .....	<500m	
Other particulars .....	N/A	
Motor overload and overtemperature protection .....	<input type="checkbox"/> Thermal or electronic overload relay <input checked="" type="checkbox"/> Electronic motor overload protection with thermal memory retention <input type="checkbox"/> Electronic motor overload protection with speed sensitivity <input type="checkbox"/> Monitoring and automatic reduction of motor current based on thermal sensor in or on motor <input type="checkbox"/> Embedded motor thermal protection disconnecting the motor <input type="checkbox"/> None	

**Possible test case verdicts:**

- test case does not apply to the test object..... : N/A (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..... : 2024-04-02

Date(s) of performance of tests..... : 2024-04-22 to 2024-05-27

**General remarks:**

The test results presented in this report relate only to the object tested.

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“(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.

**General product information:**

1. When installing the equipment, all requirements of the mentioned standard must be fulfilled and it should be suitably installed in closed electrical operation area, and fire/mechanical protection enclosure should be provided.
2. Maximum operating temperature is 55°C.
3. The input and output circuits were considered as DVC C circuits and signal circuit was considered as DVC A circuit.
4. The equipment has no overcurrent protection device. For safety operation, a suitable external circuit breaker must be employed before installation.
5. Refer to the installation and operating instruction from manufacturer for the details of loading and operating conditions.
6. Unless otherwise specified, the model EL7-EC2000N were chosen as representative models to perform all the tests.
7. All models are identical except for model name and power, see below table for details.

Model	Rated input	Rated output
EL7-EC2000N, L7N-(a)2000(b), L6N-(a)2000(b), EL7-EC2000(a), EL6-EC2000(a).	1PH AC 200-240V, 50/60Hz, 15.5A  3PH AC 200-240V, 50/60Hz, 7.4A	3PH AC 0-240VAC, 0-500Hz, 12.0A, 2000W
L7N-(a)1500(b), L6N-(a)1500(b), EL7-EC1500(a), EL6-EC1500(a).	1PH AC 200-240V, 50/60Hz, 13.0A  3PH AC 200-240V, 50/60Hz, 5.8A	3PH AC 0-240VAC, 0-500Hz, 9.5A, 1500W

**8. Report version information:**

This copy was issued base on CHTE24040134(Issued:2024-04-29).

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

<b>4</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK, THERMAL, AND ENERGY HAZARDS</b>		<b>P</b>
4.1	General		P

4.2	Fault conditions		P
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4.3	Protection against electric shock		P
4.3.1	Decisive voltage classification		P
4.3.1.1	Use of decisive voltage class (DVC) .....:	DVC A and DVC 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	A.C. working voltage		P
4.3.1.4.3	D.C. working voltage		P
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		P

4.3.4	Protection in case of direct contact		P
4.3.4.1	General		P
4.3.4.2	Protection using DVC A ..... :	For communication interfaces	P
4.3.4.3	Protection by means of protective impedance		P
4.3.4.4	Protection by means of using limited voltage		N/A
4.3.5	Protection against indirect contact		P
4.3.5.1	General ..... :	Comply with the requirements for protective class I	P
4.3.5.2	Insulation between live parts and accessible conductive parts	Basic insulation	P
4.3.5.3	Protective bonding circuit		P
4.3.5.3.1	General		P
4.3.5.3.2	Rating of protective bonding ..... :	Comply with 5.2.3.9	P
4.3.5.3.3	Protective bonding impedance		P
4.3.5.4	Protective earthing conductor ..... :	Same as phase	P

EN 61800-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.3.5.5	Means of connection for the protective earthing conductor		P
4.3.5.5.1	General		P
4.3.5.5.2	Touch current in case of failure of protective earthing conductor ..... :		P
4.3.5.6	Special features in equipment for protection class II	Class I equipment	N/A
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 ..... :	2	P
4.3.6.1.3	Overvoltage Category ..... :	III	P
4.3.6.1.4	Supply earthing systems ..... :	TN	P
4.3.6.1.5	Insulation voltages	System voltage: 300V	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 .... :	Overvoltage Category III	P
4.3.6.2.3	Circuits not connected directly to the supply mains ..... :	Overvoltage Category II	P
4.3.6.2.4	Insulation between circuits ..... :		P
4.3.6.3	Functional insulation		P
4.3.6.4	Clearance distances	(See appended table 5.2.2.1)	P
4.3.6.4.1	Determination		P
4.3.6.4.2	Electric field homogeneity		N/A
4.3.6.4.3	Clearance to conductive enclosures ..... :	See 4.3.6.4.1 & 5.2.2.5	P
4.3.6.5	Creepage distance	(See appended table 5.2.2.1)	P
4.3.6.5.1	General		P
4.3.6.5.2	Materials ..... :	IIIb	P
4.3.6.6	Coating	No such coating	N/A
4.3.6.7	PWB spacings for functional insulation ..... :		N/A
4.3.6.8	Solid insulation	(See appended table 4.3.6.8)	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 or supplementary insulation	(See appended table 4.3.6.8)	P
4.3.6.8.2.2	Double and reinforced insulation	(See appended table 4.3.6.8)	P
4.3.6.8.2.3	Functional insulation		P
4.3.6.8.3	Thin sheet or tape material	(See appended table 4.3.6.8)	P
4.3.6.8.3.1	General		P
4.3.6.8.3.2	Material thickness not less than 0,2 mm		P

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.6.8.3.3	Material thickness less than 0,2 mm		N/A
4.3.6.8.3.4	Compliance		P
4.3.6.8.4	Printed wiring boards		P
4.3.6.8.4.1	General		P
4.3.6.8.4.2	Use of coating materials		N/A
4.3.6.8.5	Wound components		P
4.3.6.8.6	Potting materials		N/A
4.3.6.9	Insulation requirements above 30 kHz		N/A
4.3.7	Enclosures		P
4.3.7.1	General .....	See cl. 4.4.3, cl. 5.2.2.4 and cl.5.2.2.5.3	P
4.3.7.2	Cast metal .....	Plastic	N/A
4.3.7.3	Sheet metal .....	Plastic	N/A
4.3.8	Wiring and connections		P
4.3.8.1	General		P
4.3.8.2	Routing		P
4.3.8.3	Colour coding		P
4.3.8.4	Splices and connections		P
4.3.8.5	Accessible connections		P
4.3.8.6	Interconnections between parts of the PDS		P
4.3.8.7	Supply connections		P
4.3.8.8	Terminals		N/A
4.3.8.8.1	Construction requirements		N/A
4.3.8.8.2	Connecting capacity		N/A
4.3.8.8.3	Connection		N/A
4.3.8.8.4	Wire bending space for wires 10 mm <sup>2</sup> and greater .....		N/A
4.3.9	Output short circuit requirements .....	(See appended table 5.2.3.6)	P
4.3.10	Residual current-operated protective (RCD) or monitoring (RCM) device compatibility	No RCD or RCM provided	N/A
4.3.11	Capacitor Discharge .....	Capacitor discharge to 60 V within 5s.	P
4.3.12	Access conditions for high-voltage PDS	Not high-voltage PDS	N/A
4.4	Protection against thermal hazards		P
4.4.1	Minimizing the risk of ignition	(See appended table 1)	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.4.2	Insulation Materials		P
4.4.2.1	General	(See appended table 5.2.3.8)	P
4.4.2.2	Material requirements	See cl. 5.2.5.1, 5.2.5.2 and appended table 1.	P
4.4.3	Flammability of enclosure materials		N/A
4.4.4	Temperature limits		P
4.4.4.1	Internal parts	(See appended table 5.2.3.8)	P
4.4.4.2	External parts of CDM		N/A
4.4.5	Specific requirements for liquid cooled PDS	No coolant used	N/A
4.4.5.1	Coolant		N/A
4.4.5.2	Design requirements		N/A
4.4.5.2.1	Corrosion resistance		N/A
4.4.5.2.2	Tubing, joints and seals		N/A
4.4.5.2.3	Provision for condensation		N/A
4.4.5.2.4	Leakage of coolant		N/A
4.4.5.2.5	Loss of coolant		N/A
4.4.5.2.6	Conductivity of coolant		N/A
4.4.5.2.7	Insulation requirements for coolant hoses		N/A
4.4.6	Motor overload and overtemperature protection		P
4.4.6.1	Means of protection		P
4.4.6.2	CDM/BDM with electronic motor overload protection		P
4.4.6.3	CDM/BDM with electronic motor overload protection with thermal memory retention		N/A
4.4.6.4	CDM/BDM with electronic motor overload protection which is speed sensitive		N/A
4.4.6.5	CDM/BDM providing monitoring and automatic reduction of motor current by means of thermal sensors		N/A
4.5	Protection against energy hazards		N/A
4.5.1	Electrical energy hazards ..... :	Check in PDS	N/A
4.5.2	Mechanical energy hazards		N/A
4.5.2.1	General		N/A
4.5.2.2	Critical torsional speed		N/A
4.5.2.3	Transient torque analysis		N/A
4.5.3	Acoustic noise emission		N/A
4.6	Protection against environmental stresses		P



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

<b>5</b>	<b>TEST REQUIREMENTS</b>		<b>P</b>
5.1	General		P
5.1.1	Test objectives and classification .....	Type tests	P
5.1.2	Selection of test samples .....	See General product information	P
5.1.3	Sequence of tests		P
5.1.4	Earthing Conditions .....	Neutral to earth	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)		P
5.2.2	Mechanical tests		P
5.2.2.1	Clearance and creepage distances (type test)	(See appended table 5.2.2.1)	P
5.2.2.2	PWB short-circuit test (type test)	(See appended table 5.2.2.2)	P
5.2.2.3	Non-accessibility test (type test) .....	IPX0	N/A
5.2.2.4	Enclosure integrity test (type test) .....	IPX0	N/A
5.2.2.5	Deformation tests	Building-in equipment	N/A
5.2.2.5.1	General		N/A
5.2.2.5.2	Deflection test (type test) .....		N/A
5.2.2.5.3	Impact test (type test), temperature (°C) .....	55	P

5.2.3	Electrical tests		P
5.2.3.1	Impulse voltage test (type test and sample test)	(See appended table 5.2.3.1)	P
5.2.3.2	A.C. or d.c. voltage test (type and routine test)	(See appended table 5.2.3.2)	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 a.c. or d.c. voltage test	5s	P
5.2.3.2.5	Verification of the a.c. or d.c. voltage test	No any electrical breakdown occurs	P
5.2.3.3	Partial discharge test (type test, sample test)		N/A
5.2.3.4	Protective impedance (type test and routine test) :		N/A
5.2.3.5	Touch current measurement (type test)		N/A
5.2.3.6	Short-circuit test and Breakdown of components test (type tests)	(See appended table 5.2.3.6)	P
5.2.3.6.1	General		P

EN 61800-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.3.6.2	Test configuration		P
5.2.3.6.2.1	Supply voltage and current	Rated supply voltage used	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
5.2.3.6.3.3	Short-circuit between phase terminals of power output and protective earth		
5.2.3.6.4	Breakdown of component test		P
5.2.3.6.4.1	Load condition	Normal load conditions	P
5.2.3.6.4.2	Application of short-circuit or open-circuit		P
5.2.3.6.5	Test sequence		P
5.2.3.6.6	Pass criteria		P
5.2.3.7	Capacitor discharge (type test) .....:	Capacitor discharge to 60 V within 5s	P
5.2.3.8	Temperature rise test (type test)	(See appended table 5.2.3.8)	P
5.2.3.9	Protective bonding (type test and routine test)	(See appended table 5.2.3.9)	P
5.2.4	Abnormal operation tests	(See appended table 5.2.4)	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/A
5.2.4.5	Cooling failure tests (type tests)		P
5.2.4.5.1	General		P
5.2.4.5.2	Inoperative blower motor (type test)		P
5.2.4.5.3	Clogged filter (type test)		P
5.2.4.5.4	Loss of coolant	No coolant used	N/A
5.2.5	Material tests	(See appended table 5.2.5)	P
5.2.5.1	High current arcing ignition test (type test)		N/A
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/A
5.2.5.4	Flammability test (type test)		N/A
5.2.6	Environmental tests (type tests)		P
5.2.6.1	General		P
5.2.6.2	Acceptance criteria		P
5.2.6.3	Climatic tests		P

EN 61800-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.6.3.1	Dry heat test (steady state)		P
5.2.6.3.2	Damp heat test (steady state)		P
5.2.6.4	Vibration test (type test)		P
5.2.7	Hydrostatic pressure test (type test and routine test) ..... :	No such liquid	N/A
5.2.8	Electronic motor overload protection test (type test)		P
5.2.8.1	General requirements		P
5.2.8.2	Test set-up		P
5.2.8.3	Pass criteria		P
5.2.8.4	CDM/BDM electronic motor overload protection test (type test)		P
5.2.8.5	CDM/BDM electronic motor thermal memory retention shutdown test (type test)		N/A
5.2.8.6	CDM/BDM electronic motor thermal memory retention loss of power test (type test)		N/A
5.2.8.7	CDM/BDM electronic motor thermal speed sensitivity test (type test)		N/A
5.2.9	Circuit functionality evaluation (routine and/or sample test)		N/A
<b>6</b>	<b>INFORMATION AND MARKING REQUIREMENTS</b>		P
6.1	General		P
6.2	Information for selection	See appended table 6, part 6.2.	P
6.3	Information for installing and commissioning	See appended table 6, part 6.3.	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		P
6.3.5.1	Motor selection		P
6.3.5.2	Motor integrated sensors		N/A
6.3.5.3	Critical torsional speeds	Checked in PDS	N/A
6.3.5.4	Transient torque analysis	Checked in PDS	N/A
6.3.6	Connections		P

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

6.3.6.1	General		P
6.3.6.2	Interconnection and wiring diagrams	Provided in the user manual	P
6.3.6.3	Conductor (cable) selection	Provided in the user manual	P
6.3.6.4	Terminal capacity and identification .....:	Provided in the user manual	P
6.3.6.5	Protection requirements		P
6.3.6.6	Earthing	Provided in the user manual	P
6.3.6.7	Protective earthing conductor current		P
6.3.6.8	Special requirements		N/A
6.3.7	Overcurrent and short-circuit protection		P
6.3.8	Motor overload protection	Provided in the user manual	P
6.3.9	Commissioning		P

6.4	Information for use	See appended table 6, part 6.4.	P
6.4.1	General		P
6.4.2	Adjustment		P
6.4.3	Labels, signs and signals	Warning for high voltage	P
6.4.3.1	General		P
6.4.3.2	Isolators	No isolator	N/A
6.4.3.3	Visual and audible signals		P
6.4.3.4	Hot surfaces		P
6.4.3.5	Equipment marking		P

6.5	Information for maintenance	See appended table 6, part 6.5.	P
6.5.1	General		P
6.5.2	Capacitor discharge	Cl. 4.3.11 was complied, instruction provided	P
6.5.3	Auto restart/bypass connection		P
6.5.4	PT/CT connection		N/A
6.5.5	Other hazards		N/A

Annex A	Examples of protection in case of direct contact		P
Annex B	Examples of overvoltage category reduction		P
Annex C	Measurement of clearance and creepage distances		P
Annex D	Altitude correction for clearances	2000m	P
Annex E	Clearance and creepage distance determination for frequencies greater than 30 kHz		P
Annex F	Cross sections of round conductors		P

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Clause	Requirement + Test	Result - Remark	Verdict
Annex G	Guidelines for RCD compability		N/A
Annex H	Symbols referred to in this part of IEC 61800		P

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Clause	Requirement + Test	Result - Remark	Verdict
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1	TABLE: List of materials and components separately evaluated					P
Object/part No	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity	
Plastic enclosure	SABIC INNOVATIVE PLASTICS US L L C	C2950(GG)	V-0, 85°C, min. 1.0mm thickness	UL 94	UL E121562	
Ventilation fan	SHENZHEN HUAXIA HENGTAI ELECTRONIC CO LTD	DA06025B24HA	DC 24V, 0.25A	UL 507	UL E254715	
(Alternative)	HONGHUA ELECTRON TECHNOLOGCA L CO LTD	HA6025H24B-Z ND07	DC 24V, 0.5A	UL 507	UL E255883	
PCB	SHENZHEN SHENKAI ELECTRONICS CO LTD	SK-4	V-0, 130°C	UL 796	UL E319204	
(Alternative)	Interchangeable	Interchangeable	V-0, 130°C	UL 796	UL	
Terminal block (CN4)	NINGBO DEGSON ELECTRICAL CO.,LTD.	9EDGRC-5.0	300V 16A	UL 1059	UL E228872	
(Alternative)	Kunshan AINEWELL Electr onics Co., Ltd.	F9C-7-5.0	300V 16A	UL 1059	UL E498070	
Y capacitor (C3,C4,C76,C7 7,C79,C80,C81 )	FUX IN PAN OCEAN ELECTRONIC LTD	MPX-X2	Min. 300V, 4700pF, 85°C, Y2 type	IEC/EN 60384-14	VDE 40015756	
Varistor (RV1, RV2, RV3, RV4)	Thinking Electronic Industrial Co., Ltd.	TVR10471KSY	470V, 125°C	IEC 61051-1, IEC 61051-2	VDE 005944	
(Alternative)	Guangdong Fenghua Advanced Technology Holding Co.,Ltd	FNR10K471BAS N1NN	470V, 125°C	IEC 61051-1, IEC 61051-2	VDE 40008242	
Transformer (T1)	WEIMEI ELECTRONICS FACTORY DONG GUAN CITY	ETD34	Class B	IEC/EN 61800-5- 1	Test with equipment	
- Bobbin	SUMITOMO BAKELITE CO	T375J	V-0, 130°C, min. 0.4mm thickness	UL 94	UL E59481	

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Clause	Requirement + Test		Result - Remark		Verdict
	LTD				
- Magnet wire	NINGBO JINTIAN NEW MATERIAL CO LTD.	*UEW/155	155°C	UL 1446	UL E227047
(Alternative)	Interchangeable	Interchangeable	Min. 130°C	UL 1446	UL
- Insulation tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO.,LTD.	CT-280B	130°C	UL 510A	UL E165111
(Alternative)	Jingjiang Jingyi Adhesiv Product CO.,LTD.	JY25-A(b)	130°C	UL 510A	UL E246950
- Margin tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO.,LTD.	WF2902	130°C	UL 510A	UL E165111
(Alternative)	Jingjiang Jingyi Adhesiv Product CO.,LTD.	WF310(a)	130°C	UL 510A	UL E246950
- Tube	DONGGUAN CITY CHANGJIE METALS & PLASTIC PRODUCTS CO LTD.	CJ-TT-L	200°C	UL 224	UL E338209
(Alternative)	DONGGUAN LING FREE HARDWARE PLASTICS PRODUCT CO.LTD.	CB-TT-L	200°C	UL 224	UL E180908
Bus capacitor (E17, E18)	CAPXON ELECTRONIC (SHEN ZHEN) CO.,LTD	UJ102M400P65 0A	400V, 1000uF, 105°C	IEC/EN 61800-5-1	Test with equipment
IGBT	STARPOWER Semiconductor Ltd.	GD50PJX65L3S _B20	650V, 150A	UL 1577	UL E340089
(Alternative)	Fuji Electric Co., Ltd.	7MBR50VKD06 0-50	650V, 150A	UL 1577	UL E82988
(Alternative)	Infineon Technologies AG	FP50R06W2E3	600V, 150A	UL 1577	UL E83335

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Clause	Requirement + Test		Result - Remark		Verdict
Relay (JK1)	Xiamen Hongfa Electroacoustic Co., Ltd.	HF105F-1/024D-1HSTF	277VAC, 16A, 85°C	IEC/EN 61810-1	VDE 40025518
(Alternative)	Zhejiang Fanhar Electronics Co., Ltd.	W15-1A2T-DC24V	277VAC, 16A, 85°C	UL 508	E475405
Relay (JK2)	Xiamen Hongfa Electroacoustic Co., Ltd.	HF175F/24-2ZTF	277VAC, 16A, 85°C	IEC/EN 61810-1	VDE 40025518
(Alternative)	Zhejiang Fanhar Electronics Co., Ltd.	FH50-2CT-DC24V	277VAC, 16A, 85°C	UL 508	E475405
Opto-coupler (U2, U27)	Lite-On Technology Corporation	LTV-817S-TA1	Viso: 5000V, Ext. cr&cl: 6.0mm, 115°C	IEC/EN 60747-5-5	VDE 40015248
-alternative	EVERLIGHT ELECTRONICS CO LTD	EL817S1	Viso: 5000V, Ext. cr&cl: 6.0mm, 115°C	IEC/EN 60747-5-5	VDE 132249
-alternative	Xiamen Hualian Electronics corp Ltd	HPC817	Viso: 5000V, Ext. cr&cl: 6.0mm, 115°C	IEC/EN 60747-5-5	VDE 40004708
Opto-coupler (U20-U26)	Suzhou Novosense Microelectronics Co.,Ltd	NSI6801C-DSWFR	Viso: 5000V, Ext. cr&cl: 6.0mm, 115°C	IEC/EN 60747-5-5	VDE 40057024
-alternative	Shanghai Sillumin Semiconductor Co., Ltd	SiLM5343TCR-DG	Viso: 5000V, Ext. cr&cl: 6.0mm, 115°C	IEC/EN 60747-5-5	VDE 40057954
-alternative	Toshiba Corporation Co.,Ltd	TLP5702(D4-TP4,E	Viso: 5000V, Ext. cr&cl: 6.0mm, 115°C	IEC/EN 60747-5-5	VDE 40043360
Supplementary information:					

5.2.2.1	General selection and information of supply earthing systems for clearance distances									-
Network systems	TN-S, TN-C, TN-CS, TT (not corner earthed)		TN-S, TT (corner earthed)		TN-C (middle point earthed)		IT (not corner earthed)		IT (corner earthed)	
Rated voltage (V)	200-240		Not evaluated		Not evaluated		Not evaluated		Not evaluated	
Max. altitude (m)	2000		--		--		--		--	
System voltage	300		--		--		--		--	
	B/S	D/R	B/S	D/R	B/S	D/R	B/S	D/R	B/S	D/R
Rated Impulse voltage (kV)	4.0	6.0	--	--	--	--	--	--	--	--
Temporary overvoltage (V)	1500/2100	1800/2550	--	--	--	--	--	--	--	--



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Clause	Requirement + Test					Result - Remark				Verdict
Clearance (mm)	3.0	5.5	--	--	--	--	--	--	--	--
Test impulse voltage for clearance (kV)	4.0	6.0	--	--	--	--	--	--	--	--
Supplementary information:										

5.2.2.1		TABLE: Working voltage measurements for clearance and creepage distances									-	
Condition #	Between	TN-S, TN-C, TN-CS, TT (not corner earthed)		TN-S, TT (corner earthed)		TN-C (middle point earthed)		IT (not corner earthed)		IT (corner earthed)		
		peak	rms	peak	rms	peak	rms	peak	rms	peak	rms	
1.	Terminals of bus capacitor	276	254	Not apply	Not apply	Not apply	Not apply	Not evaluated	Not evaluated	Not evaluated	Not evaluated	
IT corner earthed, simulated impedance (MΩ):						1kΩ according to IEC 60990.						
Supplementary information:												

5.2.2.1	TABLE: Clearance and creepage distance measurements						P
Clearance (cl) and creepage distance (cr) at/of/between:	U <sub>peak</sub> (V)	U <sub>rms</sub> (V)	Req. cl. (mm)	Meas. Cl. (mm)	Req. cr. (mm)	Meas. Cr. (mm)	
Basic/supplementary:							
Input terminals to metal enclosure	340	240	3.0	>3.9	3.0	>3.9	
Output terminals to metal enclosure	340	240	3.0	>3.9	3.0	>3.9	
Phase W to PE trace	340	240	3.0	3.2	3.0	3.2	
Phase V to PE trace	340	240	3.0	3.2	3.0	3.2	
Primary parts to earth	340	240	3.0	3.1	3.0	3.1	
Transformer T1 pprimary pin to core	340	240	3.0	3.1	3.0	3.1	
Transformer T1 secondary pin to core	340	240	3.0	3.1	3.0	3.1	
Reinforce insulation:							
Input terminals to communication ports	340	240	5.5	>7.2	5.5	>7.2	
Output terminals to communication ports	340	240	5.5	>7.2	5.5	>7.2	
Input terminals to accessible parts	340	240	5.5	>7.2	5.5	>7.2	
Output terminals to accessible parts	340	240	5.5	>7.2	5.5	>7.2	

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Clause	Requirement + Test			Result - Remark		Verdict
Transformer T1 primary pin to secondary pin	340	240	5.5	5.8	5.5	>7.2
Relay JK1 primary pin to secondary pin	340	240	5.5	>7.2	5.5	>7.2
Relay JK2 primary pin to secondary pin	340	240	5.5	>7.2	5.5	>7.2
Opto-coupler U20, U21, U22, U23, U24 primary pin to secondary pin	340	240	5.5	>7.2	5.5	>7.2
Opto-coupler U27 primary pin to secondary pin	340	240	5.5	6.5	5.5	6.5
Opto-coupler U6, U9 primary pin to secondary pin	340	240	5.5	7.0	5.5	7.0
Opto-coupler U15 primary pin to secondary pin	340	240	5.5	7.0	5.5	7.0
Opto-coupler U16 primary pin to secondary pin	340	240	5.5	6.0	5.5	6.0
Opto-coupler U2, U4 primary pin to secondary pin	340	240	5.5	6.5	5.5	6.5
<b>After deflection and impact test:</b>						
<b>Basic/supplementary:</b>						
Input terminals to metal enclosure	340	240	3.0	>3.9	3.0	>3.9
Output terminals to metal enclosure	340	240	3.0	>3.9	3.0	>3.9
Phase W to PE trace	340	240	3.0	3.2	3.0	3.2
Phase V to PE trace	340	240	3.0	3.2	3.0	3.2
Primary parts to earth	340	240	3.0	3.1	3.0	3.1
Transformer T1 primary pin to core	340	240	3.0	3.1	3.0	3.1
Transformer T1 secondary pin to core	340	240	3.0	3.1	3.0	3.1
<b>Reinforce insulation:</b>						
Input terminals to communication ports	340	240	5.5	>7.2	5.5	>7.2
Output terminals to communication ports	340	240	5.5	>7.2	5.5	>7.2
Input terminals to accessible parts	340	240	5.5	>7.2	5.5	>7.2
Output terminals to accessible parts	340	240	5.5	>7.2	5.5	>7.2
Transformer T1 primary pin to secondary pin	340	240	5.5	6.2	5.5	6.2

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Clause	Requirement + Test			Result - Remark		Verdict
Relay JK1 primary pin to secondary pin	340	240	5.5	>7.2	5.5	>7.2
Relay JK2 primary pin to secondary pin	340	240	5.5	>7.2	5.5	>7.2
Opto-coupler U20, U21, U22, U23, U24 primary pin to secondary pin	340	240	5.5	>7.2	5.5	>7.2
Opto-coupler U27 primary pin to secondary pin	340	240	5.5	6.5	5.5	6.5
Opto-coupler U6, U9 primary pin to secondary pin	340	240	5.5	7.0	5.5	7.0
Opto-coupler U15 primary pin to secondary pin	340	240	5.5	7.0	5.5	7.0
Opto-coupler U16 primary pin to secondary pin	340	240	5.5	6.0	5.5	6.0
Opto-coupler U2, U4 primary pin to secondary pin	340	240	5.5	6.5	5.5	6.5
Supplementary information:						

4.3.6.8 5.2.3.1 5.2.3.2 5.2.3.3	TABLE: Solid insulation, Impulse voltage test, A.C. or d.c. voltage test, Partial discharge test					P
Test voltage applied between:		DTI (mm)	Impulse test (kV, circuit)	Electric strength test (V d.c.)	Partial discharge test (V)	Result
Basic/supplementary:						
Input terminals to metal enclosure		--	4.0	2120VDC	--	P
Output terminals to metal enclosure		--	4.0	2120VDC	--	P
Internal wire		--	4.0	2120VDC	--	P
Transformer T1 primary pin to core		--	4.0	2120VDC	--	P
Transformer T1 secondary pin to core		--	4.0	2120VDC	--	P
Reinforced:						
Input terminals to communication ports		--	6.0	4240VDC	--	P
Output terminals to communication ports		--	6.0	4240VDC	--	P
Input terminals to accessible parts		--	6.0	4240VDC	--	P
Output terminals to accessible parts		--	6.0	4240VDC	--	P
Transformer T1 primary pin to secondary pin		--	6.0	4240VDC	--	P
2 layers insulation tape of T1		--	6.0	4240VDC	--	P
After deflection and impact test:						
--		--	--	--	--	--

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Clause	Requirement + Test			Result - Remark	Verdict

<b>After dry heat test:</b>					
<b>Basic/supplementary:</b>					
Input terminals to metal enclosure	--	4.0	2120VDC	--	P
Output terminals to metal enclosure	--	4.0	2120VDC	--	P
Internal wire	--	4.0	2120VDC	--	P
Transformer T1 primary pin to core	--	4.0	2120VDC	--	P
Transformer T1 secondary pin to core	--	4.0	2120VDC	--	P
<b>Reinforced:</b>					
Input terminals to communication ports	--	6.0	4240VDC	--	P
Output terminals to communication ports	--	6.0	4240VDC	--	P
Input terminals to accessible parts	--	6.0	4240VDC	--	P
Output terminals to accessible parts	--	6.0	4240VDC	--	P
Transformer T1 primary pin to secondary pin	--	6.0	4240VDC	--	P
2 layers insulation tape of T1	--	6.0	4240VDC	--	P
<b>After damp heat test:</b>					
<b>Basic/supplementary:</b>					
Input terminals to metal enclosure	--	4.0	2120VDC	--	P
Output terminals to metal enclosure	--	4.0	2120VDC	--	P
Internal wire	--	4.0	2120VDC	--	P
Transformer T1 primary pin to core	--	4.0	2120VDC	--	P
Transformer T1 secondary pin to core	--	4.0	2120VDC	--	P
<b>Reinforced:</b>					
Input terminals to communication ports	--	6.0	4240VDC	--	P
Output terminals to communication ports	--	6.0	4240VDC	--	P
Input terminals to accessible parts	--	6.0	4240VDC	--	P
Output terminals to accessible parts	--	6.0	4240VDC	--	P
Transformer T1 primary pin to secondary pin	--	6.0	4240VDC	--	P
2 layers insulation tape of T1	--	6.0	4240VDC	--	P
<b>After vibration test:</b>					
<b>Basic/supplementary:</b>					
Input terminals to metal enclosure	--	4.0	2120VDC	--	P
Output terminals to metal enclosure	--	4.0	2120VDC	--	P
Internal wire	--	4.0	2120VDC	--	P

EN 61800-5-1					
Clause	Requirement + Test		Result - Remark		Verdict
Transformer T1 primary pin to core	--	4.0	2120VDC	--	P
Transformer T1 secondary pin to core	--	4.0	2120VDC	--	P
<b>Reinforced:</b>					
Input terminals to communication ports	--	6.0	4240VDC	--	P
Output terminals to communication ports	--	6.0	4240VDC	--	P
Input terminals to accessible parts	--	6.0	4240VDC	--	P
Output terminals to accessible parts	--	6.0	4240VDC	--	P
Transformer T1 primary pin to secondary pin	--	6.0	4240VDC	--	P
2 layers insulation tape of T1	--	6.0	4240VDC	--	P
<b>After hydrostatic pressure test:</b>					
Supplementary information:					

5.2.3.5	TABLE: Touch current measurement							N/A
Single phase equipment								
L – N TN-S, TN-C, TN-CS, TT (not corner earthed) Figure 6	L – L TN-C, TT (middle point earthed) Figure 7	L – L TN, TT (not corner earthed) Figure 8	L – N IT (not corner earthed) Figure 9	L – N IT (corner earthed) Figure 9	L – L IT (not corner earthed) Figure 10	L – L IT (corner earthed) Figure 10	Measurement limit for 50 Hz (mA)	Measurement limit for 60 Hz (mA)
--	--	--	--	--	--	--	3.5	3.5
Three-phase equipment								
TN-S, TN-C, TN-CS, TT (not corner earthed) Figure 11	IT (star point earthed) Figure 12	IT (corner earthed) Figure 12	TN, TT (corner earthed) Figure 13	TN, TT (centre earthed) Figure 14			Measurement limit for 50 Hz (mA)	Measurement limit for 60 Hz (mA)
--	--	--	--	--	--	--	3.5	3.5
Supplementary information:								
Measurements have been carried out according to figures 11 of IEC 60990.								

5.2.3.6. 5.2.3.6.4 5.2.4.4 5.2.4.5 5.2.8	TABLE: PWB short-circuit test, Short-circuit test and breakdown of component test, Abnormal operation tests	P
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Clause		Requirement + Test			Result - Remark	Verdict
Tested item	Fault (SC, OC, OL)	Supply voltage (V)	PSCC (kA)	Test time	Test environment (ambient, fuse etc.) and observation	Result
Ventilation fan	Locked	240	5	7 min	Unit worked normally, after 7 min shut down. No damaged, no hazard.  Max. temperature: Heat sink of IGBT: 86.4°C Plastic enclosure: 62.7°C Button: 56.6°C T1 winding: 69.7°C Ambient: 55.0°C	P



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Clause	Requirement + Test		Result - Remark	Verdict
5.2.3.8	TABLE: Temperature rise test			P
	Supply voltage (V) .....	1PH 220	1PH 240	—
	Supply frequency (Hz) .....	60	50	—
	Load (V, A) .....	2000W	2000W	—
	Ambient (°C) .....	See below	See below	—
Maximum measured temperature T of part/at:		T (°C)		Allowed T <sub>max</sub> (°C)
1.	Heat sink of IGBT	63.3	63.5	90
2.	Plastic enclosure	55.5	55.5	80
3.	Button	52.3	52.3	65
4.	Input terminal block (CN4)	64.7	63.6	140
5.	Varistor (RV1)	60.8	60.8	85
6.	Varistor (RV2)	74.7	73.1	85
7.	Varistor (RV3)	69.5	68.2	85
8.	Varistor (RV4)	75.1	73.1	85
9.	Y capacitor (C3)	61.0	61.8	125
10.	Y capacitor (C4)	61.4	61.3	125
11.	Y capacitor (C76)	56.1	56.0	125
12.	Y capacitor (C77)	57.7	57.7	125
13.	Y capacitor (C79)	68.1	67.3	125
14.	Y capacitor (C80)	67.7	66.9	125
15.	Y capacitor (C81)	68.0	67.2	125
16.	Bus capacitor (E17)	67.2	66.7	105
17.	Bus capacitor (E18)	70.5	69.9	105
18.	Surface IGBT	75.7	76.1	150
19.	Winding of Transformer (T1)	58.3	58.5	105
20.	Core of Transformer (T1)	60.0	60.1	105
21.	PCB near IGBT	85.9	85.9	130
22.	PCB near D1	68.2	69.7	130
23.	PCB near Q1	64.2	65.0	130
24.	Opto-coupler (U2)	57.7	57.9	110
25.	Opto-coupler (U27)	56.9	57.2	110
26.	Opto-coupler (U20)	72.8	72.5	110
27.	Opto-coupler (U22)	75.4	75.4	110
28.	Opto-coupler (U25)	74.1	74.1	110
29.	Opto-coupler (U4)	69.3	68.8	110
30.	Opto-coupler (U16)	72.5	72.6	110



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Clause	Requirement + Test	Result - Remark	Verdict
31. Opto-coupler (U9)	72.7	72.8	110
32. Opto-coupler (U15)	78.5	78.9	110
33. Opto-coupler (U21)	78.3	78.6	110
34. Opto-coupler (U23)	78.0	78.3	110
35. Opto-coupler (U24)	78.9	79.2	110
36. Opto-coupler (U6)	72.9	72.7	110
37. Opto-coupler (U29)	56.3	56.5	110
38. Relay (JK1)	68.7	68.3	85
39. Relay (JK2)	69.0	68.6	85
40. PCB near U1	59.8	60.3	130
41. Ambient	55.0	55.0	/
Supplementary information:			
1. The maximum ambient temperature permitted by the manufacturer's specification is 55°C.			
2. The temperatures were measured under worst normal mode.			

5.2.3.8	TABLE: Temperature rise test			P
	Supply voltage (V) .....:	3PH 220	3PH 240	—
	Supply frequency (Hz) .....:	60	50	—
	Load (V, A) ..... :	2000W	2000W	—
	Ambient (°C) .....:	See below	See below	—
Maximum measured temperature T of part/at:		T (°C)		Allowed T <sub>max</sub> (°C)
42. Heat sink of IGBT		63.5	63.2	90
43. Plastic enclosure		55.2	55.2	80
44. Button		52.5	52.6	65
45. Input terminal block (CN4)		57.6	57.6	140
46. Varistor (RV1)		58.7	59.1	85
47. Varistor (RV2)		64.3	64.4	85
48. Varistor (RV3)		61.2	61.1	85
49. Varistor (RV4)		62.5	62.6	85
50. Y capacitor (C3)		60.4	61.1	125
51. Y capacitor (C4)		59.8	60.4	125
52. Y capacitor (C76)		55.5	55.6	125
53. Y capacitor (C77)		57.2	57.2	125
54. Y capacitor (C79)		61.3	61.4	125
55. Y capacitor (C80)		61.6	61.6	125
56. Y capacitor (C81)		60.5	60.7	125

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Clause	Requirement + Test	Result - Remark	Verdict
57. Bus capacitor (E17)	60.3	60.2	105
58. Bus capacitor (E18)	62.2	62.1	105
59. Surface IGBT	75.2	75.8	150
60. Winding of Transformer (T1)	57.9	57.9	105
61. Core of Transformer (T1)	59.3	59.4	105
62. PCB near IGBT	84.5	85.2	130
63. PCB near D1	67.4	68.7	130
64. PCB near Q1	64.3	64.9	130
65. Opto-coupler (U2)	57.9	58.0	110
66. Opto-coupler (U27)	57.1	57.2	110
67. Opto-coupler (U20)	71.9	71.9	110
68. Opto-coupler (U22)	74.7	74.8	110
69. Opto-coupler (U25)	73.6	73.8	110
70. Opto-coupler (U4)	64.5	64.5	110
71. Opto-coupler (U16)	71.7	72.0	110
72. Opto-coupler (U9)	72.2	72.4	110
73. Opto-coupler (U15)	78.1	78.7	110
74. Opto-coupler (U21)	77.8	78.3	110
75. Opto-coupler (U23)	77.6	78.1	110
76. Opto-coupler (U24)	78.5	79.0	110
77. Opto-coupler (U6)	71.8	71.9	110
78. Opto-coupler (U29)	56.5	56.6	110
79. Relay (JK1)	65.8	65.9	85
80. Relay (JK2)	66.6	66.8	85
81. PCB near U1	59.8	60.2	130
82. Ambient	55.0	55.0	/
Supplementary information:			
1. The maximum ambient temperature permitted by the manufacturer's specification is 55°C.			
2. The temperatures were measured under worst normal mode.			

5.2.3.9	TABLE: Protective bonding				P
	Test current (A) .....	10A			
Points of application		Resistance (mΩ)	Voltage (V)	Test time (s)	Result
PE terminal to metal enclosure		7	0.07	60	P
<b>After dry heat test:</b>					
PE terminal to metal enclosure		7	0.07	60	P

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Clause	Requirement + Test	Result - Remark	Verdict

<b>After damp heat test:</b>				
PE terminal to metal enclosure	7	0.07	60	P
<b>After vibration test:</b>				
PE terminal to metal enclosure	7	0.07	60	P
Supplementary information: limit is 20 mΩ				

5.2.5	TABLE: Material tests				P
Part	Manufacturer of material/part	Type of material/part	Test	Result	
Terminal block	NINGBO DEGSON ELECTRICAL CO.,LTD.	DG78R-B-13P-13-09A(H)	Glow wire, 950°C	P	
Supplementary information:					

6	TABLE: Information and marking requirements					P
		Product	Package	Installation	User	Maintenance
6.2	Information for selection					
- Name or trademark of the manufacturer, supplier or importer .....	OK	-	OK	-	OK	
- Catalogue number or equivalent .....	OK	-	OK	-	OK	
- Voltage rating .....	OK	-	OK	-	OK	
- Current rating .....	OK	-	OK	-	OK	
- Power rating .....	OK	-	OK	-	OK	
- Frequency .....	OK	-	OK	-	OK	
- Number of phases .....	OK	-	OK	-	OK	
- Reference to standards .....	-	-	OK	-	-	
- Date code or serial number .....	OK	-	-	-	-	
- Reference to instructions .....	-	-	OK	OK	OK	
6.3	Information for installation and comissioning					
6.3.2: Mechanical considerations	-	-	OK	-	OK	
- Dimensions (SI units) .....	-	-	OK	-	OK	
- Mass (SI units) .....	-	-	OK	-	OK	
- Mounting details (SI units) .....	-	-	OK	-	OK	
6.3.3: Environment (operation, transport, storage) .....	-	-	OK	-	OK	
- Temperature .....	-	-	OK	-	OK	
- Humidity .....	-	-	OK	-	OK	
- Altitude .....	-	-	OK	-	OK	
- Pollution .....	-	-	OK	-	OK	
- Ultra violet light .....	-	-	N/A	-	N/A	
- Type of electrical supply system .....	-	-	OK	-	-	

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Clause	Requirement + Test		Result - Remark		Verdict
- Field supply requirements (if any)..... :	-	-	OK	-	-
- IP rating .....	--	-	--	-	-
6.3.4: Handling and mounting .....	-	OK	OK	-	OK
- Packing and unpacking .....	-	OK	OK	-	OK
- Moving .....	-	OK	OK	-	OK
- Lifting .....	-	OK	OK	-	OK
- Strength and rigidity of mounting surface .....	-	OK	OK	-	OK
- Fastening .....	-	OK	OK	-	OK
- Coolant type and design pressure for liquid cooled product .....	-	-	-	-	-
- Provision of adequate access for operation, adjustment and maintenance .....	-	OK	OK	-	OK
- Warning if mounting surface exceeds 90 °C :	-	-	N/A	-	-
6.3.5.1: Motor selection .....	-	-	N/A	N/A	N/A
6.3.5.2: Motor integrated transformers .....	-	-	N/A	N/A	N/A
6.3.5.3: Critical torsional speeds .....	-	-	N/A	N/A	N/A
6.3.5.4: Transient torque analysis .....	-	-	N/A	N/A	N/A
6.3.6.2: Interconnection and wiring diagrams ..	-	-	OK	-	OK
6.3.6.3: Conductor (cable) selection .....	-	-	OK	-	OK
6.3.6.4: Terminal capacity and identification ....	OK	-	OK	-	OK
6.3.6.5: Protection requirements .....	-	-	OK	OK	OK
- Protective class .....	OK	-	OK	OK	OK
- Interface details .....	-	-	OK	-	OK
- Terminals with protective separation .....	-	-	OK	OK	OK
6.3.6.6: Earthing .....	-	-	OK	-	OK
- Symbol IEC 60417-5019, PE or green-yellow .....	OK	-	-	-	-
- Symbol IEC 6417-5172 for Class II .....	N/A	-	-	-	-
6.3.6.7: Protective earthing conductor current .....	-	-	OK	-	OK
- Symbol ISO 7000-0434 and instruction..... :	OK	-	OK	-	OK
- RCD compatibility .....	-	-	N/A	-	N/A
6.3.6.8: Special requirements .....	-	-	OK	-	OK
6.3.7: Supply overcurrent or short-circuit protection .....	-	-	OK	-	OK
6.3.8: Motor overload protection .....	-	-	OK	-	OK
6.3.9: Commissioning .....	-	-	OK	-	-
6.4	Information for use				
6.4.1: General .....	-	-	OK	OK	OK
6.4.2: Adjustment .....	OK	-	OK	OK	OK
6.4.3: Labels, signs, and signals .....	OK	-	OK	OK	OK
6.4.3.1: General .....	OK	-	OK	OK	OK

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Clause	Requirement + Test	Result - Remark			Verdict
6.4.3.2: Isolators .....	N/A	-	-	-	-
6.4.3.3: Visual and audible signals .....	OK	-	-	OK	-
6.4.3.4: Hot surfaces, symbol IEC 60417-5041 .....	N/A	-	-	N/A	-
6.4.3.5: Equipment marking .....	OK	-	OK	OK	OK
6.5	Information for maintenance				
6.5.1: General.....	-	-	-	OK	OK
- Maintenance procedures and schedules.....	-	-	-	-	OK
- Maintenance schedules .....	-	-	-	OK	OK
- Safety precautions .....	-	-	-	-	OK
- Location of live parts accessible during maintenance .....	-	-	-	-	OK
- Adjustment procedures .....	-	-	OK	OK	OK
- Repair and replacement procedures .....	-	-	-	-	OK
- Special tools list .....	-	-	-	OK	OK
6.5.2: Capacitor discharge .....	OK	-	OK	-	OK
6.5.3: Auto restart/bypass .....	-	-	N/A	N/A	N/A
6.5.4: Potential Transformer (PT) / Current Transformer (CT) connection .....	N/A	-	N/A	-	N/A
6.5.5: Other hazards .....	OK	-	-	-	OK
Supplementary information:					

ATTACHMENT 1 Photos of Product

Photo 1  
External view

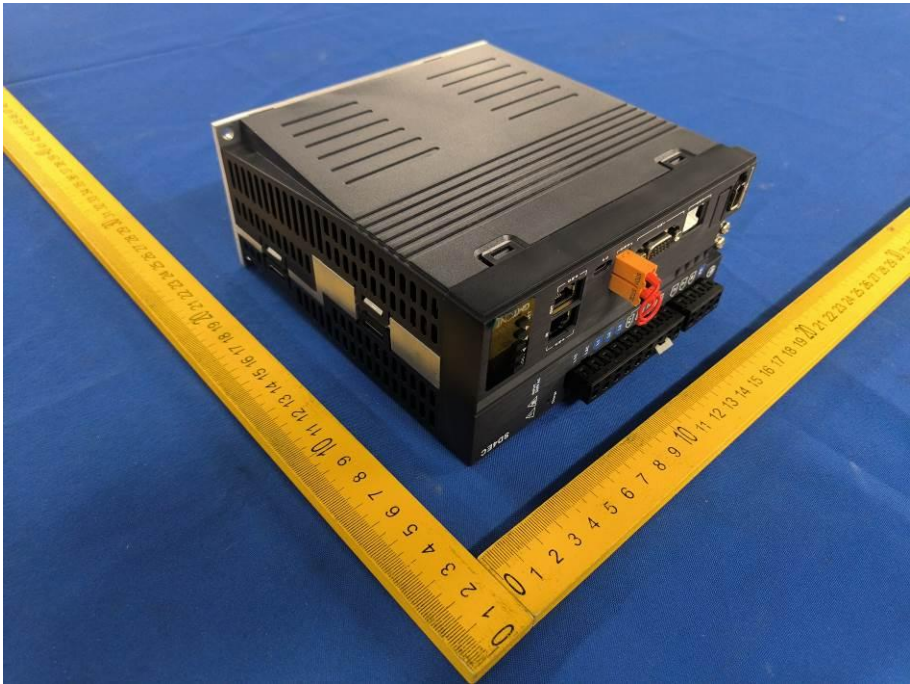
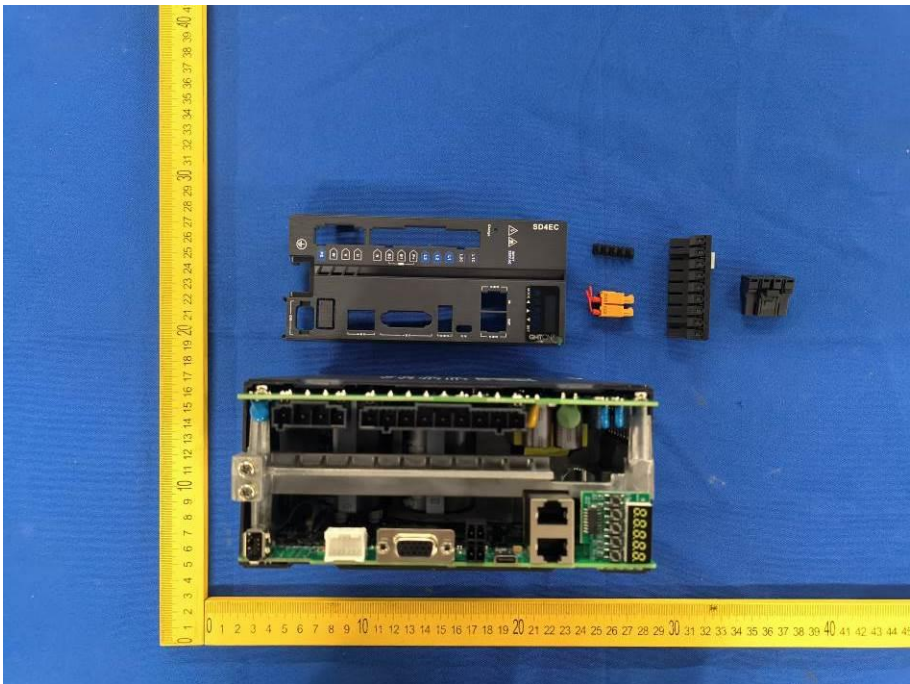


Photo 2  
External view



**Photo 3**  
Internal view



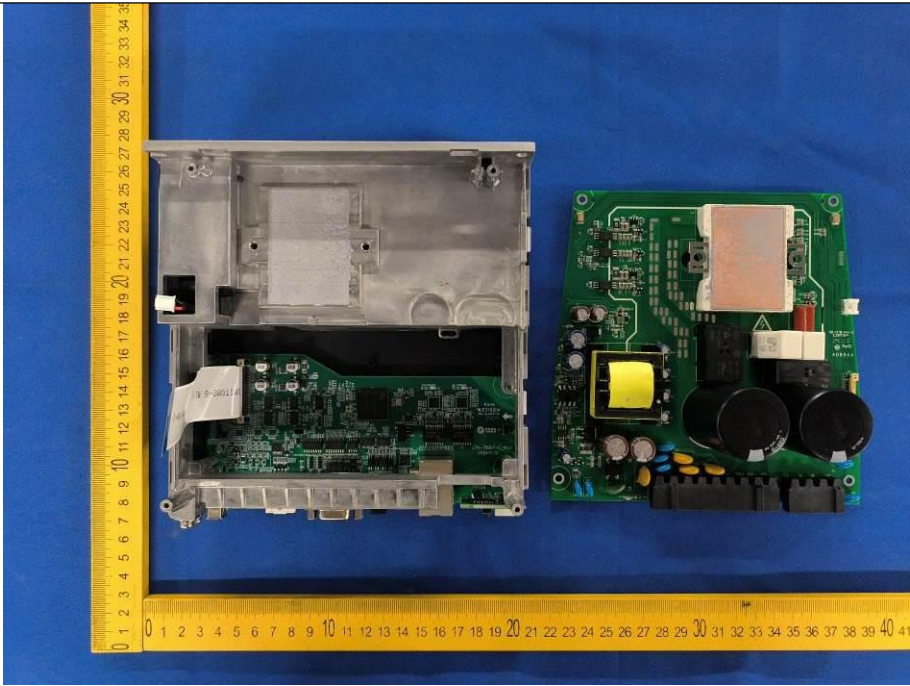
**Photo 4**  
Internal view





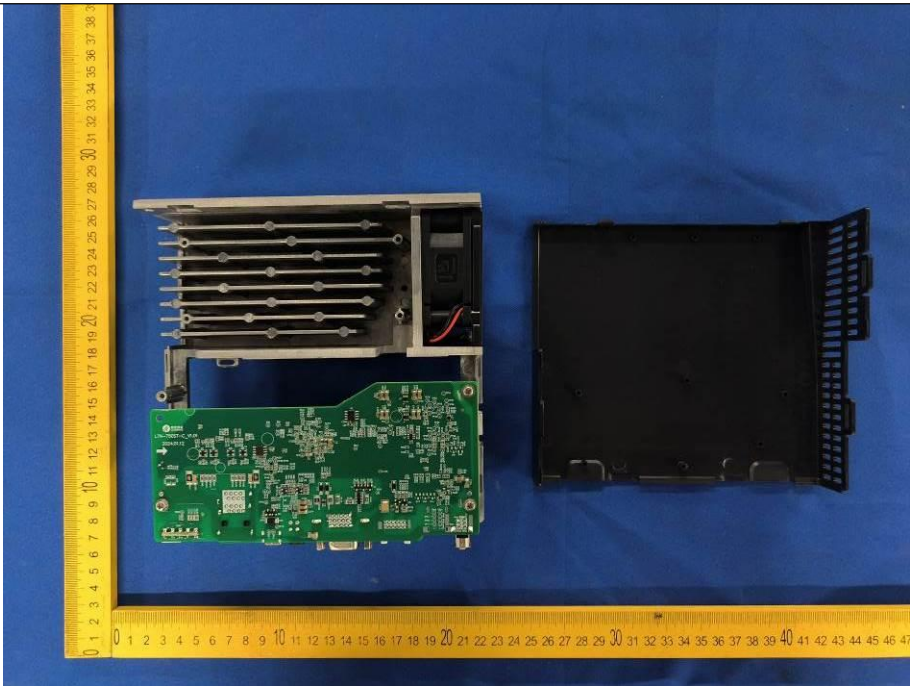
**Photo 5**

Internal view



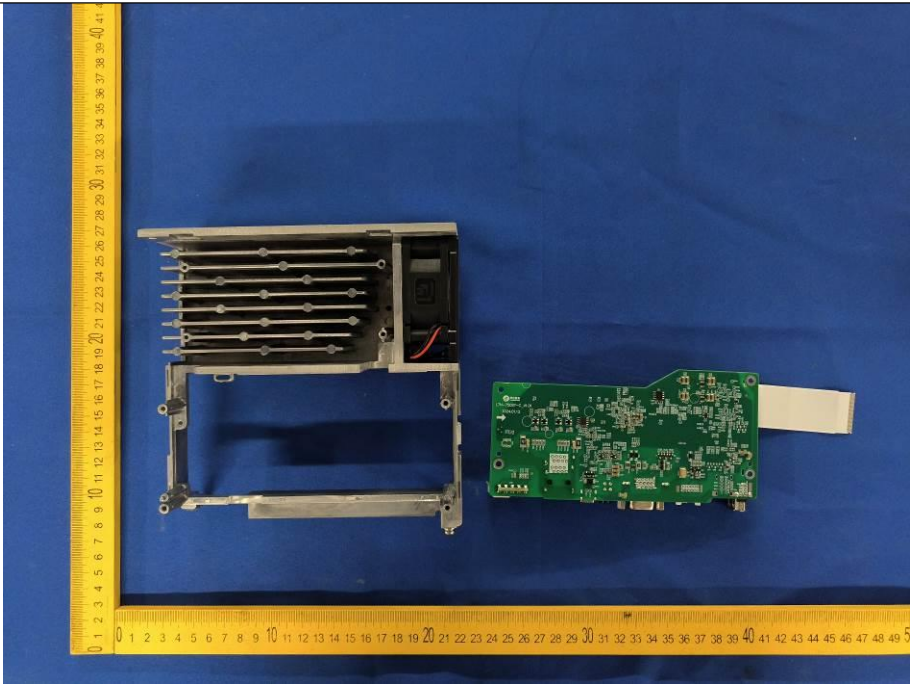
**Photo 6**

Internal view





**Photo 7**  
Internal view



**Photo 8**  
PCB view

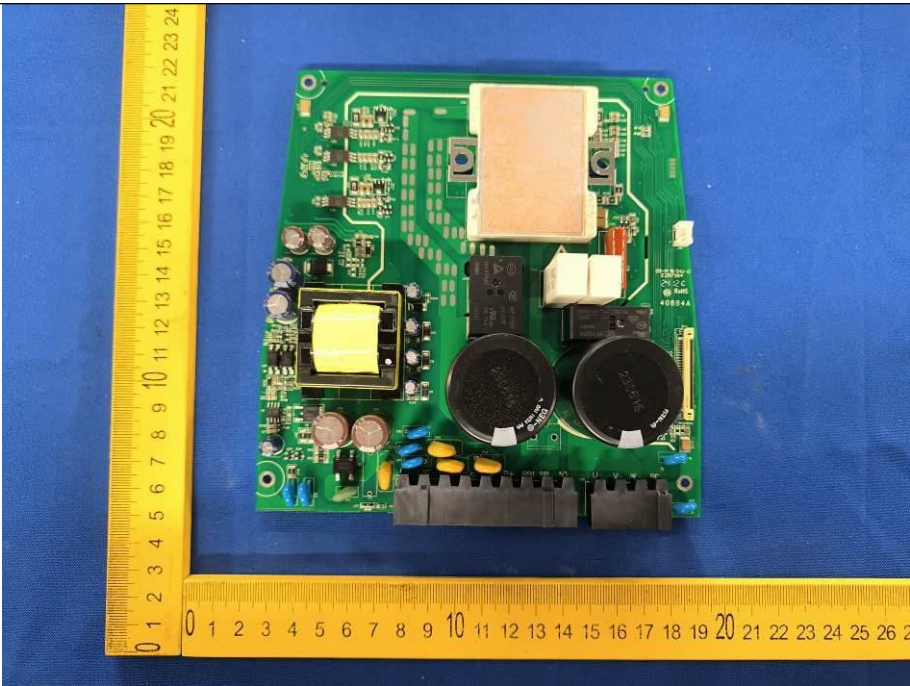


Photo 9  
PCB view

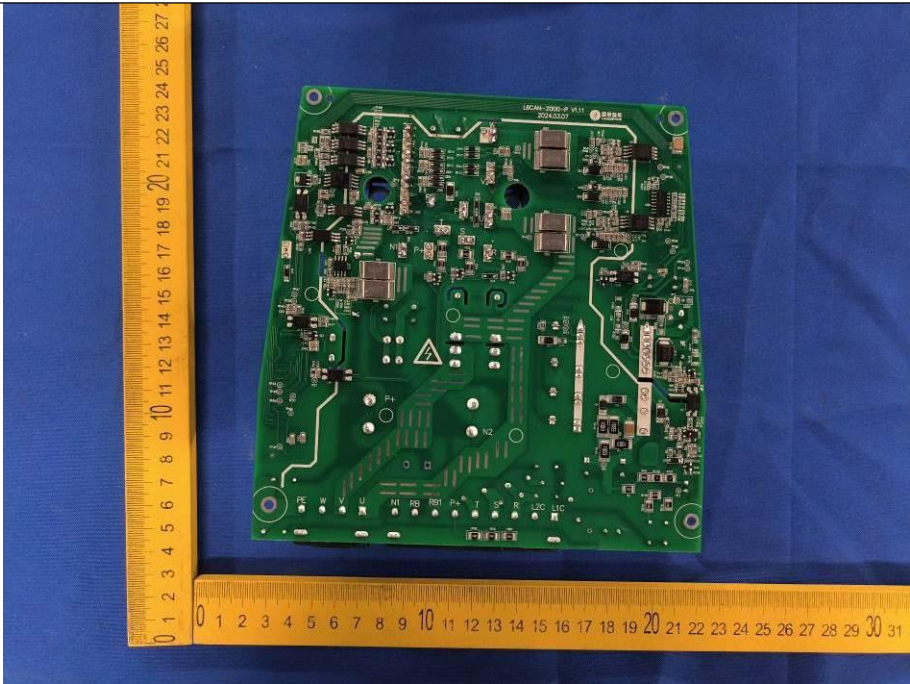
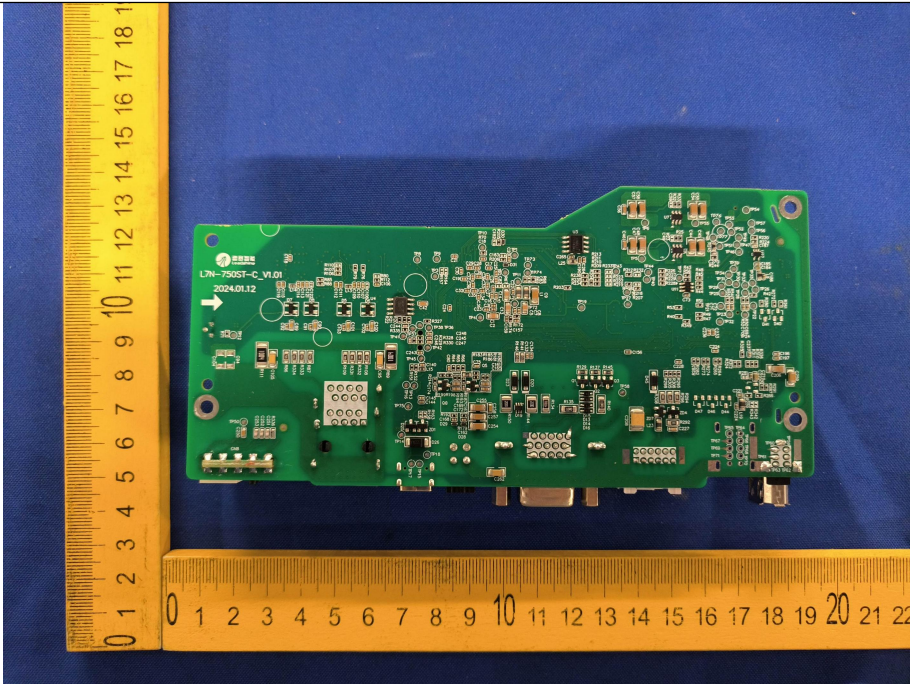
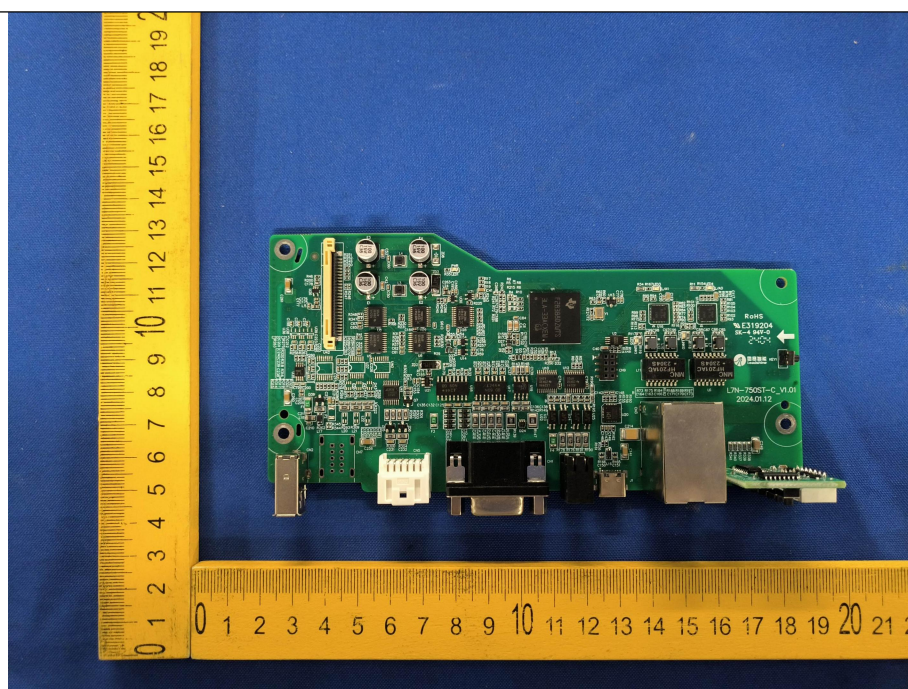


Photo 10  
PCB view





**Photo 11**



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