



**CENTRE OF TESTING SERVICE
INTERNATIONAL**

OPERATE ACCORDING TO ISO/IEC 17025

TEST REPORT

TEST REPORT NUMBER : CGZ3150910-02709-L

CTS (Ningbo) Testing Service Technology Co., Ltd.
Fl.2 South Huoju Building, No.181 Canghai Rd., Jiangdong High-tech Park,
Ningbo, China

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1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has Passed all the relevant tests conforms to a specification (only telecommunication products).

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.

The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

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1.2 Tester

Tested by:

19 January 2016Kate Zhang

Date

Name

Signature

Reviewed by:

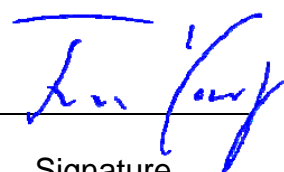
19 January 2016Rock Weng

Date

Name

Signature

Approved by:

19 January 2016Jun Yang

Date

Name

Signature



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1.3 Testing laboratory

1.3.1 Location

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Fl. 2 South Huoju Building, No. 181. Canghai Rd., Jiangdong High-tech Park,
Ningbo, China

Telephone: + 86-574-87912121

Telefax : + 86-574-87907993

1.3.2 Test location, where different from CTS:

Name: ./.

Street: ./.

Town: ./.

Country: ./.

Telephone: ./.

Fax: ./.

Teletex: ./.

1.4 Client details

1.4.1 Details of applicant

Name : Sherlotronics SA (Pty) Ltd.
Street : 251 Aintree AVE., Northriding, Randburg,
Town : Johannesburg,
Country : South Africa
Telephone : +27-11-4625101
Fax : +27-11-4628177
Teletex : ./.

Contact : Simon Knott
Telephone : ./.

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1.4.2 Details of manufacturer

Name : Sherlotronics SA (Pty) Ltd.
Street : 251 Aintree AVE., Northriding, Randburg,
Town : Johannesburg,
Country : South Africa
Telephone : +27-11-4625101
Fax : +27-11-4628177
Teletex : ./.

Contact : Simon Knott
Telephone : ./.

1.4.3 Details of factory

Name : Sherlotronics SA (Pty) Ltd.
Street : 251 Aintree AVE., Northriding, Randburg,
Town : Johannesburg,
Country : South Africa

1.4.4 Dates of application

Date of receipt of application : 10 September 2015
Date of receipt of test item : 10 September 2015
Date of test : 10 September 2015 – 19 January 2016

1.5 Test item Description

1.5.1 Description of test item

Type of product : Stand-alone Transmitter & Receiver
Model/Type reference : S4 & RX4-500
Serial number : ---

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1.5.2 Test item particulars

Test item..... :	Stand-alone Transmitter & Receiver
Trade Mark	Sherlo
Rated Frequency	<input type="checkbox"/> 50Hz; <input type="checkbox"/> 60Hz; <input type="checkbox"/> 50/60Hz; <input checked="" type="checkbox"/> DC; <input type="checkbox"/> Other:
Rated Power(Current)	20mA
Mains supply tolerance (%)	---
Over voltage category (OVC)	<input type="checkbox"/> OVC I; <input type="checkbox"/> OVC II; <input type="checkbox"/> OVC III; <input type="checkbox"/> OVC IV; <input checked="" type="checkbox"/> N/A
Class of equipment..... :	<input type="checkbox"/> Class I; <input type="checkbox"/> Class II; <input checked="" type="checkbox"/> Class III; <input type="checkbox"/> Not classified;
Degree of Protection..... :	<input checked="" type="checkbox"/> IP20
Pollution degree (PD)	<input type="checkbox"/> PD 1; <input checked="" type="checkbox"/> PD 2; <input type="checkbox"/> PD 3
Equipment mobility	<input type="checkbox"/> movable; <input type="checkbox"/> Hand-held; <input type="checkbox"/> transportable <input checked="" type="checkbox"/> Stationary; <input type="checkbox"/> for building-in; <input type="checkbox"/> direct plug-in
Connection to the mains..... :	<input type="checkbox"/> pluggable equipment; <input type="checkbox"/> permanent connection; <input type="checkbox"/> detachable power supply cord; <input type="checkbox"/> non-detachable power supply cord; <input checked="" type="checkbox"/> not directly connected to the mains;
Operating condition	<input checked="" type="checkbox"/> continuous; <input type="checkbox"/> rated operating / resting time:
Tested for IT power systems	<input type="checkbox"/> Yes; <input checked="" type="checkbox"/> No
IT testing, phase-phase voltage (V)	---
Altitude during operation (m)	< 2000 m
Mass of Equipment..... :	0,3 kg.
Instructions language	<input checked="" type="checkbox"/> English; <input type="checkbox"/> French; <input type="checkbox"/> Other:

(all informations was provided by the applicant or detected at the sample)
Please see also attachment

1.6 Test standards

<p>IEC 60950-1: 2005 + A1: 2009 + A2: 2013 Information technology equipment – Safety – Part 1: General requirements</p>
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2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.



2.2 Test environment

Temperature:	18 ... 25 °C
Relative humidity content:	20 ... 75 %
Air pressure:	86 ... 103 kPa
Details of power supply:	1-200V~ / 1-100V===
Other parameters:	---

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2.3 Conformity verification - Summary of inspection

Clause	Summary of inspection	Test result		
		N.A.	Pass	Fail
1	General	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Protection from hazards	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Wiring, connections and supply	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Physical requirements	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Electrical requirements and simulated abnormal conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Connection to telecommunication networks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Connection to cable distribution systems	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Annexes		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Test case verdicts

N.A.: Test case does not apply to the test object

Pass: Test item does meet the requirement

Fail: Test item does not meet the requirement

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3 Test results basic standard(s)

3.1 Particulars: test item vs. Test requirements

IEC 60950-1 Information technology equipment – Safety – Part 1: General requirements	
Possible test case verdicts:	
- test case does not apply to the test object: N(N/A)	
- test object does meet the requirement: P(Pass)	
- test object does not meet the requirement: F(Fail)	
Test specification:	
Standard	<input checked="" type="checkbox"/> IEC 60950-1: 2005 + A1: 2009 + A2: 2013
Test procedure	LVD COC approval.
Non-standard test method.....	N/A
Test Report Form No	IEC 60950_1D
Test Report Form(s) Originator	Centre of Testing Service
Master TRF.....	Dated Mar 2013
Copyright blank test report	Centre of Testing Service

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General remarks:

“(see remark #)” refers to a remark appended to the report.




“(see appended table)” refers to a table appended to the report.

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

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

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Copy of marking plate:

Stand-alone Transmitter & Receiver
Model No.: S4 & RX4-500
12V  20mA
 
Sherlotronics SA (Pty) Ltd.

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3.2 General requirements and results

IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict

1	GENERAL		P
---	----------------	--	---

1.5	Components		N
1.5.1	General	Class III equipment	N
	Comply with IEC 60950 or relevant component standard		N
1.5.2	Evaluation and testing of components		N
1.5.3	Thermal controls		N
1.5.4	Transformers		N
1.5.5	Interconnecting cables		N
1.5.6	Capacitors bridging insulation		N
1.5.7	Resistors bridging insulation		N
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N
1.5.7.4	Accessible parts		N
1.5.8	Components in equipment for IT power systems		N
1.5.9	Surge suppressors		N
1.5.9.1	General		N
1.5.9.2	Protection of VDRs		N
1.5.9.3	Bridging of functional insulation by a VDR		N
1.5.9.4	Bridging of basic insulation by a VDR		N
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N

1.6	Power interface		N
1.6.1	AC power distribution systems		N
1.6.2	Input current		N
1.6.3	Voltage limit of hand-held equipment		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
1.6.4	Neutral conductor		N

1.7	Marking and instructions		P
1.7.1	Power rating		P
	Rated voltage(s) or voltage range(s) (V)	12V	P
	Symbol for nature of supply, for d.c. only	See marking plate	P
	Rated frequency or rated frequency range (Hz) . :		N
	Rated current (mA or A)	20mA	P
	Manufacturer's name or trade-mark or identification mark	See marking plate	P
	Model identification or type reference	See marking plate	P
	Symbol for Class II equipment only	Class III	N
	Other markings and symbols	See marking plate	P
1.7.2	Safety instructions and marking		P
1.7.2.1	General		P
1.7.2.2	Disconnect devices		N
1.7.2.3	Overcurrent protective device		N
1.7.2.4	IT power distribution systems		N
1.7.2.5	Operator access with a tool		N
1.7.2.6	Ozone	No such parts	N
1.7.3	Short duty cycles		N
1.7.4	Supply voltage adjustment	No such parts	N
	Methods and means of adjustment; reference to installation instructions		N
1.7.5	Power outlets on the equipment		N
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)		N
1.7.7	Wiring terminals		N
1.7.7.1	Protective earthing and bonding terminals		N
1.7.7.2	Terminals for a.c. mains supply conductors		N
1.7.7.3	Terminals for d.c. mains supply conductors		N
1.7.8	Controls and indicators		P
1.7.8.1	Identification, location and marking		P
1.7.8.2	Colours		N
1.7.8.3	Symbols according to IEC 60417		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
1.7.8.4	Markings using figures		N
1.7.9	Isolation of multiple power sources		N
1.7.10	Thermostats and other regulating devices	No such parts	N
1.7.11	Durability		P
1.7.12	Removable parts		P
1.7.13	Replaceable batteries		N
	Language(s)		—
1.7.14	Equipment for restricted access locations		N

2	PROTECTION FROM HAZARDS		—
2.1	Protection from electric shock and energy hazards		—
2.1.1	Protection in operator access areas	Class III equipment	N
2.1.1.1	Access to energized parts		N
	Test by inspection		N
	Test with test finger (Figure 2A)		N
	Test with test pin (Figure 2B)		N
	Test with test probe (Figure 2C)		N
2.1.1.2	Battery compartments		N
2.1.1.3	Access to ELV wiring		N
	Working voltage (V _{peak} or V _{rms}); minimum distance through insulation (mm)		—
2.1.1.4	Access to hazardous voltage circuit wiring		N
2.1.1.5	Energy hazards		N
2.1.1.6	Manual controls		N
2.1.1.7	Discharge of capacitors in equipment		N
	Measured voltage (V); time-constant (s)		—
2.1.1.8	Energy hazards – d.c. mains supply		N
	a) Capacitor connected to the d.c. mains supply :		N
	b) Internal battery connected to the d.c. mains supply		N
2.1.1.9	Audio amplifiers		N
2.1.2	Protection in service access areas		N
2.1.3	Protection in restricted access locations		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
2.2	SELV circuits		—
2.2.1	General requirements		N
2.2.2	Voltages under normal conditions (V) :		N
2.2.3	Voltages under fault conditions (V) :		N
2.2.4	Connection of SELV circuits to other circuits :		N

2.3	TNV circuits		—
2.3.1	Limits		N
	Type of TNV circuits :		—
2.3.2	Separation from other circuits and from accessible parts		N
2.3.2.1	General requirements		N
2.3.2.2	Protection by basic insulation		N
2.3.2.3	Protection by earthing		N
2.3.2.4	Protection by other constructions :		N
2.3.3	Separation from hazardous voltages		N
	Insulation employed..... :		—
2.3.4	Connection of TNV circuits to other circuits		N
	Insulation employed..... :		—
2.3.5	Test for operating voltages generated externally		N

2.4	Limited current circuits		—
2.4.1	General requirements		N
2.4.2	Limit values		N
	Frequency (Hz) :		—
	Measured current (mA)..... :		—
	Measured voltage (V) :		—
	Measured circuit capacitance (nF or µF)..... :		—
2.4.3	Connection of limited current circuits to other circuits		N

2.5	Limited power sources		—
	a) Inherently limited output		N
	b) Impedance limited output		N

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Clause	Requirement - Test	Result - Remark	Verdict
	c) Regulating network limited output under normal operating and single fault condition		N
	d) Overcurrent protective device limited output		N
	Max. output voltage (V), max. output current (A), max. apparent power (VA)..... :		—
	Current rating of overcurrent protective device (A)		—

2.6	Provisions for earthing and bonding		—
2.6.1	Protective earthing	Class III equipment	N
2.6.2	Functional earthing		N
2.6.3	Protective earthing and protective bonding conductors		N
2.6.3.1	General		N
2.6.3.2	Size of protective earthing conductors		N
	Rated current (A), cross-sectional area (mm ²), AWG :		—
2.6.3.3	Size of protective bonding conductors		N
	Rated current (A), cross-sectional area (mm ²), AWG :		—
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min) :		N
2.6.3.5	Colour of insulation :		N
2.6.4	Terminals		N
2.6.4.1	General		N
2.6.4.2	Protective earthing and bonding terminals		N
	Rated current (A), type, nominal thread diameter (mm)..... :		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N
2.6.5	Integrity of protective earthing		N
2.6.5.1	Interconnection of equipment		N
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N
2.6.5.3	Disconnection of protective earth		N
2.6.5.4	Parts that can be removed by an operator		N
2.6.5.5	Parts removed during servicing		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
2.6.5.6	Corrosion resistance		N
2.6.5.7	Screws for protective bonding		N
2.6.5.8	Reliance on telecommunication network or cable distribution system	No such parts	N

2.7	Overcurrent and earth fault protection in primary circuits		—
2.7.1	Basic requirements	Class III equipment	N
	Instructions when protection relies on building installation		N
2.7.2	Faults not simulated in 5.3.7		N
2.7.3	Short-circuit backup protection		N
2.7.4	Number and location of protective devices		N
2.7.5	Protection by several devices		N
2.7.6	Warning to service personnel		N

2.8	Safety interlocks		—
2.8.1	General principles	No such parts	N
2.8.2	Protection requirements		N
2.8.3	Inadvertent reactivation		N
2.8.4	Fail-safe operation		N
2.8.5	Moving parts		N
2.8.6	Overriding		N
2.8.7	Switches and relays		P
2.8.7.1	Contact gaps (mm)		P
2.8.7.2	Overload test		P
2.8.7.3	Endurance test		P
2.8.7.4	Electric strength test		P
2.8.8	Mechanical actuators		N

2.9	Electrical insulation		—
2.9.1	Properties of insulating materials		P
2.9.2	Humidity conditioning		P
	Relative humidity (%), temperature (°C)	93 %, 25 °C, 48 h	—
2.9.3	Grade of insulation		P

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
2.9.4	Separation from hazardous voltages		P
	Method(s) used	Method 1	—

2.10	Clearances, creepage distances and distances through insulation		—
2.10.1	General	Class III equipment	N
2.10.1.1	Frequency		N
2.10.1.2	Pollution degrees		N
2.10.1.3	Reduced values for functional insulation		N
2.10.1.4	Intervening unconnected conductive parts		N
2.10.1.5	Insulation with varying dimensions		N
2.10.1.6	Special separation requirements		N
2.10.1.7	Insulation in circuits generating starting pulses		N
2.10.2	Determination of working voltage		N
2.10.2.1	General		N
2.10.2.2	RMS working voltage		N
2.10.2.3	Peak working voltage		N
2.10.3	Clearances		N
2.10.3.1	General		N
2.10.3.2	Mains transient voltages		N
	a) AC mains supply		N
	b) Earthed d.c. mains supplies		N
	c) Unearthed d.c. mains supplies		N
	d) Battery operation		N
2.10.3.3	Clearances in primary circuits		N
2.10.3.4	Clearances in secondary circuits		N
2.10.3.5	Clearances in circuits having starting pulses		N
2.10.3.6	Transients from a.c. mains supply		N
2.10.3.7	Transients from d.c. mains supply		N
2.10.3.8	Transients from telecommunication networks and cable distribution systems		N
2.10.3.9	Measurement of transient voltage levels		N
	a) Transients from a mains supply		N
	For an a.c. mains supply		N
	For a d.c. mains supply		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
	b) Transients from a telecommunication network :		N
2.10.4	Creepage distances		N
2.10.4.1	General		N
2.10.4.2	Material group and comparative tracking index		N
	CTI tests..... :		—
2.10.4.3	Minimum creepage distances		N
2.10.5	Solid insulation		N
2.10.5.1	General		N
2.10.5.2	Distances through insulation		N
2.10.5.3	Insulating compound as solid insulation		N
2.10.5.4	Semiconductor devices		N
2.10.5.5.	Cemented joints		N
2.10.5.6	Thin sheet material – General		N
2.10.5.7	Separable thin sheet material		N
	Number of layers (pcs) :		—
2.10.5.8	Non-separable thin sheet material		N
2.10.5.9	Thin sheet material – standard test procedure		N
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure		N
	Electric strength test		—
2.10.5.11	Insulation in wound components		N
2.10.5.12	Wire in wound components		N
	Working voltage :		N
	a) Basic insulation not under stress :		N
	b) Basic, supplementary, reinforced insulation :		N
	c) Compliance with Annex U :		N
	Two wires in contact inside wound component; angle between 45° and 90° :		N
2.10.5.13	Wire with solvent-based enamel in wound components		N
	Electric strength test		—
	Routine test		N
2.10.5.14	Additional insulation in wound components		N
	Working voltage :		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
	- Basic insulation not under stress		N
	- Supplementary, reinforced insulation		N
2.10.6	Construction of printed boards		N
2.10.6.1	Uncoated printed boards		N
2.10.6.2	Coated printed boards		N
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N
2.10.6.4	Insulation between conductors on different layers of a printed board		N
	Distance through insulation		N
	Number of insulation layers (pcs)		N
2.10.7	Component external terminations		N
2.10.8	Tests on coated printed boards and coated components		N
2.10.8.1	Sample preparation and preliminary inspection		N
2.10.8.2	Thermal conditioning		N
2.10.8.3	Electric strength test		N
2.10.8.4	Abrasion resistance test		N
2.10.9	Thermal cycling		N
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N
2.10.11	Tests for semiconductor devices and cemented joints		N
2.10.12	Enclosed and sealed parts		N

3	WIRING, CONNECTIONS AND SUPPLY		—
3.1	General		—
3.1.1	Current rating and overcurrent protection		P
3.1.2	Protection against mechanical damage		P
3.1.3	Securing of internal wiring		P
3.1.4	Insulation of conductors		P
3.1.5	Beads and ceramic insulators	No such parts	N
3.1.6	Screws for electrical contact pressure		N
3.1.7	Insulating materials in electrical connections		N
3.1.8	Self-tapping and spaced thread screws		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
3.1.9	Termination of conductors		P
	10 N pull test		P
3.1.10	Sleeving on wiring		N

3.2	Connection to a mains supply		—
3.2.1	Means of connection		N
3.2.1.1	Connection to an a.c. mains supply		N
3.2.1.2	Connection to a d.c. mains supply		N
3.2.2	Multiple supply connections		N
3.2.3	Permanently connected equipment		N
	Number of conductors, diameter of cable and conduits (mm)		—
3.2.4	Appliance inlets		N
3.2.5	Power supply cords		N
3.2.5.1	AC power supply cords		N
	Type		—
	Rated current (A), cross-sectional area (mm ²), AWG		—
3.2.5.2	DC power supply cords		N
3.2.6	Cord anchorages and strain relief		N
	Mass of equipment (kg), pull (N)		—
	Longitudinal displacement (mm)		—
3.2.7	Protection against mechanical damage		N
3.2.8	Cord guards		N
	Diameter or minor dimension D (mm); test mass (g)		—
	Radius of curvature of cord (mm)		—
3.2.9	Supply wiring space		N

3.3	Wiring terminals for connection of external conductors		—
3.3.1	Wiring terminals		N
3.3.2	Connection of non-detachable power supply cords		N
3.3.3	Screw terminals		N
3.3.4	Conductor sizes to be connected		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Rated current (A), cord/cable type, cross-sectional area (mm ²)		—
3.3.5	Wiring terminal sizes		N
	Rated current (A), type, nominal thread diameter (mm)		—
3.3.6	Wiring terminal design		N
3.3.7	Grouping of wiring terminals		N
3.3.8	Stranded wire		N

3.4	Disconnection from the mains supply		—
3.4.1	General requirement		N
3.4.2	Disconnect devices		N
3.4.3	Permanently connected equipment		N
3.4.4	Parts which remain energized		N
3.4.5	Switches in flexible cords		N
3.4.6	Number of poles - single-phase and d.c. equipment		N
3.4.7	Number of poles - three-phase equipment		N
3.4.8	Switches as disconnect devices		N
3.4.9	Plugs as disconnect devices		N
3.4.10	Interconnected equipment		N
3.4.11	Multiple power sources		N

3.5	Interconnection of equipment		—
3.5.1	General requirements		N
3.5.2	Types of interconnection circuits		N
3.5.3	ELV circuits as interconnection circuits		N
3.5.4	Data ports for additional equipment		N

4	PHYSICAL REQUIREMENTS		—
4.1	Stability		—
	Angle of 10°		N
	Test force (N)		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
4.2	Mechanical strength		—
4.2.1	General		P
4.2.2	Steady force test, 10 N	Remain intact	P
4.2.3	Steady force test, 30 N	Remain intact	P
4.2.4	Steady force test, 250 N	No hazardous parts	P
4.2.5	Impact test	No hazardous parts	N
	Fall test		N
	Swing test		N
4.2.6	Drop test; height (mm)		N
4.2.7	Stress relief test		N
4.2.8	Cathode ray tubes	No such parts	N
	Picture tube separately certified		N
4.2.9	High pressure lamps	No such parts	N
4.2.10	Wall or ceiling mounted equipment; force (N)	50N	P

4.3	Design and construction		—
4.3.1	Edges and corners		P
4.3.2	Handles and manual controls; force (N)		N
4.3.3	Adjustable controls		N
4.3.4	Securing of parts		P
4.3.5	Connection by plugs and sockets		N
4.3.6	Direct plug-in equipment		N
	Torque		—
	Compliance with the relevant mains plug standard		N
4.3.7	Heating elements in earthed equipment	No such parts	N
4.3.8	Batteries		N
	- Overcharging of a rechargeable battery		N
	- Unintentional charging of a non-rechargeable battery		N
	- Reverse charging of a rechargeable battery		N
	- Excessive discharging rate for any battery		N
4.3.9	Oil and grease	No such parts	N
4.3.10	Dust, powders, liquids and gases		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
4.3.11	Containers for liquids or gases		N
4.3.12	Flammable liquids		N
	Quantity of liquid (l)		N
	Flash point (°C)		N
4.3.13	Radiation		P
4.3.13.1	General		P
4.3.13.2	Ionizing radiation		N
	Measured radiation (pA/kg)		—
	Measured high-voltage (kV)		—
	Measured focus voltage (kV)		—
	CRT markings		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		N
	Part, property, retention after test, flammability classification		N
4.3.13.4	Human exposure to ultraviolet (UV) radiation		N
4.3.13.5	Laser (including laser diodes) and LEDs		P
4.3.13.5.1	Lasers (including laser diodes)		N
	Laser class		—
4.3.13.5.2	Light emitting diodes (LEDs)		P
	Laser class	Only used for indicator light	—
4.3.13.6	Other types		N

4.4	Protection against hazardous moving parts		—
4.4.1	General	No such parts	N
4.4.2	Protection in operator access areas		N
4.4.3	Protection in restricted access locations		N
4.4.4	Protection in service access areas		N

4.5	Thermal requirements		P
4.5.1	General		P
4.5.2	Temperature tests		P
	Normal load condition per Annex L		—
4.5.3	Temperature limits for materials	(see appended table 4.5)	P
4.5.4	Touch temperature limits	(see appended table 4.5)	P

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
4.5.5	Resistance to abnormal heat	(see appended table 4.5.5)	N

4.6	Openings in enclosures		P
4.6.1	Top and side openings		N
	Dimensions (mm)		—
4.6.2	Bottoms of fire enclosures		N
	Construction of the bottom, dimensions (mm) ...		—
4.6.3	Doors or covers in fire enclosures		N
4.6.4	Openings in transportable equipment	No opening	P
4.6.4.1	Constructional design measures		N
	Dimensions (mm)		—
4.6.4.2	Evaluation measures for larger openings		N
4.6.4.3	Use of metallized parts		N
	Conditioning temperature (°C), time (weeks)		—

4.7	Resistance to fire		N
4.7.1	Reducing the risk of ignition and spread of flame		N
	Method 1, selection and application of components wiring and materials		N
	Method 2, application of all of simulated fault condition tests		N
4.7.2	Conditions for a fire enclosure		N
4.7.2.1	Parts requiring a fire enclosure		N
4.7.2.2	Parts not requiring a fire enclosure		N
4.7.3	Materials		N
4.7.3.1	General		N
4.7.3.2	Materials for fire enclosures		N
4.7.3.3	Materials for components and other parts outside fire enclosures		N
4.7.3.4	Materials for components and other parts inside fire enclosures		N
4.7.3.5	Materials for air filter assemblies		N
4.7.3.6	Materials used in high-voltage components		N

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		—
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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
5.1	Touch current and protective conductor current		N
5.1.1	General	Class III equipment	N
5.1.2	Configuration of equipment under test (EUT)		N
5.1.2.1	Single connection to an a.c. mains supply		N
5.1.2.2	Redundant multiple connections to an a.c. mains supply		N
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N
5.1.3	Test circuit		N
5.1.4	Application of measuring instrument		N
5.1.5	Test procedure		N
	Supply voltage (V)		—
	Measured touch current (mA)		—
	Max. allowed touch current (mA)		—
	Measured protective conductor current (mA)		—
	Max. allowed protective conductor current (mA)		—
5.1.7	Equipment with touch current exceeding 3,5 mA		N
5.1.7.1	General		N
5.1.7.2	Simultaneous multiple connections to the supply		N
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks		N
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		N
	Supply voltage (V)		—
	Measured touch current (mA)		—
	Max. allowed touch current (mA)		—
5.1.8.2	Summation of touch currents from telecommunication networks		N
	a) EUT with earthed telecommunication ports ...		N
	b) EUT whose telecommunication ports have no reference to protective earth		N
5.2	Electric strength		—
5.2.1	General	Class III equipment	N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
5.2.2	Test procedure		N

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P
5.3.2	Motors		N
5.3.3	Transformers		N
5.3.4	Functional insulation		P
5.3.5	Electromechanical components		N
5.3.6	Audio amplifiers in ITE		N
5.3.7	Simulation of faults		N
5.3.8	Unattended equipment		N
5.3.9	Compliance criteria for abnormal operating and fault conditions	(see appended table 5.3)	P
5.3.9.1	During the tests	No hazards	P
5.3.9.2	After the tests	No hazards	P

6	CONNECTION TO TELECOMMUNICATION NETWORKS		—
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N
6.1.1	Protection from hazardous voltages		N
6.1.2	Separation of the telecommunication network from earth		N
6.1.2.1	Requirements		N
	Supply voltage (V)		—
	Current in the test circuit (mA)		—
6.1.2.2	Exclusions		N

6.2	Protection of equipment users from overvoltages on telecommunication networks		—
6.2.1	Separation requirements		N
6.2.2	Electric strength test procedure		N
6.2.2.1	Impulse test		N
6.2.2.2	Steady-state test		N
6.2.2.3	Compliance criteria		N

6.3	Protection of the telecommunication wiring system from overheating		N
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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Max. output current (A)		—
	Current limiting method		—

7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		—
7.1	General		N
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N
7.3	Protection of equipment users from overvoltages on the cable distribution system		N
7.4	Insulation between primary circuits and cable distribution systems		N
7.4.1	General		N
7.4.2	Voltage surge test		N
7.4.3	Impulse test		N

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3.3 Annex as stated in the standards

IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N
A.1	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)		N
A.1.1	Samples		—
	Wall thickness (mm).....		—
A.1.2	Conditioning of samples; temperature (°C)		N
A.1.3	Mounting of samples		N
A.1.4	Test flame (see IEC 60695-11-3)		N
	Flame A, B, C or D		—
A.1.5	Test procedure		N
A.1.6	Compliance criteria		N
	Sample 1 burning time (s).....		—
	Sample 2 burning time (s).....		—
	Sample 3 burning time (s).....		—
A.2	Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)		N
A.2.1	Samples, material		—
	Wall thickness (mm).....		—
A.2.2	Conditioning of samples; temperature (°C)		N
A.2.3	Mounting of samples		N
A.2.4	Test flame (see IEC 60695-11-4)		N
	Flame A, B or C		—
A.2.5	Test procedure		N
A.2.6	Compliance criteria		N
	Sample 1 burning time (s).....		—
	Sample 2 burning time (s).....		—
	Sample 3 burning time (s).....		—
A.2.7	Alternative test acc. to IEC 60695-11-5, cl. 5 and 9		N
	Sample 1 burning time (s).....		—
	Sample 2 burning time (s).....		—

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Sample 3 burning time (s)..... :		—
A.3	Hot flaming oil test (see 4.6.2)		N
A.3.1	Mounting of samples		N
A.3.2	Test procedure		N
A.3.3	Compliance criterion		N

B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		N
B.1	General requirements		N
	Position		—
	Manufacturer		—
	Type		—
	Rated values		—
B.2	Test conditions		N
B.3	Maximum temperatures		N
B.4	Running overload test		N
B.5	Locked-rotor overload test		N
	Test duration (days)		—
	Electric strength test: test voltage (V)		—
B.6	Running overload test for d.c. motors in secondary circuits		N
B.6.1	General		N
B.6.2	Test procedure		N
B.6.3	Alternative test procedure		N
B.6.4	Electric strength test; test voltage (V)		N
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N
B.7.1	General		N
B.7.2	Test procedure		N
B.7.3	Alternative test procedure		N
B.7.4	Electric strength test; test voltage (V)		N
B.8	Test for motors with capacitors		N
B.9	Test for three-phase motors		N
B.10	Test for series motors		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Operating voltage (V)		—

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		N
	Position		—
	Manufacturer		—
	Type		—
	Rated values		—
	Method of protection		—
C.1	Overload test		N
C.2	Insulation		N
	Protection from displacement of windings		N

D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		N
D.1	Measuring instrument		N
D.2	Alternative measuring instrument		N

E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N
---	---	--	---

F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		N
---	--	--	---

G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N
G.1	Clearances		N
G.1.1	General		N
G.1.2	Summary of the procedure for determining minimum clearances		N
G.2	Determination of mains transient voltage (V)		N
G.2.1	AC mains supply		N
G.2.2	Earthed d.c. mains supplies		N
G.2.3	Unearthed d.c. mains supplies		N
G.2.4	Battery operation		N
G.3	Determination of telecommunication network transient voltage (V)		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
G.4	Determination of required withstand voltage (V)		N
G.4.1	Mains transients and internal repetitive peaks		N
G.4.2	Transients from telecommunication networks		N
G.4.3	Combination of transients		N
G.4.4	Transients from cable distribution systems		N
G.5	Measurement of transient voltages (V)		N
	a) Transients from a mains supply		N
	For an a.c. mains supply		N
	For a d.c. mains supply		N
	b) Transients from a telecommunication network		N
G.6	Determination of minimum clearances		N
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N
	Metal(s) used		—
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N
K.1	Making and breaking capacity		N
K.2	Thermostat reliability; operating voltage (V)		N
K.3	Thermostat endurance test; operating voltage (V)		N
K.4	Temperature limiter endurance; operating voltage (V)		N
K.5	Thermal cut-out reliability		N
K.6	Stability of operation		N
L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		N
L.1	Typewriters		N
L.2	Adding machines and cash registers		N
L.3	Erasers		N
L.4	Pencil sharpeners		N
L.5	Duplicators and copy machines		N
L.6	Motor-operated files		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
L.7	Other business equipment		N

M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N
M.1	Introduction		N
M.2	Method A		N
M.3	Method B		N
M.3.1	Ringling signal		N
M.3.1.1	Frequency (Hz)		—
M.3.1.2	Voltage (V)		—
M.3.1.3	Cadence; time (s), voltage (V)		—
M.3.1.4	Single fault current (mA)		—
M.3.2	Tripping device and monitoring voltage		N
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N
M.3.2.2	Tripping device		N
M.3.2.3	Monitoring voltage (V)		N

N	ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)		N
N.1	ITU-T impulse test generators		N
N.2	IEC 60065 impulse test generator		N

P	ANNEX P, NORMATIVE REFERENCES		—
---	-------------------------------	--	---

Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		N
	a) Preferred climatic categories		N
	b) Maximum continuous voltage		N
	c) Pulse current		N

R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N
R.2	Reduced clearances (see 2.10.3)		N

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N
S.1	Test equipment		N
S.2	Test procedure		N
S.3	Examples of waveforms during impulse testing		N
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N
			—
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N
			—
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		N
V.1	Introduction		N
V.2	TN power distribution systems		N
W	ANNEX W, SUMMATION OF TOUCH CURRENTS		N
W.1	Touch current from electronic circuits		N
W.1.1	Floating circuits		N
W.1.2	Earthed circuits		N
W.2	Interconnection of several equipments		N
W.2.1	Isolation		N
W.2.2	Common return, isolated from earth		N
W.2.3	Common return, connected to protective earth		N
X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		N
X.1	Determination of maximum input current		N
X.2	Overload test procedure		N
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)		N
Y.1	Test apparatus		N
Y.2	Mounting of test samples		N
Y.3	Carbon-arc light-exposure apparatus		N

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Clause	Requirement - Test	Result - Remark	Verdict
Y.4	Xenon-arc light exposure apparatus		N
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		N
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N
BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—
CC	ANNEX CC, Evaluation of integrated circuit (IC) current limiters		—
CC.1	Integrated circuit (IC) current limiters		N
CC.2	Test program 1		N
CC.3	Test program 2		N
DD	ANNEX DD, Requirements for the mounting means of rack-mounted equipment		—
DD.1	General		N
DD.2	Mechanical strength test, variable N		N
DD.3	Mechanical strength test, 250 N, including end stops		N
DD.4	Compliance		N
EE	ANNEX EE, Household and home/office document/media shredders		—
EE.1	General		N
EE.2	Markings and instructions		N
EE.3	Inadvertent reactivation		N
EE.4	Disconnection of power to hazardous moving parts		N
EE.5	Protection against hazardous moving parts		N

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3.4 Tables

IEC 60950-1					
Clause	Requirement - Test			Result - Remark	Verdict
1.5.1	TABLE: List of critical components				P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾
Enclosure	CHI MEI CORPORATION	PA-765A	ABS, 85°C, V-0	---	UL E56070
Relay	HELISHUN	HLS6-4100H-1- H	3A 24VDC DC9V	---	CE Mark
PCB	UNITED ELECTECH LTD	328DS	130°C, V-0	---	UL E193317
Terminal	---	301	300V	---	CE Mark
¹⁾ An asterisk indicates a mark which assures the agreed level of surveillance					
Supplementary information:					

1.6.2	TABLE: Electrical data (in normal conditions)						N
U (V)	I (A)	I _{rated} (A)	P (W)	Fuse #	I _{fuse} (A)	Condition/status	
---	---	---	---	---	---	---	
---	---	---	---	---	---	---	
Supplementary information:							

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements						N
Clearance (cl) and creepage distance (cr) at/of/between:	U _{peak} (V)	U _{r.m.s.} (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)	
---	---	---	---	---	---	---	
---	---	---	---	---	---	---	
Supplementary information: TR=Transformer							

2.10.5	TABLE: Distance through insulation measurements					N
Distance through insulation (DTI) at/of:	U _{peak} (V)	U _{rms} (V)	Test voltage (V _{a.c.})	Required DTI (mm)	DTI (mm)	
---	---	---	---	---	---	
Supplementary information:						

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IEC 60950-1									
Clause	Requirement - Test			Result - Remark				Verdict	
4.3.8	TABLE: Batteries							N	
The tests of 4.3.8 are applicable only when appropriate battery data is not available								N	
Is it possible to install the battery in a reverse polarity position?				No hazard				N	
	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition	---	---	---	---	---	---	---	---	---
Max. current during fault condition	---	---	---	---	---	---	---	---	---
- Chemical leaks				---				N	
- Explosion of the battery				---				N	
- Emission of flame or expulsion of molten metal				---				N	
- Electric strength tests of equipment after completion of tests				---				N	
Supplementary information:									

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IEC 60950-1								
Clause	Requirement - Test				Result - Remark		Verdict	
4.5	TABLE: Thermal requirements						P	
	Supply voltage (V)	DC 12V		---		---		
	Ambient T _{min} (°C)	24,8		---		---		
	Ambient T _{max} (°C)	24,7		---		---		
Maximum measured temperature T of part/at::				T (°C)		Allowed T _{max} (°C)		
Enclosure				29,5		---	95	
Relay				31,6		---	Ref.	
PCB				31,1		---	130	
Terminal				29,9		---	Ref.	
Supplementary information:								
Temperature T of winding:		t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
---		---	---	---	---	---	---	---
Supplementary information:								

4.5.5	TABLE: Ball pressure test of thermoplastic parts					N
	Allowed impression diameter (mm)	≤ 2 mm			---	
Part				Test temperature (°C)	Impression diameter (mm)	
---				---	---	
Supplementary information:						

4.7	TABLE: Resistance to fire					N
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence	
---	---	---	---	---	---	
---	---	---	---	---	---	
Supplementary information:						

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IEC 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests		N
Test voltage applied between:		Voltage shape (AC, DC, impulse, surge)	Test voltage (V)
---		---	---
Supplementary information:			

5.3	TABLE: Fault condition tests					P
Ambient temperature (°C)		24,8 °C			---	
Power source for EUT: Manufacturer, model/type, output rating :		---			---	
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Terminal	Short-circuit	---	10 min	---	---	No hazard
Supplementary information:						

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Attachments

- Photo document
- BOM
- CDF (critical data form)
- Copies of certificates of certified components
- Instruction manual
- Circuit diagram
- Explosion block
- Other if necessary

-----End of report-----

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Attachment

Page 1 of 6

Type Designation: Stand-alone Transmitter & Receiver, S4 & RX4-500
Report Number: CGZ3150910-02709-L



Figure 1 (Over view)

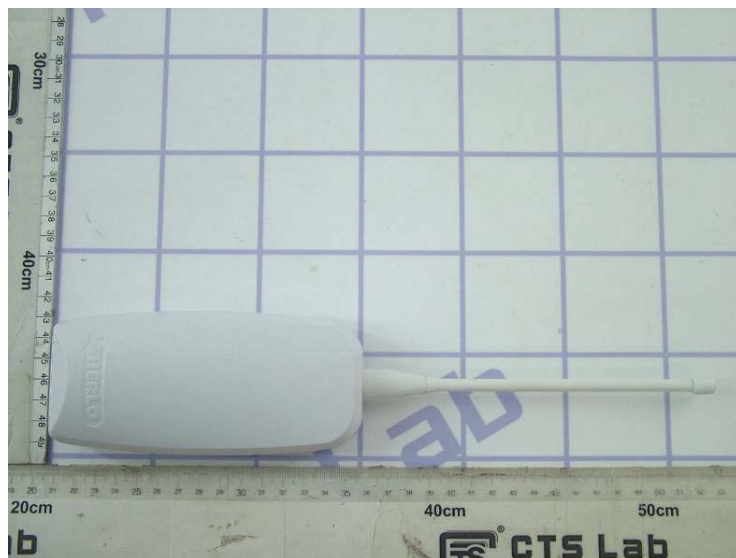


Figure 2 (Transmitter, External view -top)

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Figure 3 (Transmitter, External view -base)



Figure 4 (Transmitter, Internal view)

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Stand-alone Transmitter & Receiver, S4 & RX4-500
CGZ3150910-02709-L

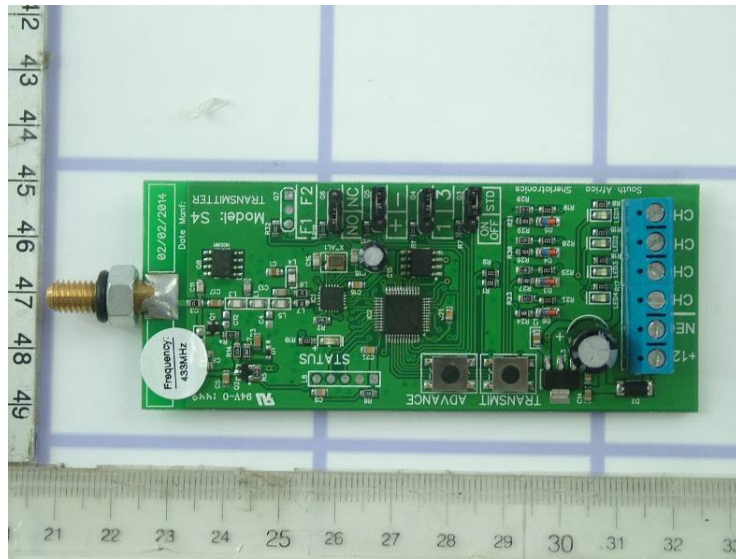


Figure 5 (Transmitter, PCB –side 1)

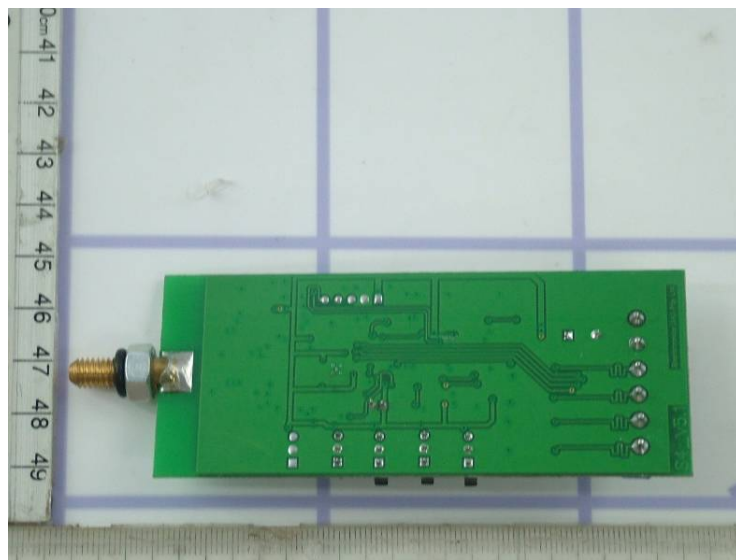


Figure 6 (Transmitter, PCB –side 2)

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Figure 7 (Receiver, External view - top)



Figure 8 (Receiver, External view -base)

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Report Number: CGZ3150910-02709-L

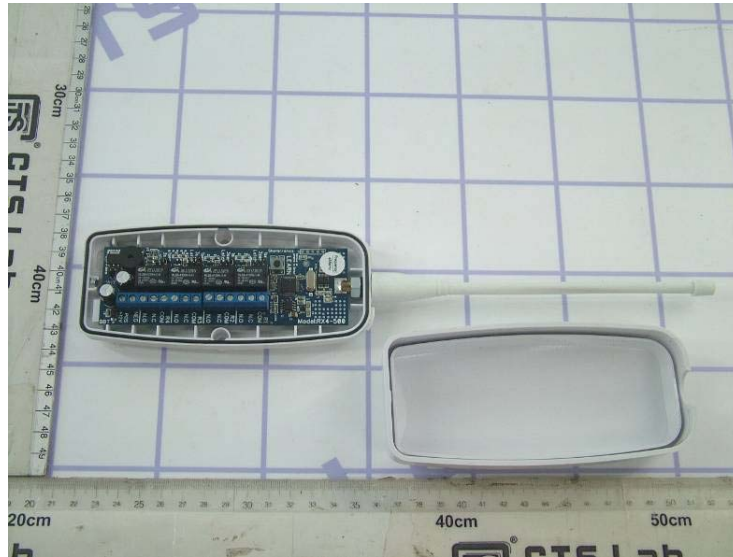


Figure 9 (Receiver, Internal view)

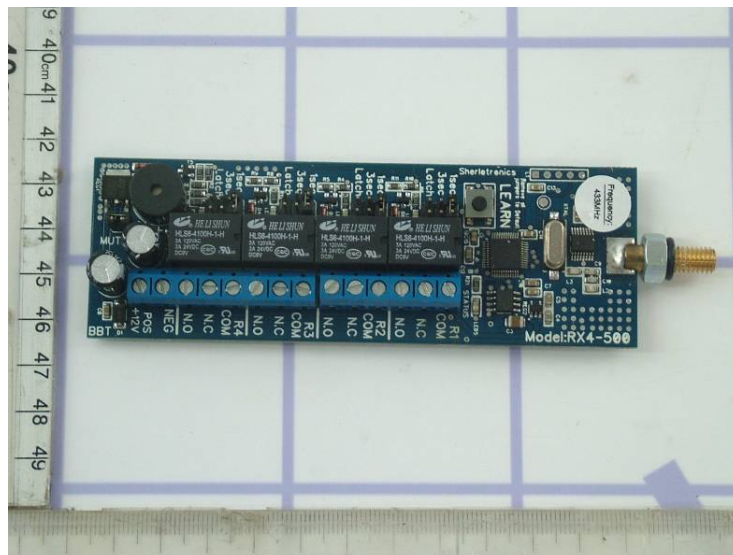


Figure 10 (Receiver, PCB -side 1)

Attachment

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Type Designation:
Report Number:

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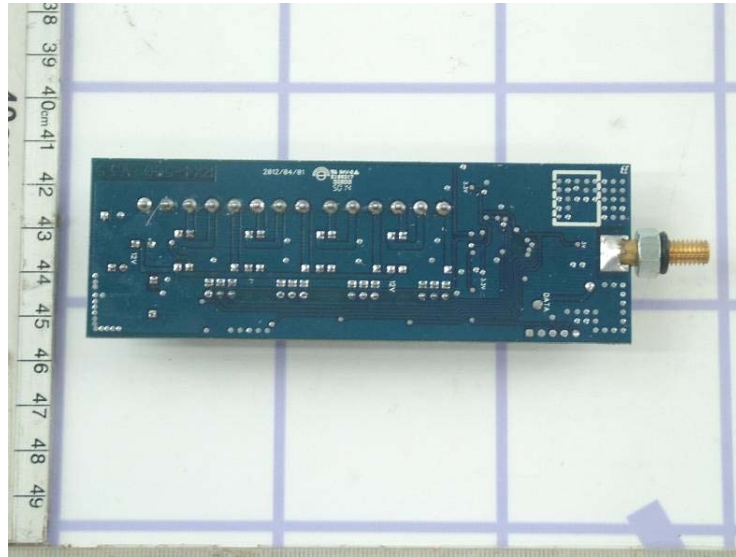


Figure 11 (Receiver, PCB –side 2)