

**TEST REPORT**  
**EN 62368-1**  
**Audio/video, information and communication technology equipment**  
**Part 1: Safety requirements**

**Report Number** ..... : 20HAM007043\_0\_44406  
**Date of issue** ..... : 23.07.2020  
**Total number of pages** ..... : 54  
**Model/Type reference** : K663S-XXX  
**Test item description** : K663S module  
**Contract or Article number** : (SC19215, 1E23FB49), SC19227

**Name of Testing Laboratory preparing the Report** ..... : Bureau Veritas CPS Germany GmbH  
**Address** : Oehleckering 40  
 DE-22419 Hamburg, Germany



**Applicant's name** ..... : Springcard Inc.  
**Address** ..... : 185 Alewife Brook Parkway, ste 210  
 Cambridge, MA 02138; USA



**Test specification:**  
**Standard** ..... : EN 62368-1: 2014/A11:2017  
**Test procedure**..... : NA  
**Non-standard test method** ..... : NA

**Remark / Bemerkung:**  
 Dieser Prüfbericht ist gültig für 12 Monate ab Ausstelldatum.  
*This report is valid for a period of 12 months from its date of issue.*  
 Das Prüfergebnis bezieht sich ausschließlich auf das angelieferte Prüfstück.  
*The result relates only to the tested item.*

<b>Result</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<b>Pass</b> <u>Genügt</u> den allgemeinen Anforderungen / <i>meets the general requirements.</i>	<b>Fail</b> Genügt den allgemeinen Anforderungen <u>nicht</u> / <i>does not meet the general requirements</i>



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Clause	Requirement + Test	Result - Remark	Verdict

<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>			
<input checked="" type="checkbox"/>	<b>Testing Laboratory:</b>	Bureau Veritas CPS Germany GmbH	
<b>Testing location/ address.....:</b>		Oehleckerring 40 22419 Hamburg, Germany	
<b>Tested by (name, function, signature) .....</b>		Ridvan Akpinar	
<b>Approved by (name, function, signature)....:</b>		Stefan Kiehn	
<b>List of Attachments (including a total number of pages in each attachment):</b>			
EN 62368-1: 2014/A11:2017 "Product Photograph" for photos of appliance			
Summary of testing:			
<b>Tests performed (name of test and test clause):</b>		<b>Testing location:</b>	
As testing scope was limited, one sample, drawn from the market was tested according to the following clauses of:		Bureau Veritas CPS Germany GmbH	
EN 62368-1: 2014/A11:2017		Oehleckerring 40	
		22419 Hamburg, Germany	
<b>Summary of compliance with National Differences (List of countries addressed):</b>			
None			



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<b>Test item particulars</b> .....	K663S module
<b>Classification of installation and use</b> .....	--
<b>Supply Connection</b> .....	Type X attachment
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object .....	NA
- test object does meet the requirement .....	P (Pass)
- test object does not meet the requirement .....	F (Fail)
- test not performed .....	NT (Not tested)
<b>Testing</b> .....	
<b>Date of receipt of test item</b> .....	26.06.2020
<b>Date (s) of performance of tests</b> .....	26.06.2020-23.07.2020
<b>General remarks:</b>	
<p>"(See Enclosure #)" refers to additional information appended to the report.          "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p> <p>When differences exist; they shall be identified in the General product information section.</p>	
<b>Name and address of factory (ies)</b> .....	Not provided

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**GENERAL PRODUCT INFORMATION:**

**General product information and other remarks:**

- Model/Type reference: SC19215, 1E23FB49, SC19227
- Ratings : 3 VDC-5VDC
- Battery : --
- Capacity : --
- Protection Class : III

**Product Description**

Serial interface contactless reader (coupling device), on antenna.

These coupling devices fit for adding a RFID HF/NFC reader/writer to any microcontroller-based product or to any embedded system with a serial interface (UART). They are able to communicate with contactless cards or compliant badges at a distance up to 10cm. And thanks to the Low Power Standby mode (LPCD), the modules can be used even with power-constrained systems.

The SpringCard K663S-XXX are made up of the K663s module linked with a 69x45mm antenna. Communication with host is with a serial link according to your needs, each card can be configured to choose you preferred protocol by switch selection

**Copy of marking plate:**





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Clause	Requirement + Test	Result - Remark	Verdict

Das Prüfergebnis bezieht sich ausschließlich auf das angelieferte Prüfstück. Proben werden nicht länger als drei Monate aufbewahrt. Ohne schriftliche Genehmigung des Prüflabors ist eine auszugsweise Vervielfältigung des Prüfberichtes nicht gestattet. Parameter die nicht durch Bureau Veritas CPS Germany GmbH's Analysenspektrum abgedeckt werden, können an akkreditierte Labore fremd vergeben werden. Die Akkreditierung bezieht sich auf die in der Akkreditierungsurkunde genannten Kompetenzbereiche. Sollte der Inhalt des Prüfberichtes einer Auslegung bedürfen, so ist der deutsche Text maßgebend.

*The result relates only to the tested item. Samples are not stored longer than three months. The report shall not be reproduced except full without the written approval of the testing laboratory. Parameters which are not covered by the lab's testing scope are subcontracted to laboratories with government approval. The accreditation relates to competences given in the accreditation certificate. If the content of the test report of an interpretation, is the German text shall prevail.*

Revisionsstand / History Sheet					
Datum Date	Geprüft von Compiled by:	Freigegeben von Approved by	Abteilung, Ort Department, Location	Kommentar Comment	Rev.
23.07.2020	Ridvan Akpinar	Stefan Kiehn	Elektrische Sicherheit ELSI, Hamburg E&E Safety, Hamburg	Erstbericht/ Initialreport	0



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Clause	Requirement + Test	Result - Remark	Verdict

**Test item particulars:**

**Product group** .....:  end product     built-in component

**Classification of use by** .....:  Ordinary person present     Children likely present  
 Instructed person  
 Skilled person

**Supply connection**.....:  AC mains     DC mains  
 not mains connected:  
 ES1     ES2     ES3

**Supply tolerance** .....:  + 10%/-10%  
 + 20%/-15%  
 +        %/ -        %  
 None

**Supply connection – type** .....:  pluggable equipment type A -  
 non-detachable supply cord  
 appliance coupler  
 direct plug-in  
 pluggable equipment type B -  
 non-detachable supply cord  
 appliance coupler  
 permanent connection  
 mating connector  other: not directly connected to the mains

**Considered current rating of protective device** .....: Location:     building     equipment  
 NA

**Equipment mobility** .....:  movable     hand-held     transportable  
 direct plug-in     stationary     for building-in  
 wall/ceiling-mounted     SRME/rack-mounted  
 other: reader/writer communicating in a serial link with its host

**Overvoltage category (OVC)** .....:  OVC I     OVC II     OVC III  
 OVC IV     other: not directly connected to the mains

**Class of equipment** .....:  Class I     Class II     Class III  
 Not classified   

**Special installation location** .....:  NA     restricted access area  
 outdoor location

**Pollution degree (PD)** .....:  PD 1     PD 2     PD 3

**Manufacturer's specified T<sub>ma</sub>** .....: (-40) – (+ 70)° C     Outdoor: minimum    ° C

**IP protection class** .....:  IPX0     IP67

**Power systems** .....:  TN     TT     IT -    V<sub>L-L</sub>  
 not AC mains

**Altitude during operation (m)** .....:  2000 m or less  Max. 3000 m

**Altitude of test laboratory (m)** .....:  2000 m or less         m

**Mass of equipment (kg)** .....:  Approximate 0,115 kg



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<b>ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:</b>	
<p>(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.)            (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.)</p>	
<p><b>Electrically-caused injury (Clause 5):</b>            (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification)            Example: + 5 V dc input ES1</p>	
<b>Source of electrical energy</b>	<b>Corresponding classification (ES)</b>
Supplied by max. 5V DC	ES1
<p><b>Electrically-caused fire (Clause 6):</b>            (Note: List sub-assembly or circuit designation and corresponding energy source classification)            Example: Battery pack (maximum 85 watts): PS2</p>	
<b>Source of power or PIS</b>	<b>Corresponding classification (PS)</b>
1 W	PS1
<p><b>Injury caused by hazardous substances (Clause 7)</b>            (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.)            Example: Liquid in filled component Glycol</p>	
<b>Source of hazardous substances</b>	<b>Corresponding chemical</b>
No such part	No such part
<p><b>Mechanically-caused injury (Clause 8)</b>            (Note: List moving part(s), fan, special installations, etc. &amp; corresponding MS classification based on Table 35.)            Example: Wall mount unit MS2</p>	
<b>Source of kinetic/mechanical energy</b>	<b>Corresponding classification (MS)</b>
Outside edges and corner of product	MS1
Equipment mass – mass < 7 kg	MS1
<p><b>Thermal burn injury (Clause 9)</b>            (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.)            Example: Hand-held scanner – thermoplastic enclosure TS1</p>	
<b>Source of thermal energy</b>	<b>Corresponding classification (TS)</b>
Accessible part	TS1
<p><b>Radiation (Clause 10)</b>            (Note: List the types of radiation present in the product and the corresponding energy source classification.)            Example: DVD – Class 1 Laser Product RS1</p>	
<b>Type of radiation</b>	<b>Corresponding classification (RS)</b>
No RS	RS1



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OVERVIEW OF EMPLOYED SAFEGUARDS				
Clause	Possible Hazard			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced
Instructed person	Only ES1 circuit	NA	NA	NA
6.1	Electrically-caused fire			
Material part (e.g. enclosure)	Energy Source (PS2: 100 Watt circuit)	Safeguards		
		Basic	Supplementary	Reinforced
Plastic enclosure	PS1: All electrical circuits	NA	NA	NA
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
NA	NA	NA	NA	NA
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3:High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	MS1	NA	NA	NA
9.1	Thermal Burn			
Body Part (e.g., Ordinary)	Energy Source (TS2)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	TS1: Accessible enclosure	NA	NA	NA
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
NA	NA	NA	NA	NA
Supplementary Information:				
(1) See attached energy source diagram for additional details.				
(2) "N" – Normal Condition; "A" – Abnormal Condition; "S" Single Fault				





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Clause	Requirement + Test	Result - Remark	Verdict

Clause		Picture of the problem
	Description of the problem:	None
		None
	Modification result:	
	None	
Clause		Picture of the problem
	Description of the problem:	None
		None



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## The Standard: EN 62368-1:2014 + AC:2015

CLAUSE	TITLE	REMARK	NOTE	PASS	FAIL	N.A	N.D
4	General			X			
5	Electrically-caused injury			X			
6	Electrically-caused fire			X			
7	Injury caused by hazardous substances					X	
8	Mechanically-caused injury			X			
9	Thermal burn injury			X			
10	Radiation			X			
A	Annex A, Examples of equipment within the scope of this document					X	
B	Annex B, Normal operating condition tests, abnormal operating condition tests and single fault condition tests			X			
C	Annex C, UV radiation					X	
D	Annex D, Test generators					X	
E	Annex E, Test conditions for equipment containing audio amplifiers					X	
F	Annex F, Equipment markings, instructions, and instructional safeguards			X			
G	Annex G, Components			X			
H	Annex H, Criteria for telephone ringing signals					X	
I	Annex I, Overvoltage categories					X	
J	Annex J, Insulated winding wires for use without interleaved insulation					X	
K	Annex K, Safety interlocks			X			
L	Annex L, Disconnect devices					X	
M	Annex M, Equipment containing batteries and their protection circuits					X	
N	Annex N, Electrochemical potentials					X	
P	Annex P, Safeguards against conductive objects			X			
Q	Annex Q, Circuits intended for interconnection with building wiring					X	



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Clause	Requirement + Test	Result - Remark				Verdict	
R	Annex R, Limited short-circuit test			X			
S	Annex S, Tests for resistance to heat and fire			X			
T	Annex T, Mechanical strength tests			X			
U	Annex U, Mechanical strength of CRTs and protection against the effects of implosion					X	
V	Annex V, Determination of accessible parts			X			
W	Annex W, Comparison of terms introduced in this document					X	
X	Annex X, Alternative method for determining clearances for insulation in circuits connected to an AC mains not exceeding 420 V peak (300 V RMS)					X	
Y	ANNEX Y, Construction requirements for outdoor enclosures					X	
<b>N.A: Not applicable – N.D: Not demanded</b>							

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Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>GENERAL REQUIREMENTS</b>		<b>P</b>
4.1.1	Acceptance of materials, components and subassemblies	See appended table 4.1.2	P
4.1.2	Use of components	Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
4.1.3	Equipment design and construction	No accessible part which could cause injury	P
4.1.15	Markings and instructions .....	(See Annex F)	P
4.4.4	Safeguard robustness	See below	P
4.4.4.2	Steady force tests .....	(See clause T.4)	P
4.4.4.3	Drop tests .....	(See clause T.7)	NA
4.4.4.4	Impact tests .....	Hand-held equipment. See clause 4.4.4.3	P
4.4.4.5	Internal accessible safeguard enclosure and barrier tests .....	No such parts	NA
4.4.4.6	Glass Impact tests .....	No glass surface used	NA
4.4.4.7	Thermoplastic material tests .....	(See Annex T.8)	P
4.4.4.8	Air comprising a safeguard .....	No such construction	NA
4.4.4.9	Accessibility and safeguard effectiveness	No damaged and no hazards.	P
4.5	Explosion	No explosion occurs during normal/abnormal operation and single fault conditions, detail see Annex M.	P
4.6	Fixing of conductors	See below	P
4.6.1	Fix conductors not to defeat a safeguard	Fixed by connectors	P
4.6.2	10 N force test applied to .....	No displacement after the testing.	P
4.7	Equipment for direct insertion into mains socket - outlets	The EUT is not for direct insertion into mains socket-outlets	NA
4.7.2	Mains plug part complies with the relevant standard .....	No such construction.	NA
4.7.3	Torque (Nm) .....	No such construction.	NA
4.8	Products containing coin/button cell batteries	No coin/button batteries used.	NA
4.8.2	Instructional safeguard	No coin/button batteries used.	NA
4.8.3	Battery Compartment Construction	No coin/button batteries used.	NA
	Means to reduce the possibility of children removing the battery .....		—
4.8.4	Battery Compartment Mechanical Tests .....	(See Table 4.8.4)	NA
4.8.5	Battery Accessibility	No battery used	NA
4.9	Likelihood of fire or shock due to entry of	Only PS1 in the equipment	NA



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Clause	Requirement + Test	Result - Remark	Verdict
	conductive object .....		
<b>5</b>	<b>ELECTRICALLY-CAUSED INJURY</b>		<b>P</b>
5.2.1	Electrical energy source classifications .....	Class III equipment and all electrical circuits of EUT are ES1, (See appended table 5.2)	P
5.2.2	ES1, ES2 and ES3 limits	Comply with ES1	P
5.2.2.2	Steady-state voltage and current .....	(See appended table 5.2)	P
5.2.2.3	Capacitance limits.....	No such capacitor	NA
5.2.2.4	Single pulse limits .....	No such single pulses with the EUT	NA
5.2.2.5	Limits for repetitive pulses .....	No such repetitive pulses with the EUT	NA
5.2.2.6	Ringing signals .....	No such ringing signals with the EUT	NA
5.2.2.7	Audio signals .....	No such audio signals with the EUT	NA
5.3	Protection against electrical energy sources	Class III equipment and all electrical circuits of EUT are ES1.	P
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	No ES2 or ES3 circuit inside of the equipment.	NA
5.3.2.1	Accessibility to electrical energy sources and safeguards	Class III equipment and all electrical circuits of EUT are ES1	NA
5.3.2.2	Contact requirements	Class III equipment and all electrical circuits of EUT are ES1	NA
	a) Test with test probe from Annex V .....		NA
	b) Electric strength test potential (V) .....		NA
	c) Air gap (mm) .....		NA
5.3.2.4	Terminals for connecting stripped wire	Class 1 energy source, no safeguards used	NA
5.4	Insulation materials and requirements		P
5.4.1.2	Properties of insulating material	Class III equipment and all electrical circuits of EUT are ES1.	P
5.4.1.3	Humidity conditioning .....	Class III equipment and all electrical circuits of EUT are ES1	NA
5.4.1.4	Maximum operating temperature for insulating materials .....	No electrical insulation system (EIS) used. See table 5.4.1.4	P
5.4.1.5	Pollution degree.....	Pollution degree 2	—
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound	Pollution degree 2 is applied	P
5.4.1.5.3	Thermal cycling	No such device	NA
5.4.1.6	Insulation in transformers with varying dimensions	No such device	NA
5.4.1.7	Insulation in circuits generating starting pulses	No such circuits	NA



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Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.8	Determination of working voltage	Class III equipment and all electrical circuits of EUT are ES1	NA
5.4.1.9	Insulating surfaces	Class III equipment and all electrical circuits of EUT are ES1	NA
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted	Thermoplastic parts have sufficient heat resistance.	P
5.4.1.10.2	Vicat softening temperature ..... :	No such part	NA
5.4.1.10.3	Ball pressure ..... :	Class III equipment and all electrical circuits of EUT are ES1	NA
5.4.2	Clearances	Class III equipment and all electrical circuits of EUT are ES1, and there is no critical insulation.	NA
5.4.2.2	Determining clearance using peak working voltage	Class III equipment and all electrical circuits of EUT are ES1, and there is no critical insulation.	NA
5.4.2.3	Determining clearance using required withstand voltage ..... :	Class III equipment and all electrical circuits of EUT are ES1, and there is no critical insulation.	NA
	a) a.c. mains transient voltage ..... :	The equipment does not directly connected to mains	—
	b) d.c. mains transient voltage ..... :	The equipment does not directly connected to mains	—
	c) external circuit transient voltage ..... :	ES1 electrical energy source used	—
	d) transient voltage determined by measurement ..... :	ES1 electrical energy source used	—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test	ES1 electrical energy source used, only the functional insulation inside the EUT	NA
5.4.2.5	Multiplication factors for clearances and test voltages ..... :	Only considered below 2000m in this report	NA
5.4.3	Creepage distances ..... :	ES1 electrical energy source used, only the functional insulation inside the EUT.	NA
5.4.3.1	General	ES1 electrical energy source used, only the functional insulation inside the EUT.	NA
5.4.3.3	Material Group ..... :	Group IIIb considered.	—
5.4.4	Solid insulation	ES1 electrical energy source used.	NA
5.4.4.2	Minimum distance through insulation ..... :	ES1 electrical energy source used, only the functional insulation inside the EUT.	NA
5.4.4.3	Insulation compound forming solid insulation	No such part	NA
5.4.4.4	Solid insulation in semiconductor devices	No such part	NA
5.4.4.5	Cemented joints	No such part	NA
5.4.4.6	Thin sheet material	No such part	NA



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Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.6.1	General requirements	No such part	NA
5.4.4.6.2	Separable thin sheet material	No such part	NA
	Number of layers (pcs) .....:	No such part	NA
5.4.4.6.3	Non-separable thin sheet material	No such part	NA
5.4.4.6.4	Standard test procedure for non-separable thin sheet material .....:	No such part	NA
5.4.4.6.5	Mandrel test	No such part	NA
5.4.4.7	Solid insulation in wound components	No such part	NA
5.4.4.9	Solid insulation at frequencies > 30 kHz .....:	No such part	NA
5.4.5	Antenna terminal insulation	No such device	NA
5.4.5.1	General	No such device	NA
5.4.5.2	Voltage surge test	No such device	NA
	Insulation resistance (MΩ) .....:	No such device	—
5.4.6	Insulation of internal wire as part of supplementary safeguard .....:	ES1 electrical energy source used, only the functional insulation inside the EUT	NA
5.4.7	Tests for semiconductor components and for cemented joints	No cemented joints	NA
5.4.8	Humidity conditioning	ES1 electrical energy source used, only the functional insulation inside the EUT	P
	Relative humidity (%) .....:	(93 ± 3) %	—
	Temperature (°C) .....:	(24 ± 2) °C	—
	Duration (h) .....:	48 h	—
5.4.9	Electric strength test .....:	ES1 electrical energy source used, only the functional insulation inside the EUT	NA
5.4.9.1	Test procedure for a solid insulation type test	ES1 electrical energy source used, only the functional insulation inside the EUT	NA
5.4.9.2	Test procedure for routine tests	ES1 electrical energy source used, only the functional insulation inside the EUT	NA
5.4.10	Protection against transient voltages between external circuit	No transient voltage from the external circuit	NA
5.4.10.1	Parts and circuits separated from external circuits	No transient voltage from the external circuit	NA
5.4.10.2	Test methods	No transient voltage from the external circuit	NA
5.4.10.2.1	General	No transient voltage from the external circuit	NA
5.4.10.2.2	Impulse test .....:	No transient voltage from the external circuit	NA
5.4.10.2.3	Steady-state test .....:	No transient voltage from the external circuit	NA



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Clause	Requirement + Test	Result - Remark	Verdict
5.4.11	Insulation between external circuits and earthed circuitry .....	Supplied by ES1 circuit , no earthed circuitry	NA
5.4.11.1	Exceptions to separation between external circuits and earth	Supplied by ES1 circuit	NA
5.4.11.2	Requirements	Supplied by ES1 circuit	NA
	Rated operating voltage $U_{op}$ (V).....	No such external circuits.	—
	Nominal voltage $U_{peak}$ (V).....	No such external circuits.	—
	Max increase due to variation $U_{sp}$ .....	No such external circuits.	—
	Max increase due to ageing $\Delta U_{sa}$ .....	No such external circuits.	—
	$U_{op} = U_{peak} + \Delta U_{sp} + \Delta U_{sa}$ .....	No such external circuits.	—
5.5	Components as safeguards		P
5.5.1	General	Components used are in accordance with their ratings, certifications and they comply with applicable parts of this standard	P
5.5.2	Capacitors and RC units	No such devices	NA
5.5.2.1	General requirement		NA
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector .....	No such devices	NA
5.5.3	Transformers		P
5.5.4	Optocouplers	No such devices	NA
5.5.5	Relays	No such devices	NA
5.5.6	Resistors		P
5.5.7	SPD's	No such devices	NA
5.5.7.1	Use of an SPD connected to reliable earthing	No such devices	NA
5.5.7.2	Use of an SPD between mains and protective earth	No such devices	NA
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable .....	No such construction	NA
5.6	Protective conductor		NA
5.6.2	Requirement for protective conductors	The EUT is Class III equipment	NA
5.6.2.1	General requirements	The EUT is Class III equipment	NA
5.6.2.2	Colour of insulation	The EUT is Class III equipment	NA
5.6.3	Requirement for protective earthing conductors	The EUT is Class III equipment	NA
	Protective earthing conductor size (mm <sup>2</sup> ) .....		—
5.6.4	Requirement for protective bonding conductors	The EUT is Class III equipment	NA
5.6.4.1	Protective bonding conductors	The EUT is Class III equipment	NA
	Protective bonding conductor size (mm <sup>2</sup> ).....	No such part	—





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Clause	Requirement + Test	Result - Remark	Verdict
	Protective current rating (A) .....	No such part	—
5.6.4.3	Current limiting and overcurrent protective devices	No such devices	NA
5.6.5	Terminals for protective conductors	The EUT is Class III equipment	NA
5.6.5.1	Requirement	The EUT is Class III equipment	NA
	Conductor size (mm <sup>2</sup> ), nominal thread diameter (mm). .....	The EUT is Class III equipment	NA
5.6.5.2	Corrosion	No such construction	NA
5.6.6	Resistance of the protective system	No such construction	NA
5.6.6.1	Requirements	No such construction	NA
5.6.6.2	Test Method Resistance (Ω) .....	No such construction	NA
5.6.7	Reliable earthing	No such construction	NA
5.7	Prospective touch voltage, touch current and protective conductor current		NA
5.7.2	Measuring devices and networks	No such part	NA
5.7.2.1	Measurement of touch current .....	No such device	NA
5.7.2.2	Measurement of prospective touch voltage	No such device	NA
5.7.3	Equipment set-up, supply connections and earth connections	No such device	NA
	System of interconnected equipment (separate connections/single connection) .....	No such device	—
	Multiple connections to mains (one connection at a time/simultaneous connections) .....	No such device	—
5.7.4	Earthed conductive accessible parts .....	No such device	NA
5.7.5	Protective conductor current	No such device	NA
	Supply Voltage (V) .....	No such device	—
	Measured current (mA) .....	No such device	—
	Instructional Safeguard .....	No such device	NA
5.7.6	Prospective touch voltage and touch current due to external circuits	No such device	NA
5.7.6.1	Touch current from coaxial cables	No such device	NA
5.7.6.2	Prospective touch voltage and touch current from external circuits	No such device	NA
5.7.7	Summation of touch currents from external circuits	No such device	NA
	a) Equipment with earthed external circuits Measured current (mA) .....	No such device	NA
	b) Equipment whose external circuits are not referenced to earth. Measured current (mA) ...	No such device	NA
<b>6</b>	<b>ELECTRICALLY- CAUSED FIRE</b>		<b>P</b>
6.2	Classification of power sources (PS) and potential ignition sources (PIS)		P
6.2.2	Power source circuit classifications	See below	P



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Clause	Requirement + Test	Result - Remark	Verdict
6.2.2.1	General	PS1.	P
6.2.2.2	Power measurement for worst-case load fault :		P
6.2.2.3	Power measurement for worst-case power source fault..... :		P
6.2.2.4	PS1 ..... :	PS1 circuit	P
6.2.2.5	PS2 ..... :	No such circuit.	NA
6.2.2.6	PS3 ..... :	No such circuit.	NA
6.2.3	Classification of potential ignition sources	See below	NA
6.2.3.1	Arcing PIS ..... :	No such PIS.	NA
6.2.3.2	Resistive PIS ..... :	No such PIS.	NA
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1 (a)	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials ..... :	No such materials used.	P
6.3.1 (b)	Combustible materials outside fire enclosure	No such materials used.	P
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard Method	Supplied by PS1 circuit.	P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits	Supplied by PS1 circuit.	P
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	Supplied by PS1 circuit.	NA
6.4.3.1	General	Supplied by PS1 circuit.	NA
6.4.3.2	Supplementary Safeguards	Supplied by PS1 circuit.	NA
	Special conditions if conductors on printed boards are opened or peeled	Supplied by PS1 circuit.	NA
6.4.3.3	Single Fault Conditions ..... :	Supplied by PS1 circuit.	NA
	Special conditions for temperature limited by fuse	No fuse used.	NA
6.4.4	Control of fire spread in PS1 circuits	Supplied by PS1 circuit.	P
6.4.5	Control of fire spread in PS2 circuits	No PS2 circuits inside of equipment.	NA
6.4.5.2	Supplementary safeguards ..... :	No PS2 circuits inside of equipment.	NA
6.4.6	Control of fire spread in PS3 circuit	No PS3 circuits inside of equipment.	NA
6.4.7	Separation of combustible materials from a PIS	Only PS1 circuit inside EUT	NA
6.4.7.1	General ..... :	Only PS1 circuit inside EUT	NA
6.4.7.2	Separation by distance	Only PS1 circuit inside EUT	NA
6.4.7.3	Separation by a fire barrier	Only PS1 circuit inside EUT	NA
6.4.8	Fire enclosures and fire barriers	Only PS1 circuit inside EUT	NA
6.4.8.1	Fire enclosure and fire barrier material properties	Only PS1 circuit inside EUT	NA
6.4.8.2.1	Requirements for a fire barrier	Only PS1 circuit inside EUT	NA



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Clause	Requirement + Test	Result - Remark	Verdict
6.4.8.2.2	Requirements for a fire enclosure	Only PS1 circuit inside EUT	NA
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier	Only PS1 circuit inside EUT	NA
6.4.8.3.1	Fire enclosure and fire barrier openings	Only PS1 circuit inside EUT	NA
6.4.8.3.2	Fire barrier dimensions	Only PS1 circuit inside EUT	NA
6.4.8.3.3	Top Openings in Fire Enclosure: dimensions (mm) .....	Only PS1 circuit inside EUT	NA
	Needle Flame test	Only PS1 circuit inside EUT	NA
6.4.8.3.4	Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) .....	Only PS1 circuit inside EUT	NA
	Flammability tests for the bottom of a fire enclosure .....	Only PS1 circuit inside EUT	NA
6.4.8.3.5	Integrity of the fire enclosure, condition met: a), b) or c) .....	Only PS1 circuit inside EUT	NA
6.4.8.4	Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating .....	Only PS1 circuit inside EUT	NA
6.5	Internal and external wiring		NA
6.5.1	Requirements	Only PS1 circuit inside EUT	NA
6.5.2	Cross-sectional area (mm <sup>2</sup> ) .....	Only PS1 circuit inside EUT	—
6.5.3	Requirements for interconnection to building wiring .....	Only PS1 circuit inside EUT	NA
6.6	Safeguards against fire due to connection to additional equipment	No such connection	NA
	External port limited to PS2 or complies with Clause Q.1	No such connection	NA

<b>7</b>	<b>INJURY CAUSED BY HAZARDOUS SUBSTANCES</b>		<b>NA</b>
7.2	Reduction of exposure to hazardous substances	No hazardous substances exposure.	NA
7.3	Ozone exposure	No ozone production within the equipment.	NA
7.4	Use of personal safeguards (PPE)	No such consideration.	NA
	Personal safeguards and instructions .....	See above.	—
7.5	Use of instructional safeguards and instructions	No hazardous substances caused injuries, the instruction safeguard was not required.	NA
	Instructional safeguard (ISO 7010) .....	(See Annex F.5)	—
7.6	Batteries .....	(See Annex M)	NA
<b>8</b>	<b>MECHANICALLY-CAUSED INJURY</b>		<b>P</b>
8.1	General	See the following details.	P
8.2	Mechanical energy source classifications	Sharp edges and corners, classified as MS1 Equipment mass < 7 kg, classified as MS1	P



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Clause	Requirement + Test	Result - Remark	Verdict
8.3	Safeguards against mechanical energy sources	No safeguards requirement for MS1	NA
8.4	Safeguards against parts with sharp edges and corners	Sharp edges and corners, classified as MS1	P
8.4.1	Safeguards	No safeguards requirement for MS1	NA
8.5	Safeguards against moving parts	No such moving part	NA
8.5.1	MS2 or MS3 part required to be accessible for the function of the equipment	No such parts	NA
8.5.2	Instructional Safeguard..... :	No such warning	—
8.5.4	Special categories of equipment comprising moving parts	No moving parts within the equipment.	NA
8.5.4.1	Large data storage equipment	No moving parts within the equipment.	NA
8.5.4.2	Equipment having electromechanical device for destruction of media	No moving parts within the equipment.	NA
8.5.4.2.1	Safeguards and Safety Interlocks.....:	No moving parts within the equipment.	NA
8.5.4.2.2	Instructional safeguards against moving parts	No moving parts within the equipment.	NA
	Instructional Safeguard.....:	No such device	—
8.5.4.2.3	Disconnection from the supply	No such device	NA
8.5.4.2.4	Probe type and force (N).....:	No such device	NA
8.5.5	High Pressure Lamps	No such device	NA
8.5.5.1	Energy Source Classification	No such device	NA
8.5.5.2	High Pressure Lamp Explosion Test.....:	(See appended table 8.5.5.2)	NA
8.6	Stability	See the following details.	P
8.6.1	Product classification	Equipment mass < 7 kg, classified as MS1.	P
	Instructional Safeguard.....:	No safeguard requirement	—
8.6.2	Static stability	MS1 product classification, no stability requirement	P
8.6.2.2	Static stability test	MS1 product classification, no stability requirement	NA
	Applied Force ..... :	MS1 product classification, no stability requirement	—
8.6.2.3	Downward Force Test	MS1 product classification, no stability requirement	NA
8.6.3	Relocation stability test	MS1 product classification, no stability requirement	NA
	Unit configuration during 10° tilt ..... :	MS1 product classification, no such requirement	—



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Clause	Requirement + Test	Result - Remark	Verdict
8.6.4	Glass slide test	MS1 product classification, no such requirement	NA
8.6.5	Horizontal force test (Applied Force) ..... :	MS1 product classification, no such requirement	NA
	Position of feet or movable parts ..... :	MS1 product classification, no such requirement	—
8.7	Equipment mounted to wall or ceiling	No such mounting means	NA
8.7.1	Mounting Means (Length of screws (mm) and mounting surface) ..... :	No such mounting means	NA
8.7.2	Direction and applied force ..... :	No such requirement	NA
8.8	Handles strength	No such part	NA
8.8.1	Classification		NA
8.8.2	Applied Force ..... :		NA
8.9	Wheels or casters attachment requirements	No such part	NA
8.9.1	Classification		NA
8.9.2	Applied force ..... :		—
8.10	Carts, stands and similar carriers		P
8.10.1	General		P
8.10.2	Marking and instructions		NA
	Instructional Safeguard ..... :		—
8.10.3	Cart, stand or carrier loading test and compliance		NA
	Applied force ..... :		—
8.10.4	Cart, stand or carrier impact test		NA
8.10.5	Mechanical stability		NA
	Applied horizontal force (N) ..... :		—
8.10.6	Thermoplastic temperature stability (°C) ..... :		P
8.11	Mounting means for rack mounted equipment	No such mounting means	NA
8.11.1	General		NA



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Clause	Requirement + Test	Result - Remark	Verdict
8.11.2	Product Classification		NA
8.11.3	Mechanical strength test, variable <i>N</i> .....		NA
8.11.4	Mechanical strength test 250N, including end stops		NA
8.12	Telescoping or rod antennas .....	No such part, (See Clause T.11)	NA
	Button/Ball diameter (mm) .....		—
<b>9</b>	<b>THERMAL BURN INJURY</b>		<b>P</b>
9.2	Thermal energy source classifications	All accessible surfaces are classified as TS1, see appended table 5.4.1.4, 6.3.2, 9.0, B.2.6.	P
9.3	Safeguard against thermal energy sources	No safeguard required for TS1	NA
9.4	Requirements for safeguards		NA
9.4.1	Equipment safeguard	No safeguard requirement	NA
9.4.2	Instructional safeguard .....	No safeguard requirement	NA
<b>10</b>	<b>RADIATION</b>		<b>P</b>
10.2	Radiation energy source classification	See below	P
10.2.1	General classification	RS1 LED energy source used.	P
10.3	Protection against laser radiation	No laser radiation energy source.	NA
	Laser radiation that exists equipment:		—
	Normal, abnormal, single-fault .....	No laser radiation energy source.	NA
	Instructional safeguard .....		—
	Tool.....		—
10.4	Protection against visible, infrared, and UV radiation		NA
10.4.1	General		P
10.4.1.a)	RS3 for Ordinary and instructed persons .....	No RS3	NA
10.4.1.b)	RS3 accessible to a skilled person.....	No RS3	NA
	Personal safeguard (PPE) instructional safeguard: .....		—
10.4.1.c)	Equipment visible, IR, UV does not exceed RS1 .....	No such parts	NA
10.4.1.d)	Normal, abnormal, single-fault conditions .....	No such parts	NA
10.4.1.e)	Enclosure material employed as safeguard is opaque.....	No such parts	NA
10.4.1.f)	UV attenuation.....	No such parts	NA
10.4.1.g)	Materials resistant to degradation UV .....	No such parts	NA
10.4.1.h)	Enclosure containment of optical radiation.....	No such parts	NA
10.4.1.i)	Exempt Group under normal operating conditions	No such parts	NA



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Clause	Requirement + Test	Result - Remark	Verdict
	..... :		
10.4.2	Instructional safeguard ..... :	No safeguard is needed for RS1	P
10.5	Protection against x-radiation	No such parts	NA
10.5.1	X- radiation energy source that exists equipment ..... :		NA
	Normal, abnormal, single fault conditions		NA
	Equipment safeguards ..... :		NA
	Instructional safeguard for skilled person..... :		NA
10.5.3	Most unfavourable supply voltage to give maximum radiation ..... :		—
	Abnormal and single-fault condition..... :	(See appended table B.3 & B.4)	NA
	Maximum radiation (pA/kg) ..... :		NA
10.6	Protection against acoustic energy sources	No such device	NA
10.6.1	<p>General</p> <p>Safeguard requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered.</p> <p>A personal music player is a portable equipment intended for use by an <b>ordinary person</b>, that:</p> <ul style="list-style-type: none"> <li>– is designed to allow the user to listen to audio or audiovisual content / material; and</li> <li>– uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and</li> <li>– has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.).</li> </ul> <p>NOTE 1 Examples are portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment.</p> <p>Personal music players shall comply with the requirements below.</p> <p>NOTE 2 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360. These requirements are valid for music or video mode only.</p> <p>The requirements do not apply to:</p> <ul style="list-style-type: none"> <li>– professional equipment;</li> </ul> <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p> <ul style="list-style-type: none"> <li>– hearing aid equipment and other devices for assistive listening;</li> <li>– the following type of analogue personal music players: <ul style="list-style-type: none"> <li>• long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and</li> </ul> </li> </ul>		NA



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Clause	Requirement + Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> <li>cassette player/recorder;</li> </ul> <p>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.</p> <p>– a player while connected to an external amplifier that does not allow the user to walk around while in use.</p>		
10.6.2	Classification		NA
10.6.2.1	<p>RS1 limits</p> <p>RS1 is a class 1 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> <li>for equipment provided as a package (player with its listening device), the <math>L_{Aeq, T}</math> acoustic output shall be <math>\leq 85</math> dB(A) when playing the fixed “programme simulation noise” described in EN 50332-1.</li> <li>for equipment provided with an electrical output socket for a listening device, the unweighted r.m.s. output voltage shall be <math>\leq 27</math> mV or 25 dB below full scale when playing the fixed “programme simulation noise” described in EN 50332-1.</li> </ul> <p>NOTE 1 Unless otherwise specified, wherever the term acoustic output is used in 10.6, <math>L_{Aeq, T}</math> is the A-weighted equivalent sound pressure level over a 30 s period.</p> <p>For music where the average sound pressure (long term <math>L_{Aeq, T}</math>) measured over the duration of the song is lower than the average produced by the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the basic limit of 85 dB(A). In this case, <math>T</math> becomes the duration of the song.</p> <p>NOTE 2 Classical music typically has an average sound pressure (long term <math>L_{Aeq, T}</math>) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the song and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the basic limit of 85 dB(A). For example, if the player is set with the programme simulation noise to 85 dB(A), but the average music level of the song is only 65 dB(A), there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dB(A).</p> <p>For equipment that is clearly designed or intended for use by children, the limits of the relevant toy standards may apply.</p> <p>NOTE 3 In Europe, the relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.</p>	Not such equipment.	NA
10.6.2.2	<p>RS2 limits</p> <p>RS2 is a class 2 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> <li>for equipment provided as a package (player with its listening device), the <math>L_{Aeq, T}</math> acoustic output shall be <math>\leq 100</math> dB(A) when playing the fixed “programme simulation noise” as described in EN 50332-1.</li> <li>for equipment provided with an electrical output socket for a listening device, the unweighted r.m.s. output voltage shall be <math>\leq 150</math> mV or 10 dB below full scale when playing the fixed “programme simulation noise” as</li> </ul>		NA





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Clause	Requirement + Test	Result - Remark	Verdict
	described in EN 50332-1.		
10.6.2.3	RS3 limits RS3 is a class 3 acoustic energy source that exceeds RS2 limits.	Not such equipment.	NA
10.6.3	Measurement methods All volume controls shall be turned to maximum during tests. Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.		NA
10.6.4	Protection of persons Except as given below, protection requirements for parts accessible to ordinary persons, instructed persons and skilled persons are given in 4.3. NOTE 1 Volume control is not considered a safeguard. Between RS2 and an ordinary person, the basic safeguard may be replaced by an instructional safeguard in accordance with Clause F.5, except that the instructional safeguard shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the instructional safeguard may be given through the equipment display during use. The elements of the instructional safeguard shall be as follows: – element 1a: the symbol, IEC 60417-6044 (2011-01) – element 2: “High sound pressure” or equivalent wording – element 3: “Hearing damage risk” or equivalent wording – element 4: “Do not listen at high volume levels for long periods.” or equivalent wording An equipment safeguard shall prevent exposure of an ordinary person to RS2 power source without intentional physical action from the ordinary person and shall automatically return to an output level not exceeding RS1 when the power is switched off. The equipment shall provide a means to actively inform the user of the increased sound pressure when the equipment is operated with an acoustic output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an acoustic output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time. NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed. NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off. A skilled person shall not be unintentionally exposed to RS3.		NA
10.6.5	Requirements for listening devices (headphones, earphones, etc.)	Not such equipment	NA
10.6.5.1	Corded passive listening devices with analog input	.	NA



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Clause	Requirement + Test	Result - Remark	Verdict
	<p>With 94 dB(A) <math>L_{Aeq}</math> acoustic pressure output, the input voltage of the fixed “programme simulation noise” as described in EN 50332-1 shall be <math>\geq 75</math> mV.</p> <p>This requirement is applicable in any music play mode where the headphones can operate, including any available setting (for example, a built-in volume level control, an additional sound feature like equalization, etc.).</p> <p>NOTE The values of 94 dB(A) and 75 mV correspond with 85 dB(A) and 27 mV or 100 dB(A) and 150 mV.</p>		
10.6.5.2	<p>Corded listening devices with digital input</p> <p>With any playing device playing the fixed “programme simulation noise” described in EN 50332-1, the <math>L_{Aeq,T}</math> acoustic output of the listening device shall be <math>\leq 100</math> dB(A).</p> <p>This requirement is applicable in any music play mode where the headphones can operate, including any available setting (for example, a built-in volume level control, an additional sound feature like equalization, etc.).</p>		NA
10.6.5.3	<p>Cordless listening device</p> <p>In cordless mode,</p> <ul style="list-style-type: none"><li>– with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and</li><li>– respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and</li><li>– with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound feature like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise,</li></ul> <p>the <math>L_{Aeq,T}</math> acoustic output of the listening device shall be <math>\leq 100</math> dB(A).</p>		NA
10.6.5.4	<p>Measurement method</p> <p>Measurements shall be made in accordance with EN 50332-2 as applicable.</p>		NA



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Clause	Requirement + Test	Result - Remark	Verdict

<b>B</b>	<b>NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS</b>		<b>P</b>
<b>B.1</b>	<b>General</b>		P
B.1.5	Temperature measurement conditions	(See appended table B.1.5)	P
B.2	Normal Operating Conditions		P
B.2.1	General requirements .....	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers .....	No such parts	NA
B.2.3	Supply voltage and tolerances	See rating label	P
B.2.5	Input test .....	(See appended table)	P
B.3	Simulated abnormal operating conditions		P
B.3.1	General requirements .....	(See appended table B.3)	P
B.3.2	Covering of ventilation openings	No such openings	NA
B.3.3	D.C. mains polarity test	No such parts	NA
B.3.4	Setting of voltage selector .....	No such voltage selector	NA
B.3.5	Maximum load at output terminals .....	No such terminals	NA
B.3.6	Reverse battery polarity	(See appended table B.3)	NA
B.3.7	Abnormal operating conditions as specified in Clause E.2.	Not audio amplifier equipment	NA
B.3.8	Safeguards functional during and after abnormal operating conditions	All safeguards remained effectively.	P
B.4	Simulated single fault conditions		P
B.4.2	Temperature controlling device open or short-circuited .....	Not such equipment.	NA
B.4.3	Motor tests	No motor used	NA
B.4.3.1	Motor blocked or rotor locked increasing the internal ambient temperature .....		NA
B.4.4	Short circuit of functional insulation	(See appended table B.4)	P
B.4.4.1	Short circuit of clearances for functional insulation		NA
B.4.4.2	Short circuit of creepage distances for functional insulation		NA
B.4.4.3	Short circuit of functional insulation on coated printed boards	(See appended table B.4)	P
B.4.5	Short circuit and interruption of electrodes in tubes and semiconductors	No such parts	NA
B.4.6	Short circuit or disconnect of passive components		NA
B.4.7	Continuous operation of components		NA
B.4.8	Class 1 and Class 2 energy sources within limits during and after single fault conditions	Class 1 energy source	P
B.4.9	Battery charging under single fault conditions :	No batteries provided for testing.	NA



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Clause	Requirement + Test	Result - Remark	Verdict
<b>C</b>	<b>UV RADIATION</b>		<b>NA</b>
C.1	Protection of materials in equipment from UV radiation	No UV radiation	NA
C.1.2	Requirements		NA
C.1.3	Test method		NA
C.2	UV light conditioning test		NA
C.2.1	Test apparatus		NA
C.2.2	Mounting of test samples		NA
C.2.3	Carbon-arc light-exposure apparatus		NA
C.2.4	Xenon-arc light exposure apparatus		NA
<b>D</b>	<b>TEST GENERATORS</b>		<b>NA</b>
D.1	Impulse test generators	No such parts	NA
D.2	Antenna interface test generator		NA
D.3	Electronic pulse generator		NA
<b>E</b>	<b>TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS</b>		<b>NA</b>
E.1	Audio amplifier normal operating conditions	No such parts	NA
	Audio signal voltage (V) .....		—
	Rated load impedance ( $\Omega$ ) .....		
E.2	Audio amplifier abnormal operating conditions		NA
<b>F</b>	<b>EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS</b>		<b>P</b>
F.1	General requirements		P
	Instructions – Language .....	German version provided	—
F.2	Letter symbols and graphical symbols	See the following for the details.	P
F.2.1	Letter symbols according to IEC60027-1		P
F.2.2	Graphic symbols IEC, ISO or manufacturer specific	Explained in IM	P
F.3	Equipment markings		P
F.3.1	Equipment marking locations	Marked on the enclosure of the equipment.	P
F.3.2	Equipment identification markings	See below	P
F.3.2.1	Manufacturer identification .....	See rating label and IM	—
F.3.2.2	Model identification .....		—
F.3.3	Equipment rating markings	See the following details.	P
F.3.3.1	Equipment with direct connection to mains	Not connected to mains	NA
F.3.3.2	Equipment without direct connection to mains	See B.2.5	P
F.3.3.3	Nature of supply voltage.....	Not connected to mains	NA
F.3.3.4	Rated voltage.....	5Vdc	—
F.3.3.4	Rated frequency .....	--	—



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Clause	Requirement + Test	Result - Remark	Verdict
F.3.3.6	Rated current or rated power .....	Not connected to mains	—
F.3.3.7	Equipment with multiple supply connections	Not such equipment	NA
F.3.4	Voltage setting device	No such devices	NA
F.3.5	Terminals and operating devices	No such devices	NA
F.3.5.1	Mains appliance outlet and socket-outlet markings .....	No such devices	NA
F.3.5.2	Switch position identification marking .....	No such switch	NA
F.3.5.3	Replacement fuse identification and rating markings .....	No such fuse	NA
F.3.5.4	Replacement battery identification marking .....	See Clause F.5	P
F.3.5.5	Terminal marking location	No such terminal	NA
F.3.6	Equipment markings related to equipment classification	See below	P
F.3.6.1	Class I Equipment	Not such equipment	NA
F.3.6.1.1	Protective earthing conductor terminal	No such terminal	NA
F.3.6.1.2	Neutral conductor terminal	No such terminal	NA
F.3.6.1.3	Protective bonding conductor terminals	No such terminal	NA
F.3.6.2	Class II equipment (IEC60417-5172)	Not such equipment	NA
F.3.6.2.1	Class II equipment with or without functional earth	Not such equipment	NA
F.3.6.2.2	Class II equipment with functional earth terminal marking	Not such equipment	NA
F.3.7	Equipment IP rating marking .....	IPXX	—
F.3.8	External power supply output marking	No such device	NA
F.3.9	Durability, legibility and permanence of marking	Marking label attached on the bottom enclosure	P
F.3.10	Test for permanence of markings	After rubbing test by water and petroleum spirit, the label still easily discernible, indelible and legible.	P
F.4	Instructions		P
	a) Equipment for use in locations where children not likely to be present - marking	Not such equipment	NA
	b) Instructions given for installation or initial use	Relevant caution texts and installation instruction are available.	P
	c) Equipment intended to be fastened in place	Not such equipment	NA
	d) Equipment intended for use only in restricted access area	Not for installation in restricted access locations	NA
	e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1	Not such equipment	NA
	f) Protective earthing employed as safeguard	Not such equipment	NA



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Clause	Requirement + Test	Result - Remark	Verdict
	g) Protective earthing conductor current exceeding ES 2 limits	Not such equipment	NA
	h) Symbols used on equipment	Explained in the user manual	P
	i) Permanently connected equipment not provided with all-pole mains switch	Not such equipment	NA
j)	j) Replaceable components or modules providing safeguard function	No such part	NA
F.5	Instructional safeguards	Instruction manual was used	P
	Where "instructional safeguard" is referenced in the test report it specifies the required elements, location of marking and/or instruction		NA
<b>G</b>	<b>COMPONENTS</b>		<b>P</b>
<b>G.1</b>	<b>Switches</b>		NA
G.1.1	General requirements	No switch used	NA
G.1.2	Ratings, endurance, spacing, maximum load		NA
<b>G.2</b>	<b>Relays</b>		NA
G.2.1	General requirements	No relay used	NA
G.2.2	Overload test		NA
G.2.3	Relay controlling connectors supply power		NA
G.2.4	Mains relay, modified as stated in G.2		NA
<b>G.3</b>	<b>Protection Devices</b>		NA
G.3.1	Thermal cut-offs	No protection device used	NA
G.3.1.1a) &b)	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		NA
G.3.1.1c)	Thermal cut-outs tested as part of the equipment as indicated in c)		NA
G.3.1.2	Thermal cut-off connections maintained and secure		NA
G.3.2	Thermal links		NA
G.3.2.1a)	Thermal links separately tested with IEC 60691	No such device	NA
G.3.2.1b)	Thermal links tested as part of the equipment	No such device	NA
	Aging hours (H).....:	No such device	—
	Single Fault Condition .....	No such device	—
	Test Voltage (V) and Insulation Resistance ( $\Omega$ ):	No such device	—
G.3.3	PTC Thermistors	No such device	NA
G.3.4	Overcurrent protection devices	No such device	NA
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.5		NA
G.3.5.1	Non-resettable devices suitably rated and marking provided		NA
G.3.5.2	Single faults conditions .....	(See appended Table B.4)	NA
<b>G.4</b>	<b>Connectors</b>		NA



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Clause	Requirement + Test	Result - Remark	Verdict
G.4.1	Spacings	No connector used	NA
G.4.2	Mains connector configuration .....		NA
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		NA
<b>G.5</b>	<b>Wound Components</b>		NA
G.5.1	Wire insulation in wound components .....	No such part used, (See Annex J)	NA
G.5.1.2 a)	Two wires in contact inside wound component, angle between 45° and 90°		NA
G.5.1.2 b)	Construction subject to routine testing		NA
G.5.2	Endurance test on wound components		NA
G.5.2.1	General test requirements		NA
G.5.2.2	Heat run test		NA
	Time (s) .....		—
	Temperature (°C).....		—
G.5.2.3	Wound Components supplied by mains		NA
<b>G.5.3</b>	<b>Transformers</b>		NA
G.5.3.1	Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1) .....	No transformer used	NA
	Position .....		—
	Method of protection .....		—
G.5.3.2	Insulation		NA
	Protection from displacement of windings .....		—
G.5.3.3	Overload test .....		NA
G.5.3.3.1	Test conditions		NA
G.5.3.3.2	Winding Temperatures testing in the unit		NA
G.5.3.3.3	Winding Temperatures - Alternative test method		NA
<b>G.5.4</b>	<b>Motors</b>		NA
G.5.4.1	General requirements	No motor used	NA
	Position .....		—
G.5.4.2	Test conditions		NA
G.5.4.3	Running overload test		NA
G.5.4.4	Locked-rotor overload test		NA
	Test duration (days) .....		—
G.5.4.5	Running overload test for d.c. motors in secondary circuits		NA
G.5.4.5.2	Tested in the unit		NA
	Electric strength test (V).....		—
G.5.4.5.3	Tested on the Bench - Alternative test method; test time (h) .....		NA



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Clause	Requirement + Test	Result - Remark	Verdict
	Electric strength test (V)..... :		—
G.5.4.6	Locked-rotor overload test for d.c. motors in secondary circuits		NA
G.5.4.6.2	Tested in the unit		NA
	Maximum Temperature ..... :		NA
	Electric strength test (V) ..... :		NA
G.5.4.6.3	Tested on the bench - Alternative test method; test time (h)..... :		NA
	Electric strength test (V)..... :		NA
G.5.4.7	Motors with capacitors		NA
G.5.4.8	Three-phase motors		NA
G.5.4.9	Series motors		NA
	Operating voltage ..... :		—
<b>G.6</b>	<b>Wire Insulation</b>		<b>P</b>
G.6.1	General	The working voltage does not exceeding ES1.	P
G.6.2	Solvent-based enamel wiring insulation		NA
<b>G.7</b>	<b>Mains supply cords</b>		<b>NA</b>
G.7.1	General requirements	No mains supply cord used	NA
	Type..... :		—
	Rated current (A)..... :		—
	Cross-sectional area (mm <sup>2</sup> ), (AWG) ..... :		—
G.7.2	Compliance and test method		NA
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		NA
G.7.3.2	Cord strain relief		NA
G.7.3.2.1	Requirements		NA
	Strain relief test force (N) ..... :		—
G.7.3.2.2	Strain relief mechanism failure		NA
G.7.3.2.3	Cord sheath or jacket position, distance (mm) :		—
G.7.3.2.4	Strain relief comprised of polymeric material		NA
G.7.4	Cord Entry ..... :		NA
G.7.5	Non-detachable cord bend protection		NA
G.7.5.1	Requirements		NA
G.7.5.2	Mass (g) ..... :		—
	Diameter (m)..... :		—
	Temperature (°C)..... :		—
G.7.6	Supply wiring space		NA
G.7.6.2	Stranded wire		NA





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Clause	Requirement + Test	Result - Remark	Verdict
G.7.6.2.1	Test with 8 mm strand		NA
<b>G.8</b>	<b>Varistors</b>		NA
G.8.1	General requirements	No varistor used	NA
G.8.2	Safeguard against shock		NA
G.8.3	Safeguard against fire		NA
G.8.3.2	Varistor overload test..... :		NA
G.8.3.3	Temporary overvoltage..... :		NA
<b>G.9</b>	<b>Integrated Circuit (IC) Current Limiters</b>		P
G.9.1 a)	Manufacturer defines limit at max. 5A.	No such device used	NA
G.9.1 b)	Limiters do not have manual operator or reset		NA
G.9.1 c)	Supply source does not exceed 250 VA ..... :		—
G.9.1 d)	IC limiter output current (max. 5A) ..... :		—
G.9.1 e)	Manufacturers' defined drift ..... :		—
G.9.2	Test Program 1		NA
G.9.3	Test Program 2		NA
G.9.4	Test Program 3		NA
<b>G.10</b>	<b>Resistors</b>		P
G.10.1	General requirements		P
G.10.2	Resistor test		NA
G.10.3	Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable		NA
G.10.3.1	General requirements		NA
G.10.3.2	Voltage surge test		NA
G.10.3.3	Impulse test		NA
<b>G.11</b>	<b>Capacitor and RC units</b>		P
G.11.1	General requirements		P
G.11.2	Conditioning of capacitors and RC units		NA
G.11.3	Rules for selecting capacitors		NA
<b>G.12</b>	<b>Optocouplers</b>		NA
	Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results) ..... :	No such component.	NA
	Type test voltage Vini ..... :		—
	Routine test voltage, Vini,b ..... :		—
<b>G.13</b>	<b>Printed boards</b>		P
G.13.1	General requirements	Only the functional insulation requirement on the PCB.	P
G.13.2	Uncoated printed boards		NA
G.13.3	Coated printed boards		NA



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Clause	Requirement + Test	Result - Remark	Verdict
G.13.4	Insulation between conductors on the same inner surface		NA
	Compliance with cemented joint requirements (Specify construction) .....		—
G.13.5	Insulation between conductors on different surfaces		NA
	Distance through insulation .....		NA
	Number of insulation layers (pcs) .....		—
G.13.6	Tests on coated printed boards		NA
G.13.6.1	Sample preparation and preliminary inspection		NA
G.13.6.2a )	Thermal conditioning		NA
G.13.6.2b )	Electric strength test		NA
G.13.6.2c )	Abrasion resistance test		NA
<b>G.14</b>	<b>Coating on components terminals</b>		<b>NA</b>
G.14.1	Requirements .....	No such coating used	NA
<b>G.15</b>	<b>Liquid filled components</b>		<b>NA</b>
G.15.1	General requirements	No such component used	NA
G.15.2	Requirements		NA
G.15.3	Compliance and test methods		NA
G.15.3.1	Hydrostatic pressure test		NA
G.15.3.2	Creep resistance test		NA
G.15.3.3	Tubing and fittings compatibility test		NA
G.15.3.4	Vibration test		NA
G.15.3.5	Thermal cycling test		NA
G.15.3.6	Force test		NA
G.15.4	Compliance		NA
<b>G.16</b>	<b>IC including capacitor discharge function (ICX)</b>		<b>NA</b>
a)	Humidity treatment in accordance with sc5.4.8 – 120 hours	No such component used	NA
b)	Impulse test using circuit 2 with $U_c =$ to transient voltage .....		NA
C1)	Application of ac voltage at 110% of rated voltage for 2.5 minutes		NA
C2)	Test voltage .....		—
D1)	10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer		NA
D2)	Capacitance .....		—
D3)	Resistance .....		—



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Clause	Requirement + Test	Result - Remark	Verdict
<b>H</b>	<b>CRITERIA FOR TELEPHONE RINGING SIGNALS</b>		<b>NA</b>
H.1	General	No such ringing signal	NA
H.2	Method A	No such ringing signal	NA
H.3	Method B	No such ringing signal	NA
H.3.1	Ringling signal	No such ringing signal	NA
H.3.1.1	Frequency (Hz) .....	No such ringing signal	—
H.3.1.2	Voltage (V) .....	No such ringing signal	—
H.3.1.3	Cadence; time (s) and voltage (V) .....	No such ringing signal	—
H.3.1.4	Single fault current (mA): .....	No such ringing signal	—
H.3.2	Tripping device and monitoring voltage.....	No such ringing signal	NA
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage complied with	No such ringing signal	NA
H.3.2.2	Tripping device	No such ringing signal	NA
H.3.2.3	Monitoring voltage (V).....	No such ringing signal	—
<b>J</b>	<b>INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION</b>		<b>NA</b>
	General requirements	No such part used	NA
<b>K</b>	<b>SAFETY INTERLOCKS</b>		<b>P</b>
K.1	General requirements	ES 1 No safety interlock provided within the equipment.	P
K.2	Components of safety interlock safeguard mechanism .....		NA
K.3	Inadvertent change of operating mode		NA
K.4	Interlock safeguard override		NA
K.5	Fail-safe		NA
	Compliance .....		NA
K.6	Mechanically operated safety interlocks		NA
K.6.1	Endurance requirement		NA
K.6.2	Compliance and Test method.....		NA
K.7	Interlock circuit isolation		NA
K.7.1	Separation distance for contact gaps & interlock circuit elements (type and circuit location) .....		NA
K.7.2	Overload test, Current (A) .....		NA
K.7.3	Endurance test		NA
K.7.4	Electric strength test .....		NA
<b>L</b>	<b>DISCONNECT DEVICES</b>		<b>NA</b>
L.1	General requirements		NA
L.2	Permanently connected equipment		NA
L.3	Parts that remain energized		NA
L.4	Single phase equipment		NA



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Clause	Requirement + Test	Result - Remark	Verdict
L.5	Three-phase equipment		NA
L.6	Switches as disconnect devices		NA
L.7	Plugs as disconnect devices		NA
L.8	Multiple power sources		NA
<b>M</b>	<b>EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS</b>		<b>NA</b>
M.1	General requirements	The product has no batteries	NA
M.2	Safety of batteries and their cells		NA
M.2.1	Requirements		NA
M.2.2	Compliance and test method (identify method):		NA
M.3	Protection circuits		NA
M.3.1	Requirements		NA
M.3.2	Tests		NA
	- Overcharging of a rechargeable battery		NA
	- Unintentional charging of a non-rechargeable battery		NA
	- Reverse charging of a rechargeable battery		NA
	- Excessive discharging rate for any battery		NA
M.3.3	Compliance ..... :		NA
M.4	Additional safeguards for equipment containing secondary lithium battery		NA
M.4.1	General		NA
M.4.2	Charging safeguards		NA
M.4.2.1	Charging operating limits		NA
M.4.2.2a)	Charging voltage, current and temperature ... :		—
M.4.2.2 b)	Single faults in charging circuitry ..... :		—
M.4.3	Fire Enclosure		NA
M.4.4	Endurance of equipment containing a secondary lithium battery		NA
M.4.4.2	Preparation		NA
M.4.4.3	Drop and charge/discharge function tests		NA
	Drop		NA
	Charge		NA
	Discharge		NA
M.4.4.4	Charge-discharge cycle test		NA
M.4.4.5	Result of charge-discharge cycle test		NA
M.4.4.6	Compliance criteria		NA
M.5	Risk of burn due to short circuit during carrying		NA
M.5.1	Requirement		NA
M.5.2	Compliance and Test Method (Test of P.2.3)		NA



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Clause	Requirement + Test	Result - Remark	Verdict
M.6	Prevention of short circuits and protection from other effects of electric current		NA
M.6.1	Short circuits	A short circuit due to the construction is not possible	NA
M.6.1.1	General requirements		NA
M.6.1.2	Test method to simulate an internal fault		NA
M.6.2	Leakage current (mA) .....		NA
M.7	Risk of explosion from lead acid and NiCd batteries		NA
M.7.1	Ventilation preventing explosive gas concentration		NA
M.7.2	Compliance and test method		NA
M.8	Protection against internal ignition from external spark sources of lead acid batteries		NA
M.8.1	General requirements		NA
M.8.2	Test method		NA
M.8.2.1	General requirements		NA
M.8.2.2	Estimation of hypothetical volume $V_z$ ( $m^3/s$ ) ...		—
M.8.2.3	Correction factors .....		—
M.8.2.4	Calculation of distance $d$ (mm) .....		—
M.9	Preventing electrolyte spillage		NA
M.9.1	Protection from electrolyte spillage		NA
M.9.2	Tray for preventing electrolyte spillage		NA
M.10	Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing) :		NA
<b>N</b>	<b>ELECTROCHEMICAL POTENTIALS</b>		<b>NA</b>
	Metal(s) used .....	Pollution degree considered	—
<b>O</b>	<b>MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES</b>		<b>NA</b>
	Figures O.1 to O.20 of this Annex applied .....		—
<b>P</b>	<b>SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS</b>		<b>NA</b>
P.1	General requirements	This is not an end product. Therefore it is not applicable	NA
P.2.2	Safeguards against entry of foreign object		NA
	Location and Dimensions (mm) .....		—
P.2.3	Safeguard against the consequences of entry of foreign object	No such part	NA
P.2.3.1	Safeguards against the entry of a foreign object	No such part	NA
	Openings in transportable equipment	No such part	NA
	Transportable equipment with metalized plastic parts .....	No such part	NA



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Clause	Requirement + Test	Result - Remark	Verdict
P.2.3.2	Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard) .....	No such part	NA
P.3	Safeguards against spillage of internal liquids	No internal liquids used in the equipment	NA
P.3.1	General requirements		NA
P.3.2	Determination of spillage consequences		NA
P.3.3	Spillage safeguards		NA
P.3.4	Safeguards effectiveness		NA
P.4	Metallized coatings and adhesive securing parts	No such part	NA
P.4.2 a)	Conditioning testing		NA
	Tc (°C).....:		—
	Tr (°C).....:		—
	Ta (°C).....:		—
P.4.2 b)	Abrasion testing .....		NA
P.4.2 c)	Mechanical strength testing..... :		NA
<b>Q</b>	<b>CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING</b>		<b>NA</b>
Q.1	Limited power sources		NA
Q.1.1 a)	Inherently limited output		NA
Q.1.1 b)	Impedance limited output		NA
	- Regulating network limited output under normal operating and simulated single fault condition		NA
Q.1.1 c)	Overcurrent protective device limited output		NA
Q.1.1 d)	IC current limiter complying with G.9		NA
Q.1.2	Compliance and test method		NA
Q.2	Test for external circuits – paired conductor cable		NA
	Maximum output current (A) .....		—
	Current limiting method .....		—
<b>R</b>	<b>LIMITED SHORT CIRCUIT TEST</b>		<b>P</b>
R.1	General requirements	In the event of a fault, the product can draw a maximum of less than 200 mA of current	P
R.2	Determination of the overcurrent protective device and circuit		NA
R.3	Test method Supply voltage (V) and short-circuit current (A)). .....		NA
<b>S</b>	<b>TESTS FOR RESISTANCE TO HEAT AND FIRE</b>		<b>P</b>
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W	Materials with the required flammability classes are used	P



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Clause	Requirement + Test	Result - Remark	Verdict
	Samples, material .....		—
	Wall thickness (mm) .....		—
	Conditioning (°C) .....		—
	Test flame according to IEC 60695-11-5 with conditions as set out		P
	- Material not consumed completely		P
	- Material extinguishes within 30s		P
	- No burning of layer or wrapping tissue		P
S.2	Flammability test for fire enclosure and fire barrier integrity		NA
	Samples, material .....		—
	Wall thickness (mm) .....		—
	Conditioning (°C) .....		—
	Test flame according to IEC 60695-11-5 with conditions as set out		NA
	Test specimen does not show any additional hole		NA
S.3	Flammability test for the bottom of a fire enclosure		NA
	Samples, material .....		—
	Wall thickness (mm) .....		—
	Cheesecloth did not ignite		NA
S.4	Flammability classification of materials		NA
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		NA
	Samples, material .....		—
	Wall thickness (mm) .....		—
	Conditioning (test condition), (°C).....		—
	Test flame according to IEC 60695-11-20 with conditions as set out		NA
	After every test specimen was not consumed completely		NA
	After fifth flame application, flame extinguished within 1 min		NA
<b>T</b>	<b>MECHANICAL STRENGTH TESTS</b>		<b>P</b>
T.1	General requirements	See below .	P
T.2	Steady force test, 10 N .....	(See appended table T2)	P
T.3	Steady force test, 30 N .....	(See appended table T2)	P
T.4	Steady force test, 100 N .....	(See appended table T4)	P



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Clause	Requirement + Test	Result - Remark	Verdict
T.5	Steady force test, 250 N .....	Hand-held equipment. See clause 4.4.4.2	NA
T.6	Enclosure impact test	Hand-held equipment. See clause 4.4.4.4	NA
	Fall test		NA
	Swing test		NA
T.7	Drop test .....	(See appended table T7)	P
T.8	Stress relief test .....	(See appended table T8)	P
T.9	Impact Test (glass)	No glass surface used	NA
T.9.1	General requirements		NA
T.9.2	Impact test and compliance		NA
	Impact energy (J) .....	Not suitable	—
	Height (m) .....	Not suitable	—
T.10	Glass fragmentation test.....	No glass surface used	NA
T.11	Test for telescoping or rod antennas	No such device.	NA
	Torque value (Nm) .....		—
<b>U</b>	<b>MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION</b>		<b>NA</b>
U.1	General requirements	No cathode ray tube used	NA
U.2	Compliance and test method for non-intrinsically protected CRTs		NA
U.3	Protective Screen .....	(See Annex T)	NA
<b>V</b>	<b>DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)</b>		<b>P</b>
V.1	Accessible parts of equipment	Class 1 energy source, no safeguards requirement	P
V.2	Accessible part criterion	Class 1 energy source, no safeguards requirement	P





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Clause	Requirement + Test	Result - Remark	Verdict

4.1.2	TABLE: List of critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1</sup>	
PCB	--	K663S (RL78- G14- CLRC663) - FSE2203-CC	--	--	--	
DC/DC Converter	LINEAR TECHNOLOG Y	CMP3551 (LTC3538EDCB #TRMPBF)	800mA	--	Based on manufacturers information	
MUL/DEMULT. bus switch	FAIRCHILD SEMICONDC TOR	CMP1739 (NC7SB3157P6 X)	--	--	Based on manufacturers information	
open drain inverter buffer	TEXAS INSTRUMENT	SERIE LVC : 74LVC1G06 (SN74LVC1G06 DCKR)	--	--	Based on manufacturers information	
open drain buffer - SC70	TEXAS INSTRUMENT	(SN74LVC1G07 DCKR) SERIE LVC : 74LVC1G07	--	--	Based on manufacturers information	
SIMPLE AND GATE (UHS Série) - SC70	FAIRCHILD SEMICONDC TOR TEXAS INSTRUMENT	(NC7SZ08P5X) (SN74LVC1G08 DCKR)	--	--	Based on manufacturers information	
SIMPLE BUS BUFFER	Diodes Zetex TEXAS INSTRUMENT	(74LVC1G125S E-7) (SN74LVC1G12 5DCKR)	--	--	Based on manufacturers information	
DFLASH	RENESAS	(R5F104GJANA #U0, R5F104GJANA #V0)	RL78-G14 - 256K FLASH 24K RAM	--	Based on manufacturers information	
MOD/DEMOD MIFARE	NXP (EX- PHILIPS)	(CLRC66303HN E)	--	--	Based on manufacturers information	
Internal wires 1	--	PTS0355	--	UL 758	Based on manufacturers information	
Upper shield	--	Méca.02 CMP619	--	--	Based on manufacturers information	



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Clause	Requirement + Test	Result - Remark	Verdict

Lower shield	--	Méca.01 CMP618	--	--	Based on manufacturers information
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Supplementary information:

The other component has the following document:

Name	Date modified	Type	Size
[EAN18385-AD]K663S-xxx-components	08.07.2020 12:28	Adobe Acrobat D...	24 KB
[EAN18385-AD]K663S-xxx-components	08.07.2020 12:27	Microsoft Excel W...	15 KB
[EAN18397-AA]Ferrite K663S-xxx symmetrical antenna	08.07.2020 12:45	Adobe Acrobat D...	50 KB
[EAN18397-AA]Ferrite K663S-xxx symmetrical antenna	08.07.2020 12:45	Microsoft Excel W...	7 KB
[FPF18220-AD]K663S-XXX -Module-Antenna	08.07.2020 12:55	Adobe Acrobat D...	50 KB
[FPF18220-AD]K663S-XXX -Module-Antenna	08.07.2020 12:54	Microsoft Excel W...	8 KB
[FSE18396-AD]K663S-xxx-PCB Assembly	08.07.2020 12:40	Adobe Acrobat D...	50 KB
[FSE18396-AD]K663S-xxx-PCB Assembly	08.07.2020 12:40	Microsoft Excel W...	7 KB

Name	Date modified	Type	Size
[EAN2202-CC]K663S (RL78-G14- CLRC663) - symetrical output - components.	08.07.2020 12:37	Adobe Acrobat D...	141 KB
[EAN2202-CC]K663S (RL78-G14- CLRC663) - symetrical output - components.	08.07.2020 12:36	Microsoft Excel W...	20 KB
[EANE018-AA]Kxxx -mechanical kit	08.07.2020 13:06	Adobe Acrobat D...	49 KB
[EANE018-AA]Kxxx -mechanical kit	08.07.2020 13:04	Microsoft Excel W...	7 KB
[FPF2268-CC]K663S (RL78-G14- CLRC663) - symetrical antenna output	08.07.2020 14:12	Adobe Acrobat D...	53 KB
[FPF2268-CC]K663S (RL78-G14- CLRC663) - symetrical antenna output	08.07.2020 14:15	Microsoft Excel W...	8 KB
[FSE2203-CC]K663S (RL78-G14- CLRC663) - symetrical antenna output -PCB Assembly	08.07.2020 13:10	Adobe Acrobat D...	48 KB
[FSE2203-CC]K663S (RL78-G14- CLRC663) - symetrical antenna output -PCB Assembly	08.07.2020 13:11	Microsoft Excel W...	7 KB



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Clause	Requirement + Test	Result - Remark	Verdict

4.8.4, 4.8.5	<b>TABLE: Lithium coin/button cell batteries mechanical tests</b>		<b>NA</b>
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(The following mechanical tests are conducted in the sequence noted.)

4.8.4.2	<b>TABLE: Stress Relief test</b>		---
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Part	Material	Oven Temperature (° C)	Comments
--	--	--	--

4.8.4.3	<b>TABLE: Battery replacement test</b>		---
---------	--	--	-----

Battery part no. ....:	--		---
------------------------	----	--	-----

Battery Installation/withdrawal	Battery Installation/Removal Cycle	Comments
	1	--
	2	--
	3	--
	4	--
	5	--
	6	--
	8	--
	9	--
	10	--

4.8.4.4	<b>TABLE: DROP TEST</b>		---
---------	-------------------------	--	-----

Impact Area	Drop Distance	Drop No.	Observations
--	--	1	--
--	--	2	--
--	--	3	--

4.8.4.5	<b>TABLE: Impact</b>		---
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Impacts per surface	Surface tested	Impact energy (Nm)	Comments
--	--	--	--

4.8.4.6	<b>TABLE: Crush test</b>		---
---------	--------------------------	--	-----

Test position	Surface tested	Crushing Force (N)	Duration force applied (s)
--	--	--	--

Supplementary information: No such batteries were used.

4.8.5	<b>TABLE: Lithium coin/button cell batteries mechanical test result</b>		<b>NA</b>
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Test position	Surface tested	Force (N)	Duration force applied (s)
--	--	--	--

Supplementary information: No such batteries were used.



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Clause	Requirement + Test			Result - Remark	Verdict		
<b>5.2</b>	<b>Table: Classification of electrical energy sources</b>						<b>P</b>
5.2.2.2 – Steady State Voltage and Current conditions							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				U (V) (Vrms or Vpk)	I (A) (Apk or Arms)	Hz	
1	5VDC	With adaptor	Max. normal operation	5V	0,2	--	ES1
5.2.2.3 - Capacitance Limits							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters		ES Class	
				Capacitance, nF	Upk (V)		
--	--	--	Normal	--	--	--	
			Abnormal	--	--		
			Single fault – SC/OC	--	--		
5.2.2.4 - Single Pulses							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Duration (ms)	Upk (V)	lpk (mA)	
--	--	--	Normal	--	--	--	--
			Abnormal	--	--	--	
			Single fault – SC/OC	--	--	--	
5.2.2.5 - Repetitive Pulses							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Off time (ms)	Upk (V)	lpk (mA)	
--	--	--	Normal	--	--	--	--
			Abnormal	--	--	--	
			Single fault – SC/OC	--	--	--	
Test Conditions: Normal – Abnormal - Supplementary information: SC= Short Circuit, OC= Short Circuit							



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Clause	Requirement + Test	Result - Remark	Verdict

5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements						P	
	Test condition	VBAT Normal condition		VBAT Abnormal condition		Fault conditions	—	
	Supply voltage (V) .....	3 – 5 VDC		3 – 5 VDC		3 – 5 VDC	—	
	Ambient T <sub>min</sub> (°C) .....	24.0		24		24	—	
	Ambient T <sub>max</sub> (°C) .....	24.0		70		24	—	
	T <sub>ma</sub> (°C) .....	70.0		70		70	—	
Maximum measured temperature T of part/at:		T (°C)					Allowed T <sub>max</sub> (°C)	
Terminal		32		70		33	130	
DC Connector		34		68		36	130	
PCB-1		38		72		48	130	
PCB-2		40		71		45	130	
Supplementary information: null								
Temperature T of winding:		t <sub>1</sub> (°C)	R <sub>1</sub> (Ω)	t <sub>2</sub> (°C)	R <sub>2</sub> (Ω)	T (°C)	Allowed T <sub>max</sub> (°C)	Insulation class
--		--	--	--	--	--	--	--
Supplementary information: Note 1: T <sub>ma</sub> should be considered as directed by applicable requirement Note 2: T <sub>ma</sub> is not included in assessment of Touch Temperatures (Clause 9)								

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics			NA
Penetration (mm).....	--			—
Object/ Part No./Material	Manufacturer/ trademark	T softening (°C)		
--	--	--		
supplementary information: null				

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics			NA
Method .....	ISO 306 / B50			—
Object/ Part No./Material	Manufacturer/trademark	Thickness (mm)	T softening (°C)	
Supplementary information:				



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Clause	Requirement + Test	Result - Remark	Verdict

5.4.1.10.3 TABLE: Ball pressure test of thermoplastics					P
Allowed impression diameter (mm)..... :				≤ 2 mm	—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)	
PCB		2,9mm	125	< 2mm	
Supplementary information:					

5.4.2, 5.4.3 TABLE: Minimum Clearances/Creepage distance								NA
Clearance (cl) and creepage distance (cr) at/of/between:	U <sub>p</sub> (V)	U <sub>rms</sub> (V)	Freq <sup>1)</sup> (Hz)	Required cl (mm)	cl (mm)	E.S. <sup>2)</sup> (V)	Required cr (mm)	cr (mm)
Supplementary information:								
1) Only for frequency above 30 kHz								
2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)								

5.4.4.2 TABLE: Minimum distance through insulation					NA
Distance through insulation (DTI) at/of	Peak voltage (V)	Insulation	Required DTI (mm)	Measured DTI (mm)	
Supplementary information:					

5.4.4.9 TABLE: Solid insulation at frequencies > 30 kHz							NA
Insulation material	E <sub>p</sub>	Frequency (kHz)	K <sub>R</sub>	Thickness d (mm)	Insulation	V <sub>PW</sub> (Vpk)	
Supplementary information:							

5.4.9 TABLE: Electric strength tests				NA
Test voltage applied between:	Voltage shape (Surge, Impulse, AC, DC, etc.)	Test voltage (V)	Breakdown Yes / No	
Supplementary information:				

5.5.2.2 TABLE: Stored discharge on capacitors					NA
Location	Supply voltage (V)	Operating and fault condition <sup>1)</sup>	Switch position	Measured voltage (Vpk)	ES Class



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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:  
 X-capacitors installed for testing:  
 bleeding resistor rating:  
 ICX:  
 1) Normal operating condition (e.g., normal operation, or open fuse), SC= short circuit, OC= open circuit

5.6.6	TABLE: Resistance of protective conductors and terminations				NA
Location	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)	

Supplementary information:

5.7.2.2, 5.7.4	TABLE: Earthed accessible conductive part		NA
Supply voltage .....	6.0Vdc		—
Location	Test conditions specified in 6.1 of IEC 60990 or Fault Condition No in IEC 60990 clause 6.2.2.1 through 6.2.2.8, except for 6.2.2.7		Touch current (mA)
	1		NA
	2*		NA
	3		NA
	4		NA
	5		NA
	6		NA
	8		NA

Supplementary Information:  
 Notes:  
 [1] Supply voltage is the anticipated maximum Touch Voltage  
 [2] Earthed neutral conductor [Voltage differences less than 1% or more]  
 [3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3  
 [4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable.  
 [5] (\*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.

6.2.2	Table: Electrical power sources (PS) measurements for classification				NA
Source	Description	Measurement	Max Power after 3 s	Max Power after 5 s <sup>(*)</sup>	PS Classification
		V <sub>A</sub> (V) :		--	
		I <sub>A</sub> (A) :		--	

Supplementary Information:  
 (\*) Measurement taken only when limits at 3 seconds exceed PS1 limits.



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Clause	Requirement + Test	Result - Remark	Verdict

6.2.3.1	Table: Determination of Potential Ignition Sources (Arcing PIS)				P
Location	Open circuit voltage After 3 s (V <sub>p</sub> )	Measured r.m.s current (I <sub>rms</sub> )	Calculated value (V <sub>p</sub> x I <sub>rms</sub> )	Arcing PIS? Yes / No	
PCB	5V	0,2	1 W	No	

Supplementary information:  
An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V<sub>p</sub>) and normal operating condition rms current (I<sub>rms</sub>) is greater than 15.

6.2.3.2	Table: Determination of Potential Ignition Sources (Resistive PIS)				NA
Circuit Location (x-y)	Operating Condition (Normal / Describe Single Fault)	Measured wattage or VA During first 30 s (W / VA)	Measured wattage or VA After 30 s (W / VA)	Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment)	Resistive PIS? Yes/No
--	--	--	--	--	--

Supplementary Information:  
A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter.  
If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification.  
A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, or (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault.

8.5.5	TABLE: High Pressure Lamp		NA
Description	Values	Energy Source Classification	
Lamp type .....	--	—	
Manufacturer .....	--	—	
Cat no.....	--	—	
Pressure (cold) (MPa) .....	--	MS_	
Pressure (operating) (MPa) .....	--	MS_	
Operating time (minutes) .....	--	—	
Explosion method .....	--	—	
Max particle length escaping enclosure (mm) :	--	MS_	
Max particle length beyond 1 m (mm) .....	--	MS_	
Overall result .....	--		

Supplementary information: null

B.2.5	TABLE: Input test							NA
U (V)	I (mA)	I rated (mA)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status	
--	--	--	--	--	--	--	--	

Supplementary information: null





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Clause	Requirement + Test	Result - Remark	Verdict

B.3 TABLE: Abnormal operating condition tests								P
Ambient temperature (°C) .....						24		—
Power source for EUT: Manufacturer, model/type, output rating :						See below		—
Component No.	Abnormal Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
1	Reverse polarity of supply	5V DC	3 h	--	--	PCB-1	30 max.	EUT did not operate. No damaged, on hazards.
						PCB-2		
Supplementary information: Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column "Abnormal/Fault." Specify if test condition by indicating "Abnormal" then the condition for a Clause B.3 test or "Single Fault" then the condition for Clause B.4.								

B.4 TABLE: Fault condition tests								P
Ambient temperature (°C) :						24		—
Power source for EUT: Manufacturer, model/type, output rating:						--		—
Component No.	Fault Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
1	Reverse polarity of supply	5V DC	3 h	--	--	PCB-1	30 max.	EUT did not operate. No damaged, on hazards.
						PCB-2	69.0	
Supplementary information: Null								

Annex M TABLE: Batteries									NA
The tests of Annex M are applicable only when appropriate battery data is not available									NA
Is it possible to install the battery in a reverse polarity position? .....									--
	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		--	--	--	--	--	--	--	--
Test results:									Verdict
- Chemical leaks							No		NA



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Clause	Requirement + Test	Result - Remark	Verdict
	- Explosion of the battery	No	NA
	- Emission of flame or expulsion of molten metal	No	NA
	- Electric strength tests of equipment after completion of tests	--	NA
Supplementary information: During testing, 1 x AA/ LR6 size "maxell" batteries were used.			

Annex M.4 Table: Additional safeguards for equipment containing secondary lithium batteries					NA
Battery/Cell No.	Test conditions	Measurements			Observation
		U	I (mA)	Temp (C)	
--	--	--	--	--	--
Supplementary Information: null					

Battery identification	Charging at $T_{lowest}$ (°C)	Observation	Charging at $T_{highest}$ (°C)	Observation
--	--	--	--	--
Supplementary Information: null				

Annex Q.1 TABLE: Circuits intended for interconnection with building wiring (LPS)						NA
Note: Measured UOC (V) with all load circuits disconnected:						
Output Circuit	Components	$U_{oc}$ (V)	$I_{sc}$ (A)		S (VA)	
			Meas.	Limit	Meas.	Limit
--	--	--	--	--	--	--
Supplementary Information: SC= Short circuit, OC= Open circuit						

T.2, T.3, T.4, T.5 TABLE: Steady force test						P
Part/Location	Material	Thickness (mm)	Force (N)	Test Duration (sec)	Observation	
PCB	Plastic	--	10	5	No damaged, no hazards	
Components	--	--	10	5	No damaged, no hazards	
Supplementary information: Null						

T.6, T.9 TABLE: Impact tests					NA
Part/Location	Material	Thickness (mm)	Vertical distance (mm)	Observation	
--	--	--	--	--	
Supplementary information:					



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Clause	Requirement + Test	Result - Remark	Verdict

T.7	TABLE: Drop tests				P
Part/Location	Material	Thickness (mm)	Drop Height (mm)	Observation	
Enclosure	Plastic	> 2	1000	No damaged, no hazards	
Supplementary information: null					

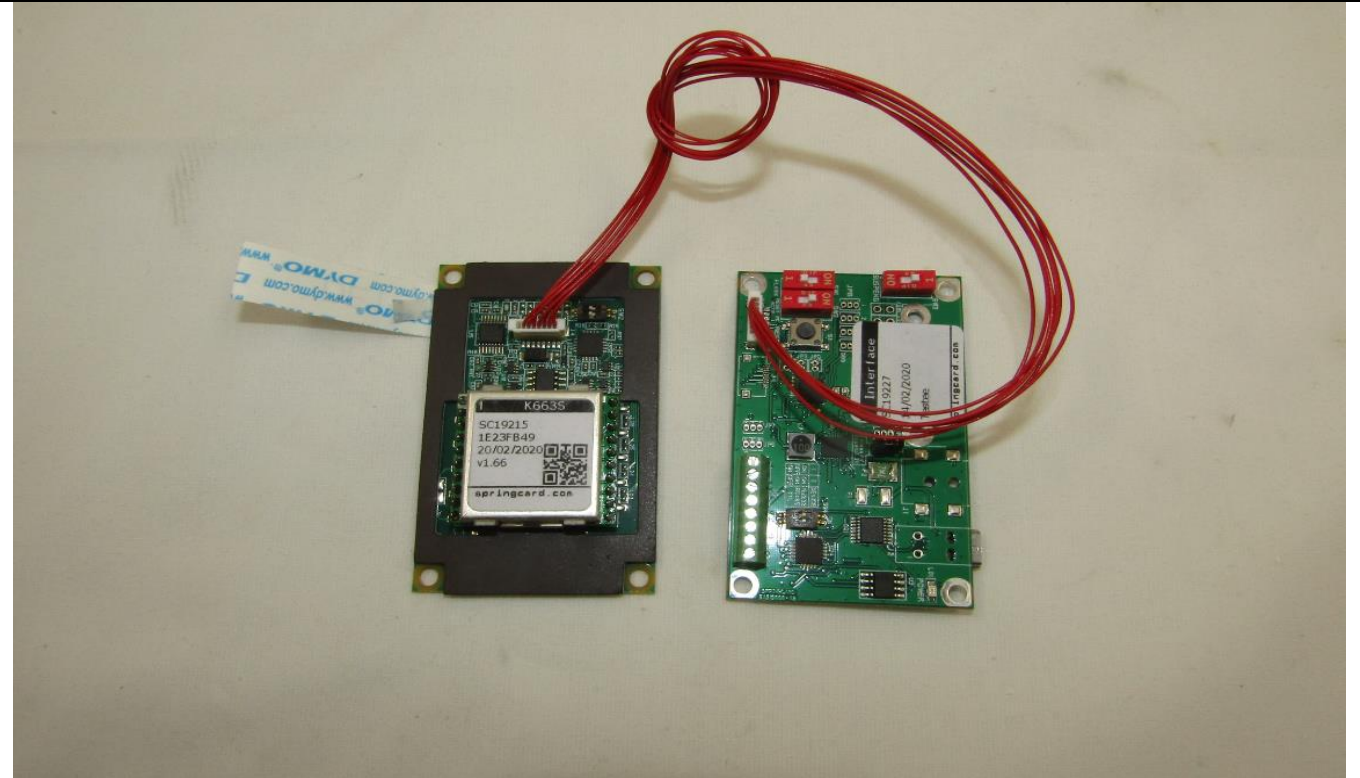
T.8	TABLE: Stress relief test					P
Part/Location	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation	
Enclosure	Plastic	> 2	70	7	No damaged, no hazards	
Supplementary information:						

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Clause	Requirement + Test	Result - Remark	Verdict
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Product Photographs

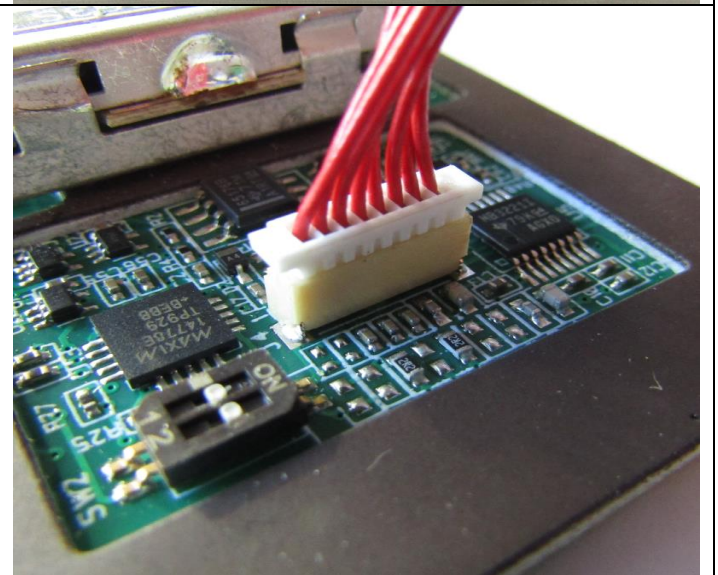
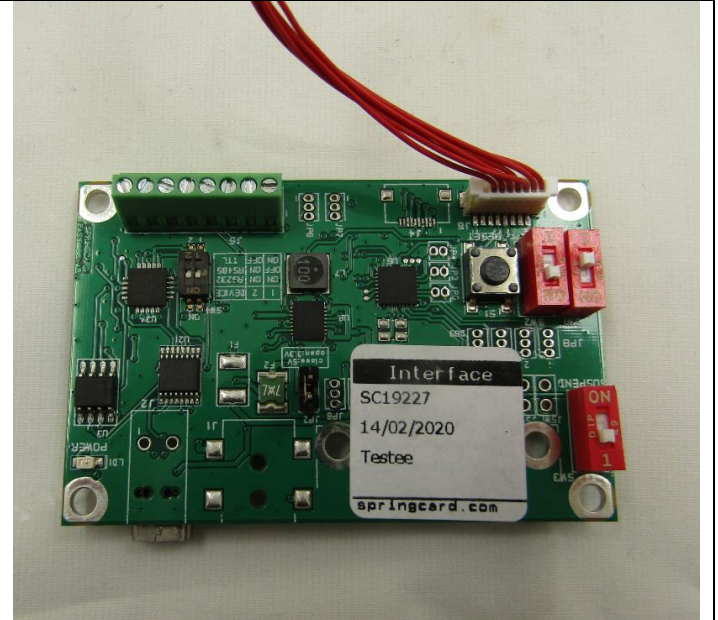
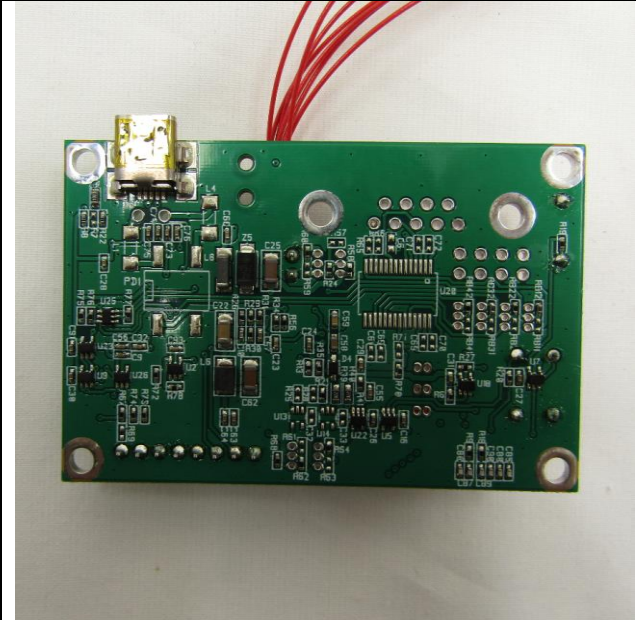
Sample 1



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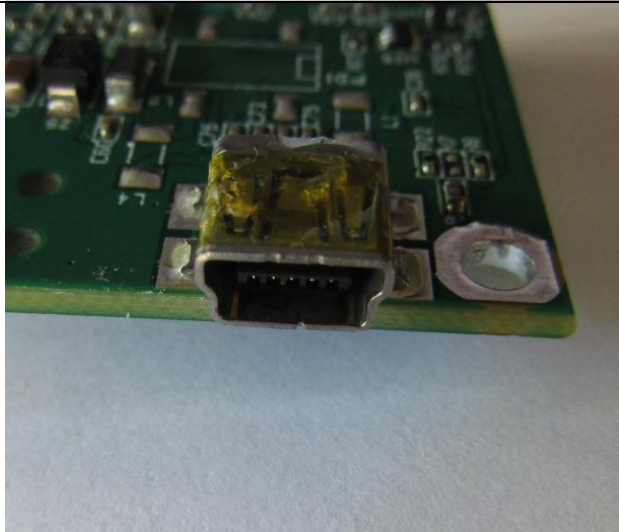
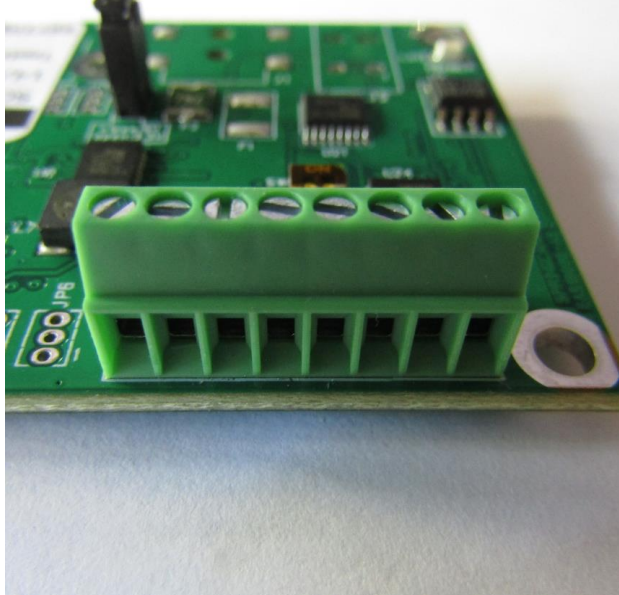
Clause	Requirement + Test	Result - Remark	Verdict
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Sample 2



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Clause	Requirement + Test	Result - Remark	Verdict

Sample 3



END TEST REPORT