

TEST REPORT

**IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006
Information technology equipment – Safety –
Part 1: General requirements**

Report Reference No. : SN1109036

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Todd shaw

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Total number of pages..... 40

Testing Laboratory : QuieTek Corporation

Address..... : 2F., No. 345, Xinhua 2nd Rd., Neihu District, Taipei, Taiwan, R.O.C.

Testing location : As above

Applicant's name : Alltek Marine Electronics Corp.

Address..... : 7F, No.605, Rueli Guang Rd., Neihu, Taipei, Taiwan, 114 R.O.C.

Manufacturer's name : Alltek Marine Electronics Corp.

Address..... : 7F, No.605, Rueli Guang Rd., Neihu, Taipei, Taiwan, 114 R.O.C.

Factory's name : Same as the manufacturer.

Address..... : Same as the manufacturer.

Test specification:

Standard : EN 60950-1:2006+A11:2009

Test procedure : Standard

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

Test item description : AIS SART

Trade Mark : AMEC

Model/Type reference..... : PLOMO-500

Ratings..... : 6Vdc, 2.4A

Copy of marking plate:

(For Example)



Note:

1. Company or brand name will screen on this rating label or one side of enclosure.
2. Rating voltage and current will show in installation guide.

Test item particulars.....:

Equipment mobility: movable hand-held transportable
 stationary for building-in direct plug-in

Connection to the mains: pluggable equipment permanent connection
 detachable power supply cord
 non-detachable power supply cord
 not directly connected to the mains

Operating condition.....: continuous
 rated operating / resting time:

Access location: operator accessible
 restricted access location

Over voltage category (OVC): OVC I OVC II OVC III OVC IV
 other:

Mains supply tolerance (%) or absolute mains supply values: Not directly connected to the mains.

Tested for IT power systems: Yes No

IT testing, phase-phase voltage (V): N/A

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

Considered current rating (A): N/A

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

IP protection class: IPX0

Altitude during operation (m): Not over 2000m

Altitude of test laboratory (m): Not over 2000m

Mass of equipment (kg): 0.283kg

Possible test case verdicts:

- test case does not apply to the test object.....: N

- test object does meet the requirement.....: P (Pass)

- test object does not meet the requirement: F (Fail)

Testing.....:

Date of receipt of test item.....: Oct., 2011

Date(s) of performance of tests.....: Oct., 2011

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

General product information:

The EUT use Li-ion battery. It has a carry bag which contains all main body, 1 meter extension pole and 10 meters buoyant lanyard. The carry bag can be mounted and hanged in the ship by wall-mount bracket.

Hardware: M-PCB-SARTV03

Software: SART Ver. 1.1

The maximum ambient temperature is specified as 55°C

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Clause	Requirement - Test	Result -remark	Verdict
1	GENERAL		P

1.5	Components		P
1.5.1	General	Components, which were found to affect safety aspects, comply with the requirements of this standard or within the safety aspects of the relevant IEC component standards (see appended table 1.5.1).	P
1.5.2	Evaluation and testing 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
1.5.3	Thermal controls	No thermal control.	N
1.5.4	Transformers		N
1.5.5	Interconnecting cables		N
1.5.6	Capacitors bridging insulation	Class III equipment.	N
1.5.7	Resistors bridging insulation		N
1.5.7.1	Resistors bridging functional, basic insulation or supplementary insulation		N
1.5.7.2	Resistors bridging double insulation or reinforced insulation between the a.c. mains supply and other circuits		N
1.5.7.3	Resistors bridging double insulation or reinforced insulation between the a.c. mains supply and circuits connected to an antenna or coaxial cable		N
1.5.8	Components in equipment for IT power distribution systems	No direct connection to the mains supply.	N
1.5.9	Surge suppressors		N
1.5.9.1	General		N
1.5.9.2	Protection of VDRs		N
1.5.9.3	Bridging of functional insulation by a VDR		N
1.5.9.4	Bridging of basic insulation by a VDR		N
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N

1.6	Power interface		P
1.6.1	AC power distribution systems..... :	No direct connection to the mains supply.	N
1.6.2	Input current	See appended table 1.6.2	P

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Clause	Requirement - Test	Result -remark	Verdict
1.6.3	Voltage limit of hand-held equipment		N
1.6.4	Neutral conductor	Class III equipment.	N

1.7	Marking and instructions		P
1.7.1	Power rating	Rating marking readily visible to operator.	P
	Rated voltage(s) or voltage range(s) (V)	No direct connection to the mains supply.	N
	Symbol for nature of supply, for d.c. only	No direct connection to the mains supply.	N
	Rated frequency or rated frequency range (Hz) ...	No direct connection to the mains supply.	N
	Rated current (mA or A)	No direct connection to the mains supply.	N
	Manufacturer's name or trade-mark or identification mark	See the page 1.	P
	Model identification or type reference	See the page 1.	P
	Symbol for Class II equipment only		N
	Other markings and symbols	Additional symbols or markings do not give rise to misunderstanding.	P
1.7.2	Safety instructions and marking	Safety instructions in English	P
1.7.2.1	General		P
1.7.2.2	Disconnect devices		N
1.7.2.3	Overcurrent protective device		N
1.7.2.4	IT power distribution systems		—
1.7.2.5	Operator access with a tool		N
1.7.2.6	Ozone	The equipment does not produce Ozone.	N
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N
1.7.4	Supply voltage adjustment		N
	Methods and means of adjustment; reference to installation instructions		—
1.7.5	Power outlets on the equipment	No power outlet.	N
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)		N
1.7.7	Wiring terminals		N
1.7.7.1	Protective earthing and bonding terminals		N
1.7.7.2	Terminals for a.c. mains supply conductors		N
1.7.7.3	Terminals for d.c. mains supply conductors		N

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Clause	Requirement - Test	Result -remark	Verdict
1.7.8	Controls and indicators	No safety relevant controls and indicators.	N
1.7.8.1	Identification, location and marking	The function of controls affecting safety is obvious regardless of language.	N
1.7.8.2	Colours		N
1.7.8.3	Symbols according to IEC 60417		N
1.7.8.4	Markings using figures	No safety relevant controls and indicators.	N
1.7.9	Isolation of multiple power sources		N
1.7.10	Thermostats and other regulating devices		N
1.7.11	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15s and then again for 15s with the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling nor lifting of the label edge.	P
S1.7.12	Removable parts		N
1.7.13	Replaceable batteries		P
	Language(s)		—
1.7.14	Equipment for restricted access locations.....		N

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	See below.	P
2.1.1.1	Access to energized parts	The unit is supplied from an external power adaptor that provides SELV only. No hazardous voltage exists within the unit.	P
	Test by inspection		N
	Test with test finger (Figure 2A)		N
	Test with test pin (Figure 2B)		N
	Test with test probe (Figure 2C)		N
2.1.1.2	Battery compartments		N
2.1.1.3	Access to ELV wiring		N
	Working voltage (V _{peak} or V _{rms}); minimum distance through insulation (mm)		—

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Clause	Requirement - Test	Result -remark	Verdict
2.1.1.4	Access to hazardous voltage circuit wiring		N
2.1.1.5	Energy hazards	No energy hazard in operator access area. The connectors of the equipment below 240VA.	P
2.1.1.6	Manual controls	No manual controls.	N
2.1.1.7	Discharge of capacitors in equipment		N
	Measured voltage (V); time-constant (s)..... :		—
2.1.1.8	Energy hazards – d.c. mains supply		N
	a) Capacitor connected to the d.c. mains supply :		N
	b) Internal battery connected to the d.c. mains supply		N
2.1.1.9	Audio amplifiers		N
2.1.2	Protection in service access areas		N
2.1.3	Protection in restricted access locations		N

2.2	SELV circuits		P
2.2.1	General requirements	See below.	P
2.2.2	Voltages under normal conditions (V)..... :	All accessible voltages are less than 42.4 V peak or 60 V dc and are classified as SELV.	P
2.2.3	Voltages under fault conditions (V)..... :	Single fault did not cause excessive volage in accessible SELV circuits. Limits of 71Vpeak and 120Vdc were not exceeded with in 0.2s and limits 42.4Vpeak and 60Vdc were not exceeded for longer than 0.2s.	P
2.2.4	Connection of SELV circuits to other circuits..... :		N

2.3	TNV circuits		N
2.3.1	Limits		N
	Type of TNV circuits..... :		—
2.3.2	Separation from other circuits and from accessible parts		N
2.3.2.1	General requirements		N
2.3.2.2	Protection by basic insulation		N
2.3.2.3	Protection by earthing		N
2.3.2.4	Protection by other constructions		N
2.3.3	Separation from hazardous voltages		N

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Clause	Requirement - Test	Result -remark	Verdict
	Insulation employed		—
2.3.4	Connection of TNV circuits to other circuits		N
	Insulation employed		—
2.3.5	Test for operating voltages generated externally		N

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

2.5	Limited power sources		N
	a) Inherently limited output		N
	b) Impedance limited output		N
	c) Regulating network limited output under normal operating and single fault condition		N
	d) Overcurrent protective device limited output		N
	Max. output voltage (V), max. output current (A), max. apparent power (VA)		—
	Current rating of overcurrent protective device (A) ..		—

2.6	Provisions for earthing and bonding		N
2.6.1	General	Class III equipment.	N
2.6.2	Size of protective earthing conductors		N
2.6.3	Rated current (A), cross-sectional area (mm ²), AWG.....		N
2.6.3.1	Size of protective bonding conductors		N
2.6.3.2	Rated current (A), cross-sectional area (mm ²), AWG.....		N
	Protective current rating (A), cross-sectional area (mm ²), AWG.....		—
2.6.3.3	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)		N
	Colour of insulation		—

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Clause	Requirement - Test	Result -remark	Verdict
	Terminals		N
2.6.3.4	General		N
2.6.3.5	Protective earthing and bonding terminals		N
2.6.4	General		N
2.6.4.1	Size of protective earthing conductors		N
2.6.4.2	Rated current (A), cross-sectional area (mm ²), AWG..... :		N
	Rated current (A), type, nominal thread diameter (mm)..... :		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N
2.6.5	Integrity of protective earthing		N
2.6.5.1	Interconnection of equipment		N
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N
2.6.5.3	Disconnection of protective earth		N
2.6.5.4	Parts that can be removed by an operator		N
2.6.5.5	Parts removed during servicing		N
2.6.5.6	Corrosion resistance		N
2.6.5.7	Screws for protective bonding		N
2.6.5.8	Reliance on telecommunication network or cable distribution system		N

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

2.8	Safety interlocks		N
2.8.1	General principles	No safety interlock.	N
2.8.2	Protection requirements		N
2.8.3	Inadvertent reactivation		N
2.8.4	Fail-safe operation		N

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Clause	Requirement - Test	Result -remark	Verdict
2.8.5	Moving parts		N
2.8.6	Overriding		N
2.8.7	Switches and relays		N
2.8.7.1	Contact gaps (mm)		N
2.8.7.2	Overload test		N
2.8.7.3	Endurance test		N
2.8.7.4	Electric strength test		N
2.8.8	Mechanical actuators		N

2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	Natural rubber, asbestos or hygroscopic material are not used.	P
2.9.2	Humidity conditioning		N
	Relative humidity (%), temperature (°C)		—
2.9.3	Grade of insulation		P
2.9.4	Separation from hazardous voltages		N
	Method(s) used		—

2.10	Clearances, creepage distances and distances through insulation		N
2.10.1	General		N
2.10.1.1	Frequency		N
2.10.1.2	Pollution degrees		N
2.10.1.3	Reduced values for functional insulation		N
2.10.1.4	Intervening unconnected conductive parts		N
2.10.1.5	Insulation with varying dimensions		N
2.10.1.6	Special separation requirements		N
2.10.1.7	Insulation in circuits generating starting pulses		N
2.10.2	Determination of working voltage		N
2.10.2.1	General		N
2.10.2.2	RMS working voltage		N
2.10.2.3	Peak working voltage		N
2.10.3	Clearances		N
2.10.3.1	General		N
2.10.3.2	Mains transient voltages		N
	a) AC mains supply		N
	b) Earthed d.c. mains supplies		N

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Clause	Requirement - Test	Result -remark	Verdict
	c) Unearthed d.c. mains supplies		N
	d) Battery operation		N
2.10.3.3	Clearances in primary circuits		N
2.10.3.4	Clearances in secondary circuits		N
2.10.3.5	Clearances in circuits having starting pulses		N
2.10.3.6	Transients from a.c. mains supply		N
2.10.3.7	Transients from d.c. mains supply		N
2.10.3.8	Transients from telecommunication networks and cable distribution systems		N
2.10.3.9	Measurement of transient voltage levels		N
	a) Transients from a mains supply		N
	For an a.c. mains supply		N
	For a d.c. mains supply		N
	b) Transients from a telecommunication network :		N
2.10.4	Creepage distances		N
2.10.4.1	General		N
2.10.4.2	Material group and comparative tracking index		N
	CTI tests		—
2.10.4.3	Minimum creepage distances		N
2.10.5	Solid insulation		N
2.10.5.1	General		N
2.10.5.2	Distances through insulation		N
2.10.5.3	Insulating compound as solid insulation		N
2.10.5.4	Semiconductor devices		N
2.10.5.5	Cemented joints		N
2.10.5.6	Thin sheet material – General		N
2.10.5.7	Separable thin sheet material		N
	Number of layers (pcs)		—
2.10.5.8	Non-separable thin sheet material		N
2.10.5.9	Thin sheet material – standard test procedure		N
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure		N
	Electric strength test		—
2.10.5.11	Insulation in wound components		N
2.10.5.12	Wire in wound components		N
	Working voltage		N

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Clause	Requirement - Test	Result -remark	Verdict
	a) Basic insulation not under stress		N
	b) Basic, supplementary, reinforced insulation		N
	c) Compliance with Annex U		N
	Two wires in contact inside wound component; angle between 45° and 90°		N
2.10.5.13	Wire with solvent-based enamel in wound components		N
	Electric strength test		—
	Routine test		N
2.10.5.14	Additional insulation in wound components		N
	Working voltage		N
	- Basic insulation not under stress		N
	- Supplementary, reinforced insulation		N
2.10.6	Construction of printed boards		N
2.10.6.1	Uncoated printed boards		N
2.10.6.2	Coated printed boards		N
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N
2.10.6.4	Insulation between conductors on different layers of a printed board		N
	Distance through insulation		N
	Number of insulation layers (pcs)		N
2.10.7	Component external terminations		N
2.10.8	Tests on coated printed boards and coated components		N
2.10.8.1	Sample preparation and preliminary inspection		N
2.10.8.2	Thermal conditioning		N
2.10.8.3	Electric strength test		N
2.10.8.4	Abrasion resistance test		N
2.10.9	Thermal cycling		N
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N
2.10.11	Tests for semiconductor devices and cemented joints		N
2.10.12	Enclosed and sealed parts		N
3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		N
3.1.1	Current rating and overcurrent protection		N

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Clause	Requirement - Test	Result -remark	Verdict
3.1.2	Protection against mechanical damage		N
3.1.3	Securing of internal wiring		N
3.1.4	Insulation of conductors		N
3.1.5	Beads and ceramic insulators		N
3.1.6	Screws for electrical contact pressure		N
3.1.7	Insulating materials in electrical connections		N
3.1.8	Self-tapping and spaced thread screws		N
3.1.9	Termination of conductors		N
	10 N pull test		N
3.1.10	Sleeving on wiring		N

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

3.3	Wiring terminals for connection of external conductors		N
3.3.1	Wiring terminals		N

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Clause	Requirement - Test	Result -remark	Verdict
3.3.2	Connection of non-detachable power supply cords		N
3.3.3	Screw terminals		N
3.3.4	Conductor sizes to be connected		N
	Rated current (A), cord/cable type, cross-sectional area (mm ²)		—
3.3.5	Wiring terminal sizes		N
	Rated current (A), type, nominal thread diameter (mm)		—
3.3.6	Wiring terminal design		N
3.3.7	Grouping of wiring terminals		N
3.3.8	Stranded wire		N

3.4	Disconnection from the mains supply		N
3.4.1	General requirement		N
3.4.2	Disconnect devices		N
3.4.3	Permanently connected equipment		N
3.4.4	Parts which remain energized		N
3.4.5	Switches in flexible cords	Not provided	N
3.4.6	Number of poles - single-phase and d.c. equipment		N
3.4.7	Number of poles - three-phase equipment		N
3.4.8	Switches as disconnect devices		N
3.4.9	Plugs as disconnect devices		N
3.4.10	Interconnected equipment		N
3.4.11	Multiple power sources		N

3.5	Interconnection of equipment		P
3.5.1	General requirements	See below.	P
3.5.2	Types of interconnection circuits	SELV	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection circuits.	N
3.5.4	Data ports for additional equipment		P

4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N
	Angle of 10°	The equipment mass less than 7kg.	N
	Test: force (N)		N

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Clause	Requirement - Test	Result -remark	Verdict
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4.2	Mechanical strength		P
4.2.1	General		N
4.2.2	Steady force test, 10 N		N
4.2.3	Steady force test, 30 N		N
4.2.4	Steady force test, 250 N	250N applied to the top, bottom and sides of external enclosure, no energy or other hazards.	P
4.2.5	Impact test		N
	Fall test		N
	Swing test		N
4.2.6	Drop test; height (mm)	After subjected 3 drops from 1m height on a hardwood surface, no energy hazards or damage to the enclosure integration.	P
4.2.7	Stress relief test	After 7 hours at 70°C and cooling down to room temperature, no shrinkage, distortion or loosening any enclosure part was noticeable on the battery pack enclosure.	P
4.2.8	Cathode ray tubes		N
	Picture tube separately certified		N
4.2.9	High pressure lamps		N
4.2.10	Wall or ceiling mounted equipment; force (N)	50N	P

4.3	Design and construction		P
4.3.1	Edges and corners	Edges and corners of the enclosure are rounded.	P
4.3.2	Handles and manual controls; force (N)		N
4.3.3	Adjustable controls	No adjustment controls.	N
4.3.4	Securing of parts	Electrical and mechanical connections can be expected to with standard usual mechanical stress. For the protection solder pins are used.	P
4.3.5	Connection by plugs and sockets	No mismatching connectors.	P
4.3.6	Direct plug-in equipment	Not direct plug-in type.	N
	Torque		N
	Compliance with the relevant mains plug standard		N

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Clause	Requirement - Test	Result -remark	Verdict
4.3.7	Heating elements in earthed equipment		N
4.3.8	Batteries	Non-rechargeable battery.	P
	- Overcharging of a rechargeable battery		N
	- Unintentional charging of a non-rechargeable battery		N
	- Reverse charging of a rechargeable battery		N
	- Excessive discharging rate for any battery	See appended table 5.3	P
4.3.9	Oil and grease	No oil or grease.	N
4.3.10	Dust, powders, liquids and gases	Equipment in intended use not considered to be exposed to these.	N
4.3.11	Containers for liquids or gases	The equipment does not contain liquids or gases.	N
4.3.12	Flammable liquids	No flammable liquid.	N
	Quantity of liquid (l)		N
	Flash point (°C)		N
4.3.13	Radiation		N
4.3.13.1	General		N
4.3.13.2	Ionizing radiation		N
	Measured radiation (pA/kg)		—
	Measured high-voltage (kV)		—
	Measured focus voltage (kV)		—
	CRT markings		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		N
	Part, property, retention after test, flammability classification		N
4.3.13.4	Human exposure to ultraviolet (UV) radiation		N
4.3.13.5	Laser (including LEDs)		N
	Laser class		—
4.3.13.6	Other types		N

4.4	Protection against hazardous moving parts		N
4.4.1	General		N
4.4.2	Protection in operator access areas		N
4.4.3	Protection in restricted access locations		N
4.4.4	Protection in service access areas		N

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Clause	Requirement - Test	Result -remark	Verdict
4.5	Thermal requirements		P
4.5.1	General	See appended table 4.5	P
4.5.2	Temperature tests		P
	Normal load condition per Annex L :		—
4.5.3	Temperature limits for materials	See appended table 4.5	P
4.5.4	Touch temperature limits	See appended table 4.5	P
4.5.5	Resistance to abnormal heat :		N

4.6	Openings in enclosures		N
4.6.1	Top and side openings		N
	Dimensions (mm) :		—
4.6.2	Bottoms of fire enclosures		N
	Construction of the bottom, dimensions (mm) :		—
4.6.3	Doors or covers in fire enclosures		N
4.6.4	Openings in transportable equipment		N
4.6.4.1	Constructional design measures		N
	Dimensions (mm) :		—
4.6.4.2	Evaluation measures for larger openings		N
4.6.4.3	Use of metallized parts		N
4.6.5	Adhesives for constructional purposes		N
	Conditioning temperature (°C), time (weeks) :		—

4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame		P
	Method 1, selection and application of components wiring and materials		P
	Method 2, application of all of simulated fault condition tests		N
4.7.2	Conditions for a fire enclosure	See below.	P
4.7.2.1	Parts requiring a fire enclosure		P
4.7.2.2	Parts not requiring a fire enclosure		N
4.7.3	Materials	See below.	P
4.7.3.1	General	PCB rated V-1 or better.	P
4.7.3.2	Materials for fire enclosures		N
4.7.3.3	Materials for components and other parts outside fire enclosures		N
4.7.3.4	Materials for components and other parts inside fire enclosures		P

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Clause	Requirement - Test	Result -remark	Verdict
4.7.3.5	Materials for air filter assemblies	No air filter assemblies.	N
4.7.3.6	Materials used in high-voltage components	No high-voltage components.	N

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

5.2	Electric strength		N
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Clause	Requirement - Test	Result -remark	Verdict
5.2.1	General		N
5.2.2	Test procedure		N

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	See below.	P
5.3.2	Motors		N
5.3.3	Transformers		N
5.3.4	Functional insulation	Method c), see appended table 5.3	P
5.3.5	Electromechanical components		N
5.3.6	Audio amplifiers in ITE		N
5.3.7	Simulation of faults	Method c), see appended table 5.3	P
5.3.8	Unattended equipment		N
5.3.9	Compliance criteria for abnormal operating and fault conditions		P
5.3.9.1	During the tests		P
5.3.9.2	After the tests		P

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

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

6.3	Protection of telecommunication wiring system from overheating		N
	Max. output current (A)		—

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Clause	Requirement - Test	Result -remark	Verdict
	Current limiting method..... :		—

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

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

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Clause	Requirement - Test	Result -remark	Verdict
A.2.5	Test procedure		N
A.2.6	Compliance criteria		N
	Sample 1 burning time (s)		—
	Sample 2 burning time (s)		—
	Sample 3 burning time (s)		—
A.2.7	Alternative test		N
	Sample 1 burning time (s)		—
	Sample 2 burning time (s)		—
	Sample 3 burning time (s)		—
A.3	Hot flaming oil test (see 4.6.2)		N
A.3.1	Mounting of samples		N
A.3.2	Test procedure		N
A.3.3	Compliance criterion		N

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

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Clause	Requirement - Test	Result -remark	Verdict
B.7.3	Alternative test procedure		N
B.7.4	Electric strength test; test voltage (V)		N
B.8	Test for motors with capacitors		N
B.9	Test for three-phase motors		N
B.10	Test for series motors		N
	Operating voltage (V)		—

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

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

E	Annex E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N
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F	Annex F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		N
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G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N
G.1	Clearances		N
G.1.1	General		N
G.1.2	Summary of the procedure for determining minimum clearances		N
G.2	Determination of mains transient voltage (V)		N
G.2.1	AC mains supply		N
G.2.2	Earthed d.c. mains supplies		N
G.2.3	Unearthed d.c. mains supplies		N
G.2.4	Battery operation		N

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Clause	Requirement - Test	Result -remark	Verdict
G.3	Determination of telecommunication network transient voltage (V)		N
G.4	Determination of required withstand voltage (V)		N
G.4.1	Mains transients and internal repetitive peaks .. :		N
G.4.2	Transients from telecommunication networks ... :		N
G.4.3	Combination of transients		N
G.4.4	Transients from cable distribution systems		N
G.5	Measurement of transient voltages (V)		N
	a) Transients from a mains supply		N
	For an a.c. mains supply		N
	For a d.c. mains supply		N
	b) Transients from a telecommunication network		N
G.6	Determination of minimum clearances		N
H	Annex H, IONIZING RADIATION (see 4.3.13)		N
J	Annex J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N
	Metal(s) used		—
K	Annex K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N
K.1	Making and breaking capacity		N
K.2	Thermostat reliability; operating voltage (V)		N
K.3	Thermostat endurance test; operating voltage (V)		N
K.4	Temperature limiter endurance; operating voltage (V)		N
K.5	Thermal cut-out reliability		N
K.6	Stability of operation		N
L	Annex L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		P
L.1	Typewriters	No typewriter.	N
L.2	Adding machines and cash registers	No adding machine or cash registers.	N
L.3	Erasers	No eraser.	N
L.4	Pencil sharpeners	No pencil sharpener.	N
L.5	Duplicators and copy machines	No duplicator or copy machine.	N
L.6	Motor-operated files	No motor-operated file.	N

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Clause	Requirement - Test	Result -remark	Verdict
L.7	Other business equipment		P
M	Annex M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N
M.1	Introduction		N
M.2	Method A		N
M.3	Method B		N
M.3.1	Ringng signal		N
M.3.1.1	Frequency (Hz) :		—
M.3.1.2	Voltage (V) :		—
M.3.1.3	Cadence; time (s), voltage (V) :		—
M.3.1.4	Single fault current (mA) :		—
M.3.2	Tripping device and monitoring voltage..... :		N
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N
M.3.2.2	Tripping device		N
M.3.2.3	Monitoring voltage (V)..... :		N
N	Annex N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)		N
N.1	ITU-T impulse test generators		N
N.2	IEC 60065 impulse test generator		N
P	ANNEX P, NORMATIVE REFERENCES		—
Q	ANNEX Q, BIBLIOGRAPHY		N
	a) Preferred climatic categories :		N
	b) Maximum continuous voltage :		N
	c) Pulse current :		N
R	Annex R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N
R.2	Reduced clearances (see 2.10.3)		N
S	Annex S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N
S.1	Test equipment		N
S.2	Test procedure		N

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Clause	Requirement - Test	Result -remark	Verdict
S.3	Examples of waveforms during impulse testing		N
T	A Annex T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N
			—
U	Annex U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N
			—
V	Annex V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		N
V.1	Introduction		N
V.2	TN power distribution systems		N
W	ANNEX W, SUMMATION OF TOUCH CURRENTS		N
W.1	Touch current from electronic circuits		N
W.1.1	Floating circuits		N
W.1.2	Earthed circuits		N
W.2	Interconnection of several equipments		N
W.2.1	Isolation		N
W.2.2	Common return, isolated from earth		N
W.2.3	Common return, connected to protective earth		N
X	Annex X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		N
X.1	Determination of maximum input current		N
X.2	Overload test procedure		N
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)		N
Y.1	Test apparatus		N
Y.2	Mounting of test samples		N
Y.3	Carbon-arc light-exposure apparatus		N
Y.4	Xenon-arc light exposure apparatus		N
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		N
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N

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Clause	Requirement - Test	Result -remark	Verdict
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BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—
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Clause	Requirement - Test	Result -remark	Verdict																																																																								
EN 60950-1:2006 – CENELEC COMMON MODIFICATIONS																																																																											
Contents	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations		P																																																																								
General	Delete all the “country” notes in the reference document according to the following list: <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">1.4.8</td> <td style="width: 25%;">Note 2</td> <td style="width: 15%;">1.5.1</td> <td style="width: 15%;">Note 2 & 3</td> <td style="width: 15%;">1.5.7.1</td> <td style="width: 20%;">Note</td> </tr> <tr> <td>1.5.8</td> <td>Note 2</td> <td>1.5.9.4</td> <td>Note</td> <td>1.7.2.1</td> <td>Note 4, 5 & 6</td> </tr> <tr> <td>2.2.3</td> <td>Note</td> <td>2.2.4</td> <td>Note</td> <td>2.3.2</td> <td>Note</td> </tr> <tr> <td>2.3.2.1</td> <td>Note 2</td> <td>2.3.4</td> <td>Note 2</td> <td>2.6.3.3</td> <td>Note 2 & 3</td> </tr> <tr> <td>2.7.1</td> <td>Note</td> <td>2.10.3.2</td> <td>Note 2</td> <td>2.10.5.13</td> <td>Note 3</td> </tr> <tr> <td>3.2.1.1</td> <td>Note</td> <td>3.2.4</td> <td>Note 3.</td> <td>2.5.1</td> <td>Note 2</td> </tr> <tr> <td>4.3.6</td> <td>Note 1 & 2</td> <td>4.7</td> <td>Note 4</td> <td>4.7.2.2</td> <td>Note</td> </tr> <tr> <td>4.7.3.1</td> <td>Note 2</td> <td>5.1.7.1</td> <td>Note 3 & 4</td> <td>5.3.7</td> <td>Note 1</td> </tr> <tr> <td>6</td> <td>Note 2 & 5</td> <td>6.1.2.1</td> <td>Note 2</td> <td>6.1.2.2</td> <td>Note</td> </tr> <tr> <td>6.2.2</td> <td>Note 6.</td> <td>2.2.1</td> <td>Note 2</td> <td>6.2.2.2</td> <td>Note</td> </tr> <tr> <td>7.1</td> <td>Note 3</td> <td>7.2</td> <td>Note</td> <td>7.3</td> <td>Note 1 & 2</td> </tr> <tr> <td>G.2.1</td> <td>Note 2</td> <td>Annex H</td> <td>Note 2</td> <td></td> <td></td> </tr> </table>	1.4.8	Note 2	1.5.1	Note 2 & 3	1.5.7.1	Note	1.5.8	Note 2	1.5.9.4	Note	1.7.2.1	Note 4, 5 & 6	2.2.3	Note	2.2.4	Note	2.3.2	Note	2.3.2.1	Note 2	2.3.4	Note 2	2.6.3.3	Note 2 & 3	2.7.1	Note	2.10.3.2	Note 2	2.10.5.13	Note 3	3.2.1.1	Note	3.2.4	Note 3.	2.5.1	Note 2	4.3.6	Note 1 & 2	4.7	Note 4	4.7.2.2	Note	4.7.3.1	Note 2	5.1.7.1	Note 3 & 4	5.3.7	Note 1	6	Note 2 & 5	6.1.2.1	Note 2	6.1.2.2	Note	6.2.2	Note 6.	2.2.1	Note 2	6.2.2.2	Note	7.1	Note 3	7.2	Note	7.3	Note 1 & 2	G.2.1	Note 2	Annex H	Note 2				P
1.4.8	Note 2	1.5.1	Note 2 & 3	1.5.7.1	Note																																																																						
1.5.8	Note 2	1.5.9.4	Note	1.7.2.1	Note 4, 5 & 6																																																																						
2.2.3	Note	2.2.4	Note	2.3.2	Note																																																																						
2.3.2.1	Note 2	2.3.4	Note 2	2.6.3.3	Note 2 & 3																																																																						
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3.2.1.1	Note	3.2.4	Note 3.	2.5.1	Note 2																																																																						
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6	Note 2 & 5	6.1.2.1	Note 2	6.1.2.2	Note																																																																						
6.2.2	Note 6.	2.2.1	Note 2	6.2.2.2	Note																																																																						
7.1	Note 3	7.2	Note	7.3	Note 1 & 2																																																																						
G.2.1	Note 2	Annex H	Note 2																																																																								
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for “one package equipment”, and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.		N																																																																								
1.5.1	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC		N																																																																								
1.7.2.1	Add the following NOTE: NOTE Z1 In addition, the instructions shall include, as far as applicable, a warning that excessive sound pressure from earphones and headphones can cause hearing loss		N																																																																								

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Clause	Requirement - Test	Result -remark	Verdict												
2.7.1	<p>Replace the subclause as follows:</p> <p>Basic requirements</p> <p>To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p> <p>c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>		N												
2.7.2	This subclause has been declared 'void'.		N												
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.		N												
3.2.5.1	<p>Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2".</p> <p>In Table 3B, replace the first four lines by the following:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;"> Up to and including 6</td> <td style="width: 20%;"></td> <td style="width: 20%;">0,75 a)</td> <td style="width: 20%;"> </td> </tr> <tr> <td> Over 6 up to and including 10</td> <td>(0,75) b)</td> <td>1,0</td> <td> </td> </tr> <tr> <td> Over 10 up to and including 16</td> <td>(1,0) c)</td> <td>1,5</td> <td> </td> </tr> </table> <p>In the conditions applicable to Table 3B delete the words "in some countries" in condition a).</p> <p>In NOTE 1, applicable to Table 3B, delete the second sentence.</p>	Up to and including 6		0,75 a)		Over 6 up to and including 10	(0,75) b)	1,0		Over 10 up to and including 16	(1,0) c)	1,5			N
Up to and including 6		0,75 a)													
Over 6 up to and including 10	(0,75) b)	1,0													
Over 10 up to and including 16	(1,0) c)	1,5													
3.3.4	<p>In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;"> Over 10 up to and including 16</td> <td style="width: 20%;">1,5 to 2,5</td> <td style="width: 20%;"> </td> <td style="width: 20%;">1,5 to 4 </td> </tr> </table> <p>Delete the fifth line: conductor sizes for 13 to 16 A.</p>	Over 10 up to and including 16	1,5 to 2,5		1,5 to 4		N								
Over 10 up to and including 16	1,5 to 2,5		1,5 to 4												
4.3.13.6	<p>Add the following NOTE:</p> <p>NOTE Z1 Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this Recommendation which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.</p>		N												
Annex H	<p>Replace the last paragraph of this annex by:</p> <p>At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level.</p> <p>Replace the notes as follows:</p> <p>NOTE These values appear in Directive 96/29/Euratom.</p> <p>Delete NOTE 2.</p>		N												

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Clause	Requirement - Test	Result -remark	Verdict
Bibliography	Additional EN standards.		—

ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS		—
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
ZB	SPECIAL NATIONAL CONDITIONS		N
1.2.4.1	In Denmark , certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.		N
1.5.7.1	In Finland, Norway and Sweden , resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.2.		N
1.5.8	In Norway , due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N
1.5.9.4	In Finland, Norway and Sweden , the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		N
1.7.2.1	In Finland, Norway and Sweden , CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Finland: "Laitte on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag"		N
1.7.5	In Denmark , socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a.		N
2.2.4	In Norway , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N
2.3.2	In Finland, Norway and Sweden there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.		N
2.3.4	In Norway , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N
2.6.3.3	In the United Kingdom , the current rating of the circuit shall be taken as 13 A, not 16 A.		N
2.7.1	In the United Kingdom , to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.		N
2.10.5.13	In Finland, Norway and Sweden , there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.		N

EN 60950-1																											
Clause	Requirement - Test	Result -remark	Verdict																								
3.2.1.1	<p>In Switzerland, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets:</p> <table border="0"> <tr> <td>SEV 6532-2.1991</td> <td>Plug Type 15</td> <td>3P+N+PE</td> <td>250/400 V, 10 A</td> </tr> <tr> <td>SEV 6533-2.1991</td> <td>Plug Type 11</td> <td>L+N</td> <td>250 V, 10 A</td> </tr> <tr> <td>SEV 6534-2.1991</td> <td>Plug Type 12</td> <td>L+N+PE</td> <td>250 V, 10 A</td> </tr> </table> <p>In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998:</p> <table border="0"> <tr> <td>SEV 5932-2.1998</td> <td>Plug Type 25</td> <td>3L+N+PE</td> <td>230/400 V, 16 A</td> </tr> <tr> <td>SEV 5933-2.1998</td> <td>Plug Type 21</td> <td>L+N</td> <td>250 V, 16 A</td> </tr> <tr> <td>SEV 5934-2.1998</td> <td>Plug Type 23</td> <td>L+N+PE</td> <td>250 V, 16 A</td> </tr> </table>	SEV 6532-2.1991	Plug Type 15	3P+N+PE	250/400 V, 10 A	SEV 6533-2.1991	Plug Type 11	L+N	250 V, 10 A	SEV 6534-2.1991	Plug Type 12	L+N+PE	250 V, 10 A	SEV 5932-2.1998	Plug Type 25	3L+N+PE	230/400 V, 16 A	SEV 5933-2.1998	Plug Type 21	L+N	250 V, 16 A	SEV 5934-2.1998	Plug Type 23	L+N+PE	250 V, 16 A		N
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SEV 5934-2.1998	Plug Type 23	L+N+PE	250 V, 16 A																								
3.2.1.1	<p>In Denmark, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.</p>		N																								
3.2.1.1	<p>In Spain, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994.</p> <p>Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994.</p> <p>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.</p>		N																								
3.2.1.1	<p>In the United Kingdom, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations.</p> <p>NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p>		N																								
3.2.1.1	<p>In Ireland, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.</p>		N																								
3.2.4	In Switzerland , for requirements see 3.2.1.1 of this annex.		N																								
3.2.5.1	In the United Kingdom , a power supply cord with conductor of 1,25 mm ² is allowed for equipment with a rated current over 10 A and up to and including 13 A.		N																								

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Clause	Requirement - Test	Result -remark	Verdict
3.3.4	In the United Kingdom , the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is: • 1,25 mm ² to 1,5 mm ² nominal cross-sectional area.		N
4.3.6	In the United Kingdom , the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N
4.3.6	In Ireland , DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.		N
5.1.7.1	In Finland, Norway and Sweden TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that - is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and - has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and - is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT.		N

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Clause	Requirement - Test	Result -remark	Verdict
6.1.2.1	<p>In Finland, Norway and Sweden, add the following text between the first and second paragraph of the compliance clause:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. <p>If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> - passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV. <p>It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1; - the additional testing shall be performed on all the test specimens as described in EN 132400; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400, in the sequence of tests as described in EN 132400. 		N
6.1.2.2	<p>In Finland, Norway and Sweden, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.</p>		N
7.2	<p>In Finland, Norway and Sweden, for requirements see 6.1.2.1 and 6.1.2.2 of this annex.</p> <p>The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.</p>		N
7.3	<p>In Norway and Sweden, there are many buildings where the screen of the coaxial cable is normally not connected to the earth in the building installation.</p>		N
7.3	<p>In Norway, for installation conditions see EN 60728-11:2005.</p>		N
ZC	A-DEVIATIONS (informative)		N
1.5.1	<p>Sweden (Ordinance 1990:944)</p> <p>Add the following:</p> <p>NOTE In Sweden, switches containing mercury are not permitted.</p>		N

EN 60950-1			
Clause	Requirement - Test	Result -remark	Verdict
1.5.1	<p>Switzerland (Ordinance on environmentally hazardous substances SR 814.081, Annex 1.7, Mercury - Annex 1.7 of SR 814.81 applies for mercury.)</p> <p>Add the following:</p> <p>NOTE In Switzerland, switches containing mercury such as thermostats, relays and level controllers are not allowed.</p>		N
1.7.2.1	<p>Denmark (Heavy Current Regulations)</p> <p>Supply cords of CLASS I EQUIPMENT, which is delivered without a plug, must be provided with a visible tag with the following text:</p> <p style="text-align: center;">Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket</p> <p style="text-align: center;"> eller </p> <p>If essential for the safety of the equipment, the tag must in addition be provided with a diagram, which shows the connection of the other conductors, or be provided with the following text:</p> <p>“For tilslutning af de øvrige ledere, se medfølgende installationsvejledning.”</p>		N
1.7.2.1	<p>Germany (Gesetz über technische Arbeitsmittel und Verbraucherprodukte (Geräte- und Produktsicherheitsgesetz – GPSG) [Law on technical labour equipment and consumer products], of 6th January 2004, Section 2, Article 4, Clause (4), Item 2).</p> <p>If for the assurance of safety and health certain rules during use, amending or maintenance of a technical labour equipment or readymade consumer product are to be followed, a manual in German language has to be delivered when placing the product on the market.</p> <p>Of this requirement, rules for use even only by SERVICE PERSONS are not exempted.</p>		N
1.7.5	<p>Denmark (Heavy Current Regulations)</p> <p>With the exception of CLASS II EQUIPMENT provided with a socket outlet in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-4a, CLASS II EQUIPMENT shall not be fitted with socket-outlets for providing power to other equipment.</p>		N
1.7.13	<p>Switzerland (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries)</p> <p>Annex 2.15 of SR 814.81 applies for batteries.</p>		N
5.1.7.1	<p>Denmark (Heavy Current Regulations, Chapter 707, clause 707.4)</p> <p>TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B.</p>		N

1.5.1	TABLE: list of critical components					P
Subject/no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity1)	
Plastic enclosure	Bayer Thai Co Ltd	6557+(f1)	V-0, min, thickness 3.0mm, 115°C	UL 94	UL/ E168120	
Cover of enclosure (red)	Chi Mei Corporation	PA-758(+)	HB, min, thickness 1.5mm, 60°C	UL 94	UL/E56070	
Battery pack	Desay Lithium Battery Co., Ltd	2CR17450E-R	6V, 2.4Ah, lithium battery	--	--	
-cell	Desay Lithium Battery Co., Ltd	CR17450E-R	Max charging Current 10mA, Max charging Voltage 12V	UL 1642	UL/MH45237	
PCB	Various	Various	V-1 or better, 105°C min	UL 94	--	
1) An asterisk indicates a mark which assures the agreed level of surveillance						

1.6.2	TABLE: Electrical data (in normal conditions)					P
U (V)	I (A)	I _{rated} (A)	P (W)	Fuse #	I _{fuse} (A)	Condition/status
6	0.08	2.4	0.48	--	--	Maximum normal load
Supplementary information: The steady state input current did not exceed the rated current at the rated voltage by more than 10 percent under maximum normal load.						

2.5	TABLE: Limited power source measurement				N
		Limits	Measured		Verdict
According to Table 2B (normal condition)					
current (in A)		8			
apparent power (in VA)		100			
Supplementary information:					

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements					N
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
Functional:						
Basic / supplementary:						

Reinforced:						
Supplementary information:						

2.10.5	TABLE: Distance through insulation measurements					N
Distance through insulation (DTI) at/of:		U peak (V)	U r.m.s. (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)
Supplementary information:						

4.3.8	TABLE: Batteries								N
The tests of 4.3.8 are applicable only when appropriate battery data is not available									
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:									
- Chemical leaks									Verdict
- Explosion of the battery									
- Emission of flame or expulsion of molten metal									
- Electric strength tests of equipment after completion of tests									
Supplementary information:									

4.5	TABLE: Thermal requirements			P
	Supply voltage (V)	:	6Vdc	—
	Ambient Tmin (°C)	:	--	—
	Ambient Tmax (°C)	:	See below	—

Maximum measured temperature T of part/at::	T (°C)	Allowed Tmax (°C)					
Discharge mode of EUT							
Ambient(T _{amb} : 26.0°C)	55.0	--					
PCB near U4	56.2	105					
PCB near U5	55.5	105					
PCB near L12	55.5	105					
PCB near Q12	57.0	105					
Battery body	55.6	--					
Plastic enclosure inside near Battery	55.6	--					
Plastic enclosure outside near Battery	55.3	95					
Supplementary information:							
Temperature T of winding:	t1 (°C)	R1 (Ω)	t2 (°C)	R2 (Ω)	T (°C)	Allowed Tmax (°C)	Insulation class
Supplementary information:							
The temperature were measured under worst normal defined in 1.2.2.1 and as described in sub-clause 1.6.2 and at voltages a described above.							

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

4.7	Table: Resistance to fire					P
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence	
Plastic enclosure	1)	1)	1)	1)	P	
PCB	--	--	--	V-1 or better	P	
Supplementary information:						
1) see appended table 1.5.1 for the source detail.						

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests				N
Test voltage applied between:		Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No	
Functional:					

Basic / supplementary:			
Reinforced:			
Supplementary information:			

5.3	TABLE: Fault condition tests					P
	Ambient temperature (°C) :			See below		—
	Power source for EUT: Manufacturer, model/type, output rating :			See appended table 1.5.1		—
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Battery over-discharge (U3 pin 1 to 2)	Short	--	10mins	--	--	Unit shut down.No fire. No hazards.
Supplementary information:						

Photo



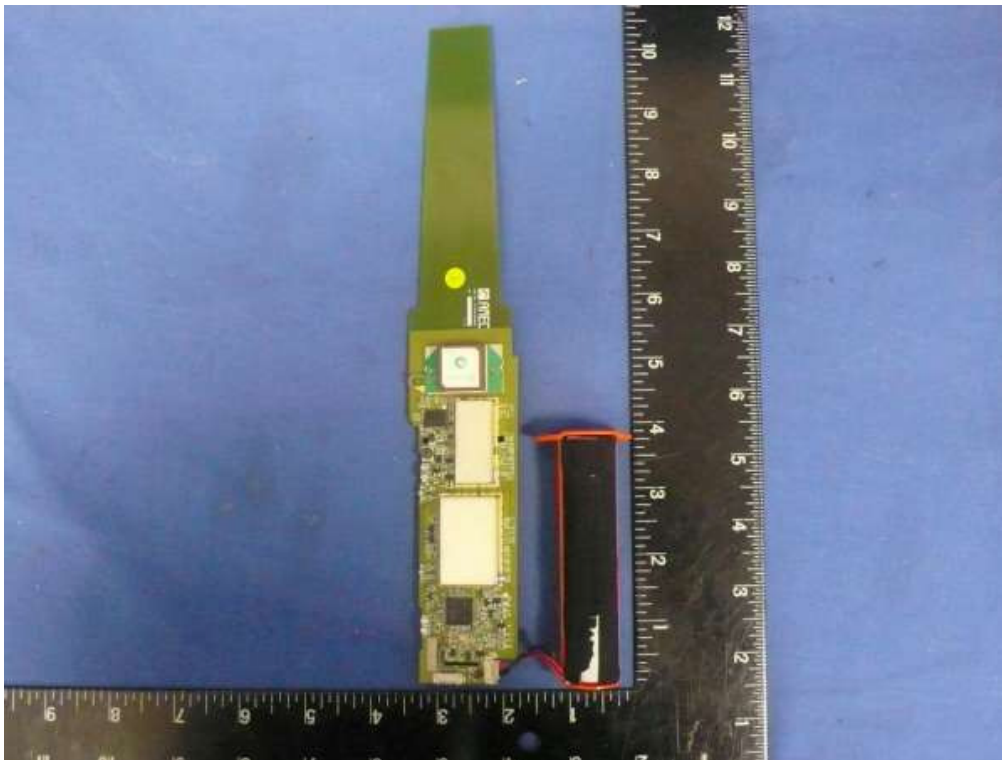
VIEW 1



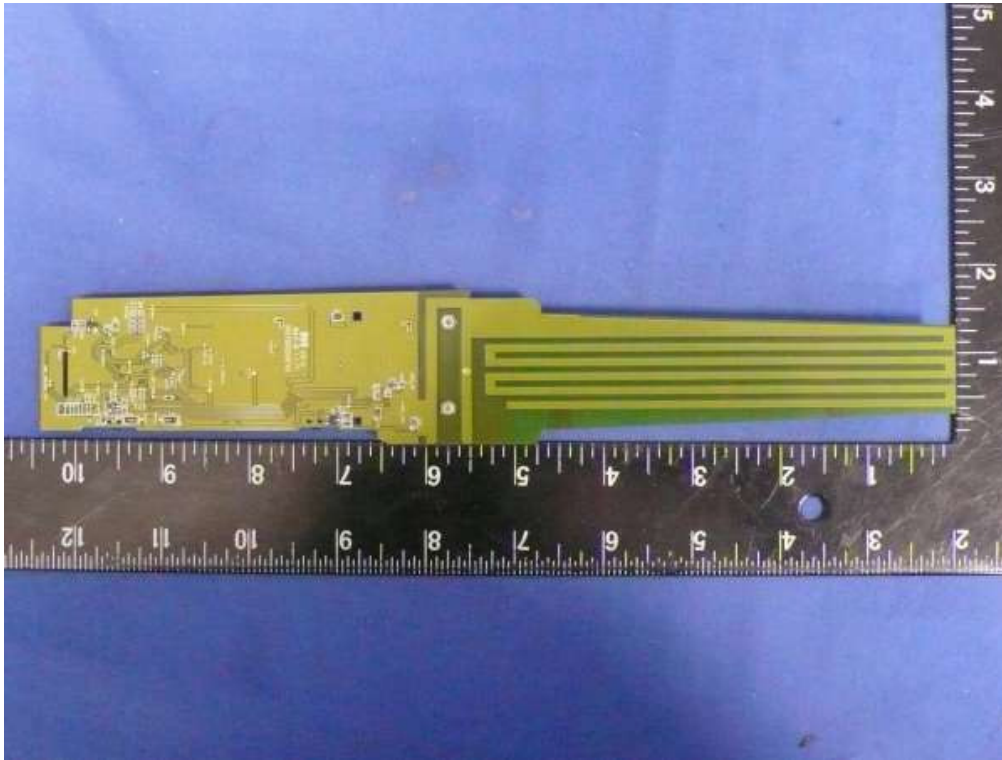
VIEW 2



VIEW 3



VIEW 4



VIEW 5



VIEW 6

-END-