EMTEK (Dongguan) Co., Ltd.
No.281, Guantai Road, Nancheng District, Dongguan, Guangdong, China
www.emtek.com.cn Tel:+86-769-22807078 Fax:+86-769-22807079

Certificate of Conformity

NO.: ED150818223S-1

The following product has been tested by us with the listed standards and found in conformity with the council LVD directive 2014/35/EU. It is possible to use CE marking to demonstrate the conformity with this LVD Directive.

Applicant	:	UNI-TREND TECHNOLOGY (CHINA) LIMITED
Address	:	No.6, Gong Ye Bei 1st Road, Songshan Lake National High-Tech Industrial Development Zone, Dongguan City, Guangdong Province, China.
Manufacturer	:	UNI-TREND TECHNOLOGY (CHINA) LIMITED
Address	:	No.6, Gong Ye Bei 1st Road, Songshan Lake National High-Tech Industrial Development Zone, Dongguan City, Guangdong Province, China.
EUT	:	Digital Multimeter
Trade Mark	:	UNI-T®
M/N	:	UT39A, UT39B, UT39C, UT39E.
Technical Data	:	CAT I 1000V, CAT II 600V.
Test Standards	:	EN 61010-1:2010 EN 61010-2-030:2010 EN 61010-2-033:2012

CE

EMTEK (DONGGUAN) CO., LTD. * CERTIFICATE *

(Manager)

August 15, 2016

The certificate is based on a single evaluation of one sample of above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab. logo.

Ver.1.0

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APPLICATION FOR LOW VOLTAGE DIRECTIVE

On Behalf of

UNI-TREND TECHNOLOGY (CHINA) LIMITED

Digital Multimeter

Model: UT39A, UT39B, UT39C, UT39E.

Prepared For : **UNI-TREND TECHNOLOGY (CHINA) LIMITED**
No.6, Gong Ye Bei 1st Road, Songshan Lake National High-Tech Industrial Development Zone, Dongguan City, Guangdong Province, China.

Prepared By : **EMTEK(DONGGUAN) CO., LTD.**
No.281, Guantai Rd., Nancheng District, Dongguan, Guangdong, China.
Tel: +86-769-22807078
Fax: +86-769-22807079

Date of Test : August 18, 2015 to August 23, 2015
Date of Report : August 15, 2016
Report Number : ED150818223S-1

TEST REPORT

EN 61010-1+EN 61010-2-030+EN 61010-2-033

Safety requirements for electrical equipment for measurement, control, and laboratory use

Part 1: General requirements

Part 2-030: Particular requirements for testing and measuring circuits
Part 2-033: Particular requirements for hand-held multimeters and other meters, for domestic and professional use, capable of measuring mains voltage

Report Reference No. ..... :	ED150818223S-1
Compiled by (name + signature) ..... :	Jerry Liao
Approved by (name + signature) .... :	Kobe Mai
Date of issue ..... :	August 15, 2016
Contents ..... :	34 Pages

Testing Laboratory	
Name..... :	EMTEK(DONGGUAN) CO., LTD.
Address ..... :	No.281, Guangtai Road, Nancheng District, Dongguan, Guangdong, China.
Testing location / address ..... :	Same as above
Applicant's name	UNI-TREND TECHNOLOGY (CHINA) LIMITED
Address ..... :	No.6, Gong Ye Bei 1st Road, Songshan Lake National High-Tech Industrial Development Zone, Dongguan City, Guangdong Province, China.
Test specification:	
Standard..... :	EN 61010-1:2010+EN 61010-2-030:2010+EN 61010-2-033:2012
Test procedure ..... :	Compliance with EN 61010-1:2010+EN 61010-2-030:2010+EN 61010-2-033:2012
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	EN 61010_1
Master TRF ..... :	2008-08
Test item	
Description ..... :	Digital Multimeter
Trademark..... :	UNI-T®
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	UT39A, UT39B, UT39C, UT39E.
Rating(s)..... :	CAT I 1000V, CAT II 600V.

Test item particulars	
Type of item tested ..... :	☒Measurement / ☐Control / ☒Laboratory
Description of equipment function ..... :	Digital Multimeter
Classification ..... :	☒Type A / ☐Type B / ☐Type C / ☐Other
Protection class ..... :	partially protected by Reinforced insulation
Measurement category ..... :	CAT I, CAT II.
Pollution degree ..... :	PD 2
Environmental rating ..... :	☐standard / ☒extended (specify): 0 ℃ to 40 ℃
Operating conditions ..... :	☒continuous / ☐short-time / ☐intermittent
Overall size of the equipment (W x D x H) ..... :	N/A
Mass of the equipment (g) ..... :	N/A
Marked degree of protection to IEC 60529 ..... :	IPX0
Test case verdicts	
Test case does not apply to the test object ..... :	N (/A)
Test object does meet the requirement ..... :	P (Pass)
Test object does not meet the requirement ..... :	F (Fail)
Testing	
Date of receipt of test item ..... :	August 18, 2015
Date (s) of performance of tests ..... :	August 18, 2015 to August 23, 2015

General remarks:

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

The test results presented in this report relate only to the item(s) tested.

"(see remark #)" refers to a remark appended to the report.
"(see Annex #)" refers to an annex appended to the report.
"(see Form A.#)" refers to a table appended to the report.

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

History
For the original product information see test report ED150818223S.
Modification 1 (ED150818223S-1)based on original report ED150818223S.
Update LVD directive, 2014/35/EU.

General product information:

The model UT39A, UT39B, UT39C, UT39E have the same circuit diagram, construction and component. The difference between these four models is only the appearance. All the tests are conducted on the model UT39C.

Summary of test results (information/comments):

The product has been tested according to standard EN 61010-1:2010+EN 61010-2-030:2010+EN 61010-2-033:2012.

- Tests performed on the bench
- Maximum ambient temperature: +40°C

EUT is designed for altitudes not exceeding 2000 m.

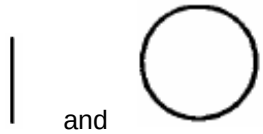
Copy of marking plate:

1, Copy of Label

(Remark: Importer label info put on all products and boxes.)

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict

5	**MARKING AND DOCUMENTATION**		**P**
5.1	Markings		P
5.1.1	Markings applicable for whole probe assembly not located on operator removable parts		P
	Letter symbols (IEC 60027) used		P
	Graphic symbols (Table 1) used; or	See label	P
	if other symbol used; explained in accompanying documentation		P
	In case of less space for required markings:		P
	- symbol 14 of table 1 used		P
	- all necessary information included in documentation		P
5.1.2	Identification		P
5.1.2 a)	Name or registered trademark	UNI-T®	P
5.1.2 b)	For type B and C, also model no. or similar	type A	P
	If designed for use with specific model this is made clear and		P
	model identified by marking or in documentation		P
5.1.3	MAINS supply		P
5.1.4	Fuses		N
	All details necessary for fuse replacement	No such fuse was used.	N
	Includes rated voltage and current breaking capacity		N
	If selected according to particular application; marked with symbol 10 and information in documentation		N
5.1.5	Necessary identification for TERMINALS, connectors etc		N
5.1.5.101	Measuring circuit TERMINALS(EN 61010-2-030)	Marked wtih V, A, earthing terminal.	P
5.1.5.101.2	Measuring circuit TERMINALS RATED for MEASUREMENT CATEGORIES II, III or IV(EN 61010-2-030)	CAT I 1000V CAT II 600V	P
5.1.5.101.3	Measuring circuit TERMINALS RATED for connection to voltages above the level of 6.3.1 (EN 61010-2-030)	Marked with symbol 14	P
5.1.5.101.4	Low voltage, permanently connected, or dedicated measuring circuit TERMINALS(EN 61010-2-030)	No such low voltage.	N

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
5.1.5.1	General If necessary for safety, an indication shall be given of the purpose of TERMINALS, connectors, controls, and indicators. Where there is insufficient space, symbol 14 from Table 1 may be used. (EN 61010-2-033)		P
5.1.5.2	TERMINALS(EN 61010-2-033)		P
5.1.5.101	Measuring circuit TERMINALS(EN 61010-2-033)		P
	Parts protected by DOUBLE INSULATION Or REINFORCED INSULATION		--
5.1.6	Switches and circuit-breakers		P
	 and	ON and OFF	P
5.1.7	Equipment protected by double insulation or reinforced insulation		P
			P
5.1.8	Field-wiring TERMINAL boxes		N
5.2	Warning markings		P
	Visible when ready for NORMAL USE		P
	If necessary marked with symbol 14		P
	Near or on particular parts of the PROBE ASSEMBLY		P
	Advise to disconnect or isolate during access to HAZARDOUS LIVE parts or		P
	marked with symbol 14 and information in the instruction manual	Mark on bottom cover.	P
	Easily touched heated parts, if not self-evident, marked with symbol 13		N
	Warning markings specified in 5.1.5.2 d), 6.1.2 b), 6.6.2, 7.3.2 b) 3), 7.4, 10.1, and 13.2.2 shall meet the following requirements. (EN 61010-2-033)		P
	a) Symbols shall be at least 2,75 mm high. Text shall be at least 1,5 mm high and contrast in colour with the background.		P
	b) Symbols or text moulded, stamped or engraved in a material shall be at least 2,0 mm high. If not contrasting in colour, they shall have a depth or raised height of at least0,5 mm.	2.3mm	P
	14 is not required to be used with symbols which are explained in the manual.	State in the user manual	P

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
5.3	Durability of markings		P
	The required markings are clear and legible (NORMAL USE)		P
	Resist cleaning (clear, legible and not worked loose)		P
5.4	Documentation		P
5.4.1	General		P
a)	Intended use	See user manual	P
b)	Technical specification	See user manual	P
c)	Name and address	See user manual	P
d)	The information in 5.4.2 to 5.4.6	See user manual	P
e)	Information about how to mitigate RISKS remaining after a RISK assessment has been performed	See user manual	P
f)	Safety reasons requires specific accessories		P
g)	Instructions shall provide guidance on how to determine that the equipment is functioning correctly;		N
h)	Instructions for lifting and carrying		N
5.4.1	General(EN 61010-2-030)		P
	Replace the first paragraph with the following paragraph: (EN 61010-2-033) The following documentation necessary for safety purposes, as needed by the OPERATOR or the RESPONSIBLE BODY, shall be provided with the equipment, in an accepted language of the country where the product is intended to be placed on the market. Safety documentation for service personnel authorized by the manufacturer shall be made available to those personnel, in a language selected by the manufacturer.		P
Adding	aa) the documentation shall indicate that probe assemblies to be used for MAINS measurements shall be RATED as appropriate for MEASUREMENT CATEGORY III or IV according to IEC 61010-031 and shall have a voltage RATING of at least the voltage of the circuit to be measured; (EN 61010-2-033)	Probe was tested with EN 61010-2-031	P
	bb) information about each relevant MEASUREMENT CATEGORY (see 5.1.5.101).		P
5.4.3	Equipment installation(EN 61010-2-030)		P
5.4.2	Ratings		P
	Maximum voltage RATING	1000V	P
	Maximum current RATING	10A	P
	Statement of the range of environmental conditions	See below	P

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
	a) altitude	< 2000m	P
	b) temperature	0℃ to 40℃	P
	c) maximum relative humidity	< 80% RH (31℃)	P
	d) RATED POLLUTION degree	II	P
	e) IPXX		N
	f) for equipment with an impact RATING less than 5 J, the information specified in 8.1 d).		N
5.4.3	Equipment installation		P
5.4.4	Operation		P
a)	Identification of operating controls		P
b)	instructions not to position the equipment so that it is difficult to operate the disconnecting device;		N
c)	Interconnection requirements		P
	Specification of accessories, materials etc		P
d)	Specification of intermittent operation limits		N
e)	Explanation of required and used symbols		P
f)	Replacement of consumables		N
g)	Cleaning if necessary		P
h)	a statement listing potentially poisonous		N
i)	detailed instructions about RISK reduction procedures relating to flammable liquids		P
j)	details of methods of reducing the RISKS of burns from surfaces		P
5.4.5	Maintenance		P
	Sufficient preventive maintenance and inspection for RESPONSIBLE BODY		P
	Parts to be supplied or examined by the manufacturer only		P
	RATING and characteristics of fuses (see 5.1.3)		P
5.4.6	Integration into systems or effects resulting from special conditions		N
6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
6.1.1	General	see Form A.4	P
6.1.2	Exceptions		--
6.1.2 a)	parts of lamps and lamp sockets after lamp removal		N
6.1.2 b)	Parts intended to be replaced by the operator (for example, battery), but only if they have a warning marking according to 5.2		N

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
6.1.2	Exceptions locking or screw-held type measuring TERMINALS, including TERMINALS which do not require the use of a TOOL.(EN 61010-2-030)	No such terminals.	N
6.2	Determination of ACCESSIBLE parts		P
	According to figure 3	see Form A.5	P
6.2.2	Examination		P
6.2.3	Openings above parts that are HAZARDOUS LIVE		N
6.2.4	Openings for pre-set controls		N
6.3	Permissible limits for ACCESSIBLE parts		P
	Measurements performed according to figure 4		P
6.3.1	Values in NORMAL CONDITION	see Form A.6	P
6.3.2	Values in SINGLE FAULT CONDITION	see Form A.7	P
6.4	Primary means of protection		N
6.4.1	General		P
	a) enclosures or protective barriers		P
	b) basic insulation		N
	c) impedance		N
6.4.2	Enclosures and protective barriers		P
6.4.3	Basic insulation		N
6.4.4	Impedance		N
6.5	Additional means of protection in case of SINGLE FAULT CONDITIONS		P
6.5.1	General prevented from becoming HAZARDOUS LIVE		P
	a) PROTECTIVE BONDING		P
	b) SUPPLEMENTARY INSULATION		P
	c) automatic disconnection of the supply		N
	d) current- or voltage-limiting device		P
	d) current- or voltage-limiting device		N
	f) PROTECTIVE IMPEDANCE		P
	Replacement of the text, ACCESSIBLE parts shall be prevented from becoming HAZARDOUS LIVE in SINGLE FAULT CONDITION. (EN 61010-2-033)		P
	a) SUPPLEMENTARY INSULATION (see 6.5.3).		P
	b) Current or voltage limiting device (see 6.5.6).		P
	c) REINFORCED INSULATION (see 6.5.3).		P

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
	d) PROTECTIVE IMPEDANCE (see 6.5.4).		N
6.5.2	Protective bonding		N
6.5.2	Not used(EN 61010-2-033)		N
6.5.2.1	General		N
6.5.2.2	Integrity of protective bonding		N
6.5.2.3	Protective conductor terminal		N
6.5.2.3	PROTECTIVE CONDUCTOR TERMINAL (EN 61010-2-030)		P
6.5.2.101	Indirect bonding for testing and measuring circuits(EN 61010-2-030)		P
6.5.2.4	Impedance of protective bonding of plug-connected equipment		N
6.5.2.5	Impedance of protective bonding of permanently connected equipment		N
6.5.2.6	Transformer protective bonding screen		N
6.5.3	Supplementary insulation and reinforced insulation		P
6.5.4	Protective impedance		N
6.5.5	Automatic disconnection of the supply		N
6.5.5	Not used(EN 61010-2-033)		N
6.5.6	Current or voltage-limiting device		N
6.6	Connections to external circuits		N
6.6.1	General		P
6.6.2	Terminals for external circuits		P
6.6.3	Circuits with terminals which are hazardous live		P
6.6.4	Terminals for stranded conductors		P
6.6.101	Measuring circuit TERMINALS (EN 61010-2-030, EN 61010-2-033)	>2.6MM	P
6.6.102	Specialized measuring circuit TERMINALS (EN 61010-2-030, EN 61010-2-033)		P
6.7	Insulation requirements		P
6.7.1	The nature of insulation		P
	Insulation between circuits and accessible parts (see 6.2) or between separate circuits consists of a combination of clearances, creepage distances and solid insulation		P
6.7.1.2	Clearances		P
	If the equipment is rated to operate at an altitude greater than 2 000 m, all clearances shall be multiplied by the applicable factor of table 3.	<2000m	P
6.7.1.3	Creepage distances		P
6.7.1.4	Solid insulation		P
6.7.1.5	Requirements for insulation according to type of circuit		P

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
	Add the following new item to the list: aa) in K.101 for measuring circuits of MEASUREMENT CATEGORIES III and IV.(EN 61010-2-033)		P
	NOTE 2 Not used.(EN 61010-2-033)		N
6.7.2	Insulation for mains circuits of overvoltage category ii with a nominal supply voltage up to 300 v		P
6.7.2.2	Solid insulation		P
6.7.2.2.2	Moulded and potted parts		P
6.7.2.2.3	Inner insulating layers of printed wiring boards		P
6.7.2.2.4	Thin-film insulation		P
6.7.3	Insulation for secondary circuits derived from mains circuits of overvoltage category ii up to 300 v		N
6.7.3.1	General		N
6.7.3.2	Clearances		N
6.7.3.3	Creepage distances		N
6.7.3.4	Solid insulation		N
6.7.3.4.2	Moulded and potted parts		N
6.7.3.4.3	Inner insulating layers of printed wiring boards		N
6.7.3.4.4	Inner insulating layers of printed wiring boards		N
6.8	Procedure for voltage tests		P
6.8.2	Humidity preconditioning	41℃, 93%RH, 48 h	P
6.8.3	Test procedures		P
6.8.3.1	The a.c. voltage test		P
6.8.3.2	The 1 min d.c. voltage test		P
6.8.3.3	The impulse voltage withstand test		P
6.9	Constructional requirements for protection against electric shock		P
6.9.1	General		P
6.9.2	Insulating materials		P
6.9.3	Colour coding		N
6.9.101	Over-range indication(EN 61010-2-030)	When connect to over range, unit was warning and protected.	P
6.9.101	METER RATINGS(EN 61010-2-033)		P
6.10	Connection to the MAINS supply source and connections between parts of equipment		N
6.10.1	MAINS supply cords		N
6.10.2	Fitting of non-detachable MAINS supply cords		N
6.10.3	Plugs and connectors		N

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
6.11	Disconnection from supply source		N
7	**PROTECTION AGAINST MECHANICAL HAZARDS**		P
7.1	The equipment shall not cause a mechanical HAZARD in NORMAL USE,		P
	a) sharp edges which could cause cuts		P
	b) moving parts		N
	c) unstable equipment		N
	d) falling equipment,		N
	e) expelled parts from the equipment		N
7.2	Sharp edges		P
7.3	Moving parts		N
7.3.1	General		N
	HAZARDS from moving parts		N
7.3.2	Exceptions		N
	Access is permitted in the following circumstances		N
a)	Moving parts which are obviously intended to operate		N
b)	Maintenance outside NORMAL USE,		N
	1) access is not possible without the use of a TOOL;		N
	2) the instructions for the RESPONSIBLE BODY		N
	3) there are warning markings on covers or parts		N
7.3.3	RISK assessment for mechanical HAZARDS to body parts		P
7.3.4	Limitation of force and pressure		N
7.3.5	Gap limitations between moving parts		N
7.4	Stability		P
7.5	Provisions for lifting and carrying		N
7.5.1	General		N
	Equipment or parts having a mass of 18 kg or more shall be provided with a means for lifting and carrying, or directions shall be given in the documentation.		N
7.5.2	Handles and grips		N
	Withstanding a force of four times the weight of the equipment, for a period of 1 min.		N
7.5.3	Lifting devices and supporting parts		N
	Withstand four times the maximum static load.		N
7.6	Wall mounting		N
7.7	Expelled parts		N

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict

8	**RESISTANCE TO MECHANICAL STRESSES**		**P**
8.1	Withstand shock and impact likely to occur in NORMAL USE, required is 5 J.		P
8.2	Enclosure rigidity tests		P
8.2.1	Static test		P
	Force of 30 N applied		P
8.2.2	Impact test		P
	Smooth steel sphere with a mass 500 g 25 g		P
	The impact test can be performed with the equipment mounted at 90° to its normal position to allow both the method of Figure 10 a) and Figure 10 b). Impact energy level J and IK Code: 1 (IK06) / 2 (IK07) / 5 (IK08) Vertical fall distance (X) mm: 200 / 400 / 1 000		P
8.3	Drop test		P
8.3.1	Equipment other than hand-held equipment and direct plug-in equipment		N
	100mm for equipment up to 20 kg		N
	25mm for between 20 kg and 100 kg		N
8.3.2	Hand-held equipment and direct plug-in equipment	Hand-held equipment	P
	The equipment is dropped once through a distance of 1 m onto a 50 mm thick hardwood board	1 m, after test, unit no any damage.	P

9	**TEMPERATURE LIMITS AND PROTECTION AGAINST THE SPREAD OF FIRE**		
9.1	General		P
9.2	Eliminating or reducing the sources of ignition within the equipment		P
9.3	Containment of fire within the equipment, should it occur		P
9.4	Limited-energy circuit		N
9.5	Requirements for equipment containing or using flammable liquids		N
9.6	Overcurrent protection		N

10	**EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT**		**P**
10.1	Integrity of CLEARANCES and CREEPAGE DISTANCES		P
10.2	Temperatures of windings		N

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
	Probe assemblies with non-metallic enclosures are resistant to elevated temperatures:		N
10.3	Other temperature measurements		P
10.4	Conduct of temperature tests		N
10.5	Resistance to heat		P
10.5.1	Requirements of 6.5 are met at an ambient temperature of 40 °C of maximum rated ambient temperature (if higher)		P
10.5.2	Non-metallic ENCLOSURES		P
	ENCLOSURES of non-metallic material shall be resistant to elevated temperatures.		P
a)	A non-operative treatment,	70°C, for 7h	P
b)	An operative treatment,		N
10.5.3	Insulating material		P
	Insulating material shall have adequate resistance to heat.		P
1)	*The test is made in a heating cabinet at the temperature measured as specified in 10.3 d) or 10.3 e) ± 2 °C, or at 125 °C ± 2 °C, whichever is higher.*	125°C	P
2)	*The Vicat softening test of ISO 306, method A120. The Vicat softening temperature shall be at least 130 °C.*		N

11	**PROTECTION AGAINST HAZARDS FROM FLUIDS**		**N**
11.1	General		N
	OPERATOR and surrounding area are protected against HAZARDS from fluids if PROBE ASSEMBLIES containing or intended to be used with fluids	No such fluids.	N
11.2	Cleaning		N
	Cleaning procedure applied three times to the probe assembly		N
11.3	Spillage		N
	liquid is likely to be spilt into the equipment, the equipment shall be designed so that no HAZARD will occur		N
11.4	Overflow		N
11.5	Battery electrolyte		N
11.6	Specially protected equipment		N
11.7	Fluid pressure and leakag		N
11.7.1	Maximum pressure		N
11.7.2	Leakage and rupture at high pressure		N
11.7.3	Leakage from low-pressure parts		N

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
11.7.4	Overpressure safety device		N
12	**PROTECTION AGAINST RADIATION, INCLUDING LASER SOURCES, AND AGAINST SONIC AND ULTRASONIC PRESSURE**		**N**
12.1	General		N
12.2	Equipment producing ionizing radiation		N
12.3	Ultraviolet (UV) radiation		N
12.4	Microwave radiation		N
12.5	Sonic and ultrasonic pressure		N
12.6	Laser sources		N
13	**PROTECTION AGAINST LIBERATED GASES AND SUBSTANCES, EXPLOSION AND IMPLOSION**		N
13.1	Poisonous and injurious gases and substances	No such device.	N
13.2	Explosion and implosion		N
13.2.3	Implosion of cathode ray tubes		N
14	**COMPONENTS AND SUBASSEMBLIES**		P
14.1	General		P
14.2	Motors		N
14.3	Overtemperature protection devices		N
14.4	Fuse holders		P
14.5	MAINS voltage selection devices		N
14.6	MAINS transformers tested outside equipment		N
14.7	Printed wiring boards		P
14.8	Circuits or components used as transient overvoltage limiting devices		N
14.101	Circuits or components used as TRANSIENT OVERVOLTAGE limiting devices in measuring circuits used to measure MAINS (EN 61010-2-030,EN 61010-2-033)		N
14.102	Probe assemblies and accessories IEC 61010-031 (EN 61010-2-033)	Probe was tested with 61010-2-031	P
15	**PROTECTION BY INTERLOCKS**		N
15.1	General		N
15.2	Prevention of reactivating		N
15.3	Reliability		N

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
16	**HAZARD RESULTING FROM APPLICATION**		P
16.1	Reasonably foreseeable misuse		P
16.2	Ergonomic aspects		N
	If the following factors could give rise to a HAZARD, a RISK assessment shall be documented, taking into account at least the following aspects:		N
	a) limitation of body dimensions;		N
	b) displays and indicators;		N
	c) accessibility and conventions of controls;		N
	d) arrangements of TERMINALS.		N
16.101	Over-range indication(EN 61010-2-030)		P
17	**RISK ASSESSMENT**		P
	a) RISK analysis		P
	b) RISK evaluation		P
	c) RISK reduction		P
101	**Measuring circuits(EN 61010-2-030, EN 61010-2-033)**		P
101.2	Current measuring circuits	Tested with maximum current 10A, for 6 000 times.	P
101.3	Protection against mismatches of inputs and ranges		P
101.3.1	General		P
101.3.2	Protection by a certified overcurrent protection device	Current fuse was used.	P
101.3.3	Protection by uncertified current limitation devices or by impedances		P
101.4	Test leads for the tests of 101.3.2 and 101.3.3	1m and 1.5mm^2 for lead	P
101.4	Functional integrity		P
Annex A	**Measuring circuits for accessible current**		**P**
A.l	Measuring circuits for d.c. and for a.c. with frequencies up to 1 MHz		P
	The current shall be measured with the circuit of figure A.1. The current shall be calculated from:	I=U/500	P
	Where I is the current, in amperes; U is the voltage in volts indicated by the voltmeter		--

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
	This circuit represents the impedance of the body and compensates for the change of physiological response of the body with frequency.		P
A.2	Measuring circuits for d.c. and for a.c. with sinusoidal frequencies up to 100 Hz		N
	If the frequency does not exceed 100 Hz, the current may be measured with the alternative circuit of figure A.2. When using the voltmeter, the current shall be calculated from:	I=U/2000	N
	Where I is the current in amperes; U is the voltage in volts indicated by the voltmeter The circuit represents the impedance of the body for frequencies not exceeding 100 Hz.		N
A.3	Current measuring circuit for electrical burns at high frequencies		N
	The current shall be measured with the circuit of figure A.3. The current shall be calculated from:	I=U/500	N
	Where I is the current amperes; U is the voltage in volts indicated by the voltmeter. This circuit compensates for the change of physiological response to the body with frequency.		N
A.4	Measuring circuit for wet contact		N
	For wet contact the circuit of figure A.4 shall be used. The current is calculated from:	I=U/500	N
	Where I is the current in amperes; U is the voltage, indicated by the voltmeter. This circuit represents the impedance of the body when there is no skin contact resistance.		N

Annex B	**Standard test fingers(see 6.2)**	**P**

Annex C	**Measurement of creepage distances and clearances**		**P**
	The width X of grooves specified in examples 1 to 11 apply to all examples as a function of the pollution degrees given in Table C.1.		P
	If the associated clearance is less than 3 mm, the minimum groove width shall be reduced to one-third Of this clearance.		P

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
	The methods of measuring creepage distances and clearances are indicated in the following Examples 1 to 11. These cases do not differentiate between gaps and grooves or between types of insulation.		P
	The following assumptions are made:		P
	a) If the distance across a groove is equal to, or larger than, the specified width X, the creepage distance is measured along the contours of the groove (see example 2);		P
	b) Any recess is assumed to be bridged with an insulating link having a length equal to the specified width X and being placed in the most unfavorable position (see example 3);		N
	d) Creepage distances and clearances measured between parts which can assume different positions in relation to each other, are measured when these parts are in their most unfavorable position.		P
Annex D	**Index of defined terms**		**P**
Annex ZA	**(normative) Normative references to international publications with their corresponding European publications**		**P**
	This European Standard incorporates by dated or undated reference, provisions from other Publications. These normative references are cited at the appropriate places in the text and the Publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).		P
Annex K	**Insulation requirements not covered by 6.7**		**P**
K.3	Insulation in circuits not addressed in 6.7, K.1 or K.2		P
K.3	Insulation in circuits not addressed in 6.7, K.1 or K.2, and in measuring circuits where MEASUREMENT CATEGORIES do not apply		P
K.101	Insulation requirements for measuring circuits of MEASUREMENT CATEGORIES II, III and IV		P
K.101.1	General		P

EN 61010-1+EN 61010-2-030+EN 61010-2-033			
Clause	Requirement + Test	Result – Remark	Verdict
K.101.2	CLEARANCES		P
K.101.3	CREEPAGE DISTANCES		P
K.101.4	Solid insulation		P
K.101.4.1	General		P
K.101.4.2	Moulded and potted parts		P
K.101.4.3	Inner insulating layers of printed wiring boards		P
K.101.4.4	Thin-film insulation		P
K.102	Reduction of MEASUREMENT CATEGORIES by the use of overvoltage limiting devices		P

Appended table			
Clause	Requirement + Test	Result – Remark	Verdict

4.4.2	**TABLE: Summary of SINGLE FAULT CONDITIONS**			**Form A.1**	**P**
Subclause	Title	Does not apply	Carried out	Comments	
4.4.2.1	Equipment or parts for short-term or intermittent operation	Yes			
4.4.2.2	Protective conductor	Yes			
4.4.2.3	Protective conductor	Yes			
4.4.2.4	Equipment or parts for short-term or intermittent operation	Yes			
4.4.2.5	Motors	Yes			
4.4.2.6	Capacitors	Yes			
4.4.2.7	Mains transformers Attach drawing of MAINS Txs showing all protective devices (see Forms A.29 and A.30)	Yes			
4.4.2.8	Outputs	Yes			
4.4.2.9	Equipment for more than one supply	Yes			
4.4.2.10	Cooling – air holes closed – fans stopped – coolant stopped	Yes			
4.4.2.11	Heating devices – timer overridden – temperature controller overridden – loss of cooling liquid – overfilled or empty or both	Yes			
4.4.2.12	Insulation between circuits and parts	Yes			
4.4.2.13	Interlocks	Yes			
List below all SINGLE FAULT CONDITIONS not covered by 4.4.2.1 to 4.4.2.4:					
4.4.1	Short circuit of D1		Yes	No hazard	
13.2.2	Battery reverse		Yes	No hazard	
13.2.2	Battery short circuit		Yes	No hazard	
16.2	Misapplication		Yes	No hazard	
Supplementary information: (see Form A.2 for details of tests)					

Appended table			
Clause	Requirement + Test	Result – Remark	Verdict

4.4	**TABLE: Testing in single FAULT CONDITION – Results**			**Form A.2**	**P**
Test sub clause	Fault No.	Fault description	Td 4.4.3 (NOTE)	How was test terminated Comments	Meets 4.4.4
4.4.1	(1)	U14(PIN 4-6) short circuit	60 s	Until temperture rise steady	P
13.2.2	(2)	Battery reverse	2 h	The product can not operating, no any hazard.	P
13.2.2	(3)	Battery short circuit	2 h	The product can not operating, no any hazard.	P

NOTE Td = Test duration in h:min:s
Record dielectric strength test on Form A.14 and temperature tests on Form A.20.
Record in the comments column for each test whether carried out during or after SINGLE FAULT CONDITION.

Supplementary information:

5.1.3c)	**TABLE: Mains supply**		**Form A.3**	**N**
	Marked rating ..... :	V		—
	Phase ..... :			—
	Frequency ..... :	Hz		—
	Current ..... :	A		—
	Power ..... :	W		—
	Power ..... :	VA		—

Test No.	Voltage V	Frequency Hz	Current A	Power in W	Power in VA	Comments

Note: Measurements are only required for marked ratings.

Supplementary information:

Appended table			
Clause	Requirement + Test	Result – Remark	Verdict

5.3	TABLE: Durability of markings	Form A.4	P

Marking method (see NOTE)	Agent
1) Printed	A Water
2) Moulded	B ☐ Isopropyl alcohol/ ☒ Petroleum spirit
3)	C (specify agent)
4)	D (specify agent)
5)	E (specify agent)

NOTE – Where applicable include print method, label material, ink or paint type, fixing method, adhesive and surface to which marking is fixed.

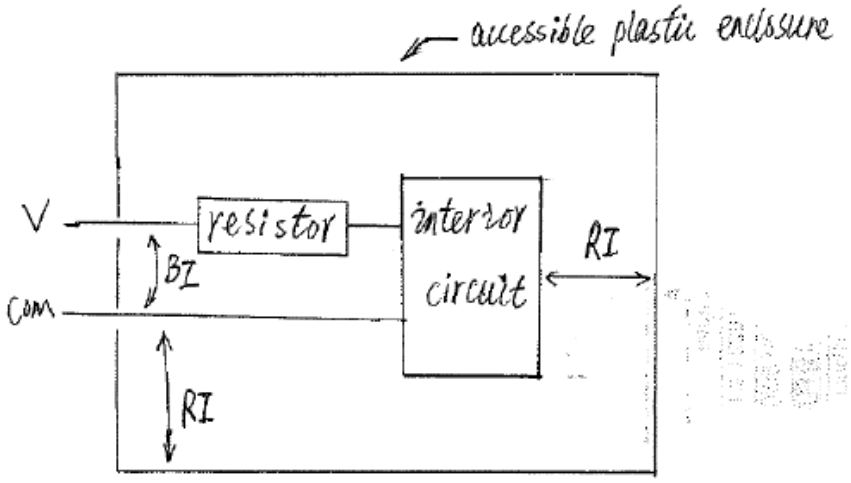
Marking location	Marking method (see above)
Identification (5.1.2)	1)
Mains supply (5.1.3)	--
Fuses (5.1.4)	--
TERMINALS and operating devices (5.1.5.1)	--
Measuring circuit TERMINALS (5.1.5.2)	1)
Switches and circuit-breakers(5.1.6)	1)
DOUBLE/REINFORCED equipment (5.1.7)	2)
Field wiring TERMINAL boxes (5.1.8)	1)
Warning marking (5.2)	2)
Battery charging (13.2.2)	--

Method	Test agent	Remains legible Verdict	Label loose Verdict	Curled edges Verdict	Comments
1), 2)	A, B	Remains legible	No loose	No curled	All markings pass the test

Supplementary information:

Appended table			
Clause	Requirement + Test	Result – Remark	Verdict

6	**TABLE: Protection against electric shock - Block diagram**	**Form A.5**	P



POLLUTION DEGREE ...: II	Measurement category (overvoltage category) ..: CAT I

Location or description	Insulation type (NOTE 1)	Maximum working voltage (NOTE 2)	CREEPAGE DISTANCE (NOTE 3) PWB mm	CTI	Other mm	CTI	CLEARANCE (NOTE 3) mm	Test voltage (NOTE 2) V	Comments
Live parts in battery Compartment to accessible surface	RI	1000	--	--	>22	--	22	6880Vr.m.s	--
Live parts on PCB to external surface of knob	RI	1000	--	--	>22	--	22	6880Vr.m.s	--
									--

NOTE 1 – Type of insulation:	NOTE 2 - Types of voltage	NOTE 3 - MEASUREMENT CATEGORY (OVERVOLTAGE CATEGORIES)
BI = BASIC INSULATION DI = DOUBLE INSULATION PI = PROTECTIVE IMPEDANCE RI = Reinforced INSULATION SI = Supplementary INSULATION	Peak impulse test voltage (pulse) r.m.s. d.c. peak	or POLLUTION DEGREES which differ from these should be shown under "Comments".

Appended table			
Clause	Requirement + Test	Result – Remark	Verdict

6.2	**TABLE: List of ACCESSIBLE parts**		**Form A.6**	**P**
6.1.1	Exceptions			—
6.2	Determination of ACCESSIBLE parts			—

Item	Description	Determination method (NOTE 5)	Exception under 6.1.1 (NOTE 4)
1	Enclosure	Test with jointed test finger; pin 3 mm diameter, (NOTE 1), there is no any hazardous parts accessible	No
2	Switch knob	Test with jointed test finger; pin 3 mm diameter, (NOTE 1), there is no any hazardous parts accessible	No

NOTE 1 – Test fingers and pins are to be applied without force unless a force is specified (see 6.2.1)
NOTE 2 – Special consideration should be given to inadequate insulation and high voltage parts (see 6.2)
NOTE 3 – Parts are considered to be ACCESSIBLE if they could be touched in the absence of any covering which is not considered to provide suitable insulation (see note to paragraph 1 of 6.4).
NOTE 4 – Capacitor test may be required
NOTE 5 – The determination methods are: visual; rigid test finger; jointed test finger; pin 3 mm diameter.

Supplementary information:

Appended table / Form A of EN 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

6.3.1	**TABLE: Values in NORMAL CONDITION** (see NOTE 1)	**Form A.7**	**P**
6.1.1	Exceptions	11.1 General	--
6.3.1	Values in NORMAL CONDITION	11.2 Cleaning	--
		11.3 Specially protected PROBE ASSEMBLIES	N

Item	Voltage			Current				Capacitance		10 s test			Comments
(see Form A.5)	V r.m.s.	V peak	V d.c.	Test circuit A1/A2/A3	mA r.m.s.	mA peak	mA d.c.	μC	mJ	V	μC	mJ	
Accessible parts to protective earth	46	58	--	A1	0.082	0.13	--	--	--	--	--	--	Sinusoidal waveform

NOTE 1 – The requirements of 6.3.1 include drying out (if specified).

Supplementary information:

Appended table / Form A of EN 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

6.3.2	**TABLE: Values in SINGLE FAULT CONDITION**											**Form A.8**	**P**
Item (See Form A.4)	Sub clause and fault No. (see FormA.2)	Voltage			Transient (see NOTE)		Current				Capacitance μF (NOTE)	Comments	
		V r.m.s.	V peak	V d.c.	V	s	Test circuit A1/A2/A3	mA r.m.s.	mA peak	mA d.c.			
Accessible parts to protective earth	See form A2	46	58	--	46	>10S	A1	0.098	0.15	--	--	Measure CAT III 1000 V	
NOTE – Transient voltages must be below the limits given from Figure 1 and the capacitance below the limits from figure 5 of IEC 61010-031.													
Supplementary information:													

Appended table / Form A of EN 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

6.4.6	**TABLE: PROTECTIVE IMPEDANCE**		**Form A.9**	**N**
A high INTEGRITY single component				
Component		Location	Comments	
A combination of components				
Component		Location	Comments	
A combination of BASIC INSULATION and a current or voltage limiting device				
Component		Location	Comments	
Supplementary information:				

Appended table / Form A of EN 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

6.5	**TABLE: CLEARANCES and CREEPAGE DISTANCES** **Form A.10**	**P**
6.4	Insulation requirements for protection against electric shock	P
6.7.2	ENCLOSURES of PROBE ASSEMBLIES with DOUBLE or REINFORCED INSULATION	P
8	Mechanical resistance to shock and impact	P
10.1	Integrity of CLEARANCES and CREEPAGE DISTANCES	P

Location (see Form A.5)	Measured (initial)		Verdict	Mechanical tests (note)				Test at max. RATED ambient	Measured after test (if required)		Verdict	Comments
	CREEPAGE DISTANCE (cr.)	CLEARANCE (cl.)		Applied force	Rigidity	Drop	Impact swing		CREEPAGE DISTANCE (cr.)	CLEARANCE (cl.)		
	mm	mm		N	(8.1)	(8.3)	(8.2.2)	(10.2)	mm	mm		
	22	22	P	--	30N, 3 times	1m height, 3 times	2m height,	40℃	16	16	P	RI
	22	22	P						17	17	P	

NOTE – Refer to Form A.10 for voltage tests following the above tests.

Supplementary information:

Appended table / Form A of EN 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

6.6	**TABLE: Voltage tests**	**Form A.11**	**P**
4.4.4	Conformity after application of fault conditions[1]		P
6.4	Insulation requirements for protection against electric shock		P
6.7.2	ENCLOSURES of PROBE ASSEMBLIES with DOUBLE or REINFORCED INSULATION		P
6.7.5	Insulation of a probe cable		P
8	Mechanical resistance to shock and impact		P
11	Protection against hazards from fluids		P

[1] Record the fault, test or treatment applied before the voltage test

	Test site altitude ..... :	< 2000m	—
	Test voltage correction factor (see Table 10) ... :	--	—

Location or references from Forms A.2 and A.5	Humidity Yes/No	Working voltage (V)	Test voltage r.m.s./ peak/ d.c (V)	Comments	Verdict
Interior circuit to accessible parts	Yes	1000Vac	6880Vr.m.s	RI	P
	Yes	1000Vac	6880Vr.m.s	RI	P

Supplementary information:

6.7.4	**TABLE: Cord anchorage of cable attachment**	**Form A.12**	N/A

Location	Pull N	Verdict	Flexing/ pull	Verdict	Rotational flexing	Verdict	Comment

Supplementary information:

10	**TABLE : Temperature Measurements**	**Form A.13**	**P**
10.1	Surface temperature limits - NORMAL CONDITION and / or SIGNLE FAULT CONDITION		P

Operating conditions:	CAT IV 250 V		
Frequency.....:	60Hz	Test room ambient temperature (t_a) .... :	24 °C
Voltage.....:	250V	Test duration..... :	2 h 21 min

Part / Location	t_m °C	t_c °C	t_{max} °C	Verdict	Comments
PCB	44.5	60.5	130	P	--
Internal surface of battery cover	36.6	52.6	85	P	--

Appended table / Form A of EN 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

10	**TABLE : Temperature Measurements**				**Form A.13**	**P**
10.1	Surface temperature limits - NORMAL CONDITION and / or SIGNLE FAULT CONDITION					P
Operating conditions:	CAT IV 250 V					
Frequency.....:	60Hz	Test room ambient temperature (t_a) .... :			24 °C	
Voltage.....:	250V	Test duration..... :			2 h 21 min	
Part / Location		t_m °C	t_c °C	t_{max} °C	Verdict	Comments
Enclosure, outside		35.4	51.4	85	P	--
Knob		33.0	49.0	70	P	--
						--

NOTE 1 - t_m = measured temperature
t_c = t_m corrected (t_m–t_a+ 40 °C or max. RATED ambient)
t_{max} = maximum permitted temperature
NOTE 2 - See also 12.1 with reference to component operating conditions
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary
NOTE 4 - The tests of 6.7.4.1 to 6.7.4.3 are performed before temperature tests.

Supplementary information:

10.5.2	**TABLE: Resistance to heat of non-metallic enclosures**		**Form A.14**	**P**
	Test method used:		See below	—
	Non operative treatment ..... :		70℃, 7h	P
	Empty ENCLOSURE ..... :		Yes	P
	Operative treatment ..... :		--	P
	Temperature during tests..... :		See above	—
	ENCLOSURE samples tested were..... :		Disassembly	—
Description		Material	Comments	Verdict
Enclosure		ABS	V-0, 85 °C	P
	Voltage test (6.8)..... :		6880Vr.m.s	P

Supplementary information:

Table of EN 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

	TABLE: 3 - List of components and circuits relied on for safety				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
Plastic enclosure	LG Chemical Ltd	AF-312	V-0, 85℃, CTI (400-600), ABS	--	UL E67171
(Alternative)	Various	Various	V-0, 85℃, CTI (400-600), ABS	--	UL
Transparent cover	Chi Mei Corporation	CM-211	HB, 50℃, CTI (400-600), PMMA	--	UL E56070
(Alternative)	Various	Various	HB, 50℃, CTI (400-600), PMMA	--	UL
Button	Shin-Etsu Chemical Co., Ltd.	KE-5606@	V-0, 150℃, CTI (400-600), Silicone (SI)	--	UL E48923
Button (Alternative)	Shin-Etsu Chemical Co., Ltd.	KE-5616M@	V-0, 150 ℃, CTI (400-600), Silicone (SI)	--	UL E48923
(Alternative)	Various	Various	V-0, 150 ℃, CTI (400-600), Silicone (SI)	--	UL
PCB	Shenzhen Hua Yan Hui Hai Electronic Co Lt	HM	V-0, 130 ℃, thickness: 1,54 mm	--	UL E237212
PCB (Alternative)	Various	Various	V-0, 130 ℃	--	UL
Fuse	Various	Various	250V, 315mA, 5*20mm	--	UL/EU

Pictures

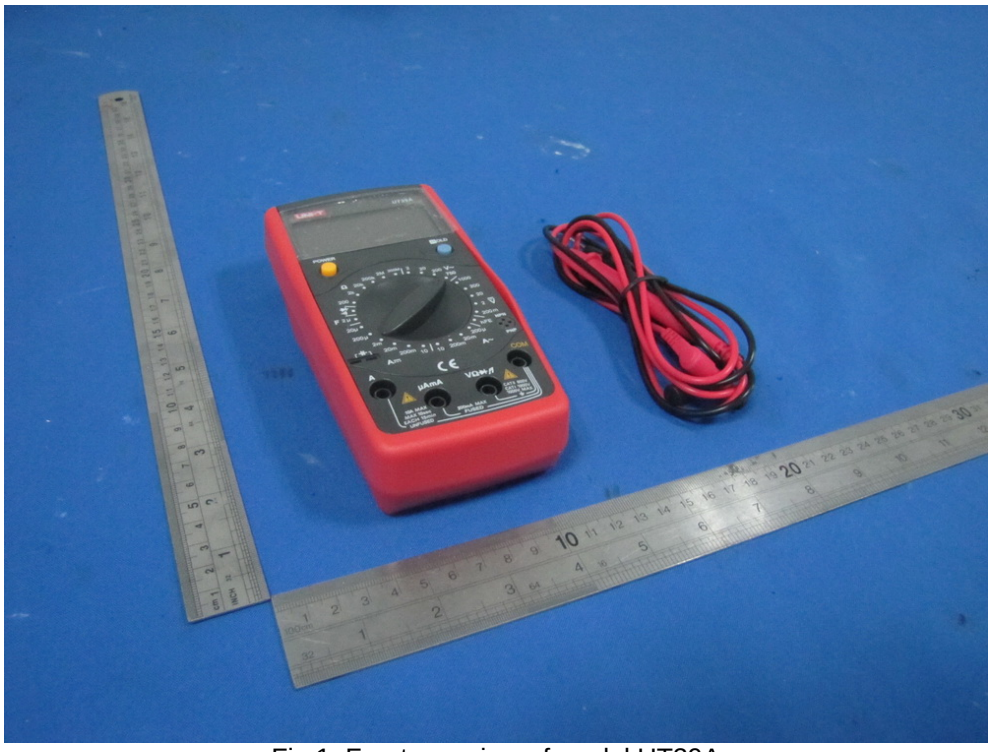


Fig 1. Front overview of model UT39A

Fig 2. Rear overview of model UT39A

Pictures

Fig 3. Front overview of model UT39B

Fig 4. Front overview of model UT39C

Pictures

Fig 5. Front overview of model UT39E

Fig 6. Internal overview of model UT39E

Pictures

Fig 7. PCB overview of model UT39E

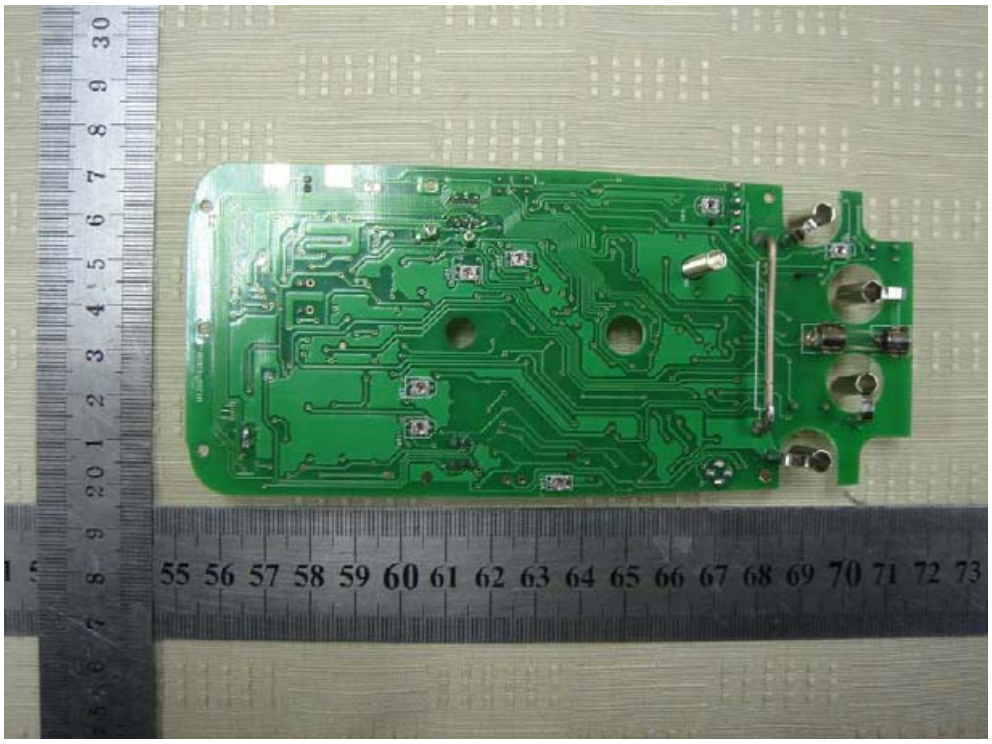


Fig 8. PCB overview of model UT39E