TEST REPORT

IEC 60950

Safety of information technology equipment

Report Reference No	0219052
Tested by (+ signature)	Sammy Wu
Approved by (+ signature)	Patrick Hsu
Date of issue	May 28, 2002
Contents	68 pages test report + 5 photo pages

Testing laboratory

Name	SEMKO AB
Address	P.O. Box 1103, SE-164 22 Kista, SWEDEN
Testing location	Compal Electronics, Inc.
	No. 581, Jui-Kuang Rd., Neihu, Taipei (114), Taiwan.

Client

Name	Compal Electronics, Inc.
Address	No. 581, Jui-Kuang Rd., Neihu, Taipei (114), Taiwan.

Test specification

Standard	IEC 60950:1991 + A1: 1992 + A2: 1993 + A3: 1995 + A4: 1996
Test procedure	CB-scheme
Procedure deviation	Group differences, special national deviations of all CENELEC countries and national differences of AU, CN, JP, KR and SG
Non-standard test method	N. A.

Test Report Form/blank test report

Test Report Form No.	I950___D/97-06
Master TRF	reference No. I950___D, dated 97-02

Test item

Description	Notebook Computer
Trademark	acer and COMPAL
Model and/or type reference	BY** and CY** (see note on page 2)
Manufacturer	Same as client
Rating(s)	Input: 19 Vdc, 3.42 or 3.68 A (see note on page 2)
	Class III

Particulars: test item vs. test requirements	
Equipment mobility	Movable
Operating condition	Continuous
Tested for IT power systems	No
IT testing, phase-phase voltage (V)	—
Class of equipment	Class III
Mass of equipment (kg)	Approx. 3.2 Kg
Protection against ingress of water	IP20

Test case verdicts	
Test case does not apply to the test object	N (.A.)
Test item does meet the requirement	P (ass)
Test item does not meet the requirement	F (ail)
Test case has not been checked	—

General remarks

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

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

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

"(see appended table #)" refers to a table appended to the report.

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

"EUT" means the equipment under test.

Note

Model designation:

- Models BY** (trade mark: acer) and CY** (trade mark: COMPAL) are identical except for model designation, rated input current and trade mark.
- The rated input current of model BY** is 3.42 A; the rated input current of model CY** is 3.68 A.
- The " * " in the model designation can be 0 – 9, A – Z or blank to denote minor change in SELV circuits. No safety concern.

Copy of marking plate

(Representative)

acer 筆記型電腦

TravelMate 270 series
MODEL NO(型號): BY25
DC RATING(額定電壓, 電流): ⎓ 19V, 3.42A
型号: BY25
额定电压, 电流: ⎓ 19V, 3.42A

Product of Acer Inc., Acer and logo are registered trademarks of Acer Incorporated.

Apparatus Claims of U.S. Patent Nos. 4,631,603; 4,577,216; 4,819,098, and 4,907,093 licensed for limited viewing uses only.

Made in Taiwan (台灣製造/台湾制造)

Acer Incorporated
宏碁股份有限公司

CY25-14.1 筆記型電腦 笔记本电脑

Model : CY25
Rating: 19V ⎓ ,3.68A
型號/型号: CY25
額定電壓, 電流 / 額定电压, 电流 : 19V ⎓ , 3.68A

COMPAL CY25 Series
FC Tested To Comply With FCC Standards
FOR HOME OR OFFICE USE

Canada ICES-003, Class/Classe B

Apparatus Claims of U.S. Patent Nos. 4,631,603; 4,577,216; 4,819,098, and 4,907,093 licensed for limited viewing uses only.

製造廠家: 仁寶電腦工業股份有限公司(台灣平鎮廠)台灣製造
制造厂家: 仁宝电脑工业股份有限公司(台湾平镇厂)台湾制造

DM
MADE IN TAIWAN

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
1	**GENERAL**		
1.5	**Components**		
1.5.1	Comply with IEC 60950 or relevant component standard	(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components		P
	Dimensions (mm) of mains plug for direct plug-in :	Not direct plug-in equipment	N
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N)		N
1.5.3	Transformers		N
1.5.4	High voltage components (component; manufacturer; flammability) ..... :	No voltage generated higher than 4 KV	N
1.5.5	Interconnecting cables		N
1.5.6	Mains capacitors		N
1.6	**Power interface**		
1.6.1	Steady state input current	(see appended table 1.6)	P
	Current deviation during normal operating cycle		P
1.6.2	Voltage limit of hand-held equipment		N
1.6.3	Neutral conductor insulated from earth and body	Class III equipment	N
1.6.4	Components in equipment intended for IT power system		N
1.6.5	Mains supply tolerance (V) ..... :	Class III equipment	N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
1.7	**Marking and instructions**		
1.7.1	Rated voltage (V) ..... :	19 V	P
	Symbol of nature of supply for d.c. ..... :	V ⎓	P
	Rated frequency (Hz) ..... :	DC supply	N
	Rated current (A) ..... :	3.42 or 3.68 A	P
	Manufacturer ..... :		N
	Trademark ..... :	acer or COMPAL	P
	Type/model ..... :	BY** and CY**	P
	Symbol of Class II ..... :	Class III equipment	N
	Certification marks ..... :		N
1.7.2	Safety instructions		P
1.7.3	Short duty cycles		N
1.7.4	Marking for voltage setting/frequency setting ..... :		N
1.7.5	Marking at power outlets ..... :		N
1.7.6	Marking at fuseholders ..... :		N
1.7.7.1	Protective earthing terminals		N
1.7.7.2	Terminal for external primary power supply conductors		N
1.7.8.1	Identification and location of switches and controls ..... :	No controls affecting safety	P
1.7.8.2	Colours of controls and indicators ..... :		N
1.7.8.3	Symbols according to IEC 60417 ..... :	The IEC 60417 No. 5009 is marked on or adjacent to the switch for stand-by purpose	P
1.7.8.4	Figures used for marking ..... :		N
1.7.8.5	Location of markings and indications for switches and controls ..... :	The marking for the switch is located on or adjacent to the stand-by switch	P
1.7.9	Isolation of multiple power sources ..... :		N
1.7.10	Instructions for installation to IT power system		N
1.7.11	Instructions when protection relies on building installation		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
1.7.12	Marking when leakage current exceeds 3,5 mA		N
1.7.13	Indication at thermostats and regulating devices		N
1.7.14	Language of safety markings/instructions		P
	Language ..... :	English and local language to each country that would be marketed	—
1.7.15	Durability and legibility		P
1.7.16	Removable parts	Located on bottom enclosure which is not removable part	P
1.7.17	Warning text for replaceable lithium batteries	The Lithium battery for RTC is not replaceable (soldered in the main board), no safety warning is required The warning for Battery Pack (Lithium type) is marked in both the operating and the service instruction	P
	Language ..... :	English and local language to each country that would be marketed	—
1.7.18	Operator access with a tool ..... :		N
1.7.19	Equipment for restricted access locations ..... :		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
2	**PROTECTION FROM HAZARDS**		
2.1	**Protection against electric shock and energy hazards**		
2.1.1	Access to energized parts		P
2.1.2	Protection in operator access areas	See Remark below	P
	Test by inspection ..... :	No concerned hazardous parts are accessible	P
	Test with test finger ..... :	No concerned hazardous parts are accessible	P
	Test with test pin ..... :	No concerned hazardous parts are accessible	P
2.1.3.1	Insulation of internal wiring in an ELV circuit accessible to operator		N
	Working voltage (V); distance (mm) through insulation ..... :		N
2.1.3.2	Operator accessible insulation of internal wiring at hazardous voltage		N
2.1.4.1	Protection in service access areas		N
2.1.4.2	Protection in restricted access locations		N
2.1.5	Energy hazard in operator access area		N
2.1.6	Clearances behind conductive enclosures		N
2.1.7	Shafts of manual controls		N
2.1.8	Isolation of manual controls		N
2.1.9	Conductive casings of capacitors		N
2.1.10	Risk of electric shock from stored charge on capacitors connected to mains circuit		N
	Time-constant (s); measured voltage (V) ..... :		—

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
2.2	**Insulation**		
2.2.1	Methods of insulation		P
2.2.2	Properties of insulating materials		P
2.2.3	Humidity treatment	Class III equipment with approved power supply	N
	Humidity (%) ..... :		—
	Temperature (°C) ..... :		—
2.2.4	Requirements for insulation		P
2.2.5	Insulation parameters	Considered	—
2.2.6	Categories of insulation	Considered	—
2.2.7.1	General rules for working voltages	Considered	—
2.2.7.2	Clearances in primary circuits	Considered	—
2.2.7.3	Clearances in secondary circuits	Considered	—
2.2.7.4	Creepage distances	Considered	—
2.2.7.5	Electric strength tests	Considered	—
2.2.8.1	Bridging capacitors ..... :		N
2.2.8.2	Bridging resistors		N
2.2.8.3	Accessible parts		N

2.3	**Safety extra-low voltage (SELV) circuits**		
2.3.1	Voltage (V) of SELV circuits under normal operating conditions and after a single fault ..... :	Measured max. 19 Vdc	—
2.3.2	Voltage (V) between any two conductors of SELV circuit(s) and for Class I equipment between any conductor of SELV circuit and equipment protective earthing terminal under normal operating conditions ..... :	Measured max. 19 Vdc	P
2.3.3	Voltage (V) of SELV in the event of a single failure of basic or supplementary insulation or of a component ..... :	Measured max. 19 Vdc	—
	Method used for separation ..... :		N
2.3.4	Additional constructional requirements		P
2.3.5	Connection of SELV circuits to other circuits	SELV to SELV circuit	P

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

2.4	**Limited current circuits**		
2.4.2	Frequency (Hz) ..... :	(see note below)	—
	Measured current (mA) ..... :	(see note below)	P
2.4.3	Measured voltage (V) ..... :	(see note below)	—
	Measured capacitance (μF) ..... :	< 0.01 μF	P
2.4.4	Measured voltage (V) ..... :		—
	Measured charge (μC) ..... :		N
2.4.5	Measured voltage (V) ..... :		—
	Measured energy (mJ) ..... :		N
2.4.6	Limited current circuit supplied from or connected to other circuits ..... :		P

Note:

2.4.2 Limited Current Circuit tested for each inverter as follows:

For " Ambit ", type T51I056.XX:

- Normal condition, between CN4, pin 2 to earth: measured as 1.2 Vp, frequency 62 kHz, 0.26 mA, limit 43.4 mA. (Worst case)
- Single fault condition of C10 shorted, DC/AC Inverter shutdown, no output immediately
- See also table 5.4 for single fault condition test

For " Taiwan Sumida ", type IV10135/T:

- Normal condition, between CN2, pin 1 to pin 2: measured as 18 Vp, frequency 53 kHz, 9.0 mA, limit 37.1 mA.
- Single fault condition of C4 shorted, between CN2, pin 1 to pin 2: measured as 20 Vp, frequency 53.2 kHz, 10.0 mA, limit 37.24 mA. (Worst case)
- See also table 5.4 for single fault condition test

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
2.5	**Provisions for earthing**		
2.5.1	Class I equipment	Class III equipment	N
	Warning label for service personnel		N
2.5.2	Protective earthing in Class II equipment		N
2.5.3	Switches/fuses in earthing conductors		N
2.5.4	Assured earthing connection for Class I equipment in systems comprising Class I and Class II equipment		N
2.5.5	Green/yellow insulation		N
2.5.6	Continuity of earth connections		N
2.5.7	Making and breaking of protective earthing connections		N
2.5.8	Disconnection protective earthing connections		N
2.5.9	Protective earthing terminals for fixed supply conductors or for non-detachable power supply cords		N
2.5.10	Corrosion resistance		N
2.5.11	Resistance (Ω) of protective earthing conductors ≤ 0,1 Ω		N
	Test current (A) ..... :		—

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
2.6	**Disconnection from primary power**		
2.6.1	General requirements		N
2.6.2	Type of disconnect device ..... :		N
2.6.3	Disconnect device in permanently connected equipment		N
2.6.4	Parts of disconnect device which remain energized		N
2.6.5	Switches in flexible cords		N
2.6.6	Disconnection of both poles simultaneously in single-phase equipment		N
2.6.7	Disconnection of all phase conductors of supply in three-phase equipment		N
2.6.8	Marking of switch acting as disconnect device		N
2.6.9	Installation instructions if plug on power supply cord acts as disconnect device		N
	Language ..... :		—
2.6.11	Interconnected equipment		N
2.6.12	Multiple power sources		N
2.7	**Overcurrent and earth fault protection in primary circuits**		
2.7.1	Basic requirements		N
2.7.2	Protection against faults not covered in 5.4		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

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
2.8	**Safety interlocks**		
2.8.2	Design		N
2.8.3	Protection against inadvertent reactivation		N
2.8.4	Reliability		N
2.8.5	Overriding an interlock		N
2.8.6.1	Contact gap (mm) ..... :		N
2.8.6.2	Switch performing 50 cycles		N
2.8.6.3	Electric strength test: test voltage (V) ..... :		N
2.8.7	Protection against overstress		N
2.9	**Clearances, creepage distances and distances through insulation**		
	Nominal voltage (V) ..... :	Considered as 250 Vac (supplementary insulation between primary and TNV circuits)	—
	General		P
2.9.2	Clearances		P
2.9.2.1	Clearances in primary circuits	Class III equipment with approved power supply	N
2.9.2.2	Clearances in secondary circuits	(see appended table 2.9.2 and 2.9.3)	P
2.9.3	Creepage distances	(see appended table 2.9.2 and 2.9.3)	P
	CTI tests ..... :	Considered as material group IIIb	—
2.9.4.1	Minimum distances through insulation	(see appended table 2.9.4)	P
2.9.4.2	Thin sheet material		N
	Number of layers (pcs) ..... :		N
	Electrical strength test: test voltage (V) ..... :		N
2.9.4.3	Printed boards		N
	Distance through insulation		N
	Electric strength test at voltage for thin sheet insulating material		N
	Number of layers (pcs) ..... :		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
2.9.4.4	Wound components without interleaved insulation		N
	Number of layers (pcs) ..... :		N
	Two wires in contact inside component; angle between 45° and 90°		N
	Routine testing for finished component		N
2.9.5	Distances on coated printed boards		N
	Routine testing for electric strength		N
2.9.6	Enclosed and sealed parts		N
	Temperature T1 (°C) ..... :		N
	Humidity % ..... :		N
2.9.7	Spacings filled by insulating compound		N
	Temperature T1 (°C) ..... :		N
	Humidity % ..... :		N
2.9.8	Component external terminations		N
2.9.9	Insulation with varying dimensions		N

2.10	**Interconnection of equipment**		
2.10.1	General requirements		P
2.10.2	Type of interconnection circuits ..... :	SELV or TNV circuits	P
2.10.3	ELV circuits as interconnection circuits		N

2.11	**Limited power source**		
	Use of limited power source ..... :	The separated approved power supply used with this Notebook complies with Limited Power Source, see also note below	P

Note:
The output of the power supply complies with the requirement of inherently Limited Power Source.

Limits: Isc = 8 A, 84 (5 x Uoc) VA.

Measured Uoc = 16.8 Vdc, Isc = 4.2 A, VA = 50.4 VA (14.8 Vdc x 3.4 A), under the maximum normal operation condition (the worst case).

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
3	**WIRING, CONNECTIONS AND SUPPLY**		
3.1	**General**		
3.1.1	Cross-sectional area of internal wiring/interconnecting cables	(see appended table 1.5.1)	P
	Protection of internal wiring and interconnecting cables	No wirings and cables used in the distribution of primary power	N
3.1.2	Wireways	Smooth wireways	P
3.1.3	Fixing of internal wiring		P
3.1.4	Fixing of uninsulated conductors	No uninsulated conductors used	N
3.1.5	Insulation of internal wiring		P
3.1.6	Wires coloured green/yellow only for protective earth connection		N
3.1.7	Fixing of beads and similar ceramic insulators		N
3.1.8	Required electrical contact pressure		N
3.1.9	Reliable electrical connections		N
3.1.10	End of stranded conductor		N
3.1.11	Use of spaced thread screws/thread-cutting screws		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
3.2	**Connection to primary power**		
3.2.1	Type of connection ..... :		N
	Design of product with more than one supply connection ..... :		N
3.2.2	Provision for permanent connection ..... :		N
	Size (mm) of cables and conduits ..... :		N
3.2.3	Appliance inlet		N
3.2.4	Type and cross-sectional area (mm²) of power supply cord ..... :		N
3.2.5	Cord anchorage		N
	Test: 25 times; 1 s; pull (N) ..... :		—
	Longitudinal displacement ≤ 2 mm ..... :		N
3.2.6	Protection of power supply cord		N
3.2.7	Cord guard		N
	D (mm) ..... :		—
	Test: mass (g) ..... :		—
	Radius of curvature of the cord ≤ 1,5 D		N
3.2.8	Supply wiring space		N
3.3	**Wiring terminals for external power supply conductors**		
3.3.1	Terminals		N
3.3.2	Special non-detachable cord		N
	Type of connection ..... :		—
	Pull test at 5 N		N
3.3.3	Screws and nuts		N
3.3.4	Fixing of conductors		N
3.3.5	Connection of connectors		N
3.3.6	Size of terminals		N
	Nominal thread diameter (mm) ..... :		N
3.3.7	Protection against damage of conductors		N
3.3.8	Terminal location		N
3.3.9	Test with 8 mm stranded wire		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
4	**PHYSICAL REQUIREMENTS**		
4.1	**Stability and mechanical hazards**		
4.1.1	Stability tests		P
	Angle of 10°		P
	Test: force (N) ..... :		N
4.1.2	Protection against personal injury	Test finger made no contact with fan inside the equipment	P
4.1.3	Warning and means provided for stopping the moving part ..... :		N
4.1.4	Edges and corners		P
4.1.5	Enclosure of a high pressure lamp		N
4.2	**Mechanical strength and stress relief**		
4.2.1	General		P
4.2.2	Internal enclosures 30 N ± 3 N; 5 s		N
4.2.3	External enclosures 250 N ± 10 N; 5 s		P
4.2.4	Steel ball tests		P
	Fall test		P
	Swing test		P
4.2.5	Drop test		N
4.2.6	Heat test for enclosures of moulded or formed thermoplastic materials: 7 h; T (°C) ..... :	70 °C	P
4.2.7	Compliance criteria		P
4.2.8	Mechanical strength of cathode ray tubes		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
4.3	**Construction details**		
4.3.1	Changing of setting for different power supply voltages		N
4.3.2	Adjustment of accessible control devices		N
4.3.4	Prevention of dangerous concentration of dust, powder, liquid and gas		N
4.3.5	Fixing of knobs, grips, handles, levers		N
	Test: force (N) ..... :		N
4.3.6	Driving belts/couplings shall not ensure electrical insulation		N
4.3.7	Retaining of sleeves		N
4.3.9	Protection of loosening parts		N
4.3.11	Resistance to oil and grease		N
4.3.12	Protection against harmful concentration of ionizing radiation, ultraviolet light, laser or flammable gases (for laser see IEC 60825-1)	The equipment does not generate ionizing radiation The CD-ROM, CD-RW, DVD/CD-RW and DVD-ROM drive used for this equipment are separately approved and checked with the appliance	P
4.3.13	Securing of screwed connections		P
4.3.15	Openings in the top of enclosure	No opening provided on top of enclosure	N
	Dimensions (mm) ..... :		—

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
4.3.16	Openings in the sides of enclosure	No opening provided on sides of enclosure	N
	Dimensions (mm) ..... :		
4.3.17	Interchangeable plugs and sockets		N
4.3.18	Torque test for direct plug-in equipment		N
	Additional torque (Nm) ..... :		N
4.3.19	Protection against excessive pressure		N
4.3.20	Protection of heating elements in Class I equipment		N
4.3.21	Protection of lithium batteries		P
	Construction of protection circuit ..... :	RTC battery is protected by a resistor (R247, 200 Ω) in series with the battery The battery pack is separately approved component, another non-approved battery pack is protect by internal circuits and tested with appliance	P
4.3.22	Ageing of barrier/screen secured with adhesive		N
	Day 1: temperature (°C); time (weeks) ..... :		N
	Day 8/22/57: a) temperature (°C) for 1 h b) temperature (°C) for 4 h c) temperature (°C) over 8 h ..... :		N
	Day 9/23/58: a) relative humidity (%) for 72 h b) temperature (°C) for 1 h c) temperature (°C) for 4 h d) temperature (°C) over 8 h ..... :		N

4.4	**Resistance to fire**		
4.4.1	Methods of achieving resistance to fire		P
4.4.2	Minimizing the risk of ignition		P
	Printed board: manufacturer; type; flammability .. :	(see appended table 1.5.1)	P
4.4.3	Flammability of materials and components		P

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
4.4.3.2	Material and component: manufacturer; type; flammability ..... :	(see appended table 1.5.1)	P
4.4.3.3	Exemptions ..... :		P
4.4.3.4	Wiring harnesses: manufacturer; flammability .... :		N
4.4.3.5	Cord anchorage bushings: manufacturer; flammability ..... :		N
4.4.3.6	Air filter assemblies: manufacturer; flammability . :		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
4.4.4	Enclosures and decorative parts: manufacturer; type; flammability ..... :	(see appended table 1.5.1)	P
4.4.5	Conditions for fire enclosures		P
4.4.5.1	Components requiring fire enclosure: manufacturer; flammability ..... :		N
4.4.5.2	Components not requiring fire enclosure ..... :	(see note below)	P
4.4.6	Fire enclosure construction		N
4.4.7	Doors or covers in fire enclosures		N
4.4.8	Flammable liquids		N

Note:

The power of this Notebook Computer is supplied from power supplies complied with Limited Power Source, Sub-clause 2.11. Components are mounted on PCB of V-1 min. rating.

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
5	**THERMAL AND ELECTRICAL REQUIREMENTS**		
5.1	**Heating**		
	Heating tests	(see appended table 5.1)	P
5.2	**Earth leakage current**		
5.2.1	General	Class III equipment	N
5.2.2	Leakage current		N
	Max. allowed current (mA) ..... :		—
5.2.3	Single-phase equipment		N
	Test voltage (V) ..... :		—
	Measured current (mA) ..... :		—
5.2.4	Three-phase equipment		N
	Test voltage (V) ..... :		—
	Measured current (mA) ..... :		—
5.2.5	Equipment with earth leakage current exceeding 3,5 mA		N
	Test voltage (V) ..... :		—
	Measured current (mA) ..... :		—
	Max. allowed current (mA) ..... :		—
	Cross-sectional area (mm²) of internal protective earthing conductor ..... :		—
	Warning label		N
5.3	**Electric strength**		
5.3.1	General		N
5.3.2	Test procedure		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
5.4	**Abnormal operating and fault conditions**		
5.4.2	Motors	The DC fan and motors in Floppy, Hard Disk, CD-ROM, CD-RW, DVD/CD-RW, DVD-ROM drive used for this equipment are separately approved and checked with the appliance	P
5.4.3	Transformers		N
5.4.4	Compliance of operational insulation		P
	Method used ..... :	c)	P
5.4.5	Electromechanical components in secondary circuits		N
5.4.6	Other components and circuits	(see appended table 5.4)	P
5.4.7	Test in any expected condition and foreseeable misuse		N
5.4.8	Unattended use of equipment having thermostats, temperature limiters etc.		N
5.4.9	Compliance		P
5.4.10	Ball-pressure test of thermoplastic parts; impression shall not exceed 2 mm		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
6	**CONNECTION TO TELECOMMUNICATION NETWORKS**		
6.1	**General**		
6.2	**TNV circuits**		
6.2.1.1	Limits of the TNV circuits		P
6.2.1.1 a)	TNV-1 circuits		N
6.2.1.1 b)	TNV-2 and TNV-3 circuits	TNV-3 circuits	P
6.2.1.2	Separation from other circuits and from accessible parts	(see appended table 2.9.2, 2.9.3 and 2.9.4)	P
	Voltage (V) in SELV circuits, TNV-1 circuits and accessible conductive parts in event of single insulation fault or component failure ..... :		N
6.2.1.3	Operating voltages generated externally		N
	Voltage (V) in SELV circuit, TNV-1 circuit or accessible conductive part ..... :		N
6.2.1.4	Separation from hazardous voltages ..... :	Class III equipment	N
	Insulation between TNV circuit and circuit at hazardous voltage		N
	Method used ..... :		N
6.2.1.5	Connection of TNV circuits to other circuits	(see appended table 5.4)	N
	Insulation (mm) between TNV circuit supplied conductively from secondary circuit and hazardous voltage circuit ..... :		N
6.2.2.1	Protection against contact with bare conductive parts of TNV-2 and TNV-3 circuits		P
	Test with test finger		N
	Test with test probe		P
6.2.2.2	Battery compartments		N
	Marking next to door/on door		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
6.3	**Protection of telecommunication network service personnel, and users of other equipment connected to the telecommunication network, from hazards in the equipment**		
6.3.1	Protection from hazardous voltages		P
6.3.2	Use of protective earthing		N
	Language of installation instructions ..... :		N
6.3.3.1	Insulation between TNV circuit and parts or circuitry that may be earthed	Insulation is subjected to the electric strength test of 6.4.2.2	P
6.3.3.2	Exclusions ..... :		N
6.3.4.1	Limitation of leakage current (mA) to telecommunication network ..... :		N
6.3.4.2	Summation of leakage currents from telecommunication network ..... :		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
6.4	**Protection of equipment users from voltages on the telecommunication networks**		
6.4.1	Separation requirements		P
6.4.2	Test procedure		P
6.4.2.1	Impulse test: separation between TNV-1 circuits/TNV-3 circuits and:		P
6.4.2.1 a)	unearthed conductive parts/non-conductive parts of the equipment expected to be held or touched during normal use; test at 2,5 kV		P
6.4.2.1 b)	parts and circuitry that can be touched by the test finger except contacts of connectors that cannot be touched by test probe; test at 1,5 kV		P
6.4.2.1 c)	circuitry which is provided for connection of other equipment; test at 1,5 kV		P
6.4.2.2	Electric strength test: separation between TNV-1 circuits/TNV-3 circuits and:		
6.4.2.2 a)	unearthed conductive parts/non-conductive parts of the equipment expected to be held or touched during normal use; test at 1,5 kV		P
6.4.2.2 b)	parts and circuitry that can be touched by the test finger except contacts of connectors that cannot be touched by test probe; test at 1,0 kV		P
6.4.2.2 c)	circuitry which is provided for connection of other equipment; test at 1,0 kV		P
6.4.2.3	Compliance criteria		P
6.5	**Protection of telecommunication wiring system from overheating**		
	Maximum continuous output current (A) ..... :		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
A	**ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE**		
A.1	Flammability test for fire enclosures of moveable equipment having a total mass exceeding 18 kg, and of stationary equipment		N
A.2	Flammability test for fire enclosures of moveable equipment having a total mass not exceeding 18 kg, and for materials located within fire enclosures		N
A.3	High current arcing ignition test		N
A.3.6	Number of arcs ..... :		N
A.4	Hot wire ignition test		N
A.4.6	Ignition time (s) ..... :		N
A.5	Hot flaming oil test		N
A.6	Flammability test for classifying materials V-0, V-1 or V-2		N
A.7	Flammability test for classifying foamed materials HF-1, HF-2 or HBF		N
A.8	Flammability test for classifying materials HB		N
A.9	Flammability test for classifying materials 5V		N
A	Tested material		N
	Preconditioning: 7 days (168 h); temperature (°C) ..... :		—
	Mounting of samples during test ..... :		—
	Wall thickness ..... :		—
	Sample 1 burning time ..... :		N
	Sample 2 burning time ..... :		N
	Sample 3 burning time ..... :		N
	Material: compliance with the requirements		N
	Manufacturer of tested material ..... :		—
	Type of tested material ..... :		—
	Additional information ..... :		—

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
B	**ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS**		
B.1	General requirements		N
	Position ..... :		—
	Manufacturer ..... :		—
	Type ..... :		—
	Rated voltage (V) or current (A) ..... :		—
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 motor in secondary circuits		N
B.7	Locked-rotor overload test for DC motor in secondary circuits		N
B.7.2	Test time (h) ..... :		N
B.7.3	Test time (h) ..... :		N
B.8	Test for motors with capacitors		N
B.9	Test for three-phase motors		N
B.10	Test for series motors		N
	Test voltage (V) ..... :		—

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
C	**ANNEX C, TRANSFORMERS**		
	Position ..... :		—
	Manufacturer ..... :		—
	Type ..... :		—
	Rated values ..... :		—
	Temperatures		N
	Thermal cut-out		N
C.1	Overload test		N
	Conventional transformer		N
C.2	Insulation		N
	Precautions ..... :		N
	Retaining of end turns of all windings		N
	Earthing test at 25 A		N
C.3	Electric strength test		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict
H	**ANNEX H, IONIZING RADIATION**		
	Ionizing radiation		N
	Measured radiation ..... :		—
	Measured high-voltage (kV) ..... :		—
	Measured focus voltage (kV) ..... :		—
	CRT markings ..... :		—
	Certified by ..... :		—
	Standard used ..... :		—
U	**ANNEX U, INSULATED WINDING WIRES FOR USE AS MULTIPLE LAYER INSULATION**		
	See separate test report		N

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components				P
object / part No.	Manufacturer / trademark	Type / model	technical data	standard	mark(s) of conformity[1])
Power Supply	Delta Electronics, Inc.	ADP-65DB	I/P: 100 – 240 Vac, 1.5 A, 50 – 60 Hz O/P: LPS, +19 Vdc, 3.42 A	IEC 60950	CB / Nemko, Certificate No. NO 8255
Alt.	Lite-On	PA-1750-11	I/P: 100 – 240 Vac, 2.3 A, 50 – 60 Hz O/P: LPS, +19 Vdc, 4 A	IEC 60950	CB / Nemko, Certificate No. NO 14749/A1
Alt.	Astec	SA80-3115	I/P: 100 – 240 Vac, 1.2 A, 50 / 60 Hz O/P: LPS, +19 Vdc, 3.79 A	IEC 60950	CB / Nemko, Certificate No. NO 15214
Alt.	Astec	SA80-3105	I/P: 100 – 240 Vac, 1.2 A, 50 / 60 Hz O/P: LPS, +19 Vdc, 3.68 A	IEC 60950	CB / Nemko, Certificate No. NO 14304
LCD Panel	AU	UB141X03	Material of LCD screen is min. V-1	Applicable part of IEC 60950	Tested with appliance
Alt.	AU	B150XN01	Material of LCD screen is min. V-1	Applicable part of IEC 60950	Tested with appliance
Alt.	IBM	ITUX95C	Material of LCD screen is min. V-1	Applicable part of IEC 60950	Tested with appliance
Alt.	LG	LP150X04	Material of LCD screen is min. V-1	Applicable part of IEC 60950	Tested with appliance
Alt.	LG	LP150E01	Material of LCD screen is min. V-1	Applicable part of IEC 60950	Tested with appliance
Alt.	Chunghwa	CLAA141XF01	Material of LCD screen is min. V-1	Applicable part of IEC 60950	Tested with appliance
Alt.	Chunghwa	CLAA150PA01	Material of LCD screen is min. V-1	Applicable part of IEC 60950	Tested with appliance
Alt.	Hitachi	TX38D85VC1CAB	Material of LCD screen is min. V-1	Applicable part of IEC 60950	Tested with appliance
Floppy Disk Drive (Optional)	Yamagata Mitsumi	D35XG	5 Vdc, Max. 1 A	IEC 60950	TÜV
Alt.	various	various	5 Vdc, Max. 1 A	IEC 60950	Nordic or TÜV

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components (continued)				P
object / part No.	Manufacturer / trademark	Type / model	technical data	standard	mark(s) of conformity[1])
Hard Disk Drive	IBM	IC25N0nnATCS 04-n	5 Vdc, Max. 1 A	IEC 60950	TÜV
Alt.	various	various	5 Vdc, Max. 1 A	IEC 60950	Nordic or TÜV
CD-ROM Drive (Optional)	Quanta Storage	SCR-242	5 Vdc, 1.5 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
Alt.	Samsung	SN-124	5 Vdc, 1.5 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
DVD-ROM Drive (Optional)	Toshiba	SD-C2612x	5 Vdc, Max. 1.6 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
Alt.	Toshiba	SD-C2502x	5 Vdc, 1.5 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
Alt.	Hitachi-LG Data Storage	GDR-8081N.....	5 Vdc, 1.0 A	IEC/EN 60950	SEMKO
Alt.	Lite-On	LSD-xx1xxxxxx	5 Vdc, 1.5 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
CD-RW Drive (Optional)	Kyushu Matsushita	UJDA340	5 Vdc, 0.9 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
Alt.	Toshiba	SR-C8102x	5 Vdc, Max. 1.8 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
DVD/CD-RW Drive (Optional)	Toshiba	SD-R2102x	5 Vdc, 1.8 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
Alt.	Toshiba	SD-R2212x	5 Vdc, Max. 1.8 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
Alt.	Kyushu Matsushita	UJDA720	5 Vdc, 1.8 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
Alt.	Kyushu Matsushita	UJDA730	5 Vdc, 1.8 A	IEC/EN 60950, IEC/EN 60825-1	TÜV
DC Fan	Forcecon	DFB40080M90 T	5 Vdc, 0.35 A, 6.6 CFM	IEC/EN 60950	TÜV
RTC Battery	Matsushita	VL1220	3 Vdc, 7 mAh	Applicable part of IEC 60950	Tested with appliance
Alt.	Hitachi Maxell	ML1220	3 Vdc, 15 mAh	Applicable part of IEC 60950	Tested with appliance
Alt.	Sanyo	ML1220	3 Vdc, 14 mAh	Applicable part of IEC 60950	Tested with appliance

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components (continued)				P
object / part No.	Manufacturer / trademark	Type / model	technical data	standard	mark(s) of conformity [1])
Battery Pack	Celxpert	BAT3XNXLX	LPS, 14.8 Vdc, 3900 mAh	IEC/EN 60950	TÜV
Alt.	Compal	BAT3XNXL	LPS, 14.8 Vdc, 3900 mAh (Consist of the following critical components)	Applicable part of IEC 60950	Tested with appliance
-Enclosure	Bayer AG	FR2000	V-0 min. 1.5 mm thick	Applicable part of IEC 60950	Tested with appliance
-Battery cell	Matsushita	CGR18650A	1950 mAh, 3.7 Vdc	Applicable part of IEC 60950	Tested with appliance
-Thermal cutoff (IP1)	NEC	H6	50 Vdc, 7 A, 139 °C	Applicable part of IEC 60950	Tested with appliance
DC / AC Inverter	Ambit	T51I056.XX	I/P: 14.8 Vdc, 0.33 A O/P: 1600 Vac, 3.3 mA (Consist of the following critical components)	Applicable part of IEC 60950	Tested with appliance
-DC / AC transformer (T1)	Guann Jye	22.0375.21	105 °C	Applicable part of IEC 60950	Tested with appliance
-High voltage capacitor (C16)	various	various	10 pF, 3 KV	Applicable part of IEC 60950	Tested with appliance
DC / AC Inverter	Sumida	IV10135/T	I/P: 14.8 Vdc, 380 mA O/P: 1700 Vac, 6.33 mA (Consist of the following critical components)	Applicable part of IEC 60950	Tested with appliance
-DC / AC transformer (T1)	Sumitomo Bakelite	CIUH8D34	105 °C	Applicable part of IEC 60950	Tested with appliance
-High voltage capacitor (C4)	various	various	220 pF, 2 KV	Applicable part of IEC 60950	Tested with appliance

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

1.5.1	TABLE: list of critical components (continued)				P
object / part No.	Manufacturer / trademark	Type / model	technical data	standard	mark(s) of conformity [1])
Modem Module	Askey	1456VQL9Q	3.3 Vdc, 300 mA, 45 °C	IEC 60950	CB / Nemko, Certificate No. NO 15709
Alt.	Askey	WLL030M	3.3 Vdc, 300 mA, 45 °C	IEC 60950	CB / Nemko, Certificate No. NO 15711
Plastic Material List:					
Enclosure	Bayer	KU2-1518B	V-1 Min. 1.2 mm thick	Applicable part of IEC 60950	Tested with appliance
Alt.	Bayer	FR2000	V-1 Min. 1.2 mm thick	Applicable part of IEC 60950	Tested with appliance
Alt.	GE Plastics Global	C6200	V-1 Min. 1.2 mm thick	Applicable part of IEC 60950	Tested with appliance
PCB	various	various	V-1, 105 °C	Applicable part of IEC 60950	Tested with appliance
PVC tube	various	various	300 V, 105 °C	Applicable part of IEC 60950	Tested with appliance
All connectors	various	various	Min. V-2	Applicable part of IEC 60950	Tested with appliance
Wiring List:					
Lamp Wire	various	various	Min. 3 kV, VW-1, 120 °C	Applicable part of IEC 60950	Tested with appliance
Internal wire	various	various	300 V, VW-1, 80 °C	Applicable part of IEC 60950	Tested with appliance

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

1.6	TABLE: electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	Ifuse (mA)	condition/status
—	3.42	19 Vdc	—	3.3	—	Max. normal operation with empty battery pack charging
—	3.42	19 Vdc	—	2.4	—	Empty battery pack charging only

2.9.2 and 2.9.3	TABLE: clearance and creepage distance measurements					P
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
SELV to TNV (SI)	354 V	250 V	2.0 mm	2.5 mm	2.5 mm	2.5 mm

2.9.4.1	TABLE: distance through insulation measurements			P
distance through insulation di at/of:	U r.m.s. (V)	test voltage (V)	required di (mm)	di (mm)
Insulator, surround to modem card (SI)	250	1500	0.4	0.4

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

5.1	TABLE: temperature rise measurements		P
	test voltage (V) ..... :	19 Vdc	—
	t1 (°C) ..... :	24.9	—
	t2 (°C) ..... :	25.0	—

temperature rise dT of part/at:	dT (K)	permitted dT (K)
PCB near CPU	37.1	65 (105 – 40)
PCB near RTC battery	31.4	65 (105 – 40)
PCB near PT1	54.9	65 (105 – 40)
PCB near PL10	39.2	65 (105 – 40)
PCB near U5	41.8	65 (105 – 40)
PCB near U10	37.3	65 (105 – 40)
H. D. D. body	22.1	—
DVD-ROM body	33.1	—
Enclosure outside (of Battery Pack)	9.5	55 (Plastic)
Enclosure inside (near CPU)	33.2	For stress relief test
Battery Cell	5.3	—
Inverter T1 coil	39.4	65 (105 – 40)

temperature rise dT of winding:	R_1 (Ω)	R_2 (Ω)	dT (K)	permitted dT (K)	insulation class

Note:

The equipment was evaluated for manufacturer's recommended maximum ambient (Tmra) of 40 °C.

5.3	TABLE: electric strength measurements		N
test voltage applied between:		test voltage (V)	breakdown

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

5.4	TABLE: fault condition tests		P
	ambient temperature (°C) ..... :	25 °C	—
	model/type of power supply ..... :	(see appended table 1.5.1)	—
	manufacturer of power supply ..... :	(see appended table 1.5.1)	—
	rated markings of power supply ..... :	(see appended table 1.5.1)	—

No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
1.	Ventilation Openings	Blocked	19 Vdc	1 hr	—	—	Observation: Temperature stabilized Damage: No damaged, no hazard Temp: T1 coil of DC/AC Inverter is 68.5 °C Max. Voltage: —
2.	DC Fan	Locked	19 Vdc	50 min.	—	—	Observation: Unit shutdown after 30 min. Damage: No damaged, no hazard Temp: T1 coil of DC/AC Inverter is max. 65 °C Max. Voltage: —
3.	Q10	S	19 Vdc	1 hr	—	—	Observation: Temperature stabilized Damage: No damaged, no hazard Temp: RTC battery is 60 °C Max. Voltage: —
4.	Output of RTC battery	S	19 Vdc	30 min	—	—	Observation: Unit shutdown immediately Damage: No damaged, no hazard Temp: — Max. Voltage: —
5.	Output of Battery Pack (Compal, type BAT3XNXL)	S	19 Vdc	50 min	—	—	Observation: Unit shutdown immediately Damage: No damaged, no hazard Temp: Max. 31.4 °C Max. Voltage: —
6.	R247	S	19 Vdc	50 min	—	—	Observation: Temperature stabilized Damage: No damaged, no hazard Temp: RTC battery is 60 °C Max. Voltage: —
7.	C10	S	19 Vdc	5 min	—	—	L. C. C. test for DC/AC Inverter, "Ambit", type T51I056.xx Observation: DC/AC Inverter shutdown immediately, no output

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

5.4	TABLE: fault condition tests (continued)						P
No.	component No.	fault	test voltage (V)	test time	fuse No.	fuse current (A)	result
8.	C16	S	19 Vdc	5 min	—	—	L. C. C. test for DC/AC Inverter, "Ambit", type T51I056.xx Observation: DC/AC Inverter shutdown immediately, no output
9.	C4	S	19 Vdc	5 min	—	—	L. C. C. test for DC/AC Inverter, "Sumida", type IV10135/T Observation: measured between pin 1 and pin 2: 20 Vp, frequency 53.2 kHz, 10 mA. (Limit 37.24 mA)
10.	C3	S	19 Vdc	5 min	—	—	L. C. C. test for DC/AC Inverter, "Sumida", type IV10135/T Observation: DC/AC Inverter shutdown immediately, no output
11.	R13	S	19 Vdc	5 min	—	—	L. C. C. test for DC/AC Inverter, "Sumida", type IV10135/T Observation: measured between pin 1 and pin 2: 20 Vp, frequency 53.2 kHz, 10 mA. (Limit 37.24 mA)
12.	C4	S	19 Vdc	5 min	—	—	L. C. C. test for DC/AC Inverter, "Sumida", type IV10135/T Observation: measured between pin 2 and earth: 7 Vp, frequency 52.1 kHz, 3.5 mA. (Limit 36.47 mA)
13.	C3	S	19 Vdc	5 min	—	—	L. C. C. test for DC/AC Inverter, "Sumida", type IV10135/T Observation: DC/AC Inverter shutdown immediately, no output
14.	R13	S	19 Vdc	5 min	—	—	L. C. C. test for DC/AC Inverter, "Sumida", type IV10135/T Observation: measured between pin 2 and earth: 7 Vp, frequency 52.1 kHz, 3.5 mA. (Limit 36.47 mA)

supplementary information

S: Short-circuited; **O:** Open-circuited; **O/L:** Overloaded
Observation: The operation condition of the EUT during the fault condition.
Damage: Which component (components) damaged during the fault condition test.
Temp: The maximum temperature of transformer winding.
Max. Voltage: the maximum accessible voltage during the fault condition.

IEC 60950			
Clause	Requirement – Test	Result - Remark	Verdict

5.4.10	**TABLE: ball pressure test of thermoplastics**		**N**
	required impression diameter (mm) ..... :	≤ 2 mm	—
part		test temperature (°C)	impression diameter (mm)