


TEST REPORT EN 60950-1, Second Edition Information technology equipment – Safety – Part 1: General requirements	
Report reference No.	B-S10060512
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Date of issue	Jun. 12, 2010
Testing By	Beide (UK) Product Service Limited
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Report body	Beide (UK) Product Service Limited
Address(U.K.).....	No.1, Undine Road, London, United Kingdom
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Applicant's Name	FRSKY ELECTRONIC CO., LTD.
Address	100 Jinxi Road, Wuxi, Jiangsu, China
Client No.	05101459
Test specification	
Standard	EN 60950-1: 2006/A11: 2009, Second Edition
Test procedure	Approval
Procedure deviation	None
Non-standard test method	N.A
Test Report Form No.	EN60950_1_2A
TRF originator	Beide (UK) Product Service Limited
Master TRF	Dated 2006-12
Test item description	2.4G Radio System
Trademark	N.A
Manufacturer	FRSKY ELECTRONIC CO., LTD.
Address	100 Jinxi Road, Wuxi, Jiangsu, China
Model and/or type reference	V8HT, DHT, TF-8M, TF-14M, V8R6, V8R7, TFR8, TFR14, TFR6, TFR4
Serial number	Engineering sample without serial number
Rating(s)	DC 6-13V

Copy of marking plate and summary of test results (information/comments):



Particulars: test item vs. test requirements	
Equipment mobility	Movable
Operating condition.....	Continuous
Mains supply tolerance (%)	+20%, -15%
Tested for IT power systems	Not for IT power systems
IT testing, phase-phase voltage (V) :	N/A
Class of equipment	Class III
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)
Testing	
Date of receipt of test item	Jun. 01, 2010
Date(s) of performance of test	Jun. 02-11, 2010
<p>General remarks</p> <p>The test result presented in this report relate only to the object(s) tested.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p> <p>"(see Enclosure #)" refers to additional information appended to the report.</p> <p>"(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p>	

<p>General product information:</p> <p>Universal transmitter and receiver for all 4ch-8ch controllers.</p> <p>Attachment:</p> <p>2 pages of temperature curve.</p>

1	GENERAL	P
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1.5	Components	P
1.5.1	General	P
	Comply with EN 60950 or relevant component standard	see appended table 1.5.1 P
1.5.2	Evaluation and testing of components	Components which are certified to EN and/or national standards are used correctly within their ratings. Components not covered by EN standards are tested under the conditions present in the equipment. P
1.5.3	Thermal controls	No such ones N
1.5.4	Transformers	No such ones N
1.5.5	Interconnecting cables	No such ones N
1.5.6	Capacitors in primary circuits	No such ones N
1.5.7	Resistors bridging insulation	No such resistors N
1.5.7.1	Resistors bridging functional insulation, basic insulation or supplementary insulation	No such resistors N
1.5.7.2	Resistors bridging double insulation or reinforced insulation between the a.c. mains supply and other circuits	No such resistors 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	No such resistors N
1.5.8	Components in equipment for IT power systems	No such equipment N
1.5.9	Surge suppressors	No such ones N
1.5.9.1	General	N
1.5.9.2	Protection of VDRs	N
1.5.9.3	Bridging of functional insulation by a VDR	N
1.5.9.4	Bridging of basic insulation by a VDR	N
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR	N

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

1.7	Marking and instructions	P
1.7.1	Power rating	See as follows P

	Rated voltage(s) or voltage range(s) (V)	DC 6-13V	P
	Symbol for nature of supply, for d.c. only	DC supply only	P
	Rated frequency or rated frequency range (Hz) ..		N
	Rated current (mA or A)		N
	Manufacturer's name or trademark or identification mark		P
	Type/model or type reference.....	V8HT	P
	Symbol of or Class II equipment only	Class III	P
	Other symbols	Additional symbol or marking does not give rise to misunderstanding.	P
	Certification marks	See marking plate on page 2	P
1.7.2	Safety instructions and marking		N
1.7.2.1	General		N
1.7.2.2	Disconnect devices	No such disconnect devices	N
1.7.2.3	Overcurrent protective devices	No such devices	N
1.7.2.4	IT power distribution systems	Not IT systems	N
1.7.2.5	Operator access with a tool	No such access	N
1.7.2.6	Ozone	No produce ozone	N
1.7.3	Short duty cycles	For continuous operation	P
1.7.4	Supply voltage adjustment	Single input voltage range without adjustment.	N
1.7.5	Power outlets on the equipment	No standard socket-outlet.	N
1.7.6	Fuse identification	No fuse	N
1.7.7	Wiring terminals	Connected via device cord	N
1.7.7.1	Protective earthing and bonding terminals	Class III equipment.	N
1.7.7.2	Terminal for a.c. mains supply conductors	DC supply	N
1.7.7.3	Terminals for d.c. mains supply conductors		P
1.7.8	Controls and indicators	See below	P
1.7.8.1	Identification, location and marking		P
1.7.8.2	Colours	No colour relevant to safety used.	N
1.7.8.3	Symbols according to IEC 60417	No symbols relevant to safety used.	N
1.7.8.4	Markings using figures		P
1.7.9	Isolation of multiple power sources	Not for multiple power sources	N
1.7.10	IT power distribution systems	Not for connection to IT power systems	N
1.7.11	Thermostats and other regulating devices	No such ones	N
1.7.12	Language	Markings and user manual in English	—

1.7.13	Durability	The label was subjected to the durability of marking test. The label was rubbed with cloth soaked with water for 15 sec and then again for 15 sec 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
1.7.14	Removable parts	No removable parts	N

2	PROTECTION FROM HAZARDS		N
2.1	Protection from electric shock and energy hazards		N
2.1.1	Protection in operator access areas	DC 6-13V	N
2.1.1.1	Access to energized parts		N
	Test by inspection		N
	Test with test finger		N
	Test with test pin		N
	Test with test probe		N
2.1.1.2	Battery compartments		N
2.1.1.3	Access to ELV wiring		N
	Working voltage (V); minimum distance (mm) through insulation		—
2.1.1.4	Access to hazardous voltage circuit wiring		N
2.1.1.5	Energy hazards		N
2.1.1.6	Manual controls		N
2.1.1.7	Discharge of capacitors in equipment		N
	Time-constant (s); measured voltage (V)		—
2.1.1.8	Energy hazards - d.c. mains supplies		N
2.1.1.9	Audio amplifiers in information technology equipment		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	DC 6-13V	P
2.2.2	Voltages under normal conditions (V)		P
2.2.3	Voltages under fault conditions (V)		P
2.2.3.1	Separation by double insulation or reinforced insulation (method 1)		N
2.2.3.2	Separation by earthed screen (method 2)	Not used	N
2.2.3.3	Protection by earthing of the SELV circuit (method 3)	Not used	N

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
	Insulation employed.....		—
2.3.2.1	General requirements		—
2.3.2.2	Protection by basic insulation		—
2.3.2.3	Protection by earthing		—
2.3.2.4	Protection by other constructions		—
2.3.3	Separation from hazardous voltages		N
	Insulation employed.....		—
2.3.4	Connection of TNV circuits to other circuits		N
	Insulation employed.....		—
2.3.5	Test for operating voltages generated externally		N
2.4	Limited current circuits		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
	Inherently limited output		N
	Impedance limited output		N
	Overcurrent protective device limited output		N
	Regulating network limited output under normal operating and single fault condition		N
	Regulating network limited output under normal operating conditions and overcurrent protective device limited output under single fault condition		N
	Output voltage (V), output current (A), apparent power (VA)..... :		—
	Current rating of overcurrent protective device (A)		—
2.6	Provisions for earthing and bonding		N

2.6.1	Protective earthing		N
2.6.2	Functional earthing		N
2.6.3	Protective earthing and protective bonding conductors		N
2.6.3.1	General		N
2.6.3.2	Size of protective earthing conductors		N
	Rated current (A), cross-sectional area (mm ²), AWG.....:		—
2.6.3.3	Size of protective bonding conductors		N
	Rated current (A), cross-sectional area (mm ²), AWG.....:		—
2.6.3.4	Resistance (Ω) of earthing conductors and their terminations, test current (A).....:		N
2.6.3.5	Colour of insulation.....:		N
2.6.4	Terminals		N
2.6.4.1	General		N
2.6.4.2	Protective earthing and bonding terminals		N
	Rated current (A), type and 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 covered in 5.3		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		N
2.8.2	Protection requirements		N
2.8.3	Inadvertent reactivation		N
2.8.4	Fail-safe operation		N
2.8.5	Moving parts		N
2.8.6	Overriding		N
2.8.7	Switches and relays		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		N
2.9.1	Properties of insulating materials		N
2.9.2	Humidity conditioning		N
	Humidity (%)		—
	Temperature (°C)		—
2.9.3	Grade of insulation		N
2.9.4	Separation from hazardous voltages		N

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	Clearances in primary circuit		N
2.10.3.3	Clearances in secondary circuits		N
2.10.3.4	Measurement of transient voltage levels		N
2.10.3.5	Clearances in circuits having starting pulses		N

2.10.3.6	Transients from an a.c. mains supply		N
2.10.3.7	Transients from a 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 voltages		N
2.10.4	Creepage distances		N
	CTI tests		—
2.10.4.1	General		—
2.10.4.2	Material group and comparative tracking index		—
2.10.4.3	Minimum creepage distances		—
2.10.5	Solid insulation		N
2.10.5.1	Minimum distance through insulation		N
2.10.5.2	Thin sheet material		N
	Number of layers (pcs)		—
	Electric strength test		—
2.10.5.3	Printed boards		N
	Distance through insulation		N
	Electric strength test for thin sheet insulating material		—
	Number of layers (pcs)		N
2.10.5.4	Wound components	No wound components	N
	Number of layers (pcs)		N
	Two wires in contact inside wound component; angle between 45° and 90°		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
2.10.5.8	Non-separable thin sheet material		N
2.10.5.9	Thin sheet material - standard test procedure		N
2.10.5.10	Thin sheet material - alternative test procedure		N
2.10.5.11	Insulation in wound components		N
2.10.5.12	Wire in wound components		N
2.10.5.13	Wire with solvent-based enamel in wound components		N
2.10.5.14	Additional insulation in wound components		N
2.10.6	Construction of printed boards	No coated PCB	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 surfaces of a printed board		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
	Electric strength test		—
2.10.9	Thermal cycling		N
2.10.10	Test for Pollution Degree 1 environment and for insulating compound		N
2.10.11	Tests for semiconductor devices and for cemented joints		N
2.10.12	Enclosed and sealed parts		N

3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection		N
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	No beads and ceramic insulators	N
3.1.6	Screws for electrical contact pressure	No screws for electrical contact pressure	N
3.1.7	Insulating materials in electrical connections	Contact pressure is not transmitted through insulating material.	N
3.1.8	Self-tapping and spaced thread screws	No self-tapping screws are used.	N
3.1.9	Termination of conductors	All conductors are reliably secured.	N
	10 N pull test		N
3.1.10	Sleeving on wiring	There are no sleeves used as supplementary insulation	N

3.2	Connection to an a.c. mains supply or a d.c. mains supply		P
3.2.1	Means of connection		P
3.2.1.1	Connection to an a.c. mains supply		N
3.2.1.2	Connection to a d.c. mains supply		P
3.2.2	Multiple supply connections	One type of supply connection	P
3.2.3	Permanently connected equipment	No permanently connected equipment	N
	Number of conductors, diameter (mm) of cable and conduits		—
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
	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
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 and nominal thread diameter (mm).....:		—
3.3.6	Wiring terminals design		N
3.3.7	Grouping of wiring terminals		N
3.3.8	Stranded wire		N

3.4	Disconnection from the mains supply		P
3.4.1	General requirement		P
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	None	N
3.4.6	Single-phase equipment and d.c. equipment		P
3.4.7	Three-phase equipment	Single phase.	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		N
3.5.1	General requirements		N
3.5.2	Types of interconnection circuits		N
3.5.3	ELV circuits as interconnection circuits		N

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

4.2	Mechanical strength		P
4.2.1	General		P
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		N
4.2.5	Impact test		N
	Fall test		P
	Swing test		N
4.2.6	Drop test		N
4.2.7	Stress relief test		P
4.2.8	Cathode ray tubes	No such tubes	N
	Picture tube separately certified		N
4.2.9	High pressure lamps	No such bulbs	N
4.2.10	Wall or ceiling mounted equipment; force (N)	No such mountable equipment	N

4.3	Design and construction		P
4.3.1	Edges and corners	Corners and edges are rounded	P
4.3.2	Handles and manual controls; force (N)	No handles and controls	N
4.3.3	Adjustable controls		N
4.3.4	Securing of parts		N
4.3.5	Connection of plugs and sockets		N
4.3.6	Direct plug-in equipment	Not for direct plug in	N
	Dimensions (mm) of mains plug for direct plug-in		N
	Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N)		N
4.3.7	Heating elements in earthed equipment	No heating elements	N
4.3.8	Batteries		P
4.3.9	Oil and grease	No oil or grease	N

4.3.10	Dust, powders, liquids and gases	No dust, powder, fluids or liquids Equipment in intended use not considered to be exposed to these.	N
4.3.11	Containers for liquids or gases	No containers	N
4.3.12	Flammable liquids	No liquids	N
	Quantity of liquid (l).....		N
	Flash point (°C)		N
4.3.13	Radiation; type of radiation	No 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	No equipment operated with UV radiating lamps	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)		P
	Laser class		—
4.3.13.6	Other types		N

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

4.5	Thermal requirements		P
4.5.1	General		P
4.5.2	Temperature tests	See appended table 4.5	P
4.5.3	Temperature limits for materials		P
4.5.4	Touch temperature limits		P
4.5.5	Resistance to abnormal heat		P

4.6	Openings in enclosures		N
4.6.1	Top and side openings		N
4.6.2	Bottoms of fire enclosures		N
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
4.6.4.2	Evaluation measures for larger openings		N
4.6.4.3	Use of metallized parts	Plastic parts only	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		N
	Method 2, application of all of simulated fault condition tests		P
4.7.2	Conditions for a fire enclosure	Applying of method 2 of clause 4.7.1	N
4.7.2.1	Parts requiring a fire enclosure		N
4.7.2.2	Parts not requiring a fire enclosure		P
4.7.3	Materials		P
4.7.3.1	General		P
4.7.3.2	Materials for fire enclosures		P
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
4.7.3.5	Materials for air filter assemblies	No air filter	N
4.7.3.6	Materials used in high-voltage components	No high voltage component.	N

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		N
5.1.1	General		N
5.1.2	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
	Test 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 and from telecommunication networks and cable distribution systems and from telecommunication networks	There is no Telecommunication network	N
5.1.8.1	Limitation of the touch current to a telecommunication network and a cable distribution system		N
	Test voltage (V) :		—
	Measured touch current (mA) :		—
	Max. allowed touch current (mA) :		—
5.1.8.2	Summation of touch currents from telecommunication networks..... :		N

5.2	Electric strength		N
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		P
5.3.2	Motors	No such ones	N
5.3.3	Transformers	No such ones	N
5.3.4	Functional insulation.....:		N
5.3.5	Electromechanical components		N
5.3.6	Audio amplifiers in information technology equipment		N
5.3.7	Simulation of faults		P
5.3.8	Unattended equipment		P
5.3.9	Compliance criteria for abnormal operating and fault conditions		N
5.3.9.1	During the tests		N
5.3.9.2	After the tests		N

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

	Test 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 the telecommunication wiring system from overheating		N
	Max. output current (A).....		—
	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 A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N
A.1	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)		N
A.1.1	Samples		—
	Wall thickness (mm).....		—
A.1.2	Conditioning of samples; temperature (°C).....		N
A.1.3	Mounting of samples		N
A.1.4	Test flame		N
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		N
A.2.3	Mounting of samples		N
A.2.4	Test flame		N
A.2.5	Test procedure		N
A.2.6	Compliance criteria		N
	Sample 1 burning time (s)		—
	Sample 2 burning time (s)		—
	Sample 3 burning time (s)		—
A.2.7	Alternative test acc. to IEC 60695-2-2, cl. 4, 8		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 d.c. motors in secondary circuits		N
B.6.1	General		N
B.6.2	Test procedure		N
B.6.3	Alternative test procedure		N
B.6.4	Electric strength test		N
B.7	Locked-rotor overload test for d.c. motors in secondary circuits		N

B.7.1	General		N
B.7.2	Test procedure		N
B.7.3	Alternative test procedure		N
B.7.4	Electric strength test		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		N
D.1	Measuring instrument	Was used for testing according to clause 5.1.6	N
D.2	Alternative measuring instrument		N

E	ANNEX E, TEMPERATURE RISE OF A WINDING		N
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F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10)		N
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G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N
G.1	Clearances	This method was not used	N
G.1.1	General		N
G.1.1	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	DC mains supply		N
G.2.3	Unearthed d.c. mains supplies		N
G.2.4	Battery operation		N
G.3	Determination of telecommunication network transient voltage (V)		N

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 levels (V)		N
G.6	Determination of minimum clearances.....:		N

H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N
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J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N
	Metal used		—

K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)		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 4.5.1)		N
L.1	Typewriters		N
L.2	Adding machines and cash registers		N
L.3	Erasers		N
L.4	Pencil sharpeners		N
L.5	Duplicators and copy machines		N
L.6	Motor-operated files		N
L.7	Other business equipment		N

M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N
M.1	Introduction		N
M.2	Method A		N
M.3	Method B		N
M.3.1	Ringling signal		N
M.3.1.1	Frequency (Hz)		—
M.3.1.2	Voltage (V)		—
M.3.1.3	Cadence; time (s), voltage (V)		—
M.3.1.4	Single fault current (mA).....:		—

M.3.2	Tripping device and monitoring voltage.....:		N
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N
M.3.2.2	Tripping device		N
M.3.2.3	Monitoring voltage (V).....:		N

N	ANNEX N, IMPULSE TEST GENERATORS (see 2.10.3.4, 6.2.2.1, 7.3.2 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		N
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Q	ANNEX Q, VOLTAGE DEPENDENT RESISTORS(VDRs)		N
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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)		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
S.3	Examples of waveforms during impulse testing		N

T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N
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U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N
U.1	Wire construction		N
U.2	Type tests		N
U.2.1	Electric strength		N
U.2.2	Flexibility and adherence		N
U.2.3	Heat shock		N
U.2.4	Retention of electric strength after bending		N
U.3	Tests during manufacture		N
U.3.1	Routine testing		N
U.3.2	Sampling tests		N

V	Annex V AC power distribution systems		N
V.1	Introduction		N

V.2	TN power distribution systems	N
V.3	TT power distribution systems	N
V.4	IT 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	N
X.1	Determination of maximum input current	N
X.2	Overload test procedure	N

Y	Annex Y Ultraviolet light conditioning test	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	N
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AA	Annex AA Mandrel test	N
		N
BB	Annex BB Changes in the second edition	N
BB.1	Numbering changes table	N
BB.2	Changes to this edition	N

C.2	Safety isolation transformer	Model: -	N
Construction details:			
Transformer part name: T1			
Recurring peak voltage			
Required clearance for reinforced insulation (from table 2H and 2J)			
Effective voltage rms			
Required creepage distance for reinforced			

insulation (from table 2L)		
Measured min. creepage distance		
Location	inside (mm)	outside (mm)
Primary-secondary		
Primary-core		
Secondary-core		
Primary-primary		
Measured min. clearances		
Location	inside (mm)	outside (mm)
Primary-secondary		
Primary-core		
Secondary-core		
Primary-primary		

1.5.1	TABLE: critical components			
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Mark(s)of conformity ¹⁾
PCB	ZHONGSHAN CAKEE (KINLON) PCB CO LTD	NST-02	94V-0, 130°C	UL E205740
	SHENZHEN SHENKAI ELECTRONICS CO LTD	SK-2, SK-4	94V-0, 130°C	UL E319204
Enclosure	SABIC INNOVATIVE PLASTICS US L L C	500(f2)	V-0, 125°C	UL E121562
			V-0, 80°C	

4.5	TABLE: maximum temperatures for model: V8FT				P
	test voltage (V)	DC 6.8V	DC 9.6V	-	—
	Output voltage (V)	-	-	-	
	t _{amb2} (°C)	21.7-22.3	21.9-22.6	-	—

Maximum temperature T of part/at:	T (°C)			allowed T _{max} (°C)
Enclosure 1	24.1	25.2	-	75
Enclosure 2	23.0	24.5	-	75
PCB	26.4	26.4	-	105
Ambient	22.3	22.5	-	--
Note:				

Photo documentation

Photo 1

View: V8R7

[✓] Top view

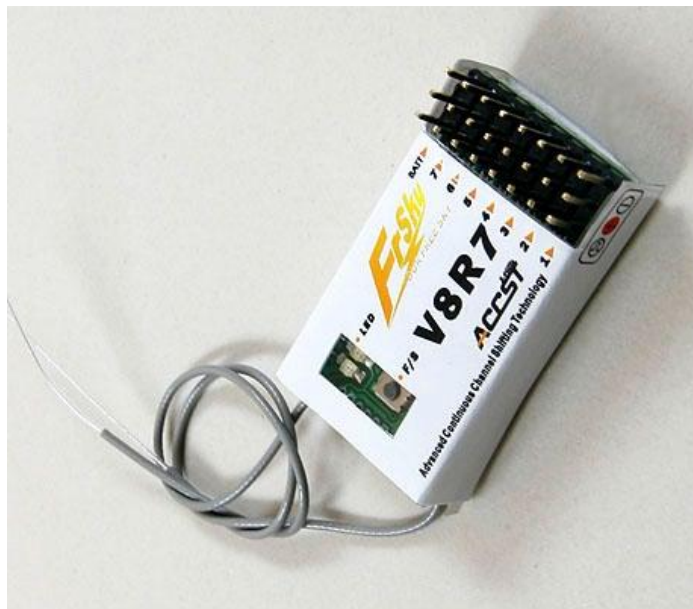


Photo 2

View: V8HT

[✓] Top view



DC 72V V8HT Normal Operation

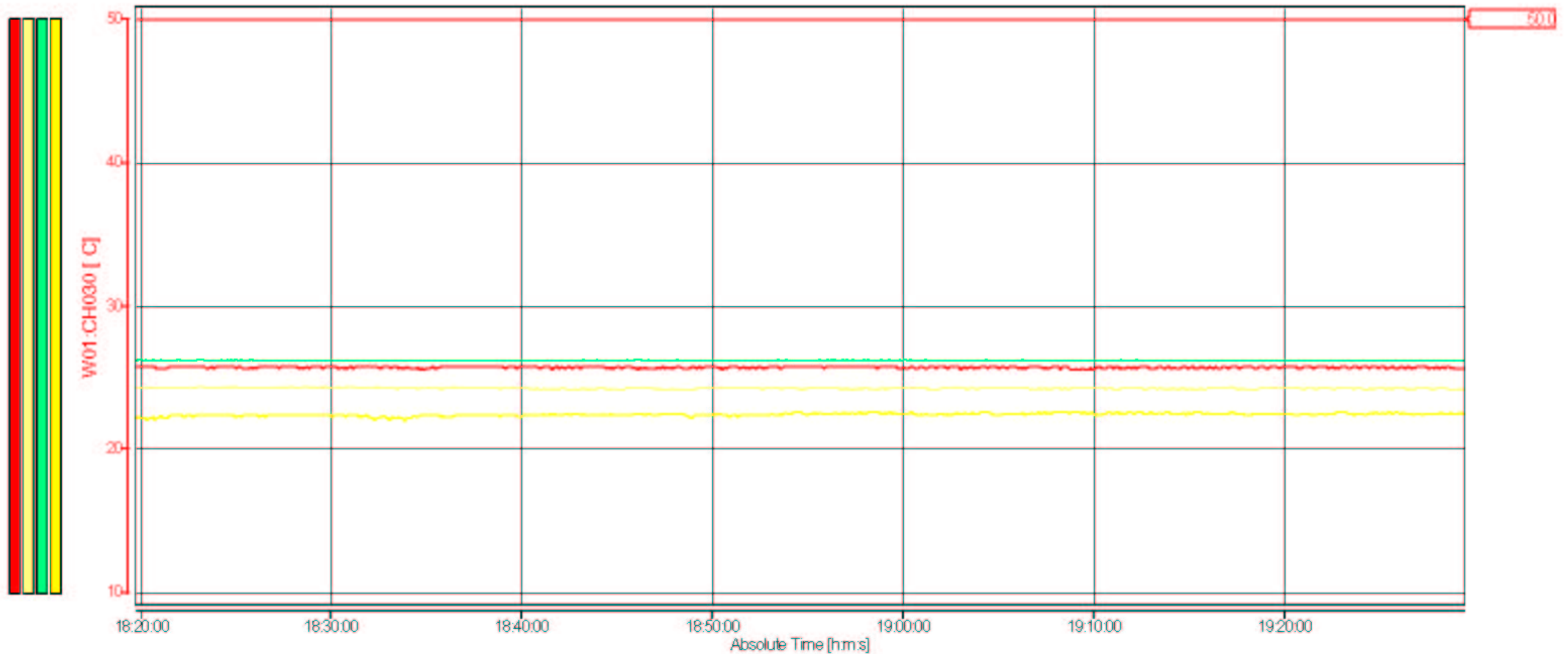
File Name : V8HT.DAQ Device Type : DA100 Expandable

Data Count : 1770 Group : 305 Channel Count : 32 Sampling Interval : 6.000 Sec

Start Time : 2010/06/07 17:49:23.5 End Time : 2010/06/07 20:46:11.5 Print Range [2010/06/07 18:19:47.5 - 2010/06/07 19:29:23.5]

Section 438 - 1136

Channel	Min	Max	P-P	Mean	RMS
W01:CH030	25.1	25.2	0.1	25.2	25.2
W02:CH031	24.1	24.5	0.4	24.4	24.4
W03:CH032	26.1	26.4	0.3	26.2	26.2
W04:CH033	21.9	22.5	0.6	22.4	22.4



DC 5.1V V8HT Normal Operation

File Name : V8HT.DAQ Device Type : DA100 Expandable

Data Count : 1769 Group : 305 Channel Count : 32 Sampling Interval : 6.000 Sec

Start Time : 2010/06/06 17:49:23.5 End Time : 2010/06/06 20:46:11.5 Print Range [2010/06/06 18:07:35.5 - 2010/06/06 20:04:35.5]

Section	182	-	1352			
Channel	Min	Max	P-P	Mean	RMS	
Enclosure 1	23.8	24.1	0.5	24.0	24.0	
Enclosure 2	22.6	23.0	0.4	22.6	22.6	
PCB	26.3	26.4	0.1	26.4	26.4	
Ambient	21.7	22.3	0.6	22.0	22.0	

