Test Report issued under
the responsibility of:

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

Report Number..... :	20TH0272-62368-1_0
Date of issue..... :	2020-07-23
Total number of pages..... :	75
Applicant's name..... :	WoM Asia Co. Ltd
Address..... :	4F., no. 86-2, Yi Wen 1st St., Taoyuan dist., Taoyuan 330, TAIWAN
Test specification:	
Standard ..... :	IEC 62368-1:2014 (Second Edition)
Test procedure..... :	CE verification
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC62368_1B
Test Report Form(s) Originator ..... :	UL(US)
Master TRF..... :	2014-03

This report is no CB Test Report.

General disclaimer:

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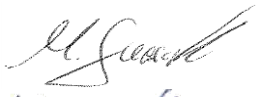
Test Item description .....:	Anybus Industrial LTE Router	
Trade Mark .....:	HMS	
Manufacturer.....:	WoM Asia Co., Ltd.	
Model/Type reference .....:	AWB5221	
Ratings .....:	24 Vdc; max. 0,2 A (4,8 W)	
Testing procedure and testing location:		
☒ Testing Laboratory:	Bureau Veritas Consumer Products Services Germany GmbH	
Testing location/ address ..... :	Businesspark A96; 86842 Türkheim; GERMANY	
Tested by (name + signature) .....:	Mirko Gausepohl	
Approved by (name + signature) .....:	Max Gebuhr	

Document History			
Date	**Internal reference**	**Modification/Change/Status**	**Revision**
2020-07-23	MGA	Initial report	0

List of Attachments (included in this report):

1: Additional test data
2: CENELEC common modifications
3: Pictures
4: Schematics, layouts, assembly diagram
5: Datasheets of safety critical components
6: Manual / installation instructions
7: List of test equipment and uncertainties of measurement

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
All tests within this test report	Bureau Veritas Consumer Products Services Germany GmbH Businesspark A96, 86842 Türkheim, GERMANY

Summary of compliance with National Differences:

List of countries addressed

Europe

The product fulfils the requirements of

- IEC 62368-1:2014 (Second Edition)
- EN 62368-1:2014 + AC:2015 + A11:2017

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective Certification Bodies that own these marks.

TEST ITEM PARTICULARS:	
Classification of use by ..... :	☒ Ordinary person ☐ Instructed person ☐ Skilled person ☐ Children likely to be present
Supply Connection ..... :	☐ AC Mains ☐ DC Mains ☒ External Circuit - not Mains connected - ☒ ES1 ☐ ES2 ☐ ES3
Supply % Tolerance ..... :	8 … 32 Vdc
Supply Connection – Type ..... :	☐ pluggable equipment type A - ☐ non-detachable supply cord ☐ appliance coupler ☐ direct plug-in ☐ mating connector ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☒ mating connector ☐ other:_____
Considered current rating of protective device as part of building or equipment installation..... :	5 A; Installation location: ☐ building; ☒ equipment
Equipment mobility..... :	DIN-rail- or wall-mounted
Over voltage category (OVC) ..... :	☐ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV ☒ other: 1500 V (only Port 9)
Class of equipment ..... :	☐ Class I ☐ Class II ☒ Class III
Access location ..... :	☐ restricted access location ☒ N/A
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified maximum operating ambient..... :	−40 … +75 °C
IP protection class ..... :	☐ IPX0 ☒ IP31
Power Systems ..... :	DC supply
Altitude during operation (m) ..... :	☒ 2000 m or less ☐ _____ m
Altitude of test laboratory (m) ..... :	☒ 2000 m or less ☐ _____ m
Mass of equipment (kg) ..... :	☒ 1,4 kg
POSSIBLE 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..... :	Rev. 0: 2020-03-30
Date (s) of performance of tests..... :	Rev. 0: from 2020-03-30 to 2020-06-30

The application includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....:	☐ Yes ☒ Not applicable (one factory location only)
Name and address of factory (ies) .....:	Jean Suen Technology 235 Taipei County, Chung He City, Jian Kang Road,No.130 6F, Section 12
GENERAL PRODUCT INFORMATION:	
Product Description The product is an Industrial 8+ 1G port Cellular Ethernet Routing Switch.	
Model Differences Only one model: AWB5221	
Additional application considerations – (Considerations used to test a component or sub-assembly) • The Input, output and internal circuits are rated ES1 • The Equipment is rated class III • The equipment provides a fire-enclosure • The product was tested for a maximum ambient of 75 °C • Information about Safety precaution and important notification see Annex 6: “ Manual / installation instruction”	

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
Note 1: Identify the following six (6) energy source forms based on the origin of the energy. Note 2: The identified classification, e.g. ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification, e.g. PS3, ES3.	
Electrically-caused injury (Clause 5): (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification)	
Source of electrical energy	**Corresponding classification (ES)**
All circuits	ES1
Electrically-caused fire (Clause 6): (Note: List sub-assembly or circuit designation and corresponding energy source classification)	
Source of power or PIS	**Corresponding classification (PS)**
Power supply input circuit	PS3
Output circuits	PS1
Injury caused by hazardous substances (Clause 7) (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.)	
Source of hazardous substances	**Corresponding chemical**
No hazardous substances present	--
Mechanically-caused injury (Clause 8) (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit MS2	
Source of kinetic/mechanical energy	**Corresponding classification (MS)**
Edges and Corners	MS1
Equipment mass	MS2 (> 1 kg, mounted ≤ 2 m)
Thermal burn injury (Clause 9) (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.)	
Source of thermal energy	**Corresponding classification (TS)**
Metal enclosure (accessible parts)	TS1
Radiation (Clause 10) (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product RS1	
Type of radiation	**Corresponding classification (RS)**
No hazardous radiation present (only low power LED´s for indication)	RS1

ENERGY SOURCE DIAGRAM
(see above table, no diagram required)
☐ **ES** ☐ **PS** ☐ **MS** ☐ **TS** ☐ **RS**

OVERVIEW OF EMPLOYED SAFEGUARDS				
Clause	**Possible Hazard**			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary – all parts	ES1	N/A	N/A	N/A
6.1	Electrically-caused fire			
Material part (e.g. mouse enclosure)	Energy Source (PS2: 100 Watt circuit)	Safeguards		
		Basic	Supplementary	Reinforced
Input circuit	PS3	Require-ments of clause 6.3.1 fulfilled	Requirements of clause 6.3.1 fulfilled	A fire enclosure is provided.
Outputs	PS1	N/A	N/A	N/A
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
No hazardous substances	--	--	--	--
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3:High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	MS1: Mass of equipment	Equipment mass below 1 kg	--	--
Ordinary	MS2: Wall-mounted	--	--	fixed (see 8.7.1)
9.1	Thermal Burn			
Body Part (e.g., Ordinary)	Energy Source (TS2)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	TS1	Comply with TS1 limits	N/A	N/A
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	TS1: only low power LEDs provided	N/A	N/A	N/A
Supplementary Information: (1) See attached energy source diagram for additional details. (2) “N” – Normal Condition; “A” – Abnormal Condition; “S” Single Fault				

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Clause	Requirement + Test	Result - Remark	Verdict

4	**GENERAL REQUIREMENTS**		P
4.1.1	Acceptance of materials, components and subassemblies	Considered	P
4.1.2	Use of components	Components comply with the requirements of this standard or, where specified in a requirements clause, with the safety aspects of the relevant IEC component standards See table 4.1.2	P
4.1.3	Equipment design and construction	Suitable safeguards are provided; the safeguards cannot be defeated by the adjustment of a control	P
4.1.15	Markings and instructions..... :	(See Annex F)	P
4.4.4	Safeguard robustness	Solid safeguard is provided and complies with applicable requirements	P
4.4.4.2	Steady force tests..... :	(See Annex T.4)	P
4.4.4.3	Drop tests ..... :	fixed equipment	N/A
4.4.4.4	Impact tests ..... :	(See Annex T.6)	P
4.4.4.5	Internal accessible safeguard enclosure and barrier tests ..... :	No internal safeguard which is accessible to an ordinary person	N/A
4.4.4.6	Glass Impact tests..... :	No parts made of glass	N/A
4.4.4.7	Thermoplastic material tests ..... :	No safeguards made of thermoplastic material	N/A
4.4.4.8	Air comprising a safeguard..... :	(See Annex T)	P
4.4.4.9	Accessibility and safeguard effectiveness	Safeguards remain effective; hazardous energy sources do not become accessible to ordinary persons.	P
4.5	Explosion	No sources present which may cause an explosion	N/A
4.6	Fixing of conductors	internal antenna wires provided	P
4.6.1	Fix conductors not to defeat a safeguard		P
4.6.2	10 N force test applied to ..... :	see appended Table T.2	P
4.7	Equipment for direct insertion into mains socket - outlets	class III product	N/A
4.7.2	Mains plug part complies with the relevant standard..... :		N/A
4.7.3	Torque (Nm) ..... :		N/A
4.8	Products containing coin/button cell batteries	No coin/button cell is used	N/A
4.8.2	Instructional safeguard		N/A
4.8.3	Battery Compartment Construction		N/A
	Means to reduce the possibility of children		—

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Clause	Requirement + Test	Result - Remark	Verdict
	removing the battery..... :		
4.8.4	Battery Compartment Mechanical Tests ..... :		N/A
4.8.5	Battery Accessibility		N/A
4.9	Likelihood of fire or shock due to entry of conductive object..... :	(See Annex P)	P

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Clause	Requirement + Test	Result - Remark	Verdict
5	**ELECTRICALLY-CAUSED INJURY**		P
5.2.1	Electrical energy source classifications ..... :	ES1 circuits only; no test required	P
5.2.2	ES1, ES2 and ES3 limits	see 5.2.1	P
5.2.2.2	Steady-state voltage and current ..... :		N/A
5.2.2.3	Capacitance limits..... :		N/A
5.2.2.4	Single pulse limits ..... :	No single pulses as energy source	N/A
5.2.2.5	Limits for repetitive pulses ..... :	No repetitive pulses as energy source	N/A
5.2.2.6	Ringing signals ..... :	No ringing signals	N/A
5.2.2.7	Audio signals ..... :	No audio signals	N/A
5.3	Protection against electrical energy sources	Class III product, no hazardous electrical energy source present, only ES1	N/A
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	Considered	N/A
5.3.2.1	Accessibility to electrical energy sources and safeguards		N/A
5.3.2.2	Contact requirements		N/A
	a) Test with test probe from Annex V..... :		N/A
	b) Electric strength test potential (V) ..... :		N/A
	c) Air gap (mm) ..... :		N/A
5.3.2.4	Terminals for connecting stripped wire		N/A
5.4	Insulation materials and requirements		N/A
5.4.1.2	Properties of insulating material	functional insulation only	N/A
5.4.1.3	Humidity conditioning ..... :	Verified by the evaluation of the material data; no hygroscopic materials used.	N/A
5.4.1.4	Maximum operating temperature for insulating materials ..... :		N/A
5.4.1.5	Pollution degree..... :	PD2	—
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound	No PD1 environment or insulation compound	N/A
5.4.1.5.3	Thermal cycling	Test not applicable	N/A
5.4.1.6	Insulation in transformers with varying dimensions	No transformers with varying dimensions	N/A
5.4.1.7	Insulation in circuits generating starting pulses	No circuits generating starting pulses	N/A
5.4.1.8	Determination of working voltage		N/A
5.4.1.9	Insulating surfaces	Not applicable, metal enclosure, no accessible insulating surface	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted	No thermoplastic parts on which conductive metallic parts are directly mounted	N/A
5.4.1.10.2	Vicat softening temperature ..... :		N/A
5.4.1.10.3	Ball pressure ..... :		N/A
5.4.2	Clearances	Not relevant – functional insulation only Remaining subclauses of 5.4.2 marked “N/A”.	N/A
5.4.2.2	Determining clearance using peak working voltage		N/A
5.4.2.3	Determining clearance using required withstand voltage ..... :		N/A
	a) a.c. mains transient voltage..... :		—
	b) d.c. mains transient voltage ..... :		—
	c) external circuit transient voltage..... :		—
	d) transient voltage determined by measurement .		—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test		N/A
5.4.2.5	Multiplication factors for clearances and test voltages..... :		N/A
5.4.3	Creepage distances..... :	Not relevant – functional insulation only Remaining subclauses of 5.4.3 marked “N/A”.	N/A
5.4.3.1	General		N/A
5.4.3.3	Material Group ..... :		—
5.4.4	Solid insulation	Not relevant – functional insulation only Remaining subclauses of 5.4.4 marked “N/A”.	N/A
5.4.4.2	Minimum distance through insulation ..... :		N/A
5.4.4.3	Insulation compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Cemented joints		N/A
5.4.4.6	Thin sheet material		N/A
5.4.4.6.1	General requirements		N/A
5.4.4.6.2	Separable thin sheet material		N/A
	Number of layers (pcs) ..... :		N/A
5.4.4.6.3	Non-separable thin sheet material		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components	No solid insulation in wound components	N/A
5.4.4.9	Solid insulation at frequencies >30 kHz ..... :		N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
	Insulation resistance (MΩ) ..... :		—
5.4.6	Insulation of internal wire as part of supplementary safeguard ..... :	functional insulation only	N/A
5.4.7	Tests for semiconductor components and for cemented joints	functional insulation only	N/A
5.4.8	Humidity conditioning		N/A
	Relative humidity (%) ..... :		—
	Temperature (°C) ..... :		—
	Duration (h) ..... :		—
5.4.9	Electric strength test ..... :	Only ES1 circuits	N/A
5.4.9.1	Test procedure for a solid insulation type test		N/A
5.4.9.2	Test procedure for routine tests		N/A
5.4.10	Protection against transient voltages between external circuit	Approved components used (only Port 9)	P
5.4.10.1	Parts and circuits separated from external circuits		P
5.4.10.2	Test methods	Approved components used see table 4.1.2	N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test ..... :		N/A
5.4.10.2.3	Steady-state test ..... :		N/A
5.4.11	Insulation between external circuits and earthed circuitry ..... :		N/A
5.4.11.1	Exceptions to separation between external circuits and earth	Not applicable: screwed protective earth to the housing	N/A
5.4.11.2	Requirements		N/A
	Rated operating voltage U_{op} (V) ..... :		—
	Nominal voltage U_{peak} (V) ..... :		—
	Max increase due to variation U_{sp} ..... :		—
	Max increase due to ageing ΔU_{sa} ..... :		—
	$U_{op} = U_{peak} + \Delta U_{sp} + \Delta U_{sa}$ ..... :		—
5.5	Components as safeguards		

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Clause	Requirement + Test	Result - Remark	Verdict
5.5.1	General	No components used as safeguard	N/A
5.5.2	Capacitors and RC units		N/A
5.5.2.1	General requirement		N/A
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector..... :	No connector with accessible capacitor voltage present	N/A
5.5.3	Transformers	No transformer used as safeguard	N/A
5.5.4	Optocouplers	No optocoupler used as safeguard	N/A
5.5.5	Relays	No relay used as safeguard	N/A
5.5.6	Resistors	No resistor used as safeguard	N/A
5.5.7	SPD's	No mains circuit provided	N/A
5.5.7.1	Use of an SPD connected to reliable earthing		N/A
5.5.7.2	Use of an SPD between mains and protective earth		N/A
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable ..... :	No external circuit consisting of a coaxial cable	N/A
5.6	Protective conductor		N/A
5.6.2	Requirement for protective conductors	class III product Permanently connected earth connection to avoid high touch current due to multiple interface connections. (No protective earthing as for class I equipment.)	N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation	No insulated conductors are used	N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm^2) ..... :		—
5.6.4	Requirement for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm2). ..... :		—
	Protective current rating (A) ..... :		—
5.6.4.3	Current limiting and overcurrent protective devices	No component connected in parallel	N/A
5.6.5	Terminals for protective conductors	Earthing connection via screw at the housing.	N/A
5.6.5.1	Requirement		N/A
	Conductor size (mm^2), nominal thread diameter (mm). ..... :	(No protective earthing as for class I equipment.)	N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective system		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method Resistance (Ω) ..... :		N/A
5.6.7	Reliable earthing	see 5.6.2	N/A
5.7	Prospective touch voltage, touch current and protective conductor current		P
5.7.2	Measuring devices and networks	Requirement not applicable for DC supply.	N/A
5.7.2.1	Measurement of touch current ..... :		N/A
5.7.2.2	Measurement of prospective touch voltage		N/A
5.7.3	Equipment set-up, supply connections and earth connections		N/A
	System of interconnected equipment (separate connections/single connection) ..... :		—
	Multiple connections to mains (one connection at a time/simultaneous connections)..... :		—
5.7.4	Earthed conductive accessible parts ..... :		N/A
5.7.5	Protective conductor current		N/A
	Supply Voltage (V)..... :		—
	Measured current (mA)..... :		—
	Instructional Safeguard..... :		N/A
5.7.6	Prospective touch voltage and touch current due to external circuits	see 5.6.2	P
5.7.6.1	Touch current from coaxial cables		N/A
5.7.6.2	Prospective touch voltage and touch current from external circuits	Not applicable: external circuit is connected to a protective earthing conductor	P
5.7.7	Summation of touch currents from external circuits	the sum of touch currents does not exceed the ES2 limits	P
	a) Equipment with earthed external circuits Measured current (mA) ..... :		N/A
	b) Equipment whose external circuits are not referenced to earth. Measured current (mA)..... :	the sum of touch currents does not exceed the ES2 limits	P

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Clause	Requirement + Test	Result - Remark	Verdict
6	**ELECTRICALLY- CAUSED FIRE**		P
6.2	Classification of power sources (PS) and potential ignition sources (PIS)		P
6.2.2	Power source circuit classifications		P
6.2.2.1	General		P
6.2.2.2	Power measurement for worst-case load fault ... :	(See appended table 6.2.2)	P
6.2.2.3	Power measurement for worst-case power source fault..... :	(See appended table 6.2.2)	P
6.2.2.4	PS1 ..... :		N/A
6.2.2.5	PS2 ..... :		N/A
6.2.2.6	PS3 ..... :	(See appended table 6.2.2)	P
6.2.3	Classification of potential ignition sources	The full device was considered as arcing and resistive PIS; no test required	P
6.2.3.1	Arcing PIS ..... :	< 50 V	N/A
6.2.3.2	Resistive PIS ..... :	Resistive PIS assumed; no test required.	P
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1 (a)	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials ..... :	(See appended table 5.4.1.4, 6.3.2, 9.0, B.2.6)	P
6.3.1 (b)	Combustible materials outside fire enclosure	Parts outside fire enclosure (supply connector only) have adequate flammability rating; see appended table 4.1.2.	P
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard Method	Method applied: Control of fire spread	P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		N/A
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	Method “Control of fire spread” applied	N/A
6.4.3.1	General		N/A
6.4.3.2	Supplementary Safeguards		N/A
	Special conditions if conductors on printed boards are opened or peeled		N/A
6.4.3.3	Single Fault Conditions..... :		N/A
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits	considered	P
6.4.5	Control of fire spread in PS2 circuits	No PS2 circuit	N/A
6.4.5.2	Supplementary safeguards ..... :		N/A
6.4.6	Control of fire spread in PS3 circuit		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.7	Separation of combustible materials from a PIS	metal enclosure; see clause 6.8	N/A
6.4.7.1	General ..... :		N/A
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers		P
6.4.8.1	Fire enclosure and fire barrier material properties	Metal enclosure	P
6.4.8.2.1	Requirements for a fire barrier		N/A
6.4.8.2.2	Requirements for a fire enclosure	Metal enclosure	P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		P
6.4.8.3.1	Fire enclosure and fire barrier openings		P
6.4.8.3.2	Fire barrier dimensions	No fire barrier provided	N/A
6.4.8.3.3	Top Openings in Fire Enclosure: dimensions (mm) ..... :	No openings on the top	N/A
	Needle Flame test		N/A
6.4.8.3.4	Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) ..... :	No openings on the bottom	N/A
	Flammability tests for the bottom of a fire enclosure ..... :		N/A
6.4.8.3.5	Integrity of the fire enclosure, condition met: a), b) or c) ..... :	c) instructions are described in the manual	P
6.4.8.4	Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating ..... :	Metal enclosure	N/A
6.5	Internal and external wiring		P
6.5.1	Requirements		P
6.5.2	Cross-sectional area (mm2) ..... :		—
6.5.3	Requirements for interconnection to building wiring ..... :	(See Annex Q.)	P
6.6	Safeguards against fire due to connection to additional equipment	(See Annex Q.)	P
	External port limited to PS2 or complies with Clause Q.1	(See Annex Q.)	P

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Clause	Requirement + Test	Result - Remark	Verdict
7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		N/A
7.2	Reduction of exposure to hazardous substances	No hazardous substances present	N/A
7.3	Ozone exposure	No ozone present	N/A
7.4	Use of personal safeguards (PPE)		N/A
	Personal safeguards and instructions ..... :		—
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010) ..... :		—
7.6	Batteries ..... :	No batteries present	N/A
8	**MECHANICALLY-CAUSED INJURY**		P
8.1	General		P
8.2	Mechanical energy source classifications		P
8.3	Safeguards against mechanical energy sources	MS1 (edges and corners)/MS2 (wall-mounting > 2 m)	P
8.4	Safeguards against parts with sharp edges and corners	No sharp edges and corners	N/A
8.4.1	Safeguards		N/A
8.5	Safeguards against moving parts	No moving parts	N/A
8.5.1	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
8.5.2	Instructional Safeguard ..... :		—
8.5.4	Special categories of equipment comprising moving parts		N/A
8.5.4.1	Large data storage equipment		N/A
8.5.4.2	Equipment having electromechanical device for destruction of media		N/A
8.5.4.2.1	Safeguards and Safety Interlocks ..... :		N/A
8.5.4.2.2	Instructional safeguards against moving parts		N/A
	Instructional Safeguard ..... :		—
8.5.4.2.3	Disconnection from the supply		N/A
8.5.4.2.4	Probe type and force (N) ..... :		N/A
8.5.5	High Pressure Lamps		N/A
8.5.5.1	Energy Source Classification		N/A
8.5.5.2	High Pressure Lamp Explosion Test ..... :		N/A
8.6	Stability		N/A
8.6.1	Product classification		N/A
	Instructional Safeguard ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
8.6.2	Static stability		N/A
8.6.2.2	Static stability test		N/A
	Applied Force ..... :		—
8.6.2.3	Downward Force Test		N/A
8.6.3	Relocation stability test		N/A
	Unit configuration during 10° tilt ..... :		—
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test (Applied Force)..... :		N/A
	Position of feet or movable parts..... :		—
8.7	Equipment mounted to wall or ceiling	MS1; Equipment mass >1kg and mounted < 2m	P
8.7.1	Mounting Means (Length of screws (mm) and mounting surface) ..... :		N/A
8.7.2	Direction and applied force..... :		N/A
8.8	Handles strength	No handles	N/A
8.8.1	Classification		N/A
8.8.2	Applied Force ..... :		N/A
8.9	Wheels or casters attachment requirements	No wheels or casters provided	N/A
8.9.1	Classification		N/A
8.9.2	Applied force..... :		—
8.10	Carts, stands and similar carriers		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions		N/A
	Instructional Safeguard ..... :		—
8.10.3	Cart, stand or carrier loading test and compliance		N/A
	Applied force..... :		—
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Applied horizontal force (N)..... :		—
8.10.6	Thermoplastic temperature stability (°C)..... :		N/A
8.11	Mounting means for rack mounted equipment		N/A
8.11.1	General		N/A
8.11.2	Product Classification		N/A
8.11.3	Mechanical strength test, variable N ..... :		N/A
8.11.4	Mechanical strength test 250N, including end stops		N/A
8.12	Telescoping or rod antennas.....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Button/Ball diameter (mm)..... :		—
9	**THERMAL BURN INJURY**		P
9.2	Thermal energy source classifications	TS1	P
9.3	Safeguard against thermal energy sources		N/A
9.4	Requirements for safeguards		N/A
9.4.1	Equipment safeguard		N/A
9.4.2	Instructional safeguard ..... :		N/A
10	**RADIATION**		P
10.2	Radiation energy source classification		P
10.2.1	General classification	Indication LEDs: RS1	P
10.3	Protection against laser radiation	No laser present	N/A
	Laser radiation that exists equipment:		—
	Normal, abnormal, single-fault ..... :		N/A
	Instructional safeguard ..... :		—
	Tool ..... :		—
10.4	Protection against visible, infrared, and UV radiation	Low power LEDs for indication only	P
10.4.1	General		P
10.4.1.a)	RS3 for Ordinary and instructed persons ..... :		N/A
10.4.1.b)	RS3 accessible to a skilled person ..... :		N/A
	Personal safeguard (PPE) instructional safeguard ..... :		—
10.4.1.c)	Equipment visible, IR, UV does not exceed RS1 :		N/A
10.4.1.d)	Normal, abnormal, single-fault conditions ..... :		N/A
10.4.1.e)	Enclosure material employed as safeguard is opaque ..... :		N/A
10.4.1.f)	UV attenuation ..... :	No UV exposure	N/A
10.4.1.g)	Materials resistant to degradation UV..... :		N/A
10.4.1.h)	Enclosure containment of optical radiation ..... :		N/A
10.4.1.i)	Exempt Group under normal operating conditions ..... :		N/A
10.4.2	Instructional safeguard ..... :		N/A
10.5	Protection against x-radiation	No x-radiation	N/A
10.5.1	X- radiation energy source that exists equipment ..... :		N/A
	Normal, abnormal, single fault conditions		N/A
	Equipment safeguards..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Instructional safeguard for skilled person .....:		N/A
10.5.3	Most unfavourable supply voltage to give maximum radiation .....:		—
	Abnormal and single-fault condition.....:		N/A
	Maximum radiation (pA/kg) .....:		N/A
10.6	Protection against acoustic energy sources		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output, dB(A).....:		N/A
	Output voltage, unweighted r.m.s. .....:		N/A
10.6.4	Protection of persons		N/A
	Instructional safeguards .....:		N/A
	Equipment safeguard prevent ordinary person to RS2 .....:		—
	Means to actively inform user of increase sound pressure .....:		—
	Equipment safeguard prevent ordinary person to RS2 .....:		—
10.6.5	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.5.1	Corded passive listening devices with analog input		N/A
	Input voltage with 94 dB(A) LAeq acoustic pressure output.....:		—
10.6.5.2	Corded listening devices with digital input		N/A
	Maximum dB(A) .....:		—
10.6.5.3	Cordless listening device		N/A
	Maximum dB(A).....:		—

B	**NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS**		P
B.2	Normal Operating Conditions		P
B.2.1	General requirements .....:	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers.....:		N/A
B.2.3	Supply voltage and tolerances		P
B.2.5	Input test.....:	(See appended table B.2.5)	P
B.3	Simulated abnormal operating conditions		N/A
B.3.1	General requirements .....:	No simulated abnormal operating conditions possible	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
B.3.2	Covering of ventilation openings		N/A
B.3.3	D.C. mains polarity test		N/A
B.3.4	Setting of voltage selector .....:		N/A
B.3.5	Maximum load at output terminals .....:		N/A
B.3.6	Reverse battery polarity		N/A
B.3.7	Abnormal operating conditions as specified in Clause E.2.		N/A
B.3.8	Safeguards functional during and after abnormal operating conditions		N/A
B.4	Simulated single fault conditions		P
B.4.2	Temperature controlling device open or short-circuited .....:	(See appended table B.4)	P
B.4.3	Motor tests	No motors present	N/A
B.4.3.1	Motor blocked or rotor locked increasing the internal ambient temperature .....:		N/A
B.4.4	Short circuit of functional insulation	See appended table B.4	P
B.4.4.1	Short circuit of clearances for functional insulation		P
B.4.4.2	Short circuit of creepage distances for functional insulation		P
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short circuit and interruption of electrodes in tubes and semiconductors		P
B.4.6	Short circuit or disconnect of passive components		P
B.4.7	Continuous operation of components		N/A
B.4.8	Class 1 and Class 2 energy sources within limits during and after single fault conditions	See table B.4	P
B.4.9	Battery charging under single fault conditions .. :	No batteries present	N/A
C	**UV RADIATION**		N/A
C.1	Protection of materials in equipment from UV radiation	No UV radiation present	N/A
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure apparatus		N/A
C.2.4	Xenon-arc light exposure apparatus		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
D	**TEST GENERATORS**		N/A
D.1	Impulse test generators		N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
E	**TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS**		N/A
E.1	Audio amplifier normal operating conditions	No audio amplifier present	N/A
	Audio signal voltage (V) .....:		—
	Rated load impedance (Ω) .....:		
E.2	Audio amplifier abnormal operating conditions		N/A
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P
F.1	General requirements		P
	Instructions – Language ..... :	English version was reviewed	—
F.2	Letter symbols and graphical symbols		P
F.2.1	Letter symbols according to IEC60027-1		P
F.2.2	Graphic symbols IEC, ISO or manufacturer specific		P
F.3	Equipment markings		P
F.3.1	Equipment marking locations		P
F.3.2	Equipment identification markings		P
F.3.2.1	Manufacturer identification .....:	See “Copy of marking plate”	—
F.3.2.2	Model identification .....:	See “Copy of marking plate”	—
F.3.3	Equipment rating markings	See “Copy of marking plate”	P
F.3.3.1	Equipment with direct connection to mains		N/A
F.3.3.2	Equipment without direct connection to mains		P
F.3.3.3	Nature of supply voltage.....:	See “Copy of marking plate”	—
F.3.3.4	Rated voltage.....:	See “Copy of marking plate”	—
F.3.3.4	Rated frequency .....:	See “Copy of marking plate”	—
F.3.3.6	Rated current or rated power .....:	See “Copy of marking plate”	—
F.3.3.7	Equipment with multiple supply connections	No multiple supply connection	N/A
F.3.4	Voltage setting device	No setting of controls	N/A
F.3.5	Terminals and operating devices		P
F.3.5.1	Mains appliance outlet and socket-outlet markings.....:	No outlets	N/A
F.3.5.2	Switch position identification marking .....:		N/A
F.3.5.3	Replacement fuse identification and rating markings.....:	Fuse not replaceable	N/A
F.3.5.4	Replacement battery identification marking.....:	No battery present	N/A
F.3.5.5	Terminal marking location		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.6	Equipment markings related to equipment classification		N/A
F.3.6.1	Class I Equipment	Class III equipment	N/A
F.3.6.1.1	Protective earthing conductor terminal		N/A
F.3.6.1.2	Neutral conductor terminal	DC device	N/A
F.3.6.1.3	Protective bonding conductor terminals		N/A
F.3.6.2	Class II equipment (IEC60417-5172)		N/A
F.3.6.2.1	Class II equipment with or without functional earth		N/A
F.3.6.2.2	Class II equipment with functional earth terminal marking		N/A
F.3.7	Equipment IP rating marking ..... :		—
F.3.8	External power supply output marking		N/A
F.3.9	Durability, legibility and permanence of marking		P
F.3.10	Test for permanence of markings	see appended table F.3.10	P
F.4	Instructions		P
	a) Equipment for use in locations where children not likely to be present - marking		N/A
	b) Instructions given for installation or initial use		P
	c) Equipment intended to be fastened in place		N/A
	d) Equipment intended for use only in restricted access area		N/A
	e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1		N/A
	f) Protective earthing employed as safeguard		P
	g) Protective earthing conductor current exceeding ES 2 limits		N/A
	h) Symbols used on equipment		N/A
	i) Permanently connected equipment not provided with all-pole mains switch		N/A
	j) Replaceable components or modules providing safeguard function		N/A
F.5	Instructional safeguards		N/A
	Where “instructional safeguard” is referenced in the test report it specifies the required elements, location of marking and/or instruction		N/A
G	**COMPONENTS**		P
G.1	**Switches**		N/A
G.1.1	General requirements	No switches present	N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.2	**Relays**		P

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Clause	Requirement + Test	Result - Remark	Verdict
G.2.1	General requirements	Approved component present – see table 4.1.2; no further tests necessary	P
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supply power		N/A
G.2.4	Mains relay, modified as stated in G.2		N/A
G.3	**Protection Devices**		N/A
G.3.1	Thermal cut-offs	No thermal cut-offs present	N/A
G.3.1.1a) &b)	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
G.3.1.1c)	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Thermal cut-off connections maintained and secure		N/A
G.3.2	Thermal links		N/A
G.3.2.1a)	Thermal links separately tested with IEC 60691	No thermal links present	N/A
G.3.2.1b)	Thermal links tested as part of the equipment		N/A
	Aging hours (H).....:		—
	Single Fault Condition .....:		—
	Test Voltage (V) and Insulation Resistance (Ω)..:		—
G.3.3	PTC Thermistors	No PTC present	N/A
G.3.4	Overcurrent protection devices	Internal fuse provided	P
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.5		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions ..... :	(See appended Table B.4)	N/A
G.4	**Connectors**		N/A
G.4.1	Spacings		N/A
G.4.2	Mains connector configuration ..... :		N/A
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A
G.5	**Wound Components**		N/A
G.5.1	Wire insulation in wound components		N/A
G.5.1.2 a)	Two wires in contact inside wound component, angle between 45° and 90°		N/A
G.5.1.2 b)	Construction subject to routine testing		N/A
G.5.2	Endurance test on wound components		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time (s) ..... :		—
	Temperature (°C) ..... :		—
G.5.2.3	Wound Components supplied by mains		N/A
G.5.3	**Transformers**		N/A
G.5.3.1	Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1) ..... :		N/A
	Position ..... :		—
	Method of protection ..... :		—
G.5.3.2	Insulation		N/A
	Protection from displacement of windings ..... :		—
G.5.3.3	Overload test ..... :		N/A
G.5.3.3.1	Test conditions		N/A
G.5.3.3.2	Winding Temperatures testing in the unit		N/A
G.5.3.3.3	Winding Temperatures - Alternative test method		N/A
G.5.4	**Motors**		N/A
G.5.4.1	General requirements		N/A
	Position ..... :		—
G.5.4.2	Test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4	Locked-rotor overload test		N/A
	Test duration (days) ..... :		—
G.5.4.5	Running overload test for d.c. motors in secondary circuits		N/A
G.5.4.5.2	Tested in the unit		N/A
	Electric strength test (V) ..... :		—
G.5.4.5.3	Tested on the Bench - Alternative test method; test time (h)		N/A
	Electric strength test (V) ..... :		—
G.5.4.6	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature ..... :		N/A
	Electric strength test (V) ..... :		N/A
G.5.4.6.3	Tested on the bench - Alternative test method; test time (h)		N/A
	Electric strength test (V) ..... :		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.4.9	Series motors		N/A
	Operating voltage ..... :		—
G.6	**Wire Insulation**		N/A
G.6.1	General	Only ES1	N/A
G.6.2	Solvent-based enamel wiring insulation		N/A
G.7	**Mains supply cords**		N/A
G.7.1	General requirements	Not directed connected to mains	N/A
	Type .....:		—
	Rated current (A) .....:		—
	Cross-sectional area (mm2), (AWG) .....:		—
G.7.2	Compliance and test method		N/A
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N) ..... :		—
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm) ....:		—
G.7.3.2.4	Strain relief comprised of polymeric material		N/A
G.7.4	Cord Entry.....:		N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Mass (g) .....:		—
	Diameter (m).....:		—
	Temperature (°C).....:		—
G.7.6	Supply wiring space		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Test with 8 mm strand		N/A
G.8	**Varistors**		N/A
G.8.1	General requirements	ES1 circuits only	N/A
G.8.2	Safeguard against shock		P
G.8.3	Safeguard against fire		N/A
G.8.3.2	Varistor overload test.....:		N/A
G.8.3.3	Temporary overvoltage .....:		N/A
G.9	**Integrated Circuit (IC) Current Limiters**		N/A
G.9.1 a)	Manufacturer defines limit at max. 5A.		N/A
G.9.1 b)	Limiters do not have manual operator or reset		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.9.1 c)	Supply source does not exceed 250 VA .....:		—
G.9.1 d)	IC limiter output current (max. 5A) .....:		—
G.9.1 e)	Manufacturers' defined drift .....:		—
G.9.2	Test Program 1		N/A
G.9.3	Test Program 2		N/A
G.9.4	Test Program 3		N/A
G.10	**Resistors**		N/A
G.10.1	General requirements	No resistor used as safeguard	N/A
G.10.2	Resistor test		N/A
G.10.3	Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable		N/A
G.10.3.1	General requirements		N/A
G.10.3.2	Voltage surge test		N/A
G.10.3.3	Impulse test		N/A
G.11	**Capacitor and RC units**		N/A
G.11.1	General requirements		N/A
G.11.2	Conditioning of capacitors and RC units		N/A
G.11.3	Rules for selecting capacitors		N/A
G.12	**Optocouplers**		N/A
	Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results) .....:	No optocouplers present	N/A
	Type test voltage Vini .....:		—
	Routine test voltage, Vini,b .....:		—
G.13	**Printed boards**		P
G.13.1	General requirements		P
G.13.2	Uncoated printed boards		P
G.13.3	Coated printed boards	No coated PCB	N/A
G.13.4	Insulation between conductors on the same inner surface	No inner layer	N/A
	Compliance with cemented joint requirements (Specify construction) .....:		—
G.13.5	Insulation between conductors on different surfaces	Class III product, 1 Layer, no requirements reg. thickness	N/A
	Distance through insulation .....:		N/A
	Number of insulation layers (pcs) .....:		—
G.13.6	Tests on coated printed boards	No coated printed boards	N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2a)	Thermal conditioning		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.13.6.2b)	Electric strength test		N/A
G.13.6.2c)	Abrasion resistance test		N/A
G.14	**Coating on components terminals**		N/A
G.14.1	Requirements ..... :		N/A
G.15	**Liquid filled components**		N/A
G.15.1	General requirements		N/A
G.15.2	Requirements		N/A
G.15.3	Compliance and test methods		N/A
G.15.3.1	Hydrostatic pressure test		N/A
G.15.3.2	Creep resistance test		N/A
G.15.3.3	Tubing and fittings compatibility test		N/A
G.15.3.4	Vibration test		N/A
G.15.3.5	Thermal cycling test		N/A
G.15.3.6	Force test		N/A
G.15.4	Compliance		N/A
G.16	**IC including capacitor discharge function (ICX)**		N/A
a)	Humidity treatment in accordance with sc5.4.8 – 120 hours		N/A
b)	Impulse test using circuit 2 with Uc = to transient voltage .....:		N/A
C1)	Application of ac voltage at 110% of rated voltage for 2.5 minutes		N/A
C2)	Test voltage .....:		—
D1)	10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer		N/A
D2)	Capacitance .....:		—
D3)	Resistance .....:		—
H	**CRITERIA FOR TELEPHONE RINGING SIGNALS**		N/A
H.1	General	No telephone ringing signals present	N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringing signal		N/A
H.3.1.1	Frequency (Hz) .....:		—
H.3.1.2	Voltage (V) .....:		—
H.3.1.3	Cadence; time (s) and voltage (V) .....:		—
H.3.1.4	Single fault current (mA):.....:		—
H.3.2	Tripping device and monitoring voltage.....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage complied with		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V) .....:		—
J	**INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION**		N/A
	General requirements		N/A
K	**SAFETY INTERLOCKS**		N/A
K.1	General requirements	No safety interlocks present	N/A
K.2	Components of safety interlock safeguard mechanism ..... :		N/A
K.3	Inadvertent change of operating mode		N/A
K.4	Interlock safeguard override		N/A
K.5	Fail-safe		N/A
	Compliance ..... :		N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Compliance and Test method ..... :		N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements (type and circuit location) ..... :		N/A
K.7.2	Overload test, Current (A) ..... :		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test ..... :		N/A
L	**DISCONNECT DEVICES**		N/A
L.1	General requirements	DC-Supply, not connected to mains	N/A
L.2	Permanently connected equipment		N/A
L.3	Parts that remain energized		N/A
L.4	Single phase equipment		N/A
L.5	Three-phase equipment		N/A
L.6	Switches as disconnect devices		N/A
L.7	Plugs as disconnect devices		N/A
L.8	Multiple power sources		N/A
M	**EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS**		N/A
		No battery present	N/A
N	**ELECTROCHEMICAL POTENTIALS**		P
	Metal(s) used..... :	verified	—

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**		P
	Figures O.1 to O.20 of this Annex applied .....:	1mm	—
P	**SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS**		P
P.1	General requirements		P
P.2.2	Safeguards against entry of foreign object	No openings	N/A
	Location and Dimensions (mm) .....:		—
P.2.3	Safeguard against the consequences of entry of foreign object		N/A
P.2.3.1	Safeguards against the entry of a foreign object		N/A
	Openings in transportable equipment		N/A
	Transportable equipment with metalized plastic parts.....:		N/A
P.2.3.2	Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard)		N/A
P.3	Safeguards against spillage of internal liquids		N/A
P.3.1	General requirements		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Safeguards effectiveness		N/A
P.4	Metallized coatings and adhesive securing parts		N/A
P.4.2 a)	Conditioning testing		N/A
	Tc (°C)..... :		—
	Tr (°C)..... :		—
	Ta (°C)..... :		—
P.4.2 b)	Abrasion testing ..... :	(See G.13.6.2)	N/A
P.4.2 c)	Mechanical strength testing..... :	(See Annex T)	N/A
Q	**CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING**		P
Q.1	Limited power sources		P
Q.1.1 a)	Inherently limited output		P
Q.1.1 b)	Impedance limited output		N/A
	- Regulating network limited output under normal operating and simulated single fault condition		N/A
Q.1.1 c)	Overcurrent protective device limited output		N/A
Q.1.1 d)	IC current limiter complying with G.9		N/A
Q.1.2	Compliance and test method		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A) ..... :		—
	Current limiting method..... :		—
R	**LIMITED SHORT CIRCUIT TEST**		N/A
R.1	General requirements		N/A
R.2	Determination of the overcurrent protective device and circuit		N/A
R.3	Test method Supply voltage (V) and short-circuit current (A)). .....:		N/A
S	**TESTS FOR RESISTANCE TO HEAT AND FIRE**		N/A
T	**MECHANICAL STRENGTH TESTS**		**P**
T.1	General requirements		P
T.2	Steady force test, 10 N ..... :	(See appended table T.2)	P
T.3	Steady force test, 30 N ..... :	(See appended table T3)	P
T.4	Steady force test, 100 N ..... :		N/A
T.5	Steady force test, 250 N ..... :		N/A
T.6	Enclosure impact test	(See appended table T6)	P
	Fall test		P
	Swing test		N/A
T.7	Drop test ..... :		N/A
T.8	Stress relief test ..... :		N/A
T.9	Impact Test (glass)		N/A
T.9.1	General requirements		N/A
T.9.2	Impact test and compliance		N/A
	Impact energy (J) ..... :		—
	Height (m) ..... :		—
T.10	Glass fragmentation test..... :	(See sub-clause 4.4.4.9)	N/A
T.11	Test for telescoping or rod antennas		N/A
	Torque value (Nm) ..... :		—
U	**MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFECTS OF IMPLOSION**		N/A
V	**DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)**		N/A
V.1	Accessible parts of equipment	No openings present	N/A
V.2	Accessible part criterion		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.1.2	TABLE: List of critical components				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity1
Enclosure	various	various	metal	IEC 62368-1	Tested with appliance
Input Connector	Dinkle	2EHDRM-S2351204P	600V, 18A Impulse Voltage: 4000V Temp:-40..+110°C	UL 486A UL 508	UR E102914
Interface RJ45 2x2	CZT	JDA221180001	-40..+85°C; Insulation 500Vac V-0	UL94 V-0	Accepted
Interface RJ45 + USB	SJC	9711-8814-S0-W-A	V-0; -40..+85°C Isolation: 500Vdc	UL- STD -94	Accepted
Internal wire	FULLGLORY	FAPQ-A705F	-40..+85°C	IEC 62368-1	Tested with appliance
PCB	BOMIN	3412-WR32901-C5	V-0	UL94	Accepted
Varistor (MOV1, MOV2, MOV3)	CNR	CNR-10D101K	-40..+85°C	UL1414 UL1449	URus E165143 VDE
Fuse (F1) SMD	Littelfuse	451 Series	-55..+125°C; 5A	JDYX2	cURus E10480
Gas tube (GDT1)	SUT	ARR-BM090M-CA8	-40..+85°C	QVGQ2	UR E200755
LTE Module	Quectel	EG25-G	-40..+85°C Supply Voltage: 3,3V..4,3V,	IEC 62368-1	Tested with appliance
Relay	Xiamen Hongfa	HFD3 Serie	-40..+85°C 30Vdc, max 4A,	UL 60947-1 UL 508 UL 60947-4-1 IEC 61810-1 DIN EN 61810-1 EN 61810-1	cURus E133481 VDE 40018867
T3	Mingtek Technology Corp.	HN2433G	See description	IEC 62368-1	Tested with appliance
T3 description	Isolation: 1500 Vdc Temp: 0°C to 70°C; A value of maximum 105 ° C is used for the insulation.				

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.

2) Description line content is optional. Main line description needs to clearly detail the component used for testing

[INT] interchangeable component; alternate components with equivalent ratings and approvals are acceptable

[ALT] specified alternate component

[OPT] optional component (not required)

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.8.4, 4.8.5	**TABLE: Lithium coin/button cell batteries mechanical tests**	N/A

4.8.5	**TABLE: Lithium coin/button cell batteries mechanical test result**	**N/A**

5.2	**Table: Classification of electrical energy sources**	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.4.1.4, 6.3.2, 9.0, B.2.6	**TABLE: Temperature measurements**					P
	Supply voltage (V) .....:	32 Vdc	8 Vdc	32 Vdc	8 Vdc	—
	$T_{measured}$ (°C) .....:	64,3	64,3	25,0	25,0	—
	$T_{specified}$ (°C) .....:	75	75	25	25	—
Maximum measured temperature T of part/at:		T (°C)				Allowed T_{max} (°C)
		component temperatures		touch temperatures		
1. Enclosure Top		78,2	76,4	37,9	37,2	-- / 48
2. Enclosure Bottom		78,3	76,6	39,1	39,1	-- / 48
3. Enclosure Front		81,4	78,8	35,8	35,8	-- / 48
4. Input connector		80,4	77,3			105
5. Ambient Relay		84,5	79,8			85
6. TVS3 Body		110,3	87,0			150
7. GNSS Module PCB		84,2	81,0			130
8. RJ45 Interface		81,1	78,2			85
9. TVS3 PCB		50,6	50,2			130
10. PCB near U36		87,4	83,2			130
11. T3 Body		80,5	79,7			105
Supplementary information: all measured values were extrapolated to the specified ambient temperature						

5.4.1.10.2	**TABLE: Vicat softening temperature of thermoplastics**	N/A

5.4.1.10.3	**TABLE: Ball pressure test of thermoplastics**	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.2.2, 5.4.2.4 and 5.4.3	**TABLE: Minimum Clearances/Creepage distance**		N/A
5.4.2.3	**TABLE: Minimum Clearances distances using required withstand voltage**		N/A
5.4.2.4	**TABLE: Clearances based on electric strength test**		N/A
5.4.4.2, 5.4.4.5 c) 5.4.4.9	**TABLE: Distance through insulation measurements**		N/A
5.4.9	**TABLE: Electric strength tests**		N/A
5.5.2.2	**TABLE: Stored discharge on capacitors**		N/A
5.6.6.2	**TABLE: Resistance of protective conductors and terminations**		N/A
5.7.2.2, 5.7.4	**TABLE: Earthed accessible conductive part**		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

6.2.2	Table: Electrical power sources (PS) measurements for classification				P
Source	Description	Measurement	Max Power after 3 s	Max Power after 5 s*)	PS Classification
A	Input max 32 Vdc	Power (W) :	PS3, no test required		PS3
		V_A (V) :			
		I_A (A) :			
B	USB Port	Power (W) :	5	--	PS1
		VA (V) :	4,76	--	
		IA (A) :	1,23	--	
C	RJ45 Ports 1-9	Power (W) :	--	--	PS1
		VA (V) :	0	--	
		IA (A) :	--	--	
Supplementary Information: (*) Measurement taken only when limits at 3 seconds exceed PS1 limits					

6.2.3.1	Table: Determination of Potential Ignition Sources (Arcing PIS)	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

6.2.3.2	Table: Determination of Potential Ignition Sources (Resistive PIS)				P
Circuit Location (x-y)	Operating Condition (Normal / Describe Single Fault)	Measured wattage or VA During first 30 s (W / VA)	Measured wattage or VA After 30 s (W / VA)	Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment)	Resistive PIS? Yes/No
Internal circuits	1)	1)	1)	1)	yes

Supplementary Information:

A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter.

If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification.

A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, or (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault.

1) No measurement required; PIS is present

8.5.5	TABLE: High Pressure Lamp	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

B.2.5	TABLE: Input test						P
U (V)	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
8	0,33	--	--	--	F1	5	Normal operation
24	0,18	0,2	--	--	F1	5	Normal operation
32	0,15	--	--	--	F1	5	Normal operation
Supplementary information: Equipment may be have rated current or rated power or both. Both should be measured							

B.3	TABLE: Abnormal operating condition tests	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

B.4	**TABLE: Fault condition tests**	P
Ambient temperature (°C) ..... :	25,0	—
Power source for EUT: Manufacturer, model/type, output rating . :	A6KW 150-40 DC	—

Component No.	Fault Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
U36	Short V_{in} to SW	32	1	F1	5A	--	--	U36 defect, Unit switch off, no hazardous

Supplementary information:

Annex M	**TABLE: Batteries**	N/A

Annex M.4	**Table: Additional safeguards for equipment containing secondary lithium batteries**	N/A

Annex Q.1	**TABLE: Circuits intended for interconnection with building wiring (LPS)**	P

Note: Measured UOC (V) with all load circuits disconnected:

Output Circuit	Components	U_{oc} (V)	I_{sc} (A)		S (VA)	
			Meas.	Limit	Meas.	Limit
USB	USB	5V	1,23	8	4,76	100
RJ45*	Ports 1 – 8	0	0	8	0	100
RJ45*	Port p	0	0	8	0	100

Supplementary Information:

*) no POE (Power over Ethernet)

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

T.2, T.3, T.4, T.5	TABLE: Steady force test				P
Part/Location	Material	Thickness (mm)	Force (N)	Test Duration (sec)	Observation
Internal parts/wiring	Div	Div	10	5	Pass
Enclosure	metal	div	30	5	Pass
Supplementary information:					

T.6, T.9	TABLE: Impact tests			P
Part/Location	Material	Thickness (mm)	Vertical distance (mm)	Observation
Enclosure	Metal	Div	1300	No deformation
Supplementary information:				

T.7	TABLE: Drop tests	N/A

T.8	TABLE: Stress relief test	N/A

Attachment 1
Additional test data

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

F.3.10	TABLE: Permanence of markings				P
marking	Condition of label after the test			Observation	
	Still legible	Not easily removable	No curling of edges		
Typ label	Yes	Yes	Yes	pass	
Supplementary information:					
Test procedure: 15 sec with water and then 15 sec with petroleum spirit					

Attachment 2
CENELEC common modifications

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 62368-1 2nd Ed.
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Audio/video, information and communication technology equipment – Part 1: Safety requirements

Differences according to.....: EN 62368-1:2014+A11:2017

Attachment Form No. .....: EU_GD_IEC62368_1B_II

Attachment Originator .....: Nemko AS

Master Attachment .....: 2017-09-22

	CENELEC COMMON MODIFICATIONS (EN)	P
	Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2014 are prefixed “Z”.	P
CONTENTS	**Add** the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords	P
	Delete all the “country” notes in the reference document (IEC 62368-1:2014) according to the following list:	P
	For special national conditions, see Annex ZB.	P
1	**Add** the following note: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU. (RoHS)	P

0.2.1	Note	1	Note 3	4.1.15	Note
4.7.3	Note 1 and 2	5.2.2.2	Note	5.4.2.3.2.2 Table 13	Note c
5.4.2.3.2.4	Note 1 and 3	5.4.2.5	Note 2	5.4.5.1	Note
5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3
5.7.5	Note	5.7.6.1	Note 1 and 2	10.2.1 Table 39	Note 2, 3 and 4
10.5.3	Note 2	10.6.2.1	Note 3	F.3.3.6	Note 3

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
4.Z1	**Add** the following new subclause after 4.9: To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. **mains**, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):	Class III equipnemt	N/A
	a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment;		N/A
	b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;		N/A
	c) it is permitted for **pluggable equipment type B** or **permanently connected equipment**, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for **pluggable equipment type A** the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.		N/A
5.4.2.3.2.4	**Add** the following to the end of this subclause: The requirement for interconnection with **external circuit** is in addition given in EN 50491-3:2009.		N/A
10.2.1	Add the following to [c] and [d] in table 39: For additional requirements, see 10.5.1.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
10.5.1	**Add** the following after the first paragraph: *For RS 1 compliance is checked by measurement under the following conditions:* *In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or presets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.* NOTE Z1 Soldered joints and paint lockings are examples of adequate locking. *The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus.* *Moreover, the measurement shall be made under fault conditions causing an increase of the high-voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.* *For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.* NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.	No x-radiation present	N/A
10.6.1	**Add** the following paragraph to the end of the subclause: EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.	The product is not a toy	N/A
10.Z1	**Add** the following new subclause after 10.6.5. **10.Z1 Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz** The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body-mounted devices, attention is drawn to EN 50360 and EN 50566	1999/519/EC is a recommendation only and not mandatory.	N/A
G.7.1	**Add** the following note: NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Bibliography	**Add** the following standards: **Add** the following notes for the standards indicated: IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN 61643-331.		P
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		N/A
4.1.15	**Denmark, Finland, Norway** and **Sweden** To the end of the subclause the following is added: **Class I pluggable equipment type A** intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and **accessible** parts, have a marking stating that the equipment shall be connected to an earthed **mains** socket-outlet. The marking text in the applicable countries shall be as follows: In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.” In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In **Norway**: “Apparatet må tilkoples jordet stikkontakt” In **Sweden**: “Apparaten skall anslutas till jordat uttag”	No class I product	N/A
4.7.3	**United Kingdom** To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.2.2	**Denmark** After the 2nd paragraph add the following: A warning (marking **safeguard**) for high **touch current** is required if the **touch current** exceeds the limits of 3,5 mA a.c. or 10 mA d.c.	Limit does not exceed	N/A
5.4.11.1 and Annex G	**Finland and Sweden** To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either • two layers of thin sheet material, each of which shall pass the electric strength test below, or • one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition • passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5kV. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions: • the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; • the additional testing shall be performed on all the test specimens as described in EN 60384-14; the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		N/A

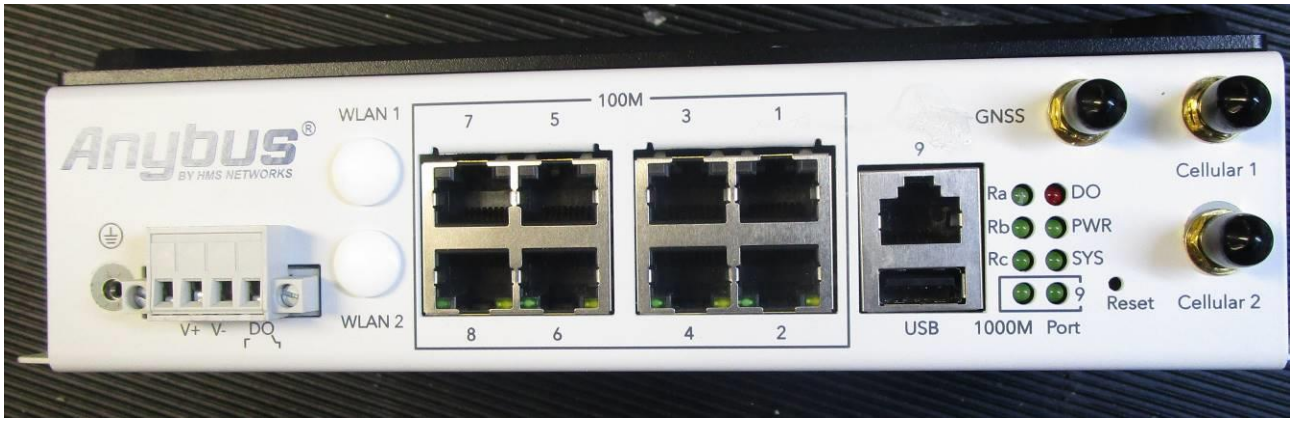
IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.5.2.1	**Norway** After the 3rd paragraph the following is added: Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).	No mains	N/A
5.5.6	**Finland, Norway** and **Sweden** To the end of the subclause the following is added: Resistors used as **basic safeguard** or bridging **basic insulation** in **class I pluggable equipment type A** shall comply with G.10.1 and the test of G.10.2.		N/A
5.6.1	**Denmark** **Add** to the end of the subclause Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment. *Justification:* In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.	No mains	N/A
5.6.4.2.1	**Ireland and United Kingdom** After the indent for **pluggable equipment type A**, the following is added: – the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug.	No mains	N/A
5.6.5.1	To the second paragraph the following is added: The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm^2 to 1,5 mm^2 in cross-sectional area.		N/A
5.7.5	**Denmark** To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the **protective conductor current** exceeds the limits of 3,5 mA a.c. or 10 mA d.c.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.7.6.1	**Norway and Sweden** To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)” NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): “Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.” Translation to Swedish: ”Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet.”.		N/A
5.7.6.2	**Denmark** To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA .	Limit does not exceed	N/A

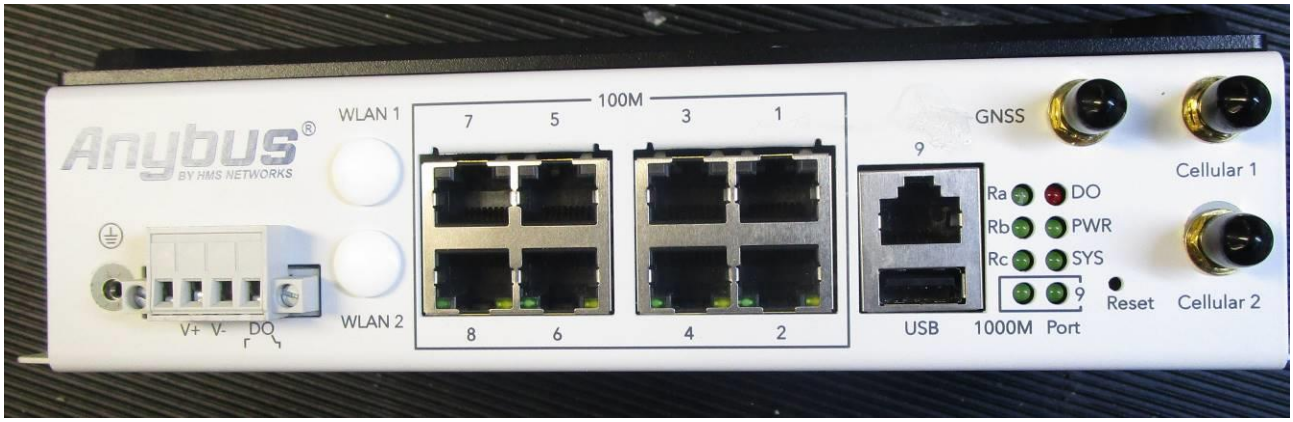
IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
B.3.1 and B.4	**Ireland and United Kingdom** The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of **direct plug-in equipment**, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the **direct plug-in equipment**, until the requirements of Annexes B.3.1 and B.4 are met		N/A
G.4.2	**Denmark** To the end of the subclause the following is added: Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2. Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a. Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c. Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a *Justification:* Heavy Current Regulations, Section 6c	No mains	N/A
G.4.2	**United Kingdom** To the end of the subclause the following is added: The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.	No mains	N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	**United Kingdom** To the first paragraph the following is added: Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations. NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.	No mains	N/A
G.7.1	**Ireland** To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard	No mains	N/A
G.7.2	**Ireland and United Kingdom** To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm^2 is allowed for equipment which is rated over 10 A and up to and including 13 A.	No mains	N/A
ZC	*ANNEX ZC, NATIONAL DEVIATIONS (EN)*		N/A
10.5.2	**Germany** The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. *Justification:* German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. **NOTE** Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int +49-531-592-6320, Internet: http://www.ptb.de	The product includes no cathode ray tube.	N/A

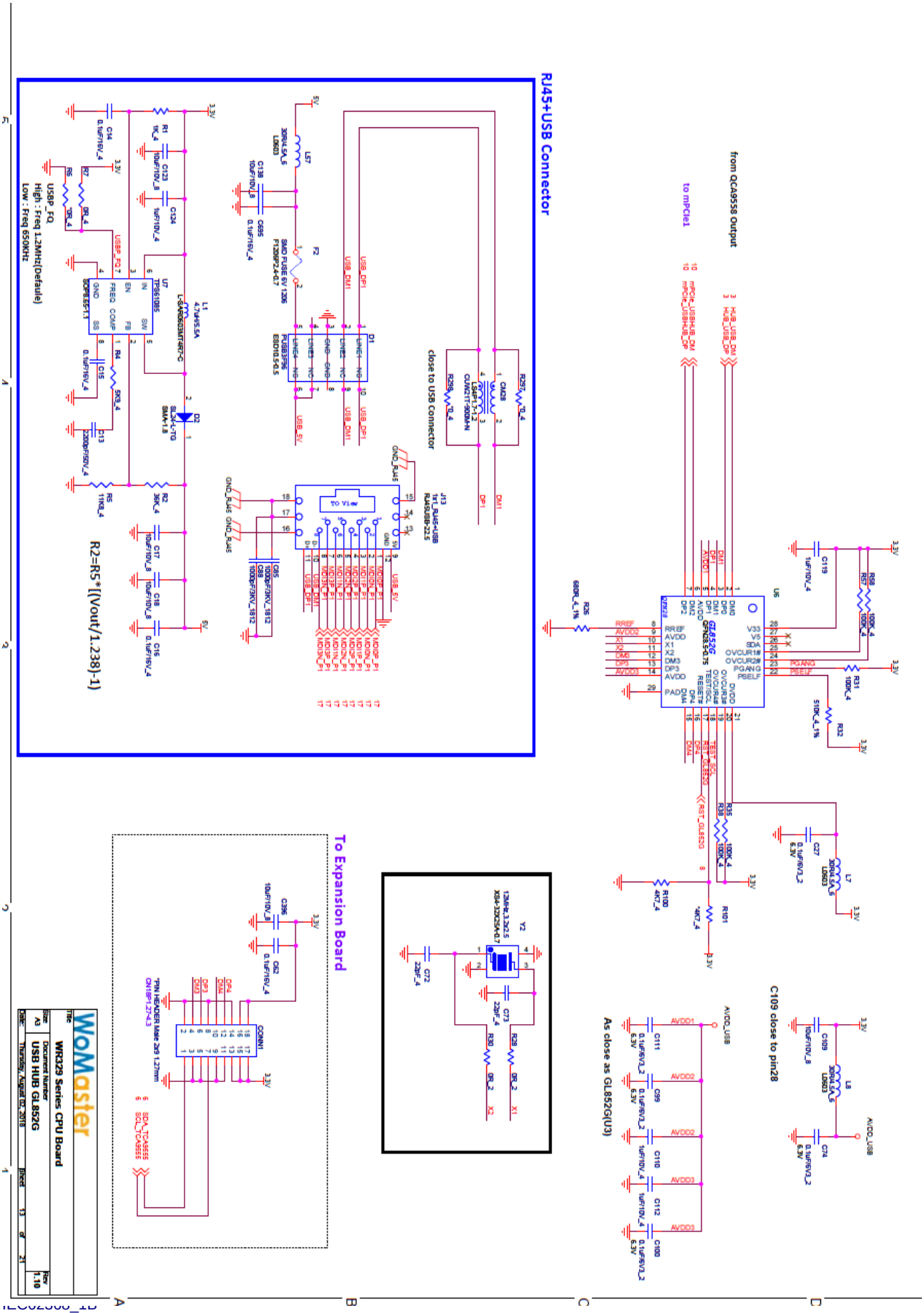
Attachment 3
Pictures

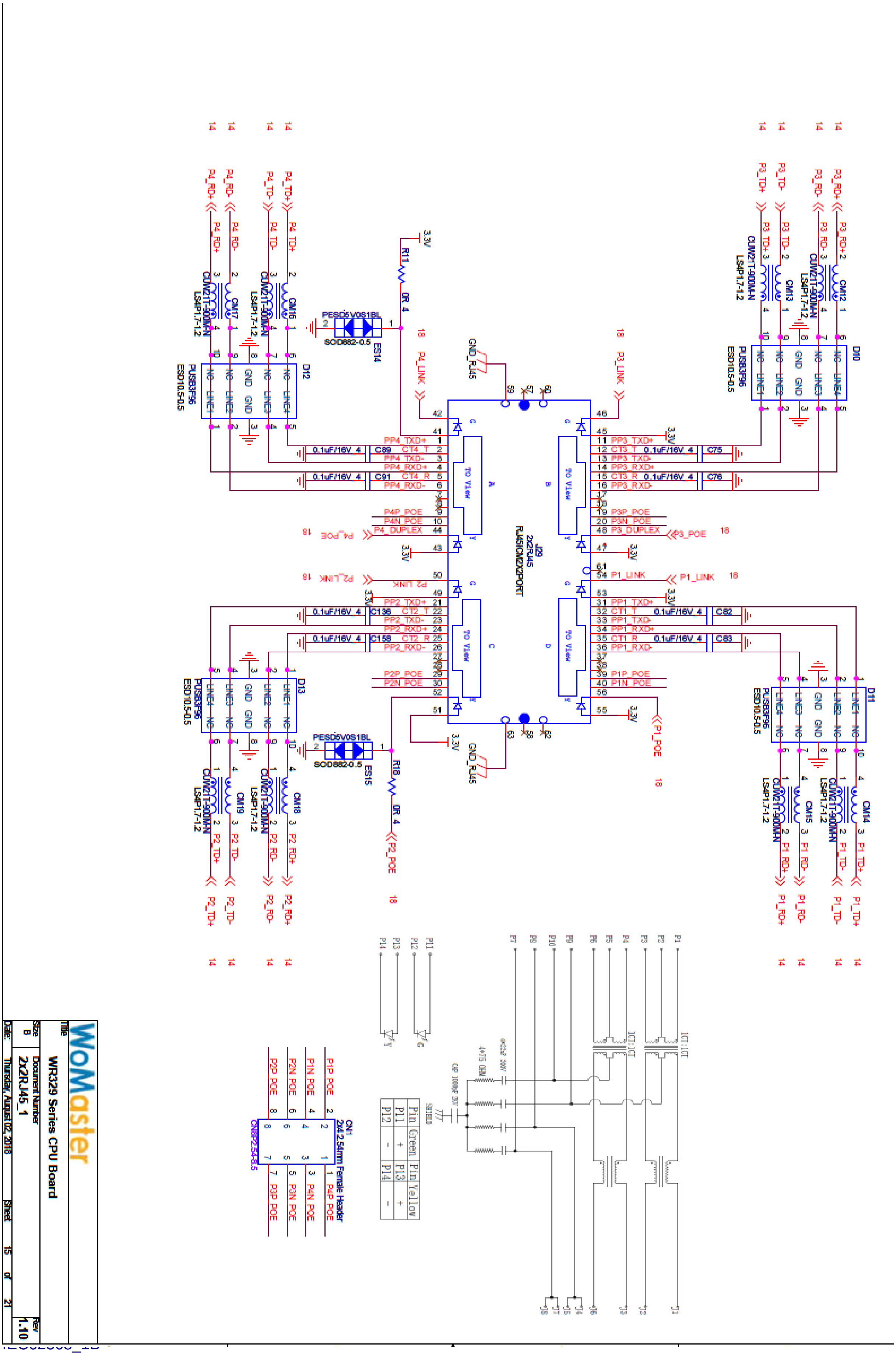

Anybus
BY HMS NETWORKS
WLAN 1
WLAN 2
100M
7 5 3 1
8 6 4 2
GNSS
Cellular 1
Cellular 2
9
Ra DO
Rb PWR
Rc SYS
9
Reset
USB
1000M Port
V+ V- DO

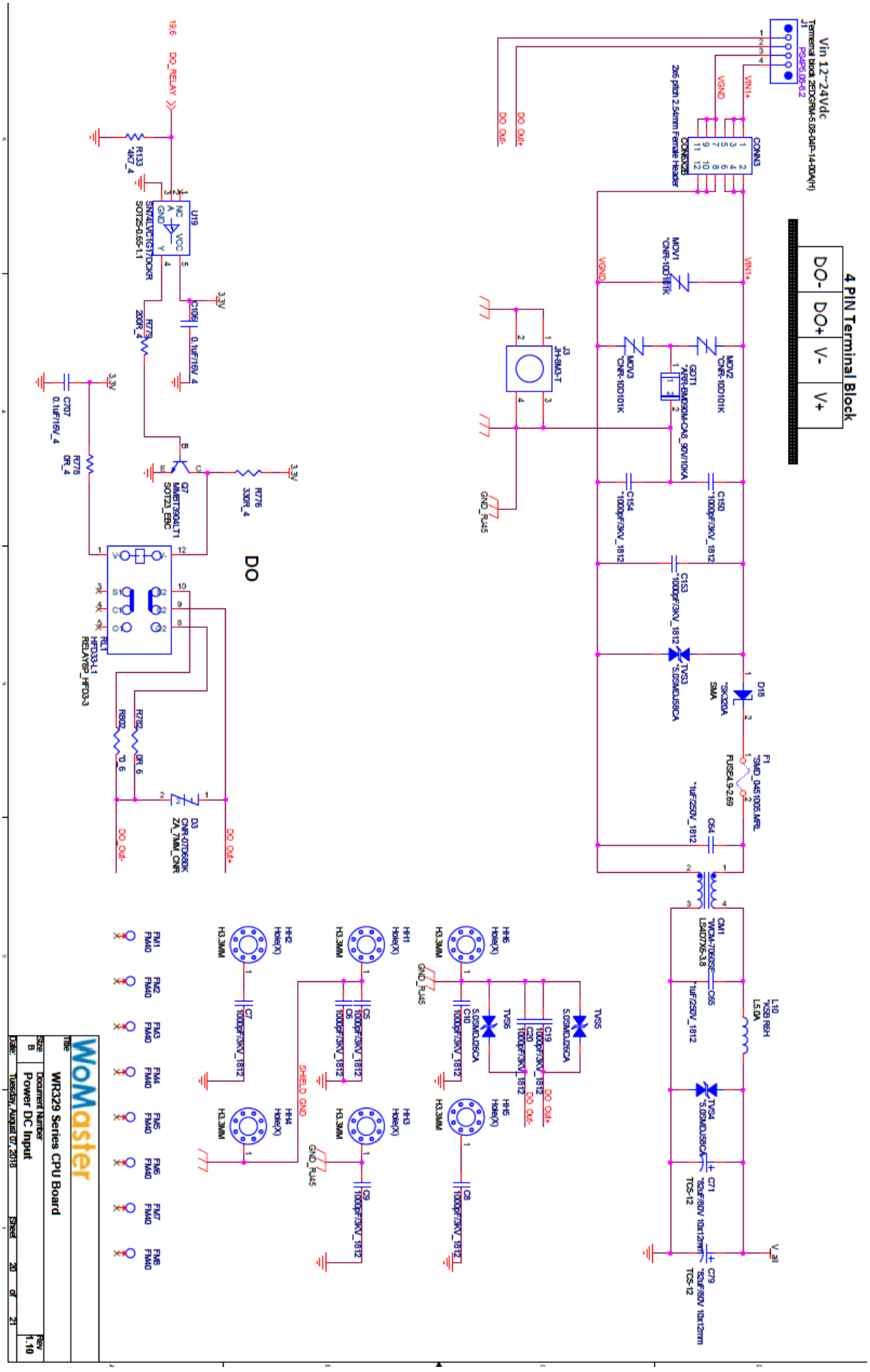

Anybus
BY HMS NETWORKS
WLAN 1
WLAN 2
100M
7 5 3 1
8 6 4 2
GNSS
9
Ra DO
Rb PWR
Rc SYS
USB
1000M Port
Reset

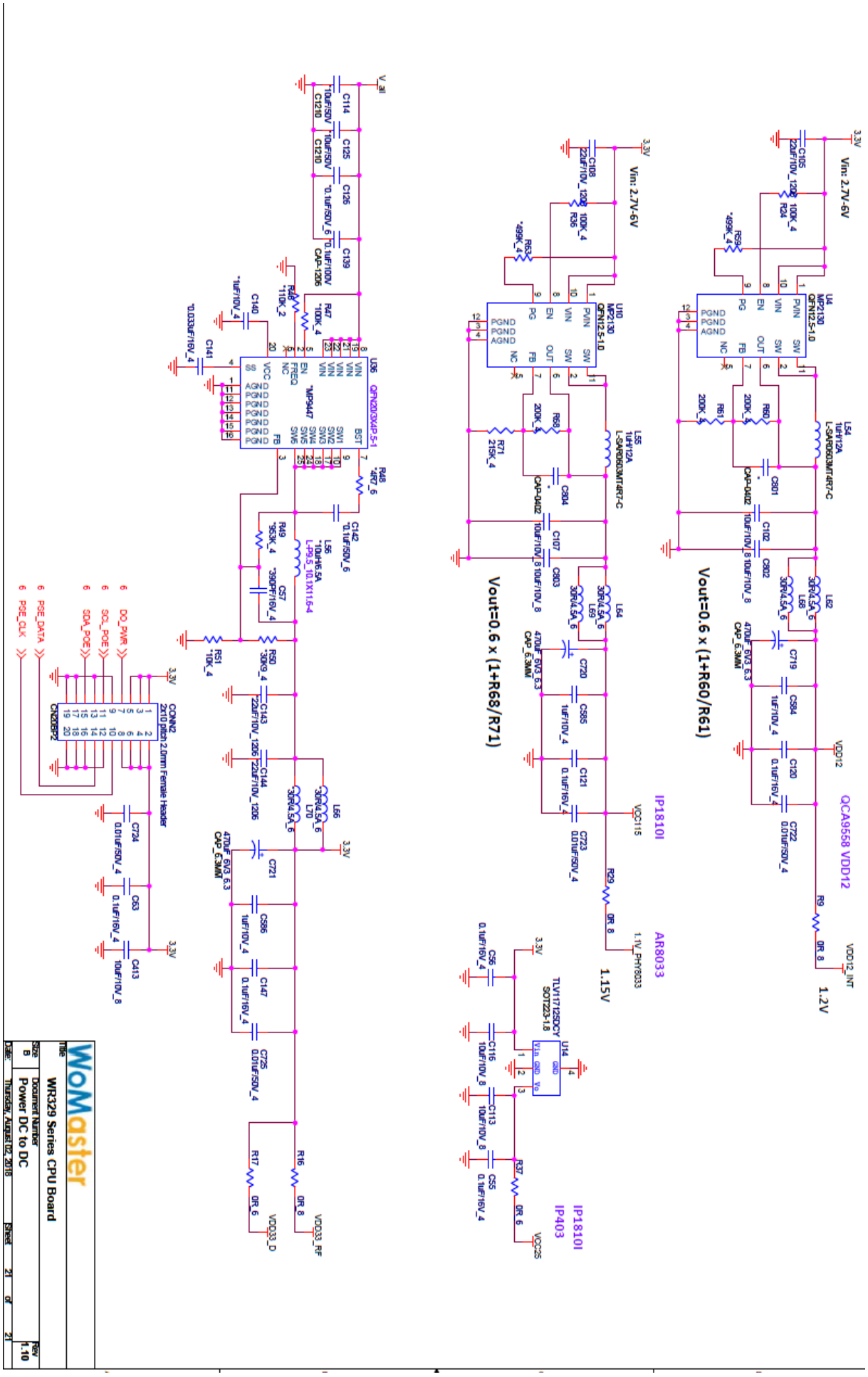

Anybus
BY HMS NETWORKS
WLAN 1
WLAN 2
100M
7 5 3 1
8 6 4 2
GNSS
Cellular 1
Cellular 2
9
Ra DO
Rb PWR
Rc SYS
9
Reset
USB
1000M Port
V+ V- DO

Attachment 4
Schematic, layouts, assembly diagram


RJ45+USB Connector
close to USB Connector
R2=R5*[(Vout/1.238)-1)
USB5P_FQ
High : Freq 1.2MHz(Default)
Low : Freq 650KHz
from GCA9558 Output
to mPCIet
C109 close to pin28
As close as GL852G(U3)
To Expansion Board
WoMaster
WR329 Series CPU Board
USB HUB GL852G
Thursday, August 02, 2018


WoMaster
WR329 Series CPU Board
2x2RJ45_1
1.10
Thursday, August 02, 2018
Sheet 15 of 21
J29
2x2RJ45
RJ45ICM2X2PORT
CN1
2x4 2.54mm Female Header


4 PIN Terminal Block
DO-
DO+
V-
V+
Vin 12~24Vdc
DO_RELAY
DO
WoMaster
WR329 Series CPU Board
Power DC Input
Tuesday, August 07, 2018


Vin: 2.7V-6V
Vout=0.6 x (1+R60/R61)
QCA9558 VDD12
1.2V
Vout=0.6 x (1+R68/R71)
1.15V
IP1810I
AR8033
IP1810I
IP403
WoMaster
WR329 Series CPU Board
Power DC to DC
Thursday, August 02, 2018

Attachment 5
Datasheets of safety critical components

CZT

SPECIFICATION FOR APPROVAL

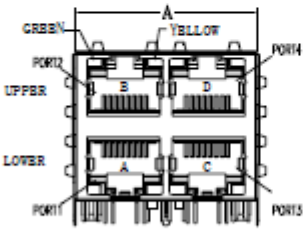
Customer Part No.:
CZT Part No.: CZT17D-137
Part Name: RJ45 ICM (10/100 Base-T 2*2 Ports)

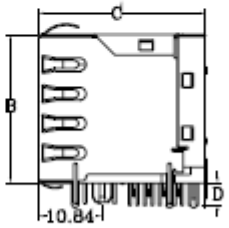
Rev.: A

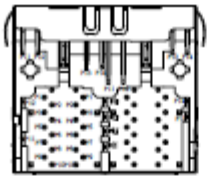
RoHS

4. Mechanical Dimension and Notes:

4-1. Mechanical Dimension:







UNIT : mm / inch
A = 31.20 / 1.228
B = 25.20 / 0.992
C = 28.40 / 1.118
D = 3.05 / 0.120

Unless otherwise specified,all dimensions tolerances is ±0.254 / 0.010.

4-2. Notes:

1. CONNECTOR MATERIAL:
   HOUSING:THERMOPLASTIC BLACK UL94 V-0
   SHIELD:Brass
   SHIELD PLATING:NICKEL
   CONTACT:PHOSPHOR BRONZE
   CONTACT PLATING: GOLD, 30 MICRO-INCHS MIN IN CONTACT AREA
2. PIN NOT ELECTRICALLY CONNECTED MAYBE OMITTED SEE ELECTRICAL DRAWING FOR OMITTED PINS
3. RJ45 CAVITIES CONFORM TO FCC RULES AND REGULATION PART 68.
4. THE PART IS RECOMMENDDED FOR WAVE SOLDERING PROCESS PEAK SOLDERING TEMPERATURE IS 260° C MAX, 10 SECS MAX
5. OPERATING TEMPERATURE T=0° C TO +70° C.
6. STORAGE TEMPERATURE T=-40° C TO +85° C.

LED SPECIFICATION				
STANDARD LED	WAVELENGTH	Forward Current	Forward V(max)	TYP
GREEN	565nm	20 mA	2.4V	2.2V
YELLOW	590nm	20 mA	2.5V	2.1V

Drawn by	Designed by	Approved by
ChenLingjuan	SunWenqun	Topup.liu

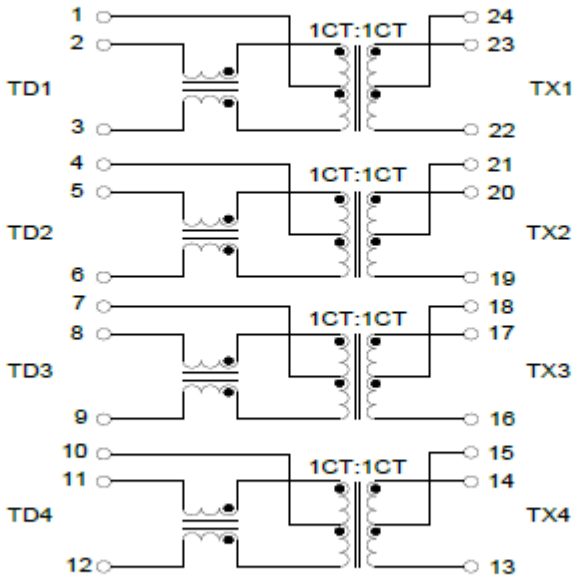
Mingtek Technology Corp.

SAMPLE TEST DATA

A. ELECTRICAL SPECIFICATIONS @25℃

Inductance OCL:	350uH Min @ 100KHz 0.2V 8mA DC BIAS	
Leakage Inductance:	0.50uH Max @ 100KHz 0.2V	
Interwinding Capacitance:	25PF TYP @ 100KHz 0.2V	
Turn Ratio:	1CT:1CT±5%	
Polarity:	2-23,5-20 ,8-17,11-14In-Phase	
Return Loss	0.5-30 MHz	- 18dB Min
	40.0MHz	- 14.4 dB Min
	50.0MHz	- 13.1 dB Min
	60-80MHz	- 12.0 dB Min
Cross Talk:	0.50-60MHz	- 40dB Min
	60-100MHz	-35dB Min
DCMR :	0.5-100MHz	- 20dB Min
Isolation HI-POT:	1500VDC 10mA 1S	
Product Type:	Green Product	
Operating Temperature:	0℃ TO 70℃	

B. SCHEMATIC:



Attachment 6
Manual/installation instructions

Safety·Precautions·–·WoMaster·CE·Wireless·Product¶

¶

Copyright¶

About·This·Document¶

This·document·provides·the·following·notes:¶

1.→ The·Declaration·of·Conformity·policy·and·manufacturer·information.¶

2.→ The·Safety·Precaution·and·important·notification.·¶

3.→ The·technical·specification·of·the·product.·¶

Please·read·this·document·carefully·before·installing·the·product.¶

Conventions¶

For·your·attention·on·important·parts,·special·characters·and·patterns·are·used·in·this·manual:¶

Note:¶

This·indicates·an·important·note·that·you·must·pay·attention·to.¶

The·Blue·Wording·is·important·note·that·you·must·pay·attention·to.¶

The·Blue·Wording·with·Big·Case·is·very·important·note·you·must·pay·more·attention·to.·¤

Warning:¶

This·indicates·a·warning·or·caution·that·you·have·to·abide.¶

The·Red·wording·is·very·important·you·must·avoid.¤

Bold:·Indicates·the·function,·important·words,·and·so·on.¶

Declaration·of·Conformity¶

¶

CE·RED·(Radio·Device·Directive)¶

While·you·see·the·CE·Marking·print·in·our·product,·it·indicates·the·product·comfort·to·the·requirement·of·the·CE·RED.¶

We·provide·the·CE·RED·Declaration·of·Conformity·(DoC)·for·our·Wireless·Router,·WLAN·AP·products·in·our·web·site.·The·DoC·includes·the·Brand·Name,·Product·Name,·Model·Name,·Description,·compliant·standards·and·Manufacture·information.·Different·product·may·comfort·to·different·standards·of·Safety,·Health,·EMC,·Radio·and·other·specific·standard.·You·can·download·the·formal·document·of·the·product·in·our·Web·site·or·apply·from·our·Sales/Technical·people.·¶

¶

The·declaration·of·CE·RED·is·authorized·at·the·following·company·and·address.¶

WoM·Asia.¶
(·Manufacturer·Name·)¶
4F,·No.86-2,·Yiwen·1st·St.,·Taoyuan·Dist.,·Taoyuan·330,·Taiwan¶
(·Manufacturer·Address·)¶

¶

¶

Safety·Precautions·–·WoMaster·Wireless·Product·¶

General·Notification¤
● → **SELV:**·The·device·is·designed·for·operation·with·SELV·(extra-low·voltage).·It·is·powered·from·DC· source.· Connect· the· unit· only· to· DC· power· source· that· complies· with· the· SELV·requirements·in·IEC/EN·62368·based·safety·standards.·The·product·does·Not·include·the·AC·power·adapter.¶ ● → **Electrical·energy·source·classifications:·ES1.**·The·energy·source·is·DC·9~30V·input.·Not·include·AC·adapter·in·the·product·package.·The·design·is·complaint·with·the·ES1·definition·of·the·EN62368-1·standard.¶ ● → **Classification·of·use·by:**·The·device·can·be·configured·by·ordinary·person,·instructed·person·and·skilled·person.·For·ordinary·person,·please·read·the·safety·precaution·and·the·user·manual·first· before· install· the· product.· The· ordinary· person· is· only· allowed· to· connect· low· voltage·(<60V)·power·connector.·If·you·need·to·change·the·power·system,·you·MUST·get·approval·and·handled·by·skilled·person.·If·you·don't·get·exact·info·you·need,·you·can·contact·our·technical·people·of·distributor·or·contact·us·by·email:·support@womaster.eu¤
¤
Power¤
For·power·connection,·make·sure·the·following·requirement·are·met:¶ ● → **Power· Specification:**· Follow·the·power·installing·instruction·of·the·user·manual,·it·indicates·the·available·input·voltage·range,·V+/V-·pin·assignment,·power·consumption·and·other·notice.¶ ● → **Power·Source:**·In·practical,·the·SELV·DC·product·has·no·internal·DC/DC·isolation·design.·For·external·power,·it·is·suggested·to·use·isolated·AC·to·DC·or·DC·to·DC·power·design·PSU·for·installation.·The·output·voltage·of·the·AC·to·DC·to·DC·Power·Supply·conforms·to·the·range·of·the·input·voltage·of·the·equipment.¶ ● → **Switch·ON·Notice:**·Only·switch·on·the·supply·voltage·while·the·housing·is·closed,·the·input·

voltage·is·correct·and·the·terminal·blocks·are·wired·correctly.¶

- **Wiring:**·The·connection·cables·used·are·permitted·for·the·specified·electronic·voltage,·current,·wire·diameter·and·temperature·range.·For·DC·voltage,·it·is·at·least·1.0mm,·AWG16.·¶
- **Grounding:**·Besides·the·PSU·selection,·the·Power·Supply·must·be·well·installed,·includes·grounded·and·other·notices·which·are·defined·in·its·instruction·guide.·The·well·digital/earth·grounding·is·important·and·make·sure·everything·is·done·correctly·before·power·on·the·system.¶
- **High·Voltage·Station·Notice:**·If·the·product·is·installed·inside·the·high·voltage·cabinet/station,·for·example·the·Wind·power·tower·is·usually·690V·power·system,·shut·down·the·power·system·before·user·go·into·the·tower.·The·error·690V·will·kill·your·life·and·can·not·be·cured.·This·is·usually·defined·in·the·Safety·Precaution·of·the·high·voltage·station,·just·remind·again·here·for·warming.¤

Environment·&·Housing¤

- **Only· operate· the· device· at· the· specified· ambient· temperature· and· humidity.·** The·temperature·of·the·surrounding·air·means·a·distance·of·up·to·5cm·from·the·device.·While·installing·multiple·devices·within·the·cabinet,·remains·suitable·width·between·the·devices·is·MUST·for·better·heat·dispersing.¶
- **Hot·surface.**·The·enclosure·is·metal·housing·with·rugged·heat·dispersing·heat·sink·on·top.·Reserve·some·space·for·top·heat·sink·can·have·better·heat·dispersing.·**Avoid·touching·the·device·while·it·is·operating,·especially·in·high·temperature·environment.**¶
- **NOT· allow· to· open· the· housing:**· Only· technicians· authorized· by· the· manufacturer· are·permitted·to·open·the·housing.·Without·the·manufacturer·permitted,·open·the·housing·means·the·product·is·not·warrantied·and·no·responsible·for·any·unexpected·risk.¶
- **IP·Degree:**·Connect·the·equipment·which·meets·the·IP·degree·of·protection·requirements·for·the·application·case.¤

Installation

- **The classification of Machine energy source is MS1.** According to the definition, the product can be installed <2m height environment.
- **Indoor Area:** The product is defined as indoor product. Most of the I/O interface is connected inside the cabinet/box, for example the power terminal block, USB and RJ-45 connectors. The RJ-45 Ethernet LAN ports (port 1~8) is only allowed to be installed within indoor area. Only the RJ-45 Ethernet WAN port (port 9) can be connected to external device outside the box.
- **USB:** The attached USB socket is defined for device maintenance purpose only. Do NOT use it for other purpose, especially for charging the battery by the USB is restricted. If the device is damaged due to the restricted behavior, this is not included in product warranty range.
- **Grounding:** The equipment must be grounded. Ground the device before connecting the Ethernet cables, RF antenna, antenna cables and power supply. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

Field WLAN Plan

- **Professional Wireless IT:** If you are installing the equipment in the factory, station, open area..., the professional Wireless IT Engineer can provide better service for AP location, channel and field plan to get better performance and coverage.
- **RF (Radio Frequency) Notice:**
  - Read the Radio output power, receiver sensitivity, antenna gain specification before installing. The shipped products and antenna comforts to the CE request and allowed to be used in all European countries.
  - When installing external antennas, the Radio Output power and antenna gain value must be allowed according to the regulations of the country.
  - When the system is operational with high gain antenna, avoid standing directly in front of

it. Strong RF fields are present when the transmitter is on.

- When the system is operational with high gain antenna in short distance, adjust the radio output lower. Strong output power plus high gain antenna is not good installation for short distance transmission.

- **Metal Limitation:** Install the device in a cabinet or in an operating site with limited access, the metal cabinet will filter the radio signals, use the extended antenna cable and install the external antenna in free space helps to get better Radio signal.
- **External Cable Protection:**
  - Install over voltage protector devices on every outdoor Ethernet cable.
  - Protect each antenna installed outside with lightening protection devices, ex: lightening arrester.

Note that You are responsible for undertaking suitable lightning protection. The Field EMD (Lightning) DAMAGE IS NOT COVERED UNDER WARRANTY.

PoE (Only for PoE model)

- If the product supports standard PoE Input, please make sure the voltage range of PSE comforts to the standard PoE request. The voltage range of the 802.3at definition is 50~57V.
- According to the PoE/PoE+ definition, the maximum current through the Ethernet cable is 600mA/802.3at or 350mA/802.3af, the CAT 5E or above standard cable is suggested and the maximum Ethernet cable distance is less than 100m.
- Users MUST use the safety certificated PoE Switch, PoE Injector and Power Supply. The Industrial PoE Switch and PoE injector/adapter is recommended.
- Be notice the maximum power consumption of the product, it is NOT allowed to connect over the specification.

Attachment 7
List of test equipment and uncertainties of measurement

List of test equipment used						
Clause	**Measurement / testing**	**No.**	**Testing / measuring equipment / material used**	**Range used**	**Calibration date**	
all	ambient		Hygro- /Thermo- /Barometer	--		
		1073			04/2017	04/2018
5.4.1.4, 6.3.2, 9.0, B.2.6	Temperature measurements	708	Power Meter		11/2019	11/2020
		1251	Daten Loggger		06/2020	06/2021
		1253.3	Thermo wire string		06/2020	06/2021
6.2.2	Electrical Power source (PIS)	708	Power Meter		11/2019	11/2020
		1128	Stopwatch		12/2019	12/2020
B.2.5	Input test	708	Power Meter		11/2019	11/2020
B.4	Fault condition tests	708	Power Meter		11/2019	11/2020
Annex Q.1	Circuits intended for interconnection with building wiring (LPS)	708	Power Meter		11/2019	11/2020
		834	DMM		03/2020	03/2021
		826	DMM		04/2020	04/2021
T.2, T.3, T.4, T.5	Steady force test	982	Digital Force Gauge		01/2020	01/2021
T.6, T.9	Impact test	501	Steel ball		11/2017	11/2020
Additional Tests						
F.3.10	Permanence of markings	746	n-Hexan	--	--	05/2023
				--		

Uncertainties of measurement		
Type of measurement		**Uncertainty of measurement (k=2)**
Input power measurement	I < 16A	±1,10 %
	I < 32A	±0,56 %
	I > 32A	±0,54 %
Input current measurement	I < 10A	±1,66 %
	I < 16A	±1,31 %
	I < 32A	±0,56 %
	I > 32A	±0,54 %
Voltage measurement	by oscilloscope	±5,51 %
	by meter	±1,87 %
Resistance measurement		±1,70%
Touch/Leakage current measurement	15 Hz ≤ f ≤ 10 kHz	±2,33 %
	10 kHz < f ≤ 1MHz, DC	±5,78 %
Temperature measurement (by thermocouple)		±1,96 °C
Time measurement	by oscilloscope (t < 40s)	±0,23 %
	by clock (t < 100min)	±0,43 %
Resistance of earthing measurement		±6,98 mΩ
Insulation resistance test		±1,03 %
Dielectric strength test		±2,90 %
Force measurements		±3,13 %
Mass measurements		±3,13 %
Mechanical energy, Impact hammer test 0,50J		±0,04 J
Linear dimension		±0,04 mm
Torque		±0,22 Nm
Angle		±0,9°
Humidity		±6,16 %
Air pressure		±1,00 %

< End of Report >