HERMON LABORATORIES

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 4 628 8001
Fax.+972 4 628 8277
e-mail: *mail@hermonlabs.com*

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

Report Number..... :	COMSAF_EN.49675
Date of issue ..... :	June 25, 2023
Total number of pages ..... :	83
Name of Testing Laboratory preparing the Report ..... :	Hermon Laboratories Ltd
Applicant's name ..... :	Compulab Ltd. 17 HaYetsira Street, Moradot HaCarmel Industrial Park, Yokneam Elite 20692, Israel
Test specification:	
Standard ..... :	IEC 62368-1: 2018 (Ed. 3.0) EN 62368-1:2020+A11:2020 UL 62368-1:2019 CSA C22.2 No. 62368 - 1:19
Non-standard test method ..... :	N/A
TRF template used. ..... :	IECEE OD-2020-F1:2020, Ed.1.4
Test Report Form No. ..... :	IEC62368_1E (modified)
Test Report Form(s) Originator .... :	UL(US)
Master TRF ..... :	Dated 2022-04-14

General disclaimer:

This report is in conformity with ISO/ IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations that are listed in the scope of Hermon Laboratories accreditation.

The test results relate only to the items tested. This test report shall not be reproduced in any form except in full with the written approval of Hermon Laboratories Ltd.

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

Test item description .....:	Industrial IoT Gateway	
Trade Mark .....:	Compulab	
Manufacturer.....:	Compulab Ltd	
Model/Type reference .....:	Fitlet3	
Ratings .....:	9-42Vdc, 36W from external power adapter	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒ **CB Testing Laboratory:**	Hermon Laboratories Ltd.	
Testing location/ address ..... :	HaTachana road, P. O. Box 23, Binyamina 30500, Israel	
Tested by (name, function, signature) ..... :	Mr. Ehud Taub Test Engineer, Product Safety	
Reviewed by (name, function, signature)...:	Mr. Yair Sapir Project Manager, Product Safety	
Approved by (name, function, signature) .. :	Mr. Ilan Benihas Head of Department, Product Safety	
☐ **Testing procedure: CTF Stage 1:**		
Testing location/ address ..... :		
Tested by (name, function, signature) ..... :		
Approved by (name, function, signature) .. :		
☐ **Testing procedure: CTF Stage 2:**		
Testing location/ address ..... :		
Tested by (name + signature) ..... :		
Witnessed by (name, function, signature). :		
Approved by (name, function, signature) .. :		
☐ **Testing procedure: CTF Stage 3:**		
☐ **Testing procedure: CTF Stage 4:**		
Testing location/ address ..... :		
Tested by (name, function, signature) ..... :		
Witnessed by (name, function, signature). :		
Approved by (name, function, signature) .. :		
Supervised by (name, function, signature) :		

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

List of Attachments (including a total number of pages in each attachment):

Appendix A – Equipment used for testing (2 page)
Appendix B – Photo Documentation (3 page)

Summary of testing:

Tests performed (name of test and test clause):

Name of test:	Test clause:
Classification and limits of electrical energy sources	5.2
Temperature measurements	5.4.1.5
Electrical power sources (PS) measurements for classification	6.2.2
Input test	B.2.5
Simulated single fault conditions	B.4
Test for the permanence of markings	F.3.10
Circuits intended for interconnection with building wiring (LPS)	Q.1

Testing location:

Hermon Laboratories Ltd.

HaTachana road, P. O. Box 23, Binyamina 30500, Israel

Summary of compliance with National Differences (List of countries addressed):

EU Group differences, Canada (CA), United States (US).

☒ **The product fulfils the requirements of: EN 62368-1:2020+A11:2020, UL 62368-1:2018 (Ed.3), CAN/CSA-C22.2 No.62368-1:2018 (Ed.3)**

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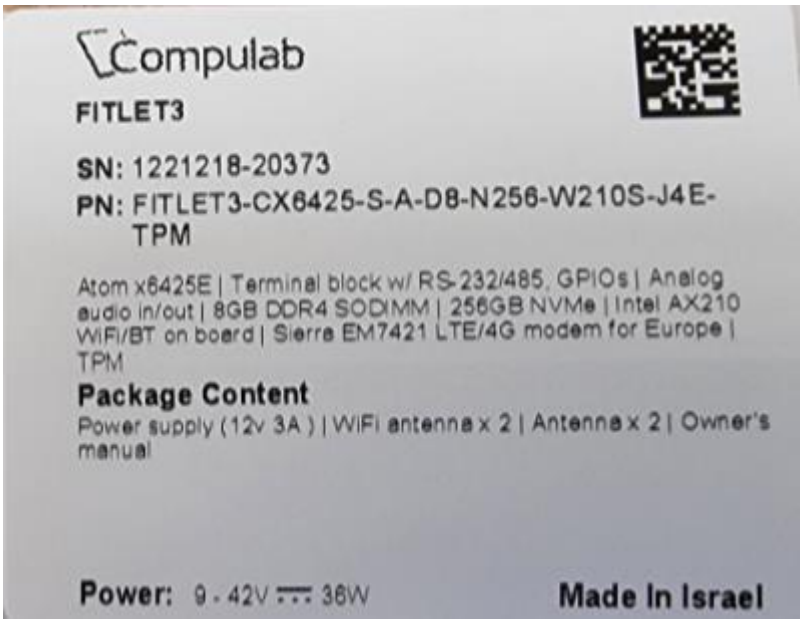
Copy of marking plate:

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



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Test item particulars:	
Product group .....:	☒ end product ☐ built-in component
Classification of use by .....:	☒ Ordinary person ☒ Children likely present ☒ Instructed person ☒ Skilled person
Supply connection.....:	☐ AC mains ☐ DC mains ☒ not mains connected: ☒ ES1 ☐ ES2 ☐ ES3
Supply tolerance .....:	☐ +10%/-10% ☐ +20%/-15% ☐ +5%/ -5% ☒ None
Supply connection – type .....:	☐ pluggable equipment type A - ☐ non-detachable supply cord ☐ appliance coupler ☐ direct plug-in ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☐ mating connector ☒ other: DC powered
Considered current rating of protective device.....:	☒ Part of external certified AC/DC adaptor Location: ☐ building ☒ equipment ☐ N/A
Equipment mobility .....:	☒ movable ☐ hand-held ☐ transportable ☐ direct plug-in ☐ stationary ☐ for building-in ☒ wall/ceiling-mounted ☐ SRME/rack-mounted ☐ other:
Overvoltage category (OVC) .....:	☐ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV ☒ other: DC powered
Class of equipment .....:	☐ Class I ☐ Class II ☒ Class III ☐ Not classified ☐
Special installation location .....:	☒ N/A ☐ restricted access area ☐ outdoor location☐
Pollution degree (PD) .....:	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified T_{ma}.....:	-40 to 85 °C ☐ Outdoor: minimum °C
IP protection class .....:	☒ IPX0 ☐ IP___
Power systems .....:	☐ TN ☐ TT ☐ IT - V_{L-L} ☒ not AC mains
Altitude during operation (m) .....:	☒ 2000 m or less ☒ 5000 m
Altitude of test laboratory (m) .....:	☒ 2000 m or less ☐ m
Mass of equipment (kg) .....:	0.560 kg

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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 .....:	March 07, 2023
Date (s) of performance of tests .....:	March 09 - April 20, 2023

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☐ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate 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**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :	As applicant

General product information and other remarks:

The EUT, model Fitlet3 is industrial IoT gateway for indoor use.
The EUT is a movable safety class III equipment that powered by 12Vdc, 3A from external certified LPS AC/DC adapter (optional: model-EA1024PR) that can be Provided with the EUT.
The user can use any other safety approved AC/DC adapter that limited to 9-42Vdc, 36W max.
In addition, the EUT includes internal low power lithium coin battery for CPU clock backup, that provides 3Vdc, 120mAh. The battery is non-rechargeable and non-replaceable by user.
The EUT is enclosed inside metal enclosure that intend for indoor use up to 85°C, functions as mechanical protection and include circuits which are classified as ES1 (Not exceed ES1 limits of 60Vdc, 42.4VPeak under normal and fault conditions.

Product details:

Model	Serial number	Hardware version	Software release
Fitlet3	Sample	Rev. 1.1	Windows 10

Model Differences -

None

Additional application considerations – (Considerations used to test a component or sub-assembly) –

The IOT gateway Fitlet3 must be powered from external LPS safety approved source that is limited to 9-42Vdc, 36W max.

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OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	**Possible Hazard**			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
ES1: internal secondary circuits powered by 9-42VDC from external AC/DC adapter	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
ES1: Internal coin battery 3Vdc (used for CPU clock backup)				
ES1: Data input/output ports		N/A	N/A	N/A
6	Electrically-caused fire			
Class and Energy Source (e.g. PS2: 100 Watt circuit)	Material part (e.g. Printed board)	Safeguards		
		B	1st S	2nd S
PS2: External certified LPS AC/DC power adapter that provide 9-42Vdc, 36W max	Enclosure and internal Components	Normal temperatures below ignition temperatures	Metal fire enclosure	N/A
PS1: Internal coin battery 3Vdc, 120mAh. (Provide less than 15VA under normal and fault conditions)	Coin Cell	N/A	N/A	N/A
PS1: Data input/output ports	Components and materials within the enclosure	N/A	N/A	N/A
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
Internal Lithium coin battery	Ordinary person / instructed person / skilled person	Protection Circuit	Metal fire enclosure	-
8	Mechanically-caused injury			
Class and Energy Source (e.g. MS3: Plastic fan blades)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
MS1: Equipment mass is less than 1kg	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
MS1: Sharp edges and corners	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
TS1: accessible enclosure surface	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R

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RS1: LED indicators	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
Supplementary Information: “B” – Basic Safeguard; “S” – Supplementary Safeguard; “R” – Reinforced Safeguard				

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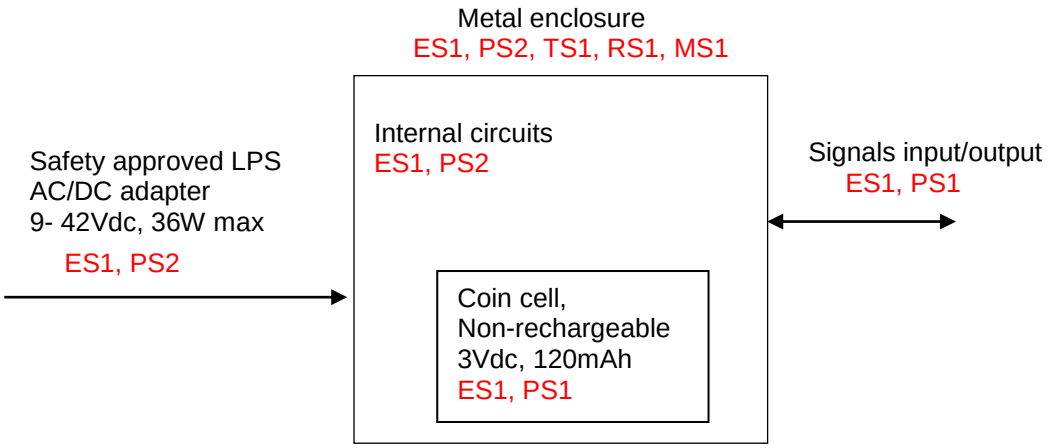
ENERGY SOURCE DIAGRAM
Optional. Manufacturers are to provide the energy sources diagram identify declared energy sources and identifying the demarcations are between power sources. Recommend diagram be provided included in power supply and multipart systems. Insert diagram below. Example diagram designs are; Block diagrams; image(s) with layered data; mechanical drawings
X ES X PS X MS X TS X RS



Hermon Laboratories Ltd.
P.O.Box 23
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IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	**GENERAL REQUIREMENTS**		P
4.1.1	Acceptance of materials, components and subassemblies	See appended table 4.1.2	P
4.1.2	Use of components	All safety critical components are certified or were tested according to this standard. Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard.	P
4.1.3	Equipment design and construction	Considered	P
4.1.4	Specified ambient temperature for outdoor use (°C) ..... :	Not for outdoor use	N/A
4.1.5	Constructions and components not specifically covered		N/A
4.1.8	Liquids and liquid filled components (LFC)	No liquids	N/A
4.1.15	Markings and instructions	See Annex F	P
4.4.3	Safeguard robustness	EUT is class III equipment powered by 9-42Vdc, 36W max from safety approved AC/DC adapter, considered as ES1/PS2. Internal coin cell is ES1/PS1. No Energy or Voltage hazards - safeguards are not necessary. Rigid metal enclosure: Robustness tests were waived by engineering considerations.	P
4.4.3.1	General	As above	N/A
4.4.3.2	Steady force tests		N/A
4.4.3.3	Drop tests		N/A
4.4.3.4	Impact tests		N/A
4.4.3.5	Internal accessible safeguard tests		N/A
4.4.3.6	Glass impact tests	No glass parts	N/A
4.4.3.7	Glass fixation tests		N/A
	Glass impact test (1J)		N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests		N/A
4.4.3.9	Air comprising a safeguard		N/A
4.4.3.10	Accessibility, glass, safeguard effectiveness		N/A
4.4.4	Displacement of a safeguard by an insulating liquid		N/A

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P.O.Box 23
Binyamina 30500, Israel
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Clause	Requirement + Test	Result - Remark	Verdict
4.4.5	Safety interlocks	No such interlocks	N/A
4.5	**Explosion**		
4.5.1	General	No explosion occurs during normal/abnormal operation and single fault conditions	P
4.5.2	No explosion during normal/abnormal operating condition	See Clause B.2, B.3	P
	No harm by explosion during single fault conditions	See Clause B.4	P
4.6	**Fixing of conductors**		P
	Fix conductors not to defeat a safeguard	All the conductors are adequately terminated	P
	Compliance is checked by test ..... :	As above	N/A
4.7	**Equipment for direct insertion into mains socket–outlets**		N/A
4.7.2	Mains plug part complies with relevant standard .. :	Not a direct plug-in equipment	N/A
4.7.3	Torque (Nm) ..... :	As above	N/A
4.8	**Equipment containing coin/button cell batteries**		P
4.8.1	General		P
4.8.2	Instructional safeguard ..... :	Internal coin battery 3Vdc, 120mAh cannot be assembling in reverse polarity. Instructional safeguard is not required	P
4.8.3	Battery compartment door/cover construction	The equipment does not include battery compartment	N/A
	Open torque test		N/A
4.8.4.2	Stress relief test		N/A
4.8.4.3	Battery replacement test		N/A
4.8.4.4	Drop test		N/A
4.8.4.5	Impact test		N/A
4.8.4.6	Crush test		N/A
4.8.5	Compliance		N/A
	30N force test with test probe		N/A
	20N force test with test hook		N/A
4.9	**Likelihood of fire or shock due to entry of conductive object**		N/A
4.10	**Component requirements**		N/A

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P.O.Box 23
Binyamina 30500, Israel
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Clause	Requirement + Test	Result - Remark	Verdict
4.10.1	Disconnect Device	EUT is Class III equipment powered by 9-42Vdc, 36W max from AC/DC certified adapter considered as ES1/PS2. Internal coin cell is considered as ES1/PS1. No hazardous energy or voltage - safeguards are not necessary. No disconnect device is required.	N/A
4.10.2	Switches and relays	No such parts which affect safety	N/A
5	**ELECTRICALLY-CAUSED INJURY**		P
5.2	**Classification and limits of electrical energy sources**		P
5.2.2	ES1, ES2 and ES3 limits	ES1: External AC/DC power adapter or equivalent power supply with output of 9-42Vdc. ES1: Data I/O ports ES1: Internal coin battery which provides 3Vdc to CPU (used for CPU clock backup).	P
5.2.2.2	Steady-state voltage and current limits .....:	See appended table 5.2	P
5.2.2.3	Capacitance limits .....:	Electrical energy source is not a capacitor	N/A
5.2.2.4	Single pulse limits .....:	Electrical energy source is not a single pulse	N/A
5.2.2.5	Limits for repetitive pulses .....:	Electrical energy source is not a repetitive pulse.	N/A
5.2.2.6	Ringing signals	Electrical energy source is not an analogue telephone ringing signal	N/A
5.2.2.7	Audio signals	No input for audio signals, only earphones connection for audio output. Electrical energy source is not comprised of audio signals.	N/A
5.3	**Protection against electrical energy sources**		N/A
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	Powered by 9-42Vdc from external LPS adapter, considered as ES1. Safeguards are not required.	N/A
5.3.1 a)	Accessible ES1/ES2 derived from ES2/ES3 circuits		N/A

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Binyamina 30500, Israel
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Fax.+972 46288277
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Clause	Requirement + Test	Result - Remark	Verdict
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		N/A
5.3.2.1	Accessibility to electrical energy sources and safeguards		N/A
	Accessibility to outdoor equipment bare parts		N/A
5.3.2.2	Contact requirements		N/A
	Test with test probe from Annex V		—
5.3.2.2 a)	Air gap – electric strength test potential (V) .....:		N/A
5.3.2.2 b)	Air gap – distance (mm) .....:		N/A
5.3.2.3	Compliance		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	Electrical energy source classified as ES1 – Safeguards are not required. Functional insulation only provided in EUT.	N/A
5.4.1.3	Material is non-hygroscopic	Hygroscopic materials are not used as insulation	N/A
5.4.1.4	Maximum operating temperature for insulating materials.....:	Insulation materials not in use	N/A
5.4.1.5	Pollution degrees .....:	Pollution degree 2	N/A
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound	Pollution degree 2 applied	N/A
5.4.1.5.3	Thermal cycling test	As above	N/A
5.4.1.6	Insulation in transformers with varying dimensions	No transformers	N/A
5.4.1.7	Insulation in circuits generating starting pulses	No such circuits	N/A
5.4.1.8	Determination of working voltage .....:	Max 42Vdc	N/A
5.4.1.9	Insulating surfaces	No insulating surfaces which accessible	N/A
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted	No such parts	N/A
5.4.1.10.2	Vicat test.....:		N/A
5.4.1.10.3	Ball pressure test .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.2	Clearances	Electrical energy source classified as ES1 – Safeguards are not required (no basic, supplementary or reinforced insulation). All circuits are secondary, provided with functional insulation. No special requirements for clearances at functional insulation.	N/A
5.4.2.1	General requirements	The equipment does not intend for outdoor use	N/A
	Clearances in circuits connected to AC Mains, Alternative method	As above	N/A
5.4.2.2	Procedure 1 for determining clearance		N/A
	Temporary overvoltage .....:		—
5.4.2.3	Procedure 2 for determining clearance		N/A
5.4.2.3.2.2	a.c. mains transient voltage.....:		—
5.4.2.3.2.3	d.c. mains transient voltage .....:		—
5.4.2.3.2.4	External circuit transient voltage.....:		—
5.4.2.3.2.5	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
5.4.2.6	Clearance measurement .....:		N/A
5.4.3	Creepage distances	Same as clearances above	N/A
5.4.3.1	General		N/A
5.4.3.3	Material group .....:		—
5.4.3.4	Creepage distances measurement .....:		N/A
5.4.4	Solid insulation	Electrical energy source classified as ES1 – Safeguards are not required (no basic, supplementary, or reinforced insulation). Functional insulation only provided in EUT.	N/A
5.4.4.1	General requirements		N/A
5.4.4.2	Minimum distance through insulation .....:		N/A
5.4.4.3	Insulating compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A

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5.4.4.5	Insulating compound forming cemented joints	No such 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
	Number of layers (pcs) ..... :		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material ..... :		N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components	No such components	N/A
5.4.4.9	Solid insulation at frequencies >30 kHz, E_P, K_R, d, V_{PW} (V) ..... :		N/A
	Alternative by electric strength test, tested voltage (V), K_R ..... :		N/A
5.4.5	Antenna terminal insulation	Equipment is considered as indoor and its antenna terminals are not exposed to external transients	N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
5.4.5.3	Insulation resistance (MΩ)..... :		N/A
	Electric strength test .....:		N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard	No supplementary safeguards are in use	N/A
5.4.7	Tests for semiconductor components and for cemented joints	No such devices or cemented joints	N/A
5.4.8	Humidity conditioning	Hygroscopic materials are not used as insulation	N/A
	Relative humidity (%), temperature (°C), duration (h) ..... :		—
5.4.9	Electric strength test	Electrical energy source classified as ES1 – Safeguards are not required (no basic, supplementary or reinforced insulation). Functional insulation only provided in EUT.	N/A
5.4.9.1	Test procedure for type test of solid insulation.....:		N/A
5.4.9.2	Test procedure for routine test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.10	Safeguards against transient voltages from external circuits	EUT is an indoor equipment which is not connected to telecommunication networks (external circuits)	N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		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
5.4.10.3	Verification for insulation breakdown for impulse test ..... :		N/A
5.4.11	Separation between external circuits and earth	No such parts	N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	SPDs bridge separation between external circuit and earth		N/A
	Rated operating voltage U_{op} (V)..... :		—
	Nominal voltage U_{peak} (V)..... :		—
	Max increase due to variation ΔU_{sp} ..... :		—
	Max increase due to ageing ΔU_{sa} ..... :		—
5.4.11.3	Test method and compliance ..... :		N/A
5.4.12	Insulating liquid	No insulating liquid in the EUT	N/A
5.4.12.1	General requirements		N/A
5.4.12.2	Electric strength of an insulating liquid ..... :		N/A
5.4.12.3	Compatibility of an insulating liquid ..... :		N/A
5.4.12.4	Container for insulating liquid ..... :		N/A
5.5	**Components as safeguards**		N/A
5.5.1	General	Electrical energy source classified as ES1 – Safeguards are not required (no basic, supplementary or reinforced insulation). Functional insulation only provided in EUT.	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..... :		N/A
5.5.3	Transformers		

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.5.4	Optocouplers		N/A
5.5.5	Relays		N/A
5.5.6	Resistors		N/A
5.5.7	SPDs		N/A
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable ..... :	EUT is not connected to mains or to external circuit consisting of a coaxial cable	N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment	Indoor equipment	N/A
	RCD rated residual operating current (mA)..... :		—
5.6	**Protective conductor**		N/A
5.6.2	Requirement for protective conductors	No use of protective conductor as a safeguard. Electrical energy source classified as ES1 – Safeguards not required.	N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation		N/A
5.6.3	Requirement for protective earthing conductors	Protective earthing conductor is not required. No provision for earthing. Electrical energy source classified as ES1 – Safeguards are not required.	N/A
	Protective earthing conductor size (mm^2) ..... :		—
	Protective earthing conductor serving as a reinforced safeguard		N/A
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors	No use of protective bonding	N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm^2). ..... :		—
5.6.4.2	Protective current rating (A)..... :		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Terminal size for connecting protective earthing conductors (mm)..... :		N/A
	Terminal size for connecting protective bonding conductors (mm) .....:		N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective bonding system	No protective earthing and bonding	N/A
5.6.6.1	Requirements		N/A

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P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.6.2	Test Method ..... :		N/A
5.6.6.3	Resistance (Ω) or voltage drop ..... :		N/A
5.6.7	Reliable connection of a protective earthing conductor	No earthing requirement	N/A
5.6.8	Functional earthing		N/A
	Conductor size (mm^2) ..... :		N/A
	Class II with functional earthing marking ..... :		N/A
	Appliance inlet cl & cr (mm) ..... :		N/A
5.7	**Prospective touch voltage, touch current and protective conductor current**		N/A
5.7.2	Measuring devices and networks	DC powered. No connection to the mains supply, no earth connection, and no connection to external circuits from coaxial cables.	N/A
5.7.2.1	Measurement of touch current		N/A
5.7.2.2	Measurement of voltage		N/A
5.7.3	Equipment set-up, supply connections and earth connections		N/A
5.7.4	Unearthed accessible parts ..... :		N/A
5.7.5	Earthed accessible conductive parts ..... :		N/A
5.7.6	Requirements when touch current exceeds ES2 limits		N/A
	Protective conductor current (mA) ..... :		N/A
	Instructional Safeguard ..... :		N/A
5.7.7	Prospective touch voltage and touch current associated with external circuits		N/A
5.7.7.1	Touch current from coaxial cables		N/A
5.7.7.2	Prospective touch voltage and touch current associated with paired conductor cables		N/A
5.7.8	Summation of touch currents from external circuits		N/A
	a) Equipment connected to earthed external circuits, current (mA) ..... :		N/A
	b) Equipment connected to unearthed external circuits, current (mA) ..... :		N/A
5.8	**Backfeed safeguard in battery backed up supplies**		N/A
	Mains terminal ES ..... :	No such batteries	N/A
	Air gap (mm) ..... :		N/A

6	**ELECTRICALLY- CAUSED FIRE**	P
6.2	**Classification of PS and PIS**	P

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict
6.2.2	Power source circuit classifications.....:	See appended table 6.2.2	P
6.2.3	Classification of potential ignition sources	See appended table 6.2.2	P
6.2.3.1	Arcing PIS .....:	Less than 50V no arcing PIS	N/A
6.2.3.2	Resistive PIS .....:	EUT powered from AC/DC 9-42Vdc, 36W LPS certified adapter. Under single fault condition the power exceeds 15W	P
6.3	**Safeguards against fire under normal operating and abnormal operating conditions**		P
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials ..... :		P
	Combustible materials outside fire enclosure .....:	No such parts	N/A
6.4	**Safeguards against fire under single fault conditions**		P
6.4.1	Safeguard method	Reduce the likelihood of ignition method was used	P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits	Coin battery assumed as PS1 under fault condition	P
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	External AC/DC adapter is certified as PS2 under normal and single fault condition. No PS3 circuits.	P
6.4.3.1	Supplementary safeguards	Selection and application of components and materials which comply with the relevant IEC standards and minimize the possibility of ignition and spread of flame	P
6.4.3.2	Single Fault Conditions ..... :	See appended table B.4	P
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits	Rigid metal enclosure functioning as fire enclosure	P
6.4.5	Control of fire spread in PS2 circuits	As above	P
6.4.5.2	Supplementary safeguards	All components mounted on V-0 class material	P
6.4.6	Control of fire spread in PS3 circuits	No PS3 circuits	N/A
6.4.7	Separation of combustible materials from a PIS	No combustible materials	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	Fire enclosure is provided	P
6.4.8.2	Fire enclosure and fire barrier material properties	Rigid metal fire enclosure	P
6.4.8.2.1	Requirements for a fire barrier	No fire barriers	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.4.8.2.2	Requirements for a fire enclosure	Rigid metal fire 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	Considered	P
6.4.8.3.2	Fire barrier dimensions	No fire barriers	N/A
6.4.8.3.3	Top openings and properties	No top openings	N/A
	Openings dimensions (mm)..... :		N/A
6.4.8.3.4	Bottom openings and properties	Flat metal plate comply with fire enclosure requirements	N/A
	Openings dimensions (mm)..... :	Test not required	N/A
	Flammability tests for the bottom of a fire enclosure		N/A
	Instructional Safeguard.....:		N/A
6.4.8.3.5	Side openings and properties	No side openings	N/A
	Openings dimensions (mm)..... :	Test not required	N/A
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c)..... :	Fire enclosure made of metal	P
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating ..... :	Metal fire enclosure is used	N/A
6.4.9	Flammability of insulating liquid.....:	No insulating liquid	N/A
6.5	**Internal and external wiring**		P
6.5.1	General requirements	External AC/DC adapter wiring covered under certified adapter. Internal wiring considered adequate for their application use.	P
6.5.2	Requirements for interconnection to building wiring ..... :	All the wiring interconnected to building are not supposed to provide power	N/A
6.5.3	Internal wiring size (mm^2) for socket-outlets..... :		N/A
6.6	**Safeguards against fire due to the connection to additional equipment**		P
7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		P
7.2	**Reduction of exposure to hazardous substances**		P
7.3	**Ozone exposure**		N/A
7.4	**Use of personal safeguards or personal protective equipment (PPE)**		N/A
	Personal safeguards and instructions ..... :	Not required	—
7.5	**Use of instructional safeguards and instructions**		N/A
	Instructional safeguard (ISO 7010)..... :	Not required	—
7.6	**Batteries and their protection circuits**		P

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8	**MECHANICALLY-CAUSED INJURY**		P
8.2	**Mechanical energy source classifications**		P
8.3	**Safeguards against mechanical energy sources**		P
8.4	**Safeguards against parts with sharp edges and corners**		P
8.4.1	Safeguards	MS1 classification, safeguards are not required	N/A
	Instructional Safeguard.....:		N/A
8.4.2	Sharp edges or corners	All edges and corners are judged to be well rounded and do not present any hazard	P
8.5	**Safeguards against moving parts**		N/A
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts	No moving parts	N/A
	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
	Moving MS3 parts only accessible to skilled person		N/A
8.5.2	Instructional safeguard.....:		N/A
8.5.4	Special categories of equipment containing moving parts		N/A
8.5.4.1	General		N/A
8.5.4.2	Equipment containing work cells with MS3 parts		N/A
8.5.4.2.1	Protection of persons in the work cell		N/A
8.5.4.2.2	Access protection override		N/A
8.5.4.2.2.1	Override system		N/A
8.5.4.2.2.2	Visual indicator		N/A
8.5.4.2.3	Emergency stop system		N/A
	Maximum stopping distance from the point of activation (m).....:		N/A
	Space between end point and nearest fixed mechanical part (mm).....:		N/A
8.5.4.2.4	Endurance requirements		N/A
	Mechanical system subjected to 100 000 cycles of operation		N/A
	- Mechanical function check and visual inspection		N/A
	- Cable assembly.....:		N/A
8.5.4.3	Equipment having electromechanical device for destruction of media		N/A
8.5.4.3.1	Equipment safeguards		N/A
8.5.4.3.2	Instructional safeguards against moving parts .....:		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.5.4.3.3	Disconnection from the supply		N/A
8.5.4.3.4	Cut type and test force (N).....:		N/A
8.5.4.3.5	Compliance		N/A
8.5.5	High pressure lamps	No such lamps	N/A
	Explosion test.....:		N/A
8.5.5.3	Glass particles dimensions (mm) .....:		N/A
8.6	**Stability of equipment**		N/A
8.6.1	General	Mass of EUT is less than 7kg classified as MS1. No stability requirements.	N/A
	Instructional safeguard.....:		N/A
8.6.2	Static stability		N/A
8.6.2.2	Static stability test .....:		N/A
8.6.2.3	Downward force test		N/A
8.6.3	Relocation stability		N/A
	Wheels diameter (mm) .....:		—
	Tilt test		N/A
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test.....:		N/A
8.7	**Equipment mounted to wall, ceiling or other structure**		P
8.7.1	Mount means type .....:	The equipment can be rack mounted	P
8.7.2	Test methods	Hanging height less than two meters and the equipment weight of less than 1 kg. Test is not required for such equipment.	N/A
	Test 1, additional downwards force (N).....:		N/A
	Test 2, number of attachment points and test force (N).....:		N/A
	Test 3 Nominal diameter (mm) and applied torque (Nm).....:		N/A
8.8	**Handles strength**		N/A
8.8.1	General	No handles	N/A
8.8.2	Handle strength test		N/A
	Number of handles.....:		—
	Force applied (N) .....:		—
8.9	**Wheels or casters attachment requirements**		N/A
8.9.2	Pull test	No wheels or casters	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.10	**Carts, stands and similar carriers**		N/A
8.10.1	General	No carts, stands and similar carriers	N/A
8.10.2	Marking and instructions.....:		N/A
8.10.3	Cart, stand or carrier loading test		N/A
	Loading force applied (N) .....:		N/A
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Force applied (N) .....:		—
8.10.6	Thermoplastic temperature stability		N/A
8.11	**Mounting means for slide-rail mounted equipment (SRME)**		N/A
8.11.1	General	No slide rail mounted equipment	N/A
8.11.2	Requirements for slide rails		N/A
	Instructional Safeguard.....:		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force (N) applied.....:		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance		N/A
8.12	**Telescoping or rod antennas**		N/A
	Button/ball diameter (mm) .....:	No telescoping rod antennas	—

9	**THERMAL BURN INJURY**		P
9.2	**Thermal energy source classifications**		P
9.3	**Touch temperature limits**		P
9.3.1	Touch temperatures of accessible parts.....:	See appended table 5.4.1.4 ,6.3.2	P
9.3.2	Test method and compliance		N/A
9.4	**Safeguards against thermal energy sources**		N/A
9.5	**Requirements for safeguards**		N/A
9.5.1	Equipment safeguard	Not necessary safeguards	N/A
9.5.2	Instructional safeguard.....:	As above	N/A
9.6	**Requirements for wireless power transmitters**		N/A
9.6.1	General	There is no wireless power transmitter	N/A
9.6.2	Specification of the foreign objects		N/A
9.6.3	Test method and compliance .....:		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10	**RADIATION**		P
10.2	**Radiation energy source classification**		P
10.2.1	General classification	The EUT does not include laser, visible, infra-red, ultraviolet, x-ray. EUT is not intended to be used with audio. LEDs are used for indication only. Classified as RS1.	P
	Lasers ..... :	No lasers	—
	Lamps and lamp systems ..... :		—
	Image projectors ..... :		—
	X-Ray ..... :		—
	Personal music player ..... :		—
10.3	**Safeguards against laser radiation**		N/A
	The standard(s) equipment containing laser(s) comply ..... :	No lasers	N/A
10.4	**Safeguards against optical radiation from lamps and lamp systems (including LED types)**		N/A
10.4.1	General requirements	No such radiation	N/A
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A
	Risk group marking and location ..... :		N/A
	Information for safe operation and installation		N/A
10.4.2	Requirements for enclosures		N/A
	UV radiation exposure ..... :		N/A
10.4.3	Instructional safeguard ..... :		N/A
10.5	**Safeguards against X-radiation**		N/A
10.5.1	Requirements	No x-radiation	N/A
	Instructional safeguard for skilled persons ..... :		—
10.5.3	Maximum radiation (pA/kg) ..... :		—
10.6	**Safeguards against acoustic energy sources**		N/A
10.6.1	General	The EUT is not defined as personal music player and not closely coupled to the ear or earphones and headphones intended for use with personal music players	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict
10.6.2	Classification		N/A
	Acoustic output $L_{Aeq,T}$, dB(A).....:		N/A
	Unweighted RMS output voltage (mV).....:		N/A
	Digital output signal (dBFS).....:		N/A
10.6.3	Requirements for dose-based systems		N/A
10.6.3.1	General requirements		N/A
10.6.3.2	Dose-based warning and automatic decrease		N/A
10.6.3.3	Exposure-based warning and requirements		N/A
	30 s integrated exposure level (MEL30) .....:		N/A
	Warning for MEL ≥ 100 dB(A) .....:		N/A
10.6.4	Measurement methods		N/A
10.6.5	Protection of persons		N/A
	Instructional safeguards .....:		N/A
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.6.1	Corded listening devices with analogue input		N/A
	Listening device input voltage (mV).....:		N/A
10.6.6.2	Corded listening devices with digital input		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A) .....:		N/A
10.6.6.3	Cordless listening devices		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A) .....:		N/A

B	**NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS**		P
B.1	**General**		P
B.1.5	Temperature measurement conditions		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 .....:	The EUT has no input for audio signals. Headphones connection in use only as audio output.	N/A
B.2.3	Supply voltage and tolerances	Considered	P
B.2.5	Input test.....:	Not connected to the mains. However, test performed per rating declaration. See appended table B.2.5.	P

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
B.3	**Simulated abnormal operating conditions**		P
B.3.1	General		N/A
B.3.2	Covering of ventilation openings	No ventilation openings	N/A
	Instructional safeguard ..... :		N/A
B.3.3	DC mains polarity test	Not connected to mains	N/A
B.3.4	Setting of voltage selector	As above	N/A
B.3.5	Maximum load at output terminals	Tested on USB ports	P
B.3.6	Reverse battery polarity	Impossible due to the design of battery connector	P
B.3.7	Audio amplifier abnormal operating conditions	No audio amplifier	N/A
B.3.8	Safeguards functional during and after abnormal operating conditions ..... :	Safeguards remain effective	P
B.4	**Simulated single fault conditions**		P
B.4.1	General	See appended table B.4	P
B.4.2	Temperature controlling device	No such device	N/A
B.4.3	Blocked motor test	No motors	N/A
B.4.4	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	PCB is uncoated	N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors	No such components	N/A
B.4.6	Short circuit or disconnection of passive components	See appended table B.4	P
B.4.7	Continuous operation of components	No such parts	N/A
B.4.8	Compliance during and after single fault conditions ..... :	Accessible parts do not exceed their energy source class. No hazards nor flames were noted during the tests.	P
B.4.9	Battery charging and discharging under single fault conditions	See Annex M	P
C	**UV RADIATION**		N/A
C.1	**Protection of materials in equipment from UV radiation**		N/A
C.1.2	Requirements	EUT not produce UV radiation	N/A
C.1.3	Test method		N/A
C.2	**UV light conditioning test**		N/A
C.2.1	Test apparatus..... :		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure test		N/A
C.2.4	Xenon-arc light-exposure test		N/A
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**		
E.1	**Electrical energy source classification for audio signals**		N/A
	Maximum non-clipped output power (W)..... :	No Audio amplifier. Only earphones connection.	—
	Rated load impedance (Ω) ..... :		—
	Open-circuit output voltage (V)..... :		—
	Instructional safeguard ..... :		—
E.2	**Audio amplifier normal operating conditions**		N/A
	Audio signal source type ..... :		—
	Audio output power (W)..... :		—
	Audio output voltage (V) ..... :		—
	Rated load impedance (Ω) ..... :		—
	Requirements for temperature measurement		N/A
E.3	Audio amplifier abnormal operating conditions		N/A
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P
F.1	**General**		P
	Language ..... :	English	—
F.2	**Letter symbols and graphical symbols**		N/A
F.2.1	Letter symbols according to IEC60027-1	No effected safety	N/A
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific		N/A
F.3	**Equipment markings**		P
F.3.1	Equipment marking locations	Marking on enclosure	P
F.3.2	Equipment identification markings	Provided	P
F.3.2.1	Manufacturer identification ..... :	Compulab Ltd	P
F.3.2.2	Model identification ..... :	Fitlet3	P
F.3.3	Equipment rating markings	9-42Vdc, 36W	P
F.3.3.1	Equipment with direct connection to mains	No direct connection to mains	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
F.3.3.2	Equipment without direct connection to mains	Eexternal PS rating is marked on the label and complies with B.2.5	P
F.3.3.3	Nature of the supply voltage ..... :		N/A
F.3.3.4	Rated voltage..... :		N/A
F.3.3.5	Rated frequency ..... :		N/A
F.3.3.6	Rated current or rated power..... :	36W	N/A
F.3.3.7	Equipment with multiple supply connections	Single supply	N/A
F.3.4	Voltage setting device	No voltage setting device	N/A
F.3.5	Terminals and operating devices	See below	N/A
F.3.5.1	Mains appliance outlet and socket-outlet markings ..... :	No appliance outlet and socket-outlet	N/A
F.3.5.2	Switch position identification marking..... :	The On/Off switch is not using as a disconnect device	N/A
F.3.5.3	Replacement fuse identification and rating markings ..... :	No replacement fuse	N/A
	Instructional safeguards for neutral fuse ..... :	No hazards	N/A
F.3.5.4	Replacement battery identification marking ..... :	No hazards	N/A
F.3.5.5	Neutral conductor terminal	No terminals for mains supply	N/A
F.3.5.6	Terminal marking location	No terminals for mains supply	N/A
F.3.6	Equipment markings related to equipment classification	Class III equipment	N/A
F.3.6.1	Class I equipment	As above	N/A
F.3.6.1.1	Protective earthing conductor terminal..... :		N/A
F.3.6.1.2	Protective bonding conductor terminals ..... :		N/A
F.3.6.2	Equipment class marking ..... :		N/A
F.3.6.3	Functional earthing terminal marking ..... :		N/A
F.3.7	Equipment IP rating marking ..... :	IPX0	N/A
F.3.8	External power supply output marking ..... :	Not such outputs	N/A
F.3.9	Durability, legibility and permanence of marking	Inspected	P
F.3.10	Test for permanence of markings	Tested	P
F.4	**Instructions**		
	Information prior to installation and initial use	Provided	P
	Equipment for use in locations where children not likely to be present	Not required	N/A
	Instructions for installation and interconnection	Provided	P
	Equipment intended for use only in restricted access area	Not intended for restricted access area	N/A
	Equipment intended to be fastened in place	No such parts	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict
	Instructions for audio equipment terminals	No such parts	N/A
	Protective earthing used as a safeguard	Class III equipment – no earth	N/A
	Protective conductor current exceeding ES2 limits	ES1 equipment	N/A
	Graphic symbols used on equipment	Not effecting safety	N/A
	Permanently connected equipment not provided with all-pole mains switch	No such parts	N/A
	Replaceable components or modules providing safeguard function	No such parts	N/A
	Equipment containing insulating liquid	No such parts	N/A
	Installation instructions for outdoor equipment	Indoor equipment	N/A
F.5	Instructional safeguards		P
G	**COMPONENTS**		N/A
G.1	**Switches**		N/A
G.1.1	General	No such parts which affect safety	N/A
G.1.2	Ratings, endurance, spacing, maximum load		
G.1.3	Test method and compliance		
G.2	**Relays**		N/A
G.2.1	Requirements	No such parts	N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supplying power to other equipment		N/A
G.2.4	Test method and compliance		N/A
G.3	**Protective devices**		N/A
G.3.1	Thermal cut-offs	No such parts	N/A
	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N/A
	b) Thermal links tested as part of the equipment		N/A
G.3.2.2	Test method and compliance		N/A
G.3.3	PTC thermistors		N/A
G.3.4	Overcurrent protection devices		N/A
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions ..... :		N/A
G.4	**Connectors**		N/A
G.4.1	Spacings	Classified as ES1 with no direct connection to mains	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	No such components	N/A
G.5.1.2	Protection against mechanical stress		N/A
G.5.2	Endurance test		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Test time (days per cycle) ..... :		—
	Test temperature (°C) ..... :		—
G.5.2.3	Wound components supplied from the mains		N/A
G.5.2.4	No insulation breakdown		N/A
G.5.3	Transformers		N/A
G.5.3.1	Compliance method ..... :		N/A
	Position ..... :		N/A
	Method of protection ..... :		N/A
G.5.3.2	Insulation		N/A
	Protection from displacement of windings ..... :		—
G.5.3.3	Transformer overload tests		N/A
G.5.3.3.1	Test conditions		N/A
G.5.3.3.2	Winding temperatures		N/A
G.5.3.3.3	Winding temperatures - alternative test method		N/A
G.5.3.4	Transformers using FIW		N/A
G.5.3.4.1	General		N/A
	FIW wire nominal diameter ..... :		—
G.5.3.4.2	Transformers with basic insulation only		N/A
G.5.3.4.3	Transformers with double insulation or reinforced insulation ..... :		N/A
G.5.3.4.4	Transformers with FIW wound on metal or ferrite core		N/A
G.5.3.4.5	Thermal cycling test and compliance		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.3.4.6	Partial discharge test		N/A
G.5.3.4.7	Routine test		N/A
G.5.4	Motors		N/A
G.5.4.1	General requirements		N/A
G.5.4.2	Motor overload test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4.2	Locked-rotor overload test		N/A
	Test duration (days) ..... :		—
G.5.4.5	Running overload test for DC motors		N/A
G.5.4.5.2	Tested in the unit		N/A
G.5.4.5.3	Alternative method		N/A
G.5.4.6	Locked-rotor overload test for DC motors		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature ..... :		N/A
G.5.4.6.3	Alternative method		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage ..... :		—
G.6	**Wire Insulation**		N/A
G.6.1	General	No such wires	N/A
G.6.2	Enamelled winding wire insulation		N/A
G.7	**Mains supply cords**		N/A
G.7.1	General requirements	Not connected to mains	N/A
	Type ..... :		—
G.7.2	Cross sectional area (mm^2 or AWG) ..... :		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) ..... :		N/A
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm) ..... :		N/A
G.7.3.2.4	Strain relief and cord anchorage material		N/A
G.7.4	Cord Entry		N/A
G.7.5	Non-detachable cord bend protection		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict
G.7.5.1	Requirements		N/A
G.7.5.2	Test method and compliance		N/A
	Overall diameter or minor overall dimension, *D* (mm) ..... :		—
	Radius of curvature after test (mm) ..... :		—
G.7.6	Supply wiring space		N/A
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	**Varistors**		N/A
G.8.1	General requirements	No Varistors	N/A
G.8.2	Safeguards against fire		N/A
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test		N/A
G.8.2.3	Temporary overvoltage test		N/A
G.9	**Integrated circuit (IC) current limiters**		N/A
G.9.1	Requirements		N/A
	IC limiter output current (max. 5A)..... :		—
	Manufacturers' defined drift ..... :		—
G.9.2	Test Program		N/A
G.9.3	Compliance		N/A
G.10	**Resistors**		N/A
G.10.1	General	No resistors used as safeguards	N/A
G.10.2	Conditioning		N/A
G.10.3	Resistor test		N/A
G.10.4	Voltage surge test		N/A
G.10.5	Impulse test		N/A
G.10.6	Overload test		N/A
G.11	**Capacitors and RC units**		N/A
G.11.1	General requirements	Not current limited circuits	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 with specifics	No optocouplers	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Type test voltage $V_{ini,a}$..... :		—
	Routine test voltage, $V_{ini,b}$ ..... :		—
G.13	**Printed boards**	Electrical energy source classified as ES1 – Safeguards not required (no basic, supplementary or reinforced insulation). Functional insulation only provided in EUT.	N/A
G.13.1	General requirements		N/A
G.13.2	Uncoated printed boards		N/A
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation ..... :		N/A
	Number of insulation layers (pcs) ..... :		—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2	Test method and compliance		N/A
G.14	**Coating on components terminals**		
G.14.1	Requirements ..... :	No such components	N/A
G.15	**Pressurized liquid filled components**		N/A
G.15.1	Requirements	No such components	N/A
G.15.2	Test methods and compliance		N/A
G.15.2.1	Hydrostatic pressure test		N/A
G.15.2.2	Creep resistance test		N/A
G.15.2.3	Tubing and fittings compatibility test		N/A
G.15.2.4	Vibration test		N/A
G.15.2.5	Thermal cycling test		N/A
G.15.2.6	Force test		N/A
G.15.3	Compliance		N/A
G.16	**IC including capacitor discharge function (ICX)**		N/A
G.16.1	Condition for fault tested is not required	No such components	N/A
	ICX with associated circuitry tested in equipment		N/A
	ICX tested separately		N/A
G.16.2	Tests		N/A
	Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test..... :		—

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Mains voltage that impulses to be superimposed on ..... :		—
	Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test ..... :		—
G.16.3	Capacitor discharge test..... :		N/A
H	**CRITERIA FOR TELEPHONE RINGING SIGNALS**		N/A
H.1	**General**		N/A
H.2	**Method A**		N/A
H.3	**Method B**		N/A
H.3.1	Ringing signal	No telephone ringing signals	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
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V) ..... :		N/A
J	**INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION**		N/A
J.1	**General**		N/A
	Winding wire insulation..... :	No such windings wires	—
	Solid round winding wire, diameter (mm) ..... :		N/A
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm^2)..... :		N/A
J.2/J.3	Tests and Manufacturing		—
K	**SAFETY INTERLOCKS**		N/A
K.1	**General requirements**		N/A
	Instructional safeguard ..... :	No safety interlocks	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
K.5.1	Under single fault condition		N/A
K.6	**Mechanically operated safety interlocks**		N/A
K.6.1	Endurance requirement		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
K.6.2	Test method and compliance ..... :		N/A
K.7	**Interlock circuit isolation**		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A
	In circuit connected to mains, separation distance for contact gaps (mm)..... :		N/A
	In circuit isolated from mains, separation distance for contact gaps (mm)..... :		N/A
	Electric strength test before and after the test of K.7.2 ..... :		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**	The EUT is powered by 9-42Vdc, 36W max from external safety approved AC/DC adapter, classified as ES1/PS2 and 3Vdc, 120mAh from internal battery. No disconnect device required.	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
	Instructional safeguard ..... :		N/A
M	**EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS**		P
M.1	**General requirements**		P
M.2	**Safety of batteries and their cells**		P
M.2.1	Batteries and their cells comply with relevant IEC standards ..... :	EUT contains safety approved low power coin battery enclosed inside EUT fire enclosure. Battery is not considered as hazardous and considered to comply with this annex without further evaluation, other than considering the appropriate use.	P

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
M.3	**Protection circuits for batteries provided within the equipment**	Tests were waived by egineering considerations	N/A
M.3.1	Requirements		N/A
M.3.2	Test method		N/A
	Overcharging of a rechargeable battery		N/A
	Excessive discharging		N/A
	Unintentional charging of a non-rechargeable battery		N/A
	Reverse charging of a rechargeable battery		N/A
M.3.3	Compliance		N/A
M.4	**Additional safeguards for equipment containing a portable secondary lithium battery**		N/A
M.4.1	General	As above	N/A
M.4.2	Charging safeguards		N/A
M.4.2.1	Requirements		N/A
M.4.2.2	Compliance ..... :		N/A
M.4.3	Fire enclosure ..... :		N/A
M.4.4	Drop test of equipment containing a secondary lithium battery		N/A
M.4.4.2	Preparation and procedure for the drop test		N/A
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%)..... :		N/A
M.4.4.4	Check of the charge/discharge function		N/A
M.4.4.5	Charge / discharge cycle test		N/A
M.4.4.6	Compliance		N/A
M.5	**Risk of burn due to short-circuit during carrying**		N/A
M.5.1	Requirement	As above	N/A
M.5.2	Test method and compliance		N/A
M.6	**Safeguards against short-circuits**		N/A
M.6.1	External and internal faults	As above	N/A
M.6.2	Compliance		N/A
M.7	**Risk of explosion from lead acid and NiCd batteries**		N/A
M.7.1	Ventilation preventing explosive gas concentration	As above	N/A
	Calculated hydrogen generation rate ..... :		N/A
M.7.2	Test method and compliance		N/A
	Minimum air flow rate, Q (m^3/h) ..... :		N/A
M.7.3	Ventilation tests		N/A
M.7.3.1	General		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
M.7.3.2	Ventilation test – alternative 1		N/A
	Hydrogen gas concentration (%) ..... :		N/A
M.7.3.3	Ventilation test – alternative 2		N/A
	Obtained hydrogen generation rate ..... :		N/A
M.7.3.4	Ventilation test – alternative 3		N/A
	Hydrogen gas concentration (%) ..... :		N/A
M.7.4	Marking ..... :		N/A
M.8	**Protection against internal ignition from external spark sources of batteries with aqueous electrolyte**		N/A
M.8.1	General	As above	N/A
M.8.2	Test method		N/A
M.8.2.1	General		N/A
M.8.2.2	Estimation of hypothetical volume V_Z (m^3/s)..... :		—
M.8.2.3	Correction factors ..... :		—
M.8.2.4	Calculation of distance *d* (mm) ..... :		—
M.9	**Preventing electrolyte spillage**		N/A
M.9.1	Protection from electrolyte spillage	As above	N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse	As above	N/A
	Instructional safeguard ..... :		N/A
N	**ELECTROCHEMICAL POTENTIALS**		P
	Material(s) used ..... :	Considered	—
O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**		N/A
	Value of *X* (mm)..... :	Not required	—
P	**SAFEGUARDS AGAINST CONDUCTIVE OBJECTS**		N/A
P.1	**General**	No ES2, ES3 or PS3 circuits. No openings in enclosure	N/A
P.2	**Safeguards against entry or consequences of entry of a foreign object**		N/A
P.2.1	General		N/A
P.2.2	Safeguards against entry of a foreign object		N/A
	Location and Dimensions (mm) ..... :		—
P.2.3	Safeguards against the consequences of entry of a foreign object		N/A
P.2.3.1	Safeguard requirements		N/A
	The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Transportable equipment with metalized plastic parts ..... :		N/A
P.2.3.2	Consequence of entry test..... :		N/A
P.3	**Safeguards against spillage of internal liquids**		N/A
P.3.1	General		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Compliance		N/A
P.4	**Metallized coatings and adhesives securing parts**		N/A
P.4.1	General		N/A
P.4.2	Tests		N/A
	Conditioning, T_C (°C) ..... :		—
	Duration (weeks)..... :		—
Q	**CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING**		P
Q.1	**Limited power sources**	EUT is class III equipment powered by 9-42Vdc, 36W max from a safety approved AC/DC source that is evaluated as LPS, and considered as ES1, PS2. All data ports (USB,HDMI, Ethernet) were tested and evaluated.	P
Q.1.1	Requirements		P
	a) Inherently limited output	EUT is evaluated as ES1/PS2 by use of an AC/DC safety approved adapter. Internal coin battery evaluated as ES1/PS1.	P
	b) Impedance limited output		N/A
	c) Regulating network limited output		N/A
	d) Overcurrent protective device limited output		N/A
	e) IC current limiter complying with G.9		N/A
Q.1.2	Test method and compliance ..... :		N/A
	Current rating of overcurrent protective device (A) ..... :		N/A
Q.2	**Test for external circuits – paired conductor cable**	EUT not connected to external circuit.	N/A
	Maximum output current (A) ..... :		N/A
	Current limiting method ..... :		—

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict
R	**LIMITED SHORT CIRCUIT TEST**		N/A
R.1	**General**	Nu such parts	N/A
R.2	**Test setup**		N/A
	Overcurrent protective device for test..... :		—
R.3	**Test method**		N/A
	Cord/cable used for test ..... :		—
R.4	**Compliance**		N/A
S	**TESTS FOR RESISTANCE TO HEAT AND FIRE**		N/A
S.1	**Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W**		N/A
	Samples, material..... :	Rigid metal fire enclosure	—
	Wall thickness (mm) ..... :		—
	Conditioning (°C) ..... :		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	**Flammability test for fire enclosure and fire barrier integrity**		N/A
	Samples, material..... :		—
	Wall thickness (mm) ..... :		—
	Conditioning (°C) ..... :		—
S.3	**Flammability test for the bottom of a fire enclosure**		N/A
S.3.1	Mounting of samples		N/A
S.3.2	Test method and compliance		N/A
	Mounting of samples ..... :		—
	Wall thickness (mm) ..... :		—
S.4	**Flammability classification of materials**		N/A
S.5	**Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power exceeding 4 000 W**		N/A
	Samples, material..... :		—
	Wall thickness (mm) ..... :		—
	Conditioning (°C) ..... :		—
T	**MECHANICAL STRENGTH TESTS**		N/A
T.1	**General**		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
T.2	**Steady force test, 10 N ..... :**	EUT is class III equipment powered by 9-42Vdc, 36W max from external safety approved AC/DC source, evaluated as LPS, considered as ES1, PS2. No energy or voltage hazards – safeguards are not necessary. Robustness tests were waived by engineering considerations.	N/A
T.3	**Steady force test, 30 N ..... :**		N/A
T.4	**Steady force test, 100 N ..... :**		N/A
T.5	**Steady force test, 250 N ..... :**		N/A
T.6	**Enclosure impact test**		N/A
	Fall test		N/A
	Swing test		N/A
T.7	**Drop test ..... :**		N/A
T.8	**Stress relief test..... :**		N/A
T.9	**Glass Impact Test .....:**		N/A
T.10	**Glass fragmentation test**		N/A
	Number of particles counted.....:		N/A
T.11	**Test for telescoping or rod antennas**		N/A
	Torque value (Nm) ..... :		N/A
U	**MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION**		N/A
U.1	**General**		N/A
	Instructional safeguard **:**	No CRT	N/A
U.2	**Test method and compliance for non-intrinsically protected CRTs**		N/A
U.3	**Protective screen**		N/A
V	**DETERMINATION OF ACCESSIBLE PARTS**		N/A
V.1	**Accessible parts of equipment**		N/A
V.1.1	General	ES1/PS2 equipment. No openings	N/A
V.1.2	Surfaces and openings tested with jointed test probes		N/A
V.1.3	Openings tested with straight unjointed test probes		N/A
V.1.4	Plugs, jacks, connectors tested with blunt probe		N/A
V.1.5	Slot openings tested with wedge probe		N/A
V.1.6	Terminals tested with rigid test wire		N/A
V.2	**Accessible part criterion**		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
X	**ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)**		N/A
	Clearance .....:		N/A
Y	**CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES**		N/A
Y.1	**General**	Indoor equipment	N/A
Y.2	**Resistance to UV radiation**		N/A
Y.3	**Resistance to corrosion**		N/A
Y.3	**Resistance to corrosion**		N/A
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by ..... :		N/A
Y.3.2	Test apparatus		N/A
Y.3.3	Water – saturated sulphur dioxide atmosphere		N/A
Y.3.4	Test procedure ..... :		N/A
Y.3.5	Compliance		N/A
Y.4	**Gaskets**		N/A
Y.4.1	General		N/A
Y.4.2	Gasket tests		N/A
Y.4.3	Tensile strength and elongation tests		N/A
	Alternative test methods ..... :		N/A
Y.4.4	Compression test		N/A
Y.4.5	Oil resistance		N/A
Y.4.6	Securing means		N/A
Y.5	**Protection of equipment within an outdoor enclosure**		N/A
Y.5.1	General		N/A
Y.5.2	Protection from moisture		N/A
	Relevant tests of IEC 60529 or Y.5.3 ..... :		N/A
Y.5.3	Water spray test		N/A
Y.5.4	Protection from plants and vermin		N/A
Y.5.5	Protection from excessive dust		N/A
Y.5.5.1	General		N/A
Y.5.5.2	IP5X equipment		N/A
Y.5.5.3	IP6X equipment		N/A
Y.6	**Mechanical strength of enclosures**		N/A
Y.6.1	General		N/A
Y.6.2	Impact test ..... :		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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

Summary of Group & National Differences

List of Countries:	Group Differences	National Differences	List of Countries:	Group Differences	National Differences
AU=Australia	--	--	IL=Israel	--	--
AT=Austria	--	--	IS=Iceland	--	--
BE=Belgium	--	--	IT=Italy	--	--
BG=Bulgaria	--	--	JP=Japan	--	--
CA=Canada	--	YES[1)]	KR=Korea, Republic	--	--
CH=Switzerland	--	--	LT=Lithuania	--	--
CN=China	--	--	LU=Luxembourg	--	--
CZ=Czech Republic	--	--	LV=Latvia	--	--
DK=Denmark	--	YES[2)]	MT=Malta	--	--
DE=Germany	--	YES[3)]	NL=The Netherlands	--	--
EE=Estonia	--	--	NO=Norway	--	YES[8)]
ES=Spain	--	--	NZ=New Zealand	--	--
FI=Finland	--	YES[4)]	PL=Poland	--	--
FR=France	--	YES[5)]	PT=Portugal	--	--
GB=United Kingdom	--	YES[6)]	RO=Romania	--	--
GR=Greece	--	--	SE=Sweden	--	YES[9)]
HU=Hungary	--	--	SK=Slovakia	--	--
HR=Croatia	--	--	SI=Slovenia	--	--
IE=Ireland	--	YES[7)]	US=United States	--	YES[10)]

Notes:

1) National differences from latest attachment to test report. Canada national standard (CAN/CSA C22.2 No. 62368-1:19)

2) National differences from latest attachment to test report. Denmark national standard (DS/EN IEC 62368-1:2020+A11:2020)

3) National differences from latest attachment to test report. Germany national standard (EN IEC 62368-1:2020+A11:2020)

4) National differences from latest attachment to test report. Finland national standard (EN IEC 62368-1:2020+A11:2020)

5) National differences from latest attachment to test report. France national standard (EN IEC 62368-1:2020+A11:2020)

6) National differences from latest attachment to test report. United Kingdom national standard (EN IEC 62368-1:2020+ A11:2020)

7) National differences from latest attachment to test report. Ireland national standard (EN IEC 62368-1:2020+A11:2020)

8) National differences from latest attachment to test report. Norway national standard (EN IEC 62368-1:2020+A11:2020)

9) National differences from latest attachment to test report. Sweden national standard (EN IEC 62368-1:2020+A11:2020)

10) National differences from latest attachment to test report. United States national standard (UL 62368-1:2019)

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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

ATTACHMENT TO TEST REPORT IEC 62368-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

AUDIO/VIDEO, INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT – PART 1: SAFETY REQUIREMENTS

Differences according to .....: EN 62368-1:2020+A11:2020

Attachment Form No. .....: EU_GD_IEC62368_1E
Attachment Originator.....: UL(Demko)
Master Attachment .....: 2021-02-04

	CENELEC COMMON MODIFICATIONS (EN)		P
	Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed "Z".		P
	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
1	**Modification to Clause 3.**		
3.3.19	**Sound exposure** *Replace 3.3.19 of IEC 62368-1 with the following definitions:*		N/A
3.3.19.1	**momentary exposure level, MEL** metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2. Note 1 to entry: MEL is measured as A-weighted levels in dB. Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information.	No sound input	N/A
3.3.19.3	**sound exposure, E** A-weighted sound pressure (p) squared and integrated over a stated period of time, T Note 1 to entry: The SI unit is Pa^2 s. $E = \int_0^T p(t)^2 \, dt$		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.3.19.4	**sound exposure level, SEL** logarithmic measure of sound exposure relative to a reference value, E_0, typically the 1 kHz threshold of hearing in humans. Note 1 to entry: SEL is measured as A-weighted levels in dB. $SEL = 10 \lg\left(\frac{E}{E_0}\right)$ dB Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.		N/A
3.3.19.5	**digital signal level relative to full scale, dBFS** levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS.		N/A
2	**Modification to Clause 10**		N/A
10.6	**Safeguards against acoustic energy sources** Replace 10.6 of IEC 62368-1 with the following:		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.1.1	**Introduction** **Safeguard** requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment intended for use by an **ordinary person**, that: – is designed to allow the user to listen to audio or audiovisual content / material; and – uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and – has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment. Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3. NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360. NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible. Listening devices sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to: – professional equipment; NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment. – hearing aid equipment and other devices for assistive listening; – the following type of analogue personal music players: • long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and • cassette player/recorder;	No sound amplifier. Not a personal music player. Not a portable equipment.	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies. – a player while connected to an external amplifier that does not allow the user to walk around while in use. For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply. The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.		N/A
10.6.1.2	**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.	See separate EMC/Radio test report	P
10.6.2	**Classification of devices without the capacity to estimate sound dose**		N/A
10.6.2.1	**General** This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3. For classifying the acoustic output $L_{Aeq,T}$, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period. For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, T becomes the duration of the song.	No sound amplifier. Not a personal music player. Not a portable equipment.	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term $L_{Aeq,T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit. For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dB.		N/A
10.6.2.2	**RS1 limits (to be superseded, see 10.6.3.2)** RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 85 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. – The RS1 limits will be updated for all devices as per 10.6.3.2.		N/A
10.6.2.3	**RS2 limits (to be superseded, see 10.6.3.3)** RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 130 detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 100 dB(A) when playing the fixed "programme simulation noise" as described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1.	No RS2	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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10.6.2.4	**RS3 limits** RS3 is a class 3 acoustic energy source that exceeds RS2 limits.	No RS3	N/A
10.6.3	**Classification of devices (new)**		N/A
10.6.3.1	**General** Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given below.	No sound amplifier. Not a personal music player. Not a portable equipment.	N/A
10.6.3.2	**RS1 limits (new)** RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1.		N/A
10.6.3.3	**RS2 limits (new)** RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1.	No RS2	N/A
10.6.4	**Requirements for maximum sound exposure**		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.4.1	**Measurement methods** All volume controls shall be turned to maximum during tests. Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.	No sound amplifier. Not a personal music player. Not a portable equipment.	N/A
10.6.4.2	**Protection of persons** Except as given below, protection requirements for parts **accessible** to **ordinary persons**, **instructed persons** and **skilled persons** are given in 4.3. NOTE 1 Volume control is not considered a **safeguard.** Between RS2 and an **ordinary person**, the **basic safeguard** may be replaced by an **instructional safeguard** in accordance with Clause F.5, except that the **instructional safeguard** shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the **instructional safeguard** may be given through the equipment display during use. The elements of the **instructional safeguard** shall be as follows: – element 1a: the symbol  , IEC 60417-6044 (2011-01) – element 2: “High sound pressure” or equivalent wording – element 3: “Hearing damage risk” or equivalent wording – element 4: “Do not listen at high volume levels for long periods.” or equivalent wording An **equipment safeguard** shall prevent exposure of an **ordinary person** to an RS2 source without intentional physical action from the **ordinary person** and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off.		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time. NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed. NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off. A **skilled person** shall not be unintentionally exposed to RS3.		N/A
10.6.5	**Requirements for dose-based systems**		N/A
10.6.5.1	**General requirements** Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause. The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration. The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.	No sound amplifier. Not a personal music player. Not a portable equipment.	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.5.2	**Dose-based warning and requirements** When a dose of 100 % *CSD* is reached, and at least at every 100 % further increase of *CSD*, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1. The warning shall at least clearly indicate that listening above 100 % *CSD* leads to the risk of hearing damage or loss.		N/A
10.6.5.3	**Exposure-based requirements** With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at. The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3. The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster. Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the unweighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than -10 dBFS for a digital interface. NOTE In case the source is known not to be music (or test signal), the EL may be disabled.		N/A
10.6.6	**Requirements for listening devices (headphones, earphones, etc.)**		N/A
10.6.6.1	**Corded listening devices with analogue input** With 94 dB L_{Aeq} acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1 shall be ≥ 75 mV. NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV.	No such devices	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.6.2	**Corded listening devices with digital input** With any playing device playing the fixed "programme simulation noise" described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.		N/A
10.6.6.3	**Cordless listening devices** In cordless mode, – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.		N/A
10.6.6.4	**Measurement method** *Measurements shall be made in accordance with EN 50332-2 as applicable.*		N/A
3	**Modification to the whole document**		P

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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

	Delete all the "country" notes in the reference document according to the following list:		P

0.2.1	Note 1 and 2	1	Note 4 and 5	3.3.8.1	Note 2
3.3.8.3	Note 1	4.1.15	Note	4.7.3	Note 1 and 2
5.2.2.2	Note	5.4.2.3.2.2 Table 12	Note c	5.4.2.3.2.4	Note 1 and 3
5.4.2.3.2.4 Table 13	Note 2	5.4.2.5	Note 2	5.4.5.1	Note
5.4.10.2.1	Note	5.4.10.2.2	Note	5.4.10.2.3	Note
5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3 and 4
5.6.8	Note 2	5.7.6	Note	5.7.7.1	Note 1 and Note 2
8.5.4.2.3	Note	10.2.1 Table 39	Note 3 and 4 and 5	10.5.3	Note 2
~~10.6.1~~	Note 3	F.3.3.6	Note 3	Y.4.1	Note
Y.4.5	Note				

4	**Modification to Clause 1**		**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.*	Added	P
5	**Modification to 4.Z1**		**N/A**

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
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): 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; 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; 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.	No connection to mains	N/A
6	**Modification to 5.4.2.3.2.4**		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.	No external circuits	N/A
7	**Modification to 10.2.1**		P
10.2.1	Add the following to [c)] and [d)] in table 39: For additional requirements, see 10.5.1.	Added	P
8	**Modification to 10.5.1**		N/A
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 pre-sets 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.	No X radiation	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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.		
9	**Modification to G.7.1**		P
G.7.1	***Add*** *the following note:* NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.	Added	P
10	**Modification to Bibliography**		P
	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
11	**ADDITION OF ANNEXES**		N/A
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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”	Class III equipment	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	Not a direct plug-in equipment	N/A
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.	Class III equipment	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.	No telecommunication networks	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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 1,5 kV. 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
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).	Class III equipment	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.	No such resistors	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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 socket-outlets	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.	Class III equipment	N/A
5.6.4.2.1	**France** After the indent for **pluggable equipment type A**, the following is added: – in certain cases, the **protective current rating** of the circuit supplied from the mains is taken as 20 A instead of 16 A.	As above	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.	As above	N/A
5.6.8	**Norway** To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as **class I equipment**. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.	Not such equipment	N/A
5.7.6	**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.	Class III equipment	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 .	As above	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.7.7.1	**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.	Not such equipment	N/A
	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

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.5.4.2.3	**United Kingdom** Add the following after the 2nd dash bullet in 3rd paragraph: An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury.	added	P
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	Not direct plug-in equipment	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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 polyphaser 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	Class III equipment. No socket-outlets.	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.	Not a direct plug-in equipment	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
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.	Class III equipment	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	As above	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.	Class III equipment	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	No cathode ray tube	N/A
ZD	**IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)**		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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

N/A

Type of flexible cord	Code designations	
	IEC	CENELEC
PVC insulated cords		
Flat twin tinsel cord	60227 IEC 41	H03VH-Y
Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F
Rubber insulated cords		
Braided cord	60245 IEC 51	H03RT-F
Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F
Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F
Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F
Cords having high flexibility		
Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H
Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H
Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H
Cords insulated and sheathed with halogen-free thermoplastic compounds		
Light halogen-free thermoplastic insulated and sheathed flexible cords		H03Z1Z1-F H03Z1Z1H2-F
Ordinary halogen-free thermoplastic insulated and sheathed flexible cords		H05Z1Z1-F H05Z1Z1H2-F

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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

ATTACHMENT TO TEST REPORT IEC 62368-1 3TH ED.
U.S.A. AND CANADA NATIONAL DIFFERENCES

AUDIO/VIDEO, INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT
PART 1: SAFETY REQUIREMENTS

Differences according to.....: CSA/UL 62368-1:2019

Attachment Form No. .....: US&CA_ND_IEC623681E
Attachment Originator.....: UL(US)
Master Attachment .....: Dated 2021-02-04

IEC 62368-1 - US and Canadian National Differences Special National Conditions based on Regulations and Other National Differences			
1 (1.3) (1DV.1)	All equipment is to be designed to allow installation in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part 1, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2. Also, for such equipment marked or otherwise identified, installation is allowed per the Standard for the Protection of Information Technology Equipment, ANSI/NFPA 75.	Comply	P
1 (1DV.2.1)	This standard includes additional requirements for equipment used for entertainment purposes intended for installation in general patient care areas of health care facilities. See Annex DVB.	The equipment not intend for entertainment purposes	N/A
1 (1DV.2.2)	This standard includes additional requirements for equipment intended for mounting under cabinets. See Annex DVC.	The equipment not intend for mounting under cabinets	N/A
1 (1DV.2.3)	IEC 62368-3 clause 5 for DC power transfer at ES1 or ES2 voltage levels is considered informative. IEC 62368-3 clause 6 for remote power feeding telecommunication (RFT) circuits is considered normative (see ITU K.50). Alternatively, equipment with RFT circuits are given in either UL 2391 or CSA/UL 60950-21. RFT-C circuits are not permitted unless the RFT-C circuit complies with RFT-V limits (≤ 200V per conductor to earth).	No remote power feeding	N/A
1 (1.4) (1DV.3)	For protection against direct lightning strikes, reference is made to NFPA 780 and CAN/CSA-B72 for additional requirements.	Indoor equipment	N/A
1 (1.5) (1DV.5)	Additional requirements apply to some forms of power distribution equipment, including sub-assemblies.	Considered	P
4.1 (4.1.17)	For lengths exceeding 3.05 m, external interconnecting cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the NEC.	Not directly connected to Mains	N/A
	For lengths 3.05 m or less, external interconnecting cable assemblies that are not types specified in the NEC generally are required to have special construction features and identification markings.	As above	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.6 (4.6.2)	Wire-wrap terminals have special construction and performance requirements.	No such wire-wrap	N/A
4.8 (4.8.3, 4.8.4.5, 4.8.5)	Coin / button cell batteries have modified special construction and performance requirements.	Coin/button battery of the CPU clock backup, is not user replaceable	N/A
5.4.2.3.2 (5.4.2.3.2.1)	Surge Arrestors and Transient Voltage Surge Suppressors installed external to the equipment are required to comply with the appropriate NEC and CEC requirements.	Class III equipment	N/A
5.5.9	Receptacles, rated 125-V, single phase, 15- or 20-A accessible to either ordinary, instructed, or skilled persons are required to be provided with GFCI Protection for Personnel if the equipment containing the receptacles is installed outdoors. The protection devices are required to comply with UL 943, and CAN/CSA C22.2 No.144.	Class III equipment	N/A
5.6.3	Protective earthing conductors comply with the minimum conductor sizes in Table G.7, except as required by Table G.7ADV.1 for cord connected equipment, or Annex DVH for permanently connected equipment.	Class III equipment	N/A
5.7.8 (5.7.8.1)	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.	Not connected to telecommunication networks	N/A
6.5.1	PS3 wiring outside a fire enclosure is required to comply with single fault testing in B.4, or be current limited per one of the permitted methods.	No PS3 circuits	N/A
Annex F (F.3.3.9)	Output terminals provided for supply of other equipment, except mains supply, are required to be marked with a maximum rating or reference to equipment permitted to be connected.	No power output terminals	N/A
Annex F (F.3.7)	Outdoor Enclosures are required to be classified and marked in accordance with UL 50 or 50E, or CAN/CSA C22.2 No. 94.1 or 94.2.	Indoor equipment	N/A
Annex G (G.7)	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs.	Not directly connected to Mains	N/A
	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.		N/A
	Flexible power supply cords are required to be compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC.		N/A
	Minimum cord length is required to be 1.5 m, with certain constructions such as external power supplies allowed to consider both input and output cord lengths into the requirement. Power supply cords are required to be no longer than 4.5 m in length if used in ITE Rooms.		N/A
	Power supply cords for outdoor equipment are required to be suitable outdoor use type as required by Section 400.4 of the NEC and Rule 4-012 of the CEC, i.e., marked “W.”		N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
Annex H.2	Continuous ringing signals under normal operating conditions up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions.	No such ringing signals	N/A
Annex H.4	For circuits with other than ringing signals and with voltages exceeding 42.4 Vpeak or 60 Vd.c., the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions.	As above	N/A
Annex Q (Q.3)	Equipment with paired conductor and/or coax communications cables/wiring connected to building wiring shall be marked or labeled to identify the Maximum Rated Voltage and Maximum Rated Current per conductor that the external circuit port(s) is intended to source into the cabling and load equipment during normal use. If the equipment has outputs that have different ratings, the equipment shall clearly identify the ratings for the different outputs in a manner the user will know each circuits rating. The equipment shall also be provided with a marking or readily available information regarding how many conductors from each type of external circuit port(s) are used to carry current.	No power inputs/outputs except the DC input which is marked adequately	P
Annex DVA (1)	Equipment that is designed such that it may be powered from a separate electrical service, is required to meet applicable requirements for service equipment for control and protection of services and their installation and complies with Article 230 of the National Electrical Code (NEC), NFPA 70 and Section 6 of the Canadian Electrical Code, Part I, CSA C22.1.	DC powered by external safety approved adapter	N/A
	Equipment intended for use in spaces used for environmental air (plenums) are subjected to special flammability requirements for heat and visible smoke release.	Not for environmental air	N/A
	For ITE room applications, automated information storage systems with combustible media greater than 0.76 m^3 (27 cu ft) are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.	Equipment is not automated information storage system	N/A
	Consumer products designed or intended primarily for children 12 years of age or younger are subject to additional requirements in accordance with U.S. and Canadian Regulations.	EUT is not primarily intended for children	N/A
	Baby monitors are required to additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors.	EUT is not a baby monitor	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Storage batteries and battery management equipment, other than associated with lead-acid batteries, and including battery backup systems that are not an integral part of stationary AV and ICT equipment, such as provided in separate cabinets, are required to be certified (listed) to the appropriate standard(s) for such storage batteries and equipment.	No such batteries	N/A
Annex DVA (5.6)	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.	No direct connection to Mains	N/A
Annex DVA (6.3)	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.	No such flammable liquid stored in equipment	N/A
Annex DVA (6.4.8)	For ITE room applications, enclosures with combustible material measuring greater than 0.9 m^2 (10 sq ft) or a single dimension greater than 1.8 m (6 ft) are required to have a flame spread rating of 50 or less. For equipment with the same dimensions for other applications, an external surface that is not a fire enclosure requires a minimum flammability classification of V-1.	Rigid metal enclosure	N/A
Annex DVA (10.3)	Equipment with lasers is required to meet the U.S. Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).	No lasers	N/A
Annex DVA (10.5)	Equipment that produces ionizing radiation is required to comply with the U.S. Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370).	Equipment not produces ionizing radiation	N/A
Annex DVA (F.3.3.4)	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings. Additional considerations apply for voltage ratings that exceed the attachment cap rating or that are lower than the "Normal Operating Condition" in Table 2 of CAN/CSA C22.2 No. 235."	No direct connection to Mains	N/A
Annex DVA (F.3.3.6)	Equipment identified for ITE (computer) room installation is required to be marked with the rated current.	Comply	P
Annex DVA (G.1)	Vertically-mounted disconnect switches and circuit breakers are required to have the "on" position indicated by the handle in the up position.	Not vertically-mounted	N/A
Annex DVA (G.3.4)	Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is required for all standard supply outlets and receptacles (such as supplied in power distribution units) if the supply branch circuit protection is not suitable.	Class III equipment	N/A
	Where a fuse is used to provide Class 2 or Class 3 current limiting, it is not operator-accessible unless it is non- interchangeable.	No such fuse	N/A
Annex DVA (G.4.2)	Equipment with isolated ground (earthing) receptacles is required to comply with NEC 250.146(D) and CEC 10-400 and 10-612.	Class III equipment. Earthing is not required	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
Annex DVA (G.5.3)	Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require special transformer overcurrent protection.	No transformers	N/A
Annex DVA (G.5.4)	Motor control devices are required for cord-connected equipment with a mains-connected motor if the equipment is rated more than 12 A, or if the equipment has a nominal voltage rating greater than 120 V, or if the motor is rated more than 1/3 hp (locked rotor current over 43 A).	No motors	N/A
Annex DVA (G.7)	Flexible cords used outdoors are required to have the suffix “W” marked on the flexible cord.	No such cord - Indoor equipment	N/A
Annex DVA (M)	For ITE room applications, equipment with battery systems capable of supplying 750 VA for five minutes are required to have a battery disconnect means that may be connected to the ITE room remote power-off circuit.	Not intended to be connected to battery systems	N/A
Annex DVA (Q)	If applicable per NEC 725.121(C), some limited power sources supplied from AV/ICT equipment are required to have a label indicating the maximum voltage and maximum current, or maximum voltage and nominal current output for each connection point. Where multiple connection points have the same rating, a single label is permitted to be used.	No such components	N/A
	Wiring terminals intended to supply Class 2 outputs in accordance with the NEC or CEC Part 1are required to be marked with the voltage rating and “Class 2” or equivalent. The marking is located adjacent to the terminals and visible during wiring.	No such wiring terminals	N/A
	Applicable parts of Chapter 8 of the NEC, and Rules 54 and 60 of the CEC, may be applicable to ITE installed outdoors with connections to communication systems.	Indoor equipment	N/A
Annex DVB (1)	Additional requirements apply for equipment used for entertainment purposes intended for installation in general patient care areas of health care facilities.	Equipment not intended for installation in general patient care areas of health care facilities	N/A
Annex DVC (1)	Additional requirements apply for equipment intended for mounting under kitchen cabinets.	No used for mounting under kitchen cabinets	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
Annex DVE (4.1.1)	Some equipment, components, sub-assemblies and materials associated with the risk of fire, electric shock, or personal injury are required to have component or material ratings in accordance with the applicable national (U.S. and Canadian) component or material requirements. These equipment and components include: appliance couplers, attachment plugs, battery backup systems, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), direct plug-in equipment, electrochemical capacitor modules (energy storage modules with ultracapacitors), enclosures (outdoor), flexible cords and cables, fuses (branch circuit), ground-fault current interrupters, interconnecting cables, modular data centers, power supply cords, some power distribution equipment, printed wiring, protectors for communications circuits, receptacles, surge protective devices, vehicle battery adapters, wire connectors, and wire and cables.	No such components	N/A
Annex DVH	Equipment for permanent connection to the mains supply is subjected to additional requirements.	No such equipment	N/A
Annex DVH (DVH.1)	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains are required to be in accordance with the NEC/CEC.	No direct connection to Mains	N/A
Annex DVH (DVH.3.2)	Terminals for permanent wiring, including protective earthing terminals, are required to be suitable for U.S./Canadian wire gauge sizes, rated 125 percent of the equipment rating, and be specially marked when specified.	No such terminals	N/A
	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm^2).	Wire binding screws are not used	N/A
Annex DVH (DVH.4)	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	Not permanently connected equipment	N/A
Annex DVH (DVH 5.5)	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment, is required to comply with special earthing, wiring, marking and installation instruction requirements.	Not intended for connection to DC mains	N/A
Annex DVI (6.7)	Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses.	Not intended for connection to telecommunication network	N/A
Annex DVJ (10.6.1)	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements.	Not intended for connection to telecommunication network. Not supplied with an earphone	N/A

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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 conformity[1]
- Description:					
Enclosure	Various	Various	Aluminium housing Width: 132.68 mm Depth:100 mm Height:35.4 mm Thickness :2 mm	IEC/EN/UL/ 62368-1	Evaluated and accepted
AC/DC adapter (Optional)	EDAC power Electronic Co (or alternative)	EA1024PR (or equivalent)	Input: 100-240VAC, 50-60Hz, 1A max. Output: 12VDC (±5%), 3A max. Operating temp: 0 to 40°C	UL 60950-1 (or equivalent)	UL (E209833) or equivalent
Coin cell battery	Panasonic (or alternative)	BR1632A (or equivalent)	Lithium, 3Vdc, 120mAh. Operation temp: -40 to 125°C	UL 1642	UL (MH12210) or equivalent
PCB	TUC (or alternative)	TU-768 (or equivalent)	Flammability rating - V-0 Max operation temperature :130°C	UL 94 UL 746	UL (E189572) or equivalent
DC Power jack	TTAF (Or equivalent)	DC-101 (Or equivalent)	Operation Temperature: 25 to 125°C Flammability: V-0 Voltage range:9-42VDC Current rating:3.5-10A	UL 94	UL (E90350) Or equivalent
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict

5.2	**TABLE: Classification of electrical energy sources**						P
Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters				ES Class
			U (V)	I (mA)	Type[1)]	Additional Info [2)]	
9-42VDC	External DC/DC convertor	Normal	9-42VDC	-	SS	-	ES1
		Abnormal					
		Single fault – SC/OC					
3VDC	Coin battery	Normal	3VDC	-	SS	-	ES1
		Abnormal					
		Single fault – SC/OC					

Supplementary information:

1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc.

2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.

Test Conditions:

Normal, Abnormal, Single fault – SC/OC (SC=Short Circuit, OC=Short Circuit)

5.4.1.4, 6.3.2, 9.0, B.2.6	**TABLE: Temperature measurements**				P
Supply voltage (V) ……...:	12Vdc				—
Ambient temperature during test T_{amb} (°C) …..:	23.1			calculated to 85°C	—
Maximum measured temperature T of part/at:	T (°C)				Allowed T_{max} (°C)
Enclosure	38.14	-	-	-	70
Input jack	43.92	-	-	105.82	125
PCB	45.56	-	-	107.46	130
Battery	41.69	-	-	103.59	125

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class

Supplementary information:

External surface temperture was taken according to the standard at 25°C.

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict

5.4.1.8	**TABLE: Working voltage measurement**				N/A
Location		RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments
Supplementary information:					

5.4.1.10.2	**TABLE: Vicat softening temperature of thermoplastics**		N/A
Penetration (mm)……:		ISO 306 / B50	—
Object/ Part No./Material	Manufacturer/trademark	Thickness (mm)	T softening (°C)
Supplementary information:			

5.4.1.10.3	**TABLE: Ball pressure test of thermoplastics**			N/A
Allowed impression diameter (mm)		≤ 2 mm		—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)
Supplementary information:				

5.4.2, 5.4.3	**TABLE: Minimum Clearances/Creepage distance**							N/A
Clearance (cl) and creepage distance (cr) at/of/between:	Up (V)	U r.m.s. (V)	Freq [1)] (Hz)	Required cl (mm)	Cl (mm)	E.S. [2)] (V)	Required cr (mm)	Cr (mm)
Supplementary information: 1) Only for frequency above 30 kHz 2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)								

5.4.4.2	**TABLE: Minimum distance through insulation**			
Distance through insulation (DTI) at/of	Peak voltage (V)	Insulation	Required DTI (mm)	Measured DTI (mm)

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:				

5.4.4.9	**TABLE: Solid insulation at frequencies >30 kHz**					N/A
Insulation material	E_P	Frequency (kHz)	K_R	Thickness d (mm)	Insulation	V_{PW} (Vpk)
Supplementary information:						

5.4.9	**TABLE: Electric strength tests**		N/A
Test voltage applied between:	Voltage shape (Surge, Impulse, AC, DC)	Test voltage (V)	Breakdown Yes / No
Functional:			
Basic/supplementary:			
Reinforced:			
Routine Tests:			
Supplementary information:			

5.5.2.2	**TABLE: Stored discharge on capacitors**				N/A
Location	Supply voltage (V)	Operating and fault condition [1)]	Switch position	Measured voltage (Vpk)	ES Class
Supplementary information: X-capacitors installed for testing: ☐ bleeding resistor rating: ☐ ICX: 1) Normal operating condition (e.g., normal operation, or open fuse), SC= short circuit, OC= open circuit					

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict

5.6.6.2	**TABLE: Resistance of protective conductors and terminations**				N/A
Accessible part		Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)
Supplementary information:					

5.7.4	**TABLE: Unearthed accessible parts**					N/A
Location	Operating and fault conditions	Supply Voltage (V)	Parameters			ES class
			Voltage (V_{rms} or V_{pk})	Current (A_{rms} or A_{pk})	Freq. (Hz)	
Supplementary information: Abbreviation: SC= short circuit; OC= open circuit						

5.7.5	**TABLE: Earthed accessible conductive part**			N/A
Supply voltage (V).....:				—
Phase(s) .....:	[] Single Phase; [ ] Three Phase: [ ] Delta [ ] Wye			
Power Distribution System .....:	☐ TN ☐ TT ☐ IT			
Location		Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment
Supplementary Information:				

5.8	**TABLE: Backfeed safeguard in battery backed up supplies**					N/A
Location	Supply voltage (V)	Operating and fault condition	Time (s)	Open-circuit voltage (V)	Touch current (A)	ES Class
Supplementary information: Abbreviation: SC= short circuit, OC= open circuit						

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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Clause	Requirement + Test	Result - Remark	Verdict

6.2.2	**TABLE: Power source circuit classifications**					P
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power[1)] (W)	Time (S)	PS class
AC/DC Power adapter input	Full load – overload	9-42VDC	-	36	5	PS2
Internal coin battery	SC	3VDC	0.1	0.6	3	PS1
Supplementary information: Abbreviation: SC= short circuit; OC= open circuit 1) Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.						

6.2.3.1	**TABLE: Determination of Potential Ignition Sources (Arcing PIS)**			N/A
Location	Open circuit voltage after 3s (Vpk)	Measured r.m.s current (A)	Calculated value (V_p x I_{rms})	Arcing PIS? Yes / No
Supplementary information: An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V_p) and normal operating condition rms current (I_{rms}) is greater than 15.				

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
Input circuit	Fault	>15	>15	No	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.					

8.5.5	**TABLE: High Pressure Lamp**			N/A
Lamp manufacturer	Lamp type	Explosion method	Longest axis of glass particle (mm)	Particle found beyond 1 m Yes / No
Supplementary information:				

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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

9.6	**TABLE: Temperature measurements for wireless power transmitters**								N/A
Supply voltage (V) .....:									—
Max. transmit power of transmitter (W) .....:									—
Foreign objects	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)
Supplementary information:									

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
9	1.1	-	10	36	-	-	Normal condtiond
12	0..9	-	10.8	36	-	-	Normal condtiond
42	0.23	-	10.5	36	-	-	Normal condtiond
Supplementary information:							

B.3, B.4	**TABLE: Abnormal operating and fault condition tests**						P
Ambient temperature T_{amb} (°C) .....:							—
Power source for EUT: Manufacturer, model/type, outputrating...:							—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
C180	Input circuit (SC)	12Vdc	5Min	-	-	The unit immediately shut down. No hazards	
USB Port	SC	5Vdc	5Min	-	-	Fault current 0.3A max. No hazards	
HDMI	SC	5Vdc	5Min	-	-	Fault current 0.1A max. No hazards	
Supplementary information: same results for the four USB ports							

M.3	**TABLE: Protection circuits for batteries provided within the equipment**		N/A
Is it possible to install the battery in a reverse polarity position? ..... :		No	—
Equipment Specification	Charging		
	Voltage (V)		Current (A)

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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

Manufacturer/type	Battery specification					
	Non-rechargeable batteries		Rechargeable batteries			
	Discharging current (A)	Unintentional charging current (A)	Charging		Discharging current (A)	Reverse charging current (A)
			Voltage (V)	Current (A)		
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Note: The tests of M.3.2 are applicable only when above appropriate data is not available.

Specified battery temperature (°C) ..... :

Component No.	Fault condition	Charge/ discharge mode	Test time	Temp. (°C)	Current (A)	Voltage (V)	Observation

Supplementary information: appropriate battery data was provided

Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal.

M.4.2	**TABLE: Charging safeguards for equipment containing a secondary lithium battery**	N/A
Maximum specified charging voltage (V) ..... :		—
Maximum specified charging current (A) ..... :		—
Highest specified charging temperature (°C) ..... :		
Lowest specified charging temperature (°C) ..... :		

Battery manufacturer/type	Operating and fault condition	Measurement			Observation
		Charging voltage (V)	Charging current (A)	Temp. (°C)	

Supplementary information:

Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature

Q.1	**TABLE: Circuits intended for interconnection with building wiring (LPS)**					P
Output Circuit	Components	U_{oc} (V)	I_{sc} (A)		S (VA)	
			Meas.	Limit	Meas.	Limit
-	USB output	5Vdc	0.3A	8A	<< 100VA	100VA
-	HDMI port	5Vdc	0.1A	8A	<< 100VA	100VA
-	Battery	3Vdc	0.1A	8A	<<100VA	100VA

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Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

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

T.2, T.3, T.4, T.5	**TABLE: Steady force test**				N/A
Part/Location	Material	Thickness (mm)	Force (N)	Test Duration (sec)	Observation
Supplementary information:					

T.6, T.9	**TABLE: Impact tests**			N/A
Part/Location	Material	Thickness (mm)	Vertical distance (mm)	Observation
Supplementary information:				

T.7	**TABLE: Drop tests**			N/A
Part/Location	Material	Thickness (mm)	Drop Height (mm)	Observation
Supplementary information:				

T.8	**TABLE: Stress relief test**				N/A
Part/Location	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation
Supplementary information:					

X	**TABLE: Alternative method for determining minimum clearances distances**			N/A
Clearance distanced between:	Peak of working voltage (V)	Required cl (mm)	Measured cl (mm)	
Supplementary information:				

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

Appendix A – Equipment used for testing

Equipment calibration

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.
Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.
In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

HL No	Equipment description	Manufacturer	Model	Ser. No.	Last Cal./Chk.	Next Cal./Chk.
4019	Temp. & Humidity Meter, (-50 - +70) deg, (20 - 99)% RH	Mad Electronics	HTC-1	NA	25-Aug-22	25-Aug-23
3460	Precision Barometer, 870 - 1050 hPa	LUFFT Mess- und Regeltechnik GmbH	DKD-K-26701	100469	17-Jul-22	17-Jul-24
5201	Multimeter, TRUE RMS	Fluke	Fluke 287	33500022	24-May-23	24-May-24
4599	Data Logger Hydra	Fluke	2620A	8719005	01-Feb-23	01-Feb-24
1814	Caliper, 150 mm	Mitutoyo	150	367	18-Jul-21	18-Jul-23
5543	High power and programmable switching power supply, 80 V / 120 A	Itech Electronic	IT6512D	8025570437 47020052	27-Jun-22	27-Jun-23

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

Measurement uncertainty

Expanded uncertainty at 95% confidence in Hermon Labs safety measurements

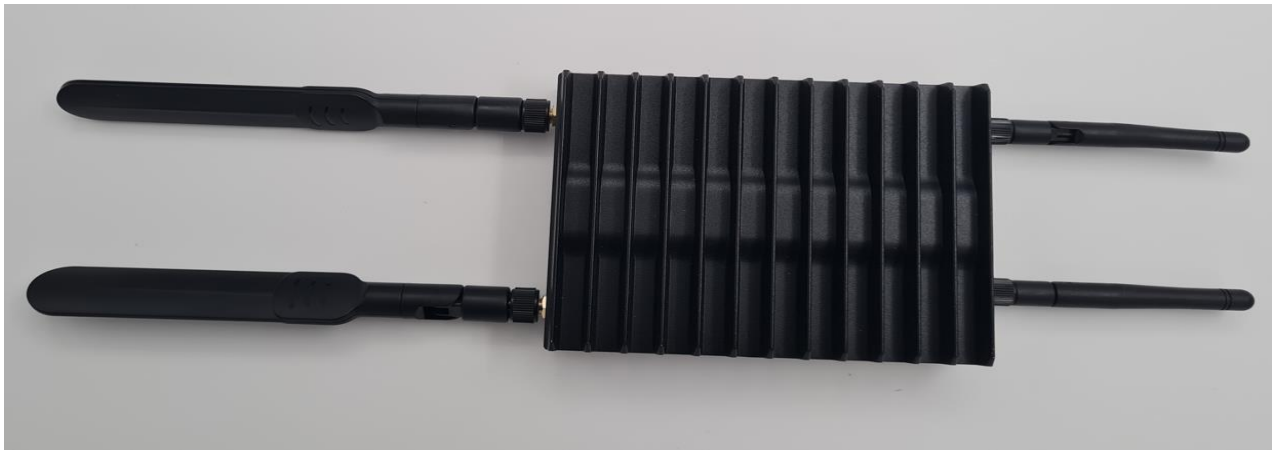
Test description	Expanded uncertainty
1. Heating test (TC method)	Option 1 ± 1.04% Option 2 ± 1.87%
2. Leakage current	For Options 1, 2 ± 6.2%
3. Input test	AC Input test uncertainty: ±3.02% DC Input test uncertainty: ±1.99%
4. Bonding impedance (Ground continuity) test	Option 1 test uncertainty: ±2.81% Option 1 test uncertainty: ±1.99%
5. Dielectric strength	HYPOTPLUS II, AC/DC Withstand Voltage Tester expanded uncertainty: ±3.55% Electrical Safety Compliance Analyzer expanded uncertainty: ±2.49%
6. Cord Test	± 0.98%
7. Voltage limitation	±1.68%
8. Transformer abnormal test	Voltage/Current method ± 3.9 % Temperature (TC method) ± 2.6 % Temperature (Resistance method) ± 1.93 %
9. Material used in high voltages	Option I uncertainty ±0.98% Option II uncertainty ±0.03%
10. Limited Current Circuit	Option 1 ±2.44% Option 2 ±3.31%
11. Energy hazard test	Option I uncertainty ±1.82% Option II uncertainty ±0.97%
12. Limited power source (2.5)	±3.9%
13. Telecom Steady state test (6.2.2.2)	±2.8%
14. Telecom Impulse test (6.2.2.1)	±3.75%
15. TNV separation from earth (6.1.2)	±2.8%
16. TNV & SELV reliability	±3.30%
17. Ringing signal criteria	Normal test ± 1.68% Leakage test ± 6.2%
18. Component failure	Voltage/ current method ± 3.9 % Temperature method ± 2.6 %
19. Cable distribution impulses	High voltage impulses expanded uncertainty using 4Kv generator ±3.75%. High voltage impulses expanded uncertainty using 10Kv generator ±5%

Note: Pass/Fail decision was based on nominal values

Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

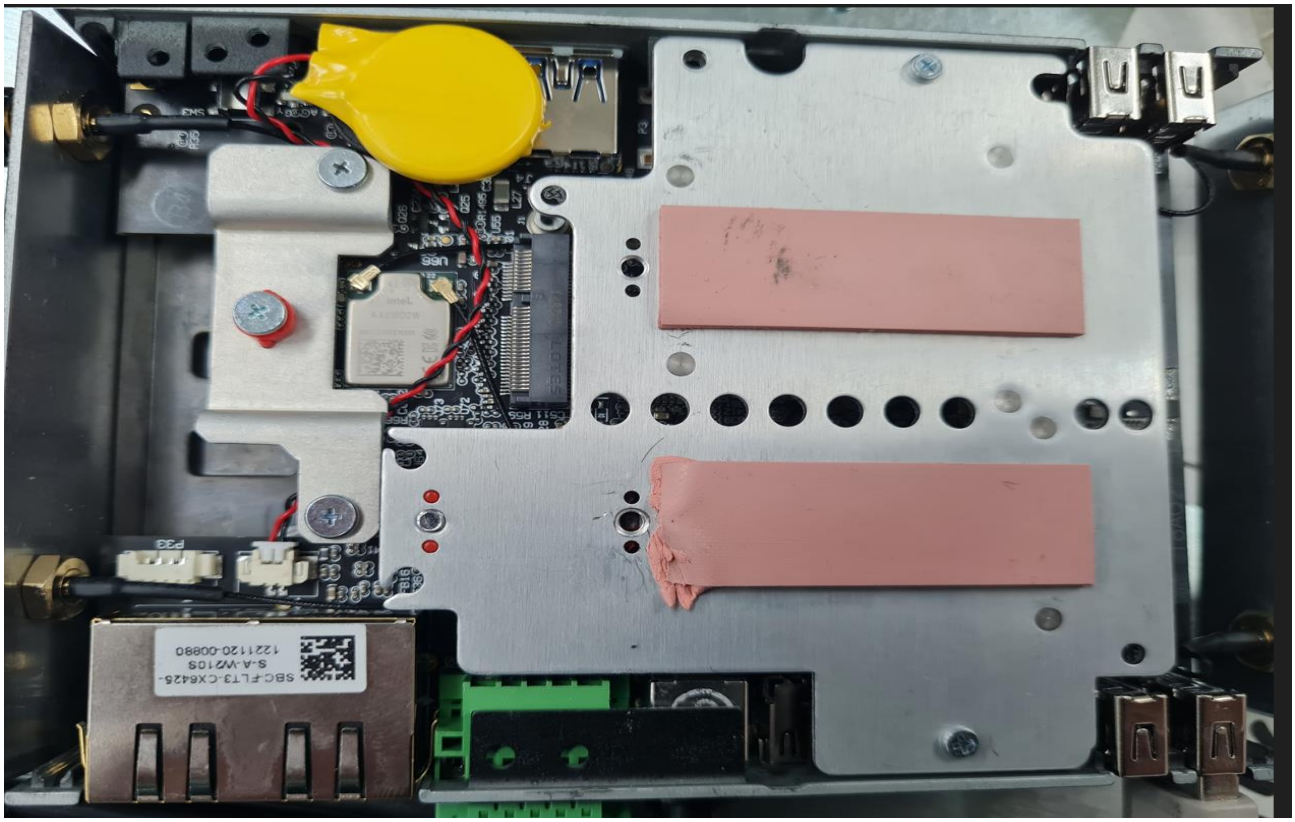
Appendix B - Photo Documentation

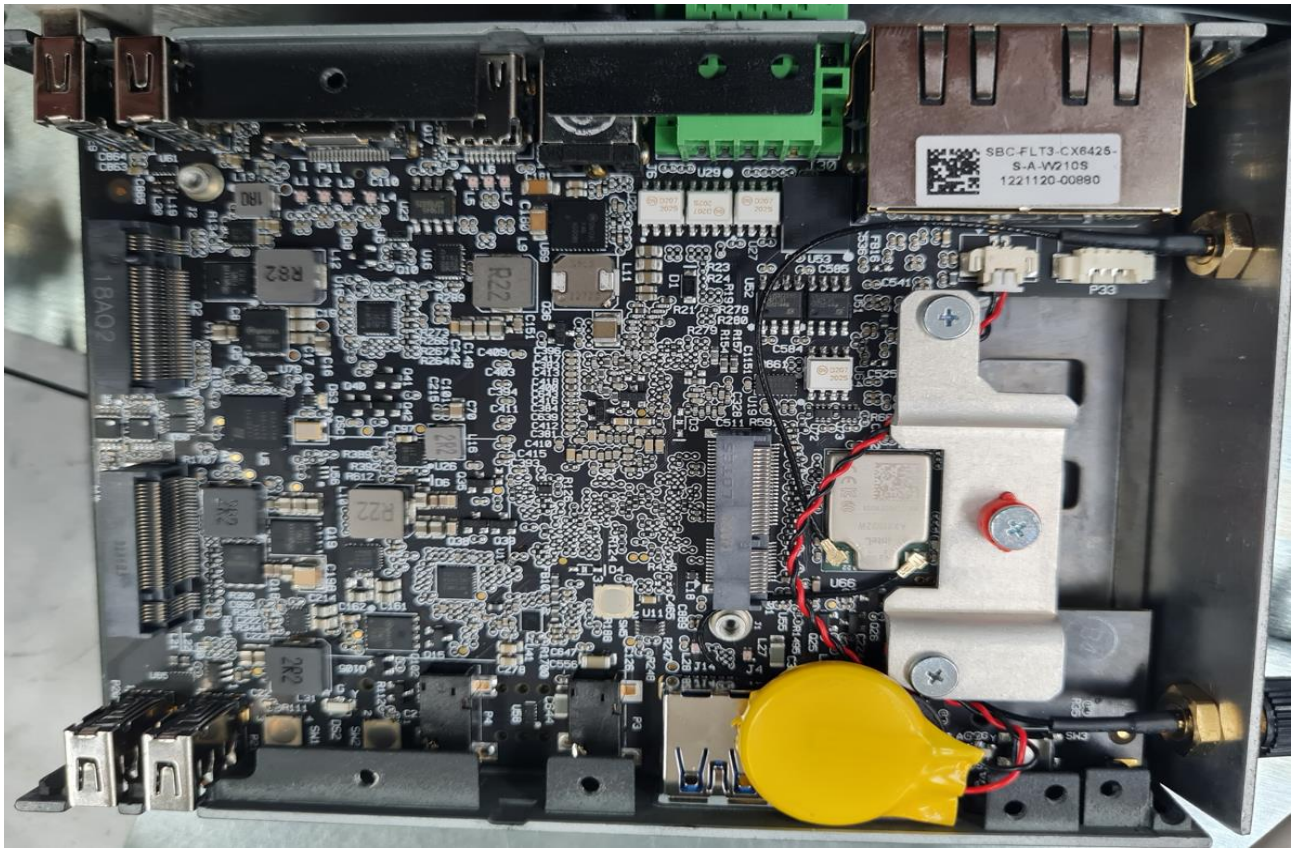
Photographs - №1, 2, 3, 4 - General view



Hermon Laboratories Ltd.
P.O.Box 23
Binyamina 30500, Israel
Tel.+972 46288001
Fax.+972 46288277
e-mail: mail@hermonlabs.com

Photograph №5, 6
internal view





Hermon Laboratories Ltd.
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Binyamina 30500, Israel
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Fax.+972 46288277
e-mail: mail@hermonlabs.com

Photograph №7
External optional AC/DC Power adapter

End of Test Report