IEC IECEE CB SCHEME

Ref. Certif. No.

JPTUV-089349-A1/M1

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	Network Switch
Name and address of the applicant Nom et adresse du demandeur	Radware Ltd. 22 Raoul Wallenberg St. 69710 Tel Aviv, Israel
Name and address of the manufacturer Nom et adresse du fabricant	Radware Ltd. 22 Raoul Wallenberg St. 69710 Tel Aviv, Israel
Name and address of the factory Nom et adresse de l'usine	See additional page(s)
Ratings and principal characteristics Valeurs nominales et charactéristiques principales	1) 100-240Vac; 60-50Hz; 2.5-1.5A; (for equipment with single power supply) 2) 100-240Vac; 50-60Hz; 5-3A; (per power supply unit) (for equipment with redundant type power supply); Class I
Trademark (if any) Marque de fabrique (si elle existe)	radware
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	N/A
Model / Type Ref. Ref. de type	ODS-EL1
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la 2ème page)	Re-issue of JPTUV-089349-A1 dated 10.12.2018, due to first modification.
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60950-1:2005+A1+A2 See Test Report for National Differences
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	50141214 003

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

TÜVRheinland®

TÜV Rheinland Japan Ltd.
Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku
Yokohama 224-0021 Japan
Phone + 81 45 914-3888
Fax + 81 45 914-3354
Mail: info@jpn.tuv.com
Web: www.tuv.com

Date: 03.04.2019

Signature: Jason C. H. Chang

1. Portwell, Inc.
No. 242, Bo-Ai St.
Shu-Lin Dist., New Taipei City
23845
Taiwan

2. CASWELL, INC.
No. 242 Bo-Ai Street,
Shu-Lin Dist., New Taipei City
23845
Taiwan

Additional information (if necessary)
Information complémentaire (si nécessaire)

Report Ref. No.: 50141214 003

Date: 03.04.2019

Signature: Jason C. H. Chang

Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT

IEC 60950-1

Information technology equipment – Safety – Part 1: General requirements

Report Number. .....:	50141214 003
Date of issue .....:	Mar. 29, 2019
Total number of pages.....:	16
Applicant's name.....:	Radware Ltd.
Address .....:	22 Raoul Wallenberg St., 69710 Tel Aviv, Israel
Test specification:	
Standard.....:	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure.....:	CB Scheme
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC60950_1F
Test Report Form(s) Originator.....:	SGS Fimko Ltd
Master TRF .....:	Dated 2014-02

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description .....:	Network Switch
Trade Mark .....:	radware ®
Manufacturer.....:	Same as applicant
Model/Type reference.....:	ODS-EL1
Ratings .....:	1) 100-240Vac, 60-50Hz, 2.5-1.5A (for equipment with single power supply) 2) 100-240Vac, 50-60Hz, 5-3A (per power supply unit) (for equipment with redundant type power supply)

Testing procedure and testing location:			
☒	**CB Testing Laboratory:**	TÜV Rheinland Taiwan Ltd., Taichung Branch	
Testing location/ address ..... :		No. 9, Ln. 36, Sec. 3, Minsheng Rd., Daya District, Taichung City 428, Taiwan Chinese Taipei	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address ..... :			
Tested by (name + signature)..... :			X Project Engineer Signed by: Bruce C.C. Tsai
Approved by (name + signature)..... :			X Reviewer Signed by: Dennis H. P. Chiu
☐	**Testing procedure: TMP/CTF Stage 1:**		
Testing location/ address ..... :			
Tested by (name + signature)..... :			
Approved by (name + signature)..... :			
☐	**Testing procedure: WMT/CTF Stage 2:**		
Testing location/ address ..... :			
Tested by (name + signature)..... :			
Witnessed by (name + signature) ..... :			
Approved by (name + signature)..... :			
☐	**Testing procedure: SMT/CTF Stage 3 or 4:**		
Testing location/ address ..... :			
Tested by (name + signature)..... :			
Witnessed by (name + signature) ..... :			

Approved by (name + signature)..... :		
Supervised by (name + signature)..... :		

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

- Measurement Section
- Photo documentation

Total number of pages in each attachment is indicated in each individual attachment.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
Name of test and test clause of tests performed are given in appended Compliance Checklist, Measurement section and Attachments if any. • Pre-production sample without serial number. • The load conditions used during testing: this equipment operated continuously under maximum normal load configuration as shown below: - RJ-45 ports and SFP+ ports were looped to simulate normal load - Optical transceiver for testing: ORING, type: SFP1G-LX10-I - Each USB port is connected to a dummy load of 5 Vdc / 0.9 A. and USB 2.0 port is connected to a USB dongle - Management RJ-45 port connected to a Hub and the Serial RJ-45 console port is connected to a personal computer	Unless otherwise indicated, all tests were performed at the location stated in “Testing procedure and testing location”.

Summary of compliance with National Differences

List of countries addressed:

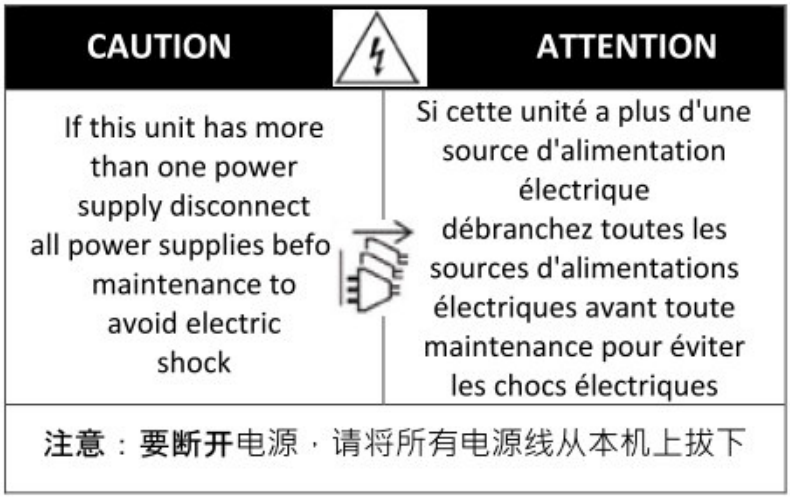
EU Group Differences, EU Special National Conditions, AU, CA, NZ, US, JP.

Explanation of used codes: AU = Australia, CA = Canada, NZ = New Zealand, US = United States of America, JP=Japan.

☒ **The product fulfils the requirements of EN 60950-1:2006 + A11:2009 + A1:2010 +A12:2011 +A2:2013**

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.



Test item particulars.....:	
Equipment mobility.....:	[X] movable [] hand-held [] transportable [] stationary [] for building-in [] direct plug-in
Connection to the mains.....:	[X] pluggable equipment [X] type A [] type B [] permanent connection [X] detachable power supply cord [] non-detachable power supply cord [] not directly connected to the mains
Operating condition.....:	[X] continuous [] rated operating / resting time:
Access location .....:	[X] operator accessible [] restricted access location
Over voltage category (OVC) .....:	[] OVC I [X] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values .....:	±10
Tested for IT power systems .....:	[X] Yes [] No
IT testing, phase-phase voltage (V) .....:	230 for Norway
Class of equipment .....:	[X] Class I [] Class II [] Class III [] Not classified
Considered current rating of protective device as part of the building installation (A) .....:	16 (20 for North America)
Pollution degree (PD) .....:	[] PD 1 [X] PD 2 [] PD 3
IP protection class .....:	IPX0
Altitude during operation (m) .....:	Up to 2000
Altitude of test laboratory (m) .....:	Less than 500
Mass of equipment (kg) .....:	4.22
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.....:	2019-01-30
Date(s) of performance of tests .....:	2019-02-15 to 2019-02-26

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.

Where statement of conformity is provided in this test report, if not otherwise indicated, “accuracy method” described in IEC GUIDE 115 has been taken to address uncertainty of measurement.

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) ..... :

1) Portwell, Inc.
No. 242, Bo-Ai St., Shu-Lin Dist., New Taipei City, 23845 Taiwan

2) CASWELL, INC.
No. 242 Bo-Ai Street, Shu-Lin Dist., New Taipei City, 23845 Taiwan

General product information:

Description of change(s):

1. The model ODS-EL1 was following changes
   a. Add alternative source of power supply for redundant type
   b. Add alternative ratings for equipment with redundant type power supply
   c. Revised address for the factory CASWELL, INC.

For the above described change(s) the following was considered to be necessary:

Change	Testing	Comments
1	• Electrical data • Resistance of earthing measurement • Humidity conditionin • Steady force test, 250 N • Impact test • Thermal requirement • Enclosure opening measurements • Touch current measurement • Electric strength tests • Fault condition tests	See copy of marking plate and sub-clauses 1.7 for the update information Certified source of redundant power supply with suitable rating used. See appended table 1.5.1 for component source, see appended sub-clauses and tables for test results. See bold type words in the "Name and address of factory (ies)" for update information.

History of amendments and modifications:

Ref. No. 50141214 001, dated Jul. 13, 2018 (original test report)

Ref. No. 50141214 002, dated Dec. 03, 2018 (amendment)

Ref. No. 50141214 003, dated Mar. 29, 2019 (modification)

Abbreviations used in the report:

- normal conditions	**N.C**.	- single fault conditions	**S.F.C**
- functional insulation	**OP**	- basic insulation	**BI**
- double insulation	**DI**	- supplementary insulation	**SI**
- between parts of opposite polarity	**BOP**	- reinforced insulation	**RI**
- power supply unit	**PSU**	- Redundant Power Supply	**RPS**
- Equipment under test	**EUT**		

Indicate used abbreviations (if any)

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7	**Marking and instructions**		P
1.7.1.1	Power rating marking	The power rating marking is provided and is readily visible in operator access area.	P
	Multiple mains supply connections.....:	See copy of marking plate, multiple supply connections has the same electrical ratings for per power supply module.	P
	Rated voltage(s) or voltage range(s) (V) .....:	See copy of marking plate.	P
	Symbol for nature of supply, for d.c. only .....:		N/A
	Rated frequency or rated frequency range (Hz) ....:	See copy of marking plate.	P
	Rated current (mA or A) .....:	See copy of marking plate.	P
1.7.1.2	Identification markings	See below.	P
	Manufacturer's name or trade-mark or identification mark .....:	See copy of marking plate.	P
	Model identification or type reference .....:	See copy of marking plate.	P
	Symbol for Class II equipment only .....:		N/A
	Other markings and symbols .....:	Other markings and symbols do not give rise to misunderstanding.	P
1.7.9	Isolation of multiple power sources .....:	A prominent marking for disconnecting all power sources is located close to the entry point,	P
2.9.2	Humidity conditioning	Tested for 120hrs.	P
	Relative humidity (%), temperature (°C) ..... :	93% R.H., 40°C.	—
3.2.2	Multiple supply connections	Considerations have been taken.	P
3.4.11	Multiple power sources	A prominent marking at each disconnect device giving adequate instructions.	P
4.2.4	Steady force test, 250 N	Test applied to top, side and rear side enclosure near the RPS.	P
4.2.5	Impact test	Test applied to top, side and rear side enclosure near the RPS.	P

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Fall test	See above.	P
	Swing test	See above.	P
5	**ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS**		**P**
5.1	**Touch current and protective conductor current**		P
5.1.1	General	See sub-clauses 5.1.2 to 5.1.6.	P
5.1.2	Configuration of equipment under test (EUT)	See below.	P
5.1.2.1	Single connection to an a.c. mains supply		P
5.1.2.2	Redundant multiple connections to an a.c. mains supply		N/A
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply	Test was applied to the equipment with two power modules connected to an a.c. mains supply at the same time.	P
5.1.3	Test circuit	Equipment of figure 5A used.	P
5.1.4	Application of measuring instrument	Using measuring instrument in annex D.	P
5.1.5	Test procedure	See appended table 5.1.6.	P
5.1.6	Test measurements	See appended table 5.1.6.	P
	Supply voltage (V) ..... :	See appended table 5.1.6.	—
	Measured touch current (mA) ..... :	See appended table 5.1.6.	—
	Max. allowed touch current (mA) ..... :	See appended table 5.1.6.	—
	Measured protective conductor current (mA) ..... :		—
	Max. allowed protective conductor current (mA) .. :		—

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components				P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
Power Supply (Alternate, Redundant type)	3Y POWER TECHNOLOGY (TAIWAN) INC	YH-5301M	I/P: 100-240 Vac, 50-60Hz, 5-3A, O/P: +3.3V/ 20A, +5V/ 20A, +12V/ 24A, -12V/ 0.5A, +5Vsb/ 3A, +3.3V & +5V = 140W, total power: 300W Class I, Tma = 50 degree C.	IEC 60950-1: 2005 + A1+ A2 EN 60950-1: 2006+A11+A1+ A12+A2 IEC 62368-1:2014 UL 62368-1, 2nd Ed, 2014-12-01, CAN/CSA C22.2 No. 62368-1-14, 2nd Ed	CB (JPTUV-059817) TÜV (R 50271298) CB (DK 76083) cULus (E142723)
- Power Module (one or two provided)	3Y POWER TECHNOLOGY (TAIWAN) INC	YM-2301E	I/P: 100-240 Vac, 50-60Hz, 5-3A. O/P: +12Vdc/24A, +5Vsb/3.0A, total power: 300W Class I, Tma = 50 degree C.	IEC 60950-1: 2005 + A1+ A2 EN 60950-1: 2006+A11+A1+ A12+A2 IEC 62368-1:2014 UL 62368-1, 2nd Ed, 2014-12-01, CAN/CSA C22.2 No. 62368-1-14, 2nd Ed	CB (JPTUV-063378), TÜV (R 50222034) CB (DK 76083) cULus (E142723)
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

1.6.2	TABLE: Electrical data (in normal conditions)					P
U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
EUT installed RPS: 3Y Power, type: YH-5301M (with two power modules) [1)]						
90Vac/ 60Hz	0.59	--	49.1	[2)]	0.59	max. normal load.
90Vac/ 50Hz	0.58	--	49.0	[2)]	0.58	Same as above
100Vac/ 60Hz	0.55	2.5	49.3	[2)]	0.55	Same as above
100Vac/ 50Hz	0.54	2.5	49.3	[2)]	0.54	Same as above
240Vac/ 60Hz	0.33	1.5	48.8	[2)]	0.33	Same as above

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

240Vac/ 50Hz	0.33	1.5	48.8	2)	0.33	Same as above
264Vac/ 60Hz	0.35	--	48.2	2)	0.35	Same as above
264Vac/ 50Hz	0.35	--	48.2	2)	0.35	Same as above
EUT installed RPS: 3Y Power, type: YH-5301M (with single power module)						
90Vac/ 60Hz	0.46	--	40.7	2)	0.46	max. normal load.
90Vac/ 50Hz	0.46	--	40.6	2)	0.46	Same as above
100Vac/ 60Hz	0.43	2.5	40.8	2)	0.43	Same as above
100Vac/ 50Hz	0.42	2.5	40.8	2)	0.42	Same as above
240Vac/ 60Hz	0.24	1.5	40.1	2)	0.24	Same as above
240Vac/ 50Hz	0.23	1.5	40.1	2)	0.23	Same as above
264Vac/ 60Hz	0.22	--	40.1	2)	0.22	Same as above
264Vac/ 50Hz	0.22	--	40.1	2)	0.22	Same as above
Supplementary information: 1. The measured input current value is the sum of the two power modules tested simultaneously. 2. In certified power module.						

4.5	**TABLE: Thermal requirements**			P
	Supply voltage (V) ..... :	90Vac/60Hz	264Vac/60Hz	—
	Ambient T_{min} (°C) ..... :	--	--	—
	Ambient T_{max} (°C) ..... :	See below	See below	—
Maximum measured temperature T of part/at.....:		T (°C)		Allowed T_{max} (°C)
EUT installed RPS: 3Y Power, type: YH-5301M (with single power module, left side) - Airflow direction of fan in power module: Outward				
Max. ambient temperature (Tma):		45.0	45.0	--
Ambient temperature during test (Tamb):		24.3	24.6	--
Surface of top enclosure (near RPS)		49.0	48.9	70
Surface of bottom enclosure (near RPS)		52.6	52.4	70

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Coil of Transformer (T1) (Power module: 3Y Power, type: YM-2301E)	63.8	63.6	110
Coil of Transformer (T2) (Power module: 3Y Power, type: YM-2301E)	59.2	59.0	110
Coil of Transformer (T401) (Power module: 3Y Power, type: YM-2301E)	70.4	70.3	90
U18 (main board)	54.9	54.8	105
U27 (main board)	61.7	61.9	105
U28 (main board)	62.6	62.4	105
RTC battery body (main board)	51.1	51.1	--

Supplementary information:

1) The temperatures were measured under worst case normal mode defined in 1.2.2.1 and as described in 1.6.2 at voltages as described in above.

2) The equipment under test (EUT) has been evaluated at maximum ambient temperature (Tma) as described above according to the manufacturer specified..

3) Thermocouple method used for measuring the temperatures.

4) While the Tamb not exceed Tma, the maximum temperatures measured are recalculated as follows: T + (Tma – Tamb) where T is the maximum temperature measured during test, Tma is the maximum ambient temperature permitted by the manufacturer's specification and Tamb is the actual ambient temperature during test.

Winding components (providing safety isolation):

- Class A Tmax = 100°C – 10°C = 90°C

- Class B Tmax = 120°C – 10°C = 110°C

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:

5.1	TABLE: touch current measurement			P
Measured between:		Measured (mA)	Limit (mA)	Comments/conditions
EUT installed RPS: 3Y Power, type: YH-5301M (with two power modules)				
To metal enclosure (earth)		1.11	3.5	Switch "e" open, "P1" normal.
To metal enclosure (earth)		1.13	3.5	Switch "e" open, "P1" reverse
To SELV connectors		0.01	0.25	Switch "e" close, "P1" normal.
To SELV connectors		0.01	0.25	Switch "e" close, "P1" reverse
supplementary information:				
1. Supply voltage: 264V, 60Hz				
2. Overall capacity: In certified power modules				

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests			P
Test voltage applied between:		Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
EUT installed RPS: 3Y Power, type: YH-5301M (with two power modules)				
Basic/supplementary:				
Primary to earthed metal enclosure		DC	2592	No
Reinforced:				
Primary to secondary		DC	4242	No
Supplementary information:				

5.3	TABLE: Fault condition tests						P
	Ambient temperature (°C) .....:				25°C, if not otherwise specified.		—
	Power source for EUT: Manufacturer, model/type, output rating .....:				See below and appended table 1.5.1 for details.		—
Component No.	Fault	Supply voltage (Vac)	Test time	Fuse #	Fuse current (A)	Observation	
EUT installed RPS: 3Y Power, type: YH-5301M (with single power module, left side)							
DC fan on power module	Stalled	264 / 60Hz	10hr	2)	0.05	Unit shutdown. I/P: 0.05 A. Maximum temperatures were obtained at: Ambient = 22.2℃, Surface of top enclosure near RPS = 27.8℃, Surface of bottom enclosure near RPS = 28.8℃, Coil of Transformer (T1) (Power module:: 3Y Power, type: YM-2301E) = 31.9℃, Coil of Transformer (T2) (Power module:: 3Y Power, type: YM-2301E) = 40.1℃, Coil of Transformer (T401) (Power module:: 3Y Power, type: YM-2301E) = 32.8℃, U18 (main board) = 25.8℃, U27 (main board) = 25.1℃, U28 (main board) = 25.4℃.	

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

DC fan on system	Stalled	264 / 60Hz	2hr	2)	0.35	Unit normal operation. I/P: 0.35 A.. Constant temperatures were obtained at: Ambient = 23.9℃, Surface of top enclosure near RPS = 34.5℃, Surface of bottom enclosure near RPS = 33.9℃, Coil of Transformer (T1) (Power module:: 3Y Power, type: YM-2301E) = 47.3℃, Coil of Transformer (T2) (Power module:: 3Y Power, type: YM-2301E) = 40.7℃, Coil of Transformer (T401) (Power module:: 3Y Power, type: YM-2301E) = 51.5℃, U18 (main board) = 56.7℃, U27 (main board) = 53.9℃, U28 (main board) = 52.8℃.
Ventilation Openings	Blocked	264 / 60Hz	6.3 hrs	2)	0.35	Unit normal operation. I/P: 0.35A. Constant temperatures were obtained at: Ambient = 23.7℃, Surface of top enclosure near RPS = 35.7℃, Surface of bottom enclosure near RPS = 35.3℃, Coil of Transformer (T1) (Power module:: 3Y Power, type: YM-2301E) = 48.4℃, Coil of Transformer (T2) (Power module:: 3Y Power, type: YM-2301E) = 43.9℃, Coil of Transformer (T401) (Power module:: 3Y Power, type: YM-2301E) = 53.5℃, U18 (main board) = 46.2℃, U27 (main board) = 49.1℃, U28 (main board) = 48.5℃.

Supplementary information:

1. Maximum temperatures of transformers based on maximum ambient temperature (Tma) of 45°C:
   Class A: Tmax = 150 °C –10 °C – (45 °C – 22 °C) = 117 °C.
   Class B: Tmax = 175 °C –10 °C – (45 °C – 22 °C) = 142 °C.
2. In certified power module.
3. At the end of the above tests, an electric strength test was conducted to the equipment

List of test equipment used:

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date

Information:
No listing of test equipment used necessary for chosen test procedure.

Clause	Requirement + Test	Result - Remark	Verdict

2.1.1.7	TABLE: Discharge test				N/A
Condition		τ calculated (s)	τ measured (s)	t u→ 0V (s)	Comments
Supplementary information:					

2.4.2	TABLE: Limited current circuit measurement					N/A
Location		Voltage (V)	Current (mA)	Freq. (kHz)	Limit (mA)	Comments
Supplementary information:						

2.6.3.4	TABLE: Resistance of earthing measurement	P
Location	Resistance measured (mΩ)	Comments
EUT installed RPS: 3Y Power, type: YH-5301M (with two power modules)		
Protective earthing terminal of appliance inlet to front metal enclosure	11	Test current: 40A; duration: 2 min., measured voltage drop: 0.44V
Protective earthing terminal of appliance inlet to earth screw on rear side	6	Test current: 40A; duration: 2 min., measured voltage drop: 0.24V
Supplementary information:		

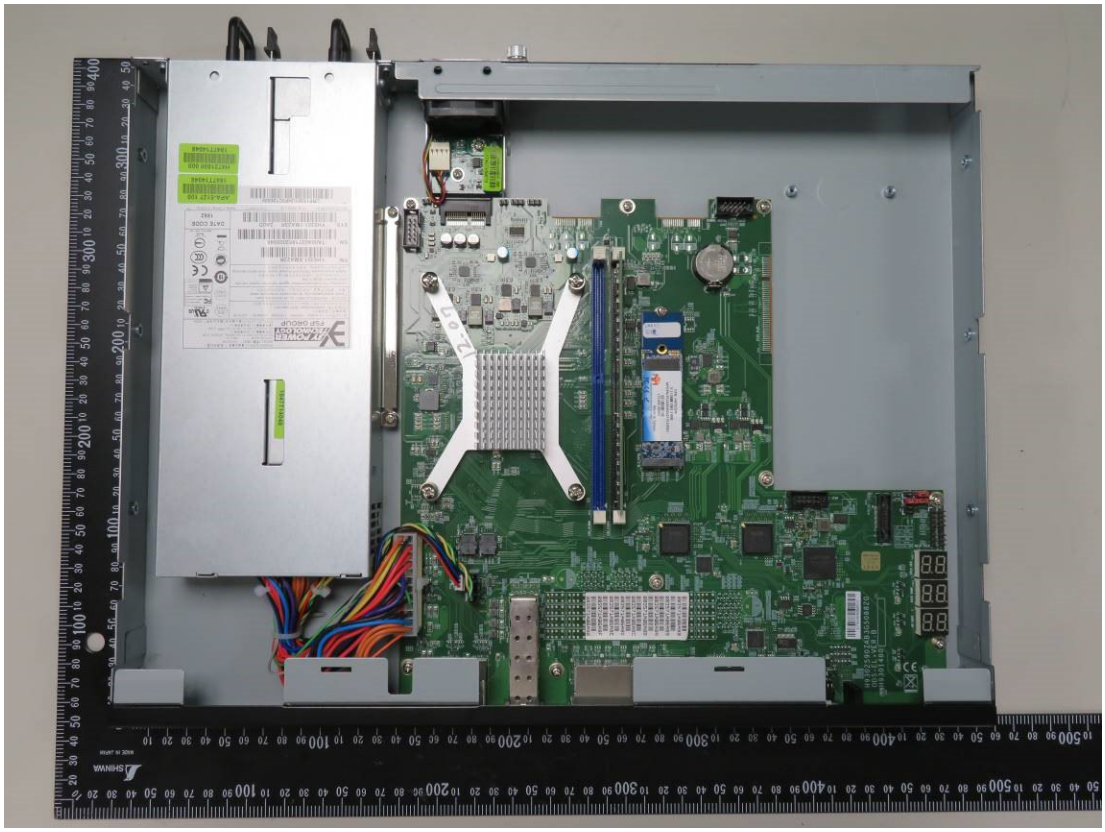
4.6.1, 4.6.2	Table: Enclosure opening measurements	P
Location	Size (mm)	Comments
EUT installed RPS: 3Y Power, type: YH-5301M (with two power modules)		
Top, bottom, left & right	--	No openings
Front	∅3.5	No bare parts at HAZARDOUS VOLTAGE, or which are energy hazards at the location of 5° projection from these openings.
Rear (measured on DC fan)	7 x 7	Fan guard use. No bare parts at HAZARDOUS VOLTAGE, or which are energy hazards at the location of 5° projection from these openings.
Rear (measured on power module)	Max. 4 x 4	Numerous rectangular openings served as a fan guard. No bare parts at HAZARDOUS VOLTAGE, or which are energy hazards at the location of 5° projection from these openings.
Supplementary information:		

Product: Network Switch

Type Designation: ODS-EL1

Product: Network Switch

Type Designation: ODS-EL1



IEC IECEE CB SCHEME

Ref. Certif. No.

JPTUV-089346-A1/M1

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	Network Switch
Name and address of the applicant Nom et adresse du demandeur	Radware Ltd. 22 Raoul Wallenberg St. 69710 Tel Aviv, Israel
Name and address of the manufacturer Nom et adresse du fabricant	Radware Ltd. 22 Raoul Wallenberg St. 69710 Tel Aviv, Israel
Name and address of the factory Nom et adresse de l'usine	See additional page(s)
Ratings and principal characteristics Valeurs nominales et charactéristiques principales	1) 100-240Vac; 60-50Hz; 2.5-1.5A (for equipment with single power supply) 2) 100-240Vac; 50-60Hz; 5-3A (per power supply unit)(for equipment with redundant type power supply); Class I
Trademark (if any) Marque de fabrique (si elle existe)	radware
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	N/A
Model / Type Ref. Ref. de type	ODS-EL1
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la 2ème page)	Re-issue of JPTUV-089346-A1 dated 11.12.2018, due to first modification.
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 62368-1:2014 See Test Report for National Differences
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	50142173 003

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

TÜVRheinland®

TÜV Rheinland Japan Ltd.
Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku
Yokohama 224-0021 Japan
Phone + 81 45 914-3888
Fax + 81 45 914-3354
Mail: info@jpn.tuv.com
Web: www.tuv.com

Date: 03.04.2019

Signature: Jason C. H. Chang

1. Portwell, Inc.
No. 242, Bo-Ai St.
Shu-Lin Dist., New Taipei City
23845
Taiwan

2. CASWELL, INC.
No. 242 Bo-Ai Street,
Shu-Lin Dist., New Taipei City
23845
Taiwan

Additional information (if necessary)
Information complémentaire (si nécessaire)

Report Ref. No.: 50142173 003

Date: 03.04.2019

Signature: Jason C. H. Chang

Test Report issued under the responsibility of:

TÜVRheinland®

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

Report Number .....:	50142173 003
Date of issue .....:	Mar. 29, 2019
Total number of pages .....:	16
Applicant's name.....:	Radware Ltd.
Address .....:	22 Raoul Wallenberg St., 69710 Tel Aviv, Israel
Test specification:	
Standard.....:	IEC 62368-1:2014 (Second Edition)
Test procedure .....:	CB Scheme
Non-standard test method.....:	N/A
Test Report Form No. .....:	IEC62368_1B
Test Report Form(s) Originator .....:	UL(US)
Master TRF .....:	2014-03

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test Item description ..... :		Network Switch	
Trade Mark ..... :		radware®	
Manufacturer ..... :		Same as applicant	
Model/Type reference ..... :		ODS-EL1	
Ratings ..... :		1) 100-240Vac, 60-50Hz, 2.5-1.5A (for equipment with single power supply) 2) 100-240Vac, 50-60Hz, 5-3A (per power supply unit) (for equipment with redundant type power supply)	
Testing procedure and testing location:			
☒	CB Testing Laboratory:	TÜV Rheinland Taiwan Ltd., Taichung Branch	
Testing location/ address ..... :		No. 9, Ln. 36, Sec. 3, Minsheng Rd., Daya District, Taichung City 428, Taiwan Chinese Taipei	
☐	Associated CB Testing Laboratory:		
Testing location/ address ..... :			
Tested by (name + signature) ..... :			X Project Engineer Signed by: Bruce C.C. Tsai
Approved by (name + signature)..... :			X Reviewer Signed by: Dennis H. P. Chiu
☐	Testing procedure: TMP/CTF Stage 1		
Testing location/ address ..... :			
Tested by (name + signature) ..... :			
Approved by (name + signature)..... :			
☐	Testing procedure: WMT/CTF Stage 2		
Testing location/ address ..... :			
Tested by (name + signature) ..... :			
Witnessed by (name + signature) ..... :			
Approved by (name + signature)..... :			
☐	Testing procedure: SMT/CTF Stage 3 or 4		
Testing location/ address ..... :			
Tested by (name + signature) ..... :			
Approved by (name + signature)..... :			
Supervised by (name + signature) ..... :			

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

- Measurement Section
- Photo documentation

Total number of pages in each attachment is indicated in each individual attachment.

Summary of testing:

Tests performed (name of test and test clause):

All applicable tests according to the referenced standard(s) have been carried out.

- Pre-production sample without serial number.
- The load conditions used during testing: this equipment operated continuously under maximum normal load configuration as shown below:
  - RJ-45 ports and SFP+ ports were looped to simulate normal load
  - Optical transceiver for testing: ORING, type: SFP1G-LX10-I
  - Each USB port is connected to a dummy load of 5 Vdc / 0.9 A. and USB 2.0 port is connected to a USB dongle
  - Management RJ-45 port connected to a Hub and the Serial RJ-45 console port is connected to a personal computer

Testing location:

Unless otherwise indicated, all tests were performed at the location stated in “Testing procedure and testing location”.

Summary of compliance with National Differences:

List of countries addressed

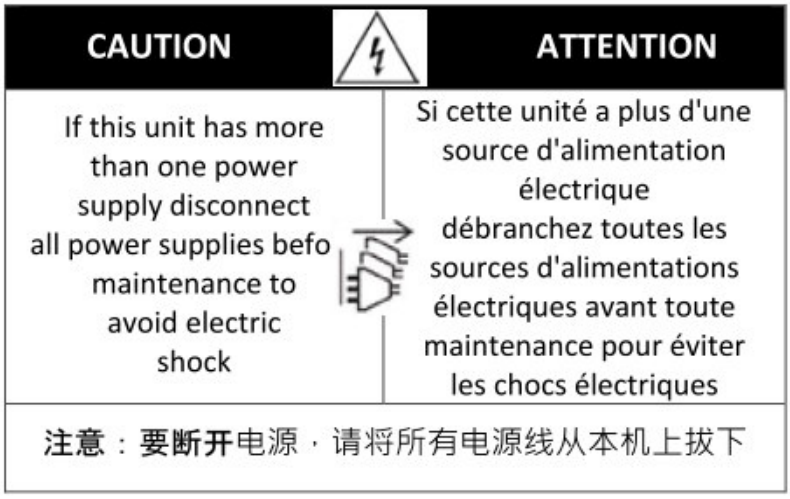
Summary of compliance with National Differences to IEC 62368-1:2014 (Second Edition) and EN 62368-1:2014 (for explanation of codes see below):

EU Group Differences, EU Special National Conditions, CA, DE, DK, FI, IT, NO, SE, US.
Explanation of used codes: CA=Canada, DE=Germany, DK=Demark, FI=Finland, IT=Italy, NO=Norway, SE=Sweden, US=United States of America.

☒ **The product fulfils the requirements of EN 62368-1:2014**

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.



TEST ITEM PARTICULARS:	
Classification of use by..... :	☒ Ordinary person ☐ Instructed person ☐ Skilled person ☐ Children likely to be present
Supply Connection ..... :	☒ AC Mains ☐ DC Mains ☐ External Circuit - not Mains connected - ☐ ES1 ☐ ES2 ☐ ES3
Supply % Tolerance ..... :	☒ +10%/-10% for AC mains ☐ +20%/-15% ☐ +25%/ -25% for DC mains ☐ None
Supply Connection – Type ..... :	☒ pluggable equipment type A - ☐ non-detachable supply cord ☒ appliance coupler ☐ direct plug-in ☐ mating connector ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☐ mating connector ☐ other:_____
Considered current rating of protective device as part of building or equipment installation..... :	16 A, 13 A (GB) or 20 A (US and Canada) Installation location: ☒ building; ☐ equipment
Equipment mobility..... :	☒ movable ☐ hand-held ☐ transportable ☐ stationary ☐ for building-in ☐ direct plug-in ☐ rack-mounting ☐ wall-mounted
Over voltage category (OVC) ..... :	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV ☐ other: _____
Class of equipment ..... :	☒ Class I ☐ Class II ☐ Class III
Access location ..... :	☐ restricted access location ☒ N/A
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified maxium operating ambient :	45 °C
IP protection class ..... :	☒ IPX0 ☐ IP___
Power Systems ..... :	☒ TN ☐ TT ☒ IT - 230 V $_{L-L}$
Altitude during operation (m) ..... :	☒ 2000 m or less ☐ _____ m
Altitude of test laboratory (m) ..... :	☒ 2000 m or less ☐ _____ m
Mass of equipment (kg) ..... :	☒ Approx. 4.22
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 .....:	2019-01-30
Date (s) of performance of tests .....:	2019-02-15 to 2019-02-26

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.

Where statement of conformity is provided in this test report, if not otherwise indicated, “accuracy method” described in IEC GUIDE 115 has been taken to address uncertainty of measurement.

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).....:	1) Portwell, Inc. No. 242, Bo-Ai St., Shu-Lin Dist., New Taipei City, 23845 Taiwan 2) CASWELL, INC. **No. 242 Bo-Ai Street, Shu-Lin Dist., New Taipei City, 23845 Taiwan**

GENERAL PRODUCT INFORMATION:

Product Description –
Description of change(s):

1. The model ODS-EL1 was following changes
   a. Add alternative source of power supply for redundant type
   b. Add alternative ratings for equipment with redundant type power supply
   c. Revised address for the factory CASWELL, INC.

For the above described change(s) the following was considered to be necessary:

Change	Testing	Comments

1.	• 5.4.8 Humidity conditioning • 5.4.1.4, 6.3.2, 9.0, B.2.6 Temperature measurements • 5.4.9 Electric strength tests • 5.6.6.2 Resistance of protective conductors and terminations • 5.7.2.2, 5.7.4 Earthed accessible conductive part • 6.4.8.3.3, 6.4.8.3.4 Enclosure opening measurements • B.2.5 Input test • B.3 Abnormal operating condition tests • B.4 Fault condition tests • T.2, T.3, T.4, T.5 Steady force test • T.6, T.9 Impact tests	See copy of marking plate and sub-clauses F.3 for the update information Certified source of redundant power supply with suitable rating used. See appended table 4.1.2 for component source, see appended sub-clauses and tables for test results. See bold type words in the “Name and address of factory (ies)” for update information.

History of amendments and modifications:

Ref. No. 50142173 001, dated Jul. 13, 2018 (original test report)
Ref. No. 50142173 002, dated Dec. 03, 2018 (amendment)
Ref. No. 50142173 003, dated Mar. 29, 2019 (modification)

Model Differences –

- N/A

Additional application considerations –

- See report 50142173 001 for details.

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.8	Humidity conditioning	Evaluated in approved SPS.	P
	Relative humidity (%).....:	93	—
	Temperature (°C) .....:	40	—
	Duration (h) .....:	120	—
5.7.3	Equipment set-up, supply connections and earth connections	Considered	P
	System of interconnected equipment (separate connections/single connection) .....:	Single equipment.	—
	Multiple connections to mains (one connection at a time/simultaneous connections) .....:	Simultaneous connections.	—
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P
F.3	Equipment markings		P
F.3.1	Equipment marking locations	The equipment marking is located on the exterior surface and it is easily visible.	P
F.3.2	Equipment identification markings	See the following details.	P
F.3.2.1	Manufacturer identification .....:	See copy of marking plate.	—
F.3.2.2	Model identification .....:	See copy of marking plate.	—
F.3.3	Equipment rating markings	See the following details.	P
F.3.3.1	Equipment with direct connection to mains	The equipment is connected to AC mains supply.	P
F.3.3.2	Equipment without direct connection to mains	See above.	N/A
F.3.3.3	Nature of supply voltage .....:	See copy of marking plate.	—
F.3.3.4	Rated voltage .....:	See copy of marking plate.	—
F.3.3.4	Rated frequency.....:	See copy of marking plate	—
F.3.3.6	Rated current or rated power .....:	See copy of marking plate.	—
F.3.3.7	Equipment with multiple supply connections	See copy of marking plate, multiple supply connections has the same electrical ratings for per power supply module.	P
L	**DISCONNECT DEVICES**		P
L.8	Multiple power sources	A prominent marking for disconnecting all power sources is located close to the entry point,	P

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]
Power Supply (Alternate, Redundant type)	3Y POWER TECHNOLOGY (TAIWAN) INC	YH-5301M	I/P: 100-240 Vac, 50-60Hz, 5-3A, O/P: +3.3V/ 20A, +5V/ 20A, +12V/ 24A, -12V/ 0.5A, +5Vsb/ 3A, +3.3V & +5V = 140W, total power: 300W Class I, Tma = 50 degree C.	IEC 60950-1: 2005 + A1+ A2 EN 60950-1: 2006+A11+A1+A12+A2 IEC 62368-1:2014 UL 62368-1, 2nd Ed, 2014-12-01, CAN/CSA C22.2 No. 62368-1-14, 2nd Ed	CB (JPTUV-059817) TÜV (R 50271298) CB (DK 76083) cULus (E142723)
- Power Module (one or two provided)	3Y POWER TECHNOLOGY (TAIWAN) INC	YM-2301E	I/P: 100-240 Vac, 50-60Hz, 5-3A. O/P: +12Vdc/24A, +5Vsb/3.0A, total power: 300W Class I, Tma = 50 degree C.	IEC 60950-1: 2005 + A1+ A2 EN 60950-1: 2006+A11+A1+A12+A2 IEC 62368-1:2014 UL 62368-1, 2nd Ed, 2014-12-01, CAN/CSA C22.2 No. 62368-1-14, 2nd Ed	CB (JPTUV-063378), TÜV (R 50222034) CB (DK 76083) cULus (E142723)
Supplementary information:					

5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements					P
	Supply voltage (V) ..... :	See below	See below	See below	--	—
	Ambient T_{min} (°C) ..... :	--	--	--	--	—
	Ambient T_{max} (°C) ..... :	--	--	--	--	—
	Tma (°C) ..... :	See below	See below	See below	--	—
Maximum measured temperature T of part/at:		T (°C)				Allowed T_{max} (°C)
EUT installed RPS: 3Y Power, type: YH-5301M (with single power module, left side) - Airflow direction of fan in power module: Outward						
Operating conditions:		Normal		--	--	--

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

Supply voltage:	90 Vac / 60Hz	264 Vac / 60Hz	--	--	--
Ambient temperature (Tamb, °C)	25.0	25.0	--	--	--
Surface of top enclosure (near RPS)	29.0	28.9	--	--	70
Surface of bottom enclosure (near RPS)	32.6	32.4	--	--	70
Maximum ambient temperature (Tma)	45.0	45.0	--	--	--
Ambient temperature (Tamb, °C) during testing	24.3	24.6	--	--	--
Surface of top enclosure (near RPS)	49.0	48.9	--	--	--
Surface of bottom enclosure (near RPS)	52.6	52.4	--	--	--
Coil of Transformer (T1) (Power module: 3Y Power, type: YM-2301E)	63.8	63.6	--	--	110
Coil of Transformer (T2) (Power module: 3Y Power, type: YM-2301E)	59.2	59.0	--	--	110
Coil of Transformer (T401) (Power module: 3Y Power, type: YM-2301E)	70.4	70.3	--	--	90
U18 (main board)	54.9	54.8	--	--	105
U27 (main board)	61.7	61.9	--	--	105
U28 (main board)	62.6	62.4	--	--	105
RTC battery body (main board)	51.1	51.1	--	--	--
Abnormal operating & fault condition: 1. Ventilation opening 2. DC fan on power module 3. DC fan on system	1	2	3	--	--
Supply voltage:	264 Vac / 60Hz	264 Vac / 60Hz	264 Vac / 60Hz	--	--
Ambient temperature (Tamb, °C)	25.0	25.0	25.0	--	--
Surface of top enclosure (near RPS)	37.0	30.6	35.6	--	80
Surface of bottom enclosure (near RPS)	36.6	31.6	35.0	--	80
Maximum ambient temperature (Tma)	45.0	45.0	45.0	--	--
Ambient temperature (Tamb, °C) during testing	23.7	22.2	23.9	--	--
Coil of Transformer (T1) (Power module: 3Y Power, type: YM-2301E)	69.7	54.7	68.4	--	165
Coil of Transformer (T2) (Power module: 3Y Power, type: YM-2301E)	65.2	62.9	61.8	--	165
Coil of Transformer (T401) (Power module: 3Y Power, type: YM-2301E)	74.8	55.6	72.6	--	140
U18 (main board)	67.5	48.6	77.8	--	300
U27 (main board)	70.4	47.9	75.0	--	300
U28 (main board)	69.8	48.2	73.9	--	300
Supplementary information:					

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

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:

Note 1: Tma should be considered as directed by appliable requirement

Note 2: Tma is not included in assessment of Touch Temperatures (Clause 9)

1) While the Tamb not exceed Tma, the maximum temperatures measured are recalculated as follows: T + (Tma – Tamb) where T is the maximum temperature measured during test, Tma is the maximum ambient temperature permitted by the manufacturer's specification and Tamb is the actual ambient temperature during test.

   Winding components (providing safety isolation):

   - Class A Tmax = 100°C – 10°C = 90°C
   - Class B Tmax = 120°C – 10°C = 110°C

2) See table B.3 & B.4

5.4.9	TABLE: Electric strength tests			P
Test voltage applied between:		Voltage shape (AC, DC)	Test voltage (V)	Breakdown Yes / No
EUT installed RPS: 3Y Power, type: YH-5301M (with two power modules)				
Functional:				
--		--	--	--
Basic/supplementary:				
Primary to earthed metal enclosure		DC	2592	No
Reinforced:				
Primary to secondary		DC	4242	No
Routine Tests:				
--		--	--	--
Supplementary information:				

5.6.6.2	TABLE: Resistance of protective conductors and terminations			P
Accessible part	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)
EUT installed RPS: 3Y Power, type: YH-5301M (with two power modules)				
Protective earthing terminal of appliance inlet to front metal enclosure	40	2	0.44	11 mΩ
Protective earthing terminal of appliance inlet to earth screw on rear side	40	2	0.24	6 mΩ
Supplementary information:				

5.7.2.2,	TABLE: Earthed accessible conductive part	P

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

5.7.4			
Supply voltage..... :		264 Vac / 60 Hz	—
Location		Test conditions specified in 6.1 of IEC 60990 or Fault Condition No in IEC 60990 clause 6.2.2.1 through 6.2.2.8, except for 6.2.2.7	Touch current (mA)
Line to earth (metal chassis), Neutral to earth (metal chassis)		1	Max. 1.13
		2*	--
		3	--
		4	--
		5	--
		6	--
		8	--

Supplementary information:

Notes:
[1] Supply voltage is the anticipated maximum Touch Voltage

[2] Earthed neutral conductor [Voltage differences less than 1% or more]

[3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3

[4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable.

[5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.

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
EUT installed RPS: 3Y Power, type: YH-5301M (with two power modules) [1)]							
90 Vac / 60Hz	0.59	--	49.1	--	[2)]	0.59	max. normal load.
90 Vac / 50Hz	0.58	--	49.0	--	[2)]	0.58	Same as above
100 Vac/ 60Hz	0.55	2.5	49.3	--	[2)]	0.55	Same as above
100 Vac/ 50Hz	0.54	2.5	49.3	--	[2)]	0.54	Same as above
240 Vac/ 60Hz	0.33	1.5	48.8	--	[2)]	0.33	Same as above
240 Vac/ 50Hz	0.33	1.5	48.8	--	[2)]	0.33	Same as above
264 Vac/ 60Hz	0.35	--	48.2	--	[2)]	0.35	Same as above

IEC 62368-1							
Clause	Requirement + Test			Result - Remark			Verdict
264 Vac/ 50Hz	0.35	--	48.2	--	2)	0.35	Same as above
EUT installed RPS: 3Y Power, type: YH-5301M (with single power module)							
90 Vac / 60Hz	0.46	--	40.7	--	2)	0.46	max. normal load.
90 Vac / 50Hz	0.46	--	40.6	--	2)	0.46	Same as above
100 Vac/ 60Hz	0.43	2.5	40.8	--	2)	0.43	Same as above
100 Vac/ 50Hz	0.42	2.5	40.8	--	2)	0.42	Same as above
240 Vac/ 60Hz	0.24	1.5	40.1	--	2)	0.24	Same as above
240 Vac/ 50Hz	0.23	1.5	40.1	--	2)	0.23	Same as above
264 Vac/ 60Hz	0.22	--	40.1	--	2)	0.22	Same as above
264 Vac/ 50Hz	0.22	--	40.1	--	2)	0.22	Same as above
Supplementary information: Equipment may be have rated current or rated power or both. Both should be measured 1. The measured input current value is the sum of the two power modules tested simultaneously. 2. In certified power module.							

B.3	TABLE: Abnormal operating condition tests							P
Ambient temperature (°C) ..... :					See table 5.4.1.4, 6.3.2, 9.0, B.2.6			—
Power source for EUT: Manufacturer, model/type, output rating . :					See table 4.1.2			—
Component No.	Abnormal Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
EUT installed RPS: 3Y Power, type: YH-5301M (with single power module, left side)								
Ventilation opening	blocked	264V/60Hz	8 hr	1)	0.35	T-type	See table 5.4.1.4, 6.3.2, 9.0, B.2.6	Unit normal operation. I/P: 0.35A. Constant temperatures were obtained

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

Supplementary information:
Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column “Abnormal/Fault.” Specify if test condition by indicating “Abnormal” then the condition for a Clause B.3 test or “Single Fault” then the condition for Clause B.4.

1. In certified power module.
2. At the end of the above tests, an electric strength test was conducted to the equipment
3. Maximum temperatures of transformers based on maximum ambient temperature (Tma) of 45°C:
   Class A: Tmax = 150 °C –10 °C = 140 °C.
   Class B: Tmax = 175 °C –10 °C = 165 °C.

B.4	**TABLE: Fault condition tests**							P
Ambient temperature (°C) ..... :					See table 5.4.1.4, 6.3.2, 9.0, B.2.6			—
Power source for EUT: Manufacturer, model/type, output rating . :					See table 4.1.2			—
Component No.	Fault Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
EUT installed RPS: 3Y Power, type: YH-5301M (with single power module, left side)								
DC fan on power module	Stalled	264V/60Hz	10 hr	1)	0.05	T-type	See table 5.4.1.4, 6.3.2, 9.0, B.2.6	Unit shutdown. I/P: 0.05 A. Maximum temperatures were obtained
DC fan on system	blocked	264V/60Hz	2 hr	1)	0.35	T-type	See table 5.4.1.4, 6.3.2, 9.0, B.2.6	Unit normal operation. I/P: 0.35 A.. Constant temperatures were obtained

Supplementary information:

1. In certified power module.
2. At the end of the above tests, an electric strength test was conducted to the equipment
3. Maximum temperatures of transformers based on maximum ambient temperature (Tma) of 45°C:
   Class A: Tmax = 150 °C –10 °C = 140 °C.
   Class B: Tmax = 175 °C –10 °C = 165 °C.

T.2, T.3, T.4, T.5	**TABLE: Steady force test**				P
Part/Location	Material	Thickness (mm)	Force (N)	Test Duration (sec)	Observation
Enclosure	Metal	Min. 0.8	250	5	No damage.

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

Supplementary information:					

T.6, T.9	TABLE: Impact tests			P
Part/Location	Material	Thickness (mm)	Vertical distance (mm)	Observation
Enclosure	Metal	Min. 0.8	250	5
Supplementary information:				

List of test equipment used:

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date

Information:
No listing of test equipment used necessary for chosen test procedure.

Clause	Requirement + Test	Result - Remark	Verdict

	Table: Enclosure opening measurements		P
Location	Size (mm)	Comments	
EUT installed RPS: 3Y Power, type: YH-5301M (with two power modules)			
Top, bottom, left & right	--	No openings	
Front	∅3.5	No bare parts at HAZARDOUS VOLTAGE, or which are energy hazards at the location of 5° projection from these openings.	
Rear (measured on DC fan)	7 x 7	Fan guard use. No bare parts at HAZARDOUS VOLTAGE, or which are ES3/PS3 hazards at the location of projection from these openings.	
Rear (measured on power module)	Max. 4 x 4	Numerous rectangular openings served as a fan guard. No bare parts at HAZARDOUS VOLTAGE, or which are ES3/PS3 hazards at the location of projection from these openings	
Supplementary information:			

Product: Network Switch

Type Designation: ODS-EL1

Product: Network Switch

Type Designation: ODS-EL1