



Test Report issued under the responsibility of:



**TEST REPORT  
IEC 62368-1**

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

**Report Number** .....: 30982609.300  
**Date of issue** .....: March 10, 2021  
**Total number of pages** .....: 89 pages + Attachments

**Applicant's name** .....: TDK-Lambda Americas Inc.  
**Address** .....: 401 Mile of Cars Way, Suite 325, National City, CA, 91950 USA

**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

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The test results presented in this report relate only to the object tested.  
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Test Item description .....	Switch Mode Power Supply	
Trade Mark .....	<b>TDK-Lambda</b>	
Manufacturer.....	Same as applicant	
Model/Type reference .....	1) CSS150-12, 2) CSS150-15, 3) CSS150-24, 4) CSS150-28, 5) CSS150-36, 6) CSS150-48	
Ratings .....	1) Input:100-240V, 2.5A, 50-60Hz / 120-180Vdc, 2.5A Output: 12Vdc, 8.3A, 100W max convection 12Vdc, 12.5A, 150W max w/ 15CFM forced air  2) Input:100-240V, 2.5A, 50-60Hz / 120-180Vdc, 2.5A Output: 15Vdc, 6.7A, 100W max convection 15Vdc, 10.0A, 150W max w/ 15CFM forced air  3) Input:100-240V, 2.5A, 50-60Hz / 120-180Vdc, 2.5A Output: 24Vdc, 4.2A, 100W max convection 24Vdc, 6.3A, 150W max w/ 15CFM forced air  4) Input: 100-240 V, 2.5 A, 50-60 Hz/120-180 V dc, 2.5 A Output: 28 V dc, 3.6 A, 100 W max convection 28 V dc, 5.4 A, 150 W max w/ 15 CFM forced air  5) Input:100-240V, 2.5A, 50-60Hz / 120-180Vdc, 2.5A Output: 36Vdc, 2.8A, 100W max convection 36Vdc, 4.2A, 150W max w/ 15CFM forced air  6) Input:100-240V, 2.5A, 50-60Hz / 120-180Vdc, 2.5A Output: 48Vdc, 2.1A, 100W max convection 48Vdc, 3.1A, 150W max w/ 15CFM forced air	
Testing procedure and testing location:		
<input type="checkbox"/>	CB Testing Laboratory:	TUV Rheinland of North America, Inc.
Testing location/ address .....		1279 Quarry Lane, Ste. A, Pleasanton, CA 94566 USA
<input type="checkbox"/>	Associated CB Testing Laboratory:	
Testing location/ address .....		
Tested by (name + signature) .....		
Approved by (name + signature).....		
<input type="checkbox"/>	Testing procedure: TMP/CTF Stage 1	
Testing location/ address .....		
Tested by (name + signature) .....		
Approved by (name + signature).....		

<input checked="" type="checkbox"/>	Testing procedure: WMT/CTF Stage 2	TDK-Lambda Americas, Inc	
Testing location/ address .....		401 Mile of Cars Way, Suite 325 National City, CA 91950	
Tested by (name + signature) .....		Anthony Villaseñor/ Product Safety Engineer	<i>A Villaseñor</i>
Witnessed by (name + signature) .....		Dan Aquino/ Test Engineer	<i>Dan Aquino</i>
Approved by (name + signature).....		Jay Dunmire/ Test Engineer	<i>Jay Dunmire</i>
<input type="checkbox"/>	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):**

Attachment 1: National Differences (37 pages)  
 Attachment 2: Photographs (2 pages)  
 Attachment 3: Schematic (1 pages)  
 Attachment 4: PCB Layouts (4 pages)  
 Attachment 5: Magnetics Diagram (30 page)

**Summary of testing:**  
 The test data was taken from the TUV CB report 30982609.001 which is in accordance with IEC 60950-1.

<b>Tests performed (name of test and test clause):</b>	<b>Testing location:</b>
<u>30982609.300</u> Electrical Strength Test (5.4.9) Safeguards Against Capacitor Discharge after Disconnection of a Capacitor (5.5.2.2) Touch Current Test (5.7.2)	<u>30982609.300</u> TDK-Lambda Americas, Inc. 401 Mile of Cars Way, Suite 325 National City, CA 91950
<u>30982609.001</u> Input Test (B.2.5) Safeguards Against Capacitor Discharge after Disconnection of a Capacitor (5.5.2.2) Maximum operating temperatures for materials, components and systems (5.4.1.4, 6.3.2, 9.0, B.2.6) Distance Through Insulation (5.4.4.2) Touch Current Test (5.7.2) Electrical Strength Test (5.4.9) Ball Pressure (5.4.1.10.3) Simulated single fault conditions (B.4) Marking Durability (F.3.9)	<u>30982609.001</u> TDK-Lambda Americas, Inc. 401 Mile of Cars Way, Suite 325 National City, CA 91950

**Summary of compliance with National Differences:****List of countries addressed**

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

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

**The product fulfils the requirements of EN 62368-1:2014+A11:2017.**

**Copy of marking plate:**

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

**CSS150-12**  
 INPUT : 100-240 V~, 2.5A, 50-60Hz  
 120-180 V===, 2.5A  
 OUTPUT(===) :  
 12V / 8.3A, 100W max convection  
 12V / 12.5A, 150W max with 15CFM forced air

 BALLANT GDFP/PT  
TYPE APPROVED



**TDK-Lambda**  
 XX MADE IN TAIWAN

**CSS150-15**  
 INPUT : 100-240 V~, 2.5A, 50-60Hz  
 120-180 V===, 2.5A  
 OUTPUT(===) :  
 15V / 6.7A, 100W max convection  
 15V / 10.0A, 150W max with 15CFM forced air

 BALLANT GDFP/PT  
TYPE APPROVED



**TDK-Lambda**  
 XX MADE IN TAIWAN

**CSS150-24**  
 INPUT : 100-240 V~, 2.5A, 50-60Hz  
 120-180 V===, 2.5A  
 OUTPUT(===) :  
 24V / 4.2A, 100W max convection  
 24V / 6.3A, 150W max with 15CFM forced air

 BALLANT GDFP/PT  
TYPE APPROVED



**TDK-Lambda**  
 XX MADE IN TAIWAN

**CSS150-36**  
 INPUT : 100-240 V~, 2.5A, 50-60Hz  
 120-180 V===, 2.5A  
 OUTPUT(===) :  
 36V / 2.8A, 100W max convection  
 36V / 4.2A, 150W max with 15CFM forced air

 BALLANT GDFP/PT  
TYPE APPROVED



**TDK-Lambda**  
 XX MADE IN TAIWAN


**CSS150-48**  
 INPUT : 100-240 V~, 2.5A, 50-60Hz  
 120-180 V===, 2.5A  
 OUTPUT(===) :  
 48V / 2.1A, 100W max convection  
 48V / 3.1A, 150W max with 15CFM forced air

 BALLANT GDFP/PT  
TYPE APPROVED



**TDK-Lambda**  
 XX MADE IN TAIWAN

**CSS150-28**  
 INPUT : 100-240 V ~ 2.5A, 50-60Hz  
 120-180 V= (0% tolerance), 2.5A  
 OUTPUT(=) :  
 28V / 3.6A, 100W max convection  
 28V / 5.4A, 150W max with 15CFM forced air

 BALLANT GDFP/PT  
TYPE APPROVED

**TDK-Lambda** MADE IN TAIWAN XX

<b>TEST ITEM PARTICULARS:</b>	
Classification of use by .....	<input type="checkbox"/> Ordinary person <input checked="" type="checkbox"/> Instructed person <input checked="" type="checkbox"/> Skilled person <input type="checkbox"/> Children likely to be present
Supply Connection.....	<input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Mains <input type="checkbox"/> External Circuit - not Mains connected - <input type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input type="checkbox"/> ES3
Supply % Tolerance .....	<input checked="" type="checkbox"/> +10%/-10% <input type="checkbox"/> +20%/-15% <input type="checkbox"/> +____%/ -____% <input type="checkbox"/> None
Supply Connection – Type .....	<input type="checkbox"/> pluggable equipment type A - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input type="checkbox"/> mating connector <input type="checkbox"/> pluggable equipment type B - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input checked="" type="checkbox"/> other: For Building In
Considered current rating of protective device as part of building or equipment installation.....	Protective device as part of the building installation (20A for North American) Installation location: <input checked="" type="checkbox"/> building; <input type="checkbox"/> equipment
Equipment mobility .....	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in <input type="checkbox"/> rack-mounting <input type="checkbox"/> wall-mounted
Over voltage category (OVC) .....	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other: _____
Class of equipment .....	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III
Access location .....	<input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Operator Accessible.
Pollution degree (PD) .....	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
Manufacturer's specified maximum operating ambient:	45°C
IP protection class .....	<input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP__
Power Systems .....	<input checked="" type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT - ____ V <sub>L-L</sub>
Altitude during operation (m) .....	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> 3000 m
Altitude of test laboratory (m) .....	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> 3000 m
Mass of equipment (kg) .....	<input checked="" type="checkbox"/> 0.5kg
<b>POSSIBLE TEST CASE VERDICTS:</b>	
- 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)
<b>TESTING:</b>	
Date of receipt of test item..... :	02/17/2021 (30982609.300) 09/14/2009 (30982609.001)
Date (s) of performance of tests .....	02/17/2021 (30982609.300) 09/14/2009 – 09/16/2009 (30982609.001)
<b>GENERAL REMARKS:</b>	
<p>"(See Enclosure #)" refers to additional information appended to the report.  "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC62368-1:</b>	
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.....:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
<b>When differences exist; they shall be identified in the General product information section.</b>	
Name and address of factory (ies) :	Power Win Technology Corp. B1F-2, No. 75, 1 Hsin-Tai 5th Rd. Shi-Chi, New Taipei City Taiwan, R. O. C.

**GENERAL PRODUCT INFORMATION:****Product Description:**

The equipment, model series as on the cover page, is a Class I switching type power supply intended for permanent installation into medical electrical apparatus.

The equipment shall be connected to the protective earth terminal of the final system.  
All models have similar design and differ in construction (wiring turns and gauge) of separation transformer T1.  
The dimensions of the double-layer PCB are 127mm by 76mm.

**History of CB report:**

30982609.300 - Original IEC/EN 62368-1 CB report

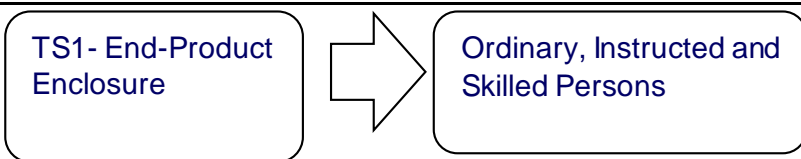
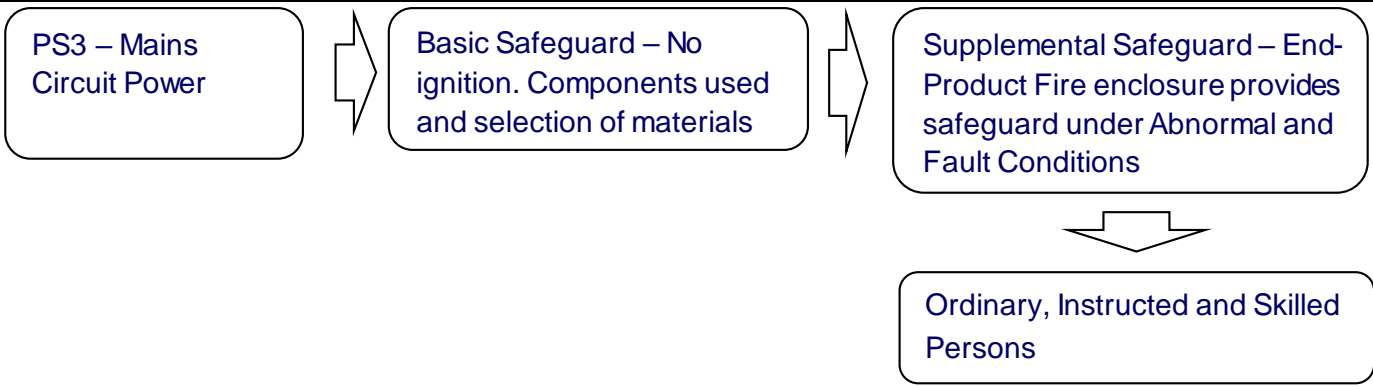
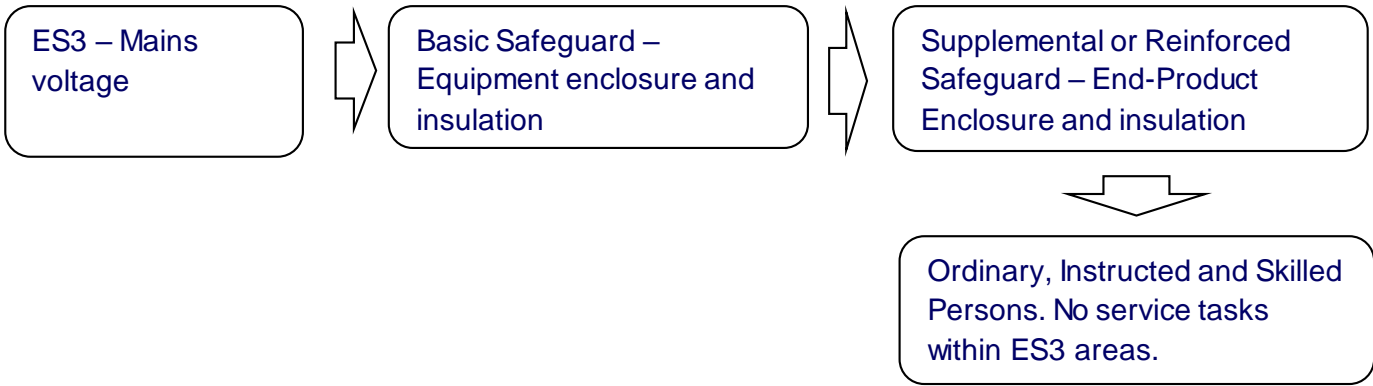
<b>ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:</b>	
(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.)	
<b>Electrically-caused injury (Clause 5):</b> (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input	
ES1	
<b>Source of electrical energy</b>	<b>Corresponding classification (ES)</b>
Primary circuit	ES3
Output circuit	ES1
<b>Electrically-caused fire (Clause 6):</b> (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts):	
PS2	
<b>Source of power or PIS</b>	<b>Corresponding classification (PS)</b>
Power Supply Primary circuit	PS3
Power Supply Output circuit (201.20W)	PS3
<b>Injury caused by hazardous substances (Clause 7)</b> (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component	
Glycol	
<b>Source of hazardous substances</b>	<b>Corresponding chemical</b>
No hazardous substances present in the product.	N/A
<b>Mechanically-caused injury (Clause 8)</b> (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit	
MS2	
<b>Source of kinetic/mechanical energy</b>	<b>Corresponding classification (MS)</b>
Equipment Weight/Mass	MS1
Sharp Edges	MS1
<b>Thermal burn injury (Clause 9)</b> (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.) Example: Hand-held scanner – thermoplastic enclosure	
TS1	
<b>Source of thermal energy</b>	<b>Corresponding classification (TS)</b>
End product Enclosure	TS1
<b>Radiation (Clause 10)</b> (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product	
RS1	
<b>Type of radiation</b>	<b>Corresponding classification (RS)</b>
No ionizing radiation produced in the product.	N/A



**ENERGY SOURCE DIAGRAM**

Indicate which energy sources are included in the energy source diagram. Insert diagram below

ES     PS     MS     TS     RS



<b>OVERVIEW OF EMPLOYED SAFEGUARDS</b>				
<b>Clause</b>	<b>Possible Hazard</b>			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	ES3: primary circuit	End- Product Equipment Enclosure	End-Product Earth	Insulation/ End- Product Enclosure
Ordinary	ES1: power supply output	End- Product Equipment Enclosure	End-Product Earth	Insulation/ End- Product Enclosure
6.1	Electrically-caused fire			
Material part (e.g. mouse enclosure)	Energy Source (PS2: 100 Watt circuit)	Safeguards		
		Basic	Supplementary	Reinforced
Input	PS3: Mains circuits	Component s and selection of materials	End-Product Equipment Enclosure	Insulation/ End- Product Enclosure
Output	PS3: Output	Component s and selection of materials	End-Product Equipment Enclosure	Insulation/ End- Product Enclosure
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
No hazardous substances present in the product.	-	-	-	-
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3:High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	MS1: Mass of Equipment	End- Product Equipment Enclosure	-	-
Ordinary	MS1: Sharp Edges	End- Product Equipment Enclosure	-	-
9.1	Thermal Burn			

Body Part (e.g., Ordinary)	Energy Source (TS2)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	TS1: Accessible surfaces	End-Product Equipment Enclosure	-	-
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
No ionizing radiation produced in the product.	-	-	-	-
Supplementary Information:				
(1) See attached energy source diagram for additional details.				
(2) "N" – Normal Condition; "A" – Abnormal Condition; "S" Single Fault				