Test Report issued under the responsibility of:

TEST REPORT
IEC 61010-1
Safety requirements for electrical equipment for measurement, control, and laboratory use
Part 1: General requirements

Report Number. ..... :	31183682.011
Date of issue ..... :	May 19th, 2014
Total number of pages ..... :	158 pages + Attachments
Applicant's name ..... :	TDK-Lambda Ltd.
Address ..... :	56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel
Test specification:	
Standard ..... :	IEC 61010-1:2010 (Third Edition)
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC61010_1J
Test Report Form(s) Originator .... :	VDE Testing and Certification Institute
Master TRF ..... :	2013-11

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.

Test item description ..... :	Programmable power supply
Trade Mark ..... :	TDK-Lambda, TDK·Lambda
Manufacturer ..... :	TDK-Lambda Ltd., 56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel
Model/Type reference ..... :	1. Z200 series; 2. Z400 series; 3. Z600 series; 4. Z800 series configuration code: Zxxx-yyy-o-p, with xxx=any number between 010 to 650 yyy=any number between 0.32 to 72 o=blank or (in any combination) L, L2, IEEE, IS420, IS510, LAN; p=blank or E, I or U

Ratings .....:	Input: 1: ~100-240V, 3A, 50/60Hz; 2: ~100-240V, 6A, 50/60Hz; 3: ~100-240V, 9A, 50/60Hz; 4: ~100-240V, 12A, 50/60Hz. Output: 1. Z200: from 0-10VDC/0-20A to 0-650VDC/0-0.32A, 220W max. 2. Z400: from 0-10VDC/0-40A to 0-650VDC/0-0.64A, 432W max. 3. Z600: from 0-10VDC/0-60A to 0-650VDC/0-1A, 682W max. 4. Z800: from 0-10VDC/0-72A to 0-650VDC/0-1.25A, 864W max.

Testing procedure and testing location:			
☒	**CB Testing Laboratory:**	**TUV Rheinland of North America**	
Testing location/ address ..... :		**12 Commerce Road, Newtown, CT 06470, USA**	
☐	**Associated CB Laboratory:**		
Testing location/ address ..... :			
	Tested by (name + signature) ..... :		
	Approved by (name + signature) ..... :		
☐	**Testing procedure: TMP**		
Testing location/ address ..... :			
	Tested by (name + signature) ..... :		
	Approved by (name + signature) ..... :		
☐	**Testing procedure: WMT**		
Testing location/ address ..... :			
	Tested by (name + signature) ..... :		
	Witnessed by (name + signature) ..... :		
	Approved by (name + signature) ..... :		
☒	**Testing procedure: SMT**		
Testing location/ address ..... :		56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel	
	Tested by (name + signature) :	Valery Rodionov	
	Approved by (name + signature) ..... :	**Rahul Mehta**	
	Supervised by (name + signature) .... :	**Kiet Wan**	
☐	**Testing procedure: RMT**		
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)

Document No.	Documents included / attached to this report (description)	Page No.
TABLE 1	List of safety relevant components	
TABLE 2	List of test equipment used	
ATTACHMENT 1	National Differences	
ATTACHMENT 2	Photo-documentation (Pages 19)	
ATTACHMENT 3	Transformer Specification Sheet (Pages 7)	

Documents referenced by this report (available on request):

Document Name or No.	Documents description	Page No.
31183682.001	Original report issued for model number Z400- and Z200 series, IEC61010-1 2nd Edition.	
31183682.003	This report for an upgrade of standard to IEC61010-1:2010 [3rd Edition], additional model Z600- and Z800 series; also change of applicant's name and address to 56 Haharoshet St.,P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel.	
31183682.005	Amendment 1 to original CB-report with number 31183682.003 for the listing of an alternate PCB-material in the list of Critical Components. The PCB is manufactured by an alternate manufacturer but according to identical specification and drawings from the applicant which haven't changed.	
31183682.007	Amendment 2 to original CB-report with number 31183682.003 for the change of configuretion code from L to Lx (with x = blank or 0-9), change of input current rating for Z600 series from 12 to 9A, change of output ratings for Z200 and Z400 series from 100Vdc to 650Vdc at same overall power, update of list of critical components due to change of output ratings.	
31183682.009	Amendment 3 to CB-report with number 31183682.007 for the change of configure tion to *xxx=any number between 010 to 650*; *yyy=any number between 0.32 to 72*	

31183682.011	***This report replaces the original CB report 31183682.009 for the change of configuration code L2 and change of input current rating from 6A to 1A for series Z600 and from 8A to 1.25A for model Z800. Also the change of output ratings for Z600 and Z800 series from 100Vdc to 650Vdc at same overall power, update of list of critical components due to change of output ratings.***

Summary of testing:

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The measurements recorded in this Report only relate to the tested items detailed on the first page of this Report and demonstrate conformity with the stated specifications. The items tested were selected by the manufacturer as the worst case representative samples of the product group detailed in the first page of this Report, with which it has design and constructional similarity and a commonality of materials and components.
The following power supplies were supplied as a representative sample of the Z200 (1), Z400 (2), Z600 (3) and Z800 (4) series:
1. Z10-20, Z100-2;
2. Z10-40, Z100-4, Z160-2.6, Z650-0.64
3. Z10-60, Z100-6;
4. Z10-80, Z100-8. Z160-5, Z650-1.25
Units which represent Z200 and Z600 series subjected to partial testing due to similarity with base series Z400 and Z800 correspondingly.

Although the Standard requires testing for a 40° C ambient temperature, the represent items have been rated and therefore tested for operation in a 50° C ambient temperature.

Test Report History:
This report may consist of more than one report and is valid only with additional or previous issued reports:

Ref. No.	Item

Tests performed (name of test and test clause):		**Testing location:**
4.4.2.2	Single fault – protective conductor	**TDK-Lambda Ltd.** **56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel**
4.4.2.7	Single fault – transformers (short / overload)	
4.4.2.8	Single fault – outputs short	
4.4.2.10	Single fault – cooling -ventilation openings blocked -fan(s) stopped	
4.4.2.12	Single fault – bridging of basic insulation	
5.1.3	Mains supply	
5.3	Durability of markings	
6	Values in normal condition (6.1.1 / 6.3.1)	
6.3	Discharge tests (6.6.2 / 6.10.3c)	
6.3.2 b)	Accessible Current	
6.5.2./4	Bonding impedance of equipment	
6.8	Dielectric strength tests + humidity	
7.4	Stability tests	
8.2.1	Static test	
8.2.2	Dynamic test	
8.3	Drop test	
10.1, 10.2, 10.3	Temperature measurements	
10.5.2	Resistance to heat of non-metallic enclosures	
Annex D	Working voltages & Creepage and Clearances	

Summary of compliance with National Differences

List of countries addressed: All EC countries are covered by the report. National Differences for Canada, Switzerland, and United States are addressed in Attachment 1.

☒ **The product fulfils the requirements of:** EN 61010-1: 2010 (3rd Edition)

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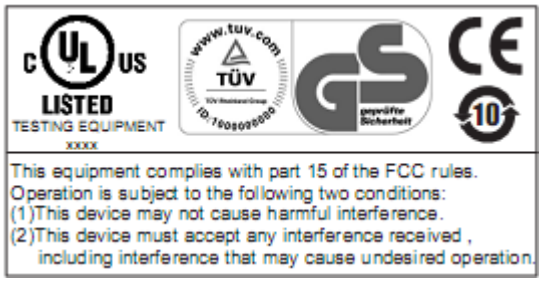
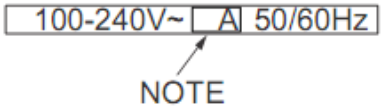
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Main marking plate



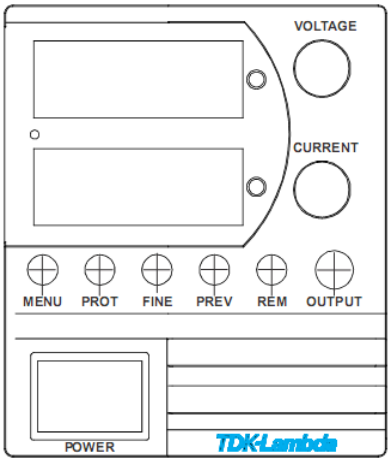
Input rating label (located on rear side near to appliance inlet)



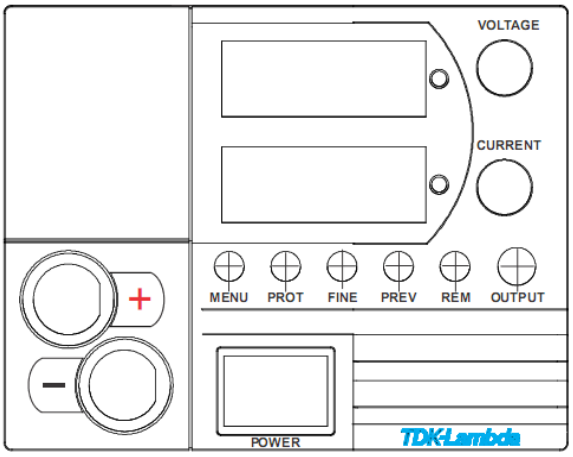
NOTE
1. Z200 series – 3A
2. Z400 series – 6A
3. Z600 series – 9A
4. Z800 series - 12A

Front side screening

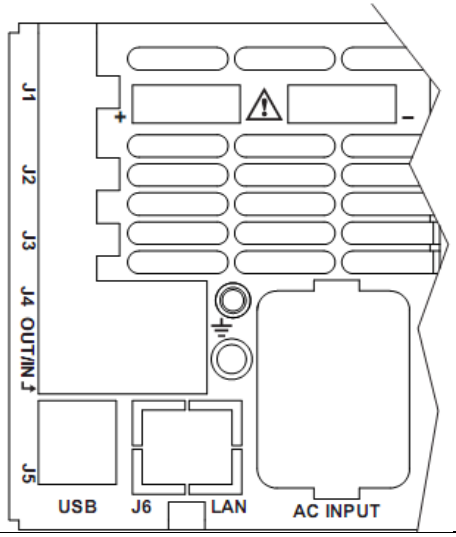
Standard enclosure



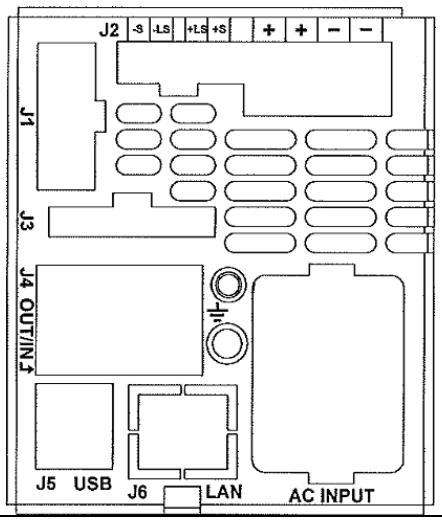
Wide body enclosure



Rear side screening
Models 10V-100V



Models 160V-650V



Test item particulars:	
Type of item ..... :	Laboratory
Description of equipment function..... :	
Connection to MAINS supply ..... :	Detachable cord set
Overvoltage category ..... :	II
POLLUTION DEGREE..... :	
Means of protection ..... :	Class I (PE connected)
Environmental conditions ..... :	Extended (Specify): max. ambient-50°C, altitude-3000m
For use in wet locations..... :	No
Equipment mobility ..... :	Portable
Operating conditions ..... :	Continuous
Overall size of equipment (W x D x H)..... :	Standard enclosure: 70/350/83; Wide body enclosure: 105/350/83
Mass of equipment (kg)..... :	Standard enclosure: 1.9 kg max; Wide body enclosure: 2.4 kg max.
Marked degree of protection to IEC 60529 ..... :	Not marked, IPX0
Possible test case verdicts:	
- Test case does not apply to the test object..... :	N/A (Not Applicable)
- Test object does meet the requirement..... :	P (Pass)
- Test object does not meet the requirement..... :	F (Fail)
Testing:	
Date of receipt of test item ..... :	11/11/2011 [original evaluation according to report number 31183682.001] 12/03/2012 [additional testing for additional models under this report] 12/19/13 [additional testing for additional models under this report 31183682.007] **04/02/14** **[additional testing for change in ratings was performed under this report 31183682.011]**
Date (s) of performance of tests ..... :	11/11/2011 – 11/29/2011 [original evaluation according to report number 31183682.001] 01/21 – 01/25/2013 [additional testing for additional models under this report] 12/19/13-12/23/13 [additional testing for additional models under this report 31183682.007] **04/02/14 – 05/18/14** **[additional testing for change in ratings was performed under this report 31183682.011]**
General remarks:	

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 testing laboratory.
"(see ENCLOSURE #)" refers to additional information appended to the report.
"(see Form A.xx)" refers to a table appended to the report.
Bottom lines for measurement tables Form A.xx are optional if used as record.

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)..... TDK-Lambda Ltd., 56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel

General product information:
Description of unit:

Z200 series, Z400 series, Z600 series and Z800 series are family of switching mode programmable power supplies with output rating as listed below:
1. Z200 series - from 0-10VDC/0-20A to 0-650VDC/0-0.32A, 220W max.
2. Z400 series - from 0-10VDC/0-40A to 0-650VDC/0-0.64A, 432W max.
3. Z600 series - from 0-10VDC/0-60A to 0-650VDC/0-1A, 682W max.
4. Z800 series - from 0-10VDC/0-72A to 0-650VDC/0-1.25A, 864W max.

Z400 and Z200 series, Z600 and Z800 series in pairs are fully identical (el. schematic, construction, PCB, components) except for some components influence of that covered by Temperature Test done for both series.
All series are constructed in two variants of enclosure.
-Standard: standard output located on the rear, no possibility to install an optional modules except for LAN;
-Wide body: two variants of wide body enclosure:
- standard output located on the rear, additional section for optional IEEE card and Isolated Analog card;
- output on front side (binding post), additional section for optional IEEE card and Isolated Analog card.

Description of model differences.

Z200 series, Z400 series, Z600 series and Z800 series Configuration Code: Zxxx-yyy-o-p

where:

xxx = max. output voltage, may be any between 10 and 650;
yyy = max. output current, may be any between 72 and 0.32;
o=options, may be one or combination of some from listed below:
blank- standard model (without an additional modules installed, standard enclosure);
L - lab. option: output on front side-binding post (wide body enclosure, standard connectors, models with output up to 60VDC);
L2 - lab. option: output on front side-binding post (wide body enclosure, isolated CATIII type connectors, all models);
IEEE- fitted with optional IEEE communication module (wide body enclosure);
IS420-fitted with optional current mode Isolated Analog module (wide body enclosure);
IS510-fitted with optional voltage mode Isolated Analog module (wide body enclosure);
LAN- fitted with optional LAN communication module (standard and wide body enclosure)
p=optional power cord set provided with unit, may be as following:
blank- power cord set not provided with unit;
E- power cord set for Europe;
I- power cord set for Israel;
U- power cord set for US/Canada.

Description of special features.
(HV circuits, high pressure systems etc.)