



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.....: 15063002 001
Date of issue: 15.11.2013
Total number of pages.....: 141

Applicant's name.....: TDK-Lambda Corp. Nagaoka Technical Center
Address.....: 2704-1 Settaya-machi, Nagaoka-shi, NIIGATA 940-1195, JAPAN

Test specification:
Standard: IEC 61010-1:2010 (Third Edition)
Test procedure: CB Scheme
Non-standard test method: N/A

Test Report Form No.....: IEC61010_1I
Test Report Form(s) Originator.....: VDE Testing and Certification Institute
Master TRF: 2013-07


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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: Switching Power Supply
Trade Mark.....: **TDK-Lambda**
Manufacturer.....: Same as applicant
Model/Type reference.....: SWS600L-**xy**, HWS600L-**xy**, SWS600L-12/DAK,
SWS600L-12/DAK2, SWS600L-12/LNF, HWS600L-36/BATz,
HWS600L-60/BATz
(**x** = 3, 5, 12, 15, 24, 36, 48 or 60; **y** = blank, /RF, /CO2, /RFCO2 or /LNF1; **z** = blank or 3 digit max which consist of 0 to 9 and/or A to Z)
Ratings.....: Refer to page 7 for details

Testing procedure and testing location:		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	TÜV Rheinland (Shanghai) Co., Ltd.
Testing location/ address..... :		B1-13/F, No.177, Lane 777, West Guangzhong Road, Zhabei District, Shanghai 200072, P.R. China
<input type="checkbox"/>	Associated CB Laboratory:	
Testing location/ address..... :		
Tested by (name + signature)		Nelson Yao 
Approved by (name + signature)..... :		Mark Chen
<input type="checkbox"/>	Testing procedure: TMP	
Testing location/ address..... :		
Tested by (name + signature)		
Approved by (name + signature)..... :		
<input type="checkbox"/>	Testing procedure: WMT	
Testing location/ address..... :		
Tested by (name + signature)		
Witnessed by (name + signature).... :		
Approved by (name + signature)..... :		
<input type="checkbox"/>	Testing procedure: SMT	
Testing location/ address..... :		
Tested by (name + signature)		
Approved by (name + signature)..... :		
Supervised by (name + signature)... :		
<input type="checkbox"/>	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 - Table 1):		
Document No.	Documents included / attached to this report (description)	Page No.
Attachment 1	National Differences	14
Attachment 2	Photo Documentation	32
Summary of testing:		
<ul style="list-style-type: none"> This test report is an upgrade to IEC 61010-1: 2010 and EN 61010-1: 2010. It replace the original test report 15038878 001 and modification report 15038878 002. The construction check and all tests are conducted on the sample according to EN 61010-1:2010 and found to be fulfilled all the requirements. The maximum operating temperature was specified as +50 °C (100% load) and + 74 °C (50% load), especially or models with suffix "RF" only +30°C (100% load) and +60°C (60% load), detail information refer to output derating curve. All models in this series are identical except for output rating, the turns of secondary winding in transformer (T32), the rating of some components in secondary circuits, input terminal block, fan airflow direction, coating material. Unless otherwise specified, all tests were conducted on base models SW S600L-5, SWS600L-5/RF, SWS600L-12/DAK, SWS600L-15, SWS600L-15/RF, SWS600L-24, SWS600L-48, SWS600L-8/RF, SWS600L-60 and SWS600L-60/RF to represent the worst case condition for the respective tests according to max. output voltage, max. output current or max. output power reasons. Heating measurement were performed under the maximum operating temperature, mounting direction and load conditions specified in instruction manual and output derating curve. Test samples are preproduction samples without serial numbers. 		
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	
15038878 001	Original test report according to IEC 61010-1: 2001	
15038878 002	Modification	
Tests performed (name of test and test clause):		Testing location:
4.4.2 Testing in single fault conditions 5.1.3c) Mains supply 5.3 Durability of markings 6.3.1 Values in normal condition 6.3.2 Values in single fault condition 6.7 Insulation requirement 6.8 Dielectric strength tests 10 Temperature measurements 10.5.3 Insulating materials		See page 2.

Summary of compliance with National Differences

List of countries addressed:

CH, CA, US, JP

Explanation of used codes: CH=Switzerland, CA=Canada, US= United States of America, JP=Japan

The product fulfils the requirements of EN 61010-1:2010 (Second 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.

<Representative>



Test item particulars:	
Type of item	: Building-in power supply unit for Laboratory, measurement or control application
Description of equipment function	: Switching power supply unit
Connection to MAINS supply.....	: Screw terminal block for building-in use
Overvoltage category.....	: II
POLLUTION DEGREE.....	: II
Means of protection	: Class I (PE connected)
Environmental conditions.....	: +74°C (refer to Summary of testing and the instruction manual)
For use in wet locations	: No
Equipment mobility	: Built-in
Operating conditions.....	: Continuous
Overall size of equipment (W x D x H)	: --
Mass of equipment (kg)	: Approx. 1.8
Marked degree of protection to IEC 60529.....	: IPX0
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	: October, 2013
Date (s) of performance of tests	: October, 2013
General remarks:	
<p>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.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>	

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. Wuxi TDK-Lambda Electronics Co., Ltd.
No.6 Xing Chuang Er Lu, 214028 Wuxi,
Jiangsu, China
2. TDK-Lambda Malaysia Sdn. Bhd.
Lot 2 & 3, Batu 9 3/4 Kawasan Perindustrian,
Bandar Baru Jaya Gading, 26070 Kuantan
Pahang Malaysia
3. TDK-Lambda Corp. Nagaoka Technical
Center
2704-1 Settaya-machi, Nagaoka-shi, NIIGATA
940-1195, JAPAN
4. Zhangjiagang Hua Yang Electronics Co., Ltd.
Zhao Feng Industrial Zone, Leyu Town,
215622 Zhangjiagang, Jiangsu, China
5. ALPS Logistics Facilities Co., Ltd.
36-1 Kasuminosato, Ami-machi Inashiki-gun,
IBARAKI 300-0396, JAPAN
6. Sendan Electronics Mfg. Co., Ltd.
1010, Habushin Nanto-shi, TOYAMA 939-
1756 JAPAN

General product information:

The tested product is switching power supply (building-in type) and is designed for research work in widely field such as laboratory within the scope of IEC/EN 61010-1.

All models in this series are identical except for output rating, the turns of secondary winding in transformer (T32), the rating of some components in secondary circuits, input terminal block, fan airflow direction and coating material.

HWS600L-xy is identical to SWS600L-xy except for type designation.

SWS600L-12/LNF is identical to SWS600L-12 except for fan type.

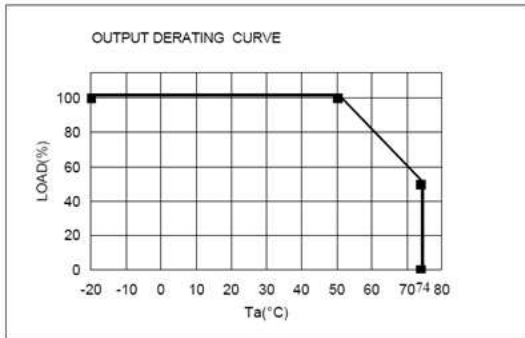
Model list:

Character Model	Input Rated Voltage (V a.c.)	Input Rated current (A)	Input frequency (Hz)	Min. Output	Rated output	Max. Output	Max. Output Power (W)
SWS600L-3y HWS600L-3y	100-240	10	50/60	2.64V d.c.	3.3V d.c.	3.96V d.c.	396
				120A	120A	100A	
SWS600L-5y HWS600L-5y	100-240	10	50/60	4.0V d.c.	5V d.c.	6.0V d.c.	600
				120A	120A	100A	
SWS600L-12y HWS600L-12y	100-240	10	50/60	9.6V d.c.	12V d.c.	14.4V d.c.	636
				53A	53A	44.2A	
SWS600L-15y HWS600L-15y	100-240	10	50/60	12.0V d.c.	15V d.c.	19.5V d.c.	645
				43A	43A	33.1A	
SWS600L-24y HWS600L-24y	100-240	10	50/60	19.2V d.c.	24V d.c.	28.8V d.c.	648 (744)
				27A (31A)	27A (31A)	22.5A (25.83)A	
SWS600L-36y HWS600L-36y	100-240	10	50/60	28.8V d.c.	36V d.c.	43.2V d.c.	648
				18A	18A	15A	
HWS600L-36/BATz	100-240	10	50/60	28.0V d.c.	36V d.c.	43.2V d.c.	648
				18A	18A	15A	
SWS600L-48y HWS600L-48y	100-240	10	50/60	38.4V d.c.	48V d.c.	56.0V d.c.	624 (720)
				13A (15A)	13A (15A)	11.14A (12.86A)	
SWS600L-60y HWS600L-60y	100-240	10	50/60	48.0V d.c.	60V d.c.	66.0V d.c.	600
				10A	10A	9.09A	
HWS600L-60/BATz	100-240	10	50/60	48.0V d.c.	60V d.c.	66.0V d.c.	600
				10A	10A	9.09A	
SWS600L-12/DAK, SWS600L-12/DAK2, SWS600L-12/LNF	100-240	10	50/60	--	12V d.c.	--	636
				--	53A	--	

Note: The values in parentheses are peak current or peak power, operating period at peak output current is less than 10s, duty less than 35% (it defines the dynamic load, peak load for 10sec and normal load for 18.6s). Average output power and current is less than max. output power and max. output current.

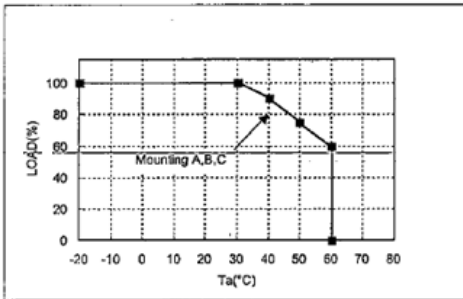
Output derating curve:

For models SWS600L-xy, HWS600L-xy:



Ta(°C)	LOAD(%)
	Mounting A,B,C
-20-50	100%
74	50%

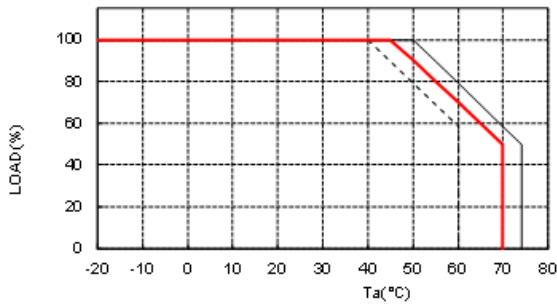
For model: SWS600L-xy, HWS600L-xy:



Ta(°C)	Load (%)
	Mounting A, B, C
-20 ~ +30	100
+40	90
+50	75
+60	60

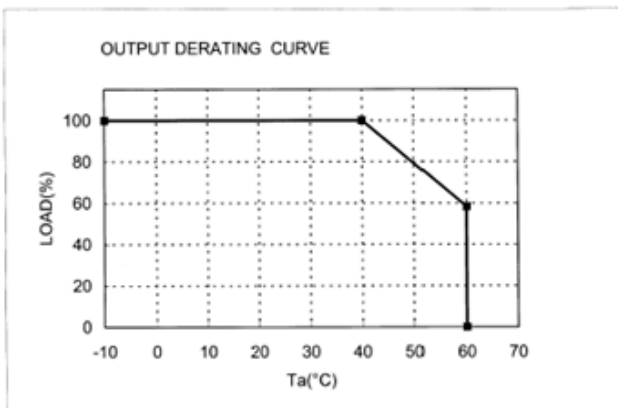
1. Output Derating Comparison

TENTATIVE



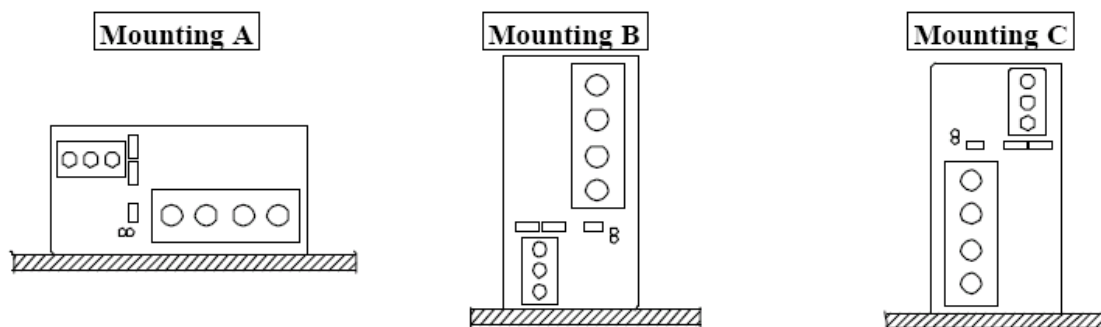
- SWS600L
- - - SWS600L-12/LNF
- SWS600L/LNF 1

For model SWS600L-12/LNF:

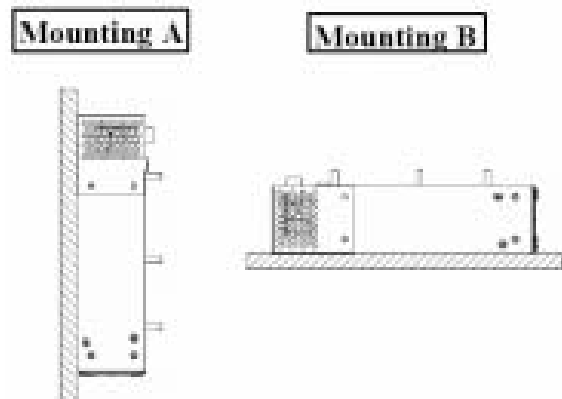


Ta(°C)	LOAD(%)
	Mounting A,B,C
-10-40	100%
60	58.3%

Mounting direction for model SWS600L-xy, HWS600L-xy, SWS600L-12/LNF:



Mounting direction for model SWS600L-12/DAK and SWS600L-12/DAK2:



Definition of variable(s):

Variable:	Range of variable:	Content:
x	3, 5, 12, 15, 24, 36, 48 or 60	Stands for output voltage.
y	Blank, /RF, /CO2, /RFCO2 or /LNF1	Blank stands for basic models. /RF stands for the cooling fan reversed installation. /CO2 stands for additional coating material on the PWB on weld side. /RFCO2 stands for the cooling fan reversed installation and additional coating material on the PWB on weld side. /LNF1 stands for Low Noise Fan 1.
z	blank or 3 digit max which consist of 0 to 9 and/or A to Z	Stands for identification of customer's request, no technical change.

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

Indicate used abbreviations (if any)