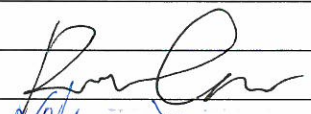
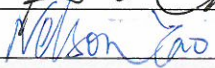




Test Report issued under the responsibility of:



TEST REPORT IEC 60950-1 Information technology equipment – Safety – Part 1: General requirements	
Report Number	15081708 001
Date of issue	2015-10-23
Total number of pages	86
Applicant's name	TDK-Lambda Corp. Nagaoka Technical Center
Address	2704-1 Settaya-machi, Nagaoka-shi, Niigata, 940-1195, JAPAN
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
Copyright © 2014 IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE System). All rights reserved.	
This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.	
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		Switching Power Supply	
Trade Mark		TDK-Lambda	
Manufacturer.....		Same as applicant	
Model/Type reference		MWS65-5, MWS65-12, MWS65-15, MWS65-24, MWS65-48	
Ratings		See the model list on 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 Testing Laboratory:		
Testing location/ address			
Tested by (name + signature)		Roy Chen	
Approved by (name + signature)		Nelson Yao	
<input type="checkbox"/>	Testing procedure: TMP/CTF Stage 1:		
Testing location/ address			
Tested by (name + signature)			
Approved by (name + signature)			
<input type="checkbox"/>	Testing procedure: WMT/CTF Stage 2:		
Testing location/ address			
Tested by (name + signature)			
Witnessed by (name + signature)			
Approved by (name + signature)			
<input type="checkbox"/>	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):

- ATTACHMENT 1 - Photo documentation (3 pages)
- ATTACHMENT 2- National Differences (28 pages)

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

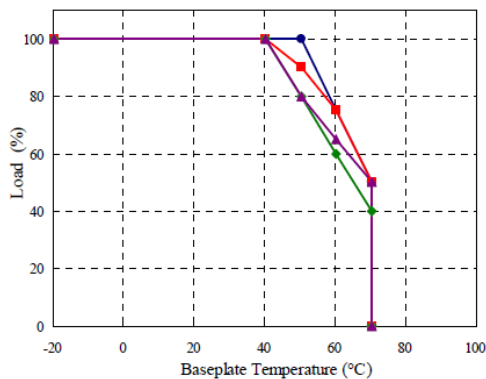
History of CB Test Report:

- 1) Test report No. 15043545 001. The test report was issued for TDK-Lambda Corp. Nagaoka Technical Center, and addressed model mentioned page 2 tested according to IEC 60950-1:2005.
- 2) Test report No. 15043545 002. The test report was issued for TDK-Lambda Corp. Nagaoka Technical Center, and addressed model mentioned page 2 tested according to IEC 60950-1:2005 for first modification.
- 3) Test report No. 15053459 001. The upgrade test report was issued for TDK-Lambda Corp. Nagaoka Technical Center, and addressed model mentioned page 2 tested according to IEC 60950-1:2005+A1.
- 4) Test report No. 15081708 001. This test report issued for TDK-Lambda Corp. Nagaoka Technical Center serves to combine and upgrade the above mentioned test reports. In this test report updates Group and National Differences. However it is separate CB test report and it does not have to be used in conjunction with any of the previously issued, above mentioned CB test reports.

Summary of testing:

- All applicable tests as described in Test Case and Measurement Sections were performed.
- Specified ambient temperature for operation is according to manufacturer's specification.(see below chart of convection cooling)
- The load conditions used during testing: Maximum normal load according to sub-clause 1.2.2.1 for this equipment is the operation with the maximum specified DC-load with maximum power condition according to the manufacturer specified.
- The equipment is operated up to 3000m above sea level as declared by manufacturer. Clearances have been evaluated according to IEC 60664-1:1992 table A.2 with a multiplication factor of 1.14 throughout this report.

■ CONVECTION COOLING



(*1)Output derating is different depending on the output voltage

- MOUNTING : (A)-(B) : 5V - 48V
(C) : 12V
(D)-(E) : 12V/48V
- MOUNTING : (C) : 5V/15V/24V/48V
(D)-(E) : 15V/24V
- ▲ MOUNTING : (D)-(E) : 5V
- ◆ MOUNTING : (F) : 5V - 48V

Ta(°C)	Load(%) A,B,C,D,E	Load(%) C,D,E	Load(%) D,E	Load(%) F
-20~40	100			
50	100	90	80	80
60	75	75	65	60
70	50	50	50	40

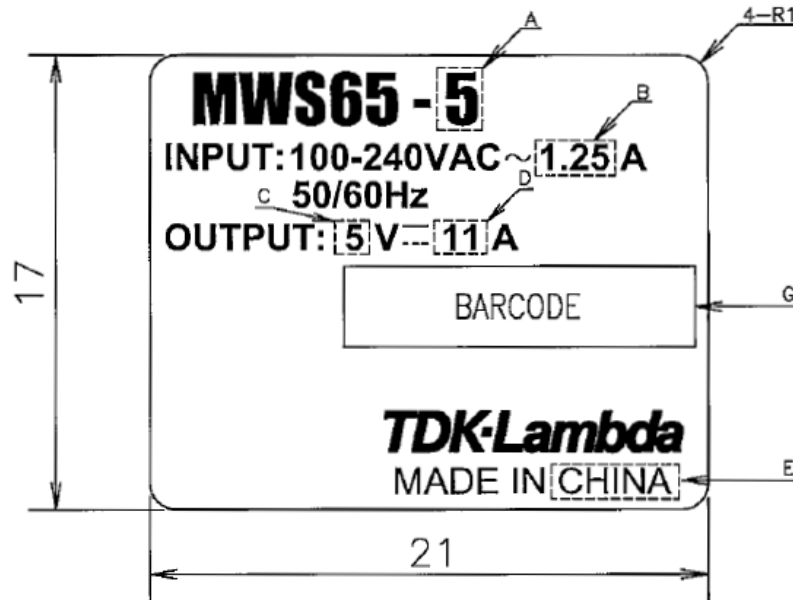
Tests performed (name of test and test clause): Tested in original report No. 15043545 001		Testing location: TÜV Rheinland (Shanghai) Co., Ltd. B1-13/F, No.177, Lane 777, West Guangzhong Road, Zhabei District, Shanghai 200072, P. R. China
Clause	Test description	
1.6.2	Input Current	
1.7.11	Durability	
2.1.1.5	Energy hazards	
2.1.1.7	Discharge of Capacitors in equipment	
2.2.2	Voltages under normal conditions	
2.2.3	Voltages under fault conditions	
2.4	Limited current circuits	
2.6.3.4	Resistance of earthing conductors and their terminations	
2.9.2	Humidity Conditioning - Electrical insulation	
2.10.2	Determination of working voltage	
2.10.3 & 2.10.4	Clearances, creepage distances	
4.5.2	Temperature tests	
4.5.5	Resistance to abnormal heat	
5.1.6	Touch current and protective conductor current	
5.2	Electric strength	
5.3	Abnormal operating and fault conditions	
Annex C	Transformers	
Modification report No. 15043545 002		Same as above
Clause	Test description	
2.10.3 & 2.10.4	Clearances, creepage distances	
Upgrade report No. 15053459 001 Testing during original evaluation according to report number 15043459 001 and 15043549 002, no further testing was deemed necessary for this upgrade of standard.		Same as above
this report No. 15081708 001 No further testing performed for the Amendment 2.		Same as above
Summary of compliance with National Differences List of countries addressed: EU Group Differences, EU Special National Conditions, AT, CA, DK, US, IT, SE, GB Explanation of used codes: AT=Austria; CA=Canada; DK=Denmark; IT=Italy; SE=Sweden; GB=United Kingdom; US = United States of America. The product fulfils the requirements of EN 60950-1:2006+A11+A1+A12+A2, UL 60950-1:2007 R10.14 and CAN/CSA C22.2 No. 60950-1-07+A1:2011+A2:2014.		

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.

<Representative>

RoHS COMPLIANCE



1. MATERIAL YUPO 80 MIC SYNTHETIC PAPER, WHITE (PURCHASED PRINTING)
PET 50MIC SYNTHETICK PAPER, WHITE (FOR INHOUSE PRINTING SEAL)
2. INK BLACK
3. SAFETY UL, C-UL APPROVAL TEMPERATURE -40°C TO 100°C

4. LETTERING :

	FONT	POINT	HEIGHT (mm)
MWS65-5	IMPACT	8	2.0
INPUT:_, OUTPUT:_	ARIAL(BOLD)	4	1.0
MADE IN CHINA	ARIAL	4	1.0
TDK-Lambda LOGO	ORIGINAL		1.5

5. OTHERS

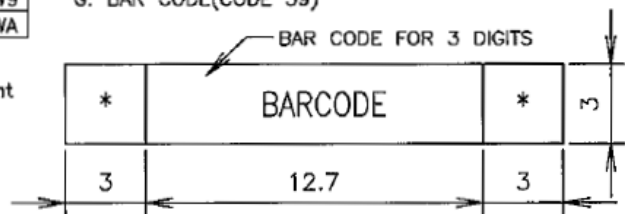
MODEL	A	B	C	D	G
MWS65-5 EHFP+	5	1.25	5	11	CW4
MWS65-12 EHFP+	12	1.35	12	5	CW6
MWS65-15 EHFP+	15	1.35	15	4.4	CW8
MWS65-24 EHFP+	24	1.35	24	2.8	CW9
MWS65-48 EHFP+	48	1.35	48	1.4	CWA

E: COUNTRY OF MANUFACTURE WILL BE SHOWN.
JAPAN or MALAYSIA or CHINA or VIETNAM.

F: BRACKETS IN DOTTED LINES SHOULD NOT APPEAR ON THE FINAL NAME PLATE.

G: BAR CODE(CODE 39)

6. RoHS Compliance :
Refer to T-L Group Green Procurement
Guideline : DL-EMS-010_.



* NO OTHER MARKING ALLOWED WITHIN 3mm OF BOTH ENDS OF THE BAR CODE.

Test item particulars	: See below
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
Connection to the mains	: <input checked="" type="checkbox"/> pluggable equipment <input checked="" type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Operating condition	: <input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	: <input type="checkbox"/> operator accessible <input checked="" type="checkbox"/> restricted access location
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:
Mains supply tolerance (%) or absolute mains supply values	: ±10%
Tested for IT power systems	: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
IT testing, phase-phase voltage (V)	: For Norway, 230V
Class of equipment	: <input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	: 16 (20 for US/CSA)
Pollution degree (PD)	: <input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	: IPX0
Altitude during operation (m)	: Up to 3000
Altitude of test laboratory (m)	: ≈17
Mass of equipment (kg)	: ≅0.12kg
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	: June, 2011 (for original report 15043545 001) November, 2011(for original report 15043545 002) August, 2012 (for report 15053459 001) N/A (for this report)
Date(s) of performance of tests	: June - July, 2011 (for original report 15043545 001) November, 2011(for original report 15043545 002) August, 2012 (for report 15053459 001) N/A (for this report)
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See ATTACHMENT #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> 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) : 1. Wuxi TDK-Lambda Electronics Co., Ltd.
No. 6 Xing Chuang Er Lu, Wuxi, Jiangsu
214028, P. R. 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. Zhangjiagang Hua Yang Electronics Co., Ltd.
Zhao Feng Industrial Zone, Leyu Town,
Zhangjiagang, Jiangsu 215622, P. R. China

General product information:

The EUTs are class I open-frame switching mode power supply intended for building-in use in information technology equipment.

The equipment employs following PCB:

- PFA-001B (primary, PB and secondary circuits, (double multilayers) PCB)

All models are identical except for following differences:

For rating differences between the models see below tables:

Model	Rated input	Minimal output	Rated output (typical)	Maximum output
MWS65-5	AC 100-240V, 1.25A, 50/60Hz	4.5Vdc	5Vdc	5.5Vdc
		11A	11A	10A
MWS65-12	AC 100-240V, 1.35A, 50/60Hz	10.8Vdc	12Vdc	13.2Vdc
		5A	5A	4.55A
MWS65-15	AC 100-240V, 1.35A, 50/60Hz	13.5Vdc	15Vdc	16.5Vdc
		4.4A	4.4A	4.0A
MWS65-24	AC 100-240V, 1.35A, 50/60Hz	21.6Vdc	24Vdc	26.4Vdc
		2.8A	2.8A	2.55A
MWS65-48	AC 100-240V, 1.35A, 50/60Hz	43.2Vdc	48Vdc	52.8Vdc
		1.4A	1.4A	1.27A

Remark:

Operating temp.: -20°C to +70°C (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual).

Item	MWS65-5	MWS65-12	MWS65-15	MWS65-24	MWS65-48
Secondary E-Capacitor (C51, C52)	10V, 1800µF max.	25V, 820µF max.	25V, 820µF max.	35V, 560µF max.	63V, 180µF max.
Secondary E-Capacitor (C53)	10V, 1800µF max.	25V, 820µF max.	25V, 820µF max.	Without	Without
Secondary E-Capacitor (C54)	10V, 1800µF	Without	Without	Without	Without
Secondary E-Capacitor (C55)	10V, 1000µF max.	25V, 560µF max.	25V, 560µF max.	35V, 390µF max.	63V, 100µF max.

Additional Information

- The product is component type power supply., the overall compliance shall be investigated in the complete information technology equipment, in particular as:
 - Fire enclosure
 - Mechanical enclosure
 - Electrical enclosure
- Some components are **pre-certified**, which have been evaluated according to the relevant requirements of IEC 60950-1, are employed in this product. Their suitability of use has been checked according to subclauses 1.5.1 and 1.5.2.
- The product is a **component** intended for incorporation in information technology equipment, the overall compliance shall be investigated in the complete information technology equipment
- The label is draft of artwork for marking plates pending approval by National Certification Bodies and it shall not be affixed to products prior to such an approval.
- Tests were repeated with each alternative source of components with identical results unless otherwise specified.

MARKINGS AND INSTRUCTIONS

- The installation instruction is provided in English, information regarding:
 - Electrical specification
 - Maximum operating temperature
- Fuse Identification (See [subclause 1.7.6](#)): F1, F2 T2.5A/ 250V

The product also marked with:

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING OF FUSE.

Definition of variable(s):

Variable:	Range of variable:	Content:
--	--	--
--	--	--

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
-Short-circuited	s-c	-No component damage	NCD
-Open-circuited	o-c	-Component damage	CD
-Overloaded	o-l	-Test repeated, similar result	RT
-Internal protection operated	IP	-No indication of dielectric breakdown	NB
-Input	i/p	-Cheesecloth remained intact	NC
-Output	o/p	-Tissue paper remained intact	NT
-Constant temperatures were obtained	CT	-The unit can recover auto when removing the abnormal condition	RA

Indicate used abbreviations (if any)