Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT

IEC 60950-1

Information technology equipment – Safety – Part 1: General requirements

Report Number.	15081710 001
Date of issue	2015-10-27
Total number of pages	130
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

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 .....:	SWS300-**xz**, SWS600-**yz**, SWS300A-**ef** (**x** = 3, 5, 7R5, 12, 15, 24, 24/SIM, 28, 36 or 48; **y** = 3, 5, 12, 12/LFN2, 15, 24, 24/BA1, 36, 36/32, 48 or 48/BA2; **z** = blank, /CQC, CO2 or /CO2; **e** = 3, 4, 5, 7R5, 12, 15, 24, 28, 36 or 48; **f** = blank, /CO2, /HC, /T, /LFN or /CQC)		
Ratings .....:	Refer to model list on pages 11-13 for details.		
Testing procedure and testing location:			
☒ **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		
☐ **Associated CB Testing Laboratory:**			
Testing location/ address.....:			
Tested by (name + signature) .....:	Roy Chen		
Approved by (name + signature) .....:	Nelson Yao		
☐ **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):

- ATTACHMENT 1 - Photo documentation (36 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:

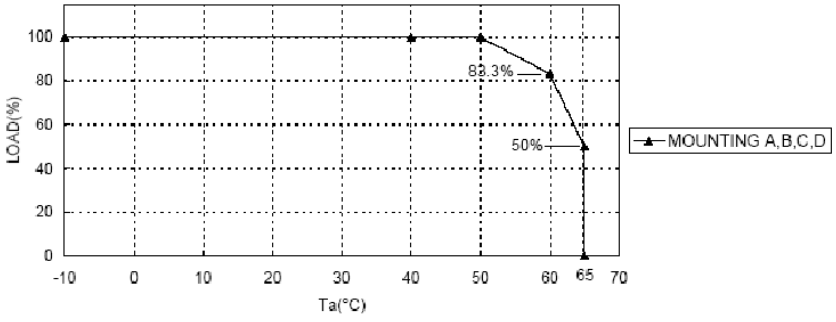
- Test report No. 15032269 001, The test report was issued for TDK-Lambda Corp. and addressed model mentioned page 2 tested to IEC 60950-1:2005 (2nd Edition).
- Test report No. 15032835 001, The test report was issued for TDK-Lambda Corp. and addressed model mentioned page 2 tested to IEC 60950-1:2005 (2nd Edition); Am1: 2009.
- Test report No. 15057319 001 This test report issued for TDK-Lambda Corp. serves to combine and update the above mentioned test reports. In this test report updates output rating to include minimum and maximum value.
- Test report No. 15081710 001. This test report issued for TDK-Lambda Corp. Nagaoka Technical Center serves to combine and upgrade test requirement for 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.

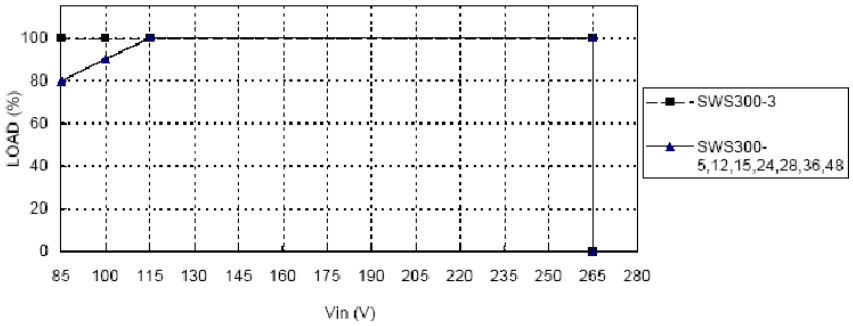
Summary of testing:

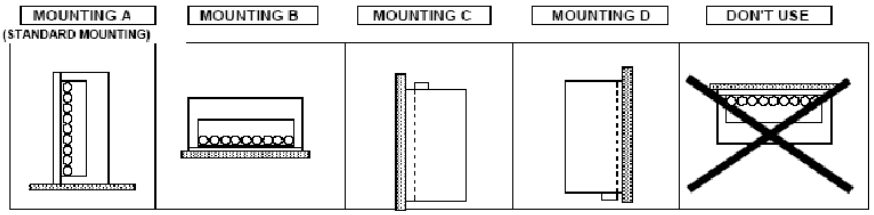
- All applicable tests as described in Test Case and Measurement Sections were performed.
- Unless otherwise specified, tests were performed on model SWS300-5, SWS300-12, SWS300-36, SWS300-48, SWS600-5, SWS600-12, SWS600-36, SWS600-48, SWS300A-5, SWS300A-24 and SWS300A-48 to representative other models.
- The maximum operating temperature was specified as +50°C maximum.
- The load conditions please refer to output de-rating curve in following pages for detail information.
- Heating measurement were performed according to the maximum operating temperature and load conditions specified in instruction manual and output de-rating curve.
- TS1 and TH201 of SWS300A are shorted for all of tests. The voltage of fan is 9.95Vdc When TH201 is short.

Output derating curve and mounting direction:

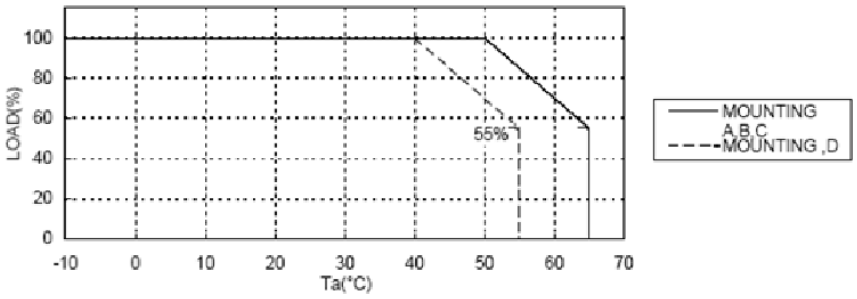
For model: SWS300-x series



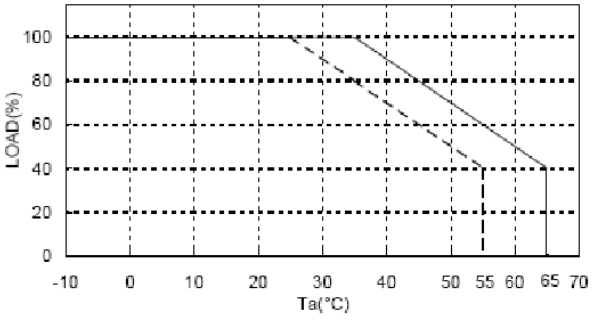




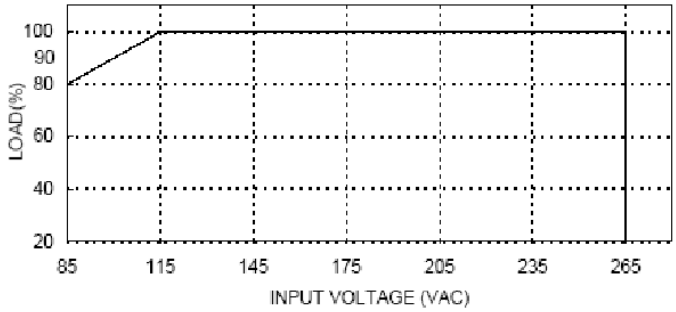
For model: SWS600-y series

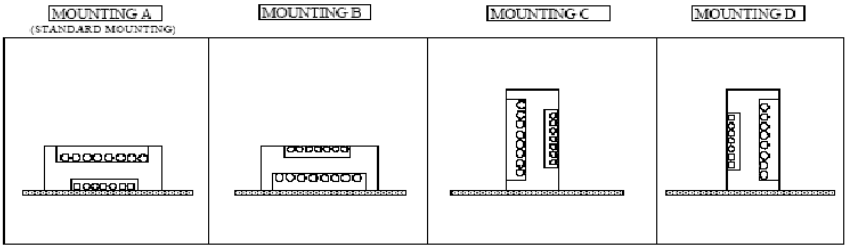


OUTPUT DERATING VS AMBIENT TEMPERATURE

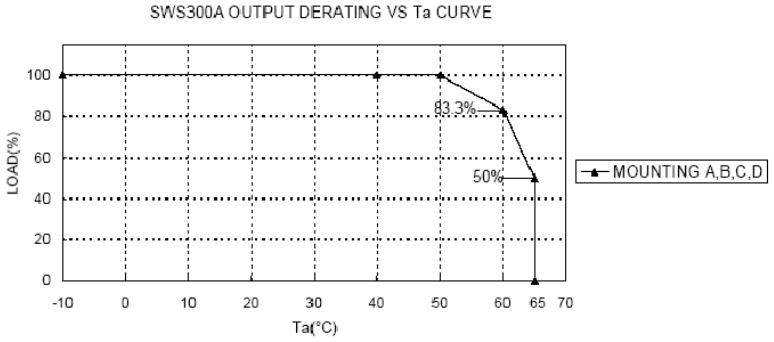


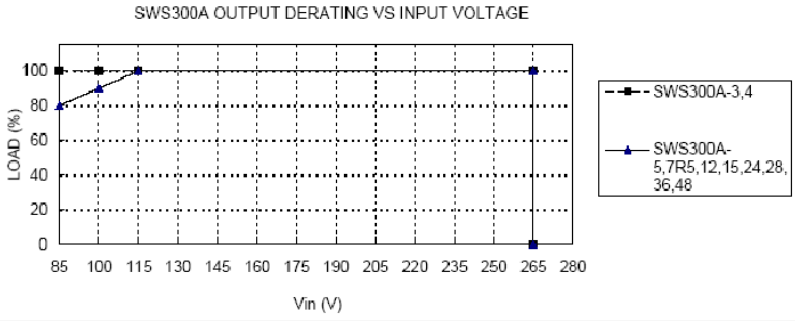
Note: For model of SWS600-12/LFN2 only.

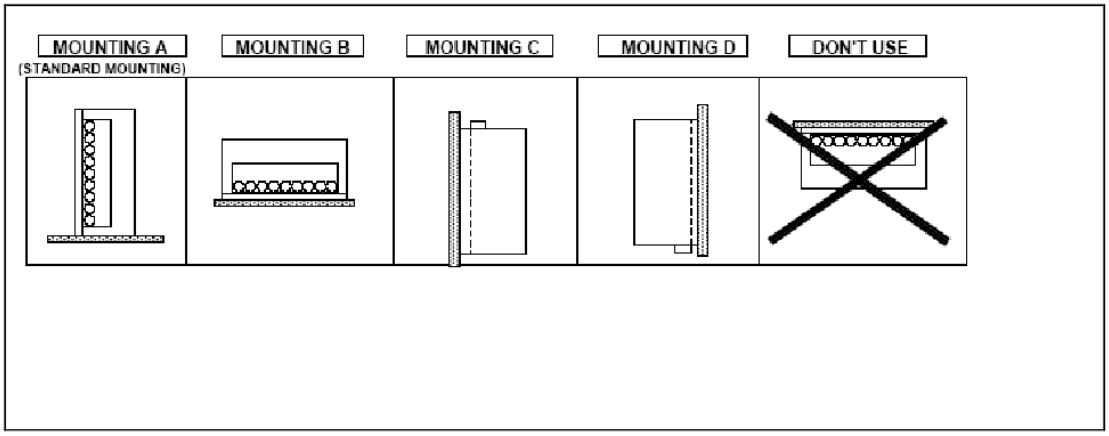




For model: SWS300A-e series






MOUNTING A
(STANDARD MOUNTING)
MOUNTING B
MOUNTING C
MOUNTING D
DON'T USE

Tests performed (name of test and test clause):

Tested in original report No. 15032269 001

Clause	Test description
1.6.2	Input Current
1.7.11	Durability
2.1.1.7	Discharge of Capacitors in equipment
2.2.2	Voltages under normal conditions
2.2.3	Voltages under fault conditions
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
5.1.6	Touch current and protective conductor current
5.2	Electric strength
5.3	Abnormal operating and fault conditions
Annex C	Transformers

Testing location:

TÜV Rheinland (Shanghai) Co., Ltd. No.2A/B building, Guangzhong Road West, Shanghai 200072, P.R. China

For report 15032835 001 Testing during original evaluation according to report number 15032269 001, no further testing was deemed necessary for this upgrade of standard	TÜV Rheinland (Shanghai) Co., Ltd. 10-15/F, Huatsing Building, No.88, Lane 777, West Guangzhong Road, Zhabei District, Shanghai 200072, P. R. China
For report 15057319 001 No further testing performed for the CB re-issue.	TÜV Rheinland (Shanghai) Co., Ltd. B1-13/F, No.177, Lane 777, West Guangzhong Road, Zhabei District, Shanghai 200072, P. R. China
this report No. 15081710 001 No further testing performed for the Amendment 2.	TÜV Rheinland (Shanghai) Co., Ltd. B1-13/F, No.177, Lane 777, West Guangzhong Road, Zhabei District, Shanghai 200072, P. R. China

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:

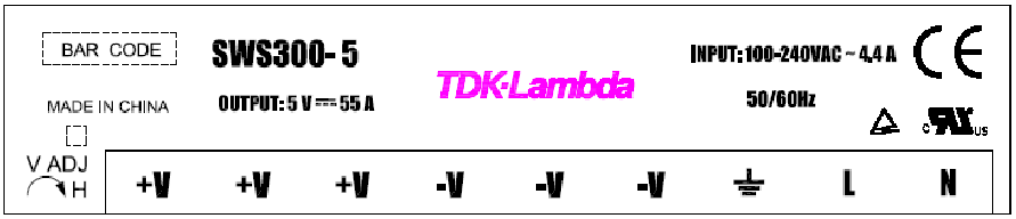
AT=Austria; CA=Canada; DK=Denmark; IT=Italy; SE=Sweden; GB=United Kingdom; US = United States of America.

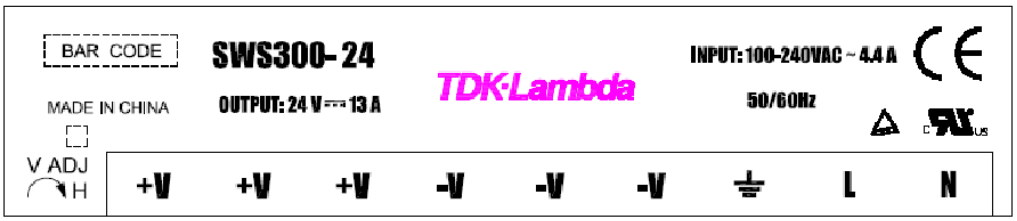
The product fulfils the requirements of EN 60950-1:2006+A11+A1+A12+A2, UL 60950-1:2007 R10.14 and CAN/CSA C22.2 No. 60950-1-07+A1:2011+A2:2014.

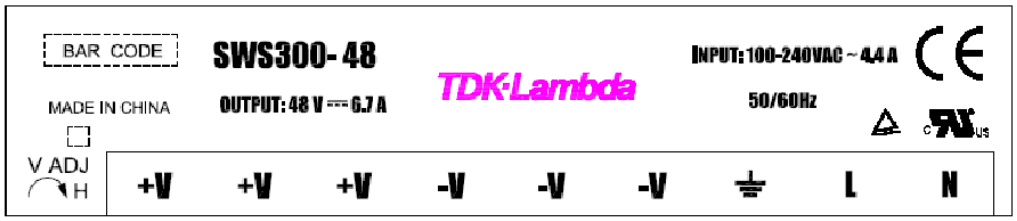
Copy of marking plate

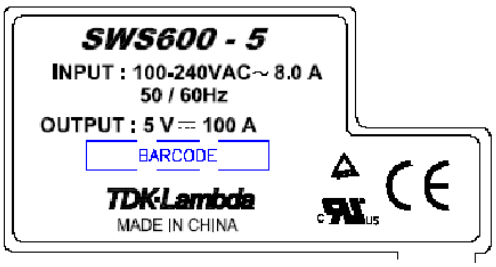
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

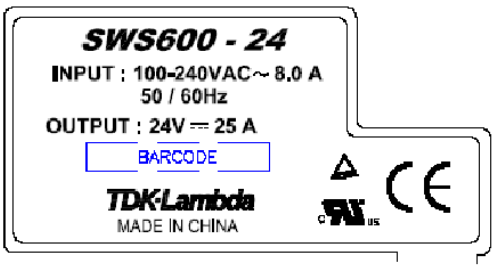
<Representative>

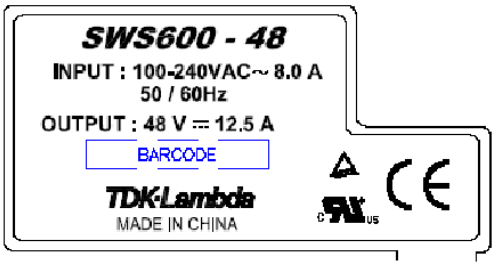




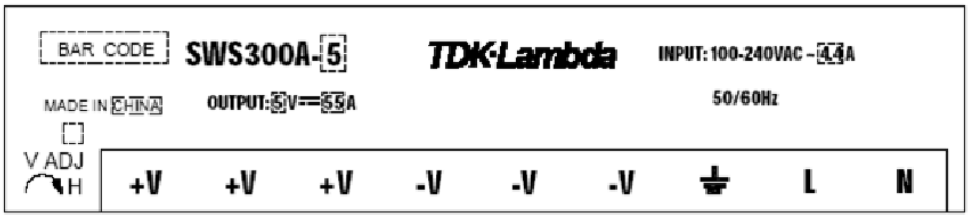


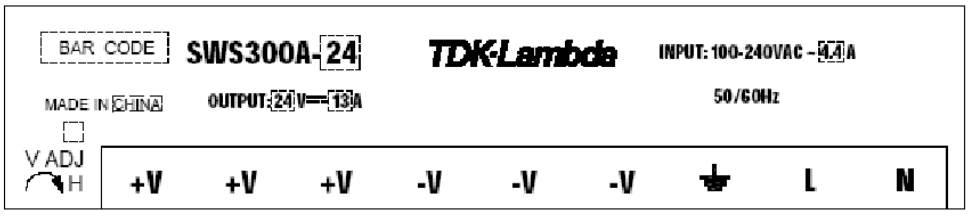


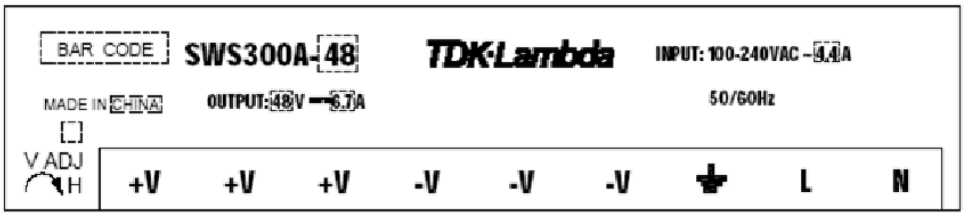




Cont.


BAR CODE
SWS300A-5
TDK·Lambda
INPUT: 100-240VAC – 4.4A
50/60Hz
MADE IN CHINA
OUTPUT: 5V 55A
V ADJ
H
+V +V +V -V -V -V L N


BAR CODE
SWS300A-24
TDK·Lambda
INPUT: 100-240VAC – 4.4A
50/60Hz
MADE IN CHINA
OUTPUT: 24V 13A
V ADJ
H
+V +V +V -V -V -V L N


BAR CODE
SWS300A-48
TDK·Lambda
INPUT: 100-240VAC – 4.4A
50/60Hz
MADE IN CHINA
OUTPUT: 48V 6.7A
V ADJ
H
+V +V +V -V -V -V L N

Test item particulars ..... :	See below
Equipment mobility ..... :	[] movable [] hand-held [] transportable [] stationary [x] for building-in [] direct plug-in
Connection to the mains ..... :	[x] pluggable equipment [x] type A [] type B [x] permanent connection [] detachable power supply cord [] non-detachable power supply cord [x] not directly connected to the mains *Note: compliance shall be evaluated in the final system*
Operating condition ..... :	[x] continuous [] rated operating / resting time:
Access location ..... :	[] operator accessible [x] restricted access location *Note: compliance shall be evaluated in the final system*
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) ..... :	For Norway, 230V
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 US/CSA)
Pollution degree (PD) ..... :	[] PD 1 [x] PD 2 [] PD 3
IP protection class ..... :	IPX0
Altitude during operation (m) ..... :	Up to 3000
Altitude of test laboratory (m) ..... :	≤ 2000
Mass of equipment (kg) ..... :	Approx. 0.95 (SWS300 and SWS300A series) Approx. 2.02 (SWS600 series)
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, 2009 (for report 15032269 001) Oct., 2010 (for report 15032835 001) July, 2013 (for report 15057319 001) N/A (for this report)
Date(s) of performance of tests ..... :	June, 2009 (for report 15032269 001) Nov., 2010 (for report 15032835 001) July, 2013 (for report 15057319 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 ☐ 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) ..... :

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. 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, Zhangjiagang, Jiangsu 215622, P.R. China
5. ALPS Logistics Facilities Co., Ltd.
   593-1 Nishi-Ohashi, Tsukba-shi, Ibaraki 305-0831 JAPAN
6. Sendan Electronics Mfg. Co., Ltd.
   1010 Habushin Nanto-shi, Toyama 939-1756 JAPAN

General product information:

The EUTs are switching mode power supply (built-in type) for the use in information technology equipment.

All models in each series are identical except for output rating, the turns of output coil (L51/L58), the turns of secondary winding in transformer (T1/T52), the rating of some components in secondary circuits and input terminal block. See model list below for detail character.

Main transformer T1 of SWS300A is identical to T1 of SWS300 except for additional primary winding P3 for decreasing peak voltage of Q2.

Model List

Character / Model	Input Rated Voltage (V a.c.)	Input Rated current (A)	Input frequency (Hz)	Min. Output	Rated Output	Max. Output	Rated Output (VA)
SWS300-3**z**	100-240	3.6A	50/60	/	3.3Vdc	/	182
				/	55A	/	
SWS300-5**z**	100-240	4.4A	50/60	/	5Vdc	/	275
				/	55A	/	

SWS300-7R5**z**	100-240	4.4A	50/60	/	7.5Vdc	/	300
				/	40A	/	
SWS300-12**z**	100-240	4.4A	50/60	/	12Vdc	/	312
				/	26A	/	
SWS300-15**z**	100-240	4.4A	50/60	/	15Vdc	/	315
				/	21A	/	
SWS300-24**z**	100-240	4.4A	50/60	/	24Vdc	/	312
				/	13A	/	
SWS300-24/SIM**z**	100-240	4.4A	50/60	/	24Vdc	/	312
				/	13A	/	
SWS300-28**z**	100-240	4.4A	50/60	/	28-29.5Vdc	/	308
				/	11-10.4A	/	
SWS300-36**z**	100-240	4.4A	50/60	/	36Vdc	/	313
				/	8.7A	/	
SWS300-48**z**	100-240	4.4A	50/60	/	48Vdc	/	322
				/	6.7A	/	
SWS300A-3**f**	100-240	3.6A	50/60	2.97Vdc	3.3Vdc	3.96Vdc	182
				55A	55A	45.8A	
SWS300A-4**f**	100-240	4.4A	50/60	3.6Vdc	4Vdc	4.8Vdc	220
				55A	55A	45.8A	
SWS300A-5**f**	100-240	4.4A	50/60	4.5Vdc	5Vdc	6Vdc	275
				55A	55A	45.8A	
SWS300A-7R5**f**	100-240	4.4A	50/60	6Vdc	7.5Vdc	9Vdc	300
				40A	40A	33.3A	
SWS300A-12**f**	100-240	4.4A	50/60	9.6Vdc	12Vdc	13.2Vdc	312
				26A	26A	23.6A	
SWS300A-15**f**	100-240	4.4A	50/60	13.2Vdc	15Vdc	18.6Vdc	315
				21A	21A	16.9A	
SWS300A-24**f**	100-240	4.4A	50/60	20Vdc	24Vdc	28.8Vdc	312
				13A	13A	10.8A	
SWS300A-28**f**	100-240	4.4A	50/60	22.4Vdc	28Vdc	33.6Vdc	308
				11A	11A	9.1A	
SWS300A-36**f**	100-240	4.4A	50/60	28.8Vdc	36Vdc	40Vdc	316.8
				8.8A	8.8A	7.9A	
SWS300A-48**f**	100-240	4.4A	50/60	40Vdc	48Vdc	57.6Vdc	321.6
				6.7A	6.7A	5.5A	

SWS600-3**z**	100-240	6.0A	50/60	/	3.3Vdc	/	330
				/	100A	/	
SWS600-5**z**	100-240	8.0A	50/60	/	5Vdc	/	500
				/	100A	/	
SWS600-12**z**	100-240	9.0A	50/60	/	12Vdc	/	600
				/	50A	/	
SWS600-12/LFN2**z**	100-240	9.0A	50/60	/	12Vdc	/	600
				/	50A	/	
SWS600-15**z**	100-240	9.0A	50/60	/	15Vdc	/	600
				/	40A	/	
SWS600-24**z**	100-240	8.0A	50/60	/	24Vdc	/	600
				/	25A	/	
SWS600-24/BA1**z**	100-240	8.0A	50/60	/	24Vdc	/	600
				/	25A	/	
SWS600-36**z**	100-240	8.0A	50/60	/	36Vdc	/	601
				/	16.7A	/	
SWS600-36/32**z**	100-240	8.0A	50/60	/	32Vdc	/	534
				/	16.7A	/	
SWS600-48**z**	100-240	8.0A	50/60	/	48Vdc	/	600
				/	12.5A	/	
SWS600-48/BA2**z**	100-240	8.0A	50/60	/	48Vdc	/	600
				/	12.5A	/	