



Test Report issued under the responsibility of:



TEST REPORT
IEC 60950-1
Information technology equipment – Safety –
Part 1: General requirements

Report Number : 15077116 001
Date of issue..... : 2015-11-02
Total number of pages : 66 (excluding attachments, refer to page 3)

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

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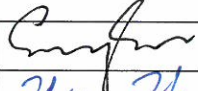
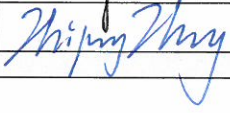
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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description		Switching Power Supply	
Trade Mark		TDK-Lambda	
Manufacturer		Same as applicant	
Model/Type reference		CUS250S1-xy (x = 4, 4R1 to 4R9 or 5; y = /K or blank)	
Ratings		AC input: See the model list on page 10 DC output: See the model list on page 10	
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)		Sunny Sun	
Approved by (name + signature)		ZhiPing Zhang	
<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 (4 pages)

- ATTACHMENT 2 - National Differences (56 pages)

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

History of CB Test Report:

- Test report No. 15057258 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. 15077116 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.
- The maximum specified operation ambient temperature is 70°C. Specified ambient temperature for operation is according to manufacturer's specification.(see next page 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 may operate up to 3000m above sea level as declared by manufacturer. Clearances have been evaluated according to IEC 60664-1 table A.2 with a multiplication factor of 1.14 throughout this report.
- Test madels: CUS250S1-5, CUS250S1-4R6 and CUS250S1-4.

Tests performed (name of test and test clause):

Tested in original CB report 15057258 001

Clause	Test description
1.6.2	Input Current
1.7.11	Durability
2.1.1.7	Discharge of Capacitors in equipment
2.2	SELV
2.6.3.4	Resistance of Earthing Circuit
2.9.2	Humidity Conditioning
2.10.2	Working Voltage measurement
2.10.3 & 2.10.4	Clearances, creepage distances
4.5.2	Temperature Tests
4.5.5	Resistance to abnormal heat
5.1	Touch Current and PE current
5.2	Electric Strength Test
5.3	Abnormal Operating and Fault Condition Test
Annex C	Transformer

Testing location:

TÜV Rheinland (Shanghai) Co., Ltd.
B1-13/F, No.177, Lane 777, West Guangzhong Road, Zhabei District, Shanghai 200072, P. R. China

For this report 15077116 001:

Same as above

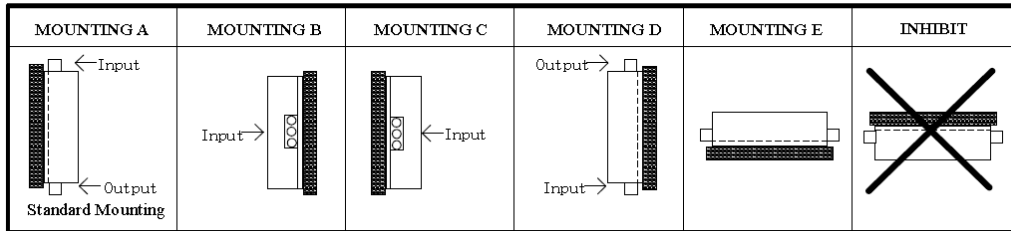
Testing during original evaluation according to report number 15057258 001, no further testing was deemed necessary for this upgrade of standard.

MOUNTING DIRECTIONS

5. Mounting Directions

5-1. Output Derating according to the Mounting Directions.

Recommended standard mounting method is (A). Method (B,C,D,E) are also possible. Refer to the output derating below. Load(%) of derating curve indicates output power.

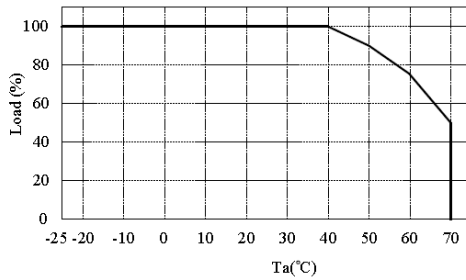


CONVECTION COOLING

5-2. Output Derating vs. Ambient temperature

Make sure that the specified temperature range is maintained.

■ CONVECTION COOLING

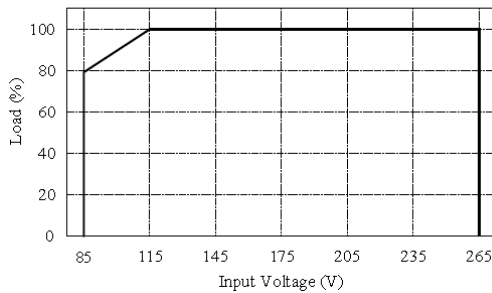


— Mounting (A),(B),(C),(D),(E)

Ta (°C)	Load (%)
	Mounting (A),(B),(C),(D),(E)
-25~40	100
50	90
60	75
70	50

5-3. Output Derating vs. Input Voltage

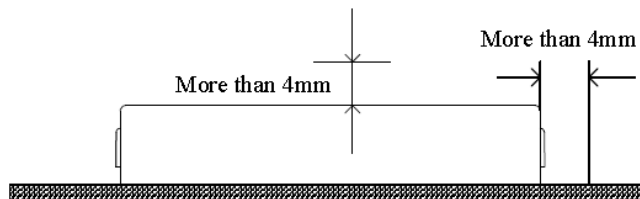
Output derating is required when the PSU operate below 115VAC input. Refer to table below for details.



Input Voltage	Load(%)
85VAC	80
115~265VAC	100

5-4. Mounting Method

- (1) The maximum allowable penetration for screw into chassis is 6mm.
- (2) Recommended torque for mounting screw: M3 screw, 0.49N·m (5kgf·cm).
- (3) Metal plate with minimum 2mm thickness and minimum 0.1m² area is recommended as mounting plate.
- (4) Keep minimum 4mm space from the surface to component side and input terminal side for safety requirement.



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

EU Group Differences, EU Special National Conditions, AT, CA, DK, US, IT, SE, GB.

* (DE, DK, FI, GB, IL, KR, SE, SI)

** (AU, CN, CH, ES, IE, NO)

*** (BY, JP)

Explanation of used codes:

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

* (DE = Germany, DK=Denmark, FI = Finland, GB = United Kingdom, IL = Israel, KR = Republic of Korea, SE = Sweden, SI = Slovenia)

** (AU = Australia, CN = China, CH = Switzerland, ES = Spain, IE = Ireland, NO = Norway)

*** (BY = Belarus, JP = Japan)

* National differences to IEC 60950-1:2005 (Second Edition) + Am 1:2009 evaluated.

** National differences to IEC 60950-1:2005 evaluated.

*** National differences to IEC 60950-1:2001 evaluated.

The product fulfils the requirements of

EN 60950-1:2006+A11+A1+A12+A2,

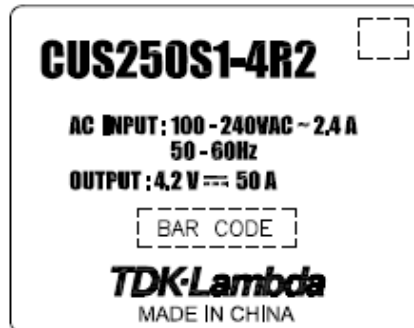
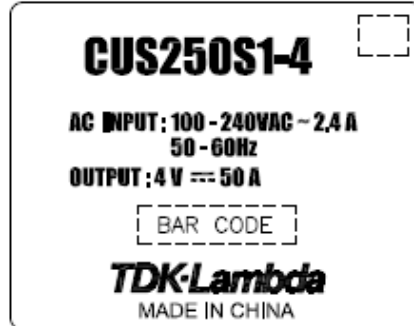
UL 60950-1:2007 R10.14 and

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>




Continued

CUS250S1-4R8 

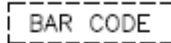
AC INPUT: 100 - 240VAC ~ 2.8 A
50 - 60Hz
OUTPUT: 4.8 V \approx 50 A

 BAR CODE


TDK-Lambda
MADE IN CHINA

CUS250S1-4R9 

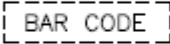
AC INPUT: 100 - 240VAC ~ 2.8 A
50 - 60Hz
OUTPUT: 4.9 V \approx 50 A

 BAR CODE


TDK-Lambda
MADE IN CHINA

CUS250S1-5 

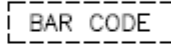
AC INPUT: 100 - 240VAC ~ 2.8 A
50 - 60Hz
OUTPUT: 5 V \approx 50 A

 BAR CODE

TDK-Lambda
MADE IN CHINA

CUS250S1-4/K 

AC INPUT: 100 - 240VAC ~ 2.4 A
50 - 60Hz
OUTPUT: 4 V \approx 50 A

 BAR CODE


TDK-Lambda
MADE IN CHINA

CUS250S1-4R1/K 

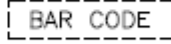
AC INPUT: 100 - 240VAC ~ 2.4 A
50 - 60Hz
OUTPUT: 4.1 V \approx 50 A

 BAR CODE


TDK-Lambda
MADE IN CHINA

CUS250S1-4R2/K 

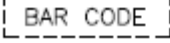
AC INPUT: 100 - 240VAC ~ 2.4 A
50 - 60Hz
OUTPUT: 4.2 V \approx 50 A

 BAR CODE


TDK-Lambda
MADE IN CHINA

CUS250S1-4R3/K 

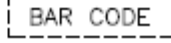
AC INPUT: 100 - 240VAC ~ 2.4 A
50 - 60Hz
OUTPUT: 4.3 V \approx 50 A

 BAR CODE

TDK-Lambda
MADE IN CHINA

CUS250S1-4R4/K 

AC INPUT: 100 - 240VAC ~ 2.4 A
50 - 60Hz
OUTPUT: 4.4 V \approx 50 A

 BAR CODE

TDK-Lambda
MADE IN CHINA

Continued

CUS250S1-4R5/K

AC INPUT: 100 - 240VAC ~ 2.4 A
50 - 60Hz
OUTPUT: 4.5 V \equiv 50 A

BAR CODE

TDK-Lambda
MADE IN CHINA

CUS250S1-4R6/K

AC INPUT: 100 - 240VAC ~ 2.8 A
50 - 60Hz
OUTPUT: 4.6 V \equiv 50 A

BAR CODE

TDK-Lambda
MADE IN CHINA

CUS250S1-4R7/K

AC INPUT: 100 - 240VAC ~ 2.8 A
50 - 60Hz
OUTPUT: 4.7 V \equiv 50 A

BAR CODE

TDK-Lambda
MADE IN CHINA

CUS250S1-4R8/K

AC INPUT: 100 - 240VAC ~ 2.8 A
50 - 60Hz
OUTPUT: 4.8 V \equiv 50 A

BAR CODE

TDK-Lambda
MADE IN CHINA

CUS250S1-4R9/K

AC INPUT: 100 - 240VAC ~ 2.8 A
50 - 60Hz
OUTPUT: 4.9 V \equiv 50 A

BAR CODE

TDK-Lambda
MADE IN CHINA

CUS250S1-5/K

AC INPUT: 100 - 240VAC ~ 2.8 A
50 - 60Hz
OUTPUT: 5 V \equiv 50 A

BAR CODE

TDK-Lambda
MADE IN CHINA

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 checked="" type="checkbox"/> type B <input checked="" 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 Note: shall be evaluated in the final system.
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 <input checked="" type="checkbox"/> Building-in equipment, shall be evaluated in the final system.
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"/> for 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)	: Less than 500
Mass of equipment (kg)	: ≅0.63kg
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	: 2013-03-20 (for original report 15057258 001) N/A (for this report)
Date(s) of performance of tests	: 2013-03-22 to 2013-04-16 (for original report 15057258 001) N/A (for this report)
General remarks:	
<p>"(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.</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, Wuxi, Jiangsu 214028, P.R. China
 2. Zhangjiagang Hua Yang Electronics Co., Ltd.
 Zhao Feng Industrial Zone, Leyu Town, Zhangjiagang, Jiangsu 215622, P. R. China

General product information:

The EUTs are a component type switching mode power supplies intended for the class I construction of information technology equipment.

The equipment employs PCB: CCB156 (primary, PB and secondary circuits)

All models are identical except for VR5, which results in different output ratings. See Model List below for details.

Model	I/p voltage (V a.c.)	Fre (Hz)	I/p current (A)	Minimal output rating	Rated output rating (typical)	Maximum output rating
CUS250S1-4y	100-240	50-60	2.4	4.0V d.c./50A	4.0V d.c./50A	4.0V d.c./50A
CUS250S1-4R1y	100-240	50-60	2.4	4.0V d.c./50A	4.1V d.c./50A	4.1V d.c./50A
CUS250S1-4R2y	100-240	50-60	2.4	4.0V d.c./50A	4.2V d.c./50A	4.2V d.c./50A
CUS250S1-4R3y	100-240	50-60	2.4	4.0V d.c./50A	4.3V d.c./50A	4.3V d.c./50A
CUS250S1-4R4y	100-240	50-60	2.4	4.0V d.c./50A	4.4V d.c./50A	4.4V d.c./50A
CUS250S1-4R5y	100-240	50-60	2.4	4.0V d.c./50A	4.5V d.c./50A	4.5V d.c./50A
CUS250S1-4R6y	100-240	50-60	2.8	4.0V d.c./50A	4.6V d.c./50A	5V d.c./50A
CUS250S1-4R7y	100-240	50-60	2.8	4.0V d.c./50A	4.7V d.c./50A	5V d.c./50A
CUS250S1-4R8y	100-240	50-60	2.8	4.0V d.c./50A	4.8V d.c./50A	5V d.c./50A
CUS250S1-4R9y	100-240	50-60	2.8	4.0V d.c./50A	4.9V d.c./50A	5V d.c./50A
CUS250S1-5y	100-240	50-60	2.8	4.0V d.c./50A	5.0V d.c./50A	5V d.c./50A

Operating temp.: -25°C to +70°C (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual).

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 and 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 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 contains instructions for connection to an IT power distribution system. (See subclause 1.7.2.4):
- Fuse Identification (See subclause 1.7.6):
F1: T6.3AH AC 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:
y	4, 4R1 to 4R9 or 5	denotes for different output voltage.
z	/K, or blank	denotes for OTP function

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)