

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	QQGQ2, QGGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Switching Power Supply
Model:	CUS200LD-zzxxxxxxx; CUS200LJ-zzxxxxxxx (zz = 3, 4, 5, 7R5, 12, 15, 18, 24, 28, 32, 36 or 48; xxxxxxx = M, J, U, B, CO, CO2, L, RTB, other alphanumeric character, symbol or blank)
Rating:	100-240 Vac, 1.3 A, 50-60 Hz (for CUS200LD-3, CUS200LJ-3) 100-240 Vac, 1.6 A, 50-60 Hz (for CUS200LD-4, CUS200LJ-4) 100-240 Vac, 1.8 A, 50-60 Hz (for all models except for CUS200LD-3, CUS200LJ-3, CUS200LD-4 and CUS200LJ-4)
Applicant Name and Address:	TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER R&D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

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Reviewed by: Toshiyuki Suzuki

Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
 - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
 - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

The units are component type switching mode power supplies intended for use in the class I construction of information technology equipment.

Output rating**Convection cooling:**

- 3.3 Vdc/24 A (for CUS200LD-3, CUS200LJ-3)
- 4.2 Vdc/24 A (for CUS200LD-4, CUS200LJ-4)
- 5 Vdc/24 A (for CUS200LD-5, CUS200LJ-5)
- 7.5 Vdc/16 A (for CUS200LD-7R5, CUS200LJ-7R5)
- 12 Vdc/10 A (for CUS200LD-12, CUS200LJ-12)
- 15 Vdc/8 A (for CUS200LD-15, CUS200LJ-15)
- 18 Vdc/6.7 A (for CUS200LD-18, CUS200LJ-18)
- 24 Vdc/5 A (for CUS200LD-24, CUS200LJ-24)
- 28 Vdc/4.3 A (for CUS200LD-28, CUS200LJ-28)
- 32 Vdc/3.75 A (for CUS200LD-32, CUS200LJ-32)
- 36 Vdc/3.35 A (for CUS200LD-36, CUS200LJ-36)
- 48 Vdc/2.6 A (for CUS200LD-48, CUS200LJ-48)

Conduction cooling:

- 3.3 Vdc/30 A (for CUS200LD-3, CUS200LJ-3)
- 4.2 Vdc/30 A (for CUS200LD-4, CUS200LJ-4)
- 5 Vdc/30 A (for CUS200LD-5, CUS200LJ-5)
- 7.5 Vdc/20 A (for CUS200LD-7R5, CUS200LJ-7R5)
- 12 Vdc/12.5 A (for CUS200LD-12, CUS200LJ-12)
- 15 Vdc/10 A (for CUS200LD-15, CUS200LJ-15)
- 18 Vdc/8.4 A (for CUS200LD-18, CUS200LJ-18)
- 24 Vdc/6.3 A (for CUS200LD-24, CUS200LJ-24)
- 28 Vdc/5.4 A (for CUS200LD-28, CUS200LJ-28)
- 32 Vdc/4.7 A (for CUS200LD-32, CUS200LJ-32)
- 36 Vdc/4.2 A (for CUS200LD-36, CUS200LJ-36)
- 48 Vdc/3.2 A (for CUS200LD-48, CUS200LJ-48)

See Enclosure Id. 7-01 for output derating characteristics (T_{ma} vs Output Load %), cooling methods, mounting directions and peak load specification.

Units were tested with considering of output voltage range as below.

- For Models CUS200LD-3, CUS200LJ-3: 2.64 - 3.96 V dc (Maximum 24 A, Maximum 79.2 W for Convection Cooling, Maximum 30 A, Maximum 99 W for Conduction Cooling)
- For Models CUS200LD-4, CUS200LJ-4: 3.36 - 5.04 V dc (Maximum 24 A, Maximum 100.8 W for Convection Cooling, Maximum 30 A, Maximum 126 W for Conduction Cooling)
- For Models CUS200LD-5, CUS200LJ-5: 4 - 6 V dc (Maximum 24 A, Maximum 120 W for Convection Cooling, Maximum 30 A, Maximum 150 W for Conduction Cooling)
- For Models CUS200LD-7R5, CUS200LJ-7R5: 6 - 9 V dc (Maximum 16 A, Maximum 120 W for Convection Cooling, Maximum 20 A, Maximum 150 W for Conduction Cooling)
- For Models CUS200LD-12, CUS200LJ-12: 9.6 - 14.4 V dc (Maximum 10 A, Maximum 120 W for Convection Cooling, Maximum 12.5 A, Maximum 150 W for Conduction Cooling)
- For Models CUS200LD-15, CUS200LJ-15: 12 - 18 V dc (Maximum 8 A, Maximum 120 W for Convection Cooling, Maximum 10 A, Maximum 150 W for Conduction Cooling)
- For Models CUS200LD-18, CUS200LJ-18: 14.4 - 21.6 V dc (Maximum 6.7 A, Maximum 120.6 W for Convection Cooling, Maximum 8.4 A, Maximum 151.2 W for Conduction Cooling)
- For Models CUS200LD-24, CUS200LJ-24: 19.2 - 28.8 V dc (Maximum 5 A, Maximum 120 W for Convection Cooling, Maximum 6.3 A, Maximum 151.2 W for Conduction Cooling)
- For Models CUS200LD-28, CUS200LJ-28: 22.4 - 33.6 V dc (Maximum 4.3 A, Maximum 120.4 W for Convection Cooling, Maximum 5.4 A, Maximum 151.2 W for Conduction Cooling)
- For Models CUS200LD-32, CUS200LJ-32: 25.6 - 38.4 V dc (Maximum 3.75 A, Maximum 120 W for Convection Cooling, Maximum 4.7 A, Maximum 150.4 W for Conduction Cooling)
- For Models CUS200LD-36, CUS200LJ-36: 28.8 - 43.2 V dc (Maximum 3.35 A, Maximum 120.6 W for Convection Cooling, Maximum 4.2 A, Maximum 151.2 W for Conduction Cooling)
- For Models CUS200LD-48, CUS200LJ-48: 38.4 - 57.6 V dc (Maximum 2.6 A, Maximum 124.8 W for Convection Cooling, Maximum 3.2 A, Maximum 153.6 W for Conduction Cooling)

Output voltage adjustment was made by Variable Resistor (VR51).

Model Differences

Model CUS200LD-zzxxxxxxx is identical to model CUS200LJ-zzxxxxxxx except for model name.

All models are identical, except for turns of Transformer and the rating of some components which results in different output ratings.

Model CUS200LD-zz and CUS200LJ-zz (zz = 3, 4, 5, 7R5, 12, 15, 18, 24, 28, 32, 36 or 48) may be followed by suffix "xxxxxxx" (xxxxxxx = M, J, U, B, CO, CO2, L, RTB, other alphanumeric character, symbol or blank). Suffix letters denote as follow:

M: Denotes for Molex connector

J: Denotes for JST connector

U: Denotes for U shape chassis

B: Denotes for Base plate

CO: Denote for PWB coating on solder side

CO2: Denote for PWB coating on both side

L: Denotes for L shape chassis

RTB: Denotes for right angle terminal block

other alphanumeric character, symbol or blank: For market purposes, no construction differences and no safety impact.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : not directly connected to the mains
- Operating condition : continuous
- Access location : N/A

- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : +10%, -10%
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I (earthed)
- Considered current rating of protective device as part of the building installation (A) : 20
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : Up to 5000
- Altitude of test laboratory (m) : N/A
- Mass of equipment (kg) : 0.38 or less

Engineering Conditions of Acceptability

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The following Production-Line tests are conducted for this product: Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV/Earthed Dead Metal: 305 Vrms, 548 Vpk
- The following secondary output circuits are SELV: All models' output.
- The following secondary output circuits are at hazardous energy levels: All models.
- The power supply terminals and/or connectors are: Not investigated for field wiring
- The maximum investigated branch circuit rating is: 20 A
- The investigated Pollution Degree is: 2
- Proper bonding to the end-product main protective earthing termination is: Required via Chassis
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJ2 insulation system with the indicated rating greater than Class A (105°C): T2 (Class 155(F))
- The following end-product enclosures are required: Fire, Electrical
- Line to Neutral Capacitor C4 and C5 may have variation in capacitance up to 0.47 µF. Therefore, consideration shall be given in controlling the capacitance value in the end-product application with respect to capacitance discharge issue.
- Primary to Ground Capacitor C1, C2 and C3 may have variations in capacitance up to 2200 pF. Therefore, consideration shall be given in controlling the capacitance values in end product application with respect to touch current issue.

Additional Information

This Test Report was based on the CB Test Certificates (Ref. Certif. No. JPTUV-084130 dated 2017-11-13 and Ref. Certif. No. JPTUV-084130-A1 dated 2018-01-24) and Test Reports (Ref. No. 50100188 001 dated 2017-11-13 and Ref. No. 50100188 002 dated 2018-01-24), which were issued by TÜV Rheinland Japan Ltd.

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number

Power rating - Model	Model Number
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