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, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Complementary CCN:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Product:	DC-DC Converter
Model:	CCG30-ww-xxS (ww: 24, xx: 03, 05, 12 or 15) or (ww: 48, xx: 03, 05, 12, 15 or 48), maybe followed by suffix "abc" (a is "/" or blank, b is "N" or blank, c is "P" or blank. Note: Suffix "N" is applicable for CCG30-48-48 only.)
Rating:	9 - 36 Vdc (for Model ww: 24, xx: 03, 05, 12 or 15) 3.2 A (for Model ww: 24, xx: 03) 4.0 A (for Model ww: 24, xx: 05 or 12) 3.9 A (for Model ww: 24, xx: 15) 18 - 76 Vdc (for Model ww: 48, , xx: 03, 05, 12, 15 or 48) 1.6 A (for Model ww: 48, xx: 03) 2.0 A (for Model ww: 48, xx: 05, 12, 15 or 48)
Applicant Name and Address:	TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA-KEN 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.

Prepared by: Ippei Fukuda Reviewed by: Tetsuo Iwasaki

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

These units are components "DC/DC Converter" with only one DC output, providing functional insulation.

Output Ratings:
3.3 V, 7 A for CCG30-24-03S and CCG30-48-03S
5 V, 6 A for CCG30-24-05S and CCG30-48-05S
12 V, 2.5 A for CCG30-24-12S and CCG30-48-12S
15 V, 2 A for CCG30-24-15S and CCG30-48-15S
48 V, 0.63 A for CCG30-48-48S

Model Differences

The differences between Models CCG30-ww-xxS followed by suffix are as follows.

Each model is identical, except for model designation, input/output rating, Transformer (T2), and secondary components.

ww: input voltage (See Ratings for detail)
xx: output voltage (See Production Description for detail)
Suffix "/": separator.
Suffix "P": Positive logic on/off control.
Suffix "N": Identification use for sales purpose only.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : N/A
- Operating condition : continuous
- Access location : for building-in (component type)
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : N/A
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Not classified
- Considered current rating of protective device as part of the building installation (A) : N/A

- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : less than 5000
- Altitude of test laboratory (m) : approximately 10 to 20 m
- Mass of equipment (kg) : 20 g
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: Case (Center of top surface) 110°C

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 secondary output circuits are SELV: Output of each model.
- The following secondary output circuits are at non-hazardous energy levels: Output of each model.
- The investigated Pollution Degree is: 2
- The following end-product enclosures are required: Fire, Electrical
- Unit intended for building-in and supplied by secondary dc power source (ES1 or ES2) which isolated from primary by double or reinforced insulation.
- Only functional insulation provided between input/output circuits, which complies with electric strength test at 1500 Vdc.
- During the test following external fuse was provided. For model CCG30-24-xxS: SOC Corp., Type 11CT, 72Vdc, 10A (UL certified component). For model CCG30-48-xxS: SOC Corp., Type DC86V11CT, 86Vdc, 6.3A (UL certified component).
- All heating tests were conducted on horizontal position. The heating test of the transformer should be performed on actual position in the end product as maximum normal load condition. And it should be confirmed that the temperature of the transformer is lower than 130 °C.
- Metal case is floating. The separation between metal case and internal parts at hazardous voltage (maximum working voltage of: 196 Vpk) has not been evaluated as any type of insulation.
- The following output circuits are at ES1 energy levels : Output of all models.
- The following output circuits are at PS2 energy levels : Output of all models.
- Classification of PIS has not been conducted. Therefore, all electrical components and conductors including printed wirings were assumed to be arcing/resistive PIS.
- This component has been evaluated in 'control of fire spread' method assuming appropriate fire enclosure is provided in end product. Unless the fire enclosure is made of non-combustible or V-0 material, the separation from the PIS shall be considered.

Additional Information

Unless otherwise stated, CCG30-48-48S was used for test purposes and is considered representative of the entire series.

The Clearances and Creepage Distances have additionally been assessed for suitability up to 5000 m elevation.

Additional Standards

The product fulfills the requirements of: UL 62368-1, 2nd Edition, 2014-12-01, CAN/CSA C22.2 No. 62368-1-14, 2nd Edition, 2014-12.

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