

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 62368-1, 2nd Ed, 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1-14, 2nd Ed (Audio/video, information and communication technology equipment Part 1: Safety requirements)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
<b>Complementary CCN:</b>	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
<b>Product:</b>	DC-DC Converter
<b>Model:</b>	CCG15-24-xxD, and CCG15-48-xxD (where xx: 12 or 15). Maybe followed by suffix /P.
<b>Rating:</b>	Input: 9 - 36 Vdc, 2.2 A (for Model CCG15-24-xxD) 18 - 76 Vdc, 1.1 A (for Model CCG15-48-xxD) Output: See Additional Information.
<b>Applicant Name and Address:</b>	TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA-KEN 940-1195 JAPAN 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: Tetsuo Iwasaki / Project Handler      Reviewed By: Masatomo Takiyama / Reviewer

**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 component "DC/DC Converter" with dual outputs.

Output ratings, see Additional Information.

**Model Differences**

The differences between Models CCG15-24-xxD and CCG15-48-xxD, with or without suffix /P, are as follow. Each models are identical, except for model designation, input/output rating, Transformer (T1), and some minor secondary side components.

xx: output voltage 12 or 15.

Suffix /P: Positive logic on/off control.

**Test Item Particulars**

Classification of use by	Skilled person
Supply Connection	External Circuit - not Mains connected ES2
Supply % Tolerance	None
Supply Connection – Type	Soldering to PCB
Considered current rating of protective device as part of building or equipment installation	-- A;
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II
Class of equipment	Not Classified
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient	60°C or 85°C, and 110°C at Case (Refer to Enclosure id. 7-01.) °C
IP protection class	IPX0
Power Systems	N/A
Altitude during operation (m)	Up to 5000 m
Altitude of test laboratory (m)	Approximately 10 to 20 m
Mass of equipment (kg)	0.02 kg

**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer’s specification of : 60°C or 85°C, and 110°C at Case (Refer to Enclosure id. 7-01)

**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 output circuits are at ES3 energy levels : All model's output circuits.
- The following output circuits are at PS2 energy levels : Output of all models.
- The investigated Pollution Degree is : 2
- The following end-product enclosures are required : Electrical
- Unit intended for building-in and supplied ES1/SELV or ES2/Hazardous Voltage power from secondary circuit which is isolated from primary circuit by double or reinforced insulation.
- Only functional insulation provided between input/output circuits, which complies with electric strength test at 1500Vdc.
- During the tests, following external fuse was provided. For model CCG15-24-xxD: SOC Corp., Type DC86V11CT, Rated 86Vdc, 6.3 A (UL Listed). For model CCG15-48-xxD: SOC Corp., Type DC86V11CT, Rated 86Vdc, 5 A (UL Listed).
- Metal case is floating. The separation between metal case and internal parts at hazardous voltage (maximum working voltage of: 138 Vpk) has not been evaluated as any type of insulation.
- The following secondary output circuits are Not SELV: All models' output circuits
- The following secondary output circuits are at non-hazardous energy levels: Output of all models.

**Additional Information**

Rated Output:

+12Vdc and -12Vdc, 0.65A respectively (total 15.6W) for CCG15-24-12D and CCG15-48-12D.

+15Vdc and -15Vdc, 0.5A respectively (total 15.0W) for CCG15-24-15D and CCG15-48-15D.

See Enclosure id.7-01 for Output Derating Specification.

Unless otherwise stated, model CCG15-48-xxD was used for test purposes and is considered representative of entire series.

**Additional Standards**

The product fulfills the requirements of: UL 60950-1, 2nd Ed, Revised October 14, 2014, CSA CAN/CSA-C22.2 NO. 60950-1 2nd Ed, Revised October 14, 2014

**Markings and Instructions**

Clause Title	Marking or Instruction Details
Equipment identification marking – Manufacturer identification	Listees or Recognized companys name, Trade Name, Trademark or File Number
Equipment identification marking – model identification	Model Number