

UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Complementary CCN:	N/A
Product:	DC-DC Power Module
Model:	PH600A280-24 May be followed by optional suffixes denoting minor variations. Refer to Model Differences in GENERAL PRODUCT INFORMATION.
Rating:	Input: 200-425 VDC, 4A Output: 24VDC, 25A Refer to General Product Information for detail.
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.

Prepared By: Tetsuo Iwasaki / Project Handler Reviewed By: Ikuro Kinno / 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

The product in this Test Report is building-in component type DC-DC Power Module which is intended to be used in information communication technology equipment.

Supply circuit to this unit is assumed to be a rectified DC circuit of AC Mains voltage up to 250V.

The output voltage is rated 24 VDC as nominal value, and is variable within the following range:

14.4 - 28.8 VDC, maximum 25 A and 600 W

The output voltage is set at any fixed value within this range by connecting resistance between TRM and -S terminals or between +V and +S terminals as part of end product.

Baseplate is assumed to be bonded to the protective earth in end product application.

Model Differences

PH600A280-24 may be followed by optional suffixes "abc" (a is /, b is UV, c is T and "a", "b", "c", may be blank)

Suffixes are defined as below.

"/" - Separator.

"UV" – No input voltage detection function provided. (Compliance does not rely on this function)

"T" - No threads in the corner provided. (Not safety related feature)

Test Item Particulars

Classification of use by	--
Supply Connection	External Circuit - not Mains connected ES3
Supply % Tolerance	None
Supply Connection – Type	PCB terminal
Considered current rating of protective device as part of building or equipment installation	N/A
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II
Class of equipment	Class I
Access location	N/A
Pollution degree (PD)	PD 2

Manufacturer's specified maximum operating ambient (°C)	at center of baseplate 100
IP protection class	IP is not classified (for building-in)
Power Systems	N/A
Altitude during operation (m)	Up to 3048 m
Altitude of test laboratory (m)	Up to 2000 m
Mass of equipment (kg)	approximately 0.41

Technical Considerations

- The product was evaluated to be used in tropical climates condition.
- The product was submitted and evaluated for use at the maximum temperature at Baseplate permitted by the manufacturer's specification of 100°C at 80% load, 85°C at 100% load. Refer to Enclosure miscellaneous id. 7-01 for Derating Curve specification.

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 end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary-Secondary: 308 Vrms/510 Vpk
- The following output circuits are at ES1 energy levels : Output circuit
- The following output circuits are at PS3 energy levels : All circuits
- The investigated Pollution Degree is : 2
- The following end-product enclosures are required : Electrical
- Cover and Frame are made of minimum V-0 material and function as a fire barrier against internal parts of the unit.
- Baseplate shall be bonded in end product.
- During the tests, following external fuse was provided.
6.3A / 450VDC, Model: BDH63, Manufacture: DAITO COMMUNICATION APPARATUS CO LTD.

Additional Information

The following are the output voltage ranges considered during the evaluation:
 14.4 - 28.8 VDC, maximum 25 A and 600 W [under the input voltage condition at 240-425 VDC]
 14.4 - 24 VDC, maximum 25 A and 600 W [under the input voltage condition at 200 VDC]
 Refer to Enclosure miscellaneous id. 7-01 for Input vs output voltage derating specification for detail.

Additional Standards

The product fulfills the requirements of:

Markings and Instructions

Clause Title	Marking or Instruction Details
F.3.2.1 Equipment identification marking – Manufacturer identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
F.3.2.2 Equipment identification marking – model identification	Model Number