

## 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, Issued: 2014-12-01 (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>	N/A
<b>Product:</b>	DC-To-DC Converters
<b>Model:</b>	FQA020ADC-XXX-(S) or -(M) FQB020ADC-XXX(-S) or (-M)  Where "XXX" may be any alphanumeric character representing non safety features.
<b>Rating:</b>	Not required:  Input: 28VDC Nominal, range 10 - 40 VDC  Output: 28VDC Nominal, range 10 - 40 VDC
<b>Applicant Name and Address:</b>	TDK-LAMBDA AMERICAS INC SUITE 100 3320 MATRIX DR RICHARDSON TX 75082 UNITED STATES

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:

Reviewed By:

### 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 DC-DC power filter modules for building in designed to help reduce differential and common mode conducted emissions from dc-dc switching power supplies.

### Model Differences

Models FQA020ADC-XXX-(S) and FQB020ADC-XXX-(S) modules are identical in construction except Q12 is not populated on model FQA020ADC-XXX-(S).

### Test Item Particulars

Classification of use by	Instructed person
Supply Connection	External Circuit - not Mains connected ES1
Supply % Tolerance	None
Supply Connection – Type	Not connected to Mains. For building in
Considered current rating of protective device as part of building or equipment installation	N/A (For building in) A; equipment
Equipment mobility	for building-in
Over voltage category (OVC)	other: Not directly connected to Mains
Class of equipment	Class III
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	25°C
IP protection class	IPX0
Power Systems	N/A
Altitude during operation (m)	2000 m or less
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	<1

### Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>ma</sub>) permitted by the manufacturer's specification of : 25°C
- The product is intended for use on the following power systems : No direct connection
- Considered current rating of protective device as part of the building installation (A) : For building in. The filter modules are not internally fused. An external fuse of 30A is recommended. See manufacturer's data sheet for additional information.
- Mains supply tolerance (%) or absolute mains supply values : No direct connection
- The equipment disconnect device is considered to be : N/A
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual
- The product was investigated to the following additional standard : EN 62368-1:2014 + A11:2017

### 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 product-line tests are conducted for this product : Electric Strength
- The following output circuits are at ES1 energy levels : All
- The following output circuits are at PS3 energy levels : Output Terminal
- The maximum investigated branch circuit rating is : EUT is for building in.
- The investigated Pollution Degree is : 2
- An investigation of the protective bonding terminals has : not been conducted
- The following end-product enclosures are required : Electrical, Fire
- The power supply was evaluated to be used at altitudes up to : "2,000 m"
- Heating Test shall be considered in end product.
- 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
- Classification of PIS has not been conducted. Therefore, all electrical components and conductors including printed wirings were assumed to be arcing/resistive PIS.
- Unit intended for building-in and supplied power from secondary circuit which is isolated from primary circuit by double or reinforced insulation.
- The Quarter brick package filter modules come with through hole pins with 4.57mm tail length are used for mounting the modules in the end user application.
- Input test Measurements were made in fixture on lab bench with Fan, rated: 14Vdc, 0.3Adc.
- The following Production-Line tests are conducted for this product: Electric Strength as follows:  
2250Vdc Input to Ground

### Additional Information

This report is based on CB report, E220248-A41-CB-1, and corresponding CB Test Certificate Ref. US-31662-UL respectively, which was previously evaluated to UL/CSA/IEC 60950-1, 2nd edition, + Amendment 1, and Amendment 2. Testing conducted in accordance with IEC 60950-1:2005 (Second Edition), Am1:2009 + Am2:2013; UL 60950-1, 2nd Edition, 2014-10-14; and CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10, was deemed equivalent to test required by IEC62368-1, 2nd Edition, CAN/CSA-C22.2 NO. 62368-1 2nd Ed, Issued December 1, 2014, and UL 62368-1 2nd Ed, Issued December 1, 2014. Testing correlation explanation is provided in Enclosure.

Additional Electric Strength test per IEC 62368-1 was conducted as part of this evaluation.

The nameplate included in the report is representative of all models covered under this report.

**Additional Standards**

The product fulfills the requirements of: EN 62368-1:2014 + A11:2017

**Markings and Instructions**

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

**Special Instructions to UL Representative**

N/A