

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, Issued: 2014-12-01 (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:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Switching Power Supplies
Model:	VS30C-3, VS30C-5, VS30C-12, VS30C-15, VS30C-24, VS30C-36, and VS30C-48
Rating:	Input:100-120Vac, 50/60Hz, 0.7A Output: VS30C-3: 3.3Vdc, 6.0A, VS30C-5: 5Vdc, 6.0A, VS30C-12: 12Vdc, 2.5A, VS30C-15: 15Vdc, 2.0A, VS30C-24: 24Vdc, 1.3A, VS30C-36: 36Vdc, 0.9A, VS30C-48: 48Vdc, 0.7A
Applicant Name and Address:	TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER R&D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN

Issue Date: 2020-08-25

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Report Reference #

E122103-A6103-UL

Revision Date: 2022-04-05

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: Toshiyuki Suzuki / Project
Handler

Reviewed By: Hiroyuki Morikawa / 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 is a series of switching power supply intended for building in to an end product.

Model Differences

All models are identical except for output rating, winding of Transformer T1. (see appended table 4.1.2)

Test Item Particulars

Classification of use by	Ordinary person
Supply Connection	AC Mains
Supply % Tolerance	Other + 10 % / - 15 %
Supply Connection – Type	mating connector
Considered current rating of protective device as part of building or equipment installation	20 A; building;
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)	70°C (refer Enclosure ID 7-02 for detail)
IP protection class	IP is not classified (for building-in)
Power Systems	TN
Altitude during operation (m)	Up to 3000 m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	0.15

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of : (See Enclosure ID 7-02)
- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20

- Mains supply tolerance (%) or absolute mains supply values : +10%/ - 15%
- The equipment disconnect device is considered to be : To be evaluated in end product

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/Ground: 155 Vrms / 352 Vpk
- The following output circuits are at ES1 energy levels : Output of all models except VS30C-48
- The following output circuits are at ES2 energy levels : Output of model VS30C-48
- The following output circuits are at PS2 energy levels : Output of all models
- 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
- The following end-product enclosures are required : Electrical, Fire
- Humidity conditioning has been conducted by tropical condition.
- The maximum continuous power supply output (Watts) relied on forced air cooling from : 1.2 m3/min air flow located 150 mm distances from the component side (by a Forced air cooling system supplied by client)
- The following magnetic devices (e.g. transformers or inductor) are provided with an IEC60085 (equipment to UL1446) insulation system with the indicated rating greater than Class A (105°C) : Transformer T1 (Class 130(B))
- Line to Neutral Capacitor (C1) may have variations in capacitance up to 0.47 uF. Therefore, consideration shall be given in controlling the capacitance value in the end-product application with respect to capacitance discharge issue.
- 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.
- The secondary outputs are SELV and are not at hazardous energy levels.
- Line to Ground capacitor (C2) may have variations in capacitance up to 0.01 uF. Therefore, consideration shall be given in controlling the capacitance value in the end product application with respect to touch current issue.

Additional Information

The following are the output voltage ranges considered during the evaluation:

VS30C-3: 2.97-3.63 Vdc, maximum 6.0 A and 19.8W
VS30C-5: 4.5-5.5 Vdc, maximum 6.0 A and 30.0W
VS30C-12: 10.8-13.2 Vdc, maximum 2.5 A and 30.0W
VS30C-15: 13.5-16.5Vdc, maximum 2.0 A and 30.0W
VS30C-24: 21.6-26.4Vdc, maximum 1.3 A and 31.2W
VS30C-36: 32.4-39.6dc, maximum 0.9 A and 32.4W
VS30C-48: 43.2-52.8Vdc, maximum 0.7 A and 33.6W

Additional Standards

The product fulfills the requirements of: CSA C22.2 NO. 60950-1-07 - Edition 2 - Revision Date 2014/10/01
UL 60950-1 - Edition 2 - Revision Date 2019/05/09

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	