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:	Built-in Power Supply
Model:	ZWS300BAF-abcdefg (Suffix; a = 12, 15, 24, 36, 48. b = "/" or blank, c = T or blank. d = R or blank, e = A, L or blank, f = CO2 or blank, g = FG or blank) ZWS300BAF-24/cdefg17 (Suffix; c = T or blank. d = R or blank, e = A, L or blank, f = CO2 or blank, g = FG or blank) EVS18-16R7abcdef, EVS36-8R4abcdef, EVS57-5R3abcdef (Suffix; a = "/" or blank, b = B or blank. c = R or blank, d = A, L or blank, e = CO2 or blank, f = FG or blank)
Rating:	For Models other than ZWS300BAF-24/cdefg17: Input: AC 100-240V, 50-60Hz, 4.0A Output: Refer to Model Differences For Model ZWS300BAF-24/cdefg17: Input: AC 100-240V, 50-60Hz, 3.4A Output: Refer to Model Differences
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: Tomoko Fujii 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

The product is a switching power supply intended for building in to an end product.

Model Differences

ZWS300BAF-12bcdefg: DC 12V (DC 9.6 - 13.2V (*1)), 25.0A (Convection), 300.0W (Convection), 25.0A (Forced Air), 300.0W (Forced Air)

ZWS300BAF-15bcdefg: DC 15V (DC 13.5 - 16.5V (*1)), 20.0A (Convection), 300.0W (Convection), 22.0A (Forced Air), 330.0W (Forced Air)

ZWS300BAF-24bcdefg: DC 24V (DC 21.6 - 27.5V (*1)), 12.5A (Convection), 300.0W (Convection), 14.0A (Forced Air), 336.0W (Forced Air)

ZWS300BAF-36bcdefg: DC 36V (DC 32.4 - 39.6V (*1)), 8.4A (Convection), 302.4W (Convection), 9.4A (Forced Air), 338.4W (Forced Air)

ZWS300BAF-48bcdefg: DC 48V (DC 39.5 - 52.8V (*1)), 6.3A (Convection), 302.4W (Convection), 7.0A (Forced Air), 336.0W (Forced Air)

ZWS300BAF-24/cdefg17: DC 17.5V (DC 16.5 - 19.3V (*1)), 12.5A (Convection), 218.75W (Convection), 14.0A (Forced Air), 245.0W (Forced Air)

(*1): Output voltage can be changed with the adjustable volume VR51 within the range.

Nomenclature; ZWS300BAF-abcdefg

(a = 12, 15, 24, 36, 48. b = "/" or blank. c=T or blank, d= R or blank. e = A, L or blank. f = CO2 or blank. g = FG or blank)

a; output voltage as above

b; (separator)

c; type of input connector

d; remote control

e; A = with covers on both component side and solder side,

L = with cover on solder side

f; CO2 = coating of both sides of PWB for functional purpose,

g; FG = low leakage current

Suffixes b, d and f are not safety relevant.

Nomenclature; ZWS300BAF-24/cdefg17

(Suffix; c = T or blank. d = R or blank, e = A, L or blank, f = CO2 or blank, g = FG or blank)

c; type of input connector

d; remote control

e; A = with covers on both component side and solder side,

L = with cover on solder side

f; CO2 = coating of both sides of PWB for functional purpose,

g; FG = low leakage current

Suffixes d and f are not safety relevant.

Model ZWS300BAF-24/cdefg17 is identical to model ZWS300BAF-24bcdefg, except electrical ratings for input ampere, output voltage, and some minor components.

EVS18-16R7abcdef: DC 18V (DC 12 - 18 (*1)), 16.7A (Convection), 300.6W (Convection), 16.7A (Forced Air), 300.6W (Forced Air)

EVS36-8R4abcdef: DC 36V (DC 24 - 36V (*1)), 8.4A (Convection), 302.4W (Convection), 8.4A (Forced Air), 302.4W (Forced Air)

EVS57-5R3abcdef: DC 57V (DC 48 - 57V (*1)), 5.3A (Convection), 302.1W (Convection), 5.3A (Forced Air), 302.1W (Forced Air)

(*1): Output voltage can be changed with the adjustable volume VR51 within the range.

Nomenclature; EVS18-16R7abcdef, EVS36-8R4abcdef, EVS57-5R3abcdef

(a = "/" or blank, b = B or blank. c = R or blank, d = A, L or blank, e = CO2 or blank, f = FG or blank)

a; (separator),
b; B = Connector Type
c; remote control,
d; A = with covers on both component side and solder side,
L = with cover on solder side
e; CO2 = coating of both sides of PWB for functional purpose,
f; FG = low leakage current
Suffixes a, c and e are not safety relevant.

Model EVS18-16R7 and EVS36-8R4 are similar to model ZWS300BAF-15 and ZWS300BAF-36 respectively, except for PWB pattern, Surge Absorber, Input Terminal, Shape of Cover (for model with -/L), and some minor components.

Model EVS57-5R3 is similar to model ZWS300BAF-48, except for Transformer T2, PWB pattern, Surge Absorber, Input Terminal, Shape of Cover (for model with -/L), and some minor components.

Models EVS Series has wider adjustable range of overcurrent protection than RWS300BAF series, and its' adjustment of overcurrent protection by VR1 is available for end-product manufacturer.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : To be determined in the end product.
- Operating condition : continuous

- Access location : N/A
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : +10%, -10%
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I (earthed)
- Considered current rating of protective device as part of the building installation (A) : 20 A
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : Up to 3000 m
- Altitude of test laboratory (m) : less than 2000 m
- Mass of equipment (kg) : Approx. 0.54 (except for suffix e=A), Approx. 0.80 (for suffix e=A), Approx. 0.74 (for suffix e=L)
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: Refer to Enclosure id 7-01, 7-07, 7-09 for Output Derating Curve.
- The product is intended for use on the following power systems: TN

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 Production-Line tests are conducted for this product: Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-Earthed Dead Metal: 251Vrms, 546Vpk, Primary-SELV: 267Vrms, 626Vpk
- The following secondary output circuits are SELV: CN51
- The following secondary output circuits are at hazardous energy levels: CN51
- 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 magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C): T2 (Class 155(F))
- The following end-product enclosures are required: Fire, Electrical
- The following secondary output circuits are ES1: All Outputs
- The following secondary output circuits are at PS3: All Outputs
- Humidity conditioning has been conducted by tropical condition.
- 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

Tests and construction investigation record was in the CB Test Report, Reference No. 4786910622-7,

4787022573 and 4787306078 issued by UL Japan, Inc.

The Clearances and Creepage Distances have additionally been assessed for suitability up to 3000 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
1.7.1 Power rating - Ratings	Ratings (voltage, frequency/dc, current)
1.7.1 Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
1.7.1 Power rating - Model	Model Number
1.7.6 Fuses - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.