

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 60950-1, 2nd Edition, 2019-05-09 (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)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
<b>Complementary CCN:</b>	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
<b>Product:</b>	AC-DC Switching Power Supply
<b>Model:</b>	ZWS15B-abcdef a = 3, 5, 12, 15 or 24 b = "/" or blank c = A, L or blank d = CO2 or blank e = FG or blank f = FV or blank
<b>Rating:</b>	Input: 100-240Vac, 50/60Hz, 0.3A for Model: ZWS15B-3bcdef, 0.4A for Models: ZWS15B-5bcdef, ZWS15B-12bcdef, ZWS15B-15bcdef, ZWS15B-24bcdef  Output: ZWS15B-3bcdef: 2.73~3.63Vdc, Max. 3A, Max.9.9W ZWS15B-5bcdef: 4.5~5.5Vdc, Max. 3A, Max.15W ZWS15B-12bcdef: 10.8~13.2Vdc, Max. 1.3A; Max.15.6W ZWS15B-15bcdef: 13.5~16.5Vdc, Max. 1A; Max.15W ZWS15B-24bcdef: 21.6~26.4Vdc, Max. 0.7A; Max. 16.8W
<b>Applicant Name and Address:</b>	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.

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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

Consists of Class B transformer and electronic components mounted on PWB.

### Model Differences

All models are identical to each other except for secondary circuit, secondary winding of transformer, output rating and designation.

Nomenclature: ZWS15B-abcdef

(a = 3, 5, 12, 15, 24. b = "/" or blank. c = A, L or blank. d = CO2 or blank. e = FG or blank. f = FV or blank)

a: output voltage

b: (separator)

c: A = with chassis and cover  
L = with chassis

d: CO2 = coating of both sides of PWB for functional purpose

e: FG = low leakage current

f: FV = fixed output voltage without adjustable volume (VR51)

### Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : To be determined
- Operating condition : continuous
- Access location : To be determined
- 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
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 0-3000
- Altitude of test laboratory (m) : 0-2000
- Mass of equipment (kg) : 0.055kg for c=blank, 0.11kg for c=L, 0.125kg for c=A
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma)

- permitted by the manufacturer's specification of: Max.60Deg.C for 100% load; Max.70Deg.C for 70% load.
- The product is intended for use on the following power systems: TN
  - The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual
  - The means of connection to the mains supply is: To be determined in end product.
  - The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS): The output for all models.

**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 heating tests were conducted on the models with metal cover and metal chassis, due to the series models are build-in power supply, the test should be considered in end product again.
- The following secondary output circuits are ES1: 3.3 Vdc Output, 5 Vdc Output, 12 Vdc Output, 15 Vdc Output, 24 Vdc Output
- The following secondary output circuits are at PS2: 3.3 Vdc Output, 5 Vdc Output, 12 Vdc Output, 15 Vdc Output, 24 Vdc Output
- 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.
- 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-SELV: 263Vrms, 528 Vpk ; Primary to earth: 384Vpk, 216Vrms.
- The following secondary output circuits are SELV: DC: secondary outputs. ,
- The following secondary output circuits are at non-hazardous energy levels: Secondary outputs ,
- The power supply terminals and/or connectors are: Not investigated for field wiring
- The maximum investigated branch circuit rating is: 20 A
- The investigated Pollution Degree is: 2
- The following end-product enclosures are required: Fire, Electrical
- The equipment is suitable for direct connection to: AC mains supply
- 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): T1 (Class 130(B))
- An investigation of the protective bonding terminals has: Not been conducted
- Proper bonding to the end-product main protective earthing termination is: Required

**Additional Information**

N/A

**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.

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