UL TEST REPORT AND PROCEDURE

Standard:	UL 62368-1, 4th Ed, 2025-07-31 (Audio/Video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1:25, 4th Ed, 2025-07-31 (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:	Switching Power Supply
Model:	HWS3000GT4-24, HWS3000GT4-48, HWS3000GT4-60, HWS3000GT4-80, HWS3000GT4-130, HWS3000GT4-250 Maybe followed by suffix "ab" (a is /, b is HD and "a", "b" may be blank)
Rating:	Input: 3Φ 380-480 VAC, 50-60 Hz, 6.0 A Output: Refer to General Product Information
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: Atsushi Saito / Project Handler Reviewed By: Toshiyuki Suzuki / 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 covered in this report is building-in type switching power supply unit, incorporating cooling fan, with a single output.

Products is non-temperature dependent unit.

<Output rating>

Model HWS3000GT4-24: 24Vdc, 125 A

Model HWS3000GT4-48: 48Vdc, 62.6 A

Model HWS3000GT4-60: 60Vdc, 50.0 A

Model HWS3000GT4-80: 80Vdc, 37.5 A

Model HWS3000GT4-130: 130Vdc, 23.2 A

Model HWS3000GT4-250: 250Vdc, 12.0 A

Model Differences

HWS3000GT4 series are identical except for output rating, winding of Transformer T1, Inductor (L31) and some components on secondary circuit (output diodes etc.) (see appended table 4.1.2).

Test Item Particulars

Product group	:	built-in component
Classification of use by	:	Ordinary person
Supply connection	:	AC Mains
Supply tolerance	:	+10%/-10%
Supply connection - type	:	Terminal Block
Considered current rating of protective device	:	30 A; Location: building
Equipment mobility	:	for building-in
Overvoltage category (OVC)	:	OVC II
Class of equipment	:	Class I
Special installation location	:	N/A
Pollution degree (PD)	:	PD 2
Manufacturer's specified Tma	:	70 °C
IP protection class	:	IPX0

Power systems	:	TN TT
Altitude during operation (m)	:	Up to 5000 m
Altitude of test laboratory (m)	:	Approx 10 to 20 m
Mass of equipment (kg)	:	approximately 2.5 kg

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 70°C (depending on the load condition, refer to Enclosure-Miscellaneous id. 07-27 for detail)

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/Earthed Dead Metal: Maximum 530 Vrms / 988 Vpk (For HWS3000GT4-250)
- The following output circuits are at ES1 energy levels : Output of Model HWS3000GT4-24, HWS3000GT4-48 and AUX output
- The following output circuits are at ES2 energy levels : Output of Model HWS3000GT4-60 and HWS3000GT4-80
- The following output circuits are at ES3 energy levels : Output of Model HWS3000GT4-130 and HWS3000GT4-250
- The following output circuits are at PS2 energy levels : AUX output
- The following output circuits are at PS3 energy levels : All model's output (V+ V-)
- Proper bonding to the end-product main protective earthing termination is : Required (via chassis)
- An investigation of the protective bonding terminals has : Been conducted
- The following end-product enclosures are required : Electrical, Fire, Mechanical
- 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.
- Primary - ground capacitor (C4, C5, C6) may have variation in capacitance up to 4700pF maximum. Therefore, consideration shall be given in controlling the capacitance value in end-product application with respect to touch current issue.
- X-Capacitor (C1, C2, C3) may have variation in capacitance up to 1.0µF maximum. Therefore, consideration shall be given in controlling the capacitance value in 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.
- Y-Capacitor (C9, C18, C23) may have variation in capacitance up to C9: 1000pF, C18: 2200pF, C23: 4700pF maximum. Therefore, consideration shall be given in controlling the capacitance value in end-product application with respect to touch current issue.
- Humidity conditioning has been conducted by tropical condition
- The following magnetic devices (e.g. transformers or inductor) are provided with IEC 60085 insulation system with the indicated rating greater than Class 105 (A): T1 (Class 180(H) for A29111x/A29114x/A29212x) or (Class 155(F) for A29112x/A29113x/A29211x) and T51 (Class 130(B))
- All tests measuring temperatures of components were conducted with the Power Supply mounted in horizontal position (Position A: Nameplate/Rating Label side up) or vertical position (Position B: Input terminal lower side and output V+ terminal upper side). 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, the located 13mm or more from the Varistors shall be considered.
- Fan speeds except for describing in additional information should be considered in end-product.
- Three phase connection except for star system should be considered in end-product.

Additional Information

The following are the output voltage ranges considered during the evaluation:
Model HWS3000GT4-24: Maximum 28.8Vdc, Maximum 125 A and 3000 W
Model HWS3000GT4-48: Maximum 52.8Vdc, Maximum 62.6 A and 3004.8 W
Model HWS3000GT4-60: Maximum 66.0Vdc, Maximum 50.0A and 3000 W
Model HWS3000GT4-80: Maximum 96.0Vdc, Maximum 37.5 A and 3000 W
Model HWS3000GT4-130: Maximum 156Vdc, Maximum 23.2 A and 3016 W
Model HWS3000GT4-250: Maximum 300Vdc, Maximum 12.0 A and 3000 W
Adjustment was made via Variable Resistor (VR41)

HWS3000GT4 series maybe followed by suffix "ab"
(a is /, b is HD and "a" and "b" may be blank)

a; (separator)
b; HD = coating on both sides of PWB for functional purpose,

Fan speed of the unit is variable (4 speed), however all tests are conducted with maximum speed due to applicant's information.
And also all thermostats (TH301, TH601, TH801) did not work as safeguard in normal/abnormal condition.

Markings and Instructions

Clause Title	Marking or Instruction Details
Equipment identification marking – Manufacturer identification	Listee’s or Recognized Company’s name, Trade Name, Trademark or File Number
Equipment identification marking – model identification	Model Number
Fuses – replaceable by ordinary or instructed person	(component ID: F1, F2, F3), Ratings (F12.5A, AC500V) and (symbol of required characteristics) located on or adjacent to fuse or fuseholder or in service manual.