

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, QGGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)																																																
Product:	Switch Mode Power Supply, Built-In AC/DC for use in ITE																																																
Model:	<p>LFWLT150-1XXX-YYY-W -V LFWLT100-1XXX-YYY-W-V</p> <p>Where: X = Any alpha and/or numeric character (representing the output voltage) Y = Any alpha and/or numeric character or blank (denotes minor input and/or output variation and /or minor SELV circuit variation) (If no fan is provided, standard airflow of 300 LFM is applicable.) V = 'K' or blank (denotes internal fan and external enclosure) W = 2 or blank, 2 denotes Class II and blank denotes Class I</p>																																																
Rating:	<p>Input: 100-240 Vac, 2.2 A Max, 47-63 Hz</p> <p>Output: 300 lfm External Cooling</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Vdc</th> <th style="text-align: center;">A</th> <th style="text-align: center;">Max W</th> </tr> </thead> <tbody> <tr> <td>LFWLT150-1XX0-YYY-W-V</td> <td style="text-align: center;">5</td> <td style="text-align: center;">20</td> <td style="text-align: center;">100</td> </tr> <tr> <td>LFWLT150-1XX1-YYY-W-V</td> <td style="text-align: center;">12</td> <td style="text-align: center;">12.5</td> <td style="text-align: center;">150</td> </tr> <tr> <td>LFWLT150-1XX2-YYY-W-V</td> <td style="text-align: center;">15</td> <td style="text-align: center;">10</td> <td style="text-align: center;">150</td> </tr> <tr> <td>LFWLT150-1XX3-YYY-W-V</td> <td style="text-align: center;">24</td> <td style="text-align: center;">6.25</td> <td style="text-align: center;">150</td> </tr> <tr> <td>LFWLT150-1XX4-YYY-W-V</td> <td style="text-align: center;">48</td> <td style="text-align: center;">3.13</td> <td style="text-align: center;">150</td> </tr> </tbody> </table> <p>Convection Cooling</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Vdc</th> <th style="text-align: center;">A</th> <th style="text-align: center;">Max W</th> </tr> </thead> <tbody> <tr> <td>LFWLT100-1XX0-YYY-W-V</td> <td style="text-align: center;">5</td> <td style="text-align: center;">16</td> <td style="text-align: center;">80</td> </tr> <tr> <td>LFWLT100-1XX1-YYY-W-V</td> <td style="text-align: center;">12</td> <td style="text-align: center;">8.33</td> <td style="text-align: center;">100</td> </tr> <tr> <td>LFWLT100-1XX2-YYY-W-V</td> <td style="text-align: center;">15</td> <td style="text-align: center;">6.67</td> <td style="text-align: center;">100</td> </tr> <tr> <td>LFWLT100-1XX3-YYY-W-V</td> <td style="text-align: center;">24</td> <td style="text-align: center;">4.17</td> <td style="text-align: center;">100</td> </tr> <tr> <td>LFWLT100-1XX4-YYY-W-V</td> <td style="text-align: center;">48</td> <td style="text-align: center;">2.08</td> <td style="text-align: center;">100</td> </tr> </tbody> </table> <p>Fan aux output rated up to 24 Vdc, 6.0 W Max. Output power derated 2.5 W/°C above 50°C (up to 70°C), with external or convection cooling. LFWLT150 series and LFWLT100 series have equivalent output ratings for convection cooling. LFWLT100 series evaluated for convection cooling only. Refer to "Miscellaneous" Enclosure for derated output electrical ratings.</p>		Vdc	A	Max W	LFWLT150-1XX0-YYY-W-V	5	20	100	LFWLT150-1XX1-YYY-W-V	12	12.5	150	LFWLT150-1XX2-YYY-W-V	15	10	150	LFWLT150-1XX3-YYY-W-V	24	6.25	150	LFWLT150-1XX4-YYY-W-V	48	3.13	150		Vdc	A	Max W	LFWLT100-1XX0-YYY-W-V	5	16	80	LFWLT100-1XX1-YYY-W-V	12	8.33	100	LFWLT100-1XX2-YYY-W-V	15	6.67	100	LFWLT100-1XX3-YYY-W-V	24	4.17	100	LFWLT100-1XX4-YYY-W-V	48	2.08	100
	Vdc	A	Max W																																														
LFWLT150-1XX0-YYY-W-V	5	20	100																																														
LFWLT150-1XX1-YYY-W-V	12	12.5	150																																														
LFWLT150-1XX2-YYY-W-V	15	10	150																																														
LFWLT150-1XX3-YYY-W-V	24	6.25	150																																														
LFWLT150-1XX4-YYY-W-V	48	3.13	150																																														
	Vdc	A	Max W																																														
LFWLT100-1XX0-YYY-W-V	5	16	80																																														
LFWLT100-1XX1-YYY-W-V	12	8.33	100																																														
LFWLT100-1XX2-YYY-W-V	15	6.67	100																																														
LFWLT100-1XX3-YYY-W-V	24	4.17	100																																														
LFWLT100-1XX4-YYY-W-V	48	2.08	100																																														
Applicant Name and Address:	EOS POWER INDIA PVT LTD UNIT 57 SDF-II SEEPZ ANDHERI (E) MUMBAI MH 400096 INDIA																																																

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: Wong Brian

Reviewed by: HyeongKyun Park

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 equipment model LFWLT150-1004-A1-K is a switch mode power supply intended for incorporation in Information Technology Equipment. The power supply is housed inside metal enclosure and has fan fitted on top cover of enclosure.

Wires are provided for Input and Output connections. The operating voltage range of EUT is 90 to 305 Vac, single phase, 47-63Hz . The equipment is rated for a maximum ambient temperature of 50°C and maximum operating altitude of 10,000 feet.

Model Differences

All models have identical primary circuits, PWB layout and differ only in transformer output windings and secondary circuit.

They are either open frame or with optional enclosure series of single output 3 Volts to 48 Volts switched mode power supply with an aux output up to 24V (limited to 6W) for a fan.

Any alphanumeric character or blank denotes minor output variation and /or minor SELV circuit variations not affecting safety.

Class II configuration (W = 2) is identical to Class I configuration (W = blank), except printed wiring board layout (increased spacing's to primary side mounting pads) and Y-Capacitors are rated Class Y1.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : for building-in
- Operating condition : continuous
- Access location : for building-in
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : +27.1%, -10% , 90 Vac to 305 Vac
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I (earthed) or Class II - To be determined in End Product
- 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) : 3048 m or less
- Altitude of test laboratory (m) : 2000 m or less
- Mass of equipment (kg) : 0.15
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: 50°C, derated 2.5 W/°C, maximum 70°C.
- The product is intended for use on the following power systems: TN
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of Bridging Capacitor C20, when provided. Primary side mounting pads for Class II series (W= 2), when C41 and C42 are provided (rated Y1).

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:

- Printed Wiring Boards are rated minimum 130°C. Electrolytic capacitors rated minimum 105°C.
- Clearance distances have been evaluated for an operating altitude of maximum 10,000 ft (3048 m), based on IEC60664-1:1992, Table A.2 (with 3048 m interpolated correction factor of 1.15).
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 305 V_{rms}, 488 V_{pk}
- The following secondary output circuits are SELV: All outputs, all models
- The following secondary output circuits are at non-hazardous energy levels: All outputs, all models
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- 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 for Class I configuration, where W = blank. Quick Connect/Spade terminal has not been investigated as part of the protective earthing/bonding path.
- The following input terminals/connectors must be connected to the end-product supply neutral: Pin 2 of Connector (J1) (non-fused supply conductor).
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJ2 insulation system with the indicated rating greater than Class A (105°C): Class F (155°C): T1 and L6. Inductors L1, L2 and L5 are suitable for up to 130°C (Functional insulation)
- The following end-product enclosures are required: Fire, Electrical
- The maximum continuous power supply output (Watts) relied on forced air cooling from: Model LFWLT150-1XX0-YYY-W; 100 W with 300 lfm external Cooling. LFWLT150 series; 150 W with 300 lfm external Cooling.
- The equipment is suitable for direct connection to: AC mains supply (but not provided with a means for direct connection)

Additional Information

This report was created as a result of a physical file transfer from E150565-A44.

48V model already exists in our Ref: Report Number: 234232 /UL E150565-A44-UL

48V model which is LFWLT150-1004 will be updated for the AC Input tolerance of the unit.

Photographs of models without enclosure and additional marking label can be referenced from E150565-

A44-UL .

The models covered under UL E150565-A44-UL are also updated to UL 60950-1, 2nd Edition, 2014-10-14/ CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 in this report.

Additional Standards

The product fulfills the requirements of: 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

Markings and instructions

Clause Title	Marking or Instruction Details
1.7.1 - Power ratings - Ratings	Output electrical ratings provided with symbol for dc (IEC 60417-1 Symbol No 5031)
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.
1.7.1 Power rating - Ratings	Ratings (voltage, frequency/dc, current)

Special Instructions to UL Representative

N/A