

UL TEST REPORT AND PROCEDURE

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| 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 (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: | ECP20UX Where X is S03, S05, S09, S12, S15, S24, S30, S48, D12, D15, D24. |
| Rating: | INPUT : 100-240 V ~ 0.4 A, 50-60 Hz Output: See Model Differences section for details. |
| Applicant Name and Address: | XP POWER L L C 15641 RED HILL AVE, SUITE 100 TUSTIN CA 92780 UNITED STATES |

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: Adam Tangocci / Project Handler Reviewed By: Gregory Ray / 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 component AC-DC power supply for building-in, open frame type.

Model Differences

The power supplies in the series are differentiated by the output voltage and current ratings, number of turns of primary/secondary windings in the Transformer (TR1 (Power)) and minor secondary components that allow for different output voltage ratings.

Unless otherwise indicated, all tests were conducted on Models ECP20US05, ECP20US48 and ECP20UD12.

Tests performed on Models ECP20US05, ECP20US48 and ECP20UD12 was considered to be representative of Models ECP20US03, ECP20US09, ECP20US12, ECP20US15, ECP20US24, ECP20US30, ECP20UD15 and ECP20UD24.

See below for Model Ratings Table:

Model ECP20US03: Output Rated: 3.3Vdc, 4A

Model ECP20US05: Output Rated: 5Vdc, 4A

Model ECP20US09: Output Rated: 9Vdc, 2.23A

Model ECP20US12: Output Rated: 12Vdc, 1.67A

Model ECP20US15: Output Rated: 15Vdc, 1.34A

Model ECP20US24: Output Rated: 24Vdc, 0.84A

Model ECP20US30: Output Rated: 30Vdc, 0.67A

Model ECP20US48: Output Rated: 48Vdc, 0.42A

Model ECP20UD12: Output Rated: +12Vdc, 0.84A and -12Vdc, 0.84A

Model ECP20UD15: Output Rated: +15Vdc, 0.67A and -15Vdc, 0.67A

Model ECP20UD24: Output Rated: +24Vdc, 0.42A and -24Vdc, 0.42A

Test Item Particulars

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|--------------------------|-----------------|
| Classification of use by | Ordinary person |
| Supply Connection | AC Mains |
| Supply % Tolerance | +10%/-10% |
| Supply Connection – Type | For building-in |

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|--|--------------------|
| 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 | Not Classified |
| Access location | N/A |
| Pollution degree (PD) | PD 2 |
| Manufacturer's specified maximum operating ambient | 50 °C |
| IP protection class | IPX0 |
| Power Systems | TN |
| Altitude during operation (m) | 3048 m |
| Altitude of test laboratory (m) | 2000 m or less |
| Mass of equipment (kg) | 0.045 kg |

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 50°C
- The product is intended for use on the following power systems : TN
- The equipment disconnect device is considered to be : To be determined in the end-product.
- Required Clearances have been adjusted by multiplying the clearance at sea level by a factor of 1.15 for operating at an altitude of 3048 meters. The correction factor is based on barometric pressure of 70kPa. If the calculated Clearance exceeded the Creepage, the Creepage was adjusted to the value of clearance.
- Power supplies covered by this report were evaluated for both Class I and Class II (double insulated). Double insulated symbol is optionally provided. Earthing symbol may only be provided for Class I power supplies.

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 product-line tests are conducted for this product : Electric Strength
- The following output circuits are at ES1 energy levels : All Outputs
- The following output circuits are at PS3 energy levels : All Outputs
- 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 (Class I)
- An investigation of the protective bonding terminals has : Not been conducted
- The following input terminals/connectors must be connected to the end-product supply neutral : AC N
- The following end-product enclosures are required : Mechanical, Fire, Electrical
- 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) : TR1, L2 - Class 130 (B).
- The power supply was evaluated to be used at altitudes up to : "3048 m"
- When installed in a Class I end product, the power supply shall be mounted in a manner that provides the minimum required Clearance between the primary side of power supply and protectively earthed accessible conductive parts.
- Heatsinks are floating and considered live. They should not be accessible in the end-product.
- A suitable main disconnect device shall be provided in the end product.
- Consideration to repeating the Touch Current test should be given in the end-product evaluation.
- The power supplies in this report have been subject to Capacitance Discharge testing. Additionally, all associated component safeguards have been assessed to the applicable requirement in Annex G.10. Additional testing should not be needed if directly connected to mains e.g. using an appliance inlet, wiring terminals, etc.
- When installed in a Class II end product, the power supply shall be mounted on insulating posts in a manner that provides the minimum required Clearance between the power supply and any accessible conductive parts.

Additional Information

Marking Plate is representative of all models.

This report is based on a previous evaluation to IEC 60950-1:2005 (2nd Ed.), Am1:2009 + Am2:2013 under CBTR Ref. No. E317867-A6-CB-3 including Amendments, CBTC Ref. No. US-26088-UL. Based on the previously conducted performance testing, only the tests conducted as part of this investigation were considered necessary.

The following tests were conducted under CTDP SMT/CTF Stage 3 to IEC 60950-1 E2+A1+A2 at XP POWER LLC, 15641 RED HILL AVE, SUITE 100, TUSTIN, CA 92780, USA:

Input: Single-Phase (1.6.2)

Capacitance Discharge (2.1.1.7)

SELV Reliability Test Including Hazardous Voltage Measurements (2.2.2, 2.2.3, 2.2.4, Part 22 6.1)

Humidity (2.9.1, 2.9.2, 5.2.2)

Determination of Working Voltage; Working Voltage Measurement (2.10.2)

Distance Through Insulation Measurements (2.10.5)

Heating (4.5.1, 1.4.12, 1.4.13)

Electric Strength (5.2.2)

Component Failure (5.3.1, 5.3.4, 5.3.7)

Abnormal Operation (5.3.1 - 5.3.9)

Transformer Abnormal Operation (5.3.3, 5.3.7b, Annex C.1)

Power Supply Output Short-Circuit/Overload (5.3.7)

The following additional tests were conducted on a sample of model ECP20UD24 in accordance with IEC 62368-1:2014 (Second Edition) at XP POWER LLC, 15641 RED HILL AVE, SUITE 100, TUSTIN, CA 92780 USA:

Electric Strength Test (5.4.9)

Prospective Touch Voltage and Touch Current Measurement (5.7)

Additional Standards

The product fulfills the requirements of: EN 62368-1:2014 + A11:2017

Markings and Instructions

| Clause Title | Marking or Instruction Details |
|--|---|
| Equipment identification marking – Manufacturer identification | Listees or Recognized companys name, Trade Name, Trademark or File Number |
| Equipment identification marking – model identification | Model Number |
| Equipment rating marking – ratings | "Input Ratings (voltage, frequency/dc, current/power)", "Output Ratings (voltage, frequency/dc, current/power)" |

Special Instructions to UL Representative

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| BD1.0 | TABLE: Production-Line Testing Requirements | | | | | |
| BD1.1 | Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information. | | | | | |
| Model | Component | Removable parts | Test probe location | Test V rms | Test V dc | Test Time, s |
| All models | TR1 | -- | Primary to Secondary | 2829 | 4000 | 1 |
| BD1.2 | Earthing Continuity Test Exemptions – This test is not required for the following models: | | | | | |
| | All models exempt. | | | | | |
| BD1.3 | Electric Strength Test Exemptions – This test is not required for the following models: | | | | | |
| | -- | | | | | |
| BD1.4 | Electric Strength Test Component Exemptions – The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test. | | | | | |
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| BE1.0 | Sample and Test Specifics for Follow-Up Tests at UL | | | | |
| Model | Component | Material | Test | Sample (s) | Test Specifics |
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