UL TEST REPORT AND PROCEDURE

Standard:	ANSI/AAMI ES60601-1 (2005 + C1:09 + A2:10)(Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) CAN/CSA-C22.2 No. 60601-1 (2008) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance)
Certification Type:	Component Recognition
CCN:	QQHM2, QQHM8 (Power Supplies, Medical and Dental)
Product:	Medical Switching Power Supply
Model:	ECM40USXX, ECM40US24-XB0194, ECM60USXX and ECM60USXX (3X5) (where XX can be any number between 05 and 48 designating the output voltage, all models may be followed by "-W")
Rating:	Model ECM40USXX and ECM40US24-XB0194: Input Rated: 100-240 V~, 50/60 Hz, 1.0A Models ECM60USXX and ECM60USXX (3X5): Input Rated: 100-240 V~, 50/60 Hz, 1.5A All Models (Except ECM40US24 -XB0194): Output: See Model Differences for details. Model ECM40US24-XB0194: Output: 23 Vdc, 1.74A
Applicant Name and Address:	XP POWER LLC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 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: Linus Park Reviewed by: David V. Alma

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

Products covered are open frame power supplies intended for building-in to be used with Medical Electrical Equipment. Units are intended for used with Class I or Class II end-products.

Model Differences

Model ECM40USXX Series and Model ECM60USXX Series are identical with exception to input and output ratings, all models may be followed by suffix "-W".

All models in Model ECM40USXX and Model ECM60USXX series are identical with exception to the Mains Transformer, T1, and minor secondary components that allow for different output voltage ratings.

Models followed by "-W" are optionally provided with two Y1 bridging capacitors (C22 and C23) and provide 2 MOPP between primary and secondary and Models without the "-W" are provided with one Y1 bridging capacitors (C17) and provide 1 MOPP between primary and secondary.

See below for Model Ratings for up to 50°C ambient:

Model ECM40US05: Output Rated: 5.0 Vdc, 8.0 A
Model ECM40US07: Output Rated: 7.0 Vdc, 5.7 A
Model ECM40US09: Output Rated: 9.0 Vdc, 4.4 A
Model ECM40US12: Output Rated: 12.0 Vdc, 3.5 A
Model ECM40US15: Output Rated: 15.0 Vdc, 2.7 A
Model ECM40US18: Output Rated: 18.0 Vdc, 2.2 A
Model ECM40US24: Output Rated: 24.0 Vdc, 1.7 A
Model ECM40US33: Output Rated: 33.0 Vdc, 1.2 A
Model ECM40US48: Output Rated: 48.0 Vdc, 0.9 A
Model ECM60US05: Output Rated: 5.0 Vdc, 12.0 A
Model ECM60US07: Output Rated: 7.0 Vdc, 8.6 A
Model ECM60US09: Output Rated: 9.0 Vdc, 6.7 A
Model ECM60US12: Output Rated: 12.0 Vdc, 5.0 A
Model ECM60US15: Output Rated: 15.0 Vdc, 4.0 A
Model ECM60US18: Output Rated: 18.0 Vdc, 3.3 A
Model ECM60US20: Output Rated: 20.0 Vdc, 3.0 A
Model ECM60US24: Output Rated: 24.0 Vdc, 2.5 A
Model ECM60US28: Output Rated: 28.0 Vdc, 2.14 A
Model ECM60US33: Output Rated: 33.0 Vdc, 1.8 A
Model ECM60US48: Output Rated: 48.0 Vdc, 1.25 A
Model ECM40US24 -XB0194: Output Rated: 23Vdc, 1.74 A

See Enclosures 7-01 for de-rating curve for ambient temperatures up to 70°C.

Model ECM60USXX Series is identical to Model ECM60USXX (3X5) with exception to Model ECM60USXX (3X5) being provided on a 3 by 5 in. printed wiring board.

Model ECM40US24-XB0194 is identical to Model ECM40US24-W with exception to the board layout, provided earthed heatsink construction, and modification to the output voltage and current rating.

Technical Considerations

- § Classification of installation and use : For building-in

- Device type (component/sub-assembly/ equipment/ system) : Component
- Intended use (Including type of patient, application location) : None
- Mode of operation : Continuous
- Supply connection : For building-in
- Accessories and detachable parts included : None
- Other options include : None
- The product was investigated to the following additional standards:: ANSI/AAMI ES60601-1 (2005 + C1:09 + A2:10) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) (includes Deviations for United States), CAN/CSA-C22.2 No. 60601-1 (2008) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) (includes National Differences for Canada), EN 60601-1: 2006 + CORR: 2010 (Medical electrical equipment Part 1: General requirements for basic safety and essential performance)
- The product was not investigated to the following standards or clauses:: Biocompatibility (ISO 10993-1), Clause 14, Programmable Electronic Systems, Electromagnetic Compatibility (IEC 60601-1-2)
- The degree of protection against harmful ingress of water is:: Ordinary
- The mode of operation is:: Continuous
- The product is suitable for use in the presence of a flammable anesthetics mixture with air or oxygen or with nitrous oxide:: No
- Unit also complied with spacing requirements of UL60601-1 (1st), CSA C22.2 No. 60601-1 (2nd), and IEC 60601-1 (2nd) for Basic for 250 Vac from Primary to Ground, Double/Reinforced for 250 Vac from Primary to Secondary.
- The power supply was evaluated for use in 50°C ambient at Full Rated Output and 50% of the Rated Output in 70°C ambient. (See De-rating Curve, Enclosure 7-01 for details)

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 component shall be considered for compliance with the Marking (clause 7) and Separation (clause 8) requirements as part of the end use application evaluation.

- § Repeat of leakage current testing and consideration of non-frequency weighted leakage to be considered as part of the end product.

- § Power supply Models with the suffix "- W" are provided with two Y1 bridging capacitor (C22 and C23) and evaluated with Two MOPP between Primary and Secondary; One MOPP primary and Earth. Models without the suffix "- W" are provided with one Y1 bridging capacitor (C17) and evaluated for 1 MOPP between primary and secondary and 1 MOPP between primary and earth.

- § This power supply has been evaluated as a continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide. The output circuits have not been evaluated for direct patient connection (Type B, BF or CF).

- § The end product shall ensure that the requirements related to accompanying documents, clause 7.9, are met.

- § The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.

- § The following secondary output circuits are at hazardous energy levels: Main Power Output

- § The output connectors are not acceptable for field connections; they are only intended for connection to mating connectors of the end-use equipment.

- § The Dielectric Strength Test conducted on this power supply (except Model ECM40US24 -XB0194) was based upon a maximum working voltage of: Primary-Earthed Dead Metal (Class I units): 347 Vpk, 244 Vrms; Primary-SEC: 356 Vpk, 240 Vrms.

- § For Class I application: Protective bonding testing shall be considered in the end product application.

- § 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): L1 and T1 (Class F, 155°C)

- § Printed Wiring Board rated 130°C.

- § Cleaning test shall be considered as part of end product evaluation.

- § The need for Marking Durability and Marking Legibility Testing shall be considered as part of the end product installation.

- § Fire/ Mechanical/ Electrical Enclosure to be provided as part of the end product.

- § When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.5 mm Clearance/4 mm Creepage between the primary sides of power supply and protectively earthed accessible conductive parts. In addition, when installed in a Class I

end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.

§ When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a min. 5 mm Clearance/8 mm Creepage between the power supply and any accessible conductive parts.

§ Models without the suffix "- W" are evaluated for 1 MOPP between primary and secondary. The end-product evaluation shall consider the need for additional protection.

§ The Dielectric Strength Test conducted on this power supply, Model ECM40US24 -XB0194, was based upon a maximum working voltage of: Primary-Earthed Dead Metal (Class I units): 353 Vpk, 243 Vrms; Primary-SEC: 491 Vpk, 249 Vrms.

§ For Model ECM40US24 -XB0194: Heat Sink (HS1) to be protectively earthed as part as end product evaluation.

Additional Information

This report is a reissue of CBTR Ref. No.E146893-A1-CB-2, CB Test Certificate Ref. No. US/12319/UL. Based on previously conducted testing and the previous review of product construction it was determined that the product continues to comply with the standard.

Nameplate marking provided is considered representative of the series.

Tests conducted on models with suffix "- W" were considered representative of models without suffix "-W".

For licenses older than 3 years, manufacturer to provide updated licenses upon NCB's request.

Additional Standards

The product fulfills the requirements of: ANSI/AAMI ES60601-1 (2005 + C1:09 + A2:10), CAN/CSA-C22.2 No. 60601-1 (2008), IEC 60601-1: 2005, EN 60601-1: 2006 + CORR: 2010

Markings and instructions

Clause Title	Marking or Instruction Details
Model	Model number
Company identification	Classified or Recognized company's name, Trade name, Trademark or File
Supply Connection	Voltage range, ac/dc, phases if more than single phase
Alternating current	
Supply Frequency	Rated frequency range in hertz
Power Input	Amps, VA, or Watts
Output	Rated output voltage, power, frequency.

Special Instructions to UL Representative
N/A

Production-Line Testing Requirements			
Test Exemptions - The following models are exempt from the indicated test			
Model	Grounding Continuity	Dielectric Voltage Withstand	Patient Circuit Dielectric Voltage Withstand
All Models	Exempt	Test	Exempt
Solid-State Component Test Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during either Dielectric Voltage Withstand Test:			
Component			
N/A			
Sample and Test Specifics for Follow-Up Tests at UL			
The following tests shall be conducted in accordance with the Generic Inspection Instructions			
Plastic Enclosure or Part	Test	Sample(s)	Test Specifics
N/A			

UL TEST REPORT AND PROCEDURE

Standard:	ANSI/AAMI ES60601-1:2005, 3rd ed. (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) CAN/CSA-C22.2 No. 60601-1 (2008) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance)
Certification Type:	Component Recognition
CCN:	QQHM2, QQHM8 (Power Supplies, Medical and Dental)
Product:	Component Switching Power Supply
Model:	ECM60UDxx, ECM60UTxx, ECM40UDxx, ECM40UTxx, ECC60UDxx, ECC60UTxx, ECC40UDxx, ECC40UTxx, ECM60UDxx (3X5), ECM60UTxx (3X5), where xx can be 21-22, 31-37, ECM60UT31>2449; all models maybe followed by "W". ECM60UT31 -XD0166, 10013486, ECM60UT31 -XE0410, 10013489
Rating:	Input Rated: 100-240 V ac, 50/60 Hz, 1.5 A Output rated: 3.3, 5, 12, 15, 24, -12 or -15 V dc, Max 40 or 60 W, Dual or Triple outputs. For Models ECM60UT31 -XD0166 and 10013486: Output Rated: Output 1: 5.6Vdc, 8A Output 2: 12.5Vdc, 3A Output 3: -12Vdc, 0.5A For Models ECM60UT31 -XE0410 and 10013489: Output Rated: Output 1: 5Vdc, 2.5 A Output 2: 12.5Vdc, 3A Output 3: -12Vdc, 1A
Applicant Name and Address:	XP POWER INC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES

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Prepared by: Linus Park Reviewed by: David V. Alma

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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 products covered in this report are component power supplies intended for use in Medical Electrical Equipment.

Model Differences

All models are identical except output electrical ratings, designation and may be provided with either dual or triple outputs. Models with designation UD represent dual outputs and UT represents triple outputs. Models rated 40 W are identical in construction to Models rated 60 W and differ for marketing purposes only. ECM models are identical to ECC models and differ in designation only. See Enclosure 7-01 for differences in output rating and manufacturers recommended ambient Tma relative to output loading and cooling.

Model ECM60UT31>2449 is identical to Model ECM60UTXX series with exception to changes to components: Optical Isolator, U3, and Capacitors, C2, C3, C22, C29.

Models ECM60UDxx (3X5) and ECM60UTxx (3X5) are identical to Models ECM60UDxx and ECM60UTxx respectively except the PWB size is larger (3X5 inches) and changes to the trace layout and secondary circuitry.

Models followed by W are provided with two Y1 bridging capacitors(C22 and C22A) and provide 2 MOPP between primary and secondary and Models without the W are provided with one Y1 bridging capacitors(C22) and provide 1 MOPP between primary and secondary.

Model ECM60UT31 -XD0166 is identical to Model ECM60UT31 -W, with exception to the capacitor configuration.

Model ECM60UT31 -XD0166 is identical to Model 10013486, with exception to the model designation.

Model ECM60UT31 -XE0410 is identical to Model ECM60UT >2449, except it is provided with two bridging capacitors (C22, C22A) instead of one.

Model ECM60UT31 -XE0410 is identical to Model 10013489, with exception to the model designation.

Technical Considerations

- Classification of installation and use : Building-in
- Device type (component/sub-assembly/ equipment/ system) : Component
- Intended use (Including type of patient, application location) : To supply regulated power
- Mode of operation : Continuous
- Supply connection : To be determined in the end product
- Accessories and detachable parts included : None
- Other options include : None
- The product was investigated to the following additional standards:: ANSI/AAMI ES60601-1 (2005 + C1:09) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) (includes Deviations for United States), CAN/CSA-C22.2 No. 60601-1 (2008) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) (includes National Differences for Canada), EN 60601-1: 2006 + CORR:2010 (Medical electrical equipment Part 1: General requirements for basic safety and essential performance)
- The product was not investigated to the following standards or clauses:: Electromagnetic Compatibility (IEC 60601-1-2), Clause 14, Programmable Electronic Systems, Biocompatibility (ISO 10993-1)
- The degree of protection against harmful ingress of water is:: Ordinary
- The mode of operation is:: Continuous
- The product is suitable for use in the presence of a flammable anesthetics mixture with air or oxygen or with nitrous oxide:: No
- Scope of Power Supply evaluation excludes the following: Patient applied parts clauses: 4.6, 7.2.10, 8.3, 8.5.2, 8.5.5, 8.7.4.7-8.7.4.9, 8.9.1.15; Battery related clauses: 7.3.3, 15.4.3; Hand Control related clauses: 8.10.4; Oxygen related clauses: 11.2.2; Fluids related clauses: 11.6.2 – 11.6.4; Sterilization clause: 11.6.7; Biocompatibility Clause: 11.7 (ISO 10993); Motor related clauses: 13.2.13.3, 13.4; Heating Elements related clause: 13.2; Flammable Anaesthetic Mixtures Protection: Annex G
- Supply connection: Overvoltage Category II
- Software is relied upon for meeting safety requirements related to mechanical, fire and shock: No

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:

- Power supply Models with the suffix W are provided with two Y1 bridging capacitor (C22 and C22A) and evaluated with Two MOPP between Primary and Secondary; One MOPP primary and Earth and Models without the suffix W are provided with one Y1 bridging capacitor (C22) and evaluated for 1 MOPP between primary and secondary and 1 MOPP between primary and earth.

- This power supply has been evaluated as a continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide. The output circuits have not been evaluated for direct patient connection (Type B, BF or CF)

- The end product shall ensure that the requirements related to accompanying documents, clause 7.9, are met.

- The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.

- The input/output connectors are not acceptable for field connections, they are only intended for connection to mating connectors of internal wiring inside the end-use equipment.

- The maximum investigated branch circuit rating is: 20 A. If used on a branch circuit greater than this, additional testing may be necessary.

- The Dielectric Voltage Withstand Test conducted on this power supply was based upon a maximum working voltage of: Primary-Earthed Dead Metal (Class I units): 340 Vpk, 240 Vrms; Primary-SEC: 406 Vpk, 261 Vrms.

- When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.5 mm Clearance/4 mm Creepage between the primary sides of power supply and protectively earthed accessible conductive parts. In addition, when installed in a Class I end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.

- When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a min. 7 mm Clearance/8.3 mm Creepage between the power supply and any accessible conductive parts.

- An investigation of the protective bonding terminal has: Not been conducted.

- For Class I application: Protective bonding testing shall be considered in the end product application.

- Suitable fire enclosure shall be provided in the end use application

- Proper bonding to the Class I end-product main protective earthing termination is required (via mounting holes on the PCB), unless for Class II applications. For Class II applications the primary side mounting pads are isolated from accessible conductive chassis by Reinforced Insulation

- Model ECM60xx series, convection cooled was submitted and tested for use at the manufacturer's recommended ambient temperature (Tmra) of 50°C, at 100% of its rated output. The output is then de-rated linearly to 50% in an ambient 70°C. Models ECM60xx provided with 5CFM of forced air cooling are rated for 100% output in an ambient of 60°C decreasing linearly to 50% of output in an ambient of 80°C. Models ECM40xx series, convection cooled, in an ambient of 60°C is rated for 100% output, decreasing linearly to 75% in an ambient of 70°C. For 5CFM of forced air cooling, in an ambient of 70°C, the output is 100%, decreasing linearly to 75% in an ambient of 80°C.

- The products were tested on a 20 A branch circuit. If used on a branch circuit greater than this, additional testing may be necessary

- The equipment has been evaluated for use in a Pollution Degree 2 environment

- Residual Voltage in Attachment Plug should be conducted in the end product with the final configuration/values of Y and bridging capacitors.

- 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): L1 and T1 are min. Class F (155°C).

- The PWB is rated 130°C.

- Cleaning test to be considered as part of end product evaluation

- The need for Marking Durability and Marking Legibility Testing shall be considered as part of the end product installation.

- Fire/ Mechanical/ Electrical Enclosure to be provided as part of the end product

- The need to measure the leakage current with a non-frequency weighted device per Clause 8.7.3 (e) shall be considered in the end product.

- A 5cfm fan should be provided based on the end product rated ambient temperature and load.

- The component shall be considered for compliance with the Marking (clause 7) and Separation (clause 8) requirements as part of the end use application evaluation.

- Temperature, leakage and Dielectric Tests should be considered in the end product

- Touch current test to be conducted as part of the end product.

Additional Information

These models have not been evaluated for use with a cover.

When submitting this Test Report to other Certification Body, the manufacturer is responsible for providing any additional information that the Body may need in order to issue its Mark, including testing for compliance with the applicable collateral standards.

Manufacturer to provide up to date IEC Licensed for component licenses greater than 3 years upon request.

This CB Report is being reissued based on an earlier CB Report E149893-A3-CB-1, issued on 2004-08-16 and amended on 2006-06-23, 2007-11-12 and corrected on 2005-04-08 and 2006-01-19 with Certificate US/8609B/UL.

Only one marking plate is provided which is representative of the other models in the series except for the output ratings

Additional Standards

The product fulfills the requirements of: ANSI/AAMI ES60601-1 (2005 + C1:09); CAN/CSA-C22.2 No. 60601-1 (2008); EN 60601-1: 2006 + CORR:2010; IEC 60601-1: 2005 + CORR. 1 (2006) + CORR. 2 (2007)

Markings and instructions

Clause Title	Marking or Instruction Details
Company identification	Classified or Recognized company's name, Trade name, Trademark or File
Model	Model number
Supply Frequency	Rated frequency range in hertz
Supply Connection	Voltage range, ac/dc, phases if more than single phase
Power Input	Amps, VA, or Watts
Output	Rated output voltage, power, frequency.

Special Instructions to UL Representative

Some of the components described in the Follow-Up Procedure are not purchased directly from a vendor but are sub-assemblies manufactured for the end-use products in this Follow-Up Procedure.

After the components have been inspected to meet the requirements of the respective section of this Follow-Up Procedure, the marking (I) "K" for XP Power (Kunshan) Limited or ("F" for Fortron Source (China) Corp will be applied to the unit as proof of inspection by the Field Representative. The unit will then be shipped to the second manufacturing location of this Follow-Up Procedure for final modification assembly.

SUB-ASSEMBLY:

The following items originate and are to be inspected at the following manufacturing locations:

XP POWER (KUNSHAN) LIMITED
230 BIN JIANG NAN RD ZHANG PU TOWN
KUNSHAN,
JIANG SU 215321 CHINA

and/or

FORTRON SOURCE (CHINA) CORP (III)
JUYUAN INDUSTRIAL PARK
TANGWEI FUYONG
BAO'AN
SHENZHEN,
GUANGDONG 518103 CHINA

Upon passing inspection, these items will be labeled as described on the previous page and shipped to subsequent manufacturing location for modifications (Final Assembly).

The following sub-assembly components are assembled at the above locations. See body of the Report for detailed description of all items noted below:

1. All components called out in the UL Procedure that are mounted to the Printed Wiring Board.
2. Printed Wiring Board assemblies are then mounted in chassis.

FINAL ASSEMBLY:

The final product is assembled with the following processes at the end-use manufacturing locations described below:

1. Change/Adjustment values of X/Y Capacitors.
2. Modify secondary circuit of power supply to adjust rating of output.

XP POWER INC
990 BENECIA AVE
SUNNYVALE CA 94085

The UL Field Representative is to verify that the initial assembly marking as described above is present on the unit and that they were shipped from any of the following manufacturing locations.

XP POWER (KUNSHAN) LIMITED
230 BIN JIANG NAN RD ZHANG PU TOWN
KUNSHAN,
JIANG SU PROVINCE 215321 CHINA

or

FORTRON SOURCE (CHINA) CORP (III)
JUYUAN INDUSTRIAL PARK
TANGWEI FUYONG
BAO'AN
SHENZHEN,
GUANGDONG 518103 CHINA

Production-Line Testing Requirements			
Test Exemptions - The following models are exempt from the indicated test			
Model	Grounding Continuity	Dielectric Voltage Withstand	Patient Circuit Dielectric Voltage Withstand
ECM and ECC series	Exempt	Test	Exempt
Solid-State Component Test Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during either Dielectric Voltage Withstand Test:			
Component			
N/A			
Sample and Test Specifics for Follow-Up Tests at UL			
The following tests shall be conducted in accordance with the Generic Inspection Instructions			
Plastic Enclosure or Part	Test	Sample(s)	Test Specifics
N/A			

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (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)
Product:	Power supply for building-in, switch mode type
Model:	ECM40USXX, ECM60USXX, ECC40USXX, and ECC60USXX (Where XX can be any number between 05 and 48 designating the output voltage. Maybe followed by 3X5) 10003831, 10006770, ECM60US12-XB0324
Rating:	Input Rated: Models ECM40USXX, ECC40USXX, 10003831: ~100-240 V, 50/60 Hz, 1A (40W) Models ECM60USXX, ECC60USXX, 10006770, ECM60US12-XB0324: ~100-240 V, 50/60 Hz, 1.5A (60W) Output: See Model Differences for details.
Applicant Name and Address:	XP POWER L L C SUITE 150 1241 E DYER RD SANTA ANA CA 92705 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.

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Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared by: Sal Oseguera Reviewed by: Linus 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

Models covered in this report are component power supply intended for use in Information Technology Equipment. Units are intended for use with Class I or Class II end-products.

Model Differences

All Models are identical, except for output ratings, minor differences in the secondary circuit components, heat-sink and the number of turns of secondary winding in the Isolation Transformer (T1).

The difference between Series ECC/ECM40/60 is model designation. The difference between Model 10003831 and the ECM/ECC Series is the heat-sink.

Model 10006770 is identical to ECM60US12 except for output ratings.
Model ECM60US12-XB0324 is identical to ECM60US12.

Output Ratings:
Model ECM40US05, ECC40US05: Output Rated: 5 Vdc, 8.0 A
Model ECM40US12, ECC40US12: Output Rated: 12 Vdc, 3.5 A
Model ECM40US15, ECC40US15: Output Rated: 15 Vdc, 2.7 A
Model ECM40US24, ECC40US24: Output Rated: 24 Vdc, 1.7 A
Model ECM40US48, ECC40US48: Output Rated: 48 Vdc, 0.9 A

Model ECM60US05, ECC60US05: Output Rated: 5 Vdc, 12.0 A
Model ECM60US12, ECC60US12: Output Rated: 12 Vdc, 5.0 A
Model ECM60US15, ECC60US15: Output Rated: 15 Vdc, 4.0 A
Model ECM60US24, ECC60US24: Output Rated: 24 Vdc, 2.5 A
Model ECM60US48, ECC60US48: Output Rated: 48 Vdc, 1.25 A

Model 10006770: Output Rated: 12.5 Vdc, 4.8 A
Model ECM60US12-XB0324: Output Rated: 12 Vdc, 5.0 A

Technical Considerations

- Equipment mobility : for building-in

- Connection to the mains : for building-in
- 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) or Class II (double Insulated)
- Considered current rating of protective device as part of the building installation (A) : 20A
- Pollution degree (PD) : PD 2
- IP protection class : IPX0
- Altitude of operation (m) : 5000
- Altitude of test laboratory (m) : less than 2000 meters
- Mass of equipment (kg) : 0.25 kg
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50°C for 100% rated output; 70°C at 50% rated output; 80°C at 50% rated output with 5cfm fan.
- The product is intended for use on the following power systems: TN
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).

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-SELV: 250 Vrms, 325 Vpk, Primary-Earthed Dead Metal: 250 Vrms, 354 Vpk
- The following secondary output circuits are SELV: Entire Series outputs.
- The following secondary output circuits are at non-hazardous energy levels: Entire Series outputs.
- 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 units
- 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 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 F, 155°C) and/or L1 (min. 130°C)
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- A suitable main disconnect device shall be provided in the end product.
- When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a min. 3.0 mm Clearance/3.0 mm Creepage between the primary sides of power supply and protectively earthed accessible conductive parts.
- When installed in a Class II end product, the power supply shall be mounted in a manner that provides, at a min. 6.0 mm Clearance/6.0 mm Creepage between the power supply and accessible conductive parts.
- Leakage Current Test to be conducted in end-product.
- Consideration to repeating Heating Tests should be given in the end-product evaluation.

- Clearance spacing evaluated for 5000 m altitude. Additional consideration maybe necessary in the end-use product.
- Need for Double Pole Fusing Warning to be considered as part of the end product.

Additional Information

The clearance distances have additionally been assessed for suitability up to 5000 m elevation (1.48 correction factor as per IEC 60664-1, Table A2).

Component licenses provided may be older than 3 years old. Manufacturer to provide updated license upon request.

Marking labels are representative of all models and ratings.

Additional Standards

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 + A1:2011, EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011, UL 60950-1 2nd Ed. Revised 2011-12-19, IEC 60950-1:2005 + A1:2009

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Power rating - Model	Model Number
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Fuses - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel

Special Instructions to UL Representative

N/A

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (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)
Product:	Power supply for building-in, switch mode type
Model:	ECM60UDxx, ECM60UTxx, ECM40UDxx, ECM40UTxx, ECC60UDxx, ECC60UTxx, ECC40UDxx, ECC40UTxx, where xx can be 21-22,31-37 representing the number of outputs and the output ratings configuration. Maybe followed by 3X5.
Rating:	Input: 100-240 V ac, 50/60 Hz, 40W or 60W, 1 A or 1.5 A. Output: 3.3, 5, 12, 15, 24, -12 or -15 V dc, Max 40 or 60 W, Dual or Triple outputs.
Applicant Name and Address:	XP POWER LLC SUITE 150, 1241 E DYER RD. SANTA ANA, CA 92705 USA

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: Sal Oseguera Reviewed by: Alan B. Flandez

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 -

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Product Description

Models covered in this report are component power supplies intended for use in Information Technology Equipment. They are open frame power supplies intended for building-in.

Model Differences

All models are identical except output electrical ratings, designation and may be provided with either dual or triple outputs. Models with designation UD represent dual outputs and UT represents triple outputs. Models rated 40 W are identical in construction to Models rated 60 W and differ for marketing purposes only. Models ECC are identical to Models ECM except for designation.

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 : +10%, -10%
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I (earthed) or Class II (double insulated)
- Considered current rating of protective device as part of the building installation (A) : 20 A
- Pollution degree (PD) : PD 2
- IP protection class : IPX0
- Altitude of operation (m) : up to 3048 meters
- Altitude of test laboratory (m) : less than 2000 meters
- Mass of equipment (kg) : 0.15 kg
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in

this test report).

- The product was submitted and tested for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 40W Models: Tma = 60°C at 100% load (40W), Convection cooling Tma = 70°C at 75% load (30W), Convection cooling Tma = 70°C at 100% load (40W), Forced air cooling Tma = 80°C at 75% load (30W), Forced air cooling 60W Models: Tma = 50°C at 100% load (60W), Convection cooling Tma = 70°C at 50% load (30W), Convection cooling Tma = 60°C at 100% load (60W), Forced air cooling Tma = 80°C at 50% load (30W), Forced air cooling Convection cooling consists of no external forced air cooling. Forced air cooling consists of an external fan blowing 132 lfm over the power supply input to output, placed approx 1 foot from power supply.
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of C22 (Pri to Sec bridging capacitor)
- The means of connection to the mains supply is: for building-in
- 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:

- Printed Wiring Board rated 130°C.
- The equipment is provided with double pole/neutral fusing. End product evaluation to consider suitable marking to service personal.
- The maximum investigated branch circuit rating is: 20 A
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary to Earthed Dead Metal: 240 Vrms, 340 Vpk , Primary to SELV: 261 Vrms, 406 Vpk
- The following secondary output circuits are SELV: All outputs
- The following secondary output circuits are at non-hazardous energy levels: All outputs
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- The investigated Pollution Degree is: 2
- Proper bonding to the end-product main protective earthing termination is: To be considered in the end use application: open frame power supply components are for building-in Class I or Class II. All units will be considered Class I, except as described below: They will be considered Class II when protection against electric shock does not rely on Basic Insulation only, unit provides additional safety precautions such as Double/Reinforced Insulation and provide minimum of 5 mm creepage and 4 mm clearance distance (mounted above chassis/accessible metal parts on Insulating posts etc). Class II units have no reliance upon protective earthing.
- 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): L1 and T1 (Class F, 130°C)
- The following end-product enclosures are required: Fire , Electrical
- The maximum continuous power supply output (Watts) relied on forced air cooling from: See Miscellaneous Enclosure - Output Ratings
- The equipment is suitable for direct connection to: AC mains supply
- An investigation of the protective bonding terminals has: Not been conducted

Additional Information

Models not evaluated for use with cover. Models also evaluated to IEC60601-1 under separate investigation.

See Miscellaneous Enclosure for Output ratings.

This report is a reissue of CBTR Ref. No.E139109-A5-CB-3, CB Test Certificate Ref. No.US/12607/UL. Based on previously conducted testing and the review of product construction it was determined that the product continues to comply with the standard. No tests were conducted under this investigation. All required tests were carried out under the original investigation.

Some of the attached Critical Component Licenses/Certs may be more than 3 years old. Manufacturer shall provide updated licenses upon request from an accepting NCB.

The Critical Components Table includes components in the product as submitted and also includes, in certain cases, alternate generic descriptions (designated as "interchangeable") for equivalent component substitutions. Recognizing NCBs may require additional information and/or evaluation to qualify alternate components.

User's Manuals, instructions and markings will be provided in the national language of the country of sale. The manufacturer is aware of the requirements for language requirements for markings/instructions, cords/cables, plugs and EMC. Detailed information may be obtained directly from the client. See Enclosure-Miscellaneous for a Letter of Assurance.

An additional evaluation was conducted to determine compliance when this product is used at an altitude of up to 3048 m. See Table 2.10.3 & 2.10.4 for details.

Additional Standards

The product fulfills the requirements of: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).

Markings and instructions

Clause Title	Marking or Instruction Details
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 - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel
1.7.1 Power rating - Ratings	Ratings (voltage, frequency/dc, current)

Special Instructions to UL Representative

N/A

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (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)
Product:	Power supply for building-in, switch mode type
Model:	ECM80US56
Rating:	Input: 100-240 V ac, 50/60 Hz, 1.65 A. Output: 56Vdc, 1.43A, 80W Max
Applicant Name and Address:	XP POWER L L C SUITE 150 1241 E DYER RD SANTA ANA CA 92705 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: Sal Oseguera Reviewed by: Bob Davis

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 -

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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 model covered in this report is a component power supply intended for use in Information Technology Equipment. It is an open frame power supply intended for building-in Class I or Class II end-products. Double insulated symbol is optionally provided. Earthing symbol may only be provided for Class I power supplies.

Model Differences

N/A

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 : +10%, -10%
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A

- Class of equipment : Class I or Class II (Determined by 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 : IPX0
- Altitude of operation (m) : up to 3048
- Altitude of test laboratory (m) : less than 2000 meters
- Mass of equipment (kg) : 0.17 kg
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50°C
- The means of connection to the mains supply is: for building-in, to be determined in the end product.
- The product is intended for use on the following power systems: TN
- The equipment disconnect device is considered to be: for building-in, to be determined in the end product.
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of C17 (Pri to Sec bridging capacitor)
- Power supplies covered by this report were evaluated for both Class I and Class II (double insulated). Double insulated symbol is optionally provided. See Conditions of Acceptability for insulation required for Class II. 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 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: 250 Vrms, 354 Vpk, Primary-SELV: 198 Vrms, 428 Vpk, ,

- The following secondary output circuits are SELV: All outputs
- The following secondary output circuits are at non-hazardous energy levels: All outputs
- 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 when the power supply is used in a Class I end product. ,
- 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: ACN J1-3
- 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): L1, L2 and T1 (Class F, 130°C)
- The following end-product enclosures are required: Electrical, Fire
- The equipment is suitable for direct connection to: AC mains supply
- Printed Wiring Board rated 130°C.
- The equipment is provided with a fuse in the hot line of the primary circuit.
- Heatsinks are floating and considered live. They should not be accessible in the end-product.
- Consideration to repeating the Touch Current test should be given in the end-product evaluation.
- When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.3 mm Clearance/2.5 mm Creepage between the primary sides of power supply and protectively earthed accessible conductive parts.
- When installed in a Class II end product, the power supply shall be mounted in a manner that provides, at a minimum, 4.6 mm Clearance/5.0 mm Creepage between the power supply and accessible conductive parts.

Additional Information

This CB Report is a reissue of CBTR Ref. No. E139109-A20-CB-1, CB Test Certificate Ref. No. US/12999/UL. Based on previously conducted testing and review of product construction, only limited testing was deemed necessary.

The clearance and creepage distances have additionally been assessed for suitability up to 3048 m elevation (1.15 correction factor as per IEC 60664-1, Table A2).

Manufacturer to provide updated component licenses for those older than 3 years upon request.

The power supply covered by this report employs Double/Reinforced Insulation between Primary and Secondary circuits.

The need for the additional testing and evaluation shall be determined in the end product investigation.

Additional Standards

The product fulfills the requirements of: EN CSA C22.2 No. 60950-1-07 + A1:2011, EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011, UL 60950-1 2nd Ed. Revised 2011-12-19, IEC 60950-1:2005 + A1:2009

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Fuses - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel
Terminals for external primary power supply conductors	Capital letter "N" located adjacent to a terminal intended exclusively for connection of the primary power neutral conductor

Special Instructions to UL Representative

N/A

CERTIFICATE OF COMPLIANCE

Certificate Number	20130412-E139109
Report Reference	E139109-A84-UL
Issue Date	2013-APRIL-12
Issued to:	XP POWER L L C SUITE 150, 1241 E DYER RD SANTA ANA CA 92705
This is to certify that representative samples of	COMPONENT - POWER SUPPLIES, INFORMATION TECHNOLOGY EQUIPMENT INCLUDING ELECTRICAL BUSINESS EQUIPMENT SEE ADDENDUM PAGE FOR MODELS
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 60950-1-Information Technology Equipment - Safety - Part 1: General Requirements. CSA C22.2 No. 60950-1-07-Information Technology Equipment - Safety - Part 1: General Requirements.
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Recognized Component Marks for the U.S. and Canada should be considered as being covered by UL's Recognition and Follow-Up Service and meeting the appropriate U.S. and Canadian requirements.

The UL Recognized Component Mark for the U.S. generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: , may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions. The UL Recognized Component Mark for Canada consists of the UL Recognized Mark for Canada: and the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Recognized Component Mark on the product.

William R. Carney

William R. Carney, Director, North American Certification Programs

UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number	20130412-E139109
Report Reference	E139109-A84-UL
Issue Date	2013-APRIL-12

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Power supply for building-in, switch mode type

Model: ECM100UXY (where X represents D2, T3 or Q4 and Y represents 1 to 7).
May be provided with suffix (3X5) or *, representing PWB size or alternate trace layout.

William R. Carney

William R. Carney, Director, North American Certification Programs

UL LLC

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (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)
Product:	Power supply for building-in, switch mode type
Model:	ECM100USXX, ECM100USXX*, ECM100USXX 3X5, ECM100USXX-DC 3X5, ECM100US33 >2413, where XX can be any number between 03 to 48 designating the output voltage
Rating:	Input: 100-240 Vac, 50/60 Hz, 2.2 A Output: 3-48 Vdc, 20 A max, not to exceed 100 W (See Enclosure Miscellaneous for details) For Model ECM100USXX-DC 3X5 only: Input: 106-333 Vdc, 1.14 A Output: 48 Vdc, 1.5A
Applicant Name and Address:	XP POWER INC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 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.

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Prepared by: Longjie Zhang Reviewed by: Scott Varner

Supporting Documentation

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A. Authorization - The Authorization page may include additional Factory Identification Code markings.

B. Generic Inspection Instructions -

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Product Description

Models covered in this report are component power supply intended for use in Information Technology Equipment. The need for the additional testing and evaluation shall be determined in the end product investigation.

Magnetic device, transformer T1 employs an (OBJY3), electrical insulation system designated Class 155 °F, max temp rise 115°C

The open frame power supply, no enclosure or chassis, is for building-in Class I or Class II end-products. Double insulated symbol is optionally provided. Earthing symbol may only be provided for Class I power supplies.

The open frame power supplies covered by this report employ Double/Reinforced Insulation between Primary and Secondary circuits.

When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2 mm Clearance between the primary side of power supply and protectively earthed accessible conductive parts. Also, when installed in a Class I end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.

When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a minimum, 4 mm Clearance between the power supply and any accessible conductive parts.

Single fault testing was conducted with the fuses specified in the critical component list (Wickmann-Werke, Type 374). These fuses were determined to be acceptable based on this testing and are subject to accepting NCB approval.

Model ECM100USXX-DC 3X5 is intended to be powered by a secondary DC source and was not evaluated for direct connection to a DC Mains supply.

Model Differences

EMC100USXX Models are identical to ECM100USXX* models except for the PWB Layout, minor secondary components (C43) and the following:

a) Model ECM100USXX* is intended for Class I installation only.
b) Model ECM100USXX is intended for either Class I or Class II Installation

EMC100USXX Models are identical to ECM100(3*5)XX Models except for the physical size of the PWB and the addition of a functional earth trace to the ECM100(3*5)XX PWB layout.

Model ECM100US33>2413 is identical to Model ECM100USXX except for the PWB Layout and the Primary and Secondary Connectors are located on the opposite side of the PWB

Model ECM100USXX-DC 3X5 is similar to Model ECM100USXX 3X5 except for different input ratings (DC input).

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 : +10%, -10%
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I or Class II (Determined by end product)
- Considered current rating of protective device as part of the building installation (A) : 20A
- Pollution degree (PD) : PD 3
- IP protection class : IPX0
- Altitude of operation (m) : Up to 2000
- Altitude of test laboratory (m) : less than 2000 meters
- Mass of equipment (kg) : 0.25 kg
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer’s specification of: 40°C

- The means of connection to the mains supply is: For building in
- 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.
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- 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 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: 250 Vrms, 340Vpk; Primary-Earthed Dead Metal: 250Vrms, 340Vpk.
- The following secondary output circuits are SELV: All ouptuts
- The following secondary output circuits are at non-hazardous energy levels: Entire Series 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: 3
- Proper bonding to the end-product main protective earthing termination is: Required when used in Class I application.
- A suitable main disconnect device shall be provided in the end product.
- To be considered in the end use application: open frame power supply, no enclosure or chassis, for building-in Class I or Class II end-products. Model ECM100USXX* is for Class I end products only, all other Models covered by this report can be installed in Class I or Class II end products. ,
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Entire

series = 250 Vrms (340Vpk)

- The following output terminals were referenced to earth during performance testing: 0 V terminals.
- The maximum investigated branch circuit rating is: 20 A
- An investigation of the protective earthing terminal 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: , Fire, , Electrical
- The following magnetic devices are provided with an OBJY3 insulation system with the indicated rating greater than Class A (105°C): T1 (Class F, 155°C). Heating test shall be conducted in the end-product.
- Heatsinks are floating and considered live. They should not be accessible in the end-product.
- The power supply shall be mounted on insulating posts that provide a minimum of 4 mm Clearance between the power supply and accessible conductive parts when installed in a Class II end product.
- The power supply shall be mounted in a manner that provides, at a minimum, 2 mm Clearance between the power supply and protectively earthed accessible conductive parts when mounted in a Class I end product. Also, the protective bonding terminal of the power supply shall be reliably bonded to the main protective earthing terminal of the end product when installed in a Class I end product.
- The power supplies covered by this report have a fuse in the neutral of the primary circuit. The need for a marking to warn a service person of the hazards associated with neutral fusing shall be considered in the end product.
- Consideration to repeating the Touch Current test should be given in the end-product evaluation.
- Model ECM100USXX-DC 3X5 is intended to be powered by a secondary DC source and was not evaluated for direct connection to a DC Mains supply.

Additional Information

Sample marking plate labels, which represent all models have been provided in Enclosure Miscellaneous. Individual units will be marked in accordance with the Output Ratings, also provided in Enclosure Miscellaneous.

This report is a re-issue of CB Test Report (Cert. No. US/14310A/UL and US/14311A/UL), Test Report Reference: E139109-A7-CB-2, issued on 2010-04-23). All required testing was carried out under the original investigation. No testing was required to upgrade the report to IEC 60950-1, Second Edition including

Amendment 1. CB Licenses have been updated over three years to the report.

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Fuses - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.
Terminals for external primary power supply conductors	Capital letter "N" located adjacent to a terminal intended exclusively for connection of the primary power neutral conductor

Special Instructions to UL Representative

N/A

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (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)
Product:	Power supply for building-in, switch mode type
Model:	ECM100UXY (where X represents D2, T3 or Q4 and Y represents 1 to 7). May be provided with suffix (3X5) or *, representing PWB size or alternate trace layout.
Rating:	Input: 100-240 Vac, 50/60 Hz, 2.2 A Max Output: V1: 5.0 or 3.0 Vdc, 12.0 or 10.0 A V2: 3.3, 5.0, 12.0, 15.0 or 24.0 Vdc, 2.0, 3.0 or 5.0 A V3 (optional): -5.0, +/-12.0 or +/-15.0 Vdc, 0.8 A V4 (optional): -5.0, -12.0 or -15.0 Vdc, 0.5 A Maximum 100 W combined outputs. See enclosure 'Miscellaneous' for specific output ratings.
Applicant Name and Address:	XP POWER L L C SUITE 150 1241 E DYER RD SANTA ANA CA 92705 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: Sal Oseguera Reviewed by: Glenn Wang

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

Models covered in this report are open frame component power supply for building-in Class I or Class II end products. Double insulated symbol is optionally provided. Earthing symbol may only be provided for Class I power supplies. The power supply is provided with 2, 3 or 4 outputs with a maximum combined power of 100 W with 5 cfm external forced air coolilng.

Model Differences

All models are similar except the number of outputs (2, 3 or 4), output voltage/current rating and corresponding PWB population. 3x5 version differs only by PWB size, mounting hole locations and additional ground trace between mounting pads. * version differs only by secondary circuit trace layout, not provided with Basic/Supplementary Insulation between secondary circuits to mounting pads.
D2 represent dual output version.
T3 represent triple output version.
Q4 represent quad output version.
y represents output voltage variation.

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 : +10%, -10%
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I or Class II (Determined by end product)
- Considered current rating of protective device as part of the building installation (A) : max. 20 A
- Pollution degree (PD) : PD 2
- IP protection class : IPX0
- Altitude of operation (m) : 3048

- § Altitude of test laboratory (m) : less than 2000 meters
- § Mass of equipment (kg) : 0.25 kg
- § The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50°C output de-rated to 80 W, convection cooling., 60°C at 100 W with 5 cfm external cooling., 70°C output de-rated to 40 W, convection cooling., 80°C output de-rated to 50 W with 5 cfm external cooling.
- § The means of connection to the mains supply is: for building-in
- § 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.,
- § The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- § The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of bridging capacitor C22.
- § 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 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: 297 Vrms, 624 Vpk,
- § The following secondary output circuits are SELV: All outputs
- § The following secondary output circuits are at non-hazardous energy levels: All outputs
- § 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 (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 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, T2 Class F (155°C)., Inductors L1 and L5 suitable for up to 130°C (Functional insulation)
- § The following end-product enclosures are required: Mechanical, Fire, Electrical
- § The maximum continuous power supply output (Watts) relied on forced air cooling from: 5 cfm external forced air-cooling directed downward.
- § A suitable main disconnect device shall be provided in the end product.
- § The following output terminals were referenced to earth during performance testing: 0 V terminals.
- § Heatsinks are floating and considered live. They should not be accessible in the end-product.
- § The power supplies covered by this report have a fuse in the neutral of the primary circuit. The need for a marking to warn a service person of the hazards associated with double pole/neutral fusing

shall be considered in the end product.

- § Consideration to repeating the Touch Current test should be given in the end-product evaluation.
- § Clearance spacing evaluated for 3048m altitude. Additional consideration maybe necessary in the , end-use product.
- § When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.3 mm Clearance/2.5 mm Creepage (3048 m altitude) between the primary sides of power supply and protectively earthed accessible conductive parts.
- § When installed in a Class II end product, the power supply shall be mounted in a manner that provides, at a minimum, 5.3 mm Clearance/6.0 mm Creepage (3048 m altitude) between the power supply and accessible conductive parts.

Additional Information

This test report was based on the CB Report by CSA International CB Certificate Number CA/7810/CSA, dated 2006-08-16, submitted via the CB Scheme and additional testing performed under UL60601-1, 1st Edition/ IEC 60601-1. The test results and clause verdicts of the above noted report were reviewed and found to comply with IEC 60950-1:2005 (2nd Ed); Am 1:2009.

The open frame power supplies covered by this report employ Double/Reinforced Insulation between Primary and Secondary circuits.

When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.3 mm Clearance between the primary side of power supply and protectively earthed accessible conductive parts. Also, when installed in a Class I end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.

When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a minimum, 5 mm Clearance between the power supply and any accessible conductive parts.

Required values for clearance are adjusted for 3048 m (1.15 correction factor as per IEC 60664-1, Table A2).

Additional Standards

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 + A1:2011, EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011, IEC 60950-1:2005 + A1:2009, UL 60950-1 2nd Ed. Revised 2011-12-19

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Fuses - Non-operator access/soldered-in	Unambiguous reference to service documentation for instructions for

fuses	replacement of fuses replaceable only by service personnel
Terminals for external primary power supply conductors	Capital letter "N" located adjacent to a terminal intended exclusively for connection of the primary power neutral conductor

Special Instructions to UL Representative

N/A

Production-Line Testing Requirements

Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.

Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
N/A						

Earthing Continuity Test Exemptions - This test is not required for the following models:

Electric Strength Test Exemptions - This test is not required for the following models:

Electric Strength Test Component Exemptions - The following solid-state components may disconnected from the remainder of the circuitry during the performance of this test:

Sample and Test Specifics for Follow-Up Tests at UL

Model	Component	Material	Test	Sample(s)	Test Specifics
N/A					