



Certificate of Compliance

Certificate: 2453170

Master Contract: 163595

Project: 70202772

Date Issued: 2018-10-30

Issued to: **GE Power Electronics, Inc**
601 Shiloh Rd
Plano, TX 75074

USA

Attention: **Danson Chen**

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and US Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only



Issued by:

Alex Hua, Certifier

PRODUCTS

CLASS 5311 11 - Power supplies - Component Type

CLASS 5311 91 - Power supplies - Component Type (Certified to U.S. Standards)

Component Power Supply for use with Information Technology Equipment and Telecommunication Equipment where the suitability of the combination is to be determined.

Model	Input (ac)	Output (dc)
EP3000AC48TE‡	100-120V, 18-15A, 50/60Hz	48-58V*, 1500W
	200-240V, 18-15A, 50/60Hz	48-58V*, 3000W†
EP3000AC48IN#	100-120V, 18-15A, 50/60Hz	48-58V*, 1500W
	200-240V, 18-15A, 50/60Hz	48-58V*, 3000W†



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EP2000AC48TE‡	100-120V, 12A, 50/60Hz	48-58V*, 1200W
	200-240V, 12A, 50/60Hz	48-58V*, 2000W†

Notes:

- *The marked output voltage in a single value, such as 52V, shall be within the range of applicable 48-58V.
- †The output power is de-rated linearly from below 176Vac input @ 0.65% per volt, leading to 1323W at 90Vac input for EP3000AC48TE and EP3000AC48IN model. The output power is de-rated linearly from below 176Vac input @ 0.526% per volt, leading to 1200W at 100Vac input for EP2000AC48TE model.
- ‡The model designation may be followed by alphanumeric suffixes denoting non-safety critical marketing options, whereas the Z denotes lead free.
- #The model designation may be followed by 0-9, A-Z, or blank or symbol for market purposes.

APPLICABLE REQUIREMENTS

- CAN/CSA-C22.2 No. 60950-1-07 (Including Amendment 1:2011 and Amendment 2:2014) - Information Technology Equipment - Safety Part 1: General Requirements
- ANSL/UL 60950-1-2014, 2nd ed. - Information Technology Equipment - Safety Part 1: General Requirements

CONDITIONS OF ACCEPTABILITY

1. The subject power supply is for use as a component in Information Technology Equipment.
2. When installed, the spacings (creepage distances and clearances) between exposed live metal parts of the subject power supply and adjacent metal parts of the ultimate enclosure should comply with the applicable requirements.
3. A suitable Electrical and Fire enclosure is to be provided and evaluated in combination with the end use equipment.
4. The subject equipment has been evaluated for use in a Pollution Degree 2 environment.
5. The subject equipment is acceptable for use at an ambient temperature not exceeding 50°C; required a 2.4%/°C de-rating for temperatures above 50°C and up to 70°C.
6. The subject equipment is not intended to be field serviced or repaired.
7. Consideration should be given at the end use equipment approval to evaluate the applicability of hot-swap testing and to provide a mating input connector so that the ground pin is connected before the line and neutral pins.
8. The 48-58Vdc output circuit is SELV which exceeds 240 VA - hazardous energy level.
9. Consideration shall be taken at the end use equipment to restrict the hazardous energy of the 48-58Vdc output from operator access.
10. The subject equipment has been evaluated for use in an IT Power System with the phase to phase voltage



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not exceeding 230Vac.

11. The subject equipment has been evaluated for use with 60A branch circuit maximum.
12. The subject equipment is provided with a varistor and spark gap connected in series between line/neutral and earth. Clearances and creepage distances between the varistor connection point and the earth complies with the requirements for BASIC INSULATION. The subject equipment should be connected to the end use equipment with permanent protective earth connections.
13. The nominal 48Vdc return is intended to be bonded to ground by the host system installation.
14. The subject equipment has been evaluated for 3000m altitude correction factor of 1.14 in accordance with IEC60664-1.
15. “CAUTION: DOUBLE POLE/NEUTRAL FUSING” marking is provided.
16. Disconnect device is to be provided by the end use equipment.



Supplement to Certificate of Compliance

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Master Contract: 163595

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
70202772	2018-10-30	Update Report to add alternative EBB Board and cover report corrections
70125041	March 28, 2017	Update report to add model EP3000AC48IN.
70037889	Jul 16, 2015	Upgrade CSA report 163595-2453170 to Am2 of CSA/UL 60950-1-07 (Second Edition) Amd 1:2011 (MOD).
70023440	Feb 18, 2015	Update CSA report 2453170 to add new model EP2000AC48TE, based on CB report CB 163595-2322629(-70021206).
2600870	Feb 11, 2013	To cover Amendment 1:2011.
2453170	Aug 25, 2011	Supersedes C/US Report 2313219 to cover alternate construction.



Descriptive Report and Test Results

MASTER CONTRACT: 163595

REPORT: 2453170

PROJECT: 70202772

Edition 1: August 25, 2011; Project 2453170 - Toronto
Issued by Eddie Chau

Edition 6: **October 30, 2018; Project 70202772 – Shanghai**
Issued by Alex Hua; Reviewed by Tracy Geng.

Report pages reissued

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	Photographs	– Enclosure 3 in CSA Evaluation document
	Marking Plate	– Enclosure 4 and 4-1 in CSA Evaluation document
	Circuit Diagram and PWB Layout Drawings	– Enclosure 5 in CSA Evaluation document
	Transformer Specifications/Drawings	– Enclosure 6 in CSA Evaluation document
	CSA Evaluation document	CSA Ref. No. CB 163595-2322629 (70202773) (Ed.7)

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PRODUCTS

CLASS 5311 11 – POWER SUPPLIES – Component Type
CLASS 5311 91 – POWER SUPPLIES – Component Type

Component Power Supply for use with Information Technology Equipment and Telecommunication Equipment where the suitability of the combination is to be determined.

Model	Input (ac)	Output (dc)
EP3000AC48TE [‡]	100-120V, 18-15A, 50/60Hz	48-58V*, 1500W
	200-240V, 18-15A, 50/60Hz	48-58V*, 3000W [†]
EP3000AC48IN [#]	100-120V, 18-15A, 50/60Hz	48-58V*, 1500W
	200-240V, 18-15A, 50/60Hz	48-58V*, 3000W [†]
EP2000AC48TE [‡]	100-120V, 12A, 50/60Hz	48-58V*, 1200W
	200-240V, 12A, 50/60Hz	48-58V*, 2000W [†]

Notes:

*The marked output voltage in a single value, such as 52V, shall be within the range of applicable 48-58V.

[†]The output power is de-rated linearly from below 176Vac input @ 0.65% per volt, leading to 1323W at 90Vac input for EP3000AC48TE and EP3000AC48IN model. The output power is de-rated linearly from below 176Vac input @ 0.526% per volt, leading to 1200W at 100Vac input for EP2000AC48TE model.

[‡]The model designation may be followed by alphanumeric suffixes denoting non-safety critical marketing options, whereas the Z denotes lead free.

[#]The model designation may be followed by 0-9, A-Z, or blank or symbol for market purposes.

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 60950-1-07 (Including Amendment 1:2011 and Amendment 2:2014)	-	Information Technology Equipment - Safety Part 1: General Requirements
ANSL/UL 60950-1-2014, 2 nd ed.	-	Information Technology Equipment - Safety Part 1: General Requirements

CONDITIONS OF ACCEPTABILITY

1. The subject power supply is for use as a component in Information Technology Equipment.
2. When installed, the spacings (creepage distances and clearances) between exposed live metal parts of the subject power supply and adjacent metal parts of the ultimate enclosure should comply with the applicable requirements.
3. A suitable Electrical and Fire enclosure is to be provided and evaluated in combination with the end use equipment.
4. The subject equipment has been evaluated for use in a Pollution Degree 2 environment.
5. The subject equipment is acceptable for use at an ambient temperature not exceeding 50°C; required a 2.4%/°C de-rating for temperatures above 50°C and up to 70°C.
6. The subject equipment is not intended to be field serviced or repaired.

7. Consideration should be given at the end use equipment approval to evaluate the applicability of hot-swap testing and to provide a mating input connector so that the ground pin is connected before the line and neutral pins.
8. The 48-58Vdc output circuit is SELV which exceeds 240 VA - hazardous energy level.
9. Consideration shall be taken at the end use equipment to restrict the hazardous energy of the 48-58Vdc output from operator access.
10. The subject equipment has been evaluated for use in an IT Power System with the phase to phase voltage not exceeding 230Vac.
11. The subject equipment has been evaluated for use with 60A branch circuit maximum.
12. The subject equipment is provided with a varistor and spark gap connected in series between line/neutral and earth. Clearances and creepage distances between the varistor connection point and the earth complies with the requirements for BASIC INSULATION. The subject equipment should be connected to the end use equipment with permanent protective earth connections.
13. The nominal 48Vdc return is intended to be bonded to ground by the host system installation.
14. The subject equipment has been evaluated for 3000m altitude correction factor of 1.14 in accordance with IEC60664-1.
15. "CAUTION: DOUBLE POLE/NEUTRAL FUSING" marking is provided.
16. Disconnect device is to be provided by the end use equipment.

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

PART 1: Minimum Markings:

Marking Method: (For Minimum Markings)

- Approved type adhesive nameplate (suitable for surface to which it is applied).

Required Information: (For Minimum Markings)

- The submitter's name and/or CSA File No. "LR 54761" or Master Contract No. "163595";
 Model or identifying designation;
 Complete electrical rating;
 Date of manufacture, serial number or date code traceable to month and year of manufacture;
 The CSA Monogram, "NRTL/C" or "c US" indicator;
 The optional indicators "CSA 60950-1" and/or "ANSI/UL 60950-1";

[X] "CAUTION:DOUBLE POLE/NEUTRAL FUSING" marking provided.

ALTERATIONS

Markings as above appear in each unit.

FACTORY TESTS

The factory test may be made at existing room temperature.

[X] Production-line Dielectric Voltage-Withstand Test: Cl 5.2.2

- (a) Only ac values are specified. As an alternative, the equivalent dc voltage (1.414 times the ac voltage) may be used.
- (b) The factory test may be done at existing room temperature.

For Grounded Units (Class I) Rated more than 130V and Up to 250V:

[X] The equipment at the conclusion of manufacture, before shipment, shall withstand for one second, without breakdown, the application of minimum 1500V ac between input and output, and between input and exposed non-current-carrying metal parts.

Transformers:

Notes:

1. Transformer manufacturer's written agreement to conduct Dielectric Strength Test on 100 percent production will be acceptable.
2. No additional factory tests are required for Certified* transformers or transformers in Certified* power supplies.

For Safety Isolating Transformers in Grounded or Double Insulated Units:

Each transformer before assembly into the equipment shall be subjected to the following dielectric strength tests for a period of one second, without breakdown:

For units rated more than 130V and up to 250V:

3000V ac from primary to SELV secondaries.

1500V ac from primary to core (if core is floating or grounded)*

1500V ac from core to SELV/ELV secondaries (if core is floating or grounded)*

*Note: If the core is not floating or grounded, but primary (or secondary), then the primary (or secondary) is tied to the core during the test.

Each unit that has a power supply cord with earthing conductor shall be tested, as a routine production-line test, to determine that earthing is provided between the earthing blade or pin of the attachment plug and the accessible dead metal parts of the unit that are likely to become energized.

Any indicating device (an ohmmeter, a battery and buzzer combination or the like) can be used to determine compliance. Only a single test is needed to be made if the accessible metal selected is conductively connected to all other accessible metal.

Warning:

The factor test(s) specified may present a hazard of injury to personnel and/or property and should only be

performed by persons knowledgeable of such hazards and under conditions designed to minimize the possibility of injury.

SPECIAL INSTRUCTIONS FOR FIELD SERVICES

1. Component descriptions marked with either the "(INT)" or "(INT*)" identifiers may be substituted with other components providing the requirements specified under the notes in the "Description" are complied with.

COMPONENT SPECIAL PICKUP

1. Component descriptions marked with the identifier "(CT)" are subject to annual pickup and Conformity Testing.

DESCRIPTION

Notes:

1. Component Substitution
 - a) Critical components (those identified by mfr name, cat no), which are NOT identified with either "INT" or "INT*" are not eligible for substitution without evaluation and report updating
 - b) The term "INT" means a "Certified" and/or "Listed" (or a "Recognized" and/or "Accepted") component may be replaced by one "Certified" and/or "Listed" by another certification organization accredited by the appropriate accreditation body or scheme requirements to the correct standard, for the same application; providing the applicable country identifiers are included and requirements in item "d" below are complied with.
 - c) The Term "(INT*)" means a "Recognized" and/or "Accepted" component may be replaced by a component that is CSA Certified. The applicable country identifiers shall be included, the requirements in item "d" below as well as any "conditions of suitability" for the component (as recorded in this descriptive report) shall be complied with;
 - d) Components which have been substituted, must be of an equivalent rating, configuration (size, orientation, mounting) and the applicable minimum creepage and clearance distances are to be maintained from live parts to bonded metal parts and secondary parts.
 - e) Substitution of a "Certified" and/or "Listed" component with a component that is "Recognized" or "Accepted" is not permitted without evaluation and report updating.
 - f) **Substitution of a "Recognized" and/or "Accepted" component by one that is not CSA Certified is not permitted without a proper evaluation as well as a report update because the Conditions of Acceptance of the original component may be different than the Conditions of Acceptance of the substitute component.**

General:

The subject power supply is a component AC-DC switch mode power supply with REINFORCED INSULATION between input and output, and BASIC INSULATION between input and ground.
 It is housed in a metal enclosure with integral fan for forced air cooling. Pin connector is provided as the input connector for mating to the mating connector in the end product.
 The conformal coating is for functional insulation purpose only, not relied on for safety insulation.
 For electric strength test, the Spark Gap SG21 had been deleted from the circuit.

Model EP3000AC48IN is same as Model EP3000AC48TE except adding one EBB board for customer application.

The following table lists the components used in the subject power supply.

TABLE: List of critical components					
Object/ part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾
Transformer (isolating) T1	SPITZER	Vendor Spec. No. EP3000TE-T1* (* means may be followed by suffix)	SPT 155-TM insulation system (Class F)	IEC 60950-1; UL 1446	UR (OBJY2) Tested with the unit. Refer to Encl. 6 for drawings

TEST HISTORY

Project 2453170 (Edition 1)

Refer to CB report in Appendix A and A1.

Project 2600870 (Edition 2)

To cover Amendment 1:2011, no additional test is required.
Appendix A2 is added.

Project 70023440 (Edition 3)

Add new model EP2000AC48TE, which is the same construction with EP3000AC48TE, except reduce the power for 1500W to 1200W at 100-120V~ input voltage range; and from 3000W to 2000W at 200-240V~ input voltage range by the software. The subject model was evaluated by CSA in the CB report CSA Ref. No. CB 163595-2322629(-70021206), with the following tests conducted (Table 1). A copy of CSA evaluation document is retained at CSA archiving database (Documentum) under project number 70021206. The evaluation document supersedes appendices A1 and A2 referenced in edition 1 and 2.

Table 1: Applicable Tests

Clause	Test Description
1.6.2	Input Current Test
4.5.2	Temperature Test
5.2	Electric Strength Test

Project 70037889 (Edition 4)

Upgrade report to Am2 of CSA/UL 60950-1-07 (Second Edition) Amd 1:2011 (MOD).

Project 70125041 (Edition 5)

Update Report to add new Model EP3000AC48IN.

The following applicable tests were conducted with satisfied test results.

Clause	Test Description
1.6.2	Input Current Test
2.1.1.7	Discharge of Capacitors
2.6.3.4	Resistance of Earth
4.5.2	Temperature Test
5.1	Touch Current
5.2	Electric Strength Test
5.3	Fault Condition Test

Project 70202772 (Edition 6)

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Update Report to add alternative EBB Board and cover report corrections. This update report is based on CSA CB Report CB 163595-2322629 (70202773) (Ed.7) with CB Certificate CA22111CSA. No additional test deemed necessary.

Construction Review:

Construction review performed with satisfactory results.

---End of Report---