

Summary of testing:

The tested samples fulfilled the requirements of test specifications.

The following tests were performed:

Test Description	UL1573:2003, R12.16/ Clause	CSA C22.2 No.166- 15/ Clause	UL746C:2006, R06.15/ Clause
Temperature Test	30	8.2	--
Dielectric Voltage-withstand Test	31	8.4	--
Strain Relief Test	34	8.12	
Ground Continuity Test	36	--	--
Overhead Product Static Loading Test	37	8.7	--
Backup-Restraint Device Loading Test	38	8.7	--
Rain Test	47	8.6	--
Glass Water-Shield Thermal Shock Test	48	8.6	--
Leakage Current Test	--	8.3	--
Humidity	--	8.5	--
Resistance to Impact Test	--	--	56
Mold Stress-Relief Distortion Test	--	--	61
Test Description	UL8750:2015/ Clause	CSA C22.2 No. 250.13-14/ Clause	--
Input Test	8.2	9.2	--
Temperature Test	8.3	9.3	--
Dielectric Voltage-Withstand Test	8.4	9.4	--
Leakage Current Measurement Test	8.7	9.7	--
Test Description	UL1012:2010 R05.14/ Clause	CSA C22.2 No.107.1 (R2011)/ Clause	--
Leakage Current Test	40	6.4	--
Temperature Test/ Temperature (Normal) Test	42	6.3	--
Dielectric Voltage Withstand Test/ Dielectric Strength Test	43	6.5	--
Tests On Insulating Materials/ Insulation Material Test	44	6.19	--
Abnormal Tests	54	--	--
Output Short-Circuit Test	54.2	--	--
Transformer Overload Test	54.7	--	--
Component Short- And Open-Circuit Test	54.8/54.11	--	--
Capacitor Test	56	--	--
Abnormal Operation Test	--	6.6	--
Securement Of Components Test	--	6.17	--
Capacitor Discharge (Energy And Shock Hazards)	--	6.20	--

Note:

Determination of the result includes consideration of measurement uncertainty from the test equipment and methods.

The products were tested as indicated above with results in conformance to the relevant test criteria.

Particulars: test item vs. test requirements

Equipment mobility : Stage luminaire
 Operating condition : Continuous
 Mass of equipment (Kg) : ARENACOB4HALO, ARENACOB4FC: 7.9Kg

Test case verdicts

Test case does not apply to the test object : N/A
 Test item does meet the requirement : P(ass)
 Test item does not meet the requirement ... : F(ail)
 Testing Instructions of standards only Info (Information Only)

Testing

Date of receipt of test item : 2017-01-12
 Date(s) of performance of test : 2017-01-12 to 2017-05-24

General remarks

The test result presented in this report relate only to the object(s) tested.
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
 "(see Enclosure #)" refers to additional information appended to the report.
 "(see appended table)" refers to a table appended to the report.
 Throughout this report a point is used as the decimal separator.

General product information:

1. The products covered by this report are fixed mounted stage luminaires suitable for use in wet locations. It is equipped with a length of power cord and attachment plug for power supply connection.
2. The products must be installed in accordance with all codes applicable to the location of the installation and in accordance with its instruction for use.
3. Maximum ambient temperature is 45°C.
4. Both models have the similar mechanical and electrical construction, main difference between them are rated wattage, power unit and LED.
5. The built-in power units were evaluated in appliance according to UL1012:2010 R05.14 and CSA C22.2 No.107.1 (R2011).

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
	CONSTRUCTION - MECHANICAL		—
4	General		P
4.1	A luminaire shall be provided with a reflector(s) or other guards to protect the lamps from mechanical damage and inadvertent contact with scenery and other combustible material.		P
4.2	A freestanding luminaire, a unit that comes attached to a stand, or a unit that has a stand specifically intended for it shall be constructed so it does not tip over when subjected to the Stability Test, Section 35.	Fixed luminaire	N/A
4.3	A product shall be provided with a means for mounting or support.	Mounting screws or omega bracket	P
4.4	An overhead product intended to be suitable for use with an accessory shall be provided with means for mounting or support of the accessory.		N/A
	Exception: An overhead product intended to be suitable for use with a cardboard color gel frame secured by adhesive tape, or another accessory with an equally low risk of injury when the accessory falls, is not required to be provided with means for mounting or support of the accessory.		N/A
4.5	A connector strip fabricated from sections joined together in the factory or the field shall be provided with a means for mounting or support of each section.		N/A
	Exception: A connector strip section having a length of 0.9 m (3 feet) or less		N/A
5	Corrosion Protection		P
5.1	Iron and steel parts shall be protected against corrosion by painting, enameling, galvanizing, plating, or other equivalent	Painting	P
	Exception No. 1: When the oxidation of iron or steel from exposure of the metal to air and moisture is not appreciable		N/A
	Exception No. 2: Bearings, laminations, or minor parts of iron or steel are not required to be protected against corrosion.		P
6	Enclosures		P

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
6.1	All splices, taps, wires not jacketed with glass fiber sleeving with a wall thickness of at least 0.64 mm (0.025 inch), transformers, current-carrying parts or devices with exposed live metal, and leads or terminals for field connection of supply wires shall be enclosed in material specified in 6.2.		P
	Exception No. 1: A component device with an integral outer enclosure that complies with 6.2 is not required to be additionally enclosed.		N/A
	Exception No. 2: Lampholder shells that are connected to the grounded (neutral) conductor and lampholder contacts that are accessible only during relamping are not required to be enclosed.		N/A
6.2	The enclosure required shall be constructed of metal, glass, ceramic, porcelain, or a polymeric material.	Metal and glass enclosure	P
6.3	After assembly, there shall be no openings in an enclosure other than those specified in Openings, Section 8.	No openings	P
7	Metal Thickness		P
7.1.1	Sheet metal used in the construction of an enclosure or wireway shall be at least as thick as indicated in Table 7.1.		N/A
	Exception No. 1: A minimum thickness is not specified for a reflector part or any part not required to serve as the enclosure		N/A
	Exception no. 2: A form of construction that uses metal with a thickness less than required in Table 7.1 is not prohibited from being used when investigated and determined to provide strength and protection equivalent to constructions in compliance with Table 7.1.		N/A
7.1.2	A metal striplight or connector-strip trough or wireway containing circuit conductors shall be made of sheet metal not less than 0.79 mm (0.031 inch) thick.		N/A
7.2	Cast metal		P
7.2.1	Cast metal thickness shall comply with the requirements in Table 7.2.	Die-cast aluminum, min. 2.5mm thickness.	P
8	Openings		N/A
8.1	The requirements in this section apply to permissible openings in the enclosure.	No openings	N/A
8.2	An open hole in the enclosure as specified in 6.1 shall not exceed the dimensions specified in Table 8.1.		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
8.3	The total area of one or more open holes shall not be more than 15 percent of the area of the surface in which it is located. This includes the wiring compartment or integral outlet box compartment.		N/A
8.4	The enclosure shall be constructed so that molten metal, burning insulation, flaming particles, or the like do not fall on the surface below.		N/A
8.5	The requirement in 8.4 specifies that an opening in an enclosure bottom be provided with a dripping material barrier above or below the opening when the opening is:		N/A
	a) Under a motor		N/A
	b) Under wiring, unless the wiring complies with the VW-1		N/A
	c) Under an unenclosed switch, transformer, relay, solenoid, and the like, unless it can be shown that malfunction of the component does not result in a fire; or		N/A
	d) Under field- and factory-made splices and overload and overcurrent protection devices		N/A
8.6	The dripping material of barrier		N/A
8.7	The mounting surface of the luminaire enclosure shall have no unused openings		N/A
9	Restraint of Overhead Objects		P
9.1	The structure and all joints of an overhead product and its accessories shall be capable of supporting a static load of not less than six times the actual load supported. The parts shall be subjected to the Overhead Product Static Loading Test.		P
	Exception No. 1: The strength of a structural component or a joint is not required to be evaluated when failure of the component or joint does not result in an object falling to the floor.		N/A
	Exception No. 2: The structure and joints supporting a cardboard color gel frame secured by adhesive tape, or other accessory that presents a low risk of injury when it falls to the floor, are not required to be evaluated.		N/A
9.2	A safety cable, safety chain, or other field-installed backup-restraint device intended to "catch" a falling object shall be capable of supporting a static load of not less than six times the intended load.		P
10	Lamp-Containment Barriers and UV Radiation Filters		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
11	Accessibility of Uninsulated Live Parts, Film-Coated Wire, and Moving Parts		P
11.1	To reduce the risk of unintentional contact and electric shock from an uninsulated live part or film-coated wire operating at greater than 30 volts (42.4 volts peak) between live parts of opposite polarity or between live parts and ground, or injury to persons from a moving part, an opening in an enclosure shall comply with either (a) or (b).	All are closed	P
	a) For an opening that has a minor dimension (as defined in 10.5) less than 25.4 mm (1 inch), such a part shall not be contacted by the probe		N/A
	b) For an opening that has a minor dimension of 25.4 mm or more, such a part or wire shall be spaced from the opening		N/A
	Exception No. 1: Lampholder shells connected to the grounded (neutral) conductor and lampholder contacts that are accessible during relamping are not required to comply with this requirement.		N/A
	Exception No. 2: A motor is not required to comply with this requirement when it complies with the requirements in 11.2.		N/A
	Exception No. 3: Wires jacketed with an outer glass-fiber sleeve with a wall thickness of at least 0.64 mm (0.025 inch) are not required to comply with this requirement.		N/A
11.2	With regard to a part or wire as specified in 11.1, in an integral enclosure of a motor	No motor used	N/A
	a) An opening that has a minor dimension less than 19.1 mm (3/4 inch) shall be used		N/A
	b) An opening that has a minor dimension of 19.1 mm or more is not prohibited from being used		N/A
11.3	The probes specified in 11.1 and 11.2 and illustrated in Figures 11.1 – 11.4 shall be applied to any depth that the opening permits and shall be rotated or angled before, during, and after insertion through the opening to any position that is required to examine the enclosure.		P
11.4	The probes specified in 11.3 and 11.5 shall be used as measuring instruments to determine the accessibility provided by an opening, and not as instruments to evaluate the strength of a material. They shall be applied with the minimum force required to determine accessibility.		P
11.5	The minor dimension of an opening is the diameter of the largest cylindrical probe having a hemispherical tip that is capable of being inserted through the opening.		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
11.6	An indirectly accessible motor is a motor		N/A
	a) That is accessible only by opening or removing a part of the outer enclosure		N/A
	b) That is located at such a height or is otherwise guarded or enclosed so it is not contacted		N/A
	A directly accessible motor is capable of being contacted without opening or removing any part or is located so as to be accessible to contact by the user.		N/A
11.7	During the examination of a product to determine whether it complies with the requirements, a part of the enclosure that is capable of being opened or removed by the user without using a tool is to be opened or removed.		N/A
	Exception: A part of the enclosure fastened by use of a thumbscrew or equivalent means that requires a positive and deliberate action by the user to open or remove it is not required to comply with this requirement.		N/A
11.8	Insulated brush caps are not required to be additionally enclosed.		N/A
12	Products for Use in Damp Locations		N/A
13	Products for Use in Wet Locations		P
	CONSTRUCTION – ELECTRICAL		—
14	General		P
14.1	A wiring device shall be prevented from any turning that applies tension to splices or other wiring connections, damages the wiring, or otherwise adversely affects the assembly.		P
14.2	A wireway shall be free from burrs and sharp edges		P
14.3	All lamps can be replaced without damaging any wiring, component, or part.	Non-replaceable LEDs	N/A
14.4	A disappearing footlight shall be arranged so that it is automatically disconnected from the supply when the footlight is moved into the recessed position.		N/A
14.5	Electrical components and electrical insulating materials, including insulated wire splicing connectors, insulated wire terminals, and insulated conductors, shall have a voltage rating of not less than the voltage involved during intended use.	Rating: ≥250V	P

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
	Exception: Electrical components and electrical insulation materials only involved with a Class 2 circuit or a limited-voltage/current circuit are not required to have an assigned voltage rating.		N/A
15	Switches		N/A
15.1	A switch shall be rated for the voltage and current of the circuit it controls and the ampere rating of the switch shall be multiplied by the derating factor as indicated in Table 15.1	No switch used	N/A
15.2	A switch shall not be connected to the secondary circuit of a ballast unless it is rated for switching the electric discharge lamp load involved.		N/A
16	Transformers		N/A
17	Motors and Motor Drive Circuits		N/A
18	Wiring and Conductors		P
18.1	General		P
18.1.1	A conductor shall be made of copper		P
18.1.2	A conductor shall have insulation rated for the voltage and condition of service to which it is subjected under conditions of intended service.		P
18.1.3	A lamp circuit conductor in a striplight shall be soldered to the lampholder terminal when the terminal is of the screw type.		N/A
18.1.4	Wire to a lamp-supported lampholder shall be provided with a strain-relief device at the end that exits the luminaire enclosure.		N/A
18.1.5	When a conductor passes through an opening or crosses over the edge of sheet metal, it shall be held away from the edges of the metal or shall be protected by a bushing or a grommet, or by rolling the edge of the metal not less than 120 degrees. Sleeving is not to be used as a means of preventing cutting and abrasion of wires.	Fiberglass sleeving used as mechanical protection	P
	Exception: The edges of sheet metal thicker than 1.07 mm (0.042 inch) are only required to be treated to remove burrs, fins, and sharp edges by reaming or an equivalent method.		N/A
18.1.6	A product shall be constructed so that wires can be factory- or field-installed, as involved, without damaging the conductor insulation. A wire enclosure shall be free from burrs, fins, and other sharp edges that come into contact with wires.		P

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
18.1.7	Not more than 4.8 mm (3/16 inch) of the threads of sheet metal and self-tapping screws shall be exposed in a wire enclosure.		N/A
	Exception: More than 4.8 mm of screw threads may be exposed when wires are held or positioned so that they do not come into contact with the threads.		N/A
18.1.8	A bushing used to comply with 18.1.5 shall be securely held in place, and a bushing constructed of insulating material shall be at least 1.2 mm (3/64 inch) thick. A rubber bushing shall not be used.		N/A
	Exception: A bushing less than 1.2 mm thick may be used when an investigation shows that the mechanical properties contemplated are provided.		N/A
18.2	Ampacity and temperature		P
18.2.1	A conductor that supplies a receptacle or cord connector shall comply with (a), (b), or (c):		P
	a) The conductor shall be sized as specified in Tables 18.1 and 18.2 to have an ampacity not less than the load current value determined as specified in 18.3.2;		P
	b) The conductor shall: 1) Be a conductor within a flexible cord or cable that is not part of a drop cord and in which the number of current-carrying conductors exceeds three and 2) Be sized as specified in Tables 18.1 and 18.2 to have an ampacity not less than the value obtained by multiplying the load current value determined as specified in 18.3.2 by the ampacity reduction factor specified in Table 18.3; or		N/A
	c) The conductor: 1) Shall be other than a conductor within the flexible cord or cable that is part of a drop cord; 2) Shall be sized not less than 0.82 mm ² (18 AWG); and 3) Shall be part of a construction that complies with the requirements described in the Temperature Test, Section 30.		N/A
	All other conductors shall not be less than 0.82 mm ² . Figure 18.1 shows an example of the application of this requirement.	Min.18AWG	P

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
18.2.2	When applying the requirement of 18.2.1 to a conductor of a connector strip that supplies a receptacle or cord connector, the conductor shall be sized using the 60°C ampacities as specified in Tables 18.1 and 18.2 for the type of wire, flexible cord, or cable involved.		P
	Exception No. 1: It shall be permitted to size a conductor of a connector strip that supplies a receptacle or cord connector using the ampacity of the conductor having the insulation temperature rating specified in the first column of Table 18.4, when the insulation temperature rating of the conductor used exceeds the value specified in the second column of Table 18.4.		N/A
	Exception No. 2: The conductor of a connector strip or drop box power supply cord rated at more than 60°C (140°F) shall be sized using the ampacities assigned for the temperature rating for the conductors		N/A
18.2.3	A conductor connected to a terminal of an electrical component used in stage and studio lighting equipment shall comply with (a), (b) or (c)		P
	Exception: A conductor connected to a terminal of an electrical component used in stage and studio luminaire equipment is not prohibited from being smaller than that specified in 18.2.3, or from having an insulation temperature rating less than that specified in 18.2.3		N/A
18.2.4	A conductor connected to a terminal of an electrical component not marked as specified in 18.2.3(a) and used in a circuit rated 100 amperes or less shall be sized to have an ampacity not less than the current involved based on connecting a conductor having an insulation temperature rating of 60°C (140°F).		P
18.2.5	A wire used in a luminaire shall have insulation rated for the highest temperature to which it is subjected as determined by the Temperature Test		P
18.2.6	A wire used in a connector strip or striplight shall be provided with insulation with a temperature rating of not less than 125°C (257°F).		N/A
	Exception No. 1: The conductor insulation on the end of a drop cord entering a connector strip housing is not prohibited from having a rating of less than 125°C, but shall not be less than 90°C (194°F),		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
	Exception No. 1: The conductor insulation on the end of a drop cord entering a connector strip housing is not prohibited from having a rating of less than 125°C, but shall not be less than 90°C (194°F)		N/A
	Exception No. 2: The conductor insulation on the end of the cord or cable described in 26.3 that enters a connector strip housing is not prohibited from having a rating of less than 125°C, but shall not be less than 90°C,		N/A
18.2.7	The conductor fill of a connector strip shall not exceed 20 percent. When calculating the connector strip fill, wires of all circuits (not including grounding or bonding conductors) are to be included.		N/A
	Exception: The conductor fill of a connector strip is not prohibited from exceeding 20 percent when the construction complies with the Temperature Test		N/A
18.2.8	The conductors of a connector strip shall be arranged so as to reduce the risk of unintended heating of surrounding metal by induction.		N/A
	Exception: The conductors are not required to be routed together in the same compartment when the construction complies with the Temperature Test		N/A
18.3	Load determination		P
18.3.1	When a circuit supplies two or more receptacles or cord connectors, it shall be assumed that any one or combination of the receptacles or cord connectors is loaded so that the involved conductors and receptacle(s) conduct the maximum current. The intended maximum available current for the receptacles and cord connectors shall be determined as specified in 18.3.2(c).		N/A
18.3.2	The total load current value for a conductor that supplies a receptacle or cord connector as specified in 18.2.1 shall be calculated by determining and adding the individual load current values as indicated in (a) – (d) for the loads supplied by the conductor.		P
	a) Lampholders		N/A
	b) Motors		N/A
	c) Receptacles and Cord Connectors		P

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
	d) Other loads		P
19	Receptacles, Drop Cords, Cord Connectors, Interconnecting Flexible Cords and Cables, and Overcurrent Protection		P
19.1	A drop cord shall consist of one of the types of flexible cord or cable identified in 26.3(a) and shall terminate in a cord connector.		N/A
19.2	External wiring used to interconnect separated assemblies of a product, such as a luminaire and a remote ballast assembly or remote control assembly, shall be flexible cord or cable of the type identified in 26.3(a), or equivalent.	Ratings: SJTW, min. 14AWG, min. 300V, min. 105°C, VW-1	P
	Exception: External wiring connected to a Class 2 circuit or a limited-voltage/current circuit is not required to be flexible cord or cable.		N/A
19.3	The slot or pin configuration of a standard receptacle or cord connector shall be that associated with the voltage of the circuit to which the receptacle or cord connector is connected.		N/A
19.4	A non-standard receptacle or cord connector shall be supplied by a circuit with a voltage rating not exceeding the voltage rating of the receptacle or cord connector being used.		P
19.5	All receptacles and cord connectors shall be of a grounding type.		P
	Exception: A receptacle or cord connector is not required to be of a grounding type when the circuit supplying the receptacle or cord connector is rated 150 volts DC or less and the product is marked as specified in 56.2 to indicate that the product is intended for use only in motion picture and television studios and similar locations.		N/A
19.6	A receptacle or cord connector shall be provided with overcurrent protection that is an integral part of the equipment when the situation described in (a) or (b) applies.		N/A
	a) The receptacle or cord connector is supplied by the secondary of a transformer that is part of the equipment.		N/A
	b) A branch circuit to which the equipment is intended to be connected supplies the receptacle or cord connector in the equipment and is provided with overcurrent protection greater than the current rating associated with the slot or pin configuration of the receptacle or cord connector.		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
	The overcurrent protection shall be of the branch-circuit type and shall not be greater than the current rating associated with the blade or pin configuration of the receptacle or cord connector.		N/A
	Exception: A 15-ampere receptacle or cord connector supplied by a circuit that is protected by branch-circuit overcurrent protection rated 20 amperes is not required to be provided with additional overcurrent protection.		N/A
19.7	A user-serviceable fuse shall be mounted or guarded so that no live parts are exposed to unintentional contact. The arrangement shall be such that, at any time during replacement, the fuse is not gripped or held by any part of the fuseholder while live parts are exposed.	No replacement fuse used	N/A
19.8	A clip for a cartridge fuse shall be mounted securely, resistant to turning, and provided with end stops.		N/A
19.9	Where markings or other manufacturer provided information associates a receptacle or connector with the Class 2 circuit classification, the receptacle or connector shall not be connected within the product to other than a circuit of either (a), (b), or (c).		N/A
	a) A Class 2 circuit		N/A
	b) A limited-voltage/current circuit		N/A
	c) An internal circuit not conductively connected to another source of voltage or current (the voltage or current is received through the receptacle or connector), and the circuit and its components comply with applicable requirements of this standard for separation from other than Class 2 and limited-voltage/current circuits.		N/A
	For such a receptacle or connector, the marking in 57.7 shall be provided.		N/A
19.10	Where markings or other manufacturer provided information associates a receptacle or connector with the Class 3 circuit classification, the receptacle or connector shall not be connected within the product to other than a Class 3 circuit as defined in 3.8. For such a receptacle or connector, the marking in 57.8 shall be provided.		N/A
20	Polarity		P

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
20.1	Equipment containing a receptacle, cord connector, or a screw-shell type lampholder shall be wired such that a wire connected to the shell or to the grounded (neutral) terminal of the receptacle or cord connector is clearly identified for the connection of the grounded conductor of the supply circuit at the point of connection to the supply.		P
	Exception: The polarity is not required to be marked when:		N/A
	a) The lampholder or receptacle is connected to a circuit electrically-isolated from the supply		N/A
	b) The lampholder or receptacle operates at a potential to ground and between conductors of 30 volts (42.4 volts peak) or less; or		N/A
	c) The lampholder has a screw-shell lampholder that does not connect any pole of the supply to the shell until the lamp is nearly fully inserted, and which fully shrouds the metallic screw base of the lamp when contact is made.		N/A
20.2	A switch that de-energizes a lampholder shall disconnect all ungrounded conductors to the lampholder.		N/A
	Exception: This requirement does not apply to a switch that de-energizes a lampholder covered by the Exception to 20.1.		N/A
20.3	A terminal intended for the connection of a grounded supply conductor shall be either:		P
	a) Made of or plated with metal that is white in color and shall be readily distinguishable from the other terminal or		N/A
	b) Identified clearly in some other manner, such as on an attached wiring diagram.		P
20.4	A lead intended for the connection of a grounded power-supply conductor shall be finished to show a white or gray color and shall be readily distinguishable from the other leads.		N/A
20.5	The lead or terminal of a product with a ballast that is intended to be connected to a branch circuit with a grounded circuit conductor (neutral) shall be identified		N/A
21	Ballasts and Capacitors		N/A
22	Printed Wiring Boards		P

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
22.1	A printed-wiring board containing circuits involving a risk of fire or electric shock or where separation of the bond between the printed-wiring board foil and the base material results in contact with circuits involving a risk of fire or electric shock, shall comply with UL 796.		P
23	Electrical Spacings		P
23.1	An electrical spacing shall comply with the requirements specified in this section.		P
	Exception No. 1: A spacing is not required to comply with the requirements in this section within snap switches, lampholders, and similar component devices covered by 2.1.1.		N/A
	Exception No. 2: A spacing between uninsulated live parts of snap switches, lampholders, and similar component devices and dead metal that is part of the device (including mounting screws, rivets, yoke, clamp, or the like) is not required to comply with the requirements in this section.		N/A
	Exception No. 3: There are no specifications for spacings in limited-voltage/current circuits or Class 2 circuits. A limited-voltage/current circuit shall comply with Limited-Voltage/Current Circuits, Section 27.		N/A
	Exception No. 4: Motor drive circuits shall comply with the following spacing requirements in the Standard for Industrial Control Equipment, UL 508		N/A
	Exception No. 5: For other than providing isolation between different circuits, spacings between traces of different potential on a printed-wiring board are not required to comply with the requirements in this section when a) The printed-wiring board has a flammability rating of V-0; b) The printed-wiring board base material has a minimum Comparative Tracking Index (CTI) of 100 volts; and c) The circuit complies with the Printed-Wiring Board Abnormal Operation Test, Section 40.		P
23.2	The electrical spacing through-air and over-surface between lampholder terminals and the metal of a striplight enclosure shall be minimum 12.7 mm (1/2 inch) for voltages up to 600 volts.		N/A
23.3	Electrical spacings at field-wiring terminals shall comply with the values specified in Table 23.1.	No field-wiring terminal	N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
23.4	At other than field-wiring terminals, electrical spacings shall comply with the values specified in Table 23.2 for potentials up to 600 volts rms and 850 volts peak.	Between live parts of opposite polarity in inlet, outlet and power unit. Between such live parts as above and accessible metal parts: Cl. =5.8mm , Cr. = 5.8mm (limit: Cl.: 2.4mm, Cr.: 2.4mm)	P
23.5	Electrical spacings between two circuits involving different voltages, such as between a limited-voltage/current circuit and a line voltage circuit, shall not be less than as required for the higher voltage circuit.		P
24	Grounding		P
24.1	All conductive parts of a product not intended to be electrically live that are accessible to persons (including during maintenance and repair), and are capable of inadvertently becoming energized, shall be grounded by being conductively bonded to a common point that incorporates provision for grounding of the luminaire.		P
	Exception: A product rated 150 volts DC or less, that is marked as specified in 58.2 to indicate that the product is intended for use only in motion-picture and television studios and similar locations, is not required to comply with the requirements in this section.		N/A
24.2	An equipment grounding means shall be:		P
	a) A pigtail lead, pressure terminal connector, or wire-binding screw complying with the requirements of Termination Provisions for Field-Connected Conductors, Section 25, or		N/A
	b) The grounding pin of an attachment plug or the equivalent.		P
	The equipment grounding means shall be at the same location as the power-supply connection means.		P
24.3	When insulated, an equipment-grounding conductor, where visible to the installer, shall have a braid of continuous green color with or without a yellow tracer or, when no braid is used, the insulation on the conductor shall be green with or without one or more yellow stripes.		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
	Exception: A conductor having green insulation and a braid of other than green shall be used when the green insulation is readily visible where connections to the branch-circuit supply wires are made.		N/A
24.4	An equipment-grounding conductor shall not be terminated on the luminaire by a screw, rivet, or equivalent device that is also used to secure another device or part that is removed during replacement of any electrical device or component.		P
24.5	The cord of a cord-connected luminaire shall contain an equipment-grounding conductor complying with 24.3 and 24.4.		P
24.6	A wire-binding screw intended for the field connection of an equipment-grounding conductor shall have a green-colored head that is hexagonal-shaped or slotted, or both.		N/A
24.7	A pressure-wire terminal for the connection of an equipment-grounding conductor shall be marked as specified in 57.1.		N/A
24.8	All parts required to be grounded shall be conductively connected to the ground termination point such that the resistance between any two points is 0.1 ohm or less as determined in the Grounding Continuity Test		P
24.9	A bonding wire or jumper connector shall not be terminated by a screw, rivet, or equivalent device that is also used to secure another device, part, or the like, that is removed during replacement of any electrical device or component		P
25	Termination Provisions for Field-Connected Conductors		N/A
26	Power Supply Connections		P
26.1	Stage luminaires, connector strips, and the like intended for permanent installation shall have provision for the entry of conduit or cable.		P
26.2	Equipment intended for permanent connection shall have termination provisions for field-connected conductors that comply with the requirements of Termination Provisions for Field-Connected Conductors, Section 25.		N/A
26.3	A portable stage luminaire shall be provided with a length of flexible cord or cable or special conductor assembly that complies with (a) – (e). A portable connector strip shall be provided with a length of flexible cord or cable that complies with (a) and (c) – (e).		P

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
	a) A flexible cord shall have a serviceability rating at least equal to extra-hard-usage types such as Type G, S, SE, SEO, SO, ST, STO, or W.		N/A
	Exception No. 1: Still photography lights are not prohibited from being provided with a flexible cord having a serviceability rating at least equal to hard-usage types such as Type SJ, SJO, SJT, or equivalent power supply cords		N/A
	Exception No. 2: Portable stage luminaires are not prohibited from being provided with a flexible cord having a serviceability rating at least equal to hard-usage types such as Type SJ, SJO, SJT, or equivalent power supply cords providing that the supply cord is not greater than 2 m (6.6 feet) in length and is rated at not more than 20A.		N/A
	b) A special assembly of conductors used in lieu of the flexible cord or cable of portable stage luminaires shall consist of stranded conductors rated minimum 125°C (257°F) and an outer glass fiber sleeve with a wall thickness of at least 0.64 mm (0.025 inch). The conductors and sleeving shall be maximum 1 m (3.3 feet) in length.		P
	Exception: The special assembly of conductors are not required to include an outer glass fiber sleeve when the conductors are part of an appliance wiring material that includes an overall jacket or outer sleeving and the appliance wiring material is equivalent to the special assembly of conductors described above with regard to resistance to abrasion and conductor insulation damage. For example, appliance wiring material Style 4418 has been determined to be equivalent to the special assembly of conductors.		N/A
	c) The flexible cord, cable, or special conductor assembly shall be sized to have an ampacity that corresponds to the electrical rating of the equipment but shall not be smaller than 0.82 mm ² (18 AWG) flexible cord, cable, or conductor, as applicable.		N/A
	d) The flexible cord, cable, or special assembly of conductors shall be terminated by an attachment plug that is of the grounding type.		N/A
	Exception No. 1: The length of flexible cord, cable, or special conductor assembly is not required to terminate in an attachment plug when the unit is marked in accordance with 57.2 or 57.3, as applicable.		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
	Exception No. 2: The attachment plug is not required to be of the grounding type when the product is rated 150 volts DC or less and is marked as specified in 56.2 to indicate that the product is intended for use only in motion picture and television studios and similar locations.		N/A
	e) The flexible cord, cable, or special conductor assembly shall be provided with a strain-relief means that complies with the Strain-Relief Test, Section 34.		P
26.4	The length of a power supply cord shall not be less than 914 mm (3 feet). The length of the power supply cord is to be measured from the face of the attachment plug to the point where the cord emerges from the enclosure.		P
	Exception: The length of the power supply cord of a connector strip is not prohibited from being less than 914 mm but shall not be less than 457 mm (18 inches).		N/A
26.5	An adaptor and connector provided for power supply connections shall:		N/A
	a) Comply with the requirements in Polarity, Section 20;		N/A
	b) Be rated for the voltage involved; and		N/A
	c) Have the same current rating as the supply circuit connector to which the adaptor or connector is intended to be connected.		N/A
27	Limited-Voltage/Current Circuits		N/A
27.1	A limited-voltage/current circuit is one that is supplied from an isolated secondary winding of a transformer and that complies with the applicable values specified in Table 27.1. Power limitations of a limited-voltage/current circuit shall be obtained by the use of any of the following configurations:		N/A
	a) An inherently-limited transformer;		N/A
	b) A non-inherently-limited transformer coupled with an overcurrent-protected device on the output circuit;		N/A
	c) A combination transformer and fixed impedance; or		N/A
	d) An arrangement determined to be equivalent to (a), (b), or (c).		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
27.2	A transformer intended to comply with the requirements in 27.1 shall be subjected to the Test for Limited-Voltage/Current Circuit Transformers, Section 41.		N/A
27.3	When an overcurrent-protective device is required to comply with the requirements in 27.1, the secondary of the transformer and the overcurrent-protective device are to be evaluated as part of the line-voltage circuits.		N/A
27.4	The overcurrent-protective device specified in 27.1(b) shall not be of the automatically-reset type but shall be trip-free when of the manually-reset type.		N/A
28	Separation of Circuits		P
28.1	Conductors of two circuits involving different voltages, such as between a limited-voltage/current circuit and a line voltage circuit, shall be separated from each other by a barrier or segregated as specified in 28.2 unless the conductors of both circuits are insulated for the maximum voltage of either circuit.		P
28.2	Conductors shall be separated from all uninsulated live parts of a different voltage circuit by a barrier or segregated from the uninsulated live parts as specified in 28.4.		P
28.3	Where a Class 2 circuit leaves the equipment's electrical enclosure, all conductors of the Class 2 circuit within the electrical enclosure shall be separated from all uninsulated live parts of other than a Class 2 circuit by a barrier or segregated from the uninsulated live parts as specified in 28.4.		N/A
28.4	Segregation of a conductor shall be accomplished by clamping, routing, or equivalent means that provides permanent separation from a conductor or an uninsulated live part of a different circuit.		P
29	Isolation Devices		N/A
29.1	An optical isolator that is relied upon to provide isolation between primary and secondary circuits as required by this standard shall be constructed in accordance with the Standard for Optical Isolators, UL 1577, and shall withstand for 1 minute, without breakdown, an AC dielectric voltage-withstand potential equal to 1000 V plus twice the rated voltage between the input and output circuits.		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
	Exception: Optical isolators that comply with the requirements for isolation devices in the Standard for Industrial Control Equipment, UL 508, are not required to comply with this requirement.		N/A
29.2	A power-switching semiconductor device that is relied upon to provide isolation to ground shall be constructed in accordance with the Standard for Electrically Isolated Semiconductor Devices, UL 1557. The dielectric voltage-withstand tests required by UL 1557 shall be conducted at a dielectric potential of 1000 V plus twice the rated voltage for 1 minute		N/A
	Exception: Power-switching semiconductor devices that comply with the requirements for isolation devices in the Standard for Industrial Control Equipment, UL 508, are not required to comply with this requirement.		N/A
	PERFORMANCE		--
30	Temperature Test		P
31	Dielectric Voltage-Withstand Test		P
32	Abnormal Operation Test	Considered the thermally most onerous operating position during temperature test	N/A
33	Dielectric Voltage-Withstand Test following Abnormal Operation Test		N/A
34	Strain-Relief Test		P
35	Stability Test		N/A
36	Grounding Continuity Test		P
37	Overhead Product Static Loading Test		P
38	Backup Restraint-Device Loading Test		P
39	Transformer Overload Test		N/A
40	Printed-Wiring Board Abnormal Operation Test		P
41	Test for Limited-Voltage/Current Circuit Transformers		N/A
42	Glass UV Filter Impact Test		N/A
43	Glass Thermal Shock/Containment Test		N/A
44	Polymeric Lamp-Containment Barrier Flammability/Containment Test		N/A
45	Motor Locked-Rotor Test		N/A

UL1573, Stage and Studio Luminaires and Connector Strips			
Clause	Requirement Test	Result - Remark	Verdict
46	Ozone Offgas Test		N/A
47	Rain Test		P
48	Glass Water-Shield Thermal Shock Test		P
49	Polymeric Water-Shield Conditioning Test		N/A
50	Gasket Conditioning Test		N/A
51	Gasket Adhesion Test		N/A
	MANUFACTURING AND PRODUCTION-LINE TEST		--
52	Dielectric Voltage-Withstand Test		P
	MARKINGS		--
53	General		P
54	Identification	Refer to the "Copy of Marking Plate"	P
55	Ratings	Refer to the "Copy of Marking Plate"	P
56	Product Location and Orientation	Refer to the "Copy of Marking Plate"	P
57	Supply and Other Field Connections		N/A
58	Lamp Replacement, Lamp Containment, and UV Radiation Filters		N/A
59	Plug-Connected Loads and Load Diversity		N/A
60	Fuse Replacement		N/A
61	Installation Instructions		P

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
4	General requirements		P
5	Mechanical construction		P
5.1	Electrical components shall conform to the particular Canadian Electrical Code, Part II (CE Code, Part II) Standard covering such components, insofar as applicable, and shall be suitable for the application.		P
5.2	Enclosures		P
5.2.1	General		P
5.2.1.1	Luminaires shall have the necessary strength and rigidity to resist the abuses to which they are likely to be subjected, without the required spacings of the electrical equipment being reduced or parts becoming loosened or displaced. Removable parts for the purpose of maintenance or relamping shall be designed or marked to prevent replacement in a position that would affect the safe operation of the		P
5.2.1.2	Luminaires shall have enclosures of sheet metal, cast metal, or other suitable materials that shall enclose all bare or insulated parts, such as wiring terminals, wiring joints, and switches, other than the contacts of lampholders, flexible cords, and openings as specified in Clause 5.2.5. Enclosure materials other than metal shall have the equivalent mechanical strength and shall comply with Clause 5.2.6.	Metal and glass enclosure	P
5.2.1.3	Seams and joints shall be securely fastened by bolts, rivets, welding, or equivalent means. There shall be not less than two such fastenings for each seam.	Fastened by screws	P
5.2.1.4	Luminaires shall be designed to protect the lamps from mechanical damage.		P
5.2.1.5	Except as limited by Table 8.1, Item E, if any part of the exterior surface attains a temperature above 150°C but not higher than 250°C, the luminaire shall be marked in accordance with Table 7.1, Item 21.	Measured temperature less than 150°C	N/A
5.2.1.6	A disappearing footlight shall be so arranged that it will be automatically disconnected from the supply when the footlight is moved into the recessed position.		N/A

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
5.2.2	Thickness of cast metal		P
5.2.2.1	For unreinforced flat surfaces in general, cast metal shall be not less than 3 mm (0.118 in) in thickness except that malleable iron or permanent-mould cast aluminum may be 2.5 mm (0.098 in) in thickness and die-cast metal may be 2.0 mm (0.078 in) in thickness.	Die-cast aluminum, min. 2.5mm thickness.	P
5.2.2.2	If the surface is curved, ribbed, or formed to give adequate mechanical strength, the thickness of the materials referred to in Clause 5.2.2.1 shall be not less than 2.5 mm (0.098 in), 1.6 mm (0.063 in), and 1.2 mm (0.047 in), respectively.		P
5.2.3	Thickness of sheet metal		N/A
5.2.3.1	Enclosures of sheet metal shall be not thinner than a) 0.78 mm (0.030 in) for sheet steel; b) 0.92 mm (0.036 in) for aluminum; and c) 0.84 mm (0.033 in) for copper or brass.		N/A
5.2.3.2	Enclosures of thinner material having adequate strength due to shape or reinforcement shall be subject to investigation in order to determine their acceptability.		N/A
5.2.4	Corrosion protection All ferrous metal parts, unless inherently resistant to corrosion, shall be protected against corrosion by painting, plating, or coating.	Painting	P
5.2.5	Ventilating openings	No openings	N/A
5.2.5.1	A ventilating opening shall not adversely affect the strength or rigidity of a luminaire.		N/A
5.2.5.2	Ventilating openings in enclosures shall be constructed, located, protected, or baffled to prevent accessibility to live parts in accordance with Clause 6.13 of CSA C22.2 No. 250.0.		N/A
5.2.5.3	Ventilating holes shall not exceed a) 968 mm ² (1.5 in ²) for each hole; and b) in total area, 15% of the total area of the enclosure.		N/A

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
5.2.5.4	Openings in enclosures shall not be located directly below terminals, switches, wiring, and other live parts unless baffled, in order to prevent molten metal, flaming particles, etc., from falling through to possibly combustible surfaces.		N/A
5.2.5.5	There shall be no openings in the mounting surface that would permit a flame to impinge on a possibly combustible surface.		N/A
5.2.6	Polymeric materials		N/A
5.2.6.1	Enclosures or baffles of polymeric material shall, based on the specific application, have performance characteristics as identified in Table 5.1 and the following requirements, as applicable:	No polymeric material used as enclosures or baffle	N/A
	a) For fixed or stationary luminaires, the polymeric ball impact test of Clause 16.41 of CSA C22.2 No. 250.0 shall apply for the parts that can be subjected to impact after final installation.		N/A
	b) For portable luminaires, the drop impact test of Clause 8.8 of CSA C22.2 No. 1993 shall apply.		N/A
	c) Enclosures shall comply with the mould stress-relief test of Clause 16.4 of CSA C22.2 No. 250.0 for moulded or formed thermoplastic material.		N/A
	d) Enclosures shall meet the following flammability ratings, given from lower to higher: HB, V-2, V-1, V-0, 5-VB, and 5-VA.		N/A
	e) An enclosure shall have an RTI (relative temperature index) rating equal to or greater than its maximum operating temperature or a generic thermal index as specified in CAN/CSA-C22.2 No. 0.17.		N/A
	f) An enclosure of polymeric material where any uninsulated live parts are located within 0.8 mm (0.032 in) of the enclosure shall meet the requirements of Table 5.1 for CTI (comparative tracking index) rating, HWI (hot-wire ignition) rating, and HAI (high-current arc resistance to ignition) rating, respectively, corresponding to the tests as specified in CAN/CSA-C22.2 No. 0.17.		N/A

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
	g) For luminaires intended for wet locations or where directly exposed to UV radiation, the material shall be UV rated or shall be tested in accordance with the UV exposure test of Clause 16.5.5 of CSA C22.2 No. 250.0.		N/A
5.2.6.2	The lens (primary optic) of an LED package in a circuit that is considered to have a risk of electric shock is not required to have an electrical enclosure when constructed of glass or polymeric material that complies with the dielectric voltage-withstand test of Clause 8.4, with a potential of 500 V applied between the lens surface and the electrical connections to the LED package.		N/A
5.2.7	Lamp containment barriers for tungsten-halogen lamps		N/A
5.2.8	Lamp containment and ultraviolet (UV) attenuation barriers for electric discharge lamps		N/A
5.2.9	Lamp containment barriers for high-pressure lamps		N/A
5.3	Mounting means and safety attachments		P
5.3.1	Suitable means shall be provided with the luminaire for the intended type of mounting or support.		P
5.3.2	The support structure associated with the luminaire (which may include the yoke and fasteners) as well as the method of attachment to the major support shall be capable of withstanding the loading test of Clause 8.7.		P
5.3.3	With removable accessories detached, the luminaire head shall have a weighted distribution such that the force required to maintain unclamped balance shall not exceed 70 N applied at either extremity.	No such removable accessories	N/A
5.3.4	A luminaire of the type that is detachable from its means of support shall have provision for the attachment of a safety chain, cable, or other positive retaining means.	Backup-restraint safety chain	P

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
5.3.5	Parts and accessories, such as barn doors, that can become detached during use shall be attached to the luminaire by means of a safety chain, cable, or other positive retaining means. The means provided shall not restrict the operation of the luminaire or accessory. The secondary safety attachment means and the chain, cable, or equivalent shall be capable of withstanding the loading test of Clause 8.7.		N/A
5.3.6	Parts and accessories incorporating polymeric materials shall comply with the test requirements of Clause 8.8.		N/A
5.3.7	Accessories shall have a positive retaining means and shall remain in place regardless of the orientation of the luminaire.		P
5.4	Arms and stems		P
5.4.1	Arms and stems shall comply with the loading test of Clause 8.7.		P
5.4.2	An arm or structural member used as a wireway shall comply with the requirements for metal or polymeric enclosures, as applicable, provided elsewhere in this Standard.		N/A
5.5	Mechanical joints		P
5.5.1	The methods used for mechanical connection between component parts and movable sections of the luminaire shall be such as to ensure ample strength and rigidity to prevent relative turning or movement that would result in damage to wiring, wiring devices, and other electrical parts. Such joints shall be capable of withstanding a torque of 2.26 Nm (20 lbf.in) and shall be capable of withstanding the loading test of Clause 8.7.		P
5.5.2	A cardboard add-on accessory secured by an adhesive, or similar accessories not presenting a risk of injury if they separate from the luminaire, shall not be required to comply with Clause 5.5.1.		N/A
5.5.3	Frictional contact alone between parts that are subject to torsion when lamps are being inserted or removed shall not be relied upon to prevent turning.		N/A
5.6	Movable joints		N/A

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
	A movable joint, such as a swivel joint, containing conductors shall be constructed so that movement of the joint will not result in damage to the insulation of conductors. Rotation shall be limited to 370°, or the movable joint shall comply with the movable joint rotation test of Clause 8.10.		N/A
	A movable joint containing conductors shall comply with the movable joint torsion and pull test of Clause 8.11 and shall remain intact and operable.		N/A
5.7	Glass lenses		N/A
5.8	Glass UV attenuation barriers		N/A
6	Electrical		P
6.1	General		P
6.1.1	Raceways shall be free from burrs and sharp edges and of such design that the luminaire can be wired without damage to the conductor insulation.		P
6.1.2	Machine and sheet-metal screws shall not be located in any part of a luminaire where their projection inside an enclosure will cause damage to the wiring.		P
6.1.3	Conductors that pass over edges or through openings in metal shall be secured from contacting the edges or be protected from cutting and abrasion. For sheet metal less than 1.1 mm (0.042 in) thick, protection shall be provided by one of the following methods: a) rolling the edge of the metal not less than 120° ; b) a bushing or grommet of a material other than rubber at least 1.2 mm (0.047 in) thick; or c) glass sleeving at least 0.25 mm (0.010 in) thick.		P
6.2	Wiring devices		P

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
6.2.1	A convenience receptacle mounted in a luminaire shall be provided with the means for bonding to ground, and the supply conductors shall be not smaller than No. 14 AWG. A separate bonding jumper shall be connected to the receptacle bonding terminal and to the metal of the luminaire enclosure in a reliable manner in accordance with Clause 6.14.2. The maximum allowable load in amperes that may be plugged into the receptacle shall be marked adjacent to the receptacle in accordance with Table 7.1, Item 7.		N/A
6.2.2	A wiring device shall be rated for the temperatures, locations, voltage, and current encountered during normal operation.		P
6.2.3	A luminaire incorporating a wiring device rated for ac use shall be marked with the frequency or for ac use only, in accordance with Table 7.1, Item 5 or 24.		N/A
6.2.4	A wiring device shall be prevented from any turning that can apply tension to conductor connections, result in damage to the conductor, or otherwise adversely affect the assembly. Friction alone between the mating parts of the assembly shall not be acceptable as a means to prevent turning.		P
6.2.5	Parts of wiring devices that are removable from outside the enclosure without the use of ordinary tools shall not result in access to live parts within the enclosure.		N/A
6.2.6	The rating of an attachment plug assembled to a flexible cord for connection to a branch circuit shall comply with Table 6.1.		P
6.3	Lampholders		N/A
6.4	Switches		N/A
6.4.1	A switch shall have a minimum ampere rating equal to the total load current it controls multiplied by the load factor shown in Table 6.2.		N/A
6.4.2	A switch other than a single-pole type shall disconnect all of the ungrounded conductors of a supply circuit simultaneously.		N/A
6.4.3	A single-pole switch shall not be connected in the neutral grounded conductor.		N/A
6.5	Supply connections		P

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
6.5.1	Luminaires intended for permanent installation shall have adequate provision for the entry of conduit, cable, or flexible cord. Means shall be provided to ensure that supply connections and wiring, which are added in the field, are readily accessible for inspection. Knockouts and threaded openings for conduit and conduit hubs shall comply with CAN/CSA-C22.2 No. 94.1 and CAN/CSA-C22.2 No. 94.2.		P
6.5.2	Portable luminaires shall be provided with a length of flexible cord that shall a) have a serviceability rating at least equal to hard-usage types such as Types SJ, SJO, and SJT; b) be of the outdoor type, such as Type SJOW or SJTW, for wet or damp location luminaires; c) have sufficient ampacity, but in no case shall the conductors be less than No. 18 AWG; d) be fitted with an attachment plug that shall be of the grounding type if bonding to ground is required in accordance with Clause 6.14; and e) be suitable for the temperatures encountered.		N/A
6.5.3	A special assembly of conductors in sleeving may be used with portable luminaires and shall be limited to a maximum length of 1 m (39.4 in) and shall comply with Clause 6.5.2 c), d), and e).		N/A
6.5.4	A conduit or cable connection shall not be made to covers giving access to supply connections unless a suitable bonding jumper is permanently attached between the enclosure and the cover. In lieu of the jumper, a hinge that complies with the impedance requirements of CAN/CSA-C22.2 No. 0.4 shall be acceptable.		P
6.5.5	Portable luminaires provided with a flexible cord that is not fitted with an attachment plug shall be marked in accordance with Table 7.1, Item 26.		N/A
6.6	Fans, motors, and motor controllers		N/A
6.7	Transformers and power supplies		P
6.7.1	Transformers and power supplies shall be bonded to the frame of the luminaire in accordance with Clause 6.14.		P

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
6.7.2	Transformers and power supplies shall operate at the specified electrical ratings under normal operating conditions of the luminaire.		P
6.7.3	Lamp controlgear and devices used with LED light sources shall comply with the applicable requirements of CAN/CSA-C22.2 No. 250.13.		P
6.8	Integral ballasts and capacitors		N/A
6.9	Limited output circuits		N/A
6.10	Separation of circuits Conductors of different class circuits, such as Class 2 and branch circuits, that might come into contact with each other, including wires in a cable, terminal box, or enclosure, shall a) have insulation rated for the highest of the circuit voltages; or b) be separated by i) a minimum of 6.4 mm (0.25 in); ii) the proper routing of the conductors within the unit; or iii) the effective use of barriers, clamps, or equivalent separation.		P
6.11	Isolation devices Class 2 circuits shall be electrically isolated from each other and from non-Class 2 circuits. Isolation shall be by an isolating transformer or isolating device such as an opto-isolator. Isolated circuits shall be subjected to the dielectric voltage-withstand test of Clause 8.4.		N/A
6.12	Conductors		P
6.12.1	Luminaires shall be wired with conductors suitable for the intended use, temperatures, and voltages.		P
6.12.2	Conductors shall be minimum No. 18 AWG except as specified in Clauses 6.12.5 and 6.12.6, and shall be rated for the voltage, current, temperature, and conditions of service for normal operation.		P
6.12.3	Joints in conductors shall comply with the requirements of CAN/CSA-C22.2 No. 0.		P
6.12.4	There shall be no wiring joints within arms or stems.		P

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
6.12.5	Conductors of a size smaller than No. 18 AWG but not smaller than No. 24 AWG may be used under the following conditions: a) where they are completely enclosed; b) where they are not subject to movement under normal use; and c) in the secondary of a transformer or in a circuit containing solid-state devices.		P
6.12.6	Conductors smaller than No. 24 AWG may be used in Class 2 or isolated LED Class 2 circuits and shall be physically separated from all other non-Class 2 or non-isolated LED Class 2 circuits [e.g., by a barrier or reliably fixed minimum spacing of 6.4 mm (0.25 in)].		N/A
6.13	Spacings		P
6.13.1	Except as permitted in Clauses 6.13.2 and 6.13.3, where the location and relative arrangement of the parts are such that permanent separation is otherwise secured, the spacings between bare live parts of different voltage and between bare live parts and non-current-carrying metal parts shall be not less than that shown in Table 6.4.		P
6.13.2	If permanent separation of the parts is assured, the spacings referred to in Clause 6.13.1 may be reduced but shall not be less than one-half of the values shown in Table 6.4. Spacings for printed circuit boards shall comply with Annex F of CSA C22.2 No. 250.0.	Between live parts of opposite polarity in inlet, outlet and power unit, between such live parts as above and accessible metal parts: Cl. =5.8mm , Cr. = 5.8mm (limit: Cl.: 3.2mm, Cr.: 4.8mm)	P
6.13.3	An insulating barrier or liner may be used to obtain the required spacings, provided that it is a) of adequate dielectric strength and resistant to moisture; b) not adversely affected by arcing and suitable for the temperature encountered; c) of adequate mechanical strength and permanently retained in place by means other than adhesives; and d) not less than 0.7 mm (0.027 in) thick, except that it shall not be less than i) 0.35 mm (0.013 in) thick if used in conjunction with a spacing not less than one-half of that required; or ii) 0.25 mm (0.010 in) thick if it is of mica or the equivalent and is held tightly in a fixed position by the parts between which the spacing is involved.		N/A

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
6.14	Bonding		P
6.14.1	All exposed non-current-carrying metal parts of luminaires that could become energized shall be in good electrical contact with each other for bonding purposes.		P
6.14.2	The methods and materials used for the bonding of a luminaire or the parts thereof shall comply with CAN/CSA-C22.2 No. 0.4.		P
6.15	Strain relief		P
6.16	Conductor protection		P
6.17	Integral fuses		N/A
6.17.1	General		N/A
6.17.1.1	Luminaires are not required to be provided with an integral fuse(s) but, if such fuses are used, the requirements of Clauses 6.17.1 to 6.17.3 shall apply.		N/A
6.17.1.2	A fuse shall be connected in each ungrounded conductor, but no fuse shall be connected in the circuit of an identified conductor.		N/A
6.17.1.3	A suitable fuse(s) shall be provided by the luminaire manufacturer and installed in the luminaire before shipment from the factory.		N/A
6.17.1.4	The rating of the fuse in volts and amperes shall be marked in accordance with Table 7.1, Item 13.		N/A
6.17.2	Fuseholders A suitable fuseholder shall be used and shall be located as close as practicable to the point of entry of the supply conductors to the luminaire enclosure.		N/A
6.17.3	Provision for disconnect		N/A
6.17.3.1	Unless the fuseholder is recognized for use as a disconnect, a separate disconnect means shall be provided and shall be located immediately adjacent to the fuseholder assembly. The disconnect means shall open all ungrounded conductors of the supply circuit simultaneously.		N/A
6.17.3.2	If a separate disconnect means is provided, the caution marking in accordance with Table 7.1, Item 9, shall be required.		N/A
6.18	Accessibility of live parts		P
6.18.1	Accessibility of live parts shall comply with the requirements of Clause 6.13 of CSA C22.2 No. 250.0.		P

CSA C22.2 No. 166-15, Stage and Studio Luminaires			
Clause	Requirement Test	Result - Remark	Verdict
6.18.2	Openings in a guard protecting a moving part from unintentional contact during use shall be of such size and shape as to prevent the passage of a straight 12.7 mm (0.5 in) diameter probe, with a straight cut-off end, from touching a bare live part or rotating part, except for a smooth shaft.		N/A
6.19	Luminaires for wet and damp locations		P
7	Markings		
7.1	General		P
7.2	Identification and ratings		P
7.3	Durability of stamped ink marking test		P
8	Tests		
8.1	General		P
8.2	Conditions for normal temperature test		P
8.3	Leakage current		P
8.4	Dielectric strength		P
8.5	Humidity		P
8.6	Weatherproofness		P
8.7	Loading		P
8.8	Loading for polymeric accessories		N/A
8.9	Locked rotor test		N/A
8.10	Movable joint rotation		N/A
8.11	Movable joint torsion and pull		N/A
8.12	Strain relief		P

UL1012, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict

CONSTRUCTION			
7	Frame and Enclosure		—
7.1	General		P
7.2	Mounting means	Fixed mounted in luminaires	P
7.3	Integral meters		N/A
7.4	Supporting material		N/A
7.5	Doors and covers		N/A
7.6	Protection against injury to persons		N/A
8	Accessibility of Uninsulated Live Parts, Film-Coated Wire, and Moving Parts		P
9	Protection of Service Personnel		—
9.1	General		N/A
9.2	Mechanical servicing		N/A
9.3	Electrical servicing		N/A
10	Assembly		N/A
11	Protection Against Corrosion		N/A
12	Supply Connections		—
12.1	Permanently-connected power units		N/A
12.2	Wiring terminals and leads		P
12.3	Cord-connected power units		N/A
12.4	Strain relief		N/A
12.5	Bushings		N/A
13	Output Connections	Terminal block	P
14	Interconnections Between Sections		N/A
15	Battery Charger Backfeed Protection		N/A
16	Grounding Connections		P
17	Bonding of Internal Parts		—
17.1	General		N/A
17.2	Bonding conductor		N/A
18	Identification for Connection of Grounded Conductors		P
19	Wire Bending Space		N/A

UL1012, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
20	Output Circuit Grounding		N/A
21	Live Parts		P
22	Internal Wiring		—
22.1	General		P
22.2	Protection of wiring		P
22.3	Electrical connections		P
23	Separation of Circuits		—
23.1	Factory wiring	Construction separation	P
23.2	Separation barriers		N/A
23.3	Field wiring		N/A
24	Insulating Materials	UL approved materials	P
25	Motors		N/A
26	Transformers		—
26.1	General		P
26.2	Coil insulation	Insulation tape and bobbin	P
27	Resistors		N/A
28	Switches and Controls		N/A
29	Overload-Protective Devices	Current fuse provided	P
30	Fuses and Fuseholders		P
31	AC Output Receptacles		N/A
32	Lampholders		N/A
33	Capacitors		P
34	Printed Wiring		P
35	Spacings		—
35.1	General		P

UL1012, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
35.2	Alternative Spacings	Between live parts of opposite polarity before fuse: Cl. = Cr. = 3.7mm (limit is 2.5mm) Between pri. and sec. circuit: Cr. = Cl. = 7.0mm (limit is 2.5mm) Between pri. circuit and dead metal parts: Cr. = Cl. = 4.0mm (limit is 2.5mm) In transformer, between different circuits: Cl. = 6.0mm, Cr. = 6.0mm (limit is 2.4mm)	P
35.3	Insulation liners and barriers		P
36	Control Circuits		N/A
37	Accessible Signal Circuits		N/A
38	Class 2 and Class 3 Output Circuits		N/A
PERFORMANCE			
39	General		—
40	Leakage current test		P
41	Power Input Test		N/A
42	Temperature Test		P
43	Dielectric Voltage Withstand Test		—
43.1	General		—
43.2	Induced potential test		N/A
43.3	Maximum-voltage measurements		P
44	Tests on Insulating Materials		P
45	Mechanical Strength Tests for Metal Enclosures		N/A
46	Strain Relief and Bushing		N/A
47	Push-Back Relief Test		N/A
48	Overload of Switches and Controls		N/A
49	Static Load Test		N/A
50	Stability Test		N/A
51	Isolated Limited Energy Circuit Capacity		N/A

UL1012, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
52	Overcurrent Protection Calibration Test		N/A
53	Neutral to Ground Potential Measurement Test		N/A
54	Abnormal Tests		—
54.1	General		—
54.2	Output short-circuit test		P
54.3	Blocked fan test		N/A
54.4	Fuse short circuit test		N/A
54.5	Voltage selector test		N/A
54.6	Relay and solenoid burnout		N/A
54.7	Transformer overload tests		P
54.8	Component short- and open-circuit test		P
54.9	Backfeed protection		N/A
54.10	Autotransformer		N/A
54.11	Evaluation of reduced spacings on printed-wiring boards		P
54.12	Reverse polarity test		N/A
55	Flanged Bobbin Transformer Abnormal Test		N/A
56	Capacitor Test		P
57	Bonding Conductor Test		N/A
58	Hot, Flaming Oil Test		N/A
MANUFACTURING AND PRODUCTION TESTS			
59	Dielectric voltage withstand test		Not Required
60	Grounding continuity test		Not Required
MARKING			
61.1	Cautionary markings		N/A
61.2	General markings		N/A
61.3	Application		N/A
INSTRUCTIONS			
62.1	General		N/A

UL1012, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
62.2	Battery chargers		N/A
—	IMPORTANT SAFETY INSTRUCTIONS		N/A
SPECIFIC POWER UNITS			
OUTDOOR USE POWER UNITS			
63	General		N/A
64	Construction		N/A
65	Performance		N/A
66	Marking		N/A
PLUG-IN POWER UNITS			
67	General		N/A
68	Construction		N/A
69	Performance		N/A
70	Marking		N/A
SCHOOL-LABORATORY POWER SUPPLIES			
71	General		N/A
72	Construction		N/A
73	Performance		N/A
74	Marking		N/A
POWER SUPPLIES RATED MORE THAN 10 KILOVOLT-AMPERES			
75	General		N/A
76	Temperature Test		N/A
77	Dielectric Voltage Withstand Test		N/A
78	Overload Test		N/A
CLASS 3 OUTPUTS - DC, OR AC DERIVED FROM NON-LINEAR SOURCES			
79	General		N/A
80	Construction		N/A
81	Overcurrent Protection		N/A

UL1012, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
82	Components		N/A
83	Maximum Output Voltage Test		N/A
84	Output Current and Power Test		N/A
85	Calibration of Overcurrent Protection Devices Test		N/A
86	Component Breakdown		N/A
87	Markings		N/A
FOREIGN VOLTAGE ADAPTERS			
88	General		N/A
89	Scope		N/A
90	Glossary		N/A
91	U.S. to Foreign Adapters		N/A
92	Foreign to U.S. Adapters		N/A
RECHARGEABLE BATTERIES WITH INTEGRAL CHARGERS			
93	Scope		N/A
94	Glossary		N/A
95	General		N/A
96	Construction		N/A
97	Performance		N/A
98	Markings		N/A
99	Instructions		N/A
POWER UNITS FOR INSTALLATION IN AIR-HANDLING SPACES			
100	Scope		N/A
101	General		N/A
102	Marking		N/A

CSA C22.2 No.107.1, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
CONSTRUCTION			
4.1	Electrical Components and Equipment		P
4.2	Enclosure		N/A
4.2.1	General		N/A
4.2.2	Thickness of Sheet Metal Enclosure for live Parts		N/A
4.2.3	Thickness of Cast Metal Enclosure for Live Parts		N/A
4.2.4	Polymeric Enclosure		N/A
4.2.5	Openings in Enclosure		N/A
4.2.6	Doors, Covers, and Guards		N/A
4.2.7	Special Purpose Enclosures		N/A
4.2.8	Protection Against Corrosion		N/A
4.3	Mechanical Assembly		P
4.4	Supply Connection	Terminal connection	P
4.4.1	Permanently Connected Power supplies		N/A
4.4.2	Cord-Connected Power supplies		N/A
4.5	Terminal Parts and leads		P
4.6	Current-carrying parts		P
4.7	Internal wiring		P
4.8	Electrical Insulation		P
4.9	Transformers		P
4.10	Motors		N/A
4.11	Capacitors		P
4.12	Suppressors		N/A
4.13	Fuses and Fuseholders	Current fuse provided	P
4.14	Overload Relays		P
4.15	Switch and Controllers		N/A
4.16	Printed Circuit Boards		P

CSA C22.2 No.107.1, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
4.17	Spacings	Between live parts of opposite polarity before fuse: Cl. = Cr. = 3.7mm (limit is 3.6mm) Between pri. and sec. circuit: Cr. = Cl. = 7.0mm (limit is 3.6mm) Between pri. circuit and dead metal parts: Cr. = Cl. = 4.0mm (limit is 3.6mm) In transformer, between different circuits: Cl. = 6.0mm, Cr. = 6.0mm (limit is 2.4mm)	P
4.18	Sparation of Circuits		P
4.19	Protection of Control, Battery, and Output Power Circuits		N/A
4.20	Disconnecting Means		N/A
4.21	Protection of Receptacles		N/A
4.22	Battery Supplies		N/A
4.23	Grounding and Bonding		P
4.24	Dielectric-Liquid-Filled Equipment		N/A
4.24.1	Liquid Level		N/A
4.24.2	Liquid Drain Valve		N/A
4.24.3	Terminal Compartment		N/A
4.24.4	Components		N/A
4.24.5	Lifting		N/A
4.24.6	Mounting		N/A
4.24.7	Gaskets		N/A
4.24.8	Dielectric Liquid		N/A
4.24.9	Emergency Pressure-Relief Device		N/A
4.24.10	Grounding		N/A
4.24.11	Conservator Tank System		N/A
4.24.12	Sealed Tank System		N/A
4.24.13	Nonsealed Tank Systems		N/A
5	Marking		N/A

CSA C22.2 No.107.1, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
TESTS			
6.1	Sequences of Tests		Info
6.2	Test Conditions		P
6.2.1	Voltage	100-240VAC	P
6.2.2	Frequency	50/60Hz	P
6.2.3	Rating (Input)		N/A
6.3	Temperature (Normal)		P
6.4	Leakage Current		P
6.5	Dielectric Strength		P
6.6	Abnormal Operation		P
6.7	Protection (Battery Supply Circuits)		N/A
6.8	Overload (Control Devices)		N/A
6.9	Endurance (Control Devices)		N/A
6.10	Compression (Metal Enclosure)		N/A
6.11	Deflection (Metal Enclosure)		N/A
6.12	Flame (Polymeric Enclosure)		N/A
6.13	Resistance to Impact		N/A
6.13.1	Polymeric Enclosure		N/A
6.13.2	Covers Over Openings in Enclosure		N/A
6.14	Conduit Connections (Polymeric Enclosure)		N/A
6.14.1	General		N/A
6.14.2	Pullout		N/A
6.14.3	Torque		N/A
6.14.4	Bending		N/A
6.14.5	Knockouts		N/A
6.15	Flaming Oil(Perforated Panels)		N/A
6.16	Printed Circuit Board Coatings		N/A
6.16.1	General		N/A
6.16.2	Dielectric Strength (New Samples)		N/A
6.16.3	Dielectric Strength (Aged Samples)		N/A
6.16.4	Dielectric Strength (After Humidity Conditioning)		N/A

CSA C22.2 No.107.1, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
6.16.5	Adhesion		N/A
6.17	Securement of Components		P
6.18	Strain Relief		N/A
6.19	Insulation Material		P
6.20	Capacitor Discharge (Energy and shock Hazards)		P
6.21	Bonding Continuity		N/A
6.22	Tank Pressure Test		N/A
6.23	Mounting Bracket Vertical Loading Test		N/A
Industrial DC Power Supplies			
7.1	Scope		N/A
7.2	Construction		N/A
7.3	Tests		N/A
7.3.1	Ratting		N/A
7.3.2	Temperature (Normal)		N/A
Power Converters for Recreational Vehicles			
8.1	Scope		N/A
8.2	Construction		N/A
8.2.1	General		N/A
8.2.2	Supply cords		N/A
8.2.3	Transfer Switch		N/A
8.2.4	Barriers		N/A
8.2.5	Grounding and Bonding		N/A
8.3	Marking		N/A
8.4	Tests		N/A
8.4.1	General		N/A
8.4.2	Rating		N/A
8.4.3	Output voltage		N/A
8.4.4	Temperature-Rated Load		N/A
8.4.5	Temperature-Maximum Continuous Load		N/A
8.4.6	Abnormal		N/A

CSA C22.2 No.107.1, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
Static Transfer Switches			
9.1	Scope		N/A
9.2	Construction		N/A
9.2.1	General		N/A
9.2.2	Isolating Means		N/A
9.3	Marking		N/A
9.4	Tests		N/A
Inverters			
10.1	Scope		N/A
10.2	Performance Characteristics		N/A
10.3	Construction		N/A
10.3.1	DC Input Overcurrent Protection		N/A
10.3.2	DC Isolation from the Load		N/A
10.4	Marking		N/A
10.5	Tests		N/A
10.5.1	General		N/A
10.5.2	Harmonic Distortion		N/A
10.5.3	Dc Injection		N/A
10.5.4	Frequency		N/A
Uninterruptible AC Power Supplies			
11.1	Scope		N/A
11.2	Construction		N/A
11.2.1	Transfer Switches		N/A
11.2.2	Inverters		N/A
11.2.3	Capacitor Surge Current Protection		N/A
11.2.4	Flammability of Internal Parts		N/A
11.2.5	Backfeed Protection		N/A
11.3	Tests		N/A
11.3.1	Rating		N/A

CSA C22.2 No.107.1, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
11.3.2	Temperature (Normal)		N/A
11.3.3	Neutral-to-Ground Voltage Measurement (AC Output Power Circuits)		N/A
11.3.4	Capacitor Surge Current		N/A
11.3.5	Load Transfer		N/A
11.3.6	Backfeed Protection		N/A
Telecommunication Equipment Power supplies			
12.1	Scope		N/A
12.2	Construction		N/A
12.2.1	Input/Output Configurations		N/A
12.2.2	Cord-Connected Inputs		N/A
12.2.3	Conduit-Connected Inputs		N/A
12.2.4	Class2 Outputs		N/A
12.3	Marking		N/A
12.4	Tests-Dielectric Strength		N/A
CATV Power Supplies			
13.1	Scope		N/A
13.2	Construction		N/A
13.2.1	Enclosure		N/A
13.2.2	Input connection		N/A
13.2.3	Wiring		N/A
13.2.4	Bonding and Grounding		N/A
13.3	Marking		N/A
Power Conversion Equipment for Use in Photovoltaic (PV) Systems			
14.1	Scope		N/A
14.2	General		N/A
14.3	Construction		N/A
14.3.1	General		N/A
14.3.2	Disconnecting Means		N/A

CSA C22.2 No.107.1, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
14.3.3	DC Input Overcurrent Protection		N/A
14.4	Tests		N/A
14.4.1	Test Conditions		N/A
14.4.2	Output Short-Circuit		N/A
14.4.3	DC Input Reverse Polarity Test		N/A
14.5	Marking		N/A
14.5.1	Product Marking		N/A
14.5.2	Installation, Operating, and Servicing Instruction		N/A
Utility-Interconnected Inverters			
15.1	Scope		N/A
15.2	Construction		N/A
15.2.1	Output Provisions		N/A
15.2.2	Output Rating		N/A
15.3	Test		N/A
15.3.1	Test condition		N/A
15.3.2	Output Rating		N/A
15.3.3	Harmonic Distortion		N/A
15.3.4	Utility Voltage and Frequency Variation		N/A
15.3.5	Anti-islanding		N/A
15.3.6	Loss of control Circuit		N/A
15.3.7	Component Faults		N/A
15.4	Marking		N/A
15.4.1	Product Marking		N/A
15.4.2	Installation, Operating, and Servicing Instruction		N/A
DC Charge Controllers			
16.1	Scope		N/A
13.2	Construction		N/A
16.2.1	General		N/A
16.3	Tests		N/A
16.3.1	Test condition		N/A

CSA C22.2 No.107.1, Power Units Other Than Class 2			
Clause	Requirement Test	Result - Remark	Verdict
16.3.2	Normal Operation		N/A
16.3.3	Temperature Compensation		N/A
16.3.4	Low-Voltage Disconnect		N/A
16.3.5	Input Failure		N/A
16.3.6	Charge Controller Miswiring		N/A
16.4	Marking		N/A
16.4.1	Product Marking		N/A
16.4.2	Installation Instruction		N/A
Electric Vehicle Chargers			
17.1	Scope		N/A
17.2	Construction		N/A
17.2.1	Frame and Enclosure		N/A
17.2.2	Supply Connections for cord-connected Units		N/A
17.2.3	External Connections and wiring		N/A
17.2.4	EV Bonding		N/A
17.2.5	Output Circuit Insulation for Conductively Coupled Units		N/A
17.2.6	Output Circuit Insulation for Conductively Coupled Units		N/A
17.3	Tests		N/A
17.3.1	Vibration Test		N/A
17.3.2	Harmonic Distortion Test		N/A
17.4	Marking		N/A
17.5	Instruction		N/A
17.5.1	Important Safety Instruction		N/A
17.5.2	Operating Instruction		N/A

UL8750, LED Equipment for Use in Lighting Products			
Clause	Requirement Test	Result - Remark	Verdict
2	General		Info
2.1	Components		P
2.2	Unit of measurement		Info
2.3	Reference publications		Info
3	Definitions		Info
4	Power supplies, LED Drivers, and Transformer		P
4.1	A power supply or LED driver that complies with mentioned standards is considered to meet the requirements	Comply with UL1012	P
4.2	A transformer for use with LED units that complies with mentioned standards is considered to meet the requirements		N/A
4.3	A power supply, LED driver, or transformer shall be used within its rated input, output, and environmental ratings		P
5	Environmental Considerations		P
5.1	Dry locations unit		N/A
5.2	Damp locations unit		N/A
5.3	Wet locations unit		P
6	Mechanical Construction		P
6.1	General		P
6.1.1	Unit intended to be used in application specified in 1.3 shall comply with the mechanical construction requirements of that standard	Evaluated in end product	P
6.1.2	Enclosure shall prevent contact with uninsulated parts and prevent mechanical damage to internal parts		N/A
6.1.3	Circuits with risk of electric shock or fire shall be provided with enclosure complies with 6.2 or 6.3		N/A

UL8750, LED Equipment for Use in Lighting Products																																																										
Clause	Requirement Test	Result - Remark	Verdict																																																							
6.1.4	Adhesive used to secure electrical or fire enclosure shall comply with adhesive support test, section 8.13. Fusion techniques, such as solvent cementing, ultrasonic welding, electromagnetic induction, and thermal welding are permitted without test.		N/A																																																							
6.2	Metal thickness		N/A																																																							
6.2.1	Thickness of metal enclosure, Table 6.1		N/A																																																							
Table 6.1 Minimum thickness of metal enclosures																																																										
	<table border="1"> <thead> <tr> <th rowspan="2">Metal</th> <th colspan="2">At small, flat, unreinforced surfaces and at surfaces of a shape or size to provide adequate mechanical strength</th> <th colspan="2">At surfaces to which a wiring system is to be connected in the field</th> <th colspan="2">At relatively large unreinforced flat surfaces</th> </tr> <tr> <th>mm</th> <th>(in)</th> <th>mm</th> <th>(in)</th> <th>mm</th> <th>(in)</th> </tr> </thead> <tbody> <tr> <td>Die-cast</td> <td>1.2</td> <td>(3/64)</td> <td>–</td> <td>–</td> <td>2.0</td> <td>(5/64)</td> </tr> <tr> <td>Cast malleable iron</td> <td>1.6</td> <td>(1/16)</td> <td>–</td> <td>–</td> <td>2.4</td> <td>(3/32)</td> </tr> <tr> <td>Other cast metal</td> <td>2.4</td> <td>(3/32)</td> <td>–</td> <td>–</td> <td>3.2</td> <td>(1/8)</td> </tr> <tr> <td>Uncoated sheet steel</td> <td>0.66</td> <td>(0.026)</td> <td>0.81</td> <td>(0.032)</td> <td>0.66</td> <td>(0.026)</td> </tr> <tr> <td>Galvanized sheet steel</td> <td>0.74</td> <td>(0.029)</td> <td>0.86</td> <td>(0.034)</td> <td>0.74</td> <td>(0.029)</td> </tr> <tr> <td>Nonferrous sheet metal other than copper</td> <td>0.91</td> <td>(0.036)</td> <td>1.14</td> <td>(0.045)</td> <td>0.91</td> <td>(0.036)</td> </tr> </tbody> </table>	Metal	At small, flat, unreinforced surfaces and at surfaces of a shape or size to provide adequate mechanical strength		At surfaces to which a wiring system is to be connected in the field		At relatively large unreinforced flat surfaces		mm	(in)	mm	(in)	mm	(in)	Die-cast	1.2	(3/64)	–	–	2.0	(5/64)	Cast malleable iron	1.6	(1/16)	–	–	2.4	(3/32)	Other cast metal	2.4	(3/32)	–	–	3.2	(1/8)	Uncoated sheet steel	0.66	(0.026)	0.81	(0.032)	0.66	(0.026)	Galvanized sheet steel	0.74	(0.029)	0.86	(0.034)	0.74	(0.029)	Nonferrous sheet metal other than copper	0.91	(0.036)	1.14	(0.045)	0.91	(0.036)		
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	Exception: A part of an enclosure that complies with the mechanical strength tests for metal enclosures of 8.15 need not comply with the thickness specified in Table 6.1.		N/A																																																							
6.2.2	All ferrous metal parts shall have corrosion protection		N/A																																																							
6.2.3	Conditions when protective coating need not be applied to steel enclosure parts		N/A																																																							
6.3	Polymeric materials		N/A																																																							
6.3.1	Properties of polymeric material in accordance to UL746C		N/A																																																							
6.3.2	Polymeric material used as an electrical or fire enclosure, shall comply with Table 6.2		N/A																																																							

UL8750, LED Equipment for Use in Lighting Products																													
Clause	Requirement Test	Result - Remark	Verdict																										
	<p style="text-align: center;">Table 6.2 Polymeric enclosure requirements</p> <table border="1"> <thead> <tr> <th rowspan="2">Performance characteristic^a</th> <th colspan="2">Function</th> </tr> <tr> <th>Electrical enclosure</th> <th>Fire enclosure</th> </tr> </thead> <tbody> <tr> <td>Impact^b</td> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> <tr> <td>UV Resistance^c</td> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> <tr> <td>Flammability</td> <td></td> <td style="text-align: center;">X^{d,e}</td> </tr> <tr> <td>Mold Stress</td> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> </tr> <tr> <td>Comparative Tracking Index (CTI)</td> <td></td> <td style="text-align: center;">Performance Level Category (PLC) of 4^f</td> </tr> <tr> <td>Hot Wire Ignition (HWI)</td> <td></td> <td style="text-align: center;">PLC of 3^f</td> </tr> <tr> <td>High Ampere Arc (HAI)</td> <td></td> <td style="text-align: center;">PLC of 2^f</td> </tr> </tbody> </table> <p>^a These characteristics are as specified in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C. Polymeric parts with deficient minimum performance characteristics can be evaluated per applicable end-product requirements in UL 746C. ^b 6.8 J (5 ft-lb) ball impact for dry or damp location, fixed or stationary units; 0.91 m (3 ft) drop impact for portable units. For damp or wet location, fixed units, the impact test is to be conducted after cold conditioning in accordance with UL 746C. ^c For wet location units. ^d V2 for portable units and track lighting luminaires. ^e 5VA for fixed or stationary units. See 6.3.4 for additional options for secondary optics. ^f Not required when all live parts are > 0.8 mm (0.030 in) from the material.</p>		Performance characteristic ^a	Function		Electrical enclosure	Fire enclosure	Impact ^b	X	X	UV Resistance ^c	X	X	Flammability		X ^{d,e}	Mold Stress	X	X	Comparative Tracking Index (CTI)		Performance Level Category (PLC) of 4 ^f	Hot Wire Ignition (HWI)		PLC of 3 ^f	High Ampere Arc (HAI)		PLC of 2 ^f	
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6.3.3	Conductive coating applied to surface shall comply with UL746C		N/A																										
6.3.4	If a fire barrier consisting of metal or of a polymeric material having a minimum flammability rating of 5VA is positioned between a circuit that represents a risk of fire and the secondary optic, the secondary optic need only be evaluated as an electrical enclosure per the requirements in Table 6.2.		N/A																										
6.3.5	Lens of LED package which is intended to form a part of the fire enclosure shall comply with the applicable requirements for LED packages in Supplement SD.		N/A																										
6.4	Enclosure openings		N/A																										
6.4.1	Open holes are not permitted in any surface of a fire or electrical enclosure except for supply connections		N/A																										
	Exception: An open hole is permitted in an enclosure intended for installation on or over an outlet box when the outlet box will serve to complete the enclosure.		N/A																										
6.4.2	Open holes are permitted for units not intended for installation in a concealed space.		N/A																										
6.5	Conductor protection		N/A																										

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Clause	Requirement Test	Result - Remark	Verdict
6.5.1	Protection for conductors that pass over edges or through openings in metal		N/A
6.6	Strain relief		N/A
6.6.1	For any accessible conductor operating above the limits for risk of fire or electric shock, a strain relief and cord pushback means shall be provided that complies with the cord strain pushback relief test requirements of 8.10, where cord or lead wire displacement could result in: a) Subjecting the supply cord or lead to mechanical damage, b) Exposing the supply cord or lead to a temperature higher than that for which it is rated, c) Reducing spacing (such as to a metal strain-relief clamp) below the minimum required values, or d) Damage to internal connections or components.		N/A
	Exception: A conductor embedded in a potting compound inside the enclosure at the cord entrance is considered to be provided with the necessary strain relief.		N/A
6.7	Potting compound		N/A
6.7.1	No leak, drip, or released of potting compound from a unit during any test		N/A
6.7.2	Polymeric potting compound shall not exceed its RTI, or, Asphalt potting compound shall remain at least 15°C below its softening point		N/A
7	Electrical Construction		P
7.1	General		P
7.1.1	Unit intended to be used in application specified in 1.3 shall comply with the electrical construction requirements of that standard		P
7.1.2	Current carrying part shall be gold, silver, copper, copper alloy, plated iron or steel, stainless steel, or other corrosion-resistant alloys		N/A

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Clause	Requirement Test	Result - Remark	Verdict
	Exception: Trace conductors and wire bonds on a printed wiring board are permitted to be of aluminum.		N/A
7.1.3	Securement of uninsulated live part		N/A
7.1.4	To prevent shifting or turning, friction is not acceptable		N/A
7.2	Accessibility		N/A
7.2.1	Use articulate probe to verify inaccessible live part		N/A
7.2.2	Remove part that without using a tool when determine acessibility		N/A
7.2.3	Insulating barrier not less than 0.71 mm thick		N/A
7.2.4	Insulating barrier used in conjunction with spacing		N/A
7.2.5	Insulating barrier in secondary circuit potential not more than 50 V		N/A
7.2.6	Insulating barrier separately evaluated by UL746C		N/A
7.3	Internal wiring		N/A
7.3.1	Mechanical strength, dielectric voltage withstand properties and ampacity of insulated conductors		N/A
7.3.2	Splice and connection shall be mechanically secured, reliable electrical contact, and provide with insulation equivalent to voltage involved		N/A
7.3.3	The electrical and mechanical connection between a conductor and any circuitry operating above the limits for risk of fire or electric shock shall be contained within an enclosure and be inaccessible in accordance with 7.2.		N/A
7.3.4	Soldered connections to PWB shall be secured by one of the methods		N/A
7.3.5	Min. 18 AWG except 7.3.6 and 7.3.7		N/A
7.3.6	Smaller than 18 AWG but no smaller than 24 AWG		N/A
7.3.7	Smaller than 24 Smaller than 24 AWG in Class 2 or isolated LVLE circuits only and are physically separated from non-Class 2 or non isolated LVLE circuits AWG in Class 2 or isolated LVLE circuits		N/A
7.4	Supply and load connections		N/A
7.4.1	General		N/A

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Clause	Requirement Test	Result - Remark	Verdict
7.4.1.1	Input and output wiring comply with 7.3 and this section		N/A
7.4.1.2	Power limited circuit wiring that is intended to be routed within building structure shall be of a suitable type for application		N/A
7.4.1.3	Units that are not intended as built-in components shall have provision for connection to a branch circuit source of supply by field wiring in 7.4.2, integral blade assembly of a direct plug-in unit in 7.4.3, or supply cord and attachment plug assembly in 7.4.3.		N/A
7.4.2	Permanently-connected units		N/A
7.4.2.1	Conduit connection		N/A
7.4.2.1.1	Branch circuit connected unit provides with field-wiring leads or terminals		N/A
7.4.2.1.2	Connection to permanent wiring system shall be by providing a means for conduit connection		N/A
7.4.2.1.3	Unthreaded openings for conduit and area surrounding shall comply table 7.1		N/A
7.4.2.1.4	Threaded opening for conduit shall comply table 7.2		N/A
7.4.2.1.5	Close all but one of conduit openings in a unit		N/A
7.4.2.1.6	Conduit closure plugs shall be suitable for the purpose with respect to environmental and enclosure flammability criteria		N/A
7.4.2.1.7	Conduit and other knockouts or twistouts shall be secured in place so they can be removed without distorting the enclosure but remain in place during normal handling, as determined by the Knockout Secureness Test, Section 8.17		N/A
7.4.2.1.8	Opening for making field connections to branch circuit supply shall be located greater than 152 mm from mentioned parts		N/A

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Clause	Requirement Test	Result - Remark	Verdict
7.4.2.1.9	The area adjacent to an opening where branch circuit supply connections are to be made in the field and which has components located within 152 mm (6 in) of the opening shall be enclosed within a wiring compartment having a volume of at least 98 cm ³ (6 in ³)		N/A
7.4.2.1.10	Field-wiring compartment shall be prevented from turning		N/A
7.4.2.1.11	Outlet box, terminal box, wiring compartment or the like shall be free from any sharp edge		N/A
7.4.2.1.12	Min. vol. of integral field-wiring compartment in accordance to Table 7.3		N/A
7.4.2.2	Field-wiring leads		N/A
7.4.2.2.1	No smaller than 18 AWG		N/A
7.4.2.2.2	Free length 15.2 cm or more		N/A
7.4.2.2.3	Insulation of a lead intended for connection of grounded conductor shall be white or gray		N/A
7.4.2.2.4	Insulation of a lead intended for connection of ungrounded conductor shall be any color other than white, gray, green, or green with yellow stripe		N/A
7.4.2.2.5	A lead intended for connection of grounding conductor shall be bare or green, or green with yellow stripe.		N/A
7.4.2.3	Field-wiring terminals		N/A
7.4.2.3.1	Suitable type of pressure wire type terminal or wire binding screw		N/A
7.4.2.3.2	Grounded terminal shall be white or silver in color, or be marked with words "NEUTRAL", "N", "W", or "White"		N/A
7.4.2.3.3	Grounding terminal shall have a green colored head, or marked with grounding symbol or abbreviation		N/A
7.4.2.3.4	DC terminal shall be marked with "-" and "+" when the polarity of supply connection is required		N/A
7.4.2.3.5	Terminal plate or stud shall be of brass or other nonferrous metal, or plated steel, min 0.76 mm thick and min. two full threads.		N/A

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Clause	Requirement Test	Result - Remark	Verdict
	Exception No. 1. Two full threads are not required if a lesser number of threads results in a secure connection and subjected to security of output terminals test of 8.11.		N/A
	Exception No. 2. A plate may be less than 0.76 mm (0.030 in) thick if the tapped threads have acceptable mechanical strength as determined by the security of output terminals test of 8.11.		N/A
7.4.2.3.6	Wire binding screw or terminal stud min. 3.5 mm dia and not more than 32 threads per 25.4mm. Brass, brass alloy, or plated iron or steel.		N/A
7.4.2.3.7	Terminal studs shall be prevented from turning		N/A
7.4.2.4	Push-in terminals		N/A
7.4.2.4.1	Terminal for supply leads only allows for termination of branch circuit supplying the power supply		N/A
7.4.2.4.2	Temperature rise shall not exceed 30°C during temperature test		N/A
7.4.2.4.3	Unit employs push-in terminals shall be marked		N/A
7.4.3	Cord-connected and direct plug-in units		N/A
7.4.3.1	A unit shall be provided with either: a) A cord-connected or direct plug-in power supply or LED driver, with an output cord for mating with the unit, or b) A power supply cord and attachment plug.		N/A
7.4.3.2	A unit having an attachment plug or direct plug-in blade configuration shall be polarized or a grounding-type as shown in Figure 7.2.		N/A
	Exception: A 2-conductor unit is not required to be supplied with a polarized plug when it does not include any single pole switches or fuses and parts that represent a risk of electric shock that may be accessible during operation or service.		N/A
7.4.3.3	3 conductor flexible cord with identification to identify grounded and grounding conductors		N/A
7.4.3.4	Component with no accessible dead-metal is not required to provide grounding		N/A
7.4.3.5	2 conductor flexible cord connects to polarized parallel-blade attachment plug		N/A
7.4.3.6	Power supply cord min. 18 AWG		N/A

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Clause	Requirement Test	Result - Remark	Verdict
7.4.3.7	For dry location, min Type SP-2, SPE-2, SPT-2 or heavier. For wet locations, additionally rated "W" or "Water Resistant"		N/A
7.4.3.8	Power supply cord min. 1.5 m long		N/A
7.4.3.9	No burrs, fins, sharp edges and projections in strain relief knot contact surface		N/A
7.4.3.10	Provide bushing at the cord entrance in metal enclosure or non-rounded opening of polymeric enclosure		N/A
7.4.3.11	15A or 20A attachment plug		N/A
7.4.4	Leads, terminals, and connectors for other than branch circuit connections		N/A
7.4.4.1	General		N/A
7.4.4.1.1	Rated for voltage, current and temperature involved		N/A
7.4.4.2	Leads		N/A
7.4.4.2.1	Comply with requirements of 7.3 and sufficient length to allow for intended connection		N/A
7.4.4.3	Output connectors		N/A
7.4.4.3.1	Unit with multiple Class 2 or LVLE connections where interconnection cumulatively exceed Class 2 or LVLE limits shall be provided with polarized connectors		N/A
7.4.4.3.2	Output connectors mounted on the enclosure provide secure connection between mating parts		N/A
7.4.4.3.3	Coaxial cable connectors shall not be used for output connections		N/A
7.4.4.4	Insulation-piercing connections		N/A
7.4.4.4.1	Intended for flexible cord or stranded conductor wire, operating above Class 2 or LVLE limits, for factory assembly only		N/A
7.4.4.4.2	Flexible cord and wire rated min. 105°C		N/A
7.4.4.4.3	Units operating above Class 2 or LVLE shall be subjected to insulation-piercing connection thermal cycling conditioning test and temperature test		N/A
7.5	Separation of circuits		N/A

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Clause	Requirement Test	Result - Remark	Verdict
7.5.1	Insulation rated for the highest of circuit voltages or shall be reliably separated min. 6.35mm		N/A
7.5.2	Units have field-installed connections for Class 2 or LVLE circuits inside enclosure wiring compartment, min. 6.35mm separation from non-Class 2 or LVLE circuits		N/A
7.5.3	Segregation of insulated conductors		N/A
7.5.4	For a Class 2, Class 3, or LVLE power limited circuit, terminals and wire connectors shall have a minimum spacing of 6.35 mm (0.25 inch) between the points where the field supply wiring and the Class 2, Class 3, or LVLE circuit connect to the driver.		N/A
7.6	Insulating materials		N/A
7.6.1	Integral parts for mounting of live parts shall be moisture-resistant materials		N/A
7.6.2	Insulation material is to be evaluated in accordance to UL746C		N/A
	Exception: Materials, such as mica, ceramic, or some molded compounds are usually acceptable for use as the sole support of live parts.		N/A
7.7	Printed wiring boards		N/A
7.7.1	Printed wiring boards shall comply with UL796		N/A
7.7.2	Conductive traces shall be bonded to the substrate for the minimum conductor width and maximum unpierced area as required by the Standard for Printed-Wiring Boards, UL 796.		N/A
	Exception No. 1: PWB that are completely encased in potting compound are permitted to exceed their specified minimum conductor width or maximum unpierced area.		N/A
	Exception No. 2: PWB connected within a Class 2 or LVLE circuit need not comply when means (such as position, distance, or barrier) are provided to ensure that the limited energy traces cannot contact non-energy limited live parts should the traces become detached from the substrate.		N/A
7.7.3	Temperatures measured in the temperature test of 8.3 shall not exceed the maximum operating temperature (MOT) of the printed wiring board.		N/A

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Clause	Requirement Test	Result - Remark	Verdict
	Exception: PWB connected within a Class 2 or LVLE circuit need not comply when means (such as position, distance, or barrier) are provided to ensure that the limited energy traces cannot contact non-energy limited live parts should the traces become detached from the substrate.		N/A
7.7.4	The flammability rating of the printed wiring board shall be no less than V-1 in accordance with UL 94		N/A
	Exception: A circuit supplied by a Class 2 or LVLE source need not comply.		N/A
7.7.5	Printed wiring boards shall comply with the requirement for direct support of current carrying parts.		N/A
	Exception No. 1: PWB that contains only a Class 2 or LVLE circuits need not comply.		N/A
	Exception No. 2: PWB that is completely encased in potting compound need not comply.		N/A
7.7.6	Where a conformal coating is used to meet the requirements of this standard, it shall comply with the requirements in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C, and be suitable for use in combination with the printed wiring board.		N/A
	Exception: Conformal coatings applied to PWBs that contain only Class 2 or LVLE circuits need not comply.		N/A
7.8	Electrical spacings		P
7.8.1	7.8.1 Minimum spacings other than on printed wiring boards or on board-mounted components shall not be less than those shown in Table 7.4, between: a) Uninsulated live parts of opposite polarity, b) Uninsulated live parts and a grounded dead-metal part, and c) Uninsulated live parts and an accessible dead-metal part.	Evaluated in end product	N/A
7.8.2	Minimum spacings on printed wiring boards and for board-mounted components shall be not less than those shown in Table 7.5		N/A

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Clause	Requirement Test	Result - Remark	Verdict
	Exception No. 1: Spacings between uninsulated live parts of different voltage on non-conformal coated printed wiring boards, their connectors, and board-mounted electrical components wired on the load side of line filters or similar voltage peak reduction networks and components		N/A
	Exception No. 2: Compliance with the dielectric withstand test specified in 8.6 shall be accepted as an alternative means to determine compliance of spacings on a printed wiring board between any uninsulated live part of opposite polarity and between live parts and ground reference points or grounded parts on the board.		N/A
	Exception No. 3: Spacings between adjacent PWB traces are permitted to be evaluated based on short circuit tests between the traces. This alternate method is not applicable when the adjacent PWB traces provide spacings: 1) Between electrically isolated circuits, or, 2) Between live parts and ground.		N/A
7.8.3	Minimum spacings at other than at field-wired branch circuit supply terminals or between uninsulated live parts and a metal enclosure are permitted to be in accordance with the Standard for Insulation Coordination Including Clearances and Creepage Distances for Electrical Equipment, UL 840. Overvoltage Category II applies to circuits directly connected to the supply source. Printed wiring boards are presumed to have a minimum CTI of 100 unless known to be greater.		N/A
7.8.4	The inherent spacings of discrete components along with other conductive parts at their point of connection to these discrete components, as well as the spacings of circuits supplied by a Class 2 or LVLE source between points of opposite polarity and to dead metal, are exempt from the spacings requirements in this section.		N/A
7.8.5	Enameled and similar film-coated wire is identified as an uninsulated live part.		P

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Clause	Requirement Test	Result - Remark	Verdict
7.8.6	Spacings between output circuitry and dead metal for a grounded-referenced circuit shall be based on the maximum open-circuit voltage to ground.		P
7.8.7	Parts subject to movement relative to other parts shall be positioned in their most severe orientation prior to measurement of spacings, unless reliably held in place.		N/A
7.9	Circuit components		P
7.9.1	Components shall have permanence and stability		P
7.9.2	Component that bridges two circuits otherwise required to be isolated from one another shall be:		P
	a) A Class Y capacitor comply,		P
	b) Two capacitors connected in series, each capacitor individually complying with dielectric voltage withstand test		N/A
	c) An isolator complying UL1577, with a suitable isolation voltage rating, or,		P
	d) A transformer complies with dielectric voltage withstand test		P
7.10	Protective devices		N/A
7.10.1	Protective device shall comply with requirements applicable to that component.		N/A
7.10.2	Protective device in primary circuit shall not be connected in neutral conductor		N/A
7.10.3	Overcurrent protective device shall be inaccessible to tampering or shall not be interchangeable with a device having a higher current rating.		N/A
7.10.4	Fuse type identification and ampere rating shall be marked		N/A
7.10.5	Eutectic material link or printed wiring board trace as an overcurrent protective device shall be conformal coated or potted, and shall comply with limited short circuit and foil trace calibration tests in UL935		N/A
7.11	Coil insulation		N/A
7.11.1	General		N/A

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Clause	Requirement Test	Result - Remark	Verdict
7.11.1.1	A coil shall be provided with insulation between the coil and any dead-metal part, and between adjacent windings.		N/A
	Exception No. 1: Two or more secondary windings may be considered as a single winding and interposing insulation is not required if, when interconnected, the windings comply with the performance requirements for a single winding		N/A
	Exception No. 2: Insulated wiring which complies with UL2353, is considered suitable insulation between the coil and any dead-metal part.		N/A
	Exception No. 3: The adequacy of insulation between windings of a coil can be determined by shorting the windings to each other		N/A
7.11.1.2	Coil insulation shall either be inherently moisture resistant or treated to render it moisture resistant		N/A
7.11.2	Insulation for transformers		N/A
7.11.2.1	Insulation between uninsulated, primary wires of opposite polarity		N/A
7.11.2.2	Insulation between primary and secondary windings		N/A
7.11.2.3	Tape used as insulation for a concentrically-wound bobbin transformer		N/A
7.11.2.4	Concentrically-wound bobbin transformer shall be subjected to output loading test		N/A
	Exception: The test is not required to be applied for 15 days if the following requirements are met:		N/A
7.11.2.5	Insulation between the primary winding and the core		N/A
	Exception: Insulation may be reduced or waived between the primary and core when all of the described conditions are met:		N/A
7.11.2.6	Insulation between the primary winding lead connections and a metallic enclosure		N/A
7.11.2.7	Insulation shall be provided between crossover lead and windings, metallic enclosure and core		N/A
7.11.2.8	Type of insulation to comply 7.11.2.7		N/A

UL8750, LED Equipment for Use in Lighting Products			
Clause	Requirement Test	Result - Remark	Verdict
	Exception No. 1: Any type or thickness of insulation, or a through air spacing less than specified in 7.8, between a crossover lead and the winding to which it is connected may be used if the coil withstands the dielectric voltage withstand test of 8.6 with the potential applied between the coil leads and with the coil lead cut at the point where it enters the inner layer.		N/A
	Exception No. 2: This requirement does not apply to insulation between a Class 2 secondary crossover lead and: a) The secondary winding to which the crossover lead is connected, b) The metallic enclosure, and c) The core.		N/A
7.11.2.9	With reference to Exception No. 1 to 7.11.2.8, the magnetic coil of a molded bobbin transformer having a slot for the crossover or start lead – unspliced at the windings – is acceptable as crossover lead insulation		N/A
7.11.2.10	Insulation between primary-lead connections and adjacent winding, and between secondary-lead connections and primary winding		N/A
7.11.3	Electrical insulaion system		N/A
7.11.3.1	A transformer or coil that operates above Class 105 (A) temperature limits as indicated in Table 8.1 during the Temperature Test of 8.3 shall incorporate an electrical insulation system that complies with the Standard for Systems of Insulating Materials – General, UL 1446.		N/A
	Exception: Under described conditions, the integral insulation materials for a transformer or coil need not be evaluated as an electrical insulation system but shall operate within the relative thermal index (RTI) or generic thermal index of the individual insulation material		N/A
7.12	Class 2 output circuits		N/A
7.12.1	When output is marked as Class 2, it shall comply with UL1310		N/A
8	Performance Tests		P
8.1	General		P

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Clause	Requirement Test	Result - Remark	Verdict
8.2	Input test		P
8.3	Temperature test	Refer to UL1573	N/A
8.4	Temperature test alcove		N/A
8.5	Temperature test oven		N/A
8.6	Dielectric voltage withstand test	Refer to UL1573	N/A
8.7	Abnormal tests		N/A
8.7.1	General		N/A
8.7.2	Component failure test		N/A
8.7.3	Output loading test		N/A
8.7.4	Output loading – alternate method		N/A
8.8	Circuit power limit measurement test		N/A
8.9	Leakage current measurement test		P
8.10	Cord strain and pushback relief test		N/A
8.11	Security of output terminals		N/A
8.12	Insulation-piercing connection thermal cycling test		N/A
8.13	Adhesive support test		N/A
8.14	Environmental tests		N/A
8.14.1	Humidity exposure		N/A
8.14.2	Water exposure		N/A
8.15	Mechanical strength tests for metal enclosures		N/A
8.16	Determination of low-voltage, limited-energy circuit status		N/A
8.17	Knockout secureness test		N/A
9	Markings		N/A
9.1	General		N/A
9.1.1	Unit intended to be used in an application shall comply with marking requirements of that standard		N/A
9.1.2	Marking shall be legible, min. 1.6mm lettering and use suitable method		N/A
	Exception: Identification and ratings markings in 9.2 are not subject to the minimum letter height requirement.		N/A

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Clause	Requirement Test	Result - Remark	Verdict
9.1.3	Pressure sensitive labels and nameplates of permanent type shall comply with UL969		N/A
9.2	Identification and ratings		N/A
9.2.1	Company name, model designation, factory ID, date of manufacturer		N/A
9.2.2	Markings for integrated or separated power source		N/A
9.2.3	Each output intended to supply Class 2 circuit shall comply with 7.12 and be marked "Class 2"		N/A
9.2.4	LED controller marking: environment, input limitations, input voltage, input current or wattage, and rated output voltage and current.		N/A
9.2.5	Markings of LED array, module, or package: Environment, input limitations, input supply ratings for constant voltage and constant current type.		N/A
9.3	Construction-related markings		N/A
9.3.1	Installation instructions of unit with push-in terminals		N/A
9.3.2	Fuse replacement marking		N/A
9.3.3	Marking when terminal compartment's or splice compartment's surface exceeds 60°C.		N/A
9.3.4	An LED driver that complies with test methods 1, 2, and 3 in 8.3.22 is permitted to be marked "dimmable."		N/A
9.3.5	An LED driver that complies with test methods 1 and 4 in 8.3.22 is permitted to be marked "dimmable – use only dimmer model(s) xxx made by xxx" or equivalent.		N/A
Supp. SA	REQUIREMENTS FOR SAFETY-RELATED ELECTRONIC CIRCUITS		N/A
Supp. SB	REQUIREMENTS FOR TYPE HL LED DRIVERS		N/A
Supp. SC	REQUIREMENTS FOR TEMPERATURE LIMITED (TYPE TL) LED DRIVERS		N/A
Supp. SD	REQUIREMENTS FOR LIGHT EMITTING DIODE (LED) PACKAGES		N/A
SD1	Scope		N/A
SD2	Definitions		--
SD3	Environmental Considerations		N/A

UL8750, LED Equipment for Use in Lighting Products			
Clause	Requirement Test	Result - Remark	Verdict
SD3.1	Humidity conditioning for LED packages designated for suitable for damp or wet locations, and for operation from other than Class 2 circuits.		N/A
SD3.2	Dry locations		N/A
SD3.2.1	LED packages designated for suitable for dry locations, for operation from other than Class 2 circuits, and to form part of an enclosure, shall be subjected to Steady Force Test.		N/A
	Exception: LED lens securement using integrally-molded compounds or fusion techniques, such as solvent cementing, ultrasonic welding, electromagnetic induction, and thermal welding are permitted without test.		N/A
SD3.3	Damp locations		N/A
SD3.3.1	LED packages designated for suitable for damp locations, for operation from other than Class 2 circuits (dry and damp location limits), and to form part of an enclosure, shall be subjected to cold conditioning for 24 hours at $0.0 \pm 1.0^{\circ}\text{C}$ and followed by the Steady Force Test.		N/A
SD3.4	Wet locations		N/A
SD3.4.1	LED packages designated for suitable for wet locations, for operation from other than Class 2 circuits (wet location limits), and to form part of an enclosure, shall be subjected to cold conditioning for 24 hours at $-35 \pm 2^{\circ}\text{C}$ and followed by the Steady Force Test.		N/A
SD4	Construction		N/A
SD4.1	Spacings		N/A
SD4.1.1	LED packages designated by the manufacturer as suitable for operation from other than Class 2 circuits shall be evaluated for spacings (distances between current-carrying parts) using the Dielectric Voltage Withstand Test, Section SD6.		N/A
SD4.2	Printed Wiring Boards (PWBs)		N/A
SD4.2.1	PWBs of LED packages that are designated by the manufacturer as suitable for operation from other than Class 2 circuits shall comply with UL 796, with maximum operating temperature (MOT) and flame ratings as noted in SD4.3.1 and SD4.4.1, respectively.		N/A
	Exception No. 1: Ceramic substrates with patterned metal electrical vias are not subject to this requirement.		N/A

UL8750, LED Equipment for Use in Lighting Products			
Clause	Requirement Test	Result - Remark	Verdict
	Exception No. 2: PWBs meeting both exceptions in SD4.3.1 and SD4.4.1 need not comply with UL 796.		N/A
SD4.3	Polymeric and other insulating materials - RTI		N/A
SD4.3.1	Polymeric and other insulating materials shall have RTI or the generic thermal index ratings which are equal to or exceed the manufacturer-designated LED package maximum junction temperature. PWBs shall have maximum operating temperature (MOT) ratings which are equal to or exceed the manufacturer-designated LED package maximum junction temperature.		N/A
	Exception No. 1: Ceramic substrates are not subject to this requirement.		N/A
	Exception No. 2: LED packages that comply with Thermal Aging, Section SD8, need not comply with this requirement.		N/A
SD4.4	Polymeric and other insulating materials – Flame rating		N/A
SD4.4.1	Polymeric and other insulating materials and PWBs of an LED package that is designated by the manufacturer as suitable for operation from other than Class 2 circuits shall have a minimum flammability rating of V1 or VTM-1 in accordance with UL 746C.		N/A
	Exception: If the total volume of polymeric and other insulating materials in an LED package is 2500 mm ³ (0.15 in ³) or less, the requirement does not apply.		N/A
SD5	Performance		N/A
SD5.1	Tests in Sections SD6 – SD9 apply when specified by requirements in Sections SD3 and SD4.		N/A
SD6	Dielectric Voltage Withstand Test		N/A
SD7	Steady Force Test – 30N		N/A
SD8	Thermal Aging Test		N/A
SD9	Markings		N/A
SD9.1	The following markings shall be provided on the smallest unit container in which the product is packaged:		N/A
	a) Company name,		N/A
	b) Model designation, and		N/A
	c) Factory identification or code, for any component produced or assembled at more than one factory.		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
3	Definitions		P
4	General Requirements		P
4.1	General requirements are given in CAN/CSA-C22.2 No.0.		P
4.2	Components		P
4.3	Units of measurement- Voltage and Current values are RMS, unless otherwise noted		P
4.4	A power supply or LED Driver		N/A
4.5	A transformer for use with LED units		N/A
5	Software safety function		N/A
5.1	Risk assessment for software safety functions per CSA C22.2 No. 0.8.		N/A
5.2	Functional safety analysis		N/A
6	Environmental considerations		P
6.1	Environmental considerations- Dry locations		N/A
6.2	Environmental considerations- Damp locations		N/A
6.3	Environmental considerations- Wet locations		P
7	Mechanical construction		P
7.1	General		N/A
7.1.1	A unit intended for use in an application identified by one of the standards specified in Clause 1.3.1 shall comply with ...	Evaluated in end product	N/A
7.1.2	Enclosure shall prevent contact with un-insulated live parts, contain fire initiated within the unit and prevent mechanical damage to internal parts		N/A
7.1.3	Circuits that pose a risk of electric shock or fire shall be provided with an enclosure that complies with Clause 7.2 or 7.3.		N/A
7.1.4	Circuits that do not pose a risk of electric shock or fire are not required to be provided within an enclosure. Circuits operating within Class 2 or LVLE levels also need not be enclosed.		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
7.1.5	Adhesives used to secure the enclosure		N/A
7.2	Metal thickness		N/A
7.2.1	Mechanical construction- Metal thickness complies with Clause 5.5 of C22.2 No. 250.0		N/A
	Note- Mechanical strength test per Clause 9.13		N/A
7.2.2	Protection against corrosion		N/A
7.2.3	Protective coating is not required to be applied to steel when..		N/A
7.3	Polymeric materials for enclosures and electrical insulation		N/A
7.3.1	RTI or generic thermal index per CAN/CSA-C22.2 No. 0.17 equal or greater than..		N/A
7.3.2	Polymeric enclosure requirements per table 1		N/A
7.3.3	Conductive coatings		N/A
7.3.4	LED package Lens- enclosure- risk of shock		N/A
7.3.5	LED package Lens- enclosure- risk of fire		N/A
7.3.6	Electrical enclosure exemptions for Class 2, LVLE or SELV circuits. Maximum touch current requirements for SELV circuits		N/A
7.3.7	Fire enclosure exemptions for Class 2, LVLE or SELV circuits. Maximum energy levels (240 VA or 20 J) for SELV circuits		N/A
7.3.8	Minimum HB materials for parts supplied from SELV or line voltages for LED circuits that exceed 240 VA or 20 J energy that comply with abnormal tests without presenting any sign of fire hazard		N/A
7.4	Enclosure openings		N/A
7.4.1	Openings in fire and electrical enclosures not allowed, other than for supply connection		N/A
	7.4.1 Note - Opening that is intended for installation on or over an outlet box when the box will serve to complete the enclosure		N/A
7.4.2	Openings shall comply with CSA 50.0 Section 10, Clause 10.4		N/A
7.5	Conductor protection		N/A
7.6	Strain relief		N/A
	Note - exemption for a conductor embedded in epoxy compound inside the enclosure at cord entrance		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
7.7	Potting compound		N/A
7.7.1	potting compound shall not leak, drip or release from a unit during tests and shall not exceed its RTI during the temperature test in Clause 9.3		N/A
7.7.2	Asphalt potting compound shall remain at least 15 °C below its softening point as specified in ASTM E28		N/A
8	Electrical construction		P
8.1	General		P
8.1.1	A unit intended to be used in an application ...		P
8.1.2	Acceptable current carrying materials		N/A
8.1.3	Securement of un-insulated live parts		N/A
8.1.4	Friction between surfaces not acceptable for securement		N/A
8.2	Accessibility		N/A
8.2.1	Accessibility using articulate probe in Fig. 1		N/A
8.2.2	Parts that be removed without the use of a tool		N/A
8.2.3	Insulating barrier minimum 0.71 mm		N/A
8.2.4	Insulating barrier minimum 0.33 mm when ..		N/A
8.2.5	Insulating barrier minimum 0.25 mm when ..		N/A
8.2.6	Insulating barrier less than 0.71 mm when ..		N/A
8.3	Internal wiring		N/A
8.3.1	Internal wiring properties		N/A
8.3.2	Internal wiring splices and connections		N/A
8.3.3	Internal wiring- enclosure and accessibility requirements		N/A
8.3.4	Soldered connections		N/A
8.3.5	Internal wiring- minimum 18 AWG required		N/A
8.3.6	Internal wiring- minimum 24 AWG permitted when..		N/A
8.3.7	Internal wiring- smaller than 24 AWG permitted when..		N/A
8.4	Supply and lead connections		N/A
8.4.1	General Input and output wiring shall comply with 8.3 as well as applicable requirements in 8.4		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
8.4.2	Permanently-connected units		N/A
8.4.2.1	Conduit connection		N/A
8.4.2.1.1	A unit intended to be connected to a branch circuit shall be provided with field-wiring leads or field-wiring terminals		N/A
8.4.2.1.2	Means for conduit connection		N/A
8.4.2.1.3	Table 2 dimensional requirements for unthreaded openings for conduit		N/A
8.4.2.1.4	Table 3 dimensional requirements for threaded openings for conduit		N/A
8.4.2.1.5	Provision to close all but one conduit opening		N/A
8.4.2.1.6	Opening is safely separated wiring compartment or is located more than 152 mm (6 in) from ..		N/A
8.4.2.1.7	Area adjacent to an opening where branch circuit supply connections are to made- which has components located within 152 mm (6 in) of the opening, shall be enclosed		N/A
8.4.2.1.8	Field-wiring compartment securement		N/A
8.4.2.1.9	Sharp edges, screw threads, burrs, fins, moving parts that may abrade conductor insulation or damage the wiring		N/A
8.4.2.1.10	Table 4 minimum wiring compartment volume requirements		N/A
8.4.2.2	Field-wiring leads		N/A
8.4.2.2.1	Leads intended for connection to the branch circuit shall be a minimum of 18 AWG		N/A
8.4.2.2.2	Lead length shall be at least 152 mm		N/A
8.4.2.2.3	Insulation of a lead intended for the connection of a grounded conductor (common or neutral) shall be white or gray		N/A
8.4.2.2.4	Insulation of a lead intended for the connection of an ungrounded (hot) conductor shall be any color other than white, gray, green, or green with a yellow stripe		N/A
8.4.2.2.5	A lead intended for the connection of a grounding conductor shall be bare (i.e., with no insulation) or shall be green or green with a yellow stripe		N/A
8.4.2.3	Field-wiring terminals		N/A
8.4.2.3.1	A pressure wire-type terminal or a wire binding screw shall be suitable for field wiring		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
8.4.2.3.2	Connection of a grounded conductor of an AC supply shall be largely white or silver in colored metal or shall be marked with the words "NEUTRAL", "N", "W" or "White". No other terminal shall be largely white or silver colored		N/A
8.4.2.3.3	Connection of a grounding conductor shall have a green colored head or the area directly adjacent to the terminal shall be marked with a grounding symbol or abbreviation (i.e., G, GR, GRD, GND, GRND, or GROUND) or the symbol (IEC 60417-1, Symbol 5019)		N/A
8.4.2.3.4	Connection of a DC supply, where polarity of the supply connection is required, shall be marked with the symbols "-" and "+" on or immediately adjacent to the supply terminals		N/A
8.4.2.3.5	Terminal plate tapped for a Wire-binding screw or stud construction		N/A
	Note 1 Lower of number of full threads permitted based on test in Clause 9.9		N/A
	Note 2 Lower plate thickness permitted based on test in Clause 9.9		N/A
8.4.2.3.6	Wire-binding screw or stud construction		N/A
8.4.2.3.7	Terminal stud securement, Clause 9.9 test		N/A
8.4.2.4	Push-in terminals		N/A
8.4.2.4.1	Terminal shall allow only for the termination of the branch circuit conductor supplying the power source. It shall not provide for additional connections, unless the push-in wiring terminal has been evaluated to handle full branch circuit current		N/A
8.4.2.4.2	A push-in wiring terminal shall not rise to a temperature exceeding 30 °C during the temperature test specified in Clause 9.3		N/A
8.4.2.4.3	A unit that employs push-in terminals shall be marked in accordance with Clause 10.3.1.		N/A
8.4.3	Cord-connected and direct plug-in units		N/A
8.4.3.1	Branch circuit connection by (a) a cord-connected or direct plug-in power supply, with an output cord for mating with the unit or (b) a power supply cord and integral polarized or grounding-type attachment plug, as shown in Figure 2		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
8.4.3.2	Three-conductor flexible cord with ground shall be provided with conductor identification- grounding conductor colored green or green with a yellow stripe and the grounded conductor colored white or gray		N/A
8.4.3.3	A grounding-type supply cord is not required when ..		N/A
8.4.3.4	Polarized parallel-blade attachment plugs and two-conductor flexible cords		N/A
8.4.3.5	The power supply cord shall be a minimum of 18 AWG		N/A
8.4.3.6	Power supply cord for "dry" locations- type SP-2, SPE-2, SPT-2, or heavier. Power supply cord for "wet" locations- also rated for outdoor use with the following surface marking: "W" or "Water Resistant"		N/A
8.4.3.7	Power supply cord shall be a minimum of 1.5 m		N/A
8.4.3.8	Power supply cord knot as strain relief		N/A
8.4.3.9	Bushing for power supply cord at the point where the cord passes through the opening in a metal enclosure or through a non-rounded opening in a polymeric enclosure		N/A
8.4.3.10	Attachment plug shall be configured for a 15- or 20-A receptacle and comply with CSA C22.2 No. 42 or CSA C22.2 No. 21		N/A
8.4.4	Leads, terminals, and connectors for other than branch circuit connections		N/A
8.4.4.1	Input and output leads, terminals and connectors shall be rated for the appropriate voltage, current, and temperature		N/A
8.4.4.2	Input and output leads shall comply with the requirements for internal wiring specified in Clause 8.3 and shall be of sufficient length to allow for the intended connection		N/A
8.4.4.3	Output connectors		N/A
8.4.4.3.1	A unit with multiple Class 2 or LVLE supply or load connections, where interconnection could cumulatively exceed Class 2 or LVLE limits, shall be provided with polarized connectors that inhibit such interconnection		N/A
8.4.4.3.2	Output connectors secured and polarized if the output direct current or if multiple outputs are provided		N/A
8.4.4.3.3	Coaxial cable connectors shall not be used for output connections		N/A
8.4.4.4	Insulation-piercing connections		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
8.4.4.4.1	Insulation-piercing terminals intended for use with flexible cord or stranded conductor wire operating above Class 2 or LVLE limits shall be for factory assembly only		N/A
8.4.4.4.2	Flexible cord and wire for insulation-piercing connections shall be rated minimum 105 °C		N/A
8.4.4.4.3	Units operating above Class 2 or LVLE limits, and intended for insulation-piercing connections, subject to thermal cycling test in Clause 9.10 and temperature test in Clause 9.3		N/A
8.5	Separation of circuits		N/A
8.5.1	Insulated conductors are rated for the highest voltage or separated		N/A
8.5.2	Minimum 6.44 mm separation between Class 2/ LVLE circuits and non Class 2/ LVLE circuits inside field wiring compartments		N/A
8.5.3	Separation of conductors by clamping, routing a barrier, or equivalent means		N/A
8.5.4	Acceptable types of barriers to separate power limited wiring from branch circuit wiring in a field wiring compartment		N/A
8.6	Insulating materials		N/A
8.6.1	materials that are not damaged by the temperatures and stresses by conditions of actual use		N/A
8.6.2	Evaluation considerations for intended applications in accordance with CAN/CSA-C22.2 No. 0.17		N/A
8.6.3	Insulating material within an LED package		N/A
8.7	Printed wiring boards		N/A
8.7.1	Printed wiring boards shall comply with the requirements of Annex C		N/A
8.7.2	Conductive traces shall be bonded to the substrate for the minimum conductor width and maximum unpierced areas as required by the adhesion requirements of Annex C.		N/A
	Notes: 1) PWBs that are completely encased in potting compound may exceed their specified minimum conductor width or maximum unpierced area.		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
	Notes: 2) A PWB connected within a Class 2 or LED Class 2 circuit need not comply when means are provided to ensure that the limited energy traces cannot contact non-energy limited live parts should the traces become detached from the substrate.		N/A
8.7.3	Temperatures measured in the temperature test shall be in compliance with Table 8.		N/A
	Notes: A PWB connected within a Class 2 or LED Class 2 circuit need not comply when means are provided to ensure that the limited energy traces cannot contact non-energy limited live parts should the traces become detached from the substrate.		N/A
8.7.4	The flammability rating of the PWB shall be in accordance with the requirements of Cl. C.2.2 and Cl. C.2.3 of Annex C.		N/A
	Notes: A circuit supplied by a Class 2 power source or LED Class 2 Controlgear need not comply.		N/A
8.7.5	PWB for direct support of current carrying parts shall comply with Cl. 5.7.1.3 and Cl. 5.7.1.4 of C22.2 No. 250.0.		N/A
	Notes 1): A PWB that contains only a Class 2 or LED Class 2 circuits need not comply.		N/A
	Notes 2): A PWB that is completely encased in potting compound need not comply.		N/A
8.8	Electrical spacings		P
8.8.1	Field- wired branch circuit per Table 6		N/A
8.8.2	Other than field- wired branch circuit per Table 7		N/A
8.8.3	PWB spacing limits per Table 5		N/A
	Note 1- Evaluation per CSA C22.2 No. 0.2, Overvoltage Category II, PWBs have minimum CTI of 100, unless known to be greater		N/A
	Note 2- alternate spacings- (0.58+0.005V) mm V is peak		N/A
	Note 3- Exemption for Encapsulated parts, inherent spacings of discrete components, and circuits supplied by Class 2/ LVLE		N/A
	Note 4- Compliance based on dielectric withstand test- Clause 9.4		N/A
8.8.4	Enameled and similar film-coated wire identified as un-insulated live part		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
8.8.5	Spacings between output circuitry and dead metal for a ground-referenced circuit based on the maximum open-circuit voltage to ground		P
8.8.6	Parts subject to movement relative to other parts shall be positioned in their most severe orientation before spacings are measured		P
8.9	Circuit components		P
8.9.1	Circuit component permanence and stability in limiting capabilities over time and use		P
8.9.2	A component that bridges two circuits		P
8.10	Protective devices		N/A
8.10.1	Protective devices shall meet the requirements applicable to that component		N/A
8.10.2	A protective device in a primary circuit shall not be connected in the neutral (grounded) conductor unless it simultaneously interrupts the grounded and ungrounded supply conductors		N/A
8.10.3	An overcurrent protective device shall be inaccessible to tampering, or it shall not be interchangeable with one having a higher current rating		N/A
8.10.4	For a user serviceable fuse- the type identification and ampere rating shall be marked in accordance with Clause 10.3.2		N/A
8.11	Coil insulation		N/A
8.11.1	General		N/A
8.11.1.1	Insulation is required between the coil and any dead-metal part, and between each adjacent pair of windings. Physical insulation material is not required if the spacings requirements specified in Clause 8.8 are met without any insulation material in place		
	Note- 1) Two or more secondary windings may be considered as a single winding if, when interconnected, the windings comply with the performance requirements for a single winding		N/A
	Note- 2) Insulated wiring which complies with CSA C22.2 No. 210		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
8.11.1.2	Coil insulation shall be either inherently moisture resistant or treated to render it moisture resistant. Film-coated magnet wire is considered to be moisture resistant		N/A
8.11.2	Insulation for transformers		N/A
8.11.2.1.a	Primary wires of opposite polarity- electrical grade paper		N/A
8.11.2.1.b	Primary wires of opposite polarity- other insulating materials with a dielectric breakdown strength of at least 2500 V in the thickness used, as determined by insulating materials tests specified in CAN/CSA-C22.2 No. 223		N/A
8.11.2.1.c	Insulated wiring which complies with the requirements of CSA C22.2 No. 210		N/A
8.11.2.2.a	Primary to secondary windings- electrical grade paper		N/A
8.11.2.2.b	primary to secondary windings- molded polymeric material		N/A
8.11.2.2.c	primary to secondary windings- other than a molded polymeric material with a dielectric breakdown strength of at least 2500 V in the thickness used, as determined by insulating materials tests specified in CAN/CSA-C22.2 No. 223		N/A
8.11.2.2.d	Insulated wiring which complies with the requirements of CSA C22.2 No. 210		N/A
8.11.2.3	Minimum 0.8 mm (1/32 in) bent up edge for tape used in concentrically-wound bobbin transformer		N/A
8.11.2.4.1	15 day output loading test (clause 9.5.3) for concentrically-wound transformer		N/A
	Note a- exemption if multiple layered winding wire is use, which comply with CSA C22.2 No. 0.17		N/A
	Note b- exemption if primary-to-secondary winding spacings are reliably maintained and comply with Table 7		N/A
	Note c- exemption if requirements in CSA C22.2 No. 0.2 are met for the primary-to-secondary creepage distance, and a comparative tracking index (CTI) rating of 100 for all insulating material is determined		N/A
	Note d- Insulated wiring which complies with the requirements of CSA C22.2 No. 210		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
8.11.2.4.2	Alternate test method of the output loading		N/A
8.11.2.5.a	Primary winding to core- electrical grade paper		N/A
8.11.2.5.b	Primary winding to core- molded polymeric material		N/A
8.11.2.5.c	Primary winding to core- a material other than a molded polymeric material and with a dielectric breakdown strength of not less than 2500 V in the thickness used, as determined by the insulating materials tests specified in CAN/CSA-C22.2 No. 223 and Annex E;		N/A
8.11.2.5.d	Insulated wiring which complies with the requirements of CSA C22.2 No. 210		N/A
8.11.2.5	Note- Insulation reduced or waived between primary and core when all of the conditions a) to d) are met..		N/A
8.11.2.6.a	Primary winding lead connections and metallic enclosure- electrical grade paper not less than 0.3mm thick		N/A
8.11.2.6.b	Primary lead connections and metallic enclosure- electrical grade paper having a total thickness of not less than 0.7mm thick		N/A
8.11.2.6.c	Primary lead connections and metallic enclosure- insulation with a minimum dielectric breakdown strength of 2500 V in the thickness used for 8.11.2.6.a and 5000 V in the thickness used for 8.11.2.6.b, as determined by the insulating materials tests specified CAN/CSA-C22.2 No. 223 and Annex E		N/A
8.11.2.6.d	Insulated wiring which complies with the requirements of CSA C22.2 No. 210		N/A
8.11.2.7	Insulation in accordance with Clause 8.11.2.8 between crossover lead and ..		N/A
8.11.2.8.a	compliance with 8.11.2.7- electrical grade paper		N/A
8.11.2.8.b	Compliance with 8.11.2.7- other insulating material with a minimum dielectric breakdown strength of 2500 V in the thickness used, as determined by the insulating materials tests specified in CAN/CSA-C22.2 No. 223 and Annex E		N/A
8.11.2.8.d	Insulated wiring which complies with the requirements of CSA C22.2 No. 210		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
8.11.2.8	Compliance with 8.11.2.7- Note 1 - Any insulation type or thickness, or a through air spacing less than what is specified in Clause 8.8, between a crossover lead and the winding to which it is connected may be used if the coil withstands the dielectric voltage withstand test specified in Clause 9.4 with the potential applied between the coil leads and the coil lead cut at the point where it enters the inner layer		N/A
8.11.2.8	Compliance with 8.11.2.7- Note 2 - Note (1) does not apply to insulation between a Class 2 secondary crossover lead and (a) the secondary winding to which the crossover lead is connected; (b) the metallic enclosure; and (c) the core		N/A
8.11.2.9	The magnet coil of a molded bobbin transformer having a slot for the crossover or start lead — unspliced at the windings — may be used as used as crossover lead insulation if ...		N/A
	Note 1 – The slots provide a graduated through air spacing to the winding, increasing to the end turns.		N/A
	Note 2 – The magnet-coil winding withstands the dielectric voltage withstand test of Cl. 9.4		N/A
8.11.2.10	Notes 1): Primary lead connections and adjacent windings- electrical grade paper		N/A
	Notes 2): Primary lead connections and adjacent windings- other insulating material with a minimum dielectric breakdown strength of 5000 V in the thickness used, as determined by the insulating materials tests specified in CAN/CSA-C22.2 No. 223 and Annex E		N/A
	Notes 3): Insulated wiring which complies with the requirements of CSA C22.2 No. 210		N/A
8.11.2.11	A transformer or coil insulation system is above class 105(A)		N/A
8.12	Class 2 Output circuits		N/A
	Class 2 output circuits shall comply with the construction, performance, and marking requirements specified in CAN/CSA-C22.2 No. 223 and Annex E.		N/A
9	Tests, procedures, and apparatus		P
9.1	General		P
9.2	Input test		P

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
9.3	Temperature test	Refer to UL1573	N/A
9.4	Dielectric voltage withstand test	Refer to UL1573	N/A
9.5	Abnormal tests		N/A
9.5.1	General		N/A
9.5.2	Component failure test		N/A
9.5.3	Output loading test		N/A
9.5.4	Output loading — Alternate method		N/A
9.6	50 W point power measurement test		N/A
9.7	Leakage current measurement test		P
9.8	Cord strain and push-back relief test		N/A
9.9	Security of output terminals		N/A
9.10	Insulation-piercing connection thermal cycling test		N/A
9.11	Adhesive support test		N/A
9.12	Environmental tests		N/A
9.12.1	Humidity exposure		N/A
9.12.2	Water exposure		N/A
9.13	Mechanical strength tests for metal enclosures		N/A
9.14	Knockout secureness test		N/A
9.15	Thermal aging test		N/A
10	Markings		N/A
10.1.1	Unit shall comply with the marking requirements in end-product standard, or, if end-use application is not specified, the unit shall comply with the marking requirements specified in this Clause.		N/A
10.1.2	Markign shall be legible, with minimum 1.6mm in lettering and use at least one of the described methods, a) to k).		N/A
10.1.3	Permanent pressure-sensitive labels and nameplates that are secured by an adhesives shall comply with C22.2 No. 0.15.		N/A
10.2	Identification and ratings		N/A

CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
10.2.1	All units shall have the following markings: company name, model designation, factory ID and date of manufacture.		N/A
10.2.2	Markings for integrated or separated power source		N/A
10.2.3	Each output intended to supply Class 2 circuit shall comply with 8.12 and be marked "Class 2"		N/A
10.2.4	LED controller marking: environment, input limitations, input voltage, input current or wattage, and rated output voltage and current (or wattage).		N/A
10.2.5	Markings of LED array, module, or package: Environment, input limitations, input voltage, and, rated current or wattage.		N/A
10.3	Construction-related markings		N/A
10.3.1	Installation instructions of unit with push-in terminals		N/A
10.3.2	Fuse replacement marking		N/A
10.3.3	Marking when terminal compartment's or splice compartment's surface exceeds 60°C.		N/A

Annex A (normative) LED Controlgear	N/A
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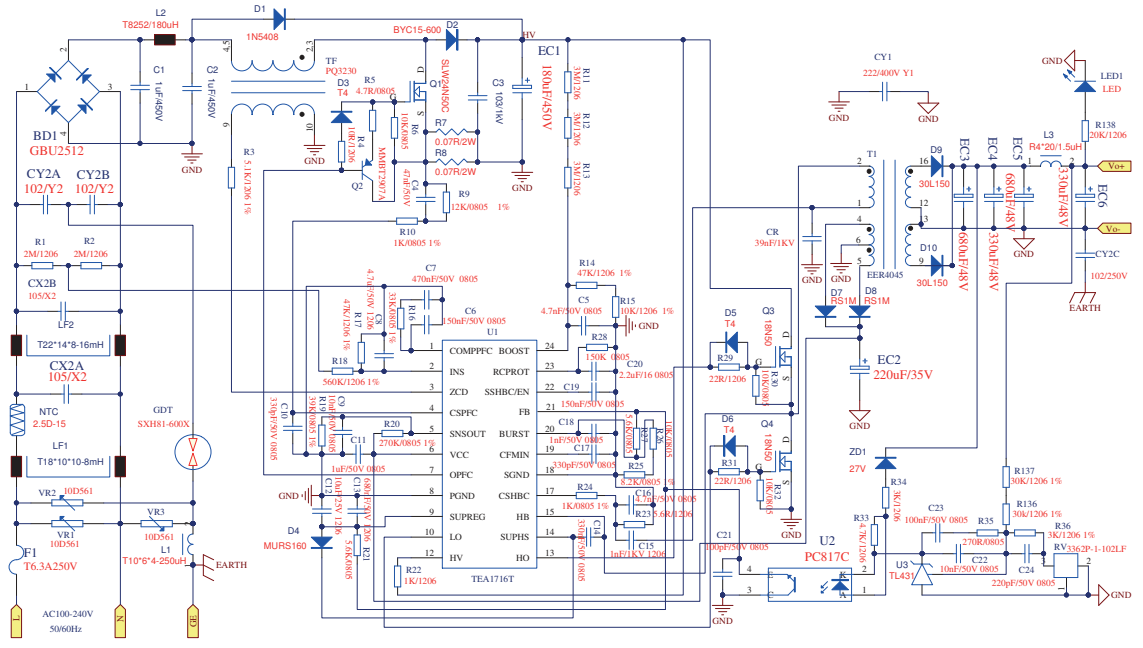
Annex B (informative) Manufacturing and production tests	N/A
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Annex C (normative) Printed circuit boards		N/A
C.2	General	N/A
C.2.1	PCBs with conformal coating or other coating evaluated per Clause C.3 testing	N/A
C.2.2	PCBs, conformal coating, and components shall have a flammability classification of at least V-2. PCB having an HB flammability rating is considered to have an equivalent of a V-2 rating when it complies with the needle flame test specified in CAN/CSA-C22.2 No. 0.17	N/A
C.2.3	Components, such as IC packages, transistors, opto-isolators, and capacitors shall be exempt from the flammability classification V-2 requirement specified in Clause C.2.2 if they are mounted on material having a flammability of at least V-1	N/A

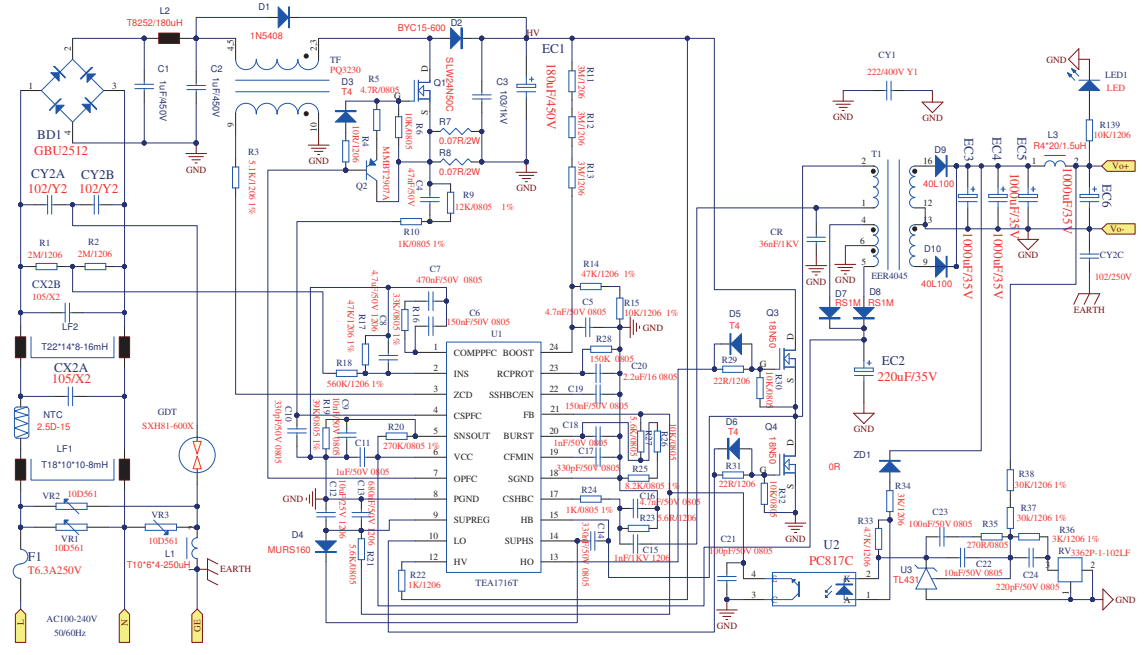
CAN/CSA-C22.2 No. 250.13-14, LED Equipment for Lighting Applications			
Clause	Requirement Test	Result - Remark	Verdict
C.2.4	Spacings between uninsulated live parts of a circuit containing a solid-state component, such as a rectifier, resistor, capacitor, or transistor shall (a) be not less than the values shown in Table 5; (b) withstand the insulation resistance test specified in Clause C.3.3; or (c) withstand the fault conditions test specified in Clause C.3.4		N/A
C.3	PCB coatings		N/A
C3.1	Dielectric strength		N/A
C3.2	Adhesion		N/A
C3.3	Insulation resistance test voltage		N/A
C3.4	Fault conditions		N/A

Illustrations

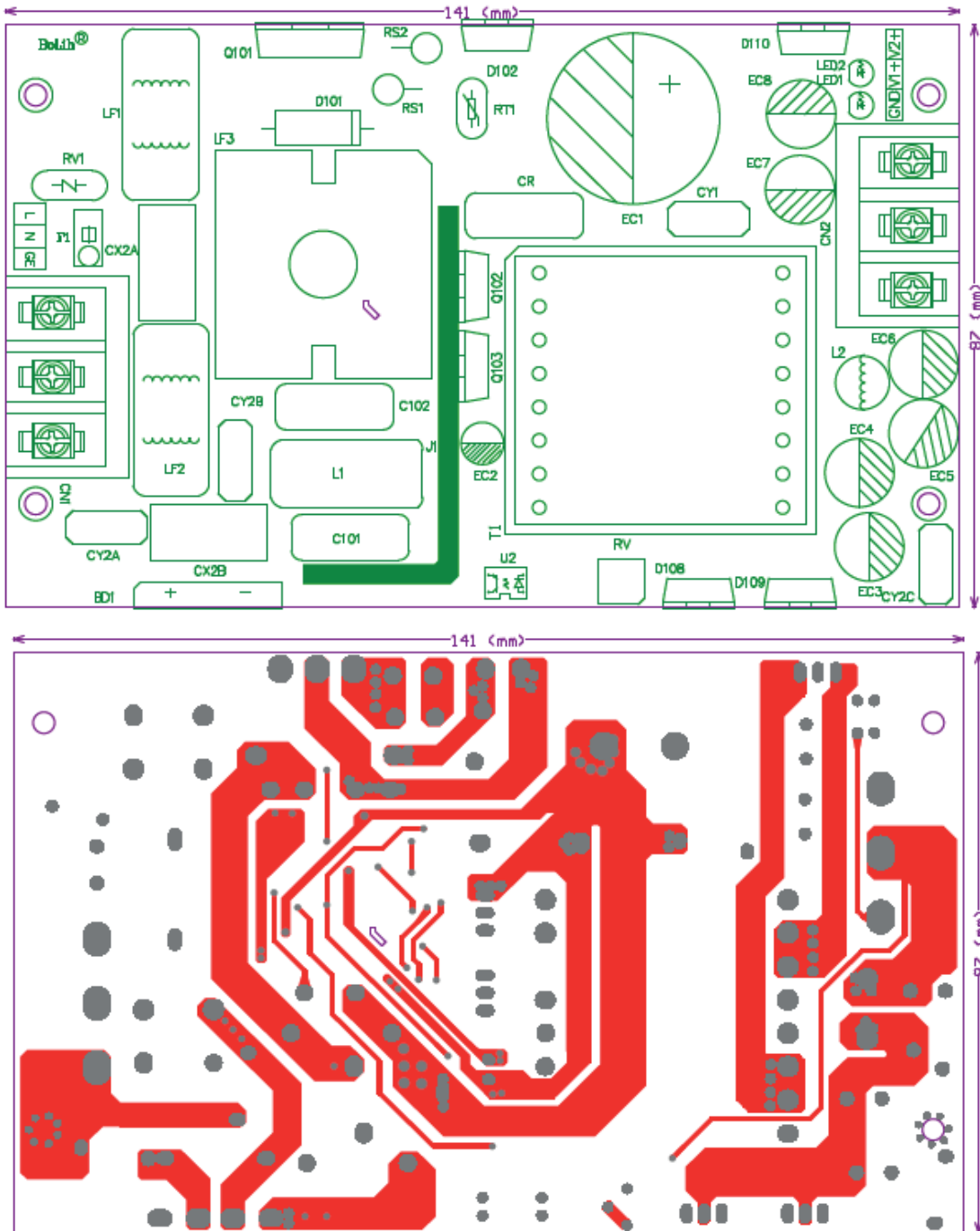
Circuit diagrams of power unit BLH-350W

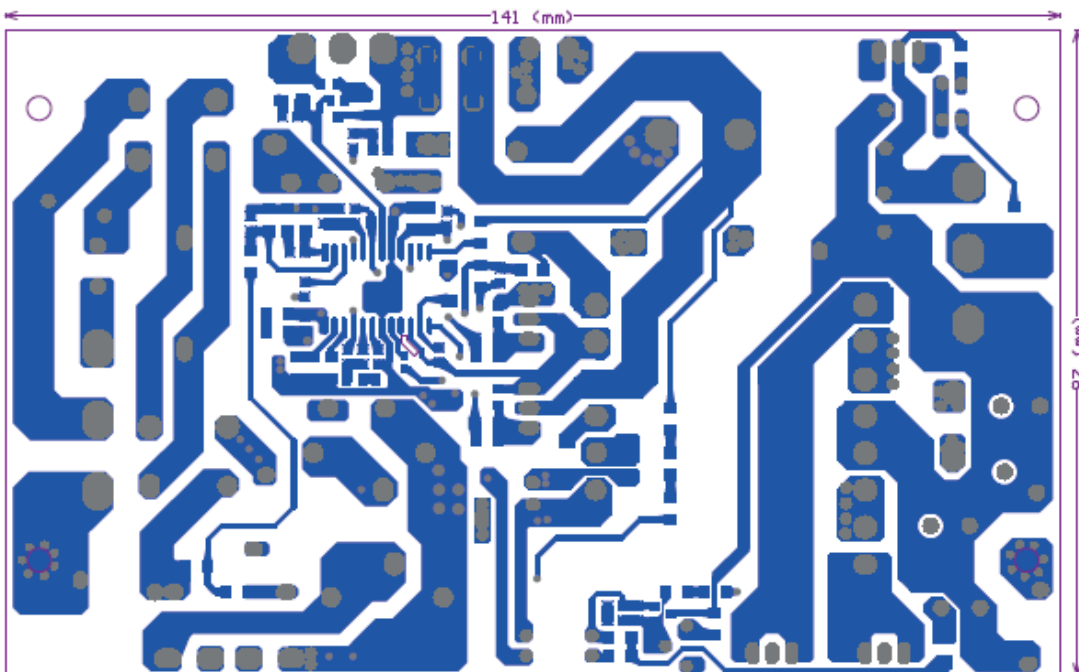
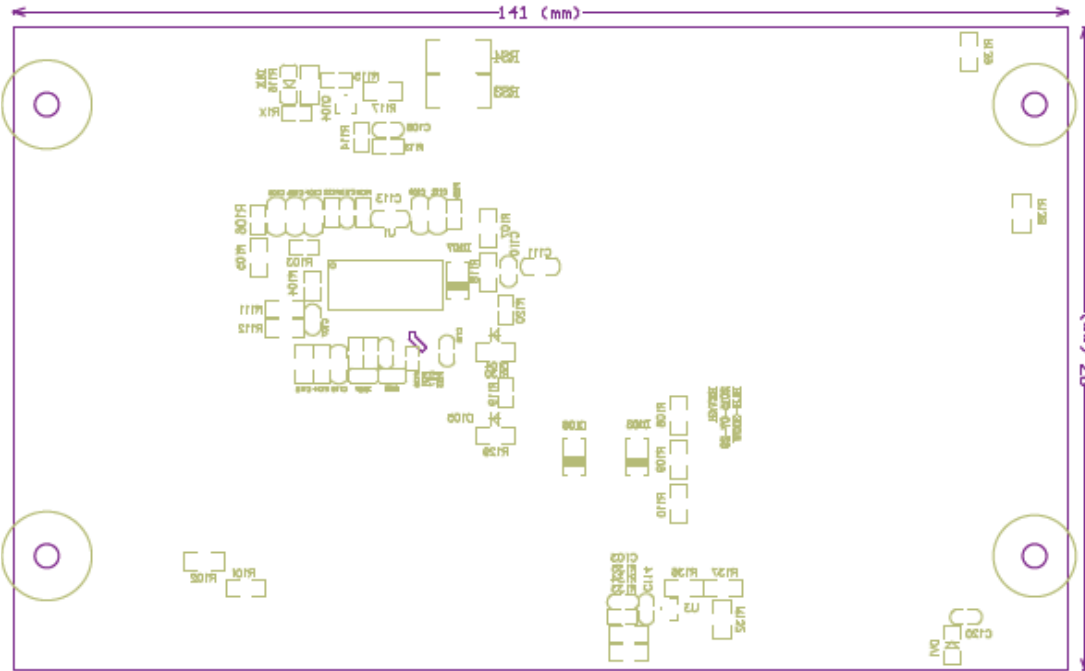


Circuit diagrams of power unit BLH-300W

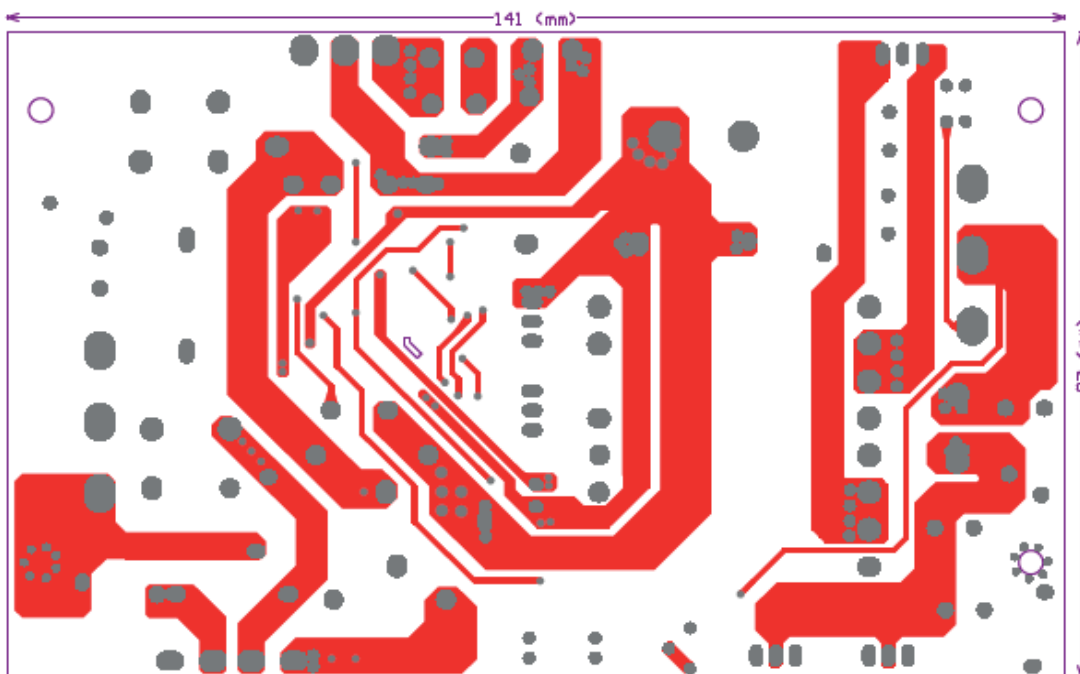
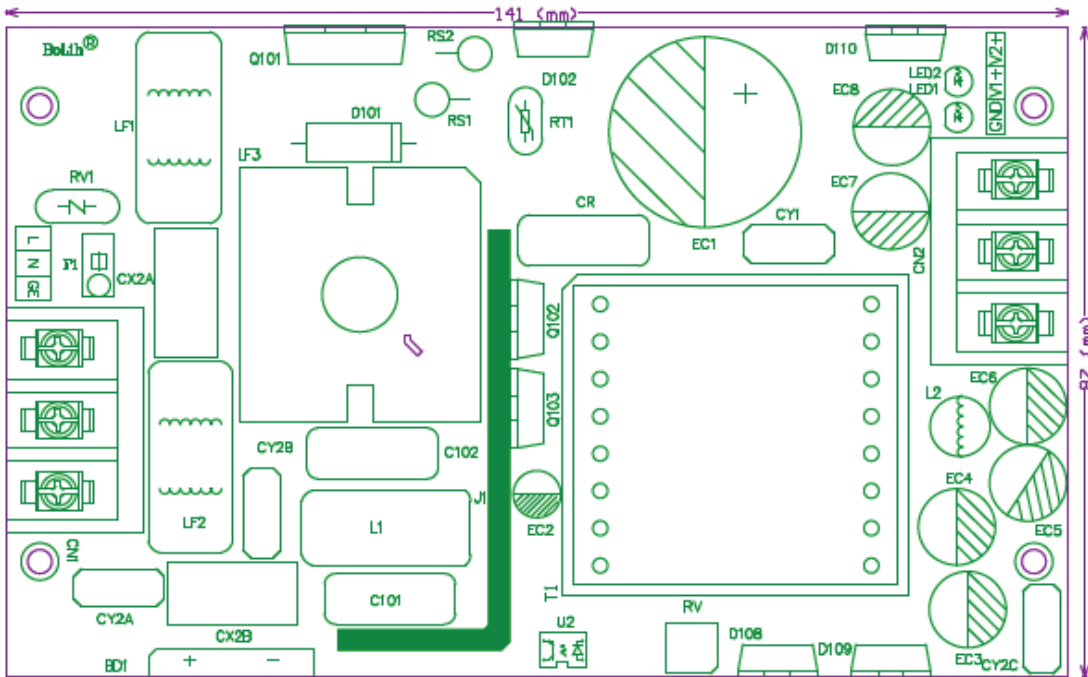


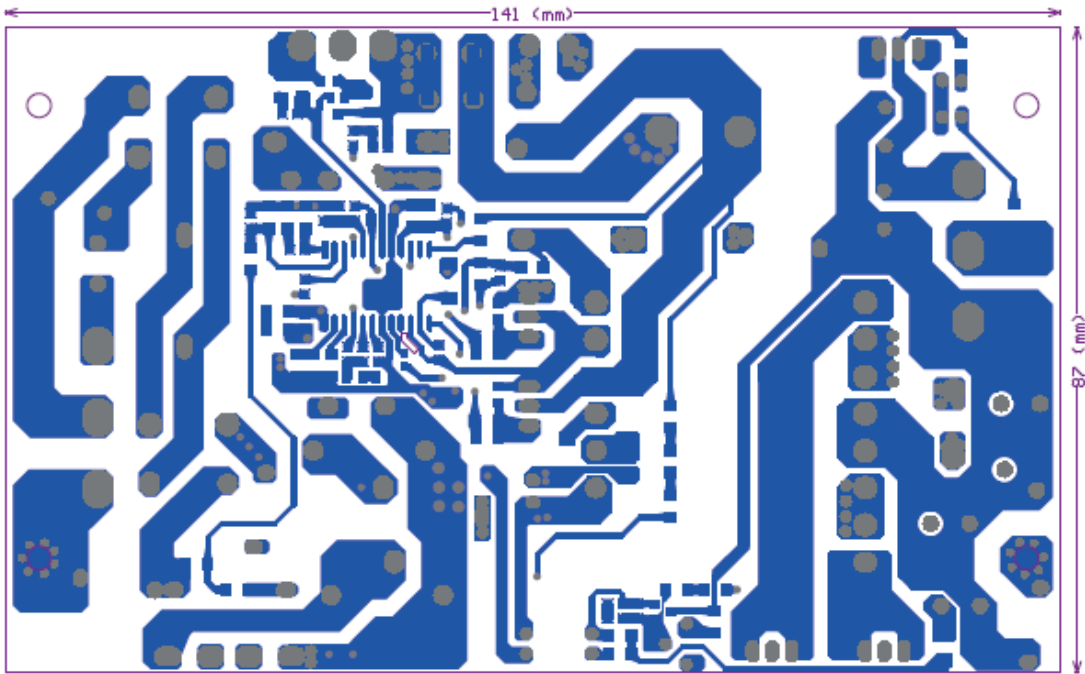
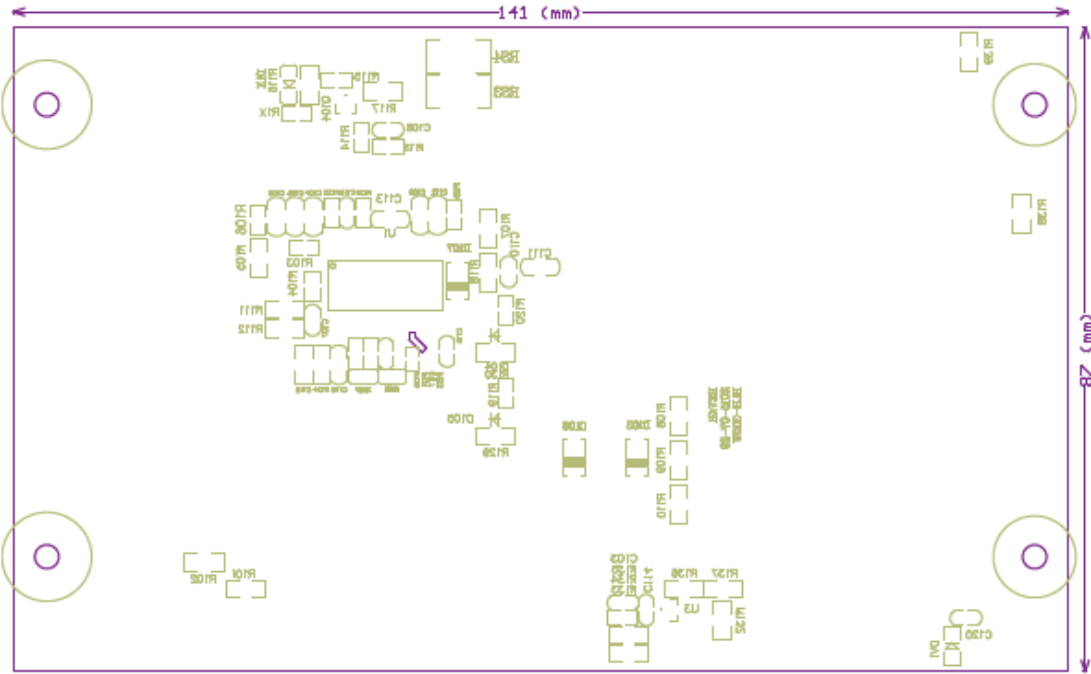
PCB layout of power unit BLH-350W

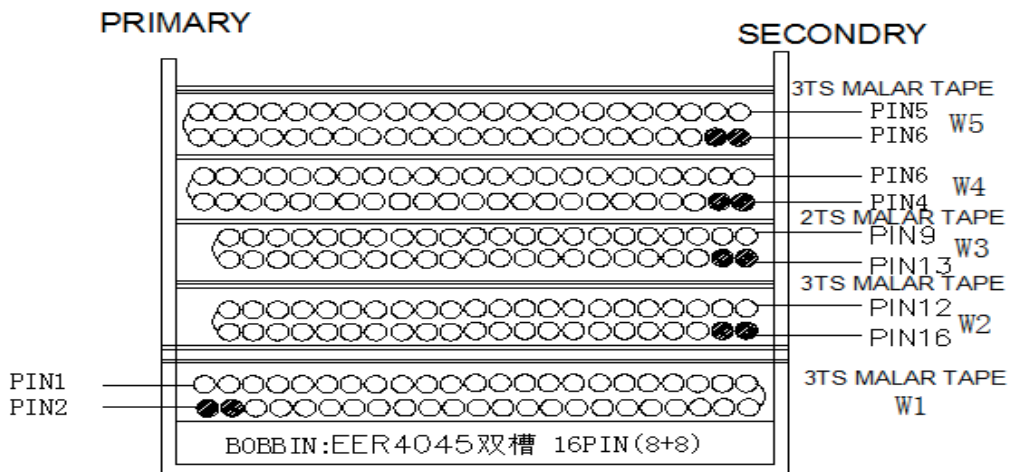
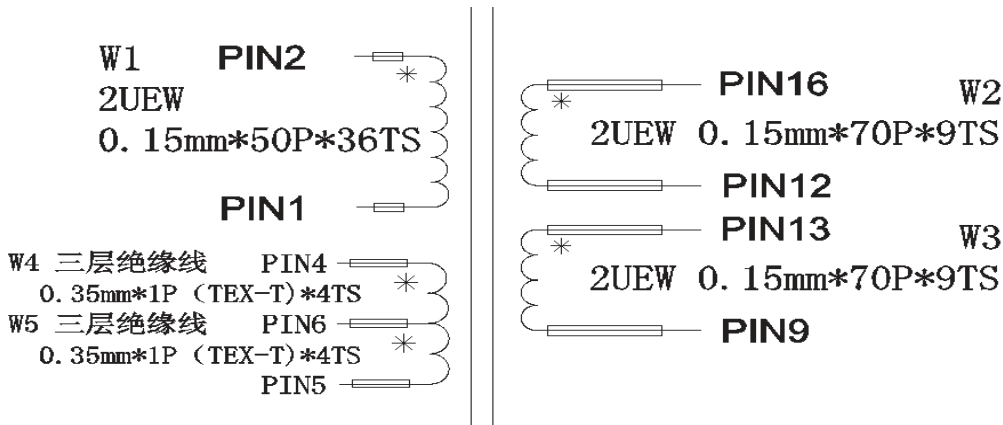
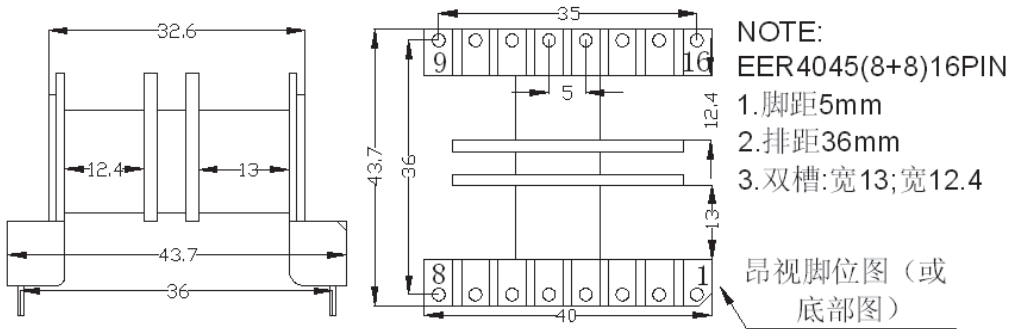




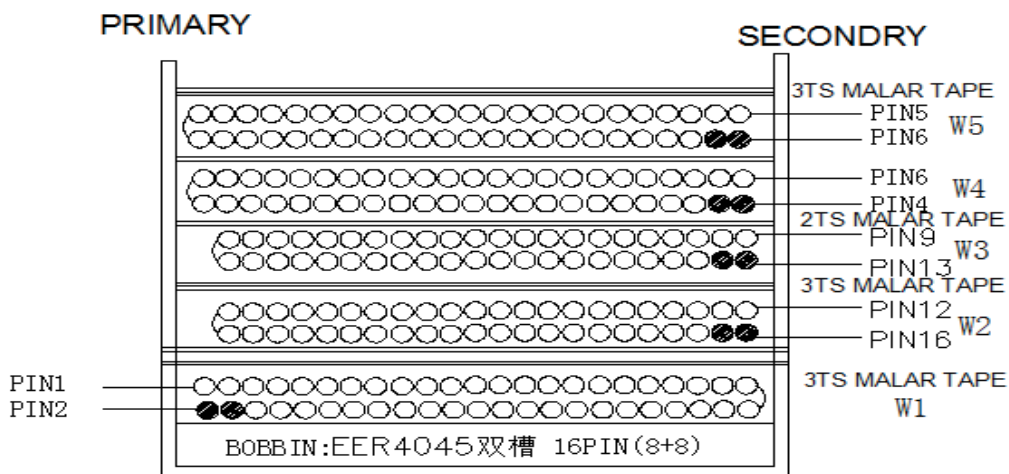
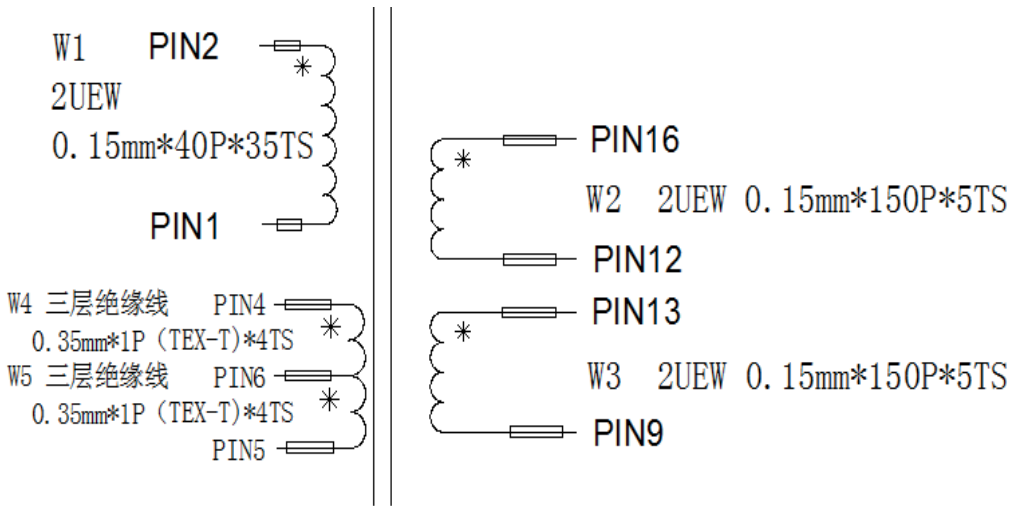
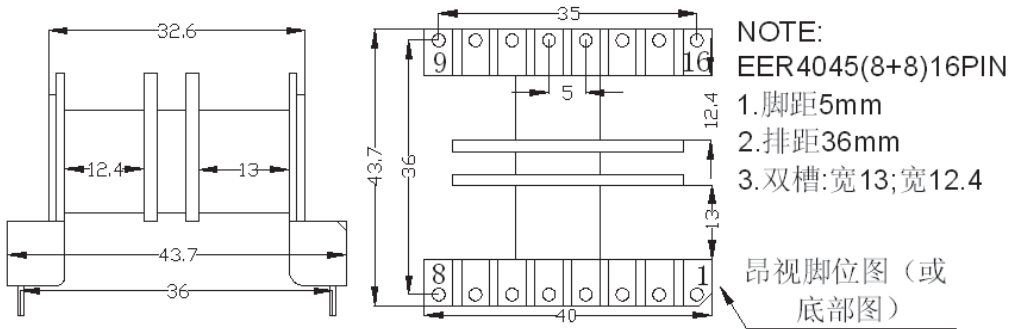
PCB layout of power unit BLH-300W





Transformer specification of power unit BLH-350W


Transformer specification of power unit BLH-300W



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