CLASSIFICATION
Constructional Data Report (CDR)

1.0 Reference and Address			
Report Number	140827050GZU-001	Original Issued: 24-Dec-2014	Revised: 9-Oct-2016
Standard(s)	UL 1993 Issued: 2012/12/04 Ed:4 Self-Ballasted Lamps and Lamp Adapters CSA C22.2 No. 1993 Issued: 2012/12/04 Ed: 2 Self-Ballasted Lamps and Lamp Adapters UL 1598C Issued: 2014/01/16 Ed: 1 Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits		

Applicant	Shenzhen Ohmax Optoelectronic Lighting Co., Ltd	Manufacturer	**Shenzhen Ohmax Optoelectronic Lighting Co., Ltd**
Address	No. 132, Fuxing Street, Hehua Community, Pinghu Subdistrict, Longgang District, Shenzhen, Guang Dong	Address	No. 132, Fuxing Street, Hehua Community, Pinghu Subdistrict, Longgang District, Shenzhen, Guang Dong
Country	China	Country	China
Contact	Mr. Pollo Wong	Contact	Mr. Pollo Wong
Phone	86-755-28455703	Phone	86-755-28455703
FAX	NA	FAX	NA
Email	pollo@led-ohmax.com	Email	pollo@led-ohmax.com

2.0 Product Description	
Product	LED tube light
Brand name	NA
Description	The products covered by this report are T8 LED light tube for dry or damp location use, each is equipped with a LED driver and LEDs.
Models	OH-GL-029, OH-GL-021, OH-GL-022
Model Similarity	Model OH-GL-029 and OH-GL-021 have similar mechanical and electrical construction, main difference among them are LED type and LED quantity. Model OH-GL-022 and OH-GL-021 have the same mechanical and electrical contruction, only LED quantity is different.
Ratings	For model OH-GL-029: 100-277V,50/60Hz, 18W, Max. 0.22A length 1200mm, 108pcs non-replaceable LEDs. For model OH-GL-021: 100-277V,50/60Hz, 36W, Max. 0.35A length 1200mm, 36pcs non-replaceable LEDs. For model OH-GL-022: 100-277V,50/60Hz, 18W, Max. 0.22A length 1200mm, 18pcs non-replaceable LEDs.
Other Ratings	Used only with listed surface mounted lighting fixture have max. 4 pcs LED tubes without diffuser or listed surface mounted lighting fixture AL-TU18，AL-TU-18-2, OHHF0001,OHHF0002 manufacture by Shenzhen Ohmax Optoelectronic Lighting Co., Ltd.

3.0 Product Photographs

Photo 1 - External view of model OH-GL-029, OH-GL-021

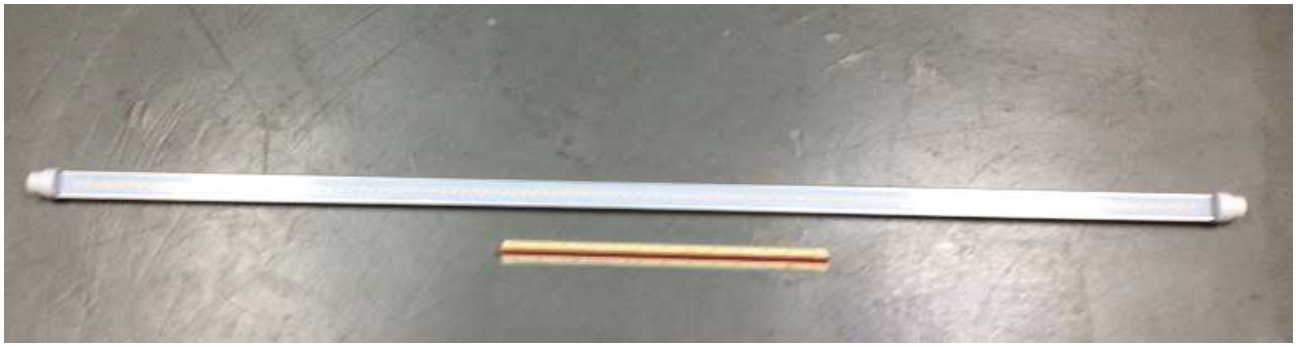
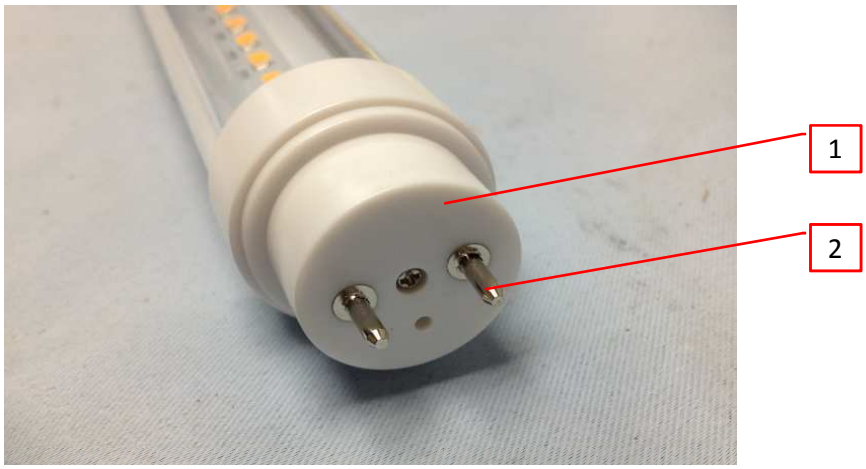


Photo 2 - View of Cap and lamp pin of model OH-GL-029, OH-GL-021



3.0 Product Photographs

Photo 3 - Explode view of model OH-GL-029

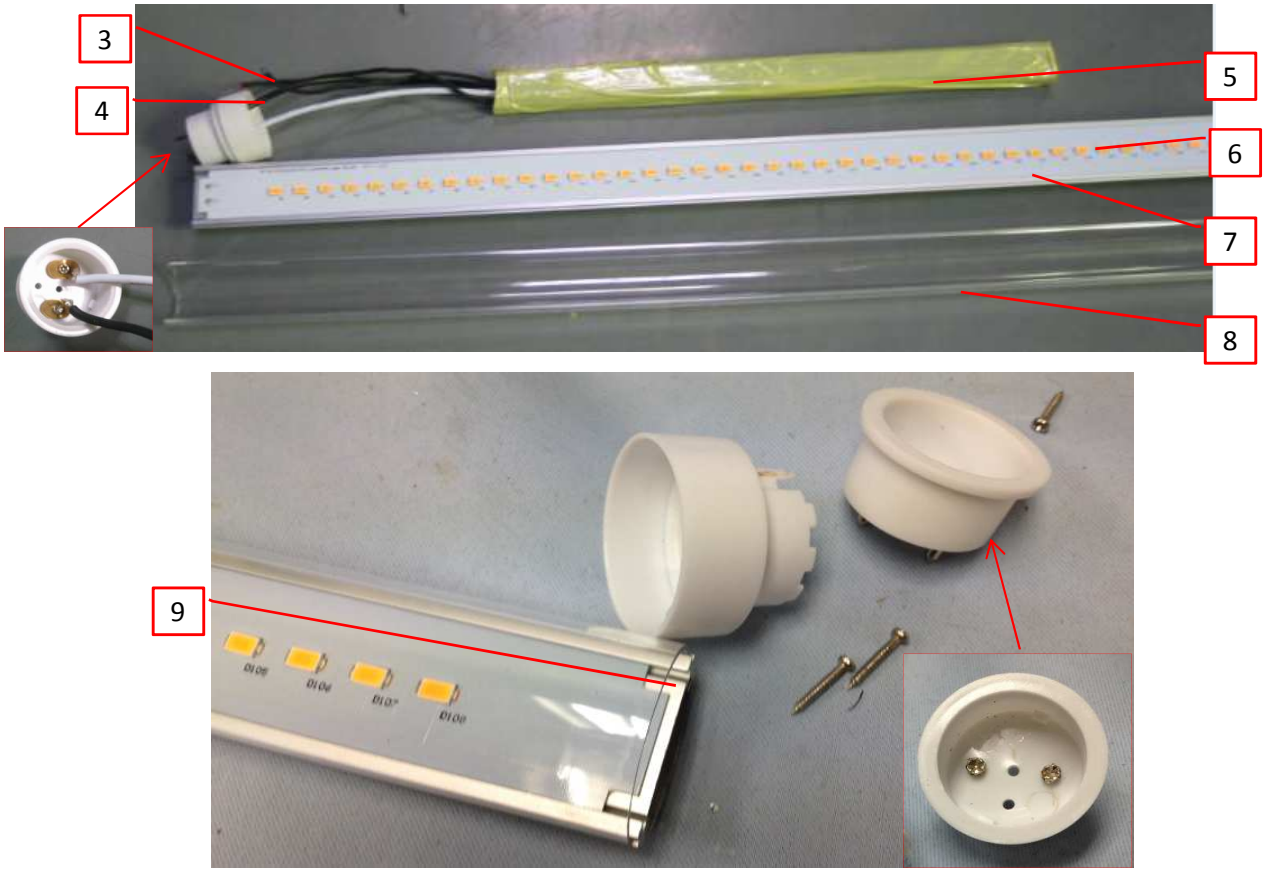
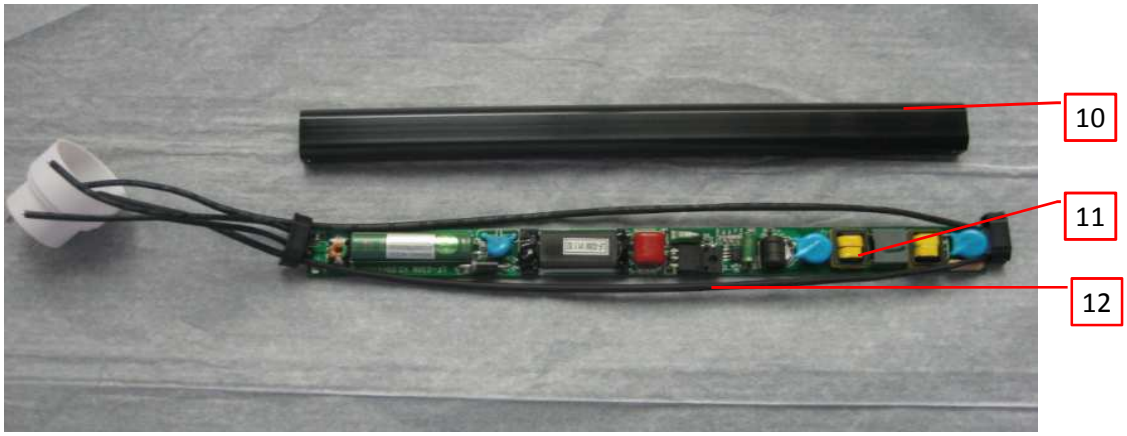


Photo 4 - LED driver view of model OH-GL-029



3.0 Product Photographs

Photo 5 - External view of model OH-GL-022, OH-GL-021

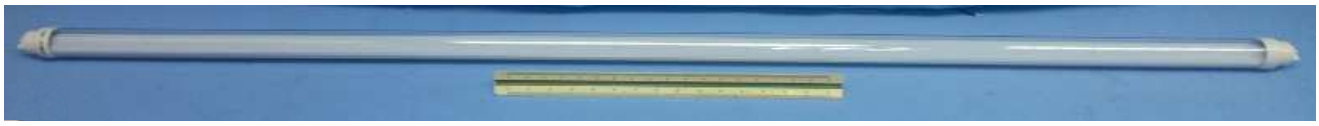


Photo 6 - LED PCB view of model OH-GL-022, OH-GL-021

4.0 Critical Components

Photo #	Item no.[1]	Name	Manufacturer/ trademark[2]	Type / model[2]	Technical data and securement means	Mark(s) of conformity [3]
2	1	Lamp cap	E I Dupont De Nemours & Co Inc	FR50(+)(f1)	PA66 material: V-0 or 5VA, RTI: 115, HAI 0, HWI 0, CTI 2, Min. thickness: 1.5mm, Fixed on the enclosure by 2 pcs of screws.	cURus
2	2	Lamp pin	Various	Various	Copper material, with diameter 2.3mm	NR
3	3	Output wire of LED driver	Various	3239	24AWG, 3000Vdc, 150°C, VW-1, AWM.	cURus
3	4	Input wire of LED driver	Various	1672	Min.20AWG, Min.300V, Min.105°C, VW-1, AWM.	cURus
3	5	Insulation tape	Jingjiang Yahua Pressure Sensitive Glue Co Ltd	CT	Polyethylene terephthalate film insulating tape, 130°C. Covered LED driver.	UR
3	6	LED	Shenzhen Refond Optoelectronics Co.,Ltd	RF-**HI57DS-FD-J	2.8-3.5V, If 150mA Size: 5.70mm×3.00mm×0.90mm. Emited: white for model OH-GL-029.	NR
3	7	LED PCB	Various	Various	Metal base PCB, V-0, 130°C, min. thickness 1.0mm, comply with UL796. Suitable for direct current support.	UR
3	8	Diffuser	Resin & Pigment Technologies Pte Ltd	S2000VR	PC material, V-2, RTI 80, min. thickness 1.5mm.	UR
3	9	Metal enclosure	Various	Various	Made of aluminium with min. 0.81mm thickness.	NR
4	10	Plastic enclosure of LED driver	E I Dupont De Nemours & Co Inc	FR50(+)(f1)	PA66 material: V-0, RTI: 105, HAI 0, HWI 0, CTI 2, Min. thickness: 1.0mm.	cURus
4	11	LED driver	Shenzhen Ledfriend Optoelectronics Co Ltd	LF-GTU022YD0540U	Input: 100-277V, 50/60Hz, Max. 0.4A Class 2 output: 27-42Vdc, 540mA	cURus
4	12	Heat-shrinkable tube	Various	Various	600V; 125°C; VW-1. Covered on input wire of LED driver.	cURus
4	13	Label(not shown)	Various	Various	Min. 100ºC when attached on metal surface.	cURus
6	14	LED II	Everlight	ELSW-ABCDE-FGHIJ -V1234	1W, If: 350mA Size: 3.5mm×3.5mm×2.03mm. for new model OH-GL-022, OH-GL-021.	NR

NOTES:

1) Not all item numbers are indicated (called out) in the photos, as their location is obvious.

2) "Various" means any type, from any manufacturer that complies with the "Technical data and securement means" and meets the "Mark(s) of conformity" can be used.

3) Indicates specific marks to be verified, which assures the agreed level of surveillance for the component. "NR" - indicates Unlisted and only visual examination is necessary. "See 5.0" indicates Unlisted components or assemblies to be evaluated periodically refer to section 5.0 for details.

5.0 Critical Unlisted CEC Components

No Unlisted CEC components are used in this report.

6.0 Critical Features

Recognized Component - A component part, which has been previously evaluated by an accredited certification body with restrictions and must be evaluated as part of the basic product considering the restrictions as specified by the Conditions of Acceptability.

Listed Component - A component part, which has been previously Listed or Certified by an accredited Certification Organization with no restrictions and is used in the intended application within its ratings.

Unlisted Component - A part that has not been previously evaluated to the appropriate designated component standard. It may also be a Listed or Recognized component that is being used outside of its evaluated Listing or component recognition.

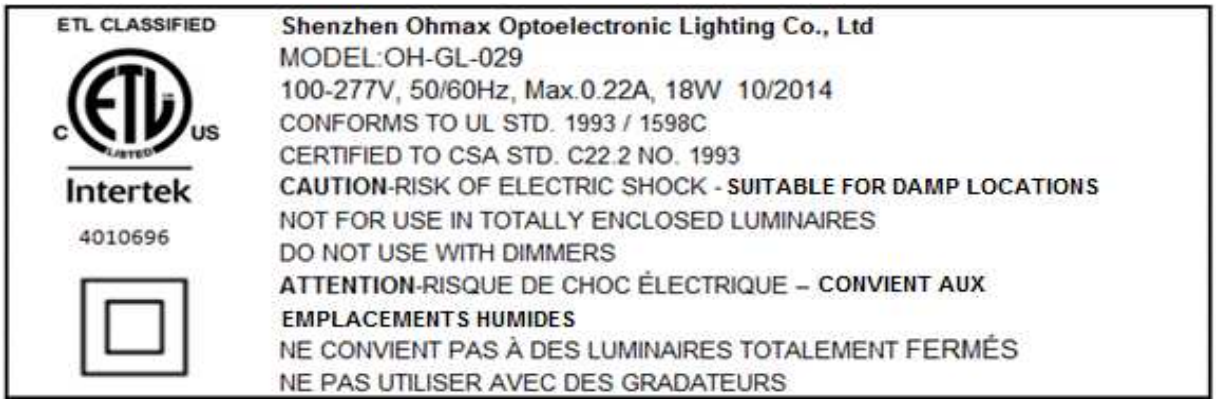
Critical Features/Components - An essential part, material, subassembly, system, software, or accessory of a product that has a direct bearing on the product's conformance to applicable requirements of the product standard.

Construction Details - For specific construction details, reference should be made to the photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements also apply.

1. Spacing - In primary circuits, 2.4 mm minimum spacing are maintained through air and over surfaces of insulating material between current-carrying parts of opposite polarity and 2.4 mm minimum between such current-carrying parts and dead-metal parts.
2. Mechanical Assembly - Components such as switches, fuseholders, connectors, wiring terminals and display lamps are mounted and prevented from shifting or rotating by the use of lockwashers, starwashers, or other mounting format that prevents turning of the component.
3. Corrosion Protection - All ferrous metal parts are protected against corrosion by painting, plating or the equivalent.
4. Accessibility of Live Parts - All uninsulated live parts in primary circuitry are housed within a metal and non-metallic enclosure constructed with no openings other than those specifically described in Sections 4 and 5.
5. Grounding - This product is not provided with a means of grounding as it's double insulation from the metal.
6. Internal Wiring - Internal wiring is routed away from sharp or moving parts. Internal wiring leads terminating in soldered connections are made mechanically secure prior to soldering. Recognized Component separable (quick disconnect) connectors of the positive detent type, closed loop connectors, or other types specifically described in the text of this report are also acceptable as internal wiring terminals. At points where internal wiring passes through metal walls or partitions, the wiring insulation is protected against abrasion or damage by plastic bushings or grommets. All wiring refer to sec. 4.0.
7. Markings - The product is marked on as labeling system as described in item no. 13 of Section 4.0 as follows:
   - manufacturer's name, trade name or trade mark
   - model number
   - date of manufacture
   - electrical ratings (volts, amperes & frequency)
   - for Canada should be both in English and French
8. Cautionary Markings - The following are required:
   - Refer to Marking page for detail.
9. Installation, Operating and Safety Instructions - Instructions for installation and use of this product are provided by the manufacturer.
   - Refer to Illustration No(s). 2 for details.

7.0 Illustrations

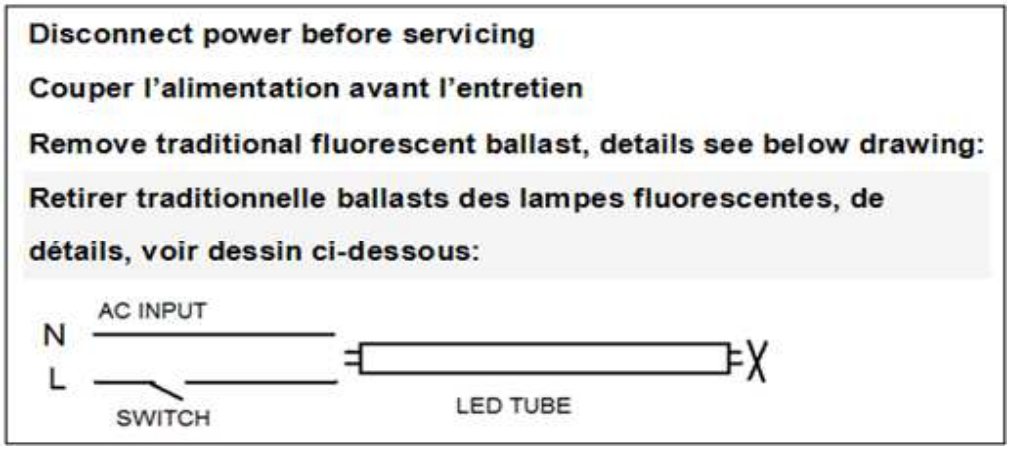
Illustration 1 - Markings



Label A

Label A was attached on the external surface of metal enclosure and visible during installation, the ETL logo shall be at least 8mm high, "C" and "US" shall be at least 2mm high, Control no. shall be at least 2mm high, "Intertek" shall be at least 2mm high, "CAUTION" and "ATTENTION" shall be at least 2.0mm high, other letters shall be at least 1.6mm high. All models have the same labels A except model no.(refer to sec. 2.0).

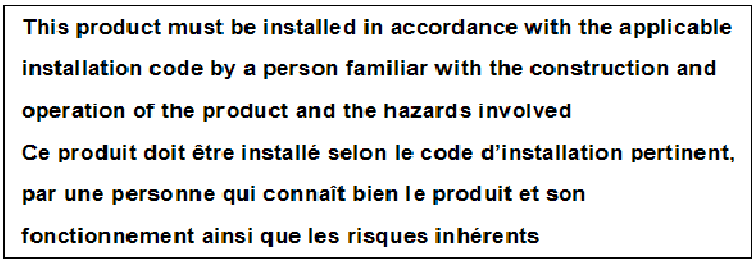
Illustration 1a - Warnings



Label B

Labels B was attached on the external surface of metal enclosure and visible during installation, all letters shall be at least 1.6mm high for all models.

Illustration 1b - Warnings



Label C

Labels C was attached on the external surface of metal enclosure and visible during installation, all letters shall be at least 1.6mm high for all models.

7.0 Illustrations

Illustration 2 - Instruction requirements

Proper luminaire refitting method.
Indicate the installation shall be done by qualified person.
Shall indicate the products covered by this report shall only be used with listed surface mounted lighting fixture have max. 4 pcs LED tubes without diffuser or listed surface mounted lighting fixture AL-TU18，AL-TU-18-2, OHHF0001,OHHF0002 manufacture by Shenzhen Ohmax Optoelectronic Lighting Co., Ltd. the distance between the lampholder is suitable for the LED tubes.

Shall include below warning:
Sentence "This device is not intended for use with emergency exit fixtures or emergency exit lights."
NE CONVIENT PAS AUX SORTIES DE SECOURS.

WARNING – Risk of fire or electric shock. LED Retrofit Kit installation requires knowledge of luminaires electrical systems. If not qualified, do not attempt installation. Contact a qualified electrician

WARNING – Risk of fire or electric shock. Install this kit only in the luminaires that have the construction features and dimensions shown in the photographs and/or drawings.

Do not make or alter any open holes in an enclosure of wiring or electrical components during kit installation.
Disconnect power before installing or removing operation.
Other warning will not lead to missuse.

Note:

Equivalent french version shall be provided

8.0 Test Summary					
Evaluation Period	27-Aug-2014 to 24-Dec-2014			Project No.	140827050GZU
Sample Rec. Date	27-Aug-2014	Condition	Prototype	Sample ID.	S140827050-001~006
Test Location	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China				
Test Procedure	Testing Lab				
Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.					
The following tests were performed:					

Test Description	UL1993 (4th ed., Dec.4, 2012)/ Clause	CSA C22.2 No.1993-12 (2nd ed., Dec.4, 2012/ Clause	UL1598C (1st ed., Jan. 16, 2014)/ Clause
Input Measurements Test	8.2 & SA8.2	8.2 & SA8.2	--
Leakage Current Test	8.4 & SA8.4	8.4 & SA8.4	--
Temperature Test	8.5 & SA8.5	8.5 & SA8.5	--
Dielectric Voltage-Withstand Test	8.6& SA8.6	8.6& SA8.6	--
Drop Test	8.8& SA8.8	8.8& SA8.8	--
Mold-Stress Relief Conditioning	8.9& SA8.9	8.9& SA8.9	--
Deflection Test	8.10& SA8.10	8.10& SA8.10	--
Test Of Dimmer Circuits	8.12.3 & SA8.12	8.12.3 & SA8.12	--
Risk Of Electric Shock - Relamping	SA8.19	SA8.19	--
Isolation Of Lamp Pins	SA8.20	SA8.20	--
Misapplication Of Lamp Supply Connections	SA8.21	SA8.21	--
Test Description	UL 496 (13th ed., rev. Nov. 25, 2013)/ Clause	CSA C22.2 No. 43-08(rev. Nov. 25, 2013)/ Clause	--
Mechanical Strength of Screwshell And Screw Base	5.2.3	5.2.3	--
Test Description	UL8750 (1st ed., rev. May. 22, 2014)/ Clause	CSA C22.2 No. 250.13-14(Jul. 1, 2014)/ 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	--

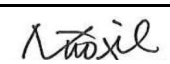
8.0 Test Summary					
Evaluation Period	30-Dec-2015 to 9-Oct-2016			Project No.	151230042GZU
Sample Rec. Date	30-Dec-2015	Condition	Prototype	Sample ID.	S151230042-001~004
Test Location	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China				
Test Procedure	Testing Lab				
Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.					
The following tests were performed:					

Test Description	UL 1993 Issued: 2012/12/04 Ed:4 Self-Ballasted Lamps and Lamp Adapters/ Clause	CSA C22.2 No. 1993 Issued: 2012/12/04 Ed: 2 Self-Ballasted Lamps and Lamp Adapters/ Clause	UL 1598C Issued: 2014/01/16 Ed: 1 Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits/ Clause
Input Measurements Test	8.2 & SA8.2	8.2 & SA8.2	--
Leakage Current Test	8.4 & SA8.4	8.4 & SA8.4	--
Temperature Test	8.5 & SA8.5	8.5 & SA8.5	--
Dielectric Voltage-Withstand Test	8.6& SA8.6	8.6& SA8.6	--
Humidity Conditioning	8.13& SA8.13	8.13& SA8.13	--

Test Description	UL8750 (1st ed., rev. May. 22, 2014)/ Clause	CSA C22.2 No. 250.13-14(Jul. 1, 2014)/ 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	--
Humidity Exposure Test	8.12.1	9.12.1	--

8.1 Signatures

A representative sample of the product covered by this report has been evaluated and found to comply with the applicable requirements of the standards indicated in Section 1.0 with regard to the risks of fire, electric shock, flammability, mechanical hazards and suitability for use in flammable atmospheres, otherwise known as classified locations only. The risks associated with the other properties of this product have not been investigated.

Completed by:	Nico Xie	Reviewed by:	Gerry Wu
Title:	Engineer	Title:	Assistant Manager
Signature:		Signature:	

9.0 Correlation Page For Multiple Listings

The following products, which are identical to those identified in this report except for model number and Listee name, are authorized to bear the ETL label under provisions of the Intertek Multiple Listing Program.

BASIC LISTEE	Shenzhen Ohmax Optoelectronic Lighting Co., Ltd
Address	No. 132, Fuxing Street, Hehua Community, Pinghu Subdistrict, Longgang District, Shenzhen, Guang Dong
Country	China
Product	LED tube light

MULTIPLE LISTEE 1	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 1 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 2	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 2 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 3	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 3 MODELS	BASIC LISTEE MODELS

10.0 General Information

The Applicant and Manufacturer have agreed to produce, test and label ETL Listed products in accordance with the requirements of this Report. The Manufacturer has also agreed to notify Intertek and to request authorization prior to using alternate parts, components or materials.

COMPONENTS

Components used shall be those itemized in this Intertek report covering the product, including any amendments and/or revisions.

LISTING MARK

The ETL Listing mark applied to the products shall either be separable in form, such as labels purchased from Intertek, or on a product nameplate or other media only as specifically authorized by Intertek. Use of the mark is subject to the control of Intertek.

The mark must include the following four items:

1) applicable country identifiers "US" and/or "C" or "US", "C" and "EU"
2) the word "Listed" or "Classified" or "Recognized Component" (whichever is appropriate)
3) a control number issue by Intertek
4) a product descriptor that identifies the standards used for certification. Example:

For US standards, the words, “Conforms to” shall appear with the standard number along with the word, “ Standard” or “Std.” Example: “Conforms to ANSI/UL Std. XX.”

For Canadian standards, the words “Certified to CAN/CSA Standard CXX No. XX.” shall be used, or abbreviated, “Cert. to CAN/CSA Std. CXX No. XX.”

Can be used together when both standards are used.

Note: A facsimile must be submitted to Intertek, Attn: Follow-up Services for approval prior to use. The facsimile need not have a control number. A control number will be issued **after signed Certification Agreements** have been received by the Follow-up Services office, approval of the facsimile of your proposed Listing Mark, satisfactory completion of the Listing Report, and scheduling of a factory assessment in your facility.

MANUFACTURING AND PRODUCTION TESTS

Manufacturing and Production Tests shall be performed as required in this Report.

FOLLOW-UP SERVICE

Periodic unannounced audits of the manufacturing facility (and any locations authorized to apply the mark) shall be scheduled by Intertek. An audit report shall be issued after each visit. Special attention will be given to the following:

1. Conformance of the manufactured product to the descriptions in this Report.
2. Conformance of the use of the ETL mark with the requirements of this Report and the Certification Agreement.
3. Manufacturing changes.
4. Performance of specified Manufacturing and Production Tests.

In the event that the Intertek representative identifies non-conformance(s) to any provision of this Report, the Applicant shall take one or more of the following actions:

1. Correct the non-conformance.
2. Remove the ETL Mark from non-conforming product.
3. Contact the issuing product safety evaluation center for instructions.

10.1 Evaluation of Unlisted Components

Because Unlisted Components are uncontrolled, and they do not fall under a third party follow up program, Intertek may require these components to be tested and/or evaluated at least once annually, more often for certain components, as part of the independent certification process. The Unlisted Components in Section 5.0 require testing and/or evaluation as indicated.

Note to Intertek Follow Up Inspector: The Component Evaluation Center, CEC, will notify you in writing when these components must be selected and sent to the CEC for re-evaluation

Ship the samples to:
Intertek Testing Services Shenzhen Limited Guangzhou Branch
ETL Component Evaluation Center
Block E, No. 7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City

CETDD Guangzhou, China.
Attn: Ms. Joey Kuang
Sample Disposition: Due to the destructive nature of the testing, all samples will be discarded at the conclusion of testing unless, the manufacturer specifically requests the return of the samples. The request for return must accompany the initial component shipment.

11.0 Manufacturing and Production Tests

The manufacturer agrees to conduct the following Manufacturing and Production Tests as specified:

Required Tests

Dielectric Voltage Withstand Test

11.1 Dielectric Voltage Withstand Test

Method:

The device may be in a heated or unheated condition for the test.

The test is to be conducted when the device is fully assembled. It is not intended that the product be unwired, modified, or disassembled for the test.

Exception: The test may be performed before final assembly if the test represents that for the completed product.

A device employing a solid-state component that is not relied upon to reduce a risk of electric shock and that can be damaged by the dielectric potential may be tested before the component is electrically connected provided that a random sampling of each day's production is tested. The circuitry may be rearranged for the purpose of the test to reduce the likelihood of solid-state-component damage while retaining representative dielectric stress of the circuit.

The test equipment shall include a transformer having an essentially sinusoidal output, a means of indicating the test potential, an audible or visual indicator of electrical breakdown, and either a manually reset device to restore the equipment after electrical breakdown or an automatic reject feature of any unacceptable unit.

Test Equipment:

If the output of the test equipment transformer is less than 500 volt-amperes, the equipment shall include a voltmeter in the output circuit to directly indicate the test potential.

If the output of the test equipment transformer is 500 volt-amperes or larger, the test potential may be

indicated:

a) By a voltmeter in the primary circuit or in a tertiary-winding circuit,

b) By a selector switch marked to indicate the test potential, or

c) For equipment having a single test-potential output, by a marking in a readily visible location to indicate the test potential. When marking is used without an indicating voltmeter, the equipment shall include a positive means, such as an indicator lamp, to indicate that the manually reset switch has been reset following a dielectric breakdown.

Test equipment other than that described above may be used if found to accomplish the intended factory control.

All test equipment shall be maintained in current calibration.

Test Records:

Test records shall be retained for a period of at least six months, and shall include test quantity, test dates, catalog or model numbers, test results, and disposition of any non-complying products.

11.1 Dielectric Voltage Withstand Test

Products Requiring Dielectric Voltage Withstand Test:

Each device shall withstand without electrical breakdown, as a routine production-line test, the application a potential between current-carrying parts of the supply circuit and accessible dead metal as below:

Condition	Application time, seconds	Applied potential	
		40 – 70 hertz	DC
A	60	1240	1754
B	1	1488	2104

Note: The test is to be in accordance with either condition A or B of Table.

12.0 Revision Summary

The following changes are in compliance with the declaration of Section 8.1:

Date/ Proj # Site ID	Project Handler/ Reviewer	Section	Item	Description of Change
9-Oct-2016	Nico Xie/	1.0	--	Added revision date. Changed the desription of UL standard from "Self-Ballasted Lamps and Lamp Adapters - UL1993 (4th ed., Dec. 4, 2012)" to "UL 1993 Issued: 2012/12/04 Ed:4 Self-Ballasted Lamps and Lamp Adapters". Changed the desription of CSA standard from "Self-Ballasted Lamps and Lamp Adapters - CSA C22.2 No.1993-12 (2nd ed., Dec.4, 2012)" to "CSA C22.2 No. 1993 Issued: 2012/12/04 Ed: 2 Self-Ballasted Lamps and Lamp Adapters". Changed the desription of UL standard from "Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits - UL1598C (1st ed., Jan. 16, 2014)" to "UL 1598C Issued: 2014/01/16 Ed: 1 Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits".
151230042GZU	Gerry Wu	2.0	--	Changed the use location from "dry location" to "dry or damp location location" in the Description column. Added new model OH-GL-022. Revised the describtion of Model Similarity. Revised rating of model OH-GL-021 from "18W, Max. 0.22A" to "36W, Max. 0.35A". Added rating of new model OH-GL-022.
		3.0	3&4	Deleted "OH-GL-021" in the title.
			5&6	Added new photos for model OH-GL-022 and OH-GL-021.
		4.0	6	Added "for model OH-GL-029" in the technical data.
			14	Added new component "LED II" for new model OH-GL-022 and OH-GL-021.
		7.0	1	Changed the use location of Label A from "USE IN DRY LOCATION ONLY" to "SUITABLE FOR DAMP LOCATIONS" and its French version.
			1a &1b	Nothing change, rearranged label B and C.
		8.0	--	Added Re-evaluation summary. Re-approved.
		12.0	--	Added the revision summary.