

File E207943
Project 4788589820

August 10, 2018
REPORT

on

Component - Audio/Video, Information and Communication Technology Equipment

INNOLUX CORP
MIAOLI HSIEN, TAIWAN

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UL TEST REPORT AND PROCEDURE

Standard:	UL 62368-1, 2nd Edition, 2014-12-01 (Audio/video, Information and Communication Technology Equipment - Part 1: Safety Requirements) CSA C22.2 No. 62368-1-14, 2nd Edition, 2014-12 (Audio/video, Information and Communication Technology Equipment - Part 1: Safety Requirements)
Certification Type:	Recognized Component
CCN:	AZOT2, AZOT8 (Components – Audio/Video, Information and Communication Technology Equipment - Component)
Product:	LCD Module
Model:	1) G156BGE-LXX, G156HCE-LXX (X can be 0-9, A-Z or blank for marketing purpose and no impact safety related critical components and constructions) 2) AC156GA01
Rating:	(optional) 5.5Vdc max., 0.32A max. (For LCD Panel with control board); 13.2Vdc max, 1A max. (For DC/DC Converter board); 3.6Vdc max., 1.5A max. (For LCD Panel with DD Converter circuit control board A, C) 5.5Vdc max., 0.32A max. (For LCD Panel with DD Converter circuit control board B)
Applicant Name and Address:	INNOLUX CORP 160 KESYUE RD JHUNAN SCIENCE PARK MIAOLI HSIEN 350 TAIWAN

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

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UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of this page through to the end of the Engineering Conditions of Acceptability.

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Prepared by: Max Ma

Reviewed by: Daniel Hsueh

Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
 - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
- C. Listing Mark/Recognized Component Mark Data Page - details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

The equipment under test (EUT) is a building-in type LCD Module supplied by ES1, intended to build into audio/video, information and communication technology equipment. Electric components are mounted on PWB incorporated with a 15.6 inch TFT-LCD panel with a LED backlight unit and panel control board.

Model Differences

All models are identical to each other except for model designation.

Test Item Particulars (NOT FOR FIELD REPRESENTATIVE'S USE)

- Classification of installation and use by: ☒ Ordinary person ☐ Instructed person
☐ Skilled person
- Supply Connection: ☐ pluggable equipment ☐ type A ☐ type B
☐ permanent connection
☐ detachable power supply cord
☐ non-detachable power supply cord
☒ not directly connected to the mains
- Equipment mobility: ☐ movable ☐ hand-held ☐ transportable
☐ stationary ☒ for building-in ☐ direct plug-in
☐ rack-mounting ☐ wall-mounted
- Over voltage category (OVC): ☐ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV
☒ other: not directly connected to the mains, to be evaluated at the end use
- Fundamental Frequency: ☐ 50/60 Hz ☐ 50 Hz ☐ 60 Hz ☒ other: N/A
- Class of equipment: ☐ Class I ☐ Class II ☒ Class III
☐ Not classified, to be evaluated at the end use
☐ Class II with functional earthing
- Access location: ☐ restricted access location ☒ N/A
- Pollution degree (PD): ☐ PD 1 ☒ PD 2 ☐ PD 3
- IP protection class: ☒ IP X0 ☐ IP ____
- Tested for IT power systems: ☐ Yes ☒ No
- IT testing, phase-phase voltage (V): ☐ ____ ☒ N/A
- Altitude during operation (m): ☒ Up to 2,000 ☐ Up to 5,000
- Altitude of test laboratory (m): ☒ Less than 2,000 ☐ Approximately ____

Mass of equipment (kg): 0.19 kg

Technical Consideration (NOT FOR FIELD REPRESENTATIVE'S USE)

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: 60°C (excluding DD converter circuit control board C), 85°C (only for DD converter circuit control board C).
- The unit is intended for build-in and supplied by a d.c. source (ES1 and PS3) which is separated from a.c. mains by double or reinforced insulation.
- LEDs provided in the product are considered low power devices: Yes

[X] Engineering Conditions of Acceptability (NOT FOR FIELD REPRESENTATIVE'S USE)

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- Safeguards for electrically-caused injury (for ES), electrically-caused fire (for PS), mechanical caused injury (for MS) and thermal burn injury (for TS) should be considered and evaluated in end product investigation.
- The accessibility for ordinary person shall be evaluated in the end product.
- The suitable Symbol/Markings/Instruction and Manual should be evaluated in end product investigation.
- The Input and Heating Test shall be conducted in the end-use product.

Additional Information

N/A

Additional Standard

The product fulfils the requirements of:

N/A

Markings, instructions and instructional safeguards						
Clause Title		Marking or Instruction Details				
		English			French	
Equipment identification marking – Manufacturer identification		Listee's or Recognized company's name, Trade Name, Trademark or File Number				
Equipment identification marking – model identification		Model Number				
Special Instructions to UL Representative						
N/A						
Production-Line Testing Requirements						
<u>Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.</u>						
Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
N/A						
<u>Earthing Continuity Test Exemptions - This test is not required for the following models:</u>						
All Models in this report						
<u>Electric Strength Test Exemptions - This test is not required for the following models:</u>						
All Models in this report						
<u>Electric Strength Test Component Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test:</u>						
N/A						
<u>Sample and Test Specifics for Follow-Up Tests at UL</u>						
Model	Component	Material	Test	Sample(s)		Test Specifics
N/A						

4.1.2	TABLE: list of critical components					Pass
Object/part or Description	Manufacturer/ trademark	type/model	technical data	Product Category CCN(s)	Required Marks of Conformity	Supplement ID
01. LCD Panel	Interchangeable	Interchangeable	15.6 inch, TFT- LCD, LED Backlight	--	--	
02. Printed Wiring Board (excluding DD converter circuit control board C)	Interchangeable	Interchangeable	V-1 minimum, 90 degree C. minimum	ZPMV2	UL	
02a. Alternate Printed Wiring Board (only for DD converter circuit control board C)	Interchangeable	Interchangeable	V-1 minimum, 105 degree C minimum	ZPMV2	UL	
03. Flexible Printed Wiring (optional)	Interchangeable	Interchangeable	Rated V-2 minimum or VTM-2 minimum, when no components mounted on surface; If components mounted on surface, it should be minimum V-1 or VTM-1.	ZPKX2, ZPMV2	UL	
03a. Plastic Material of Flexible Printed Wiring (Alternate)(optional)	Interchangeable	Interchangeable	Rated V-2 minimum or VTM-2 minimum, when no components mounted on surface.	QMFZ2, QMTS2	UL	
04. Internal Plastic (Frame)	Interchangeable	Interchangeable	Rated V-2 minimum or VTM-2 minimum.	QMFZ2, QMTS2	UL	
04a. Internal Plastic (Frame) (alternate)	--	--	Flammability level is ignored, when small parts (4g max. or 1750mm ³ max.) are separated from electrical parts (other than insulated wires and cables) by at least 13 mm of air or by a solid barrier of V-0 or VTM-0 class material	--	--	
05. Connectors and Receptacles (secondary ES1 circuits)	Interchangeable	Metal / Plastic	Copper alloy pins housed in bodies of plastic rated V-2 min. or VTM-2 min.	QMFZ2	UL	

05a. Connectors and Receptacles (secondary ES1 circuits) (Alternate)	Interchangeable	Interchangeable	--	ECBT2	UL	
05b. Connectors and Receptacles (secondary ES1 circuits) (alternate)	Interchangeable	Interchangeable	Flammability level is ignored, when small parts (4g max. or 1750mm ³ max.) are mounted on V-1 or VTM-1 class material	--	--	
05c. Connectors and Receptacles (secondary ES1 circuits) (alternate)	Interchangeable	Interchangeable	Flammability level is ignored, when small parts (4g max. or 1750mm ³ max.) are separated from electrical parts (other than insulated wires and cables) by at least 13 mm of air or by a solid barrier of V-0 or VTM-0 class material	--	--	
06. Module Label (excluding DD converter circuit control board C)	Interchangeable	Interchangeable	65 degree C if maximum Surface temperature no specified.	PGDQ2, PGJI2	UL	
06a. Alternate Module Label (excluding DD converter circuit control board C)	Interchangeable	Interchangeable	100 degree C if maximum Surface temperature no specified.	PGDQ2, PGJI2	UL	
07. DD converter circuit control board A (optional)	INNOLUX / MITSUBISHI ELECTRIC	AC156GA01 / G156BGE-L02	13.2 Vdc max., 1.05A max.	--	--	

ENCLOSURES

<u>Type</u>	<u>Supplement Id</u>	<u>Description</u>
Photographs	01	Overall View-01
Photographs	02	Overall View-02
Photographs	03	Internal view with converter board-01
Photographs	04	Internal view with converter board-02
Photographs	05	Control board A -01
Photographs	06	Control board A -02
Photographs	07	DC/DC Converter board views-01
Photographs	08	DC/DC Converter board views-02
Photographs	09	DC/DC Converter board views-03
Photographs	10	DC/DC Converter board views-04
Photographs	11	Overall views with DC/DC converter circuit control board A-01
Photographs	12	Overall views with DC/DC converter circuit control board A-02
Photographs	13	Internal view with DC/DC converter circuit control board A
Photographs	14	DC/DC converter circuit control board A views-01
Photographs	15	DC/DC converter circuit control board A views-02
Photographs	16	Overall views with DD converter circuit control board B-01
Photographs	17	Overall views with DD converter circuit control board B-02
Photographs	18	Internal view with DD converter circuit control board B-01
Photographs	19	Internal view with DD converter circuit control board B-02
Photographs	20	DD converter circuit control board B views-01
Photographs	21	DD converter circuit control board B views-02
Photographs	22	Overall views with Control board B views-01
Photographs	23	Overall views with Control board B views-02
Photographs	24	Internal view with Control board B views
Photographs	25	Control board B views-01
Photographs	26	Control board B views-02
Photographs	27	Overall views with DD converter circuit control board C-01
Photographs	28	Overall views with DD converter circuit control board C-02
Photographs	29	Internal view with DD converter circuit control board C
Photographs	30	DD converter circuit control board C views-01
Photographs	31	DD converter circuit control board C views-02

TEST RECORD NO. 1

SAMPLES:

The manufacturer submitted representative production samples of LCD Module, Models 1) G156BGE-LXX, G156HCE-LXX (X can be 0-9, A-Z or blank for marketing purpose and no impact safety related critical components and constructions), AC156GA01.

GENERAL:

Unless otherwise noted, all tests were not considered necessary based upon previous evaluation under the CB scheme. The CB Scheme Test Certificate Ref. No. DK-75528-UL and DK-75529-UL, dated 2018-08-07, and Report Ref. No. CB180712-02-A0, dated 2018-08-02 was prepared by UL International Demko A/S.

The Construction Review Datasheets were not considered necessary, since the construction review had completed during the CB certification.

The following tests were waived:

Test	Rationale for Waiving
Input test (B.2.5)	Refer to CB report
Temperature tests (5.4.1.4, 6.3.2, 9.0, B.2.6)	Refer to CB report

The following supplements are provided as a part of this Test Record. NOTE: These supplements are only available to the Applicant via the CDA system.

Type	Supplement Id	Description
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Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the U.S. and Canadian (Bi-National) Standard for Safety of Audio/video, information and communication technology equipment - Part 1: Safety requirements CSA C22.2 No. 62368-1-14, 2nd Edition, 2014-12 and UL 62368-1, 2nd Edition, 2014-12-01 (Audio/video, Information and Communication Technology Equipment - Part 1: Safety Requirements) and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

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

CONCLUSION

Samples of the product covered by this Report have been found to comply with the requirements covering the category and the product is found to comply with UL's applicable requirements. The description and test result in this Report are only applicable to the sample(s) investigated by UL and does not signify UL certification or that the product(s) described are covered under UL's Follow-Up Service Program. When covered under UL's Follow-Up Service Program, the manufacturer is authorized to use the Certification Mark of UL on such products which comply with UL's Follow-Up Service Procedure and any other applicable requirements of UL LLC. The Certification Mark of UL on the product, or the UL symbol on the product and the Certification Mark of UL on the smallest unit container in which the product is packaged, is the only method to identify products investigated by UL to published requirements and manufactured under UL's Listing and Follow-Up Service.

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