

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	NWQQ2, NWQQ8 (Information Technology Equipment Including Electrical Business Equipment)
Product:	TFT-LCD Module
Model:	LM230WF2, LM230WF3, LM230WF6 , LM230WFA
Rating:	Rated Input : 12.0 Vdc, Max 0.825 A or 5Vdc, Max. 1.770 A .
Applicant Name and Address:	LG DISPLAY CO LTD 642-3 JINPYOUNG-DONG GUMI CITY KYOUNGSANGBUK-DO 730-726 KOREA

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

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

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

Prepared by: HyunJae Im

Reviewed by: InYoung Hwang

Supporting Documentation

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

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

Product Description

Component, Color Active Matrix Liquid Crystal Display with an integral Cold Cathode Fluorescent Lamp (CCFL) backlight system or Color Active Matrix Liquid Crystal Display Light Emitting Diode (White LED) backlight system without LED driver(23 inch)

Model Differences

LM230WF3, LM230WF6 and LM230WFA are identical to LM230WF2 except for model designation, input rating and BLU type.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : N/A
- Operating condition : continuous
- Access location : N/A
- Over voltage category (OVC) : N/A
- Mains supply tolerance (%) or absolute mains supply values : N/A
- Tested for IT power systems : N/A
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class III (supplied by SELV)

- Considered current rating (A) : N/A
- Pollution degree (PD) : 2
- IP protection class : IP X0
- Altitude of operation (m) : Up to 2000m
- Altitude of test laboratory (m) : N/A
- Mass of equipment (kg) : Approximately 3 kg
- Control Board shall be considered in the end-use product.
- Tma shall be considered in the end-use product.

Engineering Conditions of Acceptability

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

- The power supply terminals and/or connectors are: Not investigated for field wiring
- The investigated Pollution Degree is: 2
- The following end-product enclosures are required: Mechanical , Fire , Electrical

Additional Information

Original (09CA18494)

1) Construction Review Only.

Reissue(10CA11737)

1. Upgrade report from UL 60950-1 1st edition to UL 60950-1 2nd edition
2. Add model name LM230WF3
3. Add the current rating of fuse by AEM and Littelfuse

10CA35381

1. Alternate current rating of LM230WF3; 5Vdc , 975mA max.

Project(10CA50378)

1. Add model name ; LM230WF6

Project(11CA05054)

1. Add model name ; LM230WFA

2. Deletion in critical component list
- Top/Side Metal cover
 - Connector(MECH) by POLYPLASTICS CO LTD
 - Light Guide Panel
3. Addition in critical component list
- Case Top, Cover Bottom
 - Wire by LTK WIRING CO LTD
4. Change current rating ; 5Vdc, 975mA max. to 5Vdc, 1045mA

Revision(11CA63783)

1. Changed input current for 5 Vdc, Max. 1.320 A.
2. Revised critical components list including as:
- a) Addition of Connector(MECH), Optional, Type Series SHJ by Japan Solderless, type H108K, H401K, 3703K by Energy Industrial and Type Series FN100-Z08B-C22 by UJU Electronics.

Revision(12CA39540)

- 1) Changed Input rating - from (12.0 Vdc, Max. 0.825 A or 5 Vdc, Max. 1.320 A) to (12.0 Vdc, Max. 0.825 A or 5 Vdc, Max. 1.770 A)
- 2) Alternate Fuse - Cooper Bussmann L L C, Type CC06MxxA, rated 32 Vdc, 2.0 or 2.5 or 3.0 A, Additional rating of Fuse - AEM COMPONENTS (SUZHOU) CO LTD, rated 32 Vdc, 2.5 A; LITTELFUSE INC, rated 125 Vdc, 5.0 A
- 3) Alternate Connector(MECH) - UJU ELECTRONICS CO LTD, Type HS100-L08N-N62-A, HS100-L08N-N62; LS MTRON LTD, Type GT108-6P, Additional Type of Connector(MECH) - JAPAN SOLDERLESS TERMINAL MFG CO LTD, Type SFM; MOLEX INCORPORATED, Type 104122
- 4) Add Volume X3

Additional Standards

The product fulfills the requirements of: N/A

Markings and instructions

Clause Title	Marking or Instruction Details
1.7.1 Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
1.7.1 Power rating - Model	Model Number

Special Instructions to UL Representative

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

TABLE: List of Critical Components

Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
LCD Panel	LG DISPLAY CO LTD	-	23.0 inch. - Screen Size : Overall 509 by 286 mm. - Composed of several parts. Panel surface consists of two sheets of glass. Polarizer films are attached on each surface. The space between two sheets of glass are filled with Liquid Crystal.	-	-
Case Top	Various	Various	Constructed of metallic of object with perforations.	-	-
Cover Bottom	Various	Various	Constructed of metallic of object with perforations.	-	-
Lamp(Backlight) (optional)	Various	Various	Includes CCFL (Cold Cathode Fluorescent Lamp). Rated Max. 1020rms (Lamp start-up voltage : Max. 1350Vrms at 25 degree C), Max. 9.0mA.	-	-
LED (Light Emitting Diode) (optional)	Various	Various	Rated Max 3.4V / Max. 160mA	-	-
Connector(MECH) (optional)	JAPAN SOLDERLESS TERMINAL MFG CO LTD(E60389)	Type Series SHJ, H, Series BD, BDB, BH, BHS, BHT, PA, PH, SFG, SFM Type F, Series FH	-	ECBT2	USR
Connector(MECH)_Alternate. (optional)	TYCO ELECTRONICS CORP(E28476)	AMP Back Light Connector Series	-	ECBT2	USR
Connector(MECH)_Alternate. (optional)	YEON HO ELECTRONICS CO LTD(E108706)	12505HS, 20015HS, 35001HS, Series 12507 / 130001WR / 20010WR / 20022WR / 65002	-	ECBT2	USR
Connector(MECH)_Alternate. (optional)	MOLEX INCORPORATED(E29179)	104047, 104099, 104105, 104122	-	ECBT2	USR

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Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
Connector(MECH)_Alternate. (optional)	C-NET CO LTD(E300857)	1004 Series, 1006 Series	-	ECBT2	USR
Connector(MECH)_Alternate. (optional)	ENTERY INDUSTRIAL CO LTD (E185177)	H108K, H401K, 3703K	-	ECBT2	USR
Connector(MECH)_Alternate. (optional)	UJU ELECTRONICS CO LTD (E236044)	Series FN100-Z08B-C22	-	ECBT2	USR
Connector(MECH)_Alternate. (optional)	UJU ELECTRONICS CO LTD (E351077)	HS100-L08N-N62-A, HS100-L08N-N62	-	ECBT2	USR
Connector(MECH)_Alternate. (optional)	LS MTRON LTD (E136083)	GT108-6P	-	ECBT2	USR
Wire (optional)	LS CABLE LTD(E52853) or SUMITOMO ELECTRIC INDUSTRIES LTD(E41105) or KURABE INDUSTRIAL CO LTD(E46702) or DERYOOK TECHNOLOGY CO LTD(E215232) or NISSEI ELECTRIC CO LTD(E56198)	Style 3239	Rated Max 6KV, AWG# 22-28, VW-1 Marked	AVLV2	USR
Wire_Alternate. (optional)	LS CABLE LTD(E52853) or SUMITOMO ELECTRIC INDUSTRIES LTD(E41105) or KURABE	Style 3443	Rated 300 V, AWG# 22-28, VW-1 Marked	AVLV2	USR

Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
	INDUSTRIAL CO LTD(E46702) or DERYOOK TECHNOLOGY CO LTD(E215232)				
Wire_Alternate. (optional)	LS CABLE LTD(E52853) or SUMITOMO ELECTRIC INDUSTRIES LTD(E41105) or KURABE INDUSTRIAL CO LTD(E46702) or DERYOOK TECHNOLOGY CO LTD(E215232)	Style 3633	Rated 3 KV, AWG# 22-28, VW-1 Marked	AVLV2	USR
Wire_Alternate. (optional)	LS CABLE LTD(E52853) or SUMITOMO ELECTRIC INDUSTRIES LTD(E41105) or KURABE INDUSTRIAL CO LTD(E46702) or DERYOOK TECHNOLOGY CO LTD(E215232)	Style 3656	Rated 300 V, AWG# 22-28, VW-1 Marked	AVLV2	USR
Wire_Alternate. (optional)	LS CABLE LTD(E52853) or SUMITOMO ELECTRIC INDUSTRIES	Style 3688	Rated 3 KV, AWG# 22-28, VW-1 Marked	AVLV2	USR

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Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
	LTD(E41105) or KURABE INDUSTRIAL CO LTD(E46702) or DERYOOK TECHNOLOGY CO LTD(E215232)				
Wire_Alternate. (optional)	LS CABLE LTD(E52853) or SUMITOMO ELECTRIC INDUSTRIES LTD(E41105) or KURABE INDUSTRIAL CO LTD(E46702)	Style 3691	Rated 6 kV, AWG# 22-28, VW-1 Marked	AVLV2	USR
Wire_Alternate. (optional)	SUMITOMO ELECTRIC INDUSTRIES LTD(E41105) or KURABE INDUSTRIAL CO LTD(E46702)	Style 10353	Rated 3 kV, AWG# 22-28, VW-1 Marked	AVLV2	USR
Wire_Alternate. (optional)	LS CABLE LTD(E52853) or SUMITOMO ELECTRIC INDUSTRIES LTD(E41105) or KURABE INDUSTRIAL CO LTD(E46702) or DERYOOK TECHNOLOGY CO	Style 10368	Rated 300 V, AWG# 22-28, VW-1 Marked	AVLV2	USR

Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
	LTD(E215232)				
Wire_Alternate. (optional)	LTK WIRING CO LTD (E148000)	Style 21016	Rated 300V, AWG# 22-28, VW-1 Marked	AVLV2	USR
Guide Panel	Various	Various	Rated V-0	QMFZ2	USR
Holder Lamp(H, G) (optional)	Various	Various	Rated V-0	QMFZ2	USR
Holder Lamp(M) (optional)	Various	Various	Rated Min. HB	QMFZ2	USR
LED FPC(or PCB) (optional)	Various	Various	Rated V-0	ZPMV2 or ZPKX2	USR
Fuse	AEM COMPONENTS (SUZHOU) CO LTD (E232989)	F1206SB/ F0603FA/ F0603HI/F1206F A	Rated 63 Vdc, 1.5 or 2.0 A or 32 Vdc, 2.5 A / 32 Vdc, 1.0 or 1.5 or 2.0 or 2.5 or 3.0 or 3.5 A / 32 Vdc, 1.0 or 1.5 or 2.0 or 2.5 or 3.0 A / 63 Vdc, 1.0 or 1.5 A respectively	JDYX2	USR
Fuse_Alternate.	LITTELFUSE INC (E10480)	Series 452/466/468	Rated 125 Vdc, 2.0 or 2.5 or 3.0 A or 5.0 A / 63 Vdc, 2.0 A / 63 Vdc, 1.0 or 1.5 or 2.0 or 2.5 A or 32 Vdc, 3.0 A respectively	JDYX2	USR
Fuse_Alternate.	PANASONIC CORPORATION, PANASONIC CORPORATION OF NORTH AMERICA (E194052)	ERBSE	Rated 32 Vdc, 1.5 A	JDYX2	USR
Fuse_Alternate.	COOPER BUSSMANN L L C (E19180)	CC06MxxA	Rated 32 Vdc, 2.0 or 2.5 or 3.0 A respectively	JDYX2	USR
Fuse_Alternate.(Thermistor-type Devices)	TYCO ELECTRONICS CORP (E74889)	miniSMDC050/ miniSMDC075/ miniSMDC110/ miniSMDC150	Rated 24 Vdc, 0.5 A / 13.2 Vdc, 0.75 A / 8 Vdc, 1.1 A / 6 Vdc, 1.5 A respectively	XGPU2	USR
PCB	Various	Various	Rated V-0	ZPMV2	USR

Enclosures

<u>Type</u>	<u>Supplement Id</u>	<u>Description</u>
Photographs	3-01	Front View_LM230WF2
Photographs	3-02	Rear View -1_LM230WF2
Photographs	3-04	Rear View -2_LM230WF2
Photographs	3-05	Front View_LM230WF6
Photographs	3-06	Rear View_1 _ LM230WF6
Photographs	3-07	Rear View_2 _ LM230WF6
Photographs	3-08	Front View_LM230WFA
Photographs	3-09	Rear View_1_LM230WFA
Photographs	3-10	Rear View_2_LM230WFA
Photographs	3-11	Front View_LM230WF3
Photographs	3-12	Rear View_LM230WF3
Diagrams		
Schematics + PWB		
Manuals		
Miscellaneous	7-01	Label_LM230WF2
Miscellaneous	7-02	LCD Panel Spec_LM230WF2
Miscellaneous	7-06	Label_LM230WF3
Miscellaneous	7-08	Label_LM230WF6
Miscellaneous	7-09	LCD Panel Spec _ LM230WF6
Miscellaneous	7-10	LED Spec
Miscellaneous	7-11	LCD Spec_LM230WFA
Miscellaneous	7-12	Label_LM230WFA
Miscellaneous	7-13	Spec-LM230WF3
Miscellaneous	7-14	LCD Panel Spec_LM230WF3