



Ref. Certif. No.

SG-OF-05371M1

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST
CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE)
CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE
CERTIFICATS D'ESSAIS DES EQUIPEMENTS
ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE CERTIFICAT D'ESSAI OC

Product
Produit

Module
(23.0 inch TFT-LCD Module)

Name and address of the applicant
Nom et adresse du demandeur

LG Display Co., Ltd.
642-3, Jinpyoung-Dong
Kumi-City, Kyoubuk 730-726, REPUBLIC OF KOREA

Name and address of the manufacturer
Nom et adresse du fabricant

LG Display Co., Ltd., 642-3, Jinpyoung-Dong, Kumi-City, Kyoubuk
730-726, REPUBLIC OF KOREA

Name and address of the factory
Nom et adresse de l'usine

LG Display Co., Ltd., 642-3, Jinpyoung-Dong, Kumi-City, Kyoubuk
730-726, REPUBLIC OF KOREA
For further information please see attachment

Rating and principal characteristics
Valeurs nominales et caractéristiques principales

Rated input: 5 V d.c., Max. 1.320 A or
12 V d.c., Max. 0.825 A
Protection class: III

Trade mark (if any)
Marque de fabrique (si elle existe)

LG Display

Model/type Ref.
Ref. de type

LM230WF3, LM230WF6, LM230WFA

Additional information (if necessary)
Information complémentaire (si nécessaire)

When installing, all requirements of below mentioned standards must be fulfilled.

A sample of the product was tested and found
to be in conformity with
Un échantillon de ce produit a été essayé et a été
considéré conforme à la

IEC 60950-1:2005

as shown in the Test Report Ref. No.
which form part of this certificate
comme indiqué dans le Rapport d'essais numéro
de référence qui constitue une partie de ce
certificat

TÜV SÜD PSB Pte Ltd
077-204381-100

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

Date, 2012-01-03
CBS 12 01 66271 556

(Michael Yu)



PSB Singapore

TÜV SÜD PSB Pte Ltd · 1 Science Park Drive · Singapore 118221

CB Certificate Ref. No. SG-OF-05371M1**Additional factory information**

Name and address of the factory

Nom et adresse de l'usine

LG Display (Nanjing) Co., Ltd.

59. Hengfei Road, Nanjing, Jiangsu Province,
210046 People's Republic of China

LG Display (Paju) Co., Ltd.

1007, Deogeun-ri, Wollong-myeon, Paju-si,
Gyeonggi-do, 413-811 Republic of Korea

LG Display (WR) Co., Ltd.

Ulica LG1, Biskupice Podgorne, Kobierzyce, 55-040,
Poland

LG Display (Guangzhou) Co., Ltd.

No.59,Kaitai Road, High-Tech Industrial
Development Zone, Science City of Guangzhou,
510663 People's Republic of China

Y. C. Yu.



Date: 2012-01-03

Signature: (Michael Yu)

PSB Singapore

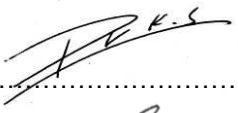


PSB Singapore

Test Report issued under the responsibility of:

NCB TÜV SÜD PSB Pte Ltd
1 Science Park Drive, Singapore 118221**TEST REPORT****IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006
Information technology equipment – Safety –
Part 1: General requirements**

Report Reference No.	077-204381-100
Date of issue	2012-01-02
Total number of pages	Test Report: 11 pages
CB Testing Laboratory	TÜV SÜD Korea Laboratory (TKL)
Address	#315 and 316, MARIO Tower, 222-12, Guro-dong, Guro-Gu, Seoul, Korea
Applicant's name	LG Display Co., Ltd.
Address	642-3, Jinpyoung-Dong, Kumi-City, Kyungbuk, 730-726 Republic of Korea
Manufacturer's name	LG Display Co., Ltd.
Address	642-3, Jinpyoung-Dong, Kumi-City, Kyungbuk, 730-726 Republic of Korea
Factory's name	(see general remarks)
Address	(see general remarks)
Test specification:	
Standard	☒ IEC 60950-1:2005 (2nd Edition) and/or ☒ EN 60950-1:2006+A11:2009
Test procedure	CB
Non-standard test method	N/A
Test Report Form No.	IECEN60950_1C
Test Report Form(s) Originator	SGS Fimko Ltd
Master TRF	Dated 2007-06
Copyright © 2007 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved. This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context. If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed. This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02. If this Test Report Form is used by non-CCA members, the CIG logo and the reference to the CCA Procedure shall be removed. This report is not valid as a CCA Test Report unless signed by an approved CCA Testing Laboratory and appended to a CCA Test Certificate issued by an NCB in accordance with CCA	

Test item description	23.0 inch TFT-LCD Module	
Trade Mark	 LG Display	
Manufacturer	LG Display Co., Ltd. (66271) 642-3, Jinpyoung-Dong, Kumi-City, Kyoungbuk, 730-726 Republic of Korea	
Model/Type reference.....	LM230WF3, LM230WF6, LM230WFA	
Ratings	5 V d.c., Max. 1.320 A or 12 V d.c., Max. 0.825 A	
Testing procedure and testing location:		
☒ CB Testing Laboratory:	TÜV SÜD Korea Laboratory (TKL)	
Testing location/ address	#315 and 316, MARIO Tower, 222-12, Guro-dong, Guro-Gu, Seoul, Korea	
☐ Associated CB Laboratory:	N/A	
Testing location/ address	N/A	
Tested by (name + signature)	Kevin Park	
Approved by (+ signature)	Charlie Kim	
☐ Testing procedure: TMP		
Tested by (name + signature)	N/A	
Approved by (+ signature)	N/A	
Testing location/ address	N/A	
☐ Testing procedure: WMT		
Tested by (name + signature)	N/A	
Witnessed by (+ signature)	N/A	
Approved by (+ signature)	N/A	
Testing location/ address	N/A	
☐ Testing procedure: SMT		
Tested by (name + signature)	N/A	
Approved by (+ signature)	N/A	
Supervised by (+ signature)	N/A	
Testing location/ address	N/A	
☐ Testing procedure: RMT		
Tested by (name + signature)	N/A	
Approved by (+ signature)	N/A	
Supervised by (+ signature)	N/A	
Testing location/ address	N/A	

Summary of testing:**Tests performed (name of test and test clause):**

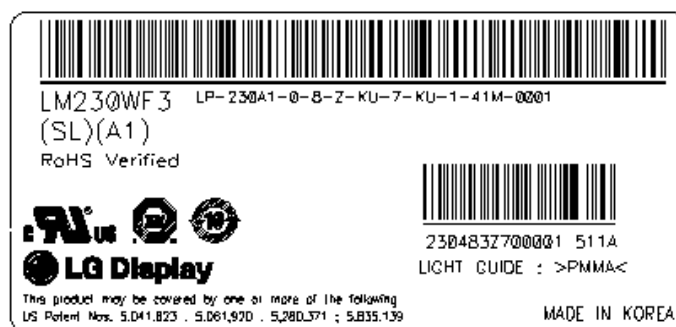
All clauses

Testing location:

TÜV SÜD Korea Laboratory (TKL)
#315 and 316, MARIO Tower, 222-12, Guro-dong, Guro-Gu, Seoul, Korea

Summary of compliance with National Differences:

1. The appliance fulfils the requirements of the standard IEC 60950-1:2005 and EN 60950-1:2006 +A11:2009.
2. When installing, all requirements of IEC 60950-1:2005 and EN 60950-1:2006+A11:2009 should be fulfilled.
3. The maximum ambient temperature permitted by the manufacturer (Tma): 50 °C

Copy of marking plate

"The above labels are drafts of an artwork for marking plate pending approval by National Certification Bodies and they shall not be affixed to products prior to such an approval"

Test item particulars:

Equipment mobility: ☐ movable ☐ hand-held ☐ transportable
☐ stationary [X] for building-in ☐ direct plug-in

Connection to the mains: ☐ pluggable equipment ☐ type A ☐ type B
☐ permanent connection
☐ detachable power supply cord
☐ non-detachable power supply cord
[X] not directly connected to the mains

Operating condition: [X] continuous
☐ rated operating / resting time:

Access location: ☐ operator accessible
☐ restricted access location

Over voltage category (OVC): ☐ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV
[X] other: N/A

Mains supply tolerance (%) or absolute mains supply values: N/A

Tested for IT power systems: ☐ Yes [X] No

IT testing, phase-phase voltage (V): N/A

Class of equipment: ☐ Class I ☐ Class II [X] Class III
☐ Not classified

Considered current rating (A): N/A

Pollution degree (PD): ☐ PD 1 [X] PD 2 ☐ PD 3

IP protection class: IPX0

Altitude during operation (m): Up to 2000 m

Altitude of test laboratory (m): 70 m

Mass of equipment (kg): Max. 2.2 kg

Possible test case verdicts:

- test case does not apply to the test object.....: N/A

- test object does meet the requirement: P (Pass)

- test object does not meet the requirement: F (Fail)

Testing:

Date of receipt of test item: 2011-11-09

Date(s) of performance of tests: 2011-11-16

General remarks:

The test results presented in this report relate only to the object 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.

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

Throughout this report a point is used as the decimal separator.

Remark 1 – Factories

1. LG Display Co., Ltd. (66271)
642-3, Jinpyoung-Dong, Kumi-City, Kyoungbuk, 730-726 Republic of Korea
2. LG Display (Nanjing) Co., Ltd. (66277)
59. Hengfei Road, Nanjing, Jiangsu Province, 210046 People's Republic of China
3. LG Display (Paju) Co., Ltd. (66278)
1007, Deogeun-ri, Wollong-myeon, Paju-si, Gyeonggi-do, 413-811 Republic of Korea
4. LG Display (WR) Co., Ltd. (66276)
Ulica LG1, Biskupice Podgorne, Kobierzyce, 55-040, Poland
5. LG Display (Guangzhou) Co., Ltd. (66343)
No.59.Kaitai Road, High-Tech Industrial Development Zone, Science City of Guangzhou, 510663 People's Republic of China

Remark 2 – History of amendments and modifications:

1. Basic CB Ref. Cert. No. SG-OF-02773 (Test Report Ref. No.: 077-238269-000), dated 2009-10-22.
2. Modification CB Ref. Cert. No. SG-OF-02773M1 (Test Report Ref. No.: 077-238269-100), dated 2010-04-12.
Addition of model name (LM230WF3), change of factory (HannStar-TPV Display (Wuhan) Corp. (69014) to LG Innotek (Huizhou) Inc. (54121)) and alternate registration of components (LED(Backlight)).
3. Modification CB Ref. Cert. No. SG-OF-02773M2 (Test Report Ref. No.: 077-238269-200), dated 2010-07-27.
Addition of rated input (Model LM230WF3: 5 V d.c., Max. 0.975 A)
4. Modification CB Ref. Cert. No. SG-OF-02773M3 (Test Report Ref. No.: 077-238269-300), dated 2010-10-04.
Addition of model name (LM230WF6) and deletion of model name (LM230WF5) and factory (LG Innotek (Huizhou) Inc. (54121)).
5. Modification CB Ref. Cert. No. SG-OF-05371 (Test Report Ref. No.: 077-204381-100), dated 2011-02-14.
Addition of model name (LM230WFA) and alternate registration of components (see appended table 1.5.1).
6. This report is for Change of rated input and alternate/change/addition of components (see appended table 1.5.1).

General product information:

1. Model LM230WF3 is basic model.
2. Model LM230WF6 and LM230WFA are identical to basic model LM230WF3 except for model designation.
3. This unit is supplied without operation manual.
4. The samples submitted for evaluation are representative of the final product and have the same quality in terms of safety aspect from each factory.

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components					P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾	
LCD Panel	LG DISPLAY CO LTD	Various	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.	IEC/EN 60950-1	Tested in equipment	
Case Top	Various	Various	Constructed of metallic of object with perforations as shown.	IEC/EN 60950-1	Tested in equipment	
Cover Bottom	Various	Various	Constructed of metallic of object with perforations as shown.	IEC/EN 60950-1	Tested in equipment	
LED (Light Emitting Diode)	Various	Various	Max. 3.4 V d.c., Max. 160 mA	IEC/EN 60950-1	Tested in equipment	
Supporter Main (optional)	Various	Various	V-0	UL 94	UL	
Guide Panel	Various	Various	V-0	UL 94	UL	
LED FPC (or PCB)	Various	Various	V-0	UL 94	UL	
Connector (MECH) (optional)	JAPAN SOLDERLESS TERMINAL MFG CO LTD	Type H Series BD, BDB, BH, BHS, BHT, PA, PH, SFG, SFM Type F Series FH, Series SHJ	V-0	UL 1977	UL	
Alt.	TYCO ELECTRONICS CORP	AMP Backlight Connector Series	V-0	UL 1977	UL	
Alt.	YEON HO ELECTRONICS CO LTD	12505HS, 20015HS, 35001HS Series 12507, 130001WR, 20010WR, 20022WR, 65002	V-0	UL 1977	UL	

IEC/EN 60950-1					
Clause	Requirement + Test		Result - Remark		Verdict
	Alt.	MOLEX INCORPORATE D	104047, 104099, 104105, 104122	V-0	UL 1977 UL
	Alt.	C-NET CO LTD	1004 Series, 1006 Series	V-0	UL 1977 UL
	Alt.	ENTERY INDUSTRIAL CO LTD	H108K, H401K, 3703K	V-0	UL 1977 UL
	Alt.	UJU ELECTRONICS CO LTD	Series FN100- Z08B-C22, HS100-L08N- N62, HS100-L08N- N62-A,	V-0	UL 1977 UL
Fuse		AEM COMPONENTS (SUZHOU) CO LTD	F1206SB F0603FA F0603HI F1206FA	63 V d.c., 1.5 or 2.0 A or 32 V d.c., 2.5 A 32 V d.c., 1.0 or 1.5 or 2.0 or 2.5 or 3.0 or 3.5 A 32 V d.c., 1.0 or 1.5 or 2.0 or 2.5 or 3.0 A 63 V d.c., 1.0 or 1.5 A	UL 248-1 UL
	Alt.	LITTELFUSE INC	Series 452* Series 466* Series 468	125 V d.c., 2.0 or 2.5 or 3.0 or 5.0 A 63 V d.c., 2.0 A 63 V d.c., 1.0 or 1.5 or 2.0 or 2.5 A or 32 V d.c., 3.0 A	UL 248-1 UL
	Alt.	PANASONIC CORPORATION , PANASONIC CORPORATION OF NORTH AMERICA	ERBSE	32 V d.c., 1.5 A	UL 248-1 UL
PCB		LG INNOTEK CO LTD or equivalent	M02, 2302 or equivalent	V-0, Min. 105 °C 1.6 mm thickness or equivalent	UL 796 UL
FPC (optional)		Various	Various	V-0	UL 94 UL
¹⁾ An asterisk indicates a mark which assures the agreed level of surveillance					
Supplementary information:					
Bold is for alternate/change/addition component.					

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.6.2	TABLE: Electrical data (in normal conditions)						P
U (V)	I (A)	I _{rated} (A)	P (W)	Fuse #	I _{fuse} (A)	Condition/status	
Model LM230WF3							
5 V d.c.	1.213	1.320	6.065	-	-	Maximum normal load (LCD Module)	
24 V d.c.	0.593	-	14.23	-	-	Maximum normal load (LED Driver)	
Supplementary information: Maximum normal load: Full white display with max. brightness and contrast, picture provided from a computer. Power source for LCD Module - Manufacturer: VUPOWER - Model: AK3005DD - Maximum output rating: 30 V/5 A Power source for LED Driver - Manufacturer: Sorensen - Model: DCS33-33E - Maximum output rating: 33 V/33 A							

4.5	TABLE: Thermal requirements		P				
	Supply voltage (V) :	LCD Module: 5 V d.c. LED Driver: 24 V d.c.	—				
	Ambient T _{min} (°C) :	See below	—				
	Ambient T _{max} (°C) :	See below	—				
Maximum measured temperature T of part/at:		T (°C) at Tma	Allowed T _{max} (°C)				
Model LM230WF3							
1. Front Panel		52.7	80				
2. Rear Metal		52.8	-				
3. PWB near F1		61.0	105				
4. Ambient (t ₂)		50 (22.5 °C)	-				
Supplementary information: Maximum temperature T at Tma(50 °C) is calculated. (T at Tma = T- t ₂ +Tma)							
Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C) at Tma	Allowed T _{max} (°C)	Insulation class

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

5.3	TABLE: Fault condition tests					P
	Ambient temperature (°C):					20-25 °C
	Power source for EUT: Manufacturer, model/type, output rating:					(see appended table 1.6.2)
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
Model LM230WF3						
*C5	Short	5 V d.c.	<1 s	-	-	Fuse opened. No hazard.

Supplementary information:

*: 10 times repeated.

For fuse open condition, same result came out for each source of fuse used.

List of test equipment used:

(Note: This is an example of the required attachment. Other forms with a different layout but containing similar information are also acceptable.)

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date
Supplementary information: No listing of test equipment used necessary for chosen CBTL test procedure.				