Certification Services

TÜVRheinland®

Martin Glagla
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October 16, 2013

Top Victory Electronics (Taiwan) Co., Ltd.
10F, No. 230, Liancheng Rd.
Zhonghe Dist., New Taipei City 23553 Taiwan

Attn: Mr. Lijia Shang

Confirmation of ENERGY STAR® certification

Type of Equipment:	Monitor
Model Number:	236LM00014
Model Name:	E2470SWDA
Product Specification:	ENERGY STAR Program Requirements for Displays Eligibility Criteria Version 6.0
TUV File Number:	17033565 001

Dear Mr. Shang:

This is notification that TUV Rheinland has certified the performance of the aforementioned product according to the ENERGY STAR® Program Requirements and has reported all required information for the certified product to the U.S. Environmental Protection Agency (EPA).

The certified product will be listed on ENERGY STAR Qualified Product website. The qualified product lists are updated on the 1st and 15th of each month. You may begin labeling the certified product in accordance to the ENERGY STAR® Partnership Agreement and Commitments.

Please review the above for accuracy and address desired changes to the below mentioned contact.

TUV Rheinland offers a broad portfolio of service providing global energy efficiency testing solutions, including EPA (ENERGY STAR®), Natural Resources Canada (NRCan), Energy Related Products (ErP) Directive, Europe EcoLabel, and Germany's Blue Angel Quality Seal as well as Green Services.

If we can be of any further assistance, please do not hesitate to call upon us.

Sincerely,
TUV Rheinland of North America, Inc.

Christina Lomba
Certification Project Manager

Martin Glagla
Certifier

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TÜV Rheinland Group

Prüfbericht-Nr.: *Test Report No.:*	**17033565 001**	**Auftrags-Nr.:** *Order No.:*	**164008118** Seite 1 von 13 *Page 1 of 13*
Kunden-Referenz-Nr.: *Client Reference No.:*	**333144**	**Auftragsdatum:** *Order date:*	**10.05.2013**
Auftraggeber: *Client:*	Top Victory Electronics (Taiwan) Co., Ltd. 10F., No. 230, Liancheng Rd., Zhonghe Dist., New Taipei City, 23553 Taiwan		
Prüfgegenstand: *Test item:*	Monitor		
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	Model Number: 236LM00014 Model Name: E2470SWDA (trademark: AOC)		
Auftrags-Inhalt: *Order content:*	ENERGY STAR Program for Displays - Initial Certification		
Prüfgrundlage: *Test specification:*	ENERGY STAR Program Requirements for Displays Eligibility Criteria Version 6.0 IEC 62301 Ed 2.0: Household Electrical Appliances - Measurement of Standby Power IEC 62087 Ed 3.0: Methods of Measurement for the Power Consumption of A/V		
Wareneingangsdatum: *Date of receipt:*	22.09.2013	Detaillierte Fotodokumentation siehe Seite 9 zu diesem Bericht *Detailed photo documentation see page 9 to this report*	
Prüfmuster-Nr.: *Test sample No.:*	Engineering Sample		
Prüfzeitraum: *Testing period:*	29.09.2013 - 29.09.2013		
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.		
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.		
Prüfergebnis*: *Test result*:*	Pass		

geprüft / tested by:			**kontrolliert** / reviewed by:		
14.10.2013	Iris Du / Test Engineer	Iris Du	15.10.2013	Alex Huang / Reviewer	Alex
Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges / Other:
This Product has an Internal Power Supply

Remark: For additional information on the sample and tests also see appendix 1.

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:*	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested

V04

Contents

1. 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 remark #)" refers to a remark appended to the report.
"(See appended table)" refers to a table appended to the report.

1.1 Complementary Materials

All attachments are integral parts of this test report.

1.1 Abriviations Used

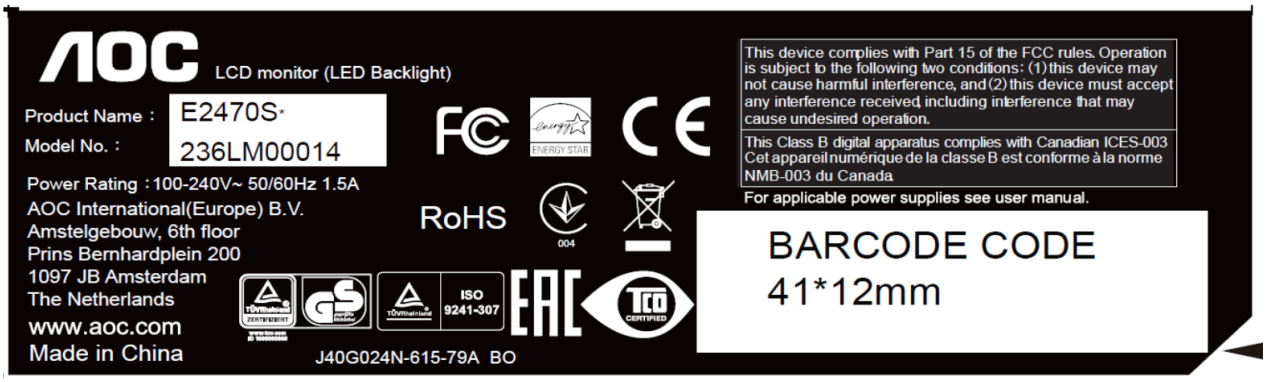
PE:	Protective Earth	**F:**	Fail
IPS:	Internal Power Supply	**sec:**	Secondary
EPS:	External Power Supply	**gnd:**	Ground
HV:	High Voltage	**I/O:**	Input/Output
pri:	Primary	**EUT:**	Equipment Under Test
N/A:	Not Appliacble	**N/T**	Not Tested (test was not performed)
P:	Pass	**P/D:**	Photo Documentation

2. Measurement and Test equipment list

Ref. No	Equipments	Model	Cal. Date	Due Date
1.884	Digital Power Meter	Yokogawa / WT-210	Jul.2013	Jul.2014
1.802	Luminance Meter	Superspot 320 Display Analysis System	Jul.2013	Jul.2014
1.888	Temperature Humidity Recorder	Sato / SK-L200TH	Dec.2012	Dec.2013
1.887	Temperature Humidity Recorder	Sato / SK-L200TH	Dec.2012	Dec.2013
3.325	AC Power Source	EXTECH / 6400 series	N/A	N/A
1.891	Stop watch	SMTWTFS	Jan.2013	Jan.2014

3. General Product Information

3.1 Ratings and System Details



- The models Model Number: 236LM00014 are 23.5 inch LCD Monitor for the use with information technology equipment.
- The unit is not an Enhanced-Performance Display. There is no Automatic Brightness Control function, bridging or network capabilities, or any additional capabilities included in Table 3 or 4 of the standard.

3.2 Generel Requirements

Clause	Requirement - Test	Remark	Verdict
3.2.1	External Power Supply : The EPS need to meet the performance requirements under the International Efficiency Marking Protocol and include the level V marking.	Not applicable	N/A
3.2.2	Power Management: i. Products shall offer at least one power management feature that is enabled by default, and that can be used to automatically transition from On Mode to Sleep Mode either by a connected host device or internally (e.g., support for VESA Display Power Management Signaling (DPMS), enabled by default). ii. Products that generate content for display from one or more internal sources shall have a sensor or timer enabled by default to automatically engage Sleep or Off Mode. iii. For products that have an internal default delay time after which the product transitions from On Mode to Sleep Mode or Off Mode, the delay time shall be reported. iv. Computer monitors shall automatically enter	Power Management Signaling (DPMS).	P

3.3 On Mode Requirements

Clause	Requirement - Test	Remark	Verdict
3.3.1	On Mode power (PON), as measured per the ENERGY STAR test method, referenced in Table 6, shall be less than or equal to the Maximum On Mode Power Requirement (PON_MAX), as calculated and rounded per Table 1.	See test results.	P
3.3.2	For products meeting the definition of an Enhanced-Performance Display, a power allowance (PEP), as calculated per Equation 3, shall be added to PON_MAX, as calculated per Table 1. In this case, PON, as measured per the ENERGY STAR test method (referenced in Table 6), shall be less than or equal to the sum of PON_MAX and PEP.	Not applicable	N/A
3.3.3	For products with Automatic Brightness Control (ABC) enabled by default, a power allowance (PABC), as calculated per Equation 3, shall be added to the Maximum On Mode Power Requirement (PON_MAX), as calculated per Table 1, if the On Mode power reduction (RABC), as calculated per Equation 2, is greater than or equal to	Not applicable	N/A

Clause	Requirement - Test	Remark	Verdict
3.3.4	For products powered with a low-voltage dc source, On Mode power (PON), as calculated per Equation 4, shall be less than or equal to the Maximum On Mode Power Requirement (PON_MAX), as calculated per Table 1.	Not applicable	N/A

3.4 Sleep Mode Requirements

Clause	Requirement - Test	Remark	Verdict
3.4.1	Measured Sleep Mode power (PSLEEP) for products without data or networking connection capabilities shall be less than or equal to the Maximum Sleep Mode Power Requirement (PSLEEP_MAX), as specified in Table 2.	See test results.	P
3.4.2	Measured Sleep Mode power (PSLEEP) for products with one or more of the bridging, network, or additional capabilities included in Table 3 or 4 shall be less than or equal to the Maximum Bridging/Network Sleep Mode Power Requirement (PSLEEP_AP), as calculated per Equation 7.	Not applicable	N/A
3.4.3	For products that offer more than one Sleep Mode (e.g., “Sleep” and “Deep Sleep”), measured Sleep Mode power (PSLEEP) in any Sleep Mode shall not exceed the Maximum Sleep Mode power Requirement.	Not applicable	N/A

3.5

Clause	Requirement - Test	Remark	Verdict
3.5.1	Measured Off Mode power (POFF) shall be less than or equal to the Maximum Off Mode Power Requirement (POFF_MAX) specified in Table 5.	See test results.	P

3.6 Luminance Reporting Requirements

Clause	Requirement - Test	Remark	Verdict
3.6.1	The as-shipped luminance and the maximum luminance shall be reported.	See test results.	P

4. Test Set-up and Operation Modes

4.1 Options / Accessories / Ancillary Equipment / Configuration for Testing

The equipment was tested without any optional accessory installed.

4.2 Measurement Uncertainty

The measured input power is: m_x (1 ± 0.0042) W

The measured ambient light value is: 5% at 10 lx, 0.7% at 300lx.

Room temperature: 23.6 ℃

Relative humidity: 58 %

5. Measurement

RESULT:

Mandate: ***On Mode power (P_{ON}), Sleep Mode power (P_{sleep}) and OFF Mode power (P_{OFF}) as calculated per the ENERGY STAR test method, shall be less than or equal to the Maximum On Mode Power Requirement (P_{ON_MAX}), Maximum Sleep Mode Power Requirement (P_{Sleep_MAX}) and Maximum Off Mode Power Requirement (P_{OFF_MAX}) as shown blelow:***

diagonal screen size	***23.5 inch***
resolution in Megapixels	***2.07 MP***
Active Sreen Area	***236.9 square inch***

P_{ON_MAX}	***≤ 22.7 Watt***
P_{Sleep_MAX} (low power)	***≤ 0.5 Watt***
P_{OFF_MAX} (Standby / OFF)	***≤ 0.5 Watt***

Test result:

Luminance level set to	**201.5 cd/m²**
Default Delay Time to Sleep (min)	**1.0**

Supply Voltage / Frequency	**100V / 50Hz**	**100V / 60Hz**
On-Mode	**18.04 Watt**	**18.06 Watt**
Sleep mode (low power)	**0.37 Watt**	**0.37 Watt**
Standby (Off-mode)	**0.2 Watt**	**0.19 Watt**
Non-Connected Sleep Mode Power	**N/A**	**N/A**

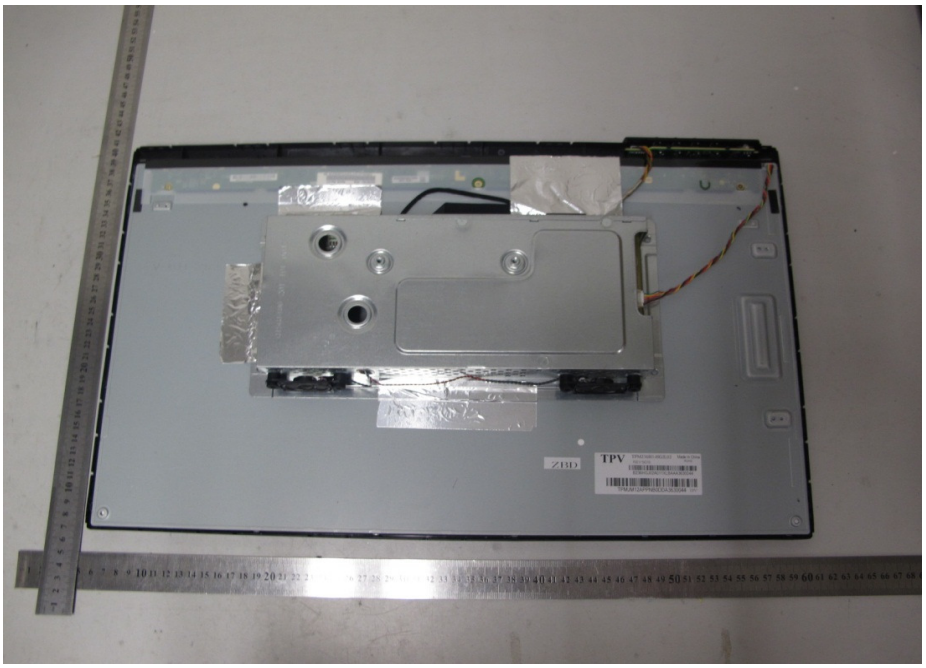
Supply Voltage / Frequency	**115V / 60Hz**	**230V / 50Hz**
On-Mode	**17.96 Watt**	**18.05 Watt**
Sleep mode (low power)	**0.37 Watt**	**0.42 Watt**
Standby (Off-mode)	**0.19 Watt**	**0.26 Watt**
Non-Connected Sleep Mode Power	**N/A**	**N/A**

6. Photos of the EUT

Pic. 1

Pic. 2

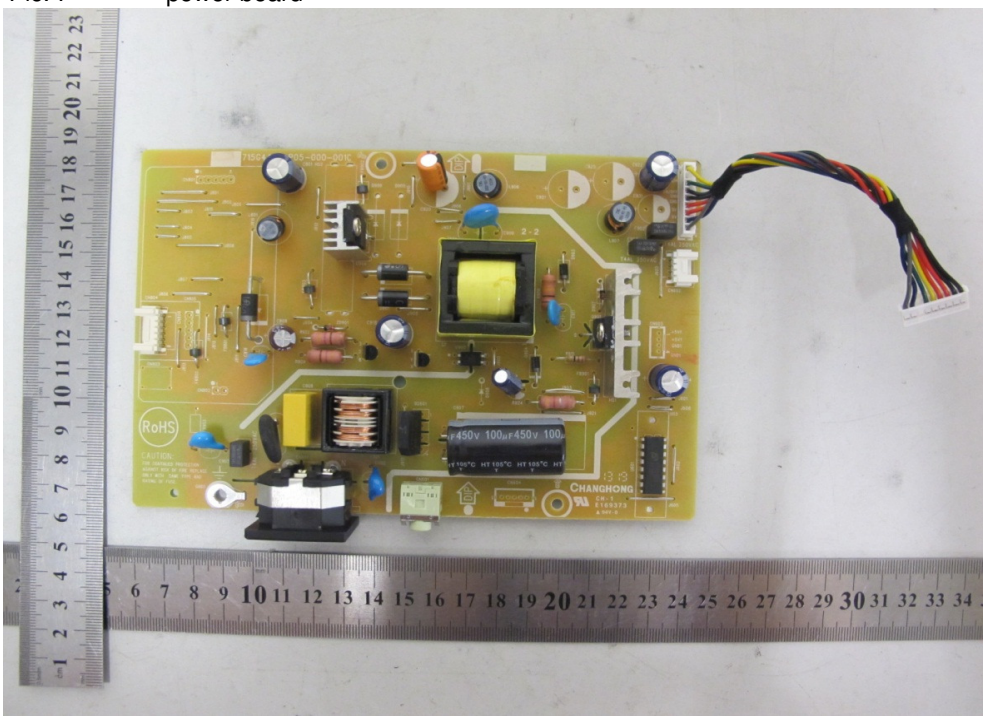
Pic. 3



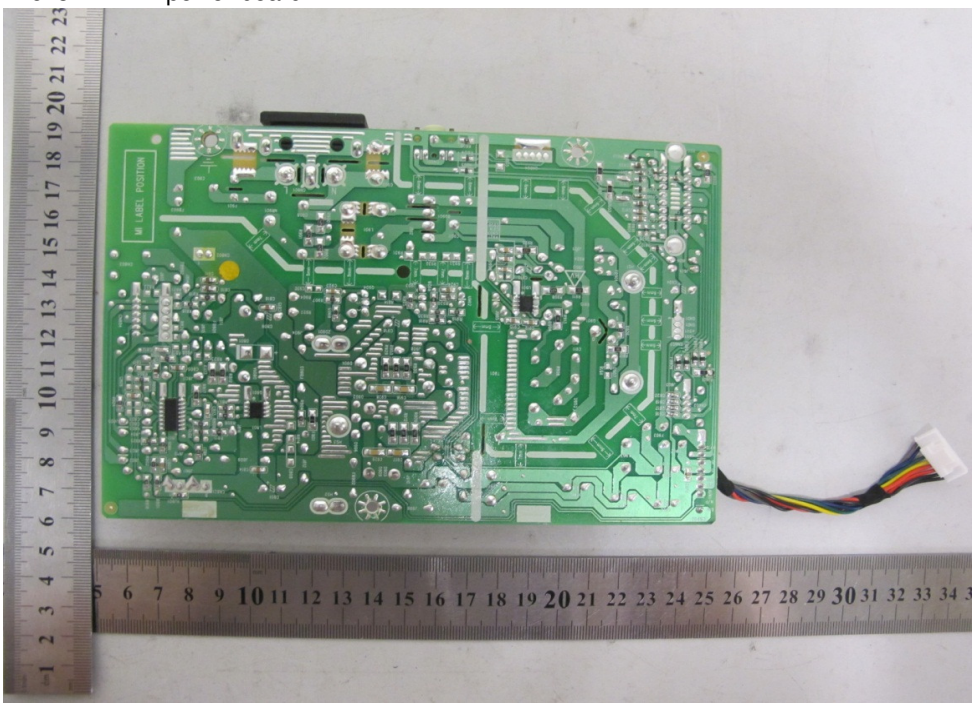
Pic. 4


TPV
TPM236H3-HGJL02
REV:SC1S
Made In China
ROHS
B236HGJ02A011XLBAAA3630044
MJM12APPNB0DDA3630044 TPV

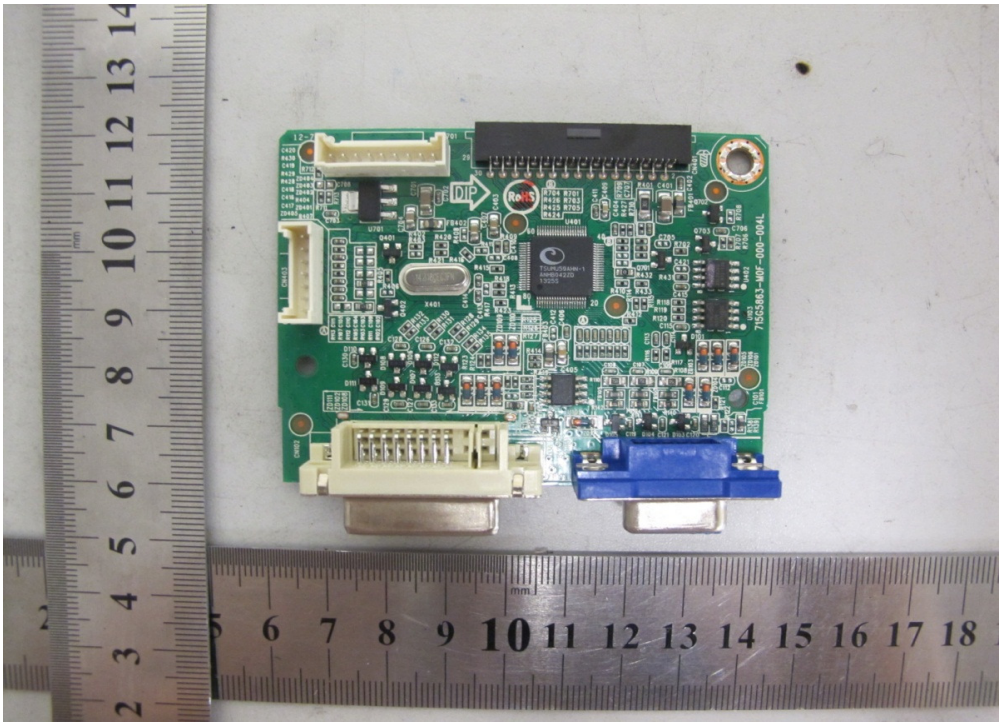
Pic. 7 power board



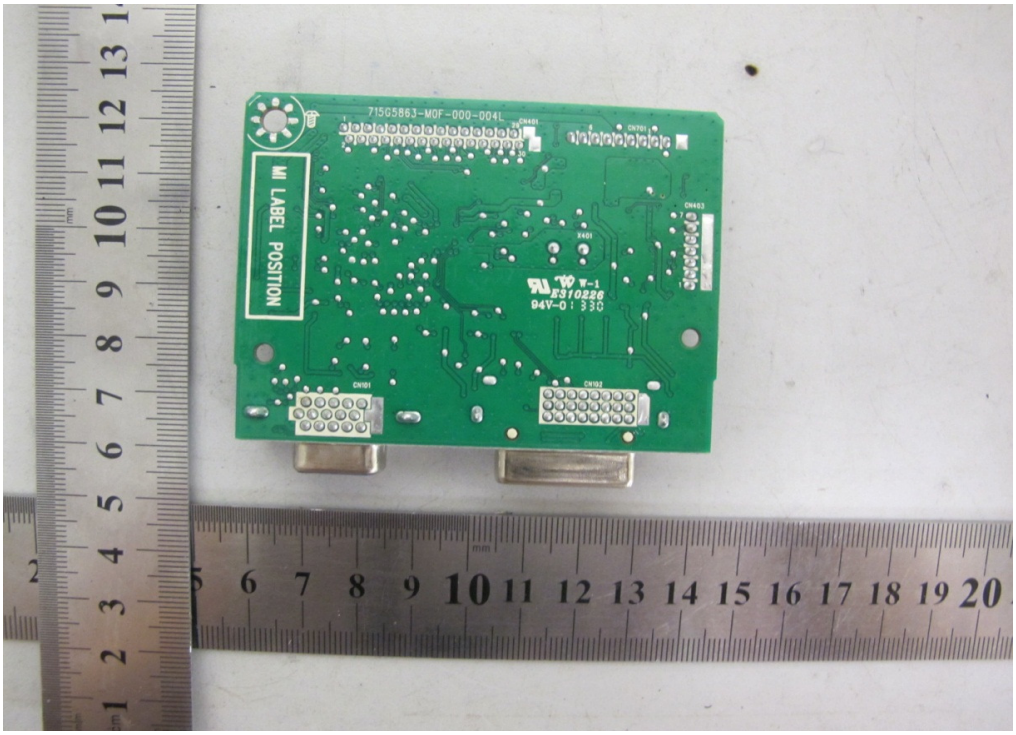
Pic. 8 power board



Pic. 9 main board



Pic. 10 main board



7. Attachment: Signed Declaration of Conformity (DoC) for family models

N/A

Appendix 1

ENERGY STAR Manufacturing Partner	Top Victory Electronics (Taiwan) Co., Ltd.
ENERGY STAR Manufacturing Partner s EPA issued Organizatic	1065104
Partner Contact Name For This Model	Lijia Shang
Type of Transaction	Initial Certification
Reason for Transaction	Initial Certification: Model Meets ENERGY STAR Requirements
Date of Transaction Type	
ENERGY STAR Model Identifier	
Certification ID	
Family ID	
Model Name	E2470SWDA
Model Number	236LM00014
Brand Name	AOC
Tested Model Name	E2470SWDA
Tested Model Number	236LM00014
Additional Models Represented by Family Series or DOE Basic	
Additional Model Name	
Additional Model Number	
Additional Identifying Information	
Is the Partner Listed the Original Equipment Manufacturer OEM	No
If the Partner is Not the Original Equipment Manufacturer Who is	TPV Display Technology (China) Co., Ltd
Currently Available on Market	No
Date Available On Market	10/20/2013
Date Tested	09/29/2013
Date CB Notified Partner of Model Qualification	
Certification Body Contact Name for This Model	Uwe Meyer
Laboratory EPA issued Organization ID	1115362
Laboratory Contact for This Model	Gina Yang
To What Major Markets is This Model Sold	All Markets
Notes	
ENERGY STAR Specification Version	6.0
Product Type	Monitor
Other Product Type	
Display Type	TN LCD
Other Display Type	
Display Backlight Technology	LED
Other Display Backlight Technology	
Display Contrast Ratio	1000:1
Viewable Screen Height (in)	11.5
Viewable Screen Width (in)	20.5
Diagonal Viewable Screen Size (in)	23.5
Viewable Screen Area (sq in)	236.9
Aspect Ratio	1.78

Appendix 1

Native Resolution Vertical (pixels)	1080
Native Resolution Horizontal (pixels)	1920
Total Native Resolution (megapixels)	2.074
Maximum Resolution Vertical	1080
Maximum Resolution Horizontal	1920
Native Pixel Density (Dp) (pixels/sq in)	8752.4
Screen Refresh Rate (Hz)	60
Horizontal Viewing Angle (degrees)	170
Vertical Viewing Angle (degrees)	160
Color Gamut	N/A
Is Color Gamut at least sRGB?	No
Is This Model an Enhanced-Performance Display?	No
Reported Contrast Ratio at -85° (Left) Horizontal Viewing Angle	
Reported Contrast Ratio at +85° (Right) Horizontal Viewing Angle	
Signal Technology	Analog; Digital
Is This Model Shipped With an External Power Supply (EPS)?	No
Is Model Sold Through Enterprise Channels?	No
Available Interfaces	DVI;VGA
Other Available Interfaces	
Data/Network/Peripheral Ports	None
Other Data/Network/Peripheral Ports	
Model Options	Built-In Speakers
Other Model Options	
Interface	DVI
Other Interface	
Data/Network Connection	None
Other Data/Network Connected	
Power Source	AC Wall Outlet
Other Power Source	
VESA FPDM2 Test Pattern Used?	No
Recommended Image Size (mm)	521mm x 293mm
Display Has an Integrated Television Tuner?	No
Mechanism for Automatically Entering Sleep or Off Mode?	Display Power Management Signaling
Other Mechanism for Automatically Entering Sleep or Off Mode	
Default Delay Time to Sleep (min)	1.0
Does Model Have a Forced Menu at Initial Start-up?	No
Is Automatic Brightness Control (ABC) Present?	No
Is Automatic Brightness Control (ABC) Enabled by Default?	No
Automatic Brightness Control (ABC) Disabled Brightness Mode	
Minimum Luminance (cd/m^2)	20.75
Maximum Measured Luminance (cd/m^2)	262.2
Maximum Reported Luminance (cd/m^2)	250.0
As-shipped Luminance (cd/m^2)	210.5
As-tested Luminance (cd/m^2)	201.5

Appendix 1

On Mode Power at 10 Lux at 115 Volts (W)	
On Mode Power at 300 Lux at 115 Volts (W)	
Measured On Mode Power at 115 Volts (W)	17.96
Reported On Mode Power at 115 Volts (W)	17.96
Measured Sleep Mode Power at 115 Volts (W)	0.37
Reported Sleep Mode Power at 115 Volts (W)	0.37
Measured Non-Connected Sleep Mode Power at 115 Volts (W)	
Measured Off Mode Power at 115 Volts (W)	0.19
Reported Off Mode Power at 115 Volts (W)	0.19
On Mode Power at 10 Lux at 230 Volts (W)	
On Mode Power at 300 Lux at 230 Volts (W)	
Measured On Mode Power at 230 Volts (W)	18.05
Measured Sleep Mode Power at 230 Volts (W)	0.42
Measured Non-Connected Sleep Mode Power at 230 Volts (W)	
Measured Off Mode Power at 230 Volts (W)	0.26
On Mode Limit (Pon_max) (W)	22.70
Sleep Mode Limit (Psleep_ap or Psleep_max) (W)	0.50
Off Mode Limit (Poff_max) (W)	0.50
True Power Factor (PF) During On Mode Testing	0.58
Low-Voltage Dc Source Power (Pl) (W)	
Adder for an Enhanced-Performance Display (W)	
Adder for Automatic Brightness Control (W)	
Number of Sleep Modes in Addition to Default Sleep Mode	0