Prüfbericht-Nr.: *Test Report No.:*	50045889 001	**Auftrags-Nr.:** *Order No.:*	164065299	Seite 1 von 17 *Page 1 of 17*
Kunden-Referenz-Nr.: *Client Reference No.:*	N/A	**Auftragsdatum:** *Order date:*	02.06.2016	
Auftraggeber: *Client:*	**Top Victory Electronics (Taiwan) Co., Ltd.** 10F., No.230, Liancheng Rd., Zhonghe Dist, Taipei City, 23553, Taiwan			
Prüfgegenstand: *Test item:*	Monitor			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	Model Number: 190LM00014 Model Name: E960SRD, E960SRDA, E960PRD, E960PRDA, I960SRD, I960SRDA, I960PRD, I960PRDA (trademark: AOC)			
Auftrags-Inhalt: *Order content:*	TÜV Rheinland Energy Star test report			
Prüfgrundlage: *Test specification:*	ENERGY STAR Program Requirements for Displays Version 7.0 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:*	02.06.2016
Prüfmuster-Nr.: *Test sample No.:*	A000373546-002
Prüfzeitraum: *Testing period:*	02.06.2016 – 02.06.2016
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass

Detaillierte Fotodokumentation
siehe Seite 13 zu diesem Bericht

Detailed photo documentation
see page 13 to this report

geprüft von / *tested by:*			**kontrolliert von** / *reviewed by:*		
13. 06, 2016	Jammy Zhang / Project Engineer		13. 06, 2016	Sherry Chen / Reviewer	
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other:*

The product covered by this report is a LCD Display LED backlighting. The test model: I960PRDA as the worst case be tested, which with VGA and DVI port.

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*

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.

1.2 Abbreviations Used

ABC:	Automatic Brightness Control	**LAN:**	Local Area Network
AEC:	Annual Energy Consumption	**THD:**	Total Harmonic Distortion
BD:	Blu-ray Disc	**USB:**	Universal Serial Bus
DVD:	Digital Versatile Disc	**STB:**	Set-top Box
DVI:	Digital Visual Interface	**WAN:**	Wide Area Network
HDMI:	High Definition Multimedia Interface	**NOPR:**	Notice of Proposed Rulemaking
EPCA:	Energy Policy andConservation Act	**TEC:**	Total Energy Consumption
UUT:	Unit Under Test		

2. Number of Units used for testing

One unit of a Representative Model, as defined in Section 1, shall be selected for testing.

For certification of a Product Family, the product configuration that represents the worst-case power demand for each product category within the Product Family shall be considered the Representative Model.

3. General Product Information

3.1 Product description

The models Model Number: 190LM00014 are 19 inch LCD Monitor for the use with information technology equipment.

Rating plate:

Configuration Summary:		
1	Forced menue	Not applicable
2	Sleep mode	Provided
3	Off mode	Provided
4	Enhanced performance display	No
5	ABC function	Not provided
6	Bridging function	Not provided
7	Networking	Not provided
8	Touchscreen function	Not provided
9	Built-in speaker	Not provided
10	Occupancy sensor	Not provided
11	Signal interface	DVI
12	Resolution	1280x1024
13	Refresh rate	60Hz

Remark:

1. The test results were obtained according to the submitted test sample.
2. No nameplate was marked on the submitted test sample.

3.2 General Requirements

Clause	Requirement – Test	Result	Verdict
3.2.1	External Power Supply: External Power Supplies (EPSs): Single- and Multiple-voltage EPSs shall meet the Level VI or higher performance requirements under the International Efficiency Marking Protocol when tested according to the Uniform Test Method for Measuring the Energy Consumption of External Power Supplies, Appendix Z to 10 CFR Part 430.	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 Sleep Mode to On 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. Monitors shall automatically enter Sleep Mode or Off Mode within 5 minutes of being disconnected from a host computer.	Confirmed with supplementing information from Manufacturer.	P
3.2.3	True Power Factor: Signage Displays shall have a true power factor in On Mode of 0.7 or greater per Section 5.2.F) in the ENERGY STAR Test Method.	Product is considered as a computer monitor.	N/A

3.3 Energy Requirements for Computer Monitors

Clause	Requirement – Test	Result	Verdict
3.3.1	The Total Energy Consumption (TEC) in kWh shall be calculated per Equation 1 based on measured values.	See test result	P
3.3.2	The Maximum TEC (E_{TEC_MAX}) in kWh for Monitors shall be calculated per Table 1.	See test result	P
3.3.3	For all Monitors, Calculated TEC (E_{TEC}) in kWh shall be less than or equal the calculation of Maximum TEC (E_{TEC_MAX}) with the applicable allowances and adjustments (applied at most once) per Equation 2.	See test result	P

Clause	Requirement – Test	Result	Verdict
3.3.4	For Monitors meeting the enhanced performance display (EPD) requirements below, only one of the following Table 2 allowances shall be used in Equation 2: i. Contrast ratio of at least 60:1 measured at a horizontal viewing angle of at least 85° from the perpendicular on a flat screen and at least 83° from the perpendicular on a curved screen, with or without a screen cover glass; ii. A native resolution greater than or equal to 2.3 megapixels (MP); and iii. Color Gamut greater than or equal to 32.9% of CIE LUV.	Not applicable	N/A
3.3.5	For monitors with Automatic Brightness Control (ABC) enabled by default, an energy allowance (E_{ABC}), as calculated per Equation 4, shall be added to E_{TEC_MAX} in Equation 2, if the On Mode power reduction (R_{ABC}), as calculated per Equation 3, is greater than or equal to 20%.	Not applicable	N/A
3.3.6	Products with Full Network Connectivity confirmed in Section 6.7 of the ENERGY STAR Test Method shall apply the allowance specified in Table 3.	Not applicable	N/A
3.3.7	Products tested with an Occupancy Sensor active shall apply the allowance specified in Table 4.	Not applicable	N/A
3.3.7	Products tested with Touch Technology active in On Mode shall apply the allowance specified in Equation 5.	Not applicable	N/A

3.4 On Mode Requirements for Signage Displays

Clause	Requirement – Test	Result	Verdict
3.4.1	The Maximum On Mode Power (P_{ON_MAX}) in watts shall be calculated per Equation 6.	Not applicable	N/A
3.4.2	For Signage Displays with ABC enabled by default, a power allowance (P_{ABC}), as calculated per Equation 8, shall be added to P_{ON_MAX}, as calculated per Equation 6, if the On Mode power reduction (R_{ABC}), as calculated per Equation 3, is greater than or equal to 20 percent.	Not applicable	N/A

3.5 Sleep Mode Requirements for Signage Displays

Clause	Requirement – Test	Result	Verdict
3.5.1	Measured Sleep Mode Power (P_{SLEEP}) in watts shall be less than or equal the sum of the Maximum Sleep Mode Power Requirement (P_{SLEEP_MAX}) and any allowances (applied at most once) per Equation 9.	Not applicable	N/A
3.5.2	Products with Full Network Connectivity confirmed in Section 6.7 of the ENERGY STAR Test Method shall apply the allowance specified in Table 6.	Not applicable	N/A
3.5.3	Products tested with an Occupancy Sensor or Touch Technology active in Sleep Mode shall apply the allowances specified in Table 7.	Not applicable	N/A

3.6 Off Mode Requirements for all Displays

Clause	Requirement – Test	Result	Verdict
3.6.1	A product need not have an Off Mode to be eligible for certification. For products that do offer Off Mode, measured Off Mode power (P_{OFF}) shall be less than or equal to the Maximum Off Mode Power Requirement (P_{OFF_MAX}) in Table 8.	See test result	P

3.7 Luminance Requirements

Clause	Requirement – Test	Result	Verdict
3.7.1	Maximum Reported and Maximum Measured Luminance shall be reported for all products; As-Shipped Luminance shall be reported for all products except those with ABC enabled by default.	See test result	P

4. TEST ROOM SET-UP

4.1 Ambient Temperature Conditions

Ambient temperature shall be 23°C ± 5°C.

4.2 Ambient Relative Humidity Conditions

Relative humidity shall be from 10% to 80%.

4.3 Ambient Light Values

a) At 12 lux, ambient lighting shall be within ± 1.0 lux; and

b) At 300 lux, ambient lighting shall be within ± 9.0 lux.

4.4 UUT Alignment

a) All four corners of the face of the Unit Under Test (UUT) shall be equidistant from a vertical reference plane (e.g., wall).

b) The bottom two corners of the face of the UUT shall be equidistant from a horizontal reference plane (e.g., floor).

4.5 Light Source for On Mode Testing

Lamp Type:

a) Standard spectrum halogen flood reflector lamp. The lamp shall not meet the definition of “Modified spectrum” as defined in 10 CFR 430.2 -Definitions1.

b) Rated Brightness: 980 ± 5% lumens.

4.6 Installation

Install the UUT in accordance with manufacturer’s instructions.

4.7 Light source Alignment for Testing Products with ABC function

a) There shall be no obstructions between the lamp and the UUT’s Automatic Brightness Control (ABC) sensor (e.g., diffusing media, frosted lamp covers, etc.).
b) The center of the lamp shall be placed at a distance of 5 feet from the center of the ABC sensor.
c) The center of the lamp shall be aligned at a horizontal angle of 0° with respect to the center of the UUT’s ABC sensor.
d) The center of the lamp shall be aligned at a height equal to the center of the UUT’s ABC sensor with respect to the floor (i.e. the light source shall be placed at a vertical angle of 0° with respect to the center of the UUT’s ABC sensor).
e) No test room surface (i.e., floor, ceiling, and wall) shall be within 2 feet of the center of the UUT’s ABC Sensor.
f) Illuminance values shall be obtained by varying the input voltage of the lamp.

4.8 Measurement Uncertainty

The measured input power is: P (W) ± 0.15%

The measured ambient light value is 100 lx (± 5 lx), 35 lx (± 2 lx), 12 lx (± 1 lx), and 3 lux (± 1 lx).

The luminance and illuminance meters: ± 2% (± 2 digits) of the digitally displayed value.

5. Test Conduct

5.1 Guidance for Power Measurements

A) Testing at Factory Default Settings: Power measurements shall be performed with the product in its as-shipped condition for the duration of Sleep Mode and On Mode testing, with all user-configurable options set to factory defaults, except as otherwise specified by this test method.

1) Picture level adjustments shall be performed per the instructions in this test method.

2) Products that include a “forced menu” that requires picture setting selection upon initial start-up shall be tested in the “standard” or “home” picture setting. In the case that no standard setting or equivalent exists, the default setting recommended by the manufacturer shall be used for testing and recorded in the test report. Products that do not include a forced menu shall be tested in the default picture setting.

B) Point of Deployment (POD) Modules: Optional POD modules shall not be installed.

C) Plug-in Modules: Optional Plug-in Modules shall be removed from the Display if the Display can be tested according to the test method without the module installed.

D) Sleep Mode with Multiple Functionalities: If the product offers multiple options for device behavior in Sleep Mode (e.g., quick start) or multiple methods by which Sleep Mode may be entered, the power during all Sleep Modes shall be measured and recorded. All Sleep Mode testing shall be carried out as per Section 6.5.

5.2 Conditions for Power Measurementsrity

A) Power measurements:

1) Power measurements shall be taken from a point between the power source and the UUT. No Uninterruptible Power Supply (UPS) units may be connected between the power meter and the UUT. The power meter shall remain in place until all On Mode, Sleep Mode and Off Mode power data are fully recorded.

2) Power measurements shall be recorded in watts as directly measured (unrounded) values at a rate of greater than or equal to 1 reading per second.

3) Power measurements shall be recorded after voltage measurements are stable to within 1%.

B) Dark Room Conditions: Unless otherwise specified, the illuminance measured at the UUT screen with the UUT in Off Mode shall be less than or equal to 1.0 lux. If the UUT does not have an Off Mode, the illuminance shall be measured at the UUT screen with the UUT’s power cord disconnected.

C) UUT Configuration and Control:

1) Peripherals and Network Connections:

a) External peripheral devices (e.g. mouse, keyboard, external hard disk drive (HDD) etc.) shall not be connected to USB ports or other data ports on the UUT.

b) Bridging: If the UUT supports bridging per the definition in Section 1 of the ENERGY STAR Eligibility Criteria for Displays Version 7.0, a bridge connection shall be made between the UUT and the Host Machine. The connection shall be made in the following order of preference. Only one connection shall be made and the connection shall be maintained for the duration of the test.

i. Thunderbolt

ii. USB

iii. Firewire (IEEE 1394)

iv. Other

c) Networking: If the UUT has networking capability (i.e., it has the ability to obtain an IP address when configured and connected to a network) the networking capability shall be activated, and the UUT shall be connected to a live physical network (e.g., WiFi, Ethernet, etc.). The physical network shall support the highest and lowest data speeds of the UUT's network function. An active connection is defined as a live physical connection over the physical layer of the networking protocol. In the case of Ethernet, the connection shall be via a standard Cat 5e or better Ethernet cable to an Ethernet switch or router. In the case of WiFi the device shall be connected and tested in proximity to a wireless access point (AP). The tester shall configure the address layer of the protocol, taking note of the following:

i. Internet Protocol (IP) v4 and IPv6 have neighbor discovery and will generally configure a limited, non-routable connection automatically.

ii. IP can be configured manually or by using Dynamic Host Configuration Protocol (DHCP) with an address in the 192.168.1.x Network Address Translation (NAT) address space if the UUT does not behave normally when autoIP is used. The network shall be configured to support the NAT address space and/or autoIP.

iii. The UUT shall maintain this live connection to the network for the duration of testing unless otherwise specified in this Test Method, disregarding any brief lapses (e.g., when transitioning between link speeds). If the UUT is equipped with multiple network capabilities, only one connection shall be made in the following order of preference:

a. WiFi (Institution of Electrical and Electronics Engineers -IEEE 802.11-2007[2])

b. Ethernet (IEEE 802.3). If the UUT supports Energy Efficient Ethernet (IEEE 802.3az2010[3]), then it shall be connected to a device that also supports IEEE 802.3az

c. Thunderbolt

d. USB

e. Firewire (IEEE 1394)

f. Other

d) Touchscreen Functionality: If the UUT features a touchscreen that requires a separate data connection, this function shall be set up as directed by the manufacturer's instructions, including connections to the Host Machine and installation of software drivers.

e) In the case of a UUT that has a single connection capable of performing multiple functions (e.g. bridging, networking, and/or touchscreen functionality), a single connector can be used to meet these functionalities provided it is the highest preferred connection the UUT supports for each functionality.

f) In the case of a UUT that has no data/network capabilities, the UUT shall be tested as-shipped.

g) Built-in speakers and other product features and functions not specifically addressed by the ENERGY STAR eligibility criteria or test method must be configured in the as-shipped power configuration.

h) Availability of other capabilities such as occupancy sensors, flash memory-card/smart-card readers, camera interfaces, PictBridge shall be recorded.

2) Signal Interface:

a) If the UUT has multiple signal interfaces, the UUT shall be tested with the first available interface from the list below:

i. Thunderbolt

ii. DisplayPort

iii. HDMI

iv. DVI

v. VGA

vi. Other Digital Interface

vii. Other Analog Interface

3) Occupancy Sensor: If the UUT has an occupancy sensor, the UUT shall be tested with the occupancy sensor settings in the as-shipped condition. For UUT's with an occupancy sensor enabled as-shipped:

a) A person shall be within close proximity of the occupancy sensor for the entire warm up, stabilization, luminance testing and On Mode to prevent the UUT from entering a lower power state (e.g. Sleep Mode or Off Mode). The UUT shall remain in On Mode for the duration of the warm up period, stabilization period, luminance test and On Mode test.

b) No person shall be within close proximity of the occupancy sensor for the duration of the Sleep Mode and Off Mode tests to prevent the UUT from entering a higher power state (e.g. On Mode). The UUT shall remain in Sleep Mode or Off Mode for the duration of the Sleep Mode or Off Mode tests, respectively.

4) Orientation: If the UUT can be rotated into vertical and horizontal orientations, it shall be tested in the horizontal orientation, with the longest dimension being parallel to the table surface.

6. Measurement

6.1 Test Data and Results

RESULT: **PASS**

Mandate: ***1. Calculated TEC (E_{TEC}) in kWh shall be less than or equal the calculation of Maximum TEC (E_{TEC_MAX}) with the applicable allowances and adjustments***
2. Off mode power shall be less than or equal to 0.5W

Display Information and settings	
diagonal screen size: (48.2 cm)	***19 inch***
Active Sreen Area:	***176 square inch***
Resolution in Megapixels	***1.31 M***
Enhanced performance display	***No***
Full network connectivity	***No***
Occupancy sensor	***No***
Touchscreen	***No***

Limits:

E_{TEC_limit}:	***≤ 44.52 kWh***
P_{OFF}:	***≤ 0.5 Watt***

Test result:

Settings	
Maximum report luminance	**222 cd/m²**
Maximum Measured Luminance	**222.0 cd/m²**
As-Shipped Luminance	**205.0 cd/m²**
As-tested Luminance	**200.0 cd/m²**
Input Signal used	**DVI**
Default Delay Time to Sleep	**5.0 min**

TEC **Total Energy Consumption (TEC) in kWh**

Volt.	Freq.	P_{ON}	P_{SLEEP}	E_{TEC}	E_{TEC_MAX}	E_{EP}	E_{ABC}	E_N	E_{OS}	E_T	E_{TEC_limit}
[V]	[Hz]	[W]	[W]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]
100	**50**	**12.22**	**0.35**	**39.46**	**44.52**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**44.52**
100	**60**	**12.22**	**0.35**	**39.46**	**44.52**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**44.52**
115	**60**	**12.10**	**0.34**	**39.03**	**44.52**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**44.52**
230	**50**	**12.21**	**0.34**	**39.37**	**44.52**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**44.52**

Off Mode

Volt.	Freq.	P_{OFF}
[V]	[Hz]	[W]
100	**50**	**0.12**
100	**60**	**0.12**
115	**60**	**0.12**
230	**50**	**0.13**

Note: **Maximal THD measured while performing all tests was 0.52%.**

7. Photographs of the UUT

Figure 1. Front view

Figure 2. Back view

Figure 3. Panel label for panel M190ETN01.0 (AU)

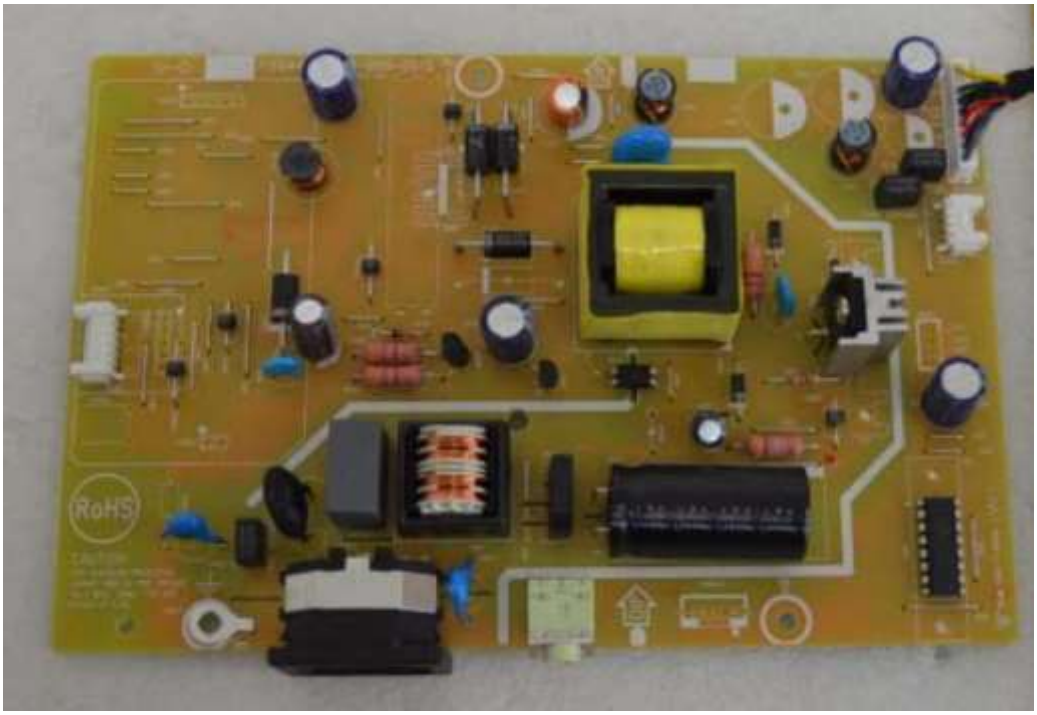

Figure 4. Power board

Figure 5. Main board

8. Attachment: Signed Declaration of Confomity (DoC) for family models

Declaration of Conformity

Difference between odels for ENERGYSTAR Display

Model number	190LM00014
Model name	difference
E960SRD	VGA+DVI
E960SRDA	VGA+DVI+Audio
E960PRD	VGA+DVI+HA Stand
E960PRDA	VGA+DVI+Audio+HA Stand
I960SRD	IPS+ VGA+DVI
I960SRDA	IPS+ VGA+DVI+Audio
I960PRD	IPS+ VGA+DVI+HA Stand
I960PRDA	IPS+ VGA+DVI+Audio+HA Stand

Signature: Maggie Zhou

Name: Maggie zhou

Title: Safety Engineer

Company name: TPV Display Technology (Wuhan) Co.,Ltd

Date: Jun.-03-16

9. Attachment: Measurement and Test equipment list

Ref. No	Equipments	Model	Cal. Date	Due Date
1.884	Digital Power Meter	Yokogawa / WT-210	Jul-2015	Jul-2016
1.802	Luminance Meter	Microvision / SS320	Jul-2015	Jul-2016
1.887	Temperature Humidity Recorder	Sato / SK-L200TH	Nov-2015	Nov-2016
1.897	AC Power Source	ALL POWER / APW-110NH	Mar-2016	Mar-2017
1.891	Stop watch	LEAF / PC396	Jan-2016	Jan-2017