IEC IECEE CB SCHEME

Ref. Certif. No.

JPTUV-076022-M1

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	LCD Monitor
Name and address of the applicant Nom et adresse du demandeur	Wuhan Hengfa Technology Co., Ltd. Zhuankou Development of Economic Technological Development Zone, Wuhan 430056, P.R. China
Name and address of the manufacturer Nom et adresse du fabricant	Wuhan Hengfa Technology Co., Ltd. Zhuankou Development of Economic Technological Development Zone, Wuhan 430056, P.R. China
Name and address of the factory Nom et adresse de l'usine	Wuhan Hengfa Technology Co., Ltd. Zhuankou Development of Economic Technological Development Zone, Wuhan 430056, P.R. China
Ratings and principal characteristics Valeurs nominales et charactéristiques principales	DC 19V, 1.3A, Class III
Trademark (if any) Marque de fabrique (si elle existe)	AOC
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	N/A
Model / Type Ref. Ref. de type	215LM00056, E2280******* (* = refer to the test report)
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la 2ème page)	For model differences, refer to the test report. Re-issue of JPTUV-3076022 dated 27.10.2016, due to first modification.
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+A1+A2 See Test Report for National Differences
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	50056042 002

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

TÜVRheinland®

TÜV Rheinland Japan Ltd.
Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku
Yokohama 224-0021 Japan
Phone + 81 45 914-3888
Fax + 81 45 914-3354
Mail: info@jpn.tuv.com
Web: www.tuv.com

Date: 22.03.2017

Signature: Dipl.-Ing. Univ. S. O. Steinke

Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT

IEC 60950-1
Information technology equipment – Safety – Part 1: General requirements

Report Number ..... :	50056042 002
Date of issue ..... :	Mar. 21, 2017
Total number of pages	13
Applicant's name ..... :	Wuhan Hengfa Technology Co., Ltd.
Address ..... :	Zhuankou Development of Economic Technological Development Zone, Wuhan 430056, P. R. China
Test specification:	
Standard ..... :	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_1F
Test Report Form(s) Originator .... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2014-02

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.

General disclaimer:

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 CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description .....:	LCD Monitor
Trade Mark.....:	AOC
Manufacturer.....:	Same as applicant
Model/Type reference.....:	215LM00056, E2280*******(*=0-9, A-Z, a-z or blank, for marketing purpose only, no technical difference)
Ratings.....:	Input: 19V⎓ , 1.3A, Class III (supplied by external AC/DC adapter)

Testing procedure and testing location:			
☒	**CB Testing Laboratory:**	TÜV Rheinland (Shenzhen) Co., Ltd.	
Testing location/ address .....:		East of F/1, F/2~F/4, Building 1, Cybio Technology Building No. 6 Langshan No.2 Road, North Hi-tech Industry Park 518057 Shenzhen Nanshan District CHINA	
☐	**Associated CB Testing Laboratory:**	N/A	
Testing location/ address .....:		N/A	
Tested by (name + signature).....:		Jet Luo	
Approved by (name + signature) .....:		Michael Yang	
☐	**Testing procedure: TMP/CTF Stage 1:**		
Testing location/ address .....:			
Tested by (name + signature).....:			
Approved by (name + signature) .....:			
☐	**Testing procedure: WMT/CTF Stage 2:**	N/A	
Testing location/ address .....:		N/A	
Tested by (name + signature).....:			
Witnessed by (name + signature) .....:			
Approved by (name + signature) .....:			
☐	**Testing procedure: SMT/CTF Stage 3 or 4:**	N/A	
Testing location/ address .....:		N/A	
Tested by (name + signature).....:			
Witnessed by (name + signature) .....:			
Approved by (name + signature) .....:			
Supervised by (name + signature).....:			

List of Attachments (including a total number of pages in each attachment):

- Photo documentation (5 pages)

Summary of testing:

Tests performed (name of test and test clause):

The tests were carried out under the most unfavourable combination within the manufacturer's operating specifications of the following parameters:

1. Operating mode: continuous under HDMI mode
2. Operating load: Normal full display, the video signal is three vertical bar signal, adjust the brightness and contrast to maximum value
3. Maximum ambient temperature: 40°C
4. Following tests performed during evaluation

Clause(s)	Test(s)
1.6.2	Input Current Test
4.5	Maximum Temperature Test
5.3	Fault Condition Test

Note:

For temperature test the thermocouples method used, regarding fault condition test simulated faults applied.

During all the tests, approved adapter which listed in Table 1.5.1 was used to power to the display.

All tests were conducted on model 215LM00056 to represents other models.

The EUT passed the test.

Testing location:

All tests as described in Test Case and Measurement Sections were performed at the laboratory described on page 2

Summary of compliance with National Differences:

See original CB report 50056042 001.

Copy of marking plate:

The artwork above may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Test item particulars.....:	
Equipment mobility.....:	[x] movable [] hand-held [] transportable [x] stationary (when wall mounted function used) [] 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 .....:	[x] operator accessible [] restricted access location
Over voltage category (OVC) .....:	[] OVC I [x] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values .....:	N/A
Tested for IT power systems .....:	[] Yes (only for Norway) [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 of protective device as part of the building installation (A) .....:	N/A
Pollution degree (PD) .....:	[] PD 1 [x] PD 2 [] PD 3
IP protection class .....:	IP00
Altitude during operation (m) .....:	Up to 5000
Altitude of test laboratory (m) .....:	below 2000
Mass of equipment (kg) .....:	2.50 kg (with base), 2.30 kg (without base)

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 .....:	Feb.14, 2017
Date (s) of performance of tests.....:	Feb.14, 2017 to Mar.07, 2017
General remarks:	

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :	Wuhan Hengfa Technology Co., Ltd. Zhuankou Development of Economic Technological Development Zone, Wuhan 430056, P. R. China

General product information:

Description of change(s):

1. Add a new model E2280******* as client request. Also update the rating label as client request.
2. Add an alternative mainboard SLB58C-WVH-A01 which integrated HDMI, D-SUB, Earphone and DC jack ports in one board, and the equipment with this mainboard is supplied by an AC/DC switching adapter NBS30D190130M2 only. Also add an alternative external power supply NBS30D190130M2 which supplied the equipment with mainboard SLB58C-WVH-A01 only.

For the above described change(s) the following was considered to be necessary:

Change	Testing	Comments
1	N/A	As the model E2280******* is exactly identical to original model 215LM00056, no test is required. For the new rating label, see page 4 for details.
2	1.6.2, 4.5, 5.3	For the new source of AC/DC switching adapter and mainboard, see table 1.5.1 in bold for details. As the ports of the new mainboard and the AC/DC switching adapter are not same as original mainboard, therefore the user manual was re-evaluated.

History of amendments and modifications:

1. Ref. No. 50056042 001, dated on Oct. 25, 2016 (original report)
2. Ref. No. 50056042 002, dated on Mar. 17, 2017 (1st modification)

Abbreviations used in the report:

- normal conditions	**N.C.**	- single fault conditions	**S.F.C**
- functional insulation	**OP**	- basic insulation	**BI**
- double insulation	**DI**	- supplementary insulation	**SI**
- between parts of opposite polarity	**BOP**	- reinforced insulation	**RI**

Indicate used abbreviations (if any)

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1	**GENERAL**		P
1.5	**Components**		P
1.5.1	General		P
	Comply with IEC 60950-1 or relevant component standard	(see appended tables 1.5.1)	P
1.5.2	Evaluation and testing of components	Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal controls		N/A
1.5.4	Transformers	Considered in external approved AC/DC adapter	N/A
1.5.5	Interconnecting cables		N/A
1.5.6	Capacitors bridging insulation	Considered in external approved AC/DC adapter	N/A
1.5.7	Resistors bridging insulation	Considered in external approved AC/DC adapter	N/A
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N/A
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N/A
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N/A
1.5.8	Components in equipment for IT power systems		N/A
1.5.9	Surge suppressors	Considered in external approved AC/DC adapter	N/A
1.5.9.1	General		N/A
1.5.9.2	Protection of VDRs		N/A
1.5.9.3	Bridging of functional insulation by a VDR		N/A
1.5.9.4	Bridging of basic insulation by a VDR		N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6	**Power interface**		P
1.6.1	AC power distribution systems	Not directly connected to mains.	N/A
1.6.2	Input current	Highest load according to 1.2.2.1 for this equipment is the operation with the maximum specified by the manufacturer. (see appended table 1.6.2)	P
1.6.3	Voltage limit of hand-held equipment		N/A
1.6.4	Neutral conductor		N/A

1.7	**Marking and instructions**		P
1.7.2	Safety instructions and marking	English and German version user manual provided.(Version in other language will be provided when submitted for national approval)	P

4.5	**Thermal requirements**		P
4.5.1	General		P
4.5.2	Temperature tests	See appended table 1.6.2	P
	Normal load condition per Annex L ..... :	(see appended table 4.5)	—
4.5.3	Temperature limits for materials	(see appended table 4.5)	P
4.5.4	Touch temperature limits	(see appended table 4.5)	P

5.3	**Abnormal operating and fault conditions**		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P
5.3.2	Motors	No motors.	N/A
5.3.3	Transformers	Transformer not used.	N/A
5.3.4	Functional insulation ..... :	By short-circuited, results see appended table 5.3.	P
5.3.5	Electromechanical components		N/A
5.3.6	Audio amplifiers in ITE ..... :	Audio amplifiers not used.	N/A
5.3.7	Simulation of faults	(see appended table 5.3.)	P
5.3.8	Unattended equipment	No such equipment.	N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions		P

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.3.9.1	During the tests	No fire or molten metal occurred and no deformation of enclosure during the tests.	P
5.3.9.2	After the tests		P

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])
AC/DC switching adapter (supplied the equipment with mainboard 715G7276-M0E-000-004I)	Shenzhen HONOR Electronic Co., Ltd	ADS-25FSG-19 19025GPG	Input:100-240Vac,50/60Hz. Max.0.7A Output: 19Vdc.1.3A (output comply with SELV , LPS and output energy level less than 240VA) Max. ambient temperature 40°C Max. altitude: 5000m	IEC 60950-1 +A1+A2 EN 60950-1 +A11+A1+A12+ A2	TUV Rheinland CB (Certificate no. JP-TUV 059702; test report no: 16064494 001) GS License S 50348615
(Alternative) (supplied with the equipment with mainboard SLB58C-WVH-A01)	**Mass Power Electronic Limited**	**NBS30D190130 M2**	**Input:100-240Vac, 50/60Hz, 0.8A** **Output: 19Vdc.1.3A** **(output comply with SELV, LPS and output energy level less than 240VA)** **Max. ambient temperature 45°C** **Max. altitude: 5000m**	**IEC 60950-1 +A1+A2** **EN 60950-1 +A11+A1+A12+ A2**	**TUV SUD CB (Certificate no. SG-OF-12681, test report No: (085-150147901-000)** **GS license Z1A 15 05 73014 274**
Mainboard	TPV Display Technology (Wuhan) Co., Ltd	715G7276-M0E-000-004I	-	IEC 60950-1	Test with appliance
(Alternative)	**Huizhou SUNNOB Electronic Co. Ltd.**	**SLB58C-WVH-A01**	**--**	**IEC 60950-1**	**Tested with appliance**
Supplementary information: **[1]) Provided evidence ensures the agreed level of compliance.**					

1.6.2	TABLE: Electrical data (in normal conditions)					P
U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
For approved AC/DC adapter under D-SUB mode						
90Vac/50Hz	0.276	--	13.98	--	--	Maximum normal condition
100Vac/50Hz	0.246	0.8	13.90	--	--	Maximum normal condition
240Vac/50Hz	0.113	0.8	13.95	--	--	Maximum normal condition
264Vac/50Hz	0.103	--	14.05	--	--	Maximum normal condition
90Vac/60Hz	0.265	--	13.92	--	--	Maximum normal condition
100Vac/60Hz	0.239	0.8	13.85	--	--	Maximum normal condition
240Vac/60Hz	0.110	0.8	13.97	--	--	Maximum normal condition
264Vac/60Hz	0.100	--	14.06	--	--	Maximum normal condition
For LCD Monitor under D-SUB mode						
19Vdc	0.660	1.3	12.54	--	--	Maximum normal condition
For approved AC/DC adapter under HDMI mode						
90Vac/50Hz	0.300	--	15.32	--	--	Maximum normal condition
100Vac/50Hz	0.269	0.8	15.25	--	--	Maximum normal condition
240Vac/50Hz	0.122	0.8	15.28	--	--	Maximum normal condition
264Vac/50Hz	0.110	--	15.33	--	--	Maximum normal condition
90Vac/60Hz	0.288	--	15.31	--	--	Maximum normal condition
100Vac/60Hz	0.260	0.8	15.24	--	--	Maximum normal condition
240Vac/60Hz	0.119	0.8	15.30	--	--	Maximum normal condition
264Vac/60Hz	0.108	--	15.34	--	--	Maximum normal condition
For LCD Monitor under HDMI mode						
19Vdc	0.720	1.3	13.68	--	--	Maximum normal condition
Supplementary information: Maximum normal condition: Normal full display, the video signal is three vertical bar signal, adjust the brightness and contrast to maximum value						

4.5	TABLE: Thermal requirements		P
	Supply voltage (V) :	DC 19V (supplied by an AC/DC switching adapter NBS30D190130M2)	--
	Ambient Tmin (°C) :	See below	--
	Ambient Tmax (°C) :	See below	--

Maximum measured temperature T of part/at::	T (°C)	Allowed Tmax (°C)
Tested on mainboard SLB58C-WVH-A01		
CN7 connector body	49.2	70-(40-24.8)=54.8
C7 capacitor body	45.4	105-(40-24.8)=89.8
PCB near Q5	52.0	105-(40-24.8)=89.8
L2 coil	53.3	120-(40-24.8)=104.8
L1 coil	63.4	120-(40-24.8)=104.8
TC1 capacitor body	46.7	105-(40-24.8)=89.8
CN1 connector body	38.6	70-(40-24.8)=54.8
PCB near U7	84.3	105-(40-24.8)=89.8
Tested on other parts		
Internal wires	31.3	80-(40-24.8)=64.8
Metal enclosure outside near HDMI port	32.7	70-(40-24.8)=54.8
Plastic enclosure inside near heat sink on mainboard	33.0	60-(40-24.8)=44.8
Plastic enclosure outside near heat sink on mainboard	31.0	60-(40-24.8)=44.8
Button	26.0	60-(40-24.8)=44.8
Transformer winding of adapter	50.3	110-(40-24.8)=94.8
AC adapter enclosure outside near Transformer	36.9	95-(40-24.8)=79.8
LCD panel	30.6	60-(40-24.8)=44.8
Ambient	24.8	--

Temperature T of winding:	t1 (°C)	--	t_2 (°C)	R_2 (Ω)	--	Allowed T_{max} (°C)	Insulation class
--	--	--	--	--	--	--	--

Supplementary information:

1. The temperatures were measured under worst normal mode defined in 1.2.2.1 and as described in sub-clause 1.6.2 and at voltages as described above.
2. The maximum ambient temperature permitted by the manufacturer's specification is 40°C

5.3	TABLE: Fault condition tests		P
	Ambient temperature (°C) .....:	25°C, if not specify the ambient temperature.	—
	Power source for EUT: Manufacturer, model/type, output rating .....:	See details on table 1.5.1	—

Component No.	Fault	Supply voltage (V)	Test time	Fuse #	input current (A)	Observation
C7	s-c	19Vdc	10mins	--	0.016	Unit shut down. No damaged, no hazards.
D7	s-c	19Vdc	10mins	--	0.095	Display function is shut down, No damaged, no hazards.
U2 pin 1-4	s-c	19Vdc	10mins	--	0.033	Unit shut down. No damaged, no hazards.
U2 pin 2-3	s-c	19Vdc	10mins	--	0.034	Unit shut down. Recoverable, no hazards
Q3 pin 1-2	s-c	19Vdc	10mins	--	0.094	Display function is shut down, No damaged, no hazards.
Q3 pin 2-3	s-c	19Vdc	10mins	--	0.094	Display function is shut down, No damaged, no hazards.
Q5 G-D	s-c	19Vdc	10mins	--	0.016	Unit shut down. No damaged, no hazards.
Q5 D-S	s-c	19Vdc	10mins	--	0.016	Unit shut down. No damaged, no hazards.
Q5 G-S	s-c	19Vdc	10mins	--	0.016	Unit shut down. No damaged, no hazards.

Supplementary information:

The ambient temperature specified by the client is 40°C.

In fault column, s-c=short-circuited.

Product: LCD Monitor

Type Designation: 215LM00056, E2280******* (*=0-9, A-Z, a-z or blank, for market purpose only, no technical difference)

Figure 1. Overall view

Figure 2. Overall view

Product: LCD Monitor

Type Designation: 215LM00056, E2280******* (*=0-9, A-Z, a-z or blank, for market purpose only, no technical difference)

Figure 3. Back view

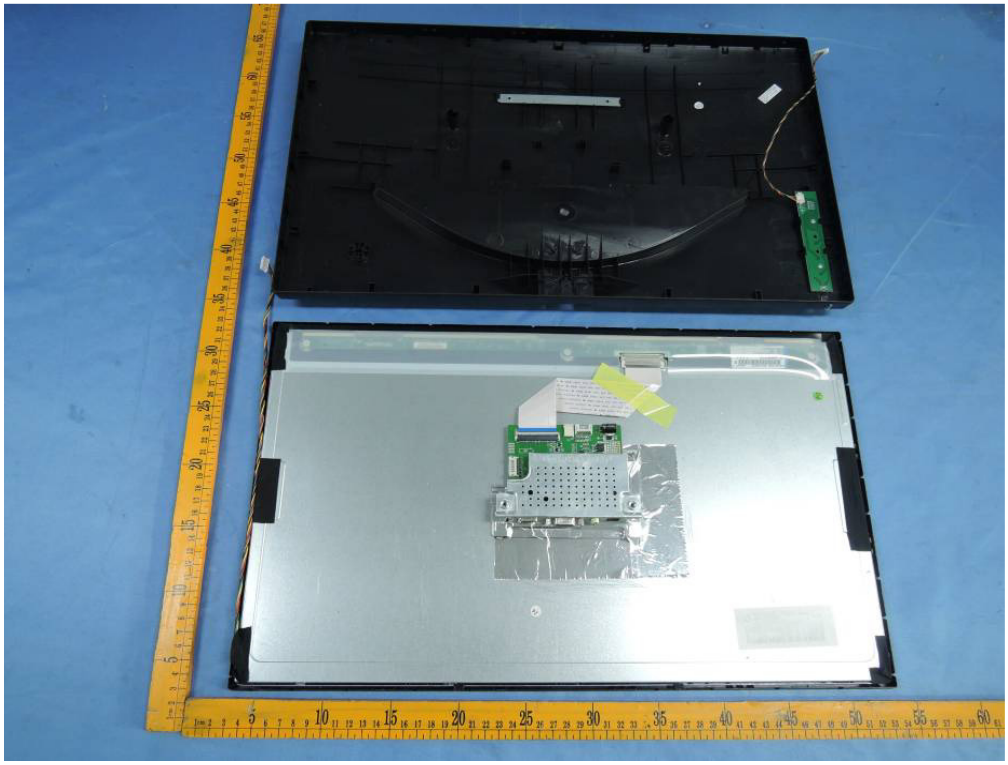

Figure 4. Internal view

Product: LCD Monitor

Type Designation: 215LM00056, E2280******* (*=0-9, A-Z, a-z or blank, for market purpose only, no technical difference)

Figure 5. Internal view

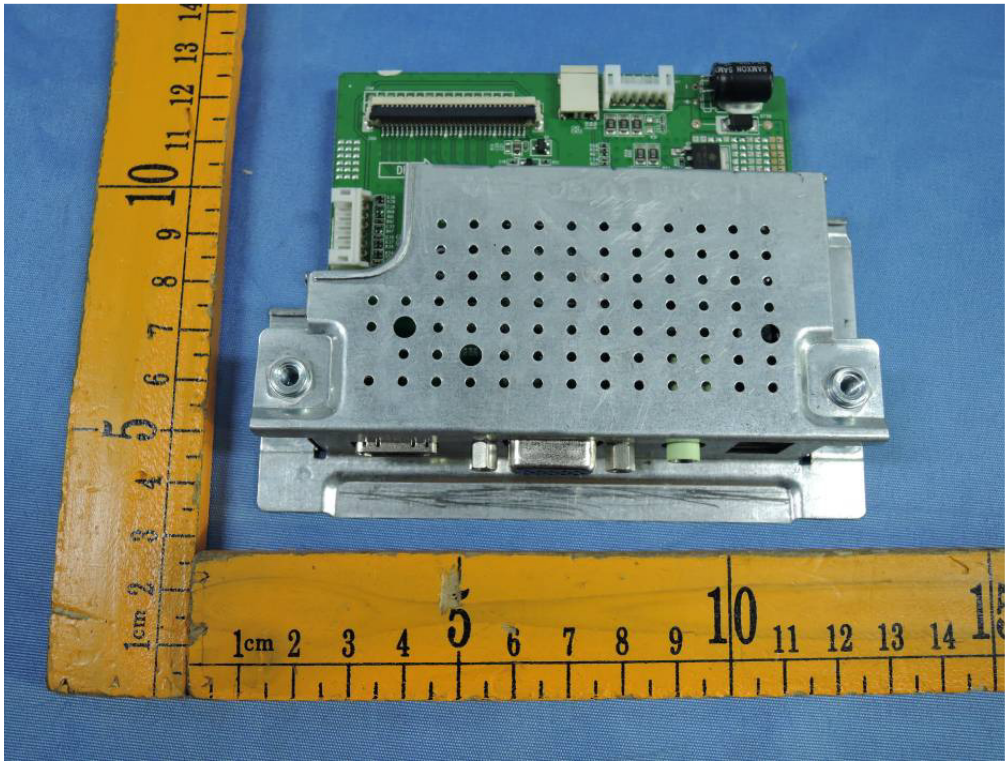

Figure 6. Mainboard PCB component side view (with metal chassis)

Product: LCD Monitor

Type Designation: 215LM00056, E2280******* (*=0-9, A-Z, a-z or blank, for market purpose only, no technical difference)

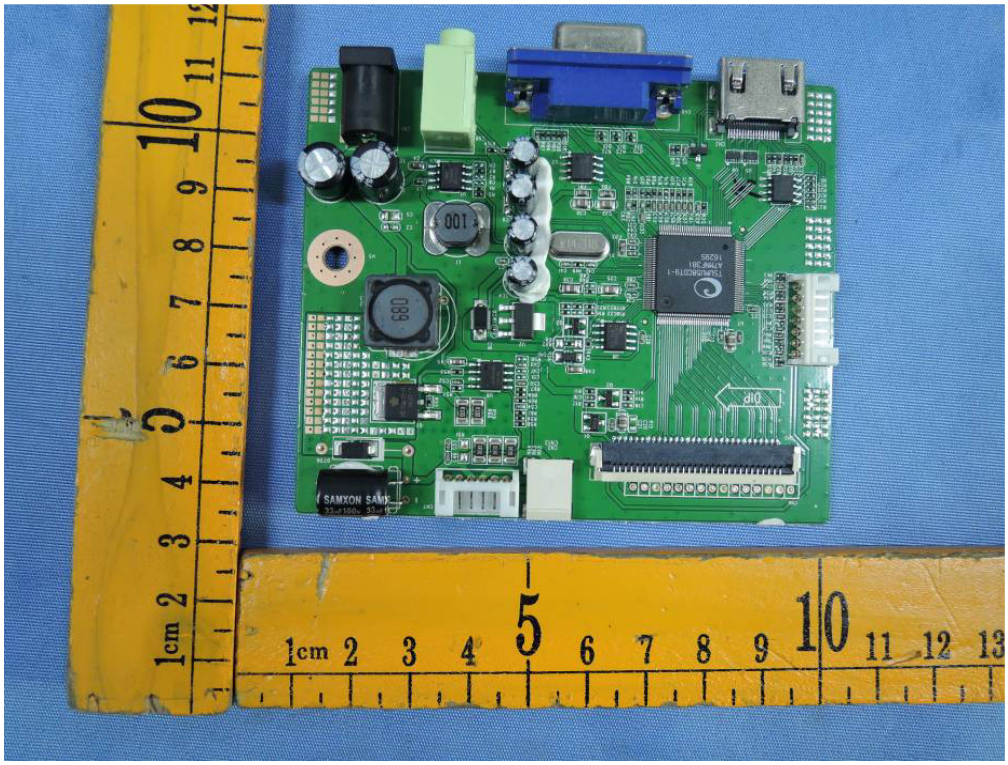

Figure 7. Mainboard PCB component side view (without metal chassis)

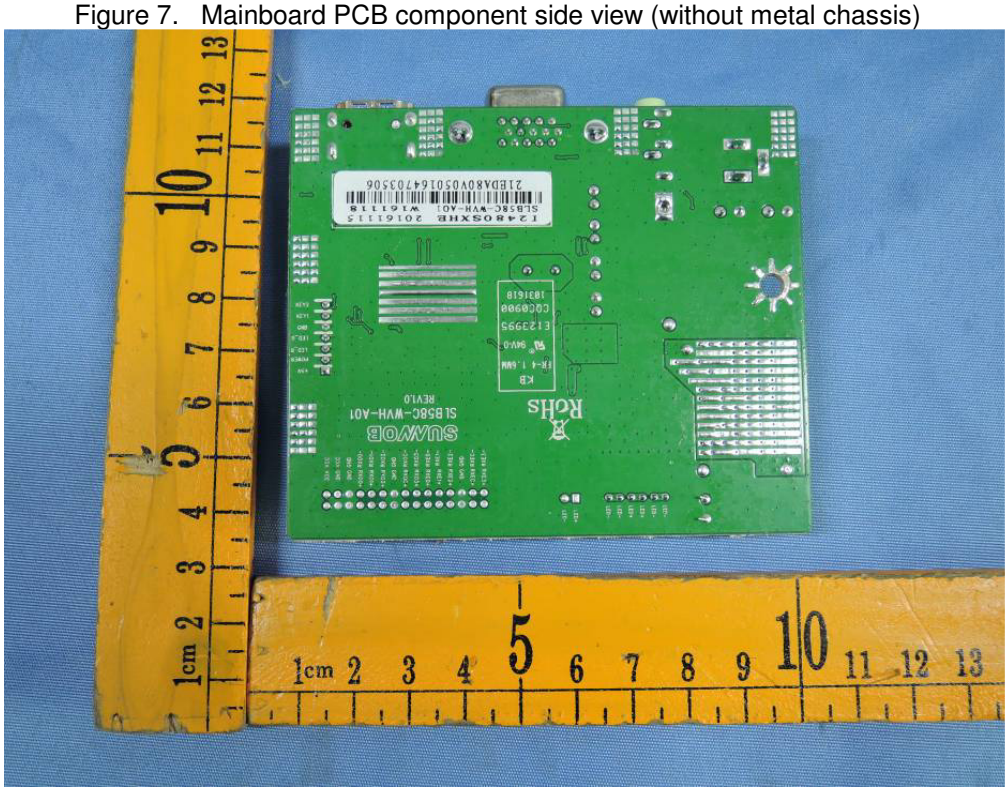

Figure 8. Mainboard PCB trace side view

Product: LCD Monitor

Type Designation: 215LM00056, E2280******* (*=0-9, A-Z, a-z or blank, for market purpose only, no technical difference)

Figure 9. Terminals view

Figure 10. Approved external AC/DC Adapter