# Product Service Manual – X203H

**Service Manual for acer: X203H**

**P/N :  9J.0VH14.T1K**

**Applicable for All Regions**

Version : 001
Date : 2009/5/8

*Notice:*
*- For RO to input specific "Legal Requirement" in specific NS regarding to responsibility and liability statements.*

**First Edition (May, 2009)**

# Content Index

# Abbreviations & Acronyms

## 1. About This Manual

This manual contains information about maintenance and service of acer products. Use this manual to perform diagnostics tests, troubleshoot problems, and align the acer product.

## 1.1 Trademark

The following terms are trademarks of Acer Inc. :
   Acer

## *Importance*

*Only trained service personnel who are familiar with this Acer Product shall perform service or maintenance to it. Before performing any maintenance or service, the engineer MUST read the "Safety Note".*

# 2. Introduction

This section contains general service information, please read through carefully. It should be stored for easy access place for quick reference.

## 2.1 RoHS (2002/95/EC) Requirements

### – Applied to all countries require RoHS.

The RoHS (Restriction of Hazardous Substance in Electrical and Electronic Equipment Directive) is a legal requirement by EU (European Union) for the global electronics industry which sold in EU and some counties also require this requirement.  Any electrical and electronics products launched in the market after June 2006 should meet this RoHS requirements.  Products launched in the market before June 2006 are not required to compliant with RoHS parts.  If the original parts are not RoHS complaints, the replacement parts can be non ROHS complaints, but if the original parts are RoHS compliant, the replacement parts MUST be RoHS complaints.

If the product service or maintenance require replacing any parts, please confirming the RoHS requirement before replace them.

## 2.2 Safety Notice

1. Make sure your working environment is dry and clean, and meets all government safety requirements.
2. Ensure that other persons are safe while you are servicing the product.
   DO NOT perform any action that may cause a hazard to the customer or make the product unsafe.
3. Use proper safety devices to ensure your personal safety.
4. Always use approved tools and test equipment for servicing.
5. Never assume the product's power is disconnected from the mains power supply. Check that it is disconnected before opening the product's cabinet.
6. Modules containing electrical components are sensitive to electrostatic discharge (ESD). Follow ESD safety procedures while handling these parts.
7. Some products contain more than one battery. Do not disassemble any battery, or expose it to high temperatures such as throwing into fire, or it may explode.
8. Refer to government requirements for battery recycling or disposal.

## 2.3 Compliance Statement

Caution: This Optical Storage Product contains a Laser device. Refer to the product specifications and your local Laser Safety Compliance Requirements.

## 2.4 General Descriptions

This Service Manual contains general information. There are 3 levels of service:
   Level 1: Cosmetic / Appearance / Alignment Service
   Level 2: Circuit Board or Standard Parts Replacement
   Level 3: Component Repair to Circuit Boards

# 3. Product Overview

## 3.1 Introduction

 X203H is defined as our new 20'W model in ACER V series which will be the ACER project in Qisda. X203H is defined as 20'W LCD Monitor supports 1600(H) x 900(V) resolution with DPMS (Display Power Management System) and ACER eColor function. There are double input types, D-sub, and DVI. X203H adopts SEC LTM200KT03 and LGD LM200WD1-TLC1. V203H has included 1W+1W speaker.X203H also support ACM 10000:1.


The features summary is shown as below,

*All panel spec. in Q201 definition depends on the variance of panel source.

*All spec. of monitor need to warm up at least 1hr.

* To test the "Contrast Ratio" and "Luminance" functions, the color status must be "User preset" mode.

* 1. "Contrast Ratio": Set "brightness" at 100, and "contrast" at 50.

* 2. "Luminance": Set "brightness" at 100, and "contrast" at 100.

| Feature items | Specifications | Remark |
|---|---|---|
| Panel supplier & module name | SEC LTM200KT03 LGD LM200WD1-TLC1 | TN, Normally white |
| Screen diagonal | 20W" | |
| Display Format | 1600(H) x 900 (V) | Panel Display information |
| Pixel Pitch | 276.8 um x 276.8um | per one triad |
| Viewing Angle (@ Contrast Ratio >= 10) | SEC LTM200KT03 R/L:160 degrees (typ) U/D: 160 degrees (typ) LGD LM200WD1-TLC1 R/L:170 degrees (typ) U/D: 160 degrees (typ) | |
| Analog interface with Scaling supported | Yes | With 15-pin D-sub connector |
| HDMI interface with Scaling supported | No | Only For 1A2H model |
| Panel native resolution supported | 1600 (H) x 900 (V)@60Hz | |
| Number of Display Colors supported | 16.7 Millions | RGB 6-bit +Hi-FRC |
| Contrast Ratio | 1000:1 (typ.), 700:1(min) | Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset |
| 1. ACM | 10000:1 | |
| 2. Luminance | 250 cd/m$^2$ (typ.),200 cd/m$^2$ (min) | Test Condition: Set Contrast at 50, Brightness at 100, |

| | | Color at User preset |
|---|---|---|
| AC power input | Yes | 90-264 Volts, 47-63 Hz. |
| DC power input (with AC power adapter) | No | |
| DPMS supported | Yes | $\leq$1W |
| LED indicator for power status showed | Yes | Blue/Amber |
| OSD for control & information supported | Yes | |
| Multi-language supported for OSD | Yes | EMEA Non-EMEA |
| Buttons control supported | Yes | 6 buttons including 1 monitor power on/off control button. |
| Flywheel control supported | No | |
| Scaling function supported | Yes | |
| Auto adjustment function supported | Yes | |
| DDC function supported (EDID ver. 1.3) | Yes | DDC2B |
| DDC-CI support version 1.1 or later | Yes | DDC-CI |
| Audio speakers supported | Yes | |
| Audio Jack (input connector) supported | Yes | Line-in connector |
| Earphone Jack (Output connector) supported | No | |
| Microphone function supported | No | |
| Mechanical Tilt base design | Yes | From -5 to +23 degree |
| VESA wall mounting design | Yes | |
| Mechanical Rotate design | No | |
| Mechanical Lift base design | No | |
| Kensington compatible lock design | Yes | |

## 3.2 Operational Specification

### 3.2.1 Power supply

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Input Voltage range | Universal input full range | 90~264VAC /47~63Hz | √ | | |
| Input Current range | 90 ~ 264VAC | $\leq$ 2.0 Arms | √ | | |
| Power Consumption | Normal "On" operation | **< 33 W** | √ | | LED: Blue |
| DPMS | DPMS "Sleep" state | $\leq$ 1 W | √ | | LED: Amber |
| DPMS | DPMS "Off" state | $\leq$ 0.5 W | √ | | LED: OFF |
| Inrush Current | 110 VAC 220 VAC | **< 30 A (peak)** **< 60 A (peak)** | √ | | Cold-start |
| Earth Leakage Current | 264 VAC/50Hz | < 3.5 mA | √ | | |
| Hi-Pot | 1. 1500VAC, 1 sec 2. Ground test: 30A, 1sec | Without damage < 0.1 ohm | √ | | (on-line test) (in-lab test) |
| Power Line Transient | IEC1000-4-4 | 1KV | √ | | |

| | IEC1000-4-5 (Surge) | Common: 2KV, Differential: 1KV | √ | | |
|---|---|---|---|---|---|
| CCFL operation range | 90 ~ 264VAC | LGD: 2.5mA~8.0mA SEC: 3.0mA~8.5mA | √ | | Depends on panel source |
| CCFL Frequency | 90 ~ 264VAC | 40KHz ~ 70KHz | √ | | Depends on panel source |
| Power cord | | Color: Black Length: 1800 +/- 50 mm | √ | | |

## 3.2.2 Signal interface

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Signal Cable | 15-pin D-Sub | Color: Black Length: 1800 +/- 30 mm | √ | | |
| | 24-pin DVI-D | Color: Black Length: 1800 +/- 50 mm | | √ | |
| Pin assignment | 15-pin D-sub connector | See Note-1 | √ | | For 15-pin D-sub |
| | 24-pin DVI-D connector | See Note-2 | √ | | For 24-pin DVI-D |
| | 19-pin HDMI connector | See Note-3 | | √ | For 19-pin HDMI |
| Analog input | Signal type | Separate analog R/G/B | √ | | For 15-pin D-sub |
| | Level | 700 mV (peak to peak) | √ | | |
| | Impedance | 75 Ohms +/- 1.5 Ohms | √ | | |
| Sync input | Signal type | Separate H/V-sync Composite H/V-sync (Positive/Negative) | √ | | For 15-pin D-sub |
| | Level | Logic High: 2.4V ~ 5.5V Logic Low: 0V ~ 0.5V (TTL level) | √ | | Refer to VESA VSIS Standard V1R1 |
| | Impedance | Minimum 2.2KΩ(pull down) | √ | | 10KΩ for application |
| | Sync Pulse Width (SPW) | 0.7μs < H-SPW 1H < V-SPW | √ | | |
| Digital input | Level | 600mV for each differential line | √ | | |
| | Impedance | 50 Ohm TDR Scan needed for DVI cable and interface board | √ | | |

Note-1: The pin assignment of 15-pin D-sub connector is as below,
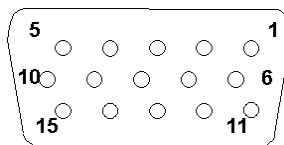
| Pin | Signal Assignment | Pin | Signal Assignment |
|---|---|---|---|
| 1 | Red video | 9 | PC5V (+5 volt power) |
| 2 | Green video | 10 | Sync Ground |
| 3 | Blue video | 11 | Ground |
| 4 | Ground | 12 | SDA |
| 5 | Cable Detected | 13 | H-Sync (or H+V) |
| 6 | Red Ground | 14 | V-sync |
| 7 | Green Ground | 15 | SCL |
| 8 | Blue Ground | | |

Note-2: The pin assignment of 24-pin DVI-D connector is as below,
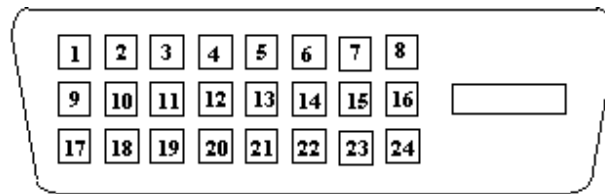


| Pin | Signal Assignment | Pin | Signal Assignment |
|---|---|---|---|
| 1 | TMDS RX2- | 13 | Floating |
| 2 | TMDS RX2+ | 14 | +5V Power |
| 3 | TMDS Ground | 15 | Ground |
| 4 | Floating | 16 | Hot Plug Detect |
| 5 | Floating | 17 | TMDS RX0- |
| 6 | DDC Clock | 18 | TMDS RX0+ |
| 7 | DDC Data | 19 | TMDS Ground |
| 8 | Floating | 20 | Floating |
| 9 | TMDS RX1- | 21 | Floating |
| 10 | TMDS RX1+ | 22 | TMDS Ground |
| 11 | TMDS Ground | 23 | TMDS Clock+ |
| 12 | Floating | 24 | TMDS Clock- |

### 3.2.3 Video performance

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Max. support Pixel rate | | 151.25 MHz | √ | | Both for analog and digital inputs |
| Max. Resolution | | 1600 x 9000 | √ | | Both for analog and digital inputs |
| Rise time + Fall time | | < 5 ms (50% of minimum pixel clock period) | √ | | 1600x900 @ 60Hz (max. support timing) |
| Settling Time after overshoot /undershoot | | < 5% final full-scale value | √ | | Refer to VESA VSIS Standard V1R1 |
| Overshoot/Undershoot | | < 12% of step function voltage level over the full voltage range | √ | | Refer to VESA VSIS Standard V1R1 |

### 3.2.4 Scan range

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Horizontal | | 31-83 KHz | √ | | |
| Vertical | | 56-76 Hz | √ | | HDMI supports 50Hz |

### 3.2.5 Plug & Play DDC2B DDC-CI Support

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| DDC channel type | | DDC2B | √ | | |
| EDID | | Version 1.3 | √ | | Refer to S/W spec. document to see the detailed EDID data definition. |
| DDC-CI | | Version 1.1 or Later | √ | | Refer to S/W spec |

### 3.2.6 Support Timings

| | | | | |
|---|---|---|---|---|
| 640x480@60Hz | 800 x 525 | 31.469 | 59.941 | 25.175 |
| 640x480@72Hz | 832 x 520 | 37.861 | 72.809 | 31.500 |
| 640x480@75Hz | 840 x 500 | 37.500 | 75.000 | 31.500 |
| 640x480@66.66Hz | 864x525 | 35 | 66.66 | 30.24 |
| 720x400@70Hz | 900x449 | 31.469 | 70.087 | 28.322 |
| 800x600@56Hz | 1024 x 625 | 35.156 | 56.250 | 36.000 |
| 800x600@60Hz | 1056 x 628 | 37.879 | 60.317 | 40.000 |
| 800x600@72Hz | 1040 x 666 | 48.077 | 72.188 | 50.000 |
| 800x600@75Hz | 1056x625 | 46.875 | 75.000 | 49.500 |
| 832x624@74.55Hz | 1152x667 | 49.722 | 74.55 | 57.28 |
| 1024x768@60Hz | 1344x806 | 48.363 | 60.004 | 65.000 |
| 1024x768@70Hz | 1328x806 | 56.476 | 70.069 | 75.000 |
| 1024x768@75Hz | 1312x800 | 60.023 | 75.029 | 78.750 |
| 1152x870@75Hz | 1456x915 | 68.681 | 75.062 | 100.000 |
| 1152x864@75Hz | 1600x900 | 67.5 | 75 | 108 |
| 1280x960@60Hz | 1800x1000 | 60 | 60 | 108 |
| 1280x1024@60Hz | 1688x1066 | 63.981 | 60.020 | 108.000 |
| 1280x1024@75Hz | 1688x1066 | 79.976 | 75.025 | 135.000 |
| 1280x720@60Hz | 1650x750 | 44.955 | 59.940 | 74.176 |
| 1280x800@60Hz | 1680x831 | 49.702 | 59.810 | 83.500 |
| 1360x768@60Hz | 1792x795 | 47.712 | 60.015 | 85.500 |
| 1600x900@60Hz | 2122x934 | 55.990 | 59.946 | 118.250 |
| 1600x900@60Hz_RB | 1800x1000 | 60.000 | 60.000 | 108.000 |
| 1600x900@75Hz | 2144x942 | 70.546 | 74.889 | 151.250 |

**Note:**

1. Show "Input Not Supported" warning message.

   When Vertical Frequency is over 76Hz or under 56Hz, the display is Black and showing "Input Not Supported" warning message. (HDMI supports 50Hz for PAL video signals.)

2. If Hf /Vf is set in the range of 31KHz~83KHz and 56Hz ~76Hz, but is not the above Resolution, then it will display the nearest mode.

## 3.3 Operational & Functional Specification

### 3.3.1 Video performance

**\*All spec. of monitor need to warm up at least 1hr.**

**SEC LTM200KT03**

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Resolution | Any input resolution modes which are under 1600x900 | 1600x900 | √ | | |
| Contrast ratio | | 1000(typ.) | √ | | Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset. |
| Brightness | At R/G/B saturated condition | 250 cd/m$^2$ (typ.),200 cd/m$^2$ (min) | √ | | Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset. |
| Response time | Rising + Falling time | On/off:5 ms (typ.),10ms(max) | √ | | Test Equipment: Westar TRD 100 or equal level equipment ; |
| Viewing angle | At Contrast ratio = 10 | R/L: 80/80 degrees (typ.) 70/70 degrees (min) | √ | | |
| | At Contrast ratio = 10 | U/D: 80/80 degrees (typ.) 70/70 degrees(min) | √ | | |
| CIE coordinate of White | | (0.31, 0.33) +/- (0.03, 0.03) | √ | | |
| Display colors | | 16.7 Millions colors | √ | | 6 bit+Hi-FRC |

**LGD LM200WD1-TLC1**

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Resolution | Any input resolution modes which are under 1600x900 | 1600x900 | √ | | |
| Contrast ratio | | 700(min),1000(typ.) | √ | | Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset. |

| Brightness | At R/G/B saturated condition | 250 cd/m$^2$ (typ.),200 cd/m$^2$ (min) | √ | | Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset. |
|---|---|---|---|---|---|
| Response time | Rising + Falling time | On/off:5 ms (typ.),10ms(max) | √ | | Test Equipment: Westar TRD 100 or equal level equipment ; |
| Viewing angle | At Contrast ratio = 10 | R/L: 85/85 degrees (typ.) 70/70 degrees (min) | √ | | |
| | At Contrast ratio = 10 | U/D: 75/85 degrees (typ.) 60/70 degrees(min) | √ | | |
| CIE coordinate of White | | (0.31, 0.33) +/- (0.03, 0.03) | √ | | |
| Display colors | | 16.7 Millions colors | √ | | 6 bit+Hi-FRC |

### 3.3.2 Brightness Adjustable Range

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Brightness adjustable range | At default contrast level (saturate point) & Full-white color pattern | (Max. brightness value – ● Min. brightness value) ≧ 100 cd/㎡ | √ | | |

### 3.3.3 Acoustical Noise

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Acoustical Noise | At 30 cm distance | ≦ 22 dB/A | √ | | Refer to C326 |

### 3.3.4 Environment

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Temperature | Operating | 0 ~ +40 ℃ | √ | | |
| | Non-operating | -20 ~ +65 ℃ | √ | | |
| Humidity | Operating | 20 ~ 80% | √ | | Non-condensing |
| | Non-operating | 20 ~ 80% | √ | | Non-condensing |
| Altitude | Operating | 12,000 feet at 25℃ | √ | | Without packing |
| | Non-operating | 40,000 feet at -30 ℃ | √ | | With packing |

### 3.3.5 Transportation

| Item | Condition | Spec | OK | N.A | Remark |
|------|-----------|------|----|-----|--------|
| (1) Vibration | Package, Non-Operating | Test Specification:<br>1. Frequency Hertz  5 ~ 250 HZ , PSD Level 0.0054 (G2/Hz)<br>2. Grms = 1.146<br>3. Sweep Time : 30 minutes per Axis<br>4. Axes : X,Y,Z | √ | | |
| (2) Unpackaged Vibration | Unpackaged, Non-Operating | Test Spectrum:<br>20 Hz  0.0185(g2/Hz)<br>200Hz  0.0185(g2/Hz)<br>Duration : 5 Minutes<br>Axis   : 3 axis<br>( Horizontal and Vertical axis ,Z axis) | √ | | |
| (3) Drop | Package, Non-Operating | 76 cm Height (MP stage) (1 corner, 3 edges, 6 faces) | √ | | |
| (4) Shock | Wooden package, Non-Operating | 1. Amplitude : Half sine-wave 50G<br>2. Duration : 10 ms<br>3. Test Times : 1<br>4.Test Sides : All 6 Sides | √ | | |

### 3.3.6 Electrostatic Discharge Requirements

| Item | Condition | Spec | OK | N.A | Remark |
|------|-----------|------|----|-----|--------|
| Electrostatic Discharge | IEC801-2 standard | Contact: 8KV<br>Air: 15KV | √ | | |

### 3.3.7 EMC

| Item | Condition | Spec | OK | N.A | Remark |
|------|-----------|------|----|-----|--------|
| TCO03 | Electric | Band 1 < 10 V/m<br>Band 2 < 1 V/m | √ | | |
| | Magnetic | Band 1 < 200nT<br>Band 2 < 25nT | √ | | |
| EMI | FCC part 15J class B | After Mass production under 1dBuv for constant measure. Besides DNSF and VCCI class-2 are optional. | √ | | |
| | EN55022 class B | | | | |

### 3.3.8 Reliability

| Item | Condition | Spec | OK | N.A | Remark |
|------|-----------|------|----|-----|--------|
| MTBF Prediction | Refer to MIL-217F | > 60,000 Hours | √ | | Excluding CCFL |
| CCFL Life time | At 25±2℃, under 7.0mA | 40,000 Hours (min) | √ | | See Note-4 |

**Note-4:** CCFL lifetime is determined as the time at which brightness of lamp is 50%. The typical lifetime of CCFL is on the condition at 7.0mA lamp current.

### 3.3.9 Audio performance

| Item | Condition | Spec | OK | N.A | Remark |
|------|-----------|------|----|-----|--------|
| Preamp + Power amp | | | | | |
| (1)Output power | | 1 Wrms/CH @ 1KHz | √ | | |
| (2)THD (@ 1W) | | <1% | √ | | |
| (3)S/N ratio | | >40dB | √ | | |
| Speaker Driver | | | | | |
| (1)Nominal impedance | | 8 ohm | √ | | |
| (2)Rated input power | | 1 W/CH | √ | | |
| (3)Frequency response | | 500~20KHz  SPL-10dB | √ | | |
| (4)Output sound pressure level | | 80 ± 3 dB (1W 0.5M) | √ | | |
| (5)Dimension of box | | 63x25x13mm$^2$ | √ | | |
| Audio Control | | | | | |
| (1)Volume range | | 0 ~100 levels | √ | | |
| (2)Mute | | On/Off | | √ | |

## 3.4 LCD Characteristics

### 3.4.1 The Physical definition & Technology summary of LCD panel

**SEC LTM200KT03**

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| LCD Panel Supplier | | SEC | √ | | |
| Panel type of Supplier | | LTM200KT03 | √ | | |
| Screen Diagonal | | 20.0" Diagonal | √ | | |
| Display area | Unit=mm | 442.8(H) x 249.075(V) | √ | | |
| Physical Size | Unit=mm | 462.8(H) x272.0(V) x 17.5(D) | √ | | |
| Weight | Unit=gram | 2600 (max.) | √ | | |
| Technology | | TN type | √ | | |
| Pixel pitch | Unit=um | 276.8(H) x276.8 (W) | √ | | Per one triad |
| Pixel arrangement | | R/G/B vertical stripe | √ | | |
| Display mode | | Normally White | √ | | |
| Support color | | 16.7Millions colors | √ | | 6 bit + HiFRC |

**LGD LM200WD1-TLC1**

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| LCD Panel Supplier | | LGD | √ | | |
| Panel type of Supplier | | LM200WD1-TLC1 | √ | | |
| Screen Diagonal | | 20.0" Diagonal (508.05 mm) | √ | | |
| Display area | Unit=mm | | √ | | |
| Physical Size | Unit=mm | 462.8(H) x272.0(V) x 14.5(D) | √ | | |
| Weight | Unit=gram | 1620 (typ.) | √ | | |
| Technology | | TN type | √ | | |
| Pixel pitch | Unit=um | 92.2xRGB (H) x276.6 (W) | √ | | Per one triad |
| Pixel arrangement | | R/G/B vertical stripe | √ | | |
| Display mode | | Normally White | √ | | |
| Support color | | 16.7Millions colors | √ | | 6 bit + HiFRC |

## 3.4.2 Optical characteristics of LCD panel

### SEC LTM200KT03

| Item | Unit | Conditions | Min. | Typ. | Max. | Remark |
|---|---|---|---|---|---|---|
| Viewing Angle | [degree] | Horizontal (Right) | 70 | 80 | - | |
| | [degree] | CR = 10 (Left) | 70 | 80 | - | |
| | [degree] | Vertical (Up) | 70 | 80 | - | |
| | [degree] | CR = 10 (Down) | 70 | 80 | - | |
| Contrast ratio | | Normal Direction | | 1000 | | |
| Response Time | [msec] | Rising Time | - | | | |
| | [msec] | Falling Time | - | | | |
| | [msec] | Rising + Falling | - | 5 | 10 | |
| Color / Chromaticity Coordinates (CIE) | | Red x | | 0.650 | | |
| | | Red y | | 0.335 | | |
| | | Green x | | 0.295 | | |
| | | Green y | | 0.605 | | |
| | | Blue x | | 0.145 | | |
| | | Blue y | | 0.075 | | |
| Color Coordinates (CIE) White | | White x | | 0.313 | | |
| | | White y | | 0.629 | | |
| Luminance Uniformity | [%] | 9 points measurement | 75 | 80 | | |
| White Luminance @ CCFL 7.0mA (center) | [cd/m$^2$] | | 200 | 250 | - | |
| Crosstalk (in 75Hz) | [%] | | | | | |

### LGD LTM200WD1-TLC1

| Item | Unit | Conditions | Min. | Typ. | Max. | Remark |
|---|---|---|---|---|---|---|
| Viewing Angle | [degree] | Horizontal (Right) | 70 | 80 | - | |
| | [degree] | CR = 10 (Left) | 70 | 80 | - | |
| | [degree] | Vertical (Up) | 60 | 75 | - | |
| | [degree] | CR = 10 (Down) | 70 | 80 | - | |
| Contrast ratio | | Normal Direction | 700 | 1000 | | |
| Response Time | [msec] | Rising Time | - | 1.1 | 2.6 | |
| | [msec] | Falling Time | - | 3.9 | 7.4 | |
| | [msec] | Rising + Falling | - | 5.0 | 10.0 | |
| Color / Chromaticity Coordinates (CIE) | | Red x | 0.643 | 0.646 | 0.649 | |
| | | Red y | 0.331 | 0.334 | 0.337 | |
| | | Green x | 0.300 | 0.303 | 0.306 | |
| | | Green y | 0.613 | 0.616 | 0.619 | |
| | | Blue x | 0.144 | 0.147 | 0.150 | |
| | | Blue y | 0.064 | 0.067 | 0.170 | |
| Color Coordinates (CIE) White | | White x | 0.310 | 0.313 | 0.316 | |
| | | White y | 0.326 | 0.329 | 0.332 | |
| Luminance Uniformity | [%] | 9 points measurement | 75 | | | |
| White Luminance @ CCFL 7.0mA (center) | [cd/m$^2$] | | 200 | 250 | - | |
| Crosstalk (in 75Hz) | [%] | | | | 1.5 | |

## 3.5 User Controls

### 3.5.1 User's hardware control definition

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Power button | | | √ | | |
| Auto button(Exit button) | | | √ | | |
| Right/Inc. button | | | √ | | |
| Left/Dec. button | | | √ | | |
| Menu button | | | √ | | |
| Mode button | | | | √ | |
| Input Select button | | | | √ | |
| E-Key button | | | √ | | |
| Mute button | | | | √ | |

### 3.5.2 OSD control function definition

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Auto Adjust | | Auto-Geometry | √ | | |
| Brightness | | | √ | | |
| Contrast | | | √ | | |
| Horizontal Position | | | √ | | |
| Vertical Position | | | √ | | |
| Clock | | | √ | | |
| Foucs | | | √ | | |
| Color | | Cool(9300K) Warm(6500K) User: Separate R/G/B adjustment | √ | | |
| OSD Position | | OSD Horizontal position OSD Vertical position | √ | | |
| OSD Time out | | From 10 sec to 120 sec | √ | | |
| OSD Lock | | | | √ | |
| Language | | EMEA/Non-EMEA languages for Asia/Europe Version | √ | | |
| Recall | | Recall All | √ | | |
| Input Select | | D-sub DVI | √ | | |
| Sharpness | | | | √ | |
| Display Information | | For input timing | √ | | |
| Volume | | | √ | | |
| Mute | | | | √ | |
| Hot key for Auto | | | √ | | |
| Hot key for Contrast | | | | √ | |
| Hot key for Volume | | | √ | | Right/left key |
| Hot key for Input Select | | | | √ | |
| Hot key for Mode | | | | √ | |
| Wide mode | | Full/Aspect | √ | | |
| ACM | | ON/OFF | √ | | |
| DDC-CI | | ON/OFF | √ | | |

| | | User/Text/Standard/Graphic/Movie | √ | | |
|---|---|---|---|---|---|
| Acer eColor Management | | User/Text/Standard/Graphic/Movie | √ | | |
| Exit | | | √ | | |

PS: "E-key" +" Power" to enter factory mode

The detailed firmware functions' specification, please refer to C212 S/W spec. document.

## 3.6 Mechanical Characteristics

### 3.6.1 Dimension

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Bezel opening | | 444.81*251.21 mm | √ | | |
| Monitor without Stand | W x H x D mm | 491.25*305.93*62.2 mm | √ | | |
| Monitor with Stand | W x H x D mm | 491.25*356.53*177.41 mm | √ | | |
| Carton Box (outside) | L x W x H mm | 540*134*411mm | √ | | |
| Tilt and Swivel range | | Tilt: -5 ~ +15 degree Swivel: 0 degree | √ | | |

### 3.6.2 Weight

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Monitor (Net) | 4.1Kg | **4.1Kg** | √ | | |
| Monitor with packing (Gross) | 5.6 **kg** | 5.6 **kg** | √ | | |

### 3.6.3 Plastic

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Flammability | | **>ABS<,94-HB** | √ | | |
| Heat deflection To | **ABS** | 65 ℃ | √ | | |
| UV stability | **ABS** | **Delta E < 8.0** | √ | | |
| Resin | | 1.BEZEL/BASE:ABS 2.UC/CLMN:ABS | √ | | |
| Texture | | **Uc:AT-IM-D02; Bezel: AT-IM-D01** | √ | | |
| Color | | **BEZEL : DB19A; UC: DB19A** | √ | | |

### 3.6.4 Carton

| Item | Condition | Spec | OK | N.A | Remark |
|---|---|---|---|---|---|
| Color | | **Kraft** | √ | | |
| Material | | **B Flute** | √ | | |
| Compression strength | | **200KGF** | √ | | |
| Burst Strength | | **16 KGF/cm$^2$** | √ | | |
| Stacked quantity | | 5 Layers Vertical | √ | | |

## 3.7 Pallet & Shipment

### 3.7.1 Container Specification

| Stowing Type | Container | Quantity of products (sets) (Every container) | Quantity of Products (sets) (Every Pallet) | Quantity of pallet (sets) (Every Container) |
|---|---|---|---|---|
| With pallet | 20' | 900 | Pallet A: 90 | Pallet A: 10 |
| | | | Pallet B: | Pallet B: |
| | 40' | 1800 | Pallet A: 90 | Pallet A: 20 |
| | | | Pallet B: X | Pallet B: X |
| Without pallet | 20' | | X | X |
| | | | X | X |
| | 40' | | X | X |
| | | | X | X |

### 3.7.2 Carton Specification

#### 3.7.2.1 Product:

| Net Weight (Kg) | Gross Weight (Kg) | Dimension w/o Base W*H*D (mm) | Dimension w/ Base W*H*D (mm) |
|---|---|---|---|
| 4.1**kg** | 5.6 **kg** | **mm** | **mm** |

#### 3.7.2.2 Package:

| Carton Interior Dimension (mm) L*W*H | Carton External Dimension (mm) L*W*H |
|---|---|
| **532*126*399mm** | **540*134*411mm** |

## 3.8 Certification

| Item | Condition | Spec | OK | N.A | Remark |
|------|-----------|------|----|----|--------|
| Environment | Green design | API Doc. 715-C49 | √ | | ISO14000 Requirement |
| | Blue Angel | German Standard | | √ | |
| | E-2000 | Switzerland | | √ | |
| | EPA | USA Standard | √ | | |
| | TCO'99 | | | √ | |
| | TCO'03 | | √ | | |
| | MPR2 | | √ | | |
| | Green Mark | | √ | | |
| PC-Monitor | Microsoft Windows | PC98/99 | √ | | |
| | DPMS | VESA | √ | | |
| | DDC 2B | Version 1.3 | √ | | |
| | USB | External | | √ | |
| Safety | UL (USA) | UL60950 3$^{rd}$ edition | | √ | |
| | CSA (Canada) | CAN/CSA-C22.2 No. 60950 | √ | | |
| | Nordic / D.N.S.F | EN60950 | | √ | |
| | FIMKO | EN60950 | | √ | |
| | CE Mark | 73/23/EEC | √ | | |
| | CB | IEC60950 | √ | | |
| | CB | EN60950 | √ | | |
| | TUV/GS | EN60950 / EK1-ITB 2000:2003 | | √ | |
| | CCC (China) | CB4943 | √ | | |
| | GOST | EN60950 | √ | | |
| | TUV type-approved | | √ | | |
| | SASO | IEC60950 | | √ | |
| EMC | CE Mark | 89/336/EEC | √ | | |
| | FCC (USA) | FCC Part 15 B | √ | | |
| | EN55022 | Class B | | √ | |
| | CISPR 22 | Class B | | √ | |
| | VCCI (Japan) | VCCI Class B | √ | | |
| | BSMI (Taiwan) | CNS 13438 | √ | | |
| | C-Tick (Australia) | AS/ NZS CISPR22 | √ | | |

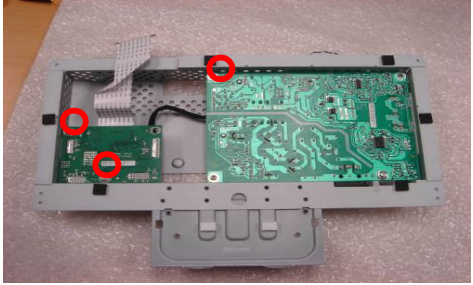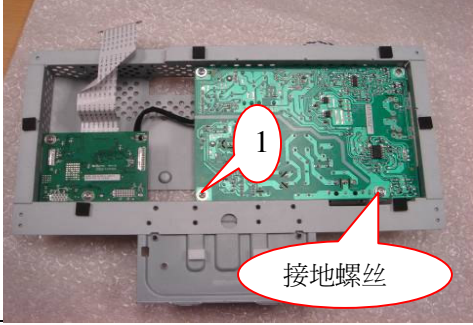| | DHHS (21 CFR) | USA X- Ray Standard | | √ | |
|---|---|---|---|---|---|
| X- Ray Requirement | DNHW | | | √ | |
| | PTB | German X- Ray standard | | √ | |
| | TUV / Ergo | | | √ | |
| Ergonomics | ISO 13406-2 | | √ | | |
| | prEN50279 | | | √ | |

## 3.9 Packing



The sequence of the accessory decided by factory
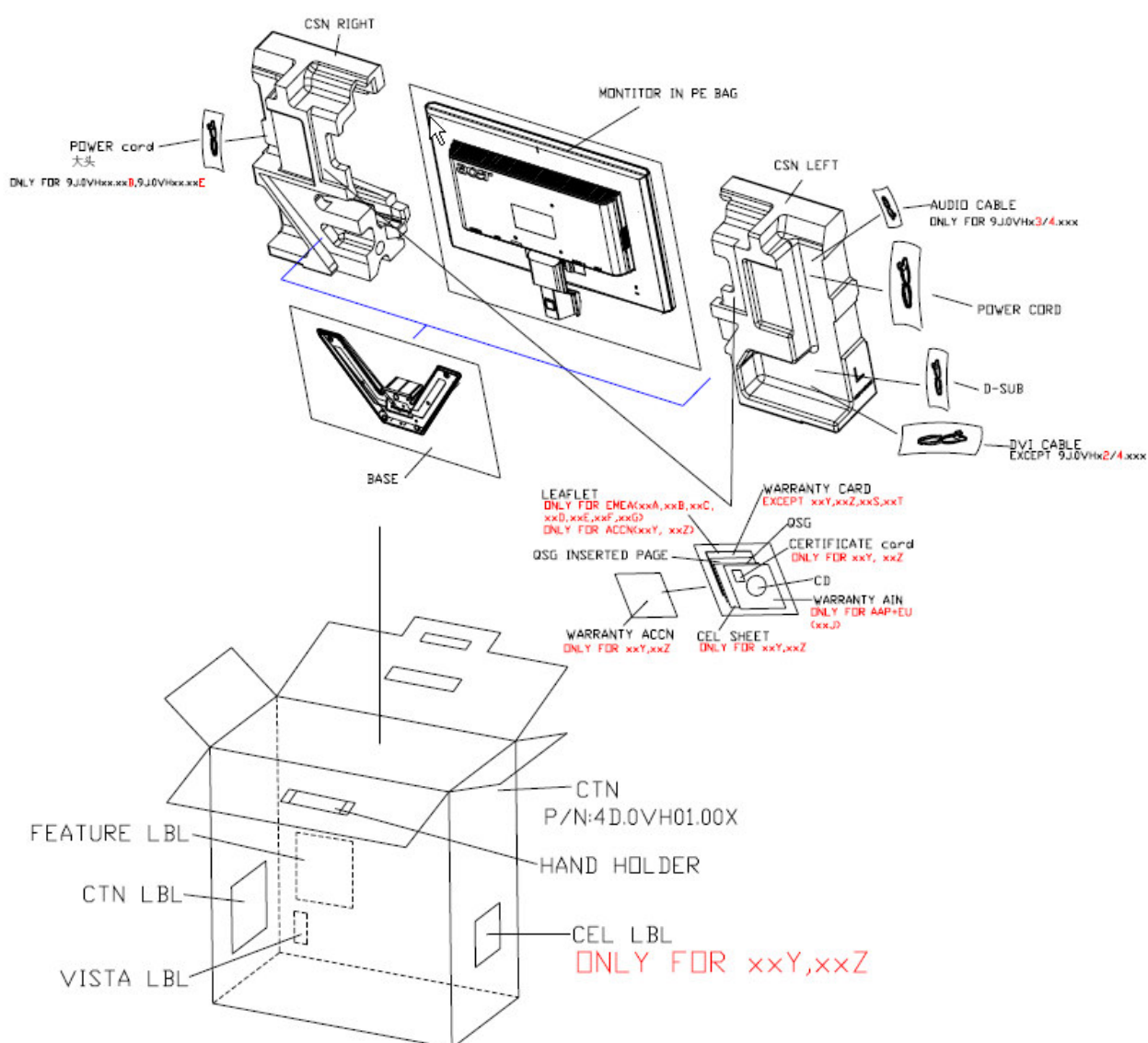
# 4. Disassembly /Assembly

## 4.1 Exploded View
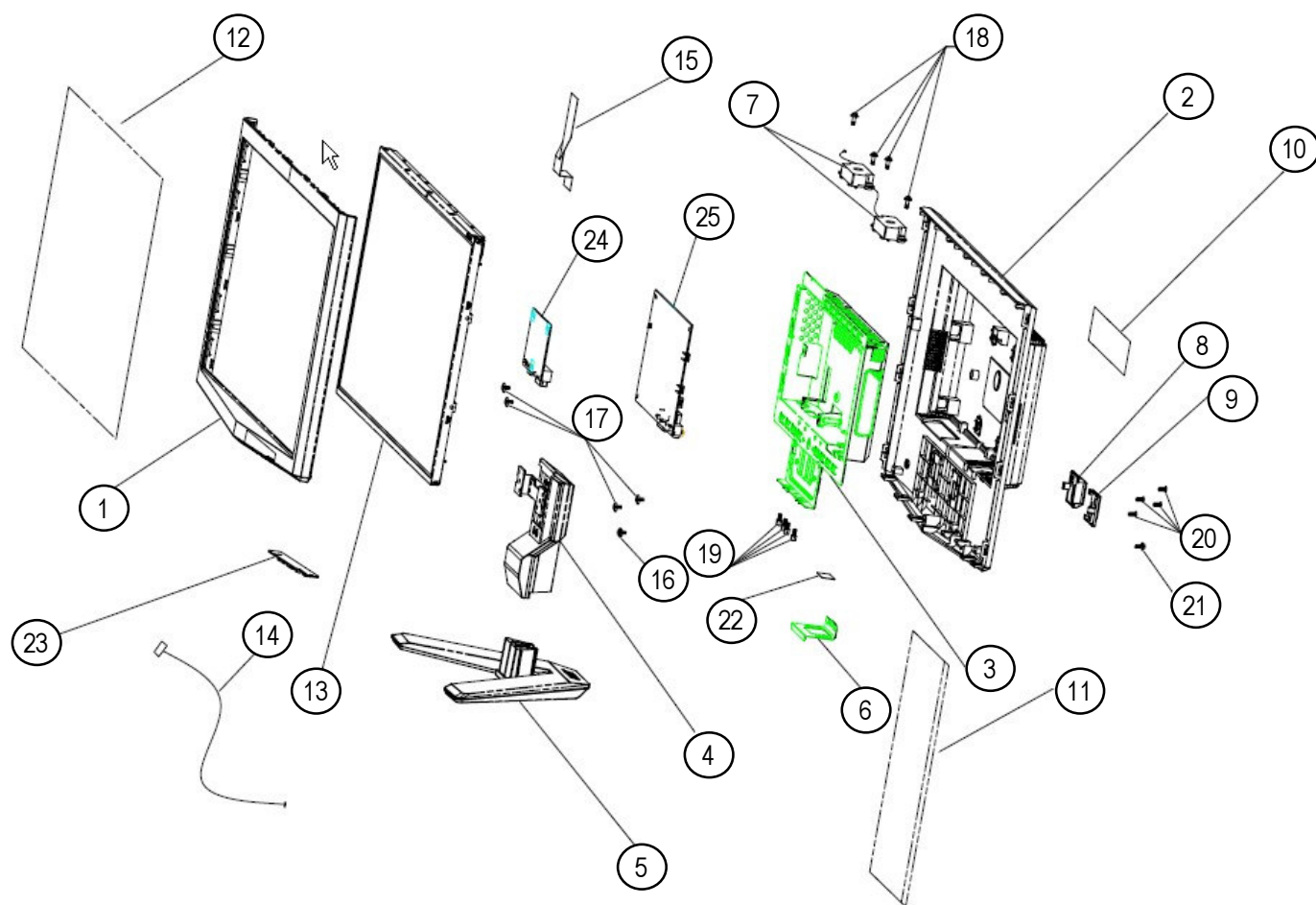
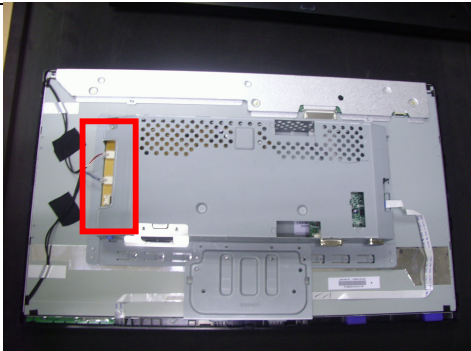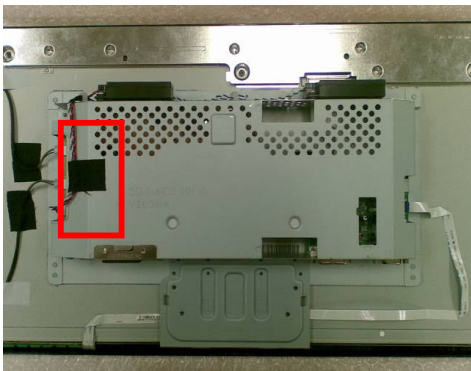| ITEM | PART NO. | DESCRIPTION | TYPE | QTY | VENDOR |
|------|----------|-------------|------|-----|--------|
| 25 | 5E.0UH02.001 | PCBA SPS BD AUDIO SEC MI V203H | | 1 | |
| 24 | 5E.0VH01.012 | PCBA IF BD MI X203H SEC D+SPK | | 1 | |
| 23 | 5E.0GT03.M01 | PCBA CTRL BD SMD P22XW | | 1 | |
| 22 | 4K.05502.001 | MYLAR PC 24.5*14*0.5 1708FPb | PART | 1 | |
| 21 | 8F.WA314.8R0 | SCRW MACH FLAT M4*8L C-ZN NYLO | PART | 1 | |
| 20 | 8F.5A456.8R0 | SCRW MACH FLAT M4*8L C-ZN NYLO | PART | 4 | |
| 19 | 8F.205B4.019 | SCRW MACH STEEL HEX #4-40 0.3 NI | PART | 4 | |
| 18 | 8F.00518.100 | SCRW TAP W/FL M3*10L(S3.8) ZN | PART | 4 | |
| 17 | 8F.00273.6R0 | SCRW TAP PH W/FL M3*6L C-ZN | PART | 4 | |
| 16 | 8F.00010.161 | SCRW TAPTILE TRS W/EXT M4*8L | PART | 1 | |
| 15 | 5K.0TB02.N01 | FFC LVDS 30P NO SILVER G2020HD | PART | 1 | |
| 14 | 5K.0GT01.021 | WIRE CTRL 7/9P 350MM X203H | PART | 1 | |
| 13 | 5F.LS1AP.001 | LCDM20W LTM200KT03 ACER | Panel | 1 | |
| 12 | 4K.0VH01.001 | FILM EPE 465*272 X203H | PART | 1 | |
| 11 | 4G.0RW03.001 | FOIL AL MYLAR 270*80 VH203 | PART | 1 | |
| 10 | 4E.0GT01.111 | LBL SPEC 89.5*49.5 WW X203H | PART | 1 | |
| 9 | 4B.0GT05.021 | CVR HINGE L ABS DB19A P22XW | PART | 1 | |
| 8 | 4B.0GT06.021 | CVR HINGE R ABS DB19A P22XW | PART | 1 | |
| 7 | 2C.409C0.051 | SPK*2 80HM 1.5W 145/390MM | PART | 1 | |
| 6 | 3K.0TB03.001 | BKT AC-IN SPTE 0.3T G2020HD | PART | 1 | |
| 5 | 6K.0K306.001 | ASSY BASE DUAL X223W | ASSEMBLY | 1 | |
| 4 | 6K.0K304.001 | ASSY CLMN ABS DB19A X223W | ASSEMBLY | 1 | |
| 3 | 6K.0VH10.001 | ASSY SHD SEC DUAL SPK X203H | ASSEMBLY | 1 | |
| 2 | 6K.0VH02.001 | ASSY RC SEC DUAL SPK X203H | ASSEMBLY | 1 | |
| 1 | 6K.0VH01.001 | ASSY BZL DB19A X203H | ASSEMBLY | 1 | |
| ITEM | PART NO. | DESCRIPTION | TYPE | QTY | VENDOR |

# 4.2 Disassembly /Assembly
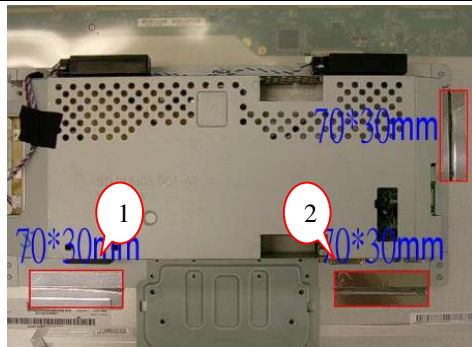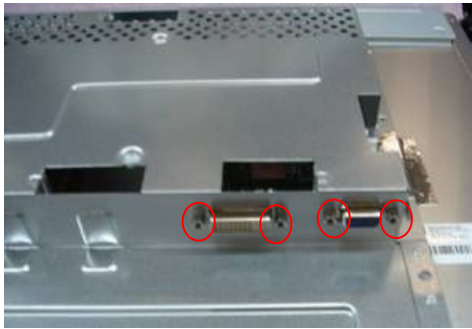
## 4.2.1 Assembly SOP

Preparation before assemble
1. Clean the room for work
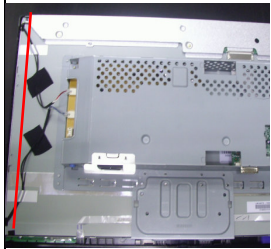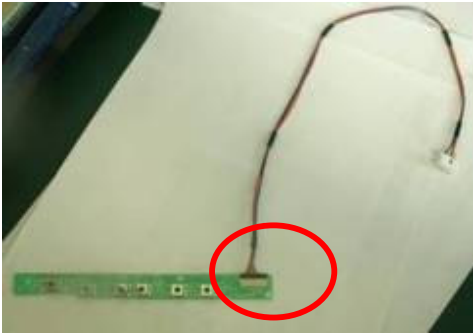2. Identify the area for material
3. Prepare the implement, equipments, materials as bellow:
    1) Press-fixture
    2) working table
    3) Screw-driver
    4) knife*1
    5) glove
    6) cleaning cloth
    7) ESD protection
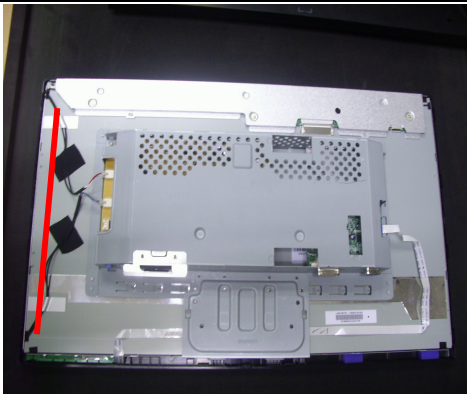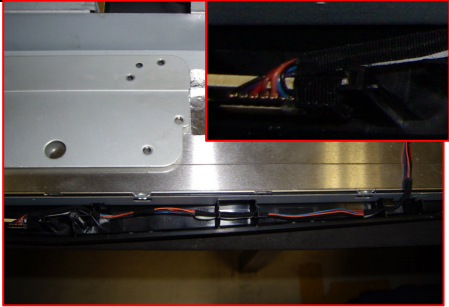
| item | picture | Operation | Tool | Notes |
|------|---------|-----------|------|-------|
| 1 |  | Stick the big Al tape to panel which can protect the Light-wire. | | The tape must cover the connect of the wire |
| 2 |  | Check and put CLM-F on the cushion carefully, | | |
| 3 |  | Assemble the panel on CLM-F. | | Go to with Left. |

| | | | | |
|---|---|---|---|---|
| 4 |  | Assemble the SPK to the main-SHD, the correct position reference on the picture, then the lock 4 screws to fasten it. | Screw-driver | Keep the ware in.<br> |
| 5 |  | Assemble the FFC to the I/F, the correct position reference on the picture | | Without the gap within |
| 6 |  | Assemble the PCBA to Main-SHD | | |
| 7 |  | Lock 3 screws on the PCBA board with this order. | Screw-driver | |
| 8 |  | Lock 2 screws on the SPS board with order. | Screw-driver | |

| 9 |  | Scan for fooling | PC | Card go with panel. |
|---|---|---|---|---|
| 10 |  | Fasten the LVDS to panel and fix the Main-BKT to CLM-F | | |
| 11 |  | Stick one Al foil on the right between pane land Main-BTK only for SEC panel | | |
| 12 |  | Stick two pieces of Al foil on the under between panel and Main-BTK only for SEC panel | | The position refer to the picture |
| 13 |  | Lock screws of side on Main-Chassis with 2/4,based on DVI. | Screw-driver | Attention the order by one to four. |

| 14 |  | Assemble the L-SHD the correct position reference on the picture | | |
| --- | --- | --- | --- | --- |
| 15 |  | Insect the inverter wire one by one and insect the speaker wire | | Keep all wires in. |
| 16 |  | Stick a tap to fix the speaker wire | | The tap must not stick to the part of the IF |
| 17 |  Mylar | Stick a Mylar under the audio connector | | |

| | | | | |
|---|---|---|---|---|
| 18 |  | Stick an acetic tape to fix the wire one by one as the picture | | Not fix the panel to the edge<br> |
| 19 |  | Fix the big Al tape to panel | | |
| 20 |  | Assemble the C/B wire to the C/B connect | | |
| 21 |  | Assemble the C/B to the BZL and insert the C/B wire to the I/F BD | | |

| | | | |
|---|---|---|---|
| 22 |  | Fix the C/B wire to the BZL | |
| 23 |  | Check and put CLM-F on the Main-Chassis carefully. | None hurt outside. |
| 24 |  | Assemble the Rear Cover. | |
| 25 |  | Check and put CLM-abs on working table carefully and assemble them together | |

| | | | |
|---|---|---|---|
| 26 | | Assemble the Hinge to the CLM-abs | |
| 27 | | Lock screws*6 onto the hinge with screw-driver | Screw-driver |
| 28 | | Lock 4 screws to RC. | (FABF-DSSDA1-***）60-80mm ＃2 9±1kg.cm |
| 29 | | Cover the CLM of L and R | |
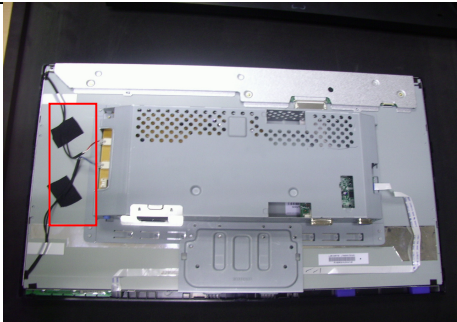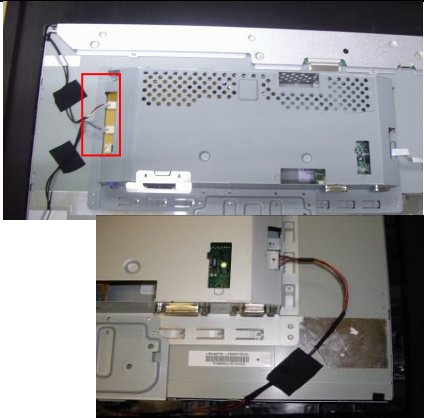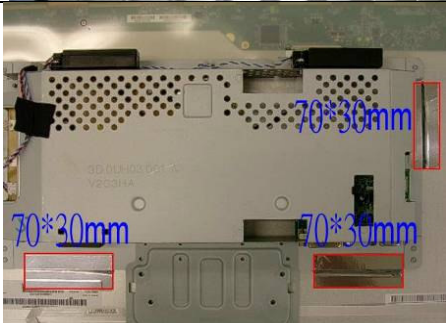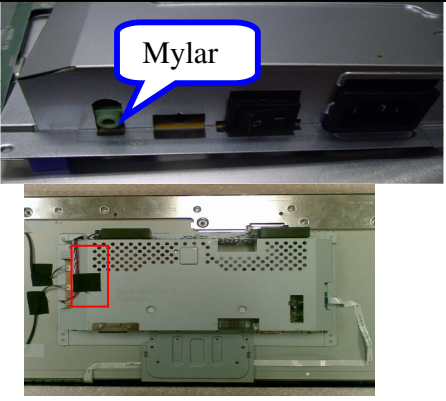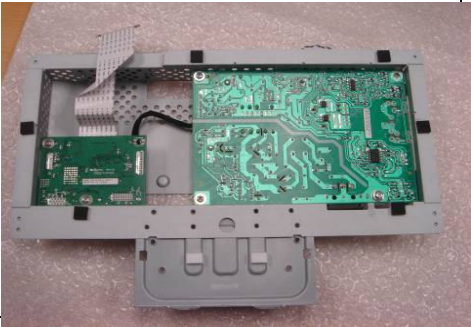
## 4.2.2 Disassembly SOP

Preparation before disassemble
1. Clean the room for disassemble
2. Identify the area for monitor
3. Check the position that the monitors be placed and the quantity of the monitor ;prepare the area or material flow; according to the actual condition plan the disassemble layout
4. Prepare the implement, equipments, materials as bellow:
   1) Press-fixture
   2) Working table
   3) Screw-driver
   4) Knife*1
   5) Glove
   6) Cleaning cloth
   7) ESD protection

| item | picture | Operation | Tool | Notes |
|---|---|---|---|---|
| 1 | | Disassemble the stand → 4 screws | Screw-driver | Kick the board first. |
| 2 | | Disassembly the bezel from the monitor, notice the disassembly order :<br>1.Left (1) parts of bezel<br>2.Top (2) parts of bezel<br>3.Bottom (3) parts of bezel<br>4. Right (4) parts of bezel<br>　Don't draw the BZL | | When disassembly the bezel ,notice don't bend the C/B .man must wear glove<br>The purpose is loose the BZL |
| 3 | | Turn over the monitor ,dismantle the Rear cover from the monitor | | |

| 4 |  | Tear out the acetic tape | | |
| 5 |  | Unlock the wires. | | |
| 6 |  | Disassembled the SHD shielding : 5 screw | Screw-driver |  |
| 7 |  | Tear down three pieces of Al foil | | |

| | | | | |
|---|---|---|---|---|
| 8 | Mylar | Tear down the Mylar and the tap | | |
| 9 |  | Disassembled the AC-soc shielding . | | |
| 10 |  | Unlock the LVDS wires. | | |
| 11 |  | Disassembled the PCBA shielding : 5 screws | Screw-driver | |
| 12 |  | Disassembled the SPK shielding : 4 screws | Screw-driver | |

| 13 |  | Get off the panel from the bezel | | |
|----|---|---|---|---|
| 14 |  | Get off the big tap from the tape | | |
| 15 |  | Disassemble the control board | | |

# 5. Level 1 Cosmetic / Appearance / Alignment Service

## 5.1 Alignment procedure (for function adjustment)

### 5.1.1 Preparation

1. Setup **input** timing to any preset modes or patterns.
2. Enter factory mode (press "Empowering" & "Power" buttons at the same time to turn on monitor).
3. Move cursor into "Burn-in Mode" tag and select "On" to enable burn-in mode.
4. Power off the monitor, remove the input source and then power on again.
5. Setup unit and keep it warm up for at least 30 minutes.
6. Setup input timing ICL-605( 1280x1024@75Hz ), 32-Grays pattern.
7. Setup unit and keep it warm up at least 30 minutes.

### 5.1.2. Timing adjustment:

1. Enter factory setting area (press "Empowering" and then press "SOFTPOWER").
2. Check the settings to following values:

   Contrast = 50
   Brightness = 85
   Color = Warm
   Language = English

   Then, turn off the monitor power.
3. Turn on power enter user area.

Figure-1: Preset Timing modes list

| | | | | |
|---|---|---|---|---|
| 640x480@60Hz | 800 x 525 | 31.469 | 59.941 | 25.175 |
| 640x480@72Hz | 832 x 520 | 37.861 | 72.809 | 31.500 |
| 640x480@75Hz | 840 x 500 | 37.500 | 75.000 | 31.500 |
| 640x480@66.66Hz | 864x525 | 35 | 66.66 | 30.24 |
| 720x400@70Hz | 900x449 | 31.469 | 70.087 | 28.322 |
| 800x600@56Hz | 1024 x 625 | 35.156 | 56.250 | 36.000 |
| 800x600@60Hz | 1056 x 628 | 37.879 | 60.317 | 40.000 |
| 800x600@72Hz | 1040 x 666 | 48.077 | 72.188 | 50.000 |
| 800x600@75Hz | 1056x625 | 46.875 | 75.000 | 49.500 |
| 832x624@74.55Hz | 1152x667 | 49.722 | 74.55 | 57.28 |
| 1024x768@60Hz | 1344x806 | 48.363 | 60.004 | 65.000 |
| 1024x768@70Hz | 1328x806 | 56.476 | 70.069 | 75.000 |
| 1024x768@75Hz | 1312x800 | 60.023 | 75.029 | 78.750 |
| 1152x870@75Hz | 1456x915 | 68.681 | 75.062 | 100.000 |
| 1152x864@75Hz | 1600x900 | 67.5 | 75 | 108 |
| 1280x960@60Hz | 1800x1000 | 60 | 60 | 108 |
| 1280x1024@60Hz | 1688x1066 | 63.981 | 60.020 | 108.000 |
| 1280x1024@75Hz | 1688x1066 | 79.976 | 75.025 | 135.000 |
| 1280x720@60Hz | 1650x750 | 44.955 | 59.940 | 74.176 |
| 1280x800@60Hz | 1680x831 | 49.702 | 59.810 | 83.500 |
| 1600x900@60Hz | 2122x934 | 55.990 | 59.946 | 118.250 |
| 1600x900@60Hz_RB | 1800x1000 | 60.000 | 60.000 | 108.000 |
| 1600x900@75Hz | 2144x942 | 70.546 | 74.889 | 151.250 |

### 5.1.3 ADC calibration (Auto color balance adjustment)
~~Analog only, it is not required for DVI-D input source
1. Setup input timing ICL-605( 1280x1024@75Hz ), pattern 42(5-Mosaic pattern with white color block) with Analog signals from Chroma video pattern generator. (it depends on Scaler IC supplier's recommendation)
2. Enter factory mode (press "Empowering" & "Power" buttons at the same time to turn on monitor).
3. Move cursor into "Burn-in Mode" tag and select "On" to enable burn-in mode.
4. Close OSD menu then press "Auto" button for auto color adjustment. (This procedure will get optimal gain/offset(clamp) values)
5. Checking if the picture is ok, or reject this monitor and check its circuit board or wire/cable connection.


### 5.1.4 Color temperature adjustment
1. Setup input timing to any preset modes, pattern 41(full white color pattern) with Analog signals from Chroma video pattern generator.
2. Enter factory mode (press "Empowering" & "Power" buttons at the same time to turn on monitor).
3. Move cursor into "Burn-in Mode" tag and select "On" to enable burn-in mode.
4. Make sure ADC calibration (auto color balance adjustment) had already been done.
5. Measure color temperature by Minolta CA-110 (or equivalent equipment).
6. Adjust the color temperature ~~ Two methods can be used to adjust RED, GREEN, BLUE value of each color temperature, C0/Cool, C1/User & C2/Warm to meet following spec requirement, the 1$^{st}$ method is by using external PC and IIC alignment protocol to do automatic adjustment, and the 2$^{nd}$ method is by manually and must be in factory mode.

| Color temperature | X+- | 0.283+(-) 0.03 |
|---|---|---|
| | Y+- | 0.297+(-) 0.03 |
| (C0/cool on OSD) | Luminance | |
| Color temperature | X+- | |
| | Y+- | |
| (C1/User on OSD) | Luminance | |
| Color temperature | X+- | 0.313+(-) 0.03 |
| | Y+- | 0.329+(-) 0.03 |
| (C3/Warm on OSD) | Luminance | |

7. Move cursor into "Burn-in Mode" tag and select "No" to disable burn-in mode.
8. Turns off the monitor power.


### 5.1.5. Writing EDID data into monitor
1. Setup a **PC** with DDC card.
2. Connect PC to monitor with a D-sub signal cable.
3. Please refer to the Q212 for the correct EDID file.
4. Runs the writing program to write the analog EDID data into EEPROM for analog input(ie. 15-pin D-sub).

5. Repeat step 4 and write the digital EDID data into EEPROM for DVI-D input(ie. 24-pin DVI-D).
6. Read both EEPROM data and confirm it to match with the Q212 definition.
**(Note : The DVI-D input may not operation correctly if the digital EDID data do not exist.)**

## 5.2 Software / Firmware Upgrade Process

### 5.2.1 Hardware prepared:

**Hardware Requirement:**

1.  ISP board x 1

VGA signal input from 15pin D-sub cable of PC or NB.

Connect to target monitor

Check the Jumpers on the ISP Circuit Board (make sure J5, J6, J7, J8 are set at ping 1,2 )

Connect ISP board and PC with printer port cable
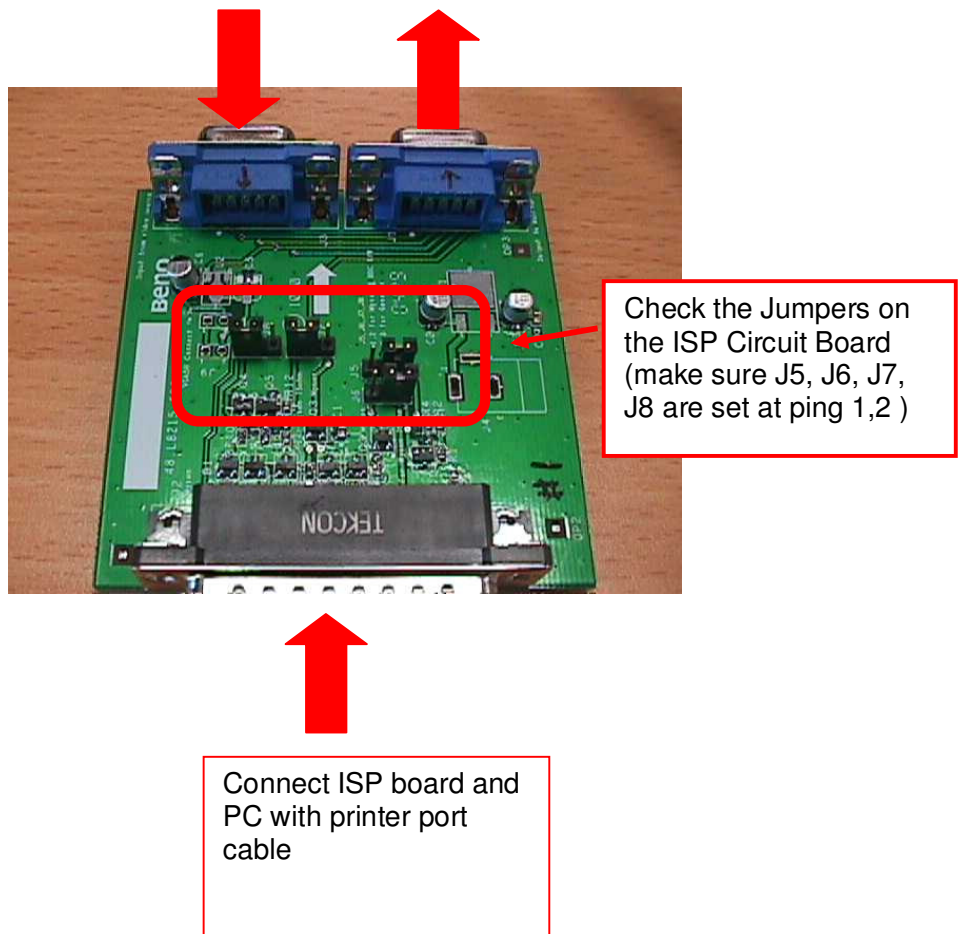
2.  DSUB VGA cables x 2
3.  Printer cable (with one male connector and another female connector) x 1.
4.  PC or Notebook with parallel (printer) port x1.

## 5.2.2 Firmware Upgrade Procedure

**Step 1:**
　　　Un-zip Port95nt and install into your computer.
**Step 2:**
　　Un-zip ISP application tool (RTDTool)
**Step 3:**
　　Press "RTD 2120 ISP" button to execute firmware program application.
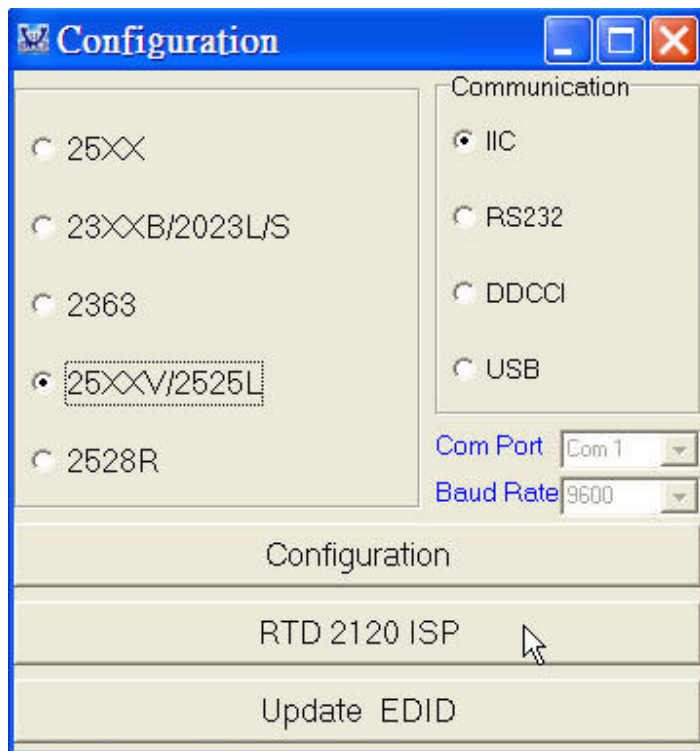
## Step 4:

Press "64K" button to load *series*.hex file and press "64~96" button to load *extend*.hex file from your computer.
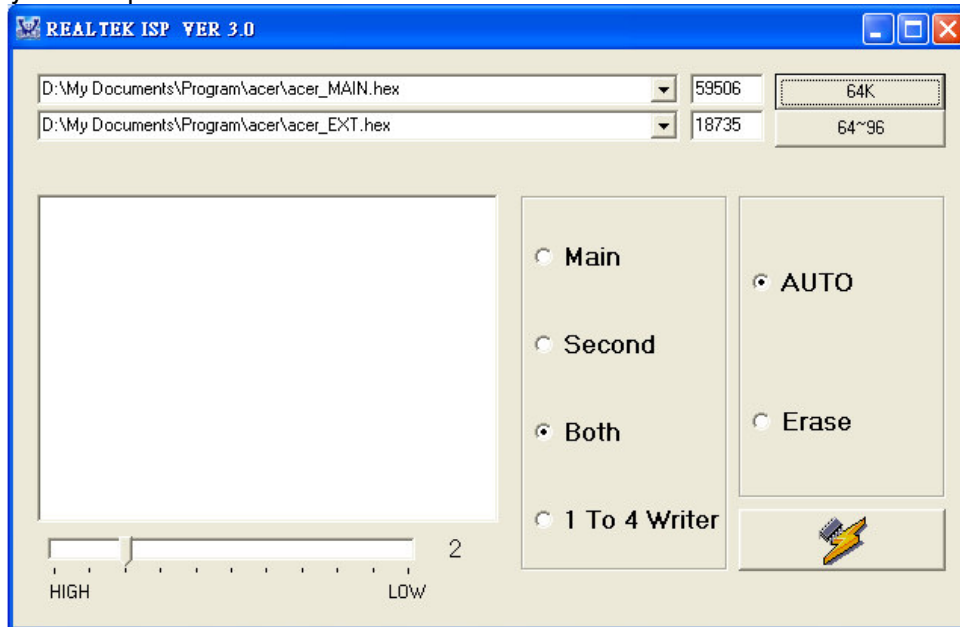


## Step 5:

Select "Erase" option and execute lightning button first, and then select "Auto" option and execute lightning button to start upgrade firmware to the monitor.
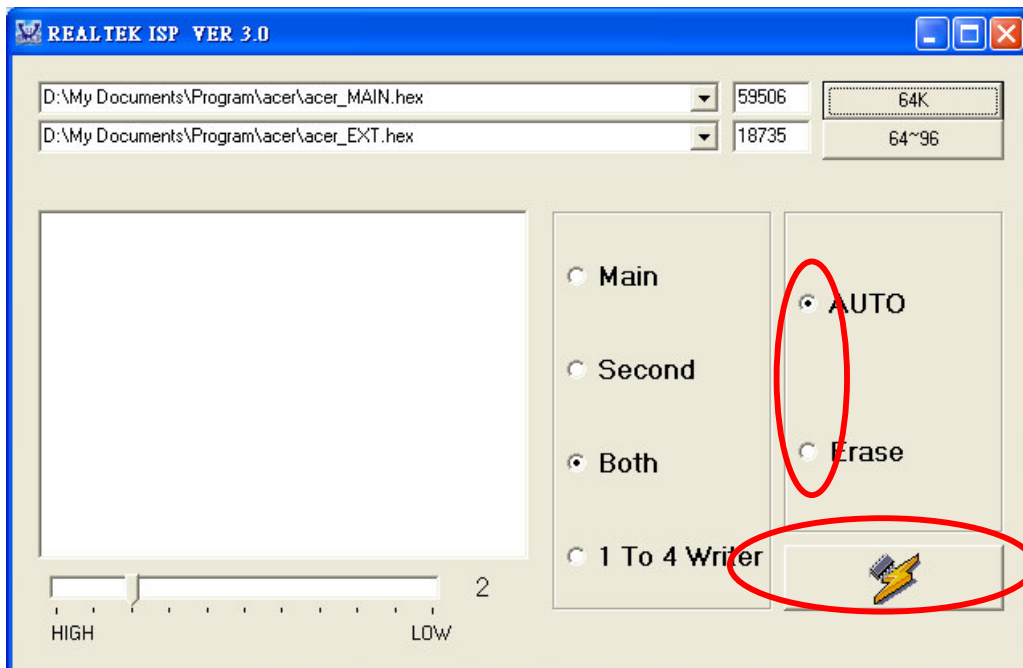
Note: you can change program speed bar to meet your equipment speed if program firmware fail.
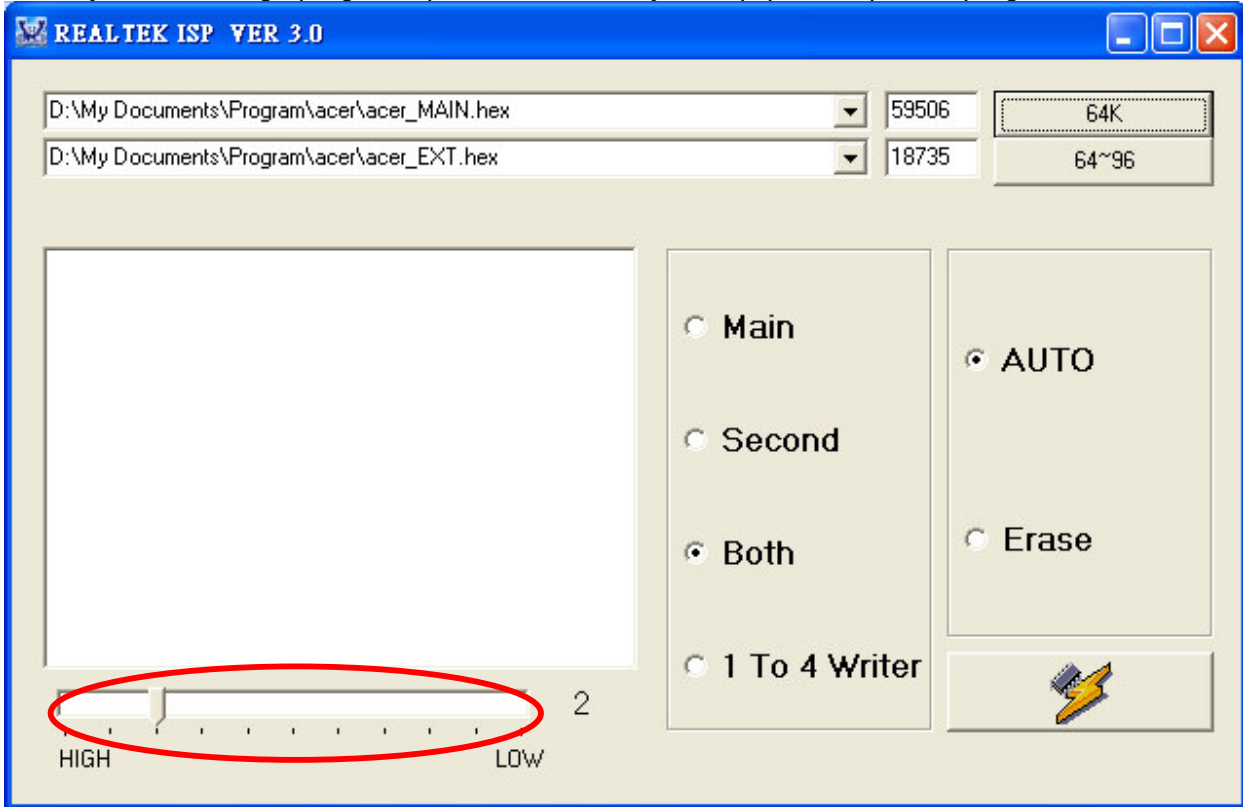


### 5.2.3 Turn Off Burn In

IF the monitor without signal input has Burn In pattern. As the following figure



Press "MENU" and ">" key at the same time to exit Burn in mode(factory mode),and soft power key off/on restart the monitor.

## 5.3 EDID Upgrade Procedure

**Step 1:**
    Run the program "Q-EDID-V012.exe", when the UI popped up
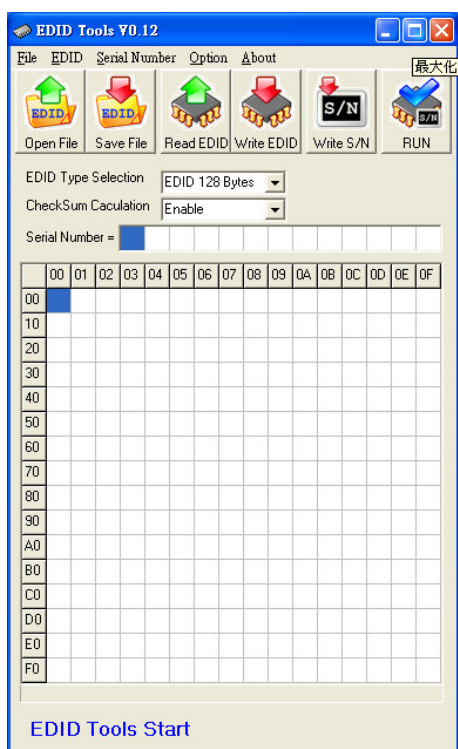
Note: If "VGA" choose 128bytes, and "DVI" choose 128bytes
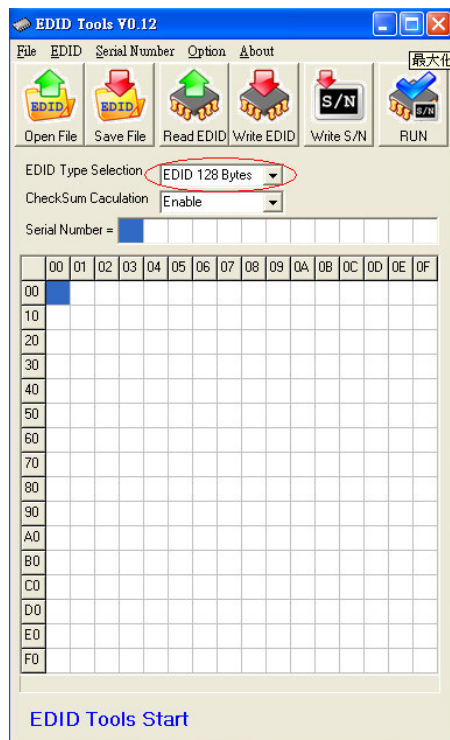


**Step 2:**
Click "Open File" and select "VGA" or "DVI" EDID file
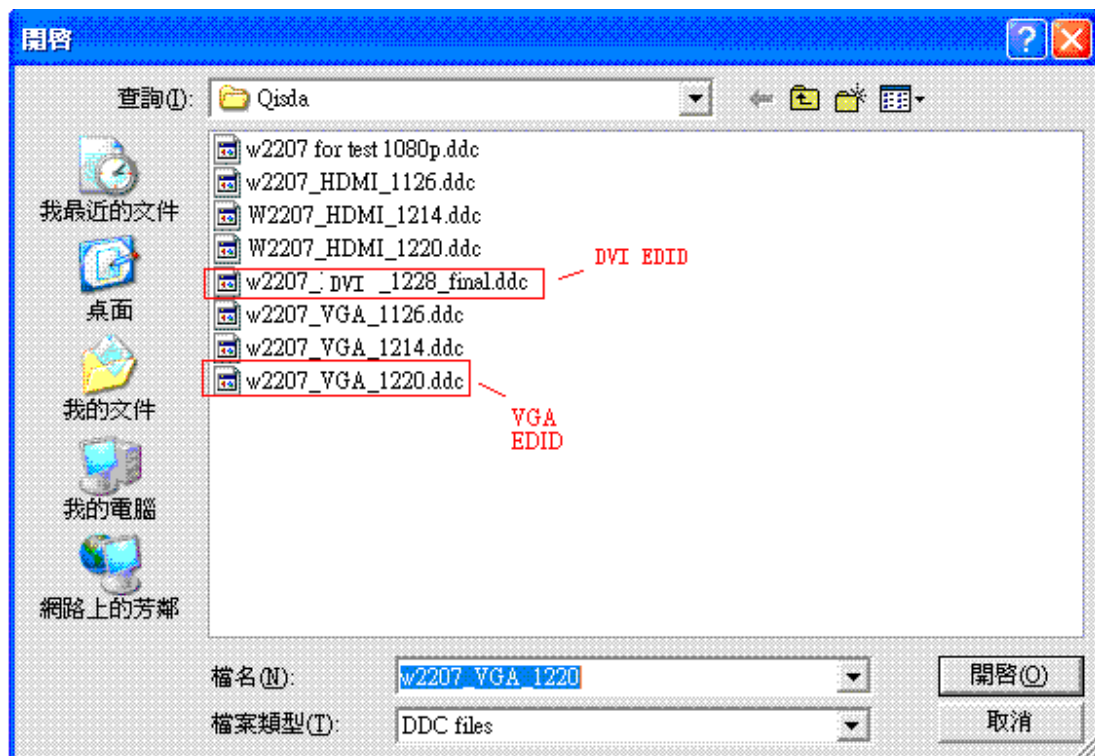
## Step 3:
If load file is successful, it shows "Open EDID Table OK..".
And then, Click "Write EDID" button to update EDID
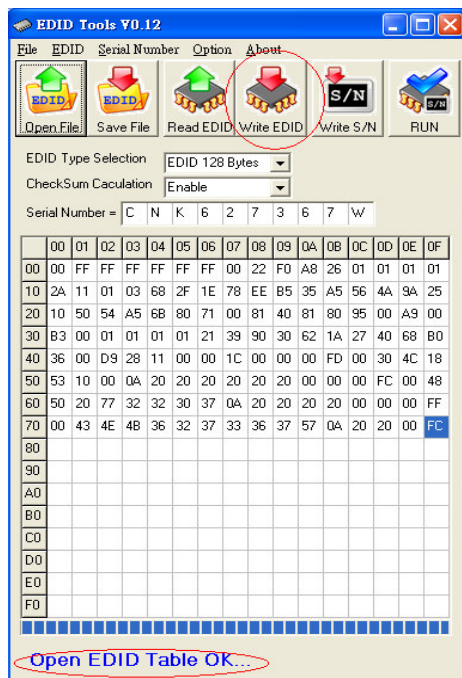


## Step 4:
If write EDID is successful, it shows"Write EDID OK …"
And then, Click "Read EDID" button to check if successful or not.
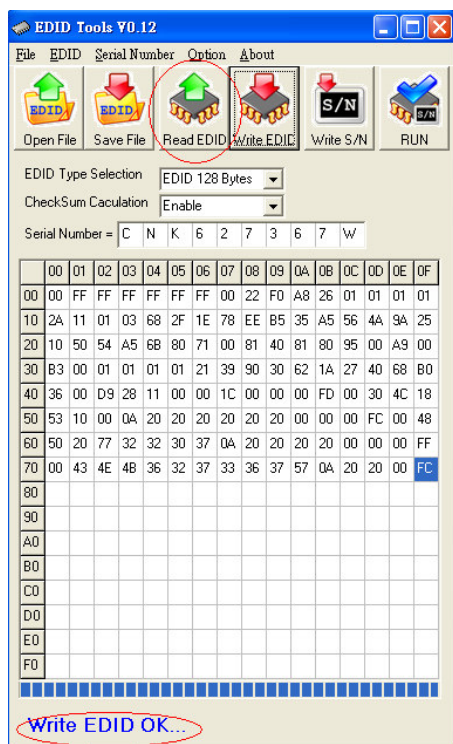
## Step 5:

If read EDID is successful, it shows"Read EDID OK …"
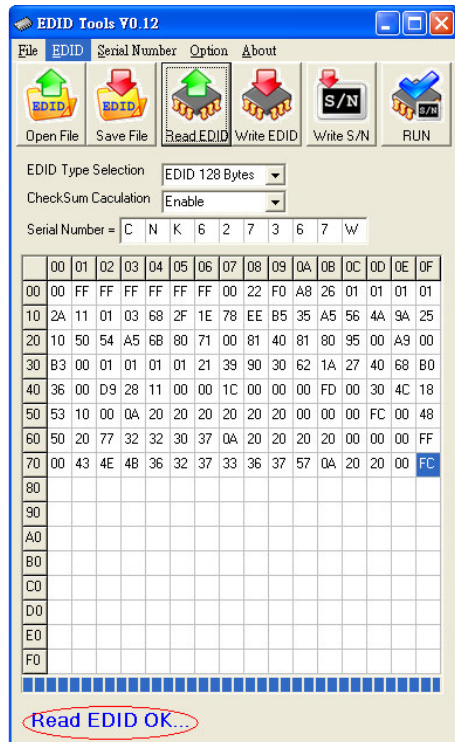
## 5.4 OSD Operation Guide

## User controls
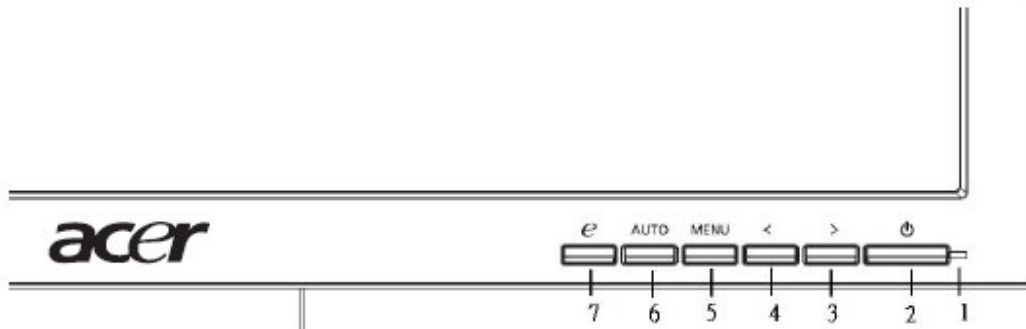


## Front panel controls

1   Power LED: Lights up to indicate the power is turned on.

2   Power switch: Turns the power on or off.

3.4  < / > : Press < or > to navigate to the desired function, press Enter to select the function. Press < or > to change the settings of the current function.

5   Menu/Enter: Activate the OSD menu when the OSD is off or activate/ deactivate the adjustment function when the OSD is on.

6   Auto adjust button/Exit:

    a   When the OSD menu is active, this button will act as the exit key (OSD menu).

    b   When the OSD menu is inactive, press this button for two seconds to activate the Auto Adjustment function. The Auto Adjustment function is used to set the HPos, VPos, Clock and Focus.

7   Empowering Key/Exit:

    a   When the OSD menu is active, this button will act as the exit key (exit OSD menu).

    b   When the OSD menu is inactive, press this button to select scenario mode.

# How to adjust a setting

1   Press the Menu button to activate the OSD window.

2   Press < or > to select the desired function.

3   Press the Menu button again to select the function that you want to adjust.

4   Press < or > to change the settings of the current function.

5   To exit and save, select the exit function. If you want to adjust any other function, repeat steps 2 to 4.
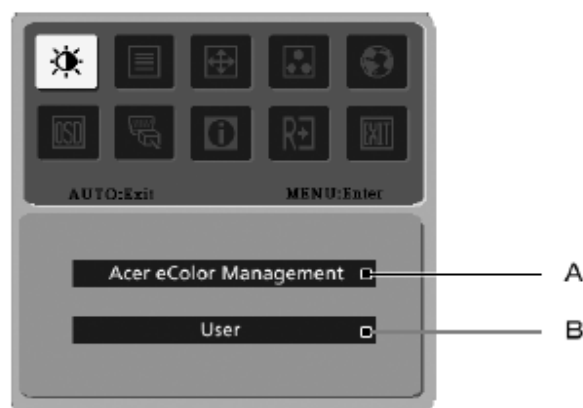


A   **Acer eColor Management**: If "Acer eColor Management" is selected, the Acer eColor Management OSD will appear.

B   User: If "User" is selected, the standard OSD will appear.



I. Only analog-input mode

II. Only digital-input mode

# User

| Main menu icon | Sub menu icon | Sub menu item | Description |
|---|---|---|---|
| ☼ | ◑ | Contrast | Adjusts the contrast between the foreground and background of the screen image. |
| | ☼ | Brightness | Adjusts the background brightness of the screen image. |
| | ACM | ACM | ACM (Adaptive Contrast Management) ACM On/Off switch, default Off. |
| ▤ | ▤ | Focus | Adjusts picture focus (available in analog mode only). |
| | ▥ | Clock | Adjusts the picture clock (available in analog mode only). |
| ✥ | ▯ | H. Position | Adjusts the horizontal position of the OSD (available in analog mode only). |
| | ▭ | V. Position | Adjusts the vertical position of the OSD (available in analog mode only). |
| ⦂ | N/A | Warm | Sets the color temperature to warm white. |
| | N/A | Cool | Sets the color temperature to cool white. |
| | R | User/red | Adjusts red intensity. |
| | G | User/green | Adjusts green intensity. |
| | B | User/blue | Adjusts blue intensity. |

| Main menu icon | Sub menu icon | Sub menu item | Description |
|---|---|---|---|
| 🌐 | N/A | English | Language selection. |
| | N/A | 繁體中文 | |
| | | Deutsch | |
| | | Français | |
| | | Espaňol | |
| | | Italiano | |
| | | 简体中文 | |
| | | 日本語 | |
| | | Suomi | EMEA version OSD only. |
| | | Hollands | |
| | | Русский | |
| OSD | ⊡ | H. Position | Adjusts the horizontal position of the OSD. |
| | ⊡ | V. Position | Adjusts the vertical position of the OSD. |
| | 🕐 | OSD Timeout | Adjusts the OSD timeout. |
| ⌨ | N/A | Analog | Selects input signal from analog (D-sub). |
| | N/A | Digital (only dual-input models) | Selects input signal from digital (DVI) (only dual-input models). |
| | N/A | DDC/CI | Turns on/off DDC/CI support |
| ⓘ | N/A | Information | Shows the resolution, H/V frequency, input port and serial number for current input. |
| R→ | N/A | Reset | Clears Auto-configuration changes and sets the color temperature to warm. |
| EXIT | N/A | Exit | Saves user changes and closes the OSD. |

# Acer eColor Management

- Operation instructions

  1. Press the *e* Empowering Key to open the Acer eColor Management OSD and access the scenario modes.
  2. Press "<" or ">" to select the mode.
  3. Press the Auto-adjust button to confirm the mode and run Auto Adjust.

*e*mpowering technology

Standard

AUTO: Adjust/Exit          ◆▶:Select

User mode | Text mode | Standard mode | Graphic mode | Movie mode
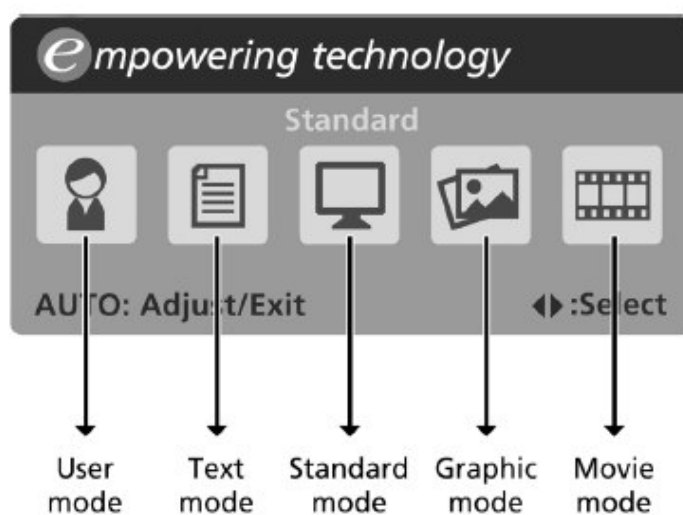
- Features and benefits

| Main menu icon | Sub menu item | Description |
|---|---|---|
| | User mode | User-defined. Settings can be fine-tuned to suit any situation. |
| | Text mode | Optimal balance of brightness and contrast to prevent eyestrain. The most comfortable way to read onscreen text. |
| | Standard mode | Default settings, reflects native display capability. |
| | Graphic mode | Enhances colors and emphasizes fine detail. Pictures and photographs appear in vibrant colors with sharp detail. |
| | Movie mode | Displays scenes in clearest detail. Presents great visuals, even in unsuitably-lit environments. |

# 6. Level 2 Circuit Board and Standard Parts Replacement

## 6.1 Trouble Shooting Guide

### 6.1.1 No Display or display is unstable (Interface Board)

```
┌─────────────────────────────┐
│ Screen is Blank and Power LED│
│ is White.                    │
└─────────────────────────────┘
              │
              ▼
         ╱─────────╲                Yes     ┌──────────────────────────────┐
        ╱  OSD shown  ╲ ────────────────────▶│ Follow instructions from OSD │
        ╲ when key     ╱                     │ dialog                       │
         ╲ pressed?   ╱                      └──────────────────────────────┘
          ╲─────────╱
              │ No
              ▼
         ╱─────────╲                No      ┌──────────────────────────────┐
        ╱  Keypad    ╲ ────────────────────▶│ Proceed to                   │
        ╲   OK?      ╱                       │ "Check Control Board".       │
         ╲─────────╱                         └──────────────────────────────┘
              │ Yes
              ▼
         ╱─────────╲                No      ┌──────────────────────────────┐
        ╱ Backlight  ╲ ────────────────────▶│ Proceed to                   │
        ╲ turned ON? ╱                       │ "Check Power Board".         │
         ╲─────────╱                         └──────────────────────────────┘
              │ Yes
              ▼
         ╱─────────╲                No      ┌──────────────────────────────┐
        ╱  Scalar    ╲ ────────────────────▶│ Proceed to                   │
        ╲ output Data?╱                      │ "Check Scalar"               │
         ╲─────────╱                         └──────────────────────────────┘
              │ Yes
              ▼
   ┌──────────────────────────┐
   │   "Check LCD Module"     │
   └──────────────────────────┘
```

## 6.1.2 Check Control Board

```
┌─────────────────────────┐
│  Checking Control Board │
└─────────────────────────┘
         │
        Yes
         │
         ▼
      ╱Working ?╲───No──►┌──────────────────────┐
      ╲         ╱        │ Replug the control   │
         │               │ wire, then retry     │
        Yes              └──────────────────────┘
         │
         ▼
      ╱ Traces ╲───No──►┌──────────────────────┐
      ╲ OK ?    ╱       │ Replace the Control  │
         │              │ Board, then retry    │
        Yes             └──────────────────────┘
         │
         ▼
   ╱Components to╲──No──►┌──────────────────────┐
   ╲Control board╱      │ Replace the          │
    ╲  OK ?    ╱        │ components, then retry│
         │              └──────────────────────┘
        Yes
         │
         ▼
┌─────────────────────────┐
│  Replace a new Control  │
│        board            │
└─────────────────────────┘
```

**6.1.3 Check Scalar**

Scalar failed to output data

Are all the power and ground pins at the correct voltage level?

NO → **Power or the ground pins has bad contacts**

YES

Are the correct RGB and Hsync signal fed to Scalar ?

NO → Are the signals presented on DSub connector?

NO → **DSUB Connector or PC failure**

YES → **Bad wiring between DSUB and Scalar**

YES

Is the correct Sinusoidal wave appeared on Crystal

NO → **Capacitors of Crystal have damaged**

YES

Measure the signal pairs on LVDS data output and clock from Scalar

Are the pixel output correct?

NO → **Scalar failed**

YES

**Check the remaining circuits**

## 6.1.4 Check LCD Module

```
                    ┌─────────────────┐
                    │ LCD module fail │
                    │  To display     │
                    │    image        │
                    └─────────────────┘
          ┌──────────────┘       └──────────────┐
          ▼                                       ▼
    ┌───────────┐                          ┌──────────────┐
    │ No Picture│                          │ White Screen │
    └───────────┘                          └──────────────┘
          │                                       │
          ▼                                       ▼
   Lamp connector OK ?                   Connection between          Bad Connection
                        ──NO──►          LVDS cable and      ──NO──► or connector,
                                         LCM connector OK ?          LVDS cable
          │ YES                                  │ YES
          ▼                                      ▼
                      Bad Connection      Connection between         Bad Connection
   Lamp wire           or connector,      LVDS cable and     ──NO──► or connector,
     OK ?    ──YES──►                      LVDS connector OK?         LVDS cable
          │                 │                    │ YES
          │ NO              ▼                     ▼
          │            Inverter board       Is U7 5V?        ──NO──► Check U7
          │               failed
          ▼                                      │ YES
       LCM failed ◄────────────────────────────┘
```

## 6.1.5 Power Board no work troubleshooting

```
                    ┌──────────────────┐
                    │   No Backlight   │
                    └────────┬─────────┘
                             │
                             ▼
                    ◇ V-inverter ok? ◇──No──►◇ Check         ◇──No──►┌──────────────────┐
                             │                │ D701/D702      │       │ Replace D701/D702│
                            Yes               │ OK?            │       └──────────────────┘
                             │                │               │
                             ▼               Yes
                    ◇  +5V ok?  ◇──No──►◇ Check          ◇──No──►┌──────────────────┐
                             │           │ D703/D704       │       │ Replace D703/D704│
                            Yes          │ OK?             │       └──────────────────┘
                             │           │                │
                             ▼          Yes
┌──────────────┐   ◇ Check CN701 pin2 ◇    ◇ Check F601,    ◇──No──►┌──────────────────┐
│ Check I/F BD │◄─No─│ (BL-ON) is Hi?  │    │ Q601, R615 OK? │       │ Replace F601,    │
└──────┬───────┘     └────────┬────────┘    └───────┬────────┘       │ Q601, R615.      │
       ▲                     Yes                   Yes                └──────────────────┘
       │                      ▼                     ▼
       │            ◇ Check CN701 pin1 ◇    ┌──────────────────┐
       └────No──────│ (BRT-ADJ) exist?  │   │   Reaplce IC601  │
                    └────────┬──────────┘   └──────────────────┘
                            Yes
                             ▼
┌──────────────┐   ◇  Check IC801  ◇
│ Replace IC801│◄─No─│     OK?      │
└──────────────┘     └──────┬───────┘
                           Yes
                             ▼
┌──────────────────┐ ◇ Check Q808, Q810, ◇
│ Replace Q808,    │◄No│ T801, T802 OK?    │
│ Q810, T801, T802.│   └─────────┬─────────┘
└──────────────────┘            Yes
                                 ▼
                        ┌──────────────────┐
                        │   Check Panel    │
                        └──────────────────┘
```

## 6.1.6 Audio Function

```
                                                      ┌─────────────────┐
                                                      │                 │
                                                      │ Audio do not work│
                                                      │                 │
                                                      └────────┬────────┘
                                                               │
                                                               ▼
┌─────────────────┐        ╱╲                             ╱╲
│                 │       ╱  ╲                            ╱  ╲
│ Plug Audio input.│◄─No─◄ Was Audio Input ╲──Yes►──── ╱ Was Audio V_DD ╲
│                 │       ╲ plugged?  ╱                 ╲   existed?  ╱
└─────────────────┘        ╲╱                            ╲╱
                            │                             │
                           Yes                            │
                            ▼                             No
┌─────────────────┐        ╱╲                             │
│ Check MCU send  │       ╱  ╲                            │
│ VOL_ON control  │◄─No─◄ Check VOL_ON ╲                  ▼
│ signal or not.  │       ╲        ╱           ┌─────────────────┐
└─────────────────┘        ╲╱                  │                 │
                            │                  │ Return Power    │
                           Yes                 │ Function Step.  │
                            ▼                  │                 │
┌─────────────────┐        ╱╲                  └─────────────────┘
│ Adjust volume   │       ╱  ╲
│ control switch to│◄─No─◄ Check VOL_ADJ ╲
│ normal.         │       ╲        ╱
└─────────────────┘        ╲╱
                            │
                           Yes
                            ▼
┌─────────────────┐        ╱╲
│                 │       ╱  ╲
│ Plug CN551      │◄─No─◄ Was CN551 ╲
│                 │       ╲ plugged? ╱
└─────────────────┘        ╲╱
                            │
                           Yes
                            ▼
┌─────────────────┐        ╱╲
│                 │       ╱  ╲
│ Plug Speaker.   │◄─No─◄ Was Speaker ╲
│                 │       ╲ plugged? ╱
└─────────────────┘        ╲╱
                            │
                           Yes
                            ▼
                  ┌─────────────────┐
                  │                 │
                  │ Replace IC551.  │
                  │                 │
                  └─────────────────┘
```

## 6.2 Circuit Operation Theory

### I. Introduction

The X203H is a 20" W (1600x900), LCD type is TN+Film and Normally White, 16.7M colors(R, G, B 6-bit data + Hi-FRC data) TFT LCD with HDCP support monitor. It's have dual (D-SUB and DVI) interface LCD monitor with a 15 pins D-sub signal cable and 24 pin DVI signal cable which support HDCP function. It's compliant with VESA specification to offer a smart power management and power saving function. It also offers OSD menu for users to control the adjustable items and get some information about this monitor. The best function is to offer users an easy method to change input source, DDC/CI Enable and Auto Adjustment items well done just by pressing hot key, we called it "Input Select", "DDC/CI" and "Auto" which can manual controlled items.
X203H also offer DDC/CI function to meet VESA standard.

### II. Block diagram

The X203H consists of a LCD module with 2 lamps, a power board, a control board, and an interface board. The block diagram is shown as below.
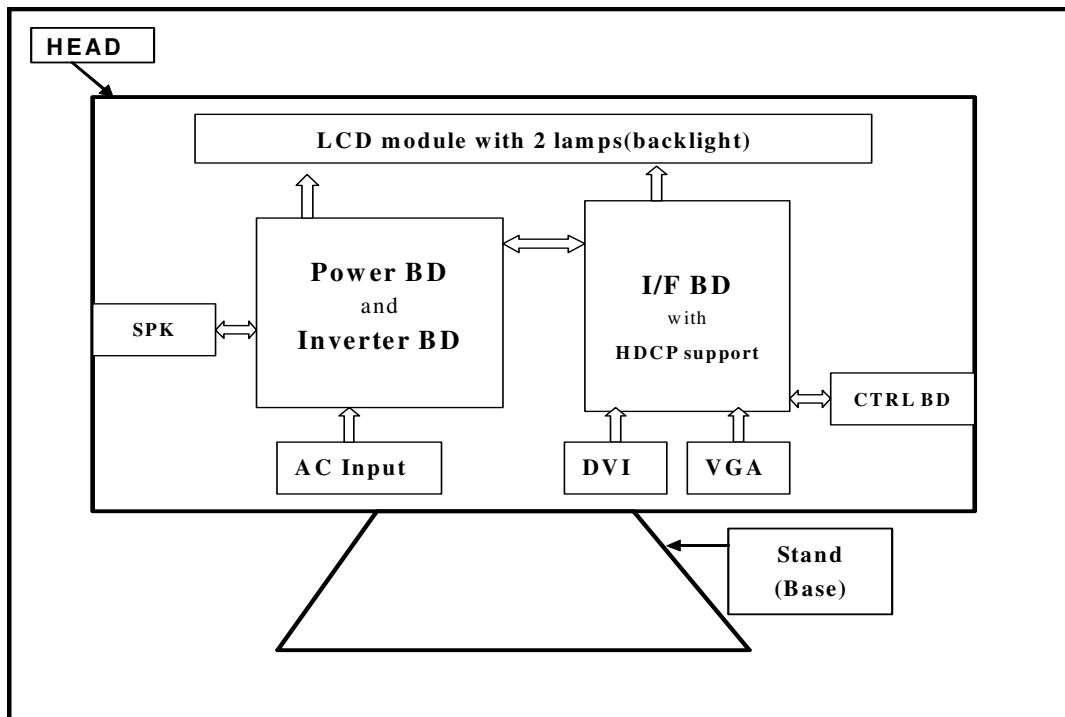
### III. Circuit Implementations:

#### A.) THE MAIN BODY:
#### A-1.) Interface board block diagram :

```
┌──────────────────────────────────────────────────────────────────────┐
│  ┌────────────────────────────────────────────────────────────────┐  │
│  │                      INTERFACE BOARD                           │  │
│  └────────────────────────────────────────────────────────────────┘  │
│                                                                        │
│                         ┌──────────────────┐                          │
│                         │    1600x900      │                          │
│                         │      LCM         │                          │
│                         └──────────────────┘                          │
│                                   ▲                                    │
│   ┌──────────────┐      ┌──────────────────┐      ┌──────────────┐   │
│   │    MCU       │◄────►│     Scalar       │◄────►│  DC +3.3V    │   │
│   │  RTD 2120L   │      │   RTD 2545LH     │      │  DC +1.8V    │   │
│   └──────────────┘      │  (Support HDCP)  │      └──────────────┘   │
│   ┌──────────────┐      │                  │      ┌──────────────┐   │
│   │  EEPROM      │◄────►│                  │◄────►│   CTRL BD    │   │
│   │  ATMEL       │      │                  │      └──────────────┘   │
│   │  24C16       │      └──────────────────┘                        │
│   └──────────────┘           │        │                             │
│                              ▼        ▼                              │
│                         ┌───────┐  ┌───────┐                        │
│                         │  DVI  │  │  VGA  │                        │
│                         └───────┘  └───────┘                        │
└──────────────────────────────────────────────────────────────────────┘
```
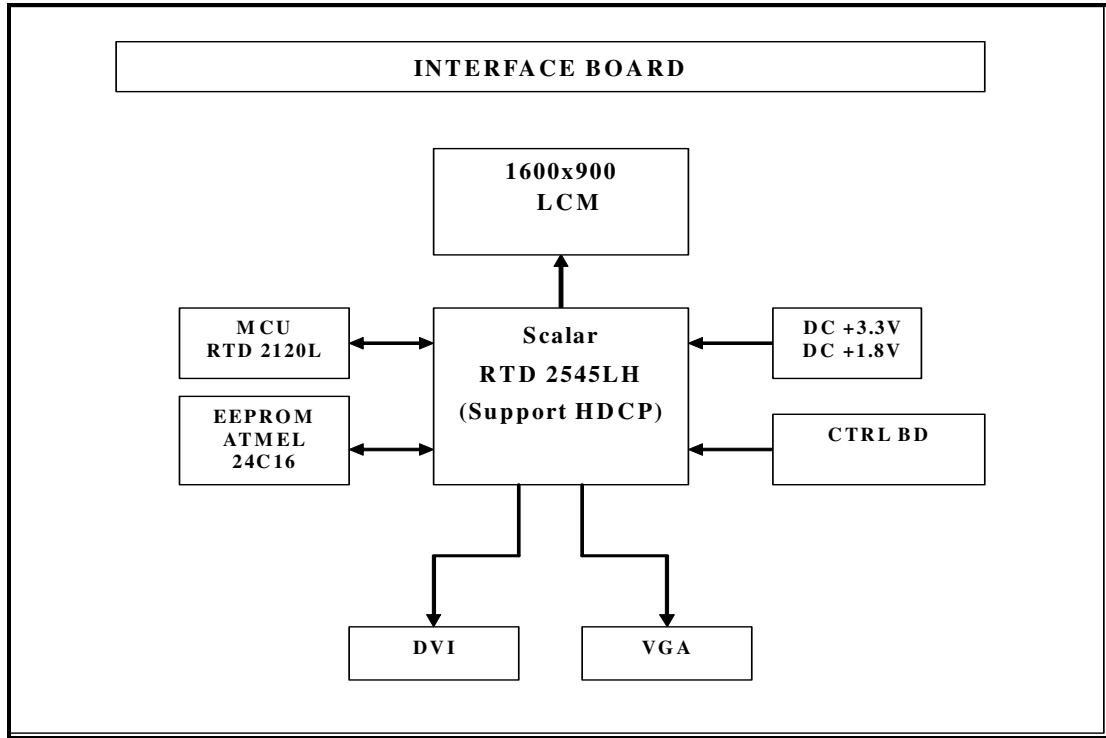
#### (a) Circuit operations:

A basic operation theory for this interface board is to convert analog signals of Red, Green and Blue to digital signals of Red, Green and Blue. The scaling IC has internal A/D converter, internal OSD, built in LVDS transmitter and auto-detect input timing functions. A/D converter is convert analog signal to digital data. OSD is offering adjustable functions to end-user. Detect timing is for detect change mode. LVDS transmitter is used to compress the digital RGB data, the Hsync, Vsync and pixel clock generated by Scaling then output to LCD module. MCU stores source code and offers H/W DDC2Bi function & controls system processing. EEPROM is stored DDC and HDCP data, OSD common data and user mode data.

#### (b) IC introduction:

1.) DDC (Display Data Channel) function: We use DDC IC to support DDC2Bi function. DDC data is store in 24C02 (EEPROM). Those data related to LCD monitor specification. PC can read them by "SDA" and "SCL" serial communication for I²C communication for DDC2Bi.

2.) Scalar IC: There are A/D, TMDS receiver, HDCP, Scaling, OSD and LVDS transmitter functions built-in the RTD2545LH IC. Scaling IC is revolutionary scaling and color engine,

capable of expanding any source resolution to a highly uniform and sharp image or down scaling from 1980x1020, combined with the critically proven integrated 8 bit triple-ADC and patented Rapid-lock digital clock recovery system. It also support detect mode and DPMS control.

3.) RTD2120L: Control unit, it controls all the functions of this interface board, just like the OSD display setting, the adjustable items, adjusted data storage, the external IIC communication, support DDC2Bi. .

4.) EEPROM: We use 24C016 to store all the adjustable data, user settings and HDCP Key and use 2 of 24C02 to store DVI and D-SUB EDID data.

## A-2.) Control board introduction :

There are 6 keys for user's control which includes "Menu", "Right", "Left", "Auto", "Empowering", and "Power". The following descriptions are the introduction of these keys.

(1) "Menu" key: to enter sub-menus or select items.

(2) "Right" key: to select previous and to increase adjustment

(3) "Left" key: to select next and to decrease adjustment

(4) "Auto" key: to perform auto adjustment and Exit key

(5) "Empowering": to Open the Acer eColor Management OSD and access the scenario modes

(6) "Power" key: to turn/off power of monitor

(7) LED: It indicates the DPMS status of this LCD monitor; green light means DPMS on (Normal operating condition). Amber light means DPMS off (Power Saving).

## A-3.) Power board diagram:

```
┌───────────┐    ┌──────────────┐    ┌──────────────┐    ┌──────────────┐    ┌──────────────┐
│ EMI Filter│───▶│ Rectifier and│───▶│  Isolation   │───▶│ Rectifier and│───▶│Inverter      │
│           │    │    filter    │    │  power       │    │    filter    │    │circuit       │
└───────────┘    └──────────────┘    │ transformer  │    └──────────────┘    └──────────────┘
                                     └──────┬───────┘
                 ┌──────────────┐    ┌──────┴───────┐    ┌──────────────┐    ┌──────────────┐
                 │PWM contrller │───▶│  Switching   │    │ Rectifier and│───▶│Audio circuit │
                 │              │    │   element    │───▶│    filter    │    │              │
                 └──────────────┘    └──────────────┘    └──────────────┘    └──────────────┘
                                                                              ┌──────────────┐
                                                                              │LDO regulator │
                                     ┌──────────────┐                         └──────────────┘
                                     │   Feedback   │◀────────────────────────
                                     │   Isolation  │
                                     └──────────────┘
```
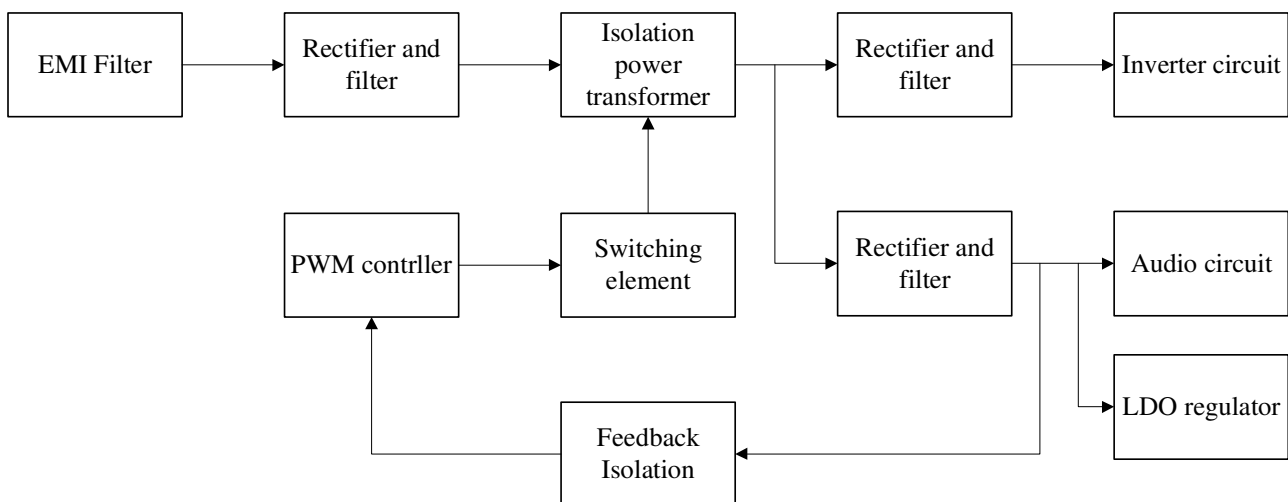
Fig.1

## #1 EMI Filter

This circuit (Fig.2) is designed to inhibit electrical and magnetic interference for meeting FCC, VDE, VCCI standard requirements.
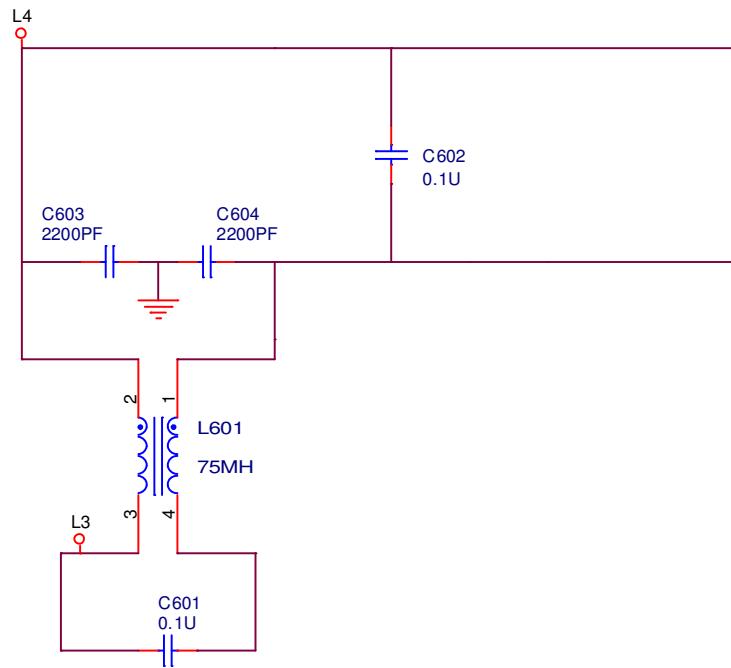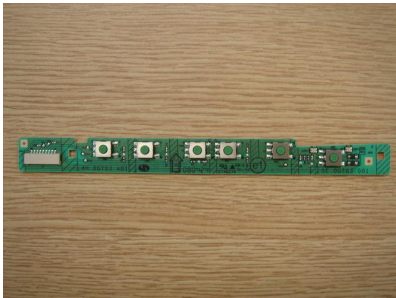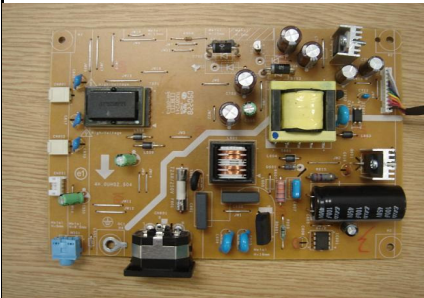


Fig.2

## 6.3 Spare Parts List

| Picture | CATEGORY | DESCRIPTION | ACER PART NO. |
|---------|----------|-------------|---------------|
|  | LCD | CCFL LCD SAMSUNG 20"W HD+ None Glare LTM200KT03 TBD LF 250nit 5ms 1000:1 2 CCFL(acer B/S) | LK.20006.006 |
| **Board** | | | |
|  | BOARD | CONTROL BOARD | 55.LBJ0Q.004 |
|  | BOARD | POWER BOARD SEC AUDIO | 19.LHC0Q.001 |
|  | BOARD | MAIN BOARD SEC DUAL WITH SPEAKER | 55.LHC0Q.001 |

**Cable**

| | | | |
|---|---|---|---|
|  | CABLE | POWER CORD US | 27.LDW0Q.003 |
|  | CABLE | DVI CABLE | 50.LBJ0Q.001 |
|  | CABLE | CABLE BETWEEN CONTROL BOARD AND M/B | 50.LHC0Q.001 |
|  | CABLE | CABLE BETWEEN M/B AND POWER BOARD | 50.LE10Q.001 |
|  | CABLE | CABLE BETWEEN M/B AND LCD PANEL | 50.LGP0Q.001 |
|  | CABLE | SIGNAL CABLE | 50.LBJ0Q.002 |

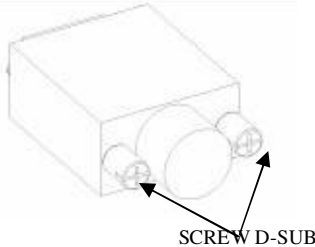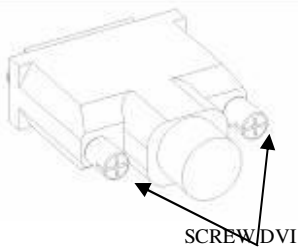| | CASE/COVER /BRACKET ASSEMBLY | STAND NECK | 60.LDX0Q.003 |
|---|---|---|---|
| | CASE/COVER /BRACKET ASSEMBLY | STAND BASE DUAL | 60.LDX0Q.010 |
| | CASE/COVER /BRACKET ASSEMBLY | LCD BEZEL ASSY | 60.LHC0Q.001 |
| | CASE/COVER /BRACKET ASSEMBLY | BACK COVER SEC DUAL WITH AUDIO | 60.LHC0Q.002 |

# Appendix 1 – Screw List / Torque

(A) **STANDARD SCREW TORQUE SPEC.**

| ITEM | P/N | DESCRIPTION | Color | Mounting Material | TORQUE (KG-CM) | HOLE SIZE (MM) | Screw Head |
|------|-----|-------------|-------|-------------------|----------------|----------------|------------|
| 1 | 8F.205B4.019 | SCRW MACH HEX #4-40*0.3" N | Ni | Metal; D-SUB;DVI Connector | 5.0±0.6 | #4-40 | X |
| 2 | 8F.00518.100 | SCRW TAP W/FL M3*10L(S3.8) ZN | NI | Metal | None tread：8～10 Have tread: 3～4 Aluminum: 4~5 | ∅2.68±0.03 | #2 |
| 3 | 8F.1A556.8R0 | SCRW MACH PH M4*8L NI NYL | NI | Metal | 11.0±1.0 | M4*0.7 | #2 |
| 4 | 8F.5A356.8R0 | SCRW MACH FH M4*8L B-ZN NYL | B-Zn | Metal | 9.0±1.0 | M4*0.7 | #2 |
| 5 | 8F.5A422.2R4 | SCRW MACH FLAT-P M2*2.4L ZN | Zn | Plastic | 1.0±0.1 | ∅1.7±0.05 | #1 |
| 6 | 8F.00273.6R0 | SCRW TAP PH F/10WSH M3*6L C-ZN | C-Zn | Metal | None tread：8～10 Have tread: 6～8 Aluminum: 4~5 | ∅2.68±0.03 | #2 |
| 7 | 8F.VZ524.6R0 | SCRW TAP FLAT+EXT M3*6L C-ZN | C-Zn | Metal | None tread：8～10 Have tread: 6～8 Aluminum: 4~5 | ∅2.68±0.03 | #2 |
| 8 | 8F.5A356.120 | SCRW MACH FH M4*12L B-ZN NYL | B-Zn | Metal | 11.0±1.0 | M4*0.7 | #2 |
| 9 | 8F.5A456.8R0 | SCRW MACH FLAT M4*8L C-ZN NYLO | C-Zn | Metal | 11.0±1.0 | M4*0.7 | #2 |
| 10 | 8F.WA314.8R0 | SCRW TAP CAP M3*1.34P*8L B-ZN | B-Zn | Plastic | 5.0±1.0 | ∅2.35±0.05 | #2 |
| 11 | 8F.PA526.120 | SCRW TAP PAN M4*12L NI | Ni | Plastic | 7.5±0.5 | ∅3.4±0.05 | #2 |
| 12 | 8F.XA326.100 | SCRW TAP FLAT M4*10L B-ZN | B-ZN | Plastic | 7.5±0.5 | ∅3.4±0.05 | #2 |
| 13 | 8F.XA314.8R0 | SCRW TAP FLAT | B-ZN | PLASTIC | 4.5±0.5 | ∅2.35±0.0 | #2 |

| ITEM | P/N | DESCRIPTION | | MOUNTING MATERIAL | TORQUE (KG-CM) | HOLE SIZE (MM) | Screw Head |
|---|---|---|---|---|---|---|---|
| | | M3*1.34P*8L B-ZN | | | | 5 | |
| 14 | 8F.5A224.6R0 | SCRW MACH FLAT M3*5L ZN | ZN | METAL | Side mount:3~4 Other: 4±0.6 | M3*0.5 | #2 |
| 15 | 8F.00010.161 | SCRW TAPTILE TRS W/EXT M4*8L | NI | METAL | 10±1.0 | M4*0.7 | #2 |

(B) **SPECIAL SCREW TORQUE SPEC.**

| ITEM | P/N | DESCRIPTION | MOUNTING MATERIAL | TORQUE (KG-CM) | HOLE SIZE (MM) | Screw Head |
|---|---|---|---|---|---|---|
| *SCREW Q'TYPE AND POSITION REFERRED TO C328.<br>*NOTES:<br>1. (A)STANDARD SCREW TORQUE SPEC.<br>2. (B)SPECIAL SCREW TORQUE SPEC.<br>3. T: TAPPING SCREW.<br>4. M: MACHING SCREW. | | | D-SUB Connector SCREW TORQUE SPEC.<br><br>SCREW D-SUB<br><br>SCREW TORQUE: 1.2±0.3 (KG-CM) | | DVI Connector SCREW TORQUE SPEC.<br><br>SCREW DVI<br><br>SCREW TORQUE : 1.2±0.3(KG-CM) | |

# Appendix 2 – Physical Dimension Front View and Side view

## Fig. 1 Physical Dimension Front View and Side view

# Fig. 2 Appearance Description
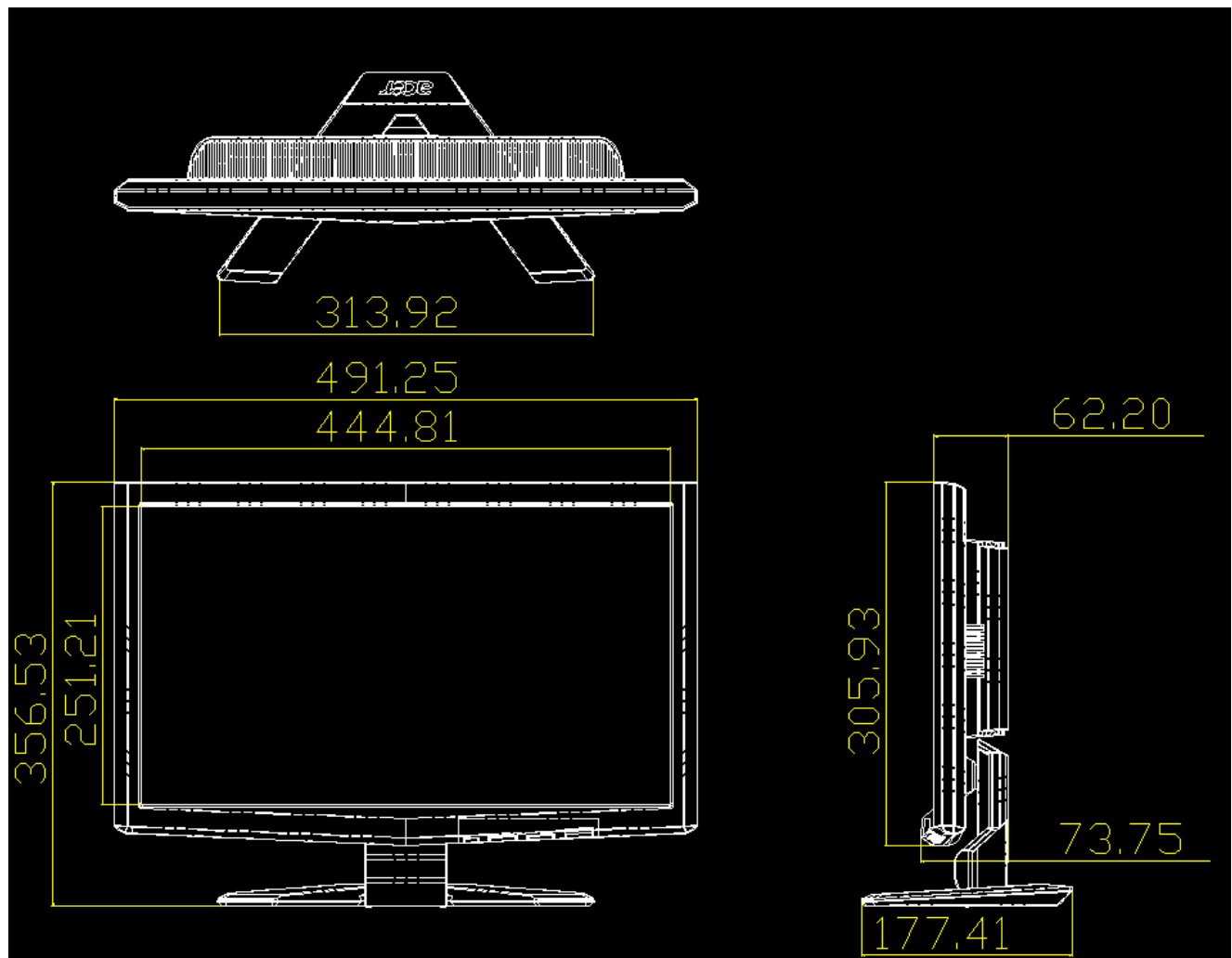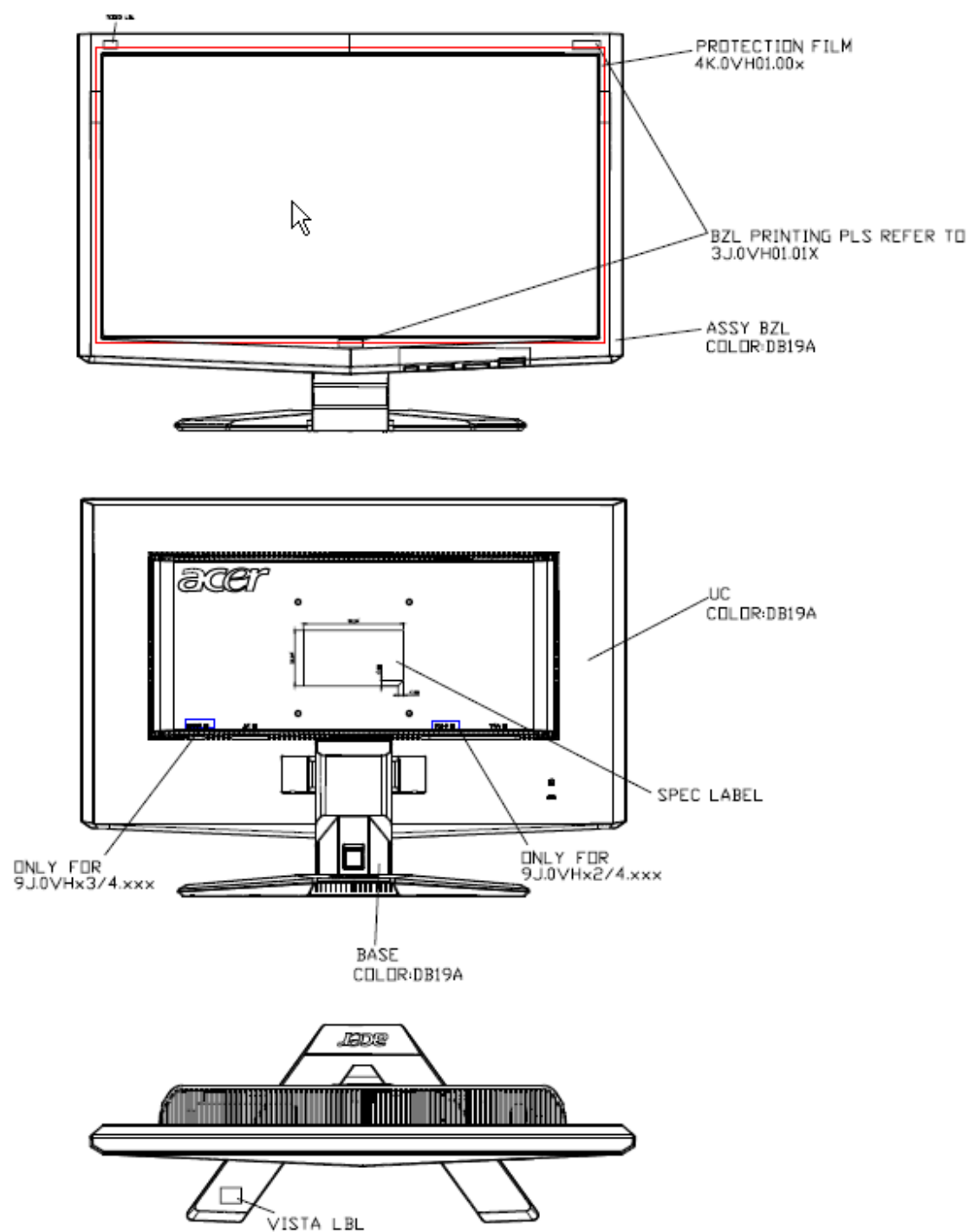


PROTECTION FILM
4K.0VH01.00x

BZL PRINTING PLS REFER TO
3J.0VH01.01X

ASSY BZL
COLOR:DB19A

UC
COLOR:DB19A

SPEC LABEL

ONLY FOR
9J.0VHx3/4.xxx

ONLY FOR
9J.0VHx2/4.xxx

BASE
COLOR:DB19A

VISTA LBL

# Appendix 3 – Interface Board

JW1
N2 Jump-Wire N2

JW2
E5 Jump-Wire E5

JW3
V-Audio Jump-Wire V-Audio

JW4
Jump-Wire

JW5
Jump-Wire

JW6
5V Jump-Wire 5V

JW7
BL_ON Jump-Wire BL_ON

JW8
V-Inverter Jump-Wire V-Inverter

JW9
+5VA Jump-Wire +5VA

JW10
+5V Jump-Wire +5V

JW11
V-Audio Jump-Wire V-Audio

JW12
Jump-Wire
Audio_GND Audio_GND

JW13
Jump-Wire
Audio_GND Audio_GND

JW14
Jump-Wire
Audio_GND Audio_GND

JW15
ISEN1 Jump-Wire ISEN1

JW16
BL_ON Jump-Wire BL_ON

JW17
Jump-Wire

JW18
Jump-Wire

JW19
VSEN Jump-Wire VSEN

JW20
VSEN1 Jump-Wire VSEN1

BRT_ADJ JW21 BRT_ADJ
Jump-Wire

V-Inverter JW22 V-Inverter
Jump-Wire

JW23
Jump-Wire
✕ ✕
(Open)
Reserved for HDMI

JR1
0 J
F F

JR2
0 J
VOL_ADJ VOL_ADJ

JR3
0 J

JR4
0 J
OVPT OVPT

JR5
0 J
VOL_ON VOL_ON

JR6
0 J
OVPT OVPT

Optical Points

OP1 OP2 OP3 OP4 OP5 OP6 OP7
OP OP OP OP OP OP OP

With GC1
H1 H2 H3 H4
HOLE_0 HOLE_0 HOLE_0 HOLE_0