

---

---

# SERVICE MANUAL

---

---

COLOR MONITOR  
**MultiSync® 20WGX<sup>2</sup>**

**MODEL ID : 20WGX<sup>2</sup>-BK(B)**

**VERY IMPORTANT!**

This Equipment is compatible with RoHS Directive and Lead-Free.

Since the equipment is compatible with RoHS Directive, use components in which the use of specific chemically noxious substances is restricted; use only designated spare parts when it is necessary to replace such parts with new parts.

Use lead-free solder for the equipment compatible with ones with substrates on which lead-free components are mounted. For the details, refer to "Caution for Lead-Free Soldering Work" given in the next page.

**1st Edition**  
**NEC DISPLAY SOLUTIONS, LTD.**  
**DECEMBER 2005**

## 1. Safety guideline in servicing

- 1) **Never touch the portions with the marking (⚡).**  
Serious injury or even death may result.
- 2) **Do not expose the set to rain or water.**  
A risk of fire or electric shock can result.
- 3) **Use an adequate power cord.**  
A risk of fire or electric shock can result.
- 4) **Do not attempt to service or modify the set without prior permission of the manufacturer.**  
A risk of fire or electric shock can result.
- 5) **Leave the maintenance service to a service engineer having qualification, knowledge and experience.**  
A risk of electric shock, injury or fire can result.
- 6) **Always employ genuine parts indicated in the service manual for replacement.**  
A risk of fire or electric shock can result.
- 7) **In reassembling use the specified binding bands, clampers, tubes and barriers--all of which are necessary for insulation/protection--in their original positions.**  
A risk of fire or electric shock can result.

## 2. Other cautions necessary

- 1) When removing the cables from their connectors, take care not to damage the wire portions so as to prevent the occurrence of poor contact.
- 2) When attaching/detaching screws, use a screwdriver that is well-fit to the screw size.

## 3. Caution for LEAD-FREE soldering work

For this equipment, parts compatible with lead-free materials are used.  
Please observe the following precautions, when performing any soldering work.

- 1) Use lead-free solder for substrates mounted with lead-free parts.  
If you use eutectic solder by mistake, solder will not fuse well because of the difference in fusion point.
- 2) Fusion Point  
Lead-free solder: 220°C  
Eutectic solder : 183°C
- 3) Solder composition of Lead-free solder: Sn-3.0Ag-0.5Cu  
[Maker] [Type]  
Nihon Genma DHB-RMA NP303-###  
Senju metal ESC F3 M705E-###  
(#:This mark shows the diameter of the solder wire.)
- 4) Use without fail a temperature adjustable soldering iron for working with lead-free solder. Moreover, the power consumption of the soldering iron must use from 25W to 75W.

[Solder Iron tip temperature and contact time]

Category of Parts		Lead-free solder	Eutectic solder
*SMD Chip	The Parts of Chip type	300-320°C (1-3sec)	260-280°C (1-3sec)
*SMD QFP	The Parts (IC) of Quad Flat Pack Package type	320-350°C (1-3sec)	280-300°C (1-3sec)
Heat sink	Heat sink	360-380°C (1-3sec)	320-420°C (1-3sec)
Ax,RD	The Parts of Axial or Radial type (The Electric Parts other than the above-mentioned. Ex.: IC, Transistor, Resistor, Capacitor)	340-370°C (1-3sec)	350-390°C (1-3sec)

\*SMD: Surface Mounting Device

# Product Specifications

Item			Specification	
			Analog Input	Digital Input
LCD			LPL LM201WE2-SLA1	
	Size		20.1" (51.1133cm)	
	Active Display Area		433.44 (H) x 270.90 (V) mm	
	Resolution		1680x1050 dots (WSXGA+)	
	Pixel Pitch		0.258mm	
	Color Depth		16,77 M color (8-bits)	
	Luminance		470cd/m <sup>2</sup> (Typ.) *1)	
	Viewing Angle(Typ.)	CR>10	Up 89 / Down 89 / Left 89 / Right 89 (Typ.)	
		CR>5	-	
	Contrast Ratio		700:1(Typ.) 1600:1 (Typ.) (Advanced DV mode ON!)	
	Response Time	ON+OFF	12ms	
		GTG	6ms by overdrive circuit integrated in panel	
	Color gamut		> 72%	
	Surface Treatment		Glare (AR<2.0%)	
	Back Light		CCFL x 10pcs (Direct Light Type)	
Input Signals	Horizontal frequency		24.7kHz - 81.2kHz	24.7kHz - 81.2kHz
	Vertical frequency		49.0Hz - 76.0 Hz	
	Video Signal		Analog RGB	Digital RGB
	Sync. Signal		Separate Sync.(TTL) Composite Sync.on Green video	TMDS
	Pixel Clock		25.2MHz - 165MHz	
	Input connector		Mini D-sub 15Pin	DVI-D
Preset Timings			User preset : 23	
USB Hub (only AN/BNBK)			USB Version 2.0 Self Powered Hub 1 upstream / 4 down stream	
Functions	Front Control		Menu/Exit, Direction (4 direction key), Select/1<->2, Reset/DV mode, Power (DC)	
	Back side		Power (AC)	
	OSM		Brightness, Contrast, Auto contrast, Advanced DV mode, DV mode, Auto adjust, H Position, V position, H size, Fine, Color control, Sharpness, Expansion mode, Off timer, LED Brightness, Hot key, Factory preset, Language, OSM Left/Right, OSM Down/Up, OSM turn off, OSM Lock out, Resolution notifier, Monitor inf.	
	Remote Control		VESA DDC/CI	
Regulations	Safety		UL/ cUL , TuV GS, CE, CB Report, PSB	
	EMC		FCC Class B, Canadian DOC Class B, C-tick Class B, CE	
	VLF / ELF		MPR-II, MPRIII, TCO'03	
	Power Management		VESA DPMS ,EPA, Energy star Ver 4.0 Tier2, GEEA label	
	Ergonomics		TUV/ERGONOMIE	
	Plug and Play		VESA DDC2B	
	Others		US Mercury Regulation, Windows XP/2000 Logo	
Environment Condition	Temperature		5-35 degree C	
	Humidity		10-80% (without condensation)	
Power Supply	Input Voltage		AC100-240V, 50 / 60Hz	
	Power consumption	Typ	84 W max (1.0 A @ 100 - 120V, 0.52 A @ 220 - 240V)	
		Power saving	<2.3W with USB hub model, <2W without USB hub (DPMS) <1W (DC Power Off) Meet to Energy Star Ver 4.0 Tier 2	
	Input Connector		3P IEC Type	
Weight	with Stand		Approx. 6.3 kg	
	without Stand		Approx. 4.6 kg	
Dimension	Net		471.4 (W) x 391.5(H) x 203.0(D) mm	
	Gross		570.0(W) x 518.0(H) x 262.0(D) mm	
VESA compatible arm mounting interface			100mmx100mm	
Tilt / Swivel / Rotation / Height Adjustment			Up & Down 30deg to -5deg / Yes +/- 170degree / NA / NA	
Accessories	AC Power code		2.0m	
	Signal Cable		2.0m : minD-sub15pin - minD-sub15pin 2.0m: DVI-D - DVI-D	
	Others		User's manual, USB cable, etc.	

\*1)60% of a mass-product should meet

# CONTENTS

	Page No.
USER'S MANUAL .....	1-1
SERIAL NUMBER INFORMATION .....	2-1
DISASSEMBLY .....	3-1
ADJUSTMENT PROCEDURES .....	4-1
INSPECTION .....	5-1
TROUBLE SHOOTING .....	6-1
CIRCUIT DESCRIPTION .....	7-1
REPLACEMENT PARTS LIST .....	8-1
BLOCK DIAGRAM .....	9-1
SCHEMATIC DIAGRAMS .....	10-1
PACKING SPECIFICATION .....	11-1
REVISION HISTORY .....	12-1

---

# ***MultiSync 20WGX<sup>2</sup>***

User's Manual

# NEC

# Index

---

Warning, Caution .....	English-1
Declaration .....	English-1
Canadian Department of Communications Compliance Statement .....	English-2
Declaration of Conformity .....	English-2
Contents .....	English-3
Quick Start .....	English-4
Controls .....	English-8
Recommended use .....	English-11
Specifications .....	English-13
Features .....	English-14
Troubleshooting .....	English-15
TCO'03 .....	English-16
Manufacturer's Recycling and Energy Information .....	English-17

**WARNING**

TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. ALSO, DO NOT USE THIS UNIT'S POLARIZED PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLETS UNLESS THE PRONGS CAN BE FULLY INSERTED.

REFRAIN FROM OPENING THE CABINET AS THERE ARE HIGH VOLTAGE COMPONENTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

**CAUTION**

CAUTION:

TO REDUCE THE RISK OF ELECTRIC SHOCK, MAKE SURE POWER CORD IS UNPLUGGED FROM WALL SOCKET. TO FULLY DISENGAGE THE POWER TO THE UNIT, PLEASE DISCONNECT THE POWER CORD FROM THE AC OUTLET. DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol warns user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any part inside this unit.



This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.

**Caution:**

When operating the MultiSync 20WGX<sup>2</sup> with a 220-240V AC power source in Europe, use the power cord provided with the monitor.

In the UK, a BS approved power cord with a moulded plug has a Black (five Amps) fuse installed for use with this equipment. If a power cord is not supplied with this equipment please contact your supplier.

When operating the MultiSync 20WGX<sup>2</sup> with a 220-240V AC power source in Australia, use the power cord provided with the monitor. If a power cord is not supplied with this equipment please contact your supplier.

For all other cases, use a power cord that matches the AC voltage of the power outlet and has been approved by and complies with the safety standard of your particular country.

**Declaration****Declaration of the Manufacturer**

We hereby certify that the colour monitor  
MultiSync 20WGX<sup>2</sup> (L205GJ) is in  
compliance with

Council Directive 73/23/EEC:

– EN 60950-1

Council Directive 89/336/EEC:

– EN 55022

– EN 61000-3-2

– EN 61000-3-3

– EN 55024

and marked with



NEC Display Solutions, Ltd.  
4-13-23, Shibaura,  
Minato-Ku  
Tokyo 108-0023, Japan



Windows is a registered trademark of Microsoft Corporation. NEC is a registered trademark of NEC Corporation. ENERGY STAR is a U.S. registered trademark.

OmniColor is a registered trademark of NEC Display Solutions Europe GmbH in the countries of EU and Switzerland.

ErgoDesign is a registered trademark of NEC Display Solutions, Ltd. in Austria, Benelux, Denmark, France, Germany, Italy, Norway, Spain, Sweden, U.K.

NaViSet is a trademark of NEC Display Solutions Europe GmbH in the countries of EU and Switzerland.

MultiSync is a registered trademark of NEC Display Solutions, Ltd. in the countries of U.K., Italy, Austria, Netherlands, Switzerland, Sweden, Spain, Denmark, Germany, Norway and Finland.

All other brands and product names are trademarks or registered trademarks of their respective owners.

As an ENERGY STAR® Partner, NEC Display Solutions of America, Inc. has determined that this product meets the ENERGY STAR guidelines for energy efficiency. The ENERGY STAR emblem does not represent EPA endorsement of any product or service.

# Canadian Department of Communications Compliance Statement

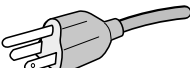
**DOC:** This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

**C-UL:** Bears the C-UL Mark and is in compliance with Canadian Safety Regulations according to CAN/CSA C22.2 No. 60950-1.

## FCC Information

1. Use the attached specified cables with the MultiSync 20WGX<sup>2</sup> (L205GJ) colour monitor so as not to interfere with radio and television reception.

- (1) The power supply cord you use must have been approved by and comply with the safety standards of U.S.A., and meet the following condition.

Power supply cord	Non shield type, 3-conductor
Length	2.0 m
Plug shape	
	U.S.A

- (2) Please use the supplied shielded video signal cable and USB cable with ferrite cores. Use of other cables and adapters may cause interference with radio and television reception.

2. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician for help.

If necessary, the user should contact the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet, prepared by the Federal Communications Commission, helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

## Declaration of Conformity

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

<b>U.S. Responsible Party:</b>	<b>NEC Display Solutions of America, Inc.</b>
<b>Address:</b>	<b>500 Park Blvd, Suite 1100</b>
	<b>Itasca, Illinois 60143</b>
<b>Tel. No.:</b>	<b>(630) 467-3000</b>

Type of Product: Display Monitor

Equipment Classification: Class B Peripheral

Model: MultiSync 20WGX<sup>2</sup> (L205GJ)

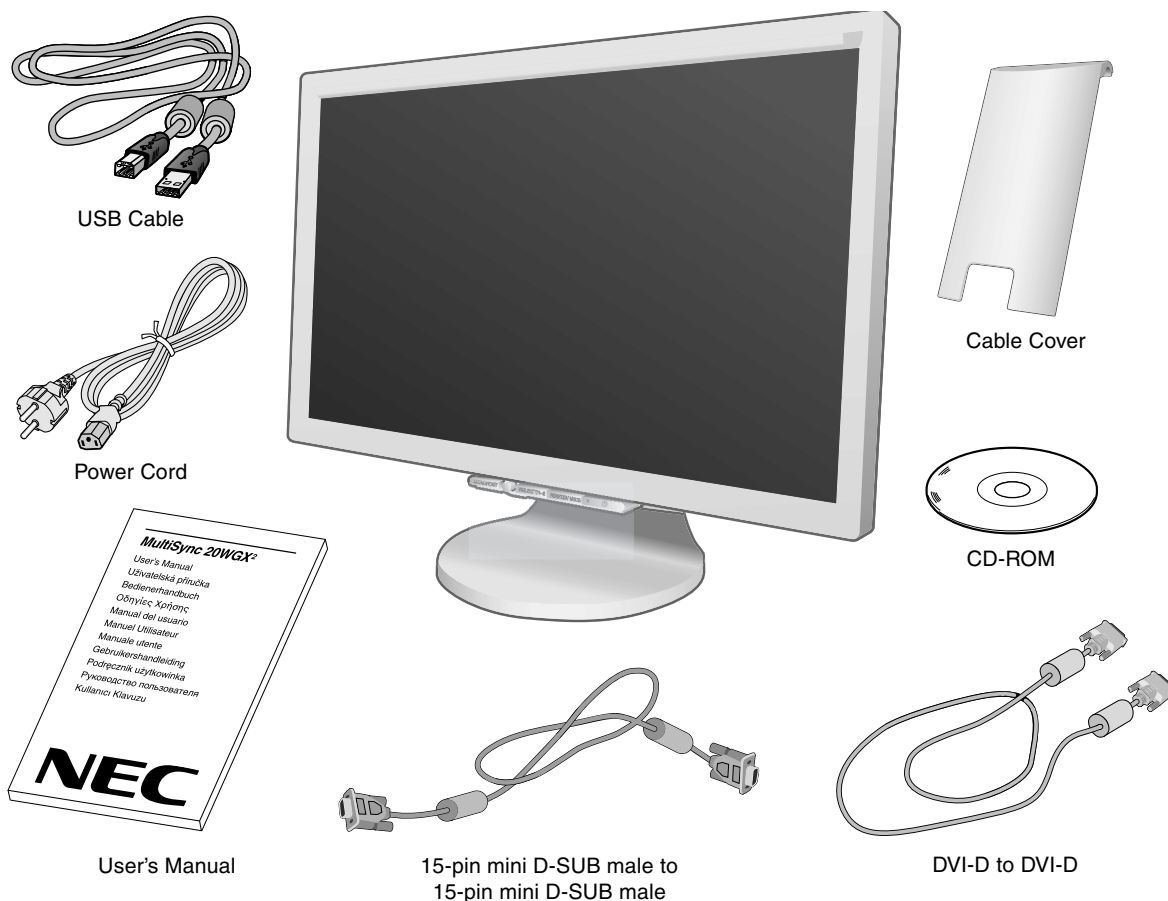


*We hereby declare that the equipment specified above conforms to the technical standards as specified in the FCC Rules.*

# Contents

Your new NEC MultiSync LCD monitor box\* should contain the following:

- MultiSync 20WGX<sup>2</sup> monitor with tilt/swivel adjust stand
  - Power Cord
  - Video Signal Cable (15-pin mini D-SUB male to 15-pin mini D-SUB male)
  - Video Signal Cable (DVI-D to DVI-D)
  - USB Cable
  - User's Manual
  - Cable Cover
  - CD ROM (includes complete User's Manual in PDF format).
- To see the User's Manual, Acrobat Reader 4.0 must be installed on your PC.

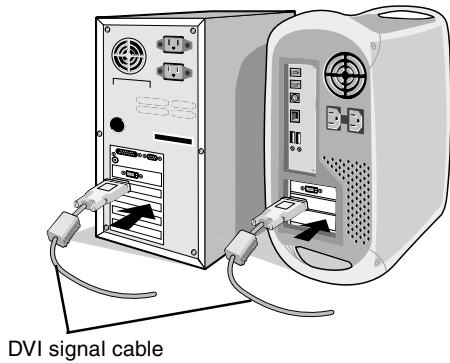


\* Remember to save your original box and packing material to transport or ship the monitor.

# Quick Start

To attach the MultiSync LCD monitor to your system, follow these instructions:

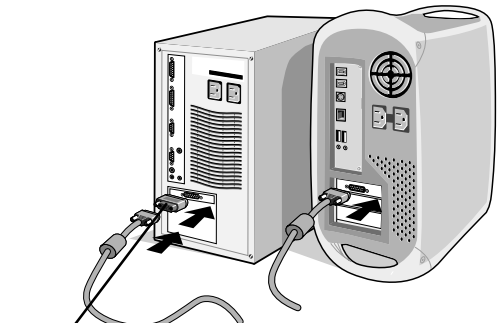
1. Turn off the power to your computer.
2. **For the PC or MAC with DVI digital output:** Connect the DVI signal cable to the connector of the display card in your system (**Figure A.1**). Tighten all screws.  
**For the PC with Analog output:** Connect the 15-pin mini D-SUB signal cable to the connector of the display card in your system (**Figure A.2**). Tighten all screws.  
**For the MAC:** Connect the Macintosh cable adapter to the computer, then attach the 15-pin mini D-SUB signal cable to the Macintosh cable adapter (**Figure B.1**). Tighten all screws.



**Figure A.1**



**Figure A.2**

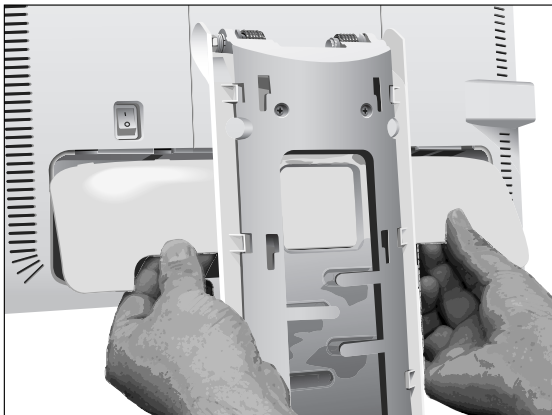


Macintosh  
Cable Adapter  
(not included)

**Figure B.1**

**NOTE:** Some Macintosh systems do not require a Macintosh cable adapter.

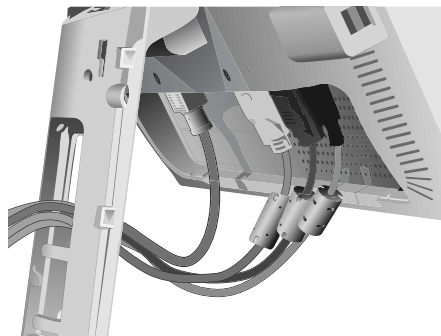
3. Remove the connector cover (**Figure C.1**).
4. Place hands on each side of the monitor to tilt the LCD panel 30 degrees angles (**Figure C.2**).
5. Connect all cables to the appropriate connectors through the square hole in the stand (**Figure C.3**).



**Figure C.1**



**Figure C.2**



**Figure C.3**

6. Place the connector cover onto the back cabinet (**Figure C.4**).
7. Place all cables into the hooks (**Figure C.5**).
8. Place hands on each side of the monitor to tilt the LCD panel back 5° (**Figure C.6**).

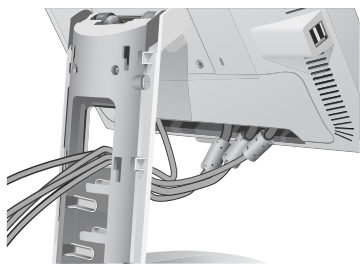


Figure C.4

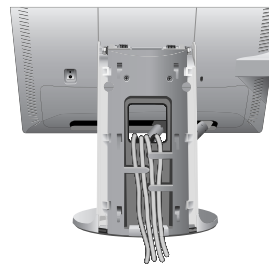


Figure C.5

9. Place the cable cover onto the stand (**Figure C.6**). To remove the cable cover, push the notch at the bottom of the cover up (towards the top of the monitor) in order to unhook the cover from the stand (**Figure C.7**).



Figure C.6

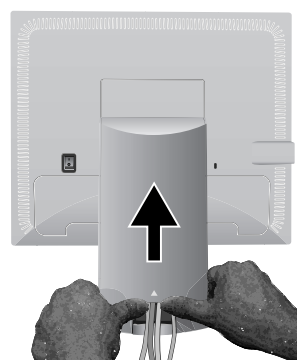


Figure C.7

10. Connect the power cord to the power outlet (**Figure D.1**).

**NOTE:** Please refer to **Caution** section of this manual for proper selection of AC power cord.

11. The vacation switch on the back side of the monitor must be turned on (**Figure D.1**). Turn on the monitor with the front power button and the computer.

**NOTE:** The vacation switch is a true on/off switch. If this switch is on the OFF position, the monitor cannot be turned on using the front button. DO NOT switch on/off repeatedly.

12. No-Touch Auto Adjust automatically adjusts the monitor to optimal settings upon initial setup for most timings. For further adjustments, use the following OSM controls:

- Auto Adjust Contrast (Analog input only)
- Auto Adjust (Analog input only)

Refer to the **Controls** section of this User's Manual for a full description of these OSM controls.

**NOTE:** If you have any problems, please refer to the **Troubleshooting** section of this User's Manual.

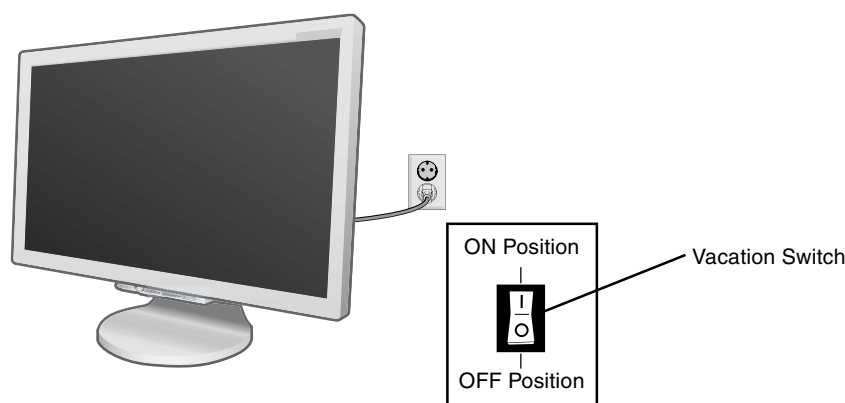
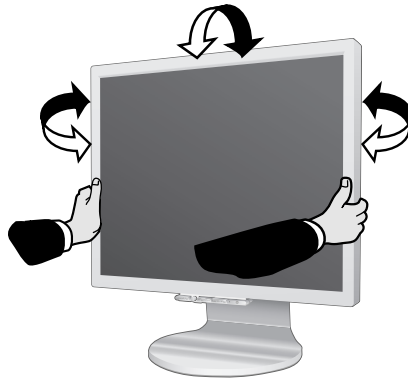


Figure D.1

## Tilt and Swivel

Grasp both sides of the monitor screen with your hands and adjust the tilt and swivel as desired (**Figure TS.1**).

**NOTE:** Handle with care when tilting and swivelling the monitor screen.



**Figure TS.1**

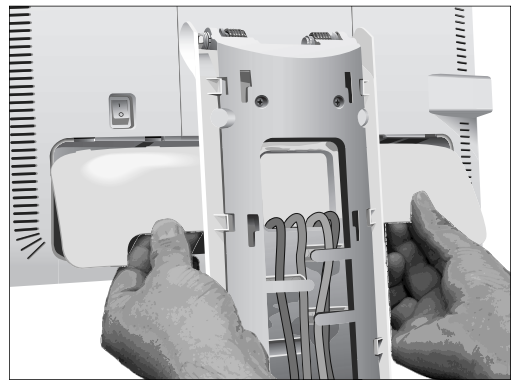
## Remove Monitor Stand for Mounting

To prepare the monitor for alternate mounting purposes:

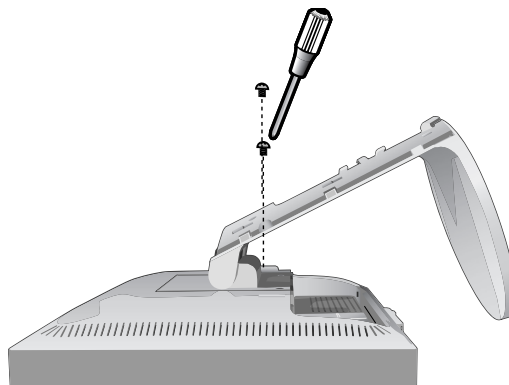
1. Place hands on each side of the monitor to tilt the LCD panel 5 degrees angles.  
Remove the cable cover (**Figure M.1**).  
Remove the connector cover (**Figure M.2**).
2. Disconnect all cables.
3. Place monitor face down on a non-abrasive surface (**Figure M.3**).
4. Remove the 2 screws connecting the stand to the monitor (**Figure M.3**).



**Figure M.1**



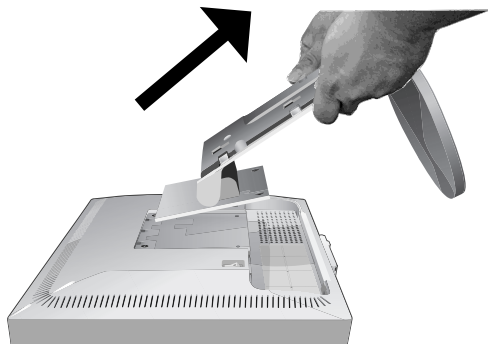
**Figure M.2**



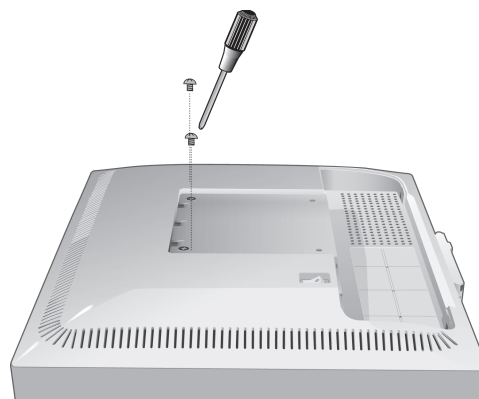
**Figure M.3**

5. Lift up the stand to unlatch the upper hooks and remove the stand (**Figure M.4**).
6. Remove the 2 screws on the top of the monitor (**Figure M.5**). The monitor is now ready for mounting in an alternate manner.
7. Connect the cables and place the connector cover on the back of the monitor.
8. Reverse this process to re-attach stand.

**NOTE:** Use only VESA-compatible alternative mounting method.  
Handle with care when removing stand.



**Figure M.4**



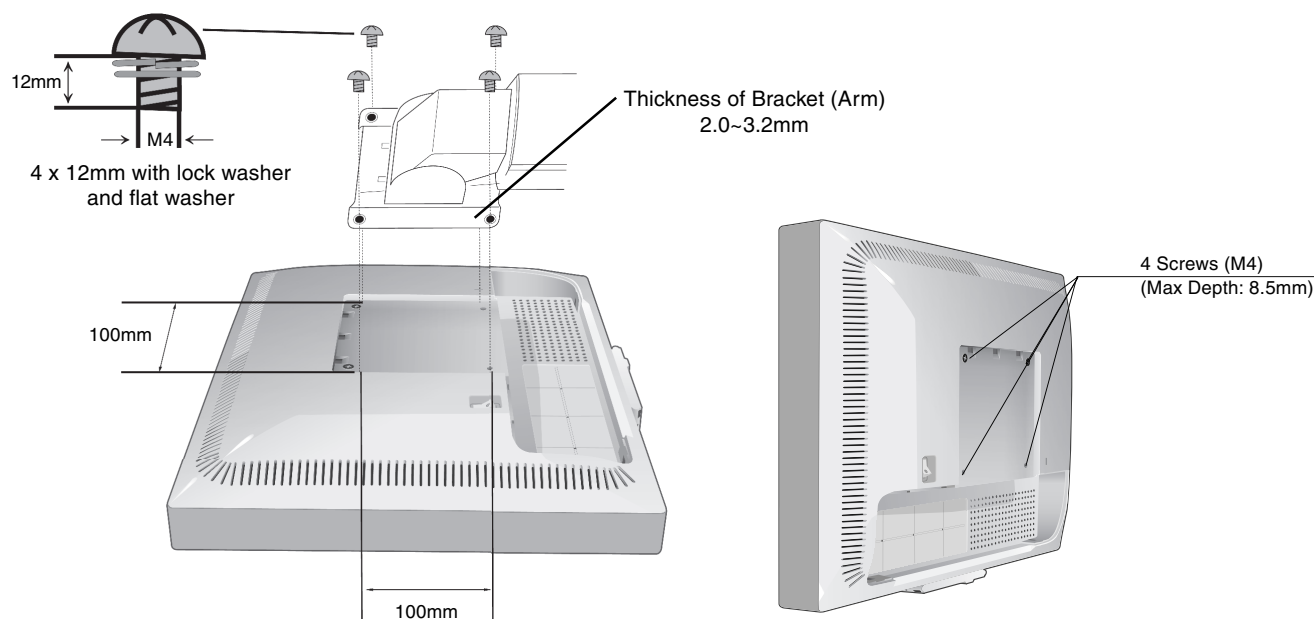
**Figure M.5**

## Flexible Arm Installation

This LCD monitor is designed for use with a flexible arm. To mount the monitor to a flexible arm:

1. Follow the instructions on how Remove Monitor Stand for Mounting to remove the stand.
2. Use the 4 screws to attach the arm to the monitor (**Figure F.1**).

**NOTE:** The LCD monitor should only be used with an approved arm (e.g. GS mark). To meet the safety requirements, the monitor must be mounted to an arm, which guarantees the necessary stability under consideration of the weight of the monitor.



**Figure F.1**

# Controls

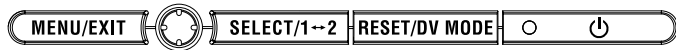
## OSM (On-Screen Manager) control buttons on the front of the monitor function as follows:


To access OSM menu, press any of the control buttons (MENU/EXIT, Left, Right, Down, Up).

To change signal input, press the SELECT button.

To change DV MODE, press the RESET/DV MODE button.

**NOTE:** OSM must be closed in order to change signal input.



Button	Menu
MENU/EXIT	Open OSM main menu. Exits the OSM controls. Exits to the OSM main menu.
4-Direction-Key	Up Left  Right Down
Left/Right	Moves the highlighted area left/right to select control menus. Moves the bar left/right to increase or decrease the adjustment. Direct adjust of brightness if HOT KEY is set to ON. Enters the OSM menu if HOT KEY is set to OFF.
Down/Up	Moves the highlighted area down/up to select one of the controls. Direct adjust of contrast if HOT KEY is set to ON. Enters the OSM menu if HOT KEY is set to OFF.
SELECT/ 1<->2RESET	Enter the OSM sub menu. Active the selected function. Change the Input source.

**RESET/DV MODE** Resets the highlighted control menu to the factory setting. Switches the DV Mode.

**NOTE:** When **RESET** is pressed in the main and sub-menu, a warning window will appear allowing you to cancel the **RESET** function by pressing the MENU/EXIT button.



## Brightness/Contrast Controls

### BRIGHTNESS

Adjusts the overall image and background screen brightness.

### CONTRAST

Adjusts the image brightness in relation to the background.

### AUTO CONTRAST (Analog input only)

Adjusts the image displayed to optimal settings.

### ADVANCED DV MODE

Activates the Advanced Dynamic Video Mode.

### DV MODE

Dynamic Visual Mode allows you to select setting for Movie, Photo and etc.



## Auto Adjust (Analog input only)

Automatically adjusts the Image Position, H. Size and Fine settings.



## Image Controls (Analog input only)

### LEFT / RIGHT

Controls Horizontal Image Position within the display area of the LCD.

### DOWN / UP

Controls Vertical Image Position within the display area of the LCD.

### H.SIZE

Adjusts the horizontal size by increasing or decreasing this setting.

### FINE

Improves focus, clarity and image stability by increasing or decreasing this setting.



## Colour Control System

**Colour Control System:** Six colour presets select the desired colour setting (sRGB and NATIVE colour presets are standard and cannot be changed).

**R,G,B:** Increases or decreases Red, Green or Blue colour depending upon which is selected. The change in colour will appear on screen and the direction (increase or decrease) will be shown by the bars.

**NATIVE:** Original colour presented by the LCD panel that is unadjustable.

**sRGB:** sRGB mode dramatically improves the colour fidelity in the desktop environment by a single standard RGB colour space. With this colour supported environment, the operator could easily and confidently communicate colour without further colour management overhead in the most common situations.

**NOTE:** When MOVIE, GAMING, or PHOTO is selected as the DV MODE, NATIVE is selected automatically as the six colour preset and cannot be changed.



## Tools

**SHARPNESS:** Adjust the image to get distinct or as soft a picture as is preferred.

**EXPANSION:** Selects the zoom mode.

**FULL:** The image is expanded to 1680 x 1050, regardless of the resolution.

**ASPECT:** The image is expanded without changing the aspect ratio.

**OFF:** The image is not expanded.

**NOTE:** EXPANSION is available only resolution under 1280 x 1024.

**OFF TIMER:** Monitor will automatically power-down when the end user has selected a predetermined amount of time.

**LED BRIGHTNESS:** You can adjust the Blue LED brightness.

**HOT KEY:** You can adjust the brightness and contrast directly. When this function is set to ON, you can adjust the brightness with left or right control and contrast with up or down control while the OSM menu is off.

**FACTORY PRESET:** Selecting Factory Preset allows you to reset all OSM control settings back to the factory settings. The RESET button will need to be held down for several seconds to take effect. Individual settings can be reset by highlighting the control to be reset and pressing the RESET button.



## Menu Tools

**LANGUAGE:** OSM control menus are available in eight languages.

**OSM LEFT/RIGHT:** You can choose where you would like the OSM control image to appear horizontally on your screen.

**OSM DOWN/UP:** You can choose where you would like the OSM control image to appear vertically on your screen.

**OSM Turn Off:** The OSM control menu will stay on as long as it is in use. In the OSM Turn Off submenu, you can select how long the monitor waits after the last touch of a button to shut off the OSM control menu.

**OSM Lock Out:** This control completely locks out access to all OSM control functions without Brightness and Contrast. When attempting to activate OSM controls while in the Lock Out mode, a screen will appear indicating the OSM controls are locked out. To activate the OSM Lock Out function, press SELECT, then right control button and hold down simultaneously. To deactivate the OSM Lock Out, press SELECT, then left control button and hold down simultaneously while in the OSM menu.

**RESOLUTION NOTIFIER:** This optimal resolution is 1680 x 1050. If ON is selected, a message will appear on the screen after 30 seconds, notifying you that the resolution is not at 1680 x 1050.



## Information

The Information menu indicates the current input, display resolution, horizontal and vertical frequency, and polarity settings of the monitor. The model and serial numbers of your monitor are also indicated.

## OSM Warning

OSM Warning menus disappear with Exit button.

**NO SIGNAL:** This function gives a warning when there is no Horizontal or Vertical Sync. After power is turned on or when there is a change of input signal, the **No Signal** window will appear.

**RESOLUTION NOTIFIER:** This function gives a warning of use with optimized resolution. After power is turned on or when there is a change of input signal or the video signal doesn't have proper resolution, the **Resolution Notifier** window will open. This function can be disabled in the Menu Tools.

**OUT OF RANGE:** When input signal is non-supported timing or the video signal doesn't have proper timing, the **Out of Range** menu will appear.

# Recommended use

## Safety Precautions and Maintenance



FOR OPTIMUM PERFORMANCE, PLEASE NOTE  
THE FOLLOWING WHEN SETTING UP AND USING  
THE MULTISYNC LCD COLOUR MONITOR:



- **DO NOT OPEN THE MONITOR.** There are no user serviceable parts inside and opening or removing covers may expose you to dangerous shock hazards or other risks. Refer all servicing to qualified service personnel.
- Do not spill any liquids into the cabinet or use your monitor near water.
- Do not insert objects of any kind into the cabinet slots, as they may touch dangerous voltage points, which can be harmful or fatal or may cause electric shock, fire or equipment failure.
- Do not place any heavy objects on the power cord. Damage to the cord may cause shock or fire.
- Do not place this product on a sloping or unstable cart, stand or table, as the monitor may fall, causing serious damage to the monitor.
- Do not place any objects onto the monitor and do not use the monitor outdoors.
- The inside of the fluorescent tube located within the LCD monitor contains mercury. Please follow the bylaws or rules of your municipality to dispose of the tube properly.
- Do not bend power cord.
- Do not use monitor in high temperature, humid, dusty, or oily areas.
- Do not cover vent on monitor.

Immediately unplug your monitor from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the monitor.
- If the monitor has been exposed to rain or water.
- If the monitor has been dropped or the cabinet damaged.
- If the monitor does not operate normally by following operating instructions.
- If glass is broken, handle with care.
- If monitor or glass is broken, do not come in contact with the liquid crystal and handle with care.



CAUTION

- Allow adequate ventilation around the monitor so that heat can properly dissipate. Do not block ventilated openings or place the monitor near a radiator or other heat sources. Do not put anything on top of monitor.
- The power cable connector is the primary means of detaching the system from the power supply. The monitor should be installed close to a power outlet which is easily accessible.
- Handle with care when transporting. Save packaging for transporting.
- **Image Persistence:** Please be aware that LCD Technology may experience a phenomenon known as Image Persistence. Image Persistence occurs when a residual or "ghost" image of a previous image remains visible on the screen. Unlike CRT monitors, LCD monitors' image persistence is not permanent, but constant images being displayed for a long period of time should be avoided. To alleviate image persistence, turn off the monitor for as long as the previous image was displayed. For example, if an image was on the monitor for one hour and a residual image remains, the monitor should be turned off for one hour to erase the image.

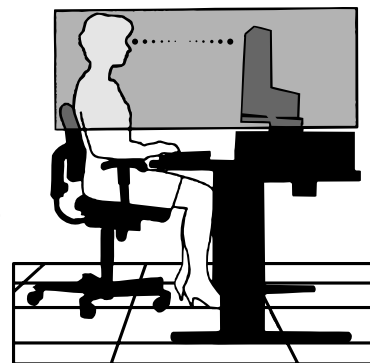
**NOTE:** As with all personal display devices, NEC DISPLAY SOLUTIONS recommends displaying moving images and using a moving screen saver at regular intervals whenever the screen is idle or turning off the monitor when not in use.



**CORRECT PLACEMENT AND ADJUSTMENT OF THE MONITOR CAN  
REDUCE EYE, SHOULDER AND NECK FATIGUE. CHECK THE  
FOLLOWING WHEN YOU POSITION THE MONITOR:**



- For optimum performance, allow 20 minutes for warm-up.
- Adjust the monitor height so that the top of the screen is at or slightly below eye level. Your eyes should look slightly downward when viewing the middle of the screen.
- Position your monitor no closer than 40 cm and no further away than 70 cm from your eyes. The optimal distance is 50 cm.
- Rest your eyes periodically by focusing on an object at least 20 feet away. Blink often.
- Position the monitor at a 90° angle to windows and other light sources to minimize glare and reflections. Adjust the monitor tilt so that ceiling lights do not reflect on your screen.
- If reflected light makes it hard for you to see your screen, use an anti-glare filter.
- Adjust the monitor's brightness and contrast controls to enhance readability.
- Use a document holder placed close to the screen.
- Position whatever you are looking at most of the time (the screen or reference material) directly in front of you to minimize turning your head while you are typing.
- Avoid displaying fixed patterns on the monitor for long periods of time to avoid image persistence (after-image effects).
- Get regular eye checkups.



### **Ergonomics**

To realize the maximum ergonomics benefits, we recommend the following:

- Use the preset Size and Position controls with standard signals.
- Use the preset Colour Setting.
- Use non-interlaced signals with a vertical refresh rate between 60-75 Hz.
- Do not use primary colour blue on a dark background, as it is difficult to see and may produce eye fatigue to insufficient contrast.

### **Cleaning the LCD Panel**

Recommended cleaning of the LCD:

- To remove dust and dirt from the surface of the LCD panel, wipe gently with a soft cloth.
- Do not rub the LCD panel with rough material.
- Do not press on the surface of the LCD panel.

### **To avoid scratches**

- Do not touch LCD panel with hard objects.
- Use only a soft cloth for cleaning the surface of the LCD panel.

### **To avoid stains**

- Clean fingerprints, water drips, chemical spills and etc. from the LCD panel immediately or discoloration and spot will occur.
- If the LCD panel is rubbed with too much force, cracking may occur, which will lead to abnormalities in the display.

### **To avoid breakage or screen trouble**

- Do not push hard on the LCD panel surface.
- Do not set heavy objects on the LCD panel surface.
- Do not leave the LCD panel under constant pressure.

### **Cleaning the Cabinet**

- Unplug the power supply.
- Use a soft cloth.
- Dampen the cloth with a mild detergent mixed with water, wipe the cabinet and dry with a soft cloth.

**NOTE:** Many plastics are used on the cabinet surface. DO NOT clean with benzene, alkaline detergent, alcoholic system detergent, glass cleaner, wax, polish cleaner, soap powder or insecticide. Do not touch the cabinet with rubber or vinyl for a prolonged period. These types of fluids and fabrics can cause the paint to deteriorate, crack or peel.

# Specifications

Monitor Specifications		MultiSync 20WGX <sup>2</sup> Monitor	Notes
LCD Module	Diagonal: Viewable Image Size: Native Resolution (Pixel Count):	43.3 cm/20.1 inches 43.3 cm/20.1 inches 1680 x 1050	Active matrix; thin film transistor (TFT) liquid crystal display (LCD); 0.258 mm dot pitch; 470 cd/m <sup>2</sup> white luminance; 1600:1 contrast ratio, typical (in Advanced DV Mode).
Input Signal	Video: Sync:	ANALOG 0.7 Vp-p/75 Ohms Separate sync.TTL Level Positive/Negative Horizontal sync. Positive/Negative Vertical sync. Positive/Negative Composite sync. Positive/Negative* <sup>2</sup> Sync on Green (Video 0.7 Vp-p and Sync. Negative 0.3 Vp-p)* <sup>2</sup>	Digital Input: DVI-D
Display Colours		16,700,000	Depends on display card used.
Synchronization Range	Horizontal: Vertical:	31.5 kHz to 81.1 kHz 56.0 Hz to 75.0 Hz	Automatically Automatically
Viewing Angle	Left/Right: Up/Down:	89°/89° (CR > 10) 89°/89° (CR > 10)	
Resolutions Supported		720 x 400* <sup>1</sup> at 70Hz 640 x 480* <sup>1</sup> at 60 Hz to 75 Hz 800 x 600* <sup>1</sup> at 56 Hz to 75 Hz 832 x 624* <sup>1</sup> at 75 Hz 1024 x 768* <sup>1</sup> at 60 Hz to 75 Hz 1152 x 864* <sup>1</sup> at 75 Hz 1152 x 870* <sup>1</sup> at 75 Hz 1280 x 960* <sup>1</sup> at 60 Hz to 75 Hz 1280 x 1024* <sup>1</sup> at 60 Hz to 75 Hz 1440 x 900* <sup>1</sup> at 60 Hz 1680 x 1050 at 60 Hz.....	Some systems may not support all modes listed.  Recommended resolution is 60 Hz for optimal display performance.
Active Display Area	Horizontal: Vertical:	433.0 mm/17.0 inches 271.0 mm/10.7 inches	
USB Hub	I/P: Port: Load Current:	USB Specification Revision 2.0 Upstream 1 Downstream 4 Maximum 0.5A per port	
Power Supply		AC 100-240V ~ 50/60Hz	
Power Consumption (without optional Sound Bar)		84 W (typ)	
Current Rating		1.0 - 0.52 A	
Dimensions		471.4 mm (W) x 391.5 mm (H) x 203.0 mm (D) 18.6 inches (W) x 15.4 inches (H) x 8.0 inches (D)	
Weight		6.3 kg (13.9 lbs)	
Environmental Considerations	Operating Temperature: Humidity: Altitude: Storage Temperature: Humidity: Altitude:	5°C to 35°C/41°F to 95°F 30% to 80% 0 to 12,000 Feet -10°C to 60°C/14°F to 140°F 10% to 85% 0 to 40,000 Feet	

\*1 Interpolated Resolutions: When resolutions are shown that are lower than the pixel count of the LCD module, text may appear different. This is normal and necessary for all current flat panel technologies when displaying non-native resolutions full screen. In flat panel technologies, each dot on the screen is actually one pixel, so to expand resolutions to full screen, an interpolation of the resolution must be done.

\*2 If your display is not showing a picture of the SOG and Composite Sync. Signal, please contact our hotline for further assistance.

**NOTE:** Technical specifications are subject to change without notice.

# Features

---

**Thin-frame design** creates more desktop space for you to work and play, while the flat screen's crisp, bright images and crystal-clear text deliver a comfortable viewing experience.

**Xtra View** technology allows for wide -angle viewing.

**No Touch Auto Adjust** automatically adjusts your optimal image settings upon initial power-on.

**Colour Control System** allows you to change between six colour settings on your display to match your personal preference.

**Redesigned OSM controls** allow you to quickly and easily adjust all elements of your screen image.

**NaViSet software** offers an expanded and intuitive graphical interface, allowing you to more easily adjust OSM display settings via mouse and keyboard.

**The flat screen's crisp, bright images and crystal-clear text** deliver a comfortable viewing experience.

**OptiClear LCD panel and Dynamic Visual Mode (DVM)** for brilliant colour and outstanding image clarity.

**ErgoDesign Features:** Enhance human ergonomics to improve the working environment, protect the health of the user and save money. Examples include OSM controls for quick and easy image adjustments, tilt base for preferred angle of vision, small footprint and compliance with MPRII and TCO guidelines for lower emissions.

**Plug and Play:** The Microsoft® solution with the Windows® 95/98/Me/2000/XP operating system facilitates setup and installation by allowing the monitor to send its capabilities (such as screen size and resolutions supported) directly to your computer, automatically optimizing display performance.

**IPM (Intelligent Power Manager) System:** Provides innovative power-saving methods that allow the monitor to shift to a lower power consumption level when on but not in use, saving two-thirds of your monitor energy costs, reducing emissions and lowering the air conditioning costs of the workplace.

**Multiple Frequency Technology:** Automatically adjusts monitor to the display card's scanning frequency, thus displaying the resolution required.

**FullScan Capability:** Allows you to use the entire screen area in most resolutions, significantly expanding image size.

**VESA Standard Mounting Interface:** Allows users to connect their MultiSync monitor to any VESA standard third party mounting arm or bracket. Allows for the monitor to be mounted on a wall or an arm using any third party compliant device.

**USB 2.0 hub** adds excitement to your computing by connecting you to digital cameras, scanners and more.

**OptiClear DVM:** Provides rich colour saturation, remarkable clarity and true-to-life contrast to enhance the user's overall visual perception.

# Troubleshooting

## No picture

- The signal cable should be completely connected to the display card/computer.
- The display card should be completely seated in its slot.
- Check the Vacation Switch should be in the ON position.
- Front Power Switch and computer power switch should be in the ON position.
- Check to make sure that a supported mode has been selected on the display card or system being used. (Please consult display card or system manual to change graphics mode.)
- Check the monitor and your display card with respect to compatibility and recommended settings.
- Check the signal cable connector for bent or pushed-in pins.

## Power Button does not respond

- Unplug the power cord of the monitor from the AC outlet to turn off and reset the monitor.
- Check the Vacation Switch on the back side of the monitor.

## Image Persistence

- Please be aware that LCD Technology may experience a phenomenon known as Image Persistence. Image Persistence occurs when a residual or "ghost" image of a previous image remains visible on the screen. Unlike CRT monitors, LCD monitors' image persistence is not permanent, but constant images being displayed for a long period of time should be avoided. To alleviate image persistence, turn off the monitor for as long as the previous image was displayed. For example, if an image was on the monitor for one hour and a residual image remains, the monitor should be turned off for one hour to erase the image.

**NOTE:** As with all personal display devices, NEC DISPLAY SOLUTIONS recommend displaying moving images and using a moving screen saver at regular intervals whenever the screen is idle or turning off the monitor when not in use.

## Image is unstable, unfocused or swimming is apparent

- Signal cable should be completely attached to the computer.
- Use the OSM Image Adjust controls to focus and adjust display by increasing or decreasing the fine total. When the display mode is changed, the OSM Image Adjust settings may need to be re-adjusted.
- Check the monitor and your display card with respect to compatibility and recommended signal timings.
- If your text is garbled, change the video mode to non-interlace and use 60Hz refresh rate.
- If you select Advanced DV mode, please select OFF.

## LED on monitor is not lit (no blue or amber colour can be seen)

- Power Switch should be in the ON position and power cord should be connected.
- Check the Vacation Switch should be in the ON position.
- Make sure the OSM LED Brightness Control is at the proper setting.

## Display image is not sized properly

- Use the OSM Image Adjust controls to increase or decrease the H. SIZE.
- Check to make sure that a supported mode has been selected on the display card or system being used. (Please consult display card or system manual to change graphics mode.)

## No Video

- If no video is present on the screen, turn the vacation switch off and on again.
- Make certain the computer is not in a power-saving mode (touch the keyboard or mouse).

## USB Hub does not operate

- Check to make sure the USB cord is properly connected. Refer to your USB device User's manual.

## TCO Development



### Congratulations!

The display you have just purchased carries the TCO'03 Displays label. This means that your display is designed, manufactured and tested according to some of the strictest quality and environmental requirements in the world. This makes for a high performance product, designed with the user in focus that also minimizes the impact on our natural environment.

Some of the features of the TCO'03 Display requirements:

#### Ergonomics

- Good visual ergonomics and image quality in order to improve the working environment for the user and to reduce sight and strain problems. Important parameters are luminance, contrast, resolution, reflectance, colour rendition and image stability.

#### Energy

- Energy-saving mode after a certain time – beneficial both for the user and the environment
- Electrical safety

#### Emissions

- Electromagnetic fields
- Noise emissions

#### Ecology

- The product must be prepared for recycling and the manufacturer must have a certified environmental management system such as EMAS or ISO 14 001.
- Restrictions on:
  - chlorinated and brominated flame retardants and polymers
  - heavy metals such as cadmium, mercury and lead.

The requirements included in this label have been developed by TCO Development in co-operation with scientists, experts, users as well as manufacturers all over the world. Since the end of the 1980s TCO has been involved in influencing the development of IT equipment in a more user-friendly direction. Our labelling system started with displays in 1992 and is now requested by users and IT-manufacturers all over the world.

For more information, please visit  
**[www.tcodevelopment.com](http://www.tcodevelopment.com)**

# Manufacturer's Recycling and Energy Information

NEC DISPLAY SOLUTIONS is strongly committed to environmental protection and sees recycling as one of the company's top priorities in trying to minimize the burden placed on the environment. We are engaged in developing environmentally-friendly products, and always strive to help define and comply with the latest independent standards from agencies such as ISO (International Organisation for Standardization) and TCO (Swedish Trades Union).

For more information, and for help in recycling your old NEC monitors, please visit our website at

<http://www.nec-display-solutions.com> (in Europe) or

<http://www.nec-display.com> (in Japan) or

<http://www.necdisplay.com> (in USA).

## Country-specific recycling programmes can also be found at:

Sweden - <http://www.el-retur.se>

Germany - <http://www.recyclingpartner.de/>

Holland - <http://www.mirec.nl/>

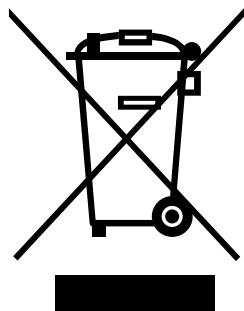
Japan - <http://www.diarcs.com/>

## Energy saving:

This monitor features an advanced energy saving capability. When a VESA Display Power Management Signaling (DPMS) Standard signal is sent to the monitor, the Energy Saving mode is activated. The monitor enters a single Energy Saving mode.

Mode	Power consumption	LED colour
Normal Operation	Approx. 84W	Blue
Energy Saving Mode	Less than 2W	Amber
Off Mode	Less than 1W	Unlit

## Disposing of your old NEC product



### Within the European Union

EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your NEC display products, please follow the guidance of your local authority, or ask the shop where you purchased the product, or if applicable, follow any agreements made between yourself and NEC.

The mark on electrical and electronic products only applies to the current European Union Member States.

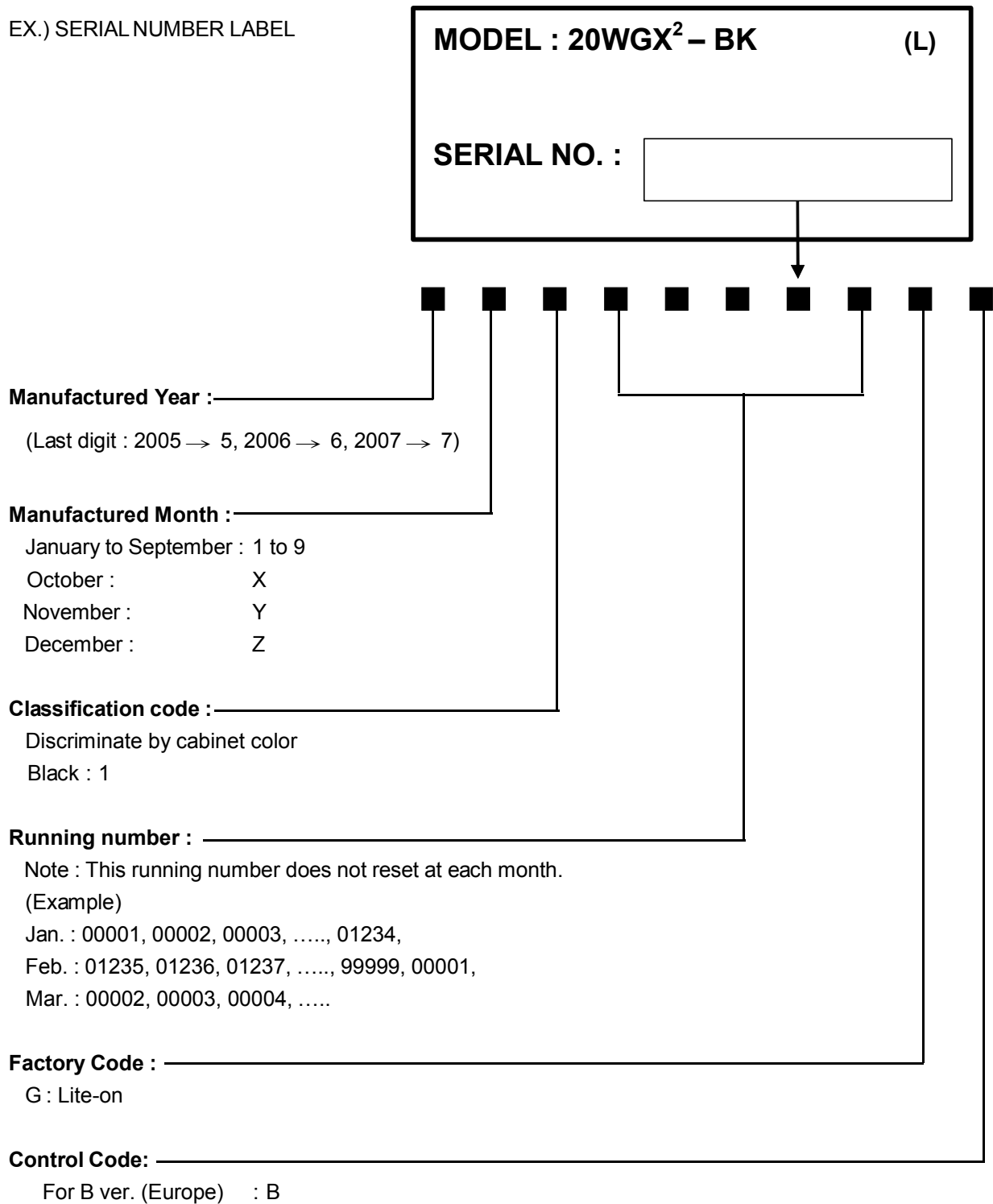
### Outside the European Union

If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.

# Serial Number Information

Refer to the serial number information shown below.

EX.) SERIAL NUMBER LABEL

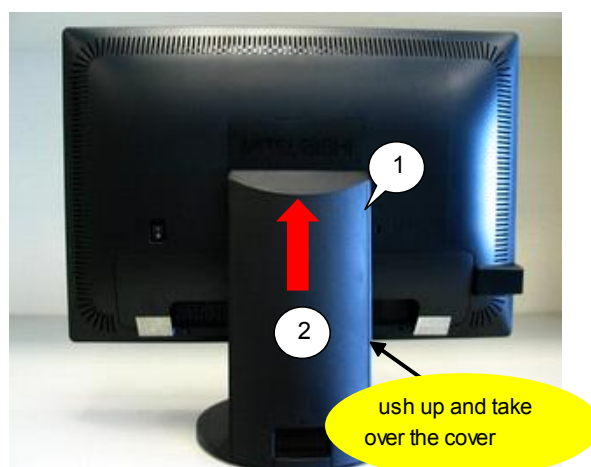


# DISASSEMBLY

- Before you disassemble the set, turn off power and pull out the power plug.
- Use the proper screwdriver. If oversize or undersize screwdriver is used, screws may be damaged.
- Assembly is the opposite process of disassembly.

Step 1 :

Symbol	For Europe (Liteon part Number)	Description	Cabinet Color	Model
1	7737710453 0A	BASE ASSY 6700 ABS 94 0 NM U20BNL	Black	B
2	77426119 1 0A	OPERABLE MANAGEMENT 6700 ABS 94 0	Black	B



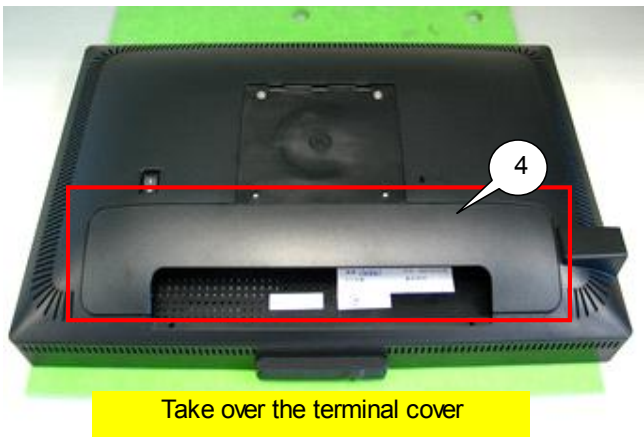
Step 2 :

Symbol	ForEuro e. (Liteon art Number)	Descri tion	Cabinet Color	Model
3	7110340102 0A	S RE MA INE NON E FLAT EAD M4 10 N	Black	B



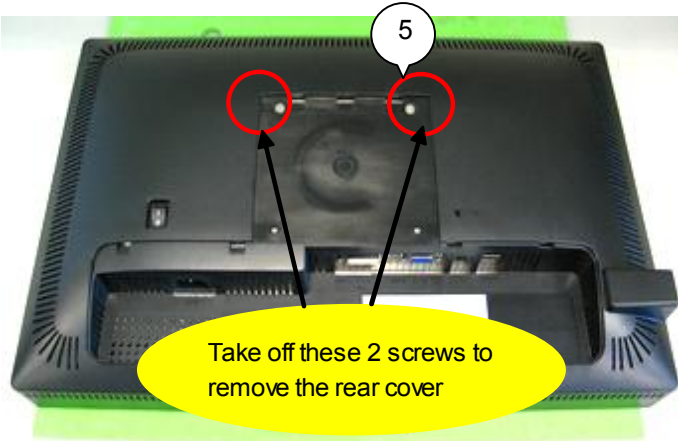
Step 3 :

Symbol	For Euro e (Liteon art Number)	Descri tion	Cabinet Color	Model
4	7742611931 0A	O ER TERMINAL BOTTOM O ER 6700 ABS	Black	B



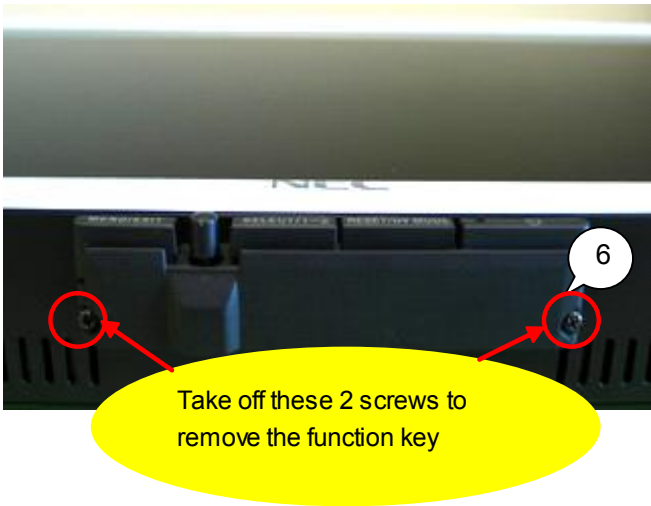
Step 4 :

Symbol	For Euro e (Liteon art Number)	Descri tion	Cabinet Color	Model
5	7110340102 0A	S RE MA INE NON E FLAT EAD M4 10 N	Black	B



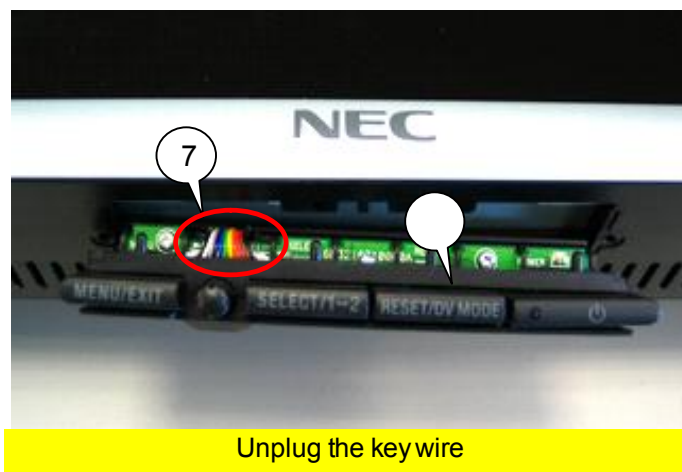
Step 5 :

Symbol	For Euro e (Liteon art Number)	Descri tion	Cabinet Color	Model
6	7140226122 0A	S RE FOR ONTROL	Black	B



Step 6 :

Symbol	For Europe (Liteon Part Number)	Description	Cabinet Color	Model
7	6711130002 90	ARNESS EY IRE 13 11 210mm 1571 30	Black	B
	5113800416P	FUN TION EY A ssy	Black	B



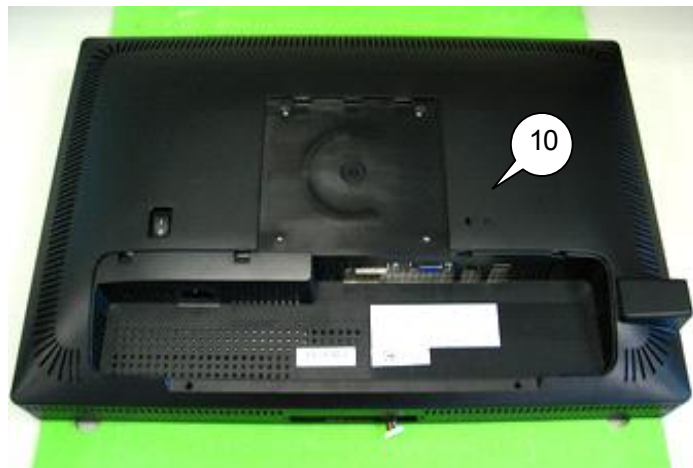
Step 7 :

Symbol	For Europe (Liteon Part Number)	Description	Cabinet Color	Model
9	7737512 57 0A	F ASSY NM 6690 6720 ABS UL-94 0	White	B

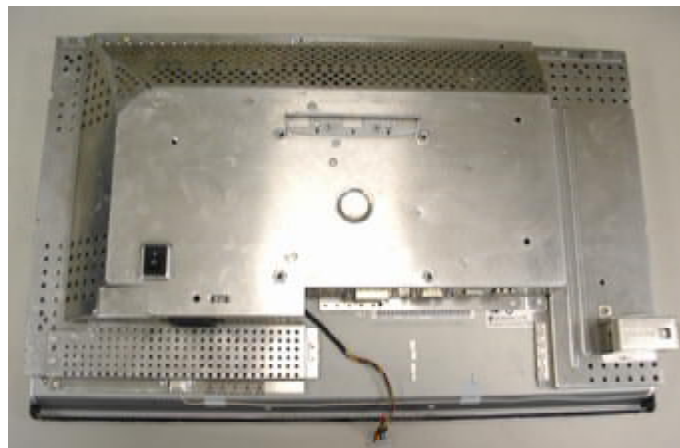


Step :

Symbol	For Euro e. (Liteon art Number)	Descri tion	Cabinet Color	Model
10	7737609551 0A	R ASSY AMA 20 S 6700 ABS UL-94 0	Black	B

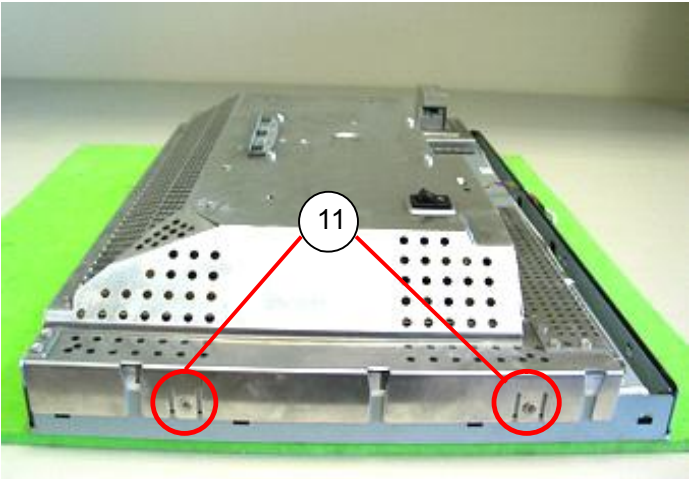
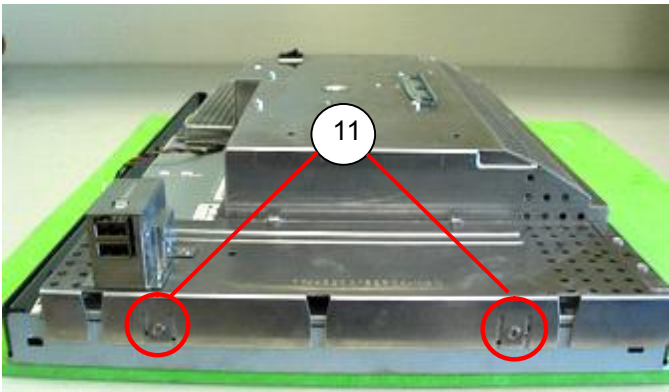


Take off the rear cover



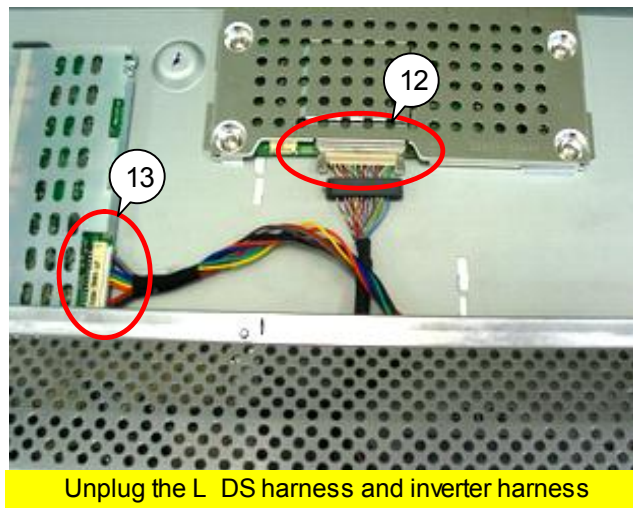
Step 9 :

Symbol	For Euro e (Liteon art Number)	Descri tion	Cabinet Color	Model
11	7110330062 0A	S RE -MA INE-FLAT EAD-M3-6	Black	B



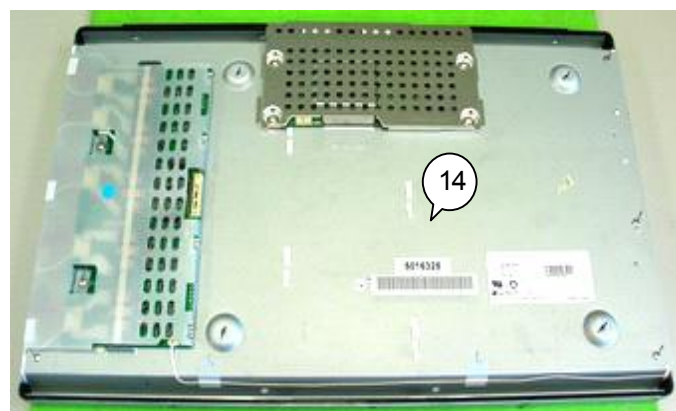
Step 10 :

Symbol	For Europe (Liteon Part Number)	Description	Cabinet Color	Model
12	67110300001 00	ARNESS L DS 30 30 220mm 15 9 30	Black	B
13	6711140240 00	ARNESS O ER 14 9 300mm 1007 24	Black	B



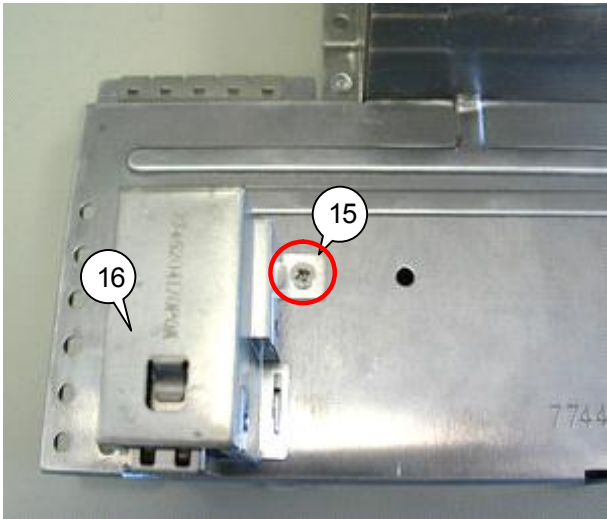
Step 11 :

Symbol	For Europe (NECDS Part Number)	Description	Cabinet Color	Model
14	3A684126	TFT LM201 E2-SLA1 LPL	Black	B



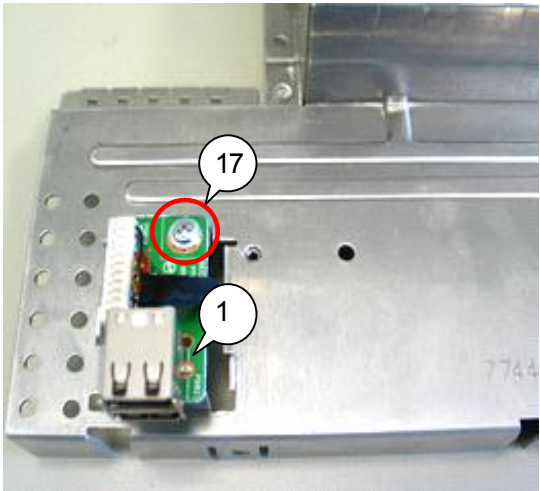
Step 12 :

Symbol	For Euro e (Liteon art Number)	Descri tion	Cabinet Color	Model
15	7110630042 0A	S RE M3_4	Black	B
16	7746204170 0A	USB S IELD O ER	Black	B



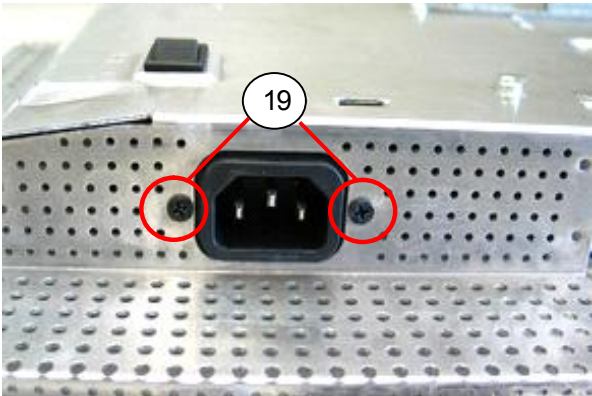
Step 13 :

Symbol	For Euro e (Liteon art Number)	Descri tion	Cabinet Color	Model
17	7110330062 0A	S RE MA INE-FLAT EAD-M3-6-NI	Black	B
1	5113700055	U20BNL(03) NE DS USB BD	Black	B



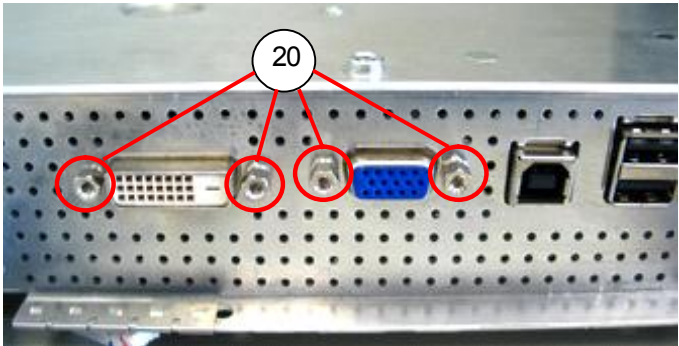
Step 14 :

Symbol	For Euro e (Liteon art Number)	Descri tion	Cabinet Color	Model
19	7140330103 0A	S RE DOUBLE T READ FLAT M3 10L	Black	B



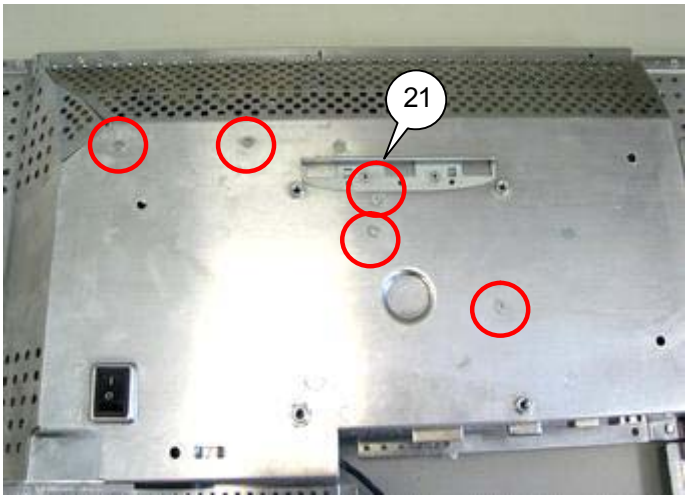
Step 15 :

Symbol	For Euro e (Liteon art Number)	Descri tion	Cabinet Color	Model
20	7740200 90	NON-STANDARD S RE -S RE - U-N	Black	B

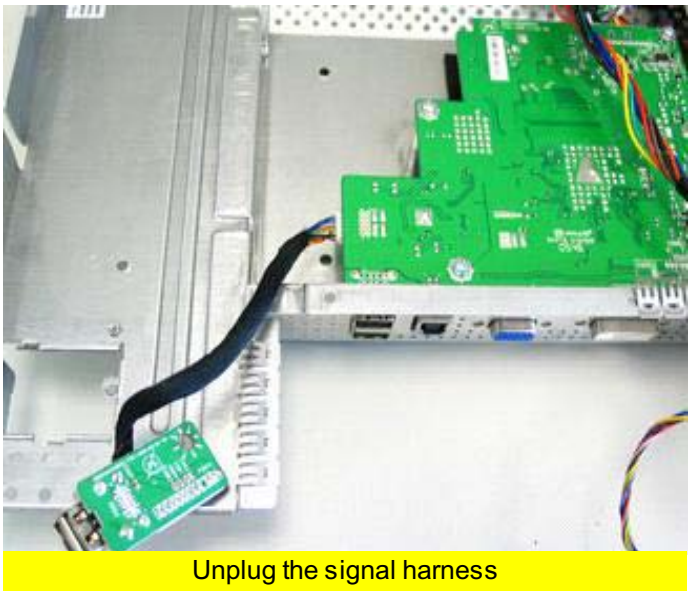


Step 16 :

Symbol	For Europe (Liteon Part Number)	Description	Cabinet Color	Model
21	7140330082P0A	SCREW-MACHINE-NON E-FLAT HEAD-M3-8-NI	Black	B

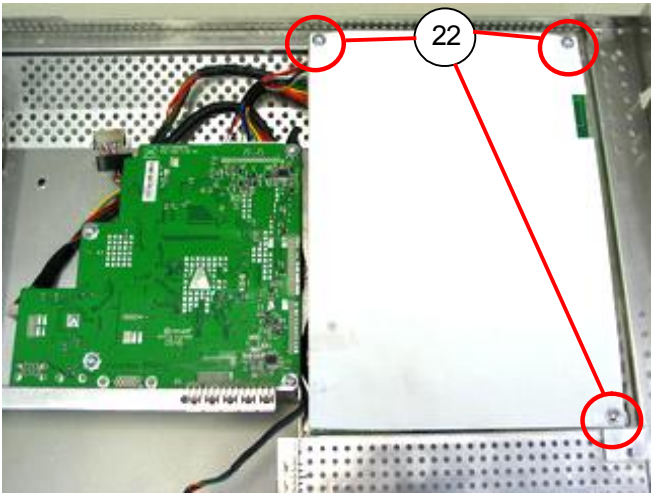


Step 17 :



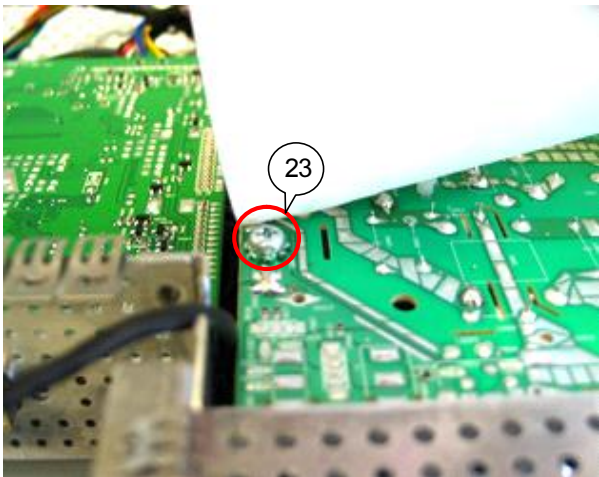
Step 1 :

Symbol	For Euro e (Liteon art Number)	Descri tion	Cabinet Color	Model
22	7740201240 0A	S RE MA INE FLAT ASER AN M3 6L Z	Black	B



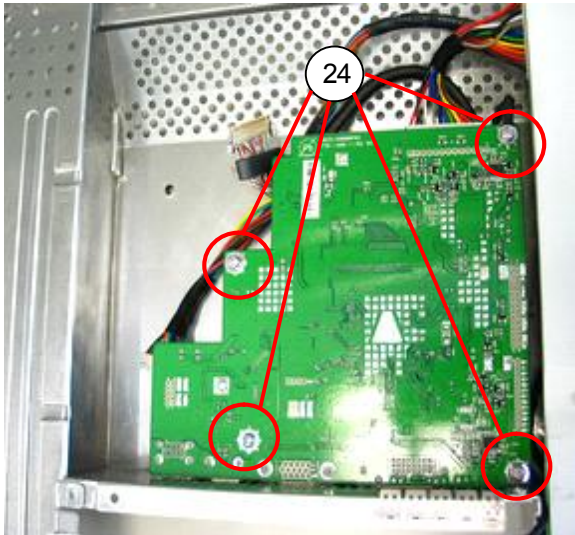
Step 19 :

Symbol	For Euro e. (Liteon art Number)	Descri tion	Cabinet Color	Model
23	71162400 1 0A	S RE -MA INE-STAR AS ER- AN-M4- -Zn	Black	B



Step 20 :

Symbol	For Europe (Liteon part Number)	Description	Cabinet Color	Model
24	7740201240 0A	SER MAIN FLAT ASER AN M3 6L Z	Black	B



Step 21 :

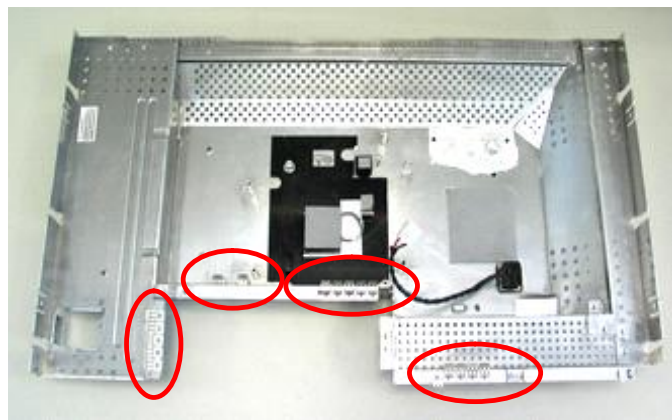
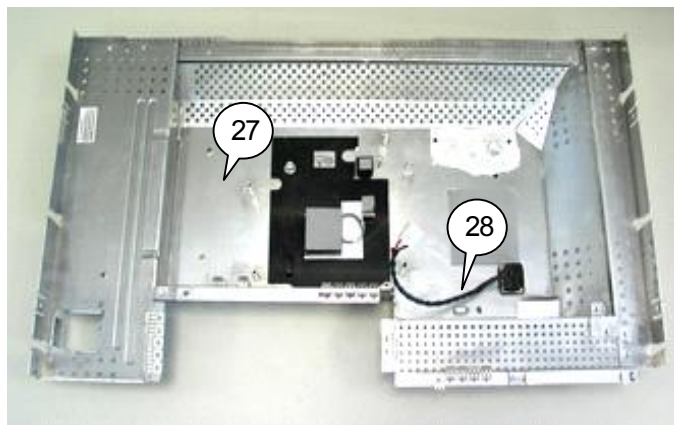
Symbol	For Europe (Liteon part Number)	Description	Cabinet Color	Model
25	51143003 5	U20BNL(03) NE DS O ER BD	Black	B
26	5113301255	U20BNL(03) NE DS INTERFA E BD	Black	B



Unplug the switch harness

Step 22 :

Symbol	For Europe (Liteon Part Number)	Description	Cabinet Color	Model
27	7746204162 0B	SHIELD SHIELD OBER ALLOY1100 T 1.0	Black	B
28	6711030003 91	ARNESSE 3 SITE BL 150mm 1007 22 E T	Black	B



Spring for EMI (Reef Spring)

**Attention:** Raise the reef spring to contact a metallic chassis of the LCD panel when you attach the LCD panel to the chassis base.  
However, be careful, for if you pull it up too hard, the leaf spring would be detached.

# AD S MEN ROCED RES

## ABLE OF CON EN S

	Page
1. Application .....	4-2
2. Default Setting .....	4-2
3. Basic Operation .....	4-3
3.1 Basic Key Function .....	4-3
3.2 Hot Key for Factory Adjust .....	4-4
3.3 Hot Key for Burn-in Mode .....	4-5
3.4 How to use Factory Mode .....	4-5
4. Adjustment .....	4-9
4.1 Measuring Instruments, Jigs and Tools .....	4-9
4.2 Power-supply Voltage .....	4-9
4.3 Power Circuit Closure .....	4-9
4.4 ADC Bias and Gain Adjust .....	4-9
4.5 Panel Brightness Check .....	4-10
4.6 Panel Color Check .....	4-10
4.7 Color Temperature Check .....	4-10
5. Reference Signal Timing .....	4-11

## . Application

This adjustment specification should be applied to the 20WGX<sup>2</sup> monitor .

## 2. Default Setting

Item	Default Setting	
	Analog	Digital
Volume	---	
Mute	---	
Brightness	100%	100%
Contrast	50%	50%
Advanced DV Mode	Off	Off
DV mode	Standard	Standard
H. Position	H/V position : optimal value for the signals, which is stated in the VESA standard or close value to the optimal value	----
V. Position		----
H Size	H size : optimal value for the signals, which is stated in the VESA standard or close value to the optimal value	----
FINE	0	----
Selection of Accucolor Preset	N (Native)	N (Native)
OSM Left/Right	Center of horizontal position	
OSM Down/Up	Center of vertical position	
OSM Turn off time	45 (sec.)	
OSM Lock out	Not locked	
Resolution Notifier	ON	
Sharpness	16.6%	
Expansion Mode	Full	
Off Timer	Off	
LED Brightness	100%	
Language	Depend on destination	
Hot Key	Depend on destination	
OSM Select	Depend on destination	
URL-Indication	Depend on destination	

\*1 : Hot Key

Destination	Default Setting
Europe	On

\*2 : Language

Destination	Default Setting
Europe	English

\*3 : Information

Model	Destination	Indicate Model Name
20WGX <sup>2</sup>	EU	20WGX <sup>2</sup>

URL : Indicate below URL.

Destination	Default Setting
For NEC model	NECDISPLAYSOLUTIONS.COM

\*4 : OSD/OSM Setting

Destination	Factory Setting
For NEC model at B version	OSM

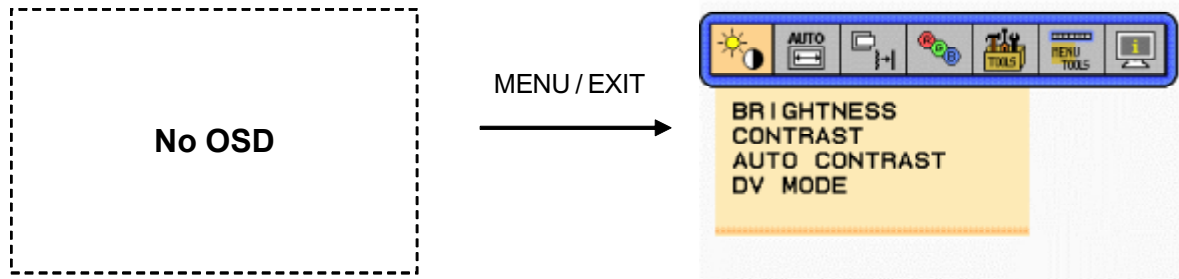
## . Basic Operation

### . Basic Key Function

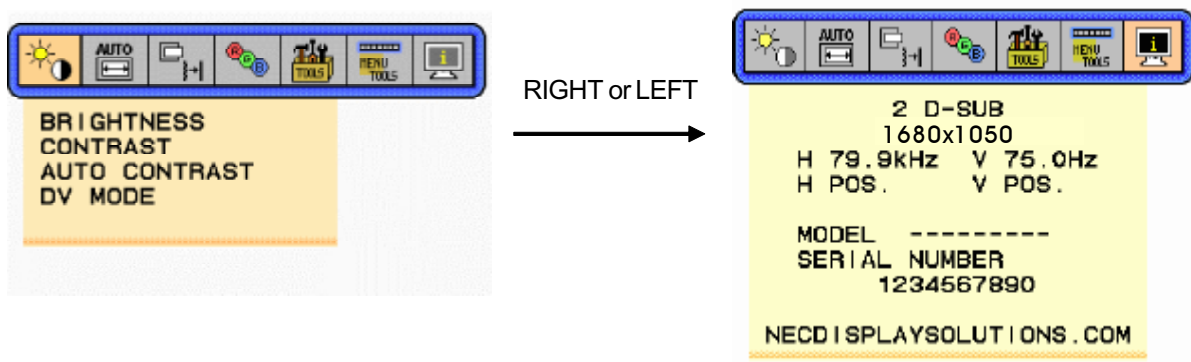
Key	Function
MENU / EXIT	Enter OSM / Exit OSM / Exit sub menu
Direction Key	Control : Move the cursor and select control items Adjust : Change the value of each function
SELECT 1 <-> 2	Enter to sub menu / Operating of auto adjust and reset / Input signal select
RESET / DV MODE	When OSM open, reset the selected item (Open Reset Warning before reset) / Hot key for DV MODE

## .2 Enter Factory Mode

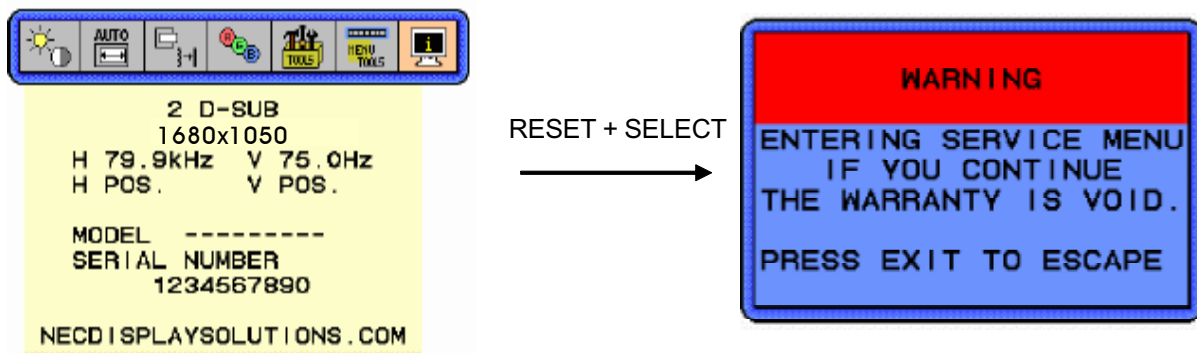
a) Press "MENU/EXIT" button then open OSM menu.



b) OSM select to "INFORMATION" menu by "RIGHT" or "LEFT" button.

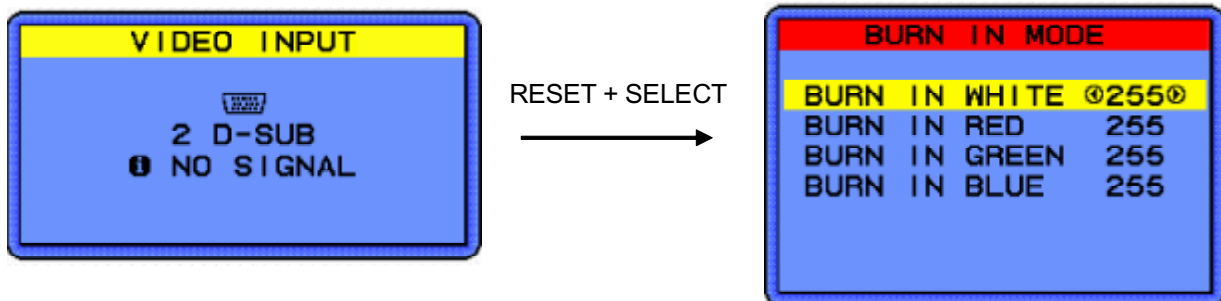


c) Press "RESET" + "SELECT" button then into Factory mode.



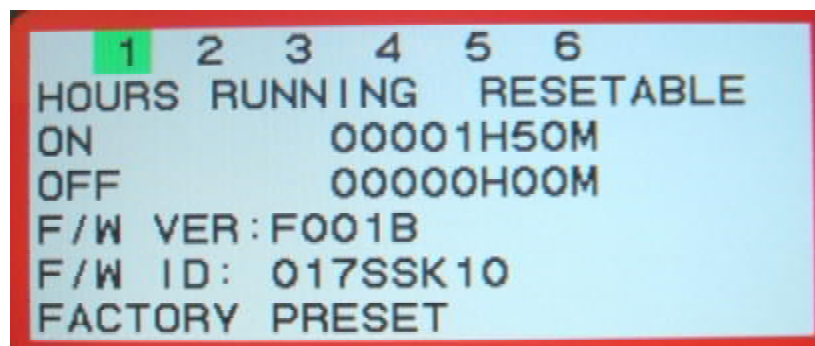
### . Enter Burn in Mode

- No signal input.
- Press "RESET" + "SELECT" button then into Burn-in mode.



### . o to use Factory Mode

Page 1



### ■ HOURS RUNNING

Indicate the "monitor power ON time" and "power save time" counted from factory shipment.

Hours Running function has four kinds of timer.

- Monitor power on time (Reset-able)
- Power save time (Reset-able)
- Monitor power on time (Un reset-able)
- Power save time (Un reset-able)

Note1: Power save time = Stand by mode + Suspend mode + off mode  
(Do not include complete off mode.)

The default is Reset-able timers, so reset-able timers shall be shown when open the tag which includes Hours Running function.

Indication of Reset-able and Un reset-able can be changed by key input.

"RESET" + "LEFT": Display Reset-able timers

"RESET" + "RIGHT": Display Un reset-able timers

When "RESET" + "LEFT" + "SELECT" key is pressed during displaying Reset-able or Un reset-able timers, reset the Reset-able timers to "0" and display Reset-able timers.

The Reset-able timers are reset to "0" by "Factory Preset" in factory mode.

All timers shall be counted up every 5 minutes and count up to 65535H55M after that all timers keep 65535H55M. Do not reset to 00000H00M after 65535H55M.

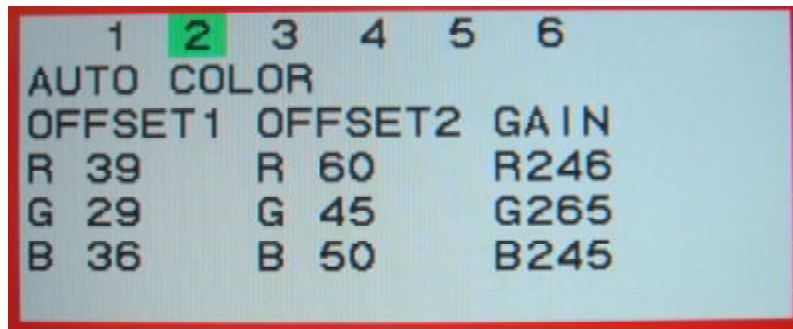
■ F/W VER : Firmware version

■ F/W ID : Firmware ID

■ FACTORY PRESET :

Reset all items of Factory preset in user mode. Clear Reset-able Hours Running. Clear Auto Adjust count. Clear First auto flag. Change OSD design to "Normal". Change Resolution Notifier to Enable.

Page 2



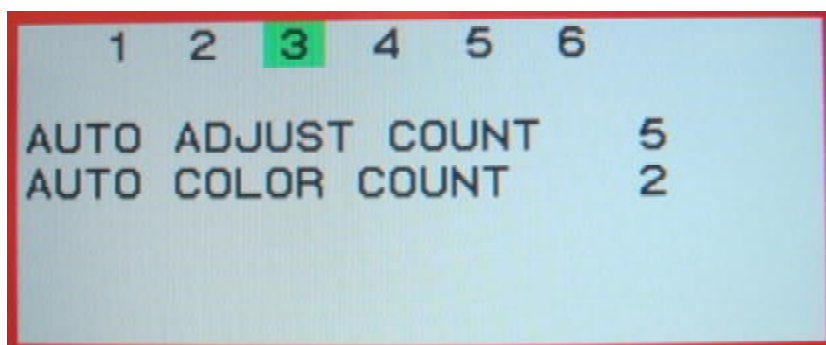
This page is used to adjust RGB offset and gain.

■ **A O COLOR :** A gain and offset are auto adjusted.

■ **GAIN (R G B) :** The manual adjustment of the gain of analog input each color can be carried out.  
( No adjustment need)

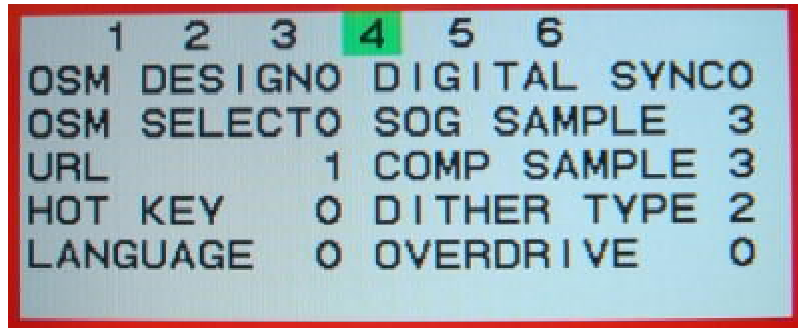
■ **OFFSE (R G B) :** The manual adjustment of the preceding stage offset of analog input each color can be carried out.  
( No adjustment need)

Page 3

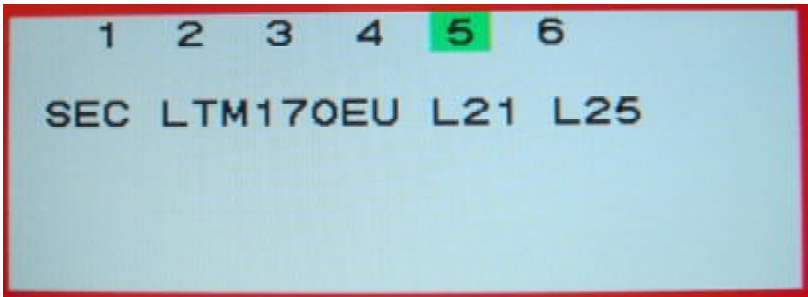


■ **AUTO ADJUST COUNT :** The total times of execution of automatic adjustment  
(H. Position , V.Position , H.Size and Fine)

■ **AUTO COLOR COUNT :** The total times of execution of automatic adjustment  
(Auto Contrast).



OSM DESIGN	BAR/Value	0/1	0 : Normal 1 : Debug mode	0
OSM SELECT	OSD/OSM	0/1	0 : OSM    1 : OSD	0
URL		0/1/2	0 : Not indicate URL 1 : MECDISPLAYSOLUTIONS.COM 2 : Not indicate URL	1
HOT KEY		0/1	0 : OFF    1 : ON	0 or 1
LANGUAGE		0/1	0 : English    1: Japan	0
DIGITAL SYNC	DE / H,V sync	0/1	0 : DE signal    1. Hsync / Vsync	No adjustment needed
SOG SAMPLE		0/1/2/3	0 : 1/4 H line average period 1 : 3/8 H line average period 2 : 1/2 H line average period 3 : 5/8 H line average period	No adjustment needed
COMP SAMPLE		0/1/2/3	0 : 1/4 H line average period 1 : 3/8 H line average period 2 : 1/2 H line average period 3 : 5/8 H line average period	No adjustment needed
DITHER TYPE		0/1/2/3	0 : Dither : Ordered dither 1 : Dither : Random dither 2 : Dither : No dither (6 bit+FRC)	No adjustment needed
OVERDRIVE		0/1	0 : Disable overdrive function 1 : Enable overdrive function	No adjustment needed



■ LCD panel type.



■ Each Color temperature Data. (Adjustment needed)

## . Adjustment

### . Measuring Instruments, Jigs and Tools

The measuring instruments, jigs, and tools required at the time of the adjustment of the unit to be adjusted are as specified below.

- a. A signal generator that can generate an output of signal timing produced by the adjusted (\*). In this case, however, this signal generator should be capable of displaying all white and all black as a screen display pattern.

\* The word "adjusted" shall mean that the amplitude of each signal R, G, B, which is output from the signal generator, is maintained at  $0.7V_{p-p} \pm 0.05V$  when a load of 75ohm is connected.

## .2 Power Supply Voltage

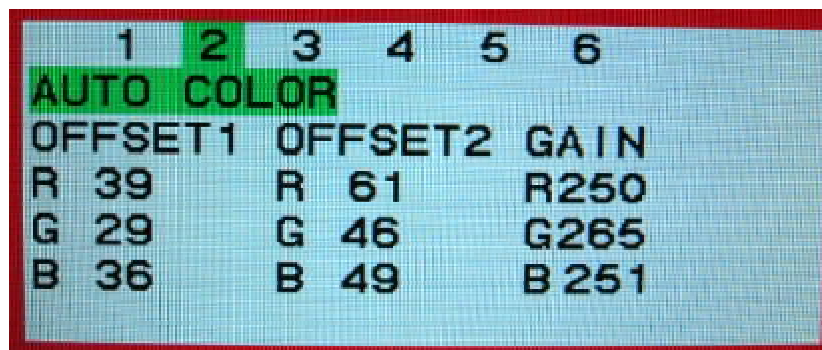
INPUT: 100Vac ~ 240Vac

### . Power Circuit Closure

- 1) Connect the suitable cable of the signal generator according to the setting mode.
- 2) Turn on the Power switch of the signal generator.
- 3) Connect the AC power cable to the unit being adjusted.
- 4) Turn on the Power switch of the unit being adjusted.
- 5) After the completion of signal discrimination, the LED is turned blue.

### . ADC Bias and Gain Adjustment

- 1) Enter an input signal of VESA 1024x768 @ 60Hz, in 32-gray gradation.
- 2) Enter the factory mode according to "3.2 Enter Factory Mode"
- 3) Press the RIGHT or LEFT buttons several times to display the [AUTO CONTRAST] adjust menu.



- 4) Pressing the SELECT button, adjust the cursor to [AUTO COLOR]. When the SELECT button is pressed, adjustment of the bias and the gain is carried out.
- 5) When adjustments have been finished, press the MENU/EXIT buttons several times to close the factory mode.

**. Panel Brightness Chec**

- 1) Enter the input signal of 1680x1050 @ 60Hz, in Full white pattern.
- 2) Proceed "Factory Preset" function of tool menu.
- 3) OSM setting "BRIGHTNESS" to Max. (100%) and "CONTRAST" to 100%.
- 4) Color temperature setting to "NATIVE".
- 5) Check the center luminance should  $\geq 250\text{cd/m}^2$ .

**. Panel Color Chec**

- 1) Enter an input signal of 1680x1050 @ 60Hz, in Full white pattern.
- 2) Proceed "Factory Preset" function of tool menu.
- 3) OSM "BRIGHTNESS" setting to Max. (100%) and "CONTRAST" setting to 50%.
- 4) Color temperature setting to "NATIVE".
- 5) Check the center color coordination.  
 $x = 313 \pm 0.03$   $y = 329 \pm 0.03$

**. Color em erature Chec**

- 1) Enter an input signal of 1680x1050 @ 60Hz, in Full white pattern.
- 2) OSM "BRIGHTNESS" setting to Max. (100%) and "CONTRAST" setting to 50%.
- 3) Color temperature setting to each color.
- 4) Each color temperature setting as below:  
9300K:  $x = 0.283 \pm 0.03$   $y = 0.297 \pm 0.03$   
8200K:  $x = 0.292 \pm 0.03$   $y = 0.307 \pm 0.03$   
7500K:  $x = 0.299 \pm 0.03$   $y = 0.315 \pm 0.03$   
6500K:  $x = 0.313 \pm 0.03$   $y = 0.329 \pm 0.03$   
5000K:  $x = 0.346 \pm 0.03$   $y = 0.359 \pm 0.03$

## . Reference Signal Timing

Item	Abbreviation	VESA 1024 768 0		ESA 0 0 0 0	
Pixel frequency	fc	65.000M		146.25M	
Horizontal frequency	fh	48.36k		65.29k	
Line Time total	Th	20.68us	1344 L	15.316us	2240 L
Horizontal active display	Thd	15.75us	1024 L	11.47us	1600 L
Horizontal sync pulse	Thp	2.09us	136 L	1.203us	176 L
Horizontal back porch	Thb	2.46us	160 L	0.711us	104 L
Horizontal front porch	Thf	0.37us	24 L	1.915us	200 L
Horizontal sync polarity		NEG ( OS)		NEG ( OS)	
Vertical Frequency	fv	60.000		59.954	
Frame time total	Tv	16.67ms	806	16.679ms	1019
Vertical active display	Tvd	15.88ms	768	16.02ms	1050
Vertical sync pulse	Tvp	0.12ms	6	0.092ms	6
Vertical back porch	Tvb	0.60ms	29	0.459ms	30
Vertical front porch	Tvf	0.06ms	3	0.046ms	3
Vertical sync polarity		NEG ( OS)		OS ( ENG)	

# INSPECTION

## TABLE OF CONTENTS

	Page
1. General Description .....	5-3
2. Electrical Characteristics .....	5-4
2.1 Input Signals .....	5-4
2.2 Power Supply .....	5-6
2.3 Power Management .....	5-7
2.4 Others .....	5-8
2.5 Touch Panel Capability .....	5-9
2.6 White Color Temperature .....	5-9
2.7 Visual Ergonomic Requirement of TCO'03 Standard .....	5-10
2.8 Criteria for Noise* .....	5-10
3. Connector Pin Assignment .....	5-11
3.1 Analog Video Input : Mini D-sub 15 pin .....	5-11
3.2 Digital Inter Face Signals .....	5-12
4. Support Video Modes .....	5-13
5. DDC Function .....	5-15
5.1 Plug & Play .....	5-15
5.2 Remote Control .....	5-15
6. Other Function .....	5-15
6.1 Full Scan Capacity .....	5-15
6.2 85Hz Refresh Rate Support .....	5-16
6.3 50Hz Refresh Rate Support .....	5-16
7. External Inspection on the LCD Module .....	5-17
7.1 Inspection Condition.....	5-17
7.2 Polarizer Defects.....	5-18
7.3 Foreign Material.....	5-19
7.4 Line Defect.....	5-19
7.5 Bezel Appearance.....	5-19
7.6 Others.....	5-19

	Page
8. Safety .....	5-20
8.1 Insulation Resistance Test .....	5-20
8.2 Dielectric Strength Test .....	5-20
8.3 Leakage Current Test .....	5-21
8.4 Ground Continuity .....	5-21
8.5 CTI Value of PCB.....	5-21
8.6 Others .....	5-21
 9. Inspection of PLUG & PLAY Communication and OSM “MONITOR INFORMATION” for Model Name/ Serial Number Inspection .....	 5-22
9.1 System Connection .....	5-22
9.2 Input Signal .....	5-23
9.3 Program .....	5-23
9.4 Operation .....	5-24
9.5 EDID Data File .....	5-29
9.6 EDID Write Protect Cancel Signal Timing .....	5-29
Appendix Reference Signal Timings .....	5-30

# 1. General Description

## Product Specifications

Item		Specification	
		Analog Input	Digital Input
LCD	LPL LM201WE2-SLA1		
	Size	20.1" (51.1133cm)	
	Active Display Area	433.44 (H) x 270.90 (V) mm	
	Resolution	1680x1050 dots (WSXGA+)	
	Pixel Pitch	0.258mm	
	Color Depth	16,77 M color (8-bits)	
	Luminance	470cd/m <sup>2</sup> (Typ.) *1)	
	Viewing Angle(Typ.)	CR>10	Up 89 / Down 89 / Left 89 / Right 89 (Typ.)
		CR>5	-
	Contrast Ratio	700:1(Typ.) 1600:1 (Typ.) (Advanced DV mode "ON")	
	Response Time	ON+OFF	12ms
		GTG	6ms by overdrive circuit integrated in panel
	Color gamut	> 72%	
	Surface Treatment	Glare (AR<2.0%)	
Input Signals	Back Light	CCFL x 10pcs (Direct Light Type)	
	Horizontal frequency	24.7kHz - 81.2kHz	24.7kHz - 81.2kHz
	Vertical frequency	49.0Hz - 76.0 Hz	
	Video Signal	Analog RGB	Digital RGB
	Sync. Signal	Separate Sync.(TTL) Composite Sync.on Green video	TMDs
	Pixel Clock	25.2MHz – 165MHz	
Input connector		Mini D-sub 15Pin	DVI-D
Preset Timings		User preset : 23	
USB Hub (only AN/BNBK)		USB Version 2.0 Self Powered Hub 1 upstream / 4 down stream	
Functions	Front Control	Menu/Exit, Direction (4 direction key), Select/1<->2, Reset/DV mode, Power (DC)	
	Back side	Power (AC)	
	OSM	Brightness, Contrast, Auto contrast, Advanced DV mode, DV mode, Auto adjust, H Position, V position, H size, Fine, Color control, Sharpness, Expansion mode, Off timer, LED Brightness, Hot key, Factory preset, Language, OSM Left/Right, OSM Down/Up, OSM turn off, OSM Lock out, Resolution notifier, Monitor inf.	
	Remote Control	VESA DDC/CI	
Regulations	Safety	UL/ cUL , TuV GS, CE, CB Report, PSB	
	EMC	FCC Class B, Canadian DOC Class B, C-tick Class B, CE	
	VLF / ELF	MPR-II, MPRIII, TCO' 03	
	Power Management	VESA DPMS ,EPA, Energy star Ver 4.0 Tier2, GEEA label	
	Ergonomics	TUV/ERGONOMIE, TCO' 03	
	Plug and Play	VESA DDC2B	
	Others	US Mercury Regulation, Windows XP/2000 Logo	
Environment Condition	Temperature	5-35 degree C	
	Humidity	10-80% (without condensation)	
Power Supply	Input Voltage	AC100-240V, 50 / 60Hz	
	Power consumption	Typ	84 W max (1.0 A @ 100 - 120V, 0.52 A @ 220 - 240V)
		Power saving	<2.3W with USB hub model, <2W without USB hub (DPMS) <1W (DC Power Off) Meet to Energy Star Ver 4.0 Tier 2
	Input Connector	3P IEC Type	
Weight	with Stand	Approx. 6.3 kg	
	without Stand	Approx. 4.6 kg	
Dimension	Net	471.4 (W) x 391.5(H) x 203.0(D) mm	
	Gross	570.0(W) x 518.0(H) x 262.0(D) mm	
VESA compatible arm mounting interface		100mmx100mm	
Tilt / Swivel / Rotation / Height Adjustment		Up & Down 30deg to -5deg / Yes +/- 170degree / NA / NA	
Accessories	AC Power code	2.0m	
	Signal Cable	2.0m : minD-sub15pin - minD-sub15pin 2.0m: DVI-D - DVI-D	
	Others	User's manual, USB cable, etc.	

\*1)60% of a mass-product should meet

## 2. Electrical Characteristics

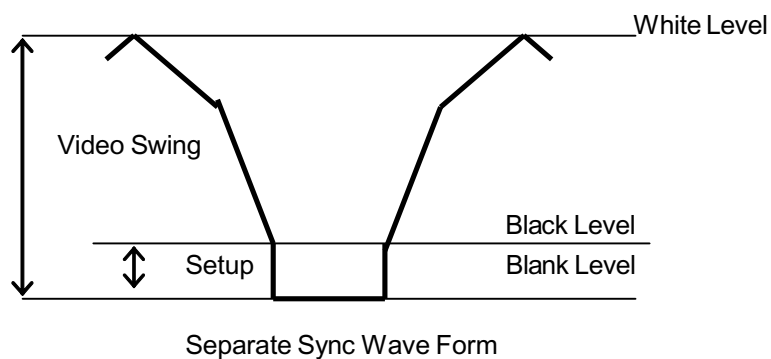
### 2.1 Input signals

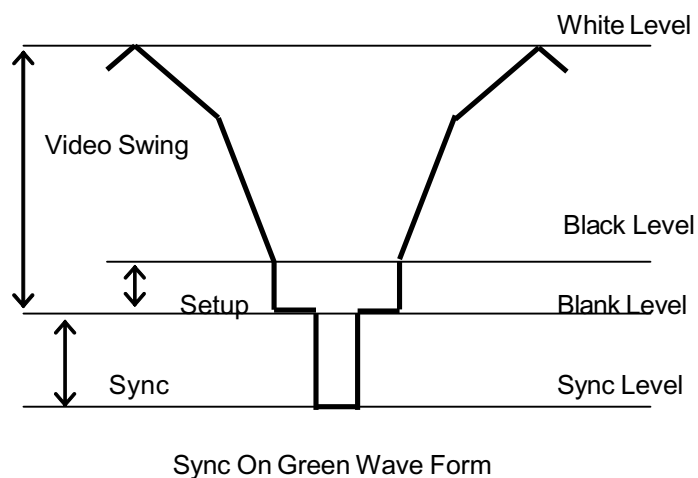
#### 2.1.1 Signals

Video signal	Analog RGB / Digital RGB (TMDS)
Sync signal	Separate Sync (Negative / Positive) Composite Sync (Negative / Positive) Sync on green : 0.3Vp-p (Negative)

#### 2.1.2 Analog Input

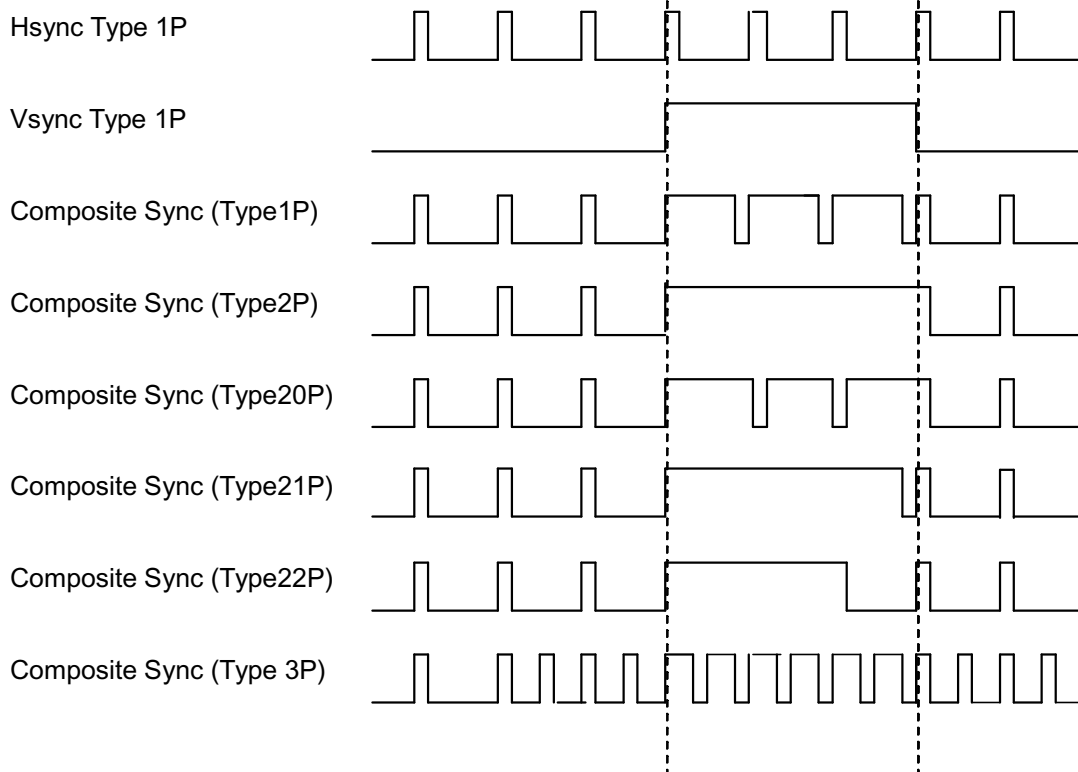
				Spec			
				min	typical	max	
Video	Analog Video			0.55V	0.70V	0.90V	Impedance 75 ohm
Sync	Sync threshold						
	Separate Sync	VIH	0	2.0V	--	5.0V	Impedance 2.2k ohm Positive / Negative
		VIL	1	0V	--	0.8V	
	Composite Sync	VIH	0	2.0V	--	0.5V	
		VIL	1	0V	--	0.7V	
	Composite Sync on Green Video			0.15Vpp	0.3Vpp	--	Impedance 2.2k ohm Positive / Negative
	Setup			-	0V	--	
Frequency Range	H-Sync			24.7kHz	--	81.2kHz	
	V-Sync			49Hz	--	76Hz	
Sync Pulse	H-Sync			0.4usec	--	--	
	V-Sync			2H	--	(14H)	
Back Porch	H-Sync			0.7us	--	--	
	V-Sync			3H	--	--	





### Composite Sync Type

This figure shows only positive sync waveform. Monitor should support negative sync waveform too.



### 2.1.3 Digital Input

Signal Format : TMDS

		Spec		
		Minimum	Typical	Maximum
Frequency Range	Dot clock	25.2MHz	--	165MHz
	H-sync	31.5kHz	--	81.2kHz
	V-sync	49Hz	--	76Hz
Sync Pulse	H-sync	--	--	--
	V-sync	--	--	--
Back Porch	H-sync	--	--	--
	V-sync	--	--	--

## 2.2 Power Supply

Input Voltage	AC100 - 240V +/- 10%
Input Current (*1)	1.0 A@AC100V / 0.52 A@AC240V
Frequency	50 / 60 Hz +/-3Hz
Power Consumption	84 W (Max) with USB no load condition (*1)
AC Leakage current	< 3.5mA (AC120V/240V) < 0.2mA (at AC100V with 2pin AC cable without GND)
Inrush current (cold start)	< 30Arms

(\*1) The power consumption should meet to Energy Star Ver 4.0 Tier 2.

Condition : Input Signal : Native resolution, maximum freq

Image pattern: Worst condition

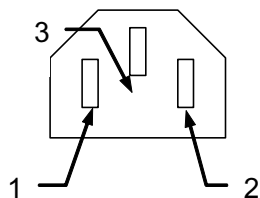
Brightness: 175cd/m<sup>2</sup> or minimum

USB Upstream: Connected

USDDownstream: No load.

Criteria: Under 50W.

kk+Inlet connector type: 3 polarity, 10A 250V 65degC  
VDE, UL CSA approved CEE input connector.  
EN60320 Class I standard compliant



Pin	Name	Definition
1	L	Live
2	N	Neutral
3	FG	GND (Ground)

## 2.3 Power Management

This function conforms DPMS of VESA, and International Energy Star Office Equipment program.

Power Management condition and status for ANALOG Input mode

State	Signals			Power	Power Consumption (W)	Recovery Time (sec)	LED status
	Horizontal	Vertical	Video	USB			
On	ON	ON	Active	ON	Refer to 3.2	---	Blue
DPMS	OFF	ON	Blanked	ON	< 2.3W (Connect only USB Upstream cable, GEEA2005 Request)	< 3sec.	Orange
	ON	OFF	Blanked	ON		< 3sec.	Orange
	OFF	OFF	Blanked	ON	< 2.0W (Not connect USB, Energy Star Ver4.0 Tier 2)	< 3sec.	Orange
DC power off	-	-	-	OFF	< 1.0W (Connect only USB Upstream cable, GEEA2005 Request) < 1.0W (Not connect USB, Energy Star Ver4.0 Tier 2 Request)	< 3sec.	None
AC power (Vacation SW) off	-	-	-	-	< 1W	---	None

Power Management condition and status for DIGITAL Input mode

State	Signals				Power	Power Consumption	Recovery Times	LED status
	DE	Horizontal	Vertical	Video	USB			
On	Pulses	ON	ON	Active	ON	Refer to 3.2	---	Blue
DPMS	No Pulses	N/A	N/A	Blanked	ON	< 2.3W (Connect only USB Upstream cable, GEEA2005 Request) < 2.0W (Not connect USB, Energy Star Ver4.0 Tier 2)	< 3 sec.	Orange
DC Power off	-	-	-	-	OFF	< 1.0W (Connect only USB Upstream cable, GEEA2005 Request) < 1.0W (Not connect USB, Energy Star Ver4.0 Tier 2 Request)	< 3 sec.	None
AC power (Vacation SW) off	-	-	-	-	-	< 1.0W	---	None

## 2.4 Others

### 2.4.1 Scaler

NEC-DS prefers Genesis OAK chipset.

	HDCP	Lead Free	Faroudja	Output Resolution
Gm5861	X	O	X	WSXGA+

### 2.4.2 Audio System

None

### 2.4.3 USB

Self Powered Hub

Version 2.0

Downstream port : 4ports x 500mA, Connector A type

(2 ports left side of monitor. 2 ports backside of monitor.)

Up Stream port : 1port, Connector B type @ back side of monitor.

Output Voltage (Connector A) : 5.0V +/- 5%

Color of Connector : Black (PC99)

USB Hub Controller : Cypress CY7C65640A

This Hub should be meet WHQL test for Windows XP Logo and USB I/F Logo.

This function should be active at the following condition.

It is not active at the following condition for power saving.

Condition	USB Circuit
On Mode	Active
PMS mode (Windows XP, Select Screen of Property -> Select Screen saver -> Select Monitor saving function -> Set "Turn off Monitor after XX minutes" condition)	Active
PMS mode (Windows XP, Select Start Menu -> Select Shut Down -> Select Stand By mode condition)	Active
Front SW OFF (DC Power OFF)	Not Active

#### 2.4.4 Dimming Control Range

Bright ness shall be controlled by OSM less than 25% to 100%.

PWM frequency should be adjusted by MPU, and default frequency should be 3.5 times by Vsync.

#### 2.5 Touch Panel Capability

None

##### 2.5.1 Touch Panel Power Output Connector

None

#### 2.6 White Color Temperature

White color temperature is 6 preset as 9300, 8200, 7500, sRGB (6500), 5000, Native.  
Default value of user color should be Native, which is maximum setting for panel.

Target of color setting

Color Temp.	Color Coordinate		Tolerance	Color Coordinate		Tolerance
	x	y		u'	v'	
9300K	0.283	0.297	±0.015	0.189	0.446	$\Delta u'v' \leq 0.01^*$
8200K	0.292	0.307	±0.015	0.191	0.453	$\Delta u'v' \leq 0.01^*$
7500K	0.299	0.315	±0.015	0.193	0.459	$\Delta u'v' \leq 0.01^*$
6500K (sRGB)	0.3127	0.3291	±0.015	0.198	0.468	$\Delta u'v' \leq 0.01^*$
5000K	0.346	0.359	±0.015	0.209	0.488	$\Delta u'v' \leq 0.01^*$

\*) TCO'03 A.2.6.1 "Color temperature variation" should follow.

sRGB should follow "Microsoft Windows Color Quality Specification for Liquid Crystal Display OEM's".

(<http://www.microsoft.com/hwdev/tech/color/ColorTest.asp>)

## **2.7 Visual Ergonomic Requirement of TCO'03 Standard**

Following items should be meet for Visual Ergonomic of TCO'03 standard.

- A2.1.1 Pixel array requirement
- A2.3.1 Luminance Level
- A2.3.2 Luminance uniformity
- A2.3.4 Luminance uniformity - angular dependence
- A2.4.2 Luminance Contrast - angular dependence
- A2.4.3 Luminance contrast - characters
- A2.6.1 Color Temp Variation (\*)
- A2.6.2 Color uniformity
- A2.6.3 RGB Setting
- A2.6.4 Color uniformity –angular dependence
- A2.6.5 Color gray scale linearity (\*)

(\*) Should be adjusted by monitor.

## **2.8 Criteria for Noise\***

Any noise shall not be audible in dead room.

Noise\*: Sound from inverter, power unit, or other electrical components.

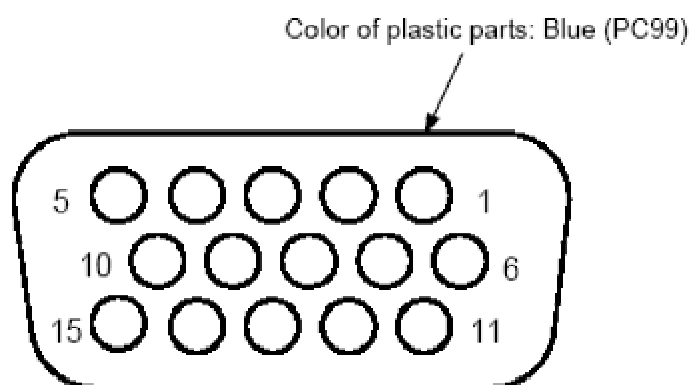
Confirmation distance: 0 cm (at the every ventilation hole)

### 3. Connector Pin Assignment

#### 3.1 Analog Video Input: Mini D-SUB 15 Pin

Pin assignment for analog video input connector

Pin No	Signal
1	Red Video
2	Green Video / Sync on Green
3	Blue Video
4	GND
5	DDC-GND
6	Red Video GND
7	Green Video GND
8	Blue Video GND
9	+5VDC (from PC)
10	Sync. GND
11	GND
12	DDC Data (SDA)
13	Horizontal sync. / Composite Sync
14	Vertical Sync
15	DDC Clock (SCL)

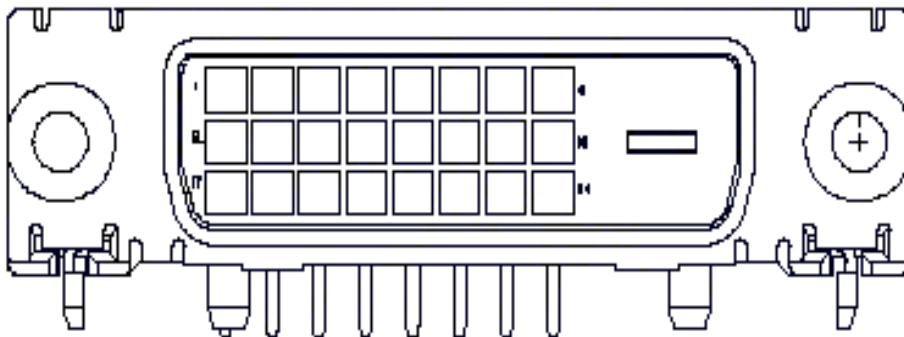


### 3.2 Digital Inter Face Signals

Pin assignment for DVI-D (24pin) connector

Pin-Assignment of DVI-D connector :					
1	TX2-	9	TX1-	17	TX0+
2	TX2+	10	TX1+	18	TX0-
3	Shield (TX2 / TX4)	11	Shield (TX1 / TX3)	19	Shield (TX0 / TX5)
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DCC-Serial Clock	14	+5V power(*)	22	Shield (TXC)
7	DCC-Serial Data	15	Ground (+5V)	23	TXC+
8	No Connect	16	Hot plug detect	24	TXC-

(\*) In case, the power of the PC unit is switched off and the power of the monitor is switched on: no voltage at pin 14.



## 4. Support Video Modes

Monitor shall judge the received signal timing by following table.

Monitor shall support all signal timings within the following frequency range.

H-Sync range: from 24.7KHz to 81.2KHz [Analog]

H-Sync range: from 31.5KHz to 81.2KHz [Digital]

V-Sync range: from 49 Hz to 76 Hz @Dot clock : under 165MHz

V total	V sync (Hz)	H sync (KHz)	Type	H POL	V POL	No.	Signal Name
V Total ≤ 480	$fV \leq 57.9\text{Hz}$	---	---	---	---	3	640*400@56
	$58.0 \leq fV \leq 77.9\text{Hz}$	---	SEP	POS	NEG	4	720*350@70
			SEP	Other	Other	5	720*400@70
			Other	---	---		---
	$78.0\text{Hz} \leq fV$	---	SEP	POS	NEG	6	720*350@85 Out of range
			SEP	Other	Other	7	720*400@85 Out of range
			Other	---	---		---
$481 \leq V$ Total ≤ 550	$fV \leq 54.9\text{Hz}$	---	---	---	---	50	640*480@50
	$55.0 \leq fV \leq 62.9\text{Hz}$	---	---	---	---	8	640*480@60
	$63.0 \leq fV \leq 67.9\text{Hz}$	---	---	---	---	1	640*480@66
	$68.0 \leq fV \leq 73.9\text{Hz}$	---	---	---	---	9	640*480@72
	$74.0 \leq fV \leq 77.9\text{Hz}$	---	---	---	---	10	640*480@75
	$78.0\text{Hz} \leq fV$	---	---	---	---	11	640*480@85 Out of range
$551 \leq V$ Total ≤ 611	$fV \leq 67.9\text{Hz}$	---	---	---	---	35	720*576@60
	$68.0\text{Hz} \leq fV$	---	---	---	---	36	720*576@75
$612 \leq V$ Total ≤ 768	$fV \leq 54.9\text{Hz}$	$fH \leq 33.0\text{KHz}$	---	---	---	51	800*600@50
		$33.1 \leq fH \leq 38.0\text{KHz}$	---	---	---	46	1280*720@50
	$55.0 \leq fV \leq 57.9\text{Hz}$	---	---	---	---	12	800*600@56
	$58.0 \leq fV \leq 62.9\text{Hz}$	---	---	---	---	13	800*600@60
	$63.0 \leq fV \leq 73.9\text{Hz}$	---	---	---	---	14	800*600@72
	$74.0 \leq fV \leq 77.9\text{Hz}$	$48.0 \leq fH \leq 5.09\text{KHz}$	---	---	---	2	832*624@75
		Other	---	---	---	15	800*600@75
	$78.0\text{Hz} \leq fV$	---	---	---	---	16	800*600@85 Out of range
$769 \leq V$ Total ≤ 864	$fV \leq 54.9\text{Hz}$	---	---	---	---	45	1024*768@50
	$55.0 \leq fV \leq 62.9\text{Hz}$	---	---	---	---	17	1024*768@60
	---	---	---	---	---	64	1280*768@60
	$63.0 \leq fV \leq 67.9\text{Hz}$	---	---	---	---	29	1024*768@66
	$68.0 \leq fV \leq 77.9\text{Hz}$	---	---	---	---	18	1024*768@70
	$73.0 \leq fV \leq 77.9\text{Hz}$	Other	---	---	---	19	1024*768@75
		$63.1 \leq fH \leq 66\text{KHz}$	---	---	---	44	1080*800@76
	$78.0 \leq fV$	--	---	---	---	20	1024*768@85 Out of range
$865 \leq V$ Total ≤ 920	$fV \leq 72.9\text{Hz}$	--	---	---	---	30	1152*864@70
	$73.0 \leq fV \leq 77.9\text{Hz}$	$fH \leq 67.9\text{KHz}$	---	---	---	21	1152*864@75
		Other	---	---	---	28	1152*870@75
	$78.0 \leq fV$	--	---	---	---	31	1152*864@85 Out of range

V total	V sync (Hz)	H sync (KHz)	Type	H POL	V POL	No.	Signal Name
921 ≤ V Total ≤ 929	fV ≤ 62.9Hz	---	---	---	---	52	1440*900@60 Reduced Blanking
930 ≤ V Total ≤ 960	fV ≤ 62.9Hz	---	---	---	---	53	1440*900@60
	63.0 ≤ fV ≤ 67.9Hz	---	---	---	---	22	1152*900@66
	68.0 ≤ fV ≤ 77.9Hz	---	---	---	---	54	1440*900@75 Out of range
	78.0Hz ≤ fV	---	---	---	---	55	1440*900@85 Out of range
961 ≤ V Total ≤ 1024	fV ≤ 54.9Hz	---	---	---	---	47	1280*960@50
	55.0 ≤ fV ≤ 67.9Hz	---	---	---	---	23	1280*960@60
	68.0 ≤ fV ≤ 77.9Hz	---	---	---	---	32	1280*960@75
	78.0Hz ≤ fV	---	---	---	---	37	1280*960@85 Out of range
1025 ≤ V Total ≤ 1076	fV ≤ 54.9Hz	---	---	---	---	48	1280*1024@50
	55.0 ≤ fV ≤ 62.9Hz	---	---	---	---	24	1280*1024@60
	63.0 ≤ fV ≤ 72.9Hz	---	---	---	---	25	1280*1024@66
	73.0Hz ≤ fV ≤ 77.9Hz	fH ≤ 80.6KHz	---	---	---	26	1280*1024@75
		80.7 ≤ fH ≤ 85.0KHz	---	---	---	27	1280*1024@76
	78.0Hz ≤ fV	---	---	---	---	38	1280*1024@85 Out of range
1077 ≤ V Total ≤ 1083	fV ≤ 62.9Hz	---	---	---	---	60	1680*1050@60 Reduced Blanking
1084 ≤ V Total ≤ 1200	fV ≤ 62.9Hz	---	---	---	---	61	1680*1050@60
	63.0 ≤ fV ≤ 77.9Hz	---	---	---	---	58	1400*1050@75 Out of range
	78.0 ≤ fV	---	---	---	---	59	1400*1050@85 Out of range
12017 ≤ V Total ≤ 1300	fV ≤ 54.9Hz	---	---	---	---	49	1600*1200@50 Out of range
	55.0 ≤ fV ≤ 62.9Hz	---	---	---	---	33	1600*1200@60 Out of range
	63.0Hz ≤ fV	---	---	---	---	34	1600*1200@65 Out of range
1301 ≤ V Total		---	---	---	---		Out of range

## 5. DDC Function

### 5.1 Plug & Play

This monitor abides by VESA DDC2B.

See page 5-29 for EDID data.

Monitor can output EDID data, although PC+5V from PC is inactive.

### 5.2 Remote Control

This monitor abides by VESA DDC/CI.

## 6. Other Function

### 6.1 Full Scan Capacity

In case the input video mode is not native resolution, the image area shall be expanded to native resolution smoothly with the function of scaling engine.

Standard resolution : 1680x1050

Expand method : Full expand mode with smoothing as follows

Down scaling : Down scaling at over 1680x1050 mode.

#### Picture Size (In Full-Screen mode)

Multi-pixel mode	Input display	Expanded Rate		Expanded Resolution
	Resolution	Horizontal	Vertical	
Expansion	720×350	2.33	3	1680×1050
Expansion	640×350	2.62	3	1680×1050
Expansion	640×400	2.62	2.62	1680×1050
Expansion	720×400	2.33	2.62	1680×1050
Expansion	640×480	2.62	2.18	1680×1050
Expansion	800×600	2.1	1.75	1680×1050
Expansion	832×624	2.02	1.68	1680×1050
Expansion	1024×768	1.64	1.36	1680×1050
Expansion	1152×864	1.45	1.21	1680×1050
Expansion	1152×870	1.45	1.20	1680×1050
Expansion	1152×900	1.45	1.16	1680×1050
Expansion	1280×768	1.31	1.36	1680×1050
Expansion	1280×960	1.31	1.09	1680×1050
Expansion	1360×768	1.23	1.36	1680×1050
Expansion	1400×900	1.2	1.16	1680×1050
Expansion	1400×1050	1.2	1.0	1680×1050
Standard	1680×1050	1.0	1.0	1680×1050

## **6.2 85Hz Refresh Rate Support**

Monitor should display 85Hz refresh rate mode as emergency mode.

Monitor should display “Out of Range” warning menu at this mode.

## **6.3 50Hz Refresh Rate Support**

In 50Hz refresh rate signal (Following signals), the display should be smooth at “Moving character”. It should be taken care of the influence by “Frame buffer mode”.

- 1) PAL signal 1
- 2) PAL signal 2
- 3) GTF 1024x768@50Hz
- 4) GTF1280x720@50Hz
- 5) GTF1280x960@50Hz

## 7. External Inspection on the LCD Module

### 7.1 Inspection Condition

#### 7.1.1 Conditions

Ambient conditions :

- a. Temperature : 20~25°C
- b. Humidity : 65 +/- 5 % RH
- c. Illumination : Single 20W fluorescent lamp non-directive  
(Appearance - 300 to 700 Lux , Display – 180 to 200 Lux)

Viewing distance :

The distance between the LCM and the inspector's eyes shall be at least 35cm.

Viewing Angle :

The inspection shall be conducted within normal viewing angle range.

Refer to the CAS for viewing angle)

#### 7.1.2 Dot Defect

##### 7.1.2.1 Bright Dot

Dots (sub-pixels) which appeared brightly in the screen when the LCM displayed with dark pattern.

- R,G or B 1 dot ----- 2 Max (BDF 95%)
- Adjacent 2 dots ----- 0 Max
- Adjacent 3 dots ----- 0 Max
- Total amount of Bright dots ----- 2 Max
- Bright dot density ----- Within  $\Phi$  10 mm

\* Small bright dot which can be seen on 64 gray pattern is to be counted as one small bright dot defect. (Max  $N \leq 3$  within 10mm\*10mm, Total Max  $N \leq 8$ ) Size of small bright dot ( $1/20 < R, G, B \leq 1/2$ )

##### 7.1.2.2 Dark Dot

Dots(sub-pixels) which appeared darkly in the screen when the LCM displayed with bright pattern.

- R,G or B 1 dot ----- 5 Max
- Adjacent 2 dots ----- 2 Max
- Adjacent 3 dots ----- 0 Max
- Total amount of Dark dot ----- 6 Max
- Dark dot density ----- Within  $\Phi$  10 mm

##### 7.1.2.3 Total amount of Dot Defects ----- 8 Max (Combination)

Note) a. Every dot herein means Sub-Pixel. (Each Red, Green, or Blue Color)

b. Damaged less than half size of sub-pixel is not counted as defect.

c. Dots darker than half brightness of sub-pixel are not defined as bright dot defect and dots brighter than half brightness of sub-pixel is not defined as dark dot defect.

## 7.2 Polarizer Defects

Items		Criteria
Scratches	Linear	$0.1 \leq W \leq 0.2$ , $0.3 \leq W \leq 2.0$ , $N \leq 3$
Dent	Circular	$D \leq 0.5$ , $N \leq 3$

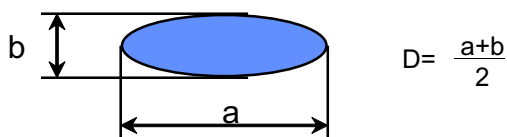
Where, W :Width

L : Length

D : Average diameter  $= (a+b)/2$

Note)

a. Average Diameter



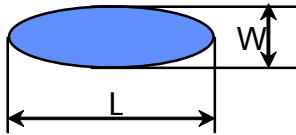
b. Linear :  $a > 2b$  , Circular :  $a \leq 2b$

c. Extraneous substances which can be wiped out, like Finger Print, Particles are not considered as a defect.

d. Defects which is on the Black Matrix(outside of Active Area) are not considered as a defect.

### 7.3 Foreign Material

Items		Criteria
Foreign Material	Linear	$W \leq 0.1$ , $0.3 \leq L \leq 2.0$ , $N \leq 3$
	Circular	$0.2 \leq D \leq 0.5$ , $N \leq 3$



W : Width  
L : Length

L : the line of apsides (Long distance)

- Linear :  $W \leq 0.1$
- Circular :  $W > 0.1$

### 7.4 Line Defect

All kinds of line defects such as vertical, horizontal or cross are not allowed.

### 7.5 Bezel Appearance

Scratches, minor bents, stains, particles on the Bezel frame are not considered as a defect.

### 7.6 Others

Issues which is not defined in this criteria shall be discussed with both parties, Customer and Supplier, for better solution.

## 8. Safety

- Destination : All over the world
- Applicable standards : UL60950/C-UL/EN60950
- Unit class : Class I units (the units protected against electric shocks by protective grounding, or those equipped with 3-core power cords)
- Ratings : AC100 - 240V 50/60Hz 1.3-0.7A

### 8.1 Insulation Resistance Test

An insulation resistance should be measured under the conditions specified below, in order to confirm that the requirements of the judgment standard are met.

#### 1) Measuring conditions

- Measuring instrument : 500V DC MEGOHM Meter
- Testing point : Between the power circuit block and the exposed metallic block (D-SUB connector)
- Measured value readout : A test voltage should be applied for one minute and the resistance value should be read out thereafter.

#### 2) Judgment standard:

The resistance of the insulation between the power terminal and the ground contact is more than 10M ohms while withstanding a voltage of 500Vdc.

### 8.2 Dielectric Strength Test

To confirm the freedom from insulation breakdown, testing should be carried out under the conditions specified below.

#### 1) Measuring conditions

- Measuring instrument: Dielectric strength tester (The specified voltage should be maintained in the state that a current of 10mA is carried.)
- Testing point: Between the electrical circuit block and the exposed metallic block (D-SUB connector)

Note : The electrical circuit block should mean the power input block (primary side). Testing should be carried out under the condition that both poles of the power plug are short-circuited. (Where a 3-core cord is used, the two poles other than the ground terminal should be short-circuited.)

#### 2) Judgment standard

There is no breakdown of the insulators or short circuits when applying an alternating potential of 1000Vac for a duration of 1(one) minute or 1500Vac for a duration of 2(two) second at 50Hz between the metallic chassis and the input power supply active and neutral terminals connected together.

### 8.3 Leakage Current Test

A leakage current should be measured under the conditions specified below, in order to confirm that the requirements of the judgment standard are met.

#### 1) Measuring conditions

- Measuring instrument : Leakage current meter (A 1500 $\Omega$  resistor should be incorporated, together with a bypass capacitor of 0.15 $\mu$  F.)
- Testing point : Between the exposed metallic block (D-SUB connector) and Phases A and B of the power source.
- Condition of the set : A power cable should be connected. The see-saw switch on the set side should be turned ON and OFF.

#### 2) Judgment standard

The current conducted between each of the power supply's contacts is less than 3.5mA at 255Vac (60Hz) and 0.2mA at 100Vac(60Hz).

### 8.4 Ground Continuity

The resistance between the ground side of the power cord and the accessible metal parts located in ground circuit shall not exceed 0.1 ohm at current load of 25mA.

### 8.5 CTI Value of PCB

CTI value of below PCB should be more than 600.

Inverter circuit.

Power supply circuit.

### 8.6 Others

VESA Display Data Channel Command Interface (DDC CI) Standard.

VESA Display Data Channel Command Interface – Proposed Implementation Guide.

USB Version 2.0.

USB I/F Logo.

Microsoft WHQL, Microsoft Windows XP logo.

Microsoft Windows Color Quality Specification for Liquid Crystal Display OEM's.

## 9. PLUG & PLAY Communication and OSM “MONITOR INFORMATION” for Model Name / Serial Number Inspection

### 9.1 System Connection

This system should be connected as shown below.

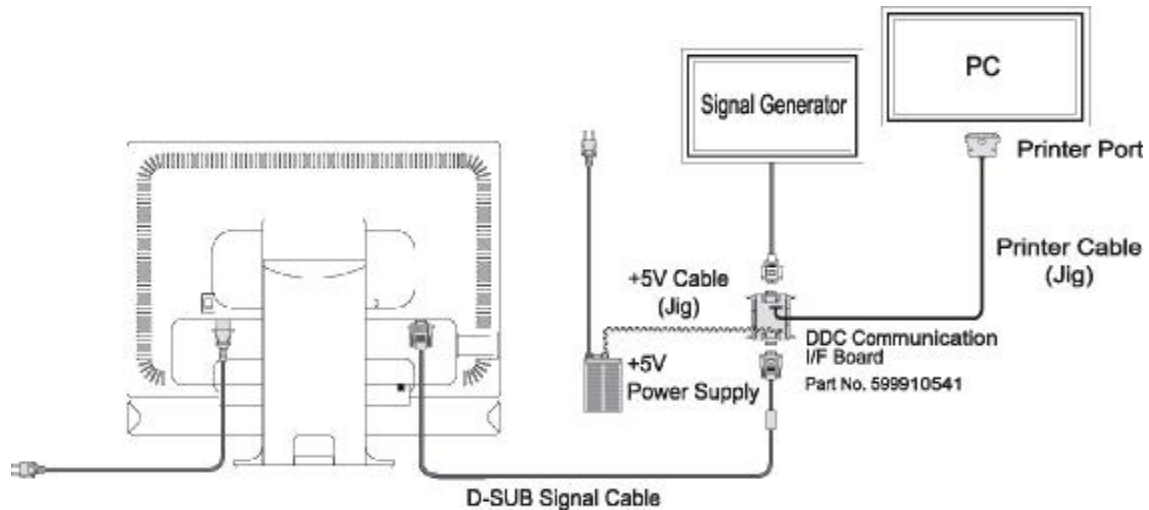


Fig 9.1.1 D-SUB connector connection

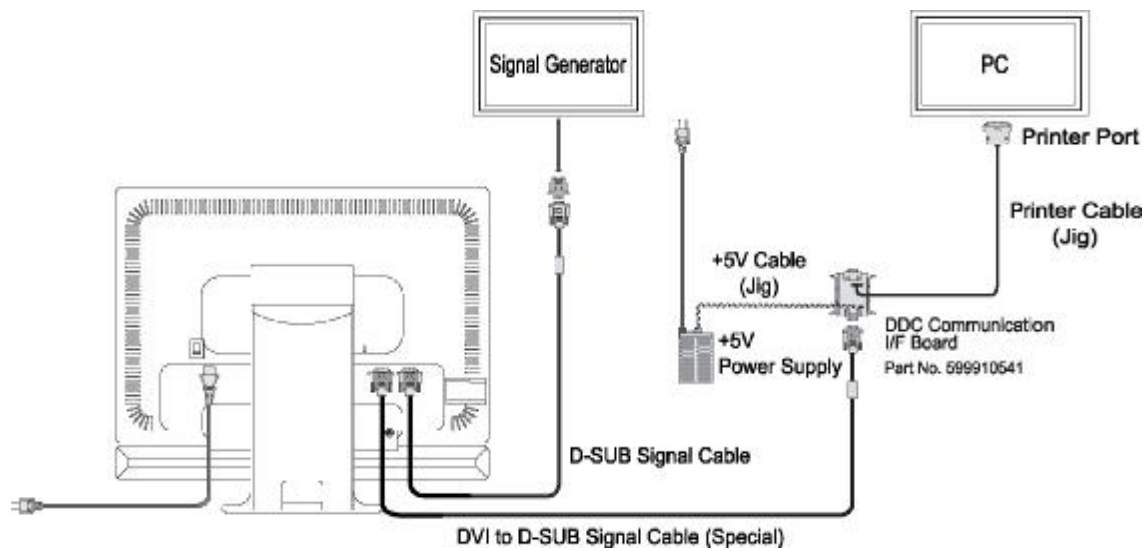
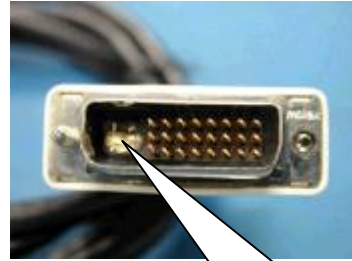


Fig 9.1.2 DVI connector connection



Modify the connector end  
by removing the five (5)  
analog pins.

Fig 9.1.3 DVI to D-SUB Signal Cable (Special)

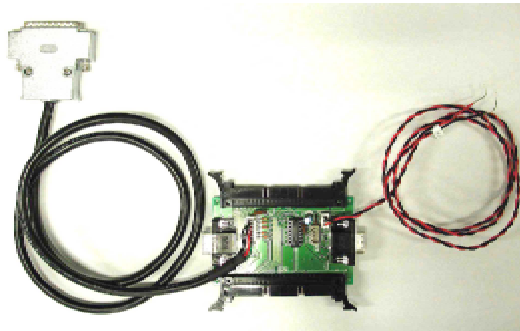


Fig 9.1.4 DDC Communication I/F Board  
(Part No.: 599910541)

## 9.2 Input Signal

Horizontal synchronization frequency : 31kHz (Negative)

Vertical synchronization frequency : 42Hz (Negative)

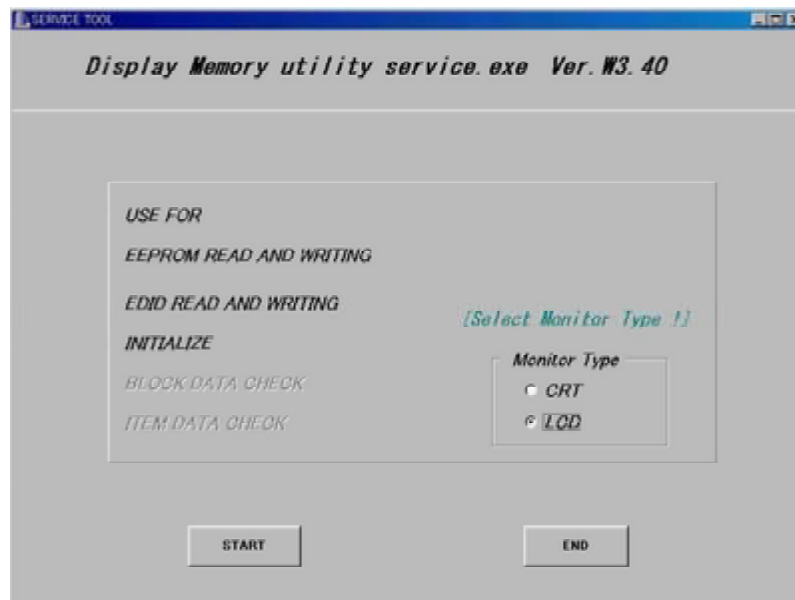
## 9.3 Program

Service tool Ver. 3.40 (Part No. 599910802)

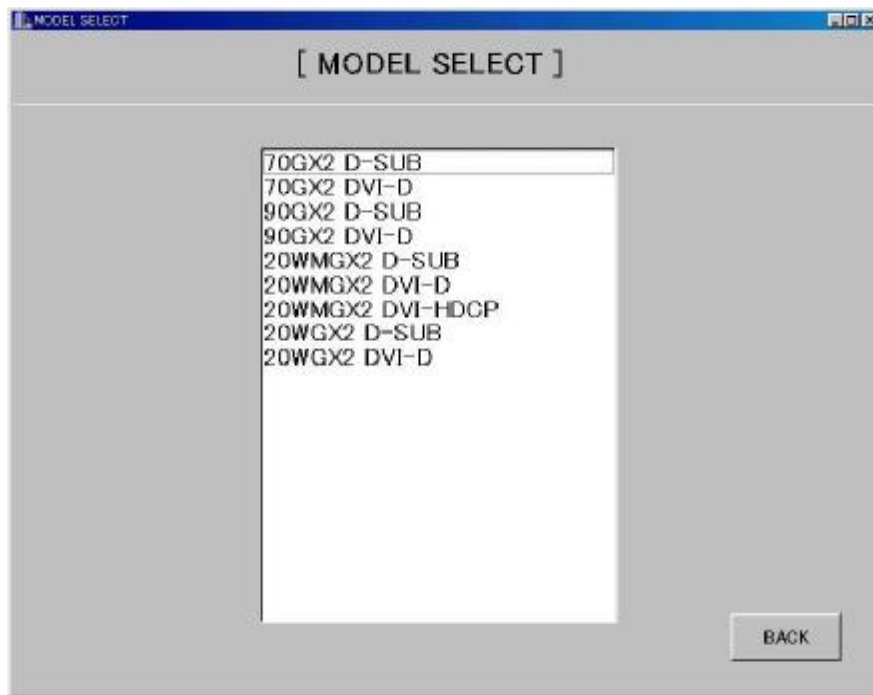
## 9.4 Operation

### 9.4.1 EDID Data Inspection and Writing to the D-SUB Connector (Analog)

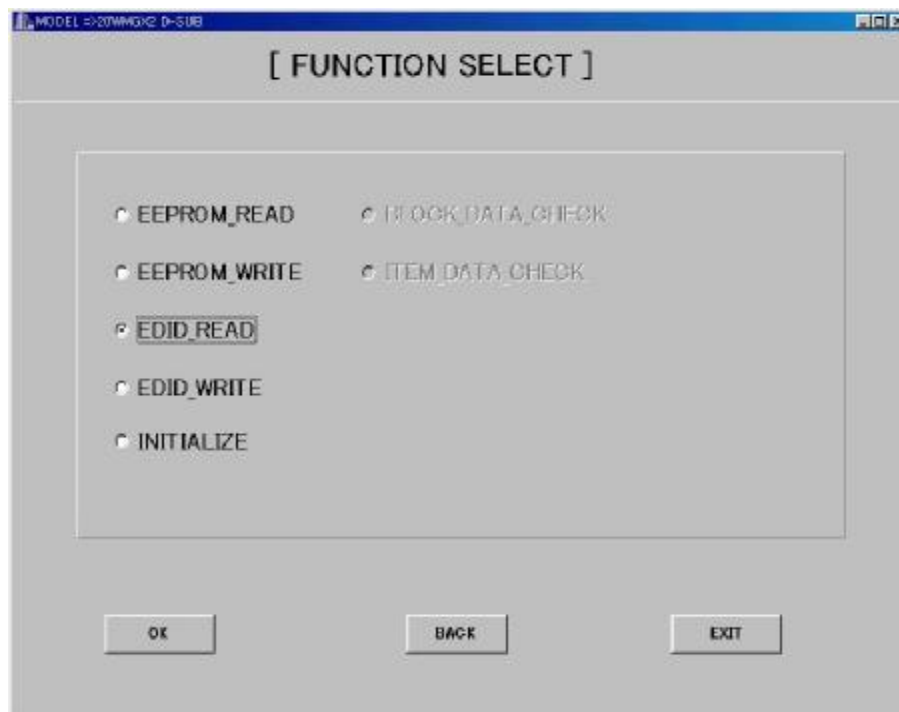
- 1) Connect the EDID data writing unit.
- 2) Create a unique directory in the PC, and copy all the files of service tool (Ver. 3.40) into that directory.
- 3) Start the service tool with file [Service2.EXE].
- 4) When the screen as shown below appears, click the [LCD] button of [Monitor Type] and press the [START] button.



5) When the screen (as shown below), move the cursor to [20WGX2 D-SUB] and double click.



6) When the screen as shown below appears, select [EDID\_READ] and press the [OK] button.



- 7) When the screen as shown below appears, confirm that the correct data are displayed in the columns of EDID DATA CONTENTS and Serial information.  
If all the displayed data are [FF] or the like, or if the serial number is different from that of the corresponding unit, then EDID data writing should be carried out.

MODEL=>LCD09V EDID=>ASSET MONITOR TYPE=>LCD DVI SELECTION=>NA

Input Serial No =>  byte   [Select File](#)

### EDID DATA CONTENTS

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
10	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
20	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
30	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
40	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
50	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
60	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
70	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

### Serial information

Year of Manufacture : 2245

Week of Manufacture : 255

Serial\_No1 => NONE

Serial\_No2 => \*\*\*\*\*

[Discrimination\_No]

STATUS

EDID Monitor read OK

- 8) Clicking the back button will display the screen in step 6. Select [EDID\_WRITE] and press the [OK] button.
- 9) When the screen as shown below appears, examine the serial number of the unit, enter an input in the column of [Input Serial No.] through the keyboard, and press the [Input OK] button.  
Enter an input in the column of [Year=>] in manufactured year(A.D. four digits) and [Month=>] in manufactured month through the keyboard, and press the [Input OK] button.

MODEL => 20WMGX2 D-SUB EDID => ASSET MONITOR TYPE => LCD DVI SELECTION => ANALOG

Input Serial No => 5Y000035GA 10 byte Input OK EDID-TXT LOAD [Select File]

EDID DATA CONTENTS EDID CODE => 20WGX2 ANALOG

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	38	A3	93	66	01	01	01	01
10	24	0F	01	03	0E	2B	1B	78	EA	C5	05	A3	57	4A	9C	25
20	12	50	54	23	08	00	81	C0	81	40	81	80	95	00	B3	00
30	01	01	01	01	01	01	21	39	90	30	62	1A	27	40	18	B0
40	36	40	B1	0E	11	00	00	1C	00	00	00	FD	00	38	3C	1F
50	51	0F	00	0A	20	20	20	20	20	20	00	00	00	FC	00	32
60	30	57	4D	47	58	32	0A	20	20	20	20	20	00	00	00	FF
70	00	35	35	30	30	30	30	31	47	41	0A	20	20	00	13	

Serial information

Year of Manufacture : 2005 Year => 2005

Week of Manufacture : 36 Month => 11

Serial\_No1 => NONE

Serial\_No2 => 55000001GA

Input OK

[Discrimination\_No]

Read EDID

STATUS

EDID File load OK

BACK Exit

10) Equipment is set as Factory mode.

<How to Factory mode>

10-1) Press "MENU/EXIT" button then open OSM menu.

10-2) OSM select to "INFORMATION" menu by "RIGHT" or "LEFT" button.

10-3) Press "RESET" + "SELECT" button then into Factory mode.

11) When the [WRITE EDID] button is pressed, writing of the EDID data only is carried out. Upon the completion of correct writing, a display of [EDID Monitor Write OK] is presented in the column of [STATUS].

MODEL => 20WGX2 D-SUB EDID => ASSET MONITOR TYPE => LCD DVI SELECTION => ANALOG

Input Serial\_No =>  10 byte Input OK EDID-TXT LOAD [Select File]

EDID DATA CONTENTS EDID CODE => 20WGX2 ANALOG

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	38	A3	93	66	01	01	01	01
10	2C	0F	01	03	0E	2B	18	78	EA	C5	05	A3	57	4A	9C	25
20	12	50	54	23	08	00	81	C0	81	40	81	80	95	00	B3	00
30	01	01	01	01	01	01	21	39	90	30	62	1A	27	40	18	B0
40	36	40	B1	0E	11	00	00	1C	00	00	00	FD	00	38	3C	1F
50	51	0F	00	0A	20	20	20	20	20	20	00	00	00	FC	00	32
60	30	57	4D	47	58	32	0A	20	20	20	20	20	00	00	00	FF
70	00	35	59	30	30	30	30	33	35	47	41	0A	20	20	00	53

EDIT

EDIT Complete

WRITE EDID

Serial information

Year of Manufacture : 2005 Year =>

Week of Manufacture : 44 Month =>

Serial\_No1 => NONE

Serial\_No2 => 5Y000035GA Input OK

Read EDID [Discrimination\_No]

STATUS

EDID Monitor write OK

BACK Exit

- 12) Display "MONITOR INFORMATION" of the OSM, and confirm that the model name (20WGX<sup>2</sup>) and serial number have been correctly written. (Check that it is also in agreement with the written-in serial number.) Model name and Serial number writing for the OSM "MONITOR INFORMATION".

#### 9.4.2 EDID Data Inspection and Writing to the DVI-PC Connector

- 1) Connect the EDID data writing unit with jigs, etc. (Refer to a DVI connector connection figure)
- 2) The "BACK" button is pushed twice and the [MODEL SELECT] screen is displayed. Cursor is united and double-clicked to [20WGX2 DVI-D].
- 3) 6) to 11) is carried out in the procedure of the 9.4.1 "EDID data inspection and writing of a D-SUB connector".
- 4) Upon the normal completion of EDID data writing, press the [Exit] button to close the program.

## 9.5 EDID Data File

EDID Data: 20WGX<sup>2</sup> A.edi (ANALOG)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	38	A3	98	66	01	01	01	01
10	Note1	Note2	01	03	0E	2B	1B	78	EA	C5	05	A3	57	4A	9C	25
20	12	50	54	BF	EF	80	71	4F	81	CF	81	4F	81	80	95	00
30	90	40	B3	00	01	01	21	39	90	30	62	1A	27	40	18	B0
40	36	40	B1	0E	11	00	00	1C	00	00	00	FD	00	38	4B	1F
50	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC	00	32
60	30	57	47	58	32	0A	20	20	20	20	20	20	00	00	00	FF
70	00	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	00	Note4

EDID Data: 20WGX<sup>2</sup> D.edi (DIGITAL)

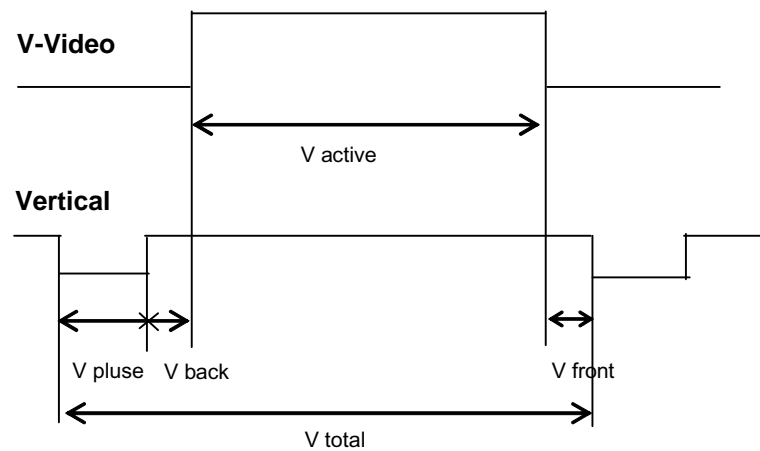
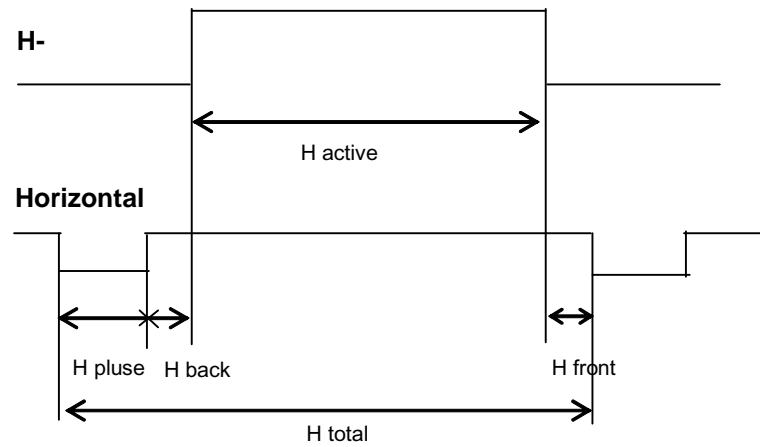
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	38	A3	99	66	01	01	01	01
10	Note1	Note2	01	03	80	2B	1B	78	EA	C5	05	A3	57	4A	9C	25
20	12	50	54	BF	EF	80	71	4F	81	CF	81	4F	81	80	95	00
30	90	40	B3	00	01	01	21	39	90	30	62	1A	27	40	18	B0
40	36	40	B1	0E	11	00	00	1C	00	00	00	FD	00	38	4B	1F
50	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC	00	32
60	30	57	47	58	32	0A	20	20	20	20	20	20	00	00	00	FF
70	00	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	Note3	00	Note4

- Note 1: address 10h      Week of manufacture  
 Note 2: address 11h      Year of manufacture - 1990  
 Note 3: address 71h ~ 7Dh      Serial Number (ASCII coded)  
    If less than 13 char, terminate with 0Ah and fill the rests with 20h.  
 Note 4: address 7Fh      Checksum  
    The sum of entire 128 byte should be equal to 00h.

## 9.6 EDID Write Protect Cancel Signal Timing

Item	Abbreviation	EDID write protect cancel	
Pixel frequency	fc	28.32MHz	
Horizontal frequency	fh	31.469kHz	
Line Time total	Th	31.777us	900CLK
Horizontal active display	Thd	25.422us	720CLK
Horizontal sync pulse	Thp	3.813us	108CLK
Horizontal back porch	Thb	1.907us	54CLK
Horizontal front porch	Thf	0.636us	18CLK
Horizontal sync polarity		NEG	
Vertical Frequency	fv	42.015Hz	
Frame time total	Tv	23.801ms	749H
Vertical active display	Tvd	21.768ms	685H
Vertical sync pulse	Tvp	0.095ms	3H
Vertical back porch	Tvb	1.494ms	47H
Vertical front porch	Tvf	0.445ms	14H
Vertical sync polarity		NEG	

## Appendix Reference Signal Timings



		MODE		MODE	
	No.	1		2	
Item	Abbreviation	MAC 640×480		MAC 832×624	
Pixel frequency	fc	30.24MHz		57.28MHz	
Horizontal frequency	fh	35.00kHz		49.73kHz	
Line Time total	Th	28.57us	864CLK	20.11us	1152CLK
Horizontal active display	Thd	21.16us	640CLK	14.52us	832CLK
Horizontal sync pulse	Thp	2.12us	64CLK	1.12us	64CLK
Horizontal back porch	Thb	3.17us	96CLK	3.91us	224CLK
Horizontal front porch	Thf	2.12us	64CLK	0.56us	32CLK
Horizontal sync polarity		NEG (/POS)		NEG (/POS)	
Vertical Frequency	fv	66.66Hz		74.55Hz	
Frame time total	Tv	15.00ms	525H	13.41ms	667H
Vertical active display	Tvd	13.71ms	480H	12.55ms	624H
Vertical sync pulse	Tvp	0.09ms	3H	0.06ms	3H
Vertical back porch	Tvb	1.11ms	39H	0.78ms	39H
Vertical front porch	Tvf	0.09ms	3H	0.02ms	1H
Vertical sync polarity		NEG (/POS)		NEG (/POS)	

		MODE		MODE	
	No.	3		4	
Item	Abbreviation	PC98 640×400 (24.8kHz)		VGA 720×350 70Hz	
Pixel frequency	fc	21.053MHz		28.322MHz	
Horizontal frequency	fh	24.83kHz		31.47kHz	
Line Time total	Th	40.274us	848CLK	31.78us	900CLK
Horizontal active display	Thd	30.400us	640CLK	25.42us	720CLK
Horizontal sync pulse	Thp	3.04us	64CLK	3.81us	108CLK
Horizontal back porch	Thb	4.04us	85CLK	1.91us	54CLK
Horizontal front porch	Thf	2.80us	59CLK	0.64us	18CLK
Horizontal sync polarity		NEG (/POS)		POS	
Vertical Frequency	fv	56.432Hz		70.087Hz	
Frame time total	Tv	17.72ms	440H	14.27ms	449H
Vertical active display	Tvd	16.11ms	400H	11.12ms	350H
Vertical sync pulse	Tvp	0.32ms	8H	0.06ms	2H
Vertical back porch	Tvb	1.01ms	25H	1.91ms	60H
Vertical front porch	Tvf	0.28ms	7H	1.18ms	37H
Vertical sync polarity		NEG (/POS)		NEG	

		MODE		MODE	
	No.	5		6	
Item	Abbreviation	VGA 720×400 70Hz		VGA 640×480 60Hz	
Pixel frequency	fc	28.322MHz		25.175MHz	
Horizontal frequency	fh	31.47kHz		31.47kHz	
Line Time total	Th	31.78us	900CLK	31.78us	800CLK
Horizontal active display	Thd	25.42us	720CLK	25.42us	640CLK
Horizontal sync pulse	Thp	3.81us	108CLK	3.81us	96CLK
Horizontal back porch	Thb	1.91us	54CLK	1.91us	48CLK
Horizontal front porch	Thf	0.63us	18CLK	0.64us	16CLK
Horizontal sync polarity		NEG		NEG (/POS)	
Vertical Frequency	fv	70.087Hz		59.992Hz	
Frame time total	Tv	14.27ms	449H	16.68ms	525H
Vertical active display	Tvd	12.71ms	400H	15.25ms	480H
Vertical sync pulse	Tvp	0.06ms	2H	0.06ms	2H
Vertical back porch	Tvb	1.11ms	35H	1.02ms	33H
Vertical front porch	Tvf	0.38ms	12H	0.35ms	10H
Vertical sync polarity		POS		NEG (/POS)	

		MODE		MODE	
	No.	7		8	
Item	Abbreviation	VGA 640×480 72Hz		VESA 640×480 75Hz	
Pixel frequency	fc	31.500MHz		31.500MHz	
Horizontal frequency	fh	37.86kHz		37.50kHz	
Line Time total	Th	26.41us	832CLK	26.67us	840CLK
Horizontal active display	Thd	20.32us	640CLK	20.32us	640CLK
Horizontal sync pulse	Thp	1.27us	40CLK	2.03us	64CLK
Horizontal back porch	Thb	4.06us	128CLK	3.81us	120CLK
Horizontal front porch	Thf	0.76us	24CLK	0.51us	16CLK
Horizontal sync polarity		NEG (/POS)		NEG (/POS)	
Vertical Frequency	fv	72.81Hz		75.00Hz	
Frame time total	Tv	13.73ms	520H	13.33ms	500H
Vertical active display	Tvd	12.68ms	480H	12.80ms	480H
Vertical sync pulse	Tvp	0.08ms	3H	0.08ms	3H
Vertical back porch	Tvb	0.74ms	28H	0.43ms	16H
Vertical front porch	Tvf	0.24ms	9H	0.03ms	1H
Vertical sync polarity		NEG (/POS)		NEG (/POS)	

		MODE		MODE	
	No.	9		10	
Item	Abbreviation	VESA 800×600 56Hz		VESA 800×600 60Hz	
Pixel frequency	fc	36.00MHz		40.00MHz	
Horizontal frequency	fh	35.16kHz		37.88kHz	
Line Time total	Th	28.44us	1024CLK	26.40us	1056CLK
Horizontal active display	Thd	22.22us	800CLK	20.00us	800CLK
Horizontal sync pulse	Thp	2.00us	72CLK	3.20us	128CLK
Horizontal back porch	Thb	3.56us	128CLK	2.20us	88CLK
Horizontal front porch	Thf	0.67us	24CLK	1.00us	40CLK
Horizontal sync polarity		POS (/NEG)		POS (/NEG)	
Vertical Frequency	fv	56.25Hz		60.32Hz	
Frame time total	Tv	17.78ms	625H	16.58ms	628H
Vertical active display	Tvd	17.07ms	600H	15.84ms	600H
Vertical sync pulse	Tvp	0.06ms	2H	0.11ms	4H
Vertical back porch	Tvb	0.63ms	22H	0.61ms	23H
Vertical front porch	Tvf	0.03ms	1H	0.03ms	1H
Vertical sync polarity		POS (/NEG)		POS (/NEG)	

		MODE		MODE	
	No.	11		12	
Item	Abbreviation	VESA 800×600 72Hz		VESA 800×600 75Hz	
Pixel frequency	fc	50.000MHz		49.500MHz	
Horizontal frequency	fh	48.08kHz		46.88kHz	
Line Time total	Th	20.80us	1040CLK	21.33us	1056CLK
Horizontal active display	Thd	16.00us	800CLK	16.16us	800CLK
Horizontal sync pulse	Thp	2.40us	120CLK	1.62us	80CLK
Horizontal back porch	Thb	1.28us	64CLK	3.23us	160CLK
Horizontal front porch	Thf	1.12us	56CLK	0.32us	16CLK
Horizontal sync polarity		POS (/NEG)		POS (/NEG)	
Vertical Frequency	fv	72.19Hz		75.00Hz	
Frame time total	Tv	13.85ms	666H	13.33ms	625H
Vertical active display	Tvd	12.48ms	600H	12.80ms	600H
Vertical sync pulse	Tvp	0.13ms	6H	0.06ms	3H
Vertical back porch	Tvb	0.48ms	23H	0.45ms	21H
Vertical front porch	Tvf	0.77ms	37H	0.02ms	1H
Vertical sync polarity		POS (/NEG)		POS (/NEG)	

		MODE		MODE	
	No.	13		14	
Item	Abbreviation	VESA 1024×768 60Hz		VESA 1024×768 70Hz	
Pixel frequency	fc	65.000MHz		75.000MHz	
Horizontal frequency	fh	48.36kHz		56.48kHz	
Line Time total	Th	20.68us	1344CLK	17.71us	1328CLK
Horizontal active display	Thd	15.75us	1024CLK	13.65us	1024CLK
Horizontal sync pulse	Thp	2.09us	136CLK	1.81us	136CLK
Horizontal back porch	Thb	2.46us	160CLK	1.92us	144CLK
Horizontal front porch	Thf	0.37us	24CLK	0.32us	24CLK
Horizontal sync polarity		NEG (/POS)		NEG (/POS)	
Vertical Frequency	fv	60.00Hz		70.07Hz	
Frame time total	Tv	16.67ms	806H	14.27ms	806H
Vertical active display	Tvd	15.88ms	768H	13.60ms	768H
Vertical sync pulse	Tvp	0.12ms	6H	0.11ms	6H
Vertical back porch	Tvb	0.60ms	29H	0.51ms	29H
Vertical front porch	Tvf	0.06ms	3H	0.05ms	3H
Vertical sync polarity		NEG (/POS)		NEG (/POS)	

		MODE		MODE	
	No.	15		16	
Item	Abbreviation	VESA 1024×768 75Hz		VESA 1152×864 75Hz	
Pixel frequency	fc	78.75MHz		108.00MHz	
Horizontal frequency	fh	60.02kHz		67.50kHz	
Line Time total	Th	16.66us	1312CLK	14.82us	1600CLK
Horizontal active display	Thd	13.00us	1024CLK	10.67us	1152CLK
Horizontal sync pulse	Thp	1.22us	96CLK	1.19us	128CLK
Horizontal back porch	Thb	2.24us	176CLK	2.37us	256CLK
Horizontal front porch	Thf	0.20us	16CLK	0.59us	64CLK
Horizontal sync polarity		POS (/NEG)		POS (/NEG)	
Vertical Frequency	fv	75.03Hz		75.00Hz	
Frame time total	Tv	13.33ms	800H	13.33ms	900H
Vertical active display	Tvd	12.80ms	768H	12.80ms	864H
Vertical sync pulse	Tvp	0.05ms	3H	0.04ms	3H
Vertical back porch	Tvb	0.47ms	28H	0.47ms	32H
Vertical front porch	Tvf	0.02ms	1H	0.02ms	1H
Vertical sync polarity		POS (/NEG)		POS (/NEG)	

		MODE		MODE	
	No.	17		18	
Item	Abbreviation	SUN 1152×900 66Hz		VESA 1280×960 60Hz	
Pixel frequency	fc	94.50MHz		108.00MHz	
Horizontal frequency	fh	61.85kHz		60.00kHz	
Line Time total	Th	16.17us	1528CLK	16.67us	1800CLK
Horizontal active display	Thd	12.19us	1152CLK	11.85us	1280CLK
Horizontal sync pulse	Thp	1.35us	128CLK	1.04us	112CLK
Horizontal back porch	Thb	2.20us	208CLK	2.89us	312CLK
Horizontal front porch	Thf	0.42us	40CLK	0.89us	96CLK
Horizontal sync polarity		POS (/NEG)		POS (/NEG)	
Vertical Frequency	fv	66.0Hz		60.00Hz	
Frame time total	Tv	15.15ms	937H	16.67ms	1000H
Vertical active display	Tvd	14.55ms	900H	16.0ms	960H
Vertical sync pulse	Tvp	0.07ms	4H	0.05ms	3H
Vertical back porch	Tvb	0.50ms	31H	0.60ms	36H
Vertical front porch	Tvf	0.03ms	2H	0.017ms	1H
Vertical sync polarity		POS (/NEG)		POS (/NEG)	

		MODE		MODE	
	No.	19		20	
Item	Abbreviation	VESA 1280×1024 60Hz		SUN 1280×1024 66Hz	
Pixel frequency	fc	108.00MHz		117.00MHz	
Horizontal frequency	fh	63.981kHz		71.69kHz	
Line Time total	Th	15.63us	1688CLK	13.95us	1632CLK
Horizontal active display	Thd	11.85us	1280CLK	10.94us	1280CLK
Horizontal sync pulse	Thp	1.04us	112CLK	0.96us	112CLK
Horizontal back porch	Thb	2.30us	248CLK	1.91us	224CLK
Horizontal front porch	Thf	0.44us	48CLK	0.14us	16CLK
Horizontal sync polarity		POS (/NEG)		POS (/NEG)	
Vertical Frequency	fv	60.02Hz		66.69Hz	
Frame time total	Tv	16.67ms	1066H	15.00ms	1067H
Vertical active display	Tvd	16.00ms	1024H	14.4ms	1024H
Vertical sync pulse	Tvp	0.05ms	3H	0.11ms	8H
Vertical back porch	Tvb	0.59ms	38H	0.46ms	33H
Vertical front porch	Tvf	0.02ms	1H	0.03ms	2H
Vertical sync polarity		POS (/NEG)		POS (/NEG)	

		MODE		MODE	
	No.	21		22	
Item	Abbreviation	VESA 1280×1024 75Hz		SUN 1280×1024 76Hz	
Pixel frequency	fc	135.00MHz		135.00MHz	
Horizontal frequency	fh	79.98kHz		81.13kHz	
Line Time total	Th	12.50us	1688CLK	12.33us	1664CLK
Horizontal active display	Thd	9.48us	1280CLK	9.48us	1280CLK
Horizontal sync pulse	Thp	1.07us	144CLK	0.47us	64CLK
Horizontal back porch	Thb	1.84us	248CLK	2.13us	288CLK
Horizontal front porch	Thf	0.12us	16CLK	0.24us	32CLK
Horizontal sync polarity		POS (/NEG)		POS (/NEG)	
Vertical Frequency	fv	75.03Hz		76.107Hz	
Frame time total	Tv	13.33ms	1066H	13.14ms	1066H
Vertical active display	Tvd	12.80ms	1024H	12.62ms	1024H
Vertical sync pulse	Tvp	0.04ms	3H	0.10ms	8H
Vertical back porch	Tvb	0.48ms	38H	0.39ms	32H
Vertical front porch	Tvf	0.01ms	1H	0.02ms	2H
Vertical sync polarity		POS (/NEG)		POS (/NEG)	

		MODE		MODE	
	No.	23		24	
Item	Abbreviation	MAC1152×870 75Hz		SUN 1024x768 66Hz	
Pixel frequency	fc	100.00MHz		70.490MHz	
Horizontal frequency	fh	68.68kHz		52.448kHz	
Line Time total	Th	14.56us	1456CLK	19.067us	1344CLK
Horizontal active display	Thd	11.52us	1152CLK	14.527us	1024CLK
Horizontal sync pulse	Thp	1.28us	128CLK	1.929us	136CLK
Horizontal back porch	Thb	1.44us	144CLK	2.270us	160CLK
Horizontal front porch	Thf	0.32us	32CLK	0.340us	24CLK
Horizontal sync polarity		NEG (/ POS)		NEG (/ POS)	
Vertical Frequency	fv	75.06Hz		65.072Hz	
Frame time total	Tv	13.32ms	915H	15.368ms	806H
Vertical active display	Tvd	12.67ms	870H	14.643ms	768H
Vertical sync pulse	Tvp	0.04ms	3H	0.114ms	6H
Vertical back porch	Tvb	0.57ms	39H	0.553ms	29H
Vertical front porch	Tvf	0.04ms	3H	0.057ms	3H
Vertical sync polarity		NEG (/ POS)		NEG (/ POS)	

		MODE		MODE	
	No.	25		26	
Item	Abbreviation	VESA 1152x864 70Hz		VESA 1280x960 75Hz	
Pixel frequency	fc	94.50MHz		129.60MHz	
Horizontal frequency	fh	63.851kHz		75.000kHz	
Line Time total	Th	15.661us	1480CLK	13.333us	1728CLK
Horizontal active display	Thd	12.190us	1152CLK	9.877us	1280CLK
Horizontal sync pulse	Thp	1.016us	96CLK	0.988us	128CLK
Horizontal back porch	Thb	2.116us	200CLK	1.975us	256CLK
Horizontal front porch	Thf	0.339us	32CLK	0.494us	64CLK
Horizontal sync polarity		POS (/NEG)		POS (/NEG)	
Vertical Frequency	fv	70.012Hz		75.000Hz	
Frame time total	Tv	14.283ms	912H	13.333ms	1000H
Vertical active display	Tvd	13.531ms	864H	12.800ms	960H
Vertical sync pulse	Tvp	0.047ms	3H	0.040ms	3H
Vertical back porch	Tvb	0.689ms	44H	0.480ms	36H
Vertical front porch	Tvf	0.016ms	1H	0.013ms	1H
Vertical sync polarity		POS (/NEG)		POS (/NEG)	

		i810 DVD resolution		i810 DVD resolution	
	No.	27		28	
Item	Abbreviation	i810 720x576 60Hz		i810 720x576 75Hz	
Pixel frequency	fc	32.98MHz		42.95MHz	
Horizontal frequency	fh	36.160kHz		45.500kHz	
Line Time total	Th	27.653us	912CLK	21.979us	944CLK
Horizontal active display	Thd	21.831us	720CLK	16.764us	720CLK
Horizontal sync pulse	Thp	1.941us	64CLK	1.490us	64CLK
Horizontal back porch	Thb	3.184us	105CLK	1.513us	65CLK
Horizontal front porch	Thf	0.697us	23CLK	2.212us	95CLK
Horizontal sync polarity		POS (/NEG)		POS (/NEG)	
Vertical Frequency	fv	60.570Hz		75.581Hz	
Frame time total	Tv	16.510ms	597H	13.231ms	602H
Vertical active display	Tvd	15.929ms	576H	12.660ms	576H
Vertical sync pulse	Tvp	0.055ms	2H	0.044ms	2H
Vertical back porch	Tvb	0.498ms	18H	0.506ms	23H
Vertical front porch	Tvf	0.028ms	1H	0.022ms	1H
Vertical sync polarity		POS (/NEG)		POS (/NEG)	

		MODE		MODE	
	No.	29		30	
Item	Abbreviation	Mac 1024x768 75Hz		Mac 1280x960 75Hz	
Pixel frequency	fc	80.00MHz		126.00MHz	
Horizontal frequency	fh	60.241kHz		74.64kHz	
Line Time total	Th	16.600us	1328CLK	13.400us	1688CLK
Horizontal active display	Thd	12.800us	1024CLK	10.160us	1280CLK
Horizontal sync pulse	Thp	1.200us	96CLK	1.210us	152CLK
Horizontal back porch	Thb	2.200us	176CLK	1.840us	232CLK
Horizontal front porch	Thf	0.400us	32CLK	0.190us	24CLK
Horizontal sync polarity		NEG (/POS)		NEG (/POS)	
Vertical Frequency	fv	74.927Hz		74.64Hz	
Frame time total	Tv	13.346ms	804H	13.400ms	1000H
Vertical active display	Tvd	12.749ms	768H	12.864ms	960H
Vertical sync pulse	Tvp	0.050ms	3H	0.040ms	3H
Vertical back porch	Tvb	0.498ms	30H	0.482ms	36H
Vertical front porch	Tvf	0.050ms	3H	0.013ms	1H
Vertical sync polarity		NEG (/POS)		NEG (/POS)	

		EDID write protect cancel		SUN Workstation	
	No.	31		32	
Item	Abbreviation	EDID		SUN 1280x800	
Pixel frequency	fc	28.32MHz		101.40MHz	
Horizontal frequency	fh	31.469kHz		64.68kHz	
Line Time total	Th	31.777us	900CLK	15.464us	1588CLK
Horizontal active display	Thd	25.422us	720CLK	12.623us	1280CLK
Horizontal sync pulse	Thp	3.813us	108CLK	1.085us	110CLK
Horizontal back porch	Thb	1.907us	54CLK	1.519us	154CLK
Horizontal front porch	Thf	0.636us	18CLK	0.237us	24CLK
Horizontal sync polarity		NEG		NEG (/POS)	
Vertical Frequency	fv	42.015Hz		76.460Hz	
Frame time total	Tv	23.801ms	749H	13.080ms	846H
Vertical active display	Tvd	21.768ms	685H	12.369ms	800H
Vertical sync pulse	Tvp	0.095ms	3H	0.108ms	7H
Vertical back porch	Tvb	1.494ms	47H	0.557ms	36H
Vertical front porch	Tvf	0.445ms	14H	0.046ms	3H
Vertical sync polarity		NEG		NEG (/POS)	

		Non-interlaced PAL		Non-interlaced PAL	
	No.	33		34	
Item	Abbreviation	GTF1024x768 50Hz		GTF1280x720 50Hz	
Pixel frequency	fc	51.89MHz		60.47MHz	
Horizontal frequency	fh	39.55kHz		37.05kHz	
Line Time total	Th	25.28us	1312CLK	26.99us	1632CLK
Horizontal active display	Thd	19.73us	1024CLK	21.17us	1280CLK
Horizontal sync pulse	Thp	2.00us	104CLK	2.12us	128CLK
Horizontal back porch	Thb	2.78us	144CLK	2.91us	176CLK
Horizontal front porch	Thf	0.77us	40CLK	0.79us	48CLK
Horizontal sync polarity		NEG (/POS)		NEG (/POS)	
Vertical Frequency	fv	50.000Hz		50.000Hz	
Frame time total	Tv	20.00ms	791H	20.00ms	742H
Vertical active display	Tvd	19.42ms	768H	19.43ms	720H
Vertical sync pulse	Tvp	0.08ms	3H	0.08ms	3H
Vertical back porch	Tvb	0.48ms	19H	0.46ms	17H
Vertical front porch	Tvf	0.03ms	1H	0.03ms	1H
Vertical sync polarity		NEG (/POS)		NEG (/POS)	

		Non-interlaced PAL		Non-interlaced PAL	
	No.	35		36	
Item	Abbreviation	GTF1280x960 50Hz		GTF1280x1024 50Hz	
Pixel frequency	fc	82.99MHz		89.379MHz	
Horizontal frequency	fh	49.40kHz		52.70kHz	
Line Time total	Th	20.24us	1680CLK	18.975us	1696CLK
Horizontal active display	Thd	15.42us	1280CLK	14.321us	1280CLK
Horizontal sync pulse	Thp	1.64us	136CLK	1.52us	136CLK
Horizontal back porch	Thb	2.41us	200CLK	2.33us	208CLK
Horizontal front porch	Thf	0.77us	64CLK	0.81us	72CLK
Horizontal sync polarity		NEG (/POS)		NEG (/POS)	
Vertical Frequency	fv	50.000Hz		50.000Hz	
Frame time total	Tv	20.00ms	988H	20.00ms	1054H
Vertical active display	Tvd	19.43ms	960H	19.43ms	1024H
Vertical sync pulse	Tvp	0.06ms	3H	0.06ms	3H
Vertical back porch	Tvb	0.49ms	24H	0.49ms	26H
Vertical front porch	Tvf	0.02ms	1H	0.02ms	1H
Vertical sync polarity		NEG (/POS)		NEG (/POS)	

		Non-interlaced PAL		Non-interlaced PAL	
	No.	37		38	
Item	Abbreviation	GTF640x480 50Hz		GTF800x600 50Hz	
Pixel frequency	fc	19.40MHz		31.15MHz	
Horizontal frequency	fh	24.75kHz		30.90kHz	
Line Time total	Th	40.40us	784CLK	32.36us	1008CLK
Horizontal active display	Thd	32.98us	640CLK	25.68us	800CLK
Horizontal sync pulse	Thp	3.30us	64CLK	2.57us	80CLK
Horizontal back porch	Thb	3.71us	72CLK	3.34us	104CLK
Horizontal front porch	Thf	0.41us	8CLK	0.77us	24CLK
Horizontal sync polarity		NEG (/POS)		NEG (/POS)	
Vertical Frequency	fv	50.000Hz		50.000Hz	
Frame time total	Tv	20.00ms	495H	20.00ms	618H
Vertical active display	Tvd	19.39ms	480H	19.42ms	600H
Vertical sync pulse	Tvp	0.12ms	3H	0.10ms	3H
Vertical back porch	Tvb	0.44ms	11H	0.45ms	14H
Vertical front porch	Tvf	0.04ms	1H	0.03ms	1H
Vertical sync polarity		NEG (/POS)		NEG (/POS)	

		MODE		MODE	
	No.	39		40	
Item	Abbreviation	1440x900 60Hz Reduced Blanking		1440x900 60Hz	
Pixel frequency	fc	88.750MHz		106.500MHz	
Horizontal frequency	fh	55.469KHz		55.935KHz	
Line Time total	Th	18.028us	1600CLK	17.878us	1904CLK
Horizontal active display	Thd	16.225us	1440CLK	13.521us	1440CLK
Horizontal sync pulse	Thp	0.361us	32CLK	1.427us	152CLK
Horizontal back porch	Thb	0.901us	80CLK	2.178us	232CLK
Horizontal front porch	Thf	0.541us	48CLK	0.751us	80CLK
Horizontal sync polarity		POS (/NEG)		NEG (/POS)	
Vertical Frequency	fv	59.901Hz		59.887Hz	
Frame time total	Tv	16.694ms	926H	16.698ms	934H
Vertical active display	Tvd	16.225ms	900H	16.090ms	900H
Vertical sync pulse	Tvp	0.108ms	6H	0.107ms	6H
Vertical back porch	Tvb	0.306ms	17H	0.447ms	25H
Vertical front porch	Tvf	0.054ms	3H	0.054ms	3H
Vertical sync polarity		NEG (/POS)		POS (/NEG)	

		Mode		Mode	
	No.	41		42	
Item	Abbreviation	1440X900 75Hz		1400x1050 60Hz Reduced Blanking	
Pixel frequency	fc	136.750MHz		101.000MHz	
Horizontal frequency	fh	70.635KHz		64.744KHz	
Line Time total	Th	14.157us	1936CLK	15.446us	1560CLK
Horizontal active display	Thd	10.530us	1440CLK	13.861us	1400CLK
Horizontal sync pulse	Thp	1.112us	152CLK	0.317us	32CLK
Horizontal back porch	Thb	1.814us	248CLK	0.792us	80CLK
Horizontal front porch	Thf	0.702us	96CLK	0.475us	48CLK
Horizontal sync polarity		NEG (/POS)		POS (/NEG)	
Vertical Frequency	fv	74.984Hz		59.948Hz	
Frame time total	Tv	13.336ms	942H	16.681ms	1080H
Vertical active display	Tvd	12.741ms	900H	16.218ms	1050H
Vertical sync pulse	Tvp	0.085ms	6H	0.062ms	4H
Vertical back porch	Tvb	0.467ms	33H	0.355ms	23H
Vertical front porch	Tvf	0.042ms	3H	0.046ms	3H
Vertical sync polarity		POS (/NEG)		NEG (/POS)	

		Mode		Mode	
	No.	43		44	
Item	Abbreviation	1400x1050 60Hz		VESA 1680x1050 60Hz Reduced Blanking	
Pixel frequency	fc	121.750MHz		119.00MHz	
Horizontal frequency	fh	65.317KHz		64.674kHz	
Line Time total	Th	15.310us	1864CLK	15.462us	1840
Horizontal active display	Thd	11.499us	1400CLK	11.118us	1680
Horizontal sync pulse	Thp	1.183us	144CLK	0.269us	32CLK
Horizontal back porch	Thb	1.906us	232CLK	0.672us	80CLK
Horizontal front porch	Thf	0.723us	88CLK	0.403us	48CLK
Horizontal sync polarity		NEG (/POS)		POS (/NEG)	
Vertical Frequency	fv	59.978Hz		59.883Hz	
Frame time total	Tv	16.673ms	1089H	16.699ms	1080H
Vertical active display	Tvd	16.076ms	1050H	16.235ms	1050H
Vertical sync pulse	Tvp	0.061ms	4H	0.093ms	6H
Vertical back porch	Tvb	0.490ms	32H	0.325ms	21H
Vertical front porch	Tvf	0.046ms	3H	0.046ms	3H
Vertical sync polarity		POS (/NEG)		NEG (/POS)	

		Mode		Mode	
	No.	45		46	
Item	Abbreviation	VESA 1680X1050 60Hz		1280X768 60Hz	
Pixel frequency	fc	146.25MHz		79.5MHz	
Horizontal frequency	fh	65.290kHz		47.776kHz	
Line Time total	Th	15.316us	2240CLK	20.931us	1664CLK
Horizontal active display	Thd	11.487us	1680CLK	16.101us	1280CLK
Horizontal sync pulse	Thp	1.203us	176CLK	1.610us	128CLK
Horizontal back porch	Thb	0.711us	104CLK	2.415us	192CLK
Horizontal front porch	Thf	1.915us	280CLK	0.805us	64CLK
Horizontal sync polarity		NEG(/POS)		NEG (/POS)	
Vertical Frequency	fv	59.954Hz		59.870Hz	
Frame time total	Tv	16.679ms	1089H	16.703ms	798H
Vertical active display	Tvd	16.082ms	1050H	16.703ms	798H
Vertical sync pulse	Tvp	0.092ms	6H	0.147ms	7H
Vertical back porch	Tvb	0.459ms	30H	0.419ms	20H
Vertical front porch	Tvf	0.046ms	3H	0.063ms	3H
Vertical sync polarity		POS(/NEG)		NEG (/POS)	

		Mode		Mode	
	No.	47		48	
Item	Abbreviation	1360X768 60Hz		1360X768 60Hz (CVT)	
Pixel frequency	fc	85.5MHz		84.750MHz	
Horizontal frequency	fh	47.712kHz		47.720kHz	
Line Time total	Th	20.959us	1792CLK	20.959us	1776CLK
Horizontal active display	Thd	15.906us	1360CLK	16.047us	1360CLK
Horizontal sync pulse	Thp	1.310us	112CLK	1.605us	136CLK
Horizontal back porch	Thb	2.994us	256CLK	2.454us	208CLK
Horizontal front porch	Thf	0.749us	64CLK	0.850us	72CLK
Horizontal sync polarity		NEG (/POS)		NEG (/POS)	
Vertical Frequency	fv	60.015Hz		59.799Hz	
Frame time total	Tv	16.662ms	795H	16.723ms	798H
Vertical active display	Tvd	16.097ms	768H	16.094ms	768H
Vertical sync pulse	Tvp	0.126ms	6H	0.105ms	5H
Vertical back porch	Tvb	0.377ms	18H	0.461ms	22H
Vertical front porch	Tvf	0.063ms	3H	0.063ms	3H
Vertical sync polarity		NEG (/POS)		POS(/NEG)	

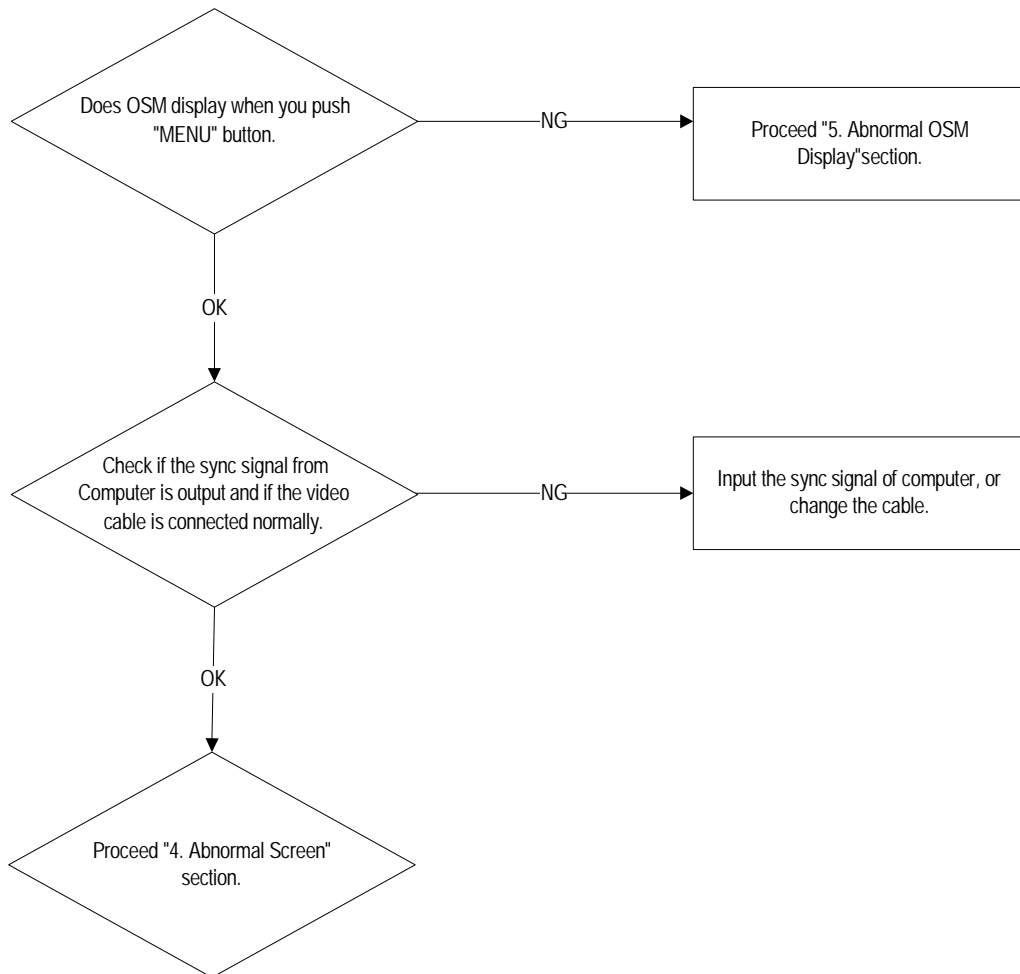
		MODE			
	No.	49			
Item	Abbreviation	1280X720 60Hz (CVT)			
Pixel frequency	fc	74.50MHz			
Horizontal frequency	fh	44.772kHz			
Line Time total	Th	22.36us	1664CLK		
Horizontal active display	Thd	17.181us	1280CLK		
Horizontal sync pulse	Thp	1.718us	128CLK		
Horizontal back porch	Thb	2.577us	192CLK		
Horizontal front porch	Thf	0.859us	64CLK		
Horizontal sync polarity		NEG (/POS)			
Vertical Frequency	fv	59.855Hz			
Frame time total	Tv	16.707ms	748H		
Vertical active display	Tvd	16.082ms	720H		
Vertical sync pulse	Tvp	0.112ms	5H		
Vertical back porch	Tvb	0.447ms	20H		
Vertical front porch	Tvf	0.067ms	3H		
Vertical sync polarity		POS(/NEG)			

# RO BLE S OO ING

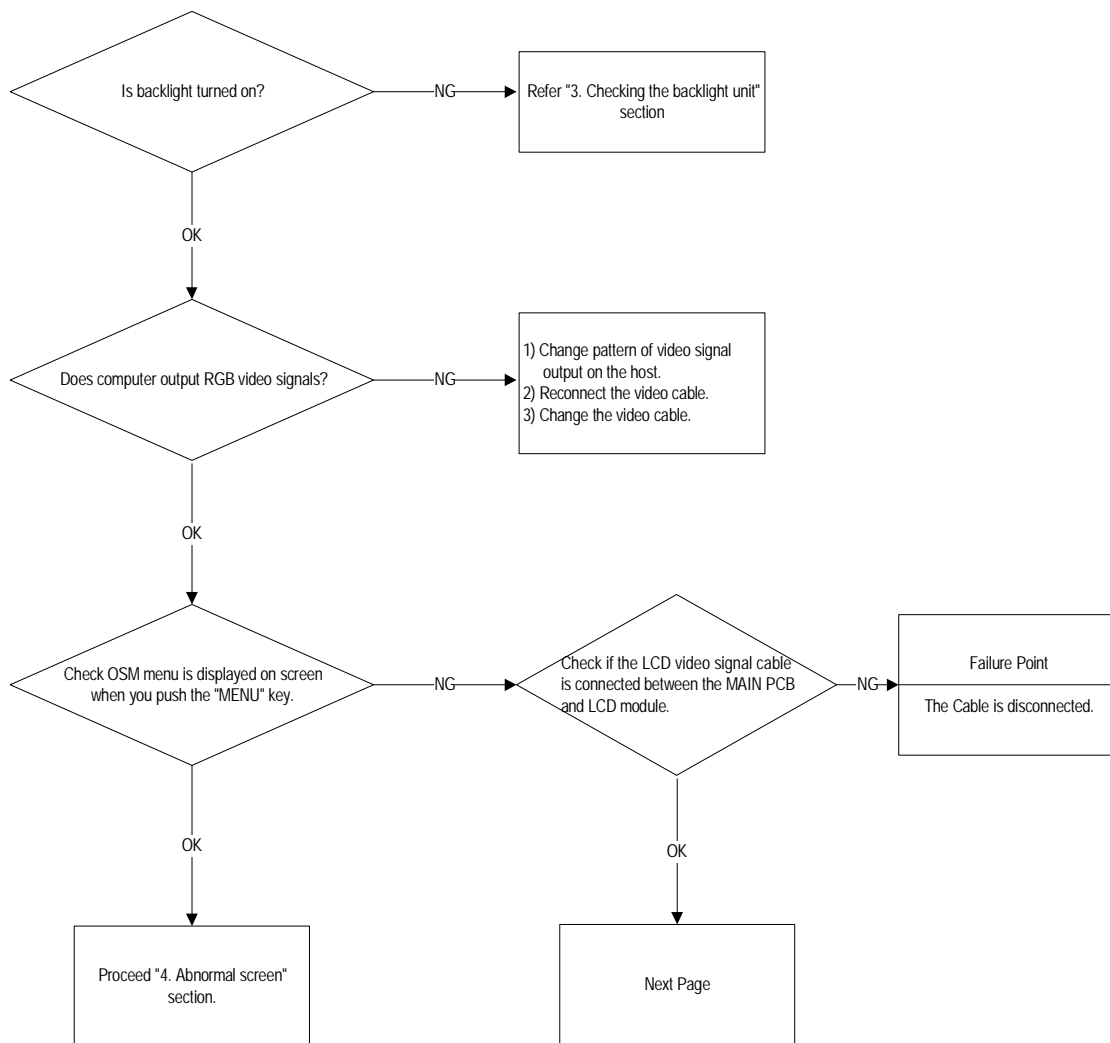
## ABLE OF CON EN S

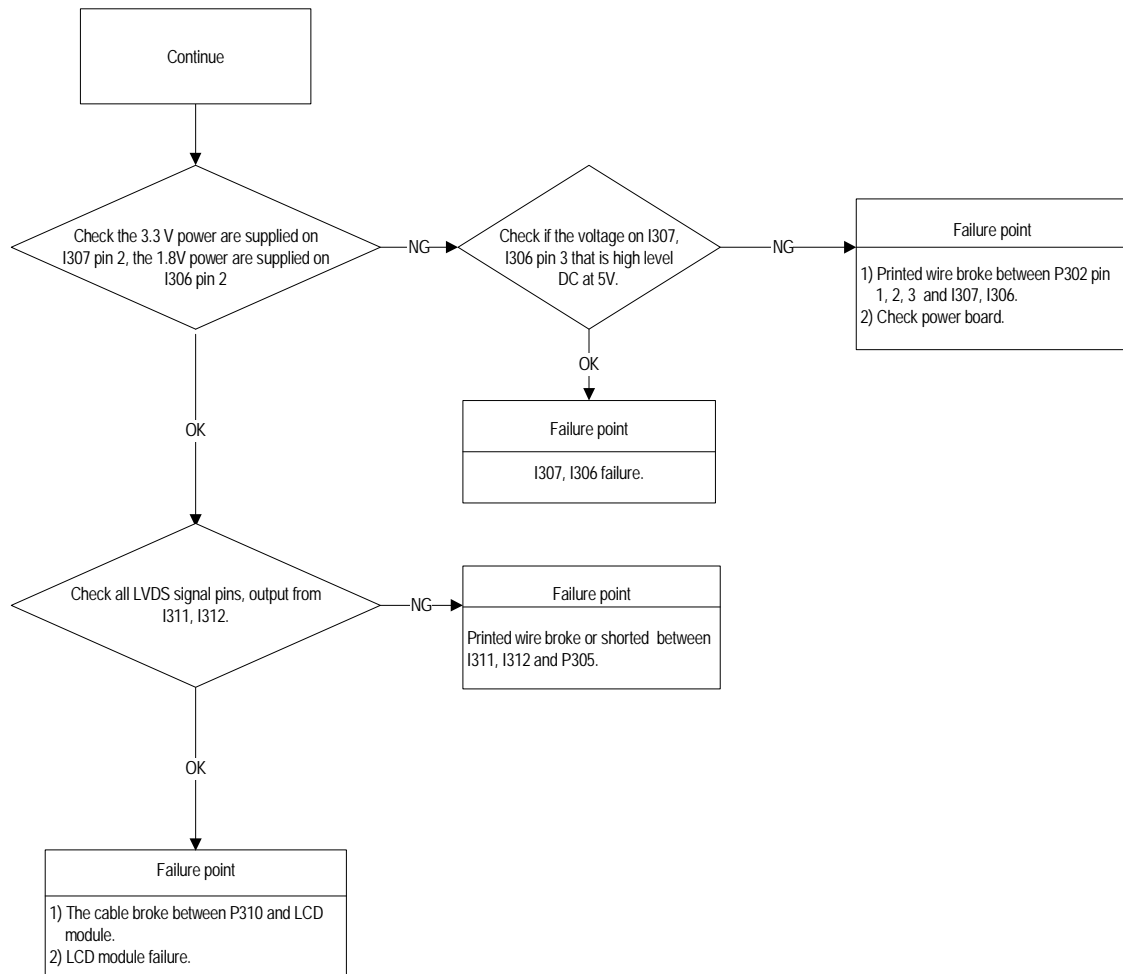
	Page
1. No Display on Screen (Screen is Black, Color of LED is Amber) .....	6-2
2. Nothing Display on Screen (Screen is Black, Color of LED is Blue) .....	6-3
3. Checking the Back Light Unit .....	6-5
4. Abnormal Screen .....	6-6
5. Abnormal OSM Display .....	6-7
5.1 OSD Adjust Problem .....	6-7
6. Abnormal Plug and Play Operation .....	6-8
6.1 Abnormal DDC2 (D-Sub) .....	6-8
6.2 Abnormal DDC2 (DVI) .....	6-8
7. Checking the Interface Circuit of Sync Signal .....	6-8
7.1 Checking the Control Circuit of Horizontal Sync Pulse .....	6-9
7.2 Checking the Control Circuit of Vertical Sync Pulse .....	6-9
8. Checking the Resolution Change IC Movement .....	6-10
9. Checking the DC/DC converter circuit .....	6-11
10. No Power On .....	6-12
11. Check the USB Hub Circuit .....	6-13
11.1 HUB is not Recongize .....	6-13
11.2 Connection Apparatus is not Recognize .....	6-14
11.3 Connection Apparatus does not Work .....	6-15
11.4 Check the USB IC .....	6-16

## 1. No Display of Screen (Screen is Black, Color of LED is Amber)

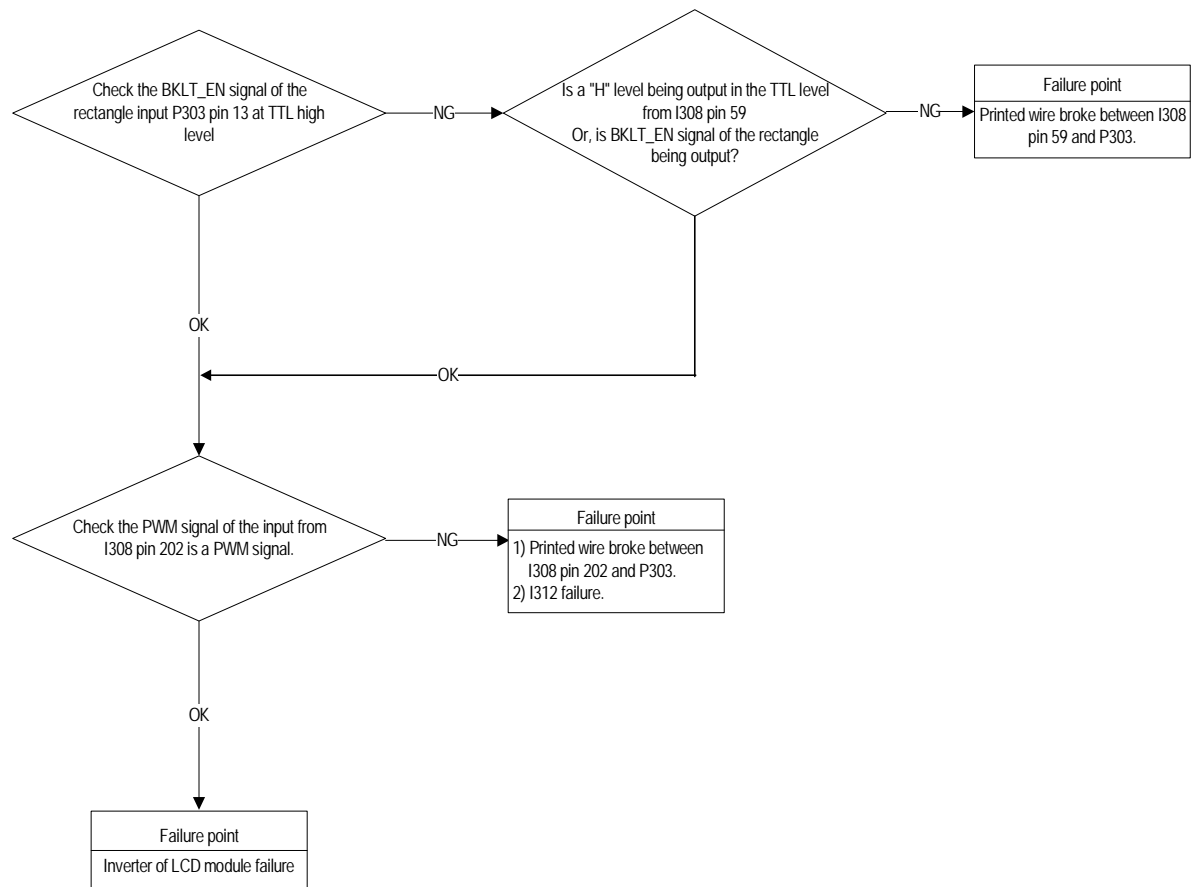


## 2. Nothing Display on Screen (Screen is Black, Color of LED is Blue)

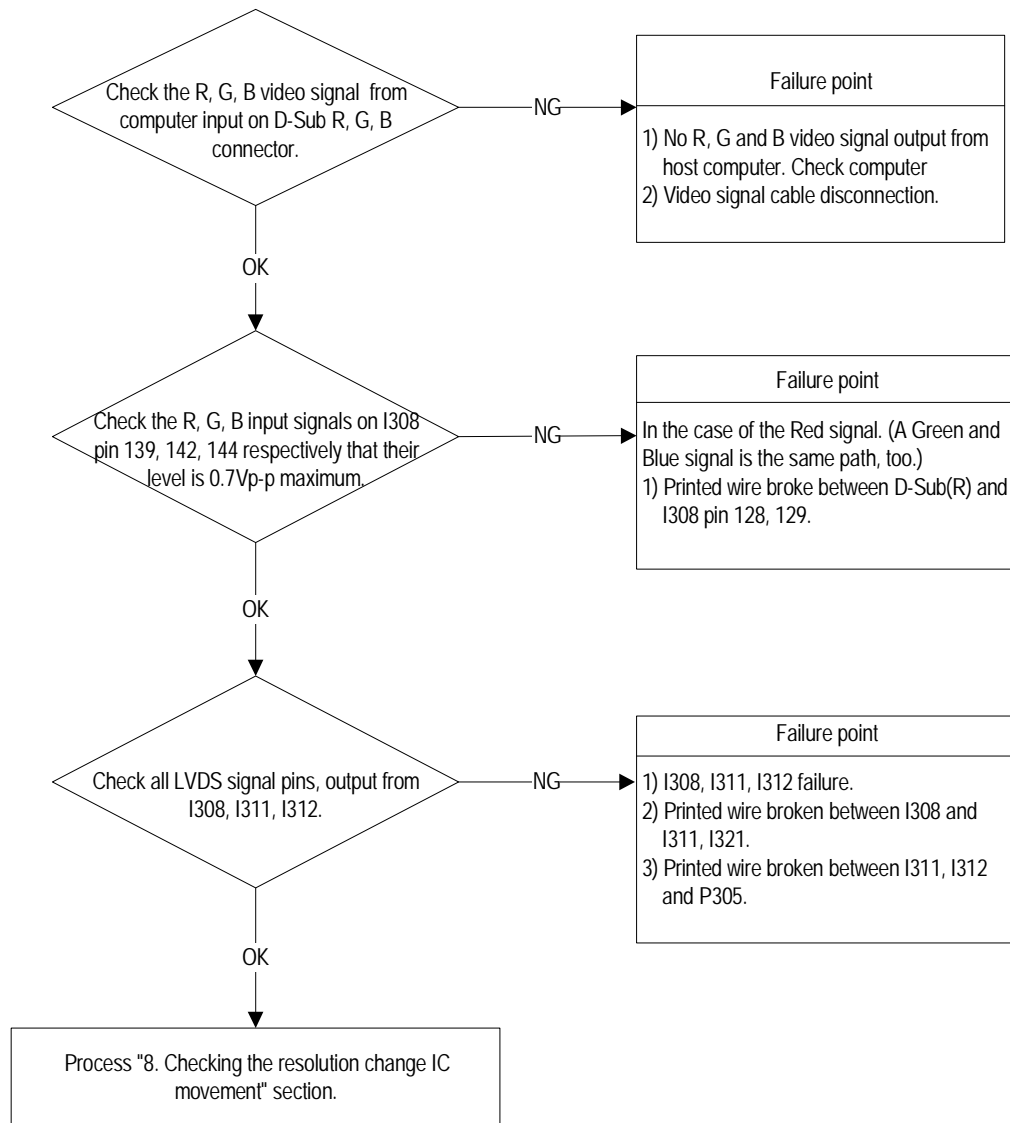




### 3. Checking the Back Light Unit

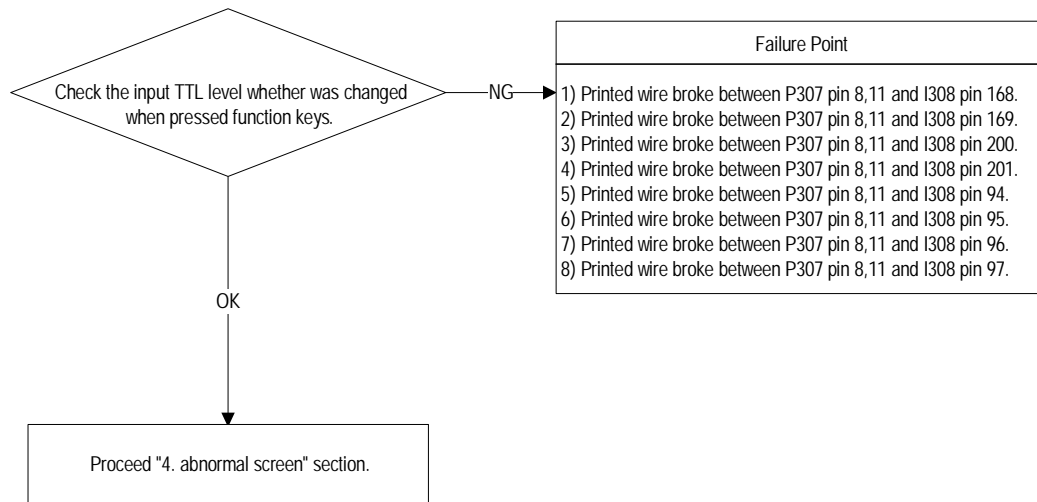


## 4. Abnormal Screen



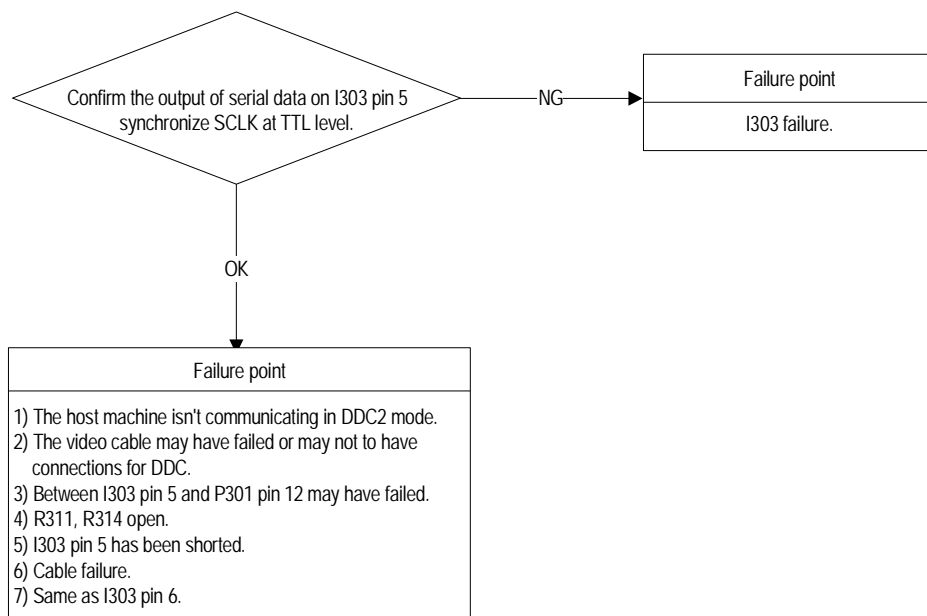
## 5. Abnormal OSM Display

### 5.1 OSD Adjust Problem

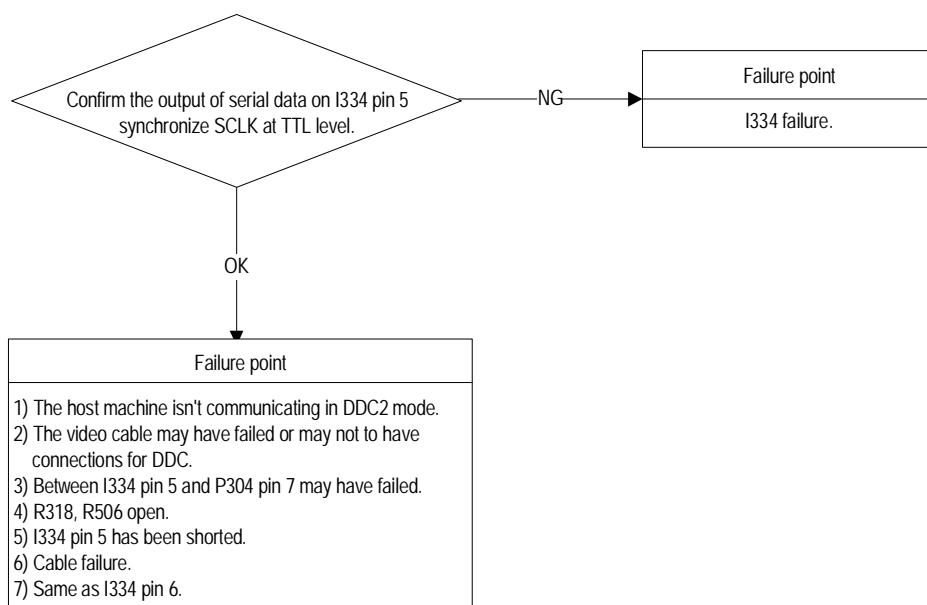


## 6. Abnormal Plug and Play Operation

### 6.1 Abnormal DDC2 (D-SUB)

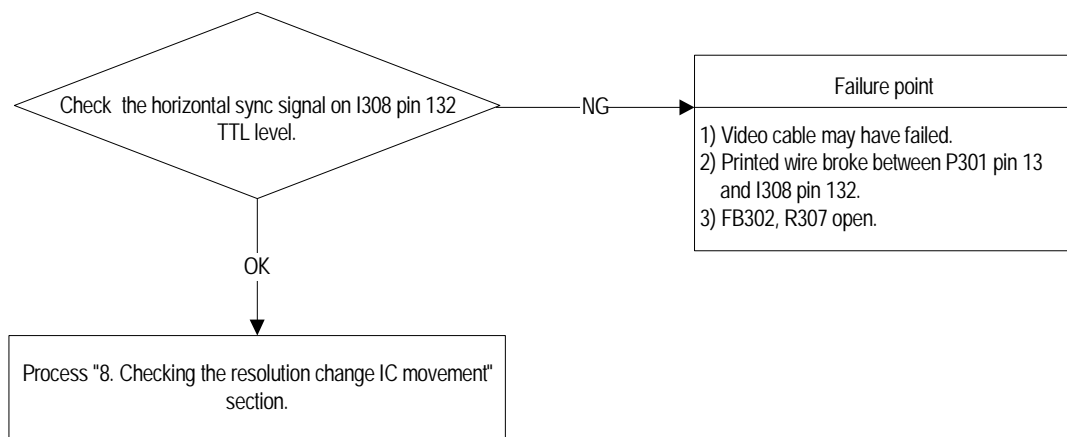


### 6.2 Abnormal DDC2 (DVI)

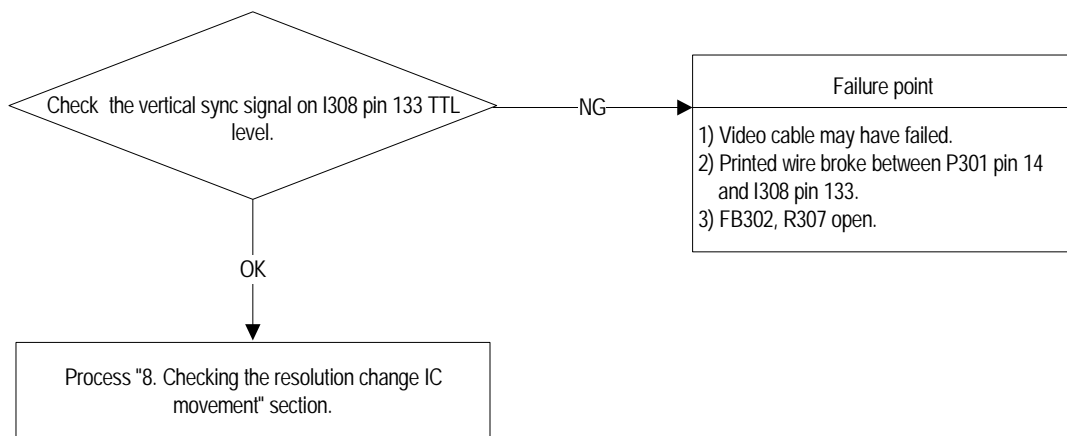


## 7. Checking the Interface Circuit of Sync Signal

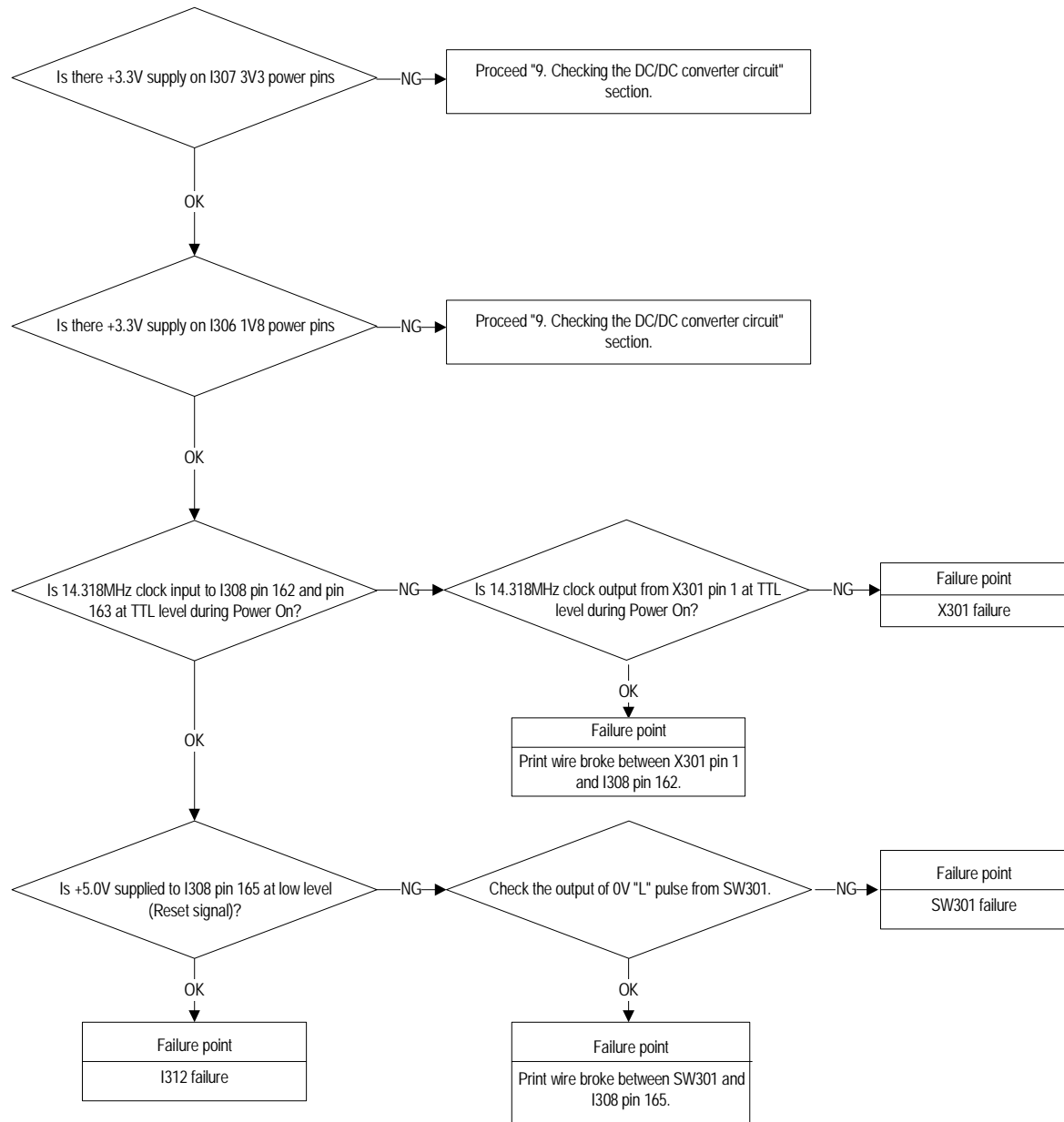
### 7.1 Checking the Control Circuit of Horizontal Sync Pulse



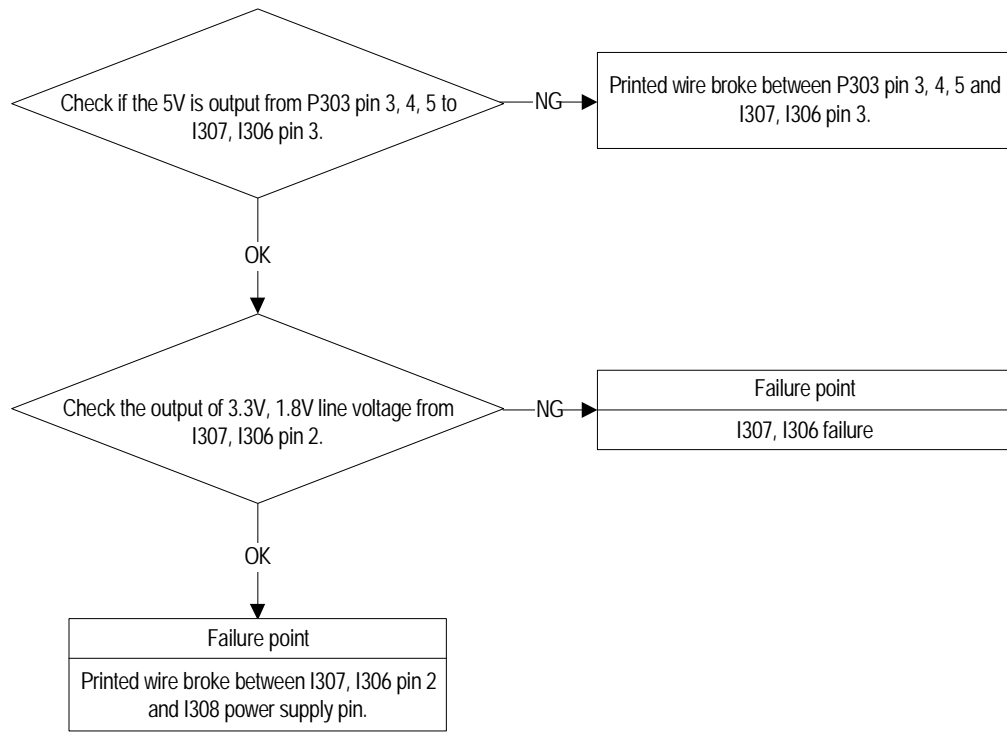
### 7.2 Checking the Control Circuit of Vertical Sync Pulse



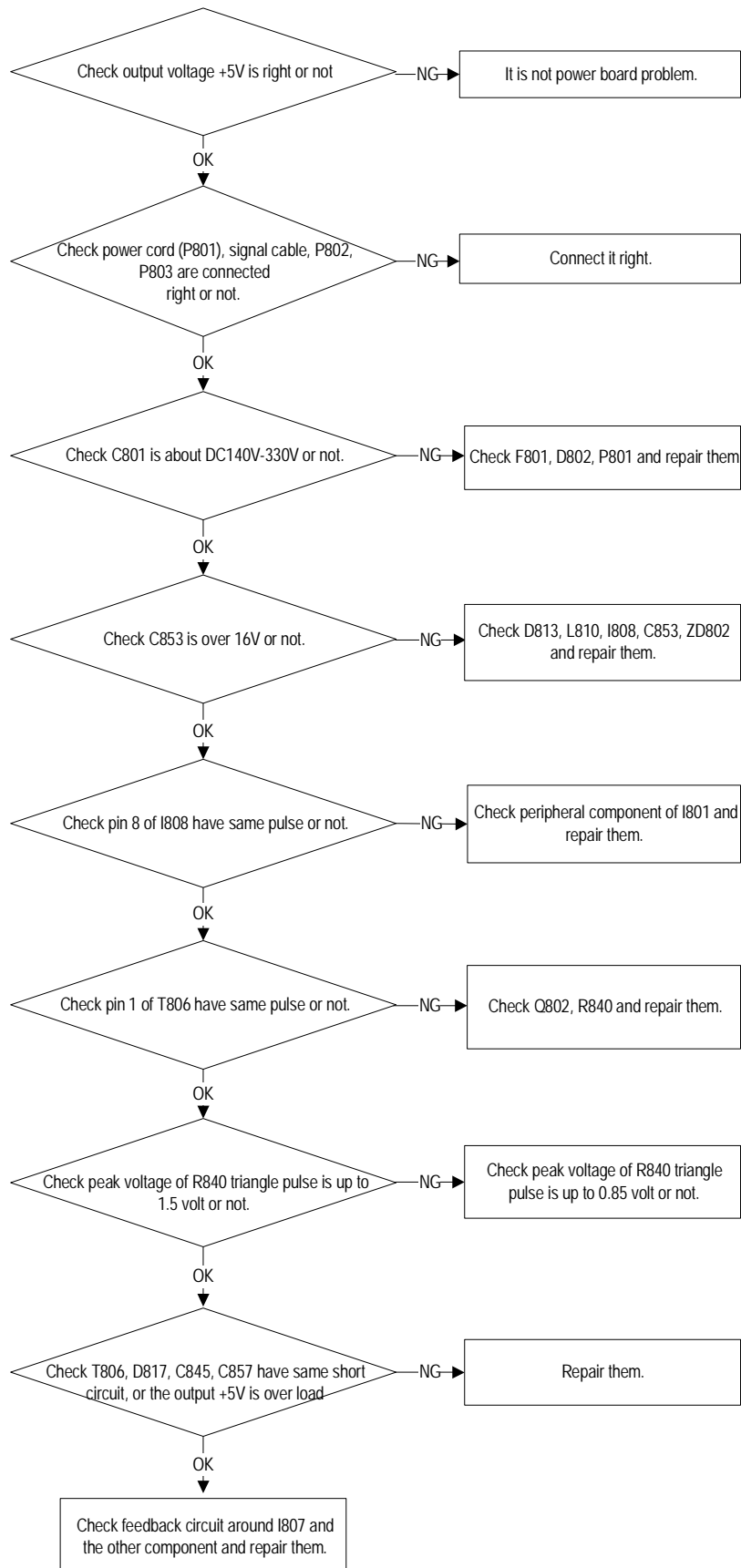
## 8. Checking the Resolution Change IC Movement



## 9. Checking the DC/DC Converter Circuit

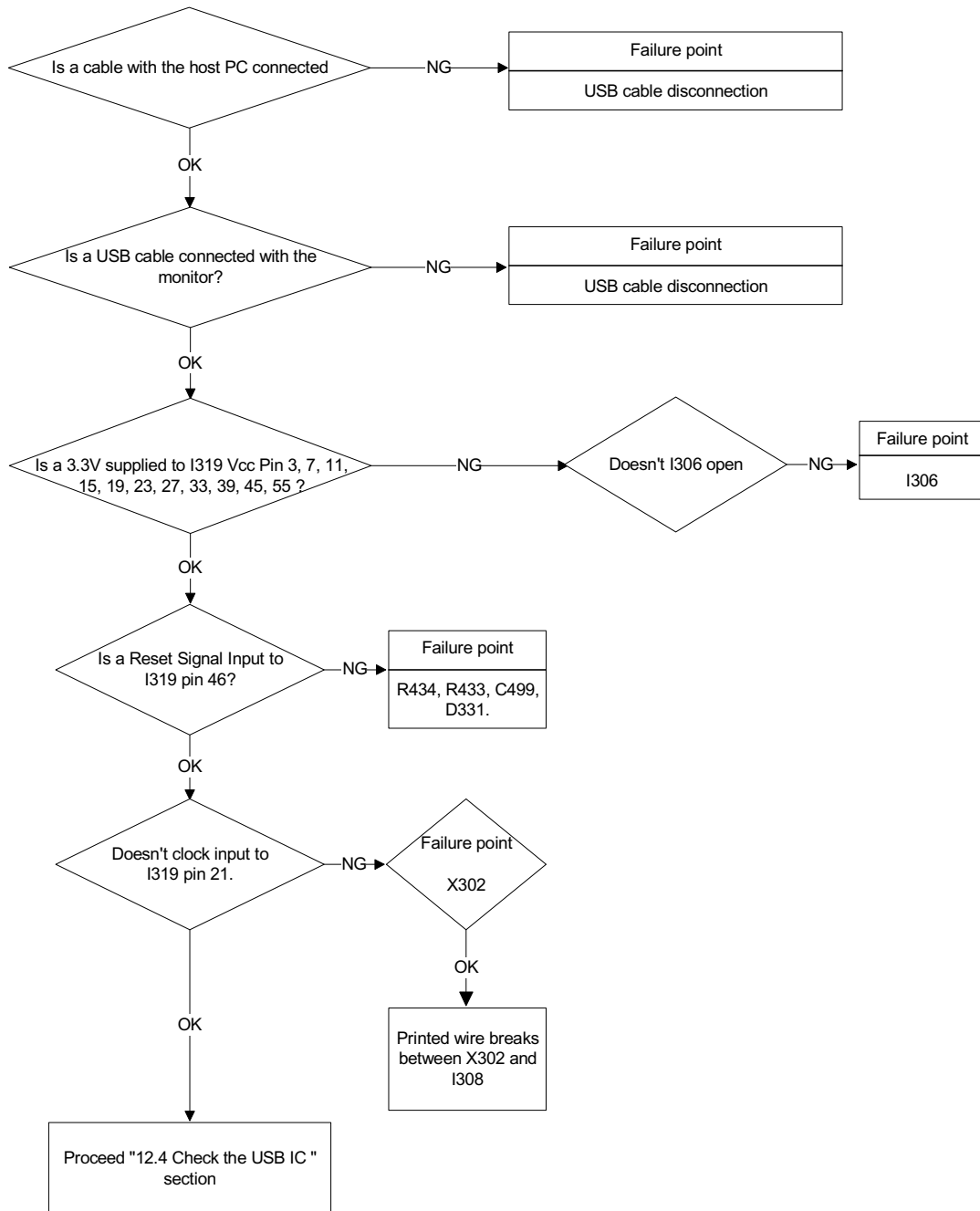


## 10. Power Board - No Power ON

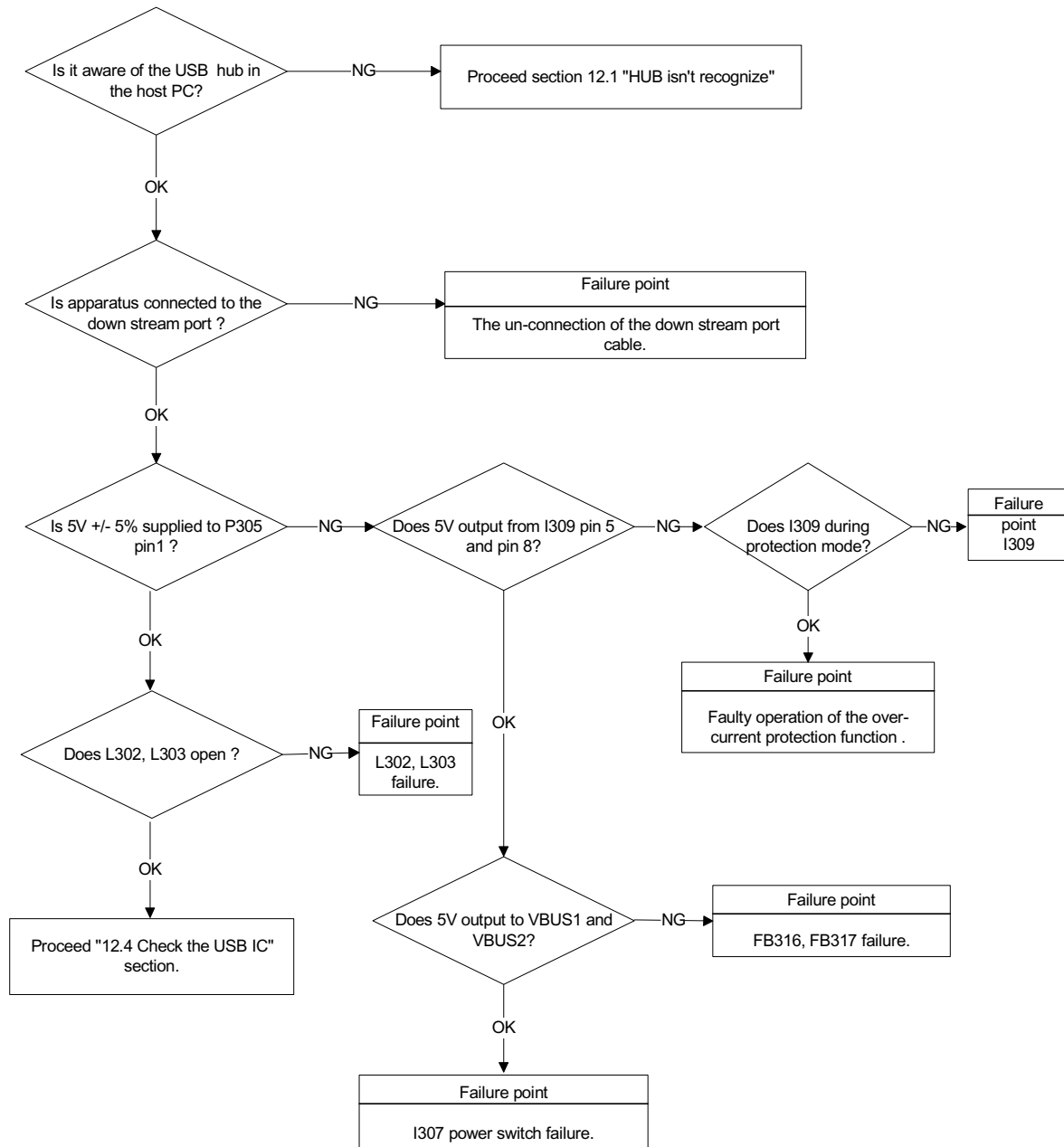


## 11. Check the USB Hub Circuit

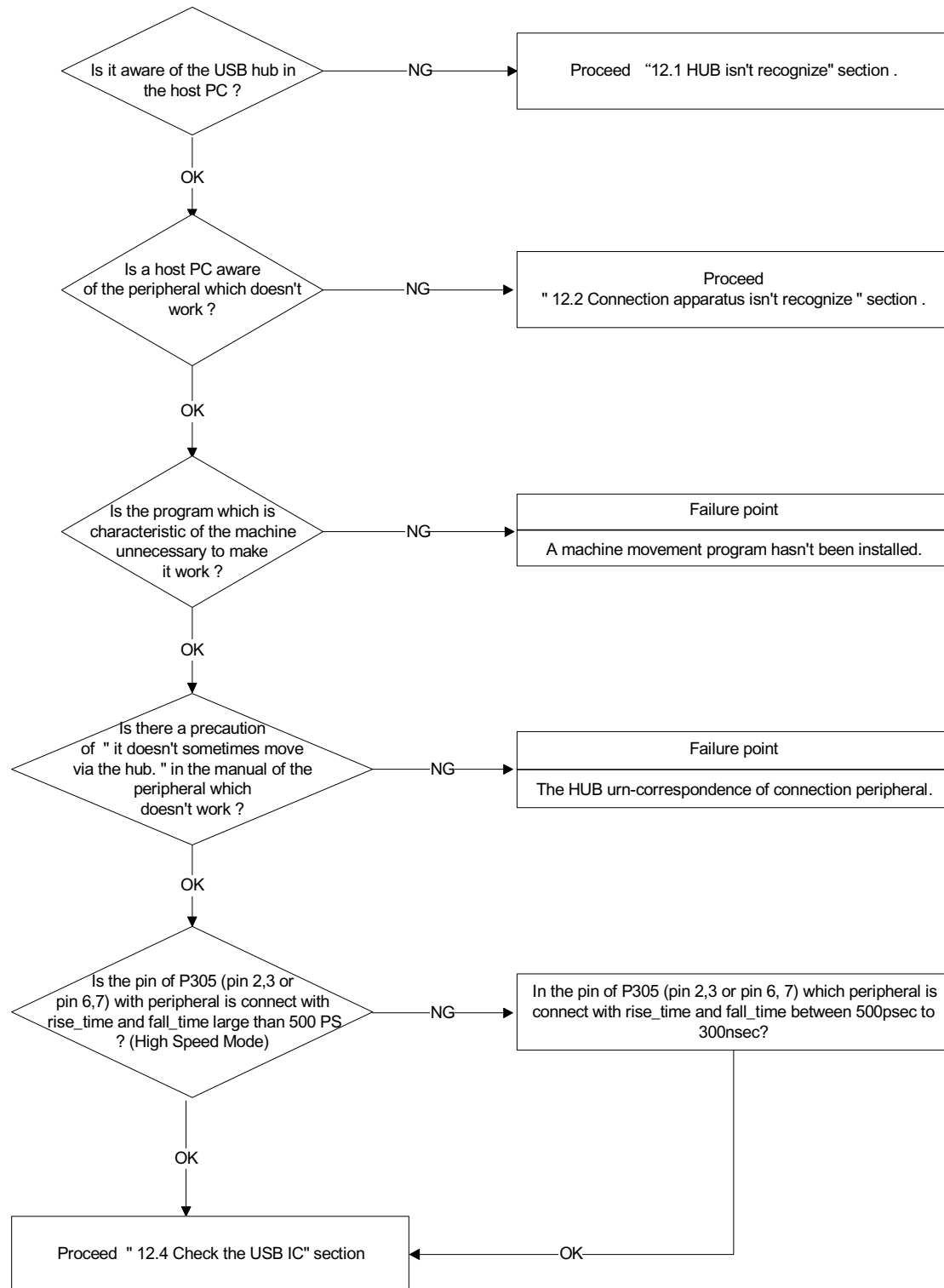
### 11.1 HUB is not Reconnize



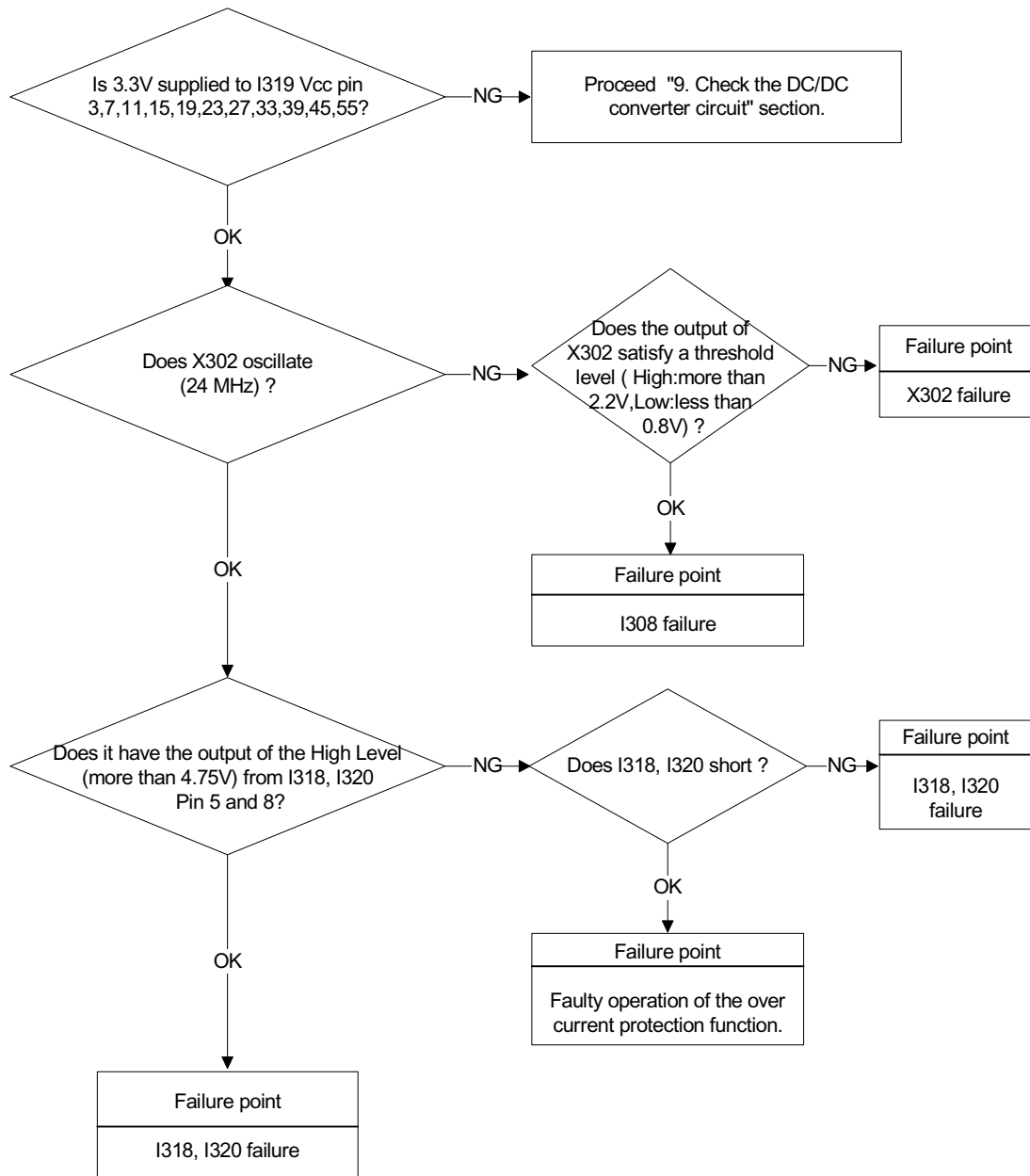
## 11.2 Connection Apparatus is not Recognize



### 11.3 Connection Apparatus does not Work



#### 11.4 Check the USB IC



# CIRCUIT DESCRIPTION

## TABLE OF CONTENTS

	Page
1. Interface Board and Panel Power Supply .....	7-2
2. Video Input Circuit .....	7-2
3. System reset, LED Control Circuit .....	7-2
4. E <sup>2</sup> PROM for EDID .....	7-2
5. E <sup>2</sup> PROM.....	7-2
6. MCU Circuit .....	7-3
7. Power Supply (Circuit diagrams MAIN PWB) .....	7-6
8. USB 2.0 Hub Circuit .....	7-8

## 1. Interface Board and Panel Power Supply

### 1.1 303 connector

A 5 power supply for L D module, scaler, and logic is generated from the 303 connector.

A12 power supply for L D module.

### 1.2 I307, I306, I317 terminal regulator

I307 : A 3.3 power supply for Scaler I I30 and SDRAM I I311 I312 are generated from the 5 .

I306 : A 1. power supply for ideo I I901 and AScaler I I30 are generated from the 3.3 .

I317 : A 3.3 power supply for USB I I319 is generated from the 5 .

I313 ON OFF control for L D Module

I327 ON OFF control for USB hub circuit.

## 2. ideo Input Circuit

The analog video signal input enters from 306 and 311, the A -coupled video signal is used to clamp the black level at 0 .

The digital TMDS input enters from 302.

## 3. System Reset, LED Control Circuit

### 3.1 System Reset

System reset is performed by detecting the rising and falling of the 5 source voltage at I30 .

### 3.2 LED Control Circuit

Blue amber control signal of the LED BLUE and LED AMBER signal pin 204, 203 from I30 .

## 4. E<sup>2</sup> ROM for EDID

The EDID of Analog input is stored in I303 and the EDID of Digital input is stored in I304 for D I E and I334 for D I to access the information of monitor.

## 5. E<sup>2</sup> ROM

Data transfer between I310 (24L 32B) and scaler I I30 is effected through the II bus S L (pin 9 ) and SDA (pin 99) of I30 . The data to be transferred to each device are stored in I310.

- I309 control data.
- OSD related setting data.
- Other control data for service menu.

## 6. M U Circuit

The source voltage for I325 is 5V, and the system clock frequency is 11.0529MHz.

### 6.1 Detection of POWER Status

Power key and RESET can on/off the system.

### 6.2 Display Mode Identification

#### 6.2.1 Functions

##### (1) Display mode identification

- The display mode of input signal is identified based on Table 1.
- When the mode has been identified through the measurement of horizontal and vertical frequencies, the total number of lines is determined with a formula where  $\text{Horizontal frequency} \times \text{Vertical frequency} = \text{Total number of lines}$ . Initial identification can be made by examining the coincidence of the obtained figure with the number of lines for the mode identified from the frequency.
- When the detected frequency if the sync signal has changed, the total number of lines should be counted even though it is the identified frequency in the same mode.

##### (2) Power saving mode.

This power saving mode is assumed when the frequency of the horizontal and vertical signal is as specified below.

- If there is no horizontal sync signal input.
- If there is no vertical sync signal input.
- If the horizontal sync signal is outside the measuring range.
- If the vertical sync signal is outside the measuring range.

NE Mode	Resolution	-fre . ( )	-fre . ( )	ixel-fre . (M )	olarity	
1	640 x 400	56.432	37.500	21.053	-	-
2	640 x 4 0	59.992	67.500	25.175	-	-
3	00 x 600	56.250	35.160	36.000		
4	00 x 600	60.320	37. 0	40.000		
5	1024 x 76	60.000	4 .360	65.000	-	-
6	12 0 x 960	60.000	60.000	10 .000		
7	12 0 x 1024	60.020	63.9 1	10 .000		
	1600 x 1200	60.000	75.000	162.000		
9	720 x 576	60.570	36.160	32.9 0		
10	1440 x 900	59.901	55.469	.750		-
11	1440 x 900	59. 7	55.935	106.500	-	
12	1400 x 1050	59.94	64.744	101.000		-
13	1400 x 1050	59.97	65.317	121.750	-	
14	16 0 x 1050	59. 0	64.670	119.000	-	
15	16 0 x 1050	59.950	65.290	146.250	-	
16	12 0 x 720	60.00	44.77	74.50	-	
17	720 x 4 0	60	31.46	27.00	-	-
1	1920 x 10 0	60i	33.75	75.25		
19	1920 x 10 0	59i	33.71	74.17		

## 6.3 User control

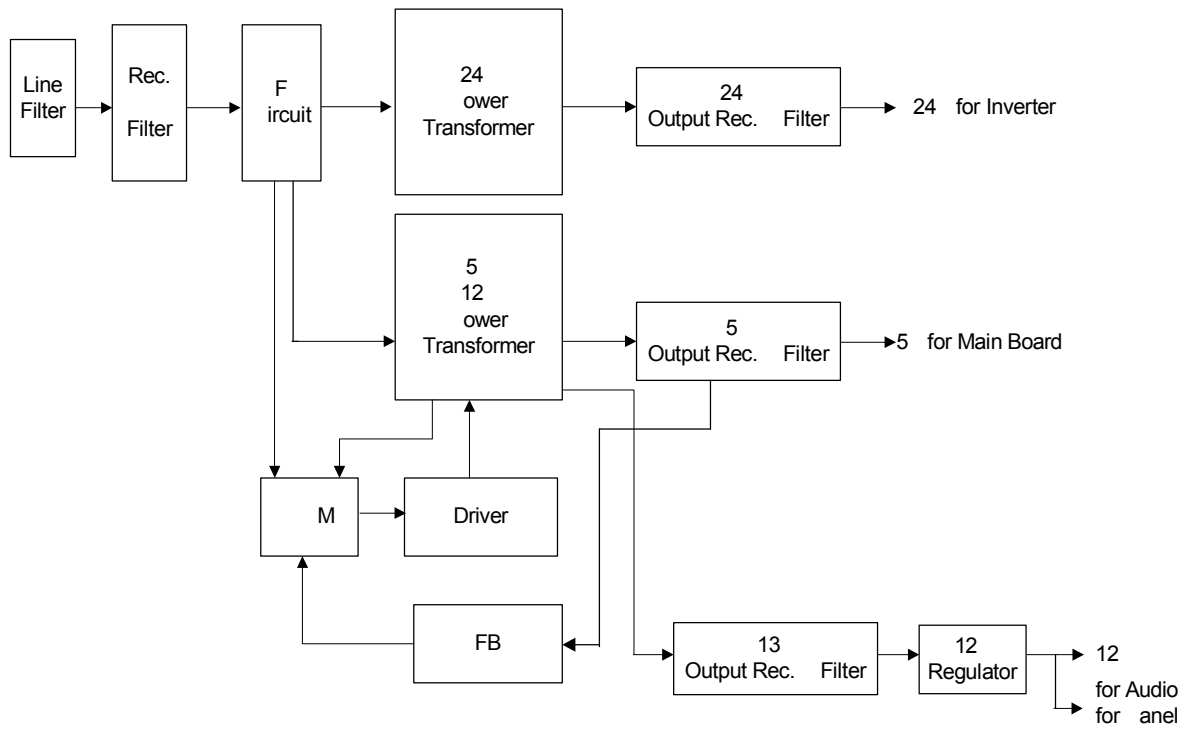
### 6.3.1 control keys

Key	Action
MENU EXIT	Enter or Exit item
SELE T	Select or Set
RESET D MODE	Reset
O ER	ower on off

## 7. Power Supply (Circuit Diagrams MAIN & B)

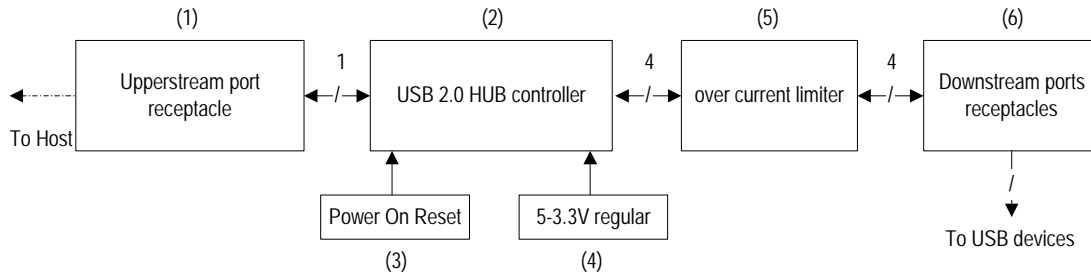
- 7.1 Line filter consists of C02, T02, C03, C05, C36, T03. It eliminates high frequency interference to meet EMI's requirement.
- 7.2 Rectifier Filter :  
Bridge diode D02 converts AC source into pulsed DC. This pulsed DC is smoothed and filtered by C01.  
R01 is NTC (negative thermal coefficient) resistors, used to reduce inrush current to be within safe range.
- 7.3 Power transformer :  
T01 converts energy for square wave from power source V01 to secondary side to generate V24.  
T06 converts energy for square wave from power source V01 to secondary side to generate V5 and V12.
- 7.4 Output :  
The square wave from T06 is rectified by D17 and D15, then filtered by C45, C57 and C4, respectively, to generate V5, V12 respectively.  
The square wave from T01 is rectified by D05, then filtered by C11, C14 generate V24 respectively.
- 7.5 Driver :  
Q02 drive T06 from VBM control of I00 for power converted respectively.  
Q01 drive T01 from VBM control of I01 for power converted respectively.
- 7.6 FB :  
Negative feedback circuit consists of photo coupler I07 and adjustable regulator I06. It can maintain output voltages V5 at a stable level.
- 7.7 Mode :  
7.7.1 Start (5 ): When power is turned on, Q02 conducts due to bias from V01 and R6. I00 starts to oscillate and outputs a pulse train through pin 1 to drive Q02.  
7.7.2 On (5 ): When Q02 turns on, V01 supplies a linearly increasing triangle current through the primary inductance of T06 to the driver Q02, once the peak value of this current multiplied by R40 exceeds 0.5 volt, pulse train will be shut down immediately to protect Q02, T06 from being burned out.  
7.7.3 Regulation (5 ): If output voltage V5 goes up, the R terminal of I00 gets more bias, accordingly photo transistor and photo diode flows more current. The voltage of pin 2 goes down, making the pulse width of pin 1 to become narrower. So the output voltage V5 will be pulled down to a stable value.  
7.7.4 SC (5 ): If output terminal is short to ground, photo transistor does not conduct, then oscillation of I00 is stop, shutting Q02 off immediately.

### Power Board Block Diagram



## . USB 2.0 USB circuit

### .1 Block Diagram



### .2 Features

- . compliant with Universal Serial Bus specification revision 2.0 (Data rate 1.5 12 4 0 Mbps).
- . 4 (Max.) downstream facing ports.
- . Supports self-powered mode only.
- . Supports over-current detection.
- . Terminal shutdown circuit.
- . Over current limiter to prevent system voltage drop.

### .3 Block Description

- (1) Host is connected to this USB hub via USB upstream cable.
- (2) Data traffic protocol between host and USB devices (downstream ports).
- (3) An active low reset output, while 3.3 power on, normal operation going back high state.
- (4) A low dropout linear regular which provides stable 3.3 for USB hub controller.
- (5) The block is equipped with an overcurrent detector that is essential for a host hub controller conforming to the USB standard.
- (6) USB devices is connected to this USB hub via USB downstream cable.

### .4 3.3 cutoff circuit for USB identification

I317 is a D D regulator to generate a 3.3 output to USB hub controller.

### .5 USB hub control circuit

I319 is a USB hub control IC made by Cypress.

I319 enables communication with upstream port when D+ and D- from the USB connector are applied to pin 1 and pin 17, respectively. Pins 14, 13, 10, 9, 6, 5, 2 and 1 are connected to the USB connector of the downstream port. They function as a communication interface between downstream and upstream ports. If an overcurrent is generated in the downstream port, it is transferred to the upstream port.

X302 is a crystal oscillator that supplies a 24MHz clock signal to the USB hub control IC.

### .6 Downstream port circuit

The USB 5 output from the power supply passes through power-switches of I31 and I320, and is led to the power supply pins (pin 1 and pin 5 of each connector) of the USB Downstream port connector.

An overcurrent signal is given from USB Downstream port through power switch connector line to detection and overcurrent has been generated in the Downstream port when detected.

# REPLACEMENT PARTS LIST

## TABLE OF CONTENTS

	Page
Model 20 GX <sup>2</sup> (B) (For Europe) .....	-2

# REPLACEMENT PARTS LIST(For Europe)

The components specified for Model 20WGX<sup>2</sup>(B)

SYMBOL	For Europe (Lite-on Part Number)	DESCRIPTION
PWB ASSYS		
0	5113301255P	U20BNL(03)_NECDS_INTERFACE BD
0	5114300385P	U20BNL(03)_NECDS_POWER BD
0	5113700055P	U20BNL(03)_NECDS_USB BD
0	5113800416P	U20BNL(99)_NECDS_FUNCTION KEY BD LCD

## CAPACITOR :

C842	6311310245P70	CAP. ALU_uF_1000_25V_T_105C_12.5x20_PW
C801	6312715141P70	CAP. ALU_uF_150_450V_LL_105C_18*46
C801	6312715141P01	CAP. ALU_uF_150_450V_LL_105C_18x45
C848	6311547945P70	CAP. ALU_uF_4.7_50V_T_105C_5*11
C811	6311447145P70	CAP. ALU_uF_470_35V__105C_10*20
C814	6311447145P70	CAP. ALU_uF_470_35V__105C_10*20
C810	6338510115P30	CAP. CD_pF_100_1000V_K_T_X7R_SEC
C850	6338510115P30	CAP. CD_pF_100_1000V_K_T_X7R_SEC
C828	6338410215P30	CAP. CD_pF_100_500V_K_T_X7R_SEC
C829	6338410215P30	CAP. CD_pF_100_500V_K_T_X7R_SEC
C849	6338210215P30	CAP. CD_pF_1000_100V_K_T_X7R_SEC
C802	6302410262P01	CAP. CD_pF_1000_250V_M_F_P=10_SY1_SEC
C805	6302410262P01	CAP. CD_pF_1000_250V_M_F_P=10_SY1_SEC
C808	6302410262P01	CAP. CD_pF_1000_250V_M_F_P=10_SY1_SEC
C836	6302410262P01	CAP. CD_pF_1000_250V_M_F_P=10_SY1_SEC
C822	6338547115P	CAP. CD_pF_470_1000V_K_T_X7R
C816	6338547215P30	CAP. CD_pF_4700_1000V_K_T_X7R_SEC
C830	6338547215P30	CAP. CD_pF_4700_1000V_K_T_X7R_SEC
C832	6338547215P30	CAP. CD_pF_4700_1000V_K_T_X7R_SEC
C804	6336510305P	CAP. CD_uF_0.01_1000V_M_T_Z5U
C854	6336510305P	CAP. CD_uF_0.01_1000V_M_T_Z5U
C308	6371110056P03	CAP. MC_pF_10_50V_J_NPO
C813	6371110252P00	CAP. MC_pF_1000_50V_J_NPO_0805_COMPOSTA
C817	6371110252P00	CAP. MC_pF_1000_50V_J_NPO_0805_COMPOSTA
C852	6371110252P00	CAP. MC_pF_1000_50V_J_NPO_0805_COMPOSTA
C864	6371110252P00	CAP. MC_pF_1000_50V_J_NPO_0805_COMPOSTA
C483	6371118056P	CAP. MC_pF_18_50V_J_NPO_SMD (PB)
C484	6371118056P	CAP. MC_pF_18_50V_J_NPO_SMD (PB)
C513	6371122056P	CAP. MC_pF_22_50V_J_NPO_SMD 060
C516	6371122056P	CAP. MC_pF_22_50V_J_NPO_SMD 060
C809	6371222102P00	CAP. MC_pF_220_50V_M_X7R SMD_0805_COMPO
C851	6371222102P00	CAP. MC_pF_220_50V_M_X7R SMD_0805_COMPO
C309	6371147056P	CAP. MC_pF_47_50V_J_NPO_SMD 060
C310	6371147056P	CAP. MC_pF_47_50V_J_NPO_SMD 060
C311	6371147056P	CAP. MC_pF_47_50V_J_NPO_SMD 060
C312	6371147056P	CAP. MC_pF_47_50V_J_NPO_SMD 060
C525	6371147056P	CAP. MC_pF_47_50V_J_NPO_SMD 060
C526	6371147056P	CAP. MC_pF_47_50V_J_NPO_SMD 060
C405	6371156956P	CAP. MC_pF_5.6_50V_J_NPO_0603
C406	6371156956P	CAP. MC_pF_5.6_50V_J_NPO_0603
C485	6371150956P	CAP. MC_pF_5_50V_J_NPO_SMD 0603
C486	6371150956P	CAP. MC_pF_5_50V_J_NPO_SMD 0603
C487	6371150956P	CAP. MC_pF_5_50V_J_NPO_SMD 0603
C488	6371150956P	CAP. MC_pF_5_50V_J_NPO_SMD 0603
C601	6371150956P	CAP. MC_pF_5_50V_J_NPO_SMD 0603
C603	6371150956P	CAP. MC_pF_5_50V_J_NPO_SMD 0603

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
604	6371150956	A . M pF 5 50 J N O SMD 0603
605	6371150956	A . M pF 5 50 J N O SMD 0603
517	6371156156 03	A . M pF 560 50 J N O
304	6371210356	A . M uF 0.01 50 J X7R
330	6371210356	A . M uF 0.01 50 J X7R
407	6371210356	A . M uF 0.01 50 J X7R
40	6371210356	A . M uF 0.01 50 J X7R
409	6371210356	A . M uF 0.01 50 J X7R
410	6371210356	A . M uF 0.01 50 J X7R
19	6371210312	A . M uF 0.01 50 X7R SMD 0 05
47	6371210312	A . M uF 0.01 50 X7R SMD 0 05
62	6373210412	A . M uF 0.1 25 X7R SMD 0 05
302	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
303	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
305	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
307	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
314	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
316	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
317	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
320	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
321	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
322	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
324	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
325	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
327	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
32	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
329	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
331	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
333	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
334	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
335	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
336	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
337	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
33	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
339	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
340	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
341	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
342	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
344	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
346	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
353	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
355	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
359	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
361	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
366	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
367	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
36	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
369	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
370	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
371	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
372	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
373	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
374	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
375	6371210416	A . M uF 0.1 50 X7R SMD 0603 B

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
376	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
377	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
37	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
379	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
3 0	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
3 4	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
3 5	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
3 6	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
3 7	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
3	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
3 9	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
390	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
391	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
392	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
396	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
397	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
39	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
399	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
400	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
401	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
404	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
411	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
412	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
414	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
417	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
419	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
420	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
421	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
422	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
427	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
42	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
429	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
430	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
431	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
432	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
433	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
434	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
446	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
447	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
44	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
456	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
457	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
459	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
462	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
464	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
465	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
46	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
469	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
470	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
471	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
472	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
473	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
474	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
475	6371210416	A . M uF 0.1 50 X7R SMD 0603 B

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
476	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
477	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
47	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
490	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
491	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
493	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
495	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
496	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
499	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
506	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
507	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
50	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
509	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
510	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
512	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
514	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
51	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
521	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
524	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
527	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
601	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
604	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
605	6371210416	A . M uF 0.1 50 X7R SMD 0603 B
23	6374222412 00	A . M uF 0.22 16 X7R 0 05 OM OSTA
31	6371247413 00	A . M uF 0.47 50 X7R 1206 OM OSTA
1	6371247413 00	A . M uF 0.47 50 X7R 1206 OM OSTA
522	6374210512	A . M uF 1 16 X7R SMD 0 05
1	6374210512	A . M uF 1 16 X7R SMD 0 05
301	6374410502	A . M uF 1 16 M Y5 SMD 0 05
343	6374410502	A . M uF 1 16 M Y5 SMD 0 05
4 9	6374410502	A . M uF 1 16 M Y5 SMD 0 05
511	6374410502	A . M uF 1 16 M Y5 SMD 0 05
523	6374410502	A . M uF 1 16 M Y5 SMD 0 05
531	6374410502	A . M uF 1 16 M Y5 SMD 0 05
532	6374410502	A . M uF 1 16 M Y5 SMD 0 05
415	63744105 6 01	A . M uF 1 16 Z Y5
603	63754106 3 01	A . M uF 10 10 Z Y5 SMD 1206 SMD
530	63744225 2	A . M uF 2.2 16 Z Y5 SMD 0 05 B
515	6374247513 10	A . M uF 4.7 16 X7R
515	6374247513 20	A . M uF 4.7 16 X7R
55	6321310512	A . MEF uF 1 450 L4 15 TAIYANG:
56	6321310512	A . MEF uF 1 450 L4 15 TAIYANG:
03	632 47432	A . X2 M uF 0.47 275 15 IL OR
06	632 47432	A . X2 M uF 0.47 275 15 IL OR
35	6311501045 60	A .ALU uF 1 50 T 105 5x11 Y EMI ON
07	6311510045 60	A .ALU uF 10 50 T 105 5x11
53	6311510045 60	A .ALU uF 10 50 T 105 5x11
61	6311510045 60	A .ALU uF 10 50 T 105 5x11
12	6311510045 60	A .ALU uF 10 50 T 105 5x11
45	6311110142 50	A .ALU uF 100 10 L3.5 2 105 5x11 YXG
43	6311310145 60	A .ALU uF 100 25 T 105 6.3x11
45	6311210245 60	A .ALU uF 1000 16 T 105 10x20
57	6311210245 60	A .ALU uF 1000 16 T 105 10x20
46	6311210245 60	A .ALU uF 1000 16 T 105 10x20

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
46	6311210245 72	A .ALU uF 1000 16 T 105 10x20 NI
356	6311122142 60	A .ALU uF 220 10 L3.5 2.5 105 6.3x11
360	6311122142 60	A .ALU uF 220 10 L3.5 2.5 105 6.3x11
362	6311122142 60	A .ALU uF 220 10 L3.5 2.5 105 6.3x11
454	6311122142 60	A .ALU uF 220 10 L3.5 2.5 105 6.3x11
461	6311122142 60	A .ALU uF 220 10 L3.5 2.5 105 6.3x11
463	6311122142 60	A .ALU uF 220 10 L3.5 2.5 105 6.3x11
492	6311122142 60	A .ALU uF 220 10 L3.5 2.5 105 6.3x11
494	6311122142 60	A .ALU uF 220 10 L3.5 2.5 105 6.3x11
347	6311322142 60	A .ALU uF 220 25 L3.5 3.5 105 x11.5
416	6311322142 60	A .ALU uF 220 25 L3.5 3.5 105 x11.5
20	6311547945 60	A .ALU uF 4.7 50 T 105 5x11
365	6311347042 60	A .ALU uF 47 25 L3.5 2 105 5x11 Y N
3 2	6311347042 60	A .ALU uF 47 25 L3.5 2 105 5x11 Y N
3 3	6311347042 60	A .ALU uF 47 25 L3.5 2 105 5x11 Y N
394	6311347042 60	A .ALU uF 47 25 L3.5 2 105 5x11 Y N
395	6311347042 60	A .ALU uF 47 25 L3.5 2 105 5x11 Y N
403	6311347042 60	A .ALU uF 47 25 L3.5 2 105 5x11 Y N
41	6311347042 60	A .ALU uF 47 25 L3.5 2 105 5x11 Y N
426	6311347042 60	A .ALU uF 47 25 L3.5 2 105 5x11 Y N

OIL AND FILTER :

L301	611100002	OIL O E OMMON(SMD) O M 160 25
L302	611100002	OIL O E OMMON(SMD) O M 160 25
L303	611100002	OIL O E OMMON(SMD) O M 160 25
L304	611100002	OIL O E OMMON(SMD) O M 160 25
L305	611100002	OIL O E OMMON(SMD) O M 160 25
L 01	61112 5131	OIL O E F u 2 2.5 13 T 0 52 LSE
L 03	6111549130	OIL O E u 5.4
L 10	6115479104 00	OIL EA ING u 4.7 T26 STAR AL0307TB
T 02	613 000002 00	LINE FILTER m 12 ET24 LSE(FLI5005EL)
T 03	613 003601	LINE FILTER m 14 FR16 12 LSE(TUBE)
FB301	6 1101 9	ORE BEAD B 2125 S 431 TIAYO
FB302	6 1101 9	ORE BEAD B 2125 S 431 TIAYO
FB332	6 110237	ORE BEAD BY201209T 170Y S ILISIN
FB334	6 110237	ORE BEAD BY201209T 170Y S ILISIN
FB343	6 110237	ORE BEAD BY201209T 170Y S ILISIN
FB344	6 110237	ORE BEAD BY201209T 170Y S ILISIN
FB345	6 110237	ORE BEAD BY201209T 170Y S ILISIN
FB346	6 110237	ORE BEAD BY201209T 170Y S ILISIN
FB347	6 110237	ORE BEAD BY201209T 170Y S ILISIN
FB34	6 110237	ORE BEAD BY201209T 170Y S ILISIN
FB303	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB304	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB305	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB312	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB313	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB314	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB315	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB316	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB317	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB321	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB322	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB324	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB325	6 110217	ORE BEAD BY201209T 300Y S ILISIN

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
FB327	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB330	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB331	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB335	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB336	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB341	6 110217	ORE BEAD BY201209T 300Y S ILISIN
FB307	6 160397	ORE BEAD SB 160 0 T 060Y S SMD ILISIN
FB309	6 160397	ORE BEAD SB 160 0 T 060Y S SMD ILISIN
FB311	6 160397	ORE BEAD SB 160 0 T 060Y S SMD ILISIN
FB306	6 1602 7	ORE BEAD SB 160 0 T 101Y S SMD ILISIN
FB30	6 1602 7	ORE BEAD SB 160 0 T 101Y S SMD ILISIN
FB310	6 1602 7	ORE BEAD SB 160 0 T 101Y S SMD ILISIN
L 02	6 1001507	ORE BEAD 5 R 3.5x6x1.0T
L 04	6 1001507	ORE BEAD 5 R 3.5x6x1.0T
L 06	6 1001507	ORE BEAD 5 R 3.5x6x1.0T

#### ONNE TOR :

301	6642151200	ONNE TOR D SUB 15 01 D 153S1B BN
302	6649001011	ONNE TOR D I D 24 IN 160 21130 NT G2
602	6649004100	ONNE TOR USB A 2 USBR 0 SA TAIT UN
310	6649003600	ONNE TOR USB Ax2 AA DG00 0MAINSU ER
602	6649003600	ONNE TOR USB Ax2 AA DG00 0MAINSU ER
309	6649003500	ONNE TOR USB B 4 ABD X004 0 MAINSU ER
02	6613090010	LUG 09 2.0mm J T A2001 2
30	6613100050	LUG 10 2.0mm A2006 R0 2x5 J T
601	6610110030	LUG 11 1.0mm JS 1254 11 YAD S IUNN
307	6613130020	LUG 13 2.0mm J T A2001 2 13
303	6611130040	LUG 13 2.5mm A2501 R2 J T
03	6611130040	LUG 13 2.5mm A2501 R2 J T
305	6613300010	LUG 30 2.0mm A2006 0 2x15 J T
304	6613040030	LUG 4 2.0mm A2001 2 4
I325B	6626440020	SO ET I 111 44TAB2 44 L
05	6614030001 00	AFER 3 3.96mm A3963 R2 3 D J T

#### DIODE

D 02	6417001610	DIODE BRIDGE GBU4 4A 00 GBU ANJIT
D 13	6412026704	DIODE ER104 1A 400 DO41 T26 35nS ANJIT
D 61	6412026704	DIODE ER104 1A 400 DO41 T26 35nS ANJIT
D 07	6412000540	DIODE ER306 3A 600 35nS ANJIT
D 20	641202630	DIODE ESD SU RESSOR ORT0603 100M 05
D 21	641202630	DIODE ESD SU RESSOR ORT0603 100M 05
D 22	641202630	DIODE ESD SU RESSOR ORT0603 100M 05
D 23	641202630	DIODE ESD SU RESSOR ORT0603 100M 05
D 04	6412026604	DIODE FAST RE O ERY G10 R 1A 00 DO 41
D 14	6412026604	DIODE FAST RE O ERY G10 R 1A 00 DO 41
D301	641200173	DIODE RLS414 LL 34 SMD RO M
D305	641200173	DIODE RLS414 LL 34 SMD RO M
D307	641200173	DIODE RLS414 LL 34 SMD RO M
D30	641200173	DIODE RLS414 LL 34 SMD RO M
D311	641200173	DIODE RLS414 LL 34 SMD RO M
D313	641200173	DIODE RLS414 LL 34 SMD RO M
D315	641200173	DIODE RLS414 LL 34 SMD RO M
D317	641200173	DIODE RLS414 LL 34 SMD RO M
D 06	641200173	DIODE RLS414 LL 34 SMD RO M
D 0	641200173	DIODE RLS414 LL 34 SMD RO M
D 16	641200173	DIODE RLS414 LL 34 SMD RO M

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
D 1	641200173	DIODE RLS414 LL 34 SMD RO M
D 17	6413060020	DIODE S OTT Y F 20A06 20A 60 B NI E
D 01	64131 0007	DIODE S OTT Y 6 E1 0A 1 mA 1 0 T52
D 12	64131 0007	DIODE S OTT Y 6 E1 0A 1 mA 1 0 T52
D 15	6412015220	DIODE S IT ING ER1002F 10A 200 35NS
D 05	6412000010 20	DIODE S IT ING ER1004F T 10A 400 50nS
D330	641200177	DIODE S IT ING MM414 0.15A 75
D331	641200177	DIODE S IT ING MM414 0.15A 75
D316	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D31	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D319	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D320	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D321	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D322	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D323	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D324	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D325	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D326	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D327	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D32	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D329	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
D332	641201951	DIODE S IT ING MMBD7000 7 75 SOT23 4nS
1	6425000115 20	DIODE T YRISTOR S R BT169D TO92 ILI S
D302	641405610	DIODE ZENER MMSZ5232B 7 5.6 SOD123 DII
D303	641405610	DIODE ZENER MMSZ5232B 7 5.6 SOD123 DII
D304	641405610	DIODE ZENER MMSZ5232B 7 5.6 SOD123 DII
D306	641405610	DIODE ZENER MMSZ5232B 7 5.6 SOD123 DII
D309	641405610	DIODE ZENER MMSZ5232B 7 5.6 SOD123 DII
D310	641405610	DIODE ZENER MMSZ5232B 7 5.6 SOD123 DII
D312	641405610	DIODE ZENER MMSZ5232B 7 5.6 SOD123 DII
D314	641405610	DIODE ZENER MMSZ5232B 7 5.6 SOD123 DII
ZD 04	641420009	DIODE ZENER RLZ22B 20mA 20.64 21.71 LL
ZD 02	6414300014 20	DIODE ZNR GDZJ-30D T26 GRANDE
ZD 03	641400001 20	DIODE ZNR GLZJ27 MINI MELF B GRANDE
ZD 1	641400001 20	DIODE ZNR GLZJ27 MINI MELF B GRANDE
ZD 01	6414240014	DIODE ZNR MTZJ T 77 24B T26
D601	641 00610	LED LTST 155TBJ S T BLUE YELLO SMD LITE

TRANSISTOR :

I329	6426011 0	FET N NL FDN335N 1.7A 20 FAIR ILD
03	6426000020 00	FET N NL 13N50 13A 500 FAIR ILD
04	642601071	FET N NL 2N7002LT1 SOT 23 LR
01	6426000010 00	FET N NL N 0 A 00 FAIR ILD
02	6426000010 00	FET N NL N 0 A 00 FAIR ILD
05	6421000535	TRANSISTOR N N 2S 945 TO 92 B
05	6421000525	TRANSISTOR N N T 945 AT E
I331	642200003 10	TRANSISTOR N N MMDT3904 SOT-363 DII
301	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
302	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
306	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
30	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
309	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
312	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
313	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
314	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
316	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
320	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
321	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
323	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
326	642200001 20	TRANSISTOR N N MBS3904 SOT23 ILI S
0	6423000225	TRANSISTOR N 2SA733 T0 92 B
0	6423000215	TRANSISTOR N TA733 AT TO
303	642300001 20	TRANSISTOR N MBS3906 SOT23 ILI S
304	642300001 20	TRANSISTOR N MBS3906 SOT23 ILI S
317	642300001 20	TRANSISTOR N MBS3906 SOT23 ILI S
31	642300001 20	TRANSISTOR N MBS3906 SOT23 ILI S
319	642300001 20	TRANSISTOR N MBS3906 SOT23 ILI S
322	642300001 20	TRANSISTOR N MBS3906 SOT23 ILI S
324	642300001 20	TRANSISTOR N MBS3906 SOT23 ILI S
327	642300001 20	TRANSISTOR N MBS3906 SOT23 ILI S
32	642300001 20	TRANSISTOR N MBS3906 SOT23 ILI S

I 31	644203430	I AI 1526 0 S IN SO AI
I320	644203430	I AI 1526 0 S IN SO AI
I313	644401470	I MOS AO3401 3 SOT23 AOS(AL A OMEGA)
I30	644400000 6 21	I MOS GM5 61 20 F GENESIS
I311	644 00015 40	I MOS M12L16161A-5TG 50 TSO ESMT
I312	644 00015 40	I MOS M12L16161A-5TG 50 TSO ESMT
I309	644 02710	I MOS SST25LF040A 33 4 S2AE SOI S
I303	644 01 20	I U 24L 02BT SN IN SOI MI RO I
I334	644 01 20	I U 24L 02BT SN IN SOI MI RO I
I310	644 01 30	I U 24L 32AT SNG IN SOI MI RO I
I319	644 02201	I U Y7 65640A LFX 56 FN TA ING
I325	644 01 900 50	I U SM 9516 25J 44 L SYN MOS
I332	644200006 24	I LINEAR(O ) LM 35 MX SOI NS
I317	644204300	I LINEAR AI 1117A 33 YTR 3 IN SOT 223 A
I327	644202734	I LINEAR AO4407 SO AOS
I32	644202734	I LINEAR AO4407 SO AOS
I 03	6442041005	I LINEAR A 431 LA 3 TO 92 ANA I
I 06	6442041005	I LINEAR A 431 LA 3 TO 92 ANA I
I306	644204400	I LINEAR LM10 5ISX-ADJ 3 TO-263 NS MSL
I307	644204400	I LINEAR LM10 5ISX-ADJ 3 TO-263 NS MSL
I 02	6442014000	I Linear LT 17D 4 DI
I 07	6442014000	I Linear LT 17D 4 DI
I 13	6442014000	I Linear LT 17D 4 DI
I 01	644200004 05	I LINEAR SG6 41SZ3 SMD SG
I 0	644200004 05	I LINEAR SG6 41SZ3 SMD SG
I 09	644400001 03	I F L6562DTR SO ST
I324	644600 10	I TTL N 7SZ04M5X 5 FAIR ILD
I326	644600002 14	I TTL SN74 14 R 14 TSSO TI
I323	644600 70	I TTL SN74L 4052A R 16 TSSO TEXAS
I333	644600 70	I TTL SN74L 4052A R 16 TSSO TEXAS
I 04	6442030200	I -LINEAR- A7 R12 -4 -TO-220F-4L-FAIR I

RESISTOR :

R 16	6253120152	RES. I R O M 1.2 1 J 05
R 19	6252100142	RES. I R O M 1 1 10 F 05
R 20	6252100142	RES. I R O M 1 1 10 F 05
R 42	6252100142	RES. I R O M 1 1 10 F 05
R 43	6252100142	RES. I R O M 1 1 10 F 05

SYMBOL	For Europe (Lite-on art Number)	DES RI TION
R 09	6253107242 00	RES. I R O M 10.7 1 F 0 05 OM O
R494	6252100246	RES. I R O M 10 1 10 F 603
R495	6252100246	RES. I R O M 10 1 10 F 603
R496	6252100246	RES. I R O M 10 1 10 F 603
R497	6252100246	RES. I R O M 10 1 10 F 603
R510	6252100246	RES. I R O M 10 1 10 F 603
R323	6252100256	RES. I R O M 10 1 10 J 603
R32	6252100256	RES. I R O M 10 1 10 J 603
R330	6252100256	RES. I R O M 10 1 10 J 603
R331	6252100256	RES. I R O M 10 1 10 J 603
R33	6252100256	RES. I R O M 10 1 10 J 603
R340	6252100256	RES. I R O M 10 1 10 J 603
R344	6252100256	RES. I R O M 10 1 10 J 603
R354	6252100256	RES. I R O M 10 1 10 J 603
R35	6252100256	RES. I R O M 10 1 10 J 603
R359	6252100256	RES. I R O M 10 1 10 J 603
R361	6252100256	RES. I R O M 10 1 10 J 603
R363	6252100256	RES. I R O M 10 1 10 J 603
R364	6252100256	RES. I R O M 10 1 10 J 603
R367	6252100256	RES. I R O M 10 1 10 J 603
R369	6252100256	RES. I R O M 10 1 10 J 603
R370	6252100256	RES. I R O M 10 1 10 J 603
R371	6252100256	RES. I R O M 10 1 10 J 603
R373	6252100256	RES. I R O M 10 1 10 J 603
R405	6252100256	RES. I R O M 10 1 10 J 603
R419	6252100256	RES. I R O M 10 1 10 J 603
R425	6252100256	RES. I R O M 10 1 10 J 603
R45	6252100256	RES. I R O M 10 1 10 J 603
R464	6252100256	RES. I R O M 10 1 10 J 603
R465	6252100256	RES. I R O M 10 1 10 J 603
R466	6252100256	RES. I R O M 10 1 10 J 603
R467	6252100256	RES. I R O M 10 1 10 J 603
R46	6252100256	RES. I R O M 10 1 10 J 603
R471	6252100256	RES. I R O M 10 1 10 J 603
R473	6252100256	RES. I R O M 10 1 10 J 603
R474	6252100256	RES. I R O M 10 1 10 J 603
R475	6252100256	RES. I R O M 10 1 10 J 603
R476	6252100256	RES. I R O M 10 1 10 J 603
R524	6252100256	RES. I R O M 10 1 10 J 603
R 4	6253100252 00	RES. I R O M 10 1 J 0 05 OM OST
R 53	6253100252 00	RES. I R O M 10 1 J 0 05 OM OST
R433	6252100356	RES. I R O M 100 1 10 J 603
R 54	6253100352 00	RES. I R O M 100 1 J 0 05 OM OS
R 56	6253100352 00	RES. I R O M 100 1 J 0 05 OM OS
R492	6252120246	RES. I R O M 12 1 10 F 603
R3 3	6252120256	RES. I R O M 12 1 10 J 603
R4 5	6252120256	RES. I R O M 12 1 10 J 603
R457	6252137246 00	RES. I R O M 13.7 1 10 F 0603 OM O
R407	6252150256	RES. I R O M 15 1 10 J 603
R410	6252150256	RES. I R O M 15 1 10 J 603
R424	6252150256	RES. I R O M 15 1 10 J 603
R42	6252150256	RES. I R O M 15 1 10 J 603
R430	6252150256	RES. I R O M 15 1 10 J 603
R436	6252150256	RES. I R O M 15 1 10 J 603

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
R437	6252150256	RES. I R O M 15 1 10 J 603
R439	6252150256	RES. I R O M 15 1 10 J 603
R 11	6253160242	RES. I R O M 16 1 F 05
R 22	62531 0242	RES. I R O M 1 1 F 05
R30	6252220156	RES. I R O M 2.2 1 10 J 603
R309	6252220156	RES. I R O M 2.2 1 10 J 603
R352	6252220156	RES. I R O M 2.2 1 10 J 603
R353	6252220156	RES. I R O M 2.2 1 10 J 603
R414	6252220156	RES. I R O M 2.2 1 10 J 603
R463	6252220156	RES. I R O M 2.2 1 10 J 603
R4 6	6252220156	RES. I R O M 2.2 1 10 J 603
R3 1	6252200156	RES. I R O M 2 1 10 J SMD 0603
R3 2	6252200156	RES. I R O M 2 1 10 J SMD 0603
R372	6252200256	RES. I R O M 20 1 10 J 603
R 55	6253200252 00	RES. I R O M 20 1 J 0 05 OM OST
R 26	6252200342	RES. I R O M 200 1 10 F 05
R 3	6252200342	RES. I R O M 200 1 10 F 05
R426	6252220356	RES. I R O M 220 1 10 J 603
R49	6252330146	RES. I R O M 3.3 1 10 F 603
R507	6252330146	RES. I R O M 3.3 1 10 F 603
R312	6252330156	RES. I R O M 3.3 1 10 J 603
R334	6252330156	RES. I R O M 3.3 1 10 J 603
R336	6252330156	RES. I R O M 3.3 1 10 J 603
R337	6252330156	RES. I R O M 3.3 1 10 J 603
R400	6252330156	RES. I R O M 3.3 1 10 J 603
R455	6252330156	RES. I R O M 3.3 1 10 J 603
R456	6252330156	RES. I R O M 3.3 1 10 J 603
R460	6252330156	RES. I R O M 3.3 1 10 J 603
R472	6252330156	RES. I R O M 3.3 1 10 J 603
R493	6252330156	RES. I R O M 3.3 1 10 J 603
R501	6252330156	RES. I R O M 3.3 1 10 J 603
R409	6252300256	RES. I R O M 30 1 10 J 603
R 35	6253330242	RES. I R O M 33 1 F 05
R 45	6253330242	RES. I R O M 33 1 F 05
R4 9	6252470146	RES. I R O M 4.7 1 10 F 603
R303	6252470156	RES. I R O M 4.7 1 10 J 603
R329	6252470156	RES. I R O M 4.7 1 10 J 603
R3 5	6252470156	RES. I R O M 4.7 1 10 J 603
R413	6252470156	RES. I R O M 4.7 1 10 J 603
R4 7	6252470156	RES. I R O M 4.7 1 10 J 603
R490	6252470156	RES. I R O M 4.7 1 10 J 603
R491	6252470156	RES. I R O M 4.7 1 10 J 603
R499	6252470156	RES. I R O M 4.7 1 10 J 603
R502	6252470156	RES. I R O M 4.7 1 10 J 603
R503	6252470156	RES. I R O M 4.7 1 10 J 603
R504	6252470156	RES. I R O M 4.7 1 10 J 603
R509	6252470156	RES. I R O M 4.7 1 10 J 603
R511	6252470156	RES. I R O M 4.7 1 10 J 603
R512	6252470156	RES. I R O M 4.7 1 10 J 603
R304	6252470256	RES. I R O M 47 1 10 J 603
R305	6252470256	RES. I R O M 47 1 10 J 603
R3 4	6252470256	RES. I R O M 47 1 10 J 603
R 17	6253560242	RES. I R O M 56 1 F 05
R349	6252604146 00	RES. I R O M 6.04 1 10 F 0603 OM O

SYMBOL	For Europe (Lite-on art Number)	DES RI TION
R 23	6253649142 00	RES. I R O M 6.49 1 F 0 05 OM O
R 25	6252649342	RES. I R O M 649 1 10 F 05
R396	6252 20356	RES. I R O M 20 0.1 J TA ING
R397	6252 20356	RES. I R O M 20 0.1 J TA ING
R421	6252100456	RES. I R MO M 1 1 10 J 603
R477	6252100456	RES. I R MO M 1 1 10 J 603
R 21	6254100443 00	RES. I R MO M 1 1 4 F 1206 OM OSTA
R 67	6254100443 00	RES. I R MO M 1 1 4 F 1206 OM OSTA
R350	6252000056	RES. I R O M 0 1 10 J 603
R351	6252000056	RES. I R O M 0 1 10 J 603
R40	6252000056	RES. I R O M 0 1 10 J 603
R411	6252000056	RES. I R O M 0 1 10 J 603
R429	6252000056	RES. I R O M 0 1 10 J 603
R431	6252000056	RES. I R O M 0 1 10 J 603
R469	6252000056	RES. I R O M 0 1 10 J 603
R302	6252100056	RES. I R O M 100 1 10 J 603
R307	6252100056	RES. I R O M 100 1 10 J 603
R313	6252100056	RES. I R O M 100 1 10 J 603
R314	6252100056	RES. I R O M 100 1 10 J 603
R317	6252100056	RES. I R O M 100 1 10 J 603
R31	6252100056	RES. I R O M 100 1 10 J 603
R319	6252100056	RES. I R O M 100 1 10 J 603
R322	6252100056	RES. I R O M 100 1 10 J 603
R332	6252100056	RES. I R O M 100 1 10 J 603
R423	6252100056	RES. I R O M 100 1 10 J 603
R434	6252100056	RES. I R O M 100 1 10 J 603
R610	6252113046	RES. I R O M 113 1 10 F 0603
R611	6252113046	RES. I R O M 113 1 10 F 0603
R4 1	6252120046	RES. I R O M 120 1 10 F SMD 0603
R4 2	6252120046	RES. I R O M 120 1 10 F SMD 0603
R606	6252120046	RES. I R O M 120 1 10 F SMD 0603
R603	62521 7046	RES. I R O M 1 7 1 10 F 0603
R324	6252020046	RES. I R O M 20 1 10 F 603
R326	6252020046	RES. I R O M 20 1 10 F 603
R333	6252020046	RES. I R O M 20 1 10 F 603
R4 3	6252200046	RES. I R O M 200 1 10 F SMD 0603
R374	6252220956	RES. I R O M 22 1 10 J 603
R376	6252220956	RES. I R O M 22 1 10 J 603
R379	6252220956	RES. I R O M 22 1 10 J 603
R3 0	6252220956	RES. I R O M 22 1 10 J 603
R3 9	6252220956	RES. I R O M 22 1 10 J 603
R395	6252220956	RES. I R O M 22 1 10 J 603
R47	6252220956	RES. I R O M 22 1 10 J 603
R50	6252220956	RES. I R O M 22 1 10 J 603
R365	6252249046	RES. I R O M 249 1 10 F 603
R60	6252249046	RES. I R O M 249 1 10 F 603
R 41	6252270052	RES. I R O M 270 1 10 J 05
R375	6252330956	RES. I R O M 33 1 10 J 603
R39	6252330056	RES. I R O M 330 1 10 J 603
R310	6252470956	RES. I R O M 47 1 10 J 603
R311	6252470956	RES. I R O M 47 1 10 J 603
R505	6252470956	RES. I R O M 47 1 10 J 603
R506	6252470956	RES. I R O M 47 1 10 J 603
R609	6252470046	RES. I R O M 470 1 10 F 0603

SYMBOL	For Europe (Lite-on art Number)	DES RI TION
R339	6252470056	RES. I R O M 470 1 10 J 603
R355	6252560946	RES. I R O M 56 1 10 F 603
R356	6252560946	RES. I R O M 56 1 10 F 603
R357	6252560946	RES. I R O M 56 1 10 F 603
R4 4	6252560946	RES. I R O M 56 1 10 F 603
R394	6252560956	RES. I R O M 56 1 10 J 603
R604	62526 1946	RES. I R O M 6 .1 1 10 F 0603
R325	6252750946	RES. I R O M 75 1 10 F 603
R327	6252750946	RES. I R O M 75 1 10 F 603
R335	6252750946	RES. I R O M 75 1 10 F 603
R602	62527 7046	RES. I R O M 7 7 1 10 F 0603
R607	6252 20046	RES. I R O M 20 1 10 F 0603
R 46	6253261242	RES. I -R O M 26.1 1 F 0 05 OM OS
R4	62526 0146	RES. I -R O M 6. 1 10 F 0603
R515	6252010046	RES. I -R O M 10 1 10 F SMD
R516	6252010046	RES. I -R O M 10 1 10 F SMD
R517	6252010046	RES. I -R O M 10 1 10 F SMD
R51	6252010046	RES. I -R O M 10 1 10 F SMD
R519	6252010046	RES. I -R O M 10 1 10 F SMD
R520	6252010046	RES. I -R O M 10 1 10 F SMD
R521	6252010046	RES. I -R O M 10 1 10 F SMD
R522	6252010046	RES. I -R O M 10 1 10 F SMD
R 66	6253470052	RES. I -R O M 470 1 J 0 05
RN301	6260002 1	RES. FRN O M 0 1 16 J
RN302	6260002 1	RES. FRN O M 0 1 16 J
RN303	6260002 1	RES. FRN O M 0 1 16 J
RN304	6260002 1	RES. FRN O M 0 1 16 J
RN305	6260002 1	RES. FRN O M 0 1 16 J
RN306	6260002 1	RES. FRN O M 0 1 16 J
RN307	6260002 1	RES. FRN O M 0 1 16 J
RN30	6260002 1	RES. FRN O M 0 1 16 J
RN309	6260002 1	RES. FRN O M 0 1 16 J
RN310	6260002 1	RES. FRN O M 0 1 16 J
RN311	6260002 1	RES. FRN O M 0 1 16 J
R 27	6212310357	RES. F O M 10 1 2 J AT52
R 61	6212120354	RES. F O M 20 1 4 J T26 MINI
R 52	6212133054	RES. F O M 33 1 4 J T26 MINI
R 62	6212147054	RES. F O M 47 1 4 J T26 MINI
R 33	6212147154	RES. F O M 470 1 4 J T26 MINI
R 6	6220322 52	RES. FS O M 0.22 1 J OR
R 1	6224656227	RES. MF O M 56.2 1 4 F T52
R 02	622 110557	RES. MGF MO M 1 1 4 J AT52
R 06	622 110557	RES. MGF MO M 1 1 4 J AT52
R 24	622 120557	RES. MGF MO M 2 1 4 J T52
R 34	622 120557	RES. MGF MO M 2 1 4 J T52
R 1	622 120557	RES. MGF MO M 2 1 4 J T52
R 71	6221224 52	RES. MOF O M 0.24 2 J OR
R 10	6221227 52	RES. MOF O M 0.27 2 J OR
R 13	6221239 52	RES. MOF O M 0.39 2 J OR
R 40	6221239 52	RES. MOF O M 0.39 2 J OR
R 05	6221010157	RES. MOF O M 100 1 4 J AT52
R 3	6221010157	RES. MOF O M 100 1 4 J AT52
R 12	6221015057	RES. MOF O M 15 1 4 J AT52
R 15	6221020157	RES. MOF O M 200 1 4 J AT52

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
R 39	6221020157	RES. MOF O M 200 14 J AT52
R 14	6221022057	RES. MOF O M 22 14 J AT52
R 57	6221022057	RES. MOF O M 22 14 J AT52
R 51	6221047057	RES. MOF O M 47 14 J AT52
R 07	6212133957 00	RES. F O M 3.3 14 J T52MINI NE SIN
R 01	6245103010	RES. R O M 10 0.3 TA B 6D 20 (META
R 2	6253127342 00	RES. I -R O M 127 1 F 0 05 OM OSTA
R 0	6253294242 00	RES. I -R O M 29.4 1 F 0 05 OM OST
R 01	6201100061	T ERMISTOR O M 10 5A 7.5 L21 S 15105MJ

ELE TRI AL ARTS MIS ELLANEOUR ARTS

01	6621030151	A INLET 3 DL DJ 3 GS A
9N040	1133003609	AD ESI E RED GLUE 3609 um m °CASTME 31
9N060	1133003609	AD ESI E RED GLUE 3609 um m °CASTME 31
9N070	1133003609	AD ESI E RED GLUE 3609 um m °CASTME 31
D 02B	1250000415	AD ESI E S RE LO ING A 450 IN YEAR
D 05B	1250000415	AD ESI E S RE LO ING A 450 IN YEAR
D 15B	1250000415	AD ESI E S RE LO ING A 450 IN YEAR
D 17B	1250000415	AD ESI E S RE LO ING A 450 IN YEAR
I 04B	1250000415	AD ESI E S RE LO ING A 450 IN YEAR
01B	1250000415	AD ESI E S RE LO ING A 450 IN YEAR
02B	1250000415	AD ESI E S RE LO ING A 450 IN YEAR
03B	1250000415	AD ESI E S RE LO ING A 450 IN YEAR
X303	6449004 20	RYSTAL 11.0592M Z 49S 20pF TO I S
X301	6449006400	RYSTAL 14.31 M AT 49 TO I S
X302	6449002660	RYSTAL 24M Z 49 S TO I 16pF 30 M
GND2	6714010601 33	ARNESS 1 100mm 1015 1 Y G 1. TIN
601A	6711110001 90	ARNESS SIGNAL 11 10 1 0mm 1571 2
D 02	7746403040 0A	EAT SIN EAT SIN NE 20MTL 2(03) U1
D 05	7746403030 0B	EAT SIN NE - 20MTL-2(03) U10( ) AL1100
2U01	1241000205	ID DATE ODE LABEL
2U04	1241000400	MODEL LABEL ITE
J001	6700060000	JUM ER IRE
J002	6700060000	JUM ER IRE
J003	6700060000	JUM ER IRE
J004	6700060000	JUM ER IRE
J006	6700060000	JUM ER IRE
J007	6700060000	JUM ER IRE
J00	6700060000	JUM ER IRE
J009	6700060000	JUM ER IRE
J010	6700060000	JUM ER IRE
J013	6700060000	JUM ER IRE
J015	6700060000	JUM ER IRE
J017	6700060000	JUM ER IRE
J01	6700060000	JUM ER IRE
J019	6700060000	JUM ER IRE
J021	6700060000	JUM ER IRE
J022	6700060000	JUM ER IRE
J023	6700060000	JUM ER IRE
J024	6700060000	JUM ER IRE
J025	6700060000	JUM ER IRE
J026	6700060000	JUM ER IRE
J027	6700060000	JUM ER IRE
J02	6700060000	JUM ER IRE
J029	6700060000	JUM ER IRE

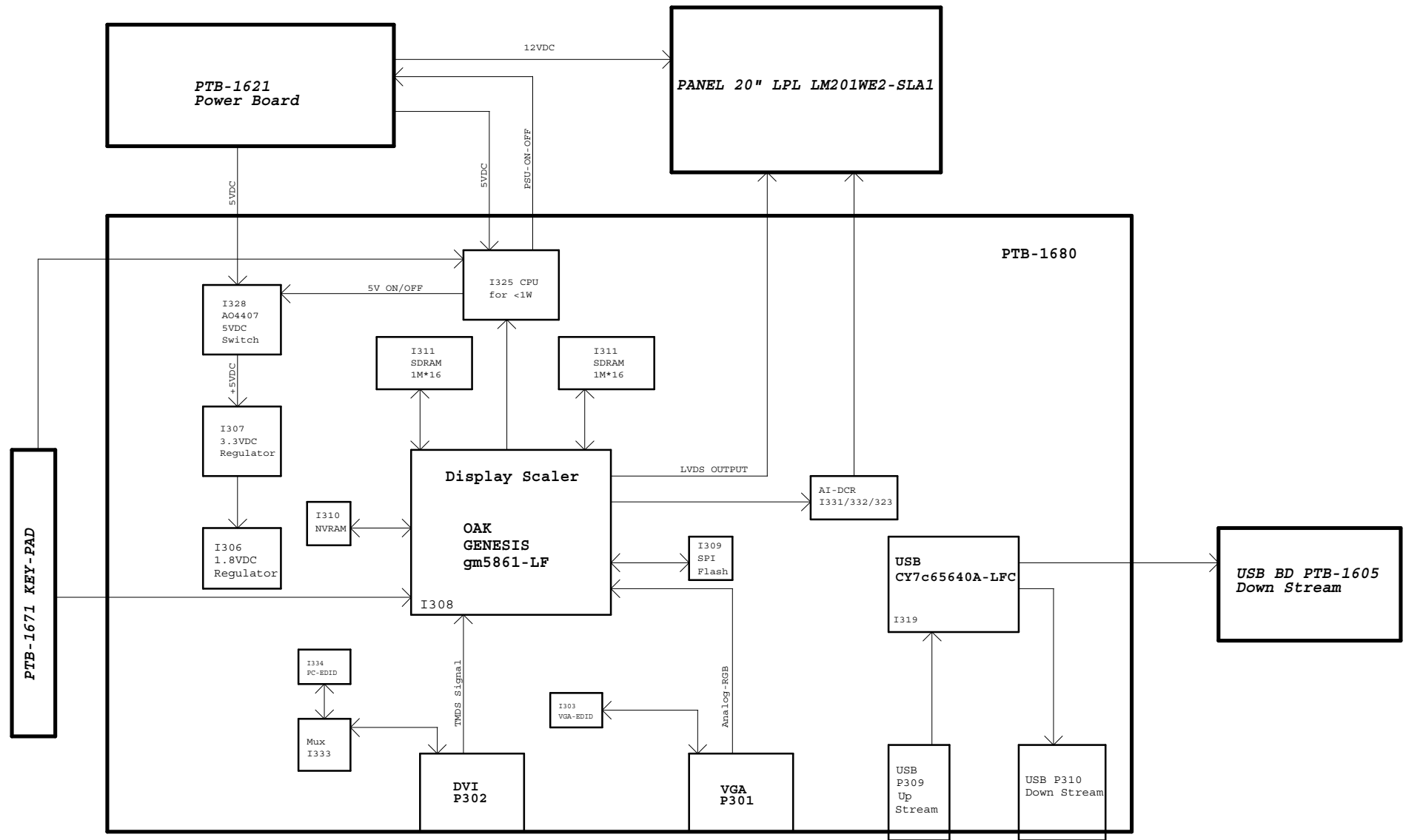
SYMBOL	For Europe (Lite-on art Number)	DES RI TION
J030	6700060000	JUM ER IRE
J031	6700060000	JUM ER IRE
J032	6700060000	JUM ER IRE
J033	6700060000	JUM ER IRE
J034	6700060000	JUM ER IRE
01A	7740200690 0B	RI ET EYELET 1.6 FOR NE
01B	7740200690 0B	RI ET EYELET 1.6 FOR NE
55A	7740200690 0B	RI ET EYELET 1.6 FOR NE
55B	7740200690 0B	RI ET EYELET 1.6 FOR NE
56A	7740200690 0B	RI ET EYELET 1.6 FOR NE
56B	7740200690 0B	RI ET EYELET 1.6 FOR NE
F 01A	7740200690 0B	RI ET EYELET 1.6 FOR NE
F 01B	7740200690 0B	RI ET EYELET 1.6 FOR NE
L 01A	7740200690 0B	RI ET EYELET 1.6 FOR NE
L 01B	7740200690 0B	RI ET EYELET 1.6 FOR NE
01D	7740200690 0B	RI ET EYELET 1.6 FOR NE
01S	7740200690 0B	RI ET EYELET 1.6 FOR NE
02D	7740200690 0B	RI ET EYELET 1.6 FOR NE
02S	7740200690 0B	RI ET EYELET 1.6 FOR NE
03D	7740200690 0B	RI ET EYELET 1.6 FOR NE
03S	7740200690 0B	RI ET EYELET 1.6 FOR NE
R 01A	7740200690 0B	RI ET EYELET 1.6 FOR NE
R 01B	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 01A	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 01B	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 01	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 01D	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 02A	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 02B	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 02	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 02D	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 03A	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 03B	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 03	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 03D	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 04A	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 04B	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 04	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 04D	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 06A	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 06B	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 06	7740200690 0B	RI ET EYELET 1.6 FOR NE
T 06D	7740200690 0B	RI ET EYELET 1.6 FOR NE
D 02A	7740200700 0B	RI ET EYELET 2 FOR NE
D 02D	7740200700 0B	RI ET EYELET 2 FOR NE
D 07A	7740200700 0B	RI ET EYELET 2 FOR NE
D 07B	7740200700 0B	RI ET EYELET 2 FOR NE
01G	7740200700 0B	RI ET EYELET 2 FOR NE
01L	7740200700 0B	RI ET EYELET 2 FOR NE
01N	7740200700 0B	RI ET EYELET 2 FOR NE
05A	7740200700 0B	RI ET EYELET 2 FOR NE
05B	7740200700 0B	RI ET EYELET 2 FOR NE
6B01S	7140220061 0A	S RE DOUBLE T READ NO AS ER AN M2 6m
6B01	7140220061 0A	S RE DOUBLE T READ NO AS ER AN M2 6m

SYMBOL	For Europe (Lite-on part Number)	DES RI TION
D 02A	71162300 2 0A	S RE MA INE STAR AS ER AN M3 L NI
D 05A	71162300 2 0A	S RE MA INE STAR AS ER AN M3 L NI
D 15A	71162300 2 0A	S RE MA INE STAR AS ER AN M3 L NI
D 17A	71162300 2 0A	S RE MA INE STAR AS ER AN M3 L NI
I 04A	71162300 2 0A	S RE MA INE STAR AS ER AN M3 L NI
01A	71162300 2 0A	S RE MA INE STAR AS ER AN M3 L NI
02A	71162300 2 0A	S RE MA INE STAR AS ER AN M3 L NI
03A	71162300 2 0A	S RE MA INE STAR AS ER AN M3 L NI
02	7740201220 0A	NUT-STANDARD NUT-FLANGE EX NUT
S1	7742612430 0A	SU ORT B INGOOD NYLON 94 0 NATURE
S2	7742612430 0A	SU ORT B INGOOD NYLON 94 0 NATURE
S3	7742612430 0A	SU ORT B INGOOD NYLON 94 0 NATURE
S4	7742612430 0A	SU ORT B INGOOD NYLON 94 0 NATURE
S5	7742612430 0A	SU ORT B INGOOD NYLON 94 0 NATURE
S6	7742612430 0A	SU ORT B INGOOD NYLON 94 0 NATURE
S601	6 53011200 40	S IT TA T E A50 ANASONI
S 301	6 53010 00	S IT TA T SF YMA2250T FOR ARD SMD
S 601	6 53001100	S IT TA T S A 2510 BL 5mm
S 602	6 53001100	S IT TA T S A 2510 BL 5mm
S 603	6 53001100	S IT TA T S A 2510 BL 5mm
S 604	6 53001100	S IT TA T S A 2510 BL 5mm
T 04	6131022400	XFRMER O ER T 1141 ER2 19 LSE LI5005
T 01	6131031700	XFRMER O ER T -1142 ER2 43 LSE LI5006
T 06	6131043600	XFRMER O ER T -1143 ER2 34 LSE LI5007
ME ANI AL ASSY		
6B01R	7742611313 0A	O ER NM 6700 6700 ABS 94 0
6B01T	7742611303 0A	O ER NM 6700 6700 ABS 94 0
6B01M	7742611330 0A	O ER LENS O ER NM NM A20BAL ISA 20
6B01N	7742 075 1 0A	US BUTTON 6700 6700 ABS 94 0
6B01	7742 07293 0B	US BUTTON 4 AXIS NOB 6700 6700
6B01	7742302550 0A	LENS O ER NM NM A20BAL ISA 20 TRANS
6L01A	7742611931 0A	O ER TERMINAL BOTTOM O ER 6700 ABS
6L01	7746204170 0A	S IELD USB S IELD O ER NE 20MTL 2(03
6L01F	7110330062 0A	S RE -MA INE-FLAT EAD-M3-6-NI
6L01G	7110330062 0A	S RE -MA INE-FLAT EAD-M3-6-NI
6L01	71162400 1 0A	S RE -MA INE-Star asher- an-M4- -Zn
6L01I	7740201240 0A	S RE MA INE FLAT ASER AN M3 6L Z
6L01J	7740201240 0A	S RE MA INE FLAT ASER AN M3 6L Z
6L01	7746503720 0A	INSULATOR NE 20MTL 2(03) U10( ) E I
6L01L	7110340102 0A	S RE MA INE NONE FLAT EAD M4 10 N
6L01M	7140226122 0A	S RE DOUBLE T READ IT OUT AS ER AN
6L01O	7740200 90	S RE u-Ni
06B01	7737609551 0A	R ASSY AMA 20 S 6700 ABS UL-94 0
6BA1	7742233051 0A	R NM AMA 20 S 6700 ABS 94 0
6BB1	7742611921 0A	RAIL ENTER ABINET 6700 ABS 94 0
6B 1	7140130061 0A	S RE MA INE IT OUT NINDING M3 6L BLA
6BD1	774 711550 0A	BRA ET S EA ER BRA ETL NE 20MTL 2(0
6BE1	774 711560 0A	BRA ET S EA ER BRA ETR NE 20MTL 2)0
6BF1	71403300 2 0A	S RE -MA INE-NONE-FLAT EAD-M3- -NI
01	7737710453 0A	BASE ASSY 6700 ABS 94 0 NM U20BNL
A1	773 000 61 0A	INGE INGE TILT ASSY NM 20 SE
B1	7742612111 0A	O ER INGE O ER(NE ) 6700 ABS 94 0

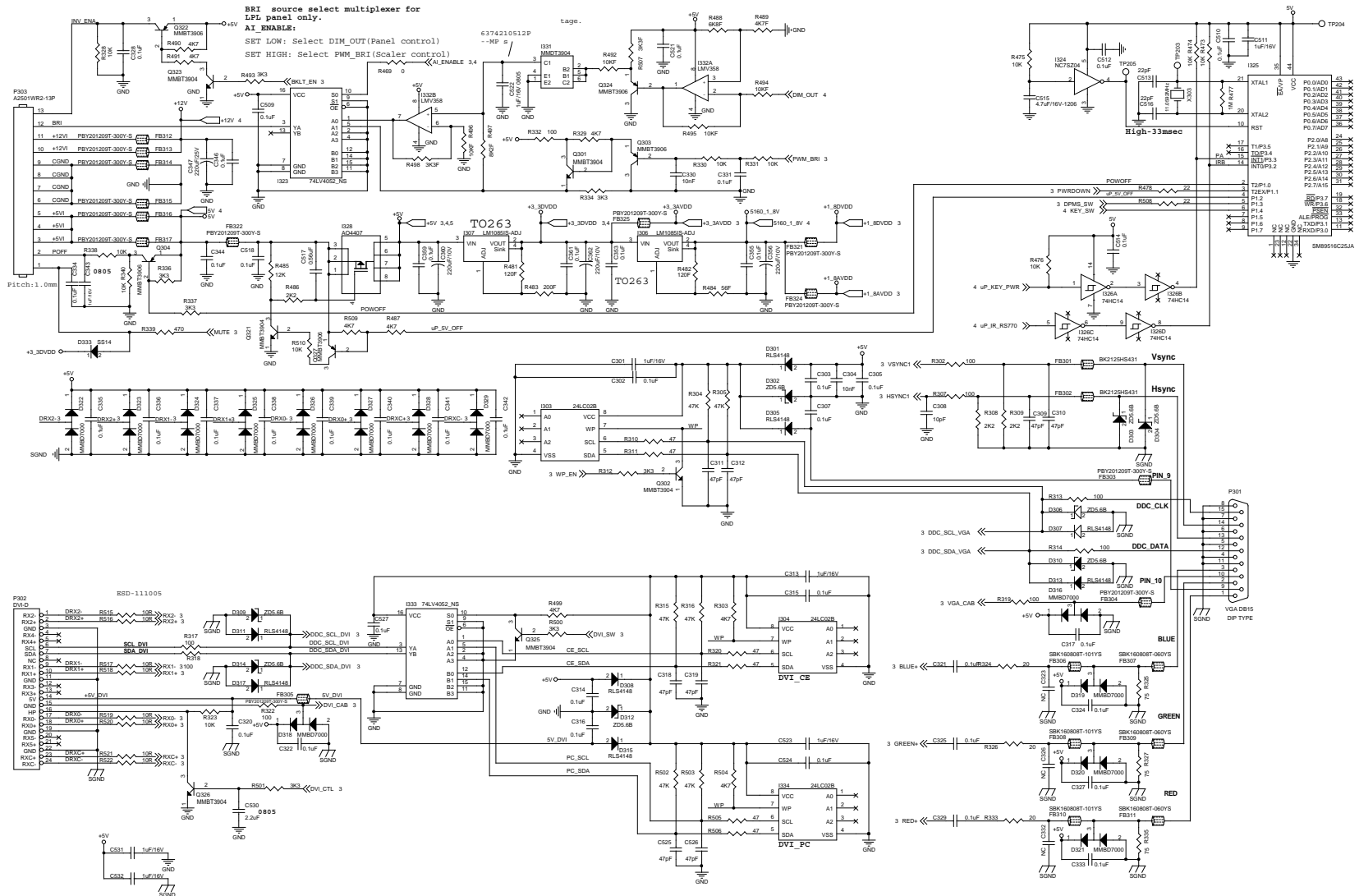
SYMBOL	For Europe (Lite-on part Number)	DESCRIPTION
1	774 711700 0A	BRA ET ESA BRA ET NE T17BNU(03) U1(
D1	774 711731 0A	BRA ET INGE ASTING DIE AST AL ALLOY
E1	7742611971 0A	O ER STAND O ER-F 6700 ABS 94 0
F1	77426119 1 0A	O ER ABLE MANAGEMENT 6700 ABS 94 0
G1	7740412101 0A	BASE STAND BASE O ER 6700 ABS 94 0
1	7740412151 0A	BASE TURN O ER NM 6700 ABS 94 0
I1	7742612031 0A	O ER STAND O ER-REAR 6700 ABS 94 0
J1	774 711710 0A	BRA ET BASE BR T TO NE T17BNU(03) U1
1	774 711720 0A	BRA ET BASE BRA ET BOTTOM NE T17BNU(
L1	774 711750 0A	SU ORT BASE LATE FULFIL AL ALLOY GRAY
M1	71401300 2 0A	S RE DOUBLE T READ NO A ER ROUND M3 L
N1	7110 40062 0A	S RE MA INE NO AS ER 1 EAD M4 6L NI
O1	7110340052 0A	S RE MA INE NO A ER FLAT EAD M4 5L NI
1	7742004090 0A	RUBBER US ION FOOT AD SILI ONE BLA
1	7110340072 0A	S RE MA INE NONE FLAT EAD M4 7 YELLO
200	3A684126 (NECDS)	TFT LM201WE2-SLA1 LPL
6F01	7737512 57 0A	F ASSY NM 6690 6720 ABS UL-94 0
6FA1	7742232307 0A	F NM - AMA20 6690 6720 ABS 94 0
6FB1	7742004130 0A	S ONGE F (TO BOTTOM) R FOAM T 1.2mm
6F 1	7742004131 0A	S ONGE F (RIG T LEFT) R FOAM T 1.2mm
6L01U	7111230041 0A	S RE -MA INE-1 AS ER-ROUND EAD-M3-4L-
6L01	7737 09922 0B	BRA ET ASSIS ASSY AL ALLOY1100 T 1.0
6LA1	7746204162 0B	S IELD S IELD O ER AL ALLOY1100 T 1.0
6LE1	7742003742 0A	RUBBER US ION T ERMAL AD SILI ON GRAY
6LF1	7746403070 0B	EAT SIN AL 1100 ANODIZE TREATMENT
6L 1	7742003743 0A	RUBBER US ION T ERMAL AD SILI ON GRAY
6LI1	7742003744 0A	RUBBER US ION T ERMAL AD SILI ON GRAY
6L 1	77464030 0 0A	EAT SIN NE - 20MTL AL ALLOY LEAN
6L01N	7140330103 0A	S RE DOUBLE T READ FLAT M3 10L BLA
6L01	7110630042 0A	S RE MA INE NONE FLAT EAD M3 4 NI
6L01Y	7742612630 0A	SU ORT B INGOOD NYLON 94 2 NATURE
6L02E	7749600770 0A	TA E MAS ING A ING 25mm(w)x40M
6L02F	7749600770 0A	TA E MAS ING A ING 25mm(w)x40M
AL001	6 7600 600	ALUMINIUM TA 30 L00 0mm 100M 3M
AL002	6 7600 500	ALUMINIUM TA 30 L0050 100M 3M
AL003	6 7600 500	ALUMINIUM TA 30 L0050 100M 3M
AL004	6 7600 500	ALUMINIUM TA 30 L0050 100M 3M
05	6711030003 91	ARNESS 3 S IT BL 150mm 1007 22 ET
303A	6711130001 90	ARNESS O ER 13 110mm 1007 24
02A	6711140240 00	ARNESS O ER 14 9 300mm 1007 24
305A	6711300001 00	ARNESS L DS 30 30 220mm 15 9 30
307A	6711130002 90	ARNESS EY IRE 13 11 210mm 1571 30
05D	7740100101	LAM ABLE IRING ABLE TIE NYLON NATU
6LB1	774 000302 0A	GROUNDING GOLD FINGER SUS
6L 1	774 000300 0A	GROUNDING GOLD FINGER D B17BNS STAINL
6LD1	774 000301 0A	GROUNDING GOLD FINGER D L19BNS STAINLE
G 01	774 000500 0A	GROUNDING ONNE TOR NE 20MTL OS OR
G 02	774 000500 0A	GROUNDING ONNE TOR NE 20MTL OS OR
G 03	774 000500 0A	GROUNDING ONNE TOR NE 20MTL OS OR
G 04	774 000500 0A	GROUNDING ONNE TOR NE 20MTL OS OR
6L01Z	774 000321 0A	GROUNDING GOLD FINGER OS OR BRONZE
6L02F	774 000660 0A	GROUNDING GOLD FINGER OS OR BRONZE
6L02G	774 000660 0A	GROUNDING GOLD FINGER OS OR BRONZE

SYMBOL	For Europe (Lite-on art Number)	DES RI TION
A ING ASSY		
1 11	774920594 0A	ARTON NE U20BN 20 GX2(B-B ) 720SETS
1 21	7749105560 0A	US ION FOAM E S AMA-20S 720SETS T B
1 31	7749002100 0A	BAG LD E E E ORDINARY FOR 50(l) 650
1 33	7749001360 0B	BAG LLD E ORDINARY ALL MODEL 500mm 0.
1 34	7749001370 0A	BAG LLD E FILM STRET RA ALL MODEL
1 42	7749600470 0A	TA E A ING 914Mx76mmx0.066mm FOR DELL
1 43	7749600200 0A	TA E MAS ING A ING 25mm(w)x45m LITEON
1 44	7749600650 0A	TA E A ING 250Mx15mmx0.95mm ALL MODEL
1 51	7749402250 0A	BOARD ORNER A ER 1200 50 3mm
1 52	77494051 0 0A	BOARD ORNER A ER 1030 50 3mm
1 53	77494019 0 0A	BOARD ORNER A ER L2050x 50x3mm
1 56	7749405320 0A	A ER BOARD 1300 1100 4mm ALL MODE
1 71	7749502450 0A	ALLET FOUR AY 1320 1145 115h NM
2B01	7735430565 0A	LABEL MODEL LB NE U20BN BL 154x51mm
2 09	7735419260	A ING LABEL ALL ALL ITE 297 210
Y001	7730302952 0A	MANUAL ASSY NE -DS U20BNL 20 GX2-L205GJ
Y0A1	7730114002 0A	MANUAL NE -DS U20BNL 20 GX2-L205GJ EMEA
Y0B1	7730203293 0A	ARD D MANUAL NE -DS U20BNL EMEA
Y0 1	7730203214 0A	ARD-NA ISET FLYER-NM -NA ISETFLYER04140
Y0D1	7730203216 0A	ARD SALES OFFI E LIST ARD NM SALES O
1 45	7749600770 0A	TA E MAS ING A ING 25mm(w)x40M
1 57	7749405360 0A	A ER BOARD 555 247 NM
2 01	773542 510 0A	A ING LABEL NM NX76(L172EN) MTS B17B
01	6716004 35	ABLE O ER TO ALL 2000mm
001	671500 20 00	ABLE IDEO D-SUB 2 2000mm BL J E
002	6715009005 00	ABLE IDEO D I-D 2 2000mm BL J E
003	67100101 6	ABLE USB A B 2000mm BL USB 2.0
Y002	7730202345 0A	ARD AUTION S EET NM A21BNS EMEA NE
Y003	7730203294 0A	ARD SETU ARD NE -DS U20BNL EMEA

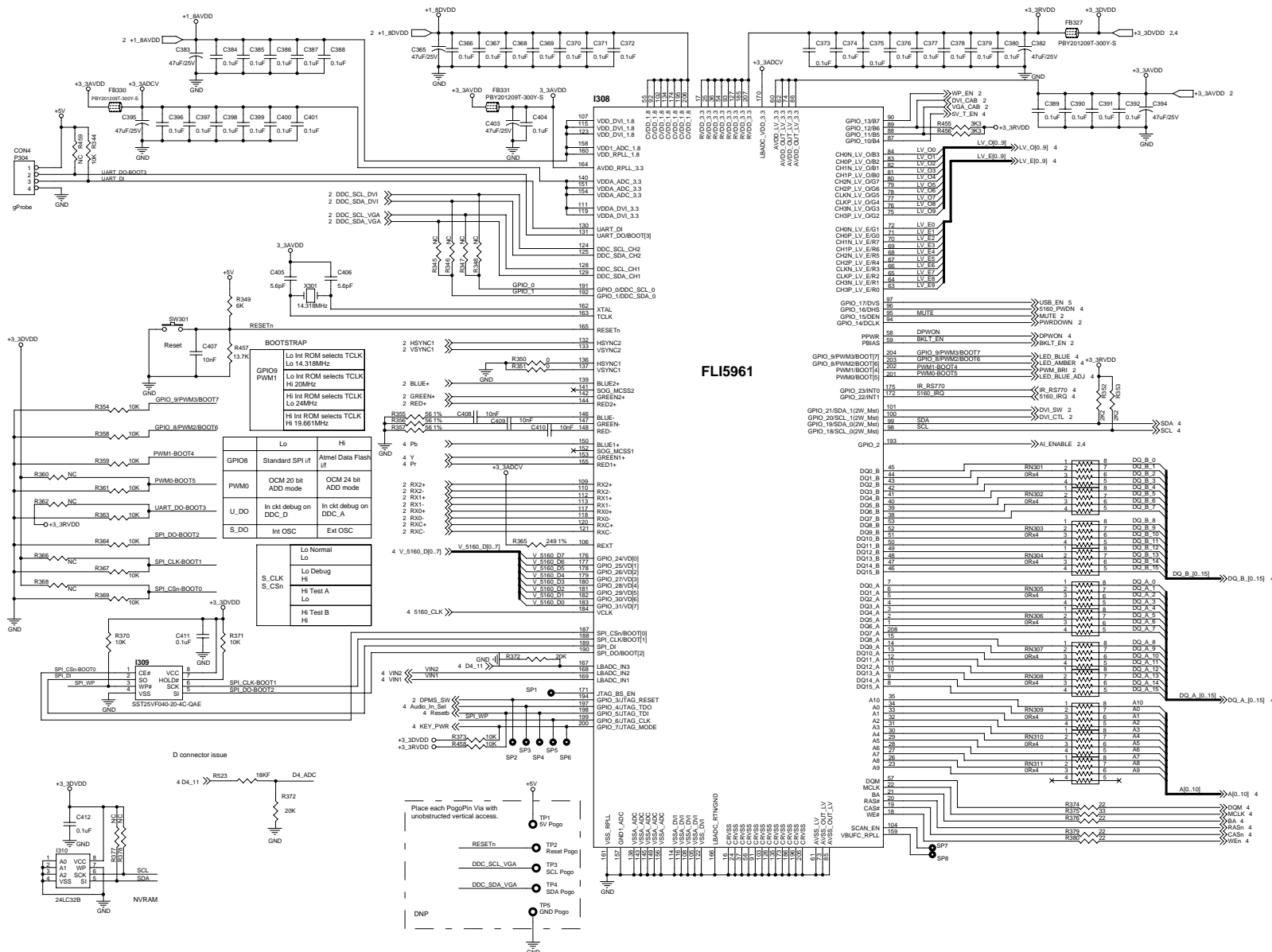
# NEC-20WGX<sup>2</sup> Block Diagram



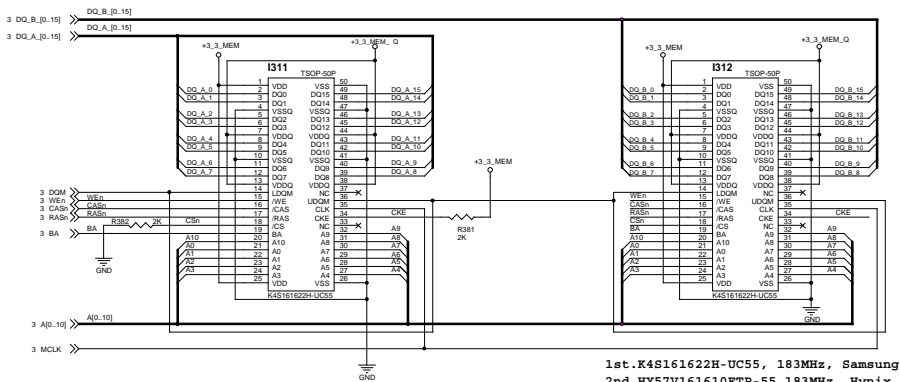
MODEL LCD 20WGX<sup>2</sup> SCHEMATIC DIAGRAM - InputsPWR - Dsub/DVI (1/5)



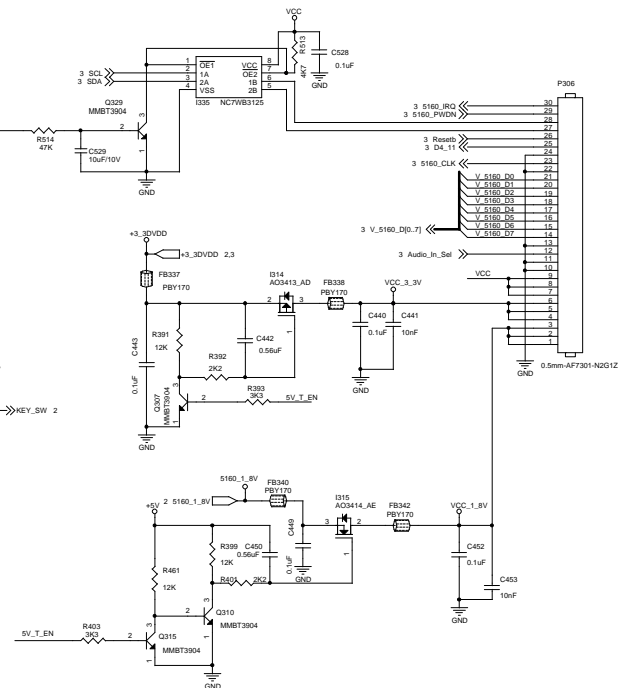
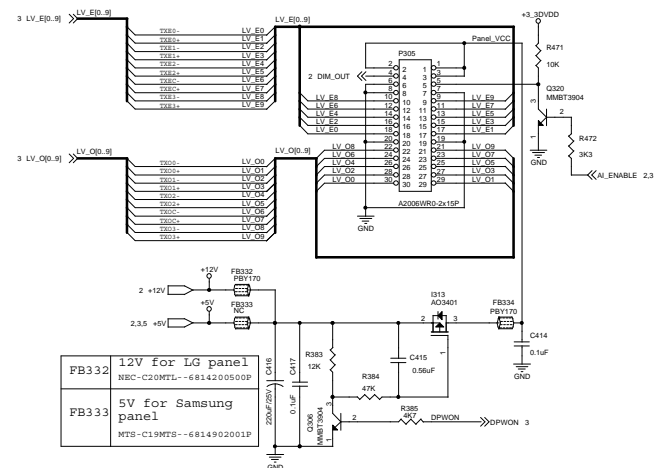
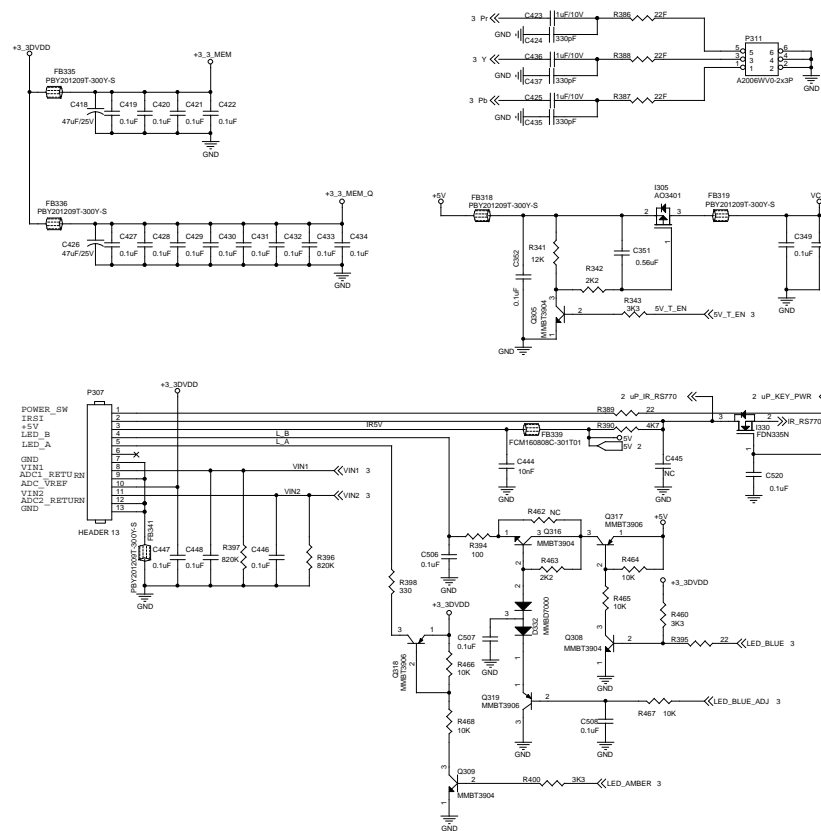
MODEL LCD 20WGX<sup>2</sup> SCHEMATIC DIAGRAM - Scaler FLI5961H/gm5861 (2/5)



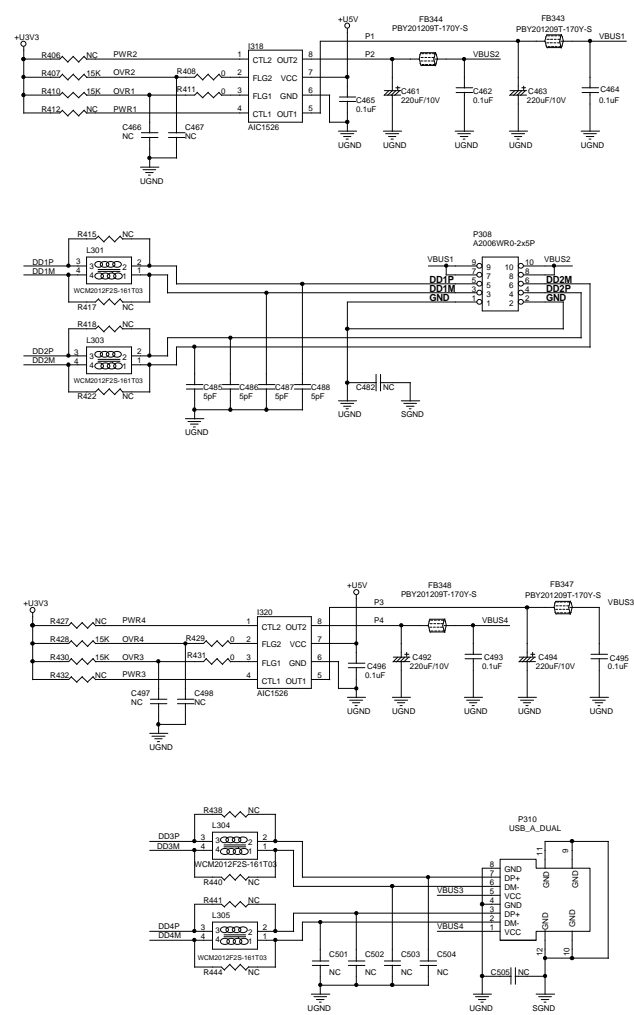
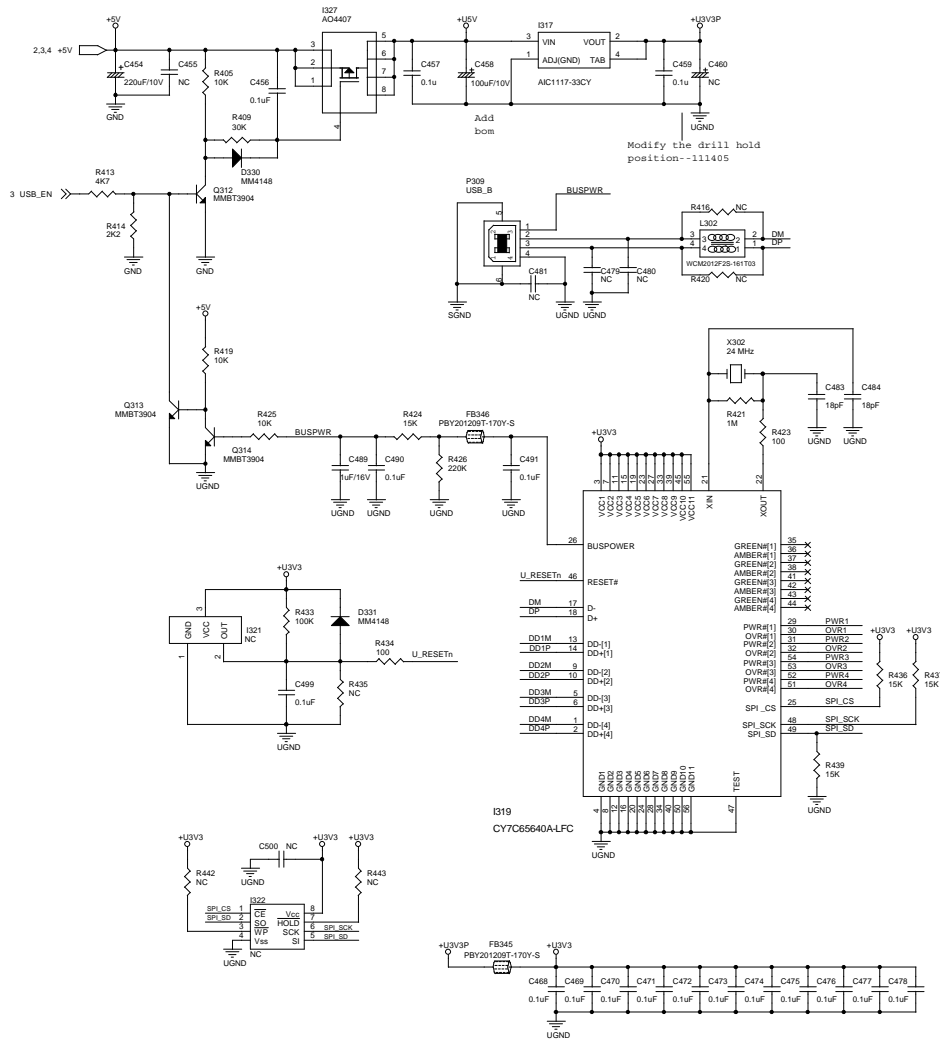
## MODEL LCD 20WGX<sup>2</sup> SCHEMATIC DIAGRAM - SDRAM & Panel outputs (3/5)



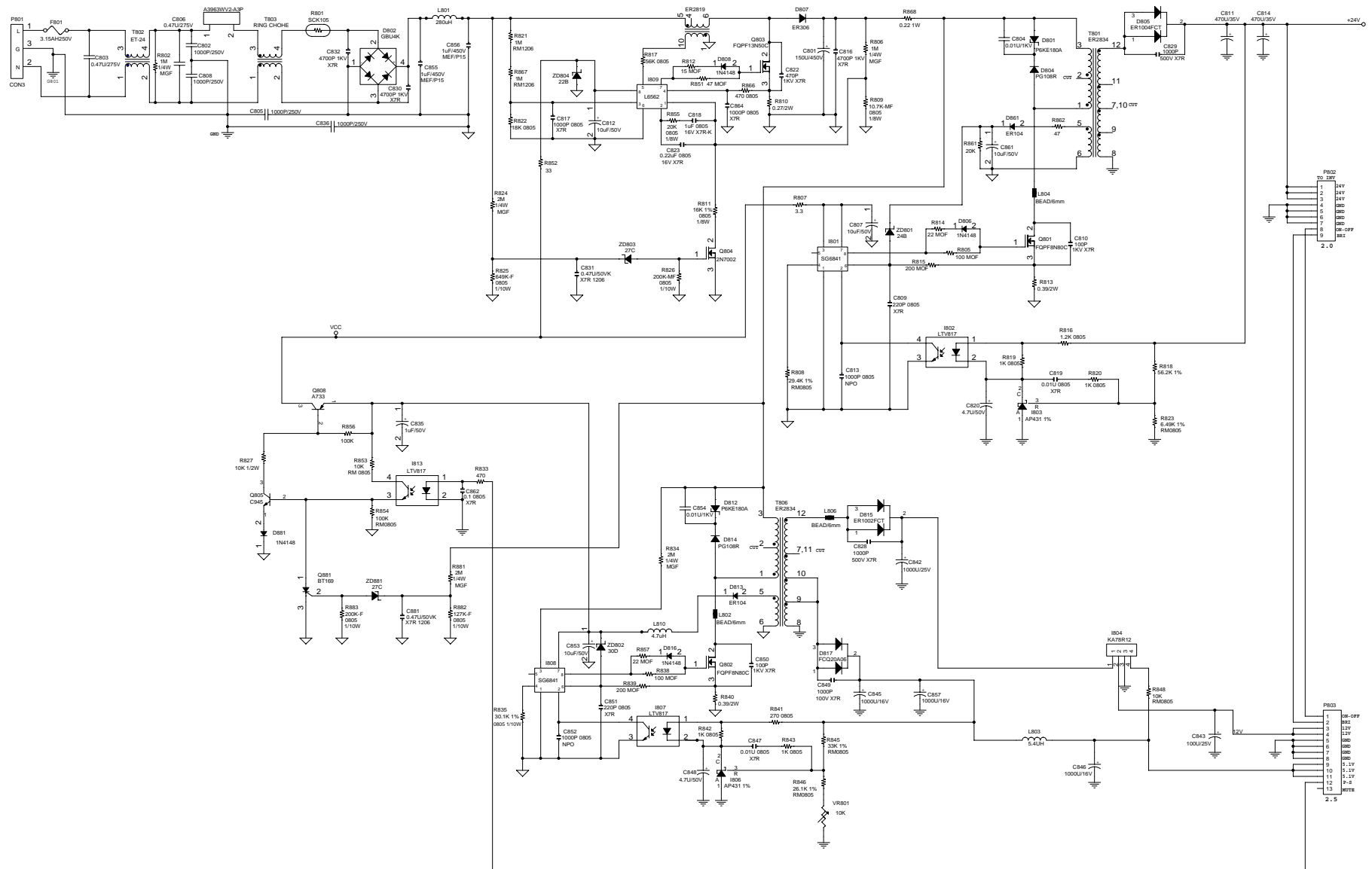
1st.K4S161622H-UC55, 183MHz, Samsung  
2nd.HY57V161610ETP-55,183MHz, Hynix  
3th.M12L16161A-5.5T, 183MHz, ESMT



## MODEL LCD 20WGX<sup>2</sup> SCHEMATIC DIAGRAM - USB (4/5)



MODEL LCD 20WG<sup>2</sup> SCHEMATIC DIAGRAM - Power (5/5)



# ACKING S ECIFICA ION

## ABLE OF CON EN S

	age
B ersion .....	11-2



Item	Description	Liteon part Number	er.	abinet color
(1)	ARTON NE U20BN 20 GX2(B-B ) 720 SETS	774920594 0A	B	Black
(2)	US ION FOAM E S AMA-20S 720SETS T B	7749105560 0A	B	Black
(3)	US ION FOAM E S AMA-20S 720SETS T B	7749105560 0A	B	Black
(4)	BAG LD E E E ORDINARY FOR 50(l) 650	7749002100 0A	B	Black
(5)	E BAG	---	B	Black
(6)	TA E A ING 250Mx15mmx0.95mm ALL MODEL	7749600650 0A	B	Black
(7)	TA E MAS ING A ING 25mm(w)x45m LITEON	7749600200 0A	B	Black
( )	IRING TIE	---	B	Black
(9)	MANUAL ASSY NE -DS U20BNL 20 GX2-L205GJ	7730302952 0A	B	Black
(10)	O ER ABLE MANAGEMENT 6700 ABS 94 0	77426119 1 0A	B	Black
(11)	ARD SETU ARD NE -DS U20BNL EMEA	7730203294 0A	B	Black
(12)	A ER BOARD 555 247	7749405360 0A	B	Black
(13)	E BAG FOR O ER	7749002500 0A	B	Black
(14)	TA E MAS ING A ING 25mm(w)x45m	7749600200 0A	B	Black
(15)	ABLE O ER TO ALL 2000mm	6716004 35	B	Black
(16)	SIGNAL ABLE GA	671500 20 00	B	Black
(17)	ABLE IDEO D I-D 2 2000mm BL J E	6715009005 00	B	Black
(1 )	ABLE USB A B 2000mm BL USB 2.0	67100101 6	B	Black

**Revision History**

Revision	Revision
New Issue (1st Edition) 2006/03	