23” TFT LCD COLOR MONITOR

Service
Service
Service

230E1HSB/00
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Service Manual

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SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINE.

Subject to modification Jan. 5th. 2009

PHILIPS

EN: 312278518420

Important Safety Notice

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company** Equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly , a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

* * Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips.

WARNING

Critical components having special safety characteristics are identified with a ⚠ by the Ref. No.in the parts list and enclosed within a broken line*
(where several critical components are grouped in one area) along with the safety symbol ⚠ on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability , express or implied, arising out of any unauthorized modification of design.
Servicer assumes all liability .

- Broken Line

FOR PRODUCTS CONTAINING LASER :

DANGER - In visible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION - The use of optical instruments with this Product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Take care during handling the LCD module with backlight unit

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment persons body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- Avoid contact with water as it may a short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a soft material.(Cleaning with a dirty or rough cloth may damage the panel.)

Technical Data (EE/ME)

1. General Specification (EE)

1.1 Panel characteristic : LGD LM230WF1
Panel source : LGD

Screen type Screen : TN+film
dimensions : 23 inches (diagonal)

LGD LM230WF1
Resolution : 1920 x 1080 (WUXGA)
Outside dimensions(mm) : 533.2(H) x 312.0(V) x 16.5(D)
Pixel pitch (mm) : 0.265x0.265

Color pixel arrangement : R. G. B. Vertical Stripe
Display surface : Hard-coating (3H), Anti-Glare
Color depth : 16.7M colors
Backlight : 4 lamps
Active area (mm) View : 509.184 (H) x 286.216(V),
angle (CR>10) Contrast : 170/160 (H)/(V) (typical)
ratio : 1000 : 1 (typical)
White luminance : 300 nits (typical)
Color gamut : 72% (typical)
Response time : 5 ms

1.2 Scanning frequencies

Horizontal scan range : 30 - 83 K Hz (automatic)
Vertical scan range : 56 - 76 Hz (automatic)

1.3 Video

Video dot rate : Analog < 205 MHz
Digital < 165MHz
HDMI < 225 MHZ

Input impedance
(Analog signal input)
- video : 75 ohm
- Sync : 2.2K ohm

Input signal levels : 700 mVpp
Sync. input signals : Analog R/G/B separate inputs
Separate horizontal and vertical /
Composite (H+V) TTL level,
Sync On Green (SOG) sync
0.3Vp-p Negative

Input impedance (Digital) : 100 ohm

Video interface : Analog, DVI ,HDMI

1.5 Physical characteristics **(ME)**

Unit dimensions
- Width : 547.2 mm
- Height : 432.8mm
- Depth : 201.4 mm

Packed unit dimensions
- Width : 596 mm
- Height : 495mm
- Depth : 134mm

Packed unit dimensions
(China only)
- Width : 596 mm
- Height : 495mm
- Depth : 134mm

Weight (monitor only) : 5.46 Kg

Title angel : - 5 ° + 2 / - 0 ° (forward)
+ 20 ° + 0 / - 2 ° (backward)

Swivel angel Height : nil
adjustment Portrait : nil
display : nil

AC input: - voltage : 100 - 240 V,
- frequency : 50 / 60 ± 2 Hz

Power consumption : 60W maximum

Ambient temperature :0 to 40 degree C

Operating

- Temperature : 5°C to 40°C
- Humidity : 20% to 80%
- Altitude : 0 to 5000 M

Storage
- Temperature : -20 to 60 degree C
- Humidity : 10% to 80%
- Altitude : 0 to 12000M

System MTBF : 50,000 Hrs

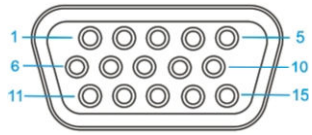
Technical Data

2. Pin Assignment

2.1 PC analog video input with D - sub connector.

Connector type of analog signal cable :
D - Sub male with DDC2B pin assignment.
Blue connector with thumb-operated jackscrews.

Pin assignment :



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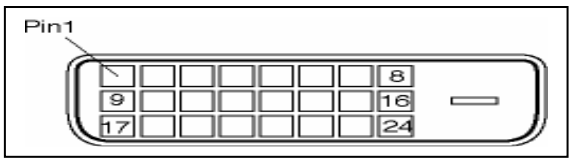
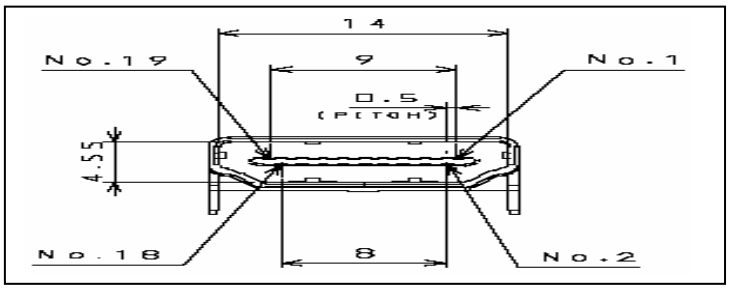
Pin	Symbol	Pin	Symbol	Pin	Symbol
1	Red	6	Red GND	11	GND
2	Green/SOG	7	Green GND	12	Bi-directional data
3	Blue	8	Blue GND	13	H sync
4	GND	9	+5V	14	V sync
5	CableDetect	10	Open	15	Data clock

2.2 PC digital video input with DVI-D connector



Pin	Symbol	Pin	Symbol	Pin	Symbol
1	T.M.D.S. data2-	9	T.M.D.S. data1-	17	T.M.D.S. data0-
2	T.M.D.S. data2+	10	T.M.D.S. data1+	18	T.M.D.S. data0+
3	T.M.D.S. data2 shield	11	T.M.D.S. data1 shield	19	T.M.D.S. data0 shield
4	No Connect	12	No Connect	20	No Connect
5	No Connect	13	No Connect	21	No Connect
6	DDC clock	14	+5V Power	22	T.M.D.S clock shield
7	DDC data	15	Ground (for +5V)	23	T.M.D.S. clock+
8	No Connect	16	Hot plug detect	24	T.M.D.S. clock-

2.4 HDMI Type A cable pin out



PIN	Signal	PIN	Signal	PIN	Signal
1	TMDS Data2+	8	TMDS Data0 Shield	15	SCL
2	TMDS Data2 Shield	9	TMDS Data0-	16	SDA
3	TMDS Data2-	10	TMDS Clock+	17	DDC/CEC Ground
4	TMDS Data1+	11	TMDS Clock Shield	18	Power+5V
5	TMDS Data1 Shield	12	TMDS Clock-	19	Hot Plug Detect
6	TMDS Data1-	13	CEC		
7	TMDS Data0+	14	NC		

Automatic Power Saving

If you have VESA / DPMS compliance display card or software installed in your PC, the monitor can automatically reduce power consumption when power saving function active. And if an input from keyboard, mouse or other devices is detected, the monitor will automatically wake up. The following table shows the power consumption and signaling of this automatic power saving feature:

Status	Power	LED	Remark
Power On	≤ 60W	Blue	The volume should be minimum when test power saving.
Power Saving	≤0.5W	Blinking Blue	
Power Off	≤ 0.5W	Off	

This monitor must comply with the Microsoft On Now specification, with two power management states, as defined by the VESA DPMS document. And must appropriately display the DPMS states. Also comply with Environmental Protection Agency (EPA) Energy Star and TCO03 power management standard strictly

ENERGY STAR is a U.S. Registered mark. AS AN ENERGY STAR PARTNER, PHILIPS HAS DETERMINED THAT THIS PRODUCT MEETS THE ENERGY STAR GUIDELINES OF ENERGY EFFICIENCY.

Factory preset mode:
This monitor has 15 factory-preset modes as indicated in the following table

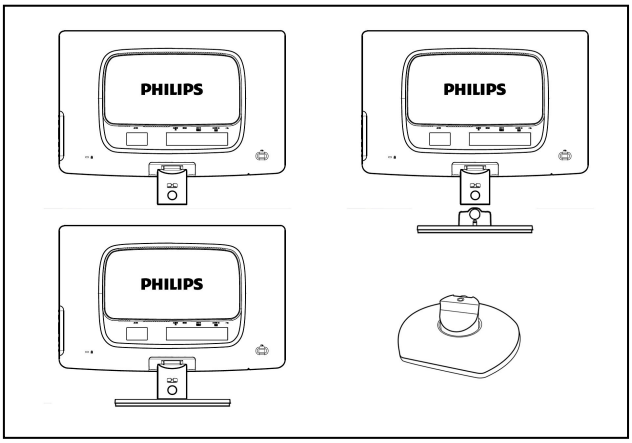
Item	H.Freq. (KHz)	Mode	Resolution	V.Freq. (Hz)	BW(MHz)
1	31.469	IBM VGA 3H	720x400	70.087	28.3
2	31.469	IBM VGA 12H	640x480	59.94	25.175
3	35	MACINTOSH	640x480	67	30.24
4	37.5	VESA	640x480	75	31.5
5	35.156	VESA	800x600	56.25	36
6	37.879	VESA	800x600	60.317	40
7	46.875	VESA	800x600	75	49.5
8	48.363	VESA	1024x768	60.004	65
9	60.023	VESA	1024x768	75.029	78.75
10	63.981	VESA	1280x1024	60.02	108
11	79.976	VESA	1280x1024	75.025	135
12	66.587	CVT 2.3MA-R	1920x1080	60	138.5
13	67.5	CEA 861	1920x1080	60	148.5
14	65.29	CVT1.76MW	1680X1050	60	146.25
15	70.635	CVT1.76MW-R	1680X1050	60	119

Connection to PC

1. Connection to PC

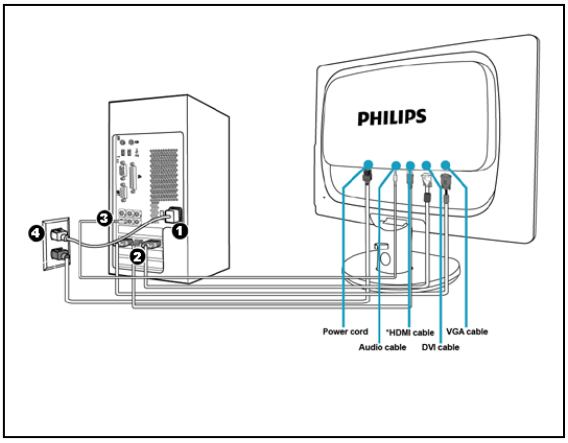
Please follow the steps to connect your LCD Monitor to PC.

a. Assembly LCD Monitor with base



b. Connect to PC

(1) Turn off your computer and unplug its power cable.
(2) Connect the monitor signal cable to the video connector on the back of your computer.
(3) Connect the audio cable to the audio port of your computer
(4) Plug the power cord of your computer and your monitor
(5) Turn on your computer and monitor. If the monitor displays an image, installation is complete



Port definition:

(1) Earphone output (2) VGA input
(3) DVI input (4) HDMI input
(5) Audio input (6) AC power input
(7)Kensington anti-thief lock

For best performance, use your Analog input and ensure that your disolay settings are set at 1920*1080@60Hz

c. Accessory Pack

Power cord

VGA cable

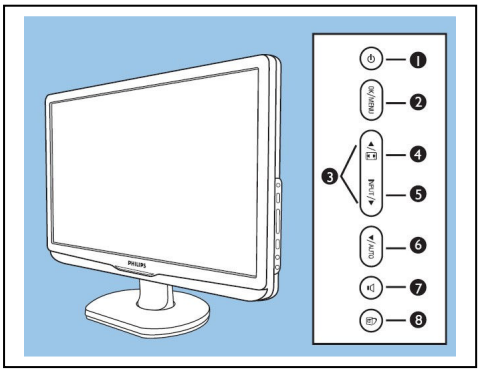
EDFU CD

Quick start

Audio cable

DVI cable

2. Function key definition

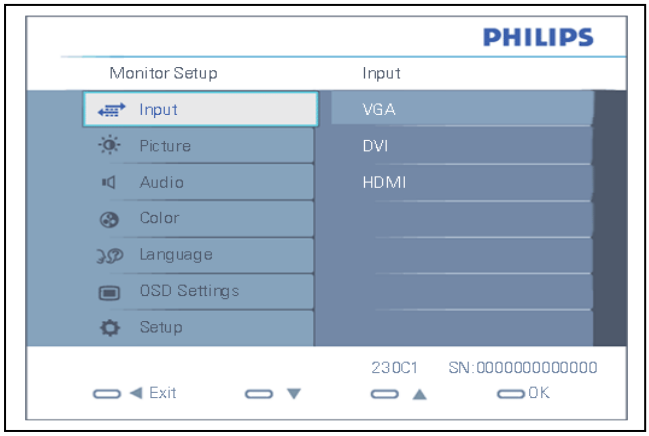


(1) To switch monitor's power On and Off
(2) To access the OSD menu.
(3) To adjust the OSD menu
(4)Change to 4:3 display
(5) To change the signal input source
(6) Automatically adjust the horizontal position, vertical position, phase and clock settings / Return to previous OSD level
(7) To adjust volume of the display

(8) SmartImage. There are five modes to be selected: Office Work, Image Viewing, Entertainment, Economy, and Off

3. Description of the On Screen Display

On-Screen Display(OSD) is a feature in all Philips LCD monitors. It allows and end user to adjust screen performance or select functions of the monitors directly through an on-screen instruction window. A user friendly on screen display interface is shown as below:



Basic and simple instruction on the control keys

According to the above OSD structure, users can

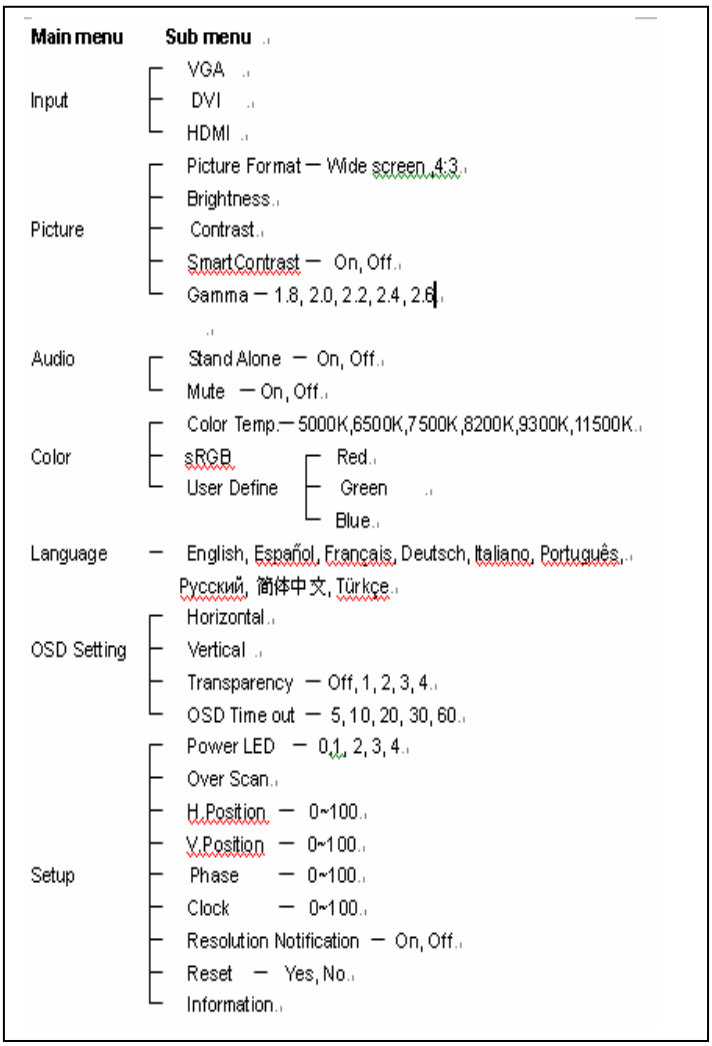
press **UP** or **DOWN** buttons to move the cursor,
press **MENU** button to confirm the choice or change
press **UP** or **DOWN** button to adjust the value
press **MENU** button to save the changes
press **AUTO** button to automatically adjust the horizontal position, vertical position,phase and clock setting

OSD Menu Control Structure

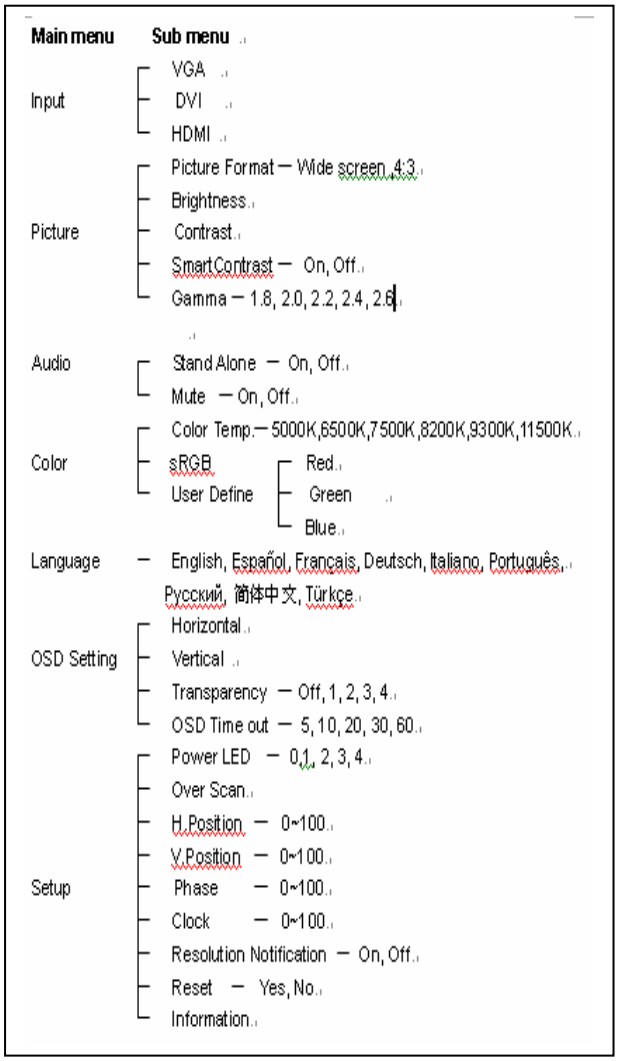
4.The OSD tree.

Below is an overall view of the structure of the On-Screen Display. You can use this as a reference when you want to work your way around the different adjustments later on.

4.1 Available for EU/AP Mode



4.2 Available for China Model



Note:

sRGB is a standard for ensuring correct exchange of colors
between different devices(e. g. Digital cameras, monitor,
printers, scanners, etc.)

Using a standard unified color space, sRGB will help represent pictures taken by an sRGB compatible device correctly on your sRGB enabled Philips monitor. In that way,
the colors are calibrated and you can rely on the correctness
of the colors shown on your screen.

Important with the use of sRGB is that the brightness and
contrast of your monitor is fixed to a predefined setting as
well as the color gamut. Therefore it is important to select the
sRGB setting in the monitor's OSD.
To do so, open the OSD by pressing the OK button on the side f your monitor. More the down button to go to color and ress OK again. Use the right button to go to sRGB. Then ove the down button and press OK again to exit the OSD.
After this, please do not change the brightness or contrast etting of your monitor. If you change either of these, the onitor will exit the sRGB mode and go to a color emperature setting of 6500K.

Advanced OSD Adjustment

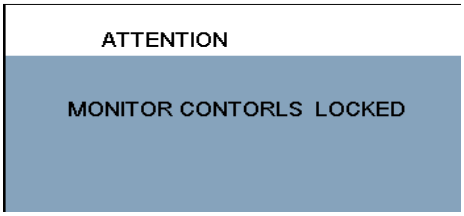
Advanced OSD Adjustment

1. Front control panel

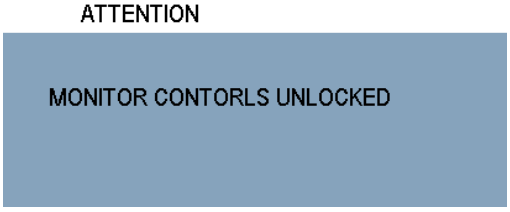
2. To Lock/Unlock OSD function

The OSD function can be locked by pressing **MENU** button for more than 6 seconds, the screen shows following windows for 5 seconds.

Every time when you press any button, this message appears on the screen automatically.

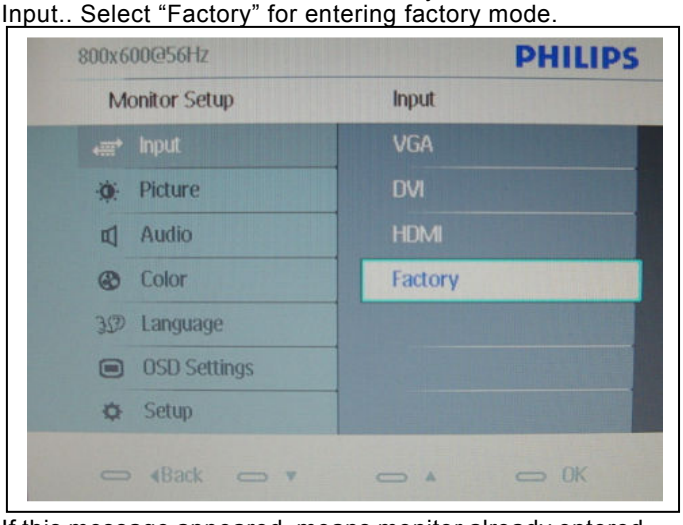


Locked OSD function can be released by pressing **MENU** button for more than 6 seconds. While press **MENU** button for OSD unlocked purpose, the screen will keep showing OSD MAIN MENU LOCKED until OSD function unlocked and screen automatically shows following window for 5 seconds.



3. Access Factory Mode

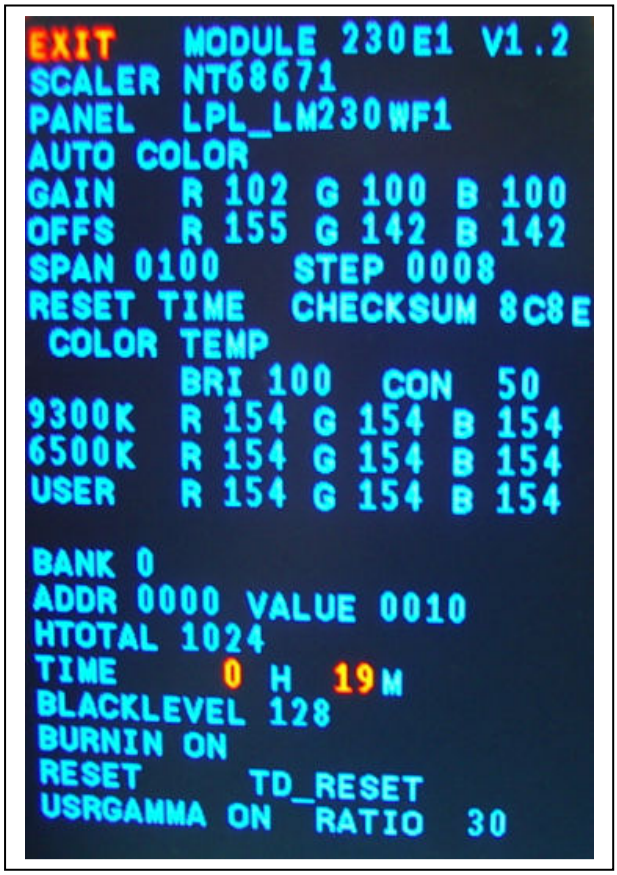
Press **POWER** button to Power off, then Press **AUTO** + **MENU** at the same time, and then press [**POWER**] for DC power on. OSD menu will be shown with “Factory” on the sub –menu of Input.. Select “Factory” for entering factory mode.



If this message appeared, means monitor already entered the factory mode.

4. Entering Burn-in mode and others

If you access into factory mode, press **MENU,**
Select Input-Factory,then press **MENU** to confirm, OSD menu willconvert into another format as below:



Move the cursor by **MENU** button, and press the **UP** or **DOWN** button to change the burn-in mode from On to Off.
Leave factory mode by simply power off(DC off) the monitor.

Warming:

* If you only want to enter burn in mode, please don’t change
any other setting items as above listed.

Appendix:

Explanation of above listed selections.

Selection	Description
Burn in On/Off	Enter Aging Mode
Auto Color	Auto Color Adjustment
Gain	ADC Gain Value Adjustment (Auto adjustment by H/W when implement Auto Color function)
Offset	ADC Offset Value Adjustment (Auto adjustment by H/W when implement Auto Color function)
9300K	9300K Color Temperature Gain Value Adjustment
6500K	6500K Color Temperature Gain Value Adjustment
Reset	Memory Racall To Factory Default Settings

OSD Attention Signals

Clock & Phase Adjustment
Due to the different quality of video signal generated from graphics cards. It is necessary to adjust CLOCK and PHASE functions for the optimal video display of LCD monitor. So maybe some flicker appeared as Fig.1 & 2.

Fig.1

Fig.2

Following steps will guide you to make correct adjustment of CLOCK and PHASE:

a. Restart your computer.
b. Press **MENU** to bring up OSD menu after the OS (Operation System) boot up.
c. Press **UP** or **DOWN** to select the option of **setup** and then press **MENU** to bring up its submenu as shown in Fig.3.
d. Select the **Clock** or **Phase** adjustment items in submenu and press **UP** or **DOWN** to adjust.
(If the phenomenon as Fig.1, you should adjust "**Phase**")
(If the phenomenon as Fig.2, you should adjust "**Clock**")
e. Quit OSD by press **MENU** button to save the settings.

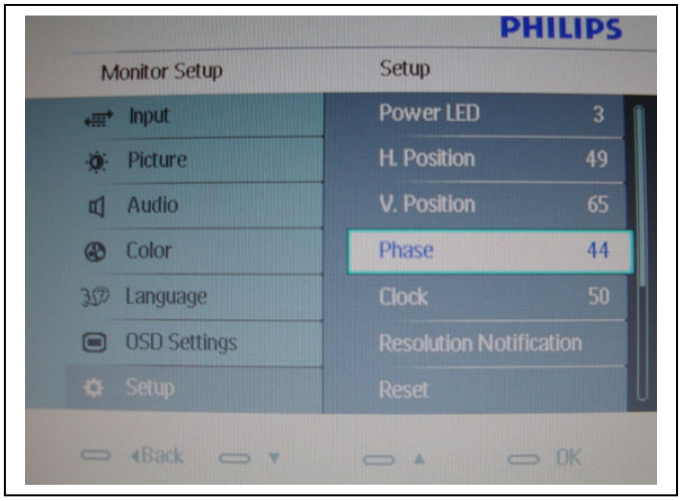


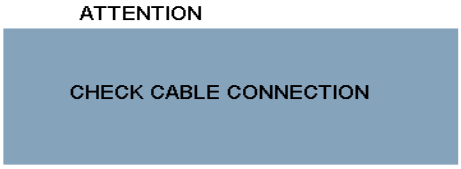
Fig.3

However, CLOCK and PHASE functions are only available while analog video signal is supplied. Operating unit under digital signal state, the video clock information can be obtained from graphics cards directly. So, it is unnecessary to adjust these functions.

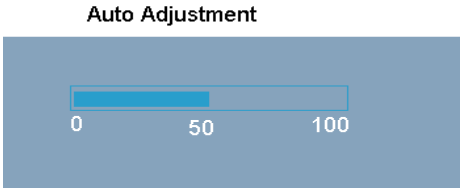
OSD Attention signal

The monitor will detect various display situation automatically. When the monitor detects the problems, the screen will show the different warning signals to remind you what is happen to your monitor.

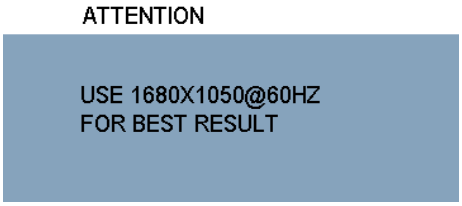
1. CHECK CABLE CONNECTION
This screen appears if there is no video signal input. Please check that the signal cable is properly connected to the video card of PC and make sure PC is on.



2. AUTO ADJUSTMENT
This screen appears when you touch the **AUTO** button. It will disappear when the monitor is properly adjusted.

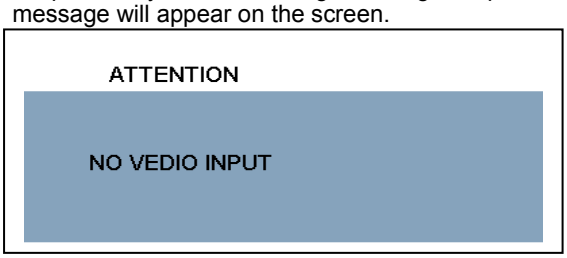


3. USE 1920X1080@60HZ FOR BEST RESULT
This message appears when the video mode input is not the recommended 1920*1080@ 60Hz. Other modes may result in some picture distortion. Please adjust the video mode to 1920*1080 @ 60Hz for best display quality.

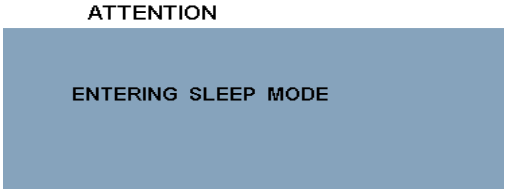


4. 85HZ OVERDRIVE MESSAGE
This message appears when the video mode input is more than 85 HZ. The message "THIS IS 85HZ OVERDRIVE,CHANGE COMPUTER DISPLAY INPUT TO 1920X1080@60HZ"
is warmed, around 5 seconds in each minutes, after 10 minutes will go into power saving mode.

5. NO VIDEO
INPUT(ENTERING SLEEP MODE
If input VGA you are selecting is not signal input, following message will appear on the screen.



After 5 s, the monitor will go into power saving mode, following message will appear on the screen.



Please check that the signal available is properly connected to the video card of PC and make sure PC is on.

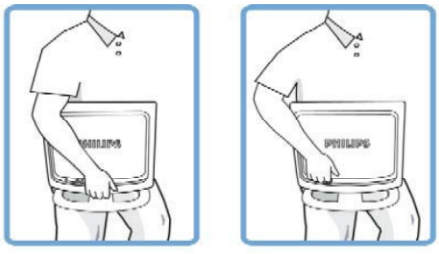
Troubleshooting Information and Safety

Safety precautions and maintenance

WARNING: Use of controls, adjustments or procedures other than those specified in this documentation may result in exposure to shock, electrical hazards and/or mechanical hazards.

Read and follow these instructions when connecting and using your computer monitor:

a. To protect your display from possible damage, do not put excessive pressure on the LCD panel. When moving your monitor, grasp the frame to lift; do not lift the monitor by placing your hand or fingers on the LCD panel.
b. Unplug the monitor if you are not going to use it for an extensive period of time.
c. Unplug the monitor if you need to clean it with a slightly damp cloth. The screen may be wiped with a dry cloth when the power is off. However, never use alcohol, solvents or ammonia-based liquids.
d. Consult a service technician if the monitor does not operate normally when you have followed the instructions in this manual.
e. The casing cover should be opened only by qualified service personnel.
f. Keep the monitor out of direct sunlight and away from stoves or any other heat source.
g. Remove any object that could fall into the vents or prevent proper cooling of the monitor's electronics.
h. Do not block the ventilation holes on the cabinet.
i. Keep the monitor dry. To avoid electric shock, do not expose it to rain or excessive moisture.
j. When positioning the monitor, make sure the power plug and outlet are easily accessible.
k. If turning off the monitor by detaching the power cable or DC power cord, wait for 6 seconds before attaching the power cable or DC power cord for normal operation.
l. To avoid the risk of shock or permanent damage to the set, do not expose the monitor to rain or excessive moisture.
m. IMPORTANT: Always activate a screen saver program during your application. If a still image in high contrast remains on the screen for an extended period of time, it may leave an 'after-image' or 'ghost image' on front of the screen. This is a well-known phenomenon that is caused by the shortcomings inherent in LCD technology. In most cases, the afterimage will disappear gradually over a period of time after the power has been switched off. Be aware, that the afterimage symptom cannot be repaired and is not covered under warranty.
o. Warning for lifting monitor - Do not use the area underneath the logo cover to grip or lift the monitor. Placing weight on the logo cover can cause it to break away from the body and cause the monitor to fall. When lifting the monitor, place one hand under the monitor's frame.



○ Do ✕ Don't

*Consult a service technician if the monitor does not operate normally when the operating instructions given in this manual have been followed.

Installation Locations

Avoid exposure to heat and extreme cold.

Do not store or use the LCD monitor in locations exposed to heat, direct sunlight or extreme cold.

Avoid moving the LCD monitor between locations with large temperature differences. Choose a site that falls within the following temperature and humidity ranges.
Temperature: 0-35°C 32-95°F
Humidity: 20-80% RH

Do not subject the LCD monitor to severe vibration or high impact conditions. Do not place the LCD monitor in the trunk of a car.

Take care not to mishandle this product by either knocking or dropping it during operation or transportation.

Do not store or use the LCD monitor in locations where there is a high level of humidity or in dusty environments. Do not allow water or other liquids to spill on or into the LCD monitor.

Trouble Shooting

This page deals with problems that can be corrected by the user. If the problem still persists after you have tried these solutions, contact your nearest Philips dealer.

Common Problems	
Having this problem	Check these items
No Picture (Power LED not lit)	a. Make sure the power cord is plugged into the power outlet and into the back of the monitor. b. First, ensure that the power button on the front of the monitor is in the OFF position, then press it to the ON position.
No Picture (Power LED is amber or yellow)	a. Make sure the computer is turned on. b. Make sure the signal cable is properly connected to your computer. c. Check to see if the monitor cable has bent pins. d. The Energy Saving feature may be activated.
Screen says	a. Make sure the monitor cable is properly connected to your computer.(Also refer to the Quick Set-Up Guide). b. Check to see if the monitor cable has bent pins. c. Make sure the computer is turned on.
AUTO button not working properly	a. The Auto Function is designed for use on standard Macintosh or IBM-compatible PCs running Microsoft Windows. b. It may not work properly if using nonstandard PC or video card. c. Make sure the computer is turned on.
Imaging Problems	
Display position is incorrect	a. Press the Auto button. b. Adjust the image position using the Phase/Clock of More Settings in OSD Main Controls.
Image vibrates on the screen	a. Check that the signal cable is properly connected to the graphics board or PC.
Vertical flicker appears	a. Press the Auto button. b. Eliminate the vertical bars using the Phase/Clock of More Settings in OSD Main Controls.
Horizontal flicker appears	a. Press the Auto button. b.Eliminate the vertical bars using the Phase/Clock of More Settings in OSD Main Controls.

Definition of Pixel Defects

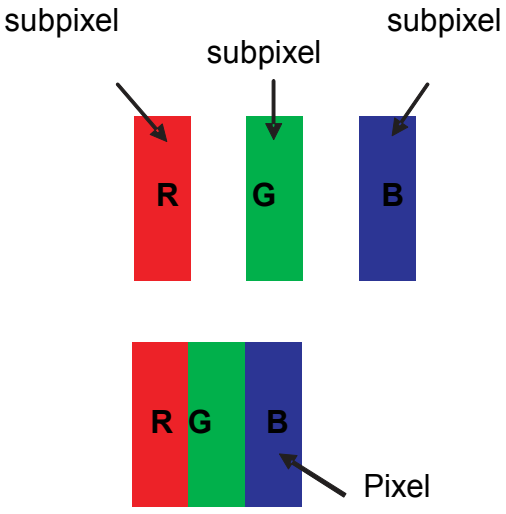
The screen is too bright or too dark	Adjust the contrast and brightness on On-Screen Display.(The backlight of the LCD monitor has a fixed life span. When the screen becomes dark or begins to flicked, please contact your sales representative).
An after-image appears	If an image remains on the screen for an extended period of time, it may be imprinted in the screen and leave an after-image. This usually disappears after a few hours.
An after-image remains after the power has been turned off	This is characteristic of liquid crystal and is not caused by a malfunction or deterioration of the liquid crystal. The after-image will disappear after a peroid of time.
Green, red, blue, dark, and white dots remains	The remaining dots are normal characteristic of the liquid crystal used in today's technology.
For further assistance, refer to the Consumer Information Centers list and contact your local Philips distributor.	

Definition of Pixel Defects

This section explains the different types of pixel defects and defines acceptable defect levels of each type. In order to quality for repair or replacement under warranty, the number of pixel defects on a TFT LCD panel must exceed these acceptable levels.

1. Definition of Pixels and Sub-pixels

A pixel, or picture element, is composed of three sub pixels in the primary colors of red, green and blue. Many pixels together form an image. When all sub pixels of a pixel are lit, the three colored sub pixels together appear as a single white pixel. When all are dark, the three colored sub pixels together appear as a single black pixel. Other combinations of lit and dark sub pixels appear as single pixels of other colors.



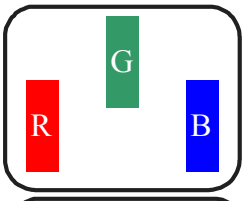
2. Types of Pixel Defects

Pixel and sub pixel defects appear on the screen in different ways. There are two categories of pixel defects and several types of sub pixel defects within each category.

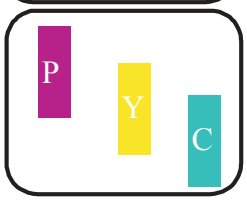
Bright Dot Defects

Bright dot defects appear as pixels or sub pixels that are always lit or 'on'. That is, a bright dot is a sub-pixel that stands out on the screen when the monitor displays a dark pattern. There are the types of bright dot defects:

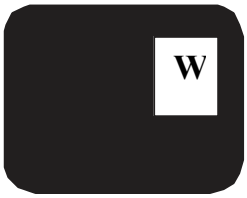
One lit red, green or blue sub pixel



Two adjacent lit sub pixels:
Red + Blue = Purple
Red + Green = Yellow
Green + Blue = Cyan (Light Blue)



Three adjacent lit sub pixels (one white pixel)

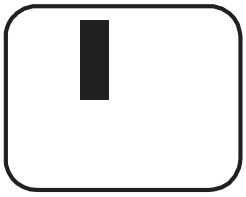


A red or blue bright dot must be more than 50 percent brighter than neighboring dots while a green bright dot is 30 percent brighter than neighboring dots.

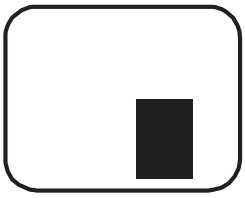
Black Dot Defects

Black dot defects appear as pixels or sub pixels that are always dark or 'off'. That is, a dark dot is a sub-pixel that stands out on the screen when the monitor displays a light pattern. These are the types of black dot defects:

One dark sub pixel



Two or three adjacent dark sub pixels



Definition of pixel defects

3. Proximity of Pixel Defects

Because pixel and sub pixels defects of the same type that are near to one another may be more noticeable, Philips also specifies tolerances for the proximity of pixel defects.
Perfect Panel - ISO 13406-2 Class II compliant do-defect-free-display.

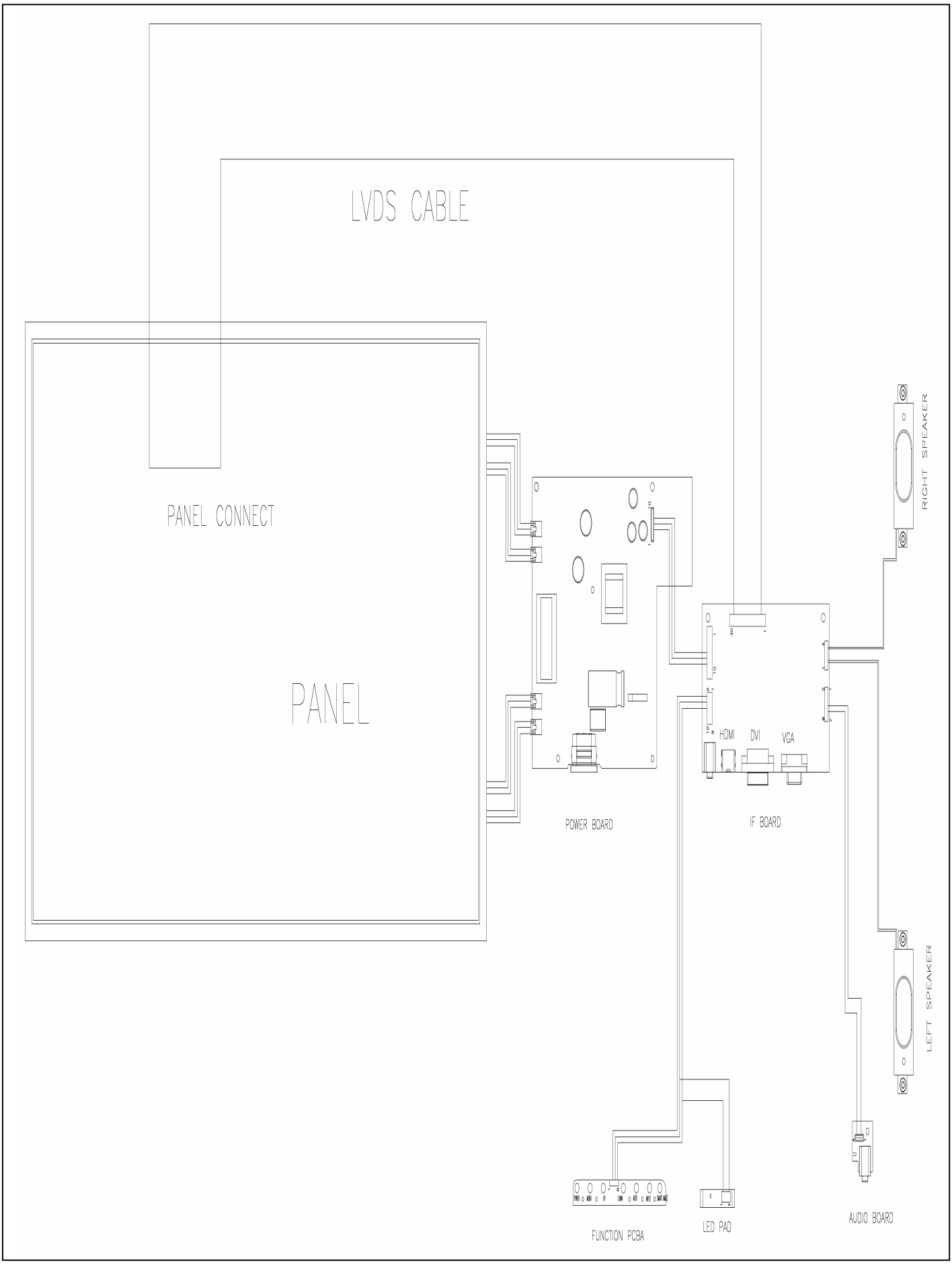
MODEL	*230E*
1 lit subpixel	3
2 adjacent lit subpixels	1
3 adjacent lit subpixels (one white pixel)	0
Distance between two bright dot defects*	15mm
Bright dot defects within 20 mm circle	0
Total bright dot defects of all types	3

MODEL	*230E*
1 dark subpixel	5
2 adjacent dark subpixels	2
3 adjacent dark subpixels (one white pixel)	1
Distance between two dark dot defects*	15mm
Black dot defects within 20 mm circle	1
Total black dot defects of all types	5

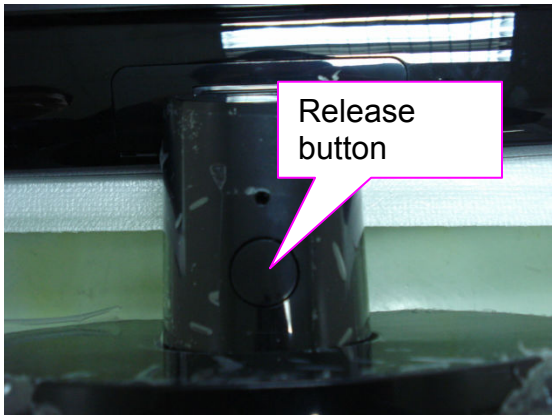
MODEL	*230E*
Total bright or black dot defects of all types	5

Note:
* 1 or 2 adjacent sub pixel defects = 1 dot defect

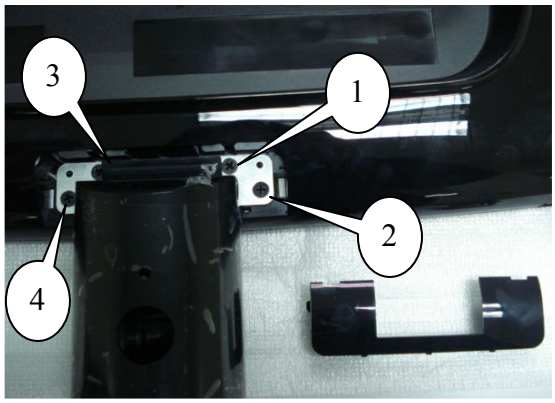
Wiring diagram



Mechnical instructions



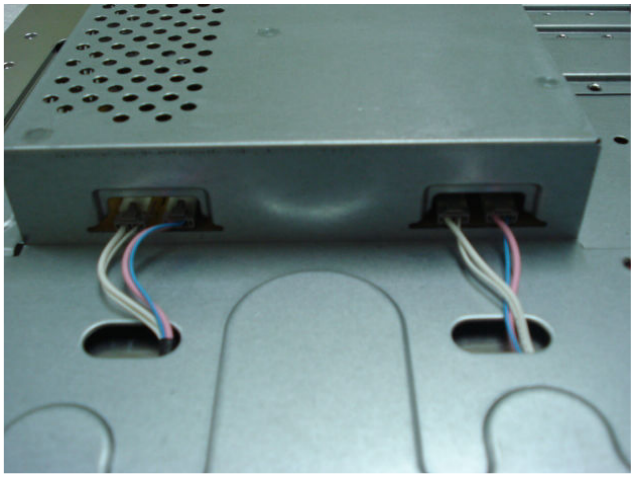
1. Press the release button, Then take off the base.



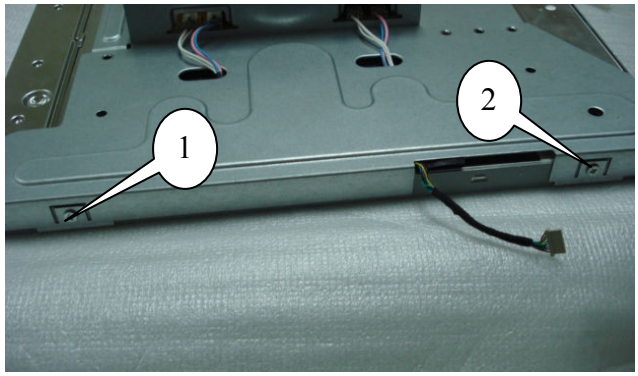
2. Remove 4pcs screw from the join of hinge & back cover, Than take off the hinge

3.Take off the back cover.

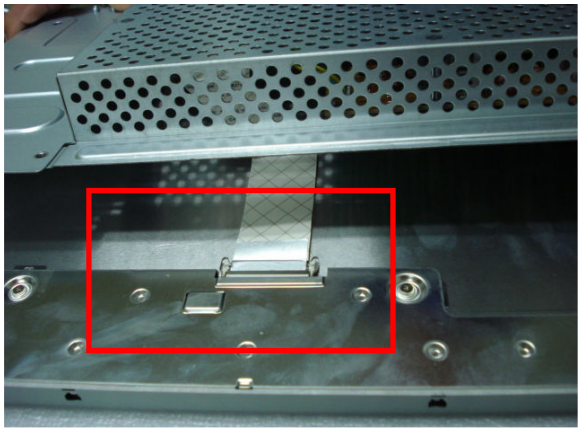
4. Disconnect the cable of function key.



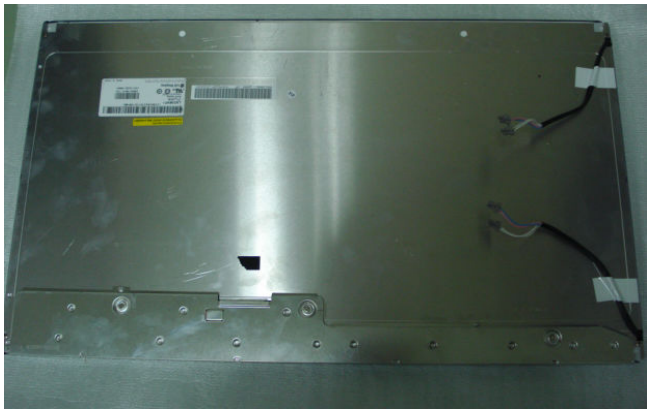
5.Disconnect the lamp cable form power board.



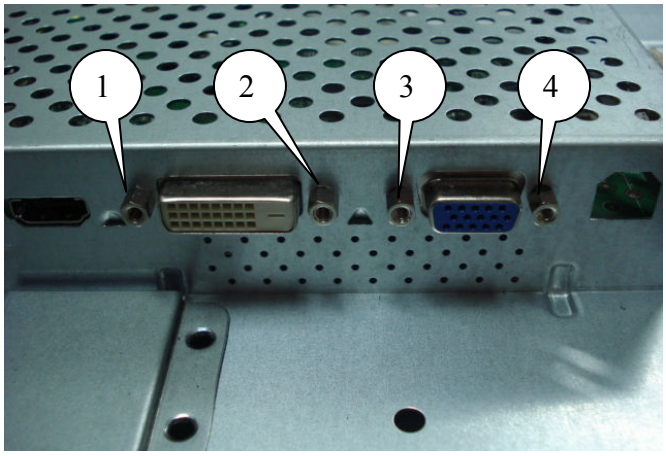
6.Take off the 4 screws which fixed the chassis and panel.. The other 2 screws locate on the other side.



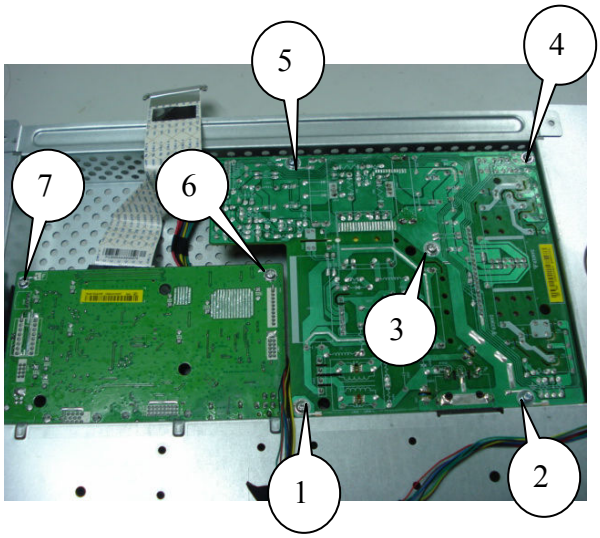
7.Tear off the tape then disconnect the LVDS cable.



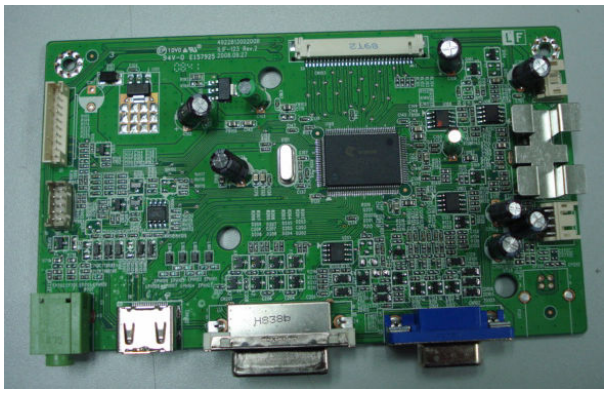
8. .Reserve the Monitor then take the panel out off the chassis.



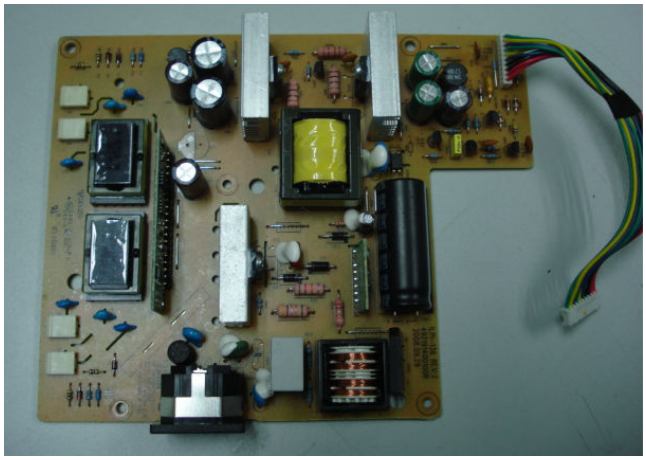
9.Remove 4PCS screws attach VGA connect and DVI connect.



10.Release 7pcs screws form P/BD & IF/BD



11. Interface board



12. Power board

Electrical instructions

F/W upload instruction
Configuration and procedure (ISP Tool)

"ISP Tool" software is provided by NOVATEK to upgrade the firmware of Scaler IC. It is a windows-based program, which cannot be run in MS-DOS.

System and equipment requirements:
1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 98/2000/XP.
3. ISP software " EasyUSB Writer V4.0 ".
(Need to install, it can not be performed directly.Double press“EasyUSB Writer V4.0.exe”to start installing,then chose the path that you want to install ,then it will perform automatically.)
4. Firmware uploading tool, as shown in Fig1.

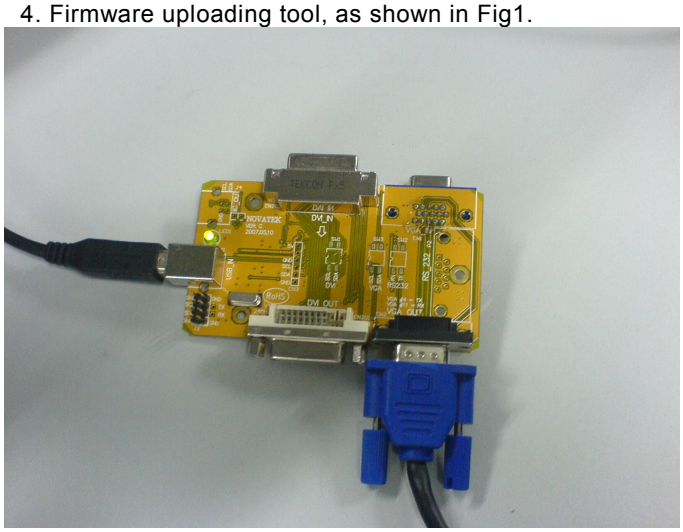


Fig1

* Connect the firmware uploading tool as Fig.1 shown.
* Before the servicer perform the ISP Tool program, the Communicating connection must be well done.The USB port connects to the computer. VGA port connects to the Monitor.
* When the connection fixed, power on the monitor.

Setup and perform the ISP Tool program

1. Save the software in your PC, and create a shortcut on the desktop.

2. Double click the ISP Tool. exe icon at the desktop then appears window as shown in Fig. 2.

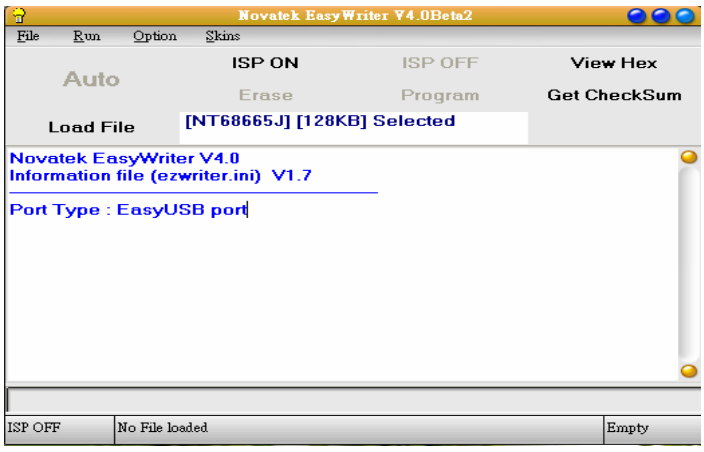


Fig. 2

3. Press the “Load File”button then select the path that save hex file , then chose file type as “Bank Switch(128K,256K)”as shown：

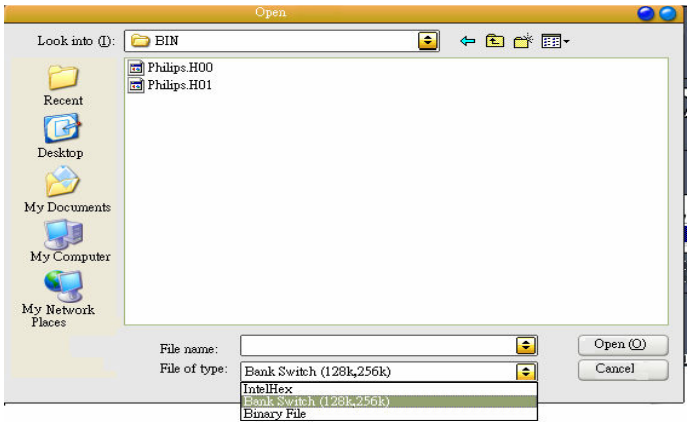


Fig3

4. Double press the “H00” file or “H01 file” ,then it acquires the hex file automatically, and a message will be showed in the dialog box to notice the operator. At this moment, please verify the checksum of the hex file with the firmware control table to make sure the suitable file will be used. Mentioned firmware control table will be provided by suppliers shown in Fig. 4.

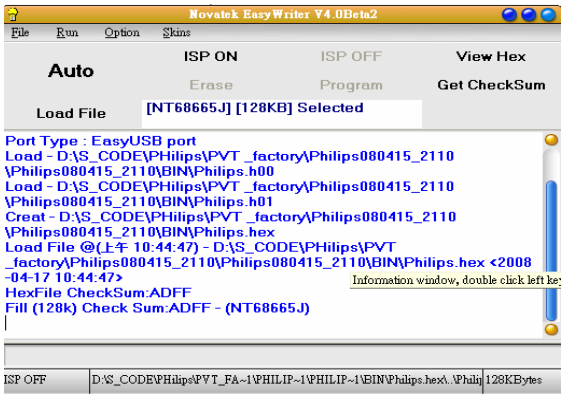


Fig4

5. Press the “ISP ON” button ,then the dialog box will has the information “ISP ON”,else has the information “ISP Fail”.If the information is“ISP Fail ,check the connectivity ,then try it again as shown in Fig. 5.

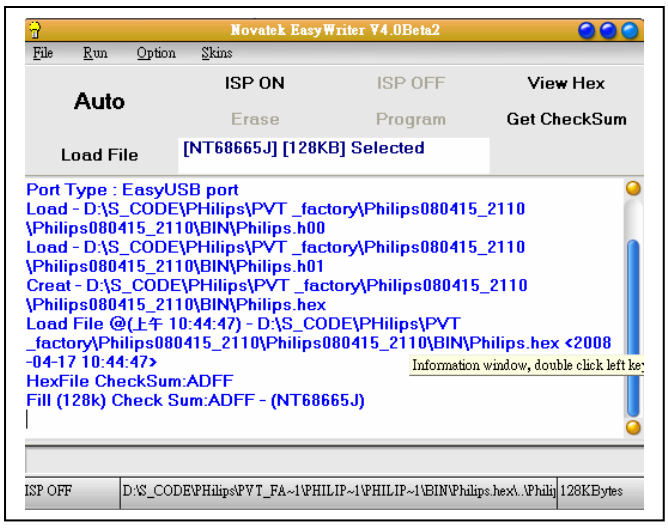


Fig. 5.

6. Press “**Auto**”button of the toolbox. Program will perform the loading process automatically. When the loading process completed, and the dialog box appeared the message of Programing Success. If Program perform fail ,resume step 5.

DDC instructions

General

DDC Data Re-programming

In case the DDC data main EEPROM which storage all factory settings were replaced due to a defect, the
serial numbers have to be re-programmed
It is advised to re-soldered DDC IC and main EEPROM from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

* According to the design concept of this product, DDC data of VGA/DVI/HDMI interface are saved in EEPROM(IC 24C02)

Additional information

Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA). Extended Display Identification Data(EDID) information may be also obtained from VESA.

System and equipment requirements

1. An i486 (or above) personal computer or compatible
2. Microsoft operation system Windows 98/2000/XP
3. Installation software of "EDID_Tool_3.7"(for VGA and DVI EDID) or "EDID_Tool_4.2" (for HDMI)
4. Executive program "EDID_Tool_3.7"(for VGA and DVI EDID) or "EDID_Tool_4.2" (for HDMI)
5. ISP tool kit, as shown in Fig1

Connect the EDID tool as follow in Fig1: The parallel port connects to the computer. VGA or DVI or HDMI port connects to the Monitor.
Including: a. Alignment fixture x 1
b. Printer cable (LPT type) x 1
c. D-sub to D-sub cable x 1 or DVI to DVI Cable x 1 or DVI to HDMI x 1

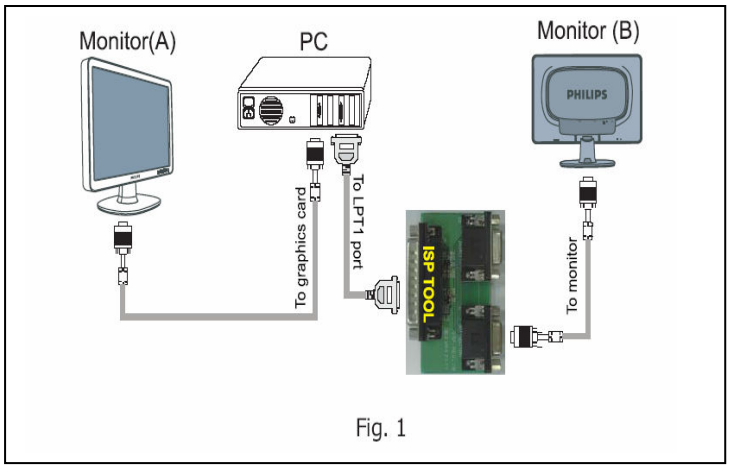


Fig 1

Install and setup EDID_Tool_3.7 program

Step 1: Double press the “EDID_Tool_3.7.exe”,as follow:
Step 2: The EDID Tool Install finished.

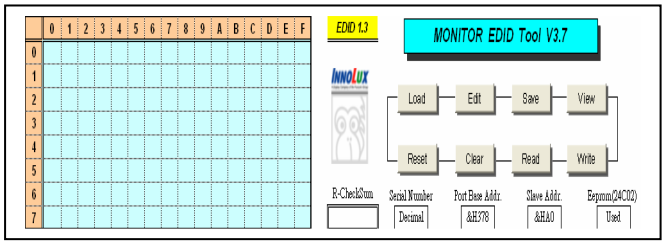


Fig 2

Re-programming DDC IC

For VGA/DVI:

Step 1: After initialize the alignment fixture, connecting all cables. Be using VGA or DVI port from monitor.

Step 2: Connect the power code of monitor and power on it.

Step 3: Double check the EDID_Tool_3.7 icon to run the EDID_Tool_3.7.exe.

Step 4: Click the LOAD icon at the main menu to open the DDC files, load the files into EDID Tool, The EDID table will be appeared automatically as shown in below photos.

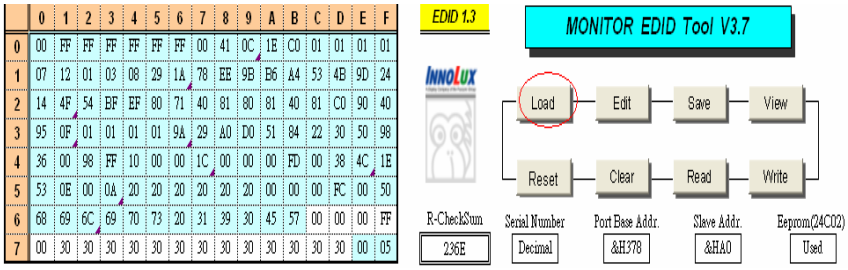


Fig 4

Step 5: In the “Detailed Timings”, key in the monitor serial number.

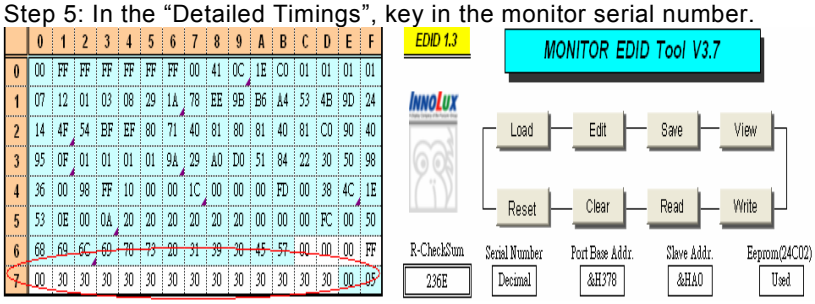


Fig 5

Step 6: Press “Write” button in the tool main ,when the DDC data download into the monitor, the message will be appeared automatically as shown in below photos.

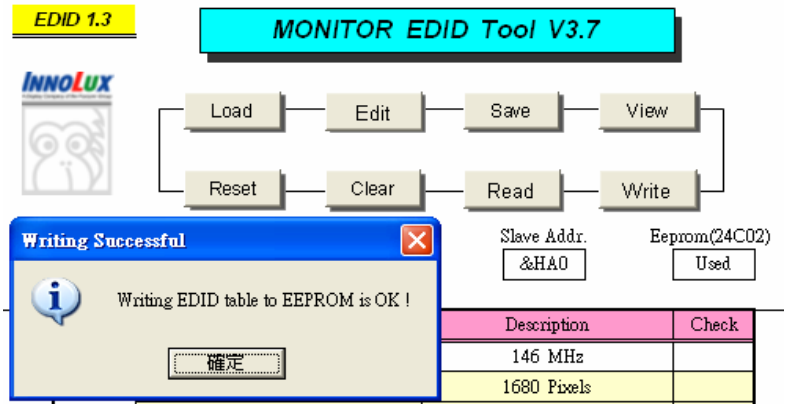


Fig 6

For HDMI:

Step 1: After initialize the alignment fixture, connecting all cables. Be using HDMI port from monitor.

Step 2: Connect the power code of monitor and power on it.

Step 3: Double check the EDID_Tool_4.2 icon to run the EDID_Tool_4.2.exe.

Step 4: Click the LOAD icon at the main menu to open the DDC files, load the files into EDID Tool, The EDID table will be appeared automatically as shown in below photos.

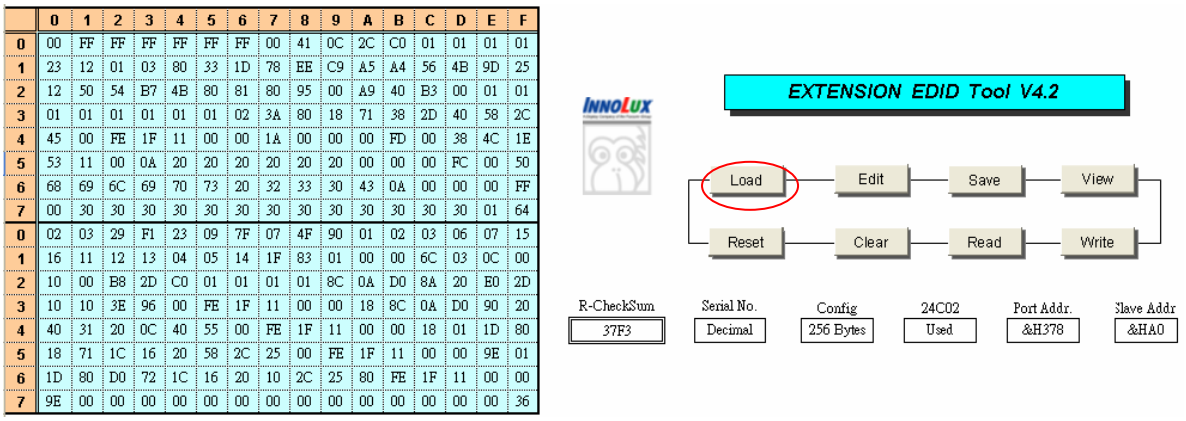


Fig 4

Step 5: In the “Detailed Timings”, key in the monitor serial number.

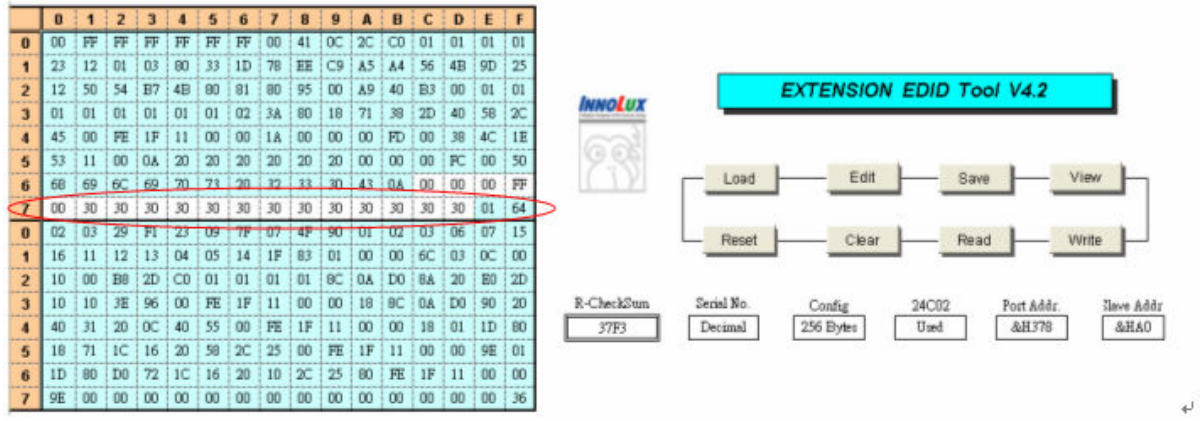


Fig 5

Step 6: Press “Write” button in the tool main ,when the DDC data download into the monitor, the message will be appeared automatically as shown in below photos.

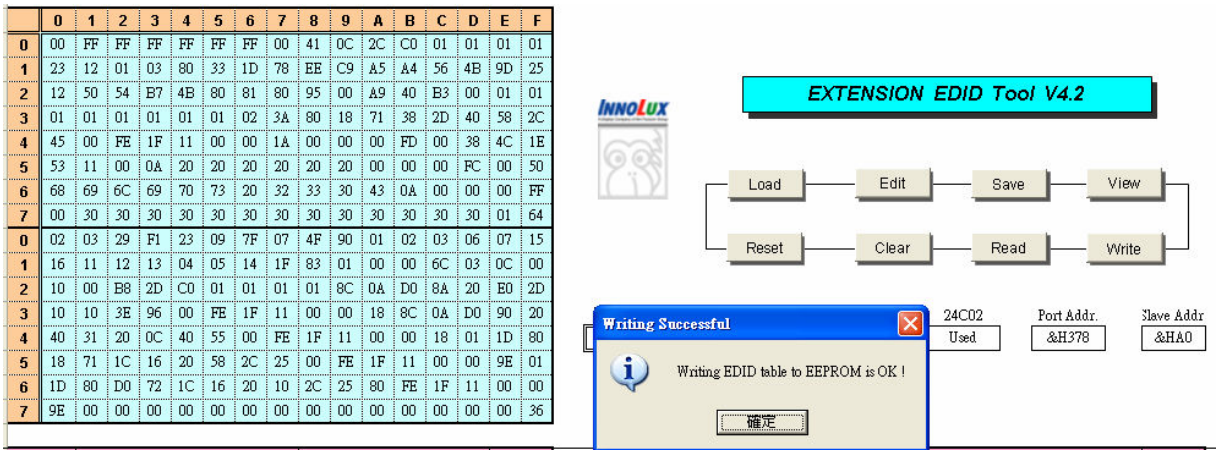


Fig 6

DDC Data

THE DISPLAY DATA CHANNEL (DDC_2B) CONTENT INCLUDING:

Analog mode:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	41	0C	2B	C0	01	01	01	01
1	23	12	01	03	0E	33	1D	78	EE	C9	A5	A4	56	4B	9D	25
2	12	50	54	B7	4B	80	81	80	95	00	A9	40	B3	00	01	01
3	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
4	45	00	FE	1F	11	00	00	1A	00	00	00	FD	00	38	4C	1E
5	53	14	00	0A	20	20	20	20	20	20	00	00	00	FC	00	50
6	68	69	6C	69	70	73	20	32	33	30	45	0A	00	00	00	FF
7	00	30	30	30	30	30	30	30	30	30	30	30	30	30	00	D3

Byte(Hex)	Field Name and Comments	Description	EDID
00~07h	Head Information		00,FF,FF,FF,FF,FF,FF,00
08~09h	ID Manufacturer Name	PHL	41,0C
0A~0Bh	Product ID Code	C02B	2B,C0
0C~0Fh	Last 5 Digits of Serial Number	Not used	01,01,01,01
10h	Week of Manufacture	35	23
11h	Year of Manufacture	2008	12
12h	EDID Version Number	1	01
13h	EDID Revision Number	3	03
14h	Video Input Definition	Analog Signal Level	0E
		0.700, 0.300 (1.000Vp-p)	
		No Blank -to-black Setup	
		Separate Syncs. Supported	
		Composite Sync. Supported	
		Sync. on Green Supported	
		No Serration Required	
15h	Max Horizontal Image Size	51 cm	33
16h	Max Vertical Image Size	29 cm	1D
17h	Display Gamma	2.2	78
18h	Power Management and Supported Feature(s)	Standby	EE
		Suspend	
		Active Off/Very Low Power	
		RGB Color Display	
		sRGB Color Space	
		Preferred Timing Mode	
		No Default GTF Supported	
19~22h	Chroma Info	R (x, y) 0.644, 0.336	C9,A5,A4,56,4B,9D,25,12,50,54
		G (x, y) 0.295, 0.614	
		B (x, y) 0.146, 0.072	
		W (x, y) 0.313, 0.329	
23h	Established Timing I	720 x 400 @ 70Hz	B7
		720 x 400 @ 88Hz (N/A)	
		640 x 480 @ 60Hz	
		640 x 480 @ 67Hz	

		640 x 480 @ 72Hz(N/A)	
		640 x 480 @ 75Hz	
		800 x 600 @ 56Hz	
		800 x 600 @ 60Hz	
24h	Established Timing II	800 x 600 @ 72Hz(N/A)	4B
		800 x 600 @ 75Hz	
		832 x 624 @ 75Hz(N/A)	
		1024 x 768 @ 87Hz(I) (N/A)	
		1024 x 768 @ 60Hz	
		1024 x 768 @ 70Hz(N/A)	
		1024 x 768 @ 75Hz	
		1280 x 1024 @ 75Hz	
25h	Manufacturers Reserved Timings	1152 x 870 @ 75Hz	80
		800 x 600 @ 85Hz (N/A)	
		1024 x 768 @ 85Hz (N/A)	
		1280 x 1024 @ 60Hz (N/A)	
		1280 x 1024 @ 85Hz (N/A)	
		1600 x 1024 @ 60Hz (N/A)	
		1600 x 1200 @ 75Hz (N/A)	
		1600 x 1200 @ 85Hz (N/A)	
26~35h	Standard Timing Identification	1280 x 1024 @ 60Hz 5: 4	81,80
		1440 x 900@60Hz 16:10	95,00
		1600 x 1200 @ 60Hz 4:3	A9,40
		1680 x 1050 @ 60Hz 16:10	B3,00
		No Application	01,01
		No Application	01,01
		No Application	01,01
		No Application	01,01
36~47h	Detailed Timing / Descriptor Block 1	1920x1080 @ 60Hz 148.5 MHz	02,3A,80,18,71,38,2D,40,58,2C,45,00, FE,1F,11,00,00,1A
48~59h	Detailed Timing / Descriptor Block 2	Min. Vertical Frequency: 56 Hz	38
		Max. Vertical Frequency: 76 Hz	4C
		Min. Horizontal Frequency: 30 KHz	1E
		Max. Horizontal Frequency: 83 KHz	53
		Max. Pixel Clock: 200 MHz	14
5A~6Bh	Detailed Timing / Descriptor Block 3	Monitor Name: Philips 230E	00,00,00,FC,00,50,68,69,6C,69,70,73,20,32,33,30,45,0A
6C~7Dh	Detailed Timing / Descriptor Block 4	Monitor Serial Number: 0000000000000	00,00,00,FF,00,30,30,30,30,30,30,30,30,30,30,30,30,30
7Eh	Extension flag		00
7Fh	Checksum		D3

For DVI:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	41	0C	2B	C0	01	01	01	01

1	23	12	01	03	80	33	1D	78	EE	C9	A5	A4	56	4B	9D	25
2	12	50	54	B7	4B	80	81	80	95	00	A9	40	B3	00	01	01
3	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
4	45	00	FE	1F	11	00	00	1A	00	00	00	FD	00	38	4C	1E
5	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC	00	50
6	68	69	6C	69	70	73	20	32	33	30	45	0A	00	00	00	FF
7	00	30	30	30	30	30	30	30	30	30	30	30	30	30	00	64

Byte(Hex)	Field Name and Comments	Description	EDID
00~07h	Head Information		00,FF,FF,FF,FF,FF,FF,00
08~09h	ID Manufacturer Name	PHL	41,0C
0A~0Bh	Product ID Code	C02B	2B,C0
0C~0Fh	Last 5 Digits of Serial Number	Not used	01,01,01,01
10h	Week of Manufacture	35	23
11h	Year of Manufacture	2008	12
12h	EDID Version Number	1	01
13h	EDID Revision Number	3	03
14h	Video Input Definition	Digital Signal Level	80
15h	Max Horizontal Image Size	51 cm	33
16h	Max Vertical Image Size	29 cm	1D
17h	Display Gamma	2.2	78
18h	Power Management and Supported Feature(s)	Standby	EE
		Suspend	
		Active Off/Very Low Power	
		RGB Color Display	
		sRGB Color Space	
		Preferred Timing Mode	
		No Default GTF Supported	
19~22h	Chroma Info	R (x, y) 0.644, 0.336	C9,A5,A4,56,4B,9D,25,12,50,54
		G (x, y) 0.295, 0.614	
		B (x, y) 0.146, 0.072	
		W (x, y) 0.313, 0.329	
23h	Established Timing I	720 x 400 @ 70Hz	B7
		720 x 400 @ 88Hz (N/A)	
		640 x 480 @ 60Hz	
		640 x 480 @ 67Hz	
		640 x 480 @ 72Hz(N/A)	
		640 x 480 @ 75Hz	
		800 x 600 @ 56Hz	
		800 x 600 @ 60Hz	
24h	Established Timing II	800 x 600 @ 72Hz(N/A)	4B
		800 x 600 @ 75Hz	
		832 x 624 @ 75Hz(N/A)	
		1024 x 768 @ 87Hz(I) (N/A)	
		1024 x 768 @ 60Hz	
		1024 x 768 @ 70Hz(N/A)	
		1024 x 768 @ 75Hz	
		1280 x 1024 @ 75Hz	
25h	Manufacturers Reserved Timings	1152 x 870 @ 75Hz	80
		800 x 600 @ 85Hz (N/A)	

		1024 x 768 @ 85Hz (N/A)	
		1280 x 1024 @ 60Hz (N/A)	
		1280 x 1024 @ 85Hz (N/A)	
		1600 x 1024 @ 60Hz (N/A)	
		1600 x 1200 @ 75Hz (N/A)	
		1600 x 1200 @ 85Hz (N/A)	
26~35h	Standard Timing Identification	1280 x 1024 @ 60Hz 5: 4	81,80
		1440 x 900@60Hz 16:10	95,00
		1600 x 1200 @ 60Hz 4:3	A9,40
		1680 x 1050 @ 60Hz 16:10	B3,00
		No Application	01,01
		No Application	01,01
		No Application	01,01
		No Application	01,01
36~47h	Detailed Timing / Descriptor Block 1	1920x1080 @ 60Hz 148.5 MHz	02,3A,80,18,71,38,2D,40,58,2C,45,00, FE,1F,11,00,00,1A
48~59h	Detailed Timing / Descriptor Block 2	Min. Vertical Frequency: 56 Hz	38
		Max. Vertical Frequency: 76 Hz	4C
		Min. Horizontal Frequency: 30 KHz	1E
		Max. Horizontal Frequency: 83 KHz	53
		Max. Pixel Clock: 170 MHz	11
5A~6Bh	Detailed Timing / Descriptor Block 3	Monitor Name: Philips 230E	00,00,00,FC,00,50,68,69,6C,69,70,73,20,32,33,30,45,0A
6C~7Dh	Detailed Timing / Descriptor Block 4	Monitor Serial Number: 0000000000000	00,00,00,FF,00,30,30,30,30,30,30,30,30,30,30,30,30,30
7Eh	Extension flag		00
7Fh	Checksum		64

For HDMI :

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	41	0C	2B	C0	01	01	01	01
1	23	12	01	03	80	33	1D	78	EE	C9	A5	A4	56	4B	9D	25
2	12	50	54	B7	4B	80	81	80	95	00	A9	40	B3	00	01	01
3	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
4	45	00	FE	1F	11	00	00	1A	00	00	00	FD	00	38	4C	1E
5	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC	00	50
6	68	69	6C	69	70	73	20	32	33	30	45	0A	00	00	00	FF
7	00	30	30	30	30	30	30	30	30	30	30	30	30	30	01	63
8	02	03	29	F1	23	09	7F	07	4F	90	01	02	03	06	07	15
9	16	11	12	13	04	05	14	1F	83	01	00	00	6C	03	0C	00
A	10	00	B8	2D	C0	01	01	01	01	8C	0A	D0	8A	20	E0	2D
B	10	10	3E	96	00	FE	1F	11	00	00	18	8C	0A	D0	90	20
C	40	31	20	0C	40	55	00	FE	1F	11	00	00	18	01	1D	80
D	18	71	1C	16	20	58	2C	25	00	FE	1F	11	00	00	9E	01
E	1D	80	D0	72	1C	16	20	10	2C	25	80	FE	1F	11	00	00
F	9E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	36

Byte(Hex)	Field Name and Comments	Description	EDID
00~07h	Head Information		00,FF,FF,FF,FF,FF,FF,0

			0
08~09h	ID Manufacturer Name	PHL	41,0C
0A~0Bh	Product ID Code	C02B	2B,C0
0C~0Fh	Last 5 Digits of Serial Number	Not used	01,01,01,01
10h	Week of Manufacture	35	23
11h	Year of Manufacture	2008	12
12h	EDID Version Number	1	01
13h	EDID Revision Number	3	03
14h	Video Input Definition	Digital Signal Level	80
15h	Max Horizontal Image Size	51 cm	33
16h	Max Vertical Image Size	29 cm	1D
17h	Display Gamma	2.2	78
18h	Power Management and Supported Feature(s)	Standby	EE
		Suspend	
		Active Off/Very Low Power	
		RGB Color Display	
		sRGB Color Space	
		Preferred Timing Mode	
		No Default GTF Supported	
19~22h	Chroma Info	R (x, y) 0.644, 0.336	C9,A5,A4,56,4B,9D,25,12,50,54
		G (x, y) 0.295, 0.614	
		B (x, y) 0.146, 0.072	
		W (x, y) 0.313, 0.329	
23h	Established Timing I	720 x 400 @ 70Hz	B7
		720 x 400 @ 88Hz (N/A)	
		640 x 480 @ 60Hz	
		640 x 480 @ 67Hz	
		640 x 480 @ 72Hz(N/A)	
		640 x 480 @ 75Hz	
		800 x 600 @ 56Hz	
		800 x 600 @ 60Hz	
24h	Established Timing II	800 x 600 @ 72Hz(N/A)	4B
		800 x 600 @ 75Hz	
		832 x 624 @ 75Hz(N/A)	
		1024 x 768 @ 87Hz(I) (N/A)	
		1024 x 768 @ 60Hz	
		1024 x 768 @ 70Hz(N/A)	
		1024 x 768 @ 75Hz	
		1280 x 1024 @ 75Hz	
25h	Manufacturers Reserved Timings	1152 x 870 @ 75Hz	80
		800 x 600 @ 85Hz (N/A)	
		1024 x 768 @ 85Hz (N/A)	
		1280 x 1024 @ 60Hz (N/A)	
		1280 x 1024 @ 85Hz (N/A)	
		1600 x 1024 @ 60Hz (N/A)	
		1600 x 1200 @ 75Hz (N/A)	
		1600 x 1200 @ 85Hz (N/A)	
26~35h	Standard Timing Identification	1280 x 1024 @ 60Hz 5: 4	81,80
		1440 x 900@60Hz 16:10	95,00
		1600 x 1200 @ 60Hz 4:3	A9,40
		1680 x 1050 @ 60Hz 16:10	B3,00
		No Application	01,01
		No Application	01,01

		No Application	01,01
		No Application	01,01
36~47h	Detailed Timing / Descriptor Block 1	1920x1080 @ 60Hz 148.5 MHz	02,3A,80,18,71,38,2D,40,58,2C,45,00,FE,1F,11,00,00,1A
48~59h	Detailed Timing / Descriptor Block 2	Min. Vertical Frequency: 56 Hz	38
		Max. Vertical Frequency: 76 Hz	4C
		Min. Horizontal Frequency: 30 KHz	1E
		Max. Horizontal Frequency: 83 KHz	53
		Max. Pixel Clock: 170 MHz	11
5A~6Bh	Detailed Timing / Descriptor Block 3	Monitor Name: Philips 230E	00,00,00,FC,00,50,68,69,6C,69,70,73,20,32,33,30,45,0A
6C~7Dh	Detailed Timing / Descriptor Block 4	Monitor Serial Number: 0000000000000	00,00,00,FF,00,30,30,30,30,30,30,30,30,30,30,30,30,30
7Eh	Extension flag		01
7Fh	Checksum		63
80	Tag	2	02
81	CEA EDID Timing Extension Ver.	3	03
82	Detail Timing Blocks Start at Byte	128 + 41	29
83	DTV Monitor support	Underscan support; Basic Audio support; Support YCbCr4:4:4; Support YCbCr4:2:2;	F1
	Native (Preferred) Mode Number	1	
84--87	Audio data block	Audio tag code--1; Bytes length of audio data block--3; Linear PCM; Two channels; Sampling Rate 32KHz/44KHz/48KHz/88KHz/96KHz/176KHz/192KHz Audio Bit Rate 16 Bit/20 Bit/24 Bit;	23,09,7F,07
88--97	Video Data Block	(Bytes length of video data block--15;) 1920X1080p 59.94/60Hz 16:9 Native 640x480p 59.94/60Hz 4:3; 720x480p 59.94/60Hz 4:3; 720x480p 59.94/60Hz 16:9; 720(1440)x480i 59.94/60Hz 4:3; 720(1440)x480i 59.94/60Hz 16:9; 720(1440)x576i 50Hz 4:3; 720(1440)x576i 50Hz 16:9; 720x576p 50Hz 4:3; 720x576p 50Hz 16:9; 1280x720p 50Hz 16:9; 1280x720p 59.94/60Hz 16:9; 1920x1080i 59.94/60Hz 16:9; 1920x1080I 50Hz 16:9; 1920x1080p 50Hz 16:9; 720x576p 50Hz 4:3 720(1440)x576i 50Hz 16:9 640x480p 59.94/60Hz 4:3	4F,90,01,02,03,06,07,15,16,11,12,13,04,05,14,1F
98—9B	Speaker Allocation Data Block;	Tag code--4; Bytes length of video data block--3; Right and Left placement;	83,01,00,00

9C—A8	Vendor Specific Data Block	Speaker tag code--3; Bytes length of video data block--6; 24 bit IEEE Registration Identifier--0x000C03; Supports_AI DC_36bit DC_30bit DC_Y444 Max_TMDS_clock=225(Max rate)/5 Latency_Fields_Present,I_Latency_Fields_Present Video_Latency Audeo_Latency Interlaced_Video_Latency Interlaced_Audeo_Latency	6C,03,0C,00,10,00,B8,2D,C0,01,01,01,01
A9—BA	Detailed Timing / Descriptor Block 1	720x480p/59.94Hz, 16:9	8C,0A,D0,8A,20,E0,2D,10,10,3E,96,00, FE, 1F,11,00,00,18
BB—CC	Detailed Timing / Descriptor Block 2	720x576p/50Hz, 4:3	8C,0A,D0,90,20,40,31,20,0C,40,55,00, FE, 1F,11,00,00,18
CD—DE	Detailed Timing / Descriptor Block 3	1920x1080i/60Hz, 16:9	01,1D,80,18,71,1C,16,20,58,2C,25,00, FE, 1F,11,00,00,9E
DF—F0	Detailed Timing / Descriptor Block 4	1920x1080i/50Hz, 16:9	01,1D,80,D0,72,1C,16,20,10,2C,25,80, FE, 1F,11,00,00,9E
F1—FC	Not use		00,00,00,00,00,00,00,00,00,00,00,00
FD	Beginning of padding		00
FE	End of padding		00
FF	Checksum		36

Safety Instruction, Warnings and Notes

Safety instruction,warnings and notes
index of this chapter:
1 Safety Instructions
2 Warnings
3 Notes

1 Safety Instructions

Safety regulations require that during a repair:
a. Connect the set to the AC Power via an isolation transformer (> 800 VA).
b. Replace safety components, indicated by the symbol , only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

a. Route the wire trees correctly and fix them with the mounted cable clamps.
b. Check the insulation of the AC Power lead for external damage.
c. Check the strain relief of the AC Power cord for proper function.
d. Check the electrical DC resistance between the AC Power plug and the secondary side (only for sets which have a AC Power isolated power supply):
* Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
* Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
* Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5
Mohm and 12 Mohm.
* Switch "off" the set, and remove the wire between the two Pins of the AC Power plug.
e. Check the cabinet for defects, to avoid touching of any inner parts by the customer.

2 Warnings

a. All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. Make sure that, during repair,
you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
b. Be careful during measurements in the high voltage section.
c. Never replace modules or other components while the unit is switched "on".
d. When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

3 Notes

3.1 General

Measure the voltages and waveforms with regard to the chassis ground or hot ground, depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative.

The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on

3.2 Schematic Notes

All resistor values are in ohms and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 Kohm).

Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).

All capacitor values are given in micro-farads ($X10^{-6}$), nano-farads (n= $X10^{-9}$), or pico-farads (p= $X10^{-12}$).

Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).

An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.

The correct component values are listed in the Electrical Replacement Parts List. Therefore, always check this list when there is any doubt.

3.3 Lead Free Solder

Philips CE is going to produce lead-free sets (PBF) from 1.1.2005 onwards.
Lead-free sets will be indicated by the PHILIPS-lead-free logo on the Printed Wiring Boards (PWB):

Figure 2-1 Lead-free logo

This sign normally has a diameter of 6 mm, but if there is less space on a board also 3 mm is possible.

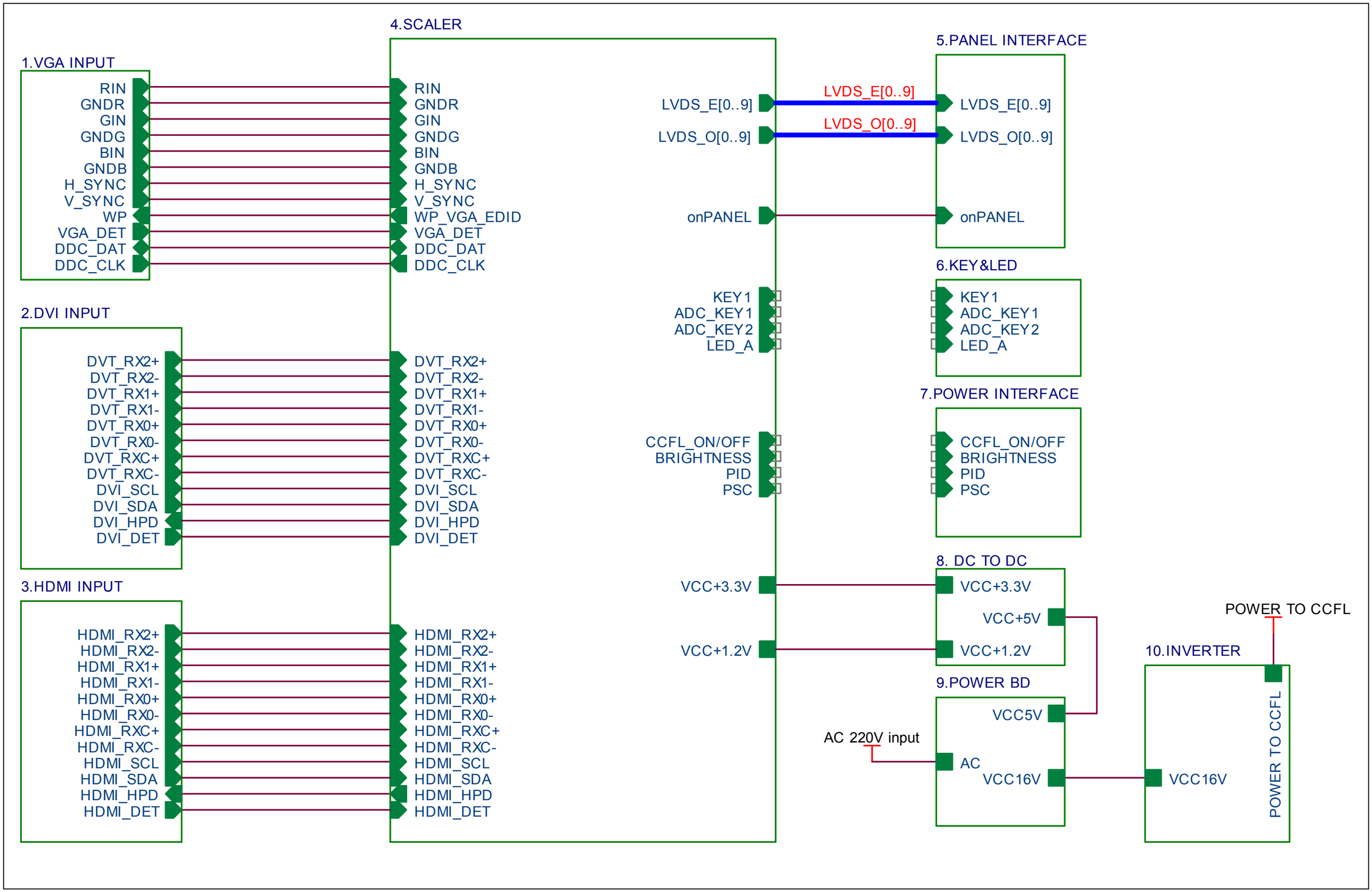
In case of doubt wether the board is lead-free or not (or with mixed technologies), you can use the following method:
* Always use the highest temperature to solder, when using SAC305 (see also instructions below).
* De-solder thoroughly (clean solder joints to avoid mix of two alloys).

Caution: For BGA-ICs, you must use the correct temperature profile, which is coupled to the 12NC. For an overview of these profiles, visit the website *http://www.atyourservice.ce.philips.com/*
You will find this and more technical information within the "Magazine", chapter "Workshop information".
For additional questions please contact your local repair desk.
Due to lead-free technology some rules have to be respected by the workshop during a repair:

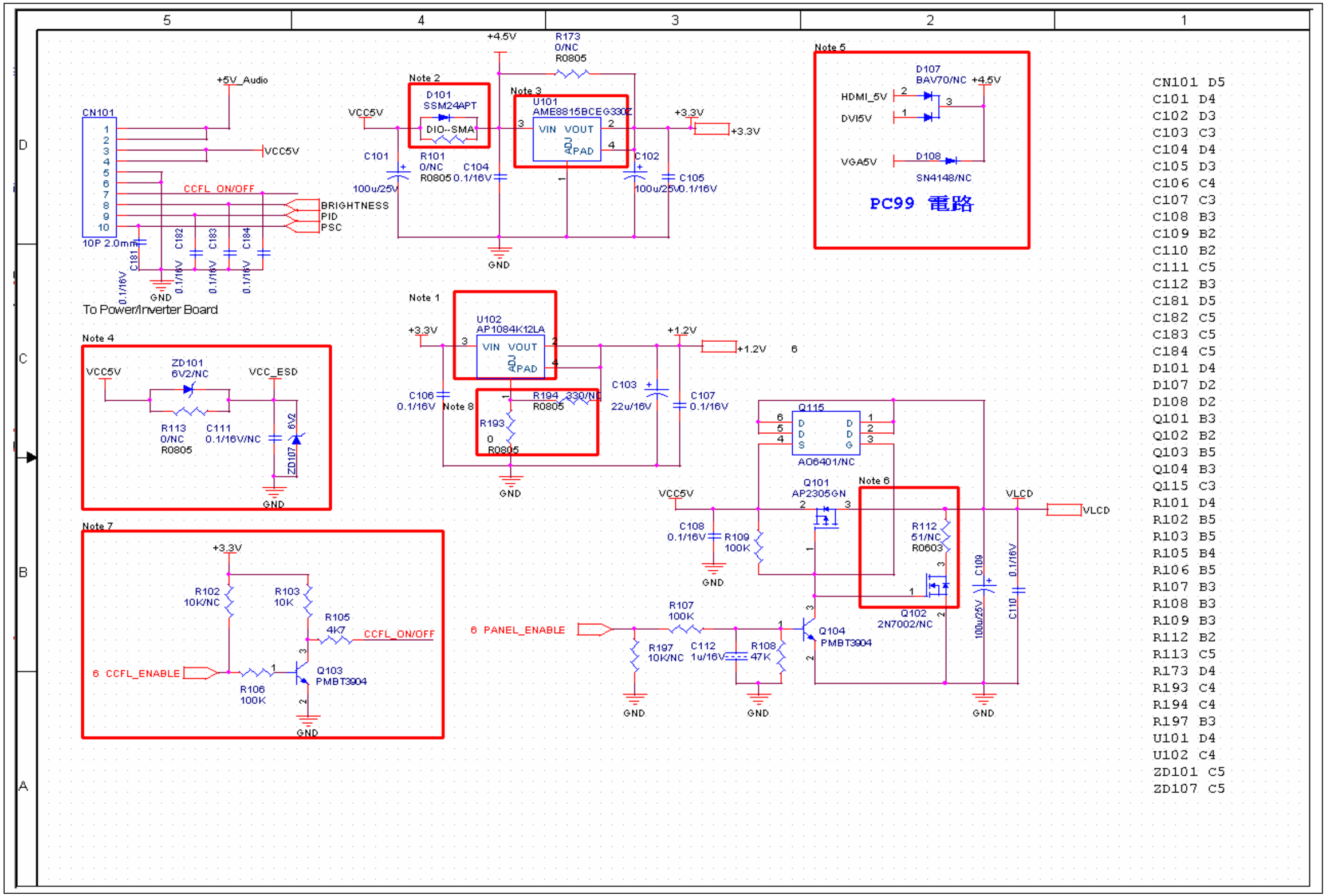
Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment.
In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.

Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able
- To reach at least a solder-tip temperature of 400 degree C.
- To stabilise the adjusted temperature at the solder-tip.
- To exchange solder-tips for different applications.

Block Diagram

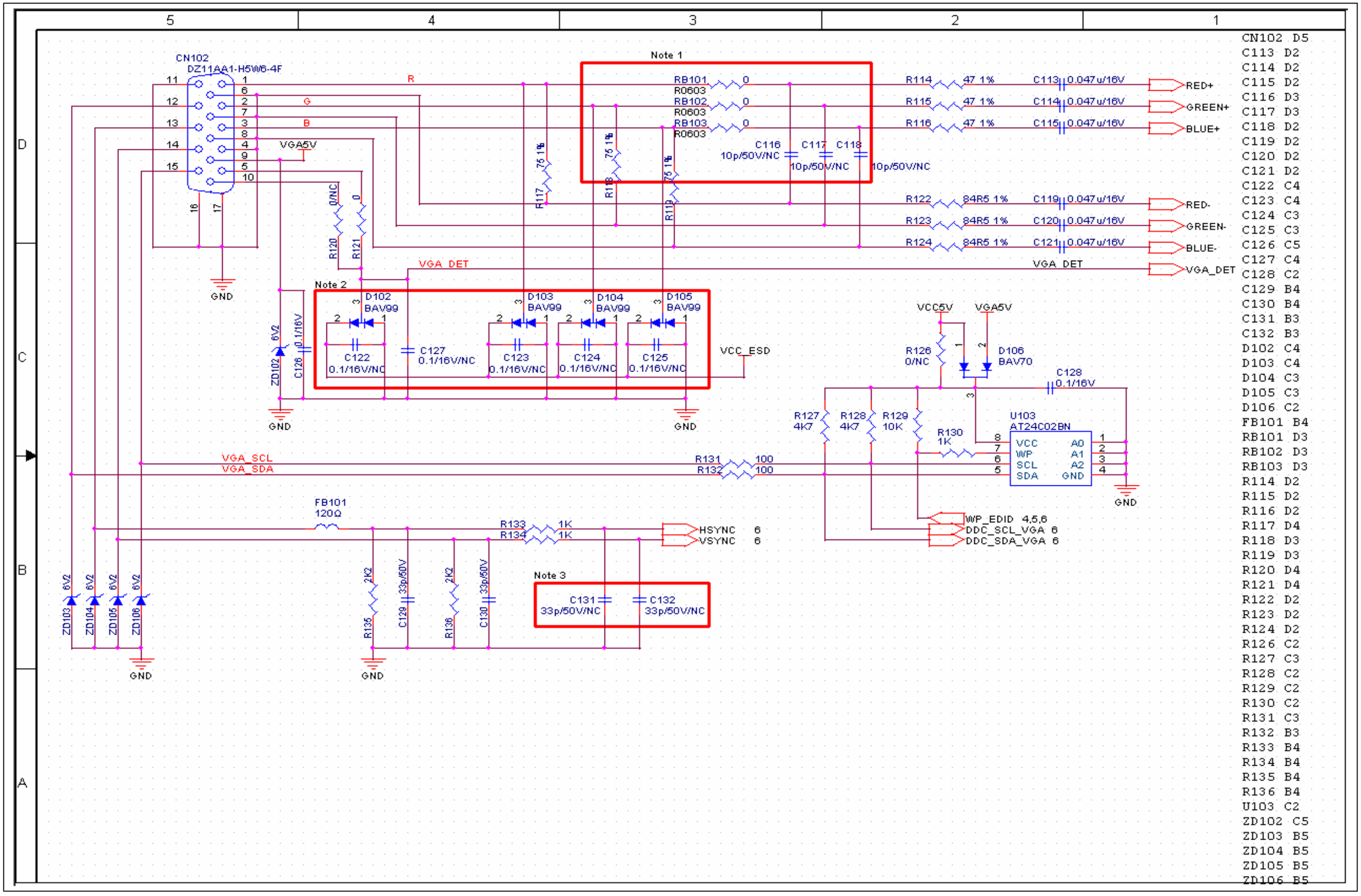


Schematic Diagram (Scaler Board - Power)



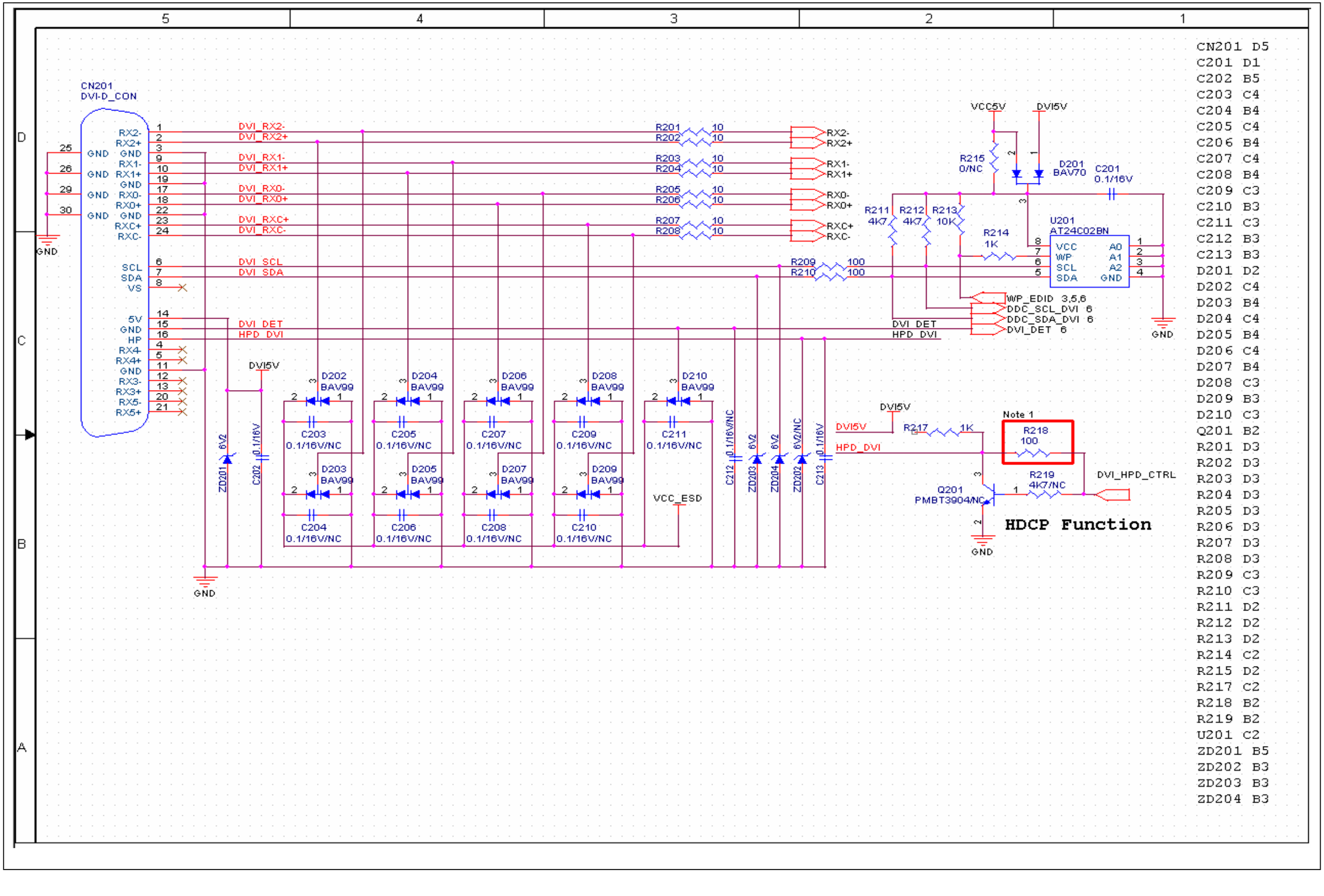
CN101 D5
C101 D4
C102 D3
C103 C3
C104 D4
C105 D3
C106 C4
C107 C3
C108 B3
C109 B2
C110 B2
C111 C5
C112 B3
C181 D5
C182 C5
C183 C5
C184 C5
D101 D4
D107 D2
D108 D2
Q101 B3
Q102 B2
Q103 B5
Q104 B3
Q115 C3
R101 D4
R102 B5
R103 B5
R105 B4
R106 B5
R107 B3
R108 B3
R109 B3
R112 B2
R113 C5
R173 D4
R193 C4
R194 C4
R197 B3
U101 D4
U102 C4
ZD101 C5
ZD107 C5

Schematic Diagram(VGA -Input)

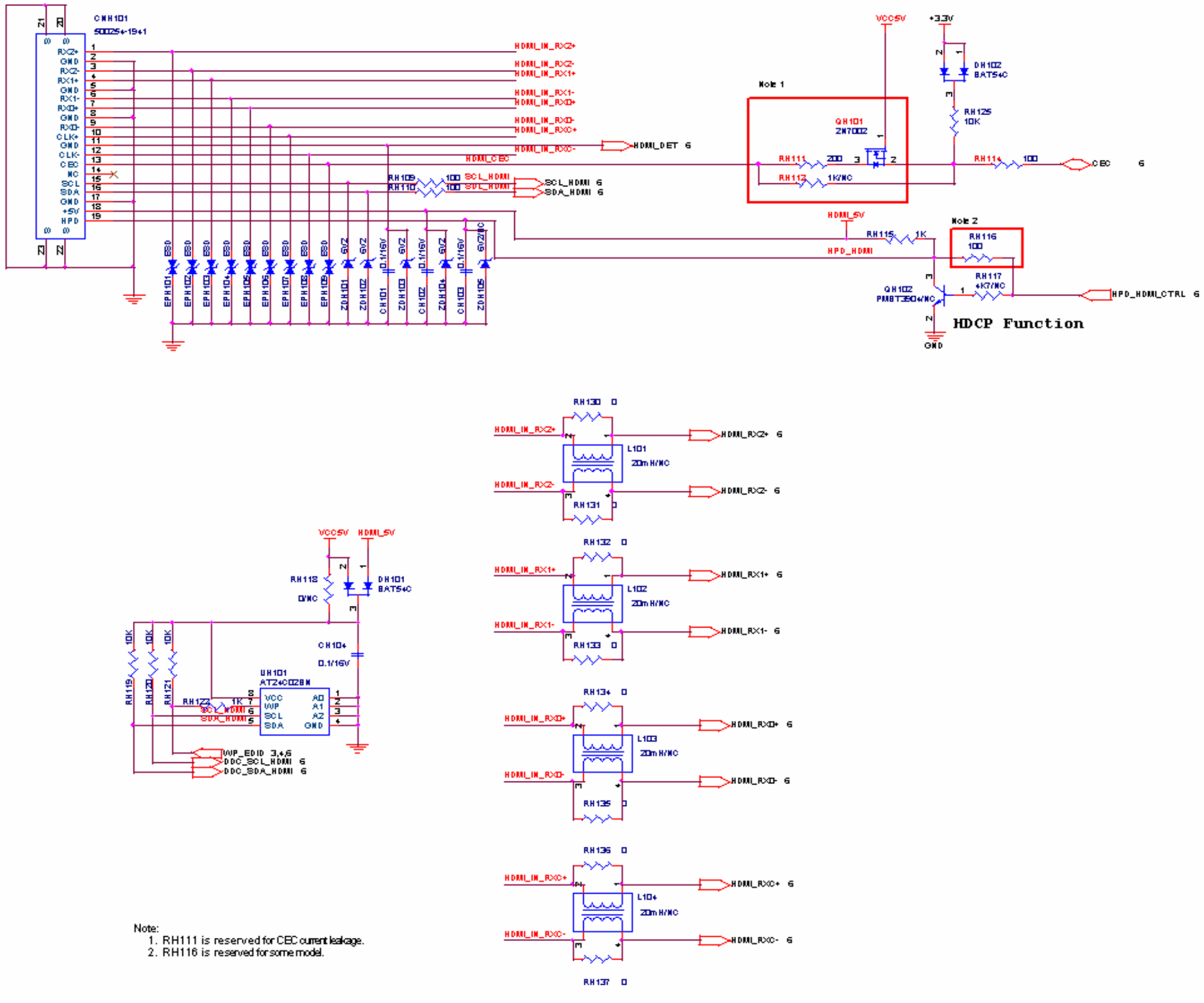


CN102 D5
C113 D2
C114 D2
C115 D2
C116 D3
C117 D3
C118 D2
C119 D2
C120 D2
C121 D2
C122 C4
C123 C4
C124 C3
C125 C3
C126 C5
C127 C4
C128 C2
C129 B4
C130 B4
C131 B3
C132 B3
D102 C4
D103 C4
D104 C3
D105 C3
D106 C2
FB101 B4
RB101 D3
RB102 D3
RB103 D3
R114 D2
R115 D2
R116 D2
R117 D4
R118 D3
R119 D3
R120 D4
R121 D4
R122 D2
R123 D2
R124 D2
R126 C2
R127 C3
R128 C2
R129 C2
R130 C2
R131 C3
R132 B3
R133 B4
R134 B4
R135 B4
R136 B4
U103 C2
ZD102 C5
ZD103 B5
ZD104 B5
ZD105 B5
ZD106 B5

Schematic Diagram(DVI -Input)



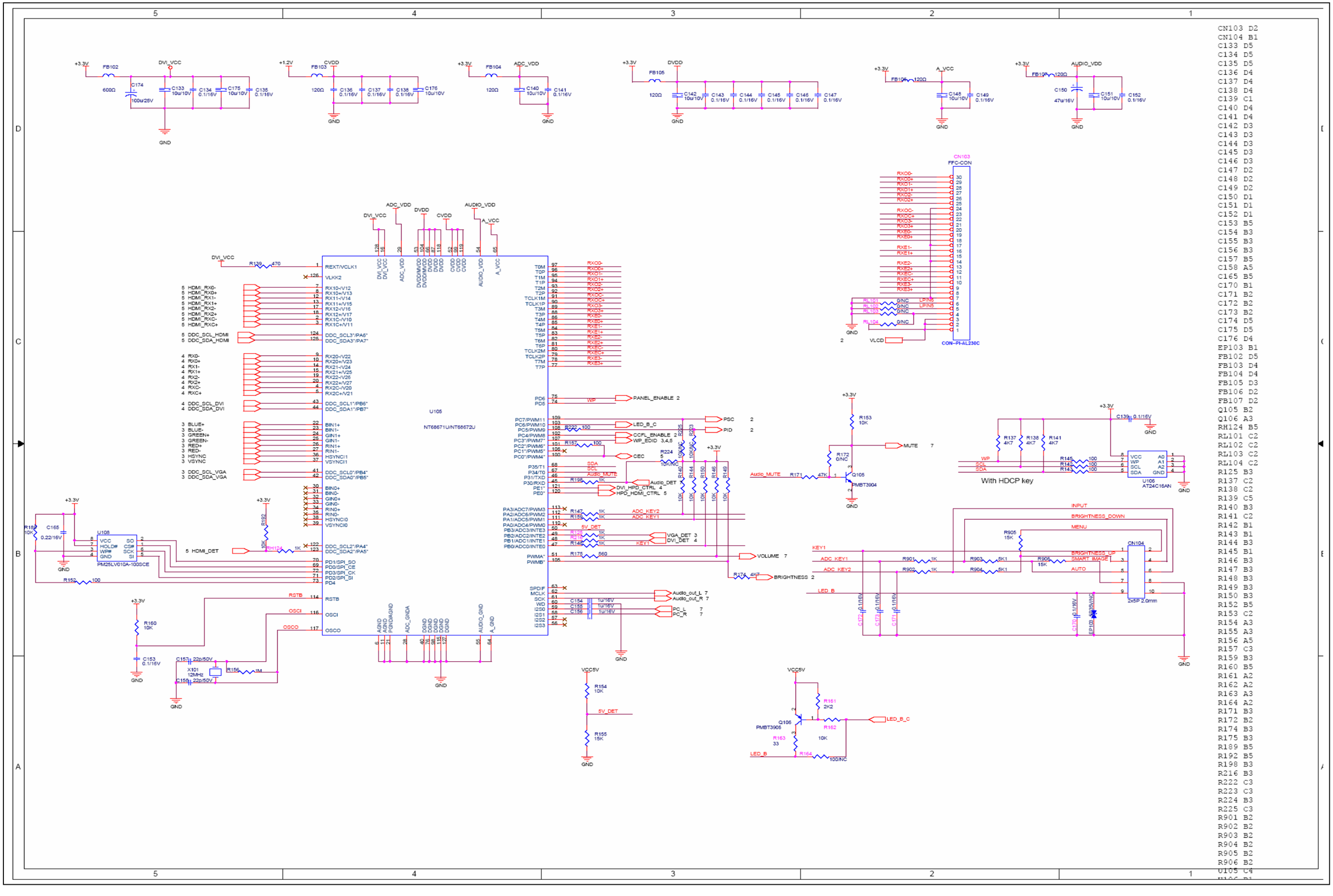
Schematic Diagram(HDMI -Input)



Note:
1. RH111 is reserved for CEC current leakage.
2. RH116 is reserved for some model.

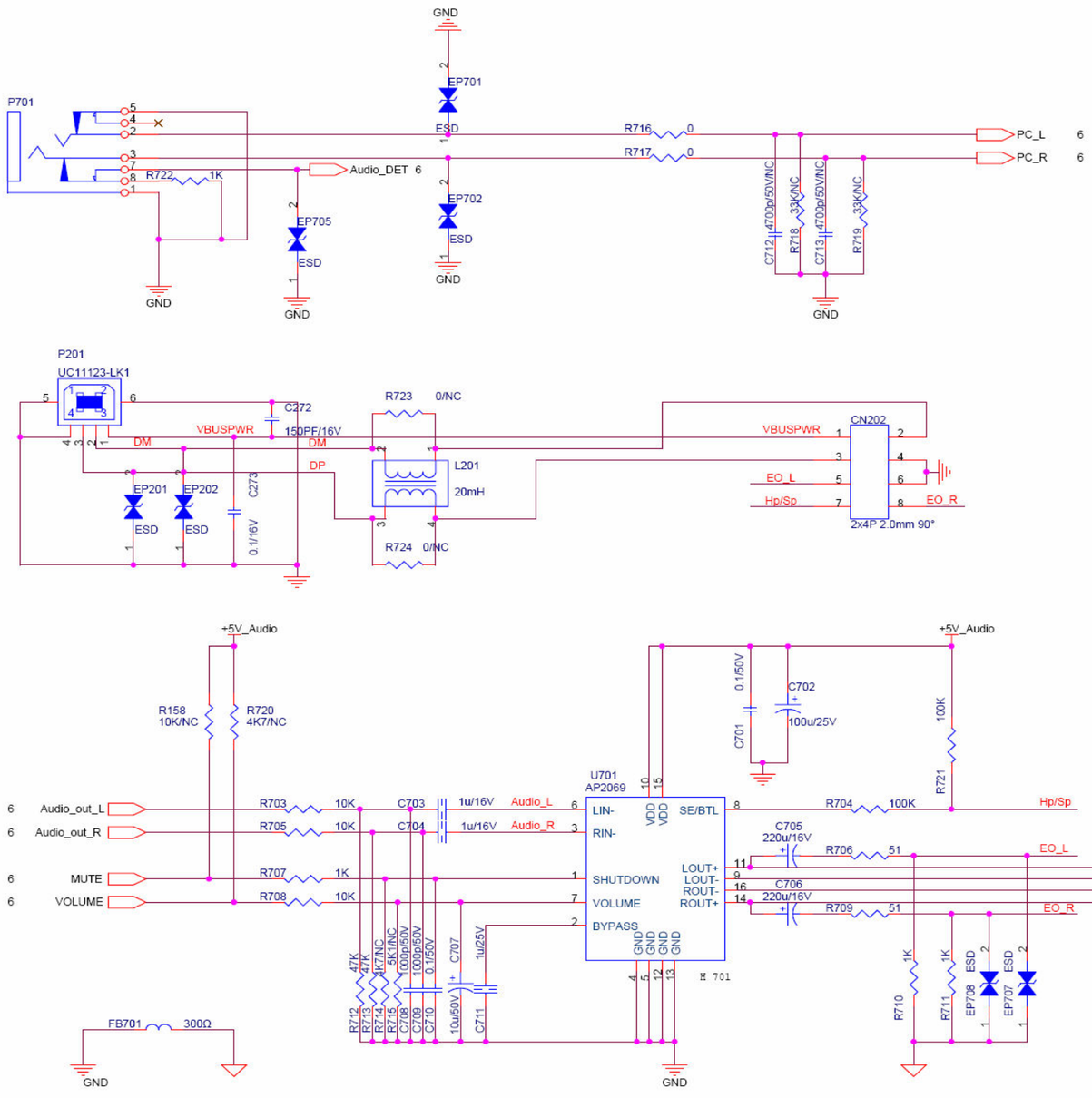
CH101 C4
CH102 C4
CH103 C4
CH104 B4
CNH101 D5
DH101 B4
DH102 D2
EPH101 C5
EPH102 C5
EPH103 C5
EPH104 C5
EPH105 C5
EPH106 C5
EPH107 C5
EPH108 C4
EPH109 C4
L101 C4
L102 B4
L103 B4
L104 A4
QH101 D3
QH102 C2
RH109 D4
RH110 D4
RH111 D3
RH112D3
RH114 D2
RH115 D3
RH116 C2
RH117 C2
RH118 B4
RH119 B5
RH120 B5
RH121 B5
RH122 B5
RH125 D2
RH130 C4
RH131 B4
RH132 B4
RH133 B4
RH134 B4
RH135 A4
RH136 A4
RH137 A4
UH101 B5
ZDH101 C4
ZDH102 C4
ZDH103 C4
ZDH104 C4
ZDH105 C4

Schematic Diagram(Scaler Board - Scaler)



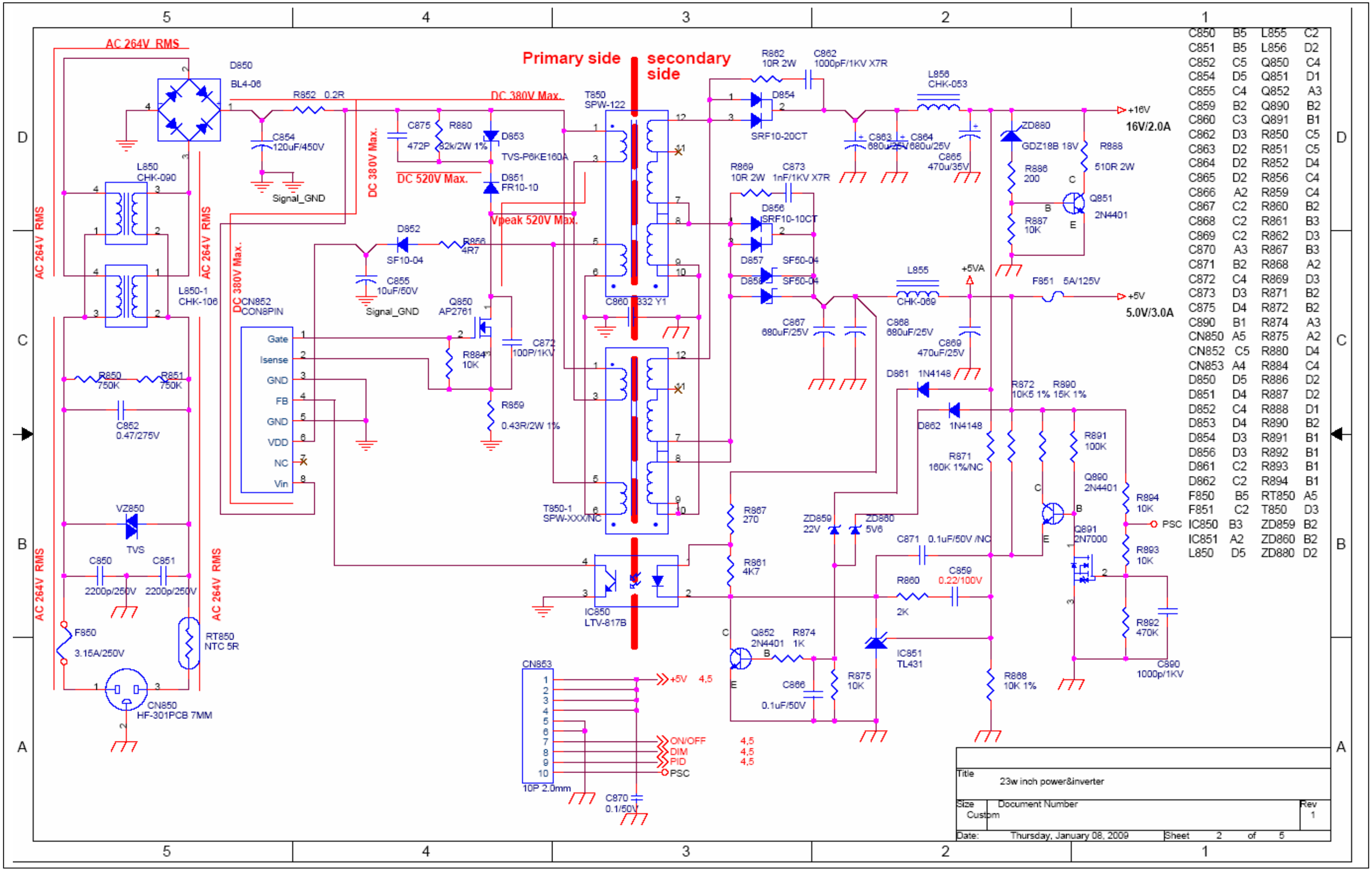
CN103 D2
CN104 B1
C133 D5
C134 D5
C135 D5
C136 D4
C137 D4
C138 D4
C139 C1
C140 D4
C141 D4
C142 D3
C143 D3
C144 D3
C145 D3
C146 D3
C147 D2
C148 D2
C149 D2
C150 D1
C151 D1
C152 D1
C153 B5
C154 B3
C155 B3
C156 B3
C157 B5
C158 A5
C165 B5
C170 B1
C171 B2
C172 B2
C173 B2
C174 D5
C175 D5
C176 D4
EP103 B1
FB102 D5
FB103 D4
FB104 D4
FB105 D3
FB106 D2
FB107 D2
Q105 B2
Q106 A3
RH124 B5
RL101 C2
RL102 C2
RL103 C2
RL104 C2
R125 B3
R137 C2
R138 C2
R139 C5
R140 B3
R141 C2
R142 B1
R143 B1
R144 B3
R145 B1
R146 B3
R147 B3
R148 B3
R149 B3
R150 B3
R152 B5
R153 C2
R154 A3
R155 A3
R156 A5
R157 C3
R159 B3
R160 B5
R161 A2
R162 A2
R163 A3
R164 A2
R171 B3
R172 B2
R174 B3
R175 B3
R189 B5
R192 B5
R198 B3
R216 B3
R222 C3
R223 C3
R224 B3
R225 C3
R901 B2
R902 B2
R903 B2
R904 B2
R905 B2
R906 B2
U105 C4

Schematic Diagram(HDMI Audio Board)



CN202 C3
CN701 B3
C272 C5
C273 C5
C701 B4
C702 B4
C703 B4
C704 B4
C705 B4
C706 B4
C707 B4
C708 B5
C709 B4
C710 B4
C711 B4
C712 D4
C713 D4
EP201 C5
EP202 C5
EP701 D4
EP702 D4
EP705 D5
EP707 B3
EP708 B3
FB701 A5
L201 C5
P201 C5
P701 D5
R158 B5
R703 B5
R704 B3
R705 B5
R706 B3
R707 B5
R708 B5
R709 B3
R710 B3
R711 B3
R712 B5
R713 B5
R714 B5
R715 B5
R716 D4
R717 D4
R718 D4
R719 D3
R720 B5
R721 B3
R722 D5
R723 C5
R724 C5
U701 B4

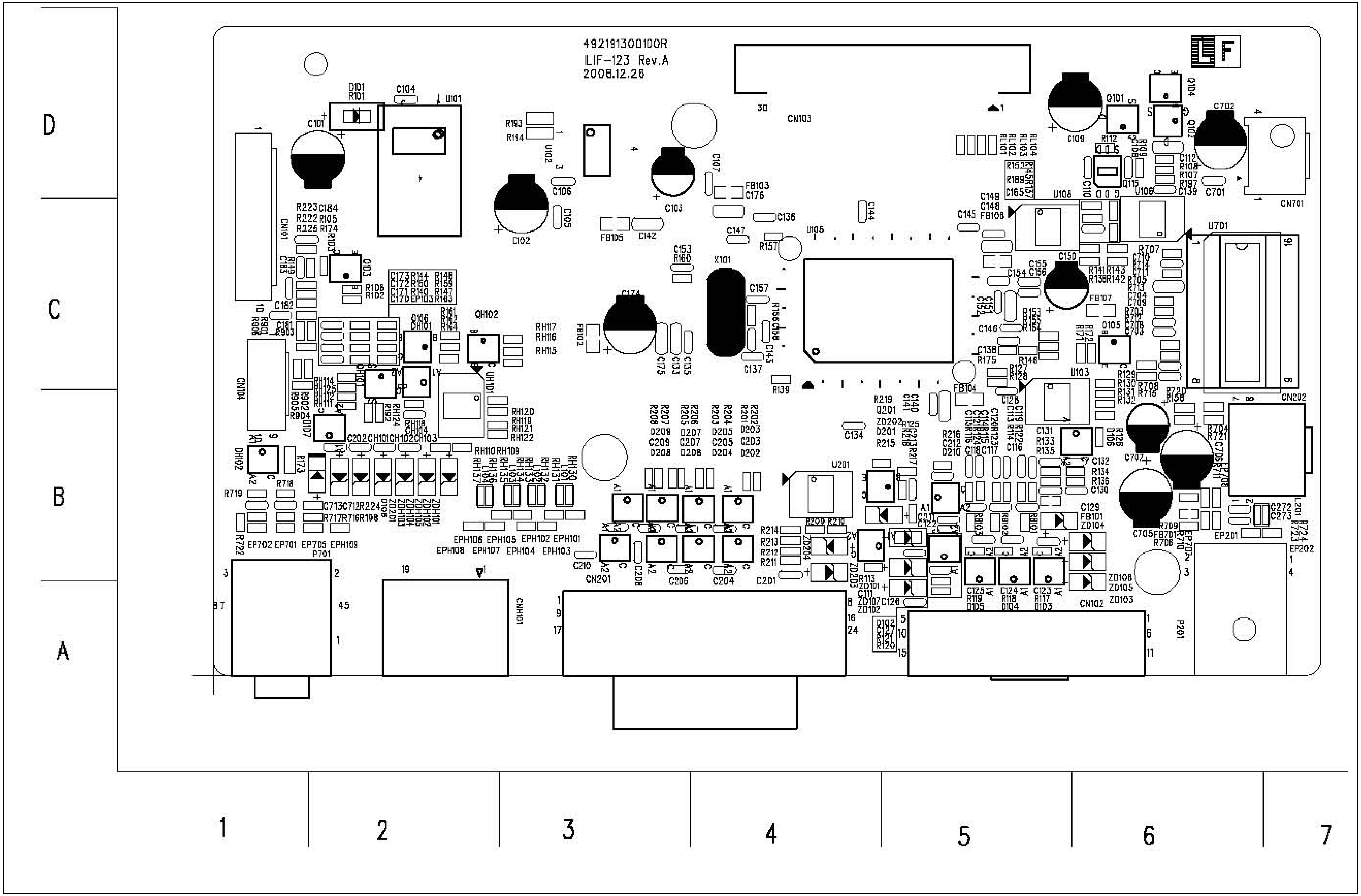
Schematic Diagram(Power Board)



C850	B5	L855	C2
C851	B5	L856	D2
C852	C5	Q850	C4
C854	D5	Q851	D1
C855	C4	Q852	A3
C859	B2	Q890	B2
C860	C3	Q891	B1
C862	D3	R850	C5
C863	D2	R851	C5
C864	D2	R852	D4
C865	D2	R856	C4
C866	A2	R859	C4
C867	C2	R860	B2
C868	C2	R861	B3
C869	C2	R862	D3
C870	A3	R867	B3
C871	B2	R868	A2
C872	C4	R869	D3
C873	D3	R871	B2
C875	D4	R872	B2
C890	B1	R874	A3
CN850	A5	R875	A2
CN852	C5	R880	D4
CN853	A4	R884	C4
D850	D5	R886	D2
D851	D4	R887	D2
D852	C4	R888	D1
D853	D4	R890	B2
D854	D3	R891	B1
D856	D3	R892	B1
D861	C2	R893	B1
D862	C2	R894	B1
F850	B5	RT850	A5
F851	C2	T850	D3
IC850	B3	ZD859	B2
IC851	A2	ZD860	B2
L850	D5	ZD880	D2

Title	23w inch power&inverter	
Size: Custom	Document Number	Rev: 1
Date: Thursday, January 08, 2009	Sheet 2 of 5	

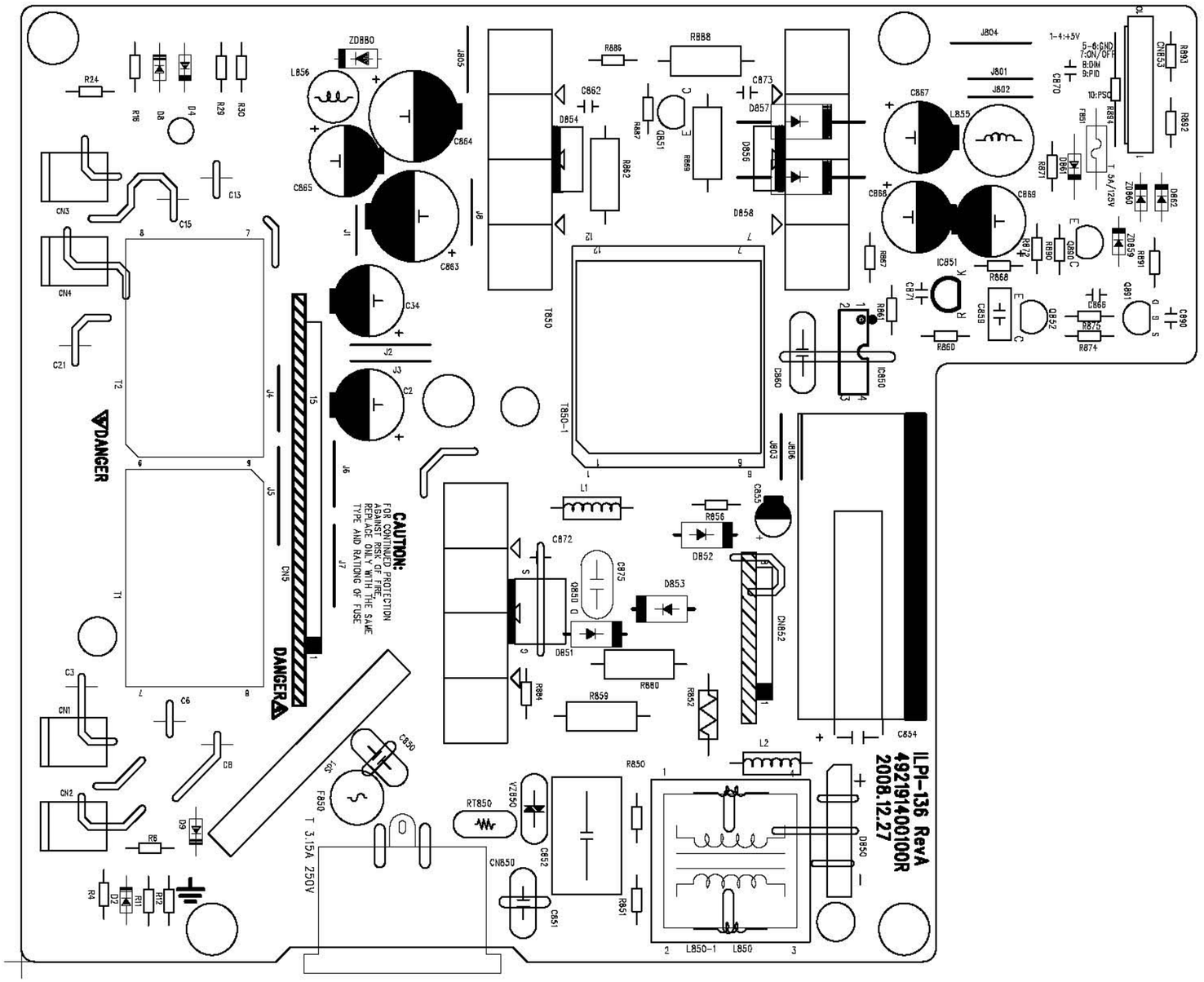
Layout side View(Scaler Board-1)



Layout side View(Scaler Board-2)

C101	D2	C131	B5	C171	C2	C706	B6	D203	B4	FB104	B5	R103	C2	R136	B6	R173	B1	R224	B2	RB101	B5	SC1	D1
C102	C3	C132	B6	C172	C2	C707	B6	D204	B4	FB105	C3	R105	C1	R137	C6	R174	C1	R225	C1	RB102	B5	SC2	D7
C103	D3	C133	C3	C173	C2	C708	C6	D205	B4	FB106	C5	R106	C2	R138	C6	R175	C5	R703	C6	RB103	B5	U1	D2
C104	D2	C134	B4	C174	C3	C709	C6	D206	B3	FB107	C6	R107	D6	R139	C4	R189	C6	R704	B6	RH109	B2	U101	D2
C105	C3	C135	C3	C175	C3	C710	C6	D207	B3	FB701	B6	R108	D6	R140	C2	R192	B2	R705	C6	RH110	B2	U102	D3
C106	D3	C136	C4	C176	C4	C711	C6	D208	B3	H701	C6	R109	D6	R141	C6	R193	D3	R706	B6	RH111	B2	U103	B5
C107	D4	C137	C4	C181	C1	C712	B1	D209	B3	L101	B3	R112	D6	R142	C6	R194	D3	R707	C6	RH112	B2	U105	C4
C108	D6	C138	C5	C182	C1	C713	B1	D210	B5	L102	B3	R113	B5	R143	C6	R197	D6	R708	C6	RH114	C2	U106	C6
C109	D6	C139	D6	C183	C1	CH101	B2	DH101	C2	L103	B3	R114	B5	R144	C2	R198	B2	R709	B6	RH115	C3	U108	C5
C110	D6	C140	B5	C184	C1	CH102	B2	DH102	B1	L104	B2	R115	B5	R145	C6	R201	B4	R710	B6	RH116	C3	U201	B4
C111	B5	C141	B5	C201	B4	CH103	B2	EP103	C2	L201	B6	R116	B5	R146	C5	R202	B4	R711	B6	RH117	C3	U701	C6
C112	D6	C142	C3	C202	B2	CH104	B2	EP201	B6	M1	D7	R117	B5	R147	C2	R203	B4	R712	C6	RH118	B2	UH101	B2
C113	B5	C143	C4	C203	B4	CN101	C1	EP202	B7	M2	A6	R118	B5	R148	C2	R204	B4	R713	C6	RH119	B2	X101	C4
C114	B5	C144	C4	C204	B4	CN102	A5	EP701	B1	M3	C4	R119	B5	R149	C2	R205	B3	R714	C6	RH120	B2	ZD101	B5
C115	B5	C145	C5	C205	B3	CN103	D5	EP702	B1	M4	D2	R120	A5	R150	C2	R206	B3	R715	C6	RH121	B2	ZD102	A5
C116	B5	C146	C5	C206	B3	CN104	C1	EP705	B2	M5	C5	R121	A5	R152	C6	R207	B3	R716	B1	RH122	B2	ZD103	A6
C117	B5	C147	C4	C207	B3	CN201	A4	EP707	B6	P201	A6	R122	B5	R153	C5	R208	B3	R717	B1	RH124	B2	ZD104	B5
C118	B5	C148	C5	C208	B3	CN202	B6	EP708	B6	P701	A1	R123	B5	R154	C5	R209	B4	R718	B1	RH125	C2	ZD105	B6
C119	B5	C149	C5	C209	B3	CN701	D7	EPH101	B3	Q101	D6	R124	B5	R155	C5	R210	B4	R719	B1	RH130	B3	ZD106	B6
C120	B5	C150	C5	C210	B3	CNH101	A2	EPH102	B3	Q102	D6	R125	B5	R156	C4	R211	B4	R720	B6	RH131	B3	ZD107	B5
C121	B5	C151	C5	C211	B5	D101	D2	EPH103	B3	Q103	C2	R126	B6	R157	C4	R212	B4	R721	B6	RH132	B3	ZD201	B2
C122	B5	C152	C5	C212	B5	D102	B5	EPH104	B3	Q104	D6	R127	C5	R158	B6	R213	B4	R722	B1	RH133	B3	ZD202	B5
C123	B5	C153	C3	C213	B5	D103	B5	EPH105	B3	Q105	C6	R128	C5	R159	C2	R214	B4	R723	B7	RH134	B3	ZD203	B4
C124	B5	C154	C5	C272	B6	D104	B5	EPH106	B3	Q106	C2	R129	C6	R160	C3	R215	B4	R724	B6	RH135	B3	ZD204	B4
C125	B5	C155	C5	C273	B6	D105	B5	EPH107	B2	Q115	D6	R130	B6	R161	C2	R216	B5	R901	C2	RH136	B2	ZDH101	B2
C126	A5	C156	C5	C701	D6	D106	B6	EPH108	B2	Q201	B4	R131	B6	R162	C2	R217	B5	R902	C1	RH137	B2	ZDH102	B2
C127	B5	C157	C4	C702	D6	D107	B2	EPH109	B2	QH101	C2	R132	B6	R163	C2	R218	B5	R903	C1	RL101	D5	ZDH103	B2
C128	B5	C158	C4	C703	C6	D108	B2	FB101	B5	QH102	C2	R133	B5	R164	C2	R219	B4	R904	C1	RL102	D5	ZDH104	B2
C129	B5	C165	C6	C704	C6	D201	B4	FB102	C3	R101	D2	R134	B6	R171	C6	R222	C1	R905	C1	RL103	D5	ZDH105	B2
C130	B6	C170	C2	C705	B6	D202	B4	FB103	D4	R102	C2	R135	B5	R172	C6	R223	C1	R906	C1	RL104	D5		

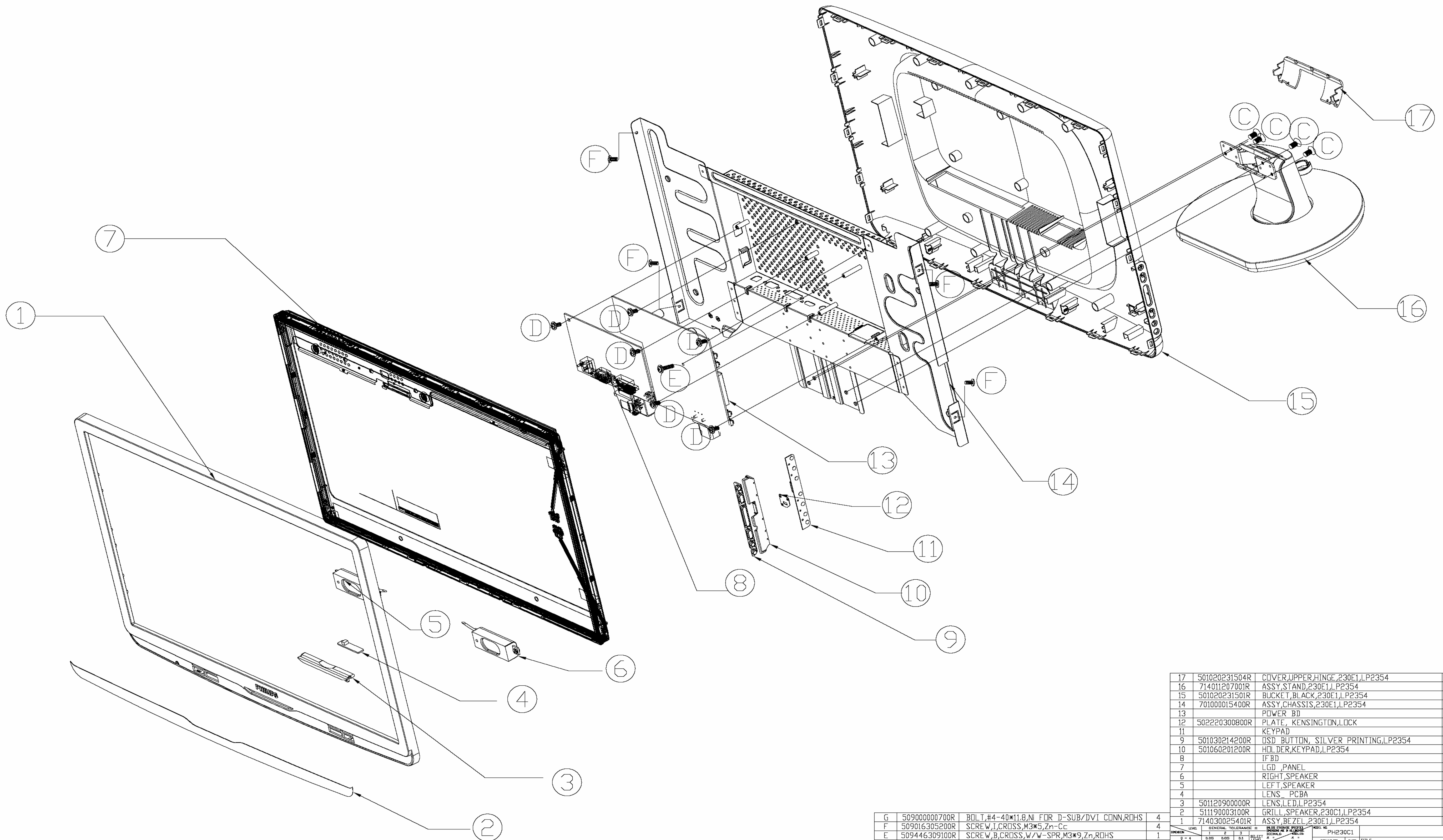
Layout side View(Power Board)



C2	D3	CN4	E1	J3	E3	R850	B5
C3	C1	CN5	C3	J4	D3	R851	A5
C6	B2	CN850	A3	J5	D3	R852	C5
C8	B2	CN852	C6	J6	D3	R856	D5
C13	F2	CN853	F8	J7	C3	R859	C5
C15	F2	D2	A2	J8	F4	R860	E7
C21	E1	D4	G2	J801	F7	R861	E6
C34	E3	D8	G2	J802	F7	R862	F5
C850	B3	D9	B2	J803	D6	R867	E6
C851	A4	D850	B6	J804	G7	R868	E7
C852	B5	D851	C5	J805	G4	R869	F5
C854	B6	D852	D5	J806	D6	R871	F7
C855	D6	D853	C5	L1	D5	R872	E7
C859	E7	D854	F4	L2	B6	R874	E8
C860	E6	D856	F6	L850	B5	R875	E8
C862	F5	D857	F6	L850-1	B5	R880	C5
C863	F3	D858	F6	L855	F7	R884	C4
C864	F3	D861	F8	L856	F3	R886	G5
C865	F3	D862	F8	Q850	C4	R887	F5
C866	E8	F850	B3	Q851	F5	R888	G5
C867	F7	F851	F8	Q852	E7	R890	E8
C868	F7	H1	D4	Q890	E8	R891	E8
C869	F7	H2	A2	Q891	E8	R892	F8
C870	F8	H3	G1	R1	F4	R893	G8
C871	E7	H4	A7	R4	A2	R894	F8
C872	C4	H5	F6	R6	B2	RT850	B4
C873	F6	H11	G7	R11	A2	SP1	B3
C875	C5	H28	C4	R12	A2	T1	C2
C890	E8	IC850	E6	R16	G2	T2	E2
CN1	B1	IC851	E7	R24	F1	T850	E5
CN2	B1	J1	F3	R29	G2	T850-1	E5
CN3	F1	J2	E3	R30	G2	VZ850	B4
ZD859	E8	ZD860	F8	ZD880	G3		

Exploded View

ZONE	REV	DESCRIPTION	DATE	APPROVED
	X1	FIRST RELEASE	2008-10-15	



17	501020231504R	COVER,UPPER,HINGE,230E1,LP2354	1
16	714011207001R	ASSY,STAND,230E1,LP2354	1
15	501020231501R	BUCKET,BLACK,230E1,LP2354	1
14	701000015400R	ASSY,CHASSIS,230E1,LP2354	1
13		POWER BD	1
12	502220300800R	PLATE, KENSINGTON,LOCK	1
11		KEYPAD	1
9	501030214200R	OSD BUTTON, SILVER PRINTING,LP2354	1
10	501060201200R	HOLDER,KEYPAD,LP2354	1
8		IFBD	1
7		LGD ,PANEL	1
6		RIGHT,SPEAKER	1
5		LEFT,SPEAKER	1
4		LENS_ PCBA	1
3	501120900000R	LENS,LED,LP2354	1
2	511190003100R	GRILL,SPEAKER,230C1,LP2354	1
1	714030025401R	ASSY,BEZEL,230E1,LP2354	1

G	509000000700R	BOLT,#4-40*11.8,Ni FOR D-SUB/DVI CONN,ROHS	4
F	509016305200R	SCREW,I,CROSS,M3*5,Zn-Cc	4
E	509446309100R	SCREW,B,CROSS,W/W-SPR,M3*9,Zn,ROHS	1
D	509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	8
C	509216608510R	SCREW,F,CROSS,M4*8,BLK-NL ROHS(NYLOK	4
A	509012306100R	SCREW,I,CROSS,T.T-3*6,Zn.ROHS	3

MODEL NO. PH230C1

TITLE EXPLODE

A0 PART NO. REV. X1

SCALE 1:1 DWG NO. SHEET 1/1

Recommended Spare Part List

230E1HSB/93
PN:823254A1W160R(LG)

Part Name		PHILIPS P/N	PCM CODE	Description	Q'ty	Location	Remark
Electronic Components:	LCD panel		631102230080RP	PANEL LM230WF1-TLA3(A)(LGD)	1	E7	LG PANEL
	MB-LCD cable		430303002300R	HRN LVDS FFC 30P 196M	1	34	
	MB-EB		430300802650R	HRN ASSY 2x4P/190mm/4P	1	33	
	MB-SB,LB		430301000270R	HRN ASSY 2x5P/220MM440MM/4P8P	1	35	
	MB-SPEAKER		430300400420R	HRN ASSY 4P/230MM395MM/2P	1	36	
	IC		412000435481R	IC AT24C02BN-SH-T	1	UH101,U103,U201	ATMEL,
	IC		412000702950R	IC NT68671UFG QFP128L	1	U105	NOVATEK,
	IC		412000224480R	IC AT24C16AN-10SU-2.7 16K	1	U103	ATMEL,
	TRANSISTOR		426000091220R	Transf ERL28 550uH SPW-122	1	T850	FOXCONN,FRONTIER,LISHIN,MEIKAI,
	TRANSISTOR		426000091060R	Transf EEL19 P4 DIP SPW-106	1	T1,T2	DARFON,FOXCONN,HUALON,LISHIN,
Mechanical Componenents :	STAND		714011207001R	STAND ASSEMBLY	1	E16	
	OSD BUTTON		714080001100R	OSD BUTTON SLIVER PRINTING	1	E9	
	HOLDER KEYPAD		501060201200R	HOLDER KEYPAD	1	E10	
	Hinge		501020231504R	COVER UPPER HINGE	1	E17	
	Speaker		618100200310R	SPEAKER LEFT RED	1	E5	
	Speaker		618100200311R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200312R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200300R	SPEAKER RIGHT GREEN	1	E6	
	Speaker		618100200301R	SPEAKER RIGHT GREEN	0	E6	
	Speaker		618100200302R	SPEAKER RIGHT GREEN	0	E6	
	DVI&D-SUB to shielding		509000000700R	BOLT,#4-40x11.8,Ni	4	G	
	PCBAs to metal shielding		509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	8	D	
PCBA:	Power board		792451400A00R	POWER BOARD PCBA	1	E13	
	Interface board		792451300A00R	INTERFACE BOARD PCBA	1	E8	
	Switch board		792451500000R	SWITCH BOARD PCBA	1	E11	
	Led board		792450500000R	LED BOARD PCBA	1	E4	
	Eraphoe board		792450400000R	ERAPHOE BOARD PCBA	1	39	
Cabinets:	Front bezel		714030025401R	FRONT BEZELassembly	1	E1	
	Back cover		714050023300R	BACK-COVER assembly	1	E15	
Accessories:	VGA CABLE		453010100320R	CABLE D-SUB BLACK/BLUE	1	22	
	POWER CORD		453070800170R	PWRCORD 10A/250V BLK 6FT CHINA	1	20	
	DVI CABLE		453030300400R	CABLE DVI-D BLACK	1	21	
	AUDIO CABLE		453030300120R	CABLE AUDIO BLACK/GREEN	1	23	
	CD		506070121801R	USER'S(CD) manual	1	30	
	GUIDE QUICK		506280113701R	GUIDE QUICK SETUP	1	31	
	CARD WARRANTY		506092007200R	CARD WARRANTY	1	32	
Packing Material:	EpE bag		506120011300R	PE BAG	1	27	
	EpE bag		506120304900R	PE BAG	1	28	
	Carton		506020031503R	CARTON	1	29	
	Cusion		506040014700R	CUSHION,EPS-TOP	1	25	
	Cusion		506040014701R	CUSHION ,EPS-BOTTOM	1	26	

Recommended Spare Part List

230E1HSB/75
PN:823254A1W130R(LG)

Part Name		PHILIPS P/N	PCM CODE	Description	Q'ty	Location	Remark
Electronic Components:	LCD panel		631102230080RP	PANEL LM230WF1-TLA3(A)(LGD)	1	E7	LG PANEL
	MB-LCD cable		430303002300R	HRN LVDS FFC 30P 196M	1	34	
	MB-EB		430300802650R	HRN ASSY 2x4P/190mm/4P	1	33	
	MB-SB,LB		430301000270R	HRN ASSY 2x5P/220MM440MM/4P8P	1	35	
	MB-SPEAKER		430300400420R	HRN ASSY 4P/230MM395MM/2P	1	36	
	IC		412000435481R	IC AT24C02BN-SH-T	1	UH101,U103,U201	ATMEL,
	IC		412000702950R	IC NT68671UFG QFP128L	1	U105	NOVATEK,
	IC		412000224480R	IC AT24C16AN-10SU-2.7 16K	1	U103	ATMEL,
	TRANSISTOR		426000091220R	Transf ERL28 550uH SPW-122	1	T850	FOXCONN,FRONTIER,LISHIN,MEIKAI,
	TRANSISTOR		426000091060R	Transf EEL19 P4 DIP SPW-106	1	T1,T2	DARFON,FOXCONN,HUALON,LISHIN,
Mechanical Componenents :	STAND		714011207001R	STAND ASSEMBLY	1	E16	
	OSD BUTTON		714080001100R	OSD BUTTON SLIVER PRINTING	1	E9	
	HOLDER KEYPAD		501060201200R	HOLDER KEYPAD	1	E10	
	Hinge		501020231504R	COVER UPPER HINGE	1	E17	
	Speaker		618100200310R	SPEAKER LEFT RED	1	E5	
	Speaker		618100200311R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200312R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200300R	SPEAKER RIGHT GREEN	1	E6	
	Speaker		618100200301R	SPEAKER RIGHT GREEN	0	E6	
	Speaker		618100200302R	SPEAKER RIGHT GREEN	0	E6	
	DVI&D-SUB to shielding		509000000700R	BOLT,#4-40x11.8,Ni	4	G	
	PCBAs to metal shielding		509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	8	D	
PCBA:	Power board		792451400A00R	POWER BOARD PCBA	1	E13	
	Interface board		792451300A00R	INTERFACE BOARD PCBA	1	E8	
	Switch board		792451500000R	SWITCH BOARD PCBA	1	E11	
	Led board		792450500000R	LED BOARD PCBA	1	E4	
	Eraphoe board		792450400000R	ERAPHOE BOARD PCBA	1	39	
Cabinets:	Front bezel		714030025401R	FRONT BEZELassembly	1	E1	
	Back cover		714050023300R	BACK-COVER assembly	1	E15	
Accessories:	VGA CABLE		453010100320R	CABLE D-SUB BLACK/BLUE	1	22	
	POWER CORD		453070800460R	PWRCORD 10A/250V BLK 6.3FT SAA	1	20	
	DVI CABLE		453030300400R	CABLE DVI-D BLACK	1	21	
	AUDIO CABLE		453030300120R	CABLE AUDIO BLACK/GREEN	1	23	
	CD		506070121801R	USER'S(CD) manual	1	30	
	GUIDE QUICK		506280113701R	GUIDE QUICK SETUP	1	31	
Packing Material:	EpE bag		506120011300R	PE BAG	1	27	
	EpE bag		506120304900R	PE BAG	1	28	
	Carton		506020031502R	CARTON	1	29	
	Cusion		506040014700R	CUSHION,EPS-TOP	1	25	
	Cusion		506040014701R	CUSHION ,EPS-BOTTOM	1	26	

230E1HSB/69
PN:823254A1W150R(LG)

Part Name		PHILIPS P/N	PCM CODE	Description	Q'ty	Location	Remark
Electronic Components:	LCD panel		631102230080RP	PANEL LM230WF1-TLA3(A)(LGD)	1	E7	LG PANEL
	MB-LCD cable		430303002300R	HRN LVDS FFC 30P 196M	1	34	
	MB-EB		430300802650R	HRN ASSY 2x4P/190mm/4P	1	33	
	MB-SB,LB		430301000270R	HRN ASSY 2x5P/220MM440MM/4P8P	1	35	
	MB-SPEAKER		430300400420R	HRN ASSY 4P/230MM395MM/2P	1	36	
	IC		412000435481R	IC AT24C02BN-SH-T	1	UH101,U103,U201	ATMEL,
	IC		412000702950R	IC NT68671UFG QFP128L	1	U105	NOVATEK,
	IC		412000224480R	IC AT24C16AN-10SU-2.7 16K	1	U103	ATMEL,
	TRANSISTOR		426000091220R	Transf ERL28 550uH SPW-122	1	T850	FOXCONN,FRONTIER,LISHIN,MEIKAI,
	TRANSISTOR		426000091060R	Transf EEL19 P4 DIP SPW-106	1	T1,T2	DARFON,FOXCONN,HUALON,LISHIN,
Mechanical Componenents :	STAND		714011207001R	STAND ASSEMBLY	1	E16	
	OSD BUTTON		714080001100R	OSD BUTTON SLIVER PRINTING	1	E9	
	HOLDER KEYPAD		501060201200R	HOLDER KEYPAD	1	E10	
	Hinge		501020231504R	COVER UPPER HINGE	1	E17	
	Speaker		618100200310R	SPEAKER LEFT RED	1	E5	
	Speaker		618100200311R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200312R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200300R	SPEAKER RIGHT GREEN	1	E6	
	Speaker		618100200301R	SPEAKER RIGHT GREEN	0	E6	
	Speaker		618100200302R	SPEAKER RIGHT GREEN	0	E6	
	DVI&D-SUB to shielding		509000000700R	BOLT,#4-40x11.8,Ni	4	G	
	PCBAs to metal shielding		509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	8	D	
PCBA:	Power board		792451400A00R	POWER BOARD PCBA	1	E13	
	Interface board		792451300A00R	INTERFACE BOARD PCBA	1	E8	
	Switch board		792451500000R	SWITCH BOARD PCBA	1	E11	
	Led board		792450500000R	LED BOARD PCBA	1	E4	
	Eraphoe board		792450400000R	ERAPHOE BOARD PCBA	1	39	
Cabinets:	Front bezel		714030025401R	FRONT BEZELassembly	1	E1	
	Back cover		714050023300R	BACK-COVER assembly	1	E15	
Accessories:	VGA CABLE		453010100320R	CABLE D-SUB BLACK/BLUE	1	22	
	POWER CORD		453070800450R	PWRCORD 10A/250V BLK 6.3FT UK	1	20	
	DVI CABLE		453030300400R	CABLE DVI-D BLACK	1	21	
	AUDIO CABLE		453030300120R	CABLE AUDIO BLACK/GREEN	1	23	
	CD		506070121801R	USER'S(CD) manual	1	30	
	GUIDE QUICK		506280113701R	GUIDE QUICK SETUP	1	31	
Packing Material:	EpE bag		506120011300R	PE BAG	1	27	
	EpE bag		506120304900R	PE BAG	1	28	
	Carton		506020031502R	CARTON	1	29	
	Cusion		506040014700R	CUSHION,EPS-TOP	1	25	
	Cusion		506040014701R	CUSHION ,EPS-BOTTOM	1	26	

230E1HSB/62
PN:823254A1W121R(LG)

	Part Name	PHILIPS P/N	PCM CODE	Description	Q'ty	Location	Remark
Electronic Components:	LCD panel		631102230080RP	PANEL LM230WF1-TLA3(A)(LGD)	1	E7	LG PANEL
	MB-LCD cable		430303002300R	HRN LVDS FFC 30P 196M	1	34	
	MB-EB		430300802650R	HRN ASSY 2x4P/190mm/4P	1	33	
	MB-SB,LB		430301000270R	HRN ASSY 2x5P/220MM440MM/4P8P	1	35	
	MB-SPEAKER		430300400420R	HRN ASSY 4P/230MM395MM/2P	1	36	
	IC		412000435481R	IC AT24C02BN-SH-T	1	UH101,U103,U201	ATMEL,
	IC		412000702950R	IC NT68671UFG QFP128L	1	U105	NOVATEK,
	IC		412000224480R	IC AT24C16AN-10SU-2.7 16K	1	U103	ATMEL,
	TRANSISTOR		426000091220R	Transf ERL28 550uH SPW-122	1	T850	FOXCONN,FRONTIER,LISHIN,MEIKAI,
	TRANSISTOR		426000091060R	Transf EEL19 P4 DIP SPW-106	1	T1,T2	DARFON,FOXCONN,HUALON,LISHIN,
Mechanical Componenents :	STAND		714011207001R	STAND ASSEMBLY	1	E16	
	OSD BUTTON		714080001100R	OSD BUTTON SLIVER PRINTING	1	E9	
	HOLDER KEYPAD		501060201200R	HOLDER KEYPAD	1	E10	
	Hinge		501020231504R	COVER UPPER HINGE	1	E17	
	Speaker		618100200310R	SPEAKER LEFT RED	1	E5	
	Speaker		618100200311R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200312R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200300R	SPEAKER RIGHT GREEN	1	E6	
	Speaker		618100200301R	SPEAKER RIGHT GREEN	0	E6	
	Speaker		618100200302R	SPEAKER RIGHT GREEN	0	E6	
	DVI&D-SUB to shielding		509000000700R	BOLT,#4-40x11.8,Ni	4	G	
	PCBAs to metal shielding		509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	8	D	
PCBA:	Power board		792451400A00R	POWER BOARD PCBA	1	E13	
	Interface board		792451300A00R	INTERFACE BOARD PCBA	1	E8	
	Switch board		792451500000R	SWITCH BOARD PCBA	1	E11	
	Led board		792450500000R	LED BOARD PCBA	1	E4	
	Eraphoe board		792450400000R	ERAPHOE BOARD PCBA	1	39	
Cabinets:	Front bezel		714030025401R	FRONT BEZELassembly	1	E1	
	Back cover		714050023300R	BACK-COVER assembly	1	E15	
Accessories:	VGA CABLE		453010100320R	CABLE D-SUB BLACK/BLUE	1	22	
	POWER CORD		453070800210R	PWRCORD 16A/250V BLK 6FT VDE	1	20	
	DVI CABLE		453030300400R	CABLE DVI-D BLACK	1	21	
	AUDIO CABLE		453030300120R	CABLE AUDIO BLACK/GREEN	1	23	
	CD		506070121801R	USER'S(CD) manual	1	30	
	GUIDE QUICK		506280113701R	GUIDE QUICK SETUP	1	31	
	CARD WARRANTY		506092007201R	CARD WARRANTY TUR	1	32	
	CARD SERVICE		506092007202R	CARD SERVICE TUR	1	40	
	CARD QSG		506092007203R	CARD QSG TUR	1	41	
Packing Material:	EpE bag		506120004701R	PE BAG	1	27	
	EpE bag		506120304900R	PE BAG	1	28	
	Carton		506020031502R	CARTON	1	29	
	Cusion		506040014700R	CUSHION,EPS-TOP	1	25	
	Cusion		506040014701R	CUSHION ,EPS-BOTTOM	1	26	

230E1HSB/97
PN:823254A1W122R(LG)

	Part Name	PHILIPS P/N	PCM CODE	Description	Q'ty	Location	Remark
Electronic Components:	LCD panel		631102230080RP	PANEL LM230WF1-TLA3(A)(LGD)	1	E7	LG PANEL
	MB-LCD cable		430303002300R	HRN LVDS FFC 30P 196M	1	34	
	MB-EB		430300802650R	HRN ASSY 2x4P/190mm/4P	1	33	
	MB-SB,LB		430301000270R	HRN ASSY 2x5P/220MM440MM/4P8P	1	35	
	MB-SPEAKER		430300400420R	HRN ASSY 4P/230MM395MM/2P	1	36	
	IC		412000435481R	IC AT24C02BN-SH-T	1	UH101,U103,U201	ATMEL,
	IC		412000702950R	IC NT68671UFG QFP128L	1	U105	NOVATEK,
	IC		412000224480R	IC AT24C16AN-10SU-2.7 16K	1	U103	ATMEL,
	TRANSISTOR		426000091220R	Transf ERL28 550uH SPW-122	1	T850	FOXCONN,FRONTIER,LISHIN,MEIKAI,
	TRANSISTOR		426000091060R	Transf EEL19 P4 DIP SPW-106	1	T1,T2	DARFON,FOXCONN,HUALON,LISHIN,
Mechanical Componenents :	STAND		714011207001R	STAND ASSEMBLY	1	E16	
	OSD BUTTON		714080001100R	OSD BUTTON SLIVER PRINTING	1	E9	
	HOLDER KEYPAD		501060201200R	HOLDER KEYPAD	1	E10	
	Hinge		501020231504R	COVER UPPER HINGE	1	E17	
	Speaker		618100200310R	SPEAKER LEFT RED	1	E5	
	Speaker		618100200311R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200312R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200300R	SPEAKER RIGHT GREEN	1	E6	
	Speaker		618100200301R	SPEAKER RIGHT GREEN	0	E6	
	Speaker		618100200302R	SPEAKER RIGHT GREEN	0	E6	
	DVI&D-SUB to shielding		509000000700R	BOLT,#4-40x11.8,Ni	4	G	
	PCBAs to metal shielding		509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	8	D	
PCBA:	Power board		792451400A00R	POWER BOARD PCBA	1	E13	
	Interface board		792451300A00R	INTERFACE BOARD PCBA	1	E8	
	Switch board		792451500000R	SWITCH BOARD PCBA	1	E11	
	Led board		792450500000R	LED BOARD PCBA	1	E4	
	Eraphoe board		792450400000R	ERAPHOE BOARD PCBA	1	39	
Cabinets:	Front bezel		714030025401R	FRONT BEZELassembly	1	E1	
	Back cover		714050023300R	BACK-COVER assembly	1	E15	
Accessories:	VGA CABLE		453010100320R	CABLE D-SUB BLACK/BLUE	1	22	
	POWER CORD		453070800210R	PWRCORD 16A/250V BLK 6FT VDE	1	20	
	DVI CABLE		453030300400R	CABLE DVI-D BLACK	1	21	
	AUDIO CABLE		453030300120R	CABLE AUDIO BLACK/GREEN	1	23	
	CD		506070121801R	USER'S(CD) manual	1	30	
	GUIDE QUICK		506280113701R	GUIDE QUICK SETUP	1	31	
Packing Material:	EpE bag		506120004701R	PE BAG	1	27	
	EpE bag		506120304900R	PE BAG	1	28	
	Carton		506020031502R	CARTON	1	29	
	Cusion		506040014700R	CUSHION,EPS-TOP	1	25	
	Cusion		506040014701R	CUSHION ,EPS-BOTTOM	1	26	

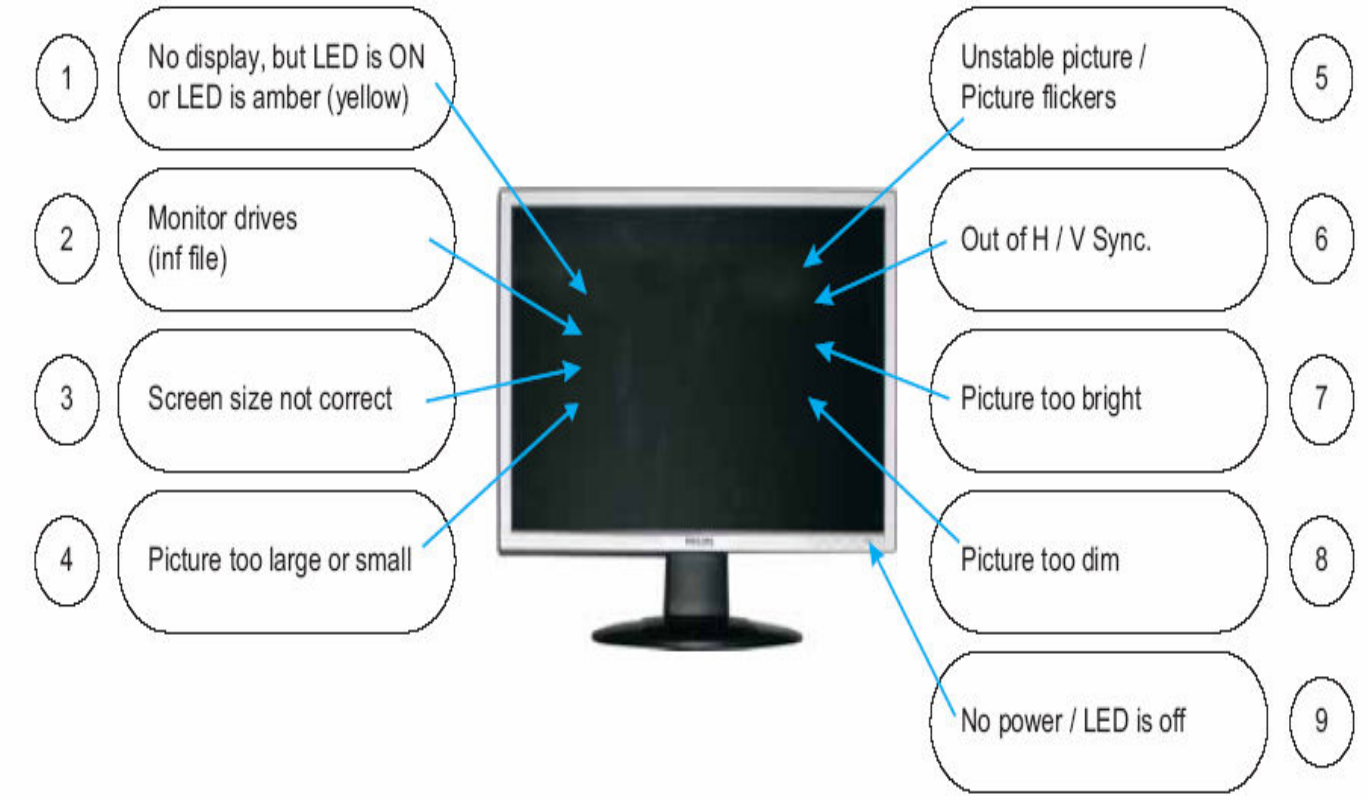
230E1HSB/00
PN:823254A1W120R(LG)

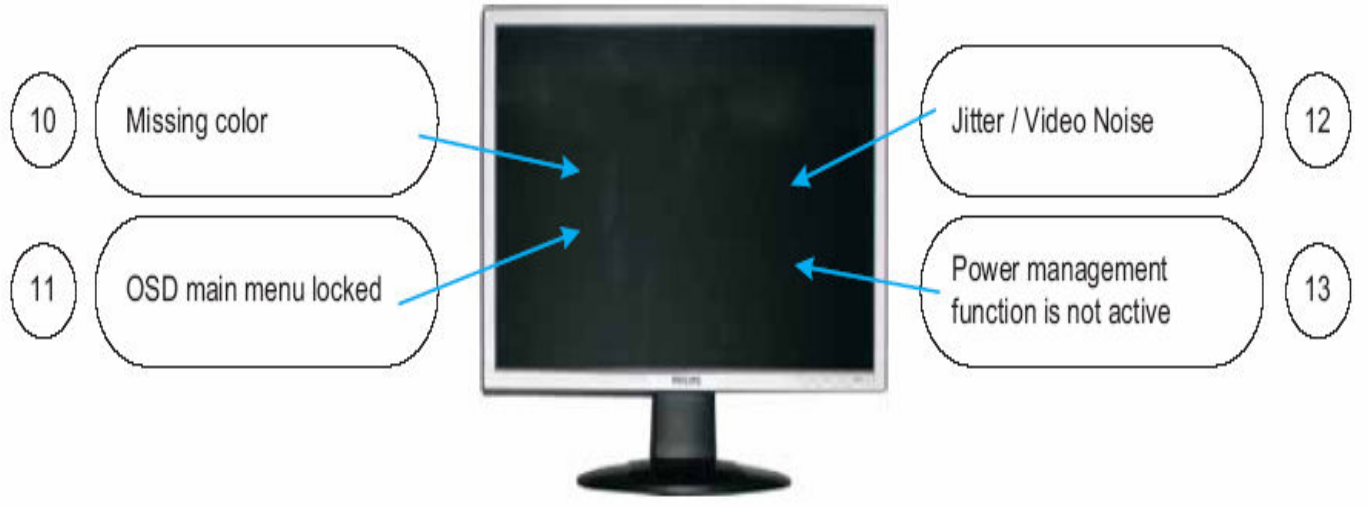
	Part Name	PHILIPS P/N	PCM CODE	Description	Q'ty	Location	Remark
Electronic Components:	LCD panel		631102230080RP	PANEL LM230WF1-TLA3(A)(LGD)	1	E7	LG PANEL
	MB-LCD cable		430303002300R	HRN LVDS FFC 30P 196M	1	34	
	MB-EB		430300802650R	HRN ASSY 2x4P/190mm/4P	1	33	
	MB-SB,LB		430301000270R	HRN ASSY 2x5P/220MM440MM/4P8P	1	35	
	MB-SPEAKER		430300400420R	HRN ASSY 4P/230MM395MM/2P	1	36	
	IC		412000435481R	IC AT24C02BN-SH-T	1	UH101,U103,U201	ATMEL,
	IC		412000702950R	IC NT68671UFG QFP128L	1	U105	NOVATEK,
	IC		412000224480R	IC AT24C16AN-10SU-2.7 16K	1	U103	ATMEL,
	TRANSISTOR		426000091220R	Transf ERL28 550uH SPW-122	1	T850	FOXCONN,FRONTIER,LISHIN,MEIKAI,
	TRANSISTOR		426000091060R	Transf EEL19 P4 DIP SPW-106	1	T1,T2	DARFON,FOXCONN,HUALON,LISHIN,
Mechanical Componenents :	STAND		714011207001R	STAND ASSEMBLY	1	E16	
	OSD BUTTON		7140800011100R	OSD BUTTON SLIVER PRINTING	1	E9	
	HOLDER KEYPAD		501060201200R	HOLDER KEYPAD	1	E10	
	Hinge		501020231504R	COVER UPPER HINGE	1	E17	
	Speaker		618100200310R	SPEAKER LEFT RED	1	E5	
	Speaker		618100200311R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200312R	SPEAKER LEFT RED	0	E5	
	Speaker		618100200300R	SPEAKER RIGHT GREEN	1	E6	
	Speaker		618100200301R	SPEAKER RIGHT GREEN	0	E6	
	Speaker		618100200302R	SPEAKER RIGHT GREEN	0	E6	
	DVI&D-SUB to shielding		509000000700R	BOLT,#4-40x11.8,Ni	4	G	
	PCBAs to metal shielding		509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	8	D	
PCBA:	Power board		792451400A00R	POWER BOARD PCBA	1	E13	
	Interface board		792451300A00R	INTERFACE BOARD PCBA	1	E8	
	Switch board		792451500000R	SWITCH BOARD PCBA	1	E11	
	Led board		792450500000R	LED BOARD PCBA	1	E4	
	Eraphoe board		792450400000R	ERAPHOE BOARD PCBA	1	39	
Cabinets:	Front bezel		714030025401R	FRONT BEZELassembly	1	E1	
	Back cover		714050023300R	BACK-COVER assembly	1	E15	
Accessories:	VGA CABLE		453010100320R	CABLE D-SUB BLACK/BLUE	1	22	
	POWER CORD		453070800210R	PWRCORD 16A/250V BLK 6FT VDE	1	20	
	DVI CABLE		453030300400R	CABLE DVI-D BLACK	1	21	
	AUDIO CABLE		453030300120R	CABLE AUDIO BLACK/GREEN	1	23	
	CD		506070121801R	USER'S(CD) manual	1	30	
	GUIDE QUICK		506280113701R	GUIDE QUICK SETUP	1	31	
Packing Material:	EpE bag		506120004701R	PE BAG	1	27	
	EpE bag		506120304900R	PE BAG	1	28	
	Carton		506020031502R	CARTON	1	29	
	Cusion		506040014700R	CUSHION,EPS-TOP	1	25	
	Cusion		506040014701R	CUSHION ,EPS-BOTTOM	1	26	

23 inch monitor different parts list

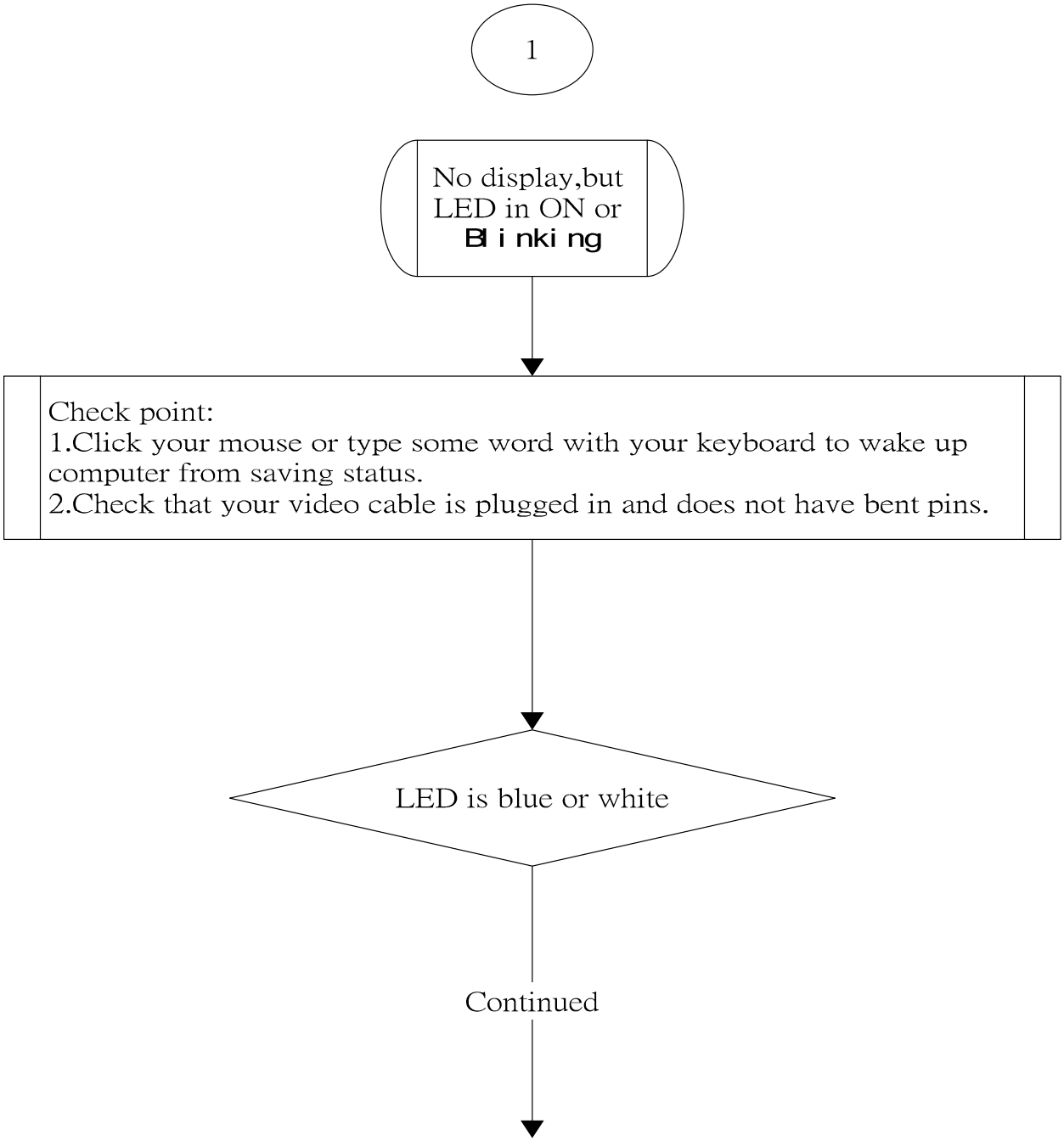
Item	Part Number	Part Description	2nd source	230E1HSB/69(LP2354-A17)	230E1HSB/75(LP2354-A17)	230E1HSB/93(LP2354-A17)	230E1HSB/97(LP2354-A17)	230E1HSB/00(LP2354-A17)	230E1HSB/62(LP2354-A17)
1	453070800170R	PWRCORD 10A/250V BLK 6FT CHINA.RVV 3Gx0.				v			
	453070800450R	PWRCORD 10A/250V BLK 6.3FT UK, H05VV-F 3		v					
	453070800460R	PWRCORD 10A/250V BLK 6.3FT SAAH05VV-F 3G			v				
	453070800210R	PWR CORD 16A/250V BLK 6FT VDE H05VV-F 3G					v	v	v
2	506020031502R	CARTON,PHILIPS(WW),LP2354 (230E1)		v	v		v	v	v
	506020031503R	CARTON,PHILIPS(CHN),LP2354 (230E1)				v			
3	506092007200R	CARD,WARRANTY,PHILIPS-PRC,LE19E3				v			
4	506092007201R	CARD,WARRANTY,PHILIPS-TUR,LE19E3							v
5	506092007202R	CARD,SERVICE,PHILIPS-TUR,LE19E3							v
6	506092007203R	CARD,QSG,PHILIPS-TUR,LE19E3							v
7	506310001601R	CHINA ENERGY LABEL,LP2354(230E1)				v			
8	506390000500R	LABEL,QC-PASS, LE1709				v			
9	713100013603R	ASSY, PACKAGE, PACK, PRC, LP2354 (230E1)				v			
	713100013608R	ASSY, PACKAGE, PACK, AP, LP2354 (230E1)		v	v		v		
	713100013602R	ASSY, PACKAGE, PACK, EU, LP2354 (230E1)						v	v
	713100013607R	ASSY, PACKAGE, PACK, TURKEY, LP2354 (230							v
10	713000099605R	ASSY PACKING, EU 1200*800,20"STD,LP2354						v	v
11	713000099606R	ASSY PACKING, EU 1200*1000,20"STD,LP2354							v
	713100013604R	ASSY PACKING, EU 1200*800,40"STD/HQ,LP23						v	v
	713100013605R	ASSY PACKING, EU 1200*1000,40"STD/HQ,LP2							v
12	506036006201R	CARDBOARD,L1120*W880*T4mm,LP2050							v
	506036007402R	CARDBOARD L1050xW680xT4mm ,LP2354						v	v
13	506039008500R	CORNER PAPER 600x50x50xT3mm LE1512						v	v
14	506120400100R	BAG AIR DUNNAGE 2000x1000mmLE1X03 ROHS						v	v
15	506150001500R	PALLET 1200x1000x120mm LE1908 ROHS							v
	506150012400R	PALLET,L1200*W800*H130,LE22E4						v	v
16	506431009400R	PROTECT,FILM,BEZEL,LOWER,LP2354					v	v	v

General Trouble Shooting Guide





General Trouble Shooting Guide

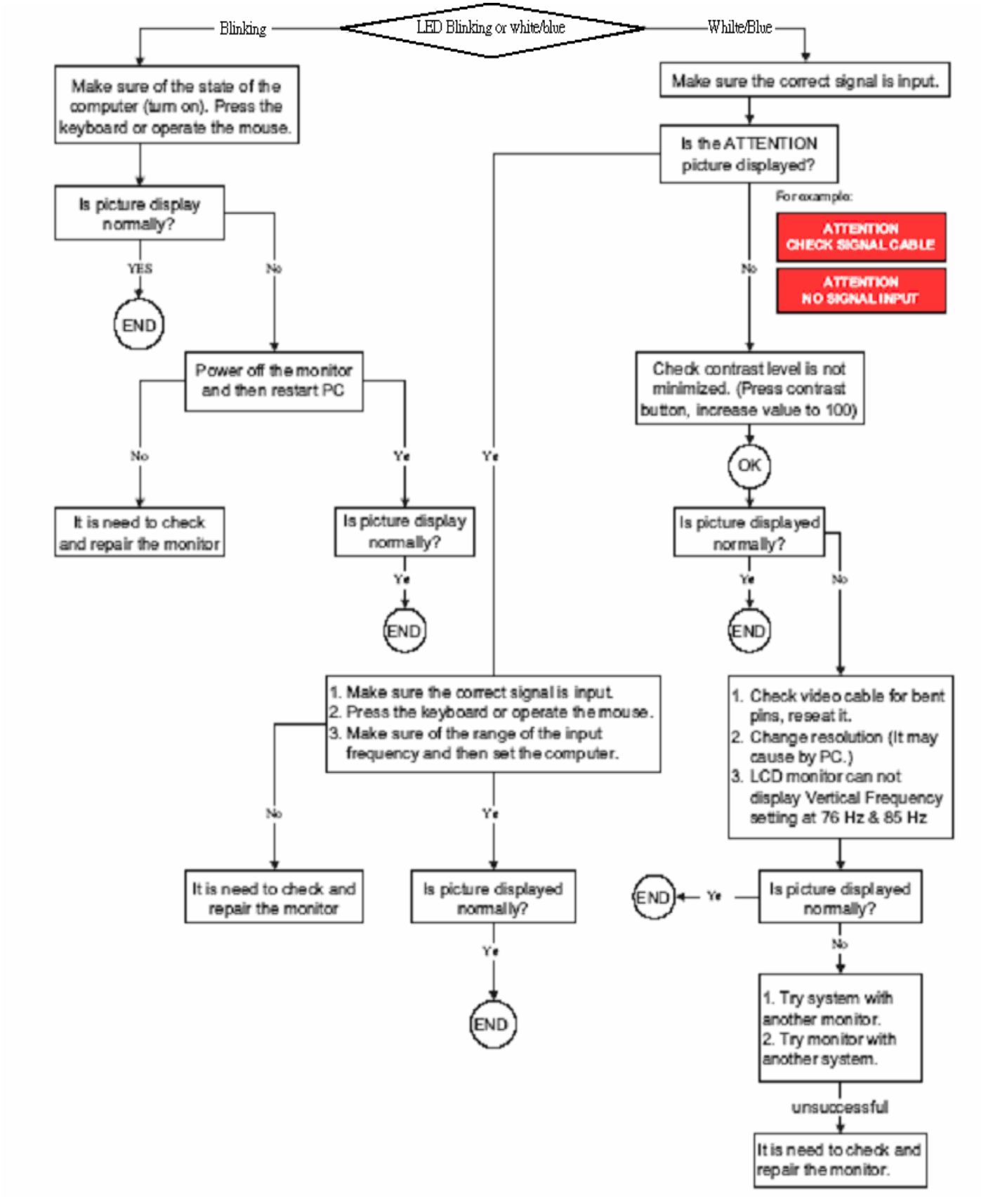


NOTE： Do not set screen saver.
It will cause “no display” problem as above mentioned.
Action: Change timer setting of screen saver or disable screen aver.

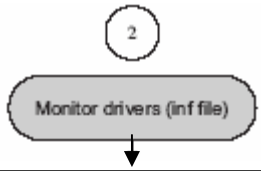
General Trouble Shooting Guide

1

Continued



General Trouble Shooting Guide



FOR WINDOWS 95/98/2000/ME OR LATER

Philips's monitors build in VESA DDC2B feature to support Plug & Play requirement for Windows 95/98/2000/Me. You can install the information file(.inf) in order to select your Philips monitor from "Monitor" dialog box in Windows 95/98/2000/Me to activate Plug &Play application. The installation procedure based on Windows 95 OEM Release 2, 98, Me and 2000 is specified as follows, (in case of connecting the monitor to the PC compliant with VESA standard with the designated signal cable, the PC reads display pixels ,frequency and color feature of this monitor to optimize the picture for the monitor automatically.)DDC: Abbreviation for Display Data Channel

For Windows 95

For Windows 95 drivers, your monitor is listed under manufacture name "Philips Business Electronics Co.".

1. Start Windows 95
2. Click the 'Start' button, point to 'setting', and then click 'control panel'.
3. Double click the' display' Icon.
4. Choose the 'setting' tab then click 'advanced…'
5. Choose 'monitor' button, point to 'change…' then click' have disk…'.
6. Click 'browse…' button then choose the appropriate drive F:(CD-ROM Drive) then click 'ok' button.
7. Click the 'ok' button then choose your monitor mode land click the 'ok'.
8. Click 'close' button.

For Windows 98

For Windows 98 drivers, our monitors are listed under 2 manufactures name "Philips", and "Philips Consumer Electronics Co." Please select "Philips"when you would like to set up your monitor in Windows setting, if you can not find the right model name just as the label indication on the back of set.

For those set that have been issued since the release of Window 98, drivers can be found in CD-ROM under the directory path of "\pc\driver\" or it may be downloaded at http://www.philips.com. Once you have installed the new driver, Windows will add a new manufacture name "Philips Business Electronics" in your system.

1. Start Windows 98
2. Click the 'Start' button, point to 'setting', and then click' control panel'.
3. Double click the 'display' Icon.
4. Choose the 'setting' tab then click 'advanced…'
5. Choose 'monitor' button, point to 'change…' then click 'next'.
6. Choose 'display a list of all the drivers in a specify location, so you can select the driver you want', then click 'next' and then click 'have disk…'
7. Click 'browse…' button then choose the appropriate drive F: (RD-ROM Drive) then click "ok" button.
8. Click the 'ok' button then choose your monitor model and click the 'next' button.
9. Click 'finish' button then click 'close' button.

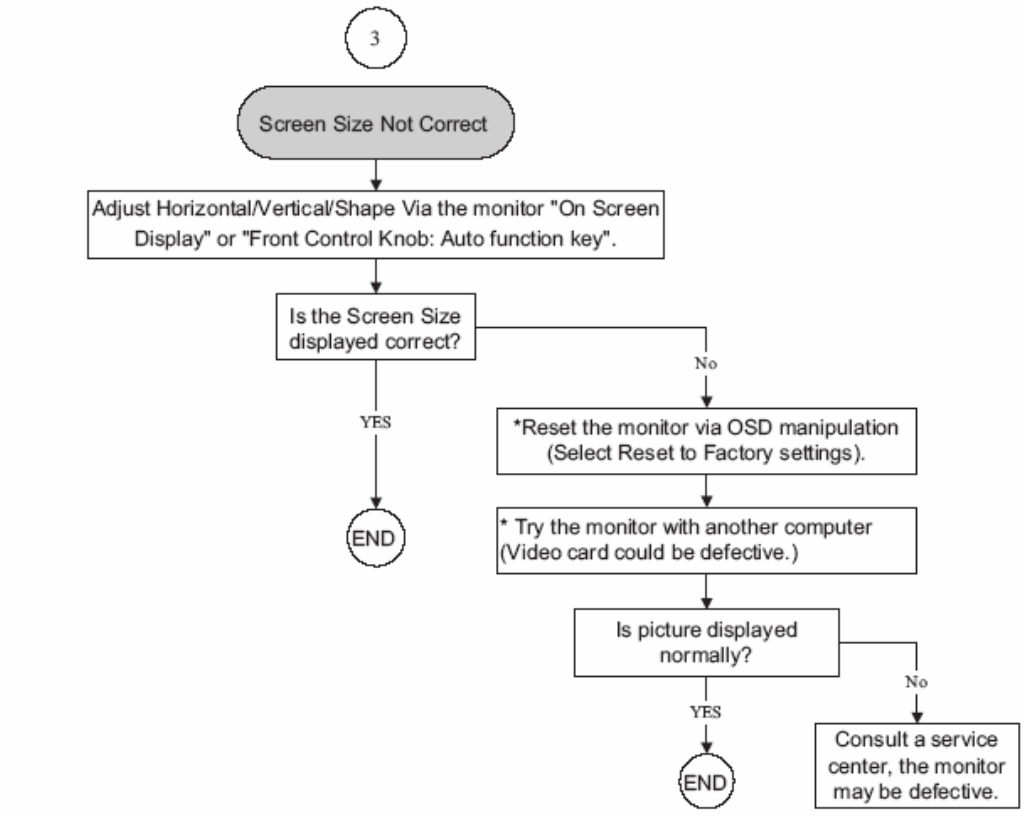
For Window Me

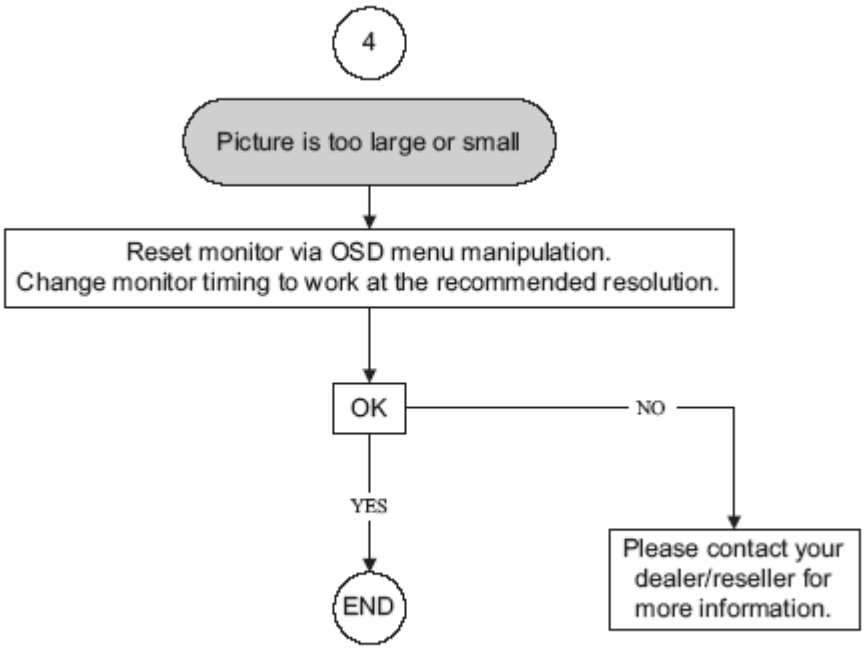
1. Start Window Me
2. Click the 'start' button, point to 'setting' , and then click 'control panel'.
3. Double click the 'display' Icon.
4. Choose the 'setting' tab then click 'advanced…'.
5. Choose 'monitor' button, then click 'change…' button.
6. Choose 'specify the location of the driver (advanced)' and click the 'next' button.
7. Choose 'display a list of all the drivers in a specific location, so you can select the driver you want', then click 'next' and then click 'have disk.'.
8. Click 'browse…' button then choose the appropriate drive F: (CD-ROM Drive) then click 'ok' button.
9. Click the 'ok' button then choose your monitor model and click the 'next' button.
10. Click 'finish' button then click 'close' button.

For Windows 2000

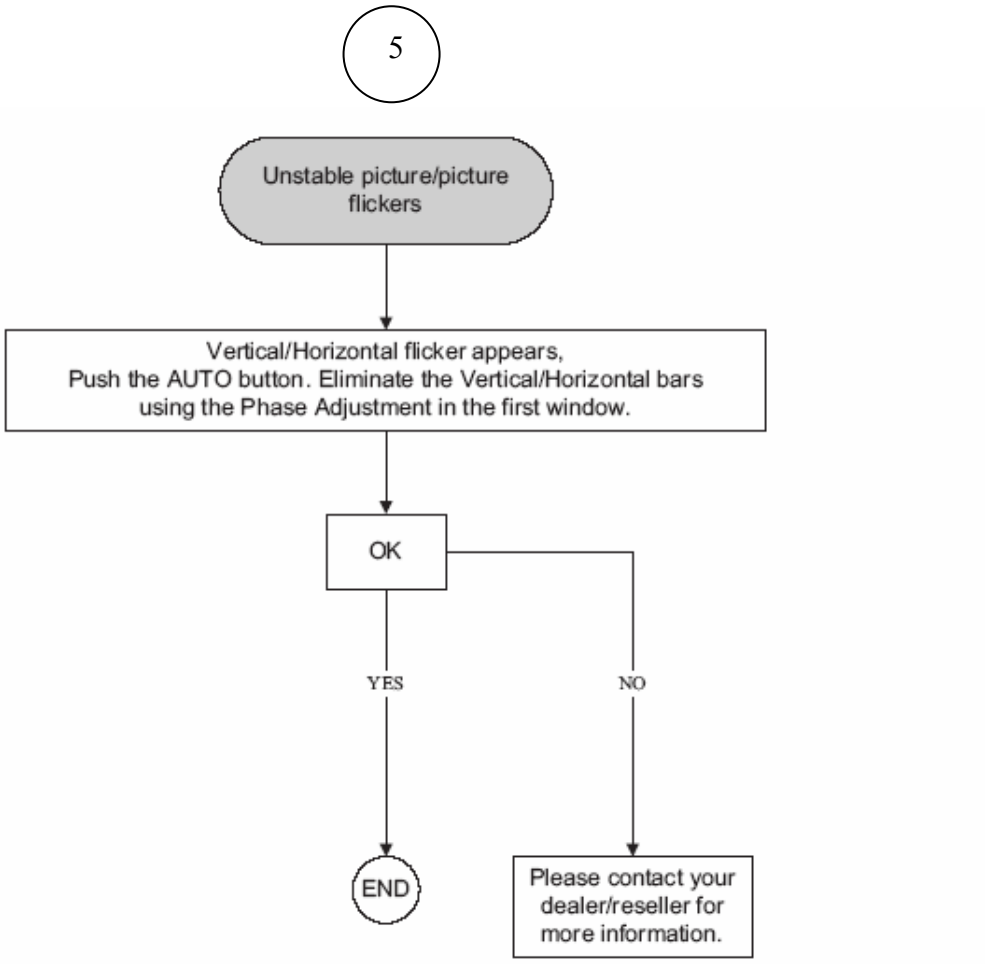
1. Start Windows 2000
2. Click the 'start' button, point to 'setting', and then click 'control panel'.
3. Double click the 'display' Icon.
4. Choose the 'setting' tab then click 'advanced…'.
5. Choose 'monitor;
- If the 'properties' button is inactive, it means your monitor is properly configured. Please stop installation.
- If the 'properties' button is active, click 'properties' button.
6. Click 'driver' and then click on 'update driver…' then click on the 'next' button.
7. Choose 'display a list of the known drivers for this device. so that I can choose a specific driver' then click 'next' and then click 'have disk…'.
8. Click 'browse…' button then choose the appropriate drive F: (CD-ROM Drive).
9. Click the 'open' button then click the 'ok' button.
10. Choose your monitor model and click the 'next' button.
11. Click 'finish' button and then click the 'close' button. If you can see the 'digital signature not found' window then click the 'yes' button.

General Trouble Shooting Guide

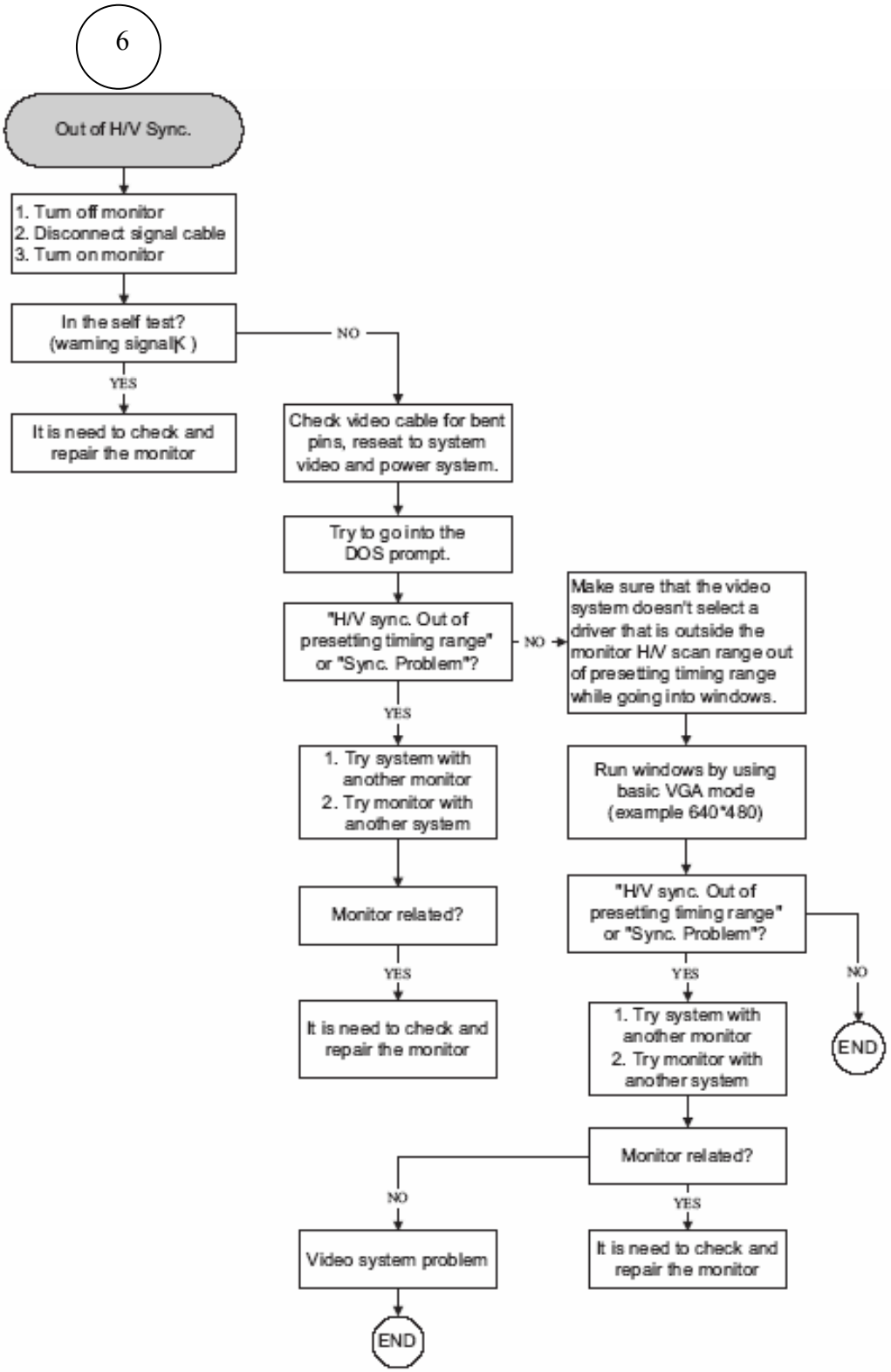




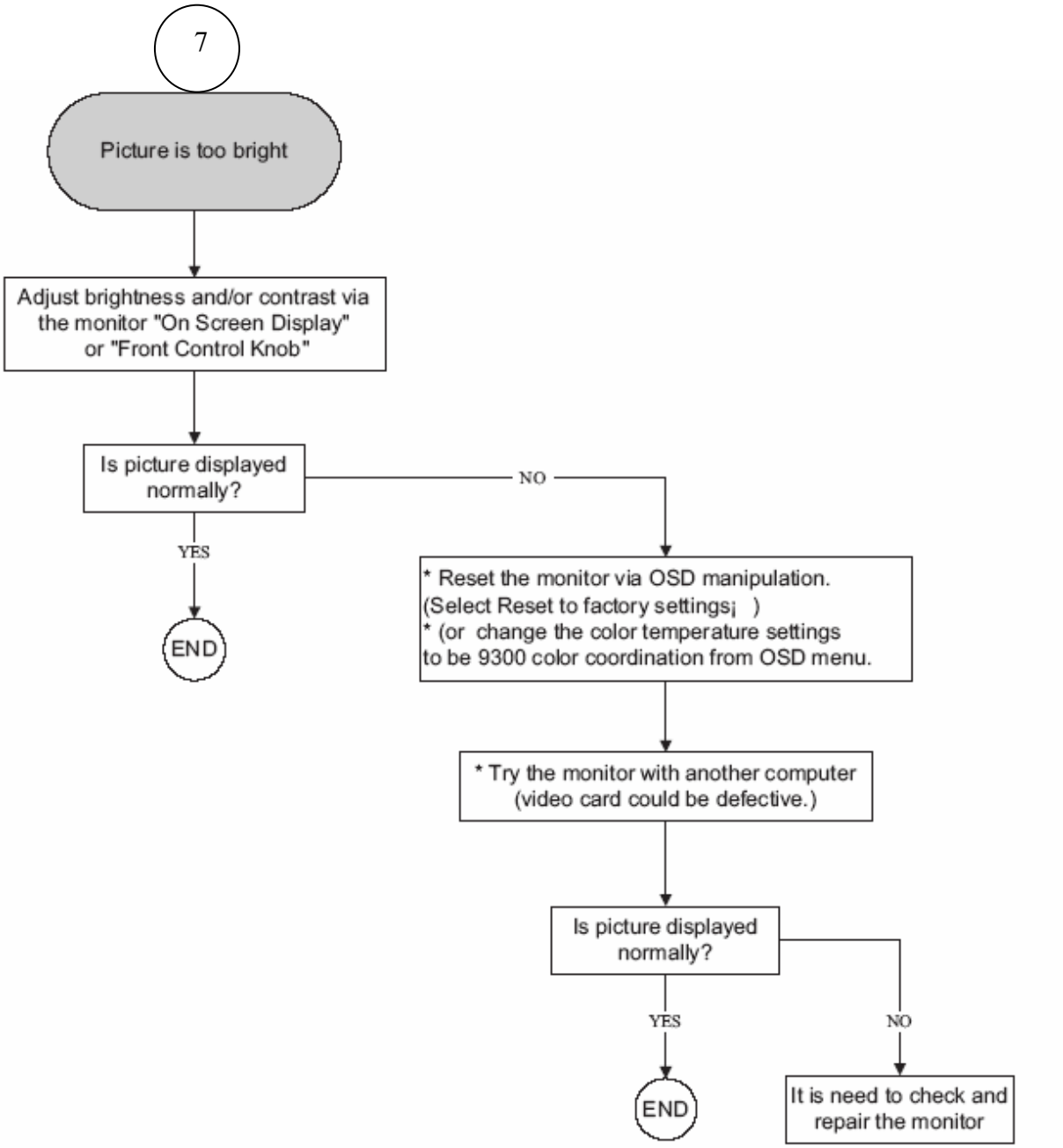
General Trouble Shooting Guide



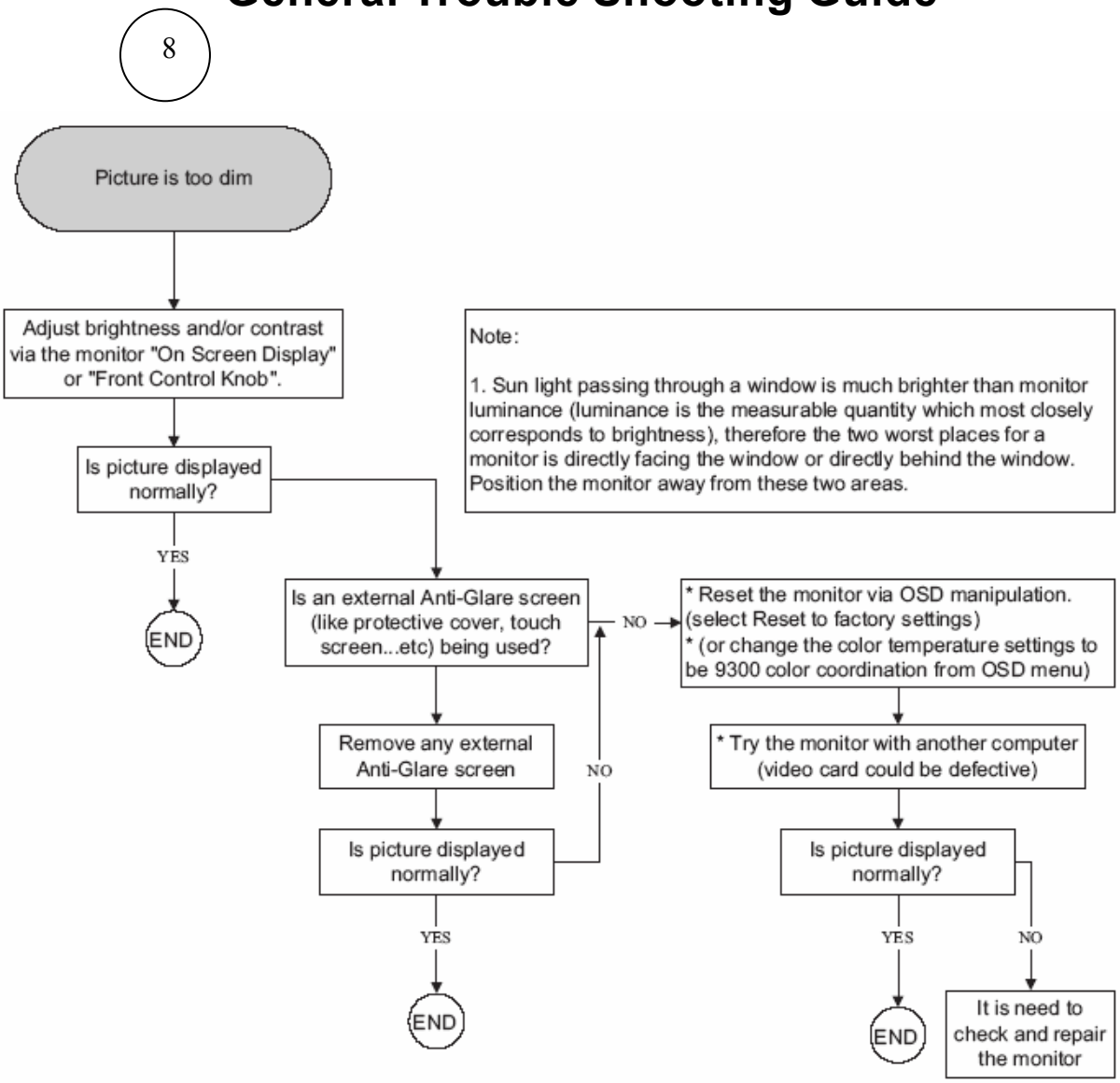
General Trouble Shooting Guide



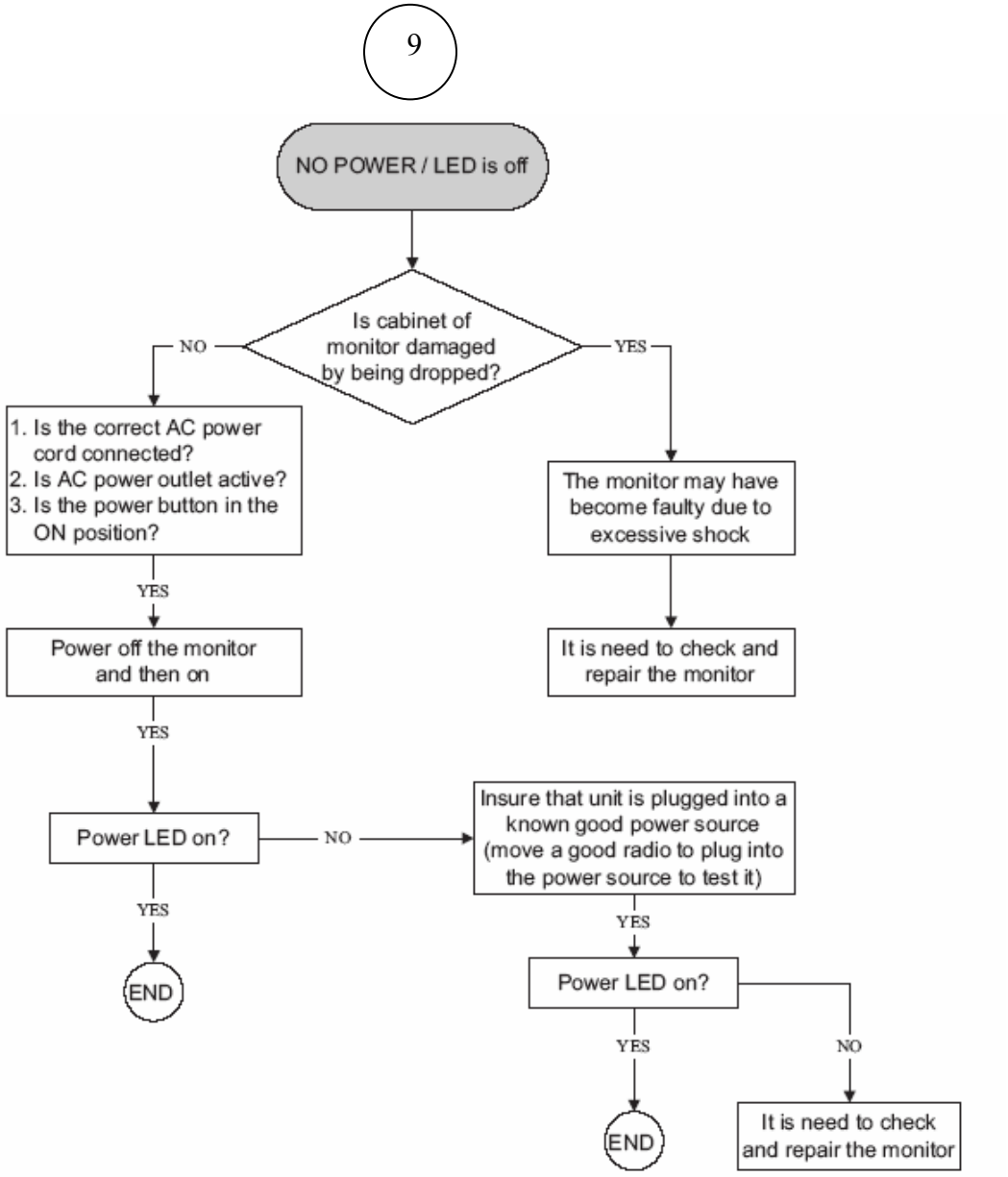
General Trouble Shooting Guide



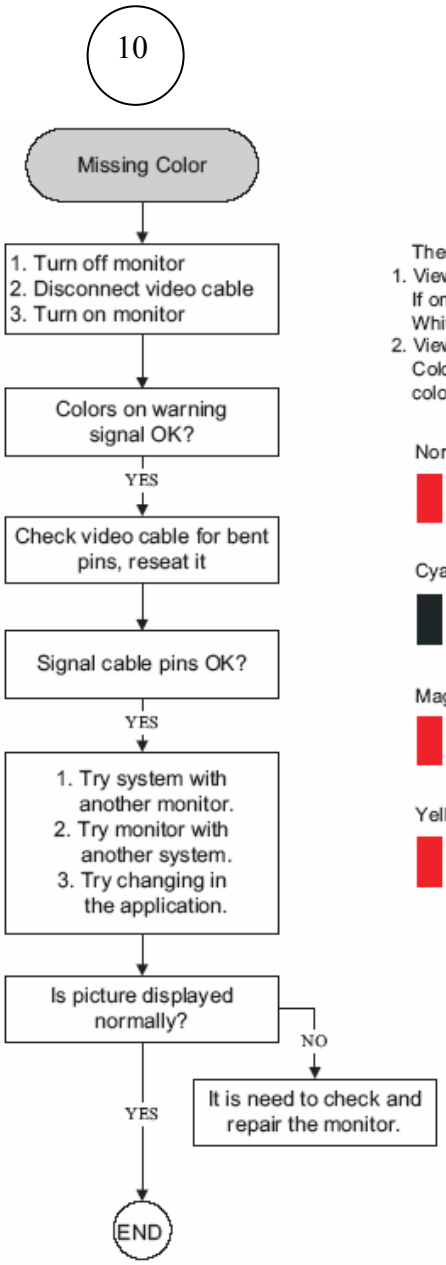
General Trouble Shooting Guide



General Trouble Shooting Guide



General Trouble Shooting Guide



There are 2 easy ways to determine the Missing color problem.

1. View an image that is supposed to be "White".
   If one of the colors (RGB) is not functioning.
   White can not be produced.
2. View an image that supposed to contain Red, Green and Blue.
   Color problems will be apparent when one or more of these colors can not be displayed.

Normal White:

RED + GREEN + BLUE = WHITE

Cyan Color means that the red sub pixel is missing.

RED + GREEN + BLUE = Cyan

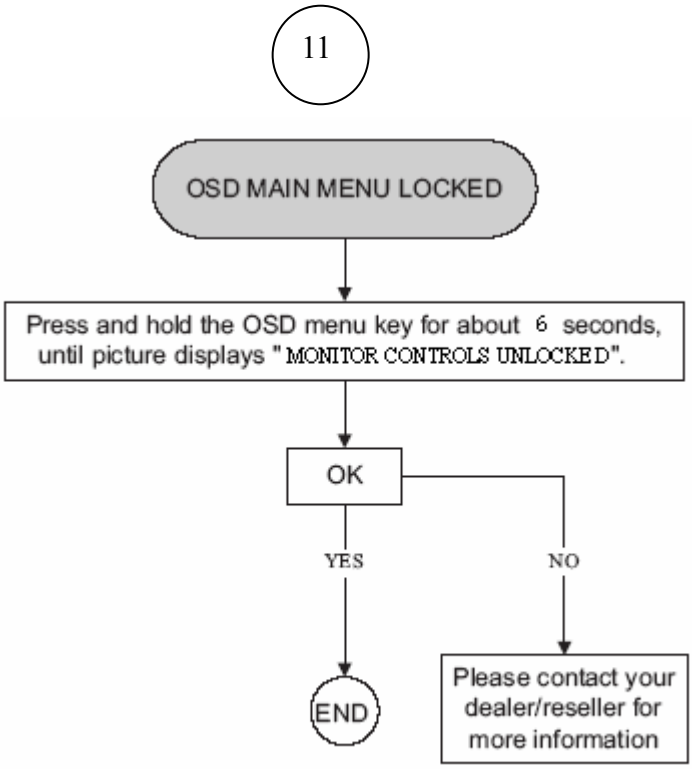
Magenta or Purple Color means that the green sub pixel is missing.

RED + GREEN + BLUE = Magenta

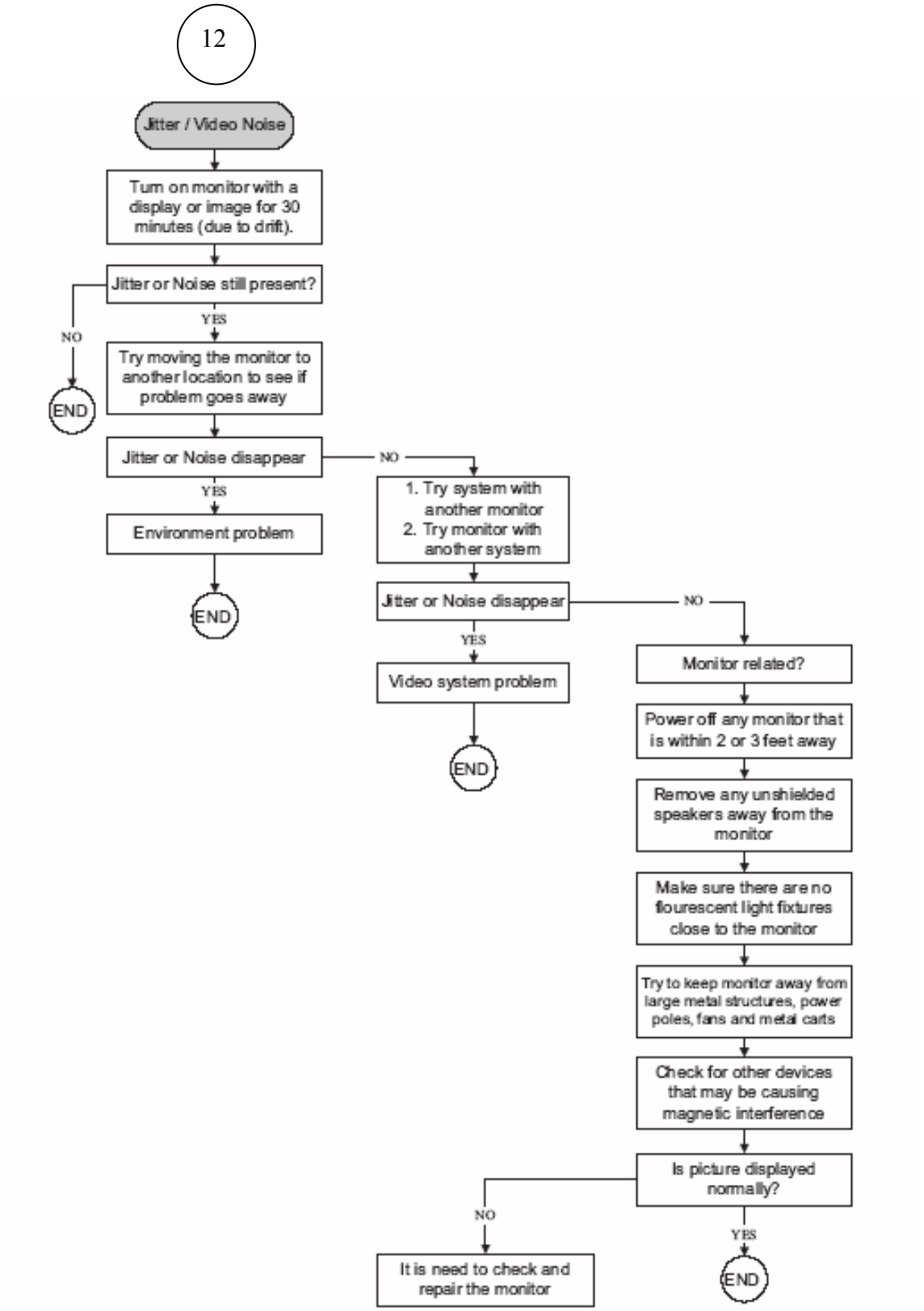
Yellow Color means that the blue sub pixel is missing.

RED + GREEN + BLUE = Yellow

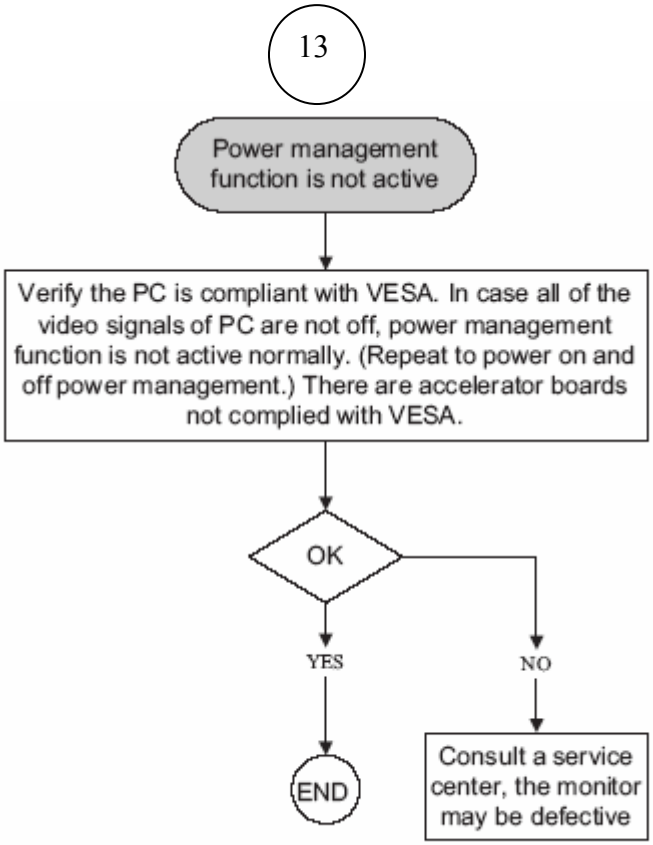
General Trouble Shooting Guide



General Trouble Shooting Guide



General Trouble Shooting Guide



General Product Specification

Specification for

Philips 230E1HSB

23''W TFT LCD Monitor,
30 - 83 kHz, 56 - 76 Hz, Analog,DVI HDMI input **(EE)**

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1. PRODUCT SPECIFICATION (PM)

1.1 Relationship

Model: LM230WF1-TLA3
Model: 230E1HSB

Customer: Philips
* Monitor No: HWE1230F
* Monitor ID:
  230E1HSB/00
  230E1HSB/62
  230E1HSB/97
  230E1HSB/69
  230E1HSB/75
  230E1HSB/93

* EAN No.:

CTN	UPC/EAN
230E1HSB/00	87 12581 47638 0
230E1HSB/62	87 12581 47661 8
230E1HSB/97	87 12581 47658 8
230E1HSB/69	87 12581 47639 7
230E1HSB/75	87 12581 47640 3
230E1HSB/93	87 12581 47641 0

1.2 Product Data (EE)

23" W TFT LCD monitor

Horizontal frequency	30 - 83	KHz
Vertical frequency	56 – 76	Hz
Screen diagonal	23	Inch
Viewing Angle(CR>10)(H/V)	170/160 °	
Max. active horizontal picture size	509.18	mm
Max. active vertical picture size	286.21	mm

2. MECHANICAL SPECIFICATION (ME)

2.1.1 Monitor Housing

The front bezel and the back cabinet are based on Innolux OEM tooling and Philips design chin.

2.1.2 VESA mounting holes

Nil

2.1.3 Kensington Slot

The monitor is equipped with a 7 mm x 3 mm slot.

2.2 Tilt of the monitor

Forward	-5q +2/-0
Backward	+20 q +0/-2q

2.3 Dimensions of monitor

The monitor has the following dimensions:
Unit dimension : 547.2mm (W) * 432.8mm (H) * 201.4mm (D)
Packed unit dimension : 596mm (W) *495mm (H) * 134mm (D) for WW
: 596mm (W) *495mm (H) * 134mm (D) for China
Net weight : 5.4 Kg (Including I/F cable 240 g)
Gross weight : 6.636 Kg for WW
: 6.636 Kg for China

3. LCD SPECIFICATION (EE)

3.1 LCD specification

Panel	LGD	
	LM230WF1-TLA3	
Resolution	1920(H) X 1080(V)	
Active area(HxV)	509.184 x 286.216	
Outside dimensions(WxHxD)	533.2 x 312.0 x 16.5 mm	
Pitch(mm)	0.265 x 0.265	
Display surface	Anti-Glare type	
Color depth	16.7M colors	
Backlight	4CCFL	
Viewing angle	170/160 for H/V	
Contrast ratio	1000:1(Typ)	
White luminance	300nit(Typ)	
Color gamut	75%	
Gate IC	GIP	
Source IC	Lusem	
Response time	5ms	

4 COSMETICS APPEARANCE (ME)

4.1 GAP definition

The gap between LCD and front bezel must be **<= 1.2mm**

4.2 Panel Offset

Panel Offset: Panel disposition tolerance inside the front bezel must be <=1.0mm

4.2 Horizontal tilt

Horizontal tilt between front bezel & LCD shall be <= 1.0mm

5. CONNECTORS (FW)

5.1 Video Connection

The monitor is equipped with a 15 pin mini D-SUB connector.

5.2 PIN Assignment

5.2.1 15 pin mini D-Sub connector

The PIN assignment of the 15 pin mini D-SUB connector / cable is as follows:

Pin	Symbol	Pin	Symbol	Pin	Symbol
1	Red	6	Red GND	11	GND
2	Green/SOG	7	Green GND	12	Bi-directional data
3	Blue	8	Blue GND	13	H sync
4	GND	9	+5V	14	V sync
5	CableDetect	10	Open	15	Data clock

6. OSD (FW)
6.1 control of OSD

The positions and functions of the buttons are defined as below.

6 Hot-key definition

FUNCTION	HOT KEY OPERATION					DESCRIPTION
	Smart Image	Auto/Back	Input \▼	MENU\OK	POWER	
FACTORY MODE		●		●	●	Press AUTO + Menu at the same time, and then press [POWER] for DC power on. OSD menu will be shown with "Factory" on the sub –menu of picture.
Demo mode	●					To enter Demo mode(3 seconds ON/OFF)
Monitor Controls Lock				●		Lock/Unlock Monitor control when press Menu (6 seconds).
DDC/CI On/OFF			●	●		DDC/CI On/OFF when press Menu+▼ (6 seconds).

OSD Tree

Level 1	Level 2	Level 3	Default
Input	VGA		
	DVI		
	HDMI		
Picture	Picture Format	(Wide screen, 4:3)	Wide
	Brightness	(0~100)	100
	Contrast	(0~100)	50
	SmartResponse	(On, Off)	Off
	SmartContrast	(On, Off)	Off
	Gamma	(1.8, 2.0, 2.2, 2.4, 2.6)	2.2
Audio	Stand Alone	(On, Off)	Off
	Mute	(On, Off)	Off
Color	Color Temp.	(5000K,6500K,7500K,8200K,9300K,11500K)	6500K
	sRGB		
	User Define	(Red:0~100)	100
		(Green:0~100)	100
		(Blue:0~100)	100
Language	English		English
	Español		
	Français		
	Deutsch		
	Italiano		
	Português		
	Русский		
	简体中文		

	Türkçe (only for 230E1)		
OSD Setting	Horizontal	(0~100)	50
	Vertical	(0~100)	50
	Transparency	(Off, 1, 2, 3, 4)	Off
	OSD Time out	(5, 10, 20, 30, 60)	20
Setup	Power LED	(0, 1, 2, 3, 4)	3
	H.Position	(0~100)	
	V.Position	(0~100)	
	Phase	(0~100)	
	Clock	(0~100)	
	Resolution Notification	(On, Off)	Off
	Reset	(Yes, No)	No
	Information		

7. ELECTRICAL SPECIFICATION (EE)

7.1 Power Specification

7.1.1 AC-DC converter

Input voltage 100- 240V
Frequency range 50~ 60HZ
Inrush current Shall be less than the ratings of critical components (including fuse, rectifiers and surge limiting device) for all conditions of line in voltage.
consumption: ≤ 58W (Max.)

7.1.2 Power Management

Status	H-sync	V-sync	Video	Power	LED	Test voltage
Power On	on	on	active	≤ 60W	Blue	90V/60HZ-264V/50Hz
Power Saving	off	on	blanked	≤0.5W	Blinking Blue LED Period: 3sec On, 3sec Off	110V/60Hz and 220V/50Hz
	on	off	blanked	≤ 0.5W		110V/60Hz and 220V/50Hz
	off	off	blanked	≤ 0.5W		110V/60Hz and 220V/50Hz
Power Off	--	--	--	≤ 0.5W	Off	90V/60HZ-264V/50Hz

7.2 Standard Test conditions (EE)

Unless otherwise specified, this specification is defined under the following conditions.

(1) Input signal: As defined in Timing table, 1920 x 1080 non-interlaced mode (1920 x 1080 @60Hz), signal sources must have 75 ohm output impedance.

(2) Luminance setting: controls to be set to 300 nits with full screen 100 % duty cycle white signal

(3) Warm up: more than 30 minutes after power on with signal supplied.

(4) Ambient light: 400 – 600 lux.

(5) Ambient temperature: 20 ± 5 ºC

7.3 Test equipment

Personal computer with Windows 98/2000/XP/VISTA
Luminance meter Minolta CA210
Videogenerator: Chroma 2227, 2230 or equivalent
Colour analyzer: Minolta or Chroma
10 times magnifier
Ruler / Template
Thickness gauge
Watt / Power Meter

7.4 Video Generator test sequence

Will be defined by Innolux or its subcontracted quality providers.

7.5 Analog input

Analog input R,G,B level:	0 - 700 mV max.
Polarity:	positive, negative
Impedance:	75 ： ± 1%
Sync:	HV separate sync, composite sync,

7.6 Optical response time

Video Bandwidth:	205MHz (dot rate)
Typical Response Time (CPT)	5ms

7.7 Protection circuit

The monitor will not be damaged by:
improper vertical or horizontal sync pulse (picture must be black at improper signals, unsynchronized pictures are not allowed)

7.8 DDC (FW)

The monitor can support DDC 2 B and DDC-CI according to the latest VESA standard.

7.8.1 DDC Details

for VGA:

1	User visible strings on .inf file	Philips 230E1
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): C0
		LSB (byte 11): 2B
4	maximum resolution	1920x1080
5	Horizontal Frequency Range	30~83 KHz
6	Vertical Frequency Range	56~76Hz
7	Monitor Name (13 characteries max.)	Philips 230E

For DVI:

1	User visible strings on .inf file	Philips 230E1
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): C0
		LSB (byte 11): 2C
4	maximum resolution	1920x1080
5	Horizontal Frequency Range	30~83 KHz
6	Vertical Frequency Range	56~76Hz
7	Monitor Name (13 characteries max.)	Philips 230E

For HDMI:

1	User visible strings on .inf file	Philips 230E1
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): C0
		LSB (byte 11): 2C
4	maximum resolution	1920x1080
5	Horizontal Frequency Range	30~83 KHz
6	Vertical Frequency Range	56~76Hz
7	Monitor Name (13 characteries max.)	Philips 230E

7.9 Timings

For VGA INPUT :

Factory preset modes: 15
Preset modes : 54
User modes : 10

Note: 1.screen displays perfect picture at 15 factory-preset modes.
2.screen displays visible picture with OSD warning when input modes are the 54 preset modes.

Mode	Resolution	H.Freq. (KHz)	V.Freq. (Hz)	BW(MHz)
IBM VGA 10H	640x350	31.469	70.086	
IBM VGA 3H	720x400	31.469	70.087	
IBM VGA 12H	640x480	31.469	59.94	
MACINTOSH	640x480	35	67	
VESA	640x480	37.861	72.809	

VESA	640x480	37.5	75	
VESA	640x480	43.269	85.008	
VESA	800x600	35.156	56.25	
VESA	800x600	37.879	60.317	
VESA	800x600	48.077	72.188	
VESA	800x600	46.875	75	
VESA	800x600	53.674	85.061	
MACINTOSH	832x624	49.7	75	
-	960x720	56.4	75	
-	960x720	44.75	60	
VESA	1024x768	48.363	60.004	
VESA	1024x768	56.476	70.069	
VESA	1024x768	60.023	75.029	
IBM XGA-2	1024x768	61.08	75.781	
VESA	1024x768	68.677	84.997	
CVT 2.3MA	1280 x768		60	
CVT 2.3MA	1280 x768	60.289	75	
	1152x864	54.1	60	
VESA	1152x864	63.851	70.012	
VESA	1152x864	67.5	75	
MACINTOSH	1152x870	68.7	75	
SUN WS	1152x900	61.845	66.004	
SUN WS	1152x900	71.81	76.15	
CVT	1280x800	49.7	59.81	
CVT	1280x800	62.8	74.93	
VESA	1280x960	60	60	
VESA	1280x960	75	75	
VESA	1280x1024	63.981	60.02	
SUN WS	1280x1024	71.691	67.189	
DOS/V	1280x1024	76	72	
VESA	1280x1024	79.976	75.025	
SUN WS	1280x1024	81.13	76.11	
VESA	1280x1024	91.1	85	
-	1280x720	44.772	60	
-	1280x720	52.5	70	
CVT-reduced blanking	1400x1050	64	60	
CVT	1400x1050	80	75	
CVT	1400x1050	91.1	85	
VESA-reduced blanking mode	1440x900	55.469	59.901	88.75
VESA	1440x900	55.935	59.887	106.5
VESA	1440x900	70.635	74.984	136.75
VESA	1600x1200	75	60	
CVT 2.3MA	1920x1080	67.05	60.0	173
CEA861	1920x1080	67.5	60	148.5
CVT 2.3MA-R	1920x1080	66.587	60	138.5
CVT1.76MW	1680x1050	65.29	60	146.25
CVT1.76MW-R	1680x1050		60	119

CVT 2.3MA	1920x1200	74.56	60.0	193
CVT 2.3MA-R	1920x1200	74.52	60	154

Remark: Timing with light blue are factory mode.

FOR HDMI&DVI:

Factory preset modes: 15
Preset modes : 52
User modes : 10

Note: 1.screen displays perfect picture at 15 factory-preset modes.
2.screen displays visible picture with OSD warning when input modes are the 52 preset modes.

Mode	Resolution	H.Freq. (KHz)	V.Freq. (Hz)	BW(MHz)
IBM VGA 10H	640x350	31.469	70.086	
IBM VGA 3H	720x400	31.469	70.087	
IBM VGA 12H	640x480	31.469	59.94	
MACINTOSH	640x480	35	67	
VESA	640x480	37.861	72.809	
VESA	640x480	37.5	75	
VESA	640x480	43.269	85.008	
VESA	800x600	35.156	56.25	
VESA	800x600	37.879	60.317	
VESA	800x600	48.077	72.188	
VESA	800x600	46.875	75	
VESA	800x600	53.674	85.061	
MACINTOSH	832x624	49.7	75	
-	960x720	56.4	75	
-	960x720	44.75	60	
VESA	1024x768	48.363	60.004	
VESA	1024x768	56.476	70.069	
VESA	1024x768	60.023	75.029	
IBM XGA-2	1024x768	61.08	75.781	
VESA	1024x768	68.677	84.997	
CVT 2.3MA	1280 x768		60	
CVT 2.3MA	1280 x768	60.289	75	
	1152x864	54.1	60	
VESA	1152x864	63.851	70.012	
VESA	1152x864	67.5	75	
MACINTOSH	1152x870	68.7	75	
SUN WS	1152x900	61.845	66.004	
SUN WS	1152x900	71.81	76.15	
CVT	1280x800	49.7	59.81	
CVT	1280x800	62.8	74.93	

VESA	1280x960	60	60	
VESA	1280x960	75	75	
VESA	1280x1024	63.981	60.02	
SUN WS	1280x1024	71.691	67.189	
DOS/V	1280x1024	76	72	
VESA	1280x1024	79.976	75.025	
SUN WS	1280x1024	81.13	76.11	
VESA	1280x1024	91.1	85	
-	1280x720	44.772	60	
-	1280x720	52.5	70	
CVT-reduced blanking	1400x1050	64	60	
CVT	1400x1050	80	75	
CVT	1400x1050	91.1	85	
VESA-reduced blanking mode	1440x900	55.469	59.901	88.75
VESA	1440x900	55.935	59.887	106.5
VESA	1440x900	70.635	74.984	136.75
VESA	1600x1200	75	60	
CEA861	1920x1080	67.5	60	148.5
CVT 2.3MA-R	1920x1080	66.587	60	138.5
CVT1.76MW	1680x1050	65.29	60	146.25
CVT1.76MW-R	1680x1050		60	119
CVT 2.3MA-R	1920x1200	74.52	60	154

Remark: Timing with light blue are factory mode.

FOR HDMI (Video timing) :

	Resolution	Pixel Clock MHz	Hsync KHz	Vsync Hz
480i	720 x 480	13.50	15.73	60
480p	720 x 480	27.00	31.47	60
576i	720 x 576	13.50	15.63	50
576p	720 x 576	27.00	31.27	50
720p	1280 x 720	74.25	44.96	60
720p	1280 x 720	74.25	37.5	50
1080i	1920 x 1080	74.25	33.75	60
1080P	1920 x 1080	148.50	67.50	60
1080i	1920 x 1080	74.25	28.125	50
1080P	1920 x 1080	148.50	56.25	50

7.10 Audio Specification

N/A

8. DISPLAY PERFORMANCE (EE)

8.1 Picture performance

Optical performance test must be done in a dark room.

Note: Test under standard test conditions unless otherwise specified

Active Image Size (all modes)

8.2 Geometric defects

No vertical or/and horizontal line defect.

No cross line defect.

8.3 Picture stability during warm up

During 10 - 30 minutes warm up time from cold condition of the monitor
at ambient temperature (25°C r 5°C) the decrease of brightness must be less than 6 Fl.

8.4 Scratches

No scratches and foreign particles visible.

3.5 Viewing angle

	Typical(10:1)
Horizental (Right + Left)	170°
Vertical (Up + Down)	160°

8.6 Jitter

No jitter visible in each condition. In case of problem a limit sample has to be defined.

8.7 Missing Pixels / missing subpixel (PM)

MODEL	*230E*
1 lit subpixel	3
2 adjacent lit subpixels	1
3 adjacent lit subpixels (one white pixel)	0
Distance between two bright dot defects*	15mm
Bright dot defects within 20 mm circle	0
Total bright dot defects of all types	3

MODEL	*230E*
1 dark subpixel	5
2 adjacent dark subpixels	2
3 adjacent dark subpixels (one white pixel)	1
Distance between two dark dot defects*	15mm
Black dot defects within 20 mm circle	1
Total black dot defects of all types	5

MODEL	*230E*
Total bright or black dot defects of all types	5

8.8 Newton Ring

No Newton Rings visible.

8.9 Luminance Output

8.9.1 Luminance Output (EE)

Test resolution: 1920 x 1080 @60Hz
Test condition: video input (RGB) = maximum white

8.9.2 Brightness

To follow Panel specification. sRGB = 80 ± 10 nits.

8.9.3 Brightness uniformity

Set contrast at 100% and turn the brightness to get average above 300 nits at centre of the screen. Apply the Fig 1, it should comply with the following formula:

$$\frac{B\_min}{B\_max} \text{ X } 100\% > 75\%$$

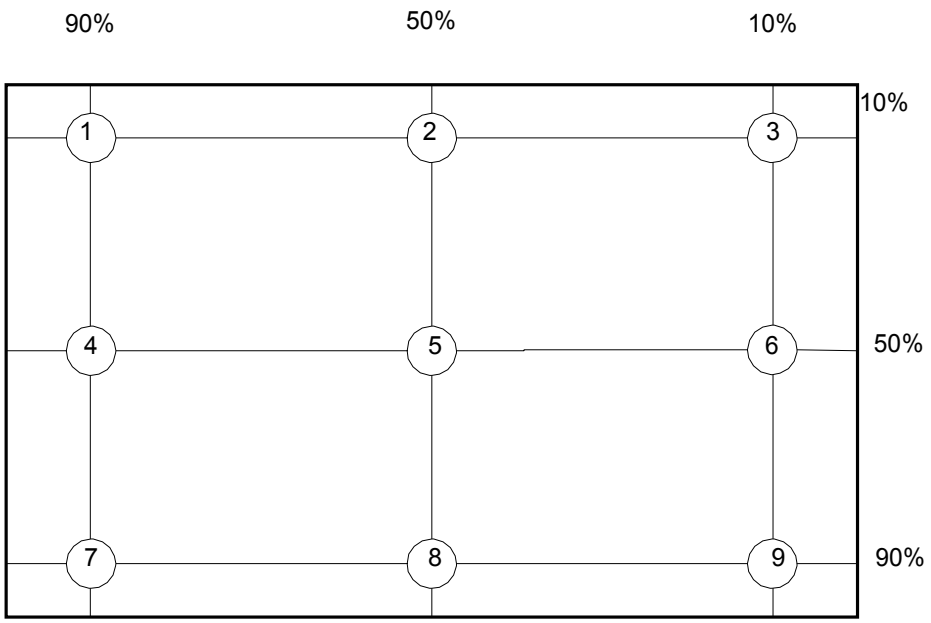
Where B_max = Maximum brightness
B_min = Minimum brightness

8.10 White Uniformity

Definition of White Variation (W):

Measure the luminance of gray level 255 at 9 points

W = Maximum [L(1), L(2) …… L(9)] / Minimum [L(1), L(2) …… L(9)]



Spec : =< 1.33 (In all ranges)

8.11 Contrast ratio

The contrast ration can be calculated by following expression.
Contrast Ratio (CR) = L255 / L0
L255 : Luminance of gray level 255
L0 : Luminance of gray level 0
Typical value: 1000:1

8.12 White color adjustment **(FW)**

There are three factory preset white color 9300K, 6500K, sRGB.

Apply full gray 64 pattern, with brightness in 100 % position and the contrast control at 50 % position. The 1931 CIE Chromaticity (color triangle) diagram (x,y) coordinate for the screen center should be:

Product specification:

Mode		Chromaticity Coordinate		Remark
OSD setting	Temp.	x	y	
Warm	6500K	0.313 ±0.020	0.329 ±0.020	For product Spec(DQA test)
		0.313 ±0.015	0.329 ±0.015	For OQC Test:
		0.313 ±0.005	0.329 ±0.005	For production alignment test
Cool	9300K	0.283 ±0.020	0.298±0.020	For product Spec(DQA test)
		0.283 ±0.015	0.298±0.015	For OQC Test:
		0.283 ±0.005	0.298±0.005	For production alignment test
User		Panel White x	Panel White y	

The test standard condition :Brightness control is at 100 contrast control is at 50

8.13 Distance between TFT LCD monitor and CRT/TFT monitor

Conducted with different modes or frequencies. No interference in a distance down to 25 cm.

9. ENVIRONMENT (EE)

9.1 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display device.

Operating:
- Temperature : 5°C to 40°C
- Humidity : 20% to 80%
- Altitude : 0 to 5000 M

Storage:
- Temperature : -20 to 60 degree C
- Humidity : 10% to 80%
- Altitude : 0 to 12000M

Note: recommend at 5 to 35ϙC, Humidity less than 60 %

10. REGULATORY STANDARDS (Safety)

Note: All certificates must be raised under the name of Philips

10.1 Safety approvals

- CB report
- CE

10.2 Power management

- Energy Star

10.3 Certificates, Reports for the production start

When the first production of the monitor starts the following documents must be sent to Philips by mail. All reports must be raised under “Philips” and have to show W0ZR model name .

- CB report
- CE
- FCC
- Service manual

11 RELIABILITY (EE)

11.1 Reliability of the monitor

The MTBF of the monitor has to be greater than 50.000 hours.

12. CUSTOMIZATION (PM)

12.1 Identity Customization

Refer to SKU

12.2 EAN /SAP Identification

Refer to SKU

12.3 Plastic

The plastic material of the monitor must be ABS-HB (base/Front/ back). Plastic type and color is released as follows:

Refer to MakeUp sheet/ Graphic sheet

12.4 Definition of serial number

Refer to Philips' definition

12.5 Definition of the barcode label

Refer to Philips' definition

12.6 Accessories

Refer to SKU

13. ECR-HANDLING

Not any change without approved ECR.
Every ECR to the golden " samples" must be approved by PHILIPS, Even ECR for minor changes must be released by PHILIPS.
For the ECR procedure the vendor has to send an ECR formular, necessary spec updates, datasheets and a photo documentation. On based on documents, PHILIPS has to decide if samples are necessary till release to changes. The vendor also has to proof be certificates and test reports, that the change has no effect on safety, EMI and TCO03.
After testing, PHILIPS has to release or reject the change request.

Safety Check Process **(safety)**

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous service may have left an unsafe condition,
which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and form the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barries, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation(including the accord). Be certain to remove loose solder balls and all
other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deteriortion and replace if necessary. Follow original layout, lead length and dress.
5. No lead or component should touch a receiving tube or a resistor rated at1watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with ans bythe Ref.No in the parts list and enclosed within a broken line *(Where several critical components are grouped in one area) along with the safety symbols on the schematic diagrams and/or exploded views.
7.When servicing any unit, always use a separate isolation transformer for the chassis failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord(one wide pin on the plug). Defeating this safety feature may create a potential hazard to the service and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform an leakage test or resistance test from the line cord to all exposed metal parts of the cabinets. Also check all metal control shafts(with knobs removed), antenna terminals, handles, screws, etc. To be sure the unit may be safety operated without danger of electrical
shock.

- Broken line

Implosion

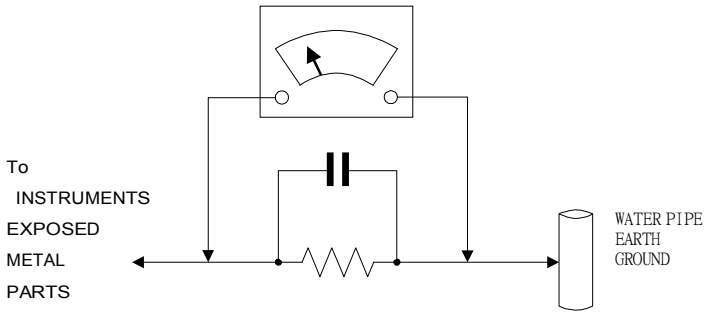
1. All picture tubes used in current model receivers are equipped with an intergral implosion system care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or other wise damaging the picture tube during installation.
2. Use only replacement tubes specified by the manufacturer.

X-radiation

1. Be sure procedures and instructions to all your service personal cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturers specified anode connectors must be used.
3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry isoperating properly there is no possibility of an X- radiation problem. High voltage should always be kept at the manufacture, rated value-no higher- for optimum performance. Every time a color set is serviced, the brightness should be run up and while monitoring the HV with a meter to be certain that the HV is requation correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV requation are always checked as a standard servicing procedure, and the reason for this prudent routine is cleanly understood by everyone. It is important ot use an accurate and reliable HV meter. It is recommended that the HV recorded on each customer s invoice, which will demonstrate a proper concern for the customer s safety.
5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a variac to bring the HV into acceptable limits while troubleshooting. Do not operate the chassis loner than necessary to locate the cause of the excessive HV.
6. New picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.
8. Most TV receivers contain come types of emergency" Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode.
These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



1500 ohm, 10W 0.15uF

Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a 1.5k, 10w resistor paralleled by a 0.15uf capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed.(note: an ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing
feature of the plug.)

Picture Tube Replacement

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same types as the original, including suffix letter, or a Philips approved tube.

Parts Replacement

Many electrical and mechanical parts in Philips television sets have specialsafety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be
obtained by using replacement components r=ated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part should in this service manual may create shock, fire, or other hazards

WARNING: Before removing the back cover, turn the unit OFF and short the HIGH VOLTAGE to the ground.

~END~