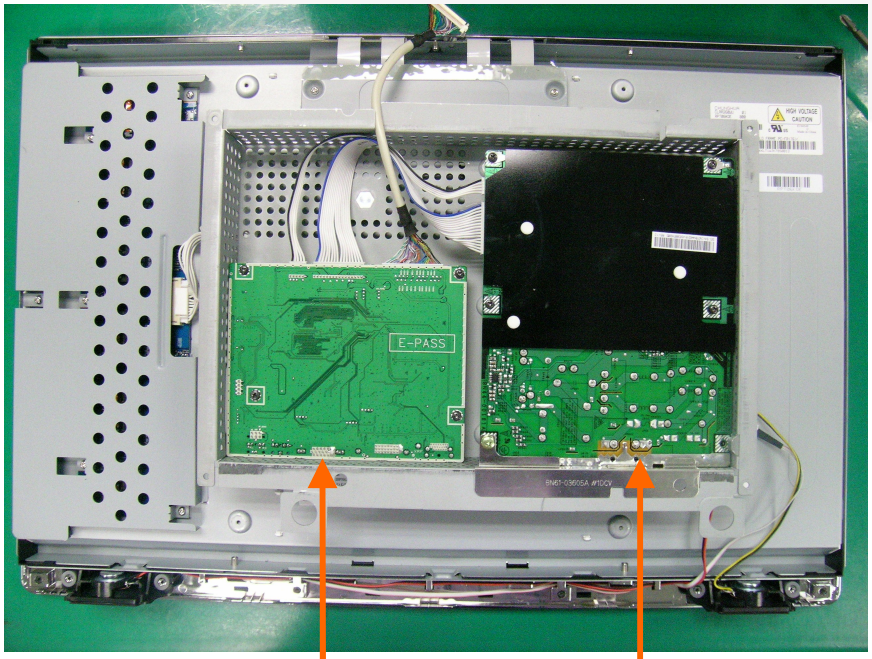
KILIMANJARO (2693HM)

TFT LCD Monitor

Samsung Electronics
Visual Display Div. R&D team

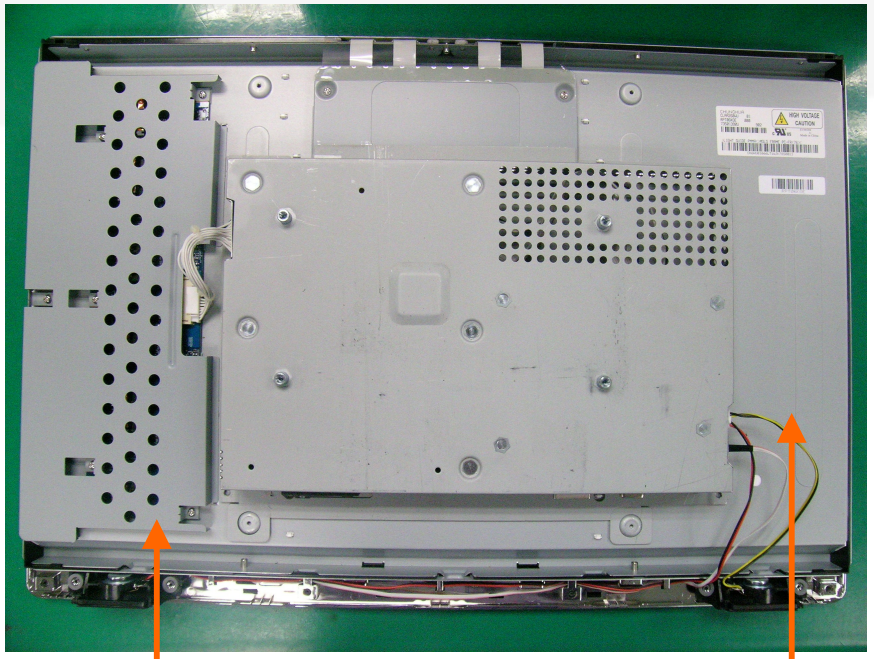
Contents

1. LCD Monitor Structure



Main Board

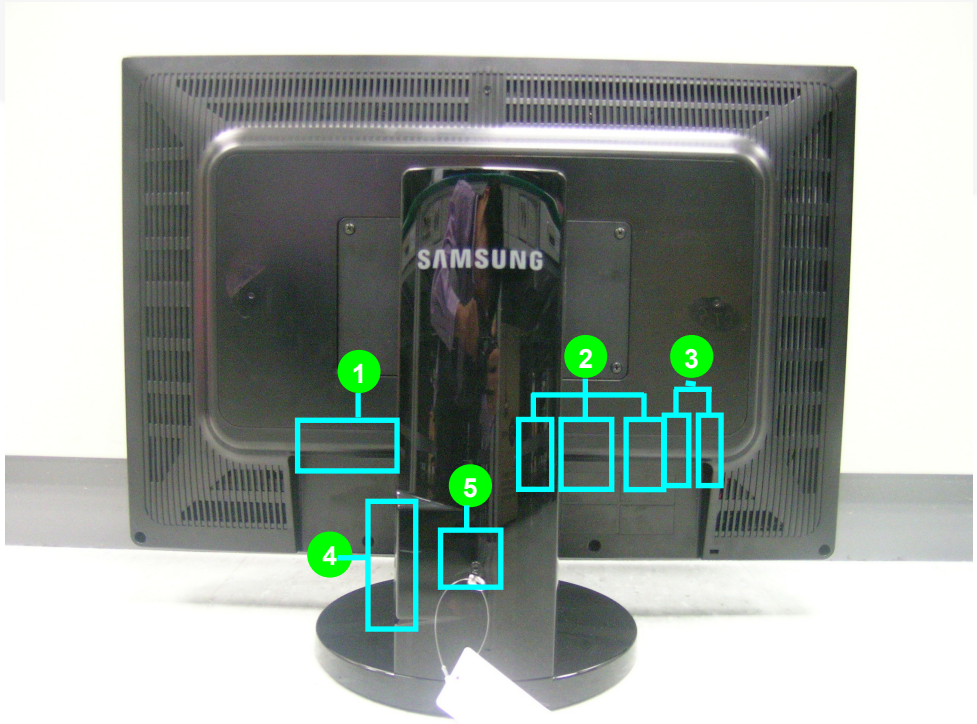
SMPS



INVERTER

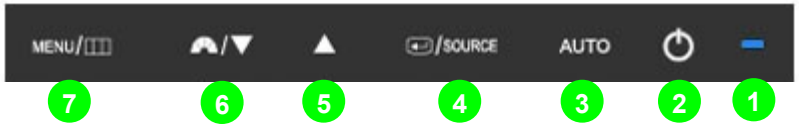
LCD Panel

2. KI LI MANJARO (2693HM)
Structure(1)



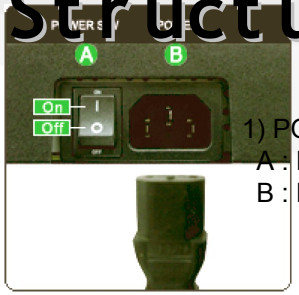
1) POWER S/W, POWER IN
2) HDMI IN, DVI IN, RGB IN
3) AUDIO IN / OUT
4) USB UP / DOWN
5) STAND STOPPER

2. KI LI MANJARO (2693HM) Structure (2)



1) LED
2) Power Touch Switch
3) AUTO Touch Switch : Set the AUTO adjustment
4) SOURCE / ENTER Touch Switch : change the input source / Select the OSD menu
5) Volume Switch : Brightness control button when OSD menu is not displayed
6) Magic Bright Switch
7) MENU Switch : Open the OSD menu / Exit the OSD menu / Go to upper side menu

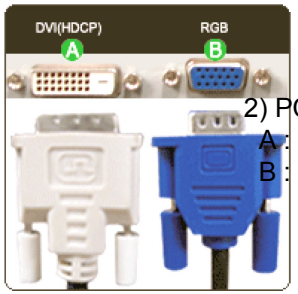
2. KI LI MANJARO (2693HM) Structure (3)



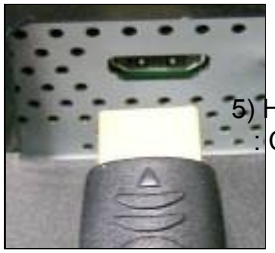
1) POWER
A : POWER S/W – Monitor Power On/Off
B : POWER IN – Connect Power Cord

) USB 2.0 :
UP – Connect to PC with the USB cable.

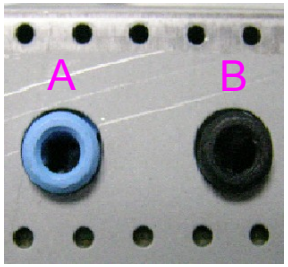
DOWN – Connect to other devices



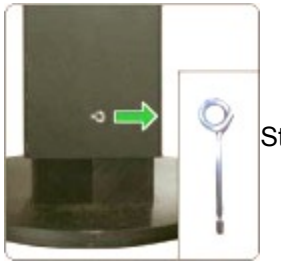
2) PC In
A : DVI(HDCP) – Connect DVI Cable
B : RGB – Connect D-Sub Cable



5) HDMI IN
: Connect the HDMI cable



3) Audio IN / OUT
A : Audio Input terminal
B : Audio Output terminal



Stand Stopper

3. Specification (1)

Model	2693HM

- Support PC / DVI / HDMI
- Apply 5ms and DCR 3000:1
- Adopt two 2W speakers
- Support TCO03
- Support optional 1 up, 2 down USB
- Apply HDCP in HDMI/DVI-D
- Support fixed image size
- Support the camera mode

  : Grayscale / Green / Aqua / Sepia
- Support Off-timer function

3. Specification (2)

Model	2693HM

Specification	
Panel Size	550.08(H) x 343.8(V) (25.5 inch diagonal)
Maximum Resolution	1920 x 1200 @ 60Hz (RB)
Colors	16.7M
Brightness	400cd/m^2
Dynamic Contrast Ratio	3000:1
Horizontal Frequency	30~81kHz
Vertical Frequency	56~75Hz
Applicable Max Frequency	154MHz
Viewing Angle	160° / 160°
Response Time	5ms
Signal Input	Analog / Digital (15pin D-sub / DVI-D (single link)) / HDMI
Power Consumption	On working 110 Watt (Max) / DPMS 2 Watt (Max)
Additional Function	Optional USB 2.0 Support (1 UP, 2 Down) in ASSY STAND

3. Specification (3)

Key Specifications	
Stand	HAS STAND
Height Adjustable	100mm
Tilt (forward / backward)	-3° / 25°
Swivel (left / right)	-175° / 175°
Power Supply	SMPS
Emissions Standard	TCO '03
Wall-Mountable	VESA (200mm x 100mm)
Custom-Mountable	o
Mac & Linux Compatibility	o

LCD Panel	
Display Area	550.08(H) x 343.8(V) (25.5 inch diagonal)
Display Element	a-si TFT active matrix
Model	CLAA260WU01

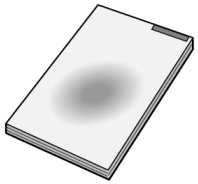
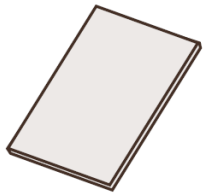
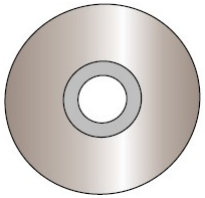
3. Specification

(4) Compatibility Verified Video Card

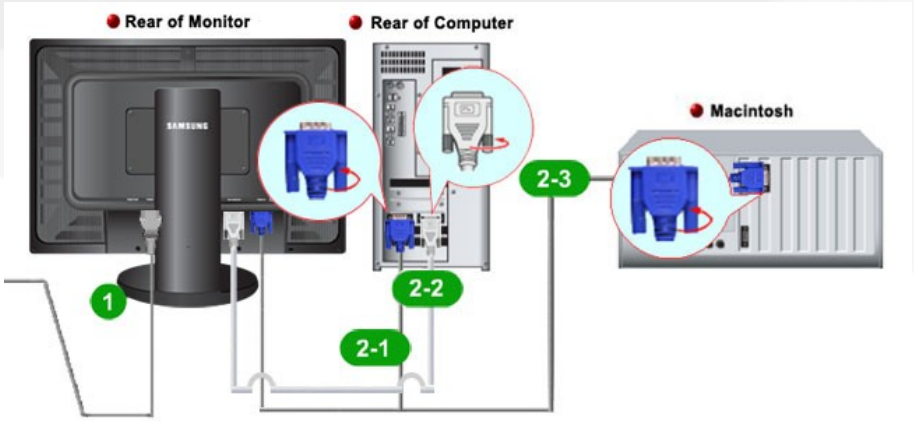
No	Chip Maker	Card Name / Manufacturer
1	ATI	Radeon 9550 / Evertop
2	ATI	Radeon X800Pro / ATI
3	nVIDIA	Geforce FX5700LE / Rextech
4	nVIDIA	Geforce 7600GS / Leadtech
5	nVIDIA	Geforce 6600GT / ASUS
6	Matrox	Millennium G550
7	Intel	i915G / IBM

3. Specification

(5) Accessories

Item	Item Name	Item	Item Name	Item	Item Name
	Quick Setup Guide		Warranty Card (Not available in all locations)		Power Cord
	User's Guide, Monitor Driver, Natural Color software, MagicTune™ software		DVI Cable (single link)		D-Sub(15 Pin) Cable

4. KI LI MANJARO (2693HM) Connection



1. Connect the power cord for your monitor to the power port on the back of the monitor. Plug the power cord for the monitor into a nearby outlet.

2. Connecting to the PC

2-1) Using the D-sub (Analog) connector on the video card : Connect the signal cable to the 15-pin, D-sub connector on the back of your monitor.

2-2) Using the DVI (Digital) connector on the video card : Connect the DVI cable to the DVI port on the back of your monitor.

2-3) Connecting to Macintosh : Connect the signal cable to the 15-pin, D-sub connector on the Macintosh.

3. Turn on your computer and monitor. If your monitor displays an image, installation is complete.

- You may get a blank screen depending on the type of video card you are using, if you connect simultaneously both the D-Sub and DVI cables to one computer.
- If you properly connect your monitor using the DVI connector but get a blank screen, check to see if the monitor status is set to

analog. Press Source Button to have the monitor double-check the input signal source.

HDMI / HDCP

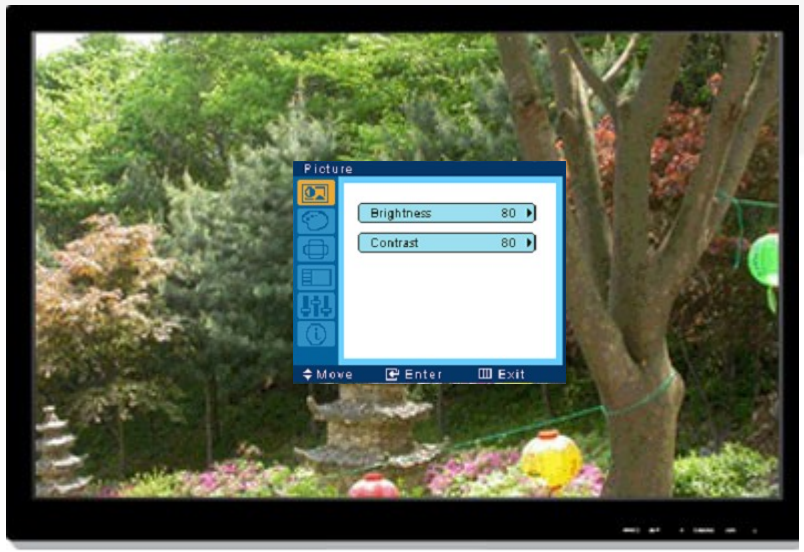
- **Features of HDMI**
  - HDMI (High-Definition Multimedia Interface) is the first interface that can transmit non-compressed full digital Video/Audio data.
  - It supports 8 channel digital audio with sufficient bandwidth and all ATSC HDTV transmission is possible.

- **Good points of HDMI**
  - HDMI is a popular format that can obtain high resolution contents with good quality of non-compressed and lossless digital data.
  - Its connection between devices is very easy and simple, and control of the whole system is also possible.
  - It can be provided variety of contents from the major film productions because of protecting their copyrights by HDCP.

- **HDCP**
  - HDCP (High-bandwidth Digital Content Protection) is embedded copy-protection system for HD display contents. HD contents including HDCP can be displayed only after decoding by HDCP key of the play device. If the player does not support HDCP or does not satisfy the standard, the output resolution is only about ¼ of original contents.

5. OSD Control (1)

(1) Picture
(2) Color
(3) Image
(4) OSD
(5) Setup
(6) Information



5. OSD Control (2)

1) Picture

Brightness → 0~100
Contrast → 0~100
MagicBright → Custom / Text / Internet / Game / Sports / Movie / Dynamic CR

2) Color

Live Color → Brilliant / Demo / Normal / Mild / Custom
Color Tone → Cool / Normal / Warm / Custom
Color Control → Red / Green / Blue Gain Adjustment
Color Effect → Off / Grayscale / Green / Aqua / Sepia
Gamma → Mode1 / Mode2 / Mode3

3) Image

Coarse / Fine / Sharpness / H-Position / V-Position
* These can be selected when input source is D-sub except for sharpness.

4) OSD

Language : Support 9 languages
H-Position / V-Position : Set OSD position
Transparency : Transparency On/Off
Display Time : 5sec / 10sec / 20sec / 200sec

***. Displayed OSD information may be different based on SOURCE.**

5. OSD Control (3)

(5) Setup

Auto Source : Find the source signal automatically (On / Off)
Reset : No / Yes
Off Timer : Off / On (Support minimum 1h ~ maximum 23h)
Customized Key : MagicBright / Live color / Color Effect / Image Size
Image Size : Be able to control when it is not the wide resolution.
HDMI Black Level : Normal / Low (Change the black level according to input HDMI signal)
AV mode : On / Off
***. HDMI Black Level and AV mode can be seen when the mode is only HDMI.**

(6) Information

Source, Frequency, Resolution Display

5. OSD Control (4)

f. OSD and other function

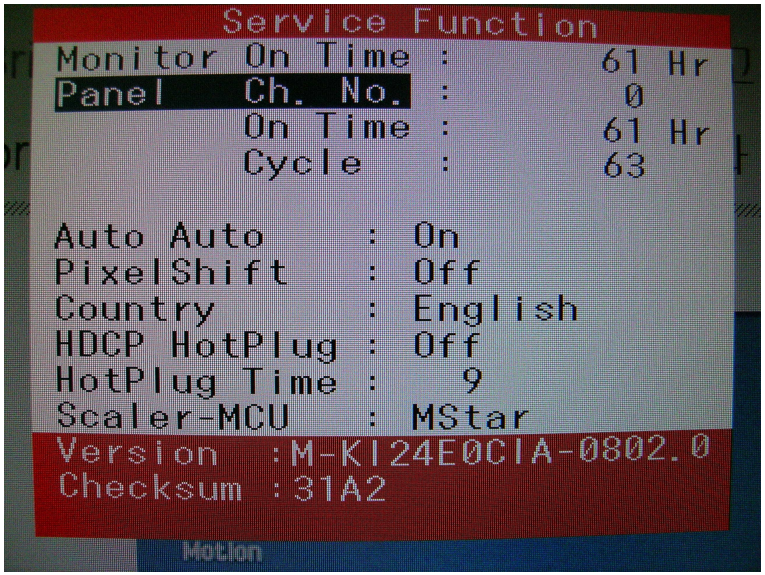
1) OSD Lock : To create a OSD LOCK with pushing the Function menu key for 5 seconds.

The Magic bright , Brightness and Contrast can be adjusted in OSD LOCK condition.

To push a menu key for 5 seconds in order to remove a Lock .

2) Factory MODE : To push a menu key for 5 seconds with minimum Brightness / Contrast ,

Then can go to factory mode. Below OSD looking can be displayed



6. Specification Comparison

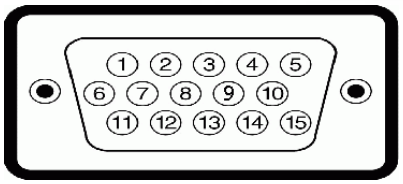
Model	2693HM	245B
Picture		
Screen Size	25.5”	24”
Brightness	400 ¤ / ¤	400 ¤ / ¤
Contrast	1000:1	1000:1
Dynamic CR	3000:1	X
Response Time	5ms	5ms
Input Signal	Analog/Digital/HDMI	Analog/Digital
Magic Color	O	O
Magic Pivot	O	O
Magic Tune	Premium	Premium
Magic Bright	7 steps (Text / Internet / Game / Sports / Movie / Dynamic CR / Custom)	7 steps (Text / Internet / Game / Sports / Movie / Dynamic CR / Custom)
Gamma	3 steps Mode1 / Mode2 / Mode3	3 steps Mode1 / Mode2 / Mode3
Color Tone	4 steps Cool / Normal / Warm / Custom	4 steps Cool / Normal / Warm / Custom

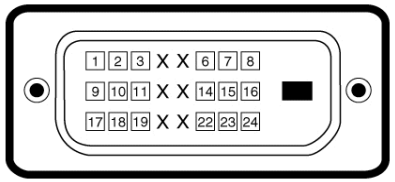
7. Signal Connections and Pin Assignments

the monitor signal cable is disconnected, the monitor starts the 'Self-Test' function

1. 15pin D-sub connector

Pin Number	Monitor Side of the 15-Pin Side Signal Cable
1	Video-Red
2	Video-Green
3	Video-Blue
4	GND
5	DDC-return
6	GND-R
7	GND-G
8	GND-B
9	DDC +5V
10	GND-sync/self-test
11	GND
12	DDC data
13	H-sync
14	V-sync
15	DDC clock





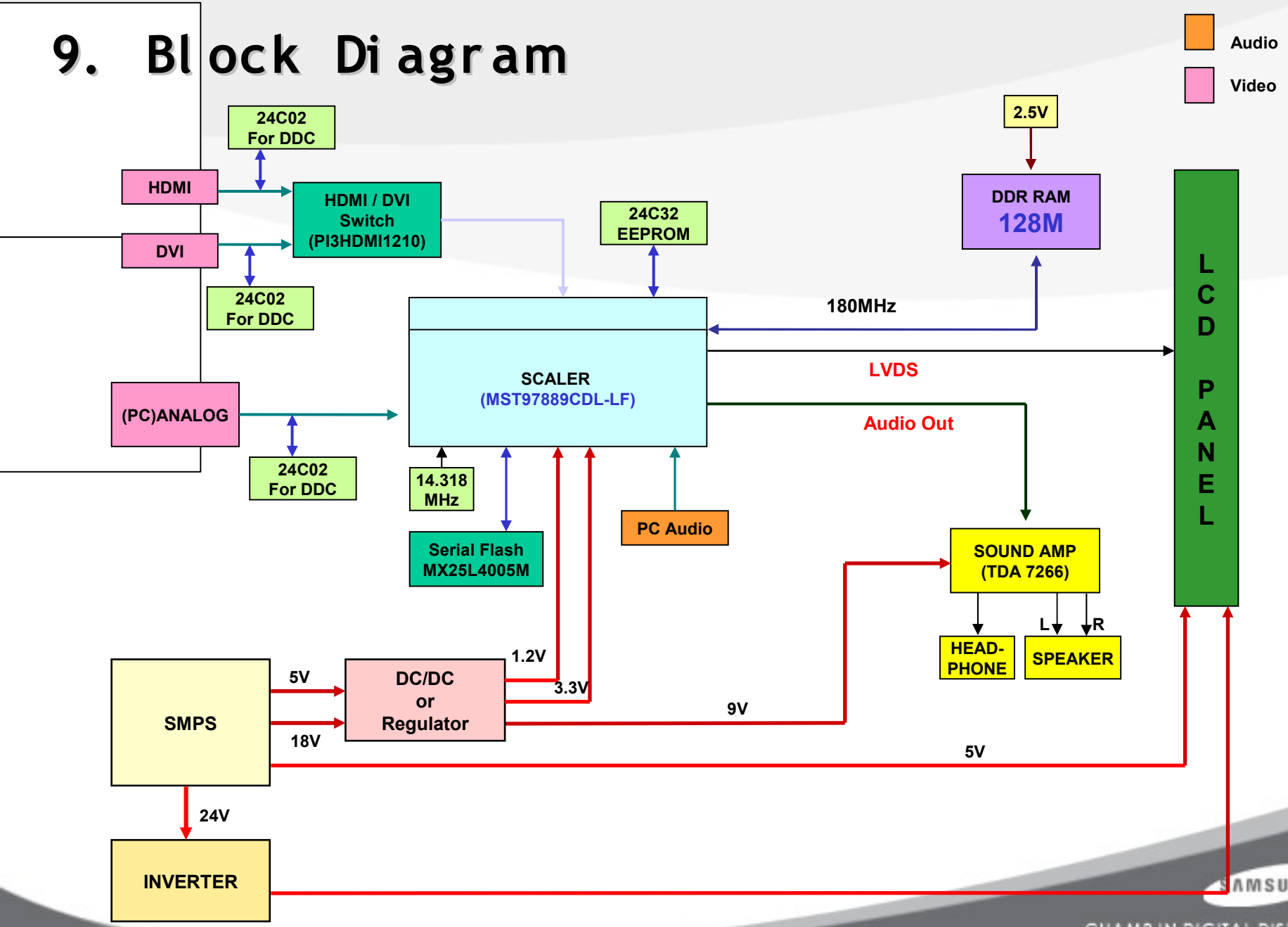
2. DVI-D connector

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data 2-	9	T.M.D.S. Data 1-	17	T.M.D.S. Data 0-
2	T.M.D.S. Data 2+	10	T.M.D.S. Data 1+	18	T.M.D.S. Data 0+
3	T.M.D.S. Data 2 Shield	11	T.M.D.S. Data 1 Shield	19	T.M.D.S. Data 0 Shield
4	No Pin	12	No Pin	20	No Pin
5	No Pin	13	No Pin	21	No Pin
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 -

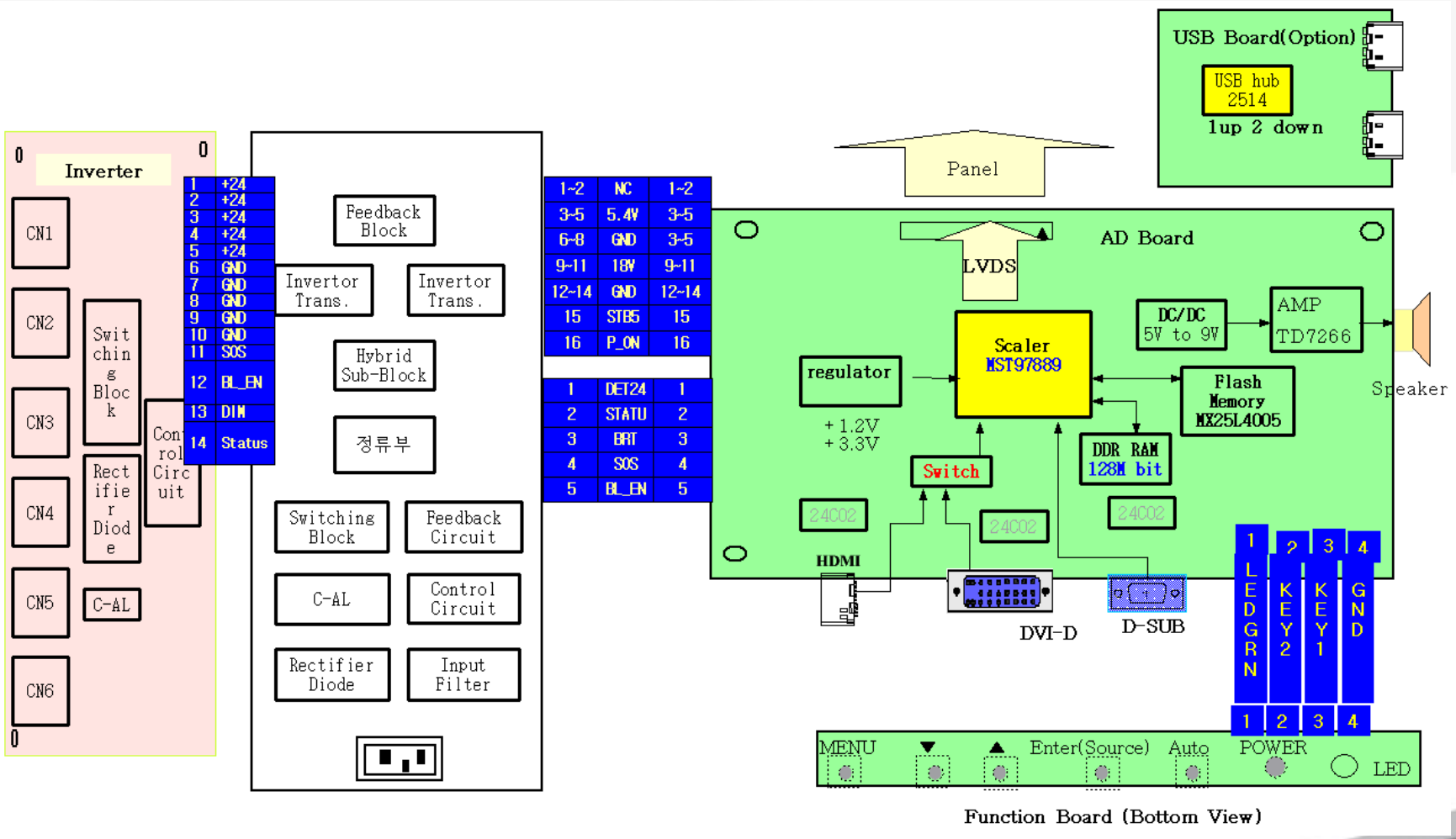
8. Display Modes

Supported Display Mode		Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
VESA 1920/60Hz(RB)	1920x1200	74.038	59.950	154.000	+/-
IBM VGA1	640x350	31.469	70.086	25.175	+/-
IBM VGA2	720x400	31.469	70.087	28.322	-/+
IBM VGA3	640x480	31.469	59.940	25.175	-/-
Mac 640/67Hz	640x480	35.000	66.667	30.240	-/-
VESA 640/72Hz	640x480	37.861	72.809	31.500	-/-
VESA 640/75Hz	640x480	37.500	75.000	31.500	-/-
VESA 800/56Hz	800x600	35.156	56.250	36.000	+/+
VESA 800/60Hz	800x600	37.879	60.317	40.000	+/+
VESA 800/72Hz	800x600	48.077	72.188	50.000	+/+
VESA 800/75Hz	800x600	46.875	75.000	49.500	+/+
Mac 832/75Hz	832x624	49.726	74.551	57.284	-/-
VESA 1024/60Hz	1024x768	48.363	60.004	65.000	-/-
VESA 1024/70Hz	1024x768	56.476	70.069	75.000	-/-
VESA 1024/75Hz	1024x768	60.023	75.029	78.750	+/+
VESA 1152/75Hz	1152x864	67.500	75.000	108.000	+/+
Mac 1152/75Hz	1152x870	68.681	75.062	100.000	-/-
VESA 1280/60Hz	1280x960	60.000	60.000	108.000	+/+
VESA 1280/60Hz	1280x1024	63.981	60.020	108.00	+/+
VESA 1280/75Hz	1280x1024	79.976	75.025	135.000	+/+
VESA 1600/60Hz	1600x1200	75.000	60.000	162.000	+/+

9. Block Diagram



10. Chassis Layout



Function Board (Bottom View)

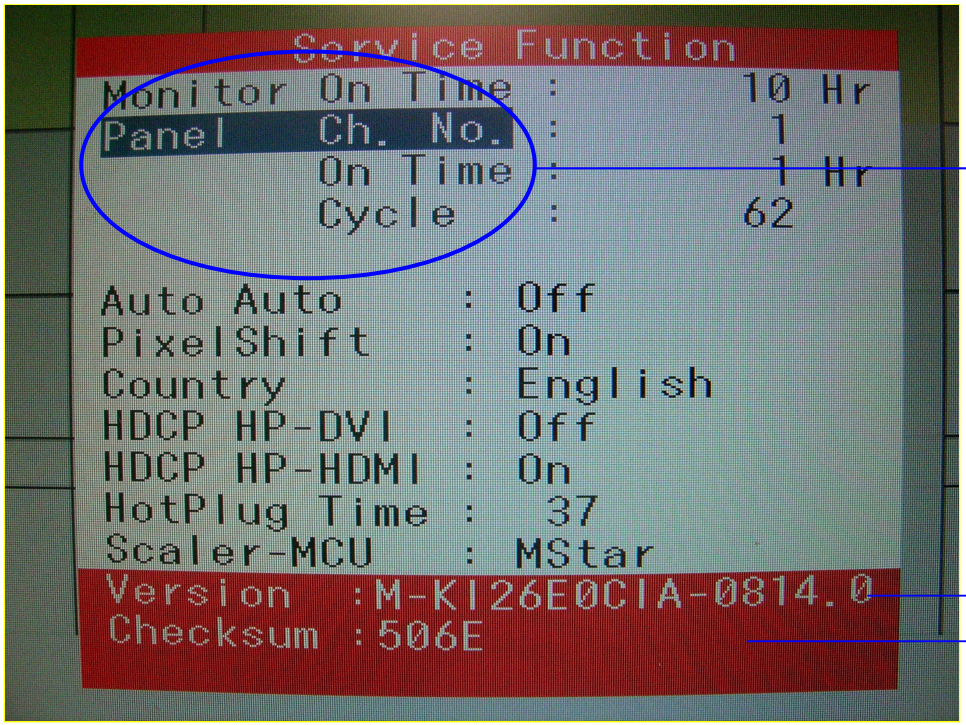
11. KILIMANJARO (2693HM) Features

No	Feature	Description	Operating method
1	**Auto Adjustment**	If 2693HM turns on in some resolution for the first time, it can execute Auto adjustment automatically for the high Quality.	
2	**Auto Power on/off**	2693HM can check the change of source automatically and change the source to the active Input.	
3	**Wall mount**	2693HM supports wall mount. (200 x 100mm)	
4	**Gamma & Color temperature Fine Adjust.**	2693HM supports 3-Step Fine Adjustment for Gamma & Color temperature.	Magictune Premium
5	**MagicBright**	2693HM supports 7 different Brightness Modes. Text, Internet, Game, Sports, Movie, Dynamic CR, Custom.	Press Magic Bright key. Select Picture → Magic Bright on OSD,
6	**Live Color**	Brilliant : Display bright parts more brightly Demo : Function to display in store Magic Color On in left side, Magic Color Off in right side Normal : Set color appearance from 92% to 72% grade Mild : Down the red color level from Brilliant mode Custom : Default state	Live Color on OSD
7	**Ergonomics Point**	Support 100mm Lowest HAS (3093TM 80mm), Pivot, Tilt	
8	**HDMI**	Make use of the latest Game Console and Multimedia Contents with supporting HDMI.	
9	**Support camera mode**	Grayscale / Green / Aqua / Sepia	Set Safety Screen on OSD.
10	**Adopt Speaker**	Adopt 2W*2 Speaker to satisfy M/M customer Needs.	

12. Service (Hot key) Function list (1)

1. Set both the brightness and contrast to 0.
2. Hold down the <Button>(Enter, Source) button for five (5) seconds.
3. The SVC Function OSD will appear.

* To exit the SVC Function OSD, you have to turn off the power.

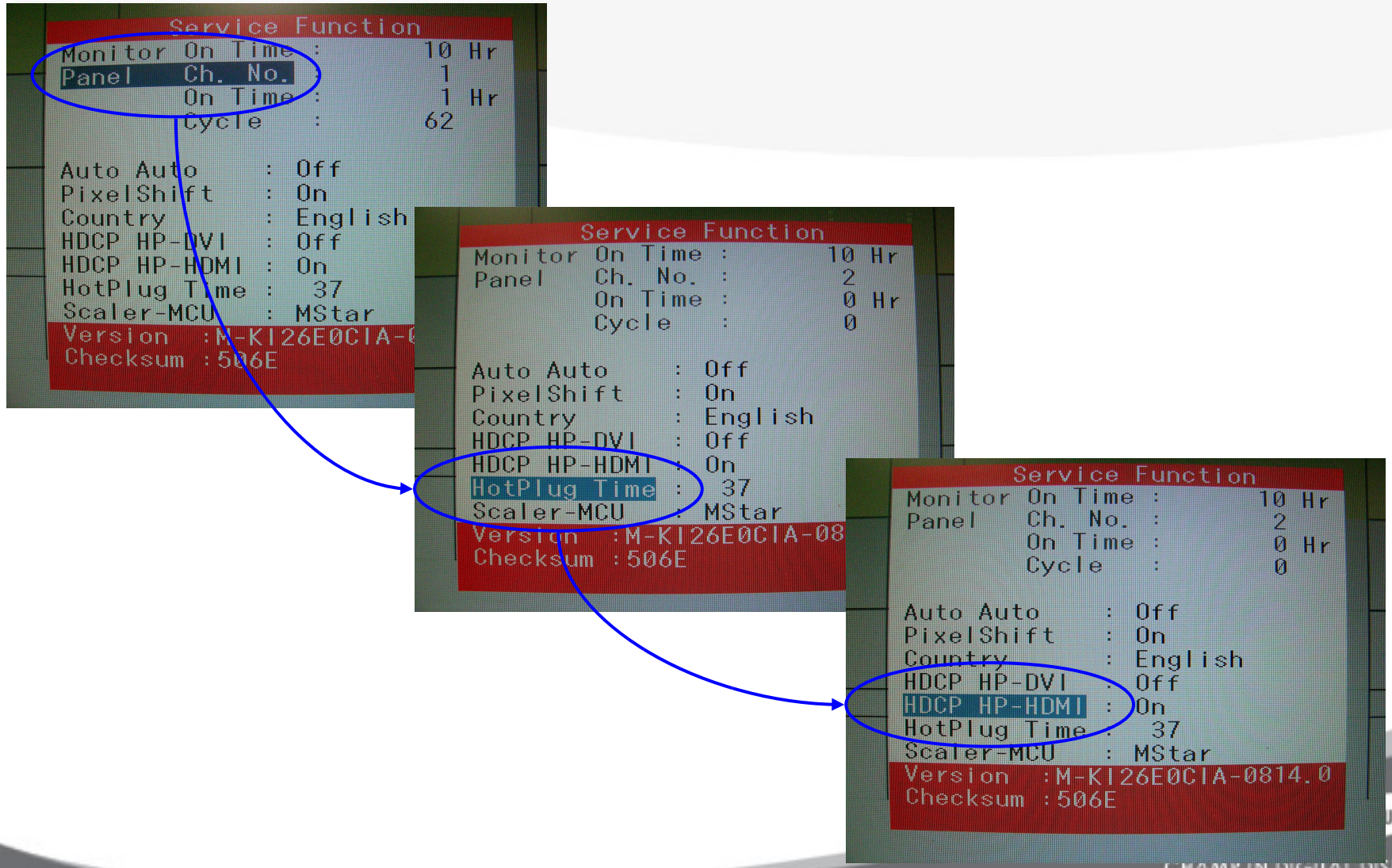


The SVC Function OSD consists of a 103 (width) X 82 (height) grid.

The SVC Function OSD shows the information, software version and Micom checksum.

12. Service (Hot key) Function list

1. Each time the button is pressed, menu is moved. Then, you can adjust sub menu with button.

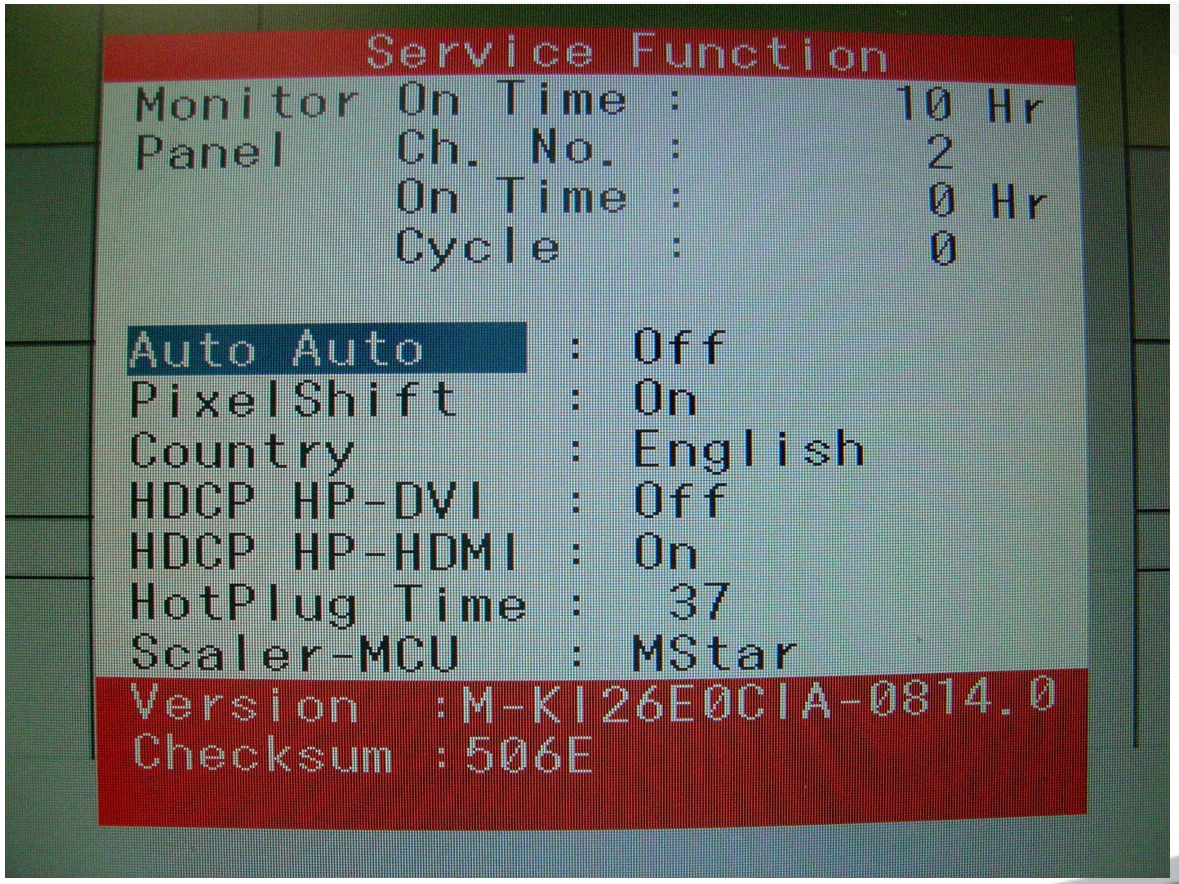


12. Service (Hot key) Function list (3)

- **When replacing the panel**

After replacing the panel, select the Panel item and then hold down the Menu button for five (5) seconds.

The Ch. No. of the panel will increase by one (1) and the time information will change to 0.



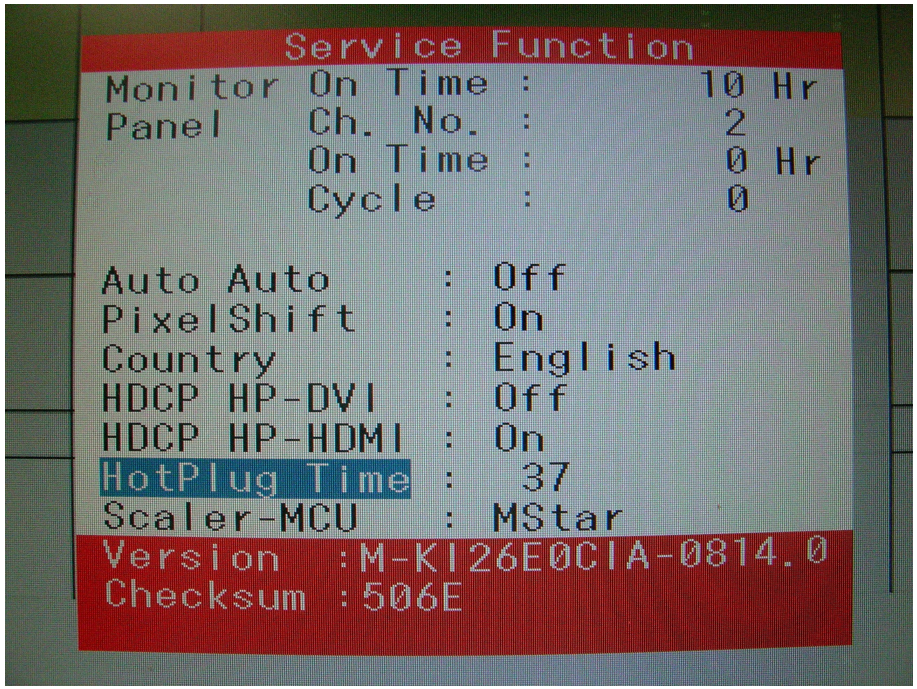
12. Service (Hot key) Function list (4)

-. HDCP Hotplug : used when HDCP Video contents are not displayed. In case that monitor is connected to some bad device which does not comply with standard.

-. HotPlug Time : If Hotplug is turn on, when monitor power off/on or changing to the DVI, hotplug pin goes to the low. This function controls this time duration.

Though Hotplug is turn on monitor can't displayed, adjust this time duration

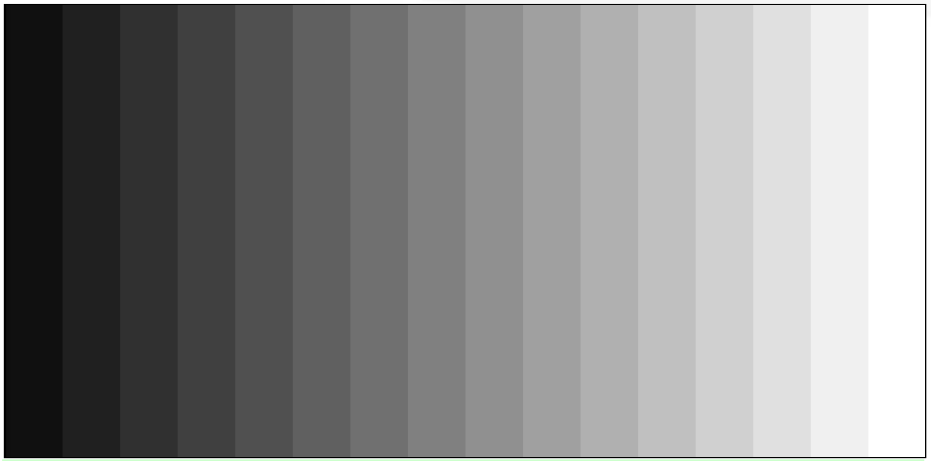
-. Default is 9(means 0.9 sec), can control 5 to 50.



12. Service (Hot key) Function list (5)

Auto Color

PC analog (1920X1200 at 60 Hz): Tools to use: MSPG-3240L



PC Analog Control Pattern(16 GRAY)

Select Language English on the OSD menu and then hold down the Menu button for five (5) seconds.

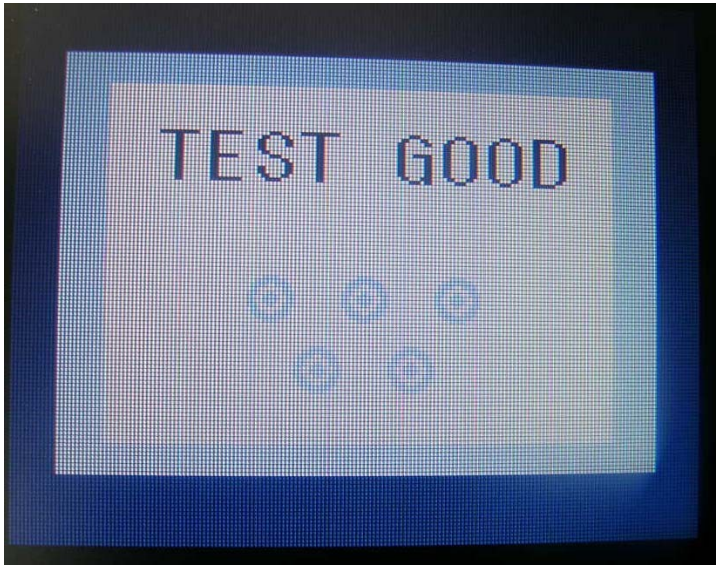
12. Service (Hot key) Function list (6)

- **The Purpose and Function of the Self-Test**

  - A Self-Test has been added to easily recognize whether the monitor has a fault or not and consequently to minimize customer claims for non-malfunctions of the product.

- **How to Perform a Self-Test**

  - Press the **Menu** button in the **DPMS** state, and determine whether the monitor is normal or not.



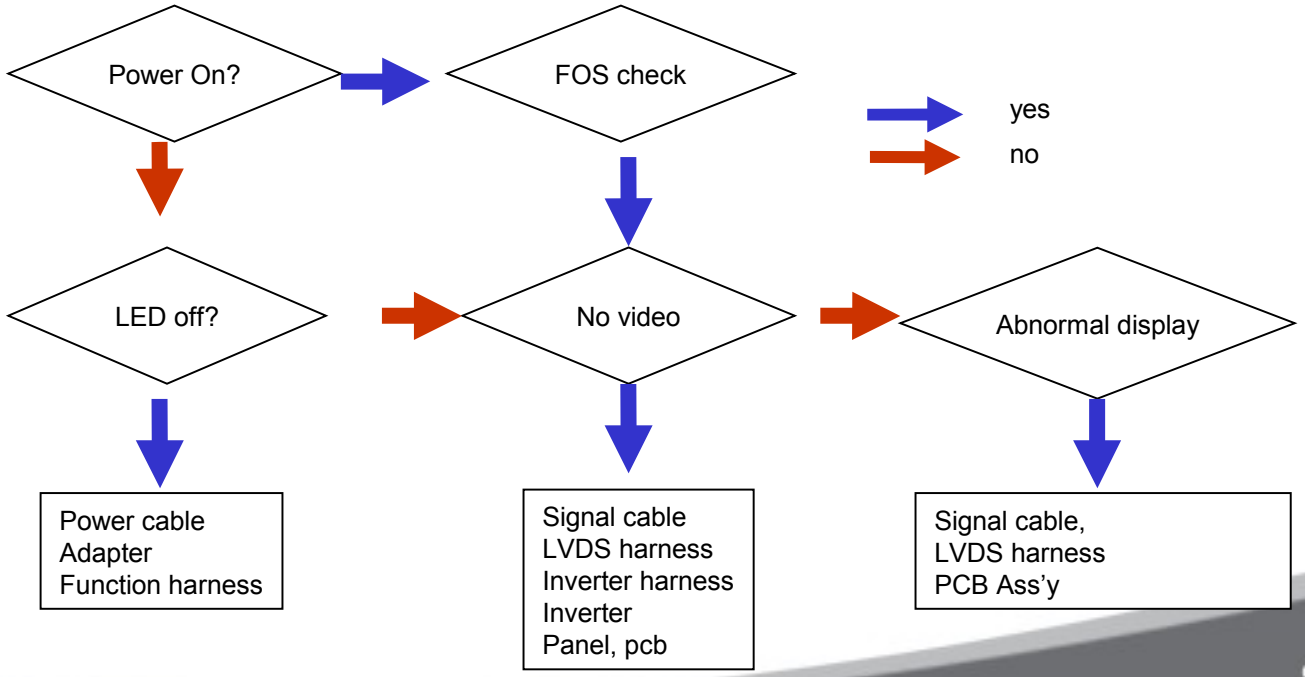
No screen	Determine according to the output message.
Focus fault	Determine according to dimming level of the "TEXT GOOD" message.
Screen trembling	Determine according to trembling level of the message window.

13. Troubleshooting

Notes:

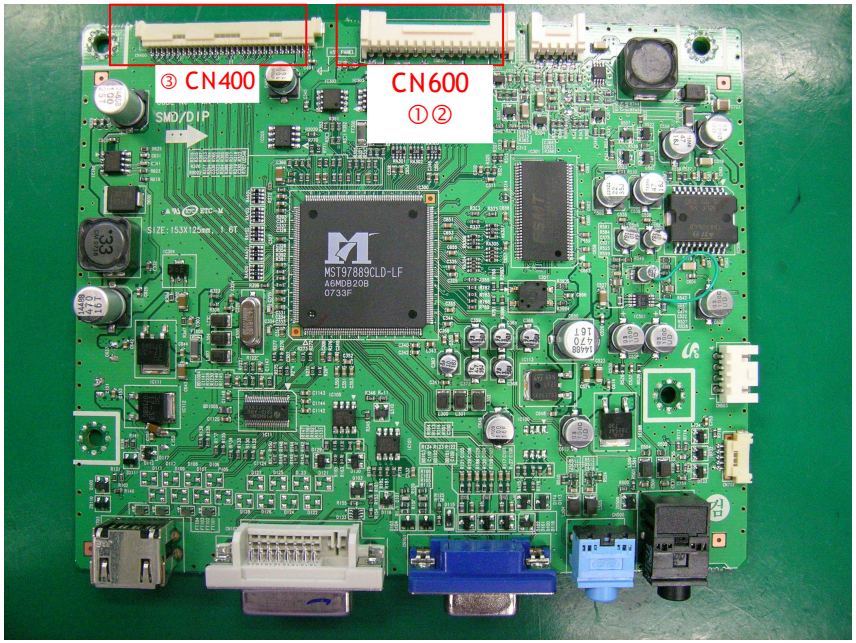
1. Before troubleshooting, setup the PC's display as below.
   - Resolution: 1920 x 1200
   - H-frequency: 75 kHz
   - V-frequency: 60 Hz
2. If no picture appears, make sure the power cord is correctly connected.
3. Check the following circuits.
   - No raster appears: Function PBA, Main PBA, SMPS
   - 5V develop but no screen: Main PBA
   - 13V, 5V does not develop: SMPS, Main PBA

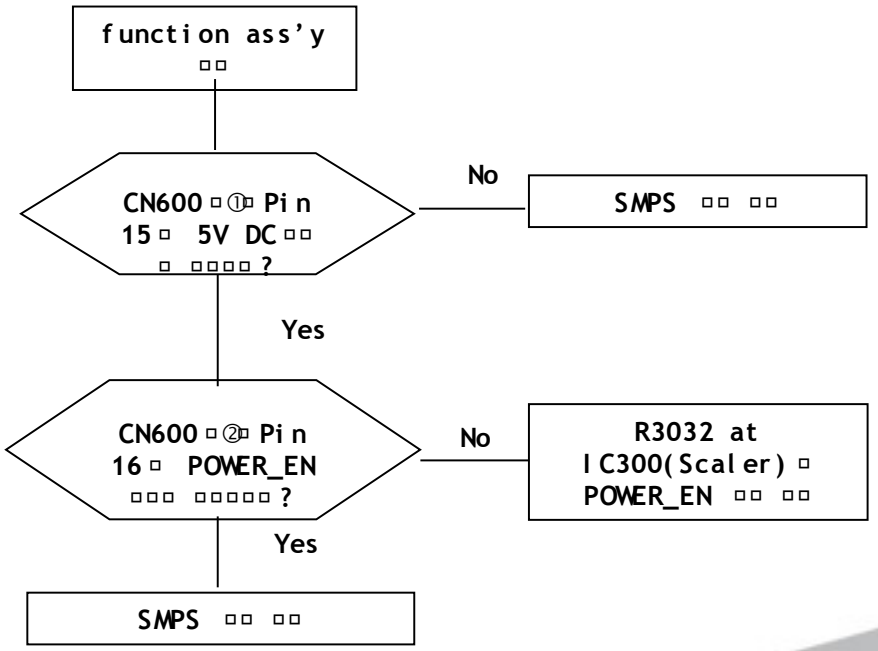
▪ Problem Checking Process



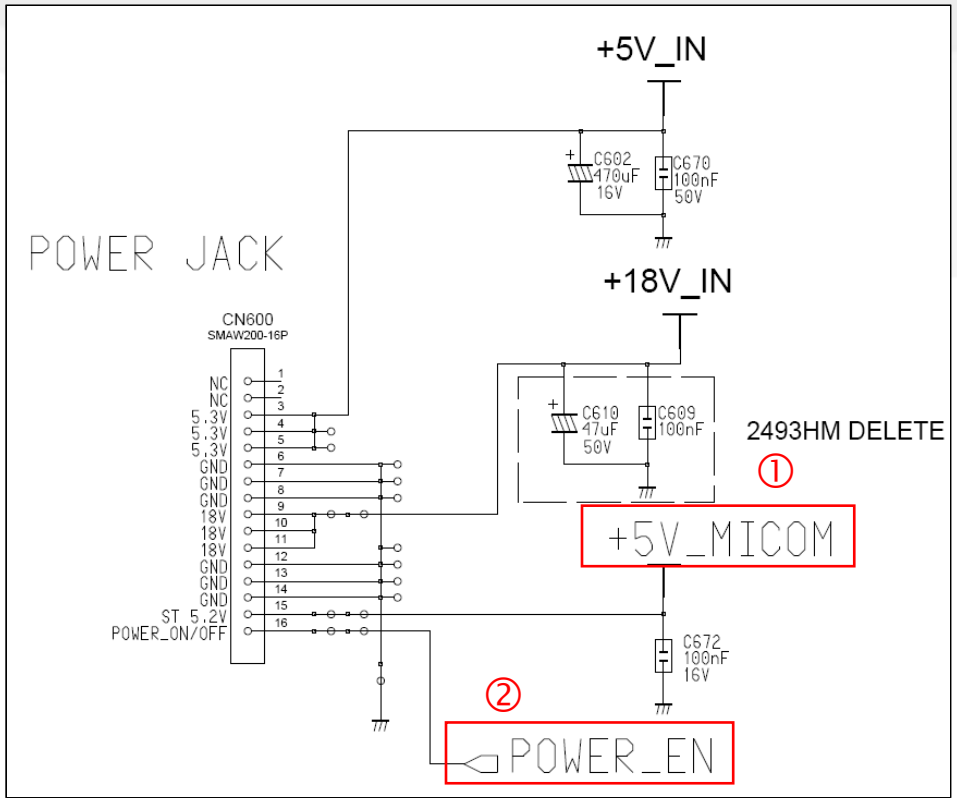
NO POWER

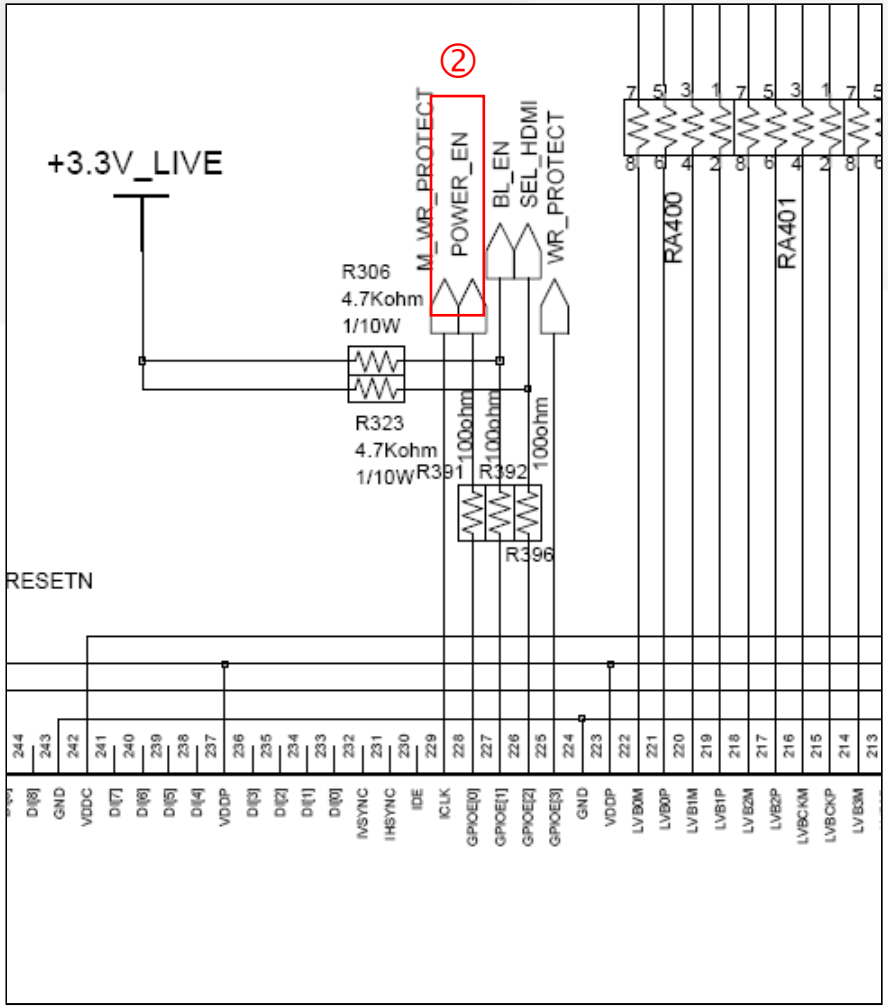
Symptom	**- When turning on the Power button after connecting the power, the LED at the front of the monitor does not operate.**
Major checkpoints	**- Check whether the Power Switch at the back of the monitor is turned on.** **- Check SMPS fuse and SMPS output power.** **- Check the connections for SMPS and Main board inside the monitor.** **- Check Main board power part and check also whether there is any abnormal output at other output terminals**
Caution	**Make sure to disconnect the power before working on SMPS**





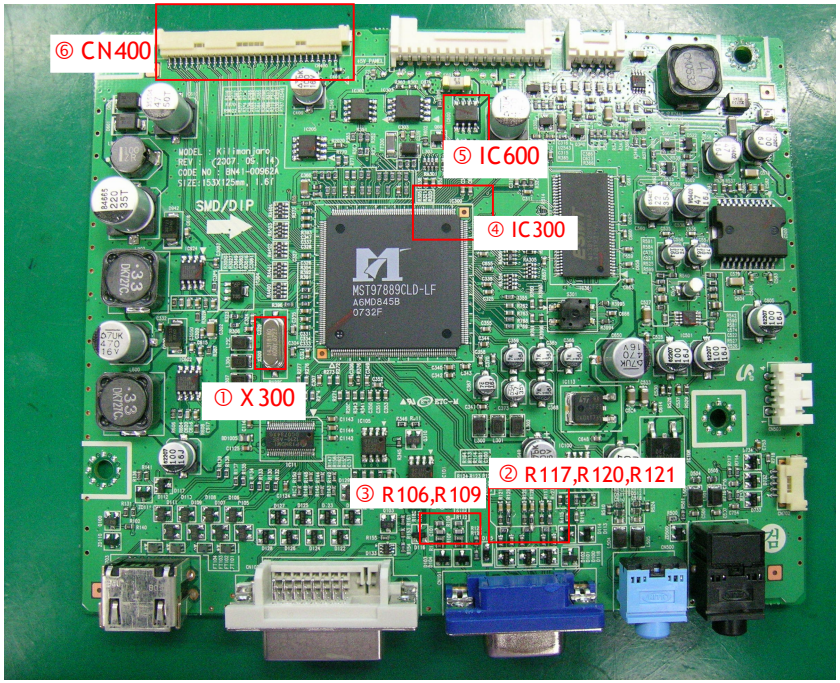
Circuit diagrams and waveforms when the power does not turn on.

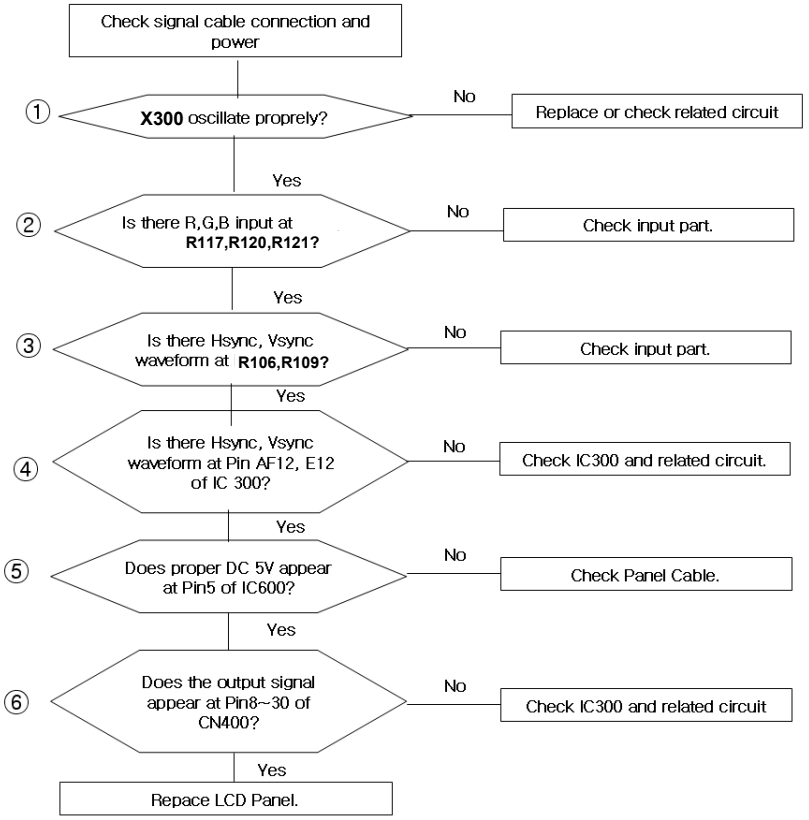




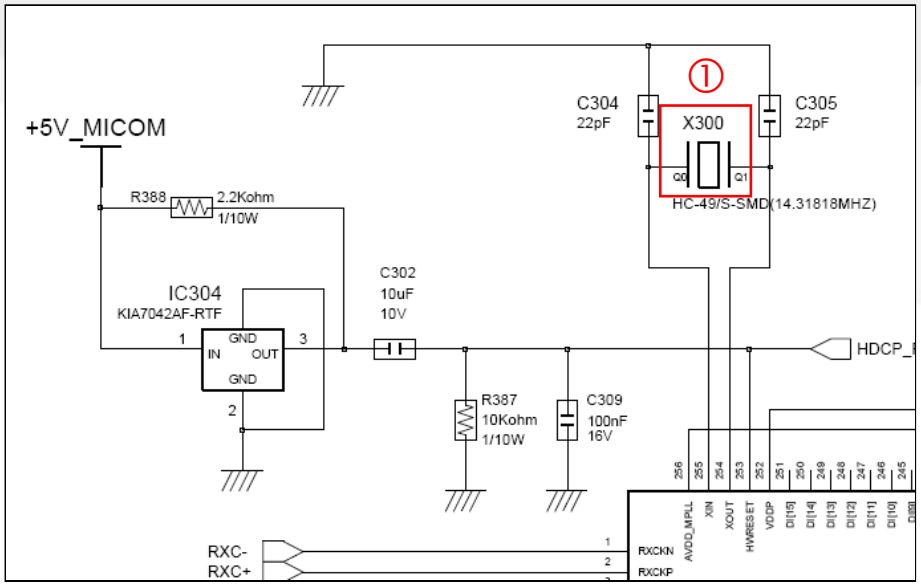
NO VIDEO (ANALOG)

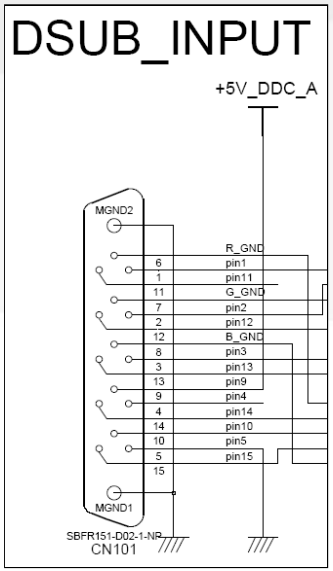
Symptom	**- Though the LED power turns on, the screen is blank when connecting D-SUB Cable**
Major checkpoints	**- Check the D-sub cable connections.** **- Check whether the LVDS cable is connected correctly to the panel.** **- Check whether the lamp connector of the panel is connected correctly to Inverter board.**
Caution	**Make sure to disconnect the power before working on SMPS**

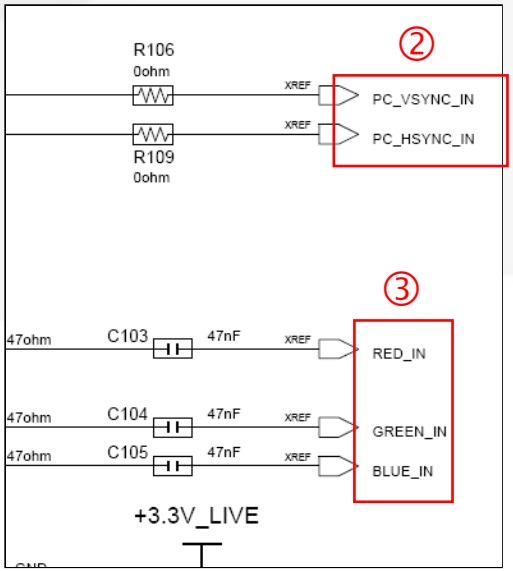


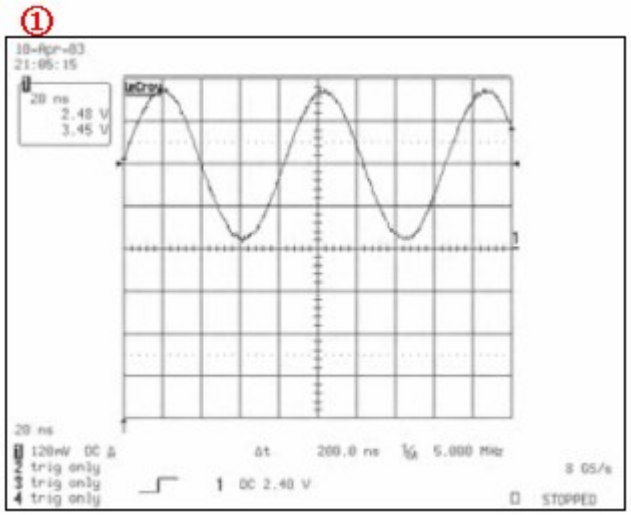


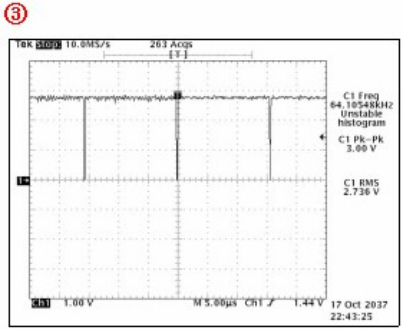
Circuit diagrams and waveforms (Analog) when on screen is displayed on the monitor.

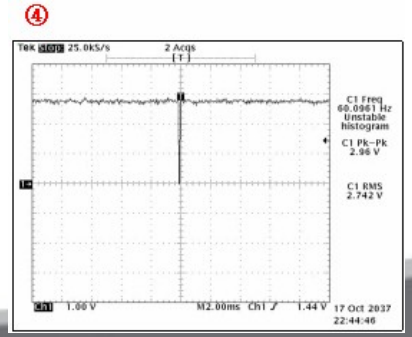


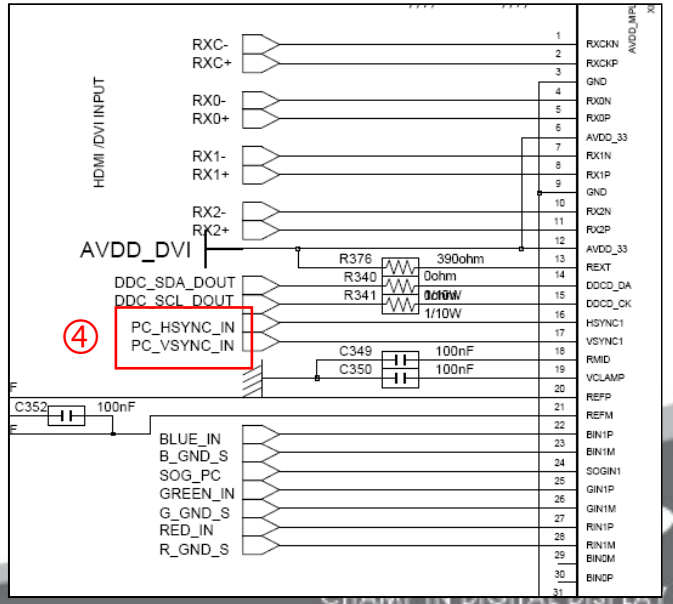






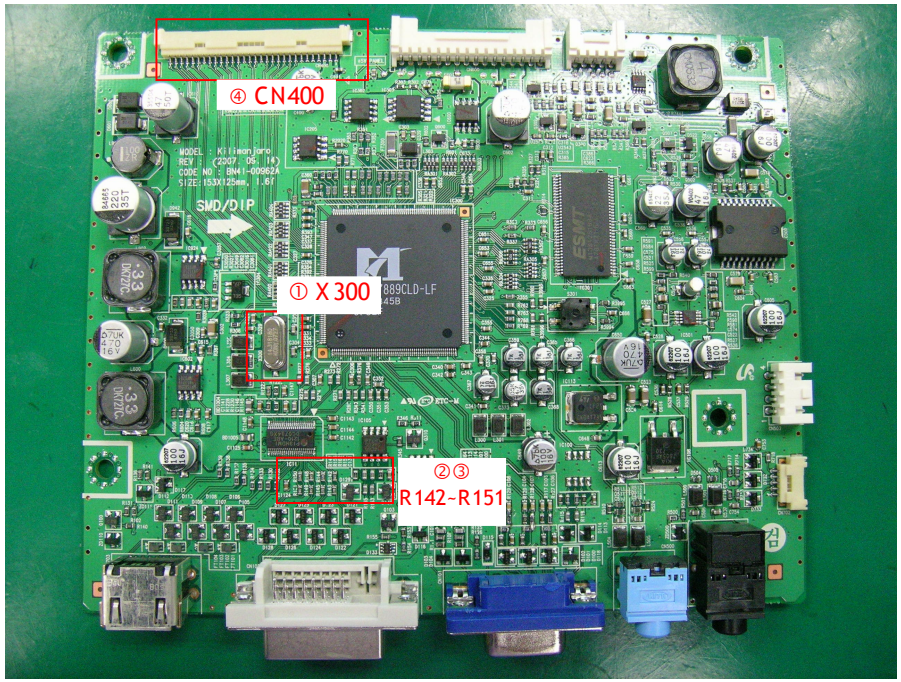


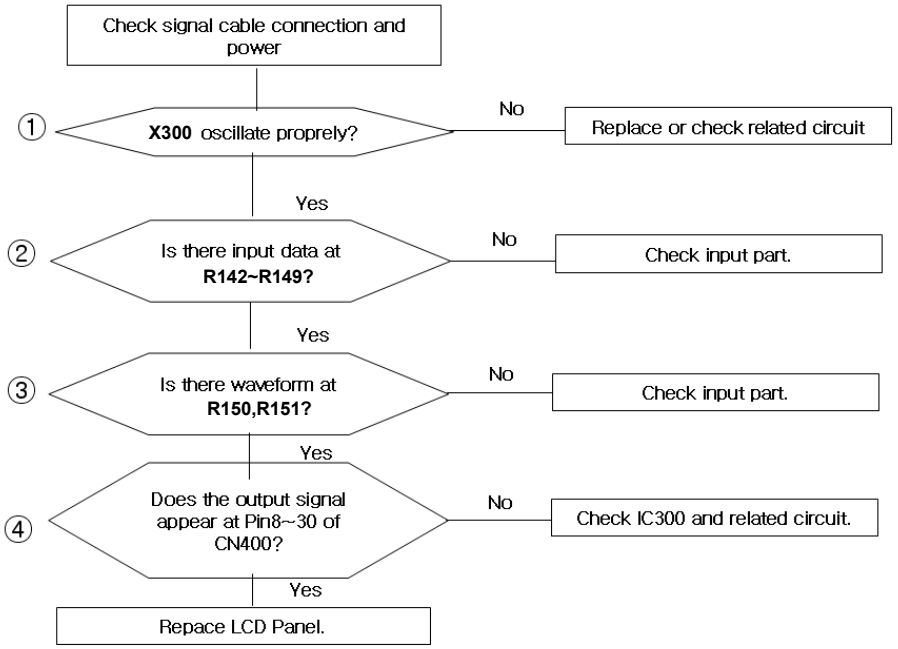




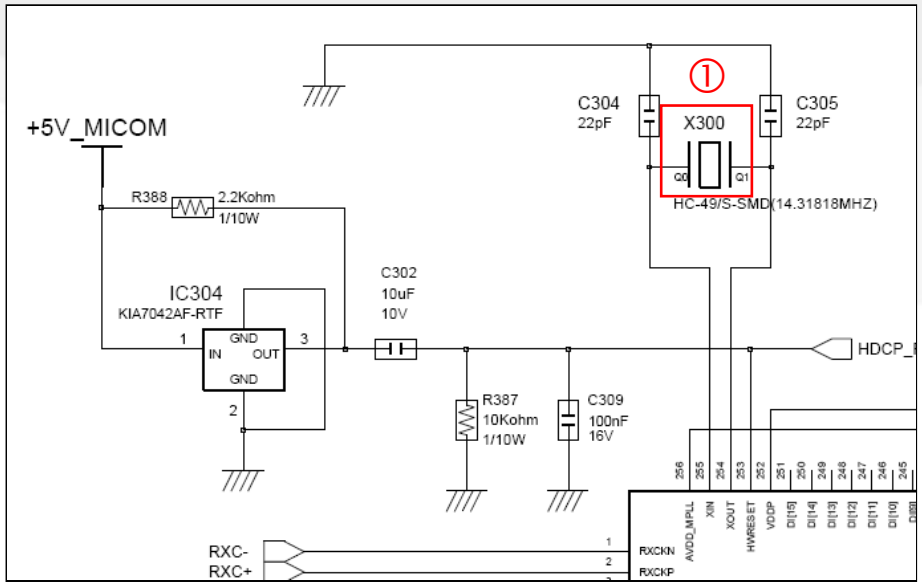
NO VIDEO (DIGITAL)

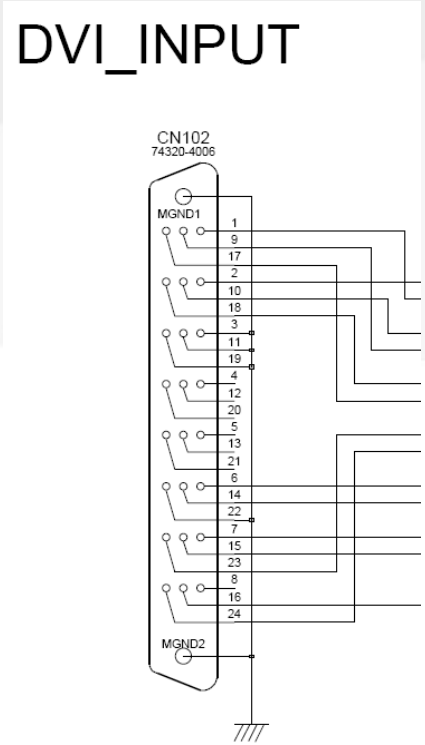
Symptom	**- Though the LED power turns on, the screen is blank when connecting DVI Cable**
Major checkpoints	**- Check the DVI cable connections.** **- Check whether the LVDS cable is connected correctly to the panel.** **- Check whether the lamp connector of the panel is connected correctly to Inverter board.**
Caution	**Make sure to disconnect the power before working on SMPS**

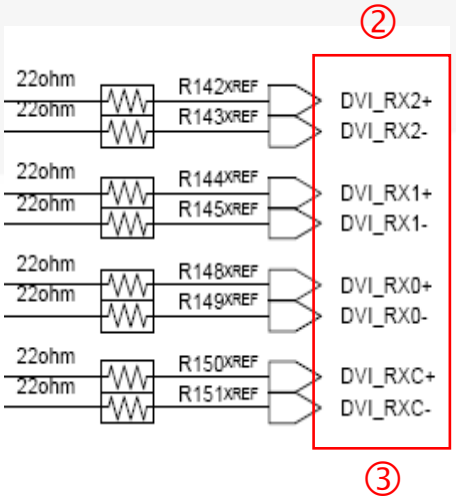


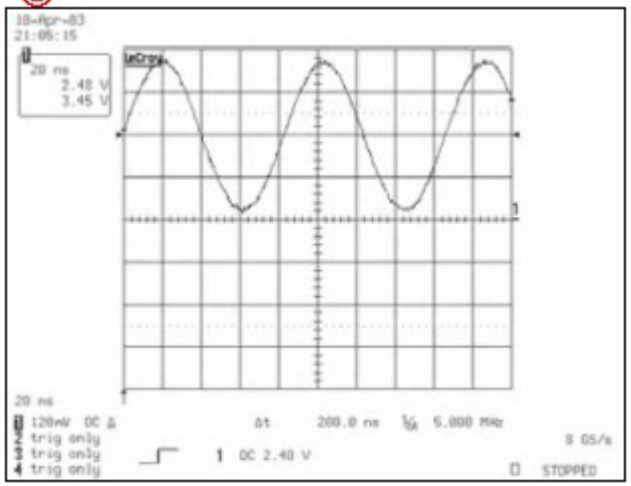


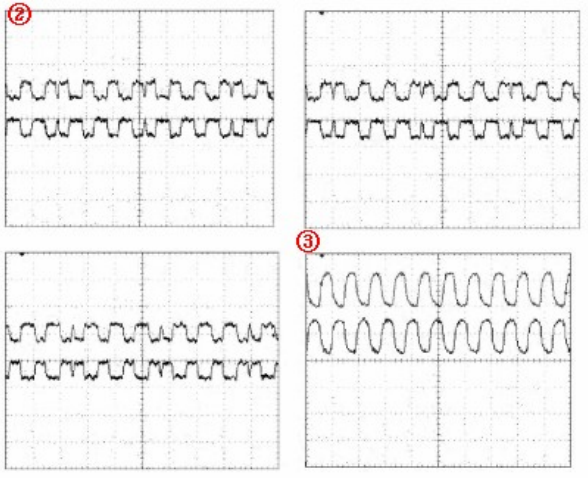
Circuit diagrams and waveforms (Digital) when on screen is displayed on the monitor.



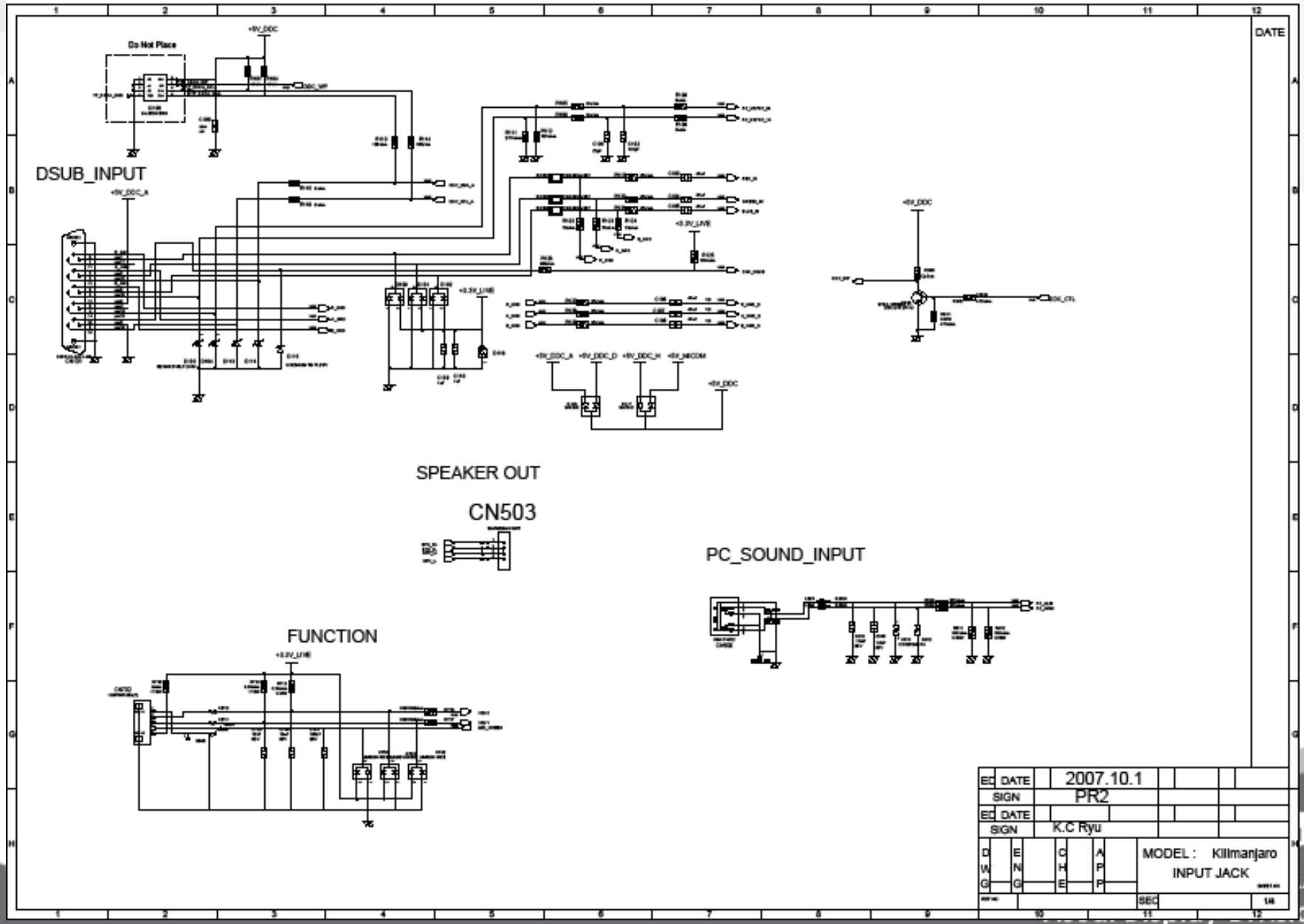




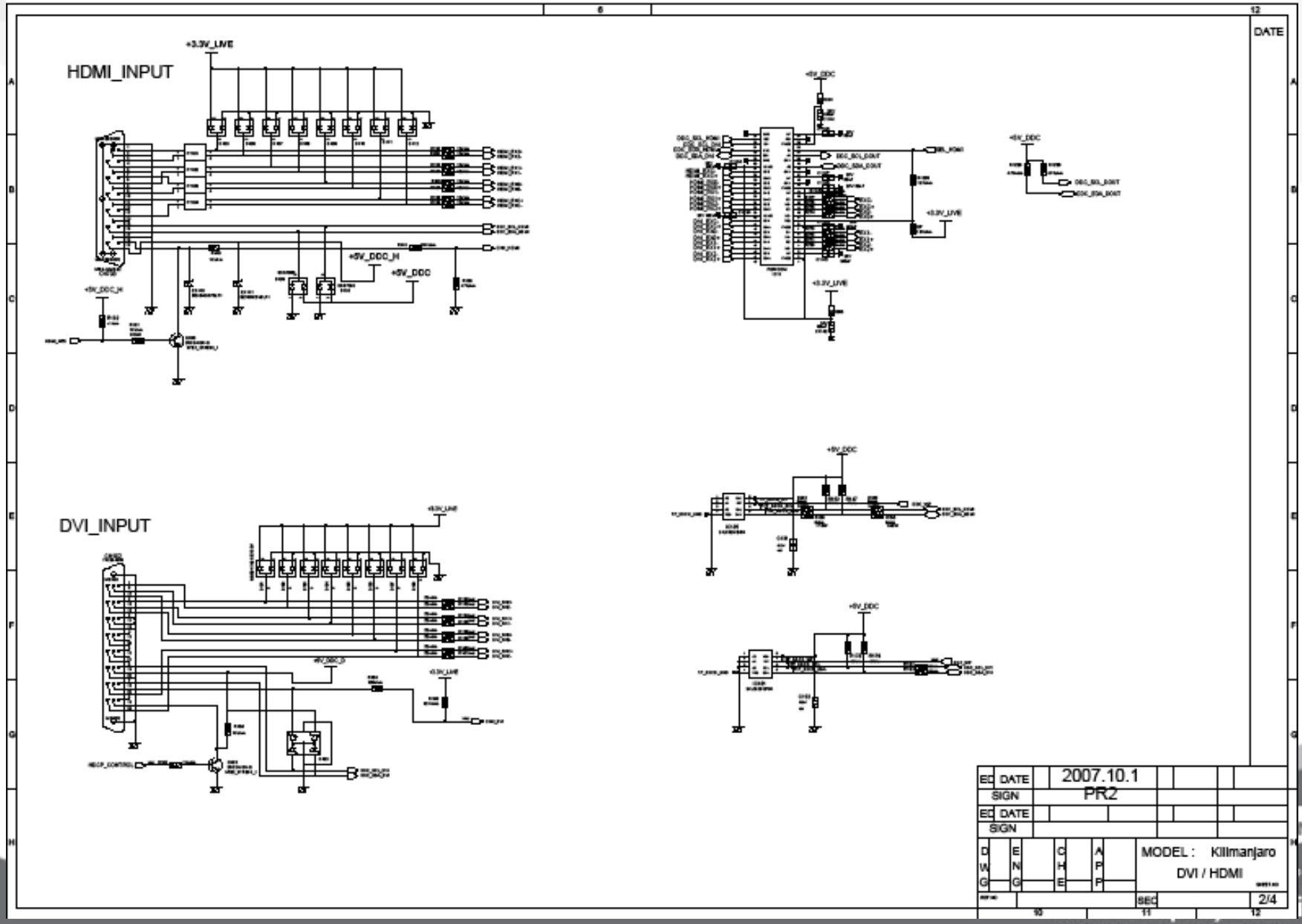




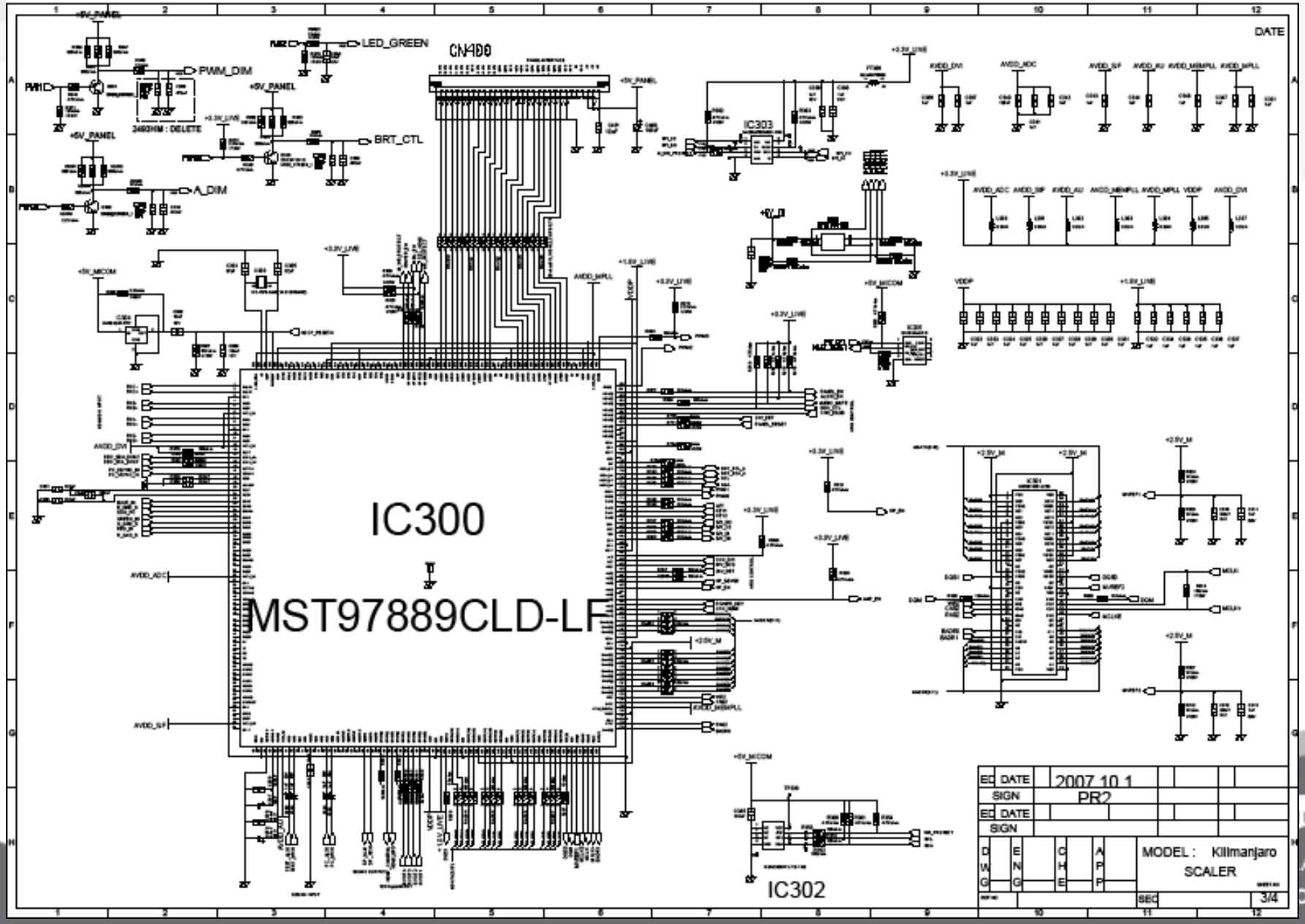
14. Main PBA - Schematics(1)



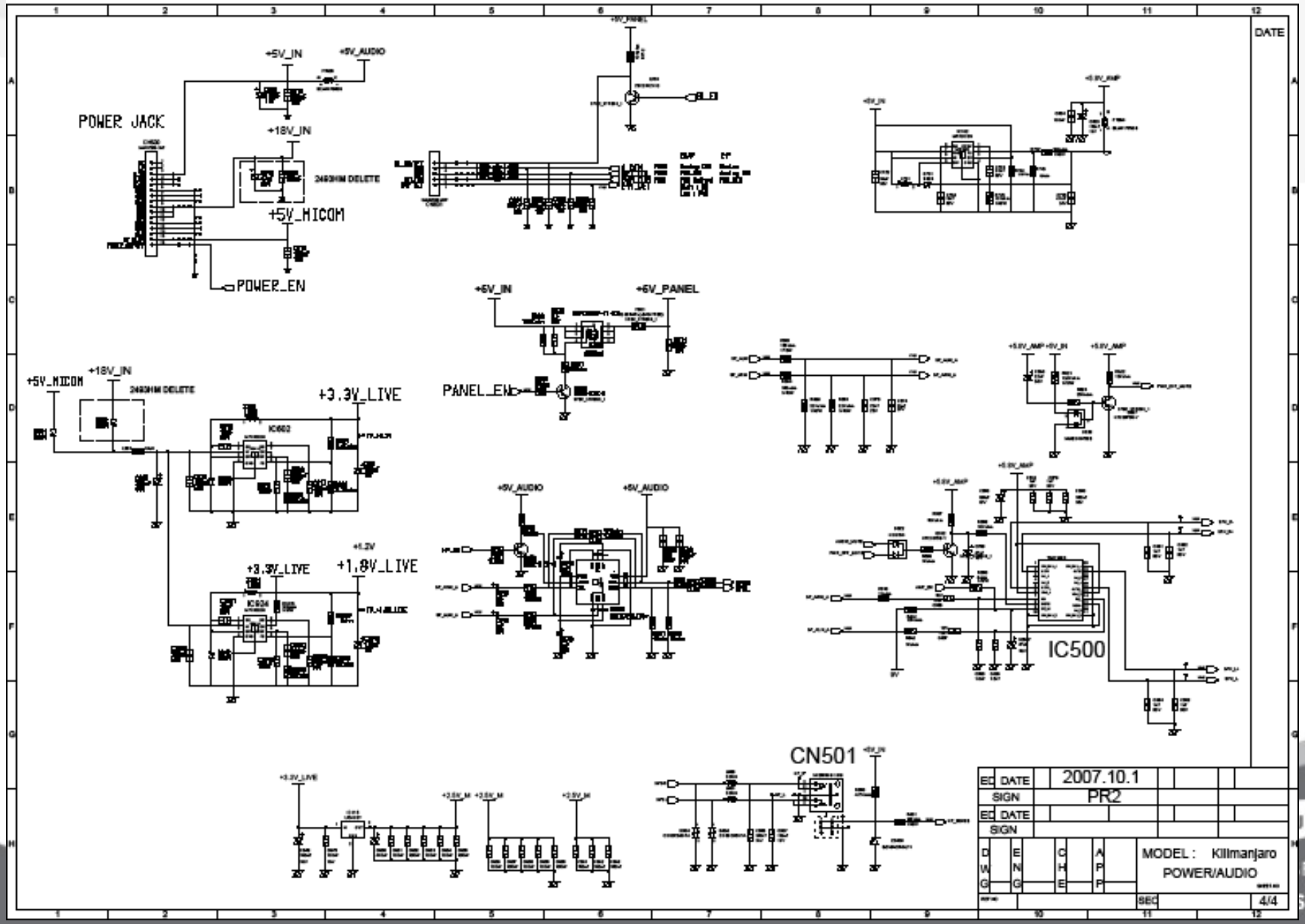
14. Main PBA - Schematics(2)



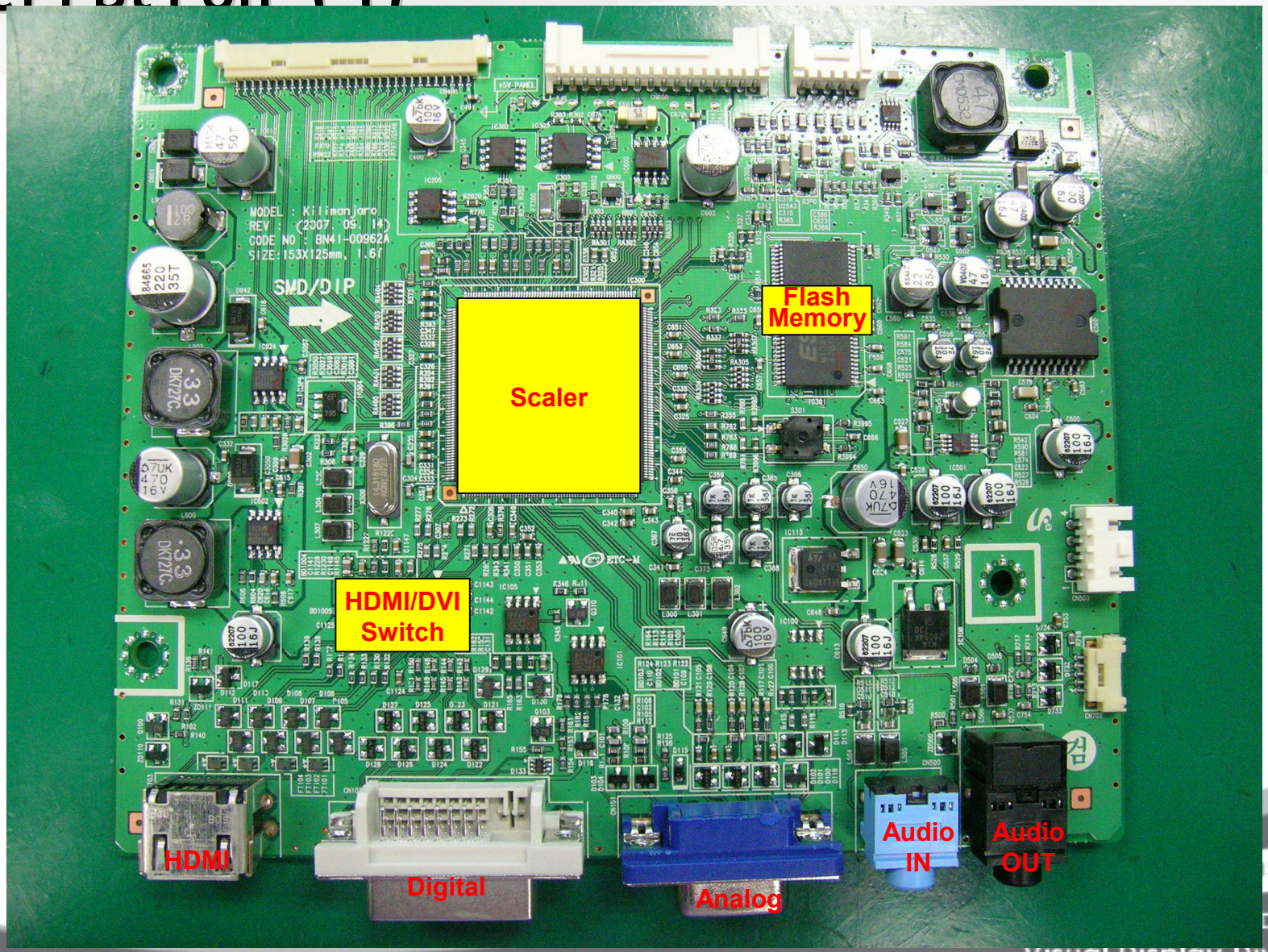
14. Main PBA - Schematics(3)



14. Main PBA - Schematics(4)



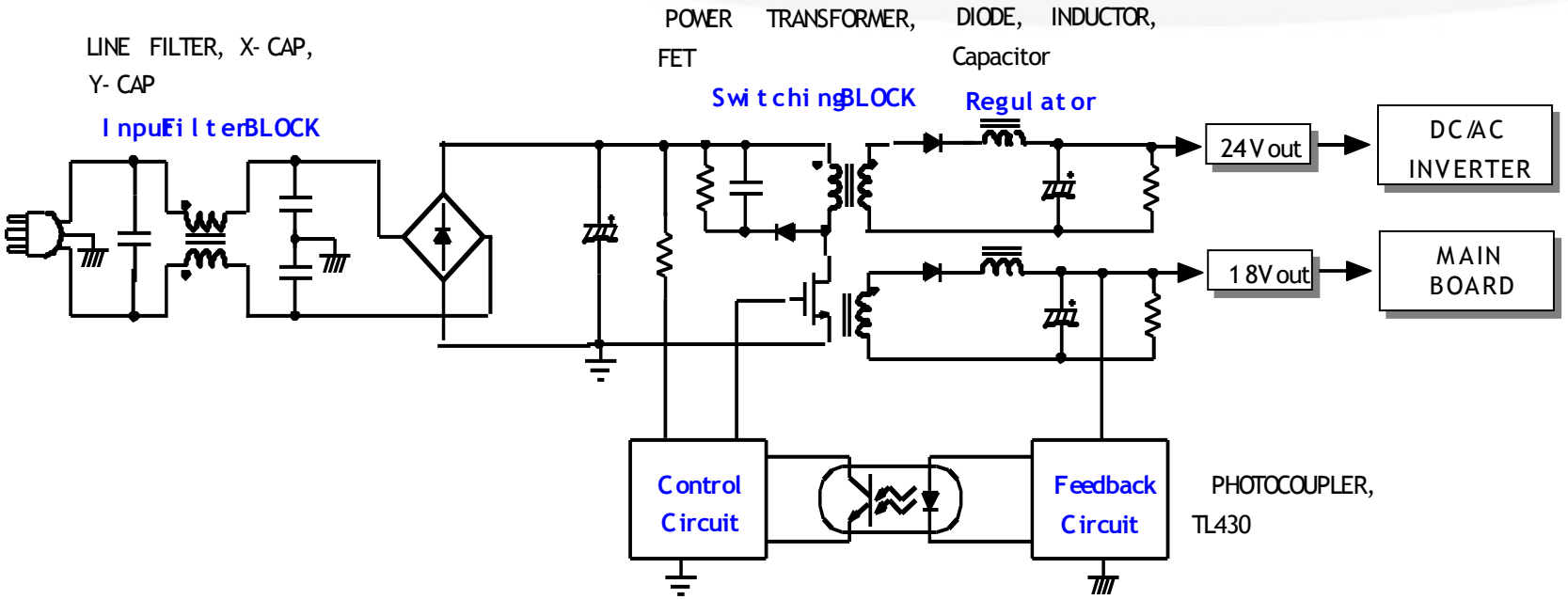
15. KILIMANJARO (2693HM) Block Description (1)



15. KILIMANJARO (2693HM) Block Description(2)

No	Block	Description	remark
1	**Scaler**	Scaler Integrate ADC and TMDS, Scaling part, Controller,	
2	**FLASH MEMORY**	Flash memory save information that SCALER needed. Program update is possible through the Firmware.	
3	**RECEIVER IC**	This chip receives DVI and HDMI signal from the source and decodes signal to scaler needed.	

16. SMPS Part Description



Ref : Inverter-Dimming

Current Control controls the current flows into the **Lamp, PWM Control** controls the **Lamp** off/on with a certain frequency, and **Complex Control** is the mixture of Current Control and PWM Control.

Current Control (Analog Dimming)

- **Dimming** is possible with almost no influence upon the **Panel**
- The **Minimum Current** enough to have no partial **Lamp** off/on is needed in the **Minimum Brightness**
- **Low Dimming Ratio (**nearly **2 : 1)**
- **Low Efficiency** in **Dimming State** because of the **Condition of Inverter** is optimized to the **Maximum Brightness**

PWM Control (Burst Dimming)

- **Dimming** by turning the **Lamp** off/on with about **300Hz ~ 1kHz** frequency
- **Water Fall** is found because of the **Noise** and the **Panel** power's unstable **Ground** according to **Current** on/off in certain period
- **High Efficiency** because the **IP Board** always operated in the **Maximum Brightness** whenever the **Lamp** is on
- Cleat up the partial **Lamp** off/on issue in the **Minimum Brightness** (**Dimming Ratio (**nearly **5:1))**

Complex Control

- Suppress the occurrence of **Water Fall** by using the **Analog Control** in the early stage of **Dimming**
- Improve the **Dimming Ratio** by using the **PWM Control** in the late stage of **Dimming**

•PROTECTION*

- **LAMP(Inverter) PROTECION**

  => If the **Lamp Connector** is disconnected or **cracked** with no **feedback**, the **Protection** function is operated.

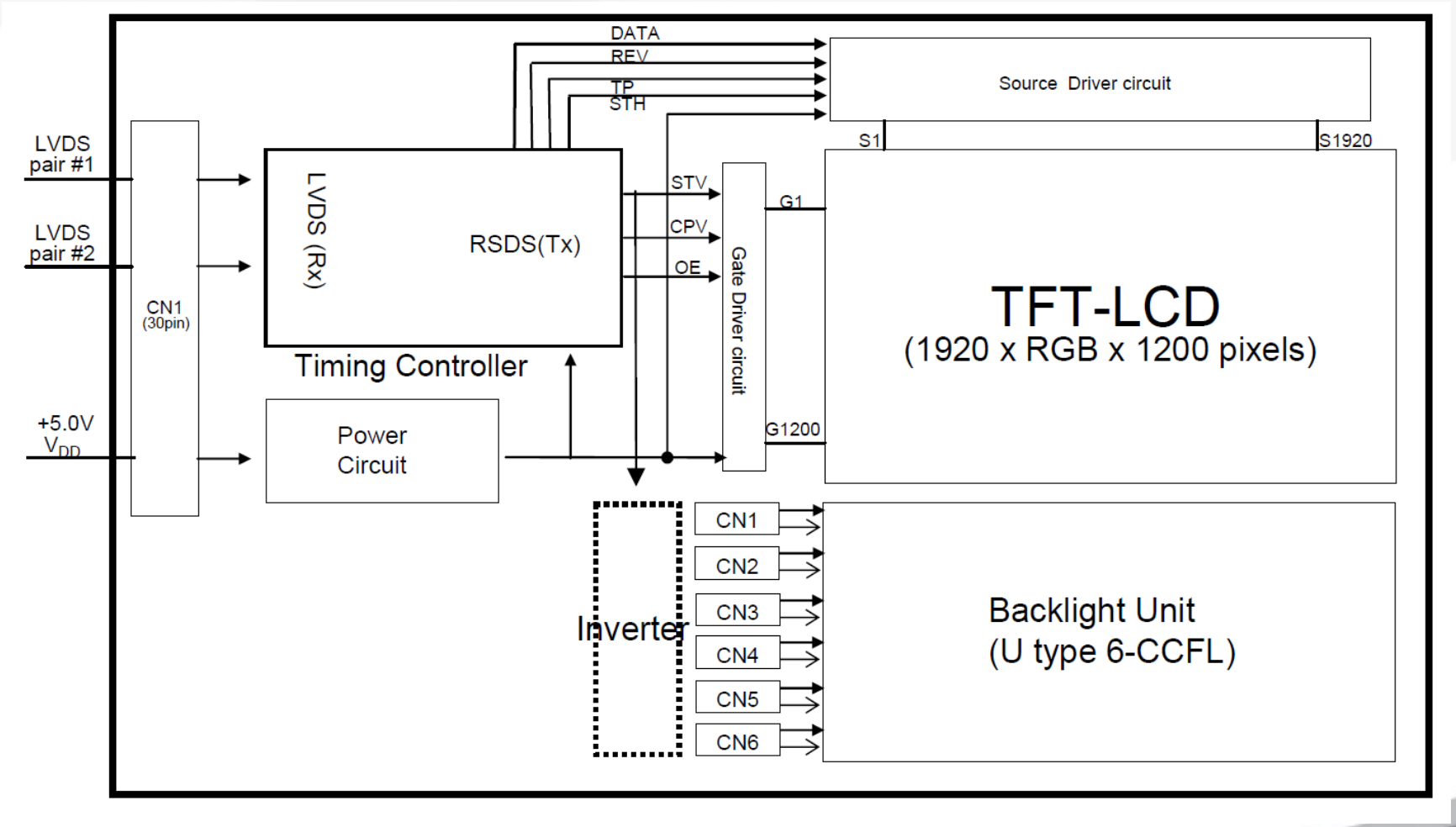
  => If output voltage of **Inverter Trans** is high, **Lamp Protection**, the **Over Voltage Protection** is operated.

- **Power Protection**

  => Every **Protection(OVP/OCP)** of **Panel** is operated in **Auto Recovery Mode**. But, only the **Thermal Protection** is operated normally when turns the **Power off**, makes it discharged and then turns the **Power on**. It works by the interior-designed function of the **Power IC**.

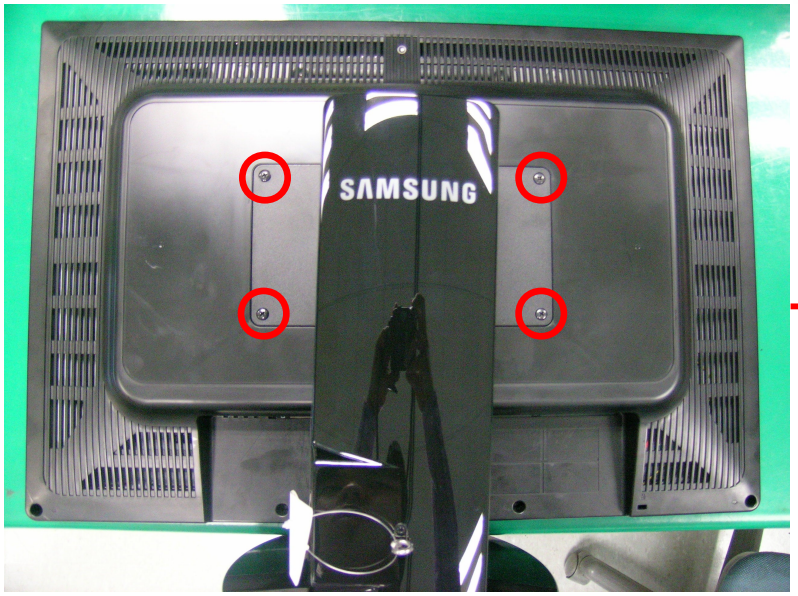
17. Panel Part Description

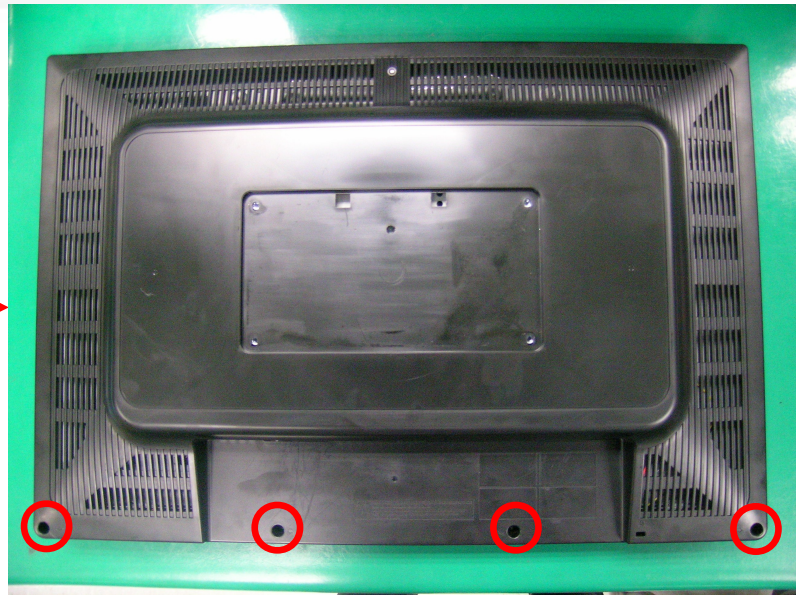
LCD PANEL : CLAA260WU01



18. Disassembly (1)

1. Disassembly stand on the flat desk.
2. Before disassembly set , separate Signal Cable and Power cord.
3. Please place the monitor on the soft cloth for preventing the panel broken.



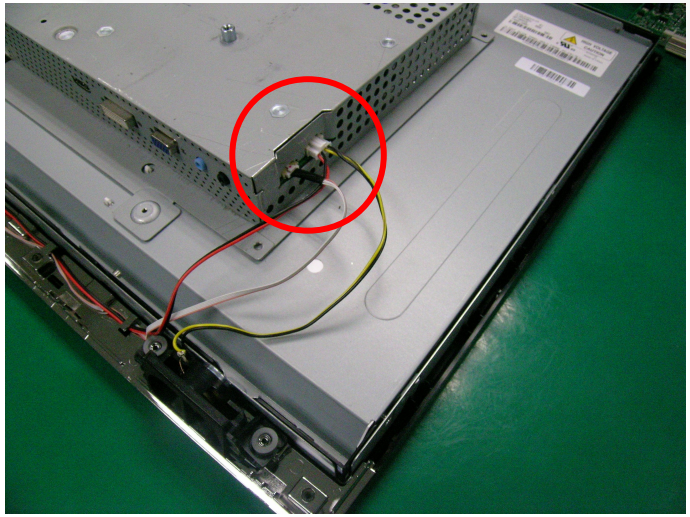


1. Place monitor face down on cushioned table. Remove 4 screws from the stand and lift up the stand.

2. Remove 4 screws at the downside of the set.

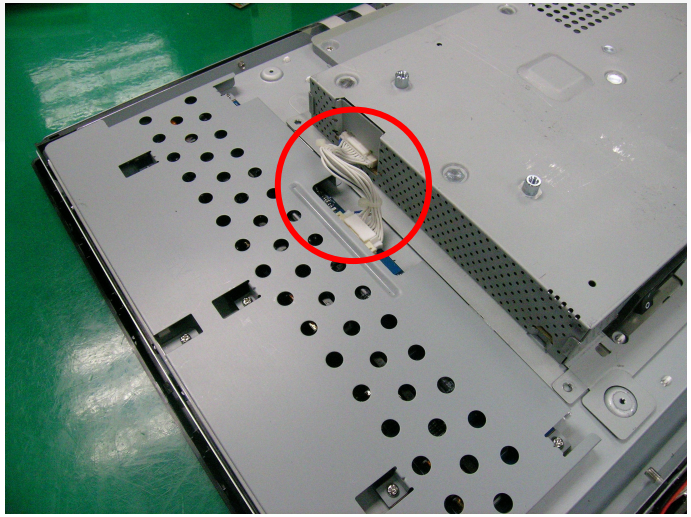
18. Disassembly (2)

Function Wire



3. Disconnect function and speaker wires from main board.

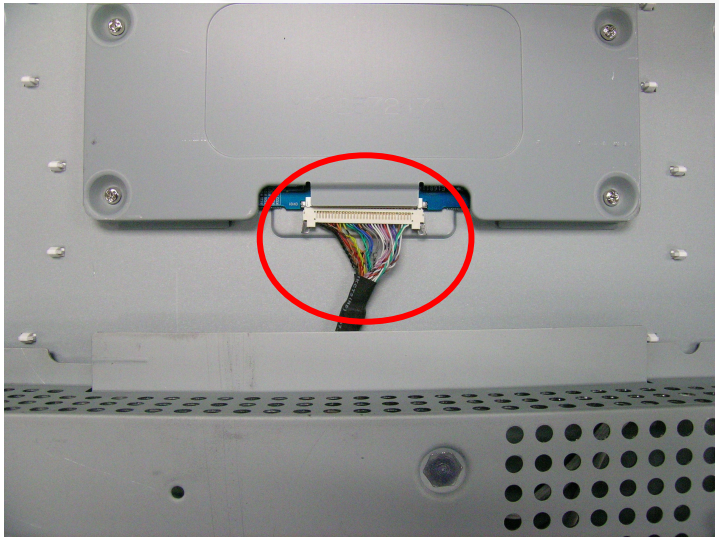
Inverter Cable



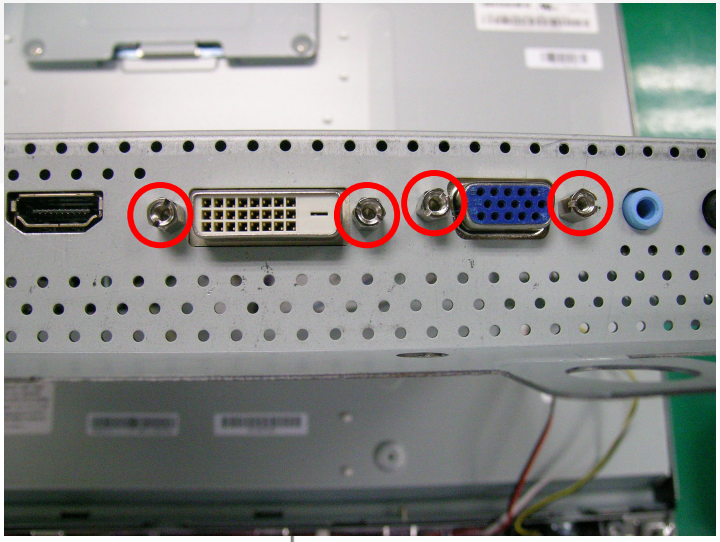
4. Disconnect cable from main board and inverter.

18. Disassembly (3)

ASSY CHASSIS



5. Lift up shield cover slowly and disconnect LVDS cable

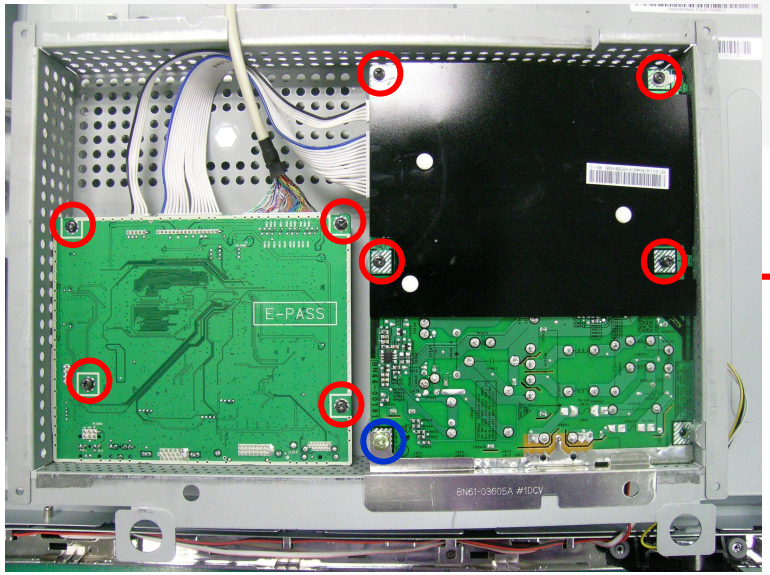


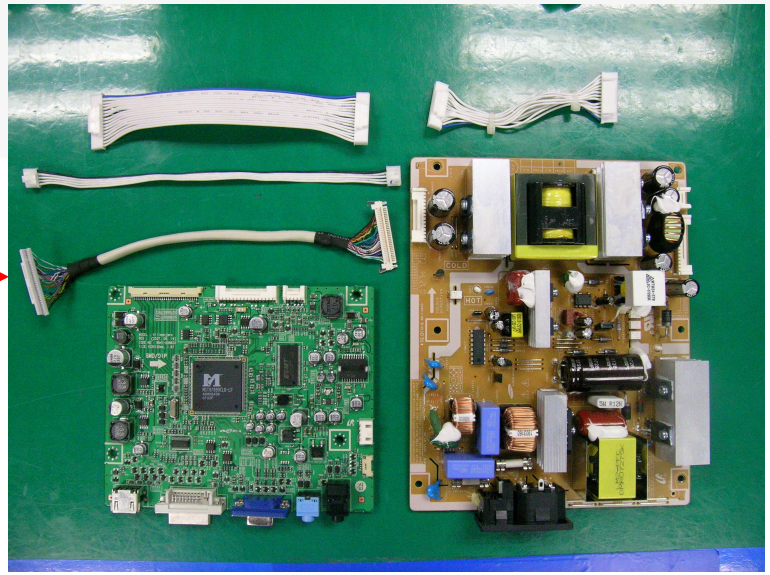
Screw

6. Remove 4 screws

18. Disassembly (4)

MAIN BOARD , SMPS



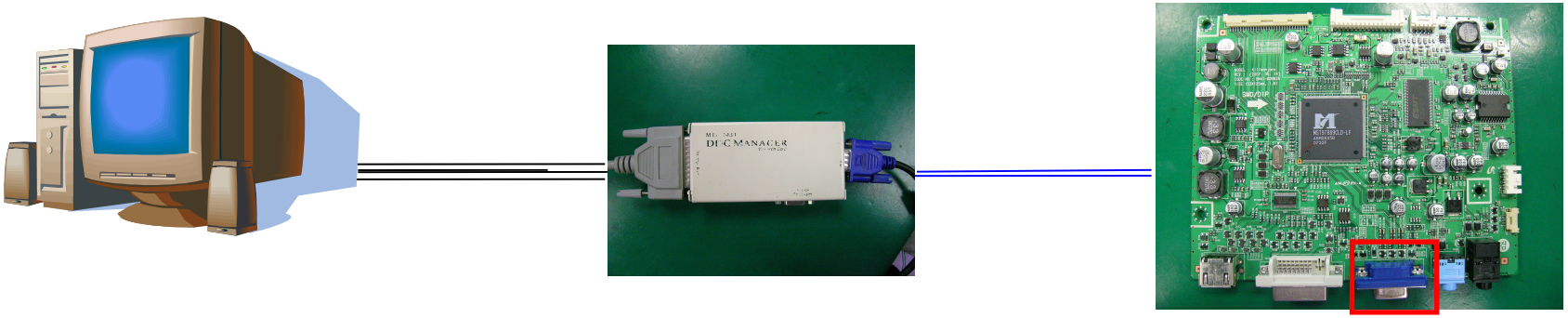


Screw

7. Remove 9 screws and lift up the boards
Disconnect cables.

19. Firmware Installation (1)

- After exchange the Main Board, We use DDC manager and must complete downloading.
- Connecting is refer to below picture.
- MICOM can be updated with DDC manager.

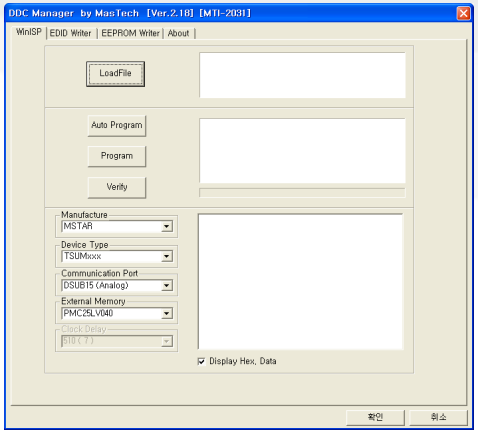


Connect to parallel port

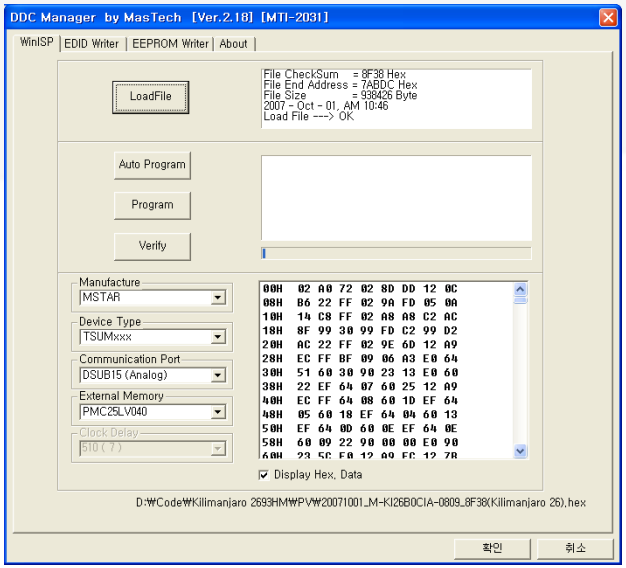
DDC MANAGER

connect to MAIN board CN101

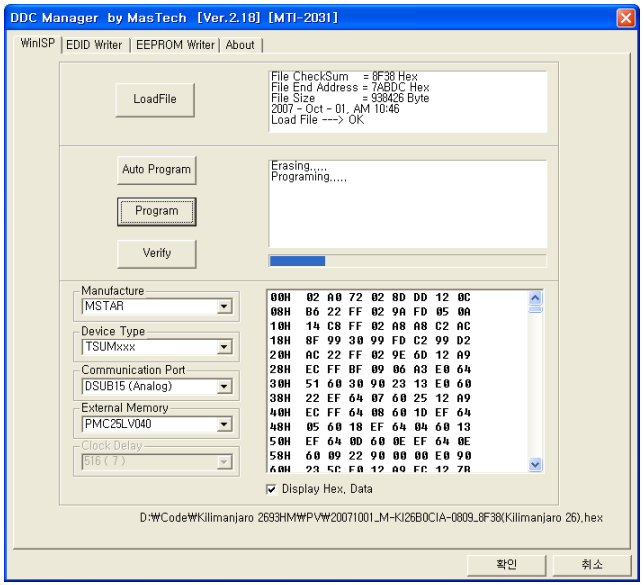
19. Firmware Installation(2)



1. Execute “winDDC”.



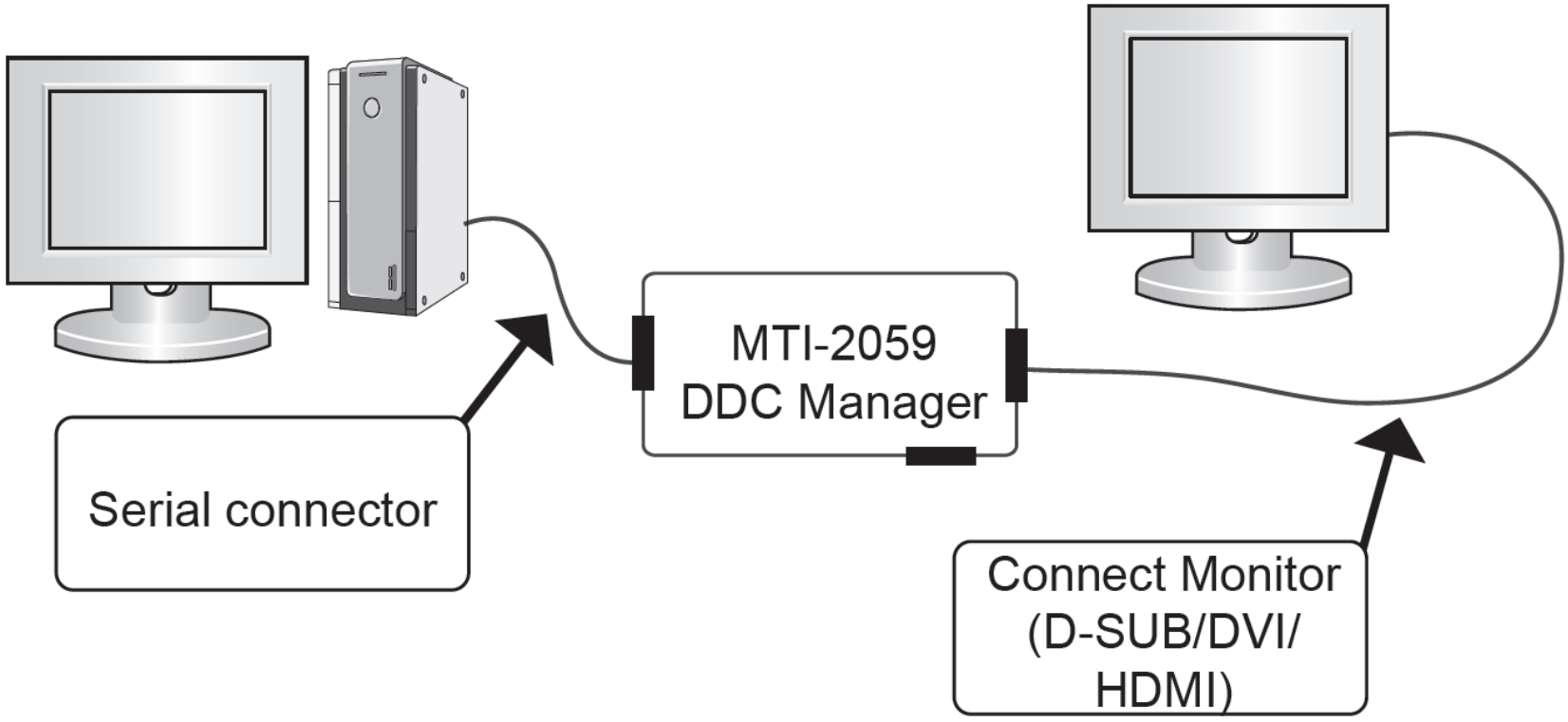
2. Click “LoadFile”and the latest code which code form is “*.hex”.



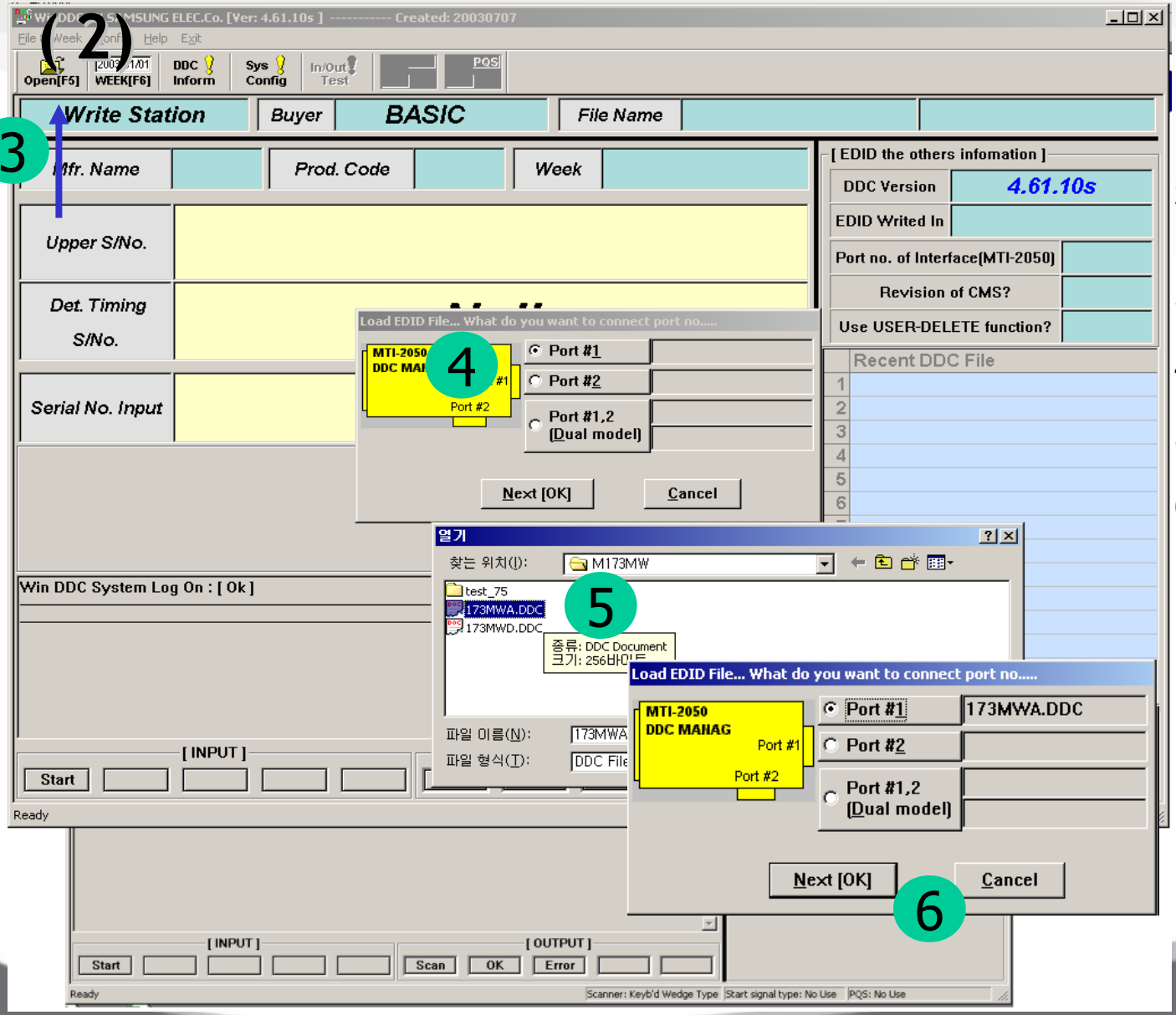
3. Click “Program”.

20. EDID Installation (1)

- EDID can be updated with DDC Manager JIG.
- Refer to below picture



20. EDID Installation (2)



1. Connect DDC Manager Jig to 2693HM with D-Sub cable and DVI cable, HDMI cable

2. Execute Winddc.exe Program on PC

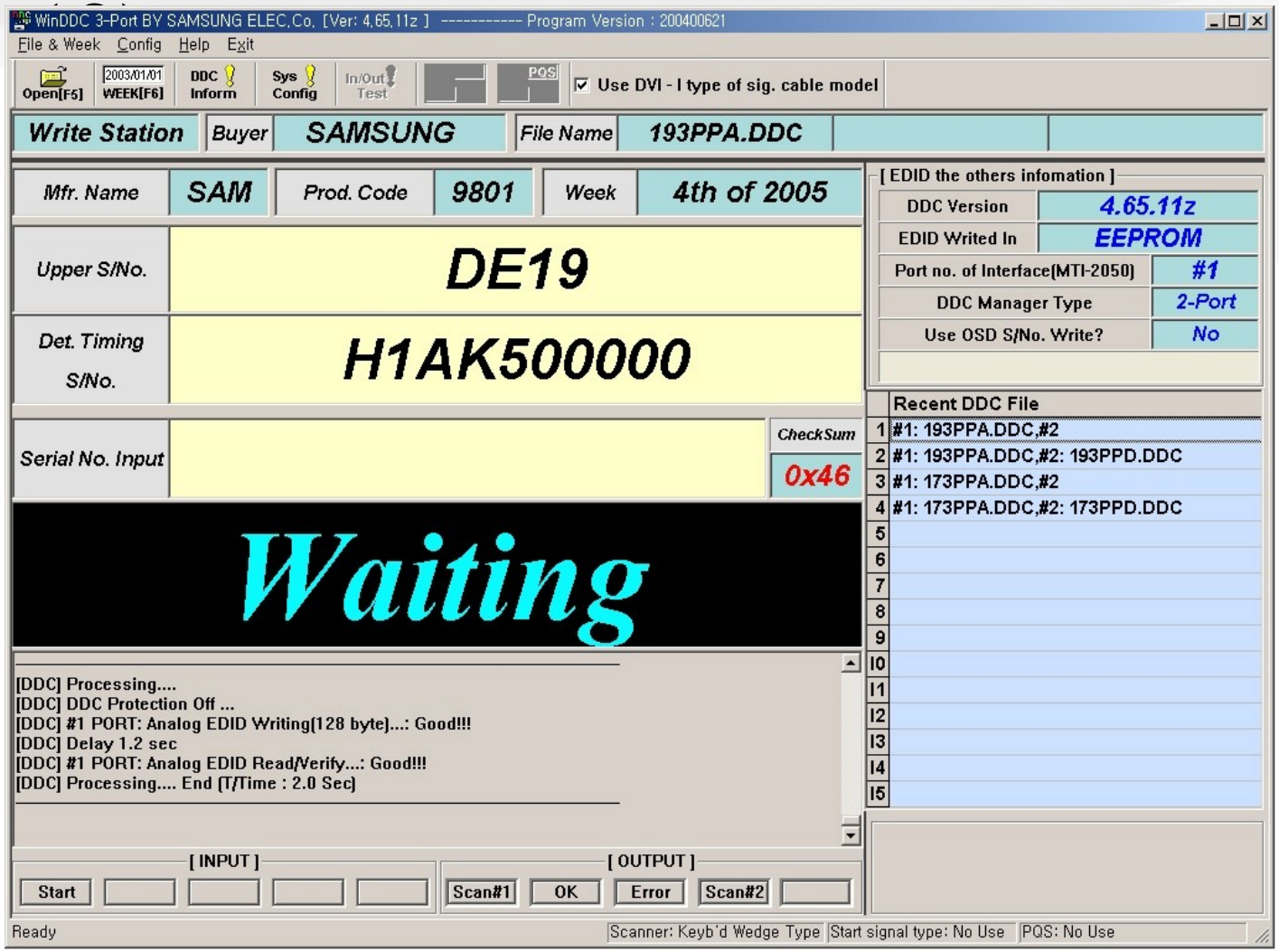
3. Click the Winddc icon.

4. File open.

5. Select Port#1

6. Load DDC file
   File Name
   “SM2693HMA.ddc” : Analog
   “SM2693HMD.ddc” : Digital
   “SM2693HMH.ddc” : HDMI

20. EDID Installation



7. Click Next(OK) button

8. Select enter button After Monitor S/N input.
If monitor is dual monitor, the digital both must input with the analog.

1. After Replacing Main PBA

You have to

- EDID input (Analog and Digital, HDMI)
- Firmware install – MICOM S/W input(use DDC manager)
- PC Auto Color Adjust

  -.select language “English” in OSD, then hold down Enter key for 5 seconds
- Factory Reset

  -.setting to Contrast and Brightness ‘0’.

  -.Push the menu button more than 5 seconds

  -.select Reset.

Thank You!

SAMSUNG