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# CHOPIN Training Manu



Samsung Electronics  
VD Div.  
LCD Monitor R&D



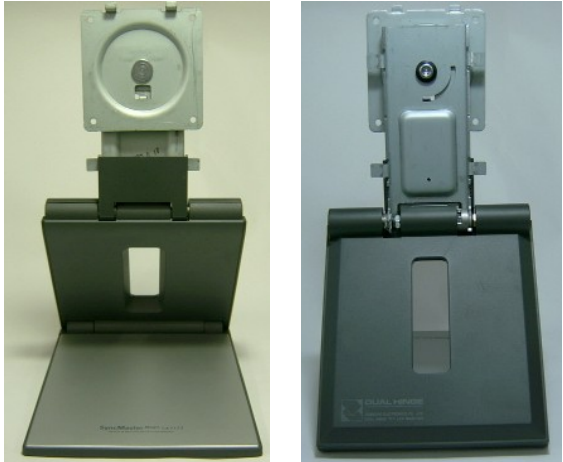
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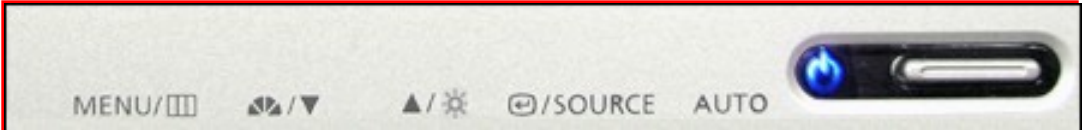
# 1. CHOPIN Basic Structure



➤ Dual Hinge Stand



- Magic Bright
- Magic Color
- Unified UI/function
- Hidden Function Key








Key Specification		
Model	750B	950B
Screen Size	17"	19"
Resolution	1280x1024@75Hz	1280x1024@75Hz
Colors	16.2M	16.2M
<b>Brightness</b>	<b>300cd/m<sup>2</sup></b>	<b>300cd/m<sup>2</sup></b>
<b>Contrast</b>	<b>700:1</b>	<b>700:1</b>
Supported Resolution	VGA ~ XSGA	VGA ~ XSGA
Horizontal Frequency	30~81kHz	30~81kHz
Sync Type	Sep./Comp./SOG	Sep./Comp./SOG
Vertical Frequency	56~75Hz	56~75Hz
Viewing Angle	150°/135°	150°/130°
<b>Response Time</b>	<b>8ms(w to b)</b>	<b>8ms(w to b)</b>
<b>Signal Input</b>	<b>Analog / Digital (15pin D-sub / DVI-D)</b>	<b>Analog / Digital (15pin D-sub / DVI-D)</b>
Power Consumption	34 Watt (Max)	38 Watt (Max)



Magic Color

Key Specifications		
Model	750B	950B
Set Dimension(mm)	380 x68.5 x411.0 (W x H x D)	423.0 x72.0 x427.5 (W x H x D)
Package(mm)	453 x393 x183 (W x H x D)	504 x437 x187 (W x H x D)
VESA(mm)	75 x 75	75 X 75
□□ (kg)	4.5 (5.8 : Package)	5.4 (6.9 : Package)
Tilt	-1° ~ 0°(Forward) 0° ~ 25°(Backward)	-1° ~ 0°(Forward) 0° ~ 25°(Backward)
Power Supply	Internal Power/Inverter (17" & 19" common use)	
Safety Mode	Up to UXGA	Up to UXGA
Magic Bright II /Magic Color  	Support	Support
Emissions Standard	TCO'03	TCO'03
Magic Tune 	Version 3.6	Version 3.6

# 3-1. Product function explanation\_1



Key Specification		
function	Detail function	explanation
Magic color	Off	Magic Color Off
	Demo	For the display in the Shop. Left-> Magic Color On, Right-> Magic Color Off
	Full	Enhance the R/G/B Color Tone
	Intelligent	Enhance the R/G/B Color Tone except skin tone color
	Magic Zone	User can adjust the certain area . (Hue/Saturation/Brightness/H&V Size/H&V Position)
Magic Bright	Custom	Factory condition
	Text	For the text user , The brightness Setting condition(100 ~ 160 cd/m2)
	Internet	For the internet user , The brightness Setting condition(140 ~ 200 cd/m2)
	Game	For the internet game user , The brightness Setting condition(225cd/m2 □□ )
	Sports	For the sports picture , The brightness Setting condition (180 cd/m2 over, 8000K)
	Movie	For the movie screen , The brightness Setting condition (200 cd/m2 over, 6500K)
Color Tone	Cool	To change a R/G/B Color, and enhance a blue Tone (9300K)
	Normal	Natural R/G/B Color
	Warm	To change a R/G/B Color, and enhance a red Tone (6500K)
	Custom	User to change a R/G/B Color Control

# 3-2. Product function explanation \_2

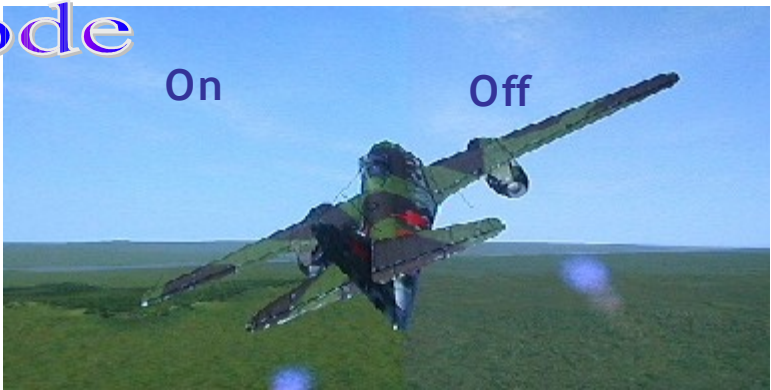


## MagicZone

Key Specification		
Function	Detail function	Explanation
MagicZone	Hue	To determine the color pure degree with a phase change in Color Domain.
	Saturation	To determine the color sharpness with gain control in color Domain.
	Brightness	The factor to determine the brightness of Color Brightness 0-> black.
	Sharpness	sharpness
	H-Position	H-position for MagicZone
	V-Position	V-position for MagicZone
	H-Size	H-size for MagicZone
	V-Size	V-size for MagicZone

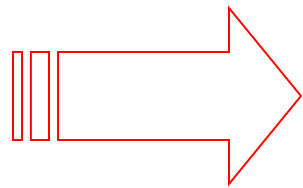
# 3-3. Magic Color

## Magic color Demo Mode



Demo Mode

## Magic color Full Mode

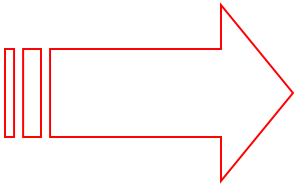


R/G/B 3 color all enhanced



# 3-4. Magic Color

Magic color  
Intelligent Mode

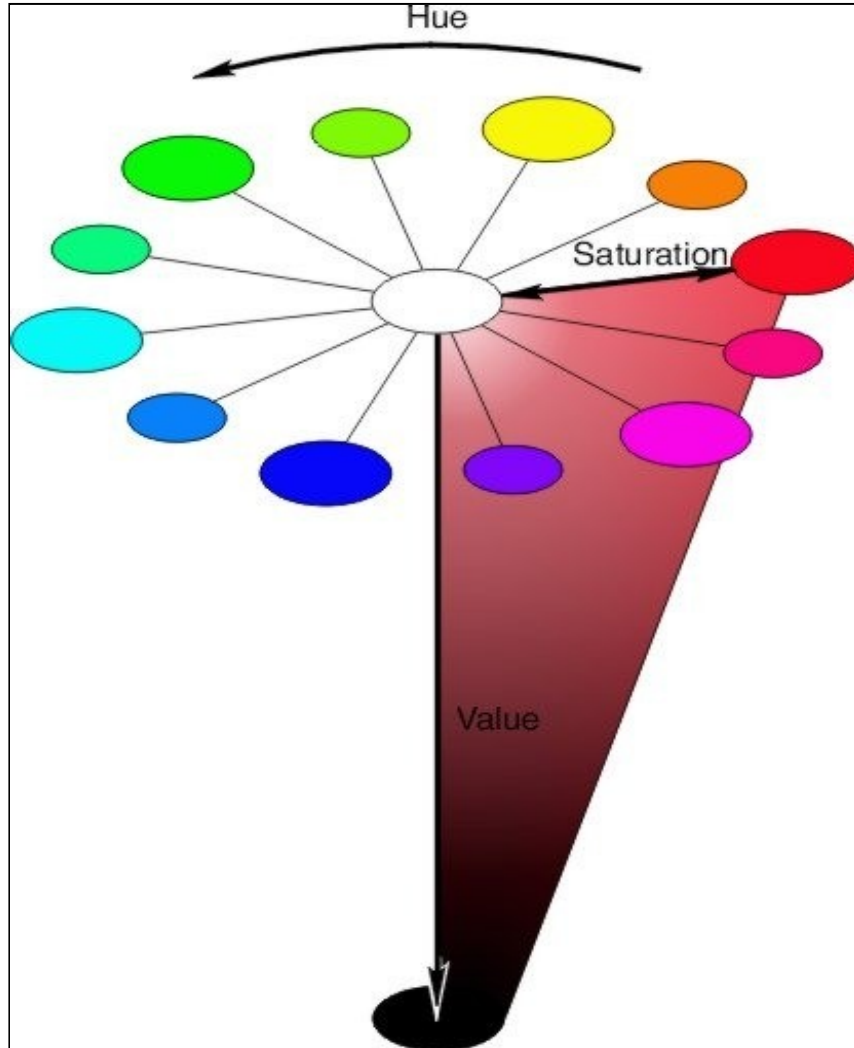


## MagicZone



Except  
Skin Tone

# Color (Hue/Saturation/Brightness)



**Hue:** Phase control for the pure degree of color in Color Domain

**Saturation :** color sharpness to control the gain in Color Domain

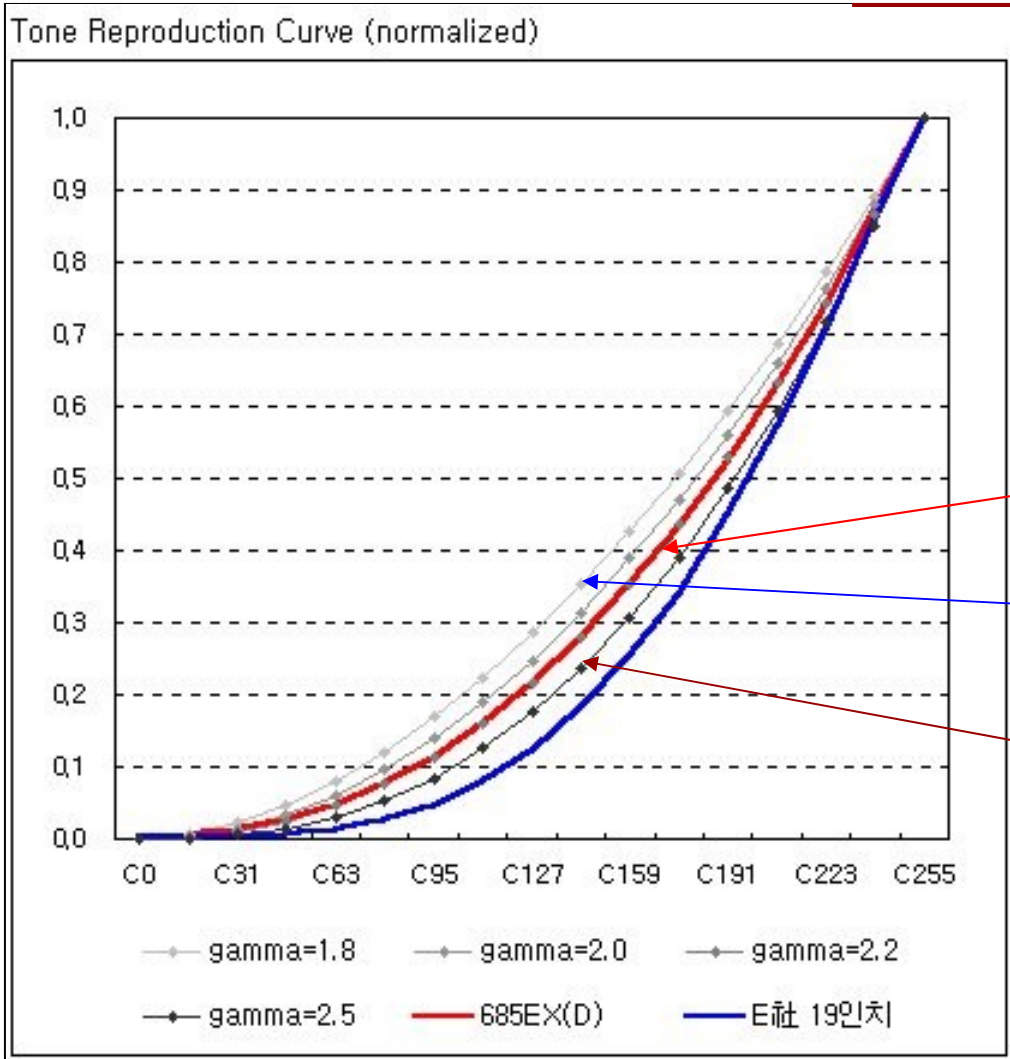
**Brightness :** To determine the Color brightness .  
Brightness 0-> Black

# 3-6. Product function explanation \_2










Key Specification		
function	Detail function	explanation
Gamma	Mode 1	Basic gamma which is support from Panel(Gamma 2.2)
	Mode 2	To adjust more brighter via Scaler (Gamma 1.8)
	Mode 3	To adjust more darker via Scaler (Gamma 2.5)
Sharpness	Sharpness	If there is a peaking from PC, to control the sharpness function to display a clear text and picture.

# 3-7. Gamma Mode



- Gamma Mode 1 :**  
2.2 Gamma □
- Gamma Mode 2 :**  
1.8 Gamma
- Gamma Mode 3 :**  
2.5 Gamma

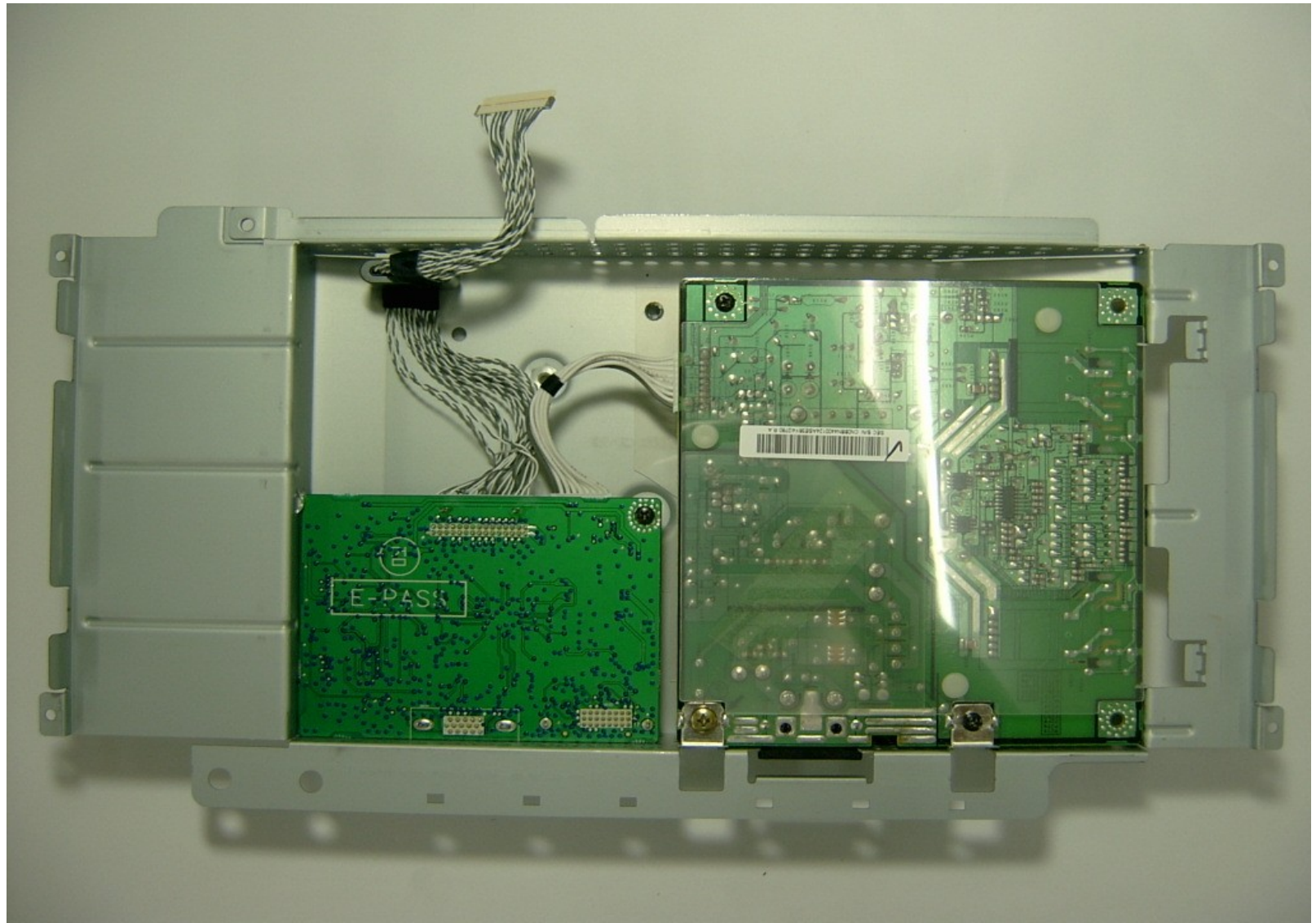
# 4. OSD Tree

 (Picture)	 (Color)	 (Image)	 (OSD)	 (Set Up)	 (Information)	 (Magic Bright)
<ul style="list-style-type: none"> <li>- Contrast</li> <li>- Brightness</li> </ul>	<ul style="list-style-type: none"> <li>- Color Tone               <ul style="list-style-type: none"> <li>.Cool</li> <li>.Normal</li> <li>.Warm</li> <li>.Custom</li> </ul> </li> <li>- Color Control               <ul style="list-style-type: none"> <li>.Red</li> <li>.Green</li> <li>.Blue</li> </ul> </li> <li>- Gamma               <ul style="list-style-type: none"> <li>.Mode1</li> <li>.Mode2</li> <li>.Mode3</li> </ul> </li> <li>-MagicColor               <ul style="list-style-type: none"> <li>.off</li> <li>.Demo</li> <li>.Full</li> <li>.Intelligent</li> <li>.MagicZone</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Fine</li> <li>- Coarse</li> <li>- Sharpness</li> <li>- H Position</li> <li>- V Position</li> </ul>	<ul style="list-style-type: none"> <li>- Language</li> <li>- Position               <ul style="list-style-type: none"> <li>.H Position</li> <li>.V Position</li> </ul> </li> <li>- Transparency</li> <li>- Display Time</li> </ul>	<ul style="list-style-type: none"> <li>- Auto Source</li> <li>- Color Reset</li> <li>- Image Reset</li> </ul>	<ul style="list-style-type: none"> <li>- resolution</li> <li>- Frequency</li> <li>- Input source</li> </ul>	<ul style="list-style-type: none"> <li>- Custom</li> <li>- Text</li> <li>- Internet</li> <li>- Game</li> <li>- Sport</li> <li>- Movie</li> </ul>



# 5. Product structure

1. Panel
2. Main Board
3. IP BOARD
4. Function Key



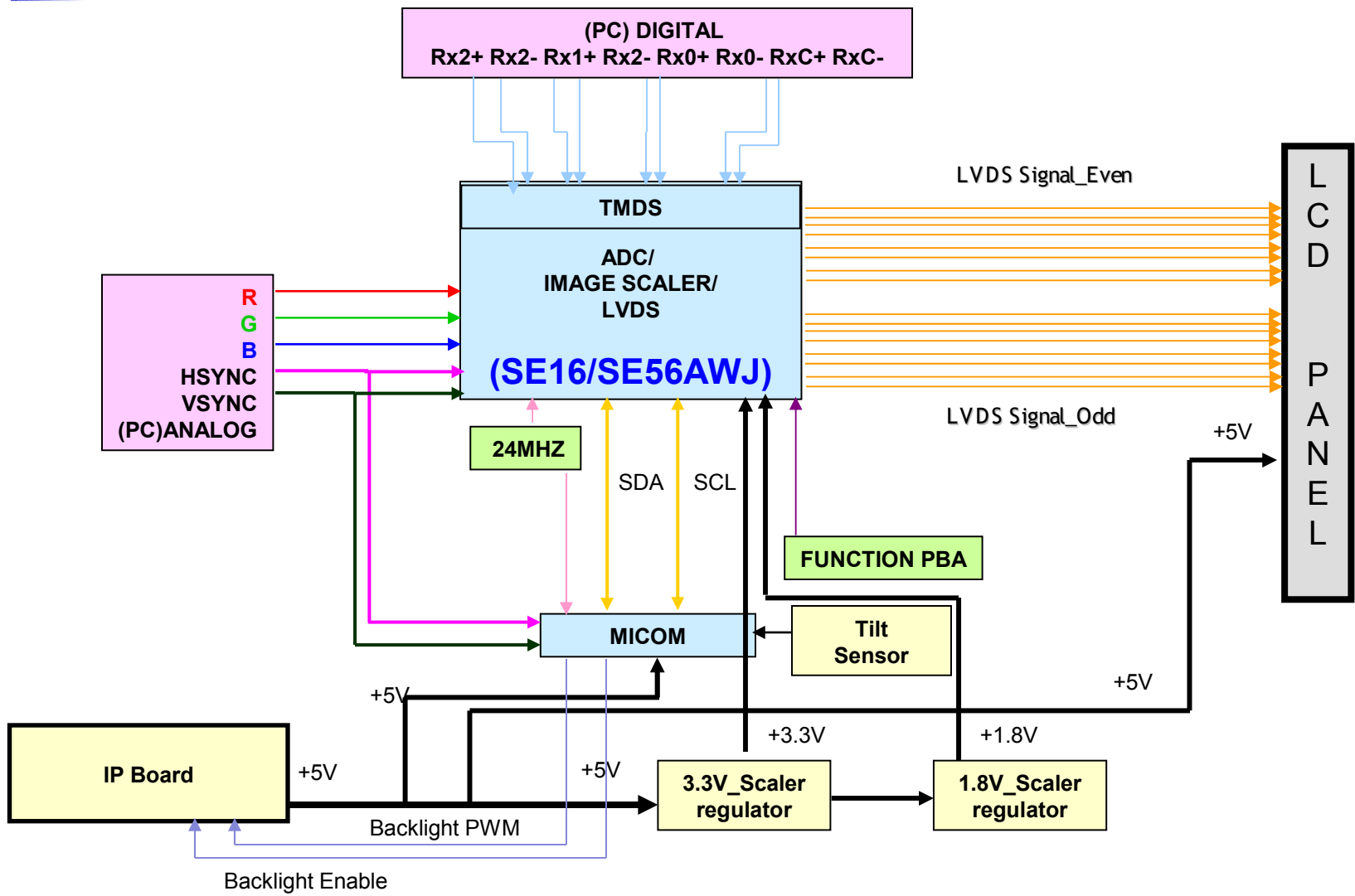
inch)

SAMSUNG

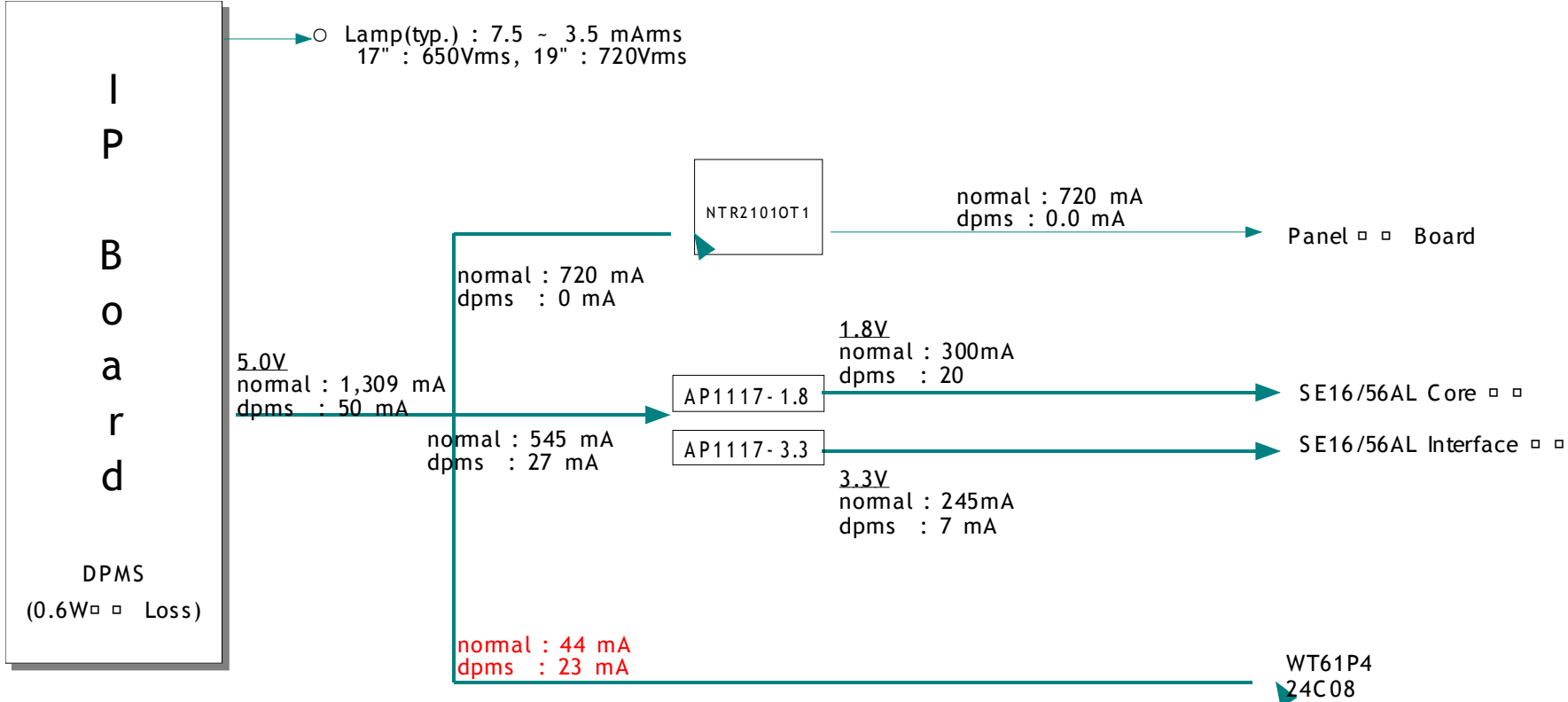




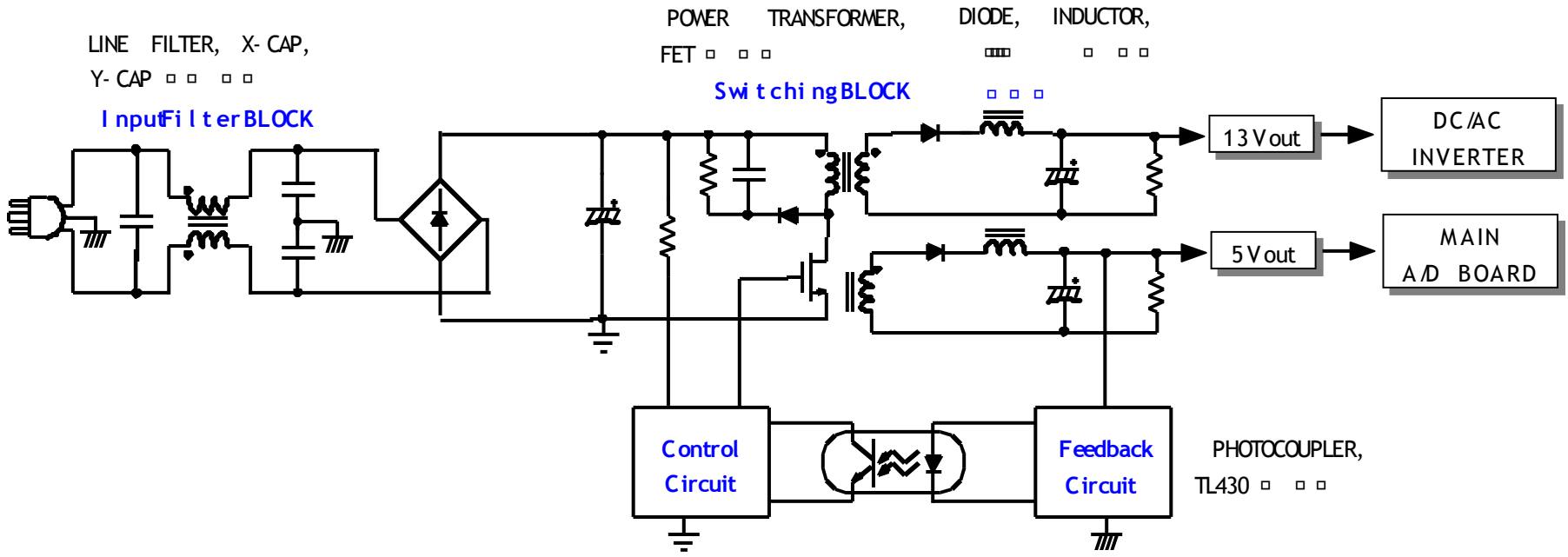
# 7. Block Diagram(Main Board)



# 8. Main Board Power Tree



# 9. IP BOARD part(SM PS Part)



# 10. IP BOARD part(Inverter Part)

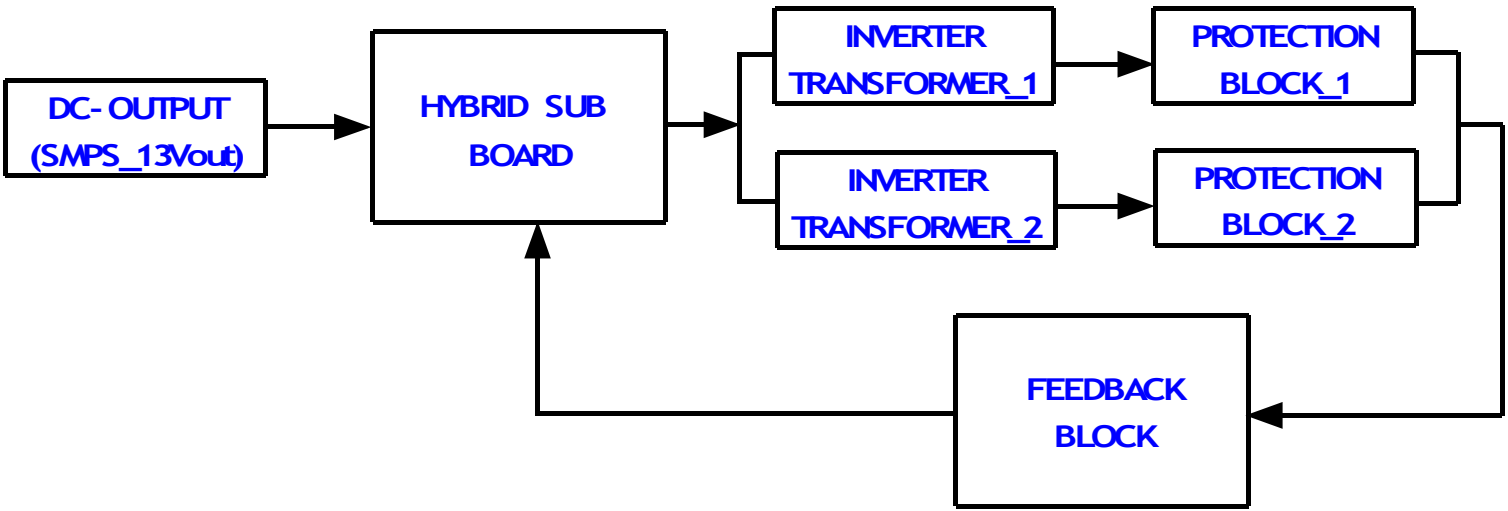


FIG 1 | INVERTER BLOCK DI AGRAM

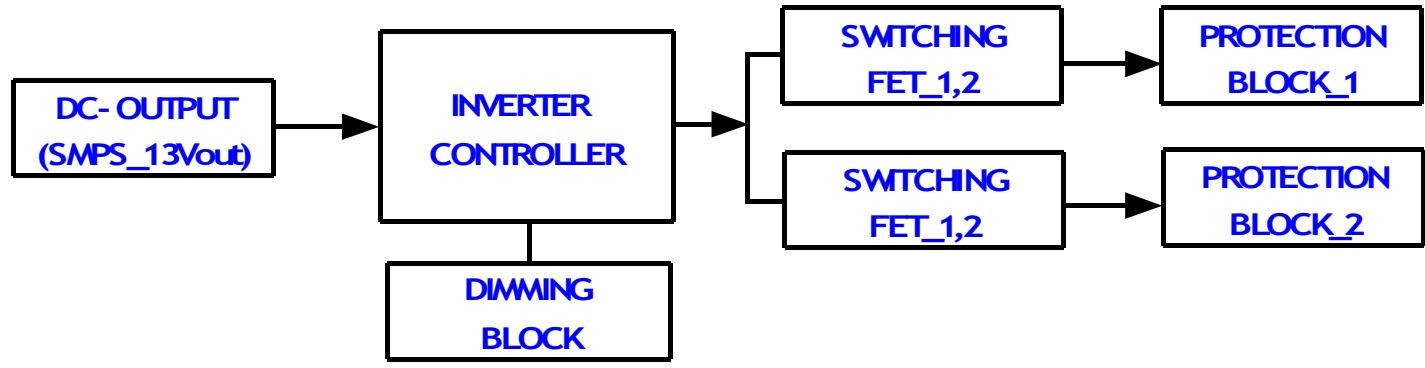


FIG 2 | INVERTER SUB BOARD BLOCK DI AGRAM

# Dimming)

To control the input current in Lamp-> **Current Control**

To control the fixed frequency in Lamp-> **PWM control**

To control the current and frequency in Lamp-> **Complex control.**

## Current Control (Analog Dimming)

- To control the Dimming without the impact to panel.
- To need a minimum current not to part lighting in Minimum Brightness
- Low Dimming Ratio ( 2 : 1)
- The optimum condition of Inverter is Maximum Brightness, so the efficiency is low in Dimming condition.

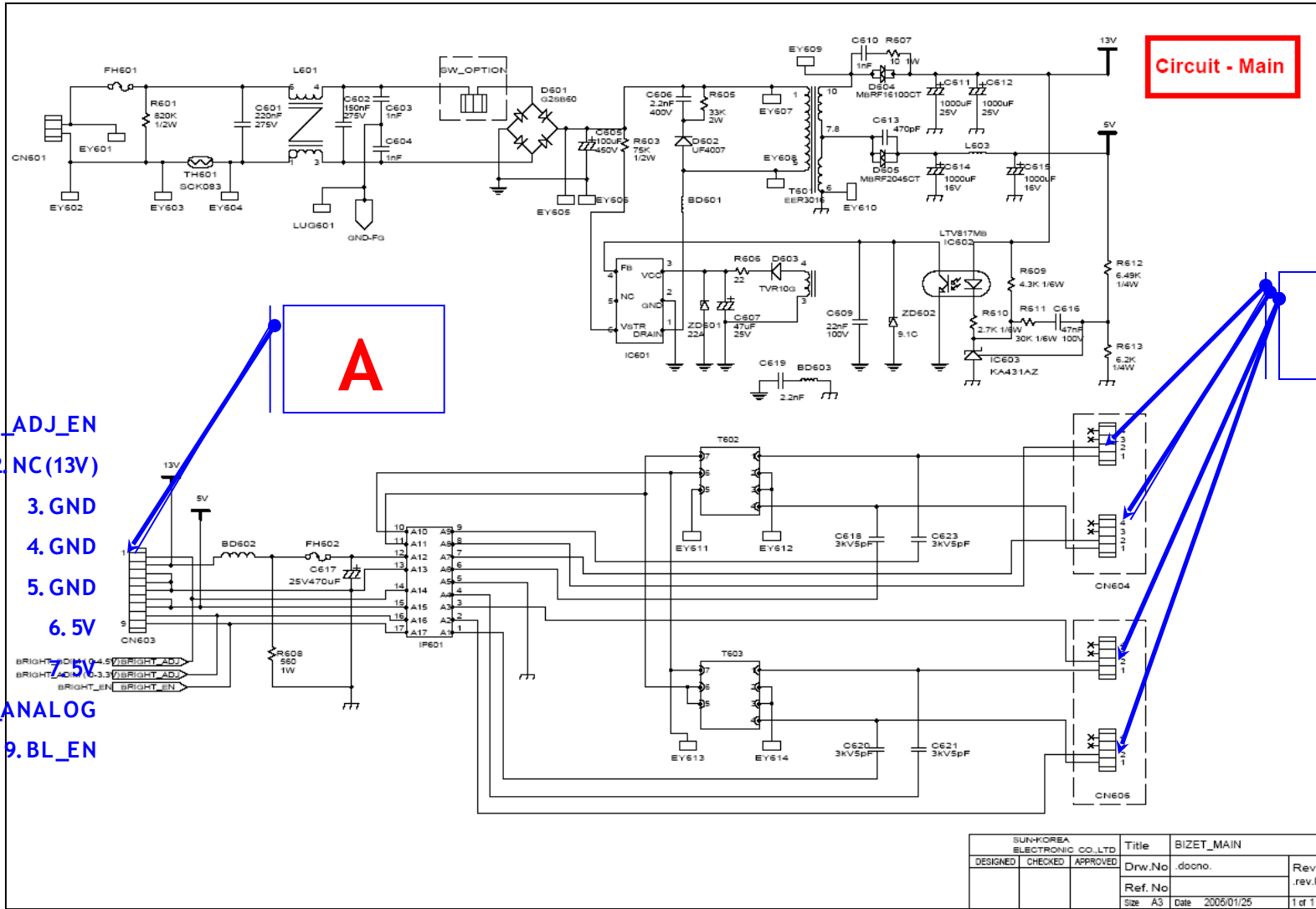
## PWM Control (Burst Dimming)

- The operate a Lamp via around 300Hz ~ 1kHz frequency .
- Large current on/off via fixed duty , panel power area ground unstable and noise happen.  
So, there is a Water fall noise
- Lamp lighting condition is always in Maximum Brightness, The efficiency is high.  
The part lighting in Minimum Brightness solved.
- High Dimming Ratio (5:1)

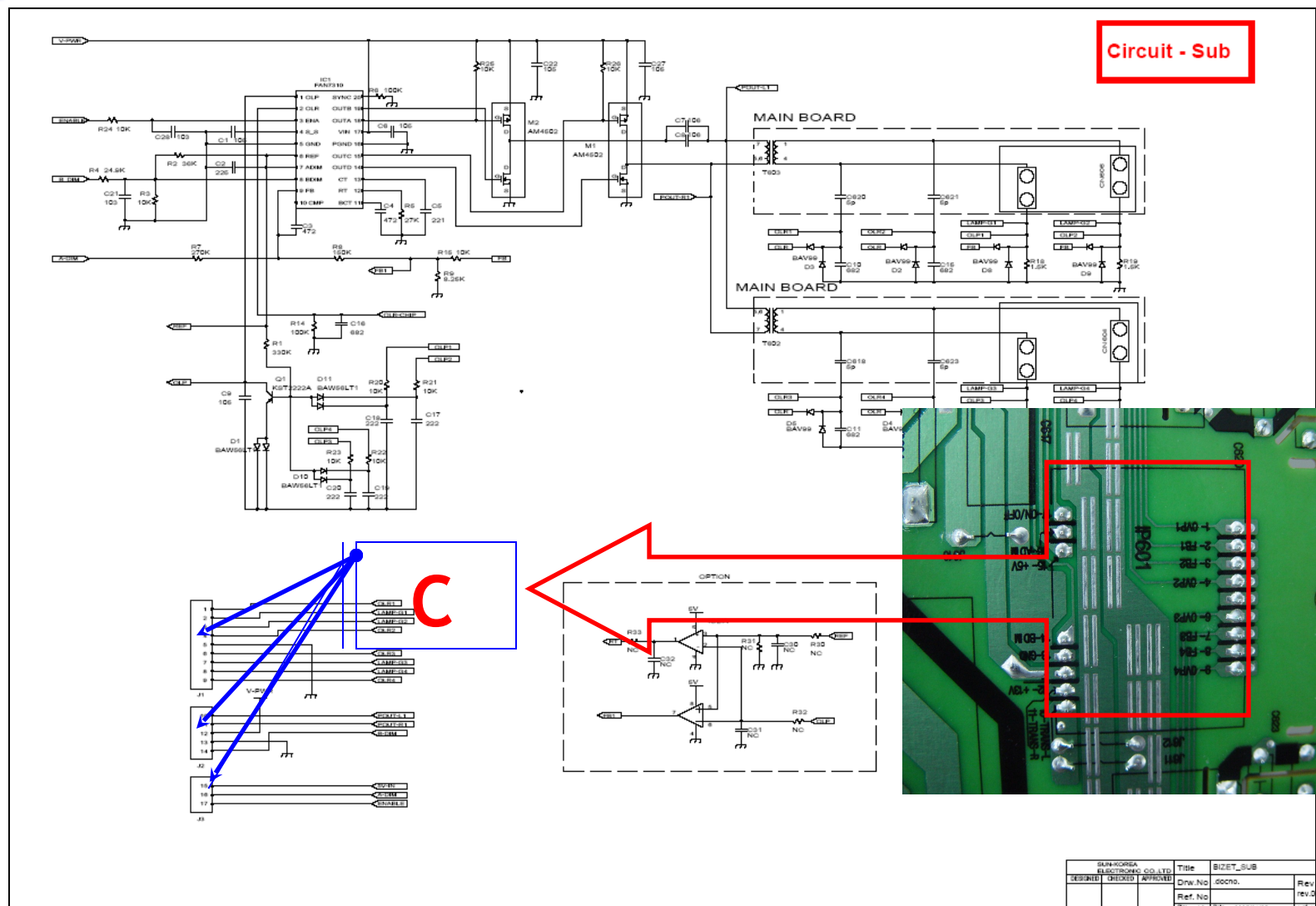
## Complex Control

- To control with Analog method in Front Dimming, so can reduce a noise.
- To control the PWM method in back Dimming, so increase a Dimming Ratio .

# 11. IP BOARD Schematic1



# 11. IP BOARD schematic2



B

C

A



PCB면과 C605  
본딩

PCB면과 C617  
본딩

TH601과 IC601 H/S  
본딩

D604와 C610  
본딩

C606과 R605  
본딩

C607과 C609  
본딩

IC603과 C616  
본딩

C606과 R605  
본딩

C607과 C609  
본딩

IC603과 C616  
본딩



## \* PROTECTION\*

### ➤ LAMP(Inverter) PROTECION

=> The protection operate in loosed lamp Connector or lamp crack.

=> The lamp protection operate with OVP , If Inverter Trans output voltage high.

### ➤ Power Protection

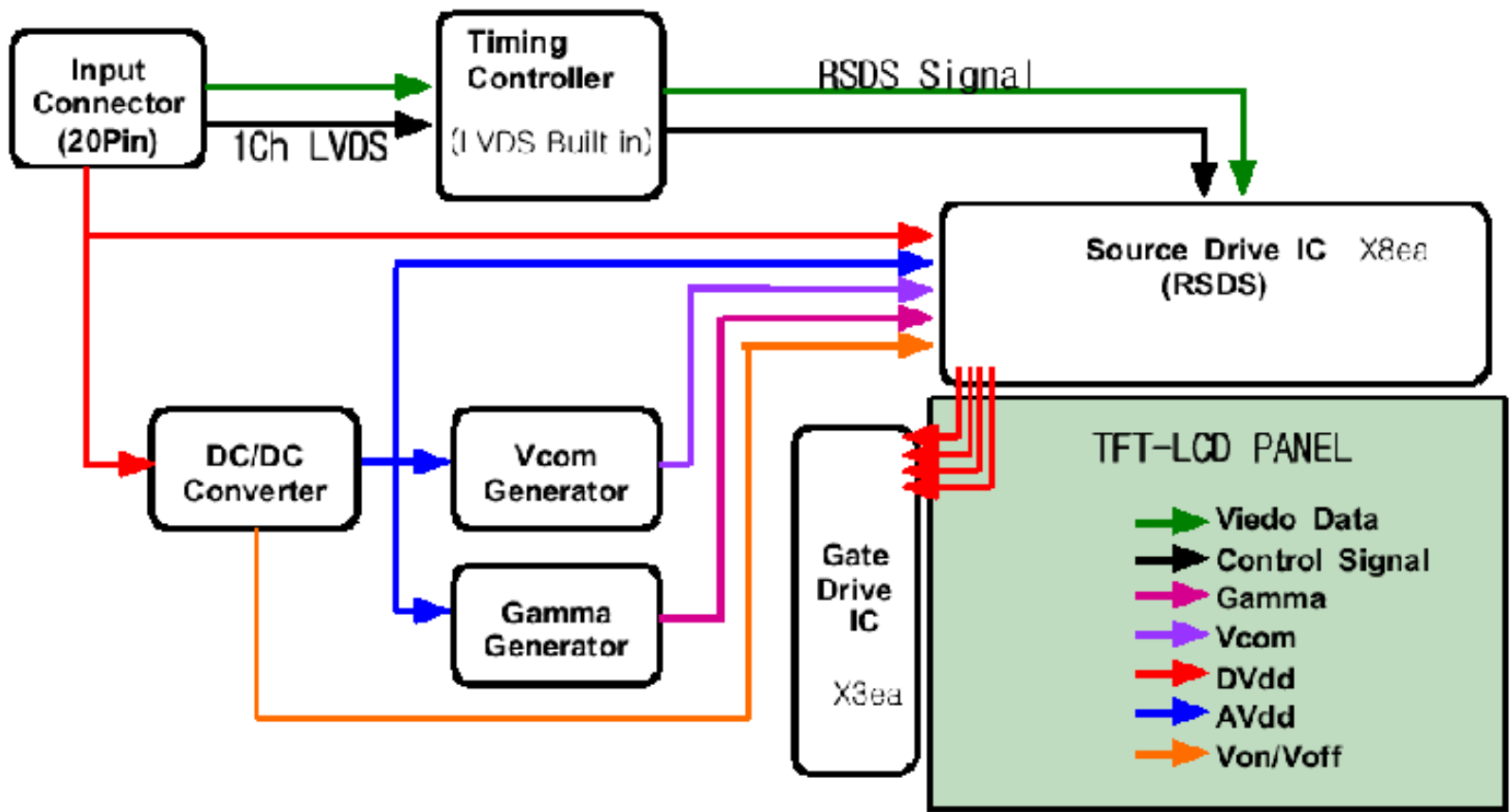
=> All protection (OVP/OCP) of Panel work as a Auto Recovery Mode.

The power rework again automatically even If the Protection shortly operating.

However, As an exception, Thermal Protection is working when Power off for the discharge and on.

It is operate by function of internal power IC.

# 12. Panel part

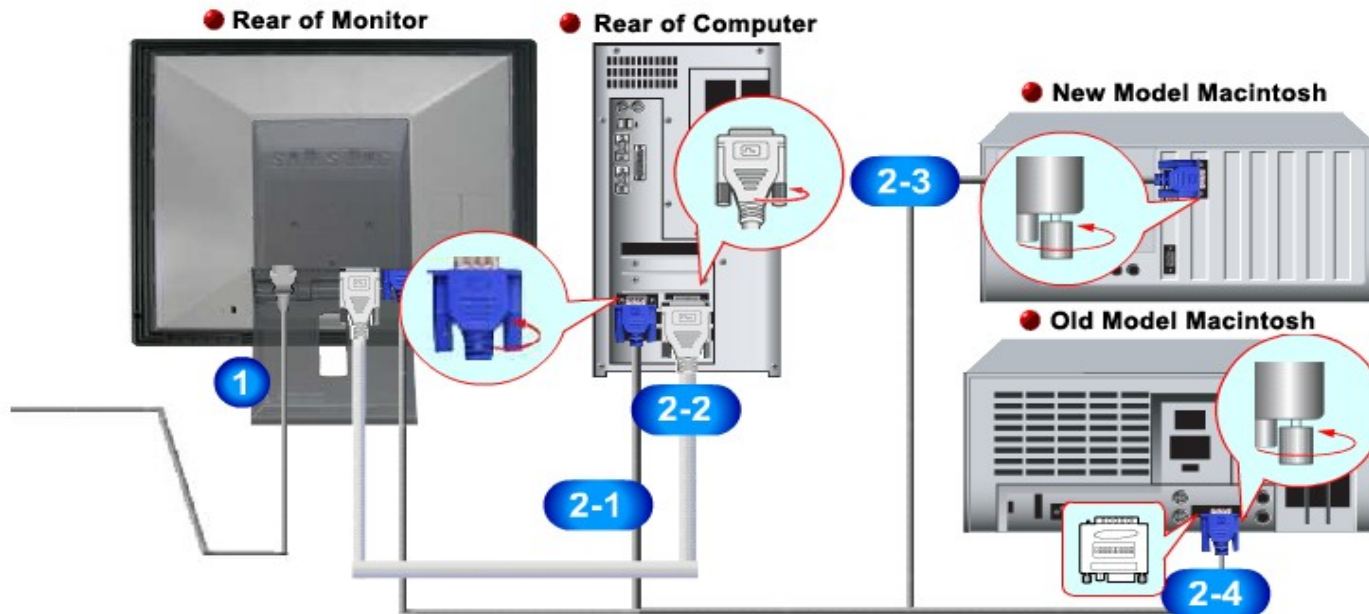


# 13. Trouble Shooting

## ❖ Checking points before trouble shooting

- **Power condition and Cable connected condition**
  - . Power Cable and signal Cable connected status check
  - . Function Key operating check
- **checking points and complementary measures before trouble shoot.**
  - . Resolution : 1024 x 768/60Hz
  - . Auto execution
  - . Return to Factory Mode
    - => Push the Menu Button and Enter(Source) Button for 5 seconds at the same time
    - Then it goes to factory mode.
- **Other sample check points**
  - . If the Lamp on / off for few seconds when power on,  
The IP board/Panel Lamp may have a problem.
  - . If the LED does not work, IP Board/Micom/Function Block have a problem.

Connecting the Monitor



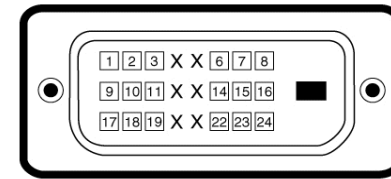
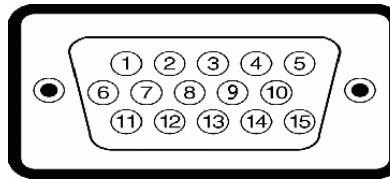
1. Power connect : 220V or 110V power cord to connect .(The voltage automatically adjusted.)
2. Connect to computer
  - 2-1) To connect to computer d-sub interface via given d-sub signal cable.
  - 2-2) To connect to computer DVI interface via DVC signal cable .
3. with connecting all cable.
  - If the computer connect to D-sub and DVI cable at the same time , Then the screen may not displayed based on graphic card.
  - If the screen is not displayed with DVI cable, Please push the source change button.

# Assignments)

The monitor can do self test if the cable is disconnected.

## 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 -

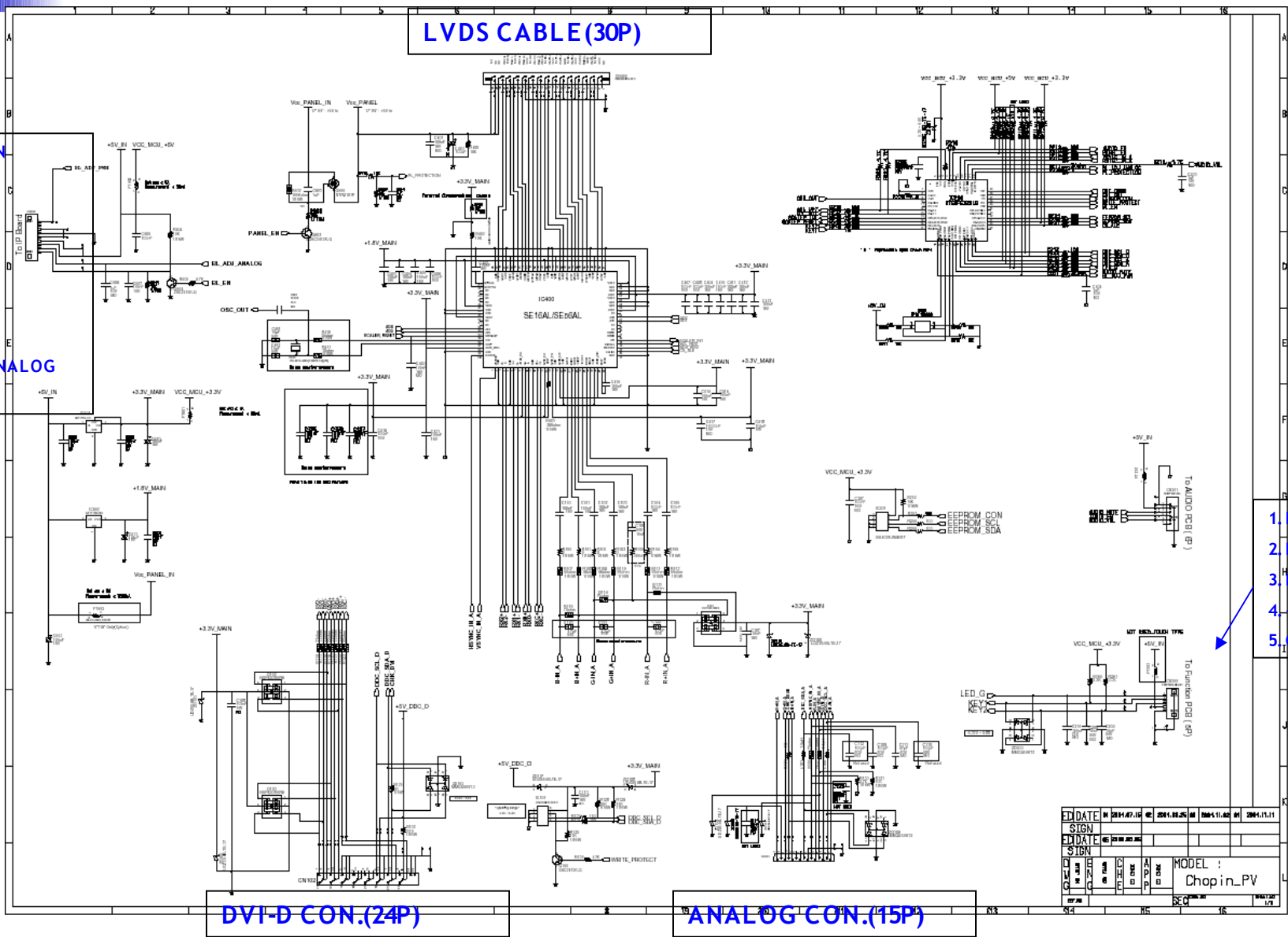
Mode)

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
IBM, 640 x 480	31.469	59.940	26.175	+/-
IBM, 720 x 400	31.469	70.087	28.322	-/+
VESA 640 x 480	37.5	75	31.5	-/-
VESA 800 x 600	37.879	60.317	40.0	+/+
VESA 800 x 600	46.875	75.0	49.5	+/+
VESA 1024 x 768	48.363	60.004	65.0	-/-
VESA 1024 x 768	60.023	75.029	78.750	+/+
VESA 1280 x 1024	63.981	60.020	108.00	+/+
VESA 1280 x 1024	79.976	75.025	135.0	+/+
SUN 1280 x 1024	81.129	76.106	135.00	-/-

# 17. Schematic Diagram(Main)

- 1. BL\_ADJ\_EN
- 2. NC (13V)
- 3. GND
- 4. GND
- 5. GND
- 6. 5V
- 7. 5V
- 8. BL\_ADJ\_ANALOG
- 9. BL\_EN

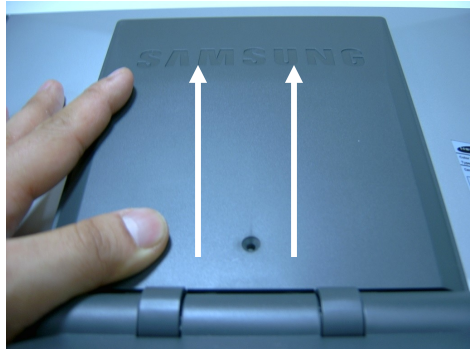
- 1. LED\_G
- 2. KEY1
- 3. KEY2
- 4. +5V-IN(not used)
- 5. GND



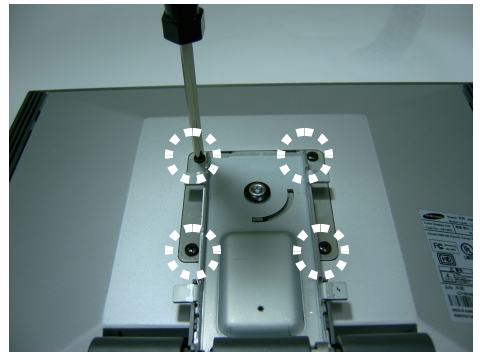
# 18. Disassemble / Assemble\_1

**Caution :**

- 1. Please the power off, before disassemble the monitor.
- 2. Please do not use other jig except given jig when disassemble.
- 3. Please disassemble based on given process as below.
- 4. Back cover open JIG : BH81-00001A



1. The monitor puts on the cushion and remove a screw on VESA cover.



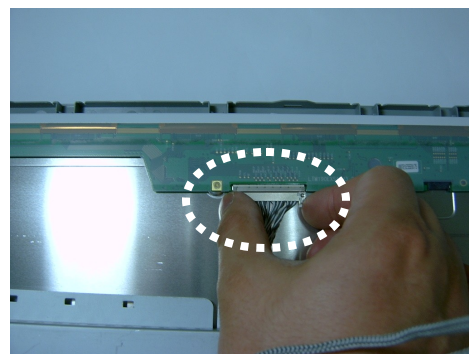
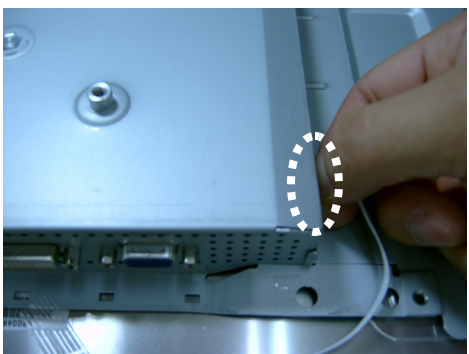
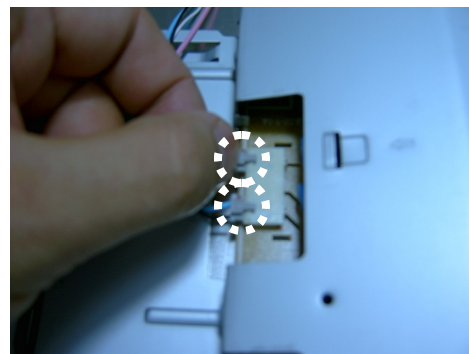
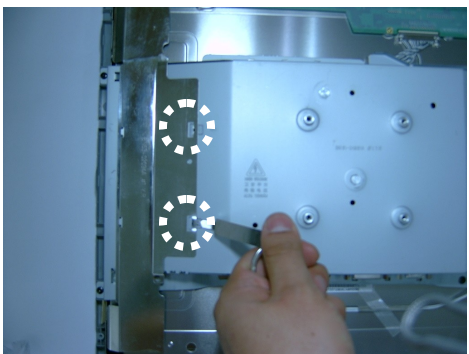
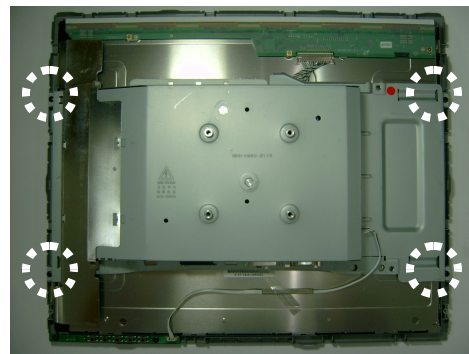
2. Pull up the VESA cover and remove it.

3. Remove 4 screws from Stand and Cover.

4. Remove 2 screws from Front cover and Back cover

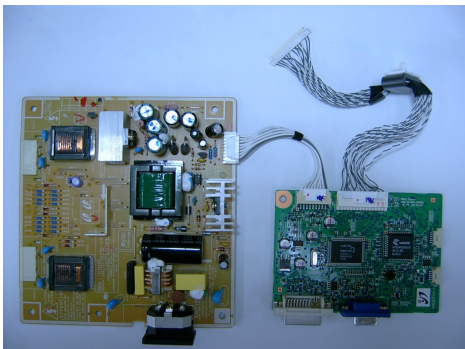
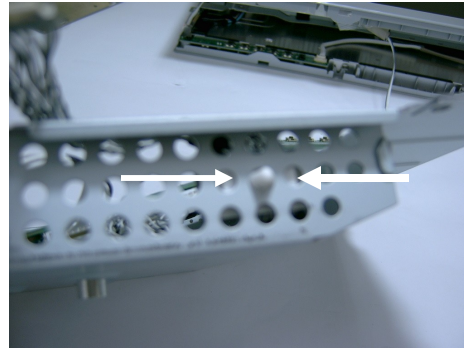
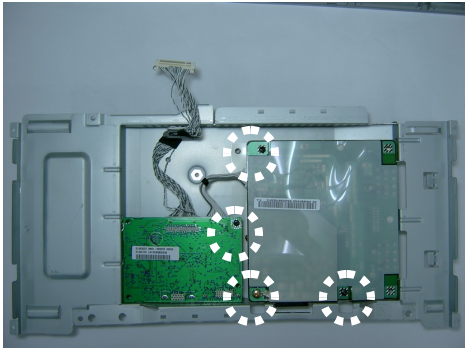
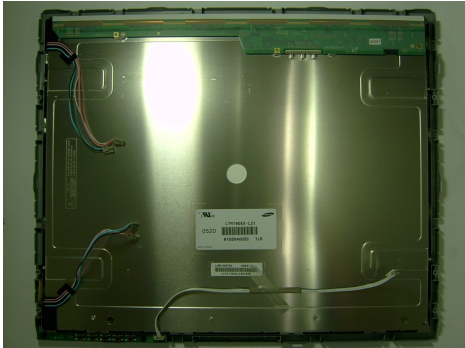


# 18. Disassemble / Assemble\_2



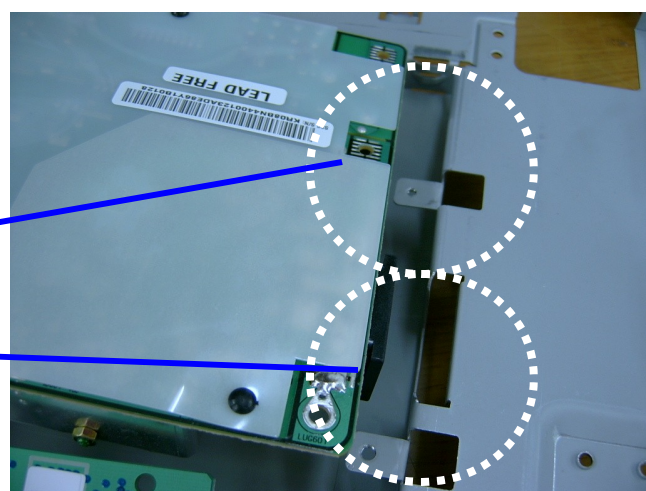
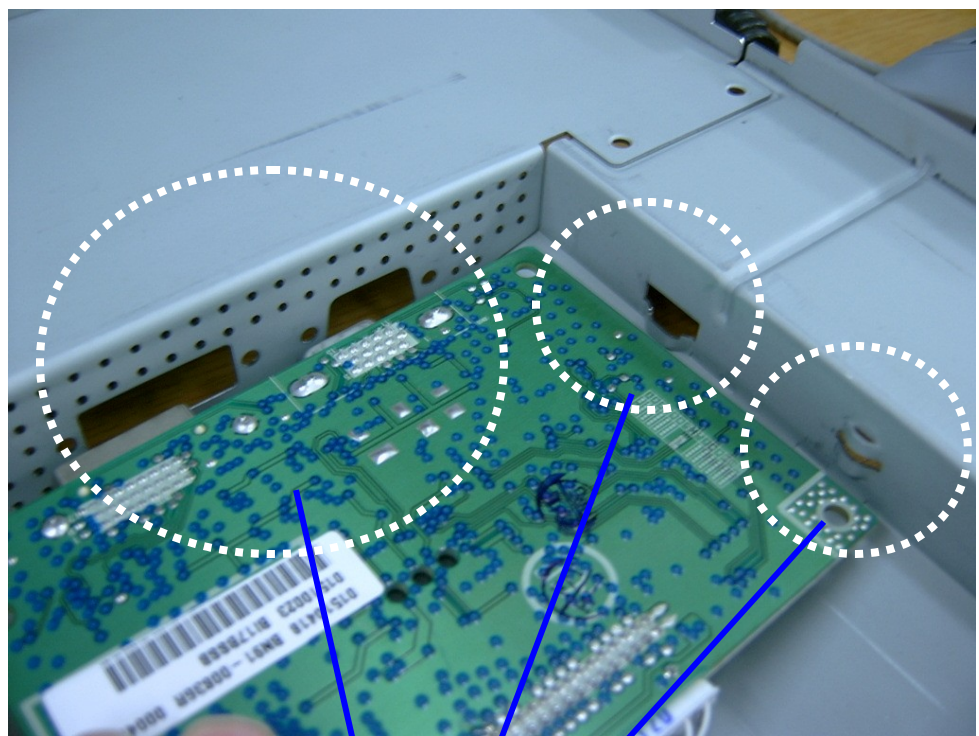
5. Disassemble the back cover using the Jig
6. Remove 4 screws from Front cover and Shield
7. Remove a TCO Shield using the JIG.
8. Disconnect 4 Lamp Wire and Wire.
9. Disconnect a FUNCTION Wire from PCB ASS'Y.
10. Disconnect a LVDS Wire from Panel.

# 18. Disassemble / Assemble\_3



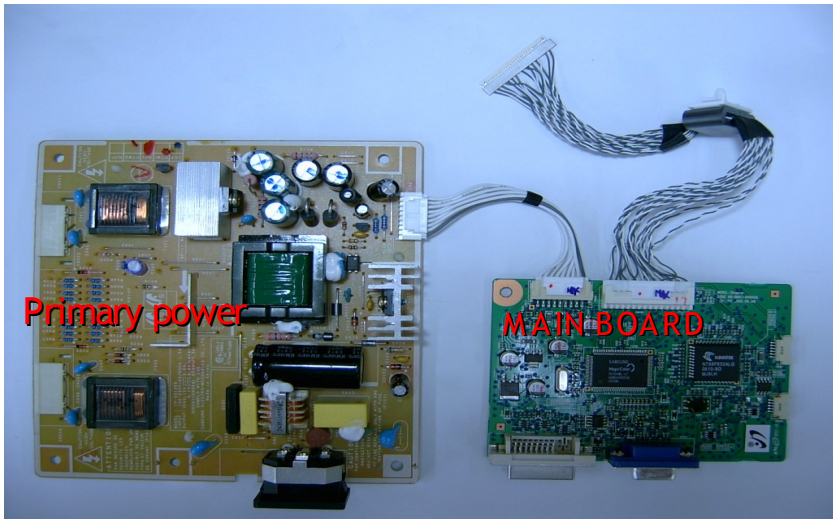
11. Disassemble the PBA from the Front Cover and LCD PANEL.
12. Remove 4 screws from PBA board and Disconnect the Main board and IP board from PCB bracket as picture.
13. Push a LVDS clamp on Bracket as picture and disconnect a PCB .
14. Totally disassembled PBA board.

# Assemble(A ss'y)\_1



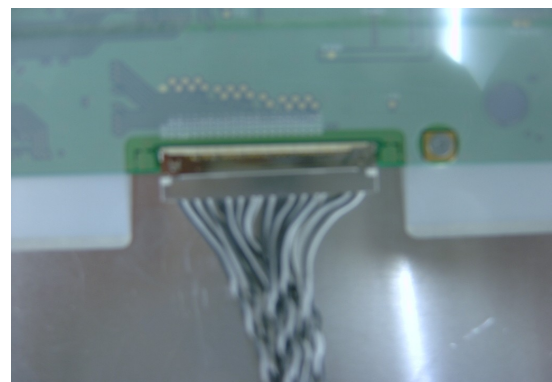
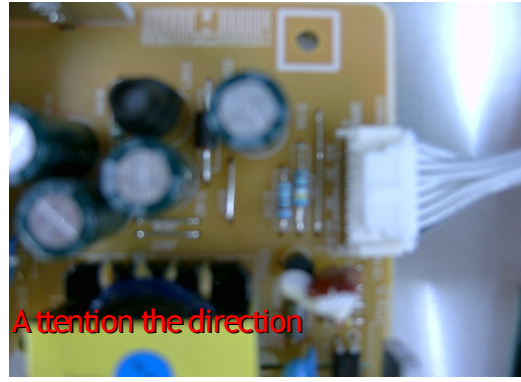
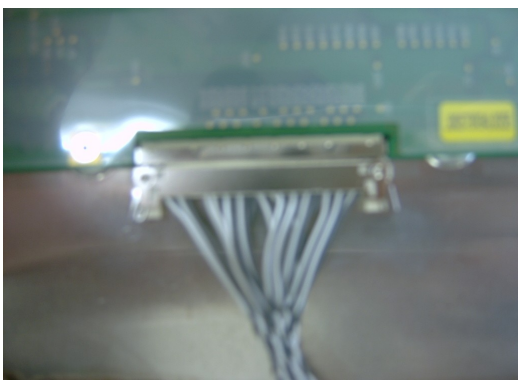
Assemble to match a HOLE

# Assemble(A ss'y)\_2



19" LVDS HARNESS

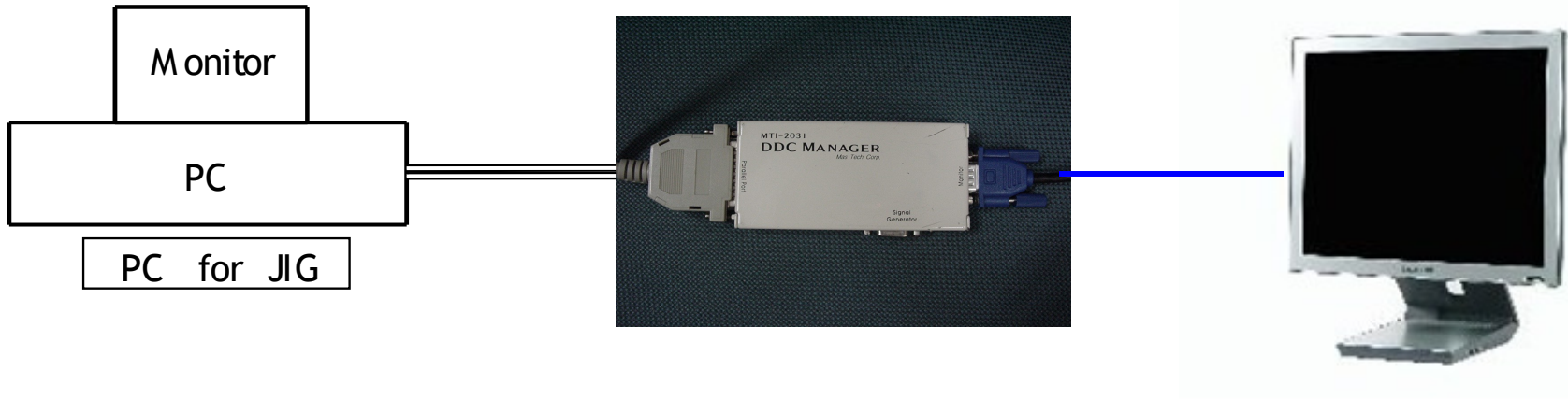
17" LVDS HARNESS



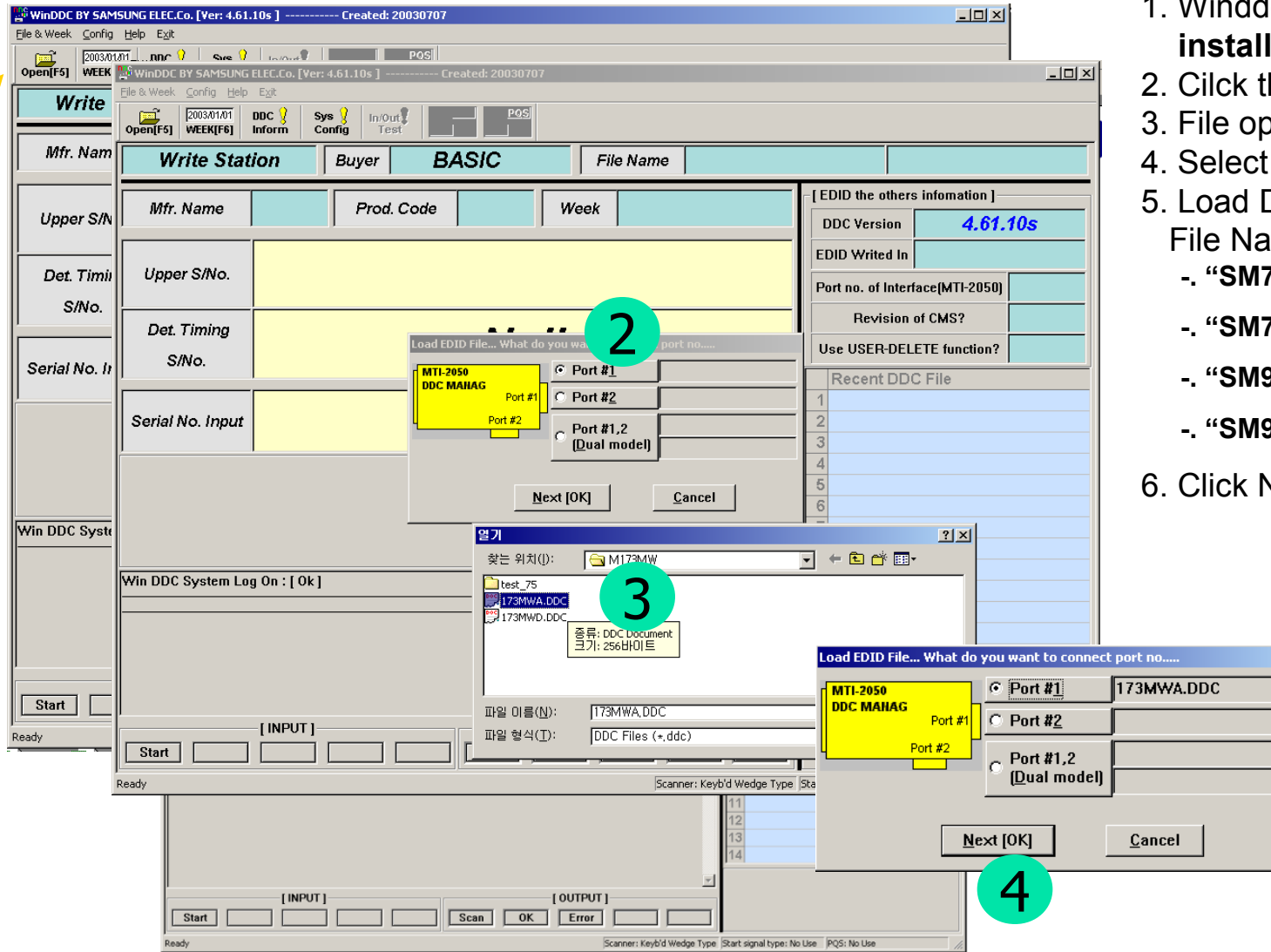
# 19. DDC Input Method

After change a Main Board ,DDC input shpuld be done via DDC control JIG.

Connecting method is refer to below picture.



# 20. DDC Input Method



1. Winddc.exe Program **install in PC**
2. Click the Winddc icon.
3. File open.
4. Select Port#1
5. Load DDC file  
File Name  
  - "SM750BA.ddc"
  - "SM750BD.ddc"
  - "SM9500BA.ddc"
  - "SM9500BD.ddc"
6. Click Next(OK) button.

# DDC Input Method



The screenshot shows the WinDDC software interface. The main window has a title bar "WinDDC BY SAMSUNG ELEC.Co. [Ver: 4.61.10s] ----- Created: 20030707". Below the title bar is a menu bar with "File & Week", "Config", "Help", and "Exit". A toolbar contains icons for "Open[F5]", "WEEK[F6]", "DDC Inform", "Sys Config", "In/Out Test", and "POS".

The main area is divided into several sections:

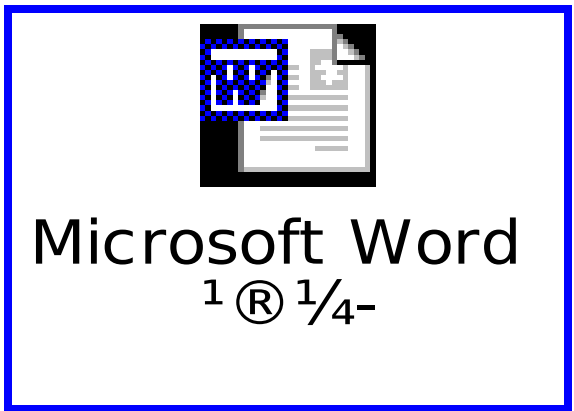
- Write Station:** Buyer: SAMSUNG, File Name: SM 930BA
- Mfr. Name:** SAM, Prod. Code: CB00, Week: 47th of 2003
- Upper S/No.:** SM 950B
- Det. Timing S/No.:** H1AK500000
- Serial No. Input:** H1AK500010 (with a green circle around the number 5), CheckSum: 0x6D
- Recent DDC File:** A list with 14 rows. Row 1 contains "#1: 173MWA.DDC,#2".
- Win DDC System Log On:** [ Ok ]
- Log Window:** [Load File] The Analog File: 173MWA.DDC  
[Week Input] 47th of 2003 (11/19)
- Buttons:** [ INPUT ] Start, [ OUTPUT ] Scan, OK, Error

The status bar at the bottom shows "Ready", "Scanner: Keyb'd Wedge Type", "Start signal type: No Use", and "PQS: No Use".

**5: Input a monitor serial number  
and push the enter key.**  
**After Analog input,  
Please do # 2 ~ 5 when digital input.**

## method

- Micom setting method when Main Board and Panel exchange.
- New Micom Program Down Loading method.



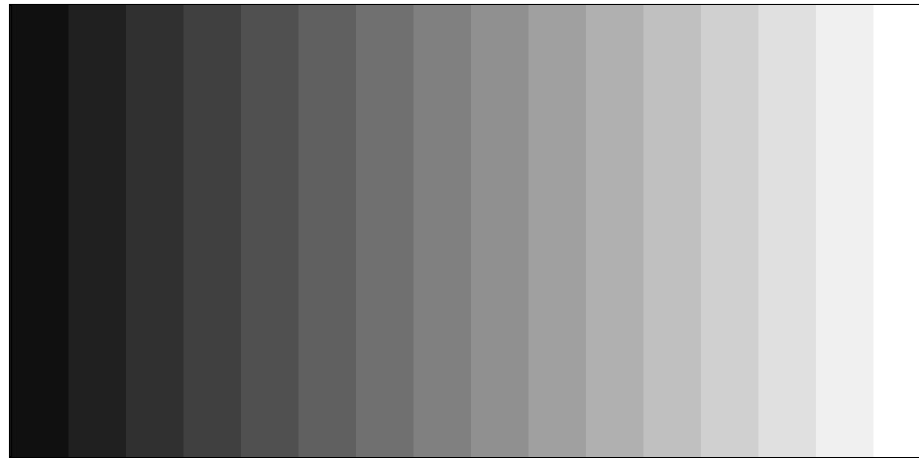


# Auto Color Calibration

SAMSUNG

## Auto Color

- Please use a PC analog ( 1024X768@60 ) or MSPG-3240L.



PC Analog adjust pattern(16 GRAY)

- Push a menu key for 5 seconds in OSD Language English.

# Monitor self -test

- Self-Test function and purpose.
- The function is for checking the MONITOR itself defect status, The purpose is to reduce a customer NDF claim call.
- Self-TEST method and judge.
- To judge a right or not to push a menu key in DPMS condition.

**TEST GOOD**

# Service Mode/Safe Mode

## ❖ Service Mode

- Please make a “0” of Brightness and Contrast value .
- Please push a Enter(Source) key form 5 seconds.
- The SVC Function OSD shown.
- Push the power off , to escape from the SVC Function

## ❖ Safe Mode

- If the input frequency is higher than supported frequency of product, It gives a time to control the video card setting to go recommended mode. This model support a **UXGA/60Hz,75Hz. The screen displayed as a downscaling condition for 1 minute.** However, If the input frequency is higher than **85Hz ,** **The monitor goes to Sync Out of Range** in order to protect a panel damage.

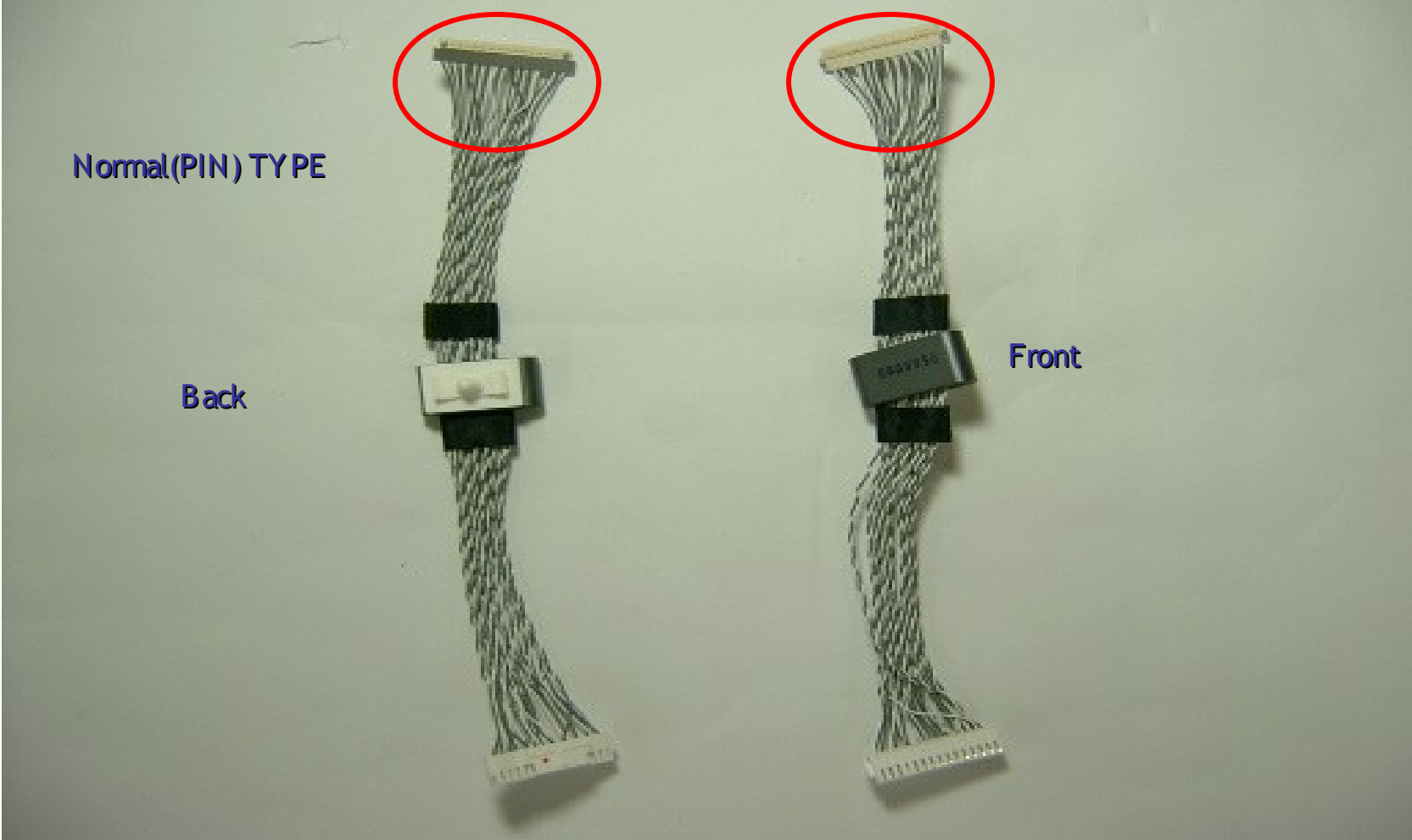
# board.

- PC color adjust condition check.
- DDC input (Analog, Digital input required)
- Push a power off / on after input a value of each model on inch divide  
Character 0xC5h
  - 17 inch : 0xC1(AMLCD LTM170EX-L21)
  - 19 inch : 0xC2(AMLCD LTM190EX-L21)
- Push a Hard power after service mode and reset.

# Harness Type □ □

## 17" LVDS HARNESS

### 1.NORMAL TYPE HARNESS feature



# Harness Type □ □

## 19" LVDS HARNESS 2. LOCKING TYPE HARNESS Feature

