

HUBBLE(275T) TFT LCD Monitor

**Samsung Electronics
Visual Display Div. R&D team**

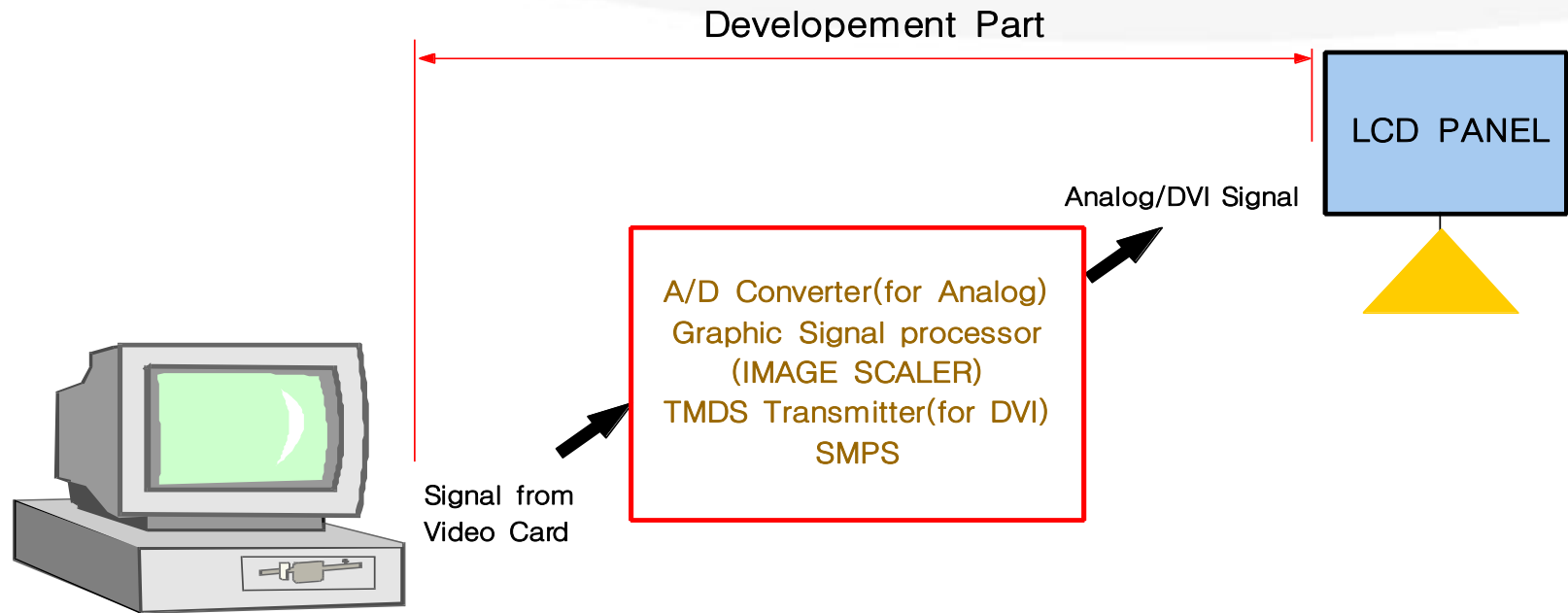
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1. LCD Monitor Structure



2. HUBBLE (275T) Structure (1)



- 1) POWER S/W, POWER IN
- 2) DVI-IN, RGB IN
- 3) VIDEO / S-VIDEO / AUDIO POWER
- 4) USB UP / DOWN
- 5) COMPONENT IN (Y, Pb, Pr)

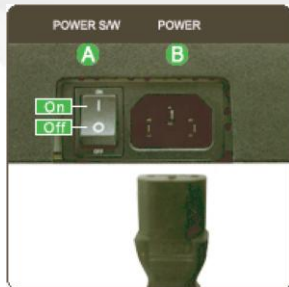
- 6) Kensington Lock
- 7) Stand Stopper

2. HUBBLE (275T) Structure (2)



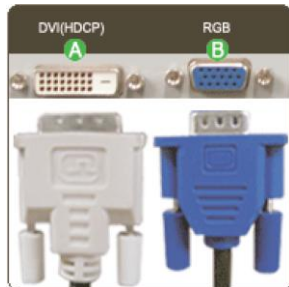
- 1) MENU Button : OSD menu open / OSD menu exit / return upper menu
- 2) Magic Bright Button
- 3) Brightness Button: Hot key to control the brightness when OSD isn't displayed
- 4) SOURCE / ENTER Button : Source change / select OSD menu
- 5) AUTO Button : auto adjustment button
- 6) PIP Button : PIP activation / deactivation button
- 7) Power switch / LED

2. HUBBLE (275T) Structure (3)



1) POWER

A : POWER S/W – monitor power On/Off
B : POWER IN – Power Cord connect



2) PC In

A : DVI(HDCP) – DVI Cable connect
B : RGB – D-Sub Cable connect



3) Video In

A : VIDEO – external input connect
B : S-VIDEO – external input connect
C : AUDIO POWER – Speaker Power connect



4) USB 2.0 :

UP – connect to PC with USB cable
DOWN – connect to other devices with USB cable



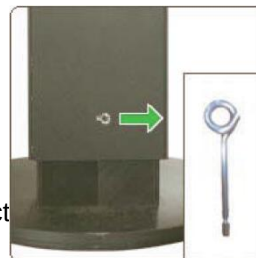
5) COMPONENT IN

: Y, Pb, Pr – DVD/DTV video input



6) Kensington Lock

A protection against the burglars in the public area



7) Stand Stopper

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3. Specification (1)



Model

275T

Analog, Digital, Video, S-Video

Improved Response Time by Adopting 16ms

Support Magic Color Pro

Magic Color, Color Tone, Gamma, 6-Color

Support PIP when the sources are Analog and Digital

Magic Bright

Magictune premium installed

Support Component Video

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3. Specification (2)



Model

275T

Key Specification	
Screen Size	27"
Maximum Resolution	1920*1200@60Hz
Colors	16.7M
Brightness	500cd/m ²
Contrast	1000:1
Horizontal Frequency	30~81kHz
Vertical Frequency	56~75Hz
Applicable Max Frequency	154MHz
Viewing Angle	178°/178°
Response Time	16ms(W to B) 6ms(G to G)
Signal Input	Analog / Digital (15pin D-sub / DVI-D (single link)) / AV / S-VIDEO / Component
Power Consumption	150 Watt (Max)
Others	USB 2.0 (1 UP, 4 Down)

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3. Specification (3)



Model

275T

Key Specifications	
Stand	HAS STAND
Height Adjustable	80mm
Tilt (forward / backward)	-3° / 25°
Swivel (left / right)	45° / 45°
Cabinet Color	Silver / black
Power Supply	SMPS
Emissions Standard	TCO '03
Wall-Mountable	VESA (200mm x 100mm)
Custom-Mountable	o
Mac & Linux Compatibility	o

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3. Specification (4)

Basic Standard for Video System	
Operating System	NTSC-3.58/4.43, PAL-M/N
Sound Operating System	None
Video Source Input	CVBS, S-Video, Component input(Y,Pb,Pr) (480p, 576p, 720p@50Hz, 60Hz, 1080i@50Hz, 60Hz)

Panel	
Display Area	581.76(H) x 363.6(V) (27.0 inch diagonal)
Display Element	a-si TFT active matrix
Model	LTM270M1-L01 Only this panel is available for 275T

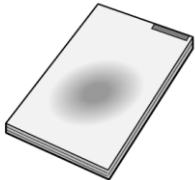
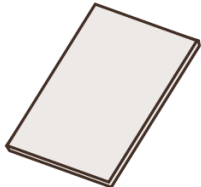
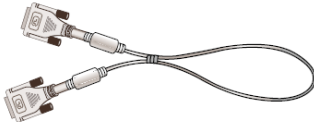
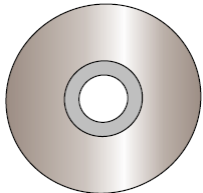
3. Specification (5)

- Compatibility Verified Video Card

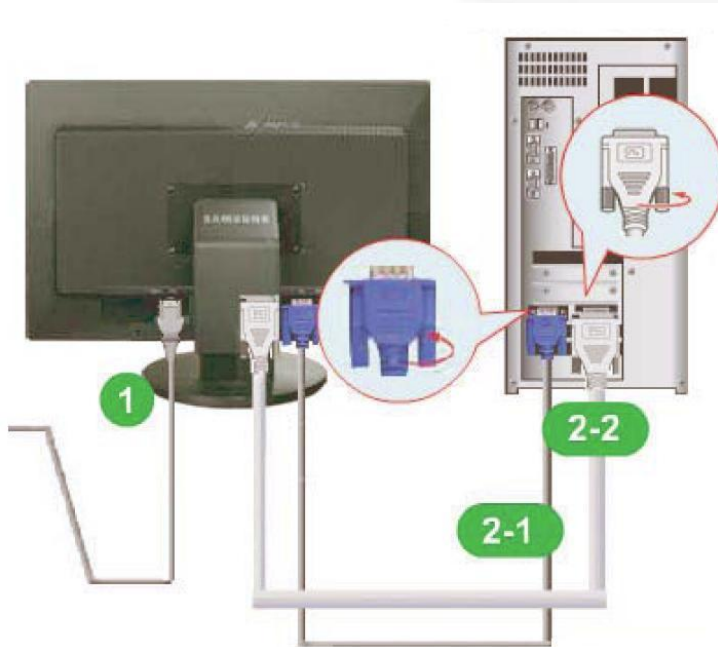
No	Chip Maker	Card Name / Manufacturer
1	ATI	Radeon 9550 / Evertop
2	ATI	Radeon X800Pro / ATI
3	nVIDIA	Geforce FX5700LE / Rextech
4	nVIDIA	Geforce 7600GS / Leadtech
5	nVIDIA	Geforce 6600GT / ASUS
6	Matrox	Millennium G550
7	Intel	i915G / IBM

3. Specification (6)

■ Accessories

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

4. HUBBLE (275T) 연결



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.

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.

Ref. : HDCP



- the word frequently shown on the specification of digital display device in these days
- HDCP : High-bandwidth Digital Content Protection, Copyright protection standard
- Copy is available in analog base, but the quantization noise occurs in the quality of video and audio theoretically.
- The restriction is urgently needed because the copy is same as the source in digital base.
- So, HDCP supports DVI interface fundamentally in digital display
- The pirate edition can be prevented.

5. OSD Control (1)

(1) Input



(2) Picture



(3) Magic Color Pro



(4) PIP



(5) Setup



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5. OSD Control (2)

(1) Input : Source List → Analog / Digital / Video / S-Video / Component
Edit Name → To create an equipment name of each input

(2) Picture

*. Analog / Digital source

MagicBright → Custom / Text / Internet / Game / Sports / Movie / Dynamic CR

Custom → Contrast / Brightness

Image Lock → Coarse / Fine / Sharpness / H-position / V-Position

(Inactivity in Digital Input)

Auto Adjustment → Auto Adjustment execution

(Inactivity in Digital Input)

SIZE → Wide / 4:3

PIP Picture → Inactivity in PIP execution. PIP adjustment Menu

Contrast / Brightness / Sharpness / Color / Tint

*. Video / S-Video / Component source

Picture Mode → Dynamic / Standard / Movie / Custom

Custom → Contrast / Brightness / Sharpness / Color / Tint

(No Tint on the PAL title)

Size → Panorama / Zoom1 / Zoom2 / Wide

Film Mode → Off / On

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

5. OSD Control (3)

(3) Magic Color Pro

Magic Color → Off

Intelligent : Color Enhancement except skin tone

Full : Color Enhancement with skin tone

Demo : Displayed Intelligent and off condition.

Color Tone → To control color temperature with 6 steps

Cool4 / Cool3 / Cool2 / Cool1 / Normal / Warm1 / Warm2

Gamma → 9 steps Gamma control

(Inactivity in Video / S-Video /Component input)

6-Color → To control the each 6 colors

Saturation : Red / Green / Blue / Cyan / Magenta / Yellow

Hue : Red / Green / Blue / Cyan / Magenta / Yellow

Reset : Color returns the factory saved condition.

(4) PIP : Activity only in Analog /Digital

PIP → On / Off

Source → Video / S-Video / Component 

Size → PIP size change.

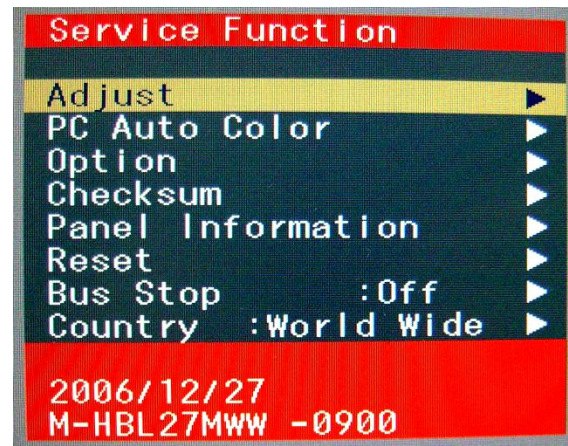
Position → PIP position change. (Activity only to select Size 1,2) 

5. OSD Control (4)

- (5) Setup : Language → To support 11 languages
Transparency → OSD transparency degree
 High / Medium / Low / Opaque
Blue Screen → To display the Blue screen mark in without Video / S-Video Source .
 (Inactivity in Analog / Digital input.)
 Off / On
Reset → Image Reset (Inactivity in Digital Source)
 Color Reset

*. 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 cab be displayed.



6. Specification Comparison

모델	275T	244T
외형		
Screen size	27"	24"
Brightness	500 cd/m ²	500 cd/m ²
Contrast	1000:1	1000:1
Response Time	16ms	16ms
Input Source	Analog/Digital/Av/S-Video/Component Video	Analog/Digital/Av/S-Video/Component Video
Magic Color	O	O
Magic Pivot	X	O
Magic Tune	Premium	4.0 Version
6-Color	O	O
Magic Bright	7 steps (Text / Internet / Game / Sports / Movie / Dynamic CR / Custom)	4 steps (Text/ Internet/ Entertain/ Custom)
Gamma	8 steps -0.2/ -0.1/ 0/ +0.1/ +0.2/ +0.3/+0.4/ +0.5/ +0.6	8 steps -0.2/ -0.1/ 0/ +0.1/ +0.2/ +0.3/+0.4/ +0.5/ +0.6
Color Tone	6 steps Warm2/ Warm1/ Normal/ Cool1/Cool2/ Cool3/ Cool4	6 steps Warm2/ Warm1/ Normal/ Cool1/Cool2/ Cool3/ Cool4

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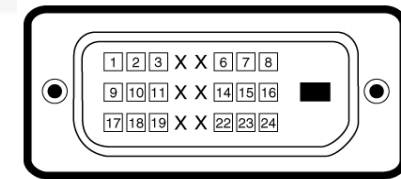
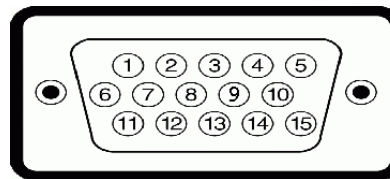
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7. Signal Connections and Pin Assignments

- If 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



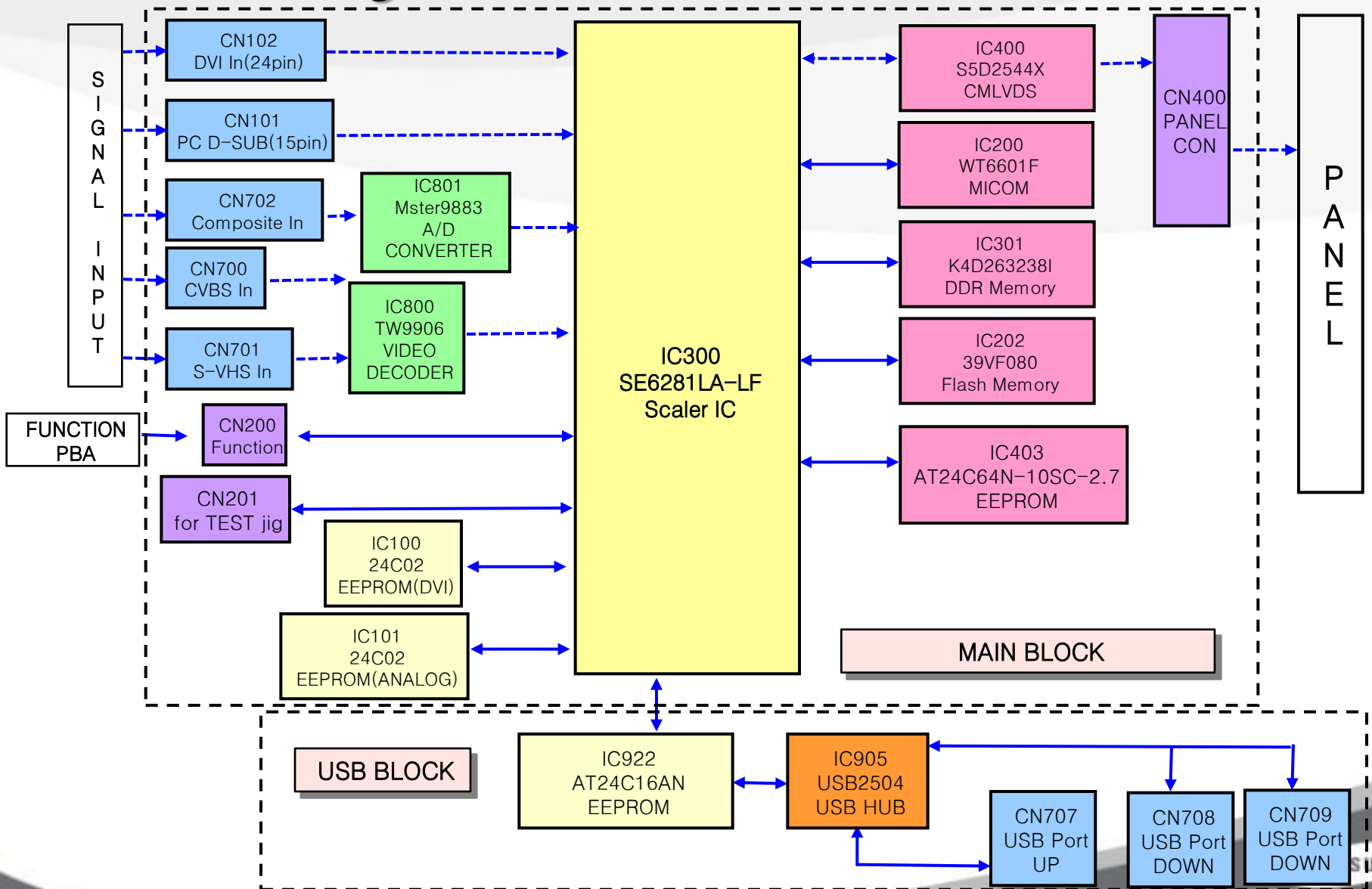
2. DVI-D connector

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 -

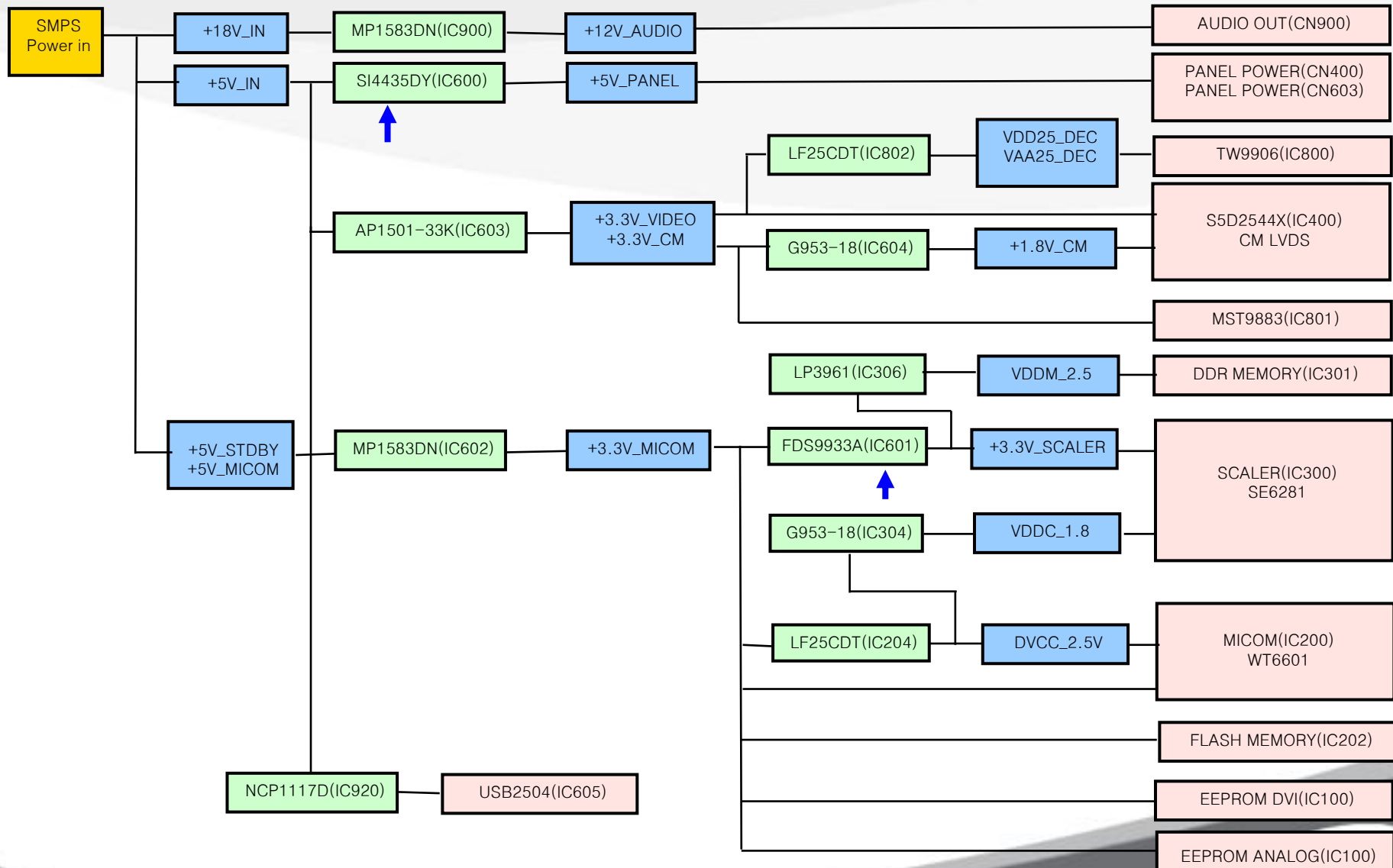
8. Display Modes

Display Mode		Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
Mac	640x480	35.000	66.667	30.240	-/-
Mac	832x624	49.726	74.551	57.284	-/-
IBM	640x350	31.469	70.086	25.175	+/-
IBM	640x480	31.469	59.940	25.175	-/-
IBM	720x400	31.469	70.087	28.322	-/+
VESA	640x480	37.500	75.000	31.500	-/-
VESA	640x480	37.861	72.809	31.500	-/-
VESA	800x600	35.156	56.250	36.000	+, -/+, -
VESA	800x600	37.879	60.317	40.000	+/+
VESA	800x600	46.875	75.000	49.500	+/+
VESA	800x600	48.077	72.188	50.000	+/+
VESA	1024x768	48.363	60.004	64.000	-/-
VESA	1024x768	56.476	70.069	75.000	-/-
VESA	1024x768	60.023	75.029	78.750	+/+
VESA	1280x1024	63.981	60.020	108.000	+/+
VESA	1280x1024	79.976	75.025	135.000	+/+
VESA	1600x1200	75.000	60.000	162.000	+/+
VESA	1920x1200	74.556	59.885	193.250	-/+

9. Block Diagram



10. Power Flow



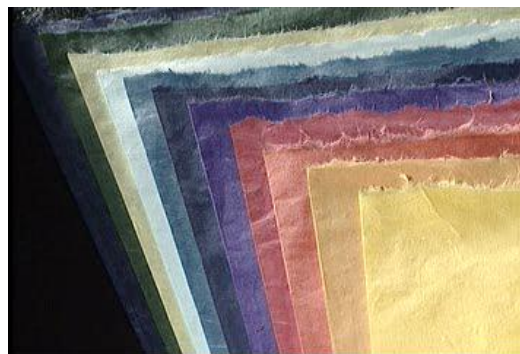
11. HUBBLE (275T) Features (1)

No	Feature	Description	Operating method
1	Auto Adjustment	If HUBBLE turns on in some resolution for the first time, it can execute Auto adjustment automatically for the high Quality.	
2	Auto Power on/off	HUBBLE can check the change of Source Automatically and change the source to the active Input.	
3	Wall mount	HUBBLE supports Wall mount.	
4	Gamma & Color temperature Fine Adjust.	HUBBLE supports 9-Step Fine Adjustment for Gamma & Color temperature.	Magictune Premium
5	Magic Bright	HUBBLE supports 7 different Brightness Modes. Text, Internet, Game, Sports, Movie, Dynamic CR, Custom.	Press Magic Bright key. Select Picture → Magic Bright on OSD,
6	Sharpness	Adjust the Sharpness.	Magic tune Premium

11. HUBBLE (275T) Features (2)

No	Feature	Description	Operating method
8	Magic Color	Off – Returns to the original mode. Demo – The screen before applying Magic Color appears on the right and the screen after applying Magic Color appears on the left. Full – Displays vivid natural color with clearness. Intelligent – Displays not only vivid natural color but also more realistic natural skin color with clearness.	Select Magic Color Pro on OSD.

Default



Magic Color

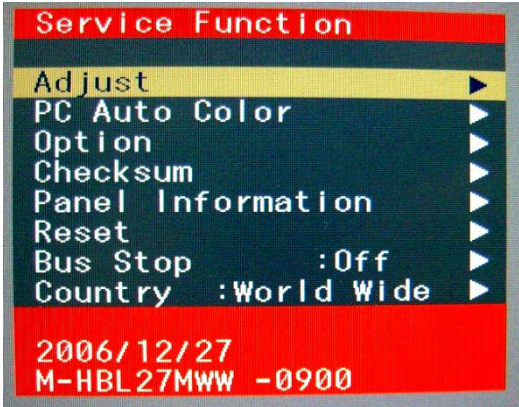


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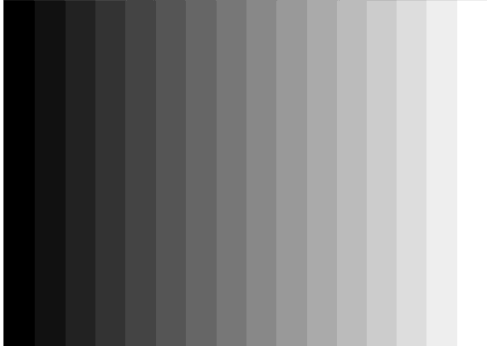
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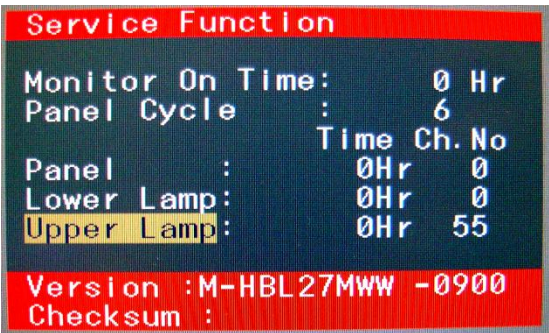
12. Service (Hot key) Function list (1)

No	Function	Operating Method
1	Hidden Service Function 	- . After setting in turn on to brightness and contrast '0' , push the 'menu' button more than 5 seconds. - . Service Function appear at left upper. - . OSD which the basic adjustment is added. 1) Adjust 2) PC Auto color 3) Option 4) Checksum 5) Panel Information 6) Reset 7) Bus Stop *. 2006/12/27: MCU firmware date. *. M-HBL27MWW-09000: MCU firmware version information (this information must be appended due to a compatibility problem report.)

12. Service (Hot key) Function list (2)

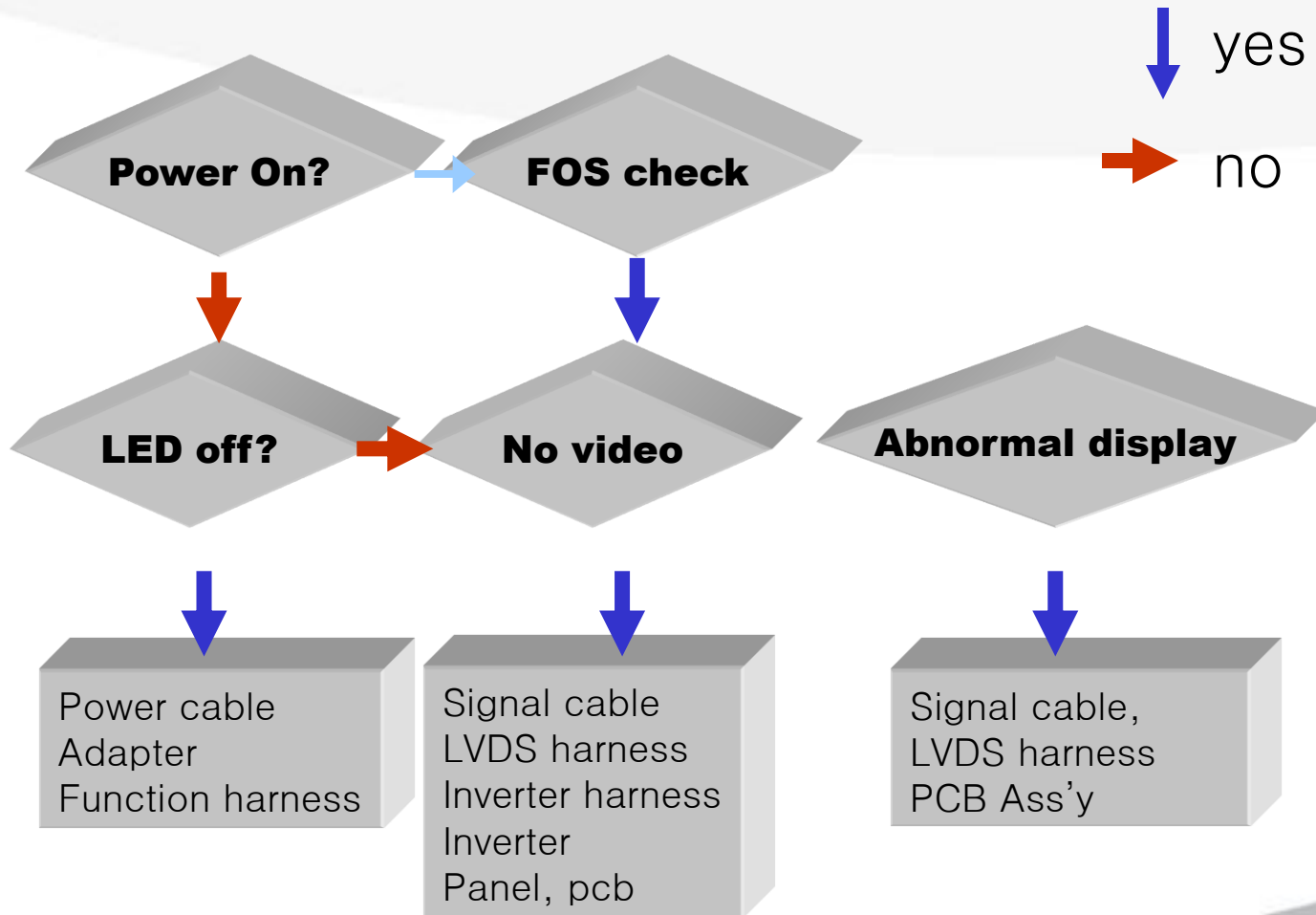
No	Function	Operating Method
2	Hidden Service Function  	Move to the (-) / (+) key, select the 'Enter' key. 1) Auto adjustment 2) PC Auto Color : in case that color of all screen is wrong, Execute the PC Auto color at 16 gray pattern of 1920*1200 60Hz  3) Option: Spread Step / Spread Span (for EMI test) 4) Checksum: MCU firmware checksum information (this information must be appended due to a compatibility problem report.)

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

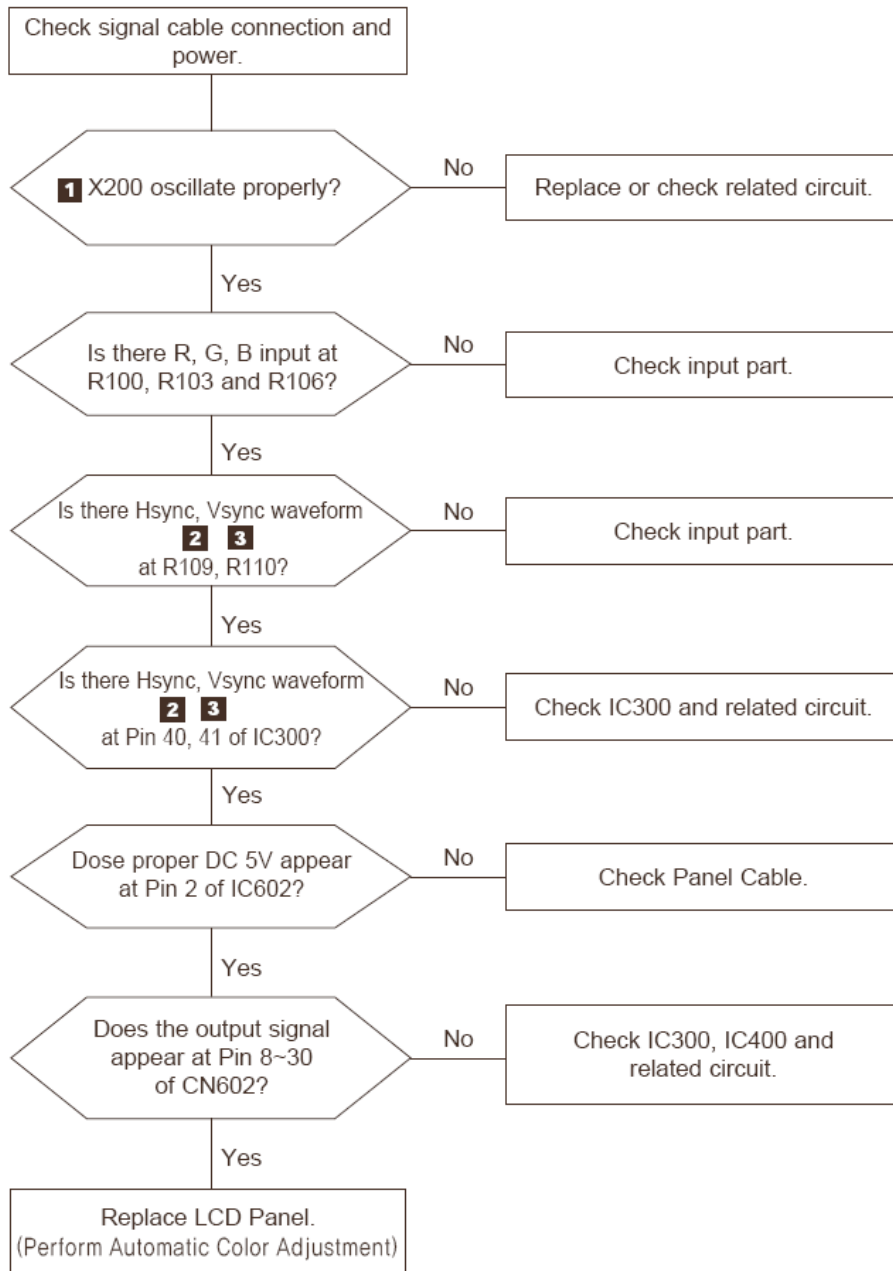
No	Function	Operating Method
3	Hidden Service Function *. When Panel Information selected  The screenshot shows a menu titled 'Service Function' with a red header. Below it, the following settings are listed: 'Monitor On Time: 0 Hr', 'Panel Cycle: 6', 'Panel: 0Hr 0', 'Lower Lamp: 0Hr 0', and 'Upper Lamp: 0Hr 55'. At the bottom, it shows 'Version: M-HBL27MWW -0900' and 'Checksum:'. The 'Upper Lamp' and 'Version' lines are highlighted in yellow.	5) Panel Information various function are included in information. ☐ Monitor On Time : Power On Time ☐ Panel Cycle : Panel On/off time (Power off, Mode change, DPMS on/off ...) ☐ Panel : Panel on Time (when the panel is changed , select the Reset) ☐ Lower lamp : Lower lamp on time (when the Lower lamp is changed , select the Reset) ☐ Upper lamp : Upper Lamp on time (when the Upper Lamp is changed , select the Reset) 6) Reset: Factory reset 7) Bus Stop: The communication Line ON / OFF

13. Troubleshooting

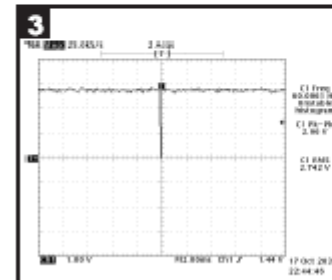
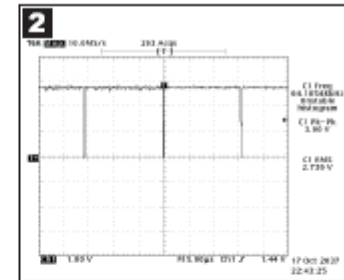
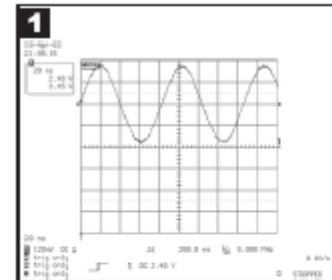
■ Problem Checking Process



4-2 No Video (ANALOG)



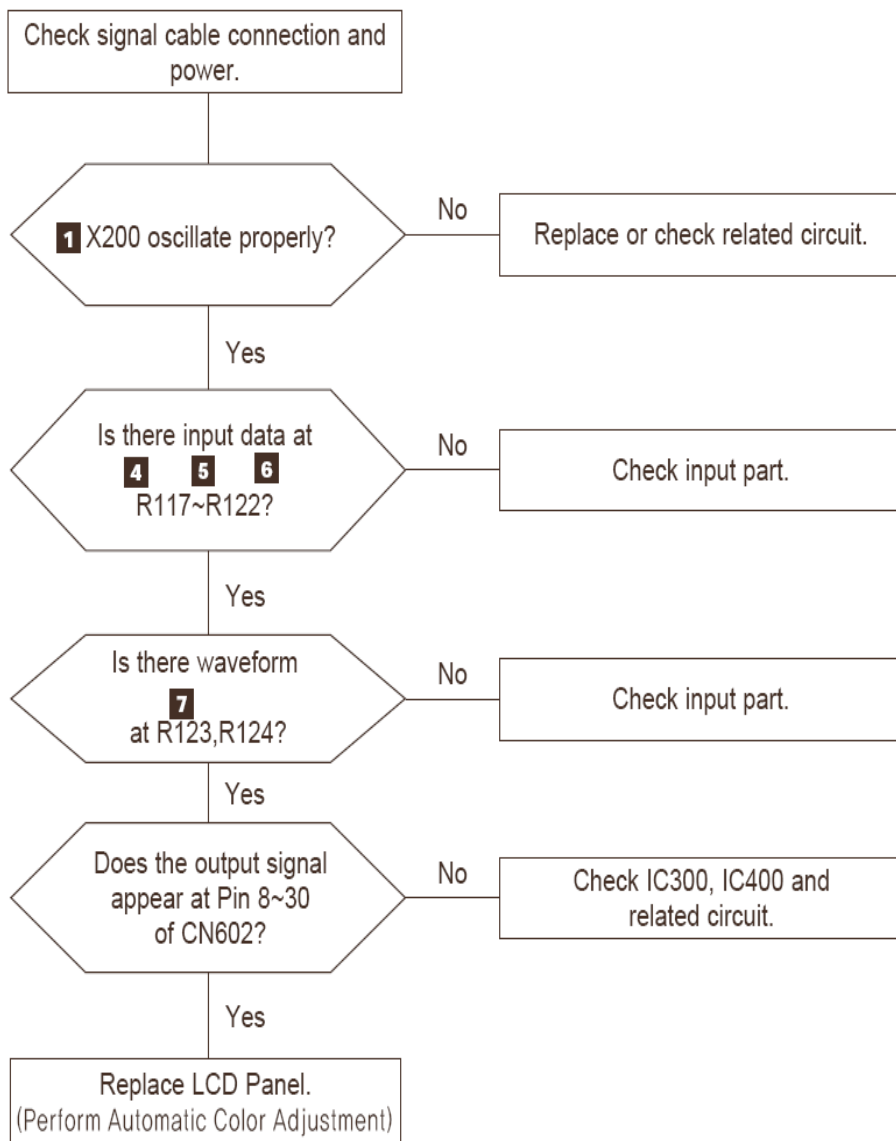
파형도



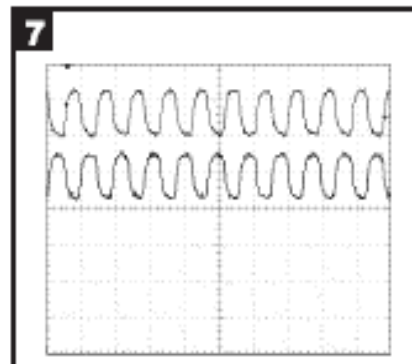
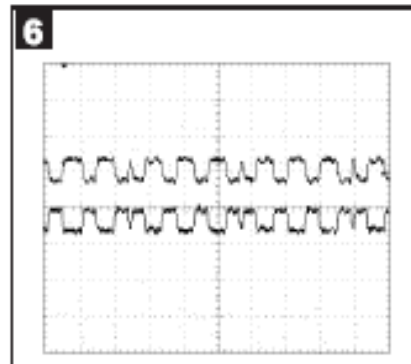
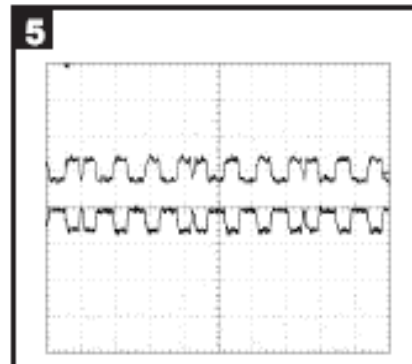
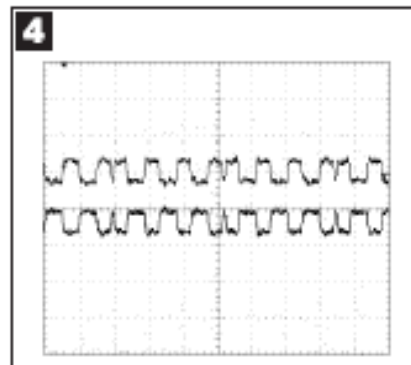
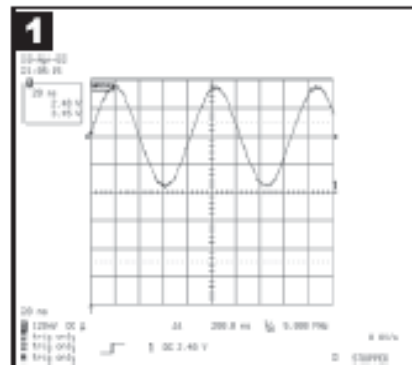
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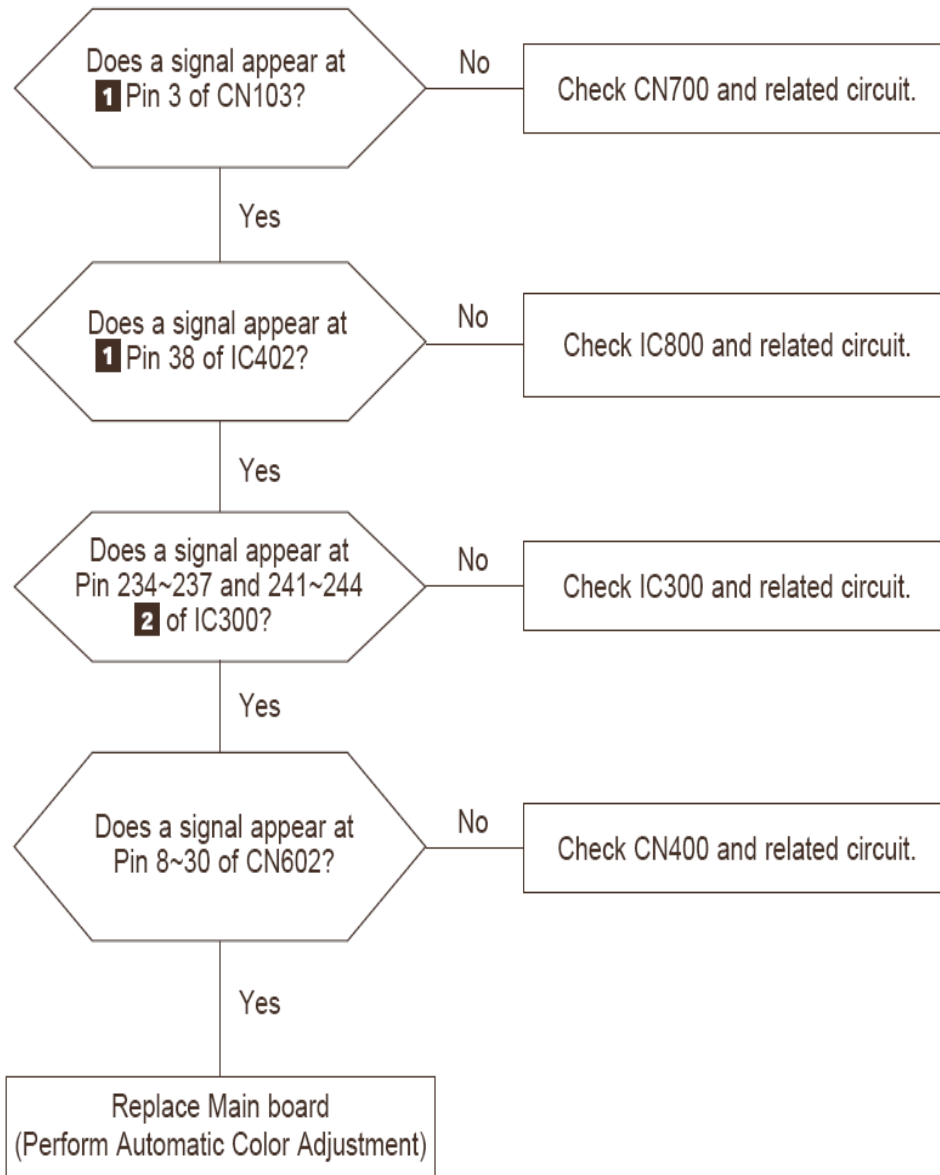
4-3 No Video (DIGITAL)



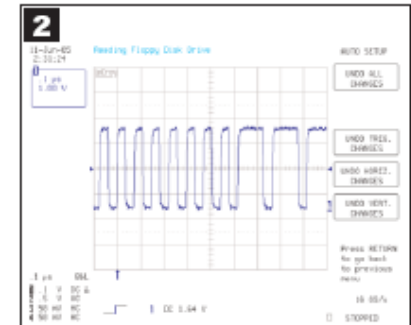
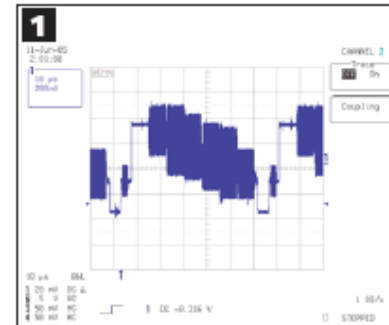
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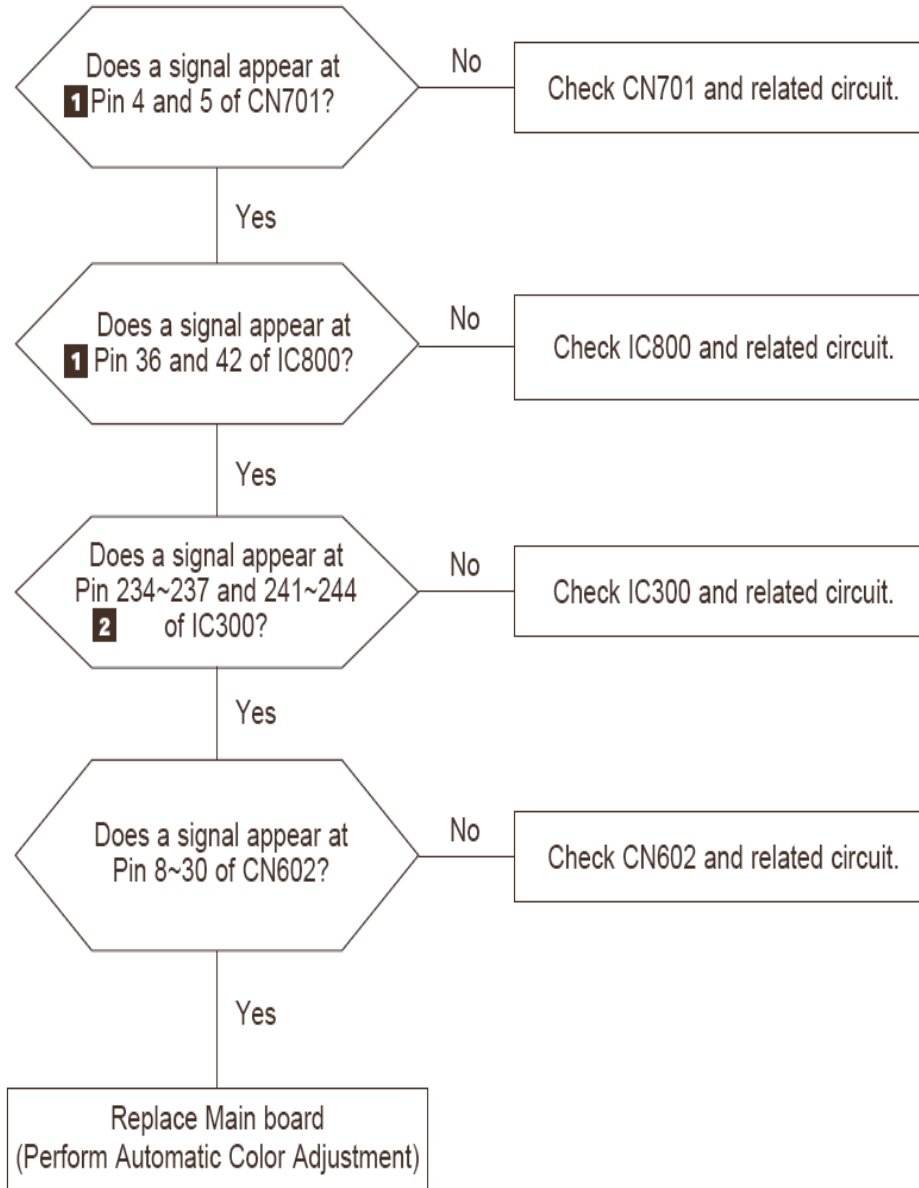
4-4 No Picture (Video Signal)



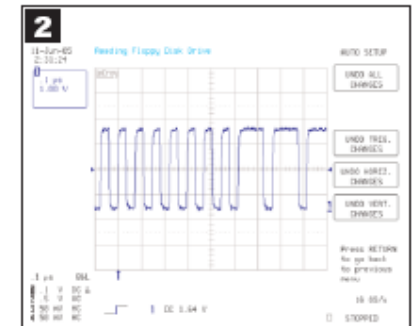
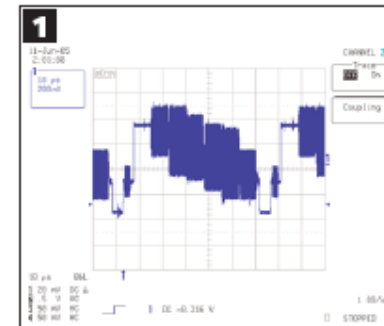
파형도



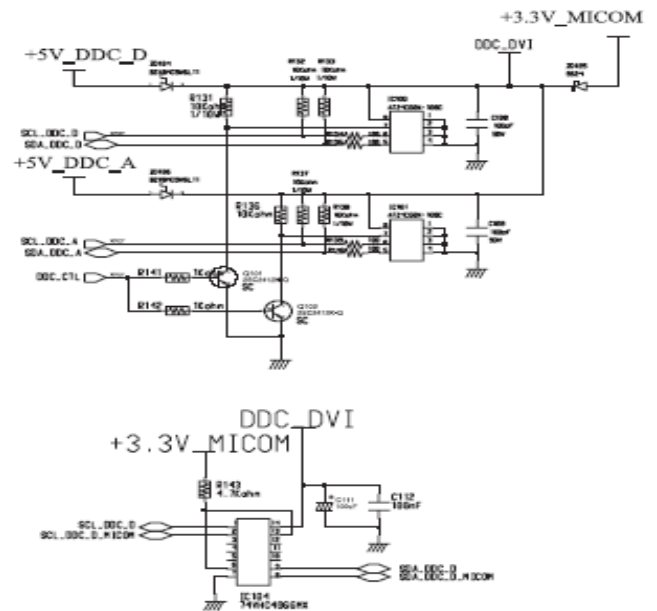
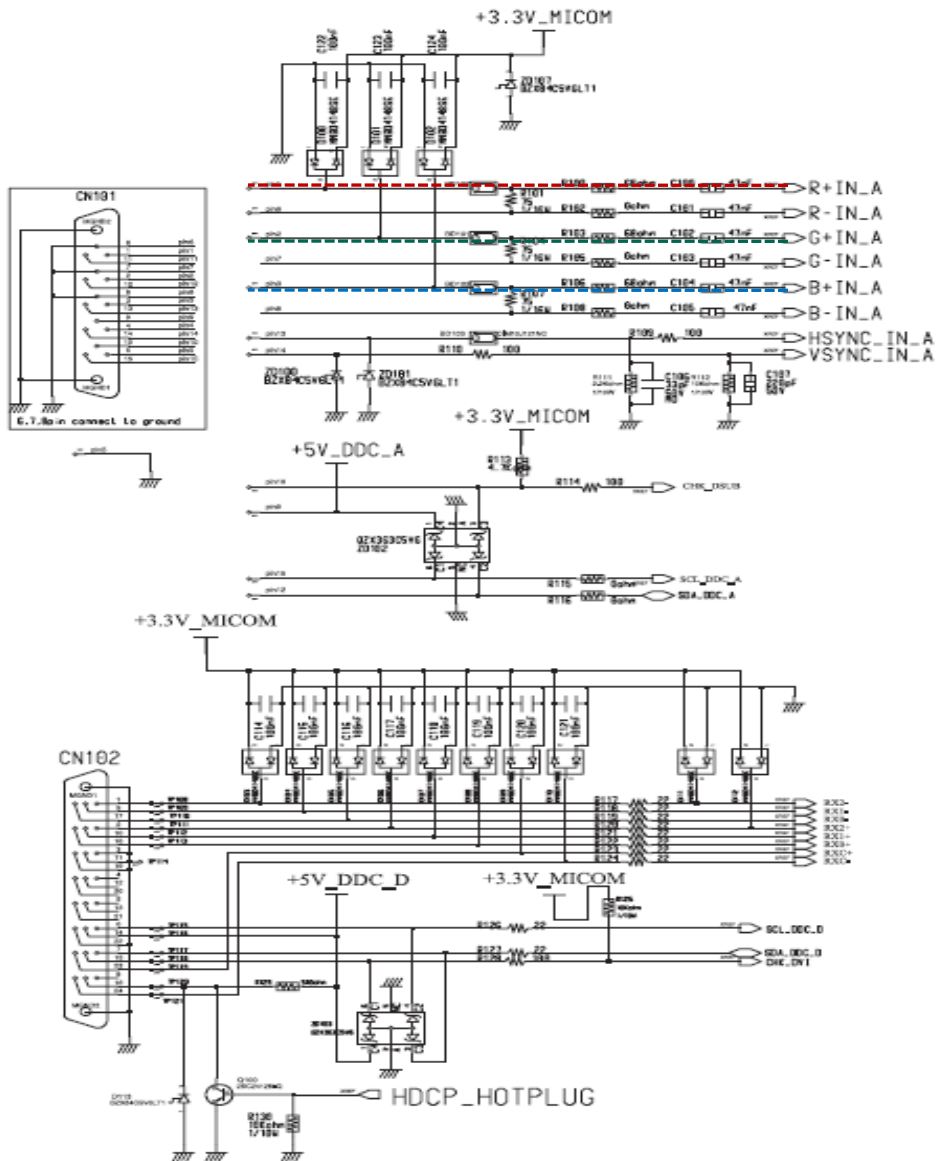
4-5 No Picture (S-Video Signal)



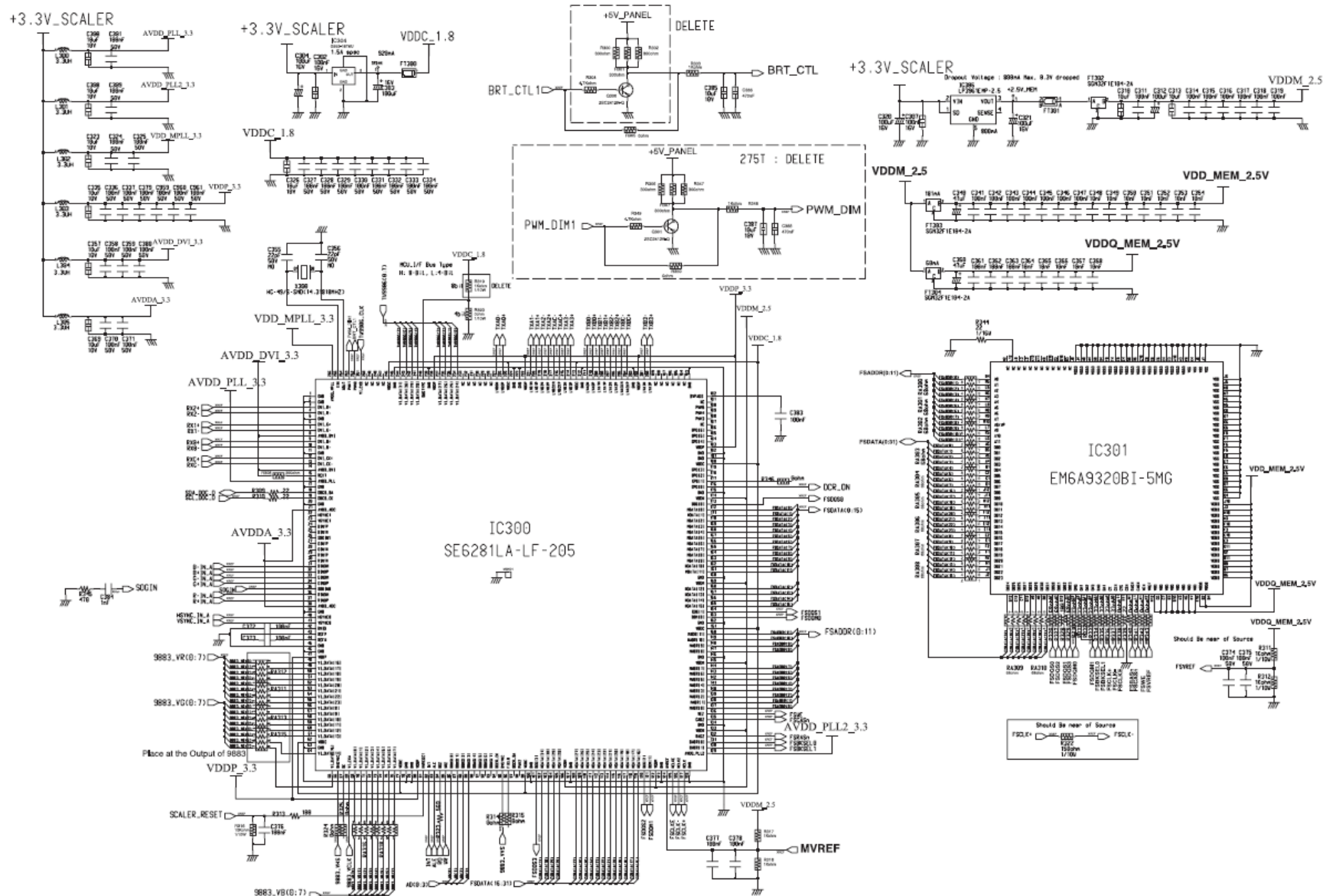
파 형 도



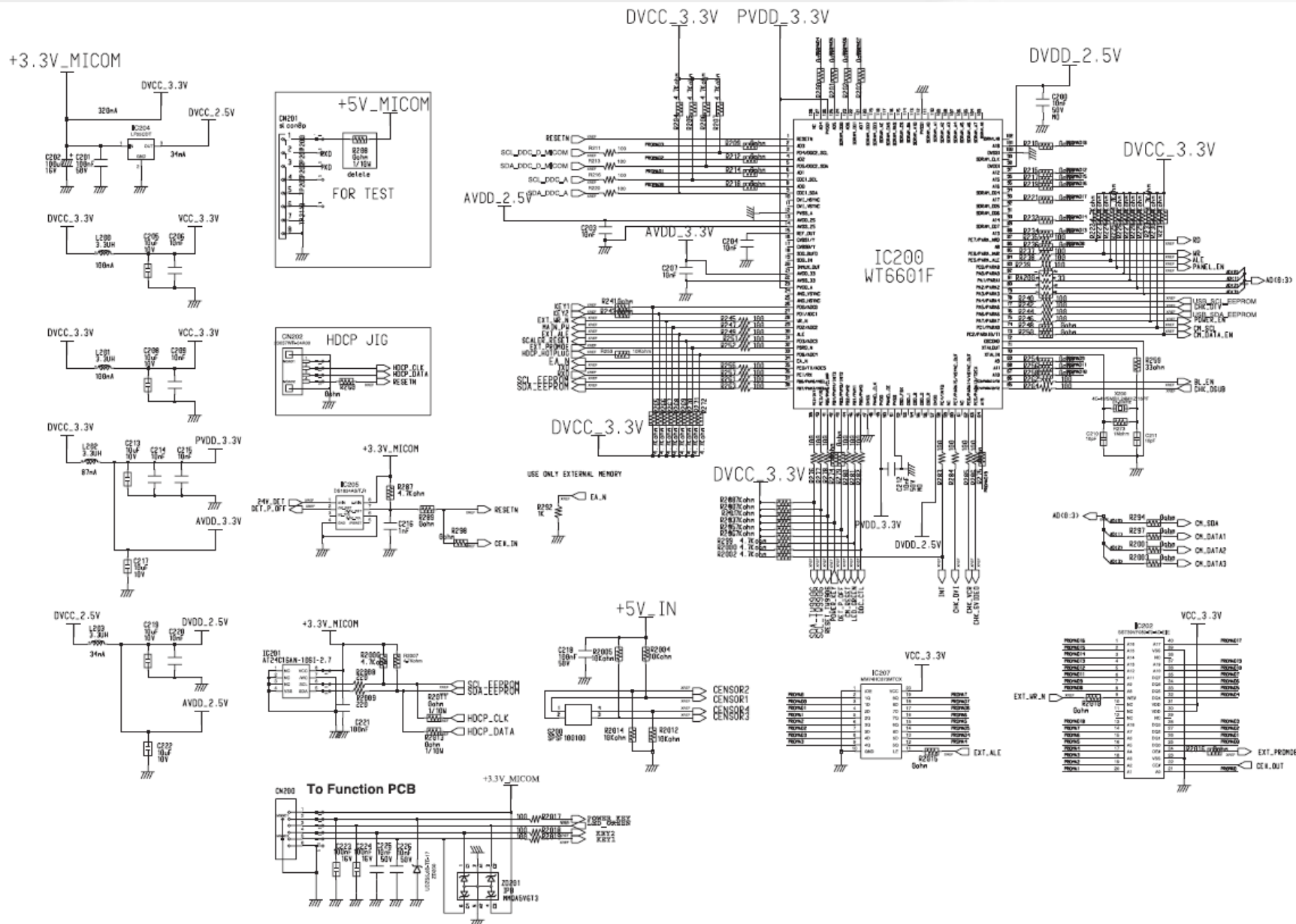
14. Main PBA – Schematics(1)



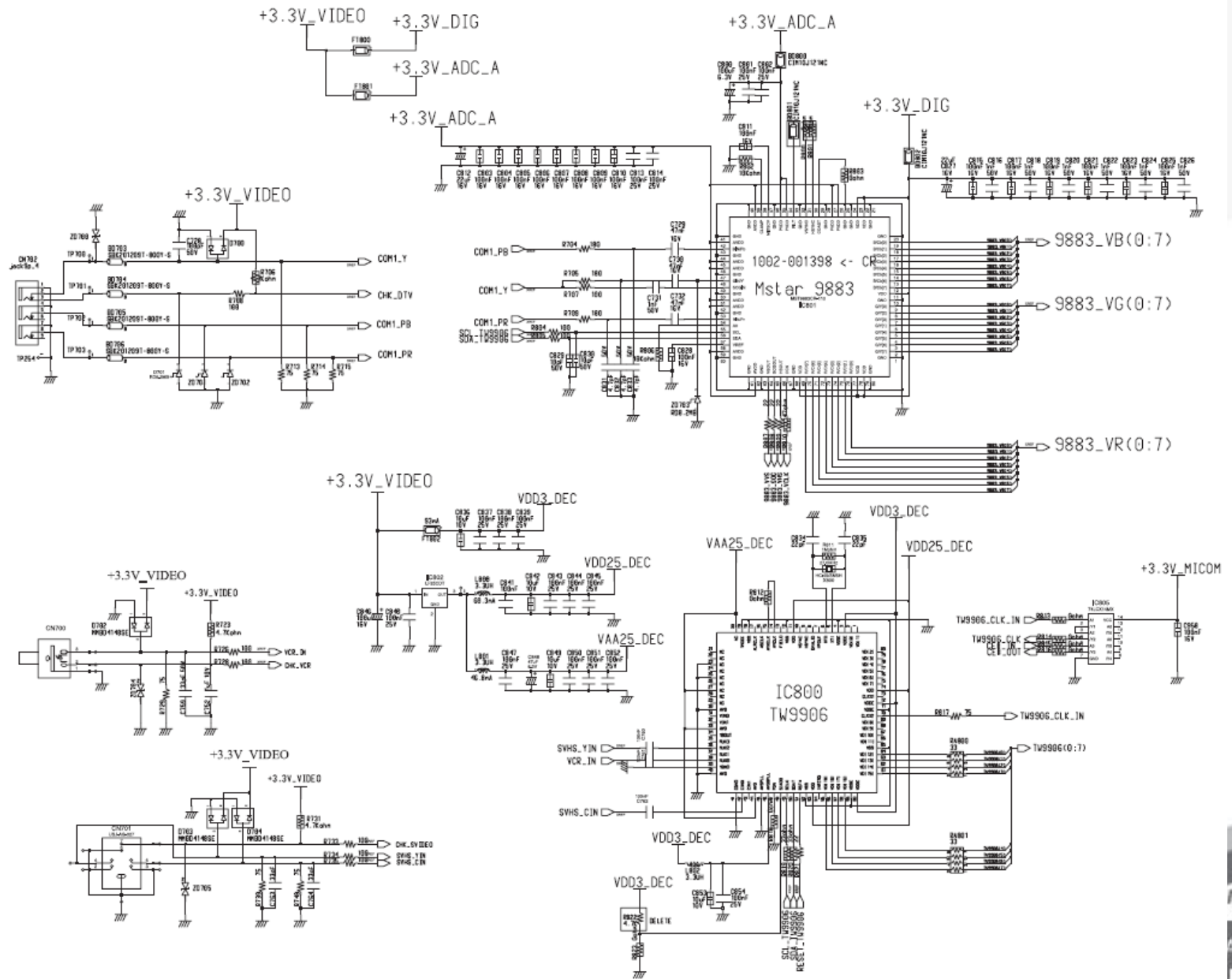
14. Main PBA – Schematics(2)



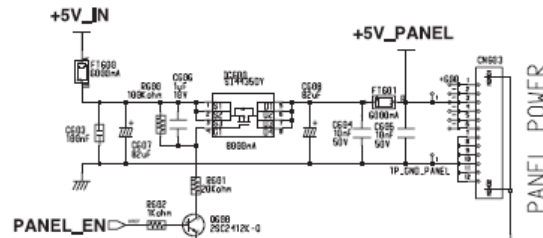
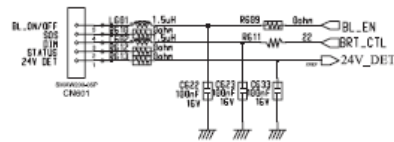
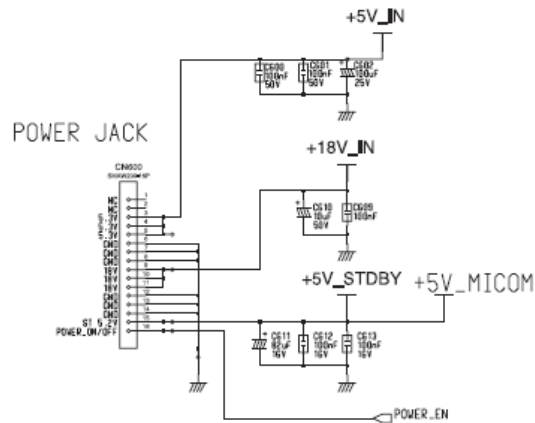
14. Main PBA – Schematics(3)



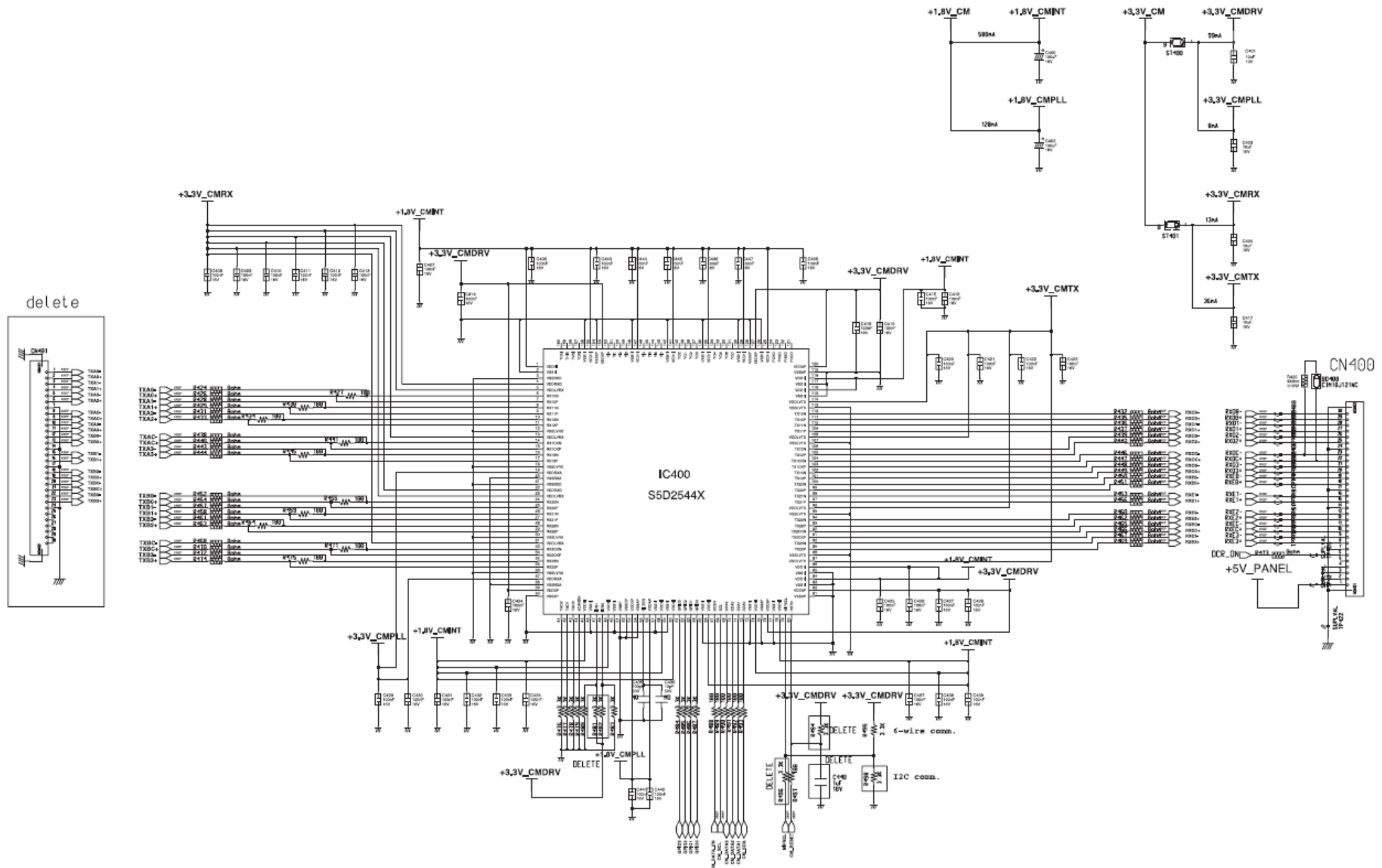
14. Main PBA – Schematics(4)



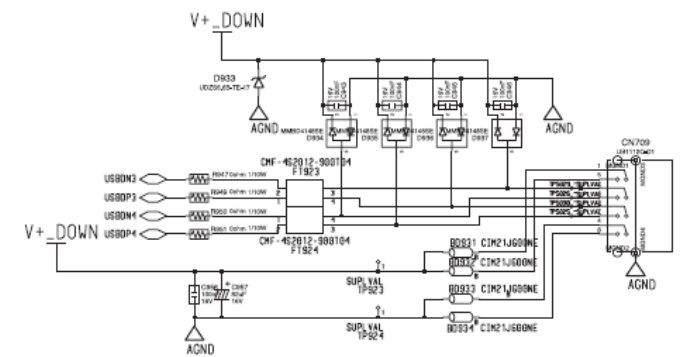
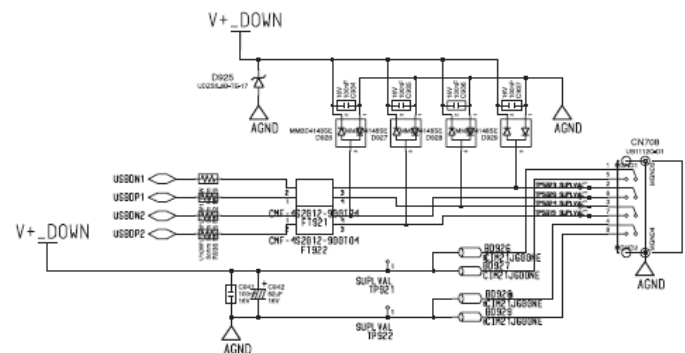
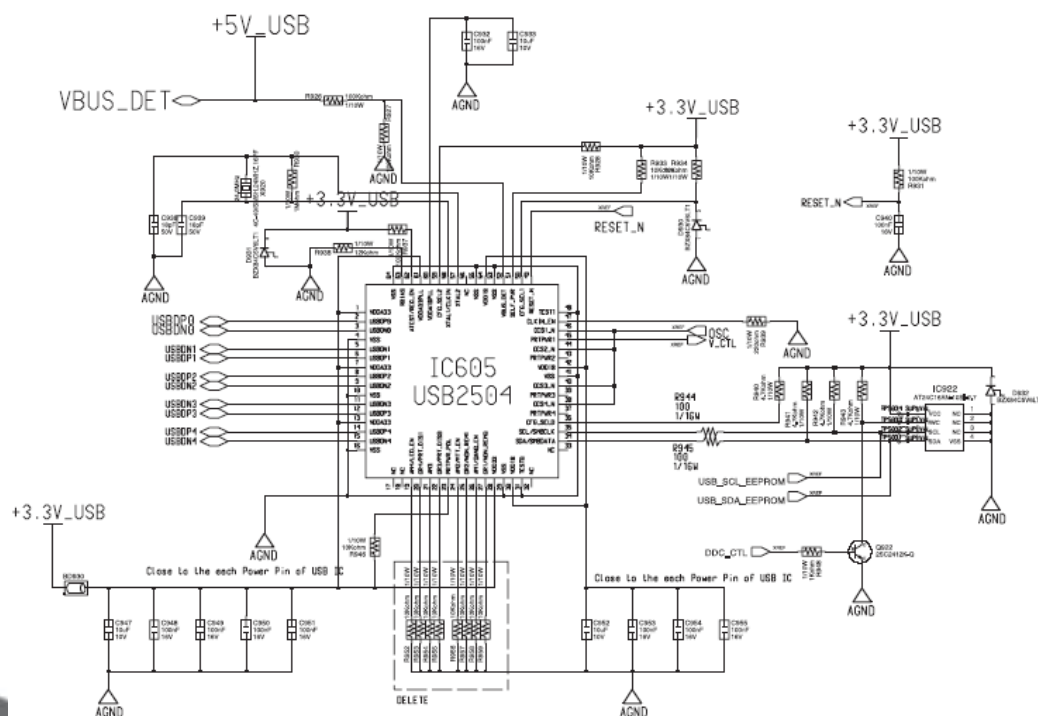
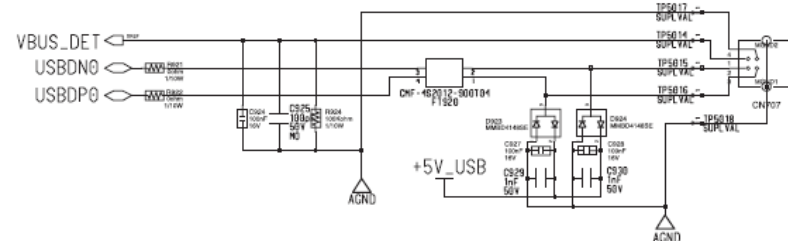
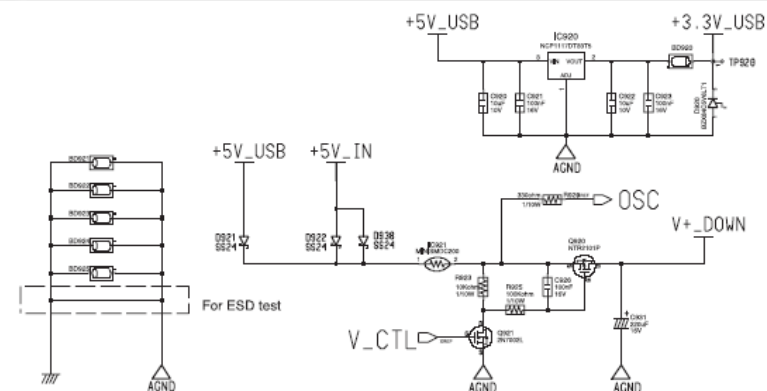
14. Main PBA – Schematics(5)



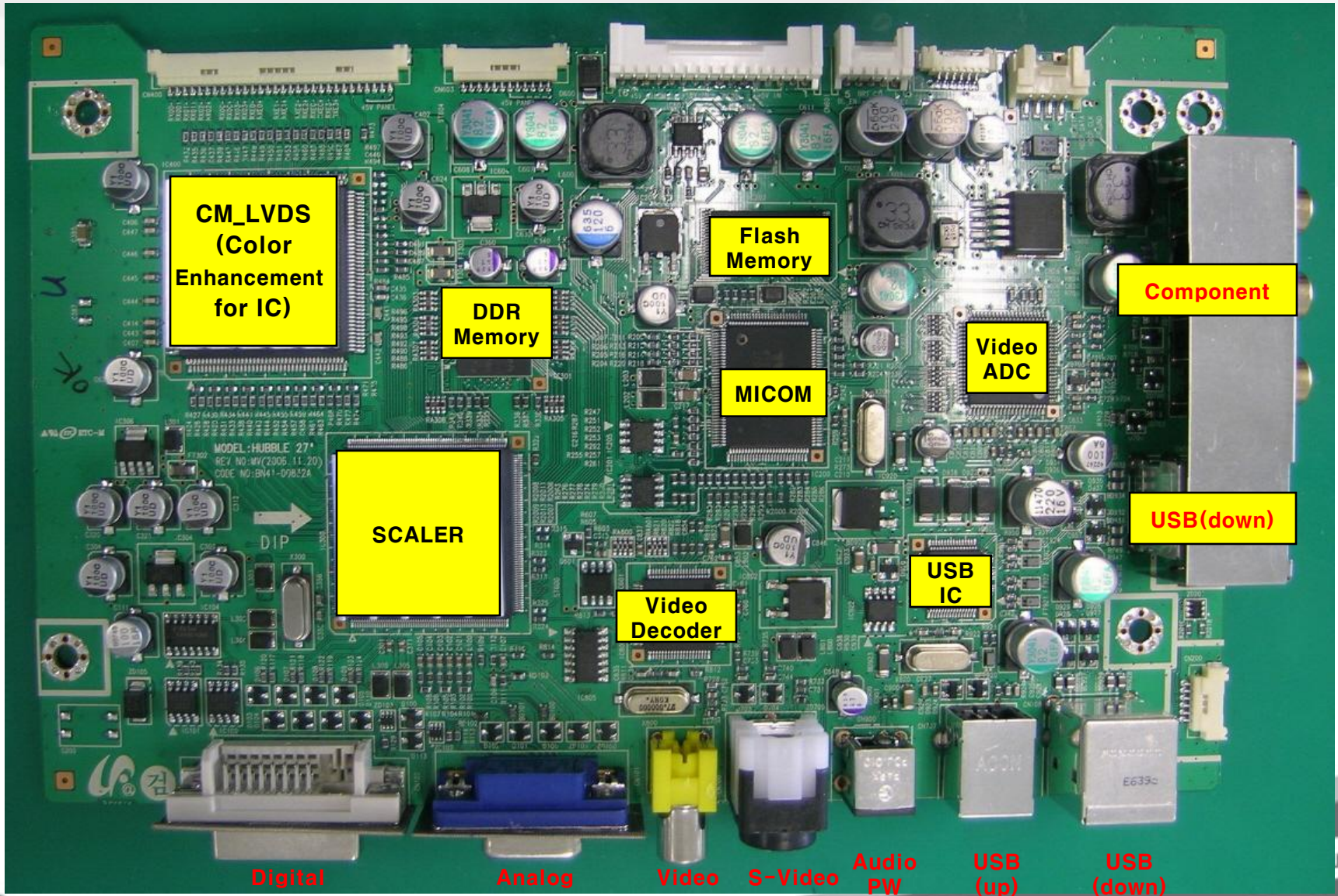
14. Main PBA – Schematics(6)



14. Main PBA – Schematics(7)



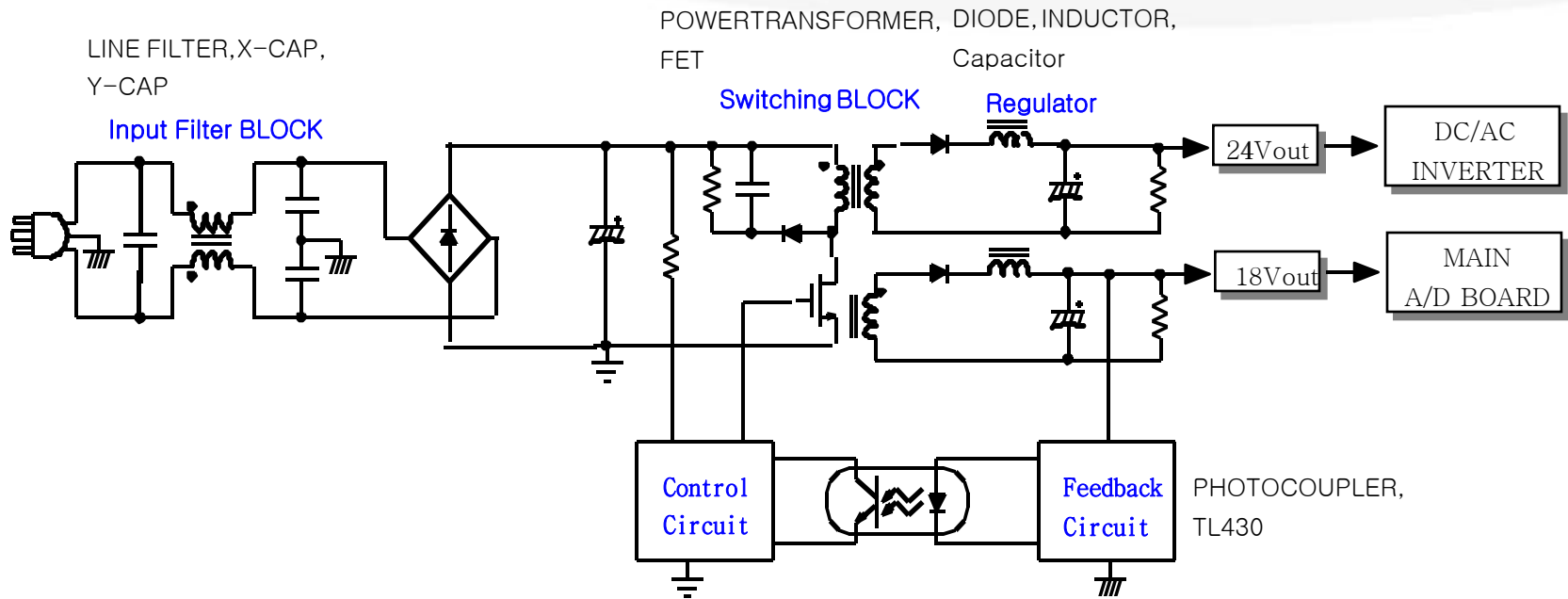
15. HUBBLE (275T) Block Description (1)



15. HUBBLE (275T) Block Description(2)

No	Block	Description	비고
1	Scaler	Scaler Integrate ADC and TMDS, Scaling part.	
2	CM_LVDS	color management IC. This chip has Color adjust for gamma adjustment, gray level color temperature compensation function.	
3	DDR MEMORY	DDR memory Save frame information that SCALER needed .	
4	VIDEO DECODER	This chip receives video signal from the source and decodes signal to scaler needed.	
6	FLASH MEMORY	Flash memory save information that MICOM needed. Program update is possible through the Firmware.	
7	MICOM	Microcontroller. Micom control all function of monitor.	

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
- Clear 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) PROTECTION

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

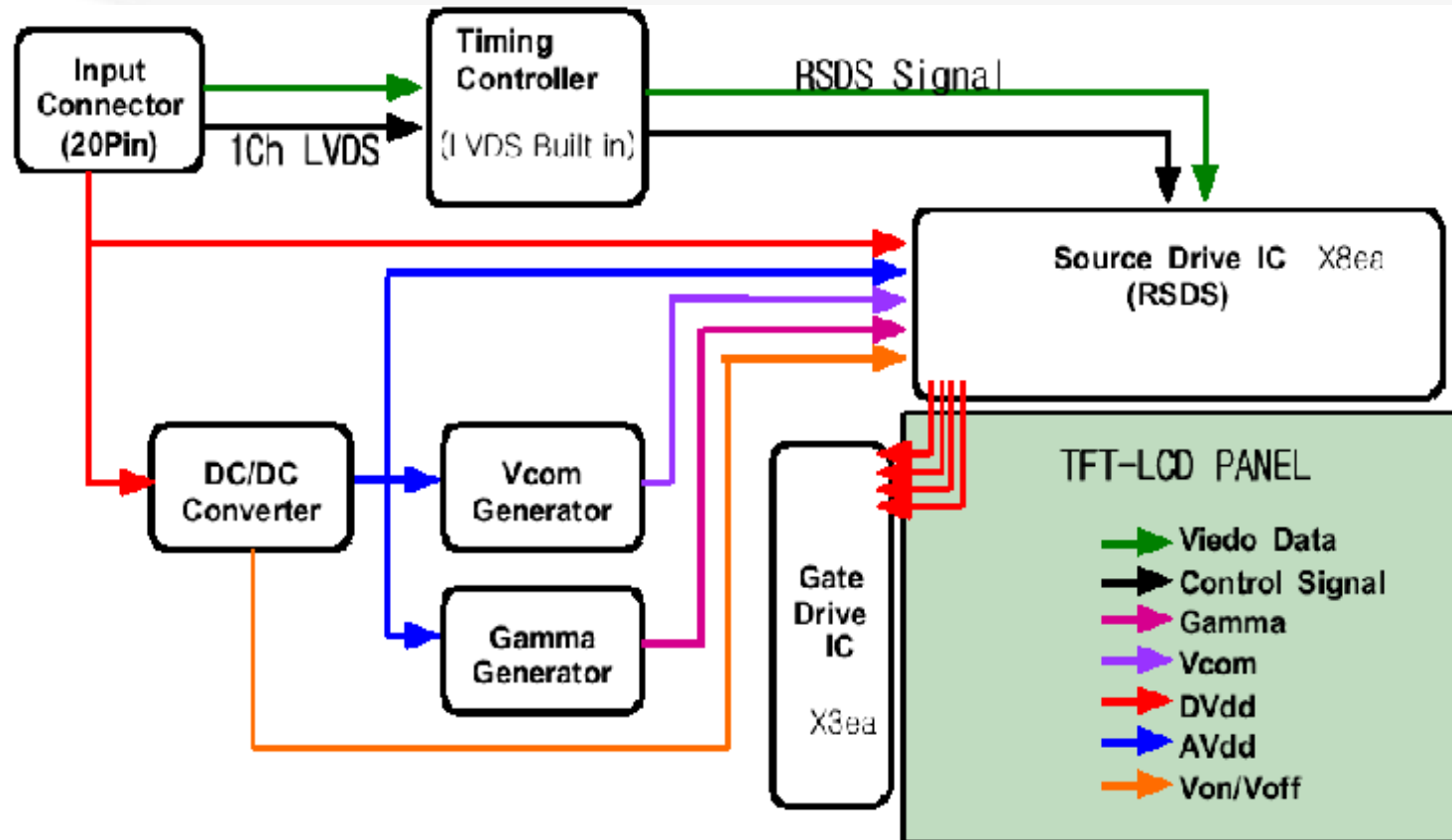
=> If output voltage of **Inverter Trans** is high, **Lamp Protection**, the **Over Voltage Protection** is operated.

➤ 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**.

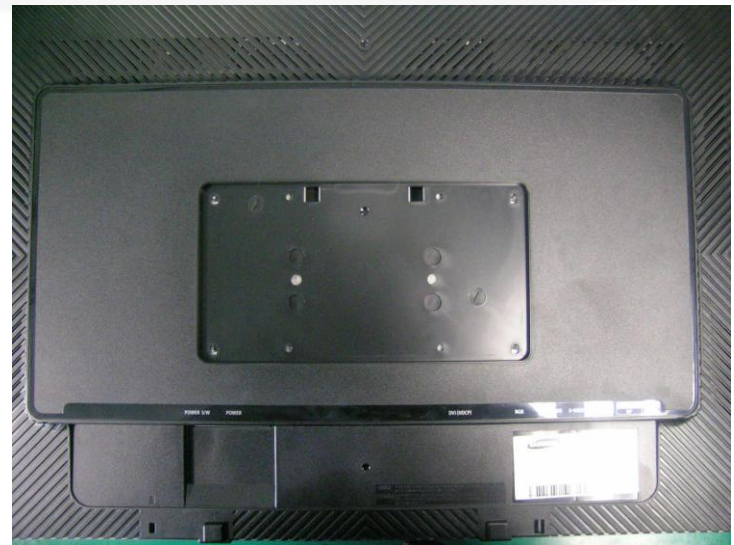
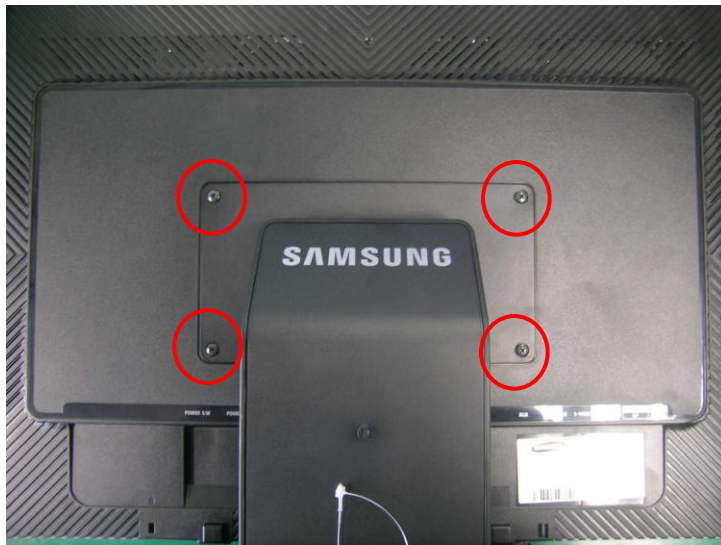
It works by the interior-designed function of the **Power IC**.

17. Panel Part Description



18. Disassembly (1)

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



1. Remove the screws for separate the stand (4 points)

18. Disassembly (2)

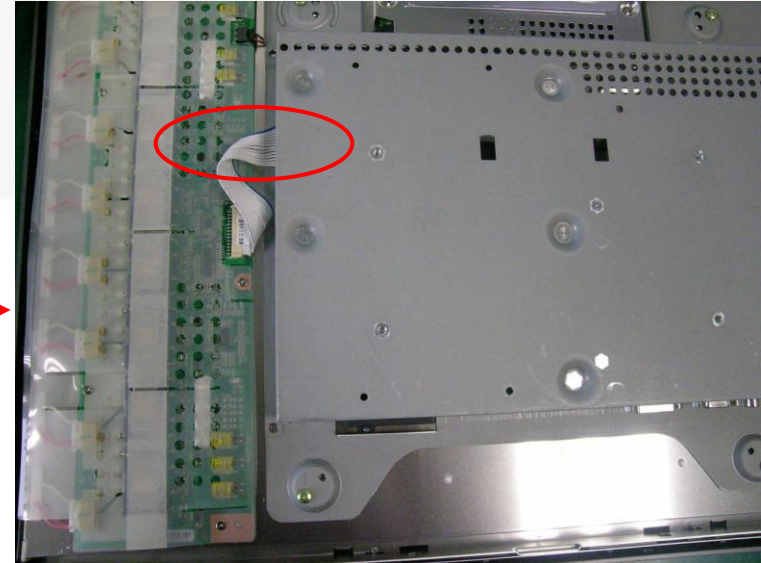


2. Use the Jig (use the hole in the lower end of Set) and lift up the rear cover.

18. Disassembly (3)

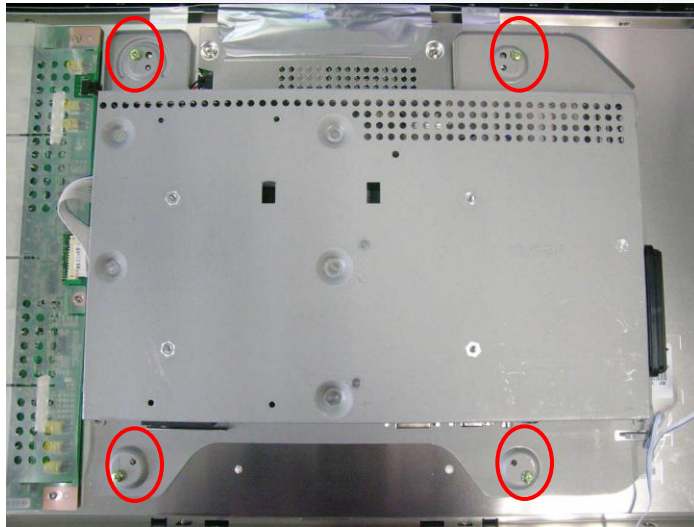


**3. Remove the PCB Harness
connected to Main Board.**

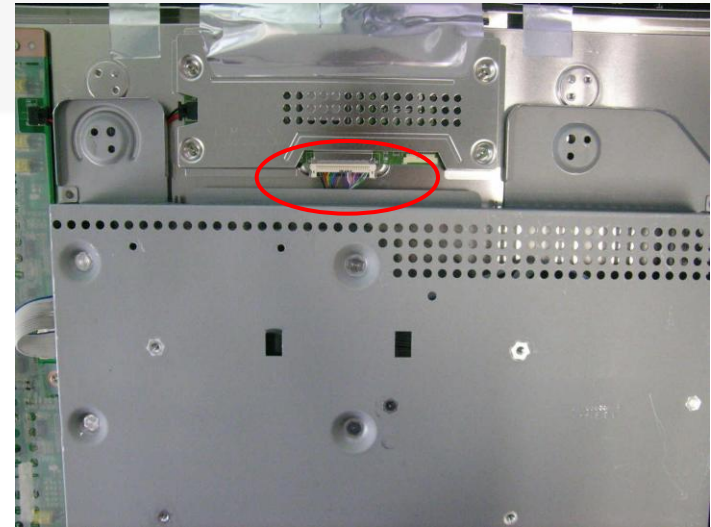


**4. Remove the Harness connected
to SMPS and Inverter.**

18. Disassembly (4)

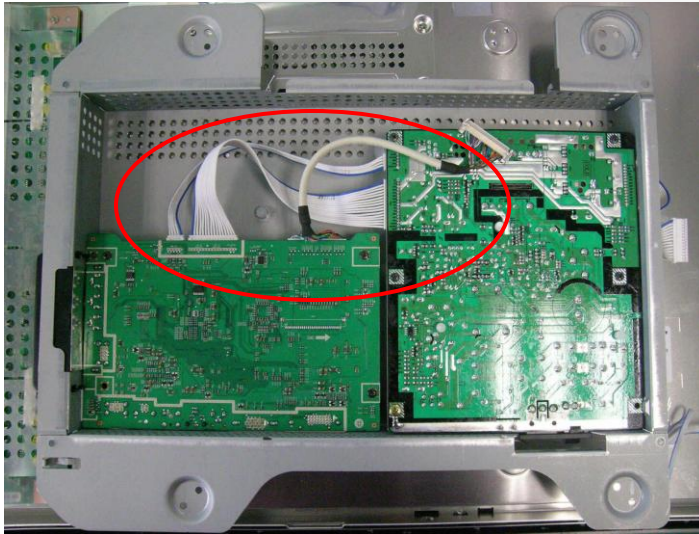


5. Remove the screws in Shield and Panel. (4 points)

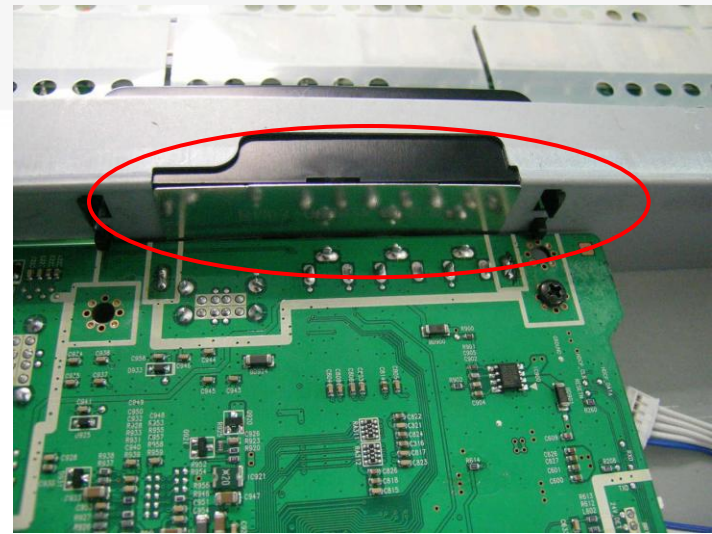


6. Lift up the Shield slowly and remove LVDS cable.

18. Disassembly (5)

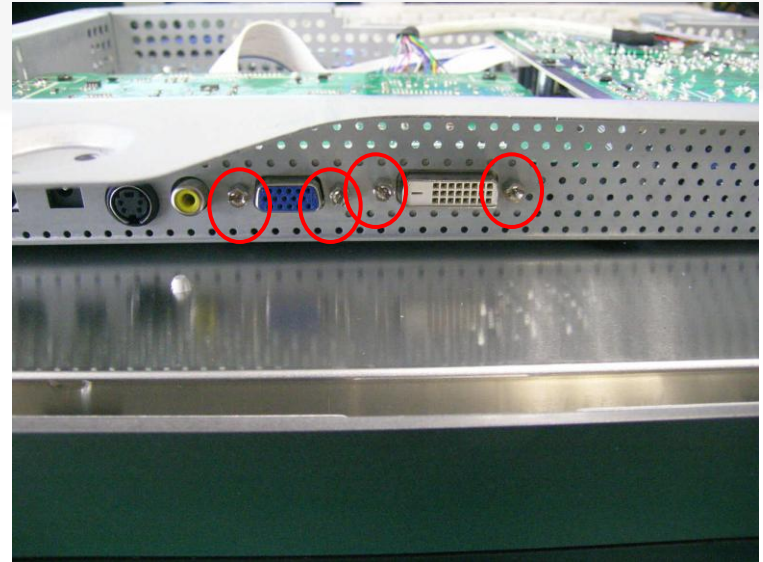
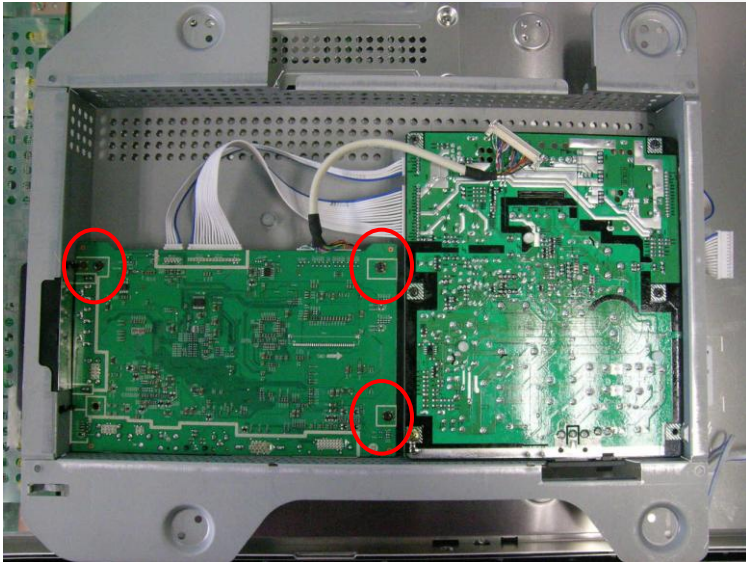


**6. Remove the harness
connected to Main Board
and SMPS.**



7. Remove the Mini-Bracket.

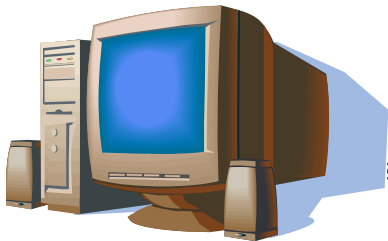
18. Disassembly (6)



8. Remove the 3 screws on Main Board and 4 hexagonal screw.

19. MICOM Code Installation (1)

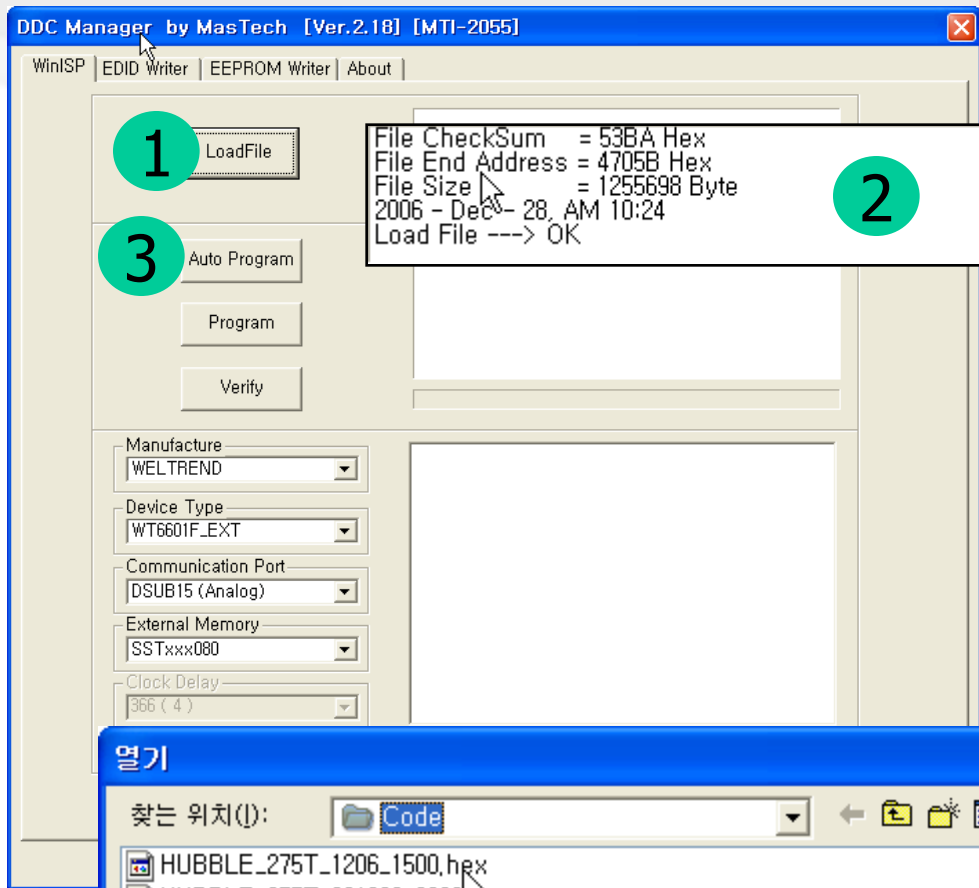
- After exchange the Main Board, We use the DDC control JIG and must complete downloading.
- Connecting is refer to below picture.
- MICOM code and EDID can be updated with DDC Manager JIG.



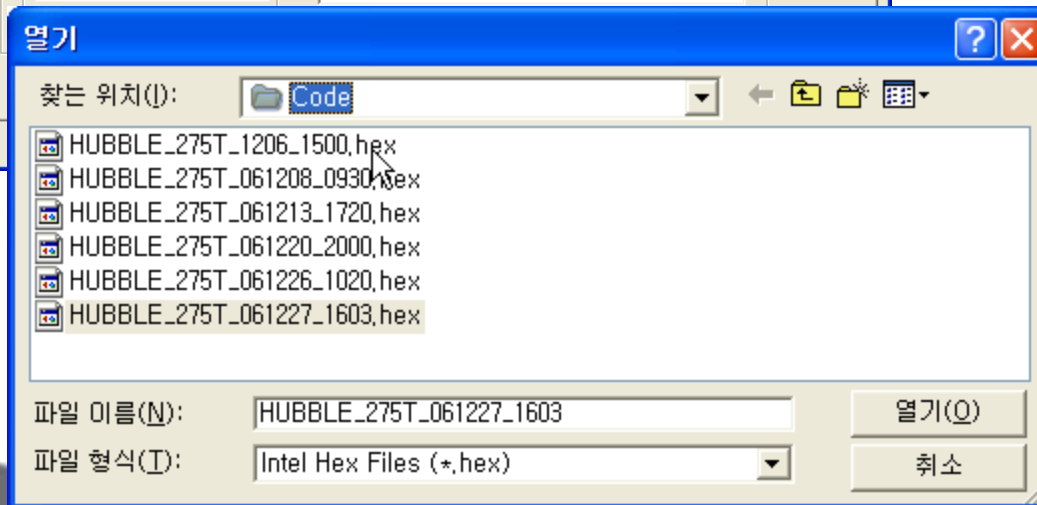
PC For JIG



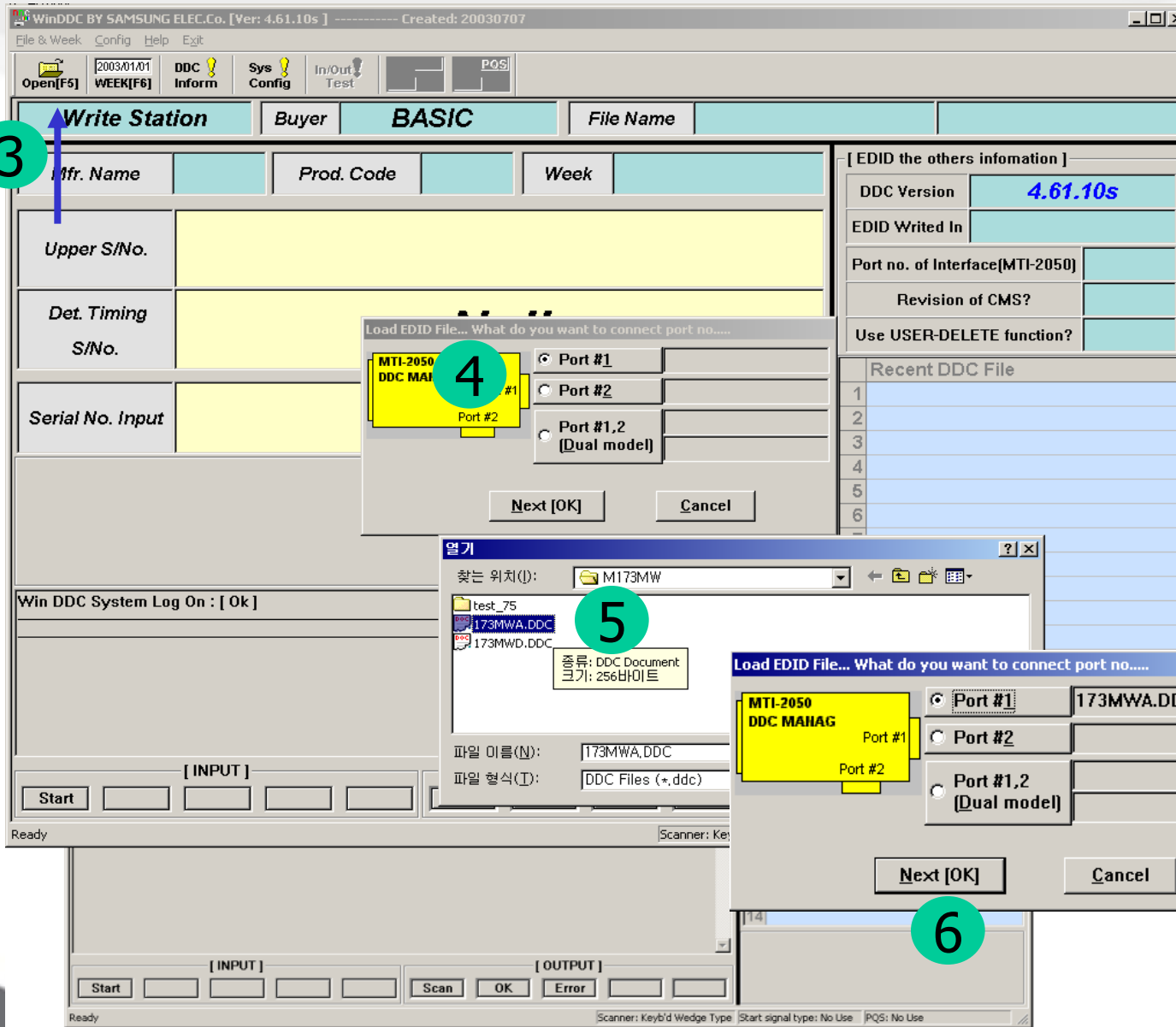
19. MICOM Code Installation(2)



1. Install DDC Manager program on PC
2. Run WinDDC
3. Click ① Load File
4. Select HUBBLE275T_061227_1603.hex file.
The file is loaded like pic ②.
5. Configure DDC Manager program as the shown pic
 - 1) Manufacture -> WELTREND
 - 2) Device Type -> WT6601F_EXT
 - 3) Communication Port -> DSUB15 (Analog)
 - 4) External Memory -> SSTxxx080
6. Click ③ Auto Program
Code will be updated with Program & Verify progress.



20. EDID Installation (1)



1. Execute Winddc.exe Program on PC
2. Click the Winddc icon.
3. File open.
4. Select Port#1
5. Load DDC file
File Name
"SM275TA.ddc"
"SM275TD.ddc"
6. Click Next(OK) button.

20. EDID Installation (2)

WinDDC 3-Port BY SAMSUNG ELEC.Co. [Ver: 4.65.11z] ----- Program Version : 200400621

File & Week Config Help Exit

Open[F5] 2003/01/01 WEEK[F6] DDC Inform Sys Config In/Out Test PDS ☒ Use DVI - I type of sig. cable model

Write Station Buyer **SAMSUNG** File Name **193PPA.DDC**

Mfr. Name **SAM** Prod. Code **9801** Week **4th of 2005**

Upper S/No. **DE19**

Det. Timing S/No. **H1AK500000**

Serial No. Input CheckSum **0x46**

Waiting

[DDC] Processing....
 [DDC] DDC Protection Off ...
 [DDC] #1 PORT: Analog EDID Writing(128 byte)...: Good!!!
 [DDC] Delay 1.2 sec
 [DDC] #1 PORT: Analog EDID Read/Verify...: Good!!!
 [DDC] Processing.... End (T/Time : 2.0 Sec)

[INPUT] [OUTPUT]

Start Scan#1 OK Error Scan#2

Ready Scanner: Keyb'd Wedge Type Start signal type: No Use PQS: No Use

[EDID the others information]

DDC Version **4.65.11z**
 EDID Writed In **EEPROM**
 Port no. of Interface(MTI-2050) **#1**
 DDC Manager Type **2-Port**
 Use OSD S/No. Write? **No**

Recent DDC File

1	#1: 193PPA.DDC,#2
2	#1: 193PPA.DDC,#2: 193PPD.DDC
3	#1: 173PPA.DDC,#2
4	#1: 173PPA.DDC,#2: 173PPD.DDC
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

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

SAMSUNG

CHAMP IN DIGITAL DISPLAY
 Visual Display Division

21. After Replacing Main PBA

You have to

- EDID input (Analog and Digital)
- Factory Reset
 - .setting to Contrast and Brightness '0'.
 - .Push the menu button more than 5 seconds
 - .select Reset.

Thank You!

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