



*PDP Training Manual*

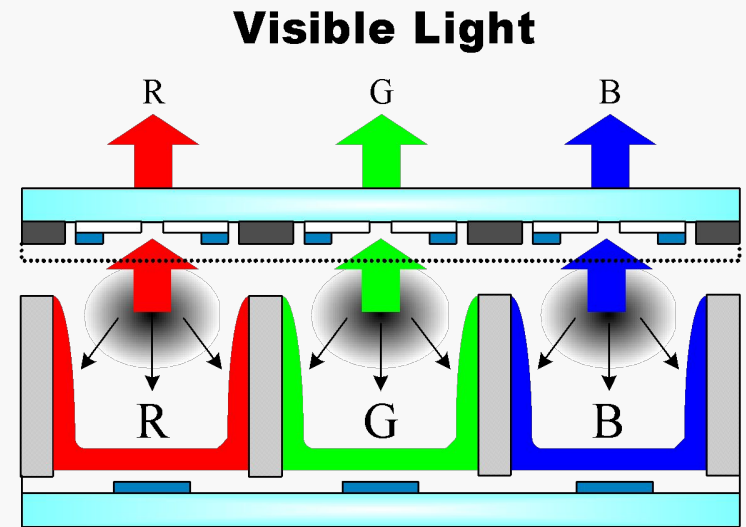
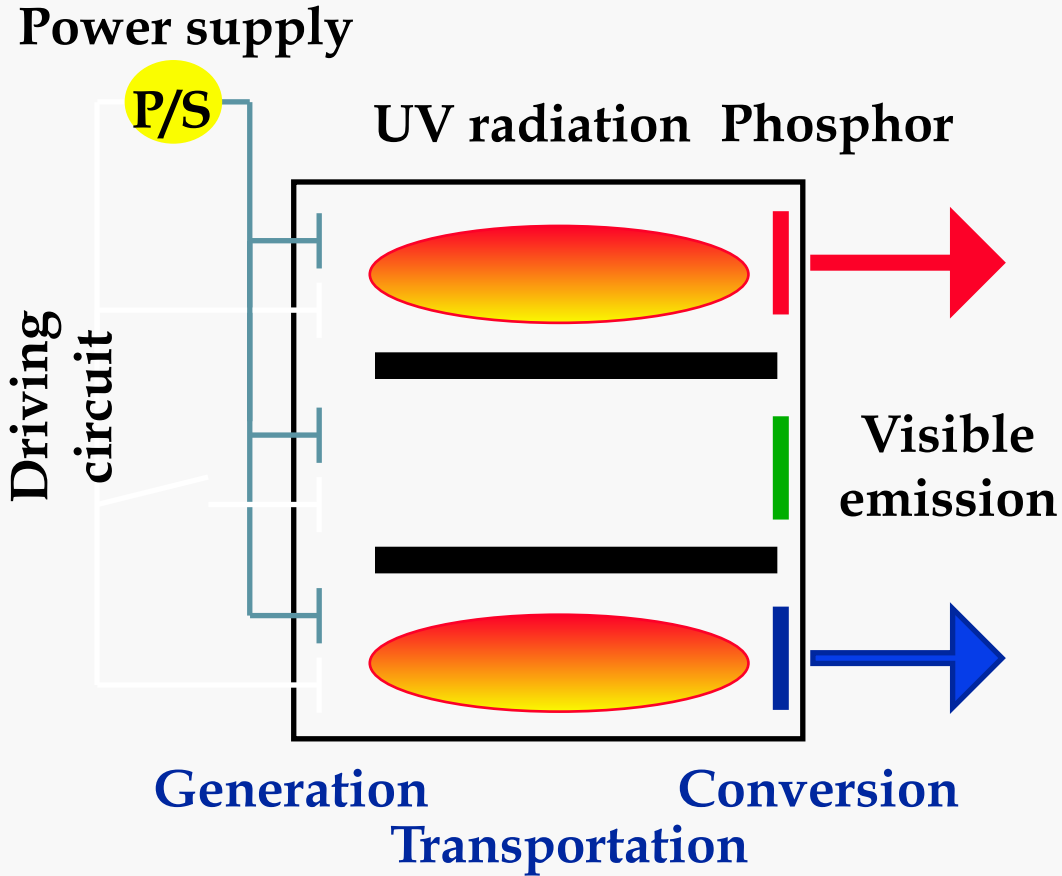
*Carmeliana  
P416*

# Agenda

- 1. Introduction to PDP**
- 2. Manufacturing & Structure of Panel**
- 3. PDP Driving Characteristics**
- 4. CARNELIAN Training**
- 5. Trouble shooting**
- 6. CIRCUIT DIAGRAM**

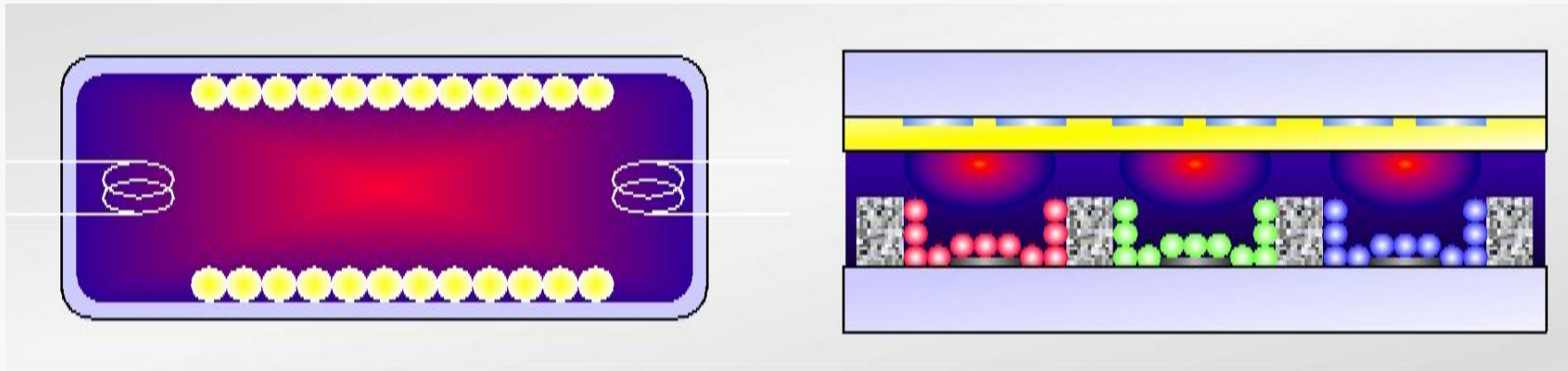
# 1. Introduction to PDP

- Concepts of PDP



## ● Fluorescent Lamp and PDP

Principle of PDP light emission is the same as fluorescent lamp. 2 pieces of glass plates are placed with a small gap of 0.1mm, which is filled with discharge gas, and one of the glass plate has a transparent electrode. When 100 and several ten V of voltage is applied to the electrodes, discharge starts and generates UV light. This UV light reaches to the other glass plate on which phosphors (R,G,B) are pasted, and the phosphors convert UV light to visible light.



< Fluorescent lamp >

< PDP >



# ● History of PDP

## 3<sup>rd</sup> Generation

Size : 30-80 inch  
 Price : Under \$10/inch  
 Definition : CRT Grade  
 Efficiency : 2-5 lm/w  
 FAN Noise : No Fan  
 Use : Public  
  
 New Production Technique

## 2<sup>nd</sup> Generation

Size : 30-60 inch  
 Price : \$10~\$20/inch  
 Definition : CRT Grade  
 Efficiency : 1-2 lm/w  
 FAN Noise : Under 30db / No Fan  
 Use : High-Income bracket Business  
  
 Establishing Mass Production Technique

## 1<sup>st</sup> Generation

Size : 20-50 inch  
 Price : \$20~\$30/inch  
 Definition : PJTV  
 Efficiency : 1-1.2 lm/w  
 FAN Noise : 35-45 db  
 Use : High-Income bracket/ Business  
  
 Upgrading Mass Production Technique

## Preceding

Size : 20 inch  
 Price : \$30~\$50/inch  
 Efficiency : 0.5-1 lm/w  
 Use : Business  
  
 Upgrading Basic Technique



## ● Merits & Demerits of PDP

### < Merits >

- Thin Type TV
- Large Scale : 80" possible
- Light Weight (42" Scale)
  - : PDP 30kg / CRT: over 100kg
  - : LCD 40" 32Kg
- Wide Angleview
- High Definition
  - : cell pitch 0.1mm
- Not-Sensitive to Magnetic Field
- Full-color
- Good Non linerity
  - : No need for TFT like LCD

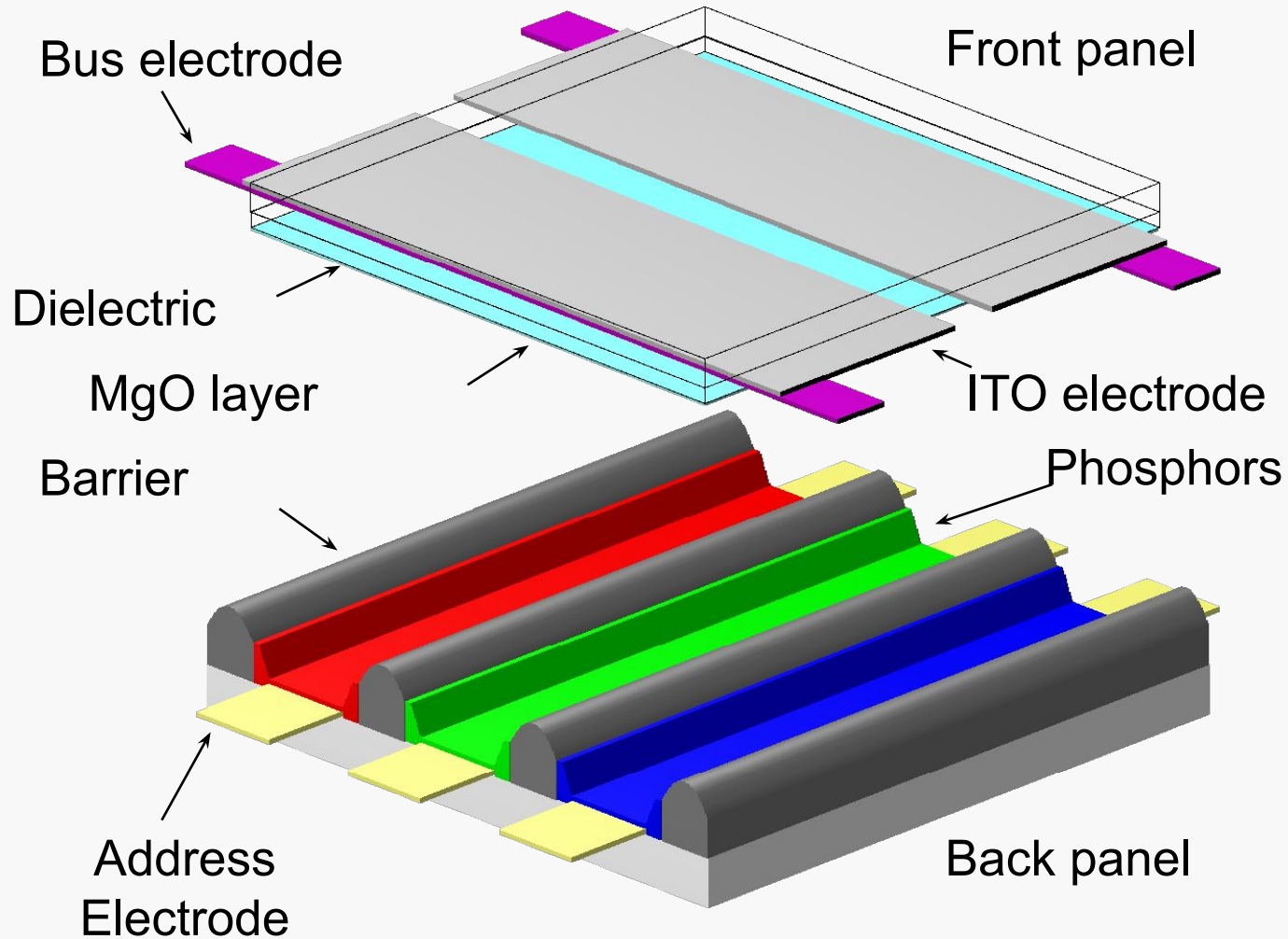
### < Demerits >

- High Power Consumption
- Low Brightness
- High Cost
- Low Lighting Efficiency
- Image Retention
- Operation Temperature
- Acoustic Noise of Driving

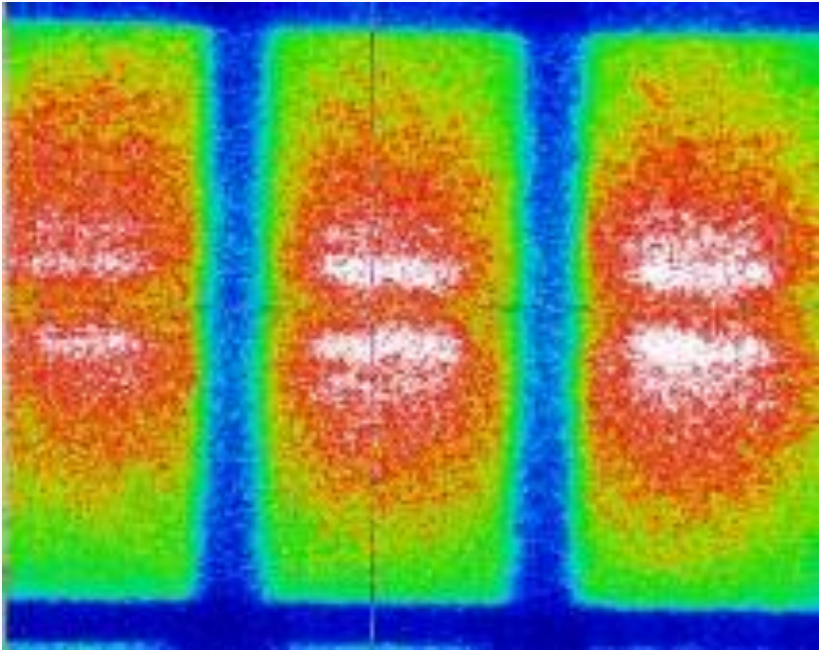
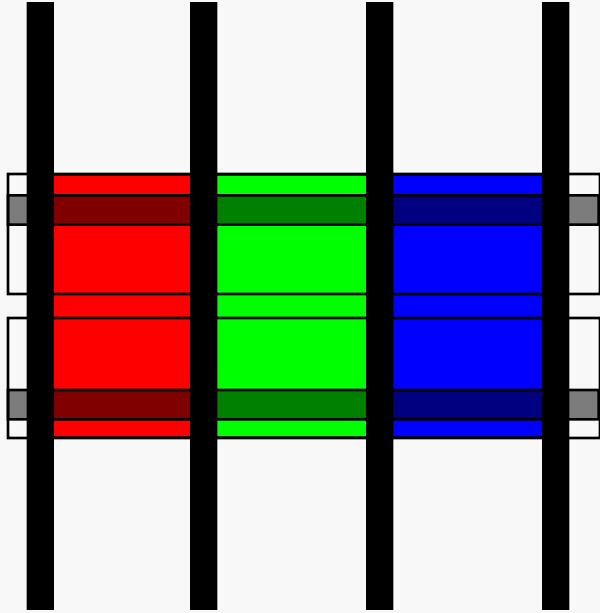
# Manufacturing & Structure of Panel

# 2. Manufacturing & Structure of Panel

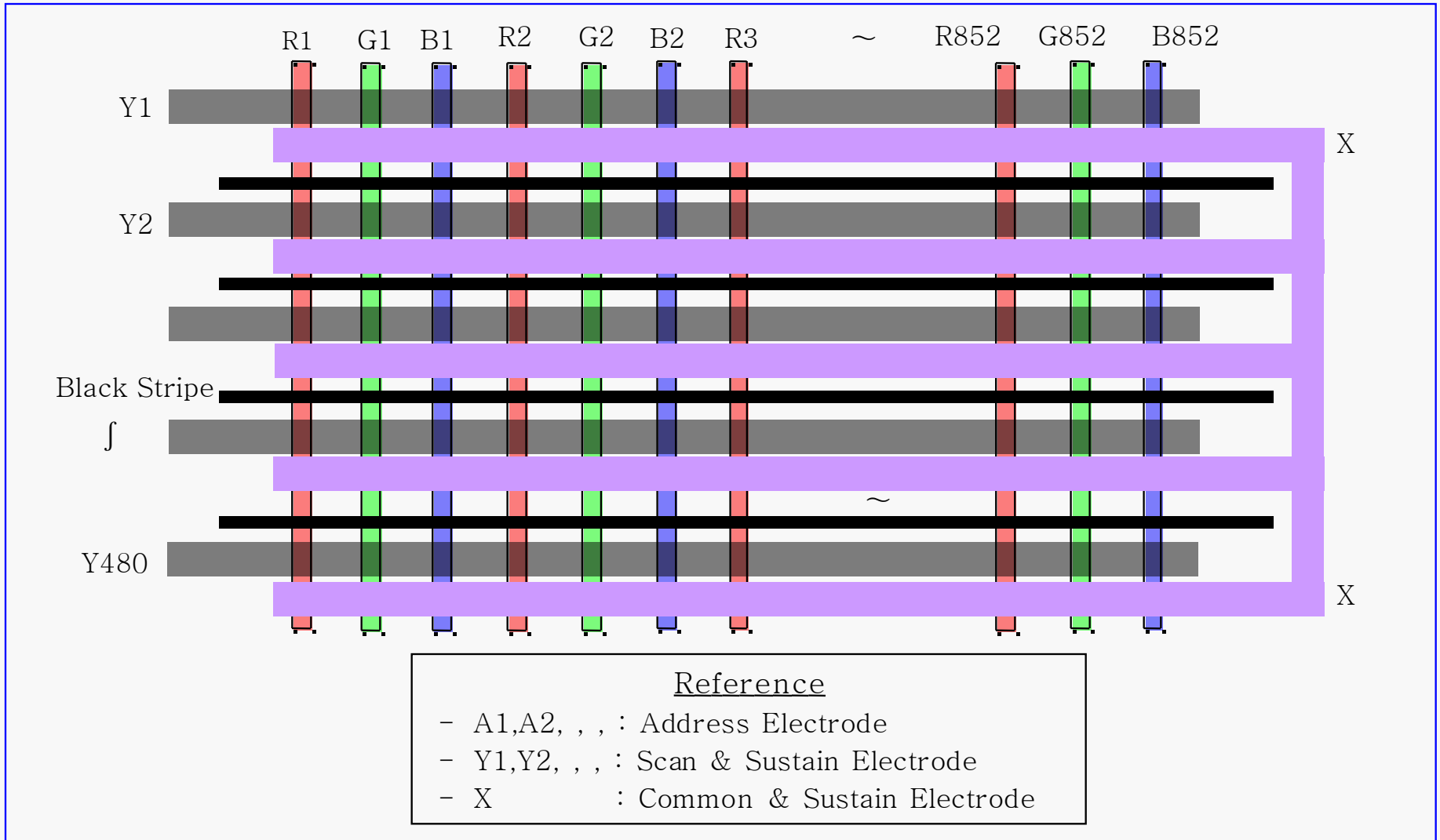
- Cell Structure of Panel



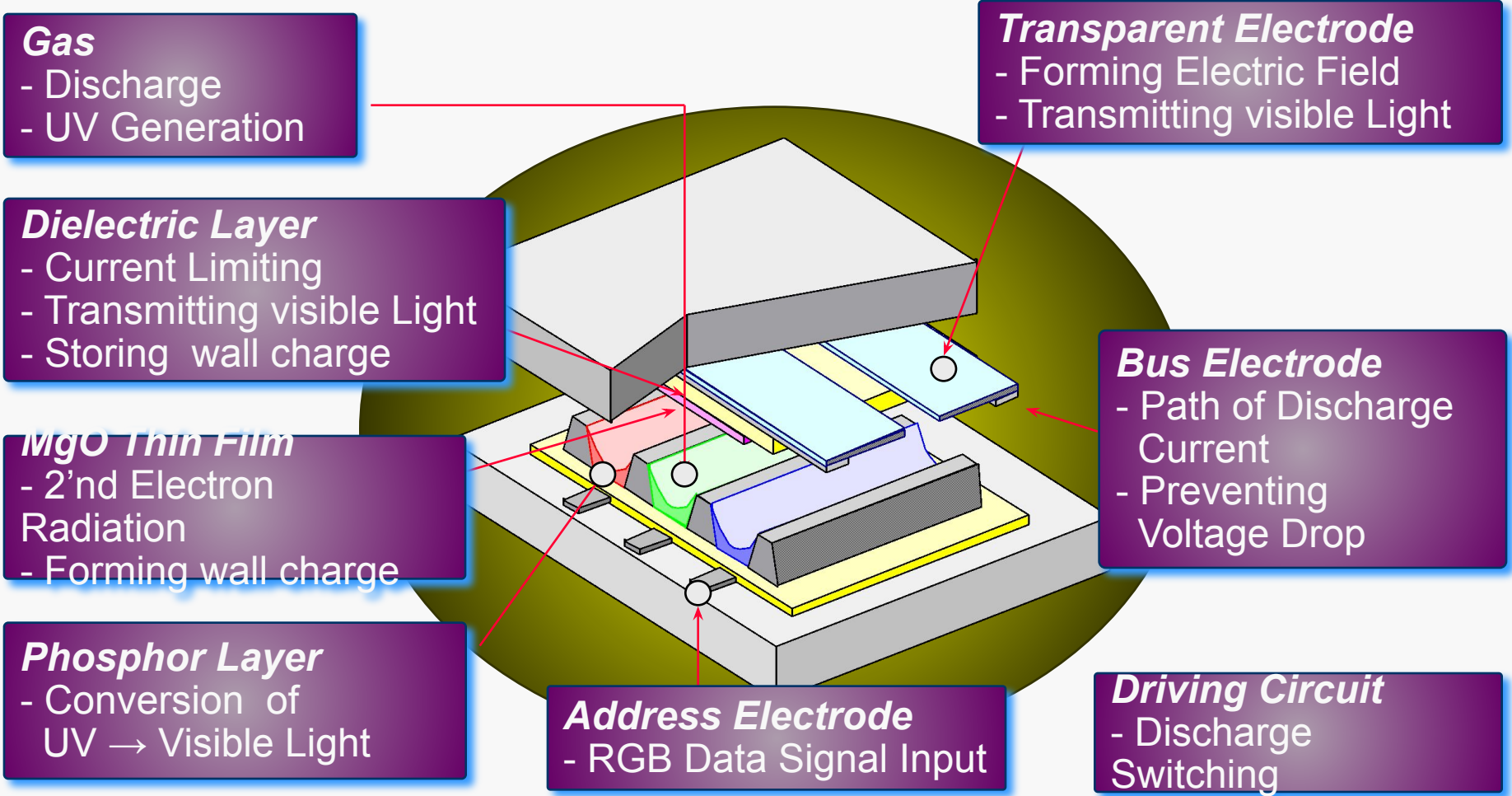
- Cell Structure of Panel



# ● Electro Arrangement of PDP(SDI Panel - SD)



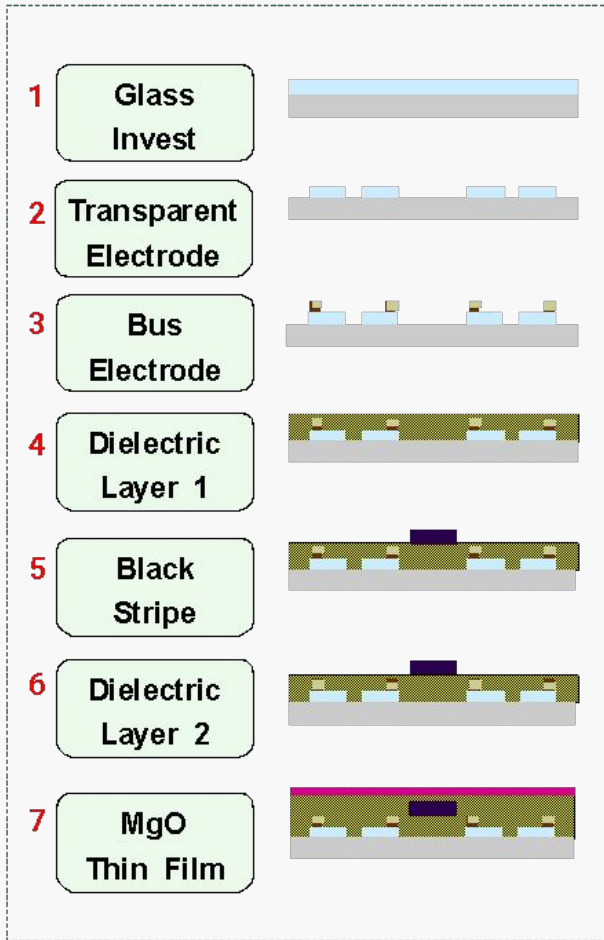
# ● Function of each PDP Cell Components



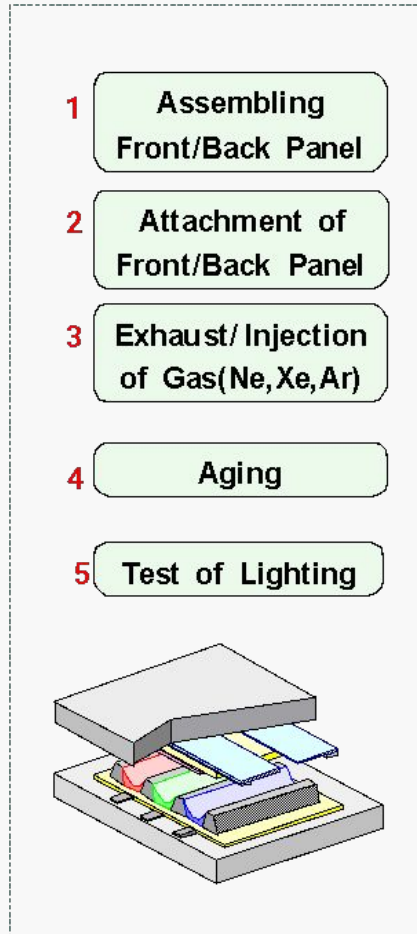


# ● Process of Panel Manufacturing

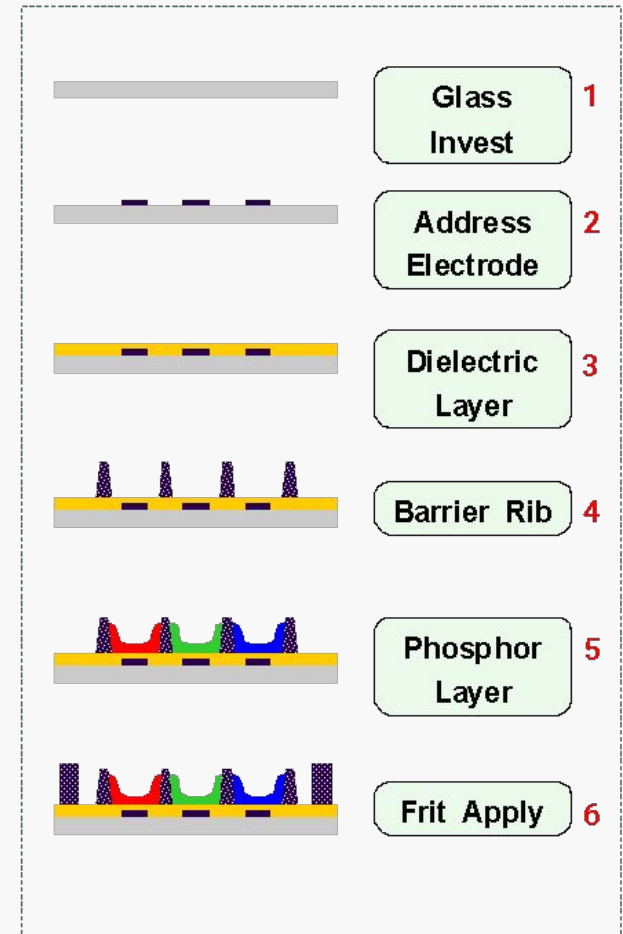
## A Front Panel



## C Assemble



## B Back Panel

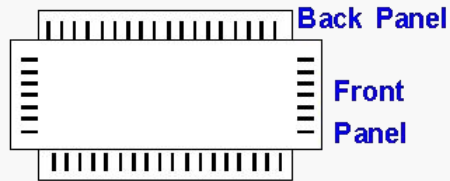




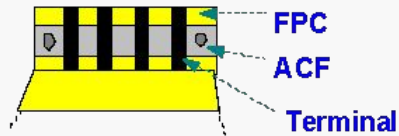
# ● Process of Panel Manufacturing

## D Inter-connection

1 Cleaning Terminal of Panel



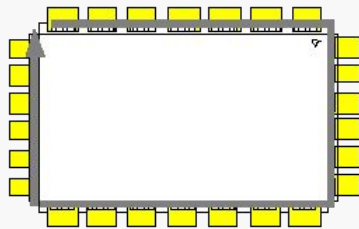
2 Attachment of ACF



3 Attachment of FPC

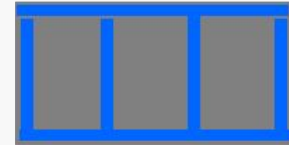


4 Silicon Apply

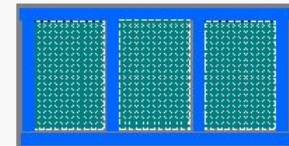


## E Chassis Assemble

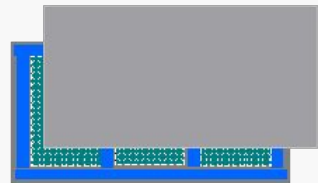
1 Attachment of Tape



2 Attachment of Heat-proof sheet



3 Attachment of Panel



4 Assembling of Circuits



# PDP Driving Characteristics

# 3. General PDP Driving Characteristics

## ● Function Description by board - 1

### ■ SMPS(Switching Mode Power Supply)

: It is the supplier to provide voltage and current to work the drive voltage and panel in each board.

### ■ X-MAIN BOARD

: It makes the drive wave form by switching FETs to Timing Controlle coming from logic-board and supplies X electrode of panel with the drive wave form via connector.

### ■ Y-MAIN BOARD

: It makes the drive wave form by switching FETs to Timing Controller coming from the logic-board and provides Y electrode of panel with the drive wave form via Scan Driver IC on Y buffer board in order.

### ■ LOGIC MAIN BOARD

: It process image signal and performs buffering of the logic-main board (to create XY drive signal and output) and the address driver output signal.

Then it supplies the output signal to the address driver IC(COF Module).

## ● Function Description by board - 2

■ **LOGIC BUFFER(E,F)** : It delivers the data signal and control signal to the COF.

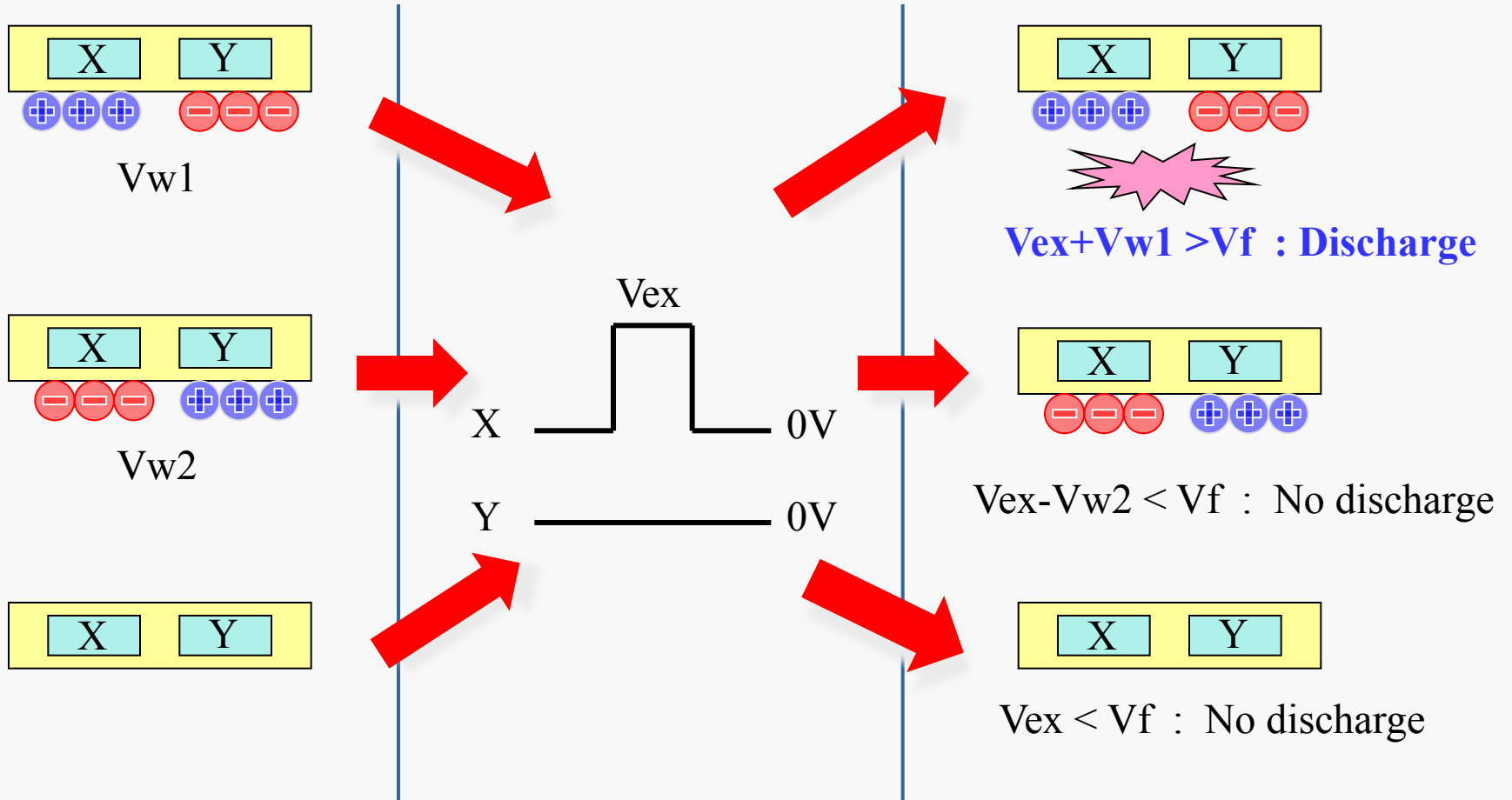
■ **AC Noise Filter**

: It has functions to remove noise(low frequency) coming from AC LINE and prevent surge.  
It gives serious effects on the safety regulations (EMC, EMI) according to AC filter.

■ **COF (Chip on Flexible)**

: It impress the Va pulse to the address electrode in the address section and forms the address discharge by electric potential difference with scanning pulse to be dismissed by the Y electrode. It is made in the form of COF and one COF consists of 4 Data Drive IC (STV7610A :96 Output), otherwise single scan is made of 7 COF.

# • Effect of Wall Charge



**Different Result with same input pulse  $V_{ex}$  according to Wall Charge state**

# • 1 Sub-Field Image Process(ADS – Address Data Separate)

**Reset**

*Function*

- Sustain Erase
- Wall Charge Set

*Issue*

- Operation margin
- Contrast
- Short Time

**Address**

*Function*

- Select On Cell

*Issue*

- High Speed
- Low Voltage
- Low Failure

**Sustain**

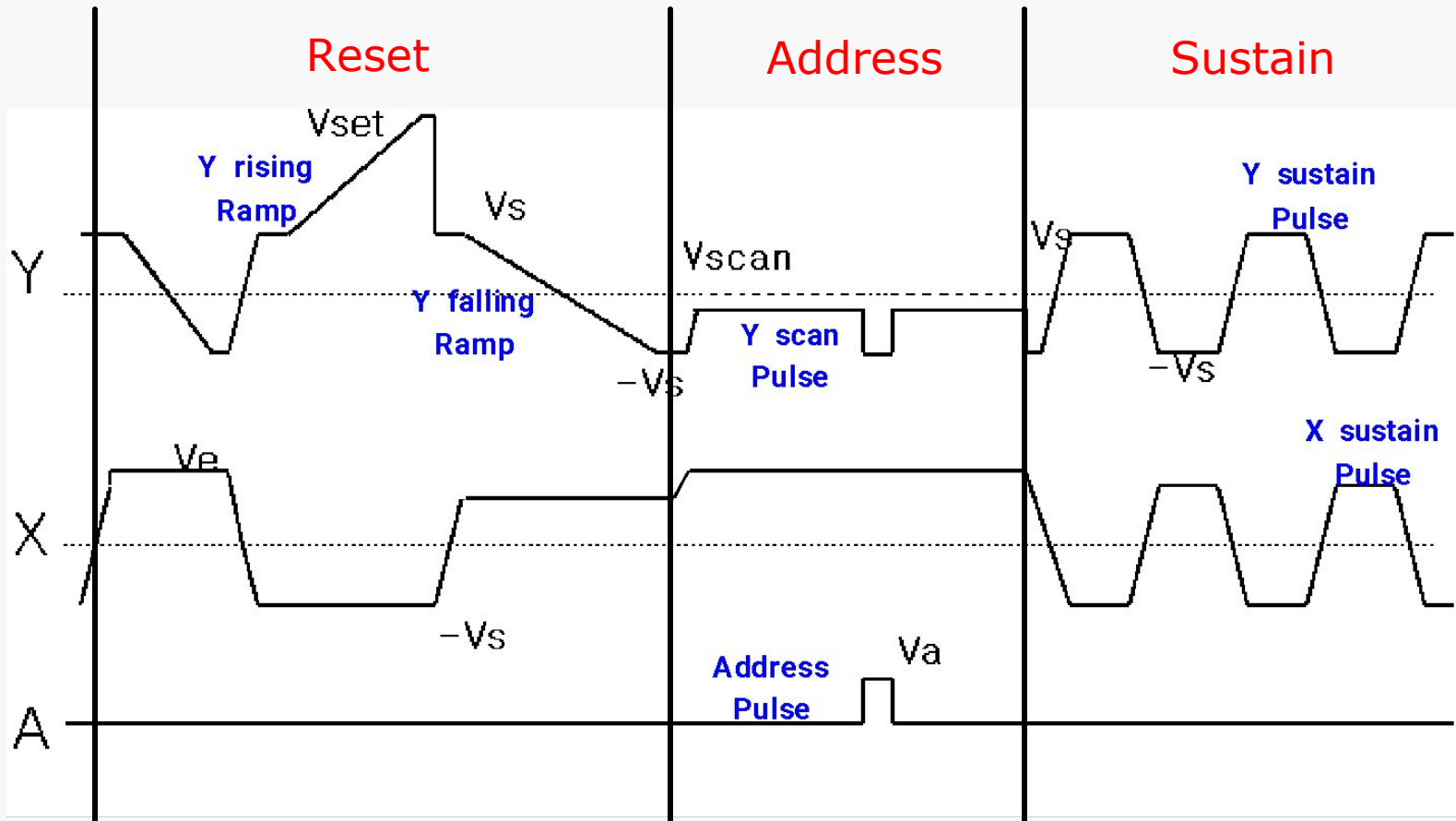
*Function*

- Discharge On Cell

*Issue*

- High Efficiency
- Low Voltage
- ERC Performance

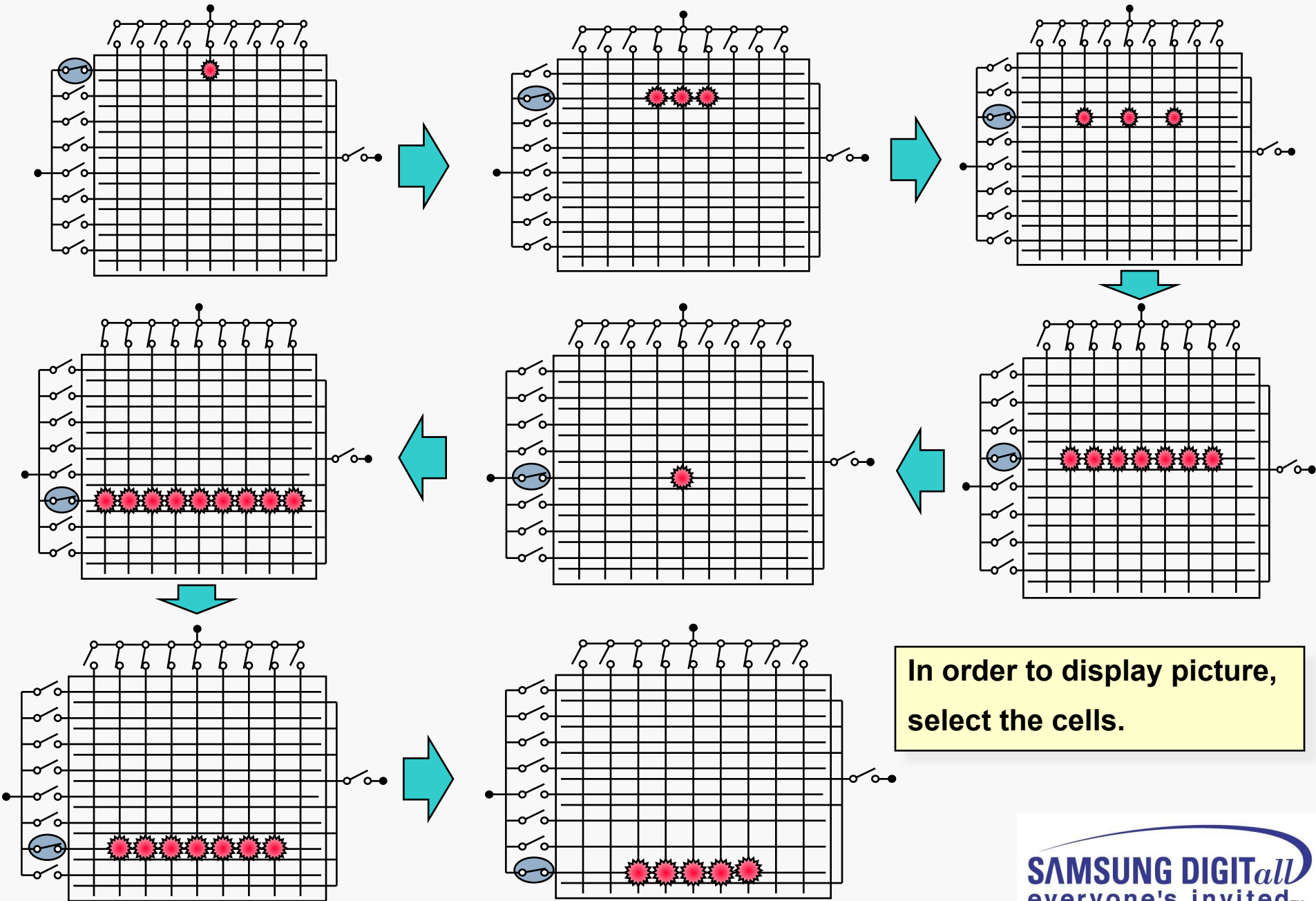
# ● Driving Waveform Specification (P3 Alexander)



|                |                              |
|----------------|------------------------------|
| A1, 2, . . . . | Address( =Data) El ectrode   |
| X              | Common & Sustai n El ectrode |
| Y1, 2, . . . . | Scan & Sustai n El ectrode   |

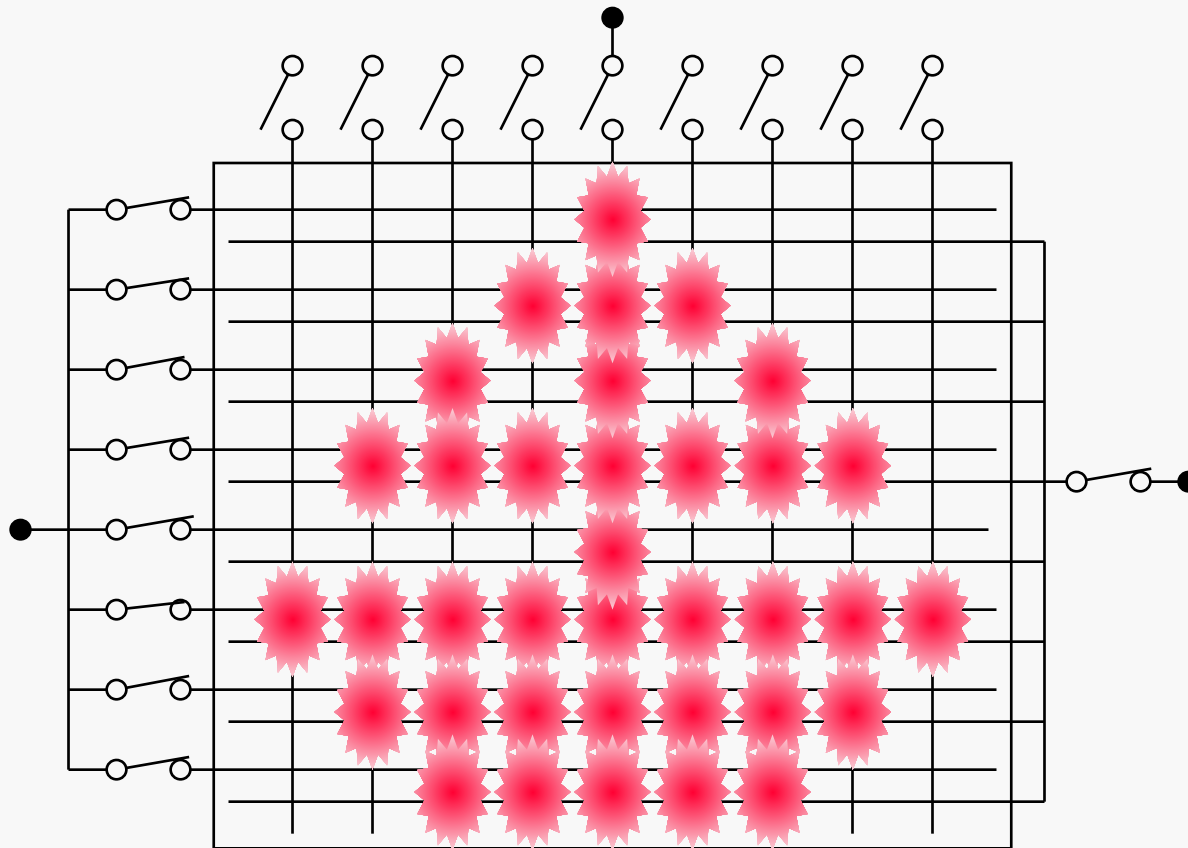
|            |     |       |      |
|------------|-----|-------|------|
| $V_s$      | 85V | $V_e$ | 110V |
| $V_{set}$  | 95V | $V_a$ | 79V  |
| $V_{scan}$ | 85V |       |      |

# ● Address Operation



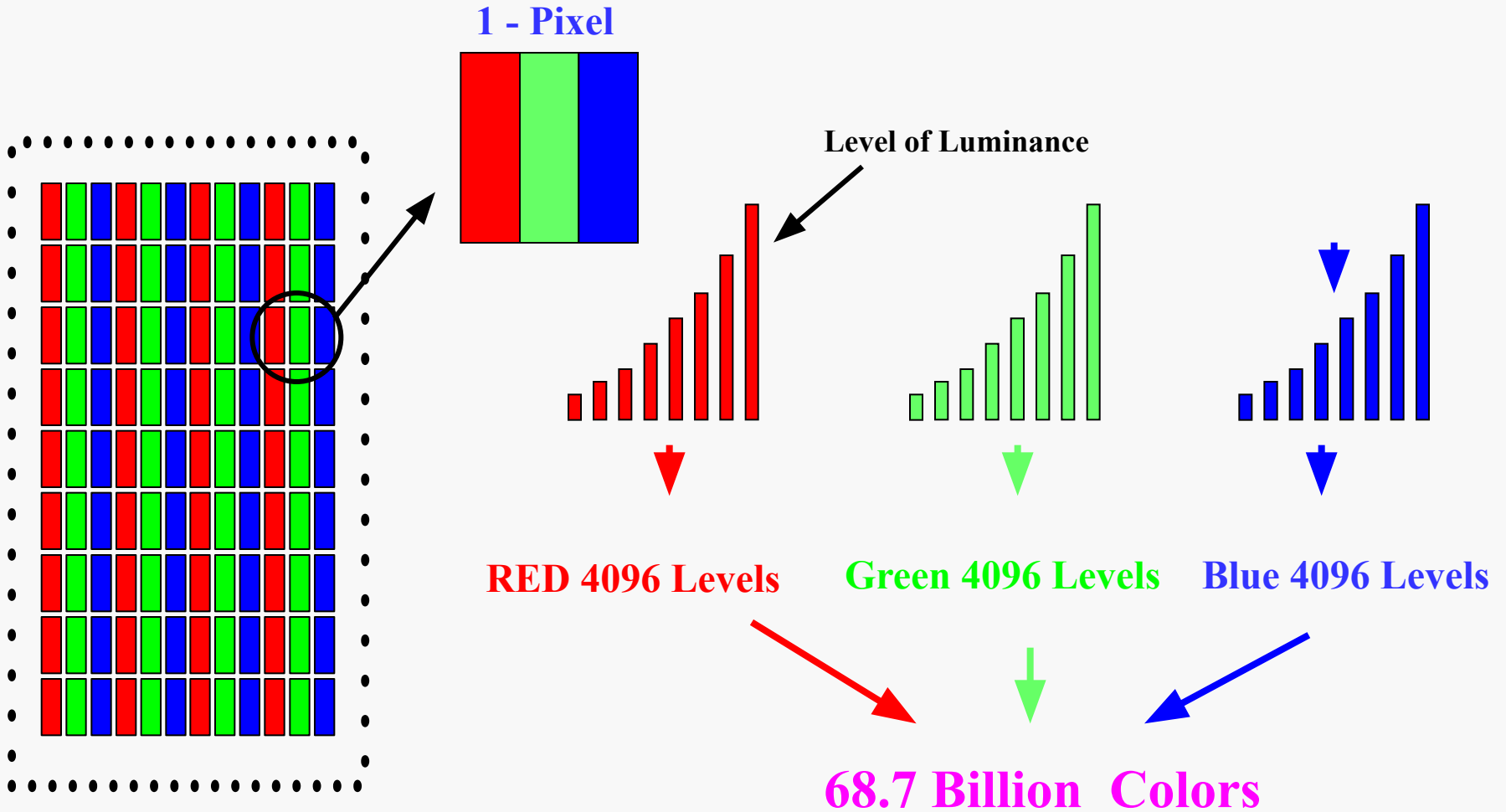


- **Sustain Operation**

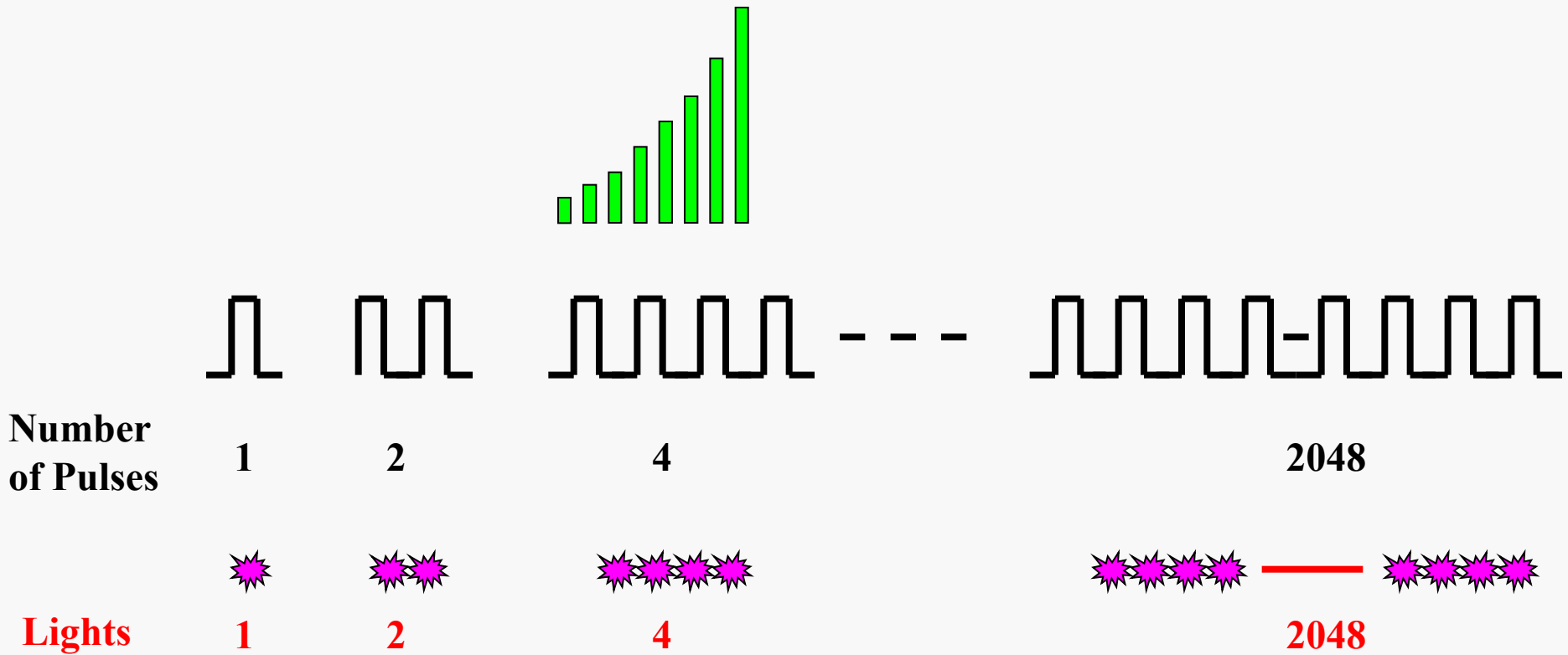


**Display cells through strong  
Sustain discharge.**

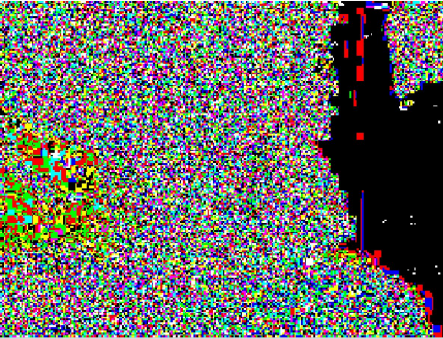
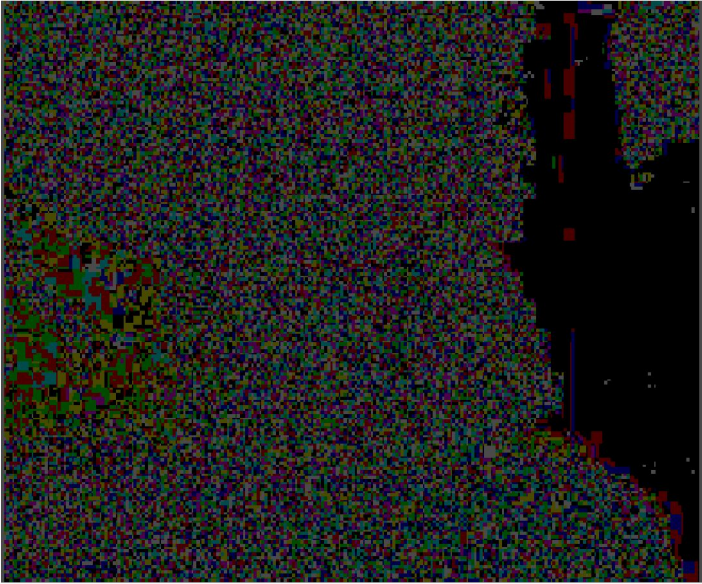
# ● Combination of R,G,B Light



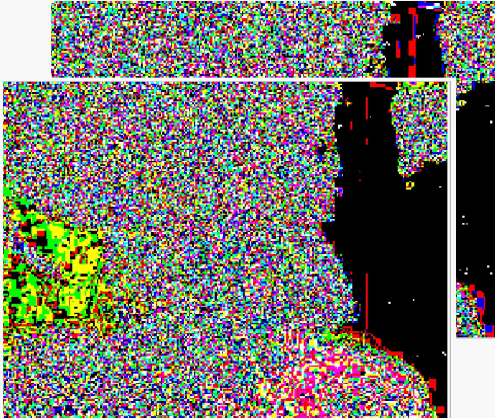
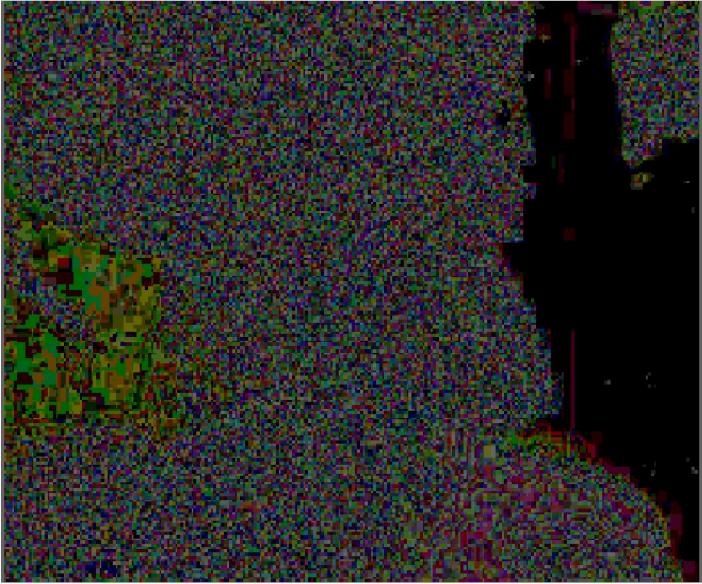
# ● Luminance Control



- 1 Picture Structure by 12 Sub-Field - 1

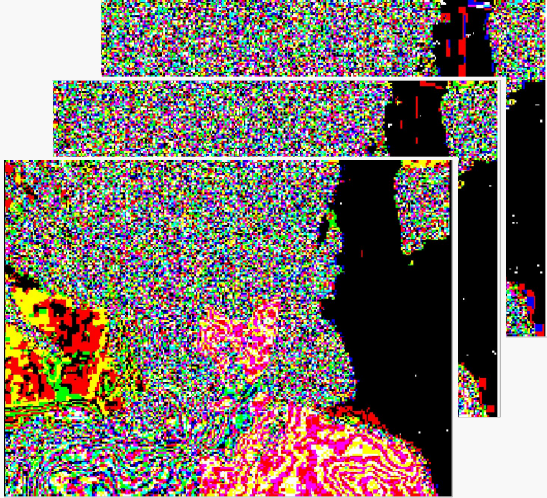


- 1 Picture Structure by 12 Sub-Field - 2

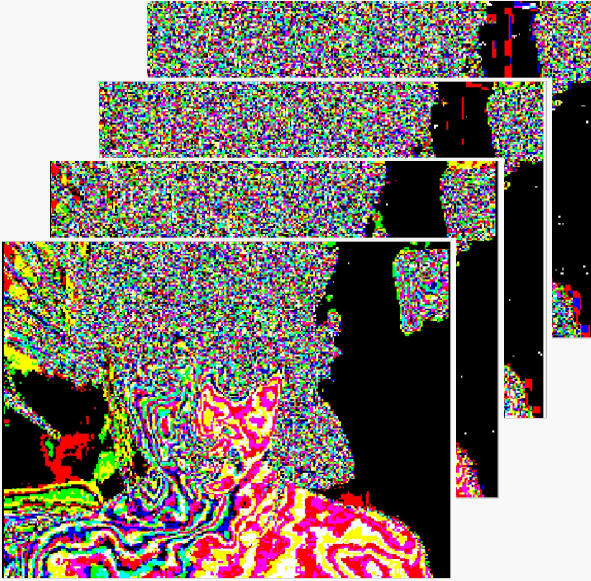
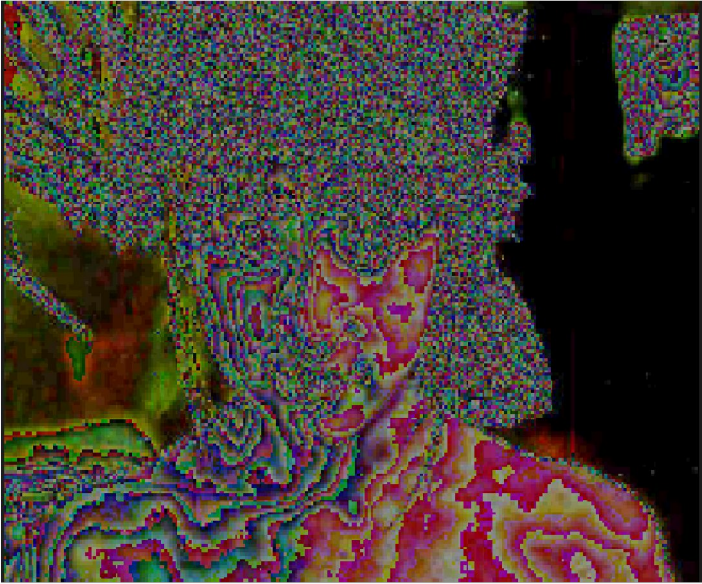




- 1 Picture Structure by 12 Sub-Field - 3

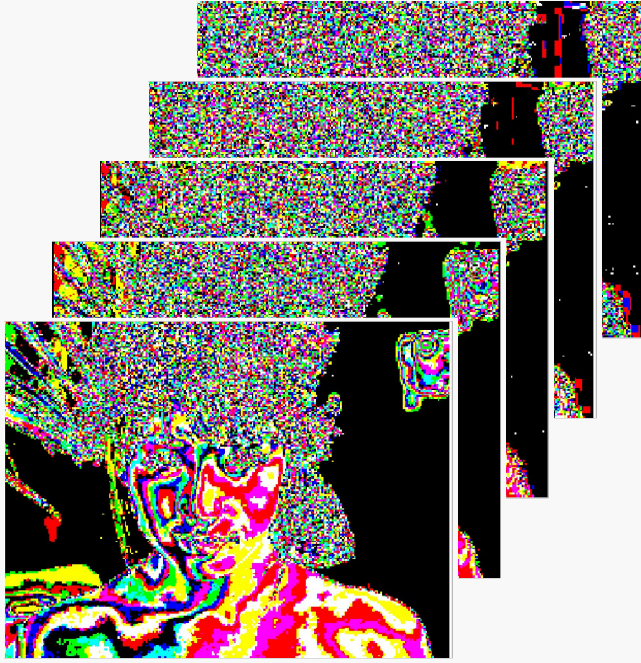


- 1 Picture Structure by 12 Sub-Field - 4



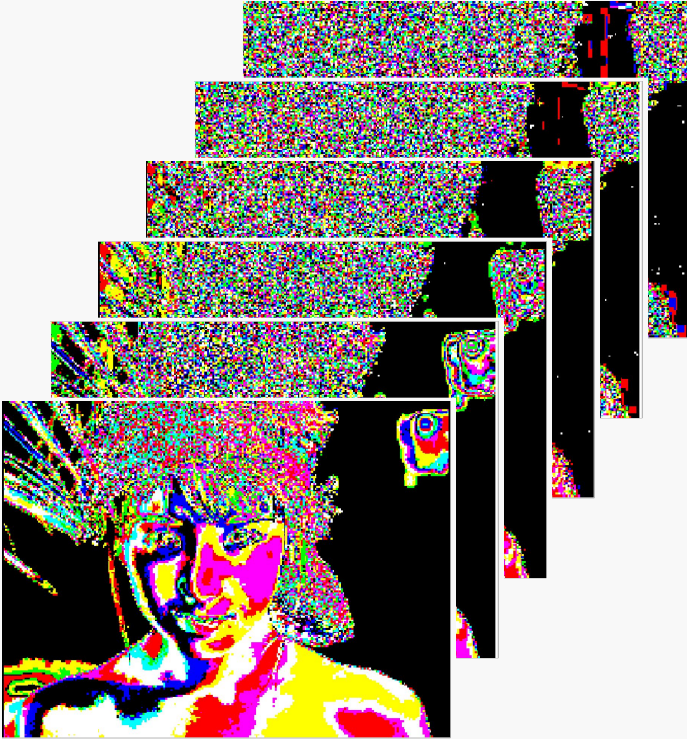
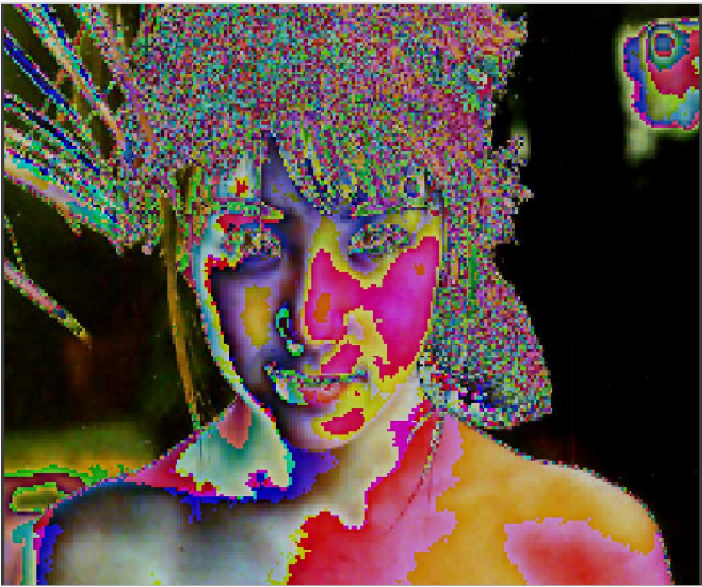


- 1 Picture Structure by 12 Sub-Field - 5

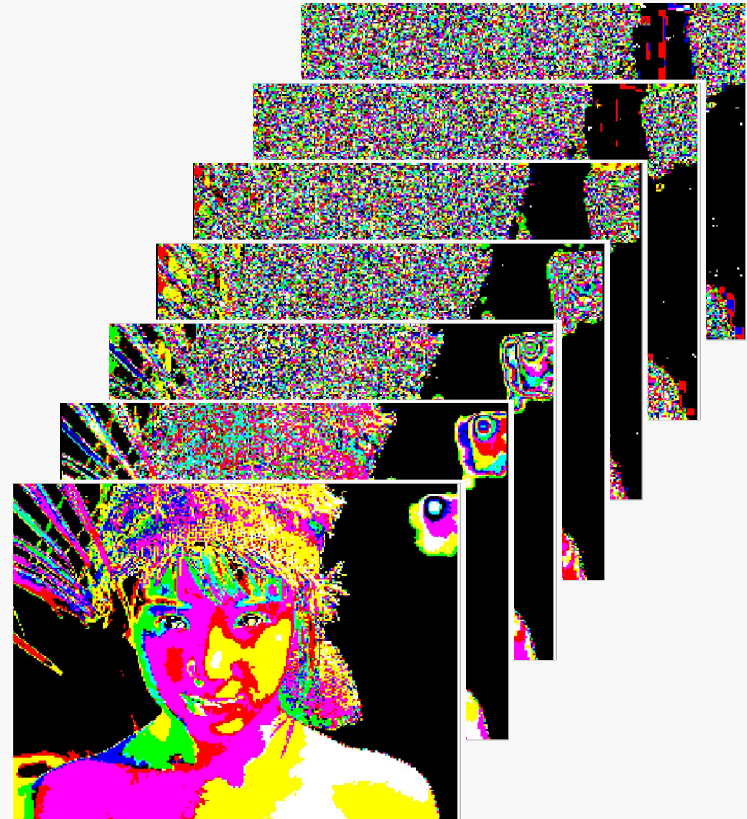




- 1 Picture Structure by 12 Sub-Field - .....

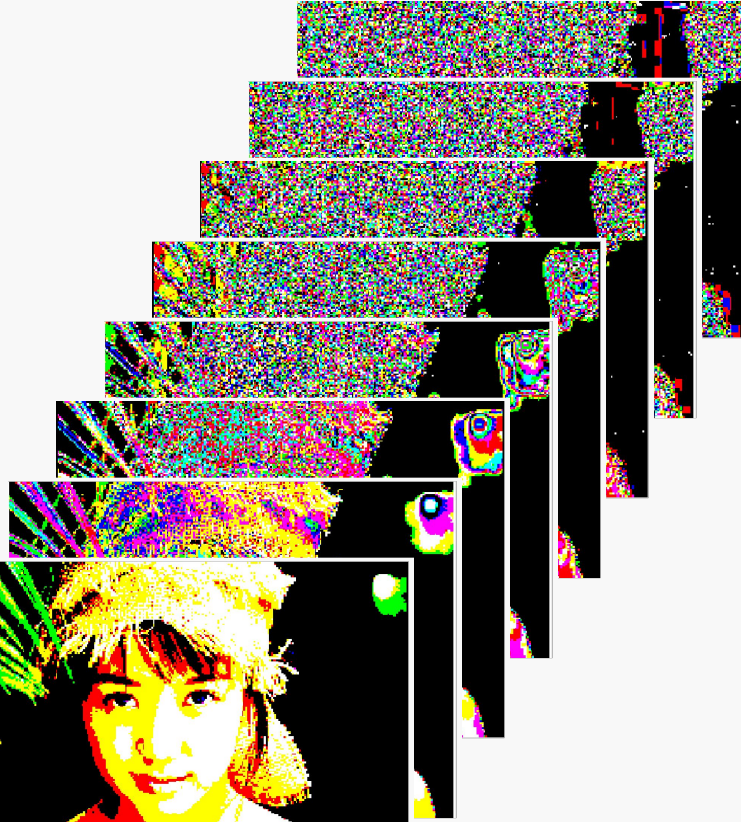


- 1 Picture Structure by 12 Sub-Field - 11







- 1 Picture Structure by 12 Sub-Field - 12










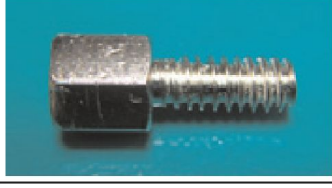


# 3. CARNELIAN Training

# ● Comparison with other Models

| Project           | LILY2 (W2A)                                                                       | CARNELIAN (W3)                                                                     |
|-------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Design            |  |  |
| Brightness        | 1500cd/m <sup>2</sup>                                                             | 1500cd/m <sup>2</sup>                                                              |
| Contrast ratio    | 10000:1                                                                           | 15000:1                                                                            |
| Tuner             | 1 Nim Tuner                                                                       | 1 Nim Tuner (Slim)                                                                 |
| Audio out         | 10W x 2                                                                           | 10W x 2                                                                            |
| Sound             | SRS Tru Surround XT                                                               | SRS Tru Surround XT                                                                |
| Speaker           | Included                                                                          | Included                                                                           |
| Video input       | -                                                                                 | 1Side                                                                              |
| S-Video input     | -                                                                                 | 1Side                                                                              |
| Component Input   | 1Rear                                                                             | 1Rear                                                                              |
| Side Input        | -                                                                                 | CVBS,S-Video, Headphone                                                            |
| HDMI              | 1Rear                                                                             | 2Rear                                                                              |
| Power Consumption | 42" : 350W<br>50" : 450W                                                          | 42" : 380W<br>50" : 480W                                                           |
| Etc.              | -                                                                                 | -                                                                                  |

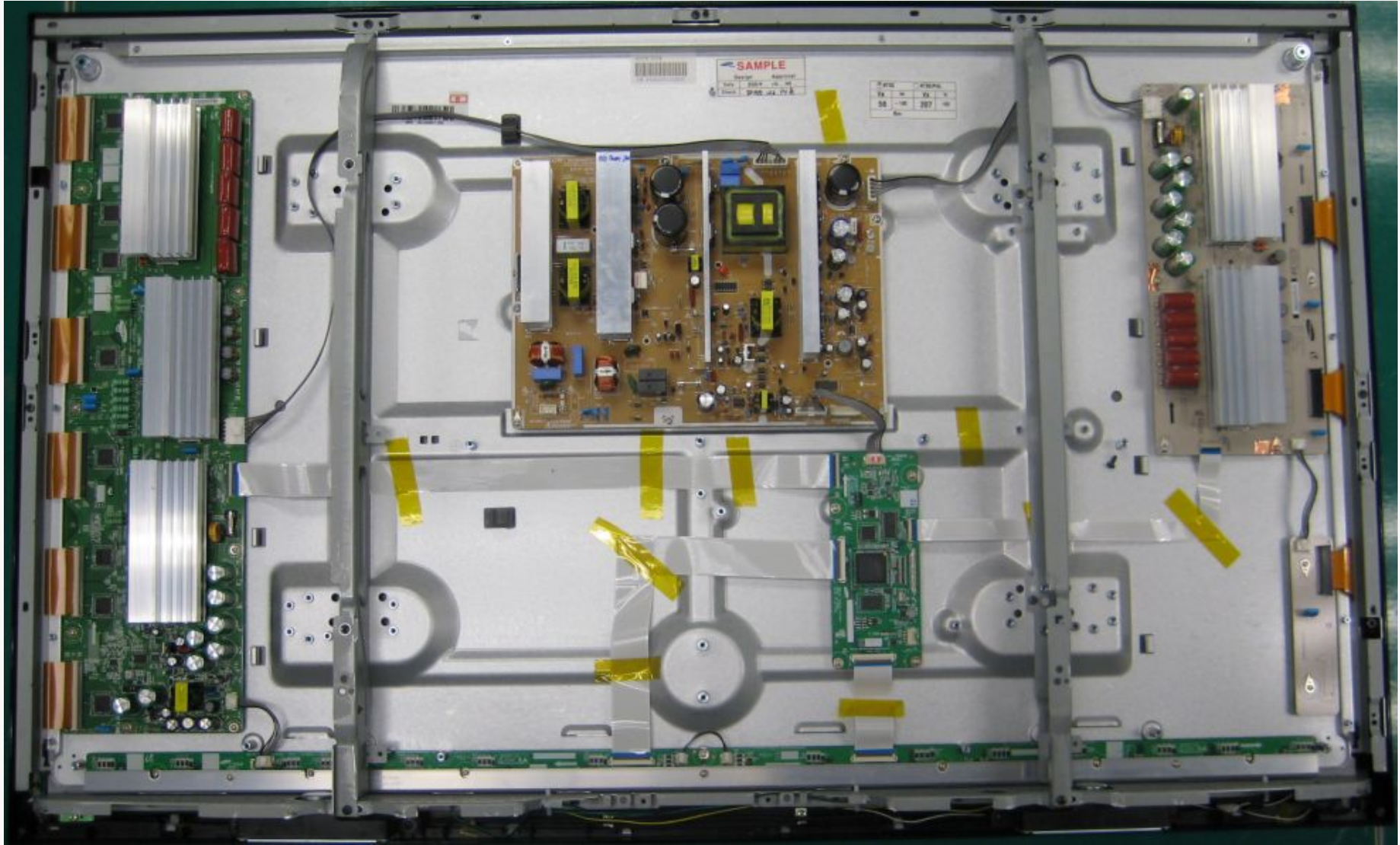
# ● Picture of PS50A416P1DX Set [Back view]



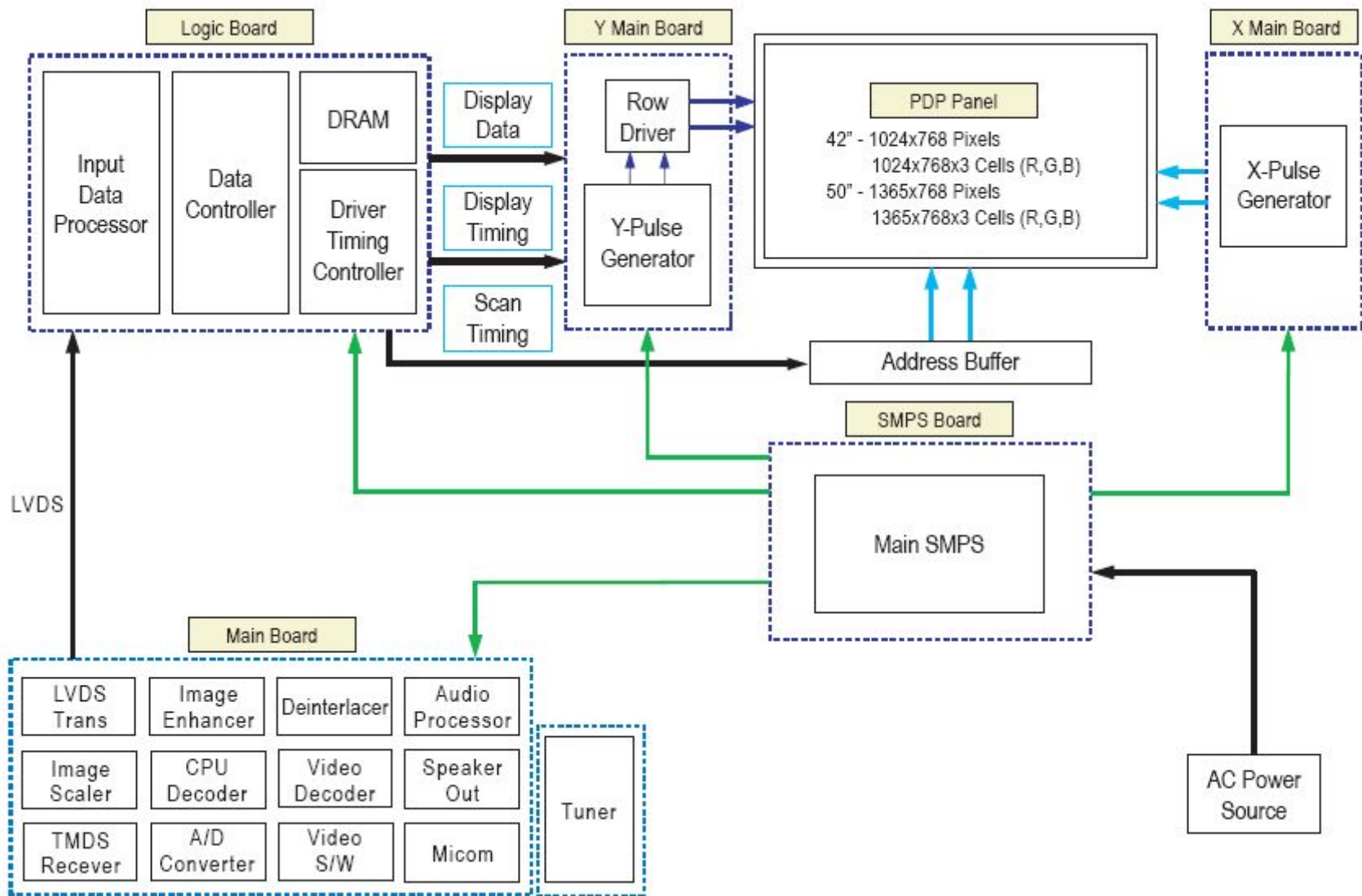
|                                                                                       |                                                                                       |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|    |    |
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- Picture of CARNELIAN 50" W3 PDP Module [Back view]

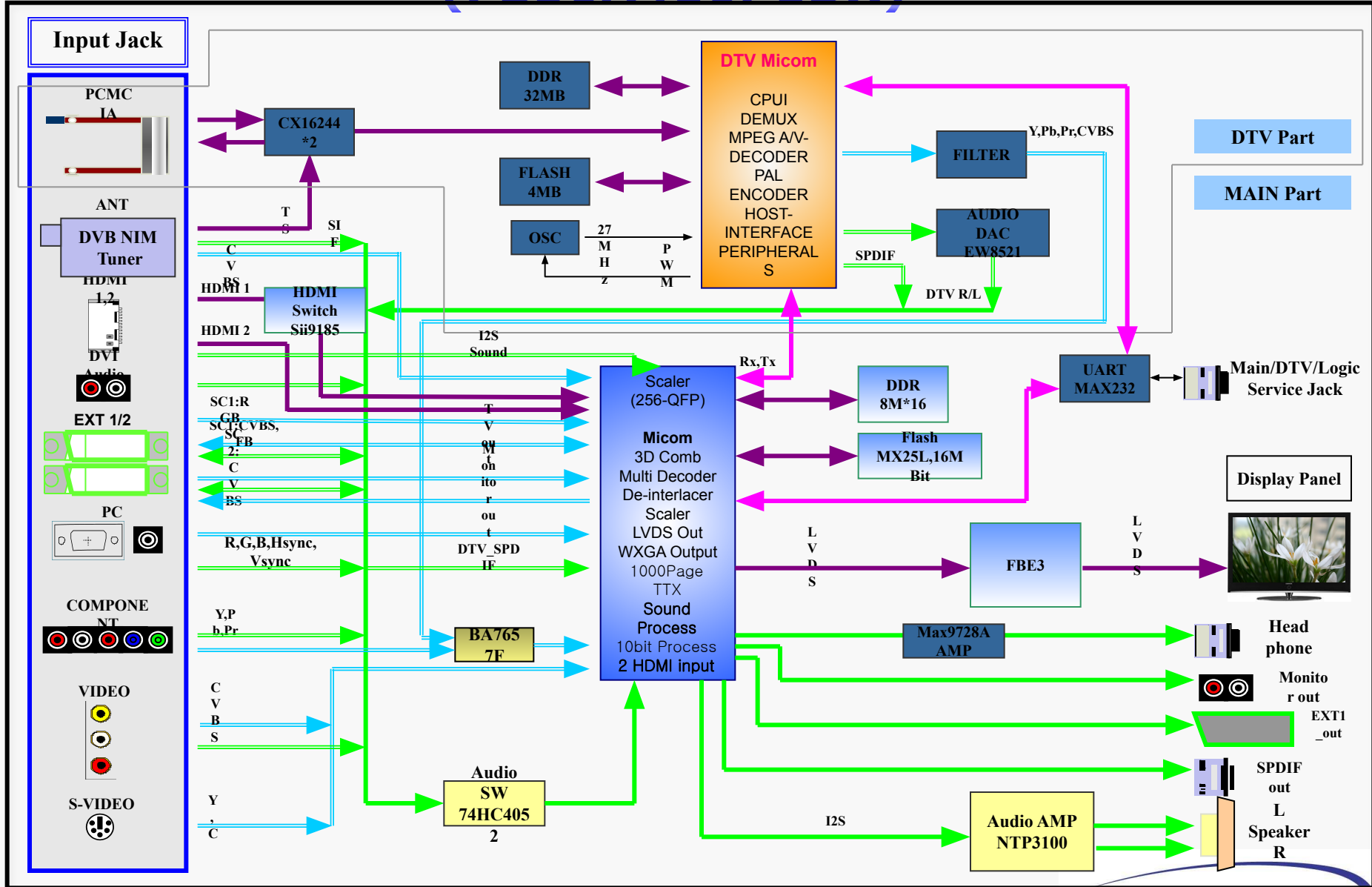


# ● General PDP SET Block Diagram

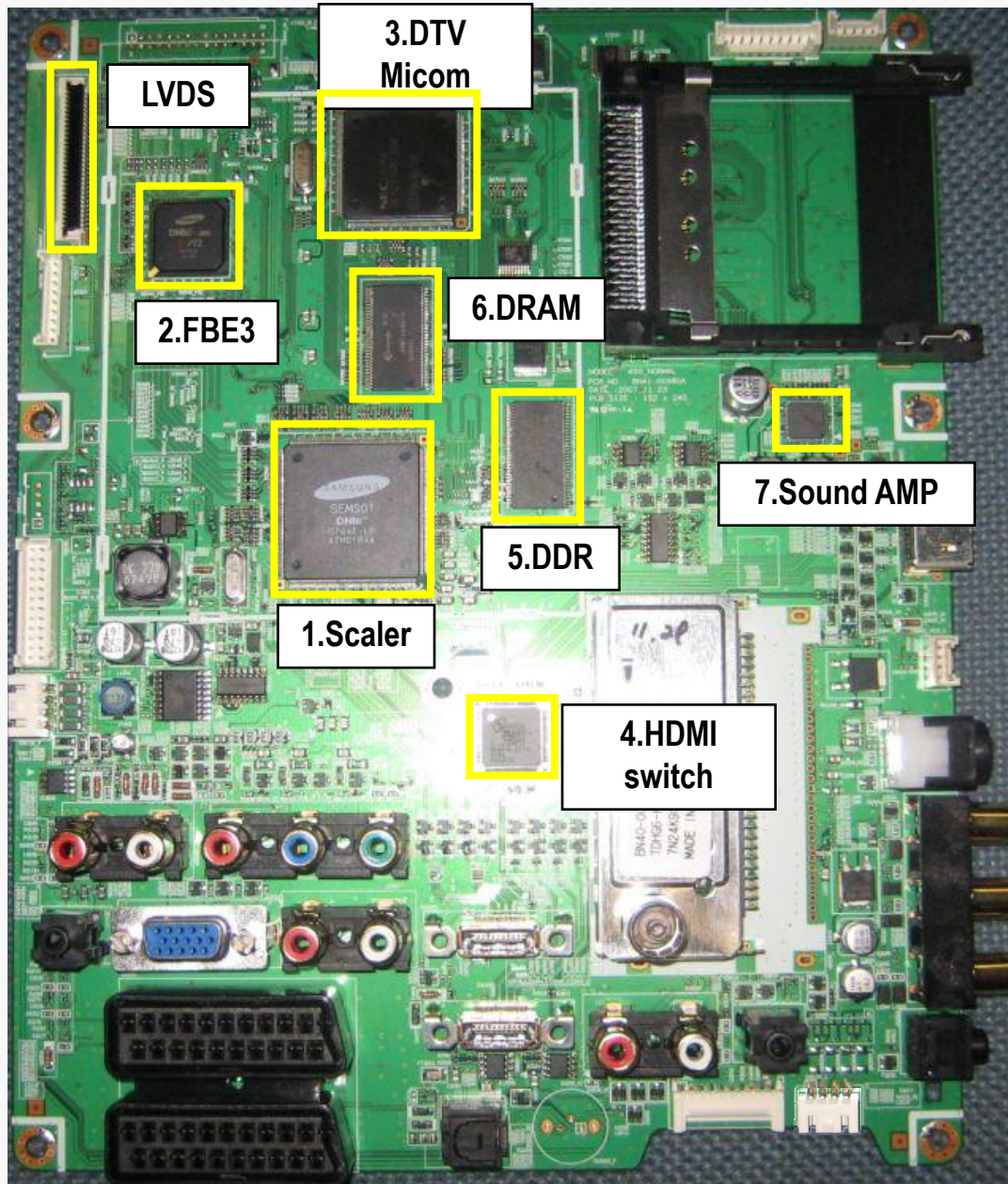




# Carnelian Block Diagram (PS50A416P1DX)



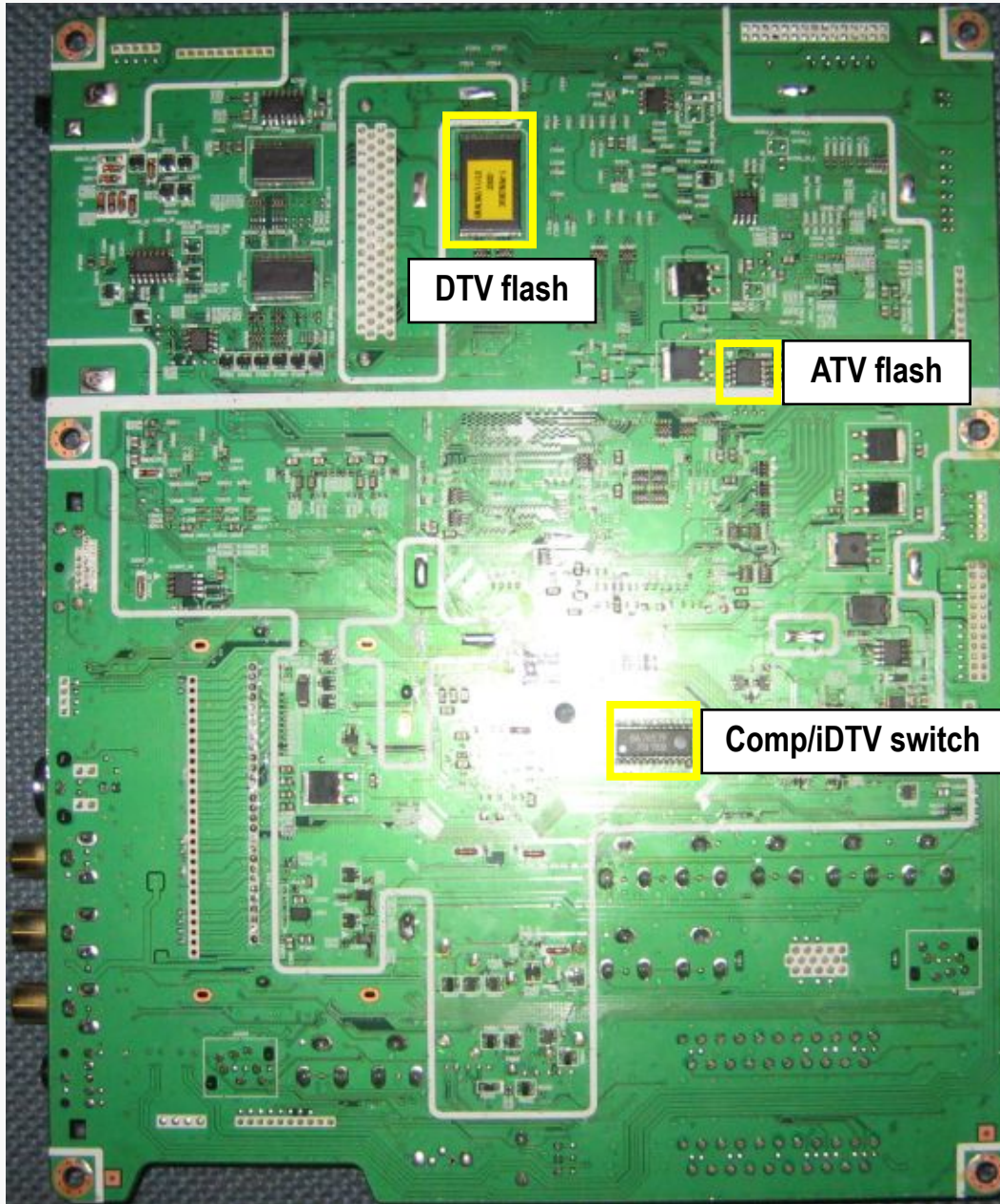
# ● Picture of PS50A416P1DX Chassis - Top



|   |        |                      |                                                                                                            |
|---|--------|----------------------|------------------------------------------------------------------------------------------------------------|
| 1 | IC5001 | IC-LCD<br>CONTROLLER | SEMS01,LQFP,256P,30x30mm,PLASTIC,3.3V,2.2W,0to+70C,TR                                                      |
| 2 | IC6001 | IC-VIDEO<br>PROCESS  | S4LF119X01,PBGA,208P,17x17mm,PLASTIC,3.6V,0to+70C,TR,FBEx                                                  |
| 3 | IC7001 | IC-DECODER           | UPD61211GM-104-GAA-A,QFP,216P,24x24mm,PLASTIC,3.3V,700mA,0to+70C,TR                                        |
| 4 | IC3001 | IC-VIDEO<br>SWITCH   | SiI9185CTU,QFP,80P,3.3V,0 to +70C,PLASTIC,TR                                                               |
| 5 | IC5201 | IC-DDR<br>SDRAM      | EM6A9160TS0A-5G,DDR<br>SDRAM,128Mbit,8Mx16,TSOP2,66P,22.22x10.16mm,5nS,2.375/2.625V,0to+70C,90m<br>A<br>TR |
| 6 | IC7002 | IC-DRAM              | HYB25D256163CE,DDR,256Mbit,16Mx16Bit,TSOP,66P,22.22x10.16mm,4ns,2.5/2.7V,<br>-,0to+7                       |
| 7 | IC2001 | IC-POWE<br>AMP       | NTP3100,QFN56,56P,8x8mm,DUAL,PLASTIC,24V,40W,-10to+85C                                                     |



- Picture of PS50A416P1DX Chassis - Bottom



# ● PS50A416P1DX SW update method (ATV software)

1. Connect the PC and PDP using D-SUB Cable and D/L jig

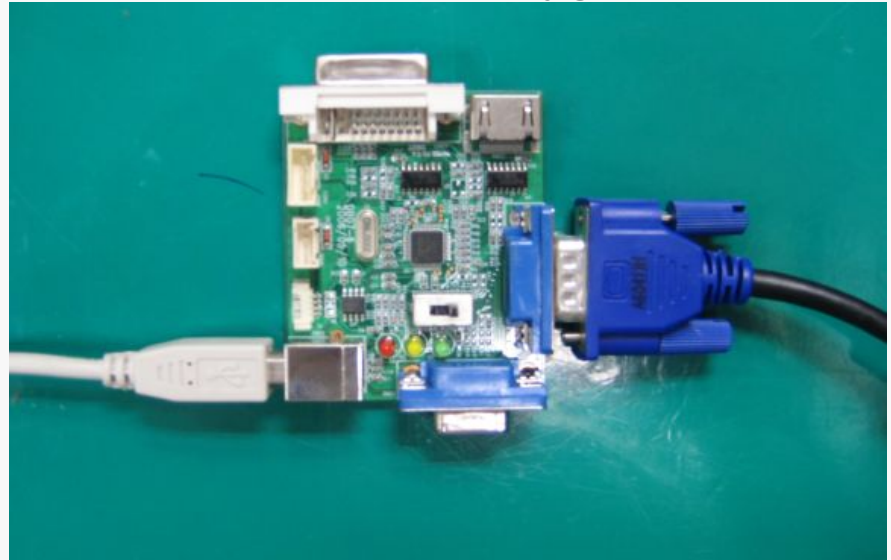
**Step by Step**



2. Run the Flash download program ISP\_Tool v4.3.0



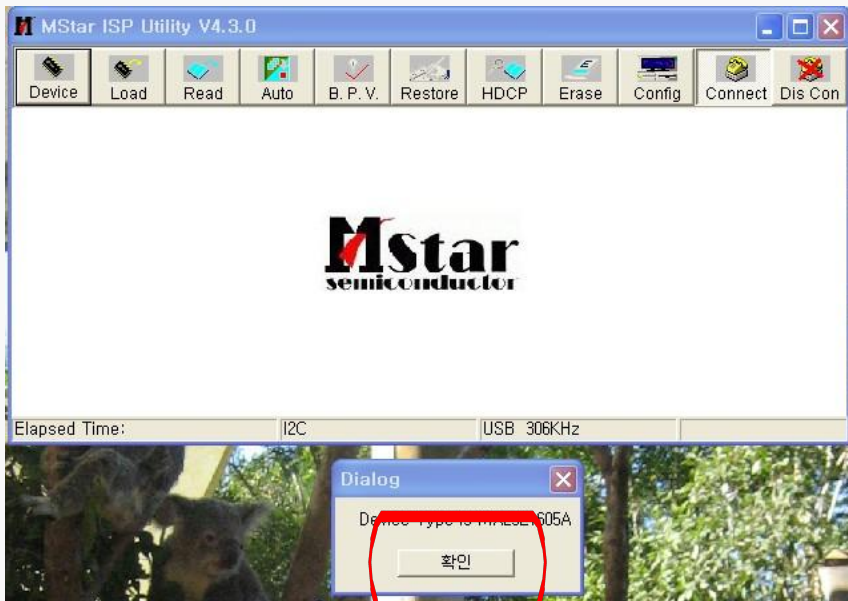
Picture of D/L jig



3. Click “Connect” button

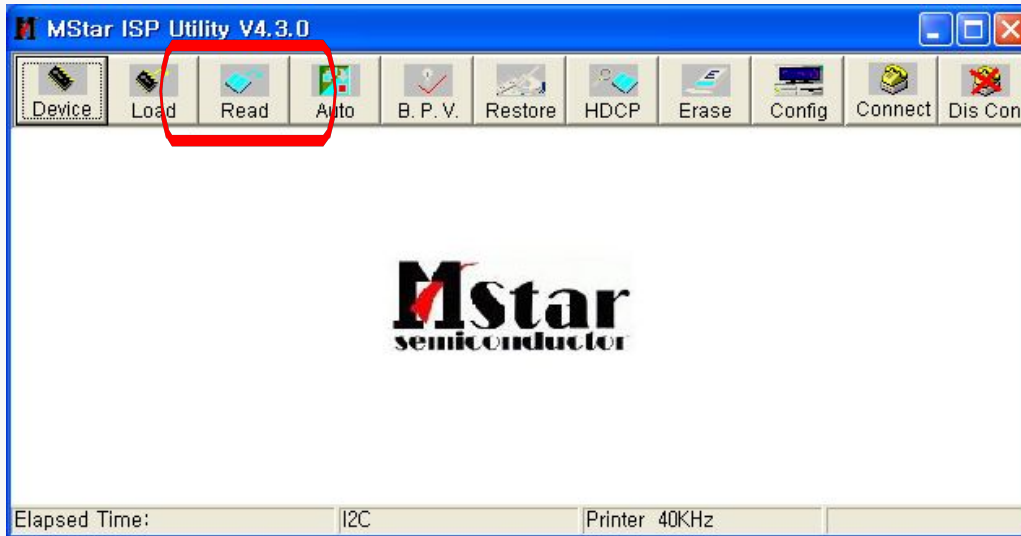


4. Now the connection with the SET is established. Click the “확인”

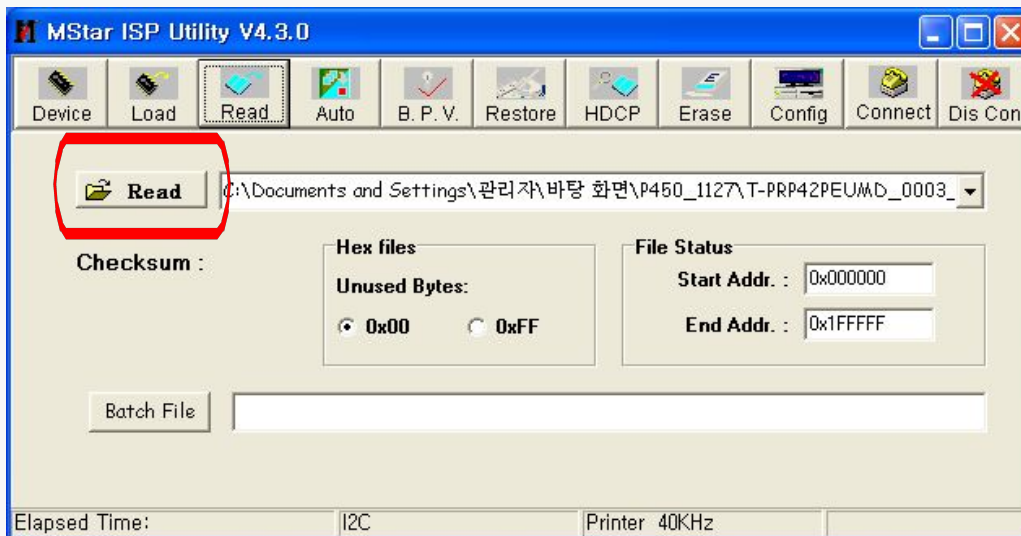




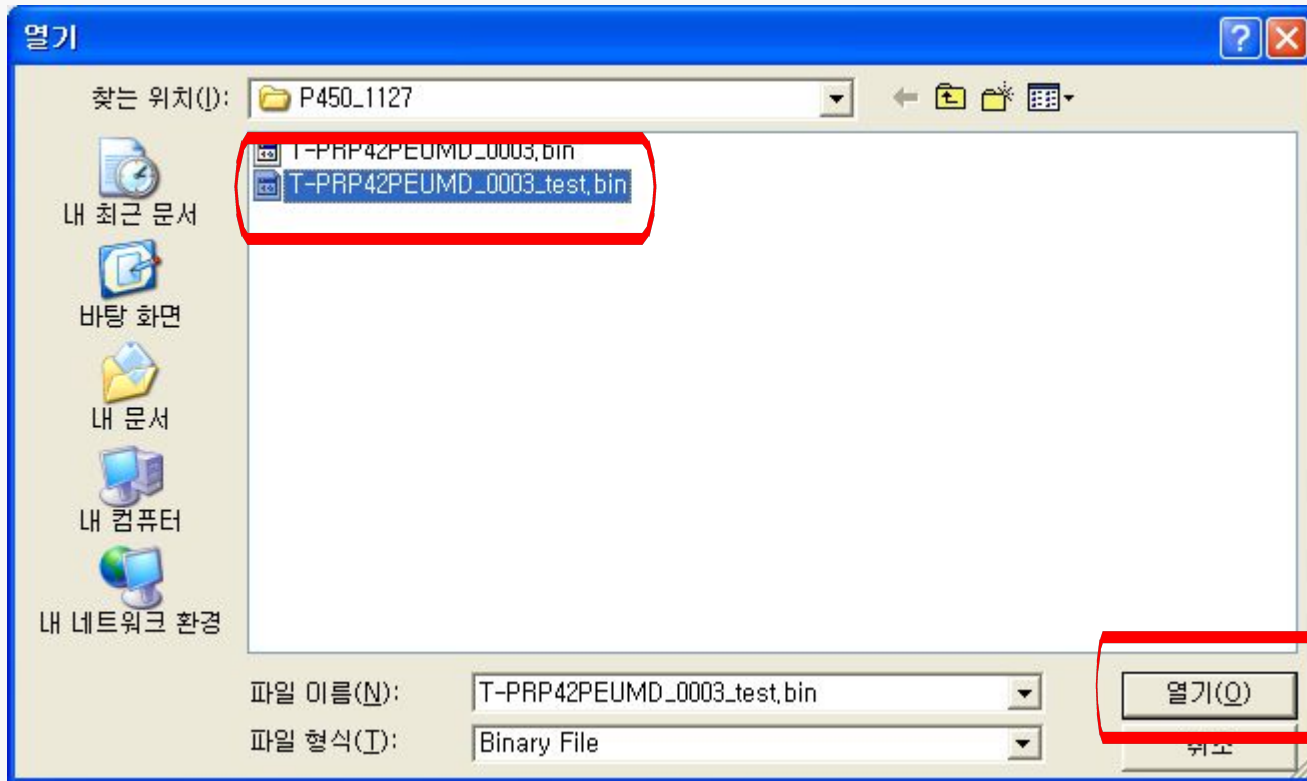
5. Connect the Power cord and click “Read”



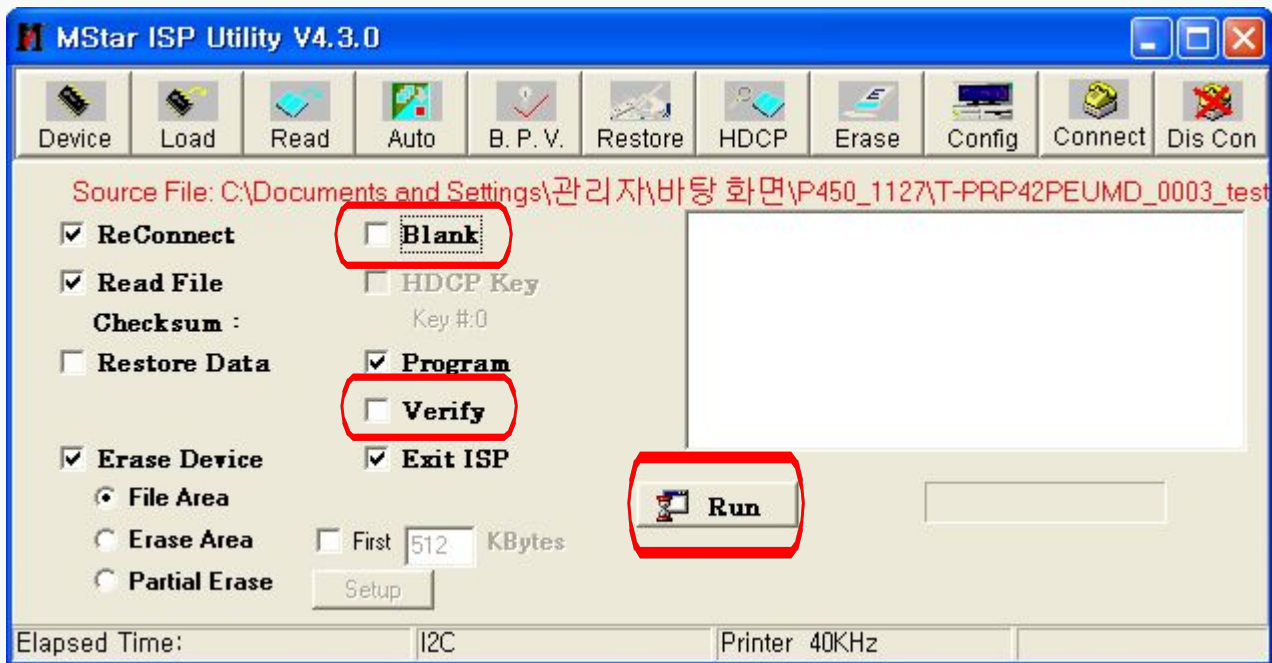
6. Click the new “Read” button



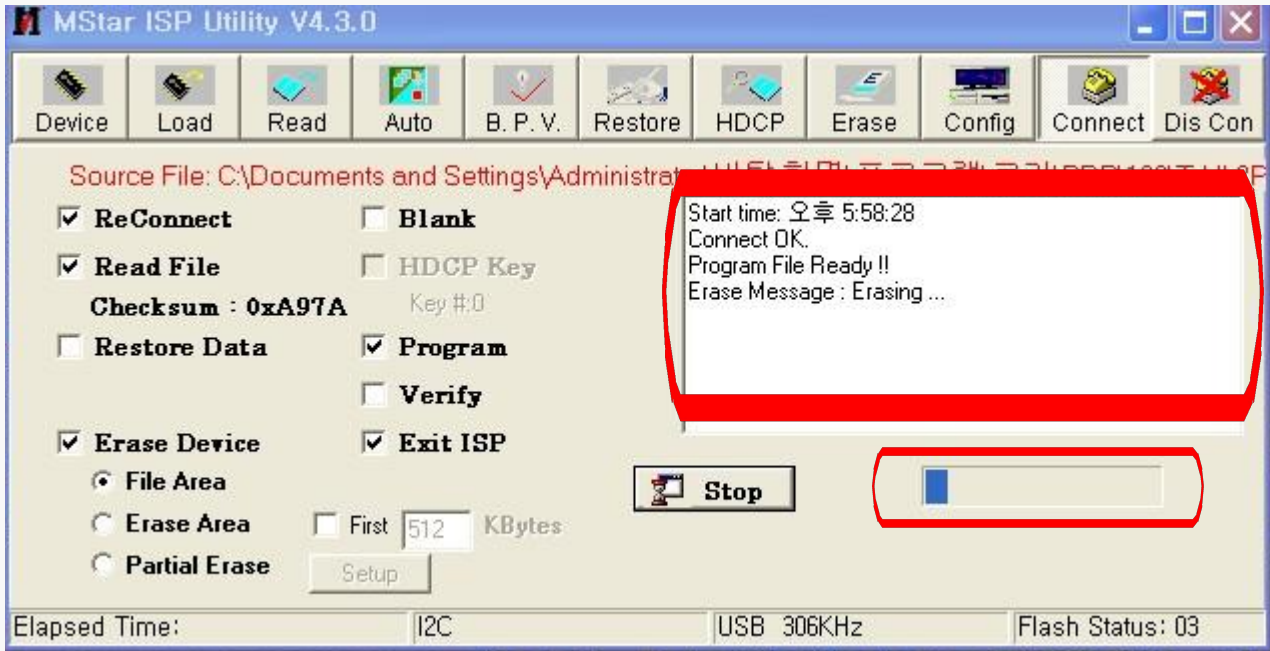
## 7. Select the upgrade file



8. Click “Auto” button, uncheck the Blank and Verify options and click “Run”



9. The download progress bar appears and D/L information is shown in the info window



# PS50A416P1DX SW update method (DTV software)

## Step by Step

1. Connect the serial D/L cable to the SET and execute the D/L program

2. Click the “Browse...” button to select the upgrade file and click “Next >”



3. Select the appropriate COM port and click “Next >”



4. After a short port scan the communication should be established

Click “Next >” to continue



5. Click “Next >” to continue





# PS50A416P1DX SW update method (DTV software)

## 6. The upgrade file is transferring to the SET

You can check the transfer progress bar and the remaining time



## 7. After the file was transferred the upgrade process will start automatically



## 8. Wait the upgrade process to finish

You can check the upgrade progress bar



## 9. After a successful upgrade the following window appears

Click "OK" to close the program



# ● Calibration (Component/HDMI/AV/PC)

## ■ White Balance – Calibration

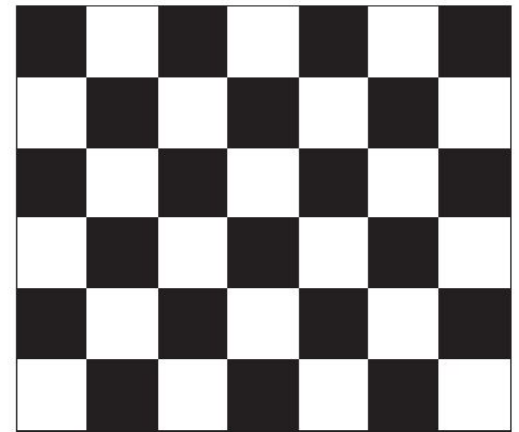
If picture color is wrong, do calibration first.

Execute calibration in Factory Mode (AV mode example):

1. Source : VIDEO (AV mode)
2. Setting Video Mode (Timing) : PAL Video (MODE : #2)
3. Setting pattern : Pattern #24 (Chess Pattern)
4. Use Equipment : K-7256 or Equipment of equality level
5. Work order:
  - 1) Enter Factory Mode and select “2. WB Adjust“ -> “Calibration”
  - 2) Select "AV CALIBRATION" and press the right button on the remote ( )
  - 3) After completing calibration, the “Success...” message will be displayed next by “AV CALIBRATION”

For Component/HDMI mode use resolution of 1280x720/60Hz (MODE: #6)

For PC mode use resolution of 1024x768/60Hz (MODE: #21)



( Chess Pattern )

# ● White Balance Adjustment

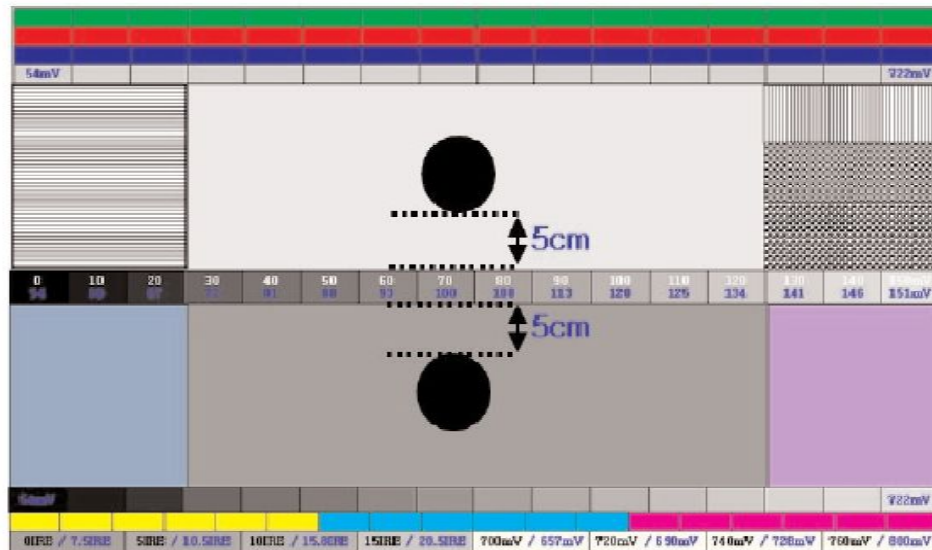
## ■ White Balance - Adjustment

If picture color is wrong, check White Balance condition.

Equipment : CA210, Patten : Toshiba  
Adjust W/B in Factory Mode

Sub brightness and R/G/B Offset controls low light region  
Sub contrast and R/G/B Gain controls high light region

Source AV : PAL composite, Component : 1280\*720/60Hz,  
HDMI[DVI] : 1280\*720/60Hz



( SAMSUNG WHITE BALANCE Adjustment PATTERN with FPD )

The WB specification can be found on the G-TMS system.

- **Picture condition in Factory mode / during WB adjust**

| No | Item          | Status    | Remark              |
|----|---------------|-----------|---------------------|
| 1  | Mode          | Dynamic   |                     |
| 2  | Colour Tone   | Cool1     |                     |
| 3  | Size          | Auto Wide | Comp/PC/HDMI : Wide |
| 4  | Digital NR    | Off       |                     |
| 5  | DNle          | Off       |                     |
| 6  | Energy Saving | Off       |                     |
| 7  | PIP           | Off       |                     |

- **Factory mode OSD**

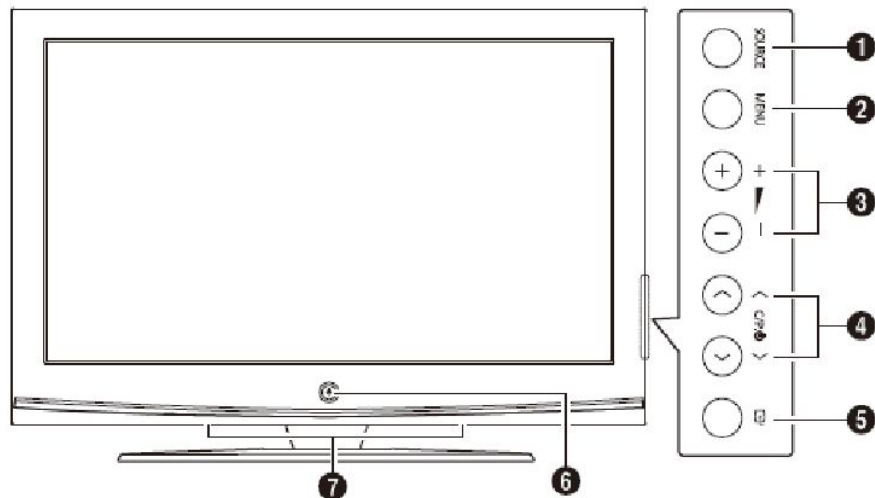
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Panel On Time(Hour) 00003      L24E_DS      TV  P 1

1. Option Table(Service) 023A 7805 0401 3309 0801 0401
2. WB Adjust
3. Information              4. Advanced Menu
Checksum
T-PRP42PEUMD-0000.0
Nov 19 2007
12:51:42
    
```

## Control Panel

### Front (or Side) Panel

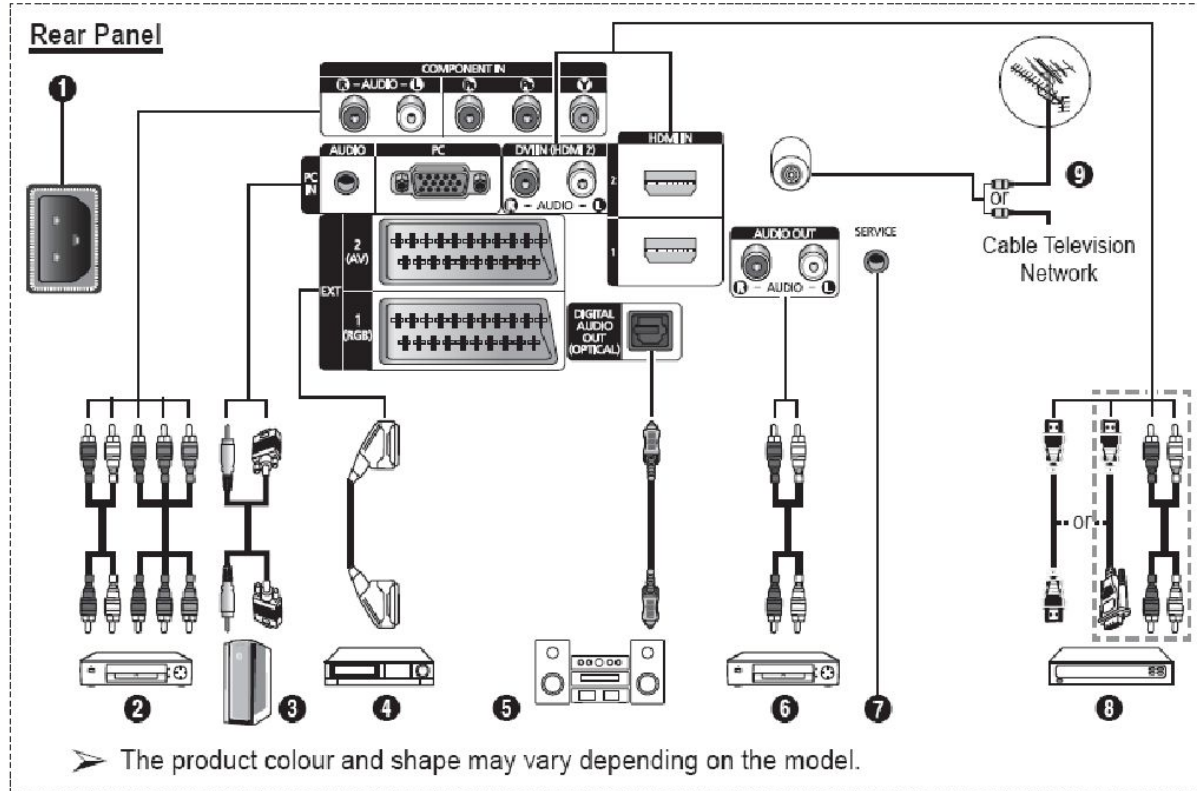


➤ The product colour and shape may vary depending on the model.

- 1 SOURCE**  
Toggles between all the available input sources (TV, Ext.1, Ext.2, AV, S-Video, Component, PC, HDMI1, HDMI2 and DTV).
- 2 MENU**  
Press to see an on-screen menu of your TV's features.
- 3 - +**  
Press to increase or decrease the volume. In the on-screen menu, use the - + buttons as you would use the ◀ and ▶ buttons on the remote control.
- 4 ^ C/P ⏻**  
Press to change channels. In the on-screen menu, use the ^ C/P ⏻ buttons as you would use the ▲ and ▼ buttons on the remote control.
- 5 ENTER**  
In the on-screen menu, use this button as you would use the ENTER button on the remote control.
- 6 POWER**  
Press to turn the TV on and off.  
**Power Indicator**  
Blinks and turns off when the power is on and lights up in stand-by mode.  
**Remote Control Sensor**  
Aim the remote control towards this spot on the TV.
- 7 Speakers**



# Connection Panel



- ◆ Whenever you connect an audio or video system to your set, ensure that all elements are switched off.
- ◆ When connecting an external device, match the colour of the connection terminal to the cable.

**1 POWER IN**  
Connect the supplied power cord.

**2 COMPONENT IN**  
Audio (AUDIO L/R) and video (Y/PB/PR) inputs for Component.

**3 PC IN / AUDIO**  
Connect to the video and audio output jack on your PC.

**4 EXT 1, EXT 2**  
Inputs or outputs for external devices, such as VCR, DVD, video game device or video disc players.

#### Input/Output Specification

| Connector | Input |            |     | Output                              |
|-----------|-------|------------|-----|-------------------------------------|
|           | Video | Audio(L/R) | RGB | Video + Audio(L/R)                  |
| EXT 1     | ✓     | ✓          | ✓   | Only TV or DTV output is available. |
| EXT 2     | ✓     | ✓          |     | Output you can choose.              |

- 8 HDMI IN(DVI IN)**
- Connect to the HDMI jack of a device with HDMI output. These inputs can also be used as a DVI connection with separate analog audio inputs. An optional HDMI/DVI cable will be necessary to make this connection. When using the optional HDMI/DVI adapter, the DVI analog audio inputs on your TV allow you to receive left and right audio from your DVI device. (Not compatible with PC)
  - When connecting this product via HDMI or DVI to a Set Top Box, DVD Player or Games Console etc, make sure that it has been set to a compatible video output mode as shown in the table below. Failure to observe this may result in picture distortion, image breakup or no picture.

**5 DIGITAL AUDIO OUT (OPTICAL)**  
Connect to a Digital Audio Component.

**6 Connecting external Audio Devices**  
Connect RCA audio signals from the TV to an external source, such as Audio equipment.

**7 SERVICE**

- Connector for service.
- Connect the serial jack between the electro-motion wall mount bracket and your TV when you want to adjust the TV viewing angle using your remote control.

- Do not attempt to connect the HDMI/DVI connector to a PC or Laptop Graphics Card. (This will result in a blank screen being displayed)

#### **DVI IN AUDIO L/R**

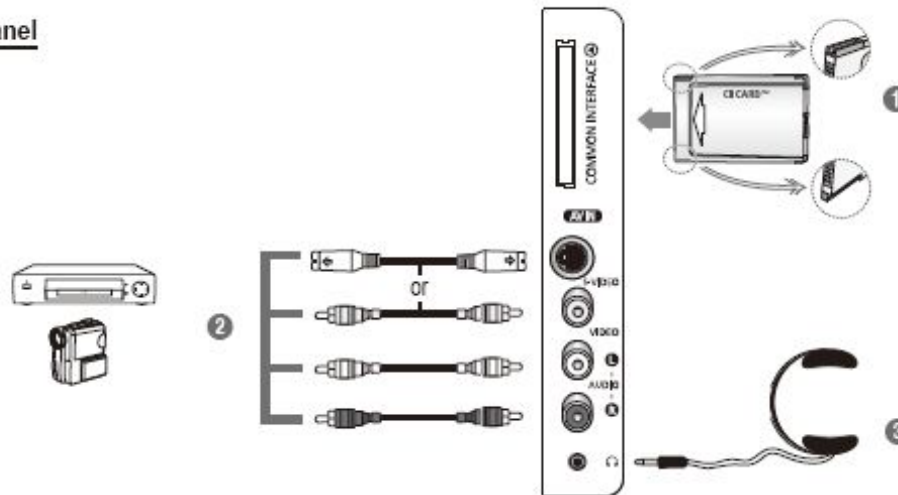
DVI audio outputs for external devices.

**9 ANT IN**  
75Ω Coaxial connector for Aerial/Cable Network.

#### Supported modes for HDMI and Component

|               | 480i | 480p | 576i | 576p | 720p | 1080i |
|---------------|------|------|------|------|------|-------|
| HDMI/DVI 50Hz | X    | X    | X    | O    | O    | O     |
| HDMI/DVI 60Hz | X    | O    | X    | X    | O    | O     |
| Component     | O    | O    | O    | O    | O    | O     |

## Side Panel









- 1 COMMON INTERFACE Slot**  
Insert CI (Common Interface) card into the slot. (refer to page 40)
  - When not inserting "CI CARD" in some channels, "Scramble Signal" is displayed on the screen.
  - The pairing information containing a telephone number, CI CARD ID, Host ID, and other information will be displayed in about 2~3 minutes. If an error message is displayed, please contact your service provider.
  - When the channel information configuration has finished, the message "Updating Completed" is displayed, indicating that the channel list is now updated.

➤ Insert the CI-Card in the direction marked on it.
- 2 S-VIDEO or VIDEO / AUDIO L/R**  
Video (S-Video or Video) and audio inputs for external devices, such as a camcorder or VCR.
- 3 Headphones jack**  
You can connect a set of headphones if you wish to watch a television programme without disturbing the other people in the room.
  - Prolonged use of headphones at a high volume may damage your hearing.

# Accessories

## 2-3 Accessories

|                      | Accessories                                                                         | Item                                                      | Item code                                 | Remark                 |
|----------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------|------------------------|
| Supplied Accessories |    | Remote Control Batteries                                  | BN59-00676A<br>4301-000103                | Samsung Service center |
|                      |    | Power Cord                                                | 3903-000145                               |                        |
|                      |    | Owner's Instructions                                      | BN68-01416A                               |                        |
|                      |    | Warranty Card<br>Registration Card<br>Safety Guide Manual | BN68-00514E<br>AA68-03575D<br>AA68-03242K |                        |
|                      |    | Ferrite Core for Earphone/Power Cord                      | 3301-001110                               |                        |
|                      |  | Ferrite Core for S-VIDEO/Power Cord                       | 3301-001305                               |                        |

# 5. Trouble shooting



# ● Check List in advance

## ■ Each cable connection condition check

- Cable is connected correctly ?

## ■ Check Voltage

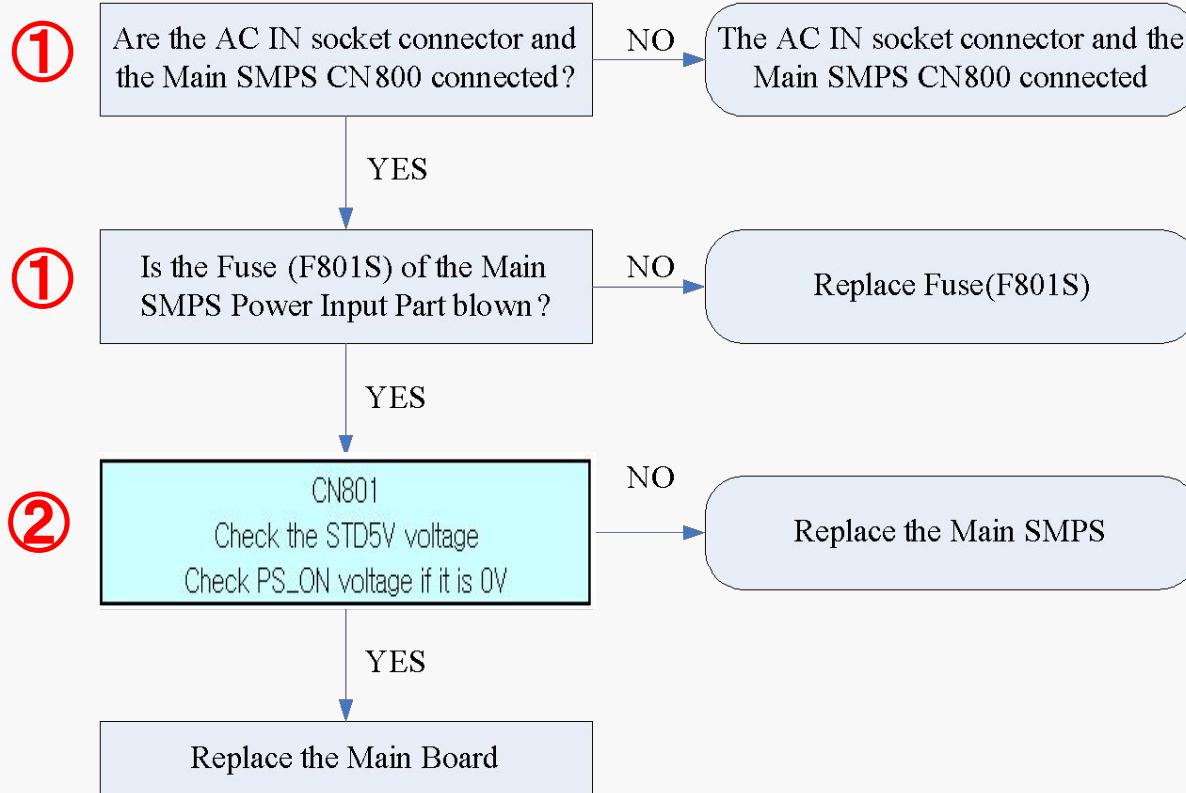
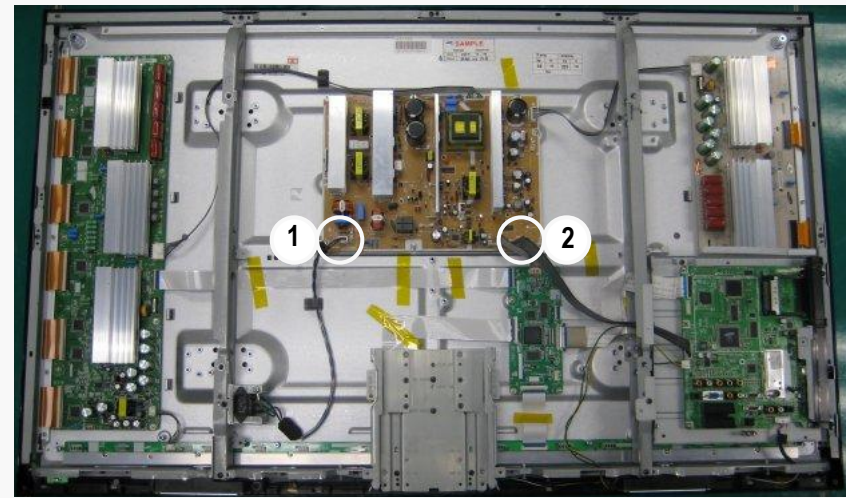
- SMPS □ □ Video main Board, SMPS □ □ X,Y Drive board, SMPS □ □ Logic board

## ■ The chart below shows abnormal condition

| Condition Name    | Description                                                    | Related Board                            |
|-------------------|----------------------------------------------------------------|------------------------------------------|
| No Voltage Output | Operating Voltages don't exist.                                | SMPS                                     |
| No Display        | Operating Voltages exist, but an Image doesn't exist on screen | Y-MAIN, X-MAIN, Logic Main, Cables, Main |
| Abnormal Display  | Abnormal Image(not open or short) is on screen.                | Y-MAIN, X-MAIN, Logic Main               |
| Sustain Open      | some horizontal lines don't exist on screen                    | Scan Buffer, FPC of X / Y                |
| Sustain Short     | some horizontal lines appear to be linked on screen            | Scan Buffer, FPC of X / Y                |
| Address Open      | some vertical lines don't exist on screen                      | Logic Main,Logic Buffer,FFC,TCP          |
| Address Short     | some vertical lines appear to be linked on screen              | Logic Main,Logic Buffer,FFC,TCP          |

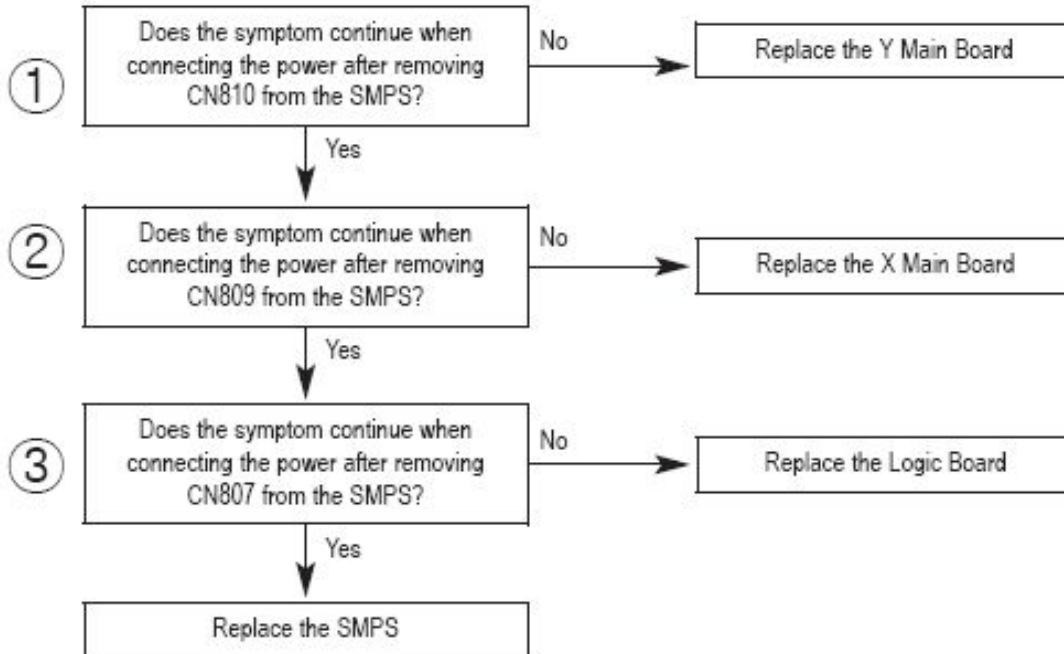
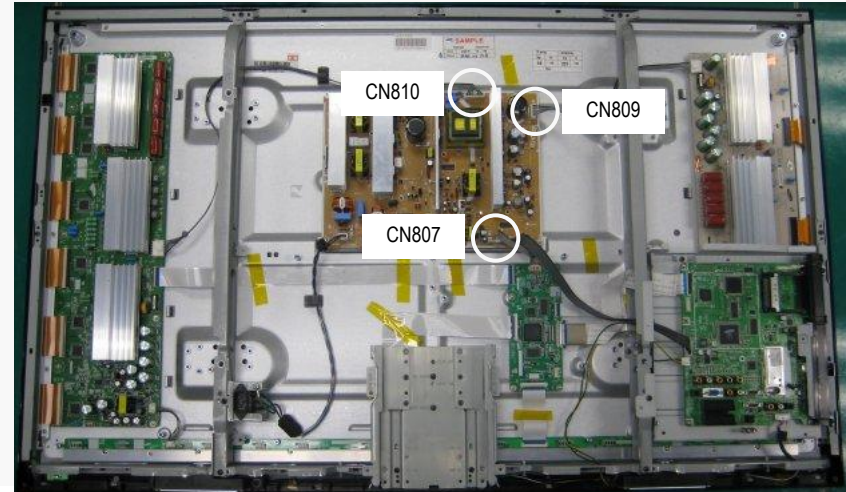
# ● No Power

- Not operate front LED
- Not operate SMPS relay



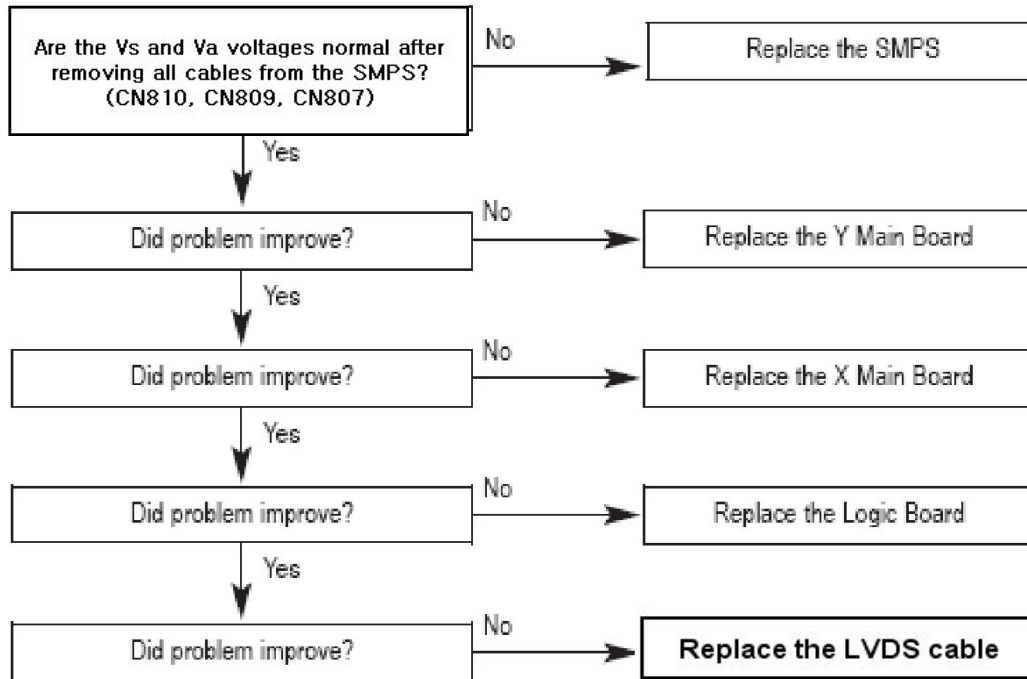
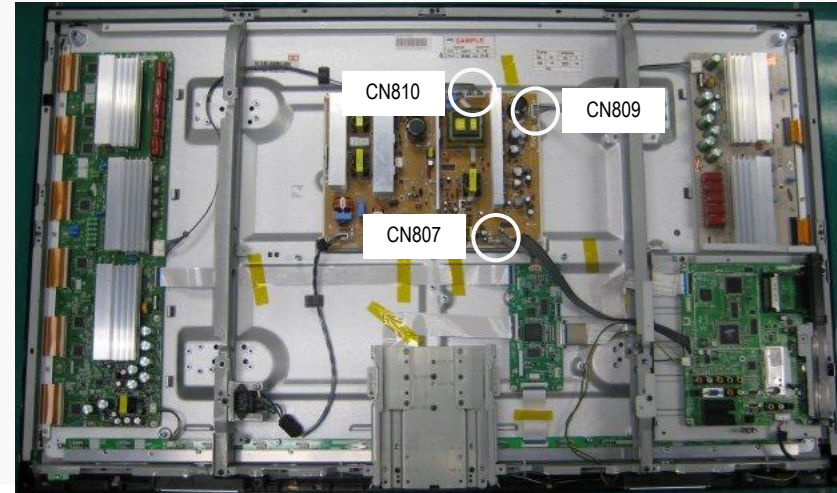
# ● SMPS relay on <-> off continually

- Operate Protection circuit because of some Ass'y problem



# ● No display but sound is normal

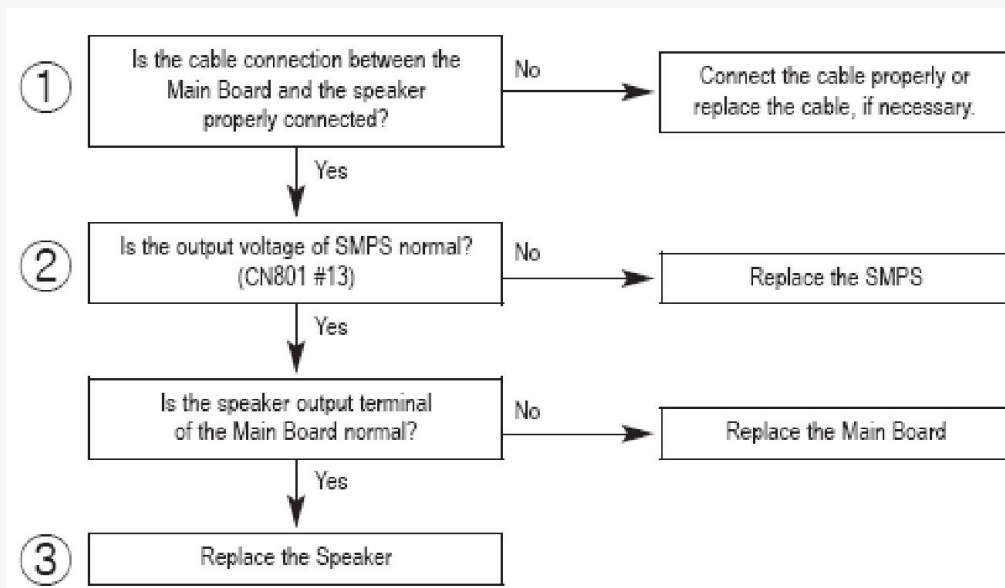
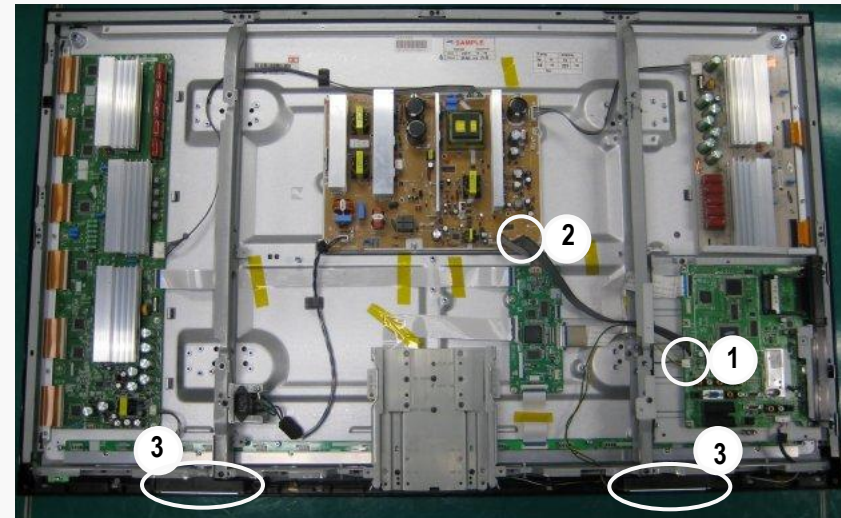
- X or Y or Logic or Y Buffer board is abnormal
- SMPS output Voltage is abnormal





# ● No sound but display is normal

- Speaker wire is not connect
- Video main board sound part defect
- Speaker part defect
- Volume level is "0"(Non-sense)





# ● PDP Dot Module SPEC – SDI module

| Item        |                | A Zone | B Zone | Remark |
|-------------|----------------|--------|--------|--------|
| Product     | Type           |        |        |        |
| 42"<br>(SD) | Dar k          | 1      | 6      |        |
|             | Br i ght       | 0      | 1      |        |
|             | Fl i cker i ng | 0      | 1      |        |
|             | TOTAL          | 7      |        |        |
| 42"<br>(HD) | Dar k          | 3      | 8      |        |
|             | Br i ght       | 0      | 1      |        |
|             | Fl i cker i ng | 1      | 2      |        |
|             | TOTAL          | 10     |        |        |
| 50"         | Dar k          | 3      | 8      |        |
|             | Br i ght       | 0      | 1      |        |
|             | Fl i cker i ng | 1      | 2      |        |
|             | TOTAL          | 10     |        |        |
| 63"         | Dar k          | 3      | 8      |        |
|             | Br i ght       | 0      | 1      |        |
|             | Fl i cker i ng | 1      | 2      |        |
|             | TOTAL          | 10     |        |        |

## ※ Special Management Items

1) It is Cell-Defect if there are dark, bright, flickering cells over **2 points** within **1.5cm** in the boundary section.

2) Before vibration/dropping test, it should be decided whether the module is good / badness first.

And after vibration/dropping test, if Cell-Defect happens more than preceding descriptions on Specification, it is Cell-Defect module.

- **A-Zone / B-Zone Size**

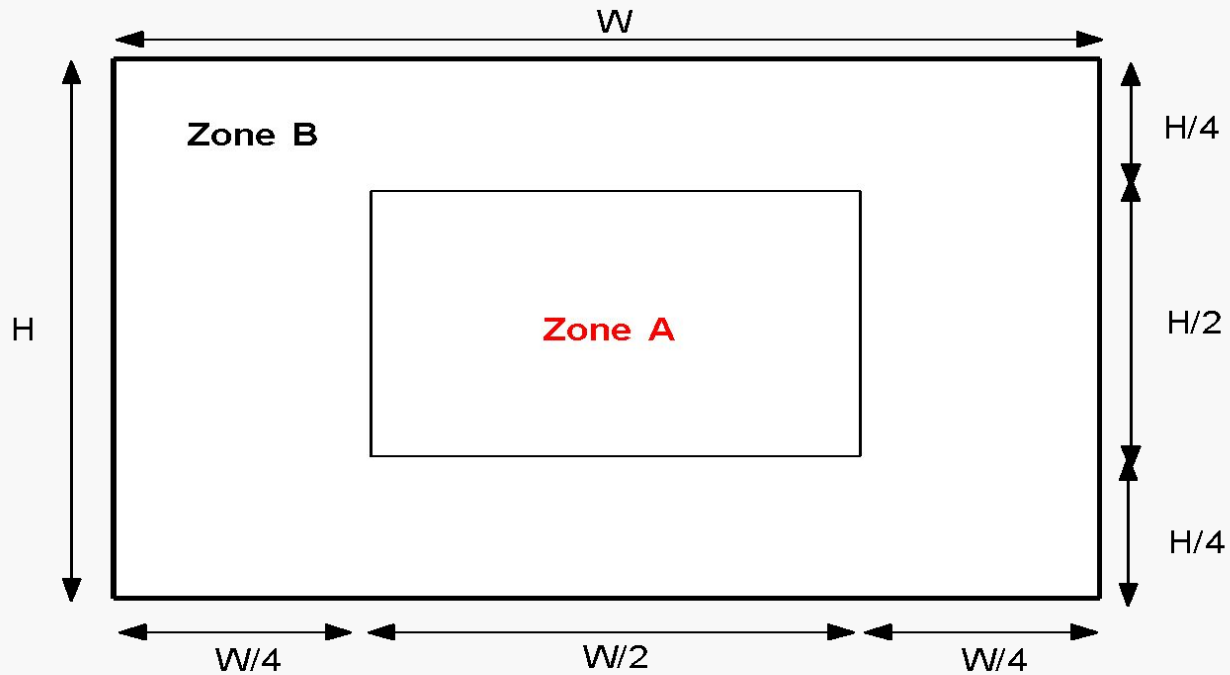
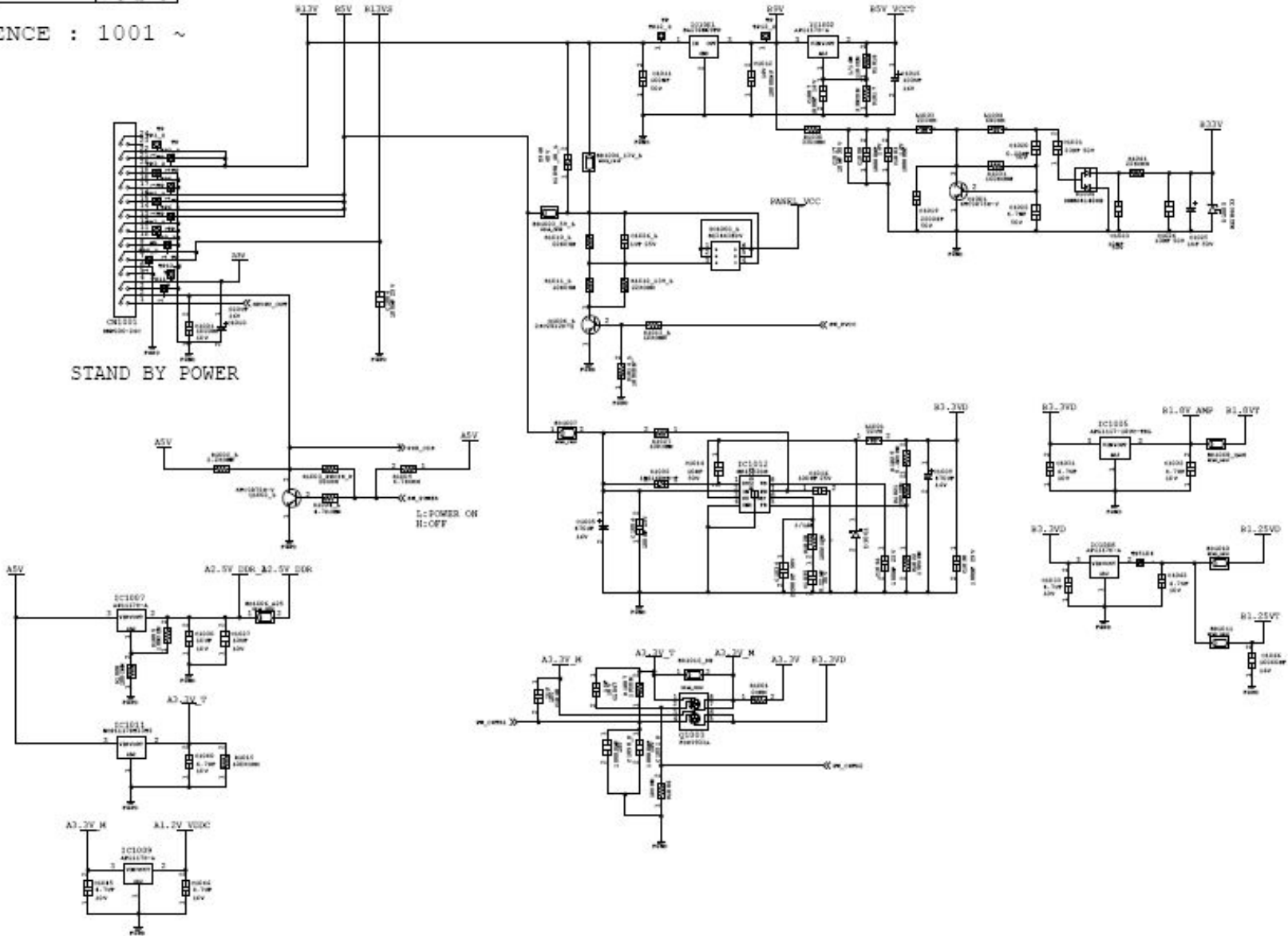


Figure-5. Measuring Area

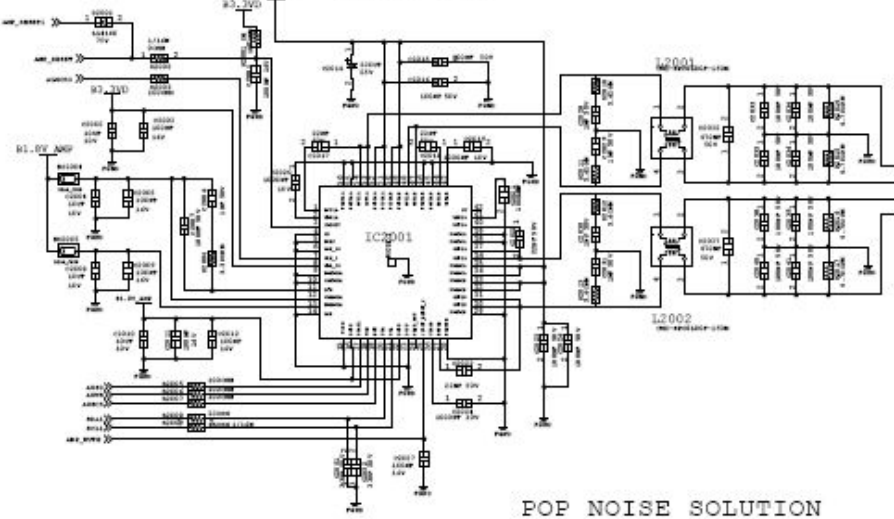
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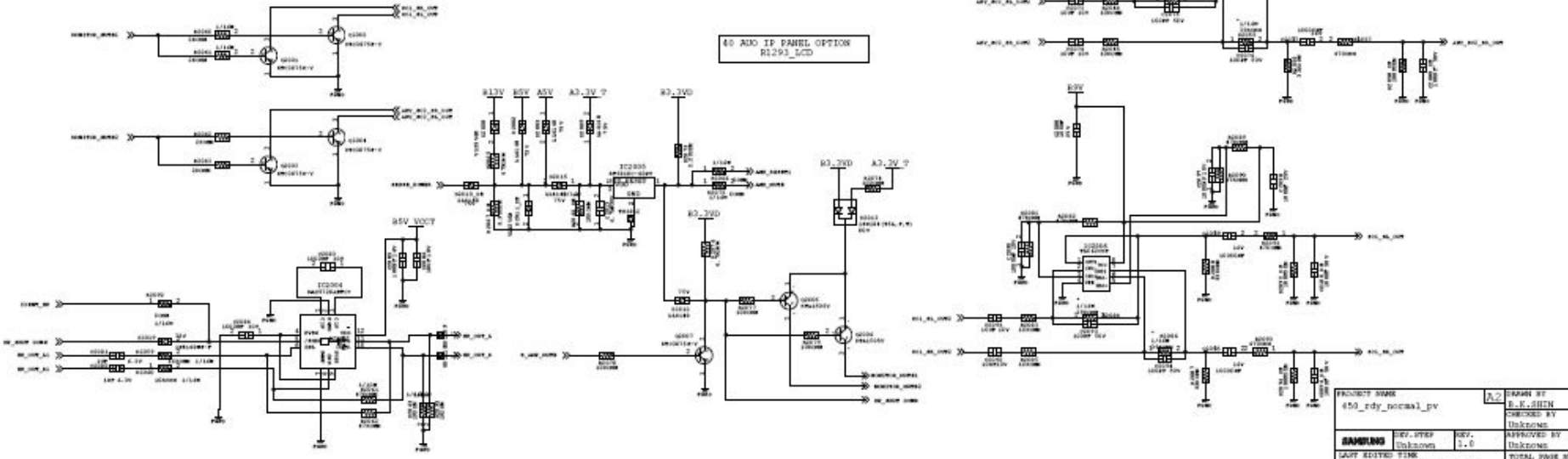
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SOUND AMP



POP NOISE SOLUTION

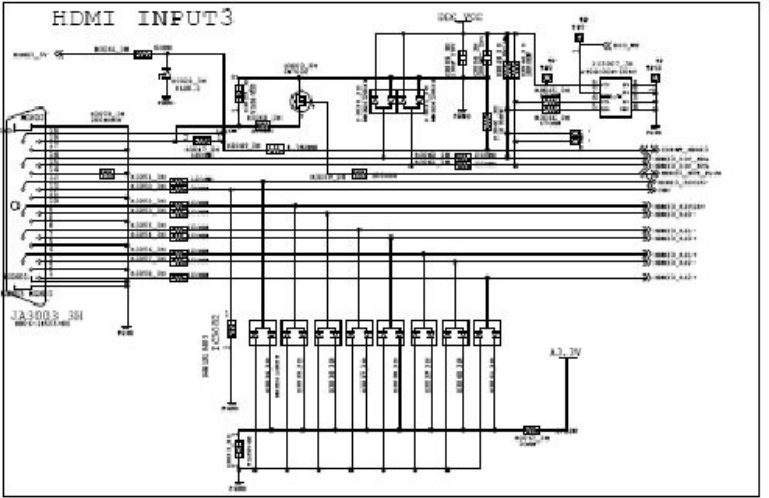
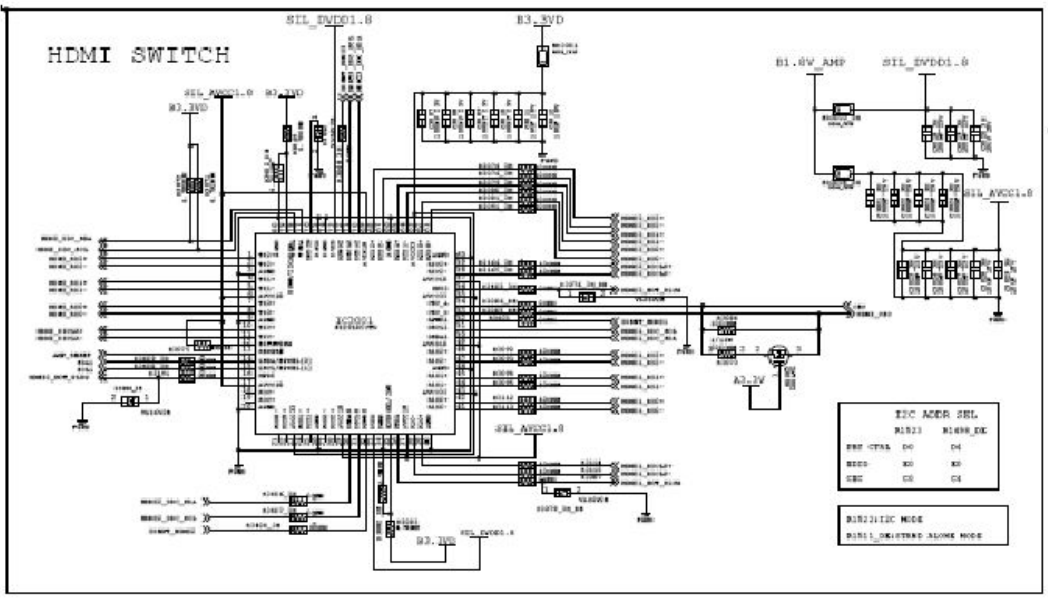
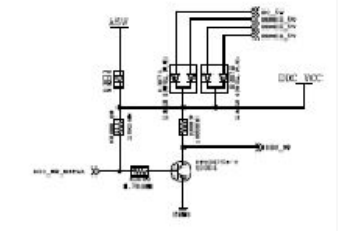
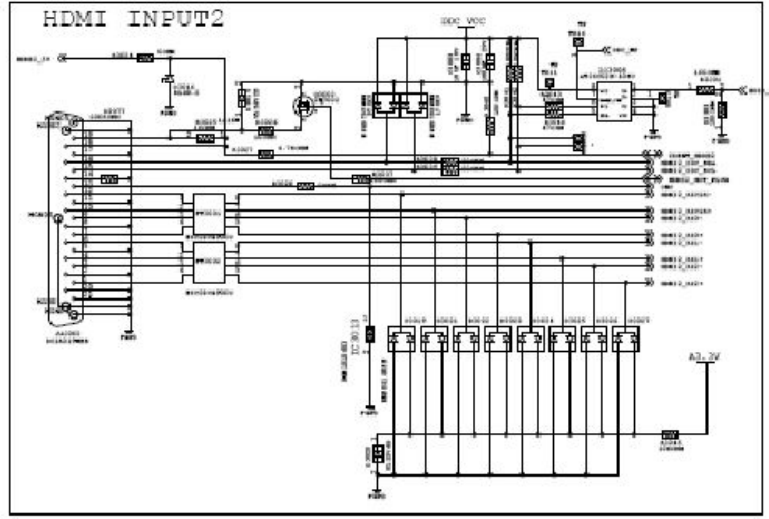
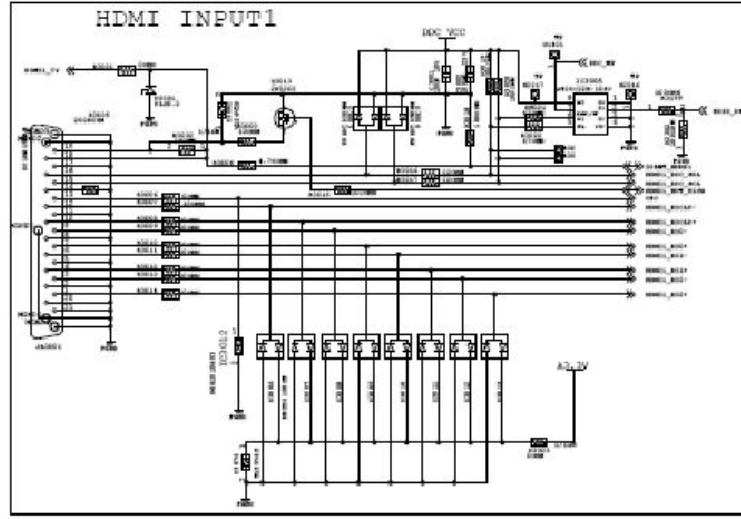
40 AUO IF PANEL OPTION  
 R1291\_LCD



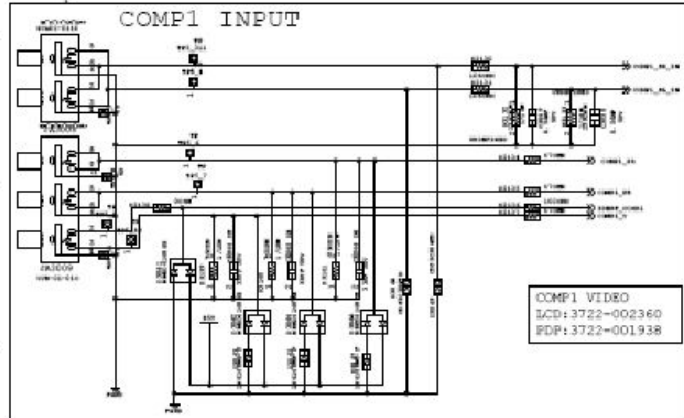
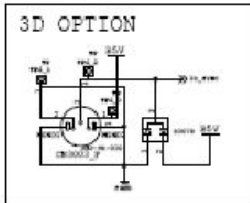
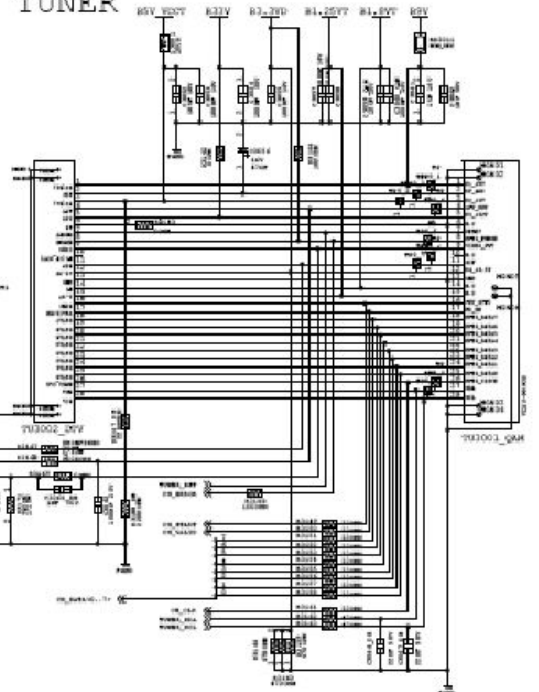
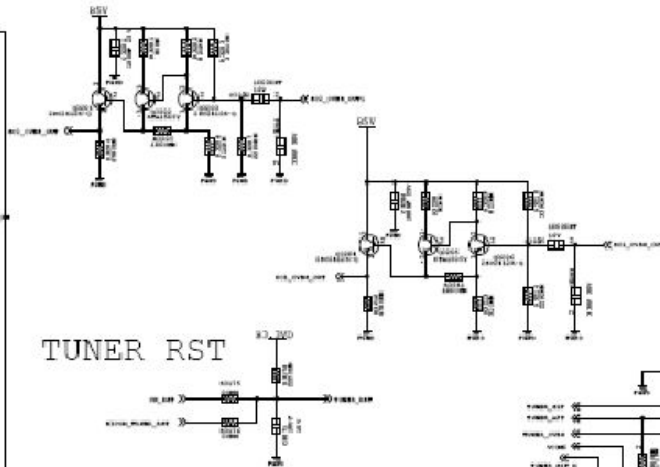
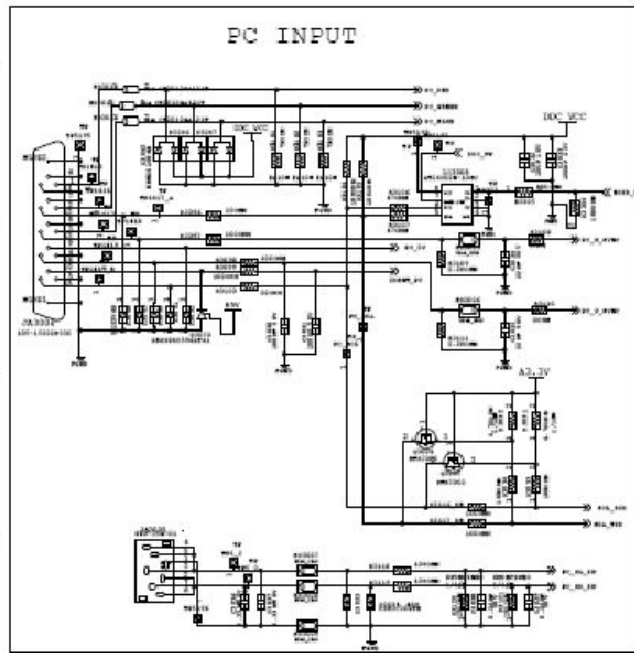
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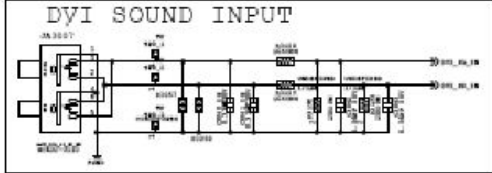
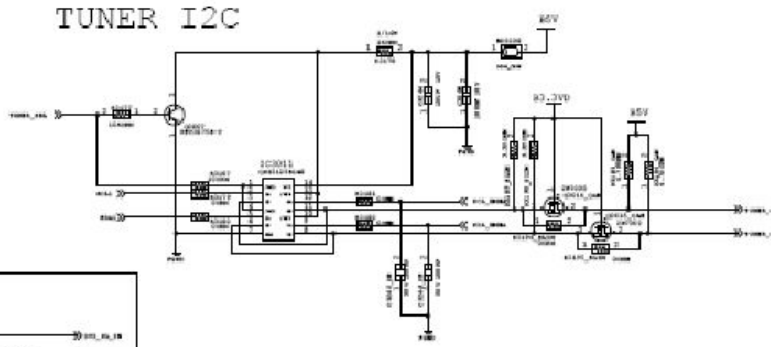
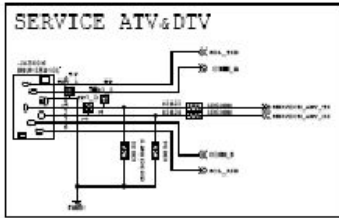
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TUNER



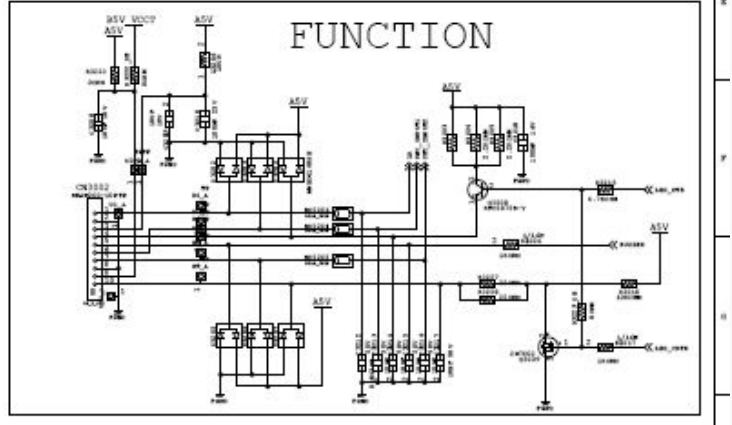
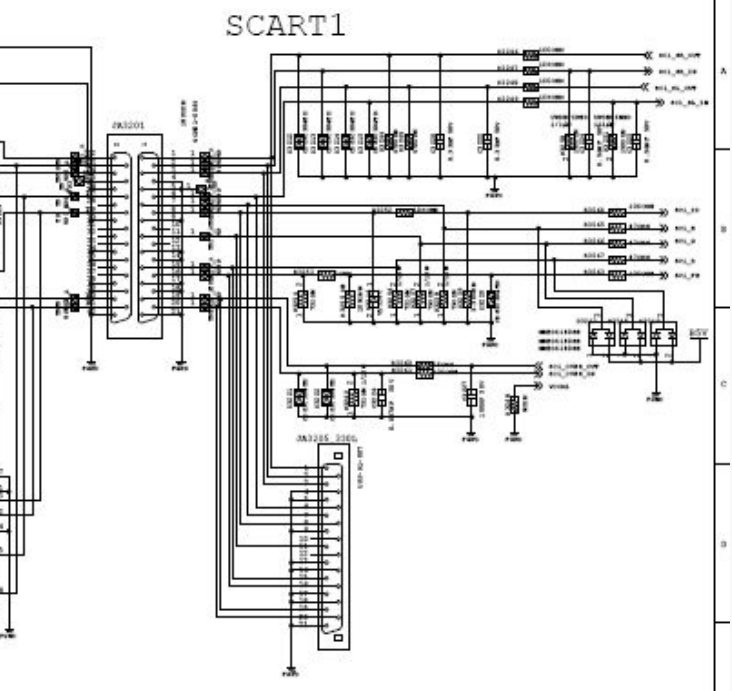
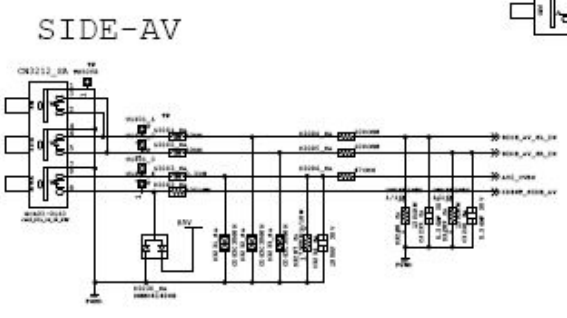
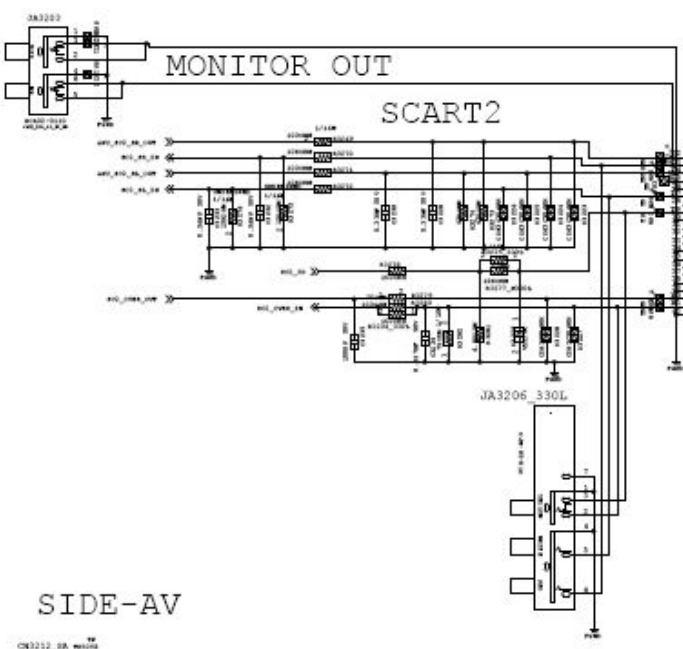
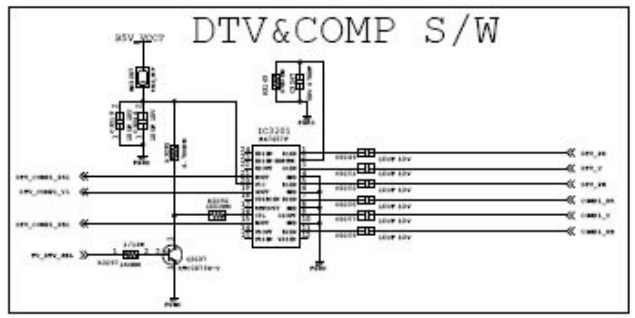
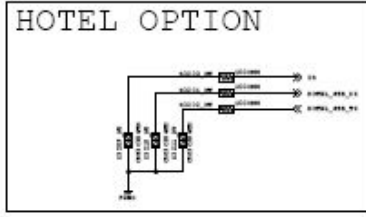
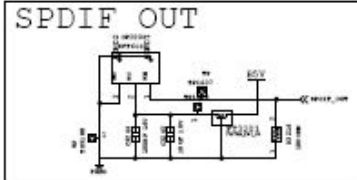
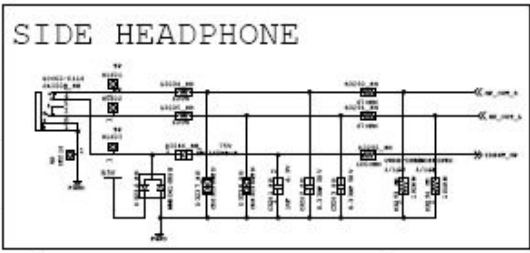
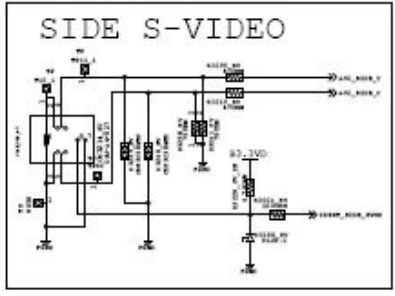
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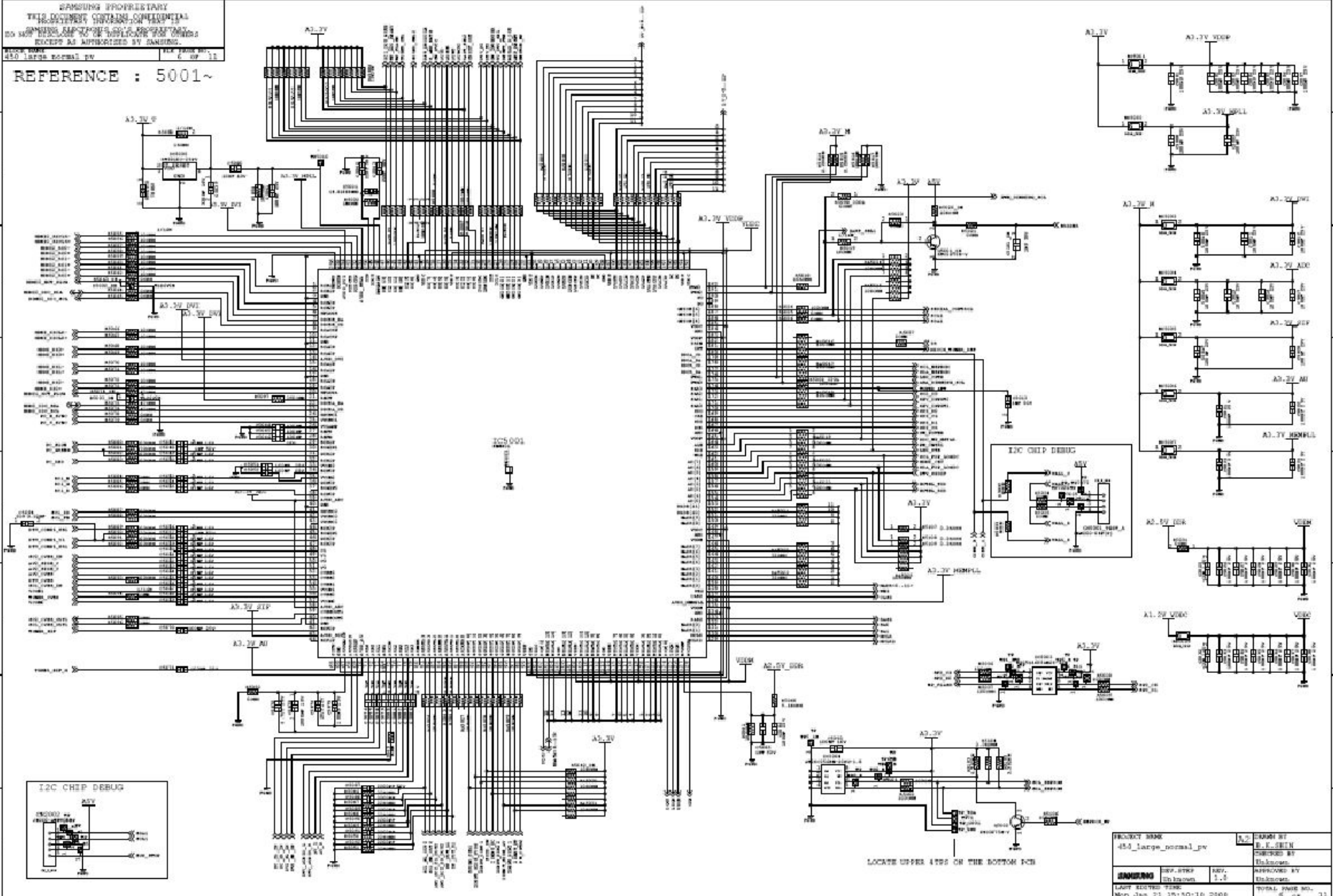


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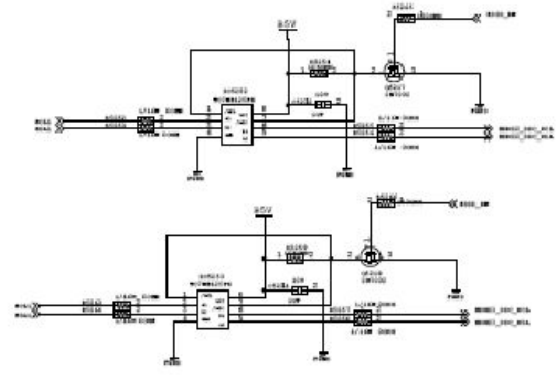
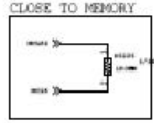
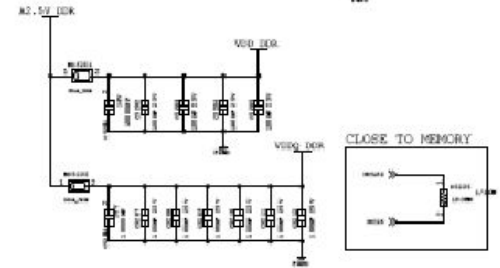
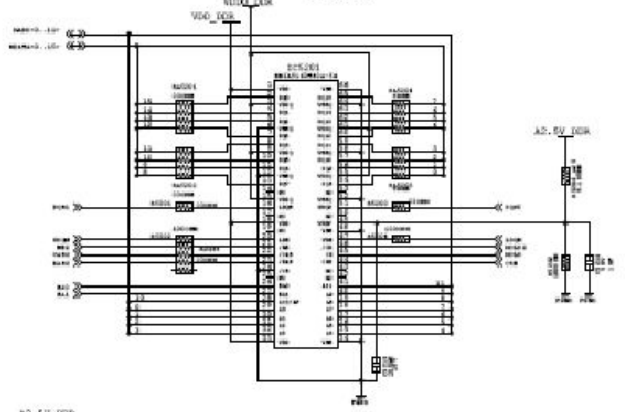
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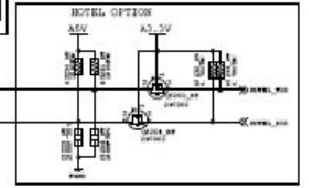
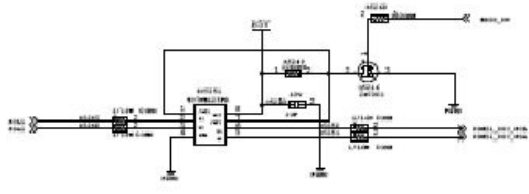
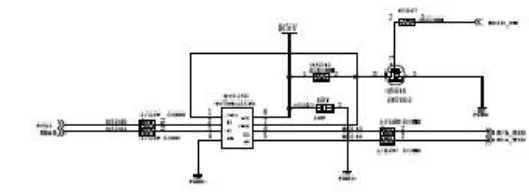
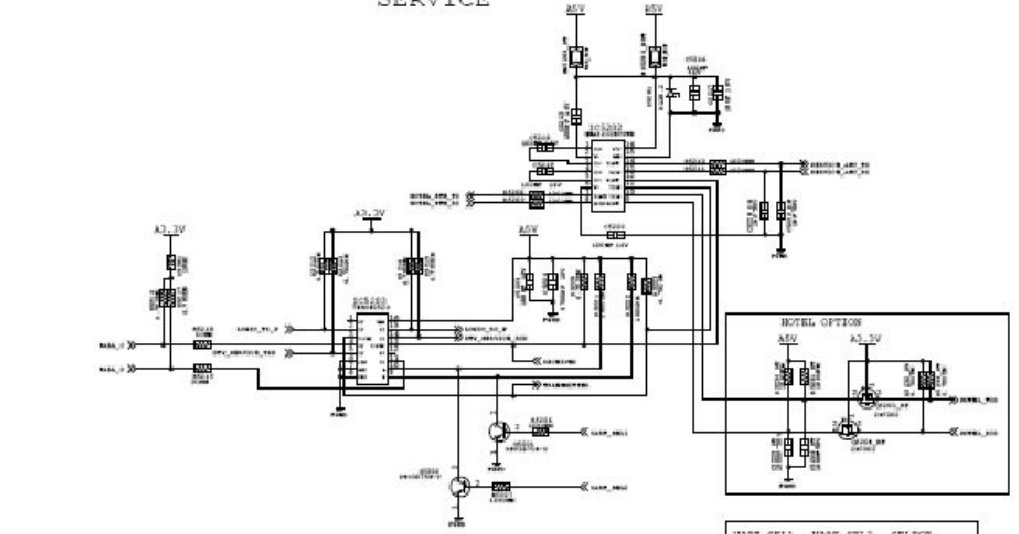
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 REVISION NO.: 7 - 0P - 11

REFERENCE : 5201 ~

DDR



SERVICE



| UART_SEL1 | UART_SEL2 | SELECT        |
|-----------|-----------|---------------|
| H         | H         | OFF           |
| H         | L         | ATV           |
| L         | L         | ICDTV         |
| L         | H         | PSE IAVTS ON  |
| L         | L         | PSE IAVTS OFF |

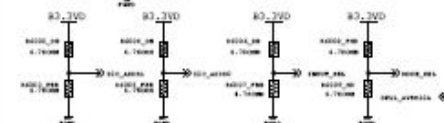
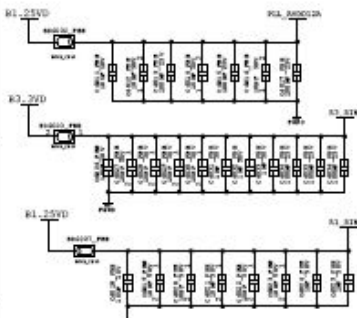
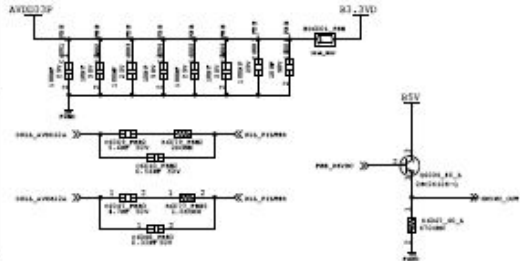
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| APPROVED BY   |                      | REVIEWED BY    |           |
| DATE REVISED  | 7/11/04              | TOTAL PAGE NO. | 7         |
| REV. 07/11/04 | Unknown              | REV. 1.0       | Unknown   |
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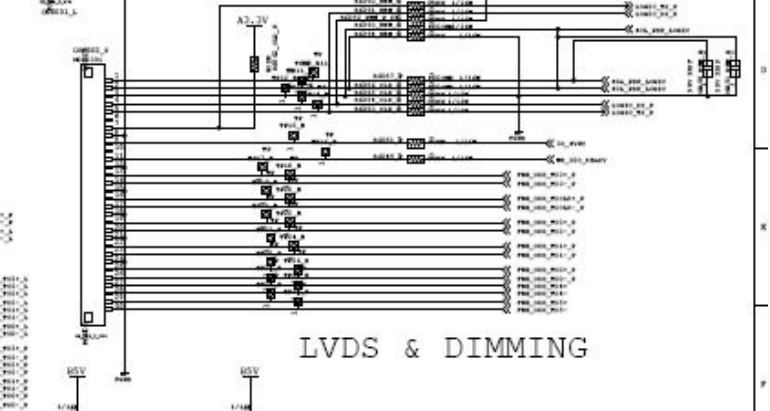
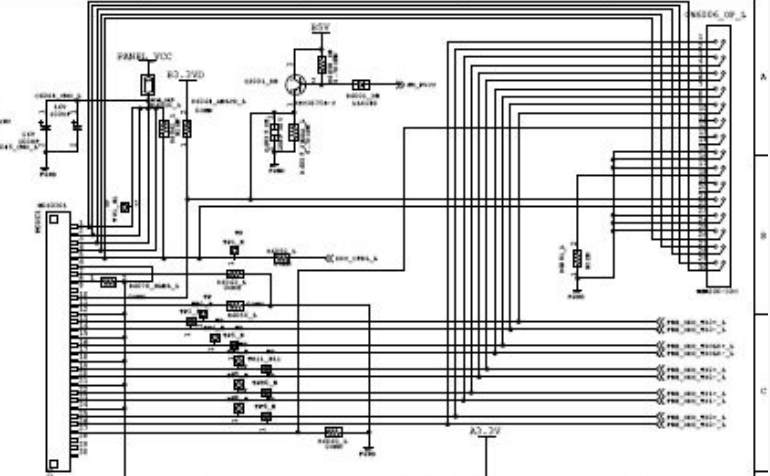
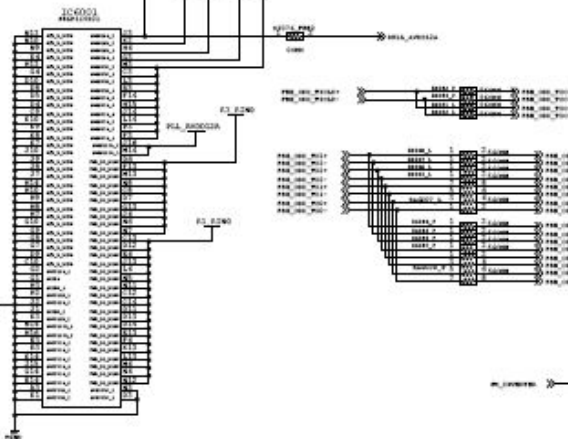
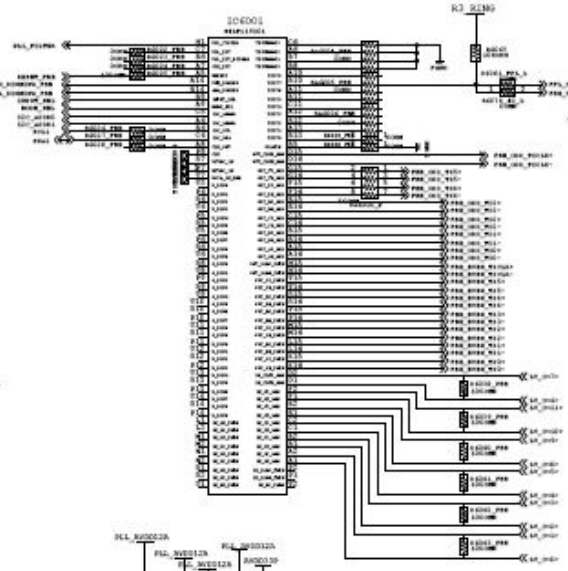
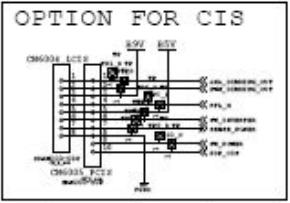
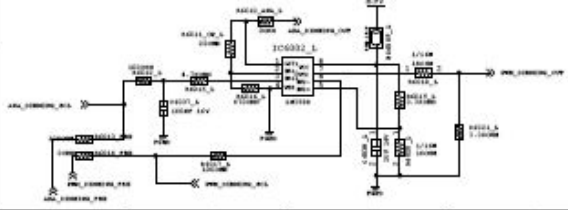
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 P/N: 6001  
 450\_large\_normal\_pv 8 of 11

REFERENCE : 6001 ~

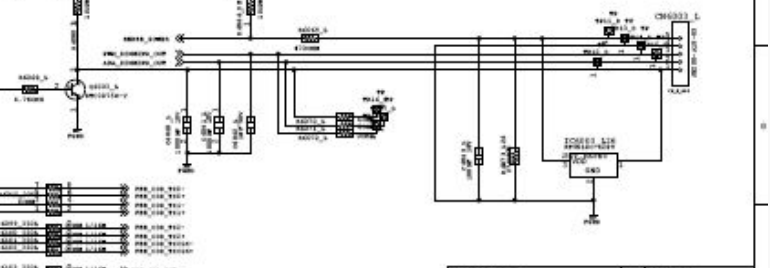
FBE



\*INPUT SEL : H-TTL, L-LVDS  
 \*MODE-SEL : H-END, L-ID  
 \*LCD PANEL OPTION  
 R2281\_0P  
 -> C0FL 3300M  
 -> RFL 6200M



LVDS & DIMMING

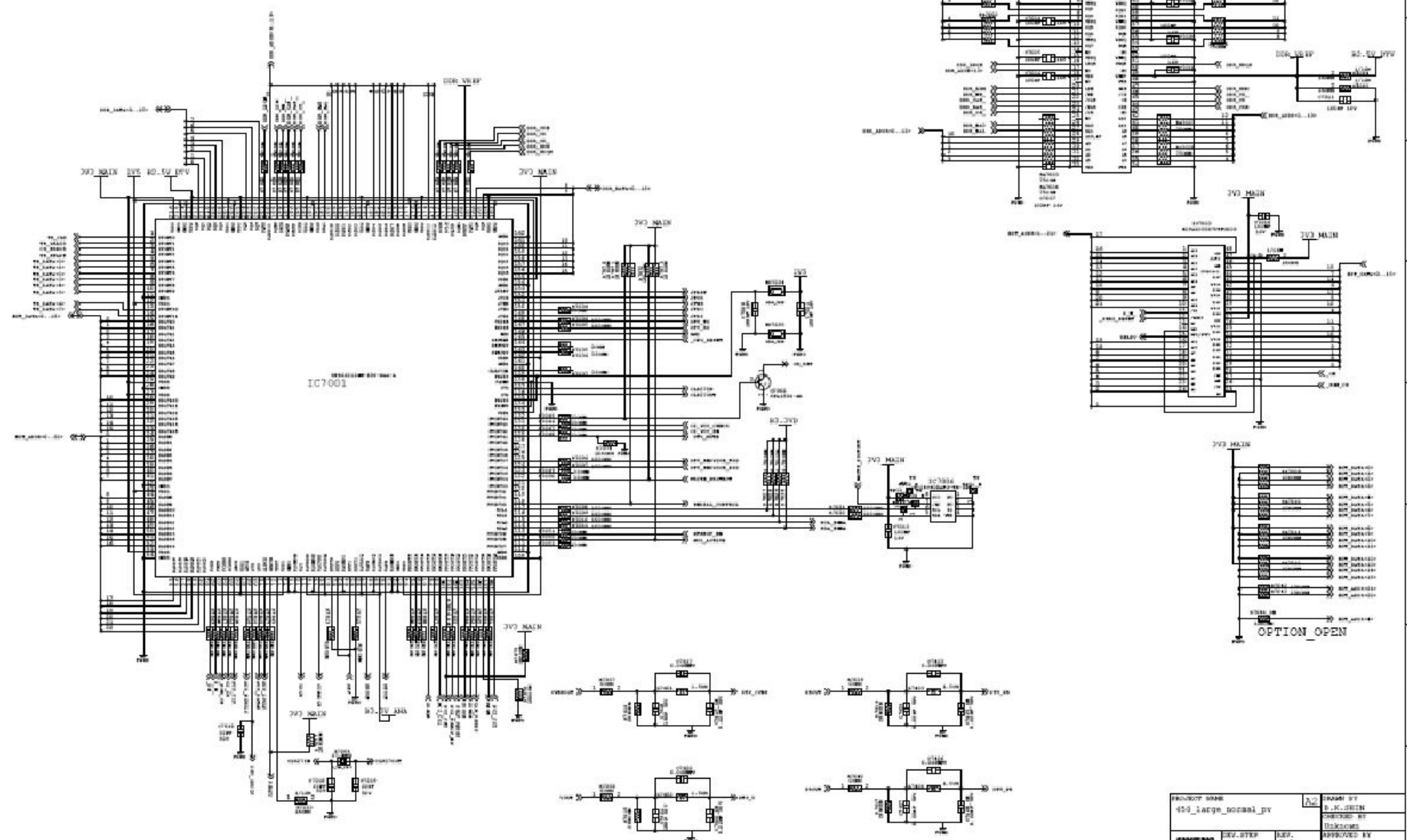


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| PROJECT NAME     | 450_large_normal_pv      | DESIGN BY      | D.K. SEHN |
| REVISION         | REV. 2.0                 | APPROVED BY    | Unknown   |
| LAST EDITED TIME | Mon Jan 21 15:14:47 2008 | TOTAL PAGE NO. | 8 of 11   |

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 DATE: 2004.03.21 15:14:55 2804 8 of 31  
 440\_large\_normal\_mv

MEMORY & EMMA2SL

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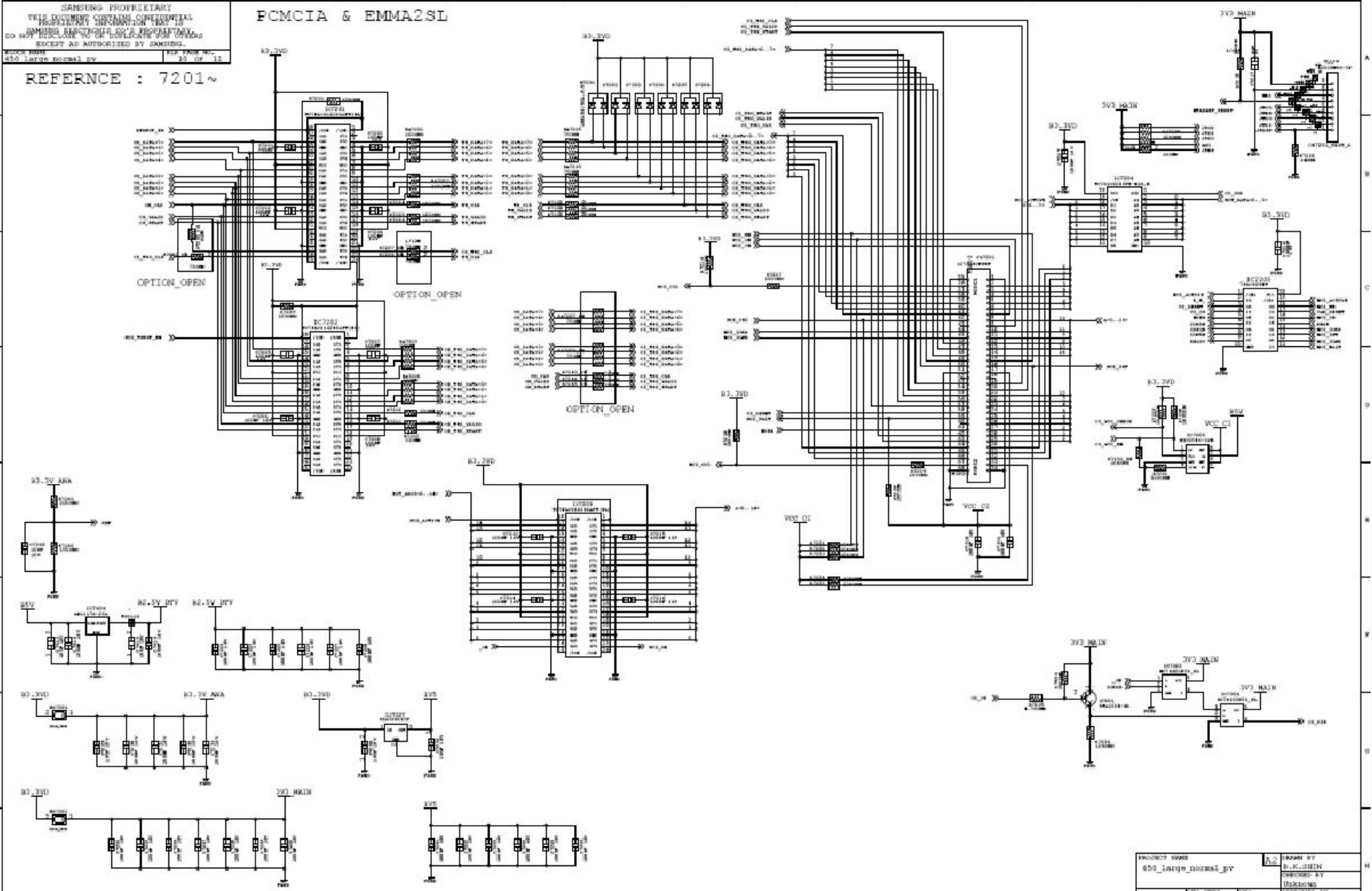


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| PRODUCT NAME      | 440_large_normal_mv | DATE           | 2004.03.21 15:14:55 2804 |
| DESIGNED BY       | S.K. SHIN           | APPROVED BY    | HWANG                    |
| DESIGNED BY       | HWANG               | APPROVED BY    | HWANG                    |
| REV. STEP         | 01stroom            | REV.           | 3.0                      |
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 430\_large\_normal\_pvr 33 sep 12

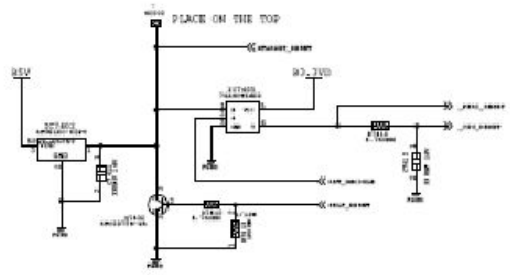
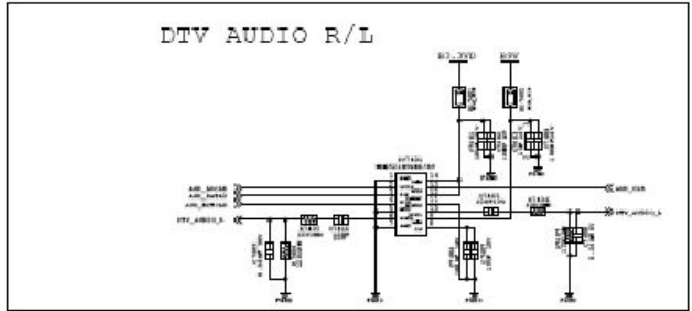
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| PRODUCT NAME      | 430_large_normal_pvr     | DESIGNED BY    | D.K. SHIN  |
| DATE              | 33 sep 12                | CHECKED BY     | W.KIM      |
| SAMSUNG           | REV. 1.0                 | APPROVED BY    | W.KIM      |
| DATE REVISED TIME | Mon Jan 22 15:25:00 2006 | PORAL BASE NO. | 2.0 0P 1.1 |



REFERENCE : 7401~



|                          |      |                |            |
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| PROJECT NAME             |      | PL2            | DESIGN BY  |
| 450_large_normal_pv      |      |                | B. E. JITH |
| DRAWN BY                 |      |                | CHECKED BY |
| SAMSUNG                  |      |                | Unknown    |
| REP. OFFICE              | REV. | APPROVED BY    |            |
| Chennai                  | 1.0  | Unknown        |            |
| NOT ENTERED TIME         |      | TOTAL PAGE NO. |            |
| Mon Jan 21 10:16:06 2008 |      | 11             | OF 13      |