PLASMA DISPLAY TV

Chassis : D72A(P) Puccini_42S5
Model : PS42P5HX/XEE

SERVICE *Manual*

PLASMA DISPLAY TV

PS-42P5H

FEATURES

■ DTV Ready PDP TV

■ 2 Way 4 Speakers

■ 1 HDMI input

■ Slim line design

■ Energy Saving

■ 12 Bit image processing
   (687 billion color)

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1. Precaution

To avoid possible damages or electric shocks or exposure to radiation, follow the instructions below with regard to safety, installation, service and ESD..

1-1 Safety Precautions

1. Make sure all protective devices are properly installed including non-metallic handles and compartment covers when installing or re-installing the chassis or chassis assemblies.

2. Make sure that no gaps exist between the cabinets for children to insert their fingers in to prevent children from receiving electric shocks. Gaps mentioned above include ventilation holes of a too great magnitude between the vaccum tube and the cabinet mask, and the improper installation of the rear cabinet.

   Errors may occur when the resistance is below 1.0 $M\Omega$ or over 5.2 $M\Omega$.
   In these cases, make sure that the device is repaired before sending it back to the customer.

3. Check for Electricity Leakage (Figure 1-1)
   Warning: Do not use an insulated transistor for checking the leakage. Use only those current leakage testers or mirroring systems that comply with ANSIC 101.1 and the Underwriter Laboratory's specifications (UL1410, 59.7).
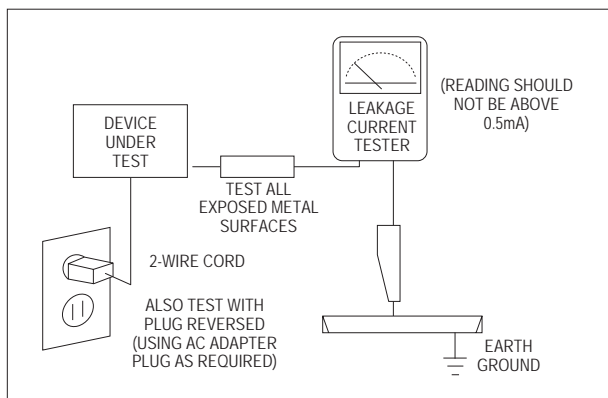

Fig. 1-1 AC Leakage Test

4. A high voltage is maintained within the specified limits using safety parts, calibration and tolerances. When voltage exceeds the specified limits, check each special part.

5. Warning for Engineering Changes:
   Never make any changes or additions to the circuit design or the internal part for this product.
   Ex: Do not add any audio or video accessory connectors. This might cause physical damage. Furthermore, any changes or additions to the original design/engineering will invalidate the warranty.

6. Warning - Hot Chassis:
   Some TV chassis are directly connected to one end of the AC power cord for electrical reasons.
   Without insulated transistors, the product can only be repaired safely when the chassis is connected to the earthed end of the AC power source.

   To make sure the AC power cord is properly connected, follow the instructions below. Use the voltmeter to measure the voltage between the chassis and the earthed ground. If the measurement is over 1.0V, unplug the AC power cord and change the polarity before re-inserting it. Measure the voltage between the chassis and the ground again.

7. Some TV chassis are shipped with an additional secondary grounding system. The secondary system is adjacent to the AC power line. These two grounding systems are separated in the circuit using an unbreakable/unchangeable insulation material.

8. When any parts, material or wiring appear overheated or damaged, replace them with new regular ones immediately. When any damage or overheating is detected, correct this immediately and make a regular check of possible errors.

9. Check for the original shape of the lead, especially that of the antenna wiring, any sharp edges, the AC power and the high voltage power. Carefully check if the wiring is too tight, incorrectly placed or loose. Never change the space between the part and the printed circuit board. Check the AC power cord for possible damages. Keep the part or the lead away from any heat-emitting materials.

10. Safety Indication:
    Some electrical circuits or device related materials
    require special attention to their safety features, which
    cannot be viewed by the naked eye. If an original part is
    replaced with another irregular one, the safety or
    protective features will be lost even if the new one has a
    higher voltage or more watts.

    Critical safety parts should be bracketed with (⚡ ⚠).
    Use only regular parts for replacements (in particular,
    flame resistance and dielectric strength specifications).
    Irregular parts or materials may cause electric shock or
    fire.

11. Pay additional attention to the current leakage as the
    voltage between the power board and the ballast is 220
    to 440v, i.e. very high.
    And also beware of possible electric shock from the
    primary power source.

1-2 Servicing Precautions

Warning 1: First carefully read the "Safety Instruction" in this service manual.
When there is a conflict between the service and the safety instructions, follow the safety instruction at all times.

Warning 2: Any electrolytic capacitor with the wrong polarity will explode.

1. The service instructions are printed on the cabinet, and should be followed by any service personnel.

2. Make sure to unplug the AC power cord from the power source before starting any repairs.
    (a) Remove or re-install parts or assemblies.
    (b) Disconnect the electric plug or connector, if any.
    (c) Connect the test part in parallel with the electrolytic capacitor.

3. Some parts are placed at a higher position than the printed board. Insulated tubes or tapes are used for this purpose. The internal wiring is clamped using buckles to avoid contact with heat emitting parts. These parts are installed back to their original position.

4. After the repair, make sure to check if the screws, parts or cables are properly installed. Make sure no damage is caused to the repaired part and its surroundings.

5. Check for insulation between the blade of the AC plug and that of any conductive materials (i.e. the metal panel, input terminal, earphone jack, etc).

6.   Insulation Check Process: Unplug the power cord from the AC source and turn the switch on. Connect the insulating resistance meter (500v) to the AC plug blade.

    The insulating resistance between the blade of the AC plug and that of the conductive material should be more than 1 $M\Omega$.

7. Any B+ interlock should not be damaged.
    If the metal heat sink is not properly installed, no connection to the AC power should be made.

8. Make sure the grounding lead of the tester is connected to the chassis ground before connecting to the positive lead. The ground lead of the tester should be removed last.

9. Beware of risks of any current leakage coming into contact with the high-capacity capacitor.

10. The sharp edges of the metal material may cause physical damage, so ensure wearing protective gloves during the repair.

11. Due to the nature of plasma display panels, partial after-images may appear if a still picture is displayed on the screen for a long period of time.
    This is caused by brightness deterioration due to the storage effect of the panel, and to prevent this from happening, we recommend that the brightness and con-trast are reduced.
    (e.g.) Contrast: 25, Brightness: 50

12. A plasma panel is a device which consists of a set of clustered pixels (cells).
    A plasma panel is approved if over 99.9% of the components satisfy the necessary conditions. A few cells may stay illuminated or may be always off, but you do not have to worry as this is an approved panel and well within the standard.

1-3 Static Electricity Precautions

1. Some semi-conductive ("solid state") devices are vulnerable to static electricity. These devices are known as ESD. ESD includes the integrated circuit and the field effect transistor. To avoid any materials damage from electrostatic shock, follow the instructions described below.

2. Remove any static electricity from your body by connecting the earth ground before handling any semi-conductive parts or ass'ys. Alternatively, wear a dischargeable wrist-belt.
   (Make sure to remove any static electricity before connecting the power source - this is a safety instruction for avoiding electric shock)

3. Remove the ESD ass'y and place it on a conductive surface such as aluminum foil to prevent accumulating static electricity.

4. Do not use any Freon-based chemicals.
   Such chemicals will generate static electricity that causes damage to the ESD.

5. Use only grounded-tip irons for soldering purposes.

6. Use only anti-static solder removal devices.
   Most solder removal devices do not support an anti-static feature. A solder removal device without an anti-static feature can store enough static electricity to cause damage to the ESD.

7. Do not remove the ESD from the protective box until the replacement is ready. Most ESD replacements are covered with lead, which will cause a short to the entire unit due to the conductive foam, aluminum foil or other conductive materials.

8. Remove the protective material from the ESD replacement lead immediately after connecting it to the chassis or circuit ass'y.

9. Take extreme caution in handling any uncovered ESD replacements. Actions such as brushing clothes or lifting your leg from the carpet floor can generate enough static electricity to damage the ESD.

CAUTION

These servicing instructions are for use by qualified service personnel only.
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

1-4 Installation Precautions

1. For safety reasons, more than two people are required for carrying the product.

2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.

3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.

4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.

5. Make sure to turn the power off and unplug the power cord from the outlet before removing the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.

6. Keep the antenna far away from any high-voltage cables and install it firmly. Contacting the high-voltage cable or the antenna falling over may cause fire or electric shock.

7. When connecting the RF antenna, check for a DTV receiving system and install a separate DTV reception antenna for areas with no DTV signal.

8. When installing the product, leave enough space (10cm) between the product and the wall for ventilation purposes.
A rise in temperature within the product may cause fire.

9. When moving a PDP with attached speakers, detach the speakers first before moving the main body.
Moving the PDP main body without separating the speakers may cause the speakers to detach, possibly causing damage or injury.

MEMO

2. Product Specification

2-1 Product Features

Block	Specfication	Major IC	Remark
RF	Tuner	Alps TMQZ6-511A	
Power	Input Voltage : AC 100V ~ 220V Stand-By : 3W less		
Video	Scaler	SVP-EX62	(Trident)
	Sub Decoder	SAA7119	(Philips)
	Picture Enhance	DNIe-Lite	(Samsung)
	Video S/W	TEA6425*2	
	Component S/W	-	
	HDMI	Sii9993	(Silicon Image)
Sound	Sound Processor	MSP4410G	(Micronas)
	Sound Control	NSP6241A	
	Audio S/W	TEA6422*2	
	Sound Amp	TAS5122	
	Sound Output	15W+15W	
Control	CPU	M30620	(Renesas)
	Sub Micom	3F8668	(Samsung)
Remocon	TM76		
etc.	Cabinet	S5	
	Product Model	PS-42P5H	
	Module	V4 42" HD	

■ Chip Description

- SVP-EX62 : 480i/576i, CVBS, Y/C, HDMI, PC input Video signal processing
- SAA7119 : CVBS, Y/C Sub Video signal , Scart RGB signal processing
- DNIe-Lite : Image Enhancer
- Sii9993 : HDMI signal receiver
- MSP4410G : SIF, Analog Audio Decoder
- NSP6241A : Sound Output Control
- TAS5122 : Sound Amp
- M30620 : Main Micom
- 3F8668 : Sub Micom

2-2 Key Features

Model	PS-42P5H
Dimensions	1425.5 (W) x 114 (D) x 825.4 (H) mm
Weight	59.2 kg
Voltage	AC 110 - 240V~ , 50 Hz
Power Consumption	290W
Number of Pixels	1024 (H) X 768 (V)
Screen Size	42 inches
VIDEO input	TV (VHF, UHF Antenna) Scart1:CVBS/S-Video/RGB Scart2:CVBS/S-Video CVBS/S-Video COMPONENT:480i/480p/720p/1080i PC HDMI
AUDIO input	Scart1 Scart2 COMPONENT PC HDMI
AV Output	VIDEO (CVBS) AUDIO (L/R)
Audio Output	15W + 15W (8 Ω)

■ H/W Configuration
- Video : SVP-EX62, TEA6425, BA7657F, DNIe-L
- Sound : MSP4440G, NSP6241A, TAS5122
- Tuner : TMQZ6-511A

■ S/W Configuration
- SVP-EX62 Trident Chip Control , DNIe-L
- CPU Master Control + Sub Micom, TTX Software
- Favorite CH, Label CH

■ Picture
- System : Video → PAL/SECAM/NTSC4.43,
          Sound → Analog
- Progressive
- Output resolution : 1024*768
- OSD : Smart user Interface Grade1
- Picture Enhancement : DNIe-L
- Still picture, Noise reduction
- Comb Filter : 3D comb filter
- PIP : D/W, Large
- Panorama : Wide

■ Sound
  - System : Stereo
  - Dolby Digital : Tru Surround XT
  - Output : 15W + 15W
  - Speaker : built-in.

■ Feature
  - Component Interface(480i/480p/720p/1080i, Y/Pb/Pr)
  - Digital Interface : HDMI
  - Picture Size : Auto Wide/16:9/4:3/Panorama/14:9/Zoom/Wide 4:3
  - Auto Program
  - Sleep Timer : 180 minute
  - Clock
  - Zoom, Previous channel, White Screen, Color Tone

■ In/Out Terminals(Rear)
  - 1 AV Input, 1 SVHS Input
  - AV Monitor Output
  - Component Input : 480i / 480p / 720p / 1080i
  - 15 Pin D-sub Input : ~ XGA (1024 x 768)
  - 1 HDMI Input (HDCP) : DTV(480p / 720p / 1080i)
  - 1 RF Input

■ Remocon
  - TM76

■ Power Supply
  - 100V ~ 240V

■ Power
  - Standy-by : 3W less
  - Max Power : 380W

■ HDMI
  - 640x480p @59.94/60Hz
  - 720x480p @59.94/60Hz
  - 720x576p @59.94/60Hz
  - 1280x720p @59.94/60Hz/50Hz
  - 1920x1080i @59.94/60Hz/50Hz

■ The table below shows all of the display modes that are supported. (N : Negative, P : Positive)
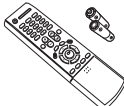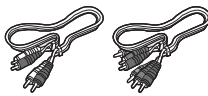
Resolution		V-Freq.(Hz)	H-Freq.(kHz)	Polarity		
				H	V	
IBM PC/AT Compatible	640 X 350	70.086	31.469	N	P	IBM
	720 X 400	70.087	31.469	P	N	IBM
	640 X 480	59.94	31.469	N	N	VESA DMT
		70	35	N/P	N/P	VESA GTF
		72.809	37.861	N	N	VESA DMT
		75	37.5	N	N	VESA DMT
	800 X 600	56.25	35.156	N/P	N/P	VESA DMT
		60.317	37.879	P	P	VESA DMT
		70	43.75	N/P	N/P	VESA GTF
		72.188	48.077	P	P	VESA DMT
		75	46.875	P	P	VESA DMT
	848 X 480	60	31.02	P	P	VESA DMT
		74.769	37.684	N	P	VESA CVT
	1024 X 768	60.004	48.363	N	N	VESA DMT
		70.069	56.476	N	N	VESA DMT
		72	57.672	N/P	N/P	VESA GTF
		75.029	60.023	P	P	VESA DMT

▶ The interlace mode is not supported.

▶ The television might operate abnormally if a non-standard video format is selected.

▶ 480i/p, 576i/p, 720p, or 1080i is not available in pc mode.

2-3 Specifications Analysis

Model	Puccini(V4)	Mozart (V3)	Nelson (V3)
Design			
Basic Display Type	PDP TV	PDP TV	PDP TV
Built-In Tuner	O	O	O
Resolution	1024*768	852*480	852*480
PDP Module	V4	V3	V3
Screen Size	42 inches	42 inches	42 inches
Aspect Ratio	16:09	16:09	16:09
Power Consumption	290W	330W	330W
Dimensions	1425.5 (W) x 114 (D) x 825.4 (H) mm	14255 (W) x 114 (D) x 825.4 (H) mm	14255 (W) x 114 (D) x 825.4 (H) mm
Weight	59.2 kg	59.2 kg	59.2 kg
Picture Brightness	1300cd/m2	1000cd/m2	1000cd/m2
Contrast Ratio	10000:1	3000:01:00	3000:01:00
Image Enhacer	DNIe-L	DNIe 3	DNIe 3
Digital Comb Filter	O	O	O
Audio Equalizer	O	O	O
Auto Volume	O	O	O
Surround Sound	SRS TreSurround XT	SRS TreSurround XT	SRS TreSurround XT
Speaker Output	15W +15W	15W +15W	15W +15W
Speaker	Included	Included	Included
Features PIP	O	O	O
Double Screen	O	O	O
Caption	X	X	X
Still Image	O	O	O
My Color Control	O	O	O
Color Weakness	O	O	O
Energy Saving	O	X	X
Anynet	X	X	X
D-Net(IEEE1394 S.400)	X	X	X
POD	X	X	X
Gemstar (TV Guide On Screen)	X	X	X
Screen Burn Protection	O	O	O
Connections Antenna	1Input	1Input	1Input
CVBS	1AV	3AV	1AV
S-Video	1Input	2Input	1Input
Component(Y/PB/PR)	1Input	1Input	1Input
PC(D-SUB)	1Input(15Pin D-Sub)	1Input(15Pin D-Sub)	1Input(15Pin D-Sub)
DVI	X	O	O
HDMI	1Input	X	X
Sub Woofer	X	X	X
Optical	X	X	X
Coaxial	X	X	X

2-4 Accessories

Accessories		Item	Item code	Remark
Supplied Accessories		User Manual	BN68-00941F	Samsung Service center
		Remote Control AAA Batteries	BN59-00468A 4301-000103	
		Power Cord	3903-000145	
Accessories that can be purchased additionally		S-VIDEO Cable	-	Internal shopping mall
		HDMI Cable	-	
		HDMI/DVI cable	-	
		Component Cables (RCA)	-	
		PC Cable	-	
		PC Audio Cable	-	
		Scart Cable	-	
		Antenna Cable	-	

3. Alignment & Adjustment

3-1 Service Instruction

* Check items listed after changing each

1. Main Board replace : ATM Channel fixing and White Balance adjustment

2. Main SMPS Board replace: Vs, Va Voltage check and adjust

5. DC-DC SMPS Board replace : Output voltage check and adjust

6. Logic Board replace : Not adjustment

7 : Y-Main Board replace : Not adjustment

8 : X-Main Board replace : Not adjustment

9 : Buffer Board replace : Not adjustment

3-2 How to Access Service Mode

■ Using the Customer Remote

1. Turn the power off and set to stand-by mode.

2. Press the remote buttons in this order; POWER OFF-MUTE-1-8-2- POWER ON to turn the set on.

3. The set turns on and enters service mode.

4. Press the Power button to exit and store data in memory.
   ※ If you fail to enter service mode, repeat steps 1 and 2 above.

5. Initial SERVICE MODE DISPLAY State

```
    Factory    AIR  10 ───────────────────────────────► Current input mode

    White Balance
    uPD64083
    ADV7402 Main
    SDP51
    MST9883
    ADV7402 Sub
    DNIe
    Logic
    PW318
    Option
    PW318 Upgrade
    TL945 Upgrade
    Reset

    Release Date : XXX   XX   XXXX   XX:XX:XX
    Code No. :     M1 Micom   XX
                   PW318      T_XXXXXXXXX-XXXX ──► Firmware version
                   TL945      0.XX
```
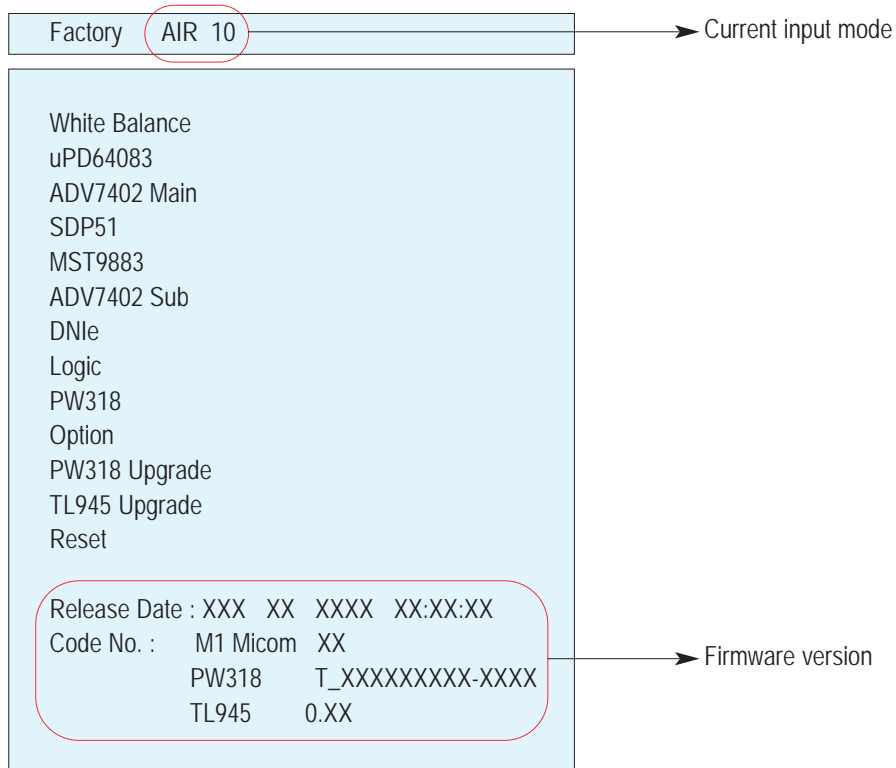
   ※ The firmware version is subject to change without notice.

4. Buttons operations within Service Mode

MENU	Full Menu Display / Move to Parent Menu
Direction keys ▲ / ▼	Item Selection by Moving the Cursor
Direction keys ◄ / ►	Data Increase/Decrease for the Selected Item
Source	Cycles through the active input source that are connected to the unit

3-3 Factory Data

★ The underlined are items applied during the service adjustment. None of the others should be adjusted.

Fatory mode OSD Display

```
1. Calibration
2. Option Table
3. White Balance
4. SVP-EX
5. SAA7119
6. MSP34XX/44XX
7. YC Delay
8. Adjust
9. DNIe
10. Chip Debugger  OFF
11. Checksum
12. Reset
13. Spread Spectrum
14. Logic


T-PCN42PEUS-XXXX
SUB Micom Ver-xxxx
```

1. Calibration
　① AV Calibration
　② PC Calibration
　③ DTV Calibration

2. Option Table

No	ITEM	Initial Value	Remark
1	Panel Option	42S5S	42S5S/42D5S/42S5H
2	Gamma	Mode - 2	Mode - 1,2,3,4
3	Analog Dimming	Mode - 3	Mode - 1,2,3,4
4	Auto Power	On	ON/OFF
5	Key Lock	OFF	ON/OFF
6	Anynet	OFF	ON/OFF
7	DDC Write	OFF	ON/OFF
8	LNA	ON	ON/OFF
9	Ant. Gain Display	OFF	ON/OFF
10	Language	English	Osd language
11	Auto FM	OFF	ON/OFF
12	High Deviation	Off	ON/OFF
13	TTX	On	ON/OFF
14	TTX List	Flop	Flop/List
15	TTX TOP	Off	ON/OFF
16	TTX Group	Auto Language	TTX language
17	TTX Level	Level 1.5	LEVEL 1.5 / 2.5
18	Shift Test	OFF	ON/OFF
19	Sound Delay1	OFF	ON/OFF
20	Sound Delay2	OFF	ON/OFF
21	Debug	OFF	ON/OFF

3. White Balance

No	Item	Range	TV/AV	Component	PC	DVI(HDMI)
1	Sub-Briteness	0~255	7	128	130	130
2	R-offset	0~255	138	128	138	138
3	G-offset	0~255	128	128	128	128
4	B-offset	0~255	146	128	144	144
5	Sub-Contrast	0~63	36	32	32	32
6	R-offset	0~255	128	128	128	128
7	G-offset	0~255	128	128	128	128
8	B-offset	0~255	148	128	128	128

4. SVP-EX

①ComB Filter

No	Item	Range	Initial Value	Remark
1	Y-Filter	0 ~ 255	80H	
2		0 ~ 255	80H	
3		0 ~ 255	80H	
4		0 ~ 255	80H	
5		0 ~ 255	80H	

②Peaking

No	Item	Range	Initial Value	Remark
1	V-Peaking	0 ~ 255	80H	
2	Peaking Delay	0 ~ 255	80H	
3	Peaking Gain	0 ~ 255	80H	
4	Peaking Width	0 ~ 255	80H	
5	Praking f0	0 ~ 255	80H	

③NR

No	Item	Range	Initial Value	Remark
1	Y-NR-Off	0 ~ 255	80H	
2	C-NR-Off	0 ~ 255	80H	
3	Y-NR-ON	0 ~ 255	80H	
4	C-NR-ON	0 ~ 255	80H	

④Deinterlace

No	Item	Range	Initial Value	Remark
1	Motion	0 ~ 255	80H	
2			80H	
3			80H	
4			80H	

⑤Picture Gain Adjust

No	Item	Range	TV/AV/S_Video	Component	PC	DVI/HDMI	
1	TCD3 Contrast	0 ~ 255	AV Calibration	78h			
2	TCD3 Brightness	0 ~ 255	AV Calibration	20h			
3	TCD3 CR Saturation	0 ~ 255	78h				
4	TCD3 CB Saturation	0 ~ 255	78h				
5	TCD3 YC Delay	0 ~ 15	00h				
		Range	480I/576I/480P/576P/1080I	720P	PC	HDMI	
6	Analog Y/G offset	00 ~ 255		DTV Calibration	PC Calibration	00 40h	
7	Analog PB/B offset	00 ~ 255		DTV Calibration	PC Calibration	02 00h	
8	Analog PR/R offset	00 ~ 255		DTV Calibration	PC Calibration	02 00h	
9	Analog Y/G Gain	00 ~ 255	D6h		E9h	D6h	
10	Analog PB/B Gain	00 ~ 255	FEh		E9h	FEh	
11	Analog PR/R Gain	00 ~ 255	FEh		E9h	FEh	
12	Black Level Setting	00 ~ 255	00h				
13	Brightness(SVP)	0 ~ 255	00h				

5. SAA7119

No	Item	Range	Initial Value
1	HTC	00 ~ 255	2
2	ATVT	00 ~ 255	1
3	LUFI	00 ~ 255	5
4	NAICO_Brig	00 ~ 255	128
5	NAICO_Cont	00 ~ 255	64
6	NAICO_Satu	00 ~ 255	64
7	NAICO_Hue	00 ~ 255	3
8	COMP_Brig	00 ~ 255	162
9	COMP_Cont	00 ~ 255	92
10	COMP_Satu	00 ~ 255	64
11	TASKA_Brig	00 ~ 255	140
12	TASKA_Cont	00 ~ 255	64
13	TASKA_Satu	00 ~ 255	64
14	LIMOD	00 ~ 255	0
15	LIFIL	00 ~ 255	2
16	LIWGT	00 ~ 255	3

6. MSP34XX/44XX

No	Item	Range	Initial Value
1	FM-Prescale	00 ~ 255	20h
2	NT-M-Prescale	00 ~ 255	20h
3	SECAM-L-Prescale	00 ~ 255	22h
4	AV-Prescale	00 ~ 255	1Ah
5	I2S_1 Prescale	00 ~ 255	10h
6	I2S_2 Prescale	00 ~ 255	10h
7	Carrier Mute	00 ~ 255	42h
8	Pilot High	00 ~ 255	0Eh
9	Pilot Low	00 ~ 255	07h

7. YC Delay

No	Item	Range	TV/AV/S_Video	Component	PC	DVI/HDMI	Remark
1	RF PAL-B/G	00 ~ 255	102				
2	RF PAL-D/K	00 ~ 255	136				
3	RF PAL- I	00 ~ 255	102				
4	RF SECAM-B/G	00 ~ 255	51				
5	RF SECAM-D/K	00 ~ 255	34				
6	RF SECAM-L/L'	00 ~ 255	51				
7	RF NTSC3.58	00 ~ 255	187	77h	77h	77h	-
8	RF NTSC4.43	00 ~ 255	187				
9	AV PAL	00 ~ 255	67				
10	AV SECAM	00 ~ 255	34				
11	AV NTSC 3.58	00 ~ 255	102				
12	AV NTSC4.43	00 ~ 255	102				
13	AV PAL60	00 ~ 255	119				

8. Adjust

No	Item	Range	TV/AV/S_Video	Component	PC	DVI/HDMI	Remark
1	Video Mute Time		10				
2	Melody Volume	0 ~ 20	5				
3	TTX Contrast	0 ~ 100	50				
4	TTX Brightness	0 ~ 100	50				
5	TTX Color	0 ~ 100	50				
6	Dynamic Contrast	0 ~ 100	100				
7	Dynamic Color	0 ~ 100	50				
8	Dynamic Sharpness	0 ~ 100	60				
9	Standard Contrast	0 ~ 100	90				
10	Standard Brightness	0 ~ 100	80				-
11	Standard Color	0 ~ 100	70				
12	Standard Sharpness	0 ~ 100	70				
13	Movie Contrast	0 ~ 100	60				
14	Movie Brightness	0 ~ 100	50				
15	Movie Color	0 ~ 100	50				
16	Movie Sharpness	0 ~ 100	40				
17	RF_dB_1	0 ~ 255	0				
18	RF_dB_2	0 ~ 255	0				
19	RF_dB_3	0 ~ 255	0				

9. DNIe Lite

No	Item	Range	TV/AV/S_Video	TV/AV/S_Video	Component	PC	DVI/HDMI
1	PATT_SEL	DNIe Lite 0x002C [13:08]	0 ~ 63	0			
2	BLACK_TILT	DNIe Lite 0x005E [15:08]	00 ~ 255	120	120	80	120
3	BLACK_GAINMAX	DNIe Lite 0x00B9 [09:00]	00 ~ 1023	85	85	93	95
4	TEST_MCC	DNIe Lite 0x00C1 [12]	0 ~ 1	0			
5	OVERLAP_MCM	DNIe Lite 0x00C1 [11:10]	00 ~ 03	0			
6	AREA_EN_MCC	DNIe Lite 0x0062 [15:11]	00 ~ 31	31			
7	R-Offset(Post)	DNIe Lite 0x0080 [09:00]	-512 ~ 511	0	0	0	0
8	G-Offset(Post)	DNIe Lite 0x0081 [09:00]	-512 ~ 511	0	0	0	0
9	B-Offset(Post)	DNIe Lite 0x0082 [09:00]	-512 ~ 511	0	0	0	0
10	R-Gain(Post)	DNIe Lite 0x007B [07 : 00]	0 ~ 255	128	128	128	128
11	G-Gain(Post)	DNIe Lite 0x007C [15 : 08]	0 ~ 255	128	128	128	128
12	B-Gain(Post)	DNIe Lite 0x007C [07 : 00]	0 ~ 255	128	128	128	128
13	Com_Offset_Sel(Post)	DNIe Lite 0x00F2 [13]	0 , 1	1			
14	Com_Gain_Sel(Post)	DNIe Lite 0x00F2 [14]	0 , 1	1			

10. Chip Debugger : ON/OFF
11. Checksum   XXXX XXXX
12. Reset
13. Spread Spectrum
14. Logic

No	Item	Range	Initial Value
1	Int/Ext Sel		0
2	Pat Sel		0
3	FCRL CON		0
4	Image Sticking		0
5	Error Mode Check		0
6	Error Code Table		0
7	Vs Reference		0
8	Vs Average		0
9	Vs to D/A		0
10	Va Reference		0
11	Va Average		0
12	Va to D/A		0

3-4 Service Adjustment

3-4-1 White Balance Adjustment

1. W/B Adjustment is required for the following two modes : : Component → Video
   (Signal equipment : MSPG-925LTH, Measurement equipment : CA210)
   ※ To adjust HDMI, use the HDMI ↔ DVI conversion cable, and connect the DVI output from MSPG-925LTH to the HDMI input.

2. Adjustment Method
－Component and Video mode Adjustment PC, HDMI mode offset.

   ※ Thus, Micom saves the PS42S5S W/B data separately for each memory mode of the block

- White Balance Coordinates by Mode

		VIDEO	COMPONENT
H/L (High Light)	x	265	265
	y	265	265
	Y(fL)	31	21
L/L Low Light	x	280	280
	y	285	285
	Y(fL)	1.3	0.8

1. Pattern Generator Device: 925 LTH (Manufacturer: Master)

2. Adjust Pattern : ABL Pattern(Master 925LTH #16 Pattern)

3. Adjust Timing : Video - PAL (Master 925LTH Model #2)
                   Component - 720P(Master 925LTH Model # 6)

4. The adjustment procedures for each mode are described as follows:
   1) Component
      ① Send the Toshiba ABL Pattern (Pattern #16) of the 1080i (Model #5) resolution signal to theComponent in port using the Master 925 LTH.
      ② Enter Factory mode, move to "White Balance" and click Select.
      ③ Set the coordinates of H/L and L/L by adjusting "Sub Contrast", "Sub Bright", "R Drive", "G Drive", "B Drive", "R Cutoff" , "G Cutoff" , and "B Cutoff".

   2) Video
      ① Send the Toshiba ABL Pattern (Pattern #16) of the 1080i (Model #5) resolution signal to the Video in port using the Master 925 LTH.
      ② Enter Factory mode, move to "White Balance" and click Select.
      ③ Set the coordinates of H/L and L/L by adjusting "Sub Contrast", "Sub Bright", "R Drive", "G Drive", "B Drive", "R Cutoff" , "G Cutoff" , and "B Cutoff".

H/L Point

L/L Point

RF(PAL/SECAM)

VIDEO(CVBS)

S-VIDEO(Y/C)

TEA6425

Video
Switch

main Picture

Sub Picture

SAA 7119

HDMI

COMPONENT
(DTV/DVD)

P C
(Analog RGB)

Sil 9993

TMDS RX

SVP EX-62

Scaler

Sub Brightness
R - Offset
G - Offset
B - Offset
Sub Contrast
R - Gain
G - Gain
B - Gain

DNIe4

Image
Enhancer

LOGIC

PDP Panel
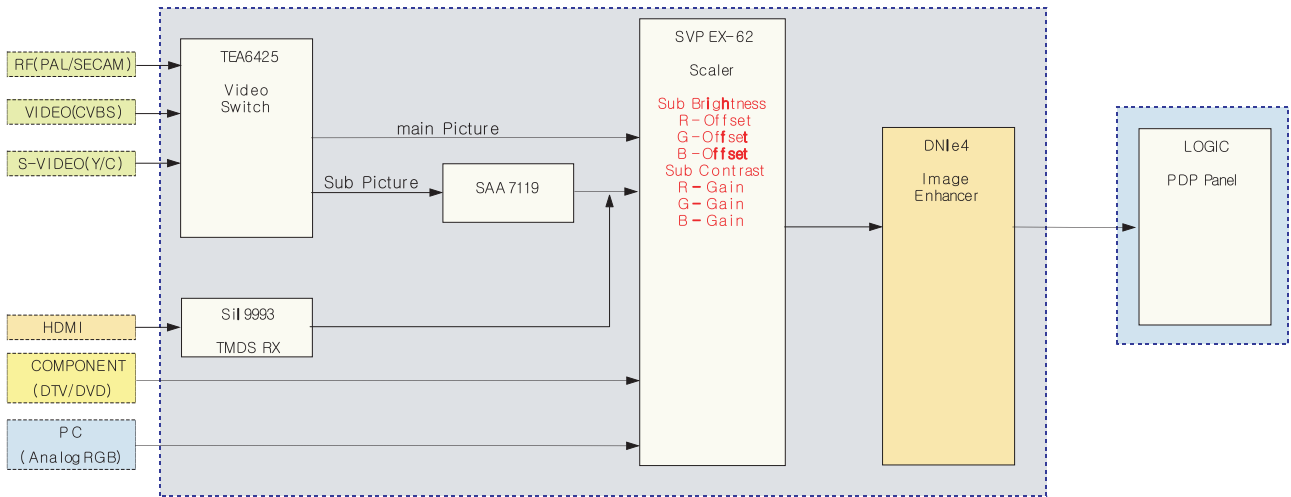
3-5 Software Upgrade

3-5-1 Digital Board TL945 Flash Upgrade

1. Connect one end of the RS-232C cable to the PC COM port and the other end of the cable to the PDP Service port while the power of the PDP is off.
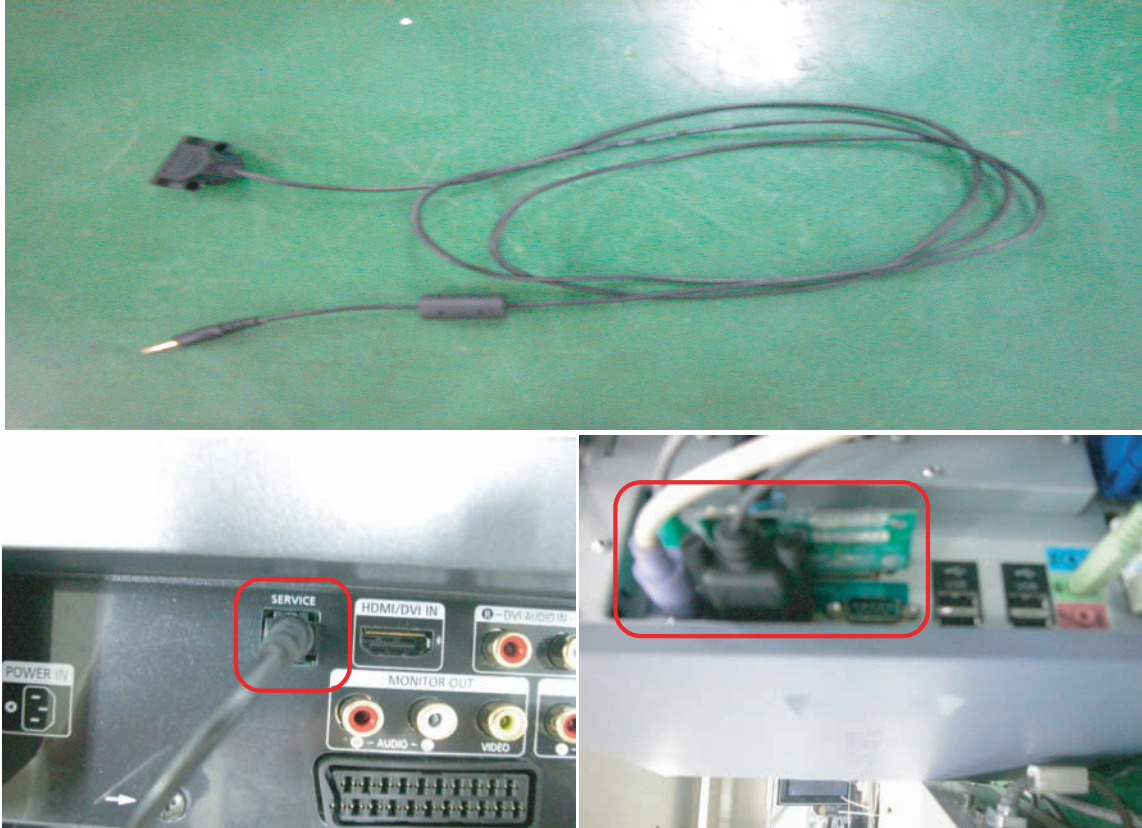
2. Rome Flash Downloader.
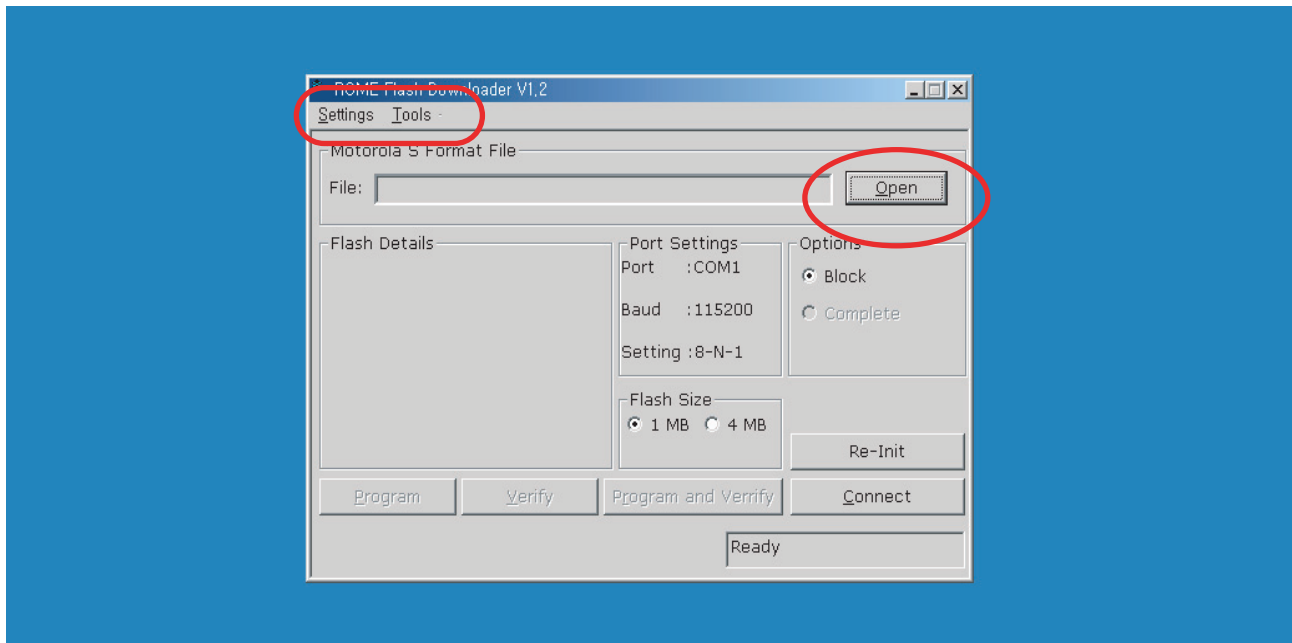
3. When the Flash Downloader is launched, click the Open button.
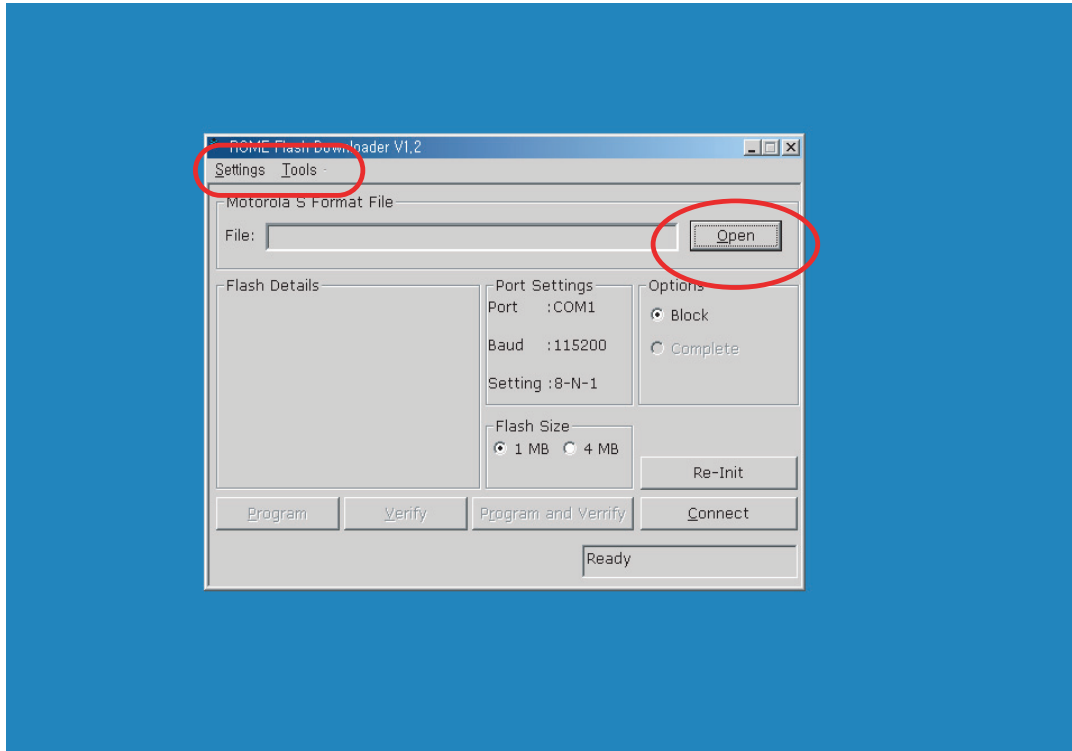
4. Select a file to be downloaded from the computer.
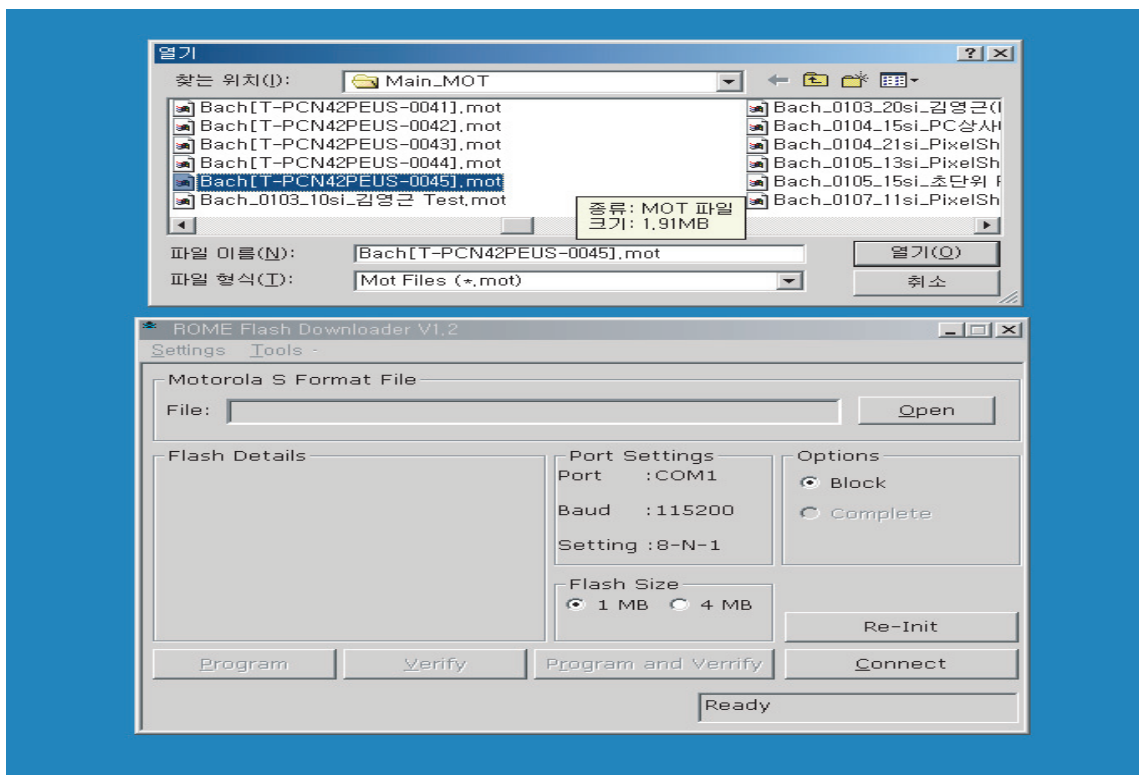
5. After selecting a target file, click the Connect button and turn the power on. When the program is activated, Ready click.
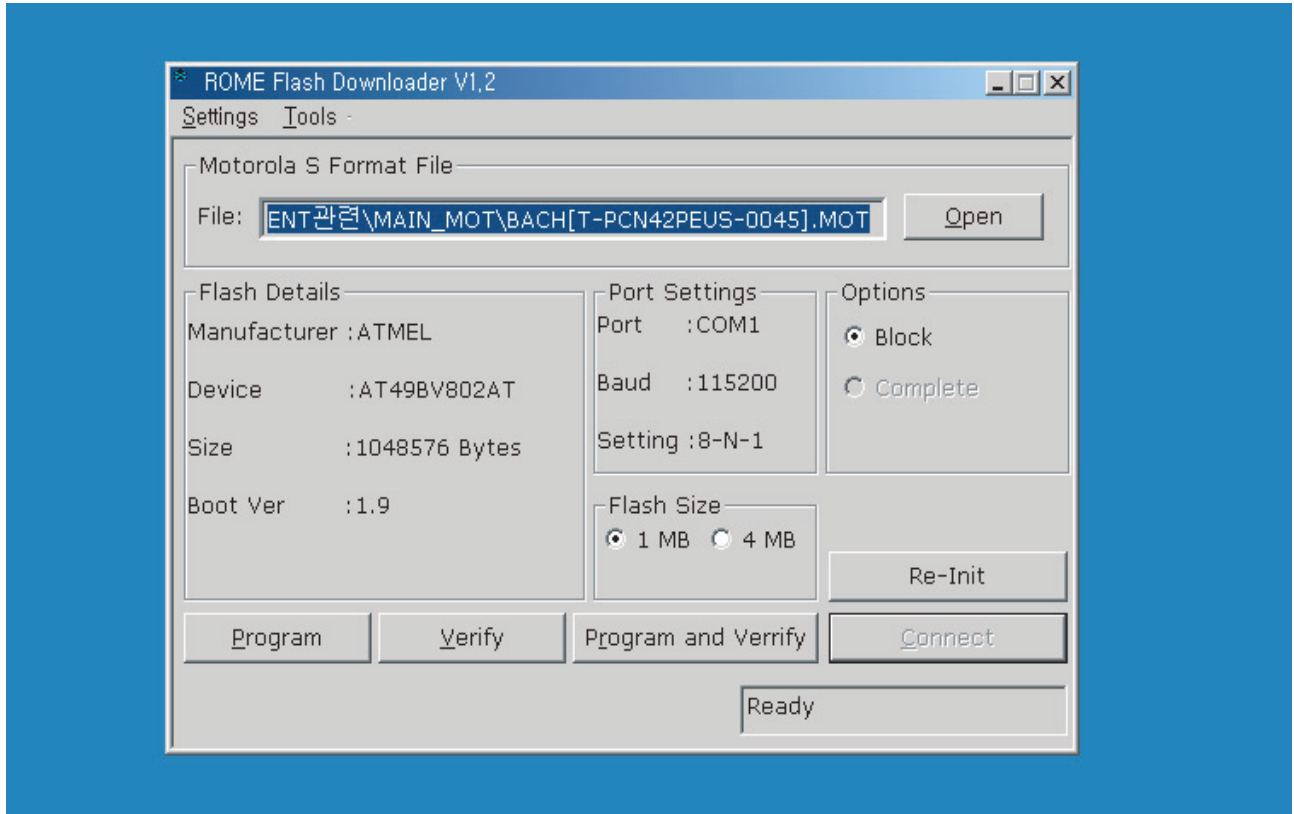
6. Note that the power must not be turned off during the download.
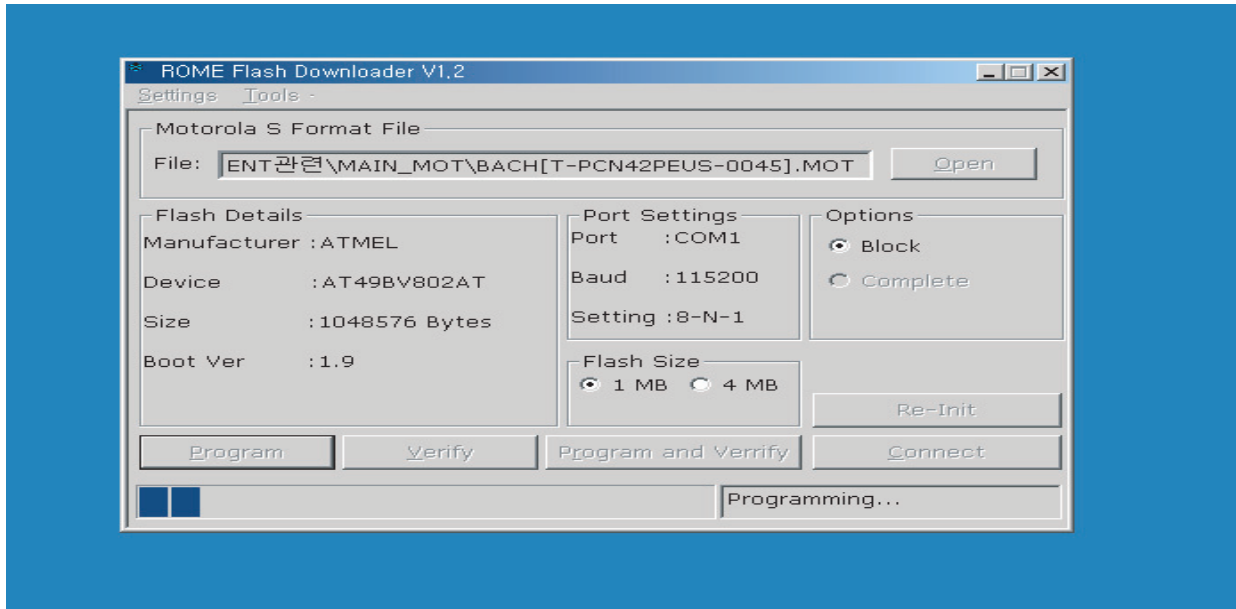
7. After the download is finished, the Flash Download Completed popup window opens. That indicates S/W upgrade is completed.
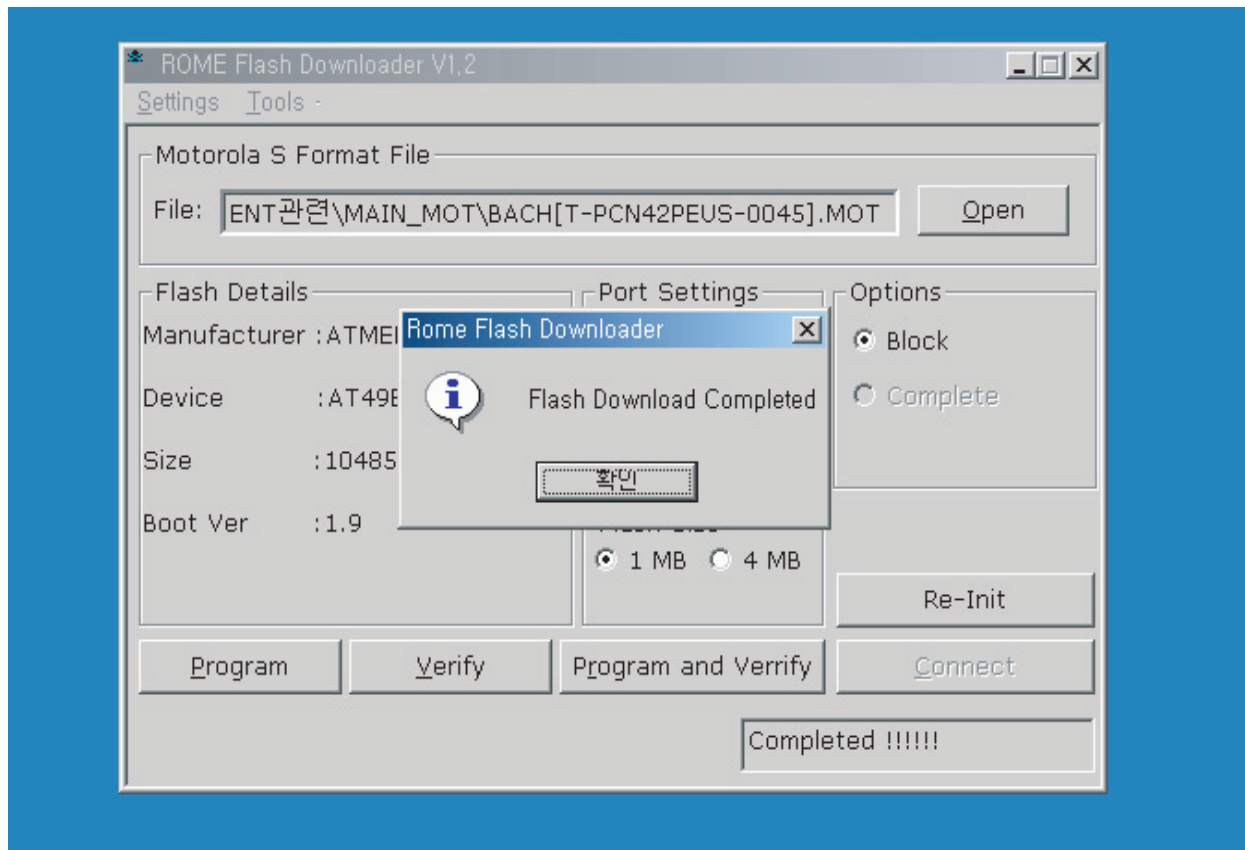
3-6 Replacements & Calibration

3-6-1 Voltage Adjustment

※ When the SMPS is replaced, the Va, Vs voltages must be checked and adjusted to the proper levels indicated on the panel sticker.

Voltage Label

Va, Vset, Vscan Test Point

Vscan adjustment

Vset adjustment

Ve adjustment

D5.3V, Vg, Ve Test Point

Vs Test Point

Va Test Point

VR514 Va adjustment

VR432 Vs adjustment
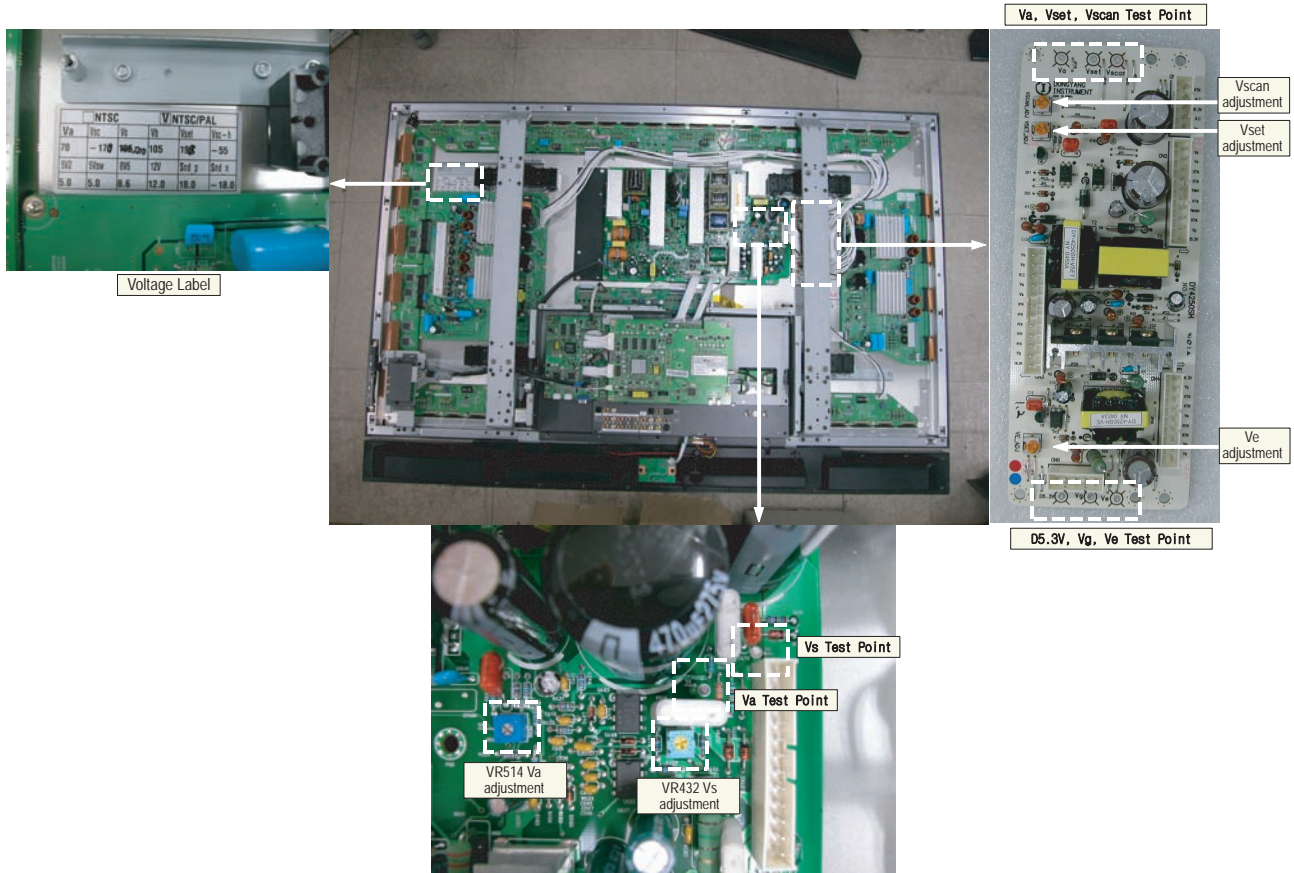
4. Exploded View & Part List

4-1 PS42P5HX/XEE

You can search for the updated part code through ITSELF web site.
URL:http://itself.sec.samsung.co.kr
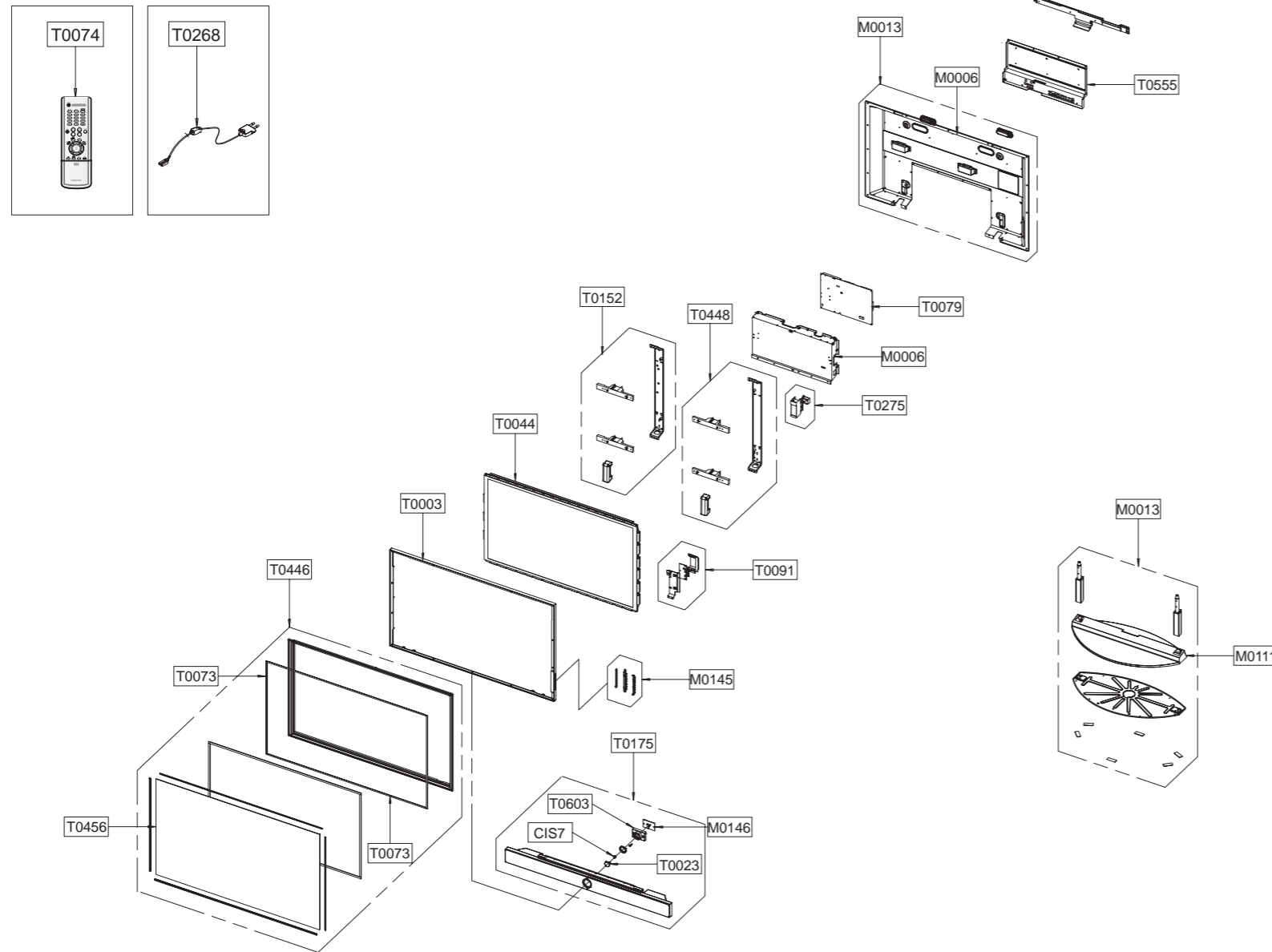
Loc.No.	Code No.	Description	Specification	Q'ty	SA/SNA	Remark
CIS7	AA61-60003B	SPRING ETC-CS	-,SUS304,-,-,OD11.2,N7,OD1	1	S.N.A	
M0006	BN63-01633C	COVER-REAR	42D5,S5,PCM,T0.5	1	S.N.A	
M0006	BN63-01634C	COVER-REAR SUB	42S5,SECC,T1.0	1	S.N.A	
M0013	BN96-02140F	ASSY STAND P-BASE	42S5H,CIS,HIPS HB,BK07	1	S.A	
M0013	BN96-01786C	ASSY COVER P-REAR	42D5,S5,PCM,T0.5	1	S.A	
M0111	BN63-01813L	COVER-STAND	42S5H,CIS,HIPS,T3.5,HB,BK07,	1	S.N.A	
T0446	BN96-02704B	ASSY BRACKET P-FRONT	42S5,42P5,EXPORT	1	S.N.A	
M0145	BN96-02550A	ASSY BOARD P-FUNCTION	SCHUBERT,CT5000-36	1	S.A	
M0146	BN96-02050B	ASSY BOARD P-POWER & IR	SCHUBERT,CT5000-	1	S.A	
T0003	BN96-02693H	ASSY COVER P-FRONT	42S5H,CIS,HIPS HB,BKN	1	S.A	
T0023	BN64-00336A	KNOB POWER	42P5,PC,VIOLET	1	S.N.A	
T0044	BN96-01886A	ASSY PDP MODULE P	M1,SPD-42P5HD,D71A,V4,	1	S.A	
T0073	AA63-01078A	GASKET-EMI	42P5,AL POIL,T1.5,7,1006	2	S.N.A	
T0073	AA63-01079A	GASKET-EMI	42P5,AL POIL,T1.5,W7,L614.5	2	S.N.A	
T0074	BN59-00468A	REMOCON	PS42S5S,TM76A,59*22*209,ZILOG MB	1	S.A	
T0079	BN94-00683C	ASSY PCB MISC-MAIN	PS-42S5H,PS-42P5H,D72	1	S.A	
T0152	BN96-01774A	ASSY BRACKET P-WALL RIGHT	SPD-42P5HD,SEC	1	S.N.A	
T0175	BN96-01737B	ASSY SPEAKER P	8ohm,P5,42,15W,Urethan co	1	S.A	
T0268	3903-000145	CBF-POWER CORD	DT,EU,FP3/YES,U(IEC C13-R	1	S.A	
T0275	BN96-02369A	ASSY MISC P-INLET	HP-R4252,STRAUSS,DOCUM	1	S.A	
T0448	BN96-01775A	ASSY BRACKET P-WALL LEFT	SPD-42P5HD,SECC	1	S.N.A	
T0456	BN67-00154A	GLASS-FILTER EMI	42 P5,Mesh,44%,1053*639	1	S.N.A	
T0555	BN96-01392R	ASSY MISC P-BRKT TERMINAL	42S5,XEC,PCM T	1	S.N.A	
T0603	BN64-00338A	WINDOW-RMC	42P5,ACRYL,5%	1	S.N.A	

5. Electrical Part List

5-1 PS42P5HX/XEE Service Item

You can search for the updated part code through ITSELF web site.
URL:http://itself.sec.samsung.co.kr

Loc.No.	Code No.	Description	Specification	Q'ty	SA/SNA
M0114	BN39-00115A	CBF SIGNAL	NL5MO,15P/15P,2990,1830MM,UL2	1	S.A
T0074	BN59-00474A	REMOCON	PASCAL,TM75B,160x58x21,ZILOG MBR	1	S.A
M0014	BN94-00685A	ASSY PCB MISC-PC MAIN	PPM42M5S,D71B,Pasc	1	S.A
T0098	BN94-00696A	ASSY PCB MISC-CONTROL	PPM42M5S,D71B,Pasc	1	S.A
T0159	BN96-01856A	ASSY PCB P-SMPS	SPD-50P5HD(DC_DC),200Vin	1	S.A
T0044	BN96-01887A	ASSY PDP MODULE P	M1,PS42S5S,D,V4,1002¡¿	1	S.A
T0159	BN96-01923A	ASSY PCB P-SMPS	PS-42S5S,100~240V	1	S.A
T0073	BN96-02038A	ASSY PDP P-X MAIN BOARD	M1,PS42S5S,D,V4,	1	S.A
T0096	BN96-02039A	ASSY PDP P-Y MAIN BOARD	M1,PS42S5S,D,V4,	1	S.A
T0048	BN96-02040A	ASSY PDP P-Y BUFF UPPER BOARD	M1,PS42S5S	1	S.A
T0049	BN96-02041A	ASSY PDP P-Y BUFF LOWER BOARD	M1,PS42S5S	1	S.A
T0142	BN96-02042A	ASSY PDP P-LOGIC BOARD	M1,PS42S5S,D,V4,1	1	S.A
T0937	BN96-02043A	ASSY PDP P-ADDRESS E BUFF BOAR	M1,PS42S5	1	S.A
T0938	BN96-02044A	ASSY PDP P-ADDRESS F BUFF BOAR	M1,PS42S5	1	S.A
M0013	BN96-02101A	ASSY COVER P-REAR	PPM42M5,SECC, T0.5	1	S.A
T0003	BN96-02105A	ASSY COVER P-FRONT	42M5,HIPS HB,GR806P	1	S.A
M0013	BN96-02367B	ASSY STAND P-BASE	42M5,PPS,BLK	1	S.A
M0018	BN97-00552A	ASSY MICOM	PPM42M5SS,D71B,29LV160,T-PSC4	1	S.A

MEMO

6. Troubleshooting
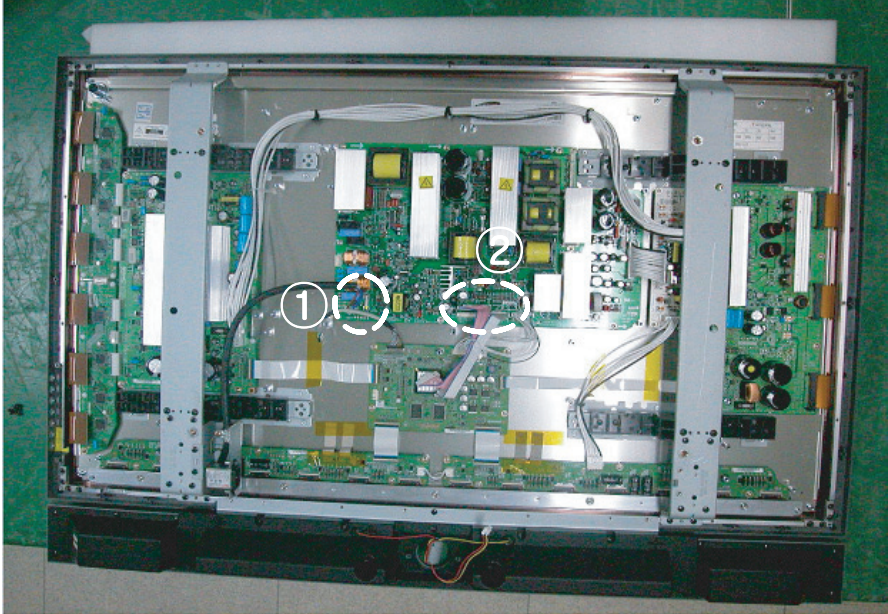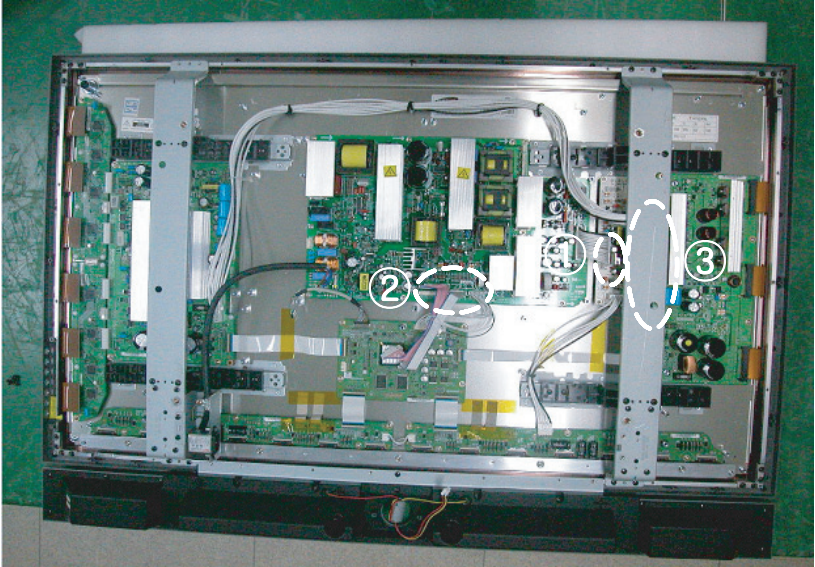
6-1 First Checklist for Troubleshooting

1. Check the various cable connections first.
   - Check to see if there is a burnt or damaged cable.
   - Check to see if there is a disconnected cable connection or a connection is too loose.
   - Check to see if the cables are connected according to the connection diagram.

2. Check the power input to the Video Board.

3. Check the voltage in and out between the SMPS ↔ Video Board, between the SMPS ↔ X, Y Drive Board, and between the Logic Boards.

6-2 Checkpoints by Error Mode

6-2-1 No Power

Symptom	- The LEDs on the front panel do not work when connecting the power cord. - The SMPS relay does not work when connecting the power cord. - The power of the unit seems to be out of order.
Major Checklist	The SMPS relay or the LEDs on the front panel do not work when connecting the power cord if the cables are improperly connected or the Video Board or SMPS is out of order. In this case, check the following: - Check the internal cable connection status inside the unit. - Check the fuses of each part. - Check the output voltage of SMPS. - Replace the Video Board.
Troubleshooting Procedures	 ① Are the AC IN socket connector and the Main SMPS CN800 connected? — No → The AC IN socket connector and the Main SMPS CN800 connected Yes ↓ ① Is the Fuse (F101) of the Main SMPS Power Input Part blown? — No → Replace Fuse (F101) Yes ↓ ② Main SMPS CN804-2 Pin 3: STB 5V Pin 5 PS-ON: Check to see if it is 0V — No → Replace the Main SMPS Yes ↓ Replace the Main Board — No → Replace the Digital Board

6-2-2 When the unit is repeatedly turned on and off
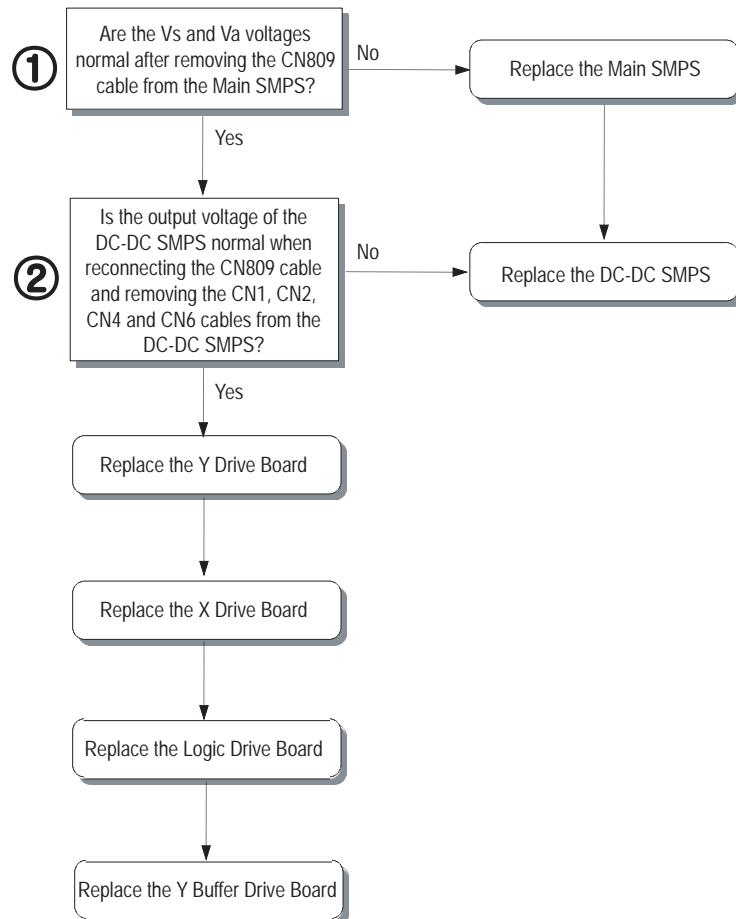
Symptom	- The SMPS relay is repeatedly turned on and off.
Major Checklist	In general, the SMPS relay repeatedly turns on and off by the protection function due to a defect on a board connected to the SMPS. - Disconnect all cables from the SMPS, operate the SMPS alone and check if the SMPS works properly and if each voltage output is correct. - If the symptom continues even when SMPS is operated alone, replace the SMPS. - If the symptom is not observed when operating the SMPS alone, find any defective ASSYs by connecting the cables one by one.
Troubleshooting Procedures	 ① Does the symptom continue after connecting the power and removing the CN800 cable from the Main SMPS? — No → ③ Does the symptom continue when connecting the power after connecting the CN800 cable and removing the CN1, CN2, CN4 and CN6 cables from the DC-DC SMPS? → Replace the DC-DC SMPS Yes ↓ ② Does the symptom continue after connecting the power and removing the CN800 cable from the Main SMPS? — ③ Does the symptom continue when connecting the power after removing the CN4 cable from the DC-DC SMPS? → Replace the X Drive Board Yes ↓ Replace the Main SMPS — ③ Does the symptom continue when connecting the power after removing CN2 from the DC-DC SMPS? → Replace the Y Drive Board ② Does the symptom continue when connecting the power after removing CN810 from the Main SMPS? → Replace the Logic Drive Board
Caution	When separating and connecting the cables such as CN809 of the Main SMPS, CN1, CN2, CN3, CN4 and CN5 of DC-DC SMPS, CN of the X Drive Board, and CN of the Y Drive Board, a spark may be generated by the electric charge of the high capacity capacitor. Therefore, wait some time after separating the power cord from the unit.

6-2-3 No Picture (When audio is normal)

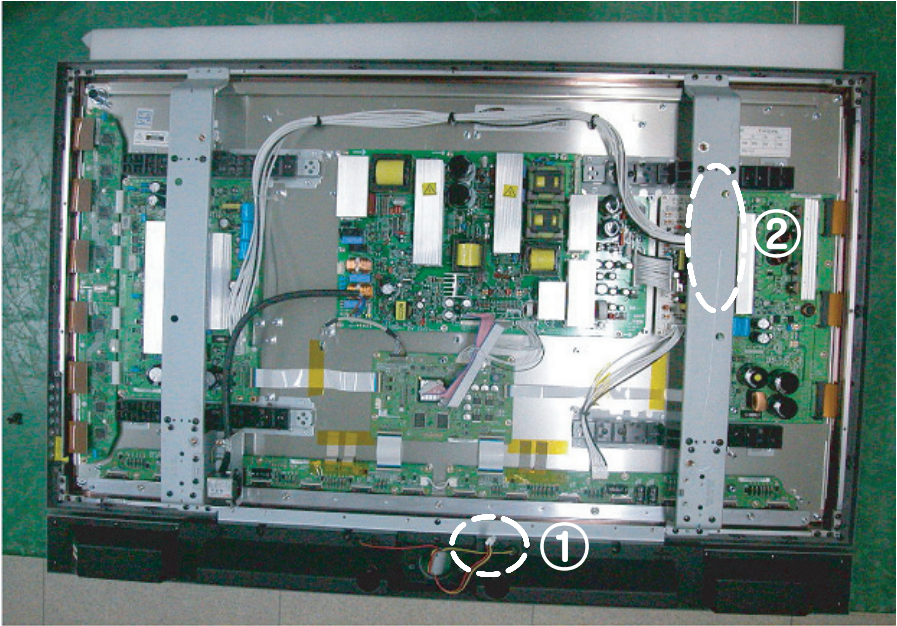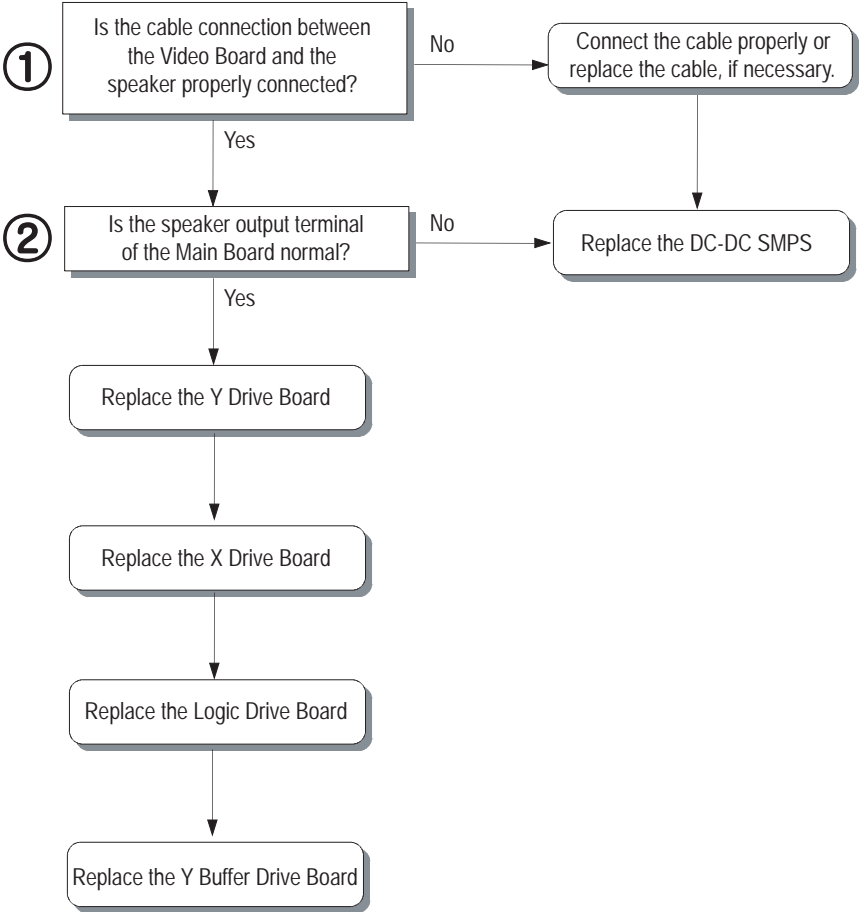| Symptom	- Audio is normal but no picture is displayed on the screen.
Major Checklist	- This may happen when the Video Board is normal but the X, Y Drive Board, Logic Board, or Y Buffer Board is out of order. - The output voltage of the Main SMPS or the DC-DC SMPS is out of order. - This may happen when the LVDS cable connecting the Main Board and the Logic Board is disconnected.
Troubleshooting Procedures	
Caution	When separating and connecting the cables such as CN809 of the Main SMPS, CN1, CN2, CN3, CN4 and CN5 of the DC-DC SMPS, CN of the X Drive Board, and CN of the Y Drive Board, a spark may be generated by the electric charge of the high capacity capacitor. Therefore, wait some time after separ ating the power cord from the unit.
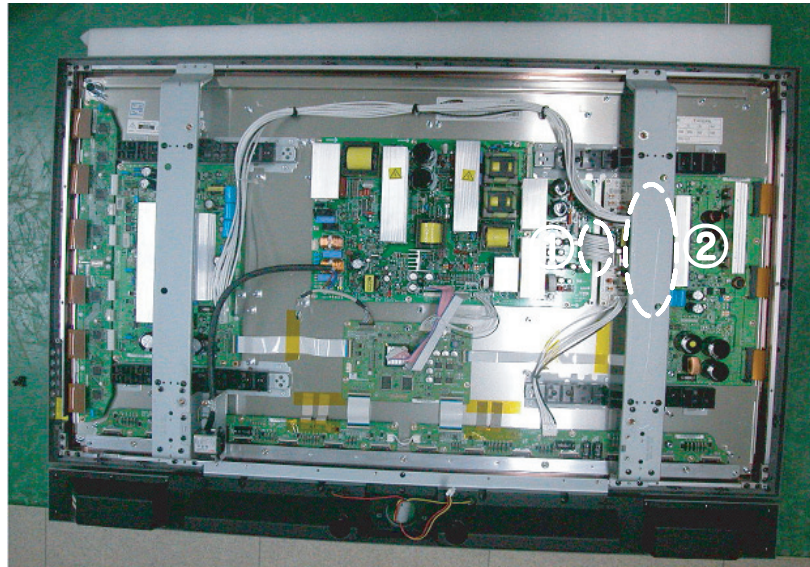
6-2-4 No Sound

Symptom	- Video is normal but there is no sound.
Major Checklist	- When the speaker connectors are disconnected or damaged. - When the sound processing part of the Video Board is out of order. - Speaker defect. - When setting the volume to 0 (Nonsense).
Troubleshooting Procedures	

① Is the cable connection between the Video Board and the speaker properly connected? — No → Connect the cable properly or replace the cable, if necessary.

Yes ↓

② Is the speaker output terminal of the Main Board normal? — No → Replace the DC-DC SMPS

Yes ↓

Replace the Y Drive Board

↓

Replace the X Drive Board

↓

Replace the Logic Drive Board

↓

Replace the Y Buffer Drive Board

6-3 Trouble-shooting with New Features

6-3-1 Installation & Connection

Problem	Solution
The unit does not turn on when I press the Power button on the remote control.	■ Check to see if the power cord is connected. ■ Confirm that the Device Selection of the remote control is set to TV.
A normal broadcast is not displayed.	Check to see if the antenna cable has been properly connected.
Cable broadcasting does not work.	Install a satellite antenna (Parabola) and connect it to the TV.
Satellite broadcasting does not work.	Subscribe to a local cable broadcasting firm and get support.

6-3-2 Menu & Remote Control

Problem	Solution
The remote control does not work.	■ Press the Select Device button to select the TV or external device. ■ Replace the battery of the remote control with a new one. ■ Insert the battery making sure the polarity (+,-) is correct. ■ Check if the angle or the distance is sufficient, or if there is any interference between the product and the remote control. ■ Make sure the user has pressed the correct button. ■ To avoid direct sunlight to the receiving panel of the TV, remove any indoor lighting or change the location of the TV. ■ Check if the power switch at the back left of the TV is turned on.
Cannot change the channel with the remote control.	■ Press the Select Device button to select the TV. ■ Change the channel using the remote control of the cable or satellite receiver.
Cannot select an A/V channel.	Press the TV/AV button and check if the AV item is grayed out. When the AV item is grayed out, you cannot select an A/V channel. Check if the connector is properly connected.
Cannot select a menu.	Check if the menu is grayed out. If a menu is grayed out, it cannot be selected.

6-3-3 Screen

Problem	Solution
The screen is black and there is no sound.	■ Check if the power cord is properly connected. ■ Turn on the power. ■ Select an AV channel that corresponds to the external device.
Only the screen is blank/it is dark or too bright.	■ Adjust the screen brightness. ■ If the screen is too dark, check to see if Power Saving Mode is set to "Super Power Saving". Although Super Power Saving Mode consumes less power than Standard Mode, Super Power Saving Mode may have the screen dark.
The screen is blue/the external channel is not displayed.	■ Check if the connector is properly installed. ■ Select an AV channel that corresponds to the external device.
The screen overlaps (double/triple).	■ Check if the antenna is properly installed. ■ Adjust the position, angle or direction of the antenna.
The screen is snowy or unclear. The picture quality gets worse when it is windy	■ Check if the antenna has been bent or moved by the wind. ■ Check the antenna for its lifetime. (Normally 3 - 5 years, 1-2 years near the coast)
Dotted or semi-dotted lines are displayed on the screen.	Install the antenna as far away from the road as possible.
The screen is black and white.	■ Adjust the color density. ■ Check if the connector is properly installed.
The colors of the screen are odd/strange.	Adjust the color tones.
Unusual lines appear on the screen.	Keep the antenna away from the power cord or connectors if possible.
Unusual lines appear on the screen when watching or	Keep the video player as far away from the TV as possible.
There is no picture on the screen when I have connected to another device through the Monitor OUT port.	A video signal is only output through the Monitor OUT port when the current input mode is TV (analog broadcast), External In or S-VIDEO. Check that the current mode is one of the above.
Black or red spots appear on the screen.	A PDP TV uses a PDP panel consisting of 123million (SD Grade) ~ 315million (HD Grade) pixels. Although a PDP panel is a product that requires high technologies to integrate a few million pixels, a bright or dark pixel may exist on the panel, this does not affect the performance of the product.
A boundary appears on the screen.	■ Displaying a still picture on the screen may permanently damage the PDP panel. ■ A boundary may appear due to the difference in the transparency of the panel when watching the picture in the 4:3 aspect ratio for a long time and the picture in the left, right and center screens is a still image. ■ A boundary may appear when watching a still picture from a DVD player or a video game console on the screen for a long time.
An after-image remains on the screen.	Due to the nature of PDP TVs, partial after-images may appear if a still picture is displayed for a certain period of time after connecting a video game console or a computer. This is caused by brightness deterioration due to the storage effect of the panel, and to prevent this from happening, we recommend you reduce 'brightness' and 'contrast'.

6-3-4 Sound

Problem	Solution

There is no sound.	■ Increase the volume.
	■ Press the Mute button.
	■ There may be no sound when the internal amplifier setting is set to Off.
	  Set the Internal Amplifier Setting to On.
	■ If you have connected the DVI signal to HDMI IN using the DVI ↔ HDMI converter cable,
	  you have to connect an additional audio (L/R) cable to the DVI Audio IN port to hear
	  audio.

The sound is very low.	■ Increase the volume. ■ Set the auto volume control to ON.
There is a lot of noise.	Keep the antenna away from the power cord or connectors if possible.
The selected language does not appear.	Press the Multiplex button to select the TV.
A "snapping" sound is emitted from the product.	This sound may be heard when the product chassis shrinks or expands due to the surrounding humidity or temperature change. This sound does not indicate a problem and there is no need to worry.
There is noise from the product.	A PDP TV may produce sound at a certain level when operating the fan to cool its internal temperature. In addition, since the high-speed switching circuit and the high current may produce noise depending on the screen brightness change, a PDP TV produces more noise than a conventional CRT TV.

6-3-5 Channel

Problem	Solution
There are no channels available.	■ Check if the antenna is properly installed. ■ Press the Auto Channel button to store channels.
Some channels are not available.	■ Adjust the position, angle or direction of the antenna. ■ Use the number keys to select a specific channel and press Store/Clear to memorize it.
Only the UHF (14-69) channels are not available.	Check if the antenna is able to receive UHF signals

6-3-6 PC

Problem	Solution
I cannot change the resolution.	Update the driver of the graphics card with the latest version.
Letters are not properly displayed.	Set the resolution lower than the current one. (e.g. 1024× 768 → 640× 480)

6-3-7 Others

| Problem	Solution
The product is hot.	Since a PDP TV displays a picture on the screen by discharging plasma, operating for a long time may introduce heat onto the panel. The internal heat of the panel is sent to the vent on the upper part of the product, and users must take care not to touch the hot air from the vent. The heat from the PDP TV does not indicate a defect or problem.

6-4 Troubleshooting Procedures by ASS'Y

| No	Name	Code No	Description	Major Symptoms
1	ASSY BOARD P-POWER	BN96-02050A	Power Button Board	The remote control does not work properly, LED does not work properly, function key mode does not work properly.
2	ASSY PCB MISC-MAIN	BN94-00662A	Main Board	No power, TV screen is broken(Check tuner CVBS), No power, Abnormal screen for each input source, Sound trouble
3	ASSY PCB P-SMPS	BN96-01856A	SMPS Board	No power, Blank screen, the Relay repeats On and Off.
4	ASSY PDP P-X MAIN BOARD	BN96-02038A	X Drive Board	Blank screen
5	ASSY PDP P-Y MAIN BOARD	BN96-02039A	Y Drive Board	Blank screen
6	ASSY PDP P-Y BUFF UPPER BOARD	BN96-02040A	Y Buffer Upper Board	Upper screen is blank
7	ASSY PDP P-Y BUFF LOWER BOARD	BN96-02041A	Y Buffer Lower Board	Lower screen is blank
8	ASSY PDP P-LOGIC BOARD	BN96-02042A	Logic Board	Blank screen, Screen noise
9	ASSY PDP P-ADDRESS E BUFF BOARD	BN96-02043A	Address E Buffer Board	Corresponding Buffer Board block screen is blank.
10	ASSY PDP P-ADDRESS F BUFF BOARD	BN96-02044A	Address F Buffer Board	Corresponding Buffer Board block screen is blank.
11	ASSY BOARD P-FUNCTION	BN96-02049A	Function Key Board	The side function key does not work properly
12	ASSY MISC P-INLET	BN96-02112A	Power	The remote control does not work properly, LED does not work properly, function key mode does not work properly.

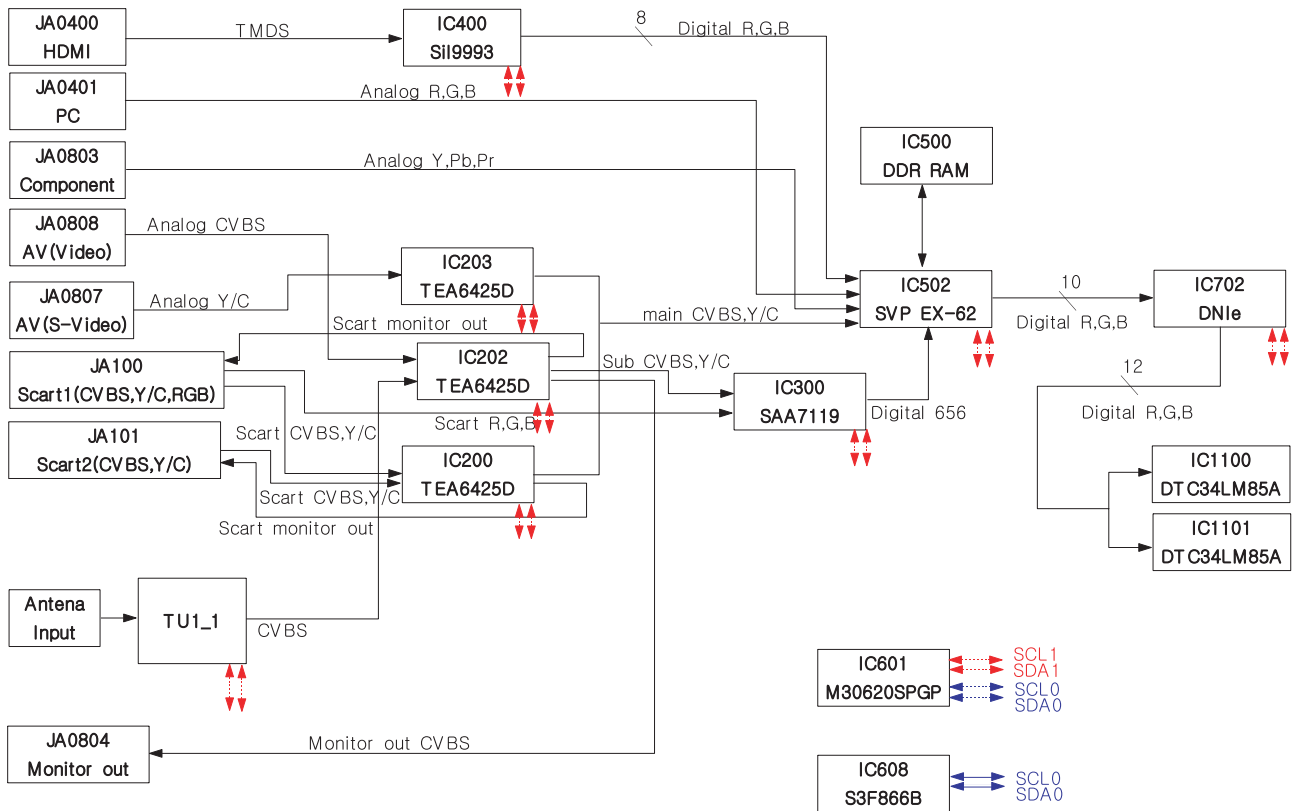# MEMO

7. Block Diagram

7-1 Overall Block Diagram
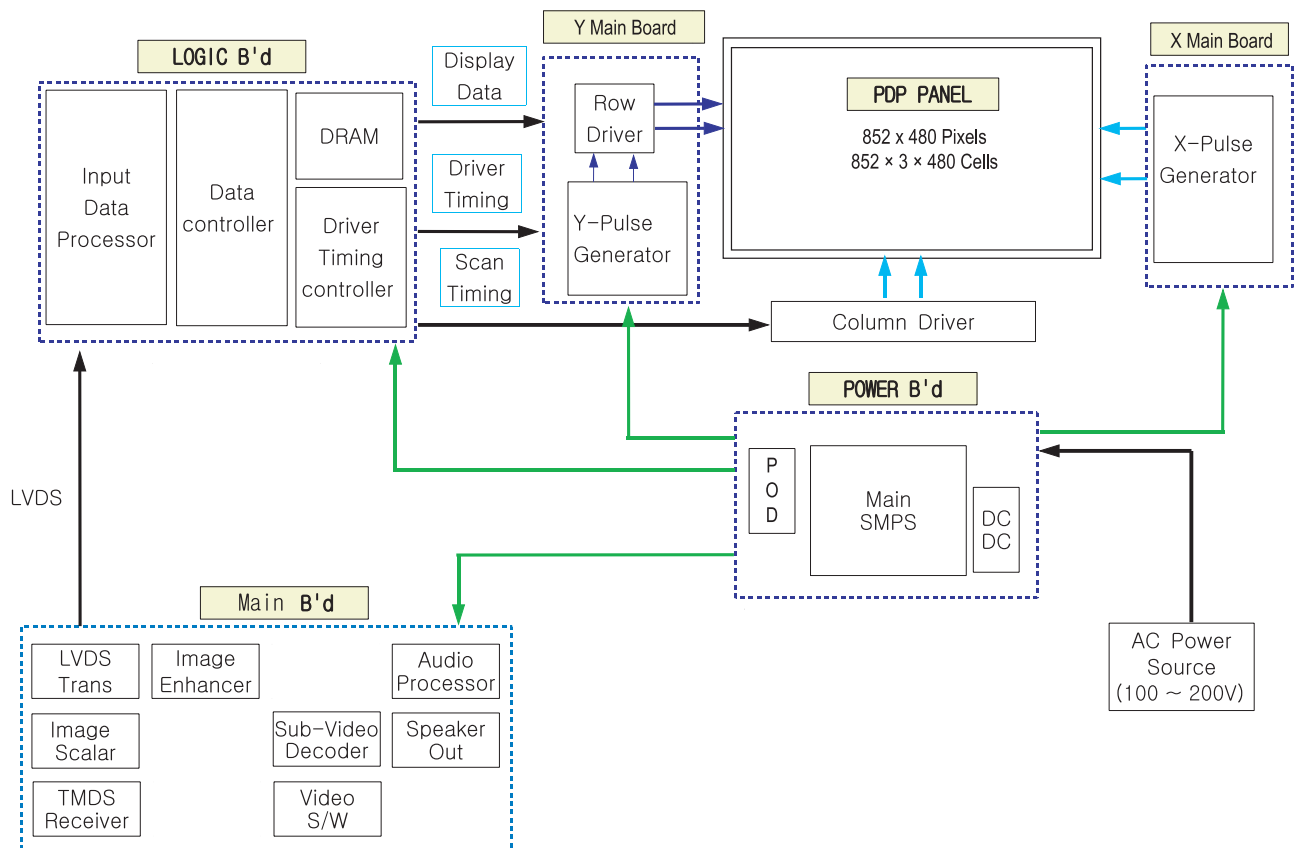
7-2 Partial Block Diagram
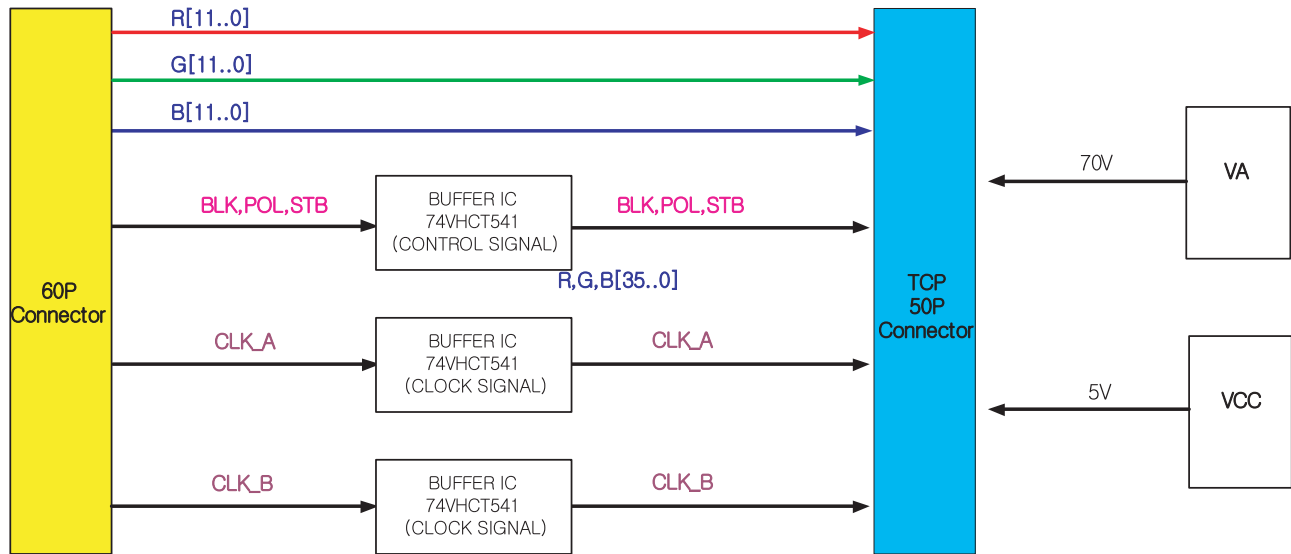
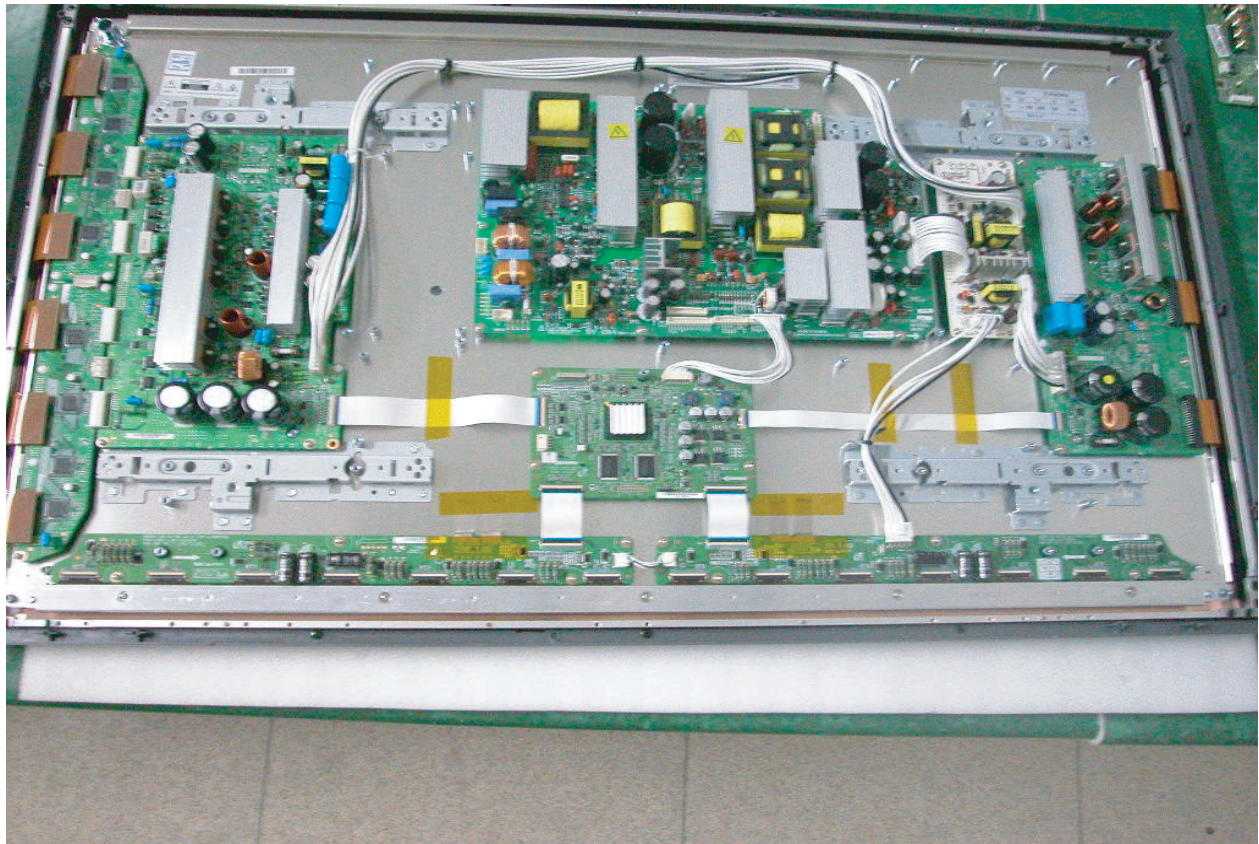## 7-2-1 Audio Signal Block Diagram
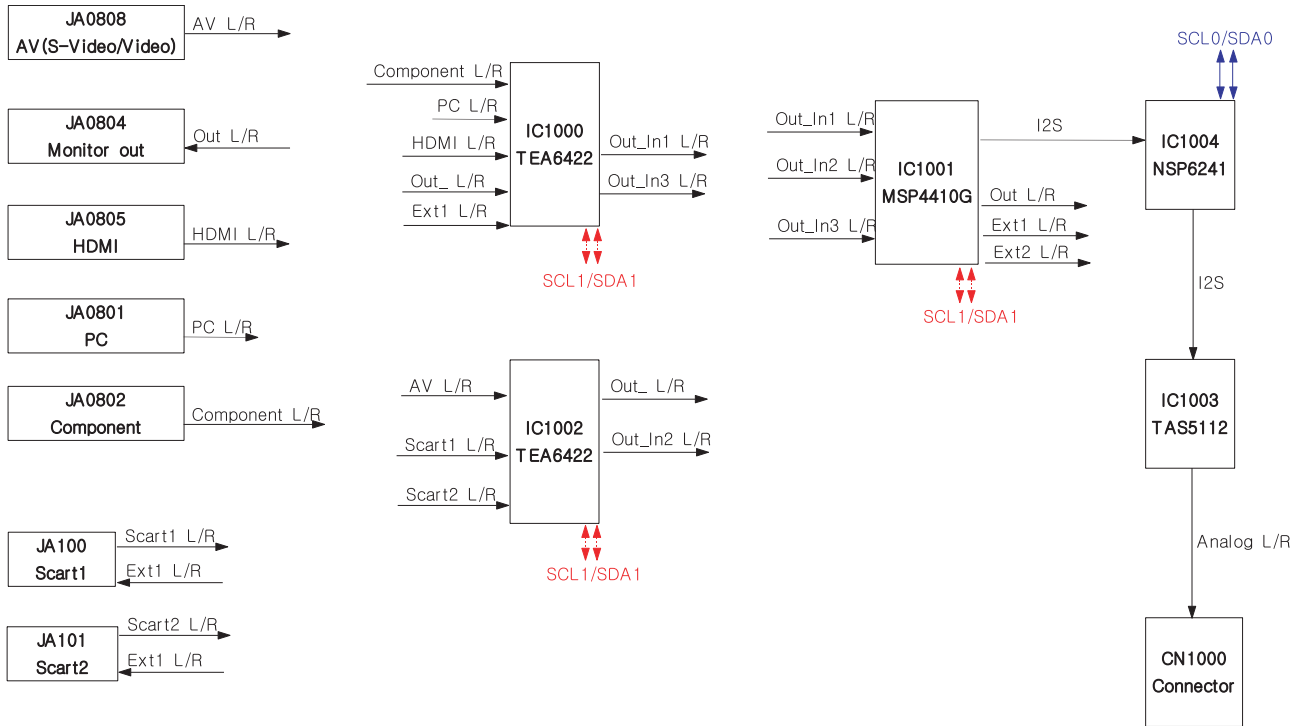
7-2-2 Video Signal Block Diagram

7-2-3 Logic Board Block Diagram

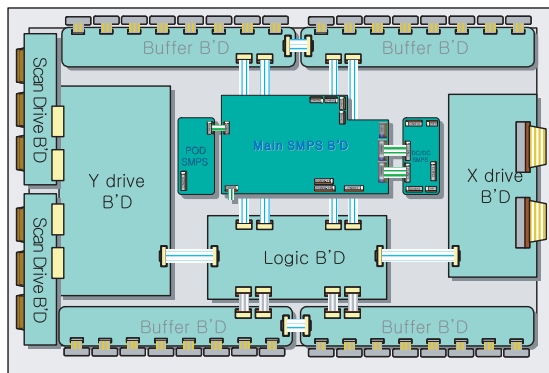# MEMO

8. Wiring Diagram

8-1 Overall Wiring
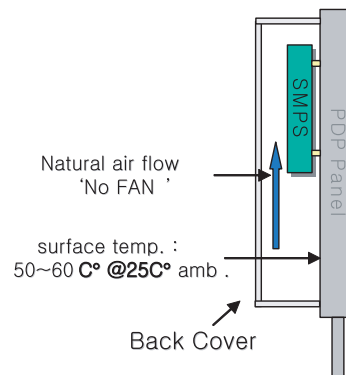

PDP panel back_side view

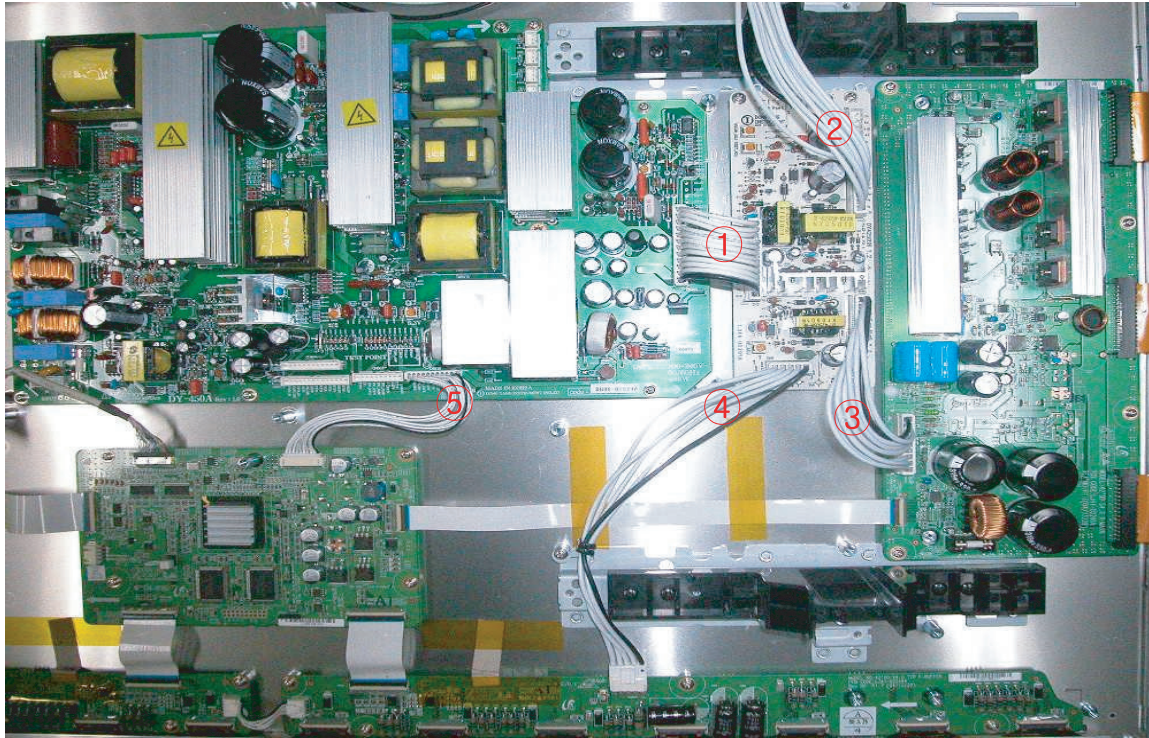PDP panel side view

< Connector Location and Wire harness Connection >

8-2 Partial Wiring

8-2-1 PDP Module ↔ SMPS Wiring

① CN809(Main SMPS) ↔ CN3(DC-DC SMPS)	
Pin No	Signal
1 ■	D5.3V
2	Vg
3	RTN
4	RTN
5	RTN
6	RTN
7	RTN
8	Va
9	Va
10	N/C
11	Vs
12	Vs

② CN2 (DC-DC SMPS) ↔ CN5007(Y B'D)	
Pin No	Signal
1 ■	Vs
2	Vs
3	RTN
4	RTN
5	Vset
6	RTN
7	Vscan
8	RTN
9	Vg
10	D5.3V

③ CN4 (DC-DC SMPS) ↔ CN4001(X B'D)	
Pin No	Signal
1 ■	D5.3V
2	Vg
3	RTN
4	RTN
5	Ve
6	RTN
7	RTN
8	Vs
9	Vs

④ CN6(DC-DC SMPS) ↔ CN2509(E-Buffer))	
Pin No	Signal
1 ■	RTN
2	N.C
3	D5.3V
4	N.C
5	Va

⑤ CN810(Main SMPS) ↔ CN2013(Logic B'D)	
Pin No	Signal
1 ■	STD_5V
2	VS_ON
3	N/C
4	PS_ON
5	RTN
6	D5.3V
7	RTN
8	RTN
9	D5.3V
10	D5.3V

8-2-2 Main Board ↔ SMPS, Side A/V, Sub Tuner Board, Power Button, Speaker Out Wiring
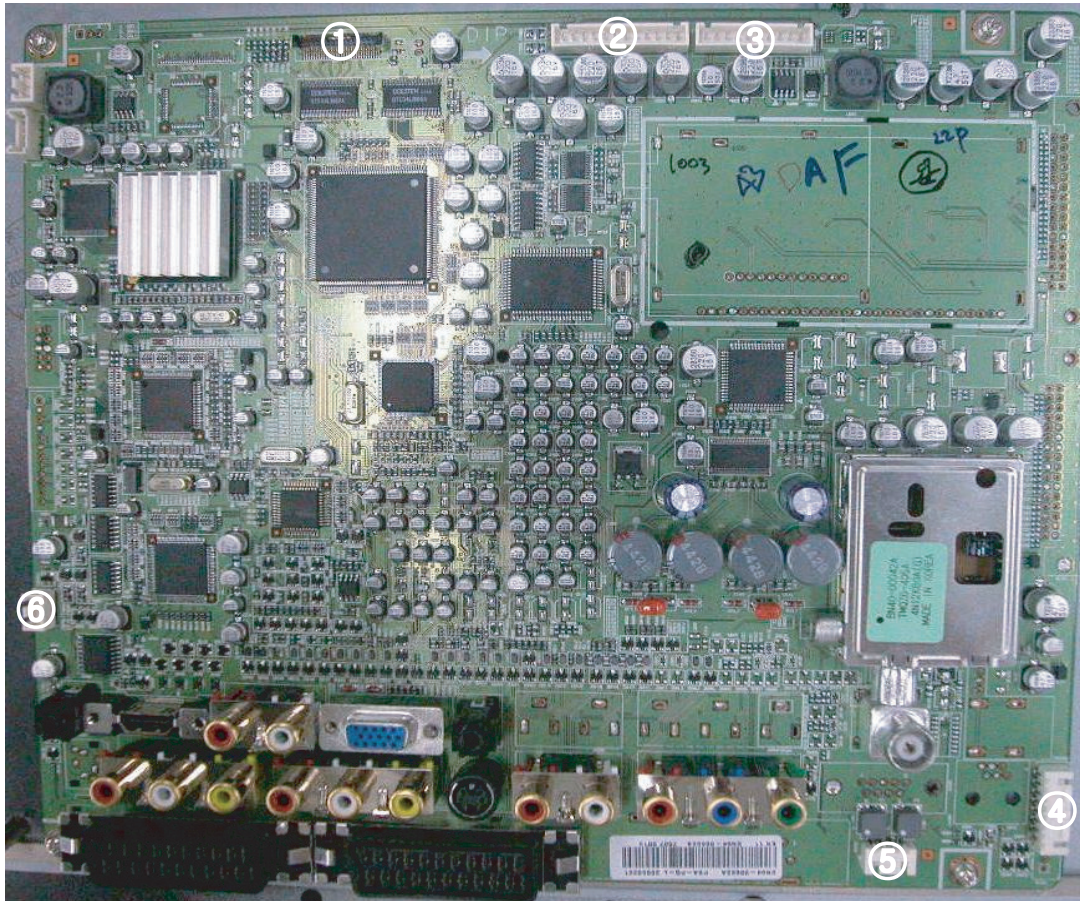
① CN804-1(MAIN SMPS) ↔ CN0902(Main Board)					
Pin No	Signal	Pin No	Signal	Pin No	Signal
1		12	TXOUT3+	23	TXOUT1B-
2	GND	13	TXOUT3-	24	TXOUT1+
3	PW_SDA0	14	TXCLKOUTB+	25	TXOUT1-
4	GND	15	TXCLKOUTB-	26	GND
5	PW_SCL0	16	TXCLKOUT+	27	GND
6	GND	17	TXCLKOUT-	28	TXOUT0+
7		18	GND	29	TXOUT0-
8	TXOUT0B+	19	GND	30	GND
9	TXOUT0B-	20	TXCLKOUT2+	31	GND
10	I2C_READY	21	TXCLKOUT-	32	GND
11	GND	22	TXOUT1B+	33	GND

② CN804-1(MAIN SMPS) ↔ CN0902(MAIN Board)	
Pin No	Signal
1 ■	5.3V
2	RTN
3	Vcs
4	Vca
5	RTN
6	RTN
7	12V
8	PS_ON
9	RTN
10	STD_5V
11	FAN_ON
12	FAN_D

③ CN803(MAIN B'D) ↔ CN0900 (MAIN Board)	
Pin No	Signal
1 ■	RTN
2	Vt
3	RTN_amp
4	RTN_amp
5	18Vamp
6	18Vamp
7	RTN
8	12V
9	RTN
10	6.5V

④ CN0901(MAIN Board) ↔ CN001(Power Button)	
Pin No	Signal
1■	GND
2	LED
3	ST5V
4	GND
5	FRONT_KEY2
6	PW_SDA3
7	PW_SCL3
8	FRONT_IR

⑤ CN1000(MAIN Board) ↔ Speaker Out	
Pin No	Signal
1	SPK_R+
2	SPK_R-
3	SPK_L+
4	SPK_L-

⑥ CN0903(MAIN Board) ↔ CN1(Function Key Board)	
Pin No	Signal
1■	FRONT_KEY1
2	FRONT_KEY2
3	GND

8-2-3 Main Board ¡ê SMPS, Power Button, Speaker, Function Board Wiring
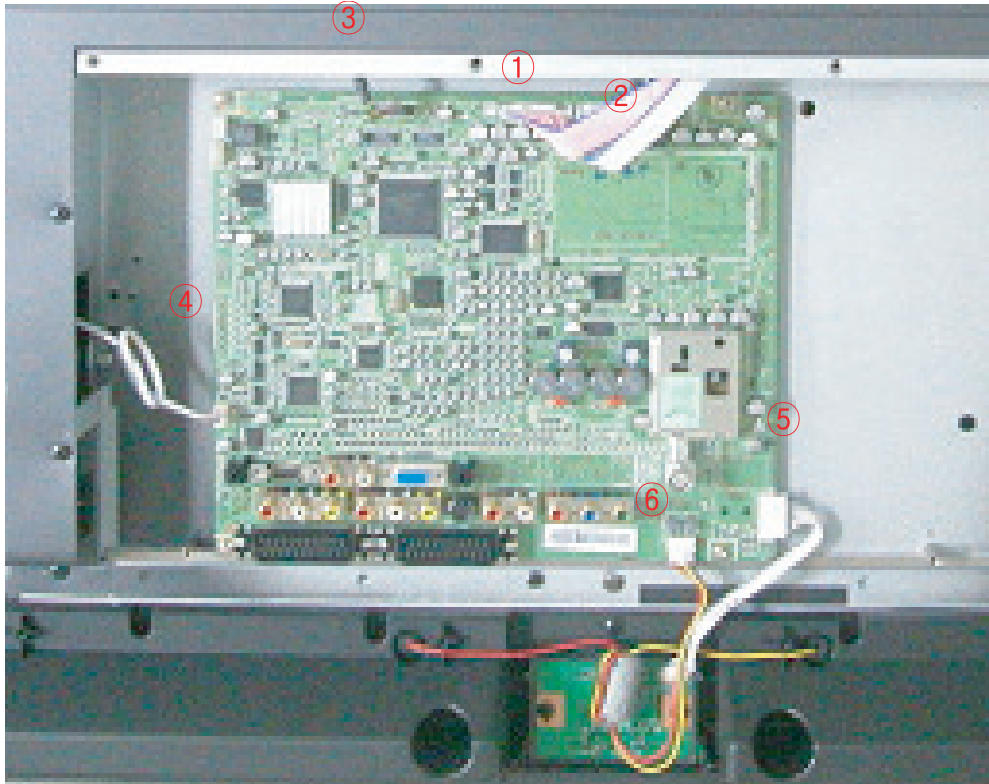
①					
P104(DIGITAL B'D) ↔ CN103(MAIN B'D)					
Pin No	Signal	Pin No	Signal	Pin No	Signal
1	SCLK	12	GND	23	FRONT_KEY1
2	945_IEC958	13	GND	24	POWER_CTR
3	LRCLK	14	S5V	25	FRONT_KEY2
4	ACLK	15	CH_6.5V	26	FRONT_IR
5	945_SDATA0	16	CH_33V	27	PW_RESET
6	I2S_5333	17	9V_A	28	UARTSEL_945
7	945_MCLK	18	GND	29	D3.3V_M
8	I2S_HDMI	19	GND	30	N.C
9	D5V	20	LED_RED	31	GND
10	GND	21	LED_GRN	32	RDY_PLUG
11	D5V	22	S_MUTE		

③			
P106(DIGITAL B'D) ↔ CN106(MAIN B'D)			
Pin No	Signal	Pin No	Signal
1	GND	13	N.C
2	GND	14	945_SDA1
3	945_TXD1	15	N.C
4	N.C	16	N.C
5	945_RXD1	17	GND
6	GND	18	LNA_ON1
7	945_TXD0	19	CAPTION
8	MAIN_SYNC_DET	20	SUB_AFT
9	945_RXD0	21	GND
10	SUB_SYNC_DET	22	RF_SW1
11	GND	23	945_CVBS
12	945_SCL1	24	GND

② P105(DIGITAL B'D) ↔ CN104(MAIN B'D)					
Pin No	Signal	Pin No	Signal	Pin No	Signal
1	GND	12	TXOUT3-	23	645AD[6]
2	TXOUT0-	13	TXOUT3+	24	645AD[7]
3	TXOUT0+	14	GND	25	GND
4	TXOUT1-	15	GND	26	656CLK
5	TXOUT1+	16	645AD[0]	27	N.C
6	GND	17	645AD[1]	28	N.C
7	TXOUT2-	18	645AD[2]	29	GND
8	TXOUT2+	19	645AD[3]	30	N.C
9	TXCLKOUT-	20	GND	31	GND
10	TXCLKOUT+	21	645AD[4]		
11	GND	22	645AD[5]		

④ P601(DIGITAL B'D) ↔ FUNCTION KEY B'D	
Pin No	Signal
1	FRONT_KEY1
2	FRONT_KEY2
3	GND

⑤ P701(DIGITAL B'D) ↔ CN107(MAIN B'D)	
Pin No	Signal
1	MAIN_CVBS
2	GND
3	N.C
4	MAIN_SIF
5	GND

⑥ P103(MAIN B'D) ↔ JO802(POD SMPS B'D)	
Pin No	Signal
1	N.C
2	+33V
3	GND
4	+12V
5	GND
6	+12V
7	GND
8	+6.5V
9	GND
10	+5.3V
11	GND
12	+5.3V

9. PCB Diagram

9-1 PDP Module, SMPS
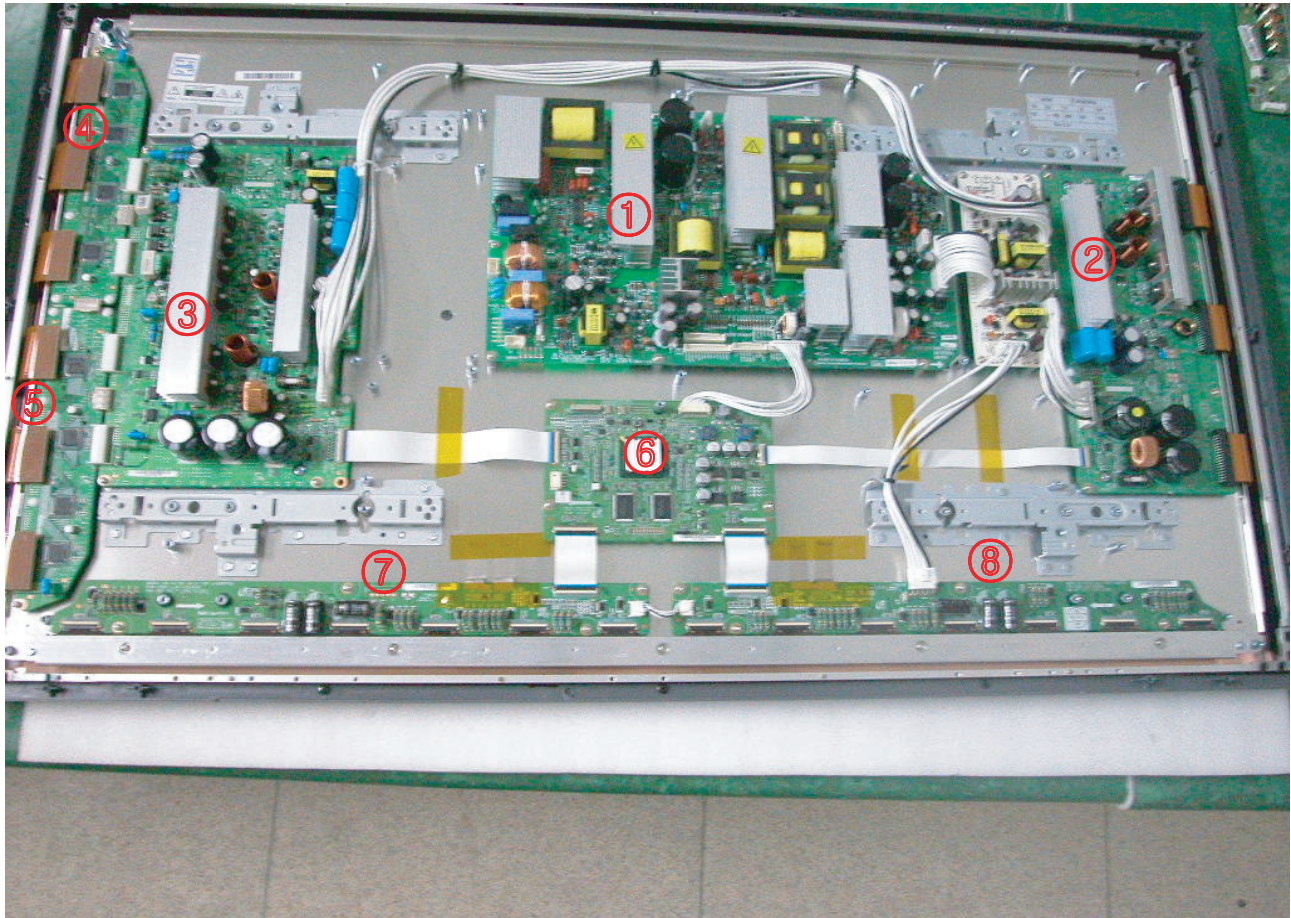
No	Name	Code No	Description
①	ASSY PCB P-SMPS	BN96-01856A	SMPS Board
②	ASSY PDP P-X MAIN BOARD	BN96-02038A	X Drive Board
③	ASSY PDP P-Y MAIN BOARD	BN96-02039A	Y Drive Board
④	ASSY PDP P-Y BUFF UPPER BOARD	BN96-02040A	Y Buffer Upper Board
⑤	ASSY PDP P-Y BUFF LOWER BOARD	BN96-02041A	Y Buffer Lower Board
⑥	ASSY PDP P-LOGIC BOARD	BN96-02042A	Logic Board
⑦	ASSY PDP P-ADDRESS E BUFF BOARD	BN96-02043A	Address E Buffer Board
⑧	ASSY PDP P-ADDRESS F BUFF BOARD	BN96-02044A	Address F Buffer Board

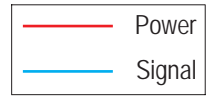## 9-2 Video Board, Function Key Borad, Power Button Board
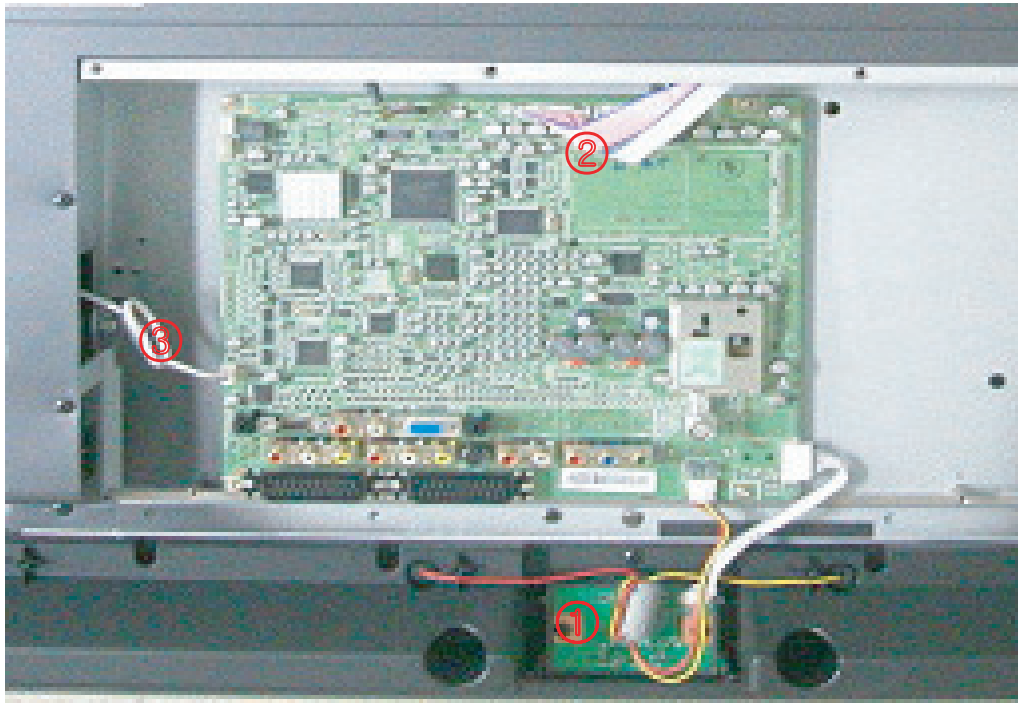
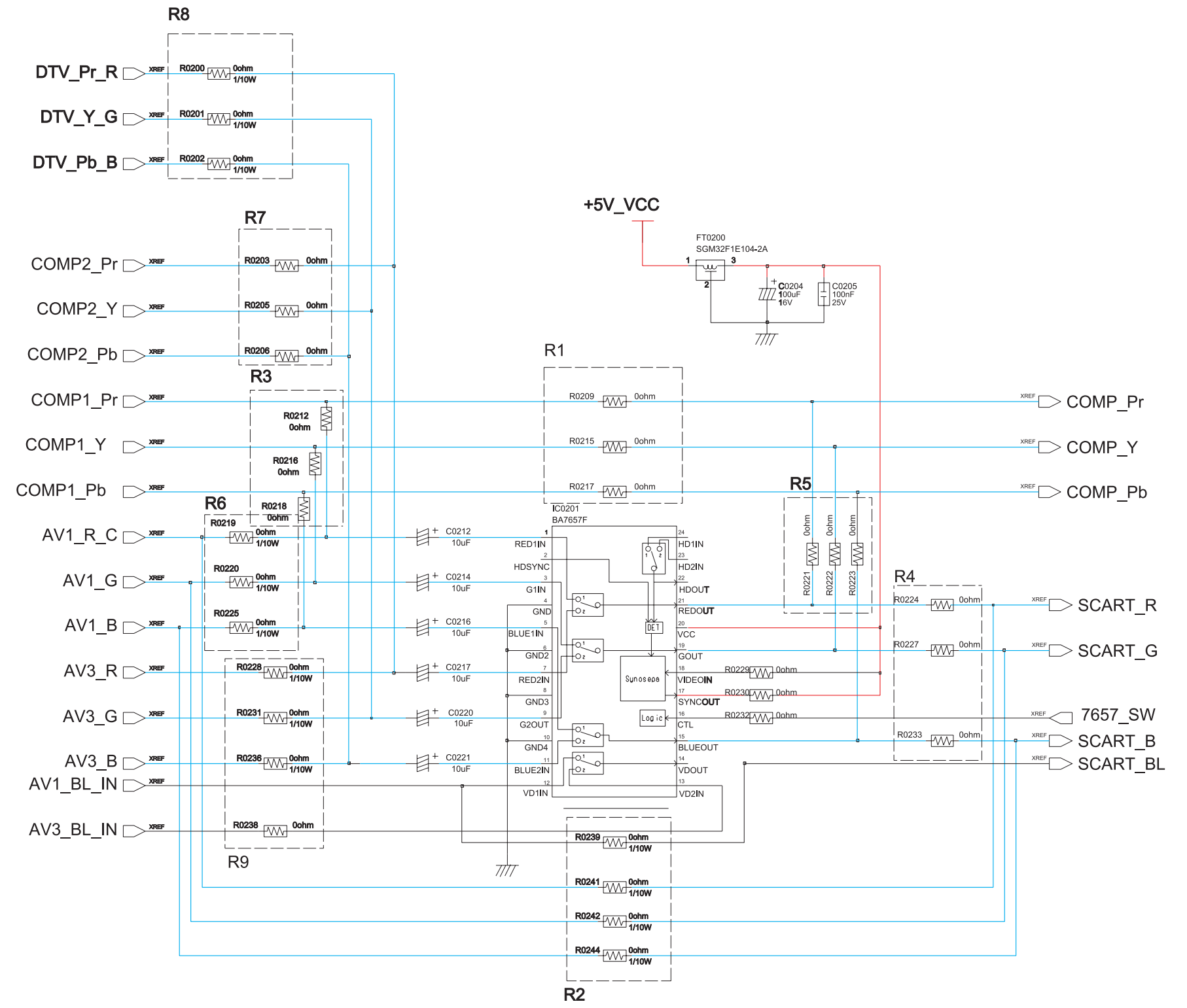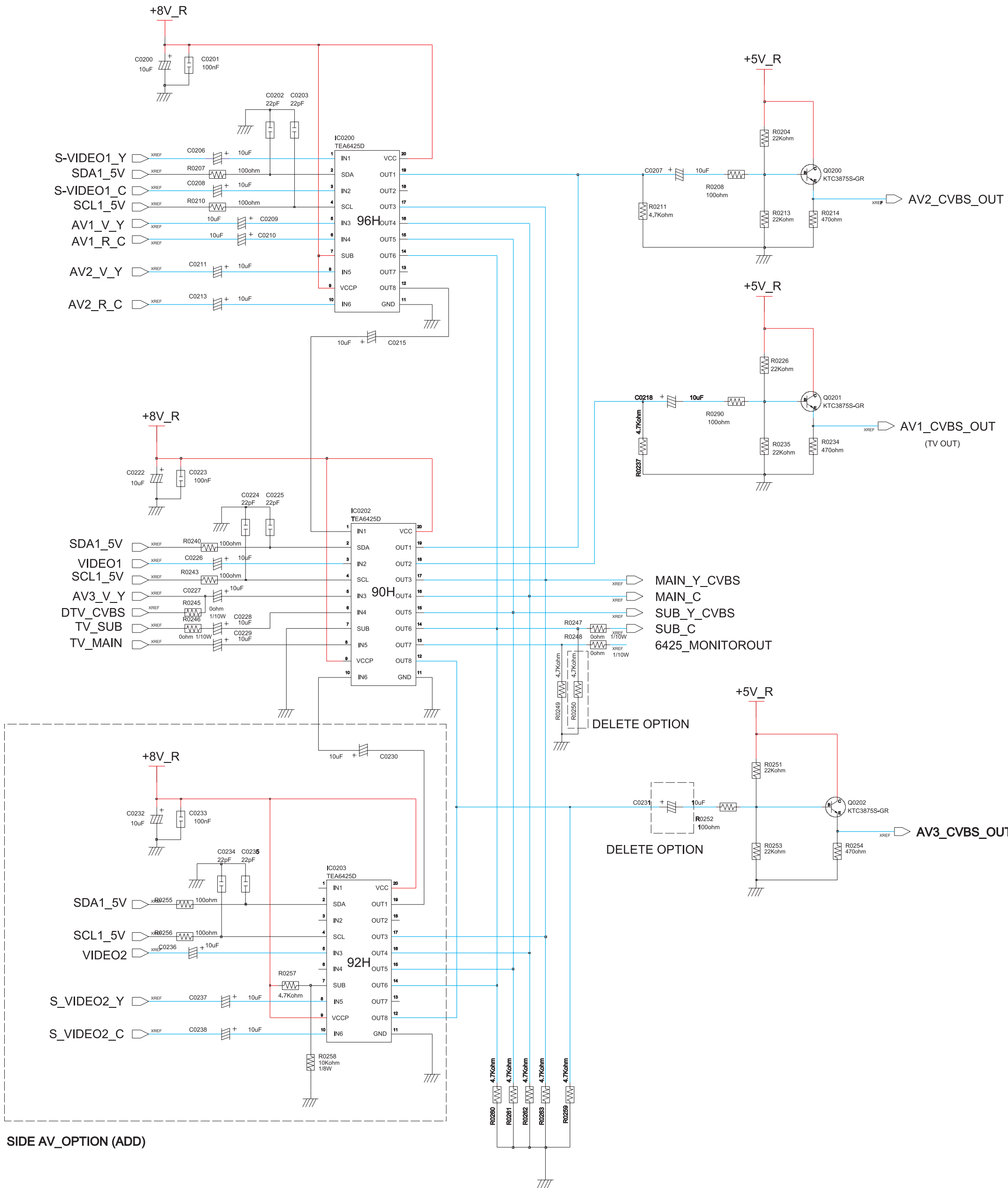| No	Name	Code No	Description
①	ASSY BOARD P-POWER & IR	BN96-02050A	Power Button Board
②	ASSY PCB MISC-MAIN	BN94-00662A	Main Board
③	ASSY BOARD P-FUNCTION	BN96-02049A	Function Key Board

10. Schematic Diagram

10-1 MAIN

10-1-1 Scart Jack

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Power

Signal

AV1: CVBS, Y/C, R/G/B
AV2: CVBS, Y/C
AV3: CVBS, R/G/B

EUROPE TUNER (Mozart)
Main : BN40-00042A
Sub : BN40-00051A

AV1_SR_OUT
AV1_SR_IN
AV1_SL_OUT
AV1_SL_IN
AV1_B
AV1_G
AV1_R_C
AV1_CVBS_OUT
AV1_V_Y

AV1_DET
AV1_BL_IN

AV2_SR_OUT
AV2_SR_IN
AV2_SL_OUT
AV2_SL_IN
AV2_R_C
AV2_CVBS_OUT
AV2_V_Y
AV2_DET

AV3_SR_OUT
AV3_SR_IN
AV3_SL_OUT
AV3_SL_IN
AV3_B
AV3_G
AV3_R
AV3_CVBS_OUT
AV3_V_Y
AV3_DET
AV3_BL_IN

SCL1_5V
SDA1_5V
SIF1
AFT1
TV_MAIN

D_TUNER
TV_SUB

CN0100 DIRECT INSERT TYPE

10-1-2 Video switch

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Power
Signal

+8V_R

S-VIDEO1_Y
SDA1_5V
S-VIDEO1_C
SCL1_5V
AV1_V_Y
AV1_R_C
AV2_V_Y
AV2_R_C

IC0200 TEA6425D

96H

+5V_R

AV2_CVBS_OUT

+5V_R

AV1_CVBS_OUT
(TV OUT)

+8V_R

SDA1_5V
VIDEO1
SCL1_5V
AV3_V_Y
DTV_CVBS
TV_SUB
TV_MAIN

IC0202 TEA6425D

90H

MAIN_Y_CVBS
MAIN_C
SUB_Y_CVBS
SUB_C
6425_MONITOROUT

DELETE OPTION

+5V_R

DELETE OPTION

AV3_CVBS_OUT

+8V_R

SDA1_5V
SCL1_5V
VIDEO2
S_VIDEO2_Y
S_VIDEO2_C

IC0203 TEA6425D

92H

SIDE AV_OPTION (ADD)

R8

DTV_Pr_R
DTV_Y_G
DTV_Pb_B

R7

COMP2_Pr
COMP2_Y
COMP2_Pb

COMP1_Pr
COMP1_Y
COMP1_Pb

R3

R6

AV1_R_C
AV1_G
AV1_B
AV3_R
AV3_G
AV3_B
AV1_BL_IN
AV3_BL_IN

R9

R1

IC0201 BA7657F

R5

R4

+5V_VCC

FT0200 SGM32F1E104-2A

COMP_Pr
COMP_Y
COMP_Pb

SCART_R
SCART_G
7657_SW
SCART_B
SCART_BL

R2

7657_SW : AV1
DTV _ _ : AV3

		COMP1	COMP2	DTV	Scart1	Scart2	BA7657	R1	R2	R3	R4	R5	R6	R7	R8	R9
Puccini	EUROPE	O	X	X	O	X	X	O	O	X	X	X	X	X	X	O
Puccini	ASIA	O	O	X	X	X	O	X	X	O	X	O	X	O	X	O
Verdi	ENGLAND	O	X	O	O	X	O	X	O	O	X	O	X	X	O	X
Bach	EUROPE	O	X	X	O	O	O	O	X	X	O	X	O	O	X	O

Power
Signal

IC0300
SAA7119E-V2

DELETE OPTION

DELETE OPTION

DELETE OPTION
In Case : 32Mhz Crystal

SDA1
SCL1

7119_MONITOROUT
7119_CLK

DIN[0:7]
7119_DVS
7119_DHS

+3.3V_VD

+3.3V_VA

+1.8V_D
+1.8V_A

Component_Y
(For Comp Sync Process)

Scart1 CVBS
(For Scart RGB Sync Process)

(Y or CVBS)

NOT USED

S-VIDEO2_Y
SUB_Y_CVBS
SCART_G
S-VIDEO2_C
DTV_Y_G
SUB_C
SCART_B
SCART_BL
DTV_Pb_B
SCART_R
TV_SUB
DTV_Pr_R

AUDIO_RESET
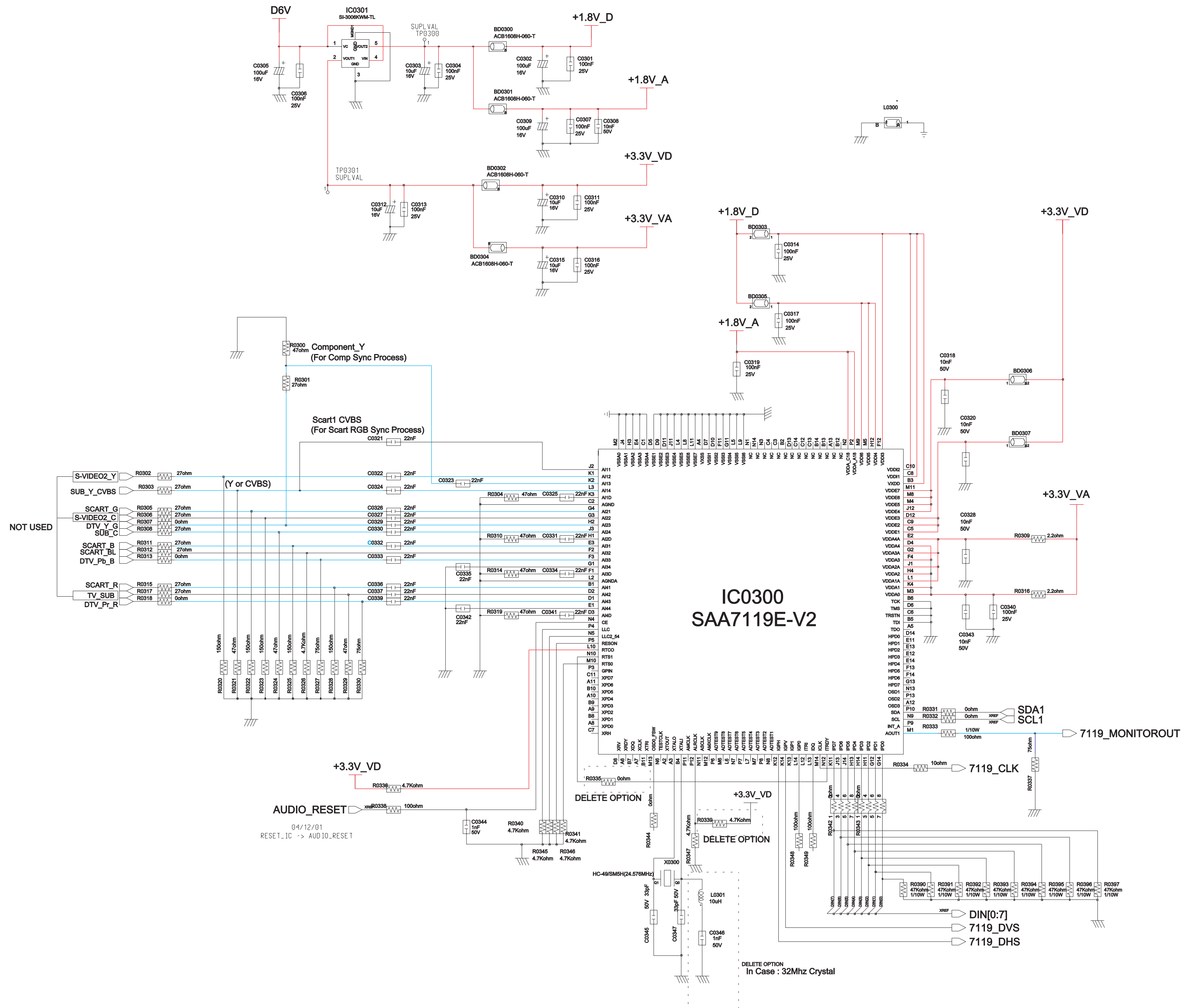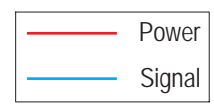
10-1-4 HDMI_PC IN

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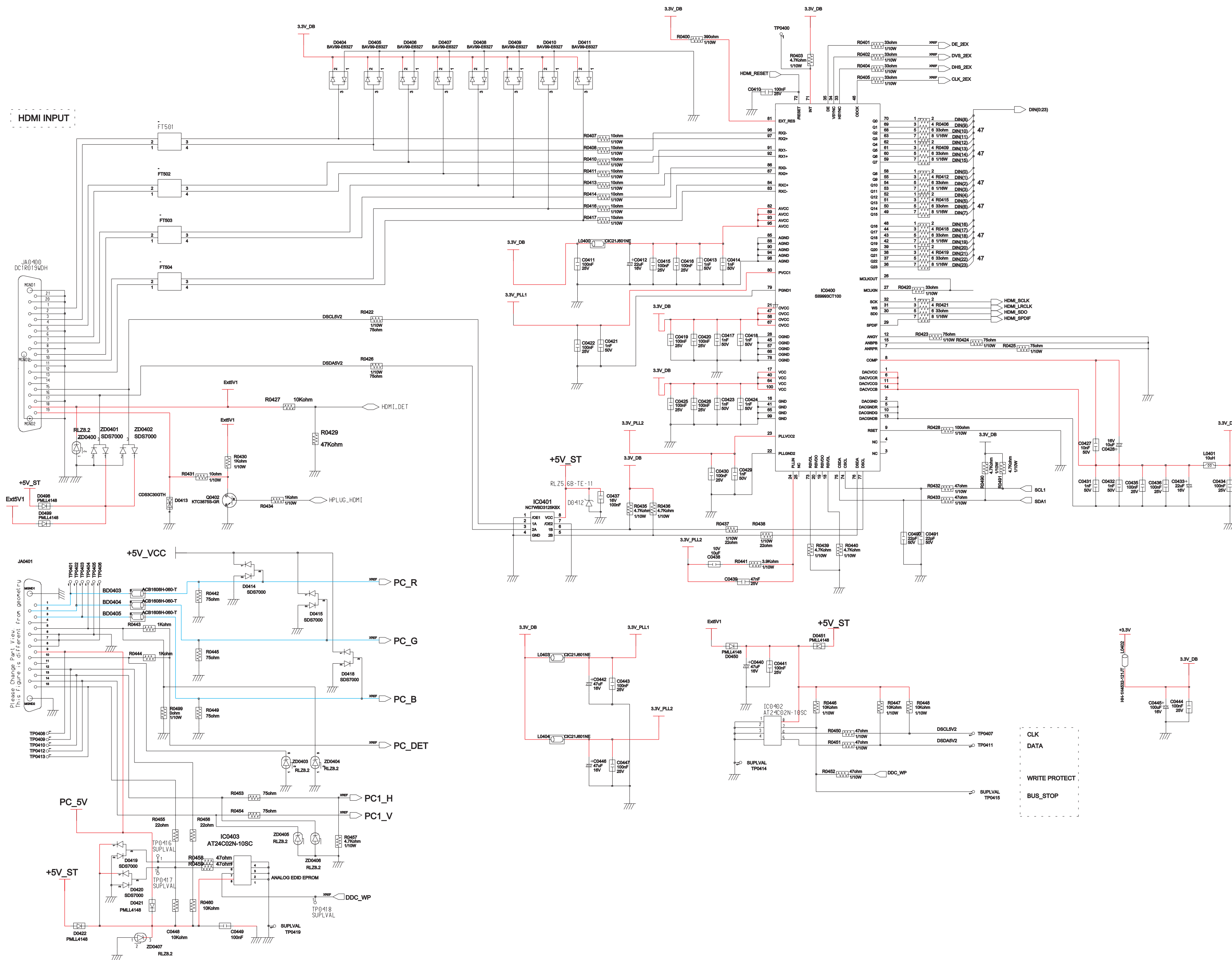
HDMI INPUT

10-1-5 SVP EX

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Power
Signal
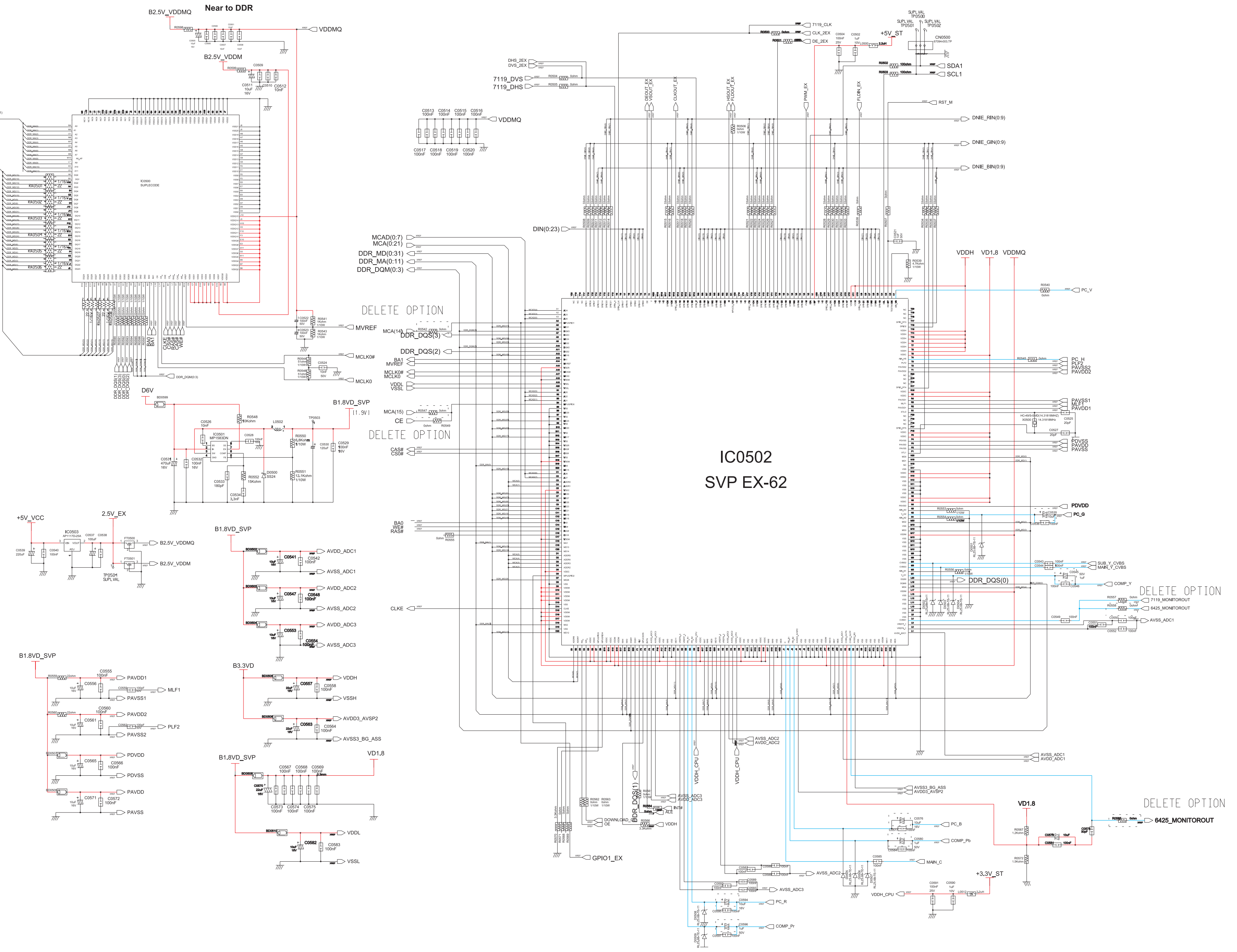
IC0502

SVP EX-62
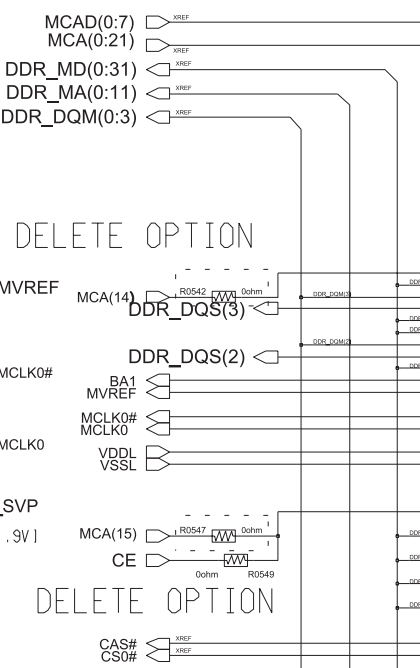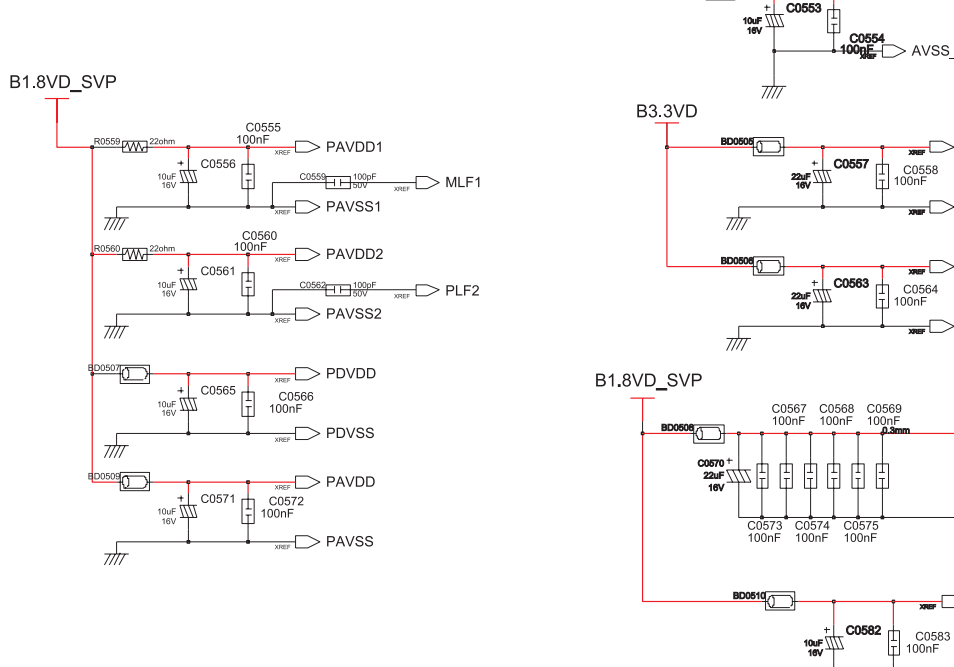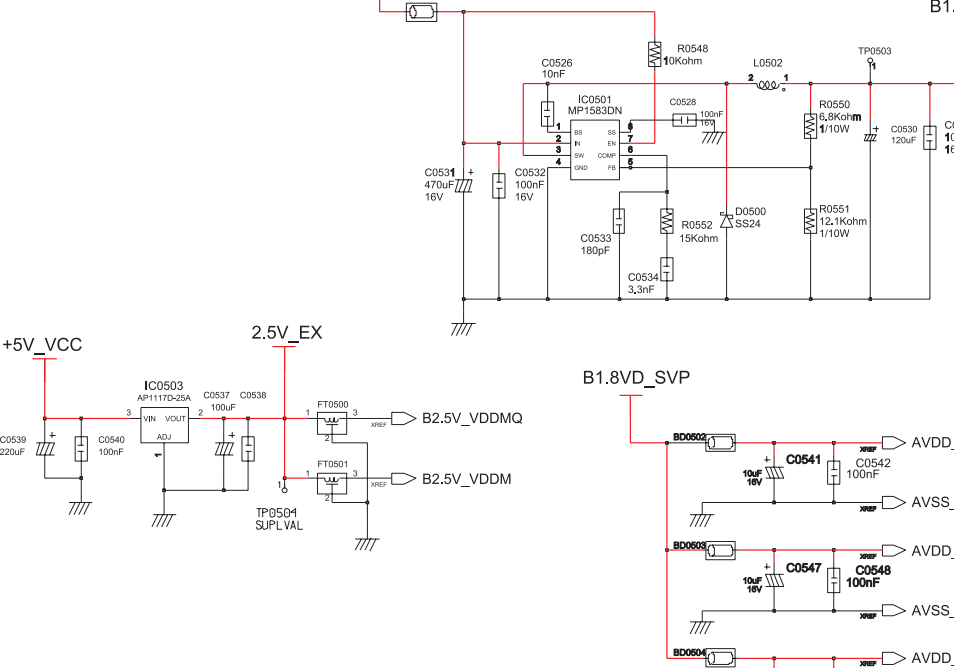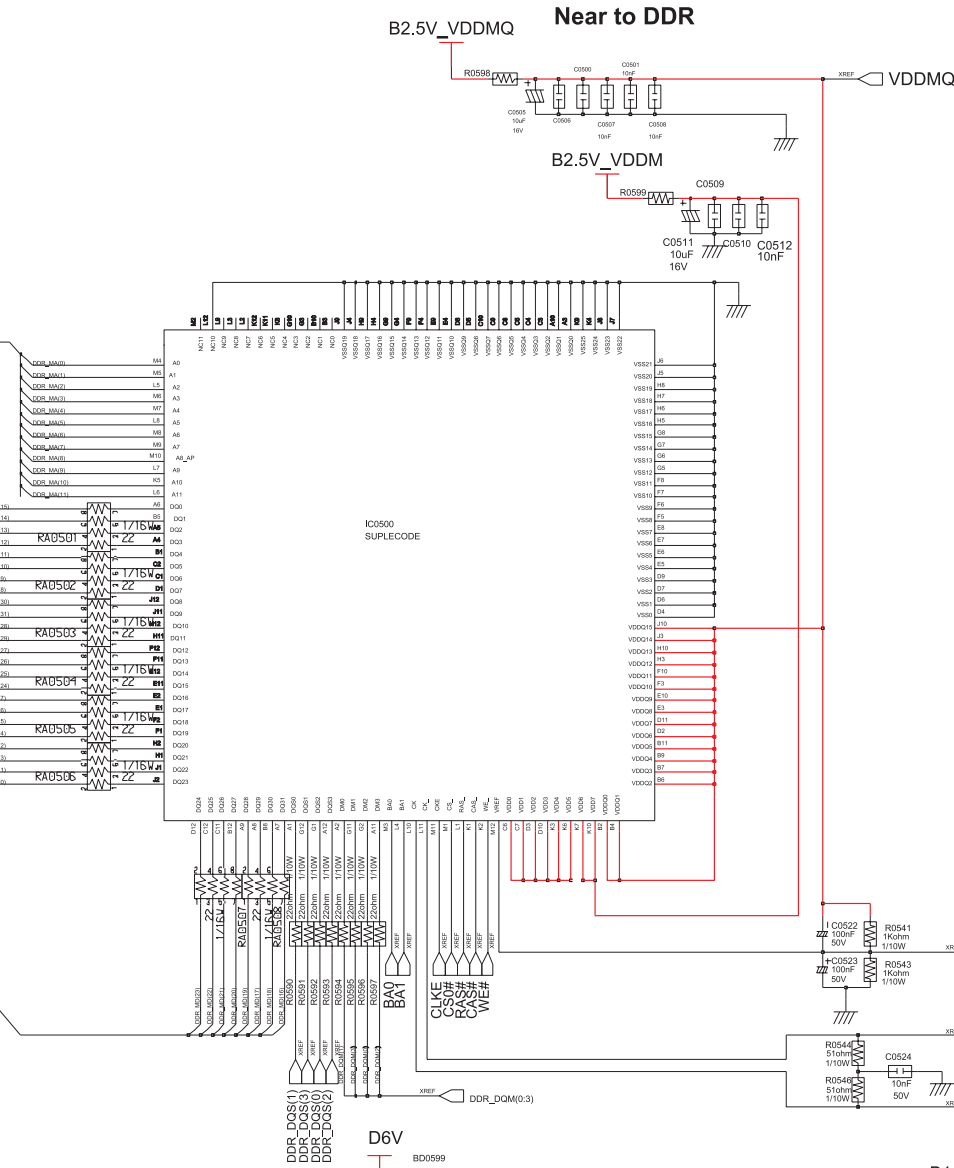
Schematic Diagram

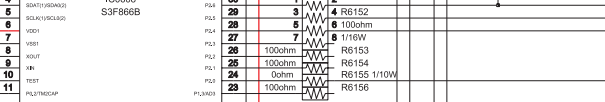## 10-1-6 MICOM

This Document can not be used without Samsung's authorization.
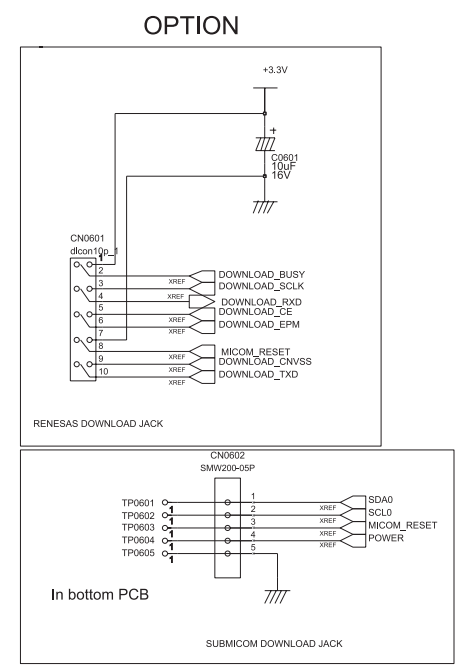
Power
Signal

OPTION

OPTION JUMPER
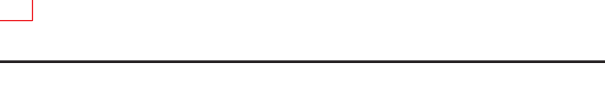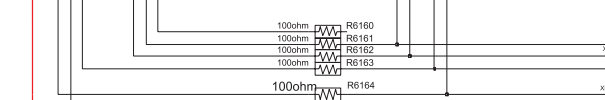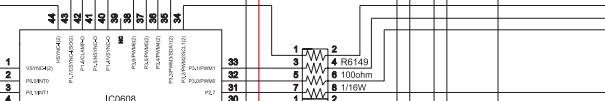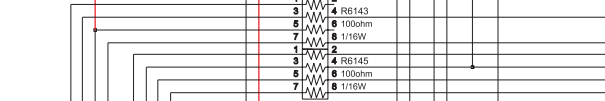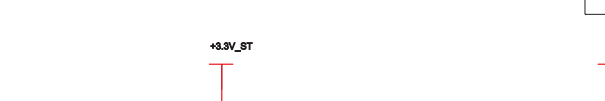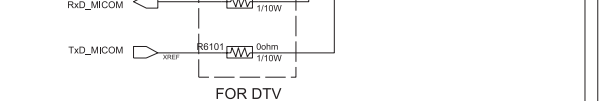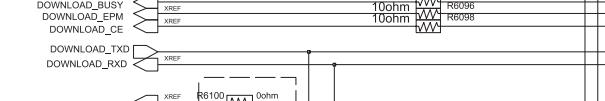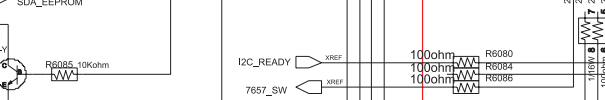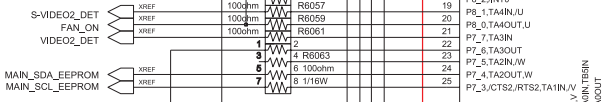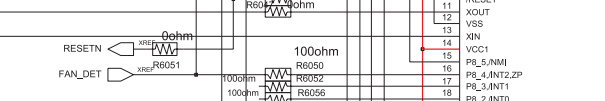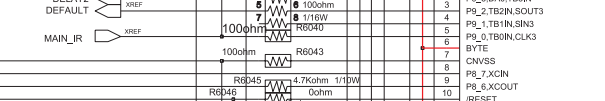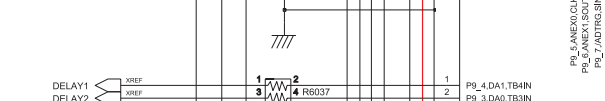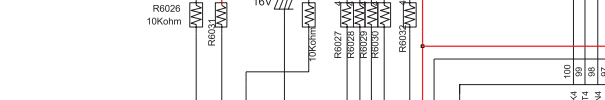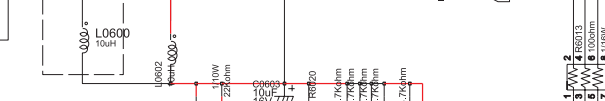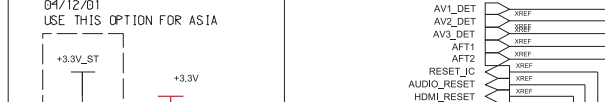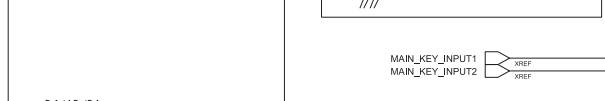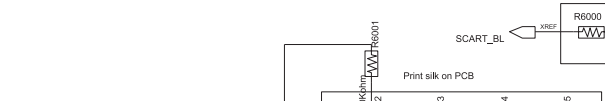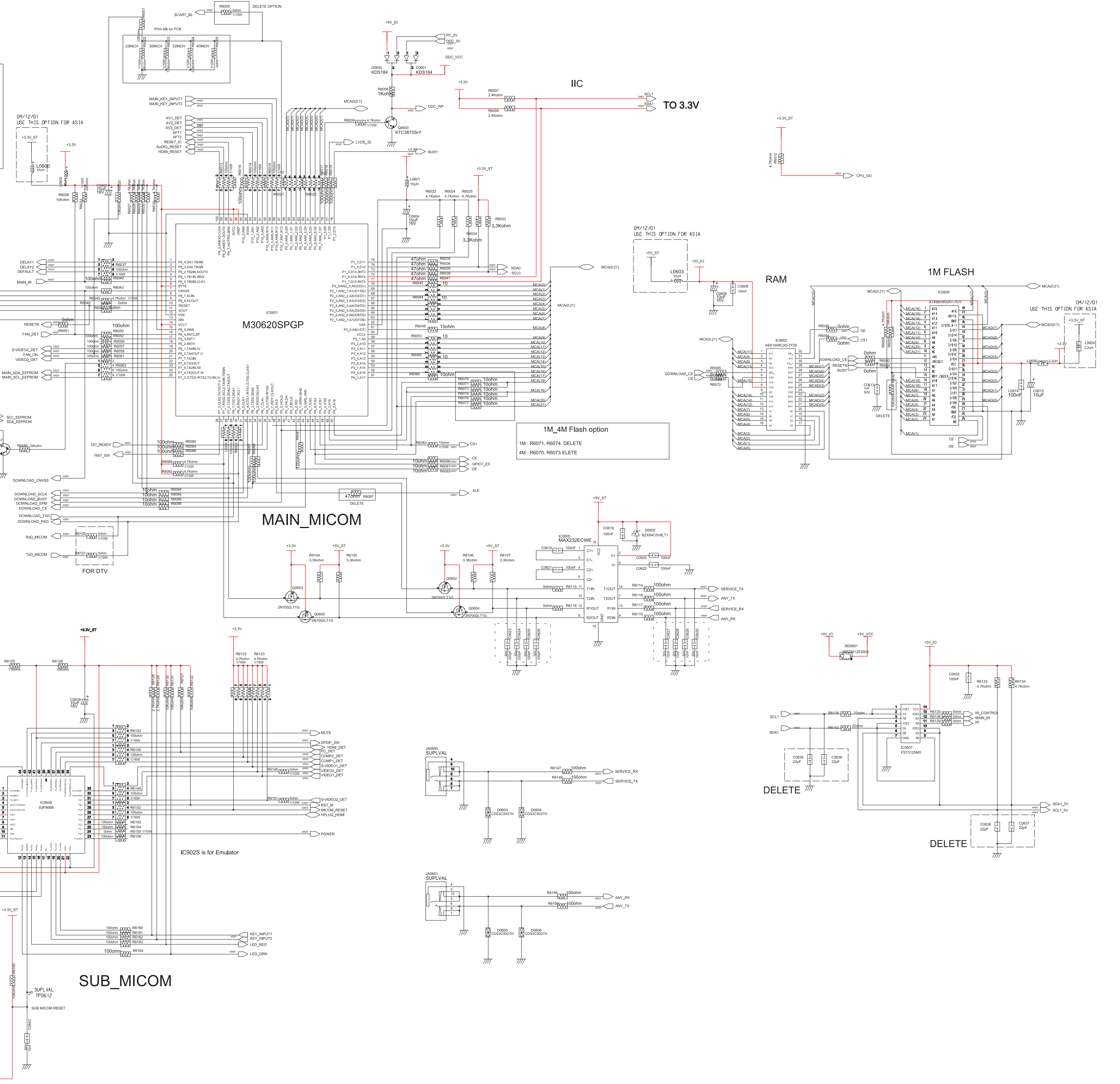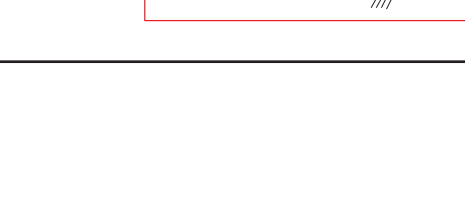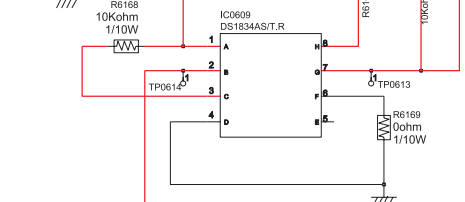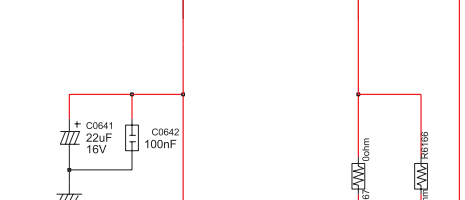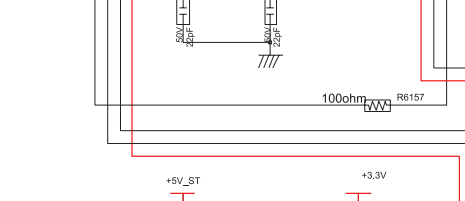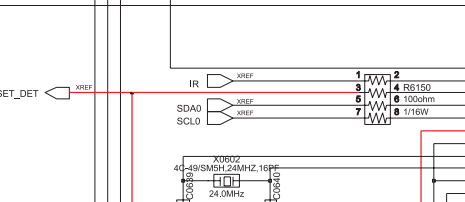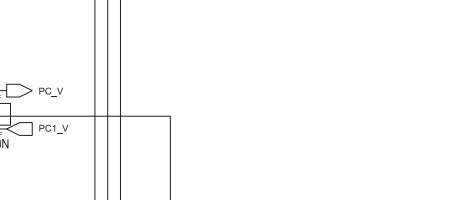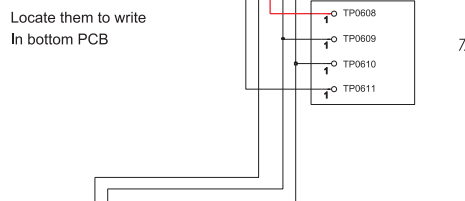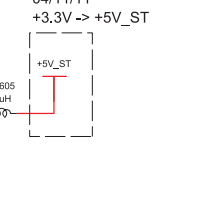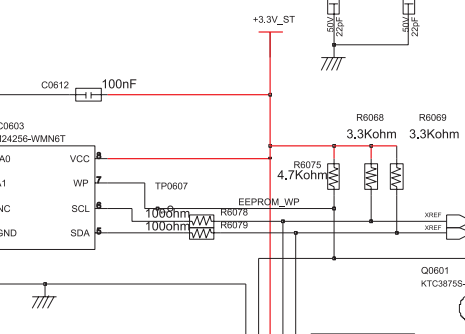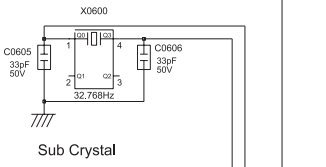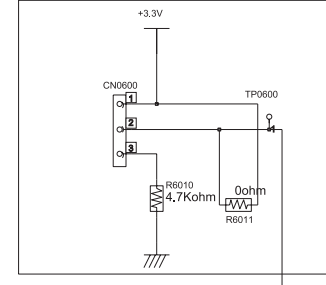
MAIN_MICOM

M30620SPGP

IIC

TO 3.3V

RAM

1M FLASH

SUB_MICOM

FOR DTV

1M_4M Flash option

1M : R6071, R6074 DELETE
4M : R6070, R6073 ELETE

IC902S is for Emulator

10-1-7 DNIe Lite

Schematic Diagram
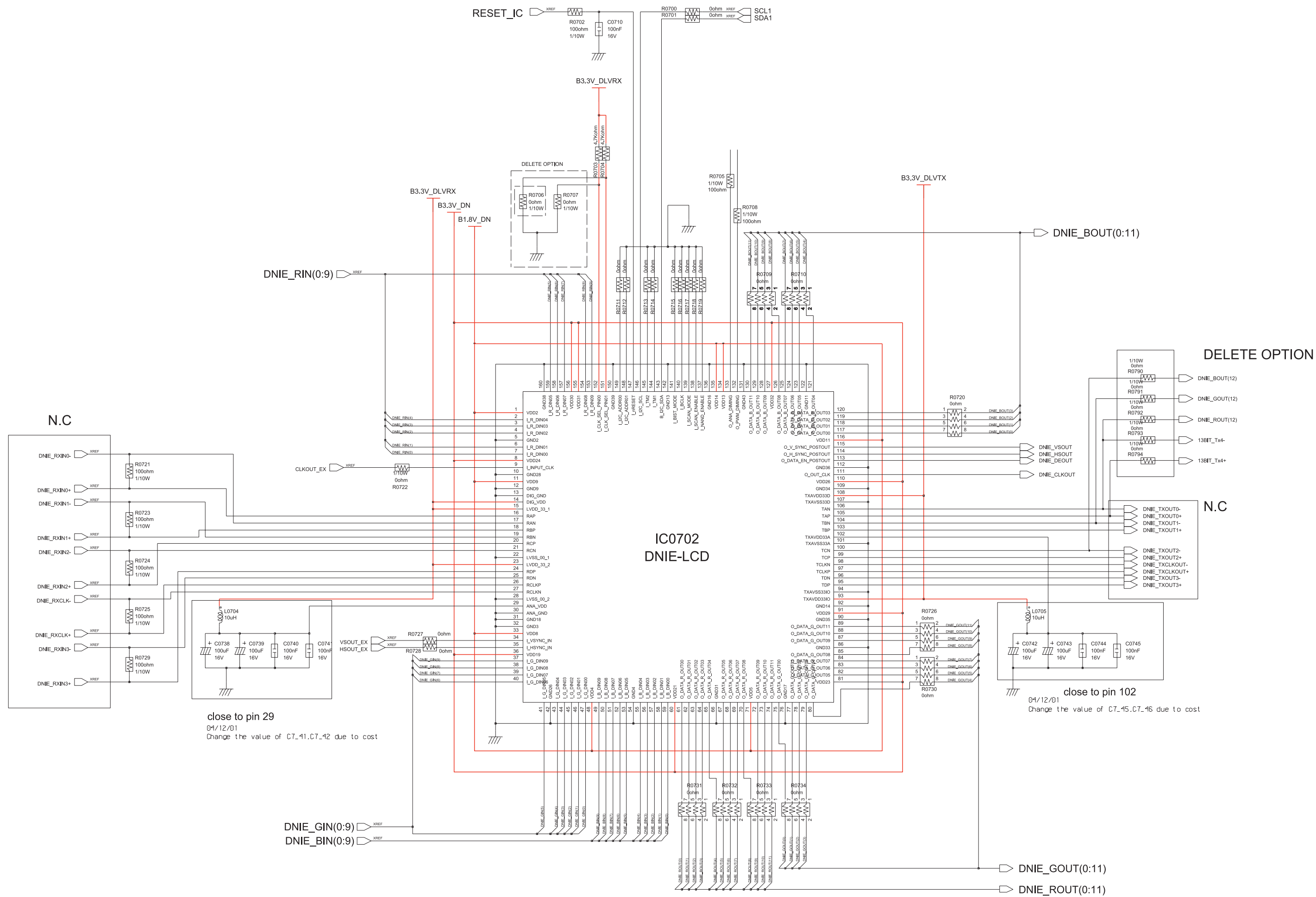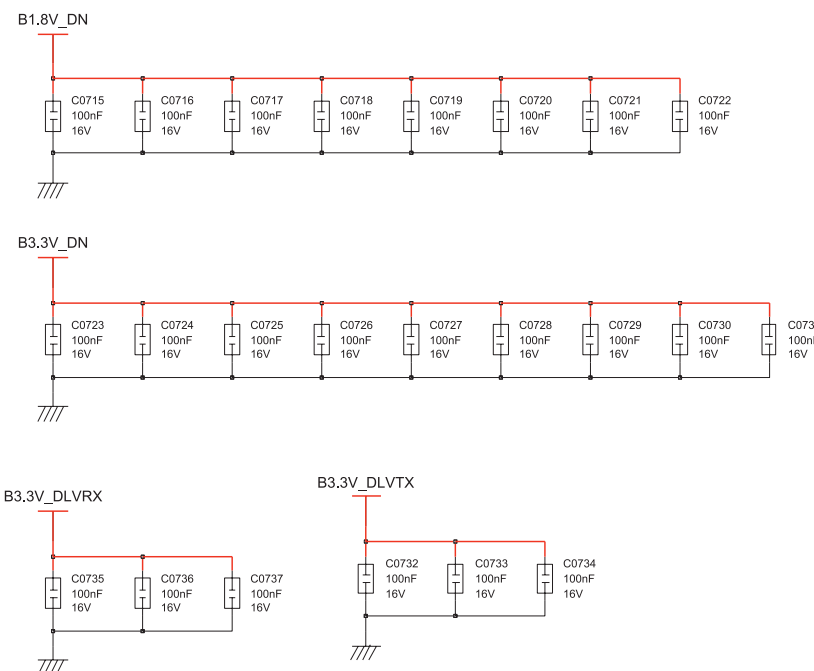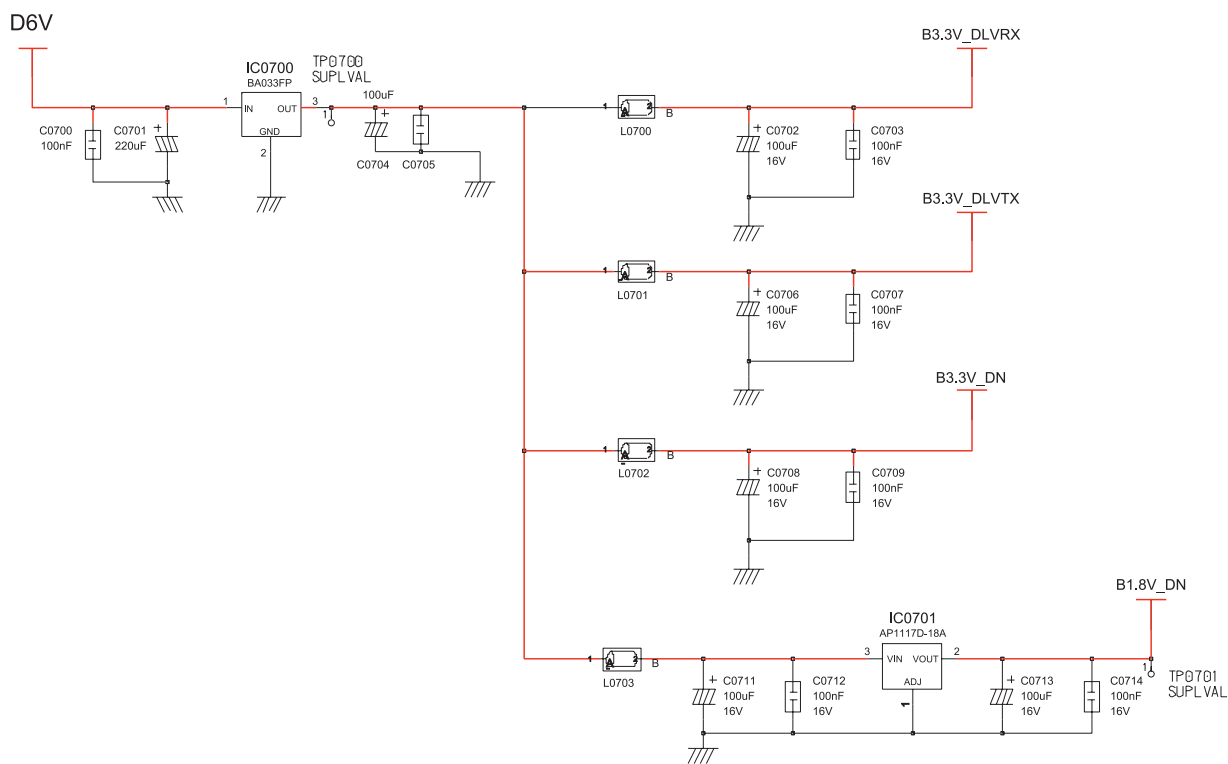
10-1-8 JACK IN/OUT

This Document can not be used without Samsung's authorization.

— Power
— Signal

COMP1_SOUND

COMP1_SL
COMP1_SR

PC_SOUND

(PHONE JACK)

PC_SL
PC_SR

COMP2_SOUND

COMP2_SL
COMP2_SR

MONITOR_OUT

+5V_R

6425_MONITOROUT

COMP1_INPUT

COMP1_Y
COMP1_DET
COMP1_Pb
COMP1_Pr

+5V_R

L_MONITOR_OUT

HDMI_SOUND

HDMI_SL
HDMI_SR

+5V_R

R_MONITOR_OUT

COMP2_INPUT

COAXIAL
COMP2_Y
COMP2_DET
COMP2_Pb
COMP2_Pr

S-VIDEO1_INPUT

S-VIDEO1_DET
S-VIDEO1_Y
S-VIDEO1_C

VIDEO1_INPUT

VIDEO2_INPUT

SIDE AV JACK

VIDEO2
VIDEO2_DET
S-VIDEO2_DET
VIDEO2_SL
VIDEO2_SR
S-VIDEO2_Y
S-VIDEO2_C

VIDEO1
VIDEO1_DET
VIDEO1_SL
VIDEO1_SR

10-1-9 CONTROL_POWER CONNECTOR

This Document can not be used without Samsung's authorization.

Power
Signal
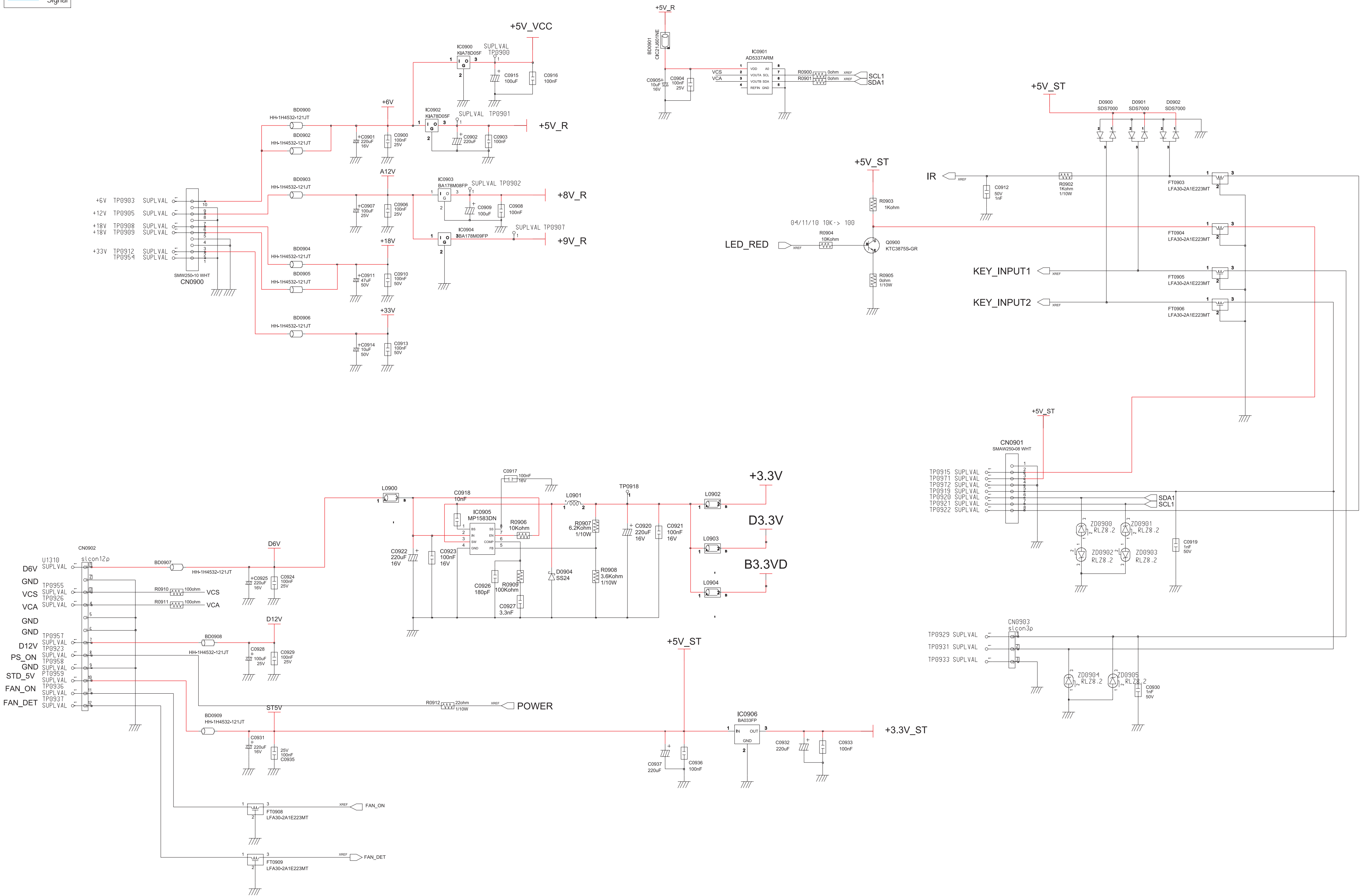
10-1-10 AUDIO PART

This Document can not be used without Samsung's authorization.

Power
Signal

ADR_SEL
LOW : B0/B1
HIGH : B4/B5
OPEN : B8/B9

NTSC : 1204-002179
PAL : 1204-002180

IC1000
TEA6422D

IC1002
TEA6422D

IC1001
MSP4410G_QA_C12_500
W:80H / R:81H

NSP6241
IC1004
NSP6241

IC1304
ADDING BOTTOM GND PAD SURFACE

IC1003
SUPLECODE
TAS5112ECA

SEPERATE GND

si_power save

10-1-11 LVDS

LED_CONTROL (DELETE OPTION)

+5V_ST

Power
Signal

R1100
1Kohm

BL-B5141
D1100

Q1100
KSC1623-G

R1101
100ohm   XREF   LED_CONTROL

DEOUT_EX XREF 0ohm R1109
VSOUT_EX XREF 0ohm R1106
HSOUT_EX XREF 0ohm R1107

DNIE_RIN(0:9) XREF
DNIE_GIN(0:9) XREF
DNIE_BIN(0:9) XREF

+3.3V

C1160 10uF   C1159 100nF
FT1103 SGM32F1E104-2A

+3.3V CLKOUT_EX XREF R1120 47ohm

BD1100 ACB1608H-060-T

C1164 10uF   C1165 100nF

BD1101 ACB1608H-060-T

C1168 10uF   C1169 100nF

IC1102
THC63LVD103

R1118 0ohm   C1161 100nF
R1119 2K

R1122 4.7Kohm 1/10W

Tx_4+ Tx_4- Tx_3+ Tx_3- Tx_CLK+ Tx_CLK- Tx_2+ Tx_2-
Tx_1+ Tx_1- Tx_0+ Tx_0-

+3.3V
SGM32F1E104-2A C1150 100uF C1151 100nF

DNIE_ROUT(0:11) XREF
DNIE_GOUT(0:11) XREF
DNIE_BOUT(0:11) XREF

IC1100
DTC34LM85A

12BIT_Tx_0-
12BIT_Tx_0+
12BIT_Tx_1-
12BIT_Tx_1+

12BIT_Tx_2-
12BIT_Tx_2+
12BIT_Tx_CLK-
12BIT_Tx_CLK+
12BIT_Tx_3-
12BIT_Tx_3+

R1111 4.7Kohm 1/10W

DNIE_HSOUT XREF R1113 22ohm
DNIE_VSOUT XREF R1114 22ohm

R1112 0ohm 1/10W XREF LVDS_32

DNIE_DEOUT XREF R1115 22ohm
DNIE_CLKOUT XREF R1116 47ohm

C1155 15pF 50V C1156 15pF 50V C1157 15pF 50V

FROM SVP EX62 (10BIT)

slcon33p

Tx_0-
Tx_0+
Tx_1-
Tx_1+

Tx_2-
Tx_2+
Tx_CLK-
Tx_CLK+
Tx_3-
Tx_3+
Tx_4-

Tx_4+   R1102 0ohm
        R1103 0ohm
        R1104 0ohm
        R1105 0ohm

SCL1 R1108 100ohm XREF
SDA1 R1110 100ohm XREF

C1152 22pF   C1153 22pF

SUPLVAL TP1100
SUPLVAL TP1101
SUPLVAL TP1102
SUPLVAL TP1103
SUPLVAL TP1104
SUPLVAL TP1105
SUPLVAL TP1106
SUPLVAL TP1107
SUPLVAL TP1108
SUPLVAL TP1109
SUPLVAL TP1110
SUPLVAL TP1111
SUPLVAL TP1162
SUPLVAL TP1163
SUPLVAL TP1164
SUPLVAL TP1165
SUPLVAL TP1112
SUPLVAL TP1113
SUPLVAL TP1168
SUPLVAL TP1169

C1154

FROM DNIe Lite (12BIT)

slcon33p
C1158

+3.3V
FT1102 SGM32F1E104-2A C1162 100uF C1163 100nF

DNIE_ROUT(12)

DNIE_GOUT(12) XREF
DNIE_ROUT(0:11) XREF
DNIE_BOUT(12) XREF
DNIE_GOUT(0:11) XREF
DNIE_BOUT(0:11) XREF

IC1101
DTC34LM85A

TXOUT3B- XREF
TXOUT3B+ XREF

DNIE_BOUT(0:11) XREF
DNIE_GOUT(0:11) XREF
DNIE_ROUT(0:11) XREF

12BIT_Tx_0b-
12BIT_Tx_0b+
12BIT_Tx_1b-
12BIT_Tx_1b+

12BIT_Tx_CLKb-
12BIT_Tx_CLKb+

DELETE OPTION

R1127 4.7Kohm 1/10W

DNIE_HSOUT XREF R1125 22ohm
DNIE_VSOUT XREF R1126 22ohm
DNIE_DEOUT XREF R1128 22ohm

R1129 0ohm 1/10W XREF LVDS_32

FT3003 ACM2012-900-2P-T

TXOUT3B-
TXOUT3B+

DELETE OPTION

DNIE_CLKOUT XREF R1130 47ohm

C1170 15pF 50V C1171 15pF 50V C1172 15pF 50V

12BIT_Tx_0- XREF
12BIT_Tx_0+ XREF

12BIT_Tx_1- XREF
12BIT_Tx_1+ XREF
12BIT_Tx_1b- XREF
12BIT_Tx_1b+ XREF
12BIT_Tx_2- XREF
12BIT_Tx_2+ XREF

12BIT_Tx_CLK- XREF
12BIT_Tx_CLK+ XREF
12BIT_Tx_CLKb- XREF
12BIT_Tx_CLKb+ XREF
12BIT_Tx_3- XREF
12BIT_Tx_3+ XREF

R1190 0ohm 1/10W R1191 1/10W

I2C_READY XREF R1121 100ohm
12BIT_Tx_0b- XREF
12BIT_Tx_0b+ XREF

LED_CONTROL

SCL1 R1123 100ohm
SDA1 R1124 100ohm XREF

C1166 22pF   C1167 22pF

SUPLVAL TP1114
SUPLVAL TP1115
SUPLVAL TP1116
SUPLVAL TP1117
SUPLVAL TP1118
SUPLVAL TP1119
SUPLVAL TP1120
SUPLVAL TP1121
SUPLVAL TP1176
SUPLVAL TP1177
SUPLVAL TP1122
SUPLVAL TP1123
SUPLVAL TP1124
SUPLVAL TP1125
SUPLVAL TP1126
SUPLVAL TP1127
SUPLVAL TP1128
SUPLVAL TP1129
SUPLVAL TP1130
SUPLVAL TP1131
SUPLVAL TP1132
SUPLVAL TP1133
SUPLVAL TP1181
SUPLVAL TP1182

10-1-12 SOUND DELAY

This Document can not be used without Samsung's authorization.

Power
Signal

10-1-13 TUNER_DTV_POWER
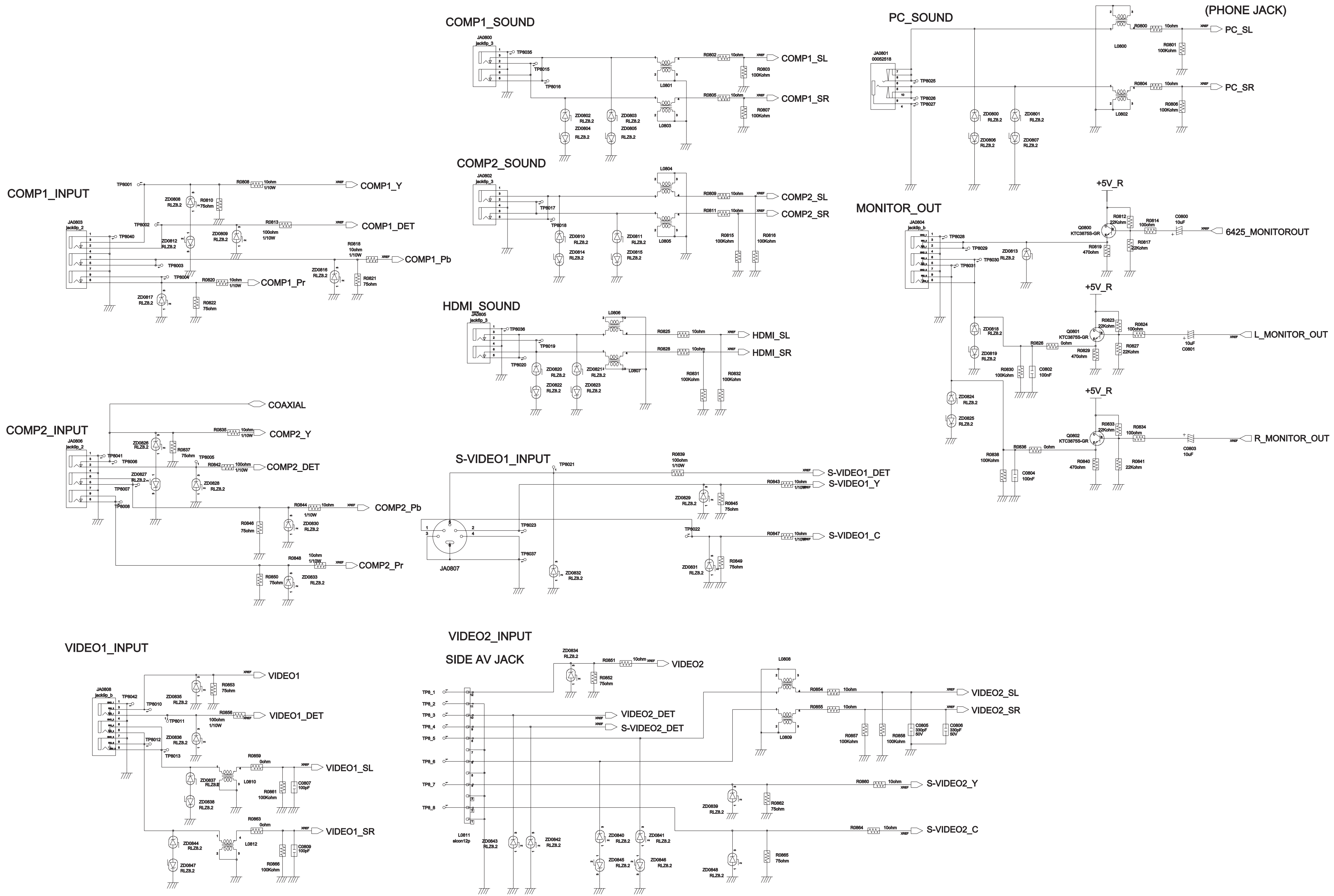
This Document can not be used without Samsung's authorization.

Power
Signal

DTV MODULE CONNECTION

DIGITAL TUNER

Main

Slave

B5V

B3.3VD

BD1300

CN1300
PCN10EA-32S-2.54DS

CN1301
PCN10EA-32S-2.54DS

BD1301
MPZ2012S300A

TU1
TDTC8250DH01E

D3.3V

R1306
R1307

R1300
R1301
R1302   CH_START
R1303   CH_VALID
R1304   DTR
R1305   CH_CLK

R1310
R1312
R1314   DTV_Y_G

R1308   DSR
R1309   CH_DATA(0)
R1311   RST
R1313   CH_DATA(1)
R1315   TXD
R1316   CH_DATA(2)
R1318   RXD

R1317
R1319
R1321   DTV_Pb_B
R1323   TV_SUB
R1325   DTV_Pr_R
         DTV_CVBS

R1320   CH_DATA(3)
R1322   RTS
R1324   CH_DATA(4)
R1326   CTS
R1327   CH_DATA(5)
R1329   DCD

R1328   DTV_LtO
R1330   DTV_RtO

R1331   CH_DATA(6)
R1332   RI
R1334   CH_DATA(7)

R1333
R1335
R1336   TxD_MICOM
R1337   DTV_SPDIF
R1339   RxD_MICOM

R1338
R1340   CH_SCL
R1342   CH_ERROR
R1344   CH_SDA
         CH_RST

R1341
R1343
R1345
R1348

VT
RF5V
+3.3V

BD1302

C1307
100uF

C1306
100nF

D_TUNER

BD1303

C1308
100uF

C1309
100nF

CH_RST

B3.3VD   R1346   10Kohm   R1347   100ohm

C1302   C1303   C1304   C1305
100nF   100nF   100nF   100nF

CH_SCL
CH_SDA

25 /3OE   /4OE 24
26 4A4   4Y4   23   CH_DATA(7)
27 4A3   4Y3   22   CH_DATA(6)
28 GND   GND   21
29 4A2   4Y2   20   CH_DATA(5)
30 4A1   4Y1   19   CH_DATA(4)
31 VCC   VCC   18
32 3A4   3Y4   17   CH_DATA(3)
33 3A3   3Y3   16   CH_DATA(2)
34 GND   GND   15
35 3A2   3Y2   14   CH_DATA(1)
36 3A1   3Y1   13   CH_DATA(0)
37 2A4   2Y4   12
38 GND   GND   11
39 2A3   2Y3   10
40 2A2   2Y2   9
41 2A1   2Y1   8
42 VCC   VCC   7
43 1A4   1Y4   6   CH_CLK
44 1A3   1Y3   5   CH_VALID
45 GND   GND   4
46 1A2   1Y2   3   CH_START
47 1A1   1Y1   2   CH_ERROR
48 /2OE   /1OE 1

74LCX16244AFT(EL)
IC1303

CH_DATA(0:7)

XREF

OPTICAL SPDIF OUT

SEL_I2S	HIGH	LOW
OUTPUT	EAGLE	HDMI

+5V_VCC

RS_232 JACK

LAN JACK

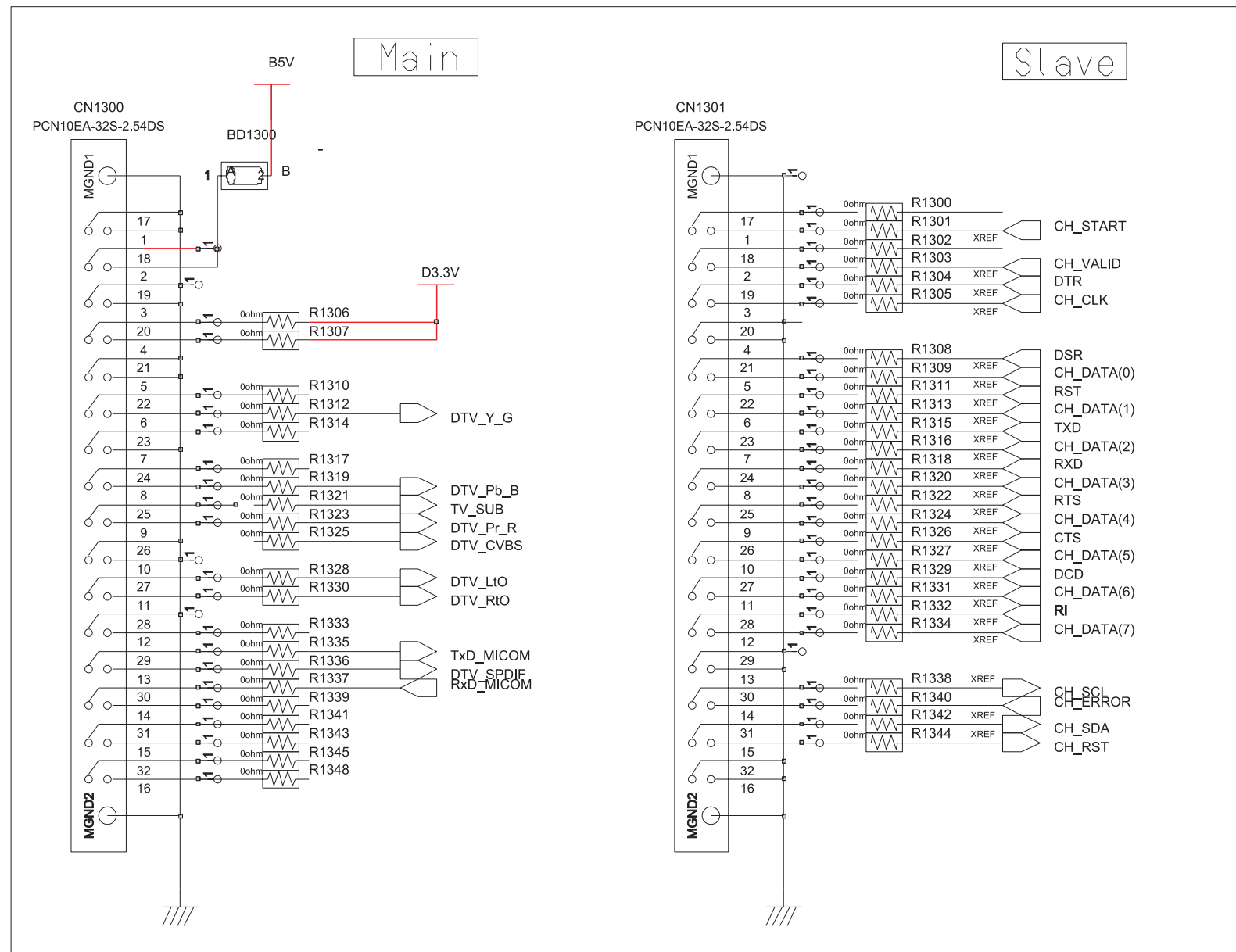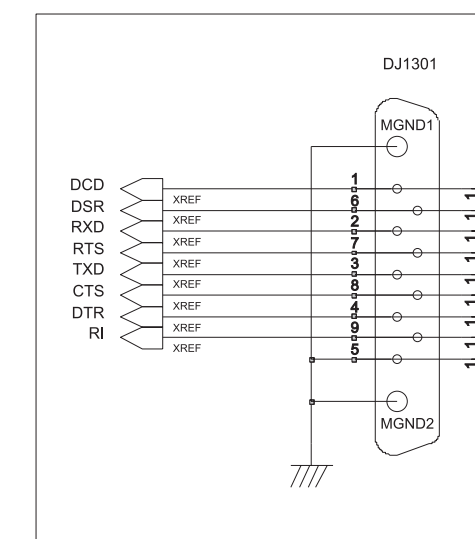DJ1301

MGND1

CN1302
DEK623PCB-T

CN1303
SMW250-02

OP13_01
CT5000-2870

+5V_VCC

DTV_SPDIF
HDMI_SPDIF
SPDIF_SW

BD1304

IC3007
DM74LS157M

C1313
100nF

C1312
10uF
16V

TP3025
TP3026
TP3027

FT3002
SGM32F1E104-2A

C1315
100nF

C1314
10uF
16V

AGND_IN

BD1305

AGND_IN

+5V_VCC

DCD
DSR
RXD
RTS
TXD
CTS
DTR
RI

TP3000
TP3001
TP3002
TP3003
TP3004
TP3005
TP3006
TP3007
TP3008

MGND2

GND_POWER
TX_2
RX_1   RX_1
TX_1   TX_1
RX_2
GND_POWER

SPDIF_COAX_OUT

10uH
L3006

Q3003
KSC1623-G

C1318
100nF

C1322   100nF

Q3004
2SA1611-M6-T1

R1351
100ohm

R1352
75ohm

L3007

COAXIAL

CN1304
UJK-SW-16D

R1399
1/10W
0ohm

D3017
CDS3C30GTH

DELETE OPTION (VERDI OPTION)

D12V

C1316
100nF
16V

BD1307

TP1322

B5V

BD1306

C1317
10nF

IC1302
MP1410ES

R1349
10Kohm

R1350
11.5Kohm
1/10W

C1324
220uF
16V

C1323
100nF
25V

2A Current

R1354
100Kohm

D1301
SS24

R1353
3.6Kohm
1/10W

OS_CON

C1320
220uF
16V

C1321
100nF
25V

C1325
180pF

C1326
3.3nF

04/12/01
C1317 value change : due to cost

10-2 Function

10-3 Power / IR

This Document can not be used without Samsung's authorization.

11. Operation Instruction & Installation

11-1 Product Features and Functions

11-1-1 Front Panel

Speaker
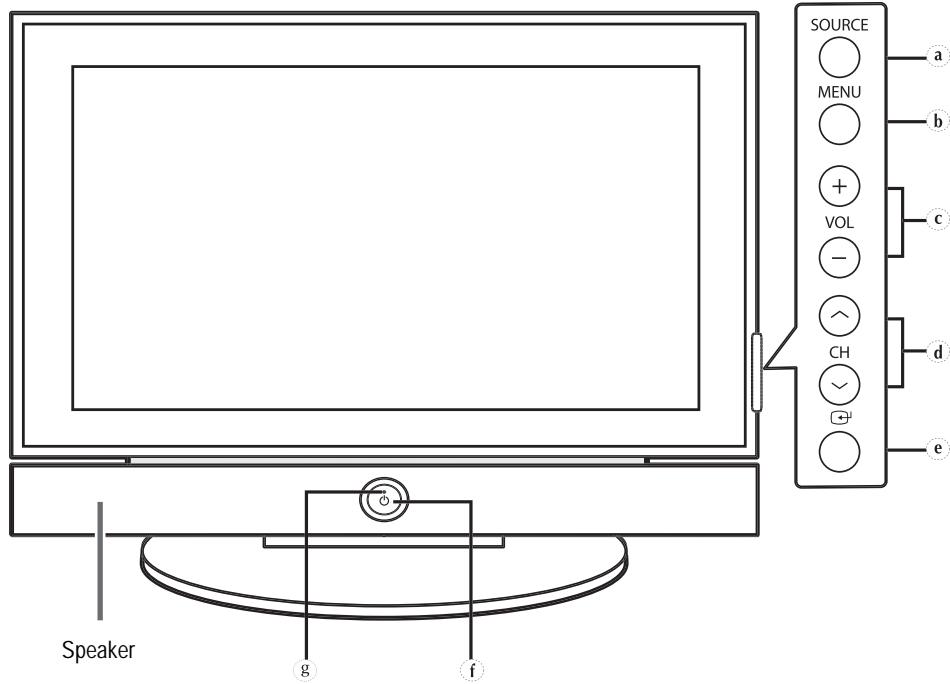
a) SOURCE button
   Select the external input source.

b) MENU button
   Display the on-screen menu.

c) VOL + , – buttons
   Adjust the volume.

d) CH ⌃, ⌄ buttons
   Select channels.

e) (ENTER) button
   Confirm your choice (Store or Enter).

f) (POWER) button
   Press to turn the TV on and off.

   Power Indicator
   - Power Off: Blue
   - Power On: Off

g) Remote Control Sensor
   Aim the remote control towards this spot on the TV.

11-1-2 Rear Panel
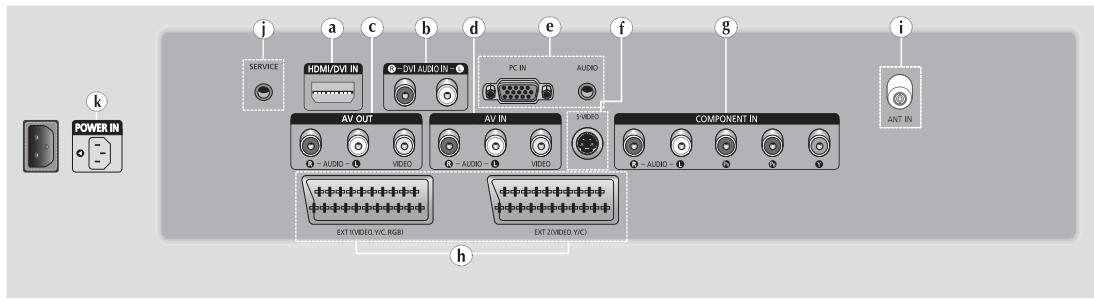
a) HDMI/DVI IN
Connect to the HDMI jack of a device with
HDMI output. These inputs can also be used
as a DVI connection with separate analog
audio inputs. An optional HDMI/DVI cable
will be necessary to make this connection.
When using the optional HDMI/DVI adapter,
the DVI analog audio inputs on your TV allow
you to receive left and right audio from your
DVI device. (Not compatible with PC)

b) DVI AUDIO IN L/R
DVI audio outputs for external devices.

c) AV OUT (VIDEO / AUDIO L/R)
Outputs for external devices.

d) AV IN (VIDEO / AUDIO L/R)
Video and audio inputs for external devices, such
as a camcorder or VCR.

e) PC IN / AUDIO
Connect to the video and audio output jack on
your PC.

f) S-VIDEO
Video input for external devices with an S-Video
output, such as a camcorder or VCR.

g) COMPONENT IN
Video (Y/P $_B$/P $_R$) and audio (AUDIO L/R) inputs for
Component.

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

i) ANT IN (75)
75 Coaxial connector for Aerial/Cable Network.

j) SERVICE
Connector for service only.

k) POWER IN
Connect the supplied power cord.

11-1-3 Remote Control

TURNS THE TV ON AND OFF

POWER

TV STB VCR CABLE DVD

PICTURE EFFECT SELECTION

MAKE THE REMOTE CONTROL WORK
FOR TV, STB, VCR, CABLE, OR DVD

S.MODE   P.MODE   MODE

SOUND EFFECT SELECTION/
TELETEXT CANCEL

1   2   3

DIRECT CHANNEL SELECTION

4   5   6

7   8   9

AUTOMATIC SWITCH-OFF/
TELETEXT PAGE HOLD

SLEEP

0

PRE-CH

SWITCH REPEATEDLY BETWEEN THE
LAST TWO CHANNELS DISPLAYED/
TELETEXT SUB-PAGE

P

VOLUME INCREASE

MUTE

SOURCE

NEXT CHANNEL/
TELETEXT NEXT PAGE

TEMPORARY SOUND SWITCH-OFF

EXTERNAL INPUT SELECTION/
TELETEXT MODE SELECTION
LIST/FASTEXT (UK)

VOLUME DECREASE

PREVIOUS CHANNEL/
TELETEXT PREVIOUS PAGE

TELETEXT DISPLAY/
MIX BOTH TELETEXT INFORMATION
AND THE NORMAL BROADCAST

TTX/MIX   INFO

INFORMATION DISPLAY/
TELETEXT REVEAL

MENU

EXIT/
TV

MENU DISPLAY/
TELETEXT INDEX

TV MODE SELECTION/
EXIT TELETEXT
(DEPENDING ON THE MODEL)

MOVE TO THE REQUIRED
MENU OPTION/
ADJUST AN OPTION VALUE
RESPECTIVELY

ENTER

CONFIRM YOUR CHOICE
(STORE OR ENTER)

PICTURE STILL

SOUND MODE SELECTION

FASTEXT TOPIC SELECTION

P.SIZE   STILL   DUAL I-II   SRS

PICTURE SIZE

TruSurround XT
MODE SELECTION

E.SAVING   PIP   POSITION

ADJUST SCREEN BRIGHTNESS
TO SURROUNDING
ENVIRONMENT

SOURCE   SWAP   SIZE   P

REW   STOP   PLAY/PAUSE   FF

REMOTE CONTROL SETUP

SET   RESET

IF YOUR REMOTE CONTROL IS NOT
FUNCTIONING PROPERLY, TAKE
OUT THE BATTERIES AND PRESS
THE RESET BUTTON FOR ABOUT
2~3 SECONDS. RE-INSERT THE
BATTERIES AND TRY USING THE
REMOTE CONTROL AGAIN.

PIP FUNCTIONS:
- PIP ACTIVATION OR DEACTIVATION
  (PIP)
- SWAPPING THE MAIN AND THE SUB
  PICTURE (SWAP)
- LOCATION SELECTION (POSITION)
- SOURCE SELECTION (SOURCE)
- SIZE SELECTION (SIZE)
- CHANNEL SELECTION (P ∧/∨)

VCR/DVD FUNCTIONS:
- REWIND (REW)
- STOP
- PLAY/PAUSE
- FAST FORWARD (FF)

■ Programming the Remote Control for Other Component
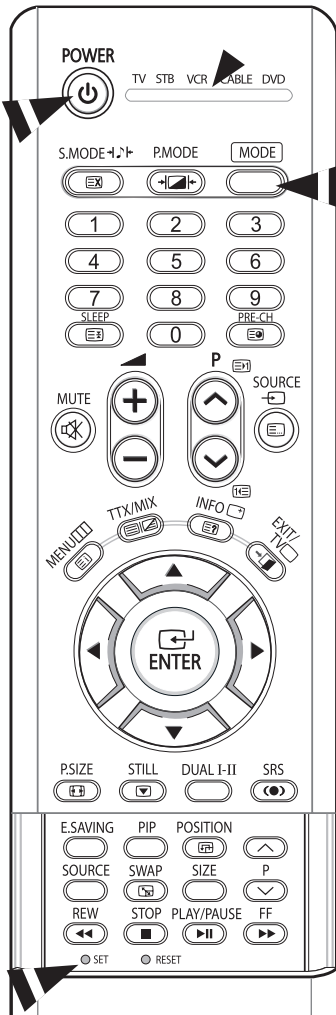
Your TV comes equipped with a universal remote control. In addition to controlling the TV, the universal remote control can also operate a VCR, Cable box, DVD, and Set-Top Box (even if your VCR, Cable box and DVD are made by manufacturers other than Samsung).

➢ The remote control might not be compatible with all VCRs, DVD players, Cable boxes, and Set-Top Boxs.

1 Turn off your VCR (Cable box or DVD).

2 Press the MODE button to switch the remote control to the VCR (CATV or DVD) mode.

➢ The remote control has five modes : TV, STB, VCR, CABLE and DVD.

3 Press the SET button.

4 Enter 3 digits of the VCR (Cable box or DVD) code listed on the next page for your VCR (Cable box or DVD).

Example: To enter code "6", press 0, 0, and 6.
To enter code "76", press 0, 7, and 6.

5 Press the POWER (⏻) button. Your VCR (Cable box or DVD) should turn on. If it turns on, your remote control is now set correctly.

➢ If it does not turn on, repeat the steps above, but try one of the other codes listed for your particular brand.

6 Once your remote control is set up, press the MODE button any time you want to use the remote control to operate the VCR (Cable box or DVD).

➢ ◆ When your remote control is in STB, VCR, CABLE or DVD mode, the volume buttons still control your television's volume.

◆ When your remote control is in TV mode, the VCR or DVD control buttons (rewind, stop, play/pause, and fast forword) still operate your VCR or DVD.

VCR Remote Control Codes

Admiral	015,088	Hitachi	014,024,044,045	Quasar	017,053
Aiwa	024	Instant Replay	017	Radio Shack	011,015,017,018,021,024, 028,036,052,062
Akai	026,031,032	JC Penny	011,014,016,017,023,025, 039,044,060,062	RCA	009,014,016,017,037,044, 046,063,078
Audio Dynamics	022,025	JCL	011,017,023,025,039,055		
Bell & Howell	011	Kenwood	011,023,025,039,055	Realistic	011,015,017,018,021,024, 028,036,052,062
Broksonic	019	KLH	082		
Candle	016,018,022,054,055,061	LG(Goldstar)	001,002,007,018,023,055, 069	Samsung	000,016,022, 031,041,051
Canon	017,062	Lloyd	024	Sansui	025
Citizen	016,018,022,054,055,061	Logik	040	Sanyo	011,021
Colortyme	023	LXI	024	Scott	022,050,058,077
Craig	016,021	Magnavox	017,038,062,065	Sears	011,014,018,021,027,028, 044,052,057
Curtis Mathes	009,016,017,023,024,055, 062,073,076	Marantz	011,017,023,025,038,039, 055,070	Sharp	015,036,048,054
Daewoo	003,004,005,006,007,008, 022,054,085	MTC	016,024	Shintom	026,035,040,064
DB	023,025	Multitech	016,024,040,041	Signature	024
Dimensia	009	NEC	011,023,025,039,055,070, 073	Sony	026,035,047
Dynatech	024			Sylvania	017,024,038,062,065
Electrohome	036	Optimus	015	Symphonic	024
Emerson	017,018,019,022,024,029, 032,036,043,050,051,056, 058,066,071,074,076,077, 079	Panasonic	017,062,084,086	Tandy	011,024
		Pentax	014,044	Tatung	039
		Pentex Research+	055	Teac	024,039,078
		Technics	017		
Fisher	011,021,027,028,052,057, 067	Philco	017,038,062,065	Teknika	017,018,024,030
		Philips	017,038	TMK	076
Funai	024	Pioneer	014,025,042,059	Toshiba	014,022,028,057,058
General Electric	009,016,017,041,062	Portland	053,054,061	Toshiko	018
Go Video	016	PROSCAN	009	Totevision	016,018
Harman Kardon	023	Quartz	011		

Cable Box (CATV) Remote Control Codes

Anvision	015,016	Magnavox	015,016,027,029,034,036, 037,040,041,048,049	Signature	054
Cable Star	015,016			Sprucer	035
DaeHan	005	Nawoo	001	Starcom	054
DeaRyung	003	NSC	017	Stargate2000	066
DongKuk	004	Oak	024,046	Sylvania	019,067
Eagle	015,016	Osk Sigma	024	TaePyungYang	002
Eastern International	020	Panasonic	011,035,047,069	Texscan	019,067
General Instrument	054	Philips	015,016,027,029,034,036, 037,040,041,048,049	Tocom	025,029,057,058,063
GI	012,013,023,031,032,033, 038,044,075,076,077			Unika	039,040,049
		Pioneer	026,028,052	Universal	059,060
Hamlin	011,012,020,021,042,056	Randtek	015,016	Viewstar	015,016,027,029,034,036, 037,040,041,048,049
Hitachi	045,051,054	RCA	008,035,074		
Jerrold	012,013,023,031,032,033, 038,044,054,070,073	Regal	011,020,021	Warner Amex	052
		Regency	010,041	Zenith	022,050,065,069
LG(Goldstar)	006	Saewoo	007		
Macom	045,051	Samsung	000,011,030,052,071,072		

DVD Remote Control Codes

Curtis Mathes	009	Philips	007	Sharp	005
JVC	003	PROSCAN	008	Sony	004
LG(Goldstar)	001	RCA	008	Toshiba	002
Panasonic	006	Samsung	000		

11-2 New Features

11-2-1 Power Saving Mode (Applies to the "Settings" of the User Menu)

1. Objectives
   - To enhance a sensible visual quality by maintaining an appropriate screen brightness according to the ambient brightness and to reduce power consumption.
   - To improve the power consumption efficiency when Power Saving Mode is selected.

2. Details
The CPU PW318 of the Video Board takes the current ambient brightness (in Lux units) stored in the Ambient Light Sensor of the Power Assy., which is attached at the front of the PDP, at given intervals through SMBUS communication (identical to I2C) and controls the PDP module to operate with the appropriate illuminance. The I2C bus is used to communicate with the PDP module, and the communication method is the same as the existing communication method.
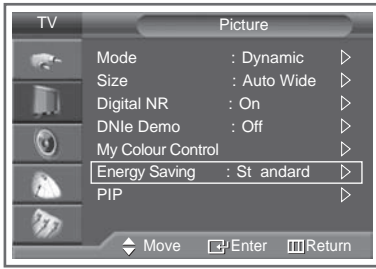   - Location of the Ambient Light Sensor

The sensor is attached to the Power Assy., which is on the front of the PDP. The location of the sensor on the Power Assy. is displayed in the figure below. External light reaches the sensor through the guide of the Power Assy.
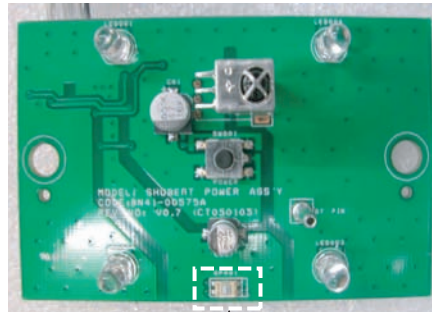
The Ambient Light Sensor IC
detects the amount of illumination.

The screen brightness is adjusted according to the brightness measured by the Ambient Light Sensor, using the Multi APC function (controls the number of sustain pulses according to the average signal levels) of the PDP panel, thus reducing power consumption.

TV	Picture	
Mode	: Dynamic	▷
Size	: Auto Wide	▷
Digital NR	: On	▷
DNIe Demo	: Off	▷
My Colour Control		▷
Energy Saving	: St andard	▷
PIP		▷

◆ Move ↵ Enter Return

TV	Picture	
Mode	: Dynamic	
Size	: Auto Wide	
Digital NR	: On	
DNIe Demo	: Off	
My Colour Control		Auto Saving
Energy Saving	:	Standard
PIP		Super Saving

◆ Move ↵ Enter Return

P.SIZE STILL DUAL I-II SRS
E.SAVING PIP POSITION
SOURCE SWAP SIZE P
REW STOP PLAY/PAUSE FF
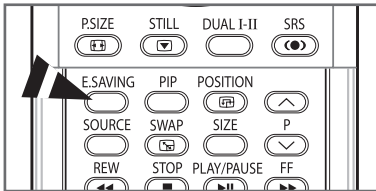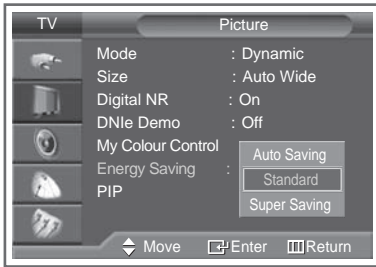
1 Press the MENU (☐☐☐) button.

Result: The main menu is displayed.

2 Press the … or † button to select Picture .

Result: The Picture menu is displayed.

3 Press the ENTER (↵) button.

4 Press the … or † button to select Energy Saving .
Press the ENTER (↵) button.

5 Select the required option by pressing the … or † button.

Result: The following options are available.

◆ Auto Saving: Automatically adjusts to the surrounding illumination.

◆ Standard: Operates in standard mode regardless of the surrounding illumination.

◆ Super Saving: Enters maximum power saving mode regardless of the surrounding illumination.

6 Press the ENTER (↵) button.

➤ This feature is not available when the input source is in PC or HDMI mode.

➤ You can select these options by simply pressing the E.SAVING button on the remote control.

11-2-2 PIP Settings (X - This PIP combination is not available, O - This PIP combination is available)

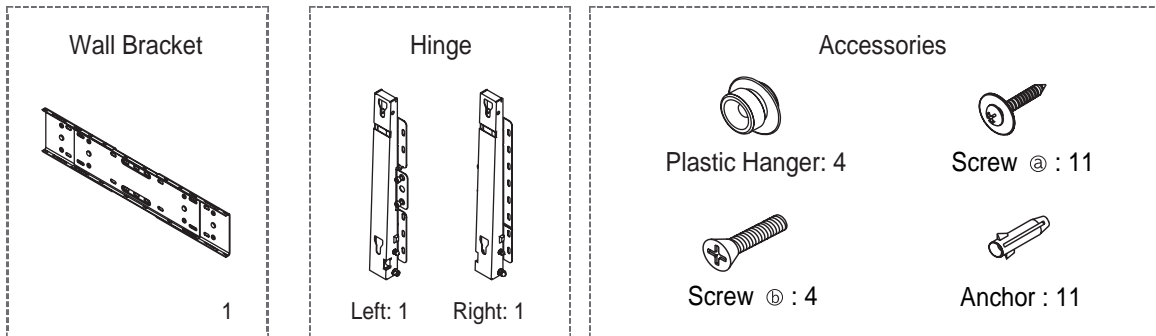| Sub \ Main	TV	Ext.1	Ext.2	AV	S-Video	Component	PC	HDMI
TV	X	O	O	O	O	O	O	O
Ext.1	O	X	O	O	O	O	O	O(RGB Excluded)
Ext.2	O	O	X	O	O	O	O	O
AV	O	O	O	X	O	O	O	O
S-Video	O	O	O	O	X	O	O	O
Component	X	X	X	X	X	X	X	X
PC	X	X	X	X	X	X	X	X
HDMI	X	X	X	X	X	X	X	X

11-3 Installation Notes and Precautions

11-3-1 Installation Notes

1. Contact a technician for installing the wall bracket.

2. Samsung Electronics is not responsible for any damage to the product or injury to yourself or others if you elect to perform the wall installation.

3. This product is for installing on cement walls. The product may not stay in place when installed on plaster or wood.

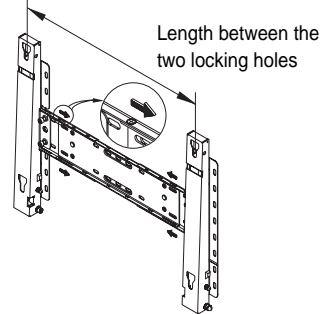### 11-3-2 Parts (Wall attachment panel is sold separately)

Wall Bracket	Hinge	Accessories	
		Plastic Hanger: 4	Screw ⓐ : 11
1	Left: 1 Right: 1	Screw ⓑ : 4	Anchor : 11

11-3-3 How to assemble the Wall Mount Bracket

1   Insert and tighten the Captive Screw in
    the direction of the arrow.
    When done, mount the wall bracket on
    the wall.
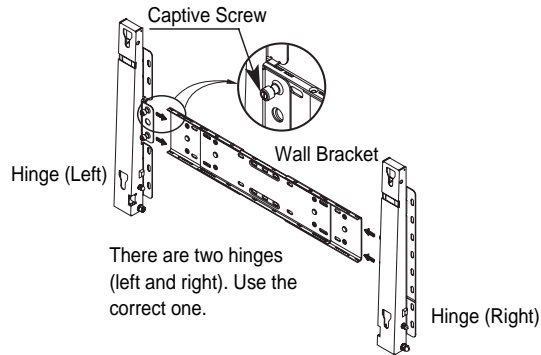
2   Before drilling into the wall, check if the length
    between the two locking holes at the back of
    the product is correct.
    If the length is too short or long, loosen all or
    some of the 4 screws on the wall bracket to
    adjust the length.

Captive Screw

Wall Bracket

Hinge (Left)

There are two hinges
(left and right). Use the
correct one.

Hinge (Right)

Length between the
two locking holes

3   Check the installation diagram and mark the drill
    points on the wall. Use the 5.0 mm bit to drill holes
    deeper than 35 mm.
    Fix each anchor in the corresponding hole.
    Match each of the brackets and hinge holes to the
    corresponding anchor holes and insert and tighten
    the 11 screws ⓐ .
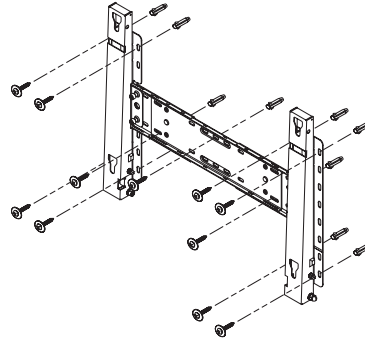
11-3-4 Fixing the TV panel to the wall attachment panel bracket

1   Remove the 4 screws on the back of the product.
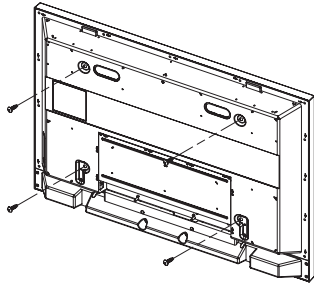

2   Insert the screw ⓑ into the plastic hanger. (See the figure below)
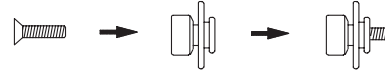
☞ ◆ Mount the product on the wall bracket and make sure it is properly fixed to the left and right plastic hangers.
    ◆ Be careful when installing the product on the bracket as fingers can be caught in the holes.
    ◆ Make sure the wall bracket is securely fixed to the wall, or the product may not stay in place after installation.

3   Tighten the 4 screws in step 2 (plastic hanger + screw ⓑ) to the rear holes of the product.
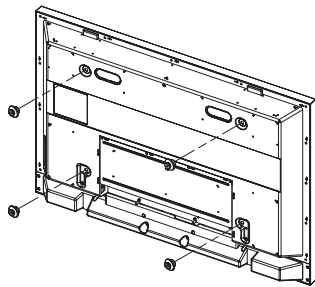
4   Remove safety pin (#) and insert the 4 product holders into the corresponding bracket holes (!). Then place the product (@) so that it is firmly fixed to the bracket. Make sure to reinsert and tighten the safety pin (#) to securely hold the product to the bracket.

PDP
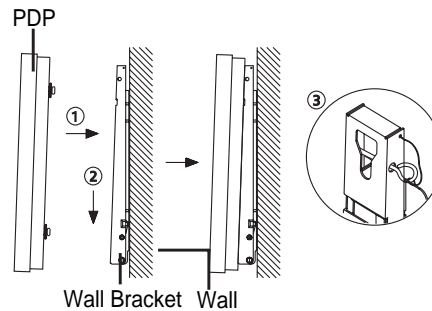
Wall Bracket   Wall

11-3-5 How to Adjust Mounting Angle

➢   Adjust the bracket angle to -2° before installing it on the wall.
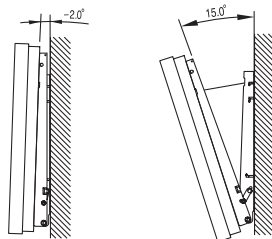
1   Fix the product to the wall bracket.

2   Hold the product at the top in the center and pull it forward (direction of the arrow) to adjust the angle. (See the figure to the right)

3   You can adjust the bracket angle between -2° and 15°.

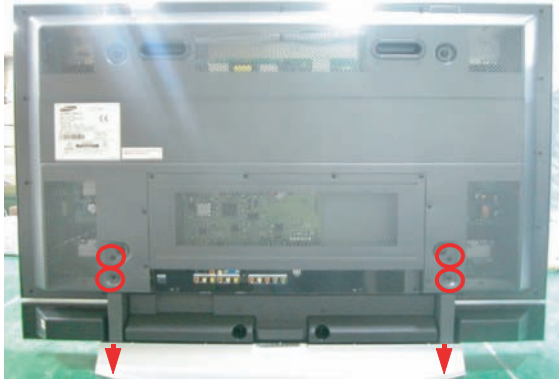Make sure to use the top center, and not the left or the right side of the product to adjust the angle.
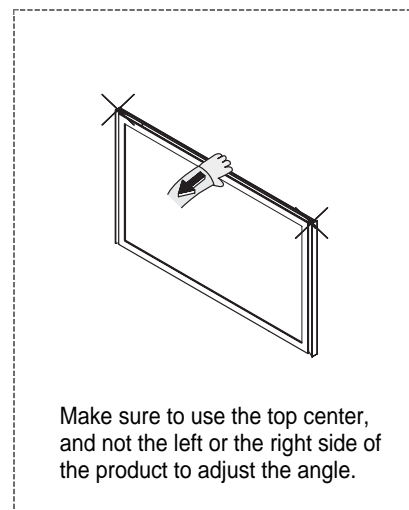
12. Disassembly & Reassembly

12-1 Overhaul Disassembly & Reassembly

⚠ Caution
- Be sure to separate the power cord before disassembling the unit.
- Discharge the capacitors first when separating PCB's with high capacity capacitors such as SMPS, X Drive Board, Y Drive Board, etc. (Sparks may be generated by an electric charge, and there is a danger of electronic shock.)
- Check that the cables are properly connected referring to the circuit diagram, when disassembling or assembling the unit and take care not to damage the cables.
- Take care not to damage the Glass Filter at the front.
- Assemble the boards in the reverse order of the disassembly.
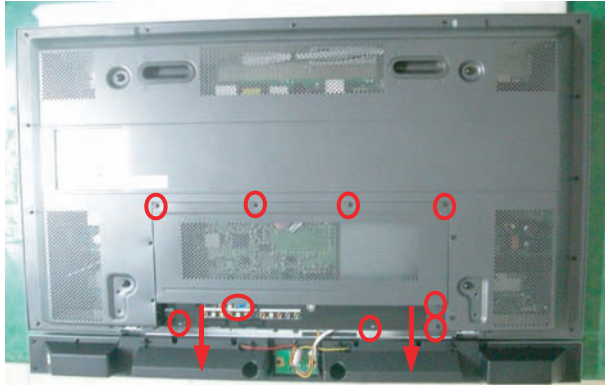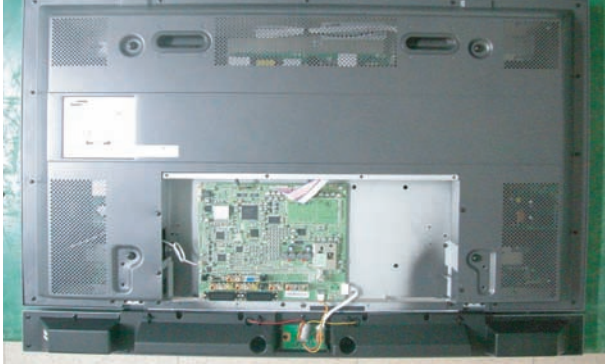
12-1-1 Separation of Stand

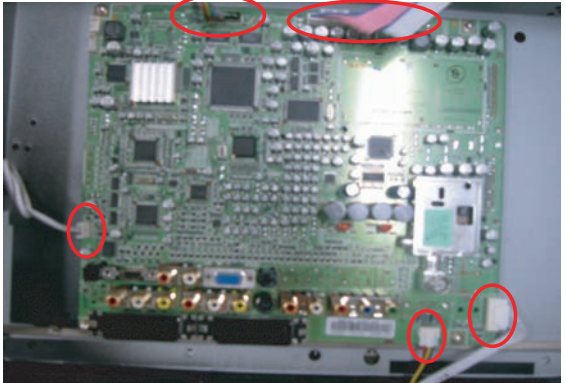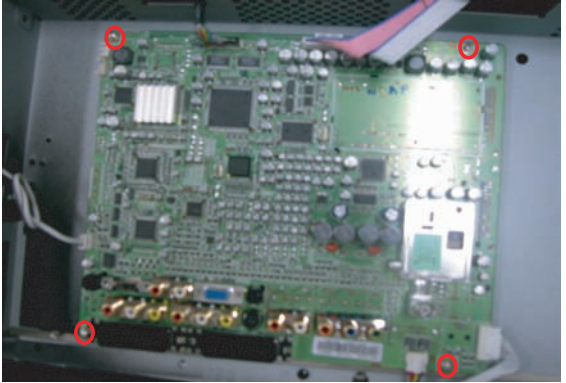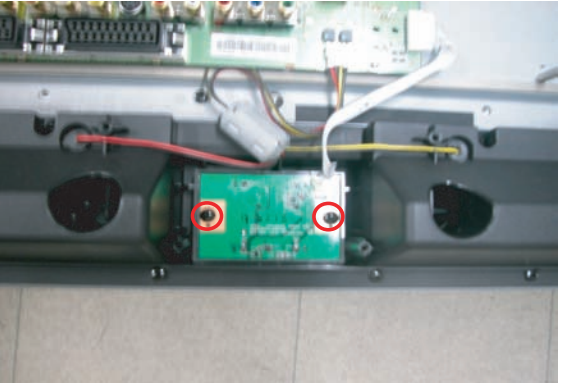| Part Name	Description	Description Photo
Stand	① Place the unit down and remove the 4 screws to separate the stand. : BH,+,S,M4,L35,ZPC(BLK) 6009-001432 ⚠ Caution: Take care not to damage the front glass when placing the unit down.	
	② Loosen and remove the screws and Stand remove.	

12-1-2 Separation of Cable Holder

Part Name	Description	Description Photo
Cable Holder	① Loosen and remove the 6 screws.	
	② Loosen and remove the screws and Cable Holder remove.	
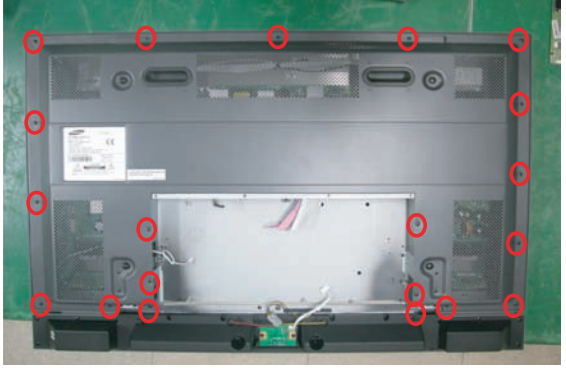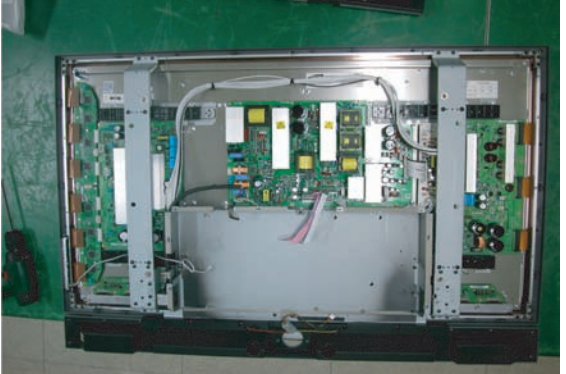
12-1-3 Separation of Sub Cover Back

Part Name	Description	Description Photo
Sub Cover Back	① Remove all marked screws	
	② Loosen and remove the screws and Cable Holder remove.	
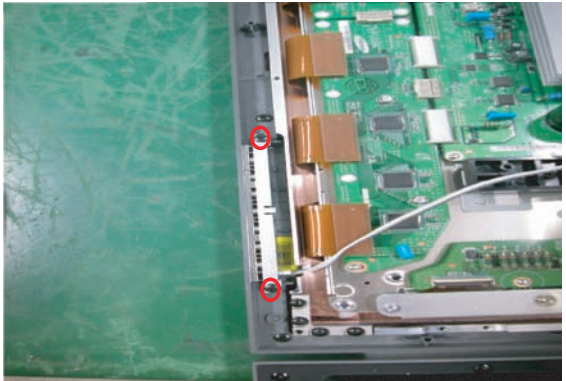
12-1-4 Separation of Audio Board

Part Name	Description	Description Photo
Audio Board	① Separate the cables connected to the Main Board remove	
	② Loosen and remove the 4 screws.	
	③ Separation of Power Button,Ambient Light Sensor,IR Receiver PCB.	
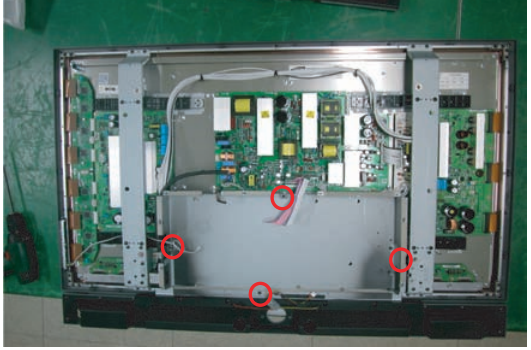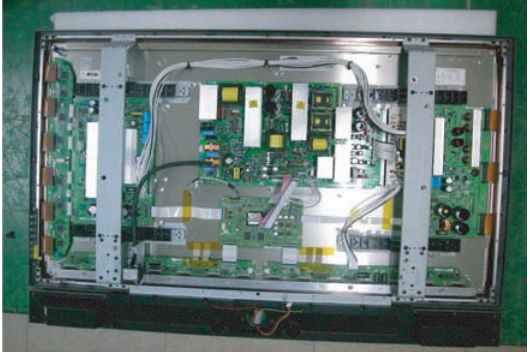
12-1-5 Separation of Back Cover

Part Name	Description	Description Photo
Back Cover	① Remove all marked screws	
	② Take care not to damage the back cover when removing it.	
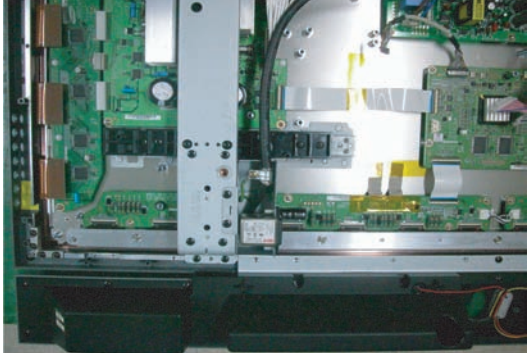
12-1-6 Separation of Function Key

Part Name	Description	Description Photo
Function Key	① Remove all marked screws	
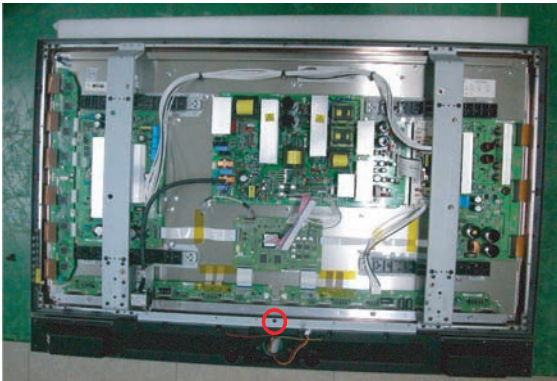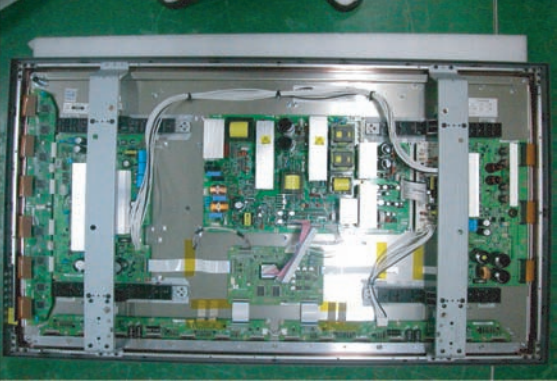
12-1-7 Separation of Audio Board Sub Back

Part Name	Description	Description Photo
Audio Board Sub Back	①Remove all marked screws	
	②Remove the Sub Back.	
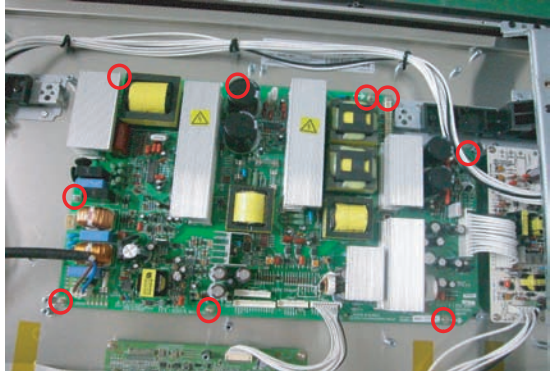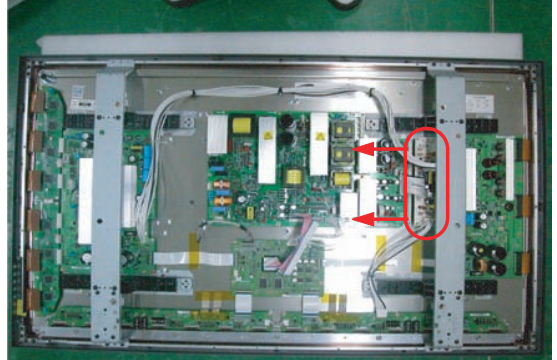
12-1-8 Separation of Power Inlet socket

Part Name	Description	Description Photo
Power Inlet socket	① Loosen and remove the 2 screws.	
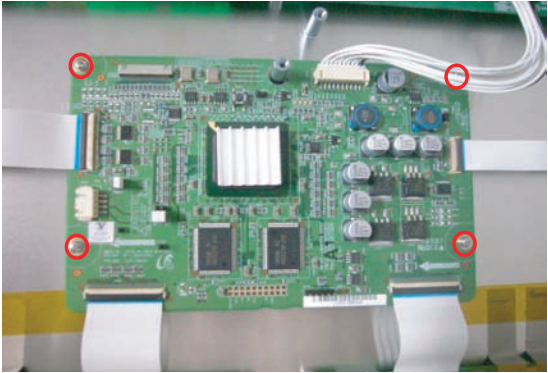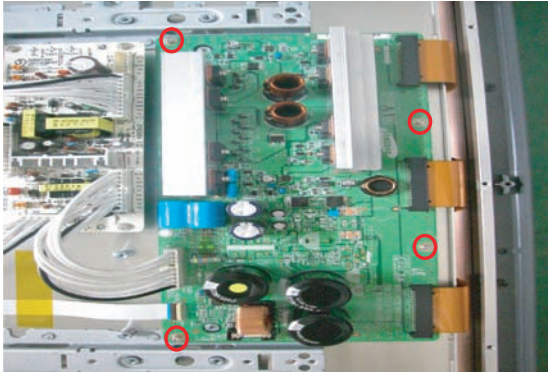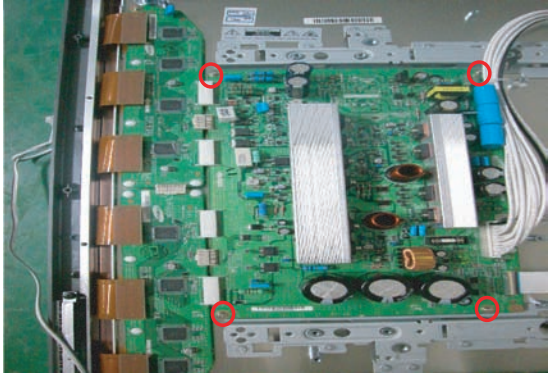
12-1-9 Separation of Speaker

Part Name	Description	Description Photo

Speaker	① Separate the cables connected to the Logic Board and then remove the 4 screws.
	   : FH,+,M3,L10,NI PLT,SWRCH 18A,FP
	     6001-000321	

	② Remove the speaker by carefully pulling it out with your hands the speaker may cause damage to it.	

12-1-10 Separation of Main SMPS, DC-DC SMPS

Part Name	Description	Description Photo
	① Separate the cables connected to the Main SMPS first and then remove the screws.	
	② Separate the cables connected to the DC-DC SMPS and then remove the screws.	

12-1-11 Separation of LogicBoard, X DriveBoard, Y Drive Board, Buffer Board , Address Buffer Board

Part Name	Description	Description Photo
Board	① Separate the cables connected to the Logic Board and then remove the screws.	
	② Separate the cables connected to the X Drive Board and remove the screws.	
	③Separate the cables connected to the Y Drive Board and remove the screws.	
	④Separate the Y Buffer Board and the Address Buffer Board depending on the problem	

MEMO

13. Circuit Description

13-1 Partial Block Description

13-1-1 Main Board
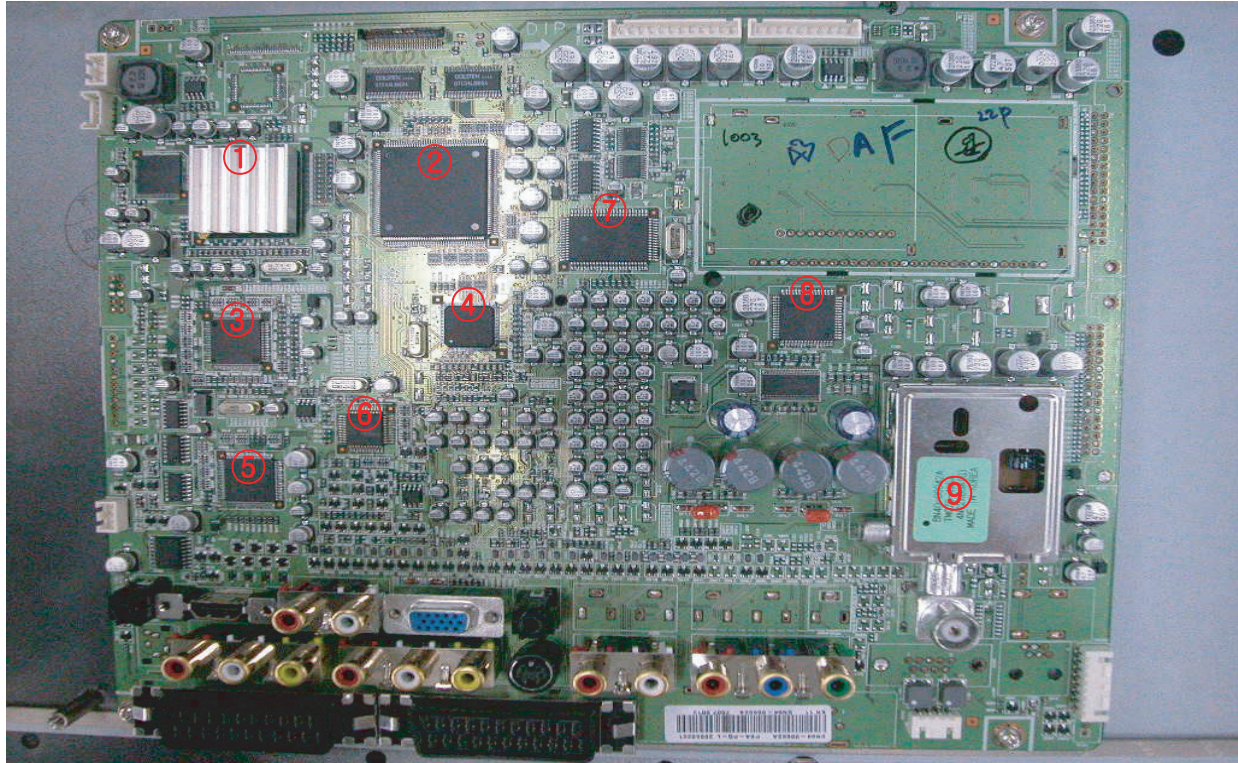
No	Name	Function	Description
①	SVP-EX62	main Video Decorder+Deinterlacer+Scaler	A Scaler IC that generates the output resolution appropriate to the PDP panel and generates the PIP screen.
②	DNIe-L	Image Enhancer	The DNIe IC for visual quality improvement.
③	M30620SPGP	main Micom	Generates various control signals required for operating the circuit.
④	SAA7119	sub Video Decorder	The Video Decoder IC that converts the Y/C and Scart RGB signals for the main screen into 10 bit digita R, G, B signals.
⑤	SIL9993	HDMI Decorder	Converts the TMDS signal on the HDMI input into 8 bit digital R, G, B signals
⑥	S3F8668	sub Micom	Detects the Power on/off signal from the remote control and the Power button and turns SMPS on or off, handles the Caption signal, and controls the signal for the LEDs on the front panel.
⑦	MSP4410G	Sound processor	Sound Processing IC
⑧	NSP6241	Sound Effect chip	Sound PWM IC
⑨	TMQZ6-405A	Tuner	Tuner CH Tuning and CVBS, SIF

13-1-2 Power Button Board
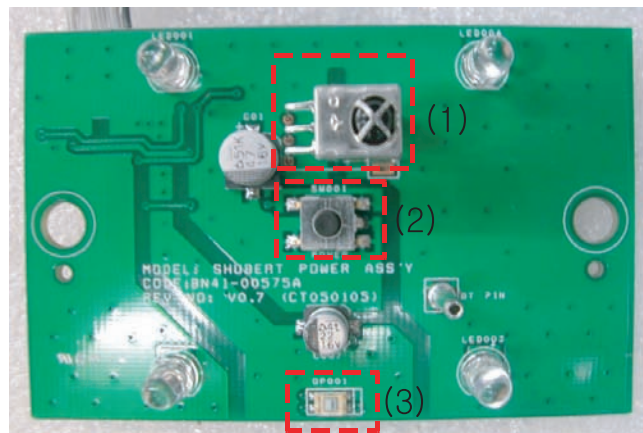
(1) RM01: Remote Control Sensor.
(2) SW001: Power button
(3) OP001: The Illumination sensor that senses the quantity of light. It senses the illumination and automatically adjusts the screen brightness according to the surrounding brightness when the Power Saving Mode of the User menu is set to Auto.

13-1-3 Function Key Board
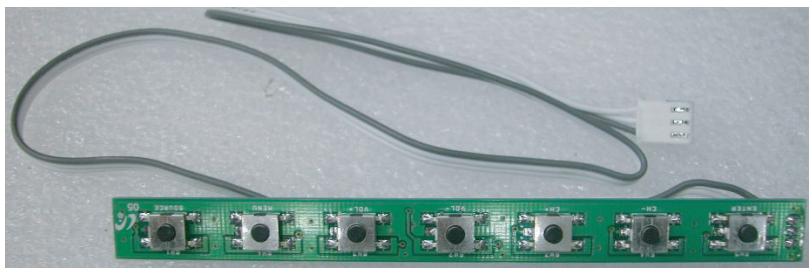
Function Key. Located on the side of the unit.

13-1-4 Main SMPS
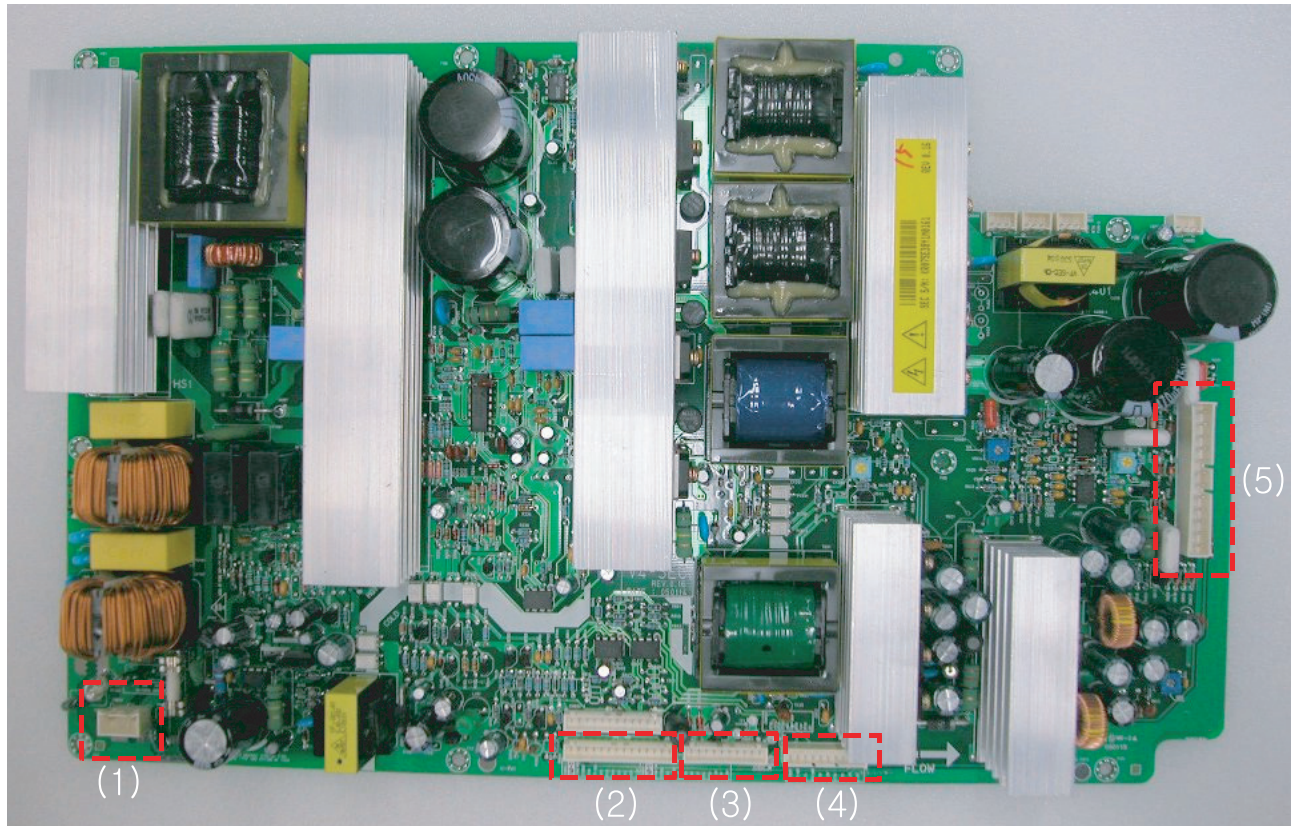
(1) CN800: AC IN (90 ~ 264V)

(2) CN804-2 (MAIN SMPS) ↔ CN109(READY B'D)	
Pin No	Signal
1 ■	FAN-D
2	FAN-ON
3	STB5V
4	RTN
5	PS-ON
6	12V
7	RTN
8	RTN
9	VCA
10	VCS
11	RTN
12	5.3V
13	RTN
14	5.3V

(3) CN803(MAIN SMPS) ↔ CN108(READY B'D)	
Pin No	Signal
1 ■	RTN
2	VT(33V)
3	RTN_AMP
4	RTN_AMP
5	18V_AMP
6	18V_AMP
7	RTN
8	12V
9	RTN
10	6V

(4) CN810(Main SMPS) ↔ CN2013(Logic B'D)	
Pin No	Signal
1 ■	5.3V
2	5.3V
3	RTN
4	RTN
5	5.3V
6	RTN
7	PS-ON
8	N.C
9	VS-ON
10	STB 5V

(5) CN809(Main SMPS) ↔ CN3(DC-DC SMPS)	
Pin No	Signal
1 ■	5.3V
2	Vg
3	RTN
4	RTN
5	RTN
6	RTN
7	RTN
8	Va
9	Va
10	N.C
11	Vs
12	Vs

※ CN811, CN806, CN807 and CN808 are not used.

1. Outline (PDP 42inch/50inch SMPS)
Considering various related conditions, the switching regulator with good efficiency and allowing for its small size and light weight was used as the power supply for PDP 42inch(Schubert)/50inch(Strauss), VS requiring high power consumption Asymmetrical Half Bridge converter and flyback converter. To comply with the international harmonics standards and improve the power factor, active PFC(Power Factor Correction) was used to rectify AC input into +400V DC output, which in turns used as input to the switching regulator.

2. Input
The power supply shall be capable of supplying full rated output power over free voltage ranges that are rated 100 VAC - 240 VAC RMS nominal. Operating voltage : 90 VAC - 264 VAC
The power supply must be able to start up under peak loading at 90V AC. The power supply shall automatically recover from AC power loss. (Note that nominal voltages for test purposes are considered to be with +/- 1.0V of nominal).
STD_5V & Vpr2(3.3V) is a SELV standby voltage that is always present when AC mains voltage present.

3. Output

Output Name	Output Voltage	Output Current(Max.)	Using in PDP Driving
VS	+190V ~ 220V (210V)	2.0A	Sustain Voltage of Drive Board
VA	+60V ~ 80V (70V)	3.0A	Address Voltage of Drive Board
D5.3V	+5.3V	5.0A	
A6.5V	+6.5V	3.0A	
FAN_9V	+9V	0.2A	
VG	+15V	1.0A	
D12V	+12V	1.5A	
A12V	+5.3V	0.5A	
18VAMP	+18V	2.5A	Amp Voltage of Audio Board
VT	+33V	0.006A	
STD_5V	+5V	1.0A	Standby for Remote Control

4. Over Voltage Protection
The over voltage sense circuitry and reference shall reside in package that are separate and distinct from the regulator control circuitry and reference. No single point fault shall be able to cause a sustained over voltage condition on any of all outputs.
The supply shall provide latch-mode Over Voltage Protection as defined below.

Parameter	Min	Unit
VS(210V)	250 ~	V
VA(70V)	100 ~	V
VCC(+5.3V)	6.8 ~	V

5. Short Circuit and Over current Protection
An output short circuit is defined as output impedance of less than 300mohms. The power supply shall shutdown and latch off for shorting VS DC rails to return. Shorts between main output rails and STD_5V shall not cause any damages to the power supply. The power supply shall either shutdown and latch off for shorting is removed, the P/S shall recover. The power supply shall be capable of withstanding a continuous short-circuit to the output without damage or over stress to the unit (components, PCB traces,connectors,etc.) under the input conditions specified in Section 3 above. Current Protection as defined below.

Output	Over Current Limit	Unit
VS(210V)	20A, Constant Current.(TBD)	A
VA(70V)	10A, Constant Current.(TBD)	A
Output except Vs,Va	No damage (Auto Recovery or Shut down.)	A

6. Troubleshooting

Power ON

STD_5V — Abnormal → ① Check the U101, D108

Normal

PFC — Abnormal → ② Check the U201, Q203, Q204

Normal

VA — Abnormal → Check the U501

Multi — Abnormal → Check the U601

Normal

VS — Abnormal → Check the Q401, Q402

Normal

Check the Other board (Image Board or Driver Board) or Cable.

13-1-5 DC-DC SMPS

(1) CN809(Main SMPS) ↔ CN3(DC-DC SMPS)	
Pin No	Signal
1 ■	5.3V
2	Vg
3	RTN
4	RTN
5	RTN
6	RTN
7	RTN
8	Va
9	Va
10	N.C
11	Vs
12	Vs

(4), (5) CN1, CN6 (DC-DC SMPS) ↔ CN2501(E-Buffer), CN2701(G-Buffer)	
Pin No	Signal
1 ■	RTN
2	N.C
3	5.3V
4	N.C
5	Va

(2) CN2(DC-DC SMPS) ↔ CN5007(Y B'D)	
Pin No	Signal
1 ■	Vs
2	Vs
3	RTN
4	RTN
5	Vset
6	RTN
7	Vscan
8	RTN
9	Vg
10	5.3V

(3) CN4(DC-DC SMPS) ↔ CN4000(X B'D)	
Pin No	Signal
1 ■	Vs
2	Vs
3	RTN
4	RTN
5	Ve
6	RTN
7	RTN
8	Vg
9	5.3V

(6) D5.3V, Vg, Ve Test Point
(7) Va, Vset, Vscan Test Point

1. Block Diagram
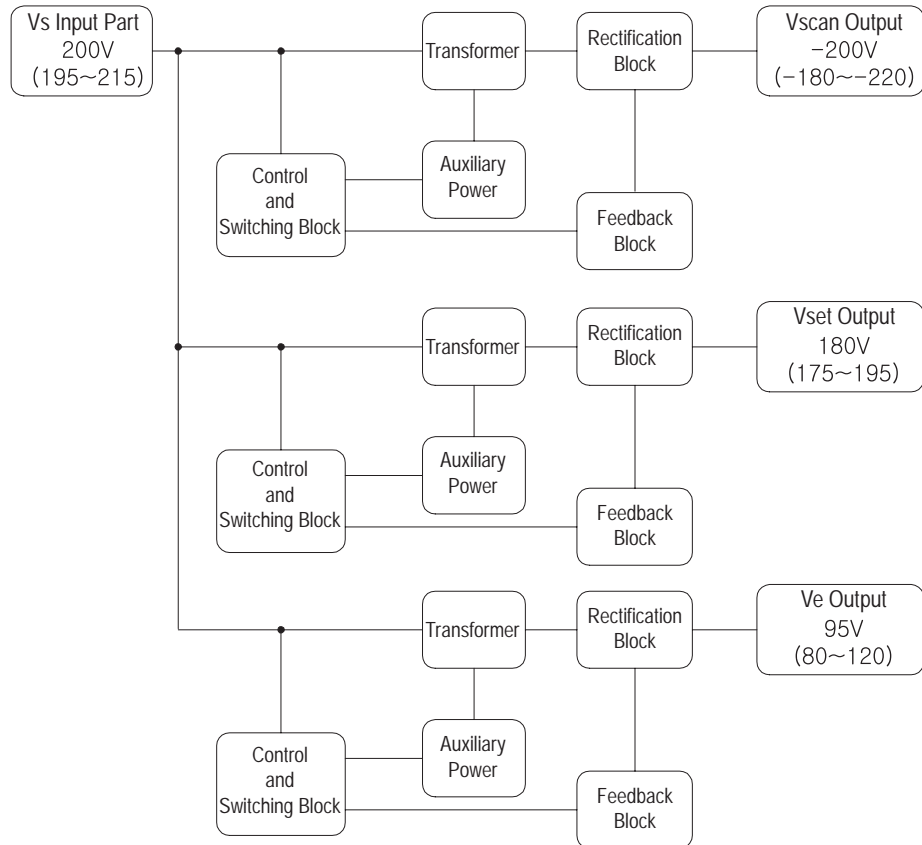
DC DC SMPS receives Vs input (195~215V) from the Main SMPS and the necessary Vscan, Vset and Ve voltages are output to operate the PDP Module as shown in the block diagram above.

13-1-6 PDP Module
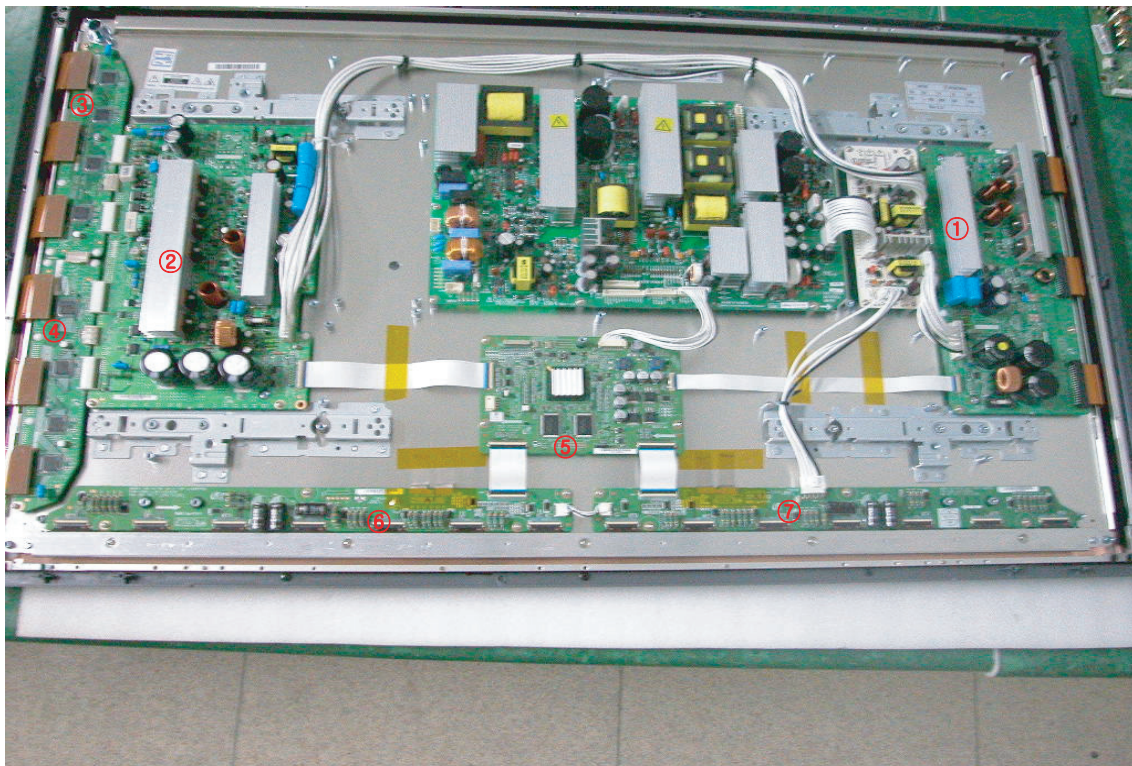
No	Name	Parts Code	Description
1	ASSY PDP P-X MAIN BOARD	BN96-02038A	X Drive Board
2	ASSY PDP P-Y MAIN BOARD	BN96-02039A	Y Drive Board
3	ASSY PDP P-Y BUFF UPPER BOARD	BN96-02040A	Y Buffer Upper Board
4	ASSY PDP P-Y BUFF LOWER BOARD	BN96-02041A	Y Buffer Lower Board
5	ASSY PDP P-LOGIC BOARD	BN96-02042A	Logic Board
6	ASSY PDP P-ADDRESS E BUFF BOARD	BN96-02043A	Address E Buffer Board
7	ASSY PDP P-ADDRESS F BUFF BOARD	BN96-02044A	Address f Buffer Board

■ A name of main part of Logic Board and vocabulary.
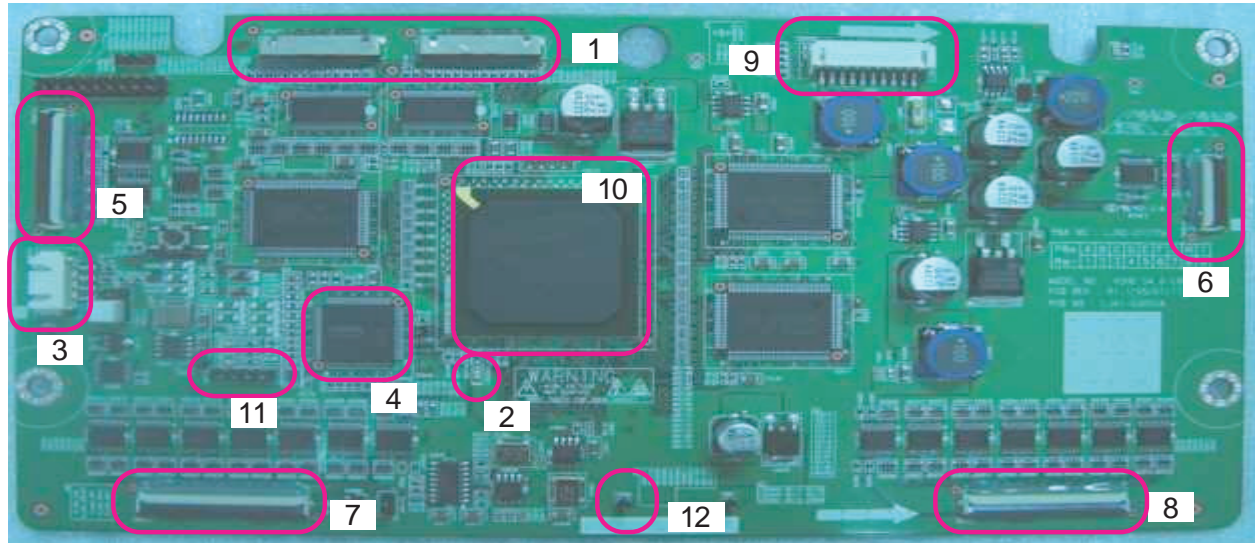
Item	Name	Explanation
①	LVDS Connector	The connector to receive the RGB, H, V, DATAEN and DCLK signals that have been LVDS encoded through the video board. At present, there are 2 LVDS, both internal and external, and only LVDS will be provided in the final version of the board.
②	Operating Status LED	The LED that shows whether the Sync and Clock signal is properly supplied to the logic board (Normal Status: Blinks at 0.8 second intervals)
③	I2C Connector	The connector for the Key Scan board that checks and controls the 512K data.
④	MICOM(ARM-PROCESSOR)	512K including the Gamma Table, APC Table, drive waveform timing and other options is saved to internal flash memory.
⑤	Y Connector	The connector to output the control signal for the Y drive board.
⑥	X Connector	The connector to output the control signal for the X drive board.
⑦	CN2075(E-Adderss Buffer Connector)	The connector to output the address data and the control signal to the E-buffer board.
⑧	CN2076(F-Adderss Buffer Connector)	The connector to output the address data and the control signal to the F-buffer board.
⑨	Power Connector	The connector to receive power (5V, 3.3V) for the Logic board.
⑩	ASIC CHIP	The main processor that generates and outputs the logic drive signal and the address data.
⑪	MICOM LOADING 5PIN CONNECTOR	The connector to load the Micom drive program. The program is loaded by connecting to the GA-WRITER.
⑫	VTOGG	TP for V Sync Check

■ About Logic Board

The Logic Board consists of a Logic Main board, which processes the video signal input through LVDS and creates the address driver output and XY drive signals, and a Buffer board, which buffers the output signal and outputs the signal to the Address Driver IC (TCP IC).

Logic Board		Function	Remark
Logic Main		- Video Signal Processing (W/L, error diffusion, APC) - Outputs the Address Driver Control and Data Signals to the Buffer board. - Outputs the XY Drive Board Control Signal	
Buffer Board	E Buffer Board	Outputs data and control signals to the bottom left TCP IC.	
	F Buffer Board	Outputs data and control signals to the bottom right TCP IC.	

■ Major Check Points and Waveforms
   - The waveform during a Normal Operation
     When the PDP set and the Logic Board are properly operating, the Operation Status LED blinks at approximately 0.8 second
     interval as shown in Figure 1.
     If the set is out of order, check the Operation Status LED first, and check that the output waveform is normal using an
     oscilloscope.
     Check if the waveform is the same as shown in Figure 2 by connecting the oscilloscope to the No. 12 TP in Figure 1. Check if
     the waveform is the same as in Figure 3 by connecting the oscilloscope to the connector that is connected to the Buffer board.
     If the measured waveform is different from the following waveforms, the board must be replaced.
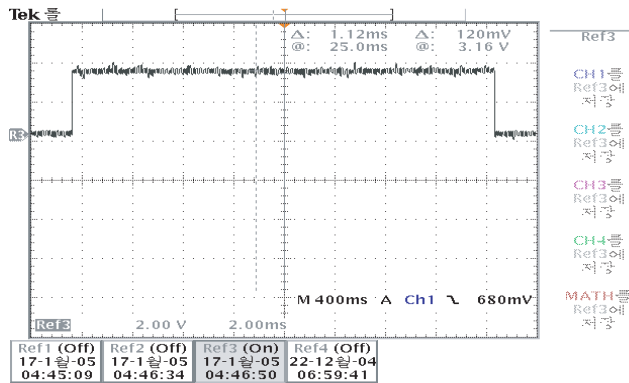   To check the waveforms, refer to the following waveform patterns.
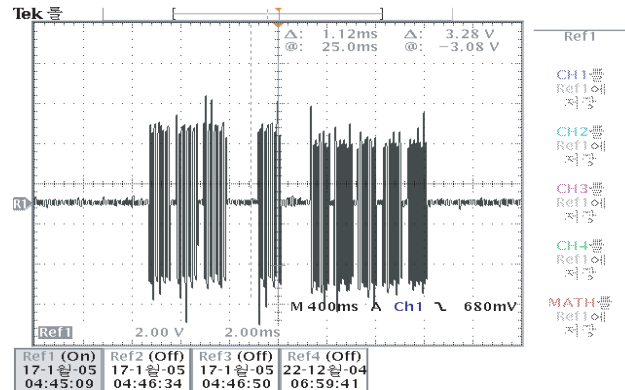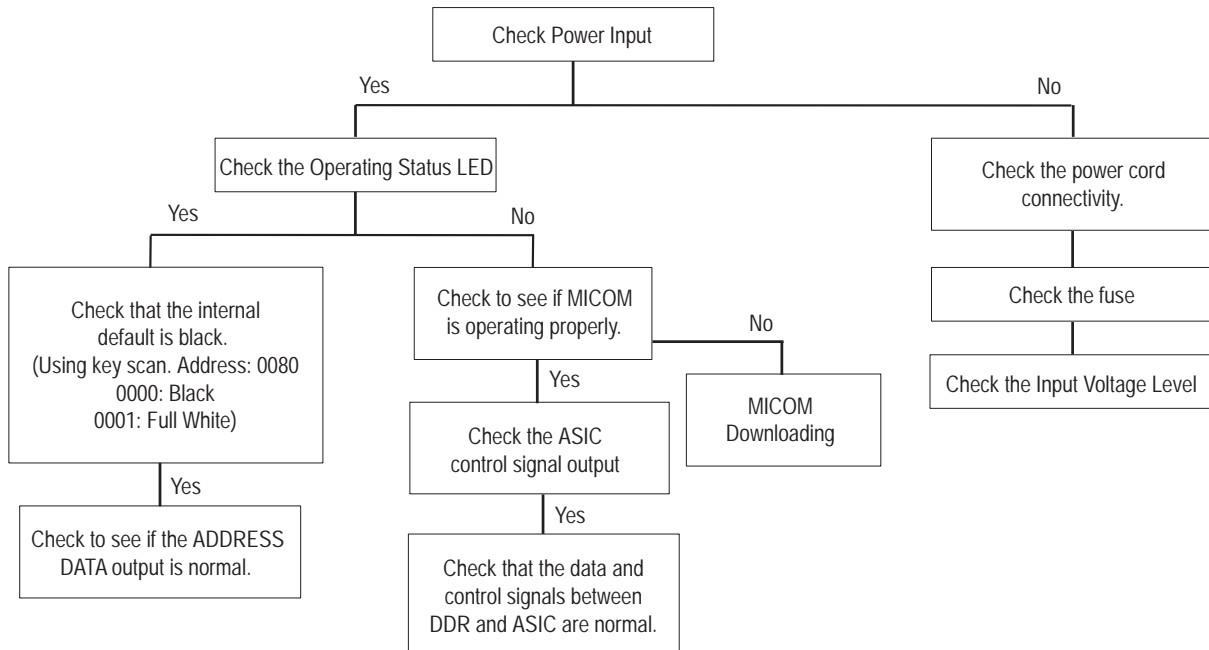

Figure 2. Normal V-SYNC Output Waveform

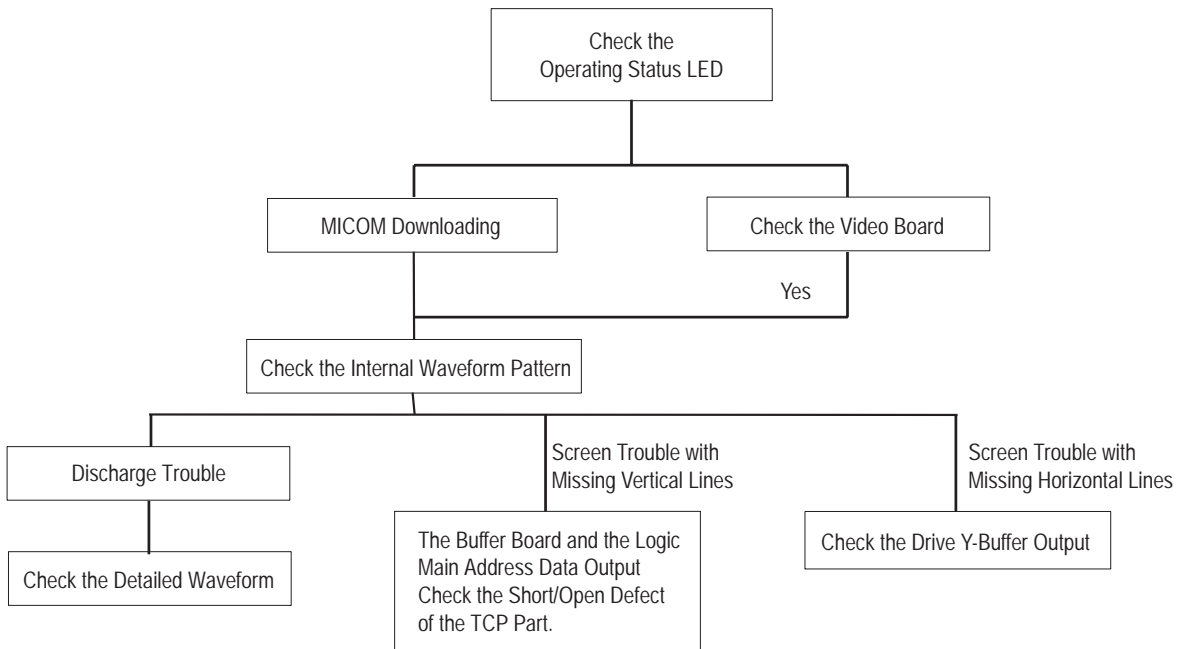Figure 3. Normal Address Data Output Waveform

■ Troubleshooting
There are various problems caused by the Logic Board and these have been classified by the Flow Chart.

- No picture on the screen

```
                          ┌─────────────────────┐
                          │  Check Power Input  │
                          └─────────────────────┘
        Yes                                              No

┌───────────────────────────┐              ┌───────────────────────────┐
│ Check the Operating Status LED │          │   Check the power cord    │
└───────────────────────────┘              │      connectivity.        │
   Yes              No                      └───────────────────────────┘

┌──────────────┐  ┌──────────────────┐      ┌───────────────────────────┐
│ Check that the │ │ Check to see if MICOM │   │     Check the fuse        │
│ internal       │ │ is operating properly. │  └───────────────────────────┘
│ default is     │ └──────────────────┘
│ black.         │           Yes     No      ┌───────────────────────────┐
│ (Using key     │                           │ Check the Input Voltage Level │
│ scan. Address: │  ┌──────────────┐  ┌──────┐ └───────────────────────────┘
│ 0080           │  │ Check the ASIC │ │ MICOM │
│ 0000: Black    │  │ control signal │ │ Down- │
│ 0001: Full     │  │ output         │ │ loading│
│ White)         │  └──────────────┘  └──────┘
└──────────────┘        Yes
   Yes
┌──────────────┐  ┌──────────────────┐
│ Check to see  │ │ Check that the data │
│ if the ADDRESS │ │ and control signals │
│ DATA output is │ │ between DDR and ASIC │
│ normal.        │ │ are normal.         │
└──────────────┘  └──────────────────┘
```

- Screen Error

```
                    ┌─────────────────────┐
                    │     Check the       │
                    │ Operating Status LED │
                    └─────────────────────┘

        ┌──────────────────┐        ┌──────────────────┐
        │ MICOM Downloading │        │ Check the Video Board │
        └──────────────────┘        └──────────────────┘
                                              Yes

        ┌────────────────────────────────┐
        │ Check the Internal Waveform Pattern │
        └────────────────────────────────┘

┌──────────────┐    ┌──────────────────┐   ┌──────────────────┐
│ Discharge     │    │ Screen Trouble with │  │ Screen Trouble with │
│ Trouble       │    │ Missing Vertical Lines │ │ Missing Horizontal Lines │
└──────────────┘    └──────────────────┘   └──────────────────┘

┌──────────────┐    ┌──────────────────┐   ┌──────────────────┐
│ Check the     │    │ The Buffer Board and │  │ Check the Drive    │
│ Detailed      │    │ the Logic Main       │  │ Y-Buffer Output    │
│ Waveform      │    │ Address Data Output  │  └──────────────────┘
└──────────────┘    │ Check the Short/Open │
                    │ Defect of the TCP Part. │
                    └──────────────────┘
```

1. X, Y Control Block

■ Drive Circuit Definition
The Drive Circuit is a circuit that generates a waveform (high-voltage pulse) for the X and Y electrode group of the panel's external port so as to control the panel. The high-voltage switching pulse is generated through the combination of the IC HYBRID (Drive block + IGBT) and FET.

■ Drive Circuit Mechanism
A picture is displayed on the PDP by applying voltage to the X, Y and ADDRESS electrodes of each pixel according to the appropriate condition. The drive waveform applied to 42HD V4 is of the ISSS (ISSS: Interweaving Scan and Selective Sustain with Scan IC) type and has IDS (InDependent Sustain) in the Scan section unlike the existing ADS. Discharges within a PDP pixel can be classified into 3 types:
① Address Discharge: To form a wall voltage within the pixel by giving information (applying DATA voltage) to the pixel to be lit.
② Sustain Discharge: Sustain Discharge is a display section that voluntarily maintains the discharge of the pixels whose wall voltage has been formed by the Address Discharge. (Optical output for displaying a picture is generated).
③ Erase Discharge: To selectively perform Address Discharge for each pixel, all pixels on the panel should be in the same status (the wall electric charge status and space electric charge status must be the same). Therefore, the Erase Discharge section is an important component for guaranteeing the drive margin, and is implemented by various methods such as applying a log waveform. However, the current 42HD V4 has adopted a wall voltage control through an RA (Repeated Auto-quenching) reset that separates the discharge area and performs switching to perform an efficient erase operation, while the gradient was the same in the RAMP section in the existing approach.

1) Address Discharge
A discharge that is caused by the difference between the plus electric potential (Va apply voltage of 65~70V + Positive Wall Charge) of the electrode and the negative electric potential (Applied GND Level + Negative Wall Charge) of the Y electrode. The Address discharge forms a wall voltage within the pixel to display color (to be discharged) before the Sustain Discharge period. That is, the pixel whose wall charge has been formed by the Address Discharge forms a Sustain Discharge vis the following Sustain pulse.

2) Sustain Discharge
A Sustain Discharge is a Self-Sustaining Discharge formed by the accumulation of the electric potential of the Sustain pulse (generally 200 ~ 210 Volt) alternating over the X and Y electrodes during the sustain period, and the wall charge depending on whether the pixel has previously been discharged or not. That is, it is controlled by the memory characteristics, one of the basic characteristics of the AC PDP (in that the past operating conditions determine the current status). That is, if a wall voltage exists on the pixel (if the pixel is on), a discharge is formed again because the applied voltage, which is the sum of the following applied Sustain voltage and the wall voltage, is higher than the discharge threshold voltage. If no wall voltage exists on the pixel (if the pixel is off), a discharge will not occur because the Sustain voltage is not higher than the discharge threshold voltage. The Sustain Discharge period is the period for generating actual optical output so as to display a picture on the PDP screen.
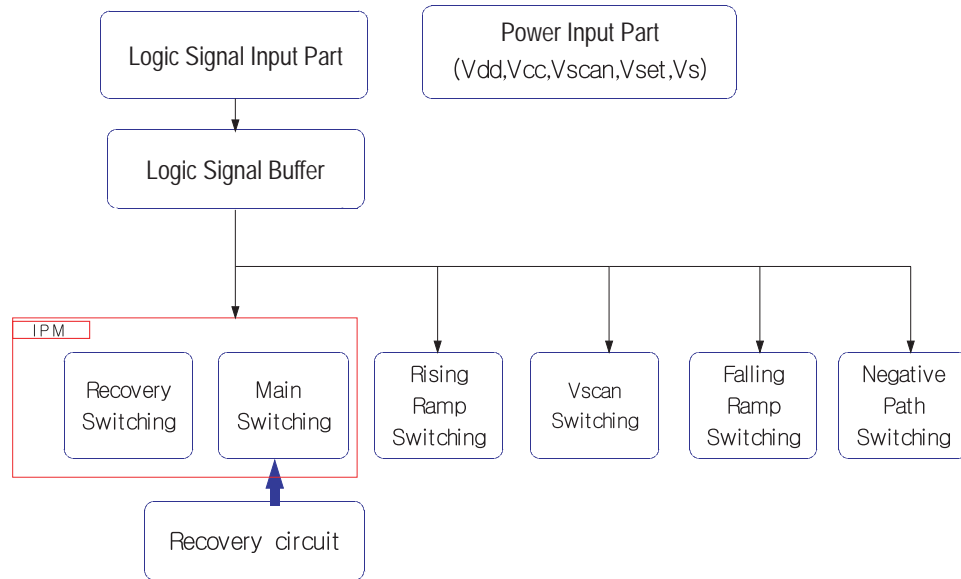
3) Erase Discharge
The purpose of a Reset (Erase) Discharge is to create uniformity of the wall voltage within all panel pixels. It evens the wall voltages regardless of the Sustain Discharge in the previous stage. The Erase Discharge has to remove the wall voltage introduced by the Sustain Discharge by supplying ions or electrons by a discharge. When the wall voltage is removed through a discharge, the time when the reverse polarity is applied to the wall voltage (fine width erasing) is to be limited or ions or electrons are to be supplied by a weak discharge (low voltage erasing) so as to prevent a wall charge in reverse polarity.
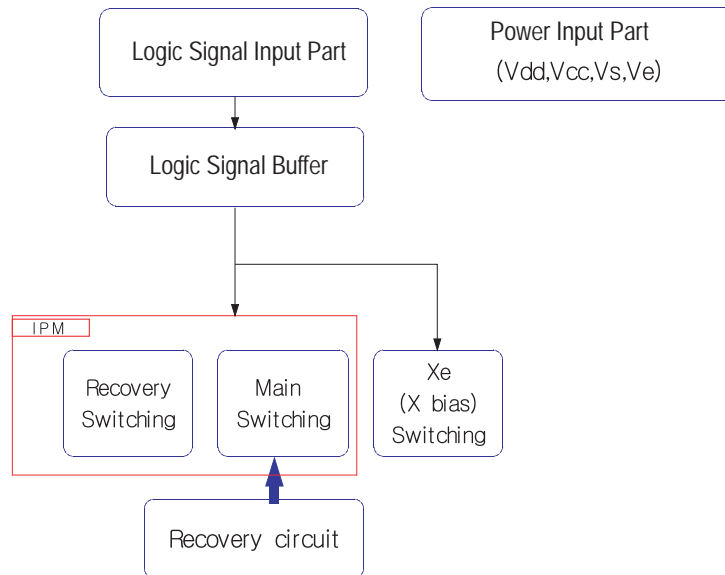There are 2 known weak discharge (low-voltage) erase methods. 1) A log waveform adopted by F company and 2) a weak erase discharge via a ramp waveform adopted by Matsushita and other companies. Both methods control the externally applied voltage by the difference of the wall voltage of the pixel by applying the rising gradient of the erasing waveform slowly, because the discharge begins when the sum of the existing remaining wall voltage and the rising waveform voltage exceeds the drive threshold voltage. In addition, a weak discharge is introduced, because the applied voltage is low.

■ Drive Circuit Operating Block Diagram

- Y Drive Board

| Logic Signal Input Part | Power Input Part
(Vdd,Vcc,Vscan,Vset,Vs) |

| Logic Signal Buffer |

IPM
| Recovery Switching | Main Switching | | Rising Ramp Switching | Vscan Switching | Falling Ramp Switching | Negative Path Switching |

| Recovery circuit |

- X Drive Board

| Logic Signal Input Part | Power Input Part
(Vdd,Vcc,Vs,Ve) |

| Logic Signal Buffer |

IPM
| Recovery Switching | Main Switching | Xe (X bias) Switching |

| Recovery circuit |

■ Requisite Components Necessary for Drive Board Operation

- Power : Supplied from the power board. The optimal value may differ from the following:
    a) Vs : 205V - Sustain
    b) Vset : 195V - Y Rising Ramp
    c) Ve : 100V - Ve bias
    d) Vscan : -190V - Scan low bias
    e) Vnf : -175V - Y falling Ramp (Created by the DC-DC power block of the Y Drive board)
    f) Vsc_h : -70V - Scan high bias (Created by the DC-DC power block of the Y Drive board)
    g) Vdd : 5V - Logic signal buffer IC and IPM
    h) Vcc : 15V - Gate drive IC [1]× IPM

- Logic Signal : Supplied by the Logic board. Gate signal of each switch

■ Drive Circuit Architecture and Function Description

- Description of the function of each board
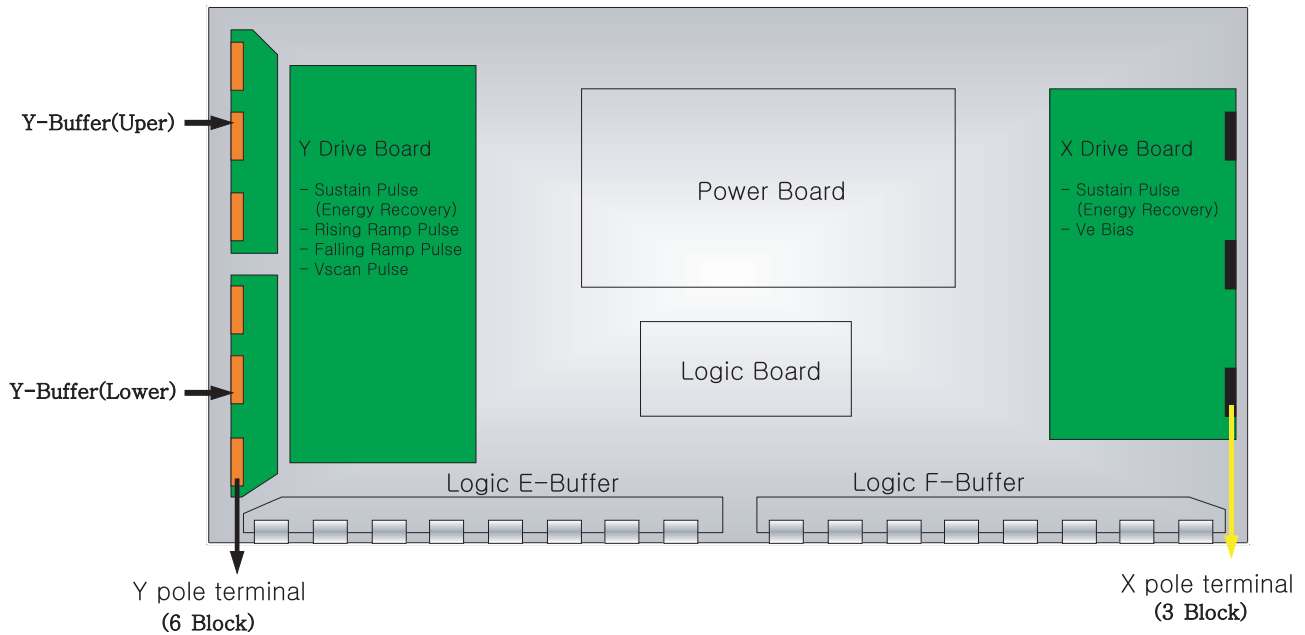
1) X Drive Board
This is connected to the X port part of the panel. 1) Sustain voltage waveform (including ERC) is output, and 2) Ve bias in the Scan section is maintained.

2) Y Drive Board
This is connected to the Y port part of the panel. It outputs 1) Sustain voltage wave form (including ERC), and 2) Y Rising, Falling Ramp waveform, and maintains 3) Vscan bias.

3) Y Buffer Board (Upper, Lower)
This board supplies the Scan waveform to the Y port and consists of Upper and Lower boards. For an HD grade unit, 6 scan driver ICs (TEXAS INSTRUMENT SN755867APZP: 64 outputs) are mounted on the board.

■ Drive Waveform Specifications

- Drive Waveform
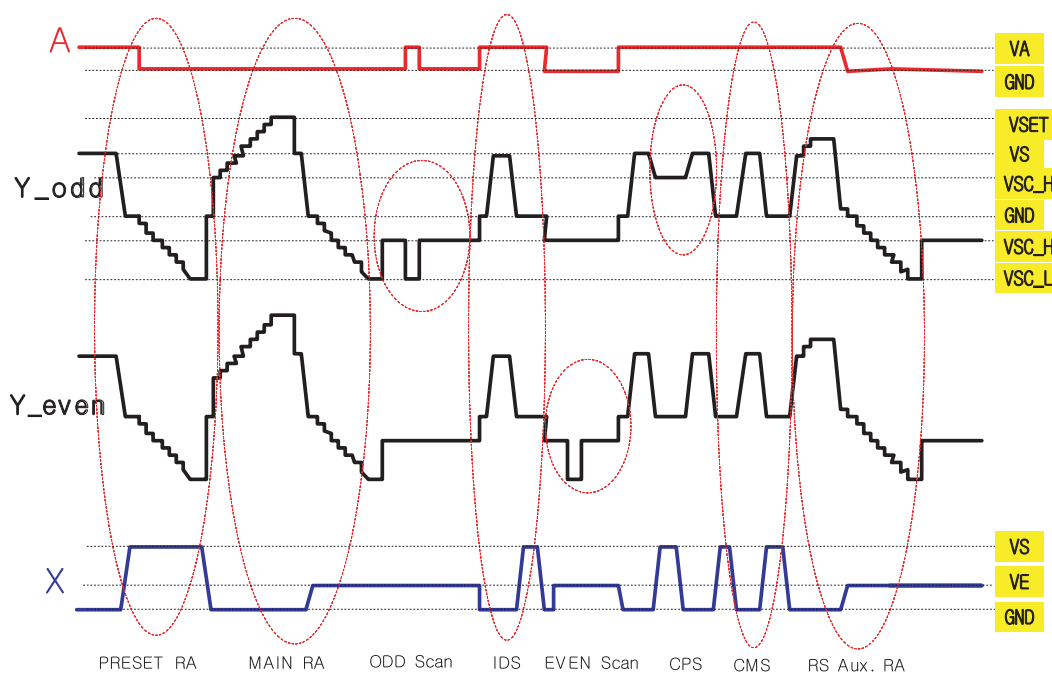
- Description of the function of each pulse

1) Y Preset RA Pulse
This is supplied to the first sub-field and erases the discharge status of the previous subfield.

2) Y Main RA Pulse
During the Y Rising Ramp section, approximately 300V~350V (Vscan-h + Vset) of external voltage is supplied to the Y electrode, and a weak discharge is started when each gap voltage is equal to the discharge start voltage. While maintaining the weak discharge, as a whole, negative wall charges are accumulated on the Y electrode and positive wall charges on the X electrode and the address electrode.
During the Y Falling Ramp section, the negative wall charges accumulated on the Y electrode by the approximately 105V of X bias are used to erase the positive wall charges on the X electrode, and the address electrode maintains most of the positive wall charges accumulated during the (0V) Rising Ramp section preparing for the next address discharge.

3) Y Scan Pulse (Odd/Even)
A scan pulse classifies the Y electrode into Odd and Even lines and selects FPC output electrodes sequentially (one line-at-a-time). At this time, Vscan is called the Scan Bias Voltage.
A Vscan voltage of approximately -175 Volt (Vsc_1) is supplied to the electrode lines. For the other lines, -56 volt (Vsc_h is higher than Vscan-l by 120V) is supplied. However, negative wall charges are accumulated on the Y electrode by the Ramp pulse, and positive wall charges are accumulated on the address electrode, and the voltage applied to the cells, to which the Address pulse (70V~75V) has been applied, becomes higher than the discharge voltage. An address Discharge occurs as a result. Since the Scan and Data pulse is applied one line at a time as above, the address time of PDP is very long.

4) IDS Pulse (InDependent Sustain Pulse)
Since an Odd Scan is performed first, the Odd line output sustains optical twice during the IDS section. At this time, a Sustain Discharge does not occur for the Even line because the Even line is not scanned.

5) CPS Pulse (ComPare Sustain Pulse)
By floating the Odd line that caused the Sustain Discharge in the IDS section to the Vscan-h level, and introducing the Sustain Discharge only for Even lines, it compensates for the optical output difference between the Even and Odd lines.

6) CMS Pulse (ComMon Sustain Pulse)
Actual optical is output during the common Sustain Discharge section.

■ Mechanism of the FET Operation and High-Voltage Switching

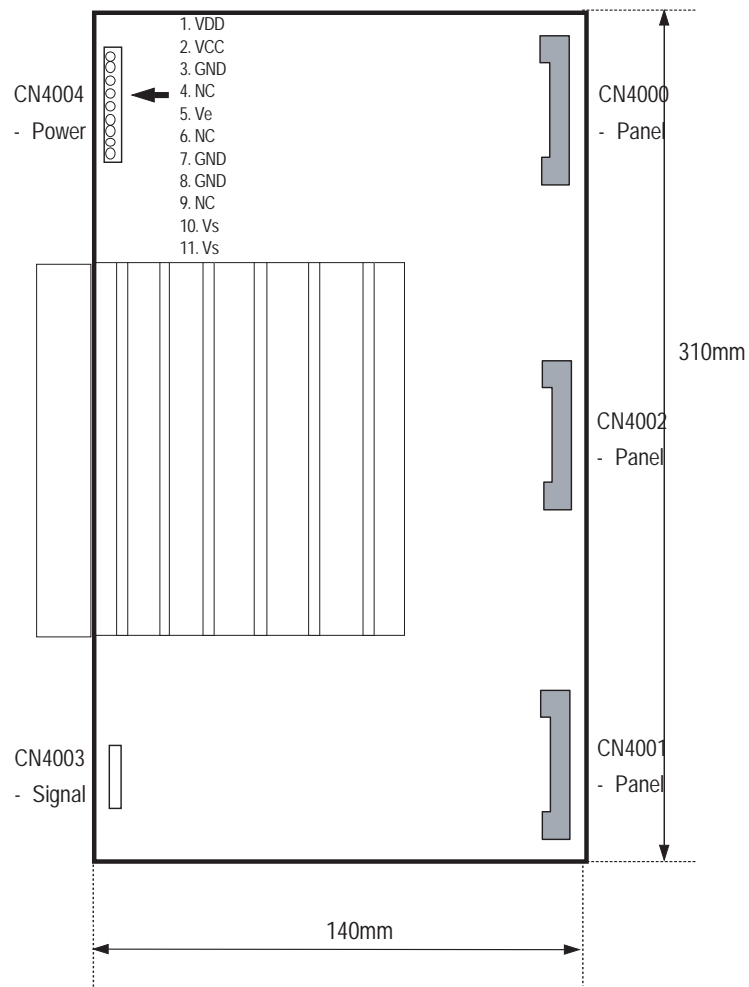### Mechanism of the FET Operation
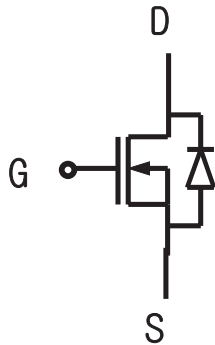
G : Gate
S : Source
D : Drain

1) When the signal is output to the gate, (positive electric potential) FET short circuits (i.e. Conductor of resistance 0)
2) When no signal is output to the gate (GND), FET changes to an open circuit (i.e. an insulator of resistance ∞).
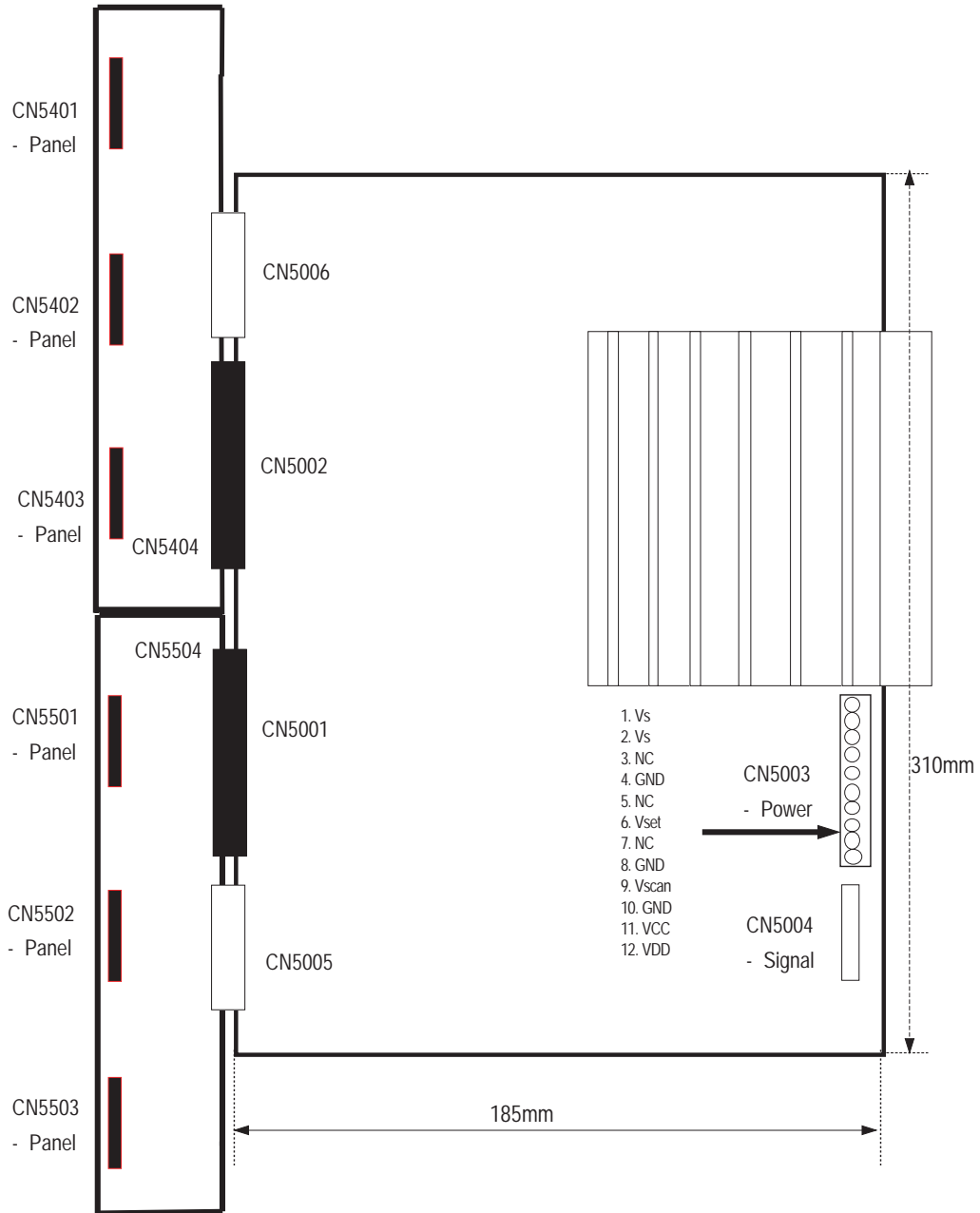
High-Voltage Switching of the FET Operation

GATE SIGNAL
(15Vp-p)

Pulse output
(180Vp-p)
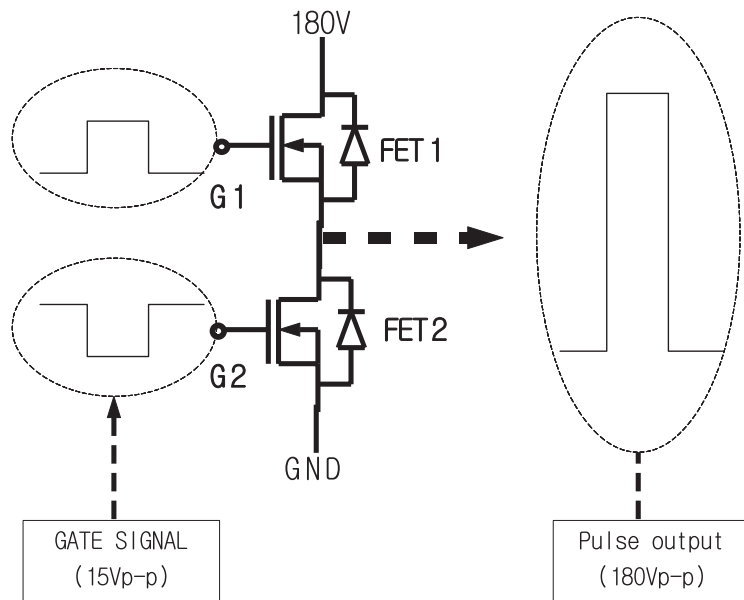
1) When no signal is applied to G1, FET1 is opened and when the signal is applied to G2, FET2 short circuits, GND is output via the output terminal.
2) When a signal is applied to G1, FET1 short circuits and when no signal is applied to G2, FET2 is opened, and 180V is output via the output terminal.

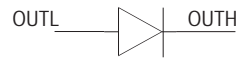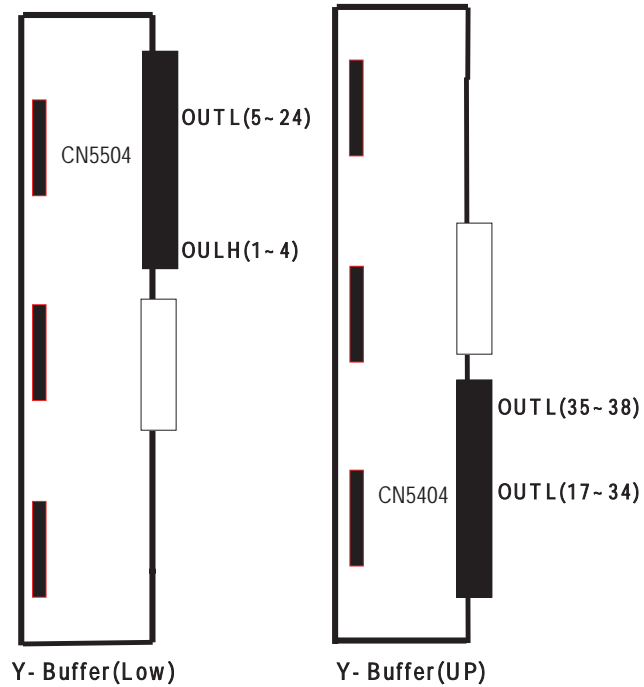■ Drive Board Connector Layout
  1) X-Main

CN4004
- Power

1. VDD
2. VCC
3. GND
4. NC
5. Ve
6. NC
7. GND
8. GND
9. NC
10. Vs
11. Vs

CN4000
- Panel

CN4002
- Panel

CN4001
- Panel

CN4003
- Signal

310mm

140mm

2) Y-Main

CN5401
- Panel

CN5402
- Panel

CN5006

CN5002

CN5403
- Panel

CN5404

CN5504

CN5501
- Panel

CN5001

1. Vs
2. Vs
3. NC
4. GND
5. NC
6. Vset
7. NC
8. GND
9. Vscan
10. GND
11. VCC
12. VDD

CN5003
- Power

310mm

CN5502
- Panel

CN5005

CN5004
- Signal

CN5503
- Panel

185mm

■ Troubleshooting the Drive Board
  1) Y Buffer
    - To check whether the Y Main board is properly working, check the operation of the Y Buffer first.
    - Separate the connector of the Y Buffer from the Y Main board
    - Check OUTL and OUTH and confirm that the forward voltage reduction is between 0.4V ~ 0.5V.
      UP - CN5407 1~10pin - OUTH / 11~33pin - OUTL
   LOW - CN5507 50~41pin - OUTH / 40~17pin - OUTL

OUTL ——|▷|—— OUTH

    - In addition, the resistance between the points must be higher than a few kΩ.

OUTL(5~24)

CN5504

OULH(1~4)

OUTL(35~38)

OUTL(17~34)

CN5404

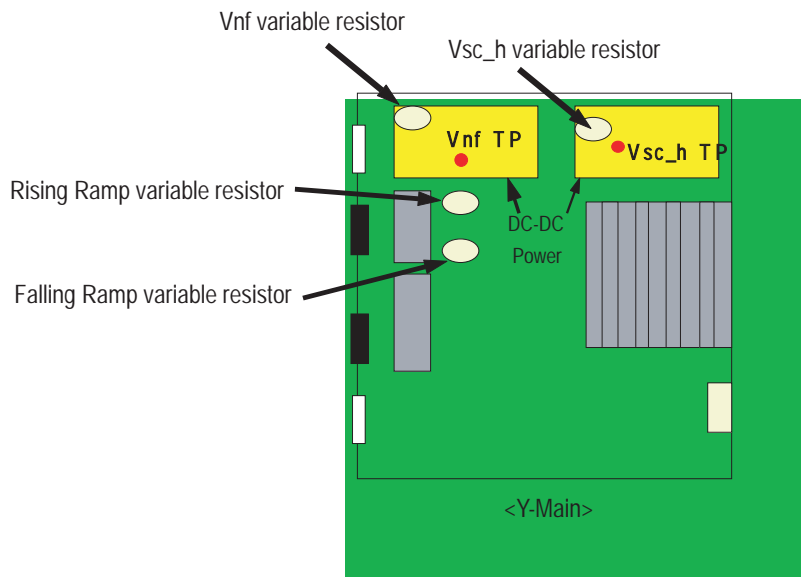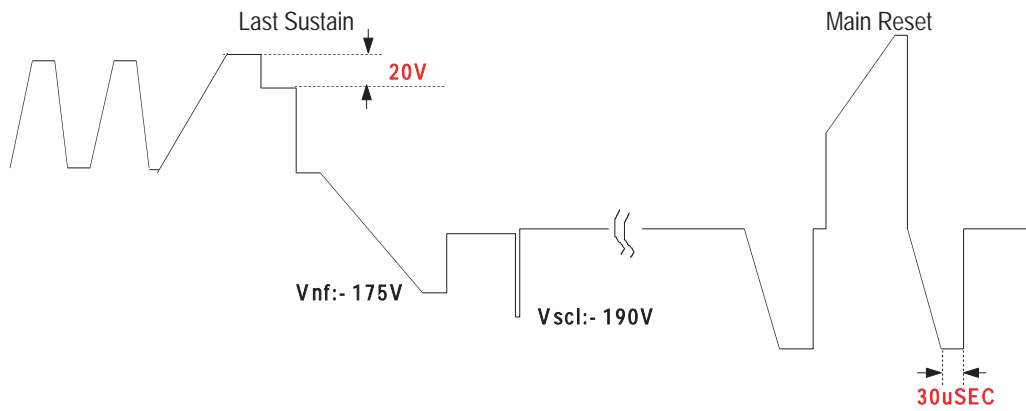**Y-Buffer(Low)**   **Y-Buffer(UP)**

2) Y Main
 - Connect the Y Main and Y Buffer, and confirm that the output from TP (line4, line383) of the Y Buffer UP is the same as
   #Attachment 1 when the power is supplied.

TP(line4)

TP(line383)
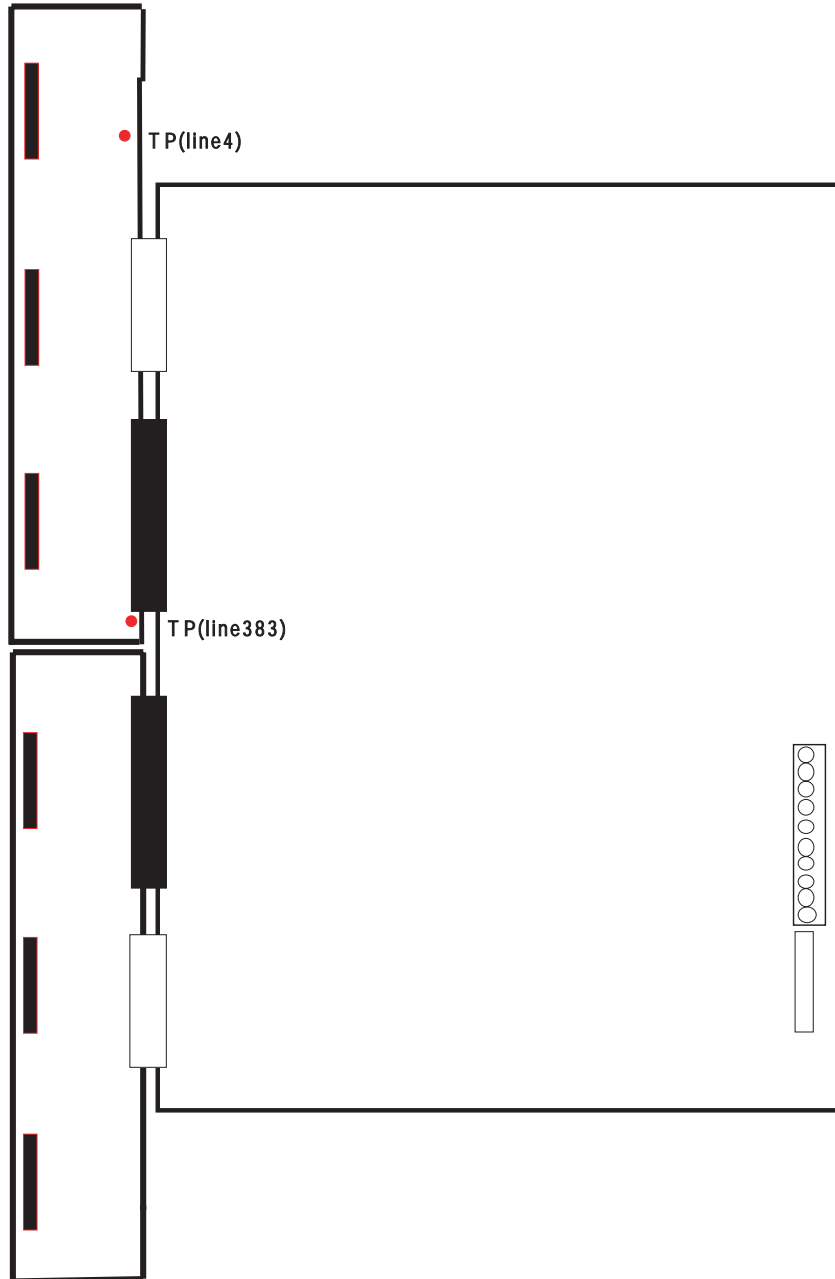
▶ Adjust the drive waveform so that the last sustain (rising: 15V) and the main reset (falling: 30usec) are the same as those in the figure.

Last Sustain   Main Reset

20V

Vnf:- 175V

Vscl:- 190V

30uSEC

Vnf variable resistor

Vsc_h variable resistor

Vnf TP   Vsc_h TP

Rising Ramp variable resistor

DC-DC
Power

Falling Ramp variable resistor

<Y-Main>

※ The Vsc_h and Vnf voltages are controlled by the DC-DC power part of the Y Main board.

<Voltage Adjustment Specifications>

Vset	Vs	Vsc_l	Vsc_h	Ve	Va	Vnf
195V	210V	-190V	-70V	100V	70V	-175

3) X
  - Check that the output of X-Out of the X board follows the waveform of #Attachment 2 when the power is supplied.

CN4004
- Power

CN4000
- Panel

X-OUT

CN4002
- Panel

CN4003
- Signal

CN4001
- Panel
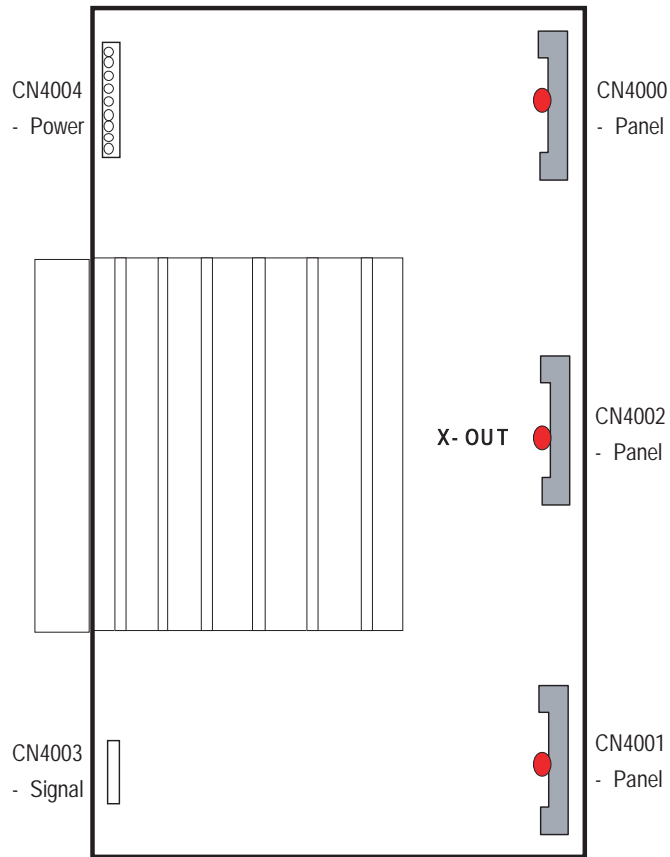
※ Attachment 1
■ Y Output Waveform

The Scan Waveform Must Be Observed

Y Output Waveform (200us/div, 100V/div)

1us/div, 100V/div (Sustain Waveform)

※ Attachment 2
■ X Output Waveform

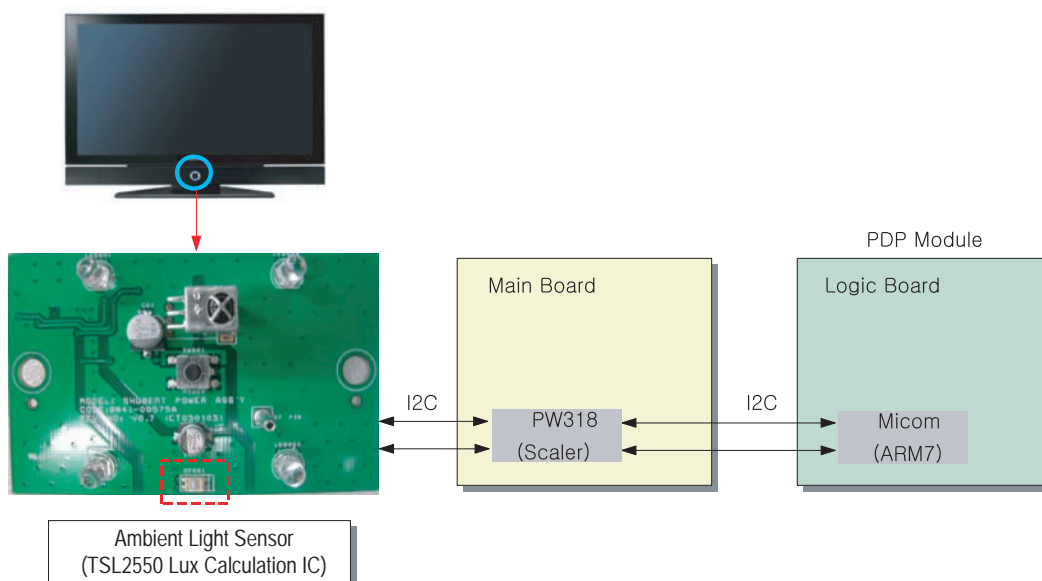X Output Waveform (200us/div, 100V/div)

2us/div, 100V/div (Sustain Waveform)

13-2 New Circuit Description

13-2-1 Power Saving Modes (Standard, Automatic, Super Power Saving)

1. Objective
To enhance a sensible visual quality by maintaining an appropriate screen brightness according to the ambient brightness and to reduce power consumption.

2. Circuit Architecture

The CPU PW318 of the Video Board takes the current ambient brightness (in Lux units), stored in the Ambient Light Sensor of Power Assy., which is attached at the front of the PDP, at given intervals through SMBUS communication (identical to I2C) and controls the PDP module to operate with the appropriate illuminance. The I2C bus is used to communicate with the PDP module, and the communication method is the same as the existing communication method.

3. Descriptions of Each Mode
   1) Standard Mode
      Standard Mode is set as standard visual quality.
   2) Auto Power Saving Mode (Ambient Light Sensor)
      This uses the TAOS 4 pin TSL2550 and is currently being used in LCD TVs. It also uses SMBUS, which is the same type as I2C, for communication. The Ambient Light Sensor can detect up to 1846 Lux in normal mode. The data of the sensor can be measured for Lux operations once every 800ms.
      Control is implemented by using R_ASL_GAIN. The number of sustain pulses moves left or right as shown in the figure on the right. For a low gradation condition, the change by R_ASL_GAIN has been minimized considering the degradation of the visual quality. That is, the Auto Power Saving mode screen controlled by the ambient light sensor aims at normal video of medium gradation.
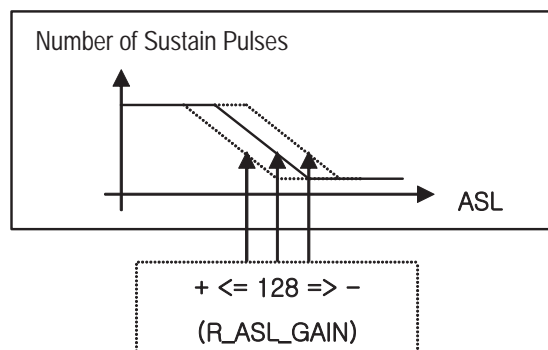
※ The following values are for a normal air signal with 80 Watt attenuation at maximum

| Detected Lux	R_ASL_GAIN (Address 0xE9)	Remarks
0 ~ 8	250	- Read the Lux value once per second and change it the target R_ASL_GAIN value by 5 per second according to the changed Lux value.
9 ~ 22	210	
23 ~ 35	170	- If more than 3 communication errors or saturation (count1>count0) is
Else	128 (default)	detected, the default value is set (R_ASL_GAIN=128).

3) Super Power Saving Mode
   This uses the Multi APC function of the PDP module, and aims at reducing power consumption more than 100 W for the white pattern, which is similar to the power consumption reduction of other manufacturers.

   - Concept of Multi APC
   : Controls the number of sustain pulses according to the ASL (Average Signal Level) by R_P_Lower_Gain value.
     In the PDP Logic, R_Multi_APC is set to 0X01, Multi_APC operates, and R_P_CM_Gain_SW is set to 0X01 so that the upper and lower limits of the APC Table can be shifted by adjusting the R_P_Lower_Gain value only.
     Therefore, the sustain pulse is controllable for the white pattern, even though it was formerly not controllable.
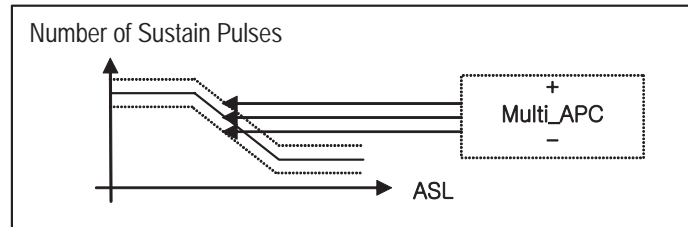


   ※ Caution: The Super Power Saving Mode screen is darker than that of Standard Mode.

14. Reference Information

14-1 Connection to a 3rd Party Device

⚠ Notice: 1. Do not connect to the power source until all connections are done, as this will cause damage to the product.
2. Make sure the sound port is properly connected (right: red, left: white).

### 14-1-1 Connecting to an Aerial or Cable Television Network

Rear of the TV

ANT IN

or

Cable Television
Network
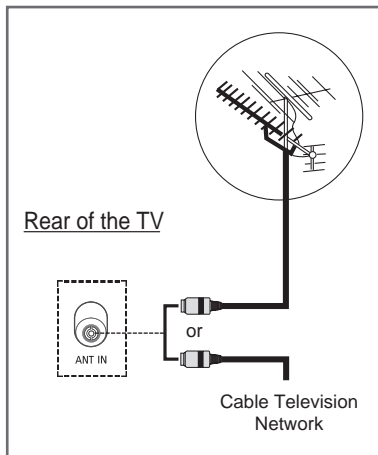
To view television channels correctly, a signal must be received by the set from one of the following sources:

◆ An outdoor aerial

◆ A cable television network

◆ A satellite network

1   In the first three cases, connect the aerial or network input cable to the ANT IN jack on the rear of the television.

2   If you are using an indoor aerial, you may need to turn it when tuning your television until you obtain a picture that is both sharp and clear.
For further details, refer to:
◆ "Storing Channels Automatically" on page 17
◆ "Storing Channels Manually" on page 18

➢   When installing or re-installing your TV, be sure to use the supplied coaxial antenna cable. If you connect using a different coaxial cable, there is risk of noise or interference to the screen image. (You must not use another general purpose cable. Use the 3M/5M/7M cable supplied by Samsung.)

14-1-2 Connecting a Satellite Receiver or Decoder

Rear of the TV

ANT IN   EXT1/VIDEO2,Y/C,RGB)   EXT 2(VIDEO, Y/C)

Satellite receiver/
Decoder
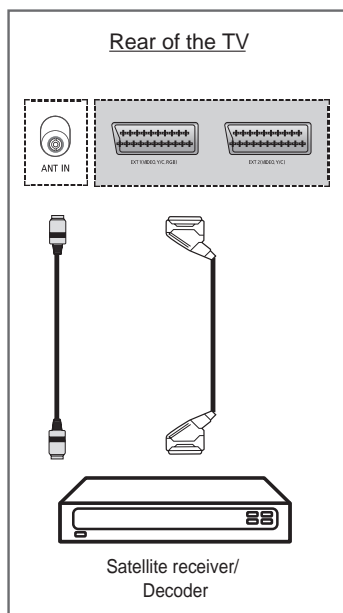
In order to watch television programmes broadcast via a satellite network, you must connect a satellite receiver to the rear of TV. Also, in order to descramble a coded transmission signal, you must connect a decoder to the rear of TV.

Using a SCART cable

Connect the receiver (or decoder) SCART cable to one of the SCART connectors on the rear of the television.

Using a coaxial cable

Connect a coaxial cable to the:
◆ Receiver (or Decoder) output socket.
◆ Television aerial input socket.

➢   If you wish to connect both a satellite receiver (or decoder) and a VCR, you should connect the:

◆ Receiver (or Decoder) to the VCR

◆ VCR to the television

Otherwise, connect the receiver (or decoder) directly to the television.

14-1-3 Connecting to External Input/Output

"EXT 1" is used for the equipment with an RGB output, such as video game devices or video disc players.

Rear of the TV

EXT 1(VIDEO,Y/C, RGB) EXT 2(VIDEO,Y/C)

VCR
DVD
Decoder /
Video Game Device
Video Disc Player
Satellite Receiver
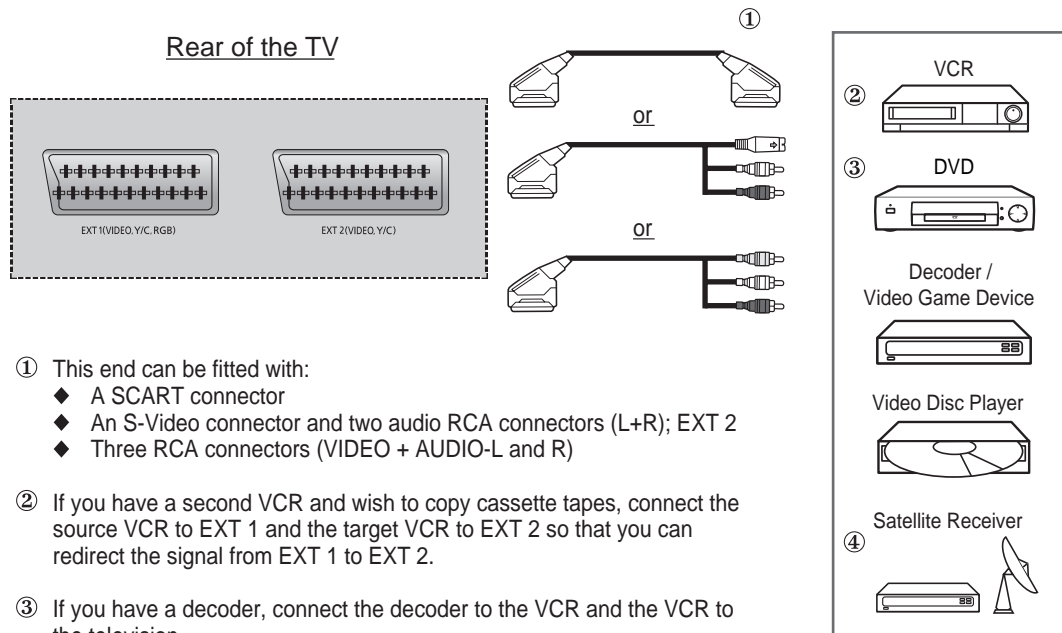
① This end can be fitted with:
 ◆ A SCART connector
 ◆ An S-Video connector and two audio RCA connectors (L+R); EXT 2
 ◆ Three RCA connectors (VIDEO + AUDIO-L and R)

② If you have a second VCR and wish to copy cassette tapes, connect the source VCR to EXT 1 and the target VCR to EXT 2 so that you can redirect the signal from EXT 1 to EXT 2.

③ If you have a decoder, connect the decoder to the VCR and the VCR to the television.

④ When you wish to record a programme, connect the receiver to EXT 1 and the VCR to EXT 2 so that you can redirect the signal from EXT 1 to EXT 2.

➢ Please be sure to match the color coded input terminals and cable jacks.

Input/Output Specification

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

14-1-4 Connecting to the AV Output

"AV OUT" are used for the equipment with an RGB output, such as video game devices or video disc players.

Rear of the TV
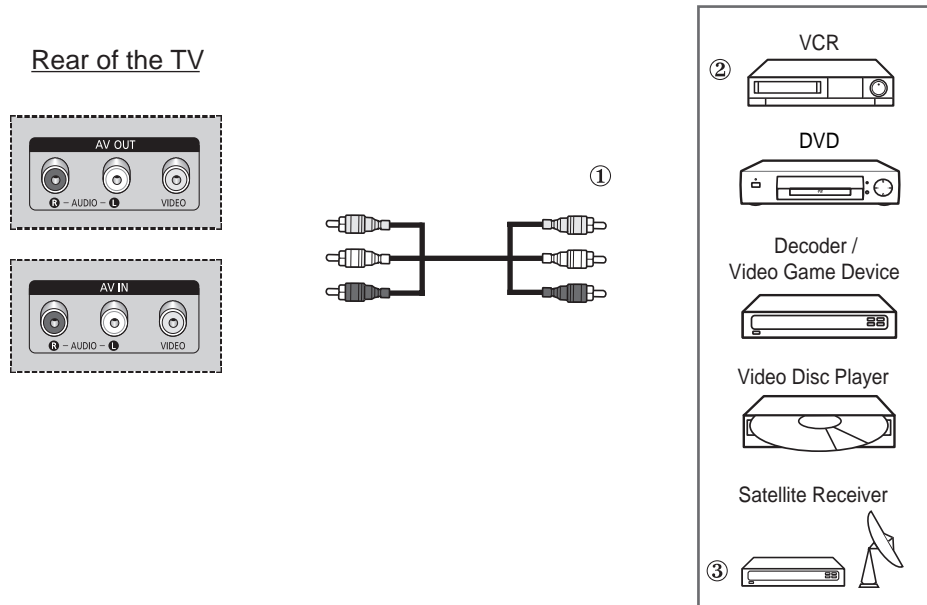

① This end can be fitted with:
  ◆ Three RCA connectors (VIDEO + AUDIO L/R)

② If you have a second VCR and wish to copy cassette tapes, connect the source VCR to "AV IN" and the target VCR to "AV OUT" so that you can redirect the signal from "AV IN" to "AV OUT".

③ When you wish to record a programme, connect the receiver to "AV IN" and the VCR to "AV OUT" so that you can redirect the signal from "AV IN" to "AV OUT".

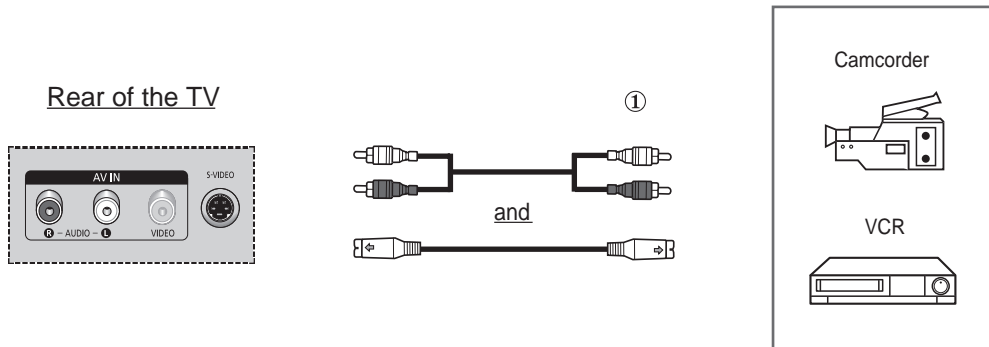➢ Please be sure to match the color coded input terminals and cable jacks.

14-1-5 Connecting to the RCA Input

➢ The RCA (VIDEO + AUDIO L /R) connectors are used for equipment, such as camcorders, video disc players, and some video game devices.

Rear of the TV

➢ Please be sure to match the color coded input terminals and cable jacks.
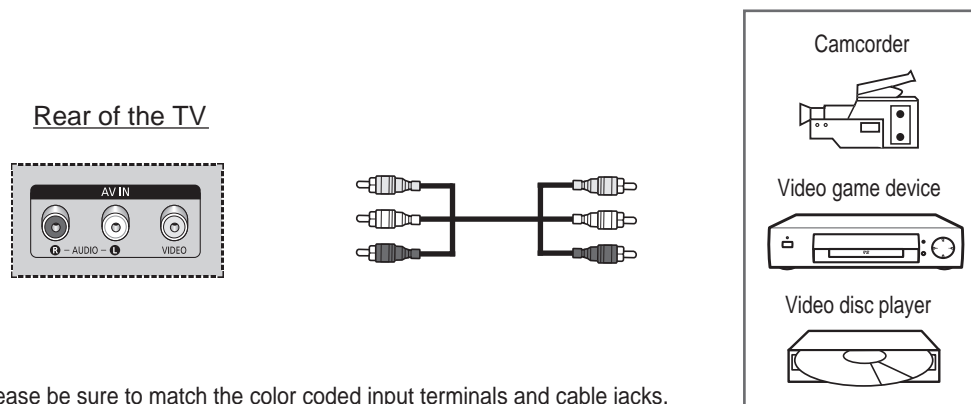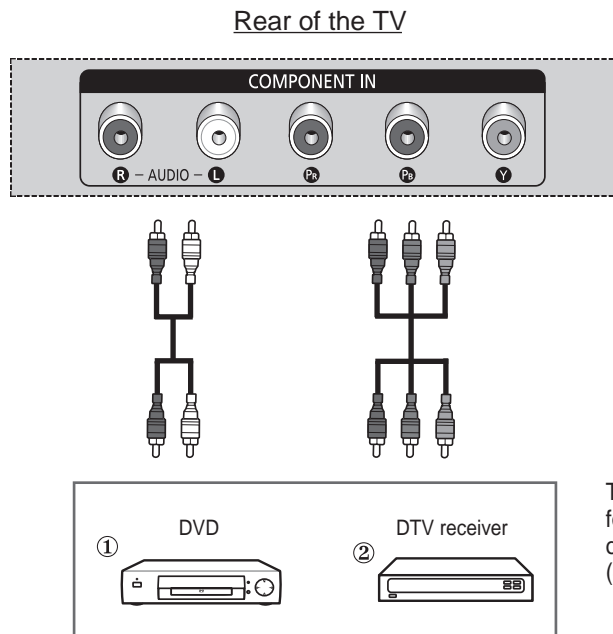
14-1-6 Connecting to the S-Video Input

➢ The S-VIDEO and AUDIO L /R connectors are used for equipment with an S-Video output, such as a camcorder or VCR.

Rear of the TV

① To play pictures and sound, both the S-VIDEO and AUDIO L /R connectors must be used.

➢ Please be sure to match the color coded input terminals and cable jacks.

## 14-1-7 Connecting to the Component Input

Rear of the TV

The COMPONENT IN connectors are used for equipment with a DVD or DTV receiver output.
(480i/480p/576i/576p/1080i)

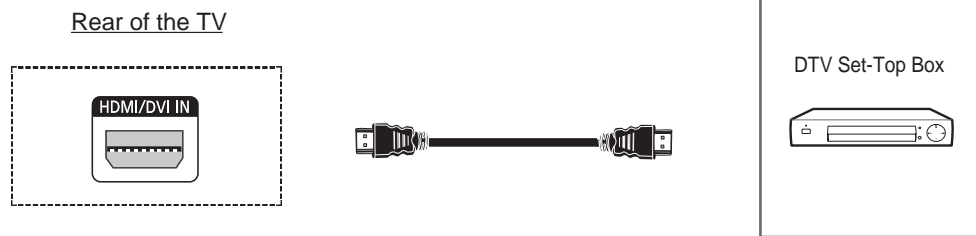➢ Please be sure to match the color coded input terminals and cable jacks.

14-1-8 Connecting to the PC Input

➢ The "PC IN" (video) and "AUDIO" connectors are used for interfacing with your PC.

Rear of the TV

PC IN   AUDIO

and

Personal Computer
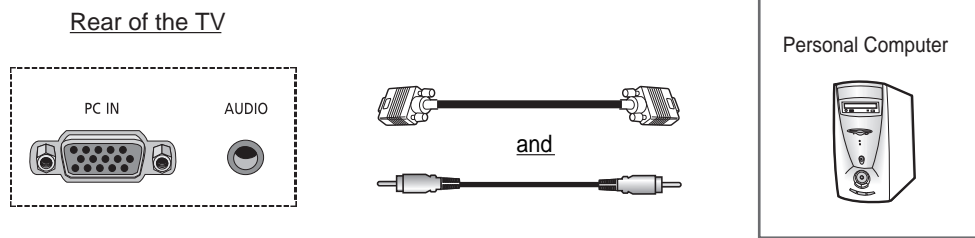
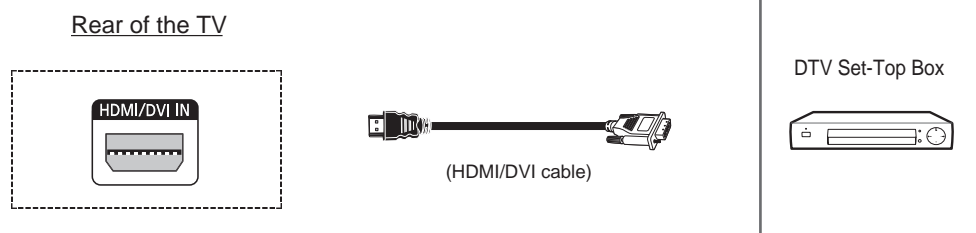## 14-1-9 Connecting to the HDMI Input

➢ The "HDMI/DVI IN" connector is used for equipment with a HDMI out.

Rear of the TV

HDMI/DVI IN

DTV Set-Top Box
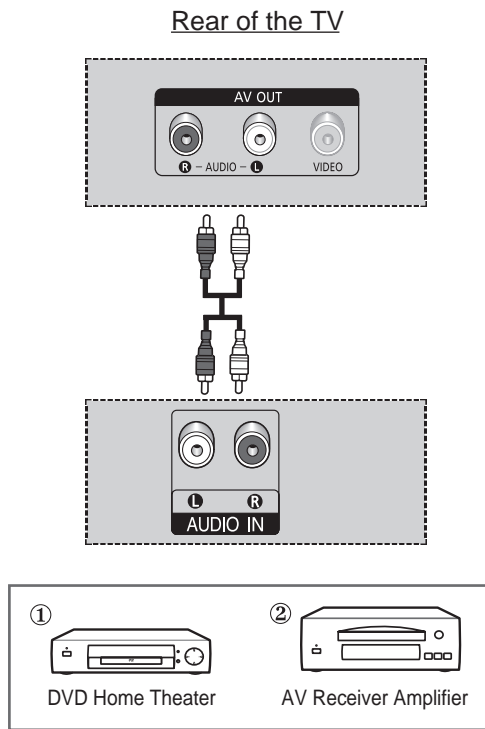
14-1-10 Connecting to the HDMI/DVI Compatible

➢ The "HDMI/DVI IN" connector is used for equipment with a DVI out.

Rear of the TV

HDMI/DVI IN

(HDMI/DVI cable)

DTV Set-Top Box

14-1-11 Connecting Home Theater System

Use the "AV OUT" ports of the PDP for Home Theater System Connections.

Rear of the TV

Connecting the Home Theater System

① Connect the monitoring audio out L and R jacks of the AV OUT on the rear-side connection panel of the PDP TV to the AUDIO IN jacks of the DVD Home Theater System (or AV Receiver) using the audio cable.

② Press the SOURCE (⊟) button to select the desired external device connected to the PDP TV.

③ If you want to hear the sound through separate speakers, cancel the internal amplifier.

DVD Home Theater   AV Receiver Amplifier

➢ Please be sure to match the color coded input terminals and cable jacks.

☞ ◆ Refer to corresponding user's manual from the manufacturer for wiring the speakers to the DVD Home Theater System (or AV Receiver).

◆ Disable the PDP TV internal speaker to enjoy the rich sound through the speakers of your Home Theater System.

To Display the DVD Home Theater

! Turn the PDP on and press the SOURCE (⊟) button to select the Ext.1, Ext.2, or Component .

@ Be sure to connect the video cable properly if desired external input (Ext.1, Ext.2, or Component) cannot be selected.

Play the DVD after activating the DVD Home Theater System.

$ Use the volume control of the Home Theater System while watching the PDP using the DVD Home Theater, where the PDP TV does not produce the audio.

14-1-12 Other issues related to other products

Problem	Descriptions
A fixed screen can cause permanent damage to the TV Braun tube.	Braun, PDP and LCD TVs can all be damaged. When a still image is displayed in a sequence, this can leave stains or after-images due to the characteristics of the panel. However, the DLP TV has the advantage that no stains or after-images are left on the screen. The DLP TV has mirror pixels on the DMD panel that project the beam onto the screen, in which the mirror is a digital representation of 0s and 1s, leaving no trace of light. The mirror returns to a blank state so that no stains or after-images are left.
Confusion between the ANYNET Port and the SERVICE Jack Port	The SAMSUNG SKY500N model has both an ANYNET port and a SERVICE jack port. Because the shape of the ANYNET port on the DLP TV is the same as that of the SERVICE jack port of the SKY500N, it fails to turn the TV off after a connection has been reported. The ANYNET port uses an RS232 port called Phone Jack, and the SERVICE jack port also uses the RS232 port. However, you must not connect the SERVICE port and the ANYNET port. Check if the port is the ANYNET port or the SERVICE port before connecting the port. Even if the TV cannot be turned on after connecting, the TV will turn on if you disconnect the connection.
Length of DVI Cable / PC RGB Cable	- A too long DVI cable may cause a malfunction or degradation of the visual quality due to an attenuation of the signal. There is no recommendation for the cable length at present. In general, although a cable length of up to 5 meters should work, please check if video is properly displayed on the screen after connecting. If you think the length of the cable is longer than for normal use, check the visual quality of the video on the screen and shorten the length, if necessary. - This also applies to the PC RGB (D-Sub) cable. When the length of the cable is longer than for normal use, video may not be displayed on the screen. In this case, shorten the cable length.
When a digitally distributed TV user receives HD-rated broadcasts:	The digital distributed TV (Ready Technique) can render HD sources as HD-rated. However, you need to install a set-top box for this purpose. The digital TV alone cannot render HD broadcasting as HD-rated. Install the formal set-top box for HD broadcasts.
When a digital distributed TV user selects normal size (4:3) to receive SD-rated digita broadcasts:	The digitally distributed TV (Ready Technique) renders any broadcasting service as SD-rated. However, when connected to a set-top box, the digital TV renders HD broadcasts as HD-rated and renders SD as SD-rated. The screen size is scaled to 4:3.
When a digitally built-in TV user receives SD (air) broadcasting:	The digitally integrated TV ("built-in" type) renders SD broadcasting as SD-rated. This can be understood easily. Even a high-resolution TV cannot improve a low resolution picture into high quality. In contrast, an SD-rated TV cannot represent HD broadcasting as HD because the resolution of the TV is lower than the original.
When selecting a picture size of 4:3 in connection with a computer or a multimedia device:	The representation capability of SD or HD-rated depend entirely on the TV set. The HD TV can render HD broadcasting as HD-rated only when it receives HD sources. In the meantime, the HD TV renders SD as SD-rated when it receives SD sources. The picture size has nothing to do with the resolution; TV models like SVP-XXL3HD or SVP-XXL6HD have a size adjustment feature to 16:9, 4:3, Panorama, Zoom1, Zoom2 and Auto Wide. This is about the aspect ratio of the top and bottom boundaries to the overall screen and users can select their preference.

■ SD/HD broadcasts and the TV's display capability are related

1. A digital broadcast should be transmitted in wide screen (an aspect ratio of 16:9) HD. If the broadcasting station converts a conventional program created in normal screen (aspect ratio of 4:3) into a digital signal and broadcasts the signal, the left and right of the picture will not be displayed.
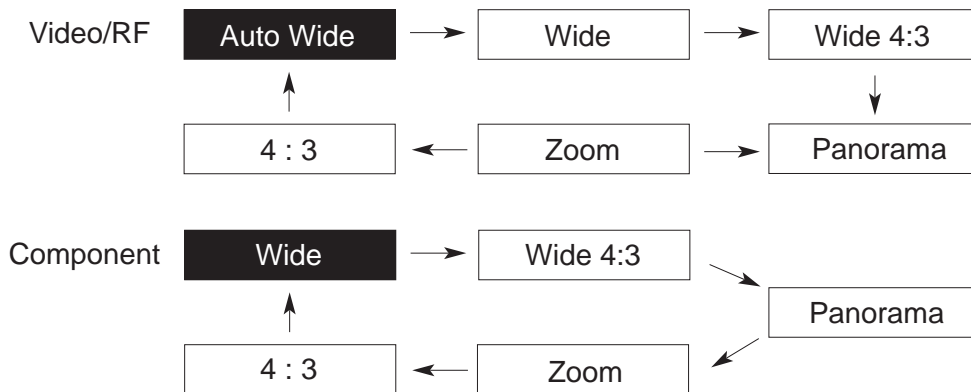   This symptom also appears in other manufacturer's TV's. The three appliance companies are trying to resolve the problem through the Ministry of Information and Communication.
   ∗ When watching an SD (normal) broadcast through a Digital (Wide) TV (480P normal broadcast)
   ∗ When watching an SD (normal) broadcast through a Digital Ready (Wide) TV (Using a set-top-box)
   ∗ When watching an analog (normal) broadcast through a wide TV
      (When watching a broadcast after changing the aspect ratio of the TV from 16:9 (wide screen) to 4:3)

2. When watching a DVD title or video tape in wide screen (21:9) through a wide (16:9) TV, watching video from a computer or game console by selecting the aspect ratio to 4:3, or watching video from a DVD, VCR, computer or game console through a wide TV by selecting the aspect ratio to normal (4:3) or wide (21:9), the left and right, or top and bottom of the picture will not be displayed.
   This symptom appears in other manufacturer's TV's. The three appliance companies are trying to resolve the problem through the Ministry of Information and Communication.

■ Changing the Order of the Picture Size for 16:9 Display Devices

Video/RF: Auto Wide → Wide → Wide 4:3 → Panorama → Zoom → 4:3 → (back to Auto Wide)

Component: Wide → Wide 4:3 → Panorama → Zoom → 4:3 → (back to Wide)

■ Changing the Order of the Picture Size for DTV 1080i/720p Sources

PC/HDMI: Wide ↔ 4:3

■ Restrictions

1. When you want to change the picture size in PIP 'ON', you must turn the PIP off before changing the size.
   However, you can change the main picture size even in PIP ON for products with no restrictions.

2. When the picture size is not Normal (4:3 for 4:3 display devices, 16:9 for 16:9 display devices) and you turn PIP on, the picture size is changed to Normal.
   However, you can turn PIP on without changing the picture size for products with no restrictions.

3. In the OSD notation for the picture size, 16:9 is represented as "Wide" instead of "16:9" for devices other than with 16:9 dislays.
   Ex: For LCD 15:9 devices, "Wide" is displayed on the OSD instead of "16:9".

4. The picture size can be changed even in the blue screen.
   However, the picture size should be controlled by the product specifications if the change is impossible due to hardware restrictions.

14-2 Technical Terms

Virtual Channel
In digital channels, a virtual channel is used. A virtual channel is a function that enables users to watch a channel by selecting a virtual channel number regardless of the region of the user. Run Auto Channel Scan for digital broadcasts, tune in to a UHF channel number according to the region for terrestrial broadcasts, or tune into a channel number allocated by the cable broadcasting station for a cable TV network, and then select a displayed virtual channel.
For example, even if you tune into channels UHF 14(MBC), 15(KBS1), 16(SBS), 17(KBS2) and 18(EBS) broadcast from Kwanak mountain in Seoul, you can watch the channels using virtual channels such as 11-1(MBC), 9-1(KBS1), 6-1(SBS), 7-1(KBS2) and 10-1(EBS) regardless of your region and the actual local channel number. The virtual channel numbers may be used nationwide, but the virtual channel numbers may vary depending on the local broadcasting stations.
(Since the digital channel numbers may vary depending on your region and can be changed by the broadcasting policy, ask your local broadcasting station or regional cable TV network company about the channel numbers.) If the virtual channel numbers are saved and the TV set can receive digital broadcasting, you can watch a digital channel by pressing the DTV+ button and pressing the first two digits of the corresponding virtual channel number.

Custom Color Adjustment
Using this function, a user can adjust the color according to personal preferences (Red, Grass-Color, Sky-Color, Gold-Color, Skin-Color, White, Standard, Custom) without affecting other colors using automatic selection mode or fine adjustment mode.

Simultaneous Screen
Using this function, a user can view two video signals from separate video sources on a single screen at the same time. For example, you can watch TV and video simultaneously.

Dolby Digital
This is the digital sound standard developed by the Dolby Laboratory. You can select your preferred digital surround mode after connecting external speakers.

Digital Broadcasting
Digital Broadcasting is a television broadcasting signal digitized and transmitted according to the United States' terrestrial digital broadcast standard, or ATSC.

Mono
A type of audio interface that transmits the audio signal through a single channel only.
Through a mono interface, it is hard to experience stereophonic sound and the sound is played using only one speaker.

Reception Sensitivity Amplification (LNA)
A signal amplification technique that amplifies a weak broadcasting signal by applying satellite technology to provide better visual quality even for users in regions where only a weak broadcasting signal is available. (LNA: Low Noise Amplifier)

Sub Woofer
A Sub Woofer is a speaker for ultra bass sound output only whose frequency is as low as 150Hz. There are two types: an active type which includes an amplifier, and a passive type, which requires an additional amplifier.

Stereo
A type of audio interface that transmits audio signal through 2 channels.
Stereo transmits audio signals for right and left sound so that you can experience stereophonic sound, and the sound is played through 2 speakers.

Partial Color Blind Person Mode
Using this function, a user can adjust the red, green or blue colors according to the preferences of the partially color-blind person so that he or she can view the clearest possible picture on the screen.

Analog Broadcasting
Analog Broadcasting is a television broadcasting signal transmitted according to the NTSC standard.

ANTENNA IN Port
The port connecting the TV aerial via a coaxial cable. It is generally used for watching public broadcast programs.

English Caption
A function that displays English captions or text information included in the broadcast signal or video tape. You can use this function for your English studies by watching AFKN or CC marked video tapes.

Video/Audio Ports
You may experience poor visual and audio quality when watching a video tape on channel 3 or 4 through the antenna cable. You can experience better visual and audio quality by connecting the TV and VCR through the Video/Audio ports. The video port is in yellow, and the audio ports are in white and red.

Wide Screen
Wide Screen refers to a screen that is horizontally longer than a conventional TV screen.
While the aspect ratio of a normal TV is 4 ：3, that of a wide screen is 16 ：9.

External Input
External Input is a connected video device such as a VCR, camcorder, DTV receiver, DVD, etc. as a video source.

Satellite Broadcasting
Satellite Broadcasting transmits programs via satellite so that a program can be viable in all areas at a high visual and sound quality. Approximately 100 channels including public broadcast channels are provided. To view a satellite broadcast, you have to install an additional receiver.

Wire Broadcasting
Wire Broadcasting refers to movie, entertainment and educational programs transmitted by a broadcasting station within a hotel or school.

Audio Multimix
Audio Multimix provides 2 audio languages when foreign movie, drama, news, etc. are broadcast. You can select and listen to one of the supported languages or you can select and listen to both languages simultaneously.

After-Image Protection
Using this function, a user can configure the options necessary for protecting the PDP TV screen.

Power Saving Mode
This function adjusts the screen brightness according to the ambient brightness so as to conserve power.

Component Port
The Component Port transmits a separate luminance signal as well as the green, blue, and red color signal and provides the best quality of all video connection types.

Cable Broadcasting
Cable Broadcasting transmits programs via cable instead of via the air. To view cable broadcasting, you have to subscribe to your local cable broadcast service provider and install an additional receiver.

Tuner
A device that enables the selecting of specific channel frequencies for TV or radio.

Panorama Screen
This refers to a screen that corrects the picture distortion due to a screen size mismatch on the TV.

Progressive Scan
Progressive scan displays the entire frame in a single sweep so as to provide clearer and sharper visual quality.

Anynet
Anynet is an AV network system that enables an easy-to-use AV interface for users by controlling all connected AV devices through the Anynet menu when the AV devices of Samsung Electronics are connected.

DVD (Digital Versatile Disc)
DVD is a large capacity storage media that can store multimedia content such as video, games, audio applications, etc. using MPEG-2 video compression technology on a CD sized disc

DRC
This is a sound quality enhancement function that automatically controls audio output so as to prevent sound quality distortion even at loud volumes and correct the sound to the speakers so that you can listen to the sound at the original sound quality.

DVI (Digital Visual Interface) Port
A DVI interface is a standard for high definition television connectivity. It provides a clear picture on the screen using TMDS which minimizes video signal loss.

DVI-D Cable
A type of DVI connector. Using this cable you can only transmit digital signals.

DVI-I Cable
A type of DVI connector. Using this cable you can transmit either digital or analog signals.

HDMI
HDMI (High-Definition Multimedia Interface) is the first industry-supported, uncompressed, all-digital audio/video interface. HDMI provides an interface between any audio/video source, such as a set-top box, DVD player, and A/V receiver and an audio and/or video monitor, such as a digital television (DTV). HDMI supports standard, enhanced, or high-definition video, plus multi-channel digital audio on a single cable. It transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements.

PCM
PCM (Pulse Coded Modulation): This refers to an uncompressed digital signal. Use this for an AV amplifier that does not support 5.1 channels when connecting the audio output via optical or coaxial cable.

SRS TruSurround XT
This function provides 5.1 channel surround sound using 2 channel speakers when inputting a stereo audio signal.

VESA Plug & Play

This function enables the automatic recognition of devices when connecting the TV to the computer without additional settings.

VHF/UHF

VHF refers to TV channels 2 to 13, and UHF refers to TV channels 14 to 69.

S-VIDEO IN Port

This is called super video. S-Video is a type of video signal which has the video luminance and the color signal separated in order to provide better visual quality.

Pixels, Resolution

The pixels are the number of small dots that make up the TV screen. The resolution represents the number of pixels on a screen. For example, if the resolution of a TV is 1366 * 768, it means the width of the screen consists of 1366 pixel columns and the height of the screen consists of 768 pixel rows. In this case, the total number of pixels on the screen is 1,049,088. The more pixels there are, the higher the visual quality that can be achieved because the picture on the screen is displayed with more pixels and therefore with more detail.

1 Pixel = 3 Sub Pixel(R+G+B)

42HD = 786.4K Pixel
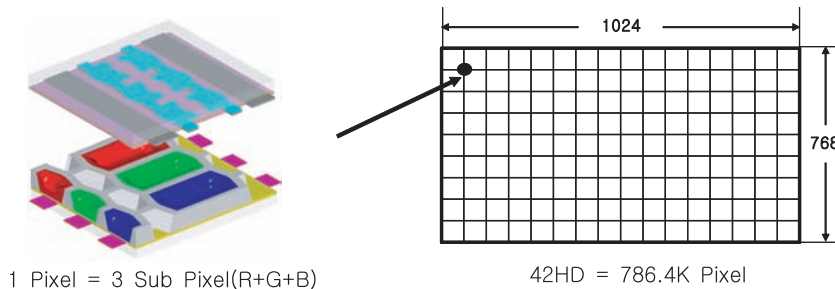
Gradation, Color Depth

Gradation describes the number of gradual brightness levels. Since all information is represented by binary numbers in a digital system, the Gradation is determined by the number of bits used to represent the brightness levels of a pixel on the TV screen. For example, if a pixel is represented by 8 bits, the Gradation is 28 or 256. Since a TV uses the three primary colors of light, R, G and B, the number of possible colors for a pixel is 256 x 256 x 256, 16,777,216, or 16.7 million colors. If 12 bits are used for a pixel, the gradation is 212 or 4096 for a color. Since three colors R, G and B are used, 4096 x 4096 x 4096 or 68.7 billion colors are supported per pixel. Since 68.7 billion colors are far more than 16.7 million colors, the picture will be displayed by far more abundant and natural colors using a 12 bit pixel. That is, since Gradation means the number of brightness levels, color represented by 4096 levels appears more natural than color represented by 256 levels.

Contrast

The contrast is the ratio of brightness of the brightest color to the darkest color. The contrast is calculated by dividing the brightness of the brightest color by the brightness of the darkest color. For example, if the brightness of the darkest color is 1 and the brightness of the brightest color is 3000, then the Contrast is 3000/1 or 3000. A higher contrast means that a dark color is displayed darker and bright color is displayed brighter so that the screen contrast can be easily distinguished. The contrast differs from the Gradient which means the number of brightness levels.

Therefore, if someone says that a 5000:1 contrast displays a color by 5000 levels, he is confusing Contrast with Gradation.
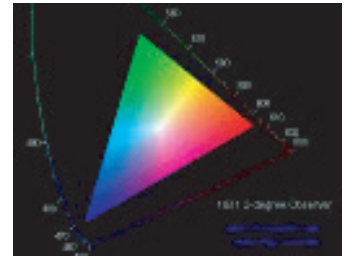
Brightness

Brightness is the brightness per unit screen area, the unit for brightness is candela (cd). For example, 1000cd/m2 means the brightness that is measured when 1000 candles are lit within 1 square meters area.

Color Reproductivity

Each color displayed on the TV screen is implemented by a pixel on color coordinates which have an X and Y axis.

For example, when a pixel on the X coordinate 0.65 and the Y coordinate 0.74 is displayed as a color and it becomes visible on the TV screen. While the possible color coordinate area is very wide, the color coordinate area of the signal broadcast from a broadcast station is smaller than that of possible color coordinates. Moreover, a TV provides a smaller color coordinate area than that of the signal from the broadcasting station even though the size of the color coordinate area varies depending on the TV model. In general, Color Reproductivity is used as follows:

The Color reproductivity of a TV is a certain % of NTSC. This means the TV displays that particular % of the color coordinate area of the NTSC signal broadcast by the broadcasting station. In general, a CRT TV provides the highest functional color reproductivity.

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