

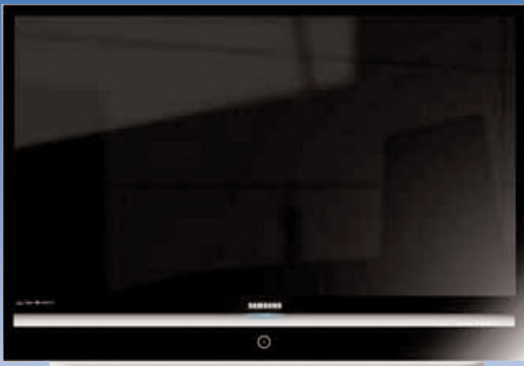


# DLP TV

Chassis : L66A(N)\_Galilei  
Model : HLS5087WX/XAA

# ***SERVICE*** Manual

## DLP TV



HL-S5087W

## FEATURES

- HD Built in TV
- NTSC/ATSC Tuner Embedded
- Digital Audio output (OPTICAL) jack
- Firmware upgrade by USB Port /Wise Link



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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.

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 transformer 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).

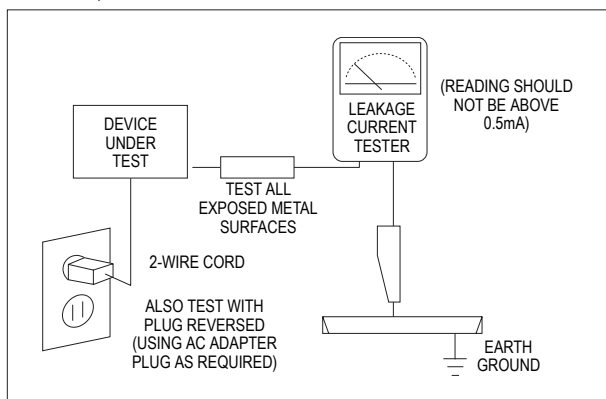




Fig. 1-1 AC Leakage Test

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 transformers, 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.

## Precaution

### 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.

## 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.

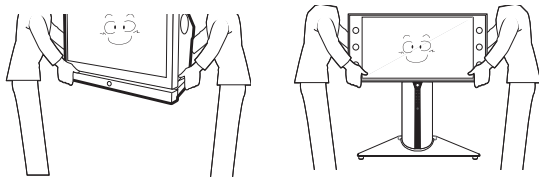
### CAUTION

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

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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. When installing the product, make sure to keep it away from the wall (more than 10cm/4 inches spacing should be around the Top, Back, and both sides of the unit) for ventilation purposes.  
Poor ventilation may cause an increase in the internal temperature of the product, resulting in a shortened component life and degraded performance.
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 repositioning 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. Contact with 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. Check the basics of the screen test.  
- Image position/size, Tilt adjustment, Actuator activation

# MEMO

## 2. Product Specification

### 2-1 Product Features

Block	Specification	Major IC	Remark
DMD	- Panel Resolution : 1920x1080	xHD5 DMD Panel	
RF	- Intergrated HDTV Tuner (NTSC/ATSC TUNER Embedded)	QamLink	
Power	- Input Voltage : AC110V~120V - Stand-By : under 1W	Stand-by (KA1M0565)	
Video	- MPEG2 Decoder/Analog Decoder. - IPC, Scaler, Video enhancer	S5H2201, TC90103 SDP51,SDP52,SDP42	
Sound	- speaker : 10W + 10W - Trusurround XT, Dolby Digital	STV8258	
Cabinet	- K3 Design		

#### ■ Chip Description

- S5H2201 : SAMSUNG S5H2201 HD-TV Audio/Video Decoder Processor is designed to provide a cost-effective, low power size and high performance micro-controller solution for HD-TV,SD-TV, STB applications. To reduce total system cost, S5H2201 also provides the following features: separate 4KB Instruction and 4KB Data Cache, an improved audio DSP, a programmable video encoder with a dual output capability of interlaced and progressive scan, Memory controller, 4-channel Timers with PWM, I/O Ports, 2-channel 8-bit ADCs, 5-channel 10-bit DACs, 2-channel UARTs with handshake, IIC-BUS interface, IIS-BUS interface, SIO, Memory-Stick(NOTE) Card Interface and PLL for clock generation.
- SDP51 : SDP51 is the chip for NR, FDP(Film Detection Processing), and IPC and it's for the video quality improvement of the flat panel TV which DTV signal is in need. For this, HD level Progressive image with the high quality will be produced when the signal with Noise Reduction is treated with Spatial/Temporal Interpolation. Film mode is processed for the film image by Film Detection Processing, and the video quality gets better with the several signal processing such as VPP(Vertical Peaking Processing). SDP51 provides 10 bit processing, Test Pattern Generator, variable Display size correspondences, and variable input/output format supports.
- SDP52 : SDP52 is developed for the high efficient scaling and the applied algorithms for SDP52 are five.
  - \* MPEG Noise Reducer
  - \* Color Transition Improvement
  - \* Auto-Wide
  - \* Pre-processor
  - \* Main/Sub Scaler
  - \* Jagging Remover
- TC90103 : 3D Comb & Video Decoder  
The TC90A103FG analog video front-end processor integrates 3DYCS for NTSC, multi standard 3L-YCS, 3D- YNR/CNR, digital multi standard color decoding, and 5-Mbits DRAM in a compact LQFP144 package. Features

- STV 8258 : The STV82x8 family, based on audio digital signal processors (DSP), performs high quality and advanced dedicated digital audio processing. These devices provide all of the necessary resources for automatic detection and demodulation of analog audio transmissions for NTSC TV broadcasts. Virtual or true, multi-channel capabilities and easy digital links make them ideal for digital audio low cost consumer applications. Starting from enhanced stereo up to independent control of 5 loudspeakers and a subwoofer (5.1 channels), the STV82x8 family offers standard and advanced features plus sound enhancements, spatial and virtual effects to enhance television viewer comfort and entertainment.

■ Important efficiency comparison

Item	X226B+GM1601(Before)	S5H2201+SDP51/52(After)
480i Input (Bit Resol.)	- 480i(8)→480p(8)→1080i(8)→1080p(10) - De-interlacing No. 2 :Picture quality deterioration	- 480i(10)→480p(10)→1080p(10) - De-interlacing No. 1
1080i Input (Component)	- Input 8bit, Output 10 bit - ME/MC IPC :480i	- Input 10bit, Output 10bit - ME/MC IPC :480i, 1080bit
Graphic Display	- X226B→DNle(P.E)→GM1601(IPC/Scale) - DNle Picture quality improvement, IPC/Scaler pass→Graphic deterioration	- S5H2201→DNle(Separate Port→ No P.E) - 1080p graphic muxing to the final output
NTSC Input	- 3D-comb : Main(Upd64083) - Super NR : Main(DNle)	- 3D-comb→Main(TC90103FG) - Super NR→Main/Sub(2xSDP51)

■ The advantages of SDP51/52

- The world's first Noise Reduction with the ME/MC tool application to 1080p Signal
- ME/MC IPC with the best performance in the world  
The clear character reproduction with Ticker Detection & Compensation
- DTV Picture quality differentiation with MPEG Noise Reduction(De-blocking/De-Ringing)
- Extended definition and uniform Scaling implementation with the horizontal 12tap and the vertical 8Tap Scaler
- Natural Edge implementation with De-Jagging function
- Pattern and fine signal sharpness improvement by Pre-Scaler and DE



## 2-2 Key Features

Model	HL-S5087W
Voltage	AC 110 - 120V~
Frequency of Operation	60Hz
Power Consumption	230 watts
Dimensions (W x D x H)	60.63 x 22.44 x 43.39 inches 1540 x 570 x 1102 mm
Weight	36 Kg / 79.37 lbs

### ■ H/W Configuration

- DMD Panel : 0.65" (1920 x1080p, TI)
- 1 Optical Engine for the Panel : Slim and Cost-effective
- Color Wheel : Y/R/C/B/G 5Color
- Lamp : 132W (50",56",61",67"71")
- NTSC/ATSC Tuners : NTSC/DTV Reception
- Support HDMI Interface : Adopts DVI/HDMI systems for digital HDs including STB.
- DNle4 : High quality image implementation
- USB Interface : Use the USB interface for service purposes (S/W Upgrade),Wise Link

### ■ S/W Configuration

- MCU : Albatross CPU
- 4-Layered Architecture : Device Driver/OS/Hardware Abstraction/Application
- OSD : 32Bit True Color Graphics OSD
- Enhanced system stability by separating the DTV control and the application control systems into multi-processes.

### ■ Picture

- DMD Panel
  - \* Panel Size : 0.65"
  - \* Panel Resolution : 1920 x 1080
- Tuner : Integrated HDTV Tuner (NTSC/ATSC Embedded)
- Display Format : 1920 x 1080

### ■ Sound

- Sound System : TruSurround XT,Dolby Digital
- Amp/Channel : 2 Channel Digital Amp
- Speaker System & Output(RMS)
  - \* Sound (RMS) : 10W + 10W

### ■ In/Out Terminals

- Rear : 2 RF In, 3 CVBS In, 2 S-VHS In, 2 Component In, 1 PC D-SUB In,  
2 HDMI In(DVI Comportable With Adaptive Jack Only) 1 Optical audio, 1 RS-232C port

## Product Specification

### ■ Feature

- Component Interface (480i/480p/720p/1080i/1080p, Y/Pb/Pr)
- Digital Interface : HDMI
- Graphic Interface : PC
- Language : English/French/Spanish
- Picture Size : 4:3/16:9/Zoom1/Zoom2/Wide Fit
- V-CHIP
- Closed Caption
- Sleep Timer : 180 Min.
- Optical sound output
- RS-232C
- Wise Link




### ■ Remocon

- TM87B





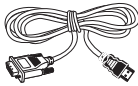




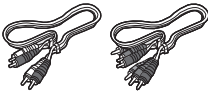
### ■ Power Supply

- AC 110V~120V

## 2-3 Specifications Analysis

Model		HL-R5078W	HL-R5668W	HL-S5087W
Design				
Picture	Display Device	DLP	DLP	DLP
	Built-in Tuner	ATSC, NTSC	ATSC, NTSC	ATSC, NTSC
	Display Format	1080p, 1080i, 720p, 480p, 480i	1080p, 1080i, 720p, 480p, 480i	1080p, 1080i, 720p, 480p, 480i
	Screen Size	50 inch	56 inch	50 inch
	Aspect ratio	16:9	16:9	16:9
	Progressive scan	Yes	Yes	Yes
	Digital Comb Filter	3D Comb	3D Comb	3D Comb
	First Surface Mirror	Yes	Yes	Yes
	Brightness	800cd/ m <sup>2</sup>	600cd/ m <sup>2</sup>	600cd/ m <sup>2</sup>
	Contrast	10000:1	10000:1	10000:1
	Color Wheel Size/Bearing	7segment/65 φ , Air Bearing	7segment/65 φ , Air Bearing	7segment/65 φ , Air Bearing
	Anti-glare Sun Screen	No	No	No
	Screen Pitch	0.098mm	0.098mm	0.098mm
	Image enhancer	DNle4	DNle4	DNle4
DMD	xHD3	xHD3	xHD5	
Audio	Base/Tremble/Balance	No	No	No
	Equalizer	5 Band	5 Band	5 Band
	Auto Volume Leveler	Yes	Yes	Yes
	Surround Sound	TruSurround XT Dolby Digital	TruSurround XT Dolby Digital	TruSurround XT Dolby Digital
	Speaker system	2 Way 4 Speaker	2 Way 4 Speaker	2 Way 4 Speaker
	Output Power	15Wx2	15Wx2	10Wx2
Features	2-Tuner Split-Screen PIP	Yes(HD/SD/QAM)	Yes(HD/SD/QAM)	No
	Split-screen Side-by-Side	Yes	Yes	Yes
	MTS with dbx Noise Reduction/SAP	Yes	Yes	Yes
	Still Picture	Yes	Yes	Yes
	Wise Link	No	No	Yes
Connections	Plug & Play	Yes	Yes	Yes
	S-Video In	Rear 2, Side1	Rear 2, Side1	Rear 2
	HDTV Component Video Input (Y, Pb, Pr) 1080p/1080i/480P/480i	Rear 2	Rear 2	Rear 2
	PC	Yes	Yes	Yes
	HDMI	Yes	Yes	Yes
	Digital Sound	Optical 1	Optical 1	Optical 1

## 2-4 Accessories

Accessories		Item	Item code	Remark
Supplied Accessories		Remocon Alkaline Battery	BP59-00107A 4301-000103	Samsung Service center
		Manual	BP68-00588A	
		Cloth-Clean	BN63-01798A	
		Power Cord	3903-000144	
Accessories that can be purchased additionally		HDMI/DVI cable	-	Internal shopping mall
		HDMI Cable	-	
		S-VIDEO Cable	-	
		Optical Cable	-	
		Antenna Cable	-	
		Component Cables (RCA)	-	

## 3. Alignment & Adjustment

### 3-1 Service Instruction

■ Check items listed after changing each

Replaced Items \ Check Items	S/W Version	Front LCD	Index Delay	Actuator Gain	V-Position H-Position	CCA	Board LED	Tilt Focus
Main Board	●	●	●	●	●	●	●	
Rear Board		●					●	
Power Board		●					●	●
Optical Engine		●	●	●	●	●		●
DMD Board				●	●			●
Lamp		●						
Color Wheel			●					
Front LED Assy		●						
Actuator		●		●			●	

※ The Rear board is irremovable and supplied as a separate part in the field

1. Software version check :

After Entering the Service mode, Check the list below

\* S/W Notation

"T\_GALIAOS0\_0001" indicates "GALILEI BASIC MODEL USA, ver. 0001".

T\_GALIAUS0\_00XX  
2006\_XX\_XX  
T-GALIUCOM5-60XX  
T-GAIAUS1\_XX

2. Front Information Window check : See page 6-7.

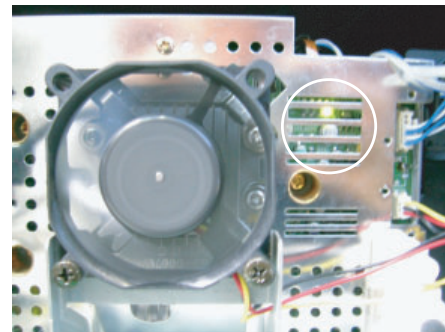
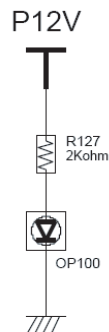
3. Index Delay adjustment : See page 3-20.

4. Actuator Gain adjustment : See page 3-23.

5. Vertical / Horizontal Position adjustment : See page 3-20.

6. CCA : See page 3-20.

7. Board LED check : Check the LED is turned on.  
(In the DMD Board)



8. Tilt/Focus adjustment : See page 3-25/26.

## 3-2 How to Access Service Mode

1. Turn off the power to put the unit into the STAND-BY mode.
2. In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" button on the Remote Control.  
In case entry into SERVICE MODE is unsuccessful, repeat the procedures above.
3. Initial DISPLAY State in times of Service Mode Switch overs

OPTION	CHECKSUM
DDP3021	SERVICE
CCA(OFF)	
SP Actuator	
DNIE	
TC90103	
SAA7119	
MST33X9	
SDP51(M)	
SDP51(S)	
SDP52	
S5H2200	
KS1409-TUNER	
STV82X8	
Cinema CCA	
ESP	
T_GALIAUS0_00XX	
2006_XX_XX	
T-GALIUCOM5-60XX	
T-GAIAUS1_XX	

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
Enter	Item Selection/execution

**3-3 Factory Data**

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

## 1. OPTION

No	Item	Range	Default	Remark
1	Factory Reset			
2	Lamp Control	0~1	Always	Dynamic, Always
3	WB Reset	ON/OFF	OFF	Initialize the White Balance value
4	EER Reset	-	-	Clear the EEPROM
5	<u>DIGITAL -&gt; DMD</u>	-	-	
6	Lamp Clear	-	-	Initialize lamp usage time. Lamp Life is set to zero
7	Lamp Life		h	Lamp on time counter
8	AUTO POWER	ON/OFF	ON	The sets turns on automatically when the power cord is plugged in
9	DNle Demo	ON/OFF	ON	DNle Demo function selection
10	MUTE TIME(Video)	0~1000	440	Time which the screen will be black while switching
11	DDC Protection	ON/OFF	ON	DDC write ON/OFF selection
12	LNA Default	ON/OFF	Auto	LNA setting OFF/Auto selection
13	PROTECT	ON/OFF	ON	Protection ON/OFF selection
14	WATCH DOG	ON/OFF	ON	Watch Dog ON/OFF selection
15	WD COUNT	0	0	Count for Watch Dog event
16	DBG/RS232 SEL	0~1	RS232	Rs232/Debug
17	BUS STOP	ON/OFF	OFF	
18	FACTORY	ON/OFF	ON	
19	SMART DEBUG	ON/OFF	OFF	All user settings are set to default
20	EER COUNT ON/OFF	ON/OFF	OFF	
21	EER COUNT		0x90d0	
22	LNA+		ON	
23	LNA Check Count		10	
24	Downloadable US RRS	ON/OFF	OFF	
25	<u>DMD→DIGITAL</u>	-	-	To trans the CCA data form DMD to DIGITAL

## 2. DDP3021

No	Item	Range	Default	Remark
1	<u>V-Position</u>	0 ~ 60	30	Screen upper and lower adjustment
2	<u>H-Position</u>	0 ~ 120	60	Screen left and right adjustments
3	<u>LAMP SYNC</u>	0~3	2	Pulse(P), Pass(T)
4	<u>INDEX DELAY</u>	0 ~ 359	45	Synchronizes the base position of the color wheel with the corresponding color signal. This is critical to the natural color display. If the index delay is not properly set, even the correct CCA coordinates will not help when displaying natural colors.
5	SEQ SELECT	0~15	0x05	Sequence Selection
6	V-FLIP	Flip/Nomal	Flip	Vertical Flip Operation
7	H-FLIP	Flip/Nomal	Flip	Horizontal Flip Operation
8	GAMMA	0 ~ 15	[4]OEM	Gamma Table Selection
9	CINEMA GAMMA	0 ~ 15	[0]FILM	
10	MPC	ON/OFF	OFF	MPC Funcion On/Off
11	DMD_BIAS	0 ~ 4	3	DMD Bias pin voltage selection
12	Lamp Boost	0 ~ 63	15	Lamp Boost value selection
13	Lamp Sync Delay	0~4095	120	Lamp Sync delay value selection
14	FPGA Select	XHD3/XHD4	XHD3	xHD3/xHD4 selection
15	Version	-	0x0000000	
16	<u>Lamp Select</u>	0~2	Philips	Philips, Osram, Ushio
17	<u>Lamp Watt</u>	120W/132W	132W	120W/132W
18	<u>Optic Select</u>	Auto/L680/K280	Auto	
19	<u>Test Pattern (DDP)</u>	0~18	0	This displays the built-in pattern of the DDP3021 chip. DDP3021 drives the DMD panel, so displaying this pattern means there is no error in the DDP3021 projection function and the panel itself.



## 3. CCA

No	Item	Range	Default	Remark
1	CCA	ON/OFF	ON	CCA On/Off Selection
2	Red-x	0~32768	646	Red-x adjustment
3	Red-y	0~32768	340	Red-y adjustment
4	Red-Y	0~32768	86	Red-Y adjustment
5	Green-x	0~32768	295	Green-x adjustment
6	Green-y	0~32768	620	Green-y adjustment
7	Green-Y	0~32768	300	Green-Y adjustment
8	Blue-x	0~32768	146	Blue-x adjustment
9	Blue-y	0~32768	58	Blue-y adjustment
10	Blue-Y	0~32768	53	Blue-Y adjustment
11	White-x	0~32768	274	White-x adjustment
12	White-y	0~32768	285	White-y adjustment
13	White-Y	0~32768	439	White-Y adjustment
14	Yellow-x	0~32768	424	
15	Yellow-y	0~32768	571	
16	Yellow-Y	0~32768	446	
17	Cyan-x	0~32768	183	
18	Cyan-y	0~32768	280	
19	Cyan-Y	0~32768	310	
20	DRedX	0~32768	646	Target Red X value for CCA

No	Item	Range	Default	Remark
21	DRedY	0~32768	340	Target Red Y value for CCA
22	DGreenX	0~32768	295	Target Green X value for CCA
23	DGreenY	0~32768	620	Target Green Y value for CCA
24	DBlueX	0~32768	146	Target Blue X value for CCA
25	DBlueY	0~32768	58	Target Blue Y value for CCA
26	DCyanX	0~32768	202	Target Cyan X value for CCA
27	DCyanY	0~32768	270	Target Cyan Y value for CCA
28	DMagentaX	0~32768	290	Target Magenta X value for CCA
29	DMagentaY	0~32768	139	Target Magenta Y value for CCA
30	DYellowX	0~32768	420	Target Yellow X value for CCA
31	DYellowY	0~32768	515	Target Yellow Y value for CCA
32	[COOL2] DWhiteX	0~32768	267	
33	[COOL2] DWhiteY	0~32768	276	
34	[COOL1] DWhiteX	0~32768	274	
35	[COOL1] DWhiteY	0~32768	285	
36	[NORMAL] DWhiteX	0~32768	283	
37	[NORMAL] DWhiteY	0~32768	269	
38	[WARM1] DWhiteX	0~32768	299	
39	[WARM1] DWhiteY	0~32768	314	
40	[WARM2] DWhiteX	0~32768	313	
41	[WARM2] DWhiteY	0~32768	329	
42	<u>WB Spread</u>	-	-	Spread CCA value to all mode

## 4. SP Actuator

No	Item	Range	Default	Remark
1	<u>Actu Gain[Patt 1]</u>	0~175	68	Actuator Gain adjustment
2	<u>Actu Gain[Patt 2]</u>	0~175	68	Actuator Gain adjustment
3	<u>Actu On/Off</u>	0~1	ON	Actuator On/Off selection
4	DB On/Off	0~1	ON	
5	DB Border	On / Off	OFF	
6	DB Weight	-	0%	
7	DB Gain	0~3	1	
8	DB Aperture	0~1	ON	
9	SB Gain	0~255	0	

## 5. DNIE

No	Item	Range	Default	Remark
1	Test Pattern(DNIE)	0~25	0	Test pattern selection
2	SNI_PROC_CEA	ON/OFF	ON	
3	SNI_PROC_CEP	ON/OFF	ON	
4	SNI_PROC_DEP	ON/OFF	ON	
5	SNI_PROC_DCE	ON/OFF	ON	
6	SNI_PROC_CCS	ON/OFF	ON	
7	SNI_PROC_BWS	ON/OFF	ON	
8	SNI_PROC_PCC	ON/OFF	ON	
9	SNI_PROC_WTE	ON/OFF	ON	
10	SNI_PROC_CTE	ON/OFF	OFF	
11	SNI_PROC_OUTP	ON/OFF	ON	
12	B_RATIO	0~65535	13000	Low level information for the minimum value
13	W_RATIO	0~65535	6000	High level information for the minimum value
14	BLACK_TILT	0~255	90	Black Stretch Area
15	B_GAIN_MAX	0~225	358	
16	WHITE_TILT	0~255	240	White Stretch Area
17	GAIN_X1	0~255	25	Gain of horizontal high frequency region
18	GAIN_X2	0~255	28	Gain of horizontal middle frequency region
19	GAIN_Y1	0~255	18	Gain of vertical high frequency region
20	GAIN_Y2	0~255	25	Gain of vertical middle frequency region
21	SUP_LIFT_SEL	ON/OFF	ON	
22	EXT_SEL	ON/OFF	OFF	
23	BOOL_SUPP_SELX1	ON/OFF	OFF	
24	BOOL_SUPP_SELX2	ON/OFF	OFF	
25	BOOL_SUPP_SELY1	ON/OFF	ON	
26	BOOL_SUPP_SELY2	ON/OFF	OFF	
27	BOOL_ENH_SEL	ON/OFF	OFF	
28	LOG_MODE	ON/OFF	ON	
29	R_MR	50~205	150	
30	CORING_ON	ON/OFF	ON	
31	RTH1	0~31	0	
32	RTH2	0~31	12	
33	NDON	ON/OFF	OFF	
34	WB_RED_C_COEFF	0~255	128	
35	WB_GRN_C_COEFF	0~255	128	
36	WB_BLU_C_COEFF	0~255	128	
37	WB_RED_B_COEFF	0~1023	512	
38	WB_GRN_B_COEFF	0~1023	508	
39	WB_BLU_B_COEFF	0~1023	512	

No	Item	Range	Default	Remark
40	R_Coring_TH1	0~31	4	
41	R_Coring_TH2	0~31	4	
42	R_Coring_TH3	0~31	4	
43	R_Coring_TH4	0~31	4	
44	H_FILTER1	0~11	1	
45	H_FILTER2	0~10	8	
46	V_FILTER1	0~4	1	
47	V_FILTER2	0~3	2	
48	Sub Color	0~100	62	
49	DNle On/Off	ON/OFF	OFF	
50	Sub Contrast	50~150	106	Brightness adjustment for the high-light parts of the screen
51	Contrast Offset	0~50	5	
52	Sub Brightness	0~511	239	Brightness adjustment for the low-light parts of the screen
53	Brightness Offset	-	-	
54	R_COEFF_MATR_CRR			
55	R_COEFF_MATR_CBG			
56	R_COEFF_MATR_CRG			
57	R_COEFF_MATR_CBB			

## 6. TC90103

No	Item	Range	Default	Remark
1	LIMYF	0~7	2	3D YNR limit level ; 000:small~111:large
2	KMFY	0~3	2	Feed back factor for 3D YNR ; 0£:x1:1/2,2:x3/4, 3:OFF
3	KFY	0~7	3	3D YNR Ga in; 000£°OFF~111:x0.875
4	LIMCF	0~7	2	3D CNR limit level ; 000£°small~111:large (INIT:110)
5	KMFC	0~3	2	Feed back factor for 3D CNR ;00:x 01:x1/2 10:x3/4 11:OFF
6	KFC	0~7	3	3D CNR Gain ;000:OFF~111x0.875
7	GVENH	0~3	1	Vertical enhance gain ;00:OFF 10:x1/4 01:x1/8 11:x1/2
8	VEN	0~3	3	Setup V enhance NL ;00: 6IRE 10:13IRE 01: 9IRE 1:16IRE
9	VEC	0~3	1	Setup corng level for V enhance ;00:OFF 10:1.6IRE 01:0.8IRE 11:2.3IRE
10	FENH	0~1	0	Sharpness fo ; 0:4.2MHz 1:3.3MHz
11	PRENH	0~1	0	Pre enhance 0:OFF 1:ON
12	GHENH	0~15	2	Adjustment Sharpness gain
13	NCLIM	0~7	0	Coring for sharpness/noise cancel ; 0:0.8IRE 1:3.2IRE 2:1.6IRE 3:6.4IRE
14	GNC	0~3	1	Setup gain for noise cancel ; 00:OFF 10:x1/2 01:x1/4 11:x1
15	GLTI	0~3	0	Setup L T I gain ;00:OFF 10:x1/4 01:x1/8 11:x1/2
16	LTI LIM	0~3	0	Setup coring level for LTI ;00:0.8IRE 10:3.2IRE 01:1.6IRE 11:6.4IRE
17	SET DELAY	0~15	10	Chroma signal delay adjustment0000:-296ns~000:Center ~ 1111:259ns(37ns step)
18	GCTI	0~3	0	Setup CTI gain ; 00:OFF 10:x1/4 01:x1/8 11:x1/2
19	CTI LIM	0~3	0	Setup coring level for CTI 00:0.4IRE 10;1.6IRE 01:0.8IRE 11:3.2IRE
20	FLTI	0~1	0	LTI fo 0:3.3MHz 1:2.2MHz OFF
21	FCTI	0~1	0	CTI fo 0:1.7MHz 1:3.4MHz
22	YCONT	0~255	66	Contrast adjustment 00h:x1/2~40h:x1~ FFh:x2.4
23	YBRIT	0~255	249	Brightness adjustment ;128:-128LSB:0 OFF~127:+127LSB(10bit) bit
24	CRGAIN	0~15	0	C r signal gain adjustment ; 1000:x0~0000:x1~0111:x1.875
25	CBGAIN	0~15	1	C b signal gain adustment ;1000:x0~0000:x1 ~0111:x1.875
26	CROFS	0~15	1	C r signal offset adjustment at output stage 1000:-8LSB~0000:- 0111:+7LSB(10bit)
27	CBOFS	0~15	1	C b signal offset adjustment at output stage 1000:-8LSB~0000:- 0111:+7LSB(10bit)
28	HUE	0~127	0	Hue adjustmemt ;1000000:-45°~0000000:0°~0111111:+43 6°
29	HUE BIAS	0~63	0	Hue Bias adjustmemt ; 000000:0°~111111+45°
30	CKILL	0~7	7	Adjustment for the sensitivity of killer detect ratio ; 000:40dB~111:-30dB
31	BTCLON	0~1	1	LSB Process at SRC Block
32	BTCL ALT	0~1	0	
33	YNRON	-	-	
34	FILON	0~15	3	
35	M_AGC_GAIN	0~225	33	
36	3D/2D	2D/3D	3D	
37	SNR	-	117[0x75]	

## 7. SAA7119

No	Item	Range	Default	Remark
1	HTC	0~3	2	
2	ATVT	0~3	1	
3	LUFI	0~15	5	
4	NAICO_Brig	0~255	112	
5	NAICO_Cont	0~255	64	
6	NAICO_Satu	0~255	64	
7	NAICO_Hue	0~255	0	
8	COMP_Brig	0~255	114	
9	COMP_Cont	0~255	62	
10	COMP_Satu	0~255	64	
11	TASKA_Brig	0~255	140	
12	TASKA_Cont	0~255	64	
13	TASKA_Satu	0~255	64	
14	LIMOD	0~3	0	
15	LIFIL	0~3	2	
16	LIWGT	0~7	0	

## 8. MST33X9

No	Item	Range	Default	Remark
1	RED CUTOFF	0~255	127	
2	GREEN CUTOFF	0~255	96	
3	BLUE CUTOFF	0~255	127	
4	PHASE	0~64	0	
5	RED GAIN	0~255	202	
6	GREEN GAIN	0~255	207	
7	BLUE GAIN	0~255	202	
8	PLLDIV	0~4096	857	
9	PLLGAIN	0~31	1	
10	CLPDLY	0~255	8	
11	CLPDUR	0~255	8	
12	HSOPW	0~255	24	
13	SYNC_CTRL	0~255	64	
14	SOGMID_CTRL	0~255	189	
15	SEP_THR	0~255	32	
16	PRECST	0~255	11	
17	POSTCST	0~255	8	
18	ADC_BWO	0~255	102	
19	ADC_BW1	0~255	6	
20	Test Pattern	0~8	0	

## 9. SDP51(M)

No	Item	Range	Default	Remark
1	Y_Offset	0~1023	0	
2	Y_Gain	0~2047	512	
3	NR_Zeromotion_MD	0~255	48	Gain control for Motion detecton
4	NR_Fullmotion_MD	0~255	96	
5	NR_Zeromotion_MC	0~255	40	Gain control for Motion compensation
6	NR_Fullmotion_MC	0~255	80	
7	VPP_ON	0~1	0	0 : VPP OFF , 1 : VPP ON
8	VPP_Gain	0~255	30	Gain Control
9	VPP_Coring	0~47	5	
10	ST_Field_CNT	0~7	5	
11	ST_Ver_Mot_Min	0~255	5	VM: vertical motion
12	ST_Ver_Mot_Max	0~255	64	
13	ST_Def_Min	0~255	5	DF: default → normal
14	ST_Def_Max	0~255	64	
15	ST_Ticker_Min	0~255	2	TD: ticker detection
16	ST_Ticker_Max	0~255	18	
17	ST_2:2_Min	0~255	5	2:2 detection (normaly source 3:2)
18	ST_2:2_Max	0~255	64	
19	Mo_Ver_Mot_Min	0~255	3	
20	Mo_Ver_Mot_Max	0~255	12	
21	Mo_Def_Min	0~255	2	
22	Mo_Def_Max	0~255	12	
23	Mo_Ticker_Min	0~255	32	
24	Mo_Ticker_Max	0~255	64	
25	Mo_2:2_Min	0~255	0	
26	Mo_2:2_Max	0~255	0	
27	Spatial_Angle_TH	0~255	300	0 : vertical interpolation(do not use directional information)
28	Ticker_Mode	0~3	3	0 : ALL OFF, 1 : interlace only, 2 : except film, 3 : ALL ON
29	Debugger_Mode	0~7	0	0: off, 1 : film, 2:Stop, 3:Motion, 4: Moving 5:judder, 6: ticker, 7: weigh
30	3:2_Mode	0~3	1	
31	2:2_Mode	0~3	1	
32	32_22 Combi	0~3	3	3 : ALL ON, 2 :film23 ON/film22 OFF, 1 : film23 OFF/film 22 ON, 0 :ALL OFF
33	3:2Count	0~255	10	
34	2:2Count	0~255	40	
35	TD_LINES	0~1023	180	
36	CAPTION_AREA_UP	0~1023	30	
37	CAPTION_AREA_DOWN	0~1023	180	



No	Item	Range	Default	Remark
38	NR ON/OFF		ON	
39	MAX_WEIGHT	0~255	110	
40	Test Pattern(SDP51M)	0~19	0	

## 10. SDP51(S)

No	Item	Range	Default	Remark
1	Y_Offset	0~1023	0	Direction Offset of the input Y
2	Y_Gain	0~2047	512	Gain of the input Y
3	NR_Zeromotion_MD	0~255	28	Gain control for Motion detecton
4	NR_Fullmotion_MD	0~255	56	
5	NR_Zeromotion_MC	0~255	28	Gain control for Motion compensation
6	NR_Fullmotion_MC	0~255	56	
7	VPP_ON	0~1	0	0 : VPP OFF , 1 : VPP ON
8	VPP_Gain	0~255	30	
9	VPP_Coring	0~47	5	Coring for the detail vertical filter.
10	ST_Field_CNT	0~7	5	The number of the referenced field for the still discrimination.
11	ST_Ver_Mot_Min	0~255	5	VM: vertical motion
12	ST_Ver_Mot_Max	0~255	64	
13	ST_Def_Min	0~255	5	
14	ST_Def_Max	0~255	64	
15	ST_Ticker_Min	0~255	2	TD: ticker detection
16	ST_Ticker_Max	0~255	18	
17	ST_2:2_Min	0~255	5	2:2 detection (normaly source 3:2)
18	ST_2:2_Max	0~255	64	
19	Mo_Ver_Mot_Min	0~255	3	
20	Mo_Ver_Mot_Max	0~255	12	
21	Mo_Def_Min	0~255	2	
22	Mo_Def_Max	0~255	12	
23	Mo_Ticker_Min	0~255	32	
24	Mo_Ticker_Max	0~255	64	
25	Mo_2:2_Min	0~255	0	
26	Mo_2:2_Max	0~255	0	
27	Spatial_Angle_TH	0~1023	300	0 : vertical interpolation(do not use directional information)
28	Ticker_Mode	0~3	3	0 : ALL OFF, 1 : interlace only, 2 : except film, 3 : ALL ON
29	Debugger_Mode	0~7	0	0: off, 1 : film, 2:Stop, 3:Motion, 4: Moving 5:judder, 6: ticker, 7: weigh
30	3:2_Mode	0~3	1	3 : All of the film modes for the current filed are off if there is judder.
31	2:2_Mode	0~3	1	1 : Only the pixel with judder is off. The REG_FLM_32_MODE is the same as the above.
32	32_22 Combi	0~3	3	3 : ALL ON, 2 :film23 ON/film22 OFF, 1 : film23 OFF/film 22 ON, 0 :ALL OFF
33	3:2Count	0~255	10	
34	2:2Count	0~255	40	
35	TD_LINES	0~1023	180	
36	CAPTION_AREA_UP	0~1023	30	
37	CAPTION_AREA_DOWN	0~1023	180	
38	FILM_32_22	0~3	3	
39	Test Pattern(SDP51S)	0~19	0	

## 11. SDP52

No	Item	Range	Default	Remark
1	DIFF_MODE	0	0	Select a differential filter
2	WS_EIGENLPF	0~31	4	
3	BLEND_ALPHA	0~255	0	
4	BLEND_BETA	0~511	0	
5	Main YH_SHOOT	0~1	1	
6	Main CH_SHOOT	0~1	1	
7	Main PC_MODE	0~1	0	Shoot Control or Median Filter
8	Main YH_SHOOT_PARA1	0~255	32	Clipping Gain Parameter
9	Main YH_SC_ALPHA	0~31	31	
10	Main YH_SLOPE	0~255	64	Small Ringing Control
11	Main AUTO_PAGE_SEL	0~1	0	Filter Page Select
12	Main YH_PAGE	0~31	1	
13	Main YV_PAGE	0~31	5	
14	Main CH_PAGE	0~31	16	
15	Main CV_PAGE	0~31	16	
16	Sub YH_SHOOT	0~1	1	
17	Sub CH_SHOOT	0~1	1	
18	Sub PC_MODE	0~1	0	Shoot Control or Median Filter
19	Sub YH_SHOOT_PARA1	0~255	32	Clipping Gain Parameter
20	Sub YH_SC_ALPHA	0~31	31	
21	Sub YH_SLOPE	0~255	64	Small Ringing Control
22	GAINU	0~1023	64	CB CTI gain
23	GAINV	0~1023	64	CR CTI gain
24	R_CHCNT_ON	0~1	1	
25	H_TRUNC	0~63	32	
26	H_INT_GAIN1	0~127	4	
27	H_INT_GAIN2	0~127	4	
28	V_INT_GAIN	0~63	4	
29	V_TRUNC	0~63	32	
30	PRE_ALPHA	0~127	4	
31	PRE_BETA	0~63	5	
32	DE_GAIN_X1	0~255	16	
33	DE_GAIN_X2	0~255	24	
34	DE_GAIN_Y1	0~255	40	
35	DE_MR	0~255	50	
36	H_RTH2	0~31	10	
37	V_RTH2	0~31	10	
38	DE_H_CORING_F1	0~31	4	

No	Item	Range	Default	Remark
39	DE_H_CORING_F2	0~31	4	
40	DE_V_CORING_F3	0~31	4	
41	BLU_C_COEFF	0~255	128	Blue contrast Gain
42	GRN_C_COEFF	0~255	128	Green contrast Gain
43	RED_C_COEFF	0~255	128	Red Contrast Gain
44	BLU_B_COEFF	0~1023	0	Blue bright level
45	GRN_B_COEFF	0~1023	0	Green bright level
46	RED_B_COEFF	0~1023	0	Red bright level
47	H_FILTER1	0~11	1	
48	H_FILTER2	0~10	4	
49	V_FILTER1	0~4	1	
50	DE-RINGING DEMO	-	0	
51	DE-BLOCKING DEMO	-	0	
52	CTI DEMO	-	0	
53	PRE-PRO DEMO	-	0	
54	Auto FRC RANGE	ON/OFF	OFF	
55	SSTL_DDS	0~10	2	
56	Overscan	0~1	ON	
57	Test Pattern(SDP52M)	0~31	0	
58	Test Pattern(SDP52S)	0~31	0	

## 12. S5H2200

No	Item	Range	Default	Remark
1	Test Pattern(ALBA)	0~255	1	

## 13. KS1409\_Tuner

No	Item	Range	Default	Remark
1	RF_AGC_TOP	-	0xBa	
2	CR_Phase_Gain	-	0x4a	
3	CR_Freg_Gain	-	0x1010	
4	Polit_Gain	-	0x01	
5	AGC_Rel	-	0x50	
6	Eq_Ctrl	-	0x030e	
7	PTL_Coell	-	0x23	
8	PTL_Step	-	0x05c0	

## 14. STV82X8

No	Item	Range	Default	Remark
1	Stereo Pilot high	0~255	35	
2	Stereo Pilot low	0~255	16	
3	SAP Pilot high	0~255	128	
4	SAP Pilot low	0~255	96	
5	MELODY-ON VOL.	0~5	3	
6	MELODY-OFF VOL.	0~5	3	
7	Speaker Type			

## 15. Cinema CCA

No	Item	Range	Default	Remark
1	DRedX	-	640	Target Red X value for CCA
2	DRedY	-	330	Target Red Y value for CCA
3	DGreenX	-	300	Target Green X value for CCA
4	DGreenY	-	600	Target Green Y value for CCA
5	DBlueX	-	150	Target Blue X value for CCA
6	DBlueY	-	60	Target Blue Y value for CCA
7	DCyanX	-	225	Target Cyan X value for CCA
8	DCyanY	-	329	Target Cyan Y value for CCA
9	DMagentaX	-	321	Target Magenta X value for CCA
10	DMagentaY	-	154	Target Magenta Y value for CCA
11	DYellowX	-	419	Target Yellow X value for CCA
12	DYellowY	-	505	Target Yellow Y value for CCA
13	D-White-X	-	313	Target White X value for CCA
14	D-White-Y	-	329	Target White Y value for CCA

## 16. ESP

No	Item	Range	Default	Remark
1	Dynamic Global On / Off	0~1	OFF	
2	Dynamic Local On / Off	0~2	1	
3	Dynamic Skin On / Off	0~100	0	
4	Dynamic Strength	0~2	1	
5	Dynamic Cont Gain	0~100	0	
6	Dynamic Satu	0~1	OFF	
7	Dynamic Satu Gain	0~255	128	
8	Sharp Picture	0~1	OFF	
9	VLUT	-	TBD0	
10	Sharp Filter	0~2	1	
11	Sharp Picture Gain	0~255	128	

## 17. SERVICE

No	Item	Range	Default	Remark
1	<u>V-Position</u>	0 ~ 60	30	Screen upper and lower adjustment
2	<u>H-Position</u>	0 ~ 120	60	Screen left and right adjustments
3	User Reset	-	-	All user settings are set to default
4	<u>INDEX DELAY</u>	0	45	Index delay adjustment
5	LAMP SYNC	0 ~ 3	0	
6	CCA	-	-	CCA menu
7	DMD→Digital			
8	Digital→DMD			
9	<u>Lamp Life</u>	-	8h	
10	Lamp Clear	-	-	Initialize Lamp usage time
11	Mute Time(Video)	-	4	
12	<u>Lamp Select</u>	-	Philips	
13	<u>Lamp Watt</u>	120W/132W	132W	
14	<u>Actuator Gain [Patt1]</u>	0 ~ 175	68	Actuator Gain adjustment
15	<u>Actuator Gain [Patt2]</u>	0 ~ 175	68	Actuator Gain adjustment
16	<u>Factory Reset</u>			

## 3-4 Service Adjustment

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### 3-4-1 Vertical / Horizontal Position Adjustment

1. Turn off the power to put the unit into the STAND-BY mode.
  2. In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" buttons on the Remote Control.
  3. Select "Service" on the first display of the Service mode menu.
  4. Select the V-position for vertical positioning and H-position for horizontal positioning by using the ▲ ▼ (Up & Down) buttons. Press the ◀ ▶ (Left or Right) buttons to adjust the screen position.
- ※ Do not set the V-position value to 34 or 35. (Setting to these values will cause horizontal lines on the right side of the screen.)

### 3-4-2 INDEX DELAY Adjustment

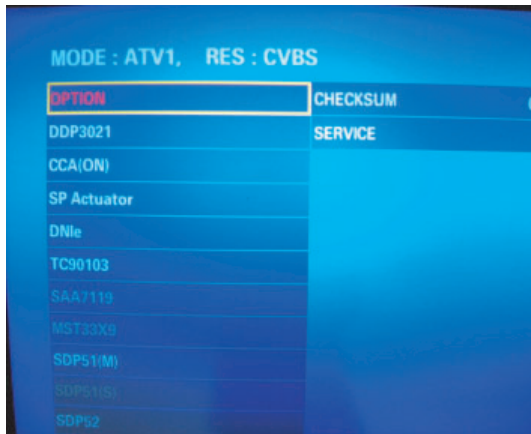
1. Turn off the power to put the unit into the STAND-BY mode.
2. In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" buttons on the Remote Control.
3. Select "Service" on the first display of the Service mode menu.
4. Press the ▲ ▼ (Up or Down) button to move to INDEX DELAY, then press ENTER to select.
5. The INDEX DELAY setup screen (with White, Red, Green and Blue bars at the bottom of the screen) will be displayed.
6. Press the ◀ ▶ (Left or Right) buttons to adjust. Check the red color at the bottom of the screen at its minimum and maximum values of changing from red to magenta, then adjust to the mean value.



### 3-4-3 CCA Adjustment Service Methods : CCA Adjustment is needed after changing a light engine or main board

■ CCA : In DLP TV, even the same RGB color may differ depending on the light engine. CCA (Color Coordinate Adjustment) corrects the color to achieve the color accuracy. CCA performs color correction after measuring and inputting the current light engine's data on actual color coordinates for displayed Red, Green, Blue, and White color patterns, using a color coordinate measuring equipment. At this moment, color correction is performed below.

- 1) This procedure is needed if the Main PCB or DMD Board are changed.
- 2) Turn off power to put the unit into the STAND-BY mode.
- 3) In order to enter the Service Mode, press "Mute" → "1" → "8" → "2" → "Power" buttons on the Remote Control.



- 4) Select "Option" on the display of the Service mode menu
- 5) If the DMD PCB is changed, Press the ▼ ▲(Up or Down) button to move to Digital → DMD, then press ENTER to select.



- 6) Then Press ENTER to save CCA information to the DMD board
- 7) If the Main PCB is changed, Press the ▼ ▲(Up or Down) button to move to DMD → Digital, then press ENTER to select.



8) Then Press ENTER to save CCA information to the Main board

\* Attention

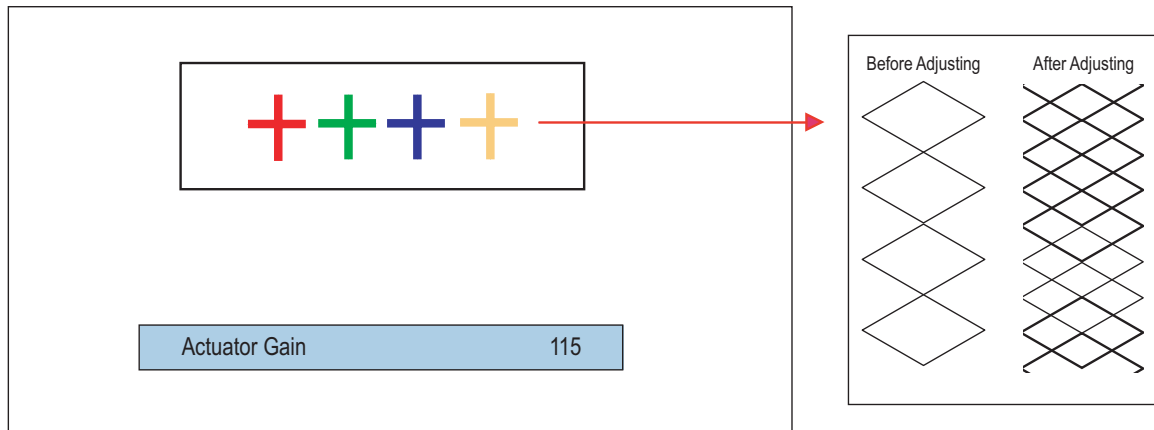
Performing CCA is independent on current display's resolution and input signal type if you don't measure color coordinates data. Measuring color coordinates data requires specific equipment not possessed by service personnel, that makes performing manual adjustment impossible. Adjusting CCA is applied to all the signal mode. Don't change desired value because it will be harmful to the color of the SET.

### 3-4-4 ACTUATOR GAIN Adjustment

#### 1. Before Adjustment

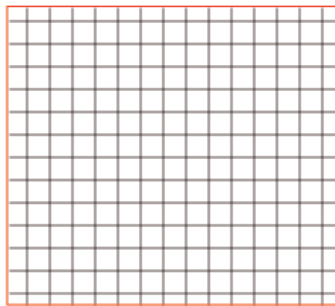
- 1) Turn off the power to put the unit into the STAND-BY mode.
- 2) In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" button on the Remote Control.
- 3) Select "Service" on the first display of the Service mode menu.
- 4) Press the ▲ ▼ (Up or Down) button to move to ACTUATOR GAIN1,2, then press ENTER to select.
- 5) The Actuator gain setup screen will be displayed.
- 6) Press the ◀ ▶ (Left of Right) button to adjust. check the smooth picture at it's minimum and maximum values of changing ,then adjust to the mean value.

- Actuator Gain1 : In case of controlling with Cross Pattern.



- Actuator Gain2 : In case of controlling with Crosshatch Pattern.

CROSSHATCH PATTERN



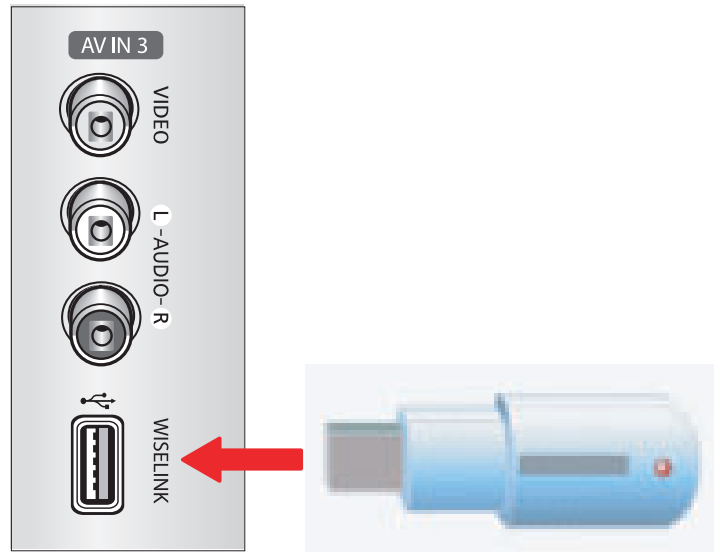
CAUTION: GAIN2 is just controlled by your eye because control value doesn't appear in picture.

#### 2. Making Adjustments

- 1) As shown in the picture above, change the actuator values to eliminate saw tooth shapes.
  - To fine tune, increase the data value ensuring that you get the center between the starting and ending points of the disappearing saw tooth shape.

## 3-5 Software Upgrade

---



1. Prepare the USB memory stick with the built-in firmware.
2. While the TV is off, insert the USB stick into the SERVICE terminal.
3. When turning on the TV, there should be a long beeping tone and the firmware download process should start. If there is no sound from the TV, turn it off and then on again.
4. When the download is complete, there will be another long beeping tone and the TV will go into standby mode.

※ Check for the Firmware Version

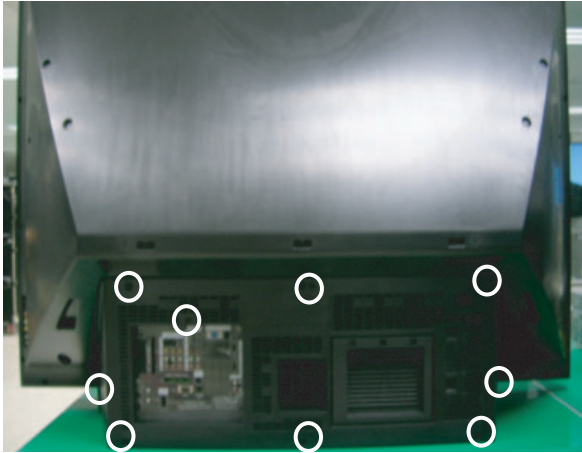
- 1) Turn off the power to put the unit into the STAND-BY mode.
- 2) In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" buttons on the Remote Control.
- 3) In case entry into SERVICE MODE is unsuccessful, repeat steps 1 and 2 directly above.
- 4) You can check the firmware version at the bottom of the Factory menu.

T\_GALIAUS0\_00XX  
2006\_XX\_XX  
T-GALIUCOM5-60XX  
T-GAIAUS1\_XX

## 3-6 Replacements & Calibration

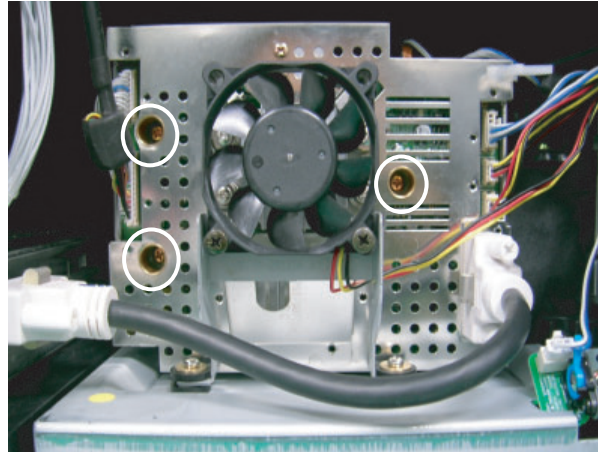
### 3-6-1 Tilt the Screen

1. Remove the 9 point screws. Remove the Bottom cover.  
Fix the safety switch on the right with tape so that the set can be turned on after removing the bottom cover.  
: TH,B,M4.L15,BLK,SWRCH18A



2. Loosen the 3 points screws.

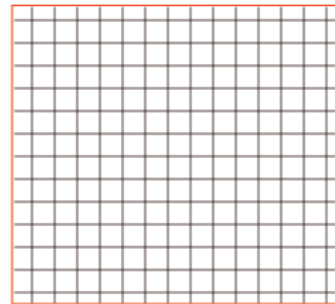
- \* Left 2 points screws  
: PWH,S,M3,L8,ZPC(YEL),SWRCH18A
- \* Right 1 points screw  
: PWH,S,M3,L7,ZPC(YEL),SWRCH18A



3. Turn off the power to put the unit into the STAND-BY mode.  
In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" buttons on the Remote Control.  
Select "DDP3021" on the first display of the Service Mode menu. Press the ▲ ▼ (Up or Down) button until the cursor position is "Test Pattern(DDP)" then press ENTER to select. Press the ► (Right) button until you see the CROSSHATCH PATTERN.  
Then, adjust the screen position, by holding both of the upper corners of the DMD board.

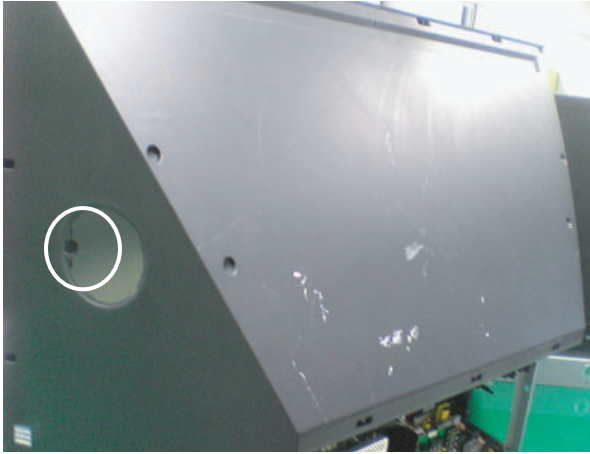


CROSSHATCH PATTERN



Fix the safety switch on the right with tape so that the set can be turned on after removing the bottom cover.

- ※ Even when those screws are loosened, the board does not separate it can be moved within the adjustable range because there are spring screws at the center holding it.
- ※ When adjusting the screen, it is better for two people to work together.  
One person should adjust the picture position while the other person looks at the screen.

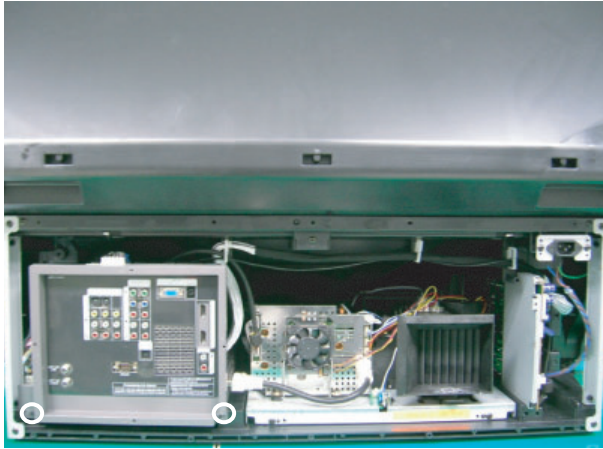


- When one person works, do the following:
  - 1) Remove the side-cover of the cabinet side.
  - 2) See the screen through the hole on the side and adjust the image location.
- ※ The movement direction of the board and the picture are opposite.
  - When the board is lifted upward, the screen descends down.
  - When it is tilted to the left, the screen tilts to the right.
- ※ When the picture adjustment is completed:  
First, tighten the two screws on the left of the DMD board and then slowly tighten the one screw on the bottom right.  
Be careful not to touch the board while tightening the screws.  
(When using an electric-powered screwdriver, be careful that the torque is not too high.)

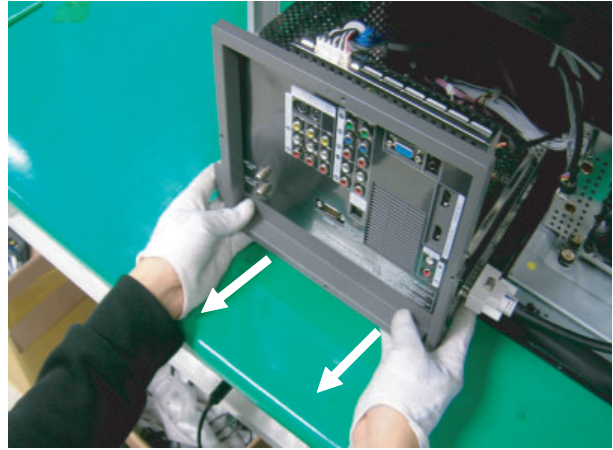


### 3-6-2 Align the Focus

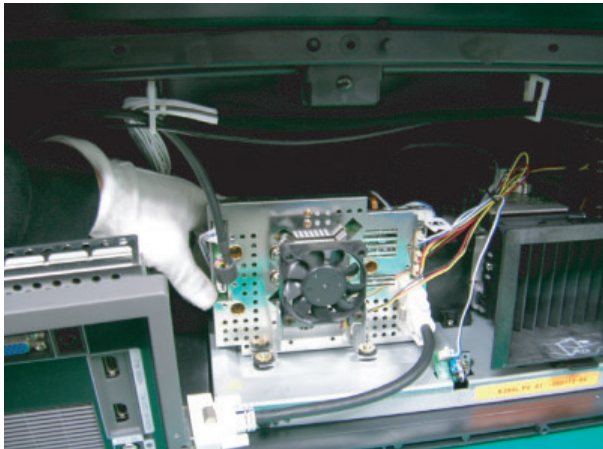
1. Remove the 2 screws.  
: TH,B,M4.L15,BLK,SWRCH18A



2. Pull out the holder Chassis

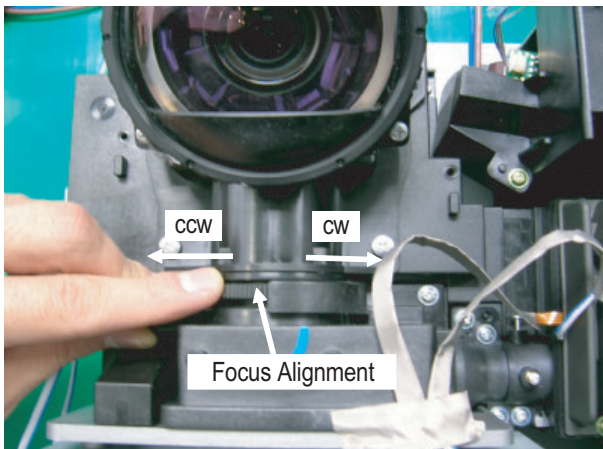


3. Adjust the Lens Focus



- 1) Input a Crosshatch pattern or enter service mode and use the internal generated patterns.
- 2) Insert your hand/finger into the unit as shown in the figure and adjust the focus alignment dial of the Projection Lens Clockwise or Counter Clockwise (See picture in step 4) until the picture is clear.
- 3) Since the alignment is done from the rear, use a mirror or a second person to confirm the adjustment is complete.

4. Adjust the Lens focus.



- ※ When one person works, do the following:
- 1) Remove the side-cover of the cabinet side.
  - 2) See the screen through the hole on the side and adjust the focus.



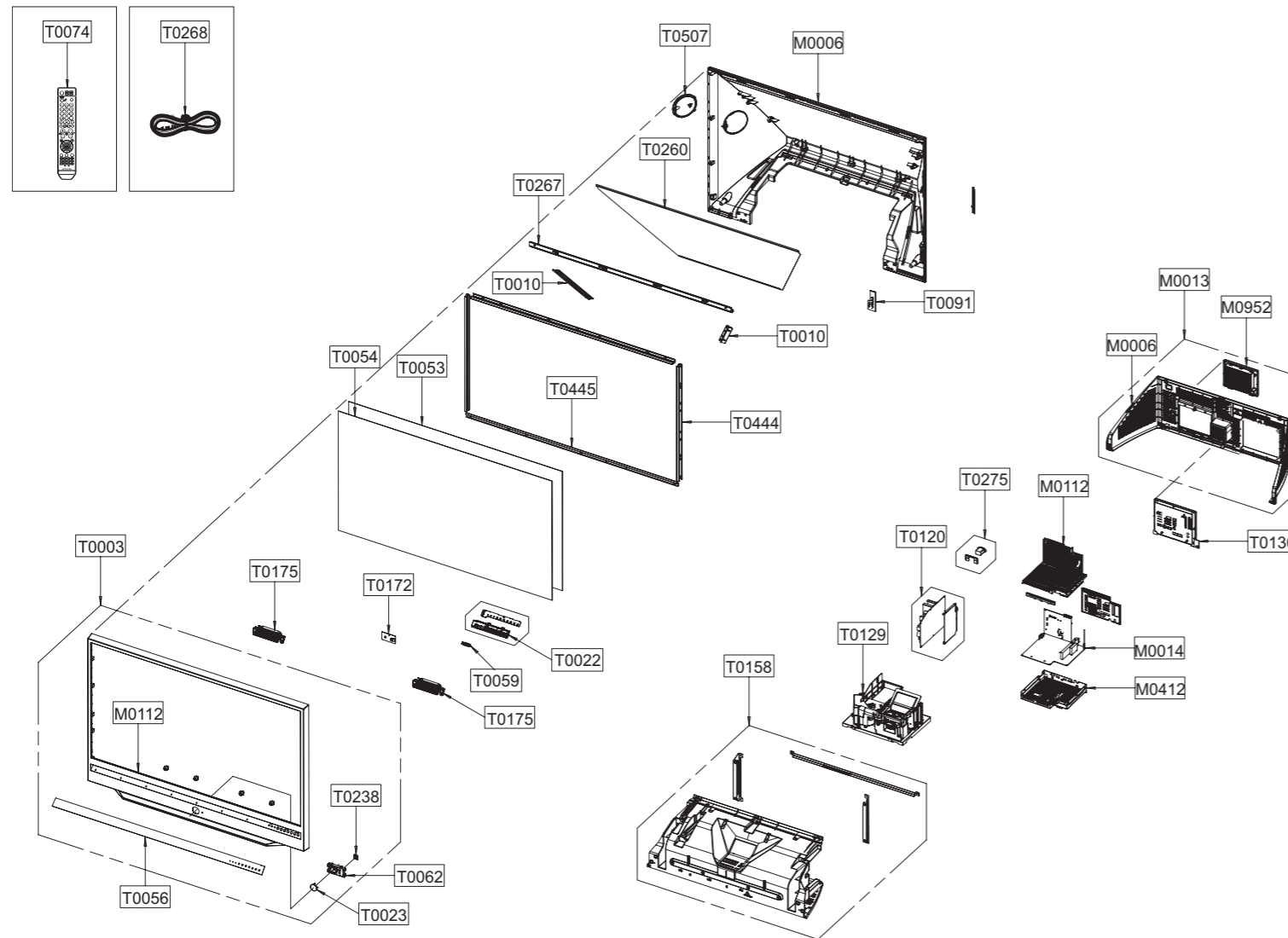
# MEMO



## 4. Exploded View & Part List

### 4-1 HLS5087WX/XAA

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
M0006	BP63-00721A	COVER-REAR	50K2/K3,HIPS,HB,BK500	1	S.N.A	
M0006	BP63-00714A	COVER-REAR BOTTOM	K2/K3,HIPS,V0,BK500	1	S.N.A	
M0013	BP96-01473A	ASSY COVER P-REAR BOTTOM	K2/K3,HIPS,V0,B	1	S.A	
M0014	BP94-02258C	ASSY PCB MAIN	ATSC_ONLY,L66A,GALILEI	1	S.A	
M0112	BP63-00724A	COVER-FRONT	50K3,ABS+PMMA,HB,BK23,STEAM,	1	S.N.A	
M0112	BP96-01432A	ASSY SHIELD P-PCB	L66A,SPTT,T0.5,POD	1	S.N.A	
M0412	BP96-01421A	ASSY BRACKET P-PCB	NOBEL,SECC,T1.0	1	S.N.A	
M0952	BP63-00710A	COVER-DUCT	K2/K3,ABS,V0,BK07,RT195	1	S.N.A	
T0003	BP96-01489A	ASSY COVER P-FRONT	50K3,SEA(L66A),ABS+PM	1	S.A	
T0010	BP96-00940A	ASSY HOLDER P-MIRROR LEFT	L6 ALL, L8,HIP	1	S.A	
T0010	BP96-00941A	ASSY HOLDER P-MIRROR RIGHT	L6 ALL, L8,HI	1	S.A	
T0022	BP64-00587A	KNOB CONTROL	K2,ABS,HB,BK07,AL V/P	1	S.N.A	
T0023	BP64-00589A	KNOB POWER	K3,PC,VIOLET	1	S.N.A	
T0053	BP67-00140A	SCREEN FRESNEL	50W,-,NTR,1126*646,1.5T,-	1	S.A	
T0054	BP67-00137A	SCREEN LENTI	50W,-,NTR,1126*646,2.4T,-,-	1	S.A	
T0056	BP63-00723A	COVER-DECORATION	50K2,PC SHEET,T0.6,SEA,	1	S.N.A	
T0059	BP64-00590A	INDICATOR LED	K2,ABS,HB,MILKY SMOG	1	S.N.A	
T0062	BP61-01227A	HOLDER-POWER	K3,ABS HB,BK07,AL V/P	1	S.N.A	
T0074	BP59-00107A	REMOCON	Einstein,TM87B,54,NTSC,L64D	1	S.A	
T0091	BP94-02270A	ASSY PCB MISC-AV SIDE	HLS5686,L64D,K2	1	S.A	
T0120	BP94-02261A	ASSY PCB POWER	L64D(L6),AC120V,ATSC(W/O	1	S.A	
T0129	BP96-01491A	ASSY ENGINE P-DLP	50K3,PHILIPS 132W,E22,	1	S.A	
T0130	BP96-01431B	ASSY COVER P-TERMINAL BOARD	GALILEI,SEA,	1	S.N.A	
T0158	BP96-01462C	ASSY COVER P-MAIN	K2,K3,SAMEX,HIPS,V0,BK	1	S.N.A	
T0172	BP94-02272A	ASSY PCB MISC-RMC	HLS5686,L64D,K2	1	S.A	
T0175	BP96-01441A	ASSY SPEAKER P	8ohm,K3,DLP,10W,BAR,Horn	1	S.A	
T0175	BP96-01441B	ASSY SPEAKER P	8ohm,K3,DLP,10W,Right,BAR	1	S.A	
T0238	BP64-00385A	WINDOW REMOCON	50L3,PC,VIOLET	1	S.N.A	
T0260	BP67-00254A	MIRROR-FRONT	Front Mirror 50",1056*551*5	1	S.A	
T0267	BP61-01234A	BRACKET-MIRROR TOP	50K2,AL6063 EXTR	1	S.N.A	
T0268	3903-000144	CBF-POWER CORD	DT,US,BP3/Y,U(IEC C13-RA)	1	S.A	
T0275	BP96-00972A	ASSY MISC P-INLET	SVP-50L6HD,HURRICANE,D	1	S.A	
T0444	BP96-01582B	ASSY BRACKET P-SCREEN SIDE	50K3,AL6063,E	2	S.N.A	
T0445	BP96-01484A	ASSY BRACKET P-SCREEN BOTTOM	50K2,SECC-1	1	S.N.A	
T0507	BP63-00709A	COVER-DUST	K2/K3,HIPS,HB,BK500	2	S.N.A	

## 5. Electrical Part List

### 5-1 HLS5087WX/XAA 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
M0013	BP96-01473A	ASSY COVER P-REAR BOTTOM	K2/K3,HIPS,V0,B	1	S.A
M0014	BP94-02258C	ASSY PCB MAIN	ATSC_ONLY,L66A,GALILEI	1	S.A
M0114	BP39-00230A	CBF SIGNAL	HLS5686W,24p/24p,20276-D,300m	1	S.A
M2893	BN39-00656B	LEAD CONNECTOR	HLR5686W,UL1569#26,UL/CSA	1	S.A
M2893	BP39-00044D	LEAD CONNECTOR	HLS5686W,UL1007#22,UL/CSA	1	S.A
M2893	BP39-00096D	LEAD CONNECTOR	HLP6163W,UL1185/2547#26,1	1	S.A
M2893	BP39-00103A	LEAD CONNECTOR	HLN507WX,UL2464 #26,UL/CS	1	S.A
M2893	BP39-00104D	LEAD CONNECTOR	HLS5686W,UL1007#26,UL/CSA	1	S.A
M2893	BP39-00140E	LEAD CONNECTOR	HLR5686W,UL2547#26,UL/CSA	1	S.A
M2893	BP39-00141C	LEAD CONNECTOR	HLS6187WX/XAA,UL1617#22,U	1	S.A
M2893	BP39-00147B	LEAD CONNECTOR	HLR5686W,UL1007#26,UL/CSA	1	S.A
M2893	BP39-00174D	LEAD CONNECTOR	HLS6187WX/XAA,UL1007#26,U	1	S.A
M2893	BP39-00180C	LEAD CONNECTOR	HLR5668WAX,UL1617#22,1P,1	1	S.A
M2893	BP39-00227A	LEAD CONNECTOR	HLS5686W,UL1007#26,UL/CSA	1	S.A
M2893	BP39-00228A	LEAD CONNECTOR	HLS5685W,UL1061#28,UL/CSA	1	S.A
M2893	BP39-00228A	LEAD CONNECTOR	HLS5685W,UL1061#28,UL/CSA	1	S.A
M2893	BP39-00229B	LEAD CONNECTOR	HLS6187WX/XAA,UL1061#28,U	1	S.A
M2893	BP39-00231B	LEAD CONNECTOR	HLS6187WX/XAA,UL1571#30,U	1	S.A
T0003	BP96-01489A	ASSY COVER P-FRONT	50K3,SEA(L66A),ABS+PM	1	S.A
T0049	BP47-00033A	LAMP-BALLAST	EUC 132D P/41,160 MM CABLE,	1	S.A
T0074	BP59-00107A	REMOCON	Einstein, TM87B,54,NTSC,L64D	1	S.A
T0120	BP94-02261A	ASSY PCB POWER	L64D(L6),AC120V,ATSC(W/O	1	S.A
T0129	BP96-01491A	ASSY ENGINE P-DLP	50K3,PHILIPS 132W,E22,	1	S.A
T0175	BP96-01441A	ASSY SPEAKER P	8ohm,K3,DLP,10W,BAR,Horn	1	S.A
T0175	BP96-01441B	ASSY SPEAKER P	8ohm,K3,DLP,10W,Right,BAR	1	S.A
T0568	BP39-00217A	CBF IF	HLR5668WAX,1PIN,1365#26,80mm,BK,D	1	S.A
T0703	BP96-01581A	ASSY DMD BOARD P	K280,Philips,DMD Board,	1	S.A
T0888	BP96-01472A	ASSY LAMP P	K2,PHILIPS 132W,HD5	1	S.A
T0889	BP96-01579A	ASSY COLOR WHEEL P	K220,SVC	1	S.A

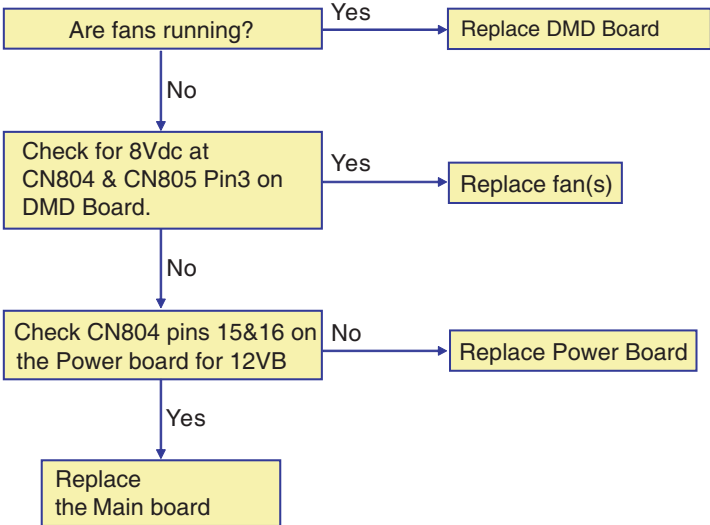
# MEMO

# 6. Troubleshooting

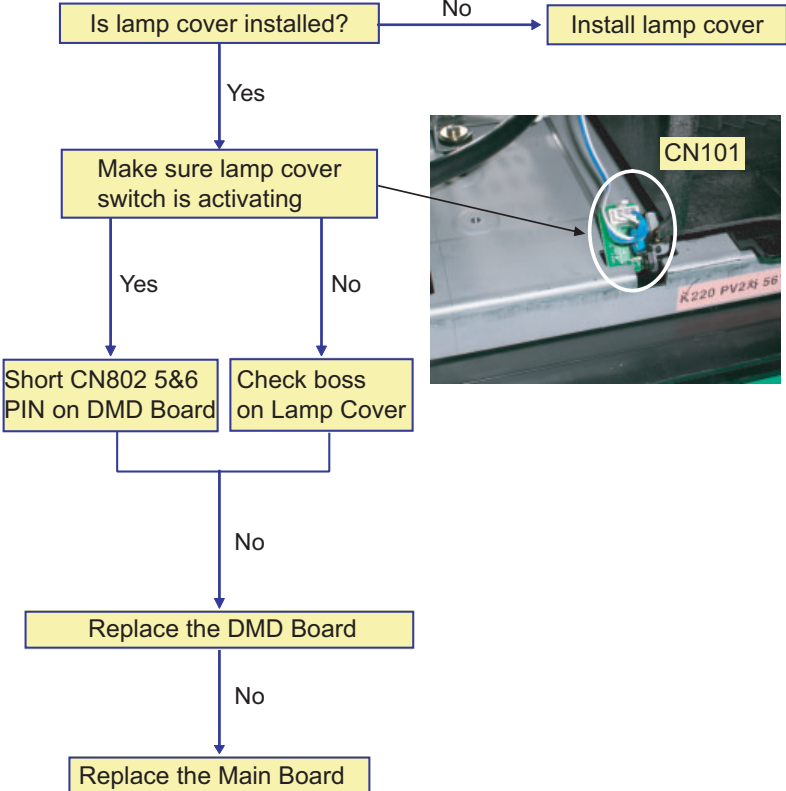
## 6-1 Checkpoints by Error Mode

- 1. Power Light: Check the master switch (ON/OFF) and the fuse to see if they are operating.
- 2. LED Blinking: See the basic LED checklist in 6-2-1.

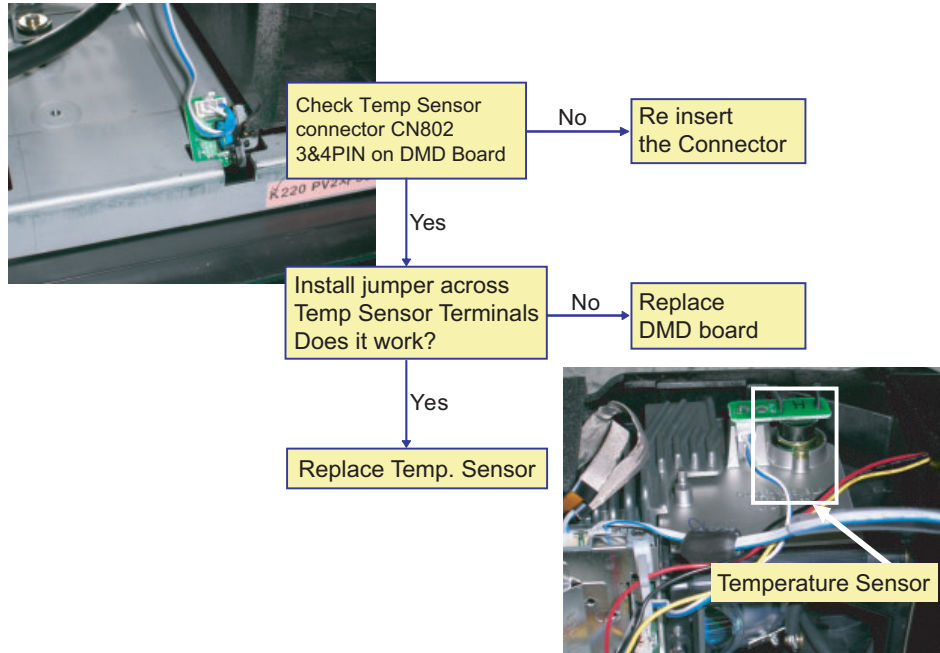
< Blinking Temp & Timer LED >



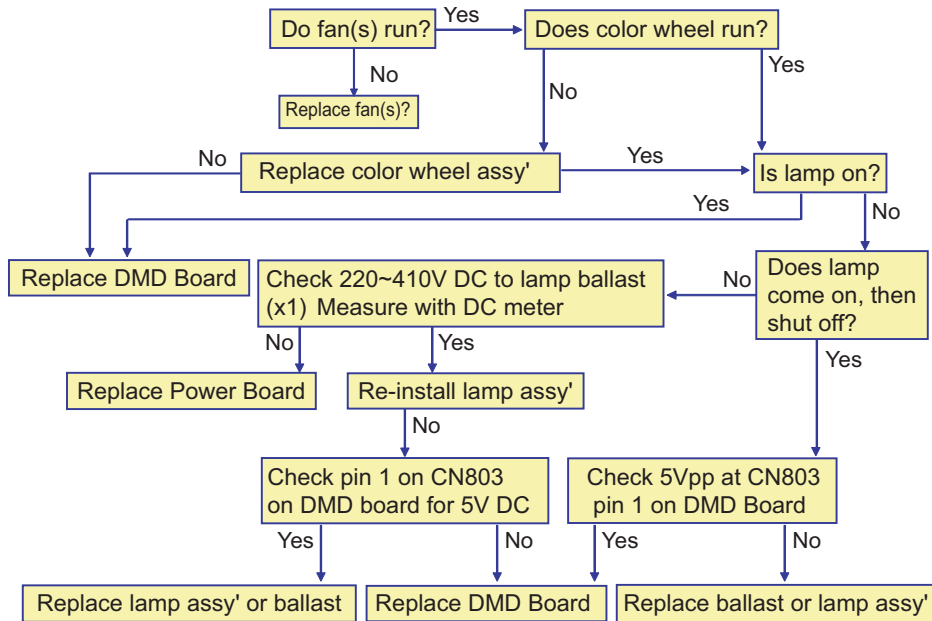
< Blinking Lamp and Temp LEDs >



< Blinking Temp LED >



A blinking lamp LED is the most common failure indication. It can be caused by no lamp, no color wheel, no fan(s), or other defective components.



### 3. Noise:

Internal noise may be caused by a foreign substance on the fan or driving device.

For a DLP TV, the lamp fan, DMD board fan and color wheel are vulnerable to noise. Sometimes the connector wire around the lamp or DMD fan makes contact with the fan, while the color wheel is protected inside the module and cannot make contact with any nearby wires. However the color wheel sensor or the drive motor may cause noise by making contact with the color wheel.

As the color wheel uses an air bearing system, it has a very slight possibility of creating internal noise.

When irregular noise occurs for no particular reason, check the inside of the TV for any foreign substances.

The DLP projection TV may cause noise as the physical screen is empty inside, causing a resonance to a particular frequency.

Thus a low vibration is not a malfunction.

Any 'creaking' noise is mostly from the structure of the device itself. A short, harsh noise may occur from a distortion or malformation due to thermal expansion between the metal joints, screws and loaded parts, respectively. Any intermittent 'creaking' noise can be removed by loosening the screws.

4. A black screen with the lamp on: Replace the DMD board.

5. Line Pattern: Regular line patterns occur vertically or horizontally: Replace the DMD board.

6. Voice Distortion: Replace the main or rear board.

7. Outside Light: This is not a product malfunction, but a possible installation or human error. This occurs when the projected light from the surrounding illumination reflects onto the screen. This disappears as the TV starts operating and the TV lamp gets brighter. However, you can avoid outside light by changing the position of the TV or the installation angle.

Decreasing the illumination or changing the indoor lighting may work.

### 8. Screen Flip-over:

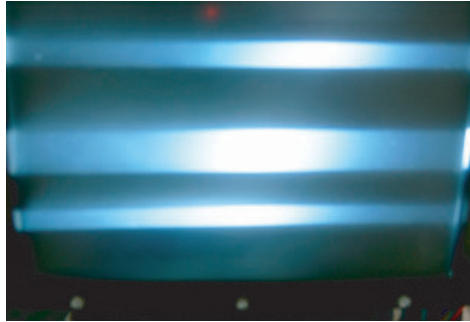
Enter Factory mode in DDP3021 and perform H-Flip (flip horizontally) and V-Flip (flip vertically).

The screen will flip over horizontally or vertically.

9. Other Screen Errors:



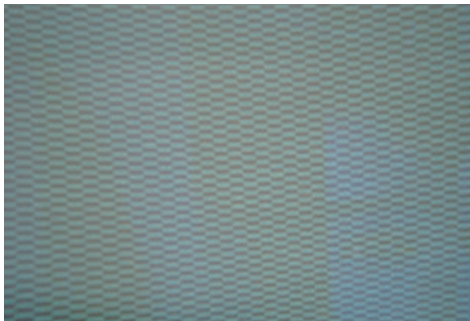
- ▶ 40 Vertical lines 16 pixels wide:  
DDP3021 or BGA, DMD panel interference.  
→ Replace the DMD board or DMD Panel



- ▶ Horizontal Bar or No Raster:  
Error in DDP3021 or the DMD panel.  
→ Replace the DMD board or DMD Panel



- ▶ Dotted Vertical Bar:  
Error in Rambus Dram(IC 403) or the soldering  
→ Replace the DMD board



- ▶ Beehive mosaic patterns all over the screen:  
Error in the TMDS Receiver (IC100) or the soldering  
The H sync signals are not transferred to DDP3021.  
→ Replace the DMD board.

### 6-1-1 Video Circuit Error Checking

■ Basics:

- The DDP3021 on the DMD board has a feature to display internal test patterns.
- DN1e, which is an end port in the digital board, has a feature to display internal test patterns.
- The rear board is the first output and the main board is the second one, followed by DMD, which is the final one.

■ Diagnosis By Module

1. Access Service Mode

(In Standby mode, press "Mute", "1", "8", "2" and "Power" to turn the screen on and enter service mode)

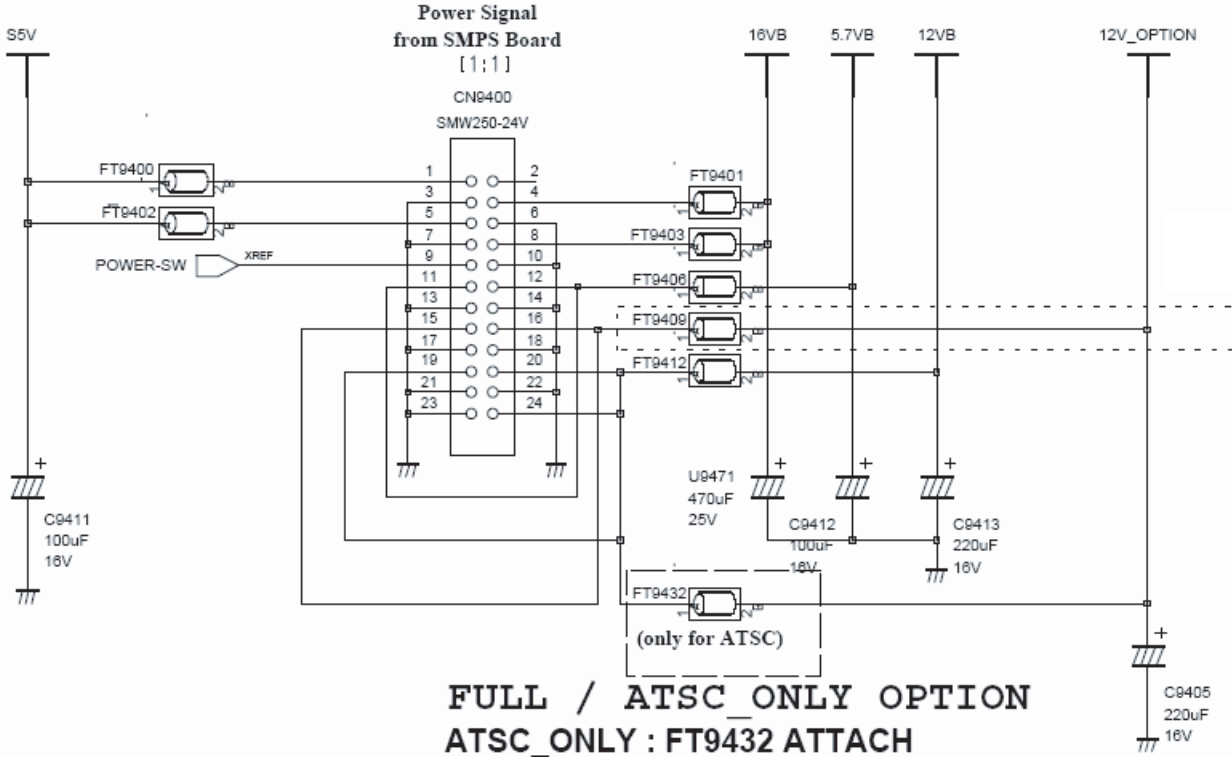
2. Check if there is an error in the DMD board

DDP3021 → TEST PATTERN → Press the right arrow key:  
 Options of FULL WHITE, BLACK, RED, GREEN and BLUE PATTERN are displayed on the screen.  
 If "Pattern" does not appear, this is a DMD board error.

3. Check if there is an error in the main board before the DMD.

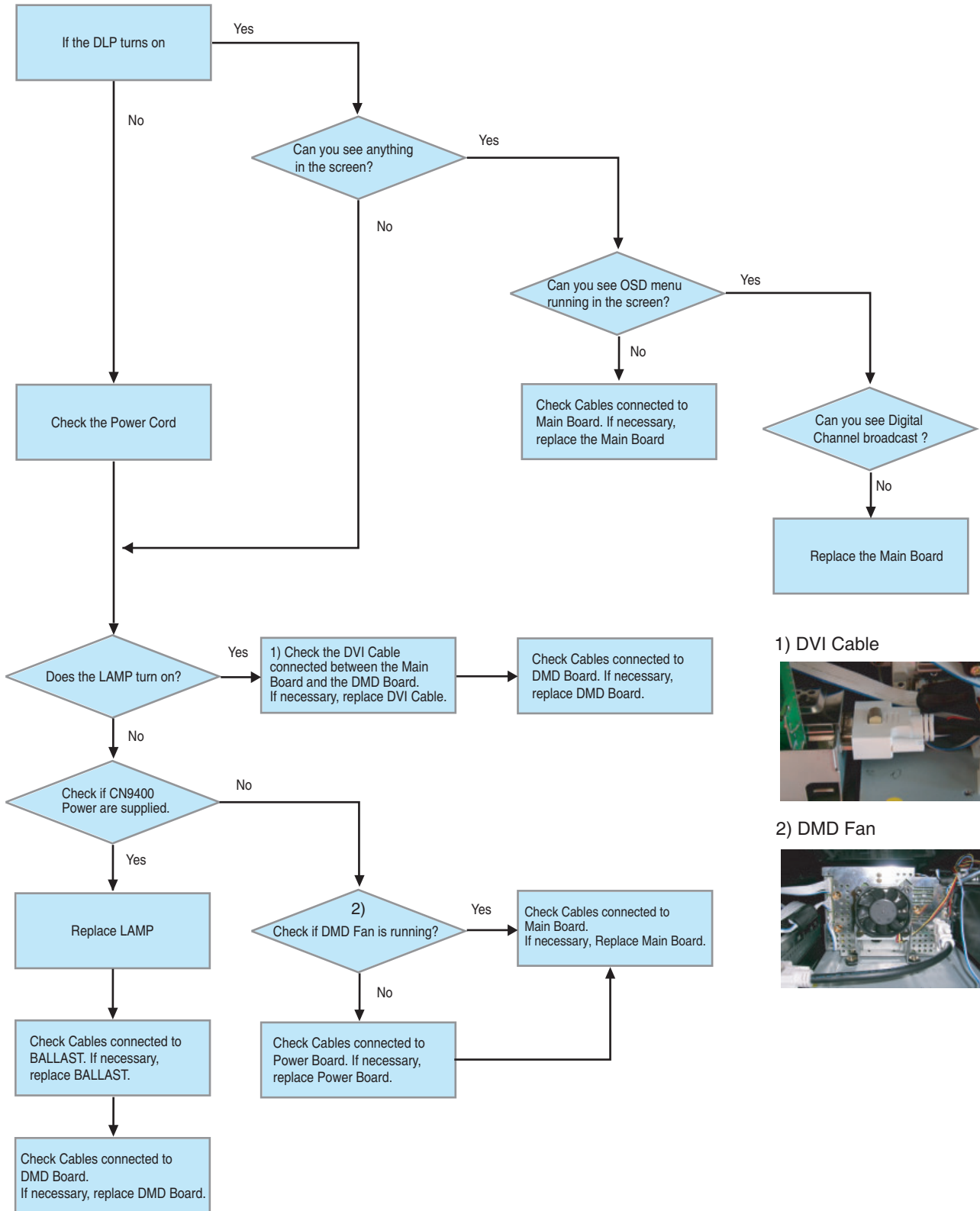
When the DMD board has been determined to be error free based on the test patterns:  
 FACTORY MODE → DN1e → TEST PATTERN normal display: no error in the main board.  
 If "Pattern" does not appear, you have to check a rear board first, and check a DMD Board second, next check a main Board.

4. Check for a power signal from the SMPS to the main boards. (See the circuit diagram below).

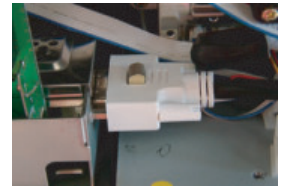




### 6-1-2 Flow Chart for Malfunction



1) DVI Cable

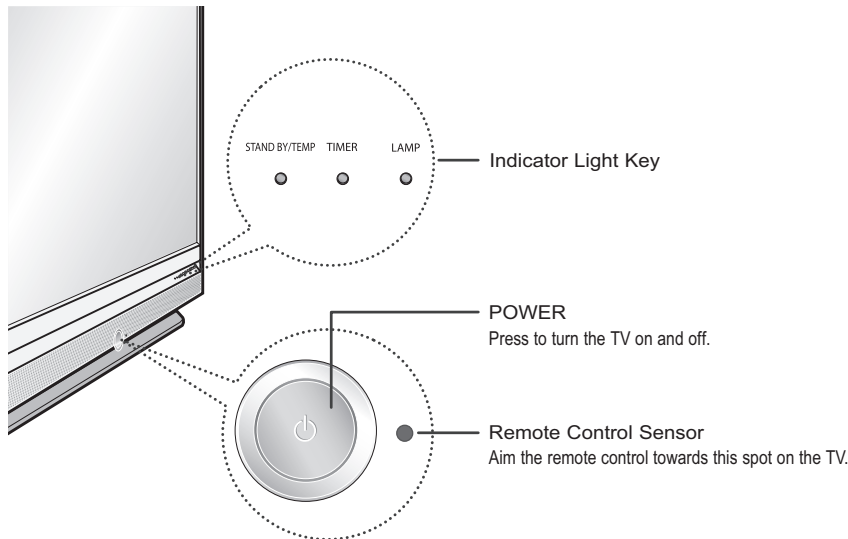


2) DMD Fan



## 6-2 Troubleshooting Procedures by Error Modes

### 6-2-1 Installation & Connection



- : Light is On
- ◐ : Light is Blinking
- : Light is Off

TIMER	LAMP	STAND BY/TEMP	Indication
○	○	●	Standby state.
○	◐	○	The picture will automatically appear in about 15 seconds.
●	◐	○	Auto Timer ON/OFF has been set and the set will automatically be turned on in about 15 seconds.
◐	○	◐	A cooling fan inside the set is not operating normally.
○	◐	◐	Lamp cover on rear of the set is not properly shut.
○	○	◐	Check if the ventilation hole on the rear of the set is blocked, because if the inner temperature is too high, the power will shut off.
◐	◐	◐	Lamp may be defective.

- \* It takes about 30 seconds for the TV to warm up, so normal brightness may not appear immediately.
- \* The TV has a fan to keep the inside lamp from overheating. You'll occasionally hear it working.

### 6-2-2 Protect Status

#### 1. When the rear cover is opened

A sensor detects when the rear cover is opened and turns the set off and then into Standby mode.

If you close the cover or fix the switch, you can turn the set on by pressing the Power button on the unit or the remote control. The set will then operate normally.

#### 2. When the temperature sensor operates

When the set is overheated, the internal temperature sensor turns the set off and the set goes to Standby mode.

When the internal temperature of the set returns to a normal range(203°F), turn the power on by pressing the Power button on the unit or the remote control. The set will then operate normally.

#### 3. Attempting to turn the lamp on fails repeatedly

If turning the lamp on fails, the set automatically tries turning the lamp on 3 times. If all attempts fail, all LED's on the front panel will blink. Check the lamp and the ballast and replace them, if necessary.

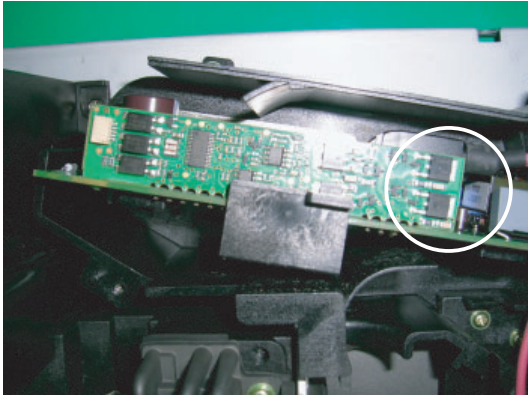
[www.fieldtechsource.net](http://www.fieldtechsource.net)

## 6-3 Troubleshooting Procedures by ASS'Y

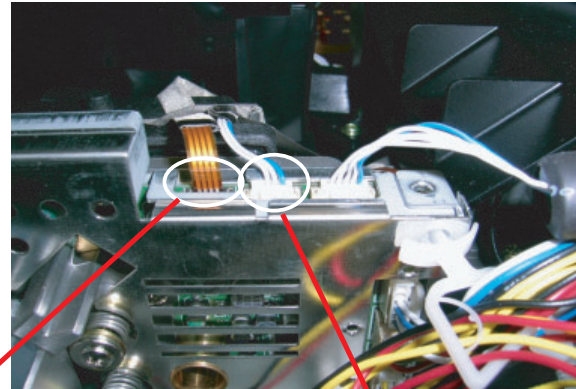
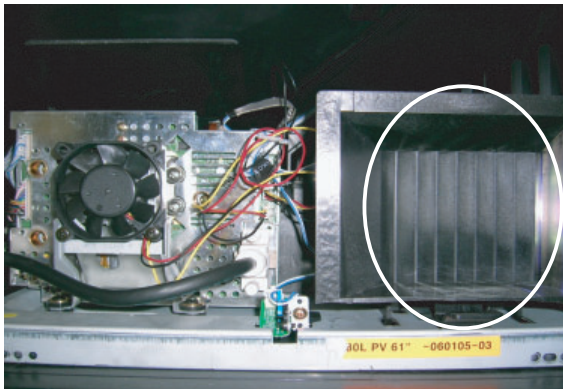
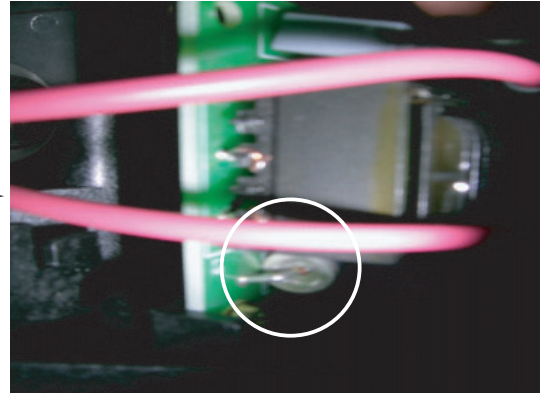
### 6-3-1 Check Lamp & Ballast

1. When the lamp is not on, check if there is anything wrong with the ballast.

Remove the lamp. Fix the safety switch on the right with tape and turn on the power. Check to see if a blue flame starts igniting in the arc gap inside the ballast momentarily during start-up. There is no problem with the ballast if there is a flame. When the ballast has no error, replace the lamp.

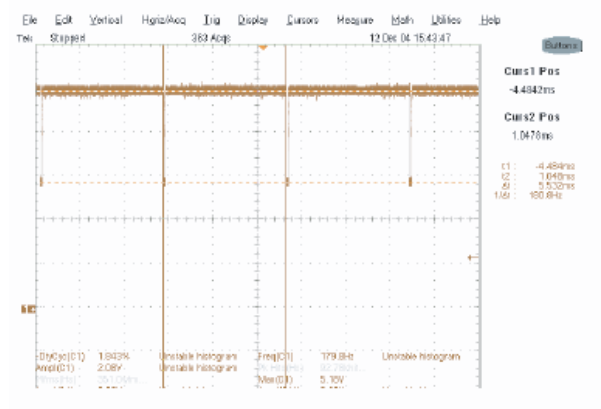
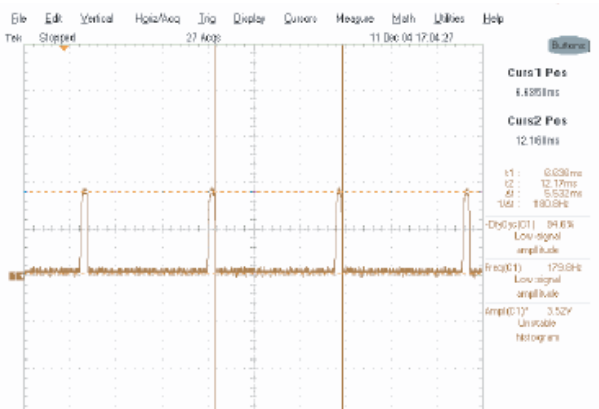


A blue flame occurs momentarily during start-up.



3.5V 240Hz

5V 60Hz

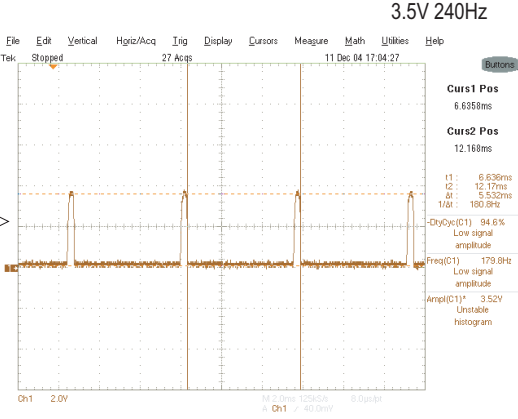
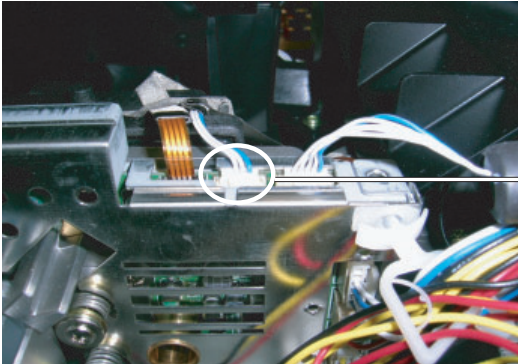


### 6-3-2 When the lamp and the ballast are normal but the lamp does not turn on or turns off right after quickly lighting up

1. Check the color wheel

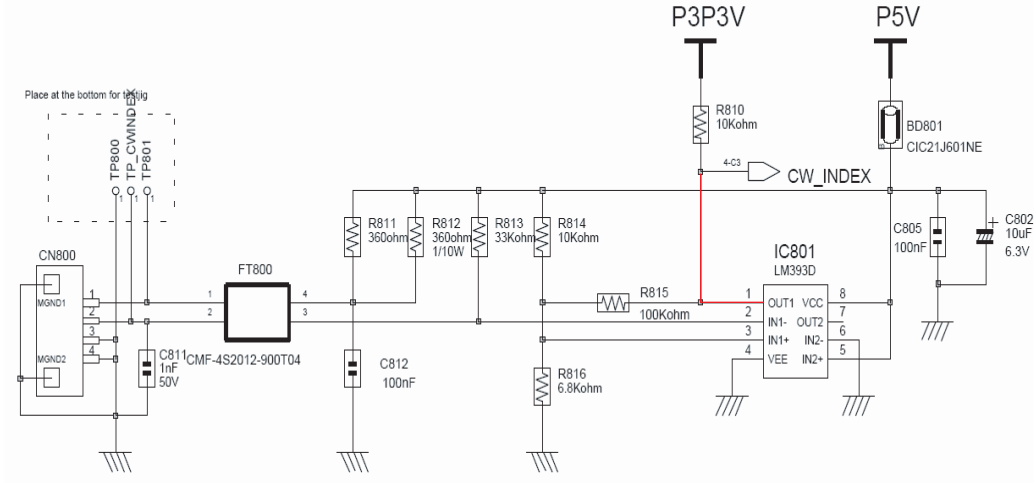
Check if the color wheel is running. + Check the DMD board and the ballast for the signals.

Check the second CN750 pin for input signals. When 3.5V, 180Hz is output, the color wheel is operating normally.



※ DMD Board Check Diagram

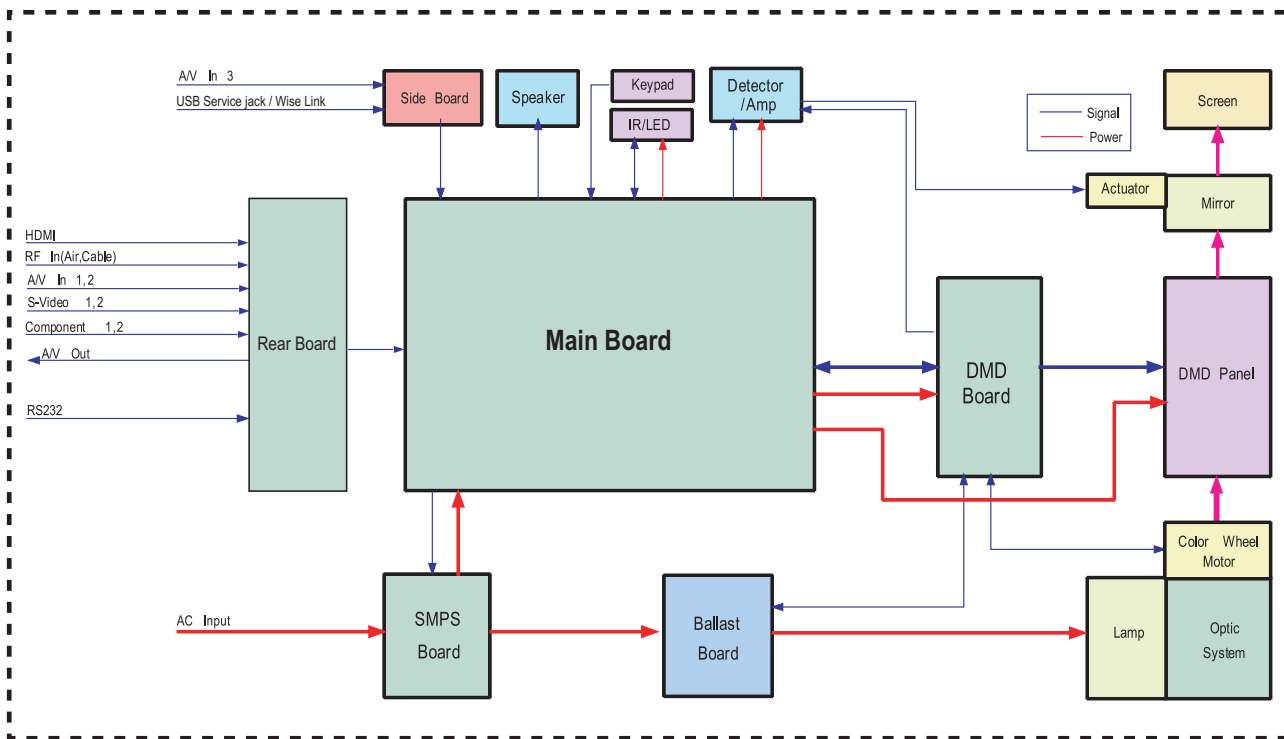
### COLOR WHEEL SENSOR DETECTION



# MEMO

## 7. Block Diagram

### 7-1 Overall Block Diagram

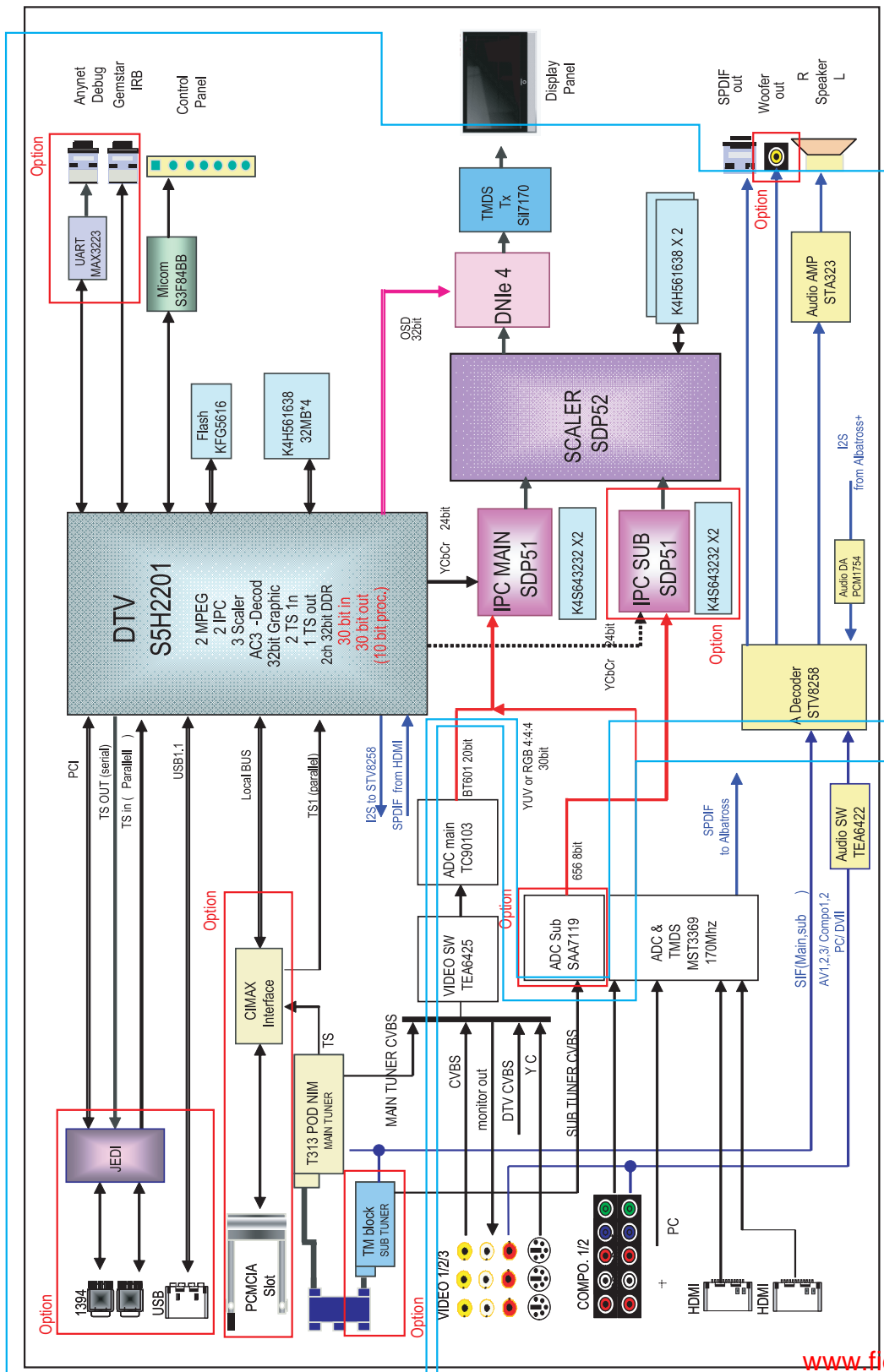


※ For the Assy Code, see the service item on page 5-1.

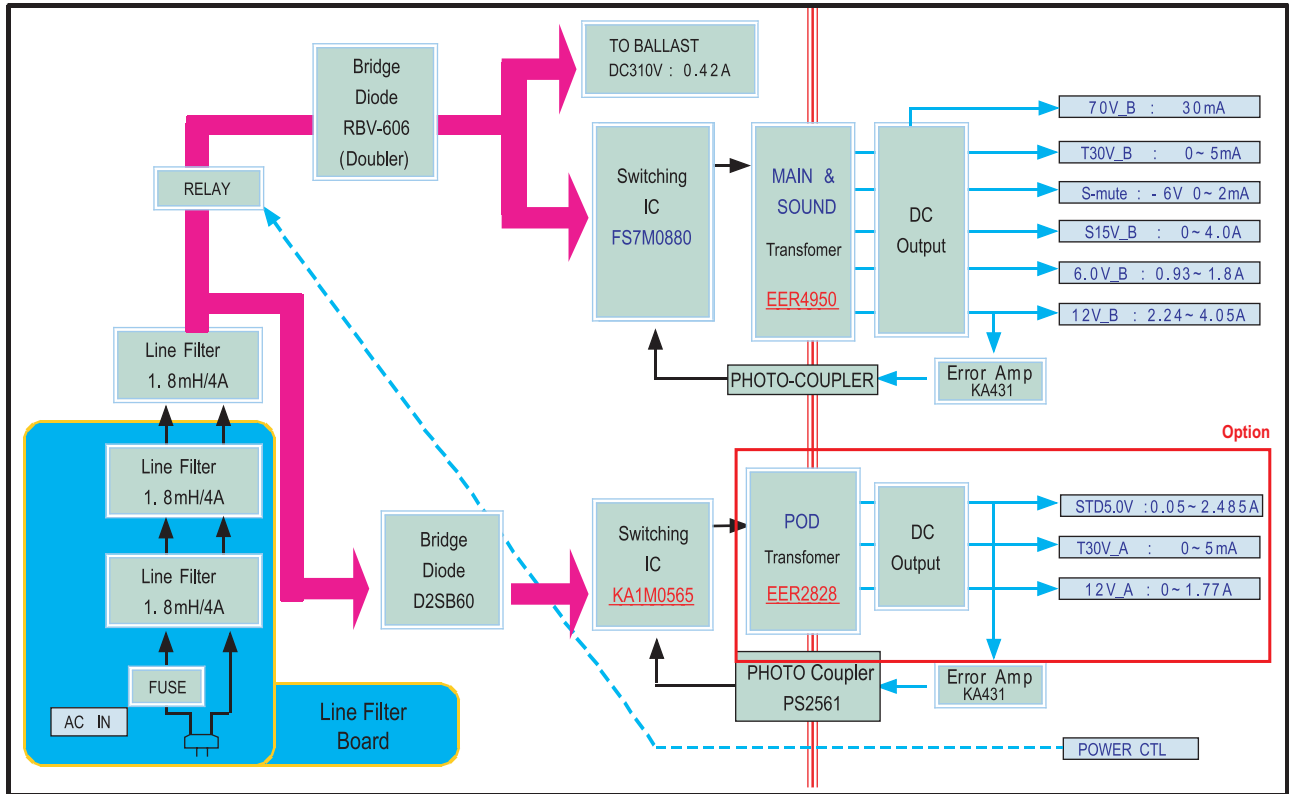
## 7-2 Partial Block Diagram

### 7-2-1 S5H2201+SDP51/52 Block Diagram

※ Options are deleted on the ATSC only Model



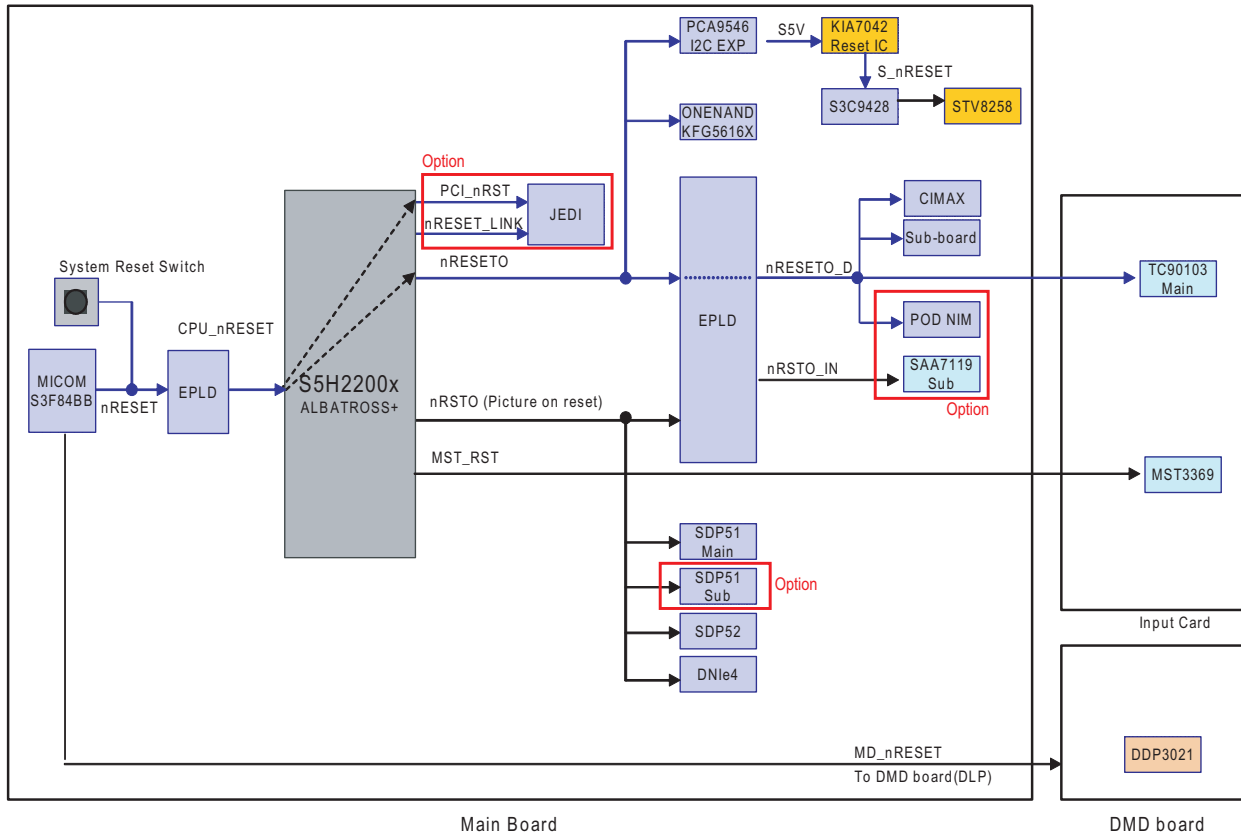
### 7-2-2 SMPS Block Diagram



※ Options are deleted on the ATSC only Model

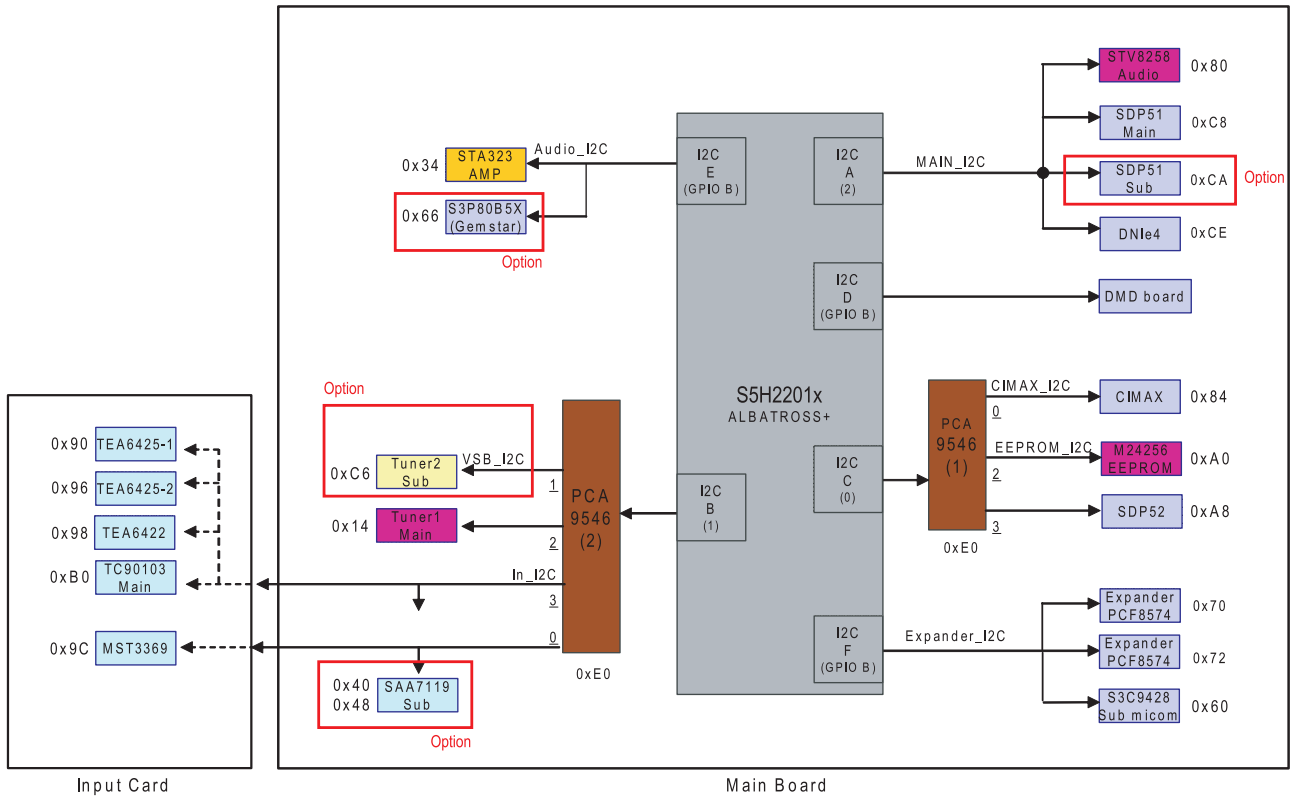


### 7-2-3 Reset Signal Flow Block Diagram



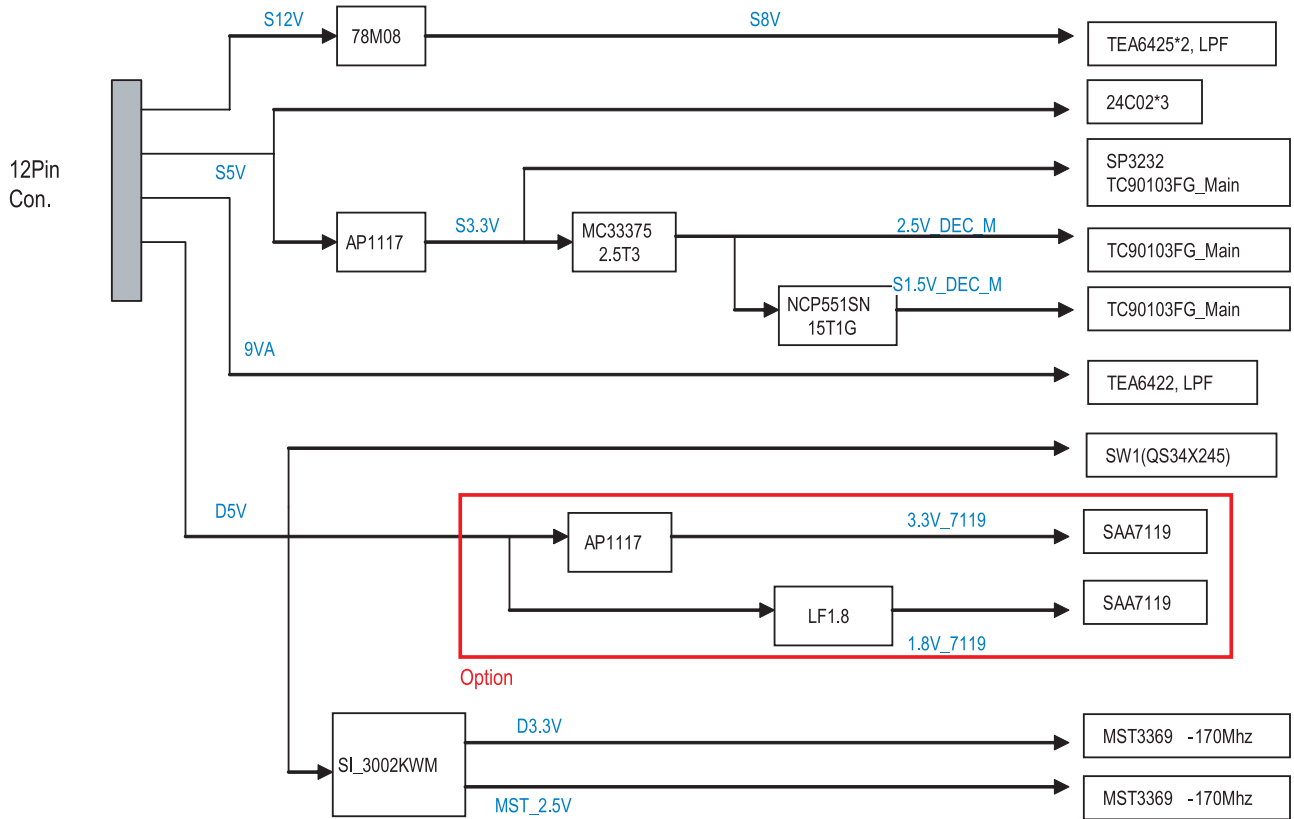
※ Options are deleted on the ATSC only Model.

### 7-2-4 S5H2201+I2c Signal Flow Block Diagram



※ Options are deleted on the ATSC only Model.

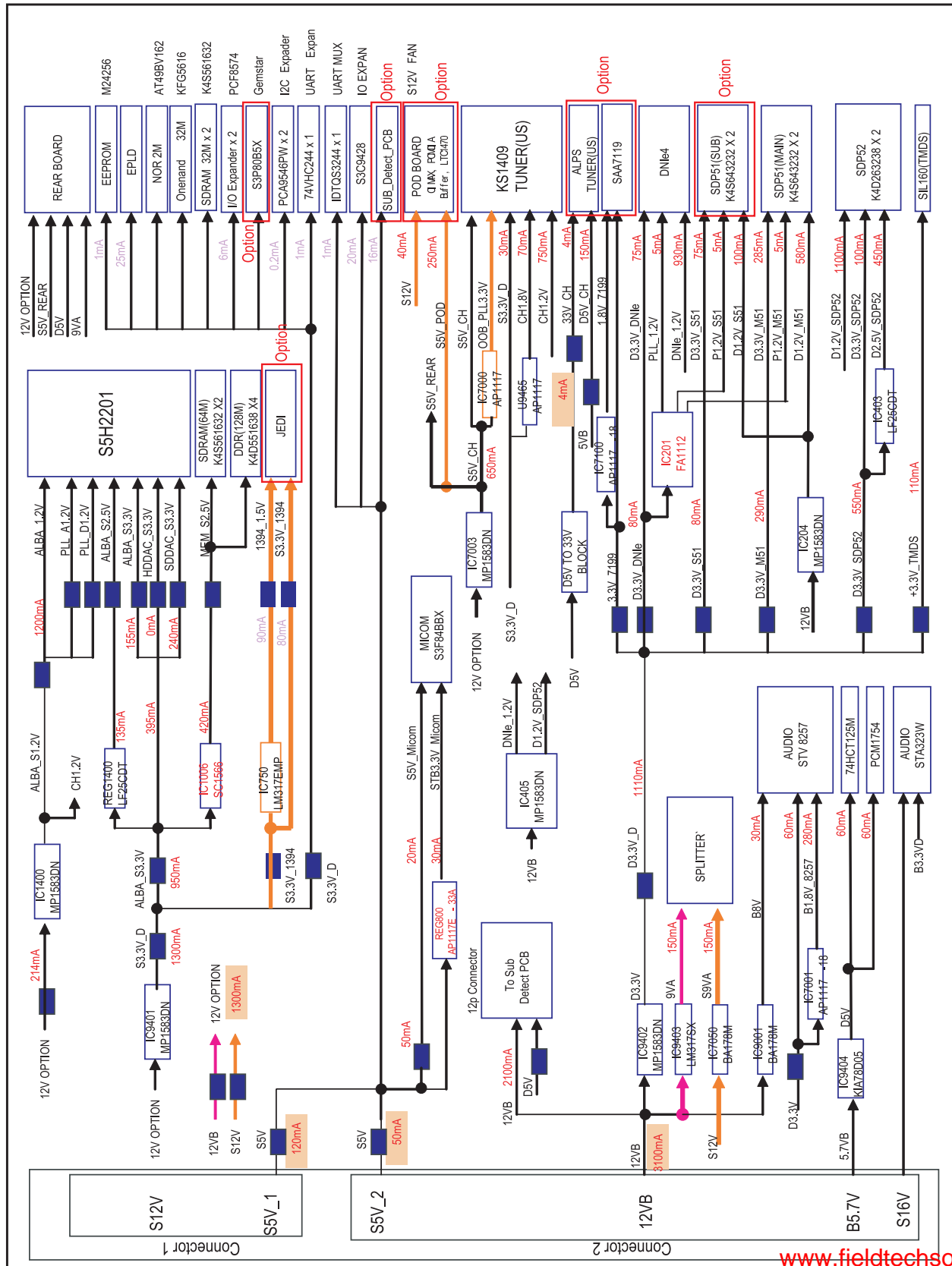
### 7-2-5 Power Flow Block Diagram(Rear Board)



※ Options are deleted on the ATSC only Model.

### 7-2-6 Power Flow Block Diagram(Main Board)

※ Options are deleted on the ATSC only Model.



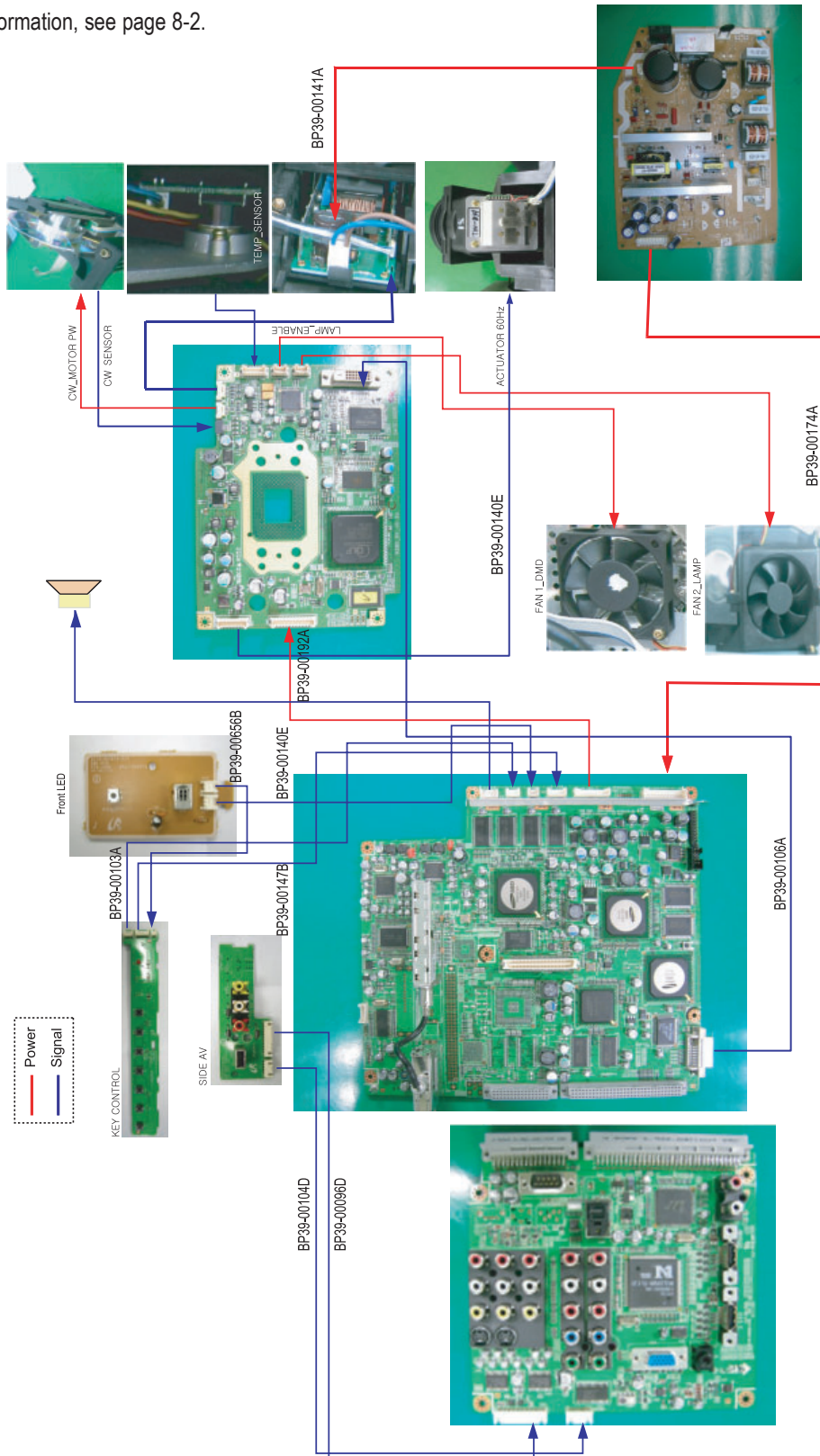
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# MEMO

# 8. Wiring Diagram













## 8-1 Overall Wiring


※ For the part information, see page 8-2.



### 8-1-2 Connect Cables

※ The code number of cable(Lead-connector) can be changed, see "5 Chapter. Electrical Part List."

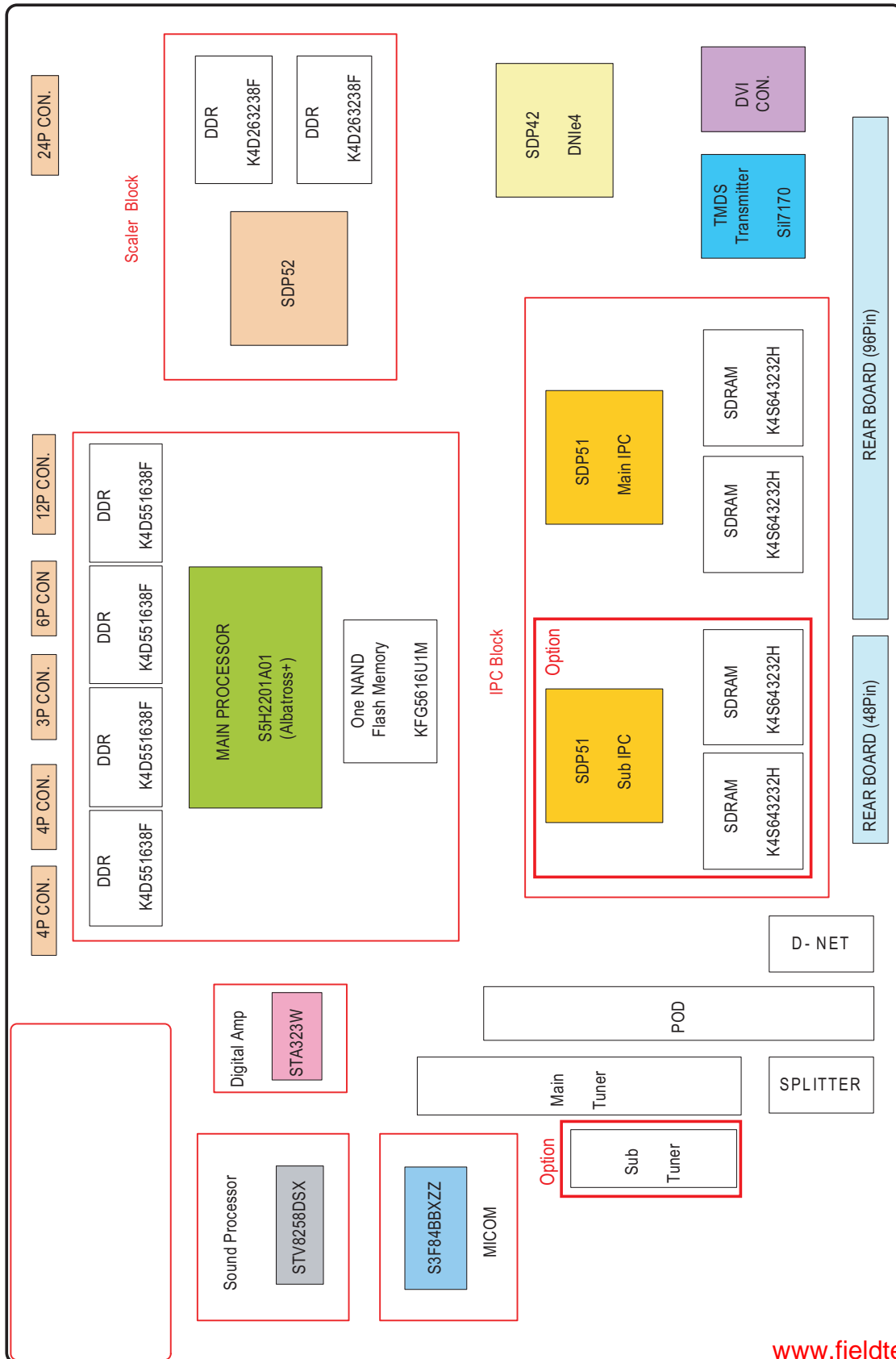
Use	Actuator_SP	side AV 11P	RMC 3p
Code	BN39-00640C	BP39-00096D	BP39-00140E
Photo			
Use	RMC 2p	key control 6p	Power 24p
Code	BN39-00656B	BP39-00147B	BP39-00174A
Photo			
Use	Ground discharge cable 1p	Inlet	SIDE AV 5P
Code	BP39-00180C	BP96-00972A	BP39-00104D
Photo			
Use	Ballast cable	key control 4p	Main to DMD cable
Code	BP39-00141A	BP39-00103A	BP39-00192A
Photo			

Use	DVI(250mm : k280)
Code	BP39-00106A
Photo	



## 8-2 Main Board Layout

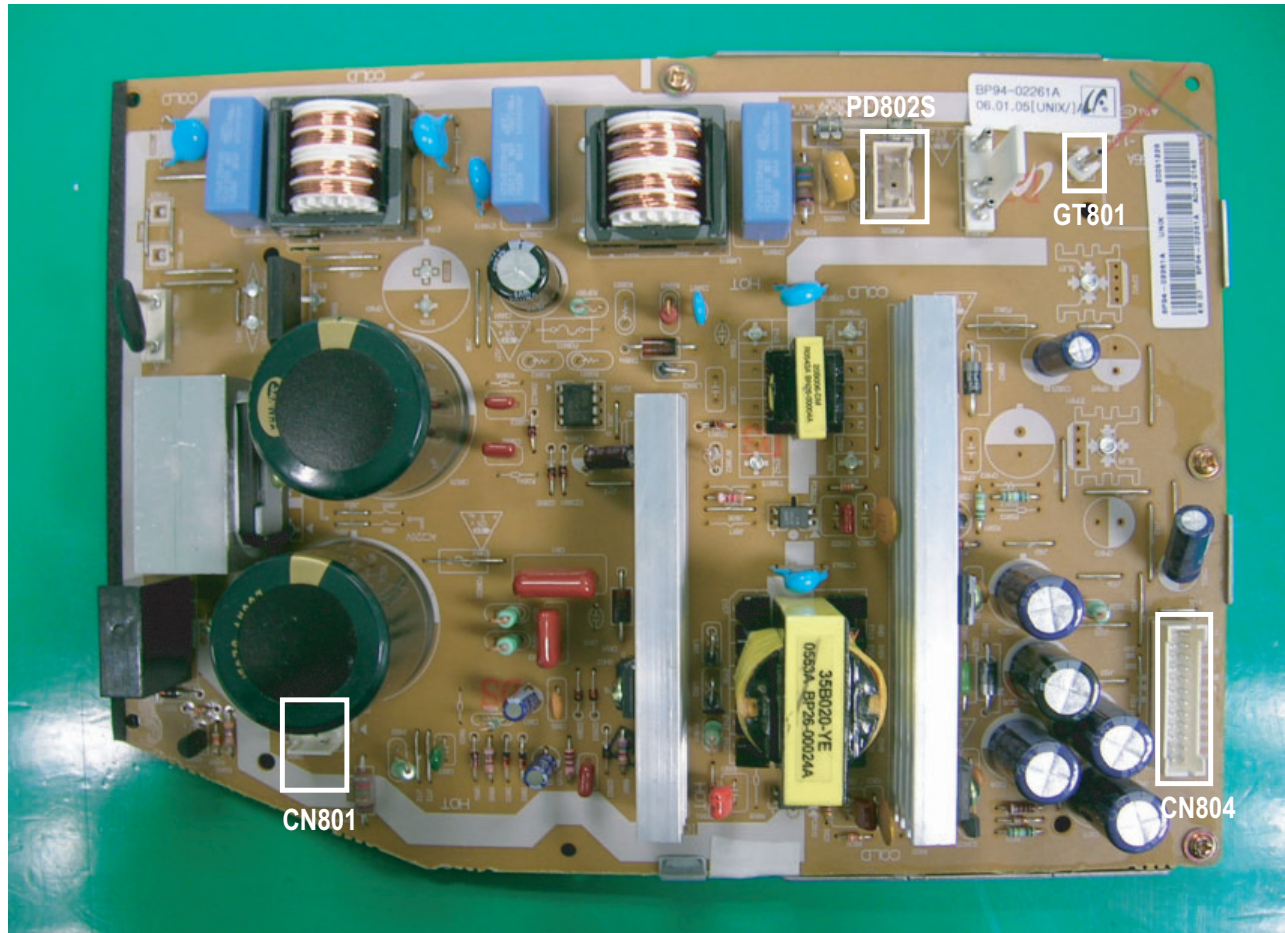
※ Options are deleted on the ATSC only Model.



## 9. PCB Diagram

### 9-1 Power Board

#### 9-1-1 Assy Power Board



#### ■ DC Power Supply

(Supplies DC power to the main PCB. The main board is responsible for the power supply to the rear/POD/DMD board.)

#### 9-1-2 Names & Roles of Key Parts

- \* CN801 : Supplies power (DC220-400v) to the ballast
- \* CN804 : Supplies power to the main board.
- \* GT801 : Anti-lightning wire connected to the main board. The anti-lightning wire should be installed for safety purposes.
- \* PD802S : Inlet type of terminal that is connected to the AC power cable.

**9-1-3 Power Board Connector Pin**

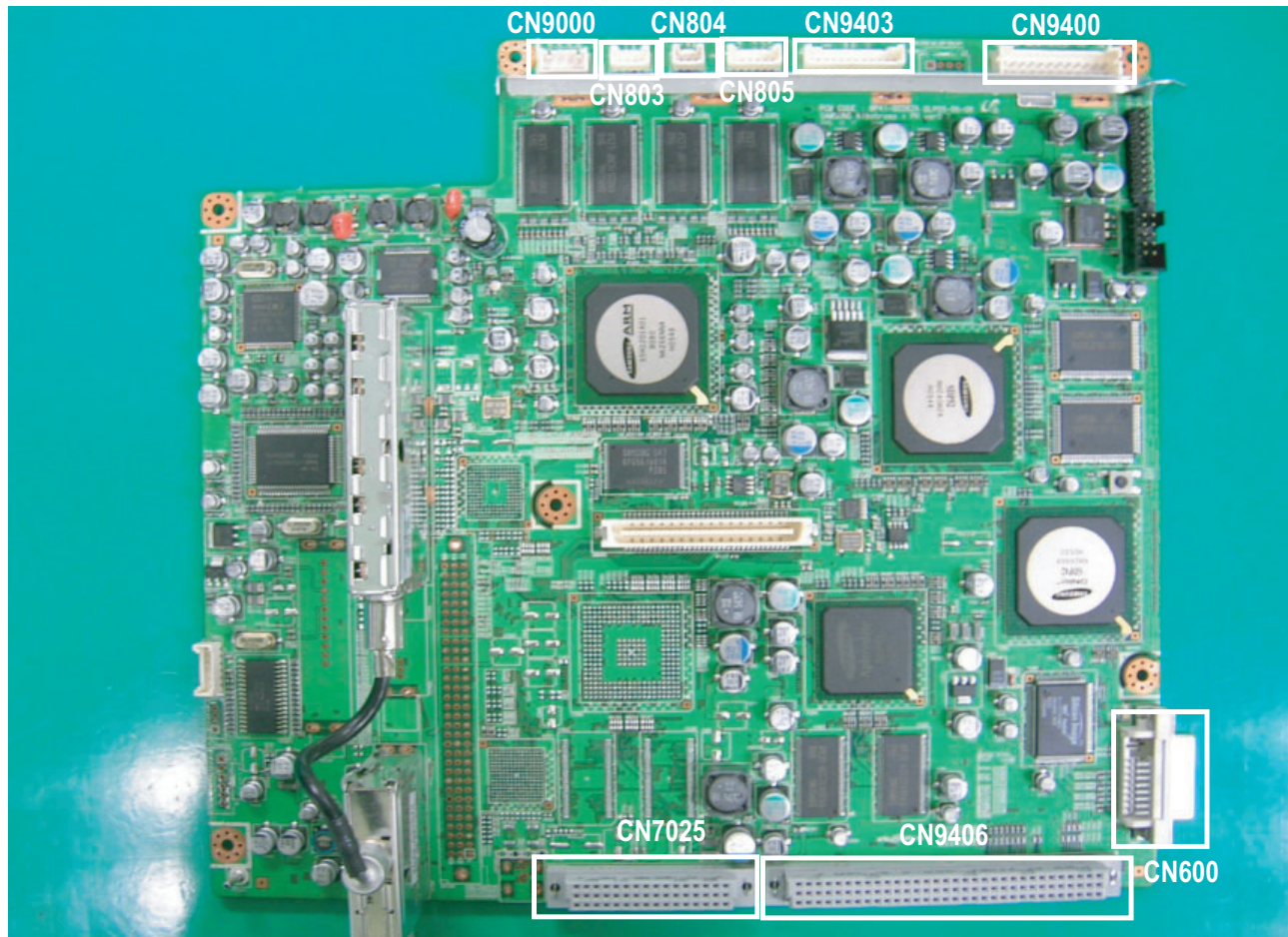
CN804

Connecting Power to Main Board

Pin Name	PIN No.		Pin Name
STD5V	1	2	N.C
GND	3	4	S14.5V
STD5V	5	6	S_GND
GND	7	8	S14.5VB
POWER_SW	9	10	S_GND
5.7VB	11	12	5.7VB
GND	13	14	GND
12V_OPTION	15	16	12V_OPTION
GND	17	18	GND
12VB	19	20	12VB
GND	21	22	GND
GND	23	24	12VB

## 9-2 Main Board

### 9-2-1 Assy Main Board



- All Digital Video Processing
- OSD / Menu
- Reset Switch (Reset to the CPU)
- Connected with POD channel Board and Rear Board

### 9-2-2 Names & Roles of Key Parts

- \* S5H2201 : RISC Processor/ USB host port/ MPEG Video decoder/ AC-3 decoder
- \* The advantages of SDP51/52
  - The world's first Noise Reduction with the ME/MC tool application to 1080p Signal
  - ME/MC IPC with the best performance in the world
  - The clear character reproduction with Ticker Detection & Compensation
  - DTV Picture quality differentiation with MPEG Noise Reduction(De-blocking/De-Ringing)
  - Extended definition and uniform Scaling implementation with the horizontal 12tap and the vertical 8Tap Scaler
  - Natural Edge implementation with De-Jagging function
  - Pattern and fine signal sharpness improvement by Pre-Scaler and DE

**9-2-3 Main Board Connector Pin**

CN9000

Pin No.	Pin Name
1	-L_OUT
2	+L_OUT
3	-R_OUT
4	+R_OUT

CN803

Pin No.	Pin Name
1	GND
2	KEY1
3	KEY2
4	GND

CN804

Pin No.	Pin Name
1	IR
2	GND
3	S5V_MICOM

CN805

Pin No.	Pin Name
1	S5V_MICOM
2	KEY-PWR
3	GND
4	LED_STB
5	LED_LAMP
6	LED_TIMER

CN9403

Pin No.	Pin Name
1	GND
2	GND
3	12VB
4	12VB
5	GND
6	SDA-M1
7	SCL-M1
8	GND
9	S5V
10	GND
11	70VB
12	GND

CN9400

Pin Name	PIN No.		Pin Name
STD5V	1	2	N.C
GND	3	4	S14.5V
STD5V	5	6	S_GND
GND	7	8	S14.5VB
POWER_SW	9	10	S_GND
5.7VB	11	12	5.7VB
GND	13	14	GND
12V_OPTION	15	16	12V_OPTION
GND	17	18	GND
12VB	19	20	12VB
GND	21	22	GND
GND	23	24	12VB

## CN651

PIN No.	Pin Name	PIN No.	Pin Name	PIN No.	Pin Name
1	GND	17	TX_ANYNET	33	GND
2	NC	18	RX_ANYNET	34	NC
3	RX_GEMSTAR	19	NC	35	SIDE_SDET
4	TX_GEMSTAR	20	GEMSTAR_IR	36	SIDE_VDET
5	GND	21	GND	37	GND
6	USBAP	22	USB_VCC_CHECK	38	USBPWON-OFF
7	USBAN	23	NC	39	WOOFER_MUTE
8	NC	24	NC	40	SPDIF_HDMI
9	GND	25	NC	41	GND
10	12V_OPTION	26	GND	42	12V_OPTION
11	S5V_REAR	27	S5V_REAR	43	GND
12	D5V	28	D5V	44	GND
13	9VA	29	9VA	45	GND
14	GND	30	DDC_EEP_WP	46	NC
15	NC	31	NC	47	HDMI1_HPLUG_CTL
16	NC	32	SPDIF_OUT	48	HDMI2_HPLUG_CTL

## CN600

PIN No.	Pin Name	PIN No.	Pin Name	PIN No.	Pin Name
1	TMDS_TX0+	9	TMDS_TX1+	17	TMDS_TX2+
2	TMDS_TX0-	10	TMDS_TX1-	18	TMDS_TX2-
3	GND	11	GND	19	GND
4	TMDS_TXC+	12	NC	20	DLP_SYNCVAL
5	TMDS_TXC-	13	NC	21	MD_nRESET
6	SCL_DDP	14	NC	22	GND
7	NC	15	LAMP_TXn_1	23	DDP_READY
8	NC	16	LAMP_Rx	24	PWRGOOD

## CN7000

Pin No.	Pin Name
1	NC
2	S9V
3	LNA_ON_OFF
4	SPL_CTL1
5	GND
6	SPL_CTL2

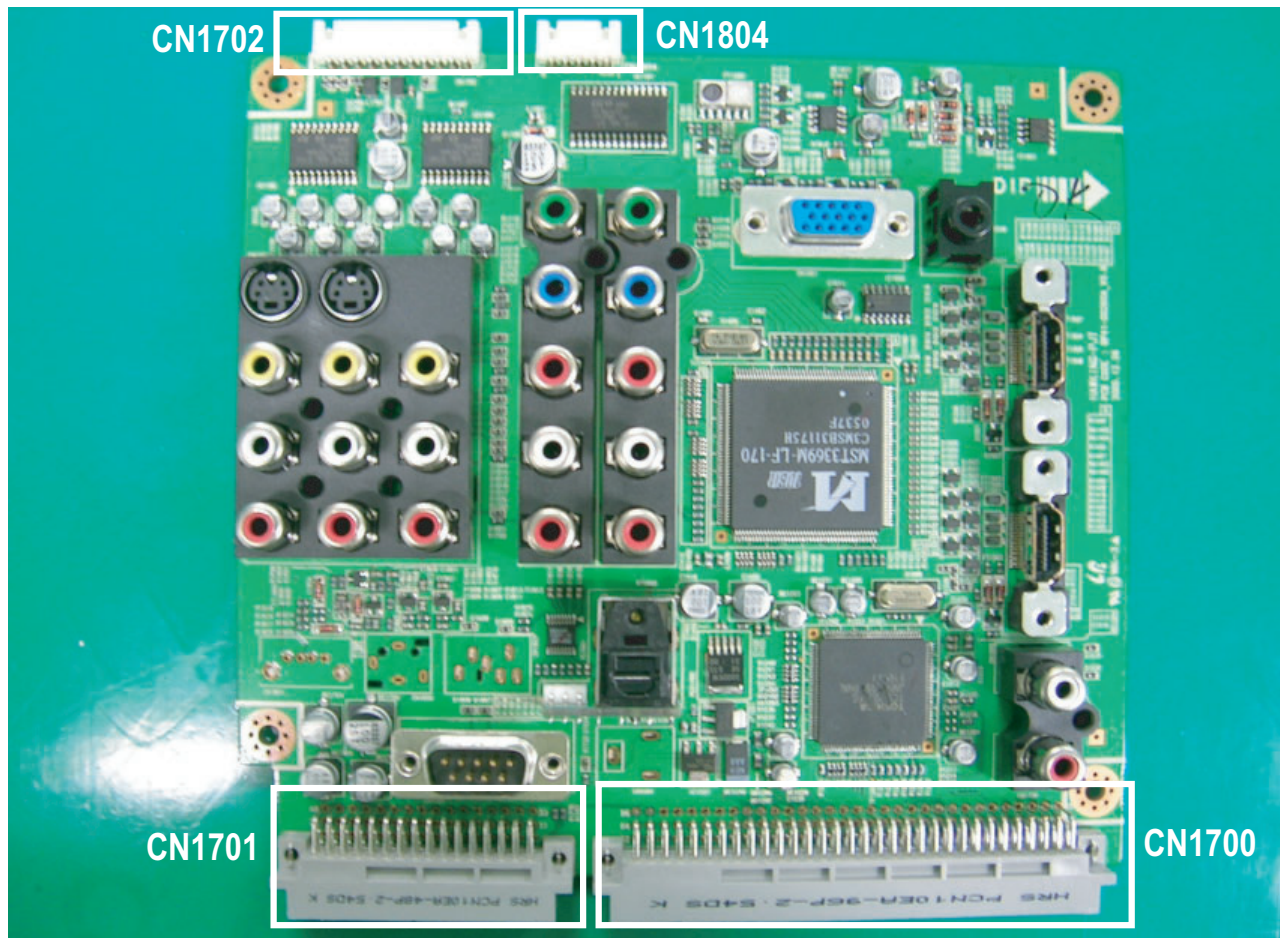


## CN9406

PIN No.	Pin Name	PIN No.	Pin Name	PIN No.	Pin Name
1	MONITOR_R	33	nRESETO_D	65	MAIN_CVBS
2	MONITOR_L	34	NRSTO_IN	66	NC
3	GND	35	IN_SW1	67	DTV_CVBS
4	NC	36	MST_nINT	68	GND
5	NC	37	MST_RST	69	V2-DET
6	NC	38	NC	70	V1-DET
7	GND	39	GND	71	COMP2-DET
8	HDMI2-ID	40	S2-DET	72	COMP1-DET
9	HDMI1-ID	41	S1-DET	73	PCJACK-ID
10	M_TC_HS	42	SDA_IN	74	MAIN_VBI
11	M_TC_VS	43	SCL_IN	75	M_TC_DE
12	M_TC_PCLK	44	GND	76	GND
13	GND	45	M_TC_R(6)	77	M_TC_R(2)
14	M_TC_R(9)	46	M_TC_R(5)	78	M_TC_R(1)
15	M_TC_R(8)	47	M_TC_R(4)	79	M_TC_R(0)
16	M_TC_R(7)	48	M_TC_R(3)	80	GND
17	GND	49	GND	81	M_TC_G(3)
18	M_TC_G(9)	50	M_TC_G(6)	82	M_TC_G(2)
19	M_TC_G(8)	51	M_TC_G(5)	83	M_TC_G(1)
20	M_TC_G(7)	52	M_TC_G(4)	84	M_TC_G(0)
21	GND	53	GND	85	GND
22	M_TC_B(9)	54	M_TC_B(5)	86	M_TC_B(2)
23	M_TC_B(8)	55	M_TC_B(4)	87	M_TC_B(1)
24	M_TC_B(7)	56	M_TC_B(3)	89	M_TC_B(0)
25	M_TC_B(6)	57	GND	89	GND
26	GND	58	SIDE_R	90	GND
27	GND	59	SIDE_L	91	GND
28	GND	60	MAIN_R	92	GND
29	GND	61	MAIN_L	93	GND
30	GND	62	I2S_RX_MCLK	94	GND
31	I2S_RX_BCLK	63	I2S_RX_LRCLK	95	RX_RS232
32	I2S_RX_DATA	64	SUB_WOOFER_OUT	96	TX_RS232

## 9-3 Rear Board

### 9-3-1 Assy Rear Board



- Analog Video Switching / Processing
- Analog Audio Switching

### 9-3-2 Names & Roles of Key Parts

- \* CN1700,CN1701 : Connected to the Main board
- \* CN1702 : Connected to the side AV
- \* CN1804 : Connected to the side USB port

- \* High Definition Multimedia Interface :

The HDMI™ (High Definition Multimedia Interface) supports compressed standard and high definition digital video formats and existing digital multi-channel audio formats.



**9-3-3 Rear Board Connector Pin**

## CN1701

PIN No.	Pin Name	PIN No.	Pin Name	PIN No.	Pin Name
1	GND	17	TX_ANYNET	33	GND
2	NC	18	RX_ANYNET	34	NC
3	RX_GEMSTAR	19	NC	35	SIDE_SDET
4	TX_GEMSTAR	20	GEMSTAR_IR	36	SIDE_VDET
5	GND	21	GND	37	GND
6	USB_AP	22	USB_VCC_CHECK	38	USBPW_ONOFF
7	USB_AN	23	NC	39	WOOFER_MUTE
8	NC	24	NC	40	SPDIF_IN
9	GND	25	NC	41	GND
10	S12V	26	GND	42	S12V
11	S5V	27	S5V	43	GND
12	D5V	28	D5V	44	GND
13	9VA	29	9VA	45	GND
14	GND	30	DDC_EEPROM_WP	46	NC
15	NC	31	NC	47	HDMI1_HPLUG_CTRL
16	NC	32	SPDIF_OUT	48	HDMI2_HPLUG_CTRL

## CN1702

Pin No.	Pin Name
1	SIDE_Y
2	SIDE_C
3	GND
4	SIDE_CVBS
5	GND
6	SIDE_L
7	GND
8	SIDE_R
9	GND
10	SIDE_SDET
11	SIDE_VDET

## CN 1804

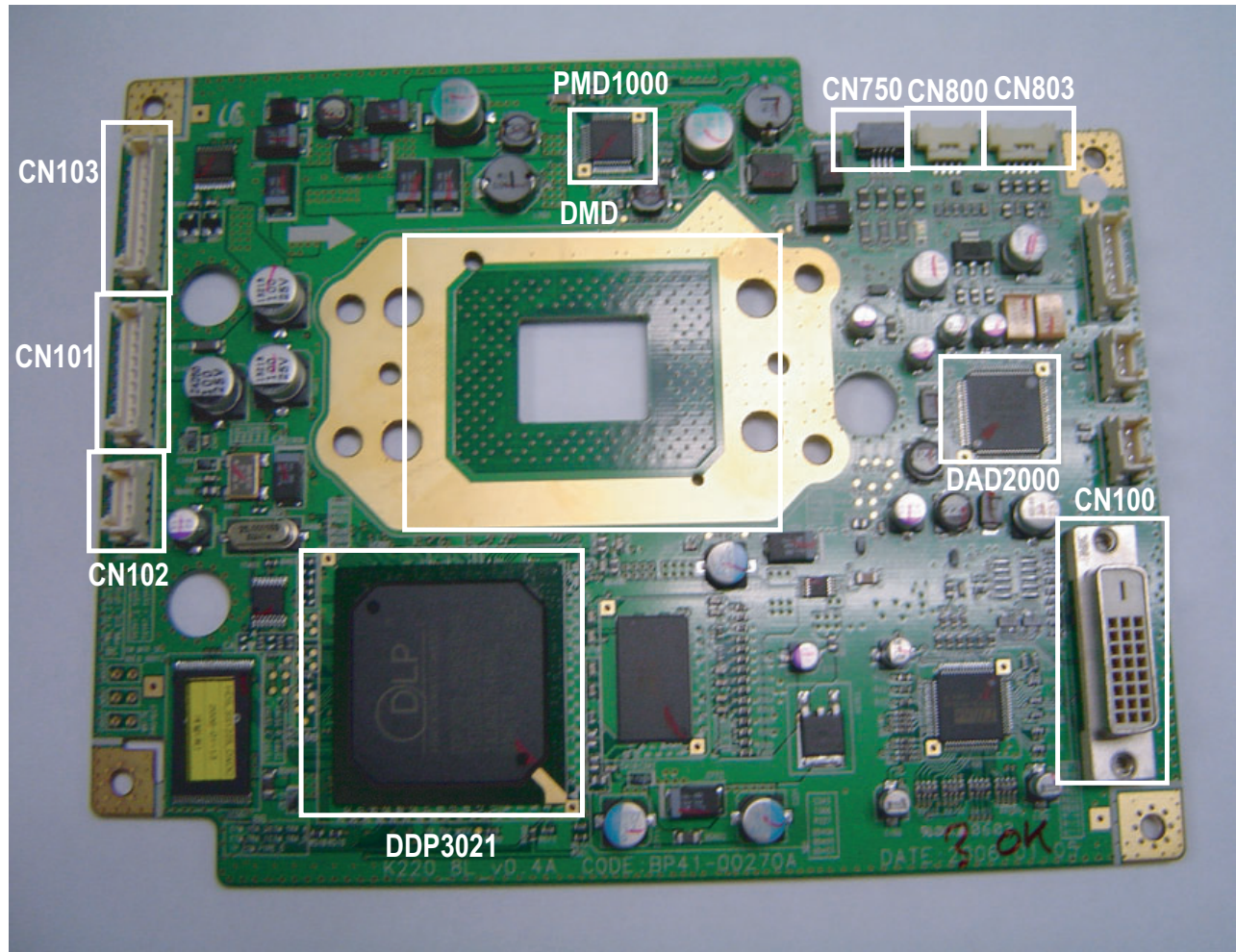
Pin No.	Pin Name
1	GND
2	POSI
3	NEGA
4	5V
5	GND

## CN1700

PIN No.	Pin Name	PIN No.	Pin Name	PIN No.	Pin Name
1	MONITOR_R_OUT	33	NRESETO_D	65	M_TU_CVBS
2	MONITOR_L_OUT	34	NRSTO_IN	66	NC
3	GND	35	NC	67	DTV_CVBS
4	NC	36	MST_INT	68	GND
5	NC	37	MST_RESET	69	AV2_DET
6	NC	38	NC	70	AV1-DET
7	GND	39	GND	71	COMP2_DET
8	HDMI2_ID	40	S2_DET	72	COMP1_DET
9	HDMI1_ID	41	S1_DET	73	PCJACK_ID
10	M_HS	42	SDA	74	MAIN_VBIR
11	M_VS	43	SCL	75	M_DE
12	M_PCLK	44	GND	76	GND
13	GND	45	M_ROUT(6)	77	M_ROUT(2)
14	M_ROUT(9)	46	M_ROUT(5)	78	M_ROUT(1)
15	M_ROUT(8)	47	M_ROUT(4)	79	M_ROUT(0)
16	M_ROUT(7)	48	M_ROUT(3)	80	GND
17	GND	49	GND	81	M_GOUT(3)
18	M_GOUT(9)	50	M_GOUT(6)	82	M_GOUT(2)
19	M_GOUT(8)	51	M_GOUT(5)	83	M_GOUT(1)
20	M_GOUT(7)	52	M_GOUT(4)	84	M_GOUT(0)
21	GND	53	GND	85	GND
22	M_BOUT(9)	54	M_BOUT(5)	86	M_BOUT(2)
23	M_BOUT(8)	55	M_BOUT(4)	87	M_BOUT(1)
24	M_BOUT(7)	56	M_BOUT(3)	89	M_BOUT(0)
25	M_BOUT(6)	57	GND	89	GND
26	GND	58	SIDE_R	90	GND
27	GND	59	SIDE_L	91	GND
28	GND	60	MAIN_R	92	GND
29	GND	61	MAIN_L	93	GND
30	GND	62	I2S_RX_MCLK	94	GND
31	I2S_RX_BCLK	63	I2S_RX_LRCLK	95	RX_RS232
32	I2S_RX_DATA	64	SUB_WOOFER_OUT	96	TX_RS232

## 9-4 DMD Board

### 9-4-1 Assy DMD Board



- Controls the lamp (ON/OFF)
- Drives the color wheel motor
- Drives the panel

### 9-4-2 Names & Roles of Key Parts

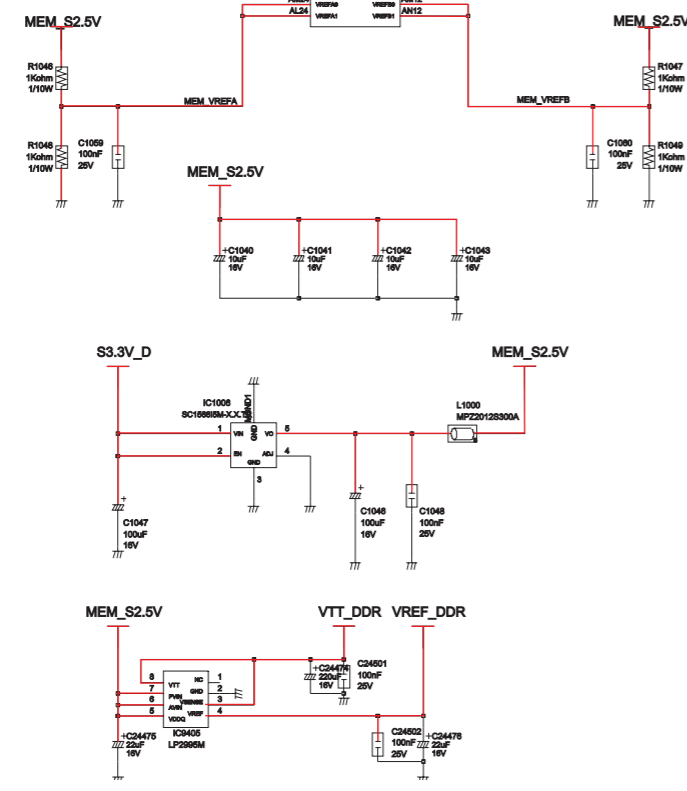
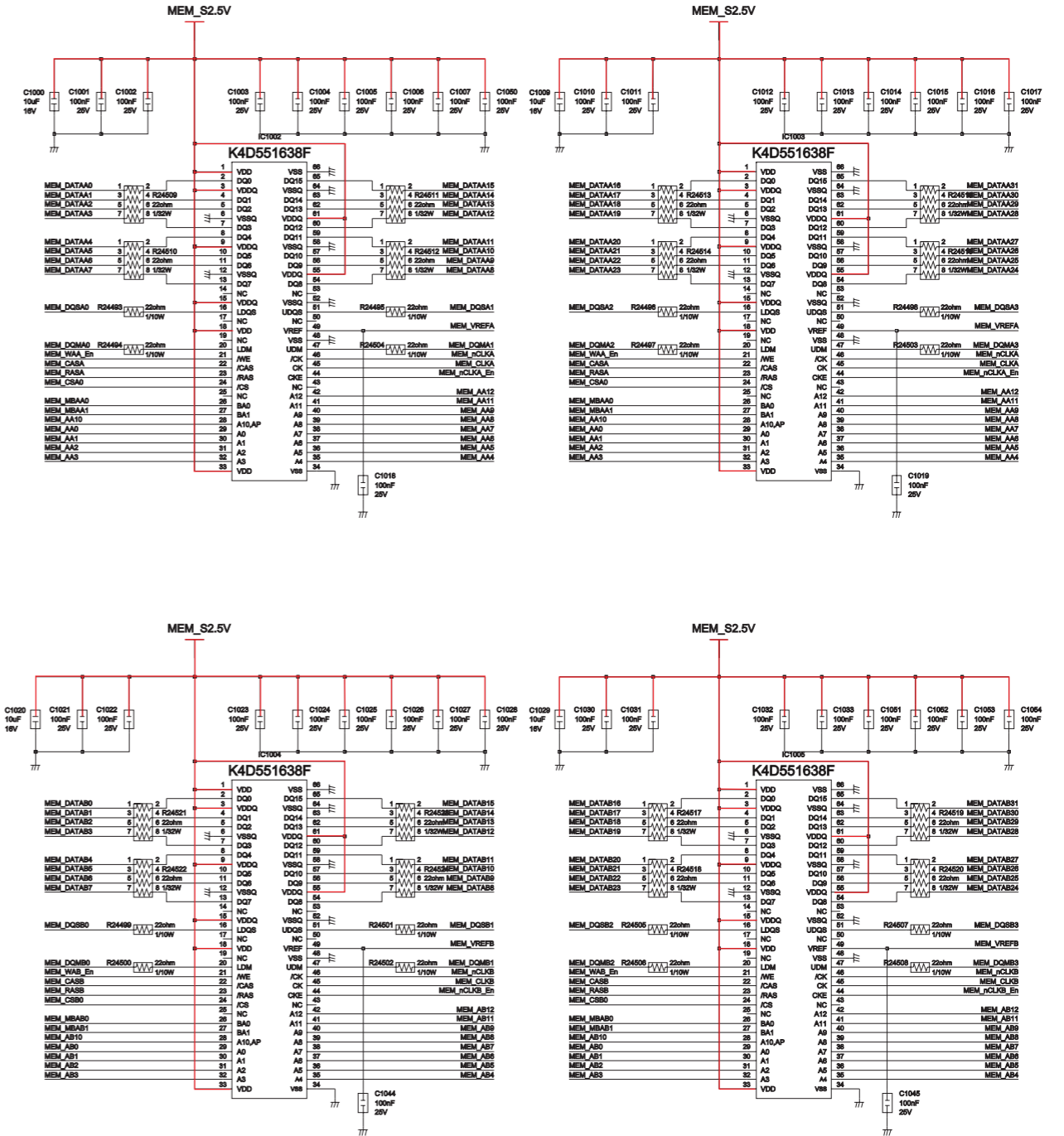
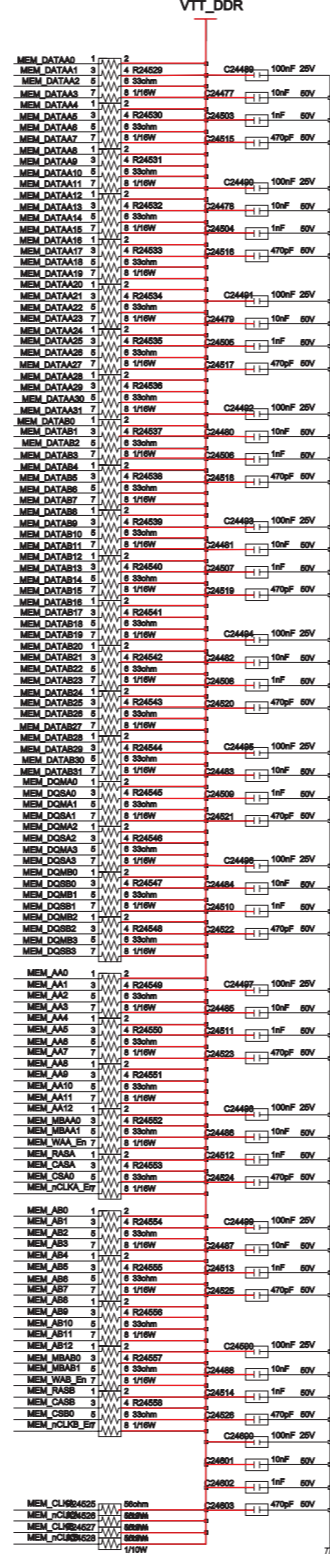
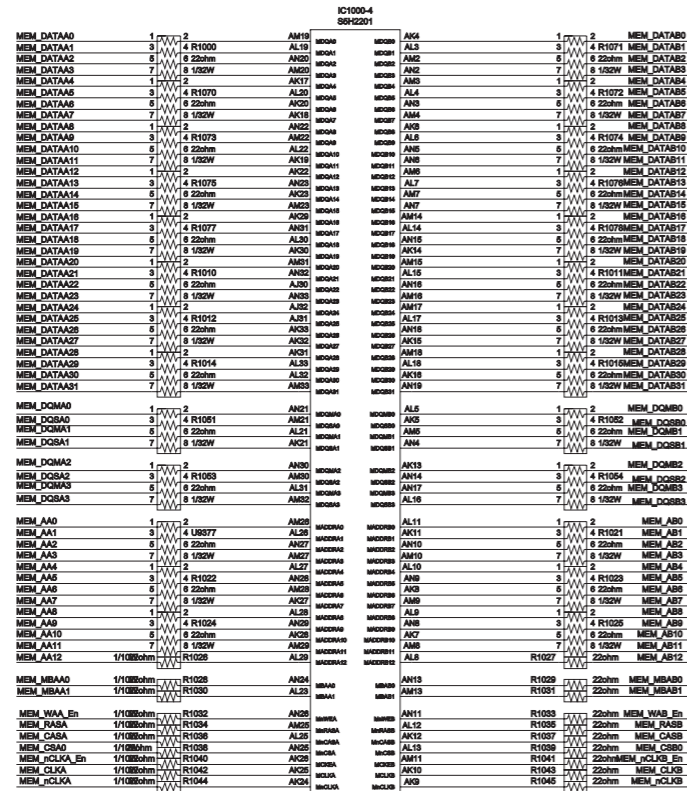
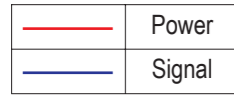
- \* CN750 : This supplies the power to drive the color wheel.
- \* CN800 : This receives the color wheel rotating signals.
- \* CN803 : This sends signals to the ballast.
- \* CN100 : The DVI cable terminal. This receives the image data from the digital board.
- \* DMD PANEL : This is protected with a heat sink and fixtures.
- \* DDP3021 : This processes the DMD drive and the signals.
- \* PMD1000 : This supplies the DMD Board power and controls the color wheel rotating.
- \* DAD2000 : This supplies DMD reset signals.

# 10. Schematic Diagram

## 10-1 Main Board

### 10-1-1 Albatross+DDR memory interface

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

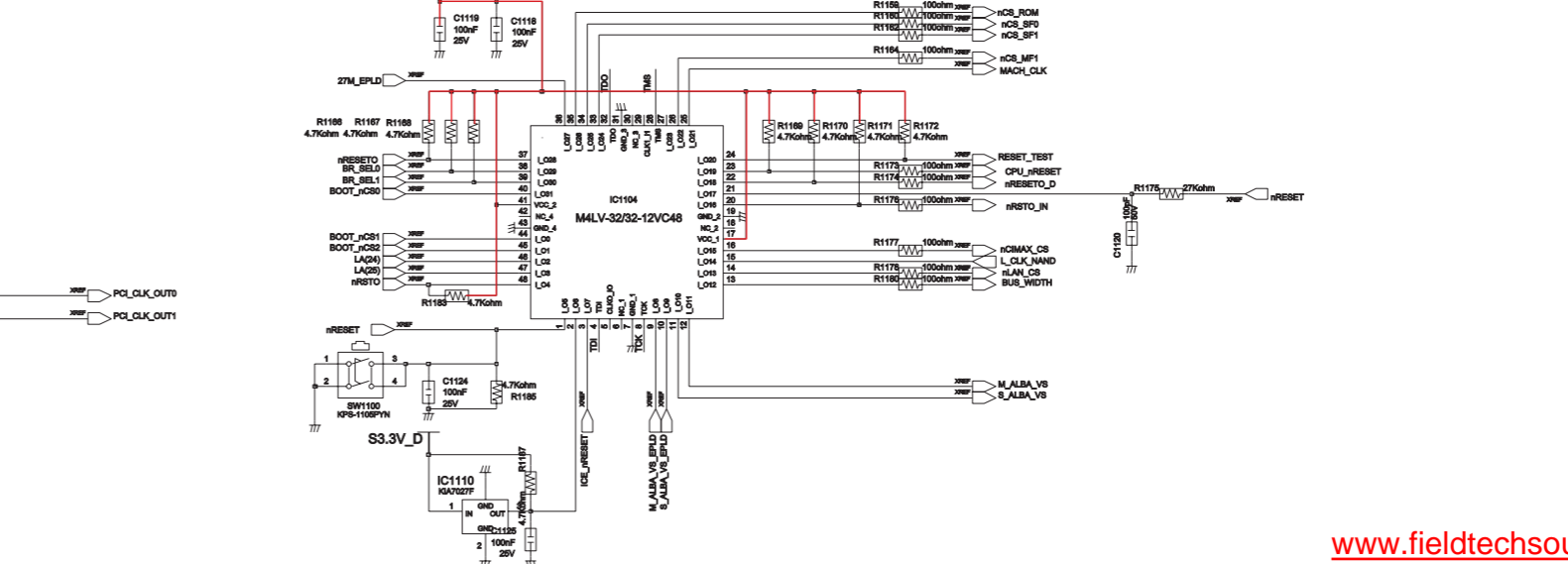
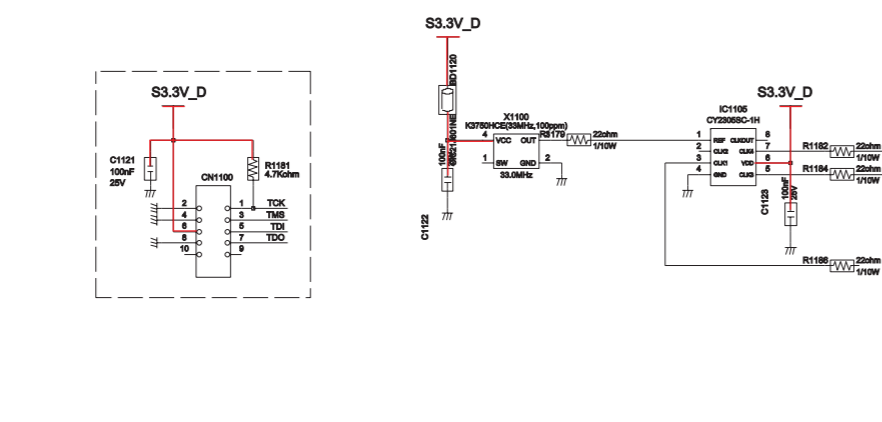
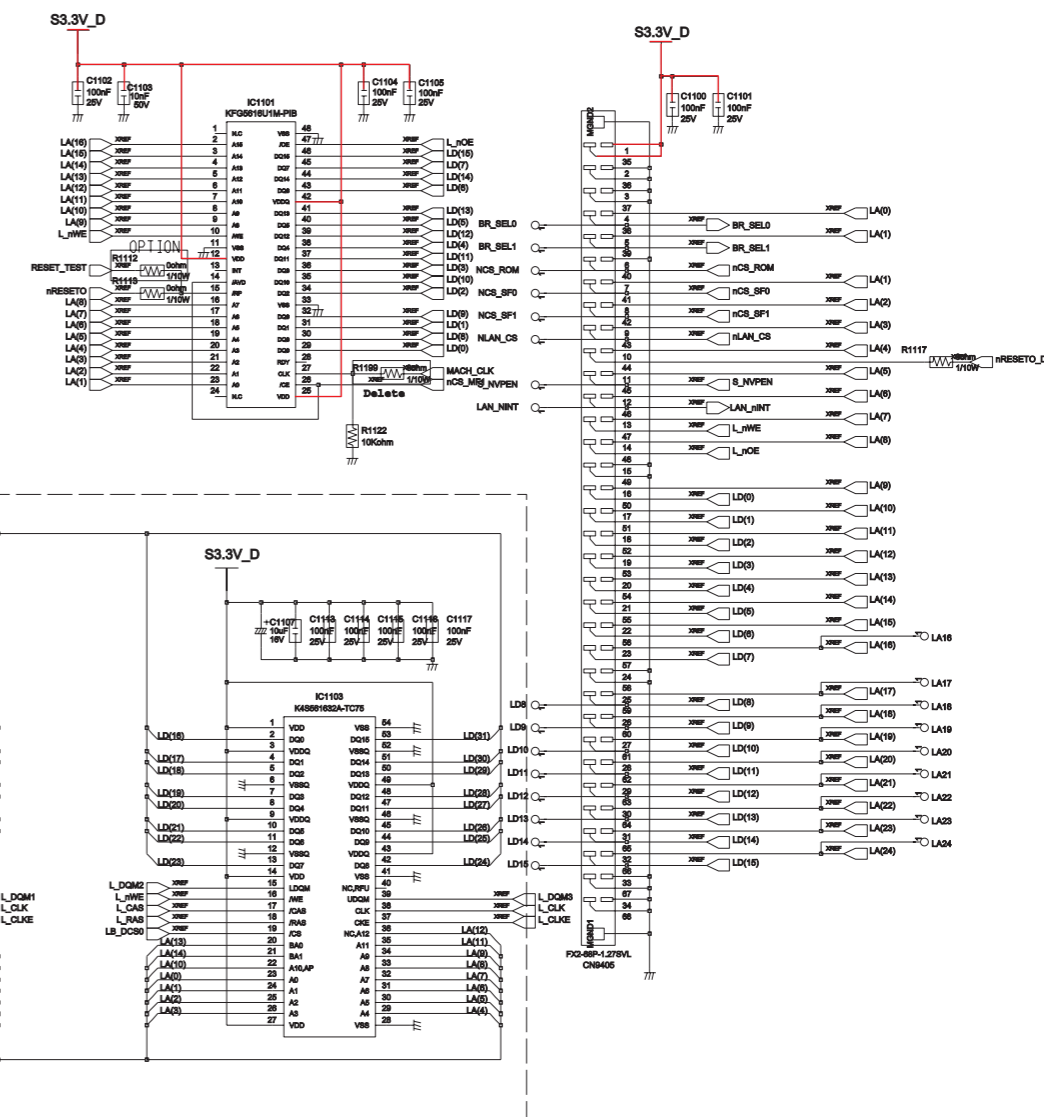
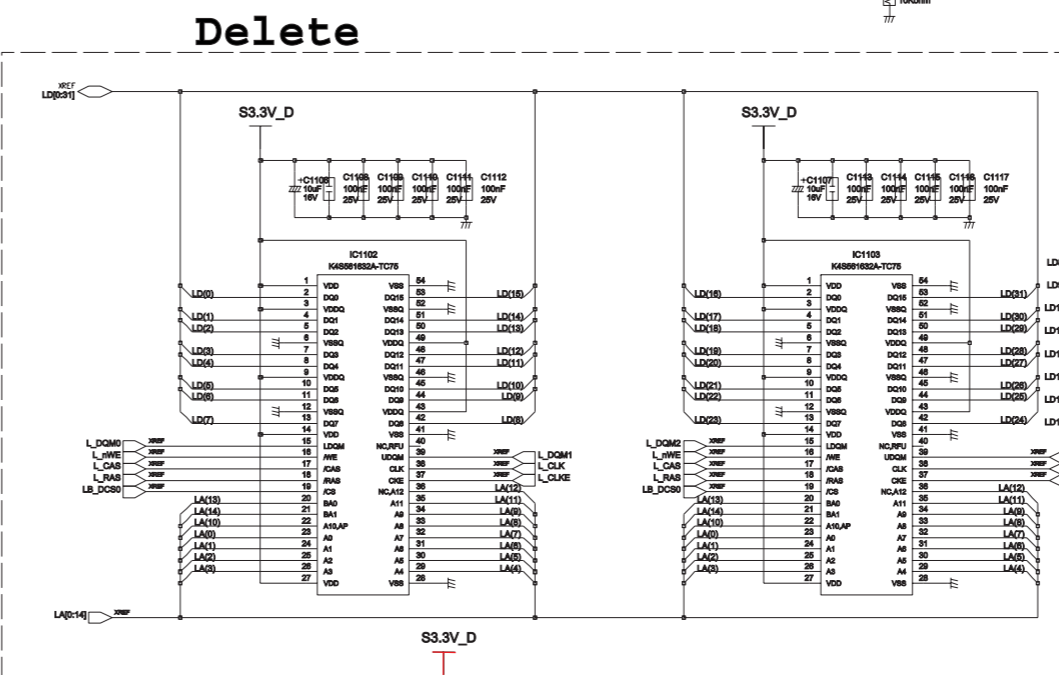
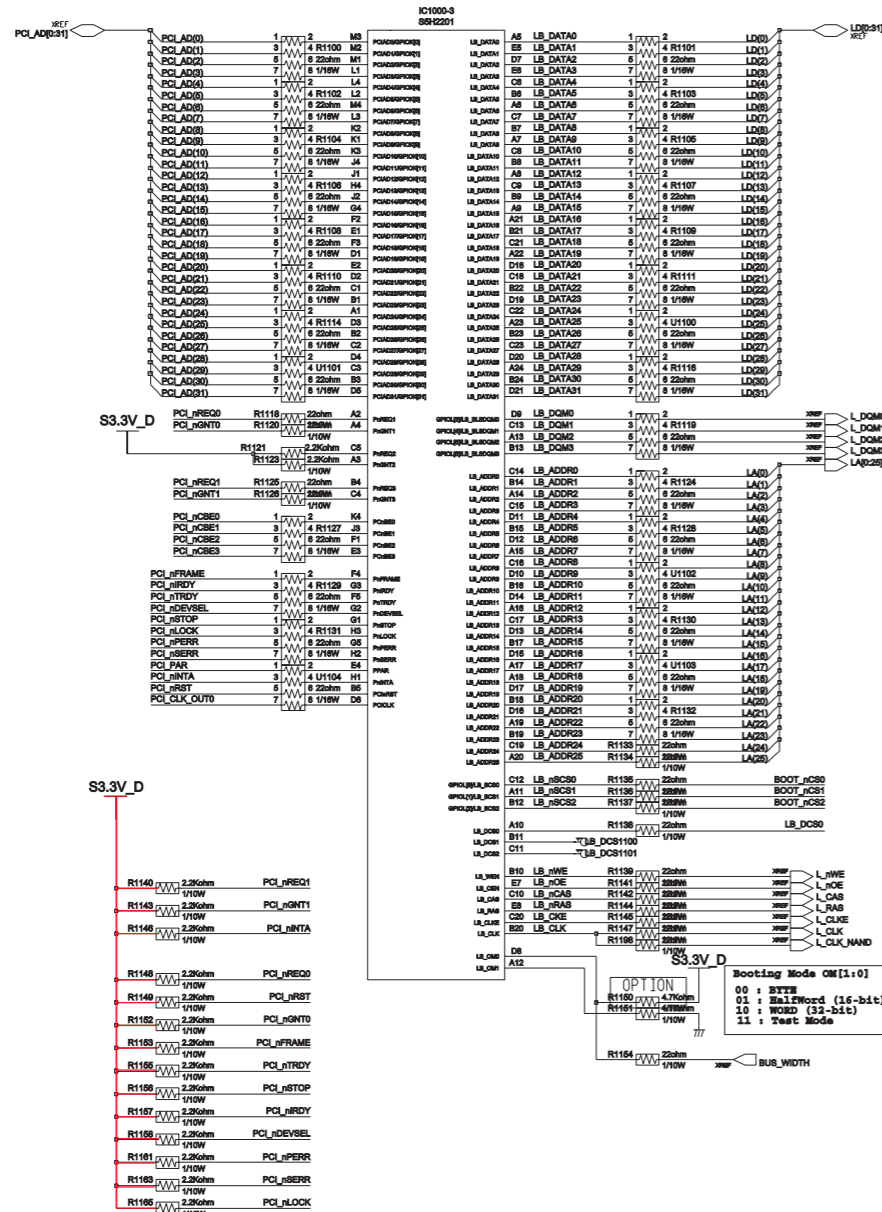
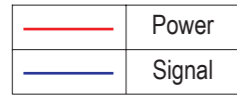


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# 10-1-2 Albatross+Local bus interface

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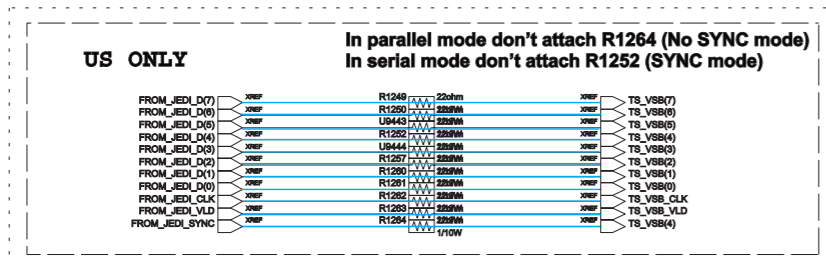


### 10-1-3 Albatross+TS AV interface

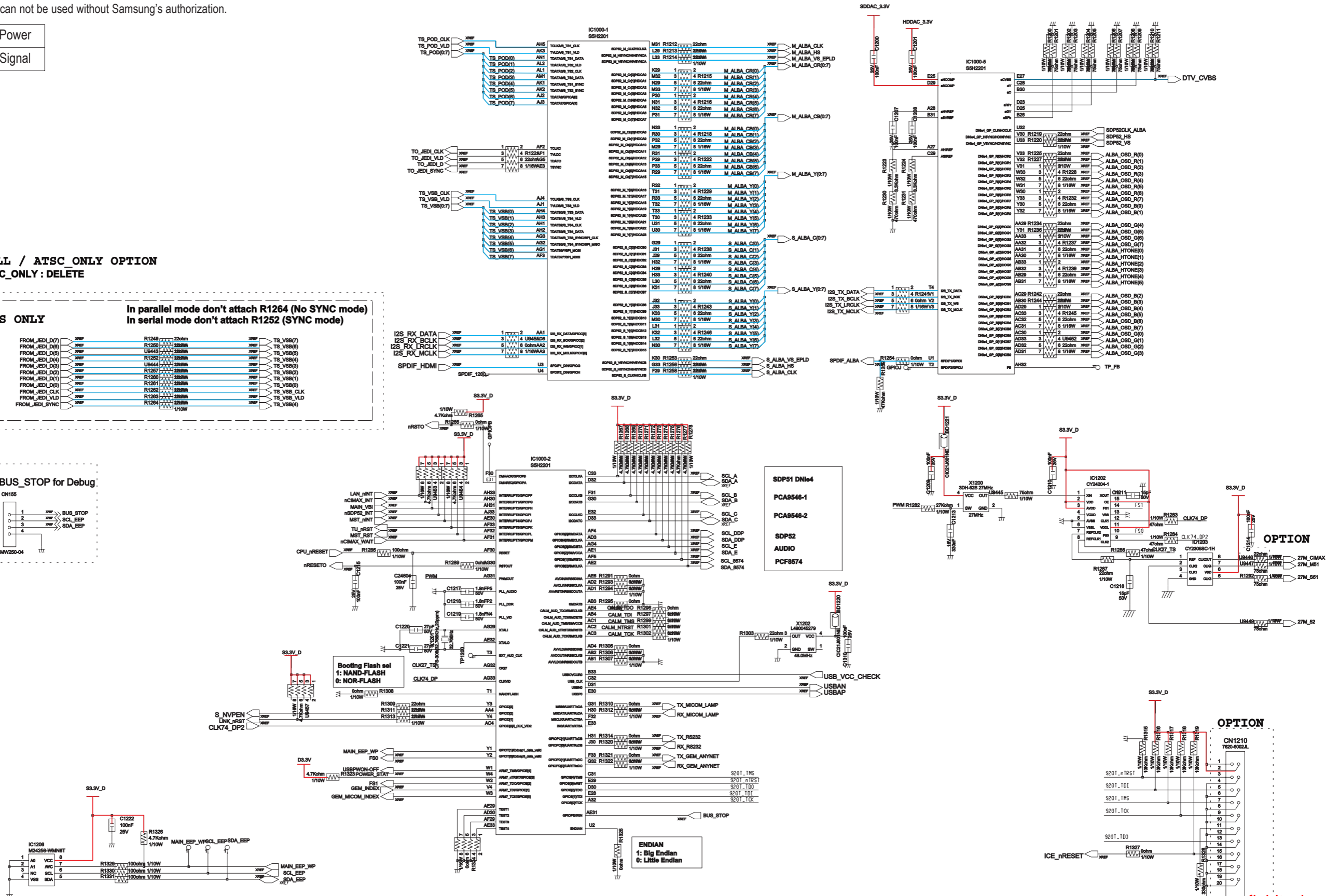
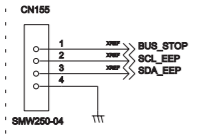
This Document can not be used without Samsung's authorization.

	Power
	Signal

FULL / ATSC ONLY OPTION  
ATSC\_ONLY : DELETE

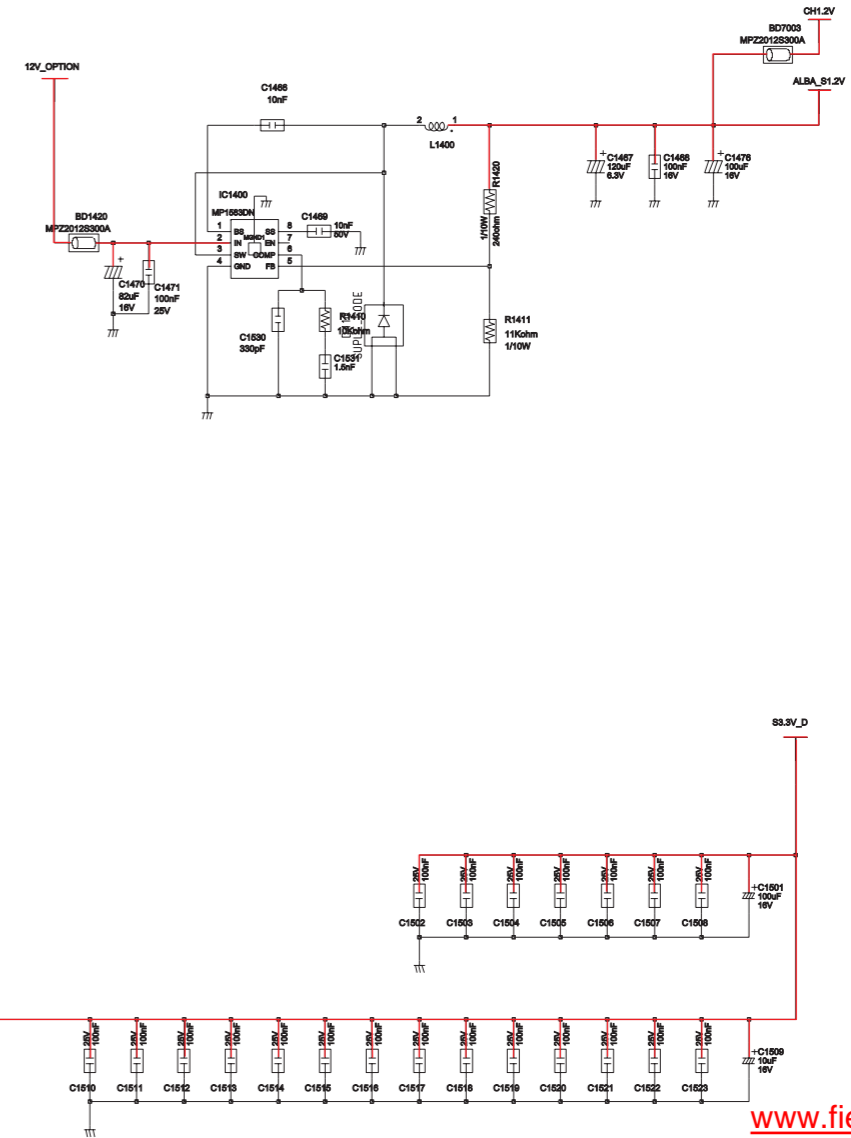
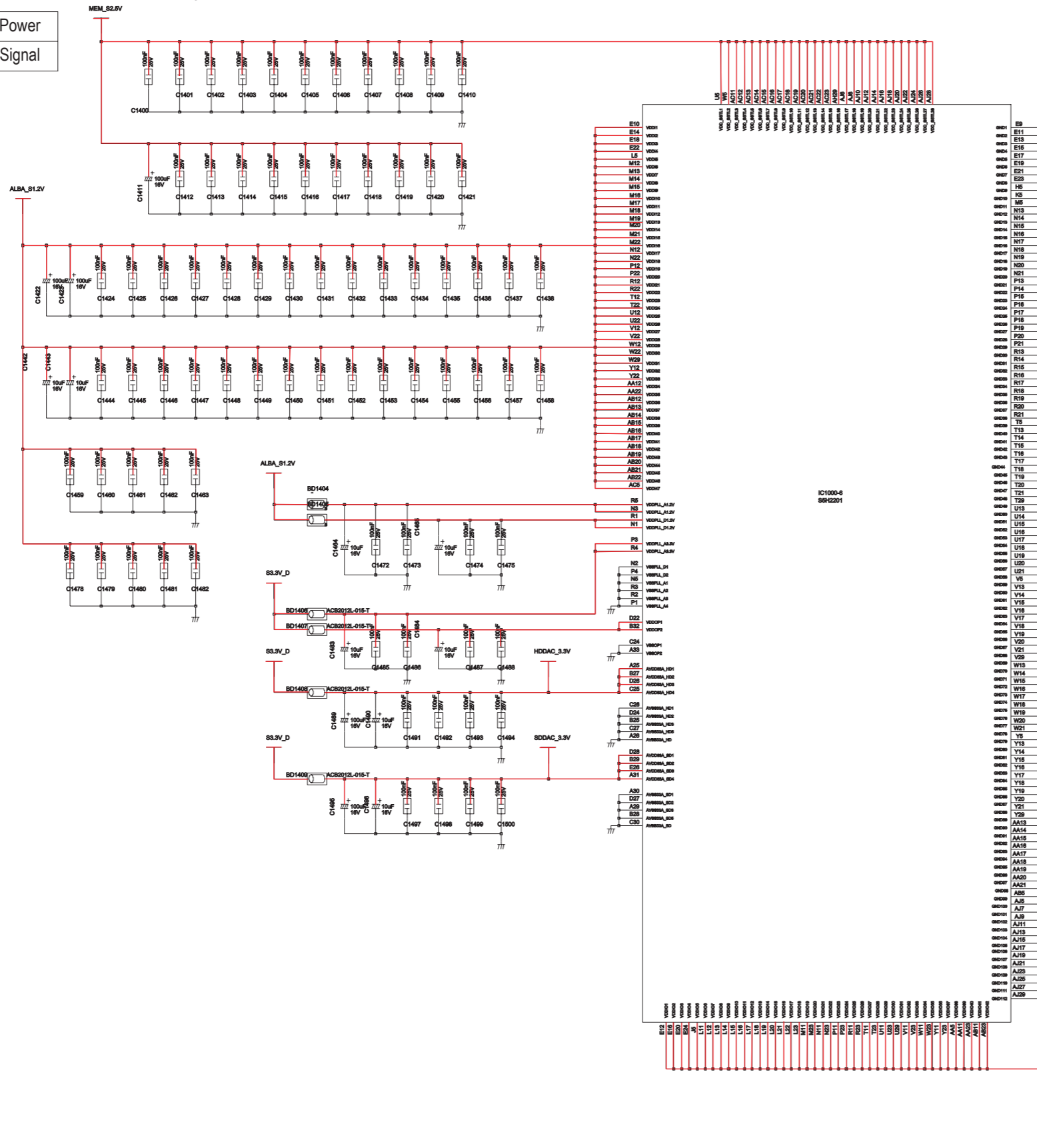
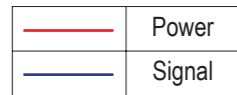


BUS\_STOP for Debug



### 10-1-4 Albatross+POWER

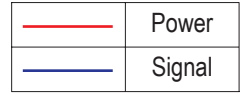
This Document can not be used without Samsung's authorization.





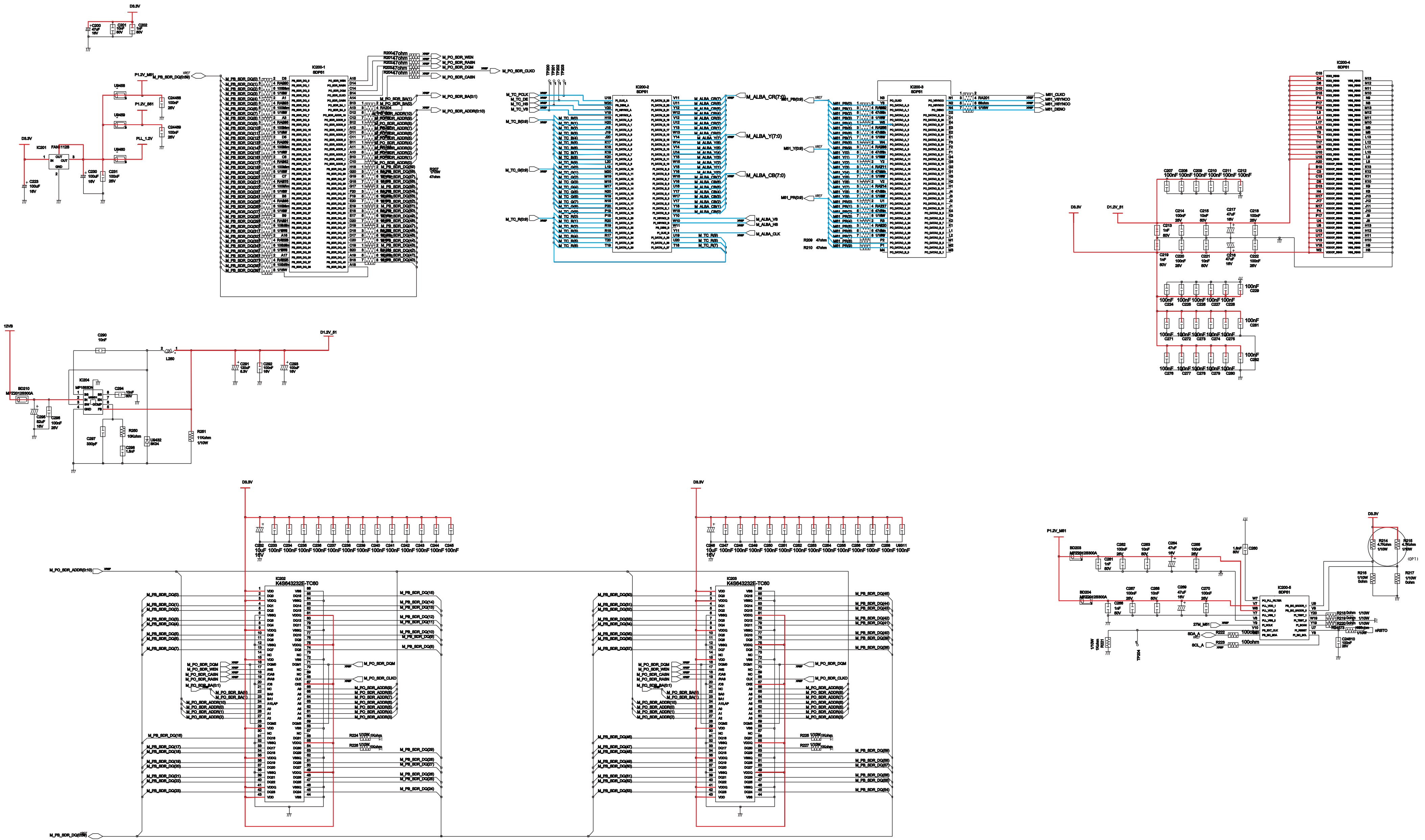
10-1-5 Main SDP51

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# SDP51\_MAIN

## I2C ADDR : C9/C8 (R/W)

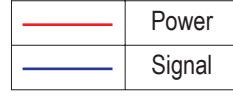




10-1-6 Sub SDP51

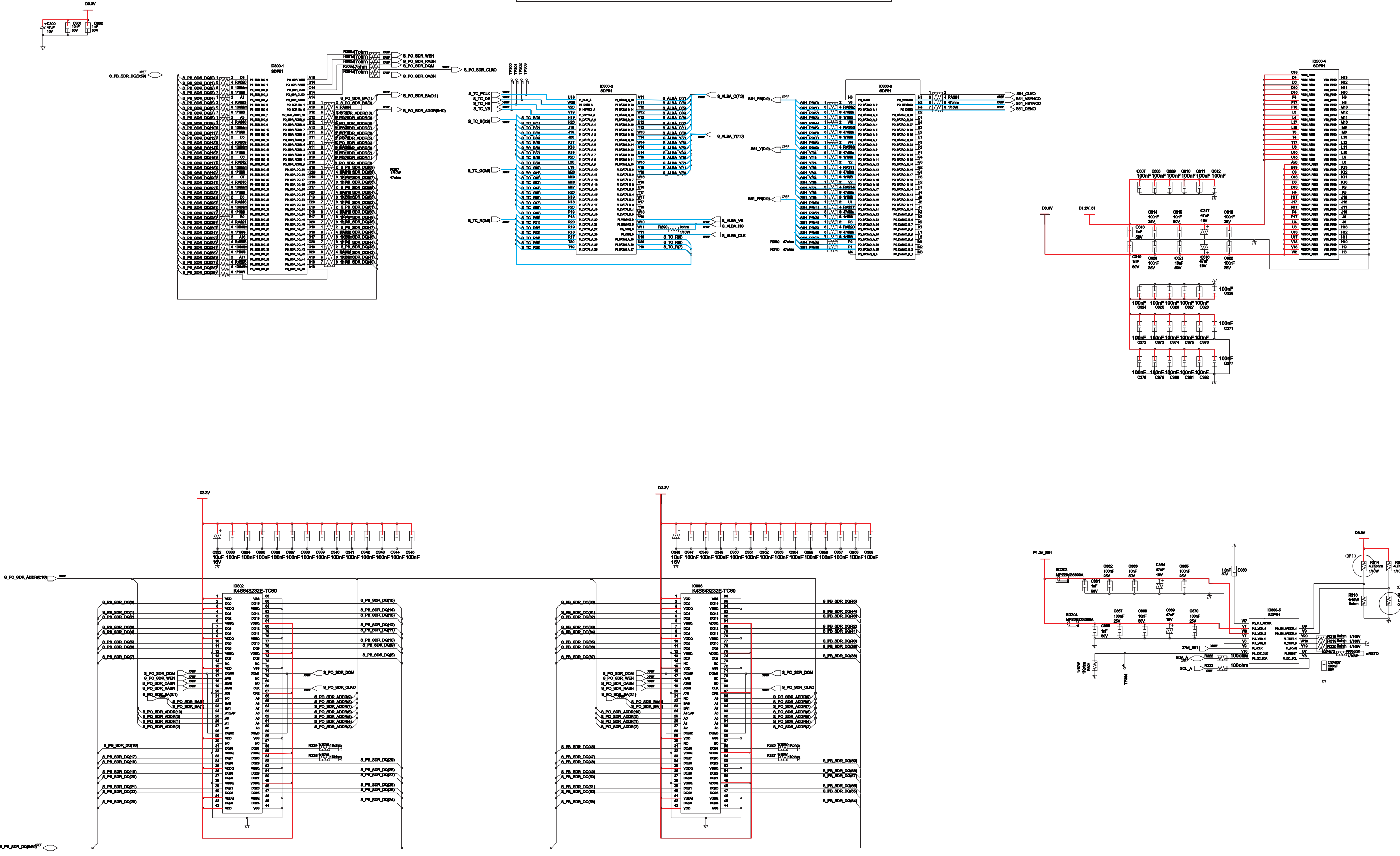
This Document can not be used without Samsung's authorization.

FULL / ATSC ONLY OPTION  
ATSC\_ONLY : DELETE



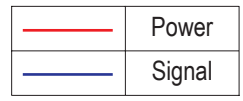
# SDP51\_SUB

## I2C ADDR : CB/CA (R/W)

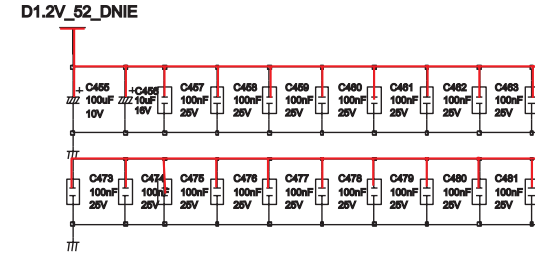
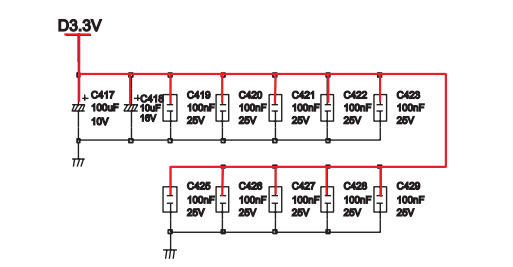
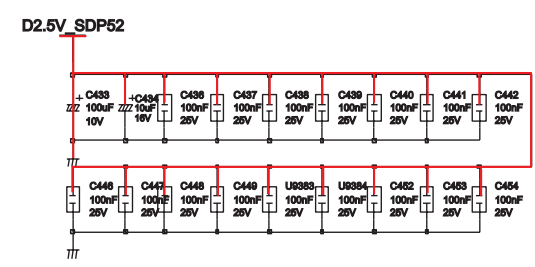
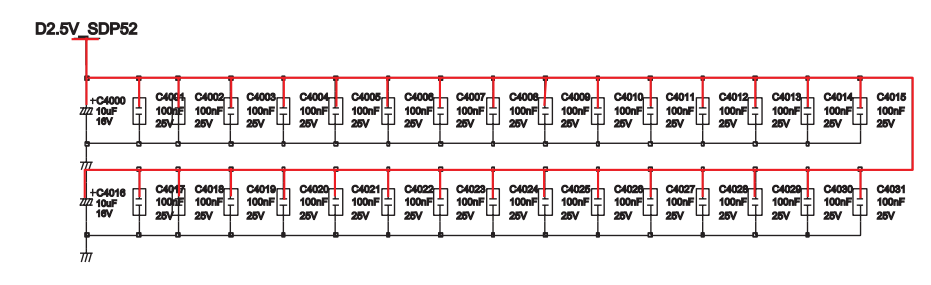
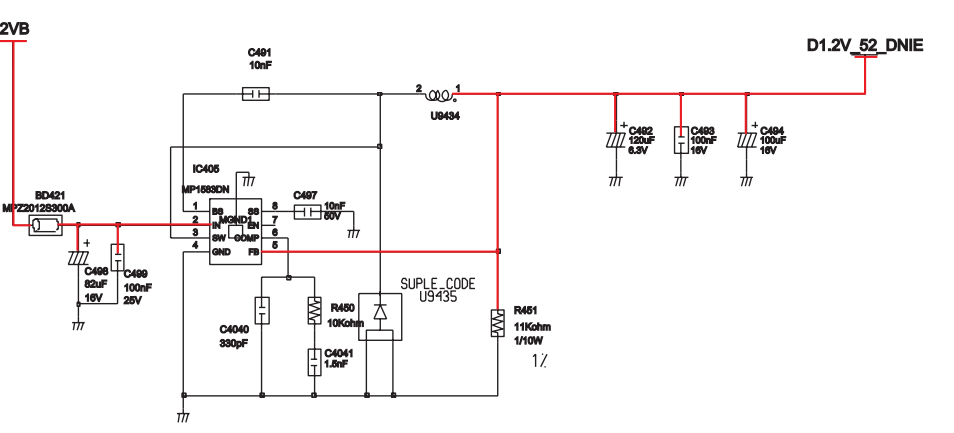
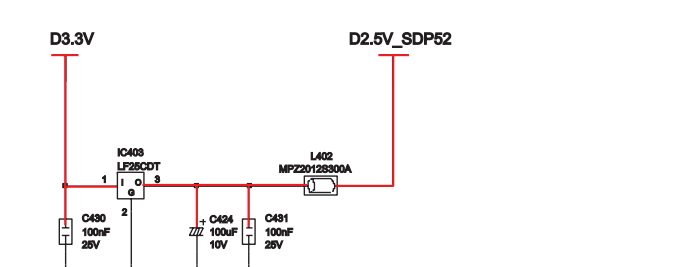
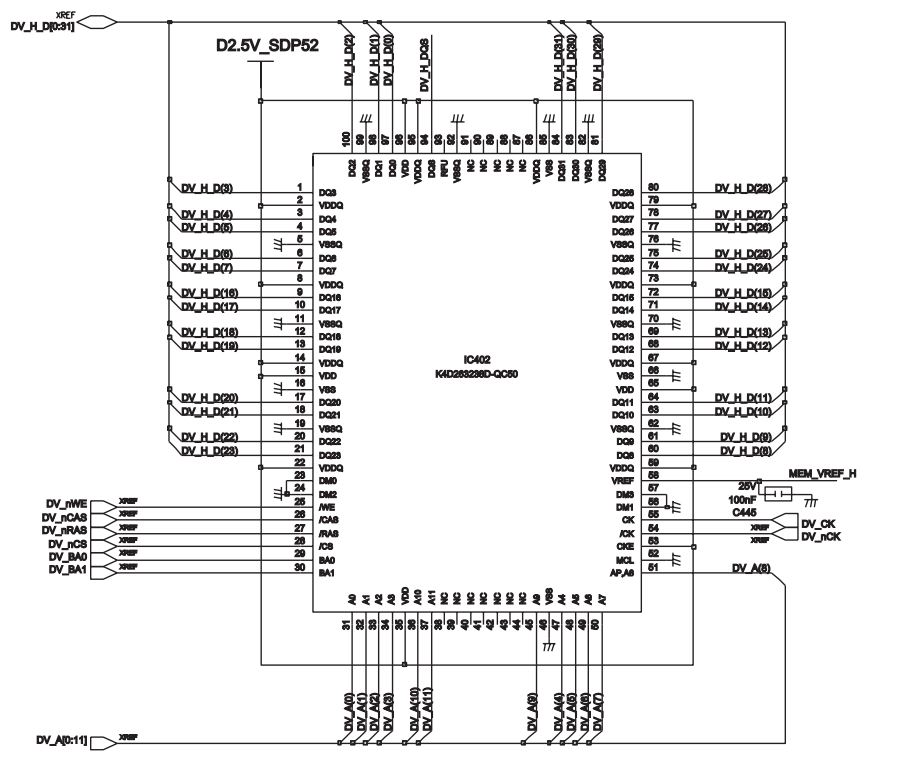
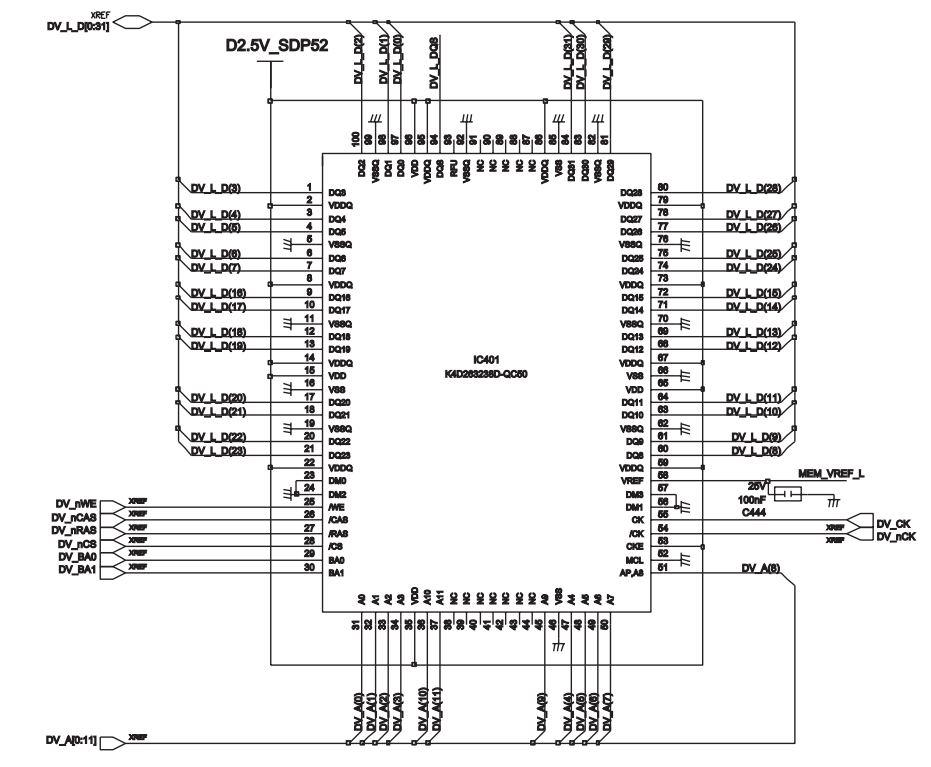
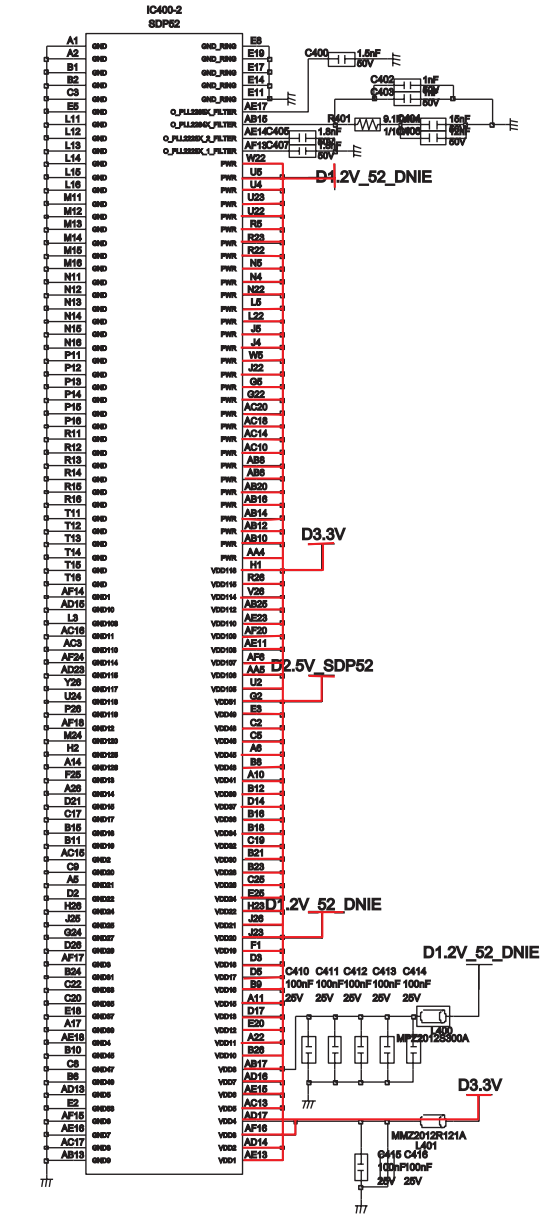
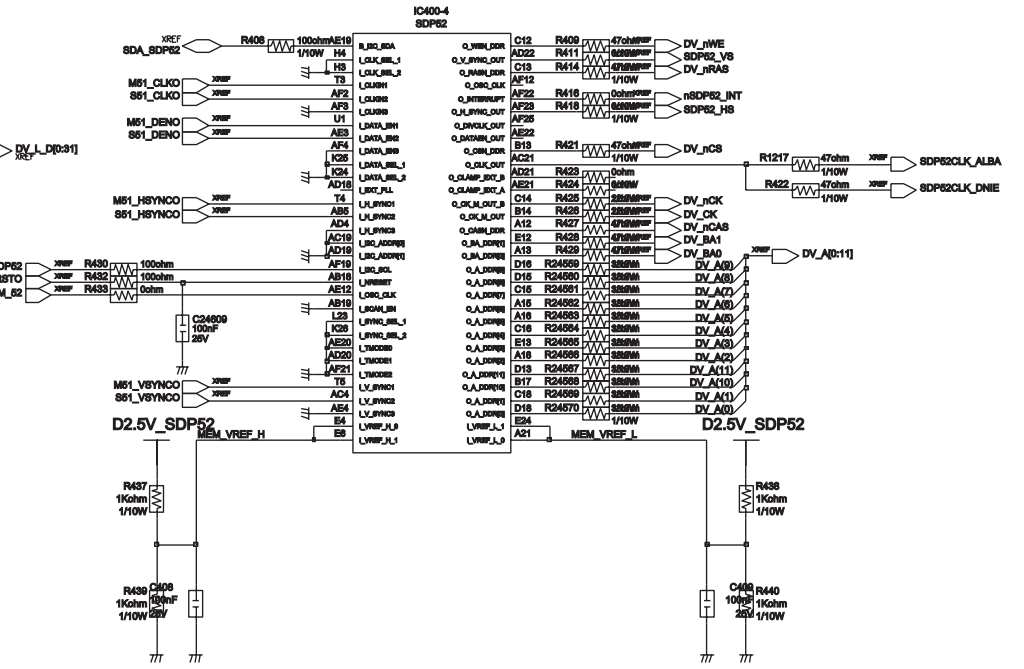
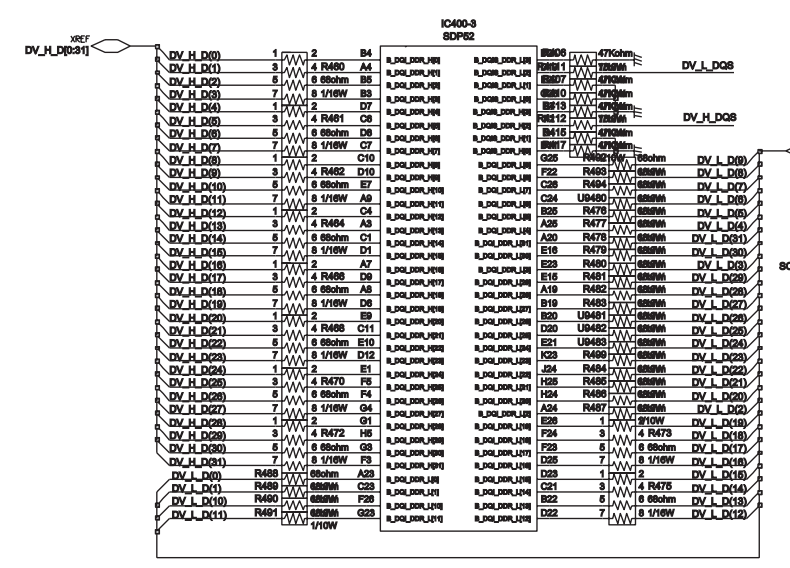
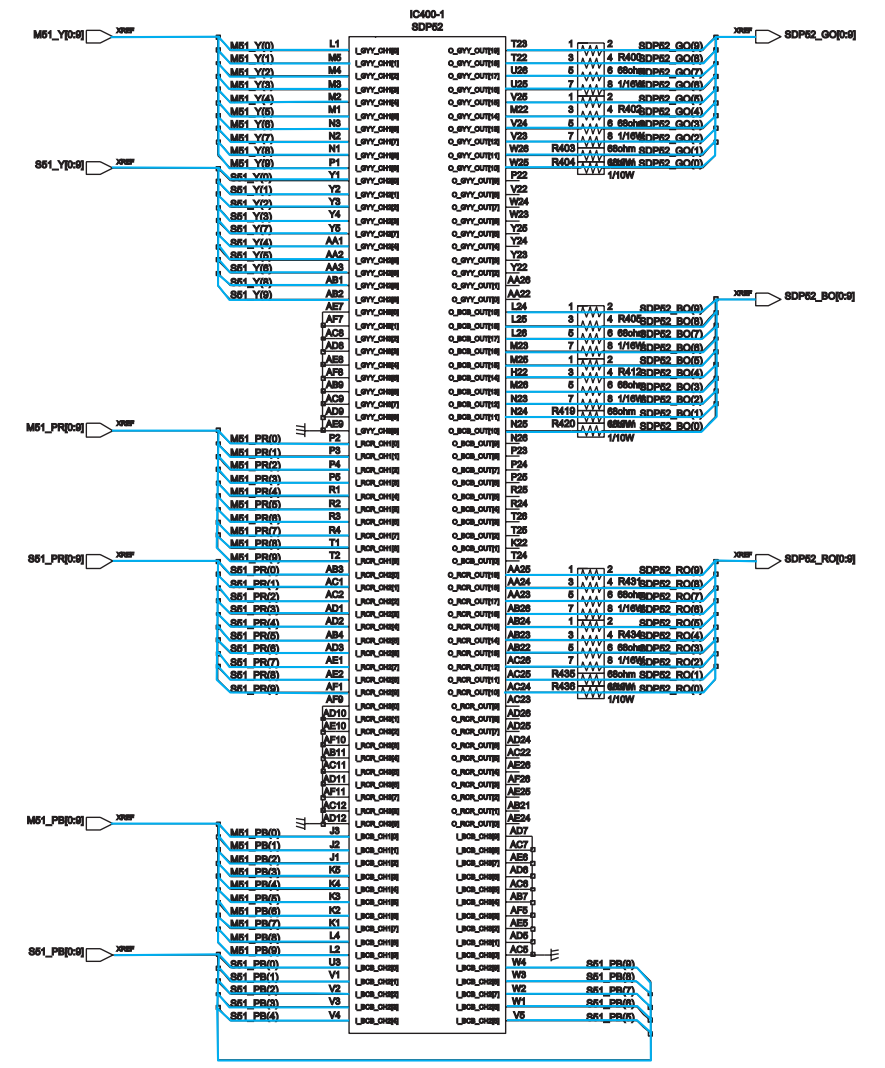


10-1-7 SDP52

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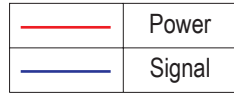
**SDP52**  
**I2C ADDR : A9/A8 (R/W)**





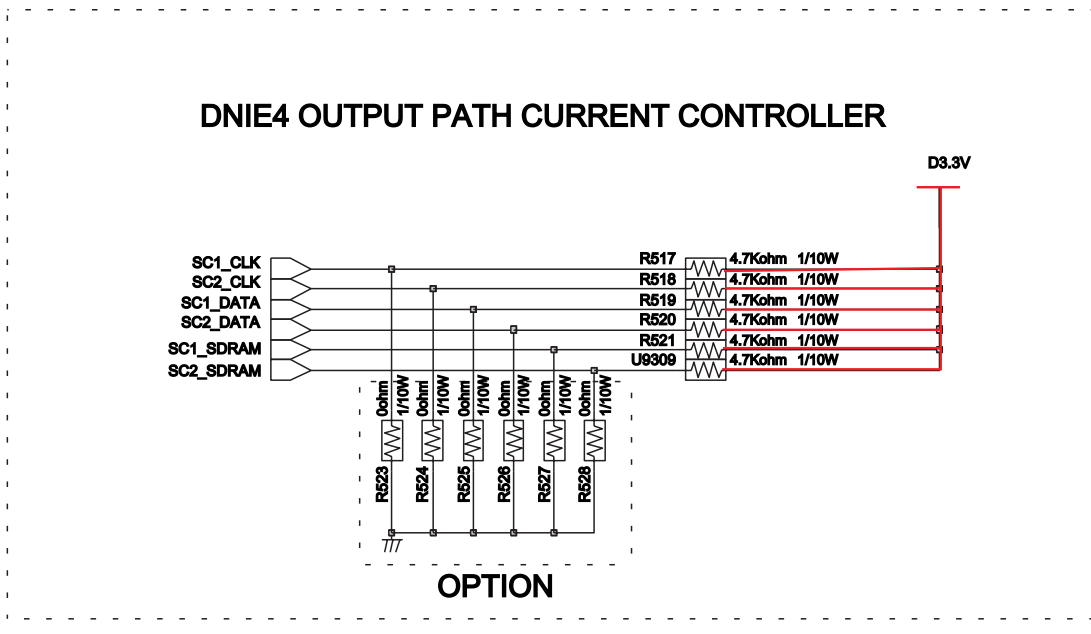
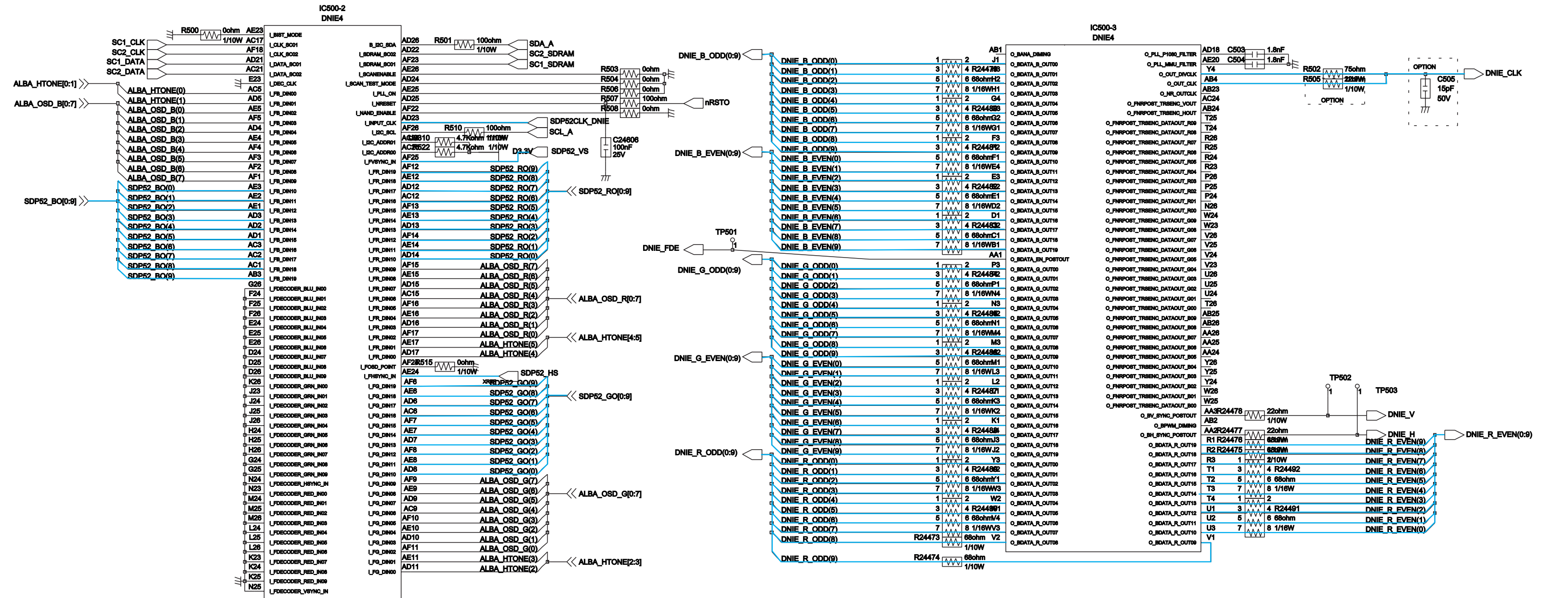
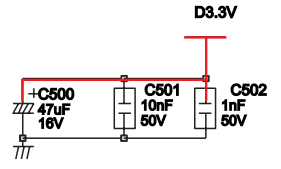
10-1-8 DNIE4

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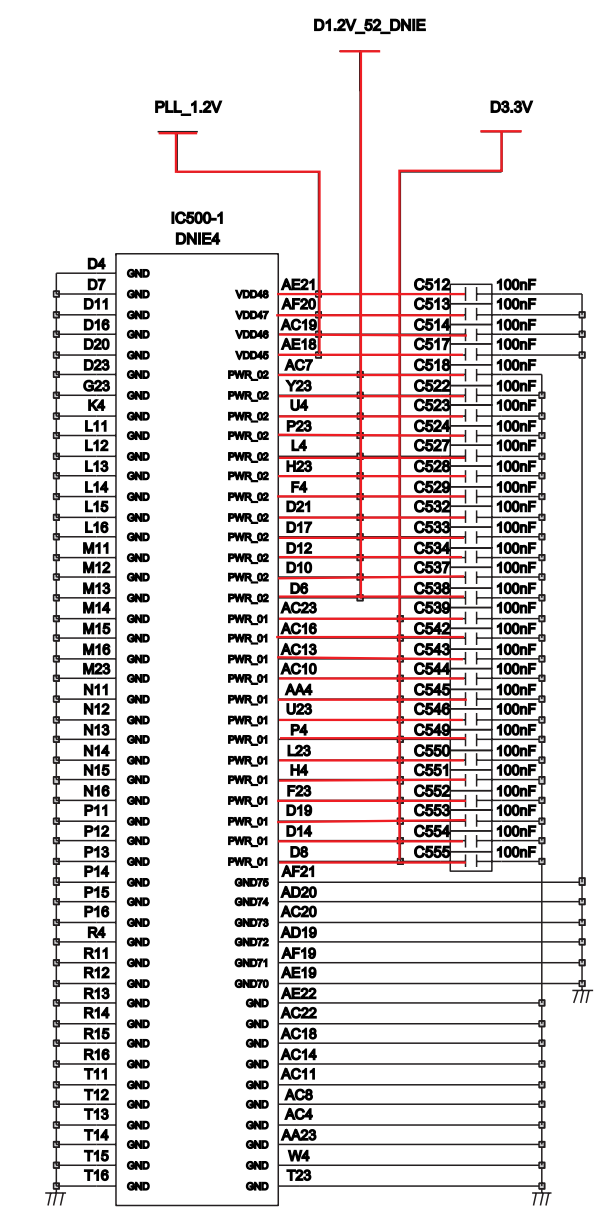
# DNIE4

## I2C ADDR : CF/CE (R/W)





IC500-4 DNIE4

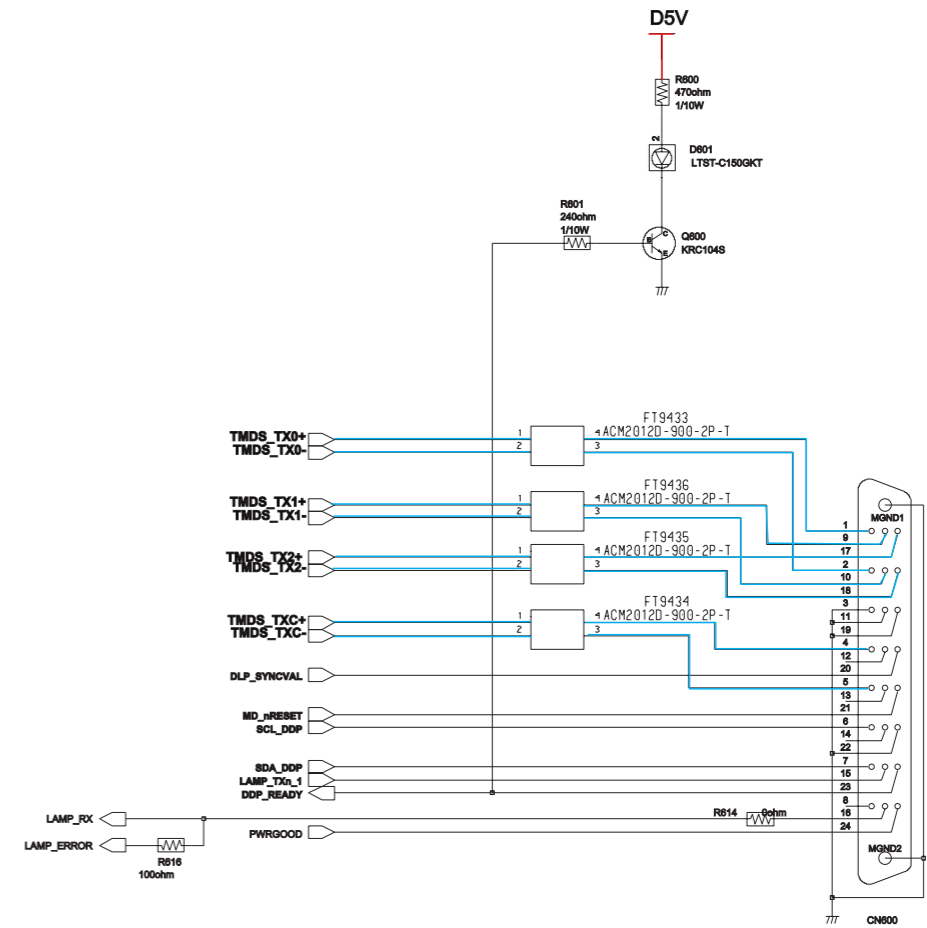
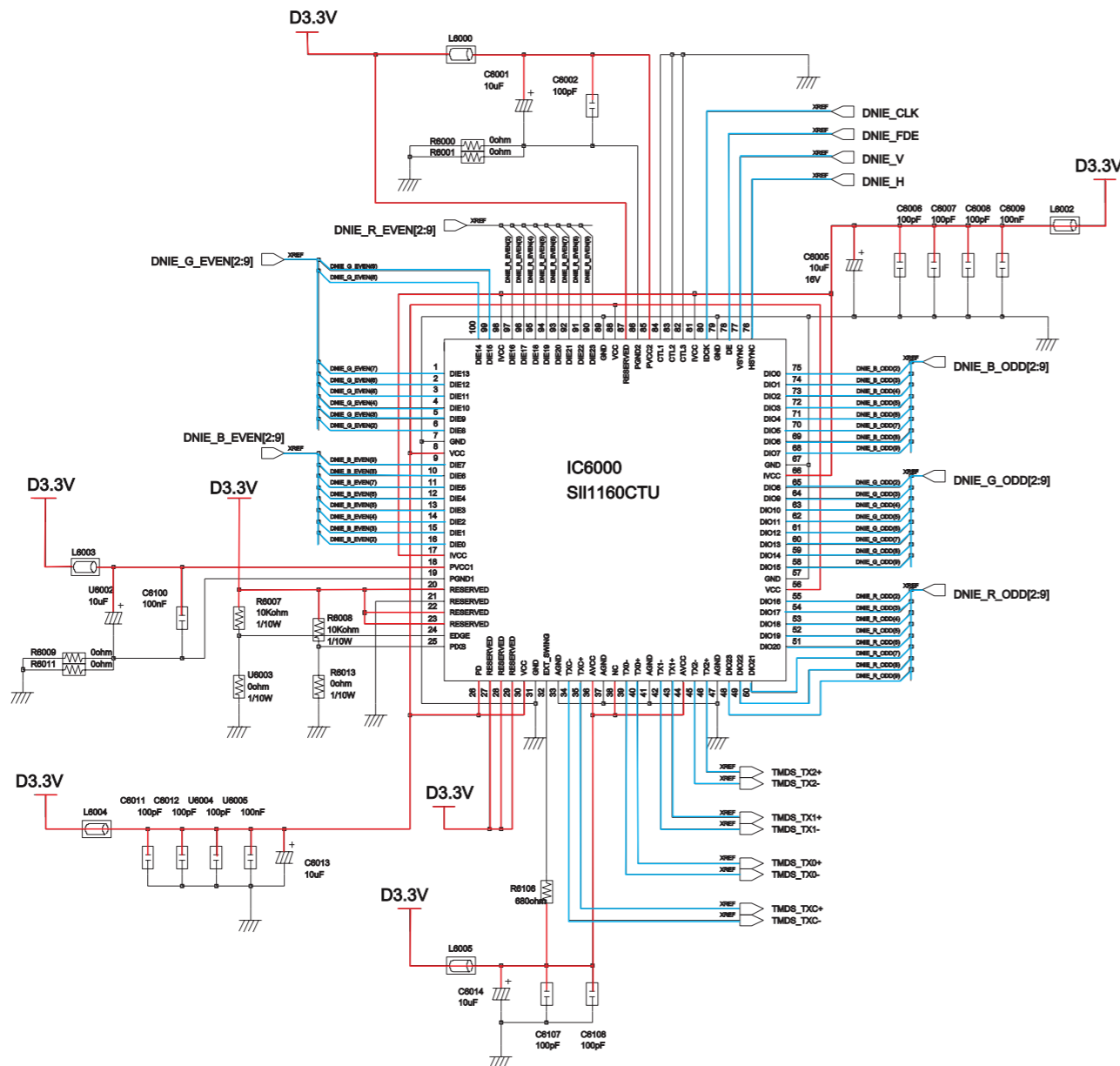
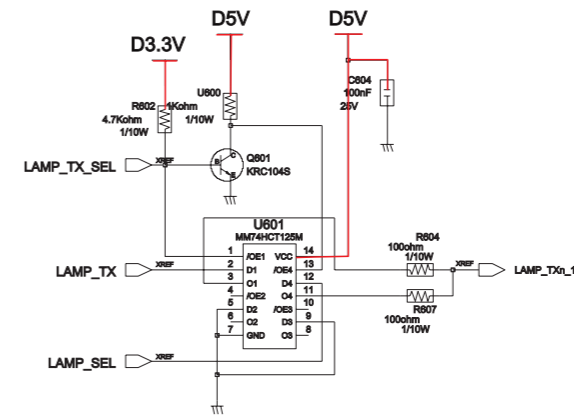
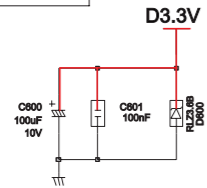
D3	I_FEDRAM_DATA00	O_SDRAM_CLK	D15
B2	I_FEDRAM_DATA01	O_FEDRAM_MEME	C12
A1	I_FEDRAM_DATA02	O_FEDRAM_DATA0	B12
A2	I_FEDRAM_DATA03	O_FEDRAM_DATA1	C13
A3	I_FEDRAM_DATA04	O_FEDRAM_DATA2	D13
CA	I_FEDRAM_DATA05	O_FEDRAM_DATA3	A16
B4	I_FEDRAM_DATA06	O_FEDRAM_DATA4	B16
AA	I_FEDRAM_DATA07	O_FEDRAM_DATA5	C16
AS	I_FEDRAM_DATA08	O_FEDRAM_DATA6	A15
C5	I_FEDRAM_DATA09	O_FEDRAM_DATA7	B15
B5	I_FEDRAM_DATA10	O_FEDRAM_DATA8	C15
AS	I_FEDRAM_DATA11	O_FEDRAM_DATA9	A14
B5	I_FEDRAM_DATA12	O_FEDRAM_DATA10	B14
C8	I_FEDRAM_DATA13	O_FEDRAM_DATA11	C14
AS	I_FEDRAM_DATA14	O_FEDRAM_DATA12	A13
B5	I_FEDRAM_DATA15	O_FEDRAM_DATA13	B13
C7	I_FEDRAM_DATA16	O_FEDRAM_DATA14	C13
A7	I_FEDRAM_DATA17	O_FEDRAM_DATA15	A12
C8	I_FEDRAM_DATA18	O_FEDRAM_DATA16	B12
C8	I_FEDRAM_DATA19	O_FEDRAM_DATA17	C12
AS	I_FEDRAM_DATA20	O_FEDRAM_DATA18	A11
AS	I_FEDRAM_DATA21	O_FEDRAM_DATA19	B11
C10	I_FEDRAM_DATA22	O_FEDRAM_DATA20	C11
B10	I_FEDRAM_DATA23	O_FEDRAM_DATA21	A10
A10	I_FEDRAM_DATA24	O_FEDRAM_DATA22	B10
B11	I_FEDRAM_DATA25	O_FEDRAM_DATA23	C10
C17	I_FEDRAM_DATA26	O_FEDRAM_DATA24	A9
B17	I_FEDRAM_DATA27	O_FEDRAM_DATA25	B9
A17	I_FEDRAM_DATA28	O_FEDRAM_DATA26	C9
D18	I_FEDRAM_DATA29	O_FEDRAM_DATA27	A8
C18	I_FEDRAM_DATA30	O_FEDRAM_DATA28	B8
B18	I_FEDRAM_DATA31	O_FEDRAM_DATA29	C8
A18	I_FEDRAM_DATA32	O_FEDRAM_DATA30	A7
C19	I_FEDRAM_DATA33	O_FEDRAM_DATA31	B7
B19	I_FEDRAM_DATA34	O_FEDRAM_DATA32	C7



### 10-1-9 TMDs

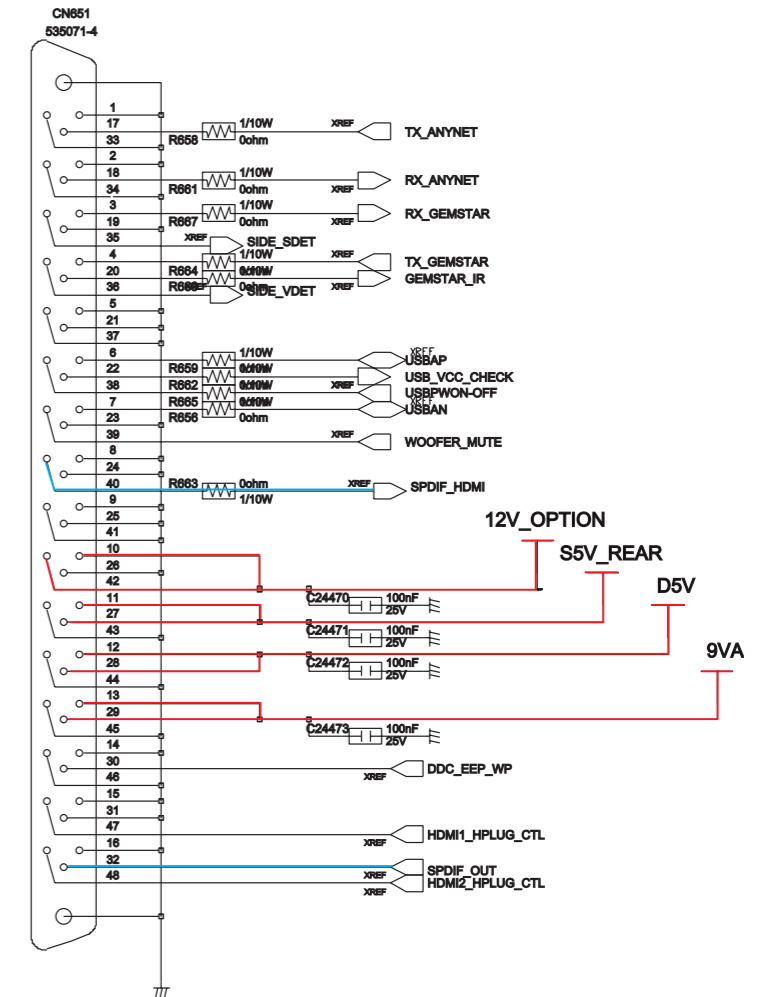
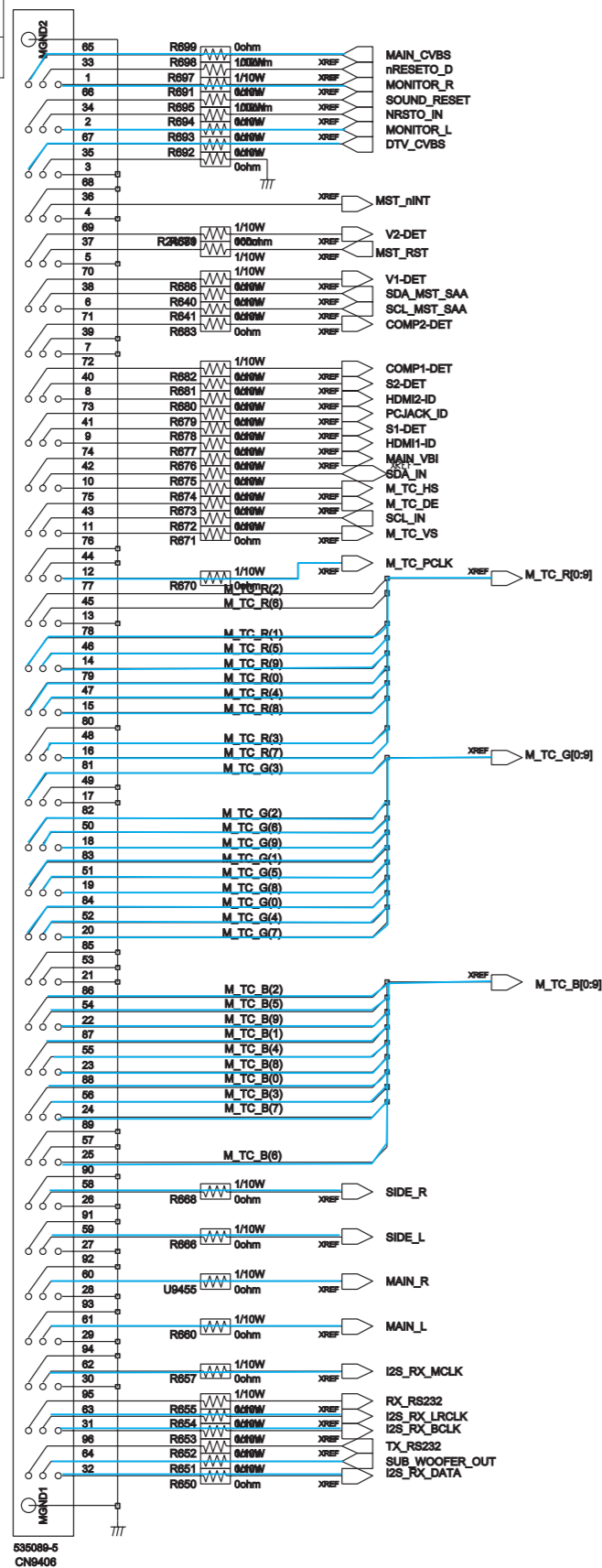
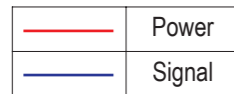
This Document can not be used without Samsung's authorization.

	Power
	Signal





### 10-1-10 TERMINAL

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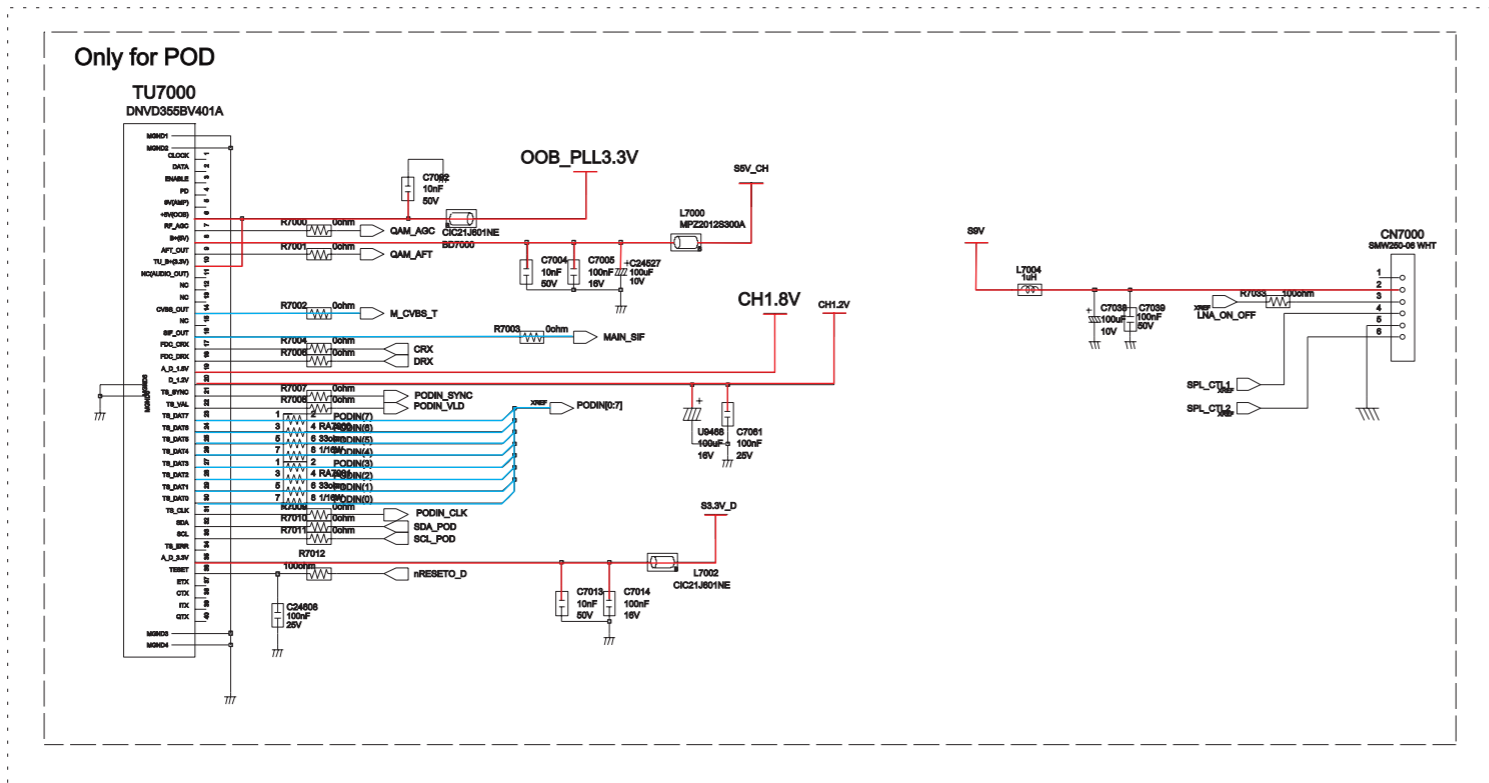


### 10-1-11 MAIN-TUNER

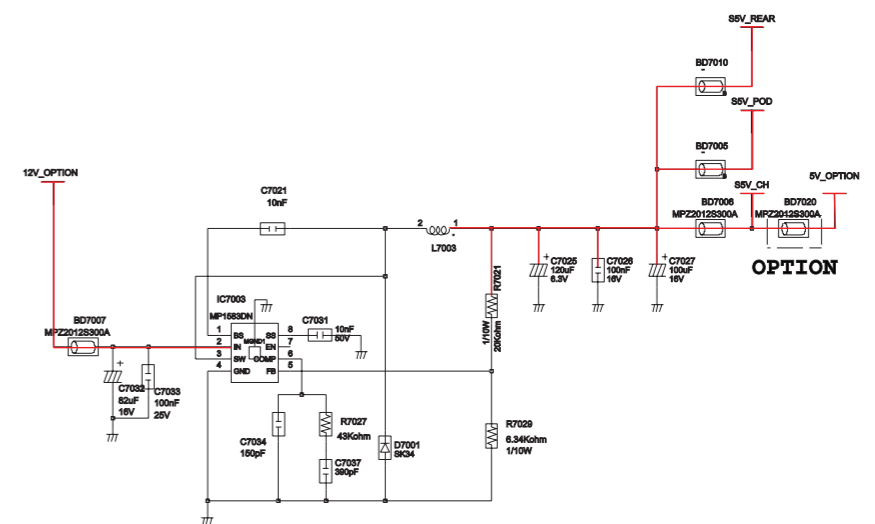
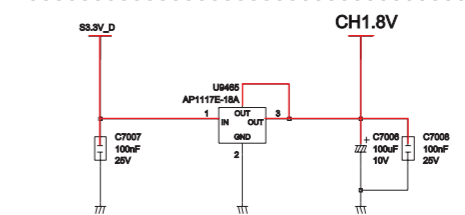
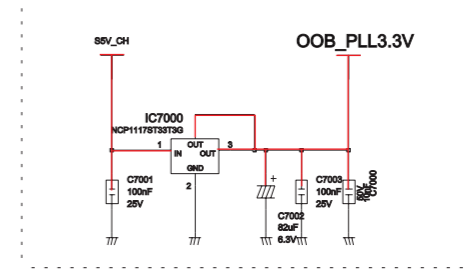
This Document can not be used without Samsung's authorization.

	Power
	Signal

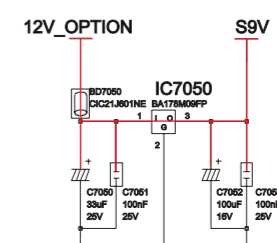
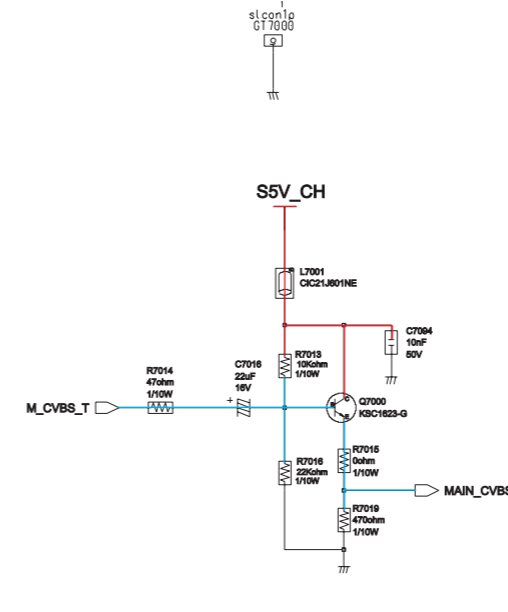
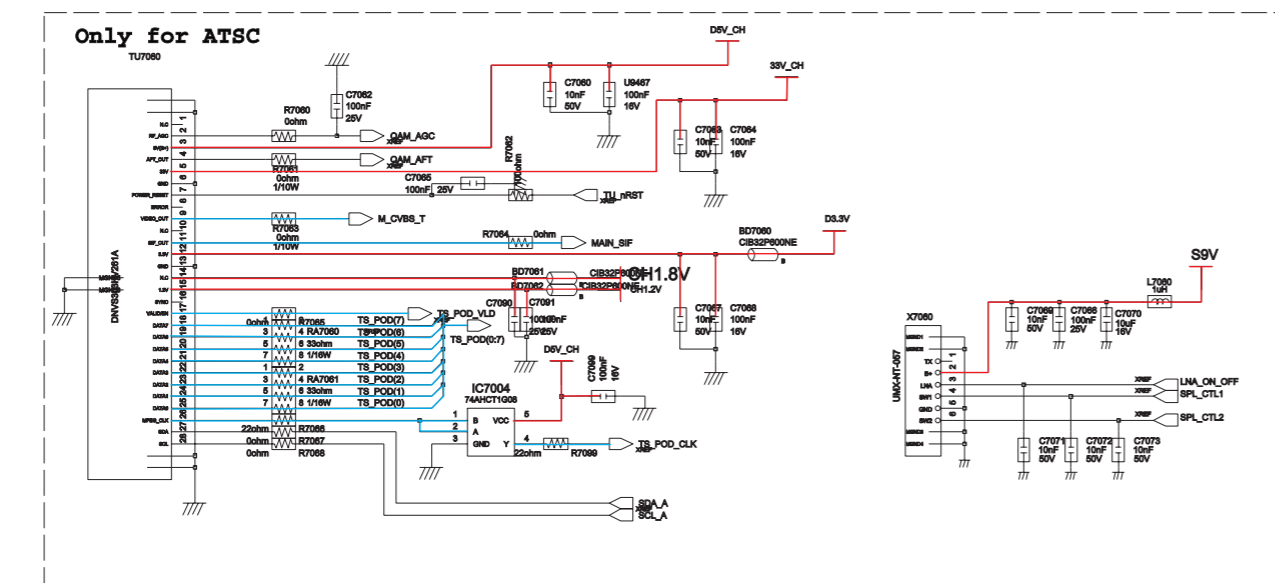
**FULL / ATSC\_ONLY OPTION**  
**ATSC\_ONLY : DELETE**



**FULL / ATSC ONLY OPTION**  
**ATSC\_ONLY : DELETE**





**FULL / ATSC\_ONLY OPTION**  
**ATSC\_ONLY : ATTACH**





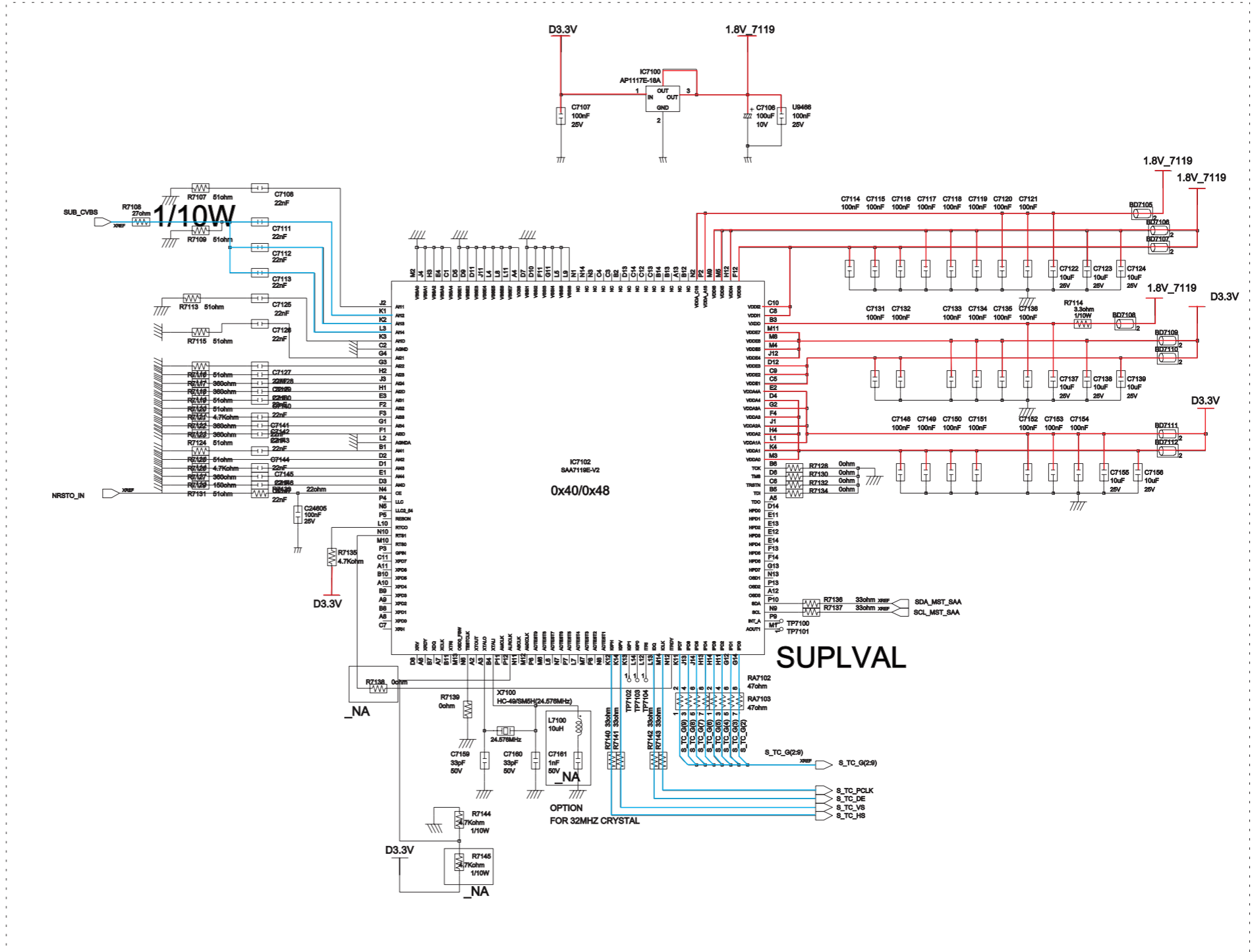
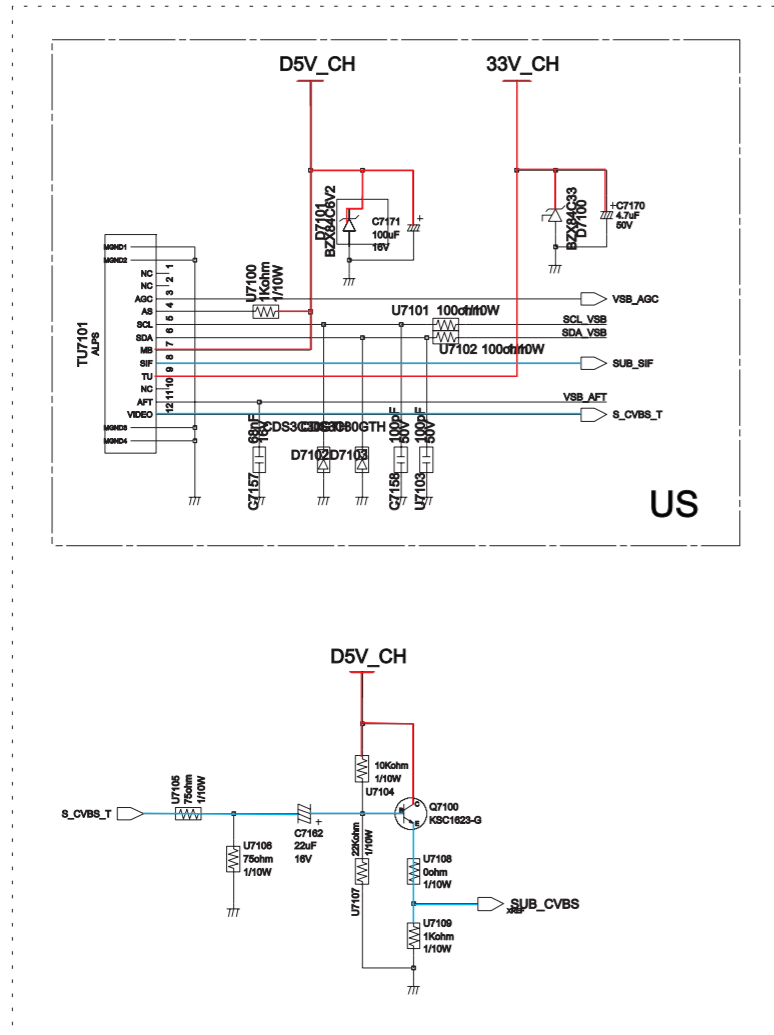
### 10-1-12 SUB-TUNER

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	Power
	Signal



FULL / ATSC ONLY OPTION  
ATSC\_ONLY : DELETE

FULL / ATSC ONLY OPTION  
ATSC\_ONLY : DELETE



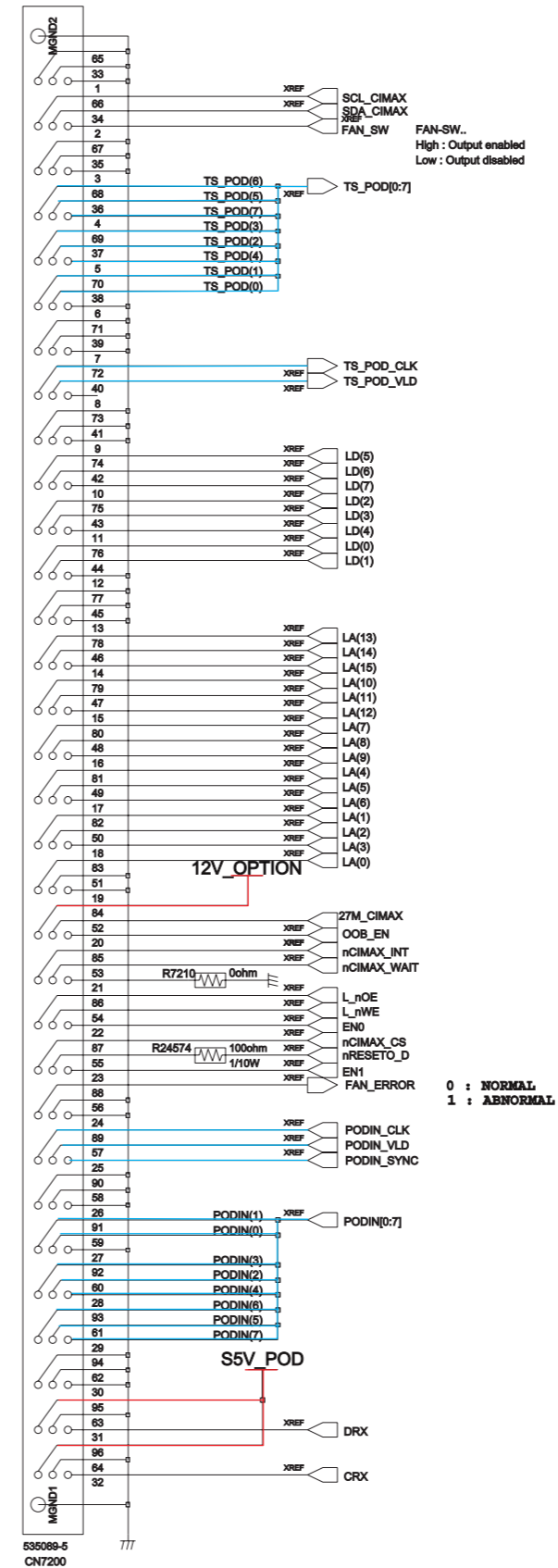
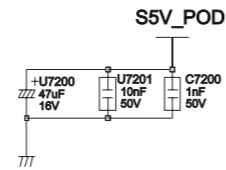
10-1-13 POD

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

	Power
	Signal

**FULL / ATSC\_ONLY OPTION**  
**ATSC\_ONLY : DELETE**

**USA / KOREA OPTION**  
**KOREA : DO NOT STUFF!!**



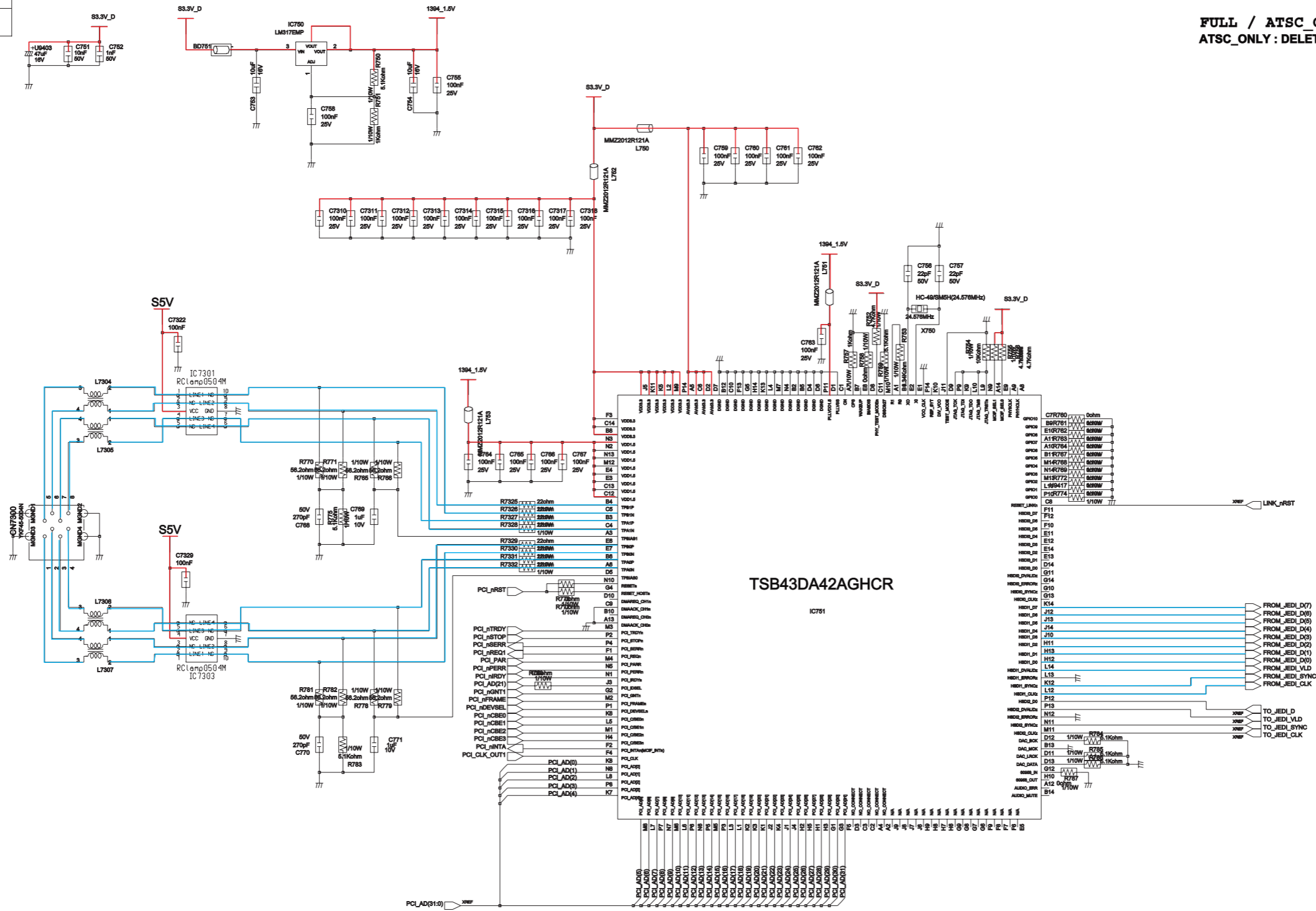


10-1-14 1394

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	Power
	Signal

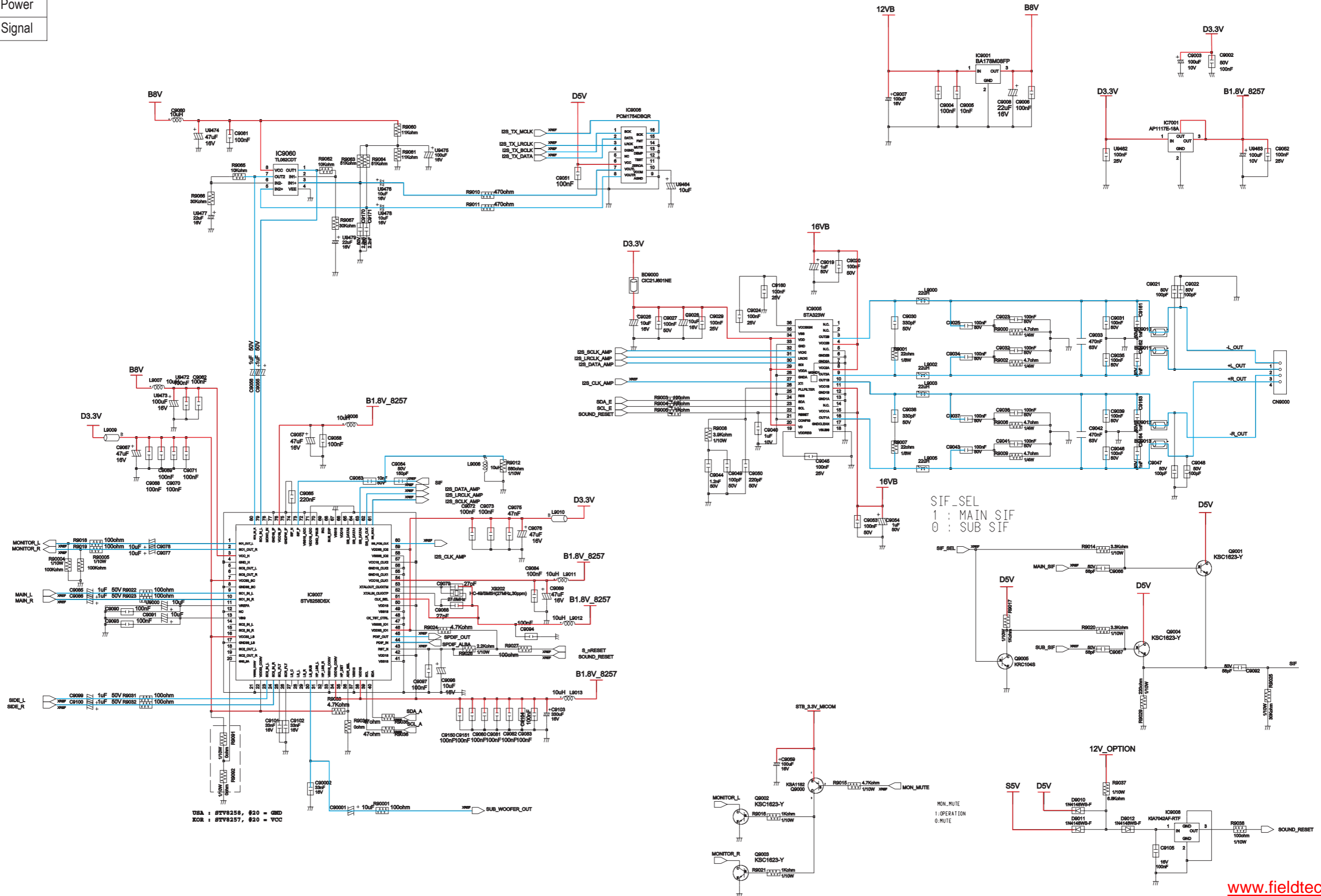
**FULL / ATSC\_ONLY OPTION**  
**ATSC\_ONLY : DELETE**



10-15 AUDIO



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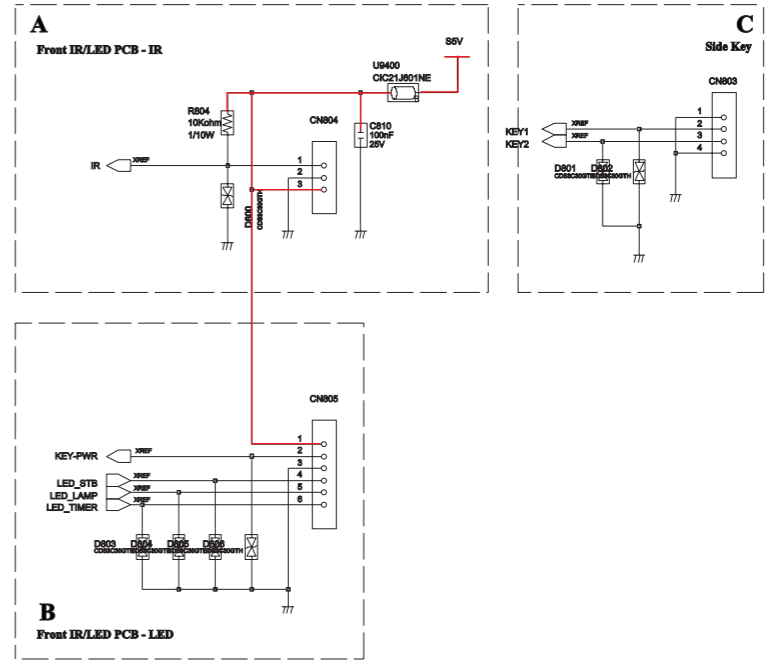
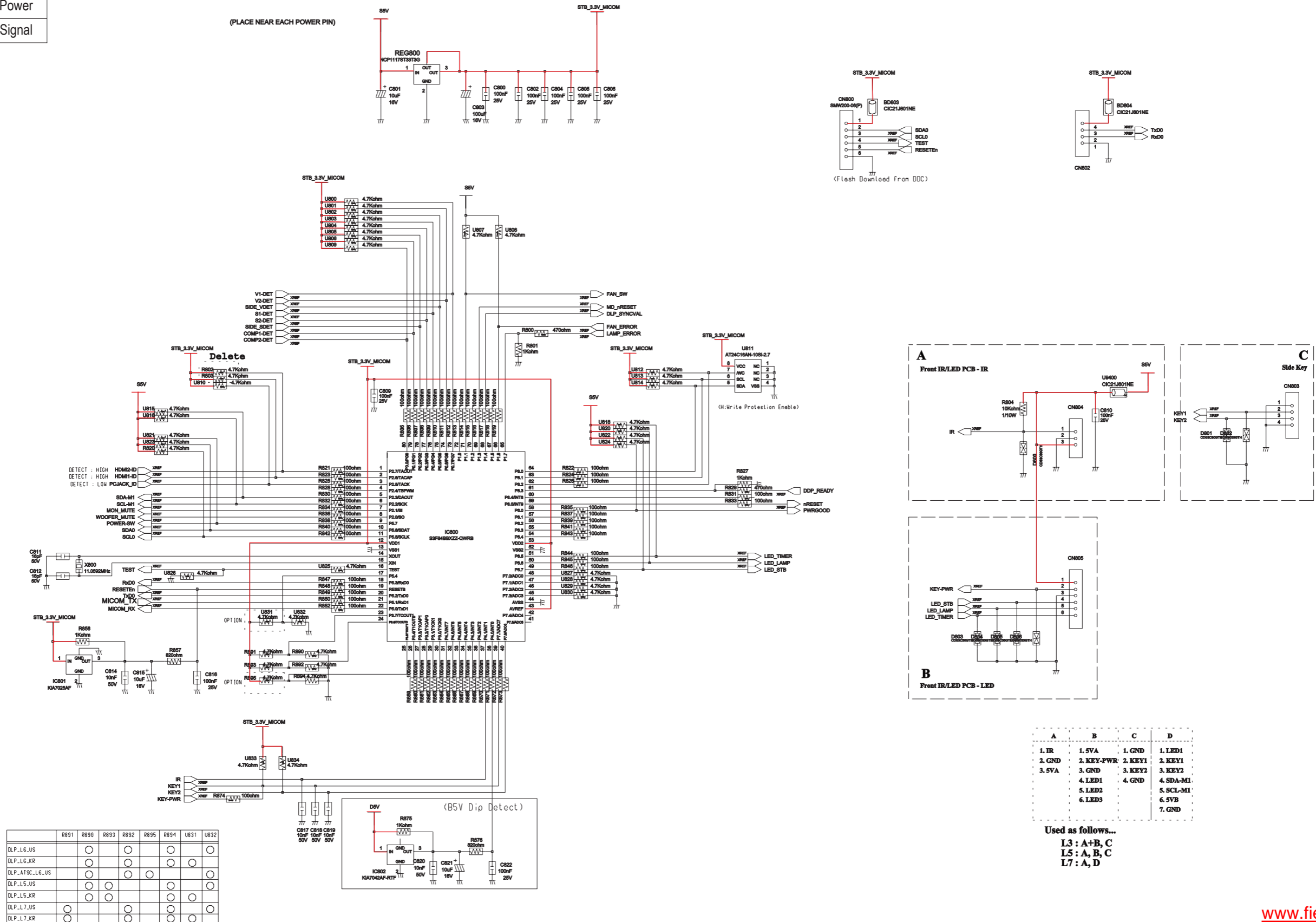
	Power
	Signal



### 10-1-16 MICOM

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	Power
	Signal



A	B	C	D
1. IR	1. 5VA	1. GND	1. LED1
2. GND	2. KEY-PWR	2. KEY1	2. KEY1
3. 5VA	3. GND	3. KEY2	3. KEY2
	4. LED1	4. GND	4. SDA-M1
	5. LED2		5. SCL-M1
	6. LED3		6. 5VB
			7. GND



Used as follows..  
 L3 : A+B, C  
 L5 : A, B, C  
 L7 : A, D

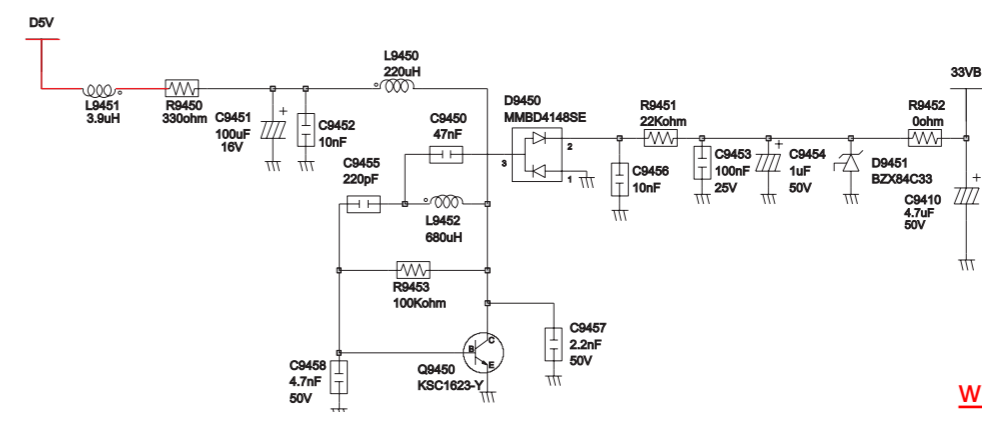
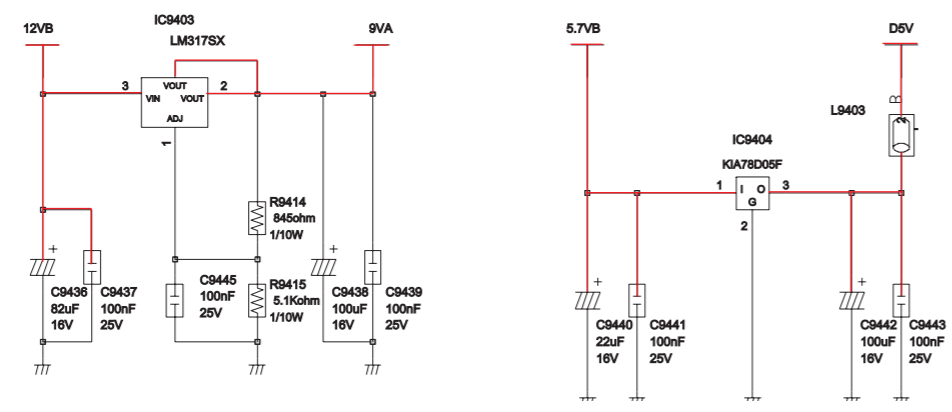
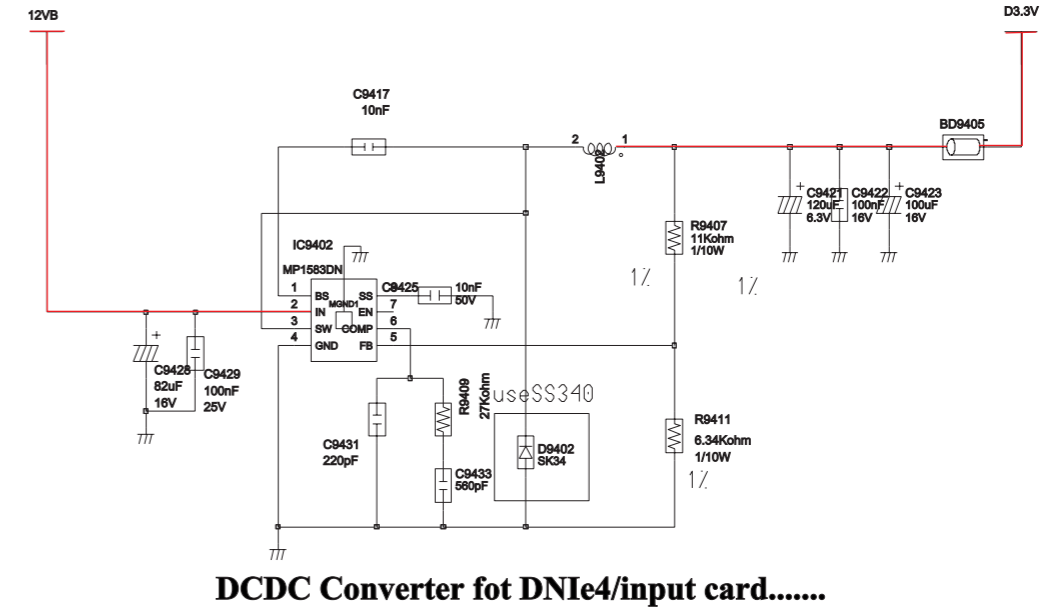
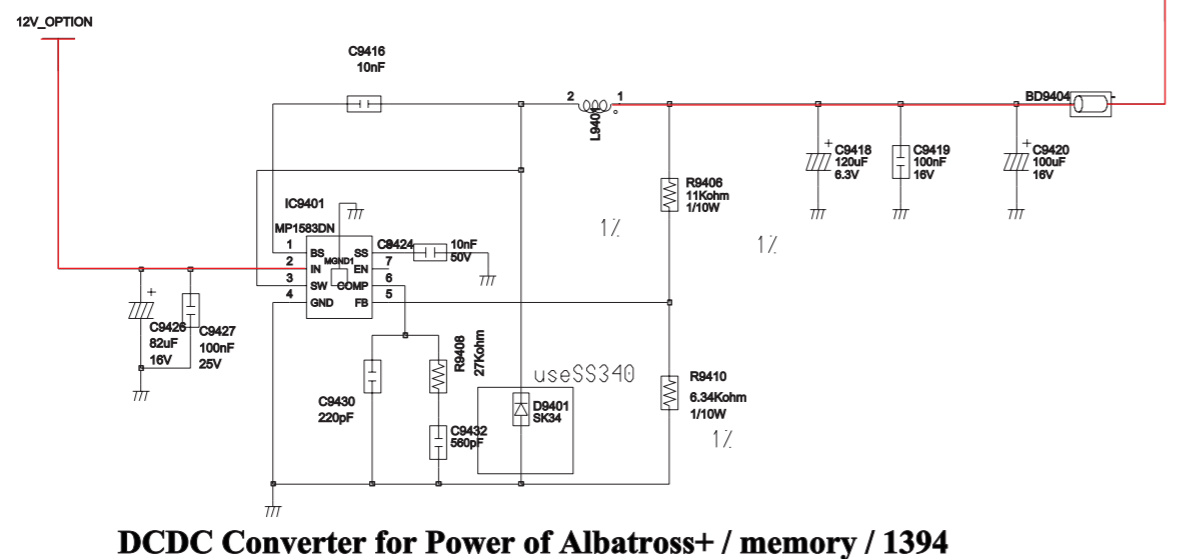
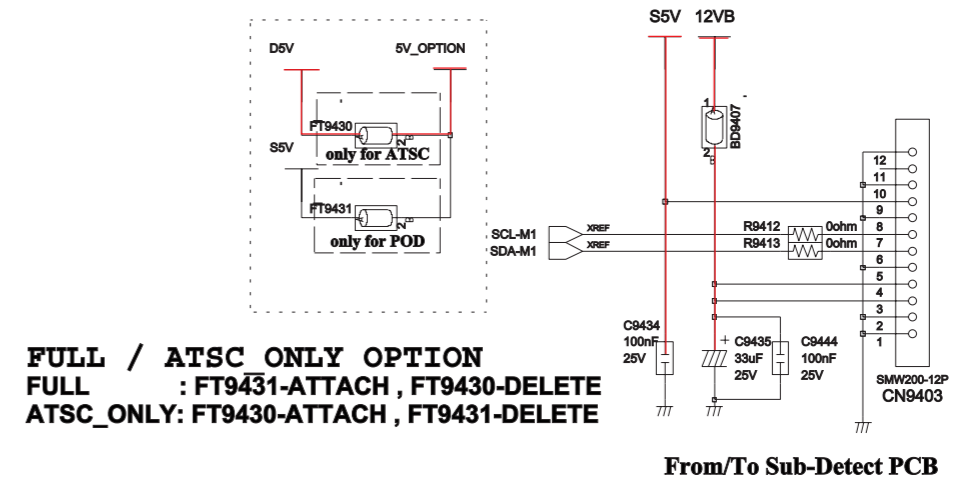
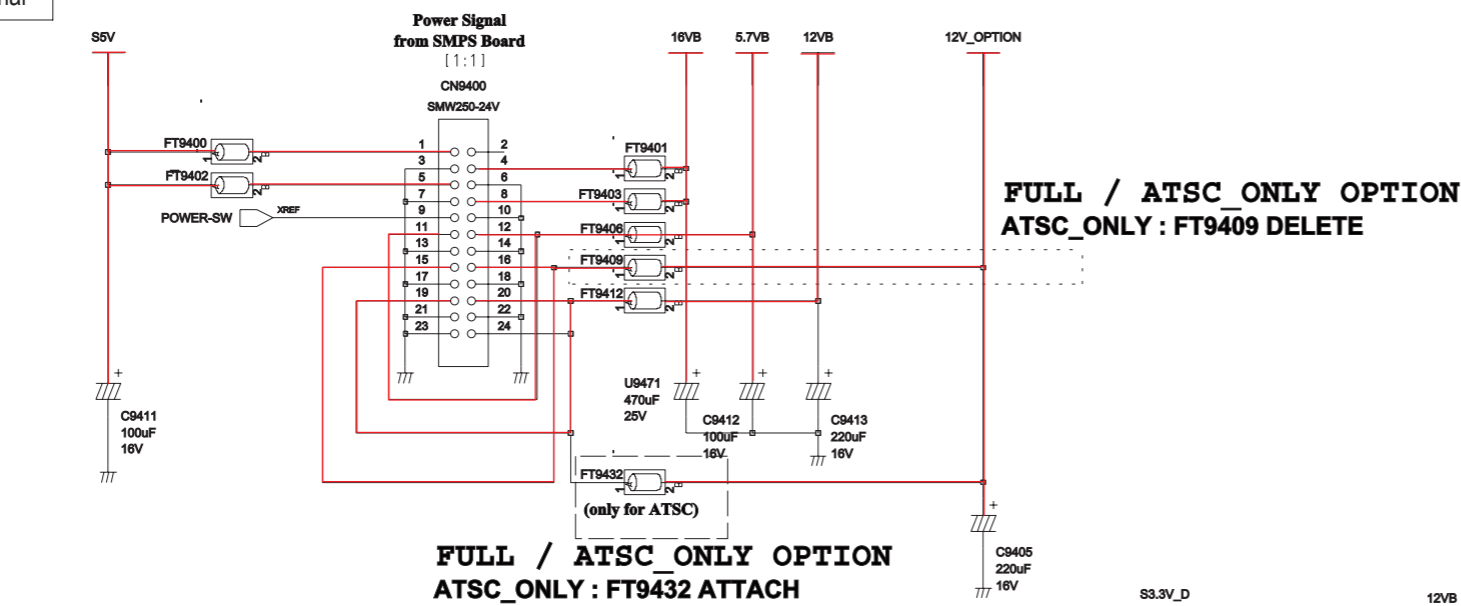
	R891	R890	R893	R892	R895	R894	U831	U832
DLP_L6_US		○		○		○	○	○
DLP_L6_KR		○		○		○	○	○
DLP_ATSC_L6_US		○		○		○	○	○
DLP_L5_US			○	○		○	○	○
DLP_L5_KR			○	○		○	○	○
DLP_L7_US	○							
DLP_L7_KR	○							



10-1-18 DC-DC

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

	Power
	Signal

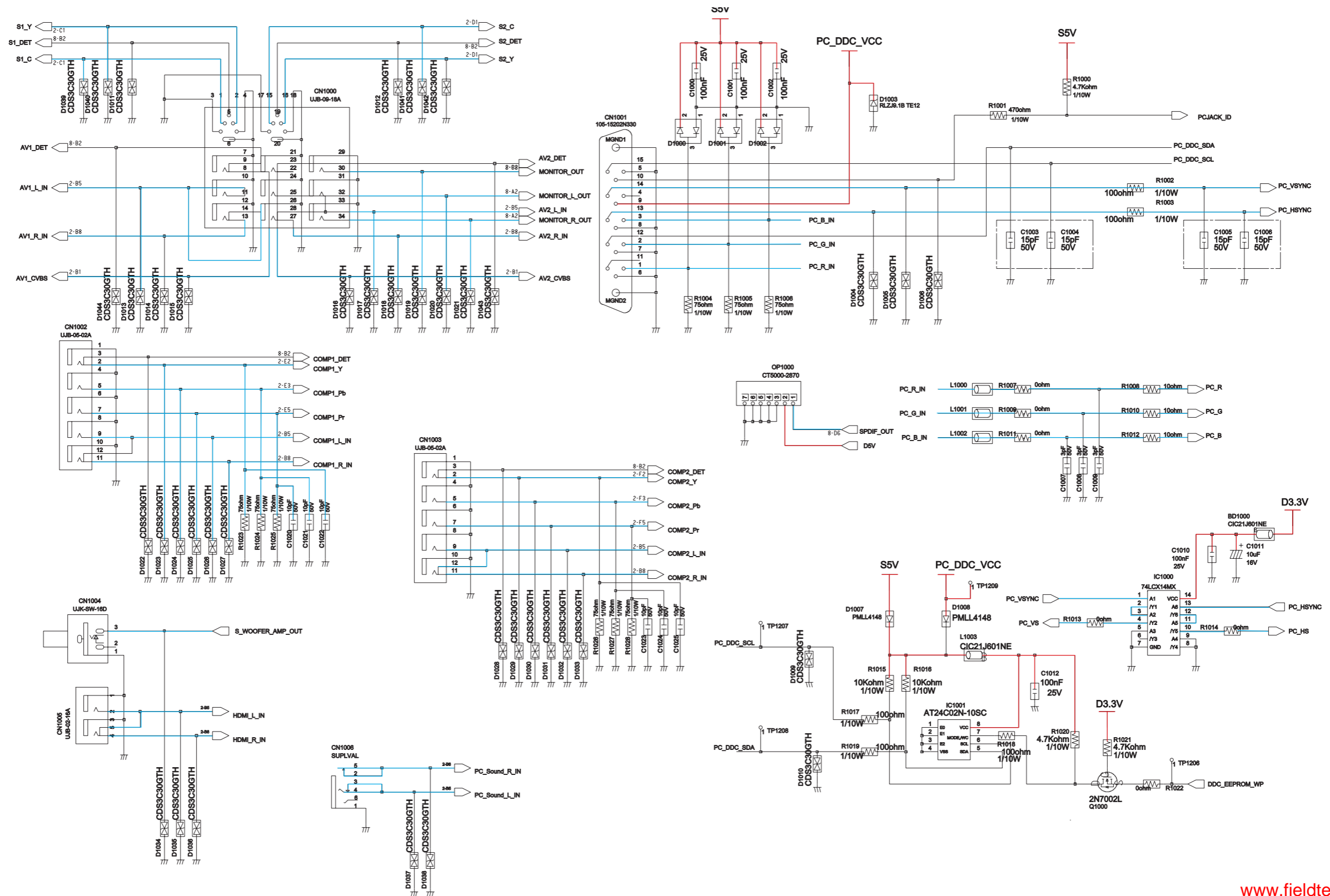


# 10-2 Rear Board

## 10-2-1 INPUT\_JACK

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<span style="color: red;">—</span>	Power
<span style="color: blue;">—</span>	Signal

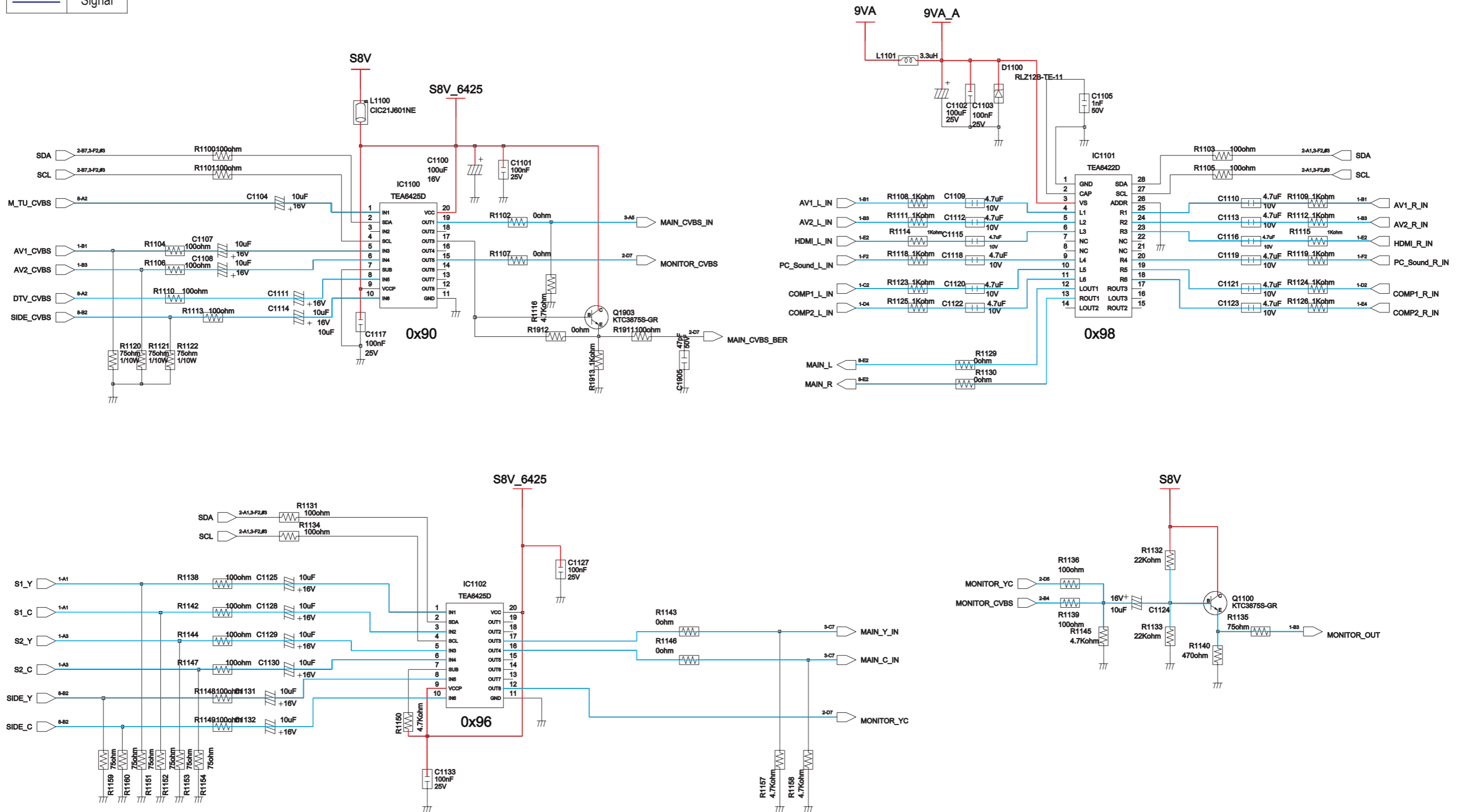




### 10-2-2 AV\_SWITCH

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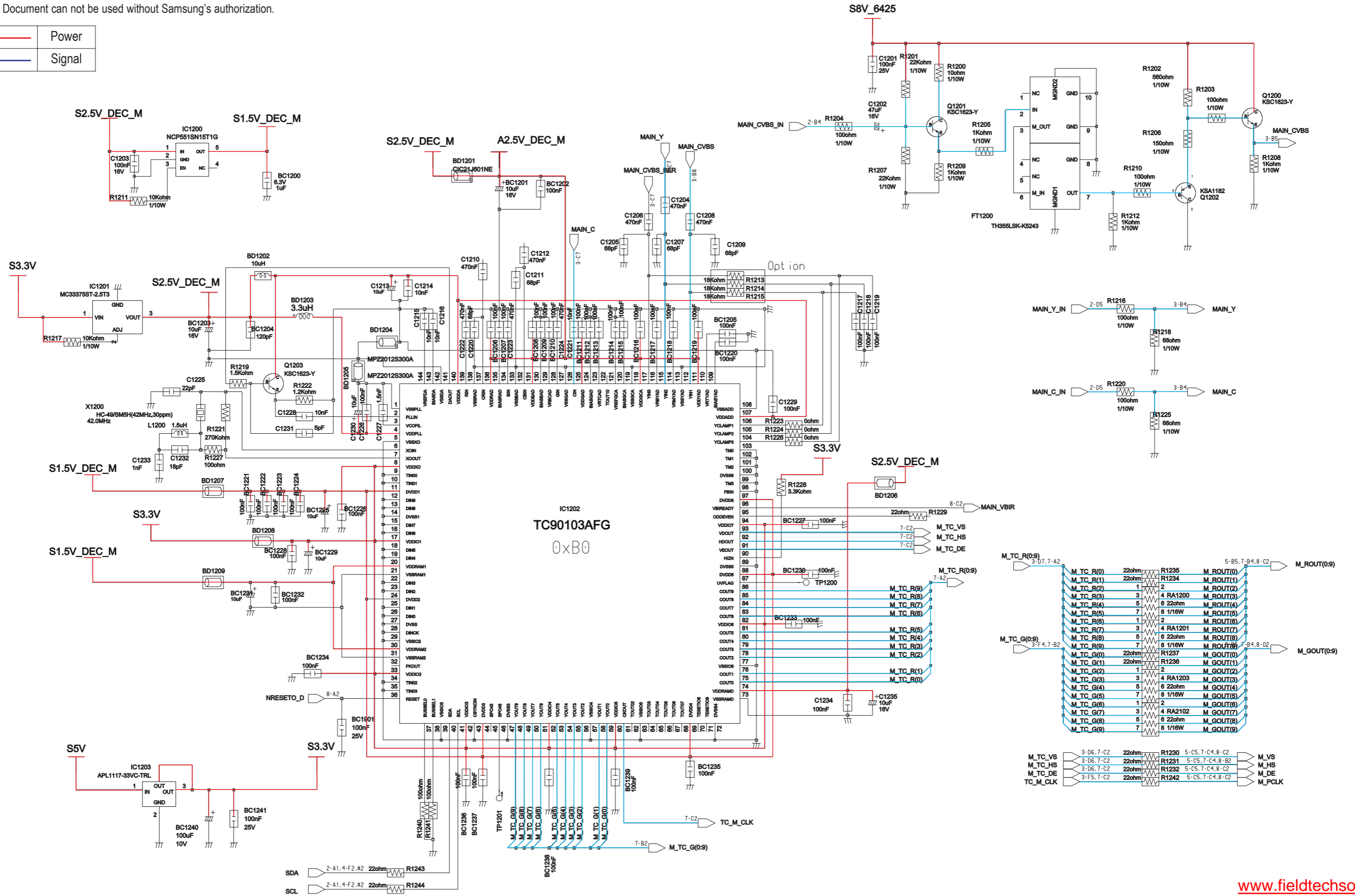
	Power
	Signal



### 10-2-3 TC90103\_MAIN

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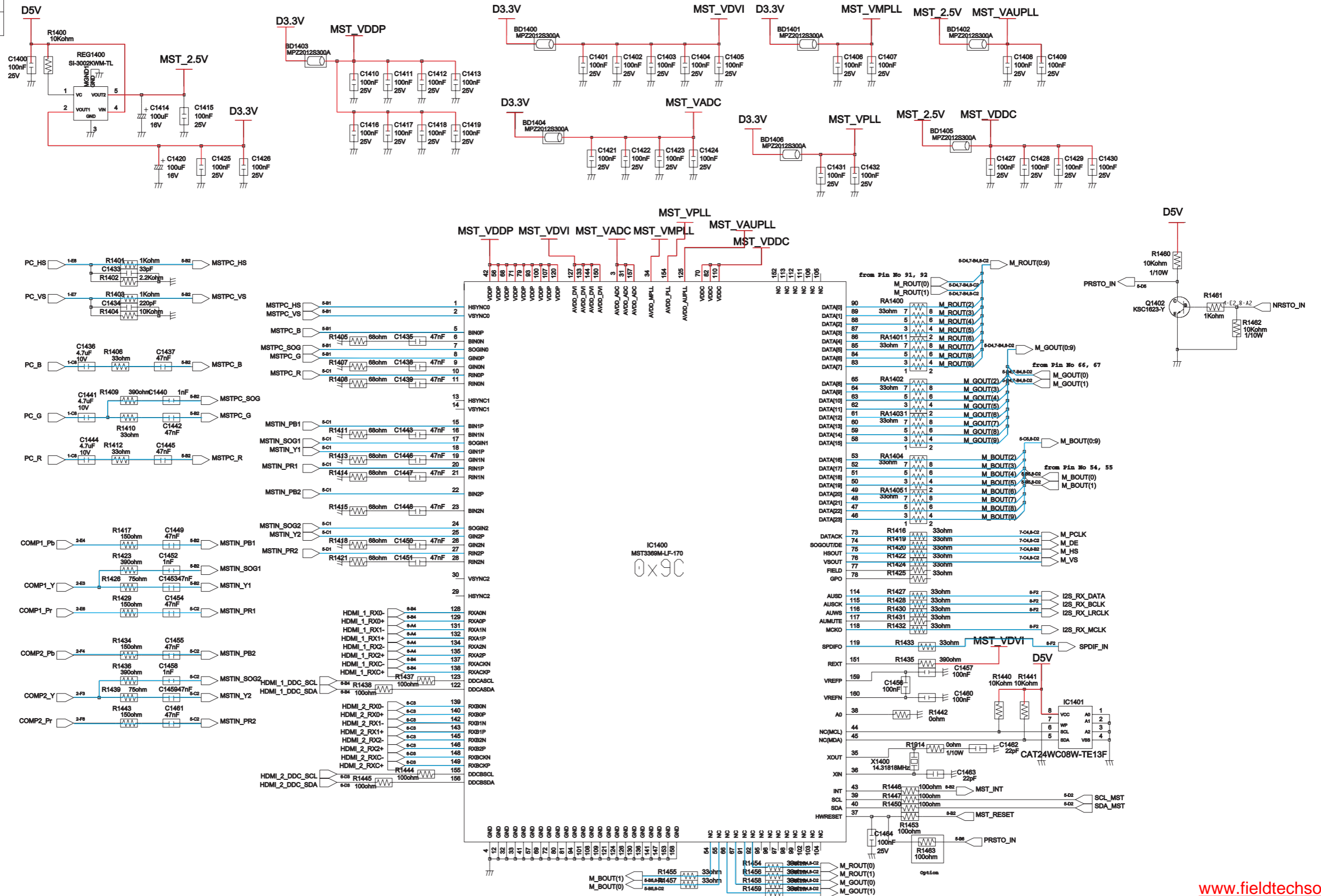
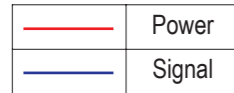
	Power
	Signal





### 10-2-4 MST3369

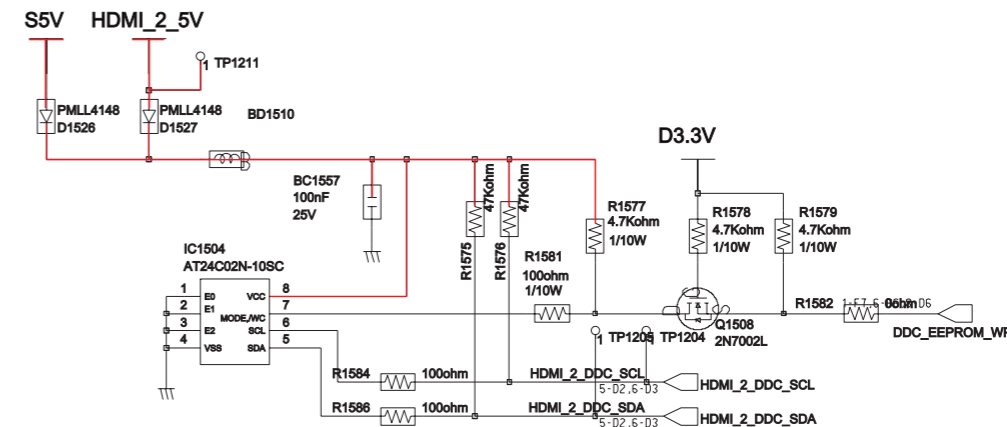
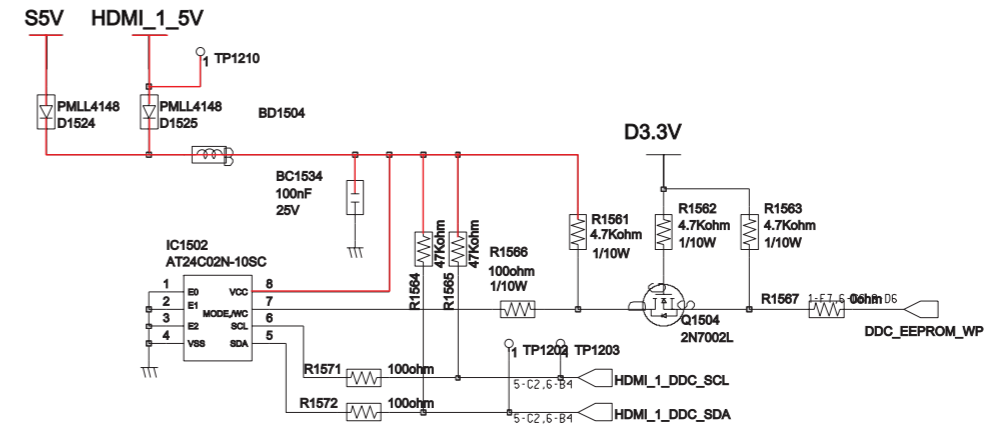
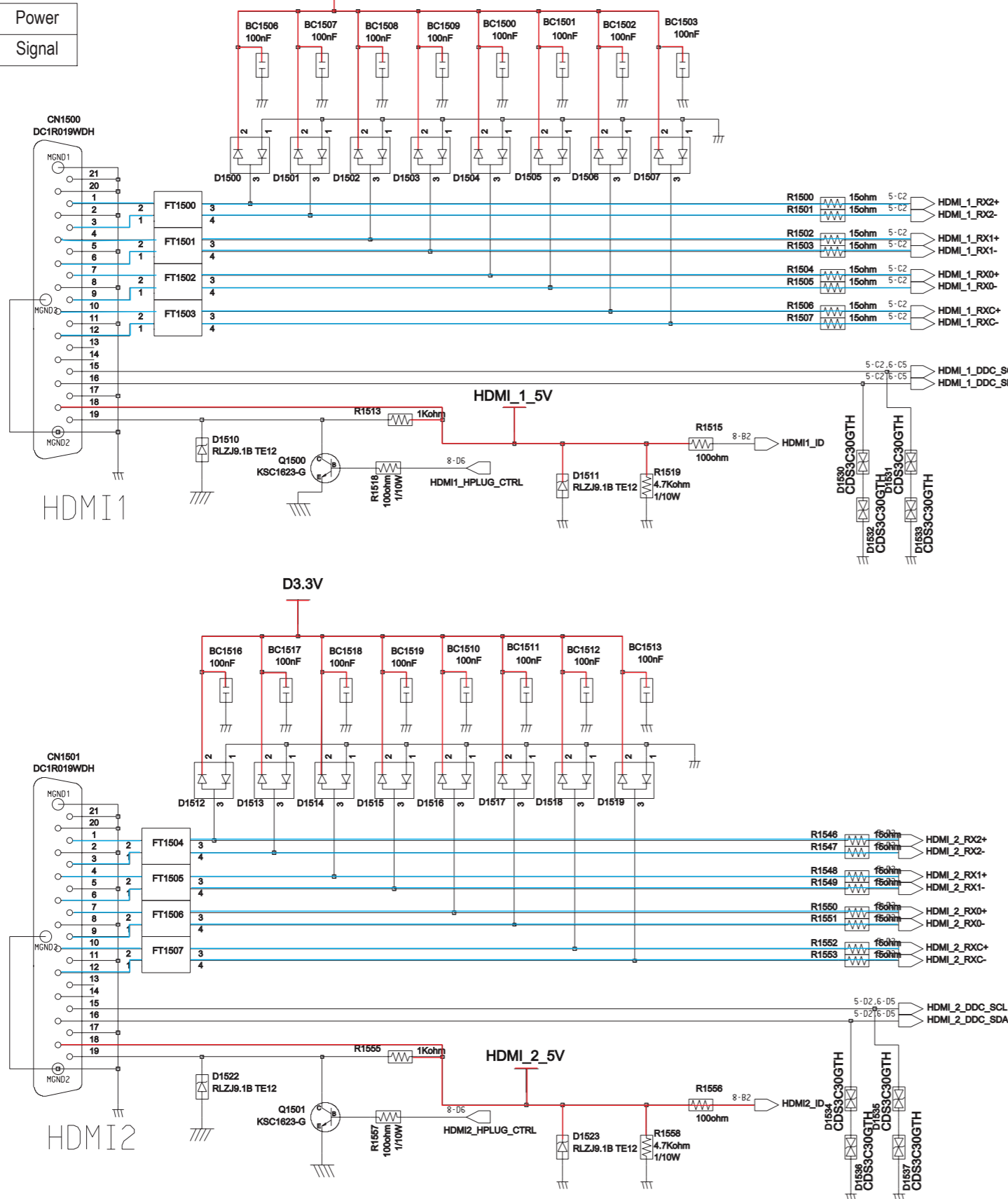
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### 10-2-5 HDMI\_JACK



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

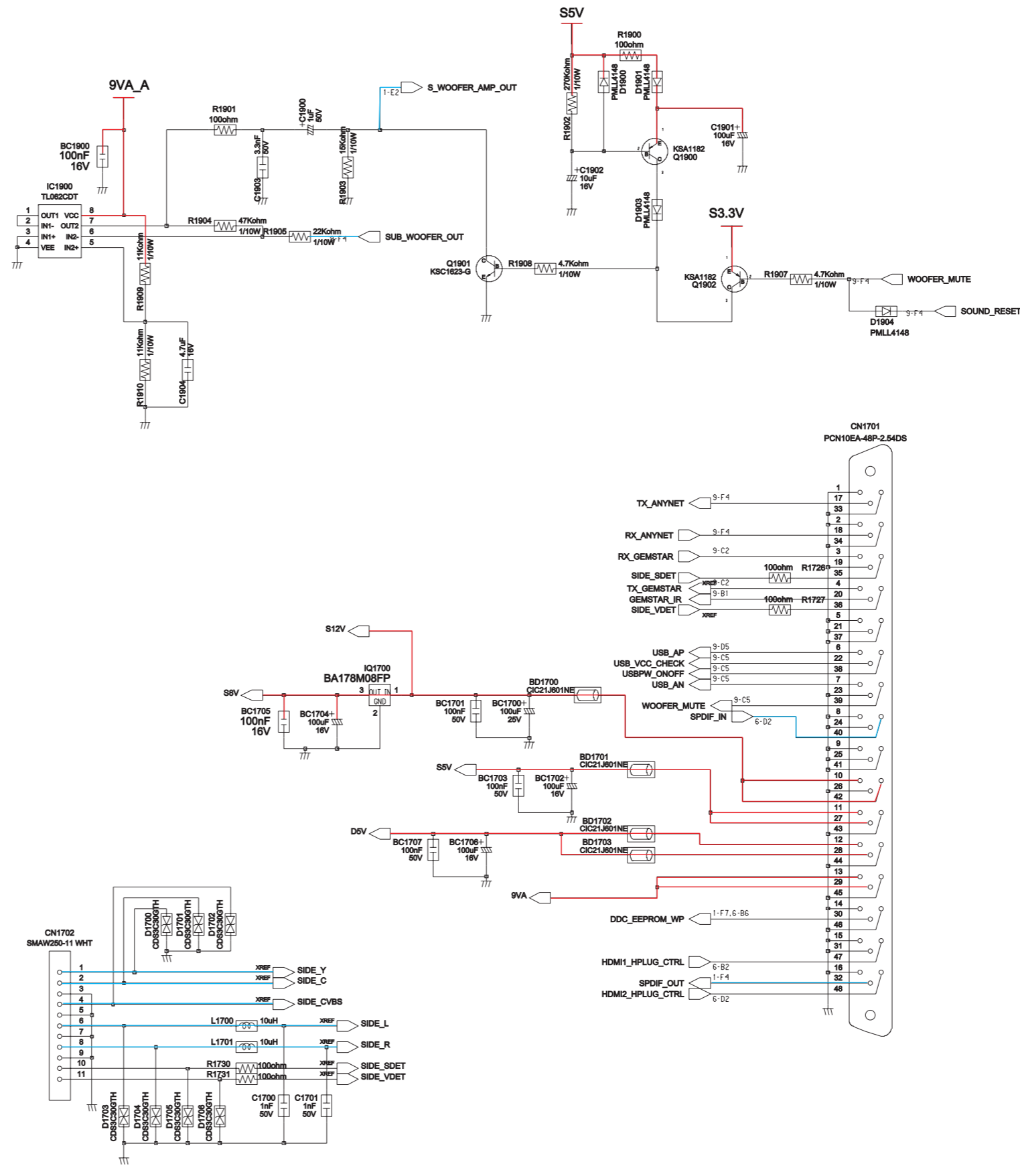
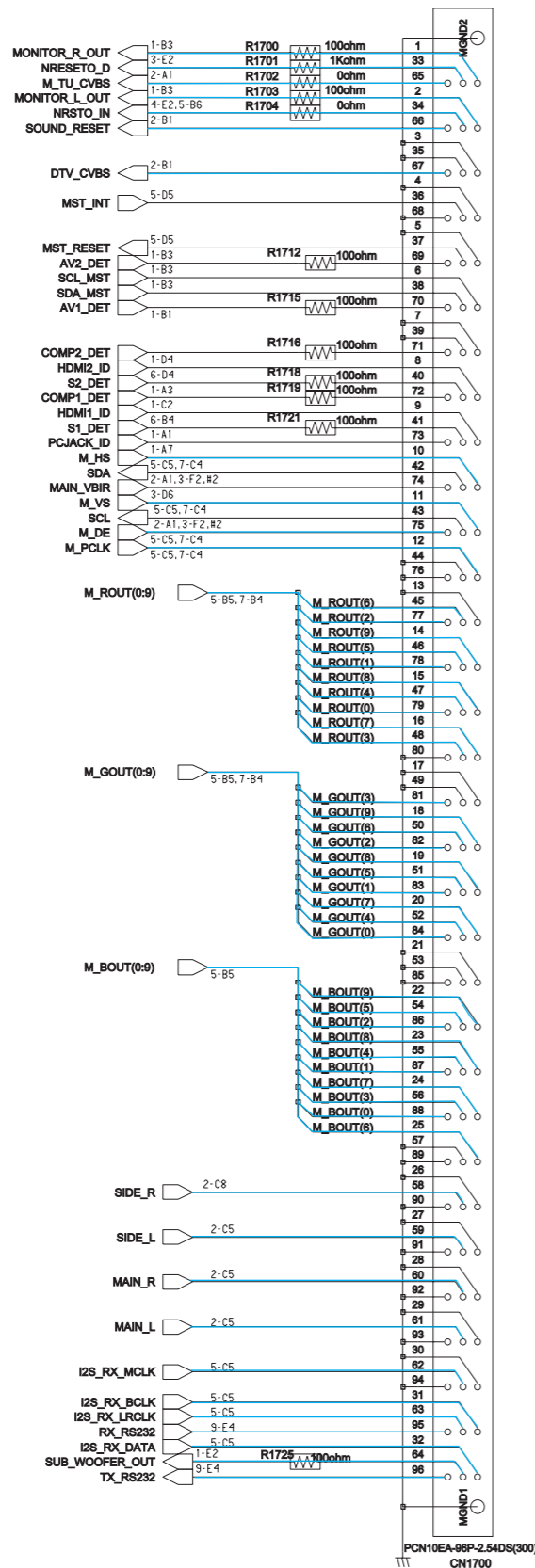
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<span style="color: blue;">—</span>	Signal



### 10-2-6 CONNECTOR

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

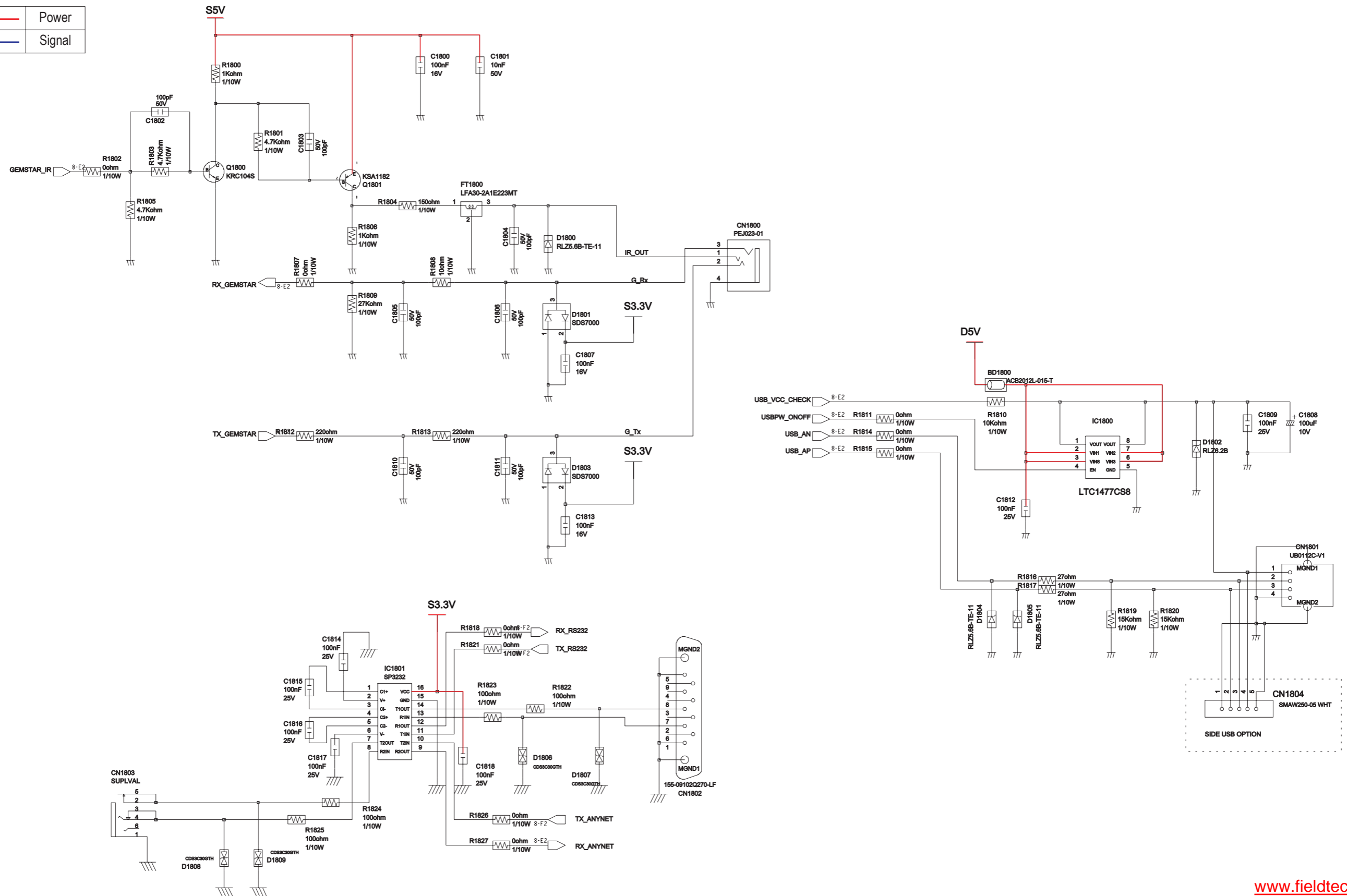
	Power
	Signal



### 10-2-7 USB\_GEMSTAR\_DEBUG

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

	Power
	Signal

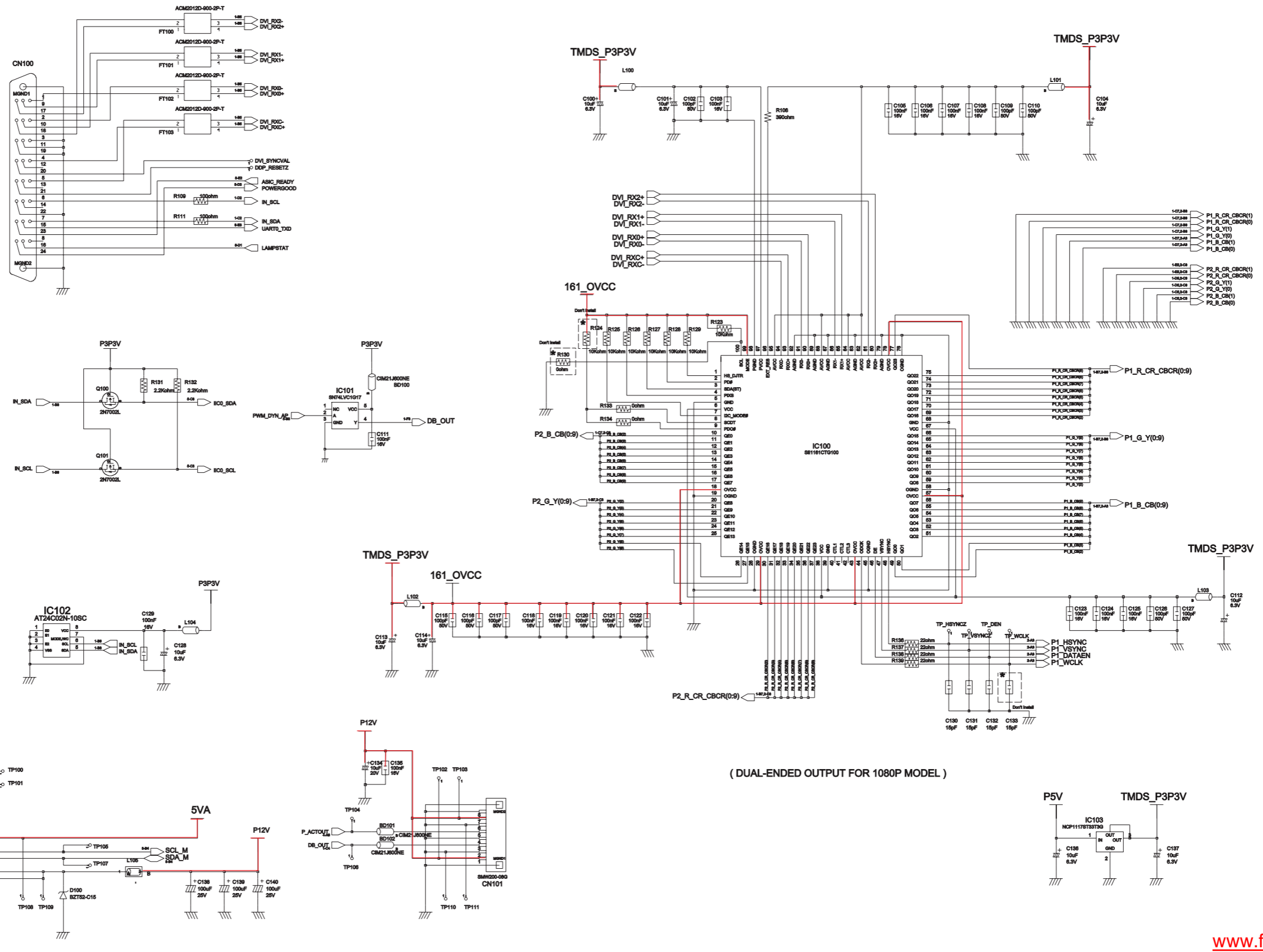
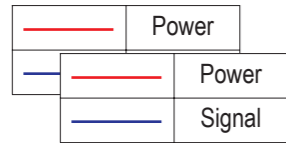


# 10-3 DMD Board

## 10-3-1 DMD-1

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### INPUT

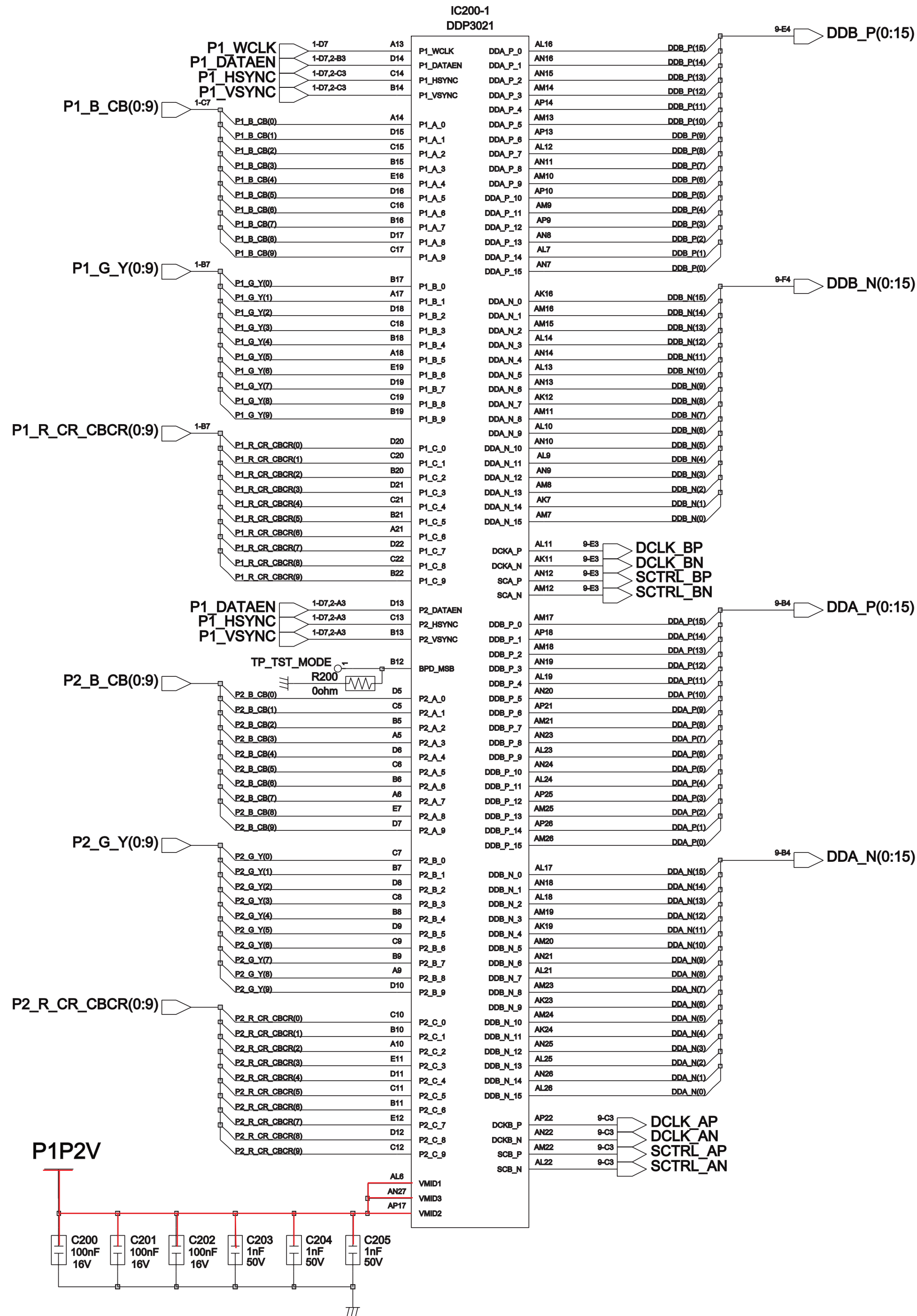




10-3-2 DMD-2

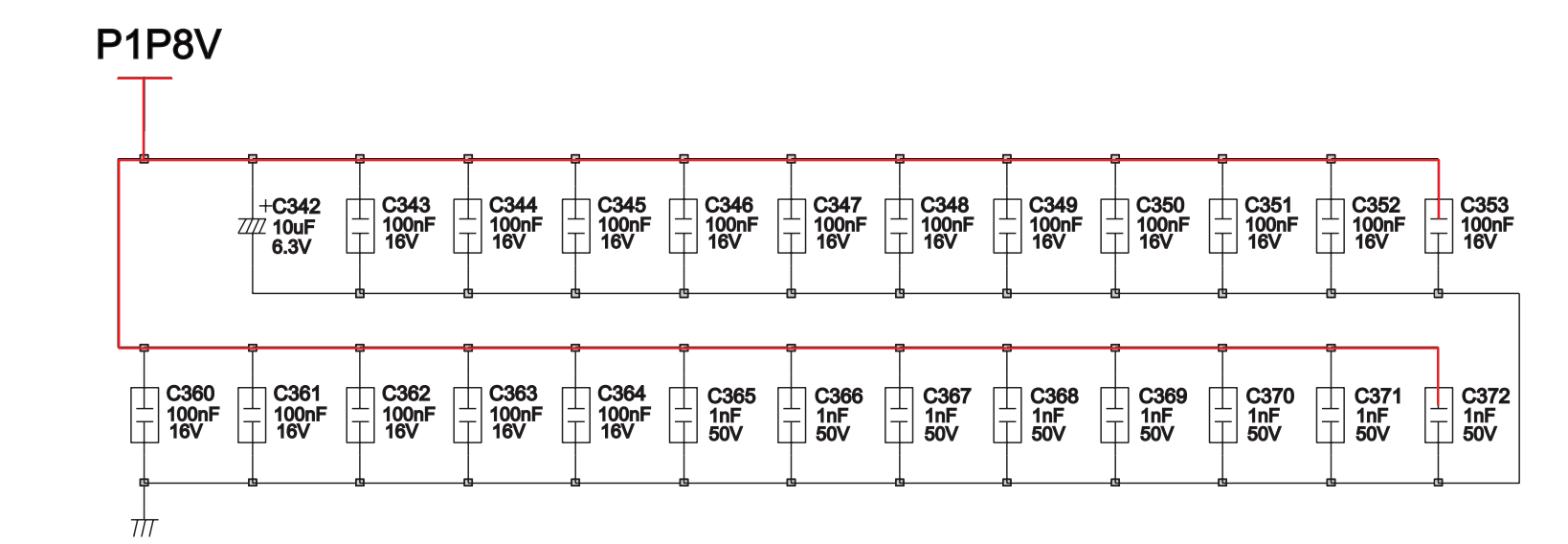
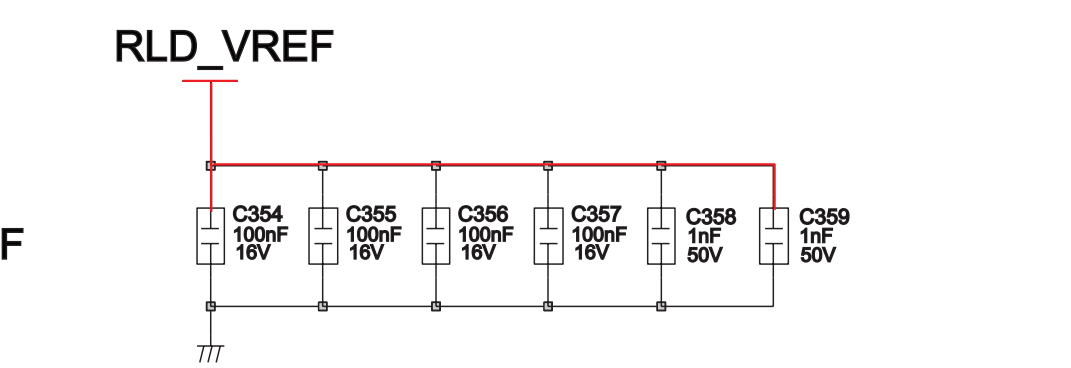
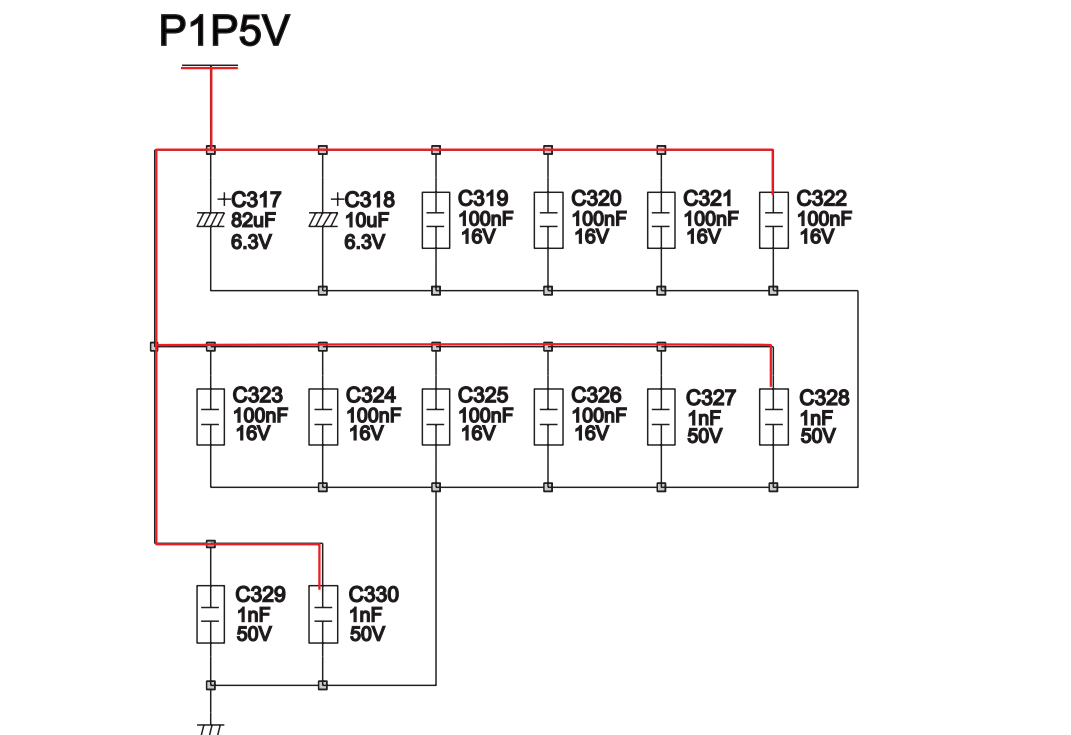
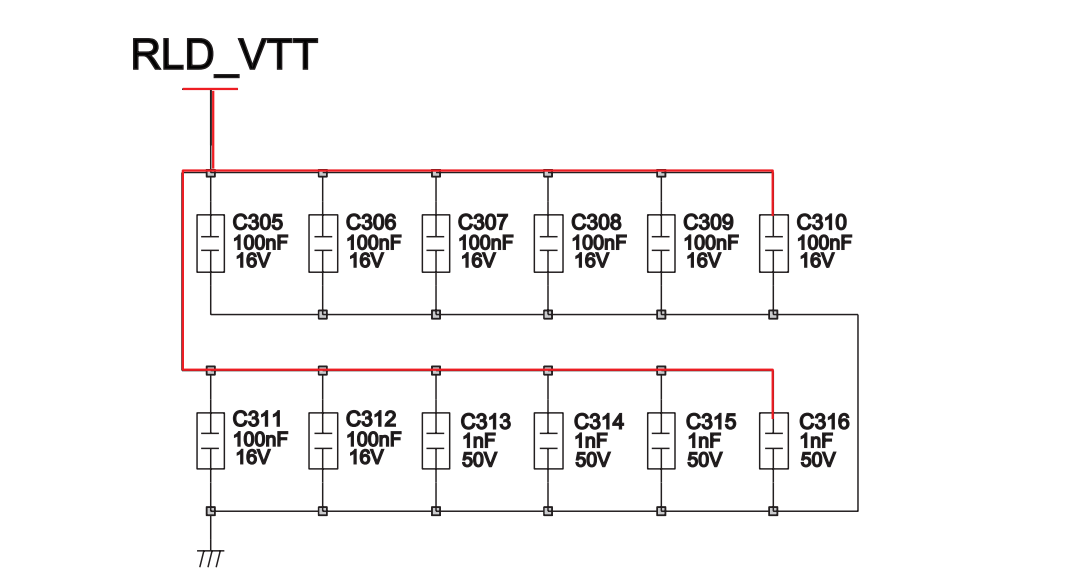
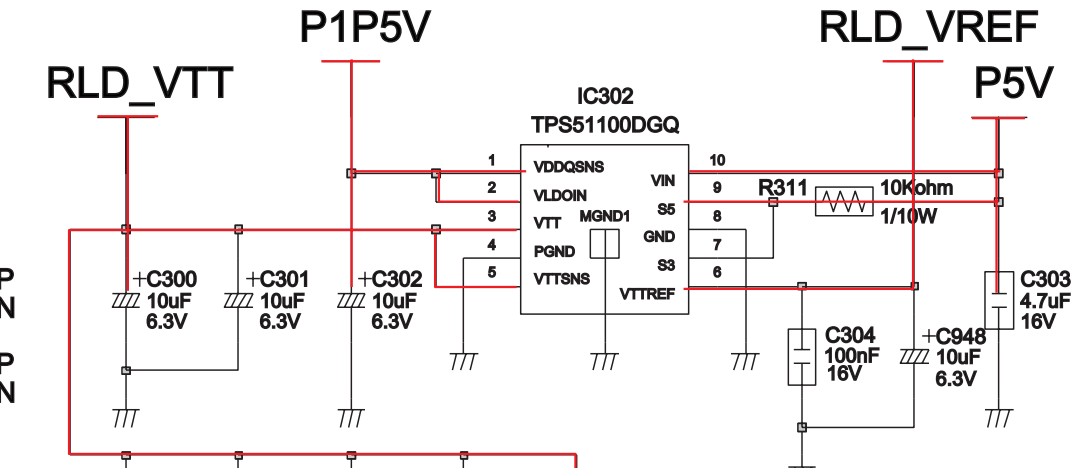
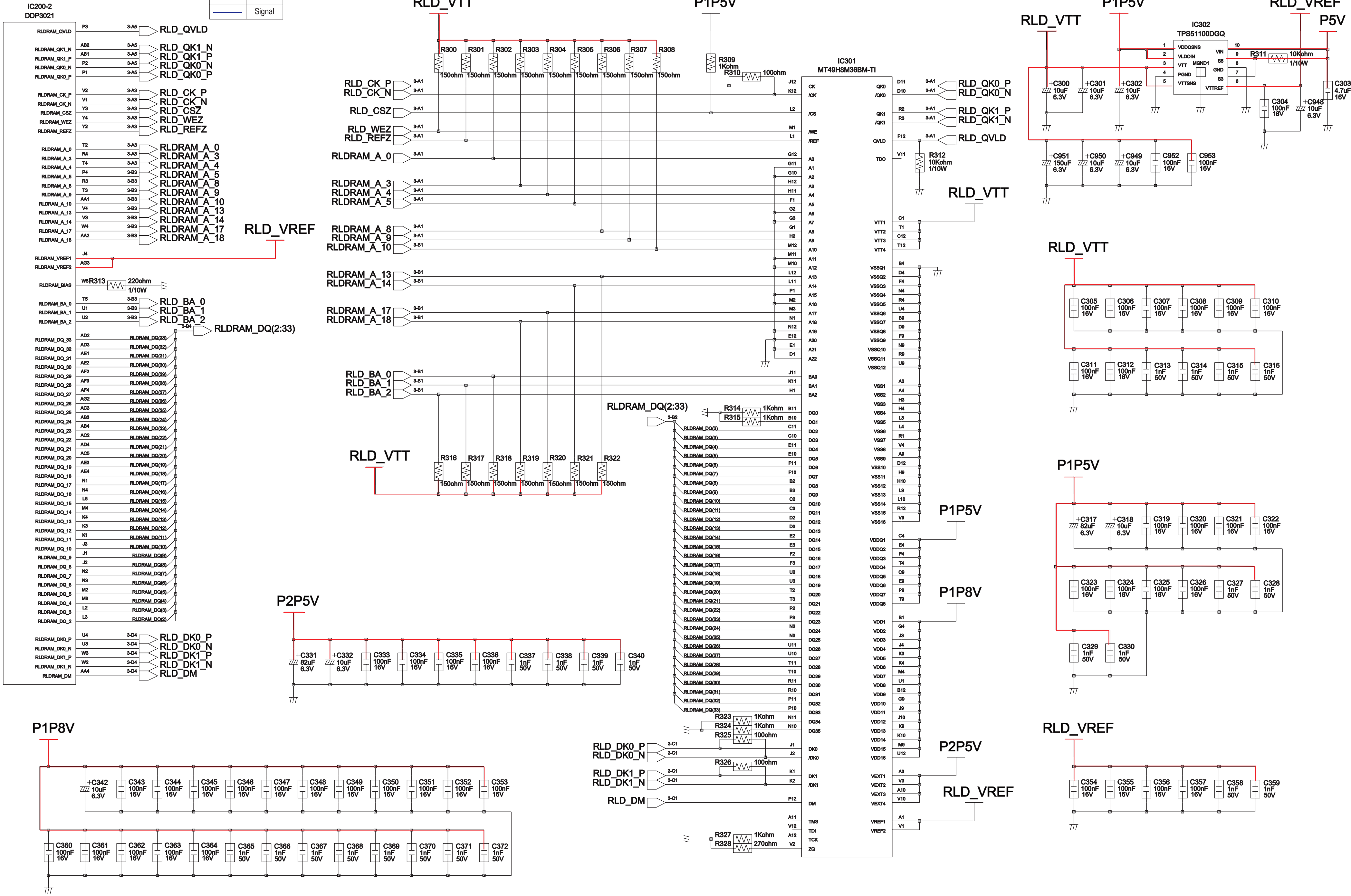
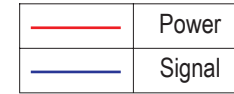
This Document can not be used without Samsung's authorization.

	Power
	Signal



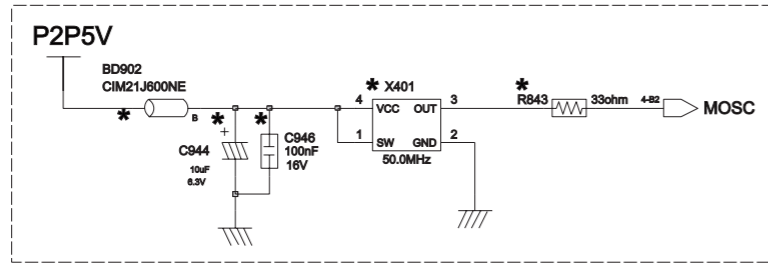
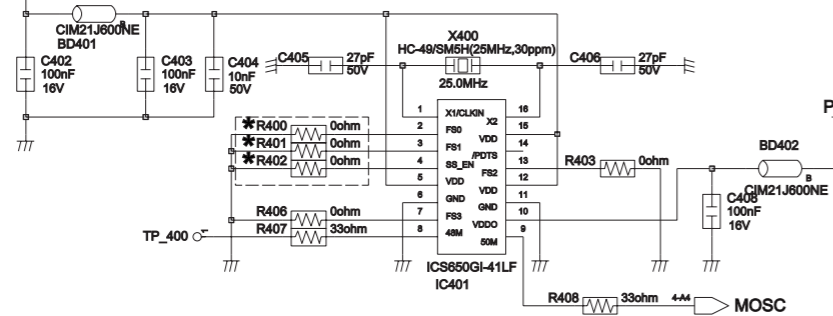
10-3-3 DMD-3

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



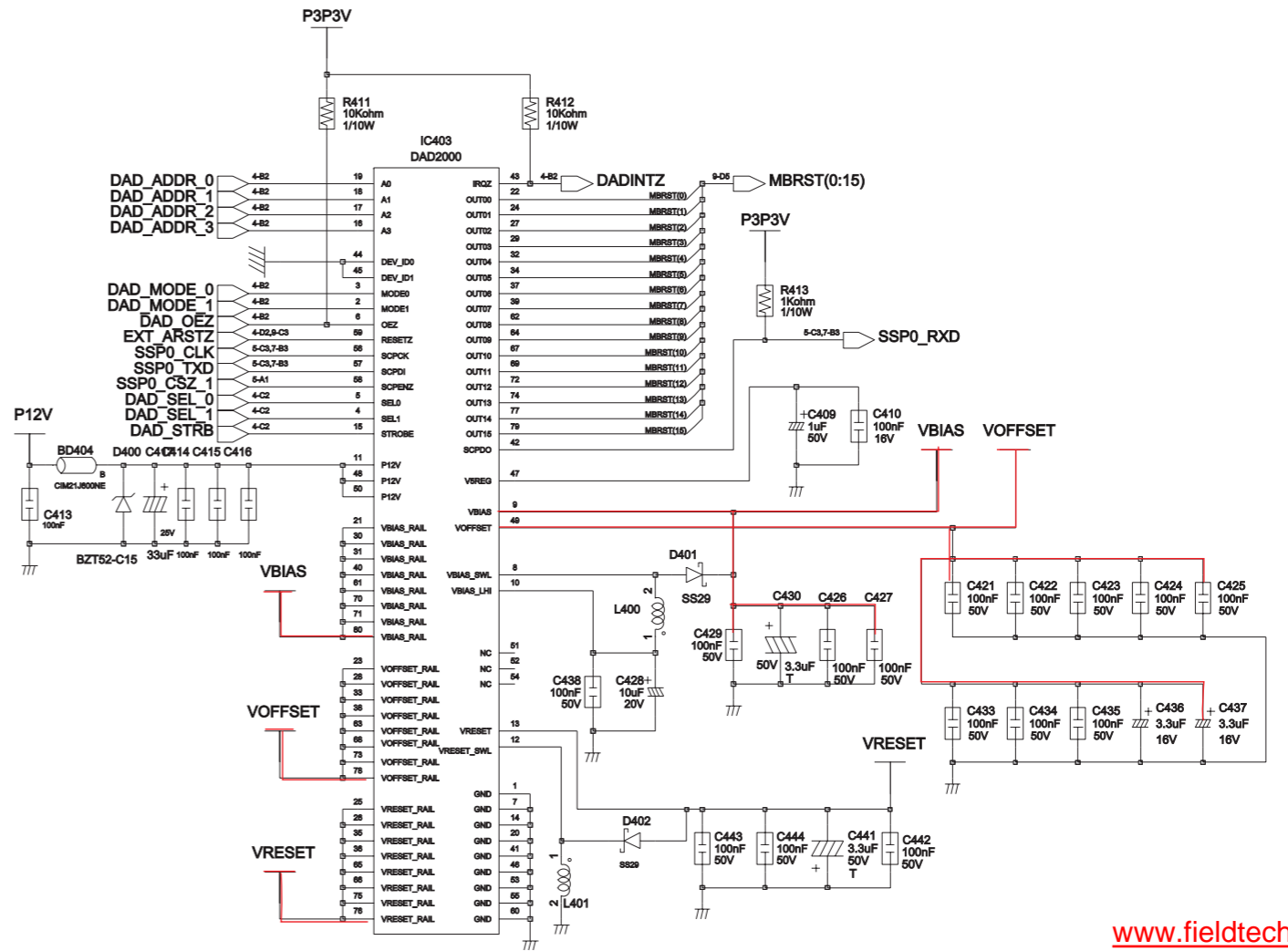
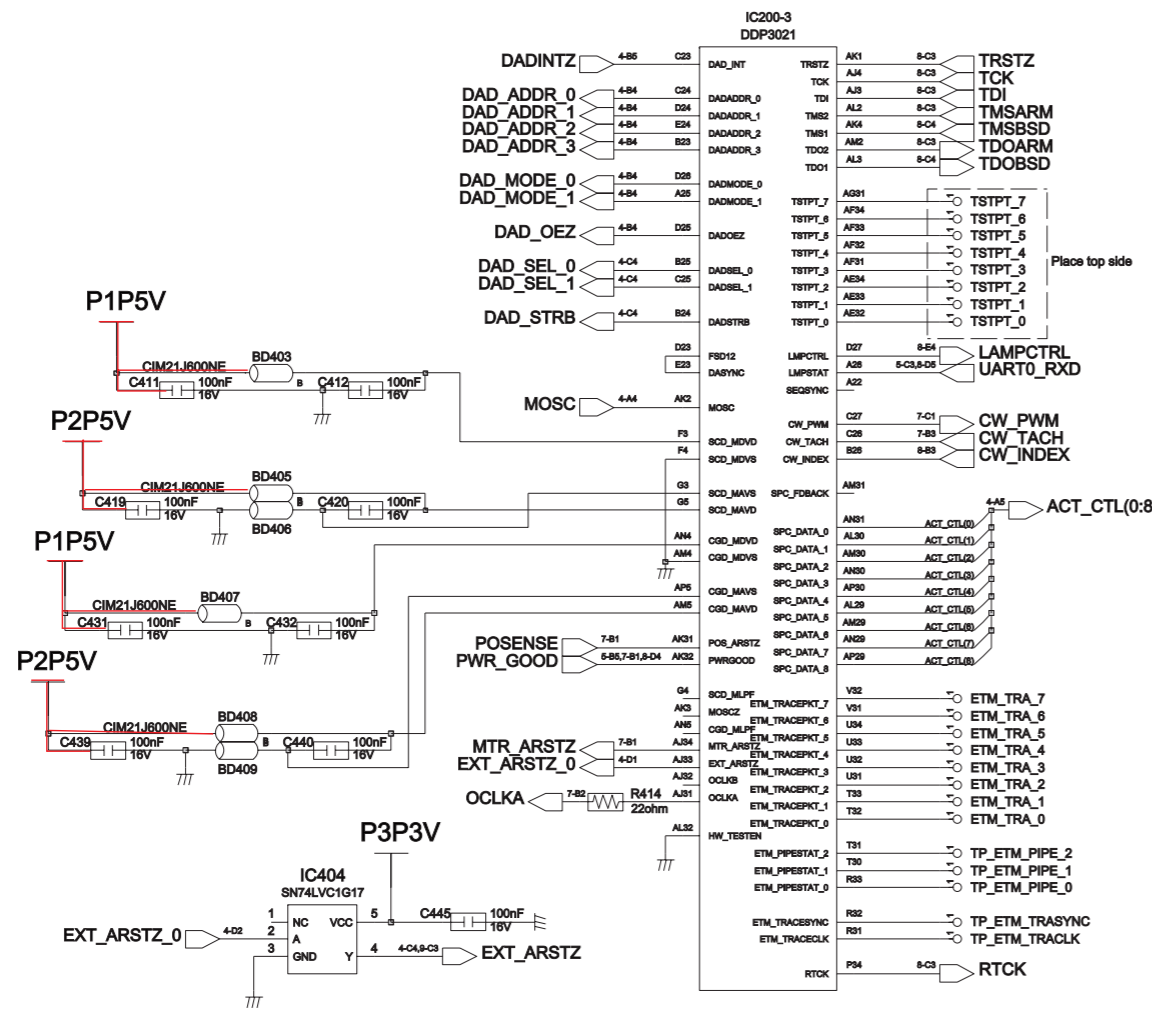
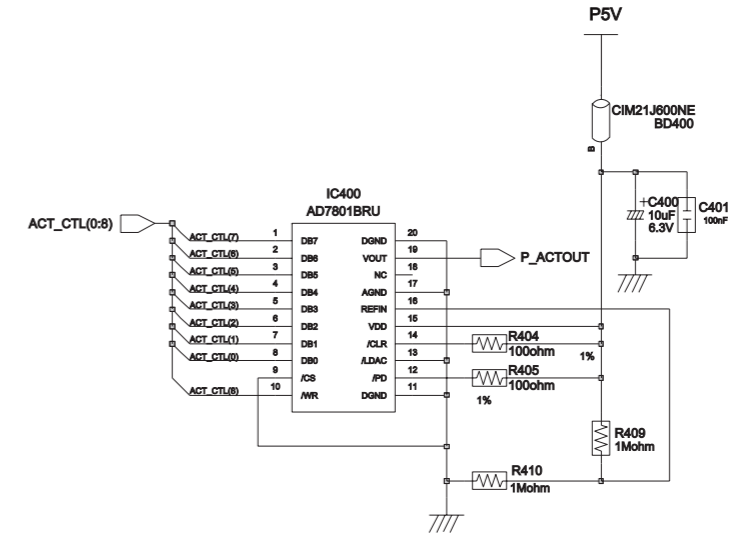
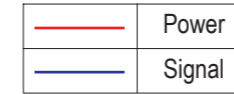
10-3-4 DMD-4

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Resistor settings for spread spectrum IC (IC401)

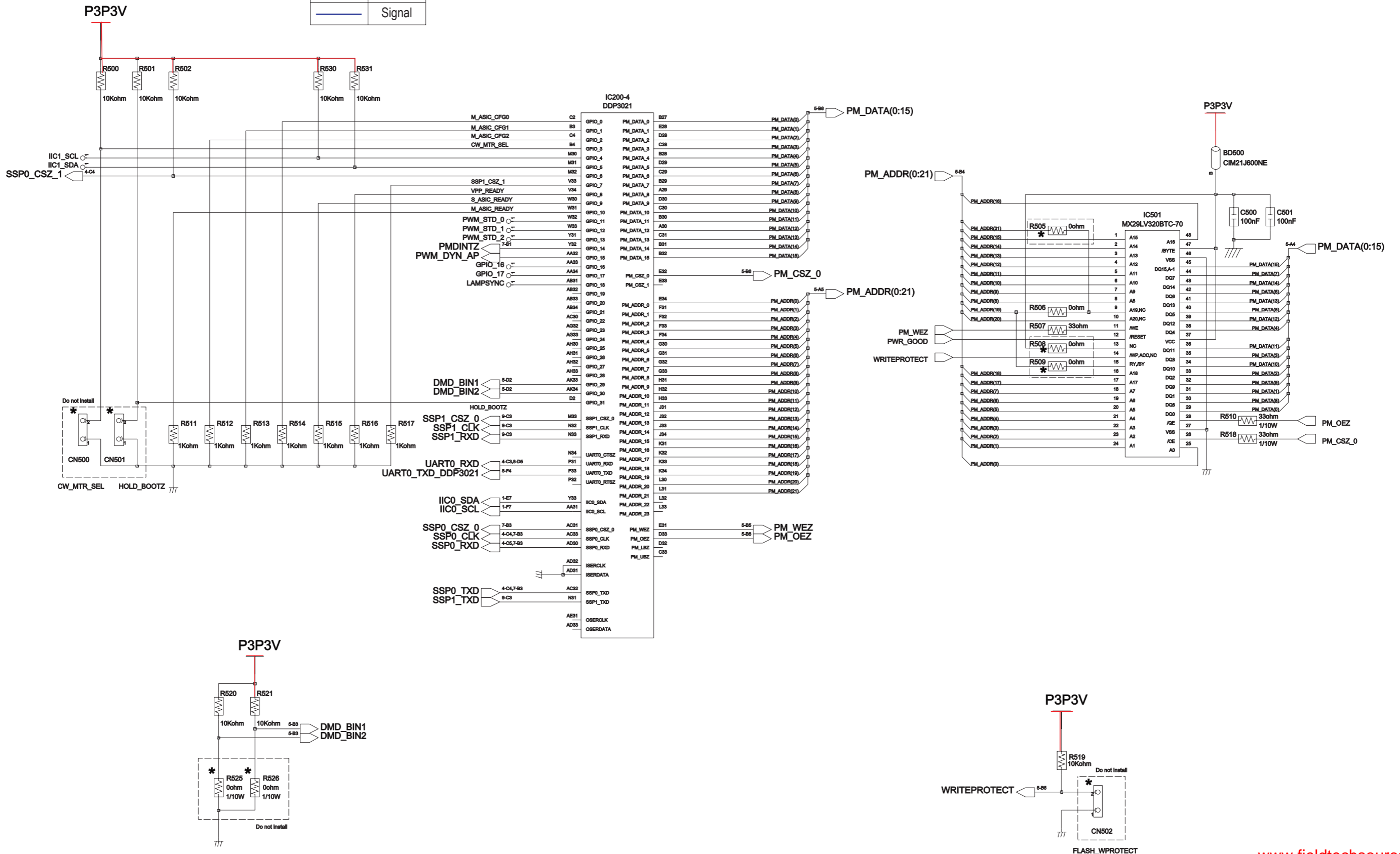
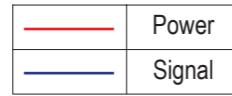
FS3 (R406)	FS2 (R403)	FS1 (R401)	FS0 (R400)	SPREAD TYPE	SS OUT
0	0	0	0	CENTER	+/- 0.25
0	0	0	X	CENTER	+/- 0.50
0	0	X	0	CENTER	+/- 0.75
0	0	X	X	CENTER	+/- 1.00
0	X	0	0	CENTER	+/- 1.25
0	X	0	X	CENTER	+/- 1.50
0	X	X	0	CENTER	+/- 1.75
0	X	X	X	CENTER	+/- 2.00
X	0	0	0	DOWN	-0.50
X	0	0	X	DOWN	-0.75
X	0	X	0	DOWN	-1.00
X	0	X	X	DOWN	-1.25
X	X	0	0	DOWN	-1.50
X	X	0	X	DOWN	-1.75
X	X	X	0	DOWN	-2.00
X	X	X	X	DOWN	-2.25





10-3-5 DMD-5

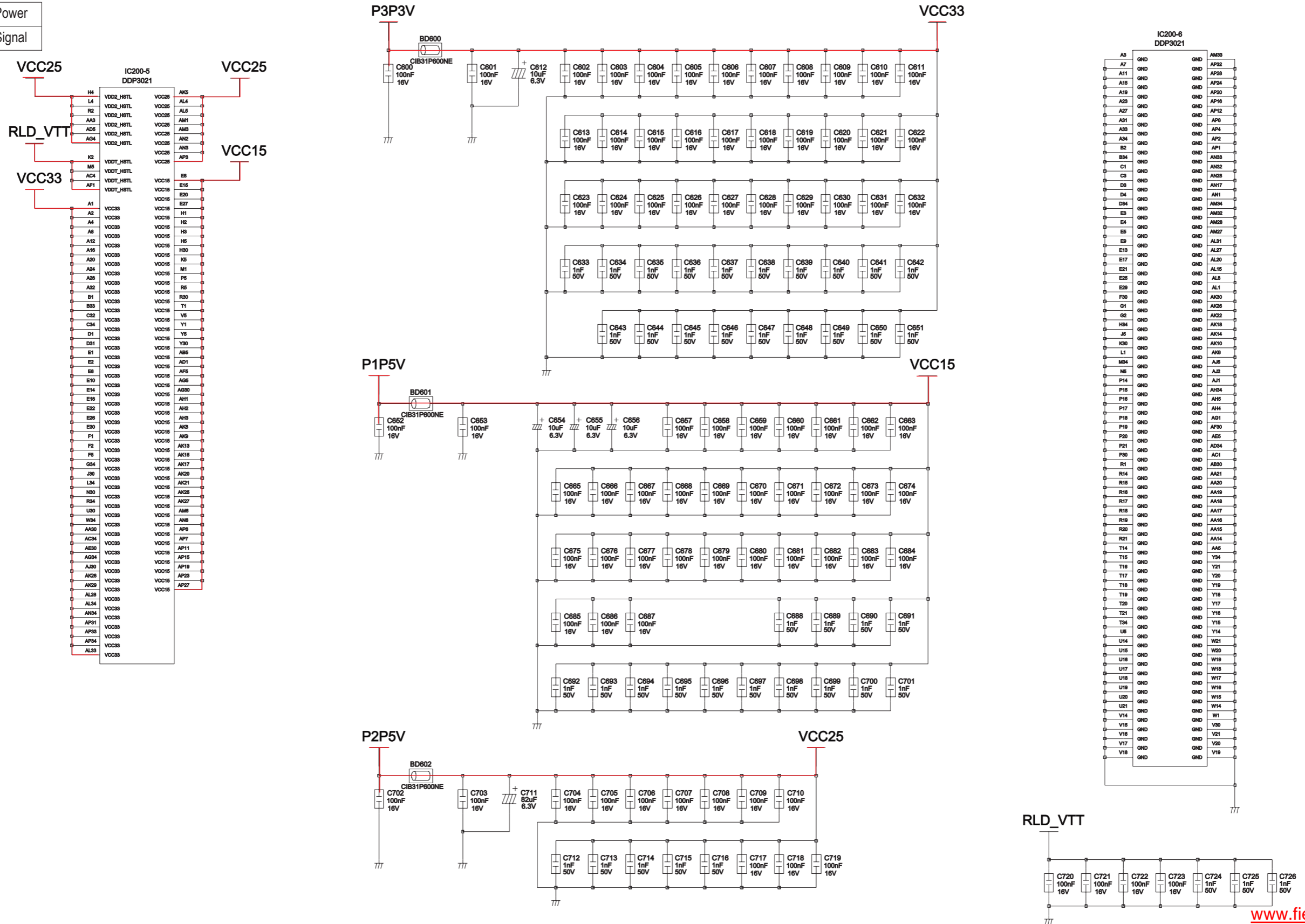
This Document can not be used without Samsung's authorization.



10-3-6 DMD-6



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

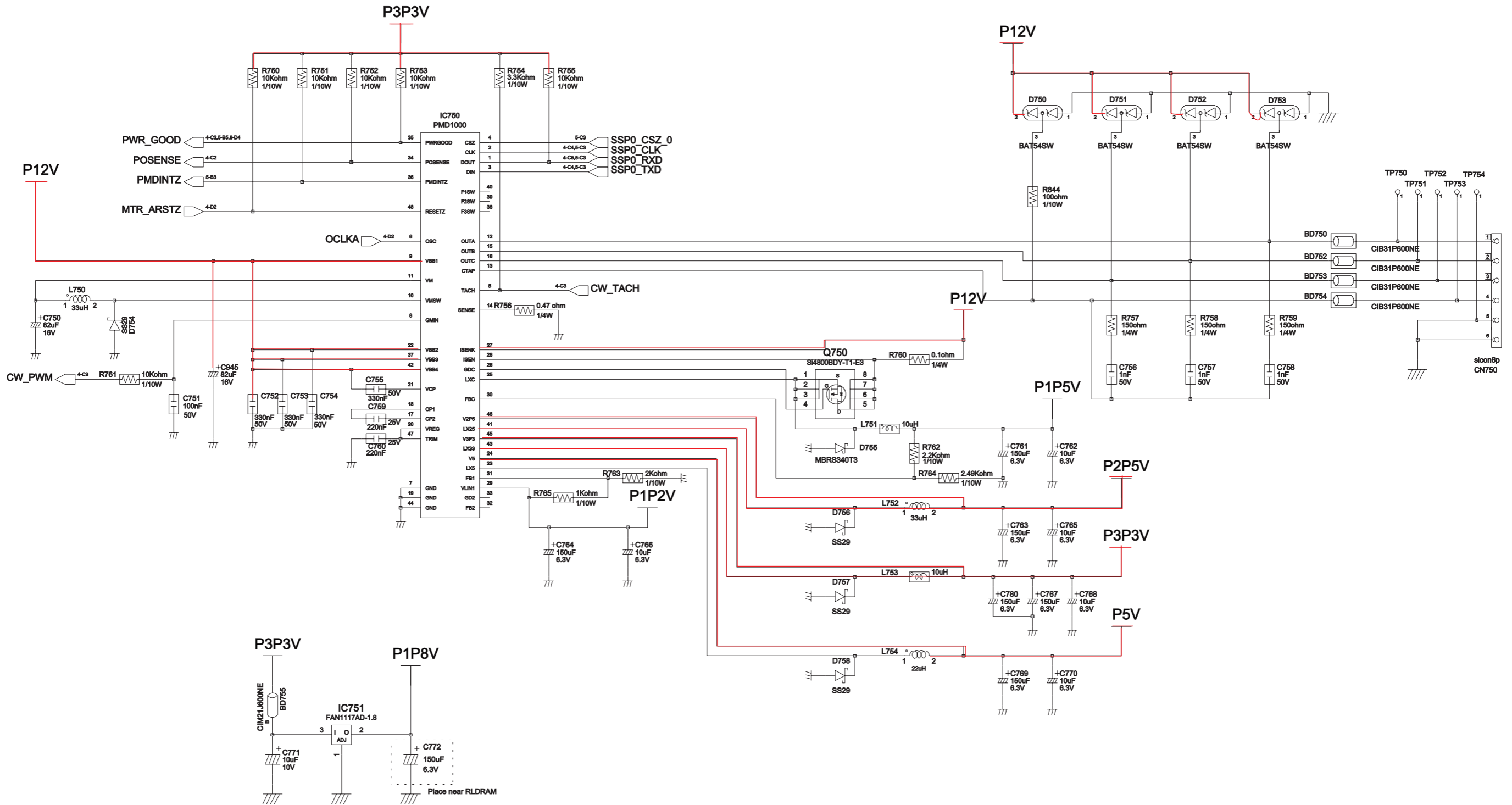
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<span style="color: blue;">—</span>	Signal



10-3-7 DMD-7

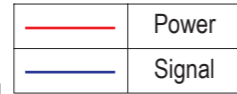
This Document can not be used without Samsung's authorization.

	Power
	Signal

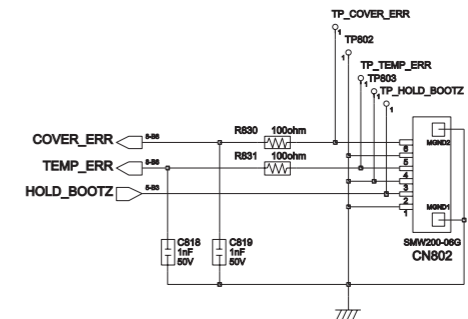
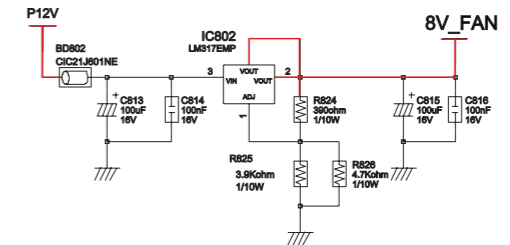
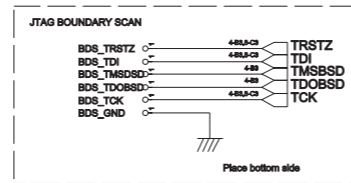
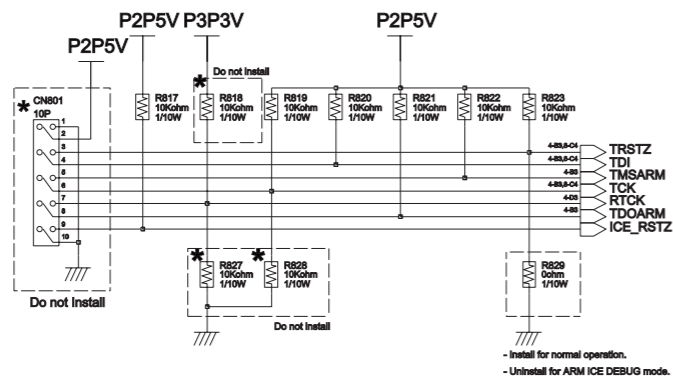
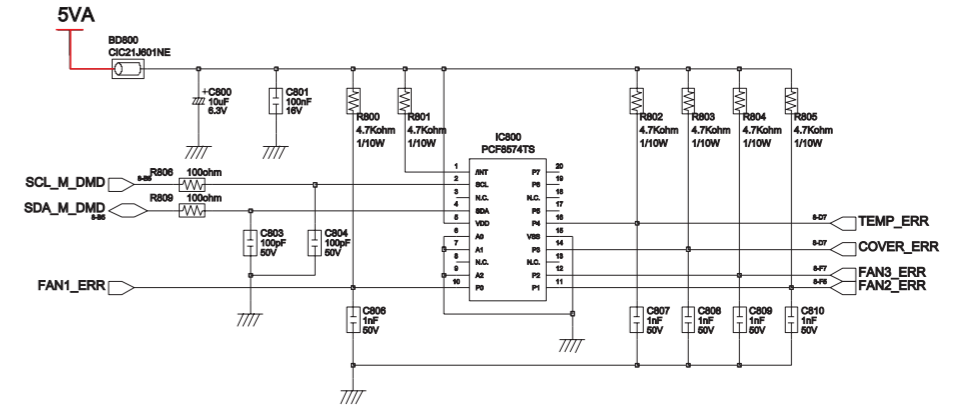
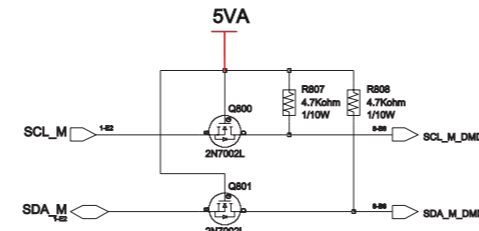
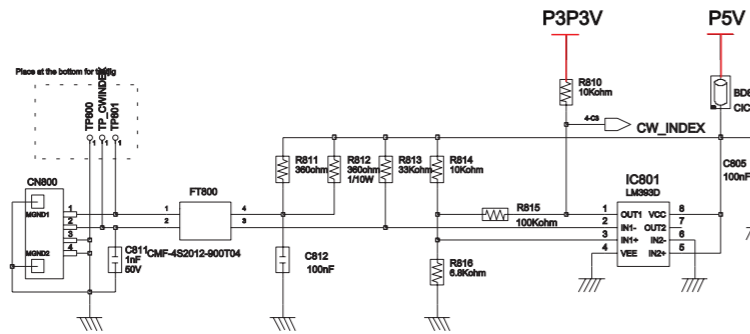


10-3-8 DMD-8

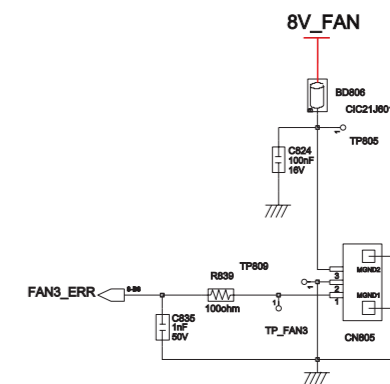
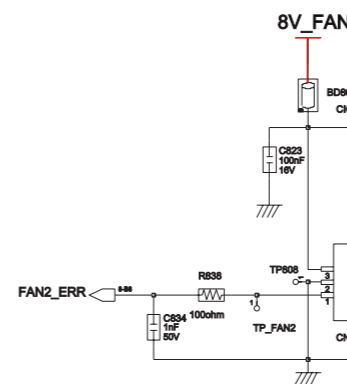
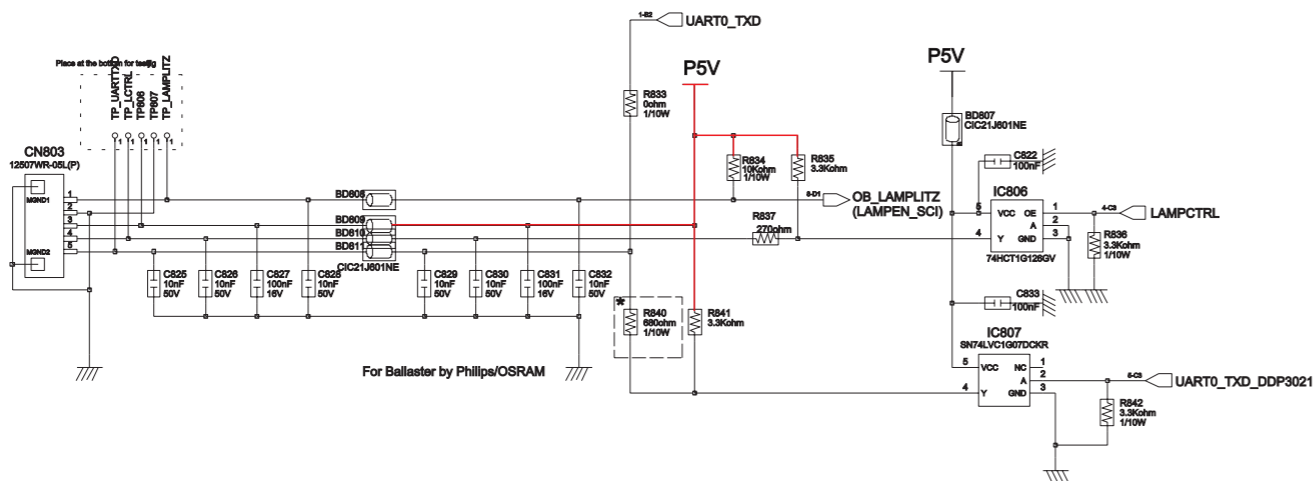
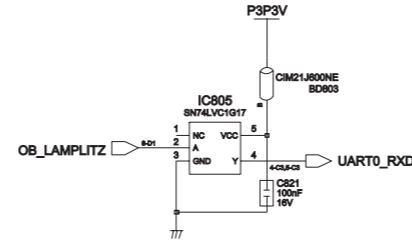
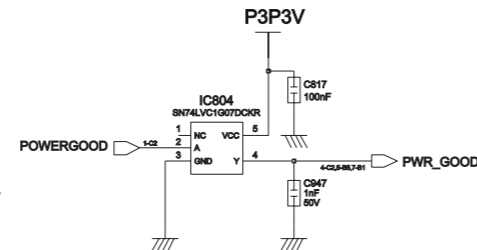
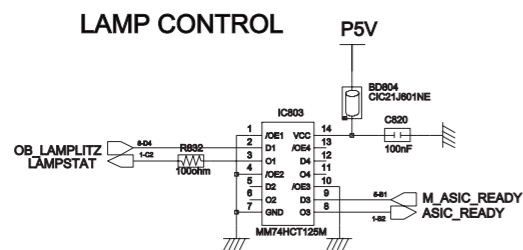
This Document can not be used without Samsung's authorization.



COLOR WHEEL SENSOR DETECTION

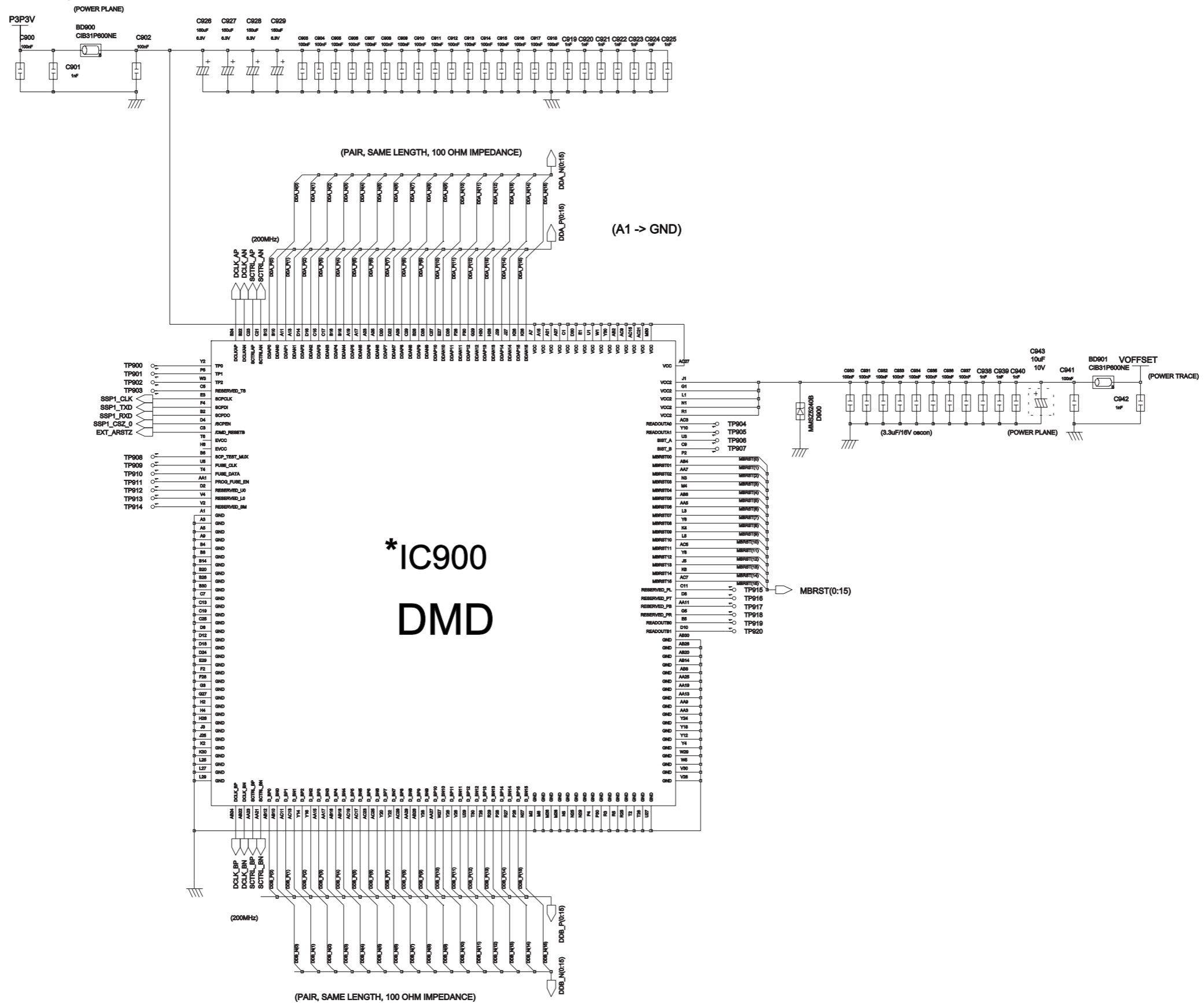


LAMP CONTROL



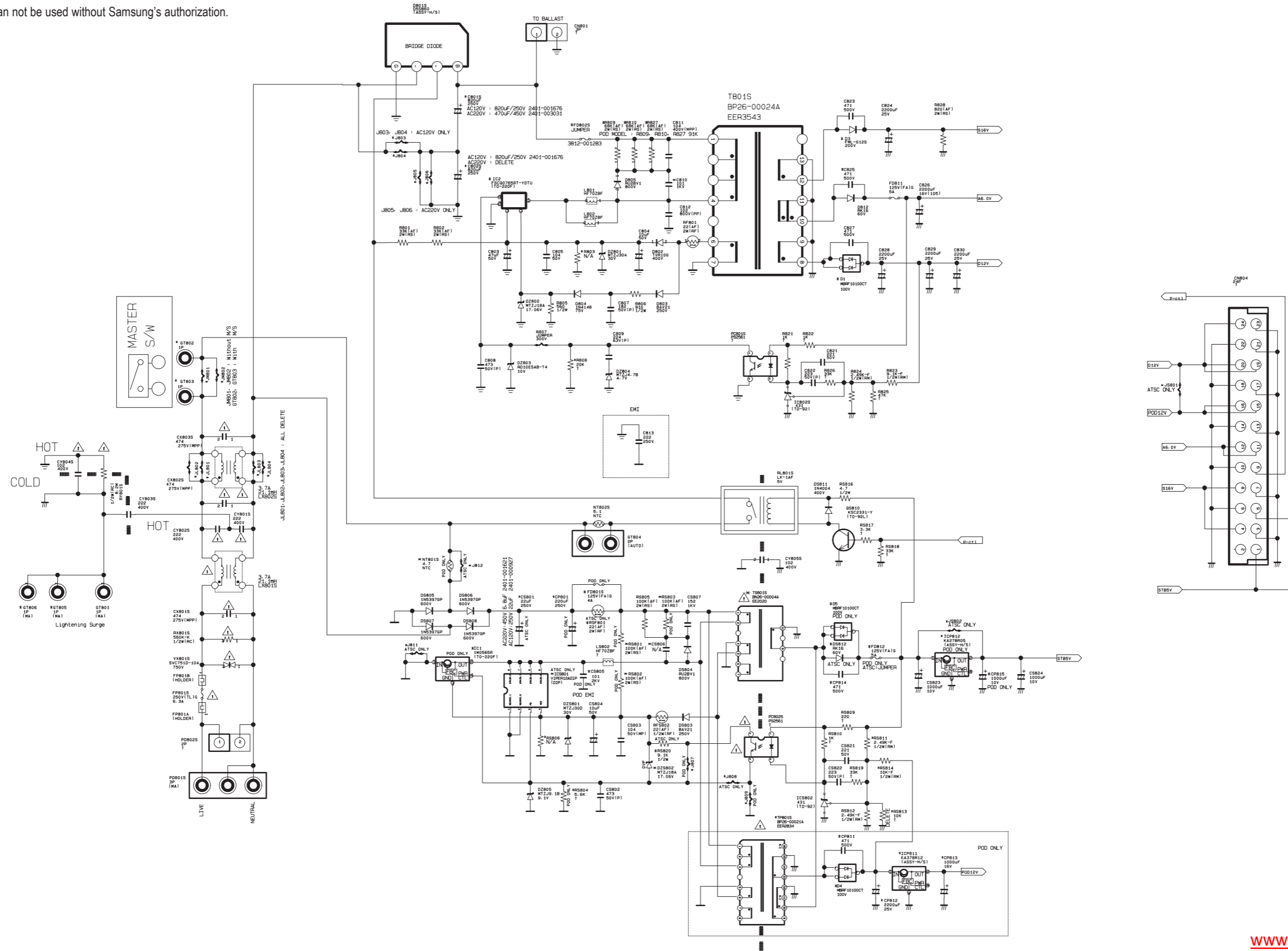
10-3-9 DMD-9

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# 10-4 Power

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

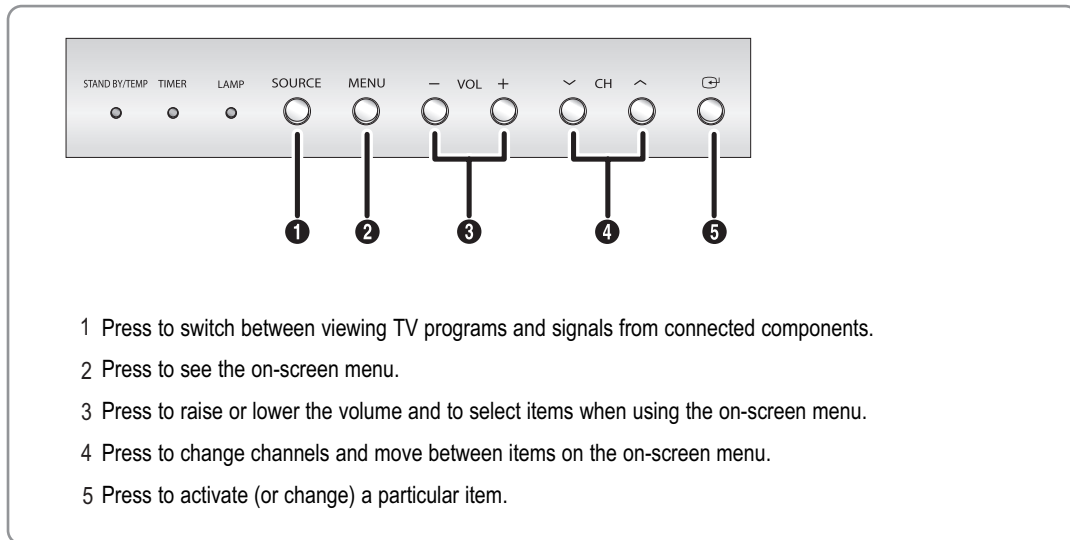


## 11. Operation Instruction & Installation

### 11-1 Product Features and Functions

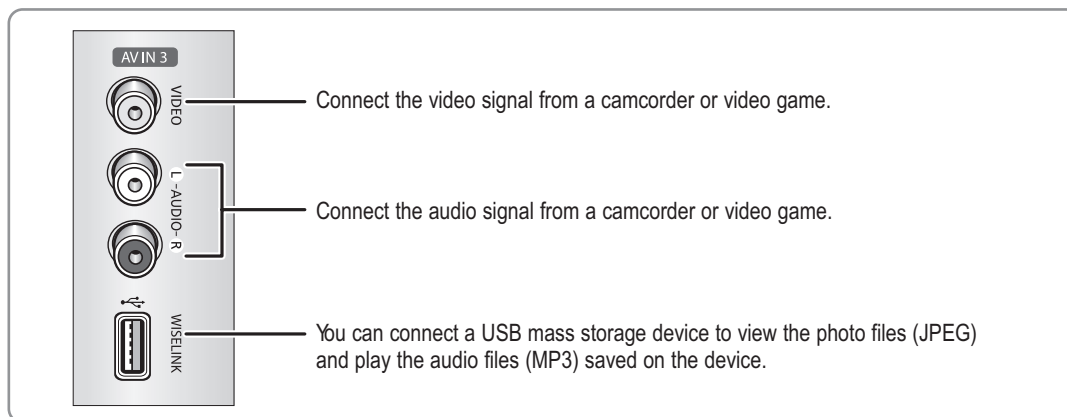
#### 11-1-1 Right side buttons

The buttons on the right side panel control your TV's basic features, including the on-screen menu system. To use the more advanced features, you must use the remote control.



#### 11-1-2 Side Panel Jacks

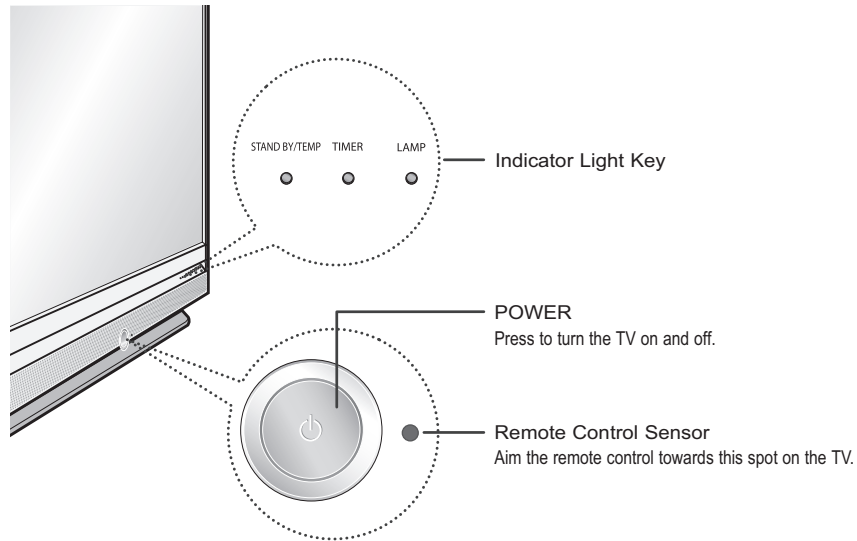
Use the right side panel jacks to connect a component that is used only occasionally (a camcorder or video game, for example).





### 11-1-3 Front Panel LED Indicators

The three lights on the front panel indicate the status of your TV.



#### Indicator Light Key

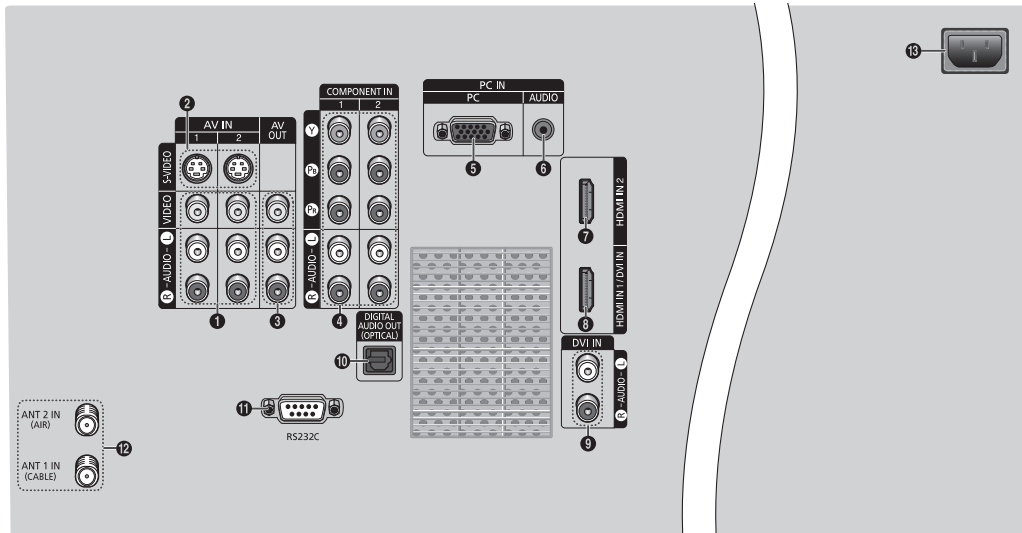
- : Light is On
- ◐ : Light is Blinking
- : Light is Off

TIMER	LAMP	STAND BY/TEMP	Indication
○	○	●	Standby state.
○	◐	○	The picture will automatically appear in about 15 seconds.
●	◐	○	Auto Timer ON/OFF has been set and the set will automatically be turned on in about 15 seconds.
◐	○	◐	A cooling fan inside the set is not operating normally.
○	◐	◐	Lamp cover on the rear of the set is not properly shut.
○	○	◐	Check if the ventilation hole on the rear of the set is blocked, because if the inner temperature is too high, the power will shut off.
◐	◐	◐	Lamp may be defective. Please contact a certified technician.

- It takes about 30 seconds for the TV to warm up, so normal brightness may not appear immediately.
- The TV has a fan to keep the inside lamp from overheating. You'll occasionally hear it working.

### 11-1-4 Rear Panel Jacks

Use the rear panel jacks to connect components such as a VCR. You can connect different components such as VCRs, Set-Top Box and a DVD player etc., because there are two sets of video input jacks and two sets of component video input jacks on the rear panel of your TV. For more information, see "Connections".

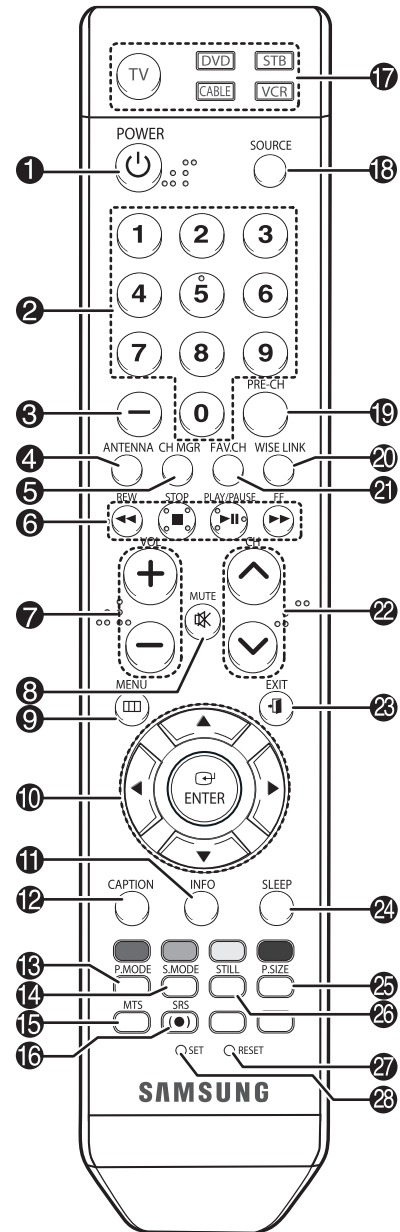


- |   |   |
|---|---|
| <p>1 VIDEO/AUDIO INPUT jacks<br/>Connect video/audio signals from external sources, such as VCR or DVD players.</p> <p>2 S-VIDEO INPUT jacks<br/>Connects an S-Video signal from an S-VHS VCR or DVD player.</p> <p>3 VIDEO/AUDIO OUTPUT jacks<br/>Sends video/audio signals from the TV to an external source, such as a VCR. These jacks are available only in TV, Video and S-Video modes.</p> <p>4 COMPONENT1, 2 jacks (Y, P, PR, AUDIO L/R)<br/>Use these jacks to connect the component video/audio signals from a DVD player or a Set-Top Box.</p> <p>5 PC VIDEO INPUT jack<br/>Connect these to the video output jack on your PC.</p> <p>6 PC AUDIO INPUT jack<br/>Connect these to the audio output jack on your PC.</p> <p>7 HDMI (High Definition Multimedia Interface) INPUT jacks (HDMI IN 1)<br/>Connect to the HDMI jack of a device with HDMI output.</p> | <p>8 HDMI (High Definition Multimedia Interface)/ DVI INPUT jack (HDMI IN 1/DVI IN)<br/>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)</p> <p>9 DVI AUDIO (L/R) IN<br/>Connect to the DVI audio output jack of an external device.</p> <p>10 DIGITAL AUDIO OUT (OPTICAL) jack<br/>Connect to a Digital Audio Component.</p> <p>11 RS232C<br/>Connect to a computer for reading and loading data information.</p> <p>12 ANTENNA terminals<br/>Two independent cables or antennas can be connected to these terminals. Use "ANT 1 IN (CABLE)" and "ANT 2 IN (AIR)" terminals to receive a signal from VHF/UHF antennas or your cable system.</p> <p>13 POWER IN<br/>Connect the supplied power cord.</p> |
|---|---|

## 11-1-5 Remote Control

You can use the remote control up to about 23 feet from the TV. When using the remote control, always point it directly at the TV. You can also use your remote control to operate your VCR, Cable box, DVD player or Samsung Set-Top Box.

- |  |  |
|--|--|
| <p>1. <b>POWER</b><br/>Turns the TV on and off.</p> <p>2. <b>Channel Number</b><br/>Press to directly tune to a particular channel.</p> <p>3. <b>-</b><br/>Press to select additional channels (digital and analog) being broadcast by the same station. For example, to select channel "54-3", press "54", then press "-" and "3".</p> <p>4. <b>ANTENNA</b><br/>Press to select "AIR" or "CABLE".</p> <p>5. <b>CH MGR</b><br/>Used to display Channel lists on the screen.</p> <p>6. <b>VCR/DVD Controls</b><br/>Controls VCR or DVD functions: Rewind, Stop, Play/Pause, Fast Forward.</p> <p>7. <b>VOL +, VOL -</b><br/>Press to increase or decrease the volume.</p> <p>8. <b>MUTE</b><br/>Press to mute the TV sound.</p> <p>9. <b>MENU</b><br/>Displays the main on-screen menu.</p> <p>10. <b>▲, ▼, ◀, ▶, ENTER</b><br/>Press to select highlight up, down, left, or right. While using the on-screen menus, press ENTER to activate (or change) a particular item.</p> <p>11. <b>INFO</b><br/>Press to display information on the TV screen.</p> <p>12. <b>CAPTION</b><br/>Controls the caption decoder.</p> <p>13. <b>P.MODE</b><br/>Adjust the TV picture by selecting one of the preset factory settings (or select your personal, customized picture settings.)</p> <p>14. <b>S.MODE</b><br/>Select Sound effect.</p> <p>15. <b>MTS (Multichannel Television Stereo)</b><br/>Press to choose Stereo, Mono or SAP (Secondary Audio Program).</p> <p>16. <b>SRS</b><br/>Activates TruSurround.</p> | <p>17. <b>Mode</b><br/>(TV/DVD/STB/CABLE/VCR)<br/>Selects a target device to be controlled by the Samsung remote control (i.e., TV, DVD, STB, CABLE, or VCR).</p> <p>18. <b>SOURCE</b><br/>Press to display all of the available video sources (TV, AV1, AV2, AV3, S-Video1, S-Video2, Component1, Component2, PC, HDMI1, and HDMI2).</p> <p>19. <b>PRE-CH</b><br/>Tunes to the previous channel.</p> <p>20. <b>WISELINK</b><br/>This function enables you to load saved photo (JPEG) and audio files (MP3) and to view or play them on the TV.</p> <p>21. <b>FAV.CH (Favorite Channel)</b><br/>Press to switch between your favorite channels.</p> <p>22. <b>CH ▲ / ▼</b><br/>Press to change channels.</p> <p>23. <b>EXIT</b><br/>Press to exit the menu.</p> <p>24. <b>SLEEP</b><br/>Press to select a preset time interval for automatic shut off.</p> <p>25. <b>P.SIZE</b><br/>Press to change the screen size.</p> <p>26. <b>STILL</b><br/>Press to pause the current screen.</p> <p>27. <b>RESET</b><br/>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.</p> <p>28. <b>SET</b><br/>Used during set up of this remote control, so that it will work compatibly with other devices (some Samsung Set-top boxes, VCR, Cable box, DVD, etc.)</p> |
|--|--|



### NOTES

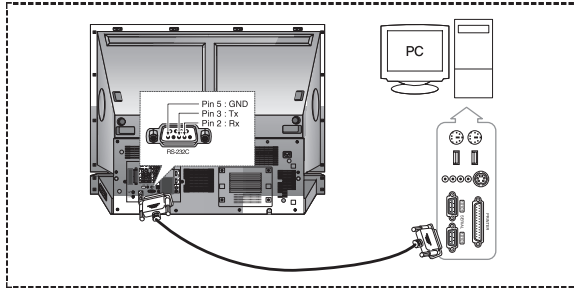
\* The Color button is used during the channel list.

\* This is a special remote control for the visually impaired, and has Braille points on the buttons.

## 11-2 New Features

### 11-2-1 RS-232C

Connect the DLP DTV using the serial port.



Do not disconnect or connect the RS-232C cable while the Computer or the DLP TV is operating. It may cause serious damage to the Computer or the DLP TV.

If the PC is not properly configured, the RS-232C connection may not work properly. For further details, refer to the Computer's product documentation.

### Serial Port Settings

Specification	RS-232C
Bit Rate	19200 bps
Data Bits	8 bits
Parity	None
Stop Bits	1 bit
Flow Control	None

### Serial Communication Protocol

#### Command Packet Structure [7bytes]

0x08	0x22	Cmd1	Cmd2	Cmd3	Value	CS
------	------	------	------	------	-------	----

- ◆ A command packet consists of 7 bytes in total.
- ◆ The two bytes 0x08 and 0x22 signify that the packet is for serial communication.
- ◆ The following 4 bytes represent a pre-defined command that can be defined by the user.
- ◆ The last byte is the checksum which checks the validity of the current packet.

Header [2 Byte]: Pre-defined values fixed to 0x08 and 0x22.

Cmd1 [1 Byte]: The first value of the code defined in the command list (Hexadecimal)

Cmd2 [1 Byte]: The second value of the code defined in the command list (Hexadecimal)

Cmd3 [1 Byte]: The third value of the code defined in the command list (Hexadecimal)

Value [1 Byte]: Input parameter for the command (Default: 0) (Hexadecimal)

CS [1 Byte]: Checksum (the 2's complement of the sum of all the values except for the CS value.)

#### Response Packet Structure [3 Bytes]

◆ Success			◆ Fail		
0x03	0x0C	0xF1	0x03	0x0C	0xFF

When the received packet from an external device has a valid value, a Success packet is sent. Otherwise, a Fail packet is sent.

A Fail packet is sent if:

- ◆ The received packet length is not equal to 7 bytes.
- ◆ The 2 byte packet header value is not equal to 0x08, 0x22.
- ◆ The check sum is incorrect.

Failure detection by an external device

An external device classifies the packet as Fail if it does not receive a Success packet within 100ms.

### Communication Sequence

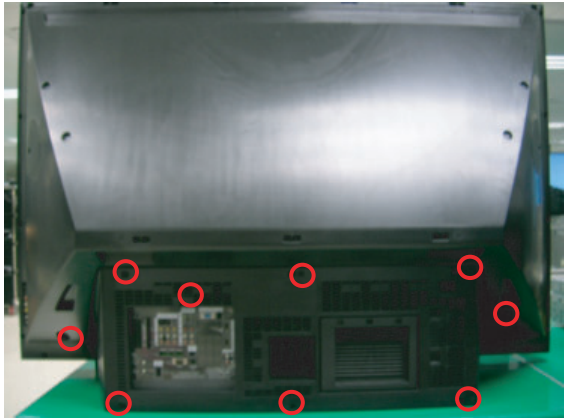

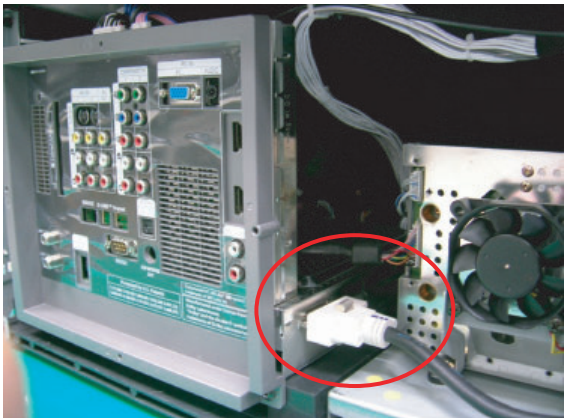
- ◆ PC  
Creates a command packet and sends it through RS232C.
- ◆ DLP DTV  
Receives a packet and parses the packet.  
Determines whether it is a success or fail, and transmits the Ack packet to the PC.  
Controls the DLP DTV with the parsed command.
- ◆ PC  
Waits for the Ack packet.  
Prepares the next command, if a Success packet arrives immediately.

# MEMO

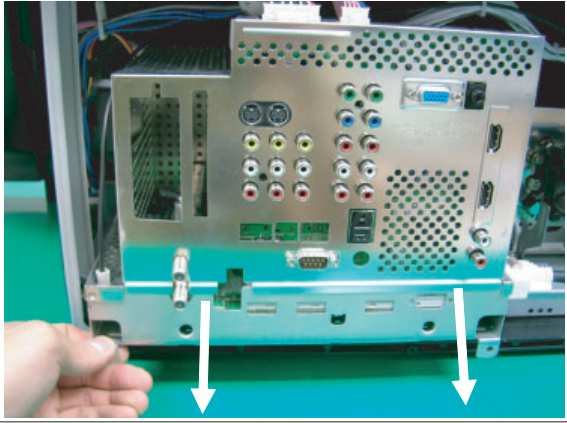
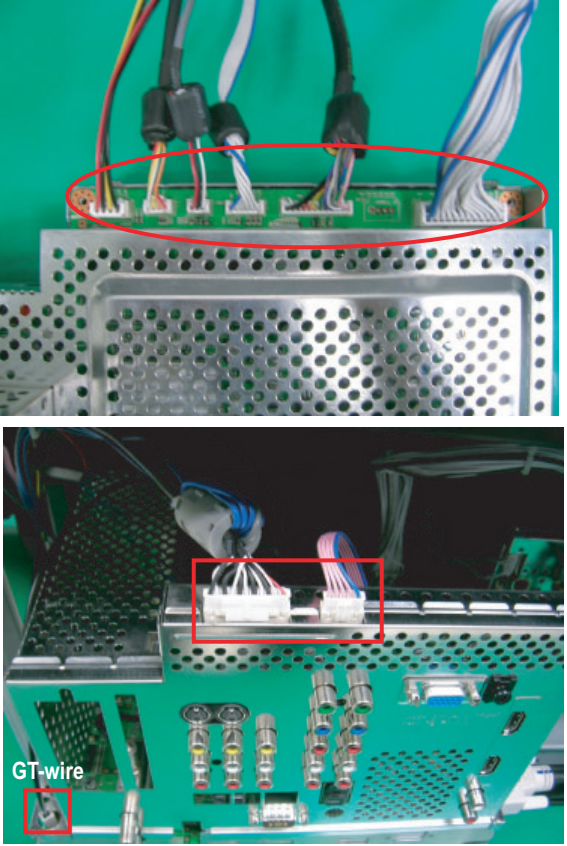
## 12. Disassembly & Reassembly

### 12-1 Overall Disassembly & Reassembly

#### 12-1-1 Separation of the back cover and the chassis


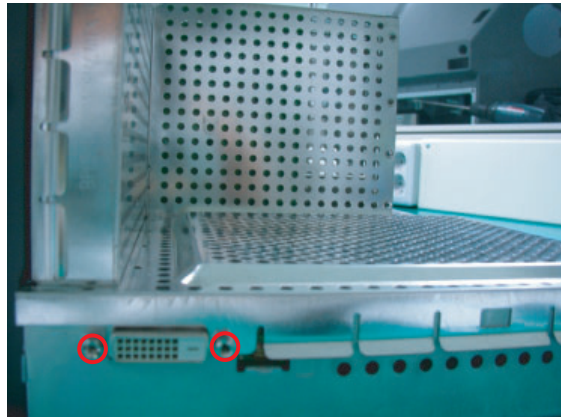


Part Name	Description	Description Photo
Back Cover	<p>① Remove 9 screws to remove the back bottom cover. : TH,B,M4.L15,BLK,SWRCH18A</p>	
Terminal Board	<p>① Remove 4 screws to remove the Terminal Board.</p> <ul style="list-style-type: none"> <li>* The 3 Terminal Board Screws : TH,B,M4.L15,BLK,SWRCH18A</li> <li>* The 3 Jack Screws : RH,B,M4,L15,ZPC(BLK),SWRCH18</li> </ul>	
DVI cable	<p>① Separate the DVI cable.</p> <p>⚠ : The DVI screw is made of soft plastic and may easily break when applying excessive force through a screw driver. Ensure that extreme caution is taken when loosening the screw.</p>	


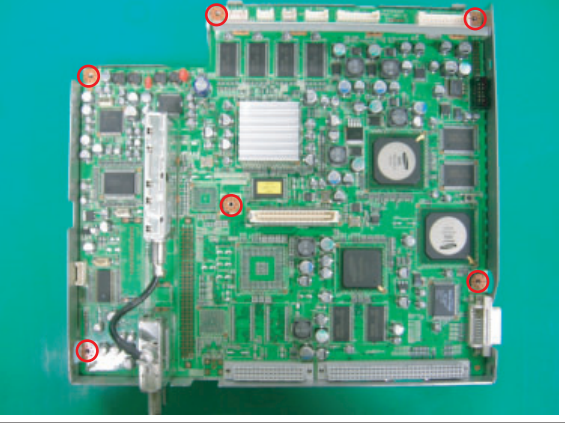
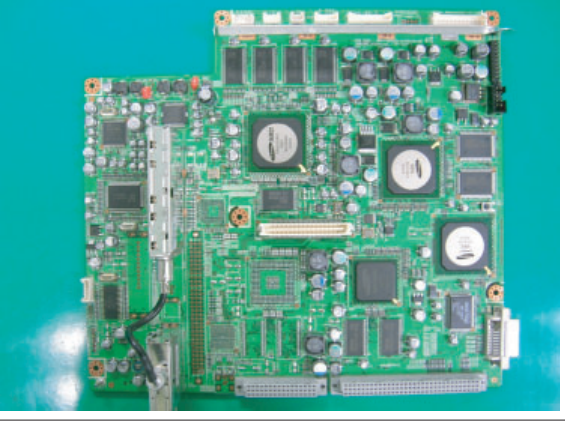
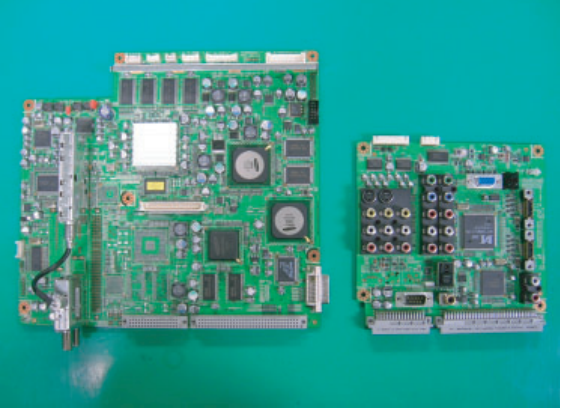


Part Name	Description	Description Photo
Holder Chassis	<p>① Pull out the holder Chassis.</p>	
Rear Board	<p>① Separate the GT-wire.</p> <p>② Separate the cables.</p> <ul style="list-style-type: none"> <li>- Main board : 6 cable</li> <li>- Rear board : 2 cable</li> </ul>	

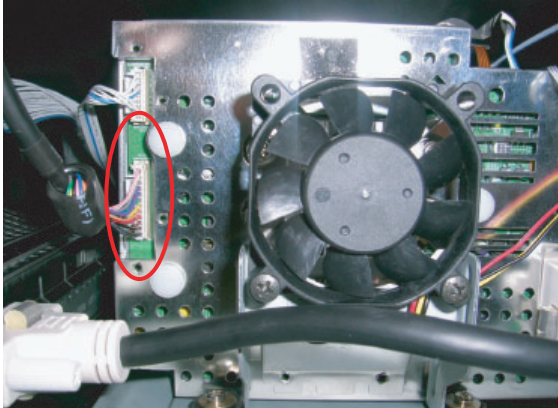

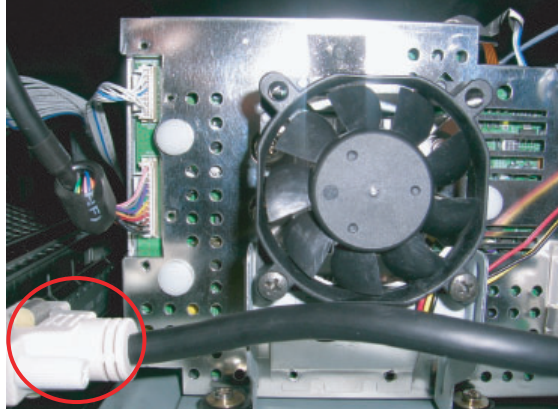
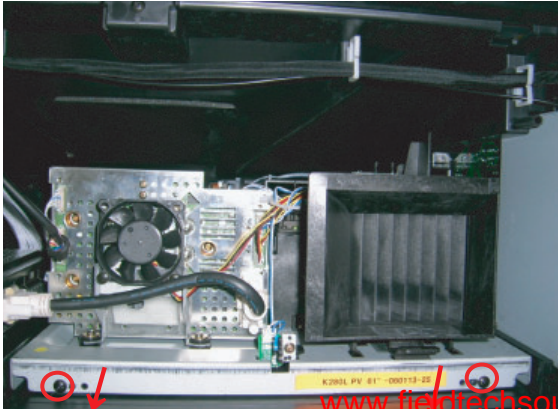


### 12-1-2 Separation of the Main and RearBoard

Part Name	Description	Description Photo
Rear Board	① Remove 2 Stand Offs from the D-Sub connector.	
	① Remove 2 Standoffs from the DVI connector.	
	① Remove the Rear shield case	
Rear Board/ Main Board/	① Remove the Mainshield case	

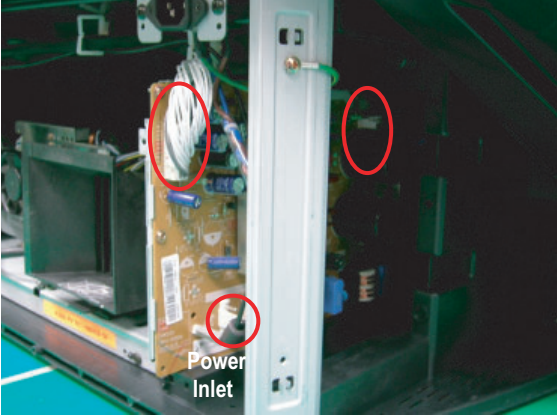
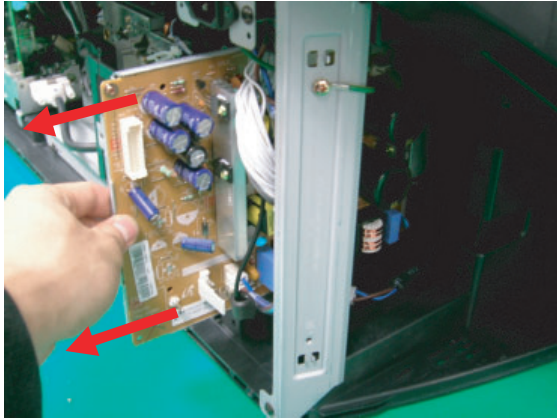
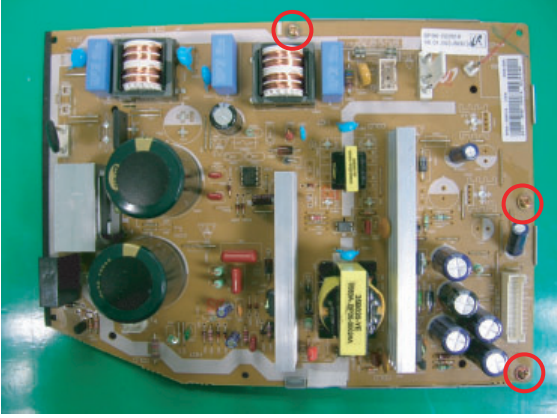
Part Name	Description	Description Photo
Main Board	① Detach Rear board from assy.	
	① Remove the 6 screws.	
	① Detach the Main board from the holder chassis	
	① Rear,Main board	

### 12-1-3 Separation of the optical engine

Part Name	Description	Description Photo
Optical Engine	① Remove the cable (the bottom one on the left side)	
	① Remove the ballast cable on the SMPS.	
	① Separate the DVI cable.	
	<p>① Remove the 2 screw. : TH,B,M4.L15,BLK,SWRCH18A</p> <p>② Remove the engine by pulling it out of the cabinet.</p> <p>⚠: Be careful when removing the Light Engine as it may get caught up by the upper cable of the case.</p>	






### 12-1-4 Separation of the Power Board

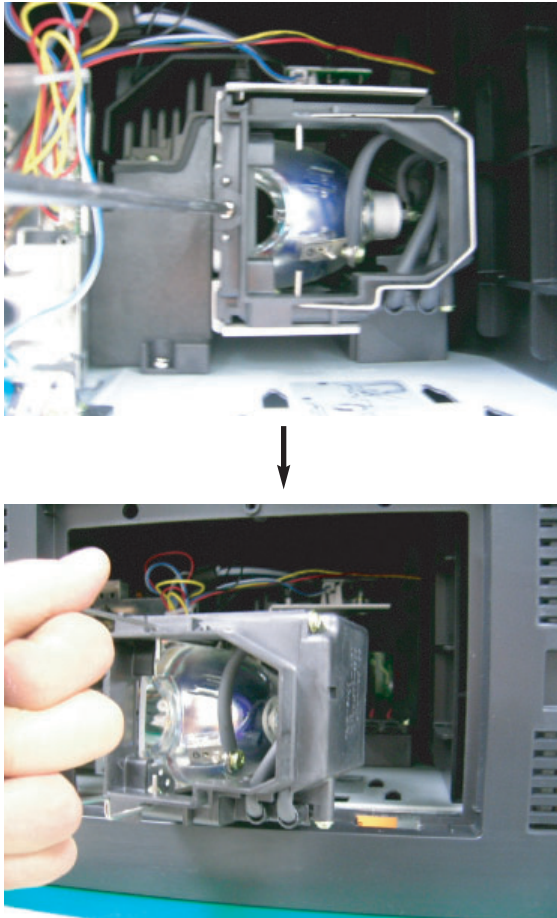
Part Name	Description	Description Photo
Power Board	<p>① Separate the Power Inlet.</p>	 <p>Power Inlet</p>
	<p>① Remove the power board carefully</p> <p>⚠ : Wear gloves when handling the power board as there may be some remaining electrical charge in the capacitors. Specifically, avoid touching any part of the capacitors.</p>	
	<p>① After removing the screws, separate the bottom power bracket. : PWH,B,M3,L10,ZPC(YEL),SWRCH18A</p>	

## 12-1-5 Lamp Replacement

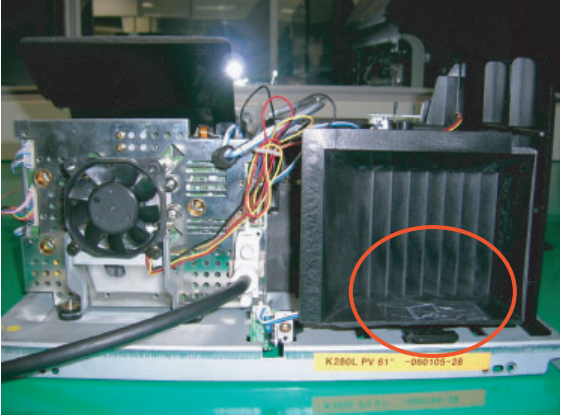
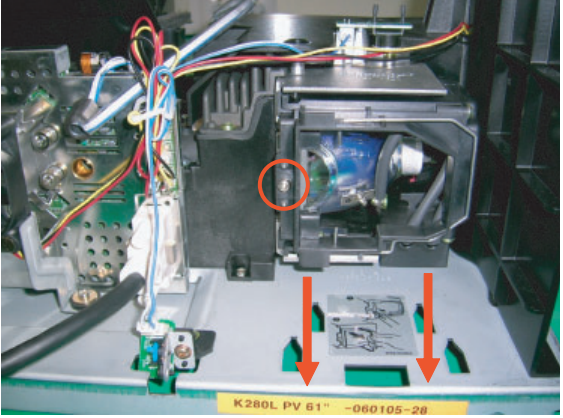
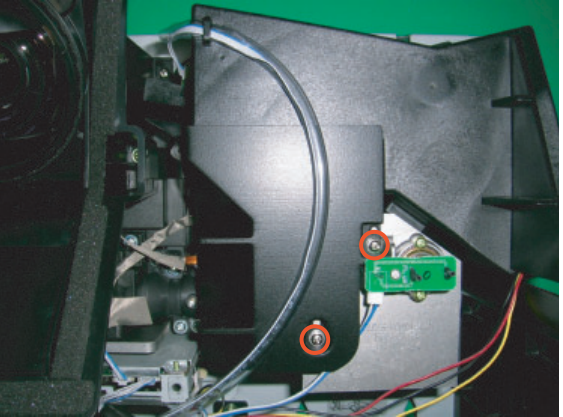
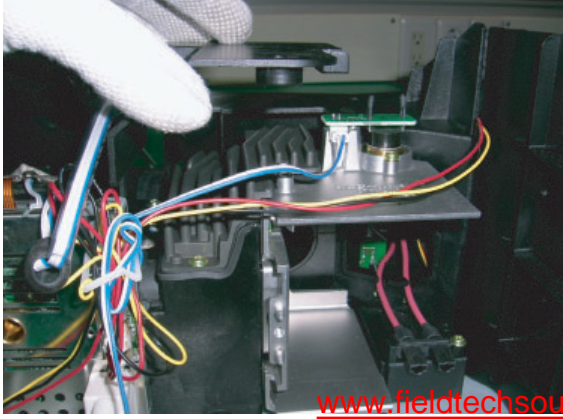
⚠ Notice

1. Replace with the correct code numbered lamp to avoid damage to the TV.
2. Turn the power off and wait for 30 minutes before replacing the lamp as it will be hot.
3. Do not touch the glass part of the lamp with your bare hands nor insert any foreign object inside the cover as it may cause poor screen quality, electric shock or fire.
4. Do not place the old lamp near flammable objects or within the reach of children.
5. Be sure to connect this TV directly to an AC wall outlet. If the TV's AC plug is connected to a cable box or other source, it will not allow for proper cool down time.

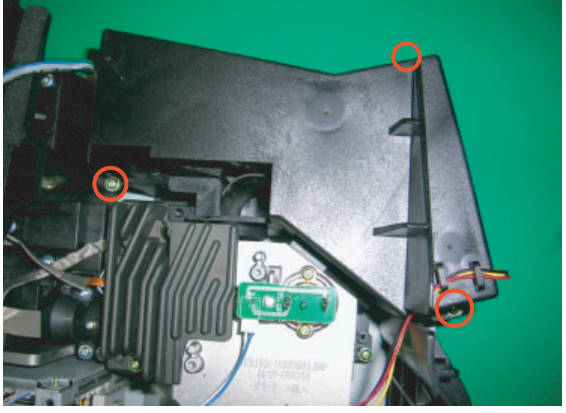
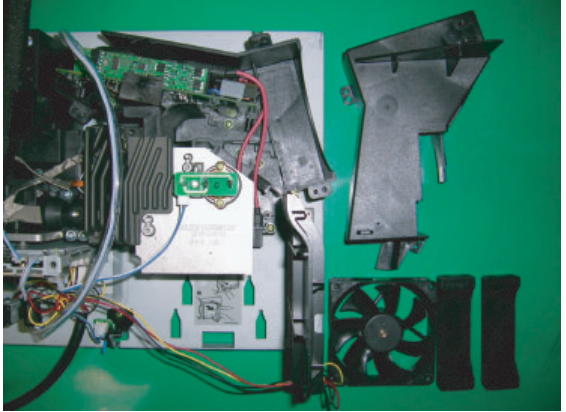
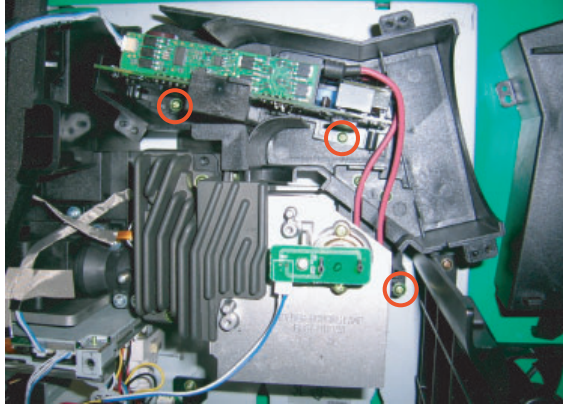
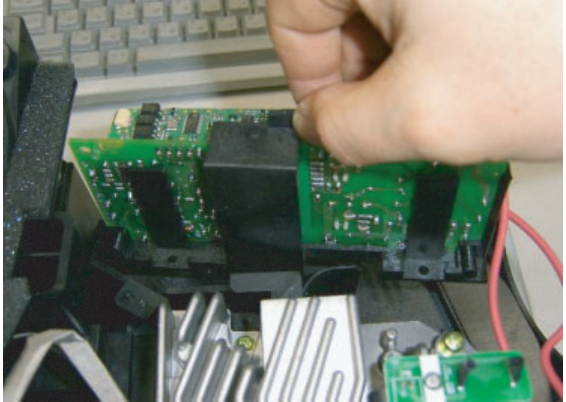
Part Name	Description	Description Photo
Lamp	① Unplug the TV, then use a screwdriver to remove the screws. : WSP,PH,+,M4,L12,ZPC(YEL),SM10C	
	① Remove the Lamp cover.	
	① Remove the lamp cover duct	

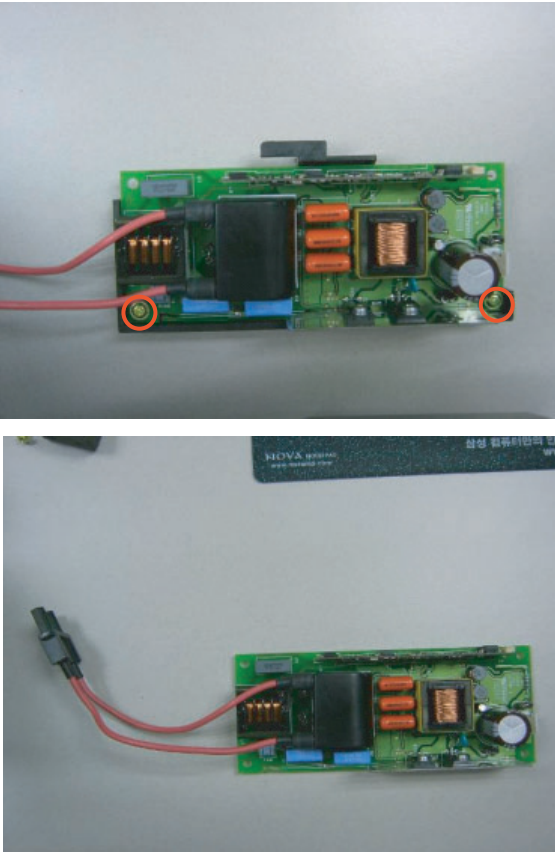
Part Name	Description	Description Photo
Lamp	① Loosen 1point screw and pull out the lamp holder	

### 12-1-6 Ballast Replacement

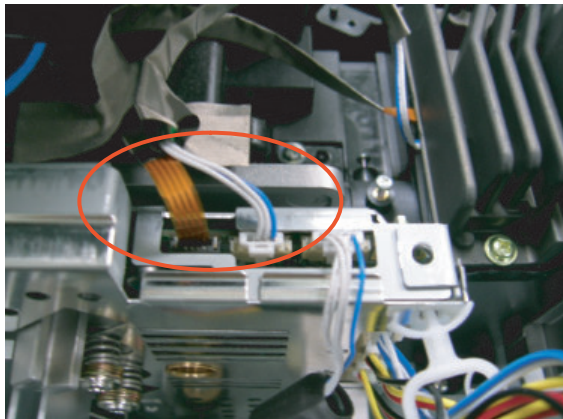
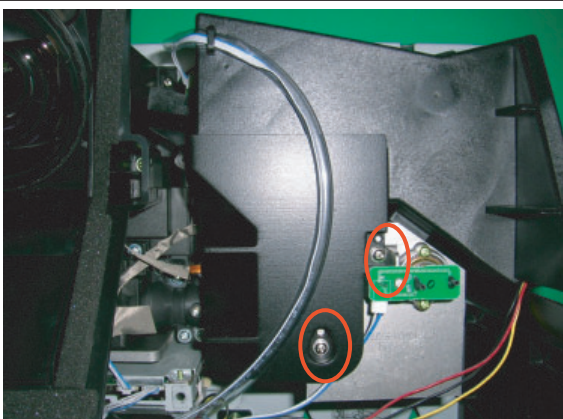
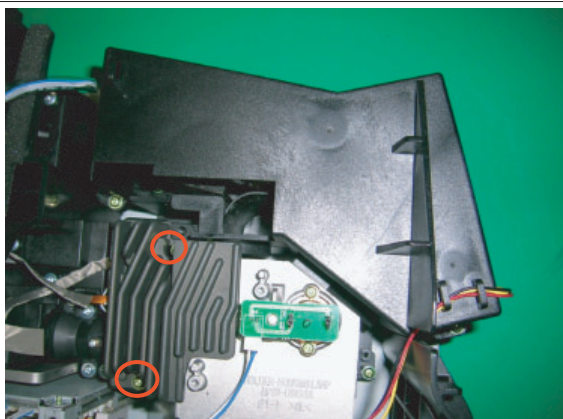
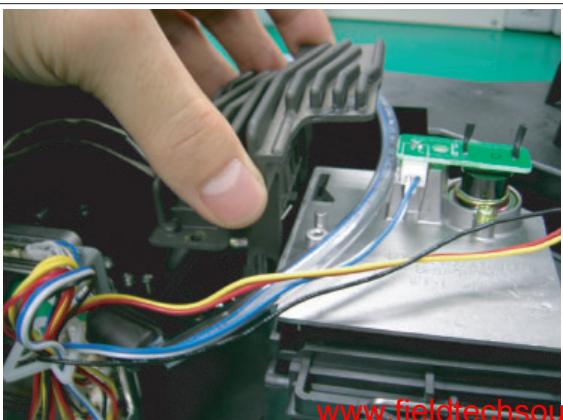
Part Name	Description	Description Photo
Ballast	① Remove the lamp cover duct.	
	① Loosen 1 point screw and pull out the lamp holder.	
	① Remove 2 screws.	
	① Remove the color wheel cover.	

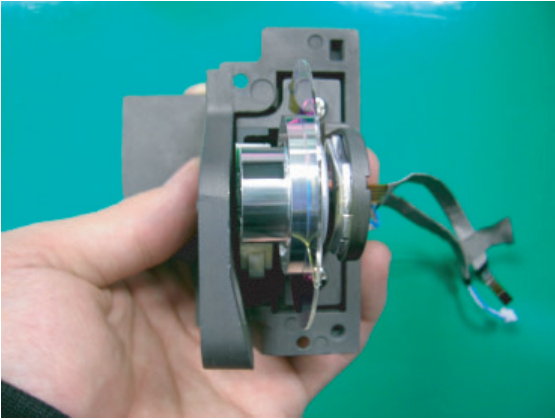


Part Name	Description	Description Photo
Ballast	① Remove 3 screws.	
	① Remove the ballast cover and the fan.	
	① Remove 3 screws	
	① Remove Ballast Assy.	

Part Name	Description	Description Photo
Ballast	① Remove 3 screw Then Remove holder-ballast	



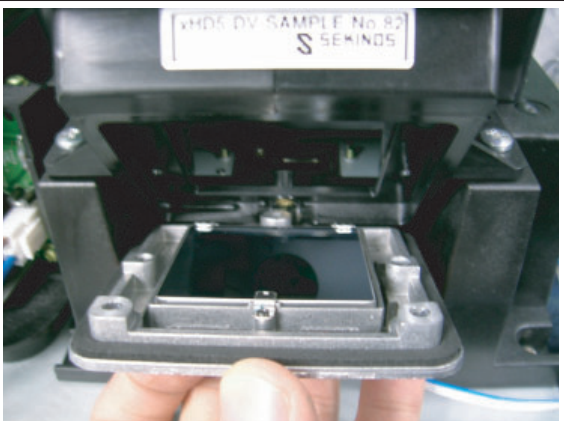
### 12-1-7 Color Wheel Ass'y Replacement

Part Name	Description	Description Photo
Color Wheel	① Remove two cables at the DMD Board.	
	① Remove 2 screws and the color wheel cover	
	① Remove 2 screws. : PWH,+ ,B,M3,L10,ZPC(YEL),SWRCH18A,-	
	① Disassemble the color wheel assembly.	

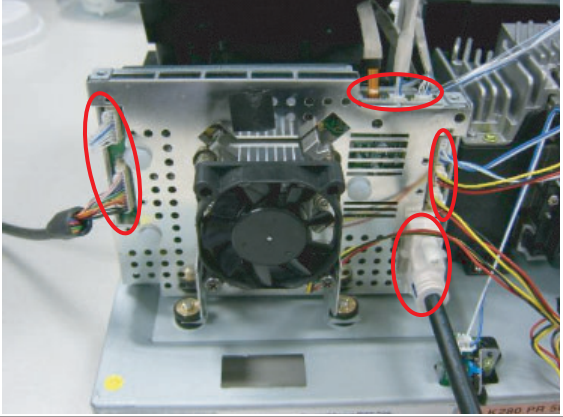
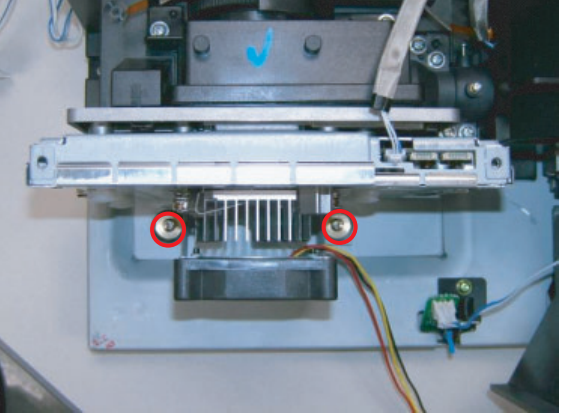
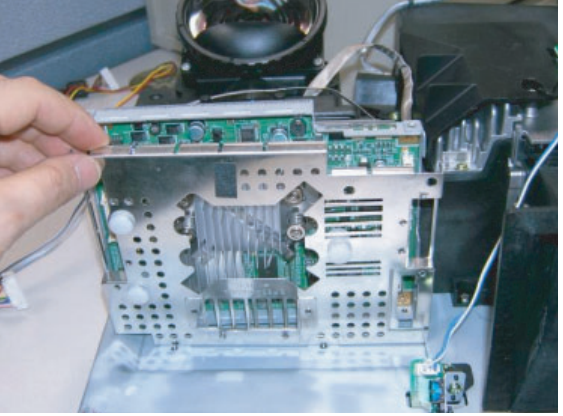
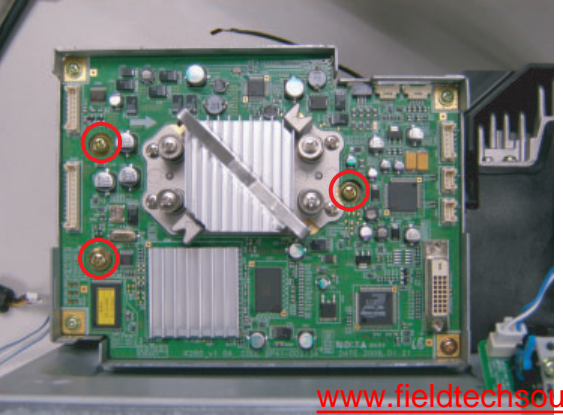
Part Name	Description	Description Photo
Color Wheel	<p>① Replace it with a new color wheel and rubber assembly.</p> <p>⚠ : Never touch the color wheel. Touch only the cover assembly.</p> <p>※ Replace the color wheel and refer to "INDEX DELAY Adjustment" on page 3-20 to adjust the index delay.</p>	 A photograph showing a person's hand holding a disassembled color wheel assembly. The assembly consists of a grey metal housing, a central silver-colored motor or lens, and a black rubber seal. A flat ribbon cable is attached to the side of the assembly. The background is a solid teal color.



### 12-1-8 Actuator(Smooth Picture) Replacement

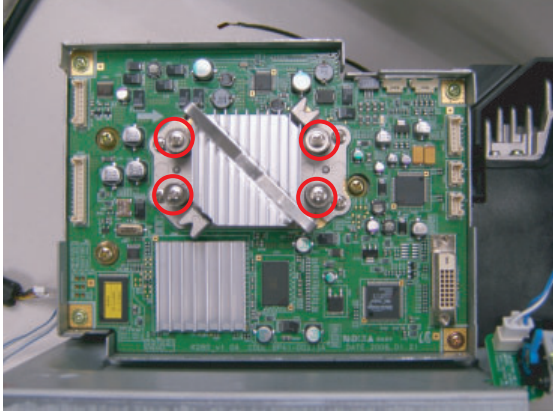
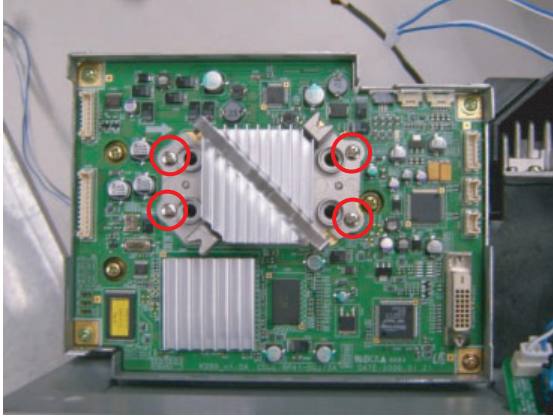

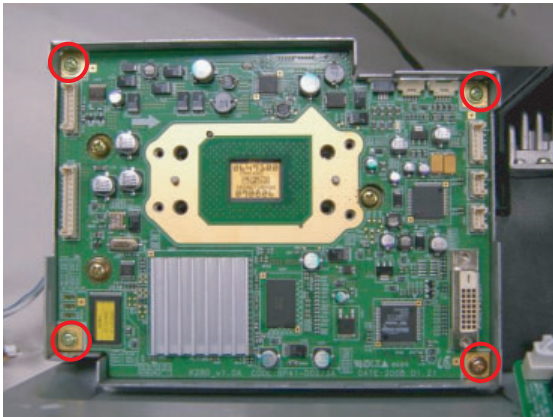
Part Name	Description	Description Photo
Actuator	① Remove the cable at the Actuator.	
	① Remove screws(3ea) at the Actuator cover. : BH,+,M3,L16,ZPC(YEL),SWRCH	
	① Replace it with a new actuator.	




### 12-1-9 Separation of the DMD Board and Panel

Part Name	Description	Description Photo
DMD Board	① Remove the 7 point cables.	
	① Remove 2 screws and remove fan assy.	
	① Remove Assy-shield-rear.	
	① Never touch 3 screws in the red circle	

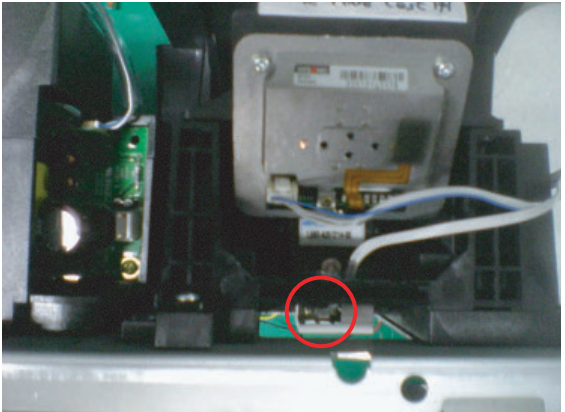
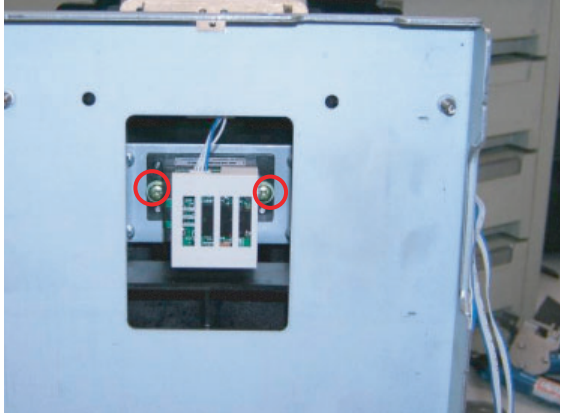
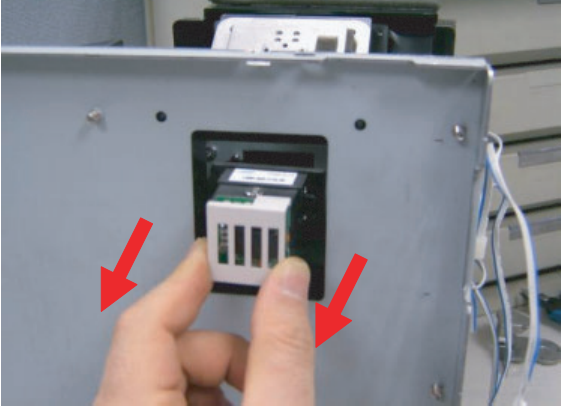
[www.fieldtechsource.net](http://www.fieldtechsource.net)




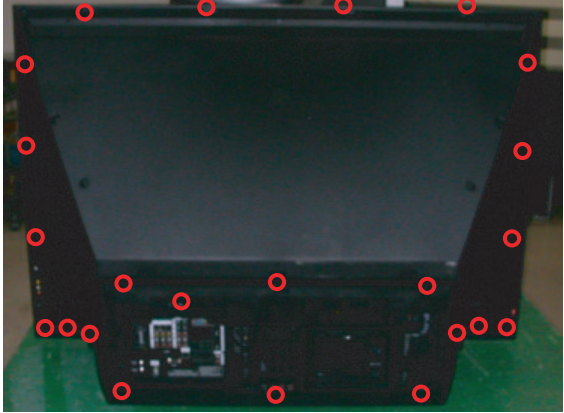

Part Name	Description	Description Photo
DMD Board	① Remove 4 spring screws.	
	① Remove 4 screws.	
	① Remove heat-sink Assy.	
	① Remove 4 screws.	

Part Name	Description	Description Photo
DMD Board	① Remove Assy-DMD board.	
	<p>① Pull out the DMD panel using by tweezers and remove DMD panel carefully.</p> <p>⚠ : Be careful not to make Panel dirty ! Be careful not to damage pin of the interposer !</p>	 

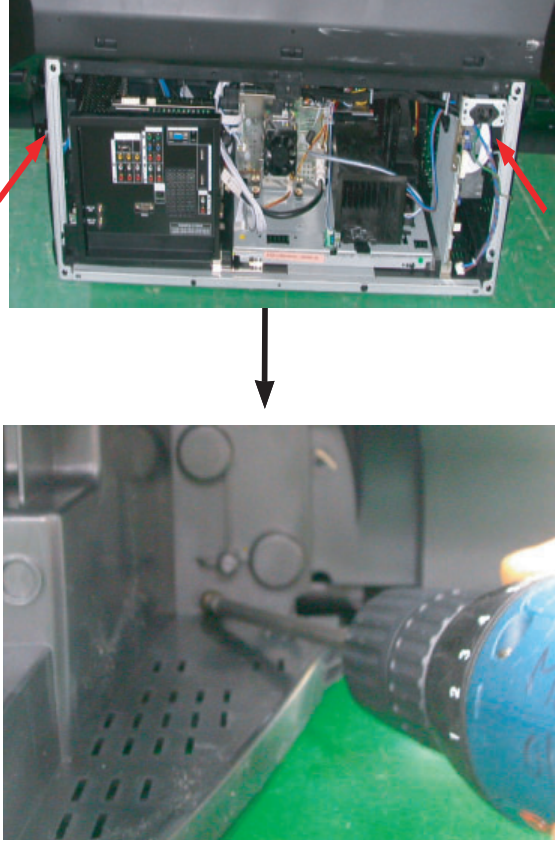
### 12-1-10 Dynamic Black replacement

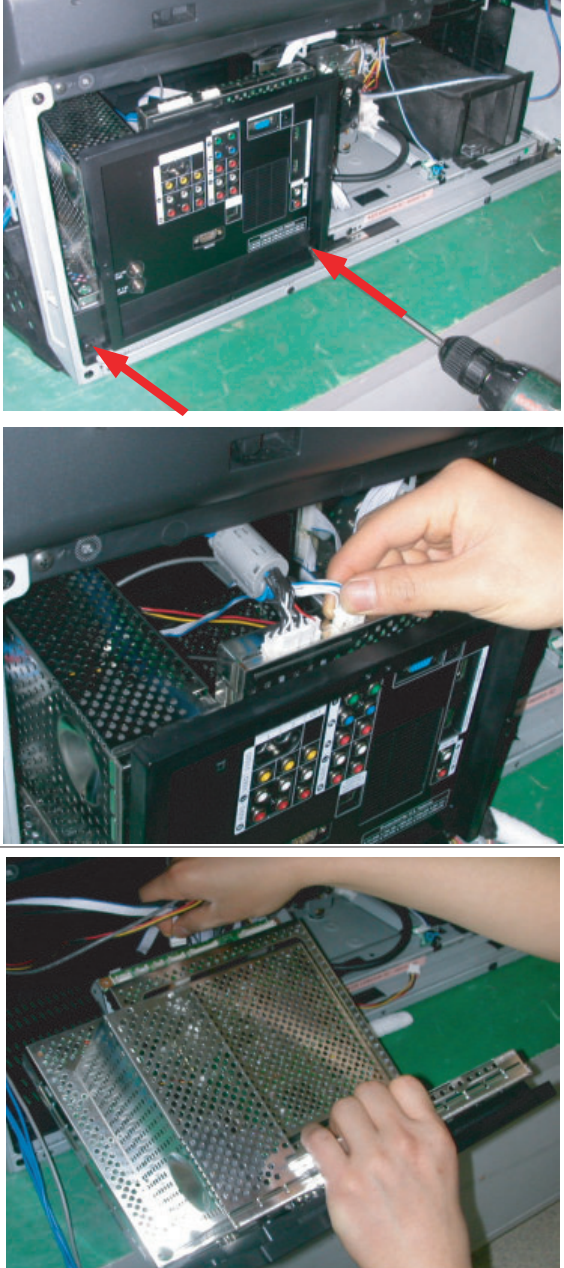

Part Name	Description	Description Photo
Dynamic black	① Disconnect Connector.	
	① Remove 2 screws : WSP,BH,+,M3,L16,ZPC(YEL),SWRCH	
	① Remove Dynamic Black assy.	

## 12-1-11 Separation of the SCREEN


Part Name	Description	Description Photo
Front, Rear	① Set.	
	<p>① Remove 14 screws used for assembling the cover rear, top and cover-front.</p> <p>② Remove 9 screws used for assembling the cover-rear, bot, and cover-main.</p> <p>③ Disassemble the cover-rear and bot.</p>	 


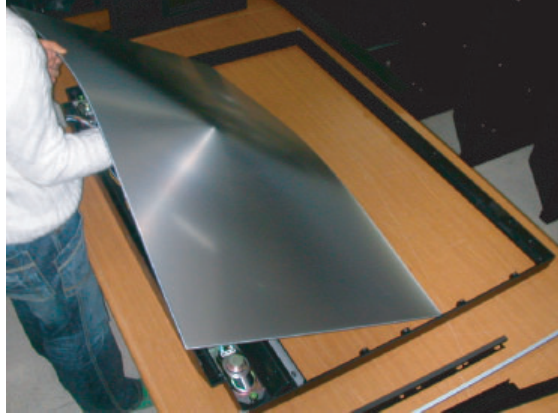


Part Name	Description	Description Photo
	<p>① Disassemble the cover-rear and bot, then remove 2 screws used for assembling the cover-front on the left and right bottom of the cover-main.</p>	

Part Name	Description	Description Photo
Connector	<p>① Remove 2 screws used for fixing the holder-terminal.</p> <p>② Detach the Chassis Assy and disassemble the connector on the part of control.</p>	
Front	<p>① Detach the cover-front from the set.</p>	



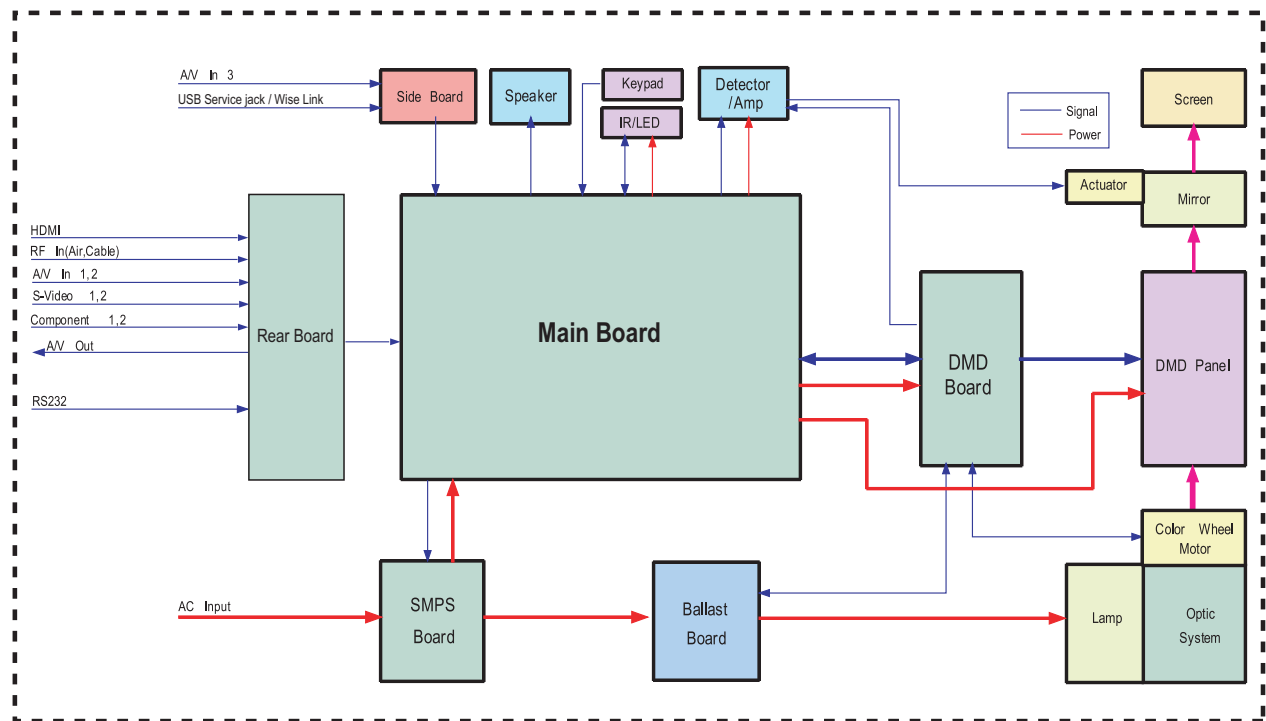
Part Name	Description	Description Photo
Brkt-Screen	<p>① Remove the screws used for fixing the brkt. ( 3 on the top, 2 on each left and right, and 5 on the bottom)</p> <p>② Disassemble the brkt. (top, side, and bottom)</p>	

Part Name	Description	Description Photo
Screen	<p>① Lift up the cover-front and put your hand under the cover-front, then lift up the screen.</p> <p>② Put your hand under the screen center and lift up the screen, then pull it toward the front and detach the screen.</p>	
	<p>① Detach the screen from the cover-front.</p>	

# MEMO

## 13. Circuit Description

### 13-1 Overall Block Description



The DLP TV is largely divided into: Power part, Engine part and Main + Rear parts.

The ass'y that consists of the DMD board, Detect (Actuator) board, lamp, ballast and optical devices is called the Engine.

The main + rear board parts receive the AV signals to output voice signals and process the remote control signals.

The engine part displays the video data on the screen, which is generated in the main + rear boards.

The AV signals are input through the main and rear boards. TC90103 processes the MUX and decoding while S5H2201 processes the CPU functions, MPEG and I2S.

Finally, the improved DNle image is sent to the DMD engine board.

The final data by DNle is processed in DDP3021 of the DMD board to display the image on the DMD panel. This image is created by the light of the lamp through the color wheel which is enlarged and projected onto the screen.

This is the DLP of the L6,L7,L8,K2 or K3 type that the actuator operates additionally during this process.

The power terminal generates the DC power needed for the product and sends it to the analog board. The analog board supplies the power to the digital and DMD boards.

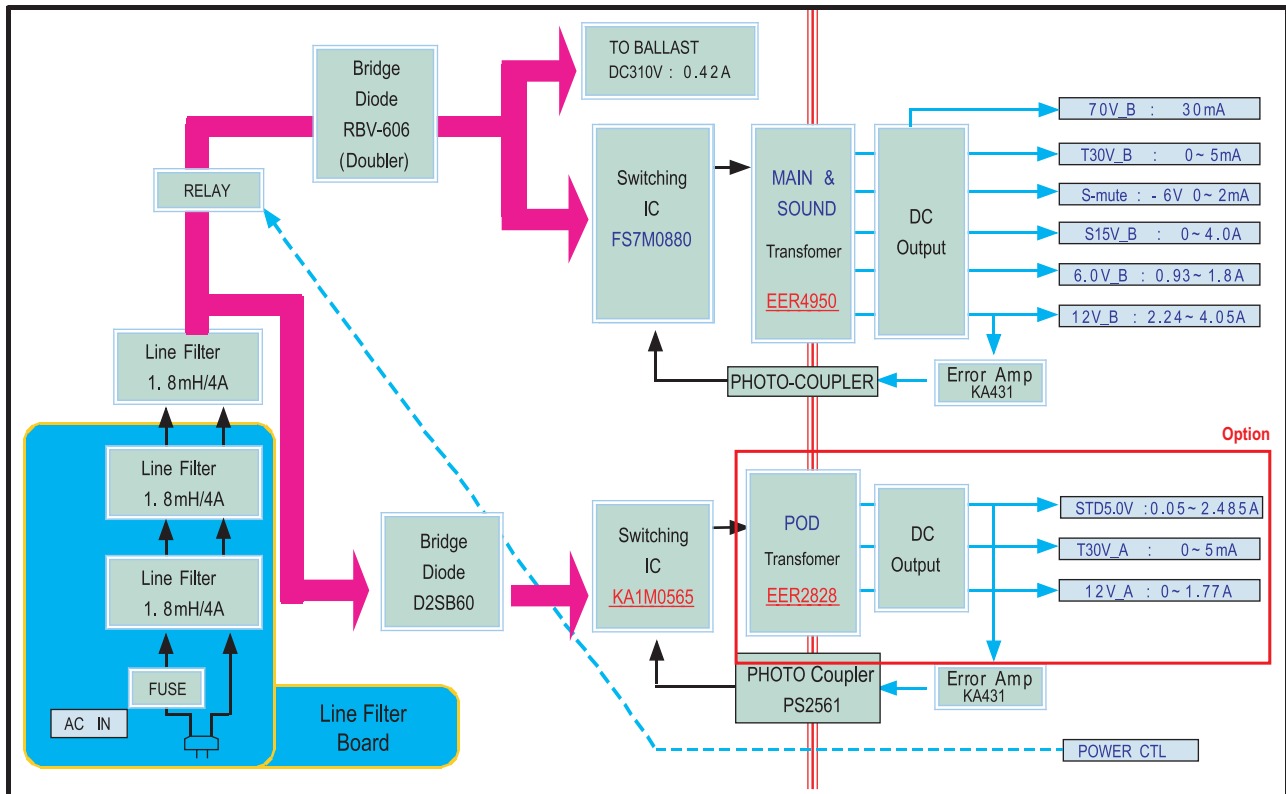
In the meantime, the power source board supplies DC220V - 400V directly to the ballast in order to light the lamp.

The ballast is like a stabilizer for lighting the lamp.

The ultimate purpose of the TV set is to project an image onto the screen and output the voice signals synchronized with the image. And based on the DMD panel used, a 1-panel TV requires a color wheel while a 3-panel TV does not. The HD3,HD4,HD5 panel needs an actuator while the HD2 does not. However, the drive mechanism and the overall block structure of the two panels are the same.

## 13-2 Partial Block Description

### 13-2-1 Power Board Block Description



#### 1. What is SMPS?

This is an acronym for Switching Mode Power Supply and this is responsible for receiving AC input voltage (Line frequency: 50HZ~60HZ) and supplying insulated DC output.

#### 2. SMPS Components

- 1) Standby Power: A combination of ICS801 (SWITCHING IC) and TS801S (TRANS) that supplies STAND-BY 5V for operating the Micom.
- 2) Multi Power: The voltage supplied when the power is turned on.  
It is a combination of IC801S and T801S that supplies various voltages including D12V, A6.5V, S14.5V, T30V and A65V.

#### 3. SMPS Operation

- 1) SMPS System: Uses Fly-Back technology for both standby and multi power.
- 2) Operation: Fly-Back is one of the most popular power-supply systems and uses less power than 200W as well as being the cheapest of all multi output SMPS systems.

Let's have a look at how it operates...

- a. Converts AC input into DC (HOT) (rectifies to DS801 before smoothing to CS801)
- b. The converted DC voltage is high, especially compared to ground, so touching it will cause electric shock.  
Use T801S (Trans) to insulate the secondary voltage and take advantage of the PWM operations of T801S and IC801S to induce it.
- c. The secondary induced voltage is a dozen-KHZ square wave power, which goes through the smoothing cap (CS822) to be generated in the standby 5V.
- d. Multi power also operates the same way.

※ Options are deleted on the ATSC only Model

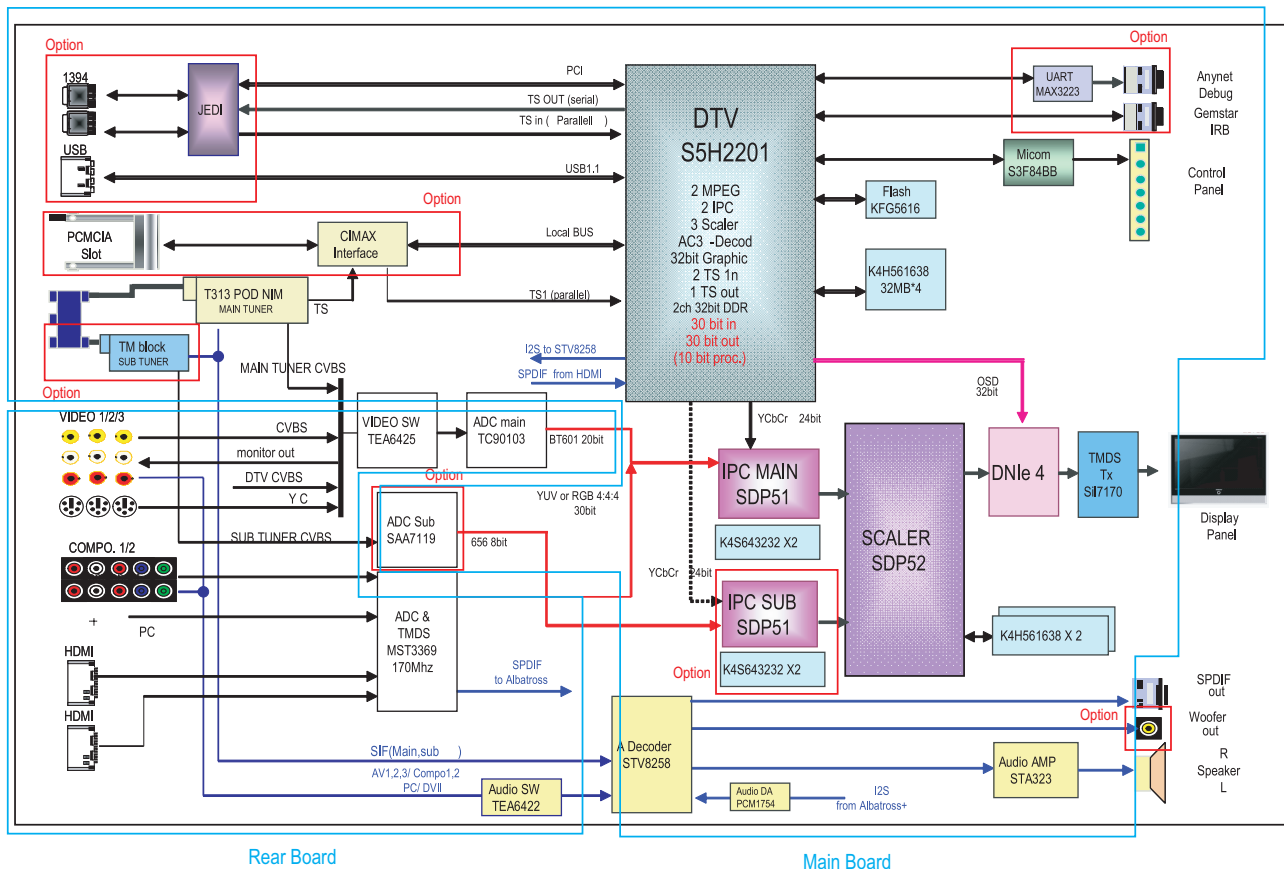
#### 4. Input&Output voltage

- 1) Input voltage
  - \* America(AC120V) - OPTION
  - \* Korea(AC220V) - OPTION
  - \* The others(AC100V~AC240V) - OPTION
- 2) Output voltage
  - \* D12V / 2.5A - 12V , 3.3V , 1.8V : For signal processing
  - \* A6.5V / 1A - For driving the tuner
  - \* S14.5V / 4A -For driving sound processor
  - \* T30V / 5mA - For driving the tuner
  - \* A65V / 30mA - For driving the actuator



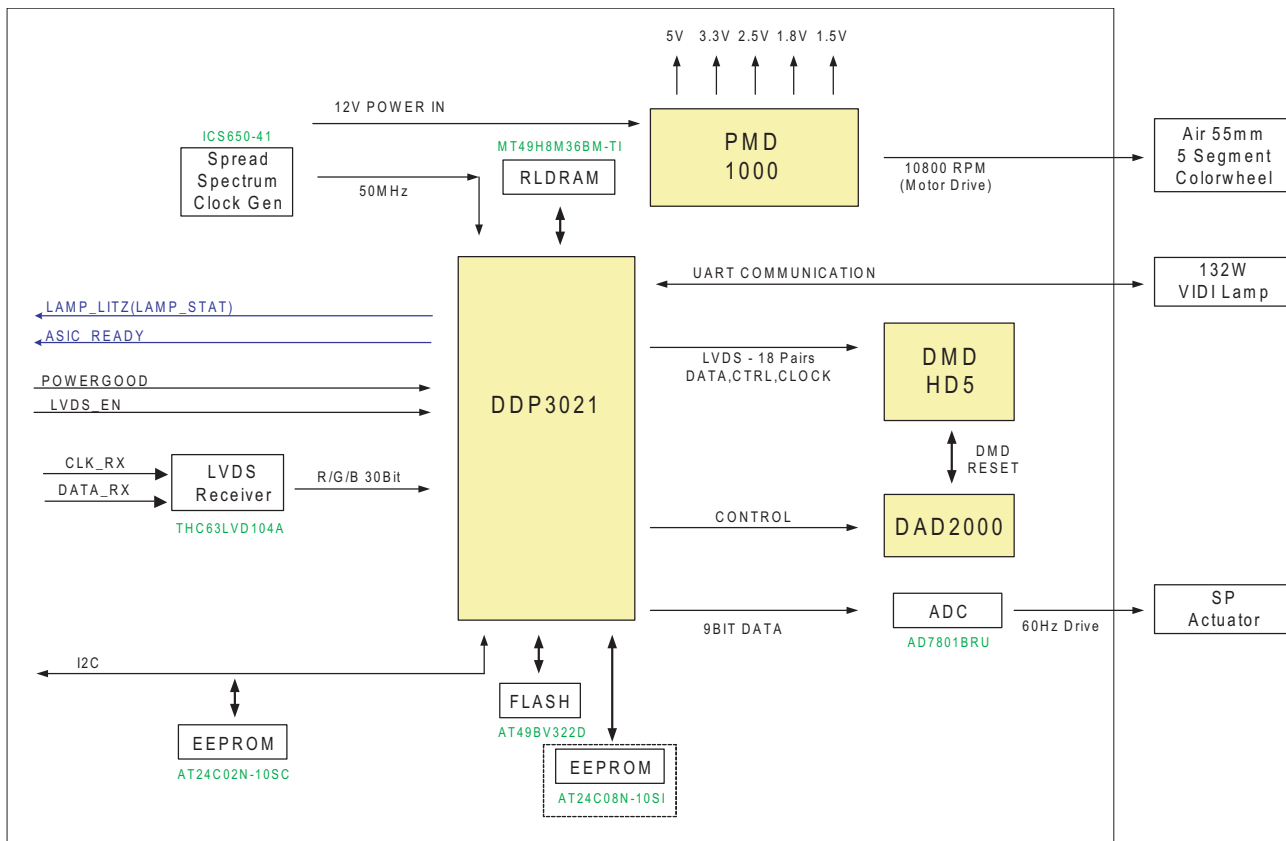
### 13-2-2 Board Block Description

※ Options are deleted on the ATSC only Model



- Select Sound/Video  
One is selected from multiple inputs by the switching ID. MICOM decides which port is used for output. For broadcasting signals, sub-outputs are transferred in CVBS and, the main outputs in Y/C through the 3D Comb, to the digital board. Sound signals are selected by the switching IC, of which only one input is transferred to the speaker.
- Detection Signal Flow  
When each port is connected to a signal cable, the detection signal is "low" and can be checked by Micom scanning.
- TC90103, SAA7119: Analog YBPBR, CVBS, Y/C(SUPER), Input MUXING and Video Decoding
- S5H2201: CPU, + MPEG Decoder, Audio signals transferred to MSP of the analog board by I2S
- DNle: Uses a noise-filtering and picture quality improvement algorithm to implement natural colors.
- Tuner: Main-HD Tuner, Sub-Analog Tuner
- HDMI: Receives Two input signal and transfers it to S5H2201.
- Others: Anynet implementation, Optical Power Port, USB Update Port (not available for MP3)

### 13-2-3 DMD Board Block Description

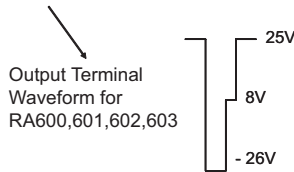
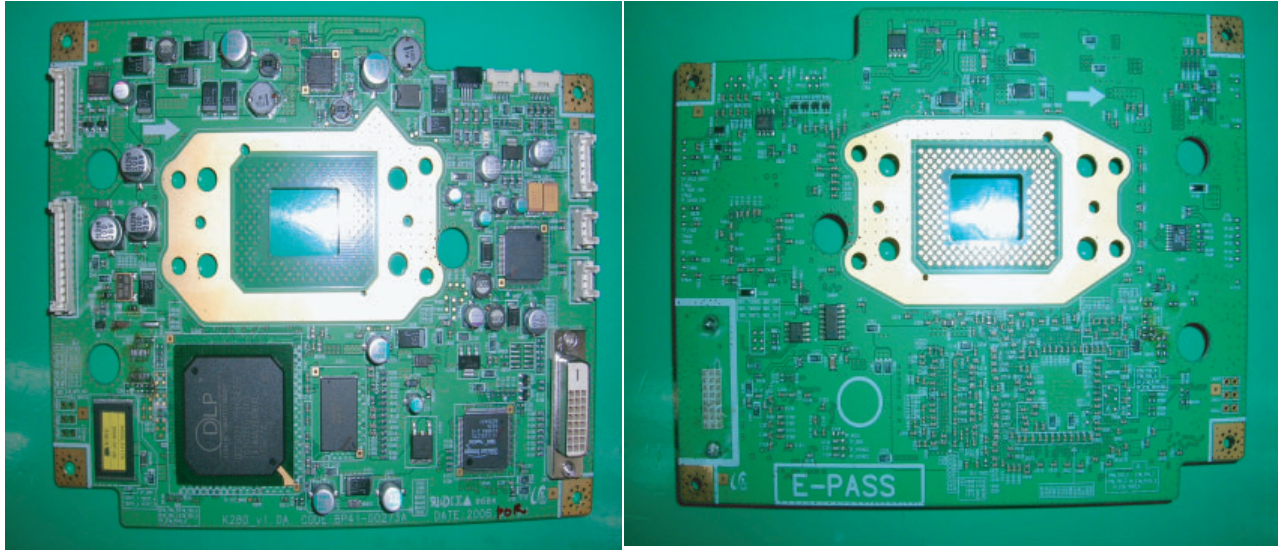


TI Chip Set

- Controls the lamp (ON/OFF)
- Drives the color wheel motor
- Drives the panel
- Controls the sensors

### 13-3 New Circuit Description

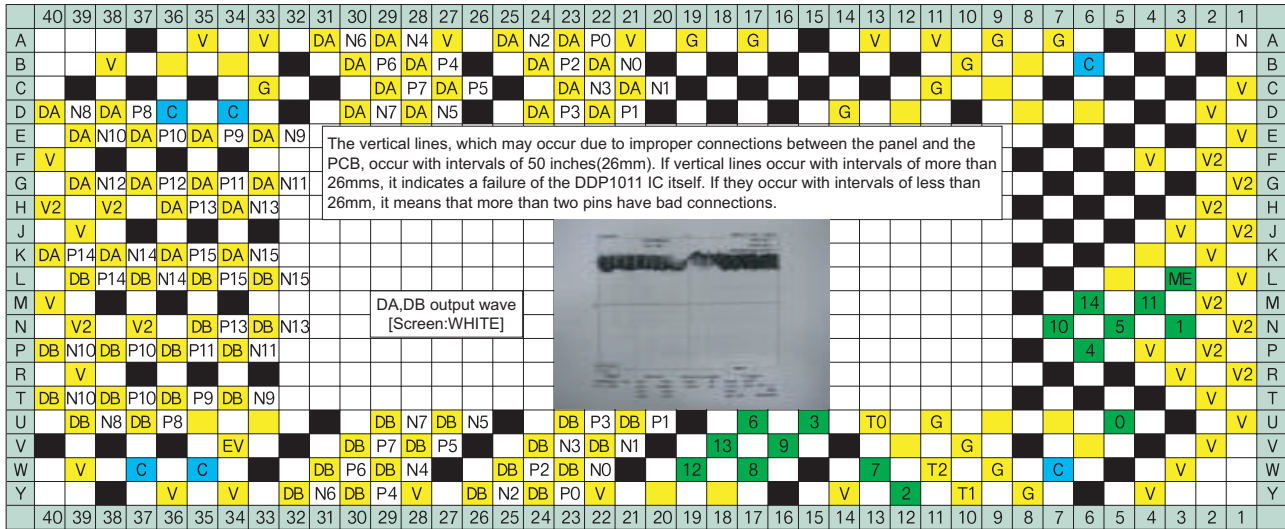
#### 13-3-1 Output Voltage States of the DMD Board Parts



LOC	Characteristics	
BD904	LAMP EN	High from DDP1011
BD902	LAMP LITZ	High(5V) before the lamp turns on, Low(0V) when the lamp turns on

#### 13-3-2 DMD Panel Pin Terminal Characteristics Diagram

※ Remove the heat sink attached to the DMD Board and tighten the screws in four places and then inspect the characteristics of each pin terminal.




Pin Name	Description	Pin Name	Description
V	Voltage : 3.3V	T	Test Point
V2	VCC2 : 8V	ME	Mirror Bias Extra
DA	A Channel Data Bus [When measured, there should be a waveform]	C	Clock
DB	B Channel Data Bus [When measured, there should be a waveform]	P#	A,B Channel Positive
NO.	MBRST# (Mirror Bias Rest) 26V	N#	A,B Channel Negative
G	The part from the present position to the GND (The black part is also a GND.)		

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### 13-3-3 Description of Terminal Characteristics

Pin Name	Description
SCTRL_BN/P	B channel LVDS serial control
DCLK_BN/P	B channel LVDS CLOCK
SCPDI	SERIAL CONTROL DATA INPUT
SCPDO	SERIAL CONTROL DATA OUTPUT
SCPENB	SERIAL CONTROL ENABLE
SCPCK	SERIAL CONTROL CLOCK
DMD RESETB	DMD LOGIC RESET
MBRST(14:0)	MIRROR BIAS RESET
MBRST_EXTRA	UNUSED MIRROR BIAS RESET
SCR_CLR	TEST CLEAR PINS(NORMAL GND)
READOUTA(1:0)	A-CHANNEL SERIAL DATA OUT DURING SPAM READ TEST OPERATION
READOUTB(1:0)	B-CHANNEL SERIAL DATA OUT DURING SPAM READ TEST OPERATION
TP(2:0)	MANUFACTURING TEST POINT(NO CONNECTED DURING NORMAL OPERATION)
RSV_A(4:0)/RSV_B(4:0)	RESERVED PINS(NORMAL:GND)
EVCC	REFERENCE VOLTAGE DURING SPAM READ TEST OPERATION(NORMAL GND)
VCC2	MIRROR ELECTRODE VOLTAGE(7.3V)
VCC	LOGIC SUPPLY
VSS	LOGIC GROUND

### 13-3-4 Engine Failure Inspection Flow Chart for the DMD Board

No.	Description	Key Point	Remark
1	1) When the power cord is plugged in, 2) DC220V~410V(typical 300V) is automatically supplied to the ballast.	Check whether the DC220V~410V(typical 300V) power is supplied to the ballast.	
2	1) When the power key is pressed via the remote control, the micom of the analog board outputs high (5V) PWR signals. 2) The power board operates normally. 5V and 12V are supplied to the DMD CN105 terminal.	Check whether 5V and 12V are supplied to the CN105 terminal.	* 12V must be supplied to operate the motor.
3	1) The MTR Reset signal is supplied to the R161 terminal of the motor IC101 from the micom on the digital board and then the motor starts to drive. 2) If the color wheel rotates for a certain time and then stops, check whether the color wheel sensor is normal. (Check the waveform on the No.2 terminal below CN102.) 	After the set is powered on, check whether 5V is detected on pin No.49 of IC101. → After a while, the sound generated by the rotating color wheel is heard.	* If 5V is not detected, the motor will not operate.
4	1) Check whether the signal (SCI: START CONTROL INPUT) that turns on lamp #2 of CN109 on the DMD board is high (5V).	Check whether CN109 #2 signal is 5V.	* When SCI is high (5V), the lamp litz of CN109 is low (0V). * CN109 #2 terminal voltage changes to pulse wave form 14 seconds after (for 50 inch TV) the time that the voltage is 5V.
5	1) Method for checking whether the DDP1010 IC RESET is normal.	If the voltage between R254 and R255 is 3V, it is normal.	* When about 4 seconds have passed after changing to pulse waveform, the screens are displayed on the set.

## 13-3-5 IC Line Up

### 1. Main Board

Items	Descriptions	Remarks
MPEG2 Decoder (Albatross)	S5H2201X01 , Samsung	2 MPEG, 2 IPC, 3 Scaler, AC3-Decod, 32bit Graphic, 2 TS 1n, 1 TS out, 2ch 32bit DDR,
DDR SGRAM	K4D551638F x 4 , Samsung	16Mx16bit (256Mbit)
One NAND Flash Memory	KFG5616U1M , Samsung	16Mx16Bit (256Mbit)
SDRAM	K4S561632E x 2 , Samsung	4Mx16x4Bit
Scaler	SDP52 , Samsung	MNR, CTI, AW, Pre-Processor, Main/Sub Scaler, JR
DDR SGRAM	K4D263238F x 2 , Samsung	4x1Mx32Bit (128Mbit)
IPC Main	SDP51 , Samsung	Input Formats(INP), Super NE/NR(NRP), IPC
SDRAM	K4S643232H x 2	32Mx4Bit (64Mbit)
Video Enhance	SDP42	DNle4
Analog Decoder, ADC_Sub	SAA7119E , Philips	Sub Tuner CVBS
TMDS Transmitter	SiI7170	iTMDS Transmitter, 10bit
Micom	S3F84BBXZZ, Samsung	Micro Controller
Audio Processor	STV8258DSX, ST	Digital Audio Decoder
Sound AMP	STA323W , ST	Digital AMP

### 2. Rear Board

Items	Descriptions	Remarks
Video Switch	TEA6425, SGS-Thomson	Video Switch IC for TV * 2
Audio Switch	TEA6422, SGS-Thomson	Audio Switch IC for TV
HDMI Receiver & ADC	MST3369M , Mstar	Digital Receiver for HDMI with HDCP(Component,HDMI,PC)
Analog Decoder, ADC Main & 3D-Comb	TC90103AFG , Toshiba	Video Processor, ADC (Video, S-Video, Main Tuner CVBS)

### 3. Power Board

Items	Descriptions	Remarks
Main SMPS	FS7M0880, Fairchild	IC-PWM Controller ; Main Power
Stand-by SMPS [America]	KA1M0565, Fairchild	IC-PWM Controller ; Stand-by Power

## 4. DMD Board

Items	Descriptions	Remarks
DMD Driver	DDP3021, TI	DLP Data Processor
Reset, Power	DAD2000, TI	DMD Power and Reset Driver
Motor Controller	PMD1000, TI	12V VCM/Spindle Pre-Driver, Power Supply(2.5V,3.3V,1.5V)
Frame Buffer	MT49H8M36BM-TI, Micron	128M(246K x 16 x 32B), Rambus DRAM
Spread Spectrum Clock Generator	ICS650-41, ICS	50Mhz Spread Spectrum Clock Generator
Program ROM	M29W800BT x 2, ST	8M(1M x 8 or 512K x 16), Flash Memory
Actuator Driver	DDP3021, TI	DLP Data Processor
AD Converter	AD7801BRU	Actuator Drive , 60Hz
TMDS Receiver	Sil7171	TMDS Digital Receiver, 75MHz



# MEMO

## 14. Reference Information

### 14-1 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	<p>- 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.</p> <p>- 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.</p>
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 digital 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.

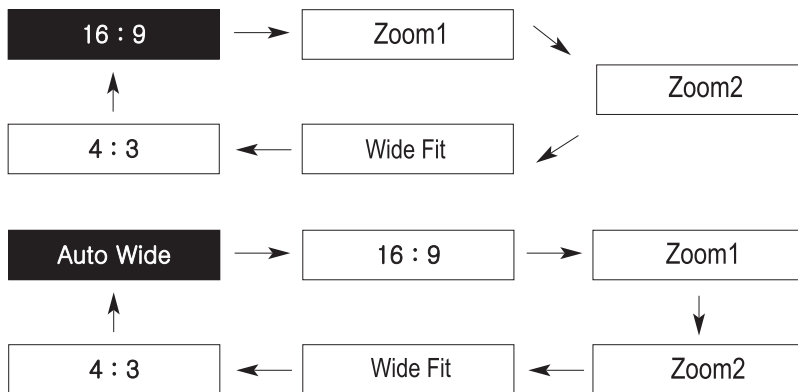
This symptom also appears in other manufacturer's TV's. The three appliance companies are trying to resolve the problem through the Ministry of Information and Communication.

- \* 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



■ Zoom 3 is available in HD broadcast only.



■ 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 displays.  
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

---

### PIP (Picture In Picture)

A feature to enable two video images being displayed on one screen at the same time. For instance, you can see the TV channel and the video image at the same time.

### Digital Broadcasting

The ATSC (Advanced Television Systems Committee) signals that the station digitalizes before transferring the audio/video signals.

### Mono

A sound system that transmits voice signals in only one channel. It is hard to experience a 3D effect but can be run with one speaker.

### LNA (Low Noise Amplifier)

This uses satellite technologies to amplify weak signals for improved quality even in poor reception areas.

### Stereo

A sound system that transmits voice signals in two channels. This implements 3D effects by transmitting to both speakers (left/right).

### Analog Broadcasting

The conventional system in which the station transfers the audio/video signals in NTSC formats.

### Antenna Terminal

A terminal which the TV antenna is connected to. A round coaxial cable is connected to this terminal, which is usually used to watch air broadcasts.

### English Captions (Subtitle)

A feature to provide English captions or character information services, which the user can use to study English using AFKN broadcasting or video tapes marked with "CC".

### Audio/Video Terminal

The old 3- or 4-channel TV with no AV terminal has a low quality issue for video tape. The problem can be resolved using an A/V terminal that separates the audio and video signals. The video terminal is in yellow; the audio terminal is divided in two, white for left and red for right.

### External Source

This includes sources from the video recorder, DTV set-top box and DVD player, (anything but the TV).

### DVI-I Cable

One of the DVI cables that can transfer both digital and analog signals.

### Satellite Broadcasting

This uses a satellite system to support a maximum of 100 channels including air services and provides high quality pictures anywhere in the country, even in poor reception areas. A set-top box (unbundled) is required to watch satellite broadcasting.

### Closed Broadcasting

Other than VHF and UHF, this includes movies, entertainment and educational programs broadcast by hotels or schools. This is different from cable broadcasting.

### Multiplexing

Two languages are provided at the same time when broadcasting foreign movies, dramas and news programs. You can choose either a native or foreign language, or choose both at the same time.

### Component Terminal (Green, Blue, Red)

This provides maximum quality by dividing the contrast signals before transferring.

### Cable Broadcasting

Compared to air broadcasting, it uses the cable system to transfer the signals. You should subscribe to a local cable broadcasting company and install a separate receiver.

### Tuner

A device used to select a particular frequency from the TV set or the radio receiver.

### Anynet

An AV networking system of Samsung's various AV devices, which enables the user to conveniently control AV devices using the TV.

### DVD (Digital Versatile Disc)

This is a CD-sized, high storage disk that can store multimedia data including videos, games and audio applications using MPEG-2 compression technology.

### DVI (Digital Visual Interface) Terminal

This is a digital signaling standard.

This uses TMDS to reduce the signal loss rate for sharper images.

### DVI-D Cable

One of the DVI cables that can only transfer digital signals.

### HDMI (High Definition Multimedia Interface)

An interface into which the digital signals as well as the high quality image data can be connected with one cable. There is no need to compress the bit rate.

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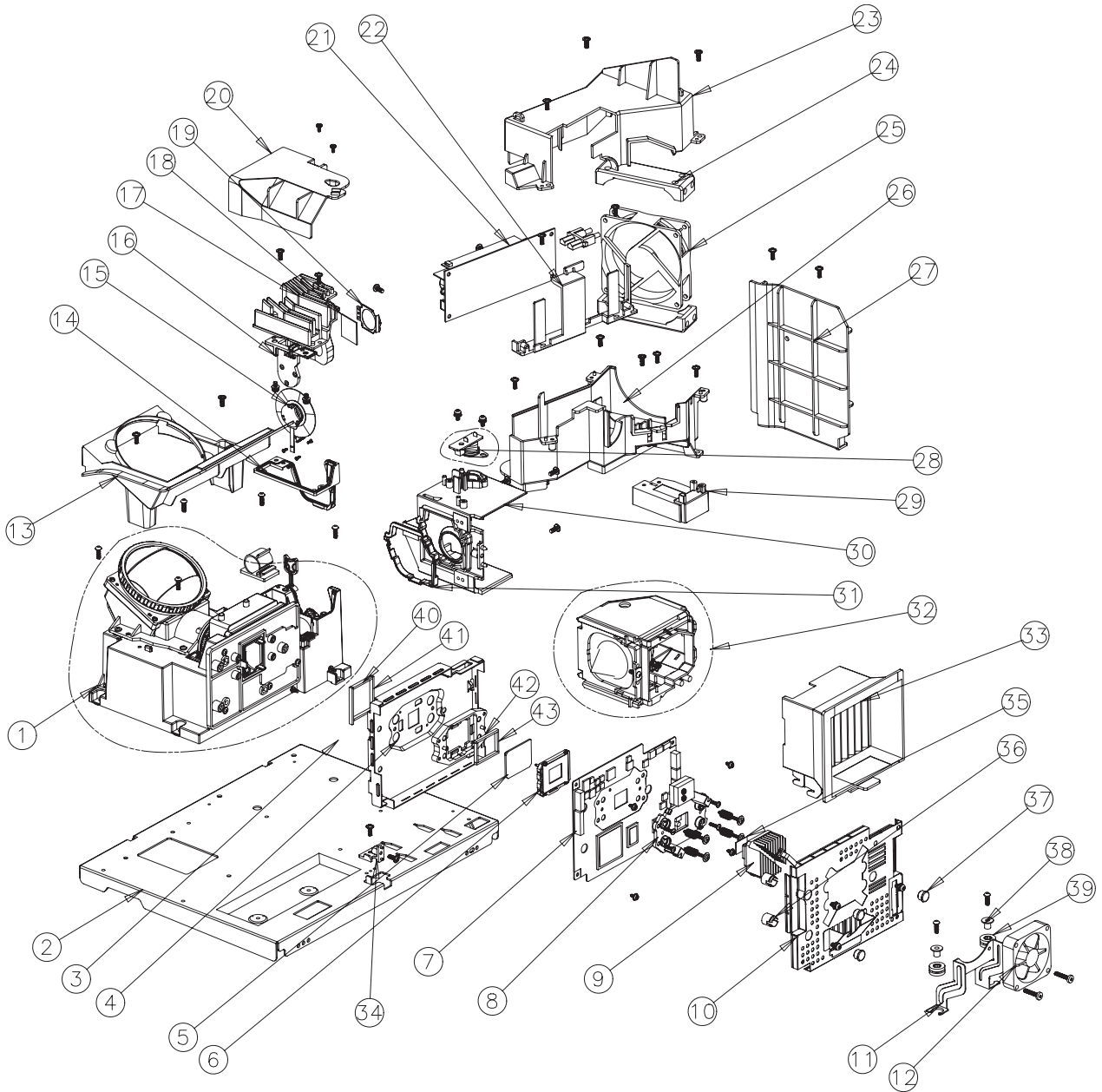
**S-video Terminal**

This is, called "Super-video", divided into video and color signals for sharper image display.

**VHF/UHF**

VHF refers to the 2 - 13 channel system; UHF indicates the 14 - 69 channel system.

# 14-3 K280 Engine Ass'y



※ See the part section on next pages(pages 14-6 to 14-8).



K280 Engine Exploded View List			
No.	Description	Specification	Q'ty
1	ASSY LENS P-OPTIC MODULE	NTR,xHD5	1
2	BRACKET-ENGINE BASE	SVP-50L6HR,SECC,T1.6,XHD5	1
3	SHIELD CASE-DMD(F)	SVP-50L6HR,SECC,T1.0	1
4	HODER-CLAMP DMD	SVP-50L6HR,MG D/C,T2.5	1
5	DLP	1920x1080/xHD5,0.65,TYPE A	1
6	HODER-SOCKET DMD	LCP,T3.0,BLACK,203PIN	1
7	ASSY PCB S-DMD	GALILEI,K3,HLS6187,XHD5	1
8	BRACKET-PANEL	SVP-50L6HR,AL D/C,T3.5	1
9	BRACKET-COOLER	SVP-50L6HR,AL,T4.0	1
10	ASSY SHIELD P-PCB	DLP ENGINE,SPTE,T0.5,DMD	1
11	BRACKET-FAN	SVP-50L6HR,SECC,T1.0	1
12	FAN	G6015M12B2-RG,K220,PBTP	1
13	COVER-P/J LENS	SVP-50L6HR,ABS,T2.5,XHD5	1
14	RUBBER-COLOR WHEEL	SVP-50L6HR,SILICON,NTR	1
15	GLASS-COLOR WHEEL	55mm,FLOAT GLASS,T0.7,AIR	1
16	HOLDER-COLORWHEEL	SVP-50L6HR,MG D/C,T2.5,INSIDE	1
17	HOLDER-COLORWHEEL	SVP-50L6HR,MG D/C,T2.5	1
18	GLASS-UV FILTER	NA,GLASS,NTR,26x26,T1.1	1
19	BRACKET-UV FILTER	SVP-50L6HR,SUS,T0.3	1
20	COVER-WHEEL	K280,PC ABS,T2.5,BLK	1
21	LAMP-BALLAST	EUC 132D P/41,132W,20KV	1
22	HODER-BALLAST	K280,PC ABS,T2.5	1
23	COVER-DUCT TOP	SVP-50L6HR,PC G/F20,T2.5,XHD5	1
24	RUBBER-FAN	SVP-50L6,CR RUBBER,30,NTR,LAMP	2
25	FAN	G9225L12B2-AG(WS),K220,PBTP	1
26	COVER-DUCT BOT	SVP-50L6HR,PC G/F20,T2.5,XHD5	1
27	COVER-LAMP	SVP-50L6HR,PPS G/F30,T2.5	1
28	ASSY MISC-THERMOSTAT	HD5,125/250VAC	1
29	HODER-BALLAST	PC G/F20,T2.5,SEKINOS	1
30	HODER-HOUSING LAMP	SVP-50L6HR,AL D/C,T3.0	1
31	RUBBER-LAMP	SVP-50L6HR,SILICON,NTR,BLACK	1
32	LAMP	UHP 120W/132W 1.0,E22,65*70,LL	1
	NUT-HEXAGON	2C,M4,ZPC(YEL),SM20C	1
	WASHER-SPRING	M4,ID4.1,OD7.6,T1.7,ZPC(YEL),S	1
	HODER-SCREW LAMP	B3K,PE,T0.5	1
	HODER-LAMP	SVP-50L6HR,PPS G/F30,T2.5	1
	BRACKET-LAMP	SVP-50L6HR,SUS,0.3,BOTTON	1
	BRACKET-LAMP	SVP-50L6HR,SUS,0.3,FRONT	1
	COVER LAMP	K280,PC G/F20,T3.0,xHD5	1
	HANDLE-LAMP	SVP-50L6HR,SUS,2.0	1
	LABEL-00,LAMP	A/P(90G),40,15,PHILIPS 132W	1
	SCREW-TAPTITE	PWH,+B,M3,L10,ZPC(YEL)	1
	SCREW-MACHINE	WSP,PH,+B,M4,L8,ZPC(YEL),SWRCH1	2
	SCREW-TAPTITE	PWH,+B,M3,L10,ZPC(YEL)	1
33	COVER-DUCT RIGHT	SVP-50L6HR,PC G/F20,T2.5,XHD5	1
34	HODER-DETECT S/W	SVP-50L6HR,PC ABS,T2.5,BLK	1
35	SHEET-PAD S/W	SVP-50L3,TIM,T0.5,NAT	

K280 Engine Exploded View List			
No.	Description	Specification	Q'ty
36	HOLDER-CAP	SVP-56K2,NYLON,1.0NTR,BODY	3
37	HOLDER-CAP	SVP-56K2,NYLON,1.0NTR,CAP	3
38	HOLDER-BOSS	K220,SUM24L,T1.0,12.5,M4	2
39	RUBBER-FAN	HD5 L/C,SILICON NTR,BLACK,M4	2
40	GASKET-MODULE R	T4,2,31	2
41	GASKET-MODULE L	T4,2,3,43.5	2
42	GASKET-DMD,R	T3.5,2.2,35.5	2
43	GASKET-DMD,R	T3.5,2.2,22.9	2
44	SCREW-MACHINE	BH,+,M3,L12,NI PLT,SWRCH18A	4
45	SCREW-MACHINE	BH,+,M3,L12,NI PLT,SWRCH18A,FP	2
46	SCREW-MACHINE	BH,+,M3,L12,NI PLT,SWRCH18A,FP	1
47	SCREW-MACHINE	BH,+,M3,L12,NI PLT,SWRCH18A,FP	5
48	SCREW-MACHINE	PWH,+,-,M3,L30,NI PLT,SWRCH18A	4
49	SCREW-MACHINE	BH,+,M2,L5,ZPC(BLK)	3
50	SCREW-MACHINE	BH,+,M2,L5,ZPC(BLK)	2
51	SCREW-TAPTITE	PWH,+,-,B,M3,L6,ZPC(YEL)	4
52	SCREW-TAPTITE	BH,+,-,S,M3,L6,ZPC(YEL)	2
53	SCREW-TAPTITE	BH,+,-,S,M3,L6,ZPC(YEL)	2
54	SCREW-TAPTITE	BH,+,-,S,M3,L6,ZPC(YEL)	2
55	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	3
56	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	2
57	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	1
58	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	2
59	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	3
60	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	2
61	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	1
62	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	2
63	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	1
64	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	2
65	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	2
66	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	2
67	SCREW-TAPTITE	PWH,+,B,M3,L10,ZPC(YEL)	3
68	SCREW-TAPTITE	BH,+,S,M4,L20,ZPC(BLK)	2
69	SCREW-MACHINE	WSP,PH,+,M4,L8,ZPC(YEL)	2
70	SCREW-MACHINE	WSP,PH,+,M4,L8,ZPC(YEL)	2
71	SCREW-MACHINE	WSP,PH,+,M4,L8,ZPC(YEL)	3
72	ASSY MISC-C/W SENSOR	C/W SENSOR,BP41-00271A	1
73	ASSY MISC-DETECTOR S/W	HD5,L64D	1
74	SPONGE-ENGINE	K220,PU FORM,18,7,NTR,FRONT	1
75	SPONGE-ENGINE	K220,PU FORM,18,7,BACK	1
76	SPONGE-ENGINE	K220,PU FORM,18,7,LEFT	1
77	SPONGE-P/J LENS	K280,PU,FORM,307	1
78	SPONGE-ENGINE	K220,PU FORM,18,7,LEFT	1
79	SPRING ETC-H/S,DMD	B3K,SUS,T1.0	1
80	SPRING ETC-COIL,DMD	B3K,SPRING,STEEL	4
81	CLAMPER CORE-WIRE	NYLON,66,-,GRAY	1
82	CLAMPER CORE-WIRE	NYLON,66,V2,-,NTR,5MM	1

K280 Engine Exploded View List			
No.	Description	Specification	Q'ty
83	CABLE CLAMP	DAWS-1NE,ID11,L21.0,NTR	1
84	HOLDER-WIRE	NYLON 6/6,NATURAL,DAWH-2NC	1
85	HOLDER-WIRE	NYLON 6/6,CAFC-2500	1
86	HOLDER-WIRE	PJTV,POM,6,NATURAL	3
87	GASKET	GASKET TYPE,0.1,20mm,150mm	2
88	GASKET	CONDUCTIVE FABRIC,2MM,10MM,40MM	2
89	GASKET	1mm,3mm,34mm	2
90	GASKET	1mm,4mm,43mm	2
91	GASKET	1mm,3mm,55mm	1
92	GASKET	5mm,10mm,10mm	3
93	GASKET	20mm,30mm	1
94	SPACER-FELT	42P4A,FELT,L20,T0.5,W20	1
95	SPACER-FELT	K220,FELT,BLACK,T0.5	2
96	HOLDER-PCB	SVP-50L6,NYLON6.6,BLACK	2
97	BRACKET-COOLER	K220,AL,T5.8PMD	1
98	COVER-LENS	SVP-50HR,PS,T0.3,XHD5	1
99	SHEET-DMD BOARD	HD5,T5.6,8.8,BLACK,PMD1000	1
100	LABEL-00,OPEN	K2/K3,T/P,60,30,COVER DUCT	1
101	LABEL WARNING	CTV,MOJO 90G,110,15,2D0,EXPORT	1
102	LABEL-00,OPEN	K2/K3,T/P,40,50,LAMP	1

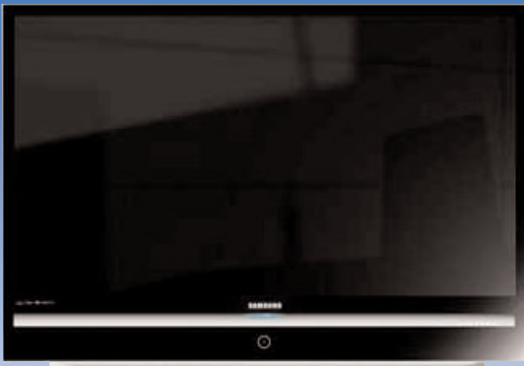


# DLP TV

Chassis : L66A(N)\_Galilei  
Model : HLS5087WX/XAA

# ***SERVICE*** Manual

## DLP TV



HL-S5087W

## FEATURES

- HD Built in TV
- NTSC/ATSC Tuner Embedded
- Digital Audio output (OPTICAL) jack
- Firmware upgrade by USB Port /Wise Link



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