Blu-ray Disc Player

BD-F8500

Application Models	BD-H8500 / BD-H8500A / BD-H8500M / BD-H8500N / BD-H8509S / BD-H8900 / BD-H8900A / BD-H8900M / BD-H8900N / BD-H8909S
Application Area	BAS,EN,GO,ZF,XY,XU,XE ,ZG

SERVICE MANUAL

Blu-Ray Disc Player

Contents

1. **Precautions**
2. **Product Specifications**
3. **Disassembly and Reassembly**
4. **Troubleshooting**
5. **PCB Diagrams**
6. **Schematic Diagrams**

Refer to the service manual in the GSPN (see the rear cover) for more information.

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1. Precautions

1.1. Safety Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1.1.1. Warnings

CAUTION

For continued safety, do not attempt to modify the circuit board. Disconnect the AC power and DC power jack before servicing.

1.1.2. Servicing the Blu-ray Disc Player

1) When servicing the Blu-ray Disc Player, Disconnect the AC line cord from the AC outlet.

2) It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

1.1.3. Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1) Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.

2) Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistorcapacitor networks, mechanical insulators, etc.

3) Leakage Current Hot Check:

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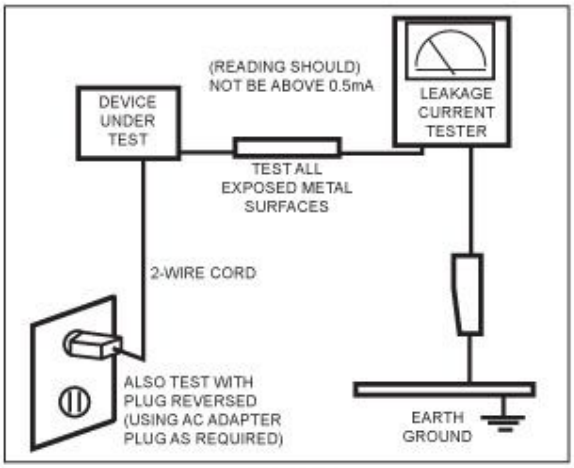

Fig. 1-1

CAUTION

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

4) With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

1.1.4. Product Safety Notices

Some electrical and mechanical parts have special safetyrelated characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

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1.2. Servicing Precautions

DANGER

An electrolytic capacitor installed with the wrong polarity might explode.

CAUTION

Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.

NOTE

If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

1.2.1. General Servicing Precautions

1) Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to: (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.

2) Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.

3) After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.

4) Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).

5) Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to theblades of the AC plug. The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.

6) Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

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1.3. Static Electricity Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1) Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.

2) After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.

3) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.

4) Use only a grounded-tip soldering iron to solder or desolder ESDs.

5) Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.

6) Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.

7) Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION

Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8) Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

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1.4. Installation Precautions

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

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

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

4) When installing the product, leave enough space (0.4m) between the product and the wall for ventilation purposes. A rise in temperature within the product may cause fire.

5) If an equipment is provided with a replaceable battery, and if replacement by an incorrect type could result in an explosion (for example, with some lithium batteries), the following applies:

CAUTION

• Risk of explosion if battery is replaced by an incorrect type dispose of used batteries according to the instructions.

• Do not dispose of batteries in a fire.

• Do not short circuit, disassemble or overheat the batteries.

• Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.

• Do not be exposed to excessive heat such as sunshine, fire or the like.

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2. Product Specifications

2.1. Product Specification

General	Weight	2.6Kg
	Dimensions	430(W) x 282(D) x 55(H) mm
	Operating Temperature Range	+5°C to +35°C
	Operating Humidity Range	10 % to 75 %
HDMI	Video	Resolution: 2160p(H8900 only), 1080p, 1080i, 720p, 576p/480p
	Audio	PCM, Bitstream
Audio Output	Digital	TOS-Link Optical
Network	Ethernet	100BASE-TX Terminal
	Wireless LAN	Built-in
	Security	WEP(OPEN/SHARED)
		WPA-PSK(TKIP/AES)
		WPA2-PSK(TKIP/AES)
	WPS(PBC)	Supported
HDD Capacity	BD-H8500	500 GB
	BD-H8900	1 TB

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2.1.1. Player Features

- Supports a Variety of Disc Types
  - Blu-ray (BD-ROM, BD-RE, BD-R), DVD Video, DVD-RW/-R (V mode and finalized only) discs and Audio CD.
  - CD-RW/CD-R, DVD-RW/-R and USB storage device content such as MP3, JPEG and DivX files.
- HDMI (High Definition Multimedia Interface)

  HDMI reduces picture noise by allowing a pure digital video/audio signal path from the player to your TV.

2.1.2. Blu-ray Disc Features

Blu-ray Discs can store 25 GB (single layer) or 50 GB (dual layer) on a single sided disc - about 5 to 10 times the capacity of a DVD. Blu-ray Discs also support the highest quality HD video available in the industry (up to 1920 x 1080 at 40 Mbit/sec) –Large capacity means no compromise on video quality. Furthermore, a Blu-ray Disc has the same familiar size and look as DVD.

NOTE

The following Blu-ray Disc features are disc dependant and will vary.

Appearance and navigation of features will also vary from disc to disc.

Not all discs will have the features described below.

- Video highlights

  The BD-ROM format for movie distribution supports three highly advanced video codecs, including AVC, VC-1, and MPEG-2.

  HD video resolutions are also available:
  - 1920 x 1080 HD
  - 1280 x 720 HD
- For High-Definition Playback

  To view high-definition contents in BD discs, an HDTV (High Definition Television) is required. Some discs may require using the player's HDMI OUT to view high-Definition content. The ability to view high-Definition content on BD discs may be limited depending on the resolution of your TV.
- Graphic planes

  Two individual, full HD resolution (1920x1080) video layers are available on top of the HD video layer.

  One layer is assigned to video-related graphics (like subtitles), and the other layer is assigned to interactive elements, such as buttons or menus. Various wipes, fades and scroll effects may be available on both layers.

- Menu graphics

  Support 256 full color resolution graphics and animation, thereby greatly surpassing the capabilities of DVDVideo. Unlike DVD, Menus can be accessed during video playback.

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- Menu sounds

  When you highlight or select a menu option on a Blu-ray disc, sounds can be heard such as button clicks or a voice over explaining the highlighted menu choice.

- Multi-page/PopUp Menus

  With DVD-Video, playback is interrupted each time a new menu screen is accessed. Due to Blu-ray Disc's ability to preload data from the disc without interrupting playback, a menu may consist of several pages.

  You can browse through the menu pages or select different menu paths, while the audio and video remain playing in the background.

- Interactivity

  Certain Blu-ray Discs may contain Animated menus and Trivia games.

- User Browsable Slideshows

  With Blu-ray Discs, you can browse through various still pictures while the audio remains playing.

- Subtitles

  Depending on what is contained on the Blu-ray Disc, you may be able to select different font styles, sizes and colors for the subtitles, Subtitles may also be animated, scrolled or faded in and out.

- BD-LIVE

  You can use a Blu-ray Disc supporting BD-LIVE through network connection to enjoy various contents provided by the disc manufacturer.

2.1.3. Disc types and contents your product can play

<Table 2-1>

Media	Disc Type	Details
VIDEO	Blu-ray Disc 3D Blu-ray Disc	BD-ROM or BD-RE/-R disc recorded in the BD-RE format.
	DVD-VIDEO DVD±RW/±R CD-RW/R	DVD-VIDEO, DVD±RW/±R discs that have been recorded and finalized. Media containing DivX, MKV or MP4 contents.
MUSIC	CD-RW/R DVD±RW/±R BD-RE/R	Music recorded on CD-RW/R, DVD±RW/±R, BD-RE/R or a USB storage media containing MP3 or WMA contents.
PHOTO	CD-RW/R DVD±RW/±R BD-RE/R	Photos recorded on CD-RW/R, DVD±RW/±R, BD-RE/R or a USB storage media containing JPEG contents.
VIDEO	HDD USB	Video, music and photos stored in a hard disc.
MUSIC		
PHOTO		

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NOTE

- The product may not play certain CD-RW/R and DVD-R because of the disc type or recording conditions.
- If a DVD-RW/-R has not been recorded properly in DVD video format, it will not be playable.
- Your product will not play content that has been recorded on a DVD-R at a bit-rate that exceeds 10 Mbps.
- Your product will not play content that has been recorded on a BD-R or USB device at a bit rate that exceeds 25 Mbps.

2.1.4. Disc types your product cannot play

- HD DVD
- DVD-RAM
- DVD-RW(VR mode)
- 3.9 GB DVD-R for Authoring.
- DVD-ROM/PD/MVDisc,etc
- Super Audio CD (except CD layer)
- CVD/CD-ROM/CDV/CD-G/CD-I/LD(CD-Gs play audio only,not graphics.)

NOTE

- The product may not play certain CD-RW/R and DVD±RW/±R because of the recording conditions.
- If a DVD±RW/±R has not been recorded properly in DVD video format, it will not be playable.
- Your product will not play content that has been recorded on a DVD±RW/±R at a bit-rate that exceeds 10 Mbps.
- Your product will not play content that has been recorded on a BD-RE/R at a bit rate that exceeds 25 Mbps.
- Playback may not work for some types of discs, or when you use specific operations, such as angle change and aspect ratio adjustment. Information about the discs is written in detail on the disc box. Please refer to this if necessary.
- When you play a BD-J title, loading may take longer than a normal title or some functions may perform slowly.

2.1.5. Available Recording Time for internal HDD

You can record digital broadcast on the internal HDD as below. Depending on the actual broadcast, available recording time may be different with the table shown below In On Screen Display, you can check available recording time as shown in "high" case in the table shown below.

<Table 2-2>

Broadcast Type	Estimated Bitrate	BD-H8500	BD-H8900
HD	20 Mbps	49 Hours	250 Hrs
SD	5 Mbps (Normal)	199 Hourss	411 Hours
	10 Mbps (High)	99 Hours	205 Hours

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NOTE

- Since the product's Timeshift and other implemented functions require a certain amount of HDD space allocated internally, the total size shown in the "Storage Device Manager" of Settings menu may differ from the HDD's capacity shown in the manual.

2.1.6. Region code

Both the product and the discs are coded by region. These regional codes must match in order to play the disc. If the codes do not match, the disc will not play. The Region Number for this product is described on the rear panel of the product.

<Table 2-3>

Disc Type	Region Code	Area
Blu-ray Disc	A	North America, Central America,South America, Korea, Japan,Taiwan, Hong Kong and South East Asia.
	B	Europe, Greenland, French territories, Middle East, Africa, Australia and New Zealand.
	C	India, China, Russia, Central and South Asia.
DVD-VIDEO	1	The U.S., U.S. territories and Canada
	2	Europe, Japan, the Middle East, Egypt, South Africa, Greenland
	3	Taiwan, Korea, the Philippines, Indonesia, Hong Kong
	4	Mexico, South America, Central America, Australia, New Zealand, Pacific Islands, Caribbean
	5	Russia, Eastern Europe, India, most of Africa, North Korea, Mongolia
	6	China

2.1.7. Logos of Discs the product can play

<Table 2-4>

Blu-ray Disc	3D Blu-ray Disc	BD-Live
DivX	PAL broadcast System in U.K., France, Germany, etc.	

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2.1.8. Supported Formats

Video File Support

<Table 2-5>

File Extention	Container	Video Codec	Resolution	Frame rate(fps)	Bit rate(Mbps)	Audio Codec
*.avi *.mkv *.asf *.wmv *.mp4 *.mov *.3gp *.vro *.mpg *.mpeg *.ts *.tp *.trp *.mov *.flv *.vob *.svi *.m2ts *.mts *.divx *.ps	AVI MKV ASF MP4 3GP MOV FLV VRO VOB PS TS SVAF	MVC	1920x1080	24/25/30	60	AC3 LPCM ADPCM(IMA, MS) AAC HE-AAC WMA Dolby Digital Plus MPEG(MP3) DTS
		Motion JPEG		FHD: MAX 30 HD : MAX 60	30	
		H.264 BP/MP/HP				
		Divx 3.11 / 4 / 5 / 6				
		MPEG4 SP/ASP				
		Window Media Video v9(VC1)				
		AVS				
		MPEG2				
		MPEG1				
		Microsoft MPEG-4 v1 , v2 , v3	1280x720			
		H 263 Sorrenson				
		Window Media Video v7(WMV1), v8(WMV2)		6~30	4	
*.webm	WebM	VP8	1920x1080	6~30	20	Vorbis

- Limitations
  - Even when the file is encoded by a supported codec listed above, a file might not be played if its content has a problem.
  - Normal playback is not guaranteed if the file's container information is wrong or the file itself is corrupted.
  - Files having higher Bit rate/frame rate than indicated in the table above may stutter when played back.
  - Seek (Jump) function is not available if the file's index table is damaged.
  - When you playback a file remotely through a network connection, video playback may stutter depending on the network speed.
  - Some USB/Digital camera devices may not be compatible with the product.
  - The AVS codec is supported only by models for China.
  - The *.ps file extension is supported only by models for China.
  - The DivX codec is not supported by models for America.
  - If the original content of a file was recorded in UHD, it cannot be played.
- Video decoder
  - Supports up to H.264 Level 4.1. (Does not support FMO/ASO/RS)
  - Does not support VC1/AP/L4.
  - CODECs except for WMVv7, v8, MSMPEG4 v3, MVC, VP6

    1) Below 1280 x 720 : 60 frames max.

    2) Above 1280 x 720 : 30 frames max.
  - Does not support GMC 2 or higher.
  - Supports SVAF Top/Bottom, Side by Side , Left/ Right view sequence type(2 ES)

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- Supports BD MVC Spec.

- Audio decoder
  - Supports WMA 10 PRO (Up to 5.1).
  - Does not support WMA lossless audio.
  - Also supports the M2 profile.
  - The RealAudio 10 lossless format is not supported by models for China and Hong Kong.
  - Does not support QCELP/AMR NB/WB.
  - Supports vorbis (Up to 2ch).
  - Supports DD+ (Up to 5.1ch)
  - The DTS LBR codec is supported only for MKV / MP4 / TS containers.

NOTE

- Playback of some MKV or MP4 file may not be supported depending on their video resolution and frame rate.

Supported Subtitle File Formats

<Table 2-6>

	Name	File Extension
External	MPEG-4 Timed text	.ttxt
	SAMI	.smi
	SubRip	.srt
	SubViewer	.sub
	Micro DVD	.sub or.txt
	SubStation Alpha	.ssa
	Advanced SubStation Alpha	.ass
	Powerdivx	.psb
	SMPTE-TT Text	.xml
Internal	Xsub	AVI
	SubStation Alpha	MKV
	Advanced SubStation Alpha	MKV
	SubRip	MKV
	VobSub	MKV
	MPEG-4 Timed text	MP4
	TTML in smooth streaming	MP4
	SMPTE-TT TEXT	MP4
	SMPTE-TT PNG	MP4

Music File Support

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<Table 2-7>

File Extention	Type	Codec	Support Range
*.mp3	MPEG	MPEG1 Audio Layer 3	
"*.m4a *.mpa *.aac"	MPEG4	AAC	
*.flac	FLAC	FLAC	Supports up to two channels.
*.ogg	OGG	Vorbis	Supports up to two channels.
*.wma	WMA	WMA	Supports WMA 10 Pro (Up to 5.1) Does not Support WMA lossless audio Supports up to M2 profile
*.wav	wav	wav	
*.mid *.midi	midi	midi	Type 0, type 1 and Seek is not supported. Only available with USB.
*.ape	ape	ape	NVT and X13 is not supported.
*.aif *.aiff	AIFF	AIFF	
*.m4a	ALAC	ALAC	

Picture File Support

<Table 2-8>

File Extention	Type	Resolution
*.jpg , *.jpeg	JPEG	15360x8640
*.png	PNG	4096x4096
*.bmp	BMP	4096x4096
*.mpo	MPO	15360x8640

Notes on the USB connection

- Your product supports USB storage media, MP3 products, digital cameras, and USB card readers.
- Some USB/digital camera devices may not be compatible with the product.
- Your product supports the FAT16, FAT32, and NTFS files systems (read only).
- Connect USB devices directly to the product's USB port. Connecting through a USB cable may cause compatibility problems.
- Inserting more than one memory device into a multi-card reader may cause the reader to operate improperly.
- The product supports the PTP protocol.
- Do not disconnect a USB device during a "loading" process.
- The bigger the image resolution, the longer the image takes to display.
- This product cannot play MP3 files with DRM (Digital Rights Management) downloaded from commercial sites.
- Your product only supports video that is under 30fps (frame rate).
- Your product only supports USB Mass Storage Class (MSC) devices such as thumb drives, flash card readers and USB HDD. (HUB is not supported.)
- Certain USB HDD Devices, multi-card readers and thumb drives may not be compatible with this product.
- If some USB devices require excessive power, they may be limited by the circuit safety device.

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- If playback from a USB HDD is unstable, provide additional power by plugging the HDD into a wall socket. If the problem continues, contact the USB HDD manufacturer.
- During the playback or copying, do not disconnect a USB device.
- SAMSUNG is not responsible for any data file damage or data loss.
- Your product does not support compression file, sparse file and encrption file of NTFS.
  - You can repair or format a USB device on your Desktop PC. (MS-Windows OS only)

Connect a USB device before using the Timeshift and Recorded TV functions

<Table 2-9>

	Do not use a USB memory stick. We do not support a USB memory stick.
	We recommend using a USB HDD with at least 5400 rpm, but a USB HDD of RAID type is not supported.

- To use the Timeshift mode or the Recorded TV function, a connected USB device must be execute the Device Format function to proper form for recording.
  - During the device formatting, do not disconnect the device while formatting is in progress. If you format the device, all files will be deleted.
  - Before formatting your device to this product, please back up your files to prevent them from damage or loss of data. SAMSUNG is not responsible for any data file damage or data loss.
- Recorded videos are DRM (digital rights managements) protected and cannot be played on a PC or other product. Note that files saved on the TV cannot be used after the main board is changed.
- At least 100 MB of free space is required for recording.
- Recording will stop if the storage's free space becomes less than 50 MB.
- If the USB device has failed the Device Performance Test, the USB device must go through the Device Format and Device Performance Test again before you record with the Guide or Channel Manager. If the device has failed the Performance Test, It cannot be used for recording.

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2.2. Chassis Product Specification

General	Features	BD-H8900/ZF BD-H8500/ZF	BD-H8900M/XU BD-H8500M/XU	BD-H8900N/XE BD-H8500N/XE	BD-H8909S/ZG BD-H8509S/ZG
Chassis					
Loader	Deck Type	Tray	Tray	Tray	Tray
	Pick up	H/H 10	H/H 10	H/H 10	H/H 10
RE-MOTE CON-TROL-LER	Remocon Code	AK59-00176A	AK59-00176A	AK59-00176A	AK59-00176A
	Button	55Key	55Key	55Key	55Key
	Battery Type	AAA	AAA	AAA	AAA
	Body Color	Black	Black	Black	Black
	Language	English	English	English	English
	Multi-Brand TV Control	Yes	Yes	Yes	Yes
	Illuminated Button	Yes	Yes	Yes	Yes
BD Profile		Profile 5.0	Profile 5.0	Profile 5.0	Profile 5.0
RE-GION CODE	BD	B	B	B	B
	DVD	2	2	2	2
Play-able Media	BD-ROM (Movie)	Yes	Yes	Yes	Yes
	BD-RE	Yes	Yes	Yes	Yes
	BD-R	Yes	Yes	Yes	Yes
	DVD-ROM (Movie)	Yes	Yes	Yes	Yes
	DVD-RAM	-	-	-	-
	DVD-R	Yes (V mode Only)	Yes (V mode Only)	Yes (V mode Only)	Yes (V mode Only)
	DVD-RW	Yes (V mode Only)	Yes (V mode Only)	Yes (V mode Only)	Yes (V mode Only)
	DVD+R	Yes	Yes	Yes	Yes
	DVD+RW	Yes	Yes	Yes	Yes
	DVD-Audio	-	-	-	-
	Audio CD	Yes	Yes	Yes	Yes
	VCD	-	-	-	-
	CD-R	Yes	Yes	Yes	Yes
	CD-RW	Yes	Yes	Yes	Yes
	Hard Disc (HDD)	Yes	Yes	Yes	Yes
	USB	Yes	Yes	Yes	Yes

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General	Features	BD-H8900/ZF BD-H8500/ZF	BD-H8900M/XU BD-H8500M/XU	BD-H8900N/XE BD-H8500N/XE	BD-H8909S/ZG BD-H8509S/ZG
Chassis					
Video Decoding Format	VC-1	Yes	Yes	Yes	Yes
	WMV9	Yes	Yes	Yes	Yes
	MPEG1	Yes	Yes	Yes	Yes
	MPEG2	Yes	Yes	Yes	Yes
	H.263	Yes	Yes	Yes	Yes
	H.264 BP/MP/HP	Yes	Yes	Yes	Yes
	MPEG4 SP/ASP	Yes	Yes	Yes	Yes
	DivX-SD/HD	Yes	Yes	Yes	Yes
	Xvid	Yes	Yes	Yes	Yes
	AVCHD (TS/Disc)	Yes	Yes	Yes	Yes
	MJPEG(AVI, Only Samsung Camera)	Yes	Yes	Yes	Yes
	Flash file (H.264 bsed flash file)	Yes	Yes	Yes	Yes
	MKV (Container)	Yes	Yes	Yes	Yes
Still Image	JPEG	Yes	Yes	Yes	Yes
	BMP	Yes	Yes	Yes	Yes
	GIF	-	-	-	-
	PNG	Yes	Yes	Yes	Yes
Video Post Processing	Audio decoding from secondary TS	Yes	Yes	Yes	Yes
	Video flipping	Yes	Yes	Yes	Yes
	Dual decoding of MPEG2-MPEG2 or AVC or VC1	Yes	Yes	Yes	Yes
	Dual decoding of AVC-AVC	Yes	Yes	Yes	Yes
	Dual decoding of VC1-VC1	Yes	Yes	Yes	Yes
	Noise Reduction	Yes	Yes	Yes	Yes
	Sharpness	Yes	Yes	Yes	Yes
	Video Output Adjustment (User control)	Yes	Yes	Yes	Yes

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General	Features		BD-H8900/ZF BD-H8500/ZF	BD-H8900M/XU BD-H8500M/XU	BD-H8900N/XE BD-H8500N/XE	BD-H8909S/ZG BD-H8509S/ZG
Chassis						
Video output Reso-lution	HDMI	3840x2160p@24F	Yes (H8900 Only)	Yes (H8900M Only)	Yes (H8900N Only)	Yes (H8909S Only)
		1920x1080P@50F (1920x1080P@60F)	Yes (Yes)	Yes (Yes)	Yes (Yes)	Yes (Yes)
		1920x1080P@24F	Yes	Yes	Yes	Yes
		1920x1080I@25F (1920x1080I@30F)	Yes (Yes)	Yes (Yes)	Yes (Yes)	Yes (Yes)
		1280x720P@50F (1280x720P@60F)	Yes (Yes)	Yes (Yes)	Yes (Yes)	Yes (Yes)
		720x576P@50F (720x480P@60F)	Yes (Yes)	Yes (Yes)	Yes (Yes)	Yes (Yes)
		720x576I@25F (720x480I@30F)	Yes (Yes)	Yes (Yes)	Yes (Yes)	Yes (Yes)
Audio decod-ing for-mat	Dolby Digital 5.1ch (AC3)		Yes	Yes	Yes	Yes
	Dolby Digital Plus		Yes	Yes	Yes	Yes
	Dolby TrueHD		Yes	Yes	Yes	Yes
	DTS 5.1ch		Yes	Yes	Yes	Yes
	DTS-HD High Resolution Audio		Yes	Yes	Yes	Yes
	DTS-HD Master Audio		Yes	Yes	Yes	Yes
	DTS 96/24, ES		Yes	Yes	Yes	Yes
	LPCM 192Khz 5.1Ch		Yes	Yes	Yes	Yes
	LPCM 96Khz 7.1Ch		Yes	Yes	Yes	Yes
	MPEG1 audio		Yes	Yes	Yes	Yes
	MPEG2 audio		Yes	Yes	Yes	Yes
	DTS-CD Decoding		Yes	Yes	Yes	Yes
	MP3 *.MP3		Yes	Yes	Yes	Yes
	WMA7		Yes	Yes	Yes	Yes
	WMA8		Yes	Yes	Yes	Yes
	WMA9		Yes	Yes	Yes	Yes
	WMA9 Pro		Yes	Yes	Yes	Yes
	AAC		Yes	Yes	Yes	Yes
	AAC-LC		Yes	Yes	Yes	Yes

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General	Features	BD-H8900/ZF BD-H8500/ZF	BD-H8900M/XU BD-H8500M/XU	BD-H8900N/XE BD-H8500N/XE	BD-H8909S/ZG BD-H8509S/ZG
Chassis					
Audio decoding format	AAC-HE	Yes	Yes	Yes	Yes
	ADPCM	Yes	Yes	Yes	Yes
	LPCM(48Khz~192Khz)	Yes	Yes	Yes	Yes
	3GPP (Container)	Yes	Yes	Yes	Yes
Audio post processing	DTS Neo:6	Yes	Yes	Yes	Yes
	Virtual Surround	-	-	-	-
	Secondary Audio Decoding and Mixing	Yes	Yes	Yes	Yes
	Down Sampling (like 96KHz to 48 KHz)	Yes	Yes	Yes	Yes
	Dynamic Range Control	Yes	Yes	Yes	Yes
	Bass Redirection Management	-	-	-	-
	Audio Mixing(Rate Conversion/ Mixing)	Yes	Yes	Yes	Yes
	Speaker Setup	-	-	-	-
	Test Tone	-	-	-	-

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General	Features			BD-H8900/ZF BD-H8500/ZF	BD-H8900M/XU BD-H8500M/XU	BD-H8900N/XE BD-H8500N/XE	BD-H8909S/ZG BD-H8509S/ZG
Chassis							
Audio Output	DD Decoder (BD/DVD)		HDMI 5.1Ch	Yes	Yes	Yes	Yes
	DD+ Decoder (BD Only)		HDMI 7.1Ch	Yes	Yes	Yes	Yes
	DD TrueHD Decoder(BD Only)		HDMI 7.1Ch	Yes	Yes	Yes	Yes
	DTS Decoder (BD/DVD)		HDMI 5.1Ch	Yes	Yes	Yes	Yes
	DTS-HD HRA Decoder (BD Only)		HDMI 7.1Ch	Yes	Yes	Yes	Yes
	DTS-HD MA Decoder (BD Only)		HDMI 7.1Ch	Yes	Yes	Yes	Yes
	LPCM (BD/DVD)		HDMI 7.1Ch	Yes	Yes	Yes	Yes
	HD Bitstream Output		HDMI	Yes	Yes	Yes	Yes
	Re-en-coding	Into DTS and Dolby	HDMI/Opti-cal	Yes (dts /dolby Selectable))	Yes (dts /dolby Selectable))	Yes (dts /dolby Selectable))	Yes (dts /dolby Selectable))
	Dual De-coding	Sec-ondary Audio	BD	Yes	Yes	Yes	Yes
Tuner	Dual Tuner			Yes	Yes	Yes	Yes
	DVB-T/C			Yes	-	-	-
	DVB-S/S2			-	-	-	Yes
	DVB-T2/C			-	Yes	Yes	-

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General	Features	BD-H8900/ZF BD-H8500/ZF	BD-H8900M/XU BD-H8500M/XU	BD-H8900N/XE BD-H8500N/XE	BD-H8909S/ZG BD-H8509S/ZG
Chassis					
DVB	Auto channel scan	Yes	Yes	Yes	Yes
	Manual channel scan	Yes	Yes	Yes	Yes
	EPG (Digital)	Yes (SI-EPG)	Yes (SI-EPG)	Yes (SI-EPG)	Yes (SI-EPG)
	TTX (OSD)	Yes	Yes	Yes	Yes
	TTX (VBI)	Yes	Yes	Yes	Yes
	Subtitle (DVB)	Yes	Yes	Yes	Yes
	Subtitle (TTX)	Yes	Yes	Yes	Yes
	LCN (Logical Channel Number)	Yes	Yes	Yes	Yes
	Favorite channel	Yes	Yes	Yes	Yes
	Parental Guide	Yes	Yes	Yes	Yes
	Channel List	Yes	Yes	Yes	Yes
	Auto Clock Setting	Yes	Yes	Yes	Yes
	Time Shift	Yes	Yes	Yes	Yes
	Radio	Yes	Yes	Yes	Yes
	OTA	Yes	Yes	Yes	Yes
	CI+ (Common Interface)	Yes	Yes	Yes	Yes
	Channel Transfer	Yes	Yes	Yes	Yes
Re-cord-ing	Number of Events (Timer Recording)	50Events	50Events	50Events	50Events
	Dual Recording	Yes	Yes	Yes	Yes
	EPG (Digital)	Yes	Yes	Yes	Yes
	OTR (Instant Recording Timer)	OFF, 10min ~6hour	OFF, 10min ~6hour	OFF, 10min ~6hour	OFF, 10min ~6hour

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General	Features	BD-H8900/ZF BD-H8500/ZF	BD-H8900M/XU BD-H8500M/XU	BD-H8900N/XE BD-H8500N/XE	BD-H8909S/ZG BD-H8509S/ZG
Chassis					
Func-tion	3D	Recording/Play	Recording/Play	Recording/Play	Recording/Play
	3D Converter (2D → 3D)	-	-	-	-
	Allshare (DMP/DMS/DMR)	Yes	Yes	Yes	Yes
	DCM(VIDEO, MUSIC, PHOTO)	Yes	Yes	Yes	Yes
	CD Ripping to MP3	Yes	Yes	Yes	Yes
	Music Info. Update	Yes	Yes	Yes	Yes
	Music Slide Show	Yes	Yes	Yes	Yes
	Automatic Chaptor Creation	Yes	Yes	Yes	Yes
	Full Screen	Yes	Yes	Yes	Yes
	Full Browser	Yes	Yes	Yes	Yes
	Dual/Clone View	-	-	-	-
	Remote Access (Remote DLNA)	Yes	Yes	Yes	Yes
	HDMI CEC (1.4a)	Yes	Yes	Yes	Yes
	USB 2.0	Yes	Yes	Yes	Yes
	WiFI [Built IN]	Yes	Yes	Yes	Yes

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General	Features		BD-H8900/ZF BD-H8500/ZF	BD-H8900M/XU BD-H8500M/XU	BD-H8900N/XE BD-H8500N/XE	BD-H8909S/ZG BD-H8509S/ZG
Chassis						
TERMI-NALS (Input/ Out-put)	CVBS Output - RCA Jack	Rear	-	-	-	-
	Audio Output -RCA Jack	Front/Rear	-	-	-	-
	Component Video out	Rear	-	-	-	-
	HDMI Out	Rear	x1	x1	x1	x1
	Digital Audio Out (Optical)	Rear	x1	x1	x1	x1
	Digital Audio Out (Coaxial)	Rear	-	-	-	-
	Ethernet Port		X1	X1	X1	X1
	Tuner RF IN	Rear	X1	X1	X1	X2
	Tuner Loop through	Rear	X1	X1	X1	-
	CI-Slot (Common Interface)	Side	X1	X1	X1	X2
	USB	Front	X1	X1	X1	X1
	USB	Rear	X1	X1	X1	X1
HDD	Capacity		1TB/500GB	1TB/500GB	1TB/500GB	1TB/500GB
	Plate Size		3.5"	3.5"	3.5"	3.5"

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General	Features	BD-H8900/ZF BD-H8500/ZF	BD-H8900M/XU BD-H8500M/XU	BD-H8900N/XE BD-H8500N/XE	BD-H8909S/ZG BD-H8509S/ZG
Chassis					
AC-CES-SORY	Remote Controller	Yes	Yes	Yes	Yes
	Batteries	Yes(x2)	Yes(x2)	Yes(x2)	Yes(x2)
	AV Cable (RCA Type)	-	-	-	-
	RF Cable	Yes	Yes	Yes	-
	HDMI Cable	-	-	Yes	-
	User's Manual (Instruction Manual)	Yes	Yes	Yes	Yes
	Quick Start Guide	Yes	Yes	Yes	Yes
	Customer Request Card	-	-	-	-
	Product Registration Card	Yes	Yes	Yes	Yes
	Warranty Card	Yes (combined in I/B)	Yes (combined in I/B)	Yes (combined in I/B)	Yes (combined in I/B)
DIS-PLAY	Display of Front Panel	VFD	VFD	VFD	VFD
	REC Display	VFD	VFD	VFD	VFD
	Power LED	-	-	-	-

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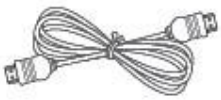
2.3. Option Product Specification

Description Fig	Description	Parts No	Remark
	Remote Control	AK59-00176A	Model Standard of BD-H8900/ZF
	Batteries for Remote Control (AAA Size)	4301-000121	Model Standard of BD-H8900/ZF S.N.A
	User Manual	AK68-02466A	Model Standard of BD-H8900/ZF S.N.A
	RF cable	AC39-00017A	Model Standard of BD-H8900/ZF
	HDMI cable	BN39-01583A	Only for BD-H8900N/ BD-H8500N
	Power cord	3903-000525	Model Standard of BD-H8900/ZF

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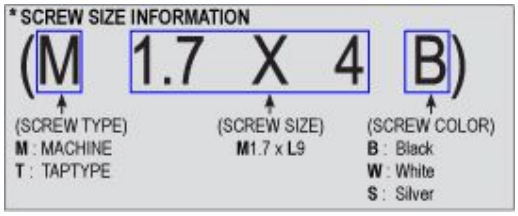
3. Disassembly and Reassembly

3.1. Cabinet and PCB

NOTE

Connector Must be removed with care



3.1.1. Top Cabinet Removal

1) Remove 3 Screws ①.
2) Remove the Top Cabinet ② in the dirrection of the arrow.
3) Disconnect Harness Cable from Front PCB.

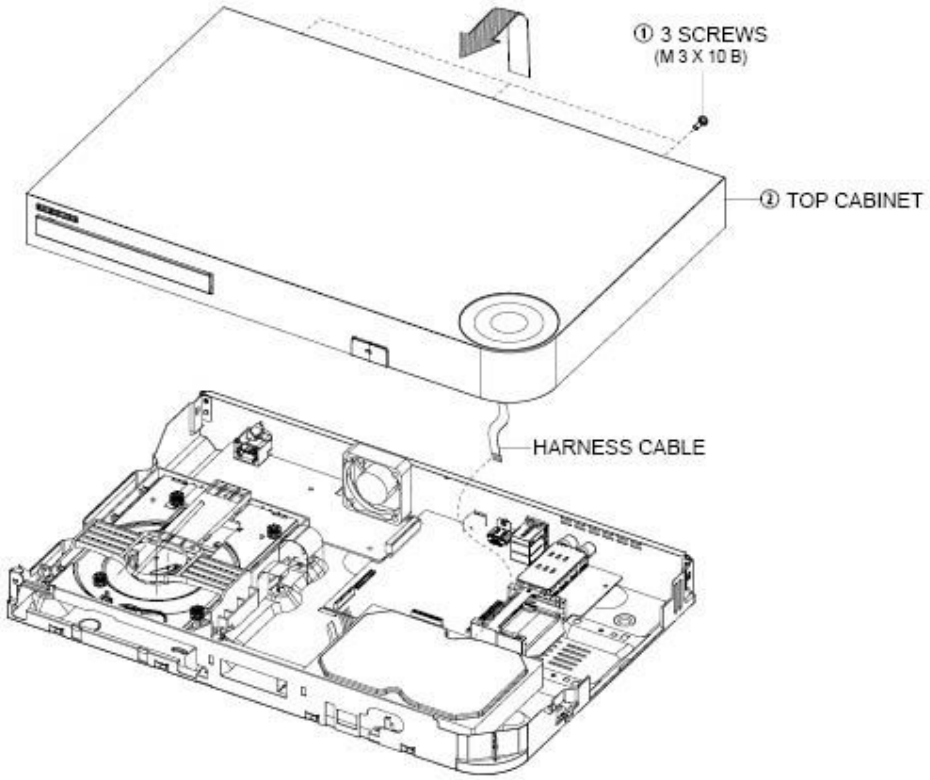


Fig. 3-1 Top Cabinet Removal

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3.1.2. Wi-Fi Module Removal

1) Remove the WiFi PCB ① and disconnect Harness cable from the Main PCB.
2) Lift the module up.

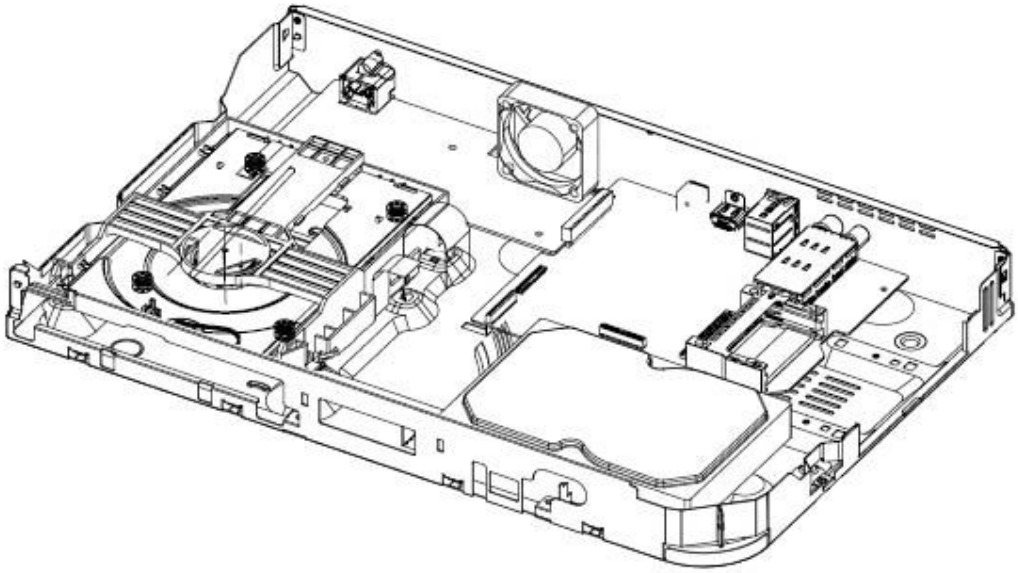

Fig. 3-2 Wi-Fi Module Removal

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3.1.3. Assy Deck Removal

1) Disconnect 2 FFC cables from the Main PCB.
2) Squeeze marked area in the direction of the arrow and pull out the Assy Deck ① forward in the direction of the arrow.

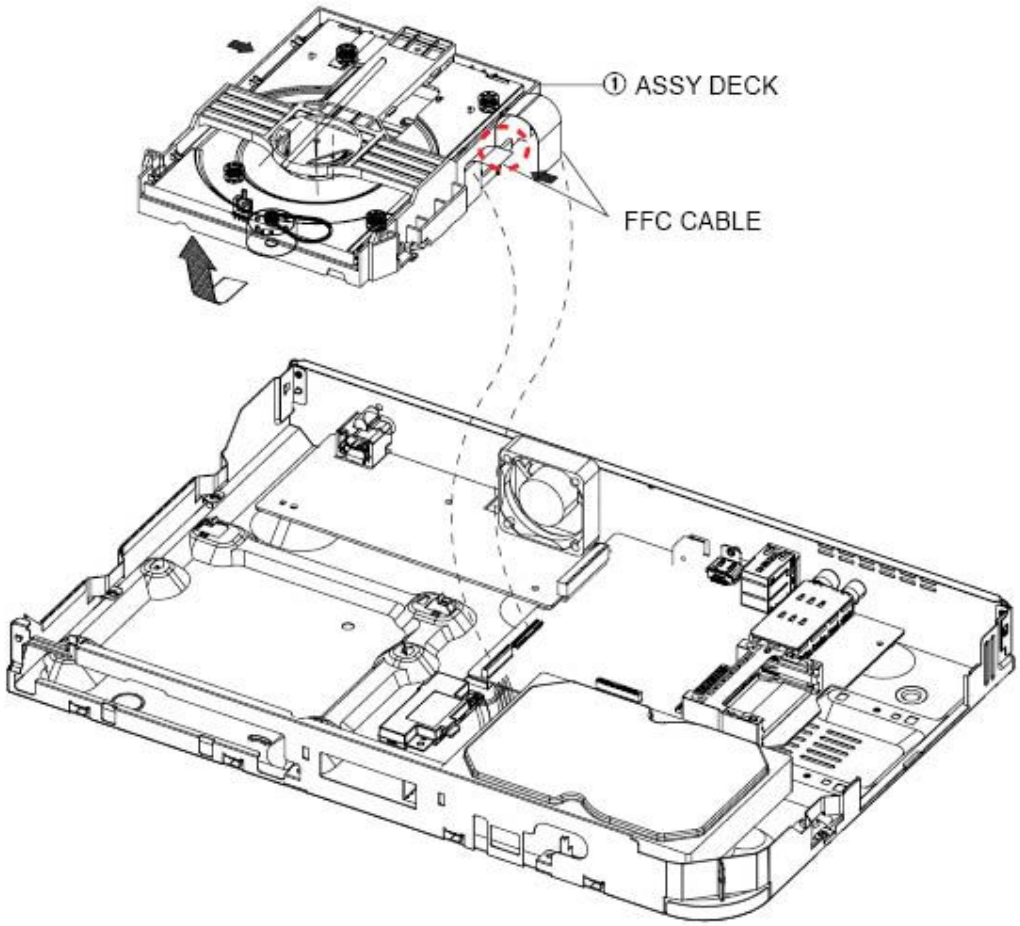

Fig. 3-3 Assy Deck Removal

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3.1.4. Assy S-HDD Removal

1) Remove 4 Screws ① Disconnect SATA Connector from the Main PCB.
2) Remove Assy S-HDD ② and lift it up.

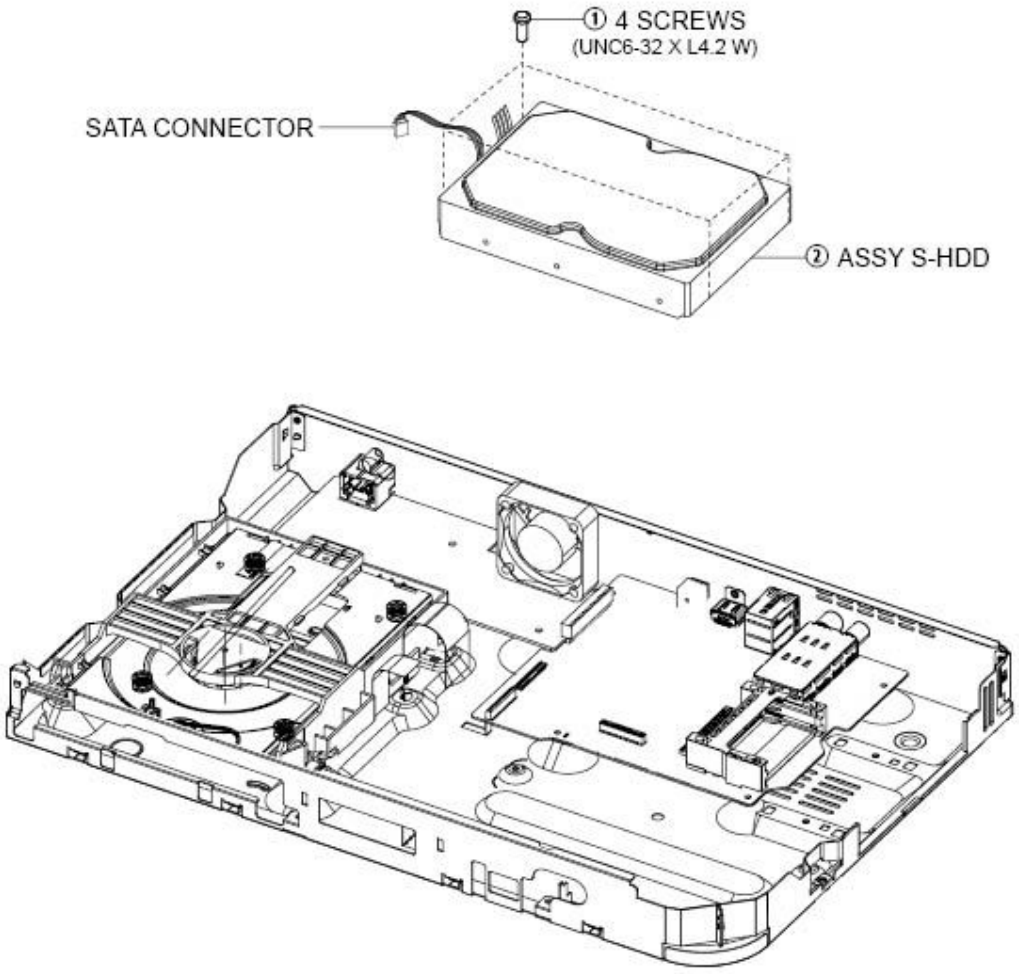

Fig. 3-4 Assy S-HDD Removal

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3.1.5. S.M.P.S PCB Removal

1) Remove 3 Screws ③ Disconnect Header-Board from the Main PCB.
2) Remove 2 Screws ① from the Fan ② and lift it up.
3) Remove S.M.P.S PCB ④ and lift it up.

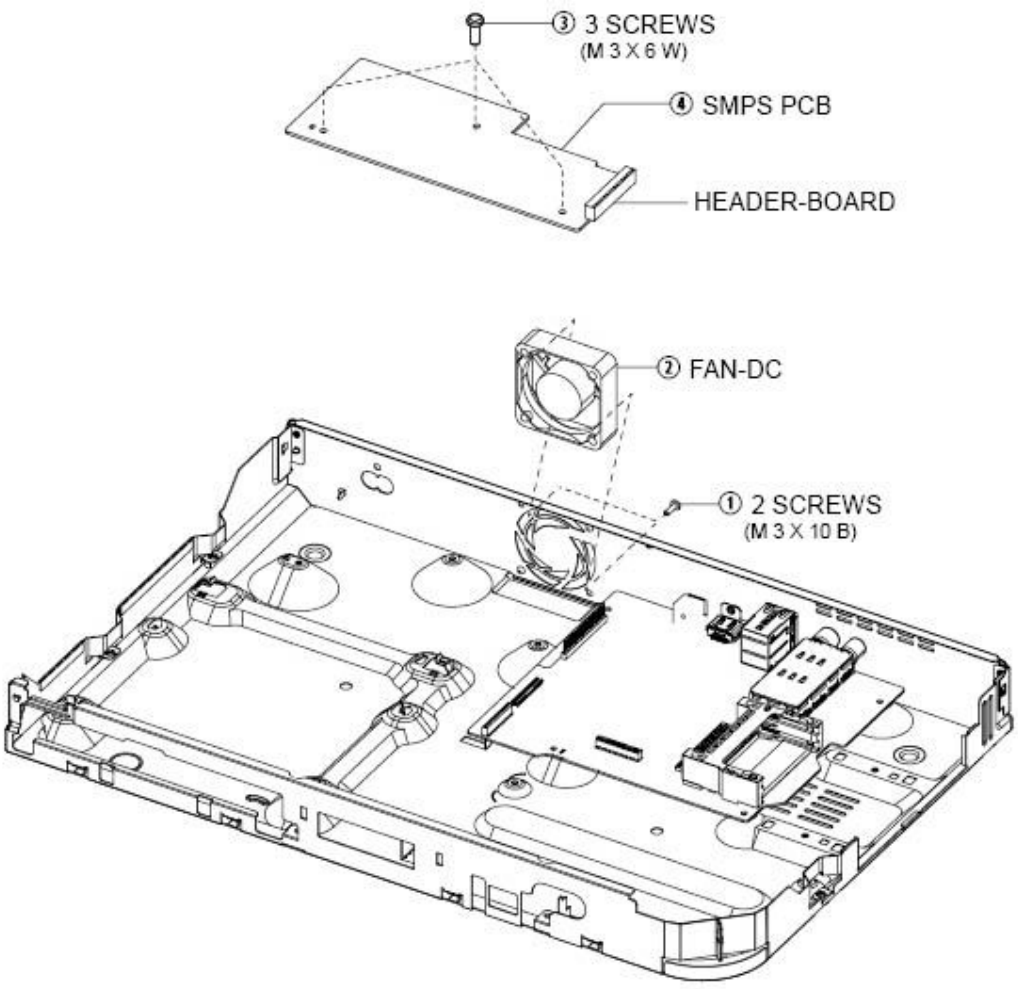

Fig. 3-5 S.M.P.S PCB Removal

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3.1.6. Front PCB Removal

1) Remove 2 Screws ① Disconnect FFC Cable from the Main PCB.
2) Remove Front PCB ② and lift it up.

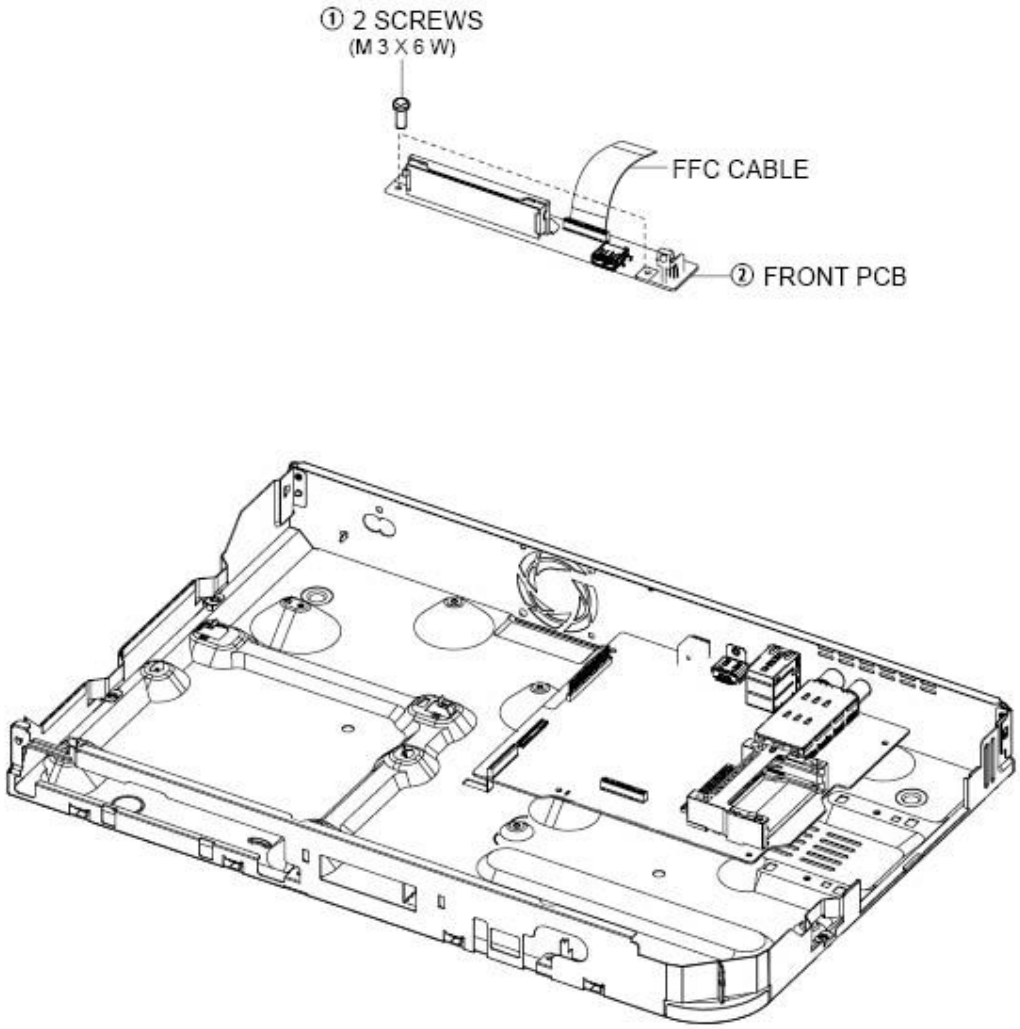

Fig. 3-6 Front PCB Removal

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3.1.7. Main PCB Removal

1) Remove 5 Screws ①, ② from the Main PCB ③ and lift it up.

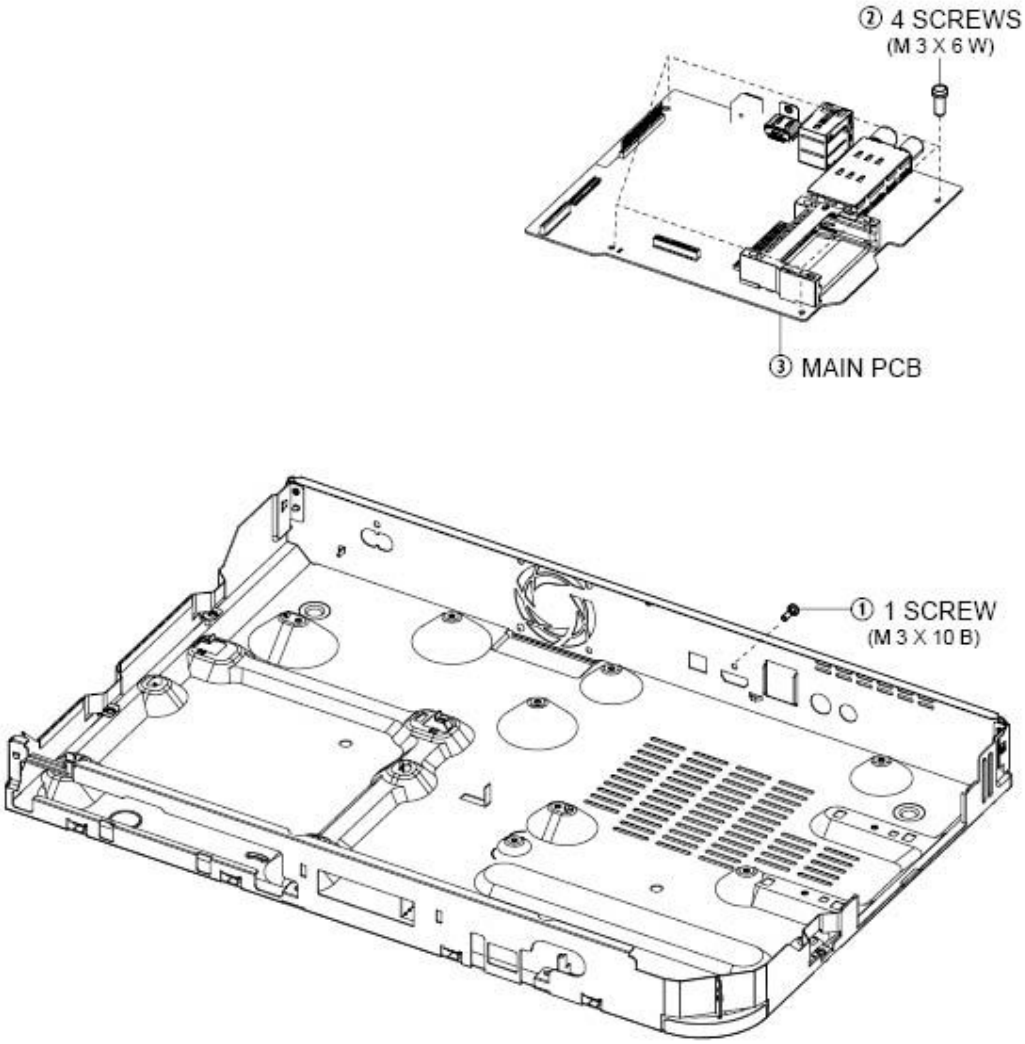

Fig. 3-7 Main PCB Removal

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3.2. PCB Location

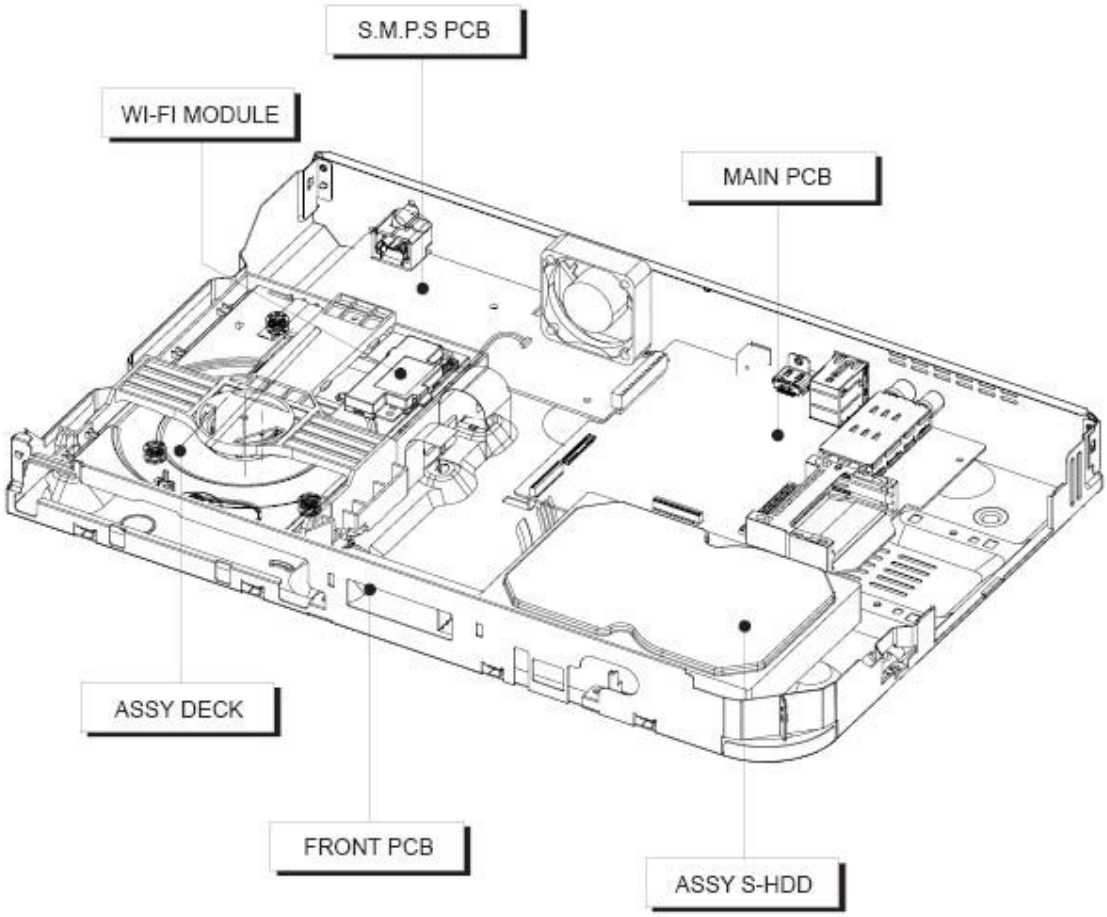

Fig. 3-8 PCB Location

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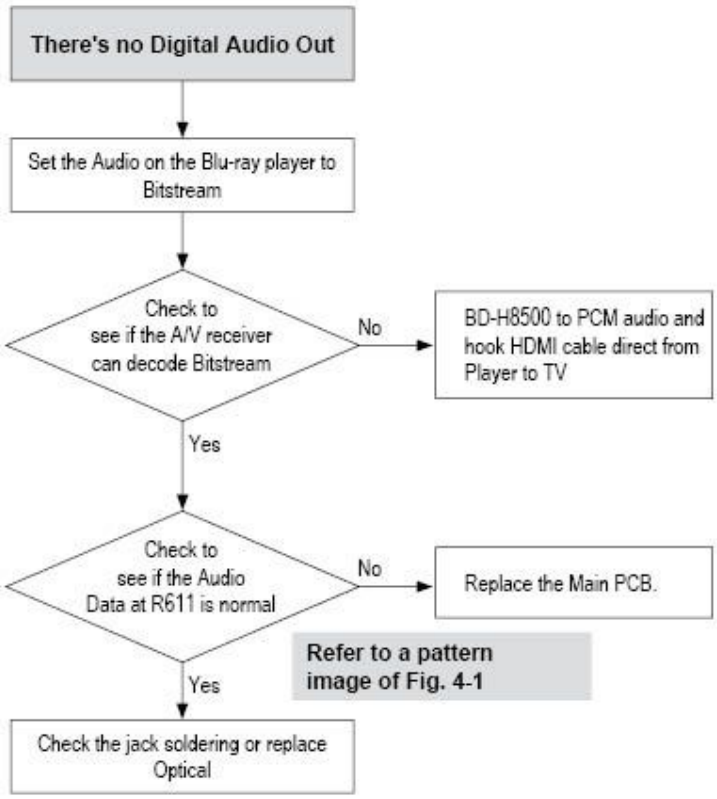
4. Troubleshooting

4.1. Troubleshooting



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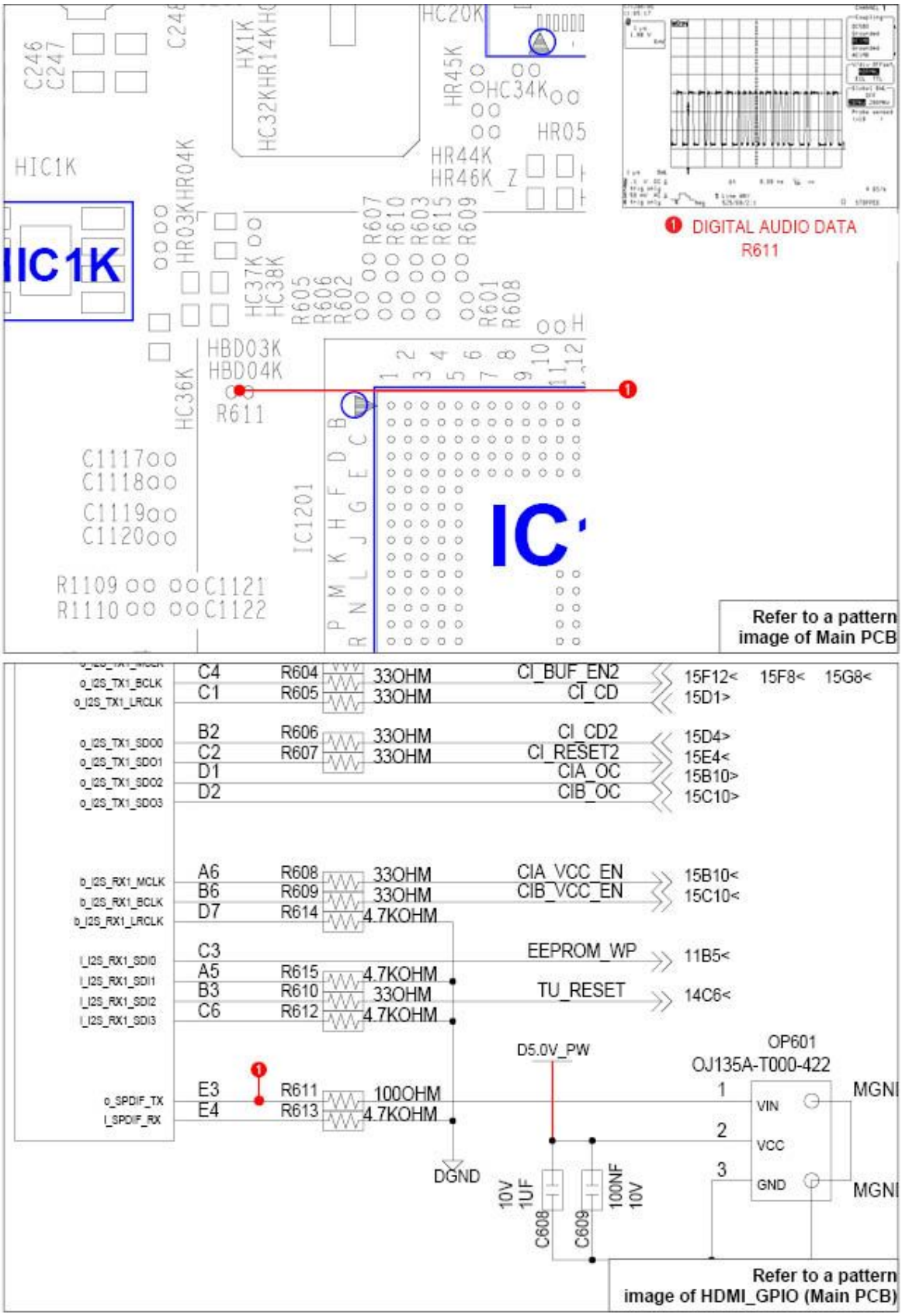

Fig. 4-1

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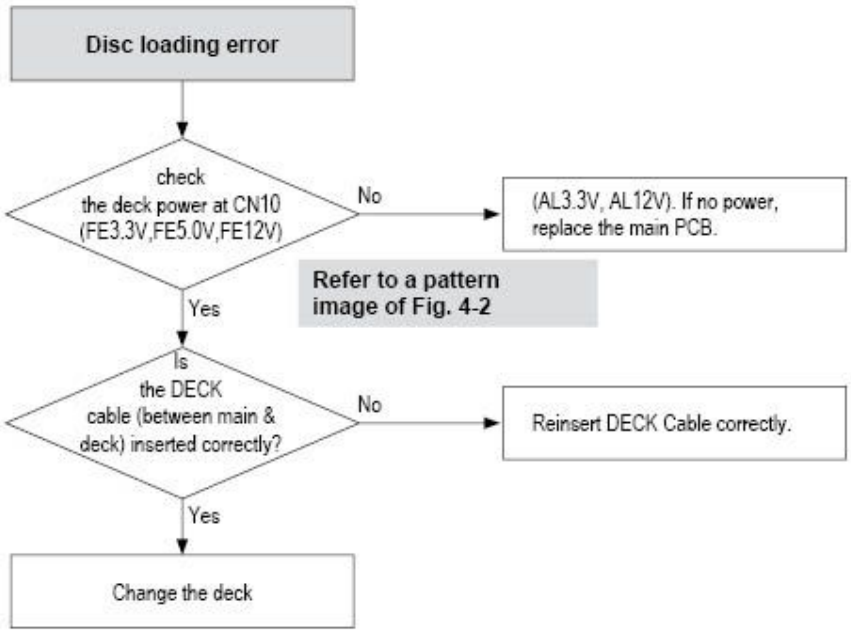

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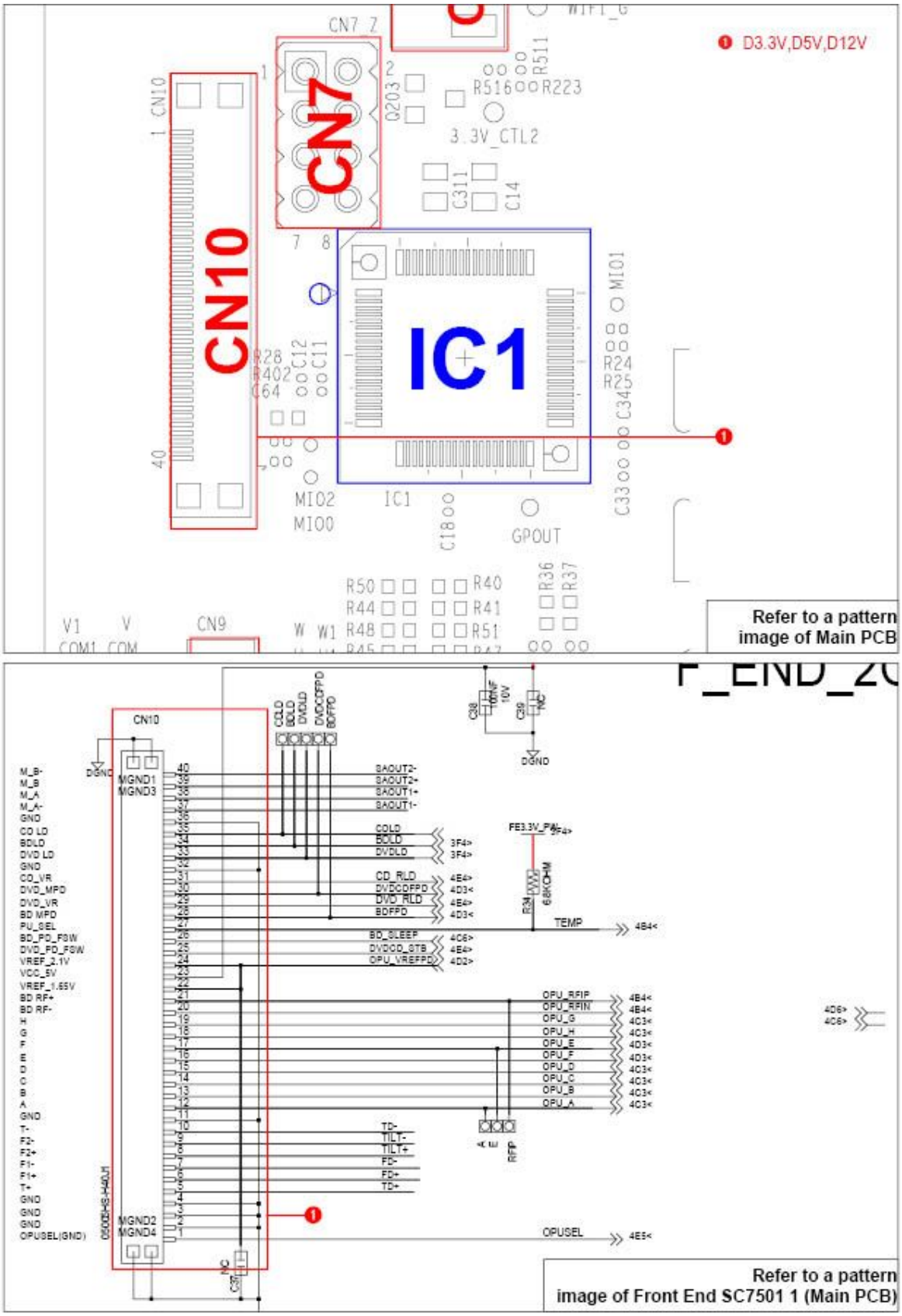

Fig. 4-2

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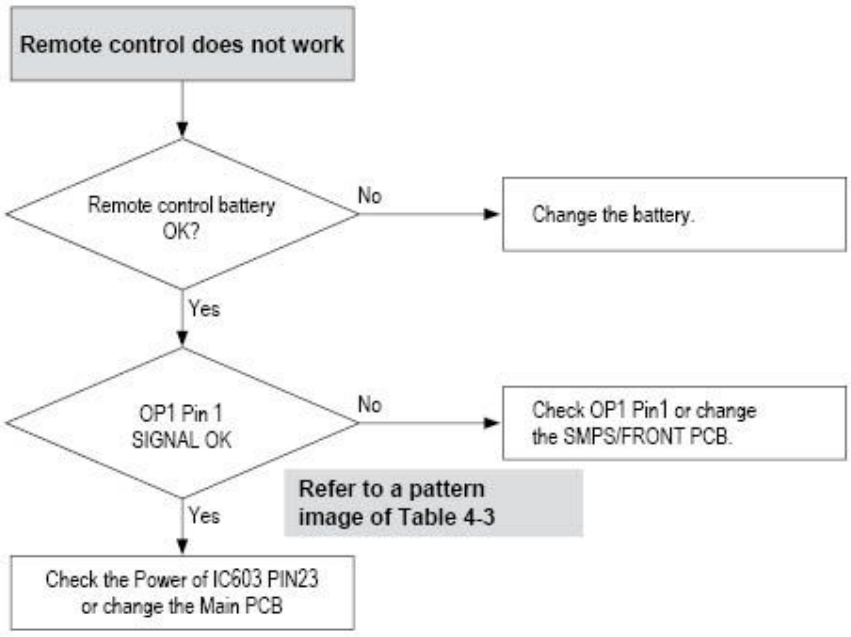

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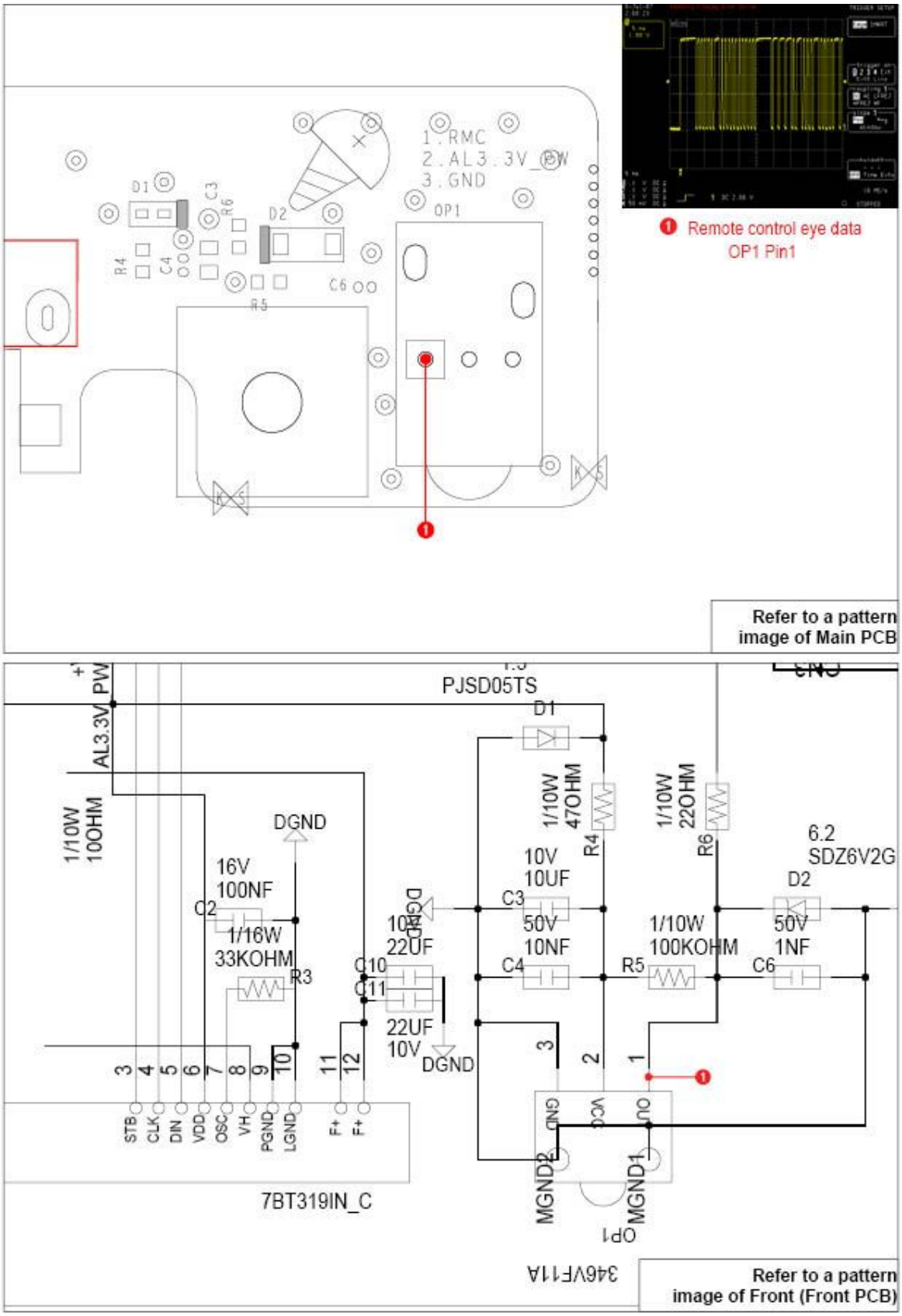

Fig. 4-3

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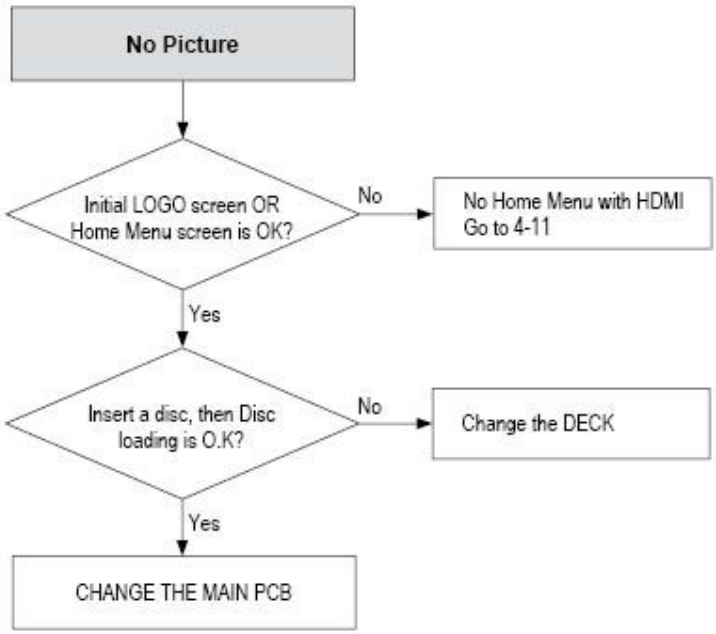

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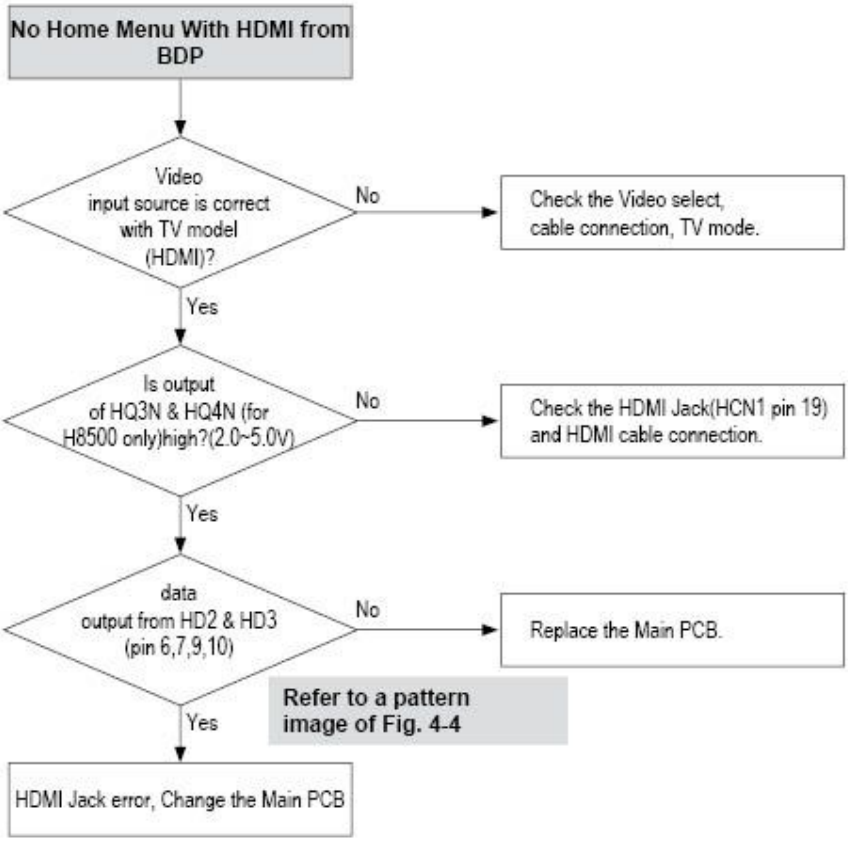

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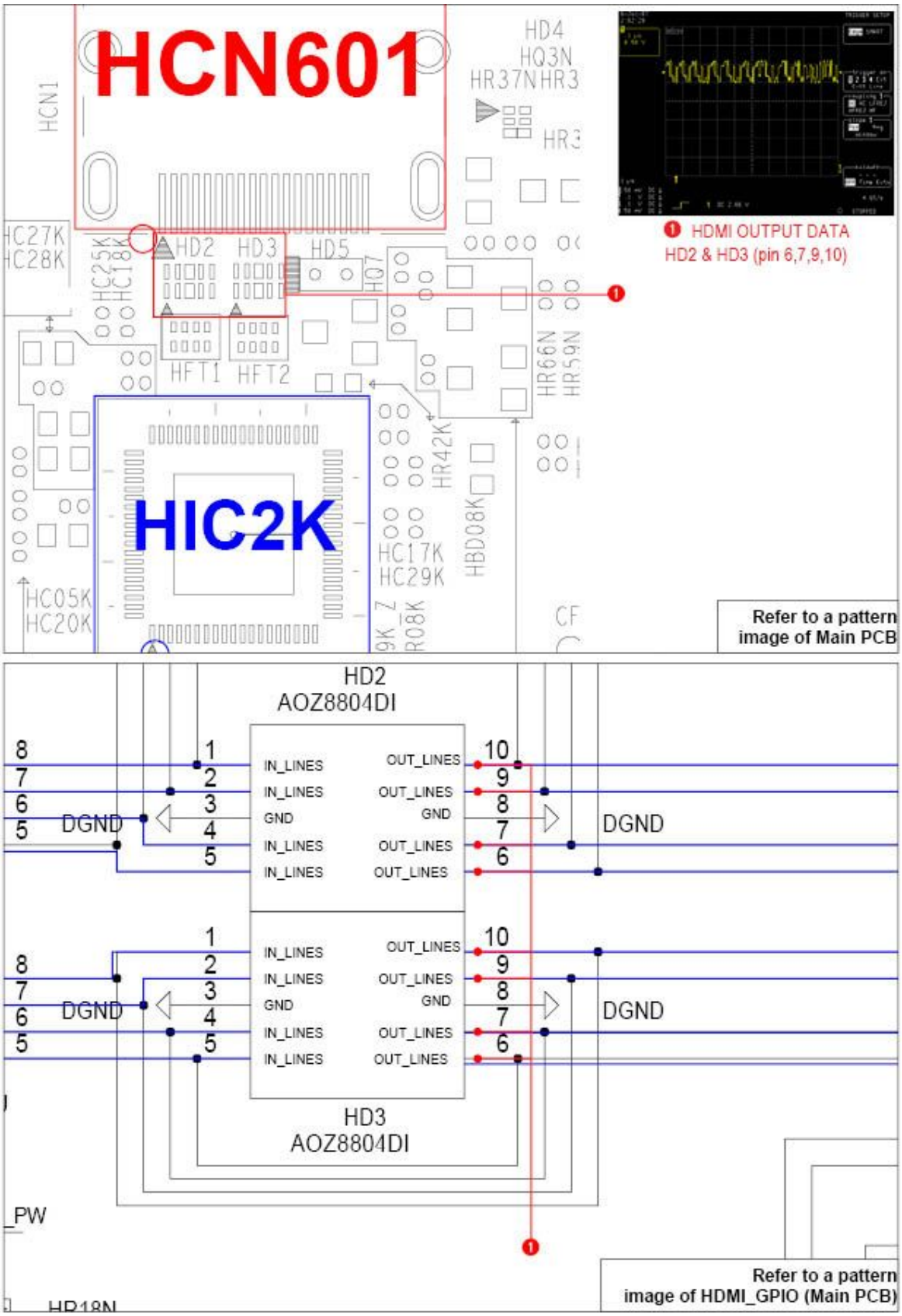

Fig. 4-4

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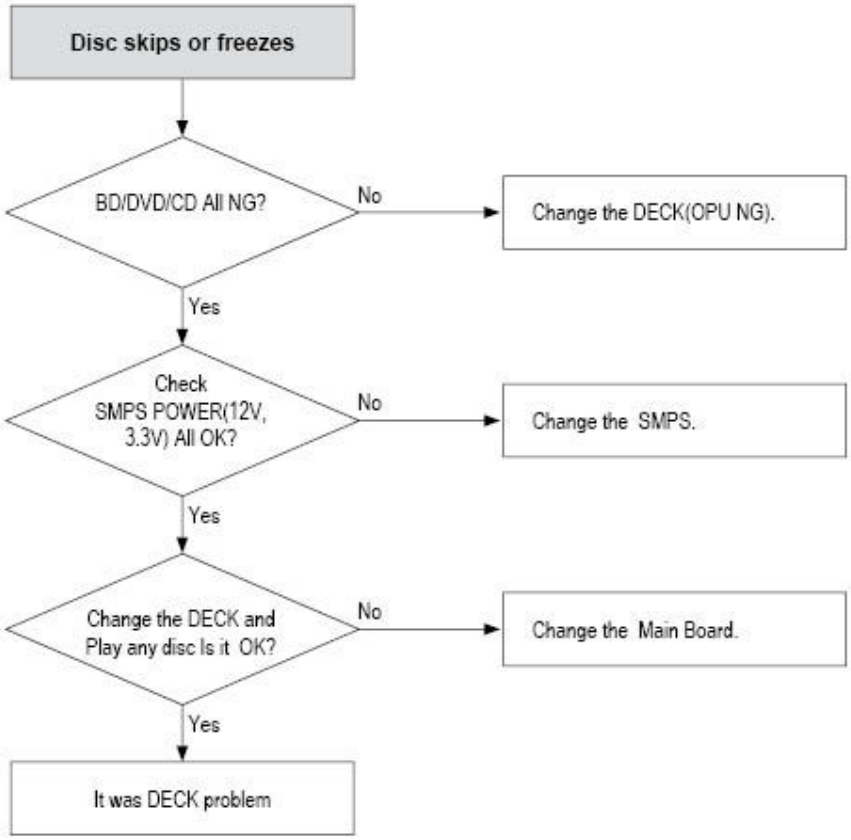

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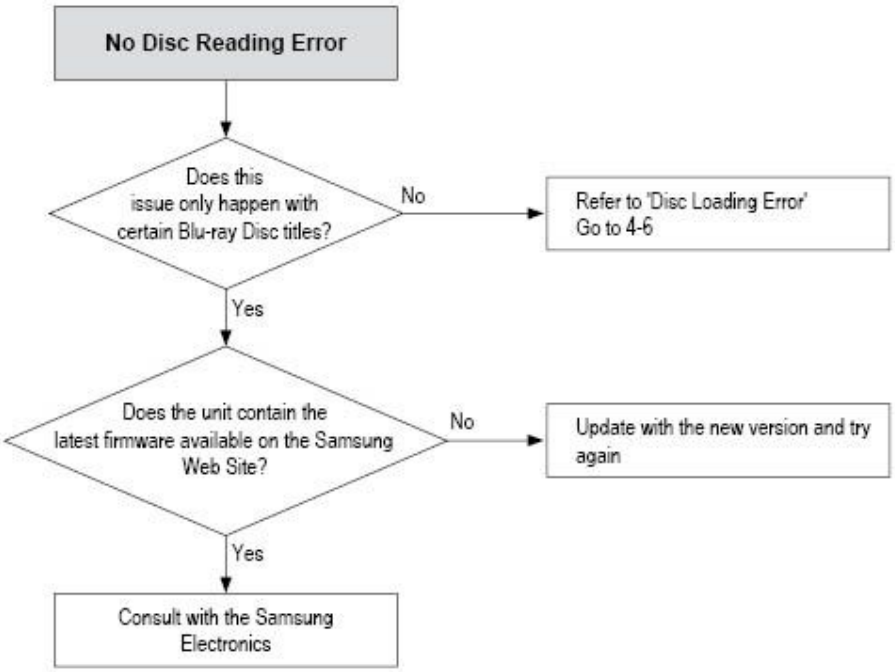

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4.2. Software Update

The Software Update menu allows you to upgrade the player's software for performance improvements or additional services. the update process.

1) In the Home screen, select the Settings, and then press the button.
2) Select Support, and then press the button.
3) Select Software Update, and then press the button.
4) To download update software and update now, select Update Now, and then press the button. See Update Now on this page for details.
5) To let the product download update software automatically when available, select Auto Update, and then press the button.

NOTE

- The upgrade is complete when the player turns off, and then turns on again by itself.
- Samsung Electronics shall takes no legal responsibility for player malfunction caused by an unstable Internet connection or consumer negligence during a software Update.
- When a system upgrade is in progress, "UPDATE" is displayed on the front panel.

4.2.1. Update Now

You can use Update Now to update the software through your network connection or by using a USB flash drive. The network instructions are below. The USB flash drive instructions are on the next page.

1) Select Update Now, and then press the button. The Update now pop-up appears.
2) The product searches on line for the latest software version.
3) If it does not find an update, the "No new updates" pop-up appears. Press the button to exit.
4) If it finds a new version, the Update Request pop-up appears.
5) Select OK. The product upgrades the software, turns off, and then turns on automatically.
6) If you do not select OK or Cancel in one minute, the product stores the new upgrade software. You can upgrade the software later using Auto Update.
7) If you select Cancel, the product cancels the upgrade.

NOTE

- When the system upgrade is done, check the software details in the Product Information section of the Contact Samsung screen.
- Do not turn off the player during the Software Update. It may cause the player to malfunction..

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4.2.2. Auto Update

You can set the Auto Update function so that the player downloads new upgrade software when it is in Auto Update mode. In Auto Update mode, the player is off, but its Internet connection is active. This allows the player to download upgrade software automatically, when you are not using it.

1) Press the ▲▼ buttons to select Auto Update Mode, and then press the ⏎ button.
2) Select On or Off. If you select On, the player will automatically download new upgrade software when it is in Auto Update mode with the power off. If it downloads new upgrade software, the player will ask you if you want to install it when you turn the player on.

NOTE

- To use the Auto Update Mode Upgrade function, your player must be connected to the Internet.

• By USB

1) Visit www.samsung.com.
2) Click SUPPORT on the top right of the page.
3) Enter the product's model number into the search field. As you enter the model number, a drop down will display products that match the model number.
4) Left click your product's model number in the drop down list.
5) On the page that appears, scroll down to and then click Firmware Manuals & Downloads.
6) Click Firmware in the centre of the page.
7) Click the ZIP button in the File column on the right side of the page.
8) Click Send in the first pop-up that appears. Click OK in the second pop-up to download and save the firmware file to your PC.
9) Unzip the zip archive to your computer. You should have a single folder with the same name as the zip file.
10) Copy the folder to a USB flash drive.
11) Make sure no disc is inserted in the product, and then insert the USB flash drive into the USB port of the product.
12) In the product's menu, go to Settings > Support > Software Update.
13) Select Update Now.
14) The product searches for the software on the USB drive. When it finds the software,the Update Request pop-up appears.
15) Select OK. The product

NOTE

- There should be no disc in the player when you upgrade the software using the USB jack.
- When the system upgrade is done, check the software details in the Product Information section of the Contact Samsung screen.
- Do not turn off the player during the software Update. It may cause the player to malfunction.
- Software Updates using the USB jack must be performed with a USB flash memory stick only.

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4.3. Deck Adjustment

- Deck Adjustment

  - You have to complete a Deck Adjustment after you replace the Main PCB Ass'y or Deck Ass'y

- Deck Replacement

  - We will not provide the P/U ass'y for 2013 Blu-ray repair, we will instead supply the full Deck ass'y for all Loader issues.

- Latest Firmware

  - It is recommended that you update the latest firmware to keep up with the most recent disc compatibility.

Deck Adjustment

- When

  - You have to complete a Deck Adjustment whenever after you replace the Main PCB Ass'y or Deck Ass'y

- Method

  - Step1 : Put the player in 'No Disc' status.
  - Step2 : Enter Home menu and press ‘5 3 7 8 7 8’ on the remote
  - Step3 : Insert a Blu-ray Disc
  - Step4 : Make sure the results are OK, if not then repeat the process.

  -> Tray will be opened automatically.

  -> You can use one of clean BD-ROM titles.

  -> You push the tray to insert the disc (do not use close key or button)

  -> You don’t need to play DVD.

  - Step5 : Eject the disc after Step 4
  - Step6 : Power off

<Step 1>

<Step 3>

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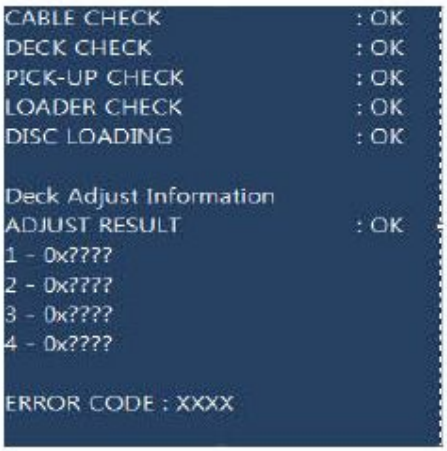

<Step 4>

HDD Replacement(only for BD-F8500)

- When
  - When you change HDD device, you have to format HDD.
- Method
  - Step1 : Copy 'HDD_FORMAT_FLAG', 'musicMetaDB.db' file to USB.
  - Step2 : Connect the USB to player.
  - Step3 : In the Menu screen, put “5 4 8 3 1” in order on remocon.
  - Step4 : In screen “HDD Format” character will be appeared, and then player will be rebooted.
  - Step5 : After Set reboots, in the Menu screen put “5 4 8 3 2” in order on remocon maintaining a connection with USB.
  - Step6 : On the VFD “DBCOPY” character will be appeared, and then player will be off.

Factory reset

- When
  - When you want reset device.
- Method
  - Step1 : Eject BD or DVD disc.
  - Step2 : Call the home menu.
  - Step3 : Press 'Stop' button on the touch panel during 5 seconds. - Step4 : Hold off the Stop button. Device will be turned off.

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5. PCB Diagrams

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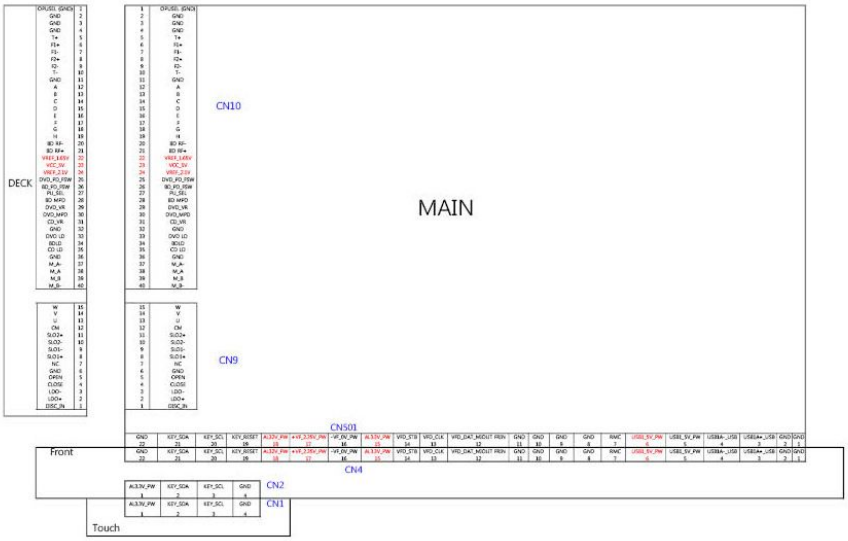
5.1. Wiring Diagram



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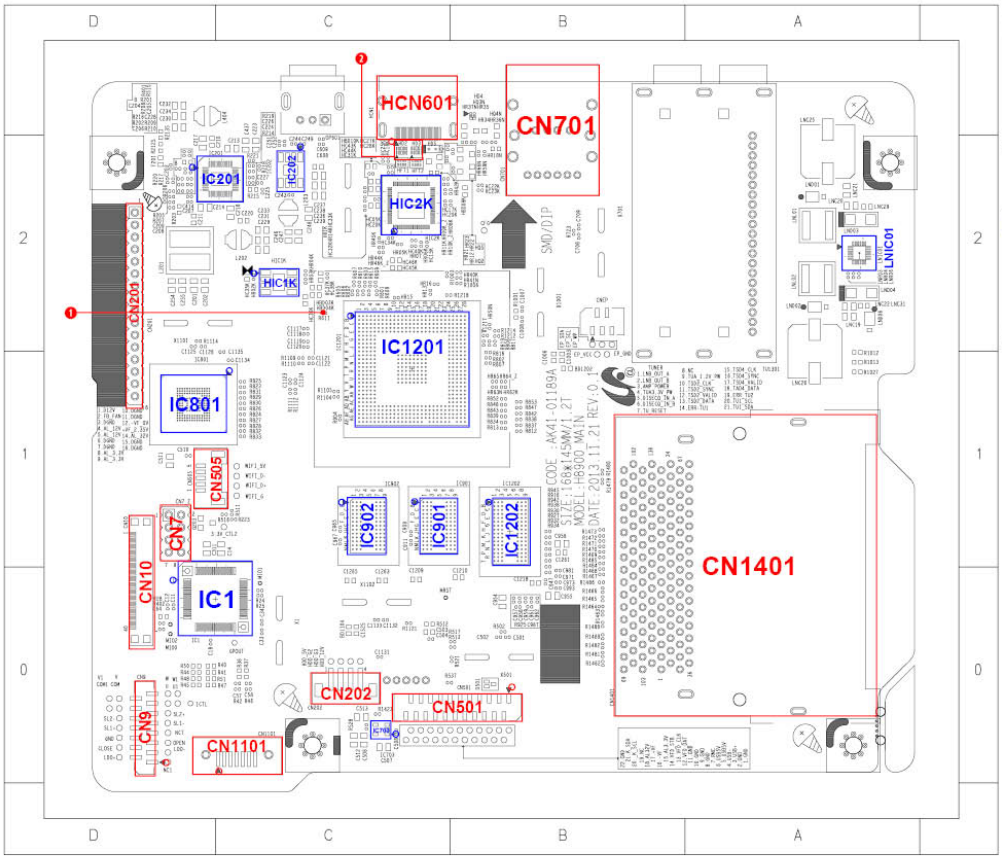
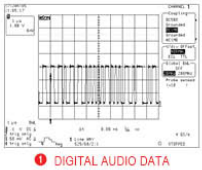
5.2. Main PCB

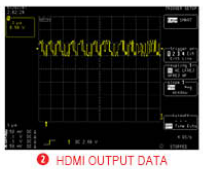
COMPONENT SIDE

LOC.NO	X-Y
CN1401	A-0
LNIC01	A-0
CN501	B-0
IC1202	B-1
CN701	B-2
IC703	C-0
CN202	C-0
CN1101	C-0
IC1202	C-0
IC901	C-1
IC902	C-1
IC1201	C-1
HIC1K	C-2
HIC2K	C-2
IC202	C-2
IC201	C-2
HCN601	C-2
CN9	D-0
CN10	D-0
CN701	D-1
CN505	D-1
IC801	D-1
CN201	D-1





❶ DIGITAL AUDIO DATA
R611



❷ HDMI OUTPUT DATA
HD2 & HD3 (pin 6,7,9,10)

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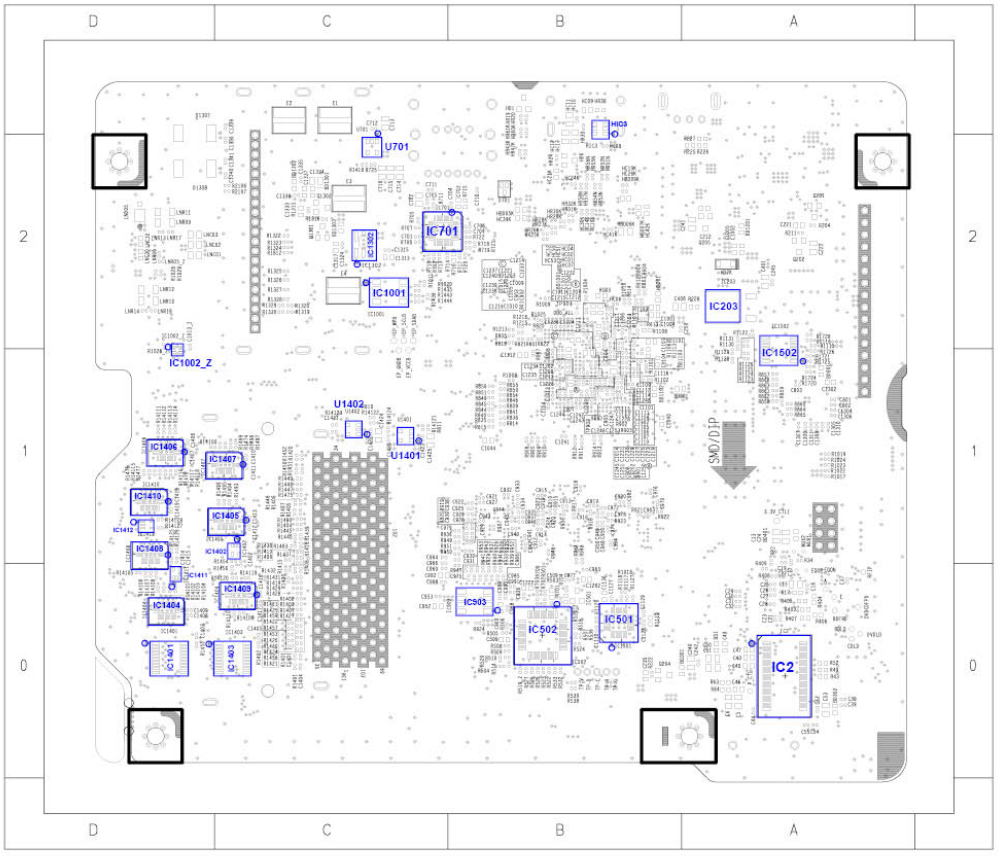
CONDUCTOR SIDE



LOC.NO	X-Y
IC2	A-0
IC1502	A-1
IC203	A-2
IC501	B-0
IC502	B-0
IC903	B-0
HIC3	B-2
IC701	B-2
IC1403	C-0
IC1409	C-0
IC1402	C-1
U1401	C-1
U1402	C-1
IC1405	C-1
IC1407	C-1
IC1001	C-2
IC1302	C-2
U701	C-2
IC1401	D-0
IC1404	D-0
IC1411	D-0
IC1408	D-0
IC1412	D-1
IC1410	D-1
IC1406	D-1
IC1002_Z	D-1

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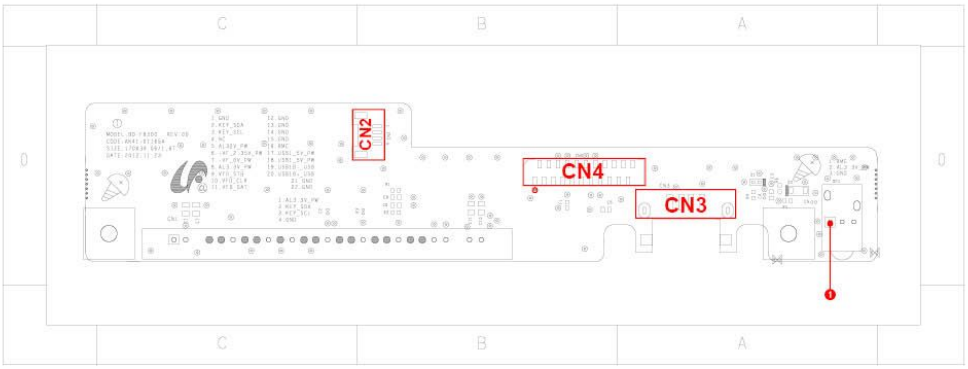
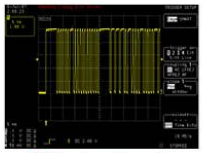
5.3. Front PCB

COMPONENT SIDE

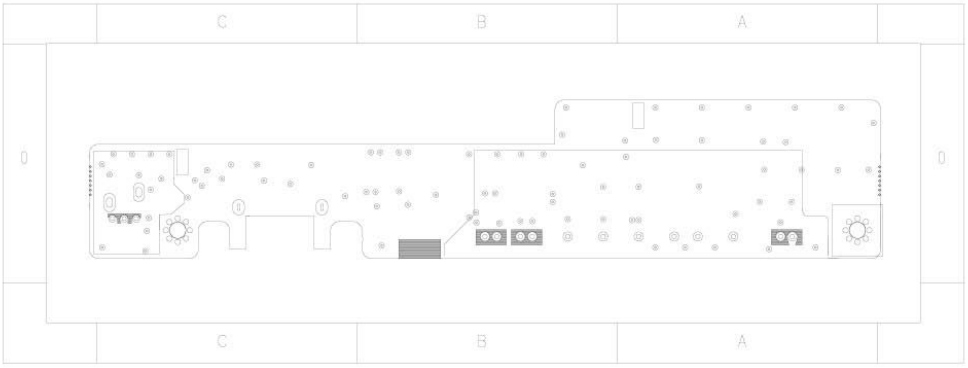




❶ Remote control eye data
OP1 Pin1

LOC.NO	X-Y
CN3	A-0
CN4	A-0
CN2	B-0

CONDUCTOR SIDE



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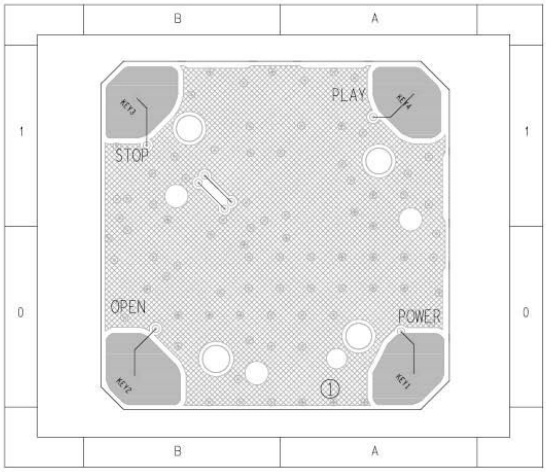
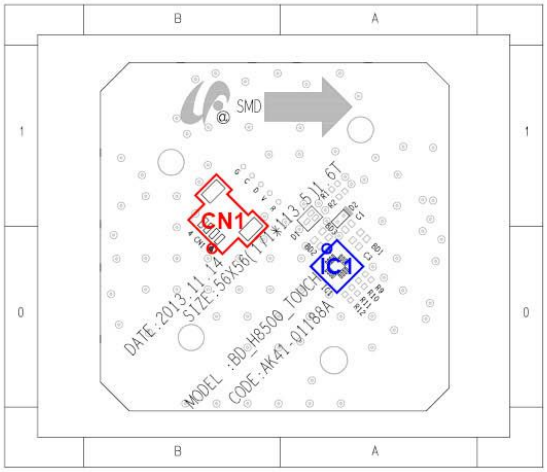
5.4. Touch PCB

COMPONENT SIDE



CONDUCTOR SIDE



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6. Schematic Diagrams

NOTE

- For schematic Diagram
  - Resistors are in ohms, 1/8W unless otherwise noted.

NOTE

Do not use the part number shown on this drawing for ordering. The correct part number is shown in the parts list (may be slightly different or amended since this drawing was prepared).

CAUTION

Most semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the “electrostatically sensitive (ES) devices” section of this service manual.

WARNING

Components identified with the mark have the special characteristics for safety. When replacing any of these components. Use only the same type.

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6.1. All Block Diagram

Block Diagram (BD-H8500)

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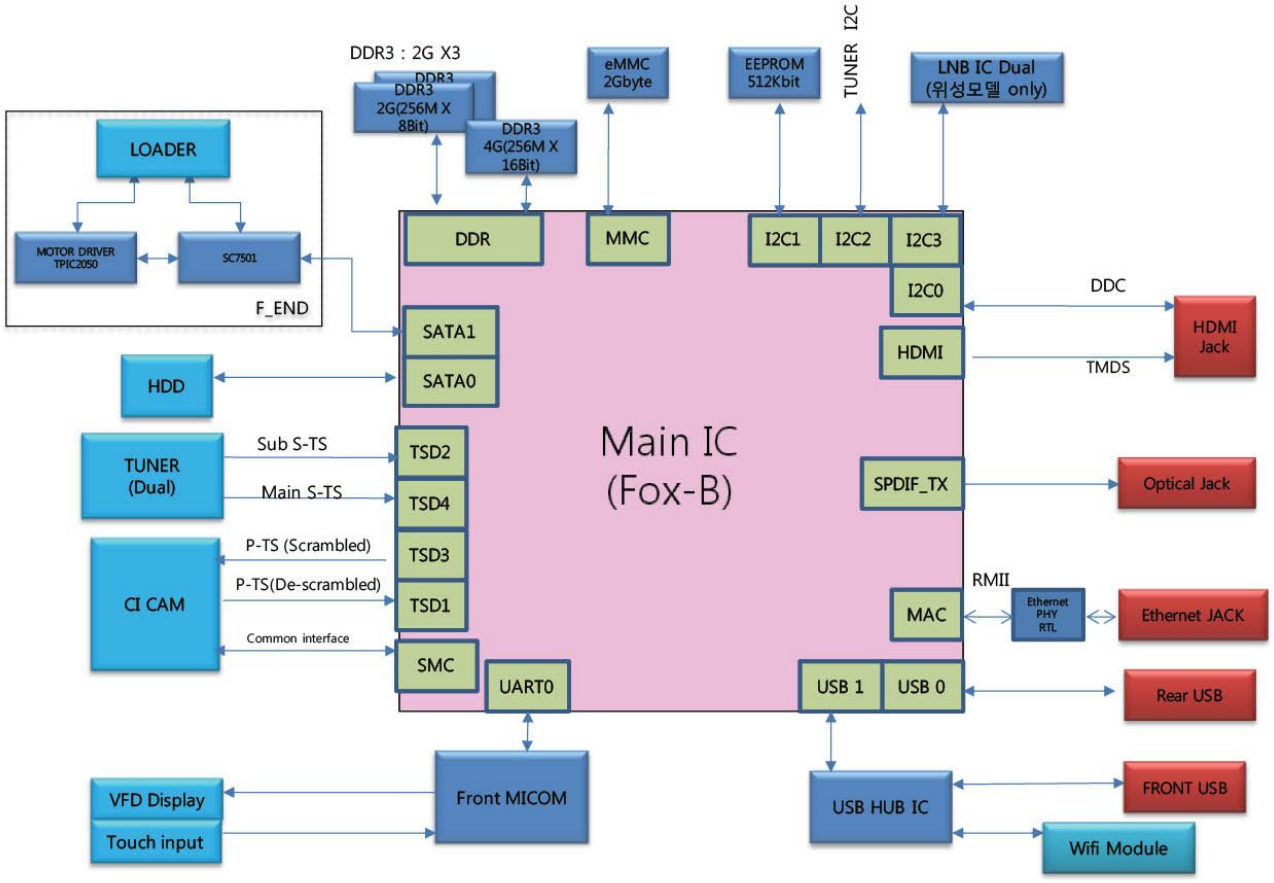

Block Diagram (BD-H8900)

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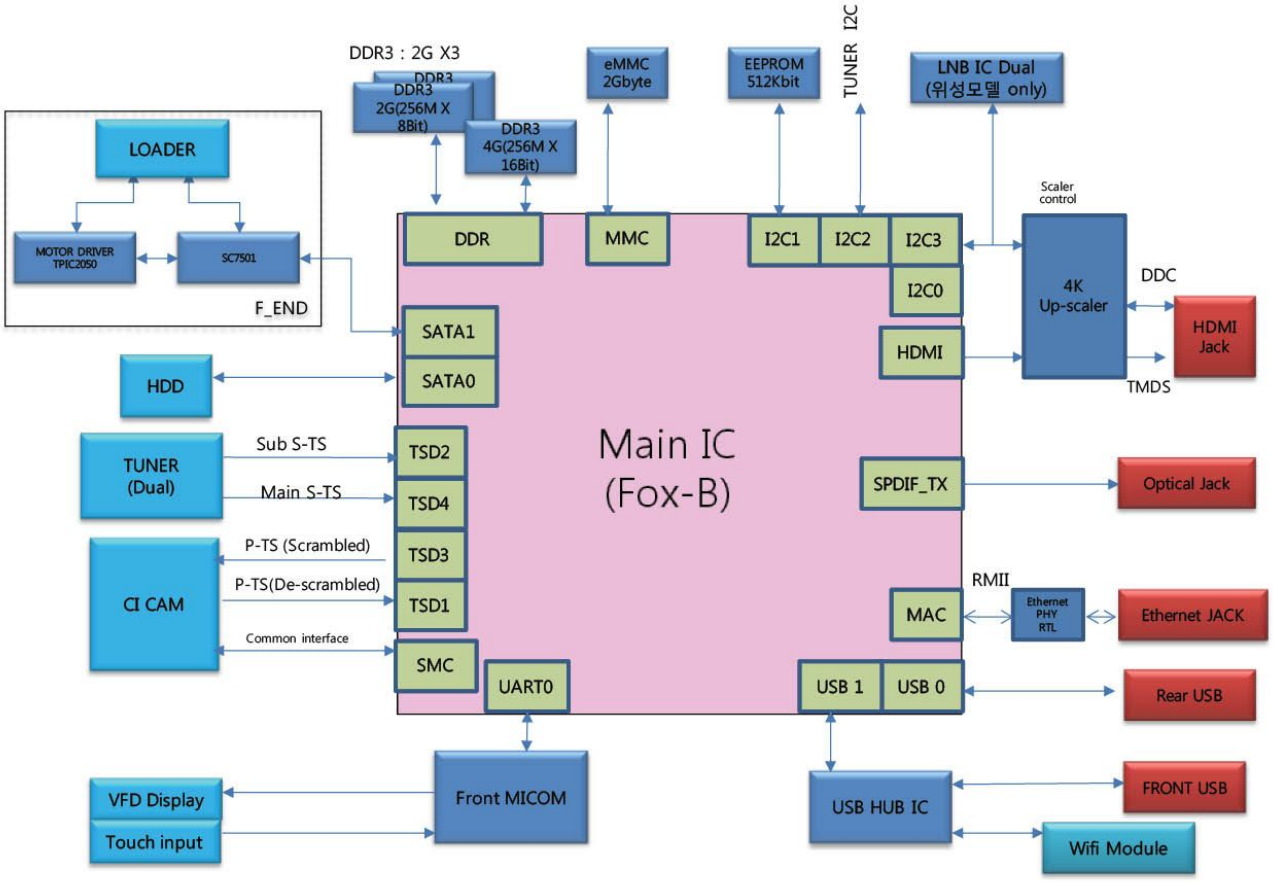

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6.2. Power

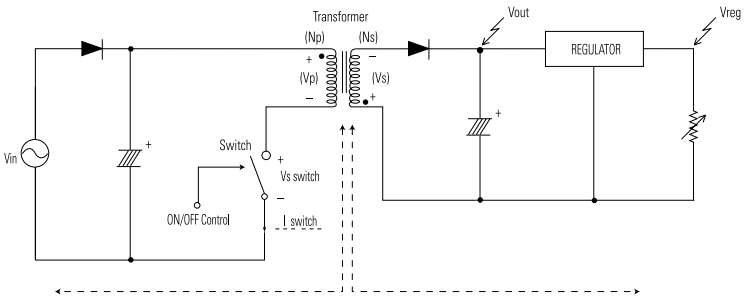
6.2.1. About S.M.P.S (Ringing Choke Converter Method)

Terms

1) 1st : Common power input to 1st winding.
2) 2nd : Circuit followings output winding of transformer.
3) f (Frequency) : Switching frequency (T : Switching cycle)
4) Duty : (Ton/T) x 100

6.2.2. Circuit descripcotion [FLY-Back RCC(Ringing Choke Converter)] Control

1) AC Power Rectification/Smoothing Terminal
   a) BD01 ~ 04 : Convert AC power to DC(Wave rectification).
   b) C1S05B : Smooth the voltage converted to DC.
   c) L1S01, C1S03, C1S04 : Noise removal at power input/output.
   d) R1S02 : Rush current limit resistance at the moment of power cord insertion.
   Without P1S02, the bridge diode might be damaged as the rush current increases.



2) SNUBBER Circuit : D1S10, C1S10, R1S10
   a) Prevent residual high voltage at the terminals of switch during switch off/Suppress noise. High inverted power occurs at switch off, because of the 1st winding of transformer : (V=-L1 xdi/dt. L1 : Leakage Induction) A very high residual voltage exist on both terminals of IC1 because dt is a very short.
   b) SNUBBER circuit protects IC1 from damage through leakage voltage suppression by RC, (Charges the leakage voltage to DIS10 and CIS10 and discharges to R1S10).

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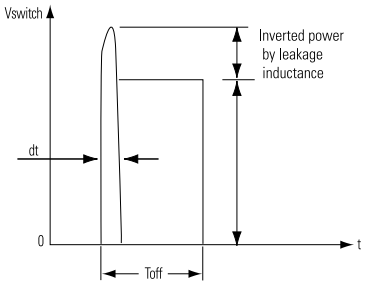


3) IC1S01 Vcc circuit

a) ICIS01, RIS05, RIS07,RIS08 : ICIS01 driving resistance (ICIS01 works through driving resistance at power cord in)

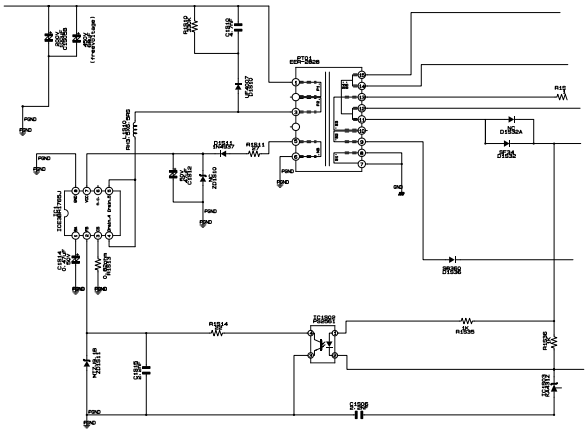
b) ICIS01 Vcc : RIS05, RIS07, RIS08

i) Use the output of transformer as Vcc, because the current starts to flow into transformer while ICIS01 is active

ii) Rectify to DIS07 and smooth to CIS09.

iii) Use the output of transformer as ICIS01 Vcc : The loads are different before and after ICIS01 driving. (Vcc of ICIS01 decreases below OFF voltage , using only the resistance dut to lode increase after ICIS01 driving.)

4) Feedback Control Circuit



a) F/B Terminal of IC1 determines output duty cycle.

b) C-E (Collector-Emitter) of and F/B potential of PQIZ1 are same.

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6.2.3. Internal Block Diagram (Internal Block Diagram of S.M.P.S Circuit)

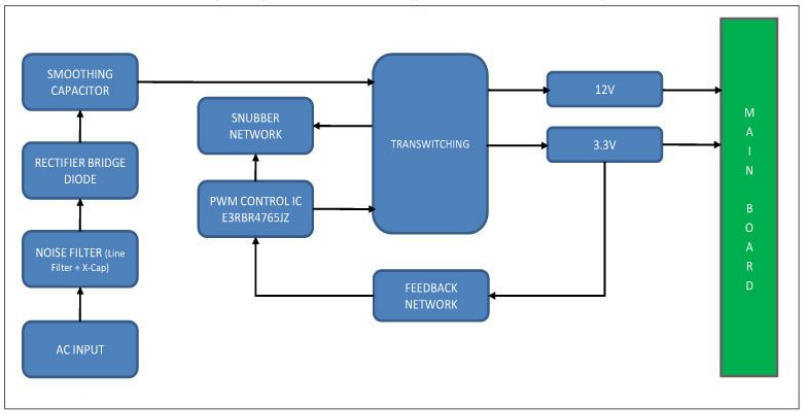

Fig. 7-4

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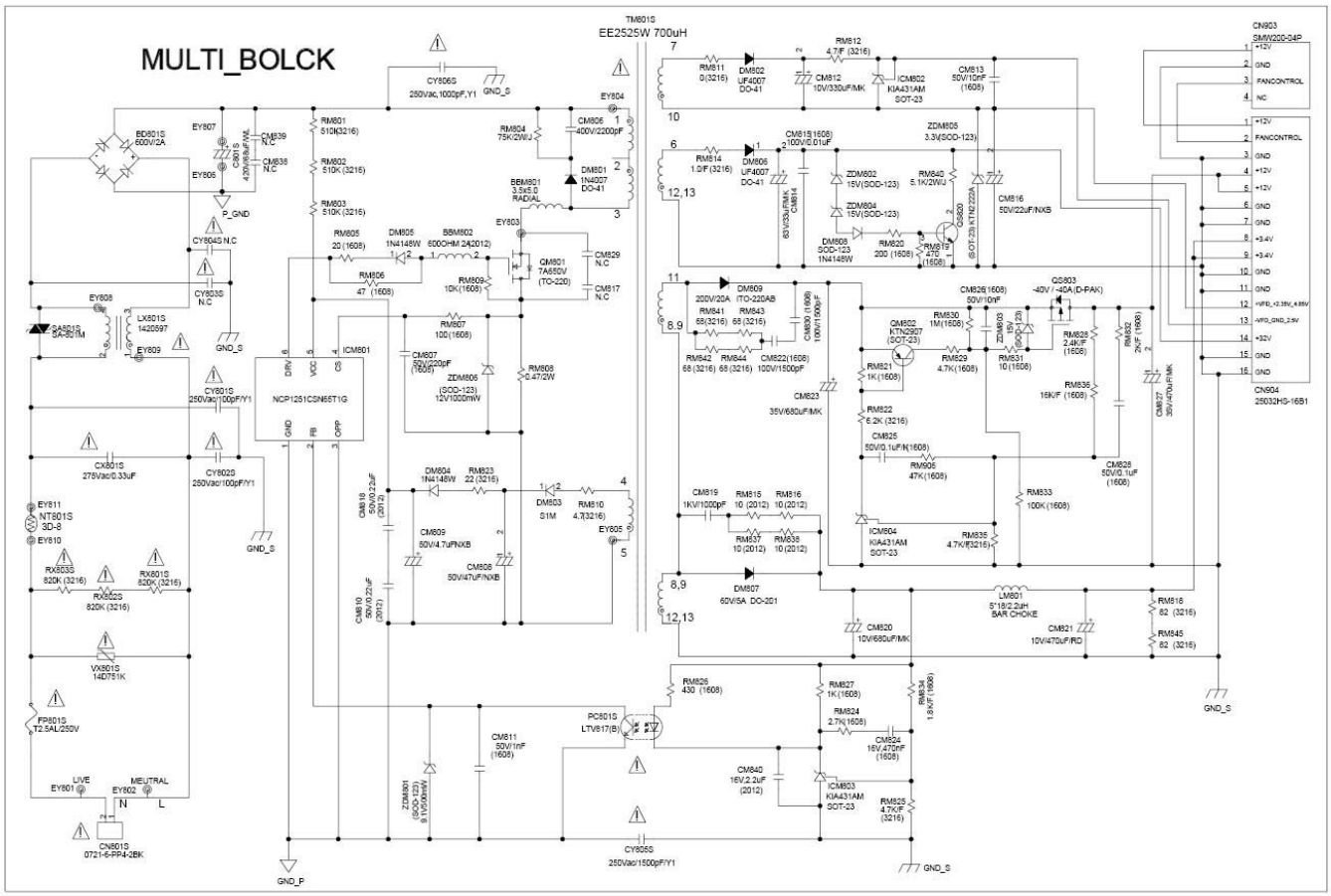
6.3. S.M.P.S (S.M.P.S PCB)



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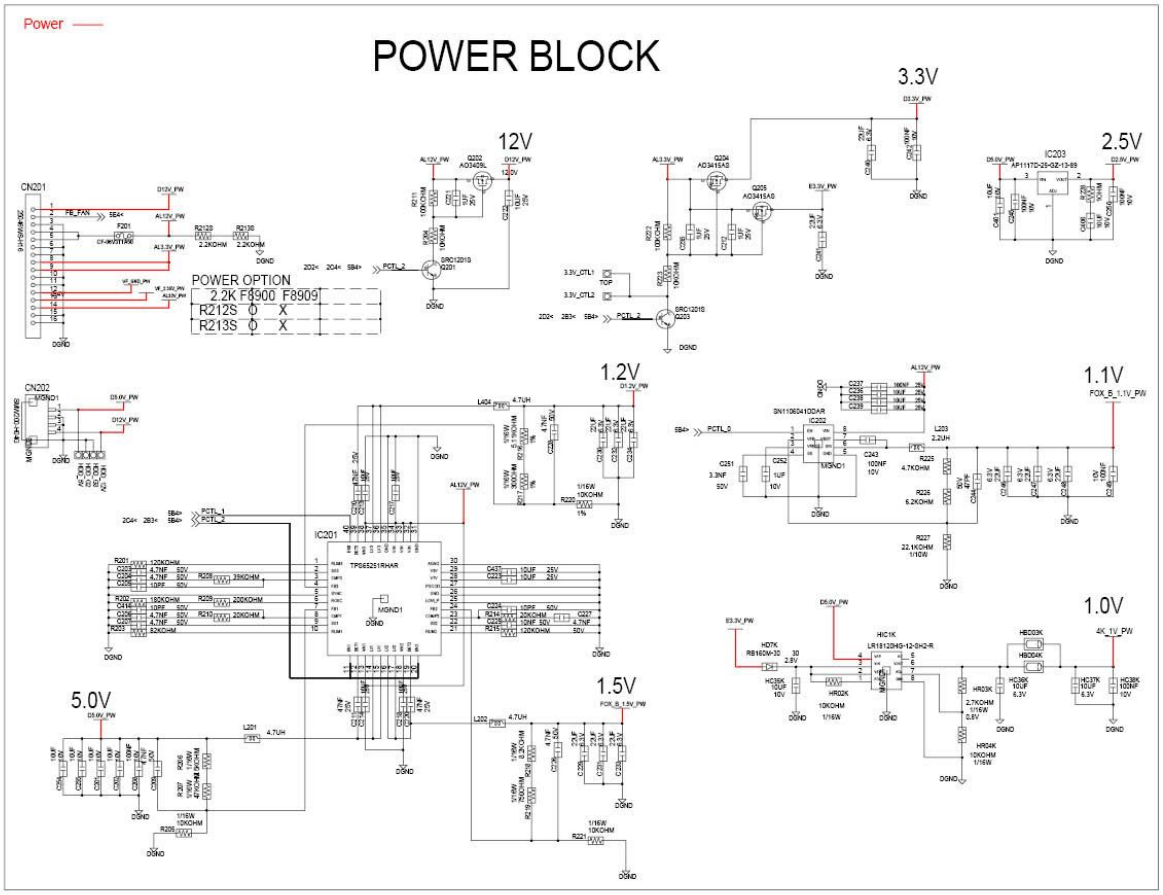
6.4. Power Block (Main PCB)



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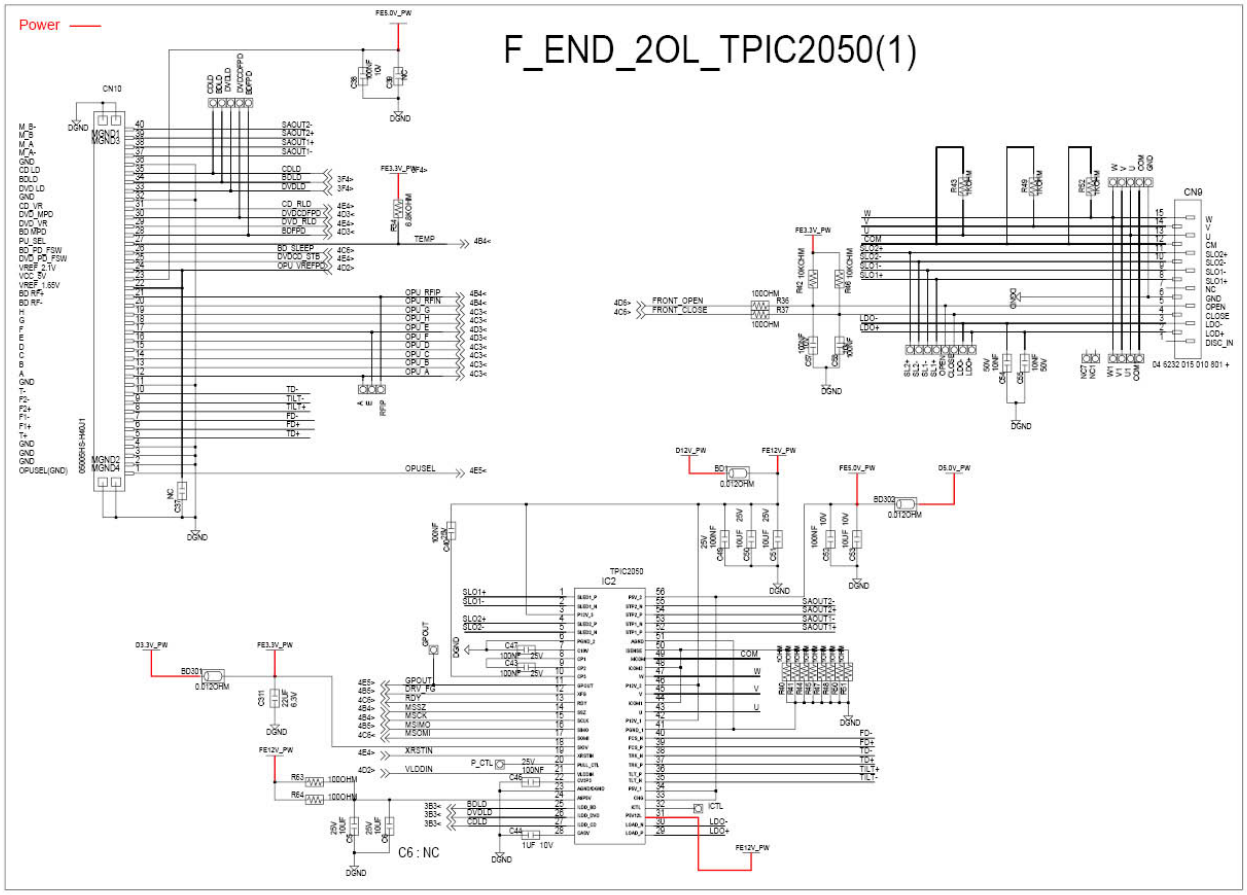
6.5. Front End SC7501 1 (Main PCB)



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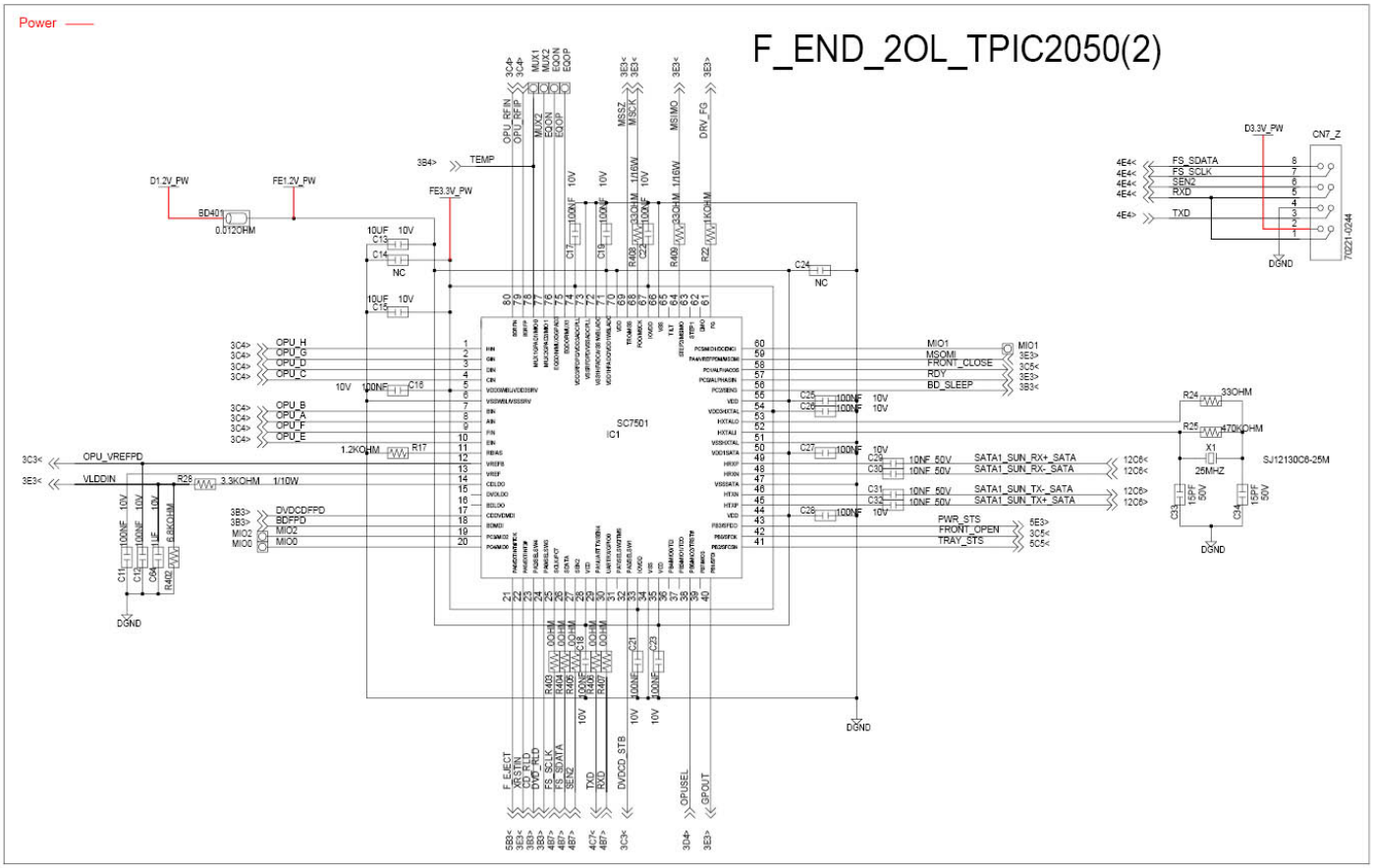
6.6. Front End SC7501 2 (Main PCB)



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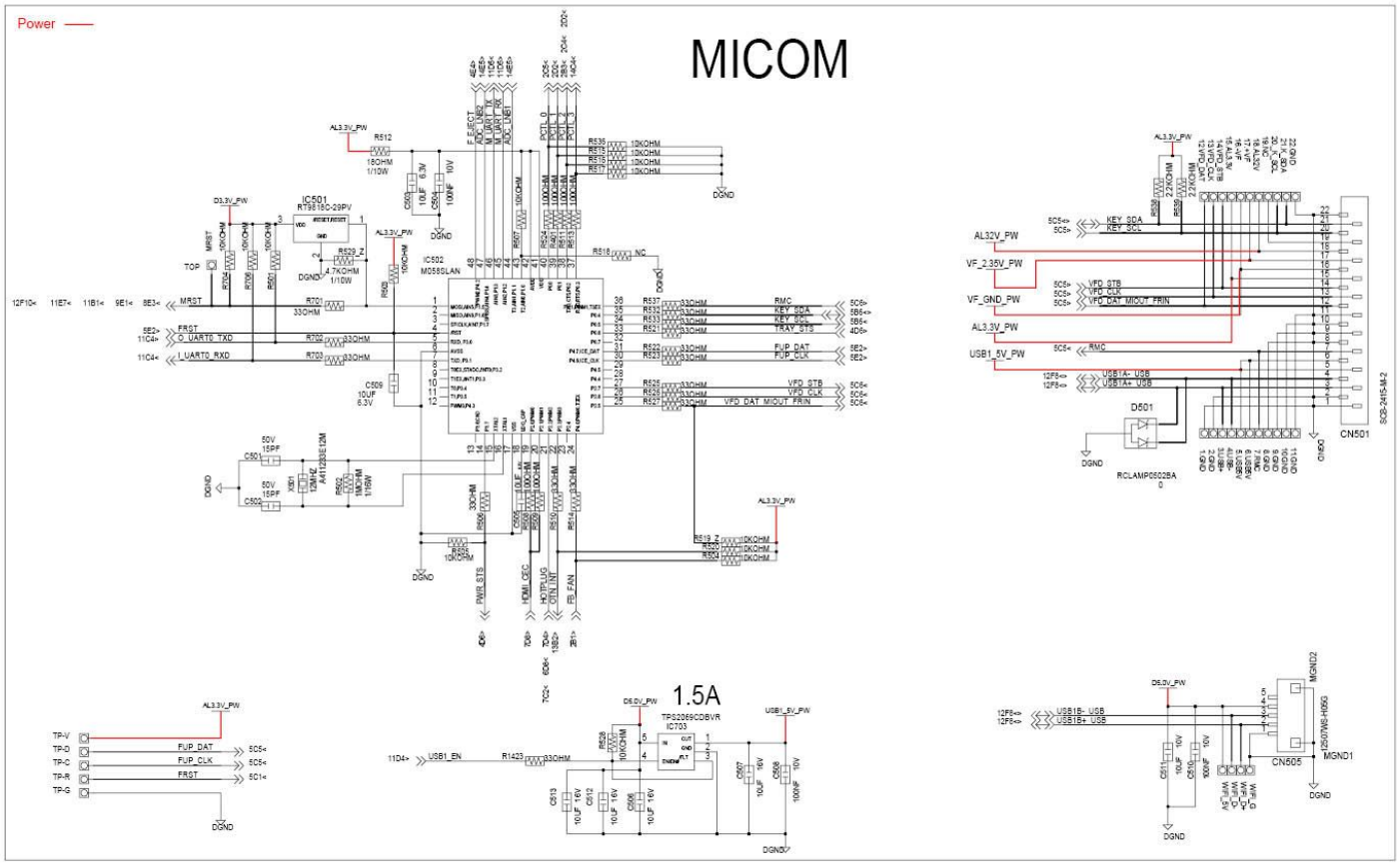
6.7. F_ Micom (Main PCB)



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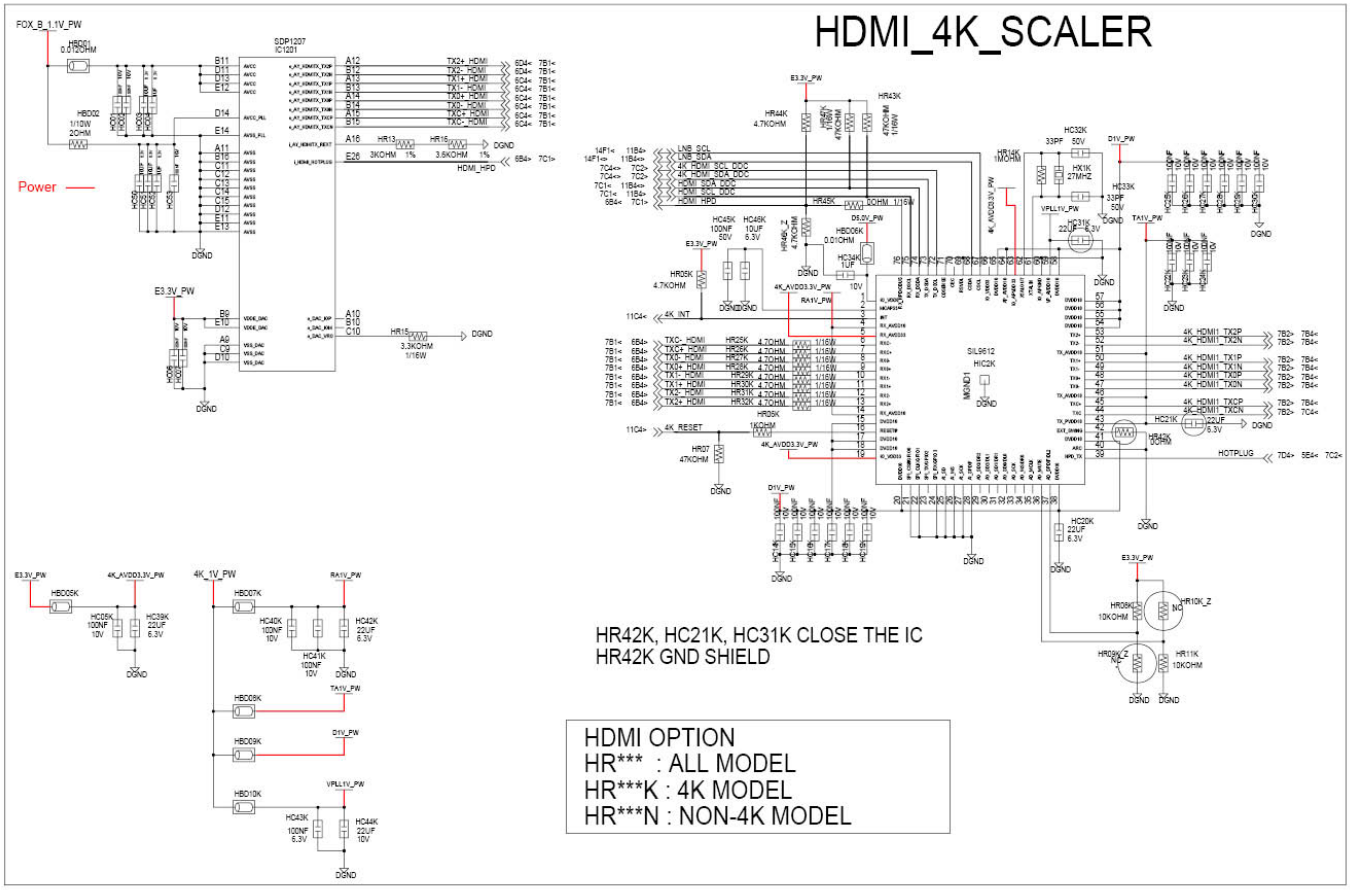
6.8. HDMI 4K UPSCALER (Main PCB)



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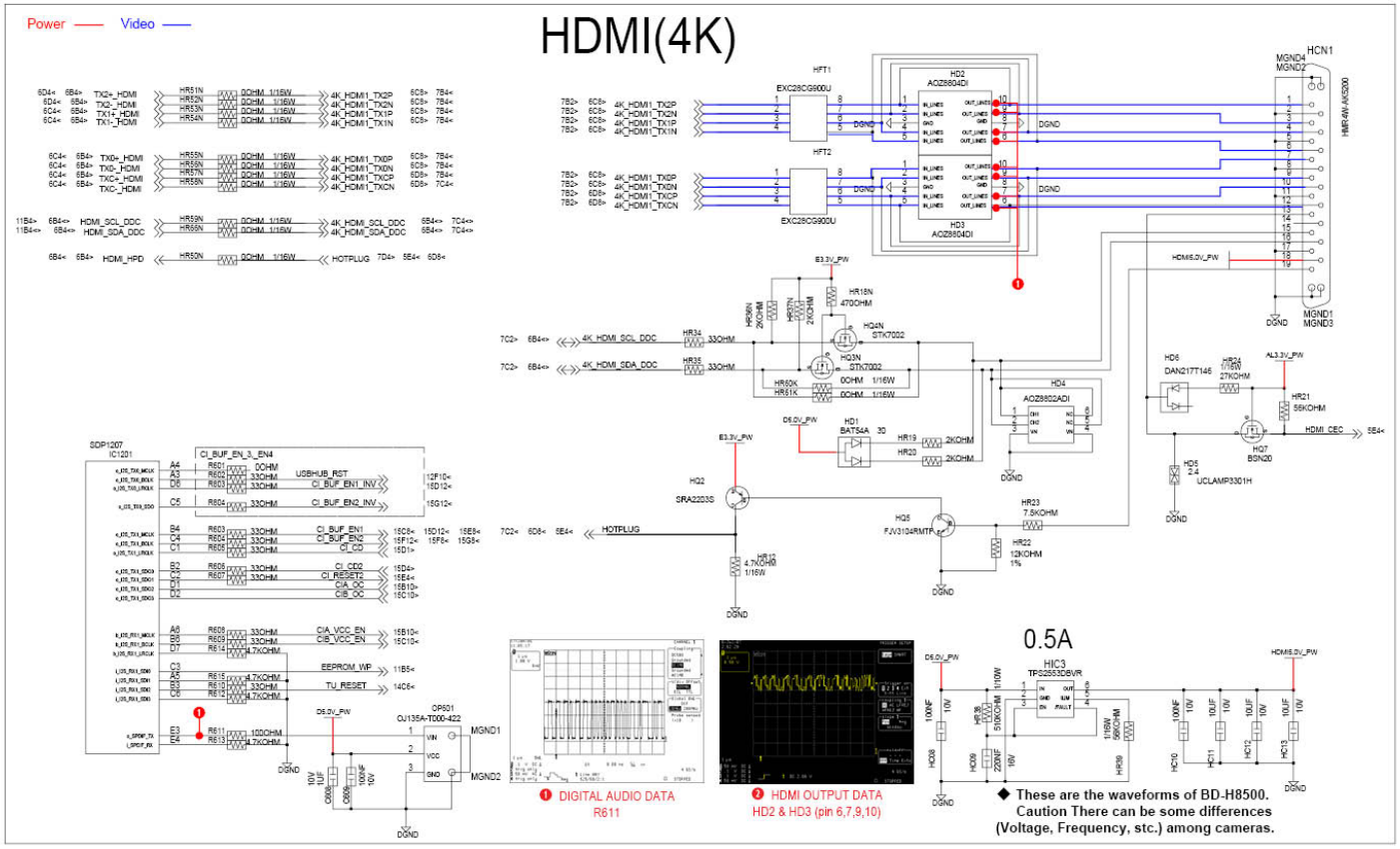
6.9. HDMI_GPIO (Main PCB)



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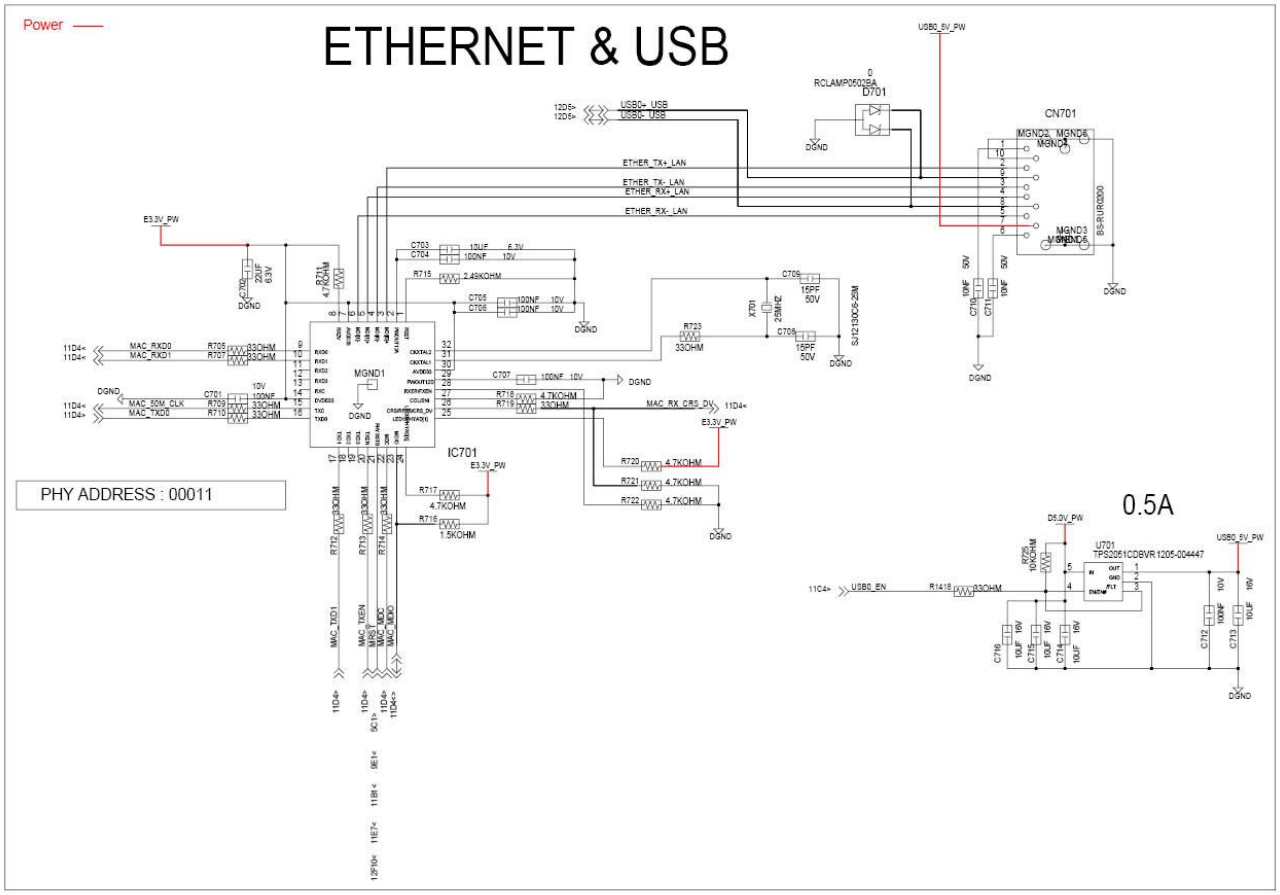
6.10. Ethernet_USB (Main PCB)



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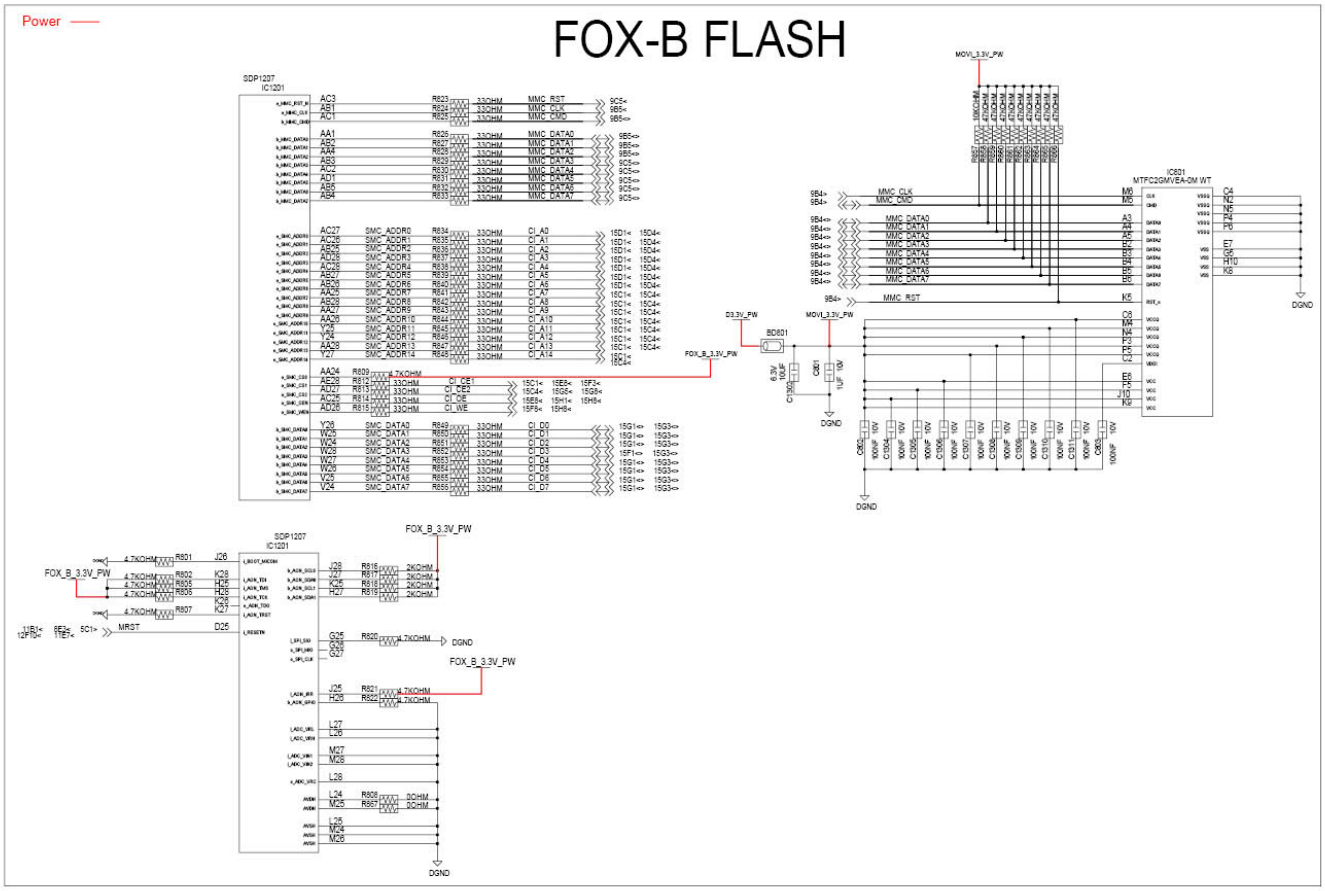
6.11. FOX-B MMC Flash (Main PCB)



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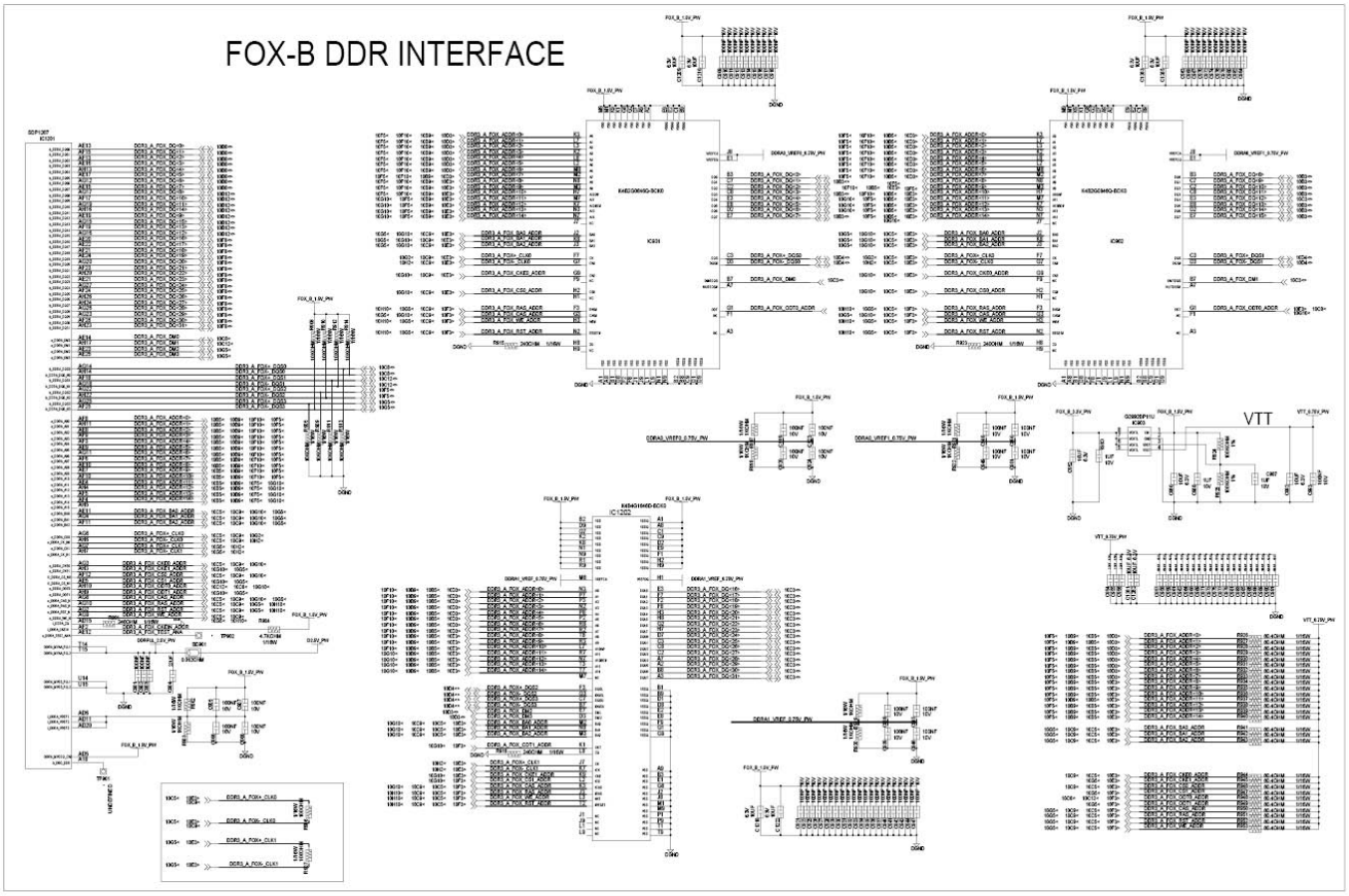
6.12. FOX-B DDR3 (Main PCB)



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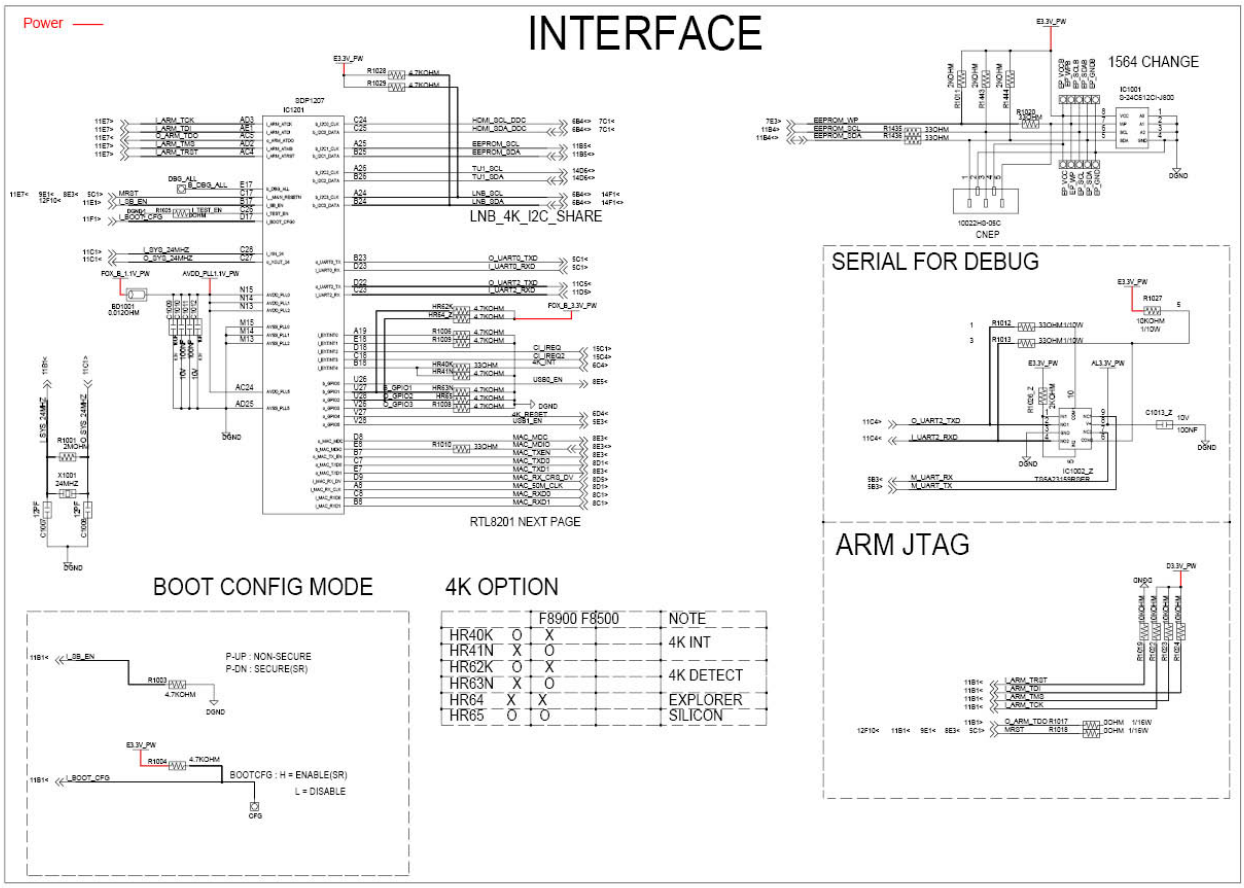
6.13. FOX-B Interface (Main PCB)



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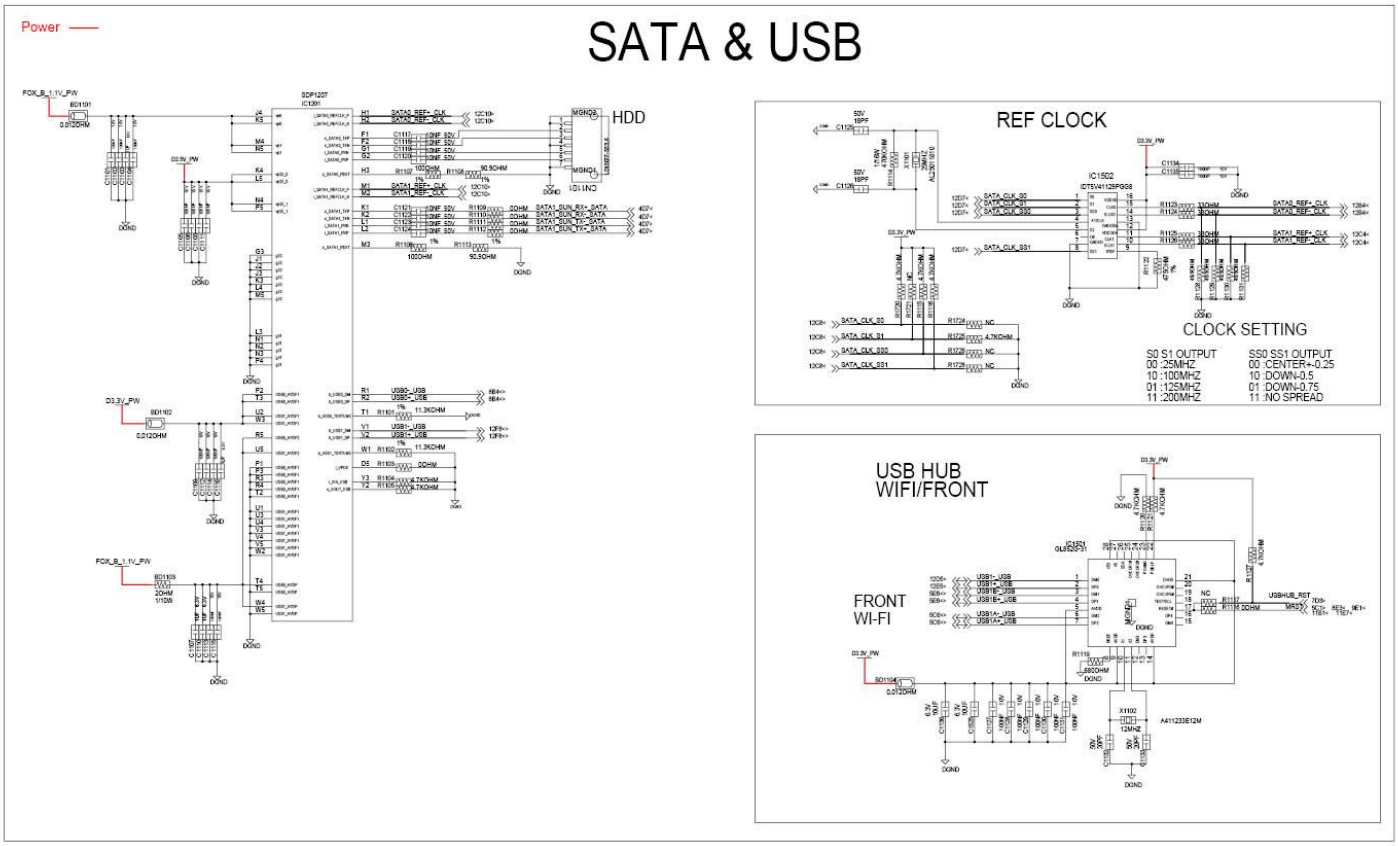
6.14. SATA_USB (Main PCB)



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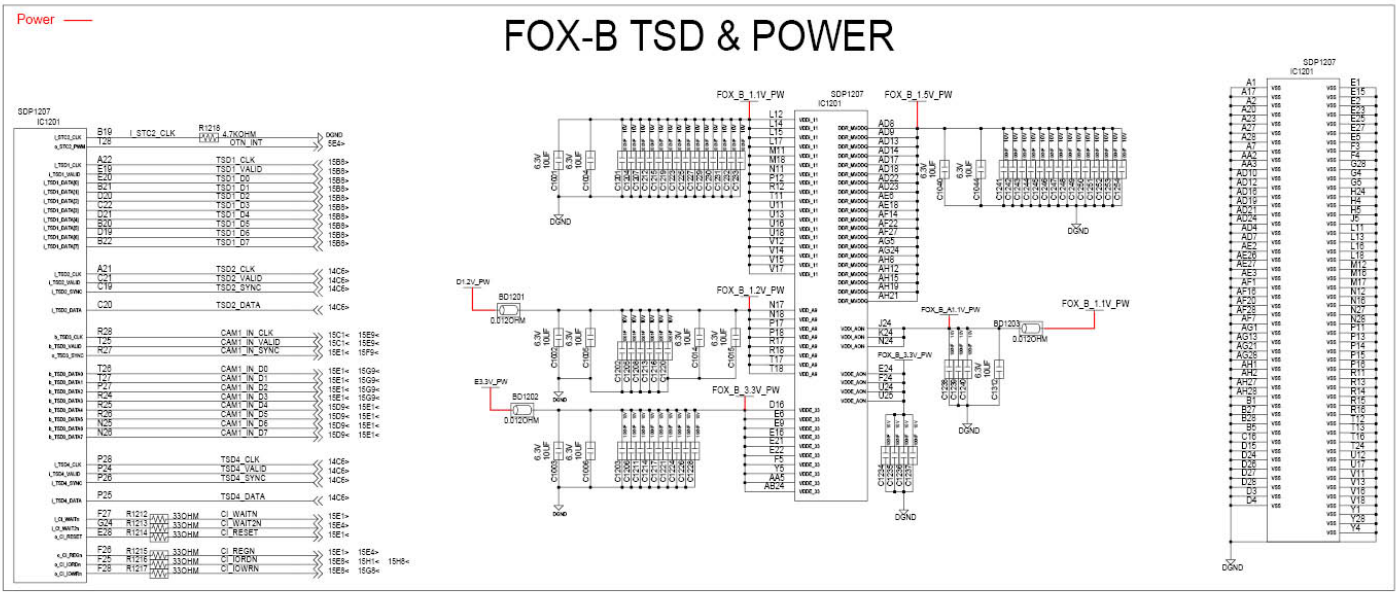
6.15. TSD_Power (Main PCB)



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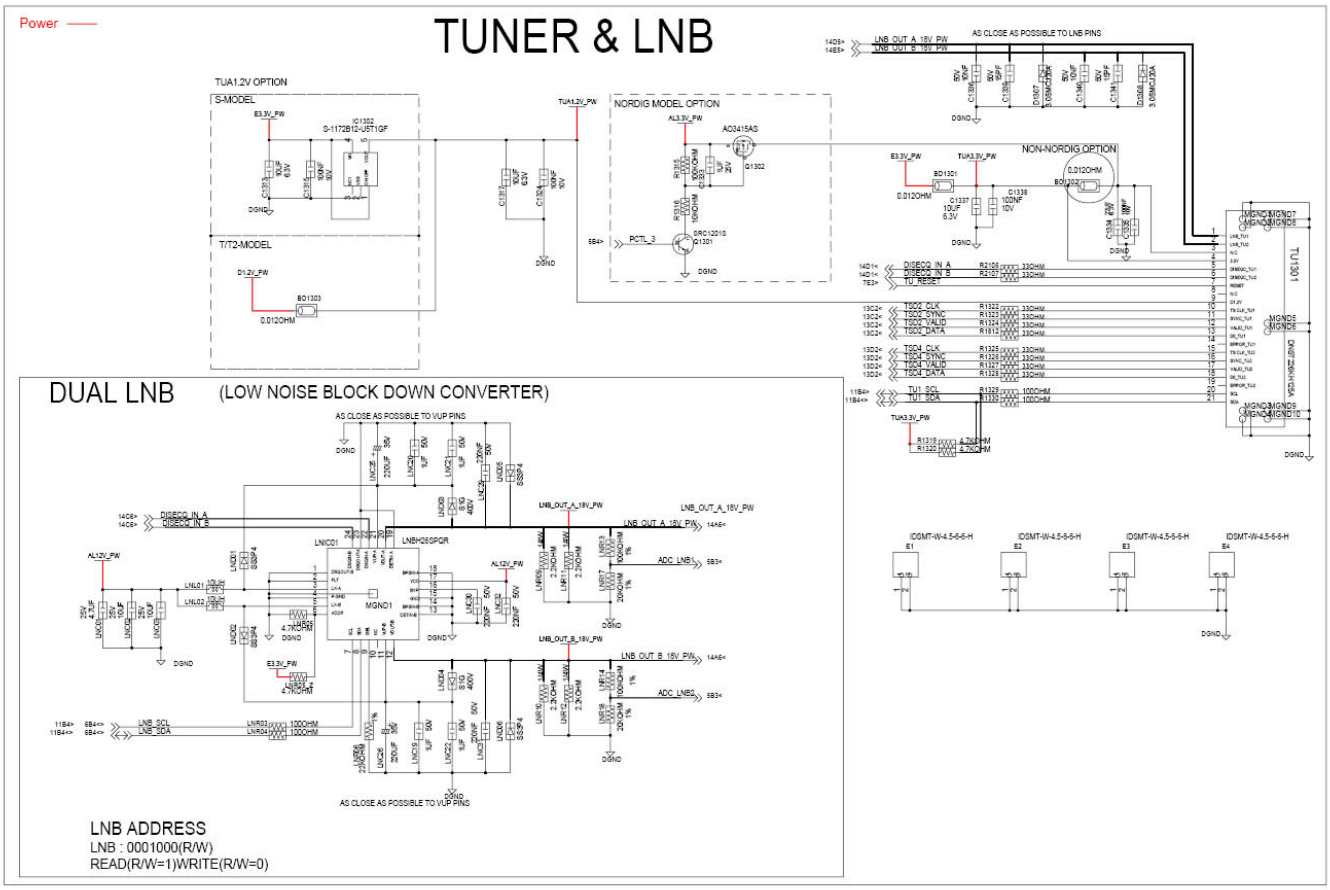
6.16. Tuner_LNB (Main PCB)



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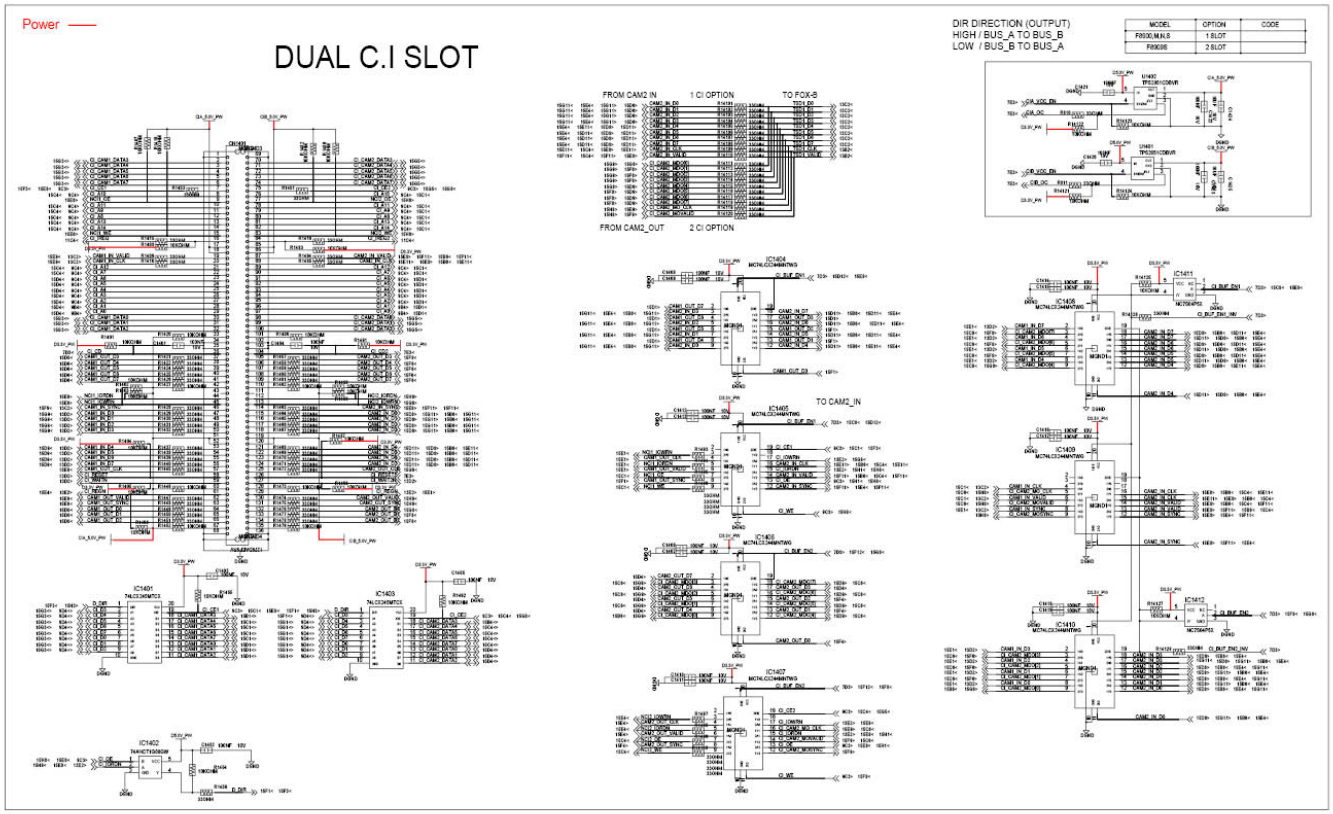
6.17. CI (Main PCB)



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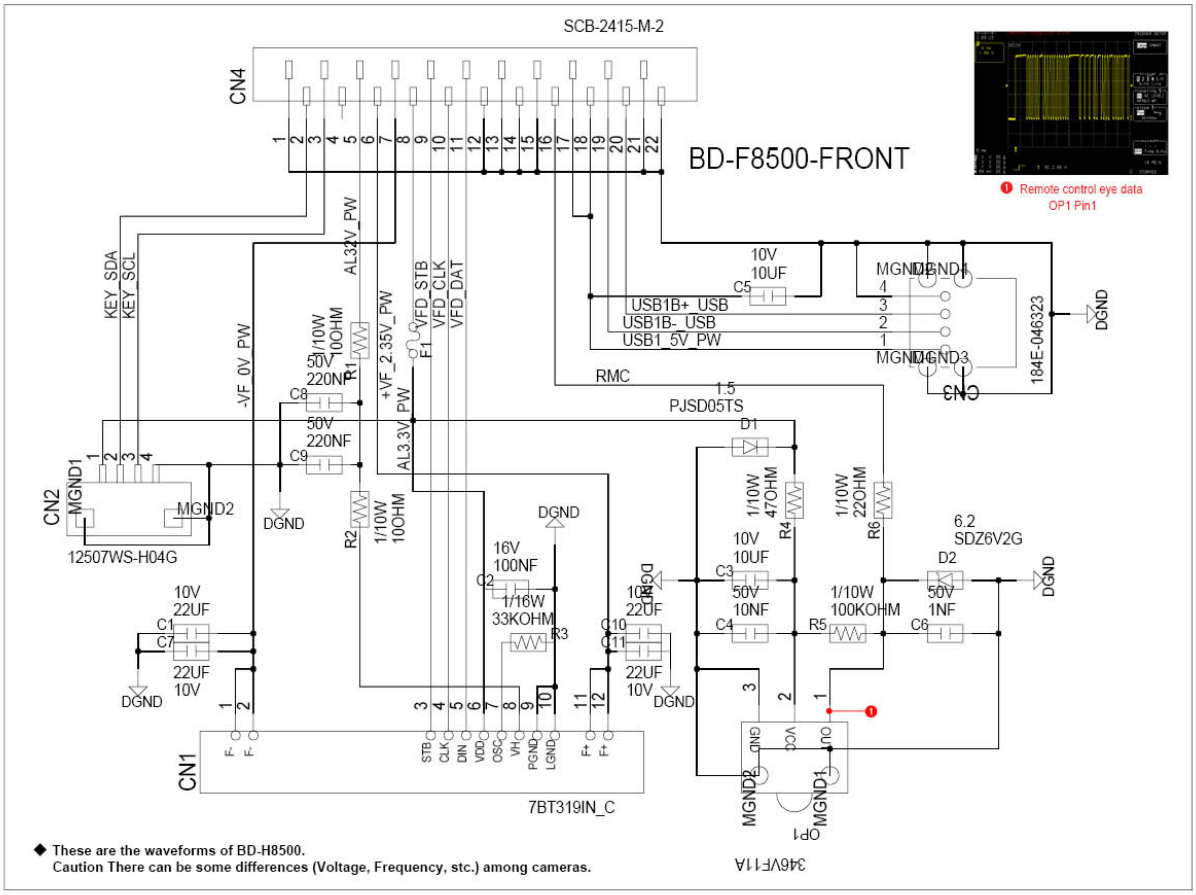
6.18. Front (Front PCB)



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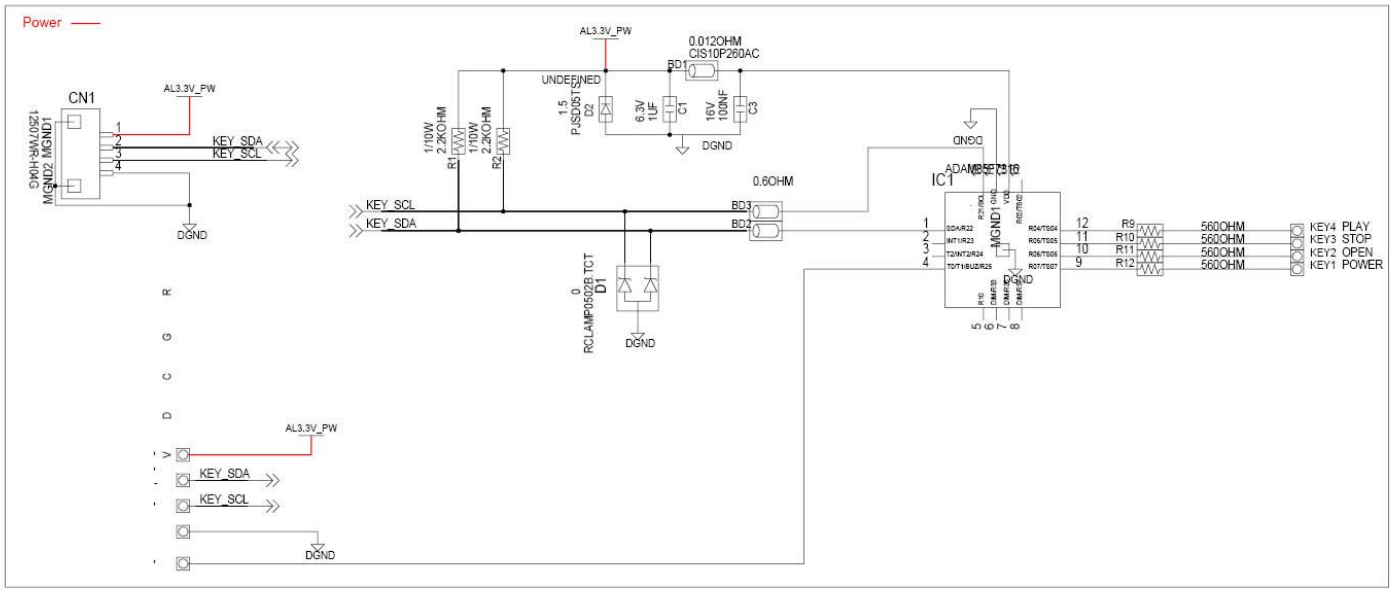
6.19. Touch (Touch PCB)



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