Home Theater BD Player HTB3510/12/98/X78/40/94/51/93/55

Service
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Service Manual

TABLE OF CONTENTS Page

CLASS 1 LASER PRODUCT

GB 3141 785 39181

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Version 1.1

PHILIPS

PCB Board Locations

VERSION VARIATIONS

Type / Versions / Board in used / Service Policy	HTB3510							
	/12	/98	X/78	/40	/94	/51	/93	/55
MAIN BOARD	M+C	M+C	M+C	M+C	M+C	M+C	M+C	M+C
POWER BOARD	M+C	M+C	M+C	M+C	M+C	M+C	M+C	M+C
AMPLIFIER BOARD	M+C	M+C	M+C	M+C	M+C	M+C	M+C	M+C
FRONT CONTROL BOARD	M+C	M+C	M+C	M+C	M+C	M+C	M+C	M+C
LOADER	M	M	M	M	M	M	M	M

＊Tips：	C -- Component Lever Repair M -- Module Lever Repair X -- Used

Product specifications

Note

- Specifications and design are subject to change without notice.

Region codes

The type plate on the back or bottom of the home theater shows which regions it supports.

Country	DVD	BD
Europe, United Kingdom	ALL 2	B
Asia Pacific, Taiwan, Korea	ALL 3	A
Latin America	ALL 4	A
Australia, New Zealand	ALL 4	B
Russia, India	ALL 5	C
China	ALL 6	C

Media formats

- AVCHD, BD, BD-R/ BD-RE, BD-Video, DVD-Video, DVD+R/+RW, DVD-R/-RW, DVD+R/-R DL, CD-R/CD-RW, Audio CD, Video CD/SVCD, Picture files, MP3 media, WMA media, DivX Plus HD media, USB storage device

File formats

- Audio:
  - .aac, .mka, .mp3, .wma, .wav, .mp4, .m4a, .flac, .ogg
  - .ra (Available only in Asia Pacific and China)
- Video:
  - .avi, .divx, .mp4, .m4v, .mkv, .asf, .wmv, .m2ts, .mpg, .mpeg, .flv, .3gp
  - .rmvb, .rm, .rv (Available only in Asia Pacific and China)
- Picture: .jpg, .jpeg, .jpe, .gif, .png

Audio formats

Your home theater supports the following audio files.

(. ra files are supported only in Asia Pacific and China)

Extension	Container	Audio codec	Bit rate
.mp3	MP3	MP3	Upto 320 kbps
.wma	ASF	WMA	Upto 192 kbps
.aac	AAC	AAC, HE-AAC	Upto 192 kbps
.wav	WAV	PCM	27.648 Mbps
.m4a	MKV	AAC	192 kbps
.mka	MKA	PCM	27.648 Mbps
		Dolby Digital	640 kbps
		DTS core	1.54 Mbps
		MPEG	912 kbps
		MP3	Upto 320 kbps
		WMA	Upto 192 kbps

		AAC, HE-AAC	Upto 192 kbps
.ra	RM	AAC, HE-AAC	Upto 192 kbps
		Cook	96469 bps
.flac	FLAC	FLAC	Upto 24 bps
.ogg	OGG	Vorbis	Variable bit rate, maximum block size 4096
		MP3	Upto 320 kbps

Video formats

If you have a high definition TV, your home theater allows you to play your video files with:

- Resolution: 1920 x 1080 pixels at
- Frame rate: 6 ~ 30 frames per second.

.avi files in AVI container

Audio codec	Video codec	Bit rate
PCM, Dolby Digital, DTS core, MP3, WMA	DivX 3.11, DivX 4.x, DivX 5.x, DivX 6.x	10 Mbps max
	MPEG 1, MPEG 2	40 Mbps
	MPEG 4 SP / ASP	38.4 Mbps
	H.264/AVC upto HiP@4.2	25 Mbps
	WMV9	45 Mbps

.divx files in AVI container

Audio codec	Video codec	Bit rate
PCM, Dolby Digital, MP3, WMA	DivX 3.11, DivX 4.x, DivX 5.x, DivX 6.x	10 Mbps max

.mp4 or .m4v files in MP4 container

Audio codec	Video codec	Bit rate
Dolby Digital, MPEG, MP3, AAC, HE-AAC, DD+	MPEG 1, MPEG 2	40 Mbps
	MPEG 4 ASP	38.4 Mbps
	H.264/AVC HiP@4.2	25 Mbps

.mkv files in MKV container

Audio codec	Video codec	Bit rate
PCM, Dolby Digital, DTS core, MPEG, MP3, WMA, AAC, HE-AAC, DD+	DivX Plus HD	30 Mbps
	MPEG 1, MPEG 2	40 Mbps
	MPEG 4 ASP	38.4 Mbps
	H.264/AVC HiP@4.2	25 Mbps
	WMV9	45 Mbps

.m2ts files in MKV container

Audio codec	Video codec	Bit rate
PCM, Dolby Digital, DTS core, MPEG, MP3, WMA, AAC, HE-AAC, DD+	MPEG 1, MPEG 2	40 Mbps
	MPEG 4 ASP	38.4 Mbps
	H.264/AVC HiP@4.2	25 Mbps
	WMV9	45 Mbps

.asf and .wmv files in ASF container

Audio codec	Video codec	Bit rate
Dolby Digital, MP3, WMA, DD+	MPEG 4 ASP	38.4 Mbps
	H.264/AVC HiP@4.2	25 Mbps
	WMV9	45 Mbps

.mpg and .mpeg files in PS container

Audio codec	Video codec	Bit rate
PCM, DTS core, MPEG, MP3	MPEG 1, MPEG 2	40 Mbps

.flv files in FLV container

Audio codec	Video codec	Bit rate
MP3, AAC	H.264/AVC upto HiP@4.2	25 Mbps
	H.263	38.4 Mbps

.3gp files in 3GP container

Audio codec	Video codec	Bit rate
AAC, HE-AAC	MPEG 4 ASP	38.4 Mbps
	H.264/AVC upto HiP@4.2	25 Mbps max

.rm, .rv, and .rmvb files in RM container (Available only in Asia Pacific and China)

Audio codec	Video codec	Bit rate
AAC, COOK	RV30, RV40	40 Mbps

Amplifier

- Total output power: 1000W RMS (30% THD)
- Frequency response: 20 Hz-20 kHz / ±3 dB
- Signal-to-noise ratio: > 65 dB (CCIR) / (A-weighted)
- Input sensitivity:
  - AUX: 2 V
  - AUDIO IN: 1 V

Video

- Signal system: PAL / NTSC
- HDMI output: 480i/576i, 480p/576p, 720p, 1080i, 1080p, 1080p24

Audio

- S/PDIF Digital audio input:
  - Coaxial: IEC 60958-3
  - Optical: TOSLINK
- Sampling frequency:
  - MP3: 32 kHz, 44.1 kHz, 48 kHz
  - WMA: 44.1 kHz, 48 kHz
- Constant bit rate:
  - MP3: 32 kbps - 320 kbps
  - WMA: 48 kbps - 192 kbps

Radio

- Tuning range:
  - Europe/Russia/China: FM 87.5-108 MHz (50 kHz)
  - Asia Pacific/Latin America: FM 87.5-108 MHz (50/100 kHz)
- Signal-to-noise ratio: FM 50 dB
- Frequency response: FM 180 Hz-12.5 kHz / ±3 dB

USB

- Compatibility: Hi-Speed USB (2.0)
- Class support: USB Mass Storage Class (MSC)
- File system: FAT16, FAT32, NTFS
- USB port: 5V ⎓, 500mA (for each port)

Main unit

- Power supply:
  - Europe/China: 220-240 V~, 50 Hz
  - Latin America/Asia Pacific: 110-127 V/220-240 V~, 50-60 Hz

- Russia/India: 220-240 V~, 50 Hz
- Power consumption: 160 W
- Standby power consumption: ≤ 0.5 W
- Dimensions (WxHxD): 435 x 58 x 280 mm
- Weight: 2.66 kg

Subwoofer

- Output power: 166 W RMS (30% THD)
- Impedance: 4 ohm
- Speaker drivers: 165 mm (6.5") woofer
- Dimensions (WxHxD): 178 x 300 x 343 mm
- Weight: 3.66 kg
- Cable length: 3.3 m

Speakers

Center speaker:

- Output power: 166 W RMS (30% THD)
- Speaker impedance: 4 ohm
- Speaker drivers: 1 x 78 mm (3") full range
- Dimensions (WxHxD): 223 x 100 x 80 mm
- Weight: 0.65 kg
- Cable length: 2.25 m

Front/Rear speaker:

- Output power: 4 x 166 W RMS (30% THD)
- Speaker impedance: 4 ohm
- Speaker drivers: 1 x 78 mm (3") full range
- Dimensions (WxHxD):
  - **HTB3510**: 90 x 185 x 82 mm (front/rear)
  - **HTB3540**: 90 x 185 x 82 mm (front); 247 x 1090 x 242 mm (rear)
  - **HTB3570**: 247 x 1090 x 242 mm (front/rear)
- Weight (front):
  - **HTB3510**: 0.53 kg/each
  - **HTB3540**: 0.53 kg/each
  - **HTB3570**: 2.66 kg/each
- Weight (rear):
  - **HTB3510**: 0.56 kg/each
  - **HTB3540/HTB3570**: 2.72 kg/each
- Cable length (front): 3.25 m
- Cable length (rear): 10.25 m

Remote control batteries

- 2 x AAA-R03-1.5 V

Laser

- Laser Type (Diode): InGaN/AlGaN (BD), AlGaInP (DVD/CD)
- Wave length: 405 +7 nm/-7 nm (BD), 655 +10 nm/-10 nm (DVD), 790 +10 nm/-20 nm (CD)
- Output power (Max. ratings): 20 mW (BD), 6 mW (DVD), 7 mW (CD)

Safety instruction, Warning & Notes

Safety instruction

1. General safety

Safety regulations require that during a repair:

. Connect the unit to the mains via an isolation transformer.

. Replace safety components indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, you must return the unit in its original condition. Pay, in particular, attention to the following points:

. Route the wires/cables correctly, and fix them with the mounted cable clamps.

. Check the insulation of the mains lead for external damage.

. Check the electrical DC resistance between the mains plug and the secondary side:

1) Unplug the mains cord, and connect a wire between the two pins of the mains plug.
2) Set the mains switch the "on" position (keep the mains cord unplug).
3) Measure the resistance value between the mains plug and the front panel, controls, and chassis bottom.
4) Repair or correct unit when the resistance measurement is less than 1MΩ.
5) Verify this, before you return the unit to the customer/user (ref. UL-standard no. 1492).
6) Switch the unit "off", and remove the wire between the two pins of the mains plug.

2.Laser safety

This unit employs a laser. Only qualified service personnel may remove the cover, or attempt to service this device (due to possible eye injury).

Laser device unit

Type : Semiconductor laser GaAlAs

Wavelength : 650nm (DVD)

: 780nm (VCD/CD)

Output power : 7mW (DVD)

: 10mW (DVD /CD)

Beam divergence: 60 degree

Note: Use of controls or adjustments or performance of procedure other than those specified herein, may result in hazardous radiation exposure. Avoid direct exposure to beam.

Warning

1.General

. All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handing during repair can reduce life drastically. Make sure that, during repair, you are at the same potential as the mass of the set by a wristband with resistance. Keep components and tools at this same potential. Available ESD protection equipment:

1) Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
2) Wristband tester 4822 344 13999.

. Be careful during measurements in the live voltage section. The primary side of the power supply , including the heat sink, carries live mains voltage when you connect the player to the mains (even when the player is “off”!). It is possible to touch copper tracks and/or components in this unshielded primary area, when you service the player. Service personnel must take precautions to prevent touching this area or components in this area. A “lighting stroke” and a stripe-marked printing on the printed wiring board, indicate the primary side of the power supply.

. Never replace modules, or components, while the unit is “on”.

2. Laser

. The use of optical instruments with this product, will increase eye hazard.

. Only qualified service personnel may remove the cover or attempt to service this device, due to possible eye injury.

. Repair handing should take place as much as possible with a disc loaded inside the player.

. Text below is placed inside the unit, on the laser cover shield:

CAUTION: VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO BEAM.

Service Hints

CAUTION

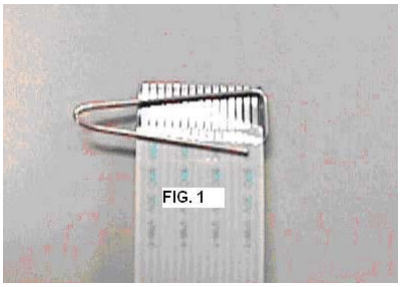
CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE DRIVE ELECTRONICS WHEN CONNECTING A NEW DRIVE.THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE

- **SWITCH OFF POWER SUPPLY**
- **ESD PROTECTION**

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the defective loader :

1. Dismantling of the loader to access the ESD protection point if necessary.
2. **Solder the ESD protection point*.**
3. Disconnect flexfoil cable from the defective loader.
4. Put a paper clip on the flexfoil to short-circuit the contacts (fig.1)
5. Replace the defective loader with a new loader.
6. Remove paperclip from the flexfoil and connect it to the new loader.
7. Remove solder joint on the ESD protection point.



ATTENTION: The laser diode of this loader is protected against ESD by a solder joint which shortcircuits the laserdiode to ground. For proper functionality of the loader this solder joint must be remove **after** connection loader to the set.

(ESD protection point is accessible from top of loader)

Only applicable for defective loader needed to be sent back to supplier for failure analysis and to support backcharging evidence.
This is also applicable for all partnership workshops.

Notes

Lead-Free requirement for service

INDENTIFICATION:

Regardless of special logo (not always indicated) 

One must treat all sets from 1.1.2005 onwards, according next rules.

Important note: In fact also products a little older can also be treated in this way as long as you avoid mixing solder-alloys (leaded/ lead-free). So best to always use SAC305 and the higher temperatures belong to this.

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
  - To reach at least a solder-temperature of 400°C,
  - To stabilize the adjusted temperature at the solder-tip
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed
  solder alloy types (leaded and lead-free). If one cannot avoid, clean carefully the
  solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- Special information for BGA-ICs:
  - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use highest lead-free temperature profile, in case of doubt)
  - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. This will be communicated via AYS-website.
  Do not re-use BGAs at all.
- For sets produced before 1.1.2005, containing leaded soldering-tin and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- On our website:
  www.atyourservice.ce.Philips.com

You find more information to:

BGA-de-/soldering (+ baking instructions)
Heating-profiles of BGAs and other ICs used in Philips-sets

You will find this and more technical information within the "magazine", chapter "workshop news".

For additional questions please contact your local repair-helpdesk.

EN Before using your product, read all accompanying safety information

CS Před použitím produktu si přečtěte doprovodné bezpečnostní informace

DA Læs alle medfølgende sikkerhedsoplysninger, inden du tager produktet i brug

DE Lesen Sie vor Verwendung dieses Produkts alle begleitenden Sicherheitsinformationen

EL Πριν χρησιμοποιήσετε το προϊόν, διαβάστε όλες τις παρεχόμενες πληροφορίες ασφάλειας

ES Antes de usar el producto, lea toda la información de seguridad adjunta

FI Lue kaikki turvallisuustiedot ennen tuotteen käyttöä

FR Avant d'utiliser votre produit, lisez l'intégralité des consignes de sécurité jointes

HU A termék használata előtt alaposan olvassa el a mellékelt biztonsági tudnivalókat

IT Prima di utilizzare il prodotto, leggere tutte le relative informazioni sulla sicurezza

NL Lees voordat u het product gaat gebruiken eerst alle bijbehorende veiligheidsinformatie

NO Lees voordat u het product gaat gebruiken eerst alle bijbehorende veiligheidsinformatie

PL Przed rozpoczęciem korzystania z produktu należy zapoznać się z informacjami dotyczącymi bezpieczeństwa

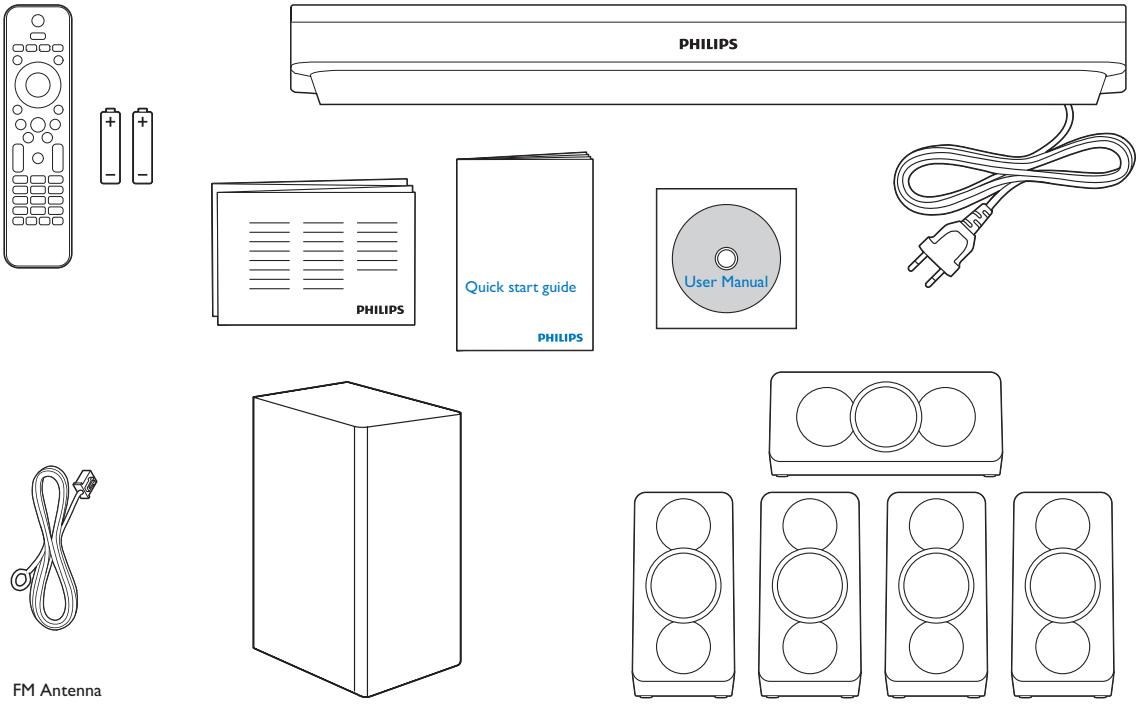
PT Antes de utilizar o produto, leia todas as informações de segurança que o acompanham

RO Înainte de a utiliza acest produs, citiţi toate informaţiile de siguranţă care îl însoţesc

SK Pred použitím produktu si prečítajte všetky sprievodné bezpečnostné informácie maklumat keselamatan yang disertakan

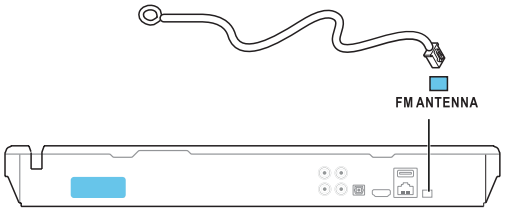
SV Innan du använder produkten ska du läsa all tillhörande säkerhetsinformation

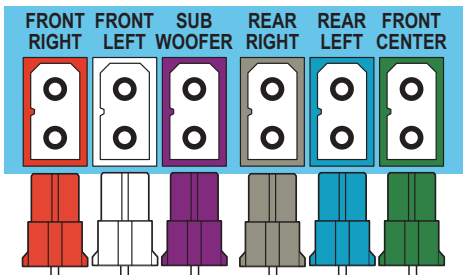
TR Ürününüzü kullanmadan önce ilgili tüm güvenlik bilgilerini okuyun

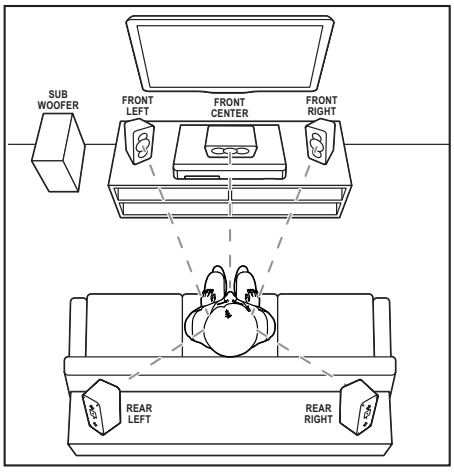


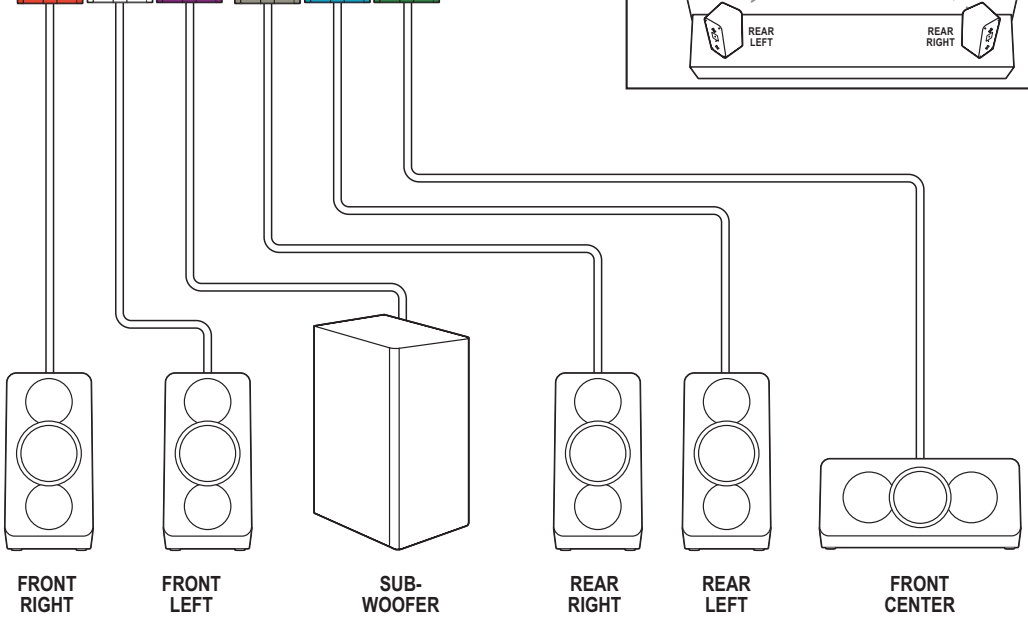
1

EN Connect the home theater
CS Přípojte domácí kino
DA Tilslut hjemmebiografen
DE Anschließen des Home Entertainment-Systems
EL Συνδέστε το home cinema
ES Conecta el sistema de cine en casa
FI Kotiteatterin liitännät
FR Connecter les enceintes au Home Cinéma
HU A házimozi csatlakoztatása
IT Collegamento del sistema Home Theater
NL Sluit de home cinema aan
NO Koble til hjemmekinoanlegget
PL Podłączanie zestawu kina domowego
PT Efectuar as ligações ao sistema de cinema em casa
RO Conectaţi sistemul home theater
SK Pripojenie k domácemu kinu
SV Anslut hemmabiosystemet
TR Ev sinemasını bağlayın



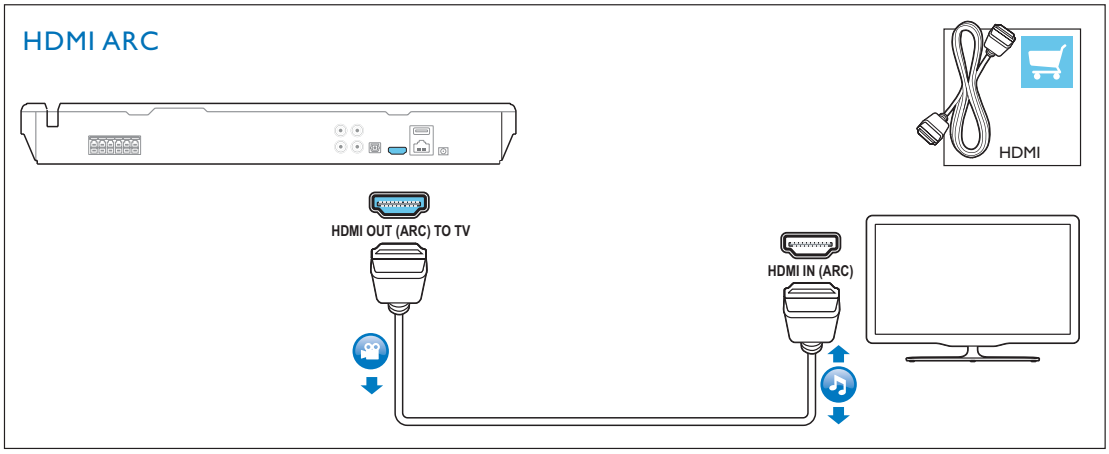


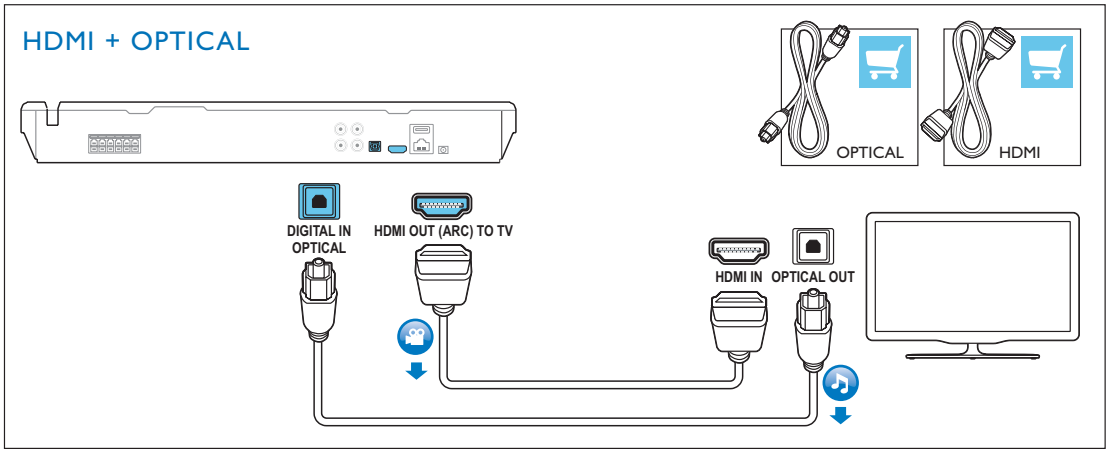




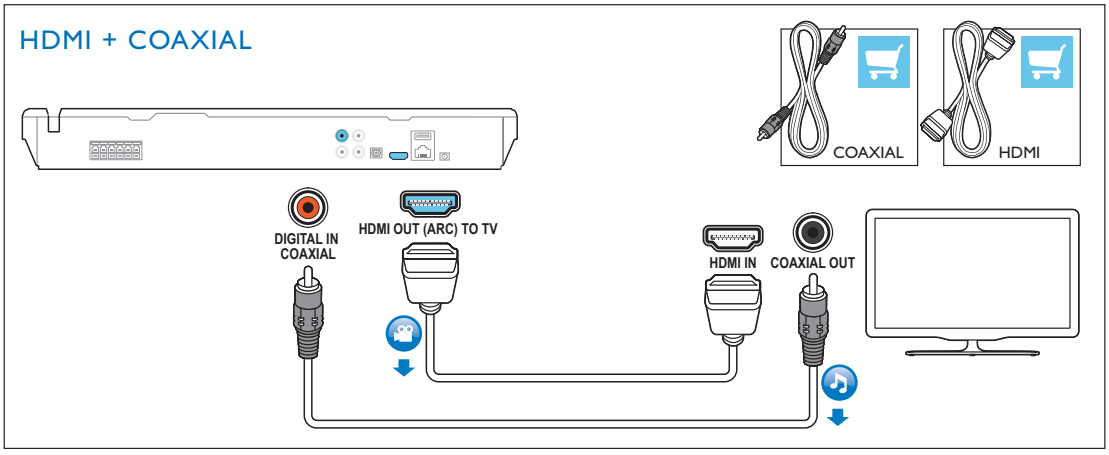
2

EN Connect to TV in one of these ways
CS Připojení k televizoru proveďte jedním z následujících způsobů
DA Tilslut til TV på en af følgende måder
DE Herstellen einer Verbindung mit dem Fernseher über einer dieser Möglichkeiten
EL Συνδεθείτε στην τηλεόραση με έναν από τους παρακάτω τρόπους
ES Conexión al televisor de una de estas maneras
FI Liitä televisioon jommallakummalla tavalla
FR Connectez-vous au téléviseur via l'une de ces méthodes
HU Csatlakoztassa a tv-készülékhez az alábbi módok egyike szerint
IT Esegui il collegamento al TV in uno dei modi indicati di seguito
NL Maak op een van de volgende manieren verbinding met de TV
NO Koble til TVen på en av følgende måter
PL Podłącz do telewizora przy użyciu jednej z tych metod
PT Ligar ao televisor de uma destas formas
RO Conectaţi-vă la televizor într-unul din aceste moduri
SK Pripojte zariadenie k televízoru jedným z týchto spôsobov
SV Anslut till TV:n på något av följande sätt
TR Aşağıdaki yöntemlerden biriyle TV'ye bağlanın

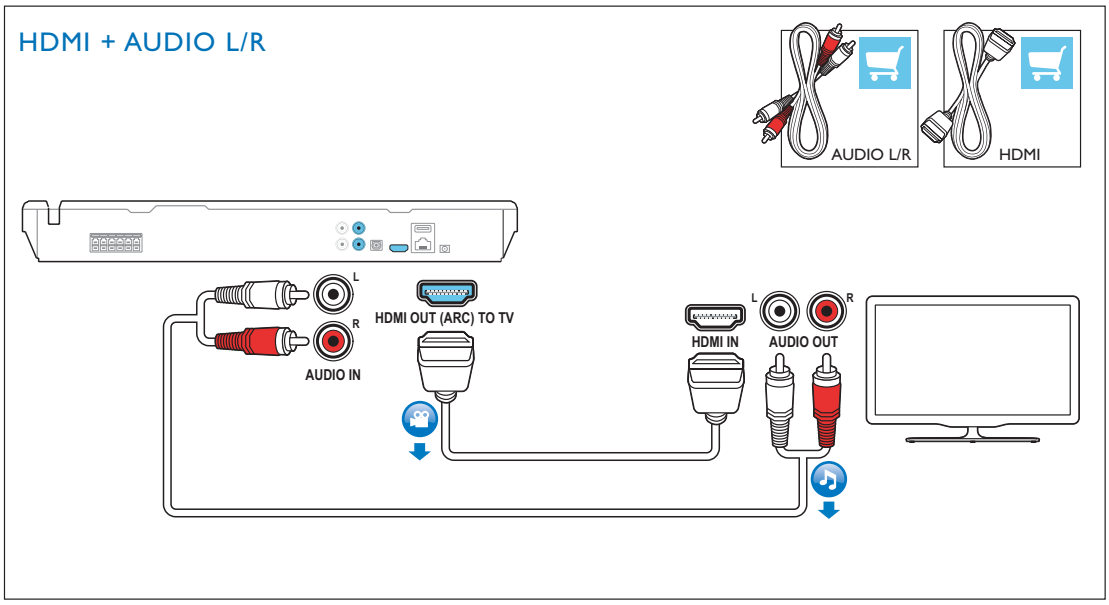




HDMI + COAXIAL



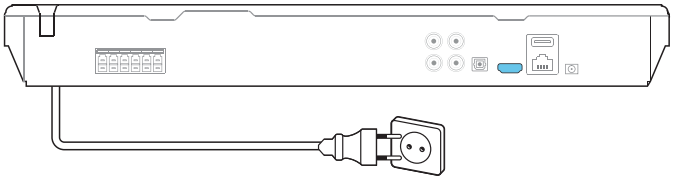
HDMI + AUDIO L/R



3

EN Switch on the home theater
CS Zapněte domácí kino
DA Tænd for hjemmebiografen
DE Einschalten des Home Entertainment-Systems
EL Ενεργοποιήστε το home cinema
ES Enciende el sistema de cine en casa
FI Virran kytkeminen kotiteatteriin
FR Mettre sous tension le Home Cinéma
HU A házimozi bekapcsolása
IT Accensione del sistema Home Theater
NL Schakel de home cinema in
NO Slå på hjemmekinoanlegget
PL Włączanie zestawu kina domowego
PT Ligar o sistema de cinema em casa
RO Porniţi sistemul home theater
SK Zapnutie domáceho kina
SV Sätt på hemmabiosystemet
TR Ev sinemasını açın

1



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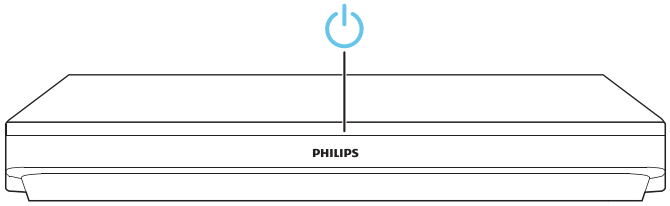

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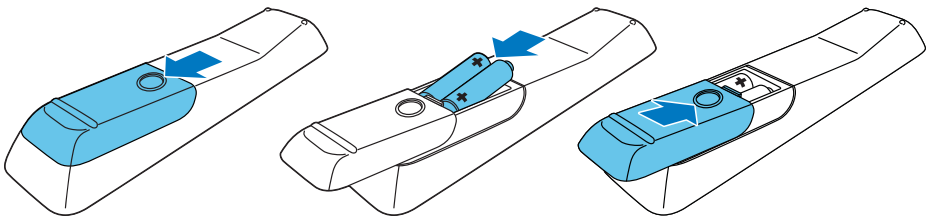
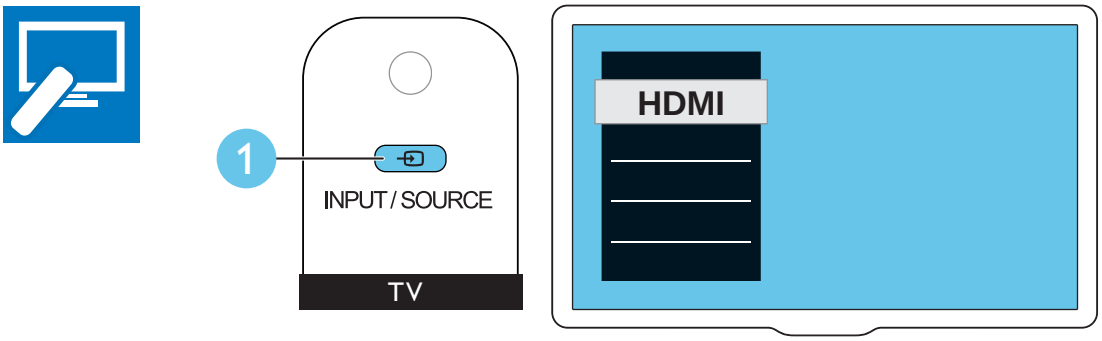
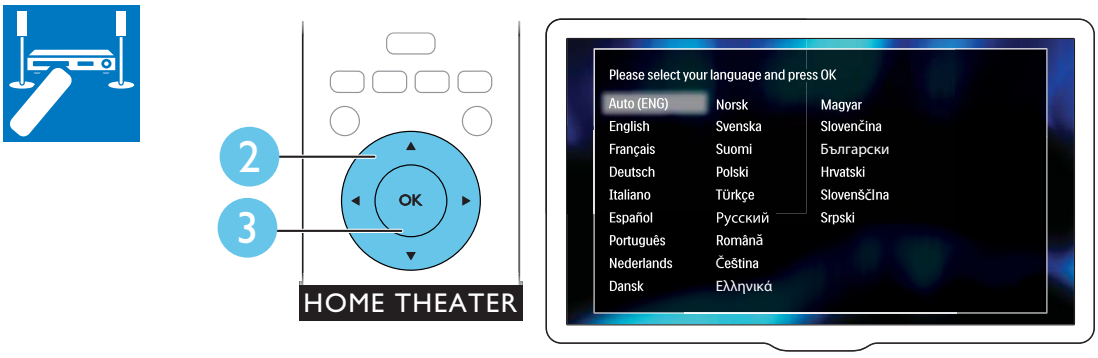


4

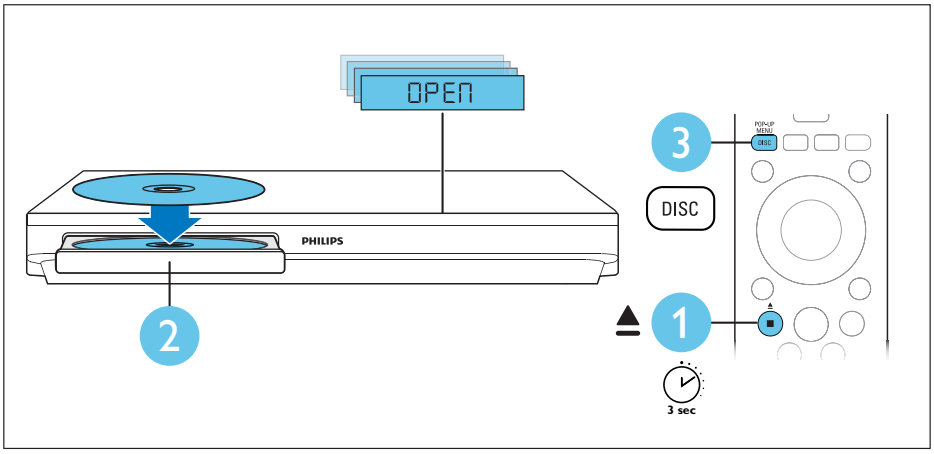
EN Complete the first time setup
CS Dokončili jste nastavení při prvním zapnutí
DA Fuldfør den indledende opsætning
DE Abschließen der Ersteinrichtung
EL Ολοκληρώστε τη ρύθμιση για πρώτη φορά
ES Finaliza la configuración inicial
FI Ensiasennuksen suorittaminen loppuun
FR Effectuer la configuration initiale
HU Az első üzembe helyezés
IT Completamento della configurazione iniziale
NL Voltooi de eerste installatie
NO Fullføre den første konfigureringen
PL Pierwsza konfiguracja
PT Executar a configuração inicial
RO Realizaţi prima configurare
SK Dokončenie prvého nastavenia
SV Slutför förstagångsinställningen
TR İlk kullanım öncesi kurulumunu tamamlayın

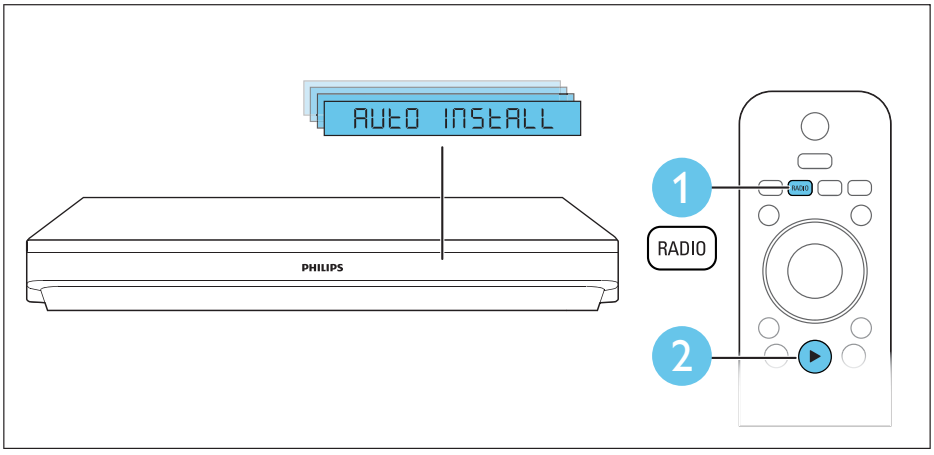


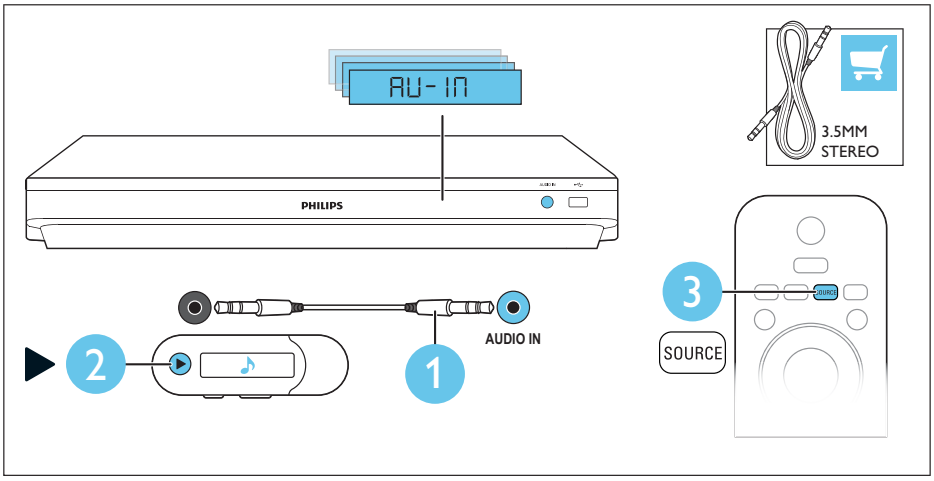


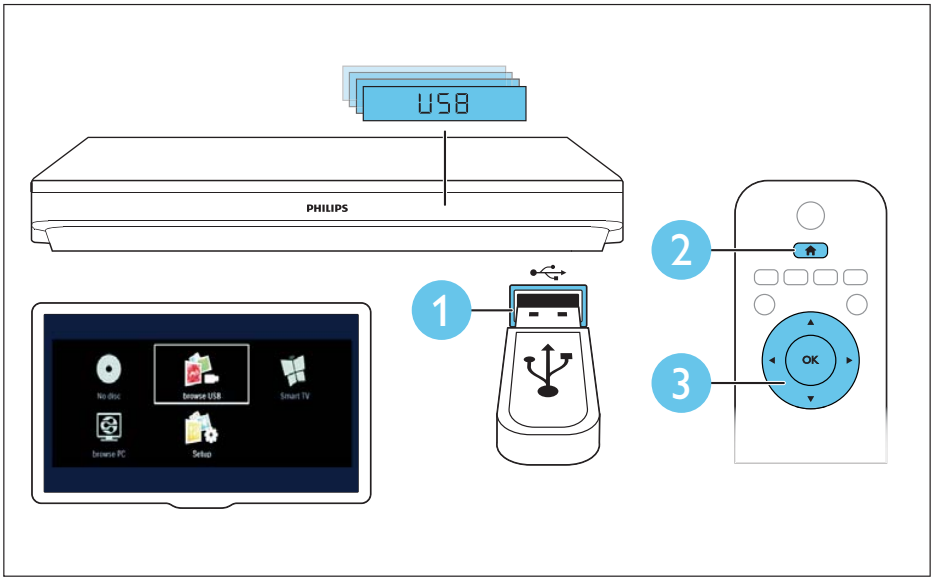
5

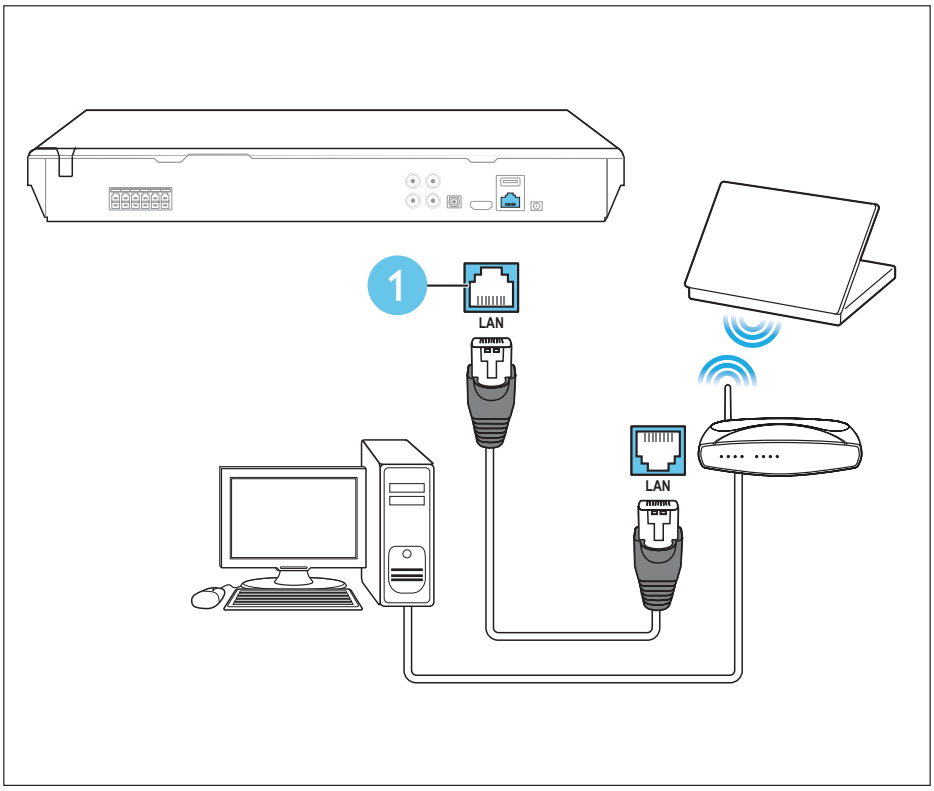
EN Use your home theater
CS Použití domácího kina
DA Brug af din hjemmebiograf
DE Verwenden des Home Entertainment-Systems
EL Χρησιμοποιήστε το home cinema
ES Uso del sistema de cine en casa
FI Kotiteatterin käyttäminen
FR Utiliser votre Home Cinéma
HU A házimozi használata
IT Utilizzo del sistema Home Theater
NL Uw home cinema bedienen
NO Bruke hjemmekinoanlegget
PL Korzystanie z zestawu kina domowego
PT Utilizar o sistema de cinema em casa
RO Utilizaţi sistemul home theater
SK Používanie domáceho kina
SV Använda hemmabiosystemet
TR Ev sinema sisteminin kullanılması











Mechanical and Dismantling Instructions

Dismantling Instruction

Detailed information please refer to the model set.

The following guidelines show how to dismantle the player.

Step 1:Open the top cover.Remove 4 screws on the back panel,dismantle the left and right baffles,then open the top cover.(Figur 1)

Figue 1

Mechanical and Dismantling Instructions

Dismantling Instruction

Detailed information please refer to the model set.

The following guidelines show how to dismantle the player.

Step 2:Dismantle the loader.Open the tray,diamantle the CD door,disconnect connectors(J11,XP7), remove 2 screws beside the loader,then pull up the loader.(Figure 2)

Step 3:Dismantle the main board.Disconnect connectors(XP6,XP9,XP4,XP13,XP15),remove 2 screws on the main board and 3 screws on the back panel.then pull up the main board.(Figure 2)

Step 4:Dismantle the amplifier board.Disconnect connectors(XP3,XP58),remove 2 screws on the amplifier board and 4 screws on the back panel.then pull up the amplifier board.(Figure 2)

Step 4:Dismantle the power board.Remove 4 screws on the power board, then pull up the board.(Figue 2)

Figue 2

Step 5:Dismantle the front control board.Remove 4 screws on the board, then pull up the board.(Figue 3)

Figue 3

Software upgrade

1.Build a folder name as UPG under root menu of USB device.

3.Copy the HTB3570.bin file(upgrade file) to the root menu of USB device.

4.Connect the USB device to HTS ,

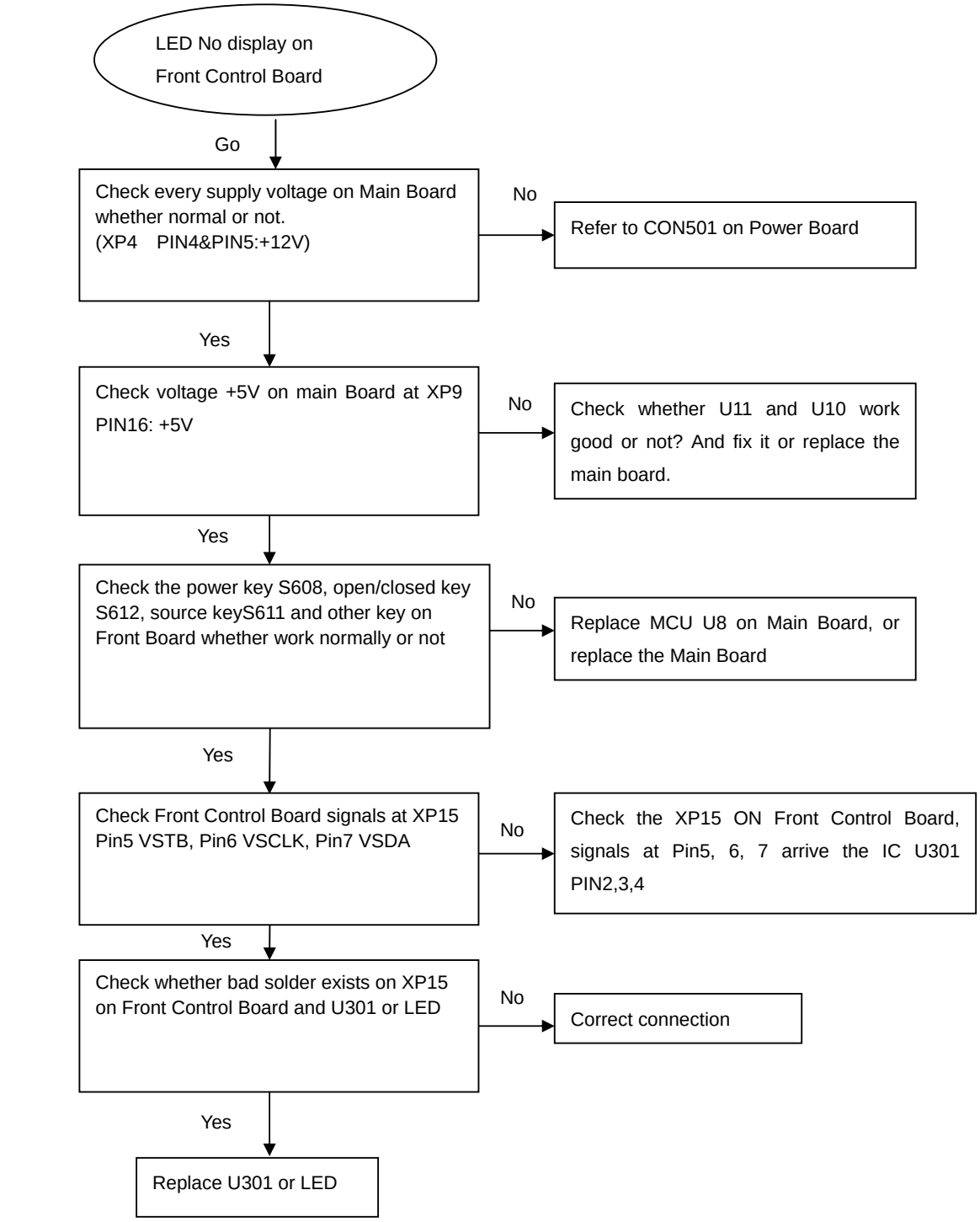
5.Power on DUT,enter into HOME UI.

6.Enter into Setup menu select Advance >>Software upgrade>>USB. If the upgrade SW was found ,it will prompt start upgrade SW,pls press ok select Start.

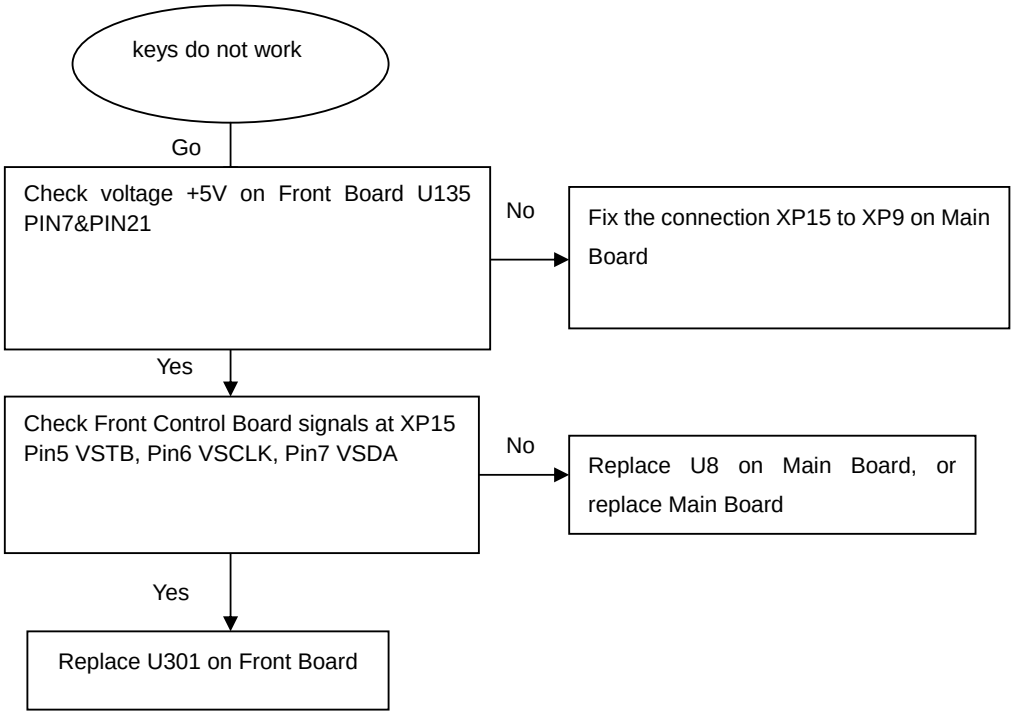
7.Don’t power off DUT .DUT will restart after SW upgrade completed.

Caution: The set must not be power off during upgrading, Otherwise the Main board will be damaged entirely.

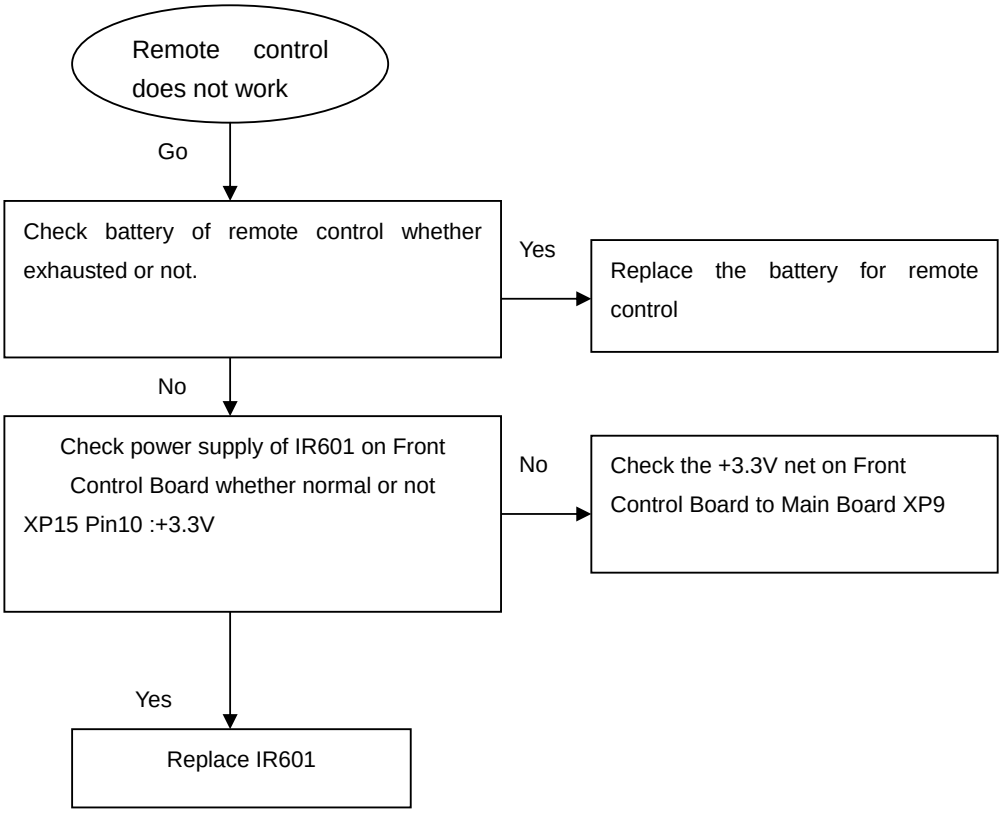
LED No display on Front Control Board



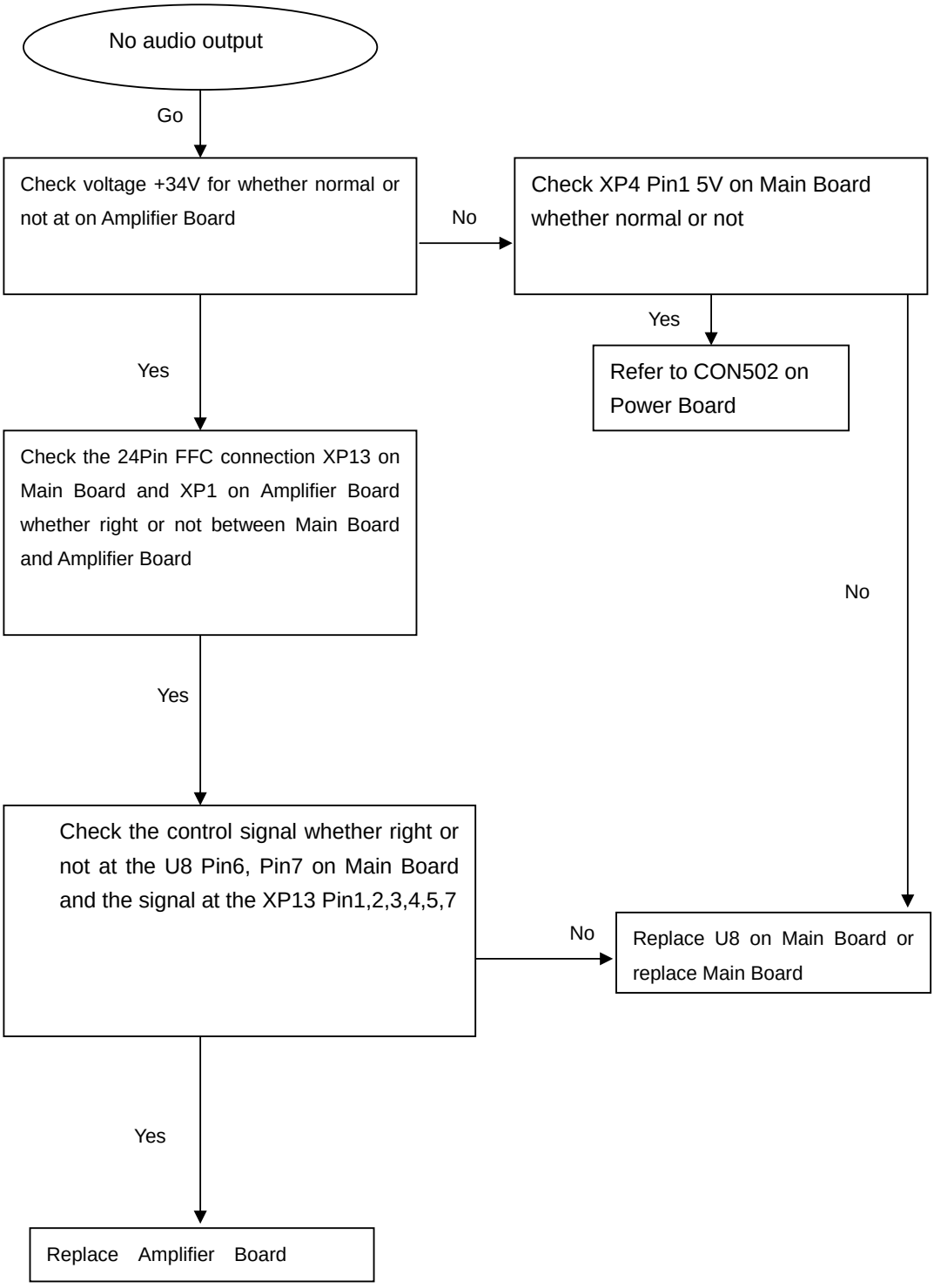
keys do not work



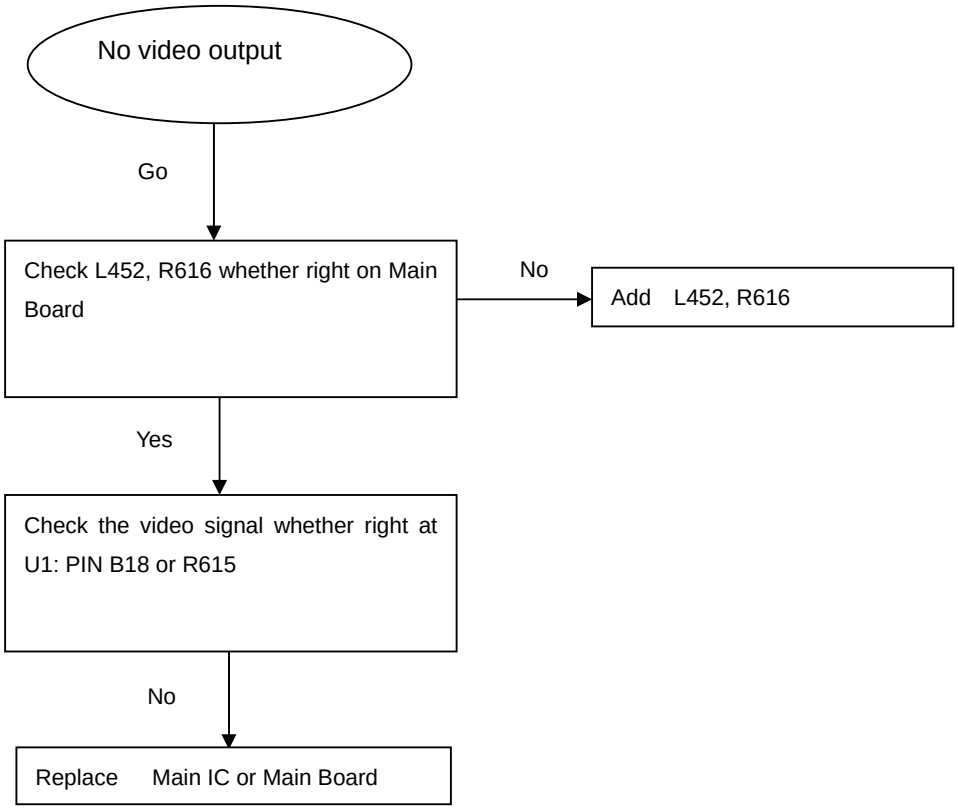
Remote control does not work



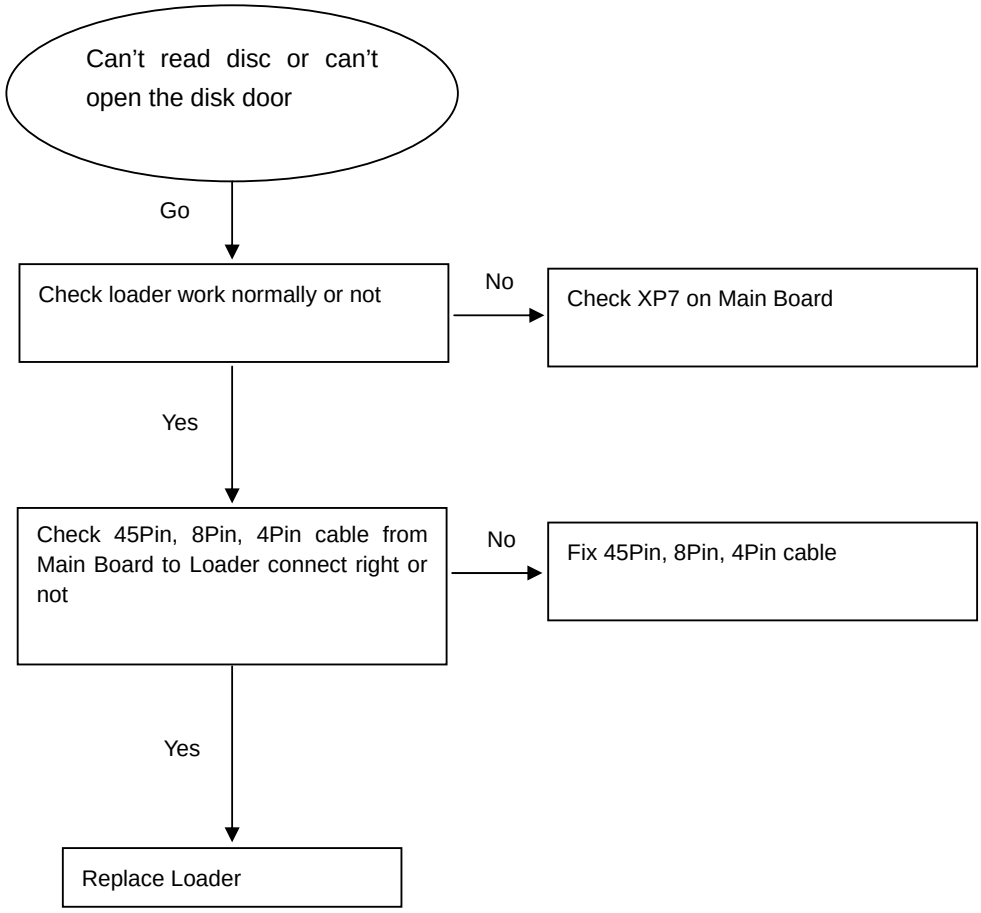
No audio output



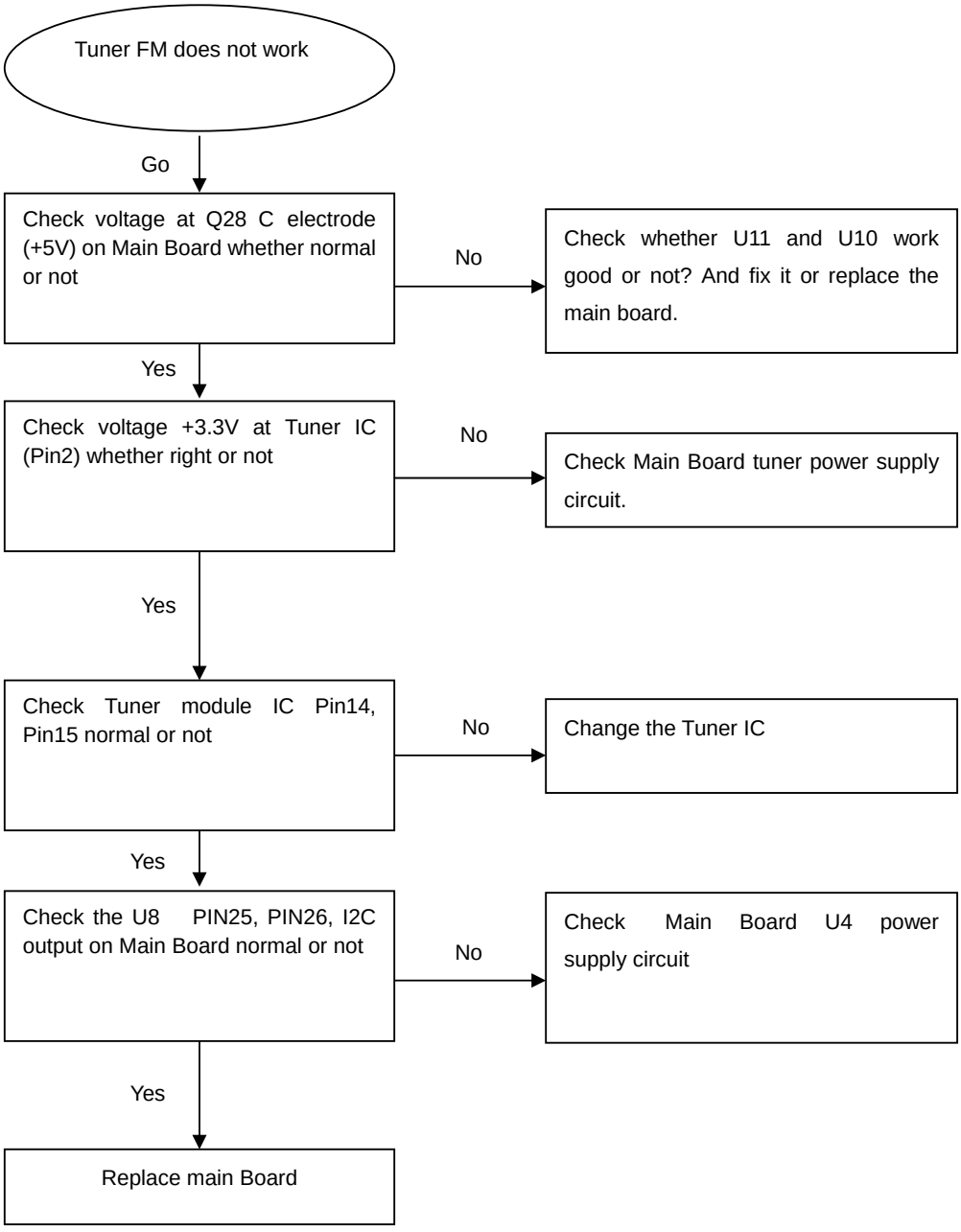
No video output



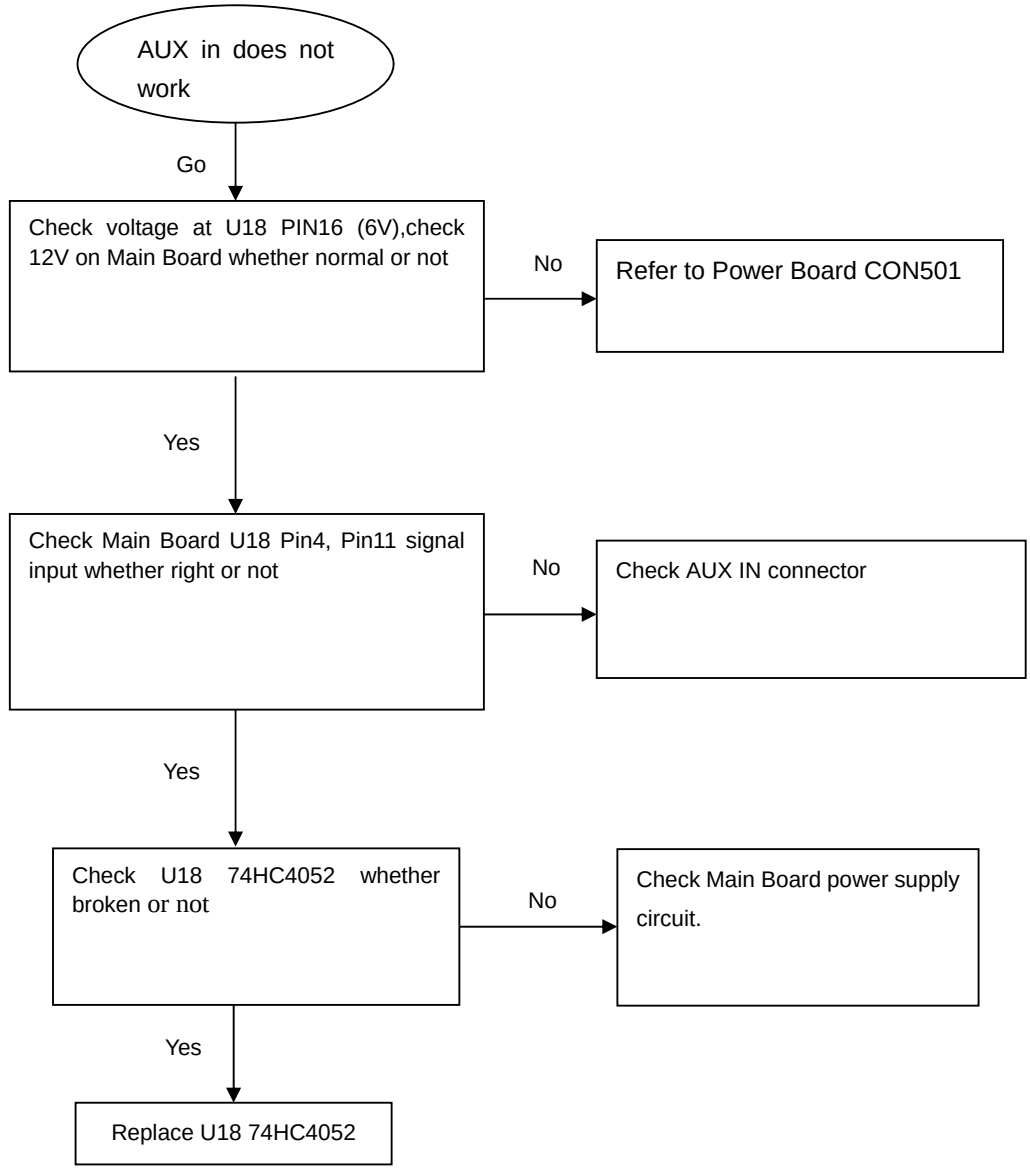
Can’t read disc or can’t open the disk door



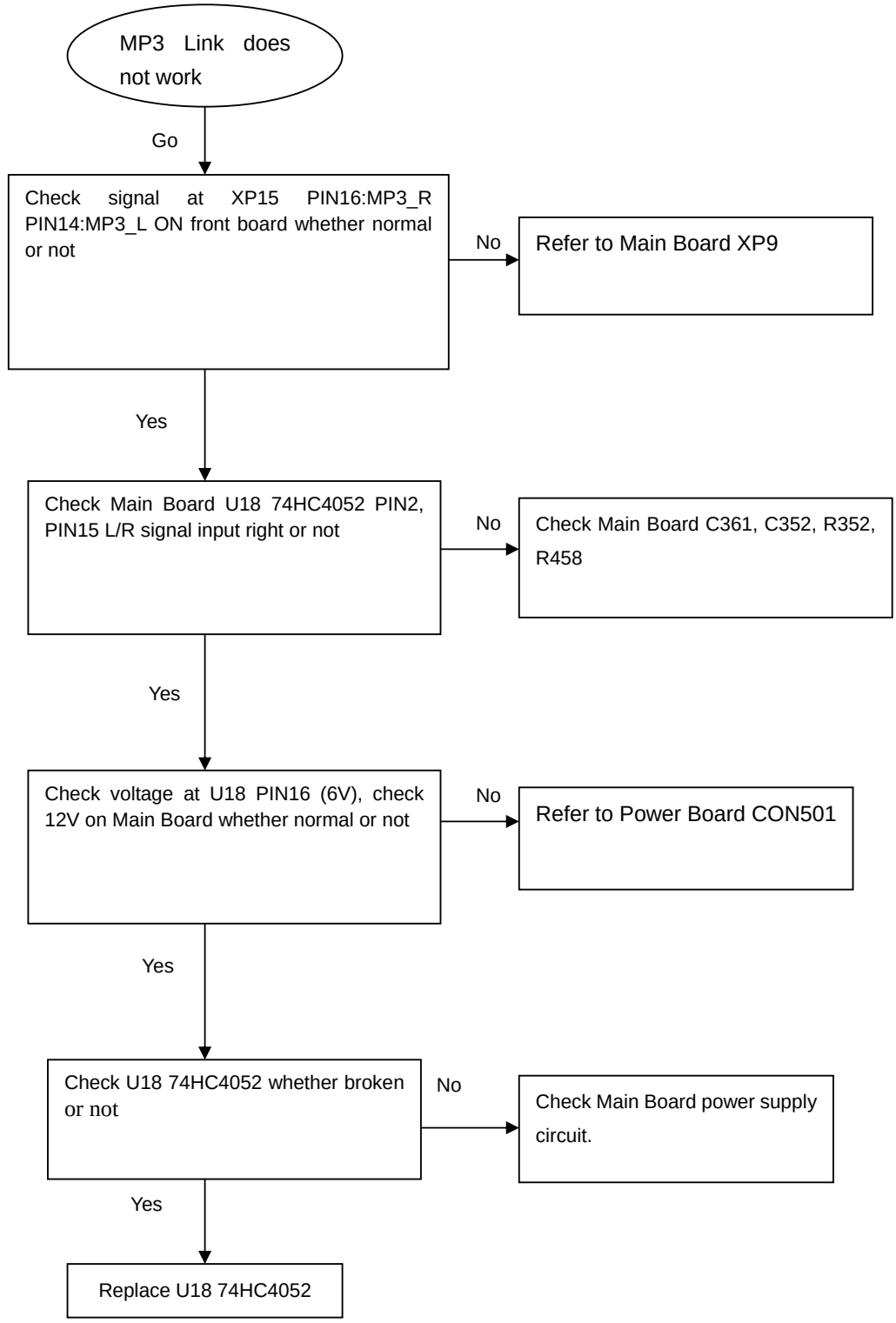
Tuner FM does not work



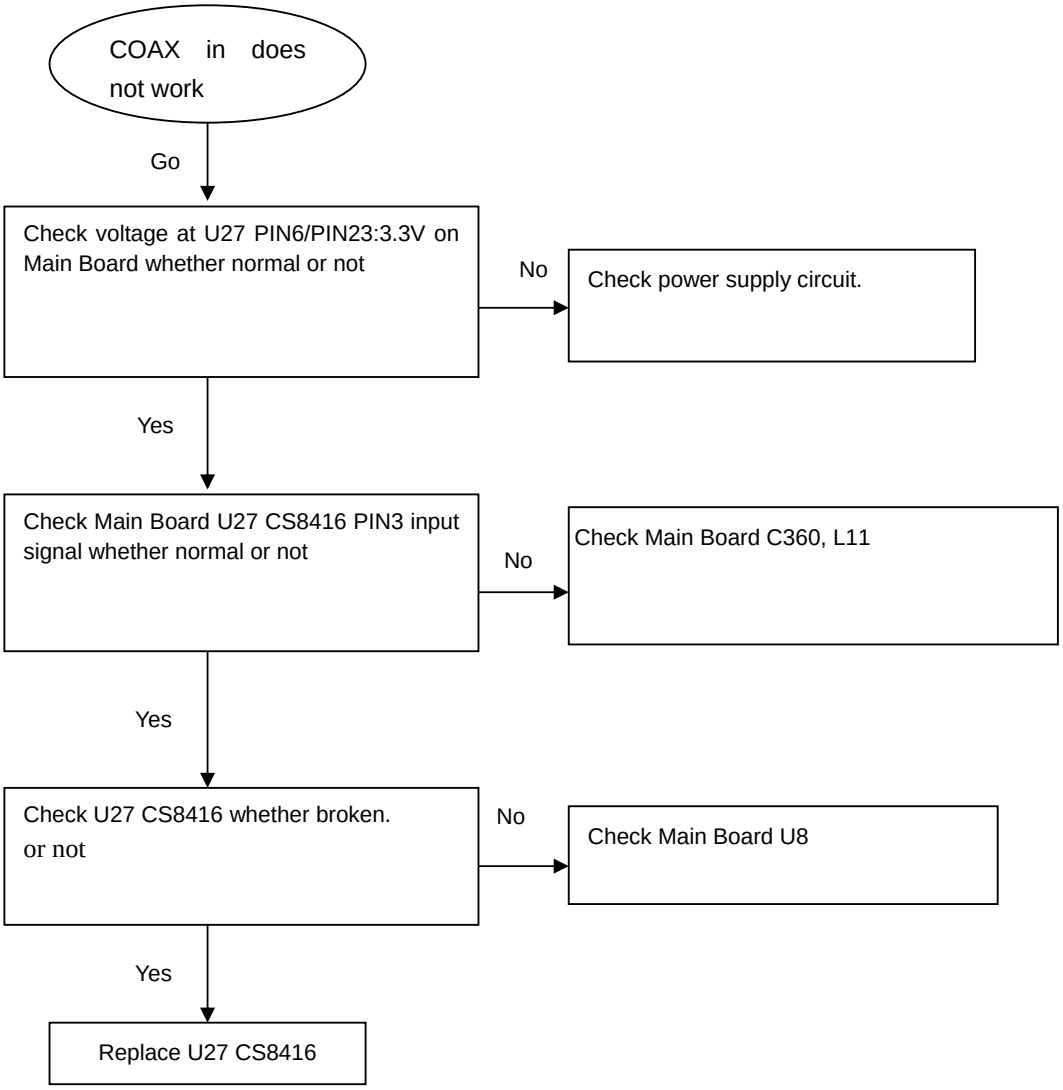
AUX in does not work



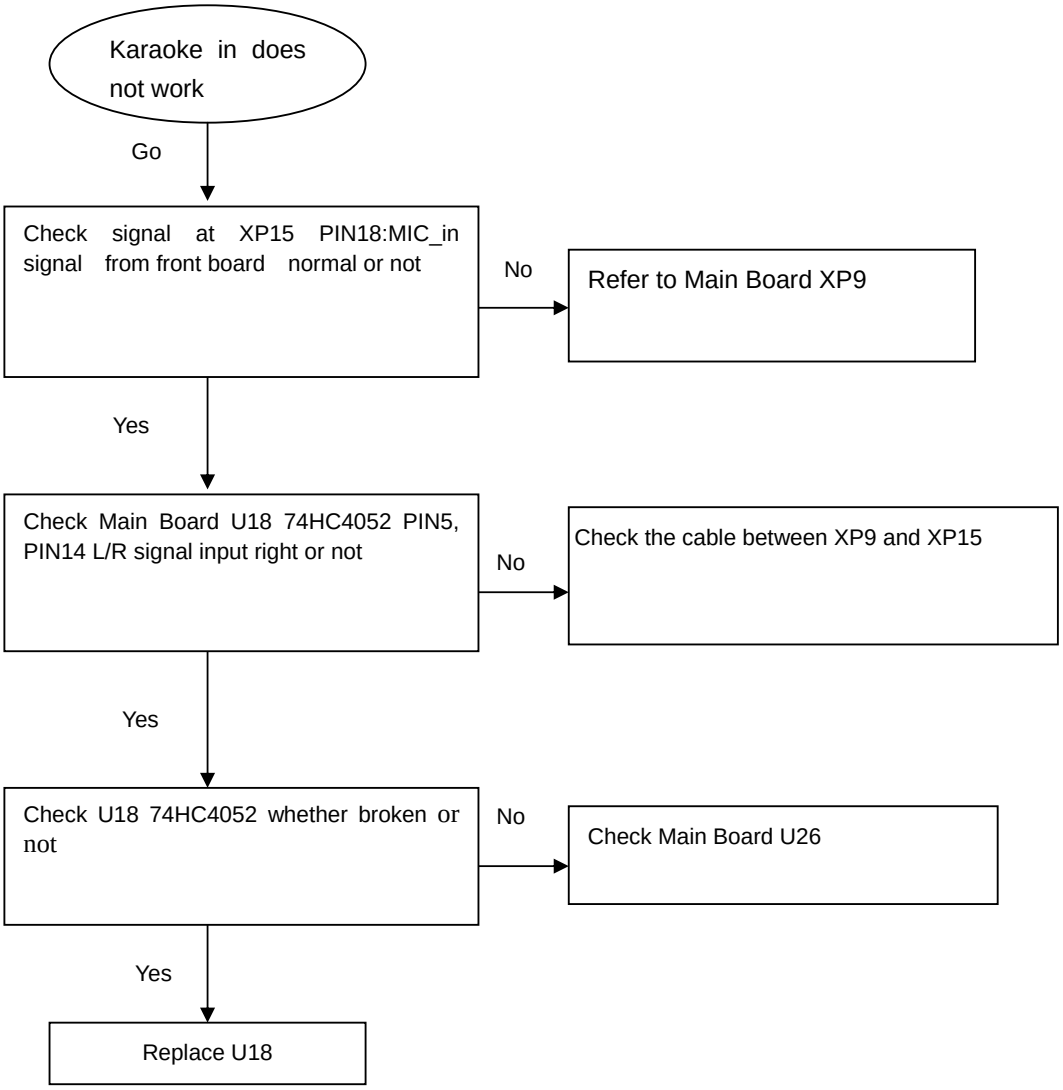
MP3 Link does not work



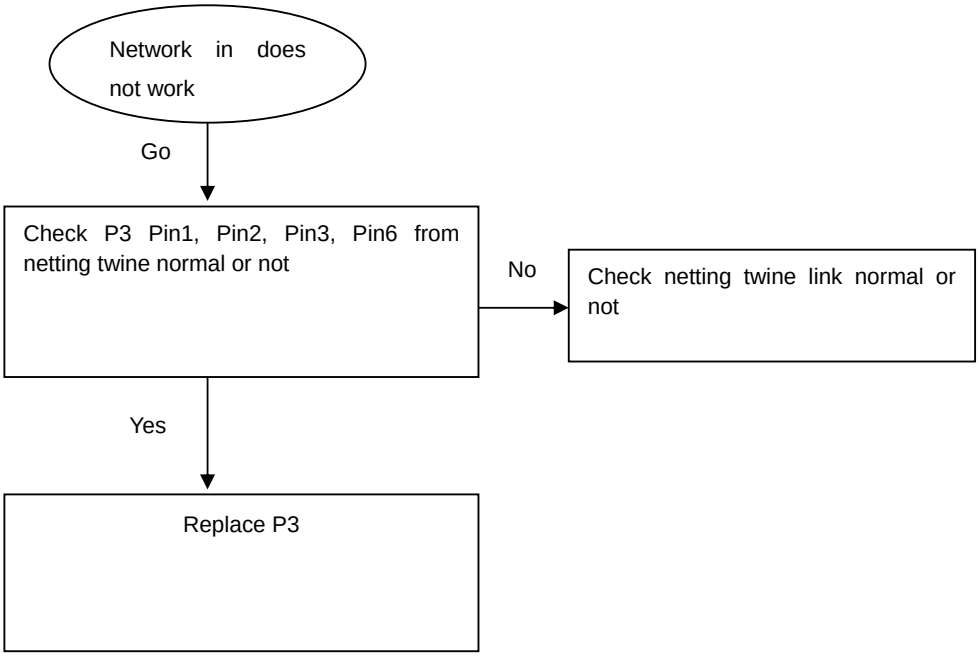
COAX in does not work



Karaoke in does not work

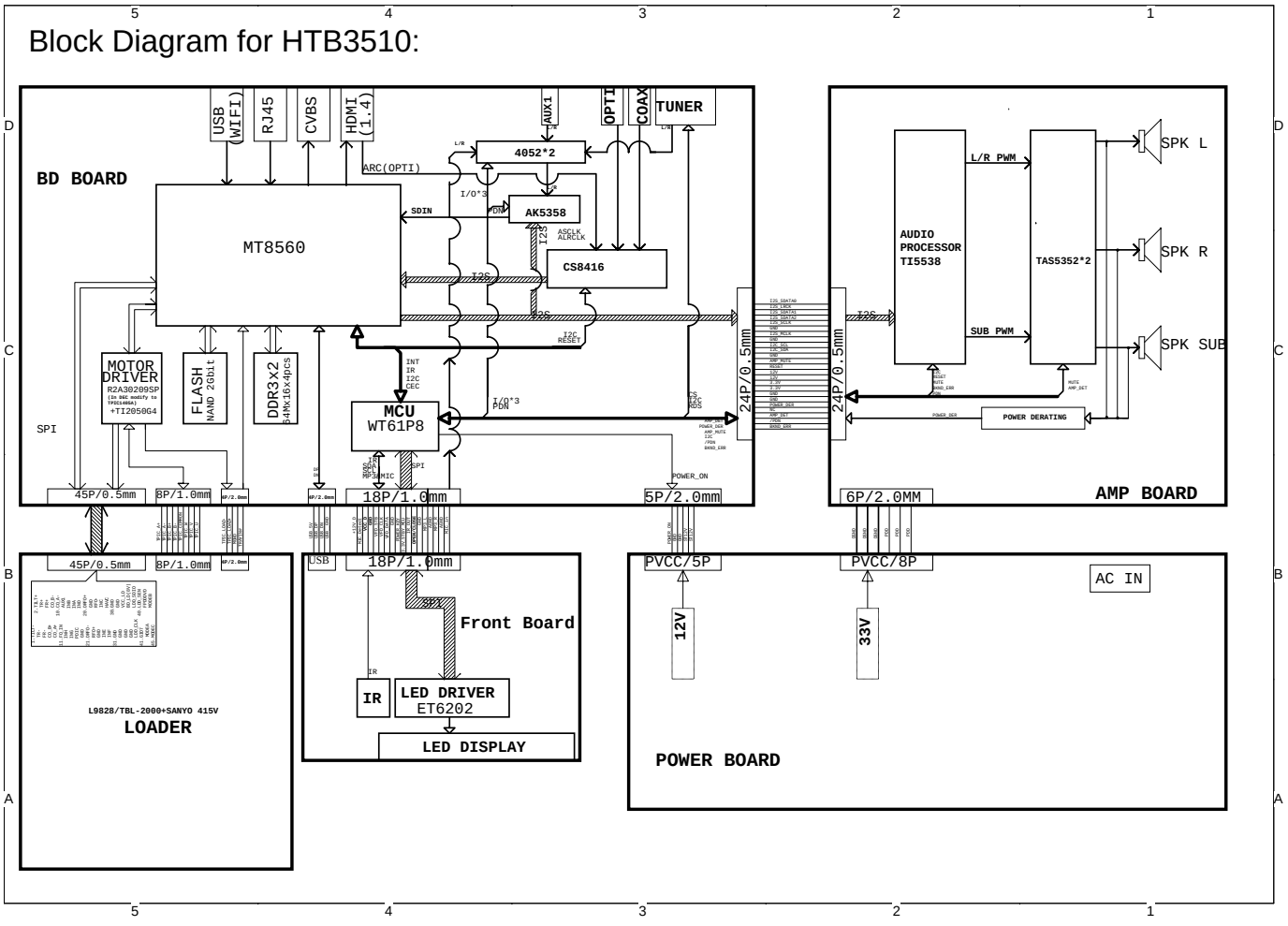


Network in does not work

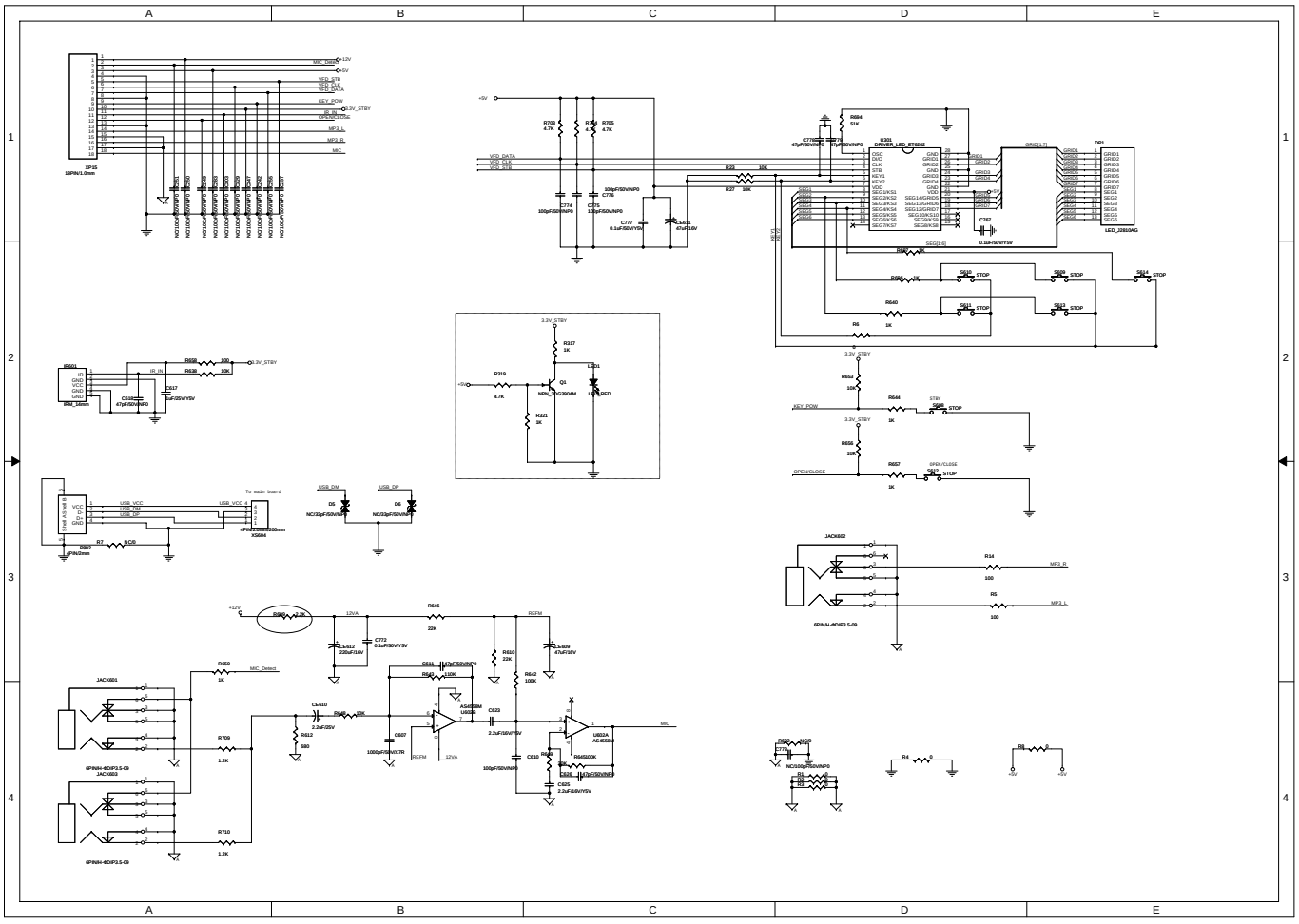


6-1

Block Diagram for HTB3510:

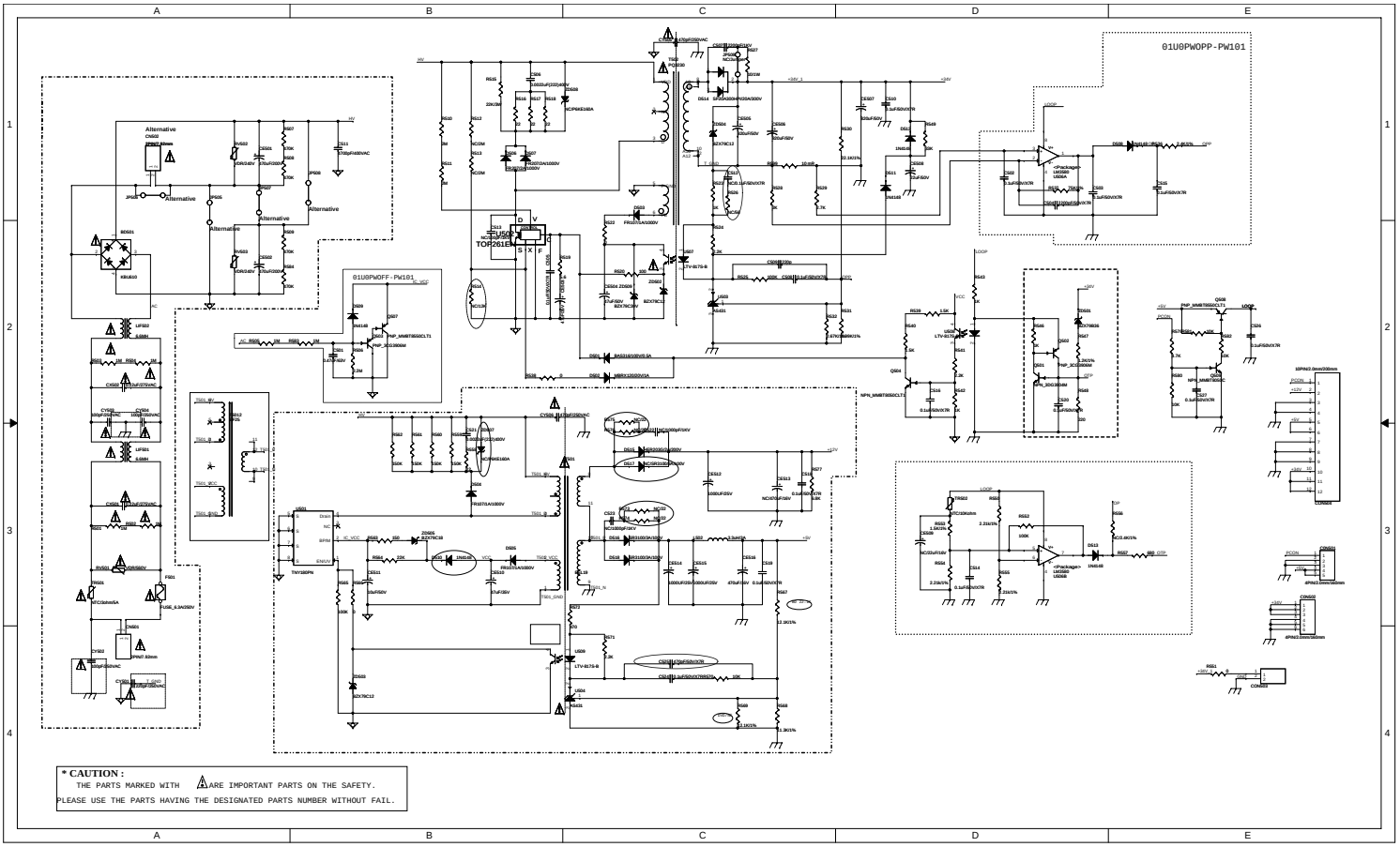


Front Control Board Circuit Diagram:

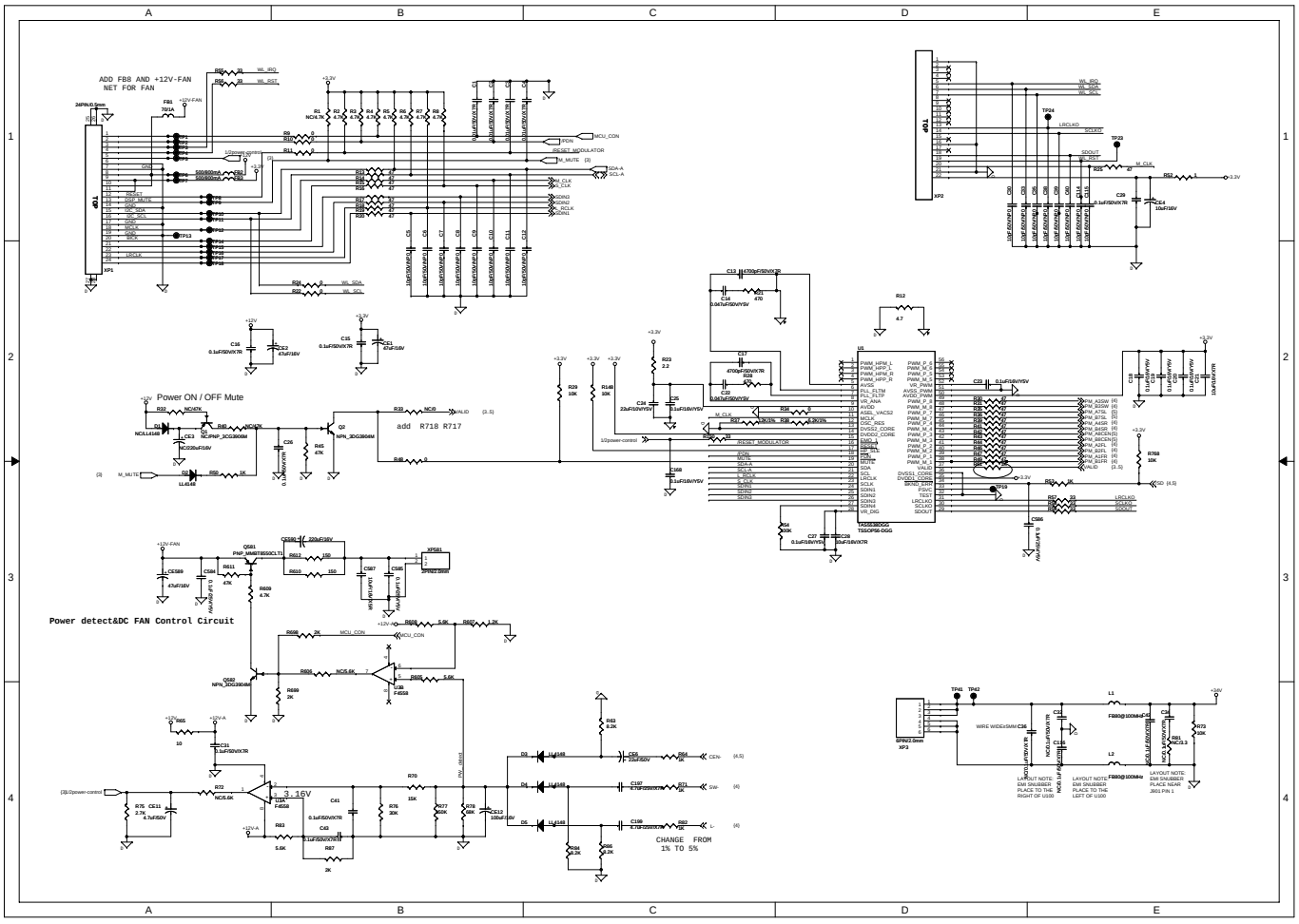


7-2

Power Board Circuit Diagram:

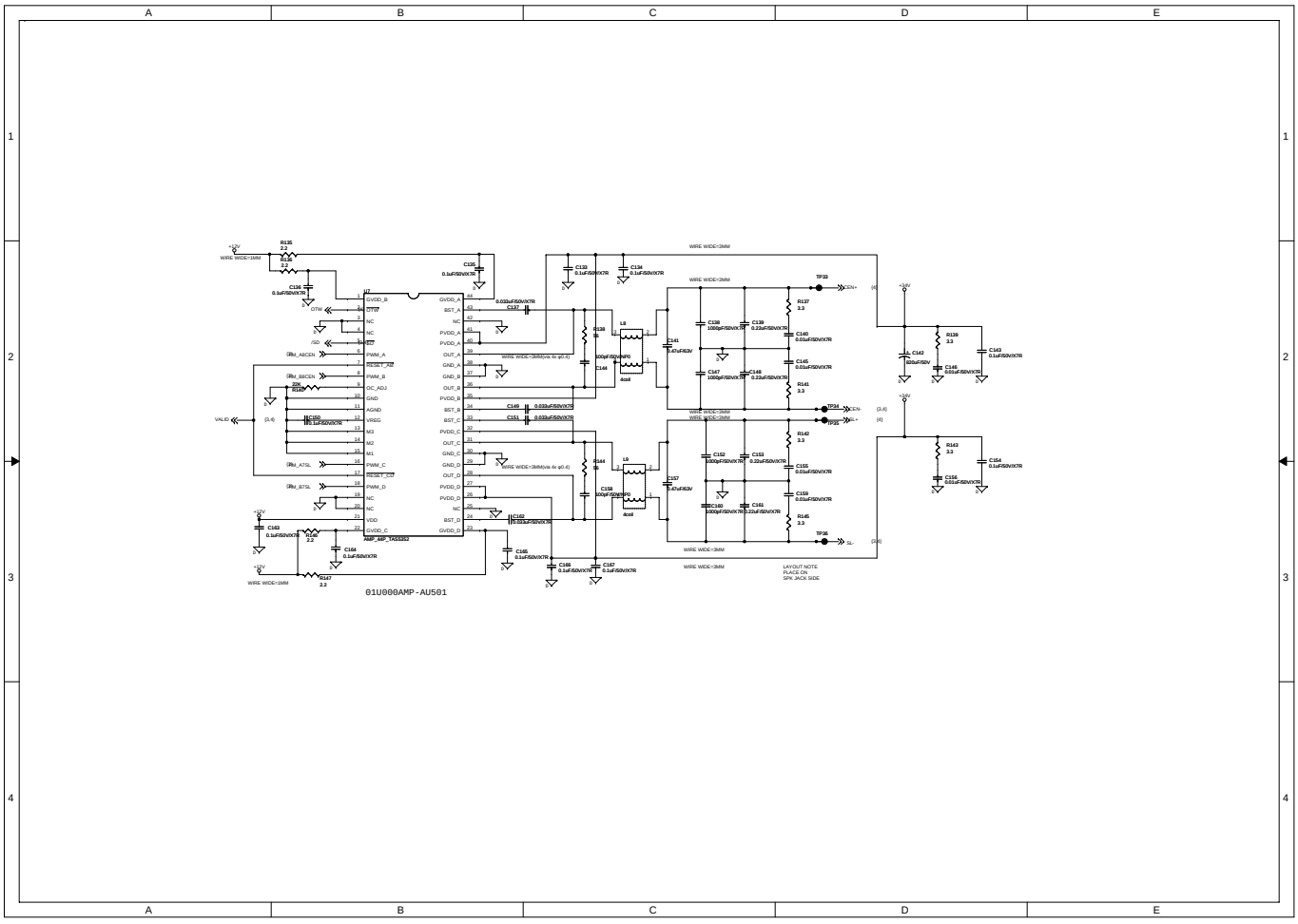


Amplifier Board Circuit Diagram:DSP

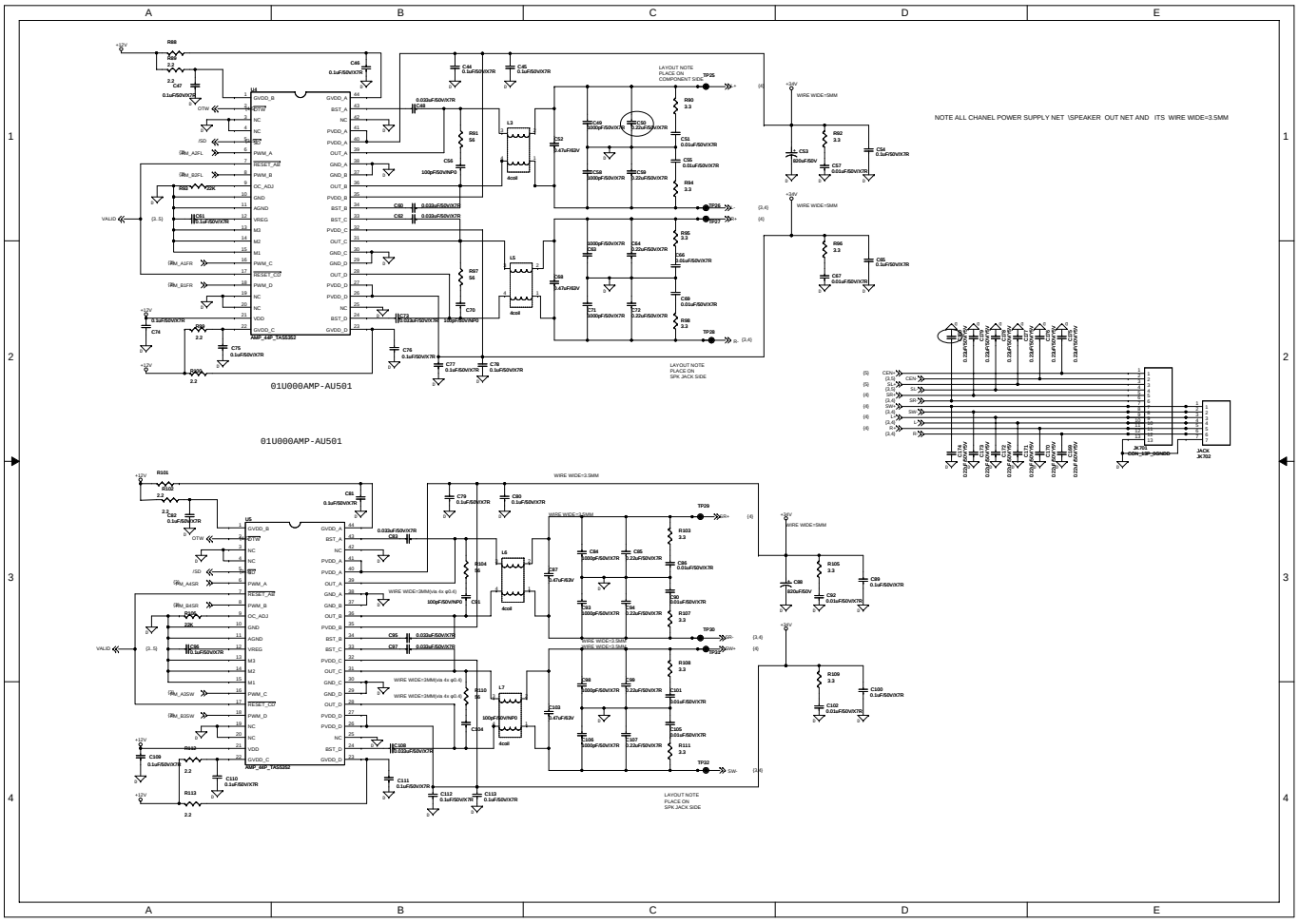


7-4

Amplifier Board Circuit Diagram:SL+SW

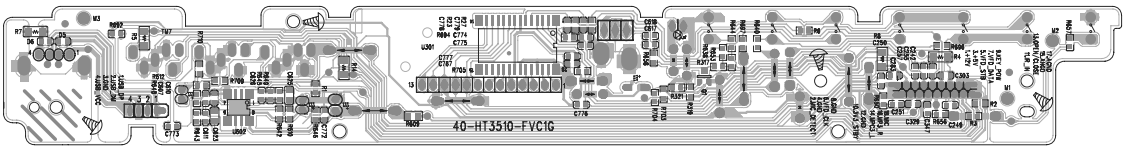


Amplifier Board Circuit Diagram:SL+SW



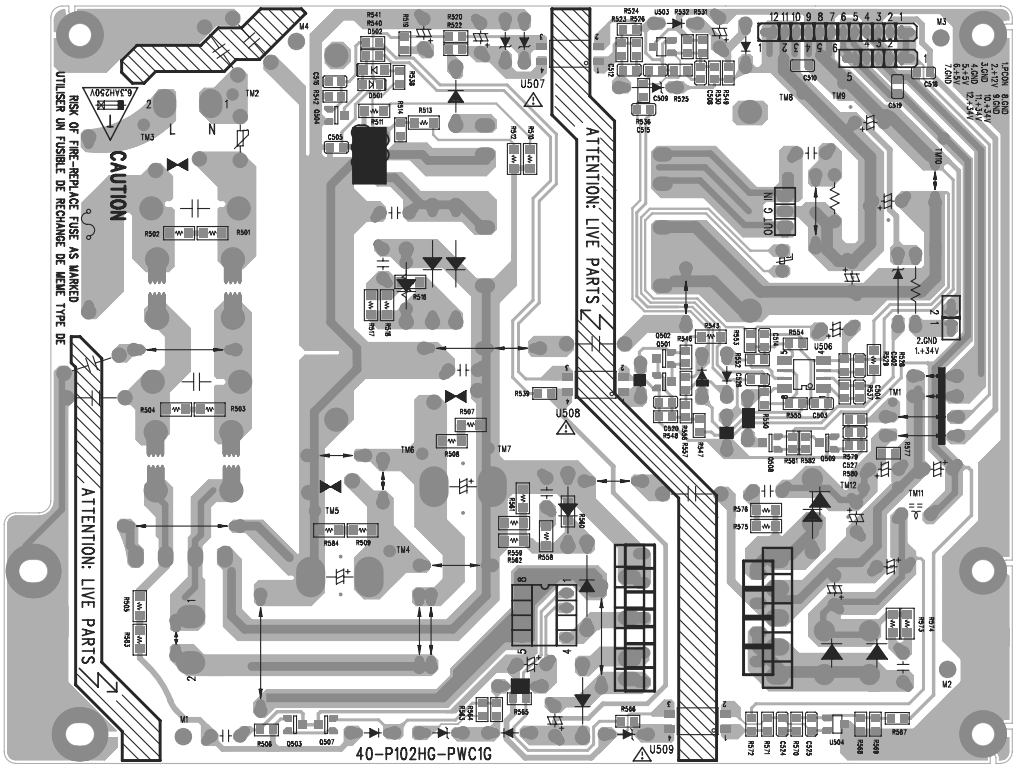
7-6

Front Control Board Print-layout(top side):



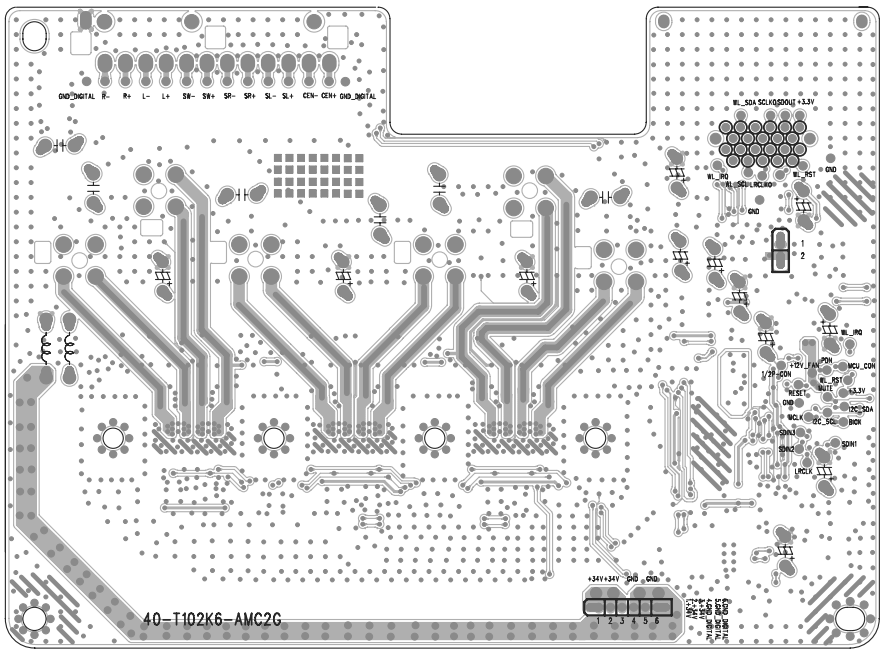
7-7

Power Board Print-layout(top side):



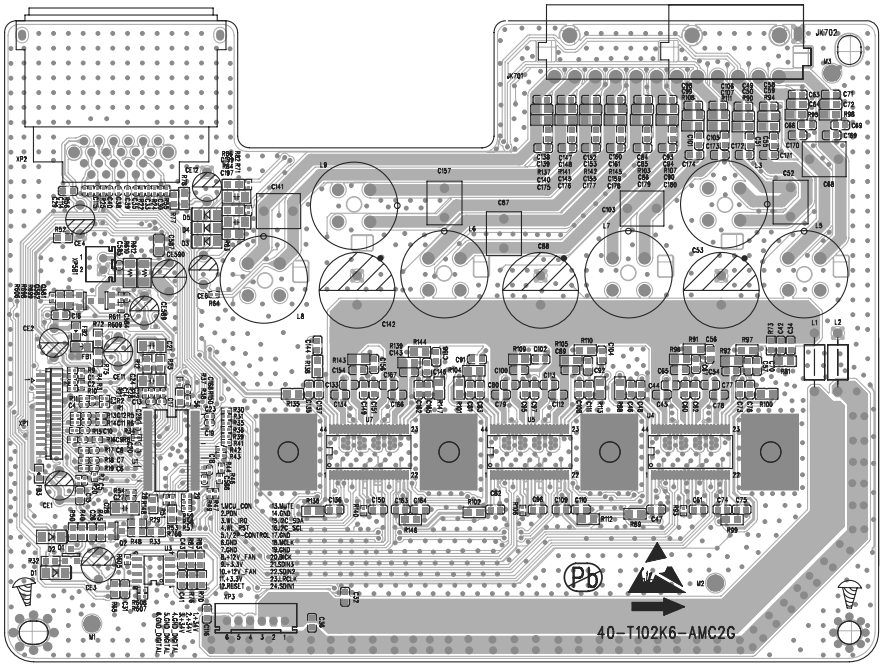
7-8

Amplifier Board Print-layout(bottom side):



7-9

Amplifier Board Print-layout(top side):



Voltages for per connect pin

XP4--From Main Board Connect to Power Board		
Pin No	**Pin Assin**	**Remarks**
1	VCC_D	4.75-5.25V
2	GND	
3	GND	
4	+12V	11.4-12.6V
5	+12V	11.4-12.6V

XP9--From Main Board Connect to Front Board		
Pin No	**Pin Assin**	**Remarks**
1	MIC_in	
2	AGND	
3	MP3_R	
4	AGND	
5	MP3_L	
6	GND	
7	OPEN/CLOSE	3.3V
8	IR_OUT	
9	3.3V_STBY_MCU	3.3V
10	POWER_KEY	3.3V
11	GND	
12	VFD_DATA	SPI
13	VFD_CLK	
14	VFD_STB	
15	GND	
16	VCC_D	4.75-5.25V
17	MIC_Detect	
18	12V_D	11.4-12.6V

XP13--From Main Board Connect to Amp Board		
Pin No	**Pin Assin**	**Remarks**
1	DATA0	I2S
2	LRCKL	
3	DATA1	
4	DATA2	
5	BCLK	
6	GND	
7	MCLK	I2S
8	GND	
9	AMP_SCL	IIC
10	AMP_SDA	
11	GND	
12	AMP_MUTE	
13	AMP_RST	
14	3.3V	3.2-3.4V
15	+12V_D	11.4-12.6V
16	3.3V	3.2-3.4V
17	+12V_D	11.4-12.6V
18	GND	
19	GND	
20	POWER_derating	
21	Reserved	
22	TH_WAR	
23	PDWN	
24	BKND_ERR	

XP6--From Main Board Connect to Front USB		
Pin No	**Pin Assin**	**Remarks**
1	USB_VCC	4.75-5.25V
2	GND	
3	USB_M1	High spped difference
4	USB_P1	

8-2

Waveforms for measure point

图1. XP11.1 DATA0

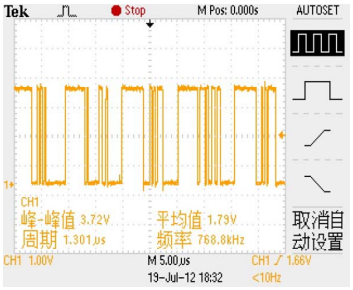


图2. XP11.2 LRCKL

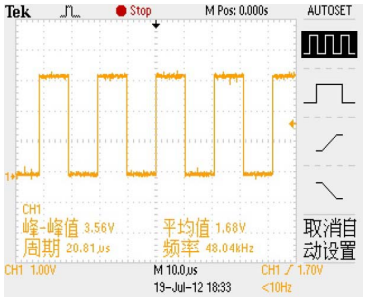


图3. XP11.3 DATA1

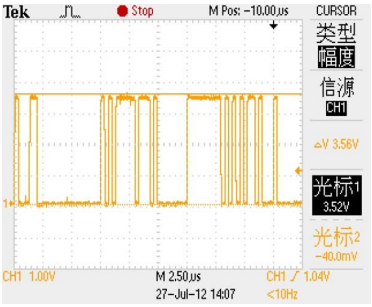


图4. XP11.4 DATA2

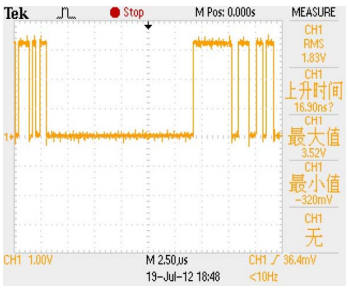


图5. XP11.5 BCLK

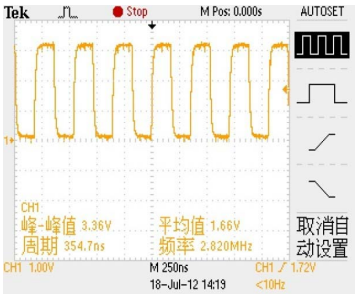
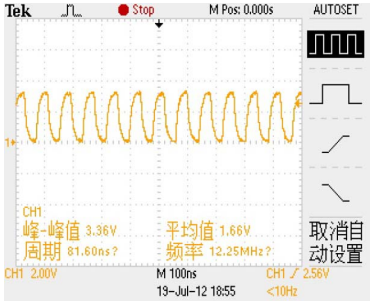


图6. XP11.7 MCLK



8-3

Waveforms for measure point

图7. XP11.9 AMP_SCL

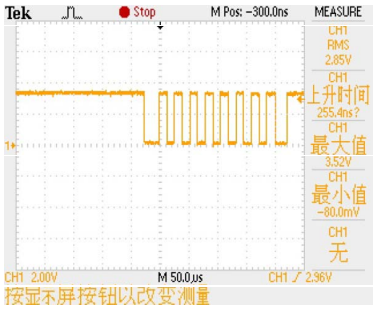


图8. XP11.10 AMP_SDA

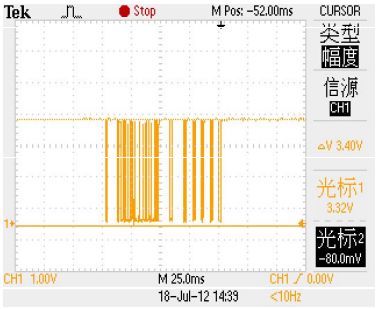


图9. XP11.12 AMP_MUTE

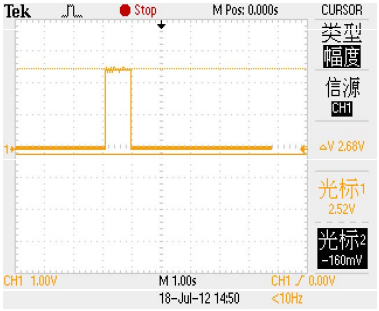


图10. XP11.13 AMP_RST

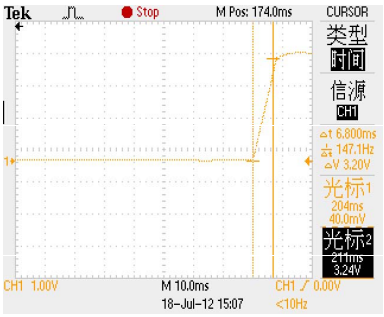
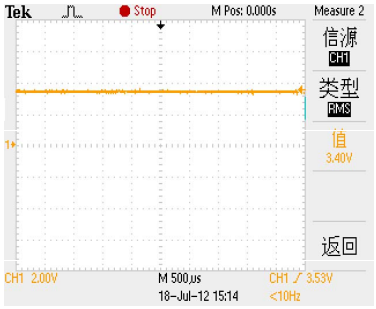
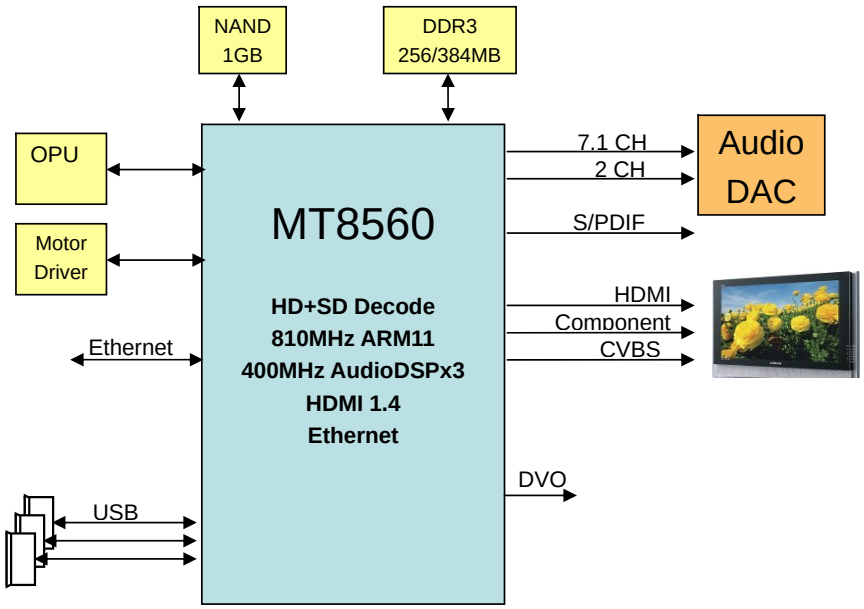


图11. XP11.20

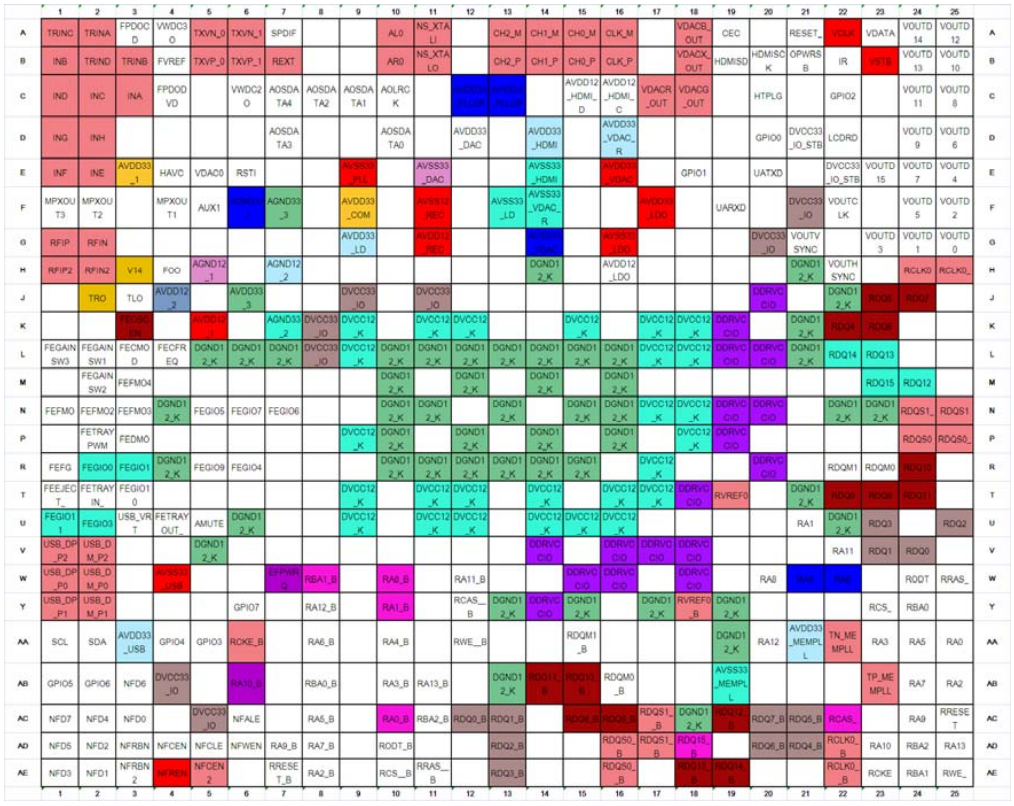
图12. XP11.23 PDWN



FUNCTIONAL BLOCK DIAGRAM FOR MAIN IC MT8560



PIN ASSIGNMENT



PIN DESCRIPTION

Pin	Symbol	Type	Description
Digital power/ground			
K9 K11 K12 K15 K17 K18 L9 L17 L18 N17 N18 P9 P18 R17 T9 T11 T12 T14 T16 T17 U9 U11 U12 U14 U15 U16	DVCC12_K	Power	1.2 V digital power

Pin	Symbol	Type	Description
H14			
H21			
J22			
K21			
L5			
L6			
L7			
L10			
L11			
L12			
L13			
L14			
L15			
L16			
L21			
M10			
M12			
M14			
M16			
N4			
N10			
N11			
N13			
N15			
N16	DGND12_K	Ground	Digital ground
N22			
N23			
P10			
P12			
P14			
P16			
R4			
R10			
R11			
R12			
R13			
R14			
R15			
T21			
U6			
U22			
V5			
Y13			
Y15			
Y17			
Y19			
AA19			
AB13			
AC18			

Pin	Symbol	Type	Description
F21 G20 J9 J11 K8 L8 AB4 AC5	DVCC33_IO	Power	3.3 V digital IO power
D21 E22	DVCC33_IO_STB	Power	3.3 V digital IO power for Stand-By Module
J20 K19 L19 L20 N19 N20 P19 R20 T18 V14 V16 V17 V18 W15 W16 W18 Y14	DDRVCCIO	Power	1.5 V digital IO power
XTAL/PLL			
AA21	AVDD33_MEMPLL	Power	3.3 V Analog Power for MEMPLL
AB19	AVSS33_MEMPLL	Ground	Analog Ground for MEMPLL
AA22	TN_MEMPLL	Analog	Test Pin
AB23	TP_MEMPLL	Analog	Test Pin
H16	AVDD12_LDO	Power	1.2V standby power
F17	AVDD33_LDO	Power	3.3V power for standby
G16	AVSS33_LDO	Ground	Analog ground for standby
C12	AVDD33_PLLGP	Power	3.3V Analog Power for PLL Group
C13	AVSS33_PLLGP	Power	Analog Ground for PLL Group
A11	NS_XTALI	I	27MHz Crystal In
B11	NS_XTALO	O	27MHz Crystal Out

Pin	Symbol	Type	Description
Audio PWM DAC interface			
D12	AVDD33_DAC	Power	3.3V Analog Power
E11	AVSS33_DAC	Ground	Analog Ground
A10	AL0	I/O	Multiple function: (1) Audio output bit clock (2) Audio PWM output (3) GPIO
B10	AR0	I/O	Multiple function: (1) Audio output master clock (2) Audio PWM output (3) GPIO
Audio interface			
U5	AMUTE	I/O	Multiple function: (1) 1st Audio DAC mute (2) GPIO
C10	AOLRCK	I/O	Multiple function: (1) Audio output left-right clock (2) 2nd Audio DAC mute (3) Video out DE signal (4) 2nd RS232 TX (5) External Interrupt 4 (6) Slave I2C clock (7) PWM control signal output (8) Ethernet Activity LED (9) GPIO
D10	AOSDATA0	I/O	Multiple function: (1) Audio output serial data 0 (2) 2nd Audio DAC mute (3) Video out DE signal (4) 2nd RS232 RX (5) External Interrupt 2 (6) Slave I2C data (7) PWM control signal output (8) Ethernet Duplex LED (9) GPIO

Pin	Symbol	Type	Description
C9	AOSDATA1	I/O	Multiple function: (1) Audio output serial data 1 (2) Audio output master clock (3) Micophone input master clock (4) Video out DE signal (5) External Interrupt 1 (6) 3th RS232 TX (7) Slave I2C clock (8) PWM control signal output (9) Ethernet Activity LED (10) GPIO
C8	AOSDATA2	I/O	Multiple function: (1) Audio output serial data 2 (2) Audio output bit clock (3) Microphone input bit clock (4) Video out DE signal (5) External Interrupt 4 (6) 3th RS232 RX (7) Slave I2C data (8) PWM control signal output (9) Ethernet Duplex LED (10) 1st Audio DAC mute (11) GPIO
D7	AOSDATA3	I/O, 5V	Multiple function: (1) Audio output serial data 3 (2) Audio output left-right clock (3) Microphone input left-right clock (4) Video out DE signal (5) External Interrupt 2 (6) 2nd RS232 TX (7) Slave I2C clock (8) PWM control signal output (9) Ethernet Speed LED (10) GPIO
C7	AOSDATA4	I/O, 5V	Multiple function: (1) Audio output serial data 4 (2) Audio line input data (3) Microphone input data (4) Video out DE signal (5) External Interrupt 1 (6) 2nd RS232 RX (7) Slave I2C data (8) PWM control signal output (9) Ethernet Link LED (10) GPIO

Pin	Symbol	Type	Description
A7	SPDIF	I/O	Multiple function: (1) SPDIF digital audio output (2) GPIO
Analog Video Out Interface			
E16	AVDD33_VDAC	Power	3.3V Analog Power
D16	AVDD33_VDAC_R	Power	3.3V Analog Power
G14	AVSS33_VDAC	Ground	Analog Ground
F14	AVSS33_VDAC_R	Ground	Analog Ground
A18	VDACB_OUT	Analog	DAC output
C18	VDACG_OUT	Analog	DAC output
C17	VDACR_OUT	Analog	DAC output
B18	VDACX_OUT	Analog	DAC output
Digital Video Output Interface			
F22	VOUTCLK	I/O, 5V	Multiple function: (1) Video out mode: CLOCK (2) 2nd RS232 TX (3) Slave I2C clock (4) PWM control signal output (5) Ethernet Activity LED (6) NAND Flash Data input/output bit 5 (7) Secure Disk interface clock (8) GPIO
H22	VOUTHSYNC	I/O	Multiple function: (1) Video out mode: HSYNC (2) 2nd RS232 RX (3) Slave I2C data (4) External Interrupt 1 (5) Ethernet Duplex LED (6) NAND Flash Data input/output bit 7 (7) Secure Disk interface command (8) GPIO
G21	VOUTVSYNC	I/O	Multiple function: (1) Video out mode: VSYNC (2) 3th RS232 TX (3) External Interrupt 2 (4) Ethernet Speed LED (5) NAND Flash Data input/output bit 6 (6) Secure Disk interface data bit 0 (7) GPIO

Pin	Symbol	Type	Description
G25	VOUTD0	I/O	Multiple function: (1) Video out 16-bit 422 mode: C0 (2) External Interrupt 4 (3) 3th RS232 RX (4) Ethernet Link LED (5) NAND Flash Data input/output bit 4 (6) Secure Disk interface data bit 1 (7) GPIO
G24	VOUTD1	I/O	Multiple function: (1) Video out 16-bit 422 mode: C1 (2) Slave I2C clock (3) NAND Flash Data input/output bit 3 (4) Secure Disk interface data bit 2 (5) GPIO
F25	VOUTD2	I/O	Multiple function: (1) Video out 16-bit 422 mode: C2 (2) Slave I2C data (3) NAND Flash Data input/output bit 2 (4) Secure Disk interface data bit 3 (5) GPIO
G23	VOUTD3	I/O	Multiple function: (1) Video out 16-bit 422 mode: C3 (2) JTAG ICE data out (3) GPIO
E25	VOUTD4	I/O	Multiple function: (1) Video out 16-bit 422 mode: C4 (2) JTAG ICE clock (3) GPIO
F24	VOUTD5	I/O	Multiple function: (1) Video out 16-bit 422 mode: C5 (2) JTAG ICE mode select (3) GPIO
D25	VOUTD6	I/O	Multiple function: (1) Video out 16-bit 422 mode: C6 (2) JTAG ICE data in (3) GPIO
E24	VOUTD7	I/O	Multiple function: (1) Video out 16-bit 422 mode: C7 (2) Audio line input data (3) GPIO

Pin	Symbol	Type	Description
C25	VOUTD8	I/O	Multiple function: (1) Video out 16-bit 422 mode: Y0 (2) Microphone input master clcok (3) 2nd RS232 TX (4) Slave I2C clock (5) PWM control signal output (6) Ethernet Activity LED (7) NAND Flash Data input/output bit 1 (8) GPIO
D24	VOUTD9	I/O	Multiple function: (1) Video out 16-bit 422 mode: Y1 (2) Microphone input bit clcok (3) 2nd RS232 RX (4) Slave I2C data (5) External Interrupt 1 (6) Ethernet Duplex LED (7) NAND Flash Data input/output bit 0 (8) GPIO
B25	VOUTD10	I/O, 5V	Multiple function: (1) Video out 16-bit 422 mode: Y2 (2) Microphone input left-right clcok (3) 3th RS232 TX (4) Slave I2C clock (5) External Interrupt 2 (6) Ethernet Speed LED (7) NAND Flash ready/busy (8) GPIO
C24	VOUTD11	I/O, 5V	Multiple function: (1) Video out 16-bit 422 mode: Y3 (2) Microphone input data (3) 3th RS232 RX (4) Slave I2C data (5) External Interrupt 4 (6) Ethernet Link LED (7) NAND Flash read enable (8) GPIO
A25	VOUTD12	I/O, 5V	Multiple function: (1) Video out 16-bit 422 mode: Y4 (2) SPDIF input master clock (3) 2nd RS232 TX (4) Slave I2C clock (5) PWM control signal output (6) Ethernet Activity LED (7) NAND Flash chip enable (8) GPIO

Pin	Symbol	Type	Description
B24	VOUTD13	I/O, 5V	Multiple function: (1) Video out 16-bit 422 mode: Y5 (2) SPDIF input bit clock (3) 2nd RS232 RX (4) Slave I2C data (5) External Interrupt 1 (6) Ethernet Duplex LED (7) NAND Flash command latch enable (8) GPIO
A24	VOUTD14	I/O, 5V	Multiple function: (1) Video out 16-bit 422 mode: Y6 (2) SPDIF input left-right clock (3) 3th RS232 TX (4) Slave I2C clock (5) External Interrupt 2 (6) Ethernet Speed LED (7) NAND Flash address latch enable (8) GPIO
E23	VOUTD15	I/O	Multiple function: (1) Video out 16-bit 422 mode: Y7 (2) SPDIF input data (3) 3th RS232 RX (4) Slave I2C data (5) External Interrupt 4 (6) Ethernet Link LED (7) NAND Flash write enable (8) GPIO
HDMI TX			
C16	AVDD12_HDMI_C	Power	1.2V Analog Power
C15	AVDD12_HDMI_D	Power	1.2V Analog Power
D14	AVDD33_HDMI	Power	3.3V Analog Power
E14	AVSS33_HDMI	Ground	Analog Ground
A15	CH0_M	Analog	HDMI TX data 0 differential pair (M)
B15	CH0_P	Analog	HDMI TX data 0 differential pair (P)
A14	CH1_M	Analog	HDMI TX data 1 differential pair (M)
B14	CH1_P	Analog	HDMI TX data 1 differential pair (P)
A13	CH2_M	Analog	HDMI TX data 2 differential pair (M)
B13	CH2_P	Analog	HDMI TX data 2 differential pair (P)
A16	CLK_M	Analog	HDMI TX clock differential pair (M)

Pin	Symbol	Type	Description
B16	CLK_P	Analog	HDMI TX clock differential pair (P)
NAND Flash Interface			
AC6	NFALE	I/O	Multiple function (1) NAND Flash address latch enable (2) GPO
AD4	NFCEN	I/O	Multiple function (1) NAND Flash chip enable (2) GPO
AE5	NFCEN2	I/O	Multiple function (1) NAND Flash 2nd chip enable (2) 2nd RS232 TX (3) External Interrupt 2 (4) 3th RS232 TX (5) Slave I2C clock (6) PWM control signal output (7) GPO
AD5	NFCLE	I/O	Multiple function (1) NAND Flash command latch enable (2) GPO
AC3	NFD0	I/O	Multiple function (1) NAND Flash Data input/output bit0 (2) GPIO
AE2	NFD1	I/O	Multiple function (1) NAND Flash Data input/output bit1 (2) GPIO
AD2	NFD2	I/O	Multiple function (1) NAND Flash Data input/output bit2 (2) GPIO
AE1	NFD3	I/O	Multiple function (1) NAND Flash Data input/output bit3 (2) GPIO
AC2	NFD4	I/O	Multiple function (1) NAND Flash Data input/output bit4 (2) GPIO
AD1	NFD5	I/O	Multiple function (1) NAND Flash Data input/output bit5 (2) GPIO
AB3	NFD6	I/O	Multiple function (1) NAND Flash Data input/output bit6 (2) GPIO

Pin	Symbol	Type	Description
AC1	NFD7	I/O	Multiple function (1) NAND Flash Data input/output bit7 (2) GPIO
AD3	NFRBN	I/O	Multiple function (1) NAND Flash ready/busy (2) GPIO
AE3	NFRBN2	I/O	Multiple function (1) NAND Flash 2nd ready/busy (2) 2nd RS232 RX (3) External Interrupt 1 (4) 3th RS232 RX (5) Slave I2C data (6) PWM control signal output (7) GPO
AE4	NFREN	I/O	Multiple function (1) NAND Flash read enable (2) GPO
AD6	NFWEN	I/O	Multiple function (1) NAND Flash write enable (2) GPO
Dram Channel A			
AA25	RA0	O	Memory address bit 0
U21	RA1	O	Memory address bit 1
AB25	RA2	O	Memory address bit 2
AA23	RA3	O	Memory address bit 3
W21	RA4	O	Memory address bit 4
AA24	RA5	O	Memory address bit 5
W22	RA6	O	Memory address bit 6
AB24	RA7	O	Memory address bit 7
W20	RA8	O	Memory address bit 8
AC24	RA9	O	Memory address bit 9
AD23	RA10	O	Memory address bit 10
V22	RA11	O	Memory address bit 11
AA20	RA12	O	Memory address bit 12
AD25	RA13	O	Memory address bit 13
Y24	RBA0	O	Memory bank address bit 0

Pin	Symbol	Type	Description
AE24	RBA1	O	Memory bank address bit 1
AD24	RBA2	O	Memory bank address bit 2
AC22	RCAS_	O	Memory column address strobe
AE23	RCKE	O	Memory clock enable
H24	RCLK0	O	Memory clock 0 positive
H25	RCLK0_	O	Memory clock 0 negative
Y23	RCS_	O	Memory chip select
V24	RDQ0	I/O	Memory data bit 0
V23	RDQ1	I/O	Memory data bit 1
U25	RDQ2	I/O	Memory data bit 2
U23	RDQ3	I/O	Memory data bit 3
K22	RDQ4	I/O	Memory data bit 4
J23	RDQ5	I/O	Memory data bit 5
K23	RDQ6	I/O	Memory data bit 6
J24	RDQ7	I/O	Memory data bit 7
T23	RDQ8	I/O	Memory data bit 8
T22	RDQ9	I/O	Memory data bit 9
R24	RDQ10	I/O	Memory data bit 10
T24	RDQ11	I/O	Memory data bit 11
M24	RDQ12	I/O	Memory data bit 12
L23	RDQ13	I/O	Memory data bit 13
L22	RDQ14	I/O	Memory data bit 14
M23	RDQ15	I/O	Memory data bit 15
R23	RDQM0	O	Memory data mask bit 0
R22	RDQM1	O	Memory data mask bit 1
P24	RDQS0	I/O	Memory positive data strobe bit 0
P25	RDQS0_	I/O	Memory negative data strobe bit 0
N25	RDQS1	I/O	Memory positive data strobe bit 1
N24	RDQS1_	I/O	Memory negative data strobe bit 1
W24	RODT	O	Memory on die termination enable

Pin	Symbol	Type	Description
W25	RRAS_	O	Memory row address strobe
T19	RVREF0	I	Memory VREF
AE25	RWE_	O	Memory write enable
AC25	RRESET	O	Memory reset
DRAM Channel B			
AC10	RA0_B	O	Memory address bit 0
Y10	RA1_B	O	Memory address bit 1
AE8	RA2_B	O	Memory address bit 2
AB10	RA3_B	O	Memory address bit 3
AA10	RA4_B	O	Memory address bit 4
AC8	RA5_B	O	Memory address bit 5
AA8	RA6_B	O	Memory address bit 6
AD8	RA7_B	O	Memory address bit 7
W10	RA8_B	O	Memory address bit 8
AD7	RA9_B	O	Memory address bit 9
AB6	RA10_B	O	Memory address bit 10
W12	RA11_B	O	Memory address bit 11
Y8	RA12_B	O	Memory address bit 12
AB11	RA13_B	O	Memory address bit 13
AB8	RBA0_B	O	Memory bank address bit 0
W8	RBA1_B	O	Memory bank address bit 1
AC11	RBA2_B	O	Memory bank address bit 2
Y12	RCAS_B	O	Memory column address strobe
AA6	RCKE_B	O	Memory clock enable
AD22	RCLK0_B	O	Memory clock 0 positive
AE22	RCLK0__B	O	Memory clock 0 negative
AE10	RCS__B	O	Memory chip select
AC12	RDQ0_B	I/O	Memory data bit 0
AC13	RDQ1_B	I/O	Memory data bit 1
AD13	RDQ2_B	I/O	Memory data bit 2

Pin	Symbol	Type	Description
AE13	RDQ3_B	I/O	Memory data bit 3
AD21	RDQ4_B	I/O	Memory data bit 4
AC21	RDQ5_B	I/O	Memory data bit 5
AD20	RDQ6_B	I/O	Memory data bit 6
AC20	RDQ7_B	I/O	Memory data bit 7
AC15	RDQ8_B	I/O	Memory data bit 8
AC16	RDQ9_B	I/O	Memory data bit 9
AB15	RDQ10_B	I/O	Memory data bit 10
AB14	RDQ11_B	I/O	Memory data bit 11
AC19	RDQ12_B	I/O	Memory data bit 12
AE18	RDQ13_B	I/O	Memory data bit 13
AE19	RDQ14_B	I/O	Memory data bit 14
AD18	RDQ15_B	I/O	Memory data bit 15
AB16	RDQM0_B	O	Memory data mask bit 0
AA15	RDQM1_B	O	Memory data mask bit 1
AD16	RDQS0_B	I/O	Memory positive data strobe bit 0
AE16	RDQS0__B	I/O	Memory negative data strobe bit 0
AD17	RDQS1_B	I/O	Memory positive data strobe bit 1
AC17	RDQS1__B	I/O	Memory negative data strobe bit 1
AD10	RODT_B	O	Memory on die termination enable
AE11	RRAS__B	O	Memory row address strobe
Y18	RVREF0_B	I	Memory VREF
AA12	RWE__B	O	Memory write enable
AE7	RRESET_B	O	Memory reset
MISC			
A19	CEC	I/O, 5V	Multiple function (1) HDMI CEC (2) GPIO (3) JTAG ICE data in

Pin	Symbol	Type	Description
D20	GPIO0	I/O, 5V	Multiple function (1) Serial interface control line (2) Slave I2C clock (3) External Interrupt 3 (4) GPIO
E18	GPIO1	I/O, 5V	Multiple function (1) Serial interface data line (2) Slave I2C data (3) External Interrupt 3 (4) GPIO
C22	GPIO2	I/O, 5V	Multiple function (1) Video output DE signal (2) 2nd RS232 TX (3) External Interrupt 1 (4) Slvae I2C clock (5) PWM control signal output (6) Ethernet Speed LED (7) GPIO
AA5	GPIO3	I/O, 5V	Multiple function (1) Audio line input data (2) 2nd RS232 RX (3) External Interrupt 2 (4) Slvae I2C data (5) PWM control signal output (6) Ethernet Link LED (7) GPIO
AA4	GPIO4	I/O, 5V	Multiple function (1) Microphone input data (2) 2nd RS232 TX (3) External Interrupt 4 (4) Slvae I2C clock (5) PWM control signal output (6) Ethernet Activity LED (7) GPIO
AB1	GPIO5	I/O, 5V	Multiple function (1) Microphone input left-right clock (2) 2nd RS232 RX (3) External Interrupt 1 (4) Slvae I2C data (5) PWM control signal output (6) Ethernet Duplex LED (7) GPIO

Pin	Symbol	Type	Description
AB2	GPIO6	I/O, 5V	Multiple function (1) Microphone input bit clock (2) 3th RS232 TX (3) External Interrupt 2 (4) Slvae I2C clock (5) PWM control signal output (6) Ethernet Speed LED (7) GPIO
Y6	GPIO7	I/O, 5V	Multiple function (1) Microphone input master clock (2) 3th RS232 RX (3) External Interrupt 4 (4) Slvae I2C data (5) PWM control signal output (6) Ethernet Link LED (7) GPIO
B20	HDMISCK	I/O, 5V	Multiple function (1) HDMI I2C Clock (2) GPIO (3) JTAG ICE clock
B19	HDMISD	I/O, 5V	Multiple function (1) HDMI I2C Data (2) GPIO (3) JTAG ICE mode select
C20	HTPLG	I/O, 5V	Multiple function (1) HDMI Hot Plug (2) GPIO (3) JTAG ICE data out
B22	IR	I/O, 5V	Multiple function (1) Infrared input (2) GPIO
D22	LCDRD	I/O, 5V	Multiple function (1) LCD read strobe (2) GPIO
E6	RSTI	I	Front-End Power on reset
B21	OPWRSB	I/O, 5V	Power Control
A21	RESET_	I, 5V	Power on reset
F19	UARXD	I/O, 5V	Reserved for debug-only Uart pins. (1) 1st RS232 RX (2) T8032 RS232 RX

Pin	Symbol	Type	Description
E20	UATXD	I/O, 5V	Reserved for debug-only Uart pins (1) 1st RS232 TX (2) T8032 RS232 TX
A22	VCLK	I/O, 5V	Multiple function (1) VFD clock (2) GPIO (3) Slave I2C data (4) Serial interface data line
A23	VDATA	I/O, 5V	Multiple function (1) VFD data (2) GPIO (3) External Interrupt 3
B23	VSTB	I/O, 5V	Multiple function (1) VFD strobe (2) GPIO (3) Slave I2C clock (4) Serial interface control line
AA1	SCL	I/O, 5V	Multiple function (1) Serial interface control line (2) Slave I2C clock (3) GPIO
AA2	SDA	I/O, 5V	Multiple function (1) Serial interface data line (2) Slave I2C data (3) GPIO
USB			
AA3	AVDD33_USB	Power	3.3V Analog power for USB
W4	AVSS33_USB	Ground	Analog ground for USB
W2	USB_DM_P0	Analog	USB port0 differential serial data bus (minus)
W1	USB_DP_P0	Analog	USB port0 differential serial data bus (plus)
Y2	USB_DM_P1	Analog	USB port1 differential serial data bus (minus)
Y1	USB_DP_P1	Analog	USB port1 differential serial data bus (plus)
V2	USB_DM_P2	Analog	USB port2 differential serial data bus (minus)
V1	USB_DP_P2	Analog	USB port2 differential serial data bus (plus)
U3	USB_VRT	Analog	USB reference resistor
E-fuse			
W7	EFPWRQ	Power	2.5V power for E-fuse programming
Ethernet PHY			
G9	AVDD33_LD	Power	Line driver 3.3V analog power

Pin	Symbol	Type	Description
F9	AVDD33_COM	Power	PLL/BG 3.3V analog power
F13	AVSS33_LD	Ground	Line driver analog ground
E9	AVSS33_PLL	Ground	PLL/BG analog ground
G11	AVDD12_REC	Power	ADC analog power
F11	AVSS12_REC	Ground	ADC analog ground
B5	TXVP_0	Analog	Ethernet TD+
B6	TXVP_1	Analog	Ethernet RD+
A5	TXVN_0	Analog	Ethernet TD-
B7	REXT	Analog	External reference resistor
A6	TXVN_1	Analog	Ethernet RD-
SERVO			
F6	AGND33_1	Analog Ground	Analog Ground
K7	AGND33_2	Analog Ground	Analog Ground
F7	AGND33_3	Analog Ground	Analog Ground
H5	AGND12_1	Analog Ground	Analog Ground
H7	AGND12_2	Analog Ground	Analog Ground
F5	AUX1	Analog I/O	Auxiliary Input Alternative Function : Signal Monitoring
K5	AVDD12_1	Analog Power(1.2V)	Power Pin
J4	AVDD12_2	Analog Power(1.2V)	Power Pin
E3	AVDD33_1	Analog Power(3.3V)	Power Pin
J6	AVDD33_3	Analog Power(3.3V)	Power Pin
L4	FECFREQ	3.3V LVTTL I/O, 5V-tolerance, Slow slew, 2, 4, 6, 8mA PDR, 75K pull-up (3.3V)	Frequency selection signal output, or LDD serial interface data or I2C SDA. The pin is spike-free at power-on stage.

Pin	Symbol	Type	Description
L3	FECMOD	3.3V LVTTL I/O, 5V-tolerance, Slow slew, 2, 4, 6, 8mA PDR, 75K pull-down (0V)	High frequency modulation mode selection signal output, or LDD serial interface command enable. The pin is spike-free at power-on stage.
P3	FEDMO	Analog Output	Disk motor control output. DAC output.
T1	FEEJECT_	3.3V LVTTL I/O, 5V-tolerance, 6 mA PDR, 75K pull-up (3.3V)	Eject/stop key input, active low. The pin is spike-free at power-on stage. Alternate function : General IO.
R1	FEFG	3.3V LVTTL I/O, 5V-tolerance, 6 mA PDR, 75K pull-up (3.3V)	Motor Hall sensor input. The pin is spike-free at power-on stage.
N1	FEFMO	Analog Output	Feed motor 1 control. DAC output.
N2	FEFMO2	Analog Output	Feed motor 2 control. DAC output.
N3	FEFMO3	Analog I/O	Feed motor 3 control. DAC output. Alternative Function : Auxiliary servo input
M3	FEFMO4	Analog I/O	Feed motor 4 control. DAC output. Alternative Function : Auxiliary servo input
H4	FOO	Analog Output	Focus servo output. PDM output of focus servo compensator.
A3	FPDOCD	Analog Input	Laser Power Monitor Input for CD APC / Differential negative input
C4	FPDODVD	Analog Input	Laser Power Monitor Input for DVD APC / Differential positive input
L2	FEGAINSW1	Analog Output	Read gain switch. 1
M2	FEGAINSW2	Analog Output	Read gain switch 2.
L1	FEGAINSW3	Analog Output	Read gain switch 3.

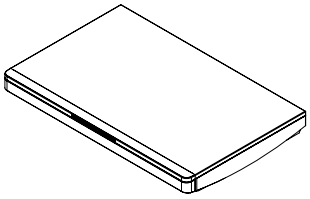
Pin	Symbol	Type	Description
R2	FEGIO0	3.3V LVTTL I/O, 5V-tolerance, 2,4,6,8 mA PDR, 75K pull-down (0V)	LDD serial interface data. The pin is spike-free at power-on stage. The pin is not allowed to pull-up in circuit layout. Alternate function: 1. Internal monitored signal output 2. General IO
R3	FEGIO1	3.3V LVTTL I/O, 5V-tolerance, 2,4,6,8 mA PDR, 75K pull-down (0V)	LDD serial interface CLK. The pin is spike-free at power-on stage. The pin is not allowed to pull-up in circuit layout. Alternate function: 1. Internal monitored signal output 2. General IO
T3	FEGIO10	3.3V LVTTL I/O, 5V-tolerance, 2,4,6,8 mA PDR, 75K pull-up (3.3V)	PC RS232 serial receive data. The pin is spike-free at power-on stage Alternate function: 1. High speed serial output port. (CLOCK) 2. Internal monitored signal output 3. LED Control Output. Initial “0” Output 4. General IO.
U1	FEGIO11	3.3V LVTTL I/O, 5V-tolerance, 2,4,6,8 mA PDR, 75K pull-up (3.3V)	PC RS232 serial transmit data. The pin is spike-free at power-on stage. Alternate function: 1. High speed serial output port (Data) 2. Internal monitored signal output 3. General IO.
U2	FEGIO3	3.3V LVTTL I/O, 5V-tolerance, 2,4,6,8 mA PDR, 75K pull-down (0V)	LED Control Output. Initial 0 Output. The pin is spike-free at power-on stage. Alternate function : . 1. Internal monitored signal output 2. General IO
R6	FEGIO4	Analog Output	Read gain switch 4 Alternate function : 1. LCD serial interface command enable. 2. LCD_DRV: Square wave output for LCD control. 3. Internal monitored signal output 4. General IO.
N5	FEGIO5	Analog Output	Read gain switch 5 Alternate function : 1. SIDM 2. LCD serial interface command enable. 3. Internal monitored signal output 4. General IO.

Pin	Symbol	Type	Description
N7	FEGIO6	Analog Output	Read gain switch 6. The pin is not allowed to pull-up in circuit layout. Alternate function : 1. SIDM 2. LCD serial interface command enable. 3. Internal monitored signal output 4. General IO.
N6	FEGIO7	3.3V LVTTL I/O, 5V-tolerance, 2,4,6,8 mA PDR, 75K pull-down (0V)	General IO. The pin is spike-free at power-on stage. The pin is not allowed to pull-up in circuit layout.
R5	FEGIO9	3.3V LVTTL I/O, 5V-tolerance, 2,4,6,8 mA PDR, 75K pull-down (0V)	General IO. The pin is spike-free at power-on stage. Alternate function : 1. Internal monitored signal output 2. Spoke input. 3. Power on reset input, high active. 4. General IO.
E4	HAVC	Analog Output	Decoupling Pin for Reference Voltage of Main and Sub Beams
C3	INA	Analog Input	Input of Main Beam Signal (A)
B1	INB	Analog Input	Input of Main Beam Signal (B)
C2	INC	Analog Input	Input of Main Beam Signal (C)
C1	IND	Analog Input	Input of Main Beam Signal (D)
E2	INE	Analog Input	Input of Sub-Beam Signal (E)
E1	INF	Analog Input	Input of Sub-Beam Signal (F)
D1	ING	Analog Input	Input of Sub-Beam Signal (G)
D2	INH	Analog Input	Input of Sub-Beam Signal (H)
F4	MPXOUT1	Analog Output	Multiplexer Output 1 for Signal Monitoring. The pin is not allowed to pull-up in circuit layout. Alternate function: Internal monitored signal output / General output.
F2	MPXOUT2	Analog Output	Multiplexer Output 2 for Signal Monitoring. The pin is not allowed to pull-up in circuit layout. Alternate function: Internal monitored signal output / General output.
F1	MPXOUT3	Analog Output	Multiplexer Output 3 for Signal Monitoring. The pin is not allowed to pull-up in circuit layout. Alternate function : Internal monitored signal output / General output.

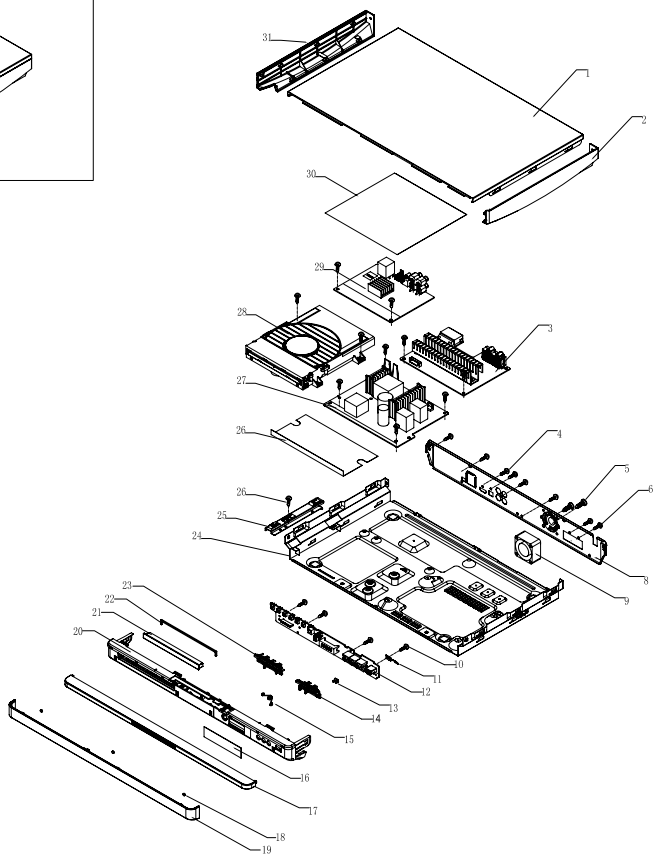
Pin	Symbol	Type	Description
K3	FEOSCEN	3.3V LVTTL I/O, 5V-tolerance, Slow slew, 2, 4, 6, 8mA PDR, 75K pull-up (3,3V)	High frequency modulation enable signal output, or LDD serial interface CLK or I2C SCL. The pin is spike-free at power-on stage.
G2	RFIN	Analog Input	Differential Input of AC Coupling RF SUM Signal (Negative)
H2	RFIN2	Analog Input	Differential Input of AC Coupling RF SUM Signal (Negative)
G1	RFIP	Analog Input	Differential Input of AC Coupling RF SUM Signal (Positive)
H1	RFIP2	Analog Input	Differential Input of AC Coupling RF SUM Signal (Positive)
J3	TLO	Analog Output	Tilt servo output
T2	FETRAYIN_	3.3V LVTTL I/O, 5V-tolerance, 6 mA, 75K pull-up (3.3V)	Tray_is_in Input, A Logical Low Indicates the Tray is IN. Feedback Flag is from Tray Connector. The pin is spike-free at power-on stage. Alternate function : General IO.
U4	FETRAYOUT_	3.3V LVTTL I/O, 5V-tolerance, 6 mA, 75K pull-up (3.3V)	Tray_is_out Input. A Logical Low Indicates the Tray is OUT. Feedback Flag is from Tray Connector. The pin is spike-free at power-on stage. Alternate function : General IO.
P2	FETRAYPWM	Analog Output	Tray DAC / PWM control output. Controlled by μP.
A2	TRINA	Analog Input	Input of Tracking Signal (A)
B3	TRINB	Analog Input	Input of Tracking Signal (B)
A1	TRINC	Analog Input	Input of Tracking Signal (C)
B2	TRIND	Analog Input	Input of Tracking Signal (D)
J2	TRO	Analog Output	Tracking servo output. PDM output of tracking servo compensator.
H3	V14	Analog Output	Output of Voltage Reference (1.4V)
E5	VDAC0	Analog Output	Output of General DAC
B4	FVREF	Analog Output	Output of Voltage Reference
C6	VWDC2O	Analog Output	Output Voltage 2 of Laser Diode Control in APC

Pin	Symbol	Type	Description
A4	VWDC3O	Analog Output	Output Voltage 3 of Laser Diode Control in APC

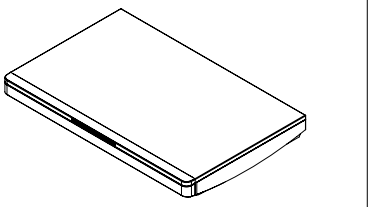
10-1



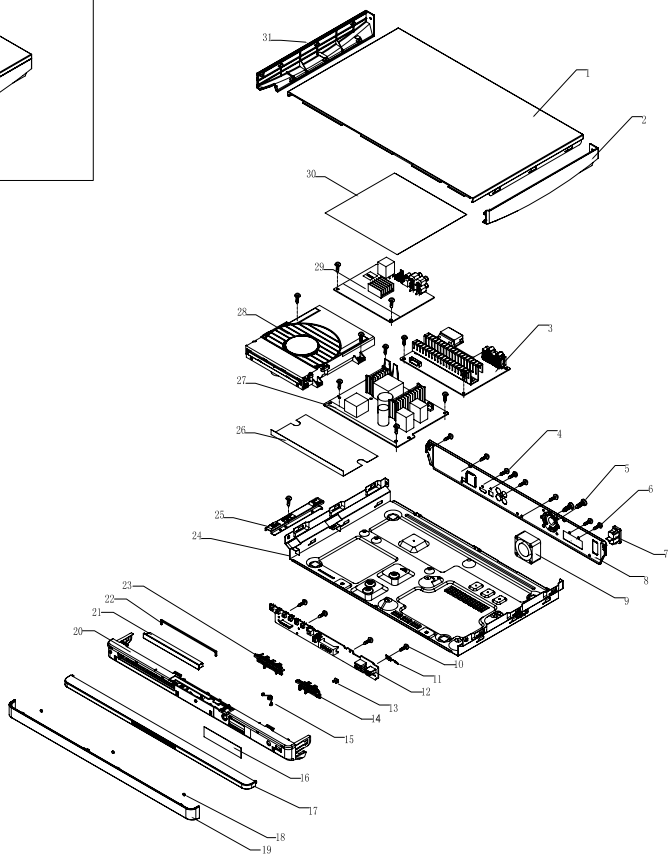
Exploded View for HTB3510/12/93/94:



10-2



Exploded View for HTB3510/98/X78/55/51/40:



Revision List

Version 1.0

* Initial Release for HTB3510/12:

Version 1.1

* Initial Release for HTB3510/98/X78/40/51/94/55/93