Service
Service
Service

Service Manual

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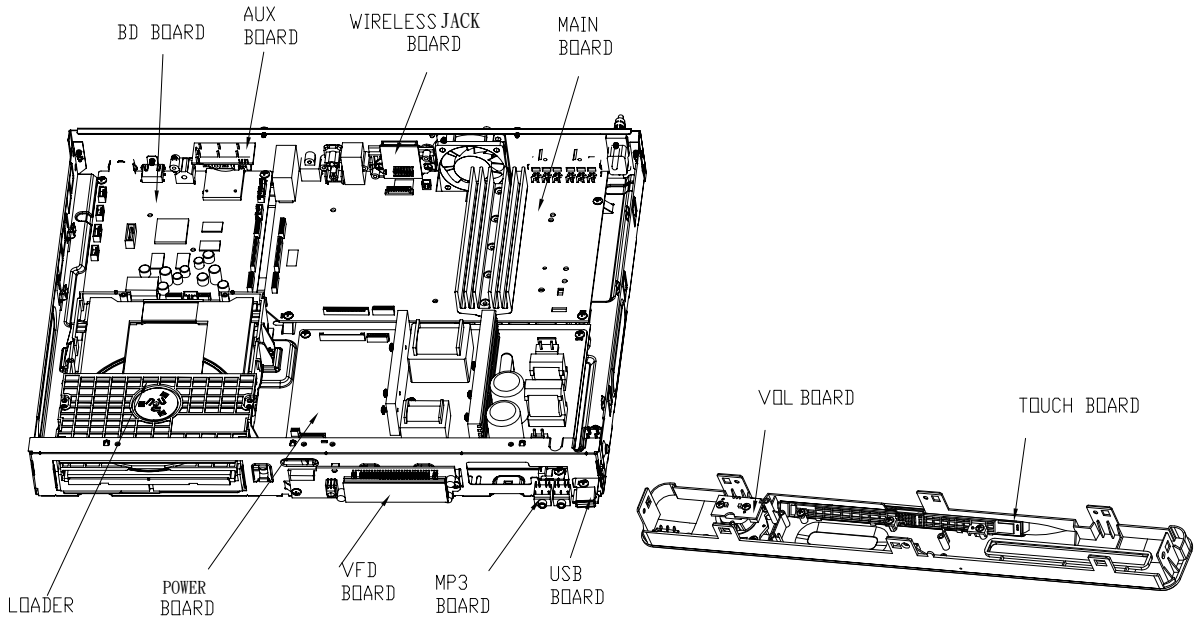
GB 3139 785 35640

Version 1.0

PHILIPS

LOCATION OF PCB BOARDS



VERSION VARIATION:

Type/Versions / Features	HTS4561 /12
Output Power - 1000W	X
Voltage (220~240V)	X
Wireless ready	X

SERVICE SCENARIO MATRIX:

Type/Versions / Board in used	HTS4561 /12
Main+VOL Board	C
Power Board	C
VFD+USB+MP3+AUX Board	Bd
BD Board	Bd
Touch Board	Bd
Wireless Jack Board	Bd

*Bd= Board Level Replacement
*C = Component Level Repair

SPECIFICATIONS

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 (Ultra)/ DivX Plus HD media, USB storage device

File formats

- Audio: .aac,.mka, .mp3, .wma, .wav, .mp4, .m4a
- Video:
  - .avi,.divx, .mp4, .mkv, .asf,.wmv, .mpg, .mpeg,
  - .rmvb, .rm (Available only in Asia Pacific and China)
- Picture: .jpg, .jpeg, .gif, .png

Audio formats

Your home theater supports the following audio files.

Extension	Container	Audio codec	Bit rate
.mp3	MP3	MP3	32kbps ~ 320kbps
.wma	ASF	WMA	64kbps ~ 160kbps
.aac	AAC	AAC, HE-AAC	192kbps
.wav	WAV	PCM	1.4Mbps
.m4a	MKV	AAC	192kbps
.mka	MKA	PCM	27.648 Mbps
.mka	MKA	AC-3	640kbps
.mka	MKA	DTS core	1.54Mbps
.mka	MKA	MPEG	912kbps
.mka	MKA	MP3	32kbps ~ 320kbps
.mka	MKA	WMA	64kbps ~ 160kbps
.mka	MKA	AAC, HE-AAC	192kbps

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, AC-3, DTS core, MP3, WMA	DivX 3.11, DivX 4.x, DivX 5.x, DivX 6.x	10Mbps max
	MPEG 1, MPEG 2	20Mbps (peak 40Mbps)
	MPEG 4 ASP	10Mbps max
	H.264/AVC HP@4.1/4.0; MP@3.2/3.1/3.0	20Mbps (peak 40Mbps)
	WMV9	20Mbps

.divx files in AVI container

Audio codec	Video codec	Bit rate
PCM, AC-3, MP3, WMA	DivX 3.11, DivX 4.x, DivX 5.x, DivX 6.x	10Mbps max
	MPEG 1, MPEG 2	20Mbps (peak 40Mbps)
	MPEG 4 ASP	10Mbps max

.mp4 or .m4v files in MP4 container

Audio codec	Video codec	Bit rate
AC-3, MPEG, MP3, AAC, HE-AAC	MPEG 1, MPEG 2	20Mbps (peak 40Mbps)
	MPEG 4 ASP	10Mbps max
	H.264/AVC HP@4.1/4.0; MP@3.2/3.1/3.0	20Mbps (peak 40Mbps)

.mkv files in MKV container

Audio codec	Video codec	Bit rate
PCM, AC-3, DTS core, MPEG, MP3, WMA, AAC, HE-AAC	MPEG 1, MPEG 2	20Mbps (peak 40Mbps)
	MPEG 4 ASP	10Mbps max
	H.264/AVC HP@4.1/4.0; MP@3.2/3.1/3.0	20Mbps (peak 40Mbps)
	WMV9	20Mbps

.asf and .wmv files in ASF container

Audio codec	Video codec	Bit rate
PCM, AC-3, MP3, WMA	MPEG 4 ASP	10Mbps max
	H.264/AVC HP@4.1/4.0; MP@3.2/3.1/3.0	20Mbps (peak 40Mbps)
	WMV9	20Mbps

.mpg and .mpeg files in PS container

Audio codec	Video codec	Bit rate
PCM, DTS core, MPEG, MP3	MPEG 1, MPEG 2	20Mbps (peak 40Mbps)
	MPEG 1, MPEG 2	20Mbps (peak 40Mbps)

Amplifier

- Total output power:
  - Europe and Asia: 1000W RMS (30% THD)
  - Latin America: 780W (10% THD)
- Frequency response: 20 Hz-20 kHz / ±3 dB
- Signal-to-noise ratio: > 65 dB (CCIR) / (A-weighted)
- Input sensitivity:
  - AUX1, AUX2: 1000 mV
  - Music iLink: 500 mV

Video

- Signalsystem: 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: 112 kbps - 320 kbps
  - WMA: 48 kbps - 192 kbps

Radio

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

USB

- Compatibility: Hi-Speed USB (2.0)
- Class support: USB Mass Storage Class (MSC)
- File system: FAT16, FAT32, NTFS
- Maximum memory support: < 160 GB

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: 105 W
- Standby power consumption: ≤ 0.5 W
- Dimensions (WxHxD): 435 x 57 x 356.5 mm
- Weight: 3.69 kg

Subwoofer

- Total output power:
  - Europe and Asia: 230W RMS (30% THD)
  - Latin America: 180W RMS (10% THD)
- Impedance: 3 ohm
- Speaker drivers:
  - Europe and Asia: 165 mm (6.5") woofer
  - India and Latin America: 203 mm (8") woofer
- Frequency response: 20 Hz-150 Hz
- Dimensions (WxHxD): 196 x 395 x 342 (mm)
- Weight: 4.8 kg
- Cable length: 3 m

Speakers

Center speaker:

- Total output power:
  - Europe and Asia: 230W RMS (30% THD)
  - Latin America: 180W (10% THD)
- System: full range satellite
- Speaker impedance: 3ohm
- Speaker drivers: 2 x 76.2 mm (3") full range
- Frequency response: 150Hz-20kHz
- Dimensions (WxHxD): 280 x 95 x 92mm
- Weight: 1.40kg
- Cable length: 2m

Front / rear speakers:

- Total output power:
  - Europe and Asia: 4 x 135W RMS (30% THD)
  - Latin America: 4 x 105W RMS (10% THD)
- Speaker impedance: 5ohm
- Speaker drivers: 2 x 76.2 mm (3") full range
- Frequency response: 150Hz-20kHz
- Dimensions (WxHxD):
  - small speakers: 100 x 280 x 104mm
- Weight:
  - small speakers: 0.98-1.07 Kg each
- Cable length (front speakers): 4m
- Cable length (rear speakers): 10m

Remote control batteries

- 2 x AAA-LR03-1.5V

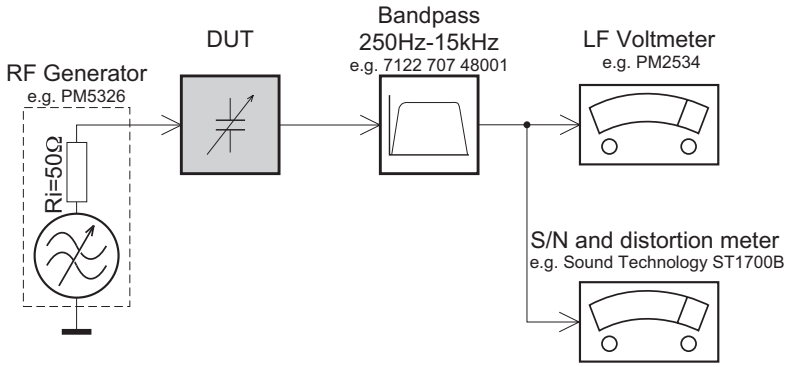
Laser

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

Specifications subject to change without prior notice.

MEASUREMENT SETUP

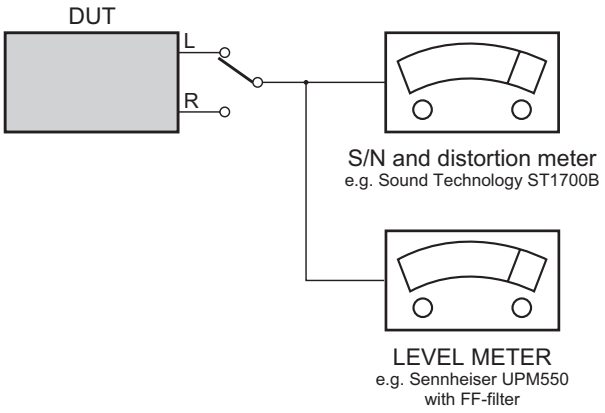
Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



SERVICE AIDS

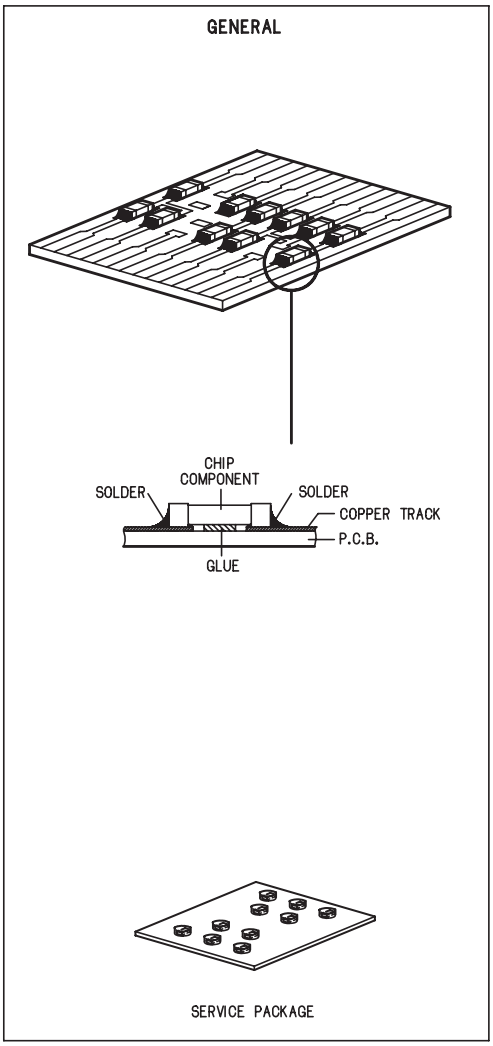
Service Tools:

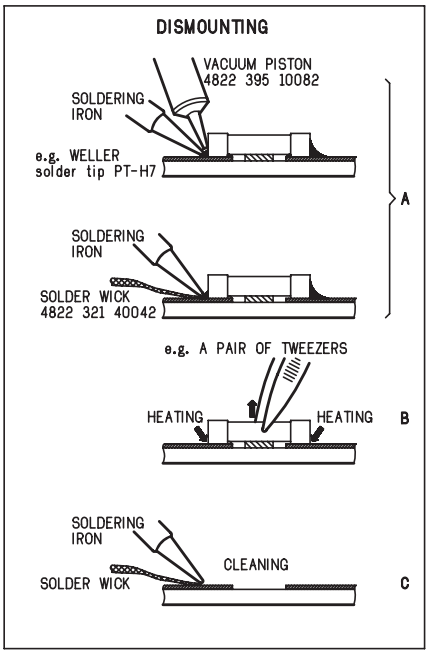
Universal Torx driver holder 4822 395 91019
Torx bit T10 150mm 4822 395 50456
Torx driver set T6-T20 .....4822 395 50145
Torx driver T10 extended 4822 395 50423

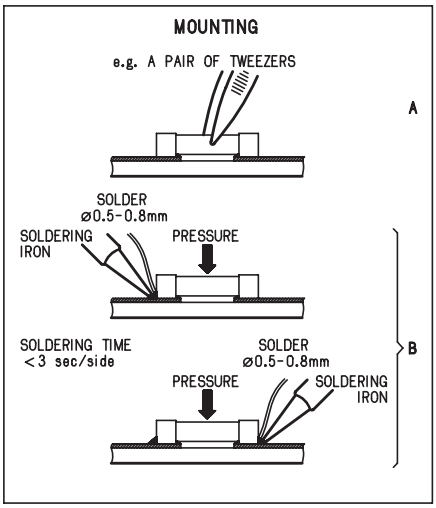
Compact Disc:

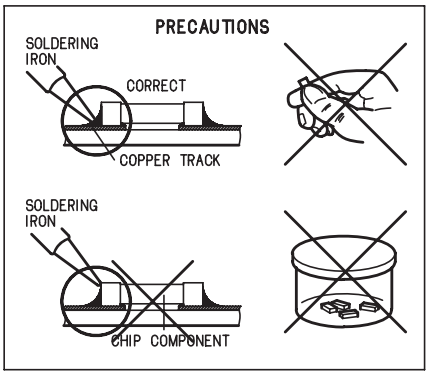
SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

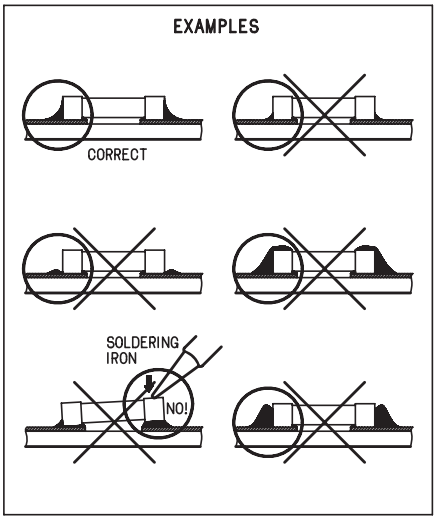
HANDLING CHIP COMPONENTS











ESD

GB **WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

NL **WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

F **ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D **WARNUNG**

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

I **AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB **ESD PROTECTION EQUIPMENT**

Complete Kit ESD3 (small tablemat, wristband, connection box, estention cable and earth cable 4822 310 10671
Wristband tester 4822 344 13999

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

Safety components are marked by the symbol ⚠ .

NL

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

De Veiligheidsonderdelen zijn aangeduid met het symbol ⚠ .

F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

Less composants de sécurité sont marqués ⚠ .

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

I

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

Componenty di sicurezza sono marcati con ⚠ .

GB

After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist, The leakage current must not exceed 0.5mA.

GB **Warning !**

Invisible laser radiation when open.
Avoid direct exposure to beam.

S **Varning !**

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

SF **Varoitus !**

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK **Advarse !**

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

F

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

Pb(Lead) Free Solder

When soldering , be sure to use the pb free solder.

INDENTIFICATION:
Regardless of special logo (not always indicated) 

one must treat all sets from **1 Jan 2005** onwards, according next rules:

Important note: In fact also products of year 2004 must 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 or does not know whether product is lead-free, 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 the 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. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website.
Do not re-use BGAs at all.

- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy 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.

Software upgrade & Procedure to restore product setting

1)Restore factory setting

a) Press “⌂” <Home> button on R/C.
b) Select <SETUP>, then press “OK” button on R/C.
c) Select <Advanced setup> ,then press < OK > button on R/C.
d) Select <Restore default settings>,then press <OK> to confirm.

2)Password change

a) Press “⌂” <Home> button on R/C.
b) Select <SETUP>, then press “OK” button on R/C.
c) Select <preference setup>, then press <OK> button on R/C.
d) Select <Change Password> <Confirm>, then press <OK> button on R/C.
“0000” is default password supplied.

3)Trade mode

a) In open model,press “⌂” <Home> button on R/C.
b) Press “2” “5” “9” on R/C,VFD will display “TRA ON” or “TRA OFF”.

4)Check software version

a) Press “⌂” <Home> button on R/C
b) Select <Setup>, then press <OK> button on R/C.
c) Select <Advanced Setup> <Version Info.>,then press <OK> button on R/C.
d) TV will show message as follow:

Model: HTS4561/ 12
Version:
System SW:027.00
Subsystem SW:20-00-00-00
Ethernet MAC:00:25:D1:01:8D:6C
For more information,frequently asked questions and software updates,please visit philips.com/support

Close

e) Select <Close> on the version display screen and press <OK> button to exit .

5) Upgrading new software

Method 1: Update software from a USB storage device
a) Create a folder named “UPG_ALL” in your USB storage device, and Copy the latest upgrading software into the folder.
b) Connect the USB storage device to the home theater.
c) Press “⌂” <Home> button on R/C, and select <Setup>.
d) Select <Advance Setup> <Software Update> <USB>.
e) TV will show message as follow:

Now searching for upgrade software!
Please wait...!

Software updates for this player have been found. Do you want to upgrade?

Cancel Start

f) Select <Start>, press <OK> button on R/C.

Software upgrade will take 5 minutes

Do not switch off!

Package version: 000025.0

Software BE 80%

Software FE Completed

Software MCU1:

Software Dock:

Software MCU3:

2 - 1

Software upgrade will take 5 minutes

Do not switch off!

Package version: 000025.0

Software BE Completed

Software FE Completed

Software MCU1: Not started

Software Dock: 2%

Software MCU3: Not started

Software upgrade will take 5 minutes

Do not switch off!

Package version: 000025.0

Software BE Completed

Software FE Completed

Software MCU1: 1%

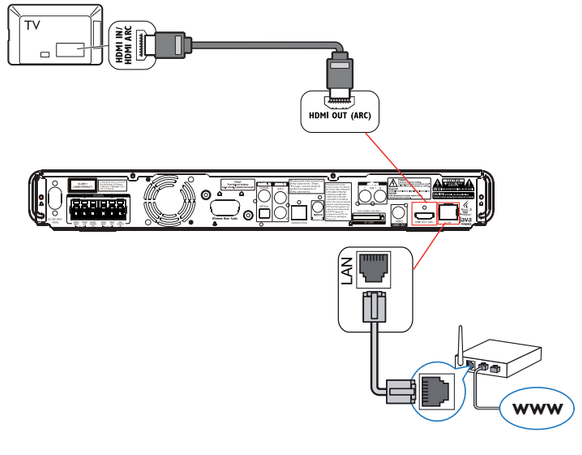
Software Dock: Failed

Software MCU3:

g)The set will shut down automatically when the software upgrade is completed.

Method 2: Update software from the internet

Note: To check for new updates, compare the current software version of your home theater with the latest software version (if available) on the Philips web site, and for BD-Live application and software update, make sure that the network router has access to the Internet and the firewall is disabled.
a) The “LAN” jack at the back panel of the set must be connect to the network router via network cable and the set connect to TV,
Prepare the connection as shown follow:



b) Press “⌂” <Home> button on R/C, and select <Setup>.
c) Select <Advance Setup> <Software Update> <Network>.
d) TV will show message as follow:

Now searching for upgrade software!
Please wait...!

Software updates for this player have been found. Do you want to upgrade?

Cancel Start

e) Select <Start>, press <OK> button on R/C.

Software upgrade will take 5 minutes

Do not switch off!

Package version: 000025.0

Software BE 80%

Software FE Completed

Software MCU1:

Software Dock:

Software MCU3:

2 - 2

Software upgrade will take 5 minutes

Do not switch off!

Package version: 000025.0

Software BE Completed

Software FE Completed

Software MCU1: Not started

Software Dock: 2%

Software MCU3: Not started

Software upgrade will take 5 minutes

Do not switch off!

Package version: 000025.0

Software BE Completed

Software FE Completed

Software MCU1: 1%

Software Dock: Failed

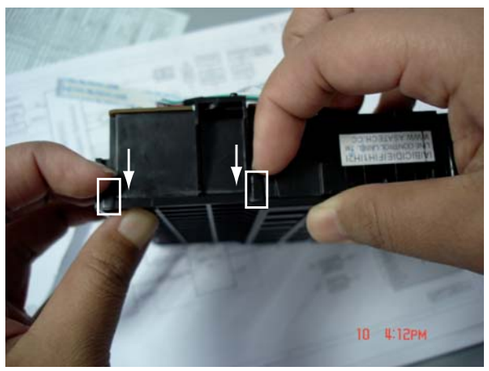
Software MCU3:

f) The set will shut down automatically when the software upgrade is completed.

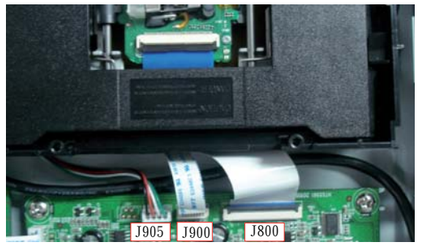
6)How to replace the defective Blu-ray Loader

a) Remove the defective Blu-ray Loader.

b) Remove the shield cover at the top of Blu-ray Loader as shown below.



c) Assembly Blu-ray Loader to “J800”,”J900”,”J905” on the top of BD Board as shown below.



d) Remove soldered joint on the ESD protection points.

Top side view of OPU

Bottom side view of OPU

Note: The 2 ESD protection points on any one side must be soldered if

o the Blu-ray Loader is OK and needs to be disconnected from connector J802, J900 and J906 of the BD Board.

o the defective Blu-ray Loader is needed to be send back to supplier for failure analysis and to support backcharging evidence.

8) Produce to change Tuner grid

In some countries, you can toggle the FM tuning grid between 50 kHz and 100 kHz. Switching the tuning grid erases all preset radio stations.

a) Press SOURCE repeatedly until RADIO appears on the display panel.

b) Press and hold (Play) to toggle between 50 kHz or 100 kHz.

.Note: repeaing the same action will toggle back to it previous tunning grid setting.

CAUTION!

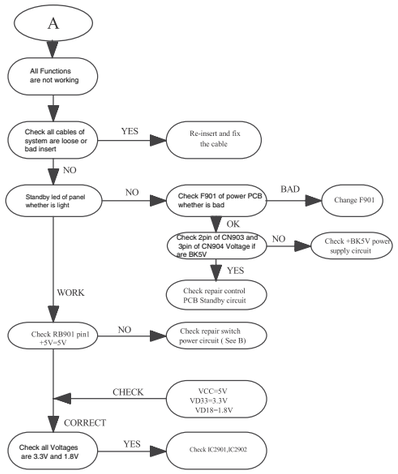
This information is confidential and may not be distributed.Only a qualified service person should reprogram the Region Code.

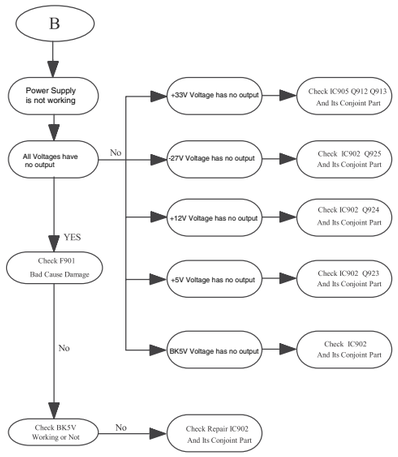
2 - 3

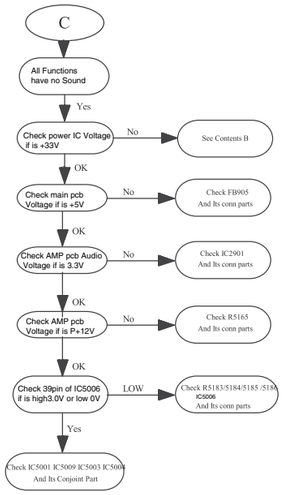
REPAIR INSTRUCTIONS

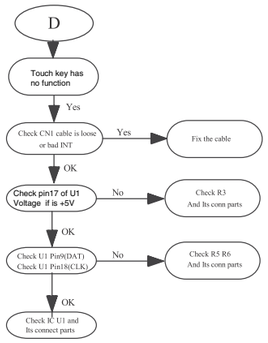
REPAIR CHART

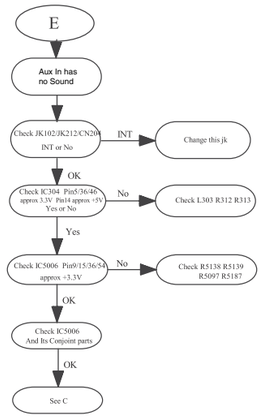
- A — All Functions are not working
- B — Power Supply is not working
- C — All Functions have no Sound
- D — Touch key has no function
- E — Aux In has no Sound
- F — MP3 In has no Sound
- G — MIC In has no Sound
- H — Tuner has no Sound
- I — Coaxial In has no Sound
- J — Optical has no Sound
- K — Ipod has no Sound

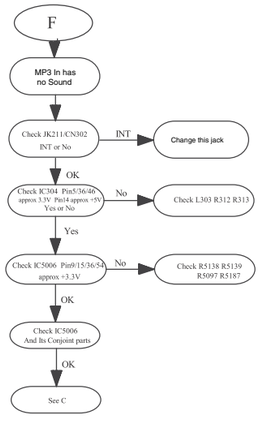


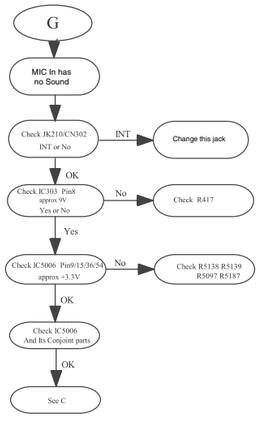


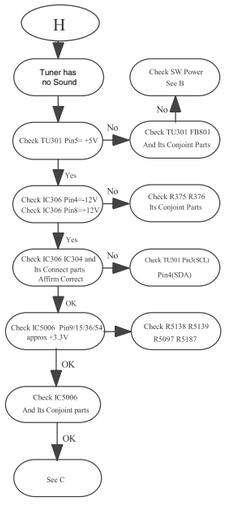


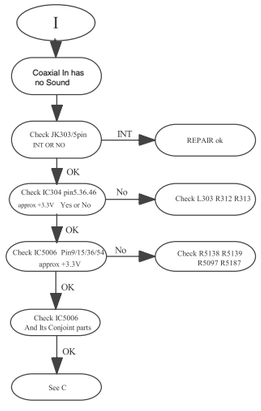


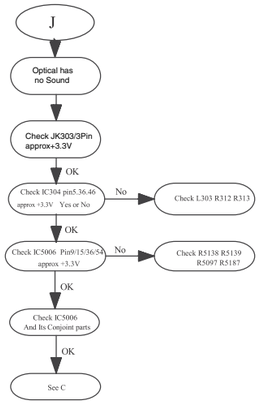


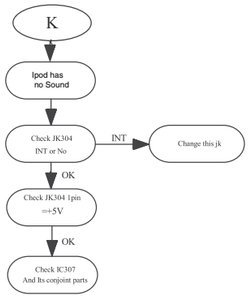












DISASSEMBLY INSTRUCTIONS

Dismantling of theTop & Front Panel Assemble

1) Loosen 6 screws and remove the Top Cover by lifting the rear portion upwards before sliding it out towards the rear.
   - 4 screws “A” at the back panel as shown in figure 1.
   - 1 screw “B” each on the left & right side as shown in figure 2.

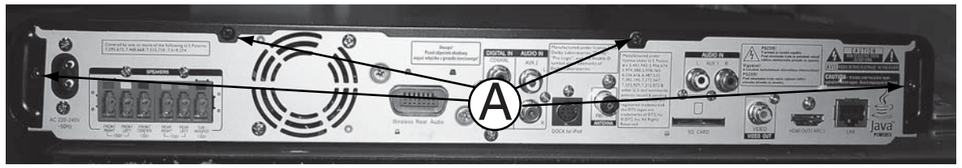


Figure 1

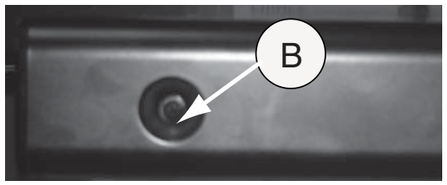


Figure 2

2) Open the DVD Tray by using the Open/Close Button while the Set is ON and disconnect the mains supply after removing the DVD Door.
   Note: If this is not possible, the DVD Tray has to be open manually.
   a) Loosen 4 screws “ E “ at the DVD Module as shown in figure 3.
   b) Rotate the gear wheel on the side of DVD Module to remove DVD Door as shown in figure 4 and figure 5 then close the tray manually by pushing it back in.
3) Loosen 5 screws remove the front panel.
   - 3 screws “C” at the bracket as shown in figure 6.
   - 1 screw “D” each on the left & right side as shown in figure 7.

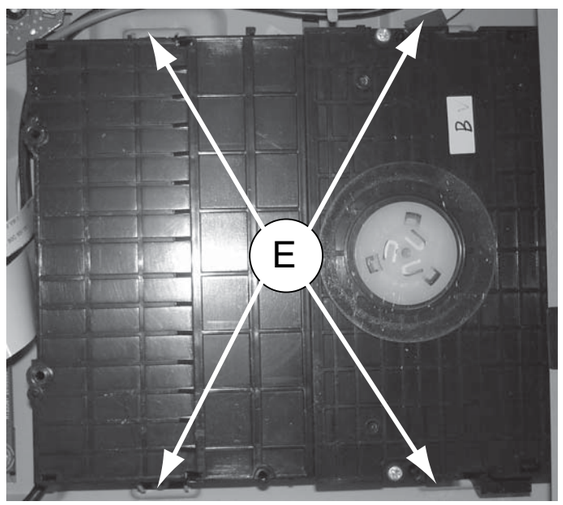
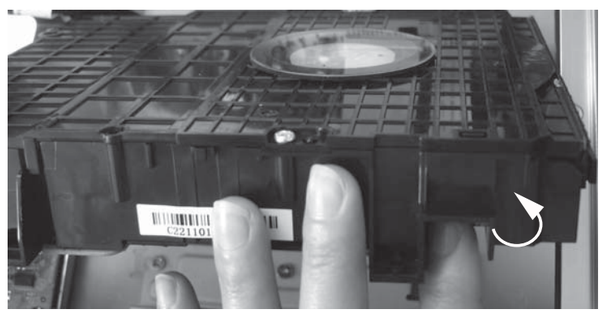


Figure 3



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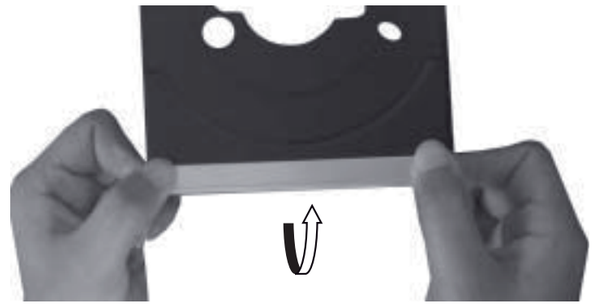


Figure 5

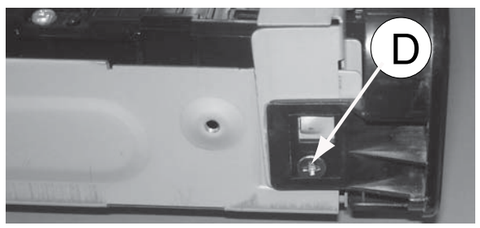


Figure 6

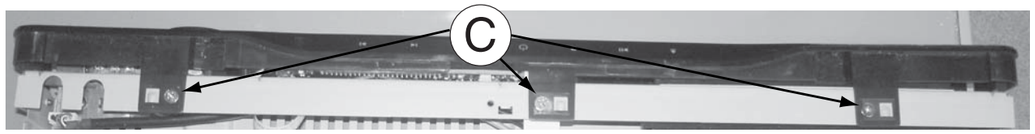


Figure 7

Dismantling of the VFD Board

1) Loosen 2 screws “F” on the top of VFD Board as shown in figure 8.

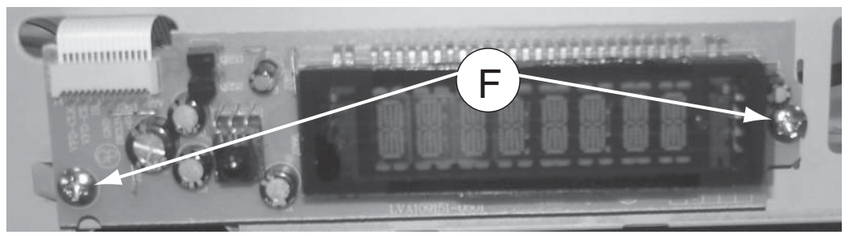


Figure 8

Dismantling of the MP3+USB Board

1) Loosen 2 screws “H” as shown in figure 9 to remove MP3+USB Board.

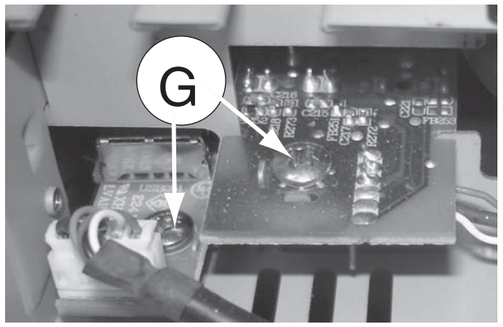


Figure 9

Dismantling of the VOL Board and VOL Button

1) Loosen 2 screws “H” as shown in figure 10 to remove VOL Board.
2) After remove VOL Board ,pull out the VOL button .

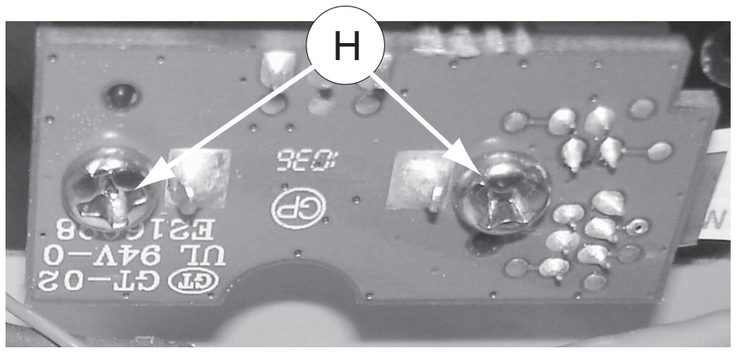


Figure 10

Dismantling of the TOUCH Board

1) Loosen 3 screws “I” on the Touch bracket as shown in figure 11.

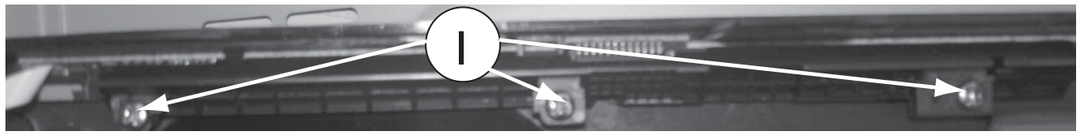


Figure 11

3 - 2

Dismantling of the POWER Board

1) Loosen 5 screws “O” on the top of power Board as shown in figure 12.

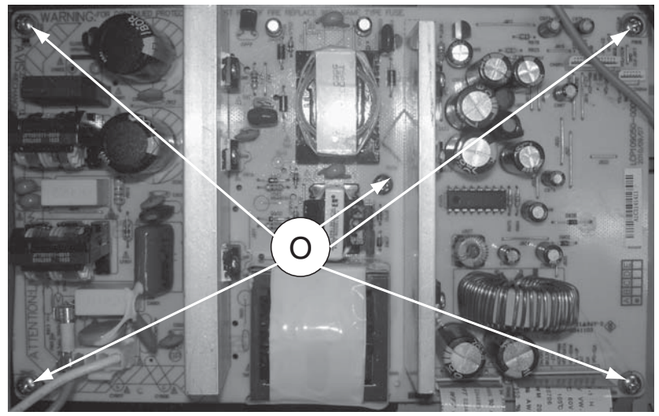


Figure 12

Dismantling of the Wireless Jack Board

1) Loosen 2 screws “J” at the back panel to remove the Wireless Jack Board as shown in figure 13.

Figure 13

Dismantling of the MAIN Board

1) Loosen 5 screws “K” on the top of Main Board as shown in figure 14.
2) At the back panel, loosen 6 screws “L” as shown in figure 15.

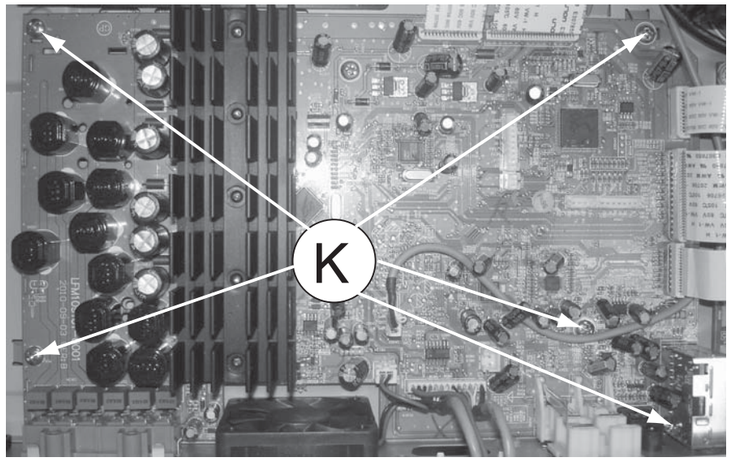


Figure 14

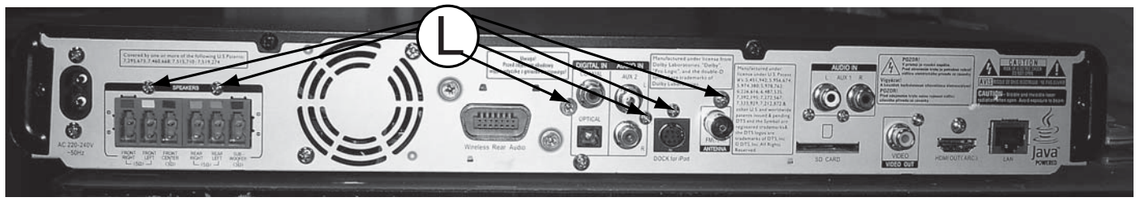


Figure 15

Dismantling of the AUX Board

1) Loosen 2 screws “M” at the back panel to remove AUX Board as shown in figure 16.

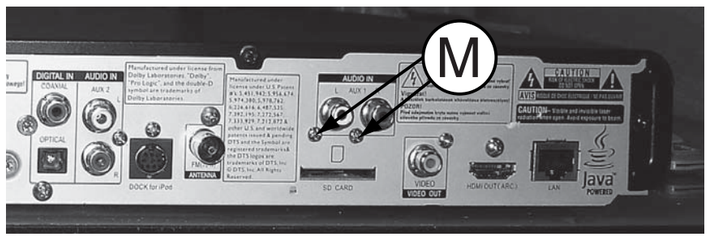


Figure 16

Dismantling of the BD Board

1) Loosen 4 screws “N” on the top of BD board as shown in figure 17.

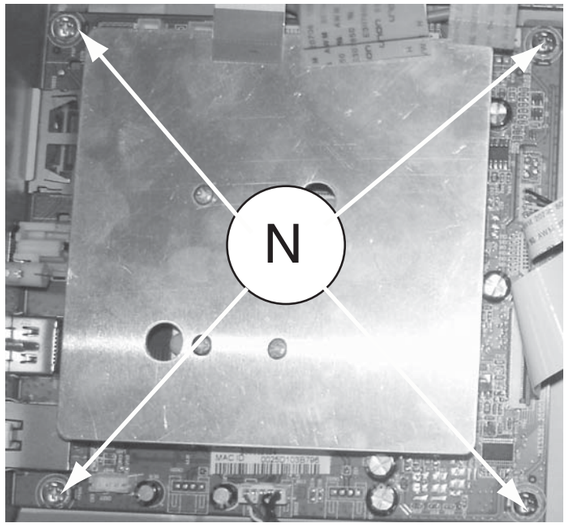
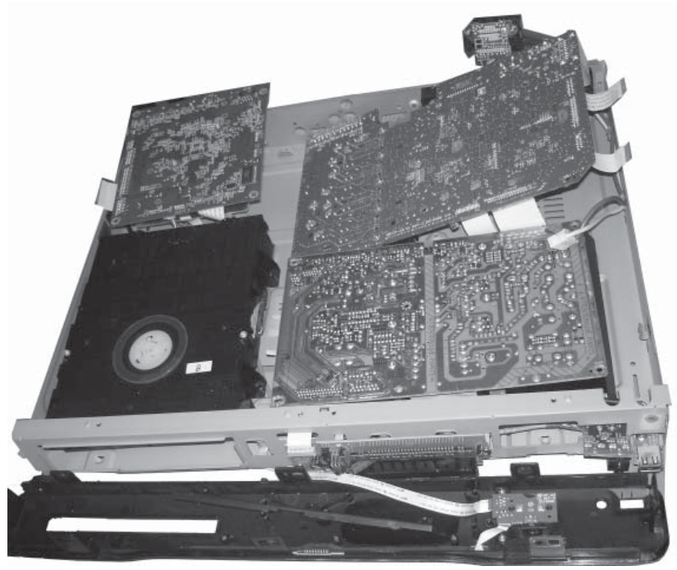


Figure 17

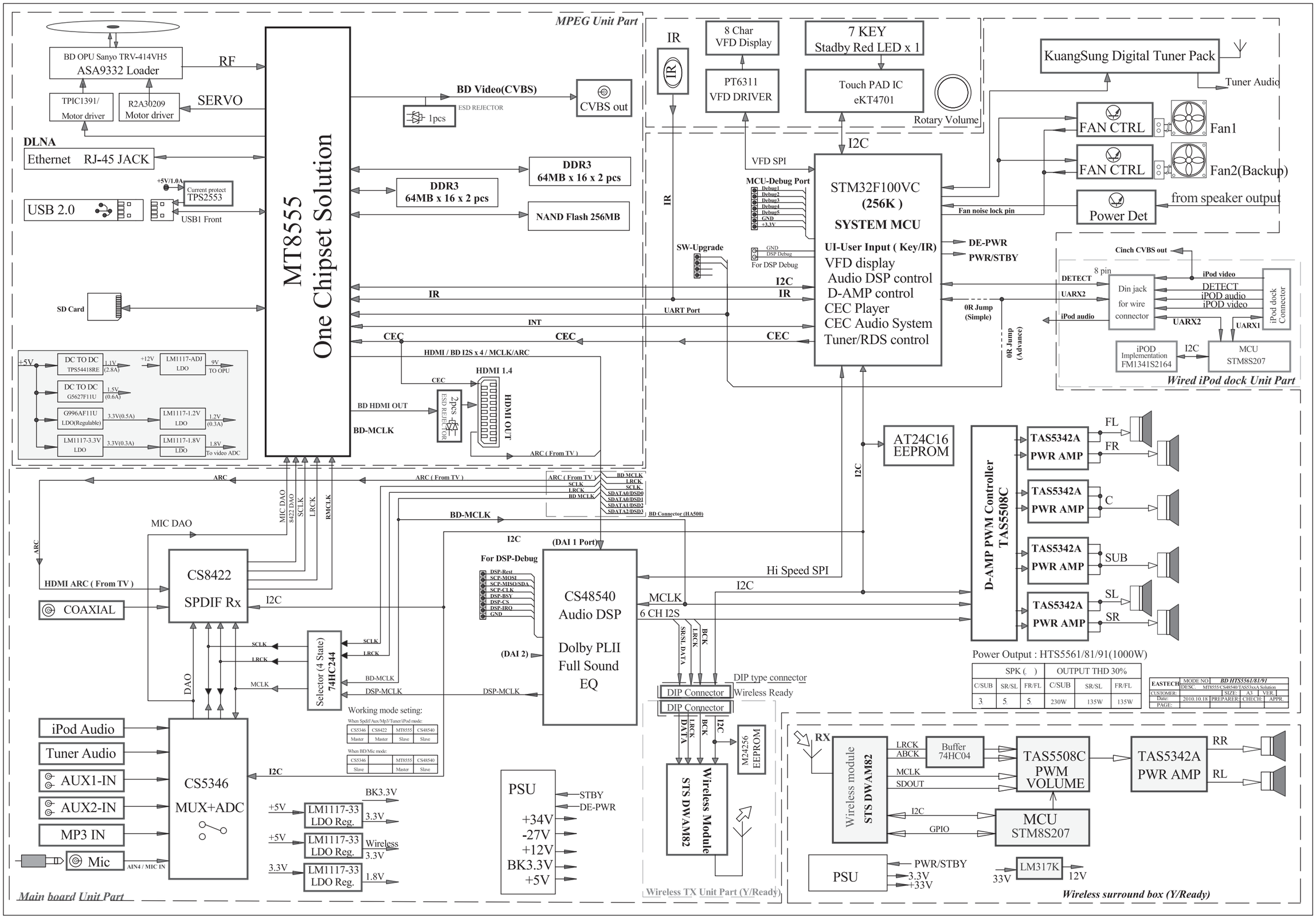
SERVICE POSITIONS



Note:In some service positions the components or copper patterns of one board may risk touching its neighbouring pc boards or metallic parts. To prevent such short-circuit use a piece of hard paper or other insulating material between them.

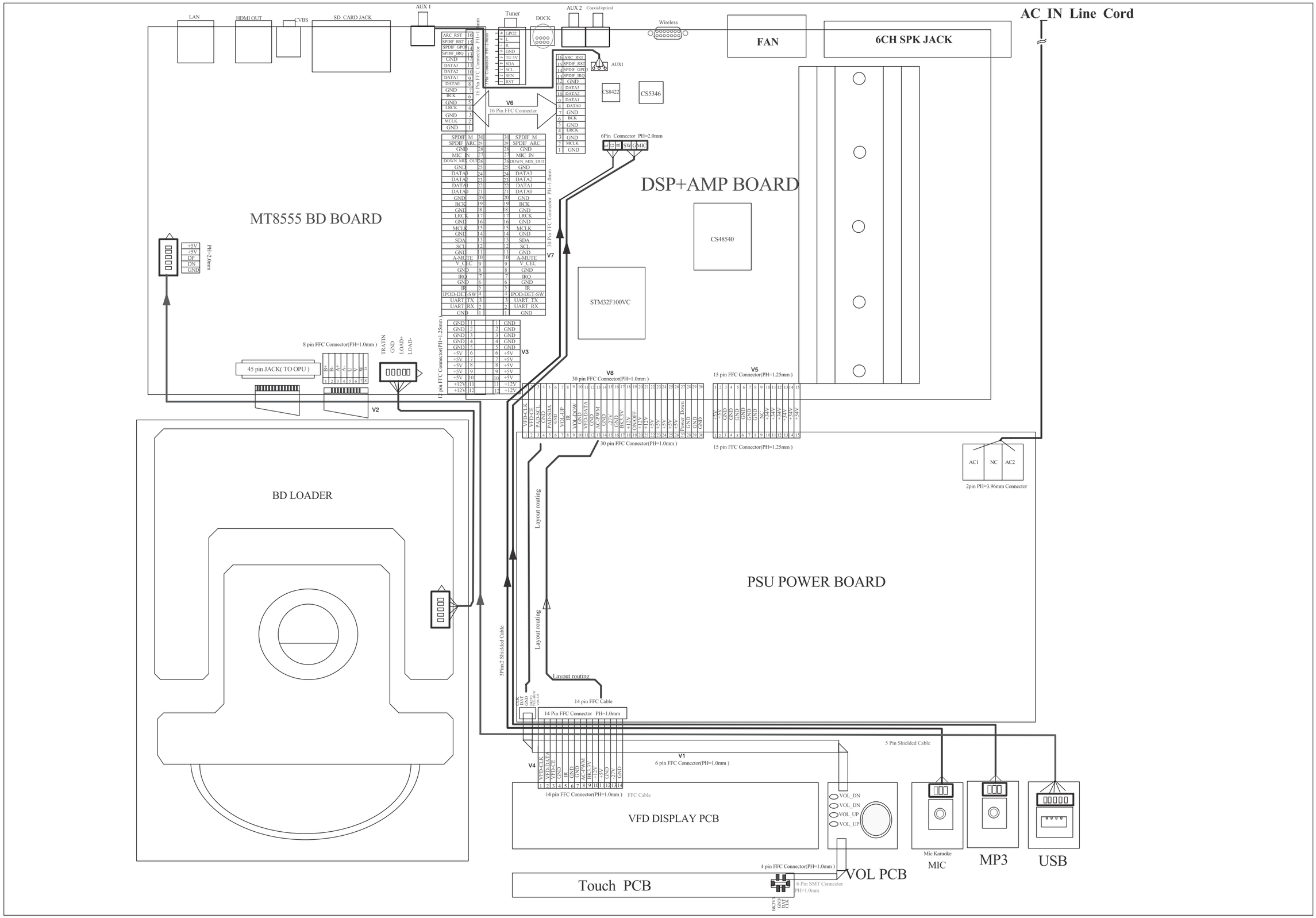
4 - 1

BLOCK DIAGRAM



4 - 2

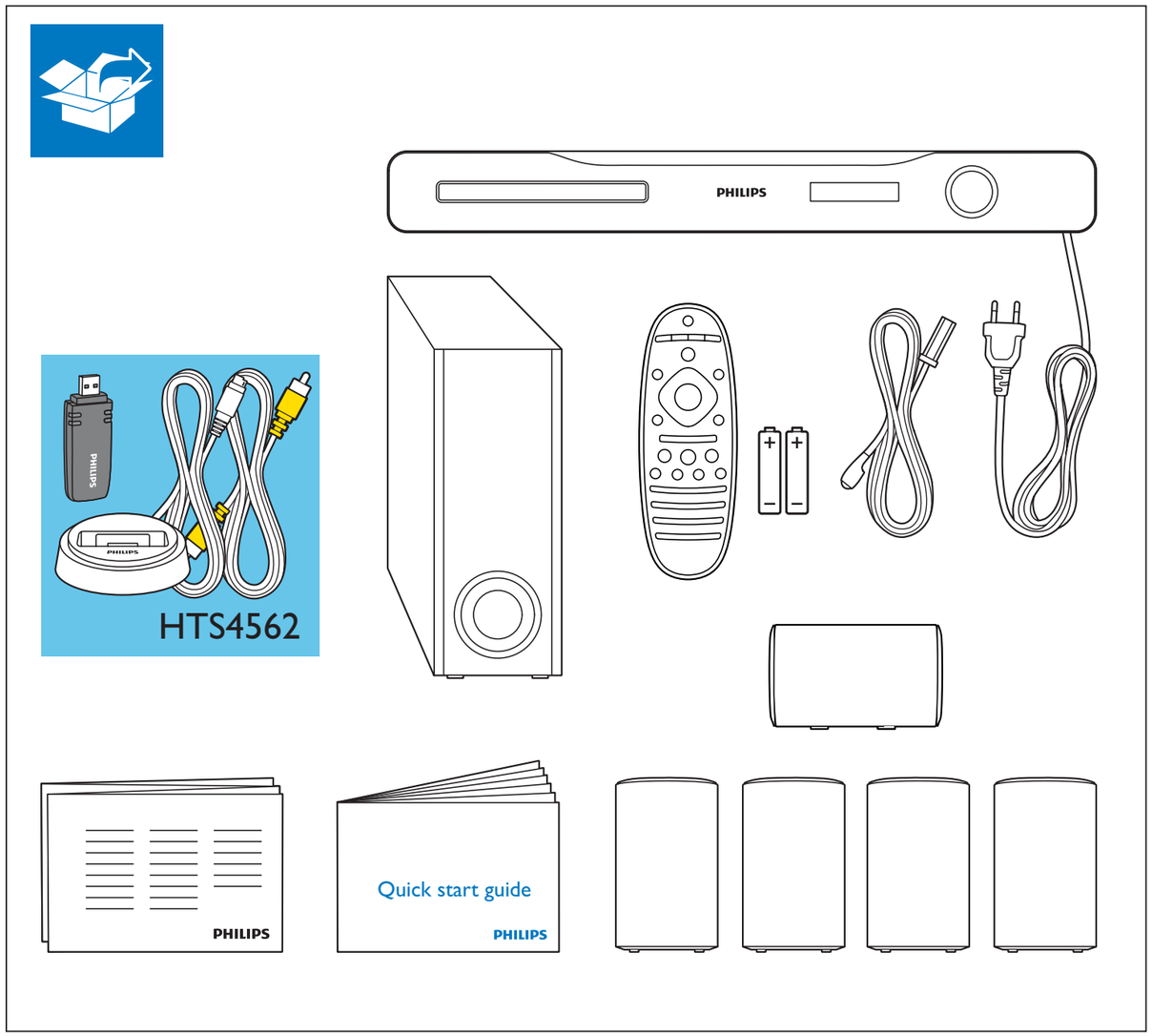
WIRING DIAGRAM



QUICK START GUIDE

The following excerpt of the QSG/DFU serves as an introduction to the set.

The complete Direction for Use can be download in the different languages from the internet site of Philips Consumer Care Center:www.support.philips.com.



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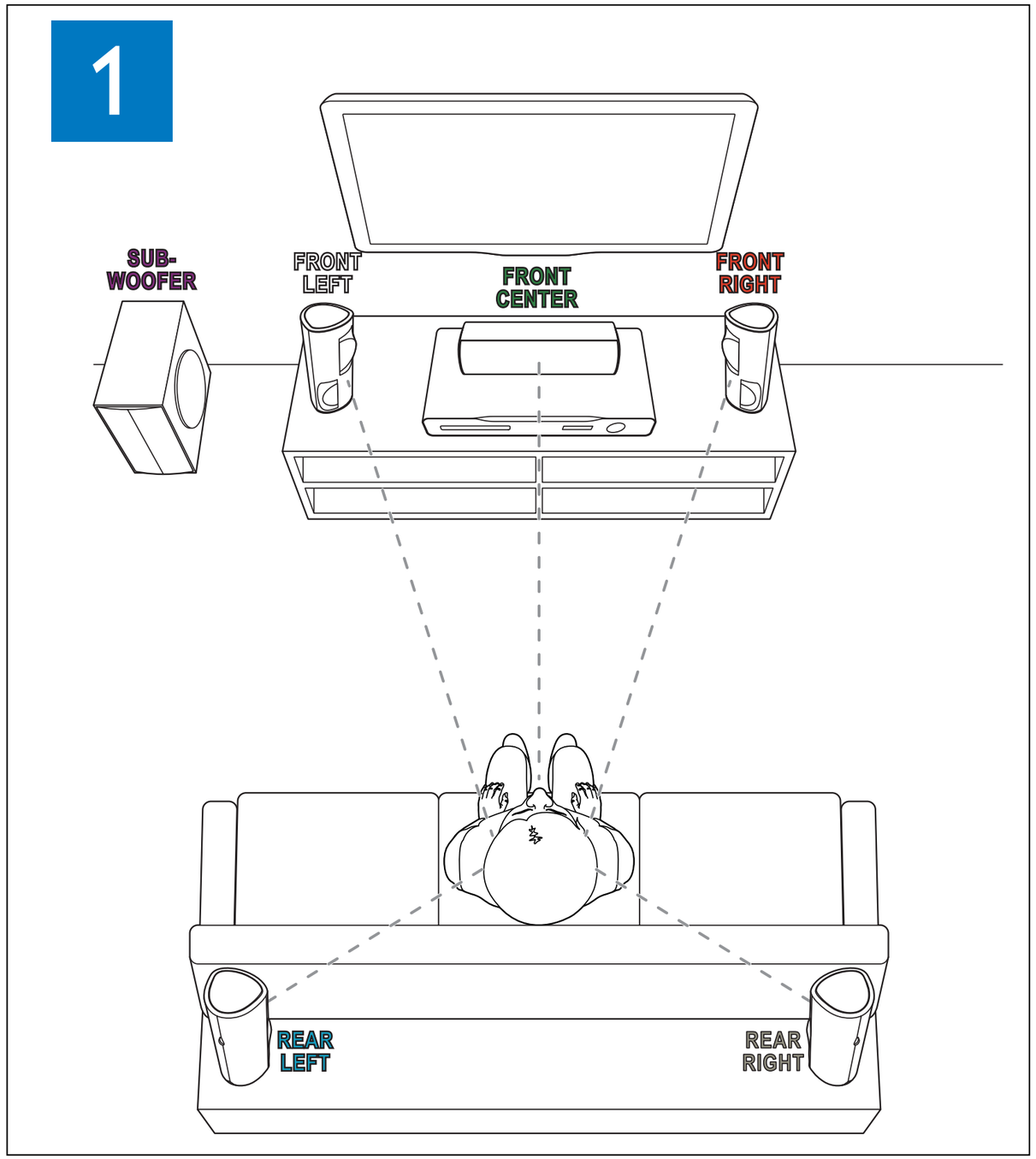

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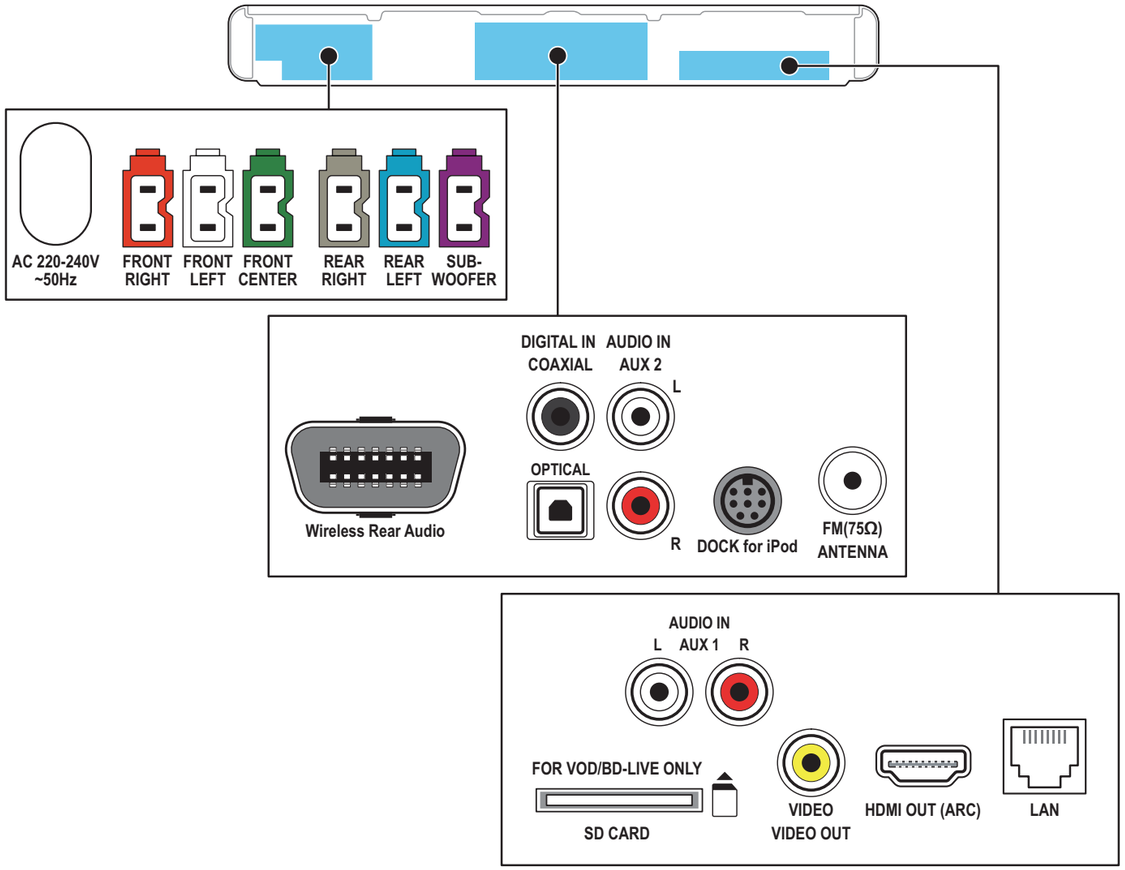
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Wireless Rear Audio
DOCK for iPod
FM(75Ω) ANTENNA
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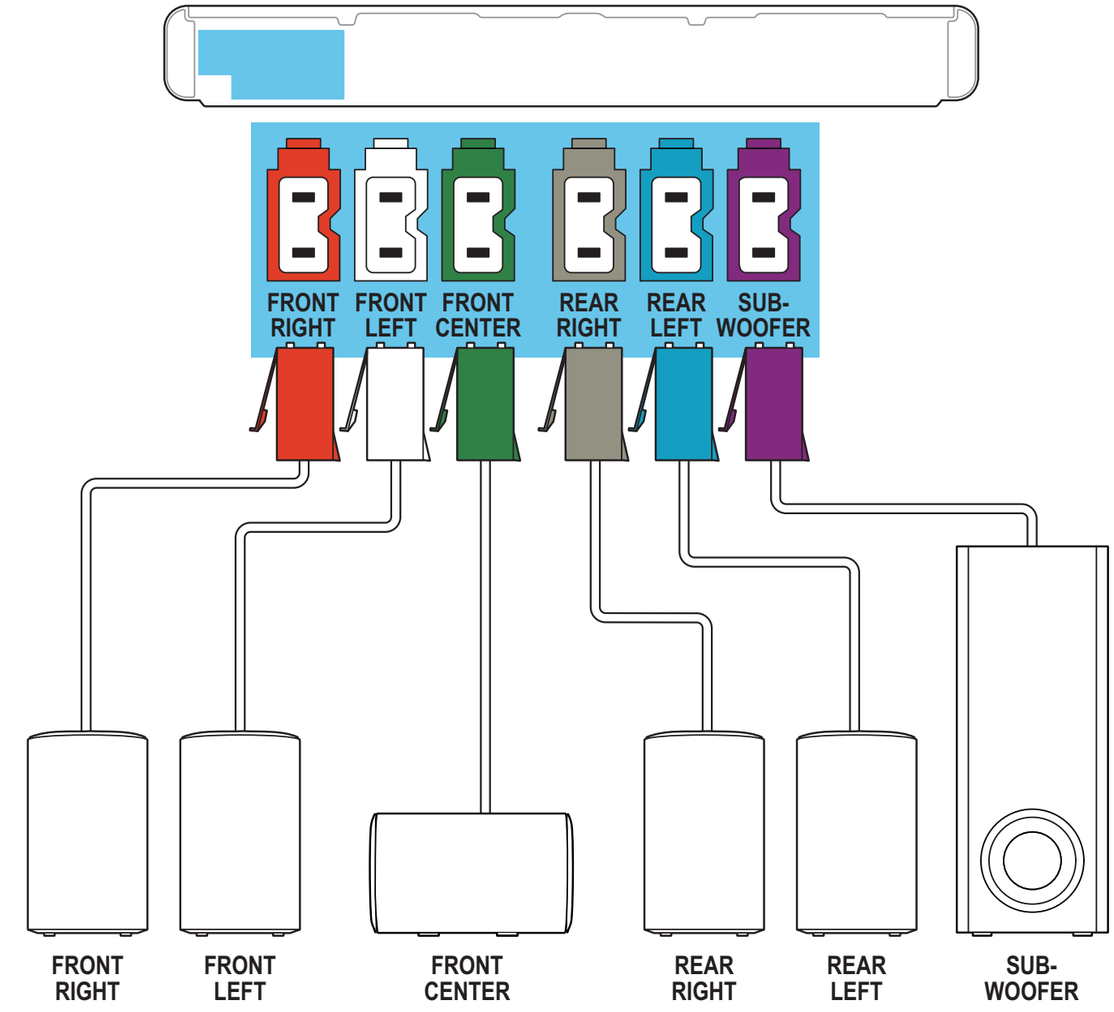
FOR VOD/BD-LIVE ONLY
SD CARD
VIDEO
VIDEO OUT
HDMI OUT (ARC)
LAN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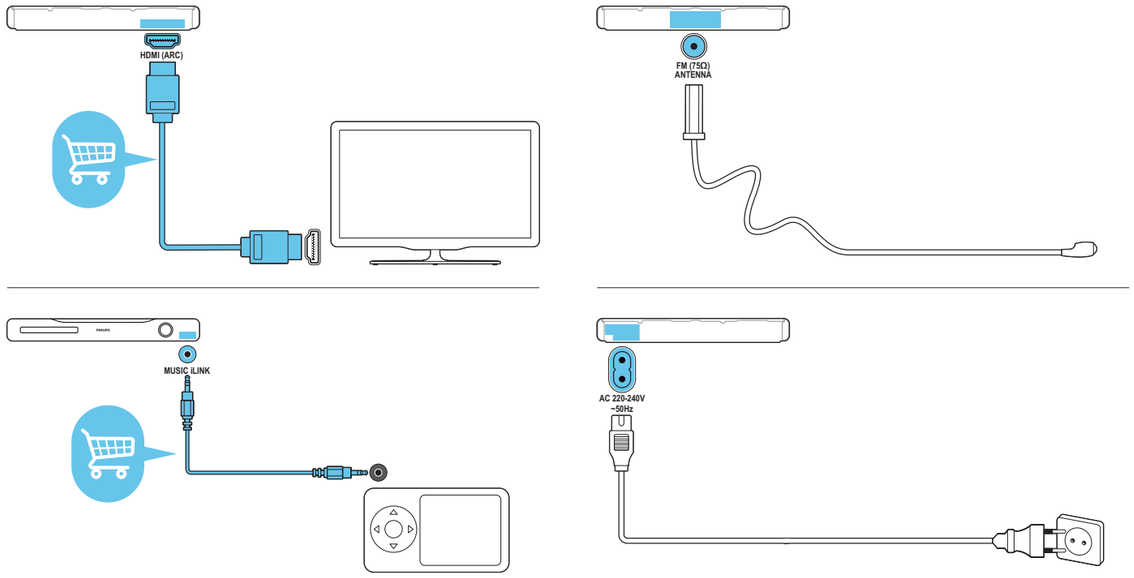
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FM (75Ω) ANTENNA
MUSIC iLINK
AC 220-240V ~50Hz

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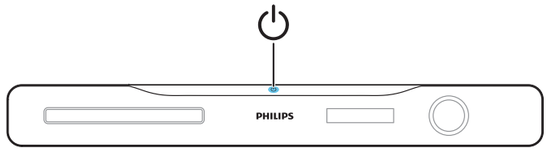
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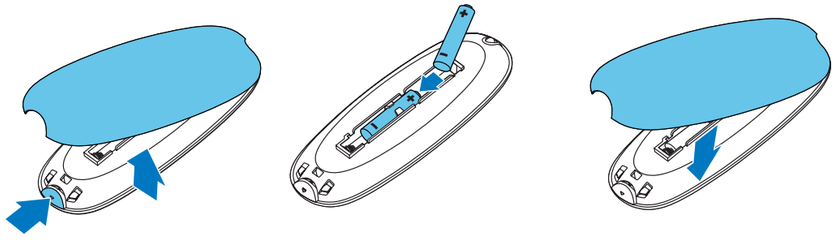

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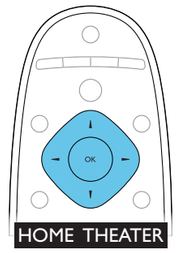
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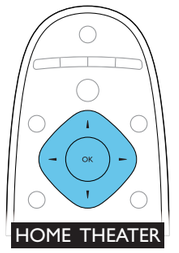
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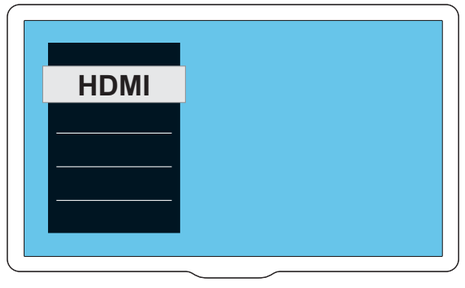
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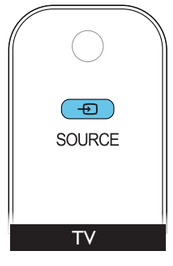
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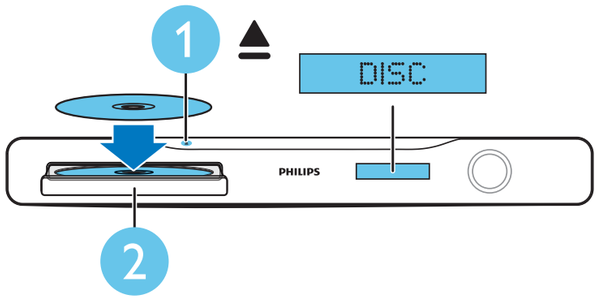
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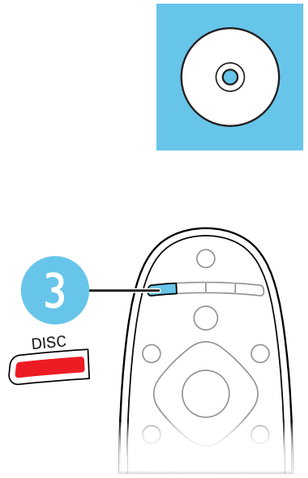
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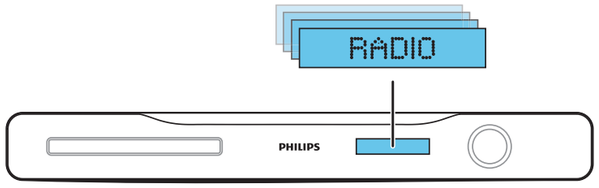
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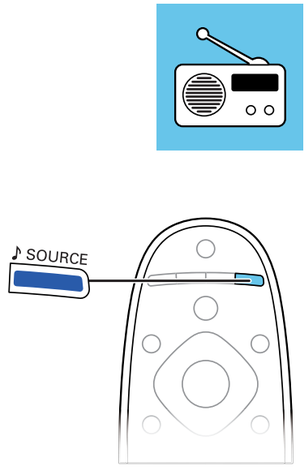
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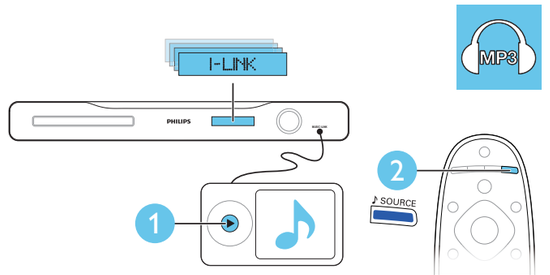
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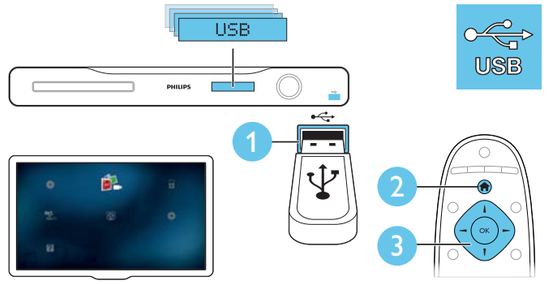
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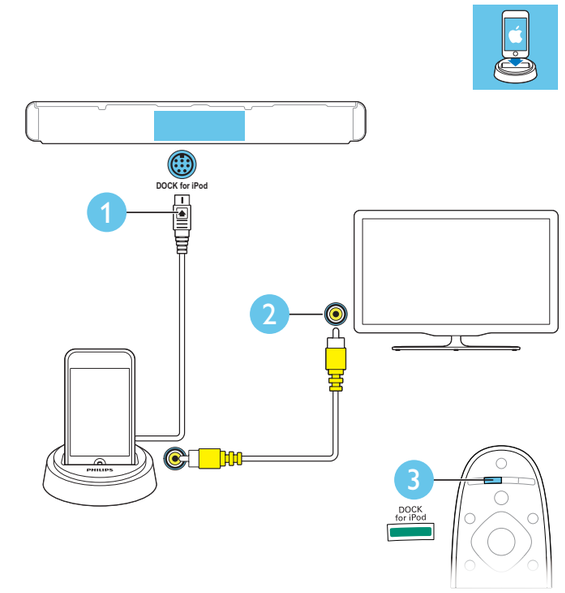
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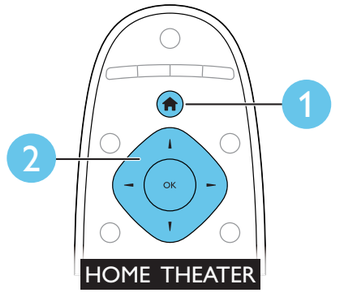
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MAIN+VOL BOARD

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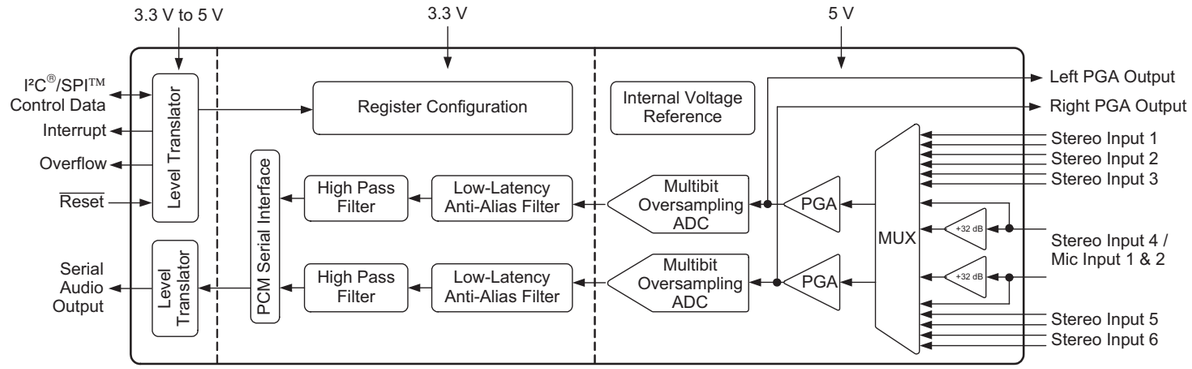
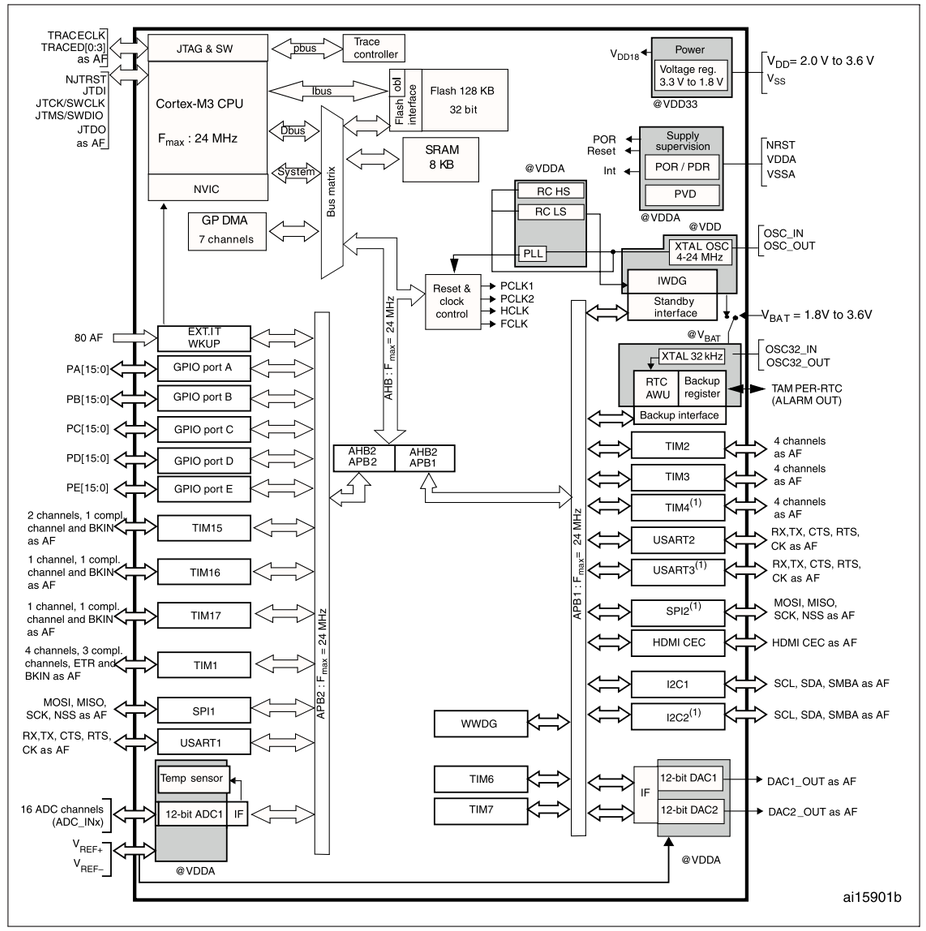
INTERNAL IC DIAGRAM - CS5346-CQZR LQFP



INTERNAL IC DIAGRAM - STM32F100VCT6



6 - 2

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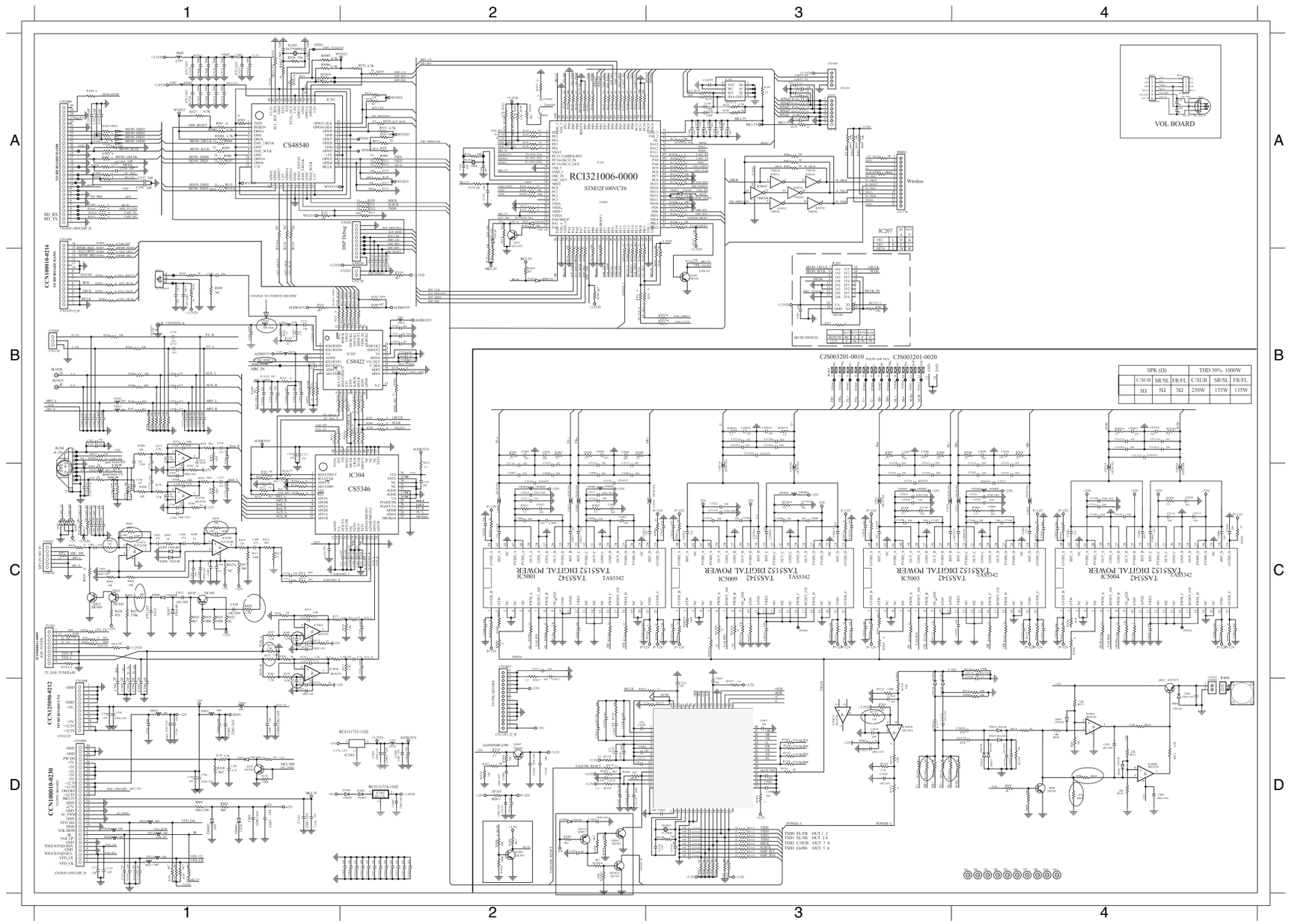

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PCB LAYOUT - TOP VIEW

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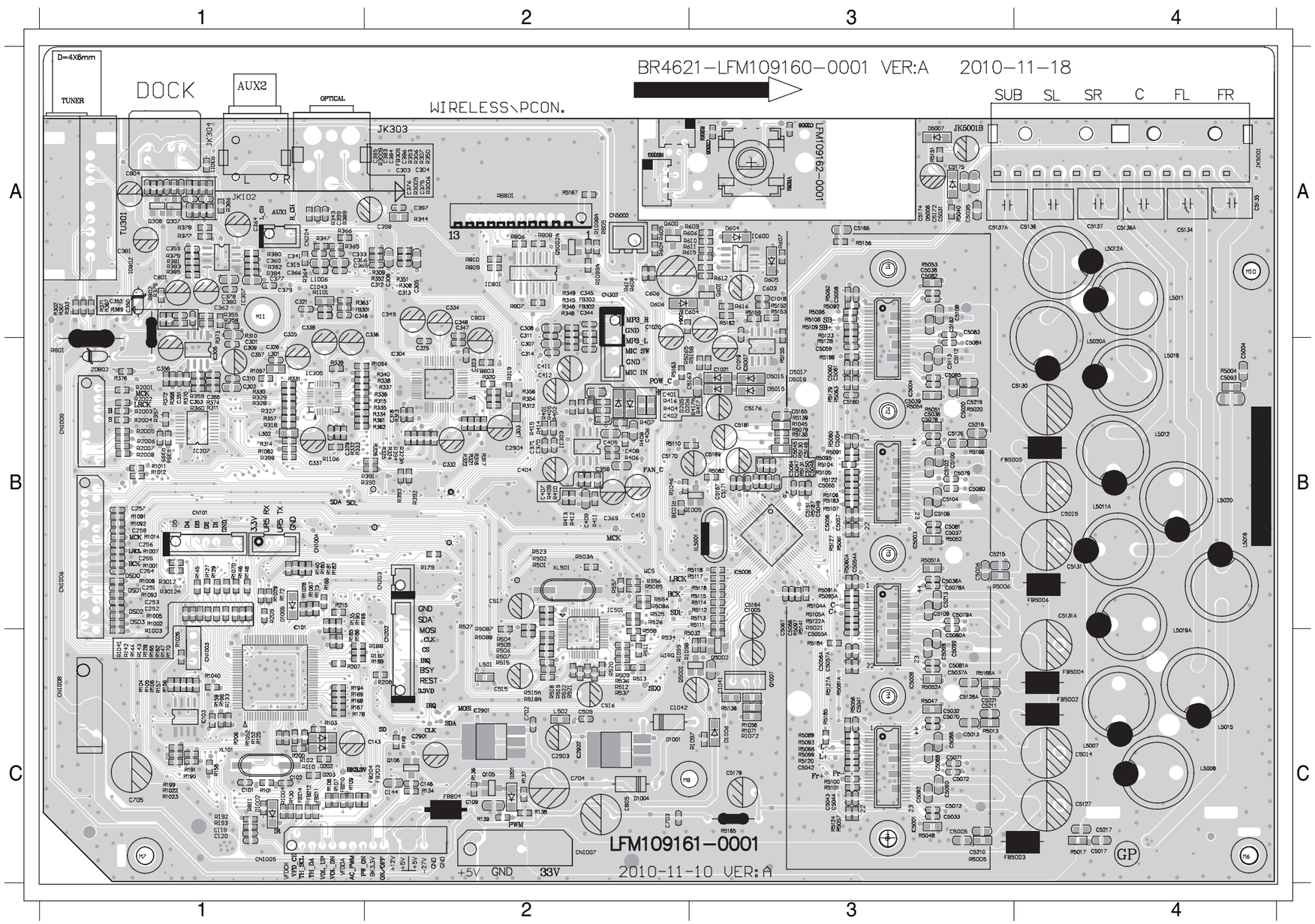

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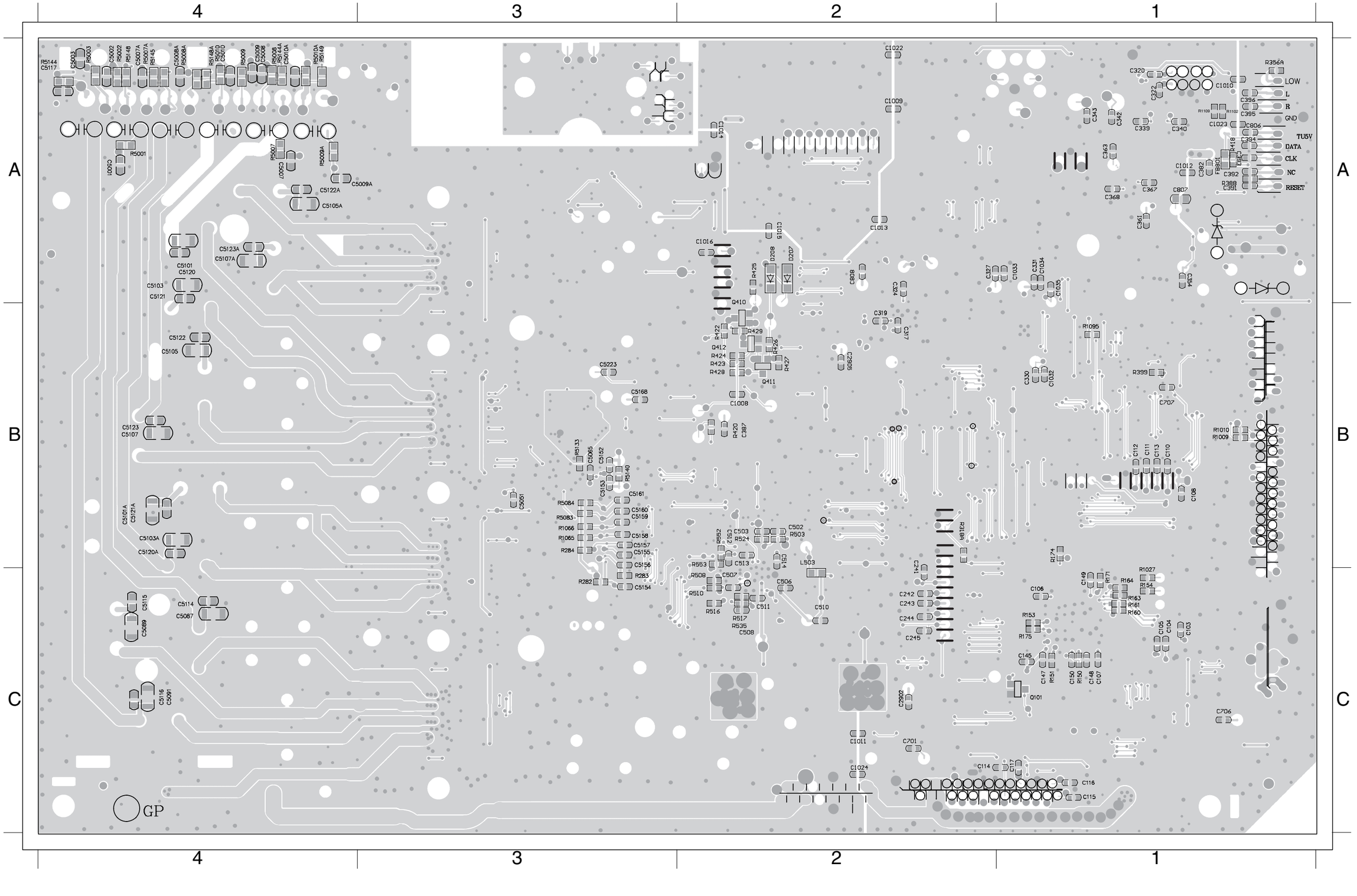

POWER BOARD

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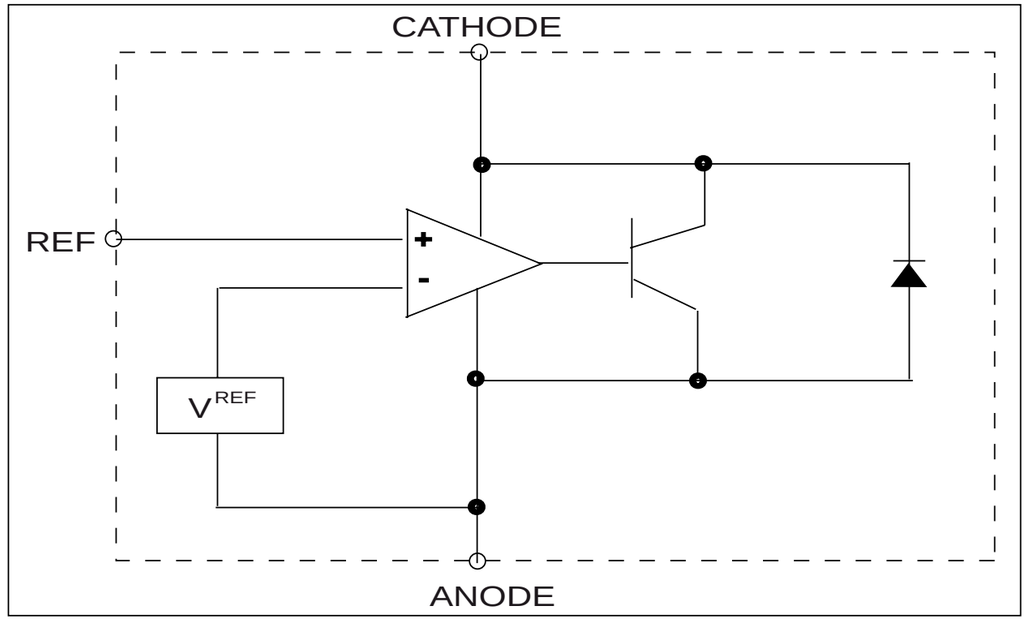

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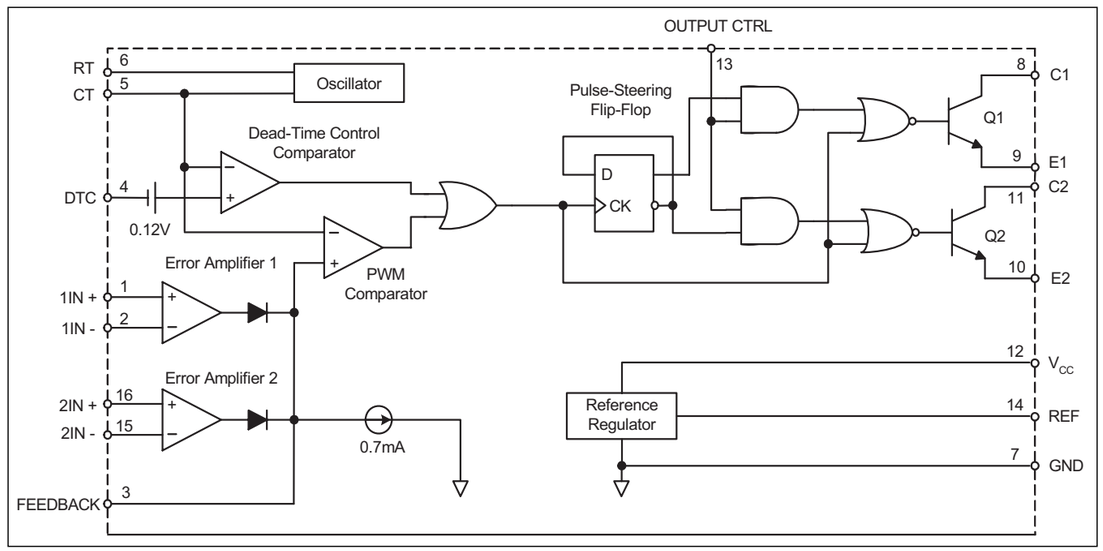

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CIRCUIT DIAGRAM

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C902	C1	C925	C3	C948	B3	C960A	C3	C971	A3	C986	C3	CE901	A1	CY902	B1	D910	A3	D924	A3	IC903	C1	Q901	C2	Q915	B3	R909	A3	R922	C3	R930D	C2	R940	B2	R945I	A3	R949	A2	R963	B3	R974	A3	R985	B3	R998	B4	ZD905	A3
C903	C1	C927	C3	C949	A3	C961	C3	C972	A3	C990	A2	CE902	A1	CY903	C1	D911	A3	D928	B4	IC904	C2	Q902	A2	Q917	C3	R910	A4	R923	C3	R930E	C2	R941	B2	R945J	A3	R950	C3	R964	B3	R975	A3	R985A	B3	R999	B4	ZD907	A4
C904	A1	C928	C3	C950	A2	C962	B3	C973	C4	C991	B3	CM901	A2	CY904	C1	D912	A4	D930	A2	IC905	B4	Q903	A2	Q918	C3	R911	B4	R924	B1	R930F	C2	R942	B2	R945K	A3	R953	C4	R965	A3	R976	A3	R986	B4	T901	B2	ZD908	A4
C905	A1	C929	B3	C951	A3	C963	B3	C974	B4	C991A	B3	CN901	C1	D902	B4	D913	A4	D931	B2	IC906	C4	Q904	C3	Q995	B4	R912	B1	R925	C3	R930G	C2	R945A	A3	R945L	A3	R954	C3	R966	B3	R977	C4	R988	B1	T902	B2	ZD909	A4
C913	C4	C930	B4	C953	C4	C964	B3	C975	B4	C992	C4	CN903	C4	D903	C2	D914	A4	D934	A4	L905	B3	Q906	C3	R901A	C4	R914	A4	R926	A3	R930H	C2	R945B	A3	R945M	A3	R955	C3	R967	A3	R978	C3	R989	A4	T903	A2	ZD910	A4
C914	C2	C931	B3	C954	C4	C965	C3	C976	C4	C993	C4	CN904	C4	D904	C2	D918	B2	F901	C1	L906	C3	Q907	C3	R902	B1	R915	A1	R927	C2	R932	A2	R945C	A3	R945N	A3	R956	B3	R968	A3	R979	B4	R990	C3	TVR901	C1	ZD913	A3
C915	B3	C938	B1	C955	C3	C966	A1	C977	C3	C994	A1	CN905	B4	D905	B2	D919	C3	GT902	B1	L907	A3	Q909	B3	R902A	C4	R916	A1	R928	C2	R933	C2	R945D	A3	R945O	A3	R957	B3	R969	A4	R980	B3	R991	C3	TVR902A	1		
C917	B3	C939	C4	C956	C3	C967	B3	C978	C2	C995	C3	CN906	A4	D906	A2	D920	B3	GT903	C2	L908	A3	Q910	B3	R903	B1	R917	A1	R929	C3	R934	B1	R945E	A3	R945P	A3	R957A	B3	R970	A4	R981	C2	R992	C3	TVR903A	1		
C922	C2	C941	B1	C957	A3	C968	A3	C980	B4	C997	B2	CX901	B1	D907	B3	D921	B3	GT904	B2	LF901	B1	Q911	B3	R904	B1	R918	A1	R930A	C2	R935	C2	R945F	A3	R946	C3	R960	A4	R971	A3	R982	C4	R993	C3	ZD902	C2		
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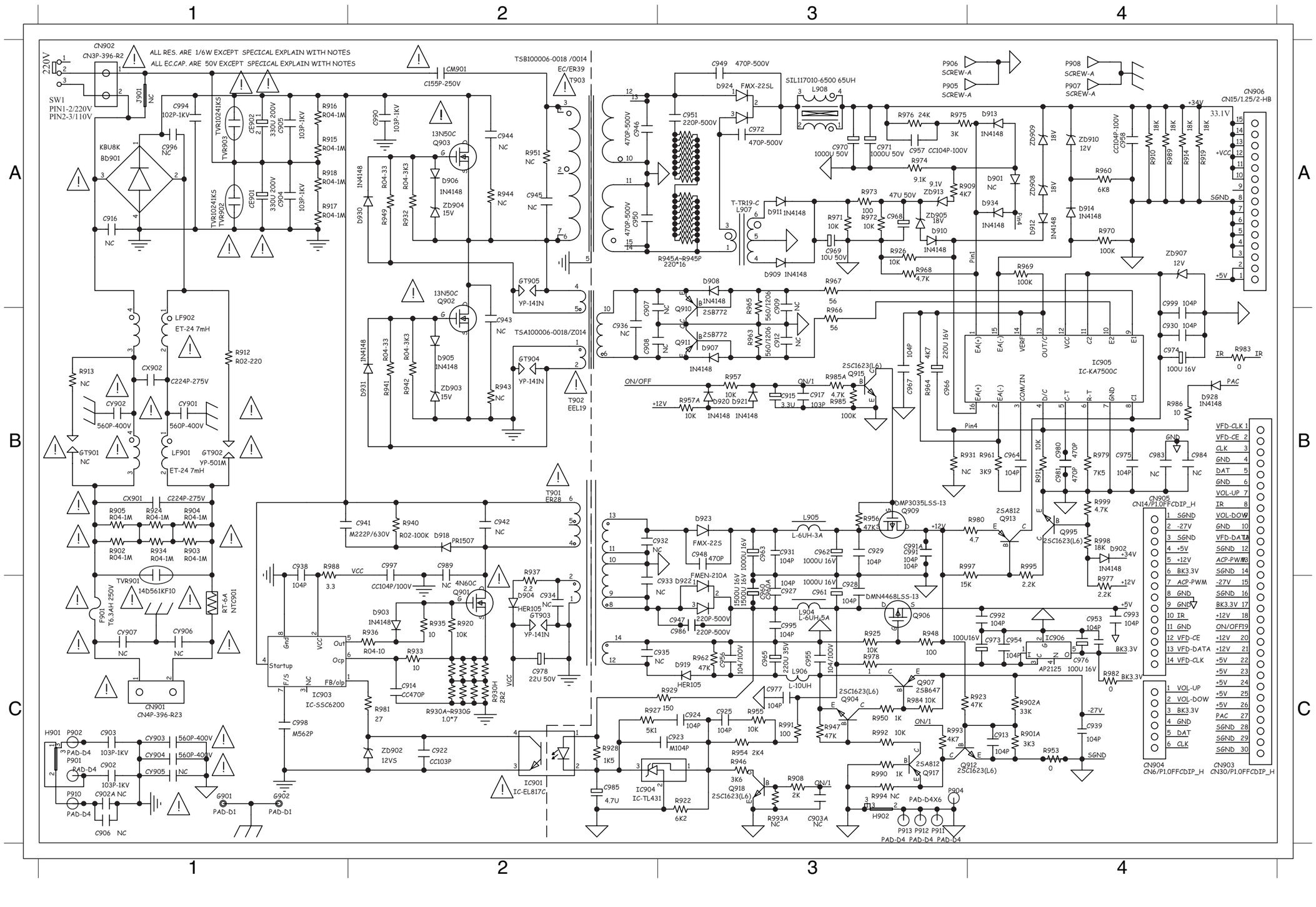

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PCB LAYOUT - TOP VIEW

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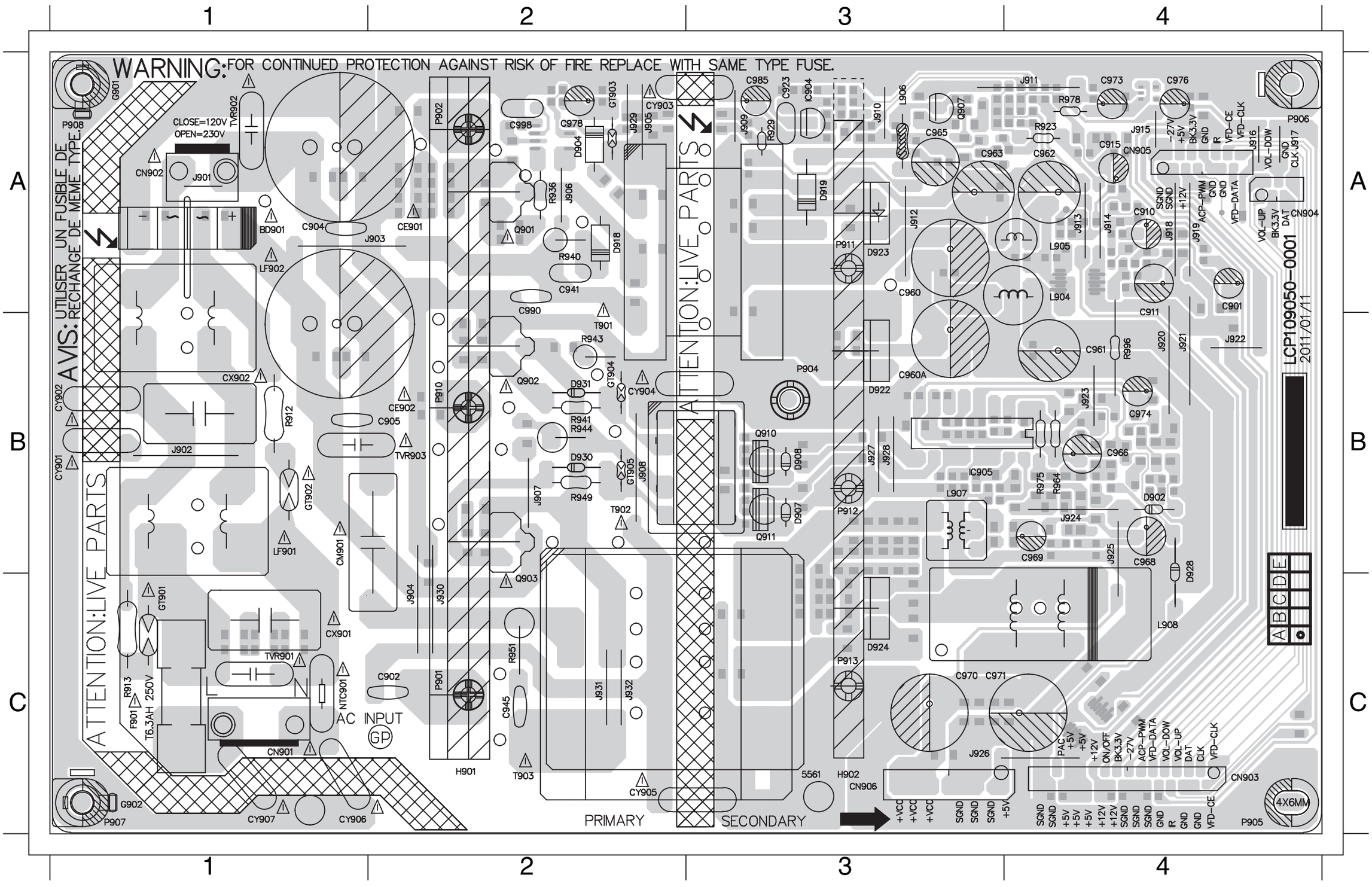
C902	C2	C923	A3	C963	A3	C971	C4	C990	A2	CN903	C4	CY901	B1	D907	B3	D924	C3	GT903	A2	J903	A2	J910	A3	J916	A4	J922	B4	J928	B3	L905	A4	NTC901	C1	Q911	B3	R941	B2	T901	B2		
C904	A1	C941	A2	C965	A3	C973	A4	C998	A2	CN904	A4	CY902	B1	D908	B3	D928	B4	GT904	B2	J904	C2	J911	A4	J917	A4	J923	B4	J929	A2	L906	A3	Q901	A2	R912	B1	R949	B2	T902	B2		
C905	B2	C960	A3	C966	B4	C974	B4	CE901	A2	CN905	A4	CY903	A2	D918	A2	D930	B2	GT905	B2	J905	A2	J912	A3	J918	A4	J924	B4	J930	C2	L907	B3	Q902	B2	R923	A4	R964	B4	T903	C2		
C910	A4	C960A	B3	C968	B4	C976	A4	CE902	B2	CN906	C3	CY904	B2	D919	A3	D931	B2	IC904	A3	J906	A2	J913	A4	J919	A4	J925	B4	J931	C2	L908	C4	Q903	C2	R929	A3	R975	B4	TVR901	C1		



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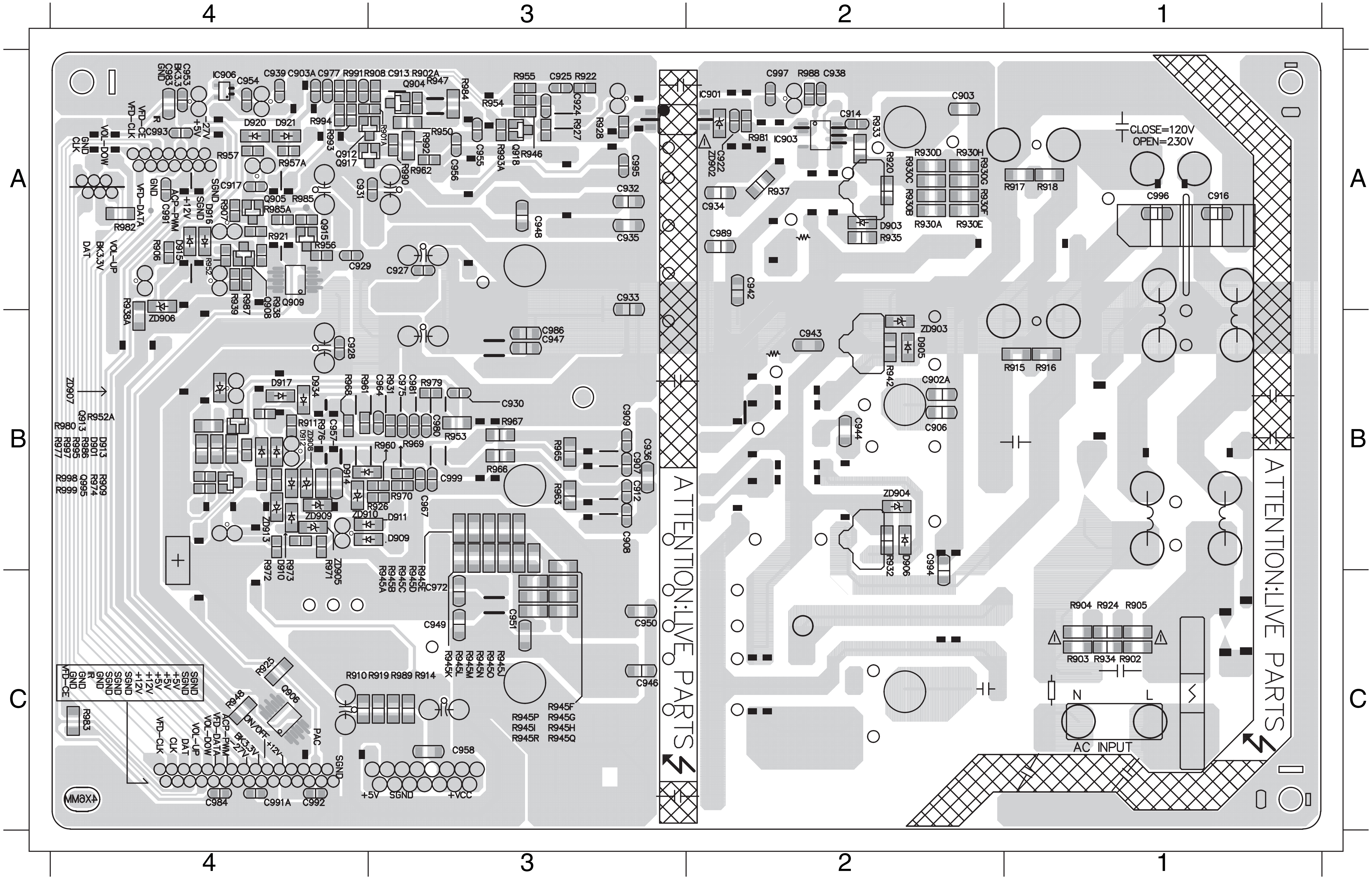
PCB LAYOUT - BOTTOM VIEW

C913	A3	C930	B3	C950	C3	C964	B3	C991	A4	D903	A2	D914	B4	IC906	A4	Q915	A4	R904	C1	R914	C3	R922	A3	R930F	A2	R938A	A4	R945G	C3	R945O	C3	R954	A3	R963	B3	R972	B4	R983	C4	R990	A3	ZD902	A2	ZD910	B3
C914	A2	C931	A4	C951	C3	C967	B3	C991A	C4	D905	B3	D916	A4	Q904	A3	Q917	A4	R905	C1	R915	B1	R924	C1	R930G	A2	R939	A4	R945H	C3	R945P	C3	R955	A3	R965	B3	R973	B4	R984	A3	R991	A4	ZD903	B2	ZD913	B4
C917	A4	C938	A2	C953	A4	C972	C3	C992	C4	D906	B2	D917	B4	Q905	A4	Q918	A3	R906	A4	R916	B1	R925	C4	R930H	A2	R945A	C3	R945I	C3	R946	A3	R956	A4	R966	B3	R974	B4	R985	A4	R992	A3	ZD904	B2		
C922	A2	C939	A4	C954	A4	C975	B3	C993	A4	D909	B3	D920	A4	Q906	C4	Q995	B4	R907	A4	R917	A1	R926	B3	R932	B2	R945B	C3	R945J	C3	R947	A3	R957	A4	R967	B3	R976	B4	R985A	A4	R993	A4	ZD905	B4		
C924	A3	C946	C3	C955	A3	C977	A4	C994	B2	D910	B4	D921	A4	Q908	A4	R901A	A3	R908	A3	R918	A1	R927	A3	R933	A2	R945C	C3	R945K	C3	R948	C4	R957A	A4	R968	B4	R977	B4	R986	B4	R995	B4	ZD906	A4		
C925	A3	C947	B3	C956	A3	C980	B3	C995	A3	D911	B3	D934	B4	Q909	A4	R902	C1	R909	B4	R919	C3	R928	A3	R934	C1	R945D	C3	R945L	C3	R950	A3	R960	B3	R969	B3	R979	B3	R987	A4	R997	B4	ZD907	B4		
C927	A3	C948	A3	C957	B4	C981	B3	C997	A2	D912	B4	IC901	A2	Q912	A4	R902A	A3	R910	C4	R920	A2	R930A	A2	R935	A2	R945E	C3	R945M	C3	R952	A4	R961	B3	R970	B3	R980	B4	R988	A2	R998	B4	ZD908	B4		
C928	B4	C949	C3	C958	C3	C986	B3	C999	B3	D913	B4	IC903	A2	Q913	B4	R903	C1	R911	B4	R921	A4	R930E	A2	R937	A2	R945F	C3	R945N	C3	R953	B3	R962	A3	R971	B4	R982	A4	R989	C3	R999	B4	ZD909	B4		



BD BOARD

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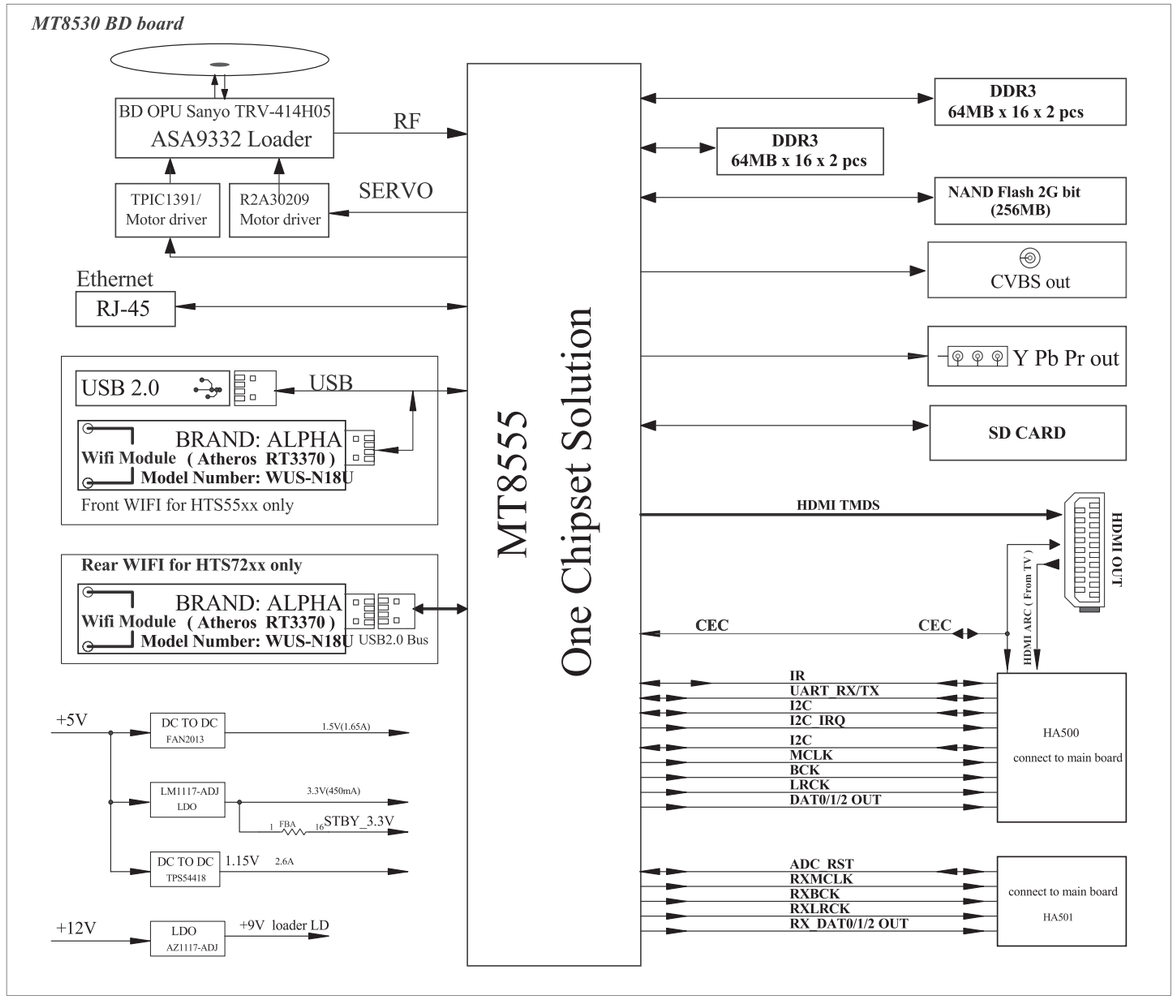
BLOCK DIAGRAM



Voltages for per connection pin

1. HA500--->>from BD board connect to main board

PIN NO	PIN Assign	Remarks
1	GND	
2	IPOD_TXD	
3	IPOD_RXD	
4	IPOD_DET_SW	
5	IR	
6	GND	
7	I2C_IRQ	
8	GND	
9	CEC	
10	AMUTE	
11	GND	
12	SCL	
13	SDA	
14	GND	
15	MCLK	
16	GND	
17	LRCK	
18	GND	
19	BCK	
20	GND	
21	DATA0	
22	DATA1	
23	DATA2	
24	DATA3 N/A	
25	GND	
26	DATA4 N/A	
27	MIC_IN	
28	GND	
29	HDMI_ARC	
30	POD_DET N/A	

2. CN202--->>from BD board connect to USB connect PCB

PIN NO	PIN Assign	Remarks
1	USB+5V	4.75V-5.25V
2	USB+5V	
3	USBP	High speed
4	USBM	difference
5	GND	

8 - 2

3. HA501--->>from BD board connect to main board

PIN NO	PIN Assign	Remarks
1	GND	
2	RX_MCLK	
3	GND	
4	RX_LRCK	
5	GND	
6	RX_BCK	
7	GND	
8	RX_DATA0	
9	RX_DATA1	
10	RX_DATA2	
11	RX_DATA3 N/A	
12	GND	
13	SPDIF_IRQ N/A	
14	SPDIF_GPIO3 N/A	
15	SPDIF_RST N/A	
16	ADC_RST	

4 J900 --->>from BD board connect to BD loader(SERVO use)

PIN NO	PIN Assign	Remarks
1	A+	0-11.6V
2	A-	0-11.6V
3	B-	0-1.6V
4	B+	0-1.6V
5	U	4.52V
6	V	4.52V
7	W	4.52V
8	COMMON	4.52V

5. J905 --->>from BD board connect to BD loader(SERVO use)

PIN NO	PIN Assign	Remarks
1	LOAD-	0.65V
2	LOAD+	0.65V
3	GND	GND
4	TYAY_IN	0V-->>open/close 3.3V
5	TYAY_OUT N/A	

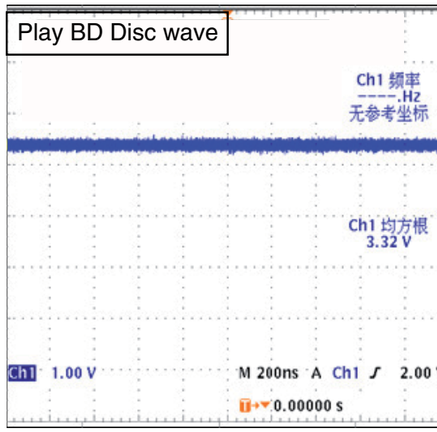
6. J800--->>from BD board connect to BD loader(SERVO use)

PIN NO	PIN Assign	Remarks
1	FOC2+	2.66V 2.4V 2.68V
2	FOC2-	2.49V 2.8V 2.52V
3	TR-	2.58V 2.59V 2.55V
4	FOC1+	2.66V 2.59V 2.7V
5	TR+	2.59V 2.62V 2.58V
6	FOC1-	2.48V 2.66V 2.52V
7	A-	0.49V 0.26V 0.48V
8	B-	0.49V 0.35V 0.4V
9	A+	0.72V 0.26V 0.42V
10	B+	0.72V 0.35V 0.4V
11	GND	GND
12	SIG_PO	n/a
13	GND	GND
14	B	2.22V 2.05V 2.36V
15	A	2.22V 2.05V 2.44V
16	D	2.26V 2.05V 2.45V
17	C	2.23V 2.06V 2.31V
18	G	2.09V 1.9V 2.37V
19	H	2.09V 1.9V 2.30V
20	F	2.09V 1.88V 2.43V
21	E	2.09V 1.9V 2.24V
22	LDO_SDIO	2.35V 2.15V 0V
23	RFO+	3.11V 2.82V 2.72V
24	RFO-	2.11V 1.92V 2.54V
25	LDO_CLK	3.25V 3.04V 0V
26	LDO_SEN	3.25V 3.02V 3.3V
27	HAVC	2.09V 1.8V 2.1V
28	VCC_PDIC	4.95V
29	GND	GND
30	GAIN_SW	3.25V 0V 1.65V
31	GND	GND
32	BD_LD	0V 0V 4.54V
33	CD_LD	1.74V 0V 0V
34	DVD_LD	0V 1.96V 0V
35	GND	GND
36	AUX1	1.55V 1.23V 1.48V
37	VCC_HFM	4.92V
38	MDI_DVD	0.15V 0V 0.15V
39	MDI_BD	0V 0V 0.08V
40	DVD_VR	0.15V 0V 0.15V
41	CD_VR	0V 0V 0V
42	DVD_HFM	0V 0V 0V
43	CD_HFM	0V 0V 0V
44	GND	GND
45	GND	GND
Disc type voltage		CD DVD BD

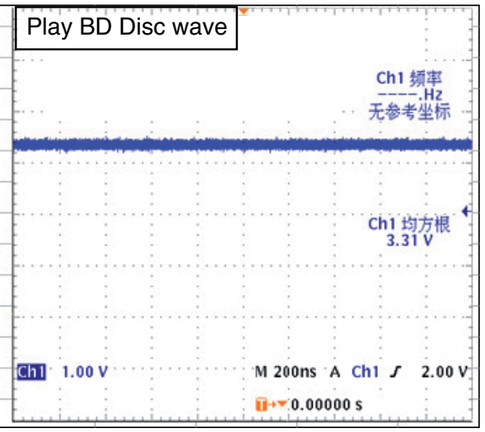
8 - 3

Waveforms for measure point

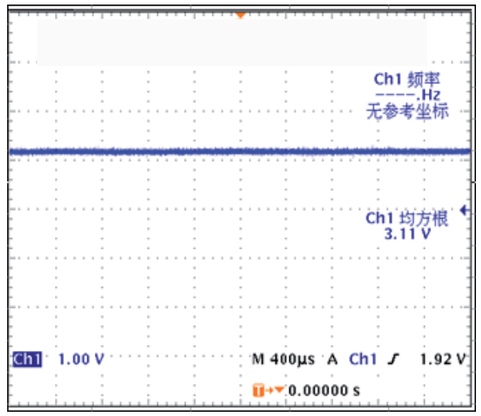
HA500 PIN2_Ipod_TX



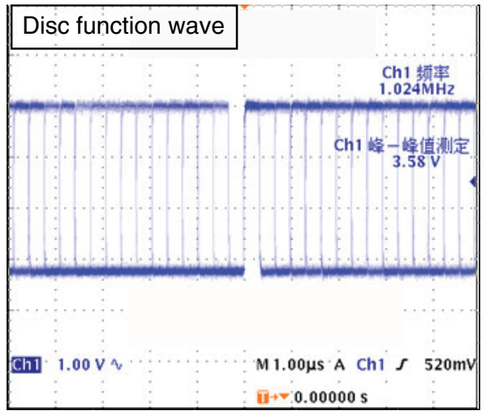
HA500 PIN3_Ipod_RX



HA500 PIN9_CEC(no single)



HA500 PIN10_MIC_IN



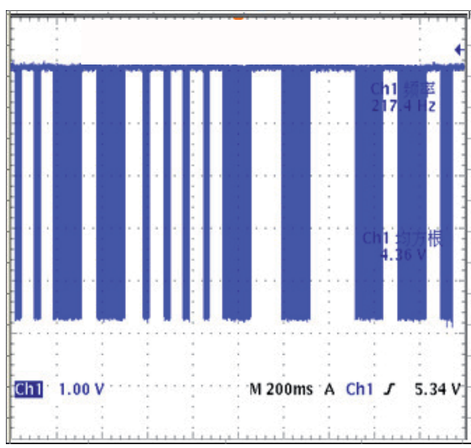
HA500 PIN5_12C_IRQ

HA500 PIN7_IR(VOL up/down)

HA500 PIN12_SCL

HA500 PIN13_SDA

HA500 PIN9_CEC



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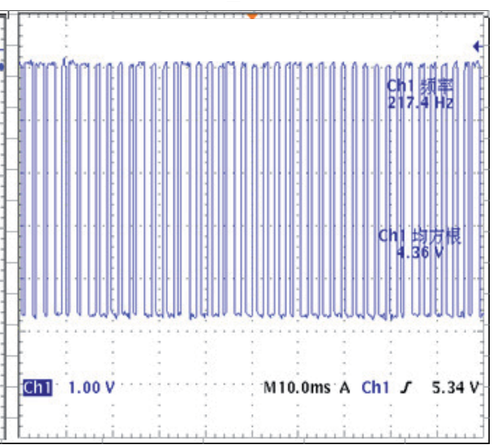

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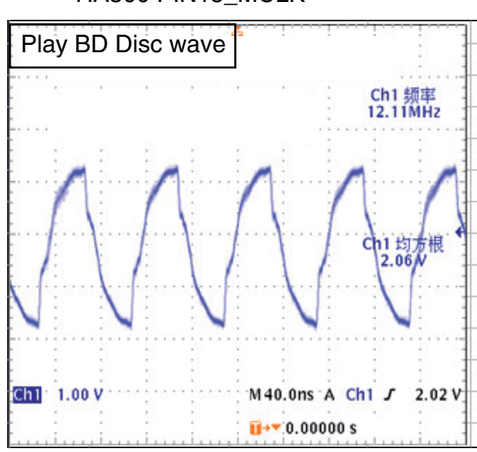

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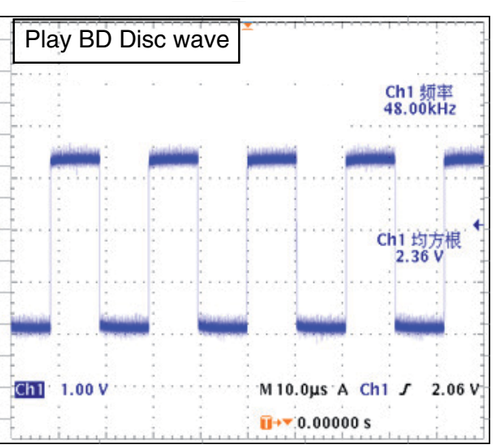
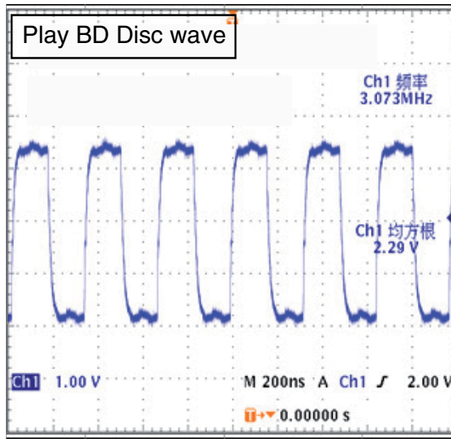


Waveforms for measure point

HA500 PIN19_BCK



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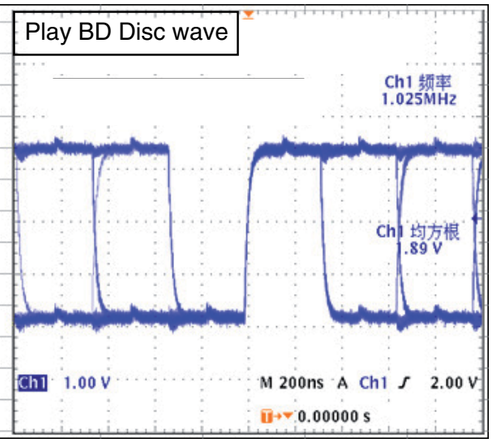
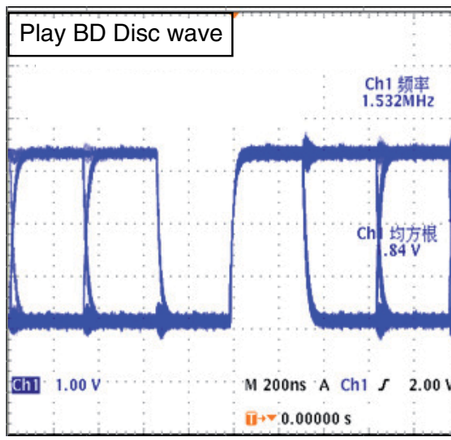
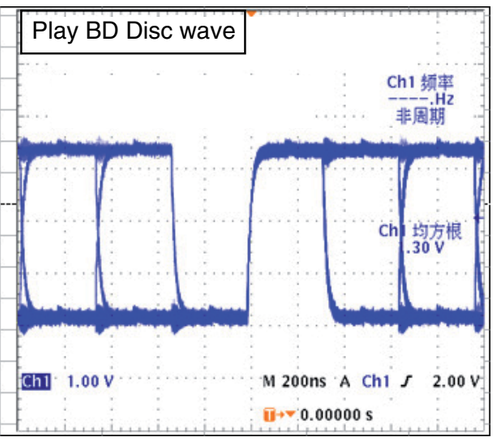


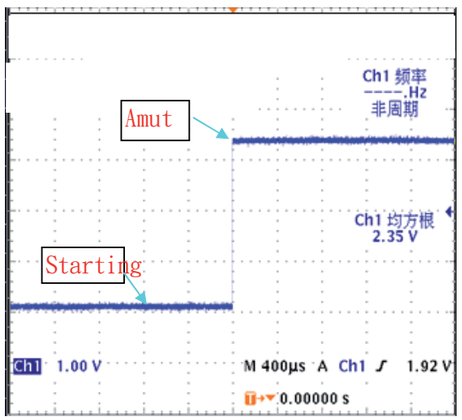
HA500 PIN22_AOSDAT1



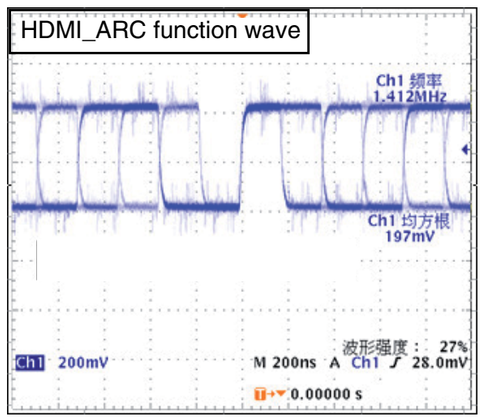
HA500 PIN23_AOSDAT2



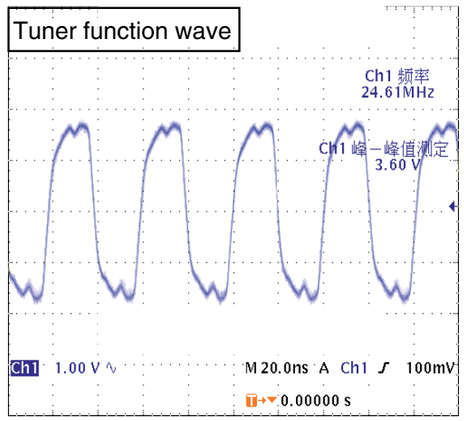
HA500 PIN10_A_MUTE



HA500 PIN29_HDMI_ARC



HA501 PIN12_RX_MCLK



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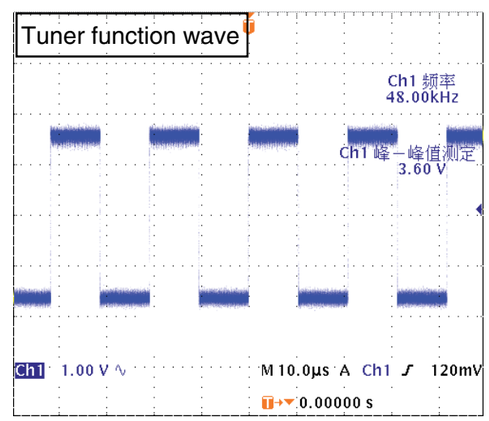
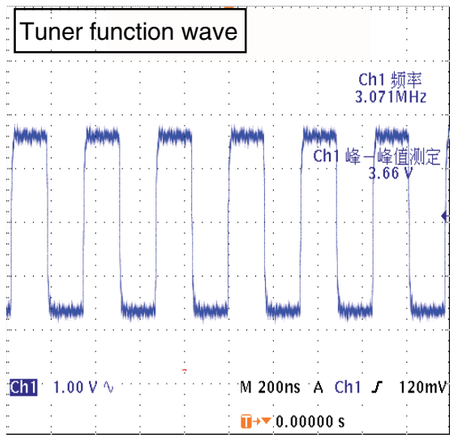
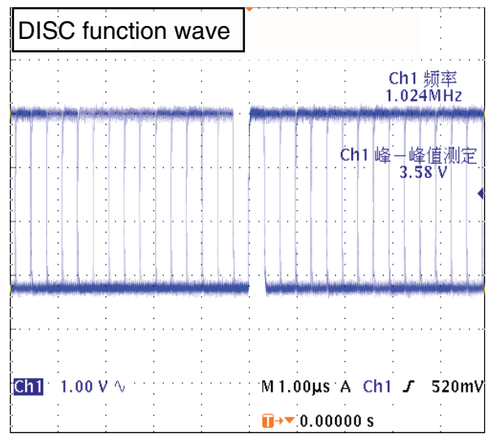


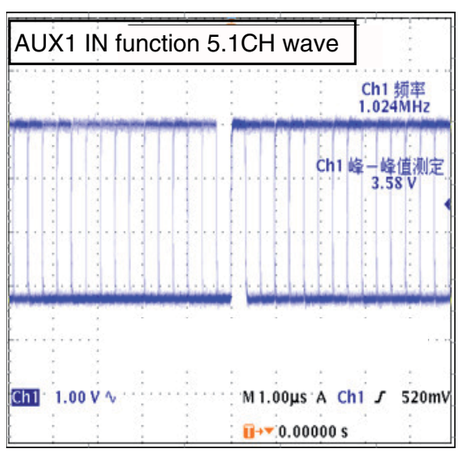
HA501 PIN6 RX_BCK



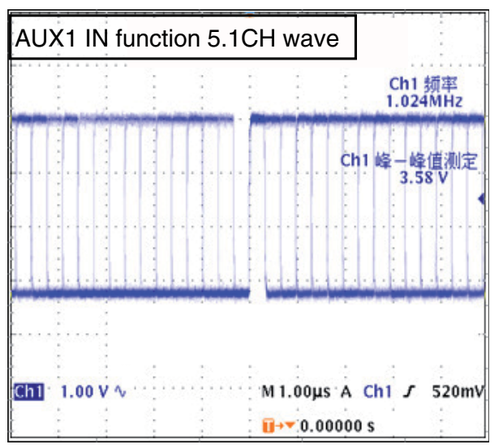
HA501 PIN8_RX_DATA0



HA501 PIN9 RX_DATA1



HA501 PIN910 RX_DATA2



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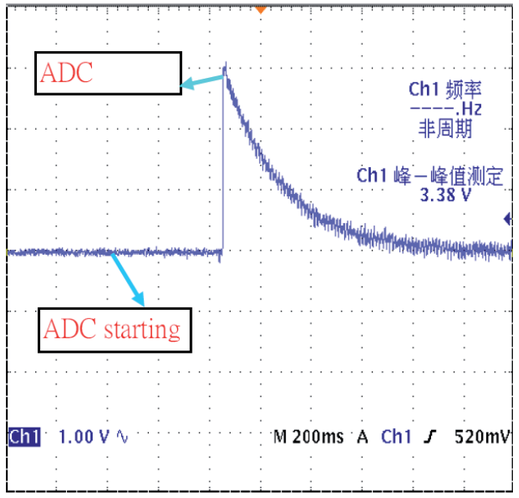
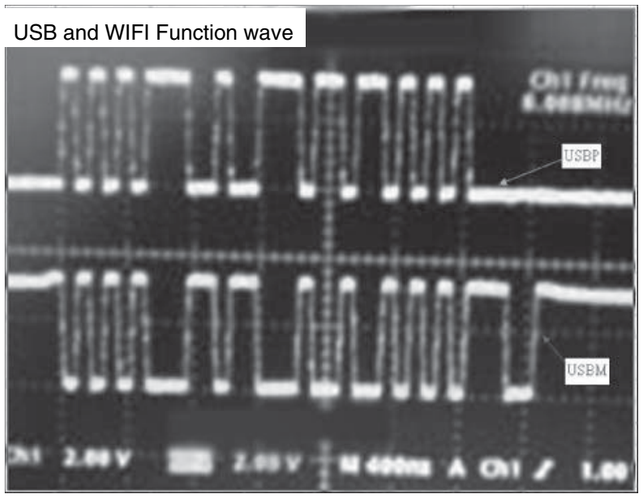
Waveforms for measure point

HA501 PIN16_ADC_RST



CN203 Pin3 USBM pin4 USBP



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TOUCH BOARD

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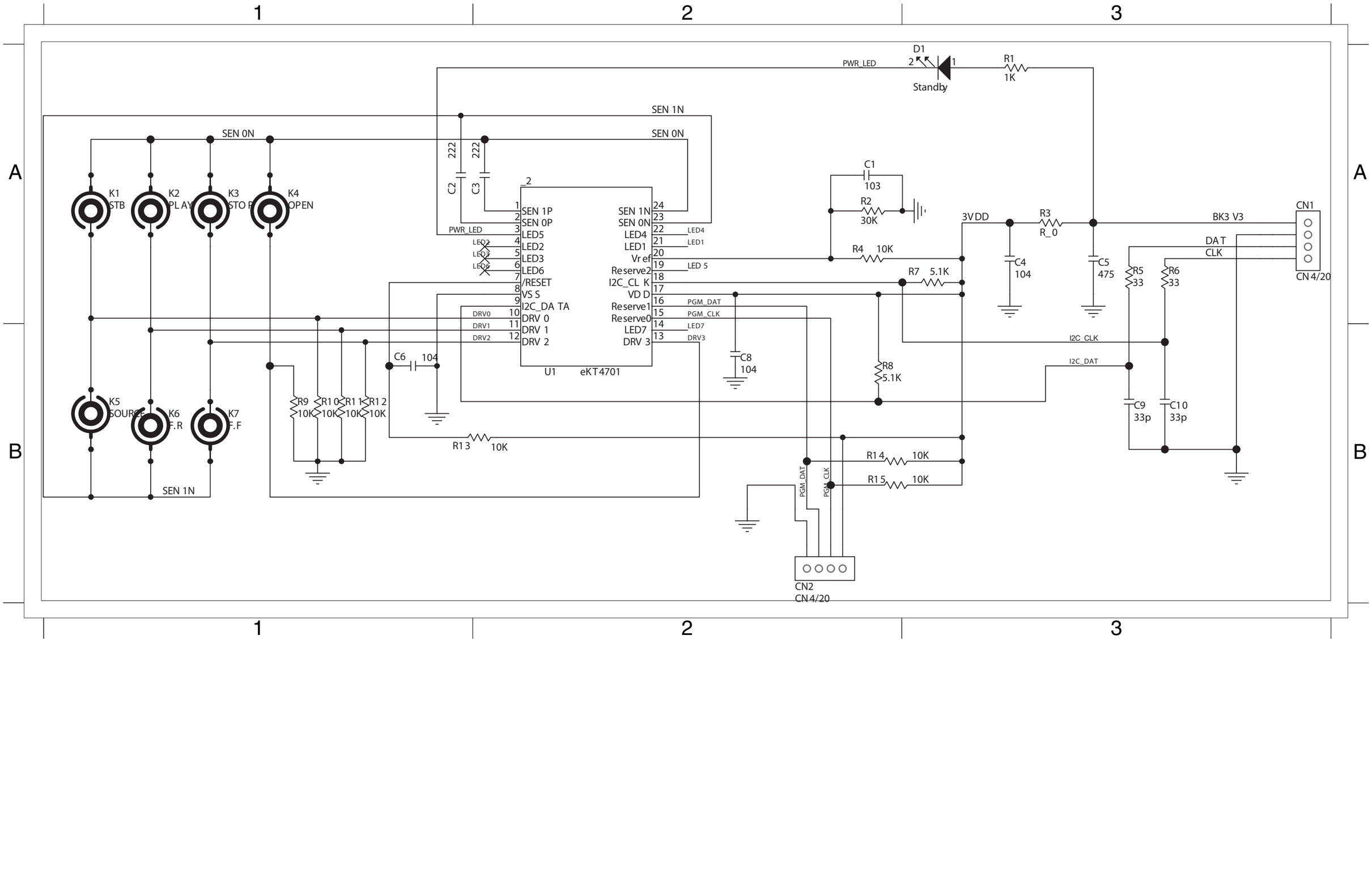
CIRCUIT DIAGRAM

C1	A2	C2	A1	C4	A3	C6	B1	C9	B3	R1	A3	R11	B1	R13	B1	R15	B2	R3	A3	R5	A3	R7	A3	R9	B1
C10	B3	C3	A2	C5	A3	C8	B2	D1	A3	R10	B1	R12	B1	R14	B2	R2	A2	R4	A2	R6	A3	R8	B2	U1	B2



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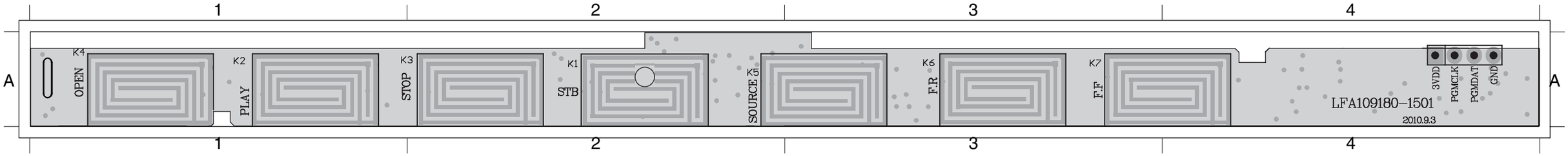
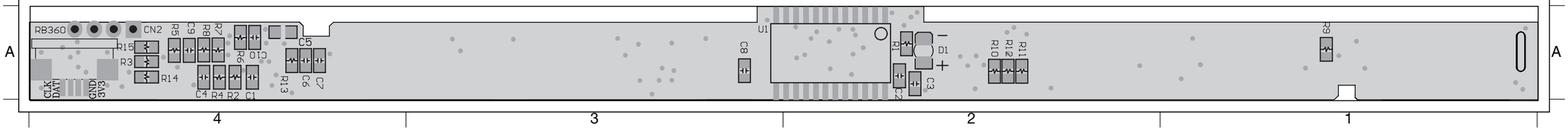
PCB LAYOUT - TOP VIEW



PCB LAYOUT - BOTTOM VIEW

C1	A4	C2	A2	C4	A4	C6	A4	C8	A3	D1	A2	R10	A2	R12	A2	R14	A4	R2	A4	R4	A4	R6	A4	R8	A4	RB360	A4
C10	A4	C3	A2	C5	A4	C7	A4	C9	A4	R1	A2	R11	A2	R13	A4	R15	A4	R3	A4	R5	A4	R7	A4	R9	A1	U1	A3



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WIRELESS JACK BOARD

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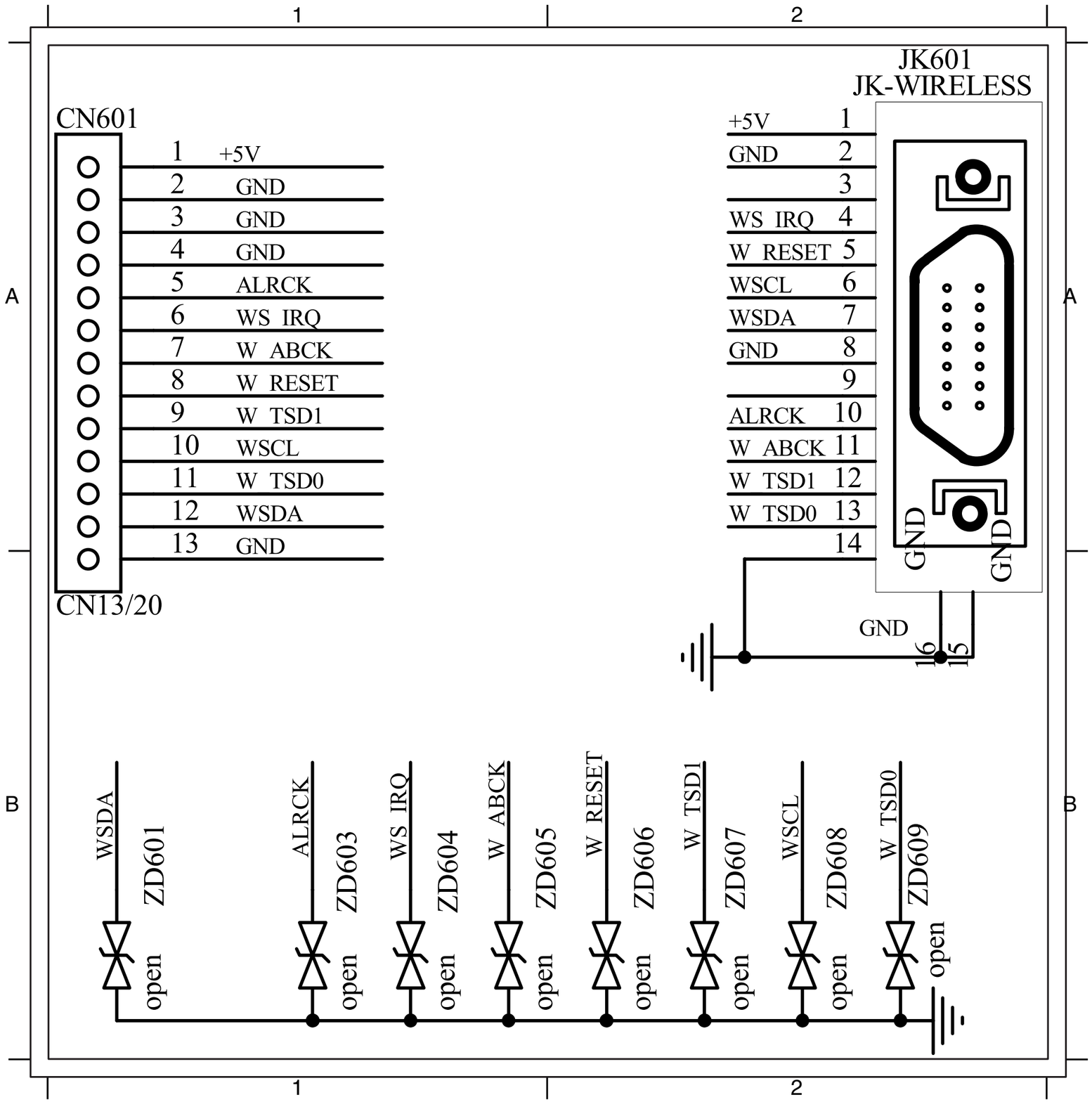
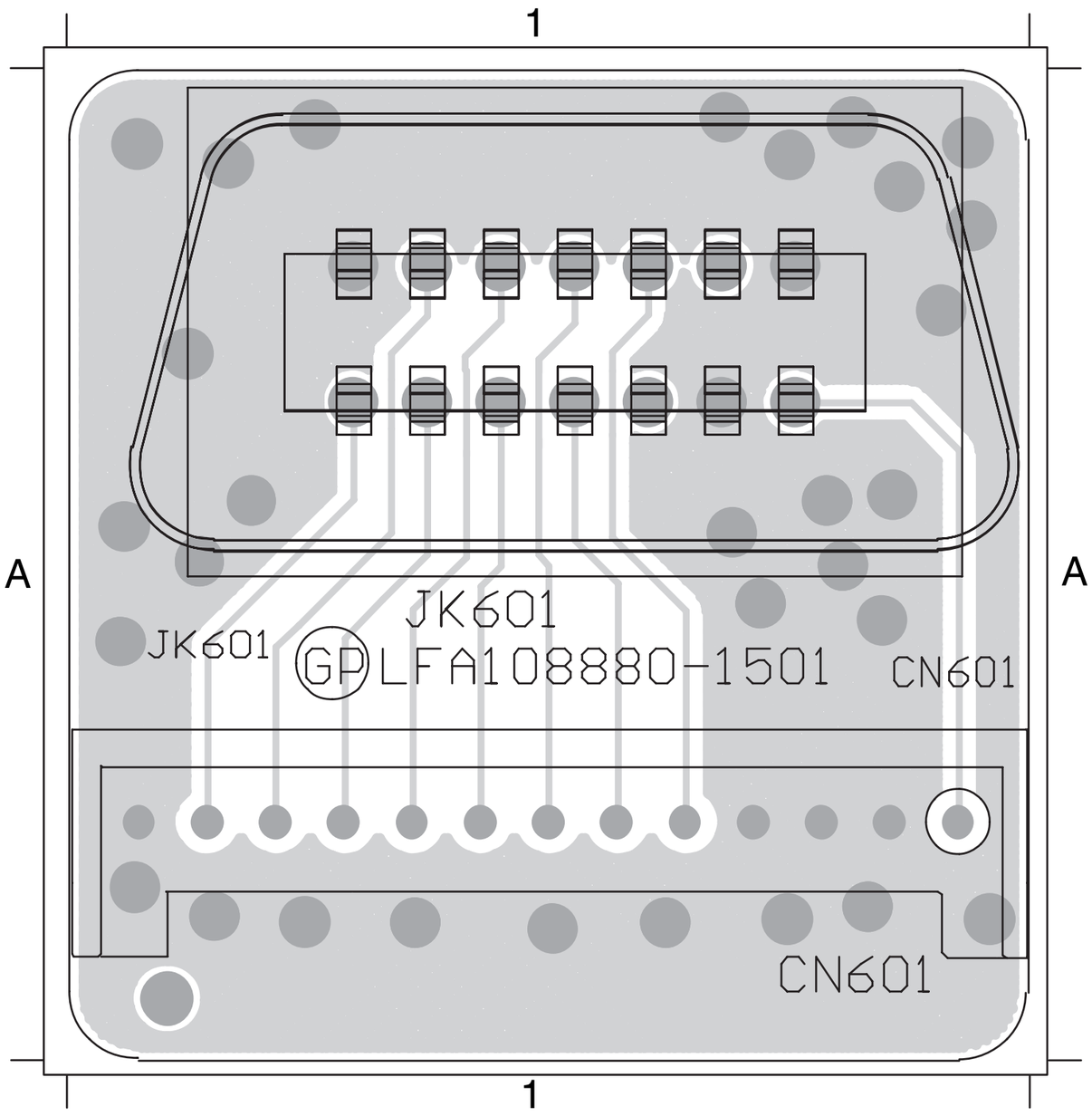
CIRCUIT DIAGRAM

CN601 A1 JK601 A1

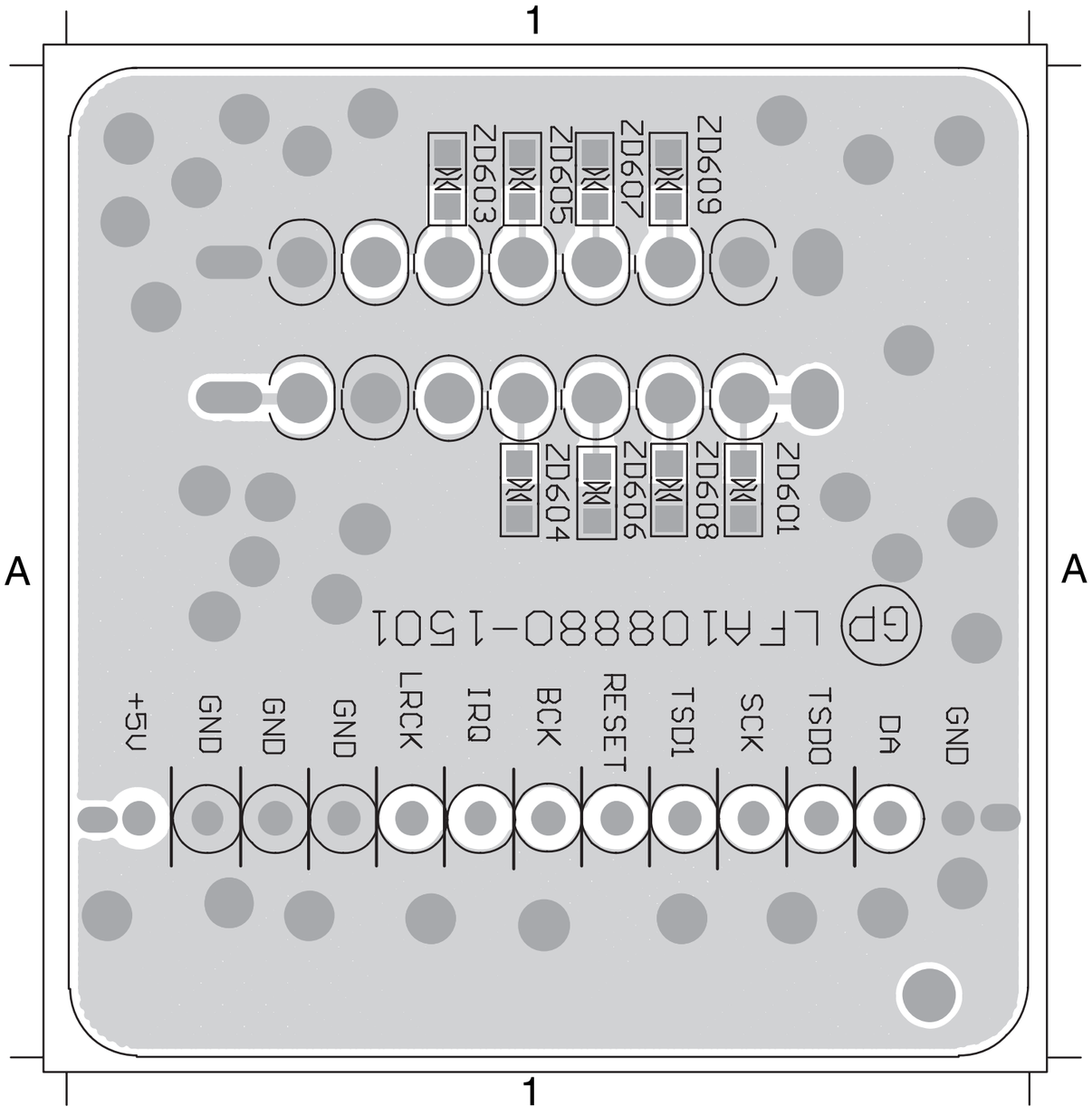


PCB LAYOUT - TOP VIEW

CN601 A1 JK601 A1



PCB LAYOUT - BOTTOM VIEW



VFD+USB+MP3+AUX BOARD

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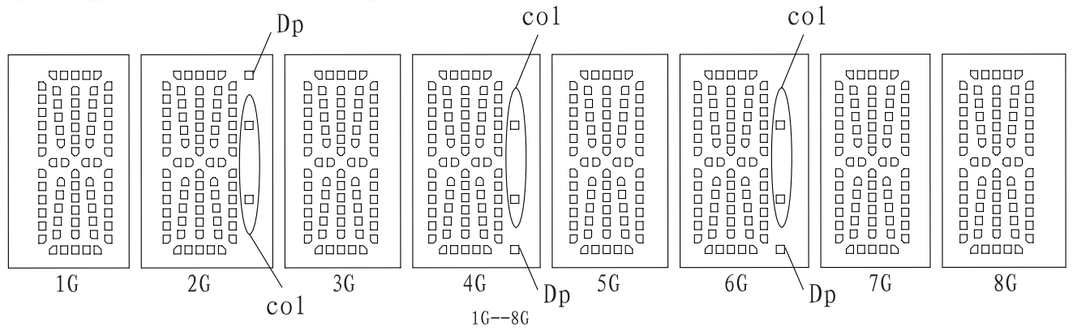
FTD DISPLAY PIN ASSIGNMENT



	1G	2G	3G	4G	5G	6G	7G	8G
P1	a	a	a	a	a	a	a	a
P2	j, p	j, p	j, p	j, p	j, p	j, p	j, p	j, p
P3	h	h	h	h	h	h	h	h
P4	k	k	k	k	k	k	k	k
P5	b	b	b	b	b	b	b	b
P6	f	f	f	f	f	f	f	f
P7	m	m	m	m	m	m	m	m
P8	g	g	g	g	g	g	g	g
P9	c	c	c	c	c	c	c	c
P10	e	e	e	e	e	e	e	e
P11	r	r	r	r	r	r	r	r
P12	n	n	n	n	n	n	n	n
P13	d	d	d	d	d	d	d	d
P14		col		col		col		
P15		Dp		Dp		Dp		

PIN CONNECTION

(Pin NO.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(Connection)	F1	F1	NP	NC	P15	P14	NC	P13	P12	P11	P10	P9	P8	P7	P6	P5
(Pin NO.)	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
(Connection)	P4	P3	P2	P1	NC	1G	2G	3G	4G	5G	6G	7G	8G	NP	F2	F2

(Notes) : Fn : (Filament Pin) nG : (Grid Pin)
Pn : (Anode Pin) NP : (No Pin)
NC : (No connection Pin)

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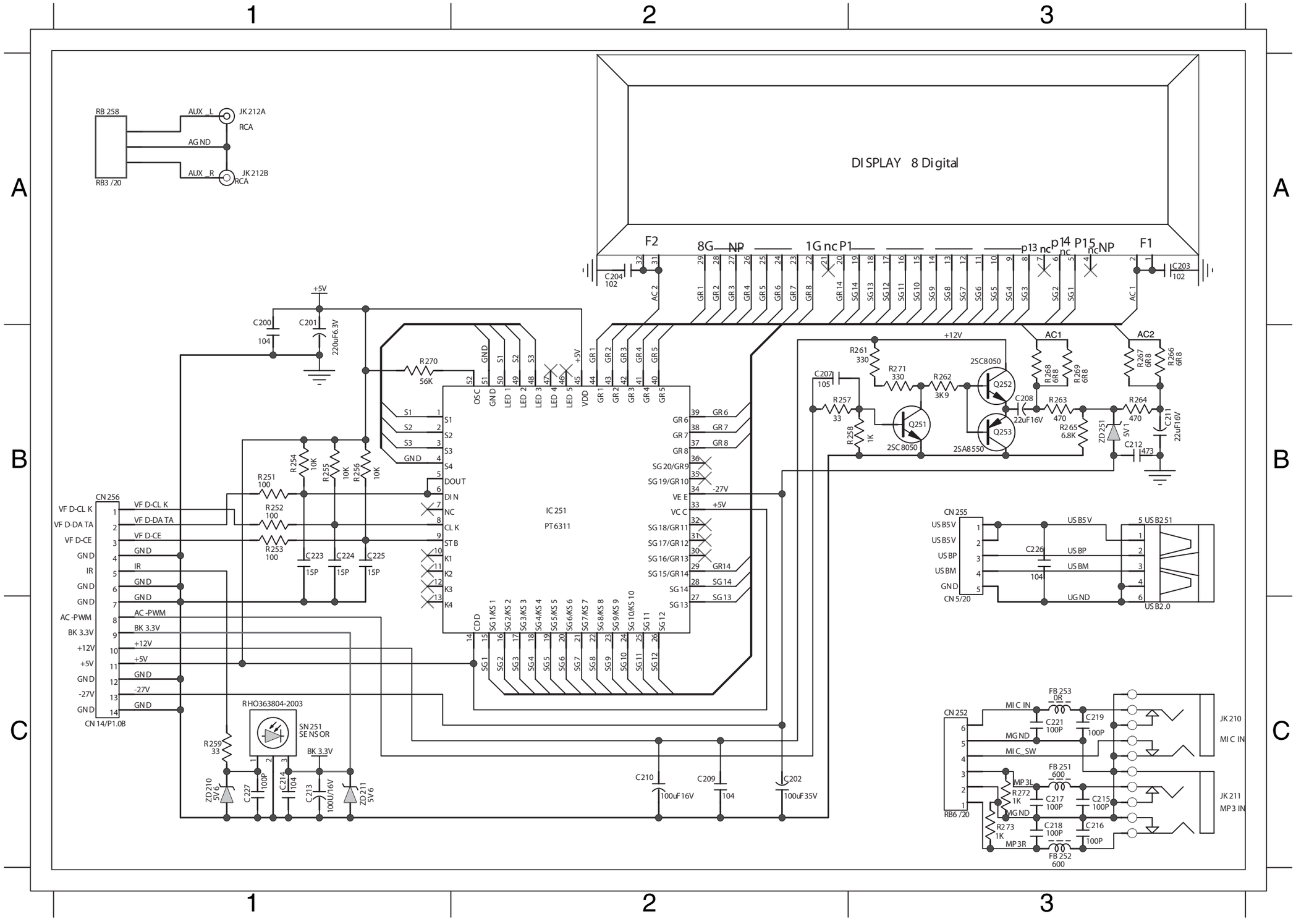
CIRCUIT DIAGRAM

C200	A1	C204	A2	C210	C2	C214	C1	C218	C3	C226	B3	CN256	B1	IC251	B2	Q251	B3	R252	B1	R256	B1	R261	B3	R265	B3	R269	B3	R273	C3	ZD210	C1
C201	A1	C207	B2	C211	B3	C215	C3	C223	B1	C227	C1	DP251	A2	IC251	B2	Q252	B3	R253	B1	R257	B2	R262	B3	R266	B3	R270	B1	RB258	A1	ZD211	C1
C202	C2	C208	B3	C212	B3	C216	C3	C224	B1	CN252	C3	FB251	C3	JK211	C3	Q253	B3	R254	B1	R258	B2	R263	B3	R267	B3	R271	B3	SN251	C1	ZD251	B3
C203	A3	C209	C2	C213	C1	C217	C3	C225	B1	CN255	B3	FB252	C3	JK212	A1	R251	B1	R255	B1	R259	C1	R264	B3	R268	B3	R272	C3	USB251	B3		



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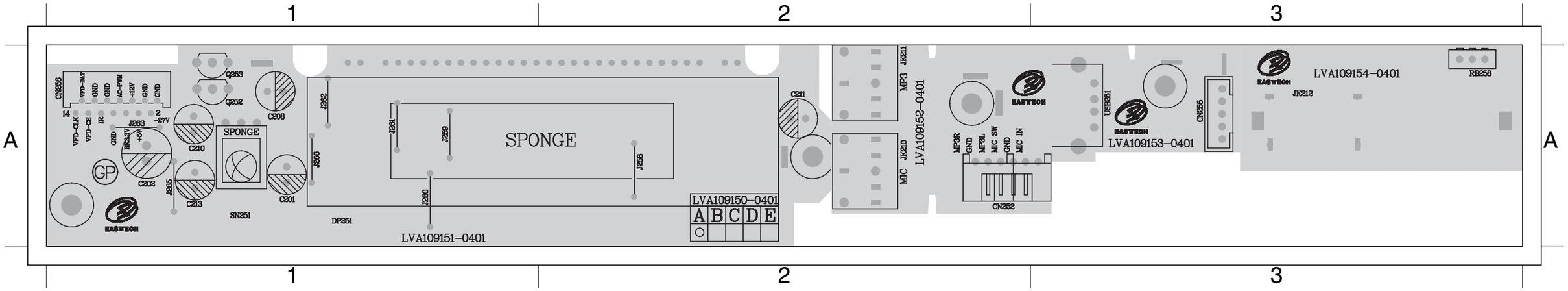
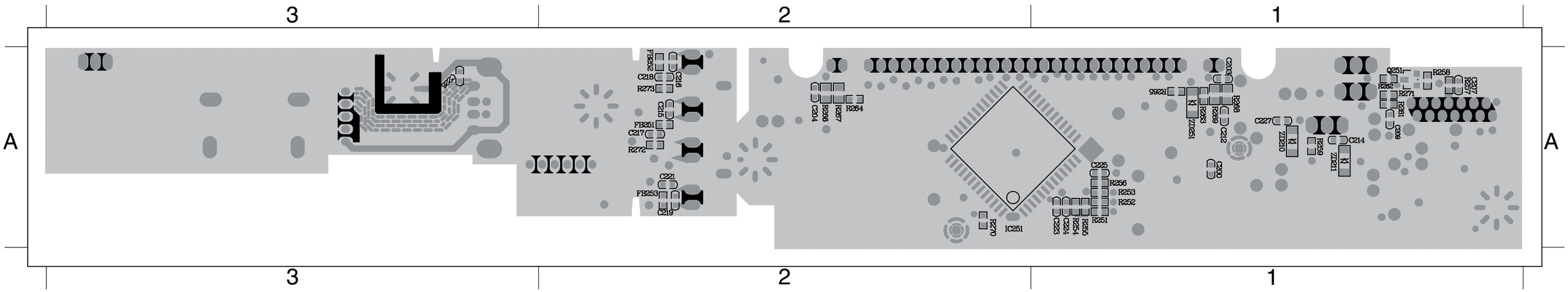
PCB LAYOUT - TOP VIEW

C201	A1	C208	A1	C211	A2	CN252	A2	CN256	A1	J258	A2	J260	A1	J262	A1	J265	A1	JK211	A2	Q252	A1	RB258	A3	USB251	A3
C202	A1	C210	A1	C213	A1	CN255	A3	DP251	A1	J259	A1	J261	A1	J263	A1	J266	A1	JK212	A3	Q253	A1	SN251	A1		



PCB LAYOUT - BOTTOM VIEW



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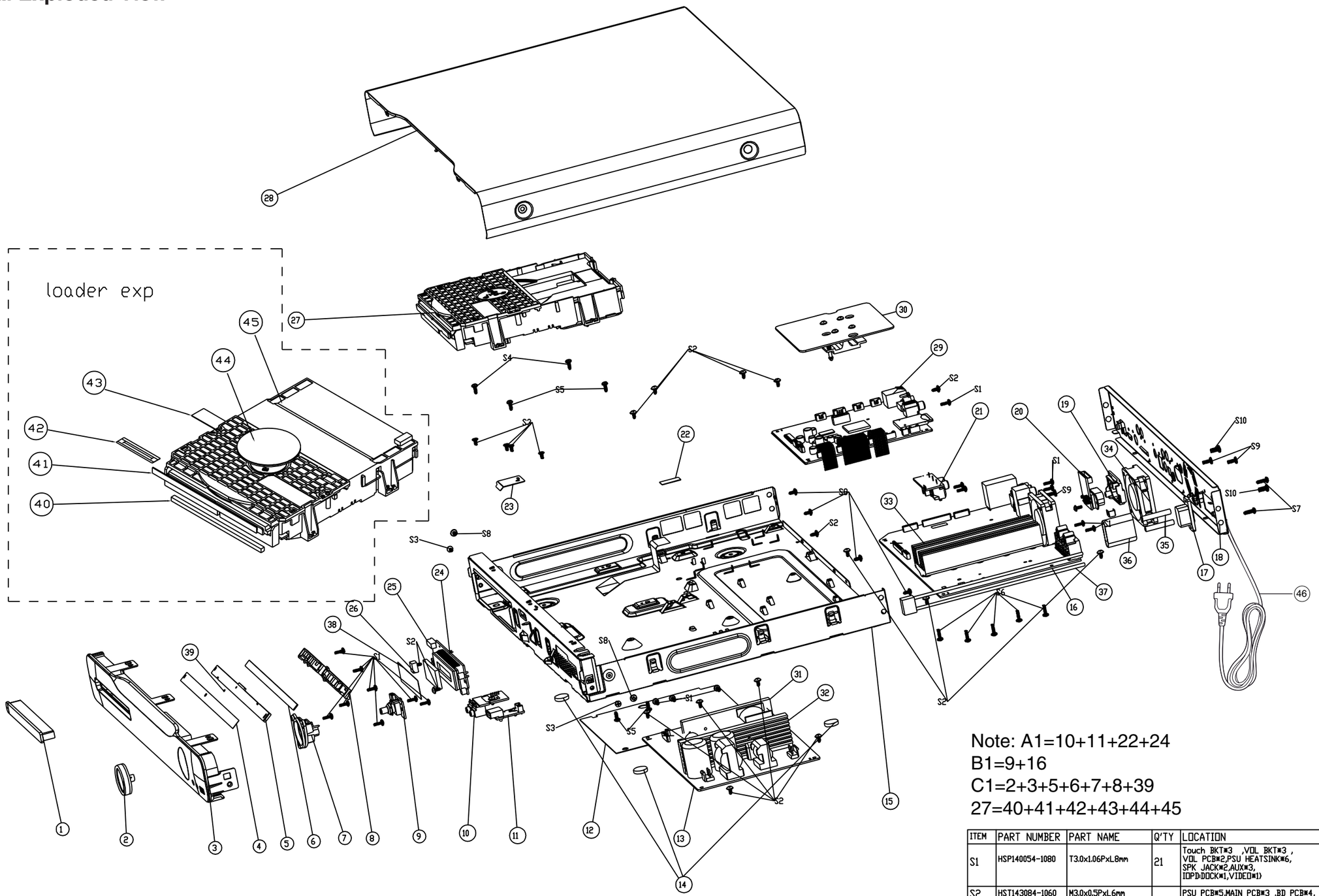
Mechanical Exploded View



Note: A1=10+11+22+24
B1=9+16
C1=2+3+5+6+7+8+39
27=40+41+42+43+44+45

ITEM	PART NUMBER	PART NAME	Q'TY	LOCATION
S1	HSP140054-1080	T3.0x1.06PxL8mm	21	Touch BKT*3 ,VOL BKT*3 , VOL PCB*2,PSU HEATSINK*6, SPK JACK*2,AUX*3, IOPD\DOCK*1,VIDEO*1)
S2	HST143084-1060	M3.0x0.5PxL6mm	19	PSU PCB*5,MAIN PCB*3 ,BD PCB*4, BACK*1,TUNER*1,HDMI*1,VFD PCB*2, MP3 PCB*1,USB PCB*1)
S3	HSF143084-1060	M3xP0.5xL6mm	6	FRONT PANEL*5 PVC*1
S4	HSW053085-1080	M3xL8mm WASHER	2	LOADER LEFT*2
S5	HST143084-1080	M3.0x0.5PxL8mm	4	LOADER RIGHT*2,AC CHANGE*2(FOR 93/98)
S6	HSP140054-1100	T3.0x1.06PxL10mm	5	AMP HEATSINK*5
S7	HST140074-1100	T3.5xL10.0	2	AC SOCKET*2
S8	HST143084-3060	M3x0.5PxL6mm BLACK	6	FOR TOP COVER*6
S9	HSD140054-1080	T3.0xP1.06xL8mm	3	FOR WIRELESS PCB *2, OPTICAL JACK*1
S10	HSP140132-1100	T5.0xP2.12xL10mm	2	FOR FAN*2

REVISION LIST

Version 1.0
*Initial release