

Service
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Service Manual

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PHILIPS

SPECIFICATIONS

AMPLIFIER

Output power 2 x 4W RMS
 Signal-to-noise ratio ≥ 60 dBA (IEC)
 Frequency response 125 – 16000 Hz
 Impedance loudspeakers 4Ω

CD PLAYER

Frequency range 125 – 16000 Hz
 Signal-to-noise ratio 65 dBA

TUNER

FM wave range 87.5 – 108 MHz
 MW wave range 531 – 1602 kHz
 Sensitivity at 75 Ω
 – FM 26 dB sensitivity 20 μ V
 – MW 26 dB sensitivity 5 mV/m
 Total harmonic distortion $\leq 5\%$

TAPE DECK

Frequency response
 Normal tape (type I) 125 – 8000 Hz (8 dB)
 Signal-to-noise ratio
 Normal tape (type I) 40 dBA
 Wow and flutter $\leq 0.4\%$ JIS

SPEAKERS

Bass reflex system
 Dimensions (w x h x d) . 146 x 228 x 160 (mm)

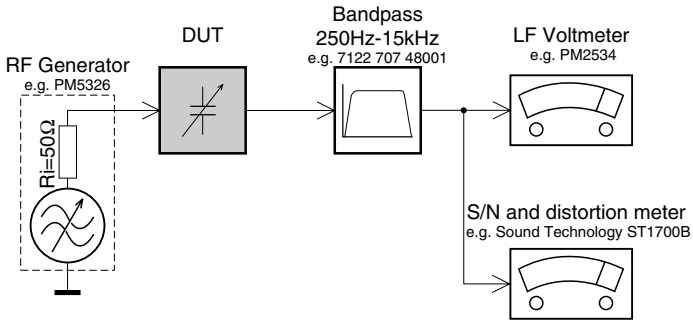
GENERAL INFORMATION

AC Power 220 – 230 V / 50 Hz
 Dimensions (w x h x d) .. 146 x 228 x 216(mm)
 Weight (with/without speakers)
 approx. 4.4 / 2.0 kg
 Power consumption
 Active 30 W
 Standby < 5 W
 Eco Power Standby < 1 W

Specifications and external appearance are subject to change without notice.

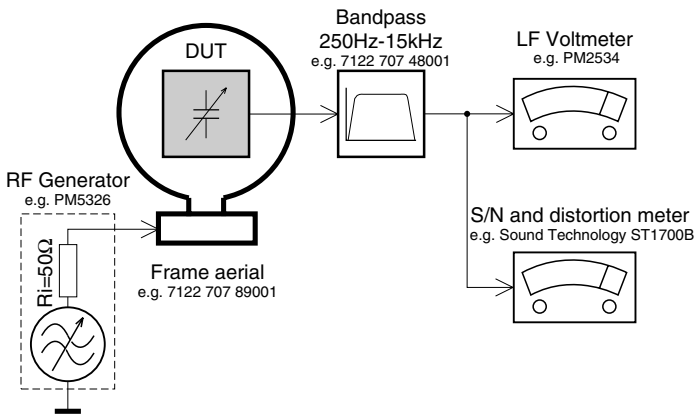
MEASUREMENT SETUP

Tuner FM



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

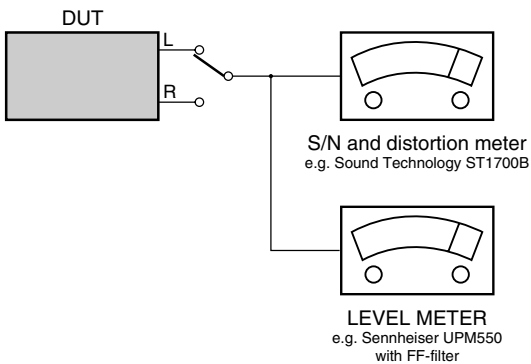
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

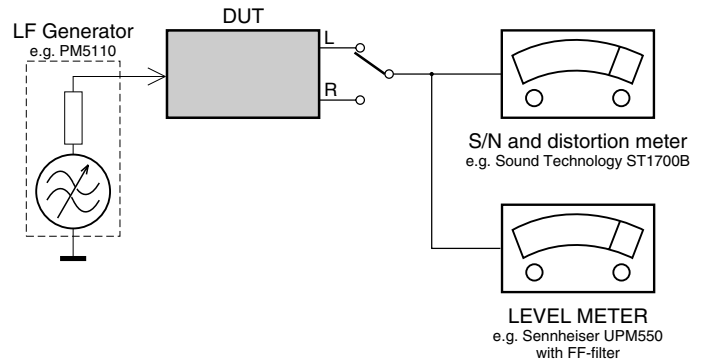
CD

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



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



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

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

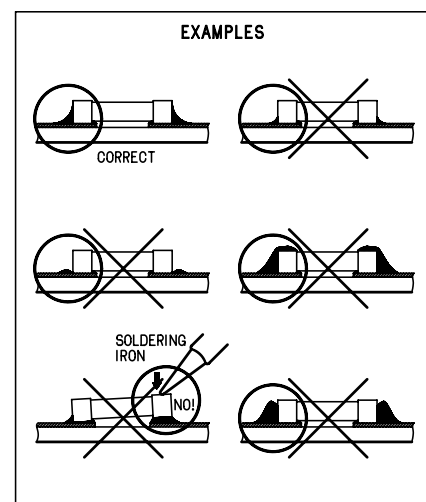
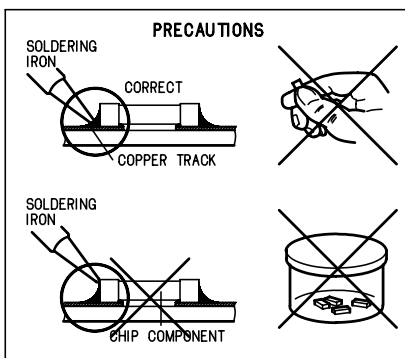
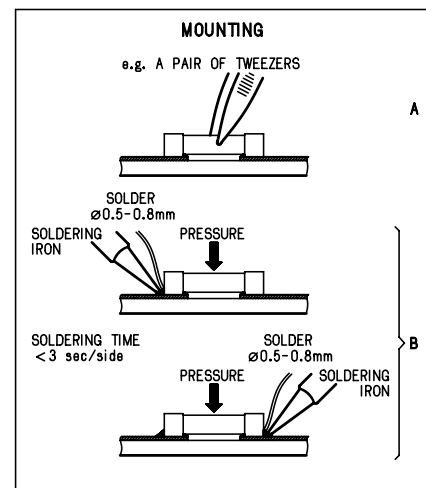
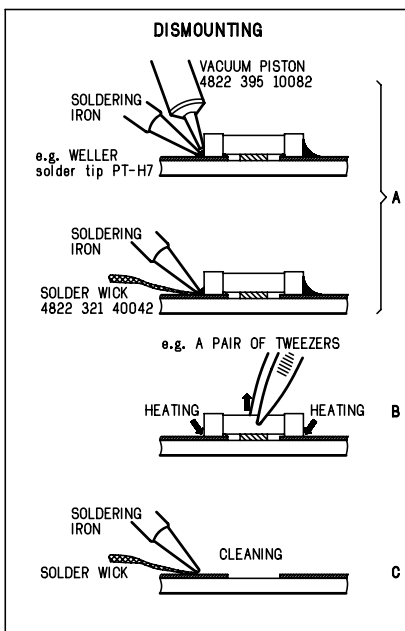
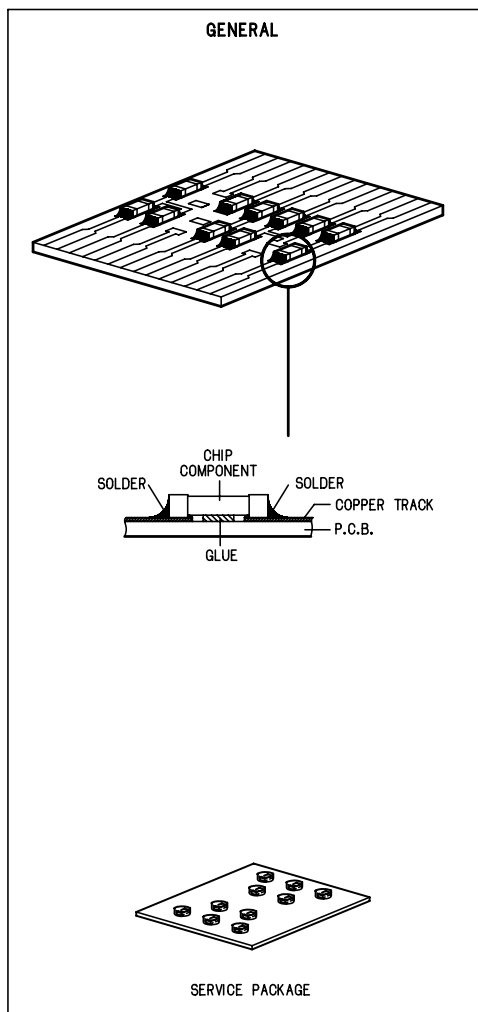
Compact Disc:

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

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm ...	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1M Ω)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS



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.

ESD**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).

Unvorsichtige Behandlung im Reparaturfall kann 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

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 \triangle .

**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 symbool \triangle

F

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

Les composants de sécurité sont marqués \triangle

D

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

Sicherheitsbauteile sind durch das Symbol \triangle 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.

Componenti di sicurezza sono marcati con \triangle

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 Advare !

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

F

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

INFORMATION ABOUT LEAD-FREE SOLDERING

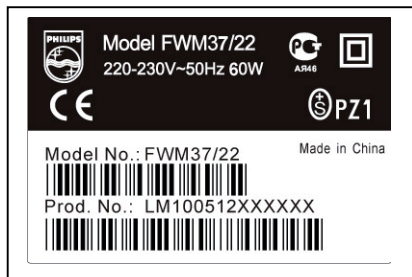
Philips CE is producing lead-free sets from 1.1.2005 onwards.

IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:



Example S/N:



Bottom line of typeplate gives a 14-digit S/N. Digit 5&6 is the year, digit 7&8 is the week number, so in this case 2005 wk12

So from 0501 onwards = from 1 Jan 2005 onwards

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".

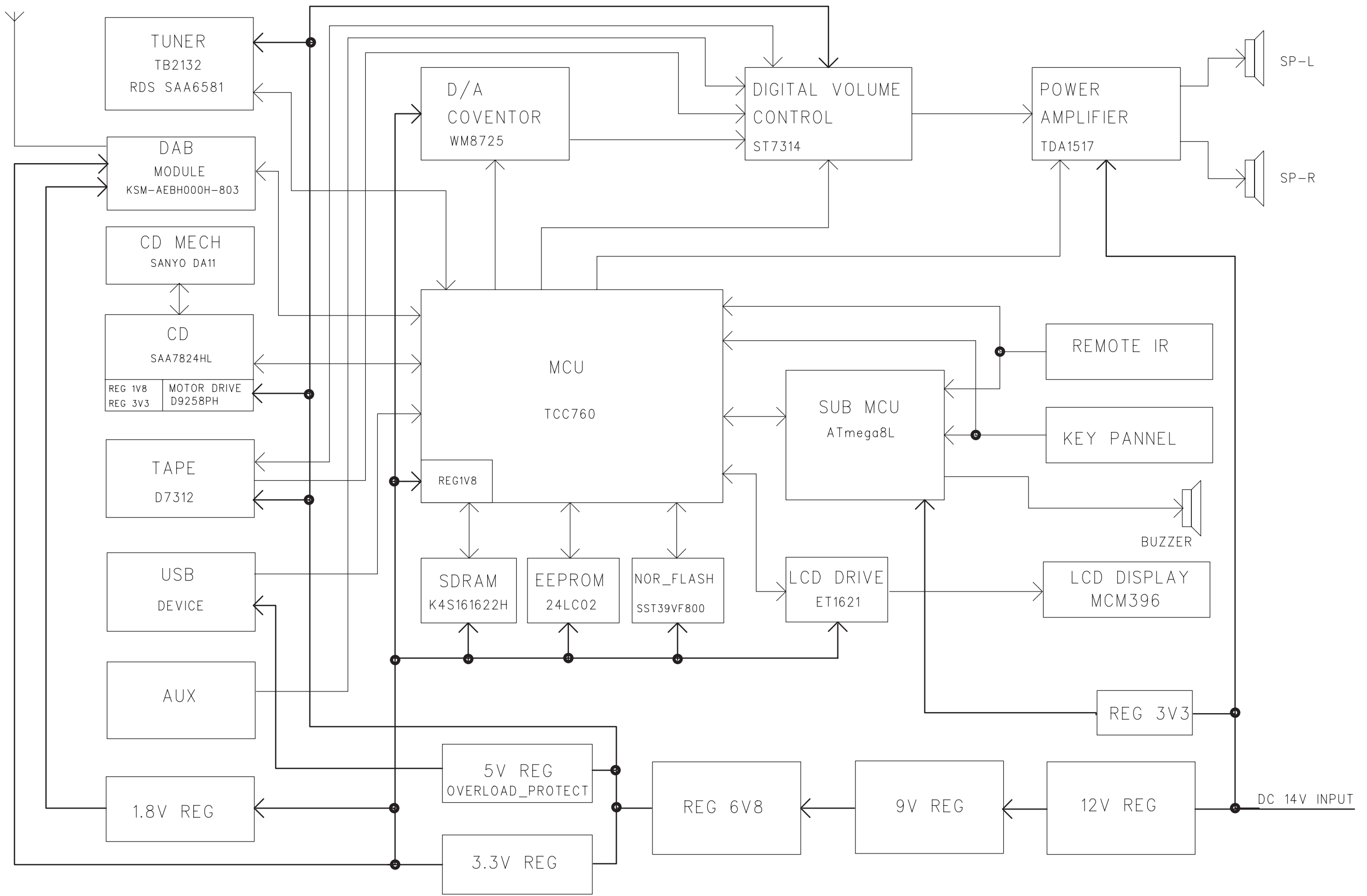
For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

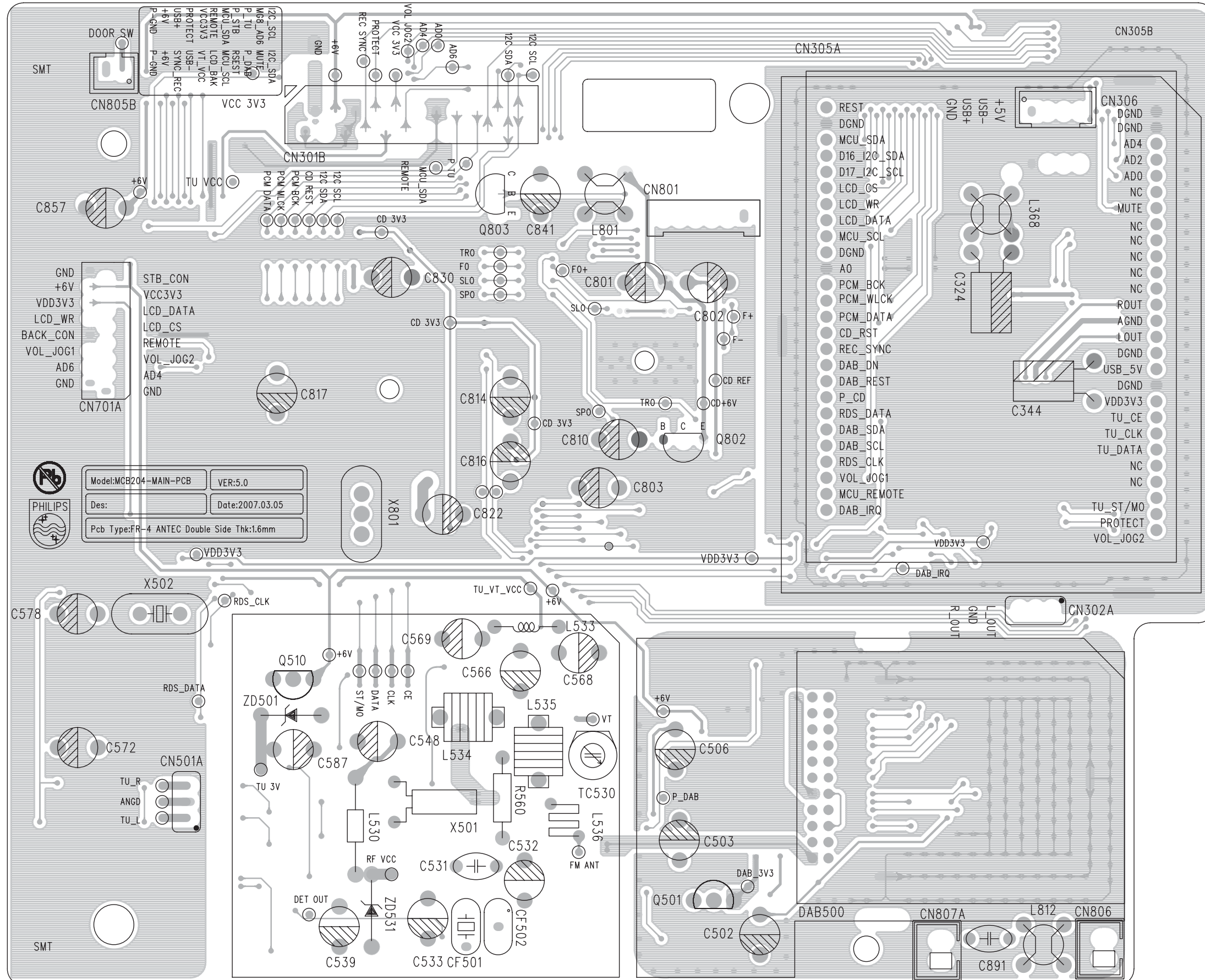
Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):
 1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
 2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
 3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
 4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

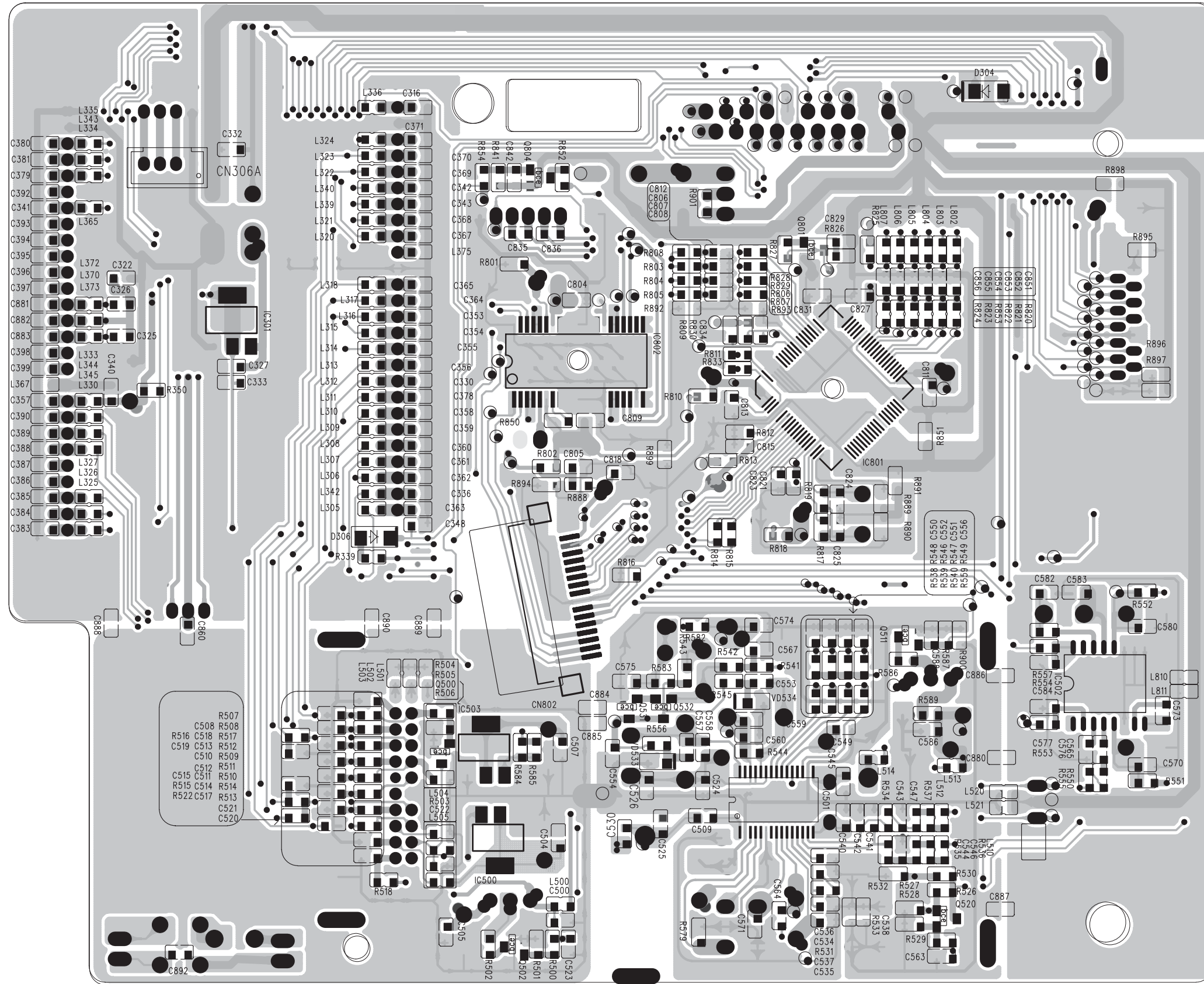
SET BLOCK DIAGRAM



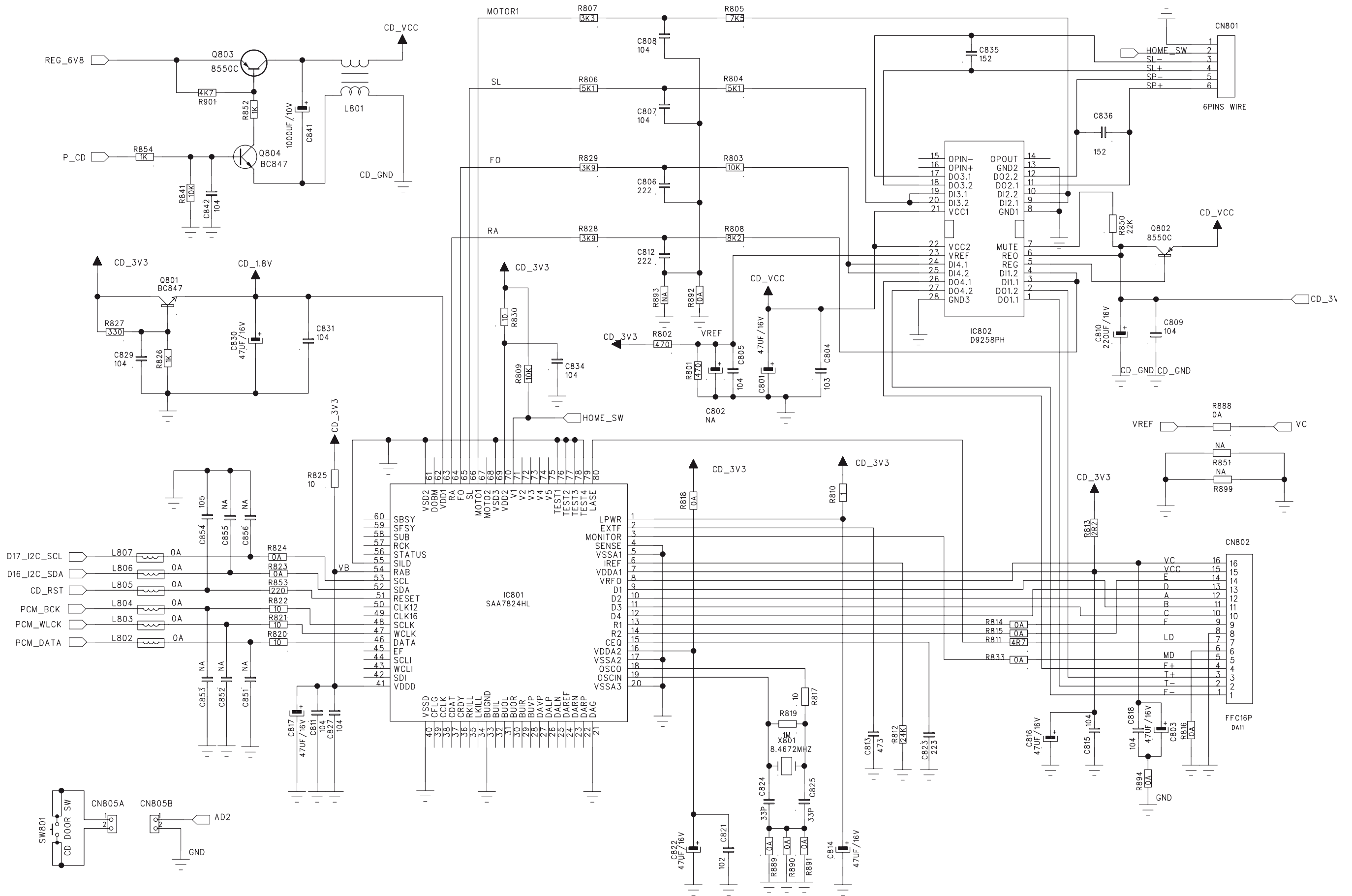
PCB LAYOUT - MAIN BOARD (TOP VIEW)



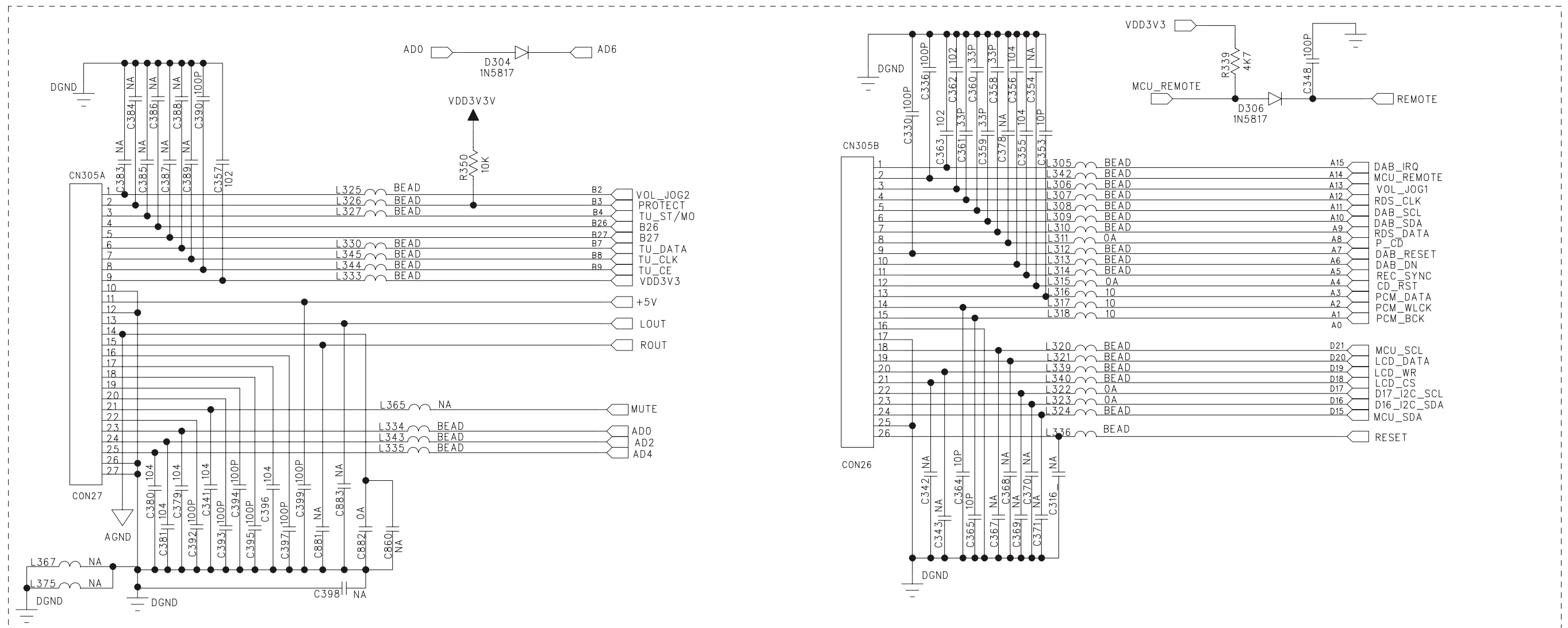
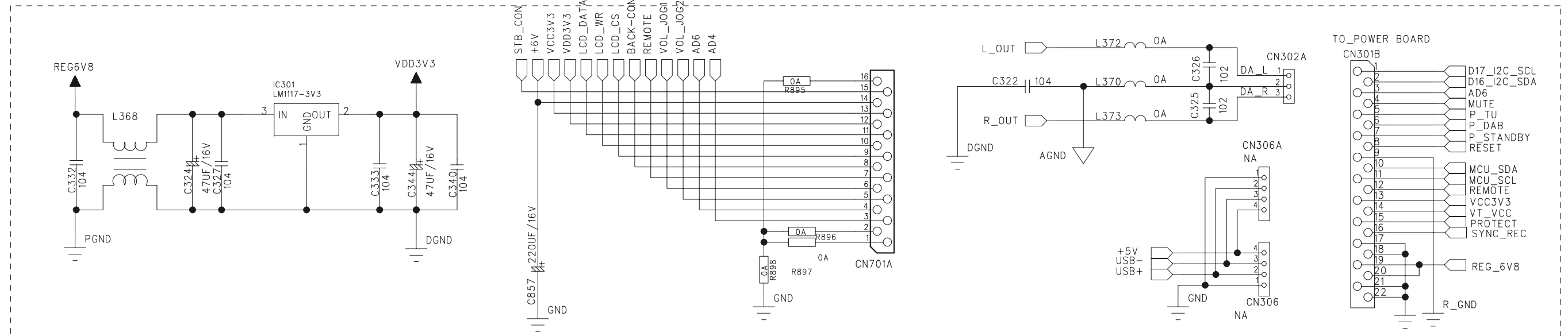
PCB LAYOUT - MAIN BOARD (BOTTOM VIEW)



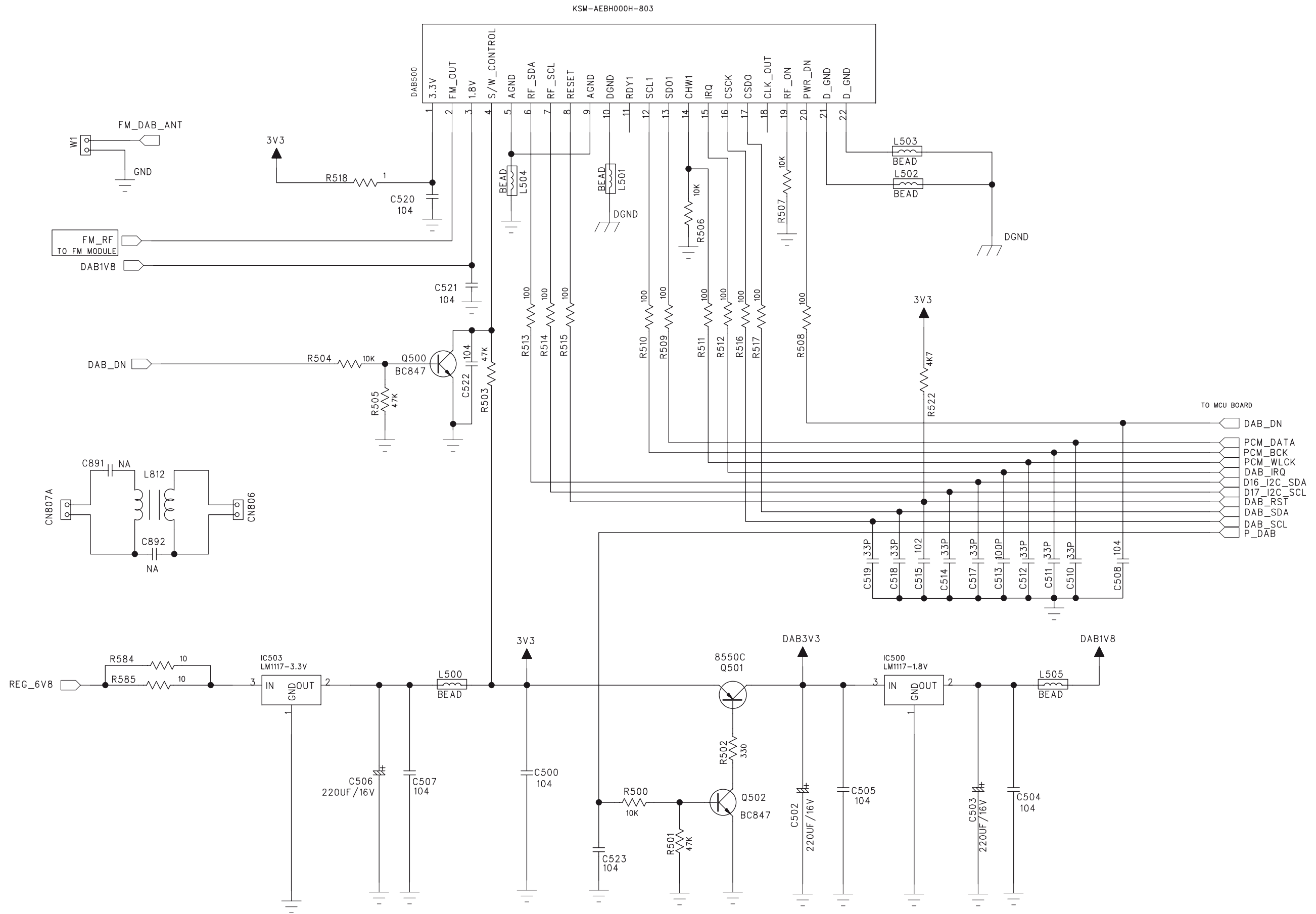
CIRCUIT DIAGRAM - MAIN BOARD CD MP3 PART



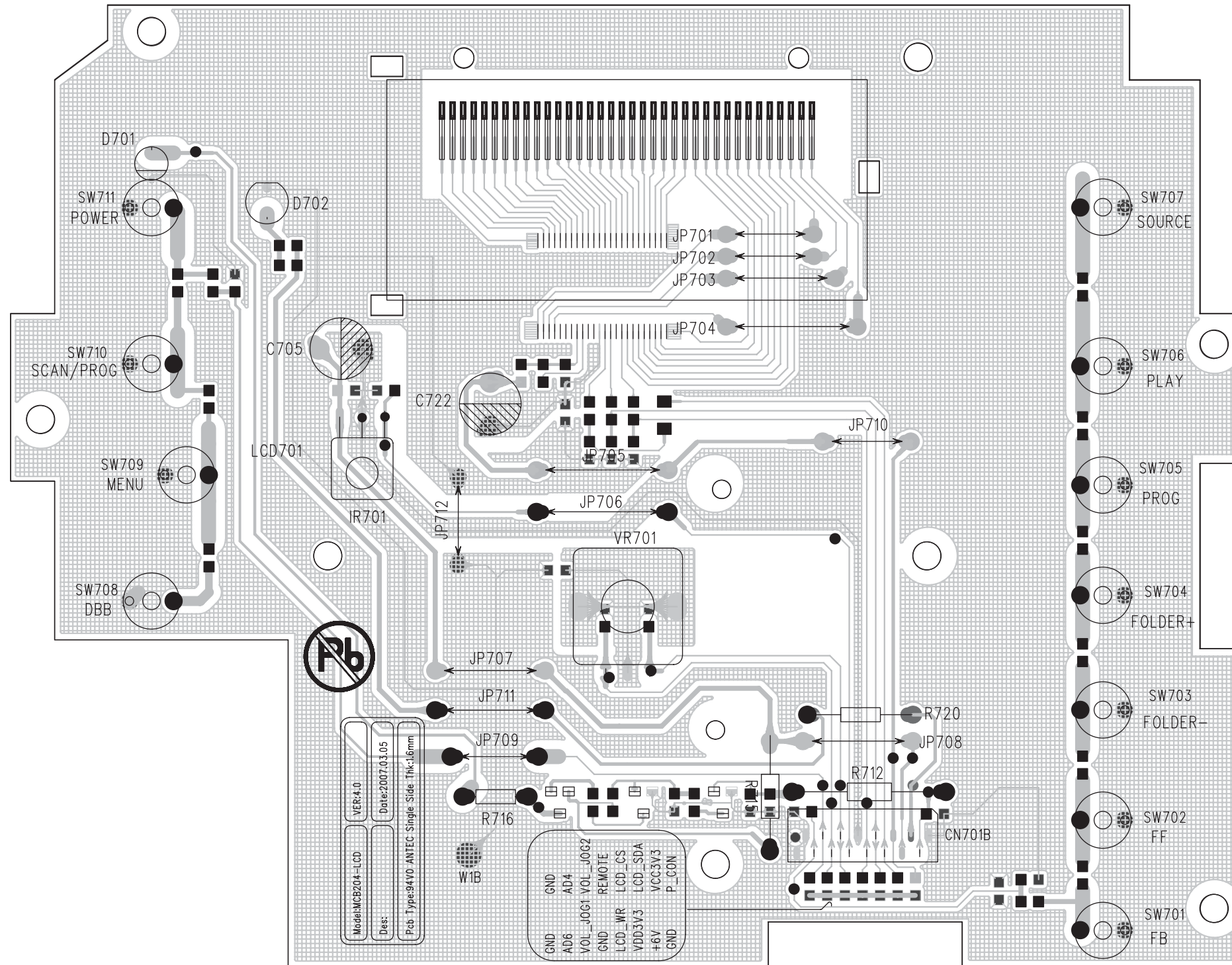
CIRCUIT DIAGRAM - MAIN BOARD INTERFACE ACE PART



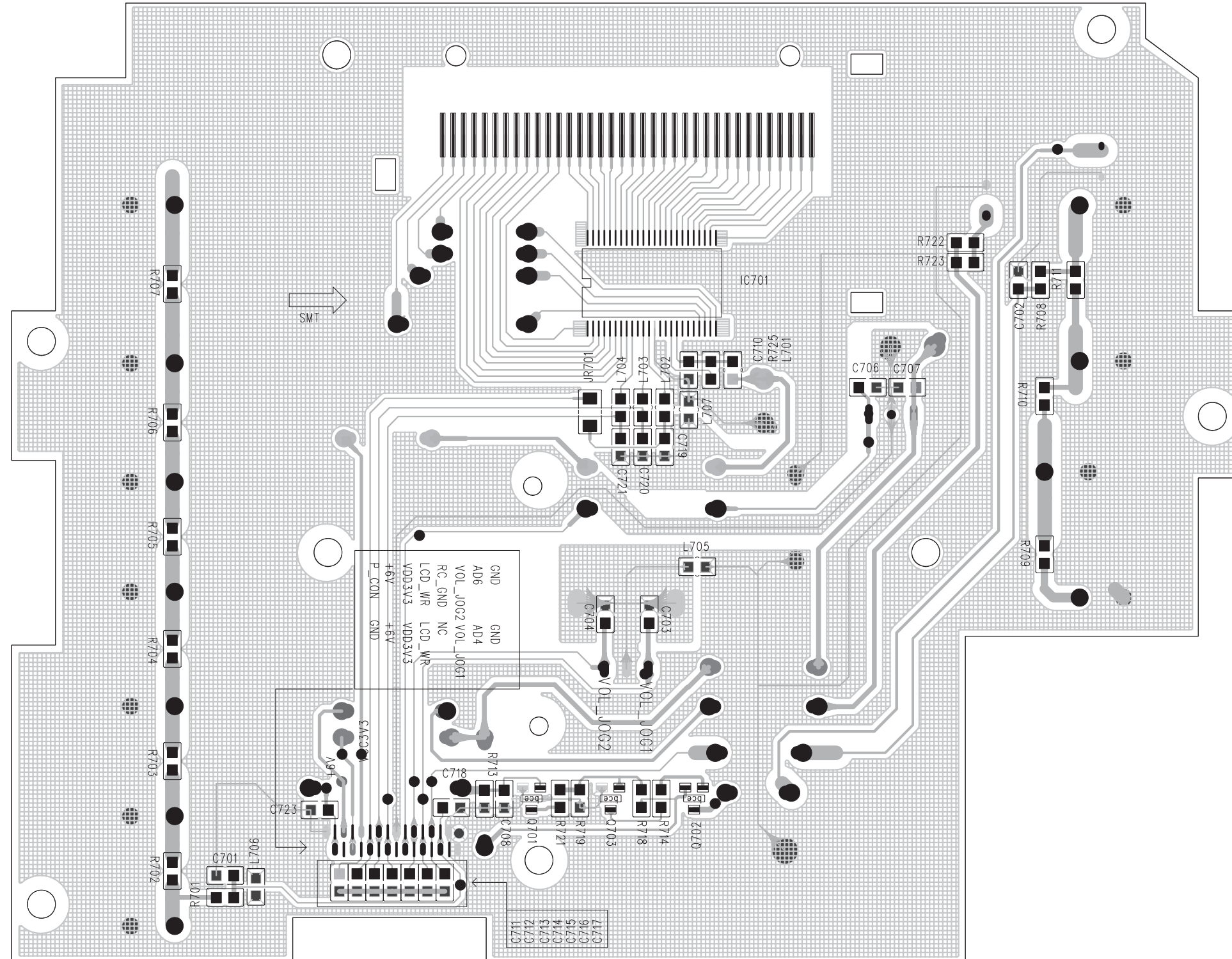
CIRCUIT DIAGRAM - MAIN BOARD DAB PART



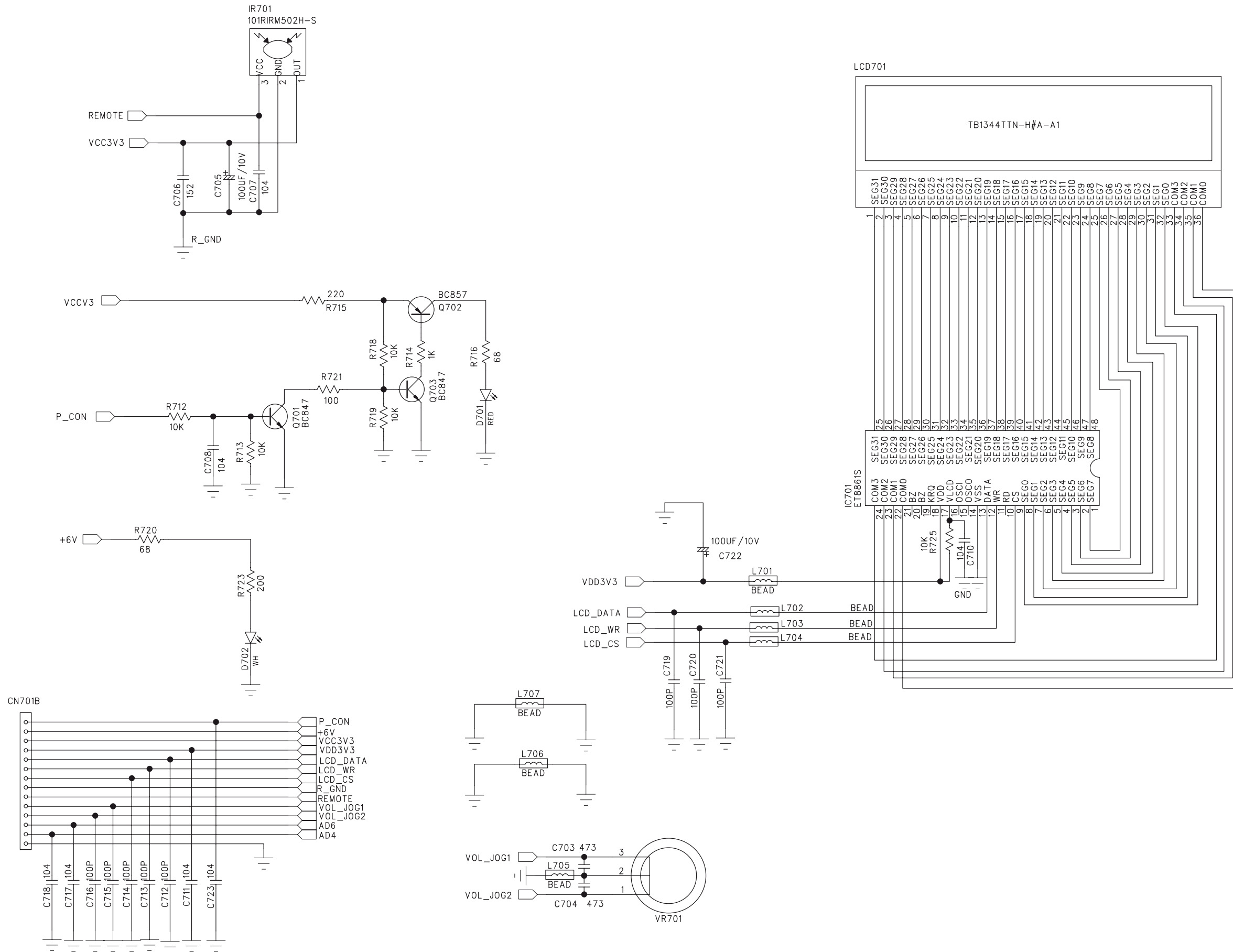
PCB LAYOUT - FRONT (LCD) BOARD (TOP VIEW)



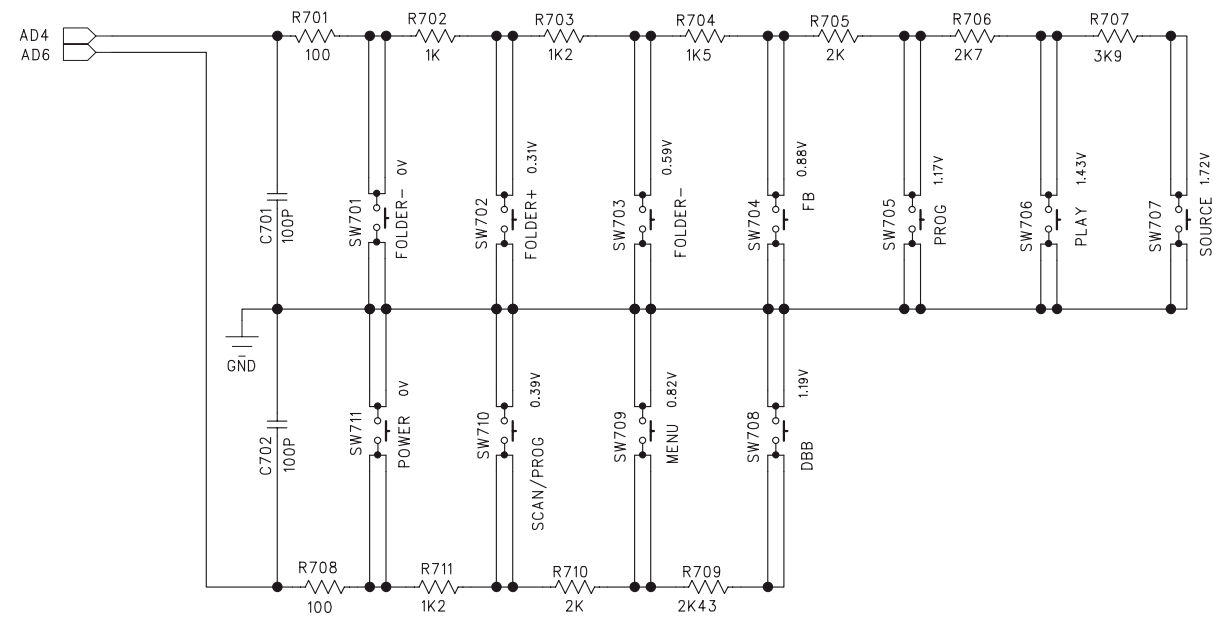
PCB LAYOUT - FRONT (LCD) BOARD (BOTTOM VIEW)



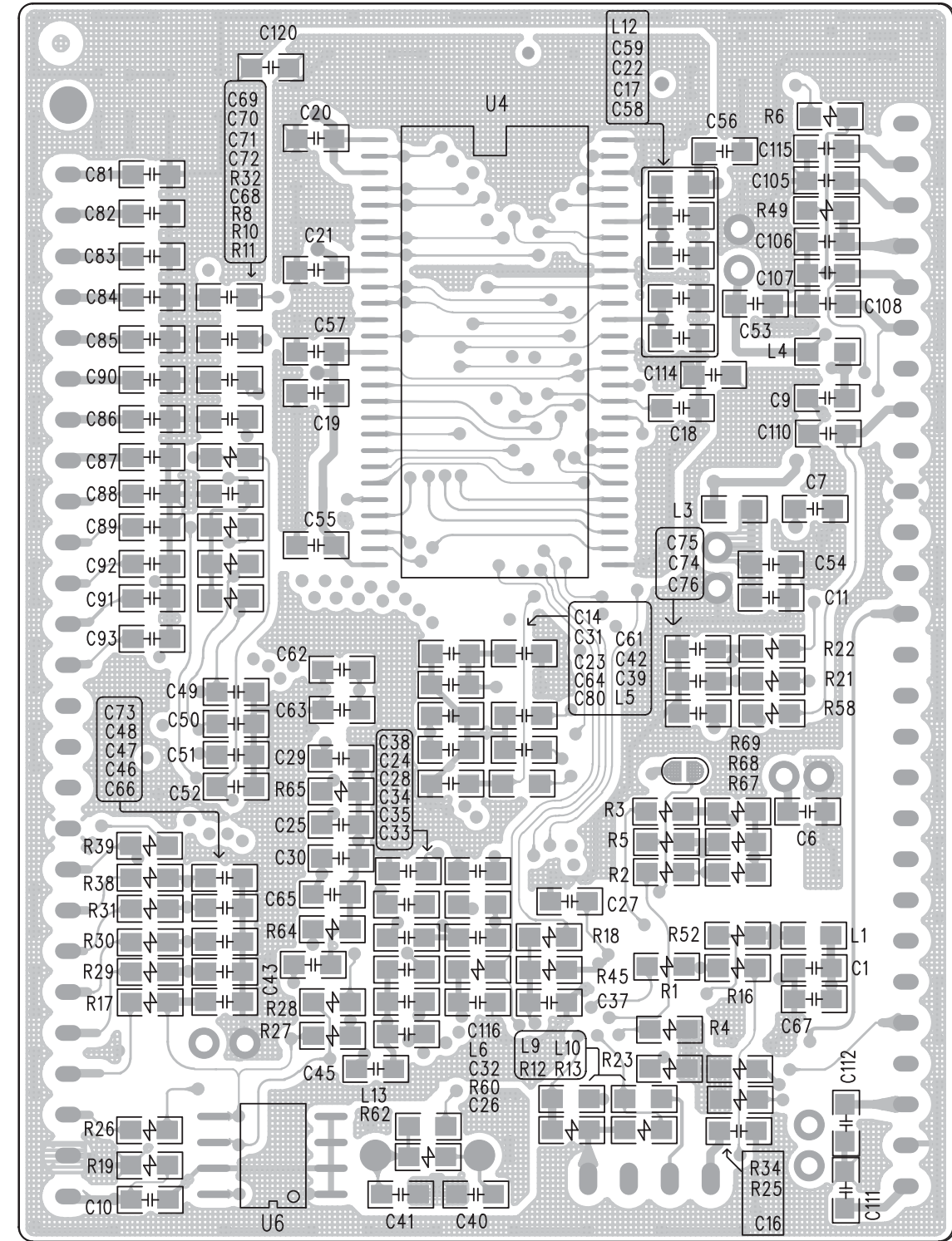
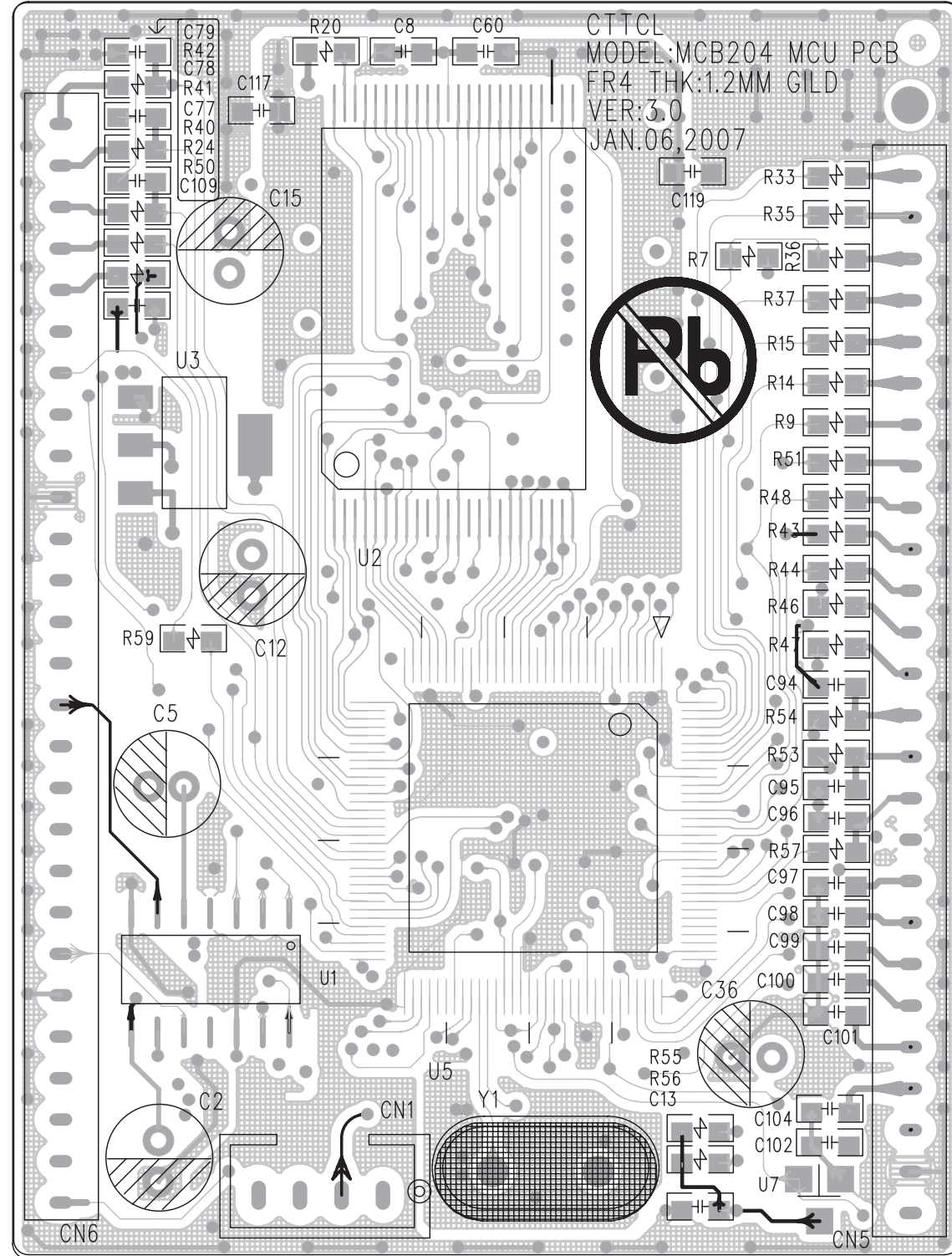
CIRCUIT DIAGRAM - FRONT (LCD) BOARD



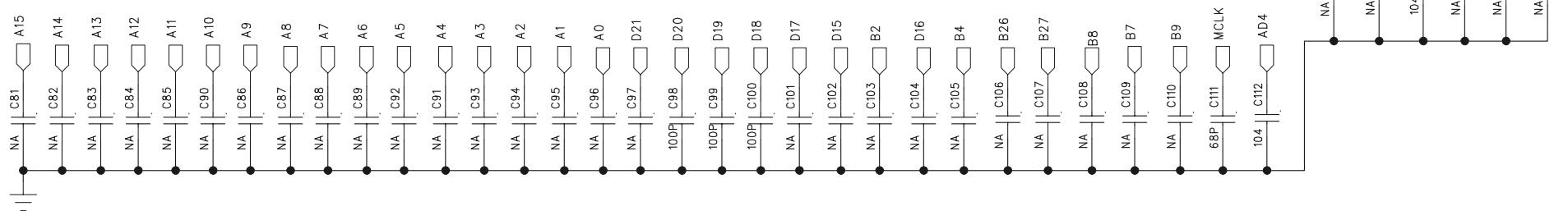
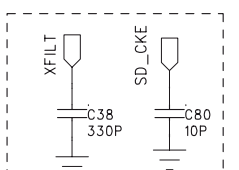
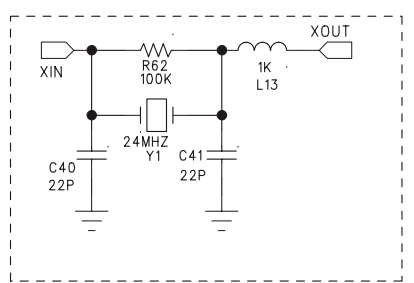
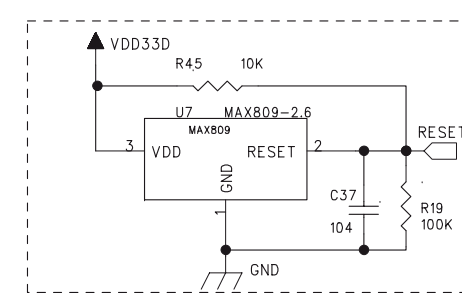
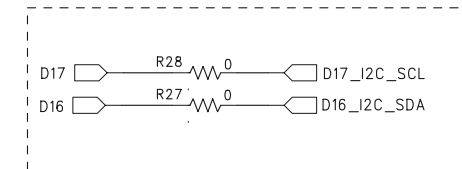
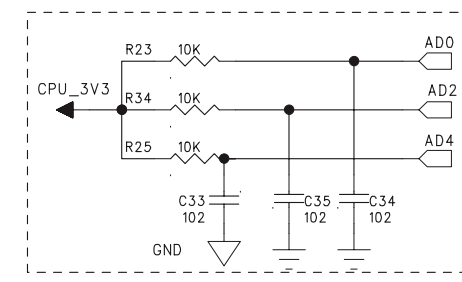
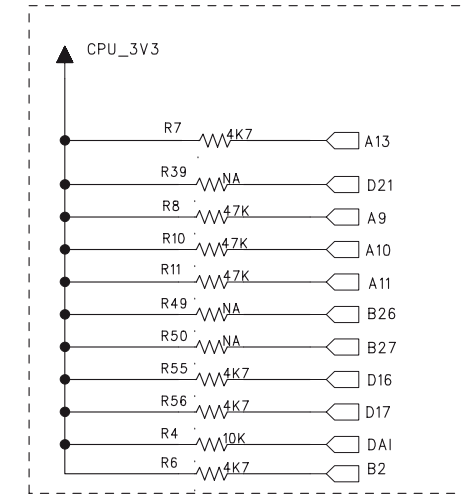
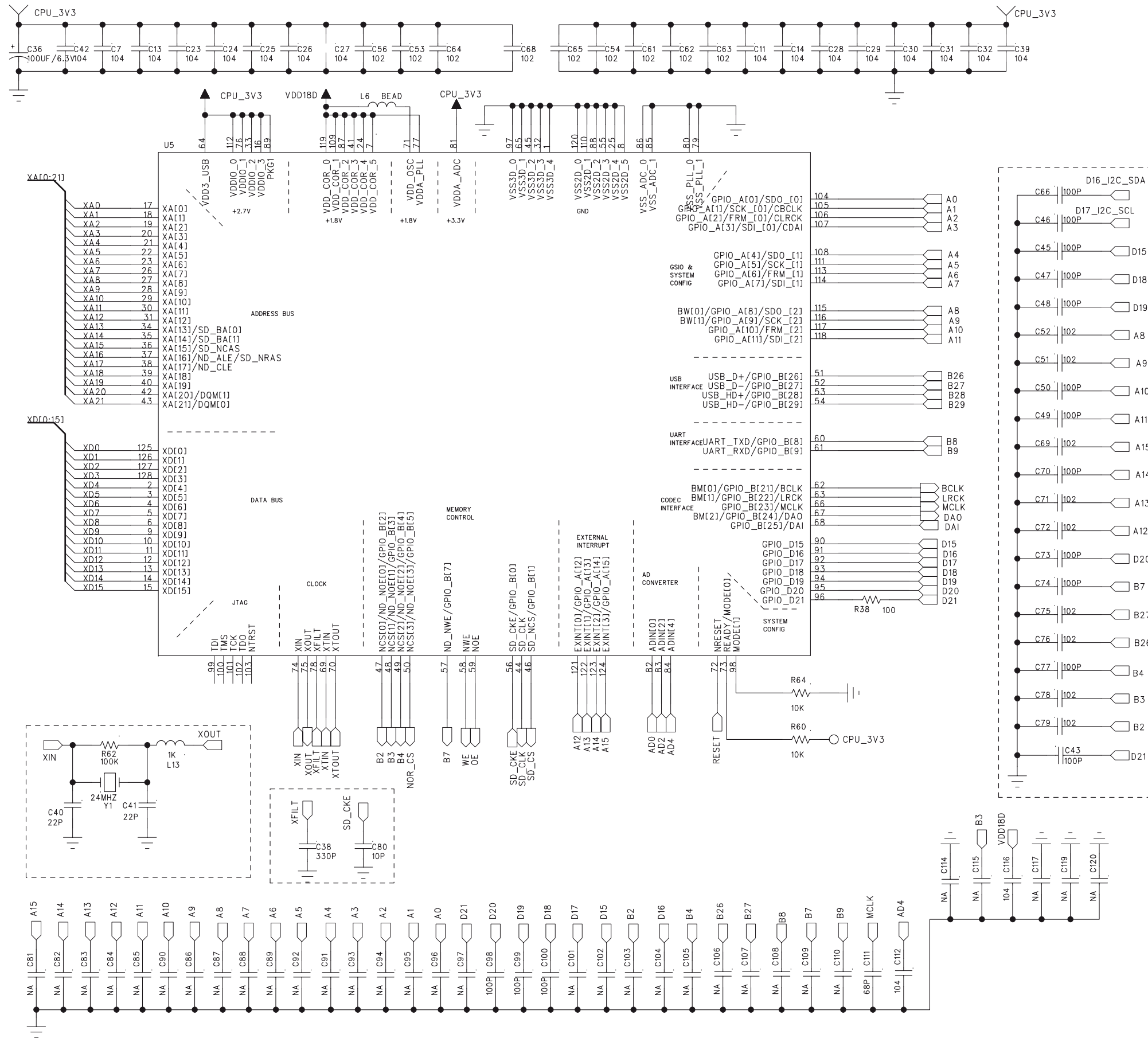
CIRCUIT DIAGRAM - FRONT (LCD) BOARD KEY PART



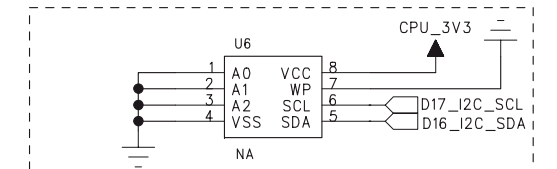
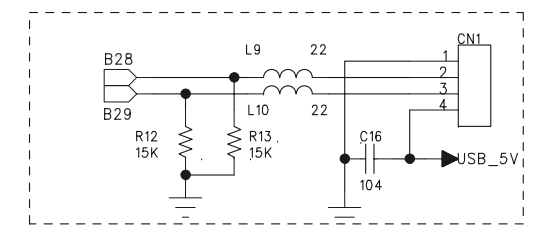
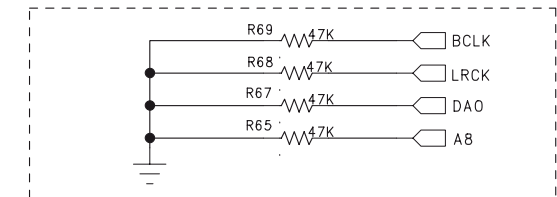
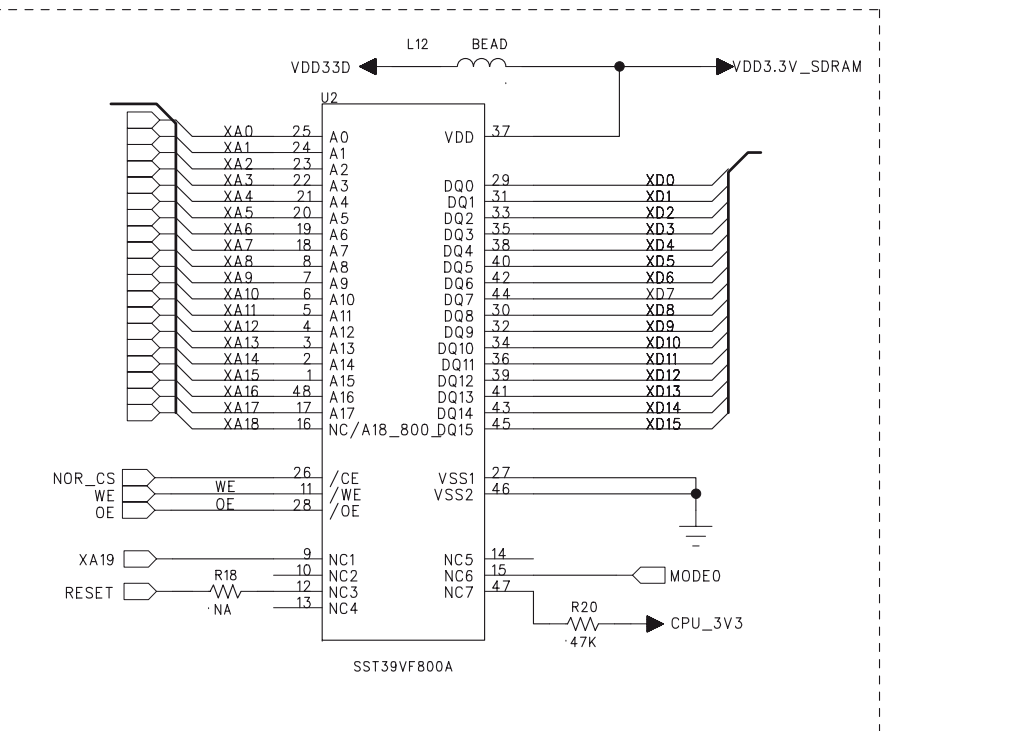
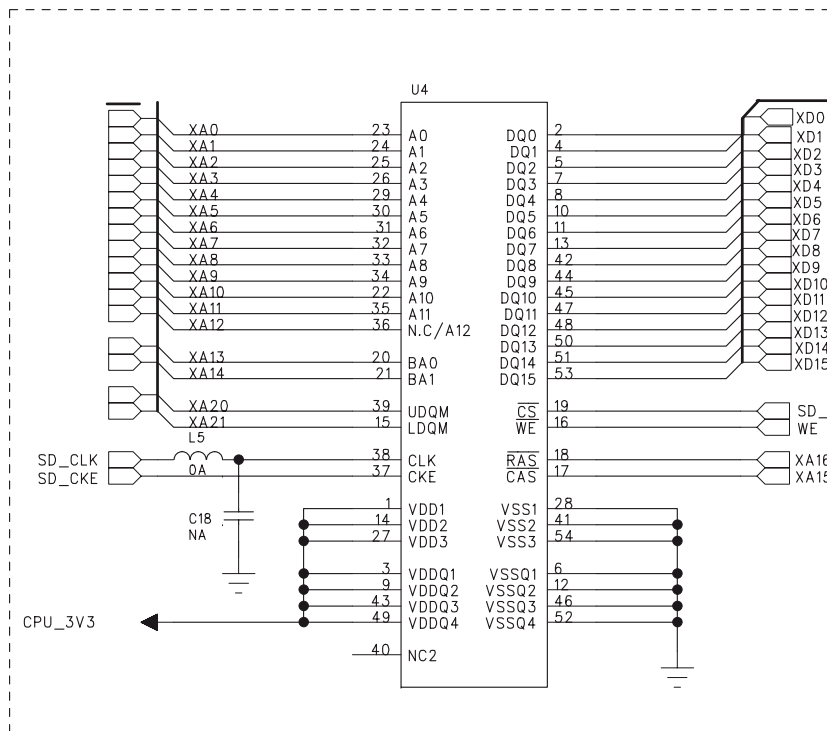
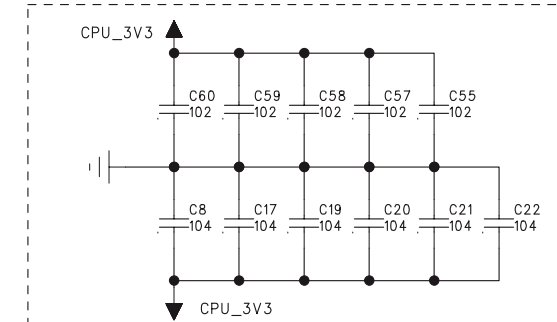
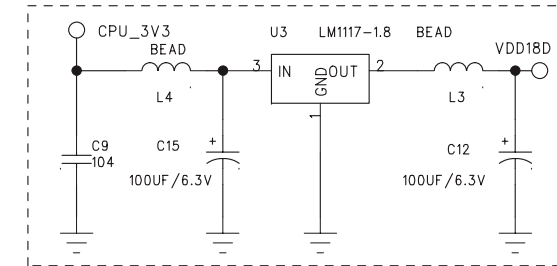
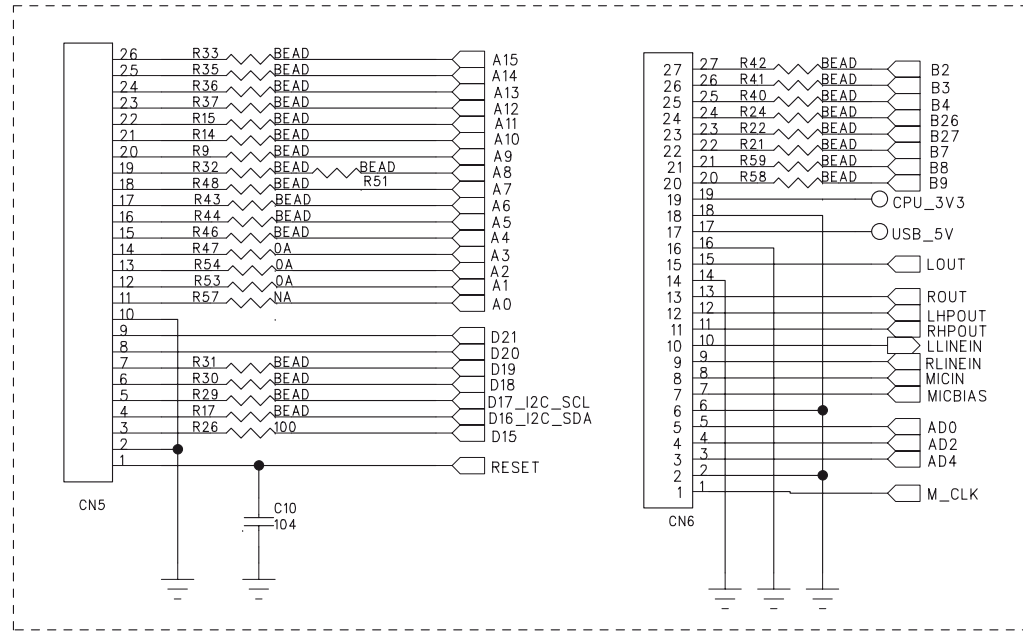
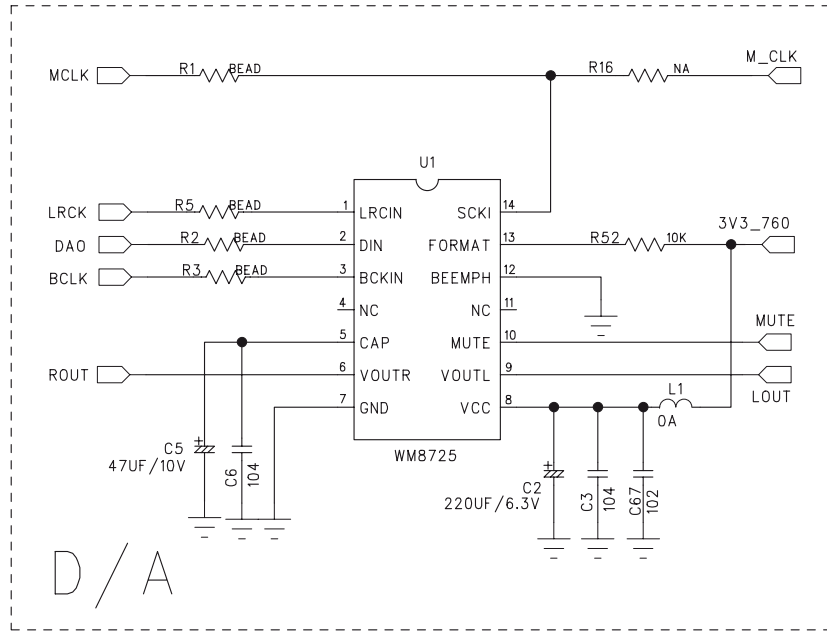
PCB LAYOUT - MCU BOARD



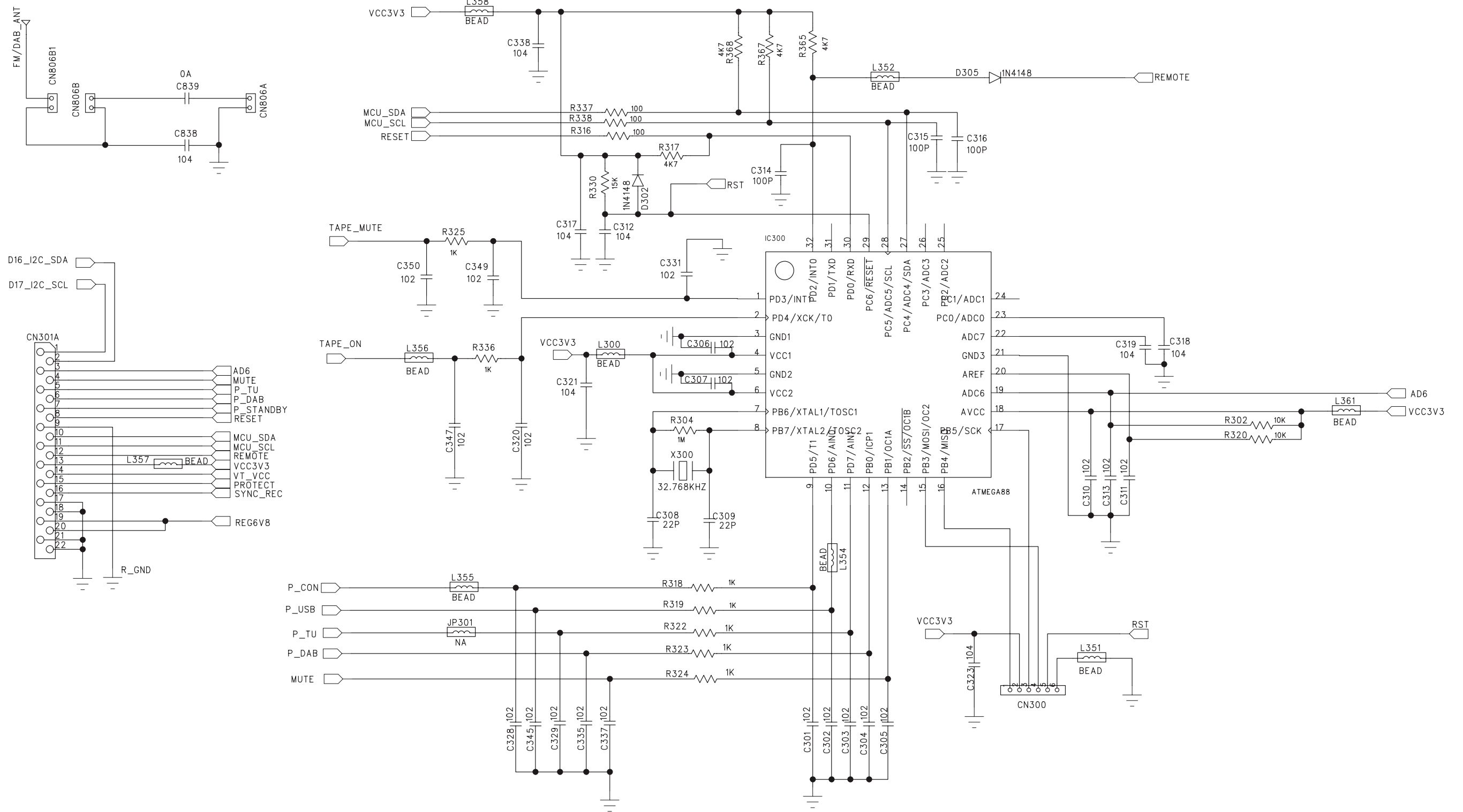
CIRCUIT DIAGRAM - MCU BOARD



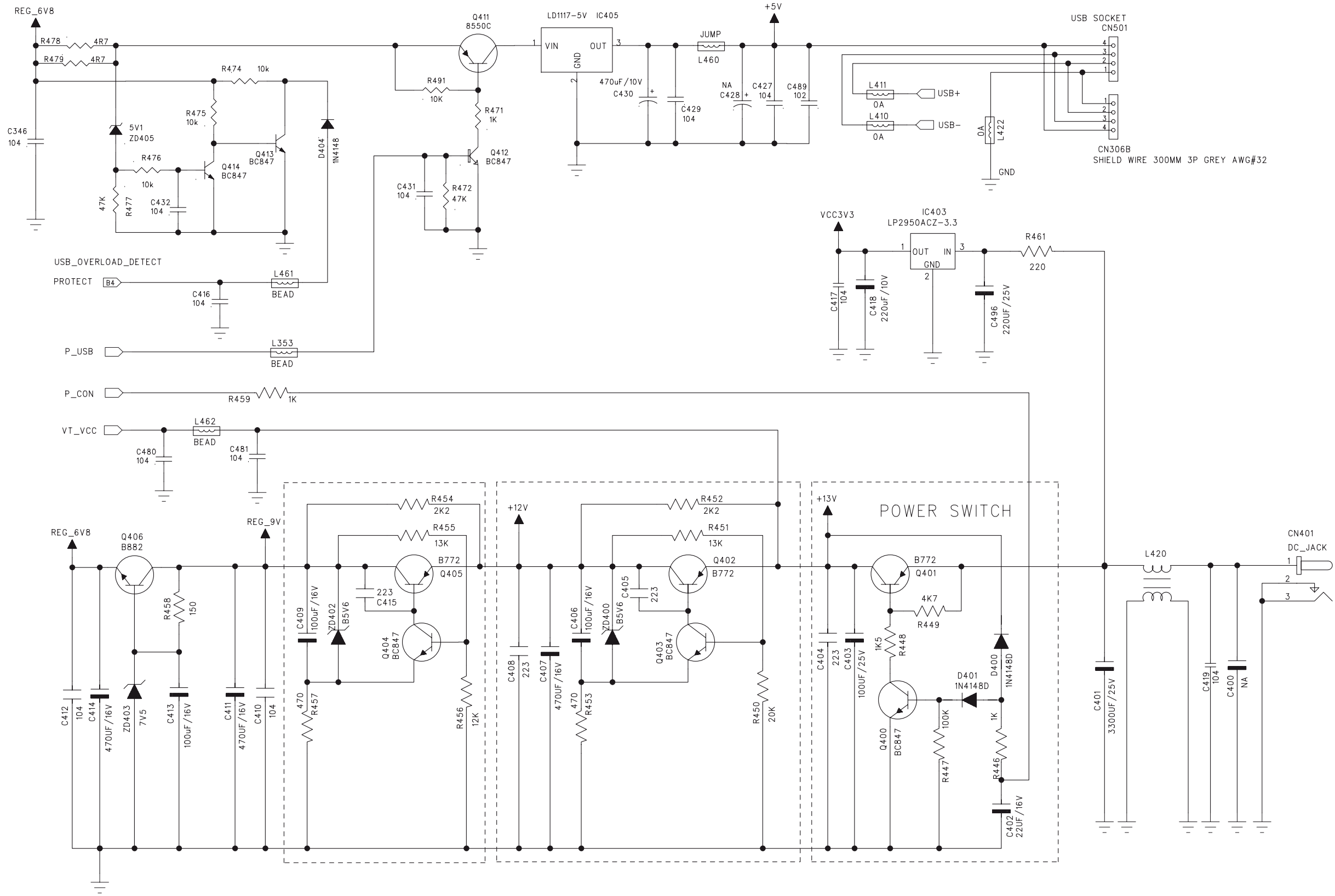
CIRCUIT DIAGRAM - MCU BOARD MEMORY PART



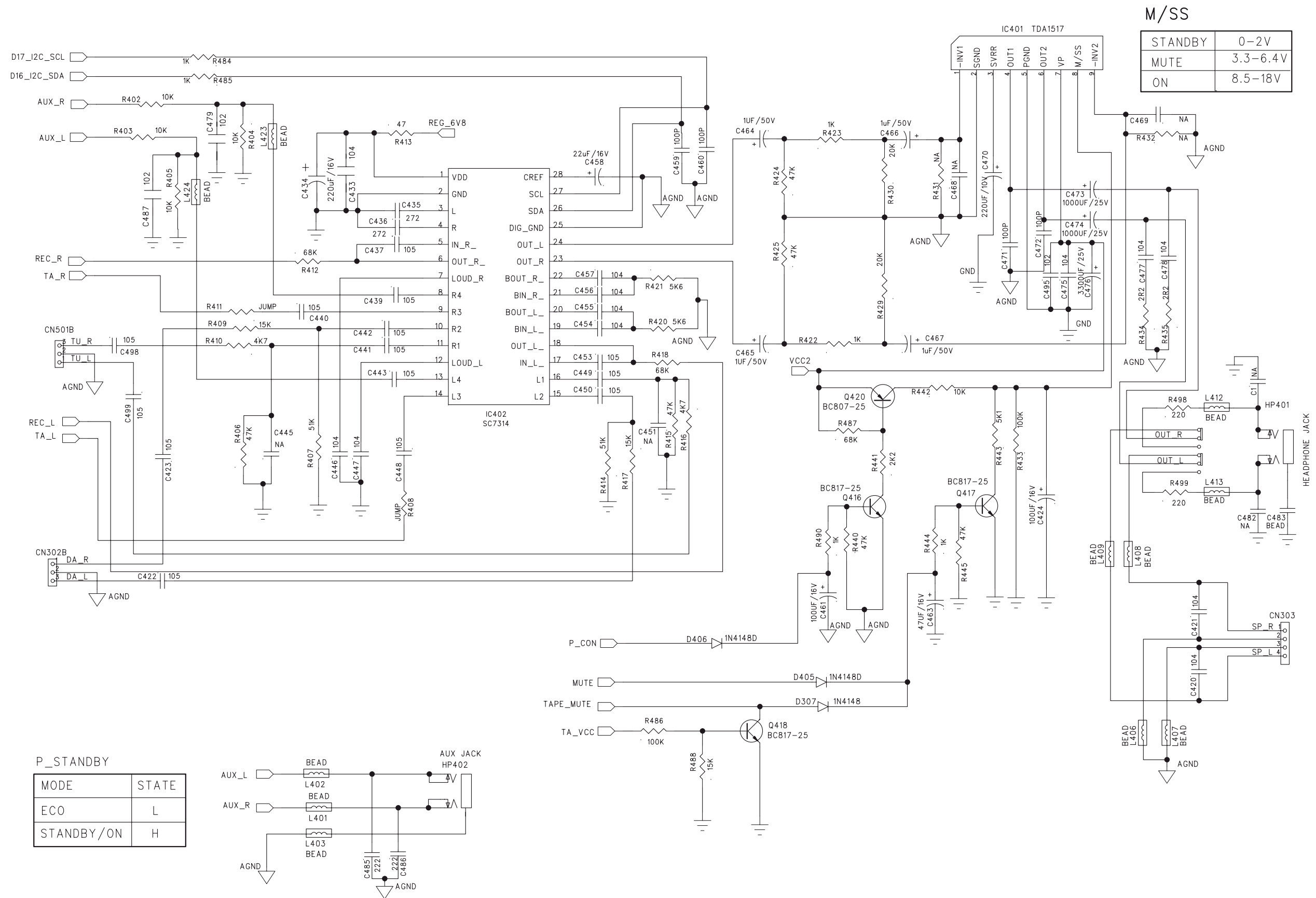
CIRCUIT DIAGRAM - MCU BOARD SUB PART



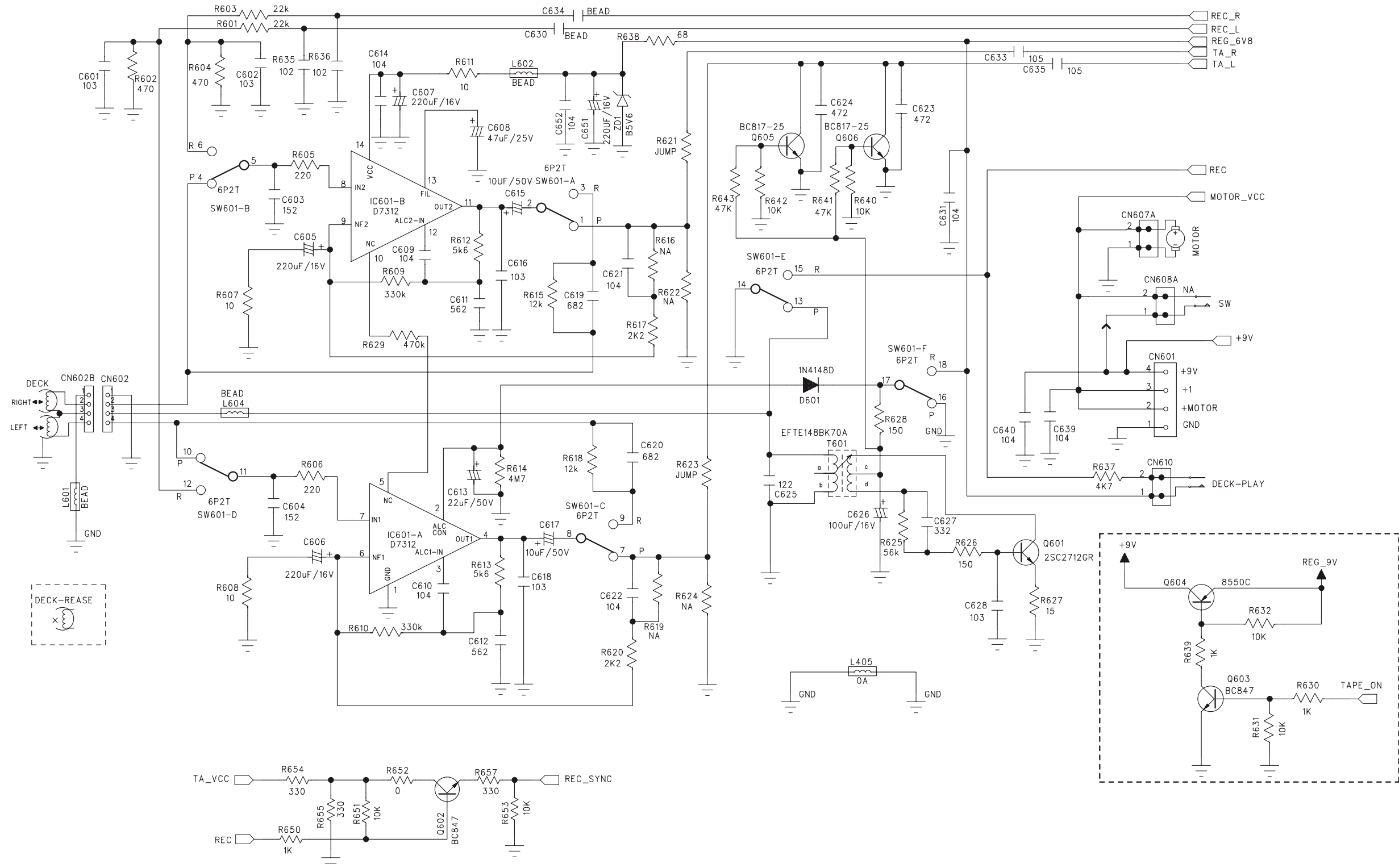
CIRCUIT DIAGRAM - POWER BOARD



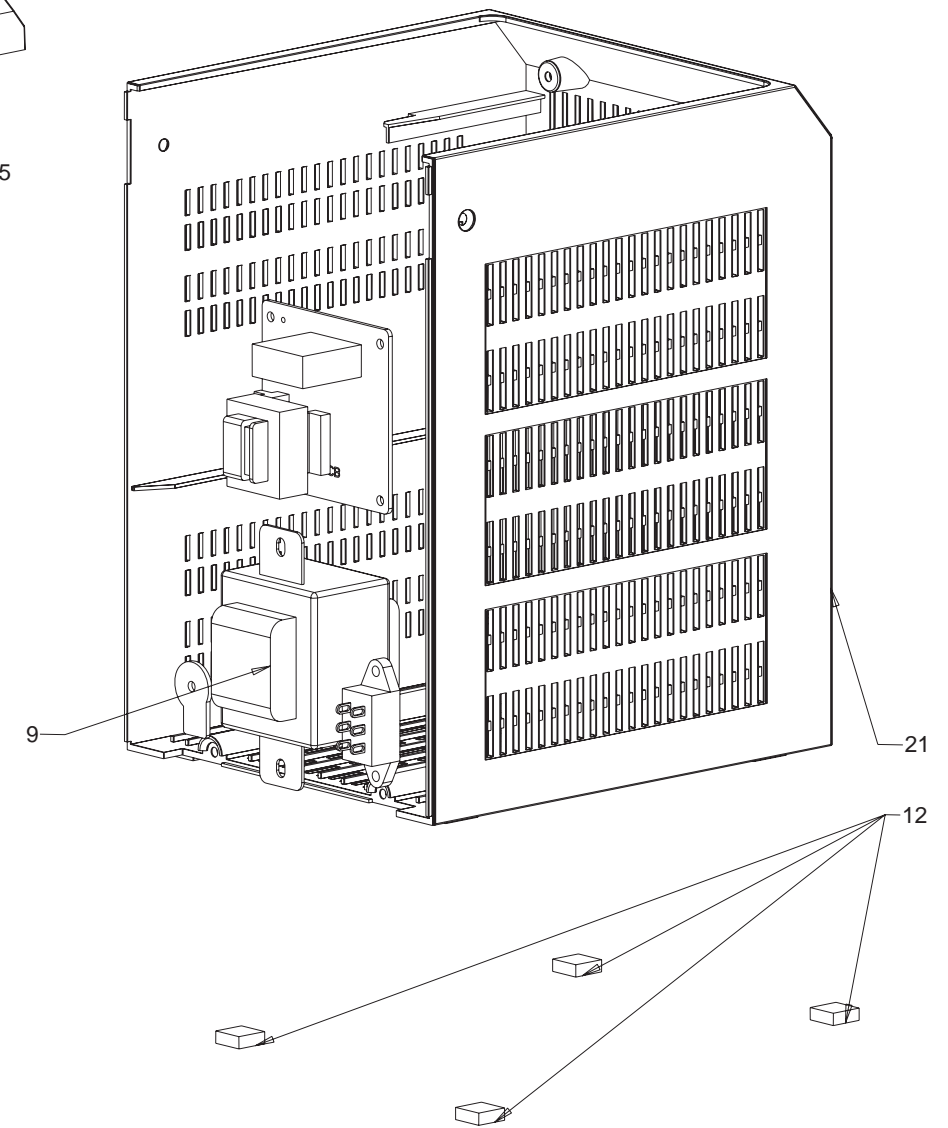
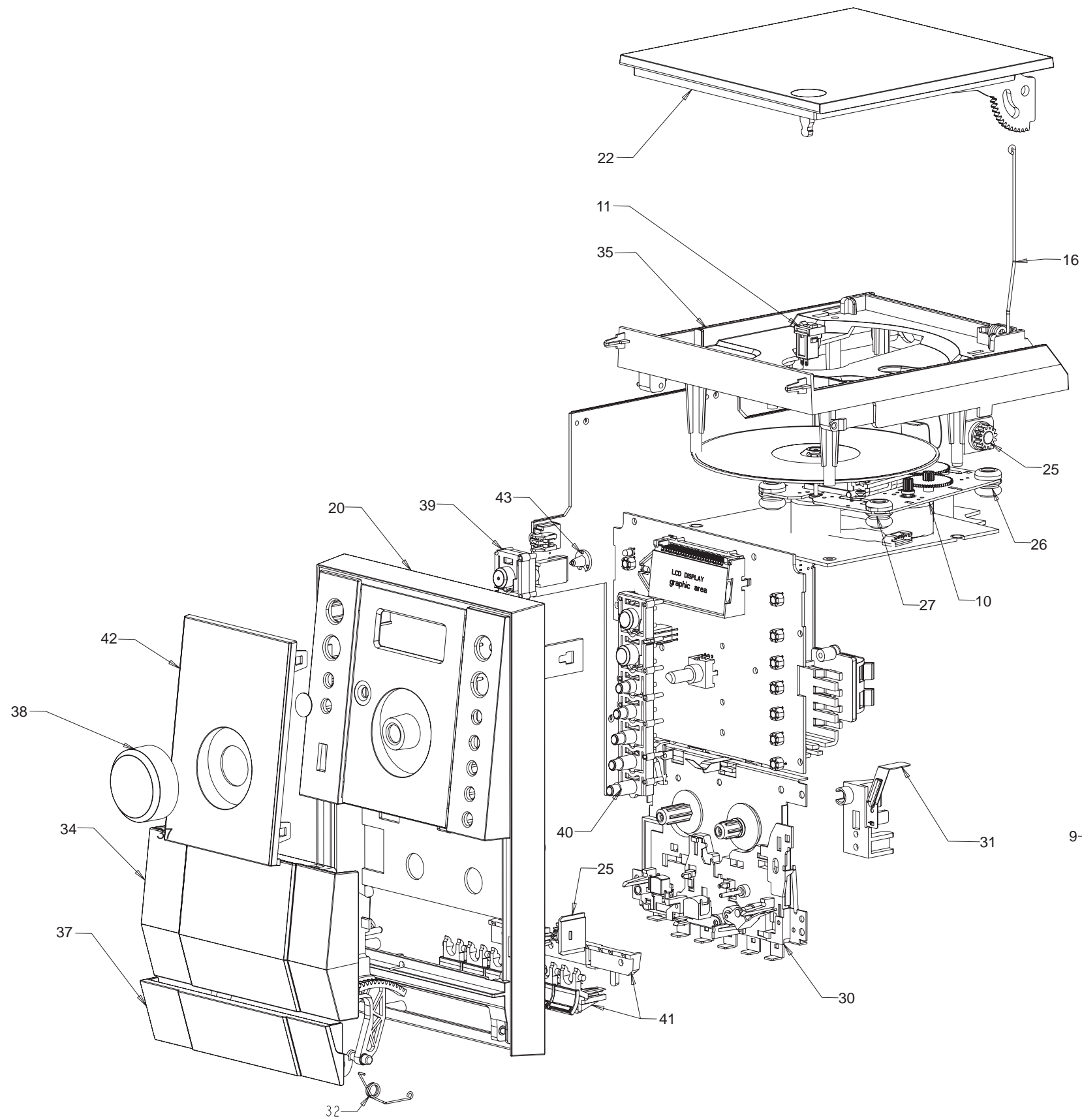
CIRCUIT DIAGRAM - POWER BOARD AUDIO PART



CIRCUIT DIAGRAM - POWER BOARD REC PART



SET MECHANICAL EXPLODED VIEW



MECHANICAL & ACCESSORIES PARTS LIST

10	994000003392	CD MECHANISM DA11B3VF (SANYO)
11	996510000933	CD DOOR SWITCH 1P2T
16	996510003744	CD DOOR SPRING
20	996510003745	FRONT CABINET
21	996510003746	REAR CABINET
22	996510003757	CD DOOR
25	994000001295	DAMPER GEAR ASS'Y
26	996510000397	CD DAMPER PINK COLOR 40DEG
27	994000005115	CD DAMPER BLACK 658PH
30	996510003764	CASS. DECK MECHANISM CT302A
31	996510003741	RECORD SPRING PLATE
32	996510003742	CASSETTE DOOR SPRING
34	996510003758	CASSETTE DOOR
35	996510003761	CD TRAY
37	996510003759	CASS KEY DOOR
38	996510003747	VOL KNOB
39	996510003748	POWER BUTTON
40	996510003749	CONTROL KEYS
41	996510003760	CASS KEY WITH HOLDER
42	996510003756	DISPLAY LENS
43	996510003762	POWER LIGHT GUIDE
ANT	996510003766	ANT WIRE ASSEMBLY L2500MM 2P
W2	996510002328	16P FFC CABLE 100MM P=1.0MM
W3	996510003765	22P FFC CABLE L140MM P1.25MM
W4	996510002328	16P FFC CABLE 100MM P=1.0MM
W5	996510003763	DUST COVER
W6	996510003767	WOODEN SPEAKER (LEFT+RIGHT)
W7	996510003768	REMOTE CONTROL
W8	△ 996510003769	SWITCHING POWER SUPPLY 13V1.4A
W9	996510003743	CASSETTE KEY DOOR SPRING

Note: Only these parts mentioned in the list are normal service parts.

ELECTRICAL PARTSLIST**MAIN BOARD**

CF501 996510003722 FM CER. DISCRIMINATOR J10.7C U1
 CF502 996510003723 FM CERAMIC FILTER LT10.7MS2 U2
 D304 996510003726 SCHOTTKYBARRIER DIODE PRLLE U3
 D306 996510003726 SCHOTTKYBARRIER DIODE PRLLE U4
 DAB500 996510003725 DAB TUNER MODULE U5

IC301 996510003731 I.C. V REGULATOR LD1117-3.3 U7
 IC500 996510003733 I.C. UTCLD1117/A 1.8V SOT-223 Y1
 IC501 996510003732 I.C. TB2132FNG
 IC502 994000003215 RDS IC SAA6581T
 IC503 996510003731 I.C. V REGULATOR LD1117-3.3

IC801 996510003730 I.C. SAA7824HL/M1A 557 C401
 IC802 994000005753 I.C. D9258PH C476
 L534 996510003728 BOBBIN COIL 2 1/2T CN303
 L535 996510003729 BOBBIN COIL 3 1/2T MD6B-03F44 CN401
 L536 996510003734 SPRING COIL 3.5X0.5X5 1/2T CN501

Q501 996510003718 TRANSISTOR KTC-8550C HP401
 Q510 996510003718 TRANSISTOR KTC-8550C HP402
 Q802 996510003718 TRANSISTOR KTC-8550C IC300
 Q803 996510003718 TRANSISTOR KTC-8550C IC401
 TC530 994000002418 TRIMMER CAP 220VDC 50%-0% IC402

VD533 996510003727 DIODE 1SV262 IC403
 VD534 996510003727 DIODE 1SV262 IC405
 X501 996510003724 CRYSTAL 75KHZ 20PF +/-20PPM IC601
 X502 994000003209 CRYSTAL 4.332MHZ HC-49/S L406
 X801 994000005742 CRYSTAL 8.4672 MHZ 20PF L407

FRONT BOARD

D701 994000005763 LED INDICATOR RED
 D702 996510001423 LED INDICATOR 3mm WHITE
 IC701 996510001064 IC ET8861S (FOR LCD DRIVER)
 IR701 994000005759 INFRARED RECEIVER IRM502H-S
 LCD701 996510003720 SEGMENT LCD DISPLAY

SW701 996510003721 TACT SWITCH TSJ-064301-250
 SW702 996510003721 TACT SWITCH TSJ-064301-250
 SW703 996510003721 TACT SWITCH TSJ-064301-250
 SW704 996510003721 TACT SWITCH TSJ-064301-250
 SW705 996510003721 TACT SWITCH TSJ-064301-250
 SW706 996510003721 TACT SWITCH TSJ-064301-250
 SW707 996510003721 TACT SWITCH TSJ-064301-250
 SW708 996510003721 TACT SWITCH TSJ-064301-250
 SW709 996510003721 TACT SWITCH TSJ-064301-250
 SW710 996510003721 TACT SWITCH TSJ-064301-250

SW711 996510003721 TACT SWITCH TSJ-064301-250
 VR701 996510003719 ROT. ENCODER

MCU BOARD

996510003740 I.C. WM8725ED 14-PIN SOIC
 996510003736 I.C. SST39VF800A-70-4C-EKE W/SV
 996510003733 I.C. UTCLD1117/A 1.8V SOT-223
 996510003737 I.C. HY57V641620ETP-7 64M SDRA
 996510003739 I.C. TCC760

996510003738 I.C. MAX809STR SOT-23
 996510003735 X'TAL 24.000MHZ 20PF +/-20PPM

POWER BOARD

994000003217 AL.E.CAP 3300UF 25V
 994000003217 AL.E.CAP 3300UF 25V
 996510000380 PUSH TERMINAL JACK PST-418
 996510001054 6.5MM DC JACK (DJ32-2)
 996510003842 USB CONNECTOR 4PINS

996510003840 3.5MM STEREO JACK
 996510003841 3.5MM AUX IN JACK
 996510003843 I.C. ATMEGA88-20AU TQFP W/SW
 996510003715 I.C. TDA1517 SOT110
 996510003846 I.C. SC7314 SELECTOR & E_VOL

996510003845 I.C. LP2950ACZ-3.3 TO-92
 996510003844 I.C. VOLTAGE REGULATOR
 996510001411 I.C.D7312/D7312CP
 996510000388 CHOKE COIL 8UH 3A1941N
 996510000388 CHOKE COIL 8UH 3A1941N

L408 996510000388 CHOKE COIL 8UH 3A1941N
 L409 996510000388 CHOKE COIL 8UH 3A1941N
 L420 994000003226 AC LINE FILTER 400UH -30%
 Q401 996510001414 TRANSISTOR KTB772
 Q402 996510001414 TRANSISTOR KTB772

Q405 996510001414 TRANSISTOR KTB772
 Q406 996510003717 TRANSISTOR KTD882 (KEC)
 Q411 996510003718 TRANSISTOR KTC-8550C
 Q601 996510003716 TRANSISTOR 2SC2712GR
 Q604 996510003718 TRANSISTOR KTC-8550C

SW601 994000002397 REC SWITCH 6P2T
 T601 996510001408 AM OSC BLACK
 X300 996510003839 CRYSTAL 32.768KHZ 12.5PF

Note: Only these parts mentioned in the list are normal service parts.