

Service  
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# Service Manual

## TABLE OF CONTENTS

|  | Page       |
|--|------------|
| Location of PCBs.....                          | 1-2        |
| Specifications .....                           | 1-3        |
| Measurement Setup .....                        | 1-4        |
| Service Aids, Safety Instruction, etc .....    | 1-5        |
| CD Playability Check.....                      | 1-6 to 1-7 |
| Software Version Checking .....                | 2          |
| Set Wiring & Block Diagram .....               | 3          |
| Audio AMP Board .....                          | 4          |
| MCU & USB & Headphone Boards .....             | 5          |
| Touch Panel & VFD & Power Key Boards.....      | 6          |
| Set Mechanical Exploded View & Parts List..... | 7          |
| Revision List .....                            | 8          |



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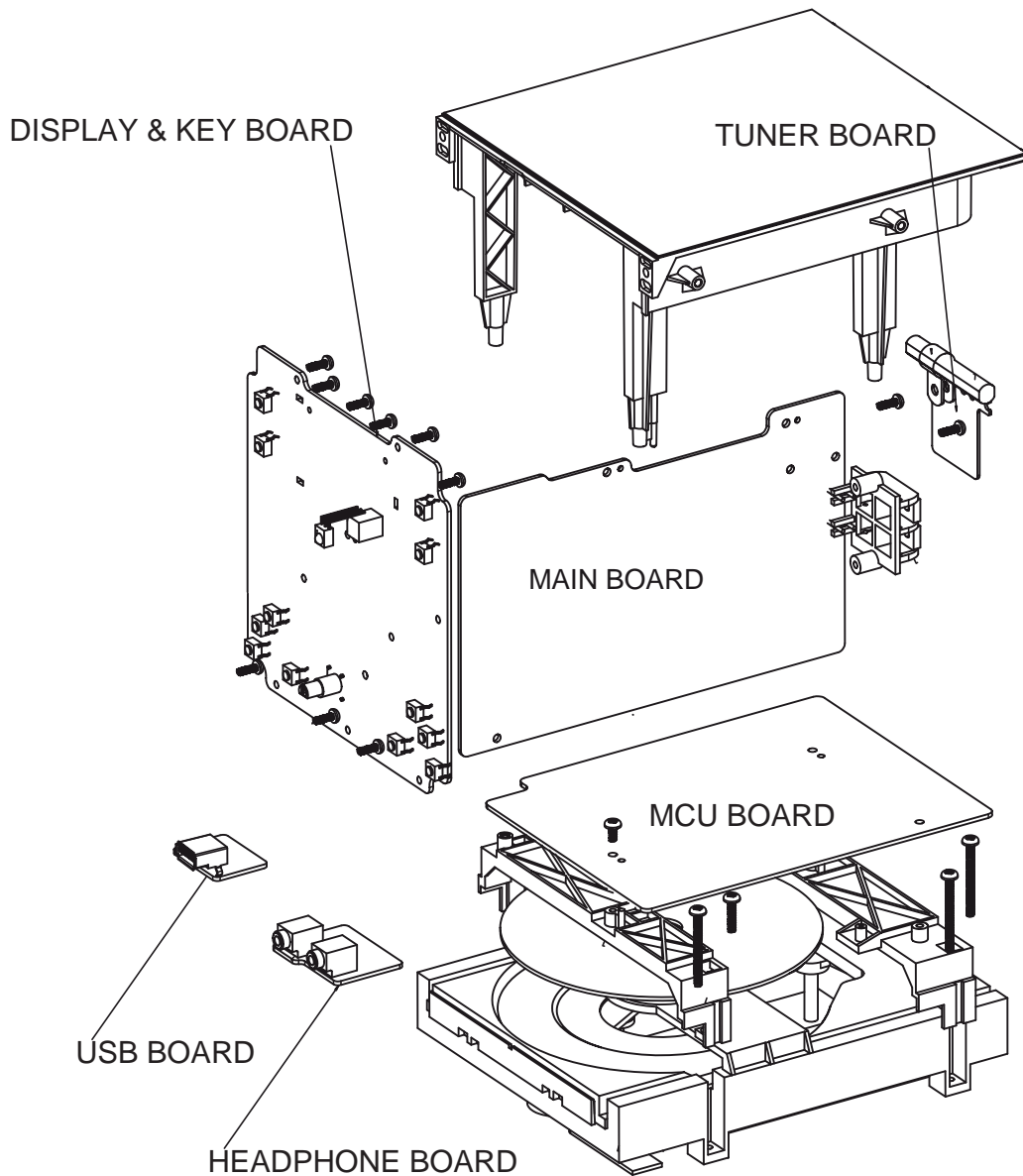


Version 1.0



# PHILIPS

# PCBS LOCATION



## VERSION VARIATIONS

| Board in used:      | Type /Versions: | MCM205 |     |     |     |     |     |  |  |     |
|---------------------|-----------------|--------|-----|-----|-----|-----|-----|--|--|-----|
|                     | Service policy  | /12    | /05 | /37 | /55 | /58 | /61 |  |  | /98 |
| MAIN BOARD          |                 | C      |     |     |     |     |     |  |  |     |
| MCU BOARD           |                 | C/M    |     |     |     |     |     |  |  |     |
| USB JACK BOARD      |                 | C      |     |     |     |     |     |  |  |     |
| DISPLAY & KEY BOARD |                 | C      |     |     |     |     |     |  |  |     |
| TUNER BOARD         |                 | M      |     |     |     |     |     |  |  |     |
| HEADPHONE BOARD     |                 | C      |     |     |     |     |     |  |  |     |
|                     |                 |        |     |     |     |     |     |  |  |     |
|                     |                 |        |     |     |     |     |     |  |  |     |

\* TIPS : C -- Component Lever Repair.  
 M -- Module Lever Repair  
 x -- Used

# Specifications

## Amplifier

|                       |                           |
|-----------------------|---------------------------|
| Rated Output Power    | 4X50W RMS                 |
| Frequency Response    | 63 - 14000 Hz, $\pm 3$ dB |
| Signal to Noise Ratio | >62dB                     |

## Disc

|                           |                                    |
|---------------------------|------------------------------------|
| Laser Type                | Semiconductor                      |
| Disc Diameter             | 12cm/8cm                           |
| Support Disc              | CD-DA, CD-R, CD-RW, MP3-CD, WMA-CD |
| Audio DAC                 | 24Bits / 44.1kHz                   |
| Total Harmonic Distortion | <1%                                |
| Frequency Response        | 20Hz - 14kHz                       |
| S/N Ratio                 | >65dB                              |

## Tuner (FM)

|                           |                                |
|---------------------------|--------------------------------|
| Tuning Range              | 87.5 - 108 MHz                 |
| Tuning grid               | 50 KHz                         |
| Sensitivity               | - Mono, 26dB S/N Ratio <22 dBu |
| Search Selectivity        | <28 dBu                        |
| Total Harmonic Distortion | <3%                            |
| Signal to Noise Ratio     | >45 dB                         |

## Speakers

|                   |      |
|-------------------|------|
| Speaker Impedance | 6ohm |
|-------------------|------|

## General information

|                               |                   |
|-------------------------------|-------------------|
| AC power                      | 220 - 230V, 50Hz  |
| Operation Power Consumption   | 42W               |
| Standby Power Consumption     | <20W              |
| Eco Standby Power Consumption | <0.8W             |
| Dimensions                    |                   |
| - Main Unit (W x H x D)       | 173 x 257 x 240mm |
| - Speaker Box (W x H x D)     | 173 x 257 x 240mm |
| Weight                        |                   |
| - With Packing                | 10.8 kg           |
| - Main Unit                   | 2.3 kg            |
| - Speaker Box                 | 2 x 2.8 kg        |

## USB playability information

### Compatible USB devices:

- USB flash memory (USB 2.0 or USB1.1)
- USB flash players (USB 2.0 or USB1.1)
- memory cards (requires an additional card reader to work with this MCM355)

### Supported formats:

- USB or memory file format FAT12, FAT16, FAT32 (sector size: 512 bytes)
- MP3 bit rate (data rate): 32-320 Kbps and variable bit rate
- WMA v9 or earlier
- Directory nesting up to a maximum of 8 levels
- Number of albums/ folders: maximum 99
- Number of tracks/titles: maximum 999
- ID3 tag v2.0 or later
- File name in Unicode UTF8 (maximum length: 128 bytes)

### Unsupported formats:

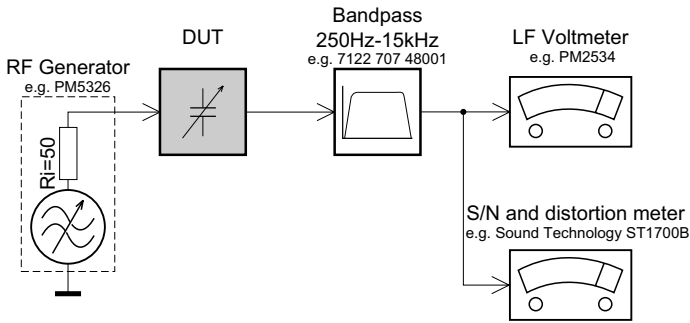
- Empty albums: an empty album is an album that does not contain MP3/ WMA files, and is not be shown in the display.
- Unsupported file formats are skipped. For example, Word documents (.doc) or MP3 files with extension .dlf are ignored and not played.
- AAC, WAV, PCM audio files
- DRM protected WMA files (.wav, .m4a, .m4p, .mp4, .aac)
- WMA files in Lossless format

## Supported MP3 disc formats

- ISO9660, Joliet
- Maximum title number: 512 (depending on file name length)
- Maximum album number: 255
- Supported sampling frequencies: 32 kHz, 44.1kHz, 48 kHz
- Supported Bit-rates: 32~256 (kbps), variable bit rates

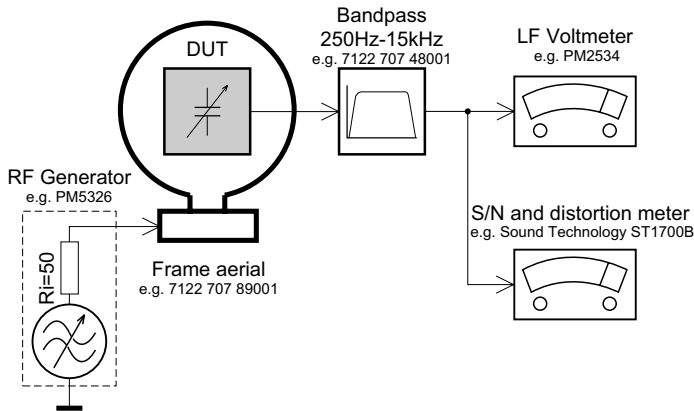
## MEASUREMENT SETUP

### Tuner FM



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

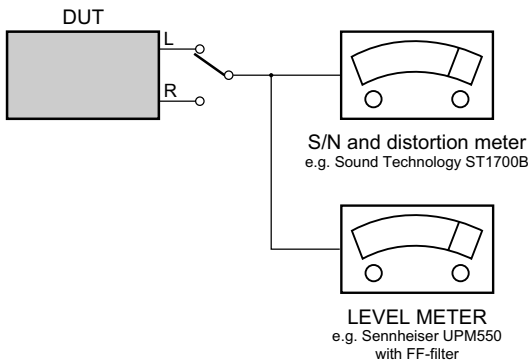
### Tuner AM (MW,LW)



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)



## SERVICE AIDS

### **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



### **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 .

**CLASS 1  
LASER PRODUCT**

## 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:



- On our website [www.atyourservice.ce.Philips.com](http://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
  - \* Lead free

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

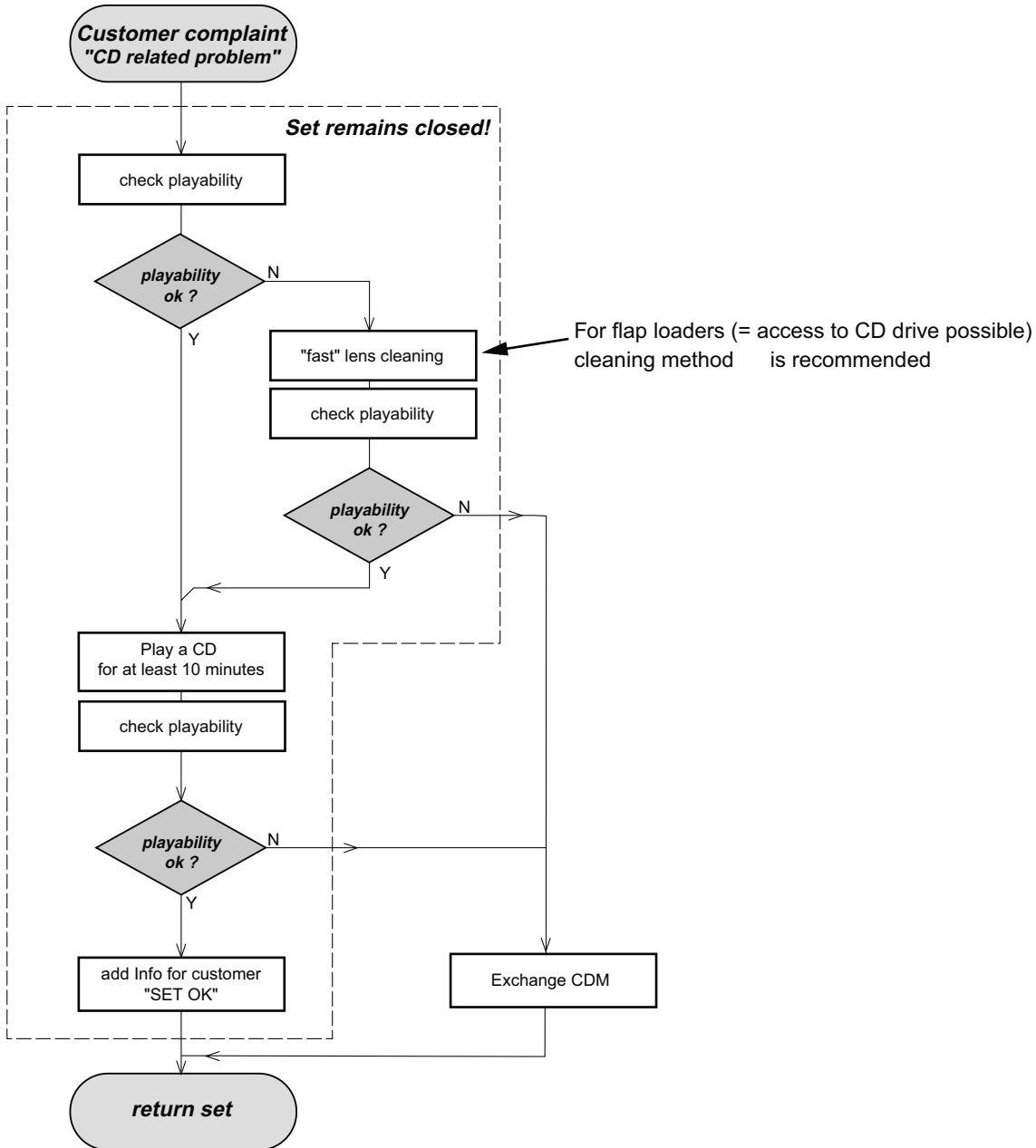
For additional questions please contact your local repair-helpdesk.

## 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.

# INSTRUCTIONS ON CD PLAYABILITY



- For description - see following pages

## INSTRUCTIONS ON CD PLAYABILITY

### PLAYABILITY CHECK

For sets which are compatible with **CD-RW** discs  
 use CD-RW Printed Audio Disc.....7104 099 96611  
 TR 3 (Fingerprint)  
 TR 8 (600µ Black dot) **maximum at 01:00**

- playback of these two tracks without audible disturbance  
 playing time for: Fingerprint  $\geq 10$ seconds  
 Black dot from 00:50 to 01:10
- jump forward/backward (search) within a reasonable time

For all other sets  
 use CD-DA SBC 444A.....4822 397 30245  
 TR 14 (600µ Black dot) **maximum at 01:15**  
 TR 19 (Fingerprint)  
 TR 10 (1000µ wedge)

- playback of all these tracks without audible disturbance  
 playing time for: 1000µ wedge  $\geq 10$ seconds  
 Fingerprint  $\geq 10$ seconds  
 Black dot from 01:05 to 01:25
- jump forward/backward (search) within a reasonable time

### CUSTOMER INFORMATION

It is proposed to add an addendum sheet to the set which informs the customer that the set has been checked carefully - but no fault was found.

The problem was obviously caused by a scratched, dirty or copy-protected CD. In case problems remain, the customer is requested to contact the workshop directly.

The lens cleaning (method ) should be mentioned in the addendum sheet.

The final wording in national language as well as the printing is under responsibility of the Regional Service Organizations.

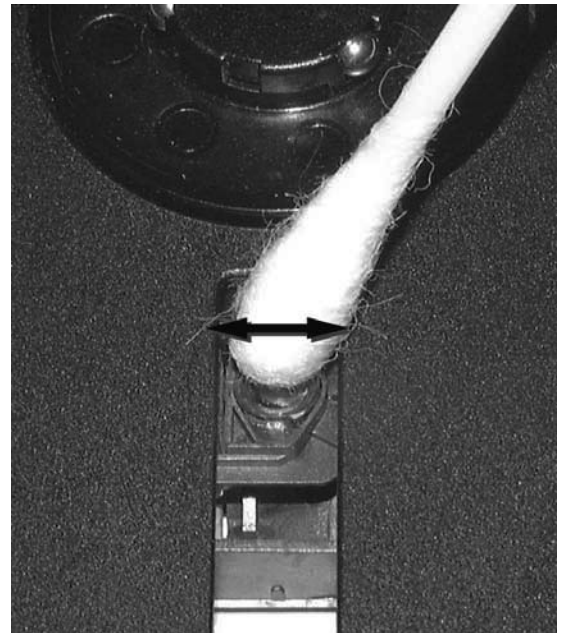
### LIQUID LENS CLEANING

**Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it. This to avoid that little particles make scratches on the lens.**

Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use "Cleaning Solvent

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. Clean the lens gently (don't press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

The direction of cleaning must be in the way as indicated in the picture below.



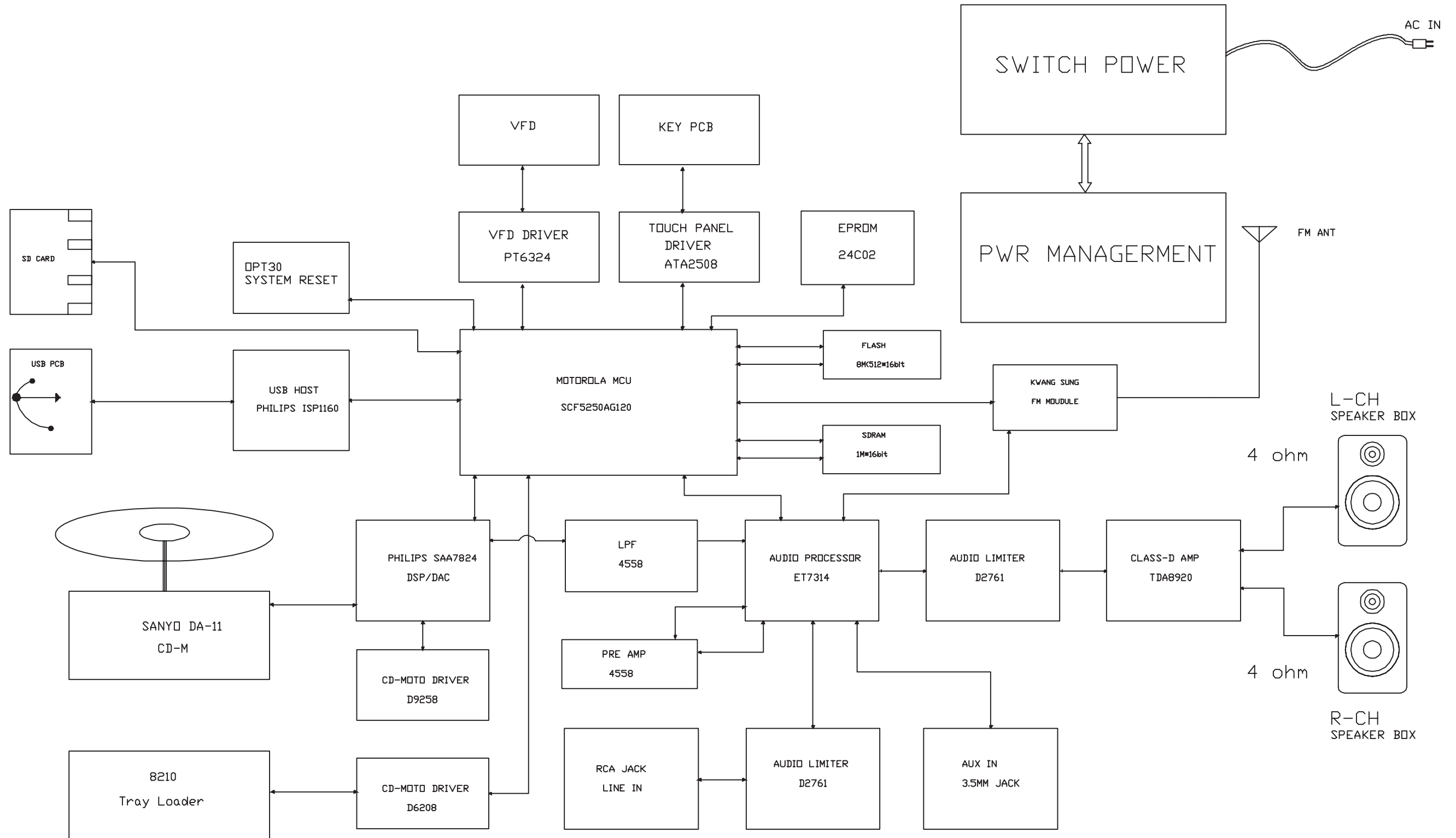
## SERVICE TEST PROGRAM

How to read software version,

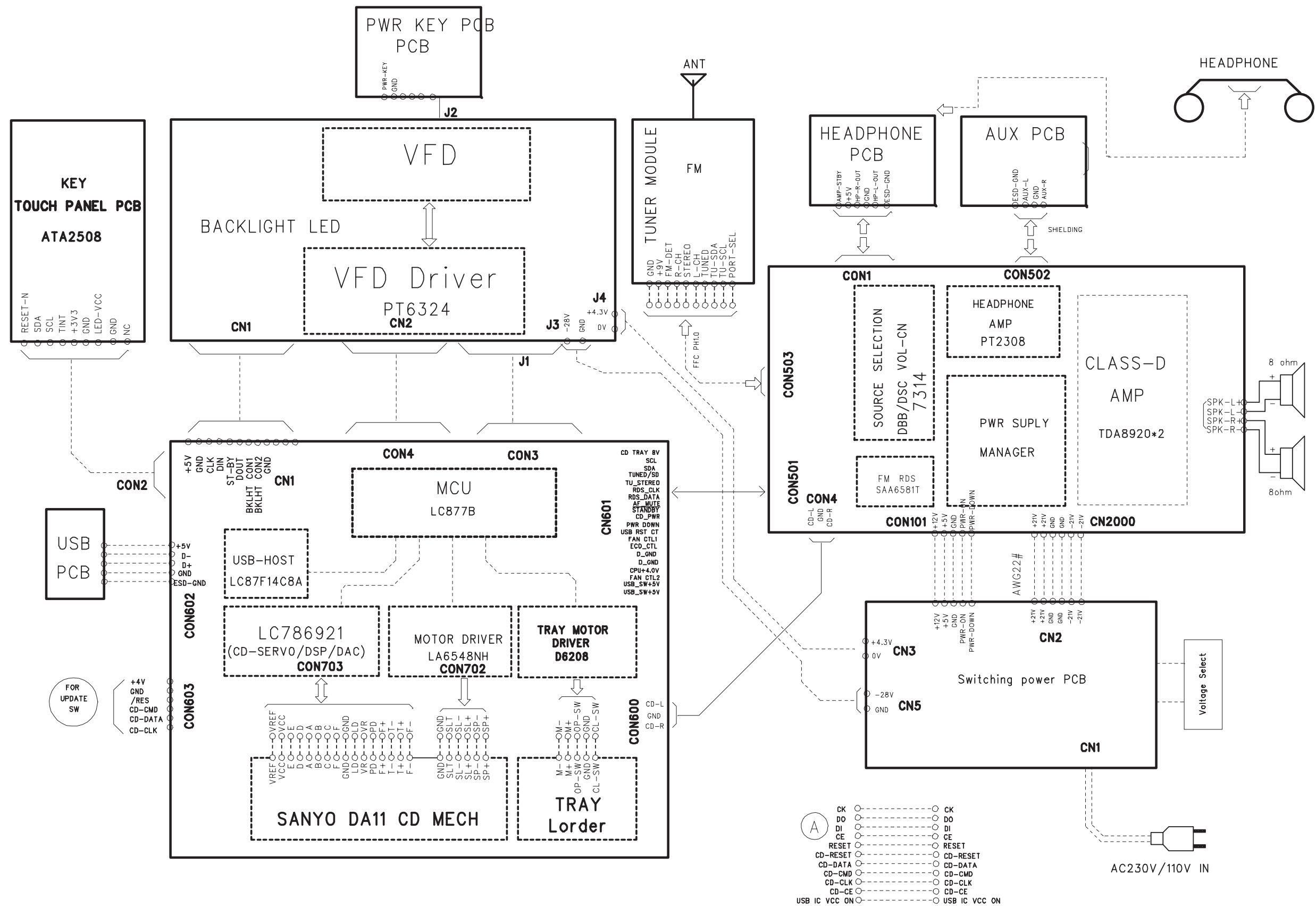
1. Standby mode, press and hold PLAY button for 5 seconds,  
LCD Display shows existing MCU software version, eg. "V300313".
2. No USB status, press and hold POWER and SOURCE buttons for 3 seconds,  
LCD Display shows existing USB software version, eg. "V0022".



# SET BLOCK DIAGRAM



# SET WIRING DIAGRAM



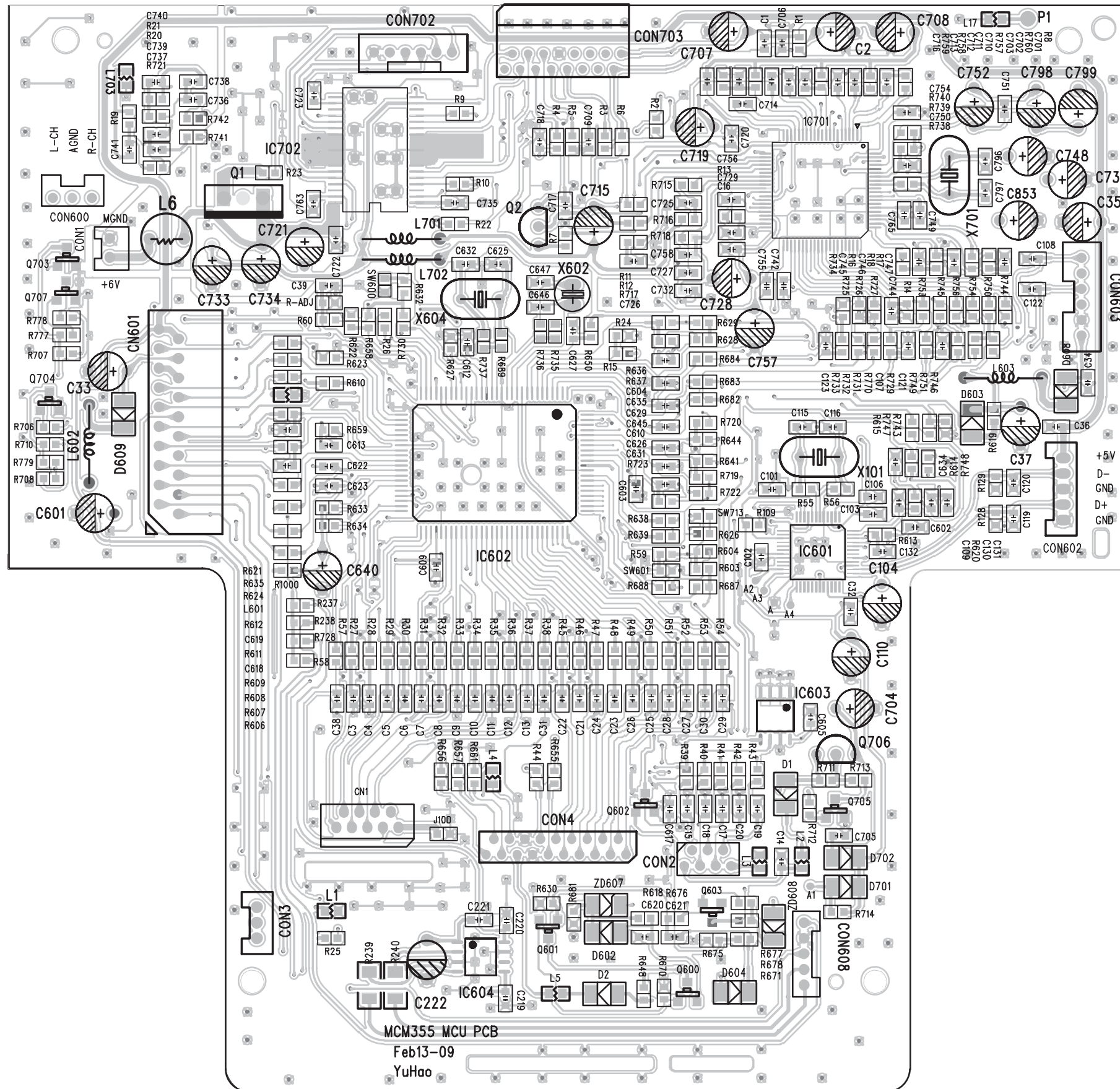






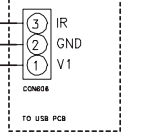
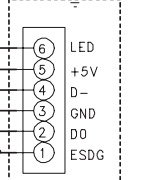
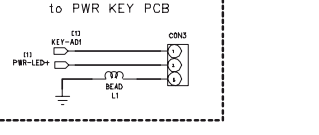
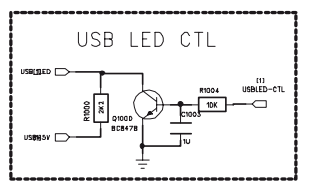
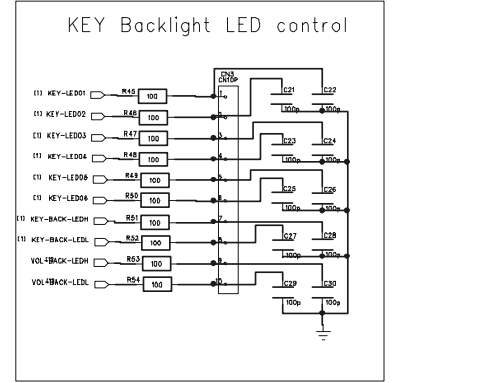
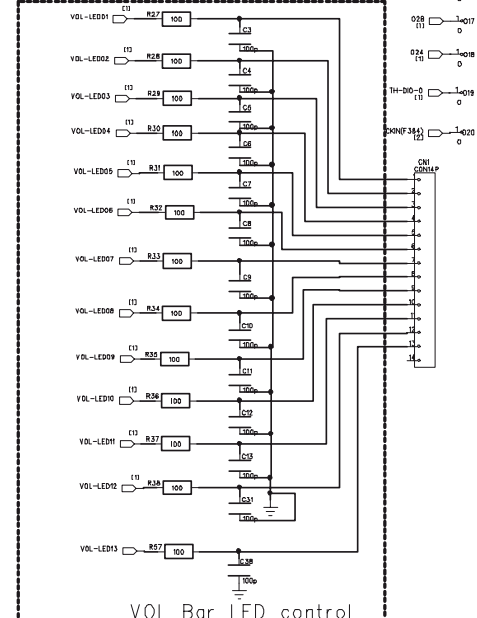
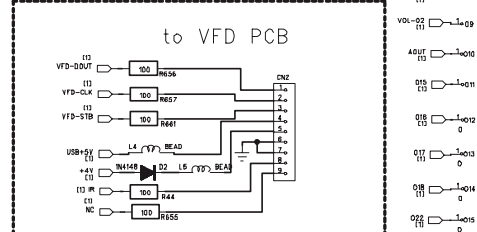
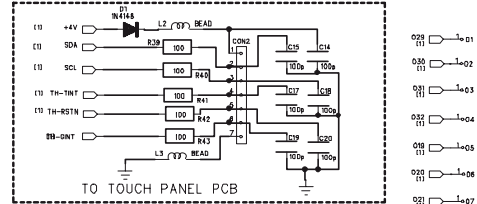
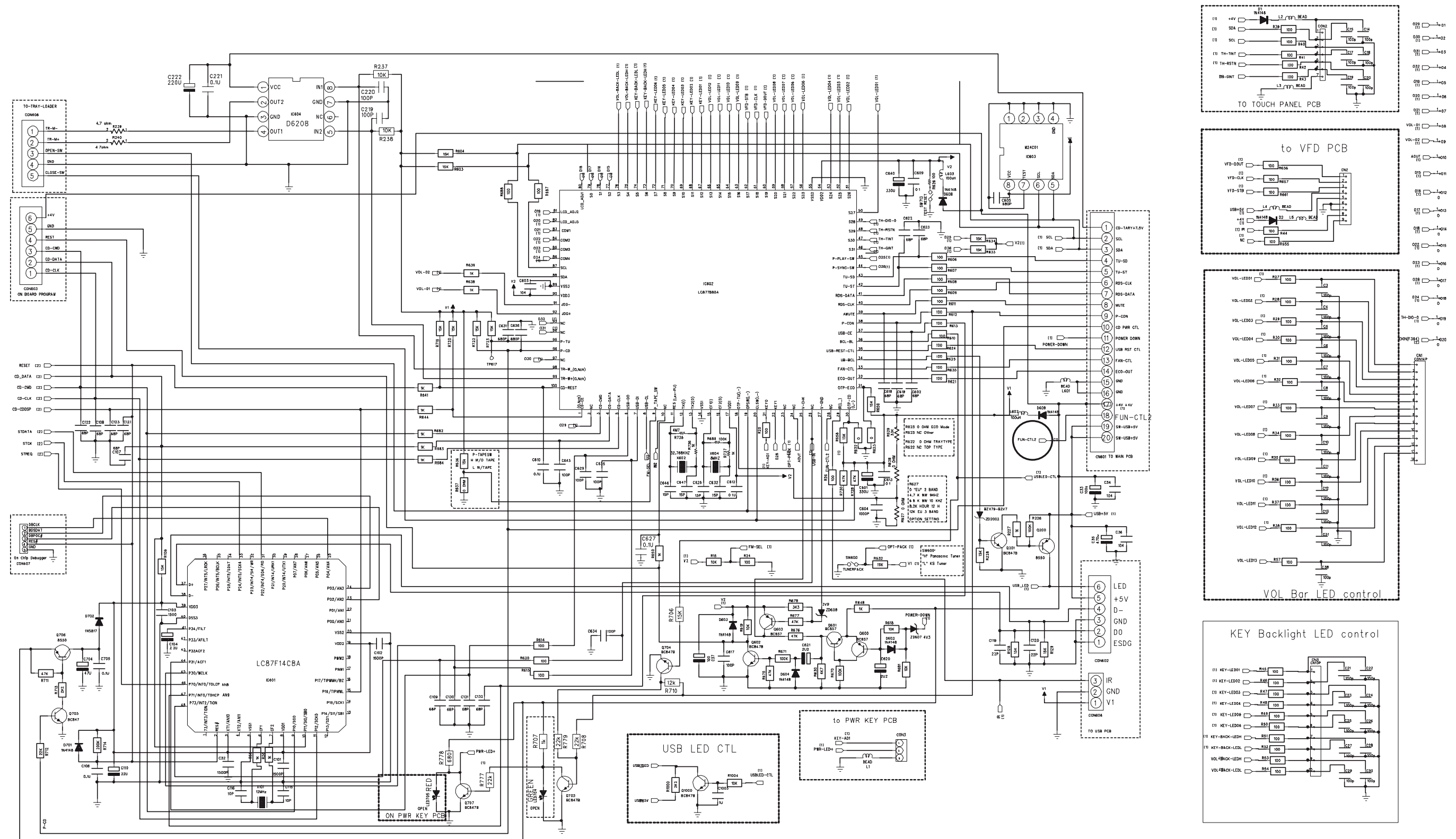


# PCB LAYOUT - MCU BOARD

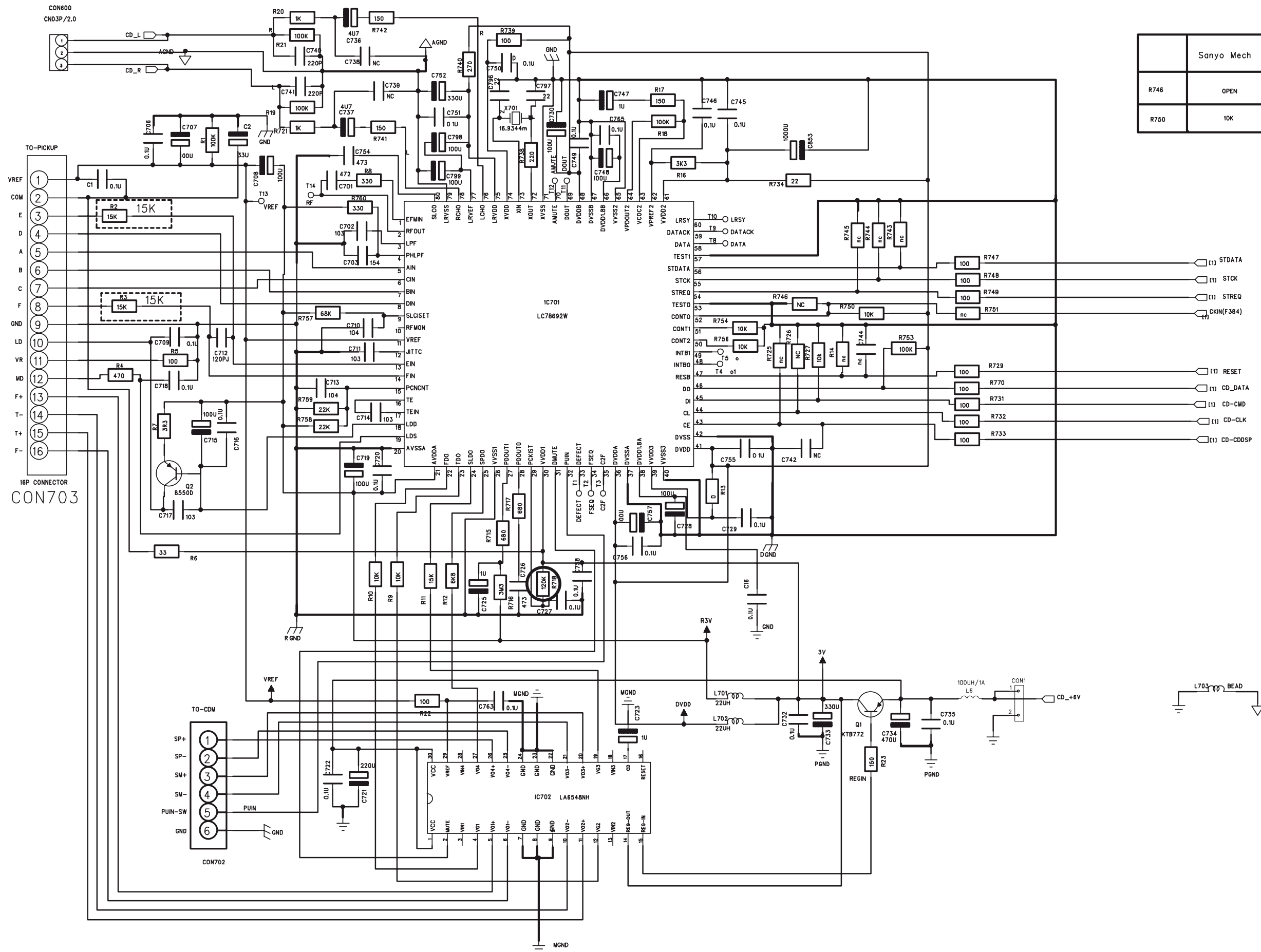




# CIRCUIT DIAGRAM - MCU BOARD (PART1)



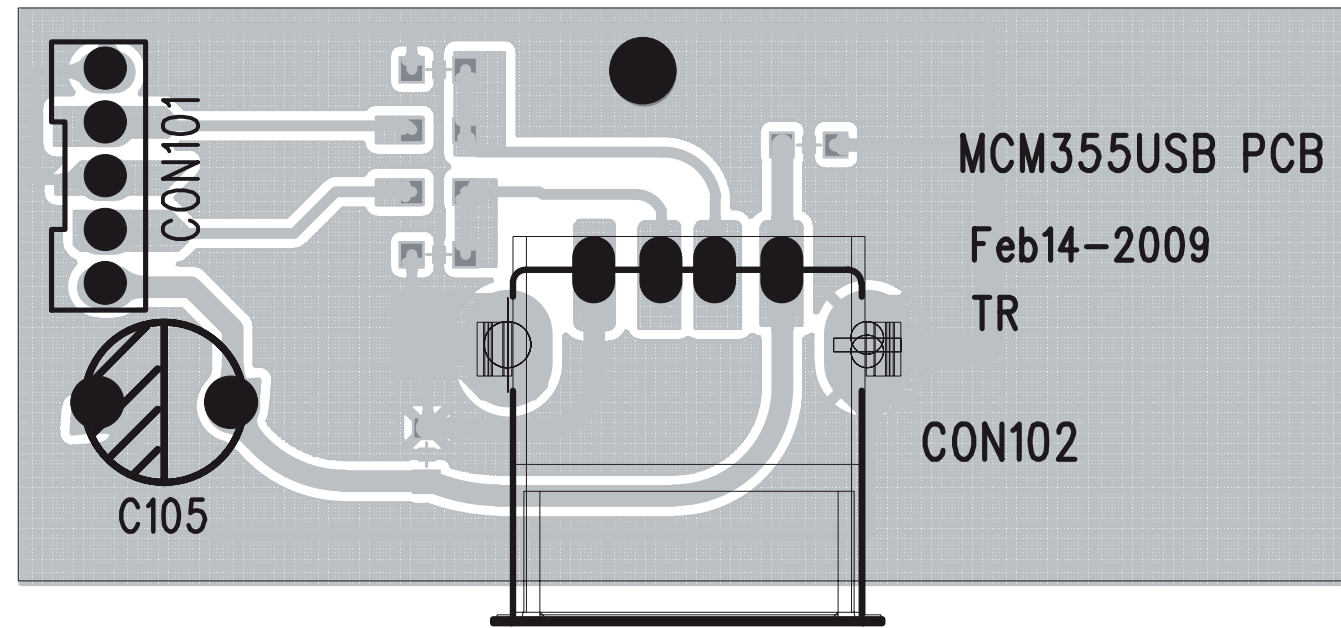
CIRCUIT DIAGRAM - MCU BOARD (PART2)



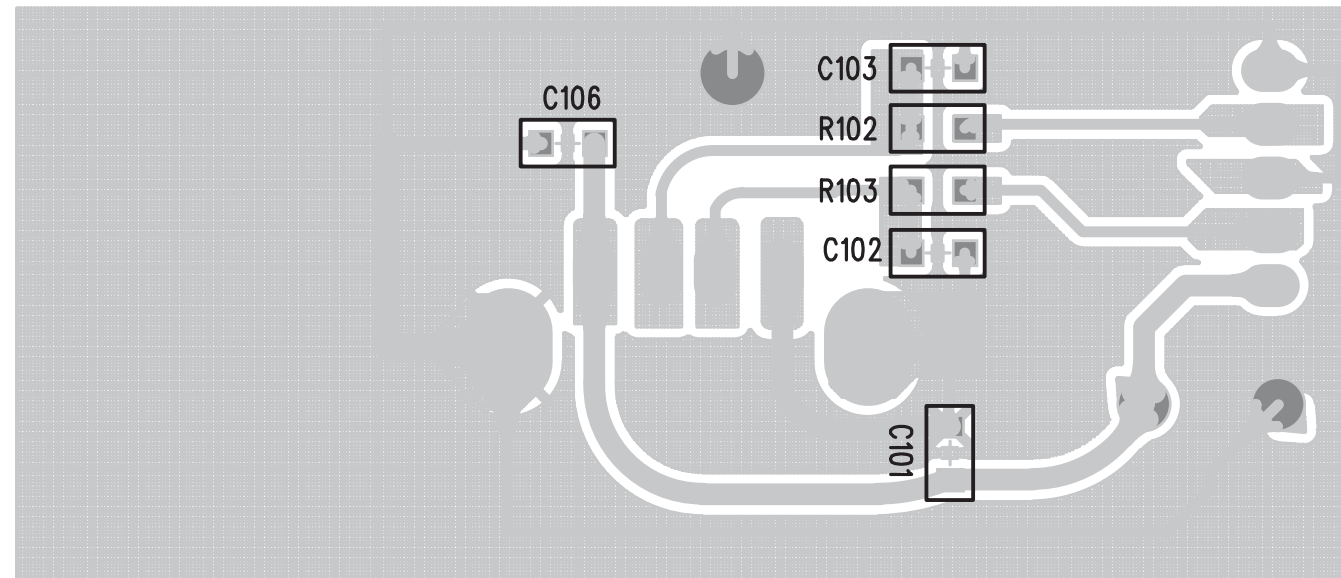
|      | Sanyo Mech | Sony Mech |
|------|------------|-----------|
| R746 | OPEN       | 10K       |
| R750 | 10K        | OPEN      |



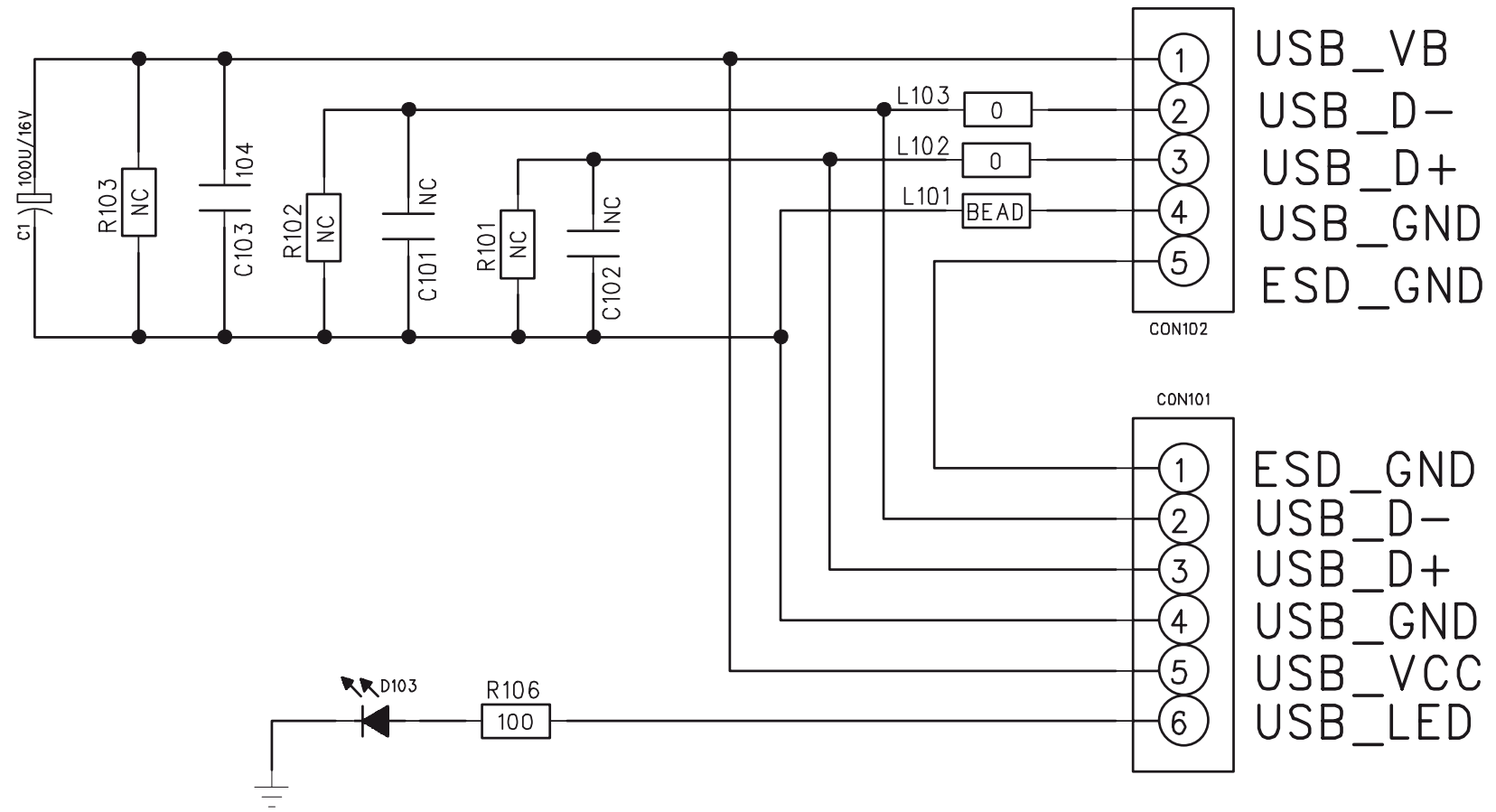
### PCB LAYOUT - USB BOARD (TOP VIEW)



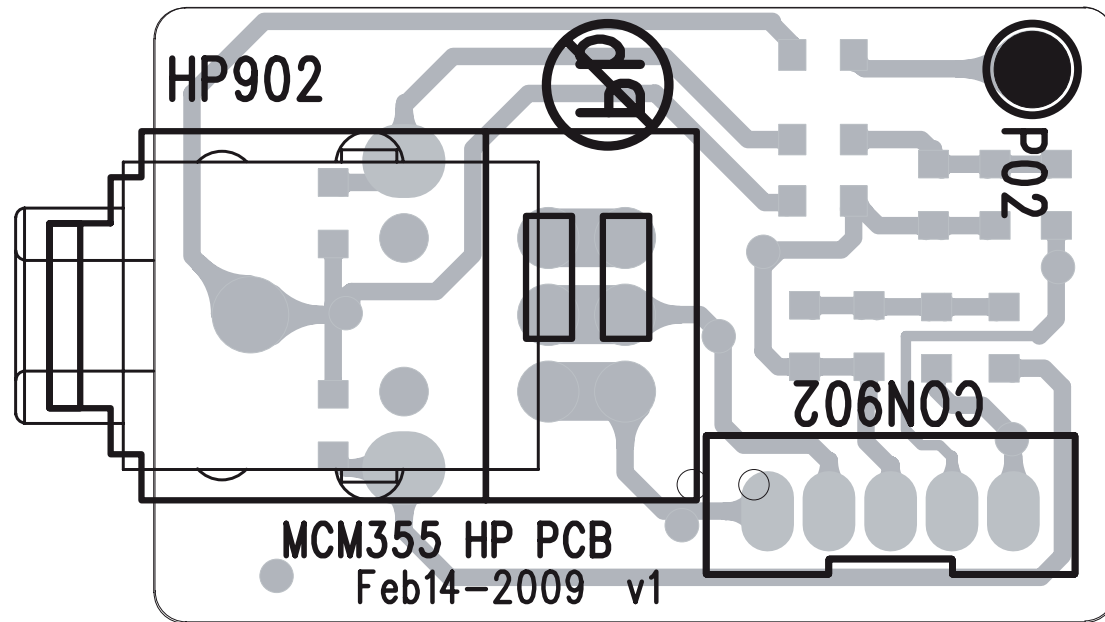
### PCB LAYOUT - USB BOARD (BOTTOM VIEW)



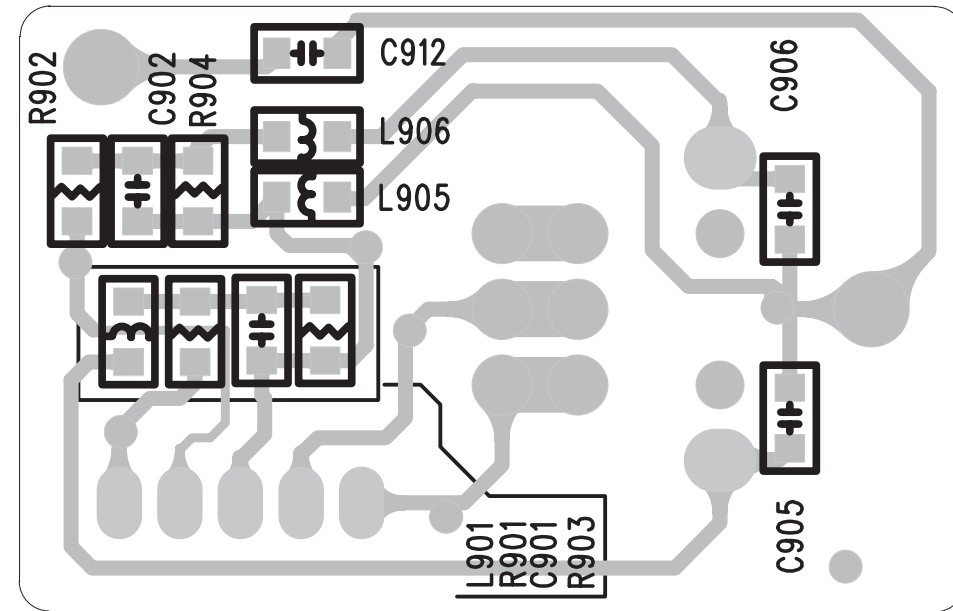
# CIRCUIT DIAGRAM - USB BOARD



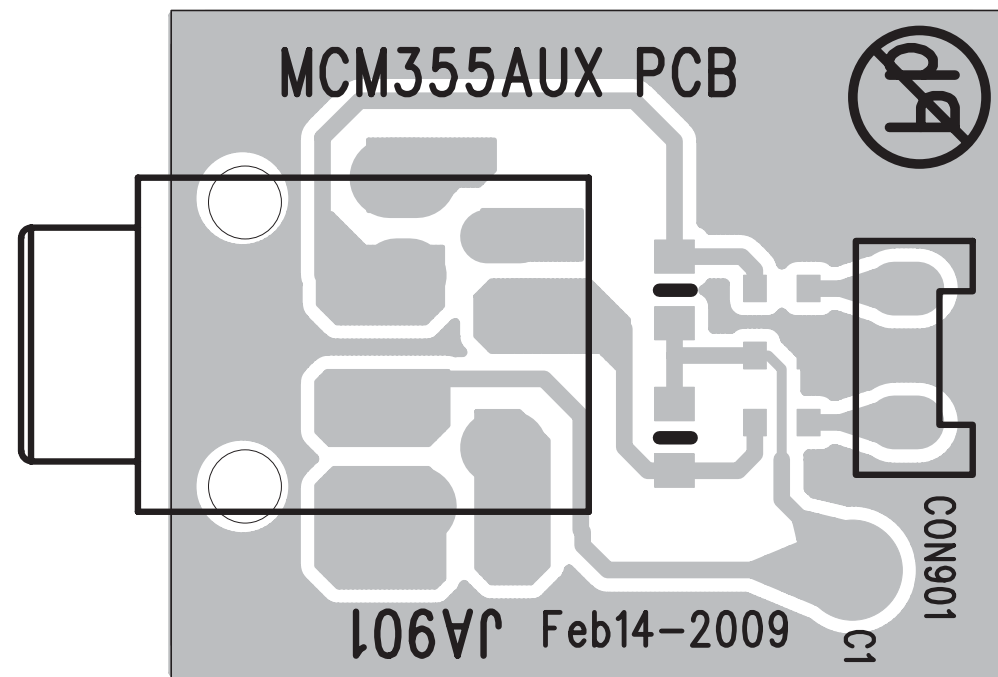
PCB LAYOUT - HEADPHONE BOARD (TOP VIEW)



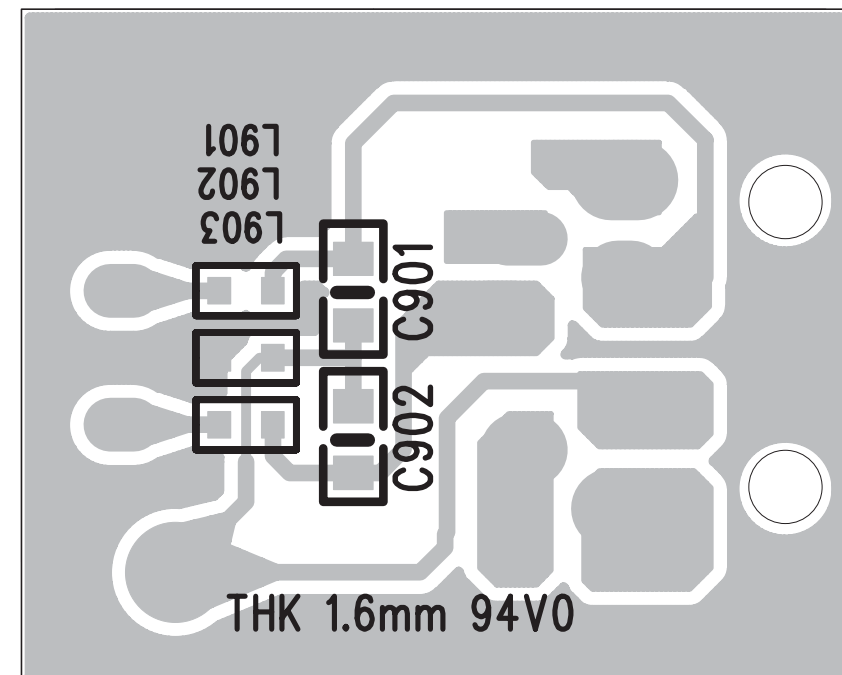
PCB LAYOUT - HEADPHONE BOARD (BOTTOM VIEW)



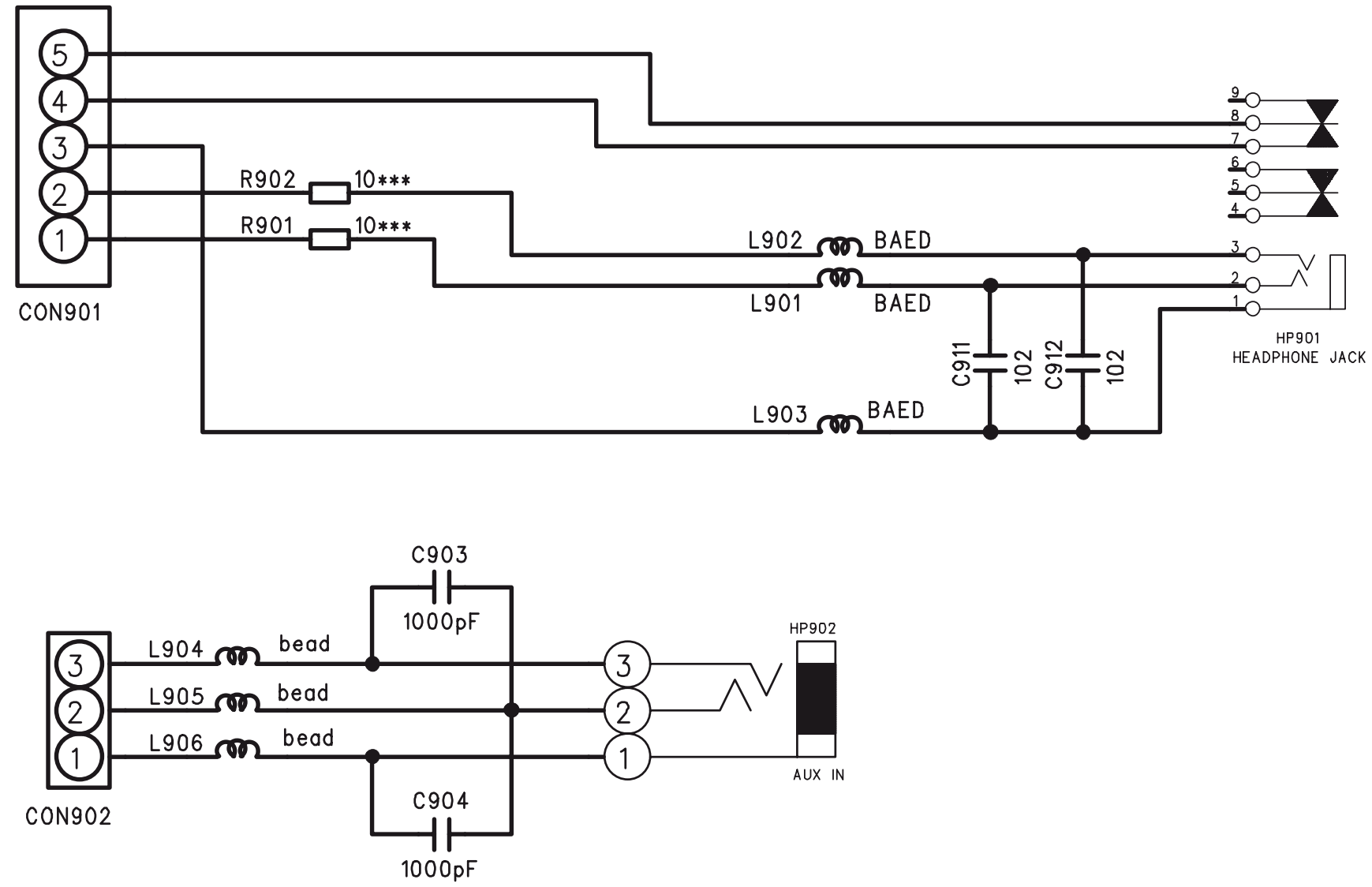
PCB LAYOUT - AUX BOARD (TOP VIEW)



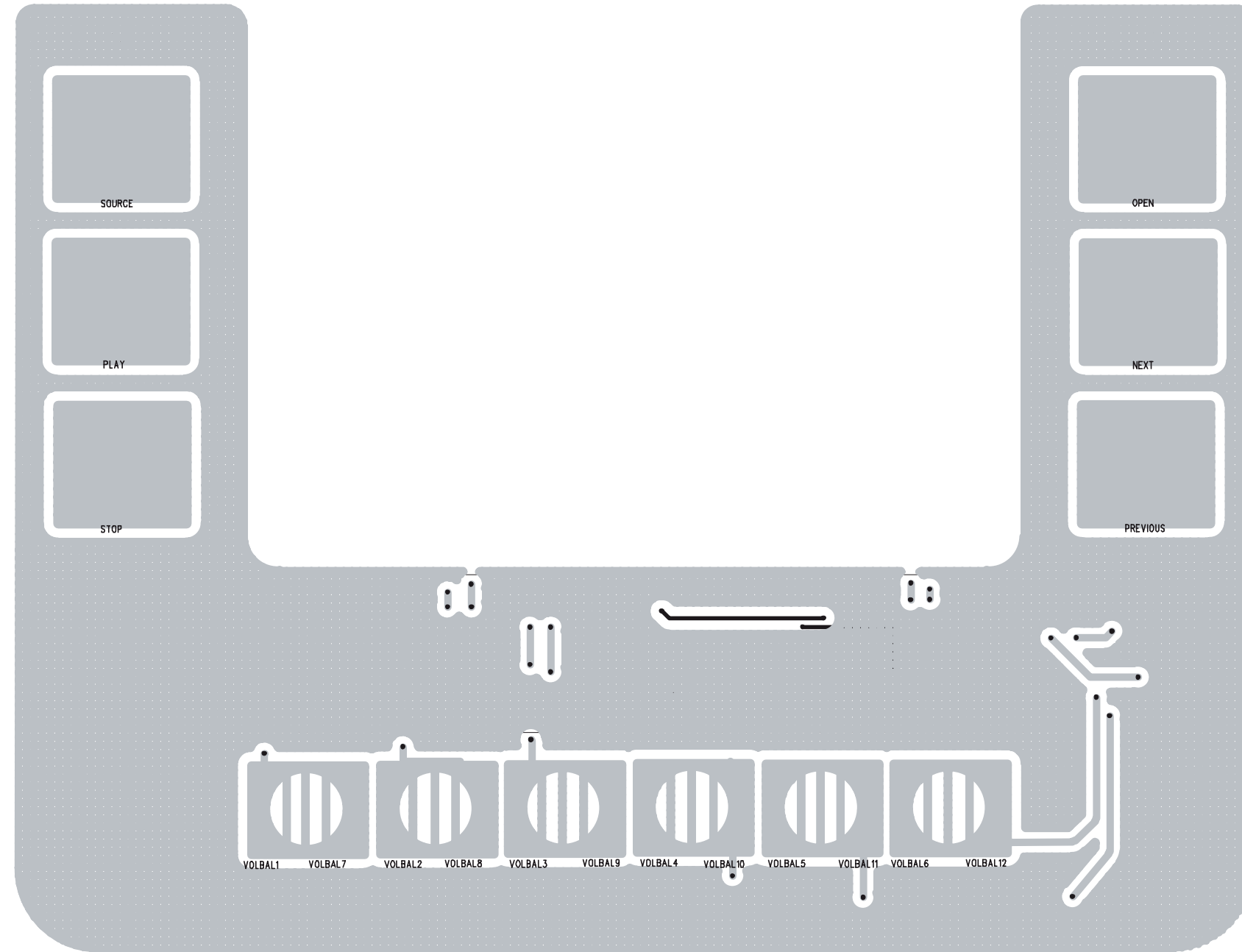
PCB LAYOUT - AUX BOARD (BOTTOM VIEW)



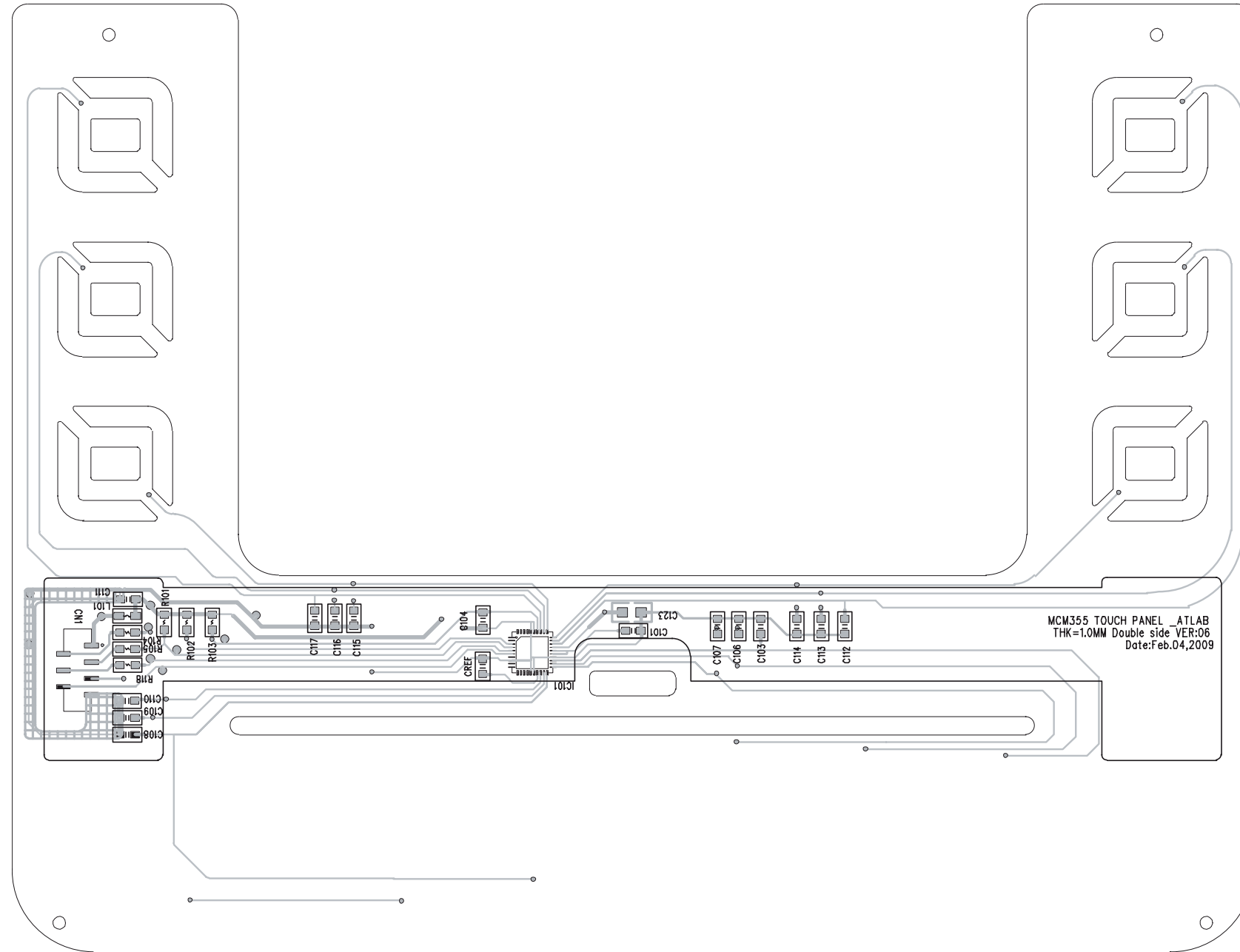
### CIRCUIT DIAGRAM - HEADPHONE & AUX JACK BOARD



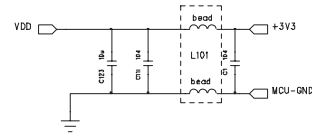
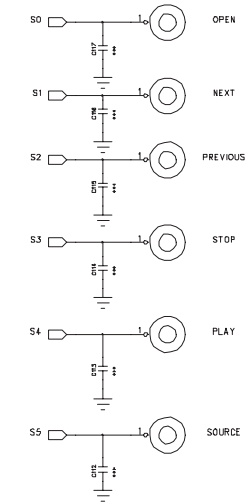
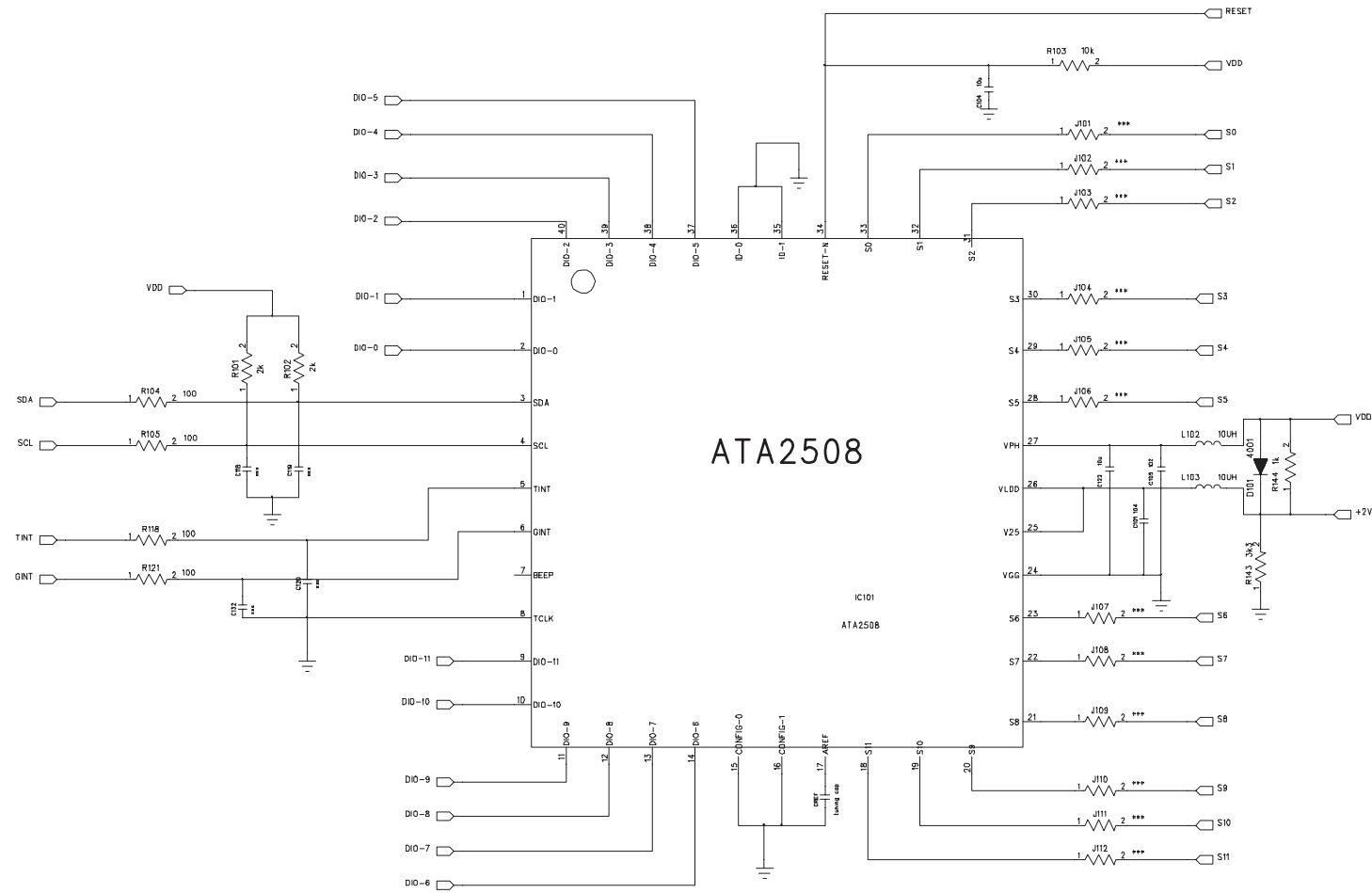
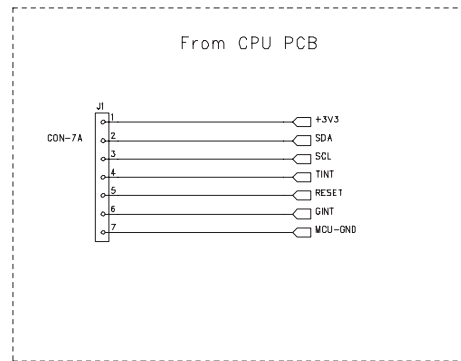
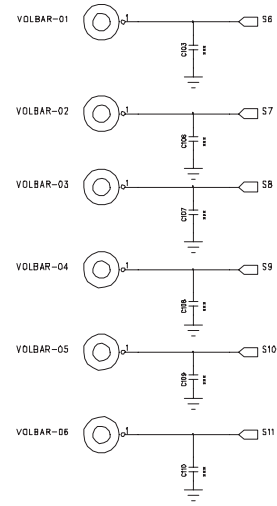
# PCB LAYOUT - TOUCH PANEL BOARD (TOP VIEW)



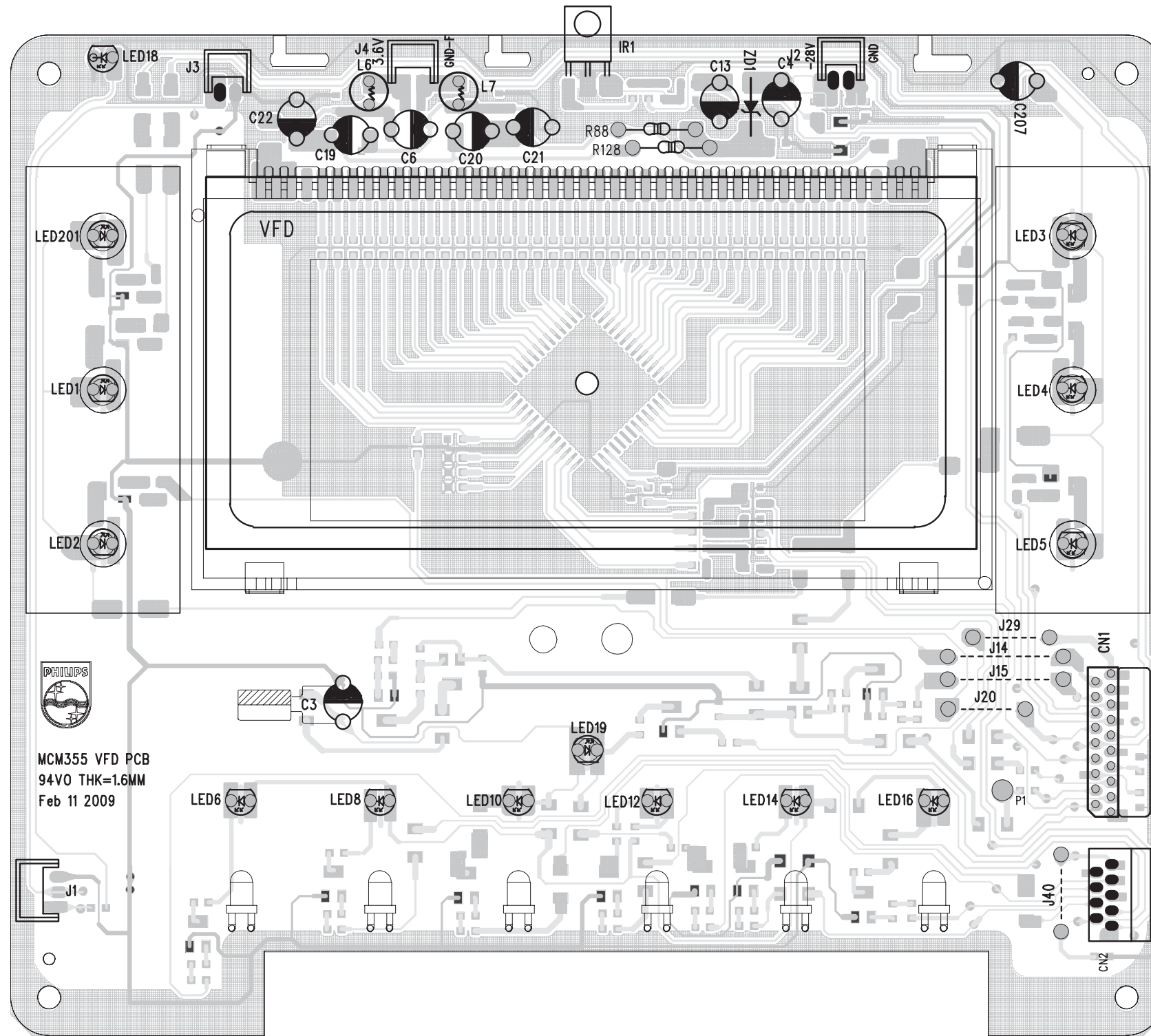
# PCB LAYOUT - TOUCH PANEL BOARD (BOTTOM VIEW)



# CIRCUIT DIAGRAM - TOUCH PANEL BOARD

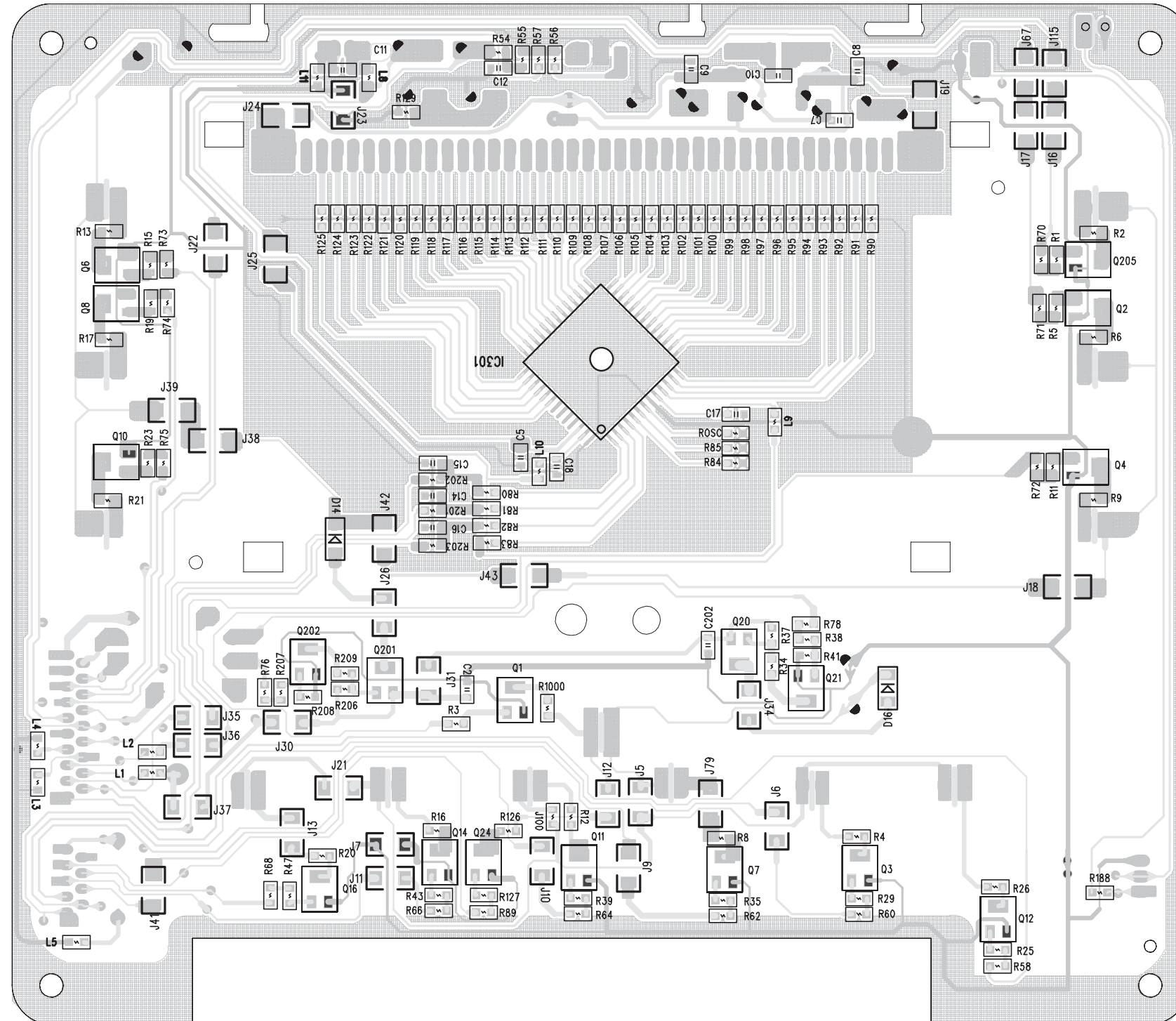


# PCB LAYOUT - VFD BOARD (TOP VIEW)

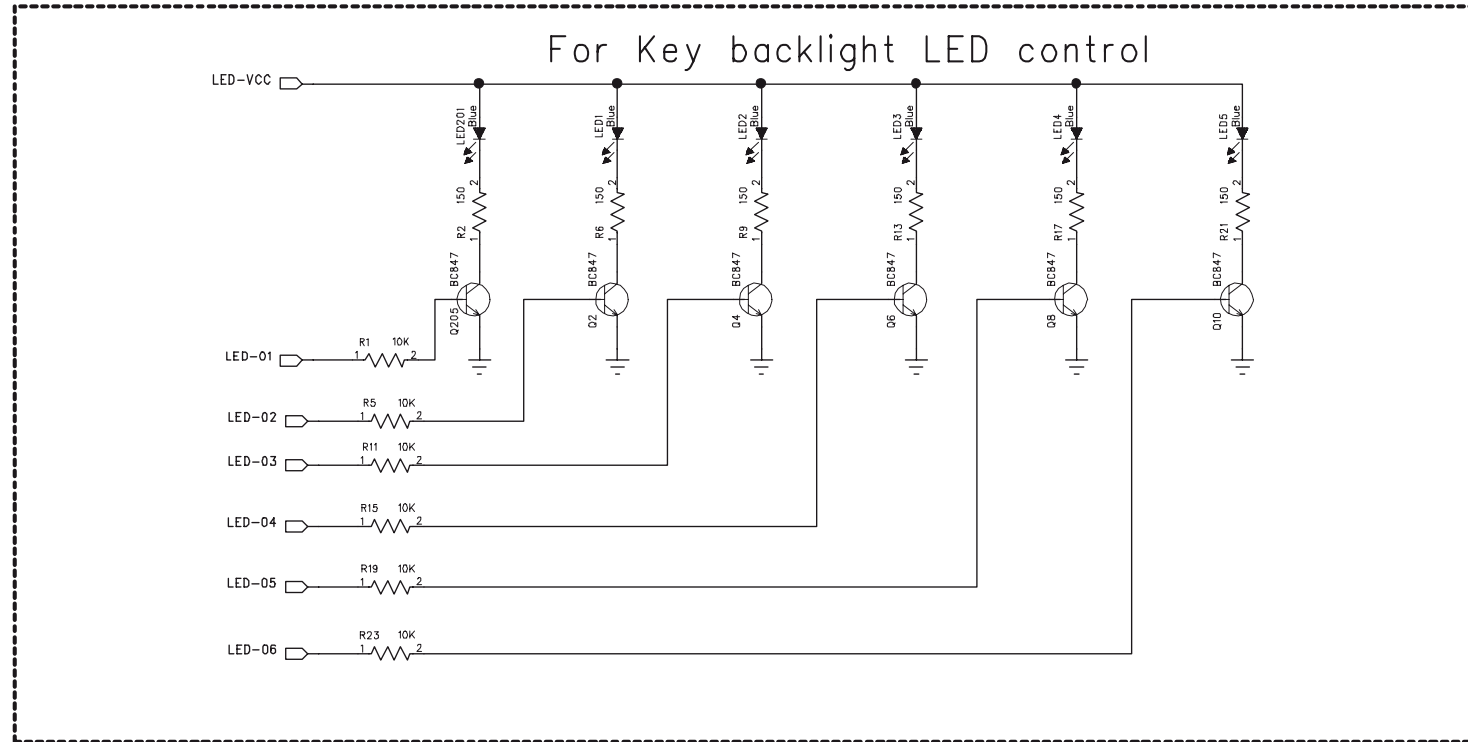
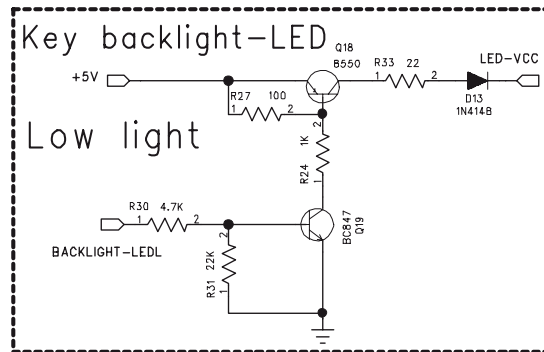
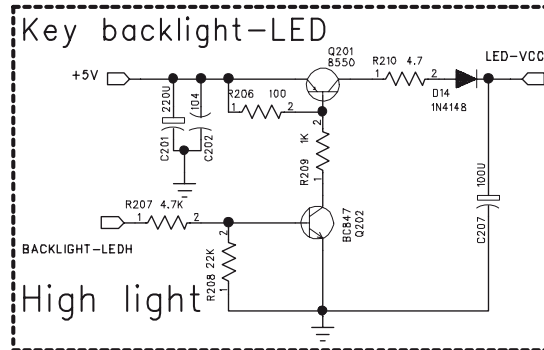
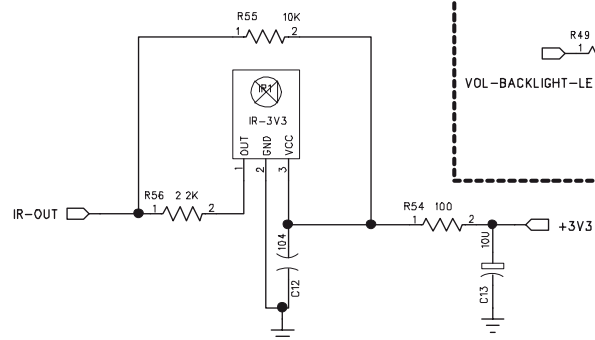
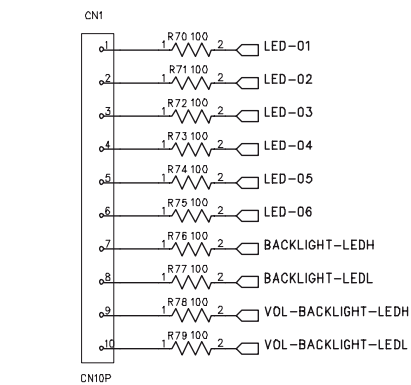
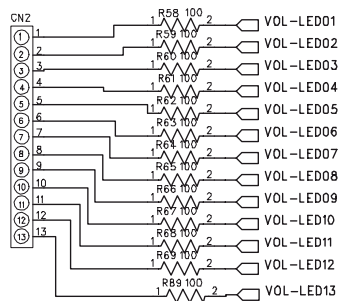
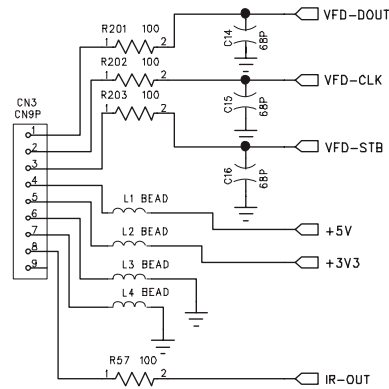




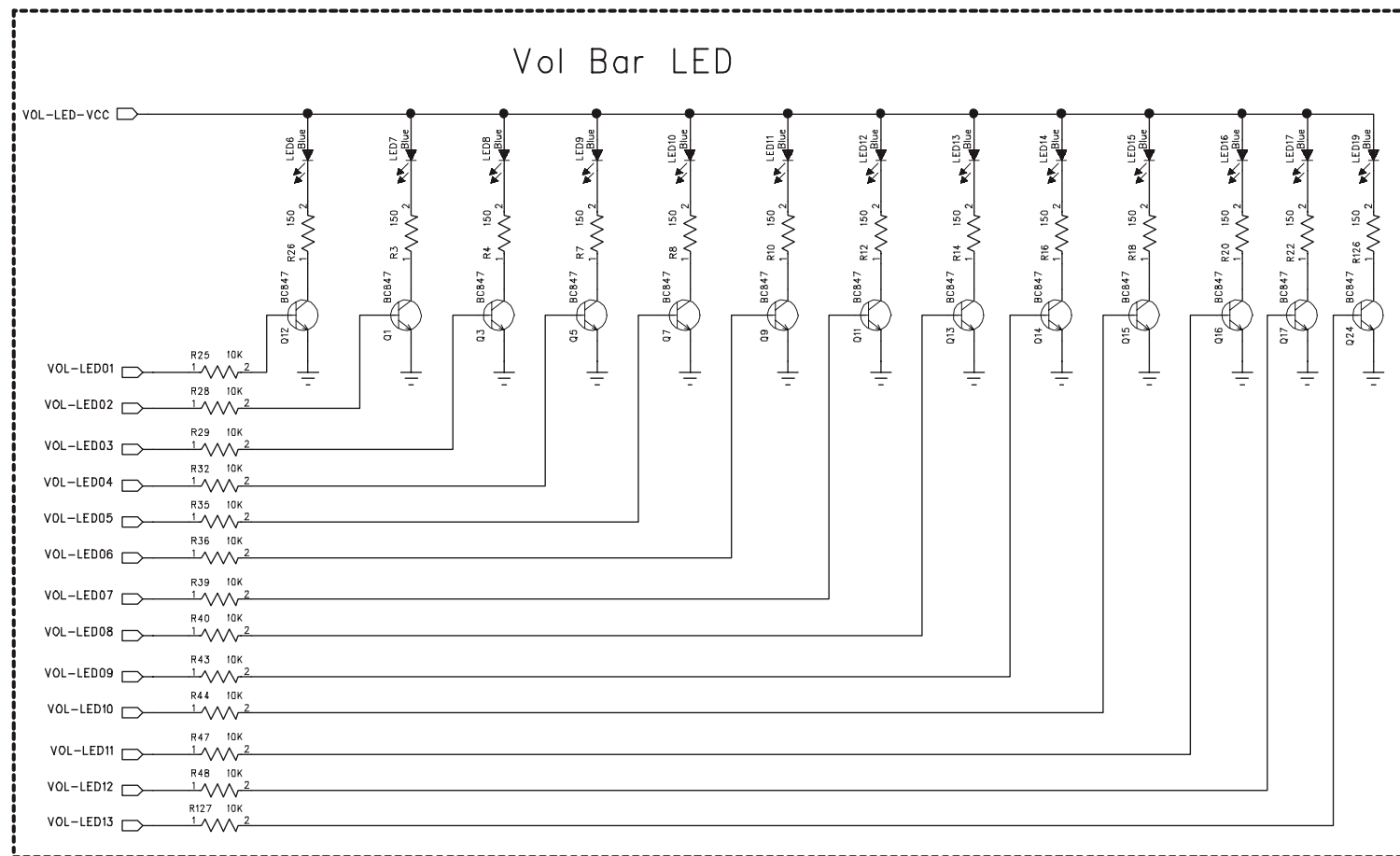
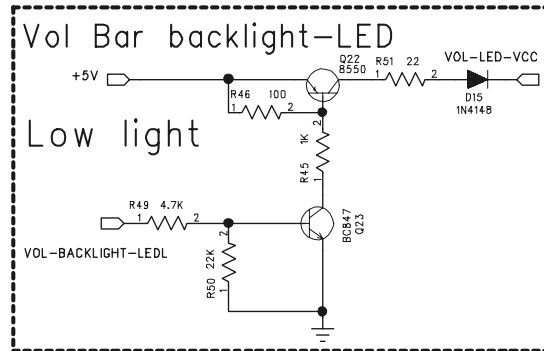
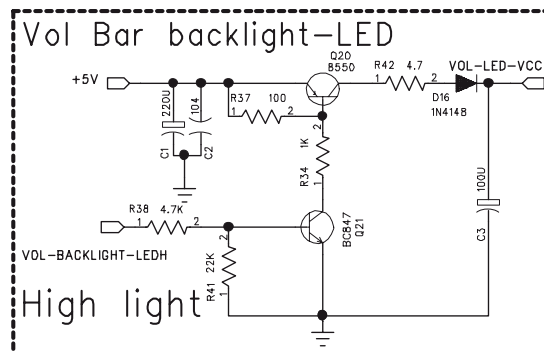
# PCB LAYOUT - VFD BOARD (BOTTOM VIEW)



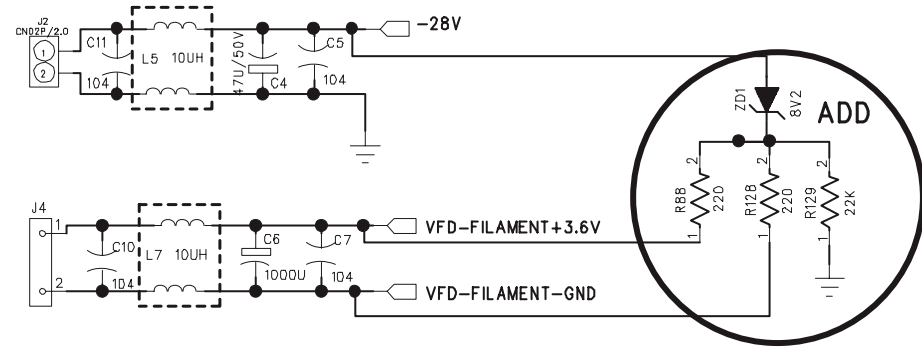
# CIRCUIT DIAGRAM - VFD BOARD (PART1)



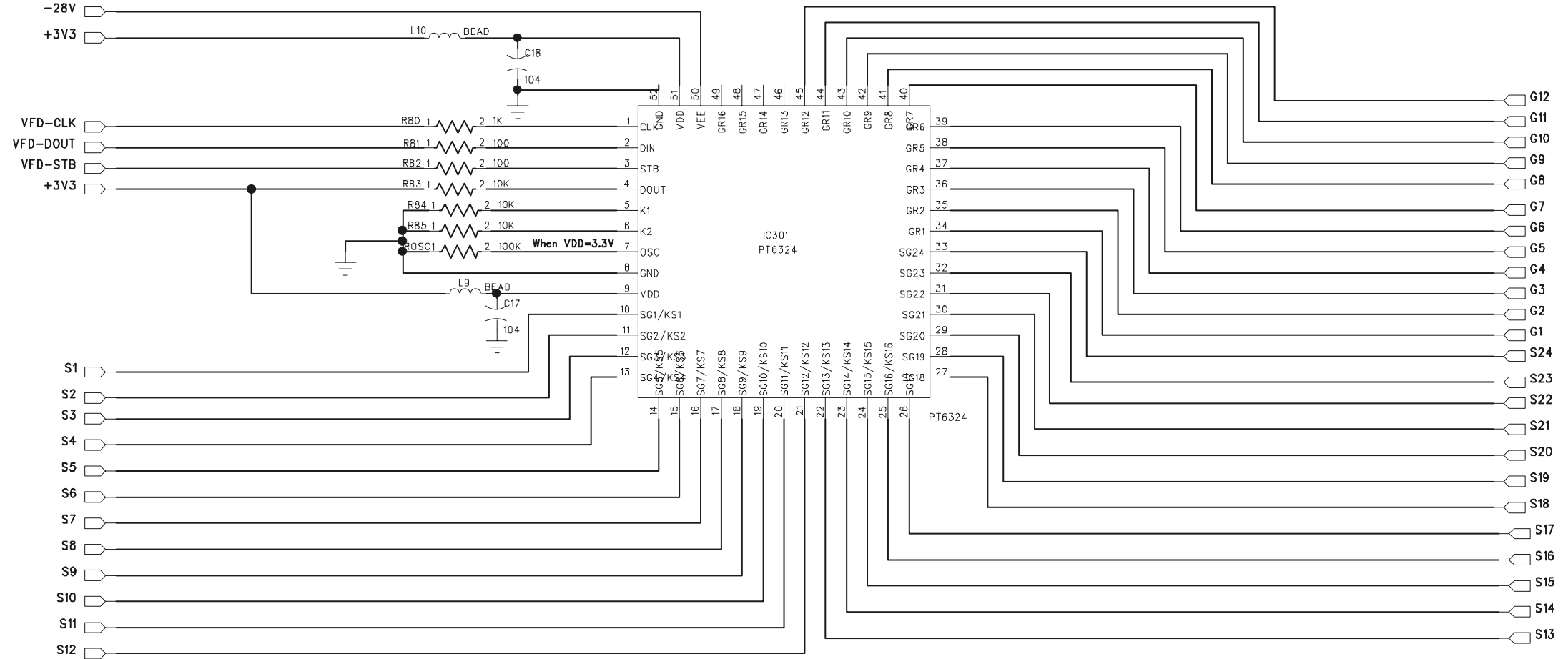
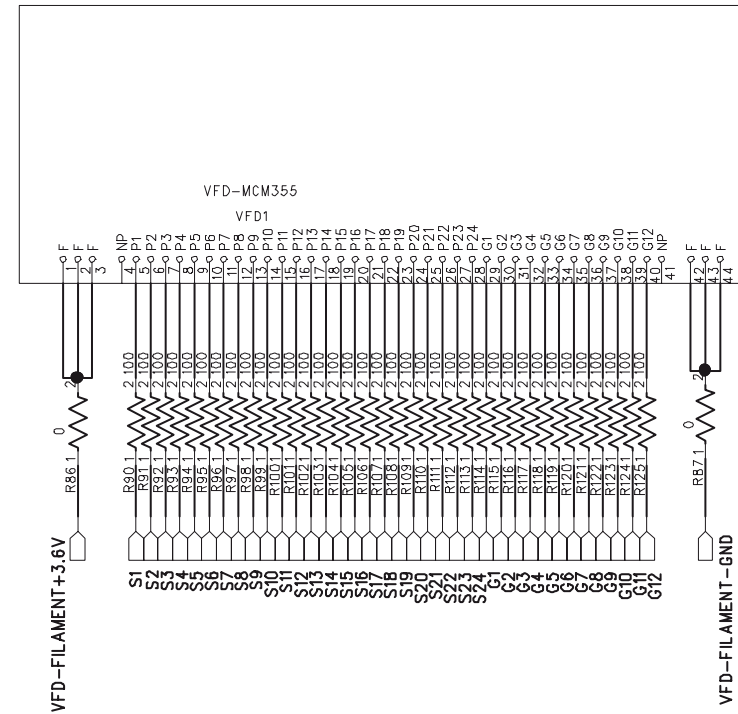
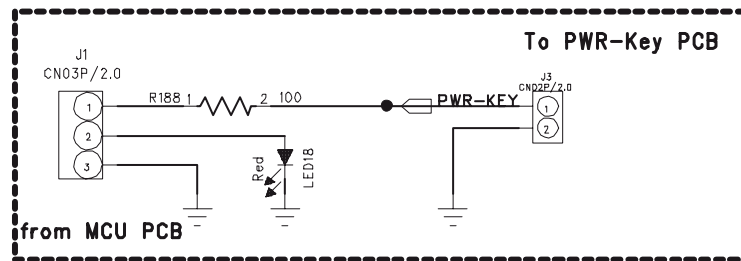
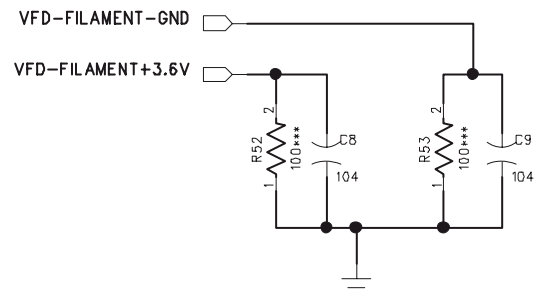
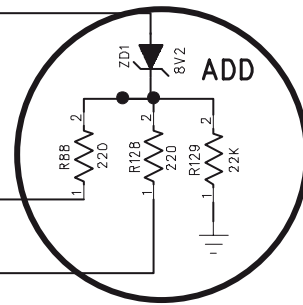
## MCM355 Backlight SCH



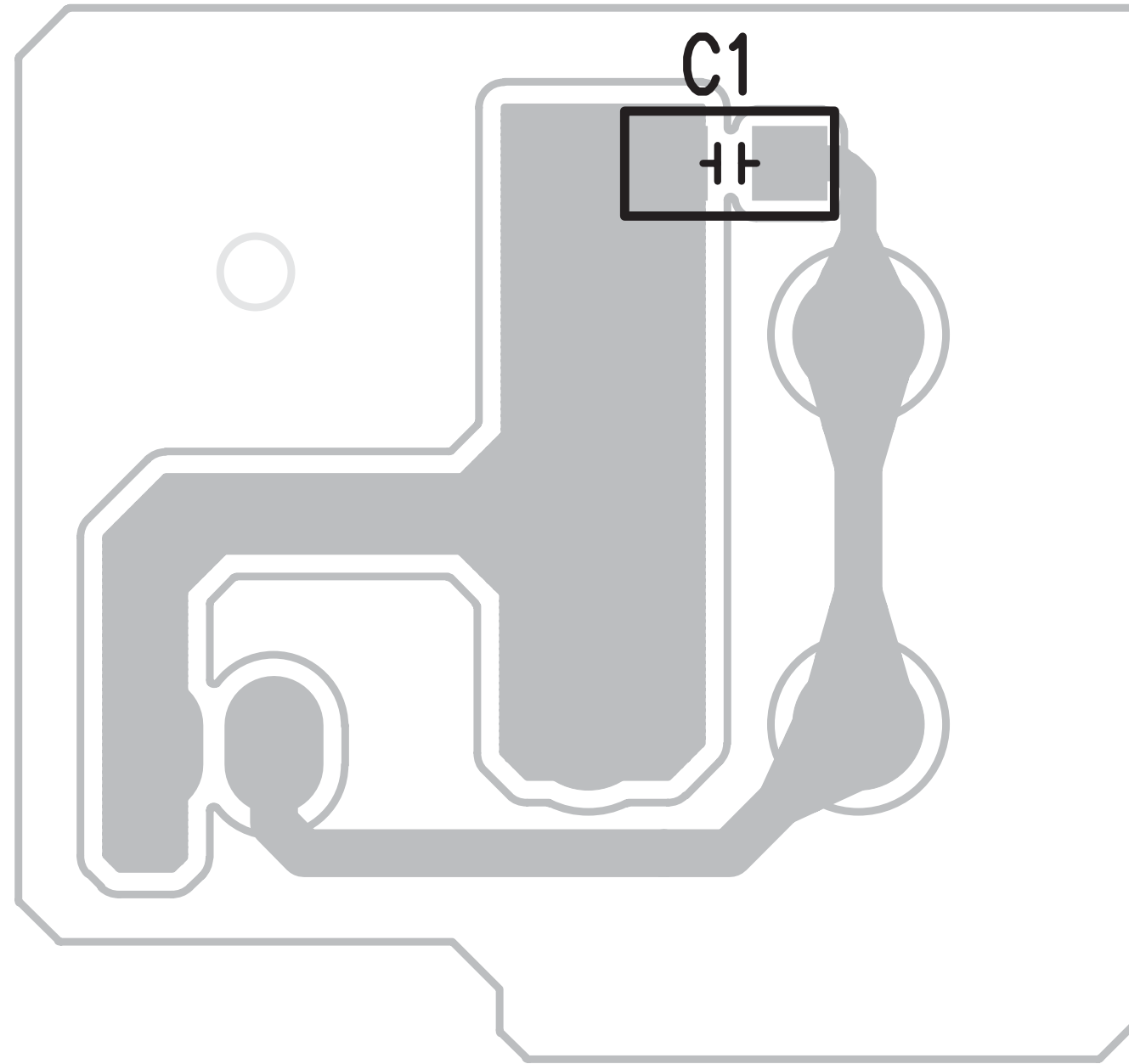
# CIRCUIT DIAGRAM - VFD BOARD (PART2)



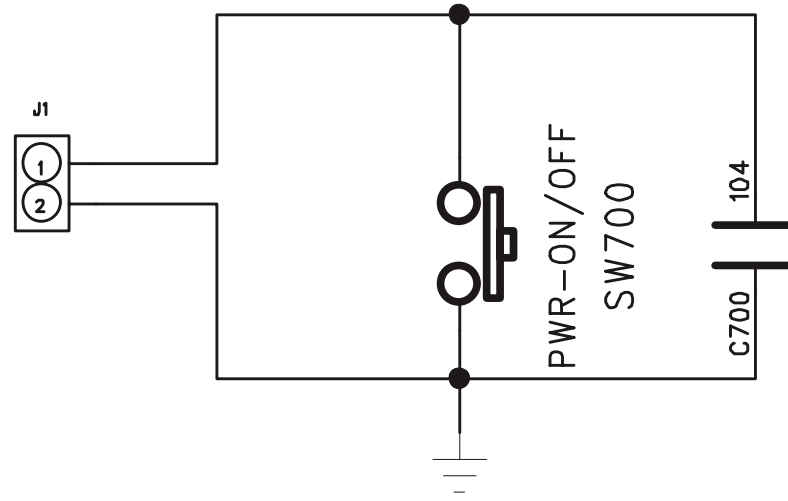
If the VFD display flash, then add this parts!



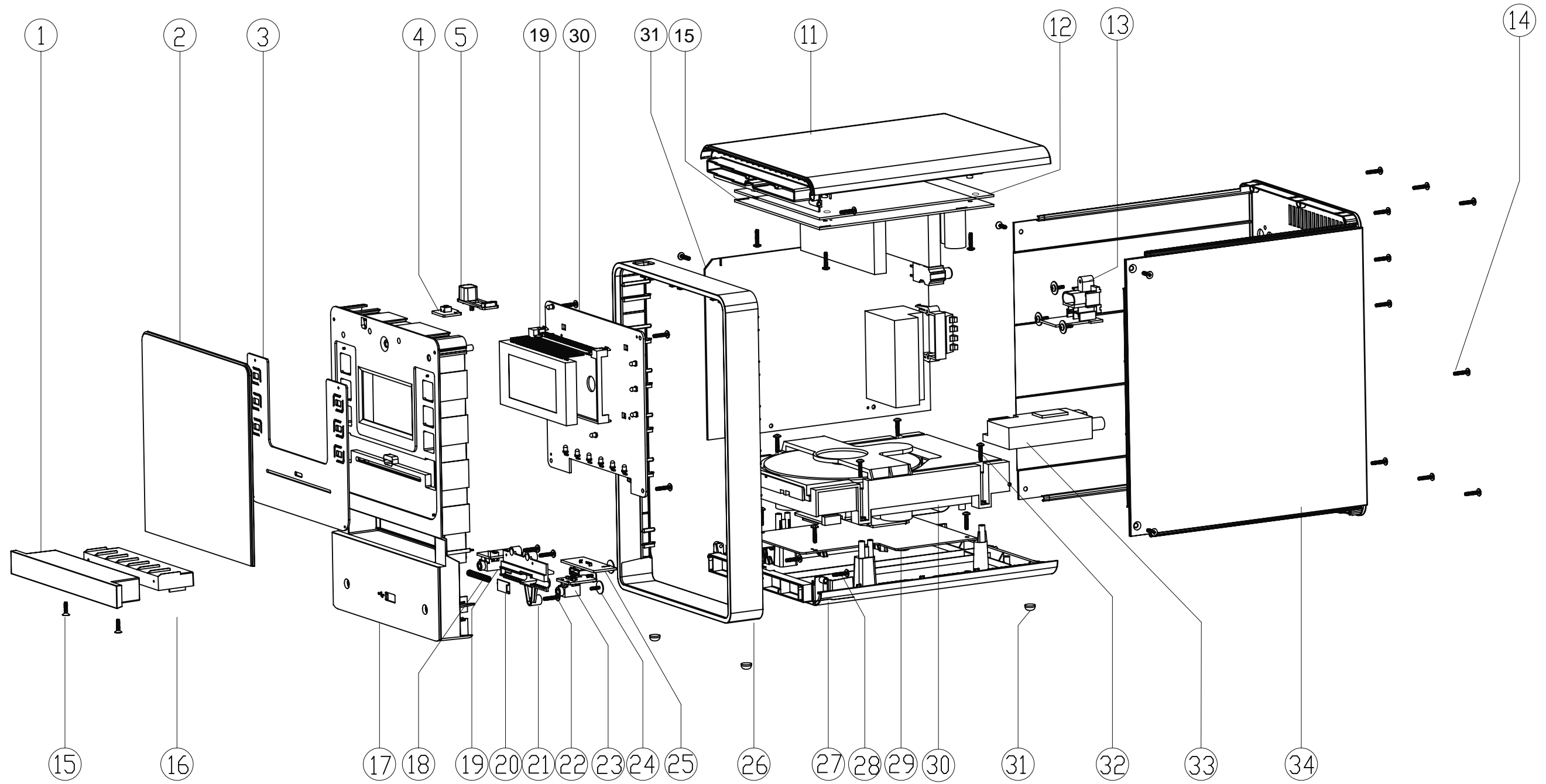
PCB LAYOUT -POWER KEY BOARD



# CIRCUIT DIAGRAM - POWER KEY BOARD



SET MECHANICAL EXPLODED VIEW



## MECHANICAL &amp; ACCESSORIES PARTS LIST

| Loc.             | 12NC           | Description                   |
|------------------|----------------|-------------------------------|
| <i>MAIN UNIT</i> |                |                               |
| 1                | 996510020641   | FRONT CABINET                 |
| 2                | 996510020642   | TOP CABINET                   |
| 3                | 996510020643   | BOTTOM CABINET                |
| 4                | 996510020644   | POWER BUTTON                  |
| 5                | 996510020654   | TOUCH PANEL LENS              |
| 6                | 996510020645   | USB DOOR                      |
| 7                | 996510020646   | CD DOOR COVER INNER           |
| 8                | 996510020647   | CD DOOR COVER OUTER           |
| 9                | 996510020648   | FRAME STAND                   |
| 10               | 996510020612   | USB BRACKET                   |
| 11               | 994000005786   | CD MECHANISM DA11VF(SANYO)    |
| 12               | 996510000871   | CD TRAY LOADER                |
| 13               | △ 996510000876 | 5 FT VDE APPROVED POWER CORD  |
| 14               | 996510012855   | FM TUNER MODULE FOR DC199A/12 |
| 15               | △ 996510020649 | SWITCHING TRANSFORMER MODULE  |
| 16               | 996510020650   | REMOTE CONTROL                |
| 17               | 996510005595   | PIG TAIL ANTENNA WIRE BLACK   |
| 18               | 996510020651   | SINGLE SPK BOX L/R            |
| 19               | 996510025038   | VFD BRACKET                   |
| 29               | 996510025148   | MCU & TOUCH PANEL PCB         |
| 30               | 996510025036   | MCM355 VFD PCB                |
| 31               | 996510025034   | AUDIO POWER AMP PCB           |
| 34               | 996510025041   | REAR CABINET                  |

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

## ELECTRICAL PARTS LIST

| Loc.   | 12NC           | Description                    |
|--------|----------------|--------------------------------|
| C2101  | 996510004554   | CBB CAP HMFS-5 0.47UF 63V      |
| C2102  | 996510004554   | CBB CAP HMFS-5 0.47UF 63V      |
| C56    | 996510004554   | CBB CAP HMFS-5 0.47UF 63V      |
| C57    | 996510004554   | CBB CAP HMFS-5 0.47UF 63V      |
| CN1    | 996510025039   | AC SOCKET 2P P7.9MM            |
| D1     | 996510010774   | DIODE 1N4148 FDLL4148          |
| D101   | 996500038177   | DIODE PRLL4001                 |
| D11    | 996510001053   | RECTIFIER DIODE RL201          |
| D2     | 996510010774   | DIODE 1N4148 FDLL4148          |
| D201   | 996500038177   | DIODE PRLL4001                 |
| D602   | 996510010774   | DIODE 1N4148 FDLL4148          |
| D603   | 996510010774   | DIODE 1N4148 FDLL4148          |
| D604   | 996510010774   | DIODE 1N4148 FDLL4148          |
| D608   | 996510010774   | DIODE 1N4148 FDLL4148          |
| D609   | 996510010774   | DIODE 1N4148 FDLL4148          |
| D7     | 996500038177   | DIODE PRLL4001                 |
| D701   | 996510010774   | DIODE 1N4148 FDLL4148          |
| D702   | 996510003726   | SCHOTTKYBARRIER DIODE PRLL5817 |
| G      | 996510025042   | FFC CABLE 120MM 16P P1MM       |
| H      | 996510025043   | FFC CABLE 260MM 7P P1MM        |
| HP901  | 994000001456   | STEREO HEADPHONE JACK          |
| HP902  | 994000001456   | STEREO HEADPHONE JACK          |
| HP902  | 994000003229   | HEADPHONE JACK D3.5MM          |
| I      | 996510025044   | FFC CABLE 260MM 9P P1MM        |
| IC1    | 996510005002   | IC D2761 (SILICORE)            |
| IC101  | 996510020609   | IC ATA2508DA-40N 40QFN         |
| IC2    | 996510012838   | IC TDA8920BTH SOT566-3         |
| IC201  | 994000005724   | IC LD1117AL-3.3V-D             |
| IC202  | 996510002327   | IC KIA7806API-U/P TO-220IS     |
| IC2101 | 996510012838   | IC TDA8920BTH SOT566-3         |
| IC301  | 996510020610   | IC VFD DRIVER PT6324QL 52P     |
| IC5    | 996510001055   | IC BA4558 SOP8                 |
| IC501  | 996510010771   | IC 7314(ANGUS)                 |
| IC502  | 996510005002   | IC D2761 (SILICORE)            |
| IC6    | 996510001055   | IC BA4558 SOP8                 |
| IC601  | 996510012832   | IC LC87F1HC8A PROGRAMMED       |
| IC601M | 994000003215   | RDS IC SAA6581T                |
| IC602  | 996510020611   | IC LC87F7BC8A-QIP-E PROGRAMMED |
| IC603  | 996510020172   | IC AT24C02B-TH-T               |
| IC604  | 996510001069   | IC D6208 SOP8                  |
| IC701  | 996510012790   | IC LC786921W-UPHI-E            |
| IC702  | 996510012791   | LA6548NHL-TE-L-E               |
| IC801  | 996510001055   | IC BA4558 SOP8                 |
| IR1    | 996510010778   | INFRARED REC STRANGLE TYPE     |
| J      | 996510025045   | FFC CABLE 260MM 19P P1MM       |
| J501   | △ 996510016570 | AC POWER SOCKET 2P VDE         |
| JACK1  | 994000003196   | 8.3MM RCA JACK                 |
| JOUT   | 996510017000   | AUDIO TERMINAL JACK 8P B/B/R/R |
| JOUT   | 996510025035   | AUDIO TERMINAL JACK 8P         |
| K      | 996510025046   | FFC CABLE 300MM 20P P1.25MM    |
| KEY1   | 996500039269   | TACT SWITCH                    |
| L      | 996510025047   | FFC CABLE 350MM 10P P1.25MM    |
| Q1     | 996510001414   | TRANSISTOR?KTB772?(KEC)?TAPE   |
| Q101   | 996500039268   | TRANSISTOR KTC-8050C           |
| Q2     | 994000003206   | TRANSISTOR 8550D               |
| Q20    | 996510002323   | TRANSISTOR S8550 SMD TYPE      |
| Q201   | 996510002323   | TRANSISTOR S8550 SMD TYPE      |
| Q203   | 994000001436   | TRANSISTOR 2SB1566-F           |

## ELECTRICAL PARTS LIST

| Loc.   | 12NC         | Description                    |
|--------|--------------|--------------------------------|
| Q214   | 994000005755 | TRANSISTOR KTA1273 TO-92L      |
| Q501   | 996500039268 | TRANSISTOR KTC-8050C           |
| Q600   | 996510012833 | TRANSISTOR BC857B              |
| Q601   | 996510012833 | TRANSISTOR BC857B              |
| Q602   | 996510012793 | TRANSISTOR BC847B              |
| Q603   | 996510012833 | TRANSISTOR BC857B              |
| Q703   | 996510012793 | TRANSISTOR BC847B              |
| Q704   | 996510012793 | TRANSISTOR BC847B              |
| Q705   | 996510012793 | TRANSISTOR BC847B              |
| Q706   | 994000003206 | TRANSISTOR 8550D               |
| Q707   | 996510012793 | TRANSISTOR BC847B              |
| T501   | 994000003226 | AC LINE FILTER 400UH -30%      |
| U1     | 996510020220 | IC PT2308L-S(L) SOP-8PIN       |
| VFD1   | 996510025037 | VFD FOR MCM355                 |
| X101   | 996510005000 | CRYSTAL 12MHZ 49S 20PF+/-20PPM |
| X602   | 996510012842 | X'TAL 32.768KHZ 12.5PF         |
| X604   | 996510016577 | X'TAL 8MHZ?20PF+/-20PPM        |
| X701   | 996510012834 | X'TAL 16.934MHZ BOX TYPE       |
| Y601   | 994000003209 | CRYSTAL 4.332MHZ HC-49/S       |
| ZD1    | 996510020636 | ZENER DIODE 12V 1/2W LL-34     |
| ZD101  | 996510012789 | ZENER DIODE 7V5                |
| ZD102  | 996510020637 | ZENER DIODE 7V5 1/2W TCLLZ7V5  |
| ZD1M   | 996510000379 | ZENER DIODE 11V 1/2W (TC11V)   |
| ZD2    | 996510020638 | ZENER DIODE TCLLZ6V2 LL34      |
| ZD2001 | 996510004556 | DIODE 5V1 1/2W TCLLZ5V1 LL34   |
| ZD201  | 996510004555 | DIODE 10V 1/2W TCLLZ10V LL34   |
| ZD204  | 996510004556 | DIODE 5V1 1/2W TCLLZ5V1 LL34   |
| ZD3    | 996510020636 | ZENER DIODE 12V 1/2W LL-34     |
| ZD4    | 996510020636 | ZENER DIODE 12V 1/2W LL-34     |
| ZD501  | 996510004559 | DIODE 8V2 1/2W TCLLZ8V2 LL34   |
| ZD607  | 996510020639 | ZENER DIODE 4V3 1/2W           |
| ZD608  | 996510020640 | ZENER DIODE 3V9 1/2W           |
| ZD608  | 996510020640 | ZENER DIODE 3V9 1/2W           |