

## SERVICE MANUAL



### SPECIFICATIONS:

|                           |                                                                                                                                                                                                 |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Disc Types                | DVD, DVD-A, DVD-V, CD-RW<br>CD-R, CD-DA, DIVX, SACD                                                                                                                                             |
| Audio Formats             | 5.1 and Stereo Downmix<br>LPCM 16 bit 44.1kHz<br>Dolby Digital 5.1 24 bit 96kHz<br>DTS Output (Digital Audio Out Only)<br>DVD Audio 2 Channel 24 bit 192kHz<br>DVD Audio 5.1 (MLP) 24 bit 96kHz |
| Video                     | Composite Video (CVBS)<br>S-Video (SVHS)<br>RGB<br>DVI-D & HDMI<br>Component (YCbCr)<br>PAL/NTSC<br>Interlaced / Progressive Scan                                                               |
| THD (unweighed)           | < 0.01%                                                                                                                                                                                         |
| Dynamic Range             | > 100dB                                                                                                                                                                                         |
| Frequency Response        | 20Hz – 20kHz                                                                                                                                                                                    |
| Video Amplitude           | 1.0V pk-pk (75 ohms)                                                                                                                                                                            |
| S-Video Amplitude         | Y: 1.0V pk-pk n (75ohms)<br>C: 0.286V pk-pk (75 ohms)                                                                                                                                           |
| Power Supply              | 100-240V AC~50/60Hz                                                                                                                                                                             |
| Max Power Consumption     | 40W                                                                                                                                                                                             |
| Dimensions mm (H x W x D) | 55 x 430 x 263                                                                                                                                                                                  |
| Weight (kg)               | 2.56 kg                                                                                                                                                                                         |

API9841/I

# **DVD89 SERVICE MANUAL**

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# Cambridge Audio DVD89 DVD Player

1. When servicing, observe the original lead dress. if a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barrier, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

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

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices,place the assembly on a conductive surface such as alminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as anti-static (ESD protected)can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, alminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

## Caution

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

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity(ESD).

## IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

## COPYRIGHT NOTICE.

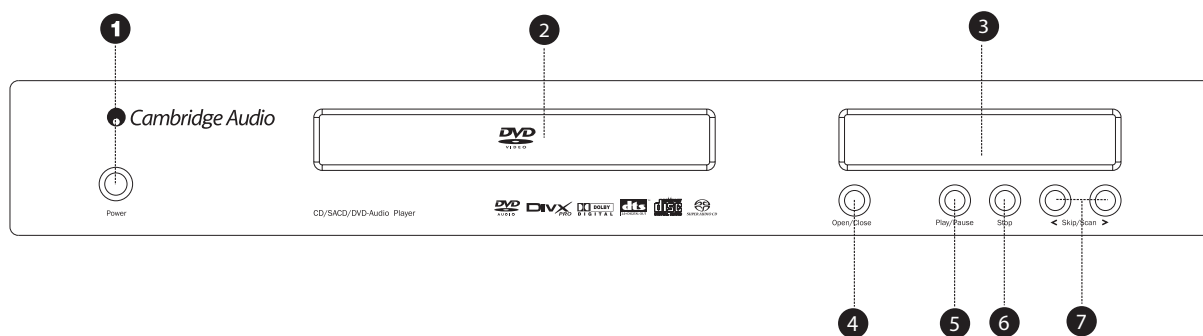
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## Safety Precautions

## Cambridge Audio DVD89 DVD Player



- 1 POWER switch
- 2 Disc tray
- 3 Display window

- 4 OPEN/CLOSE button
- 5 PLAY/PAUSE button
- 6 STOP button

- 7 Skip/Scan button

Front Panel Illustration

## Cambridge Audio DVD89 DVD Player

The laser diode in the traverse unit (optical pickup) may break down due to static electricity of clothes or human body. Use due caution to electrostatic breakdown when servicing and handling the laser diode.

Some devices such as the DVD player use the optical pickup(laser diode)and the optical pickup will be damaged

### 1. Grounding for electrostatic breakdown prevention

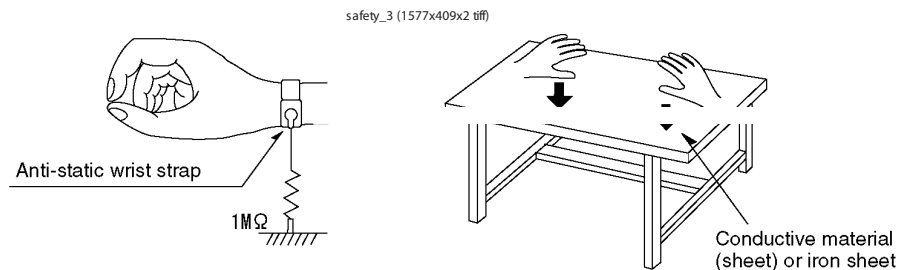
Some devices such as the DVD player use the optical pickup (laser diode) and the optical pickup will be damaged by ststic electricity in the working enviroment. Proceed servicing works under the working enviroment where grounding works is completed.

### 2. Worktable grounding

Put a conductive material sheet on the area where the optical pickup is placed, and ground the sheet.

### 3. Human body grounding

Use the anti-static wrist strap to discharge the static electricity from your body.



### 4. Handling of optical pickup

5. To keep the good quality of the optical pickup maintenance parts during transportation and before installation, the both ends of the laser diode are short-circuited.After replacing the parts with new ones, remove the short circuit according to the correct procedure. (See this Technical Guide).

6. Do not use a tester to check the laser diode for the optical pickup .This will damage the laser diode due to the power supply in the tester.

### 7. Handling precautions for Traverse Unit (Optical Pickup)

8. Do not give a considerable shock to the traverse unit(optical pickup)as it has an extremely high-precise structure.

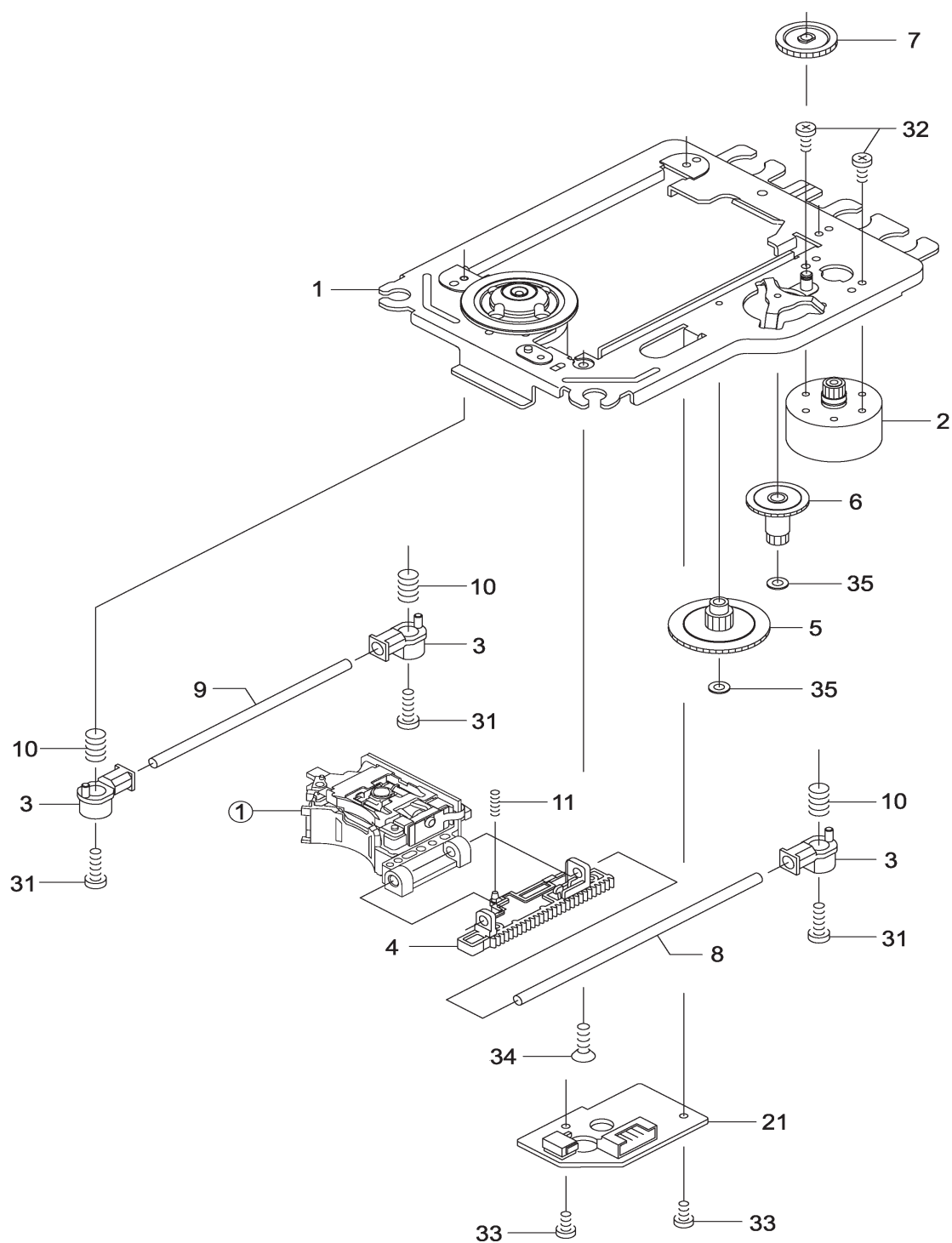
9. When replacing the optical pickup, install the flexible cable and cut is short land with a nipper. See the optical pickup replacement procedure in this Technical Guide. Before replacing the traverse unit, remove the short pin for preventingstatic electricity and install a new unit. Connect the connector as quickley as possible.

10. The flexible cable may be cut off if an excessive force is applied to it. Use caution when handling the cable.

11. The half-fixed resistor for laser power adjustment cannot be adjusted. Do not turn the resistor.

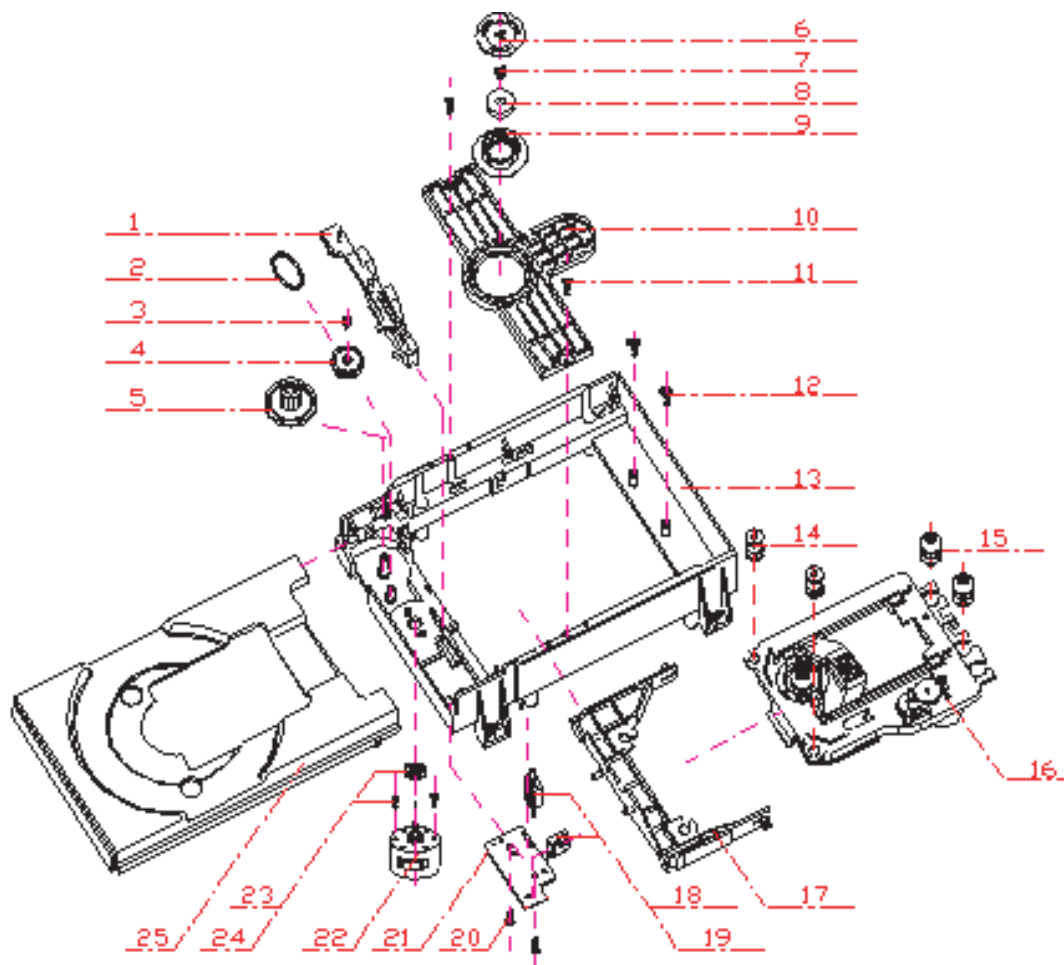
## Prevention of Static Electricity Discharge

## Cambridge Audio DVD89 DVD Player



**Mechanism Unit Exploded Diagram**

## Cambridge Audio DVD89 DVD Player

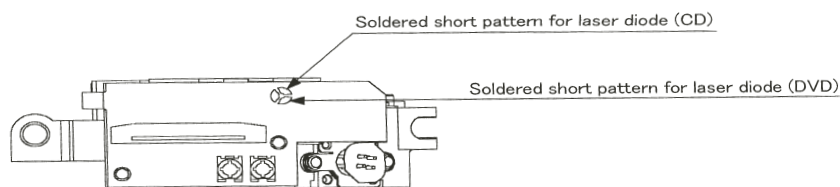


- |                                   |                          |
|-----------------------------------|--------------------------|
| 1) Bracket                        | 14) Front Silicon Rubber |
| 2) Belt                           | 15) Back Silicon Rubber  |
| 3) Screw                          | 16) Pick Up              |
| 4) Belt Wheel                     | 17) Pick Up              |
| 5) Gear Wheel                     | 18) Switch               |
| 6) Iron Chip                      | 19) Five Pin Flat Plug   |
| 7) Immobility Mechanism Equipment | 20) Screw                |
| 8) Magnet                         | 21) PCB                  |
| 9) Platen                         | 22) Motor                |
| 10) Bridge Bracket                | 23) Moto Wheel           |
| 11) Screw                         | 24) Screw                |
| 12) Screw                         | 25) Tray                 |
| 13) Big Bracket                   |                          |

**Bracket Exploded View and Parts List**

# Cambridge Audio DVD89 DVD Player

## Laser Diode Protection Shorts (Replacement Parts)



### Cautions on assembly and adjustment

Make sure that the workbenches, jigs, tips, tips of soldering irons and measuring instruments are grounded, and that personnel wear wrist straps for ground.

For replacement optical pickups open the LD short lands quickly with a soldering iron after circuit is connected.

Refrain from operation and storage in atmospheres containing corrosive gases (such as  $H_2S$ ,  $SO_2$ ,  $NO_2$  and  $Cl_2$ ) or toxic gases or in locations containing substances (especially from the organic silicon, cyan, formalin and phenol groups) which emit toxic gases. It is particularly important to ensure that none of the above substances are present inside the unit. Otherwise, the motor may no longer run.

## Protection of the Laser Diode



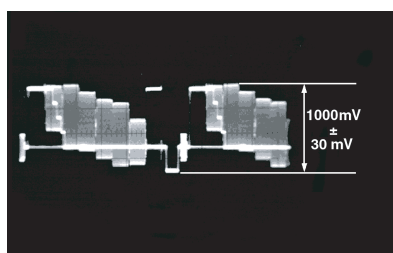
## Cambridge Audio DVD89 DVD Player

Do these confirmations after replacing a P.C.B. - (Luminance Signal)

| Measurement point          | Mode                                                                | Disc |
|----------------------------|---------------------------------------------------------------------|------|
| Video output terminal      | Color bar 75%<br>PLAY(Title 46):DVDT-S15<br>PLAY(Title 12):DVDT-S01 |      |
| Measuring equipment,tools  | Confirmation value                                                  |      |
| 200mV/dir,10 $\mu$ sec/dir | 1000mVp-p $\pm$ 30mV                                                |      |

Purpose:To maintain video signal output compatibility.

- 1.Connect the oscilloscope to the video output terminal and terminate at 75 ohm.
- 2.Confirm that luminance signal(Y+S)level is 1000mVp-p $\pm$ 30mV

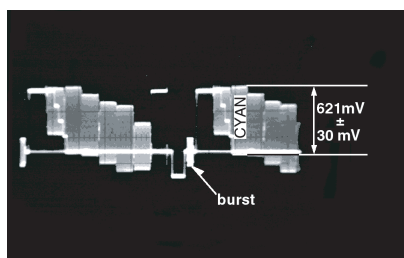


(Chrominance Signal)

| Measurement point                                      | Mode                                                                | Disc |
|--------------------------------------------------------|---------------------------------------------------------------------|------|
| Video output terminal                                  | Color bar 75%<br>PLAY(Title 46):DVDT-S15<br>PLAY(Title 12):DVDT-S01 |      |
| Measuring equipment,tools                              | Confirmation value                                                  |      |
| Screwdriver,Oscilloscope<br>200mV/dir,10 $\mu$ sec/dir | 621mVp-p $\pm$ 30mV                                                 |      |

Purpose:To maintain video signal output compatibility.

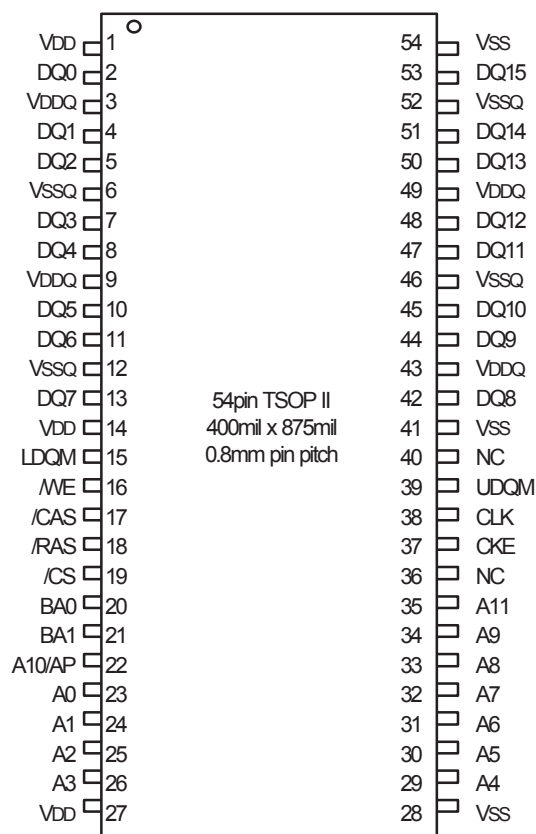
- 1.Connect the oscilloscope to the video output terminal and terminate at 75 ohm.
- 2.Confirm that the chrominance signal(C)level is 621 mVp-p $\pm$ 30mV



## Video Output Confirmations - Luminance & Chrominance Signal

# Cambridge Audio DVD89 DVD Player

## PIN CONFIGURATION

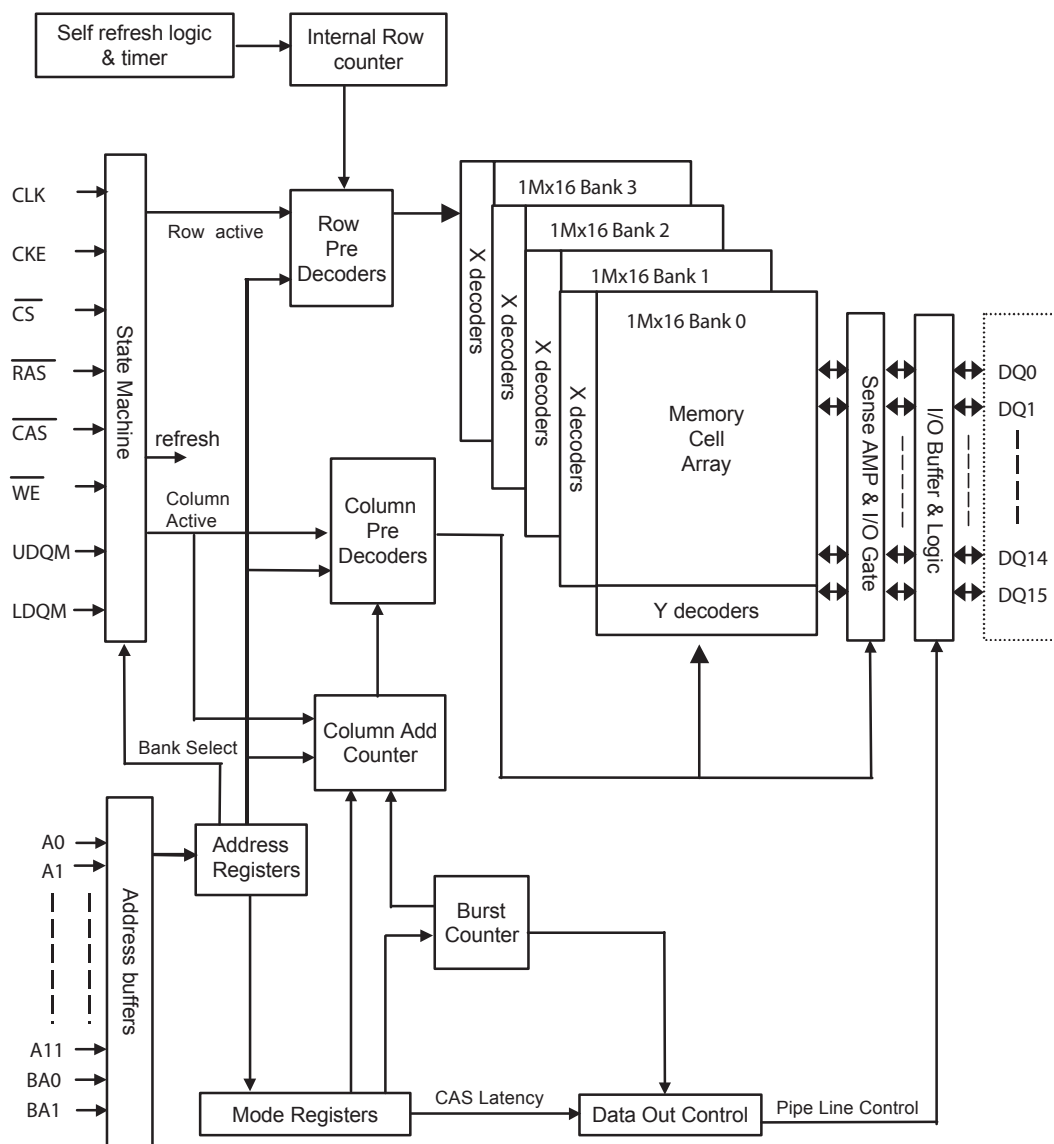


## PIN DESCRIPTION

| PIN                                                   | PIN NAME                                                      | DESCRIPTION                                                                                                                        |
|-------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| CLK                                                   | Clock                                                         | The system clock input. All other inputs are registered to the SDRAM on the rising edge of CLK                                     |
| CKE                                                   | Clock Enable                                                  | Controls internal clock signal and when deactivated, the SDRAM will be one of the states among power down, suspend or self refresh |
| $\overline{CS}$                                       | Chip Select                                                   | Enables or disables all inputs except CLK, CKE and DQM                                                                             |
| BA0,BA1                                               | Bank Address                                                  | Selects bank to be activated during $\overline{RAS}$ activity<br>Selects bank to be read/written during CAS activity               |
| A0 ~ A11                                              | Address                                                       | Row Address : RA0 ~ RA11, Column Address : CA0 ~ CA7<br>Auto-precharge flag : A10                                                  |
| $\overline{RAS}$ , $\overline{CAS}$ , $\overline{WE}$ | Row Address Strobe,<br>Column Address Strobe,<br>Write Enable | $\overline{RAS}$ , $\overline{CAS}$ and $\overline{WE}$ define the operation<br>Refer function truth table for details             |
| LDQM, UDQM                                            | Data Input/Output Mask                                        | Controls output buffers in read mode and masks input data in write mode                                                            |
| DQ0 ~ DQ15                                            | Data Input/Output                                             | Multiplexed data input / output pin                                                                                                |
| VDD/VSS                                               | Power Supply/Ground                                           | Power supply for internal circuits and input buffers                                                                               |
| VDDQ/VSSQ                                             | Data Output Power/Ground                                      | Power supply for output buffers                                                                                                    |
| NC                                                    | No Connection                                                 | No connection                                                                                                                      |

# Cambridge Audio DVD89 DVD Player

1Mbit x 4banks x 16 I/O Synchronous DRAM



(U211) HY57V64I620HG Functional Block Diagram

## Cambridge Audio DVD89 DVD Player

| Pin number                                                                                                                                                                                                                                                                | Symbol     | Type  | Description                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|------------------------------------------------------------------------------------------------------------------------|
| 1                                                                                                                                                                                                                                                                         | DVSS       | GND   | Digital ground                                                                                                         |
| 2-9                                                                                                                                                                                                                                                                       | C0-C7      | I, PD | Normal : Digital chroma input<br>VDAC test : DAC test mode [0:7] input.<br>BIST mode : BIST data input                 |
| 10                                                                                                                                                                                                                                                                        | DVDD33     | VDD   | Digital power, 3.3V                                                                                                    |
| 11                                                                                                                                                                                                                                                                        | VCK        | I     | Clock of digital video input                                                                                           |
| 12                                                                                                                                                                                                                                                                        | DVSS       | GND   | Digital ground                                                                                                         |
| 13-20                                                                                                                                                                                                                                                                     | Y0-Y7      | I, PD | Normal : Digital luma input<br>VDAC test : DAC test data [0:7] input.<br>BIST mode : BIST address input                |
| 21                                                                                                                                                                                                                                                                        | SSCK       | I     | Normal : Slave serial interface clock input<br>SCAN mode : scan reset, active low                                      |
| 22                                                                                                                                                                                                                                                                        | SSD        | IO    | Slave serial interface data input/output                                                                               |
| 23                                                                                                                                                                                                                                                                        | DVDD18     | VDD   | Power of digital core, 1.8V                                                                                            |
| 24                                                                                                                                                                                                                                                                        | PWDN#      | I, PU | Power down, active low                                                                                                 |
| 25                                                                                                                                                                                                                                                                        | RST#       | I, PU | Reset, active low                                                                                                      |
| 26                                                                                                                                                                                                                                                                        | XTAL       | I     | Normal : clock input<br>VDAC test: VDAC test clock input                                                               |
| 27                                                                                                                                                                                                                                                                        | INT        | O     | Interrupt output                                                                                                       |
| 28                                                                                                                                                                                                                                                                        | DVSS       | GND   | Digital ground                                                                                                         |
| 29                                                                                                                                                                                                                                                                        | A7/GPO0    | IO,PD | Power On: Serial interface address 7<br>BIST mode : SRAM fail output<br>Normal : General purpose output                |
| 30                                                                                                                                                                                                                                                                        | A6/GPO1    | IO,PD | Power On: Serial interface address 6<br>BIST mode : SRAM fail output<br>Normal : General purpose output                |
| 31                                                                                                                                                                                                                                                                        | TRAP2/GP02 | IO,PD | Power On: Hardware trap bit 2<br>BIST mode : SRAM fail output<br>Normal : General purpose output                       |
|                                                                                                                                                                                                                                                                           | TRAP1/GP03 | IO,PD | Power On: Hardware trap bit 1<br>BIST mode : SRAM fail output<br>Normal : General purpose output                       |
|                                                                                                                                                                                                                                                                           | TRAP0/GP04 | IO,PD | Power On: Hardware trap bit 0<br>BIST mode : SRAM fail output<br>Normal : General purpose output                       |
| Trap Mode<br>bit    2    1    0<br>0    0    0    Normal, with master 12C disable<br>1    A1   A0   Normal, with master 12C enable<br>A(1:0) : EEPROM device address select<br>0    0    1    Test scan mode<br>0    1    0    VDAC test mode<br>0    1    1    BIST mode |            |       |                                                                                                                        |
| 34                                                                                                                                                                                                                                                                        | MSCK/GPO5  | O     | Master12C on : Master serial interface clock output<br>BIST mode : SRAM fail output<br>Normal : General purpose output |

## Cambridge Audio DVD89 DVD Player

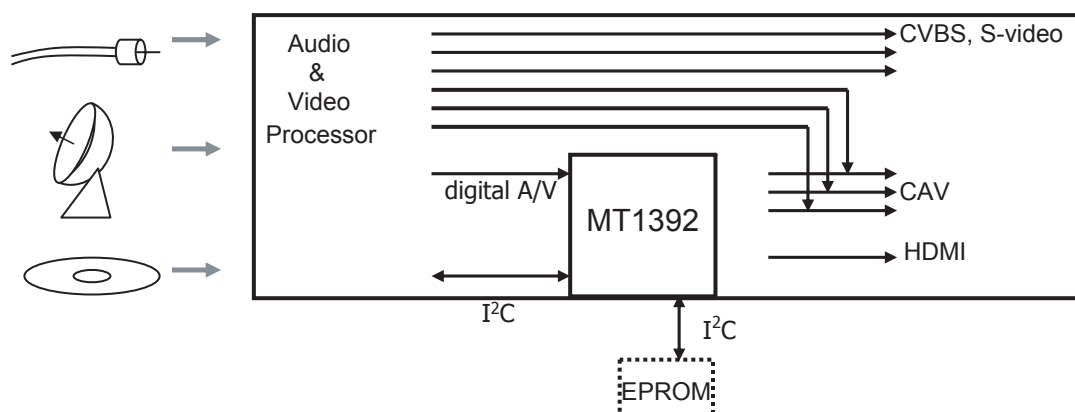
| Pin number | Symbol   | Type  | Description                                                                                                                          |
|------------|----------|-------|--------------------------------------------------------------------------------------------------------------------------------------|
|            | MSD/GPO6 | IO,PU | MasterI2C on : Master serial interface data input/output<br>BIST mode : SRAM fail output<br>Normal : General purpose output          |
| 36         | GPO7     | IO,PD | PowerON : EPROM word-address type. 1 : 16bit , 0 : 8bit<br>BIST mode : SRAM fail output<br>Normal : General purpose output           |
| 37         | GPIO8    | IO    | BIST mode : SRAM fail output<br>Normal : General purpose output / HDMI test input / down-mixed audio input                           |
| 38         | GPIO9    | IO    | BIST mode : SRAM fail output<br>Normal : General purpose output / V-sync inout / HDMI test input<br>VDAC test : PLL test enable      |
| 39         | GPIO10   | IO    | BIST mode : SRAM fail output<br>Normal : General purpose output / H-sync inout / HDMI test input<br>VDAC test : PLL test calibration |
| 40         | HTPLG    | I,PD  | HDMI Hot-Plug detection                                                                                                              |
| 41         | AVSS     | GND   | Analog ground                                                                                                                        |
| 42         | PLLC0    | A     | PLL Capacitor ground                                                                                                                 |
| 43         | PLLC1    | A     | PLL Capacitor                                                                                                                        |
| 44         | AVDD     | VDD   | Analog power, 3.3V                                                                                                                   |
| 45         | AVDD     | VDD   | Analog power, 3.3V                                                                                                                   |
| 46         | AVSS     | GND   | Analog Ground                                                                                                                        |
| 47         | AVSS     | GND   | Analog Ground                                                                                                                        |
| 48         | TCK-     | AO    | HDMI Tx clock                                                                                                                        |
| 49         | TCK+     | AO    | HDMI Tx clock                                                                                                                        |
| 50         | AVDD     | VDD   | Analog power, 3.3V                                                                                                                   |
| 51         | TX0-     | AO    | HDMI Tx channel 0                                                                                                                    |
| 52         | TX0+     | AO    | HDMI Tx channel 0                                                                                                                    |
| 53         | AVSS     | GND   | Analog Ground                                                                                                                        |
| 54         | TX1-     | AO    | HDMI Tx channel 1                                                                                                                    |
| 55         | TX1+     | AO    | HDMI Tx channel 1                                                                                                                    |
| 56         | AVDD     | VDD   | Analog power, 3.3V                                                                                                                   |
| 57         | TX2-     | AO    | HDMI Tx channel 2                                                                                                                    |
| 58         | TX2+     | AO    | HDMI Tx channel 2                                                                                                                    |
| 59         | AVSS     | GND   | Analog Ground                                                                                                                        |
| 60         | SWING    | AI    | HDMI output swing adjustment                                                                                                         |
| 61         | AVDD     | VDD   | Power of DAC, 3.3V                                                                                                                   |
| 62         | VREF     | A     | Voltage reference of DAC                                                                                                             |
| 63         | FS       | A     | DAC full scale adjustment                                                                                                            |
| 64         | AVSS     | GND   | Ground of DAC                                                                                                                        |
| 65         | AVDD     | VDD   | Power of DAC, 3.3V                                                                                                                   |
| 66         | AVSS     | GND   | Ground of DAC                                                                                                                        |
| 67         | AVDD     | VDD   | Power of DAC, 3.3V                                                                                                                   |
| 68         | G        | AO    | Component analog video output Y/Green                                                                                                |
| 69         | AVSS     | GND   | Ground of DAC                                                                                                                        |
| 70         | B        | AO    | Component analog video output Cb/Blue                                                                                                |
| 71         | R        | AO    | Component analog video output Cr/Red                                                                                                 |

## Cambridge Audio DVD89 DVD Player

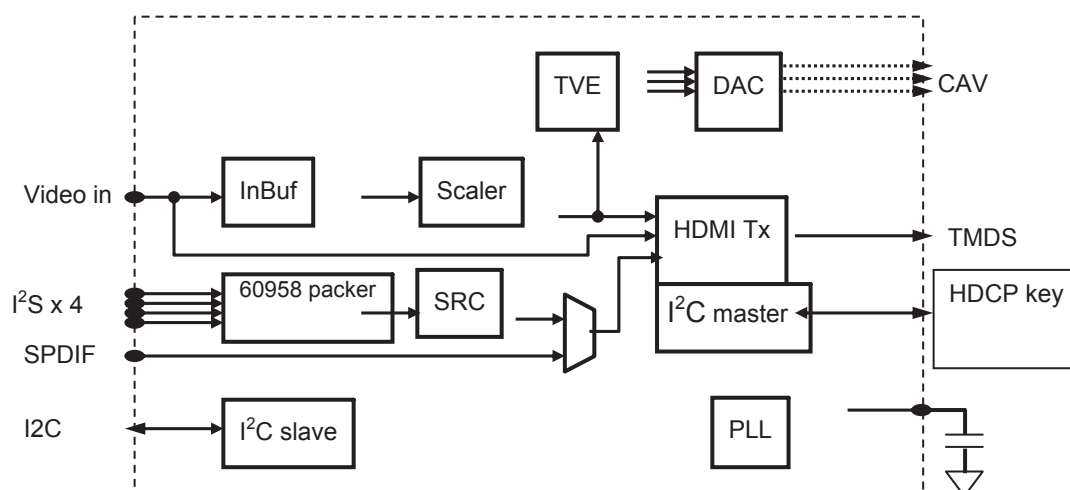
| Pin number | Symbol | Type | Description                                                                                                                                 |
|------------|--------|------|---------------------------------------------------------------------------------------------------------------------------------------------|
|            | SPDIF  | I    | Normal : S/PDIF audio input<br>SCAN mode : test_se input<br>VDAC test : VDAC test reset, active low.<br>BIST mode : BIST reset, active low. |
| 73         | AD3    | I    | Normal : I <sup>2</sup> S data of channel 6/7<br>VDAC test : VDAC test data bit 11 input                                                    |
| 74         | AD2    | I    | Normal : I <sup>2</sup> S data of channel 4/5<br>VDAC test : VDAC test data bit 10 input<br>BIST mode : BIST reset, active low              |
| 75         | AD1    | I    | Normal : I <sup>2</sup> S data of channel 2/3<br>VDAC test : VDAC test data bit 9 input<br>BIST mode : BIST verify pulse                    |
| 76         | AD0    | I    | Normal : I <sup>2</sup> S data of channel 0/1<br>VDAC test : VDAC test data bit 8 input<br>BIST mode : BIST write pulse                     |
| 77         | ACK    | I    | Normal : S/PDIF clock<br>VDAC test : VDAC test reset, active high.                                                                          |
| 78         | ABCK   | I    | I <sup>2</sup> S bit clock                                                                                                                  |
| 79         | ALRCK  | I    | I <sup>2</sup> S Left/Right channel flag                                                                                                    |
| 80         | DVDD18 | VDD  | Power of digital core, 1.8V                                                                                                                 |

# Cambridge Audio DVD89 DVD Player

## SYSTEM CONFIGURATION



## FUNCTIONAL BLOCK



## Cambridge Audio DVD89 DVD Player

### InBuf

Accept digital video signal such as CCIR656/CCIR601 for 480i and 576i, SMPTE-293 for 480p and 576p, 720p and 1080i.

Extract Hsync/Vsync from incoming CCIR656 and SMPTE-293 video signal.

Arbitrary ratio horizontal scaling, which converts standard-definition video (i.e. 480i, 480p, 576i, 576p) to high-definition video (i.e. 720p, 1080i).

### TVE

Encode 480p, 576p, 720p or 1080i video into component analog video, in Y/Cr/Cb or R/G/B format.

### 60958 Packer

Pack 8 channel I<sup>2</sup>S audio data into 60985-like data format. for HDMI transmitter

### Audio SRC

Convert the sampling rate of stereo I<sup>2</sup>S audio.

### I<sup>2</sup>C slave

Serial interface to host.

### HDMI Transmitter

Fully backward-compatible with DVI, and compliant with HDMI 1.0, DVI1.0, EIA/CEA-861B, HDCP 1.1  
Integrate High-Bandwidth Content Protection (HDCP 1.1) for both video and audio.

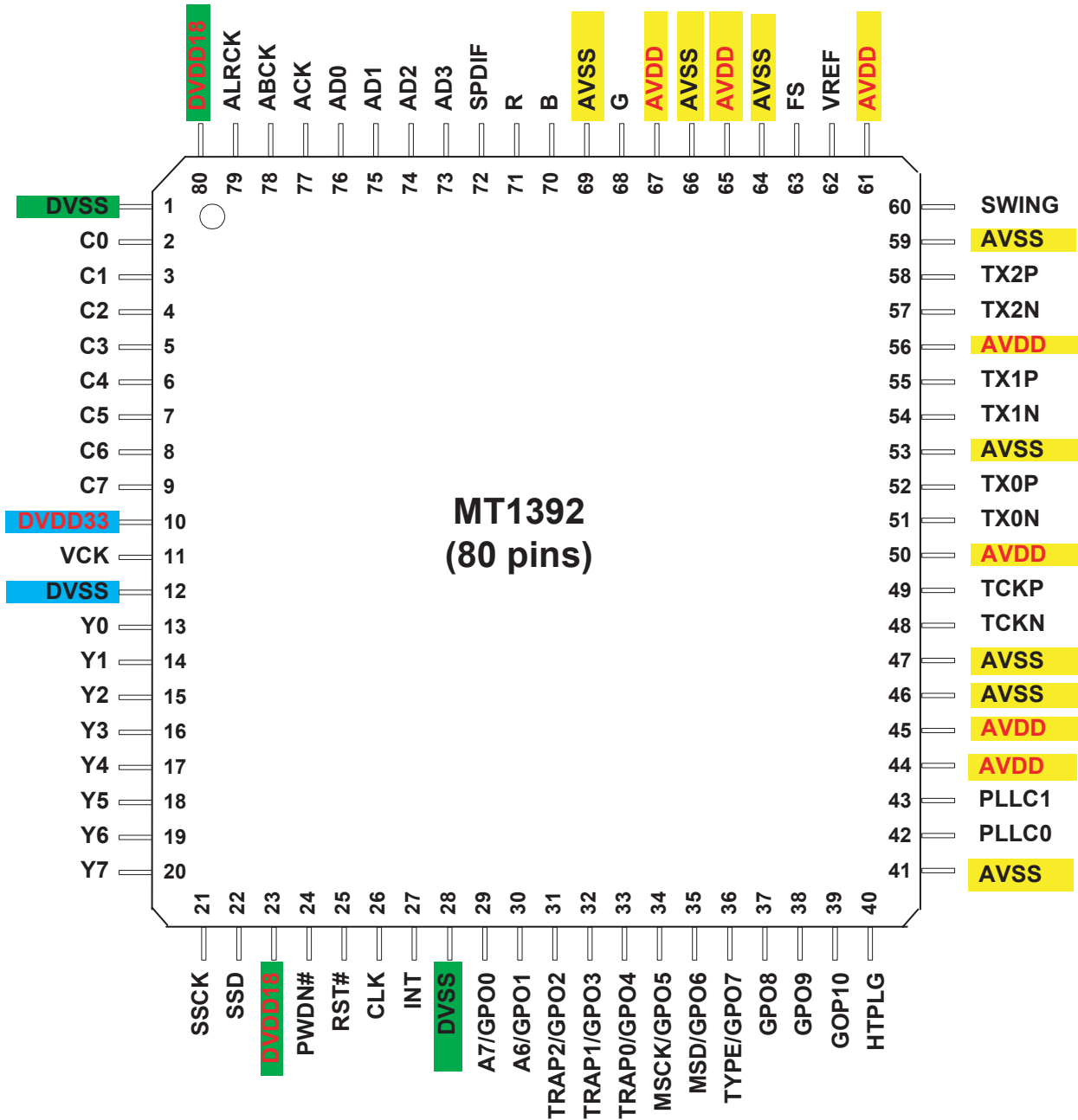
Use an I<sup>2</sup>C master interface to load HDCP keyset from external EPROM. HDCP keyset can also be sent from host through I<sup>2</sup>C slave interface.

### PLL

Input frequency 27MHz or 54MHz, output frequency 74.25MHz or 74.176MHz.

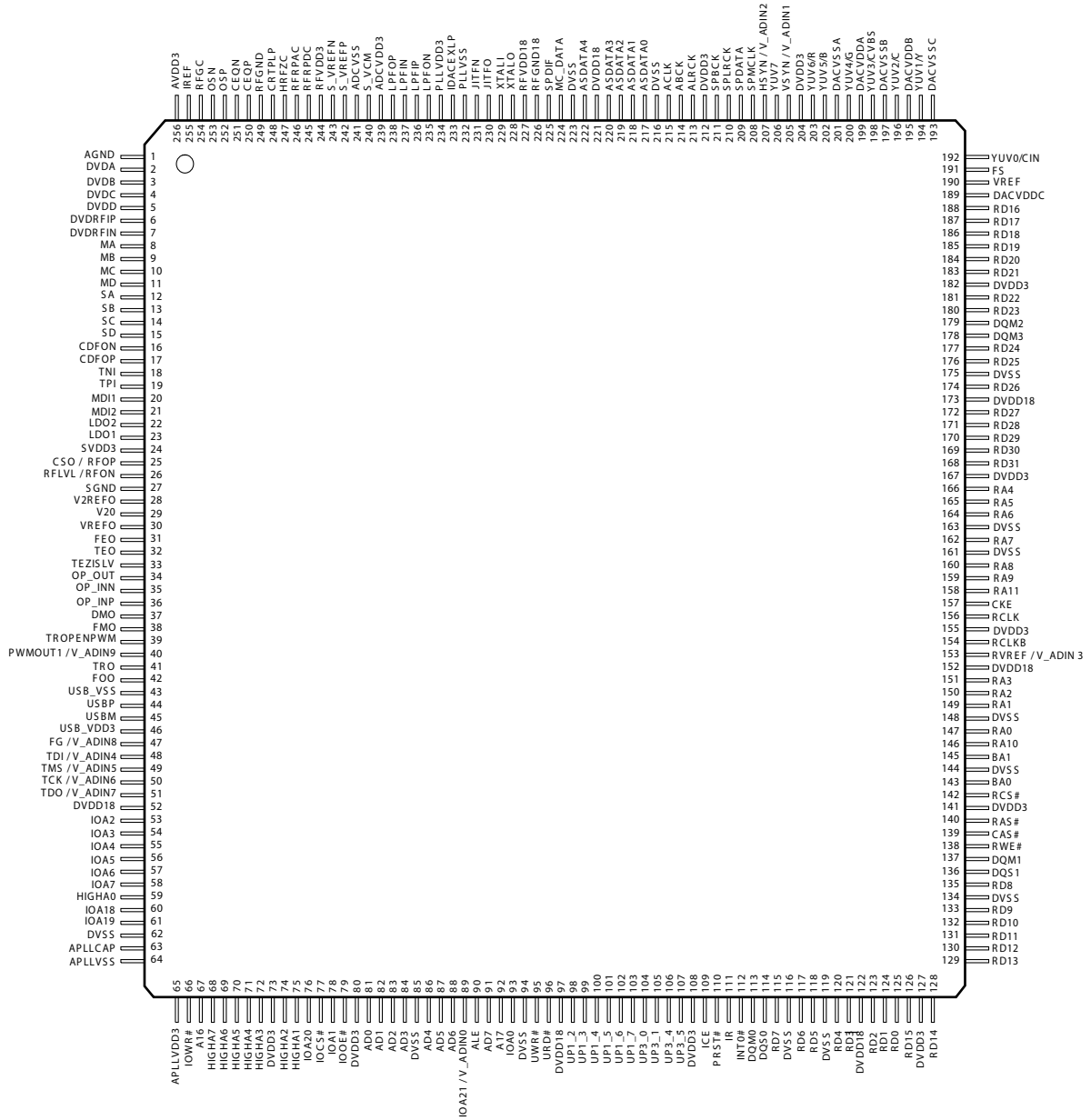


Cambridge Audio DVD89 DVD Player



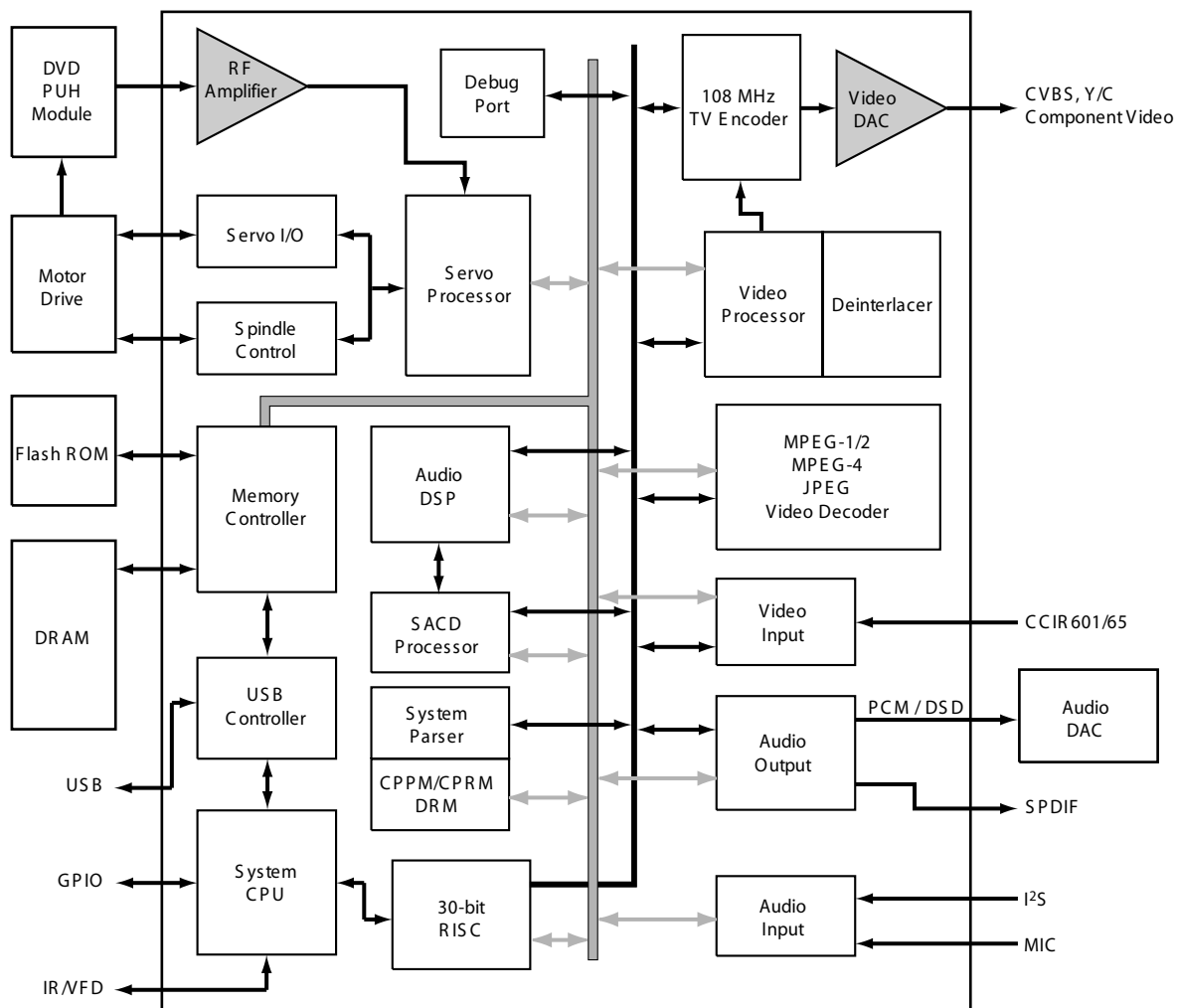
(U203) MT1392 Pinout Diagram

# Cambridge Audio DVD89 DVD Player



(U201) MT1389 Pinout Diagram

## Cambridge Audio DVD89 DVD Player



(U201) MT1389 Block Diagram

# Cambridge Audio DVD89 DVD Player

## ■ RF Interface (28)

| No. | Name    | Alt. | I/O           | Function                                                                                                                    |
|-----|---------|------|---------------|-----------------------------------------------------------------------------------------------------------------------------|
| 226 | RFGND18 |      | Ground        | Analog ground                                                                                                               |
| 227 | RFVDD18 |      | Power         | Analog power 1.8V                                                                                                           |
| 250 | CEQP    |      | Analog output | EQ offset loop capacitance                                                                                                  |
| 251 | CEQN    |      | Analog output | EQ offset loop capacitance                                                                                                  |
| 252 | OSP     |      | Analog output | RF Offset cancellation capacitor connecting                                                                                 |
| 253 | OSN     |      | Analog output | RF Offset cancellation capacitor connecting                                                                                 |
| 254 | RFGC    |      | Analog output | RF AGC loop capacitor connecting for DVD-ROM                                                                                |
| 255 | IREF    |      | Analog Input  | Current reference input. It generates reference current for RF path. Connect an external 15K resistor to this pin and AVSS. |
| 256 | AVDD3   |      | Power         | Analog power 3.3V                                                                                                           |
| 1   | AGND    |      | Ground        | Analog ground                                                                                                               |
| 2   | DVDA    |      | Analog Input  | AC coupled input path A                                                                                                     |
| 3   | DVDB    |      | Analog Input  | AC coupled input path B                                                                                                     |
| 4   | DVDC    |      | Analog Input  | AC coupled input path C                                                                                                     |
| 5   | DVDD    |      | Analog Input  | AC coupled input path D                                                                                                     |
| 6   | DVDRFIP |      | Analog Input  | AC coupled DVD RF signal input RFIP                                                                                         |
| 7   | DVDRFIN |      | Analog Input  | AC coupled DVD RF signal input RFIN                                                                                         |
| 8   | MA      |      | Analog Input  | DC coupled main-beam RF signal input A                                                                                      |
| 9   | MB      |      | Analog Input  | DC coupled main-beam RF signal input B                                                                                      |
| 10  | MC      |      | Analog Input  | DC coupled main-beam RF signal input C                                                                                      |
| 11  | MD      |      | Analog Input  | DC coupled main-beam RF signal input D                                                                                      |
| 12  | SA      |      | Analog Input  | DC coupled sub-beam RF signal input A                                                                                       |
| 13  | SB      |      | Analog Input  | DC coupled sub-beam RF signal input B                                                                                       |
| 14  | SC      |      | Analog Input  | DC coupled sub-beam RF signal input C                                                                                       |
| 15  | SD      |      | Analog Input  | DC coupled sub-beam RF signal input D                                                                                       |
| 16  | CDFON   |      | Analog Input  | CD focusing error negative input                                                                                            |
| 17  | CDFOP   |      | Analog Input  | CD focusing error positive input                                                                                            |
| 18  | TNI     |      | Analog Input  | 3 beam satellite PD signal negative input                                                                                   |
| 19  | TPI     |      | Analog Input  | 3 beam satellite PD signal positive input                                                                                   |

## ■ ALPC (4)

| No. | Name | Alt. | I/O           | Function                  |
|-----|------|------|---------------|---------------------------|
| 20  | MDI1 |      | Analog Input  | Laser power monitor input |
| 21  | MDI2 |      | Analog Input  | Laser power monitor input |
| 22  | LDO2 |      | Analog Output | Laser driver output       |
| 23  | LDO1 |      | Analog Output | Laser driver output       |

## ■ ADC for S&CD (5)

| No. | Name    | Alt. | I/O          | Function                    |
|-----|---------|------|--------------|-----------------------------|
| 239 | ADCVDD3 |      | Power        | Analog 3.3V Power for ADC   |
| 240 | S_VCM   |      | Analog Inout | S&CD- Common mode reference |
| 241 | ADCVSS  |      | Ground       | Analog ground for ADC       |
| 242 | S_VREFP |      | Analog Inout | S&CD- TOP Reference         |
| 243 | S_VREFN |      | Analog Inout | S&CD- Bottom Reference      |

## ■ Reference Voltage (3)

| No. | Name   | Alt. | I/O           | Function               |
|-----|--------|------|---------------|------------------------|
| 28  | V2REFO |      | Analog output | Reference voltage 2.8V |
| 29  | V20    |      | Analog output | Reference voltage 2.0V |
| 30  | VREFO  |      | Analog output | Reference voltage 1.4V |

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### ■ Analog Monitor Output (7)

| No. | Name    | Alt. | I/O           | Function                                            |
|-----|---------|------|---------------|-----------------------------------------------------|
| 24  | SVDD3   |      | Power         | Analog power 3.3V                                   |
| 25  | CSO     | RFOP | Analog output | Central servo Positive main beam summing output     |
| 26  | RFLVL   | RFON | Analog output | RFRP low pass, or Negative main beam summing output |
| 27  | SGND    |      | Ground        | Analog ground                                       |
| 31  | FEO     |      | Analog output | Focus error monitor output                          |
| 32  | TEO     |      | Analog output | Tracking error monitor output                       |
| 33  | TEZISLV |      | Analog output | TE Slicing Level                                    |

### ■ Analog Servo Interface (6)

| No. | Name   | Alt. | I/O           | Function                                    |
|-----|--------|------|---------------|---------------------------------------------|
| 244 | RFVDD3 |      | Power         | Analog Power                                |
| 245 | RFRPDC |      | Analog output | RF ripple detect output                     |
| 246 | RFRPAC |      | Analog Input  | RF ripple detect input(through AC-coupling) |
| 247 | HRFZC  |      | Analog Input  | High frequency RF ripple zero crossing      |
| 248 | CRTPLP |      | Analog output | Defect level filter capacitor connecting    |
| 249 | RFGND  |      | Ground        | Analog Ground                               |

### ■ RF Data PLL Interface (9)

| No. | Name     | Alt. | I/O           | Function                                              |
|-----|----------|------|---------------|-------------------------------------------------------|
| 230 | JITFO    |      | Analog output | The output terminal of RF jitter meter.               |
| 231 | JITFN    |      | Analog Input  | The input terminal of RF jitter meter.                |
| 232 | PLLVS    |      | Ground        | Ground pin for data PLL and related analog circuitry. |
| 233 | IDACEXLP |      | Analog output | Data PLL DAC Low-pass filter                          |
| 234 | PLLVDD3  |      | Power         | Power pin for data PLL and related analog circuitry.  |
| 235 | LPFON    |      | Analog Output | The negative output of loop filter amplifier          |
| 236 | LPFIP    |      | Analog Input  | The positive input terminal of loop filter amplifier. |
| 237 | LPFIN    |      | Analog Input  | The negative input terminal of loop filter amplifier. |
| 238 | LPFOP    |      | Analog Output | The positive output of loop filter amplifier          |

### ■ Motor and Actuator Driver Interface (10)

| No. | Name             | Alt.    | I/O                                                                          | Function                                                         |
|-----|------------------|---------|------------------------------------------------------------------------------|------------------------------------------------------------------|
| 34  | OP_OUT           |         | Analog output                                                                | Op amp output.                                                   |
| 35  | OP_INN           |         | Analog input                                                                 | Op amp negative input                                            |
| 36  | OP_INP           |         | Analog input                                                                 | Op amp positive input                                            |
| 37  | DMO              |         | Analog Output                                                                | Disk motor control output. PWM output.                           |
| 38  | FMO              |         | Analog Output                                                                | Feed motor control. PWM output.                                  |
| 39  | TROPENPWM        |         | Analog Output                                                                | Tray PWM output / Tray open output.                              |
| 40  | PWMOUT1          | V_ADIN9 | Analog Output                                                                | 1st General PWM output, or Version AD input 9                    |
| 41  | TRO              |         | Analog Output                                                                | Tracking servo output. PDM output of tracking servo compensator. |
| 42  | FOO              |         | Analog Output                                                                | Focus servo output. PDM output of focus servo compensator        |
| 47  | FG (Digital pin) | V_ADIN8 | LVTTL 3.3V Input, Schmitt Input, pull-up, with analog input path for V_ADIN8 | Motor Hall sensor input, or Version AD input 8                   |

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### ■ General Power / Ground (32)

| No.                                             | Name     | Alt. | I/O          | Function                                        |
|-------------------------------------------------|----------|------|--------------|-------------------------------------------------|
| 52, 97, 122,<br>152, 173, 221                   | DVDD18   |      | Power        | 1.8V power pin for internal digital circuitry   |
| 85, 116, 144,<br>163, 216                       | DVSS     |      | Ground       | 1.8V Ground pin for internal digital circuitry  |
| 73, 80, 108,<br>127, 141, 155,<br>167, 182, 212 | DVDD3    |      | Power        | 3.3V power pin for internal digital circuitry   |
| 62, 94, 119,<br>134, 148, 161,<br>175, 223      | DVSS     |      | Ground       | 3.3V Ground pin for internal digital circuitry  |
| 204                                             | DVDD3    |      | Power        | 3.3V power pin Video DAC digital circuitry only |
| 63                                              | APLLCAP  |      | Analog Inout | APLL External Capacitance connection            |
| 64                                              | APLLVSS  |      | Ground       | Ground pin for audio clock circuitry            |
| 65                                              | APLLVDD3 |      | Power        | 3.3V Power pin for audio clock circuitry        |

### ■ Micro Controller and Flash Interface (48)

| No. | Name   | Alt.    | I/O                       | Function                                                                                          |
|-----|--------|---------|---------------------------|---------------------------------------------------------------------------------------------------|
| 59  | HIGHA0 |         | Inout, 2-16MA, SR, PU     | Microcontroller address 8                                                                         |
| 75  | HIGHA1 |         | Inout, 2-16MA, SR, PU     | Microcontroller address 9                                                                         |
| 74  | HIGHA2 |         | Inout, 2-16MA, SR, PU     | Microcontroller address 10                                                                        |
| 72  | HIGHA3 |         | Inout, 2-16MA, SR, PU     | Microcontroller address 11                                                                        |
| 71  | HIGHA4 |         | Inout, 2-16MA, SR, PU     | Microcontroller address 12                                                                        |
| 70  | HIGHA5 |         | Inout, 2-16MA, SR, PU     | Microcontroller address 13                                                                        |
| 69  | HIGHA6 |         | Inout, 2-16MA, SR, PU     | Microcontroller address 14                                                                        |
| 68  | HIGHA7 |         | Inout, 2-16MA, SR, PU     | Microcontroller address 15                                                                        |
| 91  | AD7    |         | Inout, 2-16MA, SR         | Microcontroller address/data 7                                                                    |
| 88  | AD6    |         | Inout, 2-16MA, SR         | Microcontroller address/data 6                                                                    |
| 87  | AD5    |         | Inout, 2-16MA, SR         | Microcontroller address/data 5                                                                    |
| 86  | AD4    |         | Inout, 2-16MA, SR         | Microcontroller address/data 4                                                                    |
| 84  | AD3    |         | Inout, 2-16MA, SR         | Microcontroller address/data 3                                                                    |
| 83  | AD2    |         | Inout, 2-16MA, SR         | Microcontroller address/data 2                                                                    |
| 82  | AD1    |         | Inout, 2-16MA, SR         | Microcontroller address/data 1                                                                    |
| 81  | AD0    |         | Inout, 2-16MA, SR         | Microcontroller address/data 0                                                                    |
| 93  | IOA0   |         | Inout, 2-16MA, SR, PU     | Microcontroller address 0 / IO                                                                    |
| 78  | IOA1   |         | Inout, 2-16MA, SR, PU     | Microcontroller address 1 / IO                                                                    |
| 53  | IOA2   |         | Inout, 2-16MA, SR, PU     | Microcontroller address 2 / IO                                                                    |
| 54  | IOA3   |         | Inout, 2-16MA, SR, PU     | Microcontroller address 3 / IO                                                                    |
| 55  | IOA4   |         | Inout, 2-16MA, SR, PU     | Microcontroller address 4 / IO                                                                    |
| 56  | IOA5   |         | Inout, 2-16MA, SR, PU     | Microcontroller address 5 / IO                                                                    |
| 57  | IOA6   |         | Inout, 2-16MA, SR, PU     | Microcontroller address 6 / IO                                                                    |
| 58  | IOA7   |         | Inout, 2-16MA, SR, PU     | Microcontroller address 7 / IO                                                                    |
| 67  | A16    |         | Output, 2-16MA, SR        | Flash address 16                                                                                  |
| 92  | A17    |         | Output, 2-16MA, SR        | Flash address 17                                                                                  |
| 60  | IOA18  |         | Inout, 2-16MA, SR, SMT    | Flash address 18 / IO                                                                             |
| 61  | IOA19  |         | Inout, 2-16MA, SR, SMT    | Flash address 19 / IO                                                                             |
| 76  | IOA20  |         | Inout, 2-16MA, SR, SMT    | Flash address 20 / IO                                                                             |
| 89  | IOA21  | V_ADIN0 | Inout, 2-16MA,<br>SR, SMT | Flash address 21 / IO<br>While External FLASH size <= 2MB:<br>Version AD input port 0, or<br>GPIO |

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| No. | Name  | Alt.    | I/O                           | Function                                                                      |
|-----|-------|---------|-------------------------------|-------------------------------------------------------------------------------|
| 90  | ALE   |         | Inout, 2-16MA,<br>SR, PU, SMT | Microcontroller address latch enable                                          |
| 79  | IOOE# |         | Inout, 2-16MA, SR, SMT        | Flash output enable, active low / IO                                          |
| 66  | IOWR# |         | Inout, 2-16MA, SR, SMT        | Flash write enable, active low / IO                                           |
| 77  | IOCS# |         | Inout, 2-16MA,<br>SR, PU, SMT | Flash chip select, active low / IO                                            |
| 95  | UWR#  |         | Inout, 2-16MA,<br>SR, PU, SMT | Microcontroller write strobe, active low                                      |
| 96  | URD#  |         | Inout, 2-16MA,<br>SR, PU, SMT | Microcontroller read strobe, active low                                       |
| 98  | UP1_2 |         | Inout, 4MA, SR, PU, SMT       | Microcontroller port 1-2                                                      |
| 99  | UP1_3 |         | Inout, 4MA, SR, PU, SMT       | Microcontroller port 1-3                                                      |
| 100 | UP1_4 |         | Inout, 4MA, SR, PU, SMT       | Microcontroller port 1-4                                                      |
| 101 | UP1_5 |         | Inout, 4MA, SR, PU, SMT       | Microcontroller port 1-5                                                      |
| 102 | UP1_6 | SCL     | Inout, 4MA, SR, PU, SMT       | Microcontroller port 1-6<br>I <sup>2</sup> C clock pin                        |
| 103 | UP1_7 | SDA     | Inout, 4MA, SR, PU, SMT       | Microcontroller port 1-7<br>I <sup>2</sup> C data pin                         |
| 104 | UP3_0 | RXD     | Inout, 4MA, SR, PU, SMT       | Microcontroller port 3-0<br>8032 RS232 RXD                                    |
| 105 | UP3_1 | TXD     | Inout, 4MA, SR, PU, SMT       | Microcontroller port 3-1<br>8032 RS232 TXD                                    |
| 106 | UP3_4 | RXD SCL | Inout, 4MA, SR, PU, SMT       | Microcontroller port 3-4<br>Hardwired RD232 RXD<br>I <sup>2</sup> C clock pin |
| 107 | UP3_5 | TXD SDA | Inout, 4MA, SR, PU, SMT       | Microcontroller port 3-5<br>Hardwired RD232 TXD<br>I <sup>2</sup> C data pin  |
| 111 | IR    |         | Input, SMT                    | IR control signal input                                                       |
| 112 | INT0# |         | Inout, 2-16MA,<br>SR, PU, SMT | Microcontroller external interrupt 0, active low                              |

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### ■ Audio Interface (14)

| No. | Name    | Alt.             | I/O                            | Function                                                                                                                                                                                                                                                    |
|-----|---------|------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 208 | SPMCLK  | SCLK0            | Inout                          | Audio DAC master clock of SPDIF input<br>While SPDIF input is not used:<br>Serial interface port 0 clock pin<br>GPIO                                                                                                                                        |
| 209 | SPDATA  | SDIN0            | Inout                          | Audio data of SPDIF input<br>While SPDIF input is not used:<br>Serial interface port 0 data-in<br>GPIO                                                                                                                                                      |
| 210 | SPLRCK  | SDO0             | Inout                          | Audio left/right channel clock of SPDIF input<br>While SPDIF input is not used:<br>Serial interface port 0 data-out<br>GPIO                                                                                                                                 |
| 211 | SPBCK   | SDCS0<br>ASDATA5 | Inout                          | Audio bit clock of SPDIF input<br>While SPDIF input is not used:<br>Serial interface port 0 chip select<br>Audio serial data 5 part I : DSD data sub-woofer<br>channel or Microphone output<br>GPIO                                                         |
| 213 | ALRCK   |                  | Inout<br>4MA, PD, SMT          | Audio left/right channel clock<br>Trap value in power-on reset:<br>1 : use external 373<br>0 : use internal 373                                                                                                                                             |
| 214 | ABCK    | Fs64             | Output<br>4MA                  | Audio bit clock<br>Phase de-modulation                                                                                                                                                                                                                      |
| 215 | ACLK    |                  | Inout, 4MA                     | Audio DAC master clock                                                                                                                                                                                                                                      |
| 217 | ASDATA0 |                  | Inout, 4MA,<br>PD SMT          | Audio serial data 0 (Front-Left/Front-Right)<br>DSD data left channel<br>Trap value in power-on reset :<br>1 : manufactory test mode<br>0 : normal operation                                                                                                |
| 218 | ASDATA1 |                  | Inout, 4MA,<br>PD SMT          | Audio serial data 1 (Left-Surround/Right-Surround)<br>DSD data right channel<br>Trap value in power-on reset :<br>1 : manufactory test mode<br>0 : normal operation<br>While only 2 channels output:<br>GPIO                                                |
| 219 | ASDATA2 |                  | Inout, 4MA,<br>PD SMT          | Audio serial data 2 (Center/LFE)<br>DSD data left surround channel<br>Trap value in power-on reset :<br>1 : manufactory test mode<br>0 : normal operation<br>While only 2 channels output:<br>GPIO                                                          |
| 220 | ASDATA3 |                  | Inout, 4MA,<br>PD SMT          | Audio serial data 3 (Center-back/Center-left-back/Center-right-back, in 6.1 or 7.1 mode)<br>DSD data right surround channel<br>Trap value in power-on reset :<br>1 : manufactory test mode<br>0 : normal operation<br>While only 2 channels output:<br>GPIO |
| 222 | ASDATA4 | INT1#            | Inout, 4MA,<br>PD SMT          | Audio serial data 4 (Down-mixed Left/Right)<br>DSD data center channel<br>Trap value in power-on reset :<br>1 : manufactory test mode<br>0 : normal operation<br>While only 2 channels output:<br>Microcontroller external interrupt 1<br>GPIO              |
| 224 | MC_DATA | INT2#            | Inout                          | Microphone serial input<br>While not support Microphone:<br>Microcontroller external interrupt 2<br>GPIO                                                                                                                                                    |
| 225 | SPDIF   |                  | Output, 2-16MA,<br>SR : ON/OFF | SPDIF output                                                                                                                                                                                                                                                |



## Cambridge Audio DVD89 DVD Player

### ■ Video Interface (18)

| No. | Name    | Alt.             | I/O                     | Function                                                                                                                                                                                      |
|-----|---------|------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 189 | DACVDDC |                  | Power                   | 3.3V power pin for VIDEO DAC circuitry                                                                                                                                                        |
| 190 | VREF    |                  | Analog                  | Bandgap reference voltage                                                                                                                                                                     |
| 191 | FS      |                  | Analog                  | Full scale adjustment                                                                                                                                                                         |
| 192 | YUV0    | CIN              | Output<br>4mA, SR       | Video data output bit 0<br>Compensation capacitor                                                                                                                                             |
| 193 | DACVSSC |                  | Ground                  | Ground pin for VIDEO DAC circuitry                                                                                                                                                            |
| 194 | YUV1    | Y                | Output<br>4mA, SR       | Video data output bit 1<br>Analog Y output                                                                                                                                                    |
| 195 | DACVDDB |                  | Power                   | 3.3V power pin for VIDEO DAC circuitry                                                                                                                                                        |
| 196 | YUV2    | C                | Output<br>4mA, SR       | Video data output bit 2<br>Analog chroma output                                                                                                                                               |
| 197 | DACVSSB |                  | Ground                  | Ground pin for VIDEO DAC circuitry                                                                                                                                                            |
| 198 | YUV3    | CVBS             | Output<br>4mA, SR       | Video data output bit 3<br>Analog composite output                                                                                                                                            |
| 199 | DACVDDA |                  | Power                   | 3.3V power pin for VIDEO DAC circuitry                                                                                                                                                        |
| 200 | YUV4    | Y/G              | Output<br>4mA, SR       | Video data output bit 4<br>Green or Y                                                                                                                                                         |
| 201 | DACVSSA |                  | Ground                  | Ground pin for VIDEO DAC circuitry                                                                                                                                                            |
| 202 | YUV5    | B/Cb/Pb          | Output<br>4mA, SR       | Video data output bit 5<br>Blue or CB                                                                                                                                                         |
| 203 | YUV6    | R/Cr/Pr          | Output<br>4mA, SR       | Video data output bit 6<br>Red or CR                                                                                                                                                          |
| 205 | VSYN    | V_ADIN1          | Inout<br>4mA, SR<br>SMT | Vertical sync input/output<br>While no External TV-encoder:<br>Vertical sync for video-input<br>Version AD input port 1<br>GPIO                                                               |
| 206 | YUV7    | INT3#<br>ASDATA5 | Inout<br>4mA, SR<br>SMT | Video data output bit 7<br>While no External TV-encoder:<br>Microcontroller external interrupt 3<br>Audio serial data 5 part II : DSD data sub-woofer channel or Microphone<br>output<br>GPIO |
| 207 | HSYN    | INT4#<br>V_ADIN2 | Inout<br>4mA, SR<br>SMT | Horizontal sync input/output<br>While no External TV-encoder:<br>Horizontal sync for video-input<br>Microcontroller external interrupt 4<br>Version AD input port 2<br>GPIO                   |

### ■ MISC (8)

| No. | Name     | Alt. | I/O           | Function                         |
|-----|----------|------|---------------|----------------------------------|
| 43  | USB_VSS  |      | USB Ground    | USB ground pin                   |
| 44  | USBP     |      | Analog Inout  | USB port DPLUS analog pin        |
| 45  | USBM     |      | Analog Inout  | USB port DMINUS analog pin       |
| 46  | USB_VDD3 |      | USB Power     | USB Power pin 3.3V               |
| 110 | PRST#    |      | Input PU, SMT | Power on reset input, active low |
| 109 | ICE      |      | Input PD, SMT | Microcontroller ICE mode enable  |
| 228 | XTALO    |      | Output        | 27M crystal out                  |
| 229 | XTALI    |      | Input         | 27M crystal in                   |

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### ■ DRAM Interface (63)(sded by position)

| No. | Name | Alt.                          | I/O                | Function                                                                                                                                                          |
|-----|------|-------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 188 | RD16 | LLC_CLK<br>SMPTE_C[0]         | Inout<br>Pull-Down | DRAM data 16<br>While using 16-bits wide DRAM:<br>Line Locked Clock input/output<br>Digital Video output C bit 0<br>GPIO                                          |
| 187 | RD17 | YUVIN0<br>SMPTE_C[1]          | Inout<br>Pull-Down | DRAM data 17<br>While using 16-bits wide DRAM:<br>Video input data 0<br>Digital Video output C bit 1<br>GPIO                                                      |
| 186 | RD18 | YUVIN1<br>SMPTE_C[2]          | Inout<br>Pull-Down | DRAM data 18<br>While using 16-bits wide DRAM:<br>Video input data 1<br>Digital Video output C bit 2<br>GPIO                                                      |
| 185 | RD19 | YUVIN2<br>SMPTE_C[3]          | Inout<br>Pull-Down | DRAM data 19<br>While using 16-bits wide DRAM:<br>Video input data 2<br>Digital Video output C bit 3<br>GPIO                                                      |
| 184 | RD20 | YUVIN3<br>SMPTE_C[4]          | Inout<br>Pull-Down | DRAM data 20<br>While using 16-bits wide DRAM:<br>Video input data 3<br>Digital Video output C bit 4<br>GPIO                                                      |
| 183 | RD21 | YUVIN4<br>SMPTE_C[5]          | Inout<br>Pull-Down | DRAM data 21<br>While using 16-bits wide DRAM:<br>Video input data 4<br>Digital Video output C bit 5<br>GPIO                                                      |
| 181 | RD22 | YUVIN5<br>SMPTE_C[6]          | Inout<br>Pull-Down | DRAM data 22<br>While using 16-bits wide DRAM:<br>Video input data 5<br>Digital Video output C bit 6<br>GPIO                                                      |
| 180 | RD23 | YUVIN6<br>SMPTE_C[7]          | Inout<br>Pull-Down | DRAM data 23<br>While using 16-bits wide DRAM:<br>Video input data 6<br>Digital Video output C bit 7<br>GPIO                                                      |
| 179 | DQM2 | YUVIN7                        | Inout<br>Pull-Up   | Data Mask 2<br>While using 16-bits wide DRAM:<br>Video input data 7<br>GPIO                                                                                       |
| 178 | DQM3 | INT6#<br>SMPTE_CLK<br>USB_CLK | Inout<br>Pull-Up   | Data Mask 3<br>While using 16-bits wide DRAM:<br>Microcontroller external interrupt 6<br>Digital Video output Clock<br>USB port CLK input (48MHz) part II<br>GPIO |
| 177 | RD24 | SDIN1<br>MS_BS<br>SMPTE_Y[0]  | Inout<br>Non-pull  | DRAM data 24<br>While using 16-bits wide DRAM:<br>Serial interface port 1 data-in<br>MS Card BS pin part II<br>Digital Video output Y bit 0<br>GPIO               |
| 176 | RD25 | SDO1<br>MS_SDIO<br>SMPTE_Y[1] | Inout<br>Non-pull  | DRAM data 25<br>While using 16-bits wide DRAM:<br>Serial interface port 1 data-out<br>MS Card SDIO pin part II<br>Digital Video output Y bit 1<br>GPIO            |

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| No. | Name  | Alt.                           | I/O                | Function                                                                                                                                                                                                             |
|-----|-------|--------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 174 | RD26  | SDCS1<br>MSCLK<br>SMPTE_Y[2]   | Inout<br>Non-pull  | DRAM data 26<br>While using 16-bits wide DRAM:<br>Serial interface port 1 chip select<br>Memory Stick Clock part II<br>Digital Video output Y bit 2<br>GPIO                                                          |
| 172 | RD27  | SCLK2<br>SDCLK<br>SMPTE_Y[3]   | Inout<br>Non-pull  | DRAM data 27<br>While using 16-bits wide DRAM:<br>Serial interface port 2 clock pin<br>Security Disk Clock part II<br>Digital Video output Y bit 3<br>GPIO                                                           |
| 171 | RD28  | SDIN2<br>SD_CMD<br>SMPTE_Y[4]  | Inout<br>Non-pull  | DRAM data 28<br>While using 16-bits wide DRAM:<br>Serial interface port 2 data-in<br>SD Card CMD pin part II<br>Digital Video output Y bit 4<br>GPIO                                                                 |
| 170 | RD29  | SDO2<br>SD_DAT<br>SMPTE_Y[5]   | Inout<br>Non-pull  | DRAM data 29<br>While using 16-bits wide DRAM:<br>Serial interface port 2 data-out<br>SD Card Data pin part II<br>Digital Video output Y bit 5<br>GPIO                                                               |
| 169 | RD30  | SDCS2<br>SMPTE_Y[6]            | Inout<br>Pull-Up   | DRAM data 30<br>While using 16-bits wide DRAM:<br>Serial interface port 2 chip select<br>Digital Video output Y bit 6<br>GPIO                                                                                        |
| 168 | RD31  | INT5#<br>ASDATA5<br>SMPTE_Y[7] | Inout<br>Pull-Up   | DRAM data 31<br>While using 16-bits wide DRAM:<br>Microcontroller external interrupt 5<br>Audio serial data 5 part III : DSD data sub-woofer channel or Microphone<br>output<br>Digital Video output Y bit 7<br>GPIO |
| 166 | RA4   |                                | Inout              | DRAM address 4                                                                                                                                                                                                       |
| 165 | RA5   |                                | Inout              | DRAM address 5                                                                                                                                                                                                       |
| 164 | RA6   |                                | Inout              | DRAM address 6                                                                                                                                                                                                       |
| 162 | RA7   |                                | Inout              | DRAM address 7                                                                                                                                                                                                       |
| 160 | RA8   |                                | Inout              | DRAM address 8                                                                                                                                                                                                       |
| 159 | RA9   |                                | Inout              | DRAM address 9                                                                                                                                                                                                       |
| 158 | RA11  | GPIO                           | Inout<br>Pull-Down | DRAM address bit 11<br>While using DRAM size <=4MB:<br>GPIO                                                                                                                                                          |
| 157 | CKE   |                                | output             | DRAM clock enable                                                                                                                                                                                                    |
| 156 | RCLK  |                                | Inout              | DRAM clock                                                                                                                                                                                                           |
| 154 | RCLKB | USB_CLK                        | Inout              | DRAM clock invert<br>While not using DDR:<br>I) USB port CLK input (48MHz) part I                                                                                                                                    |
| 153 | RVREF | V_ADIN3                        | Analog Inout       | Reference voltage for DDR DRAM<br>While not using DDR :<br>Version AD input port 3                                                                                                                                   |
| 151 | RA3   |                                | Inout              | DRAM address 3                                                                                                                                                                                                       |
| 150 | RA2   |                                | Inout              | DRAM address 2                                                                                                                                                                                                       |
| 149 | RA1   |                                | Inout              | DRAM address 1                                                                                                                                                                                                       |
| 147 | RA0   |                                | Inout              | DRAM address 0                                                                                                                                                                                                       |
| 146 | RA10  |                                | Inout              | DRAM address 10                                                                                                                                                                                                      |
| 145 | BA1   |                                | Inout              | DRAM bank address 1                                                                                                                                                                                                  |
| 143 | BA0   |                                | Inout              | DRAM bank address 0                                                                                                                                                                                                  |

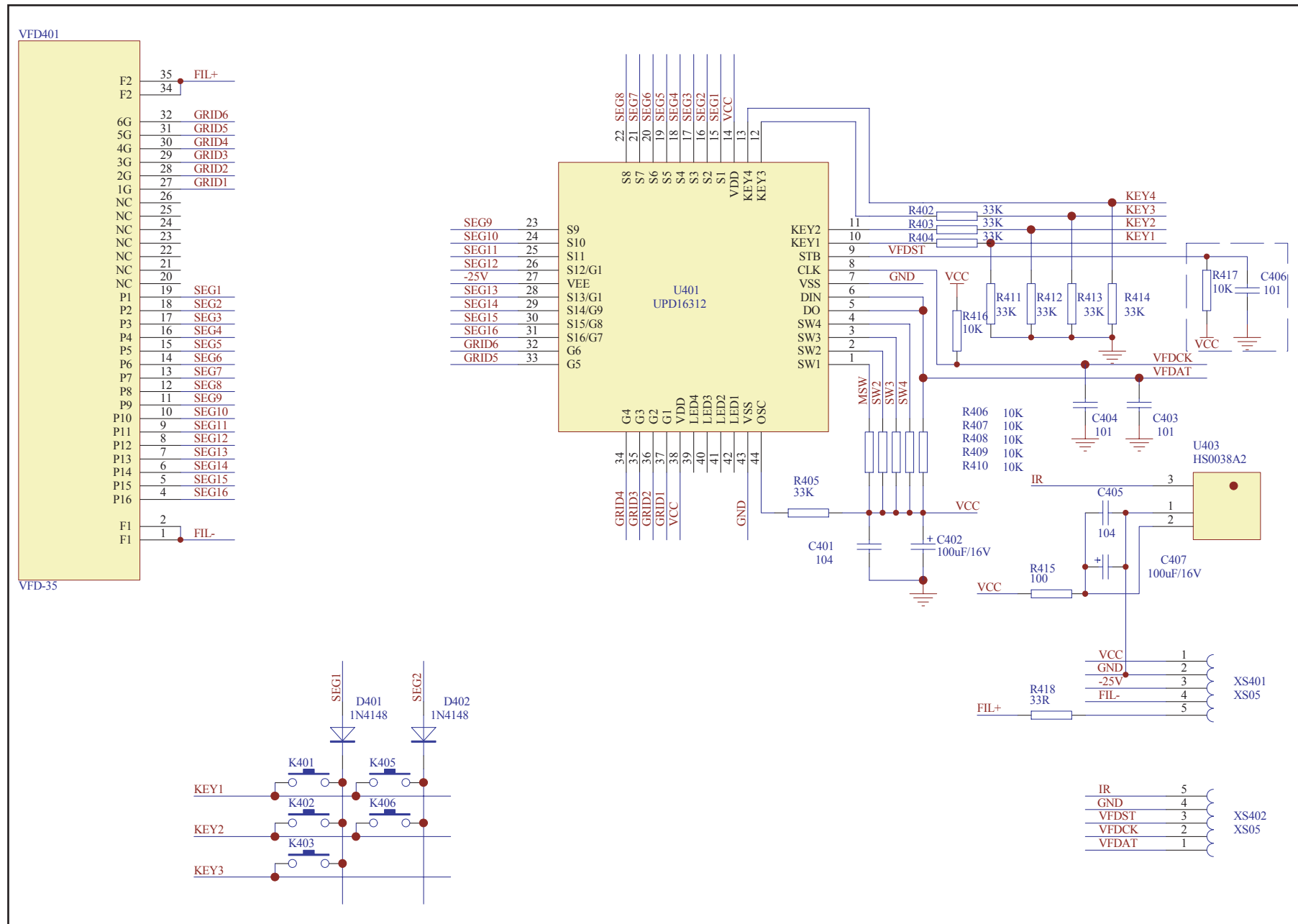
## Cambridge Audio DVD89 DVD Player

| No. | Name  | Alt.             | I/O    | Function                                                                                                                    |
|-----|-------|------------------|--------|-----------------------------------------------------------------------------------------------------------------------------|
| 142 | RCS#  |                  | output | DRAM chip select, active low                                                                                                |
| 140 | RAS#  |                  | output | DRAM row address strobe, active low                                                                                         |
| 139 | CAS#  |                  | output | DRAM column address strobe, active low                                                                                      |
| 138 | RWE#  |                  | output | DRAM Write enable, active low                                                                                               |
| 137 | DQM1  |                  | Inout  | Data mask 1                                                                                                                 |
| 136 | DQS 1 | INT7#<br>MS_BS   | Inout  | Data strobe 1 for DDR DRAM<br>While not using DDR:<br>Microcontroller external interrupt 7<br>MS Card BS pin part I<br>GPIO |
| 135 | RD8   |                  | Inout  | DRAM data 8                                                                                                                 |
| 133 | RD9   |                  | Inout  | DRAM data 9                                                                                                                 |
| 132 | RD10  |                  | Inout  | DRAM data 10                                                                                                                |
| 131 | RD11  |                  | Inout  | DRAM data 11                                                                                                                |
| 130 | RD12  |                  | Inout  | DRAM data 12                                                                                                                |
| 129 | RD13  |                  | Inout  | DRAM data 13                                                                                                                |
| 128 | RD14  |                  | Inout  | DRAM data 14                                                                                                                |
| 126 | RD15  |                  | Inout  | DRAM data 15                                                                                                                |
| 125 | RD0   |                  | Inout  | DRAM data 0                                                                                                                 |
| 124 | RD1   |                  | Inout  | DRAM data 1                                                                                                                 |
| 123 | RD2   |                  | Inout  | DRAM data 2                                                                                                                 |
| 121 | RD3   |                  | Inout  | DRAM data 3                                                                                                                 |
| 120 | RD4   |                  | Inout  | DRAM data 4                                                                                                                 |
| 118 | RD5   |                  | Inout  | DRAM data 5                                                                                                                 |
| 117 | RD6   |                  | Inout  | DRAM data 6                                                                                                                 |
| 115 | RD7   |                  | Inout  | DRAM data 7                                                                                                                 |
| 114 | DQS 0 | SCLK1<br>MS_SDIO | Inout  | Data strobe 0 for DDR DRAM<br>While not using DDR:<br>Serial interface port 1 clock pin<br>MS Card SDIO pin part I<br>GPIO  |
| 113 | DQM0  |                  | Inout  | Data mask 0                                                                                                                 |

### ■ JTAG Interface (4)

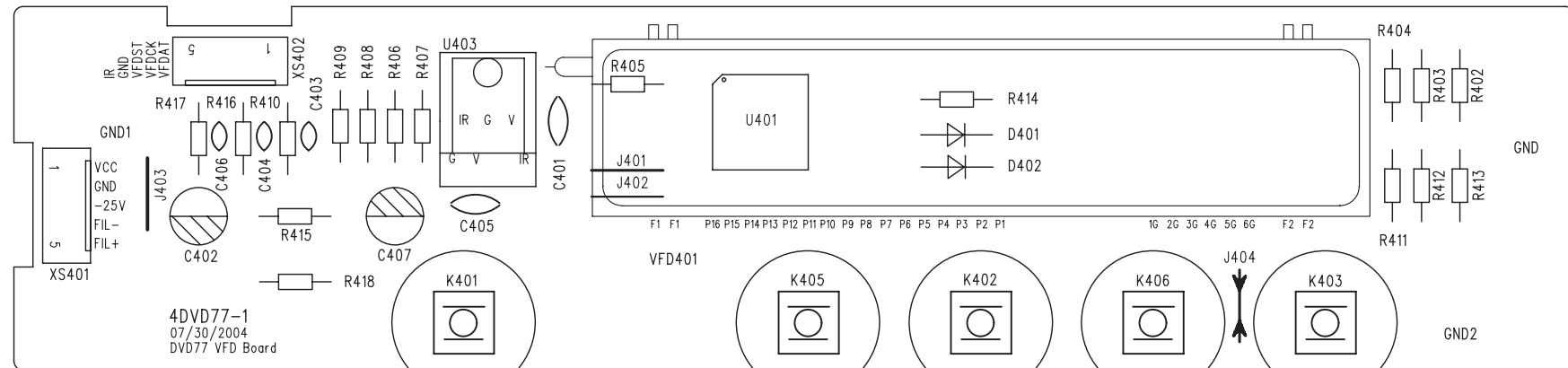
| No. | Name | Alt.                       | I/O   | Function                                                                                                                                                |
|-----|------|----------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 48  | TDI  | SDO3<br>V_ADIN4<br>SD_DAT  | Inout | JTAG data in<br>While not using Boundary Scan:<br>Serial interface port 3 data-out<br>Version AD input port 4<br>SD Card Data pin part I<br>GPIO        |
| 49  | TMS  | SDIN3<br>V_ADIN5<br>SD_CMD | Inout | While not using Boundary Scan:<br>Serial interface port 3 data-in<br>Version AD input port 5<br>SD Card CMD pin part I<br>GPIO                          |
| 50  | TCK  | SCLK3<br>V_ADIN6<br>SDCLK  | Inout | JTAG clock<br>While not using Boundary Scan:<br>Serial interface port 3 clock pin<br>Version AD input port 6<br>Security Disk Clock part I<br>GPIO      |
| 51  | TDO  | SDCS3<br>V_ADIN7<br>MSCLK  | Inout | JTAG data out<br>While not using Boundary Scan:<br>Serial interface port 3 chip-select<br>Version AD input port 7<br>Memory S tick Clock part I<br>GPIO |

# Cambridge Audio DVD89 DVD Player



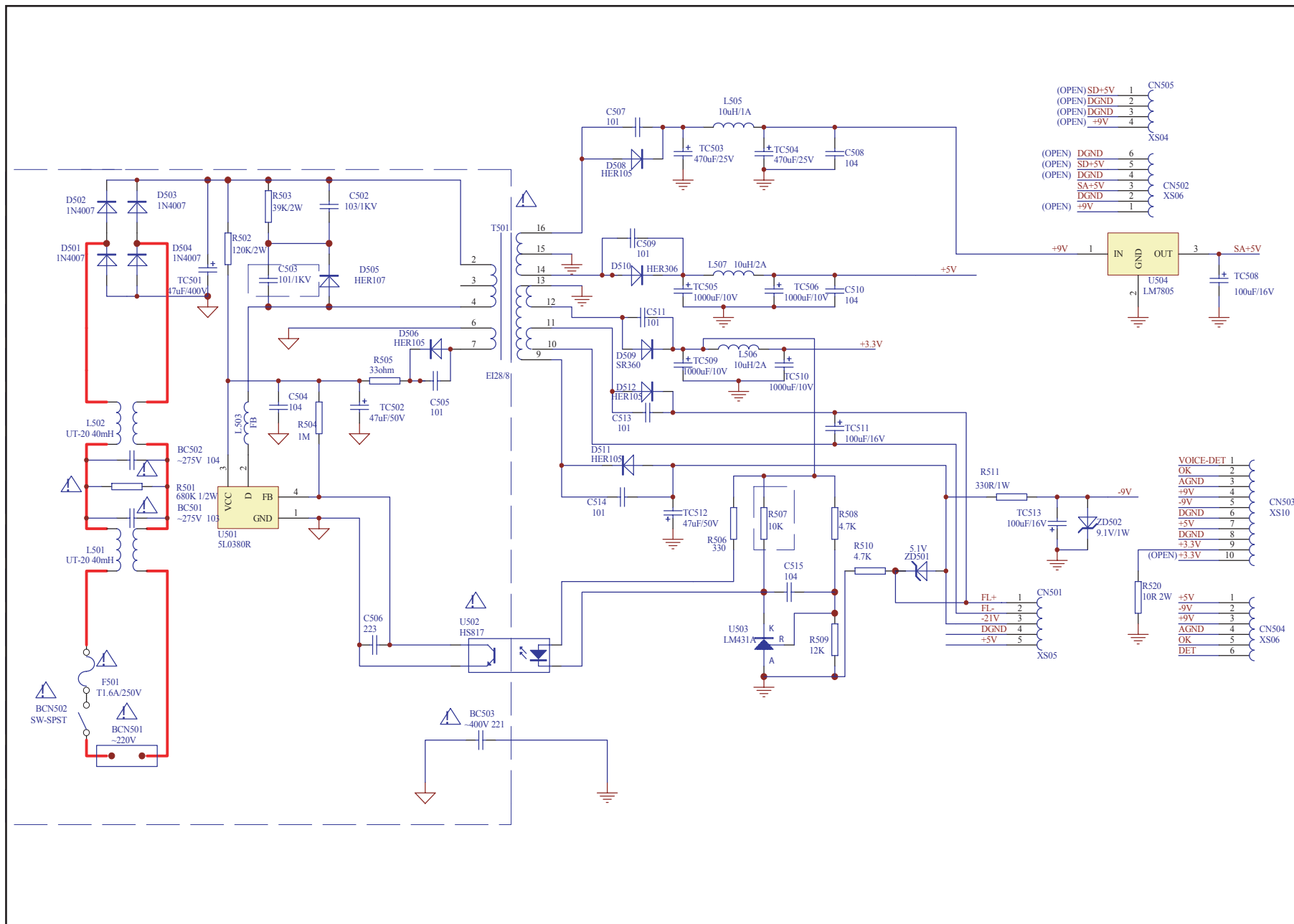
**Front Panel & VFD Schematic**

# Cambridge Audio DVD89 DVD Player



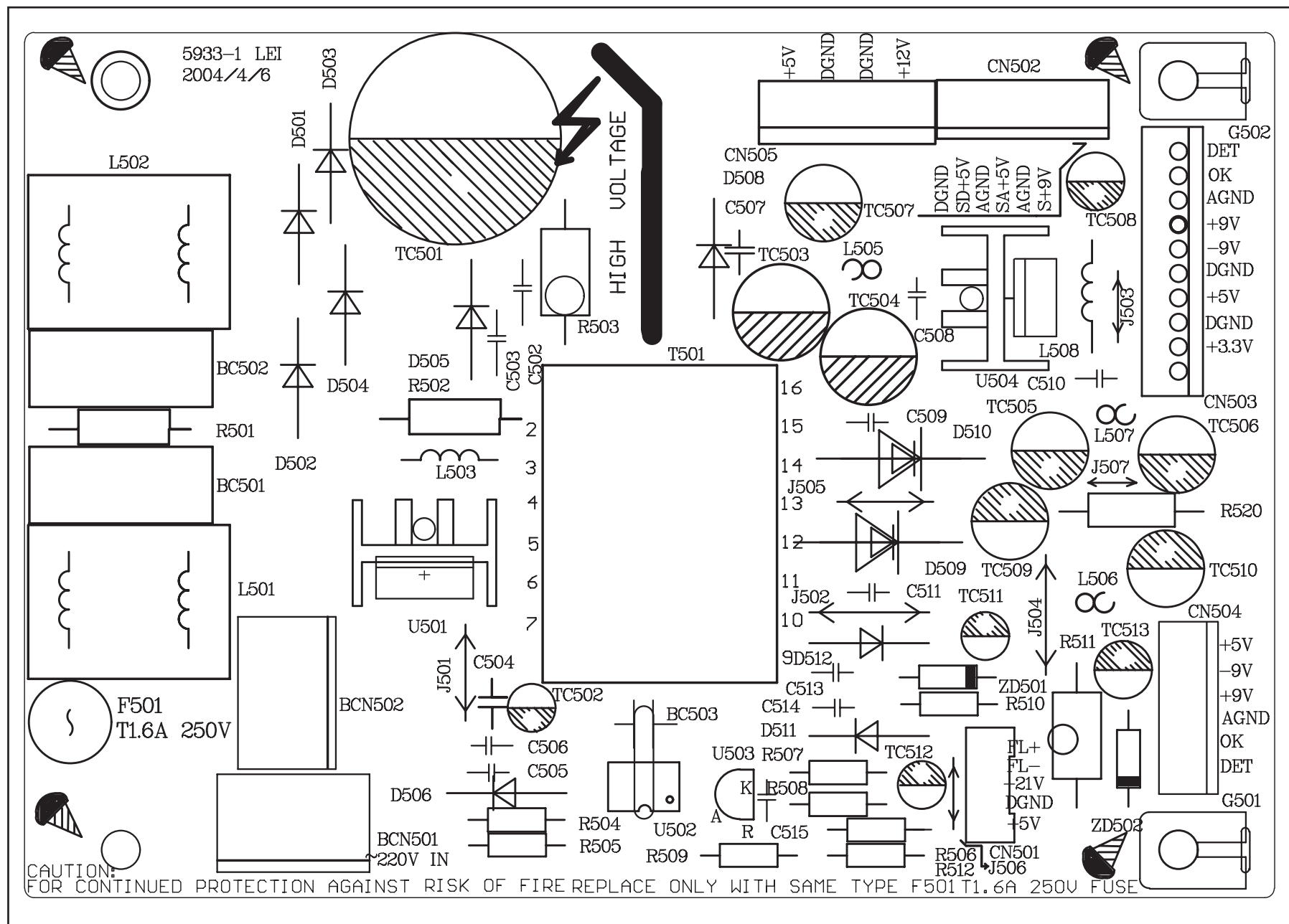
Front Panel & VFD Board Layout

# Cambridge Audio DVD89 DVD Player



Power Supply Schematic

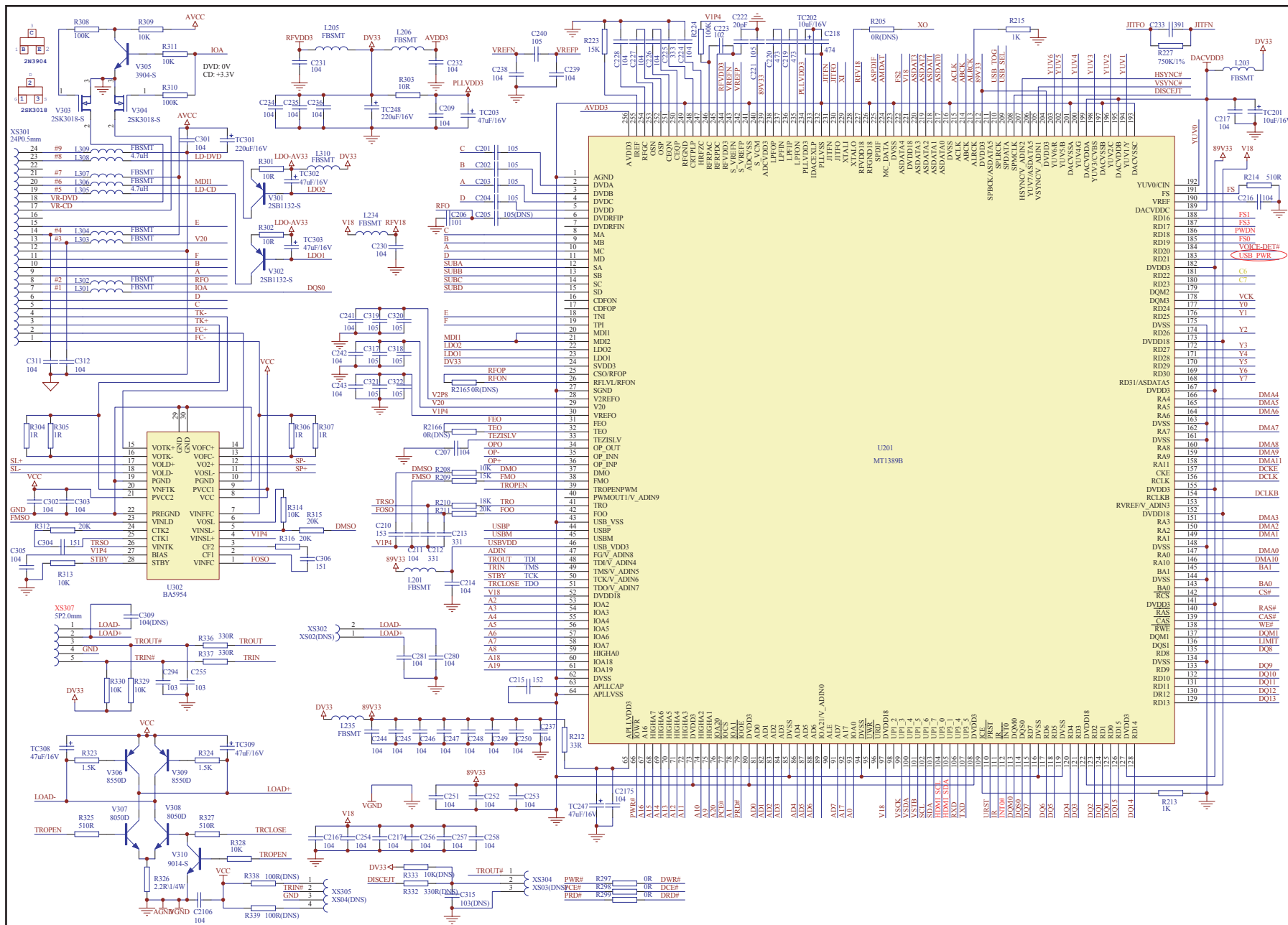
# Cambridge Audio DVD89 DVD Player



Power Supply PBC Layout

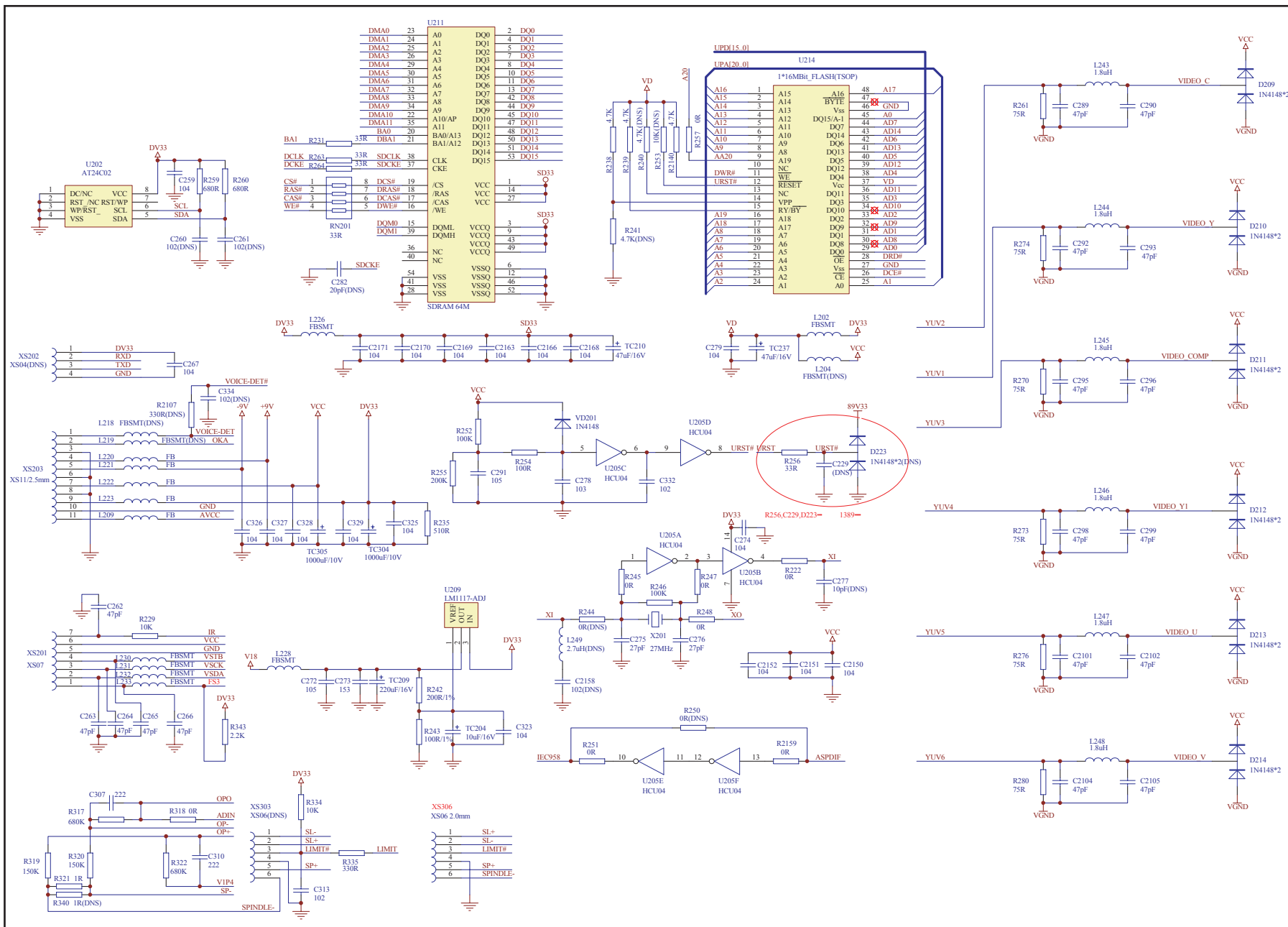


# Cambridge Audio DVD89 DVD Player



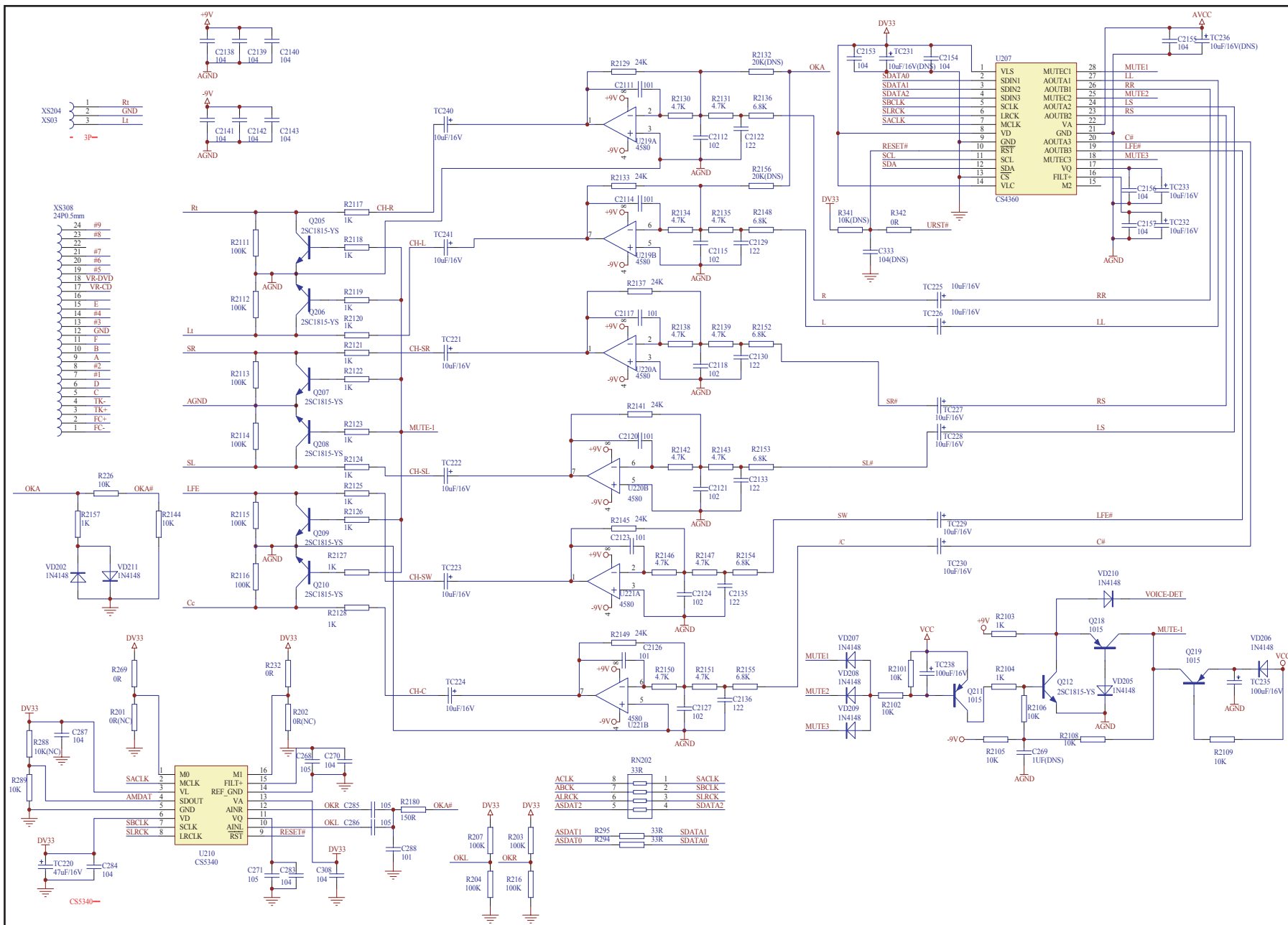
Main PCB Board (Main Processor)

# Cambridge Audio DVD89 DVD Player



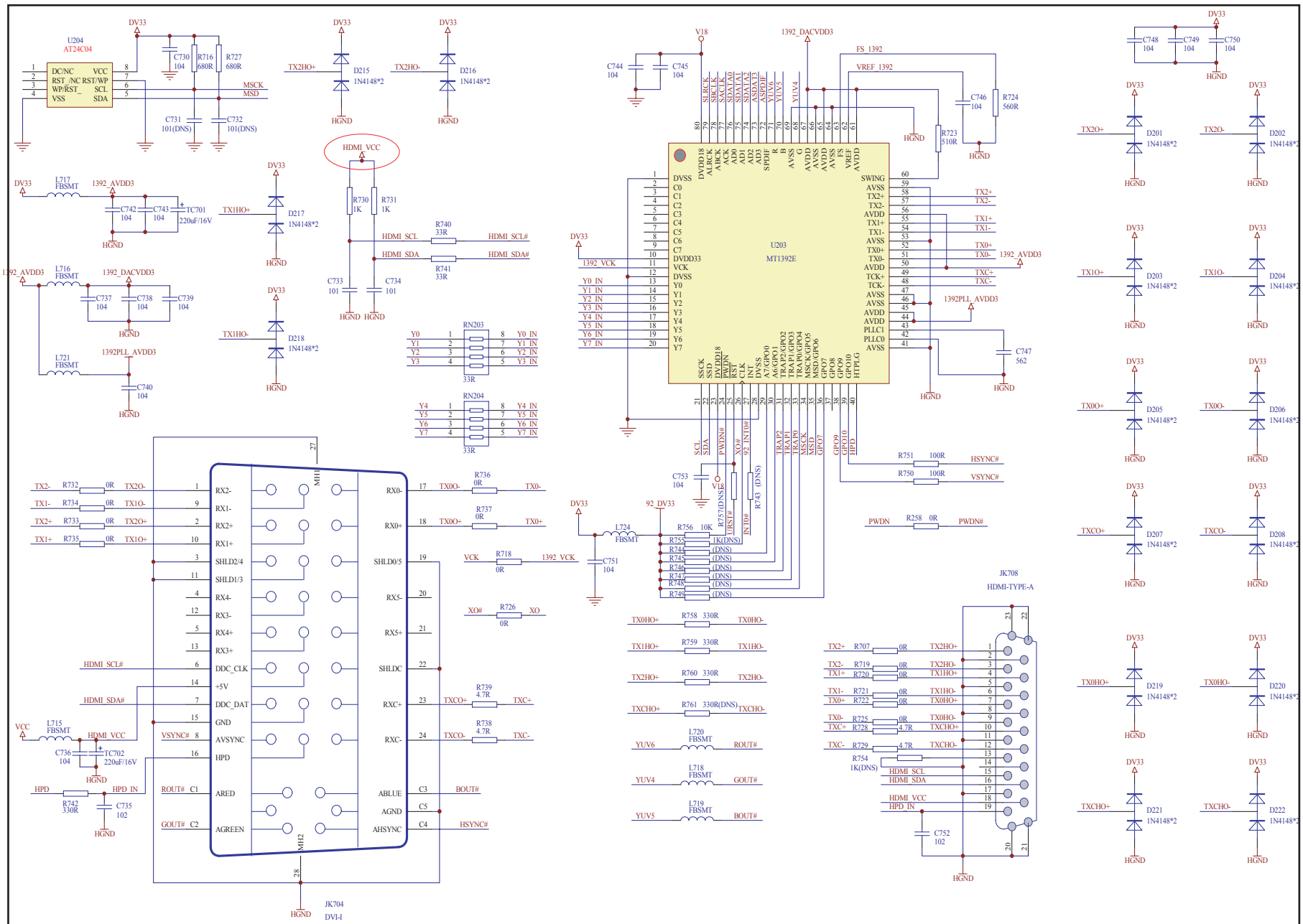
## Main PCB Board (Memory, Reset & Main Clock)

# Cambridge Audio DVD89 DVD Player



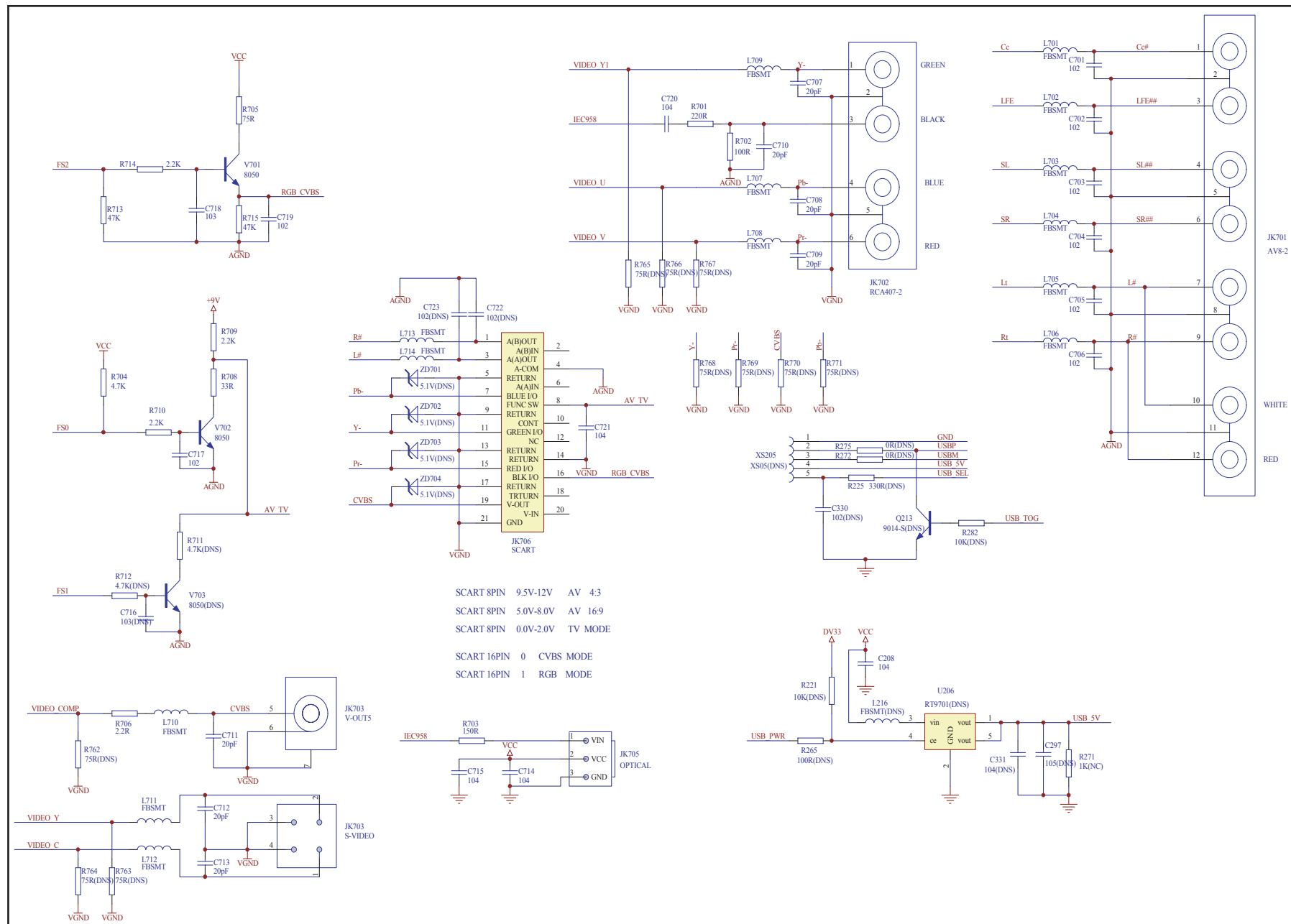
## Main PCB Board (Audio DACS, Output Filters & Mute)

## Cambridge Audio DVD89 DVD Player



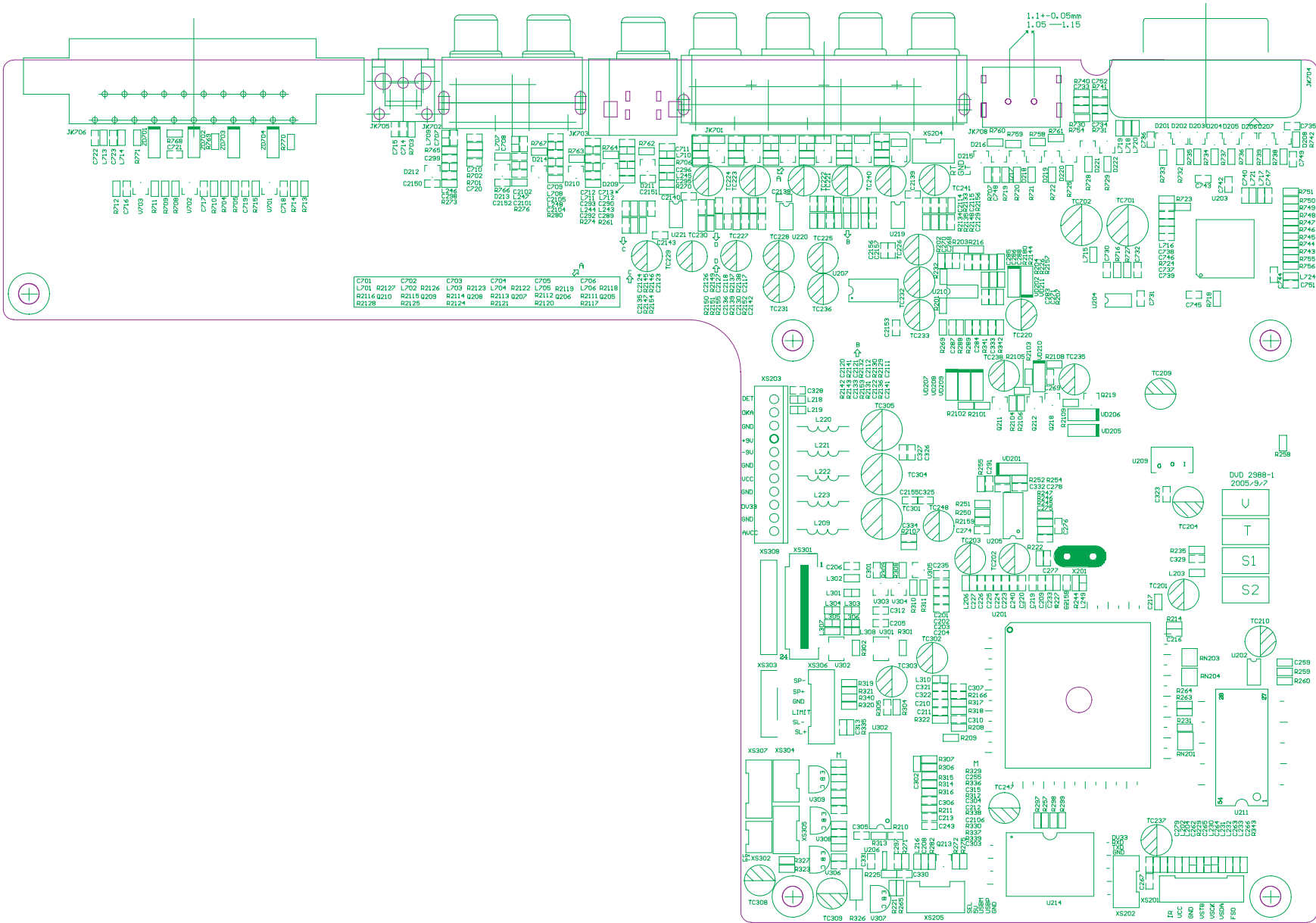
## Main PCB Board (DVI & HDMI)

## Cambridge Audio DVD89 DVD Player



## Main PCB Board (Video Outputs)

# Cambridge Audio DVD89 DVD Player



## Main PCB Board Layout

# Cambridge Audio DVD89 DVD Player

## POWER BOARD

| MATERIAL CD | MATERIAL NAME               | SPECIFICATIONS                        | UNIT | QTY | LOCATION                      |
|-------------|-----------------------------|---------------------------------------|------|-----|-------------------------------|
| 0000273     | CARBON FILM RESISTOR        | 1/4W33 $\Omega$ $\pm$ 5% SHAPED 10    | PCS  | 1   | R505                          |
| 0000278     | CARBON FILM RESISTOR        | 1/4W330 $\Omega$ $\pm$ 5% SHAPED 10   | PCS  | 1   | R506                          |
| 0000289     | CARBON FILM RESISTOR        | 1/4W4.7K $\pm$ 5% SHAPED 10           | PCS  | 1   | R510                          |
| 0010134     | METAL OXIDE FILM RESISTOR   | 1W330 $\Omega$ $\pm$ 5% SHAPED R 15x8 | PCS  | 1   | R511                          |
| 0000294     | CARBON FILM RESISTOR        | 1/4W10K $\pm$ 5% SHAPED 10            | PCS  | 1   | R507                          |
| 0000310     | CARBON FILM RESISTOR        | 1/4W1M $\Omega$ $\pm$ 5% SHAPED 10    | PCS  | 1   | R504                          |
| 0010128     | METAL FILM RESISTOR         | 1/4W3.9K $\pm$ 1%                     | PCS  | 1   | R508                          |
| 0010101     | METAL FILM RESISTOR         | 1/4W12K $\pm$ 1% SHAPED 10            | PCS  | 1   | R509                          |
| 0010135     | METAL OXIDE FILM RESISTOR   | 2W39K $\pm$ 5% SHAPED FLAT 15x9       | PCS  | 1   | R503                          |
| 0010159     | METAL OXIDE FILM RESISTOR   | 2W39K $\pm$ 5% SHAPED FLAT 15x7       | PCS  | 1   | R503                          |
| 0010148     | METAL OXIDE FILM RESISTOR   | 2W120K $\pm$ 5% SHAPED FLAT 15x7      | PCS  | 1   | R502                          |
| 0070001     | HIGH VOLTAGE RESISTOR       | 1/2W680K $\pm$ 5%                     | PCS  | 1   | R501                          |
| 0200105     | PORCELAIN CAPACITOR         | 50V 100P $\pm$ 10% 5mm                | PCS  | 6   | C505,C507,C509,C511,C514,C513 |
| 0200138     | PORCELAIN CAPACITOR         | 50V 104 $\pm$ 20% 5mm                 | PCS  | 4   | C504,C508,C510,C515           |
| 0200223     | PORCELAIN CAPACITOR         | 1000V 101 +80%-20% 7.5mm              | PCS  | 1   | C503                          |
| 0200228     | PORCELAIN CAPACITOR         | 1000V 101 $\pm$ 10% 7.5mm             | PCS  | 1   | C503                          |
| 0200224     | PORCELAIN CAPACITOR         | 1000V 103 +80%-20% 7.5mm              | PCS  | 1   | C502                          |
| 0200229     | CERAMIC CAPACITOR           | 400VAC 471 $\pm$ 10% 10mm             | PCS  | 1   | BC503                         |
| 0210023     | TERYLENE CAPACITOR          | 100V 223 $\pm$ 10% 5mm                | PCS  | 1   | C506                          |
| 0210066     | TERYLENE CAPACITOR          | 275V 104 $\pm$ 20% 15mm               | PCS  | 2   | BC502,BC501                   |
| 0210070     | TERYLENE CAPACITOR          | 275V 104 $\pm$ 10% 15mm               | PCS  | 2   | BC502,BC501                   |
| 0260327     | CD                          | GZ16V100U $\pm$ 20%6x12 2.5           | PCS  | 3   | TC508,TC513,TC511             |
| 0260027     | CD                          | CD11 16V100U $\pm$ 20%6x12 2.5        | PCS  | 3   | TC508,TC513,TC511             |
| 0260096     | CD                          | CD110 16V100U $\pm$ 20%6x12 2.5       | PCS  | 3   | TC508,TC513,TC511             |
| 0260175     | CD                          | CD11C 16V100U+20%-15%6x7 2.5          | PCS  | 3   | TC508,TC513,TC511             |
| 0260201     | CD                          | CD11C 16V100U $\pm$ 20%6x7 2.5        | PCS  | 3   | TC508,TC513,TC511             |
| 0260042     | CD                          | CD11 25V470U+20%-10%10x16 5           | PCS  | 1   | TC504                         |
| 0260043     | CD                          | CD11 25V470U $\pm$ 20%10x16 5         | PCS  | 1   | TC504                         |
| 0260163     | CD                          | CD11 50V47U $\pm$ 20%6x12 2.5         | PCS  | 2   | TC502,TC512                   |
| 0260015     | CD                          | CD11 10V1000U $\pm$ 20%8x16 3.5       | PCS  | 2   | TC506,TC510                   |
| 0260237     | CD                          | CD11 10V1000U $\pm$ 20%8x14 3.5       | PCS  | 2   | TC506,TC510                   |
| 0260252     | CD                          | GS 10V1000U $\pm$ 20%8x16 3.5         | PCS  | 2   | TC506,TC510                   |
| 0260352     | CD                          | GS 10V1000U $\pm$ 20%8x14 3.5         | PCS  | 2   | TC506,TC510                   |
| 0260704     | CD                          | GZ 25V470U $\pm$ 20%10x16 5           | PCS  | 1   | TC503                         |
| 0260697     | CD                          | GZ 10V1000U $\pm$ 20% 8x16 C5         | PCS  | 2   | TC505,TC509                   |
| 0260265     | CD                          | LP3 400V47U $\pm$ 20%22x28 10         | PCS  | 1   | TC501                         |
| 0260266     | CD                          | LS 400V47U $\pm$ 20%22x25 10          | PCS  | 1   | TC501                         |
| 0390057     | MAGNETIC BEADS INDUCTOR     | RH354708                              | PCS  | 1   | L503                          |
| 0410010     | CHOKE COIL                  | VERTICAL 10UH 1A 5mm                  | PCS  | 1   | L505                          |
| 0410011     | CHOKE COIL                  | VERTICAL 10UH 2A 5mm                  | PCS  | 2   | L506,L507                     |
| 0460282     | SWITCHING POWER TRANSFORMER | BCK-28-0286                           | PCS  | 1   | T501                          |
| 0570013     | DIODE                       | HER105                                | PCS  | 4   | D506,D508,D511,D512           |
| 0570028     | DIODE                       | HER306                                | PCS  | 1   | D510                          |
| 0680007     | SCHOTTKY DIODE              | SR360                                 | PCS  | 1   | D509                          |
| 0570014     | DIODE                       | HER107                                | PCS  | 1   | D505                          |
| 0570005     | DIODE                       | 1N4007                                | PCS  | 4   | D501~D504                     |
| 0580054     | VOLTAGE REGULATOR DIODE     | 9.1V 1W                               | PCS  | 1   | ZD502                         |
| 0880765     | IC                          | 5L0380R YDTU                          | PCS  | 1   | U501                          |
| 0880553     | IC                          | LM431ACZ TO-92                        | PCS  | 1   | U503                          |
| 0880581     | IC                          | TL431C TO-226AA(LP)                   | PCS  | 1   | U503                          |
| 0880800     | IC                          | 431L TO-92                            | PCS  | 1   | U503                          |
| 0880888     | IC                          | KA431AZ TO-92                         | PCS  | 1   | U503                          |
| 1000022     | POWER GRID FILTER           | JLB1153 33uH + $\infty$ -0%           | PCS  | 2   | L502,L501                     |
| 1080011     | PHOTOELECTRIC COUPLER       | HS817                                 | PCS  | 1   | U502                          |
| 0880379     | IC                          | LM7805 GOLD SEALED TO-220             | PCS  | 1   | U504                          |
| 1563118     | PCB                         | 5933-1                                | PCS  | 1   |                               |
| 1940029     | SOCKET                      | 9P 2.5mm                              | PCS  | 1   | CN503                         |
| 1940001     | SOCKET                      | 2P 2.5mm                              | PCS  | 1   | CN502                         |
| 1940045     | SOCKET                      | 2P 8.0mm 2#                           | PCS  | 2   | BCN501,BCN502                 |
| 2100003     | CONNECTION CORDS            | $\Phi$ 0.6 SHAPED 7.5mm               | PCS  | 2   | J506,J503                     |
| 2100004     | CONNECTION CORDS            | $\Phi$ 0.6 SHAPED 10mm                | PCS  | 2   | J501,J505                     |
| 2100006     | CONNECTION CORDS            | $\Phi$ 0.6 SHAPED 12.5mm              | PCS  | 2   | J504,J502                     |
| 2100010     | CONNECTION CORDS            | $\Phi$ 0.6 SHAPED 5mm                 | PCS  | 1   | J507                          |
| 2300021     | FUSE TUBE                   | T1.6AL 250V                           | PCS  | 1   | F501                          |
| 3580039     | HEAT RADIATION BOARD        | 11x15x25 AB009K                       | PCS  | 2   | U501,U504 FOR HEAT RADIATION  |
| 3580054     | HEAT RADIATION BOARD        | 11x15x25 WHITE AB905                  | PCS  | 2   | U501,U504 FOR HEAT RADIATION  |
| 0580006     | VOLTAGE REGULATOR DIODE     | 5.1V 1/2W                             | PCS  | 1   | ZD501                         |
| 1940024     | SOCKET                      | 5P 2.0mm                              | PCS  | 1   | CN501                         |
| 3870115     | GROUND CHIP OF POWER BOARD  | AB903                                 | PCS  | 2   | G501~G502                     |
| 4000073     | SELF-TAPPING SCREW          | BT 3x8 BLACK                          | PCS  | 2   | FIX HEAT RADIATION BOARD      |

## Power Board Parts List

## Cambridge Audio DVD89 DVD Player

### MAIN PANEL

| MATERIAL CD | MATERIAL NAME              | SPECIFICATIONS                              | UNIT | QTY | LOCATION                                            |
|-------------|----------------------------|---------------------------------------------|------|-----|-----------------------------------------------------|
| 5230060     | SOFT SPONGE SPACER         | 10×12×3 DOUBLE-SIDED HARD                   | PCS  | 2   | VCONNECT VFD SCREEN AND FRONT PANEL PCB             |
| 5230606     | SOFT SPONGE SPACER         | 12×10×8 DOUBLE-SIDED HARD                   | PCS  | 1   | CONNECT REMOTE CONTROL REVEIVER AND FRONT PANEL PCB |
| 0000268     | CARBON FILM RESISTOR       | 1/4W2.2 Ω ±5% SHAPED 10                     | PCS  | 1   | R418                                                |
| 0000175     | CARBON FILM RESISTOR       | 1/4W100 Ω ±5%                               | PCS  | 1   | R415                                                |
| 0000040     | CARBON FILM RESISTOR       | 1/6W10K±5%                                  | PCS  | 7   | R406~R410,R416,R417                                 |
| 0000137     | CARBON FILM RESISTOR       | 1/6W10K±5% SHAPED 7.5                       | PCS  | 7   | R406~R410,R416,R417                                 |
| 0000231     | CARBON FILM RESISTOR       | 1/4W51K±5%                                  | PCS  | 1   | R405                                                |
| 0260206     | CD                         | CD11C 10V100U±20%5×7 2                      | PCS  | 2   | C402,C407                                           |
| 0570006     | DIODE                      | 1N4148                                      | PCS  | 2   | D401,D402                                           |
| 0880440     | IC                         | PT6312LQ QFP                                | PCS  | 1   | U401                                                |
| 1200358     | DISPLAY SCREEN             | HNV 065S98                                  | PCS  | 1   | U402                                                |
| 1340003     | LIGHT TOUCH RESTORE SWITCH | HORIZONTAL 6×6×1                            | PCS  | 5   | K401~K403,K405,K406                                 |
| 2100003     | CONNECTION CORDS           | Φ0.6 SHAPED 7.5mm                           | PCS  | 4   | J401~J403,J404                                      |
| 2121570     | FLAT CABLE                 | 5-6P150 2.0 2 PLUG WITH L NEEDLE REVERSE 5# | PCS  | 1   | XS402                                               |
| 2120976     | FLAT CABLE                 | 5P 320 2.0 2 PLUG WITH L NEEDLE REVERSE     | PCS  | 1   | XS401                                               |
| 2360011     | RECEIVER                   | HS0038A2                                    | PCS  | 1   | U403                                                |
| 0000050     | CARBON FILM RESISTOR       | 1/6W33K±5%                                  | PCS  | 7   | R402~R404,R411~R414                                 |
| 0200131     | PORCELAIN CAPACITOR        | 50V 103 ±10% 5mm                            | PCS  | 2   | C401,C405                                           |
| 1563321     | PCB                        | 4DVD77-1                                    | PCS  | 1   |                                                     |

### Main Panel Parts List



# Cambridge Audio DVD89 DVD Player

## DECODE BOARD

| MATERIAL CD | MATERIAL NAME          | SPECIFICATIONS           | UNIT | QTY | LOCATION                                                                                        |
|-------------|------------------------|--------------------------|------|-----|-------------------------------------------------------------------------------------------------|
| 0090001     | SMD RESISTOR           | 1/16W 0 ±5% 0603         | PCS  | 27  | R222,R245,R247,R248,R251,R257,R258,R297~R299,R318,R342,R707,R718~R722,R725,R726,R2159,R732~R737 |
| 0090272     | SMD RESISTOR           | 1/16W1 ±5% 0603          | PCS  | 5   | R304~R307,R321                                                                                  |
| 0090002     | SMD RESISTOR           | 1/16W 2.2 ±5% 0603       | PCS  | 1   | R706                                                                                            |
| 0090106     | SMD RESISTOR           | 1/16W 4.7 ±5% 0603       | PCS  | 4   | R728,R729,R738,R739                                                                             |
| 0090003     | SMD RESISTOR           | 1/16W 10 ±5% 0603        | PCS  | 3   | R301~R303                                                                                       |
| 0090005     | SMD RESISTOR           | 1/16W 33 ±5% 0603        | PCS  | 11  | R212,R231,R256,R263,R264,R294,R295,R740,R741,R757,R708                                          |
| 0090006     | SMD RESISTOR           | 1/16W 75 ±5% 0603        | PCS  | 7   | R261,R270,R273,R274,R276,R280,R705                                                              |
| 0090181     | SMD RESISTOR           | 1/16W 100 ±5% 0603       | PCS  | 6   | R254,R702,R750,R751,R339,R338                                                                   |
| 0090232     | SMD RESISTOR           | 1/16W 150 ±5% 0603       | PCS  | 1   | R703                                                                                            |
| 0090008     | SMD RESISTOR           | 1/16W 220 ±5% 0603       | PCS  | 4   | R701,R758~R760                                                                                  |
| 0090009     | SMD RESISTOR           | 1/16W 330 ±5% 0603       | PCS  | 5   | R335~R337,R742,R332                                                                             |
| 0090249     | SMD RESISTOR           | 1/16W 510 ±5% 0603       | PCS  | 5   | R214,R235,R723,R325,R327                                                                        |
| 0090012     | SMD RESISTOR           | 1/16W 560 ±5% 0603       | PCS  | 1   | R724                                                                                            |
| 0090014     | SMD RESISTOR           | 1/16W 1K ±5% 0603        | PCS  | 22  | R213,R215,R730,R731,R2103,R2104,R2117~R2128,R259,R260,R716,R727                                 |
| 0090016     | SMD RESISTOR           | 1/16W 1.5K ±5% 0603      | PCS  | 2   | R323,R324                                                                                       |
| 0090017     | SMD RESISTOR           | 1/16W 2.2K ±5% 0603      | PCS  | 3   | R714,R710,R709                                                                                  |
| 0090019     | SMD RESISTOR           | 1/16W 4.7K ±5% 0603      | PCS  | 16  | R238,R239,R2130,R2131,R2134,R2135,R2138~R2140,R2142,R2143,R2146,R2147,R2150,R2151,R704          |
| 0090021     | SMD RESISTOR           | 1/16W 6.8K ±5% 0603      | PCS  | 6   | R2136,R2148,R2152~R2155                                                                         |
| 0090023     | SMD RESISTOR           | 1/16W 10K ±5% 0603       | PCS  | 18  | R208,R229,R309,R311,R313,R314,R328~R330,R334,R756,R2102,R2105,R2106,R2108,R2109,R333,R2101      |
| 0090024     | SMD RESISTOR           | 1/16W 15K ±5% 0603       | PCS  | 2   | R209,R223                                                                                       |
| 0090188     | SMD RESISTOR           | 1/16W 18K ±5% 0603       | PCS  | 1   | R210                                                                                            |
| 0090025     | SMD RESISTOR           | 1/16W 20K ±5% 0603       | PCS  | 4   | R211,R312,R315,R316                                                                             |
| 0090255     | SMD RESISTOR           | 1/16W 24K±5% 0603        | PCS  | 6   | R2129,R2133,R2137,R2141,R2145,R2149                                                             |
| 0090029     | SMD RESISTOR           | 1/16W 47K ±5% 0603       | PCS  | 2   | R713,R715                                                                                       |
| 0090034     | SMD RESISTOR           | 1/16W 100K ±5% 0603      | PCS  | 11  | R224,R246,R252,R308,R310,R2111~R2116                                                            |
| 0090197     | SMD RESISTOR           | 1/16W 150K ±5% 0603      | PCS  | 2   | R319,R320                                                                                       |
| 0090200     | SMD RESISTOR           | 1/16W 200K ±5% 0603      | PCS  | 1   | R255                                                                                            |
| 0090211     | SMD RESISTOR           | 1/16W 680K ±5% 0603      | PCS  | 2   | R317,R322                                                                                       |
| 0100019     | SMD RESISTOR NETWORKS  | 1/16W33 ±5% 8P           | PCS  | 4   | RN201,RN202,RN203,RN204                                                                         |
| 0090609     | PRECISION SMD RESISTOR | 1/16W 100 ±1% 0603       | PCS  | 1   | R243                                                                                            |
| 0090626     | PRECISION SMD RESISTOR | 1/16W 200 ±1% 0603       | PCS  | 1   | R242                                                                                            |
| 0090319     | PRECISION SMD RESISTOR | 1/16W 750K ±1% 0603      | PCS  | 1   | R227                                                                                            |
| 00003759    | CARBON FILM RESISTOR   | 1/4W2.2 Ω ±5%            | PCS  | 1   | R326                                                                                            |
| 02604379    | CD                     | CD11 16V10U±20%5×11C5    | PCS  | 16  | TC201,TC202,TC221~TC230,TC232,TC233,TC240,TC241                                                 |
| 02600029    | CD                     | CD11 16V47U±20%5×11 C5   | PCS  | 8   | TC203,TC210,TC237,TC247,TC302,TC303,TC308,TC309                                                 |
| 02601889    | CD                     | CD11 16V100U±20%6×12 C5  | PCS  | 1   | TC235                                                                                           |
| 02601819    | CD                     | CD11 16V220U±20%6×12 C5  | PCS  | 6   | TC209,TC248,TC301,TC701,TC702,TC238                                                             |
| 02606509    | CD                     | CD11 10V1000U±20%8×14 C5 | PCS  | 2   | TC304,TC305                                                                                     |
| 02606529    | CD                     | GS 10V1000U±20%8×14 C5   | PCS  | 2   | TC304,TC305                                                                                     |
| 0310085     | SMD CAPACITOR          | 50V 20P ±5% NPO 0603     | PCS  | 8   | C222,C707~C713                                                                                  |
| 0310190     | SMD CAPACITOR          | 50V 27P ±5% NPO 0603     | PCS  | 2   | C275,C276                                                                                       |
| 0310045     | SMD CAPACITOR          | 50V 47P ±5% NPO 0603     | PCS  | 17  | C262~C265,C289,C290,C292,C293,C295,C296,C298,C299,C2101,C2102,C2104,C2105,C266                  |
| 0310047     | SMD CAPACITOR          | 50V 101 ±5% NPO 0603     | PCS  | 9   | C206,C733,C734,C2111,C2114,C2117,C2120,C2123,C2126                                              |
| 0310048     | SMD CAPACITOR          | 50V 151 ±5% NPO 0603     | PCS  | 2   | C304,C306                                                                                       |
| 0310051     | SMD CAPACITOR          | 50V 331 ±5% NPO 0603     | PCS  | 2   | C212,C213                                                                                       |
| 0310052     | SMD CAPACITOR          | 50V 391 ±5% NPO 0603     | PCS  | 1   | C233                                                                                            |
| 0310066     | SMD CAPACITOR          | 50V 102 ±10% X7R 0603    | PCS  | 19  | C223,C313,C332,C701~C706,C735,C752,C2112,C2115,C2118,C2121,C2124,C2127,C719,C717                |
| 0310231     | SMD CAPACITOR          | 50V 122 ±10% X7R 0603    | PCS  | 6   | C2122,C2129,C2130,C2133,C2135,C2136                                                             |
| 0310067     | SMD CAPACITOR          | 50V 152 ±10% X7R 0603    | PCS  | 1   | C215                                                                                            |
| 0310068     | SMD CAPACITOR          | 50V 222 ±10% X7R 0603    | PCS  | 2   | C307,C310                                                                                       |
| 0310199     | SMD CAPACITOR          | 50V 562 ±10% X7R 0603    | PCS  | 1   | C747                                                                                            |
| 0310072     | SMD CAPACITOR          | 50V 103 ±10% X7R 0603    | PCS  | 5   | C255,C278,C294,C315,C718                                                                        |
| 0310201     | SMD CAPACITOR          | 50V 153 ±10% X7R 0603    | PCS  | 2   | C210,C273                                                                                       |
| 0310055     | SMD CAPACITOR          | 16V 333 ±10% X7R 0603    | PCS  | 1   | C225                                                                                            |
| 0310056     | SMD CAPACITOR          | 16V 473 ±10% X7R 0603    | PCS  | 2   | C219,C220                                                                                       |

## Decode Board Parts List

## Cambridge Audio DVD89 DVD Player

|          |                            |                                  |     |    |                                                                                                                                                                                                                                                                 |
|----------|----------------------------|----------------------------------|-----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0310207  | SMD CAPACITOR              | 50V 104 ±20% X7R 0603            | PCS | 98 | C207~C209,C211,C214,C216,C217,C224,C226~C228,C230~C232,C234~C239,C241~C254,C256~C259,C267,C274,C279~C281,C301~C303,C305,C311,C312,C323,C325~C329,C714,C715,C720,C730,C736~C740,C742~C746,C748~C751,C2106,C2138~C2143,C2150~C2157,C2163,C2166~C2171,C2174,C2175, |
| 0310543  | SMD CAPACITOR              | 50V 104 ±10% X7R 0603            | PCS | 98 | C207~C209,C211,C214,C216,C217,C224,C226~C228,C230~C232,C234~C239,C241~C254,C256~C259,C267,C274,C279~C281,C301~C303,C305,C311,C312,C323,C325~C329,C714,C715,C720,C730,C736~C740,C742~C746,C748~C751,C2106,C2138~C2143,C2150~C2157,C2163,C2166~C2171,C2174,C2175, |
| 0310362  | SMD CAPACITOR              | 16V 474 +80%-20% Y5V 0603        | PCS | 1  | C218                                                                                                                                                                                                                                                            |
| 0310234  | SMD CAPACITOR              | 16V 105 +80%-20% Y5V 0603        | PCS | 14 | C201~C204,C221,C240,C272,C291,C317~C322                                                                                                                                                                                                                         |
| 0390355  | SMD INDUCTOR               | 4.7UH ±10% 1608                  | PCS | 2  | L305,L308                                                                                                                                                                                                                                                       |
| 0390096  | SMD INDUCTOR               | 1.8UH ±10% 1608                  | PCS | 6  | L243~L248                                                                                                                                                                                                                                                       |
| 03900579 | MAGNETIC BEADS INDUCTOR    | RH354708                         | PCS | 5  | L209,L220~L223                                                                                                                                                                                                                                                  |
| 0390095  | SMD MAGNETIC BEADS         | FCM1608K-221T05                  | PCS | 43 | L201~L203,L205,L206,L226,L228,L230~L232,L234~L235,L301,L304,L307,L309,L310,L701~L712,L715~L721,L724,L306,L302,L303,L713,L714,L233                                                                                                                               |
| 0700007  | SMD DIODE                  | 1N4148                           | PCS | 6  | VD201,VD205~VD209                                                                                                                                                                                                                                               |
| 0700001  | SMD DIODE                  | LS4148                           | PCS | 6  | VD201,VD205~VD209                                                                                                                                                                                                                                               |
| 0700002  | SMD DIODE                  | LL4148                           | PCS | 6  | VD201,VD205~VD209                                                                                                                                                                                                                                               |
| 0700056  | SMD DUAL DIODE             | MMBD4148SE SOT-23                | PCS | 22 | D201~D222                                                                                                                                                                                                                                                       |
| 07800509 | TRIODE                     | S8050D                           | PCS | 2  | V307,V308                                                                                                                                                                                                                                                       |
| 07800499 | TRIODE                     | S8550D                           | PCS | 2  | V306,V309                                                                                                                                                                                                                                                       |
| 0780085  | SMD TRIODE                 | 8050D                            | PCS | 2  | V701,V702                                                                                                                                                                                                                                                       |
| 0780062  | SMD TRIODE                 | 9014C                            | PCS | 1  | V310                                                                                                                                                                                                                                                            |
| 0780197  | SMD TRIODE                 | C1815                            | PCS | 7  | Q205~Q210,Q212                                                                                                                                                                                                                                                  |
| 0780198  | SMD TRIODE                 | 2SA1015                          | PCS | 3  | Q211,Q218,Q219                                                                                                                                                                                                                                                  |
| 0780040  | SMD TRIODE                 | 3904(100-300) SOT-23             | PCS | 1  | V305                                                                                                                                                                                                                                                            |
| 0780193  | SMD TRIODE                 | 2SK3018                          | PCS | 2  | V303,V304                                                                                                                                                                                                                                                       |
| 0780115  | SMD TRIODE                 | 2SB1132                          | PCS | 2  | V301,V302                                                                                                                                                                                                                                                       |
| 0880185  | IC                         | NJM4558M SOP                     | PCS | 3  | U219,U220,U221                                                                                                                                                                                                                                                  |
| 0880562  | IC                         | 4580 SOP                         | PCS | 3  | U219,U220,U221                                                                                                                                                                                                                                                  |
| 0880361  | IC                         | 4558 SOP                         | PCS | 3  | U219,U220,U221                                                                                                                                                                                                                                                  |
| 0880322  | IC                         | MM74HCU04M SOP                   | PCS | 1  | U205                                                                                                                                                                                                                                                            |
| 0880513  | IC                         | HCU04 SOP                        | PCS | 1  | U205                                                                                                                                                                                                                                                            |
| 0881415  | IC                         | HY57V641620HGT-7 TSOP            | PCS | 1  | U211                                                                                                                                                                                                                                                            |
| 0881872  | IC                         | KSV464P4JA-70 TSOP               | PCS | 1  | U211                                                                                                                                                                                                                                                            |
| 0881182  | IC                         | LM1117MP-ADJ SOT-223             | PCS | 1  | U209                                                                                                                                                                                                                                                            |
| 0881969  | IC                         | IP1117-ADJ SOT-223               | PCS | 1  | U209                                                                                                                                                                                                                                                            |
| 0882461  | IC                         | AZ1117H-ADJ SOT-223              | PCS | 1  | U209                                                                                                                                                                                                                                                            |
| 0881057  | IC                         | CS4360 SSOP                      | PCS | 1  | U207                                                                                                                                                                                                                                                            |
| 0881031  | IC                         | 24C02N SOP                       | PCS | 1  | U202                                                                                                                                                                                                                                                            |
| 0881897  | IC                         | MT1389EE QFP                     | PCS | 1  | U201                                                                                                                                                                                                                                                            |
| 0881378  | IC                         | BA5954FP HSOP                    | PCS | 1  | U302                                                                                                                                                                                                                                                            |
| 0882427  | IC                         | MT1392E QFP                      | PCS | 1  | U203                                                                                                                                                                                                                                                            |
| 0960020  | CRYSTAL OSCILLATOR         | 27.00MHz 49-S                    | PCS | 1  | X201                                                                                                                                                                                                                                                            |
| 1940098  | SOCKET                     | 11P 2.5mm                        | PCS | 1  | XS203                                                                                                                                                                                                                                                           |
| 1940094  | CABLE SOCKET               | 24P 0.5mm SMD WITH CLASP         | PCS | 1  | XS308                                                                                                                                                                                                                                                           |
| 1940024  | SOCKET                     | 5P 2.0mm                         | PCS | 1  | XS307                                                                                                                                                                                                                                                           |
| 1940005  | SOCKET                     | 6P 2.0mm                         | PCS | 1  | XS306                                                                                                                                                                                                                                                           |
| 1940023  | SOCKET                     | 7P 2.0mm                         | PCS | 1  | XS201                                                                                                                                                                                                                                                           |
| 1910089  | TERMINAL SOCKET            | AV8-8.4-6G-3 REAL GOLD-PLATED    | PCS | 1  | JK701                                                                                                                                                                                                                                                           |
| 1090045  | ELECTRIC-OPTIC TRANSFORMER | TX179ATW                         | PCS | 1  | JK705                                                                                                                                                                                                                                                           |
| 1090024  | ELECTRIC-OPTIC TRANSFORMER | TX179AT                          | PCS | 1  | JK705                                                                                                                                                                                                                                                           |
| 1910090  | TERMINAL SOCKET            | AV4-8.4-6G-3 REAL GOLD-PLATED    | PCS | 1  | JK702                                                                                                                                                                                                                                                           |
| 1910202  | TERMINAL SOCKET            | SA-001-012 REAL-GOLD PLATED      | PCS | 1  | JK703                                                                                                                                                                                                                                                           |
| 1860029  | SCART SOCKET               | SCART-01                         | PCS | 1  | JK706                                                                                                                                                                                                                                                           |
| 1860115  | DVI SOCKET                 | (24+5)P CURLING PLUG GOLD-PLATED | PCS | 1  | JK704                                                                                                                                                                                                                                                           |
| 1860116  | HDMI SOCKET                | 51U019S-333N-A GOLD-PLATED       | PCS | 1  | JK708                                                                                                                                                                                                                                                           |
| 0911535  | SOFTWARE PROGRAM           | ROMDVD89AP-0A(16M)               | PCS | 1  |                                                                                                                                                                                                                                                                 |
| 1632717  | PCB                        | 2988-1                           | PCS | 1  |                                                                                                                                                                                                                                                                 |

## Decode Board Parts List

## Cambridge Audio DVD89 DVD Player

### Serviceable Parts

| AP Part No |         | Description                   |
|------------|---------|-------------------------------|
| PB022      | 5471589 | DVD-89 Remote Control         |
| PB023      | 5461669 | DVD-89 DVD Mechanism Complete |
| PB024      | 5447519 | DVD-89 MPEG Board Complete    |
| PB025      | 5447441 | DVD-89 PSU Board Complete     |

No Component Parts are Supplied