DVD Player

DVP3960

Service

DVP3960/37

Service

Service

Service Manual

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CLASS 1 LASER PRODUCT

Published by TCL-HY 0702 Service Audio Printed in The Netherlands Subject to modification

GB 3139 785 32460

Version 1.0

PHILIPS

Technical Specifications

TV standard (PAL/50Hz) (NTSC/60Hz)

Number of lines	625	525
Playback	Multi standard	(PAL/NTSC)

Video performance

Video DAC	12 bit, 108MHz
YPbPr:	0.7Vpp ---- 75 ohm
Video output	1Vpp ----- 75 ohm

Video format

Digital Compression	MPEG 2 for DVD,SVCD	
	MPEG 1 for VCD	
	DivX®	
DVD	**50Hz**	**60Hz**
Horiz resolution	720 pixels	720 pixels
	1920pixels	1920pixels
Vertical resolution	576lines	480 lines
	1080lines	1080lines

VCD	**50Hz**	**60Hz**
Horiz. resolution	3 52 pixels	352 pixels
Vertical resolution	288lines	240 lines

Audio format

Digital	MPEG/AC-3/ PCM	Compressed Digital 16, 20, 24bits fs, 44.1, 48, 96KHz
	MP3(ISO 9660)	96,112,128,256kbps & variable bit rate fs,32, 44.1,48 kHz

Analogue Sound Stereo

Dolby surround compatible downmix from Dolby Digital multi-channel sound

Audio performance

DA converter	24bits, 192KHz	
DVD	fs 96kHz	4Hz----44kHz
	fs 48kHz	4Hz----22kHz
SVCD	fs 48kHz	4Hz----22kHz
	fs 44.1kHz	4Hz----20kHz
CD/ VCD	fs 44.1kHz	4Hz----20kHz
Signal-Noise (1kHz)		>90dB
Dynamic Range (1kHz)		>80dB
Cross talk (1kHz)		>80dB
Distortion/Noise (1kHz)		>80dB
MPEG MP3		MPEG Audio L3

Connections

YpbPr output	Cinch 3x
Video output	Cinch(yellow)
Audio output (L+R)	Cinch (white/red)
Digital output	1 coaxial
	IEC60958 for CDDA/ LPCM
	IEC61937 for MPEG1/2,
	Dolby Digital
HDMI Out	

Cabinet

Dimensions (w X h X d)	360 x 37 x 235 mm
Weight	Approximately 2.0 kg

Power consumption

Power supply Rating	120V; 60HZ
Power consumption	<10W
Power consumption in standby mode	<1W

Specifications subject to change without prior notice.

Safety instruction, Warning & Notes

Safety instruction

1. General safety

Safety regulations require that during a repair:

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

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

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

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

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

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

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

2.Laser safety

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

Laser device unit

Type : Semiconductor laser GaAlAs

Wavelength : 650nm (DVD)

: 780nm (VCD/CD)

Output power : 7mW (DVD)

: 10mW (DVD /CD)

Beam divergence: 60 degree

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

Warning

1.General

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

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

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

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

2. Laser

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

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

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

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

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

Notes: Manufactured under licence from Dolby Laboratories. The double-D symbol is trademarks of Dolby Laboratories, Inc. All rights reserved.

Notes

Lead-Free requirement for service

INDENTIFICATION:
Regardless of special logo (not always indicated)

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

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

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

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

You find more information to:

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

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

For additional questions please contact your local repair-helpdesk.

Mechanical and Dismantling Instructions

Dismantling Instruction

The following guidelines show how to dismantle the player.
Step1: Remove 5 screws around the Top Cover, then remove the Top Cover (Figure 1).

Figure1

Step2: If it is necessary to dismantle Loader or Front Panel, It should be remove the Front door assembly first. (Figure 2)
Note: Make sure to operate gently otherwise the guider would be damaged.

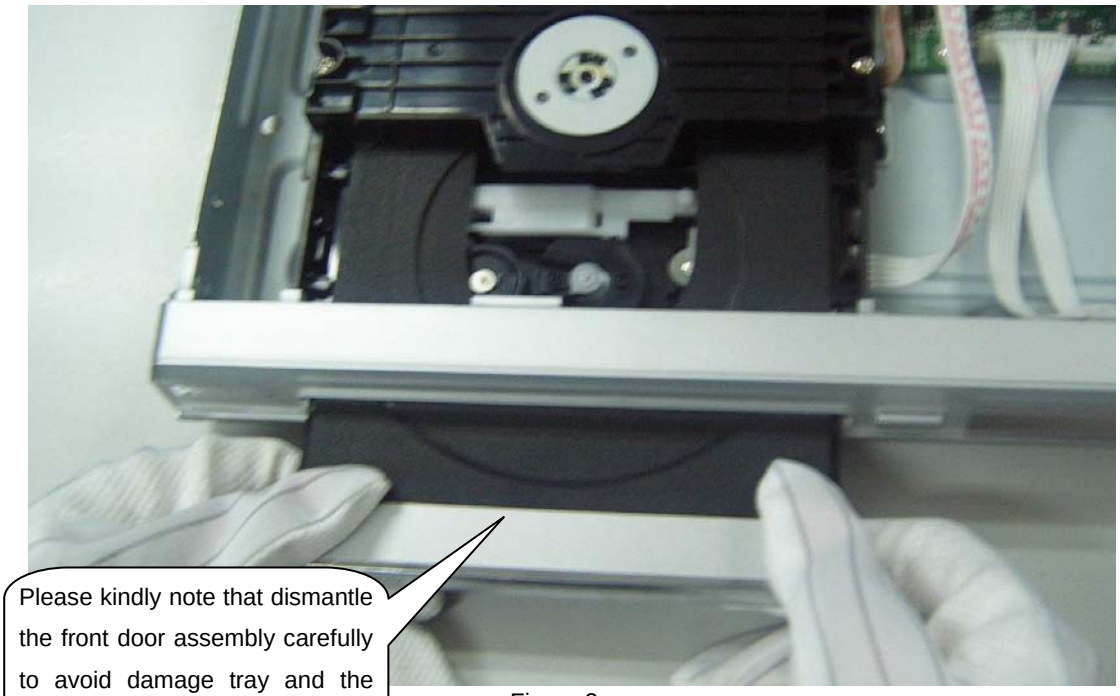


Figure 2

Mechanical and Dismantling Instructions

Dismantling Instruction

Step3: If the tray can't open in normal way, you can make it through the instruction as below (Figure 3).
Note: Make sure to operate gently otherwise the guider would be damaged.

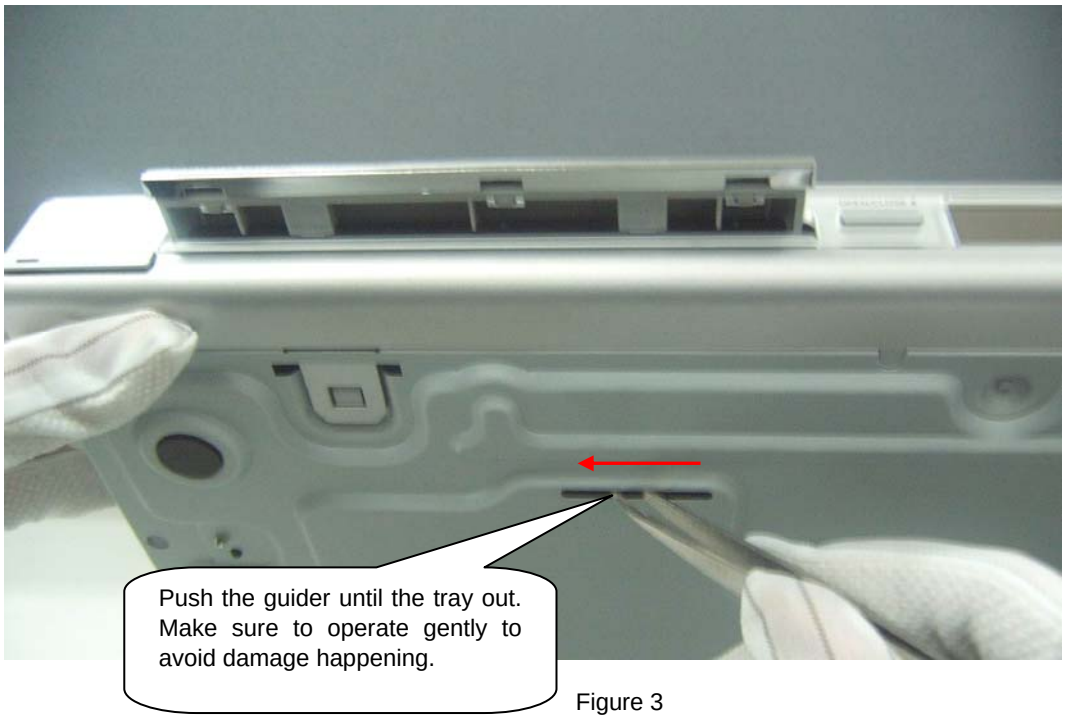


Figure 3

Step4: Dismantling Loader, disconnect the 3 connectors aiming in the below figure, and remove 4 screws around the Loader. (Figure 4)

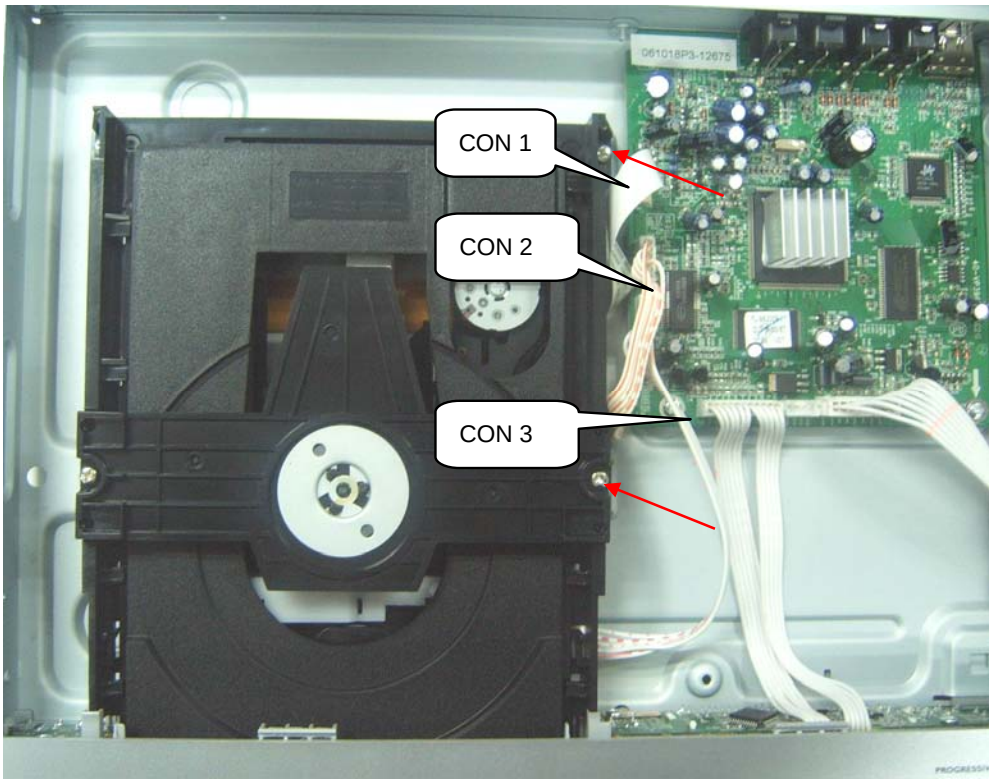


Figure 4

Mechanical and Dismantling Instructions

Dismantling Instruction

Step5: Dismantling Front Panel, disconnect the 1 connector, then release the snaps on the both sides of Front Panel and bottom cabinet , then gently pull the Panel out from the set. (Figure 5 & 6 & 7)

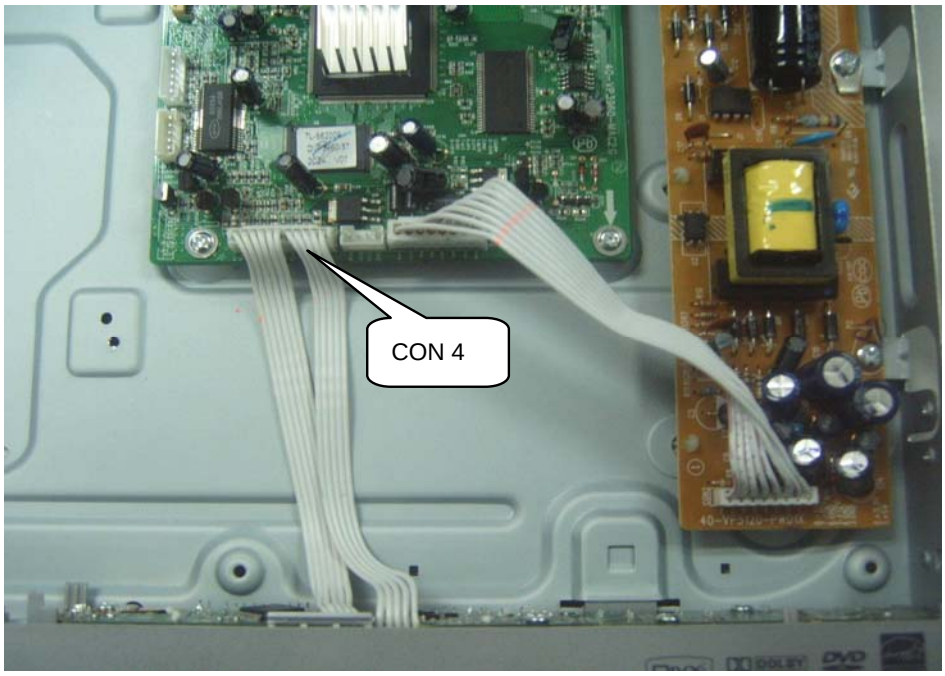


Figure 5

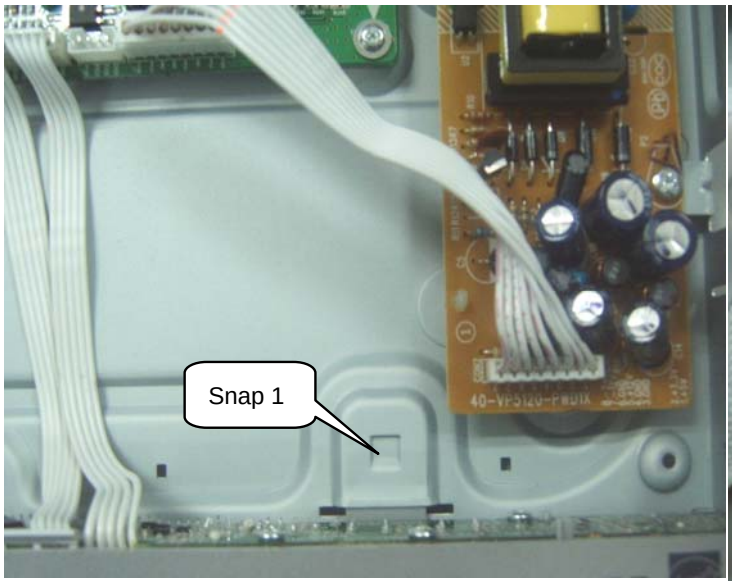


Figure 6

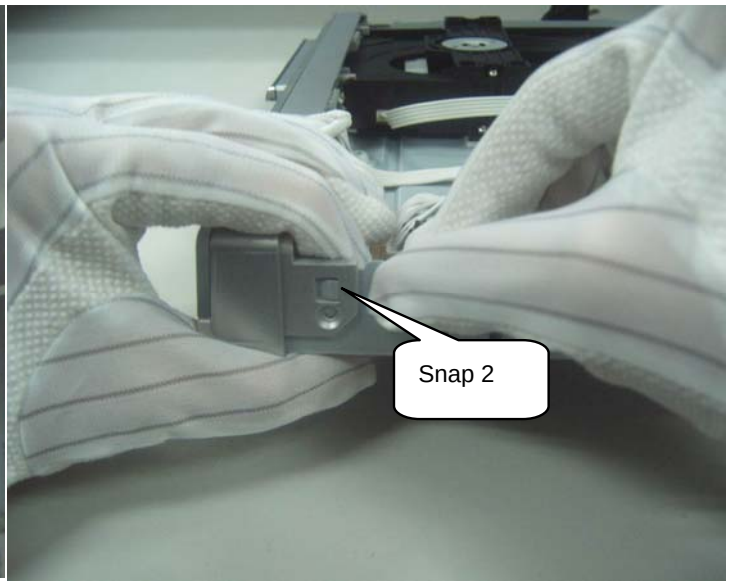


Figure 7

Mechanical and Dismantling Instructions

Dismantling Instruction

Step6: Dismantling Main Board, first disconnect the 1 connector, and then remove 5 screws to dismantle Main board. (Figure 8)

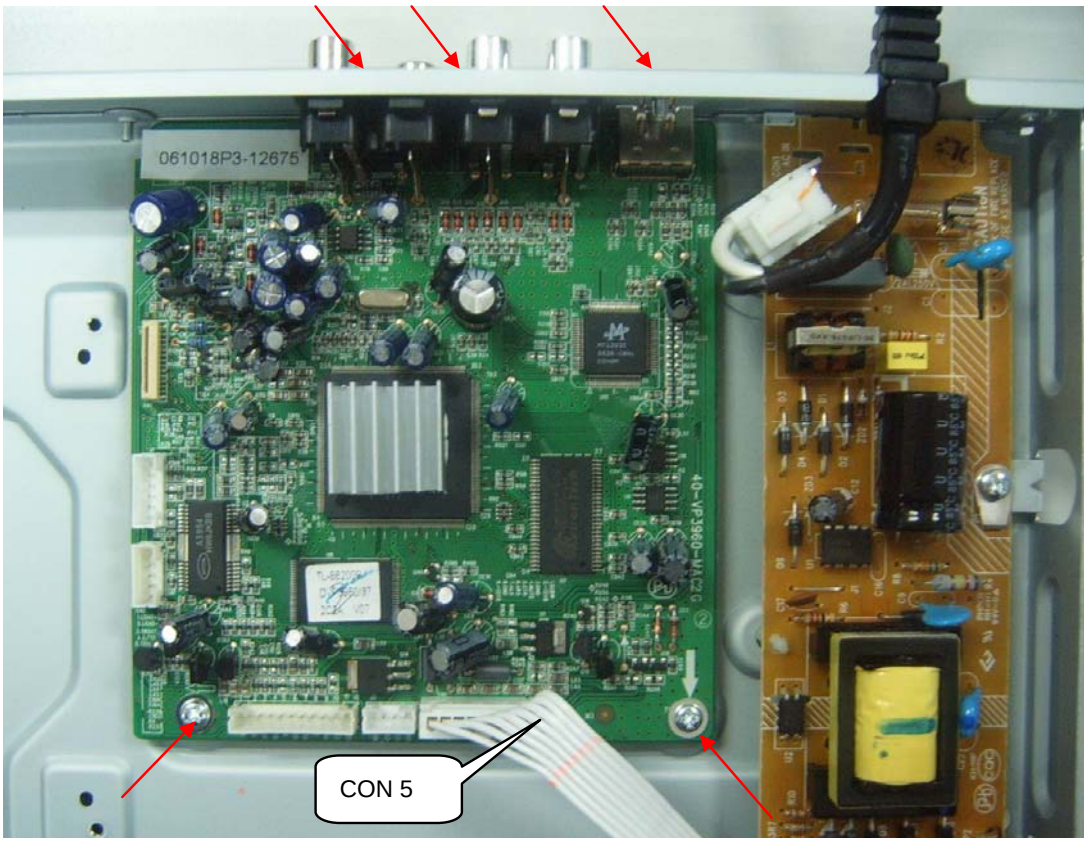


Figure 8

Step7: Remove the 2 screws on Power Board to dismantle the Power Board. (Figure 9)

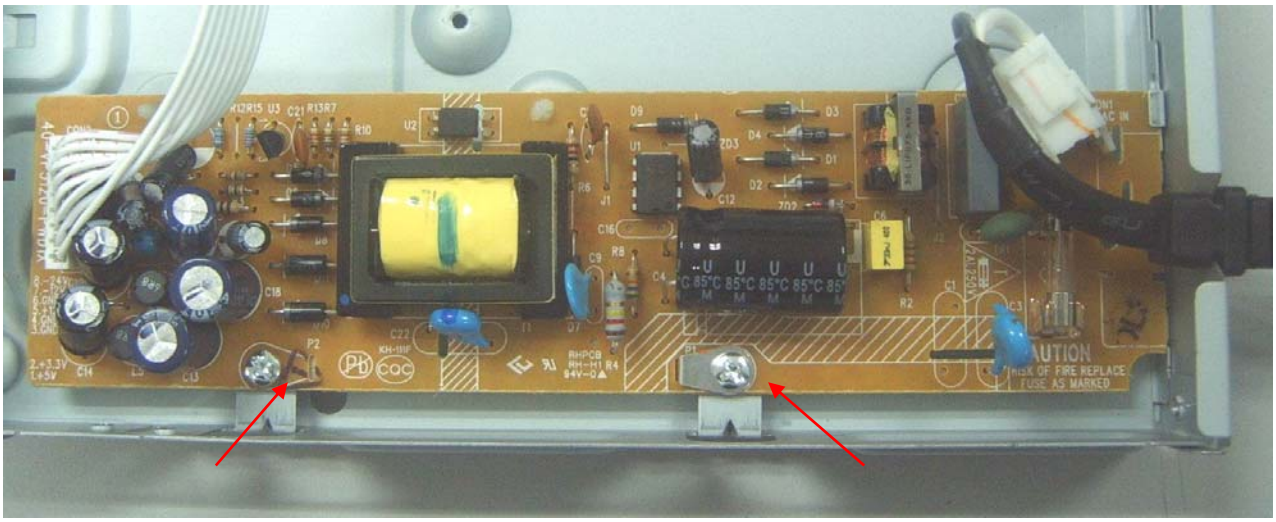


Figure 9

Mechanical and Dismantling Instructions

Dismantling Instruction

ATTENTION OF REPAIRING

Make sure adding silicon glue to fix the capacitor C4 after repairing, (Avoid the hazard of C4 touching the Top Cover.)

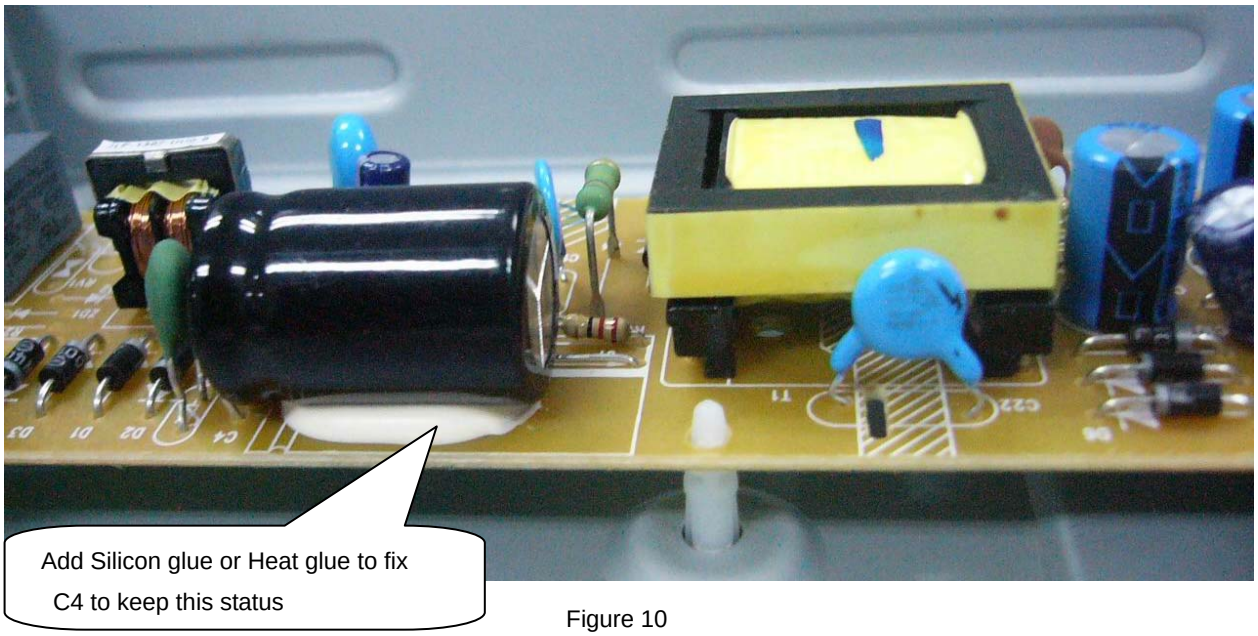


Figure 10

Software upgrade

Preparation to upgrade software

1) Start the CD Burning software and create a new CD project (Data Disc) with the following setting:
   Label: DVP3XXX (No need the label name)
   File Name: DVPXXXX_XX.BIN
   Power on the set and open the tray, then press <5><5> to check the File Name.

Note: It is required capital letter for the File System name.

2) Burn the data onto a blank CDR

A. Procedure for software upgrade:

1) Power on the set and insert the prepared Upgrade CDR.
2) The set will starts reading disc & response with the following display TV screen:
   Upgrade File DETECTED
   Upgrade?
   Press Play TO START.
3) Press <OK> button to confirm, then screen will display :
   Files coping…
   UPGRADING…
4) The upgraded tray will automatically open when files coping complete, then take out the disc.
5) About 1 minute later, the trace will automatically close when upgrading complete.

C. Read out the software versions to confirm upgrading

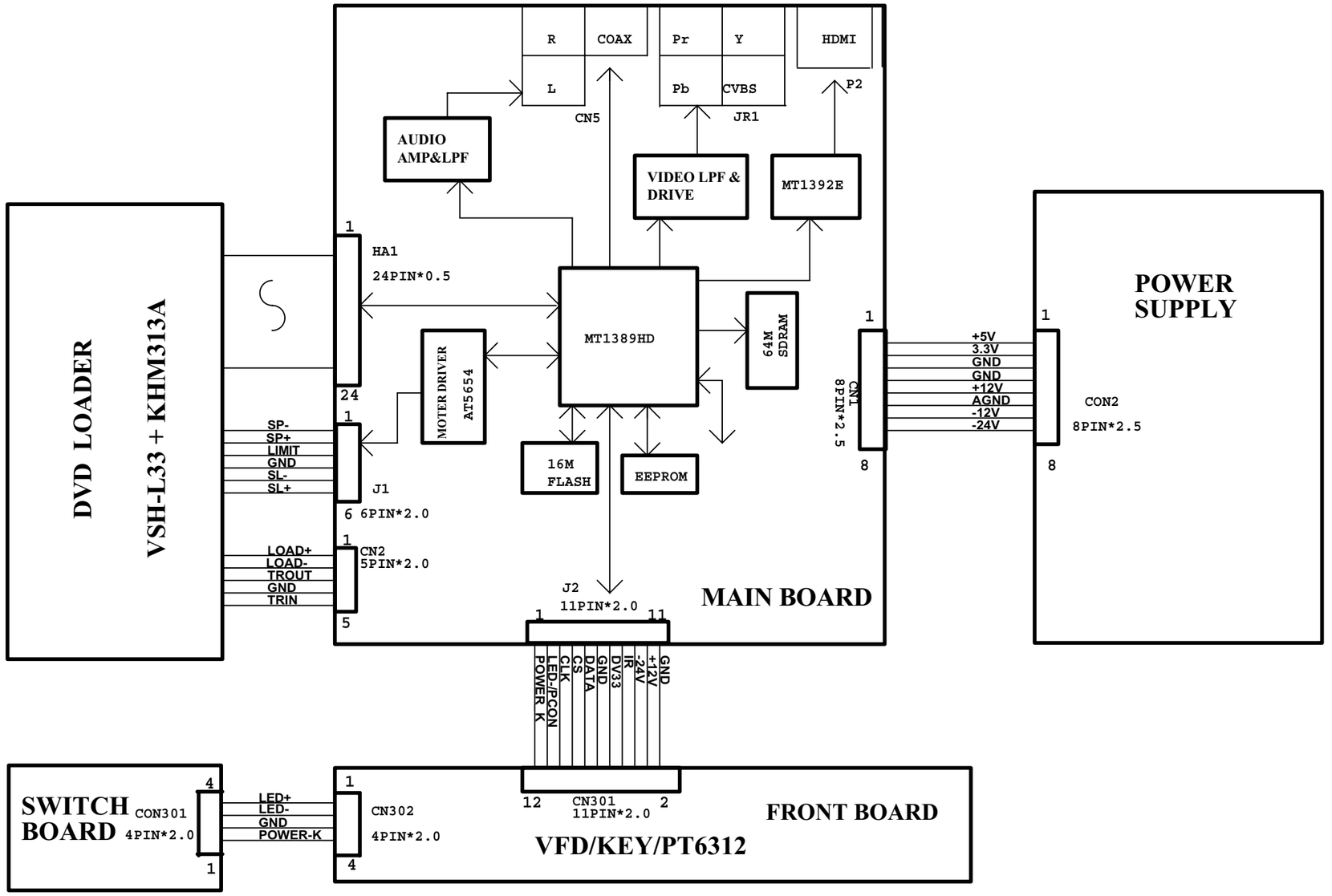
1) Power on the set and press <Setup> button on the remote control.
2) Press <1><3><7><9> button.
   The software version and other information are display on the TV screen as follows:

Version	XX.XX.XX.XX (Main version)
SUB-VER	XX.XX.XX.XX (software version of application software)
8032	XX.XX.XX.XX
Servo	XX.XX.XX.XX (software version of Servo)
RISC	XX.XX.XX.XX
DSP	XX.XX.XX.XX
Region Code	XX

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

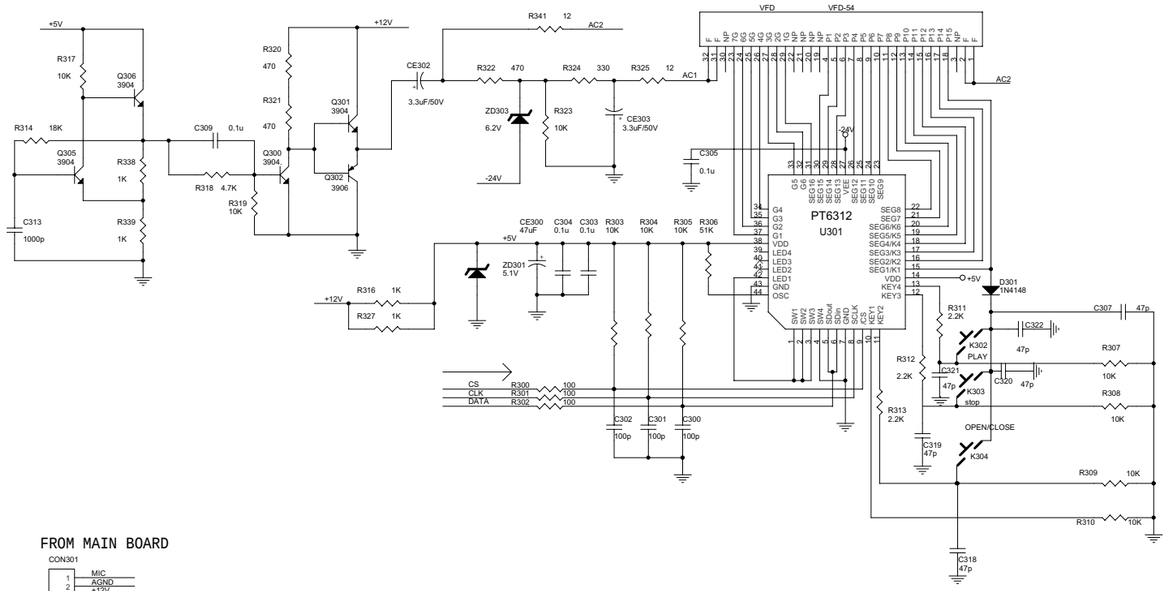
5-1

DVP3960/37 WIRING DIAGRAM

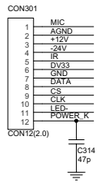


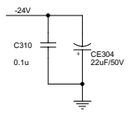
6-1

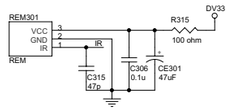
DVP3960/37 Front Board Electrical Diagram

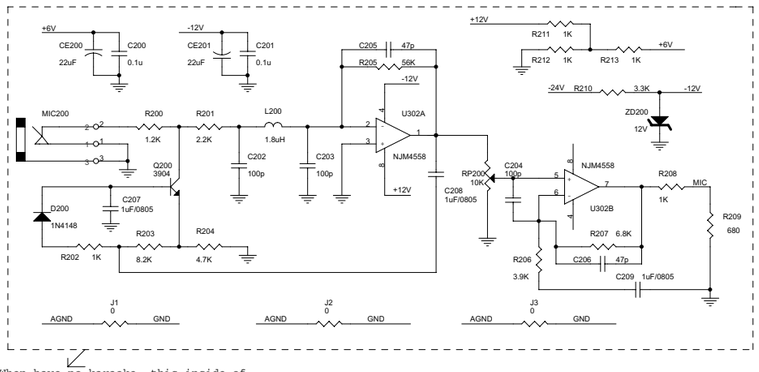


FROM MAIN BOARD

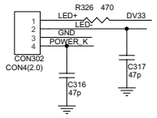






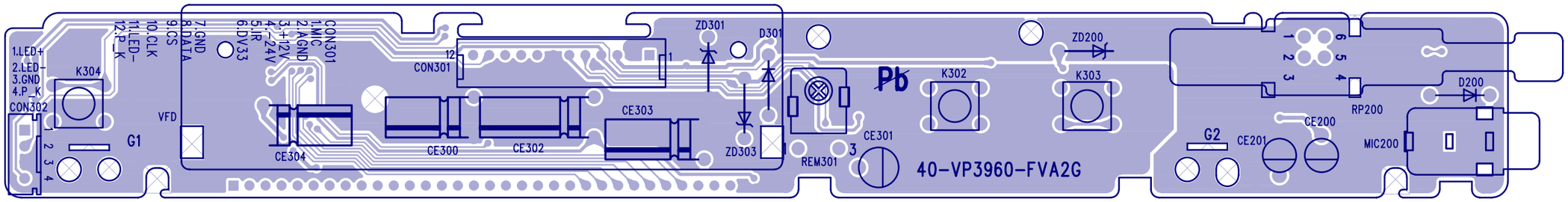


When have no karaoke, this inside of circle a piece is"OPEN"

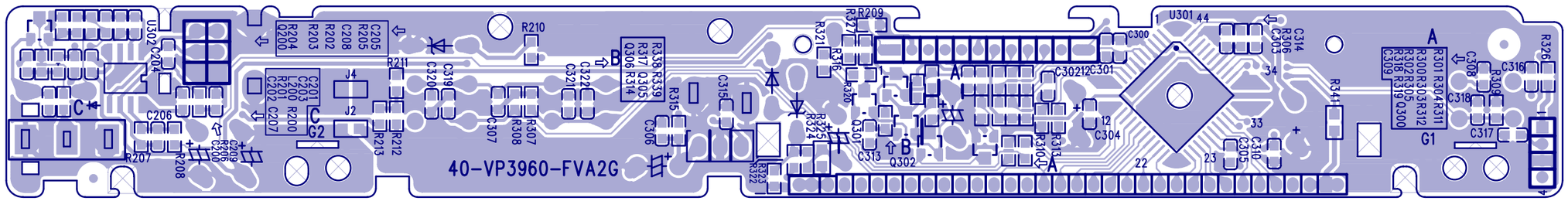


6-2

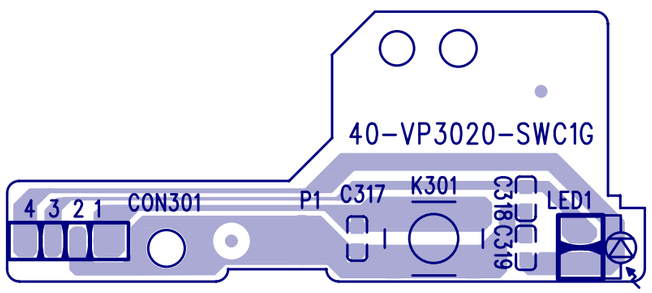
Front Board Print-layout (Top Side) for DVP3960/37



Front Board Print-layout (Bottom Side) for DVP3960/37

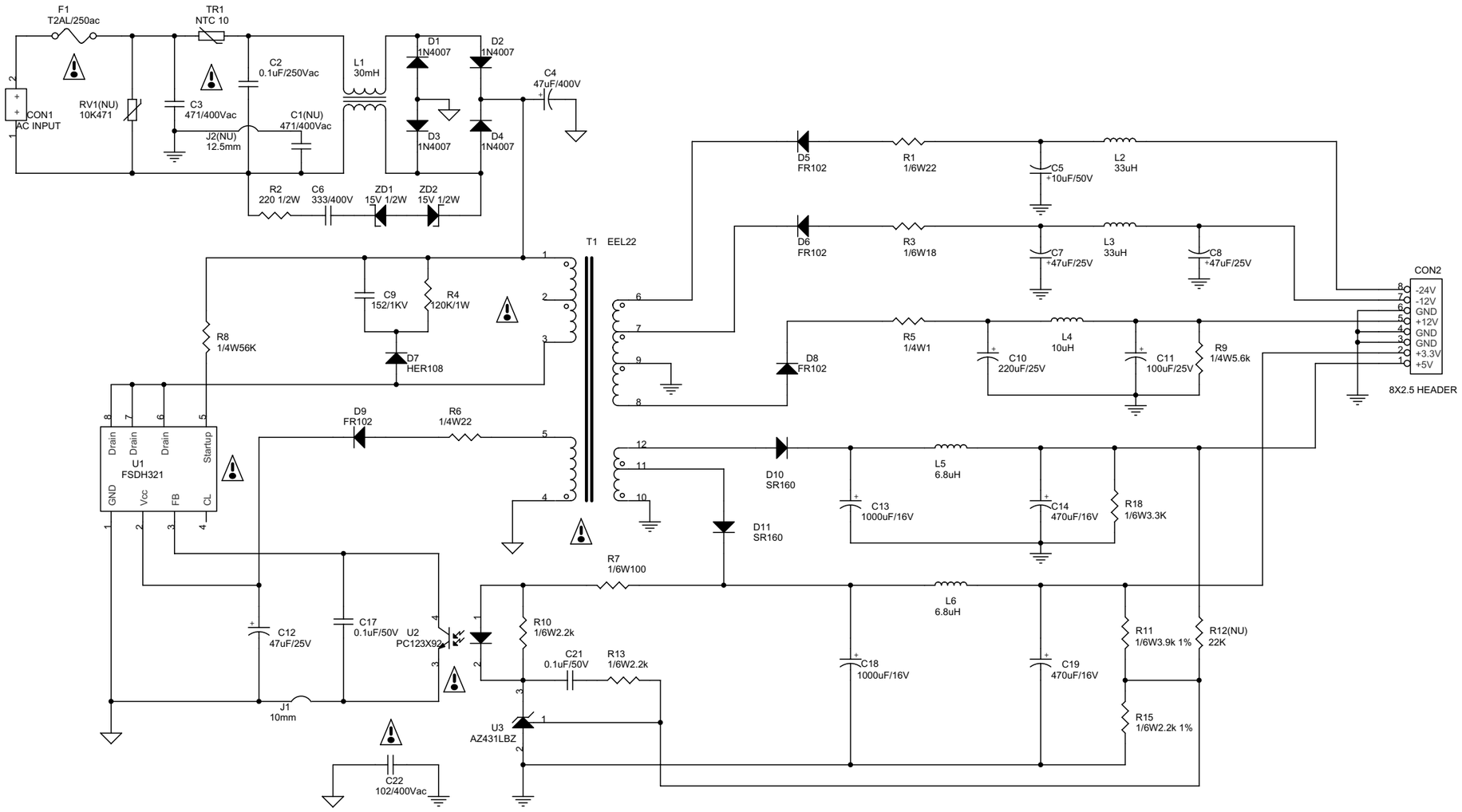


Switch Board Print-layout (Top Side) for DVP3960/37



6-3

DVP3960/37 Power Board Electrical Diagram



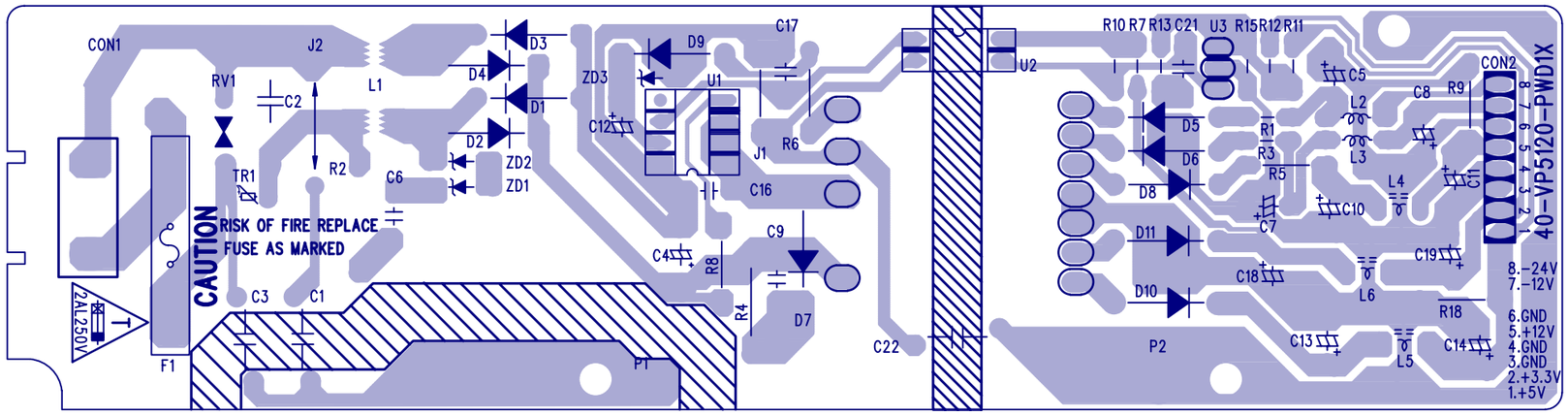
*** CAUTION :**

THE PARTS MARKED WITH ⚠ ARE IMPORTANT PARTS ON THE SAFETY.

PLEASE USE THE PARTS HAVING THE DESIGNATED PARTS NUMBER WITHOUT FAIL.

6-4

Power Board Print-layout (Bottom Side) for DVP3960/37



6-5

DVP3960/37 Main Board Electrical Diagram - POWER&CONNECTOR

MT1389HD (LQFP256) DVD MP Board for SANYO HD62/SONY
KHM313AAAPUH w/MT1392 HDMI
MD0278

C102 3D
C124 1B
CB6 2A
CB8 3A
C121 4B
C108 3D
C115 3C
C117 4C
R397 3D
R247 3C
R264 1A
R263 2A
R241 3D
D3 4B
R399 4B
C101 3D
CB81 2A
C112 1D
C113 1D
CB85 4B
CN2 2C
R240 3D
R242 3D
CN1 4D
R244 3C
R245 3C
R251 3C
R243 2D
R358 2D
R248 3C
R249 3C
R255 3B
R253 1C
R252 1C
L43 1D
L44 1D
L45 1D
L46 1D
R239 1D
R4 2D
R6 4B
R128 2D
R400 4B
ZD1 3C
R183 3A
R246 3C
R250 3C
ZD2 3C
C118 3B
CE12 3A
C103 1D
C104 1D
C105 1D
C107 1D
CE10 4B
R260 1B
R259 2B
CE37 3D
CE8 3A
R261 2A
R262 1A
C125 2A
C126 1A
L47 1D
Q16 3C
Q19 1B
Q20 1B
Q22 1A
Q21 1A
X13 2A
Q14 3D
U17 3D
Q40 4B
Q17 3C
Q18 3B
J2 1D
L4 4A
L5 4A
L42 1D
L58 3B
L63 3C
L64 3B
L65 4A
L39 3D
L41 3D
L62 3C
U1 3B
CB86 4B
C109 2D
C110 2D
C111 1D
ZD3 3D
R182 3A
R237 3D
R258 3B
Q15 3C

TO POWER BOARD

CN1
1 +5VD
2 +P33V
3 GND
4 GND
5 +P12V
6 GND
7 -P12V
8 -P24V
2.5mm*8
50mA
20mA

L39 FB AXIAL
C101 1u,0805
C102 0.1u
CE37 220uF/16V
V33
R237 NC [0R]
L41 FB AXIAL
Q14 AOD420
C108 0.1u
VCC
R240 2.2K 1%
R241 1K
U17 AZ431LBZ
R242 2.2K 1%
ZD3 NC [5.1V 1/2W]
R397 0R
Q15 S8550
+12V
100mA
L62 FB AXIAL
C115 0.1u
R245 3.3k
R246 22K
R247 1.3K
R244 3.3k
+12VA
ZD1 18V
R248 4.7K
Q16 3904
R250 22k
R249 4.7K
L63 FB500R
-12V
Q17 BT3904
ZD2 30V [NC]
+12V
C117 0.1u
R251 3.3k
PCON/LED
C118 47P
R255 4.7K [NC]
L64 FB500R
-24V
Q18 BT3904 [NC]
C121 0.1uF
R258 NC [0R]

-24V: -24V(+-10%)
+12V: +12V(+-10%)
-12V: -12V(+-10%)
+5V: +5V(+-2.5%)
+3.3V:
+3.3V(+-2.5%)

TO FRONT PANEL

DV33 VCC
C103 100P C104 100P C105 100P C107 100P
R128 10k
R4 10k
-24V +12VA
R239 10R
DV33 L42 FB500R
IR 4.7K R358 2
VSDA VSTB VSCK PCON/LED POWER_K
L43 10R L44 10R L45 10R L46 10R L47 470
4.7K R243
C109 NC C110 NC C111 NC
C112 C113 1u,0805 1u,0805
DV33
J2 11 10 9 8 7 6 5 4 3 2 1

IR VSCK VSTB VSDA URST# PCON/LED POWER_K
IR VSCK VSTB VSDA URST# PCON/LED POWER_K 2

RFV33
R252 10K R253 10K
CN2
1 LOAD+
2 LOAD-
3 TROUT
4
5 TRIN
2.0MM*5
TROUT 2
TRIN 2

RESET Circuit

DV33
CE10 100uF/16v
R399 1k
R6 10k
URST#
Q40 BT3904
D3 1N4148
R400 10k
CB86 NC/1uF
CB85 1uF

VCC
L4 FB500R
AVCC
120mA
AVCC

V33
520mA
DV33
U1 LM1117H-1.8 [1117-ADJ]
IN GND OUT
310mA
L58 FB500R
V18
CE8 220uF/16v
CB81 1u,0805
CB6 0.1uF
R182 NC [560R 1%]
R183 20R [300R 1%]

DV33 150mA L5 FB500R
RFV33
CE12 47uF/16v
CB8 0.1uF

DV33 L65 FB500R DV33HD

MO_VCC MO_VCC
R259 220R R260 220R
Q19 9012 Q20 9012
C124 0.1uF
LOAD+ LOAD-
TROPEN R261 390R Q21 9013
Q22 9013 R262 390R TRCLOSE
R263 1K C125 390pF
C126 390pF R264 1K
TRCLOSE 2

6-6

DVP3960/37 Main Board Electrical Diagram - MT1389HD&Frontend

MT1389HD

Pin Assignment v1.5

SANYO SF-HD60

HD-62	R268,R269 J1 (1-4)
KHM310A	R21,R270 J1 (1-6)

HD-62	R131(0),R132(0) R34(10),R35(10)
KHM313A	R131(100),R132(100) R34(4.7),R35(4.7)

Very Important to reduce Noise

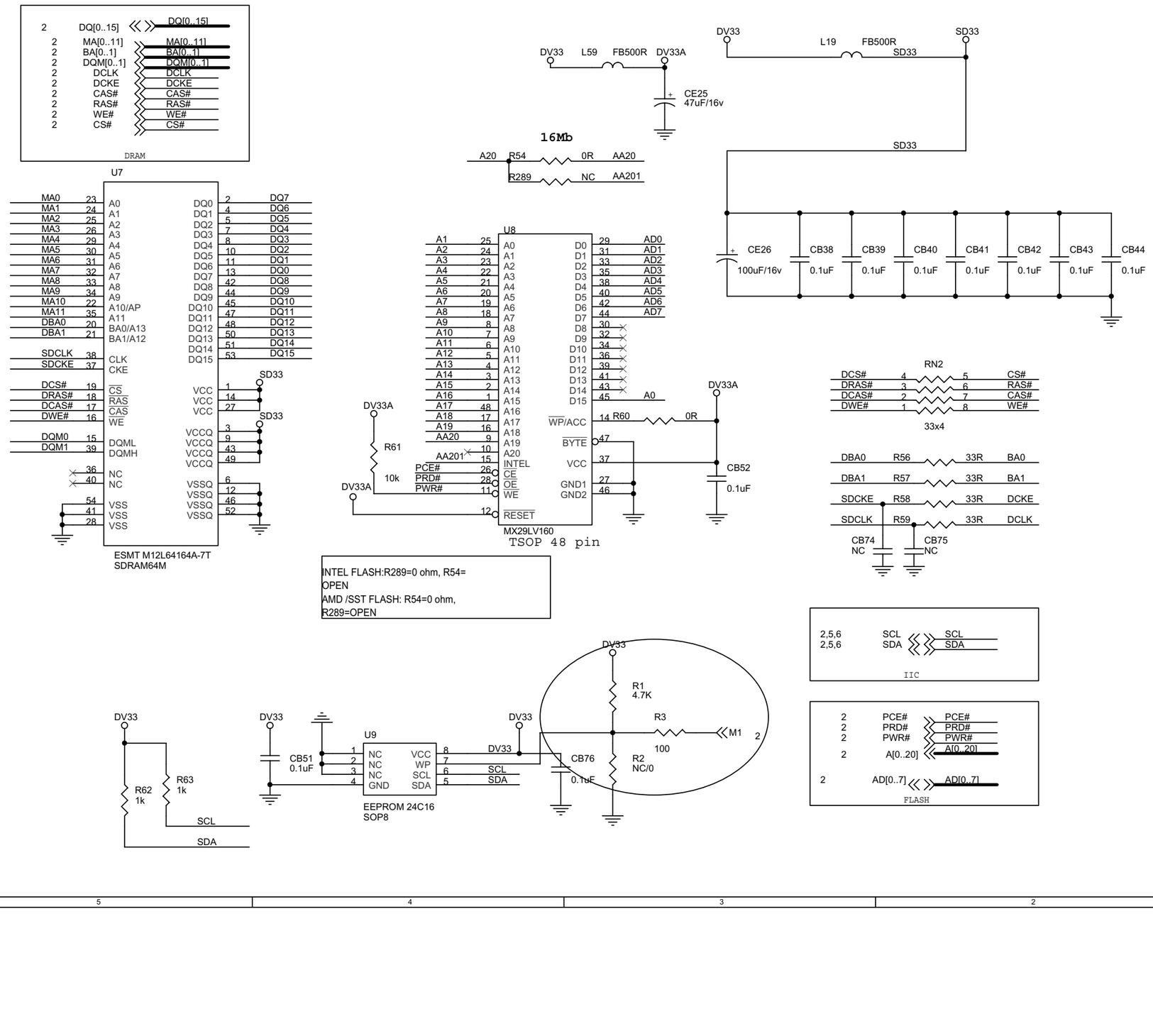
CE14/CE30/CE31 closed to IC's pin

C17,C18 should join the ground in one point!

Use it to connect the shell of the crystal to ground.

6-7

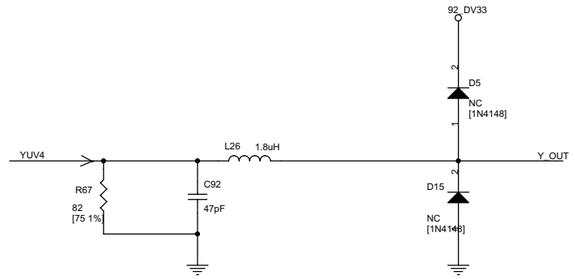
DVP3960/37 Main Board Electrical Diagram - SDRAM & FLASH

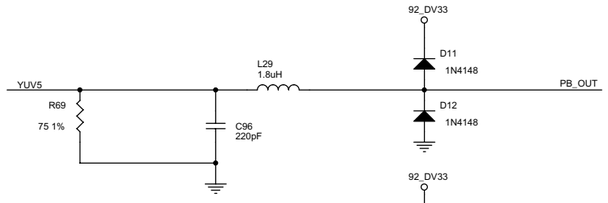


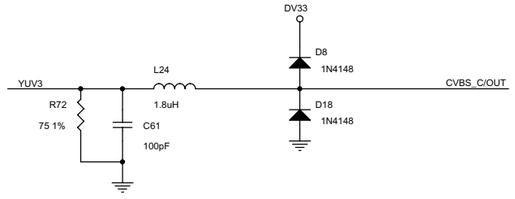
CB76	2B
CB52	3C
CB38	3C
CB39	3C
CB40	3C
CB41	2C
CB42	2C
CB43	2C
CB44	2C
CB51	5A
R60	3C
R54	4D
R62	5A
R63	5A
R1	3B
R61	4C
R56	2C
R57	2C
R58	2C
R59	2B
RN2	2C
CE25	3D
CE26	3D
R3	3B
X13	2A
U9	4B
U7	5D
L19	3D
L59	3D
U8	4D
R2	3A
CB75	3B
CB74	3B
R289	4D

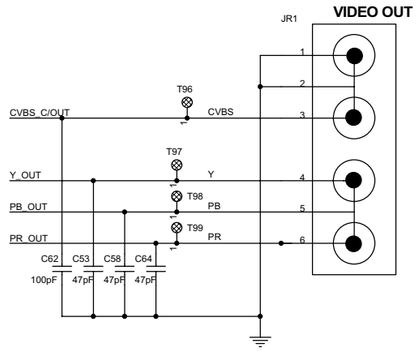
6-8

DVP3960/37 Main Board Electrical Diagram - VIDEO OUT





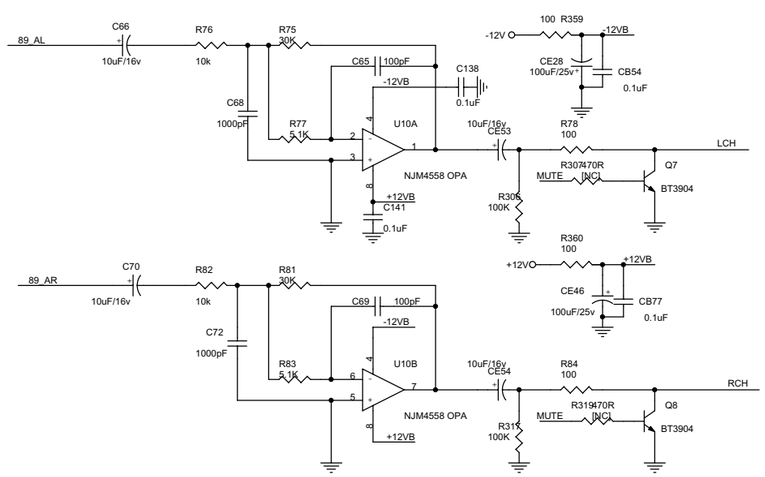


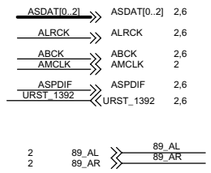


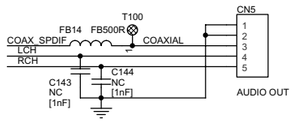
L24	4B
L26	4D
L29	4C
L32	4C
D8	4B
D11	4C
D12	4C
D13	4C
D14	4C
D18	4C
C53	3D
C58	3D
C64	3D
C92	4D
R69	5C
R72	4B
R73	5C
R67	5D
C62	3D
C61	4B
C96	4C
C97	4B
X13	2B
D5	4D
D15	4D
JR1	2D

6-9

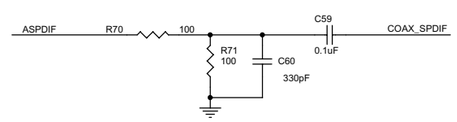
DVP3960/37 Main Board Electrical Diagram - AUDIO OUT

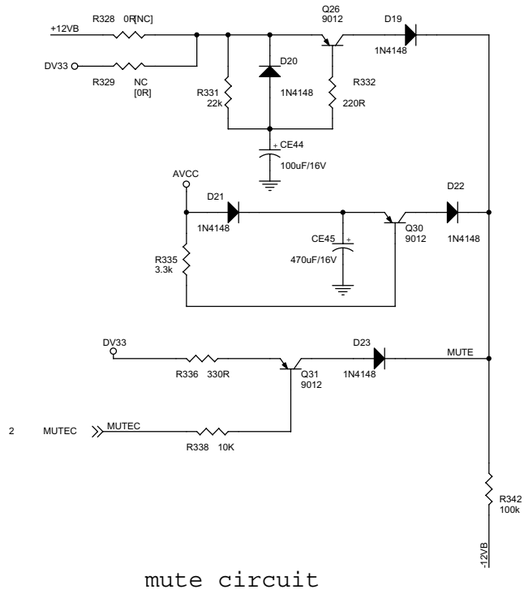






C59	1	B
CB54	3	D
CB77	3	C
C141	3	0
C138	3	D
R328	4	B
D19	3	B
D20	3	B
D21	3	B
D22	3	B
D23	3	B
R335	3	B
R81	3	C
R75	3	D
R338	3	B
CE54	3	C
CB53	3	D
R331	3	B
R306	3	D
R317	3	C
R342	3	B
CE44	3	B
CE46	3	C
CE28	3	D
R70	2	B
R71	1	B
R78	3	D
R84	3	C
R359	3	D
R360	3	C
R332	3	B
R336	3	B
C60	1	B
R83	3	C
R77	3	D
R319	3	C
R307	3	D
CB45	3	B
C69	3	C
C65	3	D
C68	4	D
C72	4	C
Q26	3	B
Q30	3	B
Q31	3	B
X13	2	B
CN5	1	C
Q7	3	D
Q8	3	C
FB14	2	C
C70	4	C
C66	4	D
C144	2	C
C143	2	C
R82	4	C
R76	4	D
R329	4	B
U10B	3	C
U10A	3	D
T100	2	C

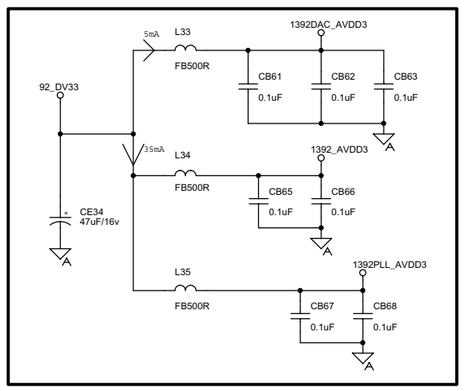




mute circuit

6-10

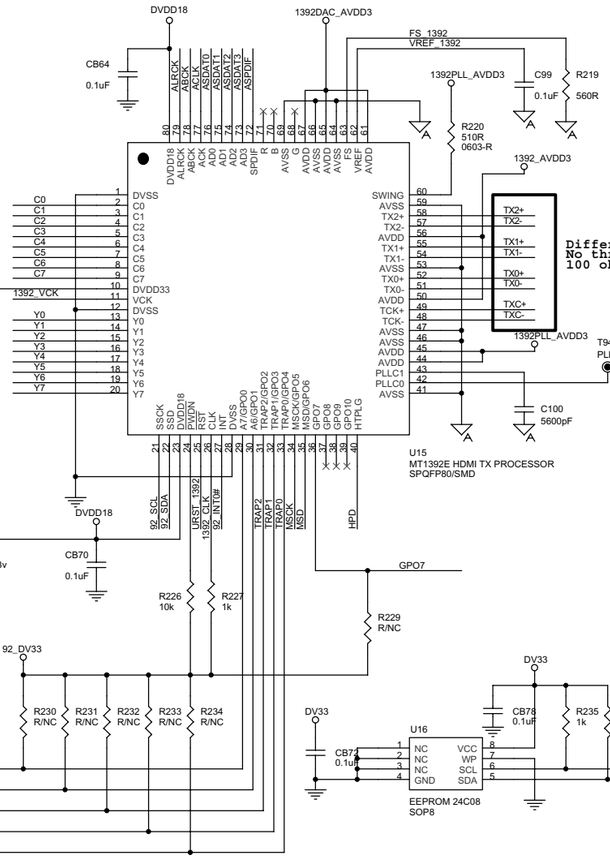
DVP3960/37 Main Board Electrical Diagram - HDMI OUT MT1392

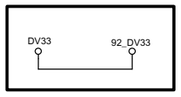


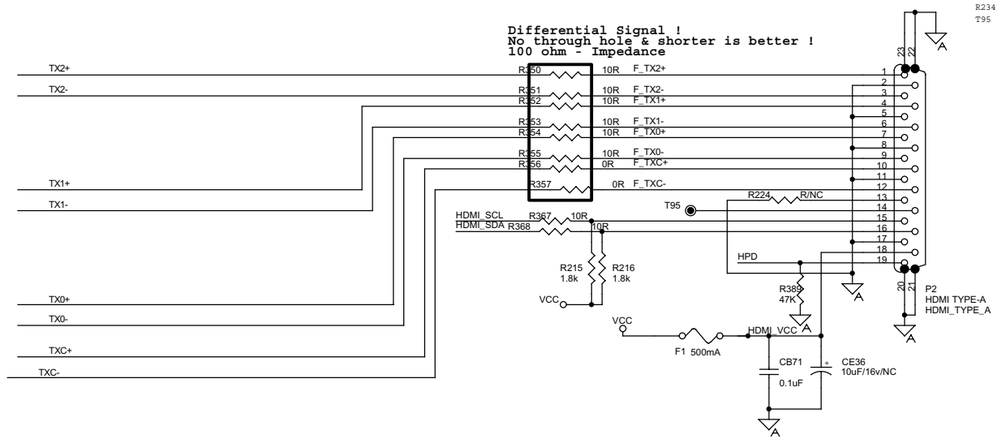
URST_1392 — URST_1392 2,5
C[0..7] — C[0..7] 2
Y[0..7] — Y[0..7] 2
ASDAT[0..3] — ASDAT[0..3] 2,5
ALRCK — ALRCK 2,5
ACLK — ACLK 2
ABCK — ABCK 2,5
ASPDIF — ASPDIF 2,5
UP3_0 — UP3_0 2
UP3_1 — UP3_1 2
SCL — SCL 2,3,5
SDA — SDA 2,3,5
INT0# — INT0# 2
1392_CLK — 1392_CLK 2
1392_VCK — 1392_VCK 2

1392_CLK — R349 NC (RR) — 1392_VCK
92_SCL — SCL
92_SDA — SDA
92_INT0# — INT0#
R218 R/NC

UP3_0 — HDMI_SCL
UP3_1 — HDMI_SDA



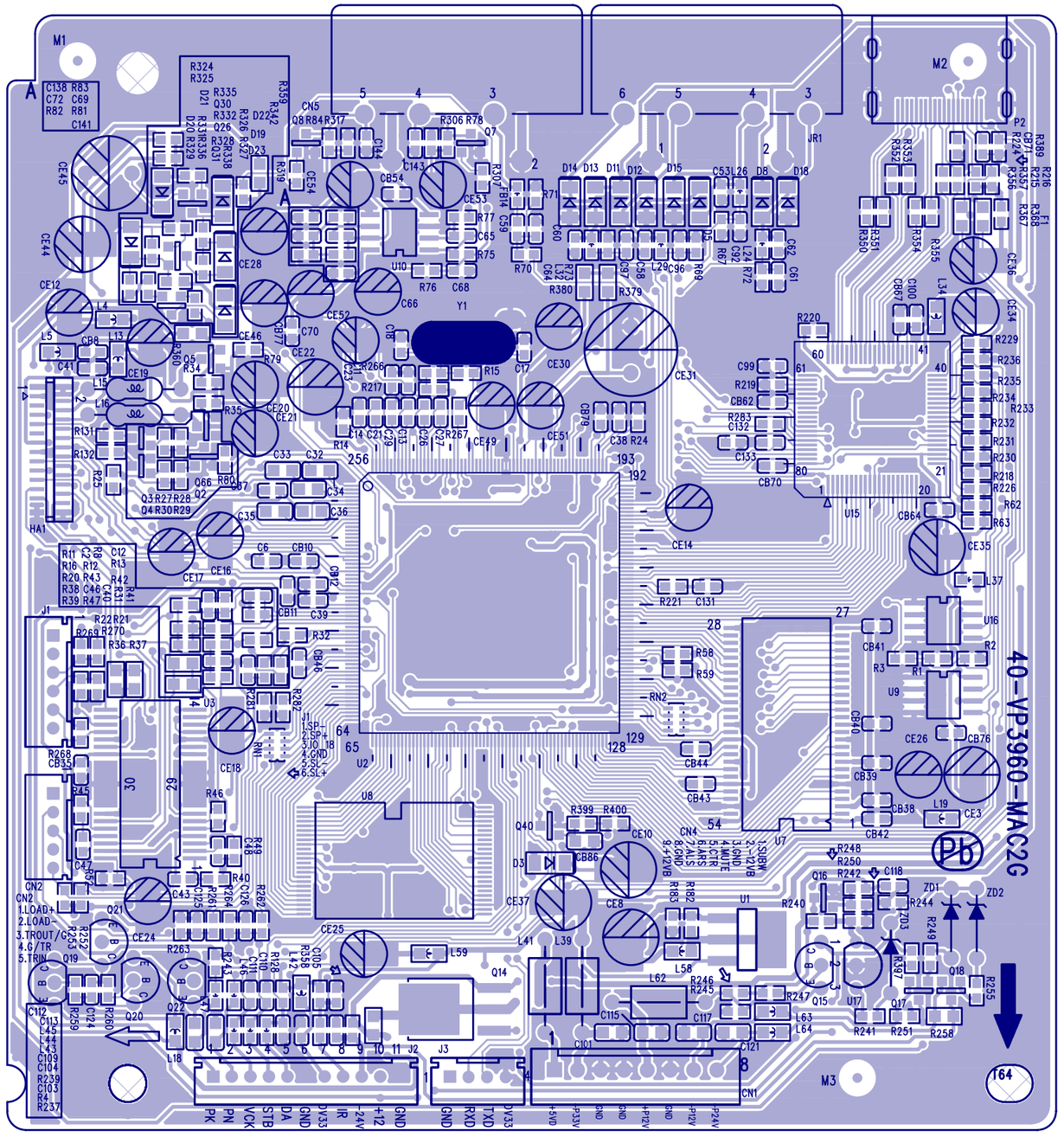




C99	4	C
CB61	5	D
CB62	5	D
CB63	4	D
CB64	5	C
CB65	5	D
CB66	5	D
CB67	5	D
CB68	4	D
CB69	5	B
CB70	5	B
CB71	1	B
CB72	4	B
CB78	4	B
R356	2	B
R357	2	B
R215	2	B
R216	2	B
R227	4	B
R235	4	B
R236	3	B
R350	2	B
R351	2	B
R352	2	B
R353	2	B
R354	2	B
R355	2	B
R367	2	B
R368	2	B
R226	4	B
CE36	1	B
R389	1	B
CE34	5	D
CE35	5	B
F1	1	B
R220	4	C
R219	4	C
C100	4	B
X13	2	B
U16	4	B
L33	5	D
L34	5	D
L35	5	D
L36	5	B
L37	5	B
P2	1	B
U15	5	C
R349	5	C
T94	3	B
R218	5	C
R224	1	B
R229	4	B
R230	5	B
R231	5	B
R232	5	B
R233	5	B
R234	4	B
T95	1	B

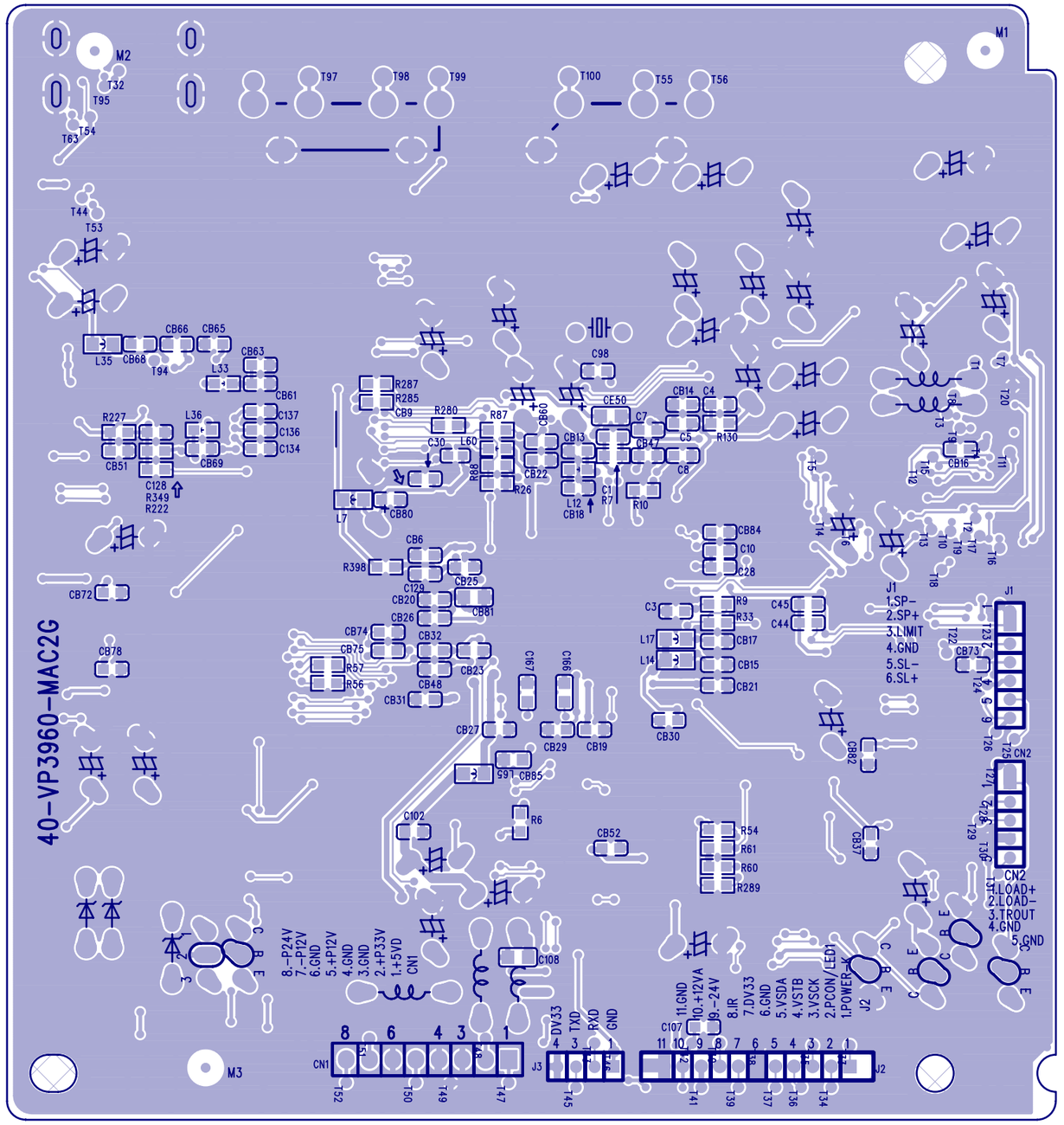
6-11

Main Board Print-layout (Top Side) for DVP3960/37

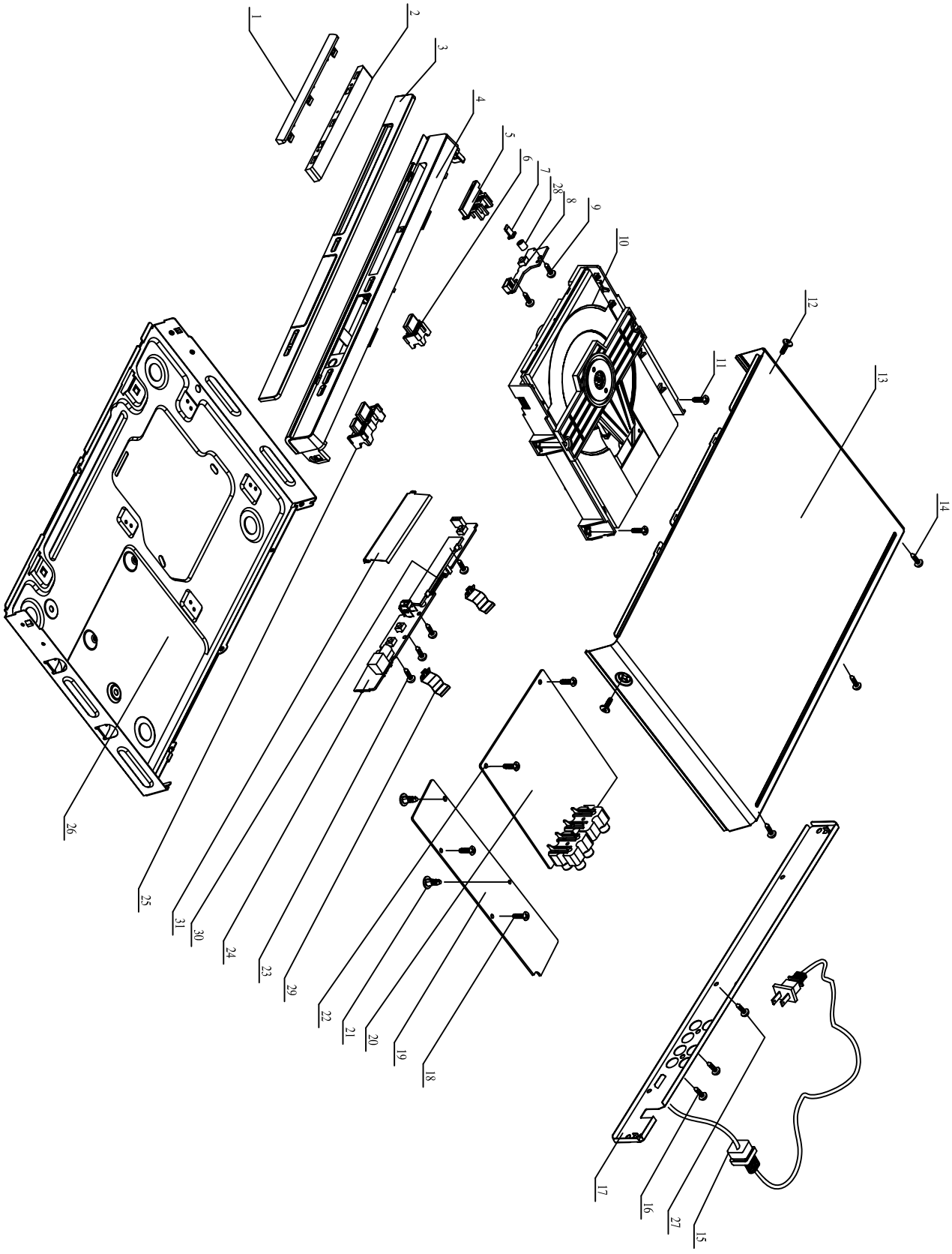


6-12

Main Board Print-layout (Bottom Side) for DVP3960/37



DVP3960/37 Exploded View



Remark: Ass'y1 is the assemble component for location 1,2
Ass'y2 is the assemble component for location 3,4,5,6,25

DVP3960/37 Parts List

VC	996510001106	VIDEO CABLE 1500mm
AC	996510001107	AUDIO CABLE 1500mm WHITE/RED
RC	996500034176	REMOTE CONTROL

Note:Only the parts mentioned in this list are normal service spare parts

REVISION LIST

Version 1.0
* Initial release