

DVD Micro Theater**MCD130****Service****MCD130/93 MCD130/96**

Service Manual

TABLE OF CONTENTS

	Page
• How to remove the CD manually from the tray.....	2
• How to check the return Unit.....	3-6
• Software Upgrade.....	7
• How to select right language.....	8
• Block diagram.....	9-1
• Wiring diagram.....	9-2
• Main board	
Circuit diagram.....	9-3.... 9-8
Layout diagram.....	9-9.... 9-10
• Exploded diagram.....	9-11
• Revision List.....	10

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CLASS 1 LASER PRODUCT

PHILIPS

2.0 SAFETY INSTRUCTIONS

(GB) WARNING

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

ESD



(NL) WAARSCHUWING

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

(F) ATTENTION

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

(D) WARNUNG

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

(I) AVVERTIMENTO

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

(GB)

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

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

(NL)

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

(F)

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

(D)

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

(I)

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

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

Caution: These servicing instructions are for use by qualified service personnel only.

To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.



(GB) Warning !

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

(S) Varning !

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

(SF) Varoitus !

Avatussa laitteessa ja suojalukiukseen ohittaaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso sääteeseen!

(DK) Advarse !

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

2.1 ESD PROTECTION

- レンズには絶対に触れないでください。
- DO NOT TOUCH THE LENS.
- LINSE NICHT BRÜHREN.
- NE PAS TOUCHER LA LENTILLE.

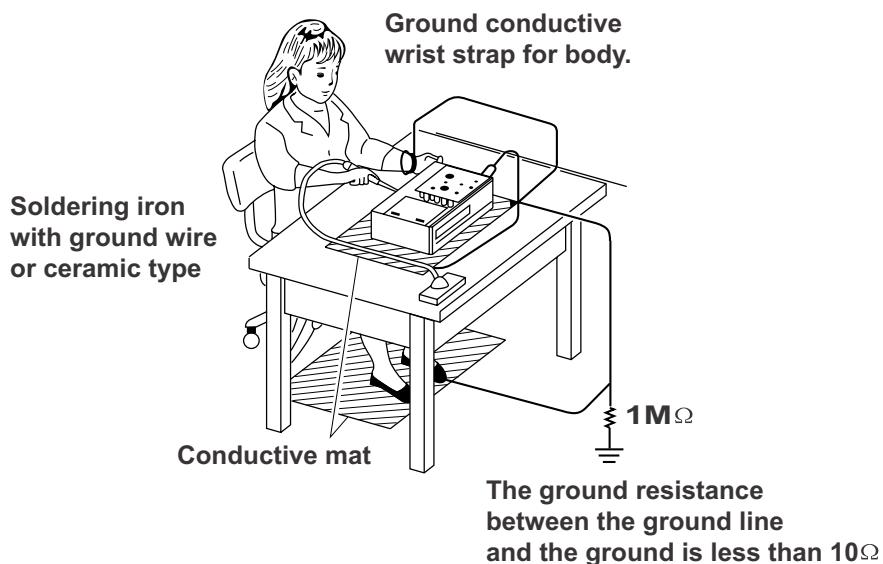
When the power supply is being turned on, you may not remove this laser cautions label. If it removes, radiation of laser may be received.

PREPARATION OF SERVICING

Pickup Head consists of a laser diode that is very susceptible to external static electricity.

Although it operates properly after replacement, if it was subject to electrostatic discharge during replacement, its life might be shortened. When replacing, use a conductive mat, soldering iron with ground wire,etc. to protect the laser diode from damage by static electricity.

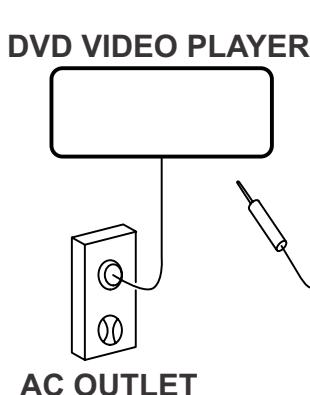
And also, the LSI and IC are same as above.



SAFTY NOTICE**SAFTY PRECAUTIONS****LEAKAGE CURRENT CHECK**

Plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000Ω per volt or more sensitivity. Connect a 1500Ω 10W resistor, paralleled by a $0.15\mu F$ 150V AC capacitor between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of cabinet (antennas, handle bracket, metal cabinet screwheads, metal overlays, control shafts, etc.).

Measure the AC voltage across the 1500Ω resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3V. A reading exceeding 0.3V indicates that a dangerous potential exists, the fault must be located and corrected. Repeat the above test with the DVD VIDEO PLAYER power plug reversed. NEVER RETURN A DVD VIDEO PLAYER TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.

READING SHOULD NOT EXCEED 0.3V**AC VOLTMETER**

(5000Ω per volt
or more sensitivity)

Good earth ground
such as a water pipe,
conduit, etc.

Test all exposed metal.
Voltmeter Hook-up for Leakage Current Check



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

MCD130 – DVD Micro Theatre

Hardware Requirement Specification



Valid for stroke version:

Stroke Version	Countries / Region	MCD130
/12	Europe	
/05	UK	
/37	USA & Canada	
/51	Russia	
/55	Latin America (Including Mexico)	
/93	China	✓
/94	India	
/96	Taiwan	✓
/98	Asia Pacific (except Korea, Thailand)	✓

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MCD130	PRODUCT SPEC		
Page 1 of 10	Sheet-190	Rev.1.0	

MCD130 DVD Micro Theatre

Technical Specifications (Philips Sheet-190)

Contents

1.	EPICTION	3
2.	ACCESSORIES.....	3
3.	General Description	4
4.	Safety requirements.....	5
5.	BSMI requirements	5
6.	CCC requirements	5
7.	Power-Supply	5
8.	Audio (all test with 22k Ohm load unless specified)	6
9.	Speaker (all test with 8 Ohm dummy load).....	6
10.	Video Output.....	6
11.	YUV Video Output	7
12.	Miscellaneous Electrical.....	7
13.	Playability Requirement (See attached in last page).....	8
	DISC Playability (details refer to Playability Test Plan).....	8
	Power On / Off Disturbances	9
14.	Mechanical Specification (Refer PQR or PQP).....	10
15.	Critical component	10
16.	Cosmetic Specification	10
17.	Change History	10

Acceptance Status		Version:	1		
Department	Development	PS & P	Project	Representative	
Name	Gavin He & Waley Chen	Keith CHOW	Simon Wong		
Date					
Sign					

1. EPICTION		DESCRIPTION	Pos
	DVD door		
		Open /Close button	
		Remote IR Sensor	
		Power and play indicator	
		Power button	
		Stop button	
		Previous button	
		Play/Pause button	
		Next button	
		Vol button	
		USB Jack	
CABINET			
Dimensions (L x W x H):	TBA	Material: Refer to Cosmetic Specification	
		Finishing: Refer to MUS specification	
Bear unit weight (kg)	TBA		
Main set	Connector type		
CVBS & YUV OUTPUT X 1	RCA4 x1		
L/R OUTPUT X 1	RCA 2x1		
Speaker connector	2 red + 2 black		
2. ACCESSORIES			
1) Warranty Card			
2) Remote Control,			
3) User Manual,			
4) Video cord 1.2m			
5) Speaker wire(one side fixed in speaker)			

MCD130	PRODUCT SPEC Sheet-190	Rev.1.0
Page 3 of 10		

3. General Description

DVD Micro Theatre

Key Components:

Optical Pickup: S76RFXP2 (IM)

Chip set/Solution: MT1389QEHN-W

Disc Size: 8cm/12cm

Playable disc type: DVD/DVD+RW/DVD+R/CD/CD-R/CD-RW / DVD-R/-RW

Video output signal: PAL/AUTO/NTSC (output only, with Macrovision)

Video format: DVD / VCD / SVCD / JPEG /

Audio format: CD/MP3, MP3-DVD, Dolby digital (down mix), WMA

User Interface:

OSD language:

English, Trad-Chinese, Bahasa Melayu, Thai, Korean for 98 version

Eng, **Simplified-Chinese** for 93 version

Eng, Trad-Chinese, for 96 version

(Detail, refer to UI requirement)

Screen Saver function.

Button functions: Refer to MUS.

Standby power: <1.0W

Picture Quality: refer to DVP3600/98 (NO VIDEO BUFFER)

Sound Quality: refer to MCD2010 (NO OUTSIDE 2CH AUDIO DA)

USB Performance: refer to DVP3600/93 without CD Ripping function

Lifetime : 3 years (min.)

Temperature & Humidity:

Operating Temperature & Humidity

0-50 deg C / 30-90%; Charging Temperature: 0 - +40 degC

Storage Temperature & Humidity

-20-70 deg C / 30-95%

Climatic requirements, Indoor product

Weight:

TBC Kg +/- 30% with / Video cord / IFU / GB

Version	Region	Countries	Voltage	Frequency	AC Cord Type
93	6	China	110V- 240V	50Hz,60Hz	CCC flat 2-pin
96	3	Taiwan	110V- 240V	50Hz,60Hz	Taiwan Plug (CNS 690 approved)
98	3	Asia	110V- 240V	50Hz,60Hz	VDE 2-pins round

4. Safety requirements

CB approval
MCD130

IEC60065:2001 + A1:2005 & EN60065:2002 + A1:2006,

5. BSMI requirements

– Active Radiation, Radiation Immunity, Conductive Interference
CNS 13438/CNS 13439

6. CCC requirements

GB8898-2001 / GB13837-2003 / GB17625.1-2003

7. Power-Supply

AC Power	Typical	Limit	Remarks
Power Supply voltage	100- 240V	+/- 10%	
Standby Power (power switch OFF)	-	<1W	

8. Audio (all test with 22k Ohm load unless specified)

DVD-Audio Line out	Condition	Typical	Limit	
1. Output voltage 1kHz (V)		2Vrms	+/- 1dB	Apply 8 ohm loading no component damage
2. THD 20-20kHz		0.03%	0.06%	
3. Dynamic range	1kHz		>85dB	
4. A-weighted S/N ratio	Tr15/Tr49		>90dB	
5. Frequency response	20-20kHz	-	+1 / -0.5dB	
6. Channel separation	1kHz	-	>=85dB	
7. Channel balance	1kHz		+/- 1dB	

9. Speaker (all test with 8 Ohm dummy load)

CDDA-Speaker Out	Condition	Typical	Limit	
1. Output power RMS 1kHz	CDDA 1kHz/0dB THD 10%	10W	>10W	
2. Max THD 1kHz	Volume max	20%	>20%	
3. THD	Test Power: 1w	100Hz	-	<1%
		1kHz	-	<1%
		10kHz	-	<1%
4. Frequency response	Reference: 1kHz 0dB Test Power: 1w	40Hz	-3dB	+/-2dB
		100Hz	10dB	+/-2dB
		1kHz	0dB	Ref
		10kHz	0dB	+/-2dB
		20kHz	-3dB	+/-2dB
5. S/N ratio	Filter: A-weighted Test power: 1w	1kHz	-	>67dBA
		5kHz	-	>67dBA
6. Max Hum noise	CDDA 1kHz/0dB; Vol=Max	-	<2mV	
7. Min Hum noise	CDDA 1kHz/0dB; Vol=1	-	<2mV	
8. Channel separation	1kHz	-	>=30dB	
9. Channel balance	1kHz	0dB	+/- 2dB	

DVD Dolby 1.5

10. Video Output

AV output ports special requirement	>10V DC	No component damaged
Connection Port Impedance	75 ohm	

CVBS Video Output (PAL / NTSC)				
DVD-Video composite	Condition	Typical	Limit	
1. White Bar	-	714mVpp	+10/-20	
2. Sync. Amplitude	-	286mVpp	+/-40	
3. Amplitude o/p	-	1000mVpp	+10/-20	
4. Burst amplitude	-	286mVpp	+1/-4	
5. Burst/chroma ratio	-	-	+/-10	
6. S/N luminance	Un-weighted	-	>55	
7. S/N chroma (AM)	Un-weighted	-	>55	
8. S/N chroma (PM)	Un-weighted	-	>52	
9. Video bandwidth	-	PAL/8MHz	-7	
10 Chroma/Luminance			<100	
11 Sub-carrier frequency (Chroma) (ppm)	-	4.43361875MHz / PAL 3.579545MHz / NTSC	+/-30	
12 Subcarrier locked / unlocked	-	-	Locked	

11. YUV Video Output

Description	Test Signal	Specification		Class achievement	
		NTSC	PAL	NTSC	PAL
Y White level	100% White	714 mVpp +/- 10%	700 mVpp +/- 10%		
Sync.amplitude	100% White	286 mVpp +/- 40mV	300 mVpp +30mV / - 50mV		
U amplitude o/p	75% color bar (T2 C1)	286mV ± 40mV	300mV ± 50mV		
V amplitude o/p	75% Colour bar	525mV ± 10%	525mV ± 10%		
S/N on outputs: U V	100% red (T2 C17)	≥55 dB *	≥55 dB		
Video Bandwidth (0.5MHz-10MHz)	Multi-burst	+1dB/-6dB	+1dB/-6dB		
multi-burst C9) (T2	video amplitude	Ref. 0dB 90.8 IRE			
	0.5MHz	+1dB / - 1dB	+1dB / -1dB		
	1.0MHz	+1dB / - 1dB	+1dB / -1dB		
	2.0MHz	+1dB / - 2dB	+1dB / -2dB		
	4.0MHz	+1dB / - 3dB	+1dB / -3dB		
	4.8MHz	+1dB / - 5dB	+1dB / -5dB		
	5.8MHz	+1dB / - 10dB	+1dB / -10dB		

View test: For both NTSC and PAL a viewing test is necessary to determine any annoying phenomena which can not be determined by standard video measuring procedures. In case of the doubt, the viewing test is decisive

12. Miscellaneous Electrical

1. EMC for EURO	EMC	-	4dB	Below Limit
2. ESD test(UAN-D1724)	<= 8kV	-	Ok	No abnormal allowed
	<= 15KV	-	Ok	No component damage
3. Mains spike	+/-1500V	-	Ok	
4. Mains failure	100% mains drop	-	Ok	Refer to CTQ

5. Laser beam shut off when the CD door open	-	-	Ok	
-------------------------------------------------	---	---	----	--

Auto Power Off	Con	Typical	Limit	
Screen saver	-	15	+/-30%	After push / disc stop
Power off –stand by	-	20	+/-30%-	After Screen saver functional
IR remote	Condition	Typical	Limit	
Max. operating (degree)	<= +/- 45° => +/- 30° 0°	-	5 7 10	(M)
Quiescent Current		-	<1uA	
Operating Voltage		2.3 - 3.5V		
Operating Current		9 – 16mA		
Carrier Frequency		36KHz	+/- 2%	
Battery Storage Time		? Year		Temperature:
Battery Life Time				After 20 hours continuous sending (2s/time), IR power should be at least 20μW/cm²
Audio/ Video Characteristic Testing discs				
Manufacturer	Disc name			
1) TOSHIBA	TSD-4			
2) DOLBY	Test disc			
3) ABEX	TDV-540A			
4) SONY	Test CD Type 4			

13. Playability Requirement (See attached in last page).

DISC Playability (details refer to Playability Test Plan)

DVD Video playability	Condition	Typical	Limit	
1. Scratch	-	-	<=1.6	ABEX TDV-541

MCD130

PRODUCT SPEC

Sheet-190

2. Black dot	-	-	NA	ABEX TDV-545	
3. Fingerprint	-	-	NA	ABEX TDV-545	
4. Non-Centre	-	-	NA	ABEX TDV-552	
5. Vertical deviation disc	-	-	NA	ABEX TDV-562	
<hr/>					
DVD+ RW Video playability	Condition	Typical	Limit		
Normal playback			OK	Philips HAC11	
Black dot			0.8	Philips HAC11	
Fingerprint			OK	Philips HAC11	
Philips marginal DVD-9			OK	Philips LVP12.01 – layer 0 Philips LVP12.02 – Layer 1	
<hr/>					
CD playability	Condition	Typical	Limit		
Abex-TCD732RA(VDD)	Track 15		OK		
Abex-TCD713(ECC 210um)			NA		

Power On / Off Disturbances

> -52 dB suppression of the disturbance with regard to the rated output voltage.

The peak level has to be measured according to IEC 60651 weighted (A) curve.

14. Mechanical Specification (Refer PQR or PQP)

15. Critical component

Description	Manufacturer	Model no. Version
DVD Chip set	MTK	MT1389QEHN-W
Laser pick up	IM	S76RFXP2
Remote Control	TianZeHuan	T47
Power IC	Infineon	0B2273AMP(SOT23-6)
LOADER	KeQin	RT-628
FLASH(16M)	EON/MX	EN25QH16-104HIP/MX25L1606EM2I-12G
IC(AMP)	TI	TPA3110D2

16. Cosmetic Specification

All cosmetic color please refer Philips MUS color specification

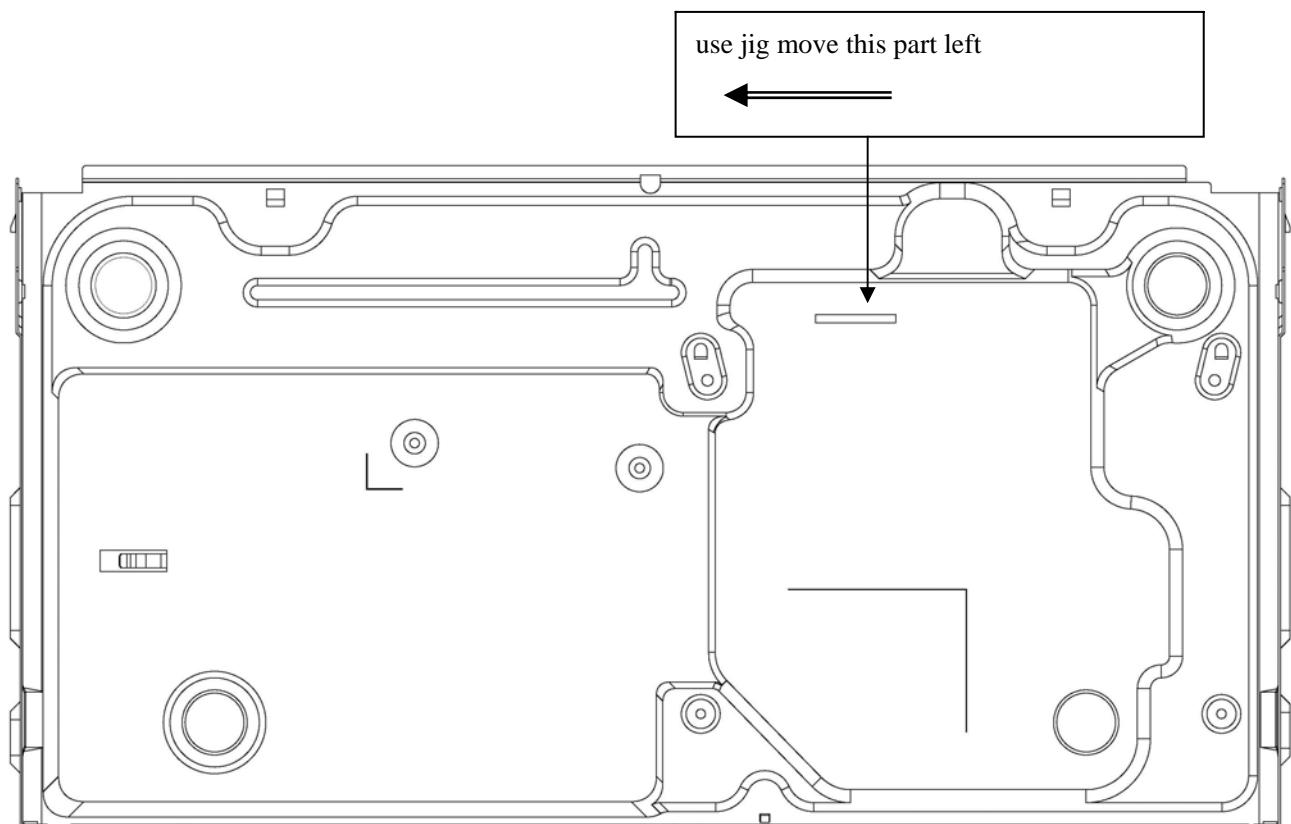
No.	Part Description	Texture	Finishing	Color	Remarks

17. Change History

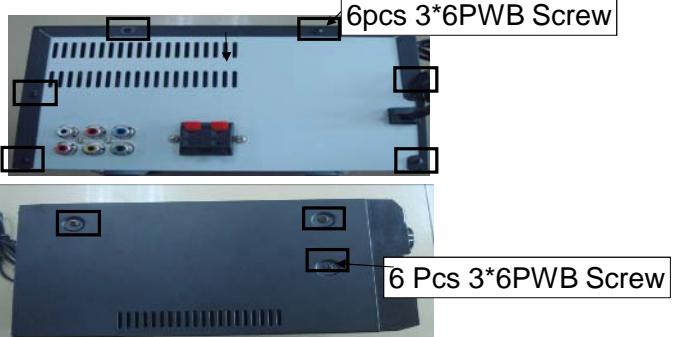
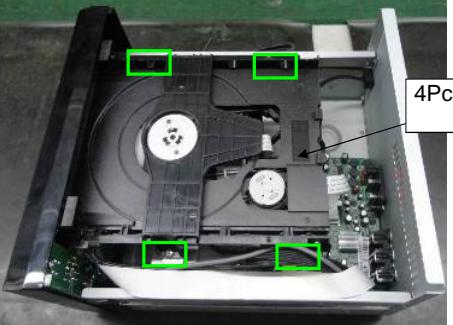
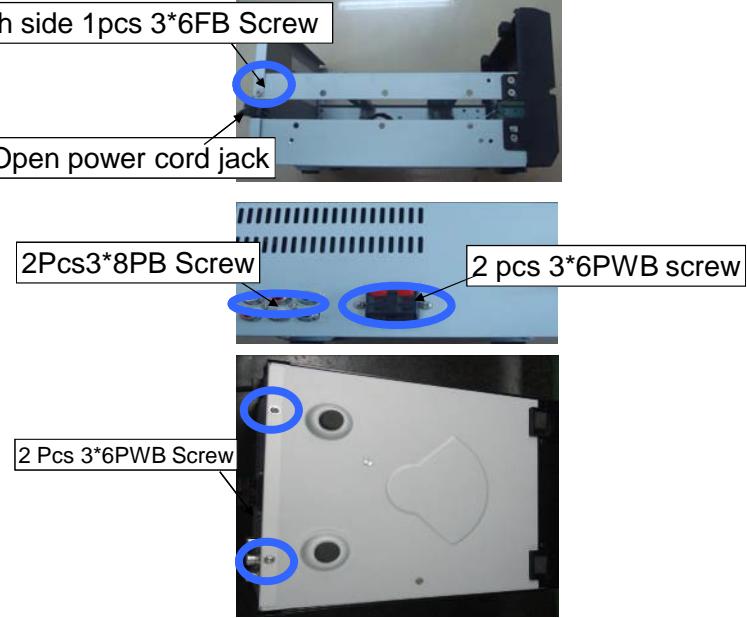
Version	Date	Description	by
0.1	2011-11-09	initial	Eric

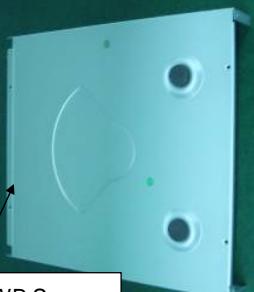
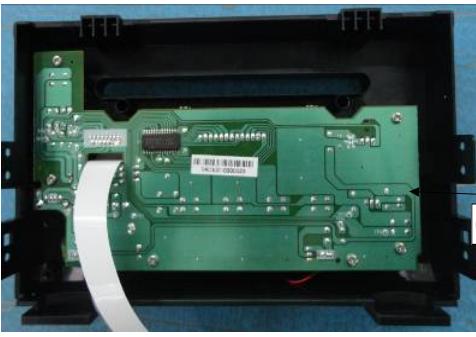
How to remove the CD manually from the tray

1. Please do as below instruction in case the tray can not be open:
 - a. Power off the DVD player.
 - b. Please gently push the guider and wait until the tray comes out(Figure1).



How to open the set

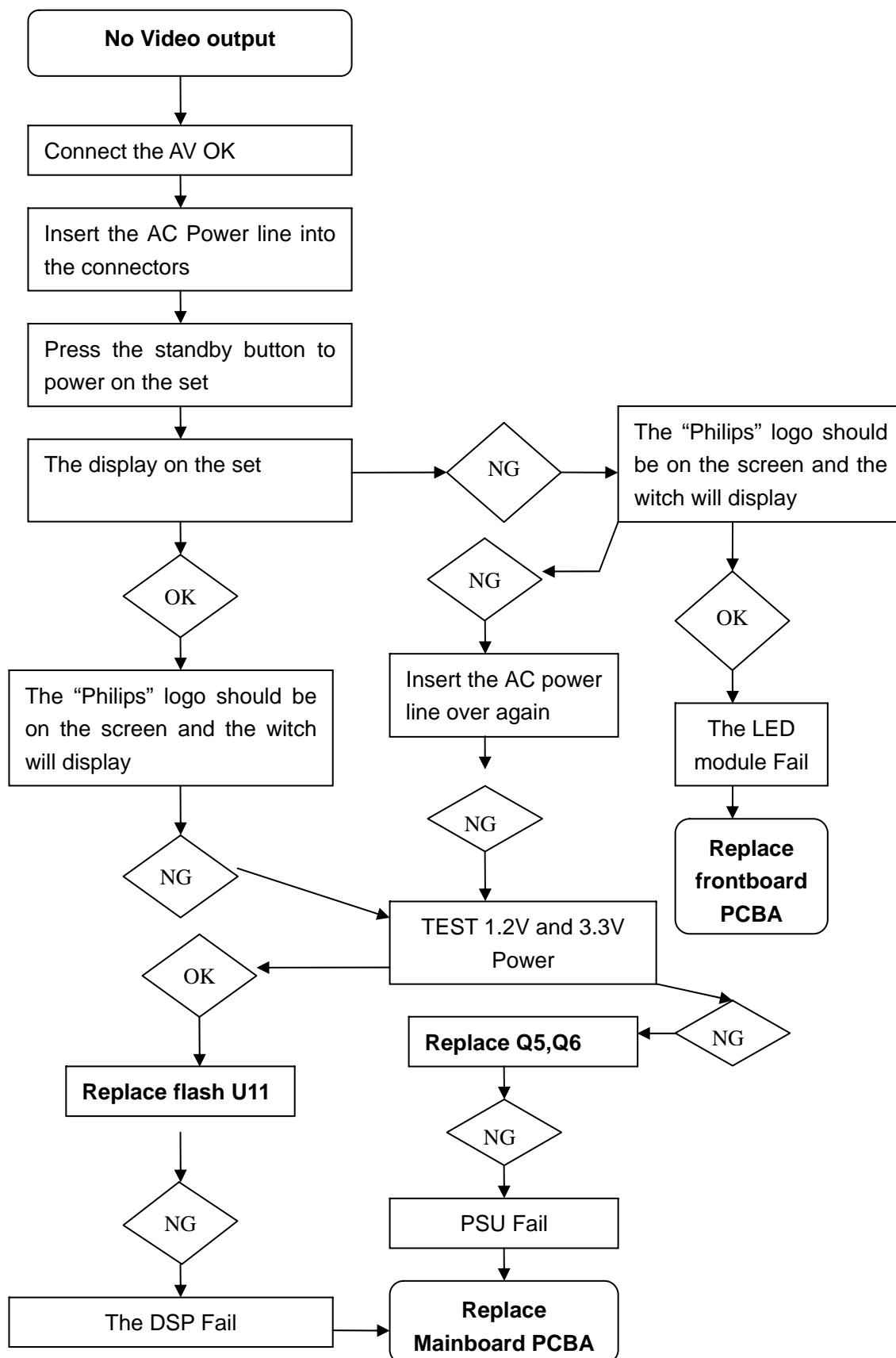
Step	Items	Pics	Remark
1	Topcover		Total 12 PCS Screws
2	Loader		Total 4 PCS Screws
3	Rear panel		Total 8 pcs Screw

4	Loader holder	 <p>Each side 2 pcs 3*6FB Screw</p>	Total 4 PCS Screw
5	PCBA	 <p>2Pcs 3*6PWM Screw</p>	Total 2 PCS Screw
6	Front Panel1	 <p>2Pcs 3*6PWB Screw</p>  <p>Front Panel</p>	Total 2 PCS Screw
7	Front Panel2	 <p>6 pcs 3*8PA Screw</p>	Total 6 PCS Screw

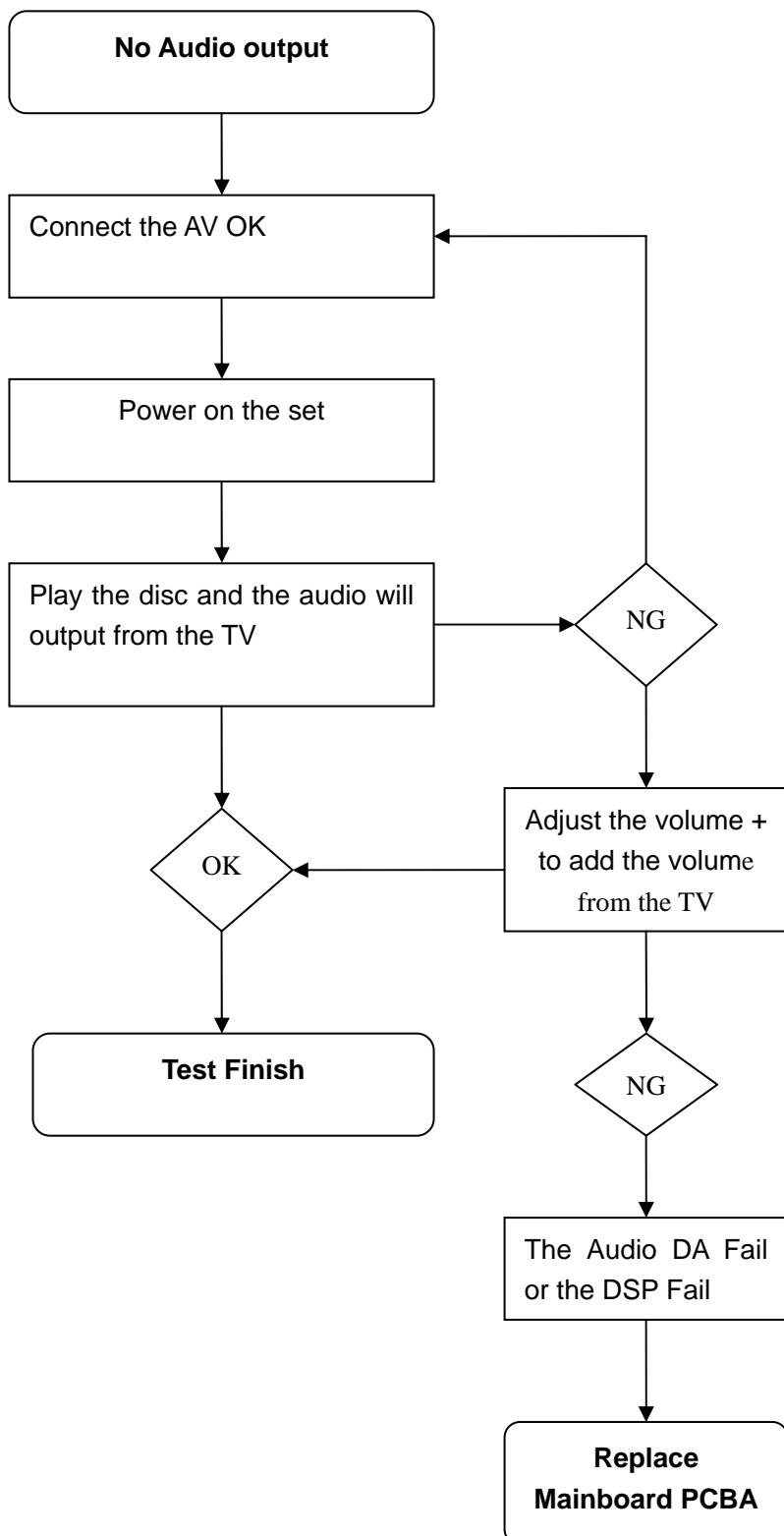
How to check the return unit

1, No output

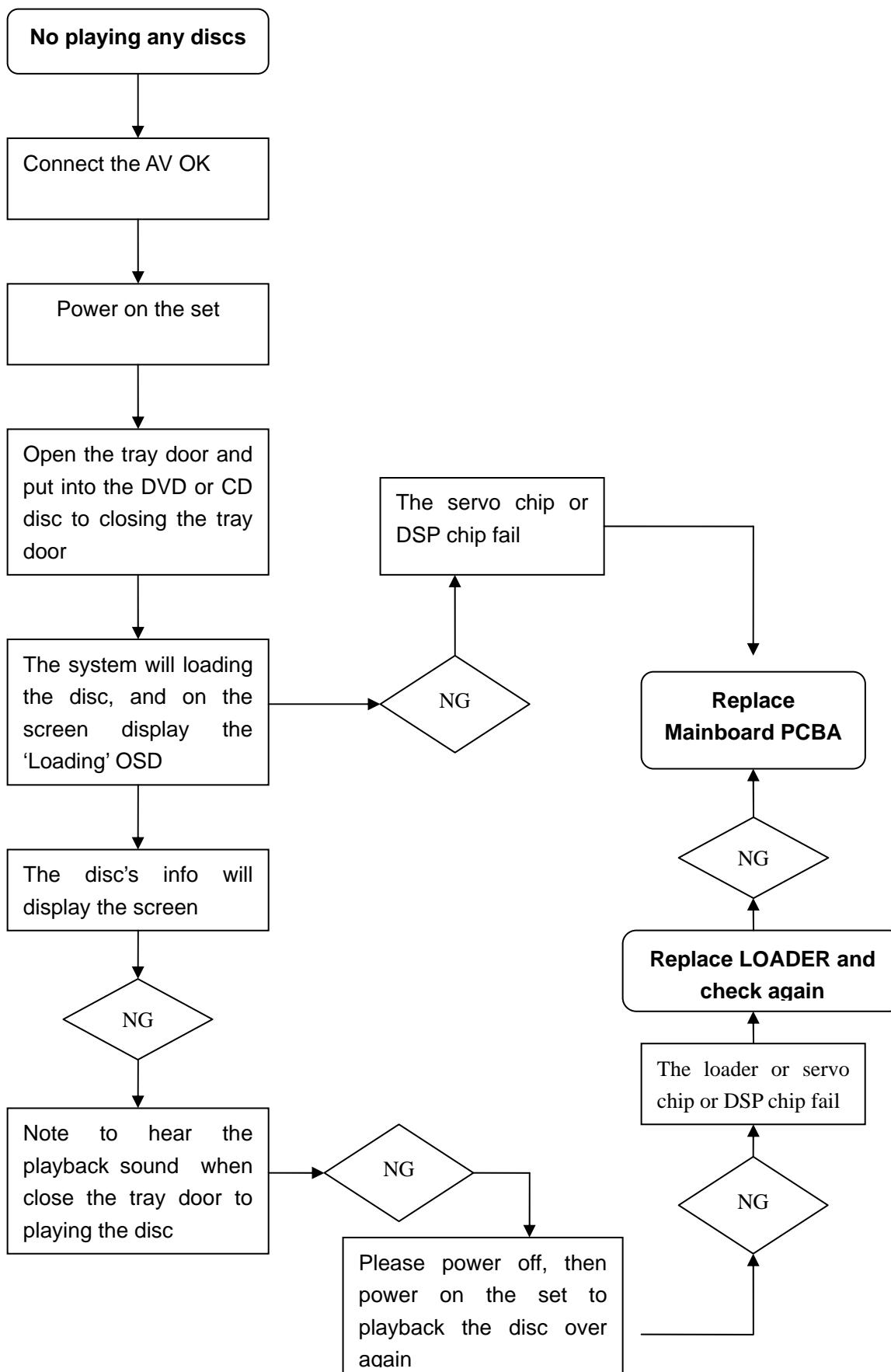
Video



2, No Audio output



3, No playing any discs



Software upgrade

1. Get the software firmware,the name must be **MCD130/XX.BIN**, and all character must be large.

or press SETUP key on the RC,in “ Preferences” menu can see the option of “Version info”, Then, enter the Version info menu and you can see its upgrade file which shown of File Name

2. Copy the upgrade firmware onto CD disc.

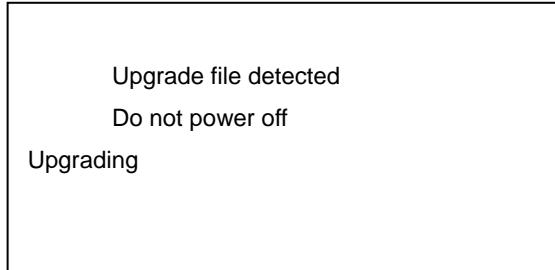
3. Play the firmware CD disc,and the upgrade menu will appear.



Upgrade file detected
Upgrade ?
press PLAY to start

4. First Select PLAY button and start to automatically upgrade on the first upgrade menu.

5. Then,the upgrade process will start and appear “Upgrading”,please don’t power off during this state.



Upgrade file detected
Do not power off
Upgrading

6. During the updating, the tray door is openning,. when the update is completed, the unit will power off and then re-start automatically to close the tray door to play the current disc on the tray.

How to select the right language

(1) How to change the OSD language

First, press SETUP key on the RC,in “ General Setup” you can see the option of “OSD Language”,

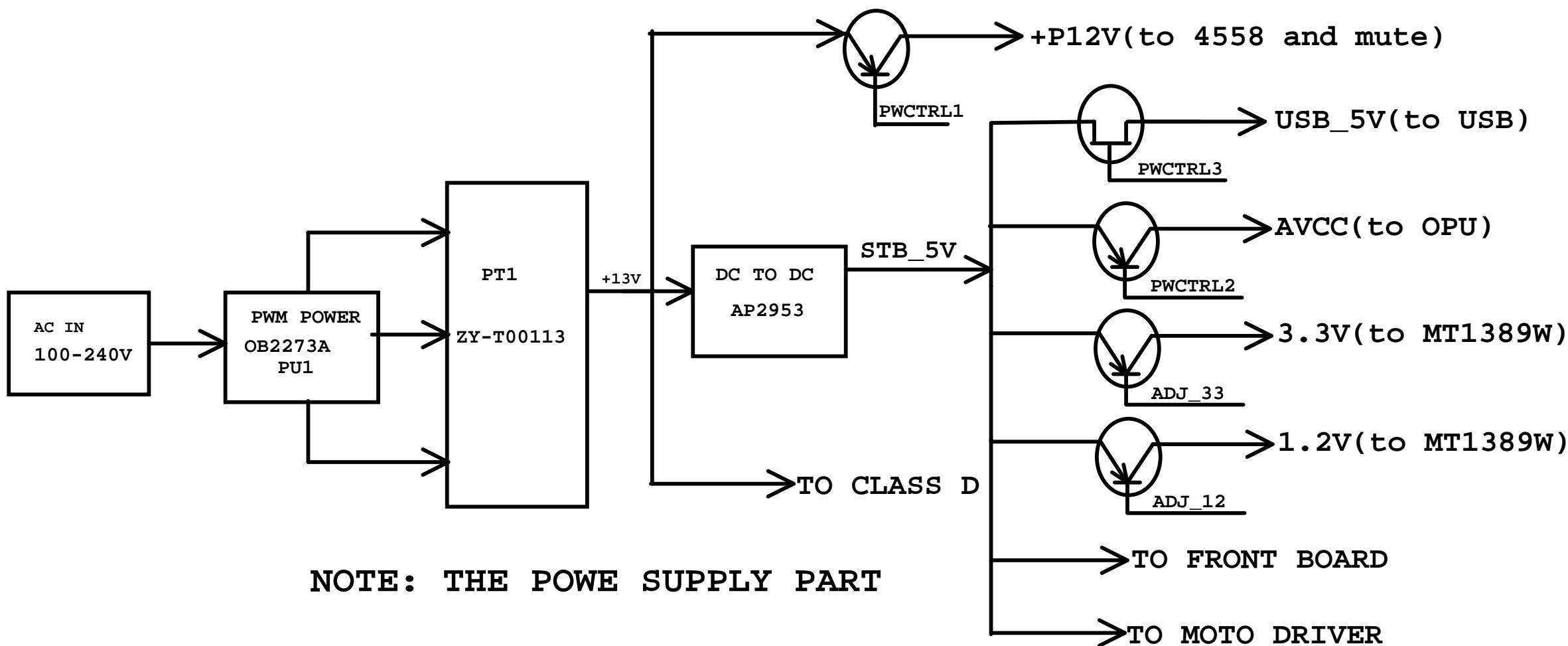
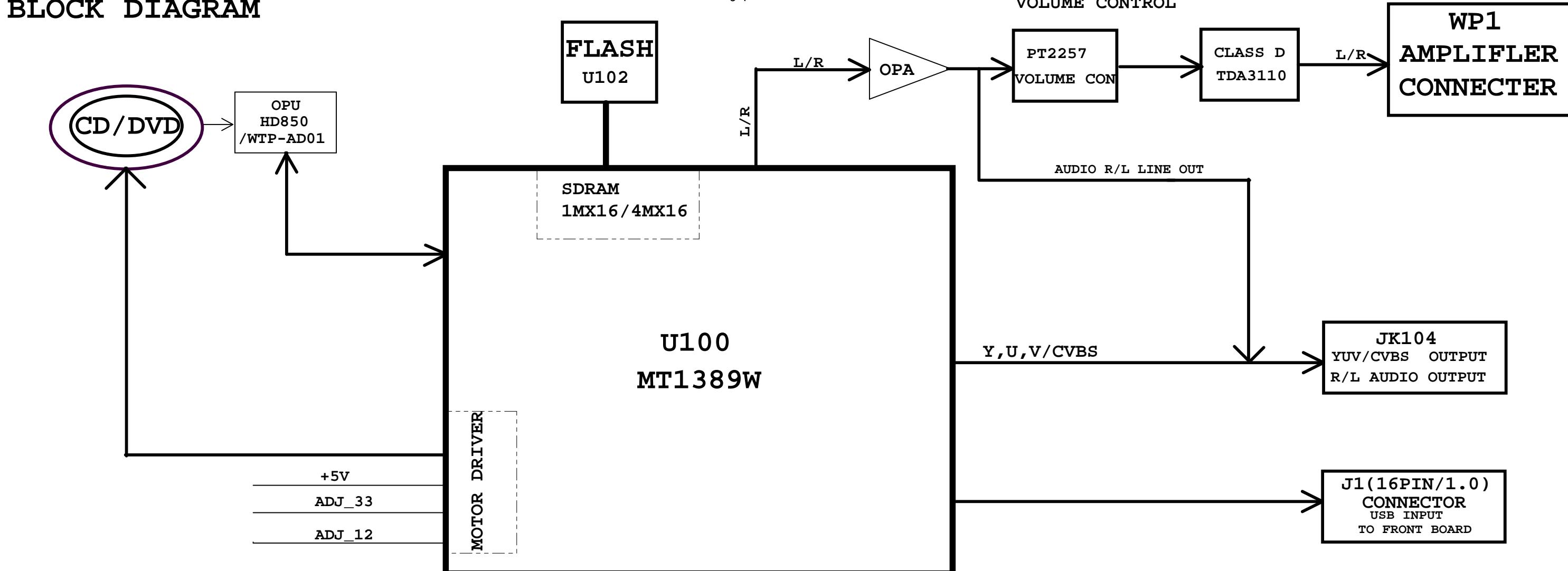
Then,press Right key to enter the osd language menu and select language which you want.

(2) How to change the Audio default language

First, press SETUP key on the RC,in “ Preferences” menu can see the option of “Audio”,

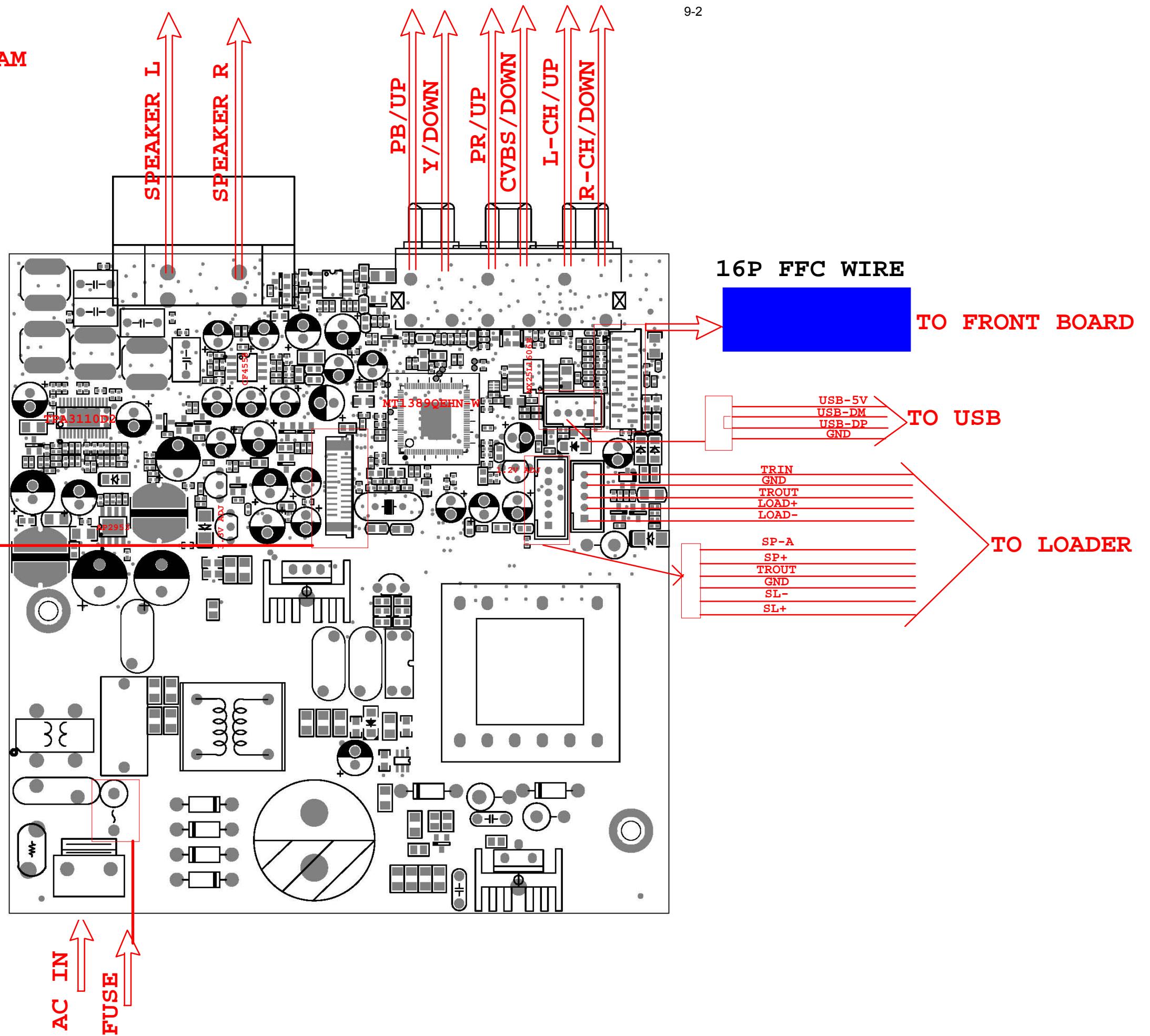
Then,press Right key to select Audio or subtitle language. which you want

BLOCK DIAGRAM



NOTE: THE POWER SUPPLY PART

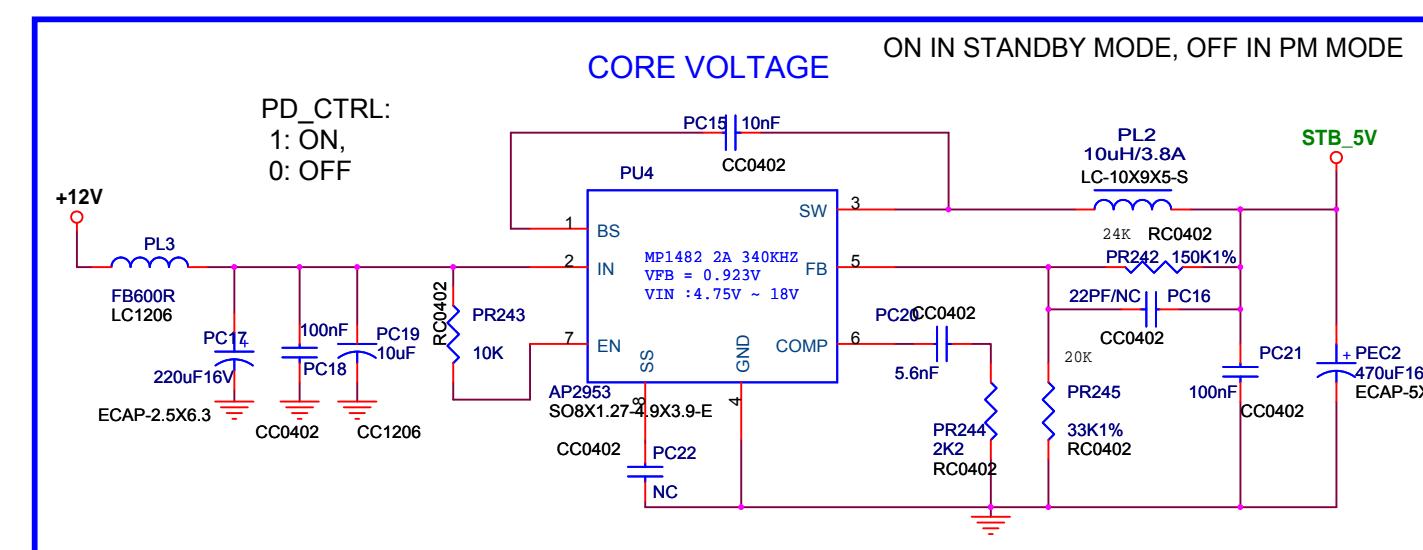
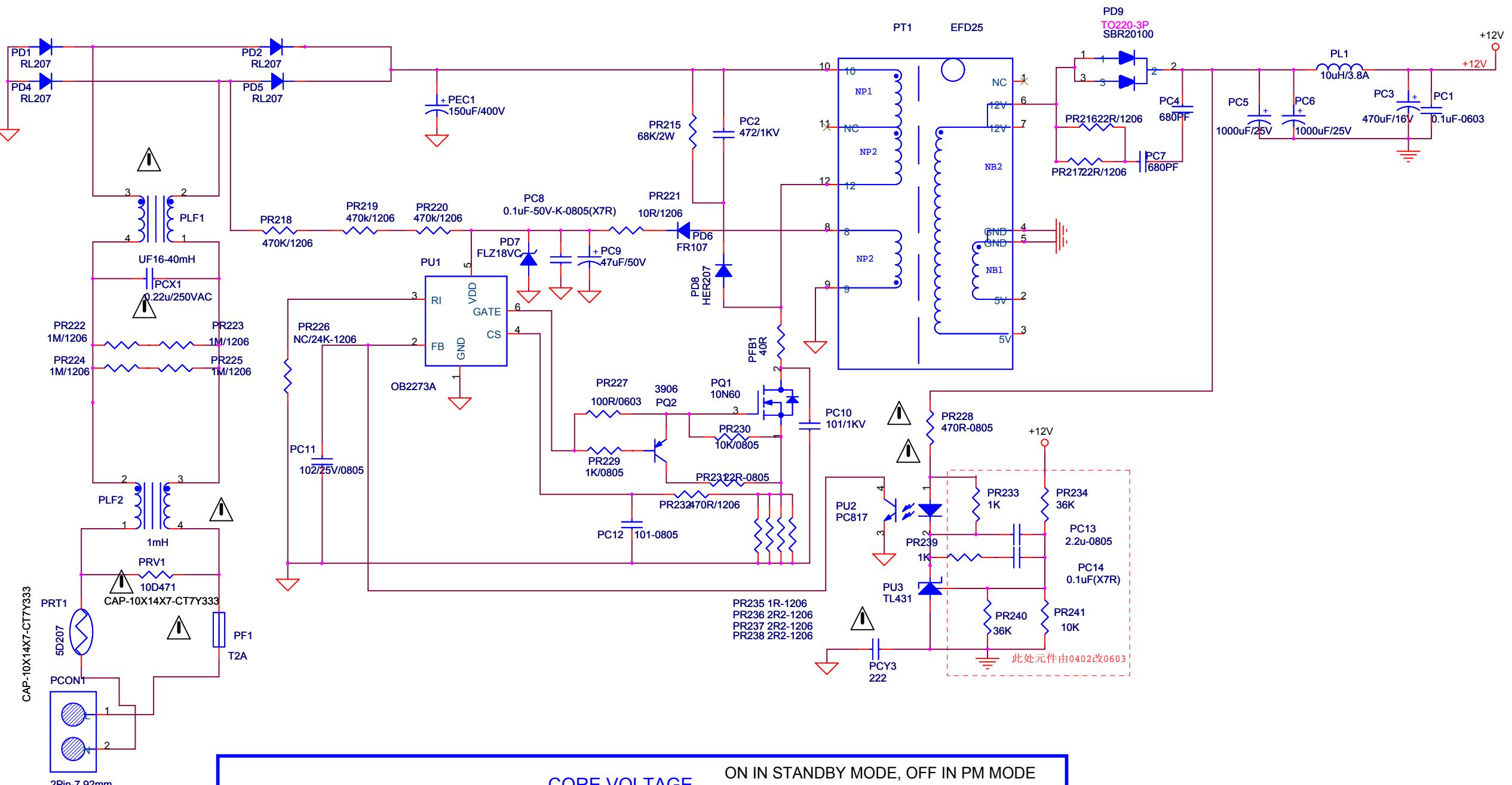
SET WIRING DIAGRAM



CIRCUIT DIAGRAM - MAIN BOARD

PART 1

9-3

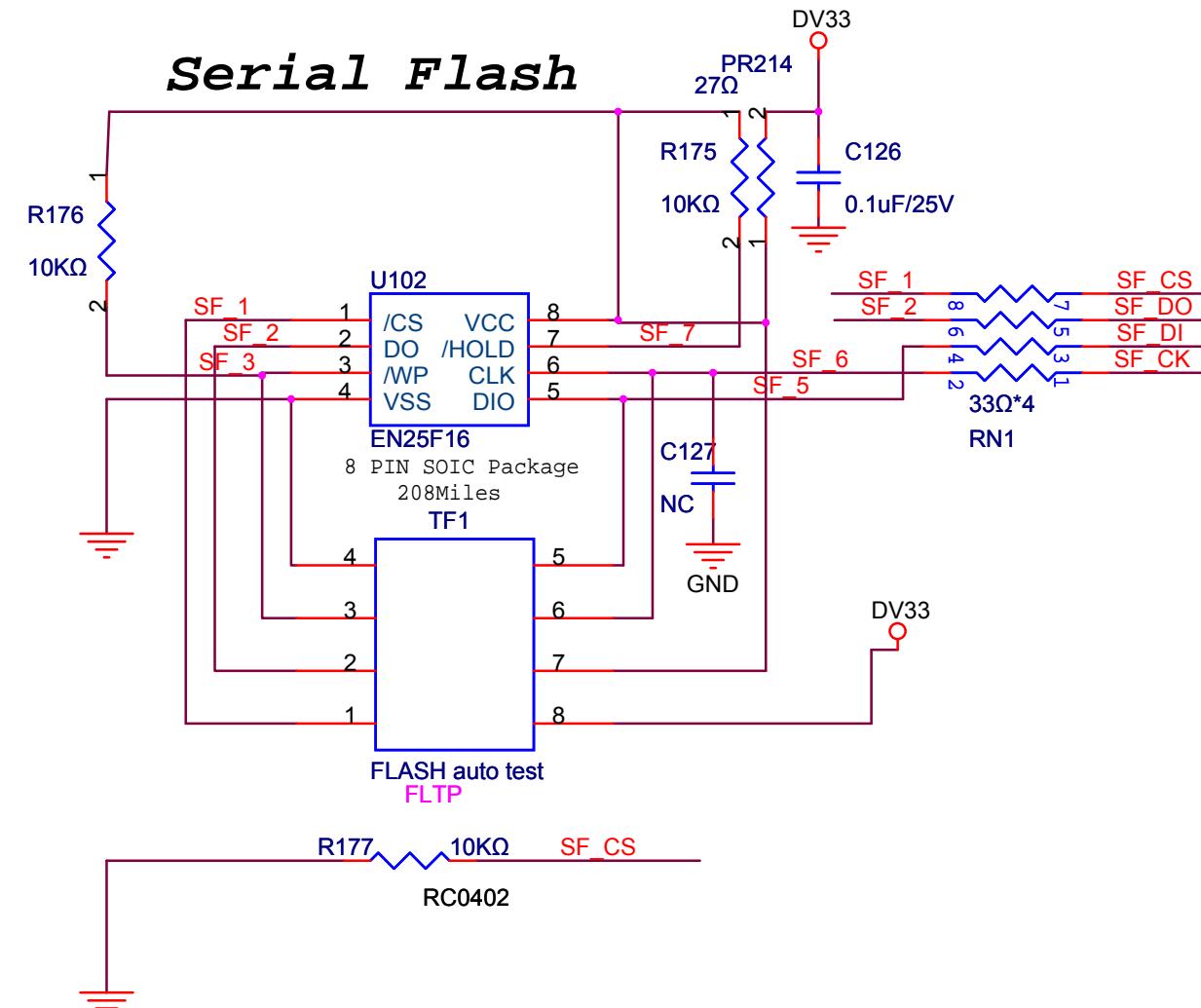


CIRCUIT DIAGRAM - MAIN BOARD

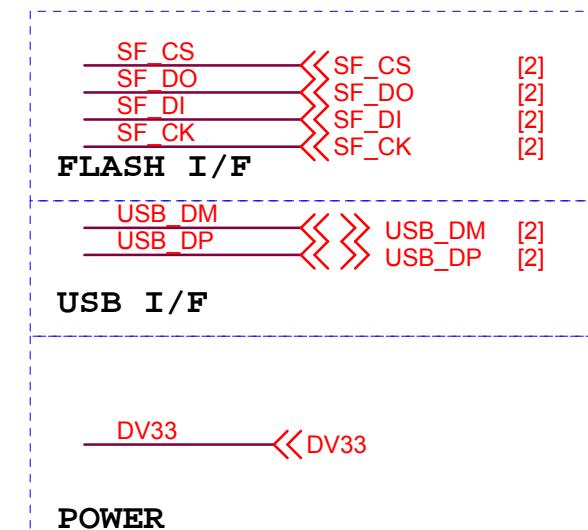
PART 2

9

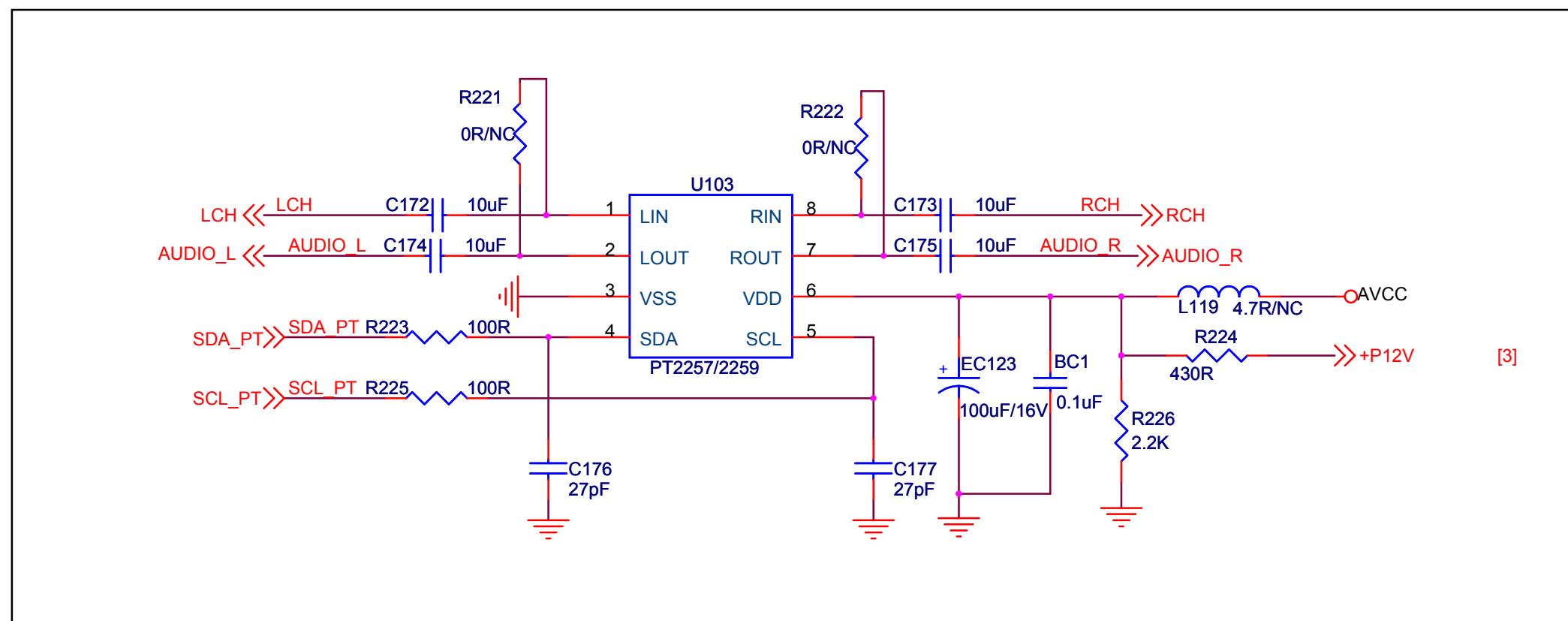
Serial Flash



OFF-PAGE CONNECTION



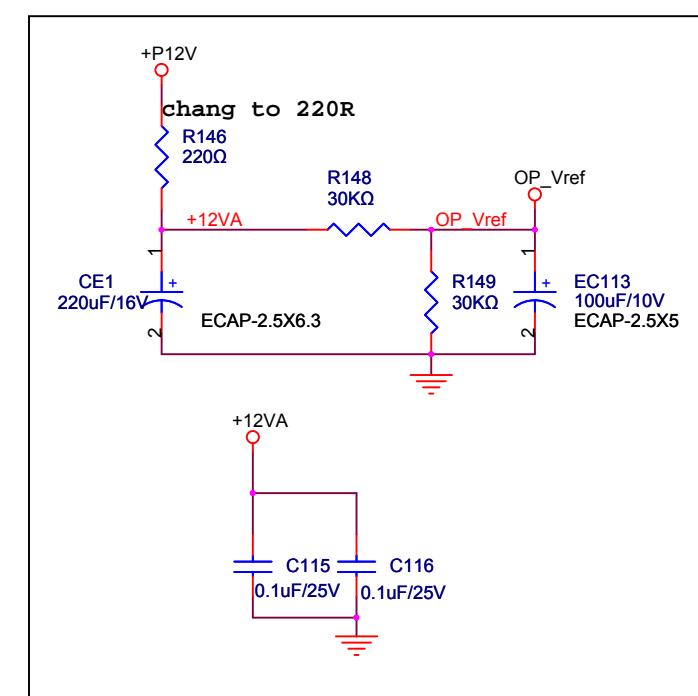
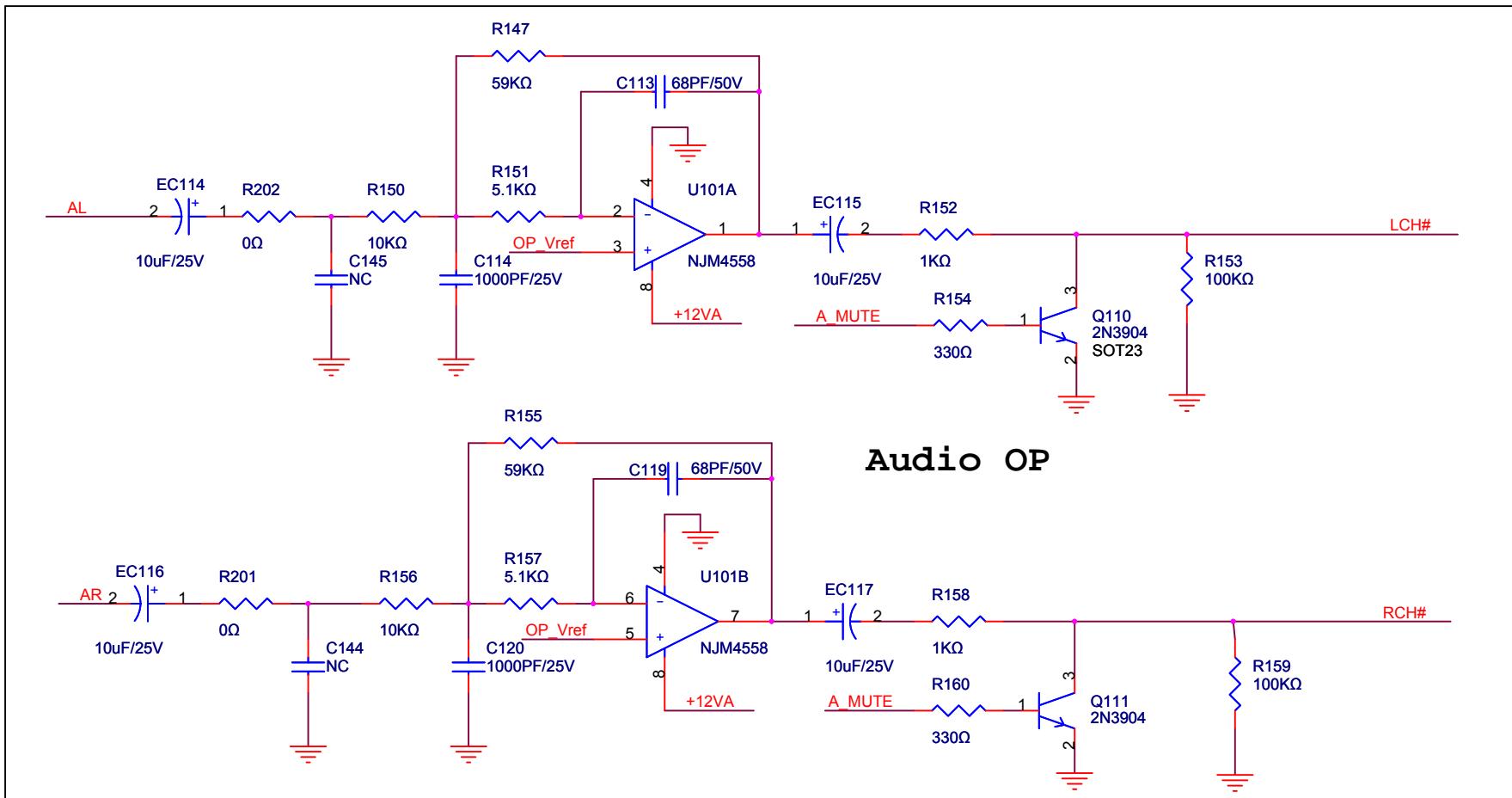
VOLUME CONTROLLED



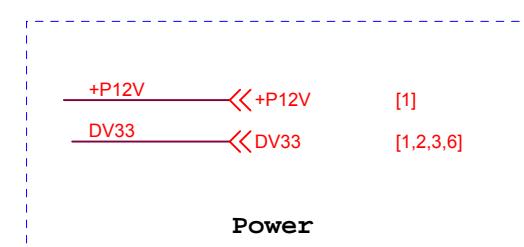
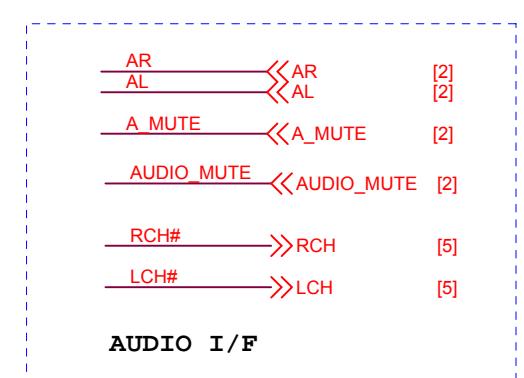
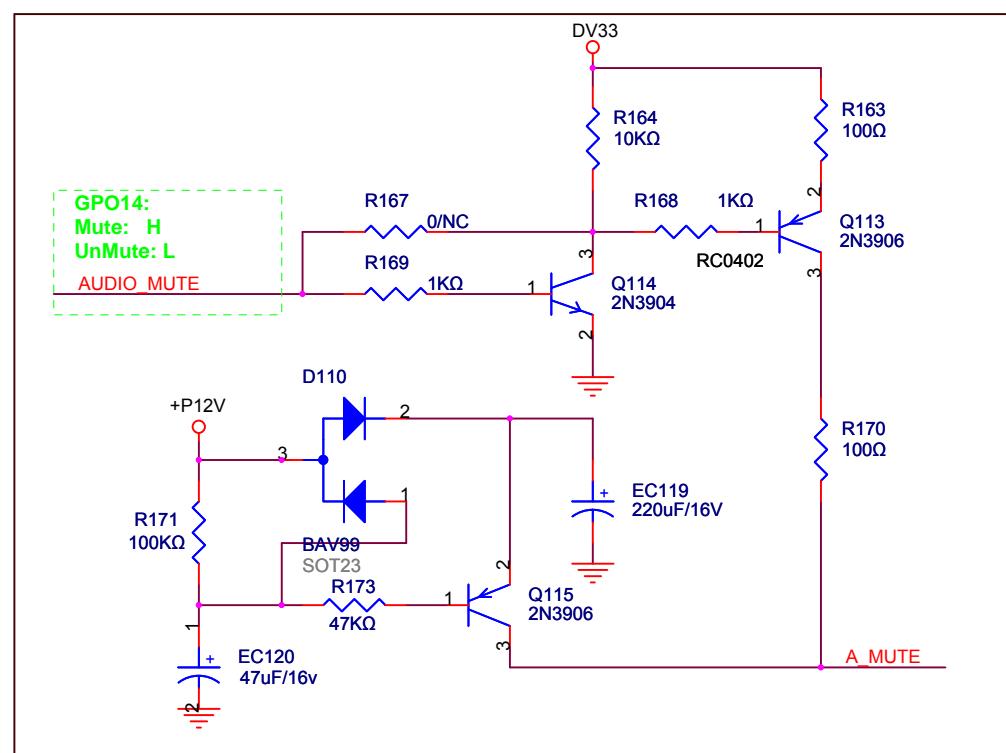
CIRCUIT DIAGRAM - MAIN BOARD

PART 3

9-5



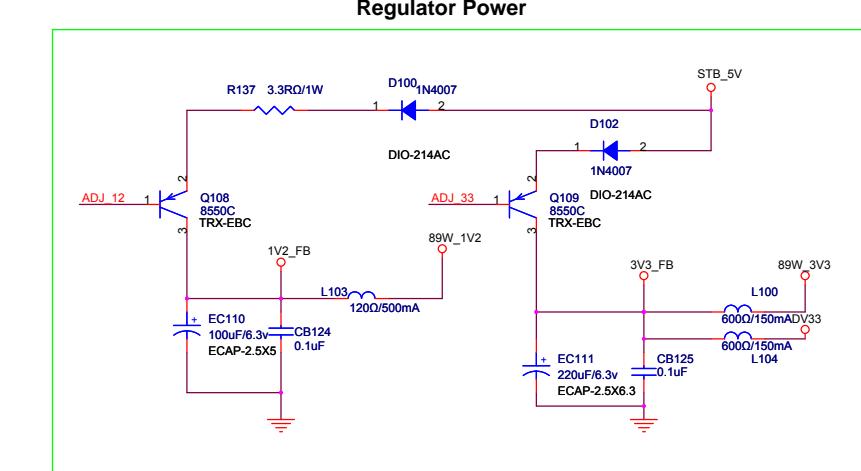
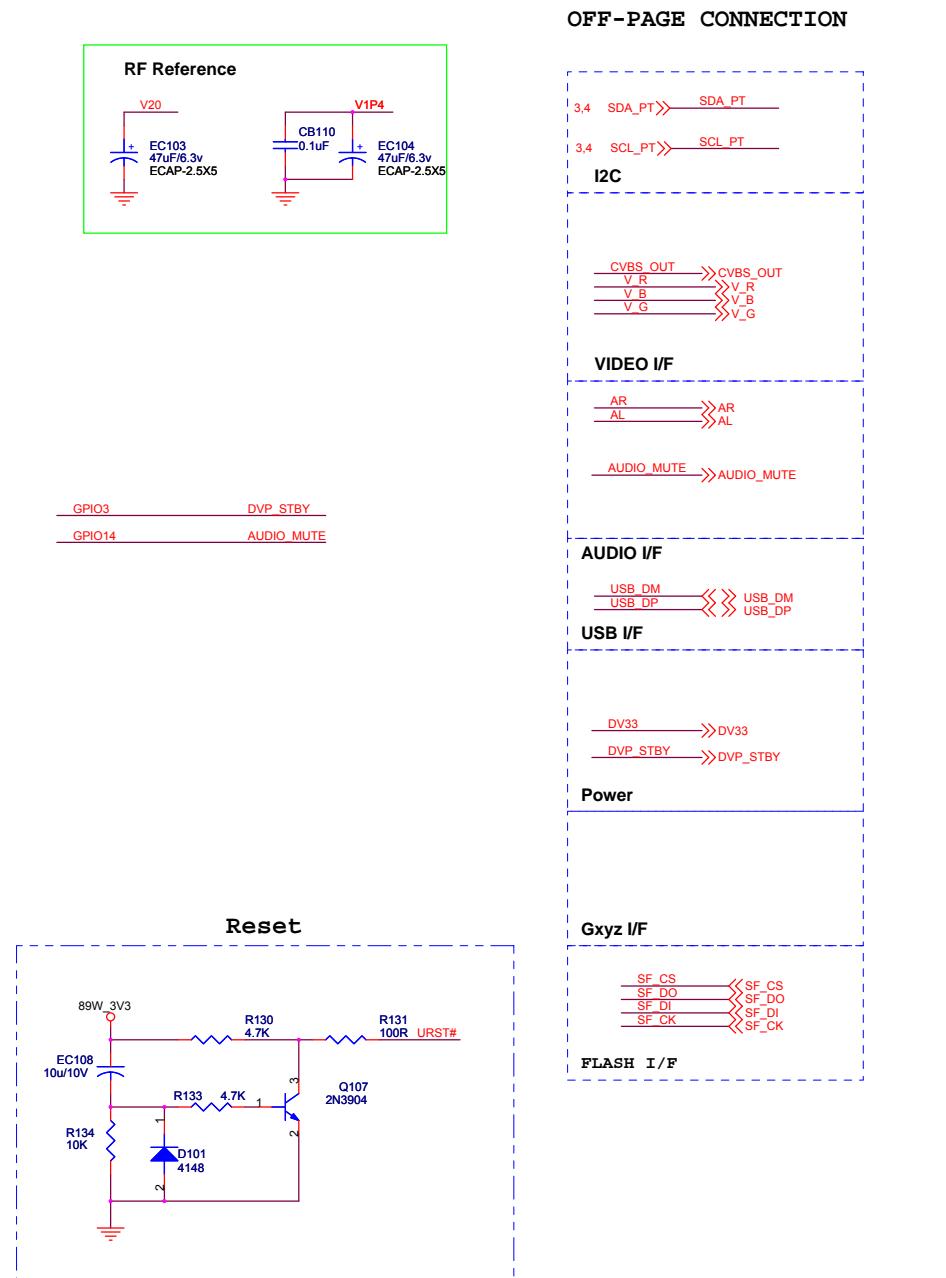
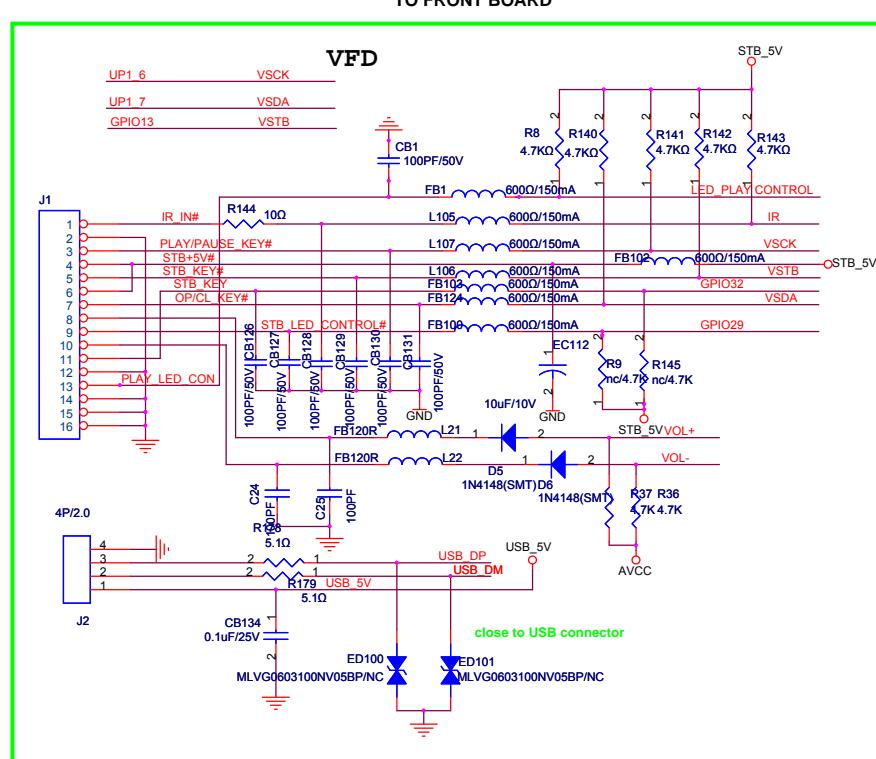
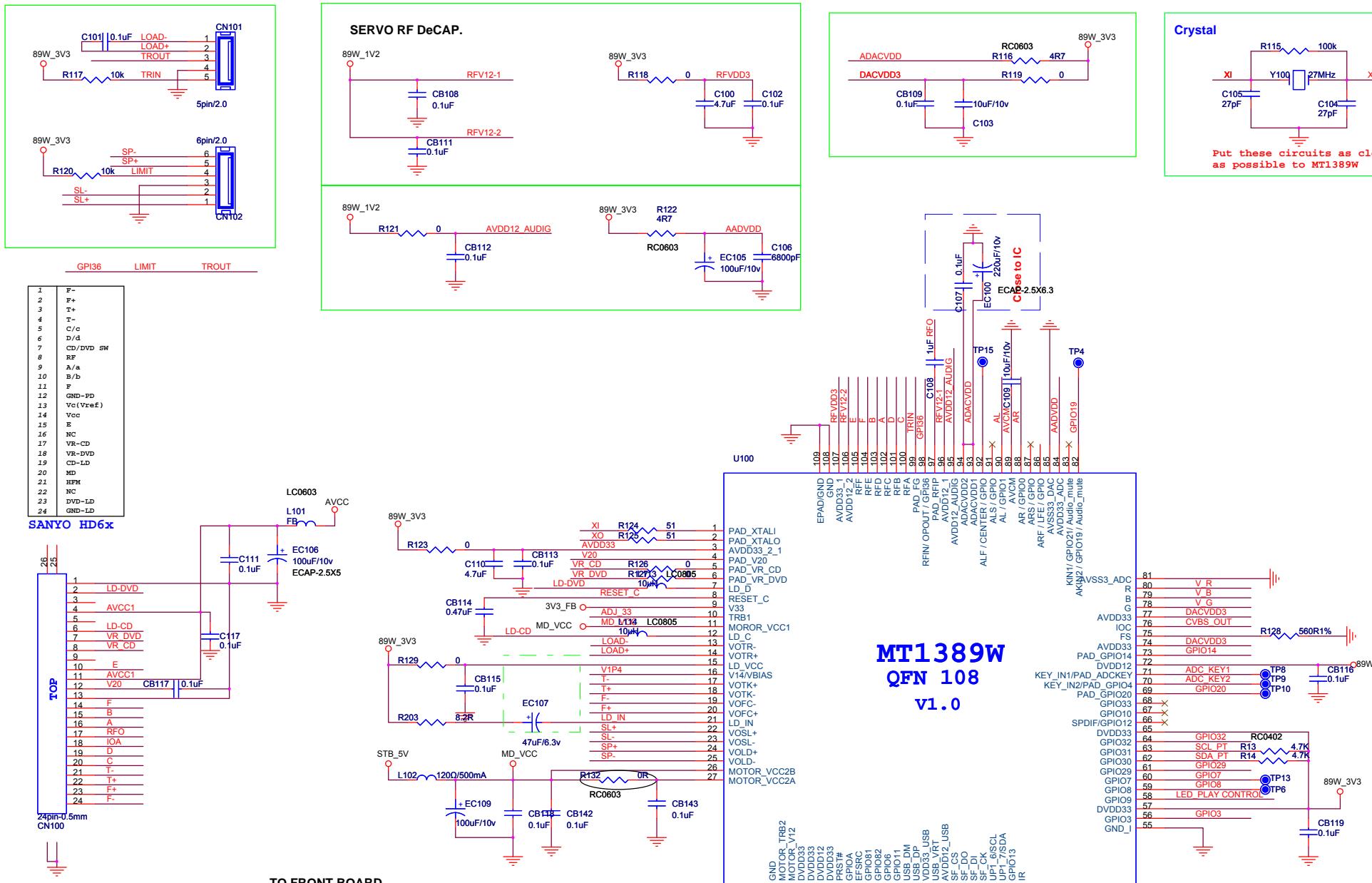
AudioMute



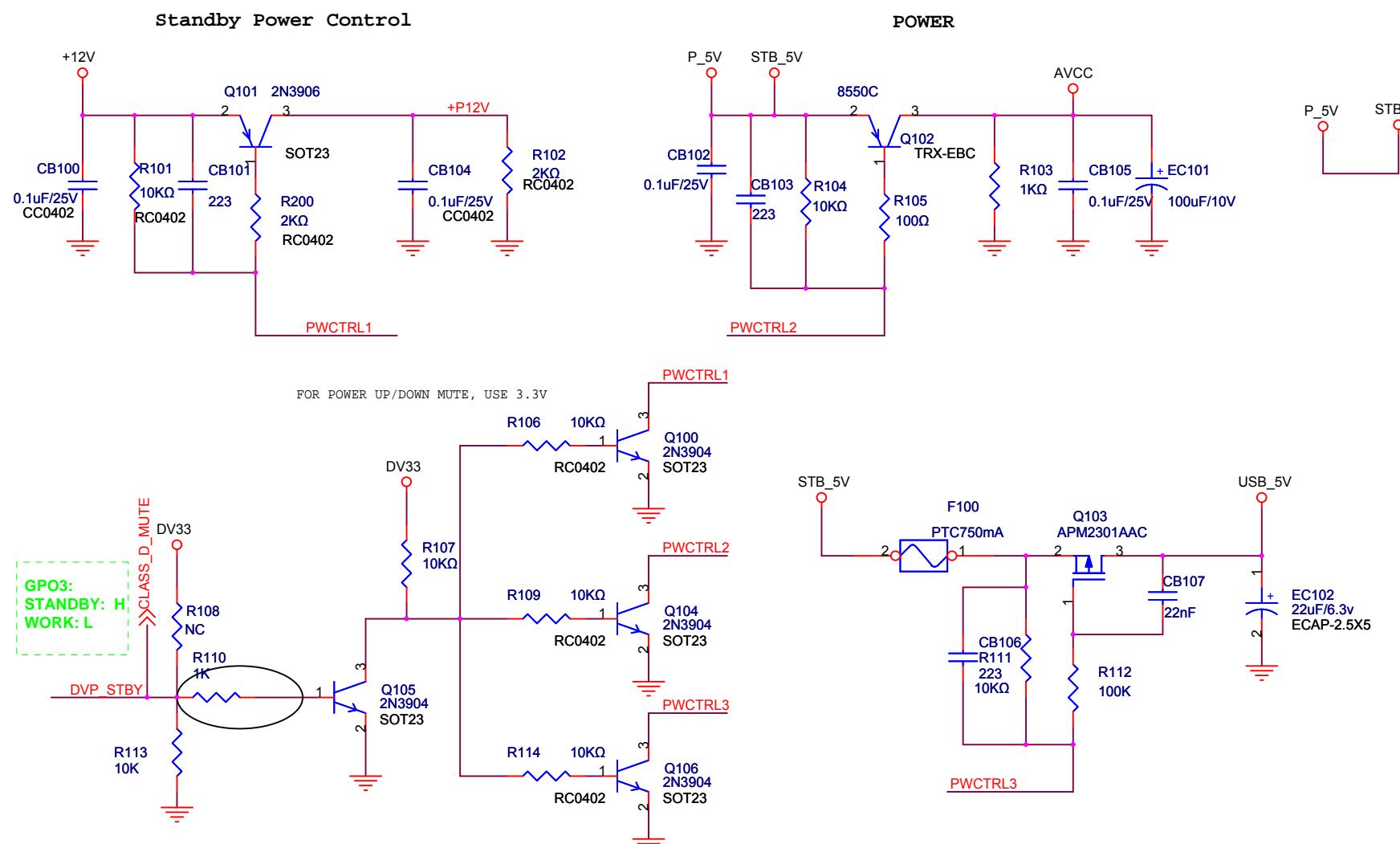
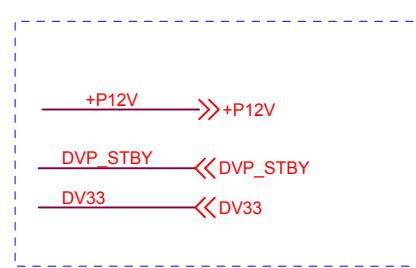
CIRCUIT DIAGRAM - MAIN BOARD

9-6

PART 4



OFF-PAGE CONNECTION



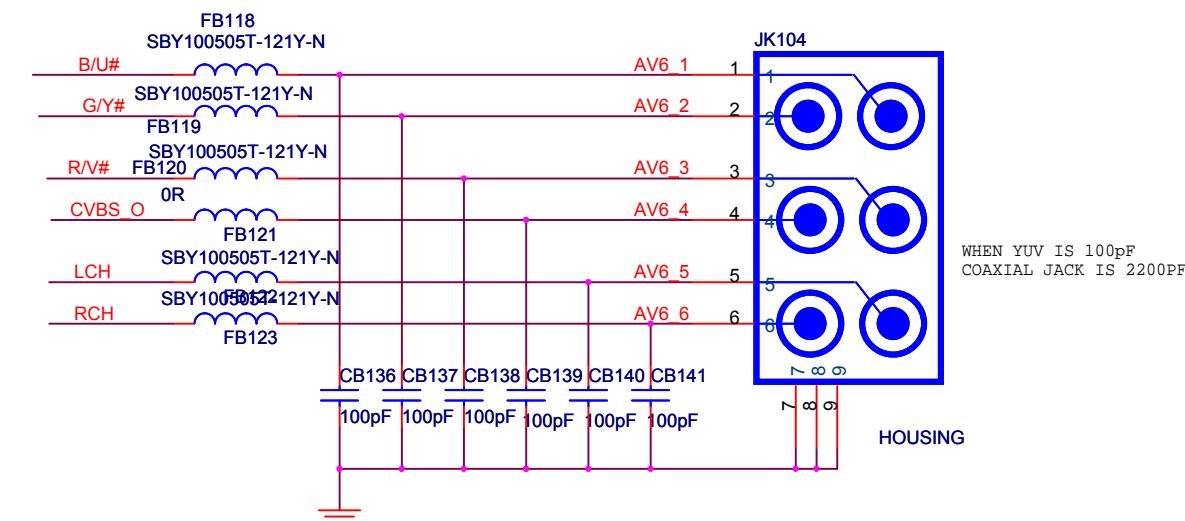
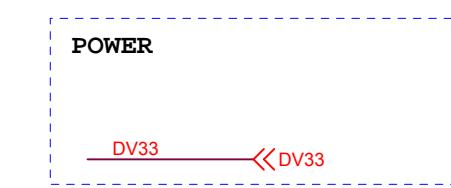
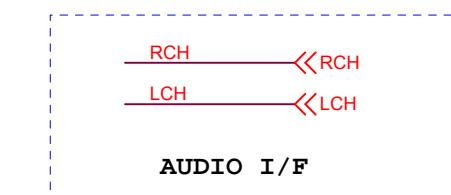
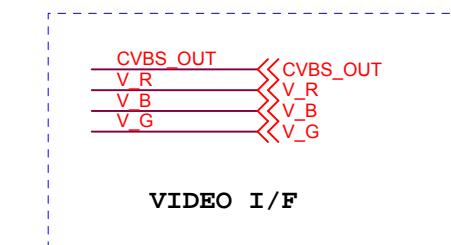
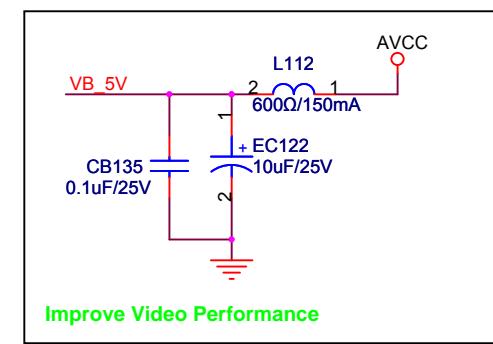
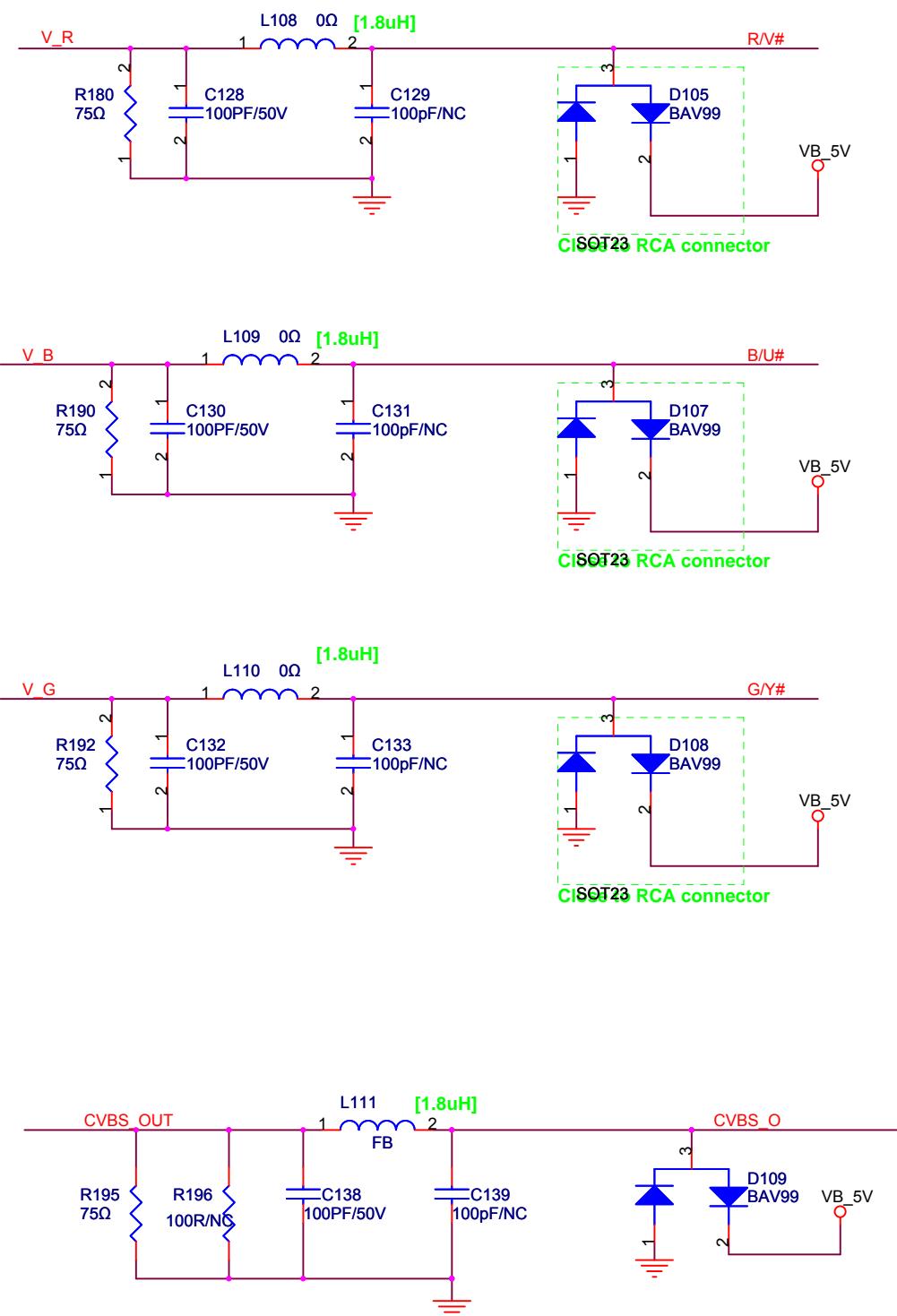
MT1389W General GPIO List

Name	PIN	Features
VR_CD	5	VR_CD
VR_DVD	6	VR_DVD
PAD_FG	99	TRIN
GPI36	98	LIMIT TROUT
GPIOA	36	IOA
UP1_6	51	VSCK
UP1_7	52	VSDA
GPIO13	53	VSTB
GPIO9	58	MS_D0 SD_D0
GPIO8	59	MS_BS SD_CMD
GPIO7	60	MS_CLK SD_CLK
GPIO20	69	MSC_DET
GPIO6	40	RS232_RXD1 UART_RXD1
GPIO11	41	RS232_TXD1 UART_TXD1
GPIO29	61	Gxyz_LOAD
GPIO30	62	Gxyz_CLK
GPIO31	63	Gxyz_DA1
GPIO32	64	Gxyz_DA2
GPIO12	66	ASPDIF
AKIN1	83	AKIN1
AKIN2	82	/
GPIO14	73	AUDIO_MUTE
KEY_IN1	71	ADC_KEY
KEY_IN2	70	POWER_KEY
GPIO3	56	DVP_STBY
GPIO10	67	SCART1 HSYNC
GPIO33	68	SCART2 VSYNC

CIRCUIT DIAGRAM - MAIN BOARD

PART 6

9-8

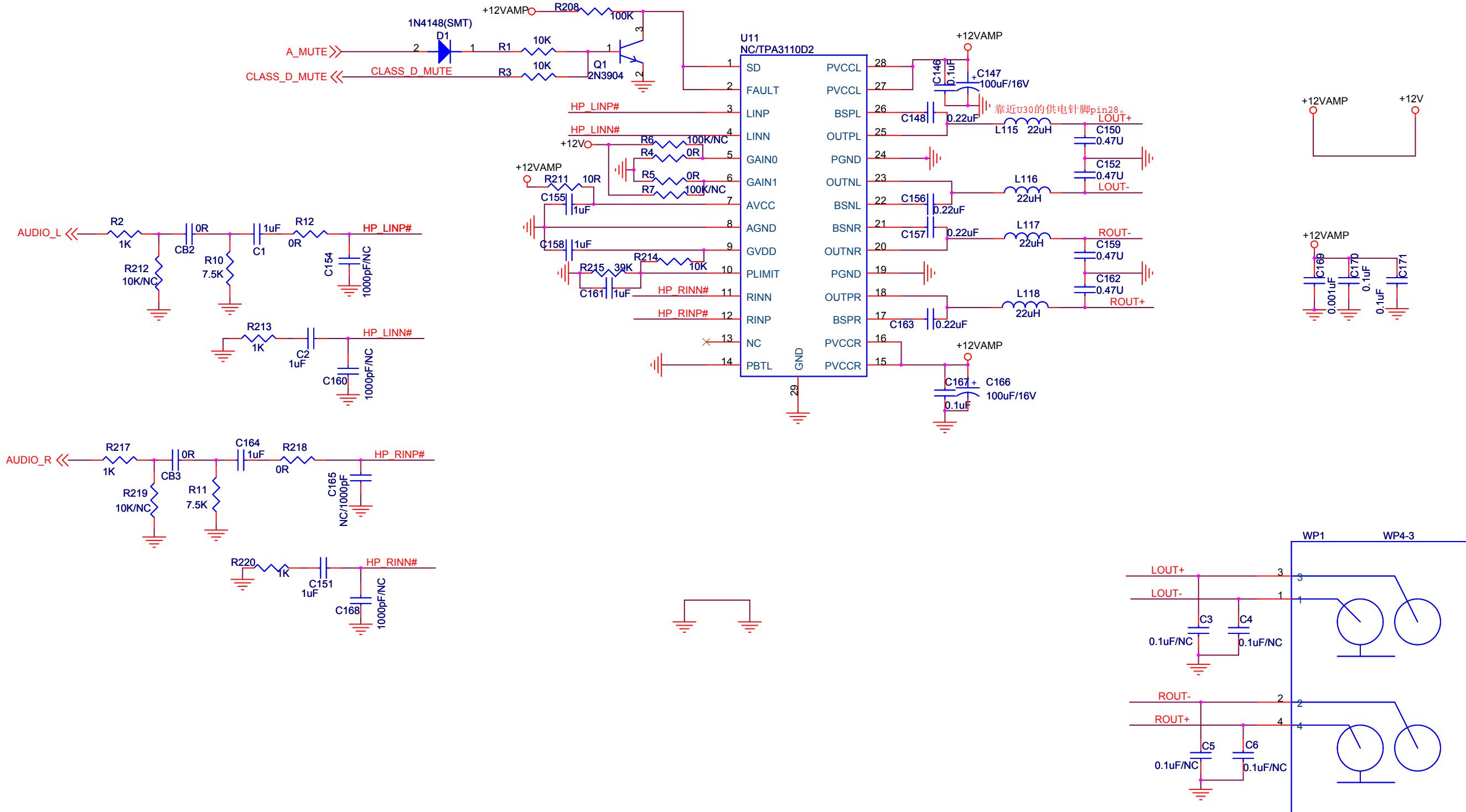


CIRCUIT DIAGRAM - MAIN BOARD

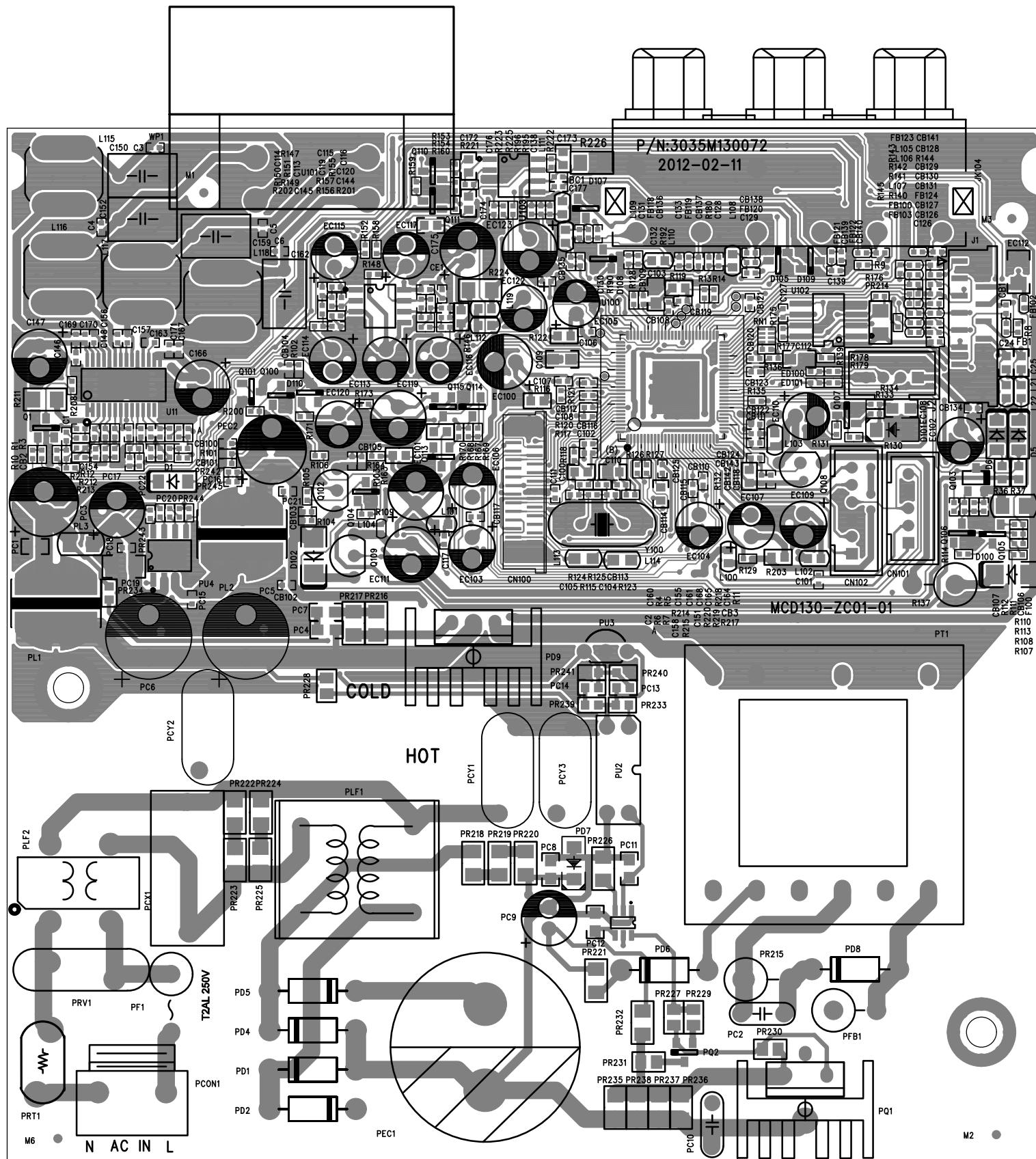
PART 7

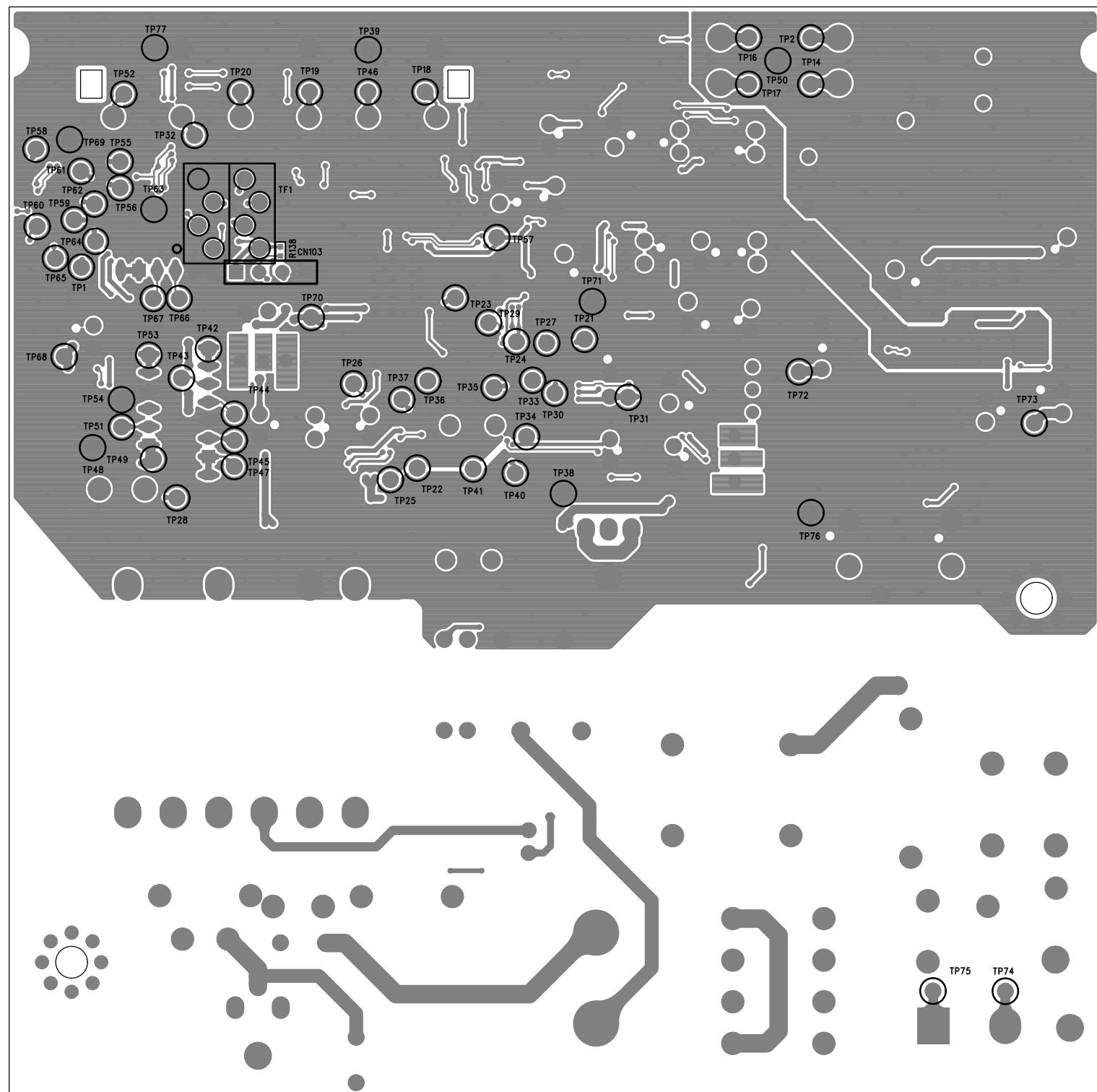
9-9

AMP

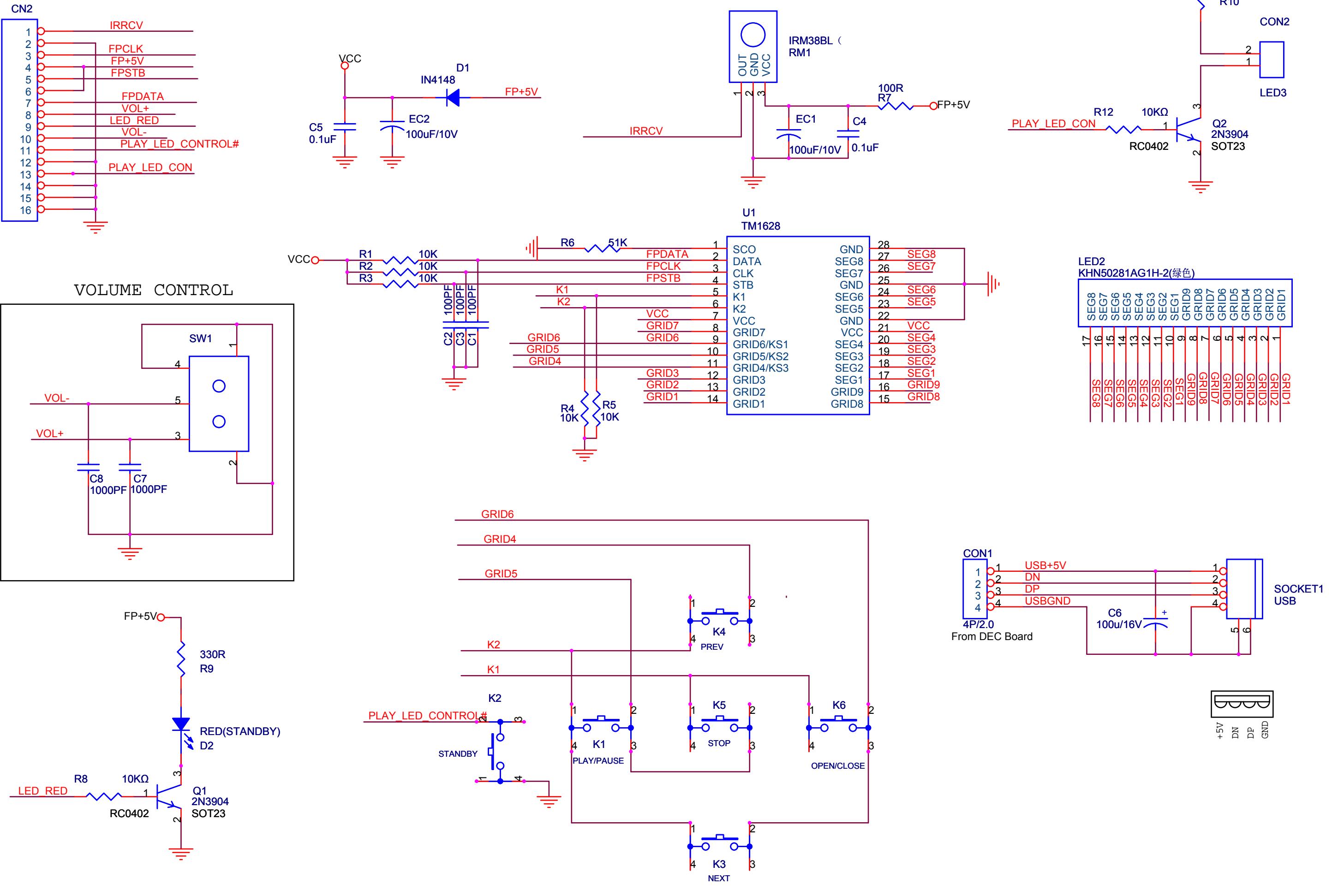


LAYOUT DIAGRAM - MAIN BOARD

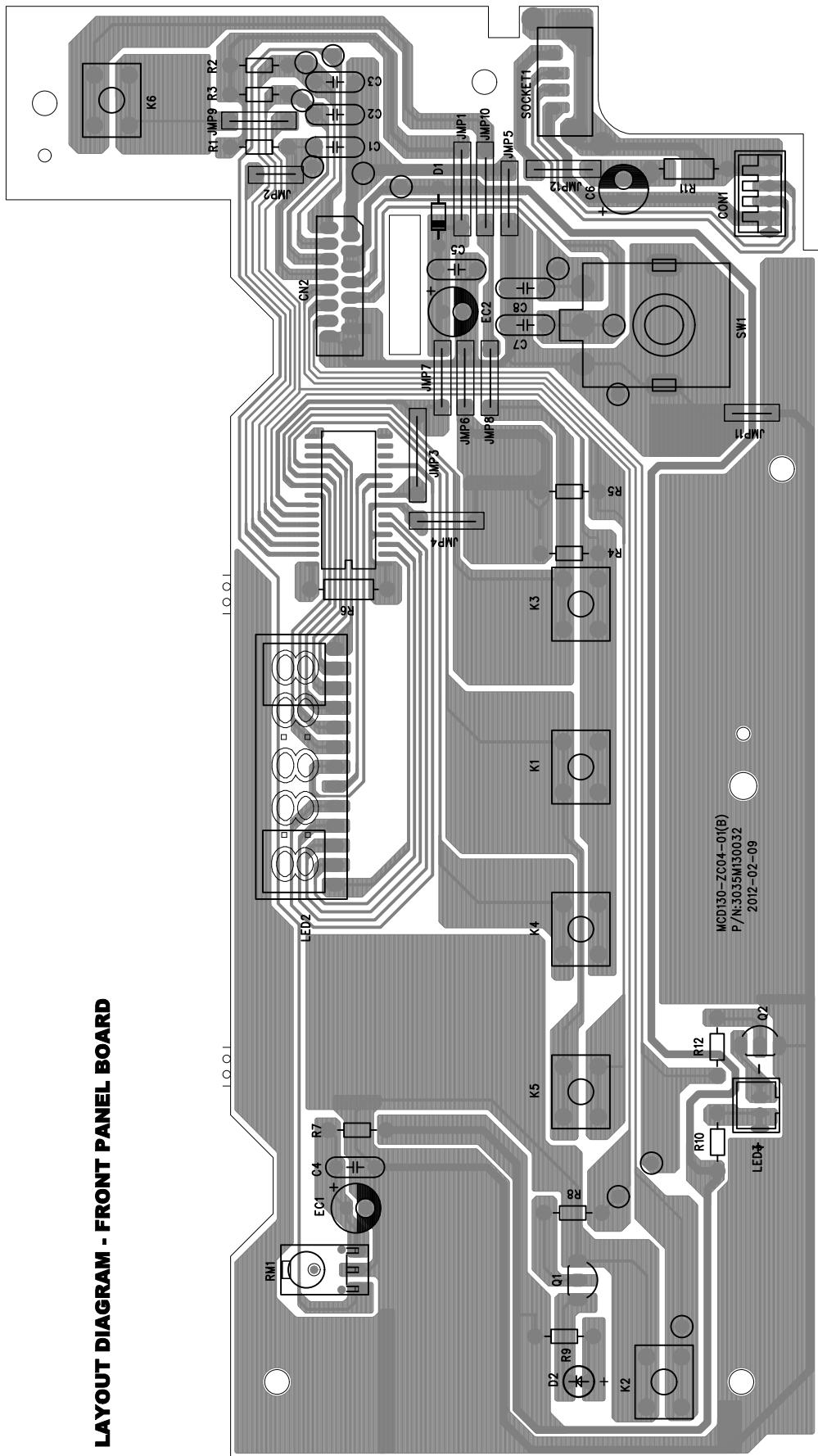


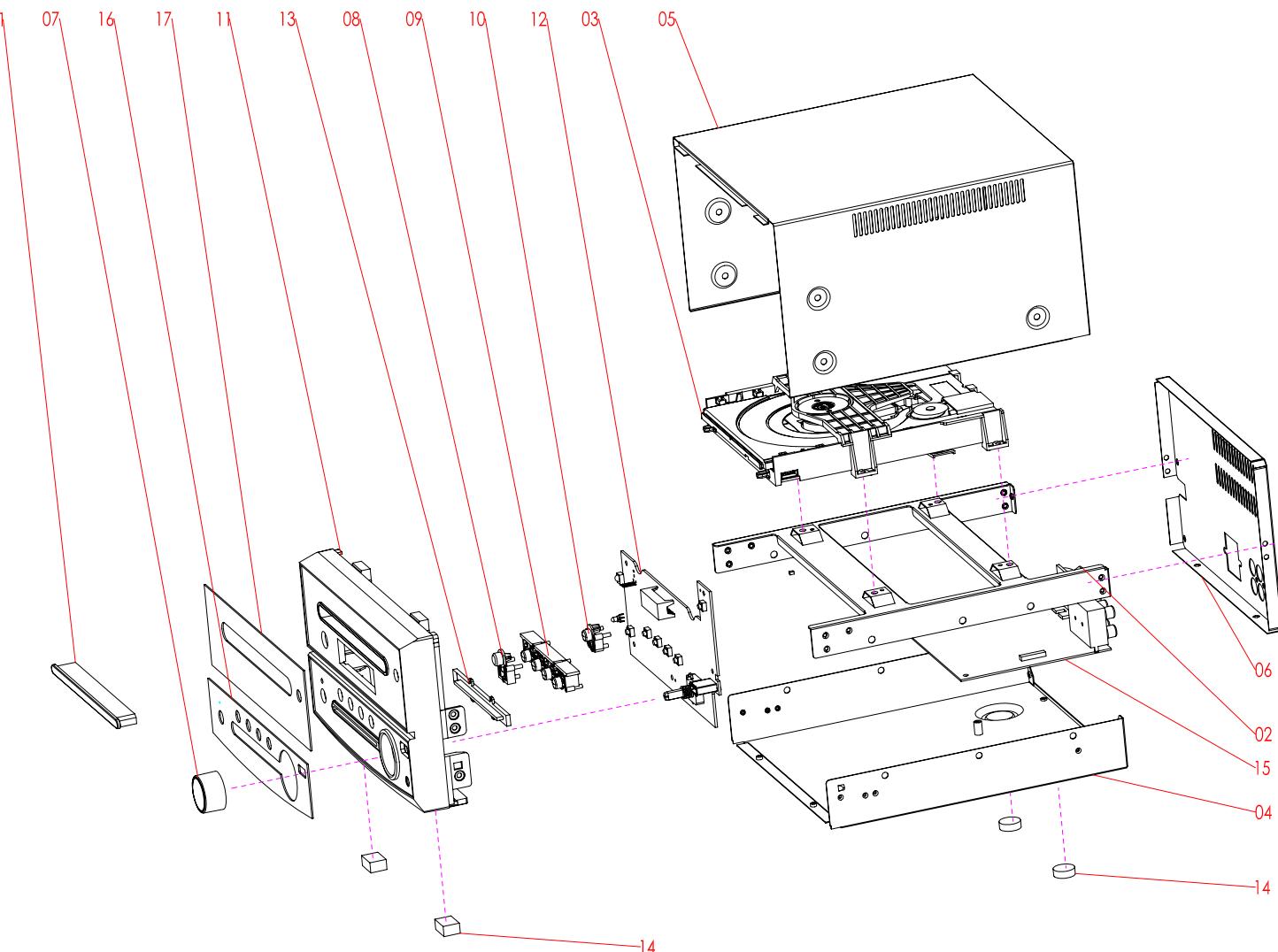


CIRCUIT DIAGRAM - FRONT PANEL BOARD



AYOUT DIAGRAM - FRONT PANEL BOARD





Item	Part Numer	Description	Qty
17		MIRROR UP	1
16		MIRROR DOWN	1
15		MAIN BOARD ASSY MCD130/93	1
14		FOOT	4
13		LIGHT GUIDE	1
12		FRONT PANEL BOARD ASSY	1
11		FRONT PANEL	1
10		OPEN/CLOSE BUTTON	1
09		FUNTION BUTTON	1
08		POWER BUTTON	1
07		VOLUME BUTTON	1
06		REAE PANEL	1
05		TOP COVER	1
04		BOTTOM CHASSIS	1
03		LOADER HOUSING KT628	1
02		LOADER TRAVERSE(IM S76RFXP2)	1
01		TRAY DOOR	1

Revision List

Version 1.0

* initial Release