Seu Mini Hi-Fi System

FWM6000/all

Service
Service
Service

Service Manual

PureDigital 3 CD CHANGER MAX SOUND KARAOKE USB DIRECT RIP PLUS MP3 LINK

TABLE OF CONTENTS

CLASS 1
LASER PRODUCT

Published by LX 1212 Service Audio Printed in The Netherlands Subject to modification

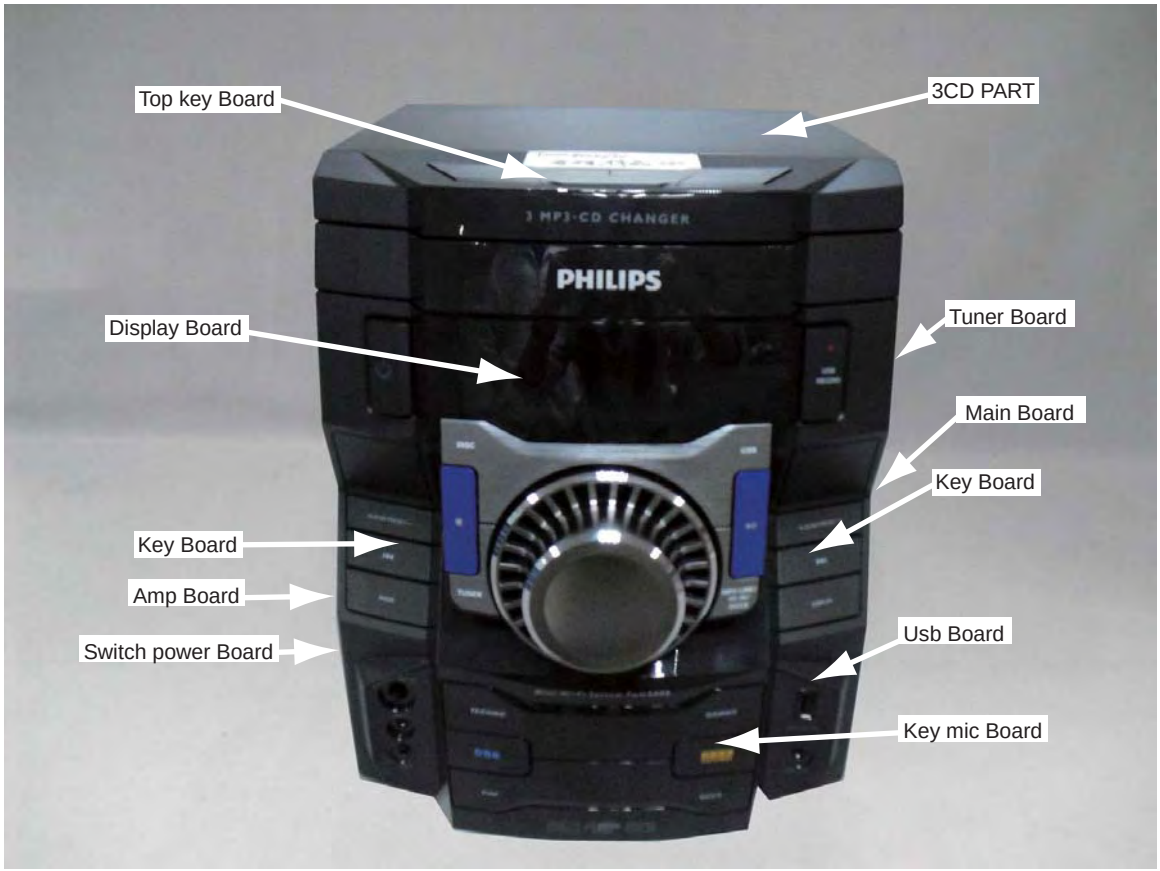
3141 785 37530

Version 1.0

PHILIPS

Technical Specification and Connection Facilities

Location of PC Boards



VERSION VARIATION

Type /Versions: / Service policy / Board in used:	FWM6000									
	/10 (EUROPE)	/55 (LATAM)	x/77 (ARGENTINA)	x/78 (BRAZIL)						
Main BOARD	C/M	C/M	C/M	C/M						
display BOARD	C/M	C/M	C/M	C/M						
amp BOARD	C/M	C/M	C/M	C/M						
key BOARD	C/M	C/M	C/M	C/M						
mic BOARD	C/M	C/M	C/M	C/M						
tuner BOARD	C/M	C/M	C/M	C/M						
Switch Power BOARD	M	M	M	M						
cd BOARD	C/M	C/M								
mcu BOARD	C/M	C/M								

Type /Versions: / Features / Feature diffrence	FWM6000									
	/10	/55	x/77	x/78						
RDS										
VOLTAGE SELECTOR										
ECO STANDBY - DARK										

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

C/M
C/M

FWM6000 SH 190 Contact List

DEPICTION	Pos	Description	Page

CABINET

Diemensions with Boxes (wxhxd) ?mm X ?mm X ?mm	Material : HIPS / ABS / POM / V2 / SAN	
Diemensions without Boxes (wxhxd) ?mm X ?mm X?mm	Finshing : Chrome Plate	
Weight (inclusive packing)?KG	Units in Masstercarton	
Weight (exclusive packing & batery)?KG	Units in Dealercarton	

Remarks :

1	used into		

Remark :

GENERAL PART 1 - FRONT PANNEL SPECICFICATION

Class No		Ver	Issued Date
FWM6000/ All Version		1	23-Sep-11
		2	
		3	

NAME : XB.ZHANG	11	11	SH 190 - 1			A4
CHECK:	DATE :					

DEPICTION	Pos	Description	Page
	1	F.M. Anntena	
	2	A.M. Antenna	
	3	Aux Input	
	4	A.C. Voltage Selector	
	5	AC INTPUT	
	6	SubWoofer Socket	
	7	FAN	
	8	LOW /HIGH Left / Right Speaker Socket	
	9		
	10		
	11		
	12		
	13		
	14		
	15		
	16		
	17		
	18		
	19		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		

CABINET

Diemensions with Boxes (wxhxd)?mm X ? mm X ? mm	Material :HIPS	
Diemensions without Boxes (wxhxd) ?mm X ?mm X ?mm	Finshing : Chrome Plate	
Weight (inclusive packing)?Kg	Units in Masstercarton	
Weight (exclusive packing & batery)?Kg	Units in Dealercarton	

GENERAL PART 1 - BACK PANNEL SPECICFICATION

Class No		Ver	Issued Date
FWM600/ All Version		1	23-Sep-11
		2	
		3	

NAME : XB.ZHANG	10	10	SH 190 - 2		A4
		DATE :			

GENERAL DESCRIPTION
MP3-USB Mini Hi FiSystem with Digital Tuner, 3CD/MP3
(4x70W+1x220W) For FWM6000 Power Amplifier,LCD Display,Aux in ,Remote control
Subwoofer Boxes of 6Ohm x 1

LIFETIME : 7 Years

Class	Tuner	Supply + Amplifier	USB	Recorder	Clock	CD-mp3
I			X	N/A		
II	X	X			X	X
III						
Page	10	3-6	9		8	11

SAFETY requirements

Version	Safety	EMC
/98	EN 60065	CISPR 13
/55	EN 60065	CISPR 13
/12	EN 60065	EN 55013 / EN 55020
/05	EN 60065	EN 55013 / EN 55020
/79	EN 60065	CISPR 13
/37	UL 60065	FCC99

RADIATION / IMMUNITY requirments (EMC) for 12 version only

CLIMATIC requirements
ALL climates : + 5 Dregree till + 35 Degree
MODERATE climates : + N.A till N.A Degree

PERFORMANCE CLASSES

POWER SUPPLY

MAINS (A.C.)	120 Vac (110V-10%, 120V ±10%)	230 Vac ± 10 %	127 / 240 Vac ± 15 %	240 Vac ± 10 %	220 Vac ± 10 %
Version	/ 37	/ 12 /05	/ 55/77/78 /98	/ 79	/ 61, /93
Voltage Selection	No	No	Yes	No	No
Frequency	60Hz ±5%	50Hz	60/50Hz	50Hz	60Hz, 50Hz

POWER Consumption

	/ 12/ 05	/ 5577/78/98	/61 /93	/ 37
Standby mode without clock display(after 15 minute)	< 1W	< 5W	< 1W	< 1W
(DEMO mode " OFF ") , NOM. A, INPUT				
Maximum :	120W/150W @ 0.1A	120W/150W @ 0.1A	120W/150W @ 0.1A	120W/150W @ 0.2A
@ 1/8 Prated , NOM. A, INPUT	130W	130W	130W	130W
ECO Power mode :(after 15 minute of auto)	NC	NC	NC	NC

Quality : 0.8 % (Major) 2.0 % (Mirror)
Reliability : 3.0 % (C 42)
Tested according to General Test Instruction refer to PHILIPS standary (UAN -D1591)
Measured according to PHILIPS standary (UAN - L1059) unless other wise stated
All not mentioned date, please refer to PHILIPS standary (XUW - 0010 - JUNE 2001)

DERIVED	REMARKS	APPROBATION

Remarks

GENERAL PART 1 - GENERAL SPECICFICATION

Class No			Ver	Issued Date
		FWM6000/ All Version	1	23-Sep-11
			2	
			3	

NAME : XB.ZHANG			10	10	SH 190 - 3			A4
KT			CHECK	DATE :				

TECHNIAL DESCRIPTION

Total power 500W, matching LOUDSPEAKER of 4 x 6R+1 x 6R . INPUT SOURCE, CD/MP、TUNER、USB 、AUX、 LINE INPUT、 3DSC (Digital Sound Control). IS (Incredible Sound)

GENERAL PART

OUTPUT stage Protection : Yes Temperature : Yes Shorcircuit : Yes

LoudSpeaker D.C. Protection : Yes.

INDICATORS

Standby Mode Indicator : LCD display Clock active

ECO Mode Indiicator : LCD turns off, ECO - Standby LED turn on

ELECTRICAL DATA

DSC :	Techno, Pop, Jazz, Optimal（n/a Rock）	Channel Differencer at -40dB	3	dB
MAX	YES	Hum ((Vol. Min. to Vol. Max -20 dB)) (A-Weight)	< 200	nW
IS :	YES	Residual Noise (Volume Minium) (A-Weight)	< 60	nW
VAC :	N/A	Channel Separation (at 1 kHz)	≥ 45	dB
WOOX :	N/A	Signal / Noise (A-Weight)	≥ 57	dB
		Subwoofer Out Hum(Volume minmun) (A-Weight)	<4	µW

INTERCONNECTS

Input Sensitity(±2 dB)rated ouput power at 1 kHz and 10kHz. Line Output Voltage (*1)

Tuner	:	FM 67.5KHZ AM80% Modulation -6dB	Line Out (Left / Right)	N.A
CD	:	0 dB track (Audio Disc 1, Trk 35)	Subwoofer Out	FWM6000
USB	:	0 dB track (Audio Disc 1, Trk 35)	Headphone	N/A
AUX /	:	Nor: 600mV Lim: 350mV ~ 900mV for /37	Digital Coaxial Out	N.A
Line input	:	Nor: 2V Lim: 1.5V ~ 2.5V for /55	Booster Out	N.A

Microphone (mic REF output 500mW)	:	Description	Nom	Limit	Unit	Frequency response @±3dB		
		input leven	1.2	1.5	mV			
		REF THD	3	5	%		FWM6000	35HZ-150HZ(reference 70KHZ)
		Noise Ratio	50	45	dB			40HZ-5KHZ(reference 1KHZ)
		Fre response	1	+/-3	dB			5KHZ-16KHZ(reference 10KHZ)

OUTPUT POWER (* 1) At THD = 10% (Measured with 20Hz-20KHz filter), both channels driven (Low channel at 1KHz, High channel at 10k)

Power output (RMS)	FWM6000	Subwoofer channel	220W per channel(Lim '-1dB)
Power output (RMS)		Low channel	70W per channel (Lim '-1dB)
Power output (RMS)		High channel	70W per channel (Lim '-1dB)

LOUDSPEAKER (BOXES) Please to package document of Speaker Box Assy

Rated Impedance

FWM 653 : 6 Ohms at 125Hz to 16 KHz

FWM653 Subwoofer : 6 Ohm at 40HZ to 125HZ

Remarks

(*1) Electrical parameters are to be measuremend at specker terminals across 6 Ohm load (pure resistor)
with rated input signal in AUX mode; DSC setting in Jazz mode with DBB OFF
IS off and OSM unless specified otherwise
One channel signal input (L or R), two channel load (< Low ch. L + High ch. L > or < Low ch. R + High ch. R >)
Measuremend output power only for AUX model and CD model of used audio analyzer equipment.

(*2)

GENERAL PART 1 - TECHNAICAL SPECICFICATION

Class No		Ver	Issued Date
FWM6000 All Version		1	23-Sep-11
		2	
		3	

NAME : XB.ZHANG	10	10	SH 190 - 4				A4
		CHECK	DATE :				

AUDIO SIGNAL PROCESSING

MP3-USB Mini Hi Fi System with Digital Tuner , 3 CDC-MP3, (4×70W+220W)only Universal Class D Power Amplifier

1) DSC (Digital Sound Control)

Select AUX as input source with the following set conditions:

Inject sine wave 600mV at 1 KHz to L/R channels of AUX-IN socket.

Set DSC to JAZZ(Flat) mode and switch off DBB.

Refence level for DSC's without DBB OFF=1W.

Refence level for DSC'S with DBB on=1.2V at the speaker terminal .

Inject sine wave 500mV-2.4V to AUX-IN socket with frequencies indicated in Table 1.

For Subwoofer in put 600mV 60HZ @ 6R

Tabel 1a (Tolerance ± 3dB)

Frequency	DSC Modes with DBB Off				
	JAZZ	ROCK	TECHNO/Samba/Samba	OPTIMAL/Jungle/Jungl	Pop,
60 Hz	+6	+10	+13	+8	+8
1 kHz	0	+0.5	-0.5	+1	+1
12 kHz	-1	+1.5	-4	+1.5	+1.6

Tabel 1b (Tolerance ± 3dB)

Frequency	DSC Modes with DBB 1 ON				
	JAZZ	ROCK	TECHNO/Samba/Samba	OPTIMAL/Jungle	Pop,
60 Hz	+10	+15	+15	+13	+14
1 kHz	0	+0.5	-0.5	1.5	1.5
12 kHz	-0.5	+1	-5	1.5	1.5

Tabel 1b (Tolerance ± 3dB)

Frequency	DSC Modes with DBB 2 ON				
	JAZZ	ROCK	TECHNO/Samba/Samba	OPTIMAL/Jungle	Pop,
60 Hz	+15	+21	+21	+18	+19
1 kHz	0	+1	-0.5	+0.5	+0.6
12 kHz	-1	+3	-2	+1.5	+1.6

Tabel 1b (Tolerance ± 3dB)

Frequency	DSC Modes with DBB 3 ON				
	JAZZ	ROCK	TECHNO/Samba/Samba	OPTIMAL/Jungle	Pop,
60 Hz	+20	+23	+23	+22	+23
1 kHz	0	+1	-0.5	+0.5	+0.6
12 kHz	+1	+4	-0.5	3	4

2) DBB (Dynamic Bass Boot)

Select AUX or Line input as input source with the following set conditions :

Inject sine wave 500mV at 1kHz to L/R channels of AUX - IN socket.

Set DSC to JAZZ(Flat) mode and switch off DBB,

Reference level for the test is 1.7V on the speaker terminals.

Tabel 2 (Tolerance ± 3dB)

Frequency	DBB OFF	DBB 1	DBB 2	DBB 3
60 Hz	-1	+4	+9	+15
1 Hz	0	0	0	+1
12K Hz	0	0	0	+1.5

AUDIO SIGNAL PROCESSING

MP3-USB Mini Hi Fi System with Digital Tuner , 3 CDC-MP3, (4×70W+220W)only FWM653, Universal Class D Power Amplifier

3) IS (Incredible Sound)

Select AUX or Line input as input source.
Inject sine wave 2V at 1kHz to AUX-IN or Line input socket, one channel at a time (input level 600mV for /37,2V for /55).
Set DSC to JAZZ (Flat) mode and switch of DBB, OSM & INCREDIBLE SURROUND.
Adjust volume level to obtain 1W across 6 OHM load at L/R speaker output.
Inject sine wave 2V to AUX-IN or Line input socket withfrequency indicated in Table 3 (input level 600mV for /37,2V for /55).

Table 3 (Tolerence ± 3 dB)

FREQ	INPUT LEVEL		OUTPUT LEVEL			
			IS OFF		IS ON	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
60 Hz	2V	-	- 1.0 dB	-	+2.0 dB	-16.0 dB
1 kHz	2V	-	0	-	+ 3.5 dB	-1 dB
12 kHz	2V	-	- 0.5 dB	-	+ 3.0 dB	-9.0 dB

Note : The above specs also apply to right channel.

4) DSC Mode (Jazz , Rock, TECHNO/Samba and OPTIMAL/Jungle)

The VEC modes are software controlled by switching the combination between DBB and DSC modes
as show in Table 4.

VEC MODE	DBB Level preset
Jazz	DBB OFF
Rock	DBB 3
TECHNO/Samba	DBB 3
OPTIMAL/Jungle/Jungle	DBB 2

Note : When these modes are activ DBB and DSC will not be displayed

5) MAX (Maximum Sound) (Tolerence ± 3 dB)

Select AUX or Line input as input source.
Inject sine wave 2V at 1kHz to AUX-IN or Line input socket, one channel at a time (input level 600mV for /37,2V for /55).
Set DSC to JAZZ (Flat) mode and switch of DBB, OSM & INCREDIBLE SURROUND.
Adjust volume level to obtain 1W across 3 OHM load at L/R speaker output.
The 1W level will be used as 0 dB reference
Inject sine wave 2V to AUX-IN or Line input socket withfrequency indicated in Table 5 (input level 600mV for /37,2V for /55).

FREQ	Max OFF	Max ON		
60 Hz	6	23		
1 kHz	0	+5		
12 kHz	-1	+7		

TECHNIAL DESCRIPTION

SOFTWARE IMPLEMENTED CLOCK / TIMER FUNCTION WITH 32.768KHZ QUARTZ OSCILLATOR.

GENERAL PART

Timer Setting	:	Clock and Timer
Timer Wakeup Mode	:	CD or Tuner or USB
Remarks Time Setting	:	12hr for /37 version, 24hrs for other version.
Volume at Wakeup	:	Last Setting
No of Timer Settings	:	1
Clock Accuracy	:	Nom : 1 sec/day Limit : 2 sec/day

INDICATORS		
Display Type(only FWM462/FWM653)	:	LCD
Display Type(only FWM663)	:	VFD

Remark

Input sensitivity

CLOCK / TIMMER SPECICFICATION

Class No		Ver	Issued Date
FWM6000/ All Version		1	23-Sep-11
		2	
		3	

NAME : XB.ZHANG			10	10	SH 190 - 8		A4
KT		CHECK	DATE :				

TECHNIAL DESCRIPTION
See also SH 190 USB Audio Module (300605)
Measurment are directly done at the coonector on the board

GENERAL PART

Measurement are directly done at the connector on CDC board

Description	Specification
Output Resistance	N/A
Output Voltage RL = 33 k ohm ( )dB, 1 Khz)	N/A
Channel Unbalance	< = +/- 3 dB
REF THD + Noise (0dB, 1Khz)	<=2%
Channel Crosstalk ((0 dB, 1 KHz))	>= 35dB
(0 dB, 1 KHz)	>=35dB
Signal to Noise Ratio (0dB,1kHz) (A - weighted)	>= 57dB(A - weighted)
Frequency response @±3	sub 40HZ-125HZ(Reference 60HZ)
	125HZ-5KHZ(Reference 1KHZ)
	5KHZ-16KHZ(Reference 10KHZ)

USB Measurement at Set Level

Electrical Parameters are to be measured at speaker teminals across 6 ohm load with 500mW output and DSC setting in Jazz Mode

Description	Specification
Channel Crosstalk (0 dB, 1 KHz)	>= 35dB (with 1 KHz filter)
Signal to Noise Ratio (0 dB, 1 KHz)	>= 55dBA (A - weighted)
Channel Unbalance (0 dB, 1 KHz)	+/- 2dB

TECHNIAL DESCRIPTION

TUNER used SI4730 soultion

GENERAL PART

WAVE RANGE	TOLERANCE	TUNING GRID
FM(55/37) 87.5 - 108.00 MHz	QUARTZ PRECISION	100 kHz
FM(12) 87.5 - 108.00 MHz		50KHZ
AM (55/37) 530 - 1700 kHz	QUARTZ PRECISION	10 kHz
AM (12) 531 - 1602 kHz	QUARTZ PRECISION	9 kHz

AERIAL

FM : PIGTAIL ANT WIRE 300 Ohm(for/37) 75ohm for 55/12

AM : FRAME ANT. 18.1 uH with shielding

INDICATORS

VFD

A.M	Nom	Limit	Unit	F.M.	Nom	Limit	Unit
				- 3 dB Limiting Point	: 17	23.5	dBf
Amplification Reverse	: - 2	-4	dB	Amplification Reverse	: 0	-4	dB
AGC Figure of Merit	: 30	25	dB	Distortion (RF 1mV, Frq Dev.75 kHz)	: 2	3	%
Distortion (RF 50mV, M 80%)	: 3	5	%	Stereo - 46 dB Quieting	: 46	49	dBf
IF	: 450	± 3	kHz	Crosstalk (RF1mV, Freq Dev.40kHz)	: 25	18	dB
				IF	: 10.7	± 0.03	MHz
Search Tuning Sensitivity	: α26	+/-10	dB		24-30	19-35	dBf
S/N Ratio	45	40	dB		50	45	dB

Wave Range		Noise Limited Sensitivity α26 dB			Image Rejection	IF Rejection	Large Signal	Selectivity
MW 610 kHz	Nom.	3500		uV/m	NC	NC	1000mv/m	22db
	Lim.	4000		Uv/m	NC	NC	500mv/m	18db
MW 1440 kHz	Nom.	1500		uV/m	NC	NC	1000mv/m	22db
	Lim.	4000		uV/m	NC	NC	500mv/m	18db
FM 98 MHz	Nom.	18		dBf	NC	NC	116 dBu	30db
	Lim.	22		dBf	NC	NC	108 dBu	25db
FM 108 MHz	Nom.	18		dBf	NC	NC	116 dBu	45db
	Lim.	22		dBf	NC	NC	108 dBu	25db

Remarks：MAX.Sens -6dB

TUNER SPECICFICATION

Class No		Ver	Issued Date
	FWM6000/ All Version	1	23-Sep-11
		2	
		3	

NAME :XB.ZHANG	10	10	SH 190 - 10			A4
KT			CHECK	DATE :		

TECHNIAL DESCRIPTION

CD + MP3 - Part Specifications (CD MECHAISM DA11VZSS)

	Input	AMP IC Output	Motor	Logic control
Active components		L/R TDA8922CTH	3CD-TDA7073	BX8804
		SUB TAD8920CTH	--	
			--	
	Signal processsing	D/A converter	HF-preamplifier	Servo processor
Active components	TDA7468D	WM8782SEDS/R	NJM4556AM	BU9543KV+BA5826FP

AUDIO part: Measurement with Audio Signals Disc-783 7104 078 04911 on spkeakers or Headphone socket with nom.load

Description		Extern Filter	Nom	Lim	Unit
De-emphasis		15us / 50us Switchable via Subcode information			
Frequency accuracy			N/A	± 0.5	%
Channel Unbalance			1	2	dB
Frequency Response (40Hz - 125Hz) reference 60Hz	FWM6000	Sub ch		± 3	dB
Frequency Response (125Hz -5kHz)reference 1kHz		Low ch		± 3	
Frequency Response (5KHz -16 kHz)reference 10kHz		high ch		± 3	
Signal to Noise Ration (Unweighted)			60	50	dBA
Signal to Noise Ration (A - weighted)			65	55	dBA
Crosstalk (1kHz) (A - weighted)			>= 35dB		dB
					dB
THD (1KHz -6dB)			0.2	<1	%
THD (10KHz -20dB)			<1	<3	%

REMARKS:

1. Amplification reserve for CD = +2dB ('±2dB),Ref.Level for CD is a 0dB track instead of a .-6dB track.

Playability :(acc.To AR 30-05-239)

	Limit	Typical	Test disc
Wedge	600um	900um	TNO 7, 9 of SBC 444A(7104 099 24990)
Eccentric	150um	200um	TNO 1, 24 of 200um disc (7104 099 24960)
Fingerprint	No audible defect		TNO 11 of Sub chassis 8A
Black dot	500um	800um	TNO 13 of SBC 444A (7104 099 24990)
Skew 0.6mm	No audible defect		TNO 1,6 of 0.6mm skew (7104 099 28260)
Bad HF track	No audible defect		TNO 8 of Sub chassis 8A
Hwavy fingerprint	No track jumper/plops		TNO 10 of Sub chassis 8A
Playback position	Solid, Normal position (Set is located on a flat surface, floor)		

1. Playback of above mentioned tracks possible wihout track loss or audible defects.
2. Double black dot, max. diameter, thin/disk is according to PQR or AR 30-05-239
3. This unit can playback (only) CD-R or CD-RW discs. For performance specification, Please refer to module. specification of CD99 (3103 308 52190)

CD / MP3 SPECICFICATION

Class No		Ver	Issued Date
	FWM6000/ All Version	1	23-Sep-11
		2	
		3	

NAME : XB.ZHANG	10	10	SH 190 -11			A4
KT	CHECK	DATE :				

TECHNIAL DESCRIPTION

Microphone

See also SH 190 testing with 20 to 20k Hz filter,input leven 1mv rms(lim:2mv rms) Rs=600ohm output 500mW
Measurment are directly done at the coonector on the board

GENERAL PART

Measurement are directly done at the connector Microphone(mic1,mic2)

Description			Specification		
			Nom	Lim	Unit
Output Resistance			N/A		
Output Voltage RL = 33 k ohm ( )dB, 1 Khz)			N/A		
Channel Unbalanceo about(mic1 and mic2)			1	+/- 3	dBA
THD + Noise (0dB, 1Khz)vol max			6	8	%
Channel Crosstalk ((0 dB, 63Hz))			N/A		
(0 dB, 1 KHz)			N/A		
Signal to Noise Ratio (0dB,1kHz) (A - weighted)			45	35	dBA
Microphone Power output(RMS)			550	+/- 20%	mW
Microphone input leven (Rms)			1	2	mV
Max Hum Noise(mic vol max,main vol max)			6	8	mV
Vol.min=vol1.(mic vol min,main vol 1)			2	4	mV
Microphone Frequency response at volume 23,input leven 1mv rms, connect main load					
	FL/FR ch	63HZ	5	±3	dB
		1KHZ	0	ref	dB
		10KHZ	0	±3	dB

Remarks :

testing with 20 to 20k Hz filter

USB SPECICFICATION

Class No			Ver	Issued Date
		FWM6000/ All Version	1	23-Sep-11
			2	
			3	

NAME : XB.ZHANG			11	9	SH 190 -9			A4
			CHECK	DATE :				

TECHNIAL DESCRIPTION

iPOD - Part Specifications

GENERAL PART

Measurement are directly done at the for support DCK3060 Dock

Description	Extern	Nom	Lim	Unit
Output Resistance			N/A	Ohms
Channel Unbalance			< ± 2	dB
Frequency Response (30Hz - 10 kHz) ref 1khz		3	3± 2	dB
Signal to Noise Ration (Unweighted)(*1)		50	45	dB
Signal to Noise Ration (A - weighted)(*1)		55	50	dBA
input sensitivity		500	900	mV
Charge Supply Voltage (DC +5V 800mA)(only Ipod)		+5		V

Remark

(*1) Measured at iPOD level 2)testing with 20 to 20k Hz filter

iPOD SPECICFICATION

Class No		Ver	Issued Date
	FWM6000 All Version	1	23-Sep-11
		2	
		3	

NAME : XB.ZHANG	11	5	SH 190 -5			A4
KT		CHECK				

VERSION OVERVIEW FWM6000

Ver	DEST	APPROBATION		TUNER				AC SUPPLY			MIC MIX	MATRIX SURR. SPK.
		SAFETY	EMC	Wave RANGE	GRID	AERIAL SOCKET	AERIAL SUPPLIED	MAINS VOLTAGE	SOC.	CORD		
/55/98/77/78	OVS	EN60065 CLASS II SISR TAIWAN	CISPR 13	FM 87.5-108MHz MW 530-1700kHz or 531-1602kHz	100kHz 9kHz 10kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	110-127V Switched 220 - 240V 50/60Hz	IEC	IEC	No	No
/05 / 12	EUROPE	EN60065 SEMKO DEMKO NEMKO SEV BS415-UK	EN55013 EN55020	FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	230V 50Hz	IEC	IEC	No	No
/79	AUST / NZ	EN60065 CLASS II		FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	240V 50Hz	IEC	IEC	No	No
/37	USA Canada	UL 6500	FCC 99	FM 87.5-108MHz MW 530-1710kHz	100kHz 10kHz	JALCO Click Fit JST XH 2P Side	300 Ohm Dipole Loop Sagami 18.1uH	120V 60Hz	UL	UL	No	No
/35	China	EN60065 CLASS II		FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	220V 60Hz	IEC	IEC	No	No
/ 33	Korea	EN60065 CLASS II		FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	220V 60Hz	IEC	IEC	No	No

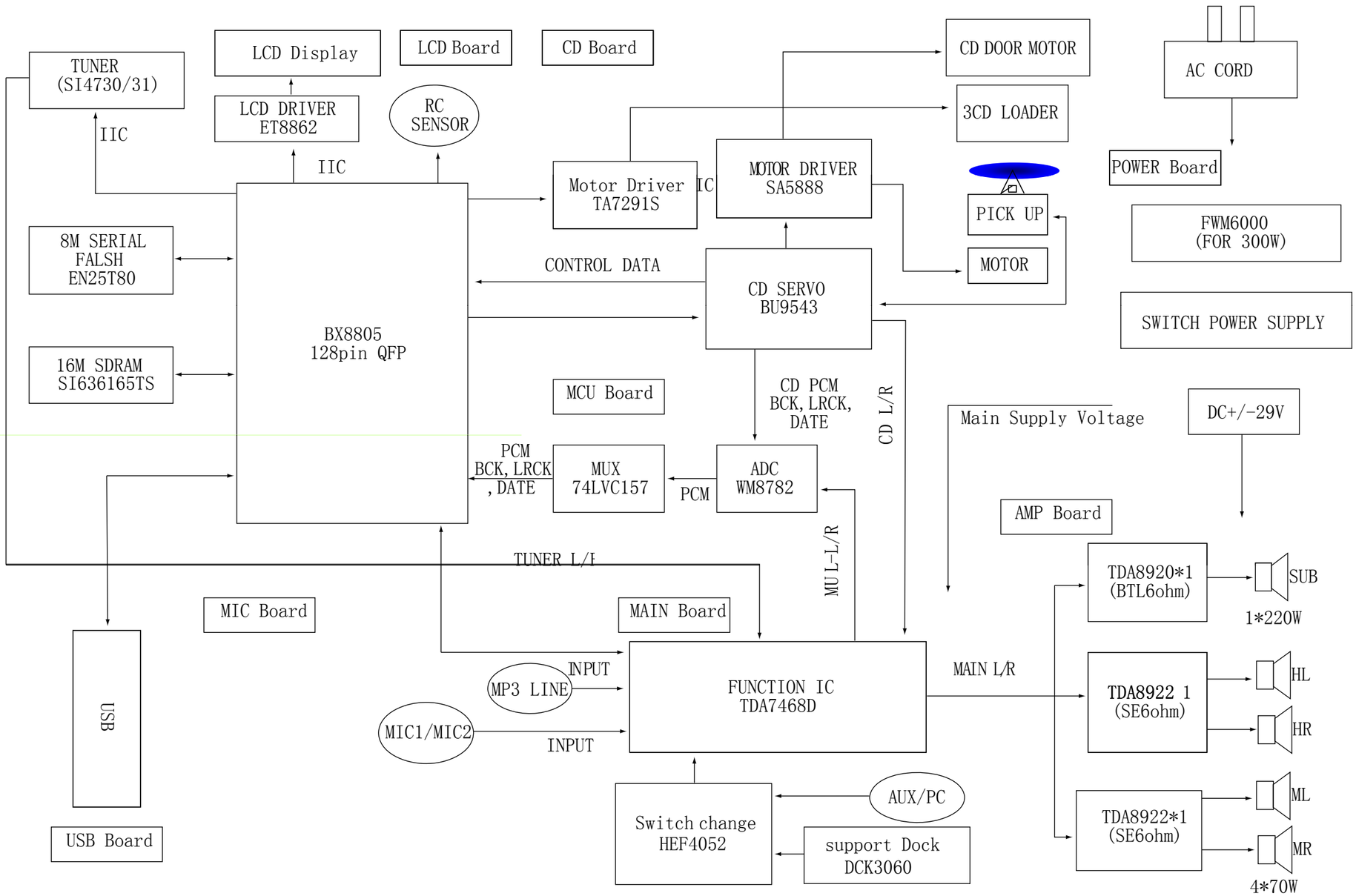
VERSION OVERVIEW

Class No			Ver	Issued Date
		FWM6000/ All Version	1	23-Sep-11
			2	
			3	

NAME : XB.ZHANG			10	10	SH 190 - 12			A4
KT			CHECK	DATE :				

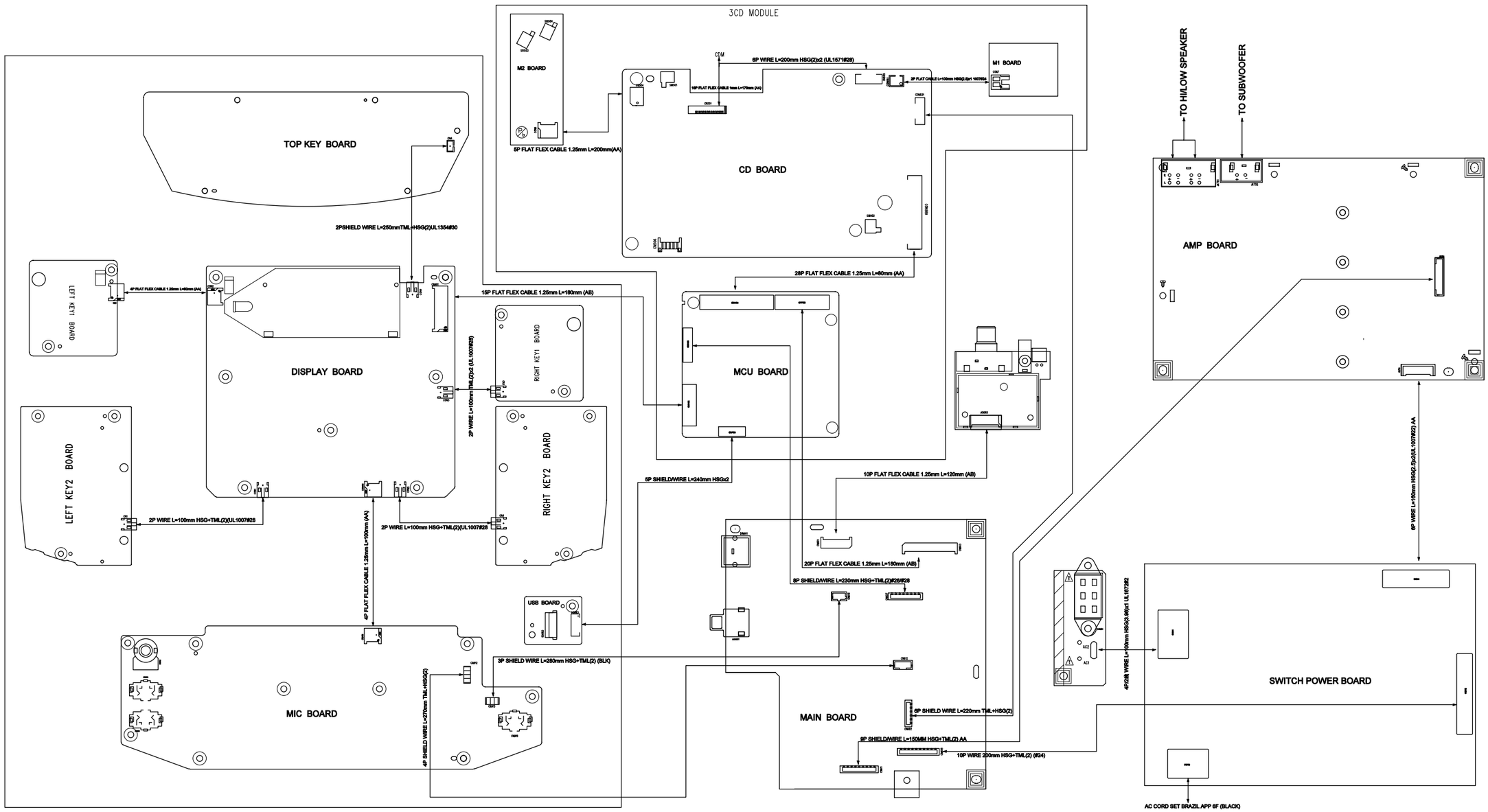
3-1

BLOCK DIAGRAM



4-1

WIRING DIAGRAM

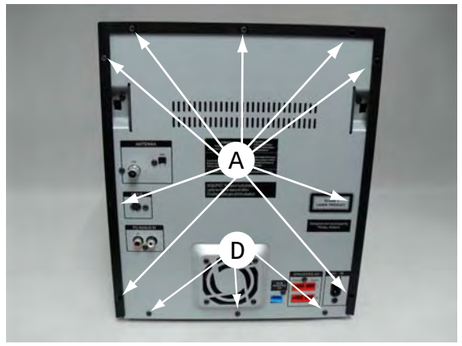


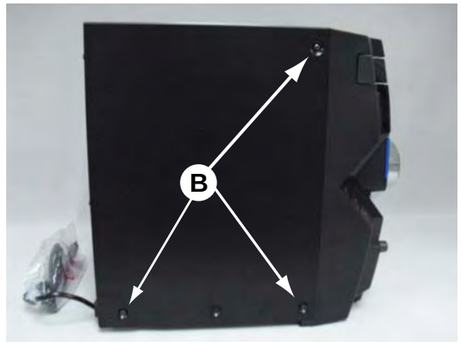
5-1

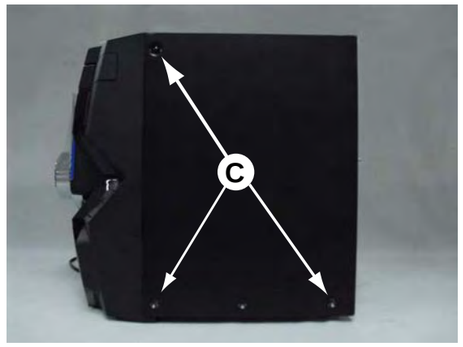
DISASSEMBLY INSTRUCTIONS

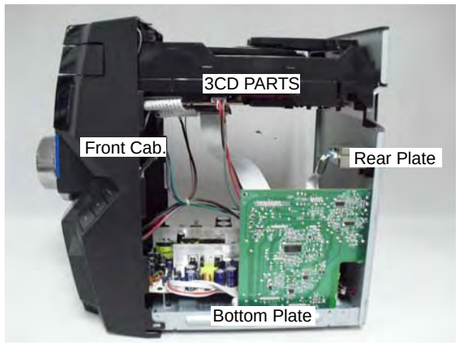
Dismantling of Rear Portion

1)Remove 9 screws A and 6 screws B/C as indicated to loosen the outer plate.
2)Remove 3 screws D as indicated to loosen the Rear portion .



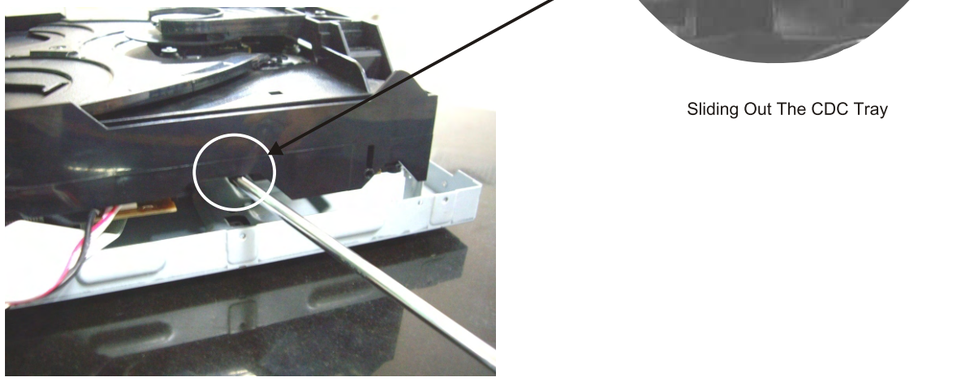






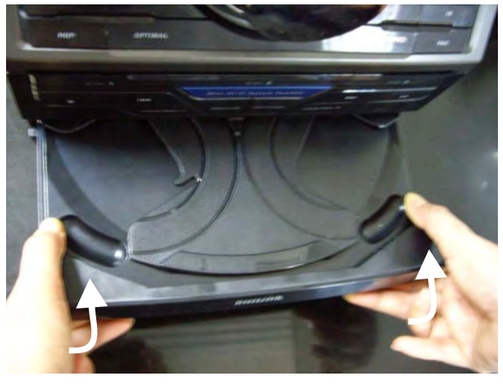
Dismantling of the CDC Module

1)Slide out the CDC Tray as shown in the diagram below with the help of a flat head screw driver.
2)Remove the Cover Tray CDC as indicated.
3)Loosen 2 screws E and 2 screws F to remove the CDC Module as indicated.



Sliding Out The CDC Tray

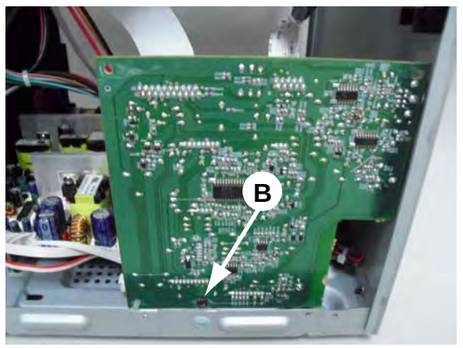
Remove Cover Tray CDC

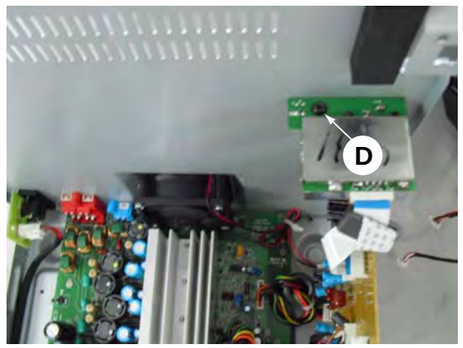


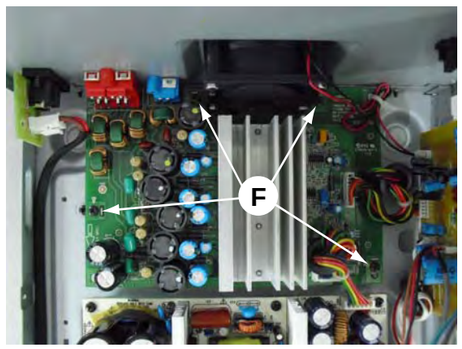
5-2

Dismantling of the PCB Board

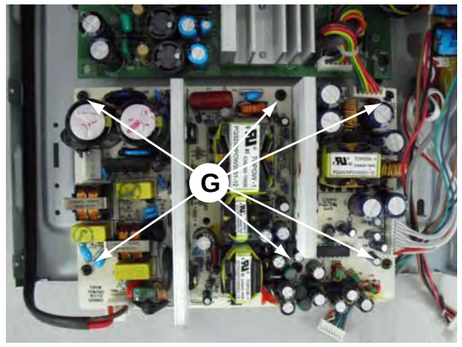
1)Remove 2 screws A and 1 screw B as indicated to loosen the Main Board.
2)Remove 2 screws C and 1 screw D as indicated to loosen the Tuner Board.
3)Remove 2 screws E and 4 screws F as indicated to loosen the Amp Board.

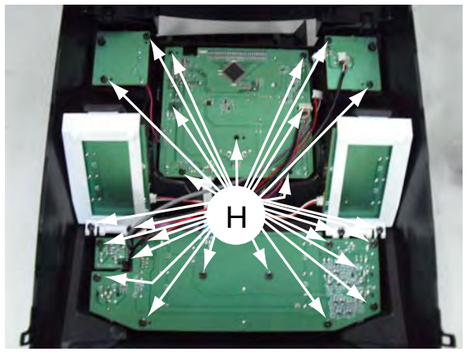


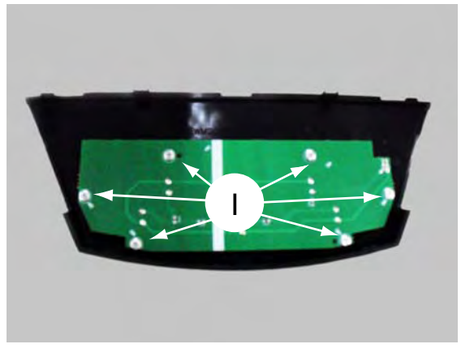




4)Remove 6 screws G as indicated to loosen the Switch power Board.
5)Remove screws H as indicated to loosen the Display Board & Key Board & Usb Board.
6)Remove Top panel and 6 screws I as indicated to loosen the Top Key Board.

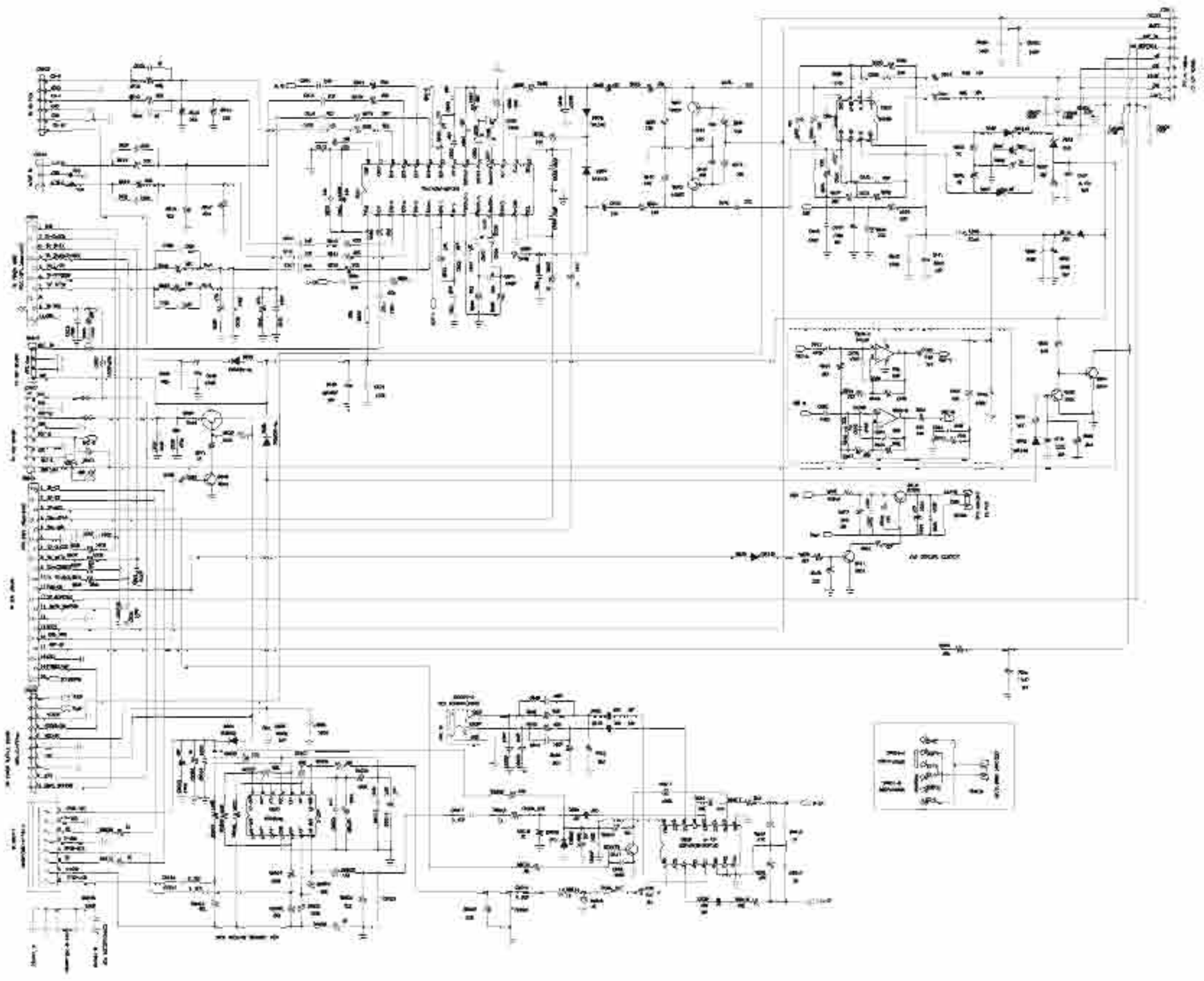






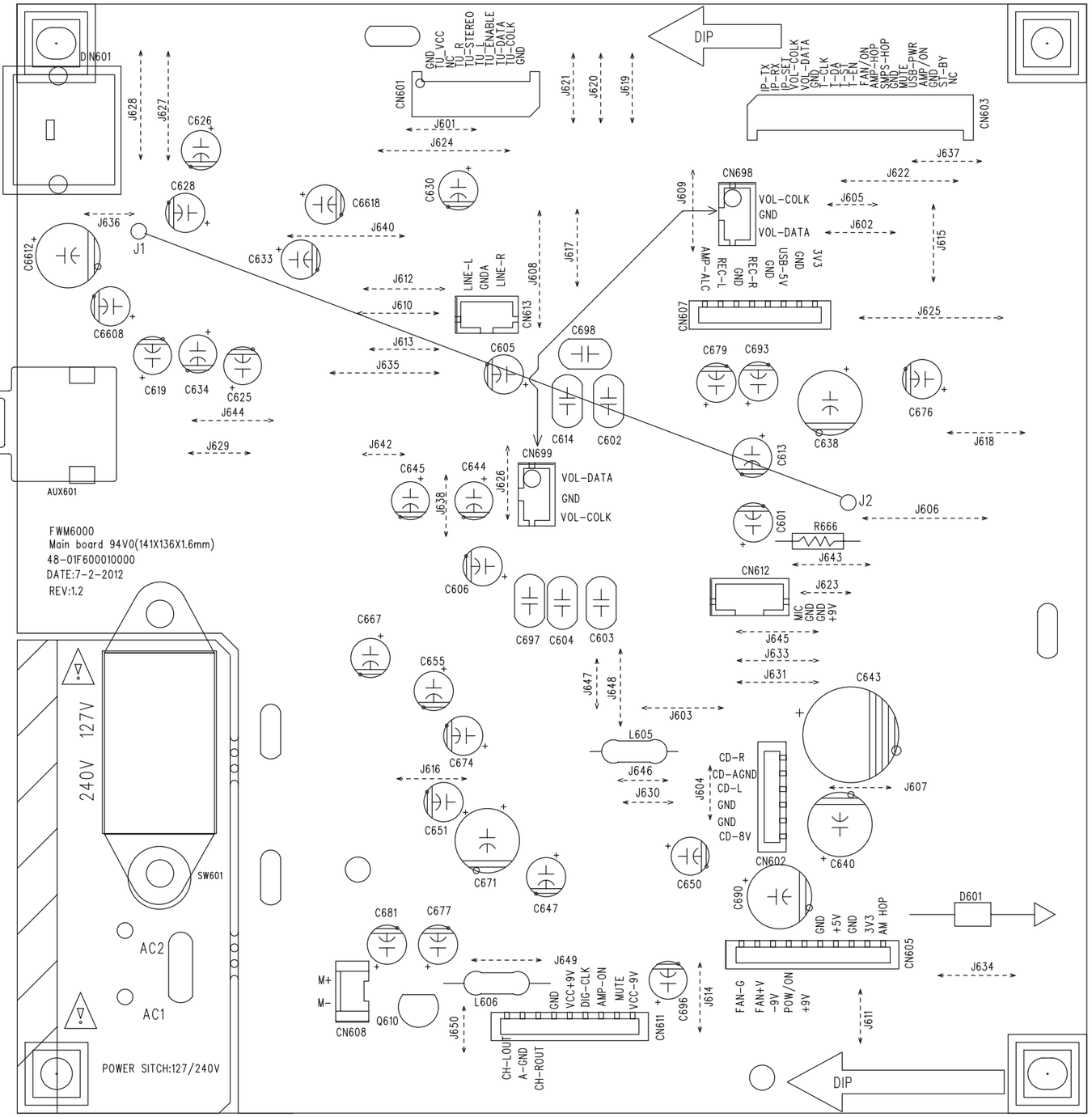
6-1

CIRCUIT DIAGRAM - MAIN BOARD



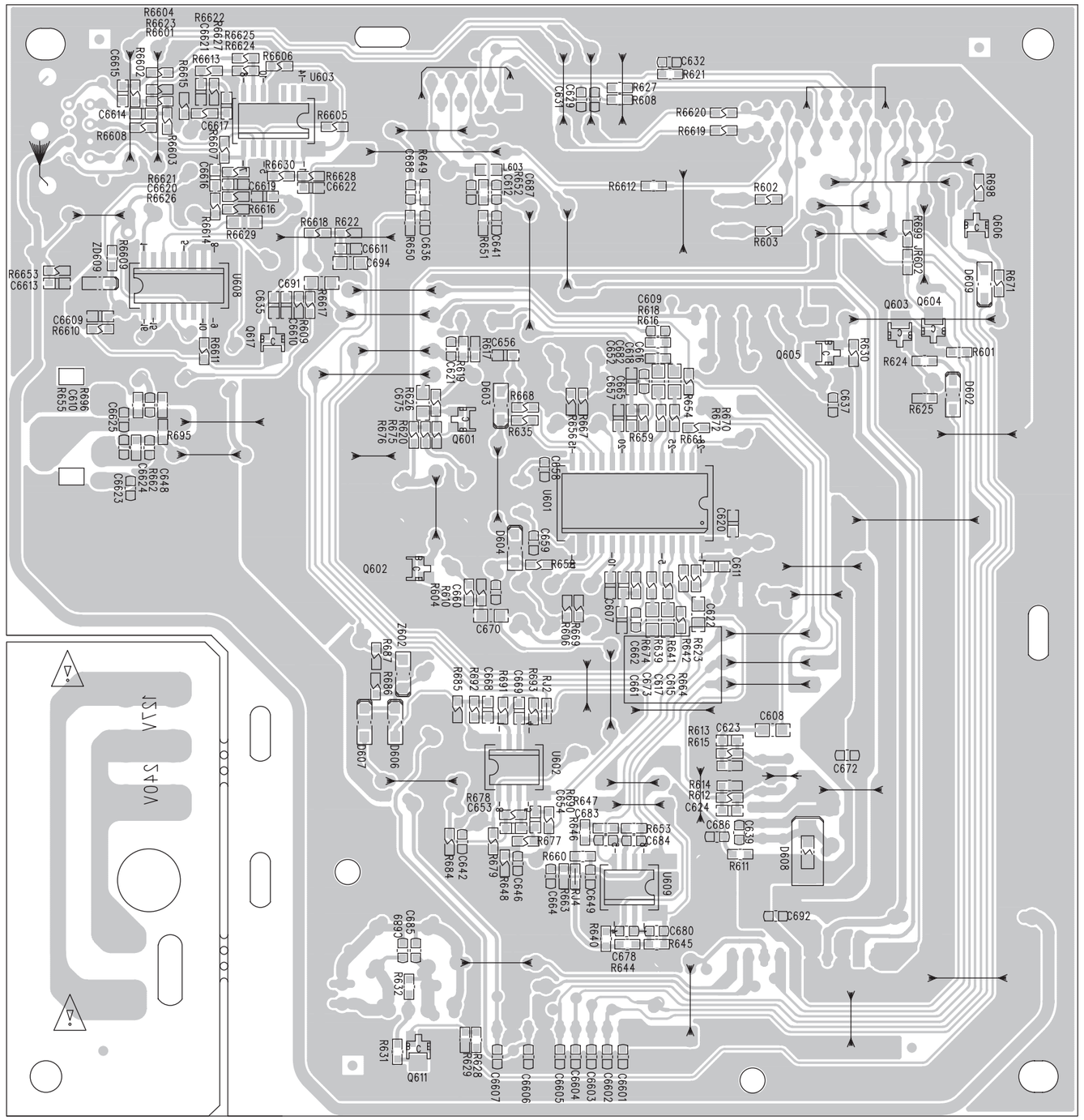
6-2

PCB LAYOUT - MAIN BOARD
TOP SIDE



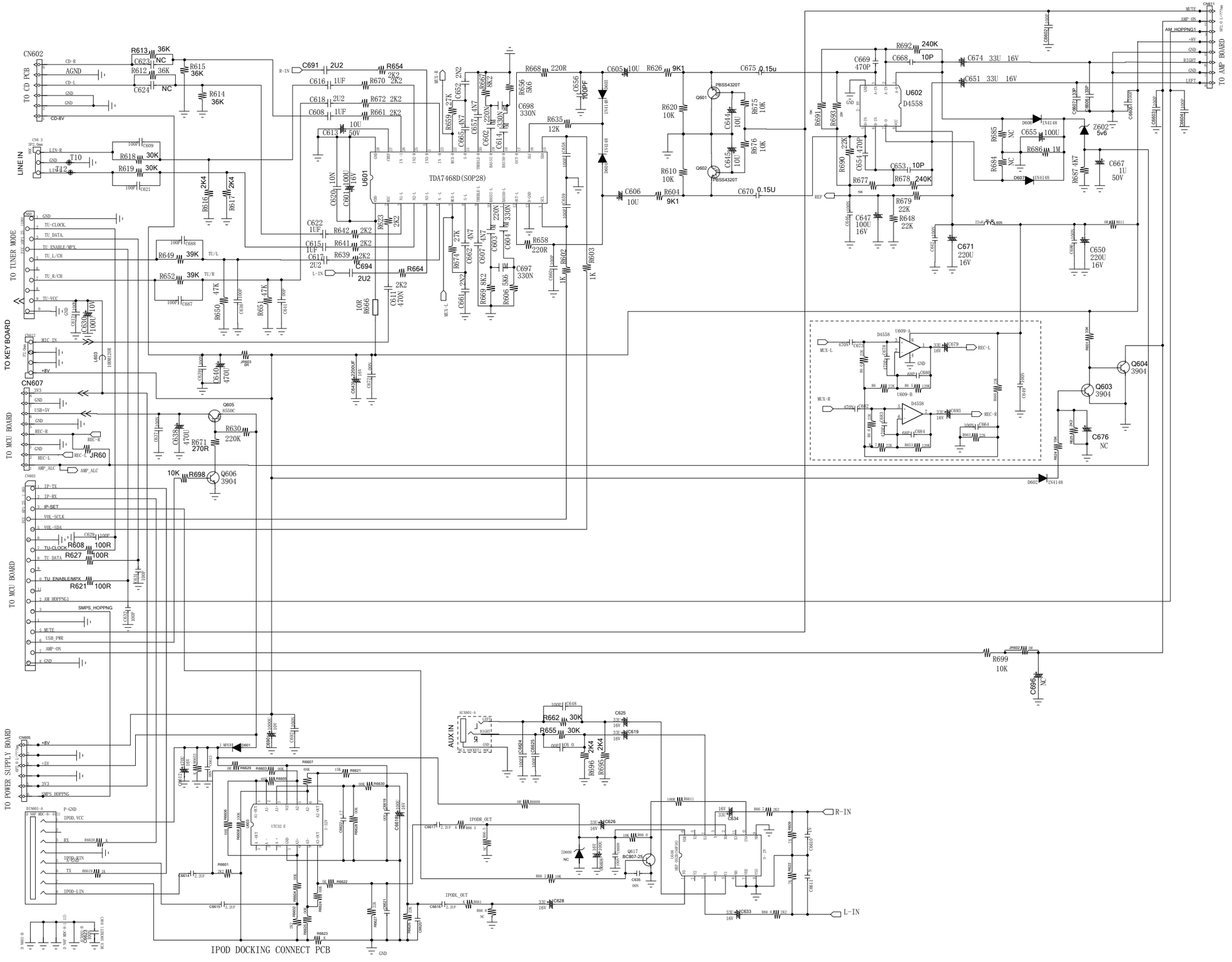
6-3

PCB LAYOUT - MAIN BOARD
BOTTOM SIDE



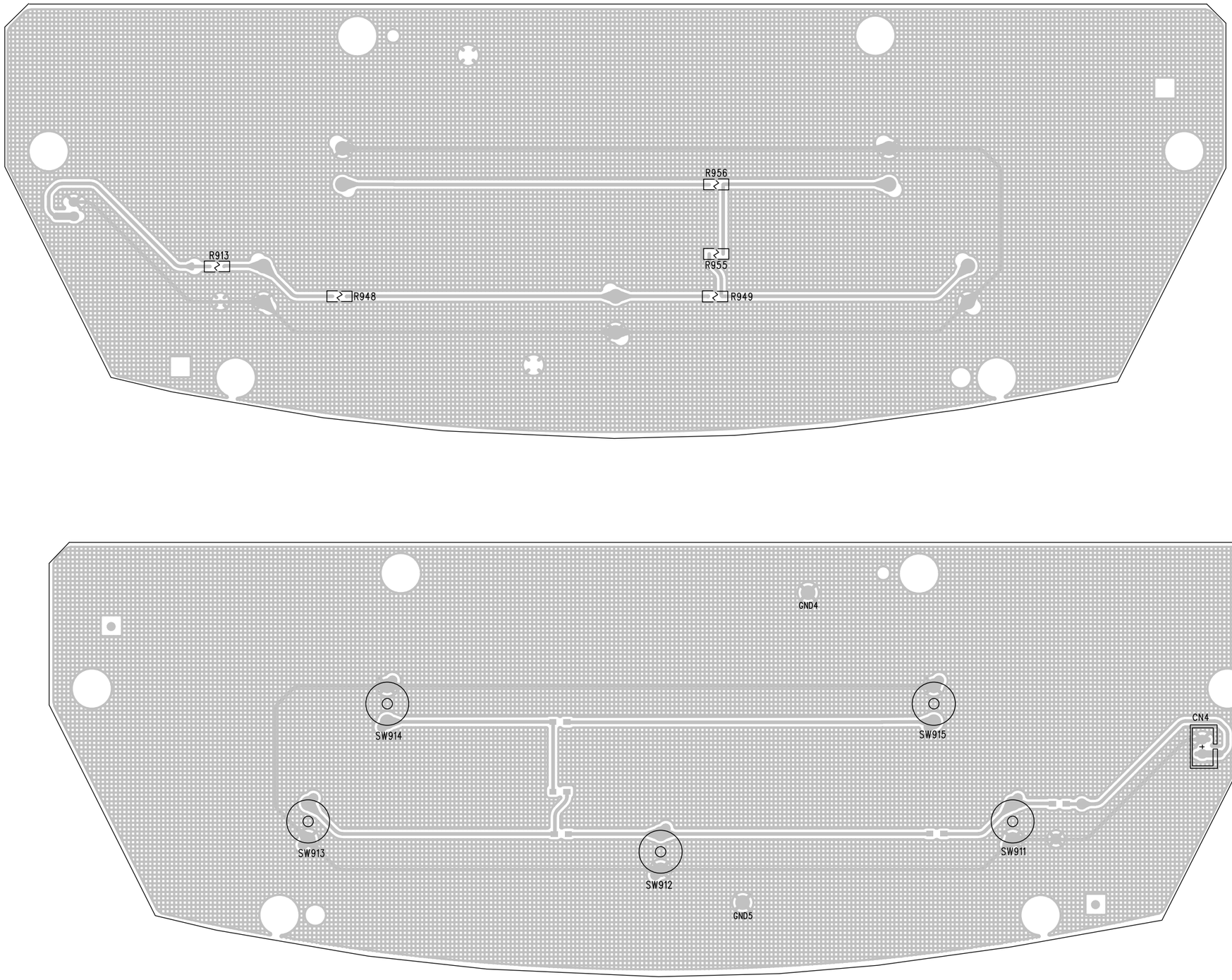
7-1

CIRCUIT DIAGRAM - KEY BOARD



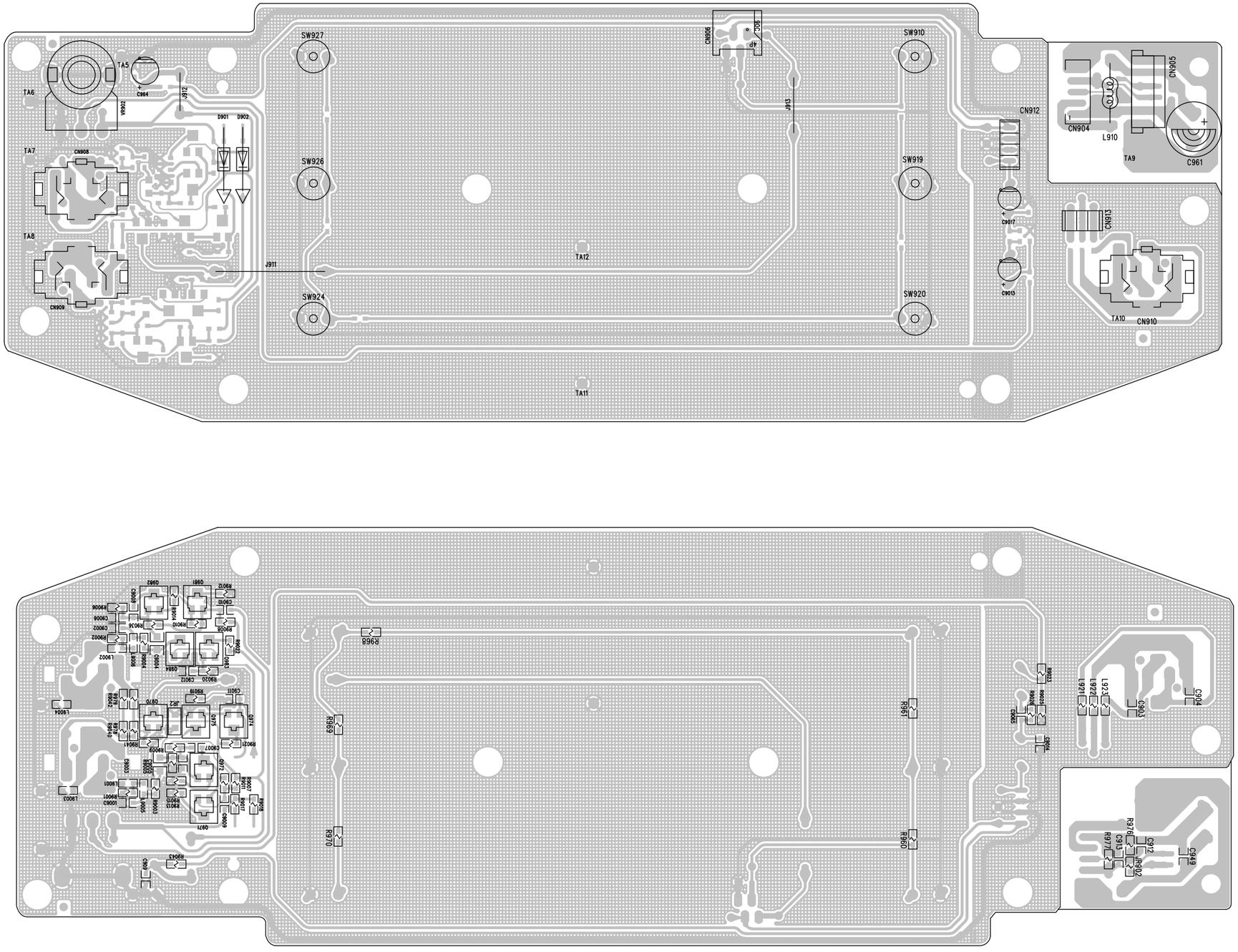
7-2

PCB LAYOUT - KEY BOARD



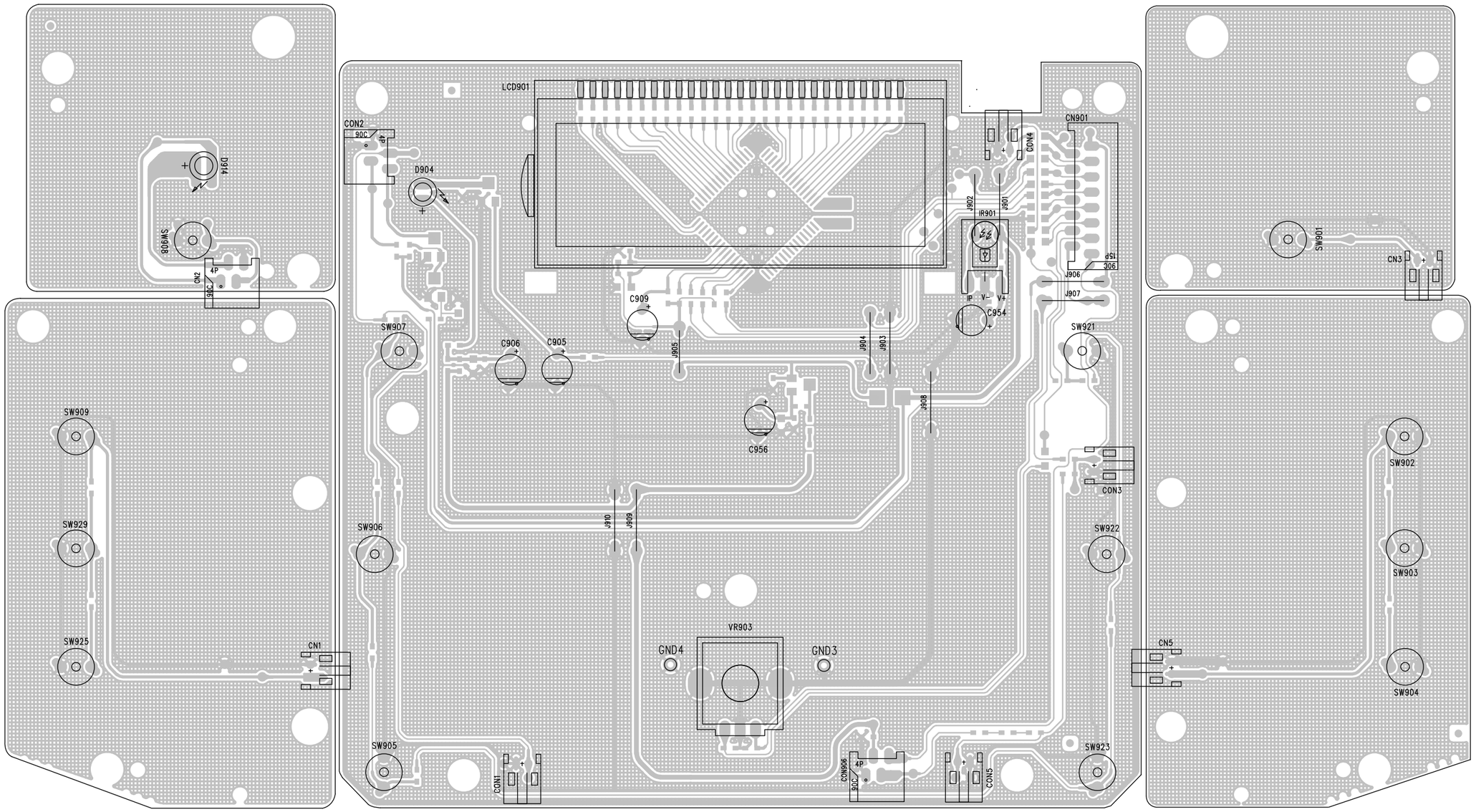
7-3

PCB LAYOUT - KEY/MIC BOARD



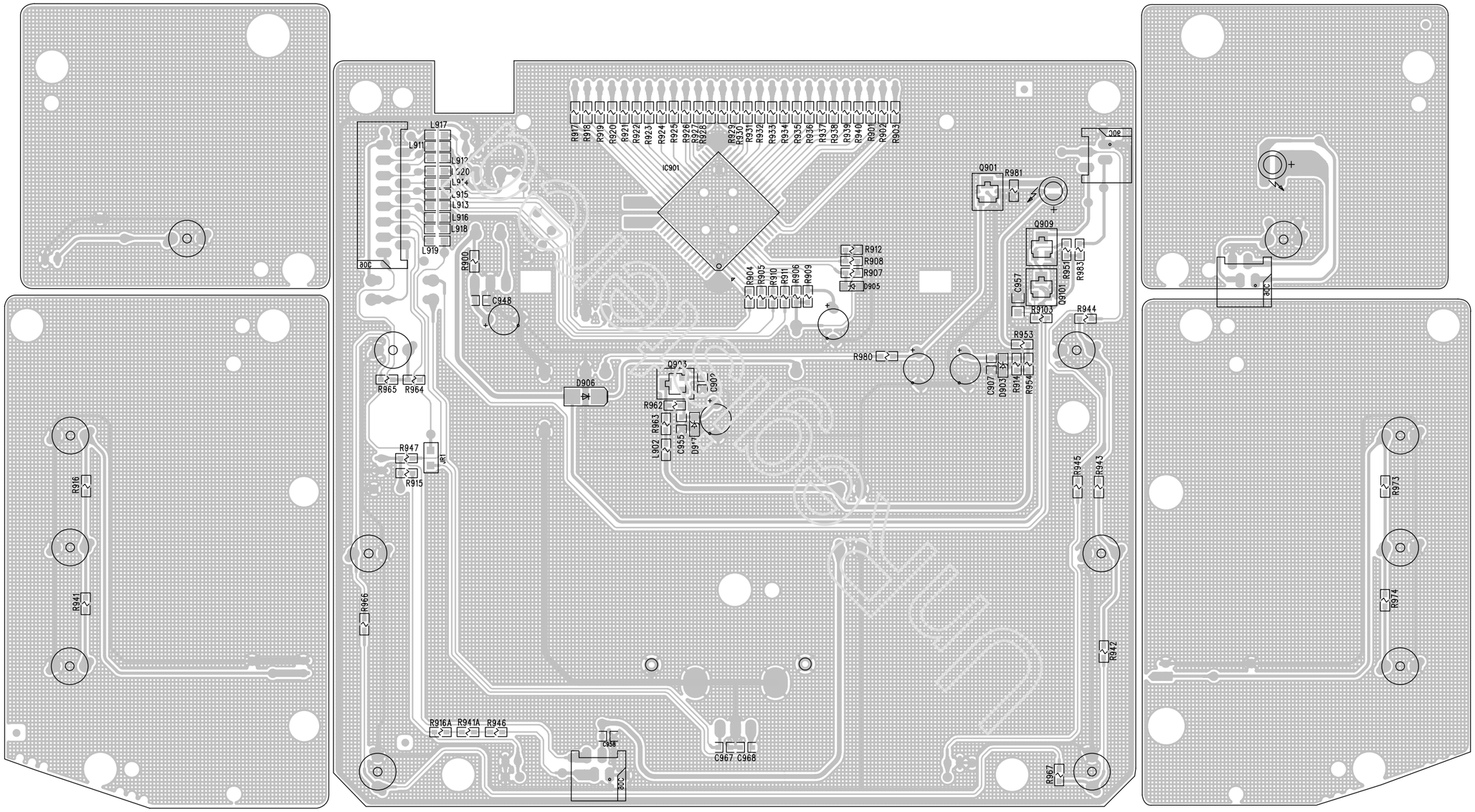
7-4

PCB LAYOUT - DISPLAY BOARD
TOP SIDE



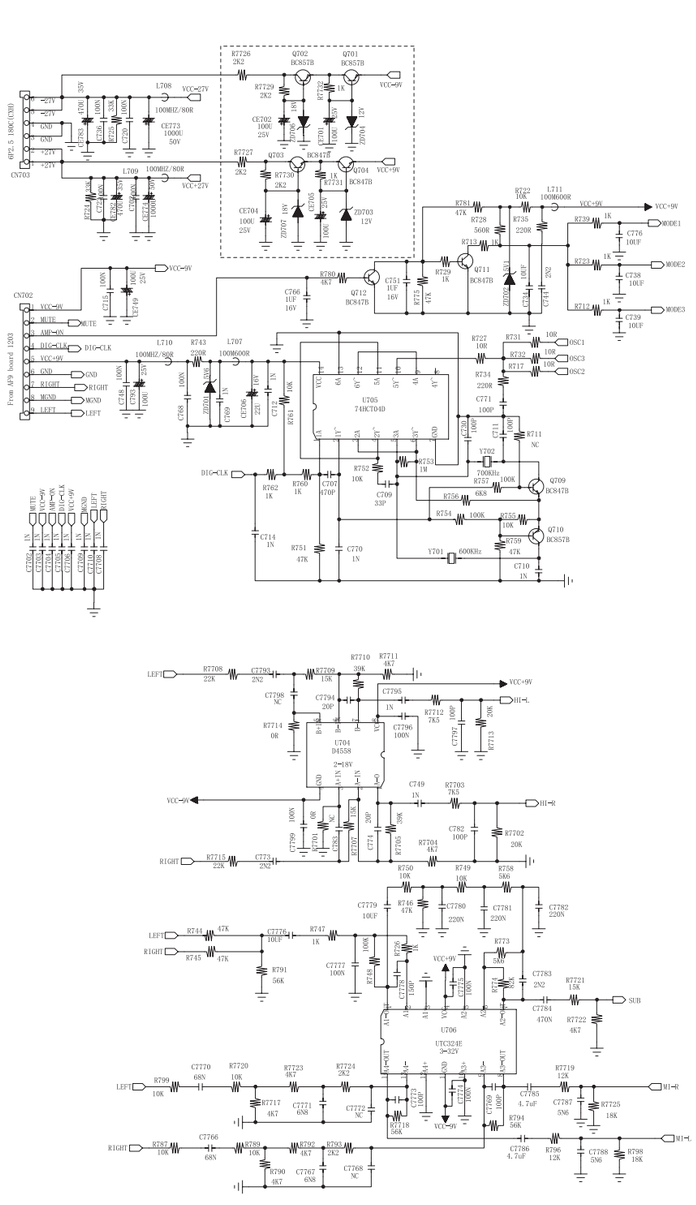
7-5

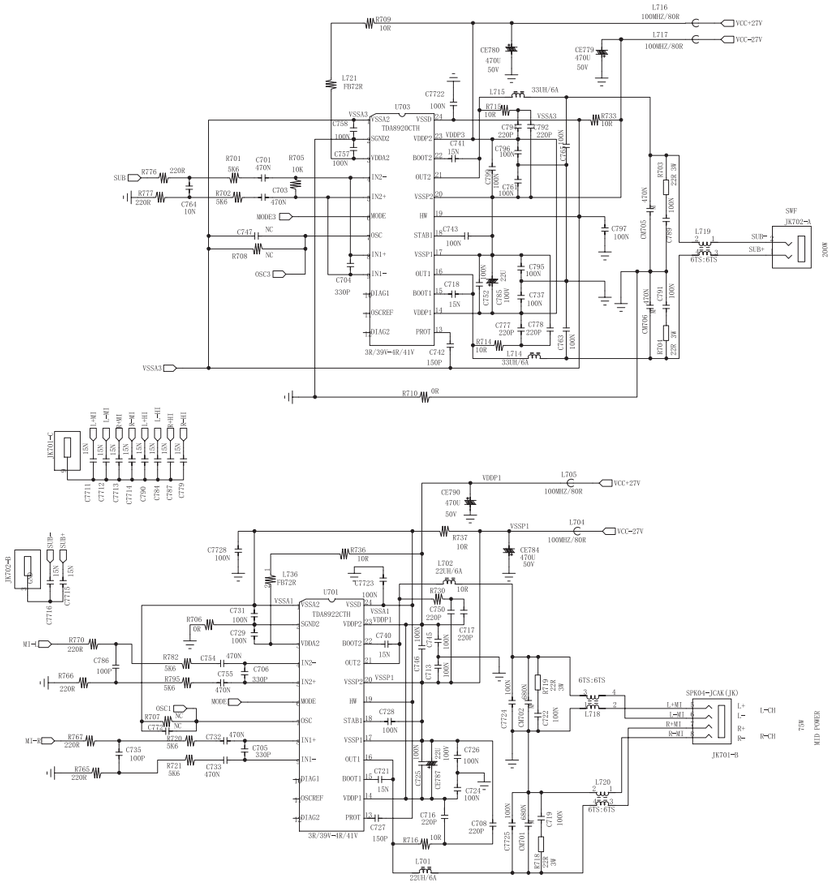
PCB LAYOUT - DISPLAY BOARD



8-1

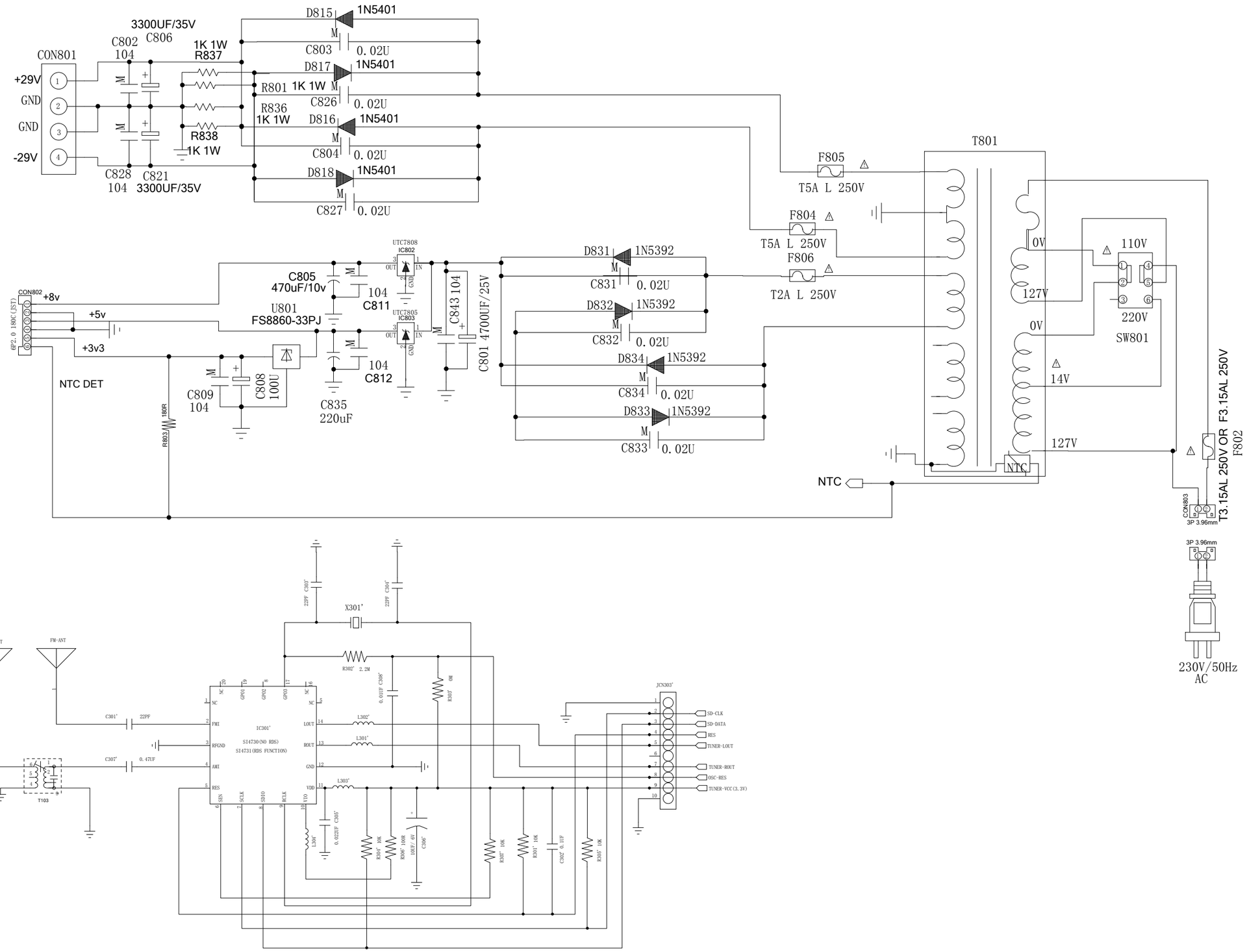
CIRCUIT DIAGRAM - AMP BOARD





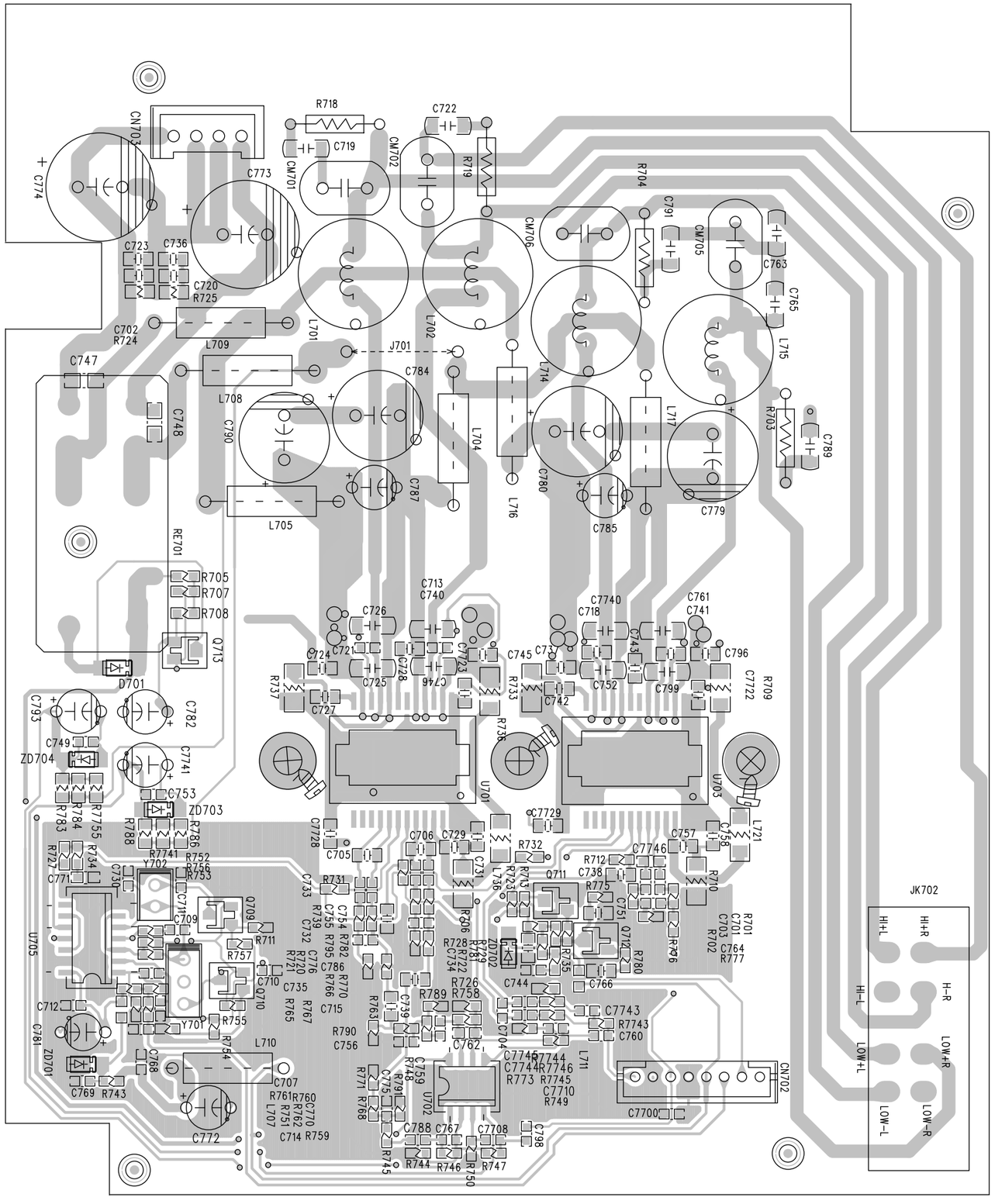
8-2

CIRCUIT DIAGRAM - TUNING/POWER BOARD



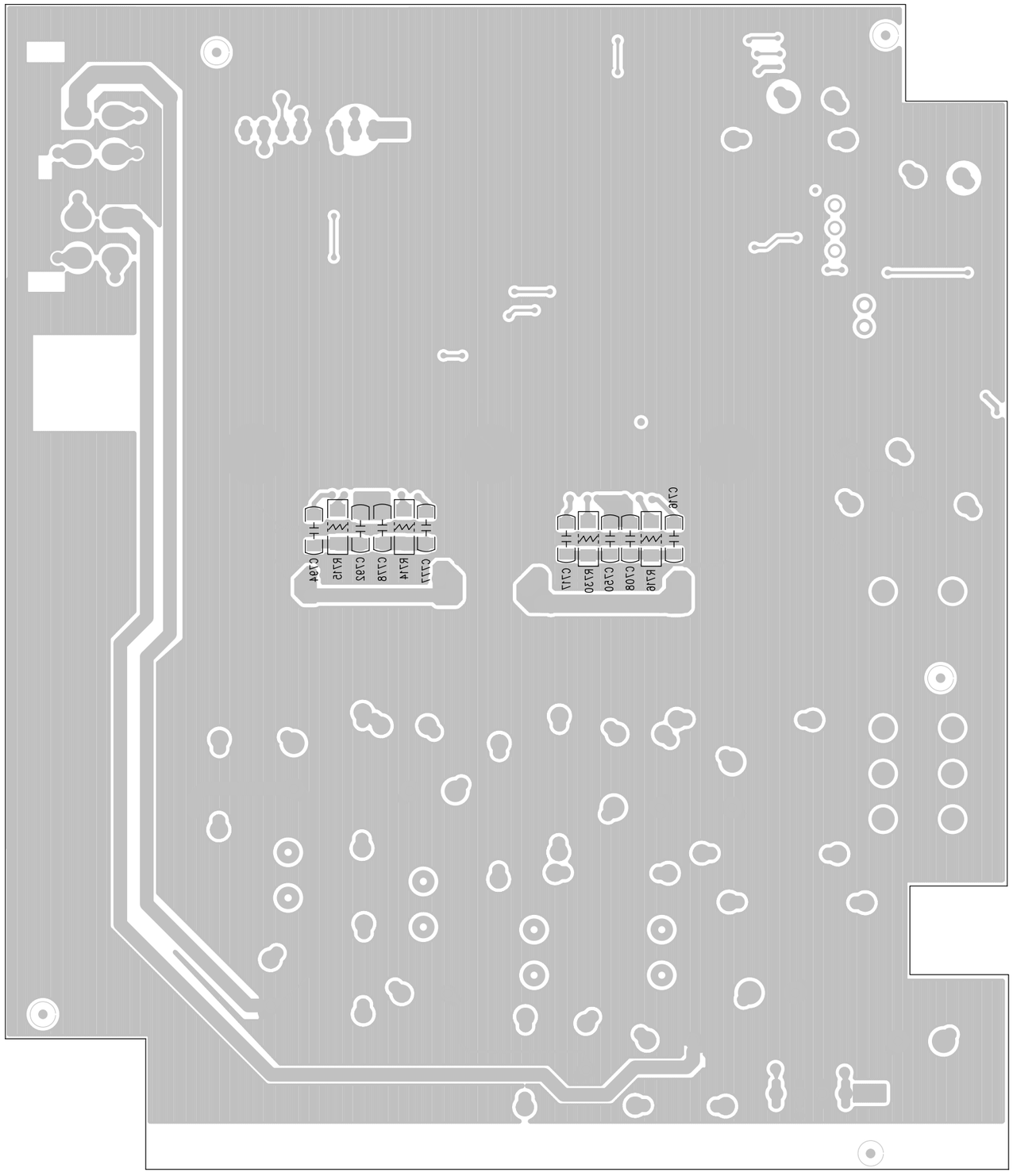
8-3

PCB LAYOUT - AMP BOARD
TOP SIDE



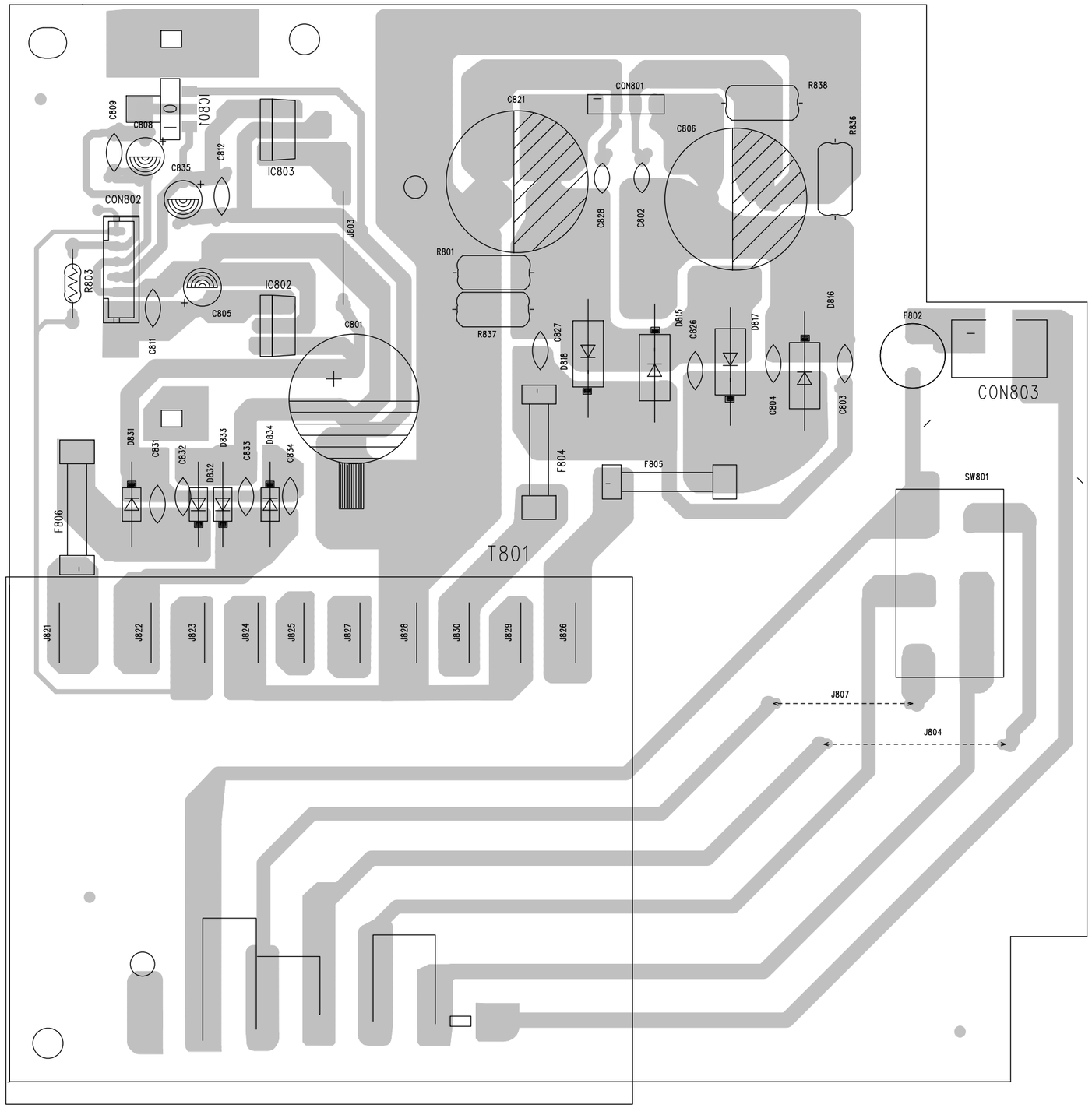
8-4

PCB LAYOUT - AMP BOARD



8-5

PCB LAYOUT - TUNER BOARD



9-1

CIRCUIT DIAGRAM - MCU BOARD

TO MAIN BOARD CW105 8PIN-2.0

+3V3 V3
GND
USB+5V B+5V
GND
ENC_R C_R
GND1 R1105 0R
ENC_L C_L
AMP_ALC# AMP_ALC R180 0R AMP_ALC

TO MAIN BOARD CW103 FFC20PIN-1.25

IP_TX# IP_TX R103 100 IP_TX
IP_RX# IP_RX R108 100 IP_RX
IP_SET# IP_SET R113 100 IP_SET
VOL_SCLK# VOL_SCLK R122 100 VOL_SCLK
VOL_SDA# VOL_SDA R126 100 VOL_SDA
GND
TU-SCL# TU-SCL R176 FB600 TU_SCLK
TU-SDA# TU-SDA R175 FB600 TU-SDA
NC
TU-RESET# TU-RESET R177 FB600 TU-RESET
FAN_ON# FAN_ON R1107 100 FAN_ON
AM_CHANGE# AM_CHANGE R133 100 AM_CHANGE
SMPS_CHANGE# SMPS_CHANGE R107 0R SMPS_CHANGE/NTC
FWM4000 FOR NTC
MUTE# MUTE R132 100 MUTE
USB_PWR# USB_PWR R123 100 USB_PWR
AMP_ON# AMP_ON R182 100 AMP_ON
GND
POWER_ON_1 R116 FB600 POWER_ON

MUX-SEL# R134 FB600 MUX-SEL
4094-DATA# R184 FB600 4094-DATA
4094-OE0# 4094-OE0# R185 FB600 4094-OE0
4094-CP0# R187 FB600 4094-CP0
+3V3 V3
GND
CD-MCK# MCK# R193 100 CD-MCK
CD-DIN-OUT# DIN-OUT# R194 FB600 CD-DIN-OUT
CD-RW# R195 100 CD-RW
CD-BUSY# R196 FB600 CD-BUSY
CD-SCOR# R197 100 CD-SCOR
GND
CD-16M# R192 100 CD-16M
GND
CD-DATOUT# R198 100 CD-DATOUT
CD-LRCK# R199 100 CD-LRCK
CD-BCK# R100 100 CD-BCK
3CD1_SW# D1_SW# R1106 0R 3CD1_SW
DAC-DATA# R109 100 DAC-DATA
DAC-LRCK# DAC-LRCK# R110 FB600 DAC-LRCK
DAC-BCK# DAC-BCK# R111 100 DAC-BCK
GND
DAC-MCK# R130 100 DAC-MCK
GND
OP/CL_DET# OP/CL_DET# R190 4K7 OP/CL_DET
3CD0_SW# D0_SW# R189 FB600 D0_SW
CL_DET R178 10K
LIMIT_DET# MIT_DET# R147 100 MIT_DET

TO CD BOARD CW101 FFC28PIN-1.25

Note: FWM3000/3500 CW101 PIN18, PIN26 of NC

POWER_ON2 R1116 FB600
3V3# L104 22UH POWER_ON
GND5 R1111 0R V3
R/C# R1115 100
M# R146 100 R/C
LCD-CS# D-CS# R1121 100 M
LCD-WR# D-WR# R1122 FB600 D-CS
LCD-DATA# D-DATA# R1120 100 D-WR
GND4 R1110 0R D-DATA
KEY1# R1113 FB600 KEY1
KEY0# R1112 FB600 KEY0
KEY3# R1114 FB600 KEY3
VOL+# VOL+ R1119 100 DIG1
VOL-# VOL- R1123 100 DIG2
MIC_DET# R1118 100 MIC_DET

TO DISPLAY BOARD CW102 FFC18PIN-1.25

TO USB CW104 6PIN-2.0

GND2 R1109 0R
D+ D+
D- D-
USB+5V USB+5V
GND3 R1108 0R C102 100n C110 100/10V

SOCKET

AMP_ON
POWER_ON
R128 10K
R145 10K

DVD_SW R1106 10K
RESET# R139 10K
SCLK R157 10K
DIG1 R154 10K
DIG2 R153 10K
LIMIT_DET# R152 10K
REV1 R159 10K
REV0 R160 10K
LCD-WR R161 10K
LCD-CS R162 10K
MIC_DET R1102 10K
CD1_SW R1104 10K
SDA R163 10K
V3

R1127 680R FOR FWM4000 NTC

DIM C176 100P
IR C119 100P
FAN_ON C108 104
LIMIT_DET C118 100P
TU-SCL C127 100P
TU-SDA C120 100P
TU-RESET C101 100P
VOL_SCLK C132 100P
VOL_SDA C141 100P
4094-OE C150 100P
MUTE C174 104
USB_PWR C122 104
DAC-LRCK C139 18P
DAC-BCK C142 100P
AMP_ON C100 104
TU_SCL C153 100P
POWER_ON C177 104
CD-BCLK-IN C147 18P
CD-MCK C130 18P
CD-DIN-OUT C121 18P
IP_TX C104 100P
IP_SET C107 100P

C179 103P DL-#
C170 100P SMPS_CHANGE#
C116 100P D
C173 100P D-CS
C138 100P CD-WR#
C128 100P CD-CS#
C129 100P CD-DATA#
C171 104 AMP_ALC#
C172 104 CDO_SW#
C154 100P -SDA
C131 100P M_CHANGE#
C112 104P /CL_DET#
C178 103P DL+#
C149 NC
R151 10K
C175 104 CD-16M
C117 104 CD1_SW#
C159 104 V3
C158 104 V3
C156 104 V2
C157 104 V2
C111 104 V3
C102 100P V2
P_RX#

L109 FB220R +3V3
R1126 10K
R1125 10K
C180 104
IC102 N25S80(8MB)
VCC /CS
/HOLD DO
CLK /WP
DI GND

D_16M SDA SCLK DL_SDA DL_SCLK DL_SET
470R 1K
R114 R143
F_SCK F_CS F_MISO F_MOSI
CAS CLK
L108 FB600
WE
RAS CKE
R115 100
CS LDQM UDQM
BA0 A10 A09 A08 A07 A06 A05

GP06 F_MOSI
LIMIT_DET GP08
TU-RESET GP09
FAN_ON GP010
AM_CHANGE GP11
SMPS_CHANGE/NTC GP12
IP_TX GP13. UART0. RX_DATA
IP_RX GP14. UART0. TX_DATA
MUTE GP 5. UART1. RX_DATA
USB_PWR GP 6. UART1. TX_DATA
4094-DATA R142 FB600 GP17
4094-OE0 R141 FB600 GP 8
4094-CP0 R155 FB600 GP19
CD-MCK R144 560R GP20
CD-DIN-OUT GP21
DAC-DATA R127 100 DDATA
3V3 IOVDD33
DAC-MCK R124 3k3 DMCK
DAC-BCK R125 100 DBCK
DAC-LRCK R102 100 DLRCK
CD-RW GP22
CD-BUSY GP23
3CD1_SW GP24
3CDO_SW GP25
MIC_DET GP26
POWER_ON GP27
AMP_ON GP28
TD1/GP43
VDD12
VSS12

J-TEK
IC105 HWD809R
VDD RESET
GND
R137 100K
TDI
TDO
TMS
TCK
NTRST
GND
VDD
RESET
TDO/GP44 TMS/GP45 TCK GP59 GP29 GP30/RCLKO GP31/DATA0 GP32/LRCK0 GP53 GP54 GP55 GP56 RESET NTRST IOVSS33 TEST XI XO IOVDD33 IOVSS33 USBDM33 IOVSS33 IOVDD33 USB+ USB- USBVSS33 PLL3VSS12 PLL3VDD12 PLL2VSS12 PLL2VDD12 PLL1VSS12 PLL1VDD12 ADIN4 ADIN3 ADIN2
R121 10K
R149 100
R119 10K
C148 104
R120 1M
R118 470
X101 12MHz 10PPM
C115 18P
C109 18P
R104 560R
CD-SCOR
CD-BCLK-IN
CD-DAT-IN
CD-LRCK-IN
DVD
LCD_CS
LCD-DATA
LCD-WR
IE
IE
OP/CL_DET
KEY2
AMP_ALC
KEY1
KEY0
R140 1K
R138 1K
R112 1K
R135 39
R136 39
AMP ALC 1.10V start to control for 6000

BSU

IC104
M12L16161A00
AD5/EAD5
AD4/EAD4 AD3/EAD3 IOVSS33 IOVDD33 AD2/EAD2 AD1/EAD1 AD0 D15 D7 D14 D6 D13 D5 D12 D4 D11
GPO2 VSS12 VDD12 D3 D10 D2 D9 D1 D8 D0 GPO1 GPO0 AVSS33 AVDD33 ADIN0 ADIN1
A04 A03 A02 A01 A00 D15 D07 D14 D06 D13 D05 D12 D04 D11 D03 D10 D02 D09 D01 D08 D00
VDD1 DQ0 VSS1 DQ1 VDD2 DQ2 VSS2 DQ3 VDD3 LDQM WE CAS RAS CS BA0 A10 A00 A01 A02 A03 VDD4
VSS6 DQ15 DQ14 VSS5 DQ13 DQ12 VDD6 DQ11 DQ10 VSS4 DQ9 DQ8 VDD5 NC2 UDQM CLK CKE NC1 A09 A08 A07 A06 A05 A04 VSS3
D00 D01 D02 D03 D04 D05 D06 D07 LDQM WE CAS RAS CS BA0 A10 A00 A01 A02 A03 VDD4
D15 D14 D13 D12 D11 D10 D09 D08 3V3 UDQM CLK CKE A09 A08 A07 A06 A05 A04 VSS3

C163 104 C164 104 C166 104 C167 104 C144 104 C155 104

L101 22UH V3
C165 100/10
C145 104
IC107 ME6219-1.2V
OUT IN GND
C133 10/10
C134 104
C140 100/10
1V2
C113 104 C160 104 C162 104

R165 10K
R166 10K

MCU

IC101
BX8805

ADC_3V3
Q101 3906
+3V3
L106 22UH
C136 10/10
C137 104
R105 2K2
Q102 3904
MUX-SEL
R106 10K
R131 100
R129 330
ADC_16M
IC108 74LVC2G04
R101 56K
X102 11.2896MHz
C152 15P
C151 15P

REC OSC

R1124 8.2K
ENC_R
R1117 8.2K
ENC_L
L102 22UH ADC_3V3
C124 10/10
C123 104
C114 10/10
C169 100P
C168 100P
R172 1.2K
R173 3K3
R174 1.2K
C104 104
C105
IC106 WM8782SEDS
R186 10K
M/S ATXL AINVPL COM AINVPR AGND AVDD VREFP VREFGND
MCLK DOUT LRCLK AGND DVDD BCLK DFL FSAMPEN FORMAT XMID
ADC_16M
ADC_DATA
ADC_LRCK
ADC_BCK
R150 1K
R1101 100
R1102 100
C106 104
C161 10/10
L103 22UH ADC_3V3
R148 4K7
C125 100n
C126 10/10

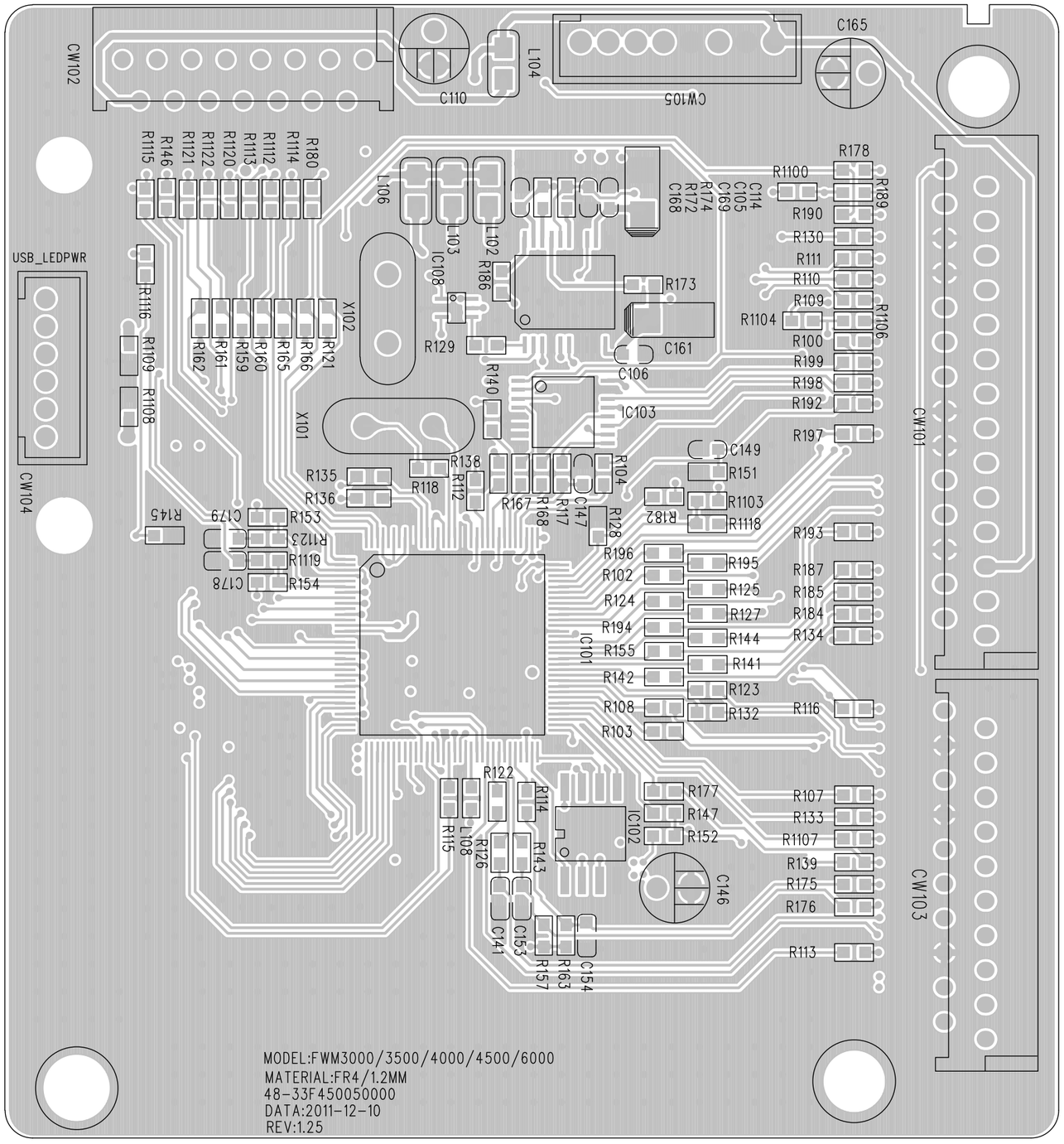
REC ADC

ADC_BCK
CD-BCK
ADC_DATA
CD-DATOUT
3V3
R168 2K2 CD-DAT-IN
2K2 R117 CD-BCLK-IN
L105 10UH
C135 10/10
C143 104
IC103 74HC157A
MUX-SEL
CD-LRCK
ADC_LRCK
R167 2K2 LRCK-IN

MULTIPLEXER

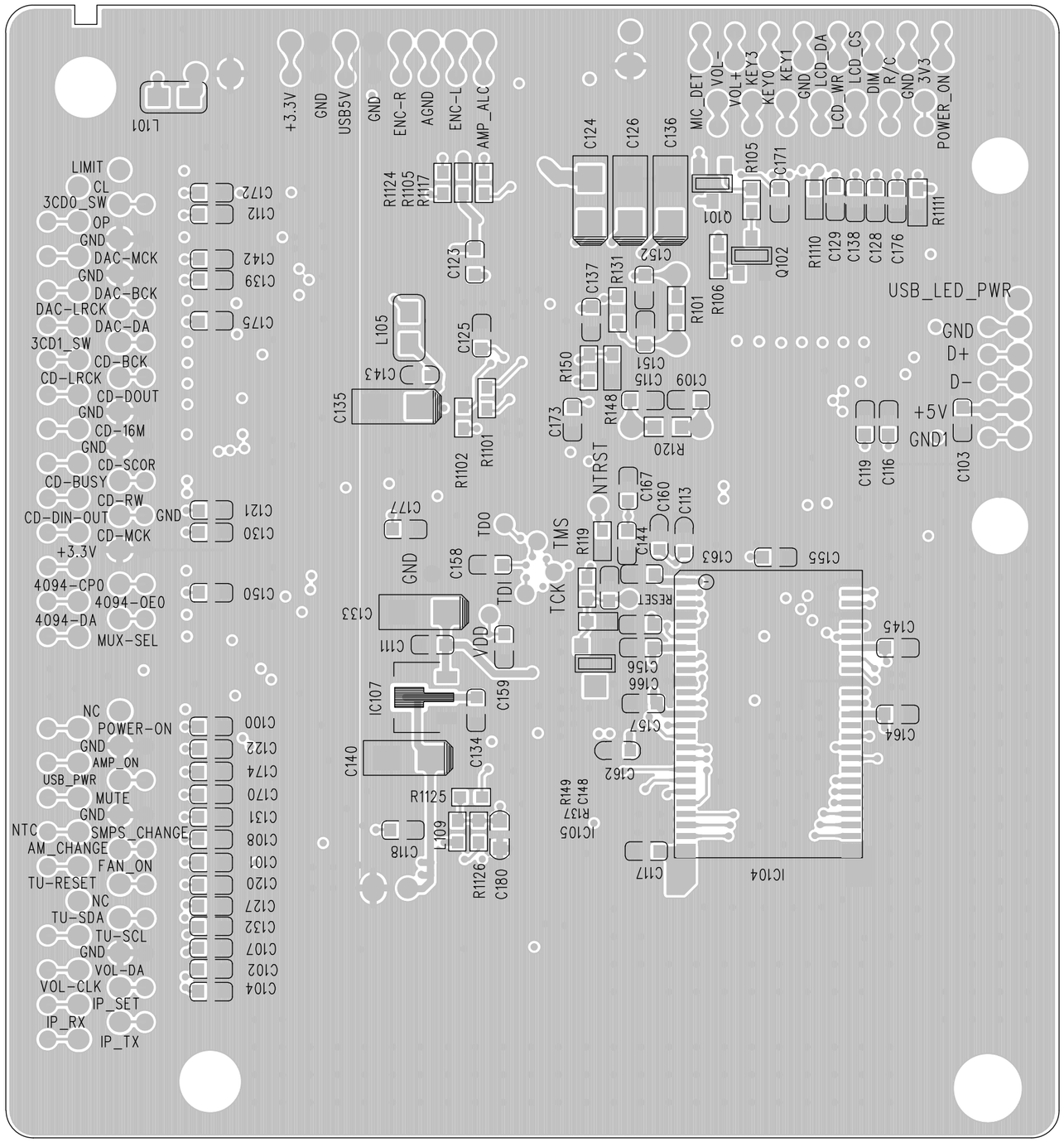
9-2

PCB LAYOUT - MCU BOARD
TOP SIDE



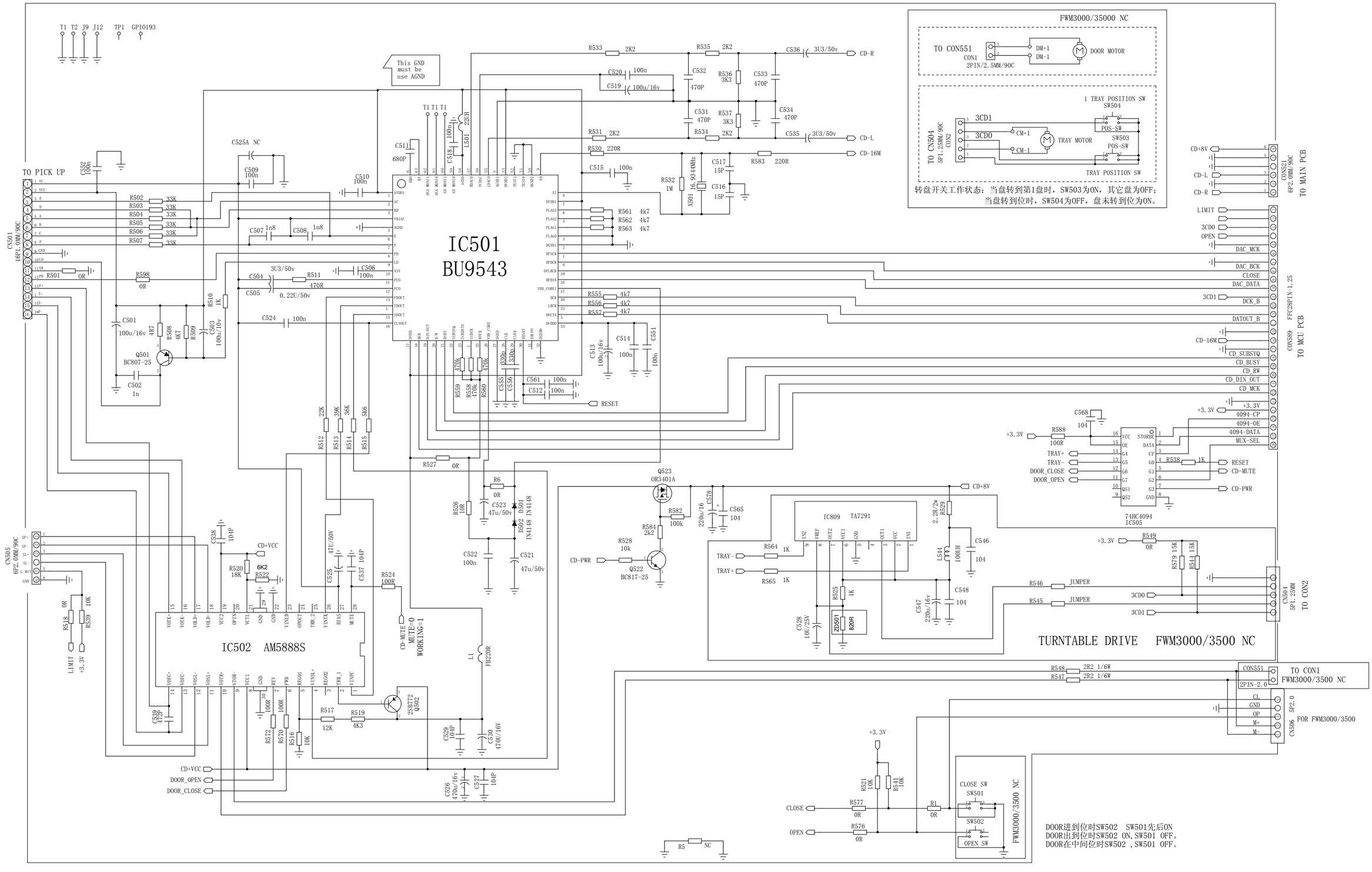
9-3

PCB LAYOUT - MCU BOARD
BOTTOM SIDE



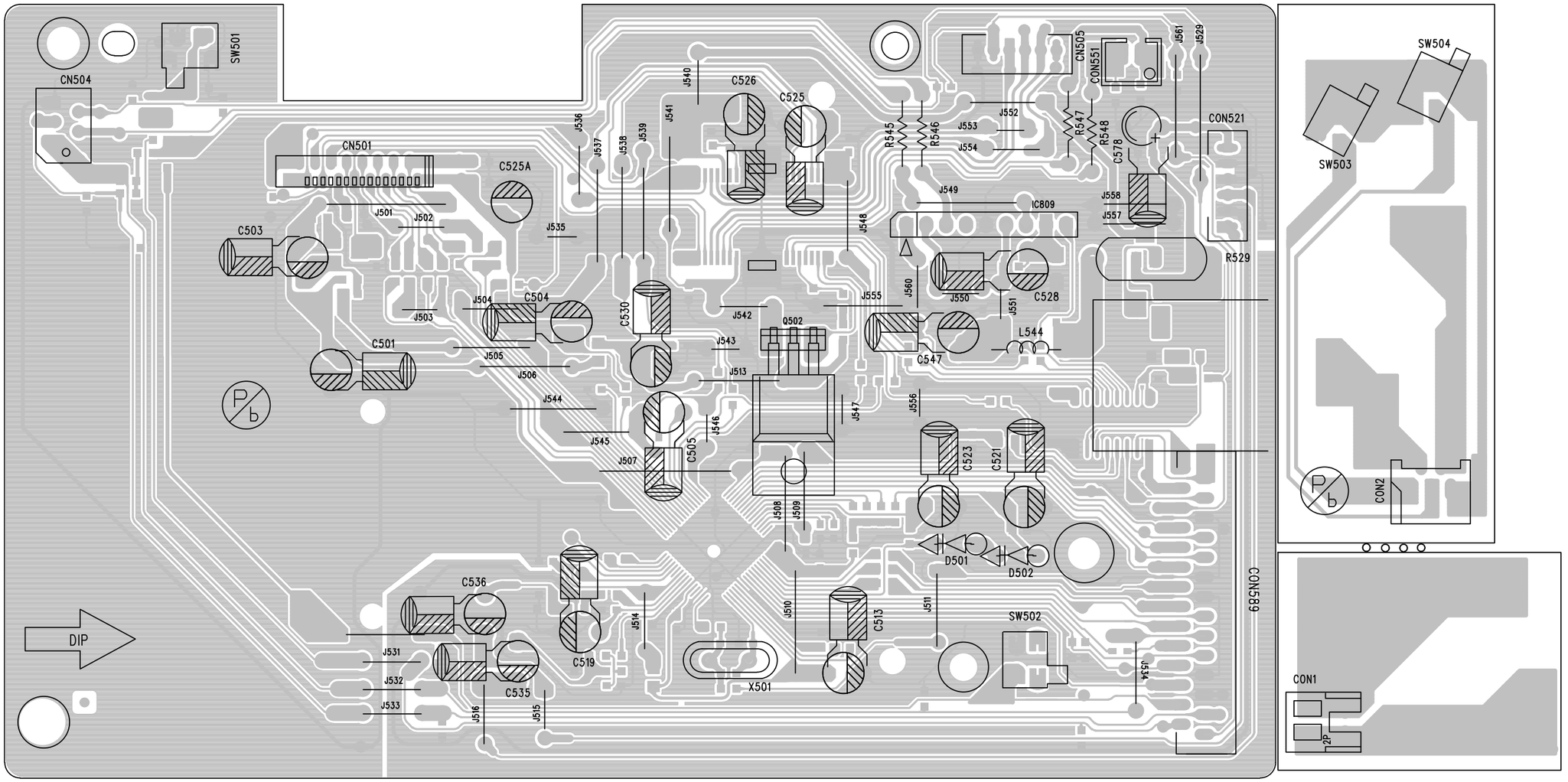
10-1

CIRCUIT DIAGRAM - CD BOARD



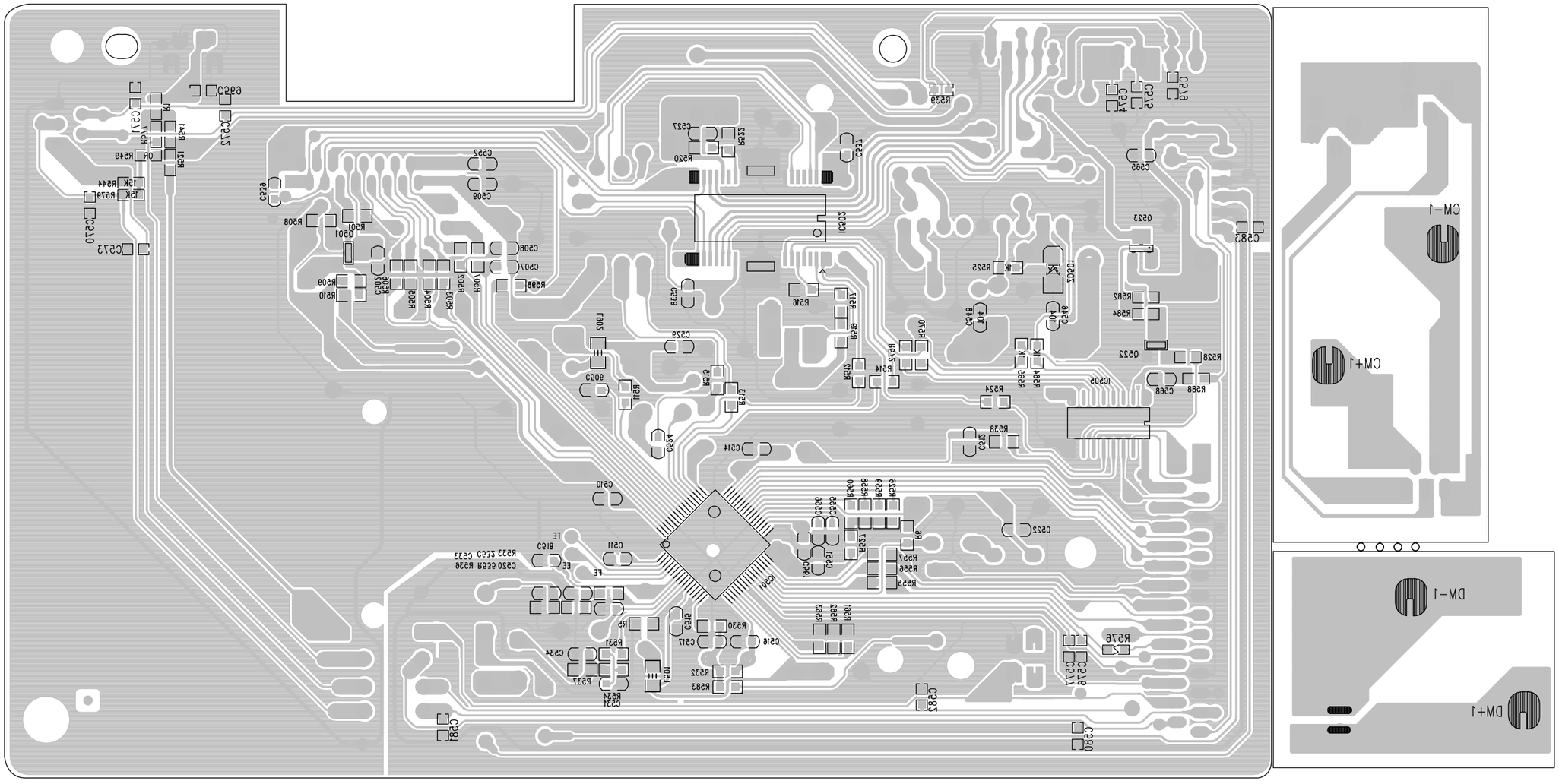
10-2

PCB LAYOUT - CD BOARD
TOP SIDE



10-3

PCB LAYOUT - CD BOARD
BOTTOM SIDE



EXPLODED VIEW

11-1

11-1