240W Dock for iPod/iPhone Mini Hi-Fi System

FWM400D

-/05/12

Service
Service
Service

Service Manual

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CLASS 1
LASER PRODUCT

Published by LX 1113 Service Audio Subject to modification

3141 785 36080

Version 1.0

PHILIPS

GENERAL DESCRIPTION

Micro Hi-Fi System with PLL Tuner , CD-MP3, USB ,IPHONE/IPOD DOCKING POWER OUTPUT :60W *4

MP3 LINK , Remote Control

LIFETIME : 7 Years

Class	Tuner	Supply + Amplifier	Loudspeaker Boxes	IPHONE/IPOD	USB	CD	Clock	MP3 LINK
I			X					
II	X	X		X		X	X	X
III								
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SAFETY requirements

Version	Safety	EMC
05/12/	IEC60065	EN55013, EN55020
55/	IEC60065	x
98/	IEC60065	
37/	UL6500	FCC
79/	IEC60065	
96/	IEC60065	

RADIATION / IMMUNITY requirments (EMC)

CLIMATIC requirements

ALL climates : + 5 Dregree till + 35 Degree

MODERATE climates : + N.A till N.A Degree

PERFORMANCE CLASSES

POWER SUPPLY

MAINS (A.C.)	230V-240VAC/50HZ	120/230Vac	120V AC	220V-230VAC/50HZ
Version	/12/05/79	/55/98	37/	/96
Voltage Selection	NO	Yes	NO	NO
Frequency	50Hz	60/50Hz	60Hz	50Hz

POWER CONSUMPTION :

	ALL VERSION			
Stadby :	<2W			
(DEMO mode " OFF ") , NOM. A, INPUT				
Maximum :				
@ 1/8 Prated , NOM. A, INPUT	?			
ECO Power mode :	<0.5W			

Q and R according to Product Division Rules

Quality : 0.4 % (Major) 1.5 % (Mirror)

Reliability : 2.0 % (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 - jun 2001)

DERIVED	REMARKS	APPROBATION

TECHNIAL DESCRIPTION

Total power 240W, matching SPEAKER of 60W x 4 channel 4 ohm load.

GENERAL PART

OUTPUT stage Protection : Yes Temperature : YES Shorcircuit : Yes

LoudSpeaker D.C. Protection : Yes.

INDICATORS

Standby Mode Indicator : LCD display Clock active, LED backlight turn ON

ECO Mode Indiicator : LCD turns off, ECO - Standby LED turn on (Only for 12/05/37)

ELECTRICAL DATA

DSC :	Rock, Jazz, Optimal, Techno	Channel Differencer at -46dB	3	dB
DBB	OFF	Hum (Volume Minimun -)	0.25	µW
SIS :	N/A	Residual Noise (Volume Level=1)	< 0.5	µW
VAC :	N/A	Channel Separation (at 1 kHz)	⩾ 35	dB
WOOX :	N/A	Signal / Noise (weighted)	⩾ 55	dB
		S/N (Headphone)	>=85	dB

INTERCONNECTS

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

Tuner	:	FM MODE 40KzH (CD -6dB)	Line Out (Left / Right)	N.A
CD / USB	:	0 dB track (Audio Disc 1, Trk 35)	Subwoofer Out	N.A
TAPE	:	NC	Headphone	NA
MP3 Link	:	Nor: 500mV Lim: 350mV ~ 800mV CD 0dB	Digital Coaxial Out	N.A
AUX IN	:	NC	Booster Out	N.A

OUTPUT POWER (* 1ch) At THD = 10% (Measured with 20Hz-22KHz filter),

Power output (RMS)	4 channel	60W*4 Measure 1ch

Rated Impedance :4 ohm

Remarks

(*1) Electrical parameters are to be measuremend at specker terminals across 4 Ohm load (pure resistor) with rated input signal in AUX mode; DSC OFF mode with DBB OFF IS off unless specified otherwise

AUDIO SIGNAL PROCESSING

Micro Hi-Fi System with PLL Tuner ,USB, CD-MP3, 60W*4 channel (1speaker load) Class D Digital Power Amplifier

1) DSC (Digital Sound Control)

Input sinewave 500mV at 1kHz to R/L channel of MP3 Link socket

Set DSC to Flat mode

Adjust volume to obtain 500mW across 4 ohm load at 1ch speaker ouput

The 500mW will be used as 0dB reference

Tabel 1a (Tolerance ± 3dB)

Frequency	DSC Modes with DBB Off VOL=20			
	JAZZ	ROCK	CLASSIC	POP
100Hz	+2dB	+8dB	+6dB	-4dB
1KHz	0	0	0	+2
10KHz	-2dB	+6dB	+2dB	-4dB

2) DBB (Dynamic Bass Boot)

Play CD testing signal of 1KHZ

Set DSC to FLAT mode and switch off DBB

Adjust volume level will be as "18"

Tabel 2 (Tolerance ± 3dB)

Frequency	DBB OFF	DBB ON		
100Hz	0	+10dB		

TECHNIAL DESCRIPTION

USB

See also SH 190 USB Audio Module (300605)

Measurment are directly done at the connector on the board

GENERAL PART

Measurement are directly done at the connector on CDC board

Description	Specification
Output Resistance	< = 1.5 kOhm
Output Voltage RL = 33 k ohm ( )dB, 1 Khz)	830mVrms +/- 1.5dB
Channel Unbalance	< = +/- 3 dB
THD + Noise (0dB, 1Khz)	<= 0.5
Channel Crosstalk (100Hz - 16,000 Hz)	>= 35 dB
(0 dB, 1 KHz)	>= 40 dB
Signal to Noise Ratio (0dB,1kHz)	>= 65dBA (A - weighted)
Frequency Response (+/- 3dB), reference 1kHz	100Hz - 10kHz

TECHNIAL DESCRIPTION

CD + MP3 - Part Specifications

CD mechnism refer to Philips standard specification

GENERAL PART

Measurement are directly done at the connector on CDC board

Description	Extern	Nom	Lim	Unit
Output Resistance	No		< 100	Ohms
Output Voltage - Unloaded (0dB , 1 kHz)	No	0.5	± 1	Vrms
Channel Unbalance	No		< ± 2	dB
Frequency Response (125 Hz - 16 kHz)	No		± 3	dB
Signal to Noise Ratio (Unweighted)	Yes	60	50	dB
Signal to Noise Ratio (A - weighted)	Yes	65	55	dBA
Crosstalk (1kHz)	Yes	65	55	dB
Crosstalk (125Hz to 16kHz)	No	36	30	dB
Hum & Noise (*1)	No	400	500	nW
Emphasis	-	/	/	/

TECHNICAL SPECIFICATION

TECHNIAL DESCRIPTION

SOFTWARE IMPLEMENTED CLOCK / TIMER FUNCTION WITH 75.000 kHz QUARTZ OSCILLATOR.

GENERAL PART

Timer Setting	:	Clock and Timer
Timer Wakeup Mode	:	LAST SETTING (MODE)
Remarks Time Setting	:	for 24hrs (05/12/98/55/79/96) ,for 12 hrs (37/)
Volume at Wakeup	:	Last Setting
No of Timer Settings	:	1
Clock Accuracy	:	Normal: 1 sec/day Limit : 2 sec/day

INDICATORS

Display Type	:	LCD

TECHNIAL DESCRIPTION

TUNER using Si4704

GENERAL PART

WAVE RANGE	TOLERANCE	TUNING GRID
FM 87.5 - 108.00 MHz (12/05/98/55/79/96)	Quartz Precision	50KHZ
FM 87.5 - 108.00 MHz (37/)	Quartz Precision	100KHz
NC		

AERIAL

FM : 75 ohm input socket with Pig Tail Antenna

MW : NC

INDICATORS LCD DISPLAY

ELECTRICAL DATA

A.M	Nom	Limit	Unit	F.M.	Nom	Limit	Unit
				- 3 dB Limiting Point	: 17	23.5	dBf
Amplification Reverse	/	/	dB	Amplification Reverse	: 0	-4	dB
AGC Figure of Merit	/	/	dB	Distortion (RF 1mV, Frq Dev.75 kHz)	: 2	3	%
Distortion (RF 50mV, M 80%)	/	/	%	Stereo - 46 dB Quieting	: 46	49	dBf
IF	/	/	kHz	Crosstalk (RF1mV, Freq Dev.40kHz)	: 25	18	dB
				IF	/	/	MHz

Wave Range		Noise Limited Sensitivity 26 dB			Image Rejection dB	IF Rejection dB	Large Signal	Selectivity S3 / S9 / 300kHz dB
MW 600 kHz	Nom.	1500uV/M			/	/	/	/
	Lim.	4000uV/M			/	/	/	/
MW 1400 kHz	Nom.	1500uV/M			/	/	/	/
	Lim.	4000uV/M			/	/	/	/
FM 98 MHz	Nom.		18dBf		/	/	116 dBf	30
	Lim.		22dBf		/	/	108 dBf	25

VERSION VARIATION

Type /Versions: / Service policy / Board in used:	FWM200D									
	/05	/12		/79		/96	/94			/98
Display BOARD	C	C		C						
Main BOARD	C	C		C						
USB BOARD	C	C		C						
MP3 In BOARD	C	C		C						
Iphone BOARD	C	C		C						
RADIO BOARD	C	C		C						
Power BOARD	C	C		C						
AMP BOARD	C	C		C						
Type /Versions: / Features / Feature diffrence	FWM200D									
	/05	/12		/79		/96	/94			/98
RDS										
VOLTAGE SELECTOR										
ECO STANDBY - DARK	√	√								

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

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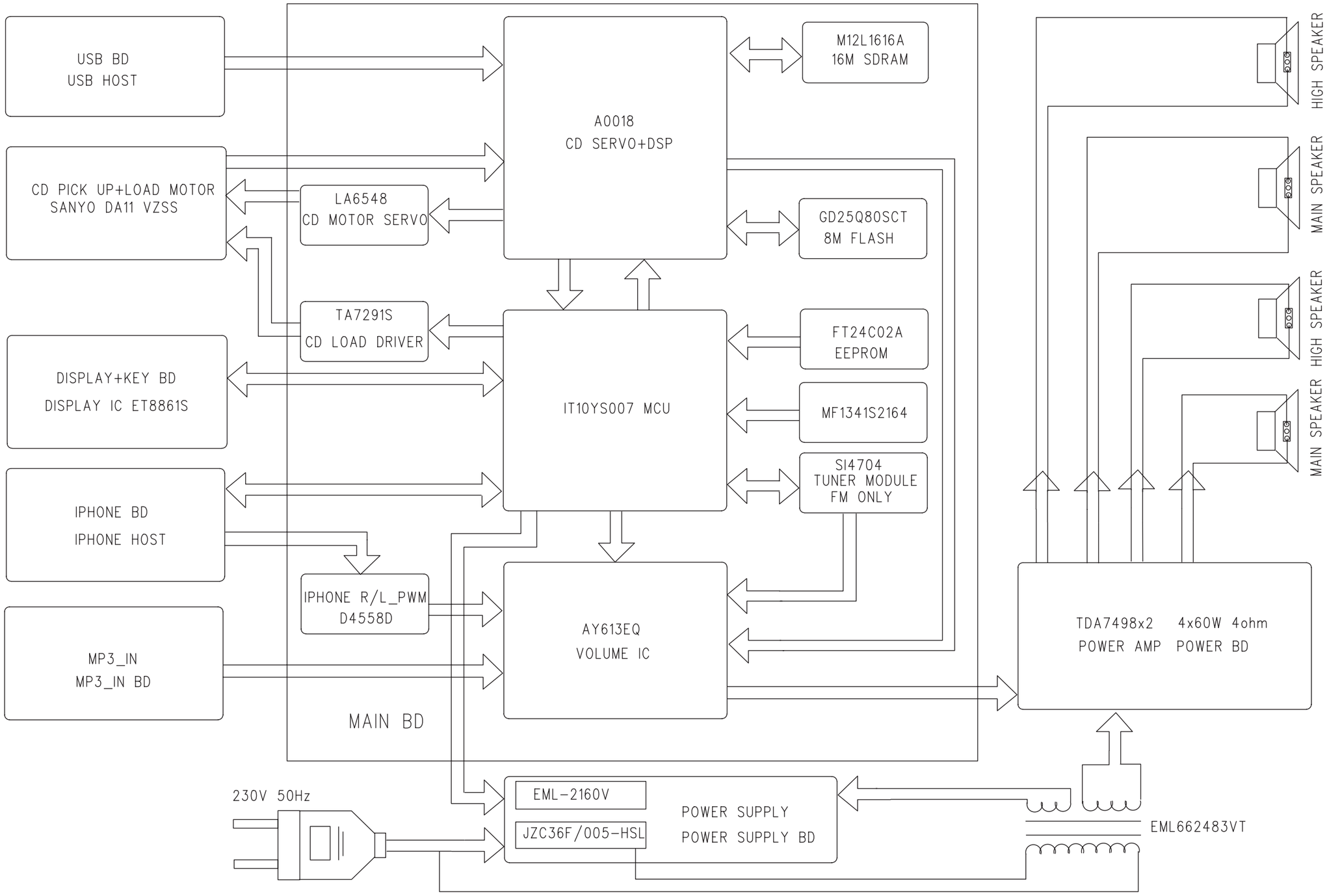
SET BLOCK DIAGRAM



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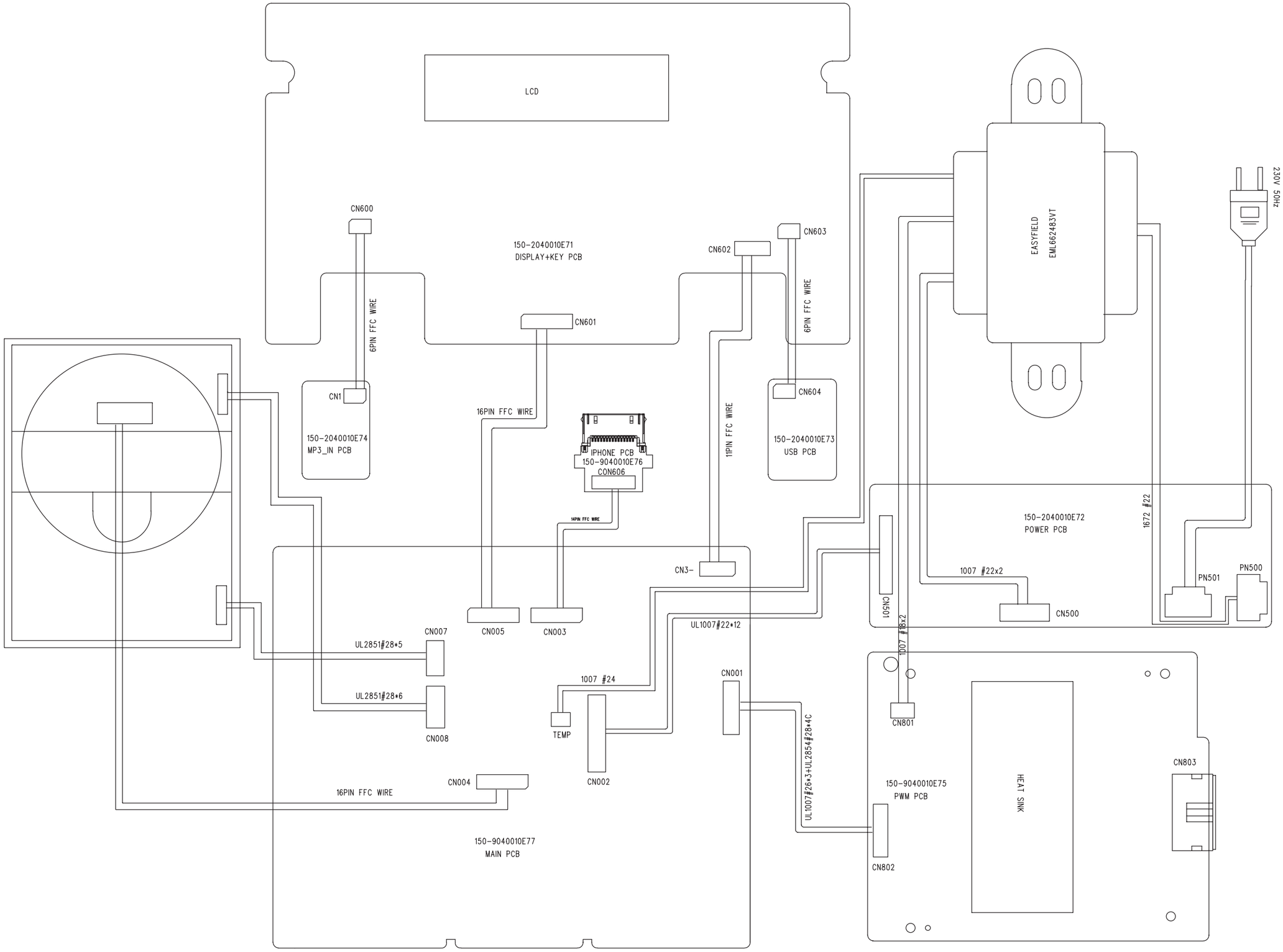
SET WIRING DIAGRAM



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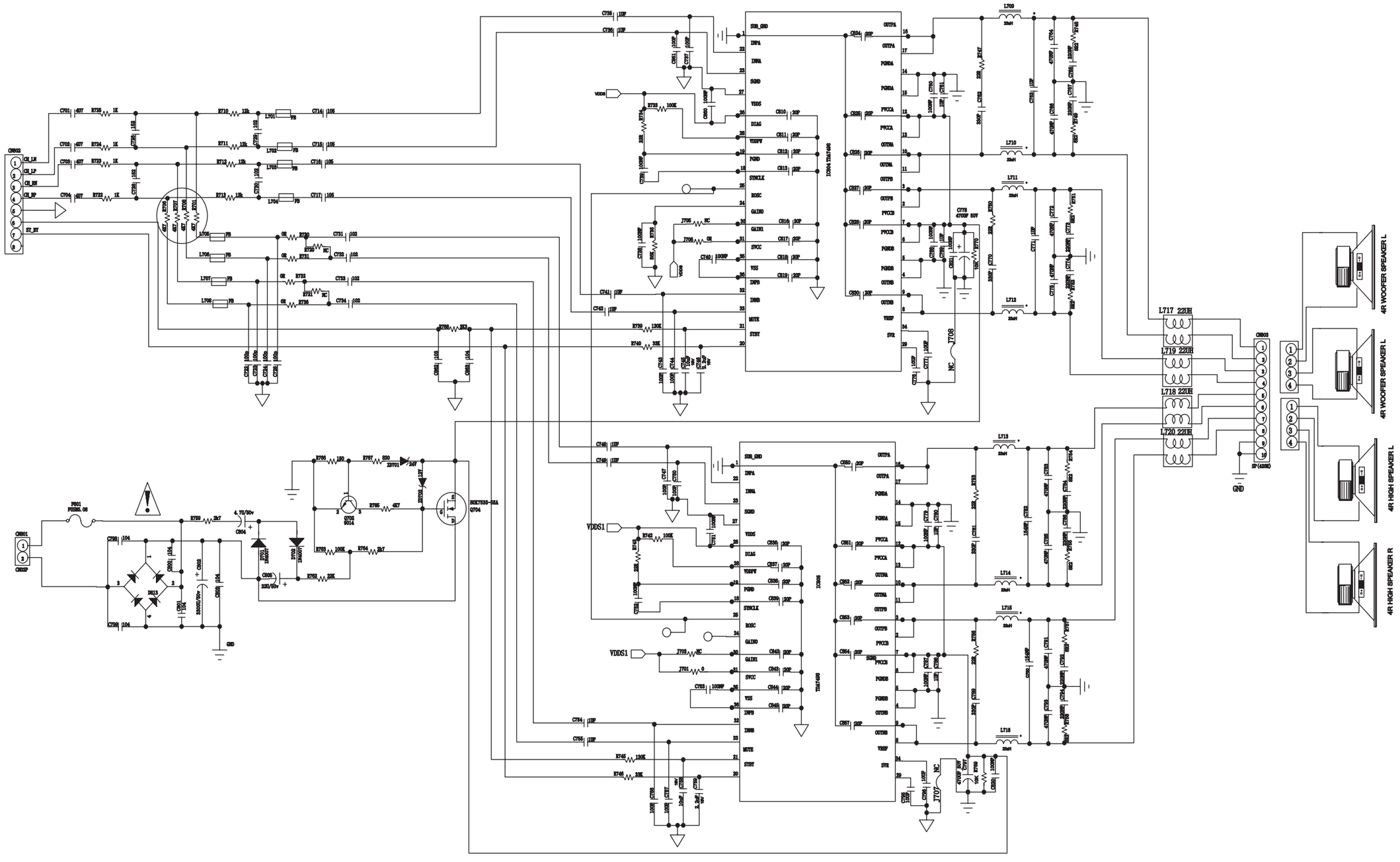
CIRCUIT DIAGRAM - AMP BOARD



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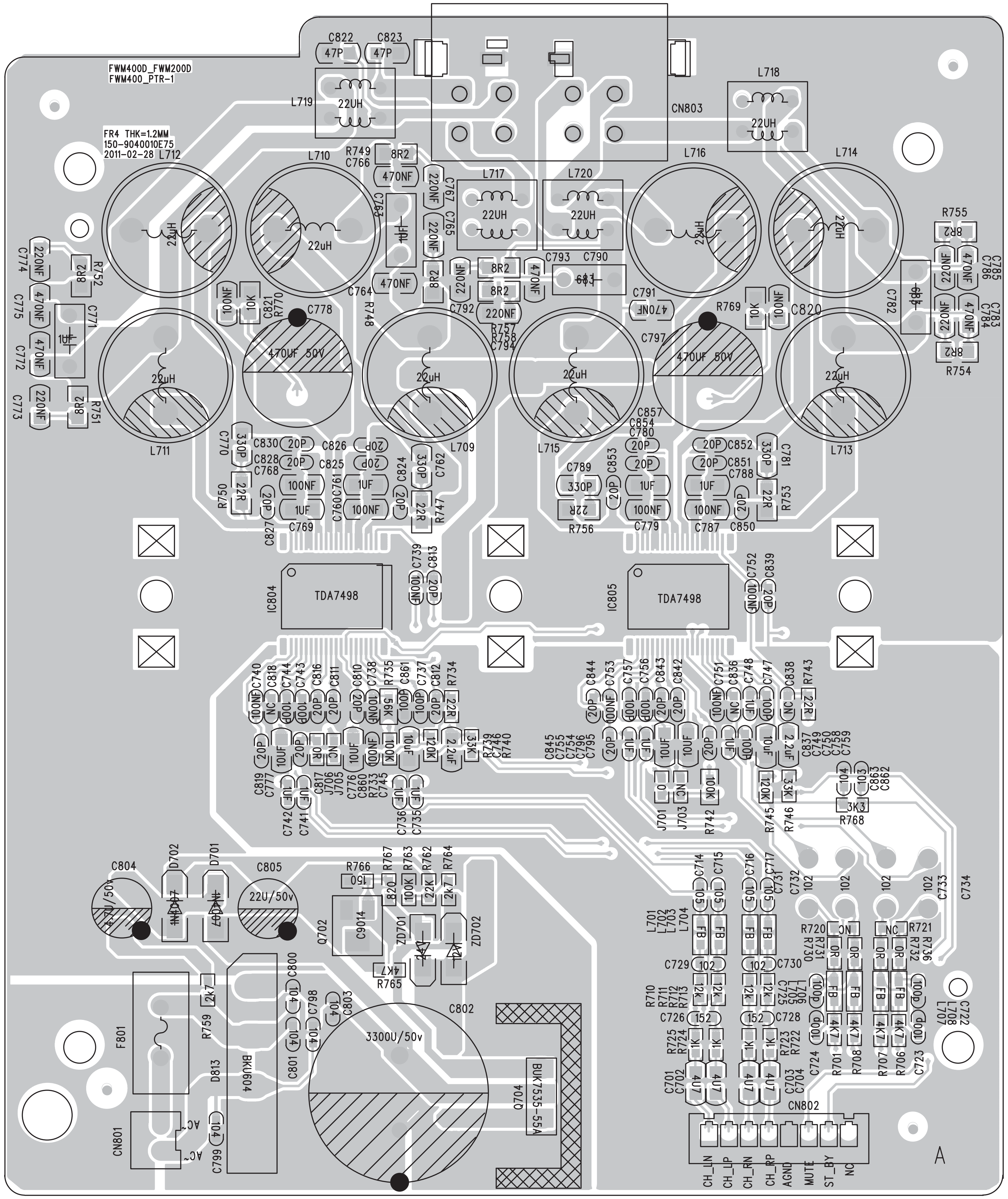
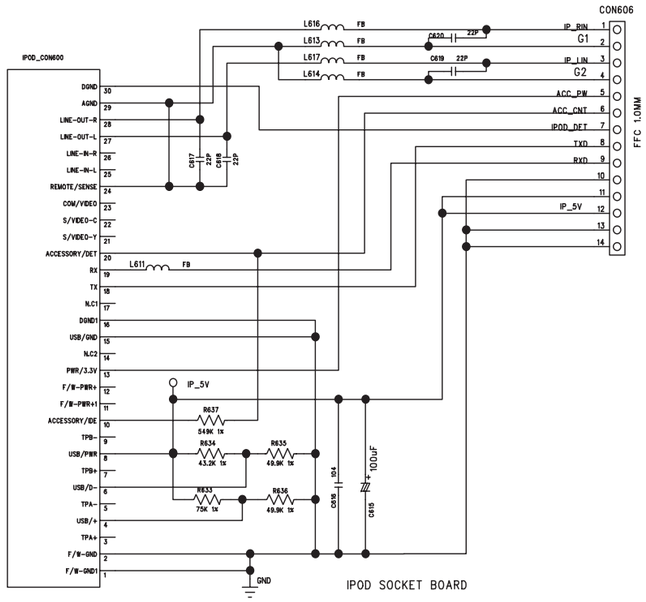
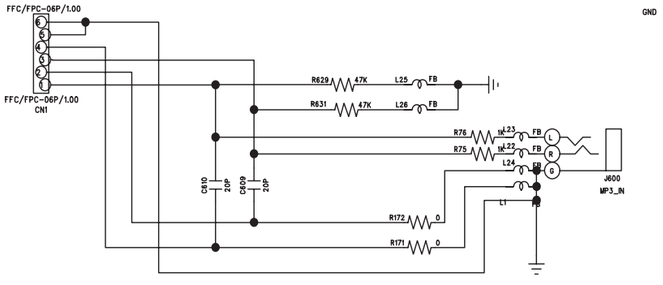
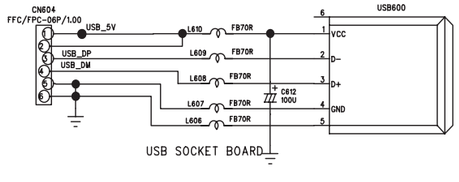
LAYOUT DIAGARM - AMP BOARD
TOP SIDE VIEW

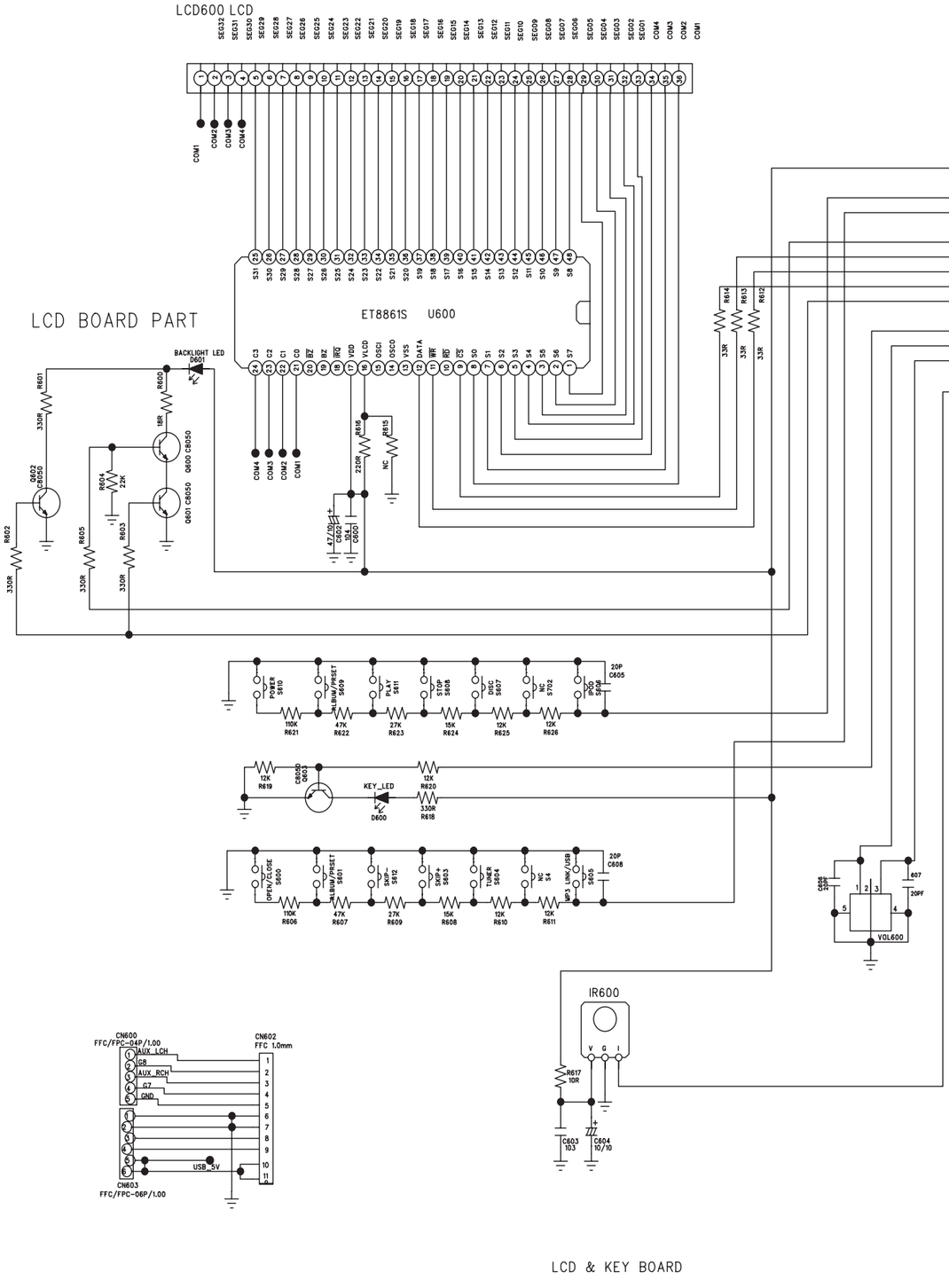


CIRCUIT DIAGARM -DISPLAY BOARD
TOP SIDE VIEW









LCD & KEY BOARD

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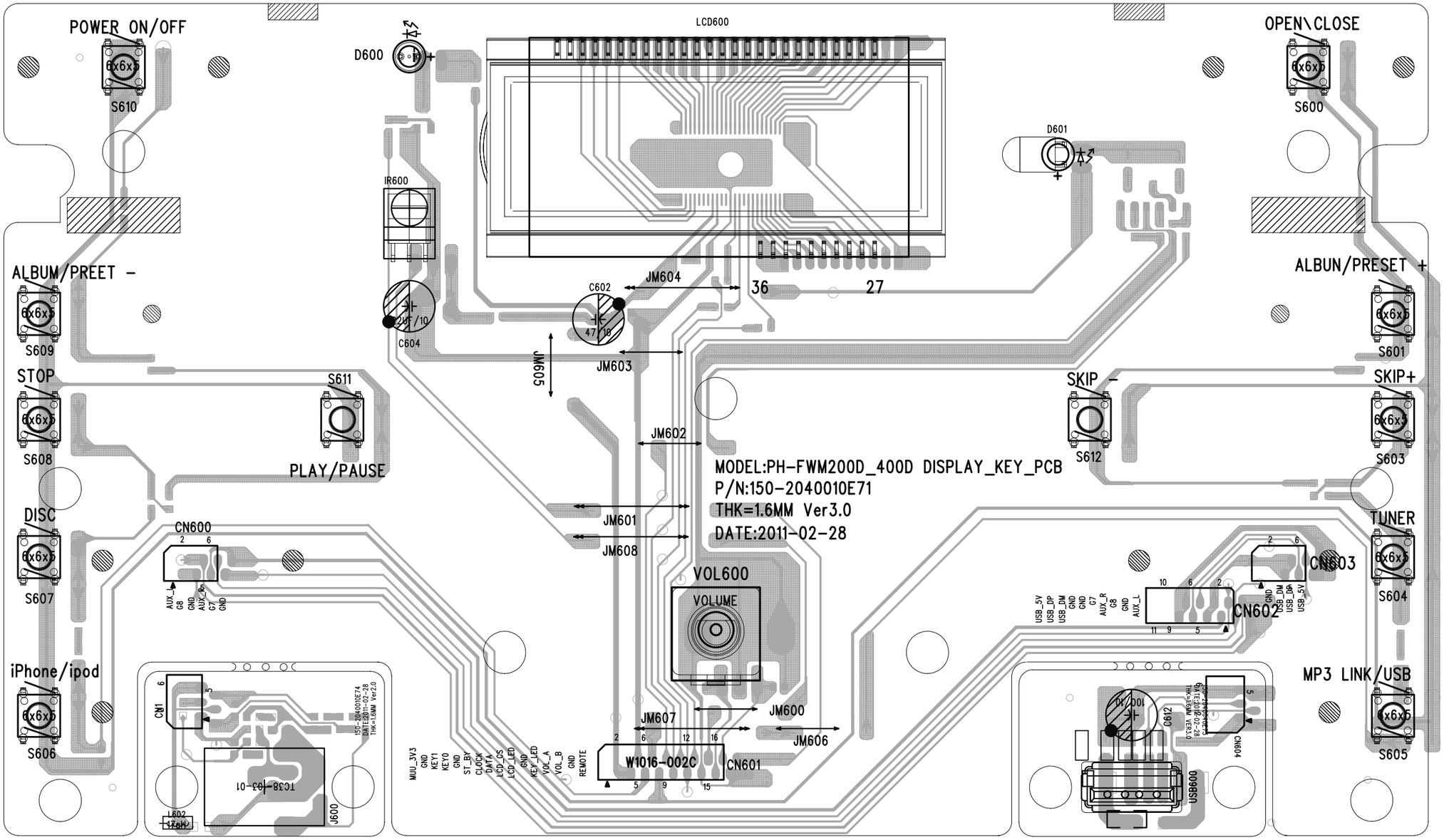
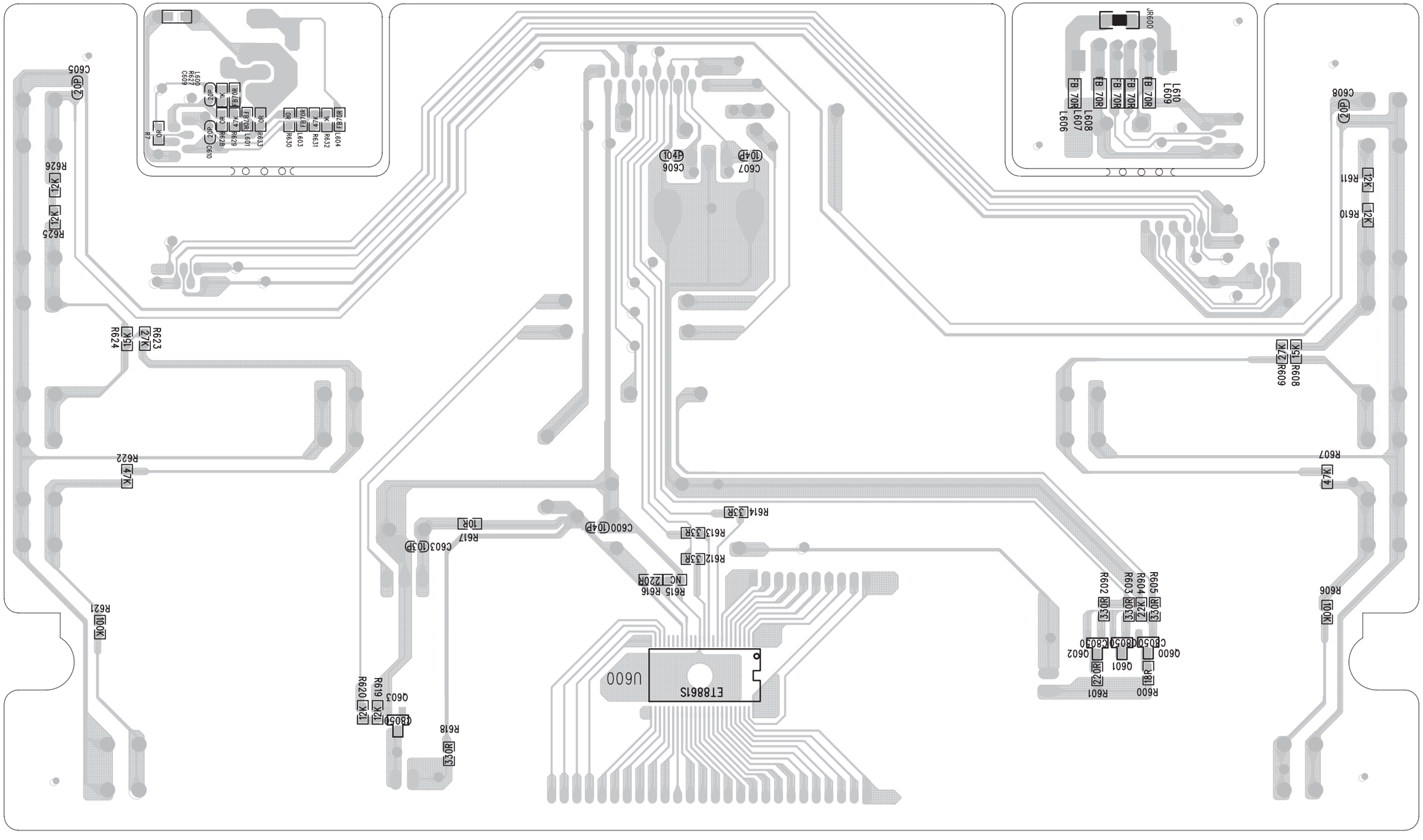
LAYOUT DIAGARM - DISPLAY BOARD
TOP SIDE VIEW



5-3

LAYOUT DIAGARM - DISPLAY BOARD
BOTTOM SIDE VIEW



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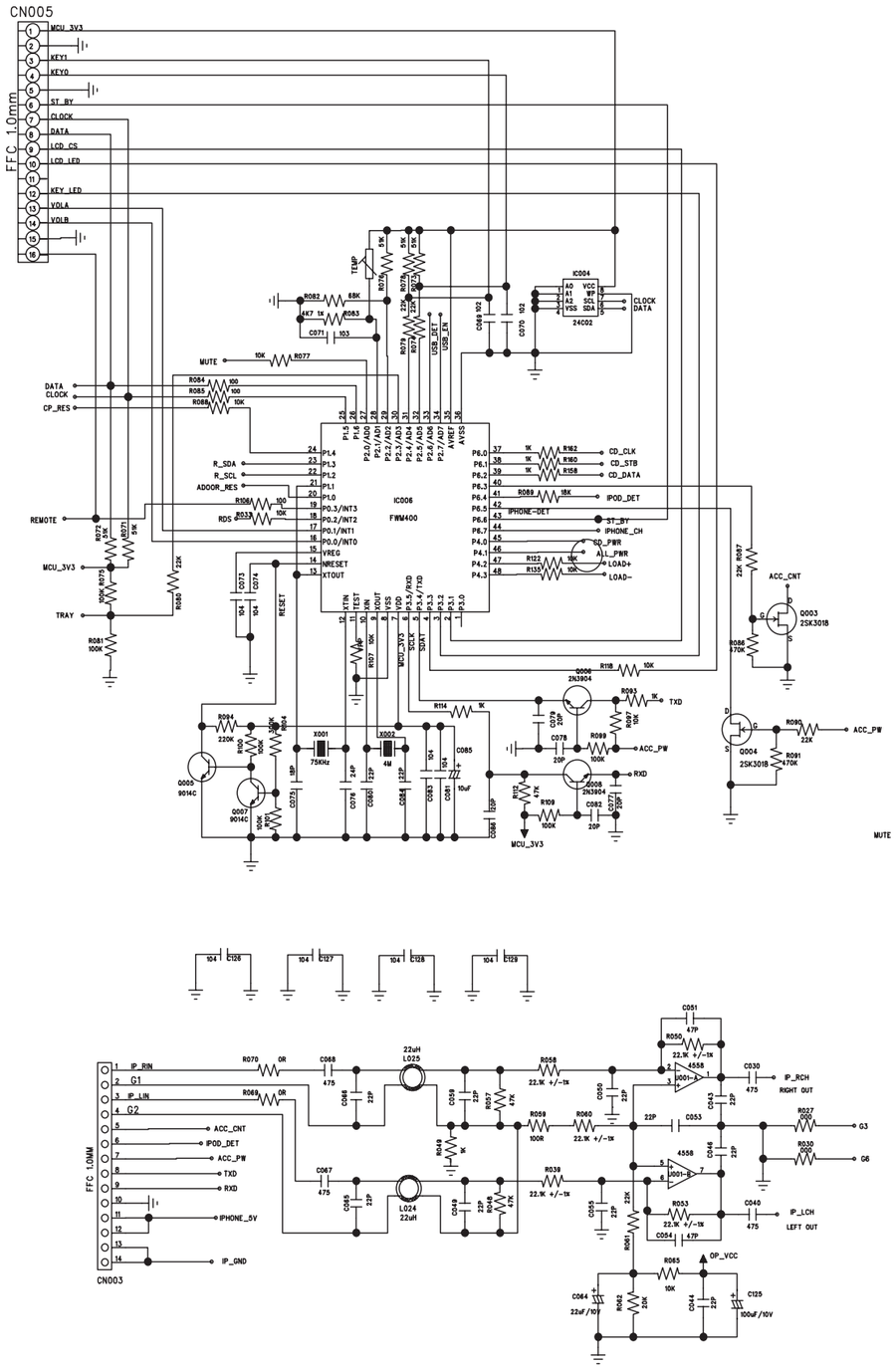
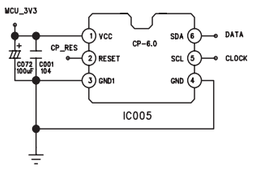
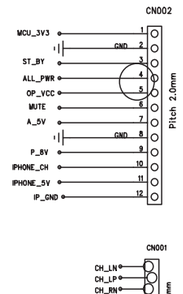
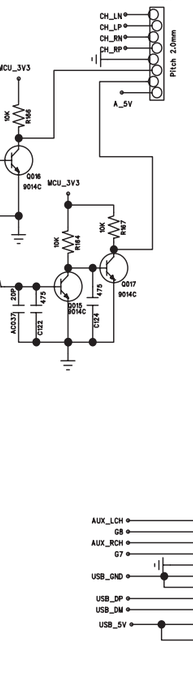
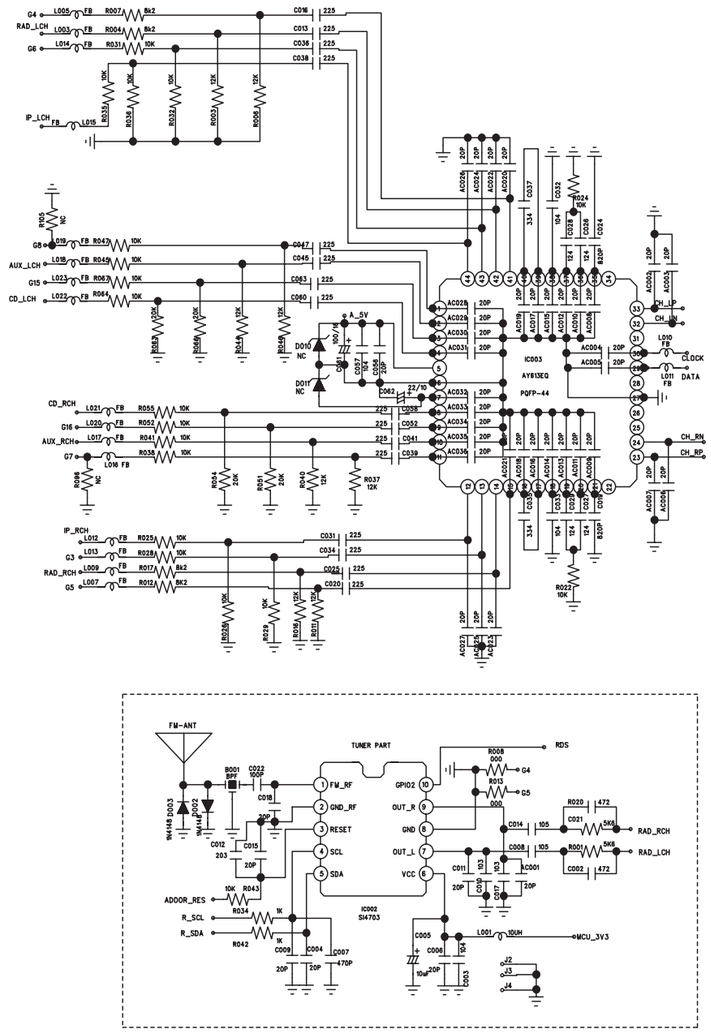
CIRCUIT DIAGARM - MAIN BOARD PART 1

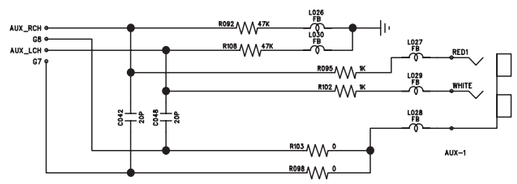


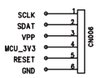






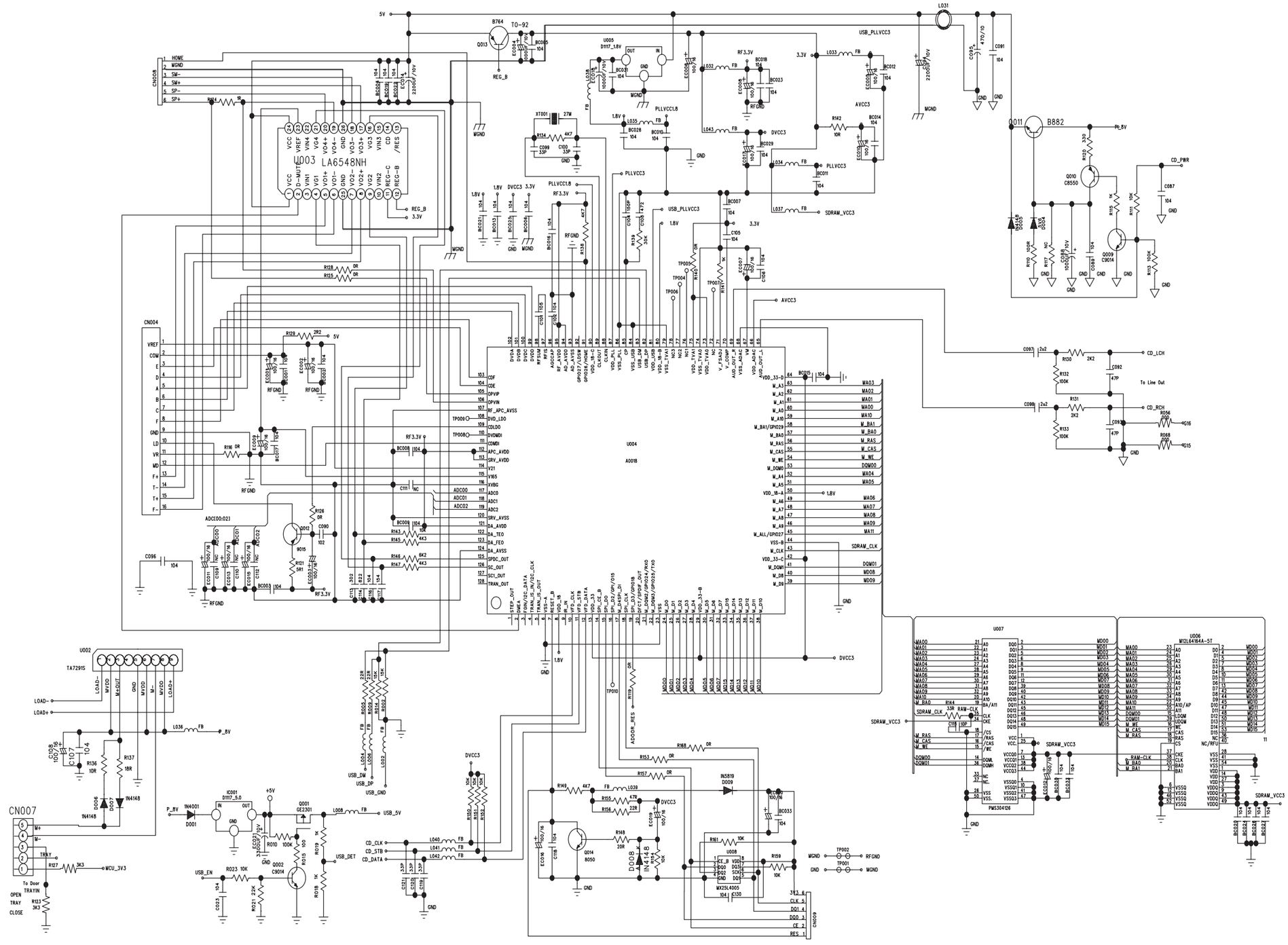






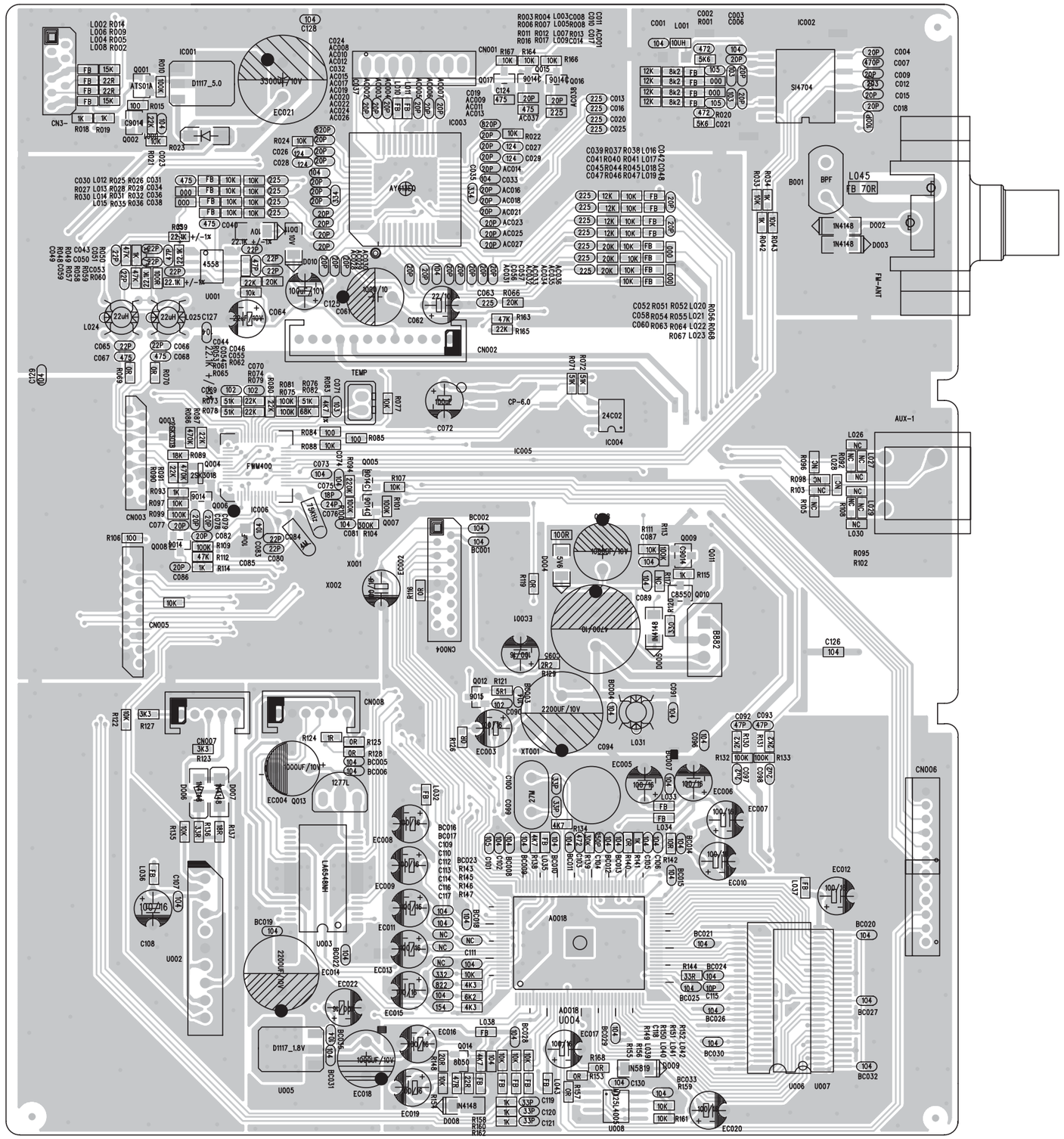
6-2

CIRCUIT DIAGARM - MAIN BOARD PART 2



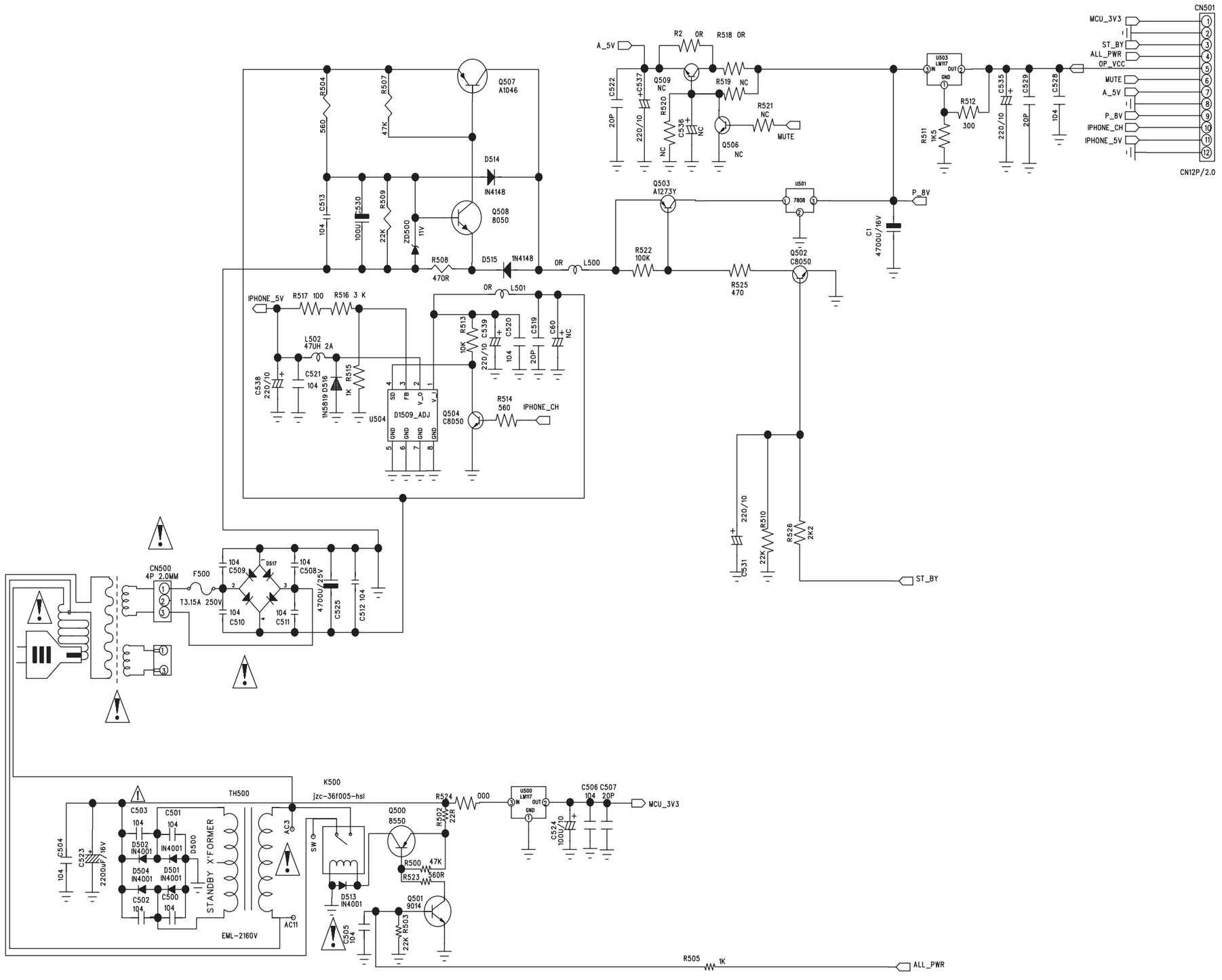
6-3

LAYOUT DIAGRAM - MAIN BOARD
TOP SIDE VIEW

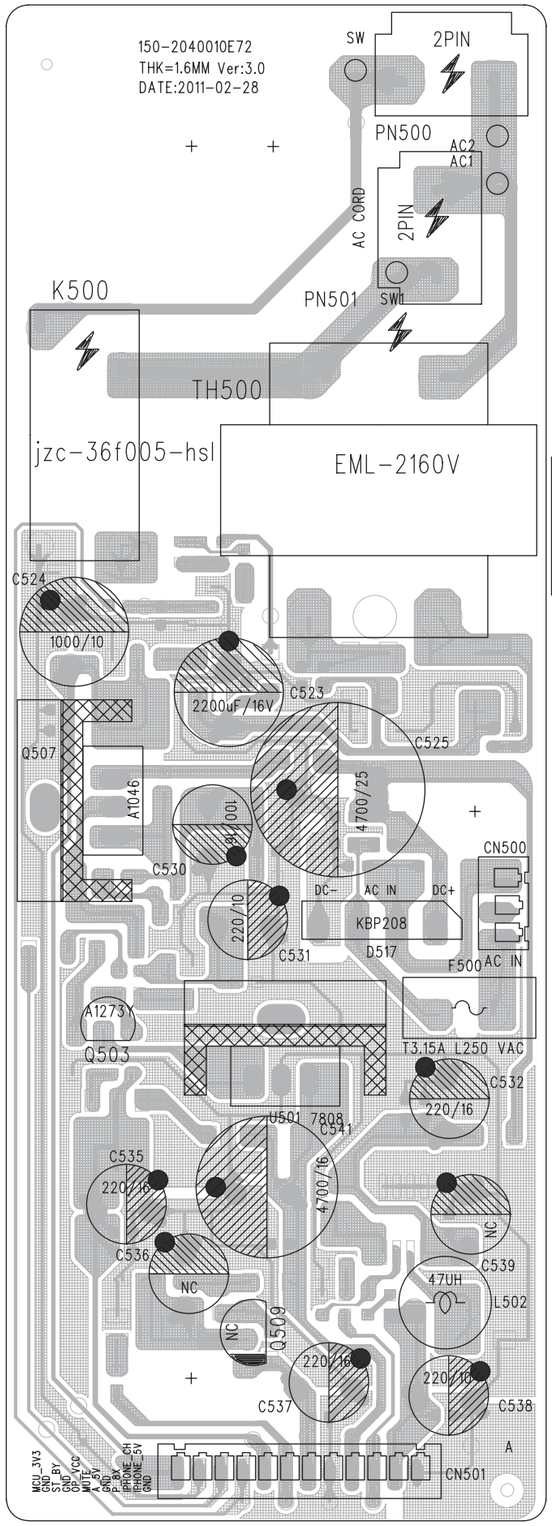


7-1

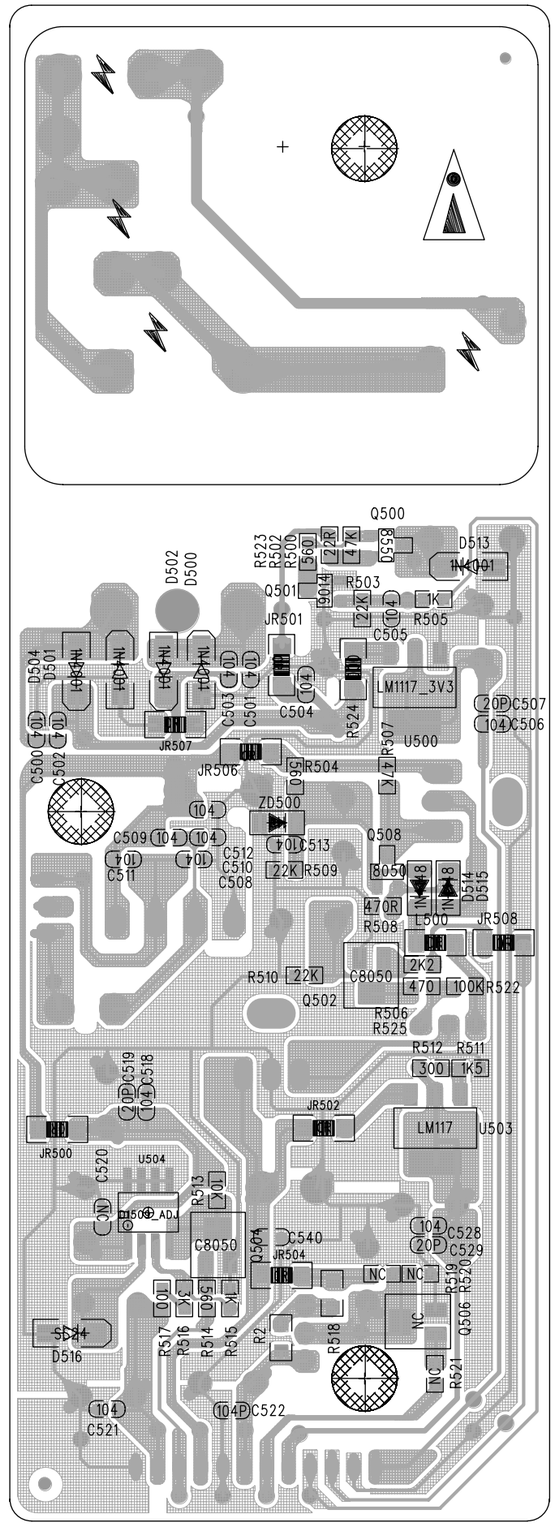
CIRCUIT DIAGARM - POWER BOARD



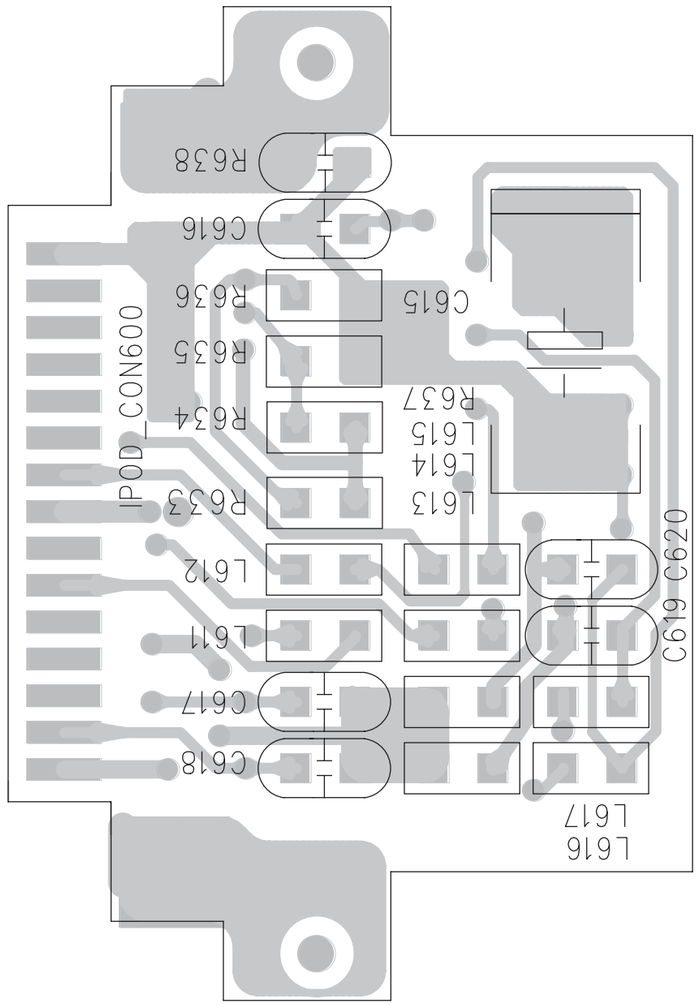
LAYOUT DIAGARM - POWER BOARD
TOP SIDE VIEW



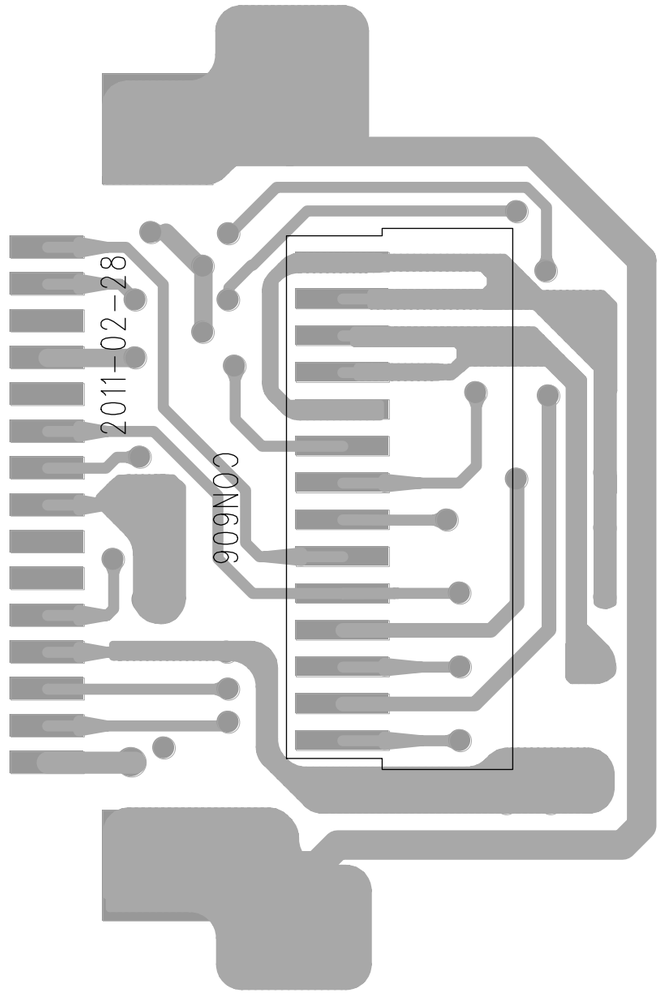
LAYOUT DIAGARM - POWER BOARD
BOTTOM SIDE VIEW



LAYOUT DIAGARM - IPOD BOARD
TOP VIEW



LAYOUT DIAGRAM-IPOD PCB
BOTTOM VIEW



9-1

EXPLODED VIEW DIAGRAM