

# ONKYO SERVICE MANUAL

## DVD RECEIVER MODEL DR-645(S)/(B)



RC-798S

**There is no repair part available.  
Please replace the complete product  
or use a new product to secure repair parts.**

### Silver and Black models

S CMP2P	220-240V AC, 50/60Hz
B CMP2P	220-240V AC, 50/60Hz
S CMQ3P	220-240V AC, 50/60Hz
S CMR6P	220-240V AC, 50/60Hz

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\triangle$  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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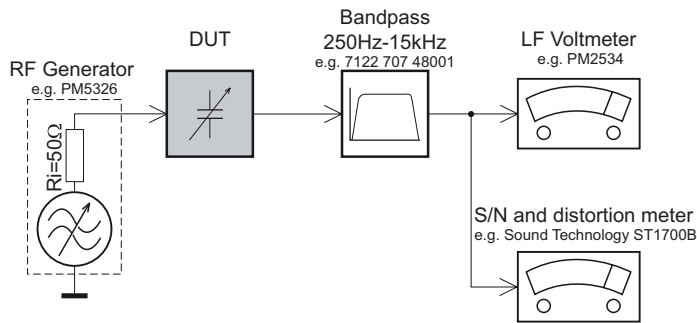
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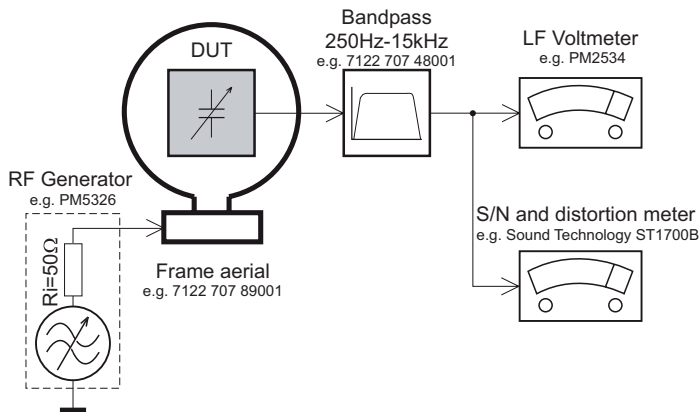
# Measurement Setup

## Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilotone (19kHz, 38kHz).

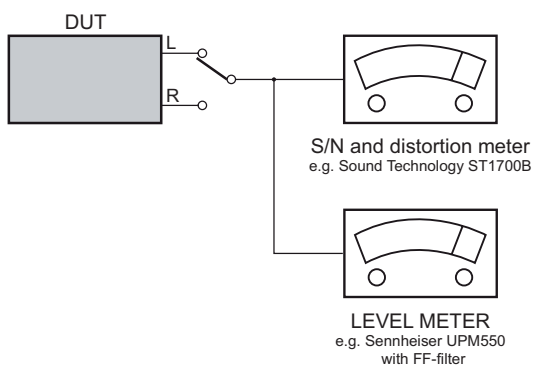
## Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage. Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

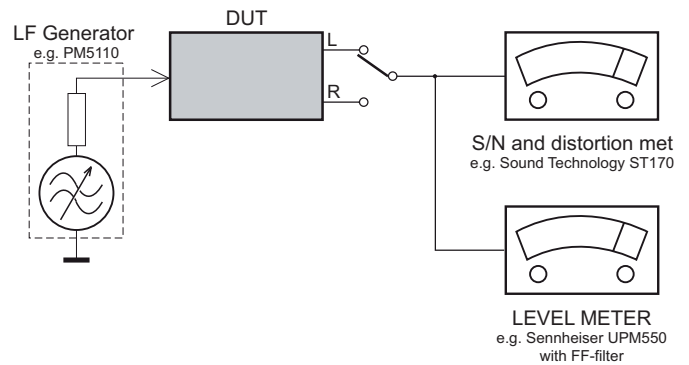
## CD

Use Audio Signal Disc SBC429 4822 397 30184  
(replaces test disc 3)



## Recorder

Use Universal Test Cassette CrO2 SBC419 4822 397 30069  
or Universal Test Cassette Fe SBC420 4822 397 30071



# SAFETY ATTENTION

### Common Controlling

During maintenance, please take common controlling to protect component system and electronic parts and prevent damages to the circuit due to improper operation.

Led out wire should be kept away from high-pressure or high-temperature parts.

### Maintenance Attention

Attention: please read 《SAFETY ATTENTION》 carefully. If there are unexpected conflicts between safety attention and maintenance attention, please abide to safety attention: Safety first.

#### Common Maintenance Attention

- ① Before using, please unplug the power cord of the component system.
  - Disassemble any parts of circuit board and the other parts.
  - Cut-off and re-connecting component machine plug and other inserting parts.
  - Abreast electrolysis capacitance and checking parts, Note: anti-polarity and changed wrong will cause explosion.
- ② Don't spray chemical dose on the component system, surroundings and any parts.
- ③ Except other specification of this manual, clean the appliance with a cotton swab of dedicated detergent. Please notes:
  - It is a kind of inflammable mixing.
  - Except other specification of this manual, soldering point doesn't use lubricant.

### ES

Some semi-conductor parts are easily damaged by static charges, these parts are called: ES. They are mainly the cores of transistor lead identification. The following technical ways can be used to reduce the damages by static charges.

- ① Before connecting semi-conductor or the parts. Let off the static charges of the body by connecting the earth. In the other hand, to prevent potential shock hazard, please use industrial static handle before connecting power for checking the equipment.
- ② After discharging the ES parts, put it on connecting appearance, for example. Aluminum surface preventing accumulating static charges to damage the parts.
- ③ Only use anti-static charges grounded soldering irons to discharge the parts or connect ES parts.
- ④ Some soldering pads called "Anti-static charges" can also generate charges to damage ES parts.
- ⑤ Don't use poisonous and caustic agent which these kinds of chemicals can generate static charges to damage the ES parts.
- ⑥ Keep ES components in conductive packages until they are used (mostly replacing ES components with conductive electronic-plating, metal box or similar conductive materials).
- ⑦ After taking repaired ES components form Anti-static charges cone, please insert the ES components to the parts of circuit light as soon as possible.
- ⑧ During handling sealed ES components, trying to reduce the movement of the body (clothes rubbing and moving on the rag

can generate static charges to damage the ES parts).

### Common Soldering Rules

- ① Use only grounded low-voltage soldering irons, and proper size and shape, these will maintain the soldering iron temperature range of 350°C~390°C.
- ② Use RMA specified resin flux; include 60% Tin 40% lead.
- ③ To maintain soldering iron and including tin very well.
- ④ Clean the soldering surface, please use metal brush but not poisonous and caustic agent to do it.
- ⑤ Adopt the melting ways:
  - Make soldering iron head to reach normal temperature form 350°C~390°C.
  - Heat lead wire of the parts, until soldering pads melt.
  - Quickly melt soldering tin by anti-static charges.Notes: Quickly operation, prevent heating the electronic-plating copper.
- ⑥ Adopt the following soldering technology.
  - Make soldering iron head to reach normal temperature from 350°C~390°C.
  - Firstly hold the soldering iron and welding rod to the led wire of the part, until soldering pads melt.
  - Quickly make soldering iron head move forwards led pins of the parts and electro-plating copper.Notes: Quickly operating, avoid heating electronic-plating copper of printed circuit board.
- Check the soldering zone strictly, use iron brush to clean more sprayed soldering tin.

### IC's Discharging/Changing

IC pins inserting chute some printed circuit board. Through chute to insert IC pins will be bolded and flat along electrons-plating copper when the hole is slot you can discharge and change IC.

#### Discharging

- ① Flat the discharging IC pins, point the soldering iron head to the pins, make the soldering tin melt.
- ② Before discharging IC, suck off the loaded solder pads by tin with Anti static charges.

#### Changing

- ① Replaced IC is inserted in circuit board carefully.
- ② Bold each IC pin point the circuit board and solder.
- ③ Clean soldering zone by a small hard brush (lover protective layer)

### What items do you need attention on charging IC and chip?

Because IC and chip are slim and damaged easily by static charges. Pay attention to the following items when changed it.

- ① Prevent damages for chip parts by heat. Don't exposed soldering iron.
- ② Pre - heating soldering iron at about 100°C when some parts are easily damages suddenly.
- ③ To prevent some parts for heating hurried, soldering iron head

## SAFETY ATTENTION

temperature from 350°C ~390°C.

- ④ Because small parts can't hold too much solder tin, so use small soldering tin 0.3mm soldering. According to the situation, adding soldering.
- ⑤ Please be careful when changing parts, the speed of soldering should be quick in order to prevent damages for circuit board.
- ⑥ To re-connecting well, clean the basic board.
- ⑦ Prevent tin spray on the board to make printed circuit board have happened short circuit.
- ⑧ Aim at the first terminal of IC and fix it, then aim at other terminals, it can solder easily just like this.
- ⑨ To prevent damages for parts and circuit board, please confirm parts are good or not which can avoid repeat disassembly.
- ⑩ During soldering, check the soldering connecting specially for many pins small parts.
- ⑪ Checking is very important after changing, it can use enlarger soldering leakage, false soldering, short circuit upper of printed circuit board, breaking. Not touching very well because of soldering.

### “Small Type” detachable transistor discharge and changing

- ① Heat the round pins and clean tin of transistor.
- ② Discharge heat-radiator, and set screw.
- ③ Discharge the heat-radiator from printed circuit board.
- ④ Insert new transistor to the circuit board.
- ⑤ Solder each transistor pins and cut/more led wire.
- ⑥ Re-install the heat-radiator.

### Diode discharge/charging

- ① Clip the pins of led, and clip the body of led better, discharging the damaged led.
- ② Bend two pins, Which are vertical to circuit board.
- ③ Check the polarity of the led, then place led pins into the soldering plate.
- ④ Press the connecting point and solder them.
- ⑤ Check two soldering points. If not smooth or more soldering, please re-soldering.

### Electro-plating copper repairs

When soldering time is too long, the more heat will upper electronic-plating copper please abide to the following rules and programs.

IC connecting electronic-plating copper repairs. Use led wire to solder electronic-plating copper repairing IC connecting electronic-plating copper (only for IC).

- ① Use sharp knife to scrape the damaged (electronic-plating copper).

- ② Strip the remind tin soldering agent from reminder.
- ③ Bold the skip wire to be a small “U”, soldering with IC pins.
- ④ Along breaking electronic-plating copper to good electronic-plating copper after soldering, cut the more skip wires.

### Repairing other electronic-plating copper

Using the following technology to repair other wrong electronic-plating copper including installing skip wires on circuit board.

- ① Use sharp knife to scrape wrong skip wire of electronic-plating copper at least 1/4 inch's copper to ensure once skip wire working.
- ② From both sides of broken electro-plating copper soldering led wire with the nearest parts along the electronic-plating copper wire.
- ③ Use insulating wire soldering the near two parts (20# wire).  
Notes: Ensure insulating wire's insulation, not happened (to parts or sharp edge).

### Checking progress of CD part

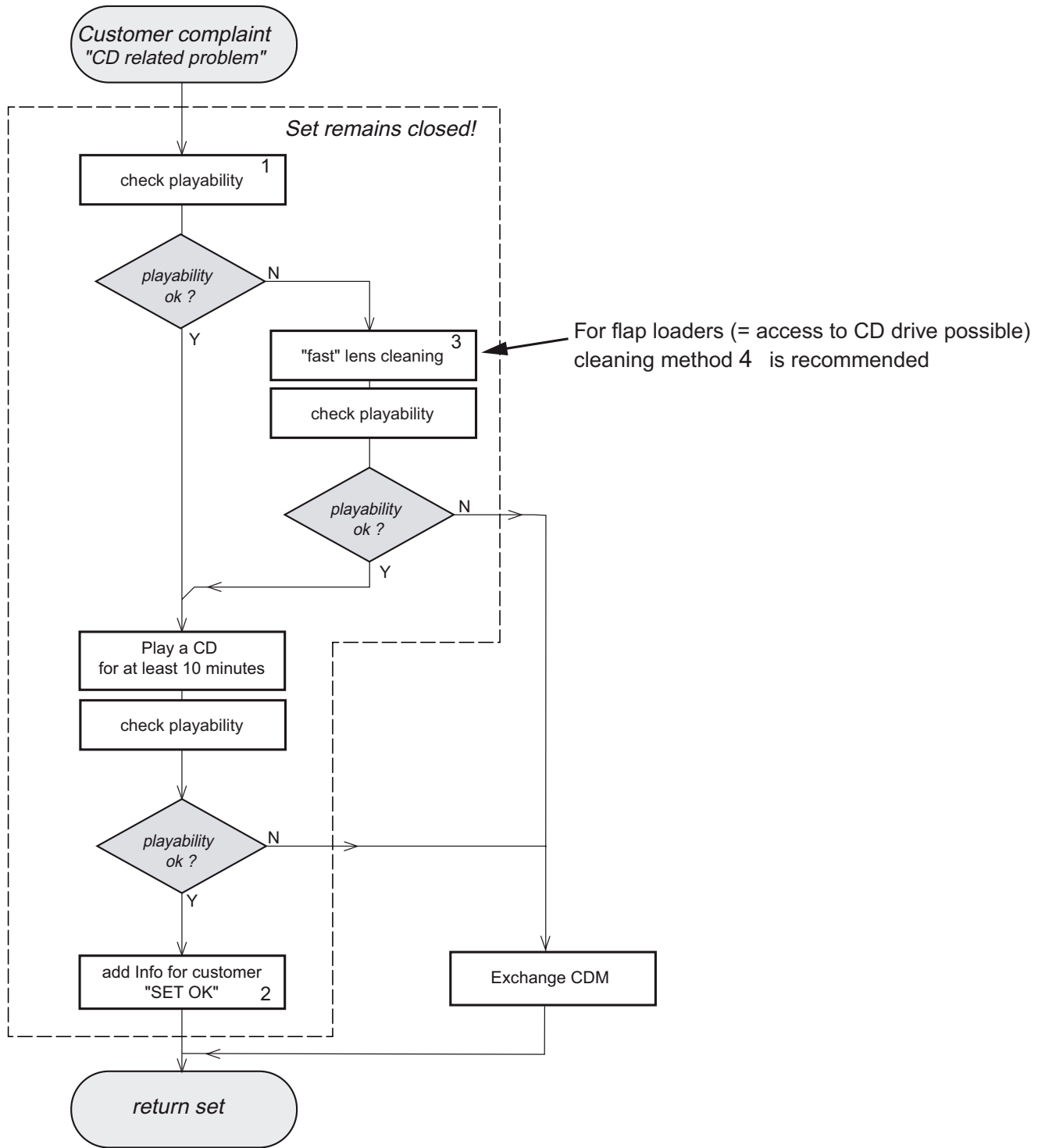
When the CD is playing the music happened unstable or without sound, that means the CD part is out of order, and it should be checked and repaired.

### Discharging laser head need to pay attention

In order to prevent the laser head being destroyed by the static charges that laser light led form units, the following measures should be taken when it is discharge:

- ① To lay a electric blanket on the working table and packing the exchange parts with black color of packing material.
- ② Put the conducting electric blanket on the conductor base, make the conducting electric blanket to connect earth in a good state.
- ③ Put a hand on the conducting electric blanket, make it the same electric potential as the earth.
- ④ Then discharge the laser led and check the unit parts.
- ⑤ Please finish the work on the conducting electric blanket.. Don't let clothes or resource of other static charges touch the laser head parts.
- ⑥ The conducting electric ring which is on the wrist should be connected with the conducting electric blanket.
- ⑦ The conducting electric blanket and the working table that made of copper or other conductor should be properly connected to earth.
- ⑧ When changing laser head components, should be short of the terminal of printed board's short circuit.
- ⑨ After finishing changed laser head components, should cut off the terminal of short circuit.

# Instruction On CD Playability



1 - 4 For description - see following pages

## Instruction On CD Playability

### PLAYABILITY CHECK

For sets which are compatible with CD-RW discs  
use CD-RW Printed Audio Disc .....7104 099 96611  
TR 3 (Fingerprint)  
TR 8 (600µ Black dot) maximum at 01:00

- playback of these two tracks without audible disturbance  
playing time for: Fingerprint  $\geq 10$ seconds  
Black dot from 00:50 to 01:10
- jump forward/backward (search) within a reasonable time

For all other sets  
use CD-DA SBC 444A .....4822 397 30245  
TR 14 (600µ Black dot) maximum at 01:15  
TR 19 (Fingerprint)  
TR 10 (1000µ wedge)

- playback of all these tracks without audible disturbance  
playing time for: 1000µ wedge  $\geq 10$ seconds  
Fingerprint  $\geq 10$ seconds  
Black dot from 01:05 to 01:25
- jump forward/backward (search) within a reasonable time

### CUSTOMER INFORMATION

It is proposed to add an addendum sheet to the set which informs the customer that the set has been checked carefully - but no fault was found.  
The problem was obviously caused by a scratched, dirty or copy-protected CD. In case problems remain, the customer is requested to contact the workshop directly.  
The lens cleaning (method 3 ) should be mentioned in the addendum sheet.

The final wording in national language as well as the printing is under responsibility of the Regional Service Organizations.

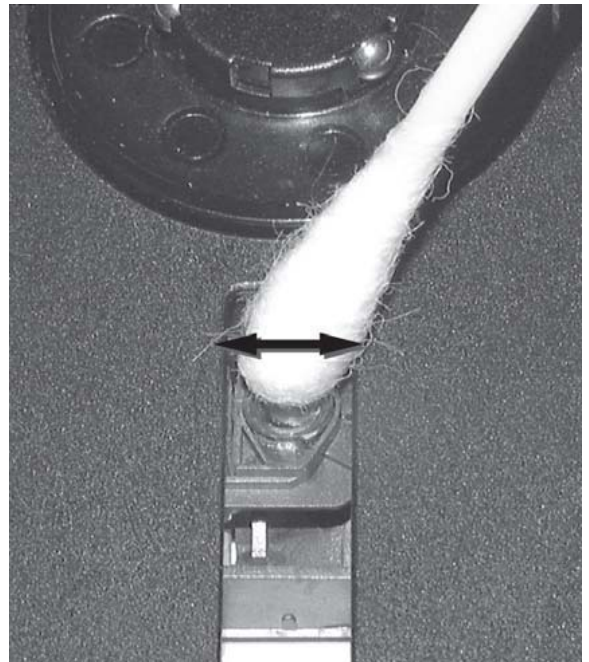
### LIQUID LENS CLEANING

Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it. This to avoid that little particles make scratches on the lens.

Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use "Cleaning Solvent"

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. Clean the lens gently (don't press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

The direction of cleaning must be in the way as indicated in the picture below.



# Electrical Specification

## NEON ELECTRICAL FACTORY LTD. ELECTRICAL SPECIFICATION

MODEL: 645

MEASURED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_

TEST CONDITIONS:

1. POWER SUPPLY: AC ADAPTER DVD version : V1.0 2010 08 17
2. REF OUTPUT: 4Ω 1W , Sound effect off
4. FM MONO: 22.5KHz Dev, 1KHz MODULATION , 75Ω IMPEDANCE , 60dBu
5. FM STEREO : MAIN+SUB = 67.5KHz, PILOT : 7.5KHz, COMPOSITE: 40.0KHz

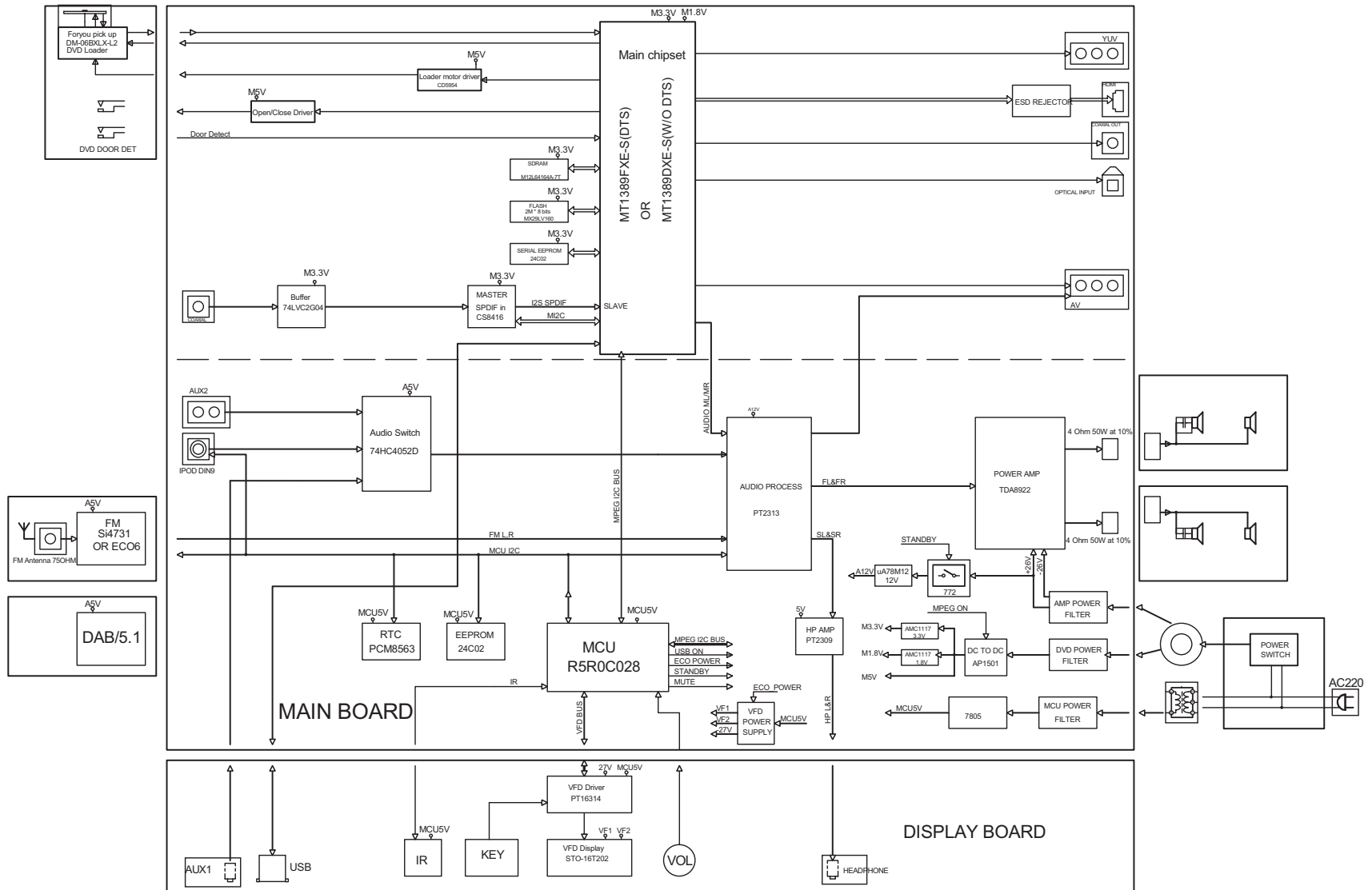
FM SECTION:							
NO	TEST ITEMS	UNIT	NOM.	LIMIT	TEST DATA		
					1#	2#	
1	Frequency Range	MHz		87.5--108			
2	30dB Quenting Sens.	90	18	26			
		98	18	26			
		106	18	26			
3	-3dB Limiting Point	dBu	17.5	22			
4	FM IF Rejection 98MHZ S/N=30dB	dB	50	40			
5	Image Reject 98MHZ S/N=30dB	dB	30	15			
6	Selectivity S 0.3	dB	40	33			
7	S/N ( A-WIGHTED)	MONO	dB	55	45		
8	Over Distortion	%	2	4			
9	Modulation HUM	dB	55	40			
10	Frequence Response	100Hz	-6	-7			
		4K	-6	-7			
11	AM Suppression I/B 48--82dBf	dB	35	30			
12	Auto Tunning Stop Sens.	dBu		<40			
13	Stereo Turn On	dBu	22	28			
14	Stereo Channel Separation 1K	dB	30	20			
15	THD 10% POWER	W	50	43			
1	RDS SENSITIVITY (2KHz)	90	33	36			
		98	33	36			
		106	33	36			
DVD SECTION:							
	TEST ITEMS	UNIT	NOM.	LIMIT	TEST DATA		
					1#	2#	
	Total Harmonic Distortion	125Hz	%	≤1	≤1.5		
		1KHz	%	≤1	≤1.5		
		10KHz	%	≤1	≤1.5		
	S/N (1KHz, A-weightde)	dB	70	60			
	Frequence Response	dB		20Hz ± 3dB			
	Channel Difference	dB	0	≤2			
	Channel Separation	1K	L	dB	50	40	
			R	dB	50	40	
		10K	L	dB	45	35	
			R	dB	45	35	
4	Residual noise (Vol 1)	mv		≤1			
5	THD10% Output Power	W	50	43			
6	HUM (VOL MAX)	mv		≤5			
IPOD SECTION:							
1		1KHz	%	≤1	≤1.5		
2	Channel Difference	dB	0	≤2			
3	Channel Separation	1K	L	dB	50	40	
			R	dB	50	40	
		10K	L	dB	45	35	
			R	dB	45	35	
4	THD10% Output Power	W	50	43			



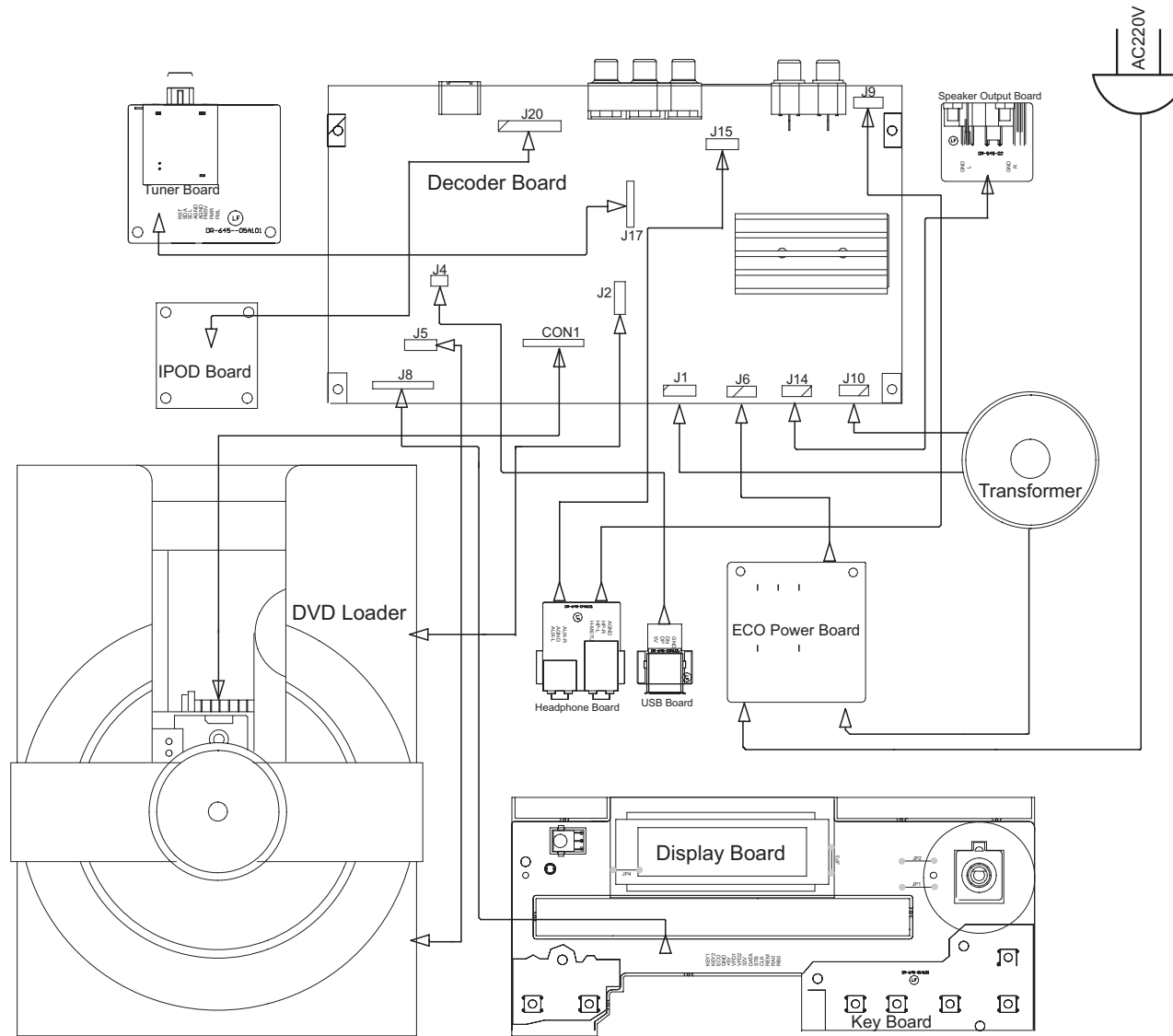
# Electrical Specification

LINE OUT								
1		Channel Unbalance		dB		$< \pm 2$		
2		Frequency response (20Hz-20KHz)		dB		$< \pm 3$		
3		S/N (A-Weighted)		dB	70	60		
4		THD (1KHz) at 0dBFS		%		$\leq 0.5$		
5		Channel Separation	1K	dB	55	40		
			10K	dB	45	35		
			20K	dB				
6		Output level (1KHz/0dB)		mV	1300	$\pm 200$		
AUX SECTION:								
NO	TEST ITEMS			UNIT	NOM.	LIMIT	TEST DATA	
							LINE1	LINE2
1	L/R OUTPUT POWER (10% THD, 40hm, 1KHz)			W	50	43		
2	FREQUENCY RESPONSE AT LOUDSPEAKER OUT	L/R	60Hz	dB		$\pm 3$		
			20KHz	dB	0	$\pm 3$		
3	AMPLIFIER DISTORTION			%	-	1		
4	CHANNEL SEPARATION 1000Hz		L	dB	$\geq 55$	$\geq 45$		
			R	dB	$\geq 55$	$\geq 45$		
5	Channel Unbalance			dB	0	$\leq 1$		
6	LEVEL DIFFERENCE (RATED OUTPUT POWER AT 1KHz)	FM 1KHz 67.5KHz DEV, 68dBf		dB	-	$\pm 6$		
		AM 1KHz 80% mod. 74dB		dB	-	$\pm 3$		
		cd 1K 0dB		dB	-	$\pm 3$		
		0.5V 47K OHM		dB	-	$\pm 5$		
7	INPUT SENSITIVITY (RATED OUTPUT POWER AT 1KHz, 10%THD)			mV	600	$\pm 200$		
8	S/N RATIO (1KHz, A-WEIGHTED)			dBA	$\geq 67$	$\geq 60$		
9	HUM (VOL. MAX)			mv	-	$\leq 5$		
10	RESIDUAL NOISE (VOL. 1. with signal)			mv	-	$\leq 1$		

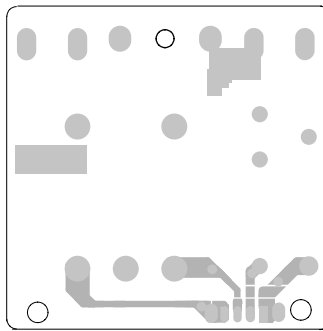
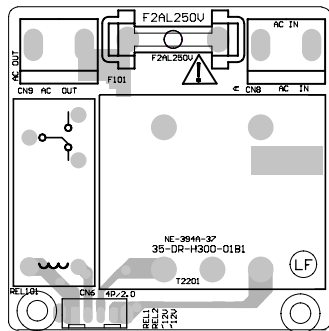
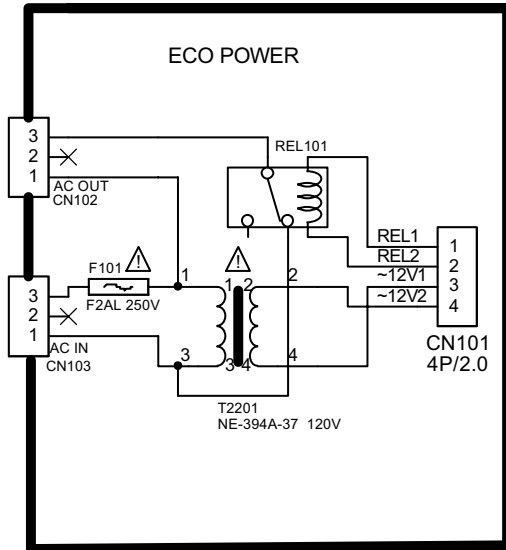
Block Diagram



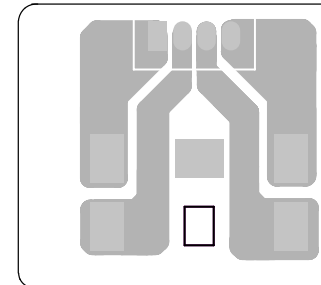
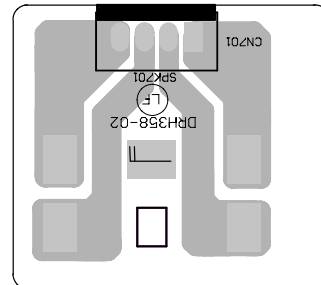
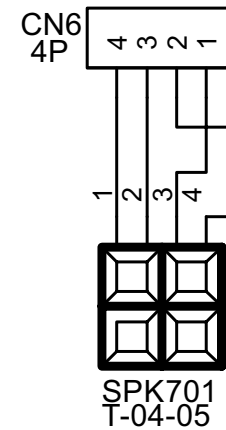
Wiring Diagram

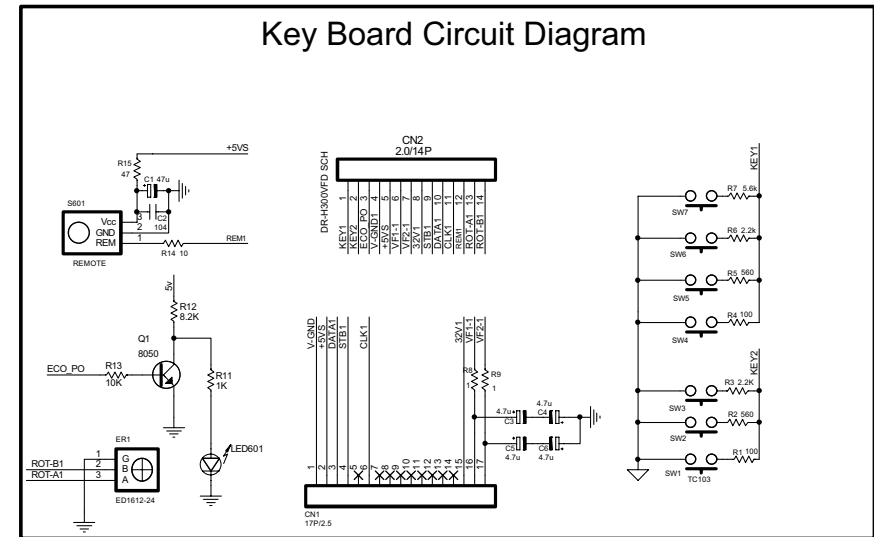
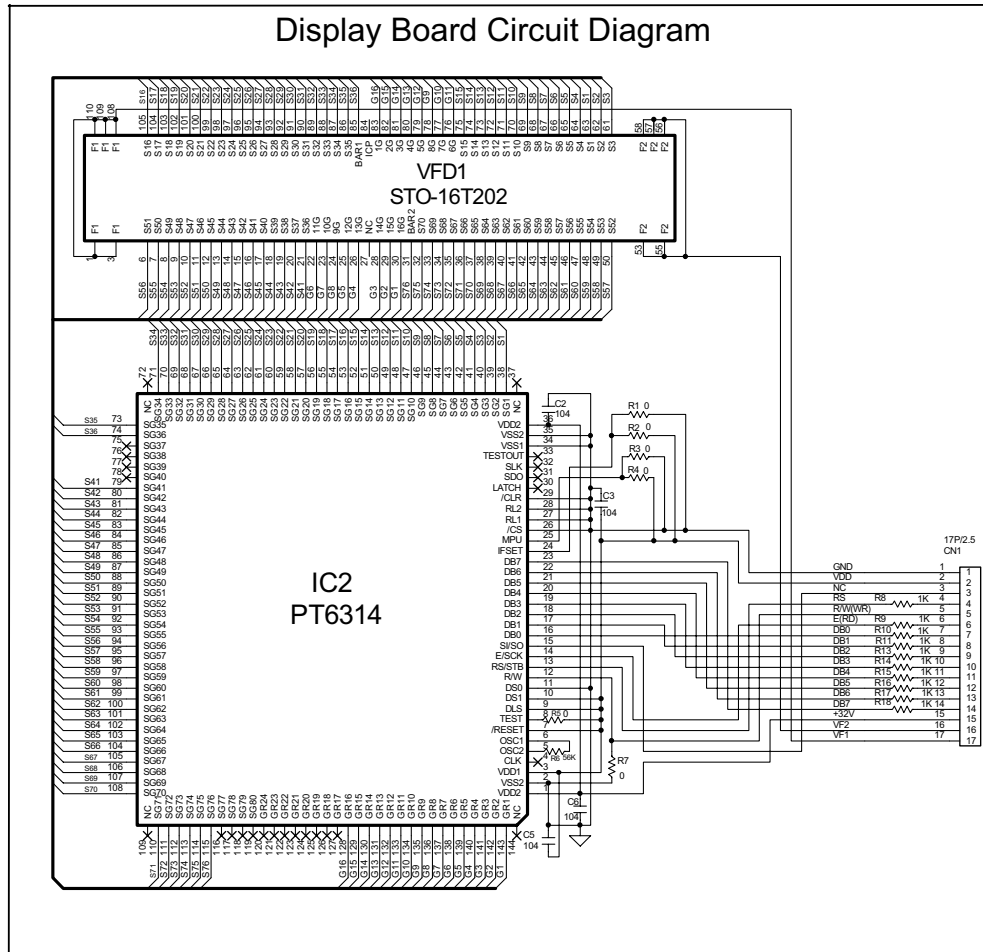


### ECO Power Board

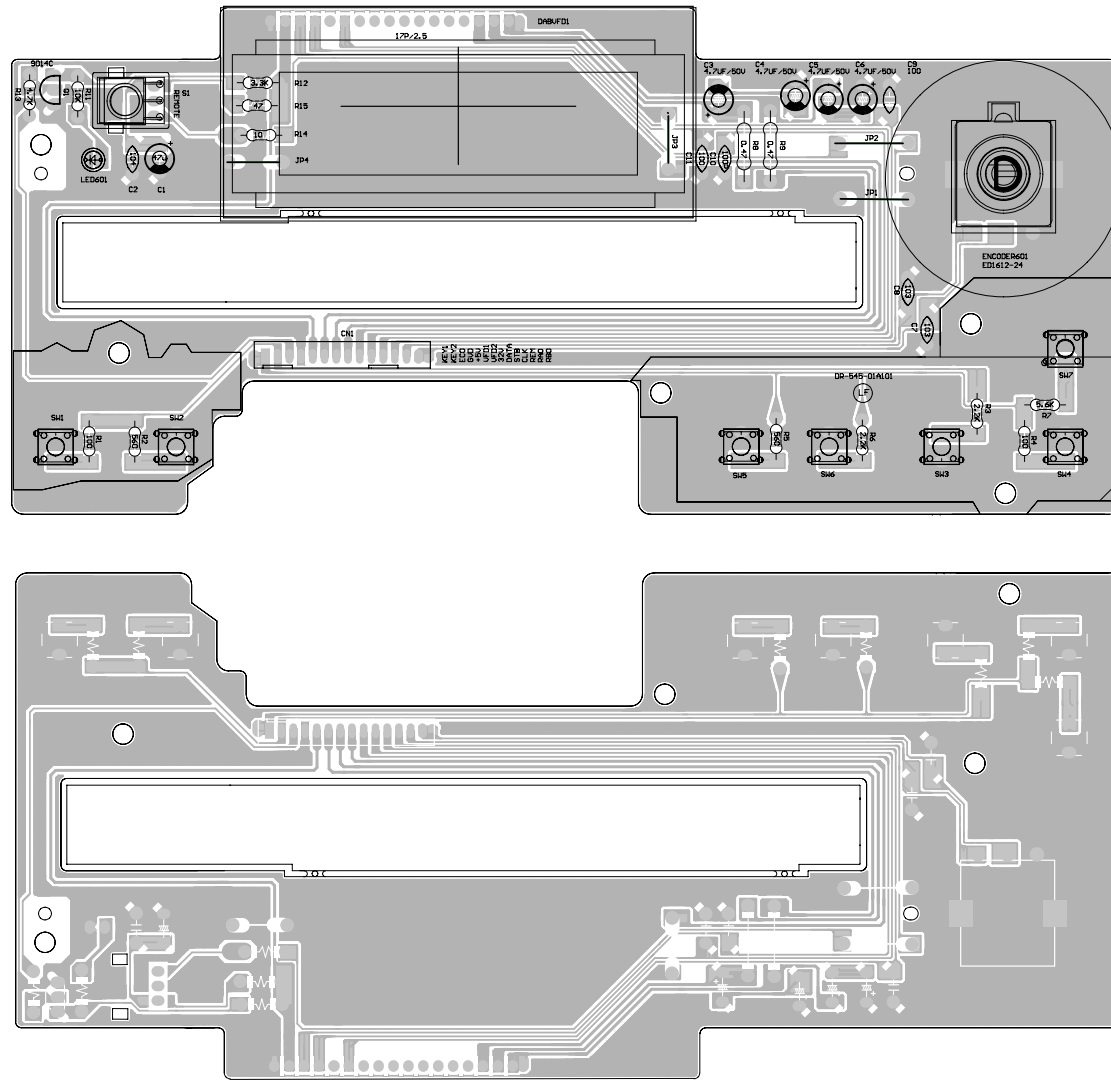


### Speaker Output Board

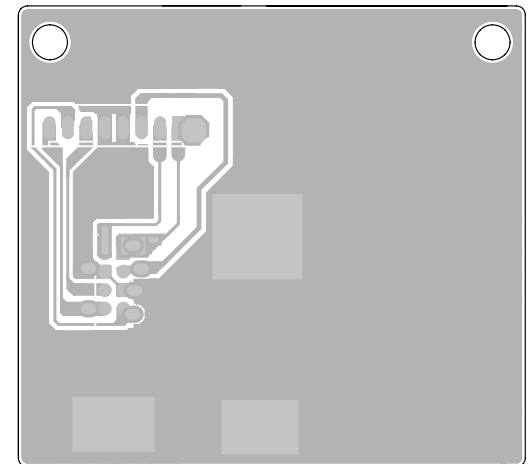
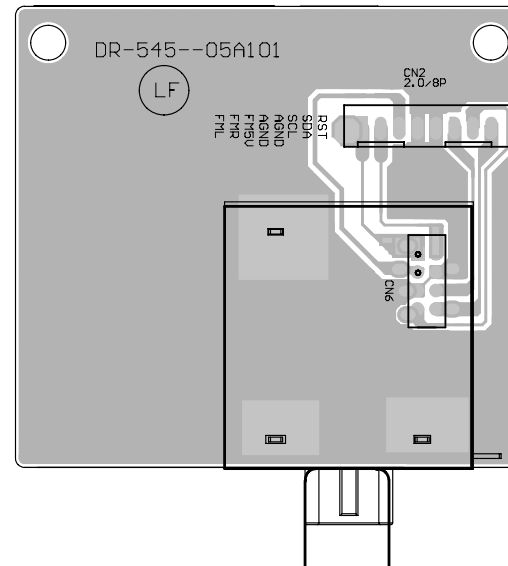
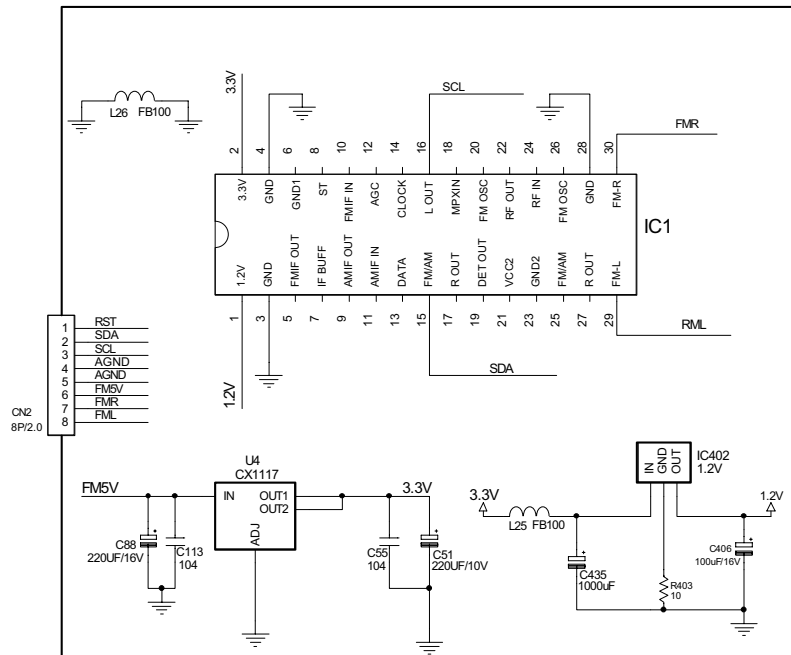




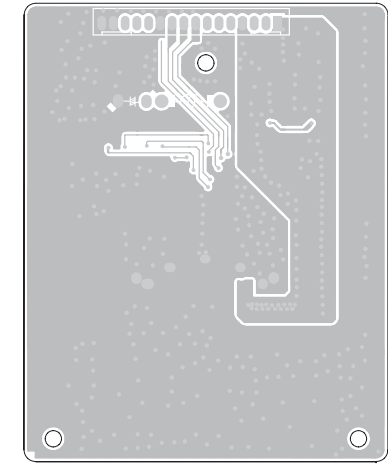
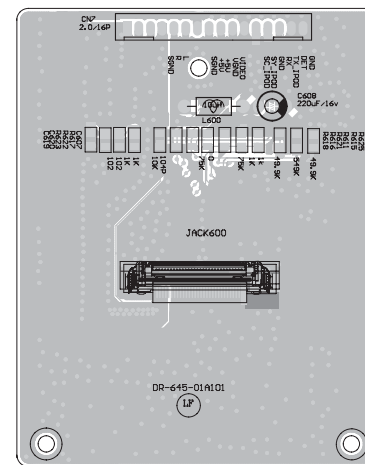
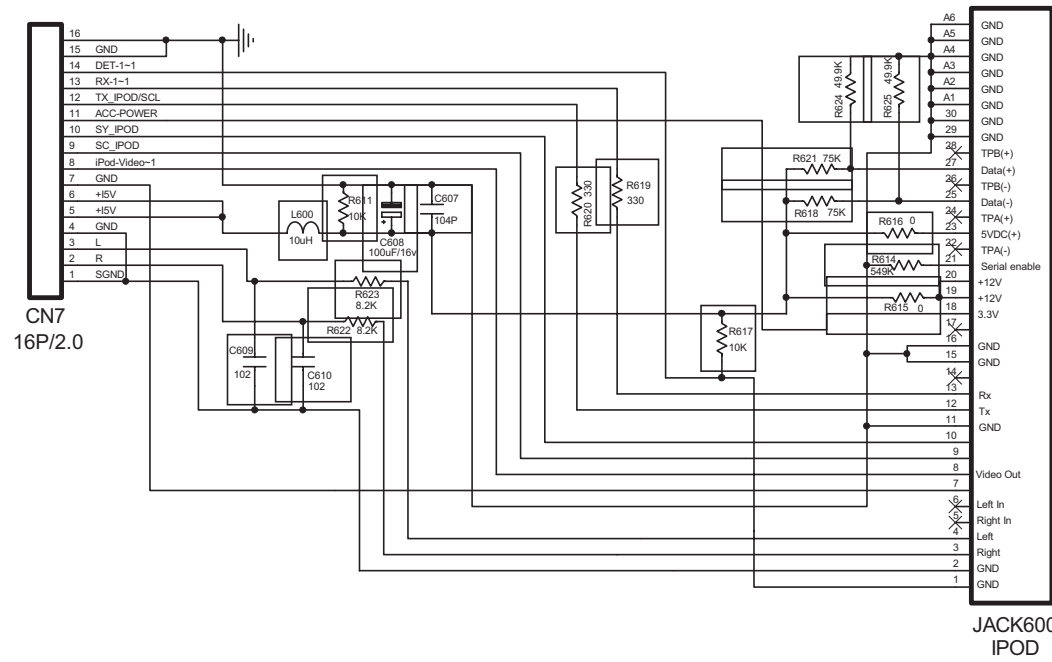
Display and Key Board -- Layout Diagram



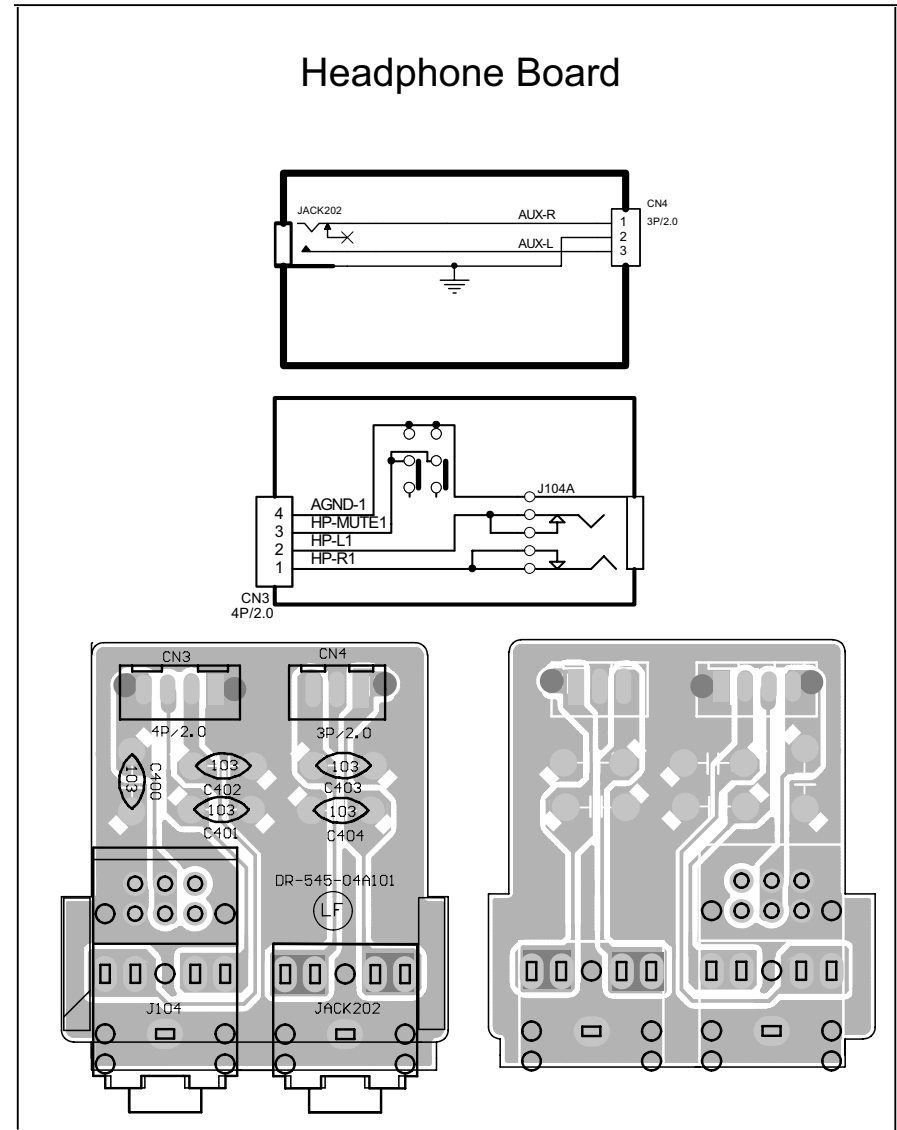
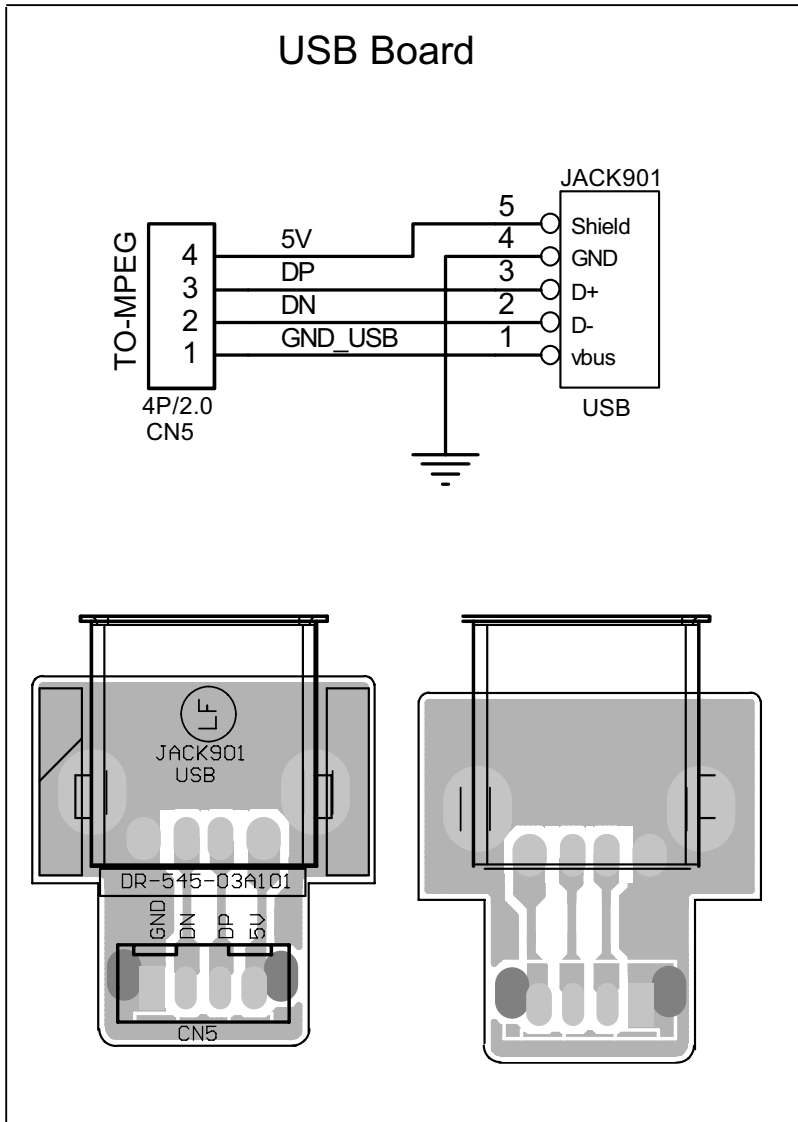
Tuner Board -- Circuit and Layout Diagram



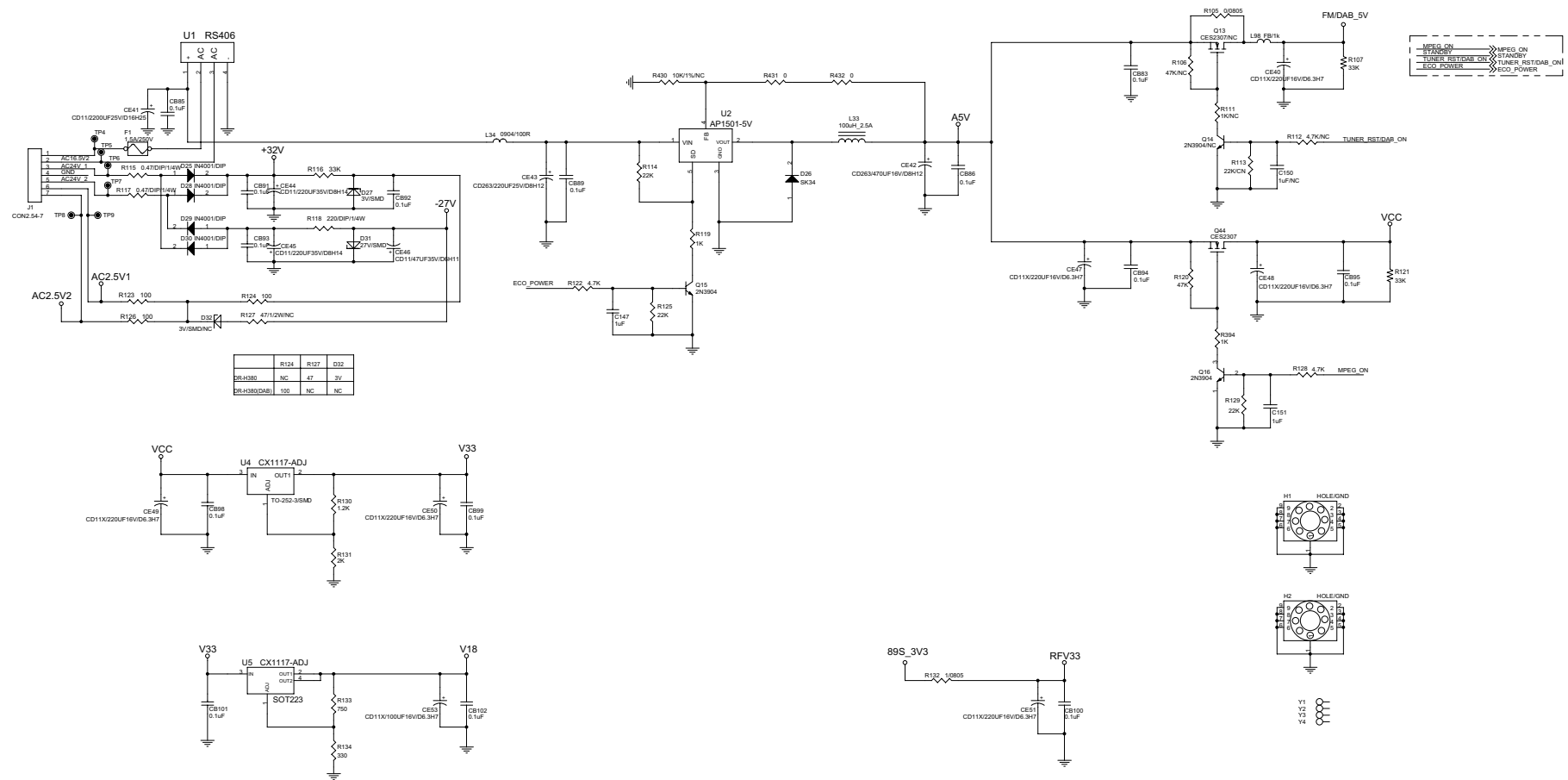
IPOD Board -- Circuit and Layout Diagram



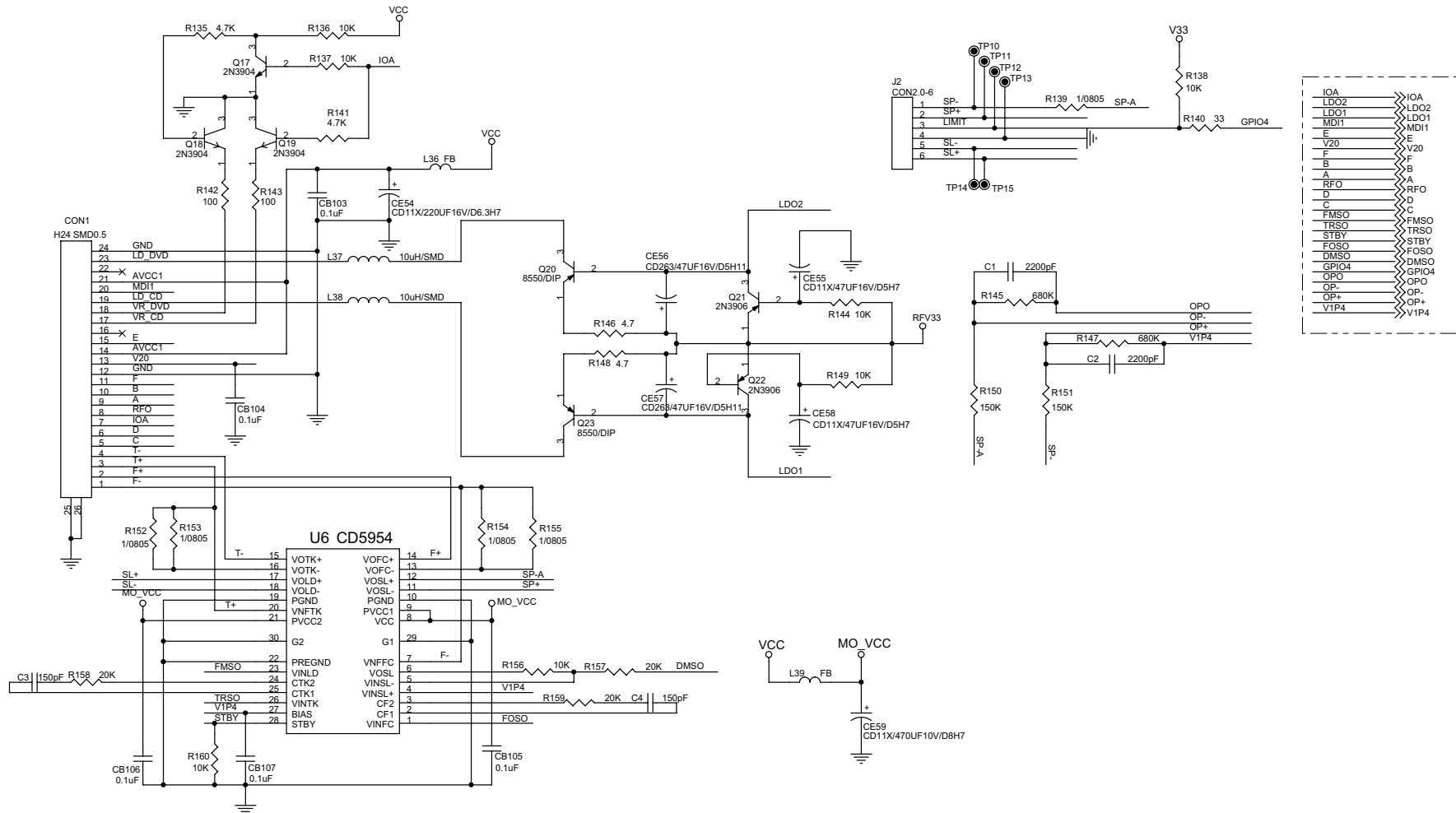




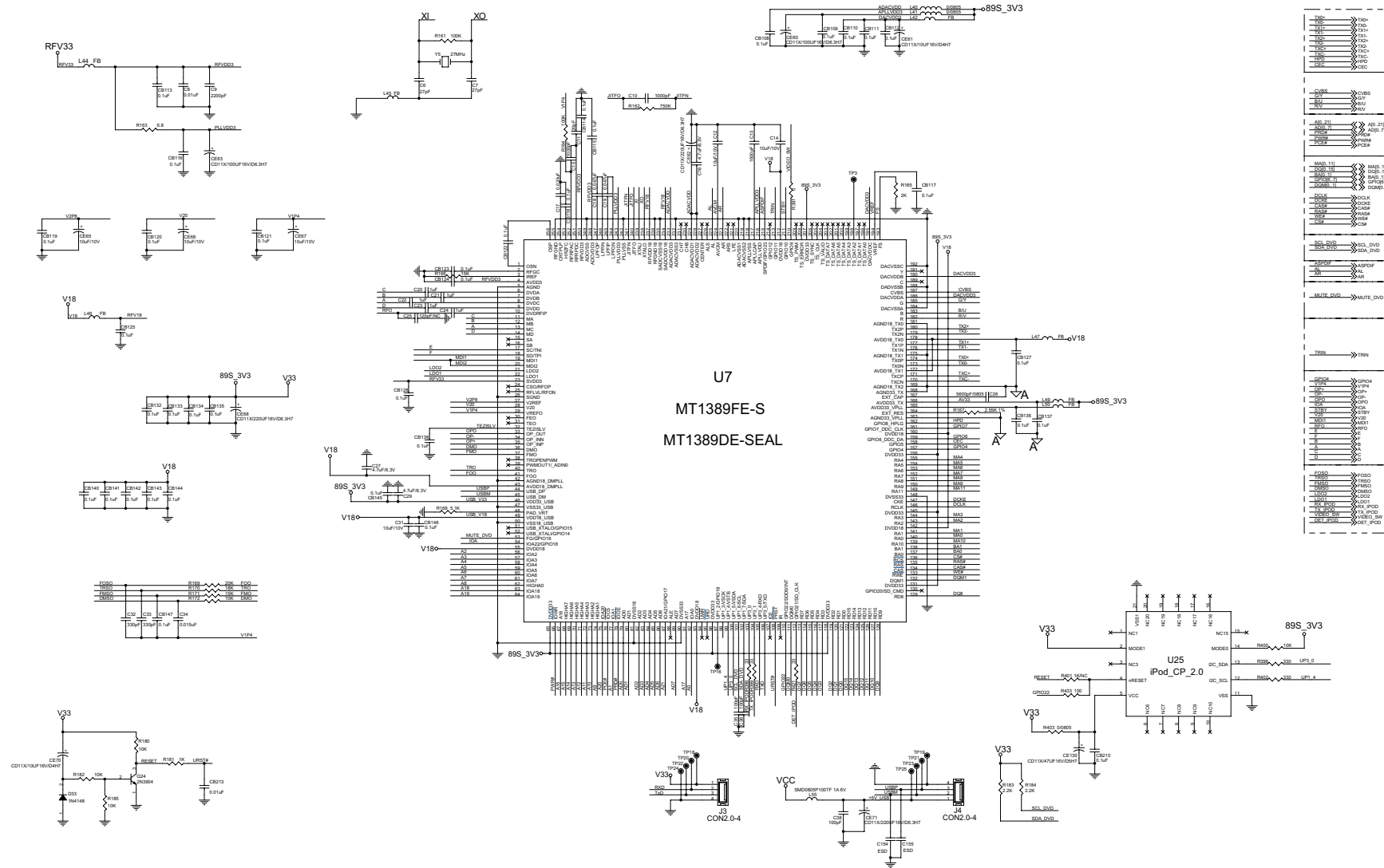
# Decoder Board -- Circuit Diagram 1



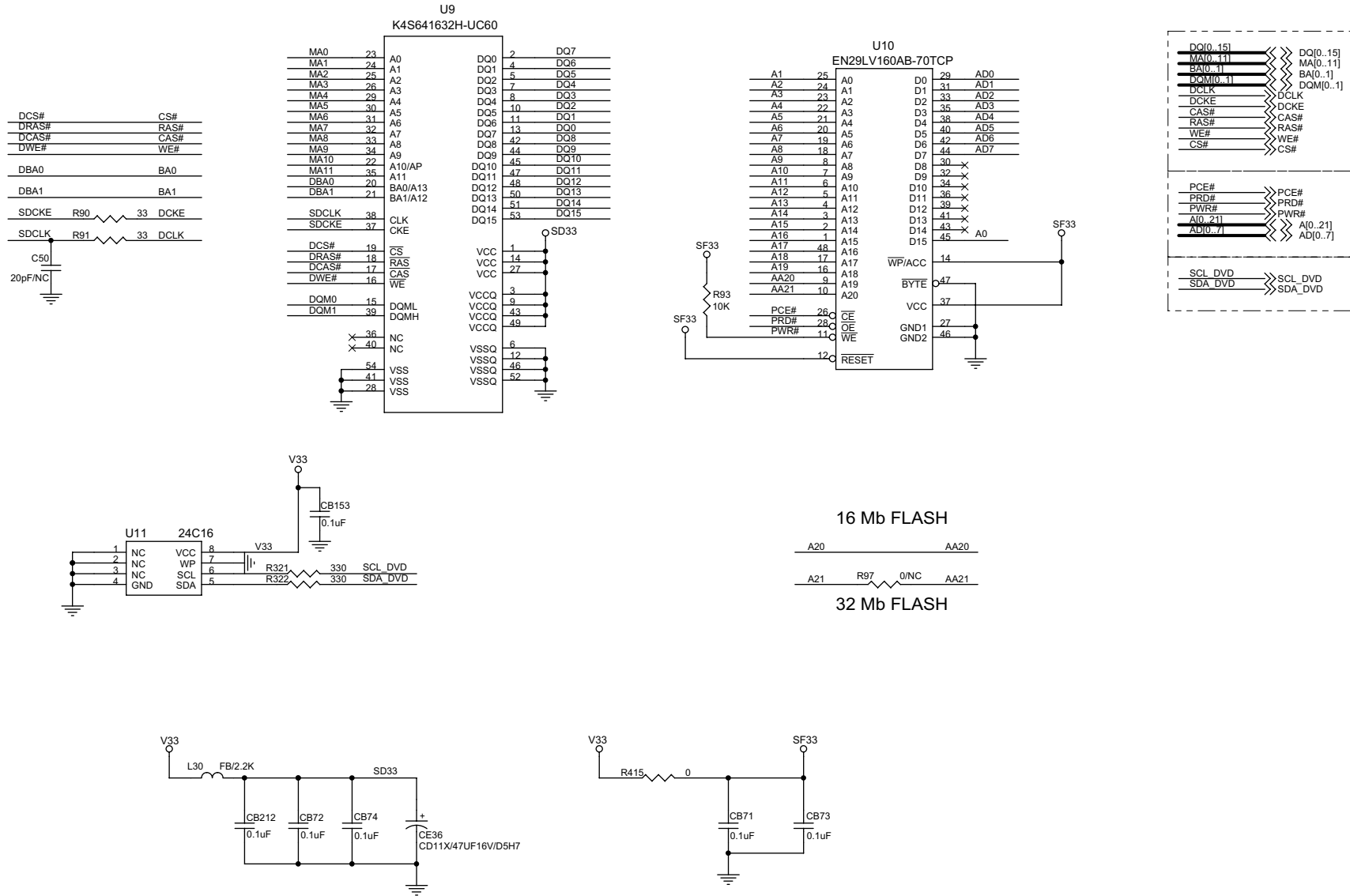
Decoder Board -- Circuit Diagram 2



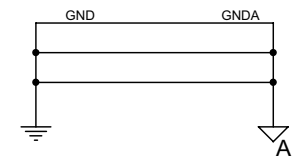
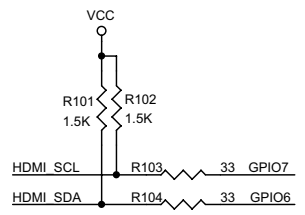
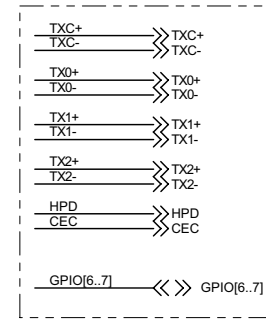
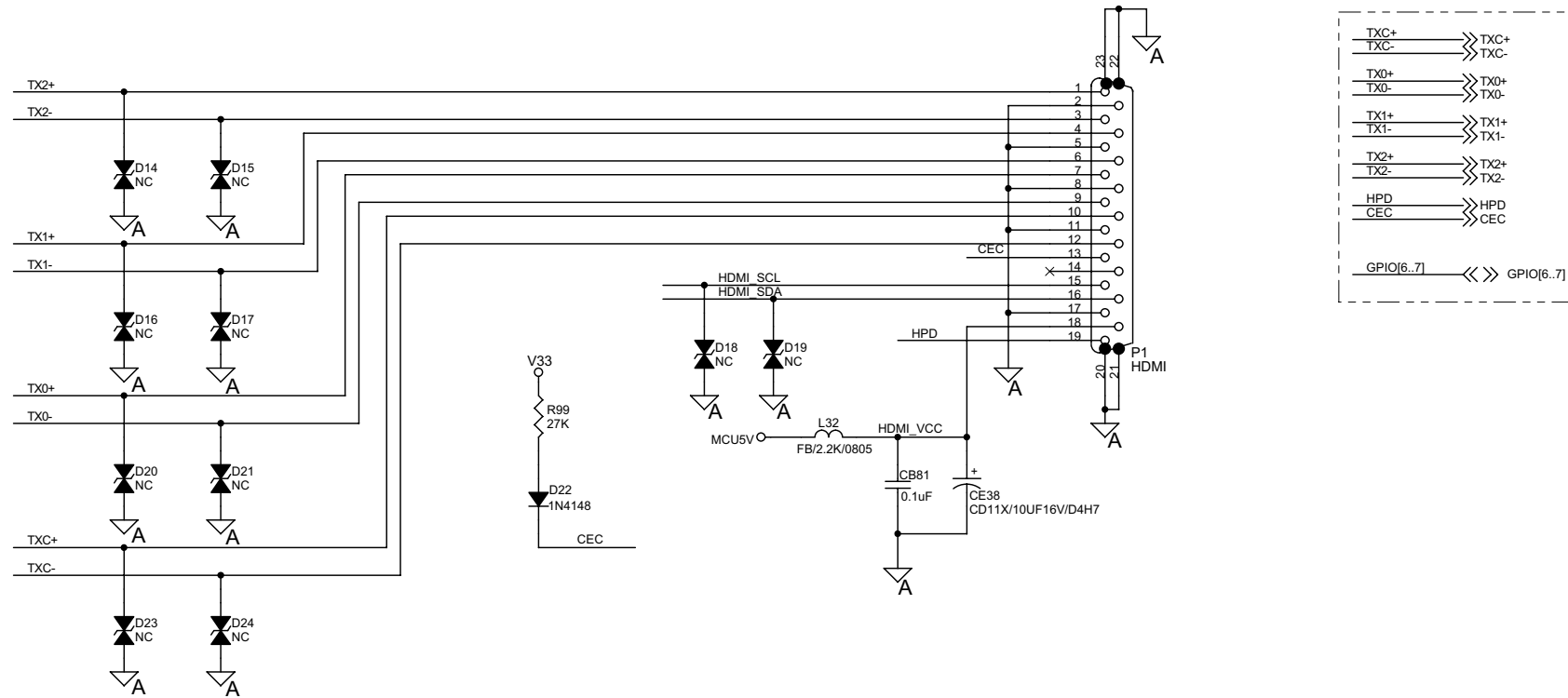
Decoder Board -- Circuit Diagram 3



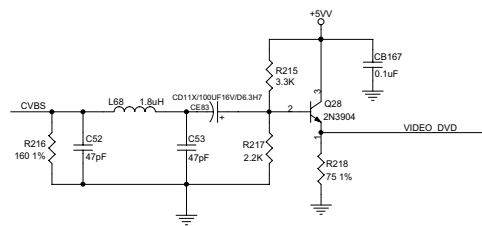
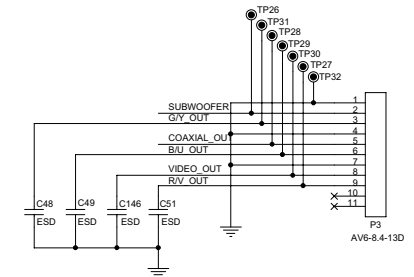
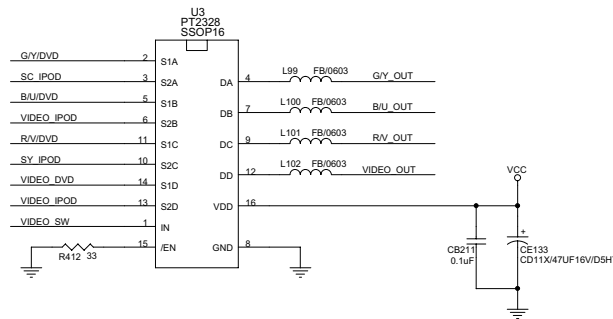
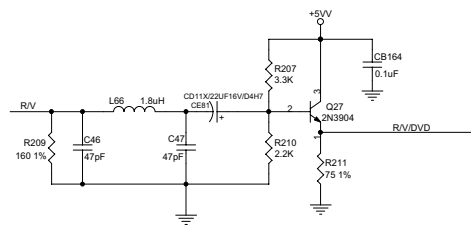
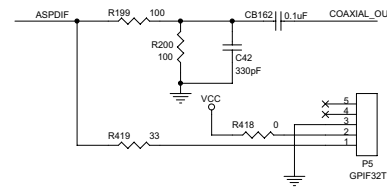
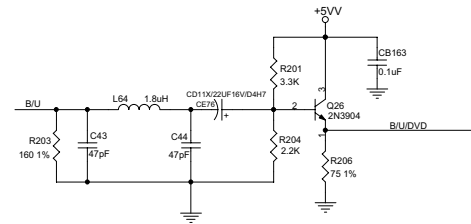
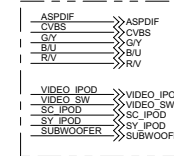
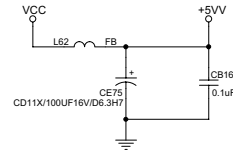
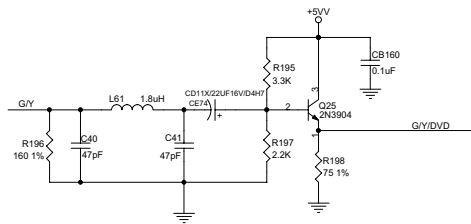
Decoder Board -- Circuit Diagram 4



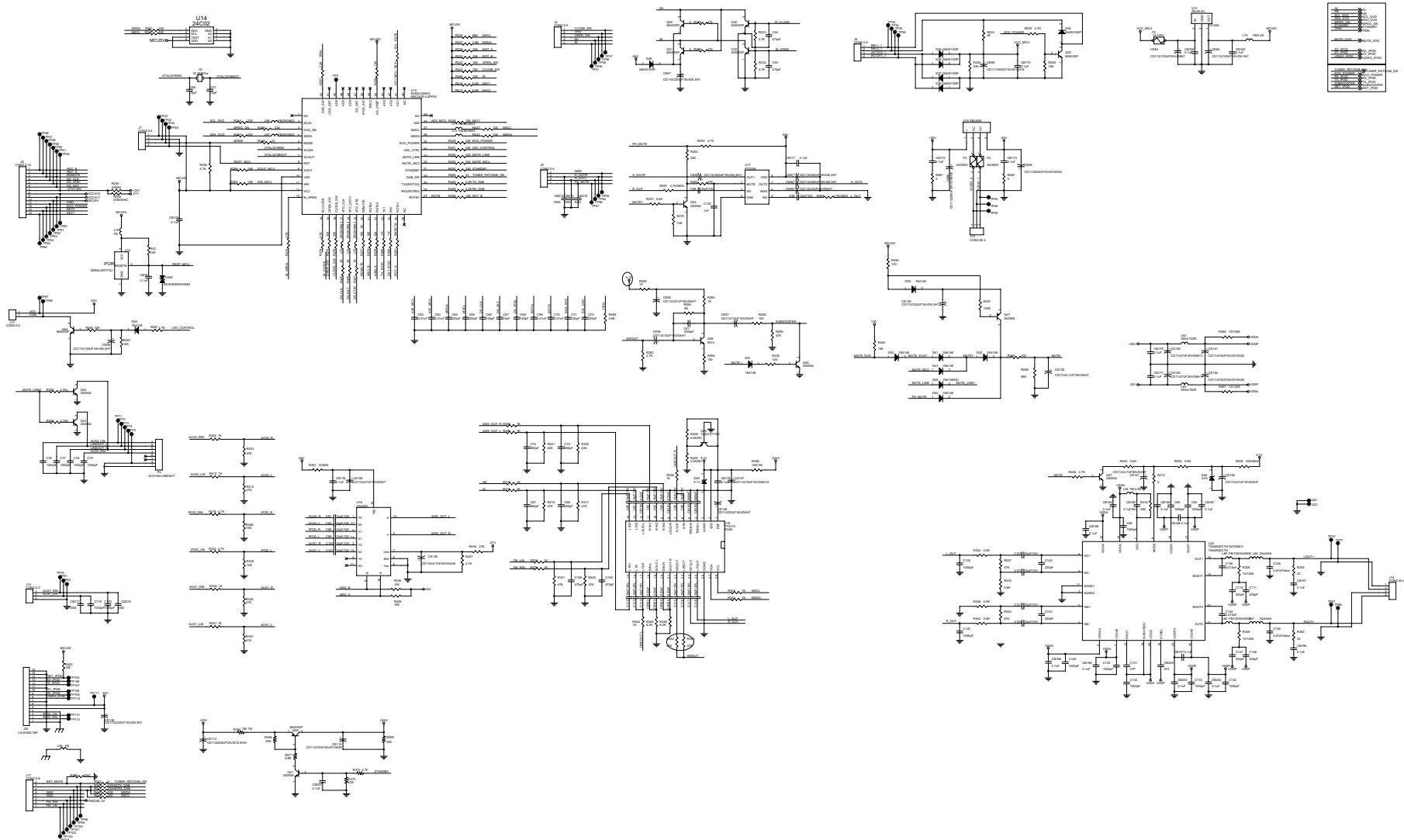
Decoder Board -- Circuit Diagram 5



Decoder Board -- Circuit Diagram 6

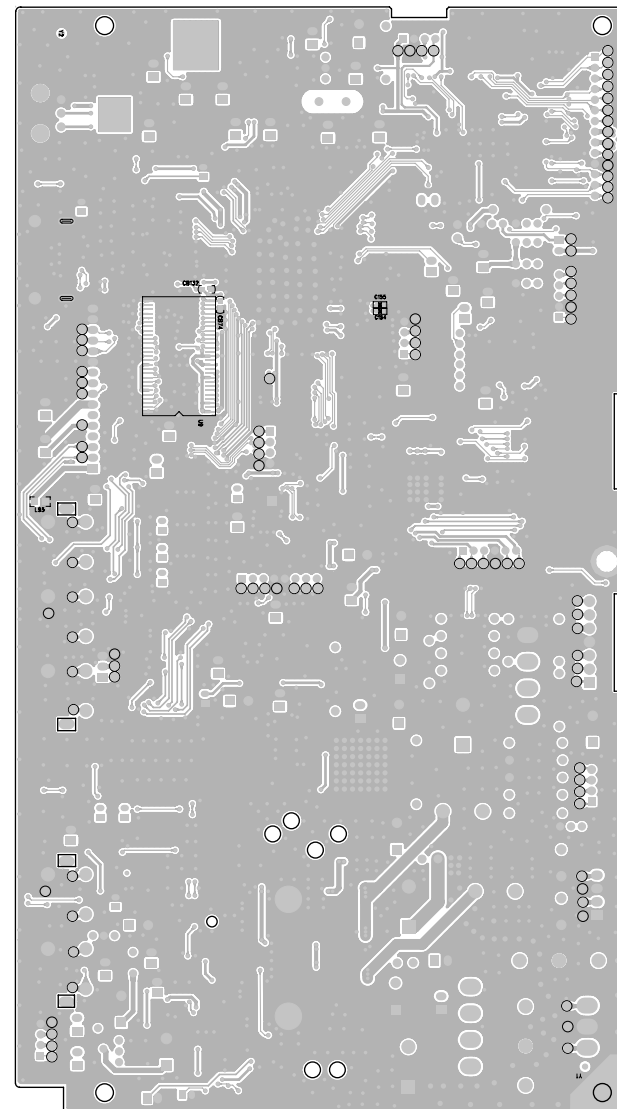
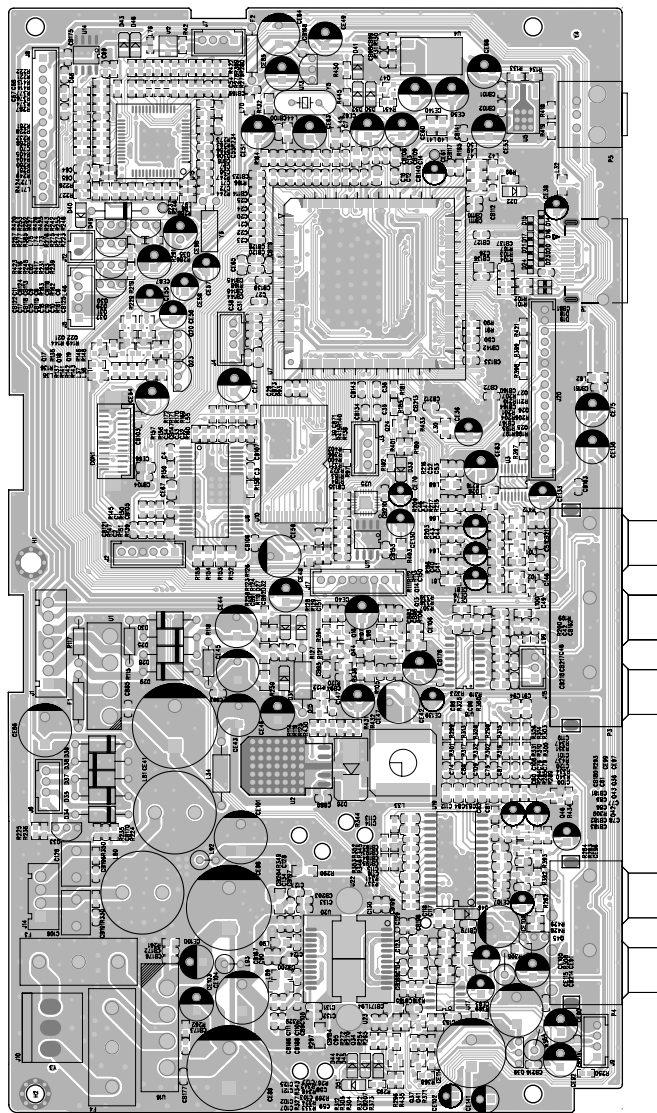


Decoder Board -- Circuit Diagram 7

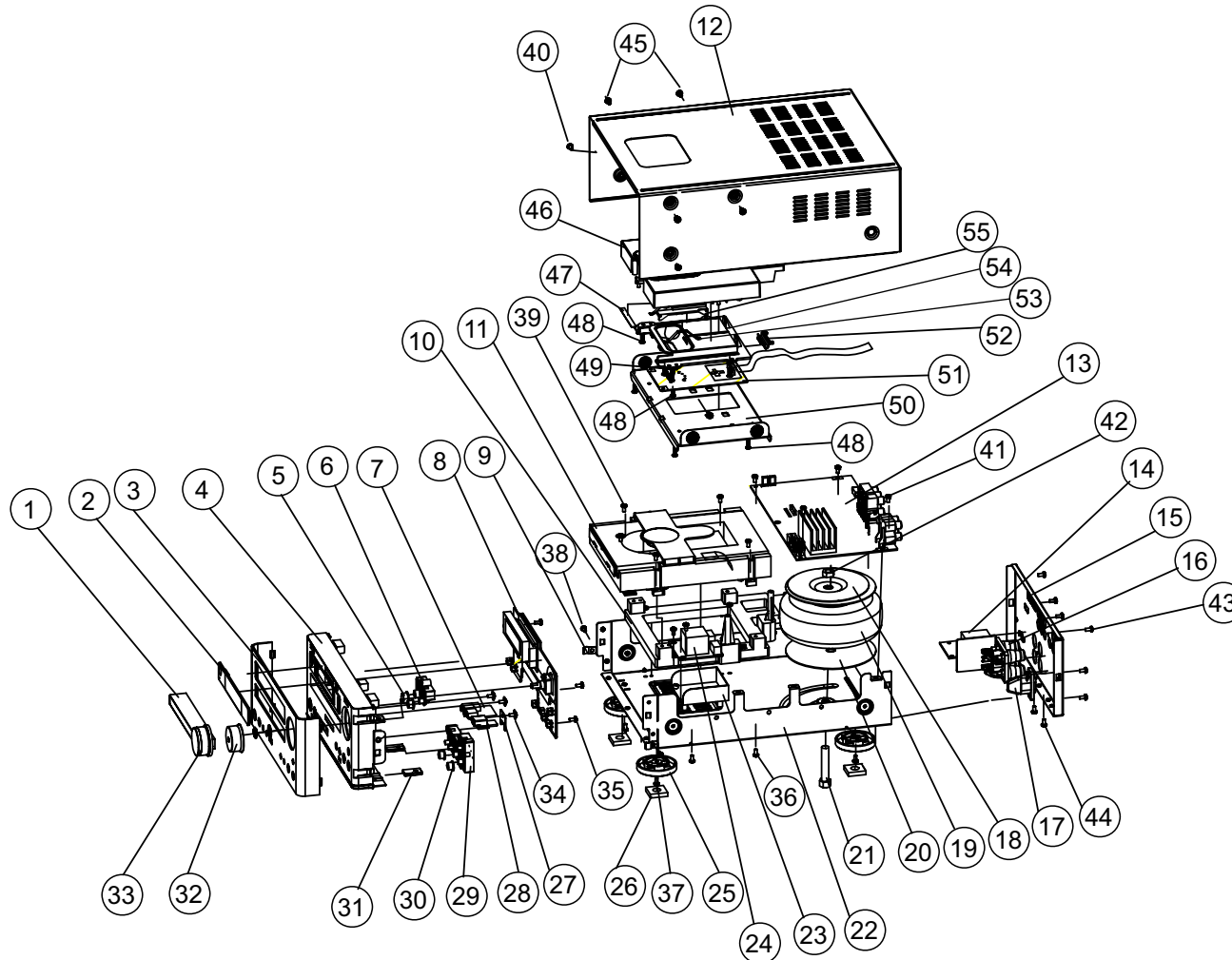




Decoder Board -- Layout Diagram



Exploded View



55		IPOD DOOR COVER(ABS)
54		IPOD COVER(ABS)
53	37-DR645-03A100	IPOD DOOR SPRING
52		IPOD SOCKET BRACKET(ABS)
51		IPOD BOARD ASS'Y
50	37-DR645-02A100	IPOD BRACKET
49		IPOD SOCKET BRACKET
48	38001204	SCREW 2.6 X 8 BA
47	36000626	BLACK SPONGE 35X6X1 40°
46		IPOD SOCKET COVER ABS
45	38000279	SCREW 3 X 6 BMTT (PLATING)
44	38000279	SCREW 3 X 6 BMTT (PLATING)
43	38000114	SCREW 3 X 10 PA (PLATING)
42		TRANSFORMER--Screw
41	38000712	SCREW 3 X 6 PM (PLATING)
40	38000279	SCREW 3 X 6 BMTT (PLATING)
39	38000166	SCREW 3 X 10 PWA (PLATING)
38	38000068	SCREW 3 X 5 FMTT (PLATING)
37	38000634	SCREW 3 X 8 PWMTT (PLATING)
36	38000193	SCREW 3 X 10 BA (PLATING)
35	38000489	SCREW 3 X 8 PA (PLATING)
34	38000800	SCREW 3 X 10 PWA (PLATING)
33		VOLUME KNOB COVER
32		VOLUME CORE/ABS
31		PLASTIC PAD/ABS
30		DR545 PLAY BUTTON COVER
29		PLAY BUTTON BRACKET/ABS
28		USB BOARD ASS'Y
27	37-DRH635-01A100	USB PRESS PLATE
26	36000824	BLACK SPONGE
25	39-DRH300-08A101	FOOT-1/ABS
24		ECO PWOER BOARD ASS'Y
23	39-DRH300-14B200	POWER BOARD BOX
22	37-DRH380-14A100	DVD METAL BOTTOM CHASSIS
21		TRANSFORMER--Nut
20		TRANSFORMER--Rubber Pad
19		TRANSFORMER
18		TRANSFORMER--Metal Plate
17	24000039	AC SOCKET
16		SPK OUTPUT BOARD
15		DVD BACK METAL PLATE
14	07-DR545-05A101	RADIO DATA TRANSFER PCB
13		DECODER BOARD PARTS/ONKYO
12		DVD METAL BOTTOM CHASSIS
11	08-MCD906-06A104	DVD LOADER MECHANISM
10	39-DRH380-14A100	DVD MECHANISM BRACKET ABS
9	37-DR545-04A100	SHEET COPPER/14XRX0.2
8		Display and Key Board ASS'Y
7		HEADPHONE BOARD ASS'Y
6		POWER BUTTON BRACKET/ABS
5		POWER BUTTON COVER
4		DVD FRONT CABINET/ABS
3		ALUMINUM FRONT CABINET
2	39-DR545-04B102	DISPLAY LENS/PMMA
1	39-DR545-02A101	DVD DOOR(ABS)
S/N	P/N	Description

## Revision List

### Revision List

Version 1.0

\* Initial Release

Version 1.1

\* Update power board circuit diagram

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