

HITACHI

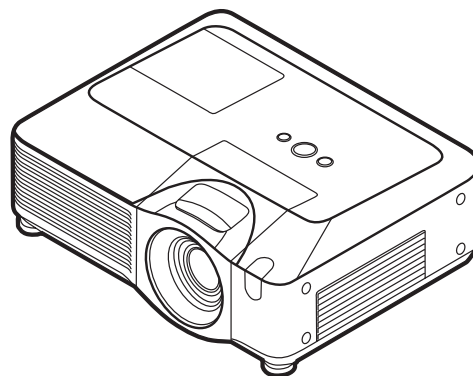
SERVICE MANUAL

SM0321

CP-SX635W(ED3SX40N)

Warning

The technical information and parts shown in this manual are not to be used for the development, design, production, storage or use of nuclear, chemical, biological or missile weapons or other weapons of mass destruction or military purposes or purposes that endanger global safety and peace. Moreover, do not sell, give, or export these items, or grant permission for use to parties with such objectives. Forward all inquiries to Hitachi Ltd.



Caution

Be sure to read this manual before servicing. To assure safety from fire, electric shock, injury, harmful radiation and materials, various measures are provided in this Hitachi Multimedia LCD Projector. Be sure to read cautionary items described in the manual to maintain safety before servicing.

Service Warning

1. When replacing the lamp, avoid burns to your fingers, the lamp becomes very hot.
2. Never touch the lamp bulb with a finger or anything else. Never drop it or give it a shock as this may cause bursting of the bulb.
3. This projector is provided with a high voltage circuit for the lamp. Do not touch the electric parts of power unit (circuit) and power unit (ballast) after turning on the projector.
4. Do not touch the exhaust fan during operation.
5. The LCD module assembly is likely to be damaged. When replacing the LCD LENS/PRISM assembly, do not hold the FPC of the LCD module assembly.
6. Use the cables which are included with the projector or as specified.

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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

Multimedia LCD Projector

January 2009

CP-SX635(ED3SX40N)

1. Features

- High Brightness
- Remote Control Via Your Web Browser
- Low Noise
- Rich Connectivity

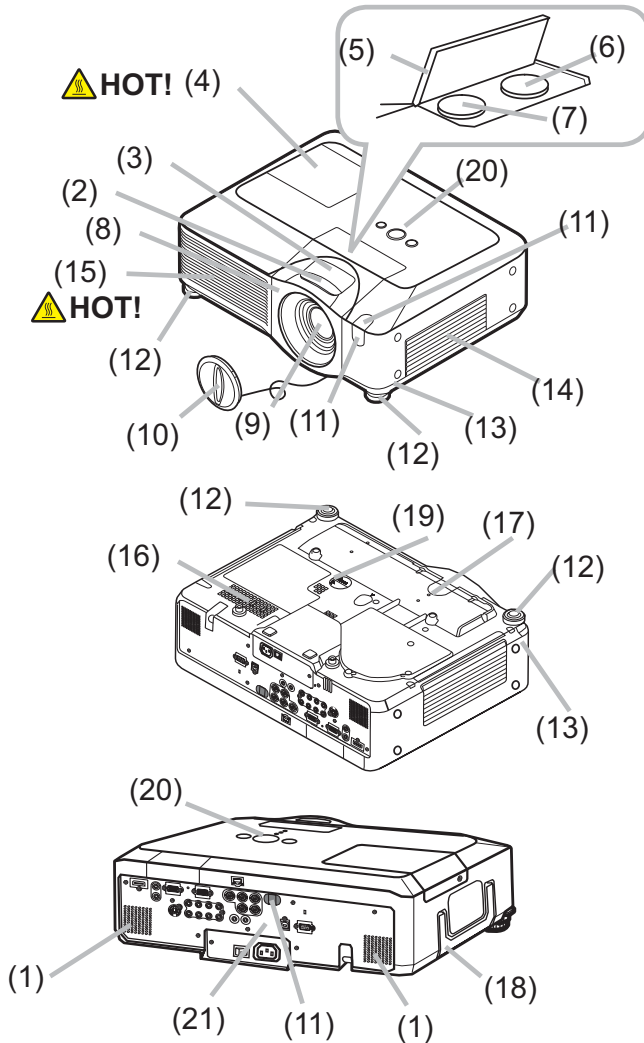
2. Specifications

Liquid crystal panel	Drive system		TFT active matrix	
	Panel size		2.0cm(0.79 type)	
	Number of pixels		1400 (H) x 1050 (V)	
Lamp			275W UHB	
Digital signal	HDMI		Type:T.M.D.S Signal level : DC : 3.3V±5% AC : 0.15-1.56Vp-p	
RGB signal	RGB IN	D-sub 15pin	Video : Analog 0.7Vp-p(75Ω termination) H/V. sync. : TTL level (positive/negative) Composite sync. : TTL level	
		BNC		
	RGB OUT		Video:Analog 0.7Vp-p, 75Ω output impedance (positive) H/V. sync.: TTL level (positive/negative) Composite sync.: TTL level	
VIDEO signal	VIDEO IN		1.0Vp-p (75Ω termination)	
	S-VIDEO IN		Y signal: 1.0±0.1Vp-p, (75Ω termination) C signal: 0.286±0.1Vp-p (NTSC burst signal, 75Ω termination) 0.3±0.1Vp-p (PAL/SECAM burst signal, 75Ω termination)	
	COMPONENT VIDEO	Y	1.0±0.1Vp-p, 75Ω termination (positive)	
		C _B /P _B	0.7±0.1Vp-p, 75Ω termination (positive)	
		C _R /P _R	0.7±0.1Vp-p, 75Ω termination (positive)	
AUDIO signal	AUDIO IN 1		500mVrms, 47kΩ or more (max. 2Vrms)	
	AUDIO IN 2			
	AUDIO IN 3/4 L/R		500mVrms, 47kΩ or more (max. 2Vrms)	
	HDMI		Linear PCM format Sampling frequency : 48kHz, 44.1kHz, 32kHz	
	AUDIO OUT		0~500mVrms, output impedance 1kΩ (max. 2Vrms)	
RS232C	INPUT		Hi: Max. 20V, Min. 2.6V	Lo: Typ. -20.0V, Max. 0.8V
	OUTPUT		Hi: Typ. 8.0V, Min. 5.0V	Lo: Typ. -7.0V, Max. -5.0V
USB (Mouse)	I/O Level (differential)	Amplitude of differential signal	(D ⁺) - (D ⁻) > 0.2V D ⁺ >2.8V, D ⁻ <0.3V or D ⁺ >2.8V, D ⁻ <0.3V	
		Amplitude of signal	INPUT: "L"=0.8V or less, "H"=2.0V or more	
			OUTPUT: "L"=0.3V or less, "H"=2.8V~3.6V	
NETWORK	100Base-TX/10Base-T		Differential output: 1.9~2.1V (100Ω termination)	
Speaker			4W x 2	
Power supply			AC100~120V/5.0A, AC220~240V/2.1A	
Power consumption			460W	
Dimensions			418 (W) x 139 (H) x 319 (D) mm (Not including protruding parts)	
Weight			7.1kg	
Temperature range			Operation : 5~35°C Storage : -20~60°C	
Accessories			Remote control x1 Batteries x 2 RGB cable x 1 User's manuals x 1 Power cords x 3 LENS CAP x 1	

3. Names of each part

Projector

- (1) Speakers (x 2)
- (2) Focus ring
- (3) Zoom ring
- (4) Lamp cover
The lamp unit is inside.
- (5) Lens shift cover
- (6) Horizontal lens shift dial
- (7) Vertical lens shift dial
- (8) Front cover
- (9) Lens
- (10) Lens cover
- (11) Remote sensors (x 3)
- (12) Elevator feet (x 2)
- (13) Elevator knobs (x 2)
- (14) Filter cover
The air filter and intake vent are inside.
- (15) Exhaust vents
- (16) Intake vents
- (17) Rivet hole
- (18) Handle
- (19) Battery cover
- (20) Control panel
- (21) Rear panel



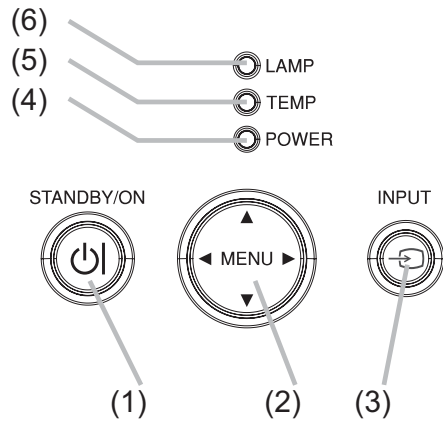
⚠ WARNING ▶ HOT! : Do not touch around the lamp cover and the exhaust vents during use or just after use, since it is too hot.

- ▶ Do not look into the lens or vents while the lamp is on, since the strong light is not good for your eyes.
- ▶ Do not grab the front cover to hold the projector up, since the projector may drop down.
- ▶ Do not handle the elevator knobs without holding the projector, since the projector may drop down.

⚠ CAUTION ▶ Maintain normal ventilation to prevent the projector from heating up. Do not cover, block or plug up the vents. Do not place anything that can stick or be sucked to the vents, around the intake vents. Clean the air filter periodically.

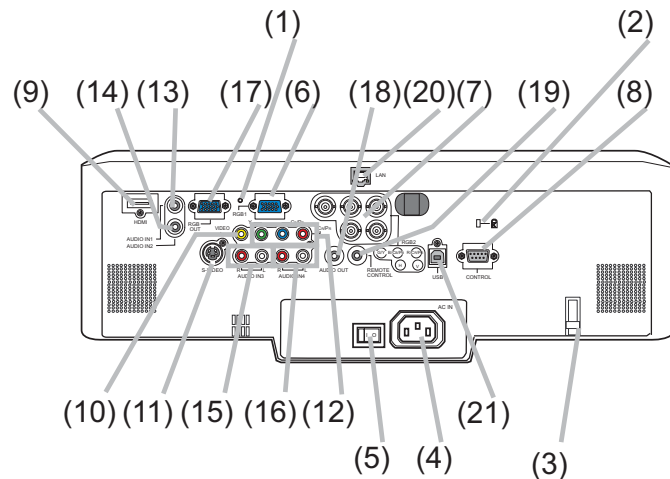
Control panel

- (1) **STANDBY/ON** button
- (2) **MENU** button
It consists of four cursor buttons.
- (3) **INPUT** button
- (4) **POWER** indicator
- (5) **TEMP** indicator
- (6) **LAMP** indicator



Rear panel

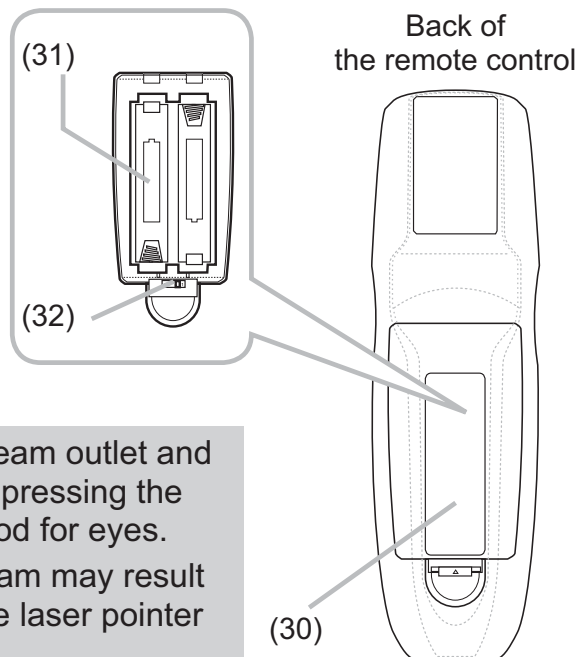
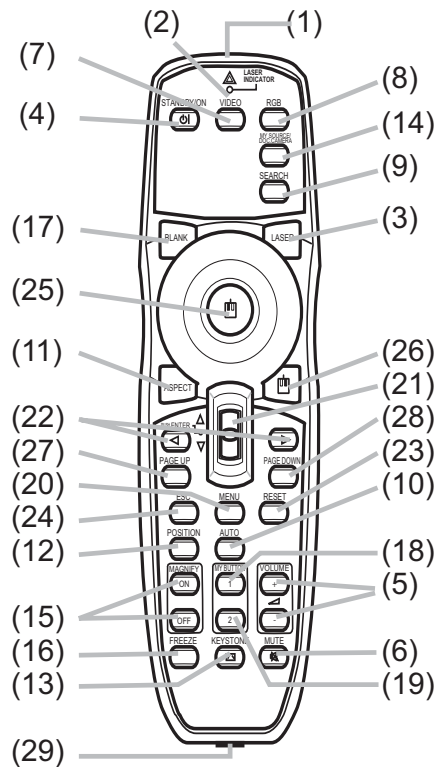
- (1) Shutdown switch
- (2) Security slot
- (3) Security bar
- (4) **AC IN** (AC inlet)
- (5) Power switch
- (6) **RGB1** port
- (7) **RGB2(G/Y, B/Cb/Pb, R/Cr/Pr, H, V)** port
- (8) **CONTROL** port
- (9) **HDMI** port
- (10) **VIDEO** port
- (11) **S-VIDEO** port
- (12) **COMPONENT (Y, Cb/Pb, Cr/Pr)** ports
- (13) **AUDIO IN1** port
- (14) **AUDIO IN2** port
- (15) **AUDIO IN3 (R/L)** ports
- (16) **AUDIO IN4 (R/L)** ports
- (17) **RGB OUT** port
- (18) **AUDIO OUT** port
- (19) **REMOTE CONTROL** port
- (20) **LAN** port
- (21) **USB** port



⚠ CAUTION ► Do not use the security bar and the security slot to prevent the projector from falling down, since it is not designed for it.
 ► Use the shutdown switch only when the projector is not turned off by normal procedure, since pushing this switch stops operation of the projector without cooling it down.

Remote control

- (1) Laser pointer
It is a beam outlet.
- (2) **LASER INDICATOR**
- (3) **LASER** button
- (4) **STANDBY/ON** button
- (5) **VOLUME+/-** buttons
- (6) **MUTE** button
- (7) **VIDEO** button
- (8) **RGB** button
- (9) **SEARCH** button
- (10) **AUTO** button
- (11) **ASPECT** button
- (12) **POSITION** button
- (13) **KEystone** button
- (14) **MY SOURCE/DOC.CAMERA** button
- (15) **MAGNIFY - ON/- OFF** buttons
- (16) **FREEZE** button
- (17) **BLANK** button
- (18) **MY BUTTON - 1** button
- (19) **MY BUTTON - 2** button
- (20) **MENU** button
- (21) Lever switch : acting 3 functions as below.
Cursor button ▲ : to slide toward the side marked ▲.
Cursor button ▼ : to slide toward the side marked ▼.
ENTER button : to push down the center point.
- (22) Cursor buttons ◀/▶
- (23) **RESET** button
- (24) **ESC** button
- (25) Mouse left button
- (26) Mouse right button
- (27) **PAGE UP** button
- (28) **PAGE DOWN** button
- (29) Wired remote control port
- (30) Battery cover
- (31) Battery holder
- (32) Frequency switch



⚠ WARNING ▶ Do not look into the beam outlet and point the beam at people and pets while pressing the LASER button, since the beam is not good for eyes.

⚠ CAUTION ▶ Note that the laser beam may result in hazardous radiation exposure. Use the laser pointer only for pointing on the screen.

4. Adjustment

4-1 Before adjusting

4-1-1 Selection of adjustment

When any parts in the table 4-1 are changed, choose the proper adjusting items with the chart.

Table 4-1: Relation between the replaced part and adjustment

Replaced part	Adjustment				
	Flicker (Chap.4-2)	Ghost (Chap.4-3)	PSIG (Chap.4-4)	White balance (Chap.4-5)	Color uniformity (Chap.4-6)
Dichroic optics unit	○	○	△	△	△
LCD/LENS prism assembly	○	○	○	○	○
PWB assembly Main	○	○	○	○	○
Lamp unit assembly	△	△	×	△	△

○ : means need for adjustment. × : means not need for adjustment.
△ : means recommended.

4-1-2 Setting of condition before adjustments

- Before starting adjustments, warm up projector for about 10 minutes. Turn off the automatic keystone function in OPTION Menu. If you changed [AUTO KEYSTONE] from [TURN ON] to [TURN OFF], set to [TURN ON] after adjustment.
- Set Zoom Wide to Max. And project an image with more than 1m (40 inches) in diagonal size.
- Normalizing the video adjustments
Press the [MENU] button to display the EASY menu. If Advanced menu comes up, move to the Easy menu.
Select the RESET in the EASY menu and press the [▶] or [ENTER] button to open the RESET dialog. Choose the EXECUTE with the [▲] button.
Note that the projector will not allow you to reset its adjustment values with no signal input.
- Perform all adjustments from the FACTORY MENU. Operate as follows to display the FACTORY MENU.

When you use the remote control...

- Press the [MENU] button of the remote control to display the Easy menu. (If the Advanced menu appears, move to the Easy menu.)
- Select the RESET in the Easy menu, and then press the [▶] or [ENTER] button.
- Next, press the [RESET] button one time. And hold the [RESET] button for 3 seconds or lon-

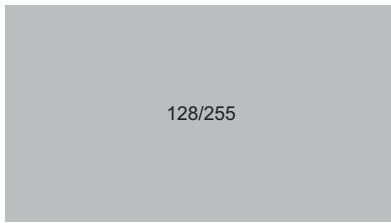
ger (the FACTORY MENU will appear).

When you use the keypad of the projector...

- Press the [▲], [▼], [◀] or [▶] button of the projector to display the Easy menu. (If the Advanced menu appears, move to the Easy menu.)
- Select the RESET in the Easy menu, and then press the [▶] or [ENTER] button.
- Next, press the [▼] button one time. And re-press and hold the [▼] button together with the [INPUT] button for 3 seconds or more (the FACTORY MENU will appear).

4-2 Flicker adjustment (V.COM adjustment)

Test pattern for the adjustment



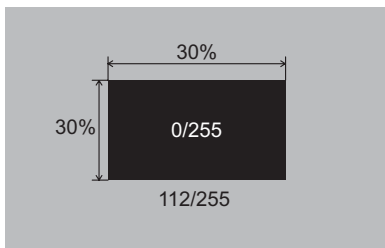
Adjustment procedure

1. Use DAC-P - V.COM - R: in the FACTORY MENU to adjust so that the flicker at the center of the screen is less than the flicker at the periphery. (When the flicker is about the same across the whole screen, adjust so that the flicker at the center of the screen is somewhat less than elsewhere.)
2. In the same way, use DAC-P - V.COM-G: in the FACTORY MENU to adjust the G color flicker.
3. In the same way, use DAC-P - V.COM-B: in the FACTORY MENU to adjust the B color flicker.

NOTE: The test pattern shown on the left sometimes has a horizontal line across the screen.

4-3 Ghost adjustment

Test pattern for the adjustment

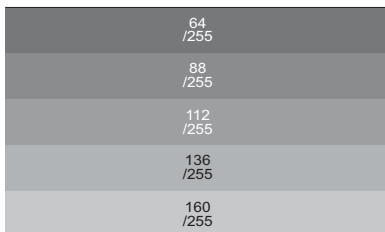


Adjustment procedure

1. Make this adjustment after completing the adjustment in the section 4-2. Set 0 to the GHOST R, G, B in OPTION - SERVICE Menu.
2. Use DAC-P - GHOST - R: in the FACTORY MENU to adjust so that R color ghost is at a minimum. (Set the adjustment value to default, and then raise the value. When a ghost appears to the left of a vertical line, reduce the value by 6 steps.)
3. In the same way, use DAC-P - GHOST-G: in the FACTORY MENU to adjust so that G color ghost is at a minimum.
4. In the same way, use DAC-P - GHOST-B: in the FACTORY MENU to adjust so that B color ghost is at a minimum.

4-4 PSIG adjustment (vertical bars adjustment)

Test pattern for the adjustment



↑↓ Press ENTER key



Adjustment procedure

1. Make this adjustment after completing the adjustment in the section 4-3.
2. Use DAC - P_PSIG - R : in the FACTORY MENU and use it so that vertical bars are minimized.
3. In the same way, use DAC - P_PSIG - G : in the FACTORY MENU and use it so that vertical bars are minimized.
4. In the same way, use DAC - P_PSIG - B : in the FACTORY MENU and use it so that vertical bars are minimized.

4-5 White balance adjustment (visual inspection)

Preparations

1. Perform these adjustments after the adjustments described in Section 4-4.

Adjustment procedure

1. First, adjust the G color.
2. Select GAMMA, SUB-CNT, and G: in the FACTORY MENU. If the background is white solid, press the [ENTER] key on the Remote control transmitter to change to [G] monochrome in the 33-tone grayscale.
3. Adjust GAMMA, SUB-CNT, and G: in the FACTORY MENU so that brightness of 33 steps is best.
4. Don't adjust GAMMA, SUB-BRT, and G: in the FACTORY MENU because we want to keep the best contrast ratio.
5. Then adjust colors R and B.
2. Reset gamma correction before adjustment.
 - Place the cursor on [GAMMA] in the FACTORY MENU, press the [RESET] key and select RESET.
6. Select GAMMA, SUB-CNT, and G: in the FACTORY MENU. If the background is white solid, press the [ENTER] key on the remote control to change to [W] monochrome in the 33-tone grayscale.
7. Adjust GAMMA, SUB-BRT, R: and B: in the FACTORY MENU so that low-brightness white balance is best.
8. Adjust GAMMA, SUB-CNT, R: and B: in the FACTORY MENU so that middle-brightness white balance is best.
9. Repeat steps 7 to 8 above, and adjust so that brightness white balance of 33 steps is best.

4-6 Color uniformity adjustments

Preparations

1. Perform these adjustments after the adjustments described in the section 4-5.

2. Make a color uniformity adjustments for the following tones.

- MIN tone (approx. 7% input signal)
- MID-1 tone (approx. 14% input signal)
- MID-2 tone (approx. 21% input signal)
- MID-3 tone (approx. 29% input signal)
- MID-4 tone (approx. 36% input signal)
- MID-5 tone (approx. 50% input signal)
- MID-6 tone (approx. 61% input signal)
- MAX tone (approx. 75% input signal)

NOTE: The brightness level of the test patterns in MID-4 and MID-6 is selectable.

3. Select the [C.UNIF.] in the FACTORY MENU and press the **[▶]** key. This operation displays the Adjust Tone menu (shown below) on the bottom of the screen.

To choose the tone to be adjusted, press the **[▶]** key and then use the **[▲]** or **[▼]** key.

Select the major adjustment lattice point No. and color, and then adjust them.

4. The major adjustment lattice point numbers (a total of 17 points) corresponds to the major adjustment lattice point positions in the diagram on the right. The color uniformity of the entire screen can be adjusted by adjusting the white balance for each of the points starting in order from the low numbers.

5. Adjustment point No.1 should not be adjusted, because it controls the brightness of the entire screen.

6. To temporarily turn correction off, place the cursor on [C.UNIF.] in the Adjust Tone menu and press the **[▼]** key. The ON/OFF menu appears. Place the cursor on [ON] with the **[▶]** key and press the **[▼]** key. To turn it on again, place the cursor on [OFF] and press the **[▲]** key.

7. Although this adjustment can also be made using internal signals, we will here use the [ENTER] key on the remote control to select the following two signals.

- Solid monochrome adjustment color (use G color adjustment when a color differential meter is used).
- Solid white (use for adjustment other than above).

8. Reset color-shading correction before adjustment.

- When resetting all values of 8 tones and all colors, place the cursor on [C.UNIF.] in the FACTORY MENU, press the [RESET] key and select RESET in the dialog.

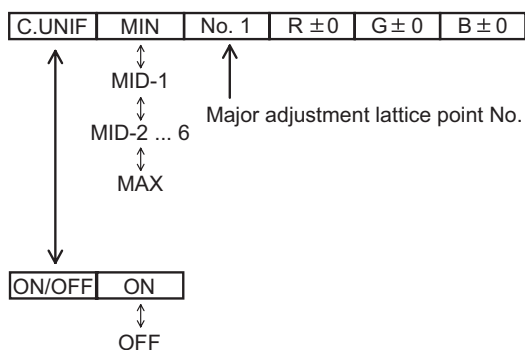
- When resetting only 1 tone, place the cursor on the tone such as MID-1 to be reset, press the [RESET] key and select RESET in the dialog.

- Single tone and monochrome resets cannot be performed.

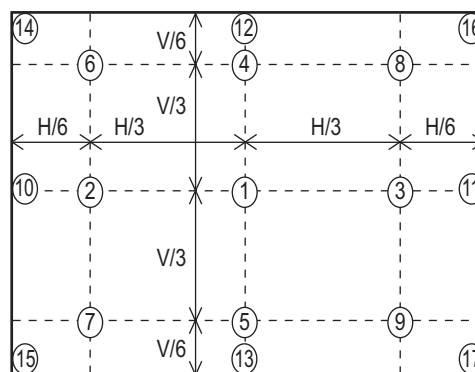
FACTORY MENU

VID-AD
C. UNIF.
DAC-P
GAMMA
STRIPE
OPTION

Adjust tone menu



Major adjustment lattice point position



Adjustment procedure 1

(When a color differential meter is used)

1. First adjust the [MID-1] tone [G:].
2. Select adjustment point [No.2][G:].
When the background is not [G] monochrome, press the [ENTER] key on the remote control to switch to solid [G] monochrome.
3. Measure the illumination at adjustment points No. 2, No.3, No.10 and No.11.
The values should be:
No.2 = Y2 [lx] No.10 = Y10 [lx]
No.3 = Y3 [lx] No.11 = Y11 [lx]
4. No.2 and No.3 adjustment points have the average of Y2 and Y3.
 $Y2 = (Y2 + Y3) / 2 \pm 2 [\%]$
 $Y3 = (Y2 + Y3) / 2 \pm 2 [\%]$
5. No.10 and No.11 adjustment points have the average of Y10 and Y11.
 $Y10 = (Y10 + Y11) / 2 \pm 2 [\%]$
 $Y11 = (Y10 + Y11) / 2 \pm 2 [\%]$
6. Then adjust the [MID-1] tone [R] and [B].
When the background is [G] monochrome, press the [ENTER] key on the remote control to switch to solid white.
7. Measure the color coordinates of adjustment point [No.1] and make a note of them.
Assume that they are $x = x1$, $y = y1$.
Note: When the CL-100 color and color difference meter is used, the $[\Delta]$ (delta) mode is convenient. When adjustment point [No.1] color coordinate has been selected, set the slide switch on the side to $[\Delta]$ (delta) while holding down the [F] button on the front panel. The measurement shown after this displays the deviation from measurement point 1.
8. Measure the color coordinates of measurement point [No.2] and adjust [No.2][R:] and [B:] so that the coordinates are as follows.
 $x = x1 \pm 0.005$, $y = y1 \pm 0.010$
9. Similarly, measure adjustment points [No.3] to [No.17] and adjust their color coordinates starting in order from the small number points.
This completes adjustments required for [MID-1].

Note: Since excessive correction may lead to a correction data overview during internal calculations, use the following values for reference.

[No.2] to [No.5] ± 40 or less

[No.6] to [No.9] ± 50 or less

[No.10] to [No.13] ± 70 or less

[No.14] to [No.17] ± 120 or less

10. Then adjust the [MIN] tone [G] so that the adjustment values are two times as much as [MID-1] tone [G] values.
This completes [G] color adjustments.
11. Then adjust [MIN] tone [R] and [B].
Select [No.2] [B:] and press the [ENTER] key on the Remote control transmitter to change to solid white.
12. Measure the color coordinates of adjustment point [No.1] and make a note of them.
Assume that they are $x = x1$, $y = y1$.
13. Now measure the color coordinates of measurement point [No.2] and adjust [No.2][R:] and [B:] so that the coordinates are as follows.
 $x = x1 \pm 0.005$, $y = y1 \pm 0.010$ (Target)
 $x = x1 \pm 0.020$, $y = y1 \pm 0.040$
14. Similarly, measure adjustment points [No.3] to [No.17] and adjust their color coordinates starting in order from the small number points.
This completes [MIN] tone adjustments.
15. Now make similar adjustments for [MID-2] tone.
(Adjust [MID-2] tone [G] so that the adjustment data set half as many as [MID-1] tone [G].)
16. Now make similar adjustments for [MID-3], [MID-5], [MAX] tones. (It is not necessary to adjust the [G] data in these tones.)
17. After completing the step 16, set the value of the [MID-4] tone [R]: [No.2] to the mean of the values of the [R]: [No.2] in the [MID-3] and [MID-4] tones.
18. Set all the values for the [No.2] to [No.17] of the [MID-4] tone [R] and [B] in the same way as the step 17.
19. Finally, set the data of the [MID-6] tone [R] and [B] using the values of the [MID-5] and [MAX] tones in the same way as the [MID-4] tone [R] and [B] adjustments in the step 17 and 18.

Adjustment procedure 2

(visual inspection)

1. First adjust [MIN] tone [G:].
2. Select [No.2] [G:].
If the background is [G] monochrome, press the [ENTER] key on the remote control to switch to solid white.
3. View measurement point [No.2] and [No.3].
Lower the [G] color intensity only of the color point whose [G] color is more intense than measurement point [No.1].
4. View measurement point [No.10] and [No.11].
Lower the [G] color intensity only of the color point whose [G] color is more intense than measurement point [No.1], and raise the intensity of the point whose color intensity is lower than measurement point [No.1].
5. Now adjust the [MIN] tone for colors [R] and [B].
6. View measurement points [No.2], [No.3], [No.10] and [No.11]. Adjust the [R] and [B] of each measurement point so that they have the

same color as measurement point [No.1].

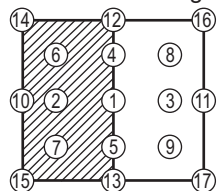
Adjustment technique:

First, adjust [B:] of the point whose color is to be adjusted so that it approximates that of [No.1]. If [R:] is low at this time, the image will have cyan cast, in which case [R:] is increased. On the other hand, if [R:] is excessive, the image will have a magenta cast, in which case [R:] is decreased.

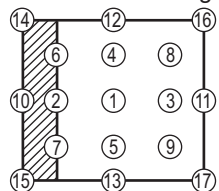
Overall, a cyan cast makes it easy to see color shading.

7. Next, view measurement points [No.4], [No.5], [No.12], [No.13] and make similar adjustments.
8. Then adjust measurement points [No.6], [No.7], [No.8], [No.9], [No.14], [No.15], [No.16] and [No.17]. This completes the [MIN] tone adjustments.
9. Make similar adjustments for other tones, except the [MID-4] and [MID-6] tones, as described in steps 1 to 8 above.

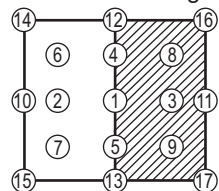
No. 2 deviation range



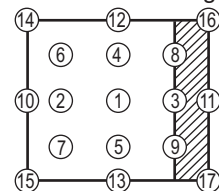
No. 10 deviation range



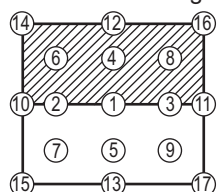
No. 3 deviation range



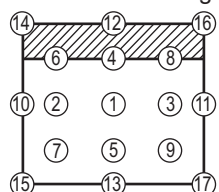
No. 11 deviation range



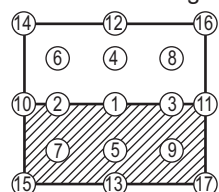
No. 4 deviation range



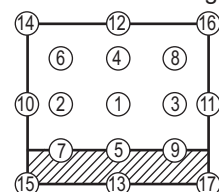
No. 12 deviation range



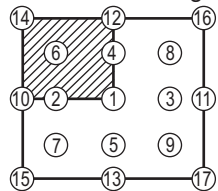
No. 5 deviation range



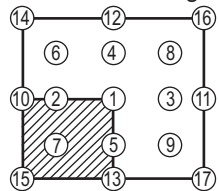
No. 13 deviation range



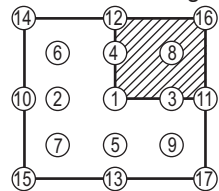
No. 6 deviation range



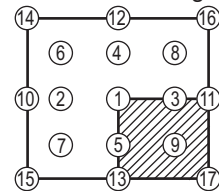
No. 7 deviation range



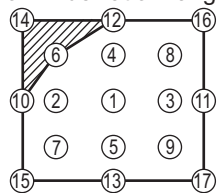
No. 8 deviation range



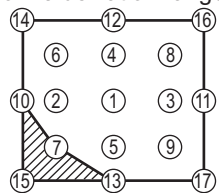
No. 9 deviation range



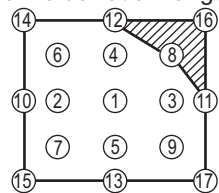
No. 14 deviation range



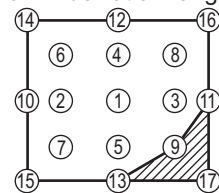
No. 15 deviation range



No. 16 deviation range

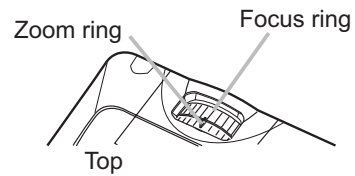


No. 17 deviation range



4-7 Adjusting the zoom and focus

1. Use the zoom ring to adjust the screen size.
2. Use the focus ring to focus the picture.

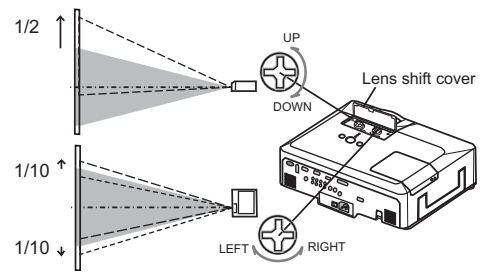


4-8 Adjusting the lens shift

1. Use the vertical lens shift knob to shift the picture upward or downward.
2. Use the horizontal lens shift knob to shift the picture left or right.

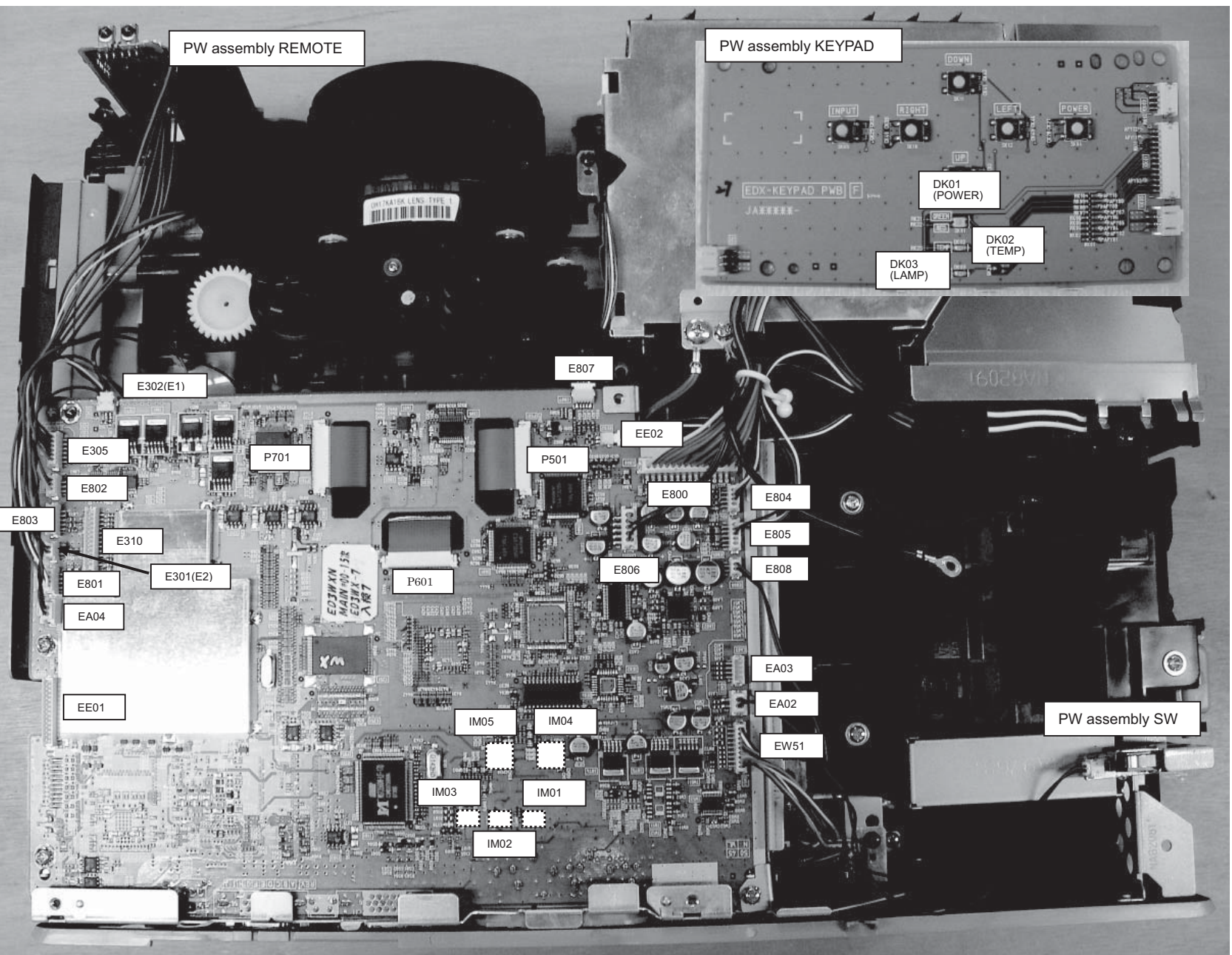
NOTE

When the vertical lens shift is adjusted, it is recommended to shift the picture upward for fine adjustment



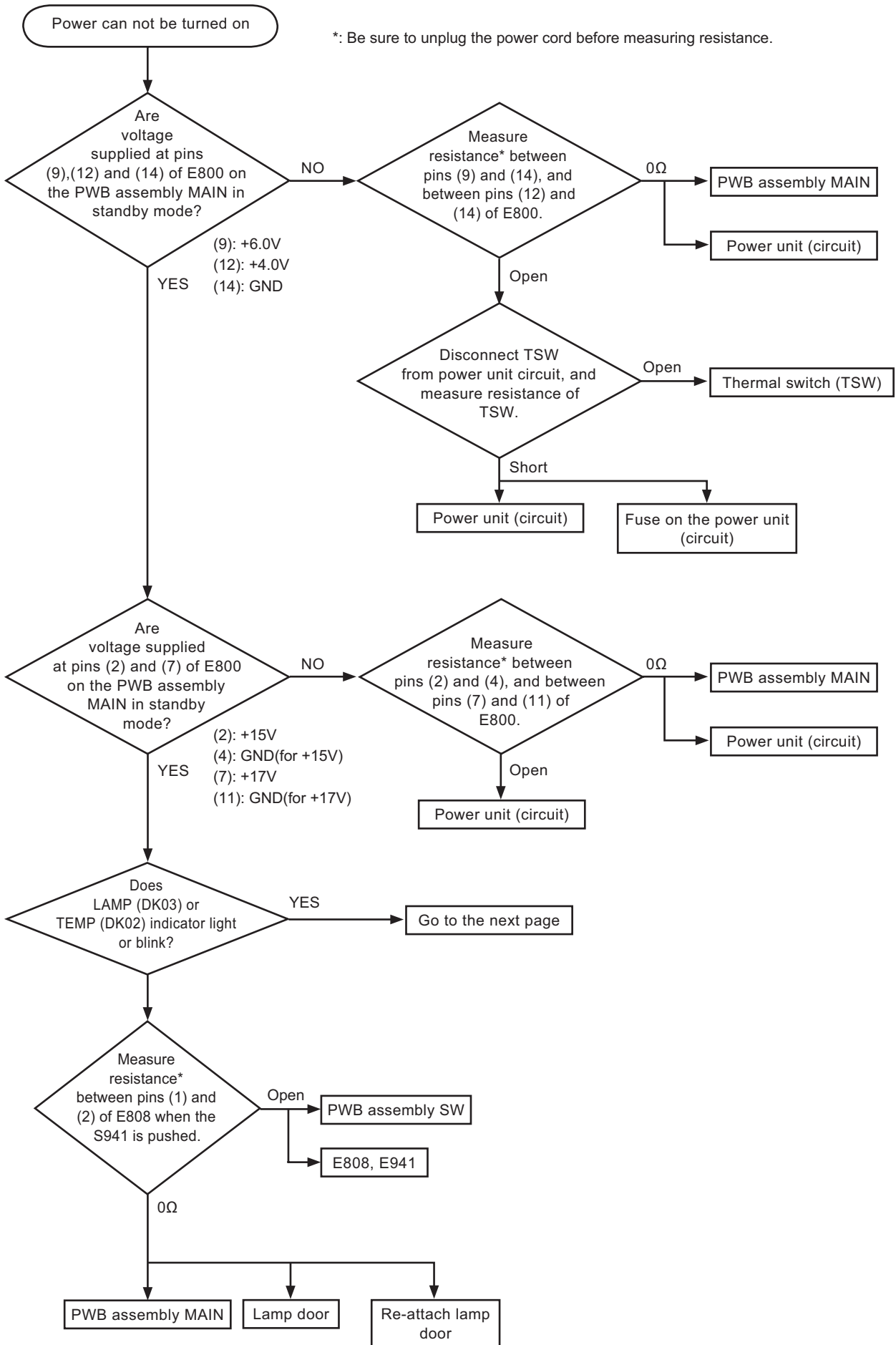
5. Troubleshooting

Check points



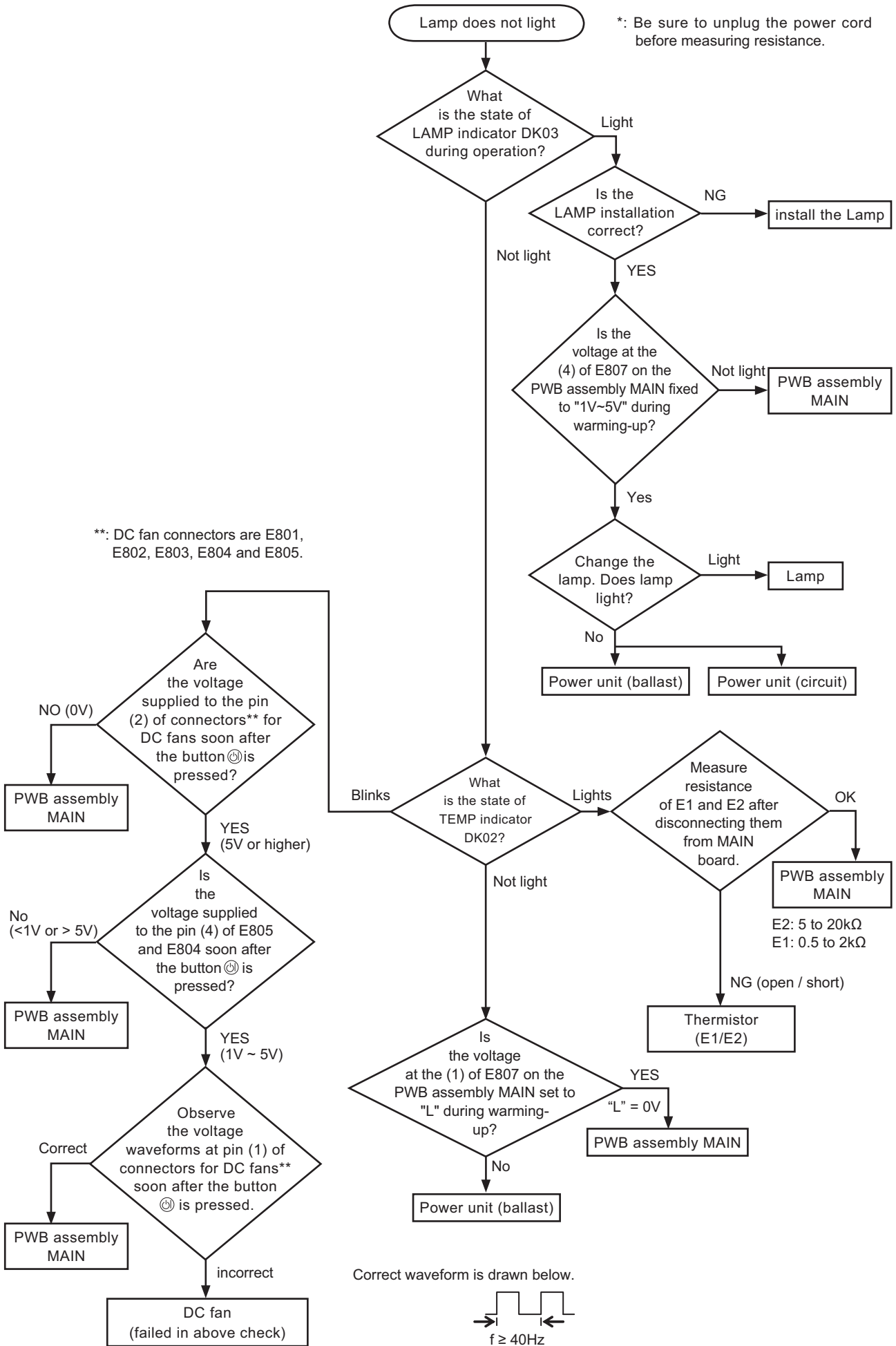
CP-SX635(ED3SX40N)

*: Be sure to unplug the power cord before measuring resistance.

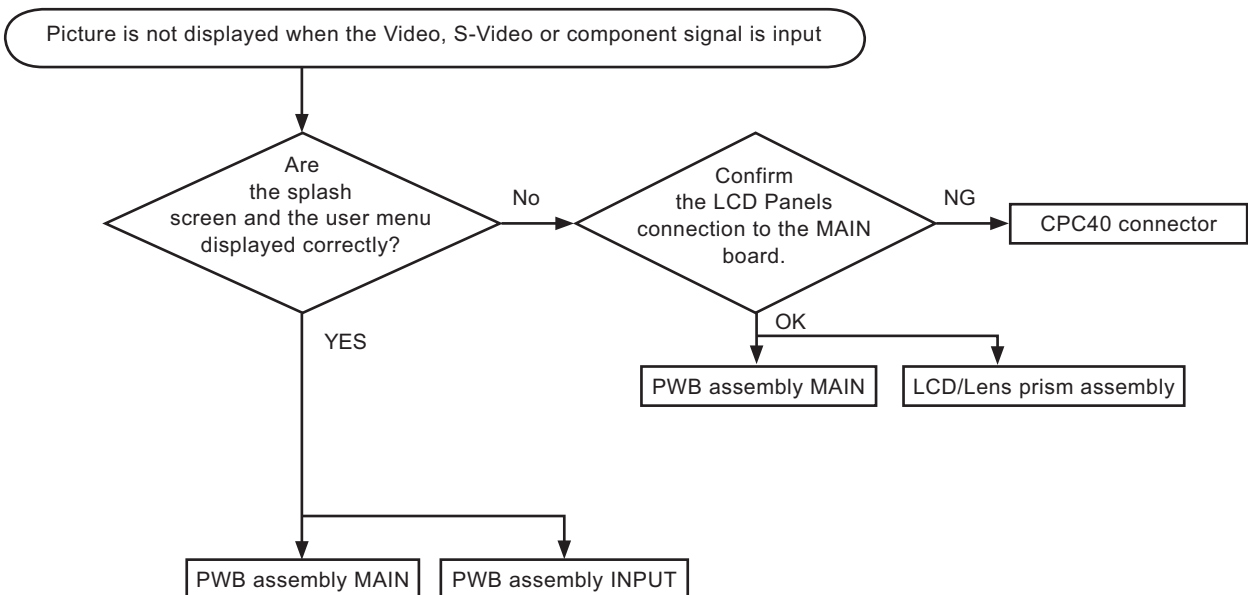
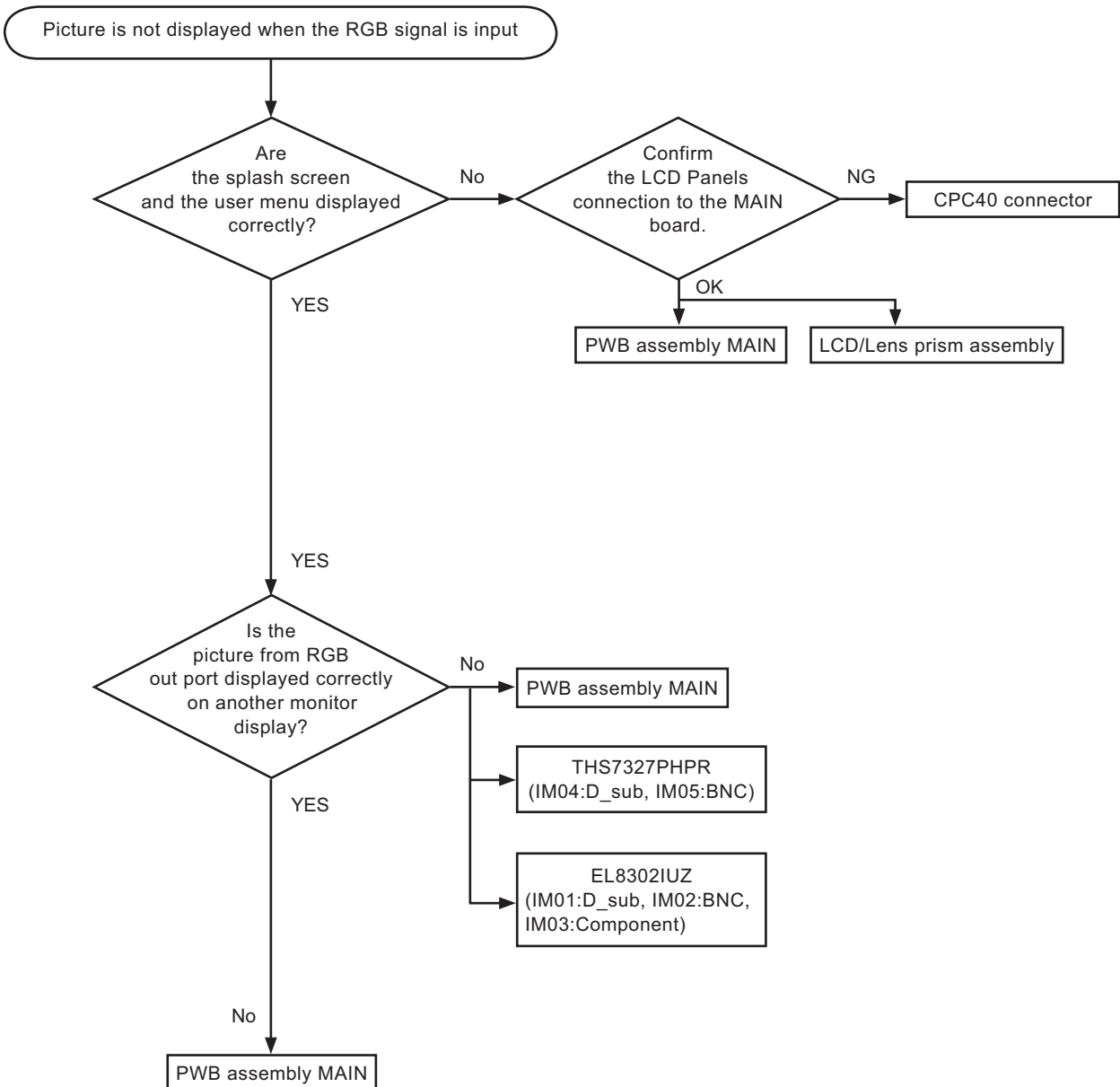


CP-SX635(ED3SX40N)

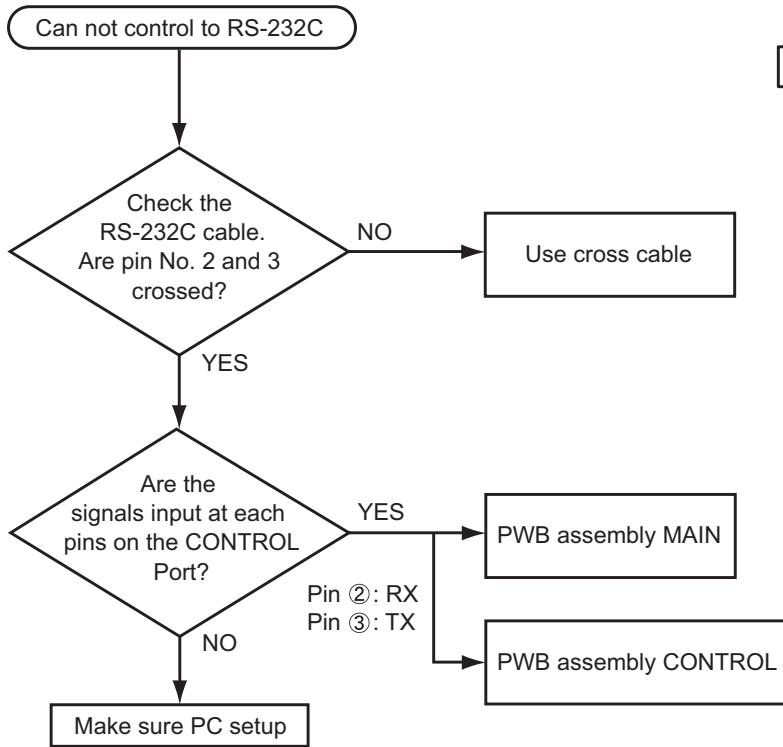
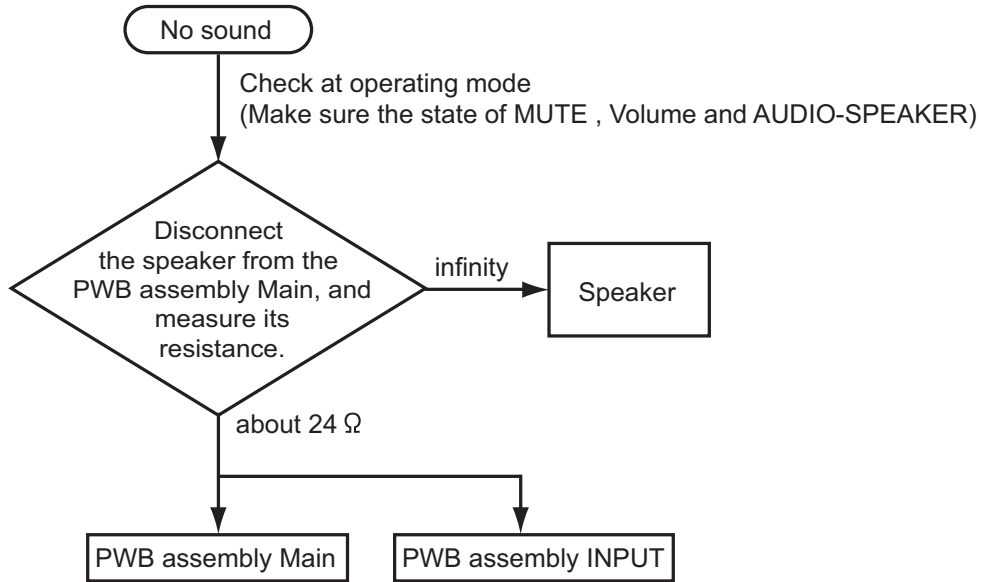
*: Be sure to unplug the power cord before measuring resistance.



CP-SX635(ED3SX40N)



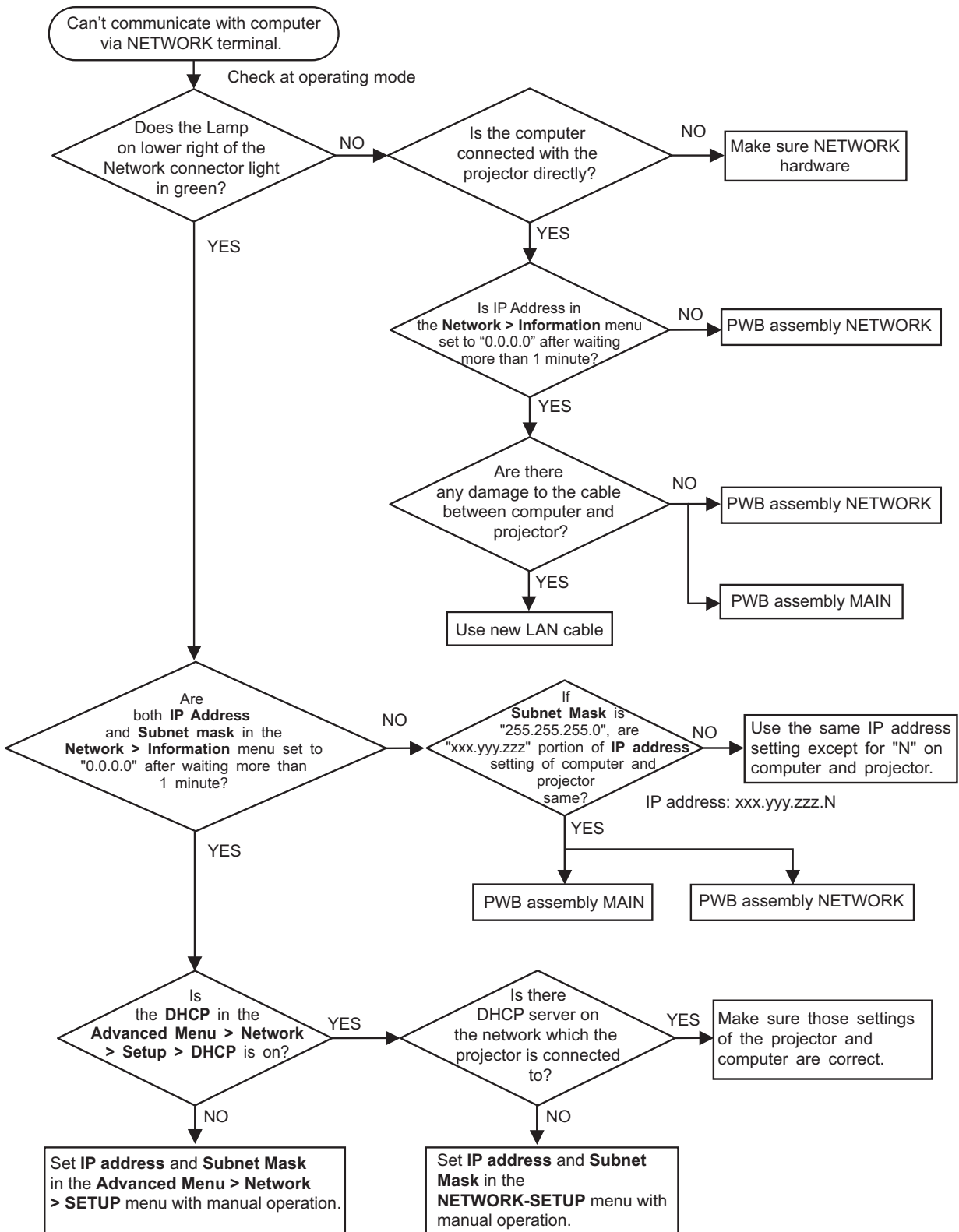
CP-SX635(ED3SX40N)



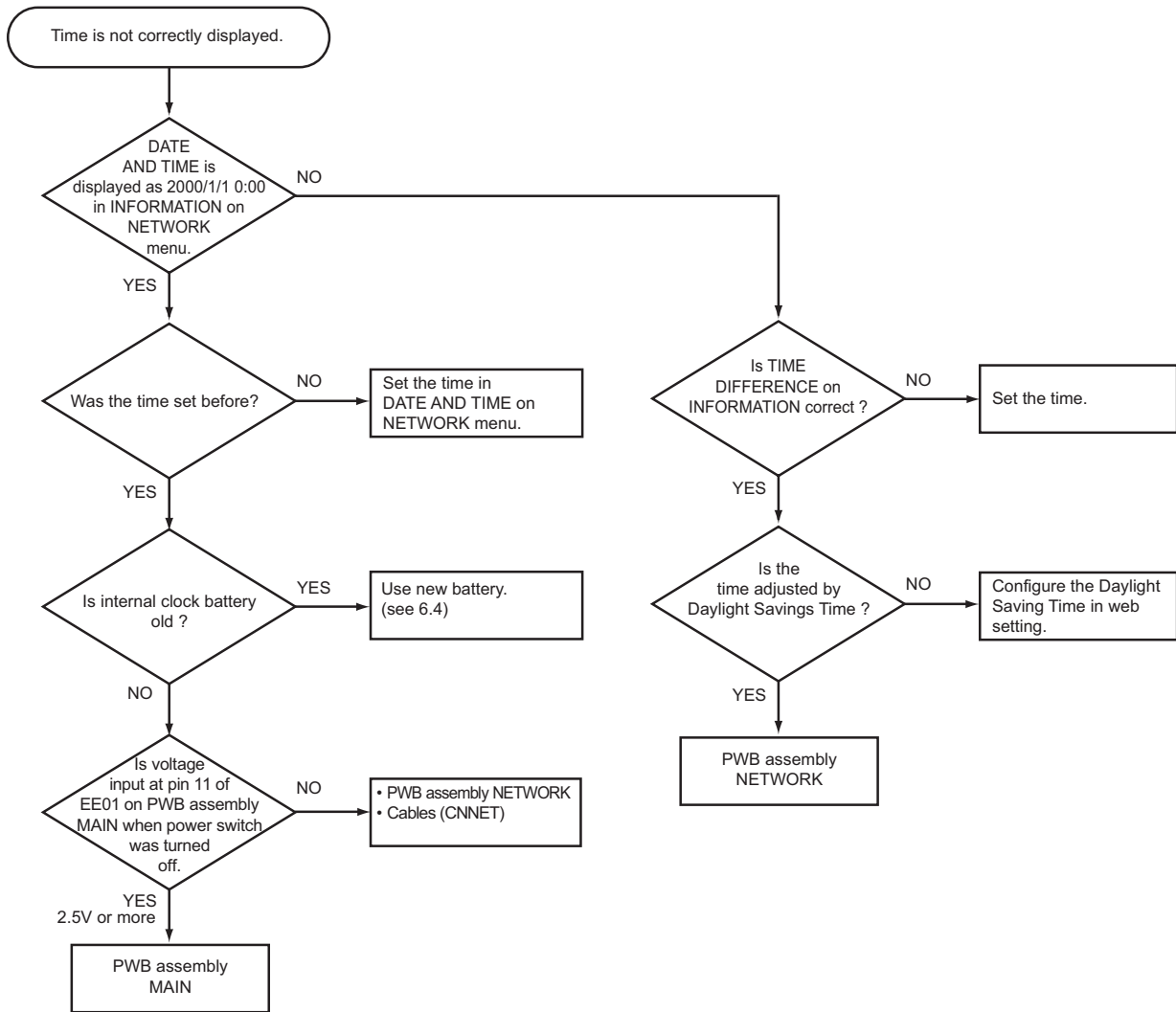
The check after parts change

1. PC power supply OFF
 2. Connection of cable
 3. Projector starting
 4. PC starting
- *When not operating :
PC set up change of cable.

CP-SX635(ED3SX40N)



CP-SX635(ED3SX40N)



6. Service points

6-1 Lead free solder [CAUTION]

This product uses lead free solder (unleaded) to help preserve the environment. Please read these instructions before attempting any soldering work.

⚠ CAUTION

Always wear safety glasses to prevent fumes or molten solder from getting into the eyes. Lead free solder can splatter at high temperatures (600°C).

■ Lead free solder indicator

Printed circuit boards using lead free solder are engraved with an "F" or "LF".

■ Properties of lead free solder

The melting point of lead free solder is 40-50°C higher than leaded solder.

■ Servicing solder

Solder with an alloy composition of Sn-3.0Ag-0.5Cu or Sn-0.7Cu is recommended.

Although servicing with leaded solder is possible, there are a few precautions that have to be taken. (Not taking these precautions may cause the solder to not harden properly, and lead to consequent malfunctions.)

Precautions when using leaded solder

- Remove all lead free solder from soldered joints when replacing components.
- If leaded solder should be added to existing lead free joints, mix in the leaded solder thoroughly after the lead free solder has been completely melted (do not apply the soldering iron without solder).

■ Servicing soldering iron

A soldering iron with a temperature setting capability (temperature control function) is recommended.

The melting point of lead free solder is higher than leaded solder. Use a soldering iron that maintains a high stable temperature (large heat capacity), and that allows temperature adjustment according to the part being serviced, to avoid poor servicing performance.

Recommended soldering iron:

- Soldering iron with temperature control function (temperature range: 320-450°C)

Recommended temperature range per part:

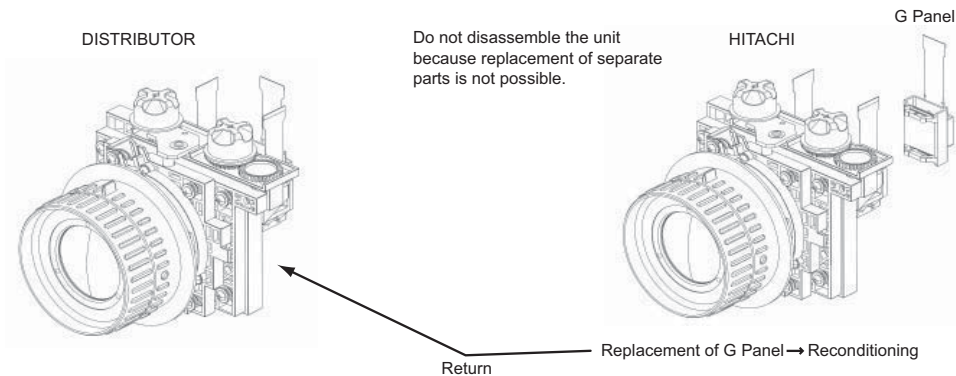
Part	Soldering iron temperature
Mounting (chips) on mounted PCB	320°C±30°C
Mounting (chips) on empty PCB	380°C±30°C
Chassis, metallic shield, etc.	420°C±30°C

The PWB assembly which has used lead free solder

PWB assembly MAIN	PWB assembly INPUT
PWB assembly REMOTE	PWB assembly SW
PWB assembly CONTROL	PWB assembly NETWORK
PWB assembly KEYPAD	POWER UNIT (BALLAST)
PWB assembly BATTERY	POWER UNIT (CIRCUIT)

6-2 Before Replacing The LCD/Lens Prism

You should not replace separately the parts of the liquid crystal LCD/Lens prism because it works properly only when used together. Therefore, regarding these parts, you can either replace part, LCD/Lens prism assembly, or send the whole unit LCD/Lens prism assembly back to HITACHI, where we will replace the malfunctioning part, recondition the device and send it back to you.



6-3 Cleaning up dust from panels and optical filters

! WARNING

Wear sunglasses to protect your eyes when you maintain the projector with its lamp on.

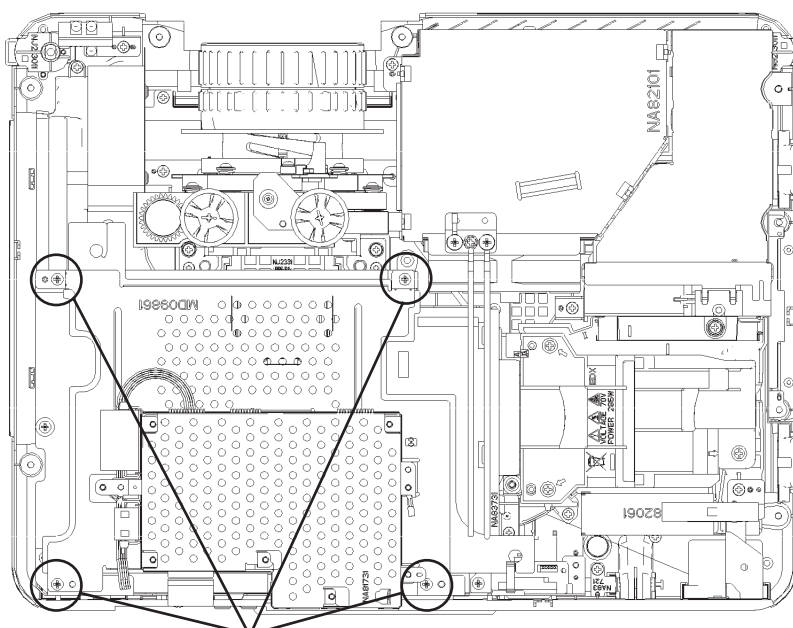
1. Preparation

Please prepare cleaning tools and materials as follows. And prepare relatively clean room not to work in additional dust, while removing operation.

- (1) Swab for cleaning : P#: NX05742, "Cotton stick L70"
- (2) Air duster (Dust blower, spray can)
- (3) Vacuum cleaner

2. Disassemble and setting up.

- (1) Turn off the projector, and unplug the power cord.
- (2) Remove the lamp cover and upper case, according to the disassembling diagram of chapter 8.
- (3) Unscrew the shield bracket of PWB assembly MAIN to make it free.



Remove these screws

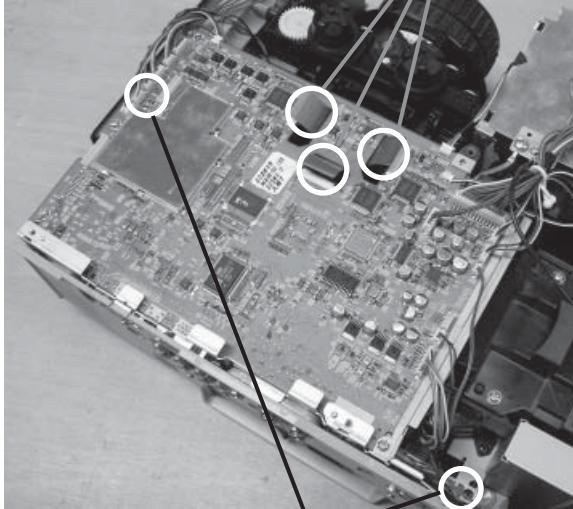
! CAUTION

Make sure to remove the shield bracket before removing the PWB assembly MAIN. Otherwise, flexible cables will be damaged.

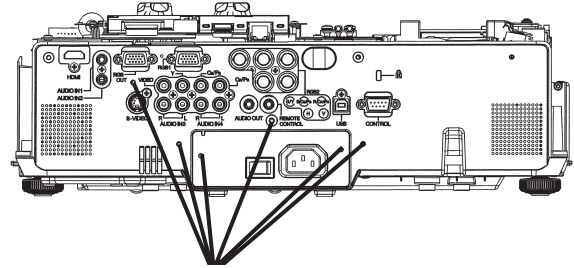
CP-SX635(ED3SX40N)

(4) Unscrew PWB assembly MAIN to make it free and disconnect the LCD panel flexible cables.

Flexible cables of LCD panel



Remove these screws

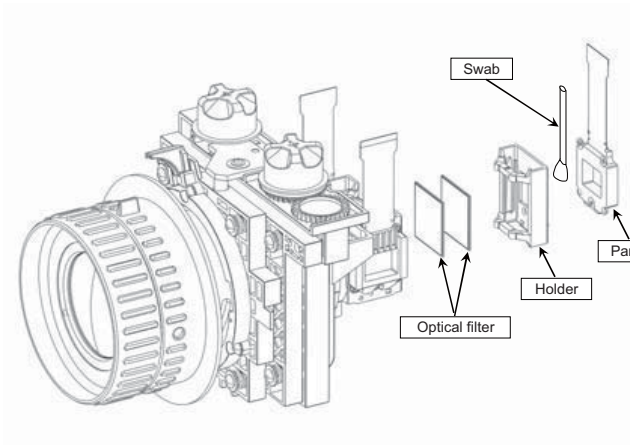


Remove these 6 screws

(5) Press and hold the switch S941 using an insulator during maintenance.

(6) Keep the unscrewed wires away from all of electric parts.

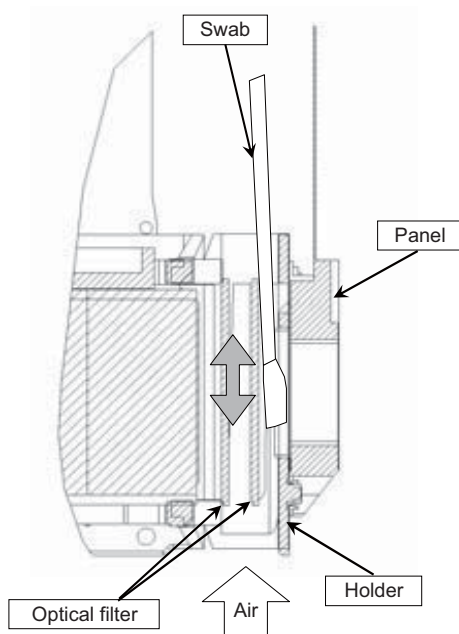
3. Maintenance point



Each color part has same construction. By using swab and air duster, you can easily remove dust from panel and optical filter.

4. Cleaning the panels and optical filters

- (1) Turn on the set and lit on the lamp.
- (2) By using swab and air duster, remove the dust. Focusing dust makes you check the dust on screen.



- While removing the dust, separated dust will be blown off by air cooling system.
- Please pay attention not to damage panels and optical filters.

5. Re-assembly

- (1) Turn off the set and unplug the power cord.
- (2) Remove an insulator from S941.
- (3) Screw down the PWB assembly MAIN and connect the LCD panel flexible cables to the PWB assembly MAIN.
- (4) Re-assemble the set.
- (5) While re-assembling, please clean the intake filter by using a vacuum cleaner.

6-4 Battery

⚠ WARNING

Always handle the batteries with care and use them only as directed. Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

And also improper use may result in cracking or leakage, which could result in fire, injury and/or pollution of the surrounding environment.

- Be sure to use only the batteries specified. Do not use batteries of different types at the same time. Do not mix a new battery with used one.

- Make sure the plus and minus terminals are correctly aligned when loading a battery.

If the battery is placed in the battery holder upside-down, it may be hard to remove.

- Keep a battery away from children and pets. If swallowed consult a physician immediately for emergency treatment.

- Do not short circuit or solder a battery.

- Do not allow a battery in a fire or water. Keep batteries in a dark, cool and dry place.

- If you observe a leakage of a battery, wipe out the flower and then replace a battery. If the liquid adheres to your body or clothes, rinse well with water immediately.

- Obey the local laws on disposing the battery.

6-4-1 Replacing Internal Clock Battery

Consumption of the battery makes the clock not to work correctly. When the clock is wrong or it has stopped, please replace the battery according to the following procedures.

1. Turn the projector off, and unplug the power cord. Allow the projector to cool sufficiently.
2. After making sure that the projector has cooled adequately, slowly turn over the projector, so that the bottom is facing.
3. Turn the battery cover fully in the direction indicated "OPEN" using a coin or the like, and pick the cover up to remove it.
4. One of two kinds of clock battery holder, A or B shown to the right, is inside the battery cover.

For A holder:

Pry up the battery using a flathead screwdriver or the like to take it out. While prying it up, put a finger lightly on the battery since it may pop out of the holder.

For B holder:

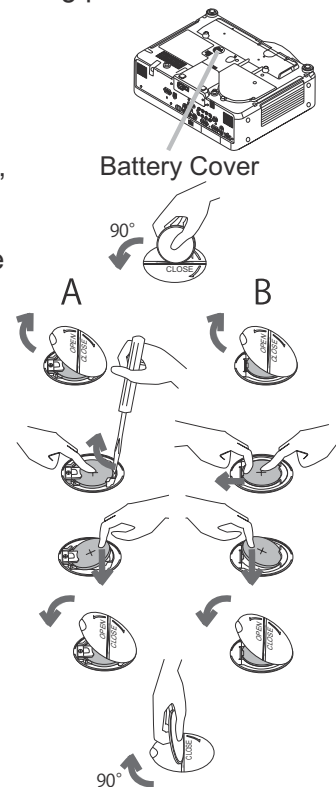
Press the metal claw of the battery holder putting a finger lightly on the battery since it may pop out of the holder.

Then the battery will come up. Remove the battery.

5. Replace the battery with a new **HITACHI MAXELL**, Part No. **CR2032** or **CR2032H**.

Slide the battery in under the plastic claw, and push it into the holder until it clicks.

6. Replace the battery cover in place, then turn it in the direction indicated "CLOSE" using such as coins, to fix.



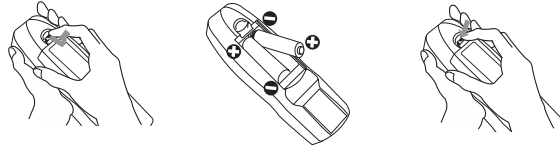
If the battery is placed in the battery holder upside-down, follow the procedure below to remove and reload it properly.

1. Remove the battery cover as described in steps 1 through 3 above.
2. While lifting the side of the projector closest to the lens, press the metal claw of the battery holder. The battery will fall out of the holder, so be careful not to lose it.

NOTE

- The internal clock's time will be reset when the battery is removed. Please reconfigure the time via the menu or a web browser after replacing the battery.

6-4-2 Potting batteries into the remote control



- Use the batteries included in this product or two new batteries of the specified type: **HITACHI MAXELL**, part number **LR6** or **R6P**.
- 1. Remove the battery cover.
 - Slide back and remove the battery cover in the direction of the arrow.
- 2. Insert the batteries.
 - Align and insert the two AA batteries according to their plus and minus terminals as indicated in the remote control.
- 3. Close the battery cover.
 - Replace the battery cover in the direction of the arrow and snap it back into place.

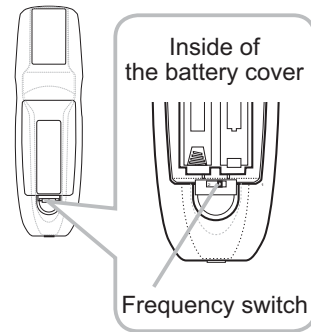
Changing the frequency of remote control signal

The accessory remote control has the choice of the mode 1 or the mode 2, in the frequency of its signal.

If the remote control does not function properly, attempt to change the signal frequency. Please remember that the “REMOTE FREQ.” in SERVICE item of OPTION menu of the projector to be controlled should be set to the same mode as the remote control.

To set the mode of the remote control, slide the knob of the frequency switch inside the battery cover into the position indicated by the mode number to choose.

Back of the remote control



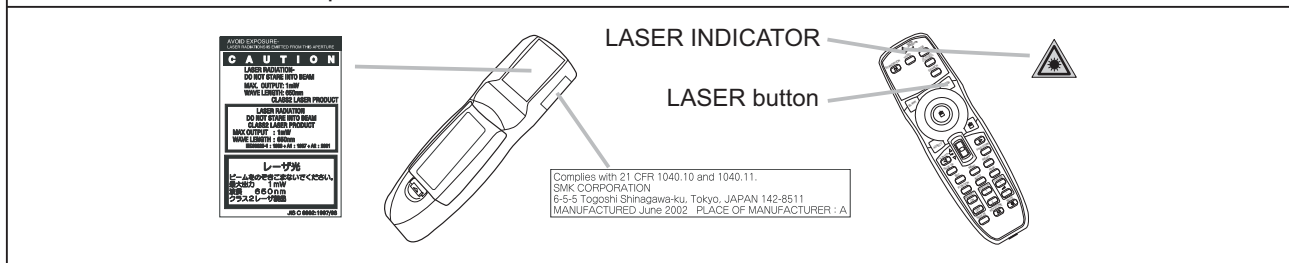
● About the Laser pointer

⚠ WARNING

- The laser pointer of the remote control is used in place of a finger or rod. Never look directly into the laser beam outlet or point the laser beam at other people. The laser beam can cause vision problems.

⚠ CAUTION

- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



This remote control has a laser pointer in place of a finger or rod. The laser beam works and the LASER INDICATOR lights while the LASER button is pressed.

6-5 Air filter

WARNING

- Before caring, make sure the power switch is off and the power cable is not plugged in, then allow the projector to cool sufficiently. The care in a high temperature state of the projector could cause an electric shock, a burn and/or malfunction to the projector.
- Use only the air filter of the specified type. Do not use the projector with the air filter and the filter cover removed. It could result in a fire and/or malfunction to the projector.
- The air filter should be cleaned periodically. If the air filter becomes clogged by dust or the like, internal temperatures rise and could cause a fire, a burn and/or malfunction to the projector.

NOTE

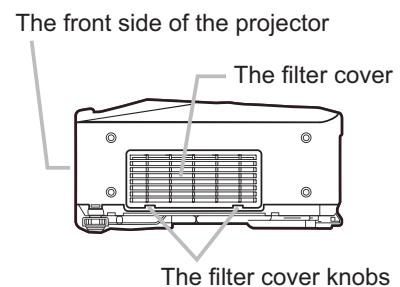
- Please replace the air filter when it is damaged or too soiled, and also when you replace the lamp.
- Please reset the filter time only when you have cleaned or replaced the air filter, for a suitable indication about the air filter.
- The projector may display the message such as “CHECK THE AIR FLOW” or turn itself off, to prevent the internal heat level rising.

If the air filter becomes clogged by dust or the like, internal temperatures rise and could cause a fire, a burn and/or malfunction to the projector. When the indicators or a message prompts to clean the air filter, clean the air filter as soon as possible.

Please check and clean the air filter periodically, even if there is no message. Please replace the air filter when it is damaged or too soiled.

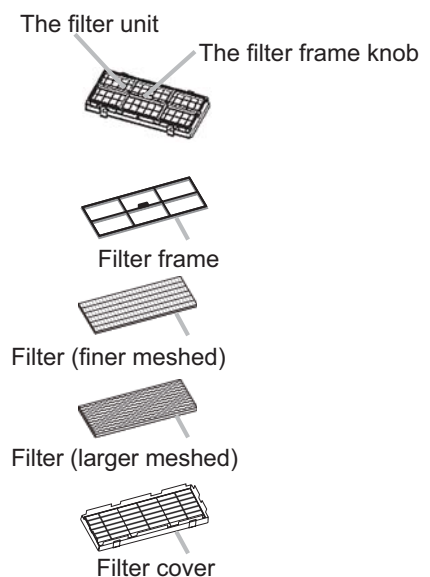
And also when you replace the lamp, please replace the air filter. An air filter of specified type will come together with a replacement lamp for this projector.

1. Turn the projector off, and unplug the power cord. Allow the lamp to cool for at least 45 minutes.
2. When the projector is suspended from the ceiling, apply the vacuum cleaner to and around the filter cover first, to prevent penetration of dust or the like.
3. Hold the filter cover knobs while lifting it. The filter unit made up the filter cover and others will come off.
4. Use a vacuum cleaner for the filter vent of the projector and the filter frame side of the filter unit.










If the air filter is damaged or too soiled, replace it according to the following procedure number 5 to 7. Otherwise, please jump to the procedure number 8.

5. To remove the filter frame, hold the filter cover while holding and pulling the filter frame's knob by another hand.
6. Set new filters where former filters were. Put the larger meshed filter into a filter cover first. Then put the finer meshed filter on the larger meshed one.
7. Put the filter frame back.
8. Put the filter unit back into the projector.
9. Turn the projector on and reset the filter time using the FILTER TIME function.



- (1) Press the MENU button to display a menu. When the EASY MENU has appeared, please skip the next step (2).
- (2) Point at the “OPTION” in the left column of the menu using ▼/▲ button, then press the ► button.
- (3) Point at the “FILTER TIME” using ▼/▲ button, then press the ► button. A dialog will appear.
- (4) Press the ▲ button to select “RESET” on the dialog. It performs resetting the filter time.

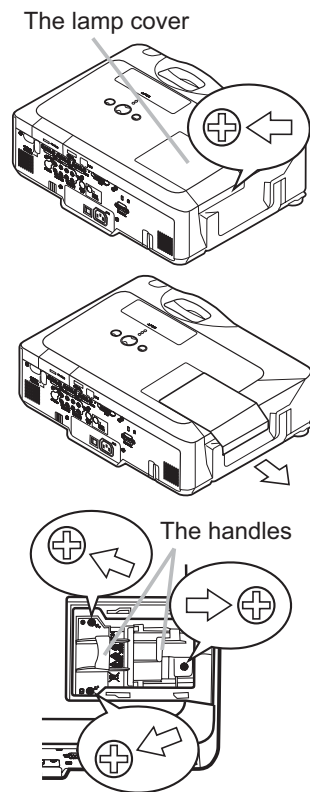
6-6 Lamp

 WARNING	 <small>HIGH VOLTAGE</small>	 <small>HIGH TEMPERATURE</small>	 <small>HIGH PRESSURE</small>
<p>• The projector uses a high-pressure mercury glass lamp. The lamp can <u>break with a loud bang, or burn out</u>, if jolted or scratched, handled while hot, or worn over time. Note that each lamp has a different life-time, and some may burst or burn out soon after you start using them. In addition, when the bulb bursts, it is possible for <u>shards of glass</u> to fly into the lamp housing, and for <u>gas containing mercury</u> to escape from the projector's vent holes.</p>			
<p>• About disposal of a lamp • This product contains a mercury lamp; do not put it in the trash. Dispose of in accord with environmental laws. For lamp recycling, go to www.lamprecycle.org. (in the US) For product disposal, contact your local government agency or www.eiae.org (in the US) or www.epsc.ca (in Canada).</p>			
 Disconnect the plug from the power outlet	<ul style="list-style-type: none"> • If the lamp should break (it will make a loud bang when it does), unplug the power cord from the outlet. Note that shards of glass could damage the projector's internals, or cause injury during handling. • If the lamp should break (it will make a loud bang when it does), ventilate the room well, and make sure not to breathe the gas that comes out of the projector vents, or get it in your eyes or mouth. • Before replacing the lamp, turn the projector off and unplug the power cord, then wait at least 45 minutes for the lamp to cool sufficiently. Handling the lamp while hot can cause burns, as well as damaging the lamp. 		
	<ul style="list-style-type: none"> • Never unscrew except the appointed (marked by an arrow) screws. • Do not open the lamp cover while the projector is suspended from above. This is dangerous, since if the lamp's bulb has broken, the shards will fall out when the cover is opened. • Do not use the projector with the lamp cover removed. At the lamp replacing, make sure that the screws are screwed in firmly. Loose screws could result in damage or injury. 		
	<ul style="list-style-type: none"> • Use only the lamp of the specified type. • If the lamp breaks soon after the first time it is used, it is possible that there are electrical problems elsewhere besides the lamp. • Handle with care: jolting or scratching could cause the lamp bulb to burst during use. • Using the lamp for long periods of time could cause it dark, not to light up or to burst. When the pictures appear dark, or when the color tone is poor, please replace the lamp as soon as possible. Do not use old (used) lamps; this is a cause of breakage. 		

● Replacing the Lamp

A lamp has a finite product life. Using the lamp for long periods of time could cause the pictures darker or the color tone poor. Note that each lamp has a different lifetime, and some may burst or burn out soon after being started using.

1. Turn the projector off, and unplug the power cord. Allow the projector to cool for at least 45 minutes.
2. Prepare a new lamp.
3. Loosen the screw (marked by arrow) of the lamp cover and then slide the lamp cover to the side to remove it.
4. Loosen the 3 screws (marked by arrow) of the lamp, and slowly pick up the lamp by the handles.
5. Insert the new lamp, and retighten firmly the 3 screws of the lamp that are loosened in the previous process to lock it in place.
6. Slide the lamp cover back in place and firmly fasten the screw of the lamp cover.
7. Turn the projector on and reset the lamp time using the LAMP TIME function in the OPTION menu.
 - (1) Press the MENU button to display a menu. Only when the EASY MENU has appeared, please perform the next step (2).
 - (2) Point at the "Go to Advanced Menu ..." in the menu using ▼/▲ button, then press the ► button.
 - (3) Point at the "OPTION" in the left column of the menu using ▼/▲ button, then press the ► button.
 - (4) Point at the "LAMP TIME" using ▼/▲ button, then press the ► button. A dialog will appear.
 - (5) Press the ▲ button to select "RESET" on the dialog. It performs resetting the lamp time.



NOTE

- Please reset the lamp time only when you have replaced the lamp, for a suitable indication about the lamp.

6-7 Lens

⚠ WARNING

- Before replacing the projector lens, be sure to read this manual, the “User’s Manual-Safety Guide” and the “Optional Lens User’s Manual” of the LCD projector for use with this lens.
- Do not place the lens in a location subject to direct sunlight or other strong lighting or near heat-radiating equipment.
- Do not subject the lens to shocks.
- Be sure to unplug the LCD projector before replacing the lens.
- Do not touch the fan of the LCD projector during operation.
- Before replacing the lens, be sure to turn off and unplug the LCD projector, and allow at least 45 minutes for the projector to fully cool.
- When attaching, take care so that dust not enter inside.

⚠ CAUTION

- When replacing the lens, do not touch the LCD panels or polarizing plates of the LCD projector or subject them to shocks.
- When replacing the lens, be careful not to damage the connectors or wires inside the LCD projector.
- After replacing the lens, part of the lens may stick out from the LCD projector.

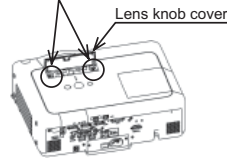
⚠ ATTENTION

- Do not touch the lens directly with your hands or fingers.
This can dirty the lens and cause deterioration in image quality.
- The lens is a precision optical device. Carefully handle the lens without subjecting it to shocks or vibrations.
- When resting the lens on a surface, place the lens face down on a soft cloth.
- Select Lens type in OPTION-SERVICE-LENS TYPE Menu after changing the Lens.

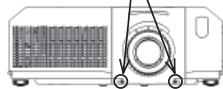
Replacing the Lens

1.Remove the front cover.

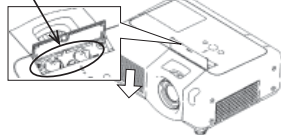
- (1) Remove the 2 screws marked \triangle (triangle) from the inside of the lens knob cover.



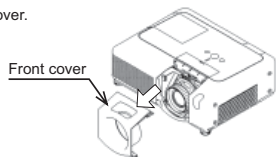
- (2) Remove the 2 screws marked \triangle (triangle) from the front of the projector.



- (3) Turn the lens shift dial, and lower the projection lens to the lowest position.

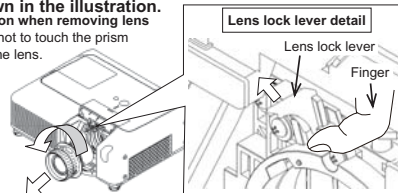


- (4) Remove the front cover.



2.Insert your finger from the side, turn the lens to the left and remove while pulling up on the lens lock lever, as shown in the illustration.

- ※ Caution when removing lens
Be sure not to touch the prism behind the lens.

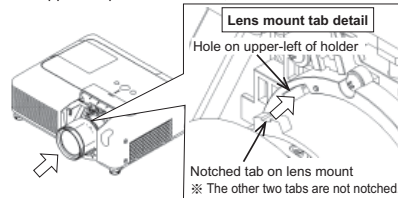


3.Attach the replacement projection lens.

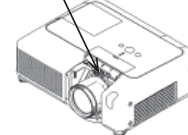
- (1) Attach the lens blinder to the rear of the projection lens while holding open the lens blinder hole.



- (2) Line up the notched tab on the lens mount with the hole on the upper-left part of the holder, and insert the lens.



- (3) Turn the lens to the right until it “clicks” into place to ensure that the lens is locked in place.



4.Reattach the front cover to complete lens replacement.

- (1) Reattach the included front cover.
 (2) Re-fasten the 2 screws marked \triangle (triangle) that were removed in step 1.(2).
 (3) Re-fasten the 2 screws marked \triangle (triangle) that were removed in step 1.(1).

6-8 Other care

WARNING

Before caring, make sure the power switch is off and the power cable is not plugged in, and then allow the projector to cool sufficiently. The care in a high temperature state of the projector could cause a burn and/or malfunction to the projector.

Avoid wetting the projector or inserting liquids in the projector. It could result in a fire, an electric shock, and and/or malfunction to the projector.

- Don't put a container containing water , cleaner or chemicals near the projector.
- Don't use aerosols or sprays.

CAUTION

Please take right care of the projector according to the following. Incorrect care could cause not only an injury but adverse influence such as discoloration, peeling paint, etc.

- Do not use cleaner or chemicals other than those listed below.
- Do not polish or wipe with hard objects.

● **Inside of the projector**

In order to ensure the safe use of the projector, it needs to clean and inspect the projector about once a year.

● **Caring for the lens**

If the lens is flawed, soiled or fogged, it could cause deterioration of display quality. Please take care of the lens, being cautions of the handling.

1. Turn the projector off, and unplug the power cord. Allow the projector to cool sufficiently.
2. After making sure that the projector is cool adequately, lightly wipe the lens with a commercially available lens-cleaning wipe. Do not touch the lens directly with your hand.

● **Caring for the cabinet and remote control**

Incorrect care could have adverse influence such as discoloration, peeling paint, etc.

1. Turn the projector off, and unplug the power cord. Allow the projector to cool sufficiently.
2. After making sure that the projector is cool adequately, lightly wipe with gauze or a soft cloth.
If soiling is severe, dip soft cloth in water or a neutral cleaner dilute in water, and wipe lightly after wringing well. Then, wipe lightly with a soft, dry cloth.

6-9 Notice of AUTO adjustment

Use of AUTO adjustment with the image through RGB input optimizes V_POSI, H_POSI, and H_PHASE automatically.

In case that projected image has dark tone around its peripheral, AUTO operation sometimes makes artifacts in the image, shifts capture area and so on. Those failures are caused by period of image data is not exactly distinguished to period of blanking on signal processing.

To avoid such phenomena, AUTO function should be used with the full size picture that has bright tone on its peripheral.



Image when AUTO operates correctly



Image when AUTO fails.

- Noting image of top or bottom lines.
- Shift of the image to East or West.
- Artifacts on image. Etc.

Note

- 1) The phenomenon at the failure of AUTO adjustment depends on resolution of input source, scene of picture etc.
- 2) There is no failure above in AUTO with video source through VIDEO, S-VIDEO or COMPONENT input. The reason is why recognition of input signal's standard does not need to search the capture range from input signal itself.

6-10 How to deactivate the security functions

This projector is equipped with security functions.

(1) MyScreen PASSWORD

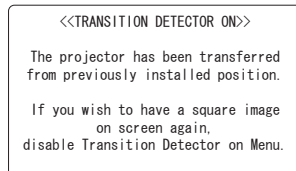
The MyScreen PASSWORD function can be used to prohibit access to the MyScreen function and prevent the currently registered MyScreen image from being overwritten.

(2) PIN LOCK

PIN LOCK is a function which prevents the projector from being used unless a registered Code is input.

(3) Transition detector

Transition detector is a function which prevents the projector from being used if vertical angle of the projector and mirror setting is not same with recorded.



Transition Detector Alarm

(4) MY TEXT

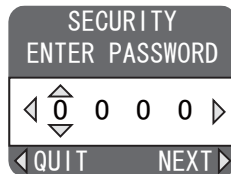
This item allows you to display your own message (MY TEXT) on the START UP screen and INPUT-INFORMATION. It can be protected by a password to prevent it from being overwritten.

It is possible to deactivate all security functions temporarily with the following procedures.

(1) Go to "SECURITY" on OPTION Menu and press the ► button.

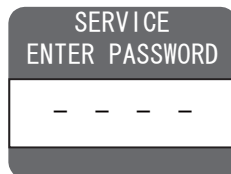
Then, ENTER PASSWORD box will be displayed.

(The BOX will be displayed by pressing the [MENU] button (remote) or [▲/▼/◀/▶] button (keypad) when Transition Detector Alarm is displayed.)



ENTER PASSWORD box

(2) Press the [Magnify off] button once, then press [Magnify off] button of remote for 3 second or more to display SERVICE PASSWORD box.



SERVICE PASSWORD box

(3) Enter the Life Key (MENU, ▼, KEYSTONE, ▲). Then all security functions will be deactivated temporarily.

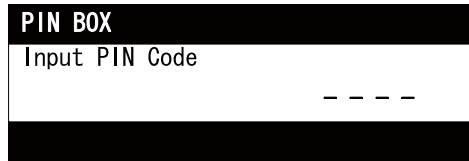
Note: • The Life key can be used up to 30 times. The key cannot be used thereafter. If the Life key cannot be used, see the paragraph of SECURITY in the User's Manual.

The frequency in which Life key is input will be set to 0 after the registered code is input.

- The SECURITY Menu can not be operated if the SECURITY PASSWORD was released by Life key.
- The Mirror, Keystone and Auto keystone are not memorized though they are possible to operate if Transition Detector was released by Life key.
- The MyScreen Lock on SCREEN Menu keeps "TURN ON" if MyScreen PASSWORD was set when SECURITY PASSWORD was released by Life key.

6-11 PIN LOCK System

If the following PIN BOX menu appears after power on the projector, the PIN LOCK system has been activated. Under such a condition, key operations and signal displaying are inhibited. To open the PIN LOCK system, we need to input the correct 4 digits PIN CODE. If correct PIN CODE is not input in 5 min., the lamp will be automatically turned off.



PIN BOX

Returning repaired unit

Use the Master PIN code. See the paragraph of Releasing the PIN LOCK system deactivation.

Swap unit/Returned unit

Release all security systems. See the paragraph of the PIN LOCK system deactivation.

Releasing the PIN LOCK System

When the PIN BOX menu is displayed, sequentially enter the codes with remote controller as follows. In accordance with remote controller button entry, “*” mark appears in the PIN BOX menu.

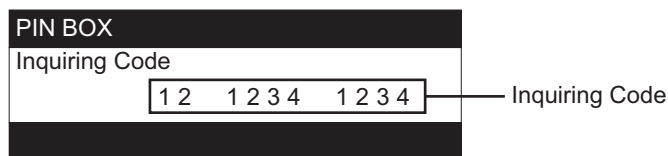
Master PIN codes

- 1st entry code: Press the “MENU” button.
- 2nd entry code: Press the “▼” button.
- 3rd entry code: Press the “KEYSTONE” button.
- 4th entry code: Press the “▲” button.

Note: The Master PIN codes can be used up to 30 times. The codes cannot be used thereafter. If the Master PIN codes cannot be used, see the paragraph of the PIN LOCK system deactivation.

The PIN LOCK System deactivation

1. When the PIN BOX menu is displayed, press “RESET” for 3 seconds or more in order to get the ID Inquiring Code.



PIN BOX (ID Inquiring Code)

2. Send HITACHI sales company the Inquiring code (10 digits) to inquire the correct PIN code.
3. With the PIN BOX menu displayed, input the correct PIN code. Enter the correct PIN CODE that HITACHI sales company informed.
4. Open menu and select “TURN OFF” from the PIN LOCK items in the SECURITY menu. Then the PIN BOX menu appears.
Password is required to display the Security Menu.
See the Security in OPTION menu: User’s Manual - Operating Guide.
5. Input the correct PIN code in the PIN BOX menu.
6. Then, PIN LOCK will be set to “TURN OFF”.
7. Deactivate the MyScreen PASSWORD and Transition Detector too.
Reset the Security Password to the [1500].
See the Security in OPTION menu: User’s Manual - Operating Guide.

6-12 Related Messages

When the unit's power is on, messages such as those shown below may be displayed. When any such message is displayed on the screen, please respond as described below.

Although these messages will be automatically disappeared around several minutes, it will be reappeared every time the power is turned on.

Message	Description
NO INPUT IS DETECTED ***	There is no input signal. Please confirm the signal input connection, and the status of the signal source.
SYNC IS OUT OF RANGE *** [fH] *****kHz [fV] *****Hz	The horizontal or vertical frequency of the inputted signal is outside of the response parameters of this unit. Please confirm the specs for this unit or the signal source specs.
INVALID SCAN FREQ. ***	An improper signal is input. Please confirm the specs for your projector or the signal source specs.
CHECK THE AIR FLOW	The internal portion temperature is rising. Please turn the power OFF, and allow the unit to cool down at least 20 minutes. After having confirmed the following items, please turn the power ON again. <ul style="list-style-type: none"> • Is there blockage of the air passage aperture? • Is the air filter dirty? • Does the peripheral temperature exceed 35°C? If the same indication is displayed after the remedy, please set FAN SPEED of the SERVICE item in the OPTION menu to HIGH.
REMINDER ***HRS PASSED AFTER THE LAST FILTER CHECK. FILTER MAINTENANCE IS ESSENTIAL TO REMOVE WARNING MESSAGE, RESET FILTER TIMER. SEE MANUAL FURTHER INFO.	A note of precaution when cleaning the air filter. Please immediately turn the power OFF, and clean or change the air filter by referring to the "Air Filter" section of this manual. After you have cleaned or changed the air filter, please be sure to reset the filter timer.

6-13 HIDDEN SERVICE MENU

HIDDEN SERVICE	
AIR-SENSOR	EXECUTE
LAMP ALARM	NONE
STARTUP TYPE	1
BNC TERMINATION	TTL
SYNC SLICE LEVEL-1	4
SYNC SLICE LEVEL-2	4
PJLink	TURN OFF
PANEL TIME	1234h
LONG KEY	NORMAL
NETWORK RESET	
SOFT RESET	

To display the OSD for "HIDDEN SERVICE MENU" set up.

By the control panel	By the remote control transmitter
<ol style="list-style-type: none"> 1. Display the Advanced menu by the "MENU" button. (If EASY MENU appears, choose "Go to Advanced menu" to display ADVANCED MENU.) 2. Select the "OPTION" on the menu. 3. Continue press the button [◀] first, then press the button [◀] together with "INPUT", and hold for 3 seconds. 	<ol style="list-style-type: none"> 1. Display the menu by the "MENU" button. (If EASY MENU appears, choose "Go to Advanced menu" to display ADVANCED MENU.) 2. Select the "OPTION" on the menu. 3. Press the "MAGNIFY OFF" button. Next hold the "MAGNIFY OFF" button for 3 seconds.

● AIR - SENSOR

Execute this item to adjust the air sensor.

● LAMP ALARM

Select the lamp alarm level. 3 Level ↔ 1 Level ↔ None
 "3 Level" shows three kinds of lamp-messages according to the LAMP TIME count.
 "1 Level" shows one kind of lamp-message according to the LAMP TIME count.
 "None" shows no lamp-messages. It is the factory default setting.

● STARTUP TYPE

Select the startup screen type. 1 : shows Hitachi Logo
 2 : No Hitachi Logo

● BNC TERMINATION

Select the RGB2 (BNC) Terminator. 75 ohm ↔ TTL

● SYNC SLICE LEVEL-1

Set the Sync separation slice level of the RGB1. (1~7)

● SYNC SLICE LEVEL-2

Set the Sync separation slice level of the RGB2 (BNC). (1~7)

● PJLink

Select the PJLink. Turn off ↔ Turn on

● PANEL TIME

Use time of LCD panel. Reset the PANEL TIME whenever you changed the LCD/LENS prism assembly.

● LONG KEY

Select the remote control button operation mode. NORMAR LONGThe LONG allows to control the projector with the remote control unit when you hold a button of it for about 3seconds, and makes MY BUTTON 1/2 function as LONG KEY DISABLE/LONG KEY ENABLE compulsorily. If you use these buttons to control the projector as you assigned with the MY BUTTON menu, set to the NORMAL.

● NETWORK RESET

If this is executed, all of the network setting are initialized.

● SOFT RESET

If this is executed, all of the user data is initialized. Never use it when not required.

6-14 RUN TIME window

● Set operating time display method (accumulated lamp time display method)

1. Select "OPTION" from the Advanced menu, then place the cursor on the "LAMP TIME".
2. Press the [▶], [ENTER] or [RESET] button.
3. Press the [Reset] button once, then press [KEYSTONE] button of the remote control for 3 seconds or more to display the screen shown below. (The menu will close after 10 seconds if there are no further operations.)
4. Use [▲] or [▼] to select the usage status number. (The usage status is as shown below.)

RUN TIME	
LAMP	1234 h
NORMAL	1000 h
WHISPER	234 h
AC	2000 h
On	1
Off	0
No.0	

- ← Lamp time
- ← Lamp time(Normal)
- ← Lamp time(Whisper)
- ← AC energizing time
- ← Number of times on
- ← Number of times off
- ← Usage status number(See below)

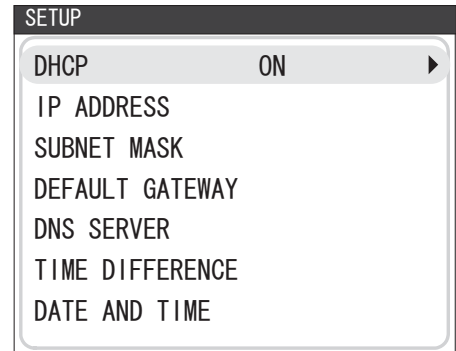
Usage status number

- 0 Total usage status
- 1 Current usage status
- 2 Usage status before first reset
- 3 Usage status before second reset
- ||
- 9 Usage status before eighth reset

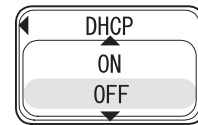
6-15 Reset of the Network Web password / User ID, Network Control password

ATTENTION : Performing this operation initializes the network settings. If the projector has the customized settings in the network, make a note of the network settings to restore them before this operation.

1. Display the SETUP in the NETWORK menu.



2. Select "TURN OFF" in the item of DHCP.



3. Enter "255.255.255.255" in the item of IP ADDRESS.



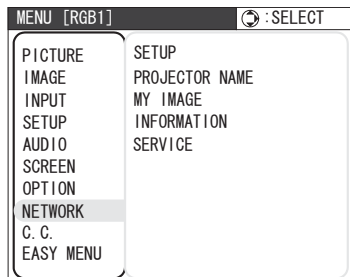
4. Enter "255.255.255.255" in the item of SUBNET MASK.



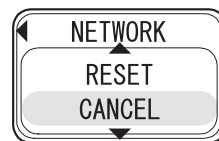
5. Enter "255.255.255.255" in the item of DEFAULT GATEWAY.



6. While NETWORK menu is displayed, press the RESET button of the remote control.



Press RESET button



7. Press ▲ button to execute reset.

The operation described above resets not only Web password but also NETWORK settings.

NOTE:

When you execute this reset operation with any other settings than above (described in the step 2 to 5), the WEB password, SNTP server address, DATE AND TIME and other schedule settings are not initialized, but the network settings (DHCP, IP ADDRESS, SUBNET MASK and DEFAULT GATEWAY) are initialized.

8. If the network settings had been customized, restore them by manual operation.

Wiring of the circuit power supply

Wiring of the circuit power supply main board

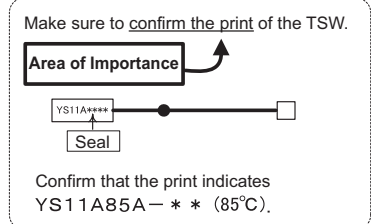
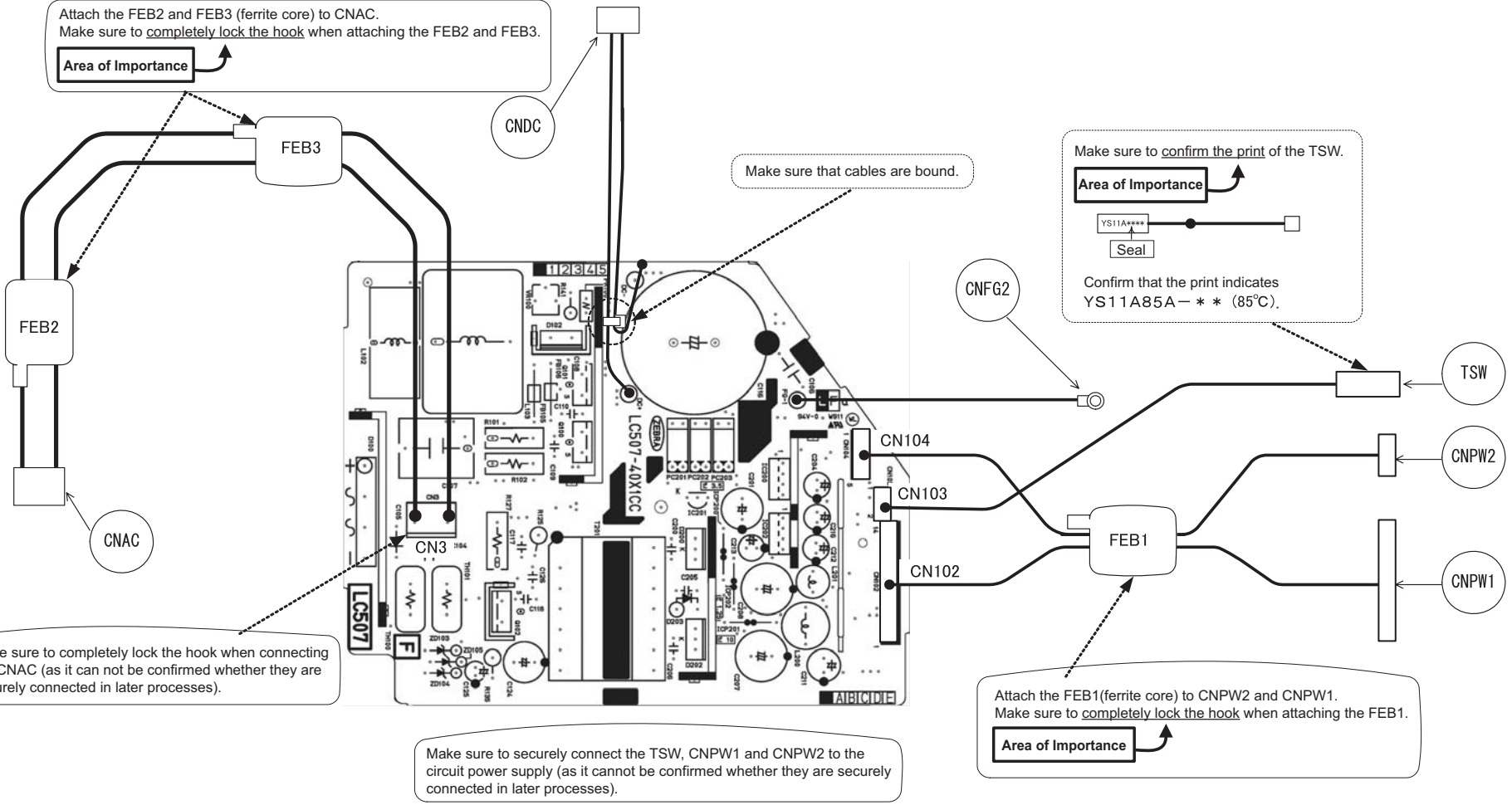
- (1) Connect the TSW. Make sure to confirm the seal (based on the diagram below) when attaching the TSW.
- (2) Connect the CNPW1 and CNPW2, Attach the FEB1.
- (3) Connect the CNAC, Attach the FEB2 and FEB3 to the CNAC.

Area of Importance

The operations with this symbol have implications with laws/standards. It is possible to be in violation of these laws/standards in the case that these operations are not carried out according to the instructions. Assemble according to the operation instructions.

Attach the FEB2 and FEB3 (ferrite core) to CNAC.
Make sure to completely lock the hook when attaching the FEB2 and FEB3.

Area of Importance



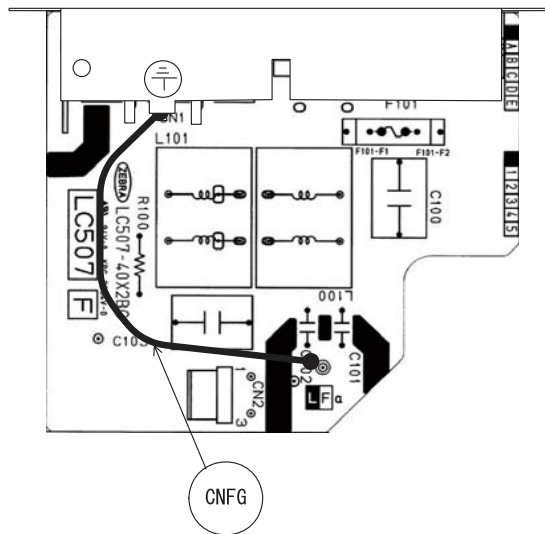
Attach the FEB1 (ferrite core) to CNPW2 and CNPW1.
Make sure to completely lock the hook when attaching the FEB1.

Area of Importance

Wiring of the noise filter board

Wiring of the noise filter board

- (1) Style the CNFG.

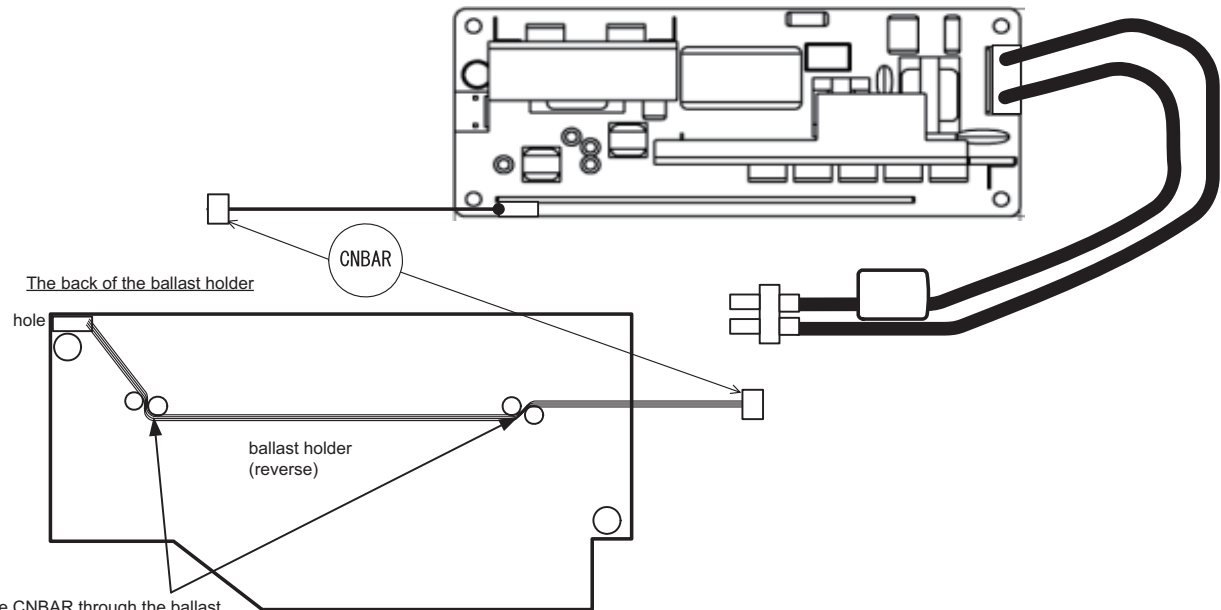


Style the CNFG cable like above diagram.
It is to prevent to lift the engine when attaching the engine.

Wiring of the ballast power supply

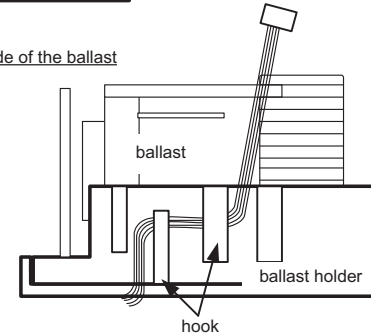
Wiring of the ballast power supply

- (1) Attach the CNBAR to the standing board.
- (2) Pass the CNBAR through the ballast holder's hole. Then, put the CNBAR along the back.
- (3) Pinch the CNBAR with the two bosses.
- (3) Pass the CNBAR through the two hooks at the side of the ballast holder.



Pass the CNBAR through the ballast holder's hole. Then, pinch the CNBAR with the two bosses.

Side of the ballast



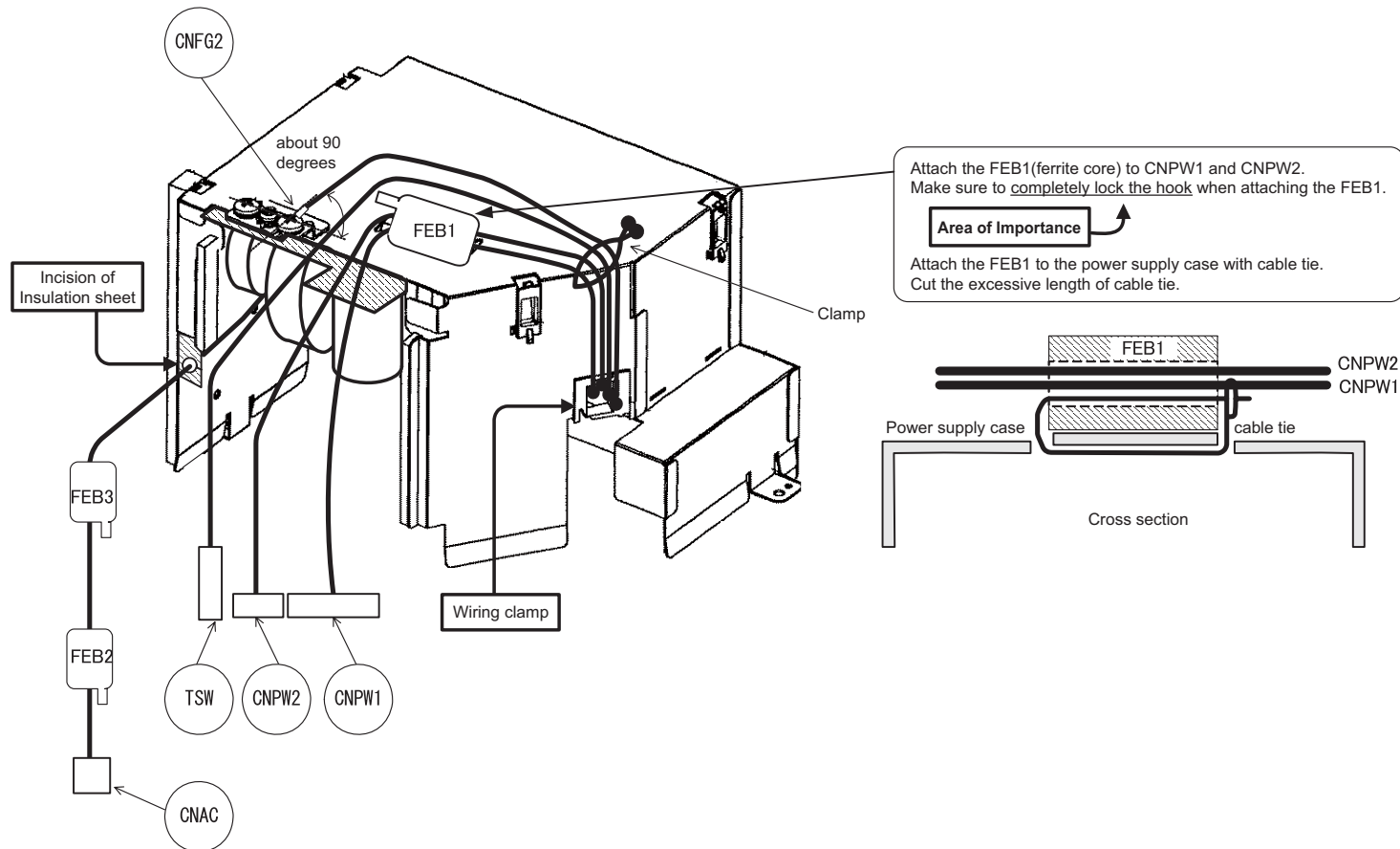
Make sure there is no cable loosening from the standing board to the hook.

Area of Importance

Wiring of the power supply block

Wiring of the power supply block

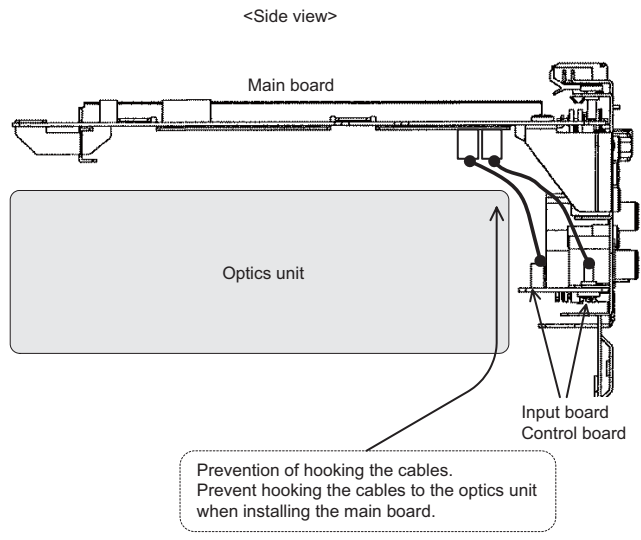
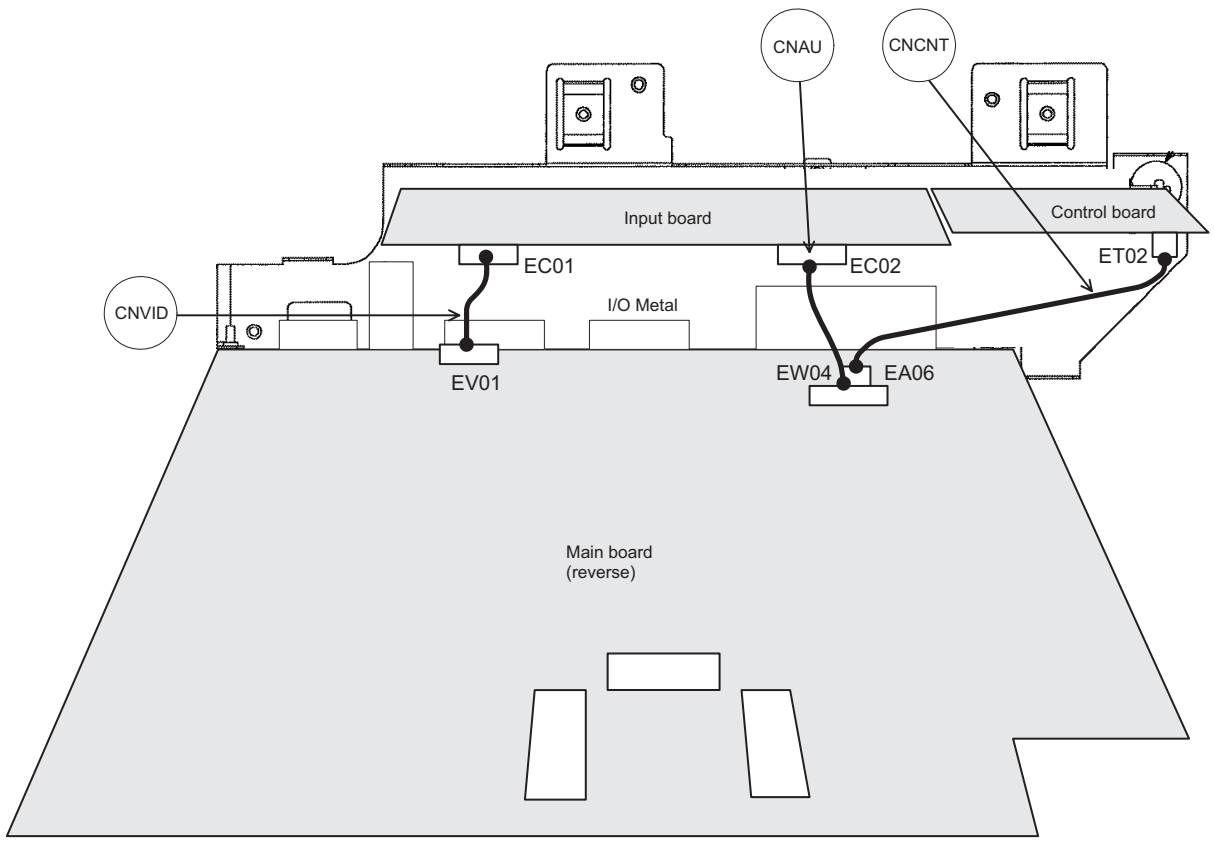
- (1) Pass the CNPW1, CNPW2, TSW and CNFG2 through the wiring clamp of power supply case.
Do not make excessive length of the cables in power supply case. Make sure not to touch the primary.
- (2) Attach the FEB1 to the CNPW1 and CNPW2.
- (3) Attach the FEB1 to the upper surface of power supply case with cable tie. **Area of Importance**
- (4) Bundle the CNPW1, CNPW2, TSW and CNFG2 with clamp.
- (5) Attach the CNFG2 to the power supply case with screw.
- (6) Pass the CNAC through the incision of insulation sheet.



Preparation for attaching the main board

Wiring when attaching the control board.

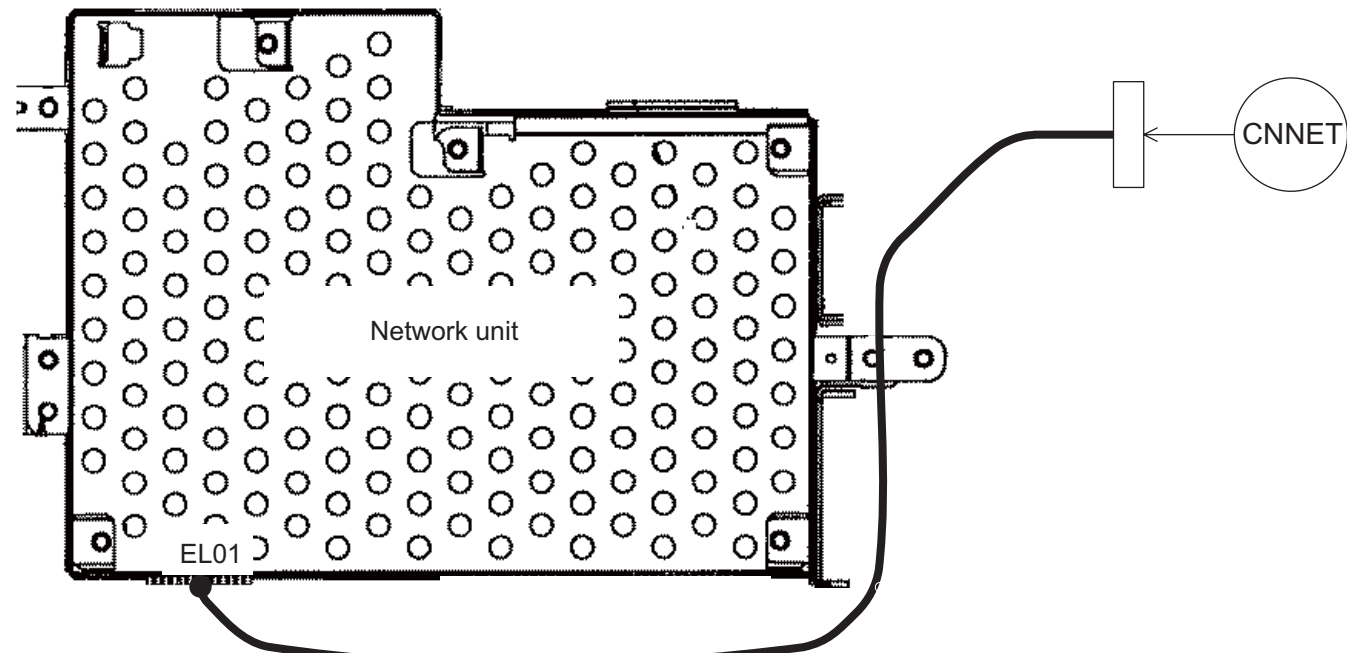
- (1) Connect the control board to the main board with CNCNT.
- (2) Connect the input board to the main board with CNAU and CNVID.



Preparation for attaching the network board

Preparation for attaching the network board

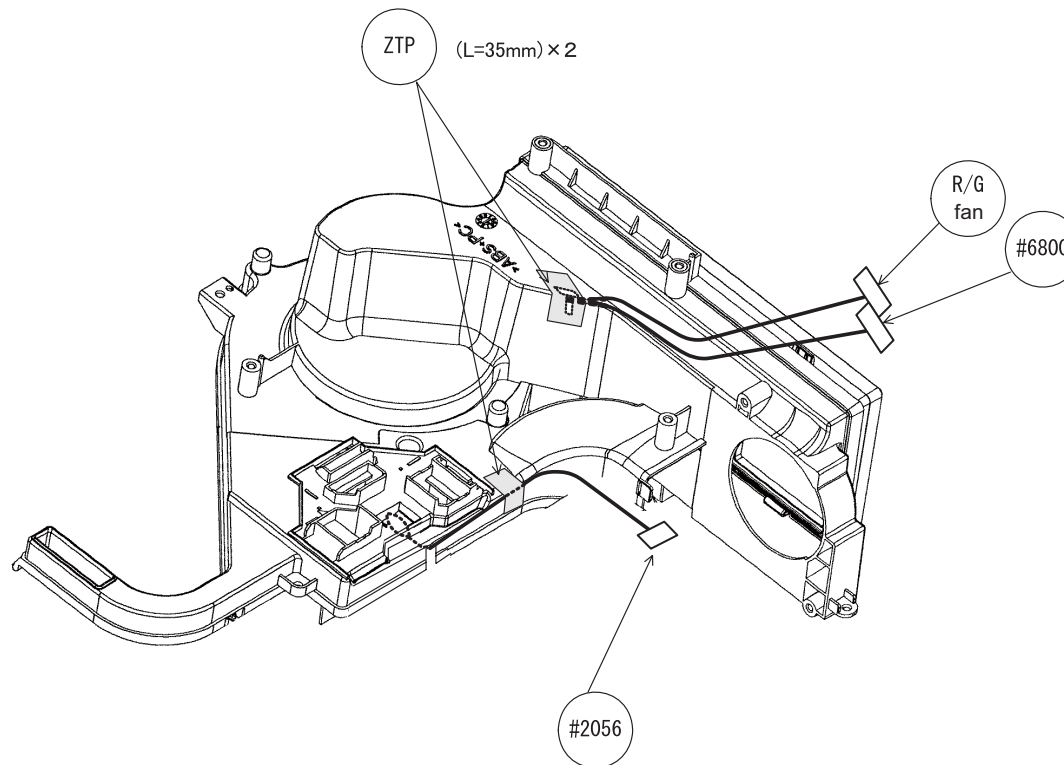
(1) Connect the CNET.



Preparation for attaching the duct

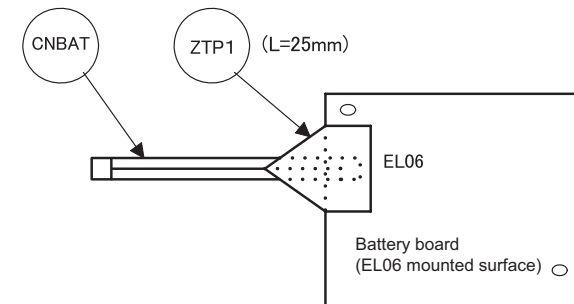
Wiring when attaching the duct

- (1) Pass the #2056 through the incision of duct, and attach it to the duct absorbing the excessive length with tape. #2056 have to be along the side of duct.
- (2) Pass the cable of #6800 and R/G fan through the duct hole, and attach them to the duct absorbing the excessive length with tape.
(Cable is fixed with tape, so it is impossible to draw out the cable even if the cable length becomes insufficient at the later procedure.)



Preparation for attaching the battery board

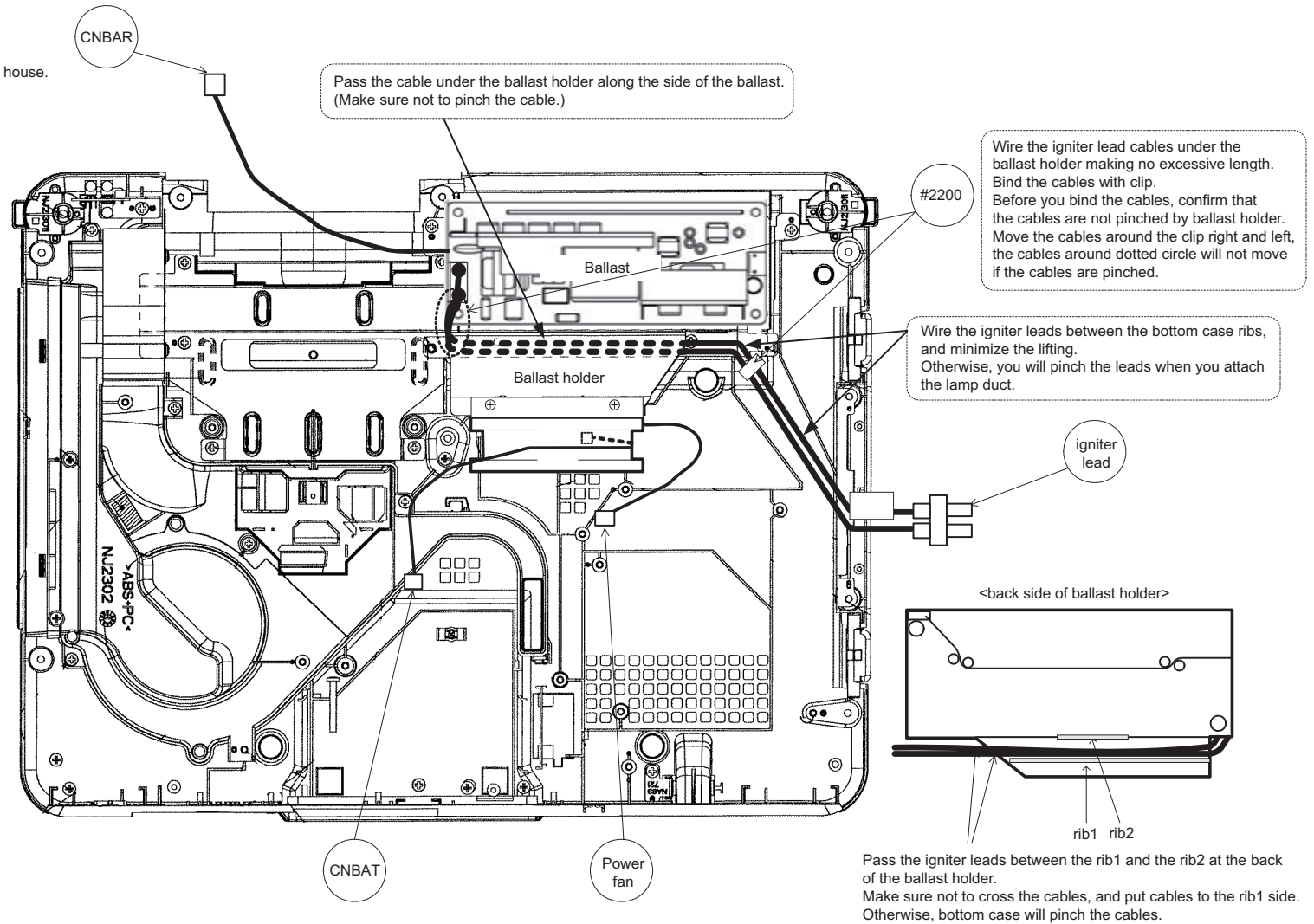
Connect the CNBAT to the battery board first.
Unit the connector with tape (L25=mm) to prevent being come off. (Bends the corner of the tape)



Attaching the ballast

Wiring of the ballast

(1) Wire the igniter lead, and attach to the lamp house.



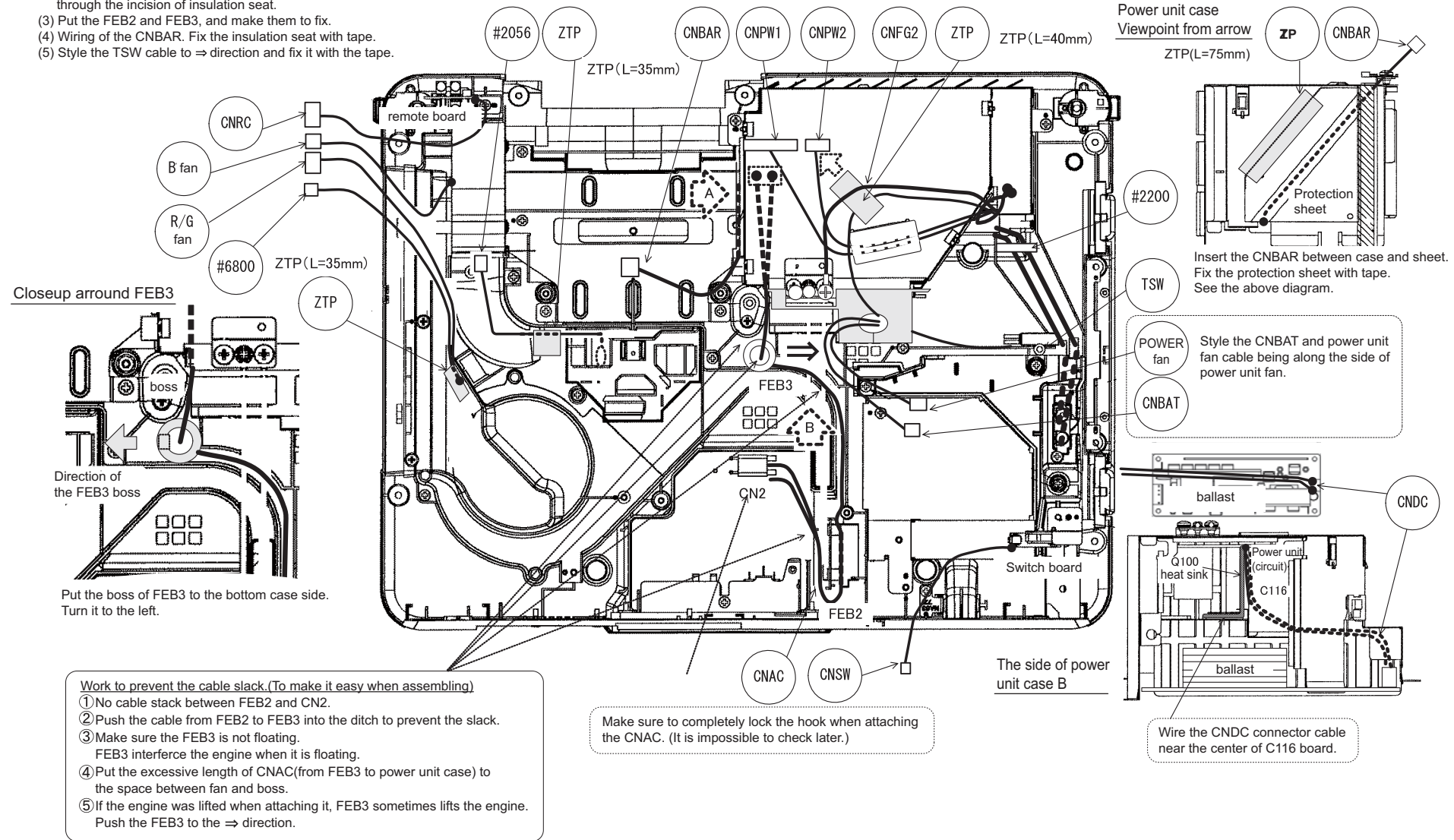
Attaching the power unit block

Wiring when assembling the power supply block

- Connect the circuit power supply and noise filter board with CNAC.
Connect the circuit power supply and the ballast power supply with CNDC.
- Pass the TSW, lamp fan lead, power supply fan lead and CNBAT through the incision of insulation seat.
- Put the FEB2 and FEB3, and make them to fix.
- Wiring of the CNBAR. Fix the insulation seat with tape.
- Style the TSW cable to ⇒ direction and fix it with the tape.

Wiring except for the power unit

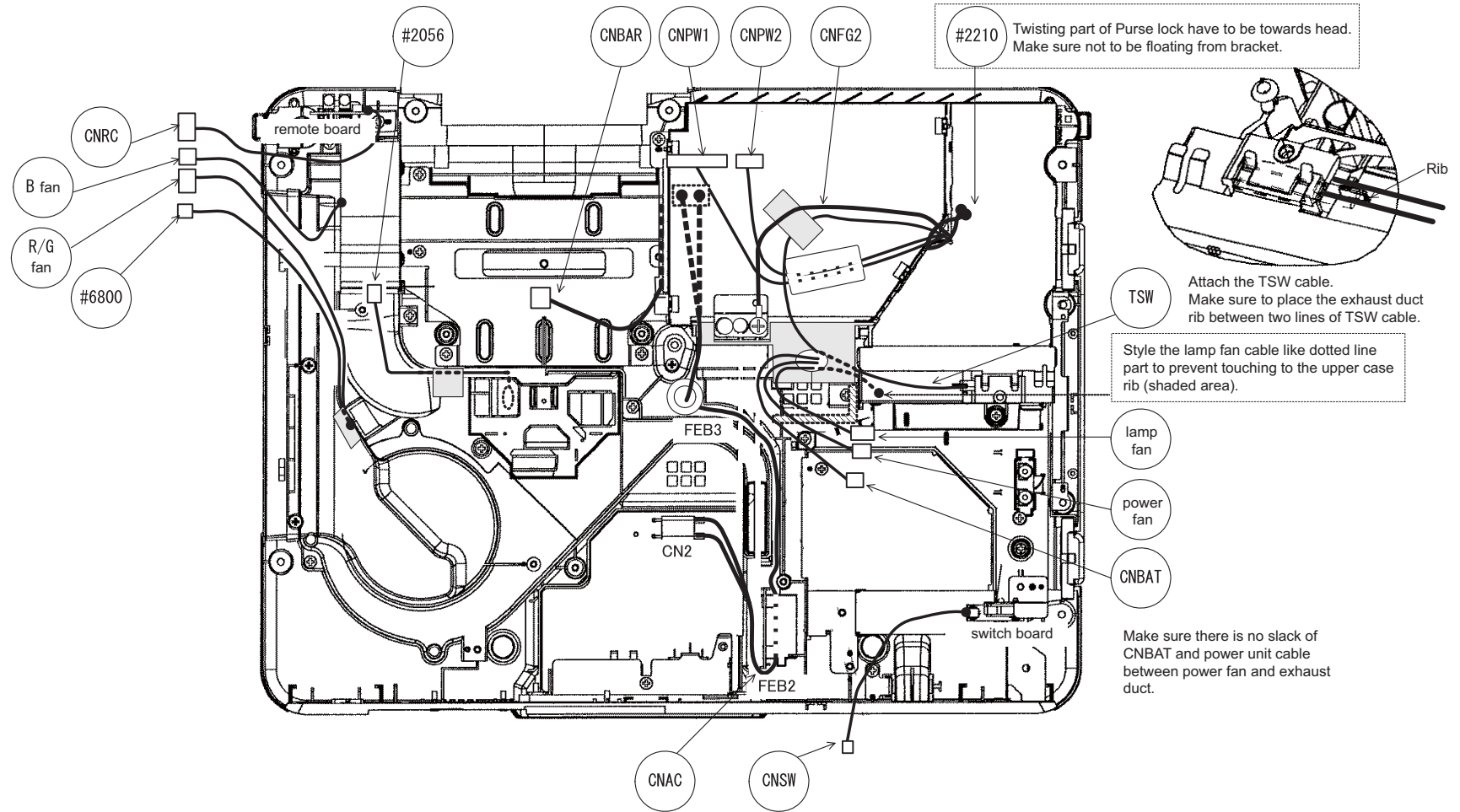
- Attach the igniter lead to bottom case with wire clamp #2200.
- Connect the CNRM to the remote board.
- Connect the CNSW to the switch board.
- Connect the CNBAT to the battery board.



Attaching the fan duct

Wiring of the fan duct

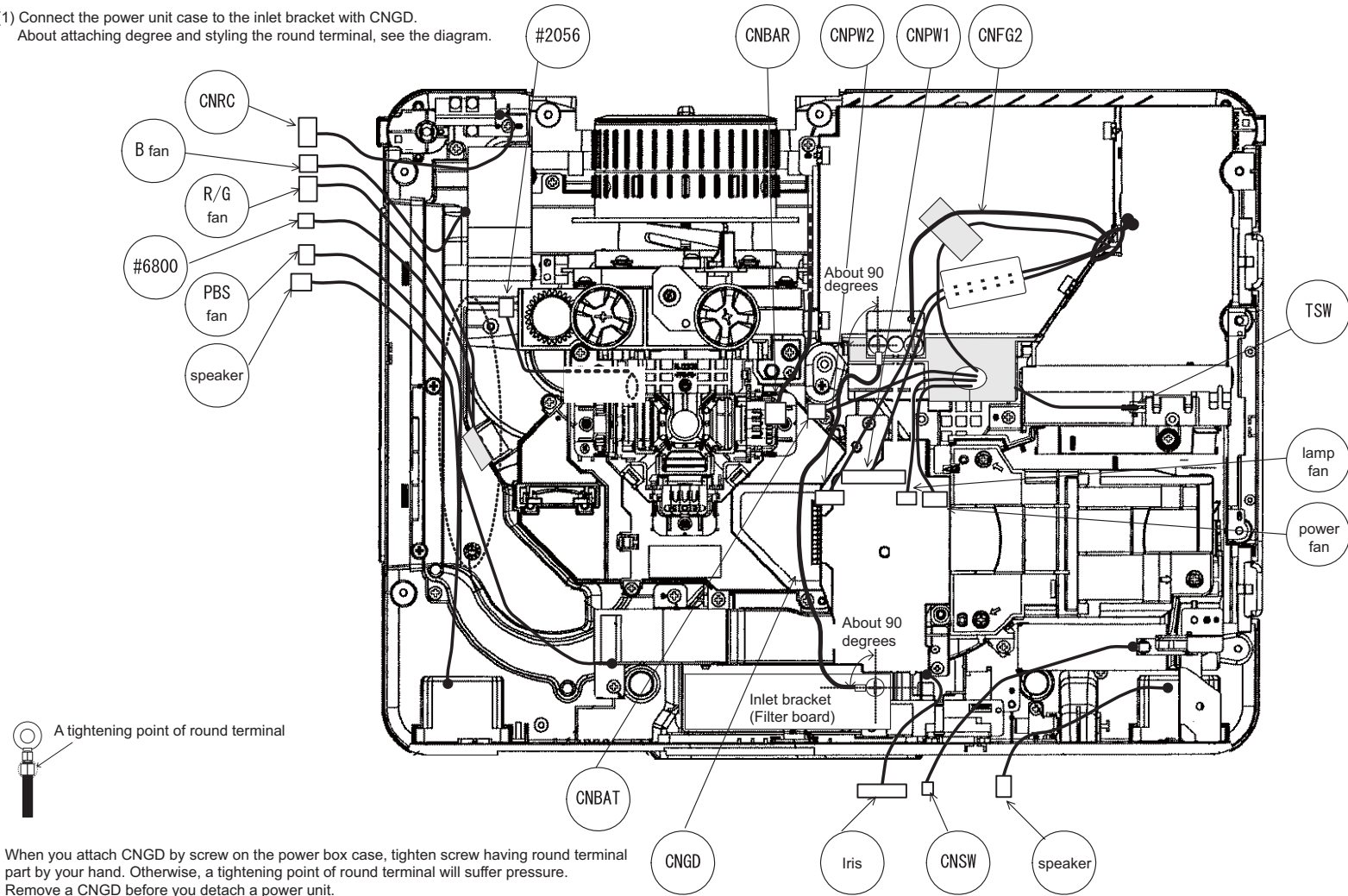
- (1) Attach the TSW to the upper part of fan duct.
- (2) Pass the lamp fan lead through the incision of the insulation sheet.
- (3) Fix the purse lock (#2210) at the exit surrounding. See diagram below.



Preparation for attaching the engine

Wiring when attaching the engine

- (1) Connect the power unit case to the inlet bracket with CNGD.
About attaching degree and styling the round terminal, see the diagram.



When you attach CNGD by screw on the power box case, tighten screw having round terminal part by your hand. Otherwise, a tightening point of round terminal will suffer pressure. Remove a CNGD before you detach a power unit. Otherwise, a tightening point of round terminal will be damaged.

Preparation for attaching main board and shield case

Wiring when attaching the main board

- (1) Connect the flexible cable.
(Three places under shield)
- (2) Connect the #2056, CNBAT and CNBAR completely.
It is hard to connect after shield was attached.
- (3) Connect the CNPW1, CNPW2, lamp fan and power unit fan to the main board.

Connect the CNRC, B fan, #6800, PBS fans and speaker cable to the main board passing through the incision of insulation sheet.

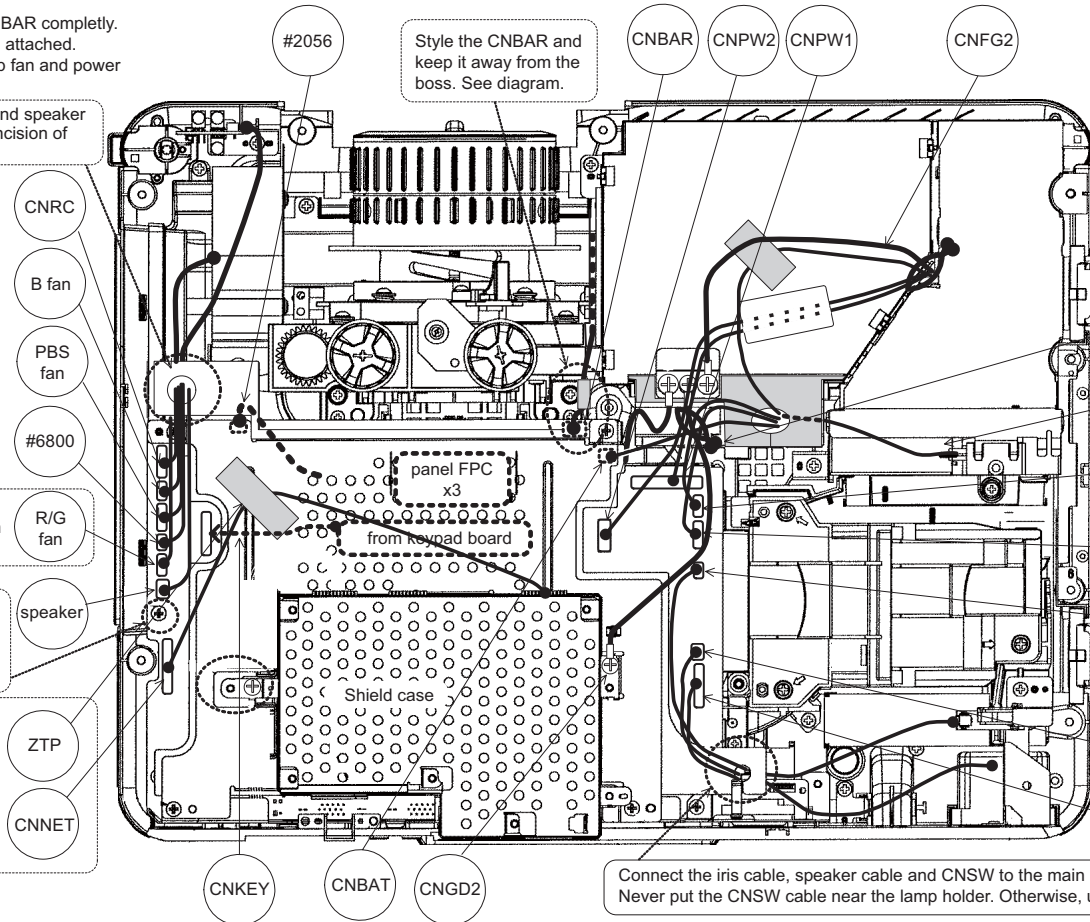
Do not pass the R/G fan cable through the incision of insulation sheet.

Never put the speaker cable on the boss.
Otherwise, the cable will be damaged by screw.

Attach the CNET cable with ZTP2 (L=50mm) to the position shown in diagram.
Make sure there is no excessive length of CNET.

Wiring when attaching the shield case

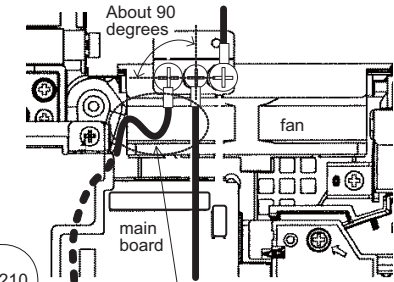
- (1) Connect power unit case and Network shield case with CNGD2.
- (2) Connect the CNRC, B fan, R/G fan, #6800, PBS fan and speaker cable to the main board.
- (3) Connect the iris cable, speaker cable and CNSW to the main board.
- (4) Bundle the CNPW1, CNPW2, lamp fan and power unit fan cable on the power with #2210.
- (5) Connect the CNET to the main board.



Put CNKEY cable near shield case.
Otherwise, customer will find CNKEY cable around lens shift dials.

Connect the iris cable, speaker cable and CNSW to the main board passing through the incision of the insulation sheet.
Never put the CNSW cable near the lamp holder. Otherwise, upper case will pinch the cable.

Closeup of power supply case screw.

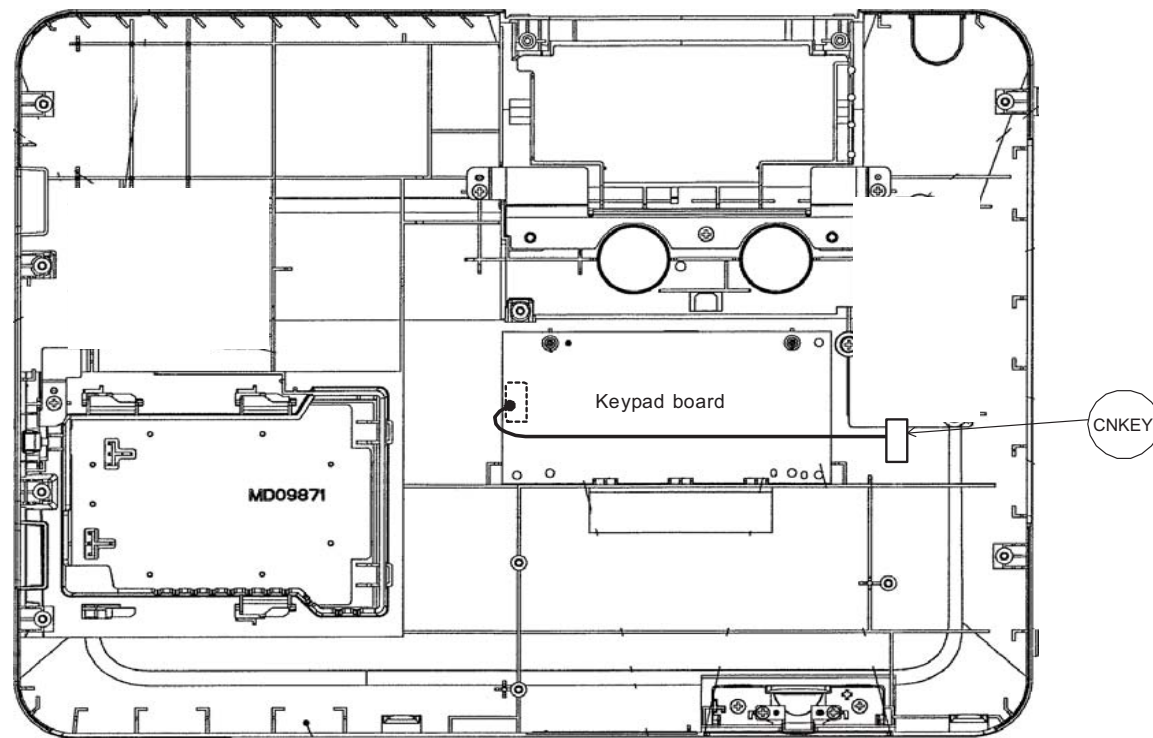


CNGD
Style the CNGD inserting it into the concave portion of the upper part of fan.
Area of Importance
To prevent touching with the rotating parts of fan.

Preparation for attaching upper case

Wiring when attaching the keypad board

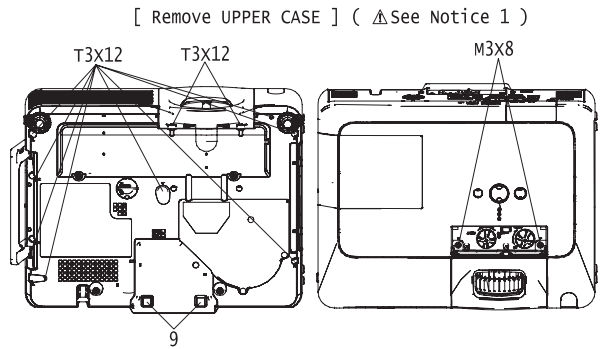
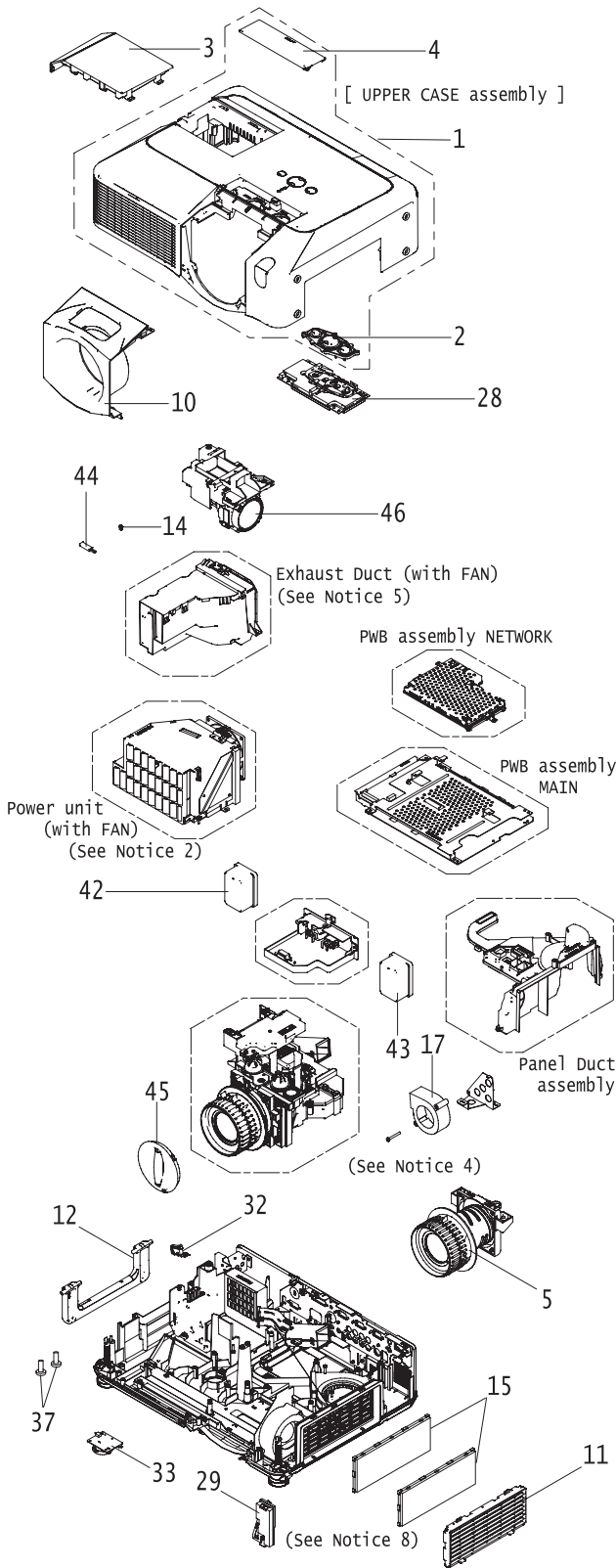
- (1) Connect CNKEY to keypad board.
- (2) Connect CNKEY to main board.



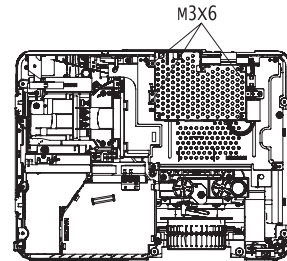
8. Disassembly diagram

M : Meter Screw

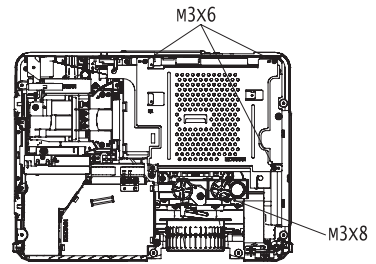
T : Tapping Screw



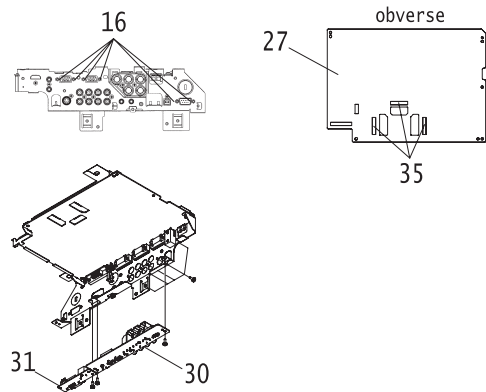
[Remove Network unit]



[Remove Shield of PWB assembly MAIN]



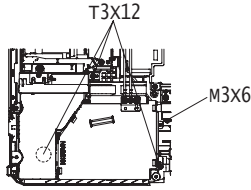
[PWB assembly MAIN]



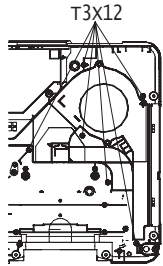
CP-SX635(ED3SX40N)

M : Meter Screw
T : Tapping Screw

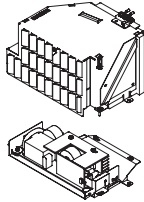
[Remove Duct and Power unit]



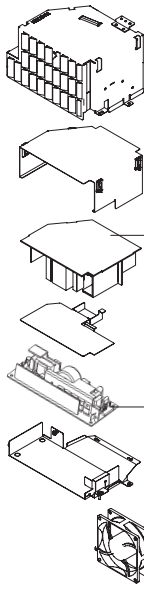
[Remove Panel Duct assembly]
(See Notice 3)



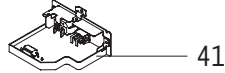
[POWER UNIT]
- assembly -



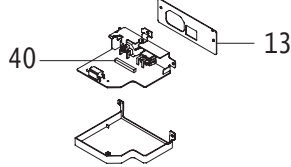
- Disassembly -
(See Notice 7)



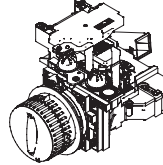
[FILTER UNIT]
- assembly -



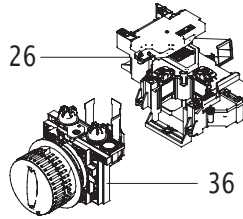
- Disassembly -



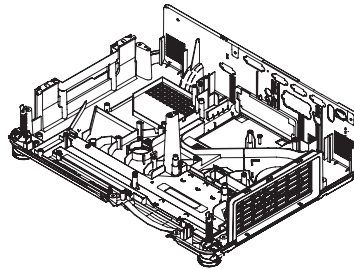
[LCD/LENS/PRISM/
DICHROIC OPTICS UNIT]
- assembly -



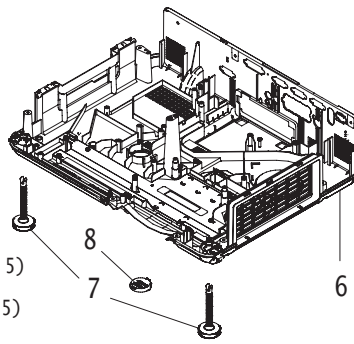
- Disassembly -



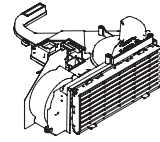
[BOTTOM CASE]
- assembly -



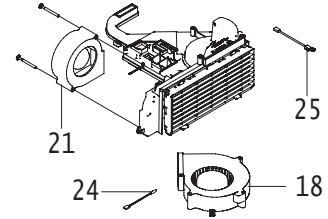
- Disassembly -



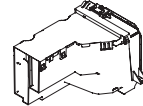
[PANEL DUCT]
- assembly -



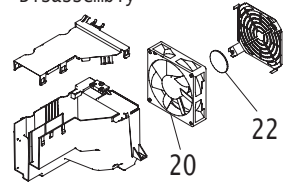
- Disassembly -



[EXHAUST DUCT]
- assembly -



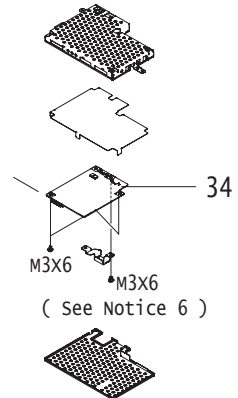
- Disassembly -



[NETWORK UNIT]
- assembly -



- Disassembly -



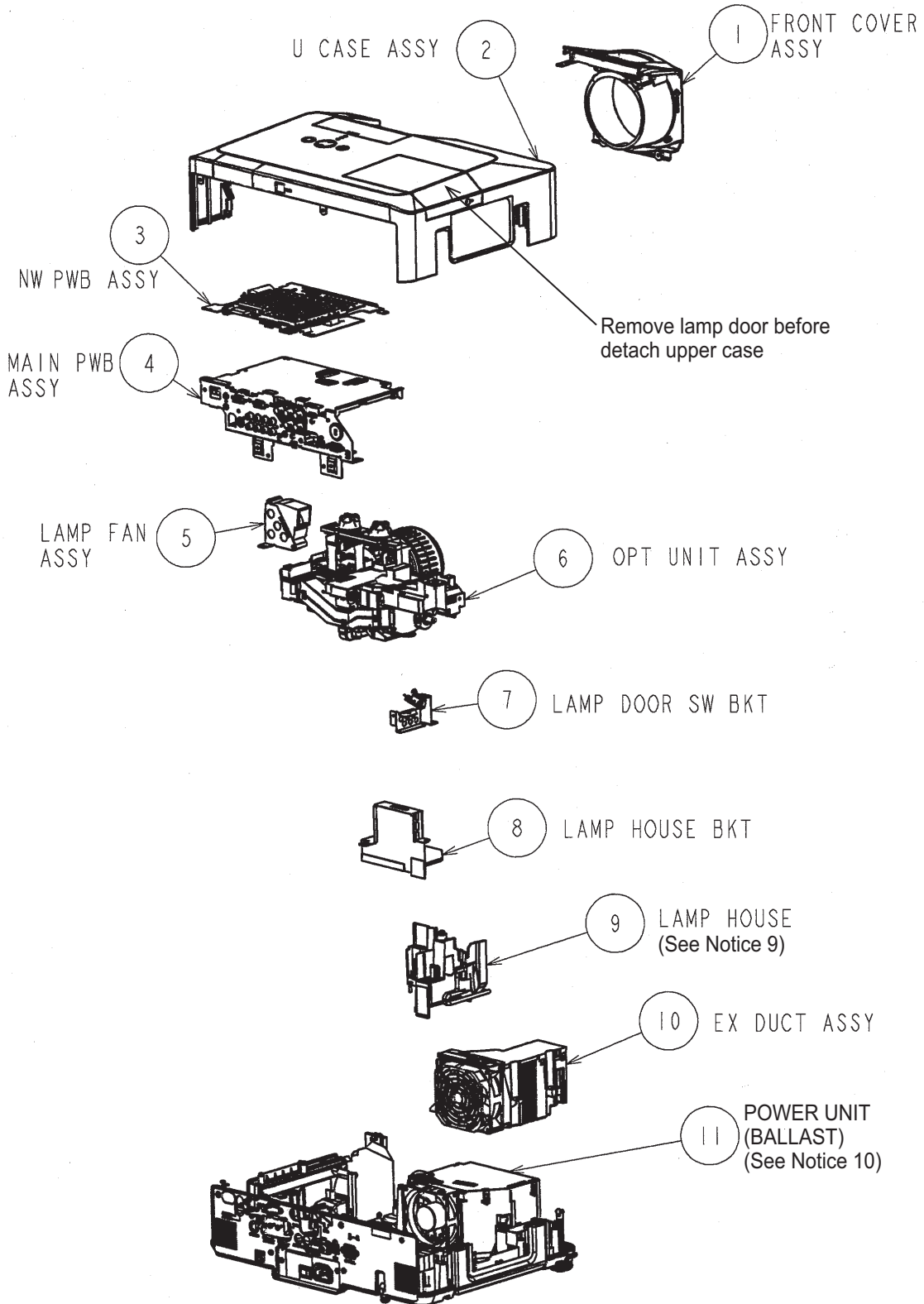
(See Notice 6)

Notice

The step of the disassembly / The step of the assembly.

Disassemble the projector in order of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 as shown in the diagram.

Assemble the projector in order of 11, 10, 9, 8, 7, 6, 5, 4, 3, 2 and 1 as shown in the diagram.



Notice

1. Detach and attach the upper case.

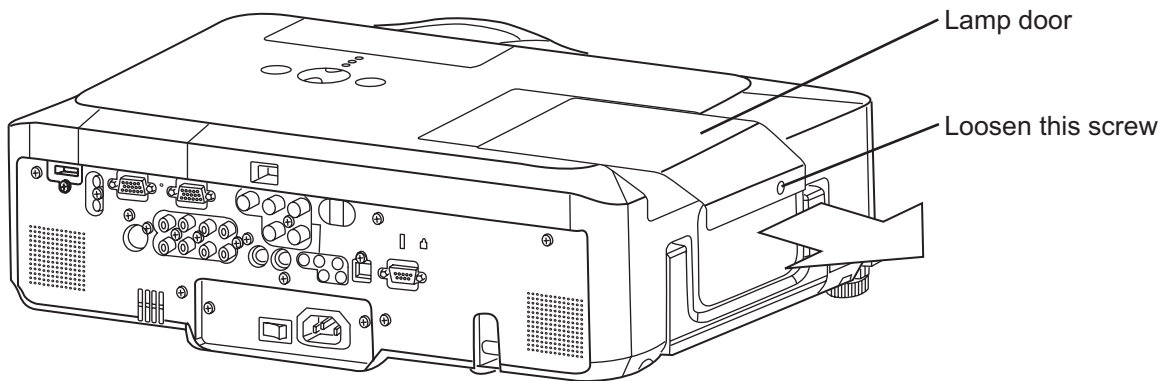
Follow the procedure below to detach and attach the upper case.

When disassembling

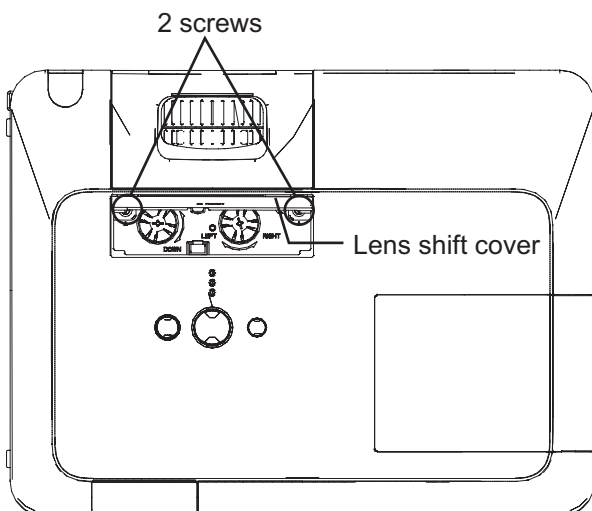
- a. Remove the Lamp door.

⚠ CAUTION

The lamp door must be removed before the upper case when disassembling the machine. If the upper case is detached with the lamp door installed, the MAIN board might be damaged.



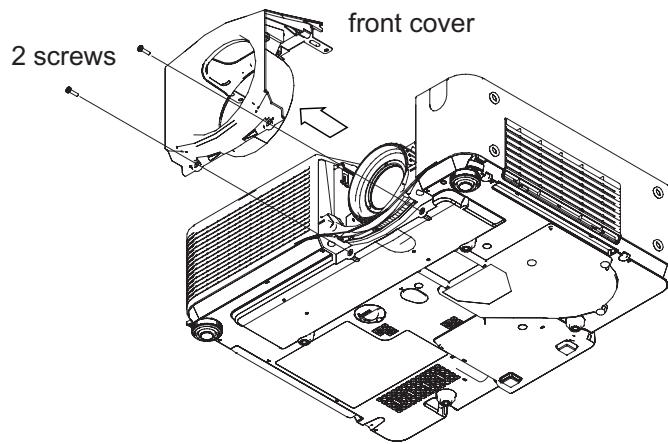
- b. Remove 2 screws on the front and 2 screws on the upper case.
(1) Before remove 2 screws on the upper case, open the Lens shift cover.



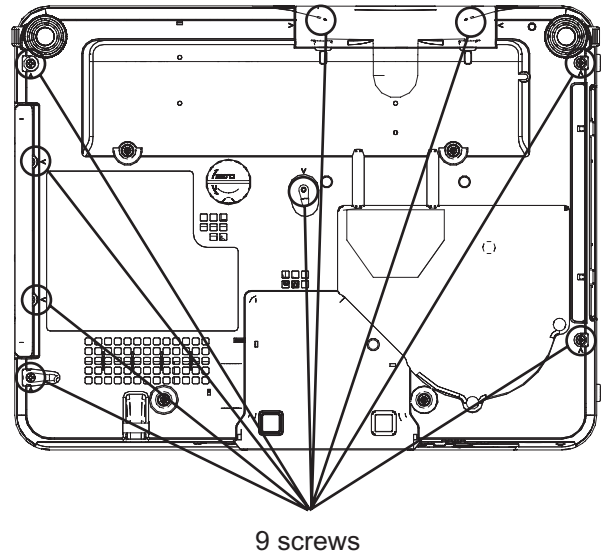
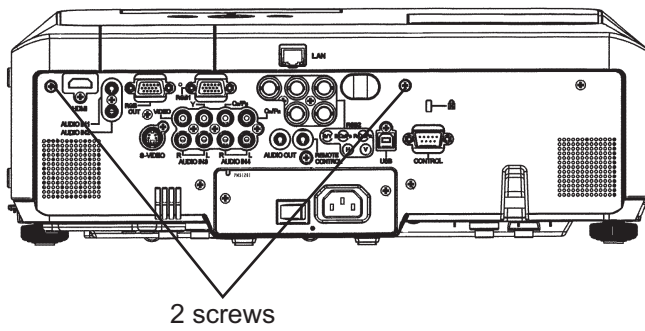
CP-SX635(ED3SX40N)

(2) Remove 2 screws on the front.

(3) Remove the front cover.



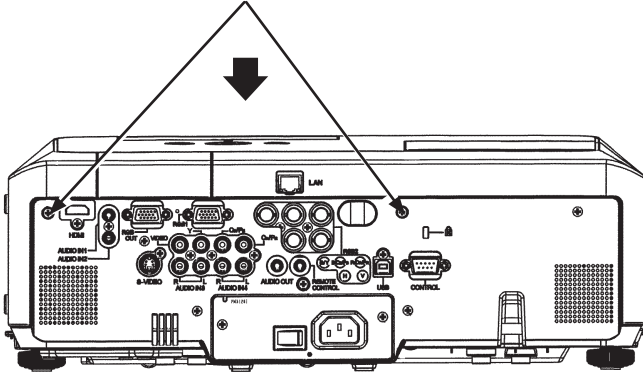
c. Remove 9 screws on the bottom and 2 screws on the rear to detach the upper case.



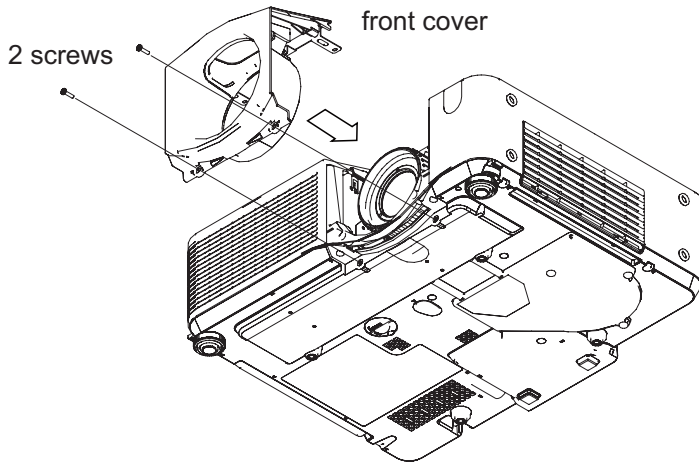
When assembling

- a. Tighten 9 screws on the bottom and 2 screws on the rear after attaching the upper case with the lamp door separated.

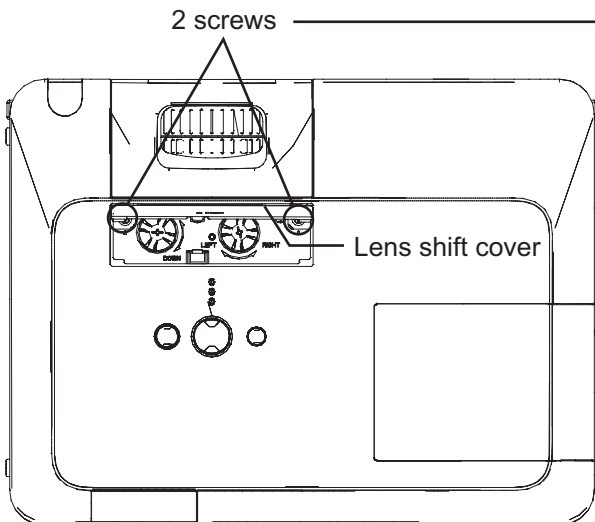
In order not to make a gap between the upper and the bottom cases, tighten these screws while pressing down the upper case in the direction of the arrow. Be careful not to bend the outside casing. (Torque: 0.39-0.59N•m)



- b. Attach the Front cover.
 - (1) Attach the Front cover.
 - (2) Tighten 2 screws on the front.



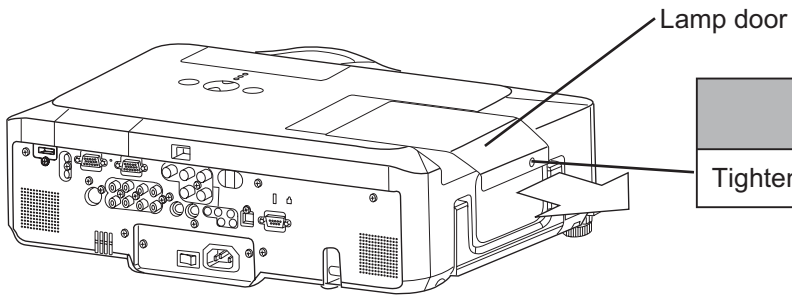
- (3) Open the Lens shift cover.
- (4) Tighten 2 screws on the upper case.



CAUTION

When re-assembling, tighten these screw at the torque of 0.49 ± 0.1 N•m so that the screw holes are not damaged.

c. Attach the Lamp door.



CAUTION

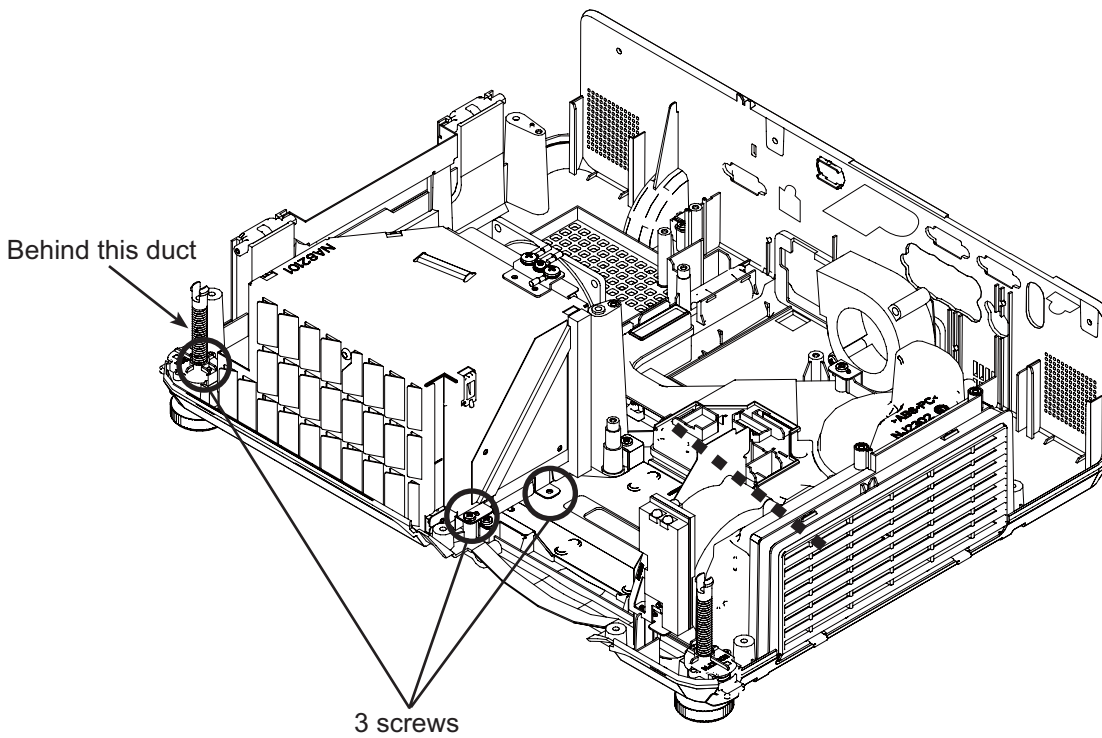
Tighten this screw using a manual screwdriver.

2. Replacing the power units.

Remove the screw to take off the duct.

Remove the 3 screws to take off the power unit.

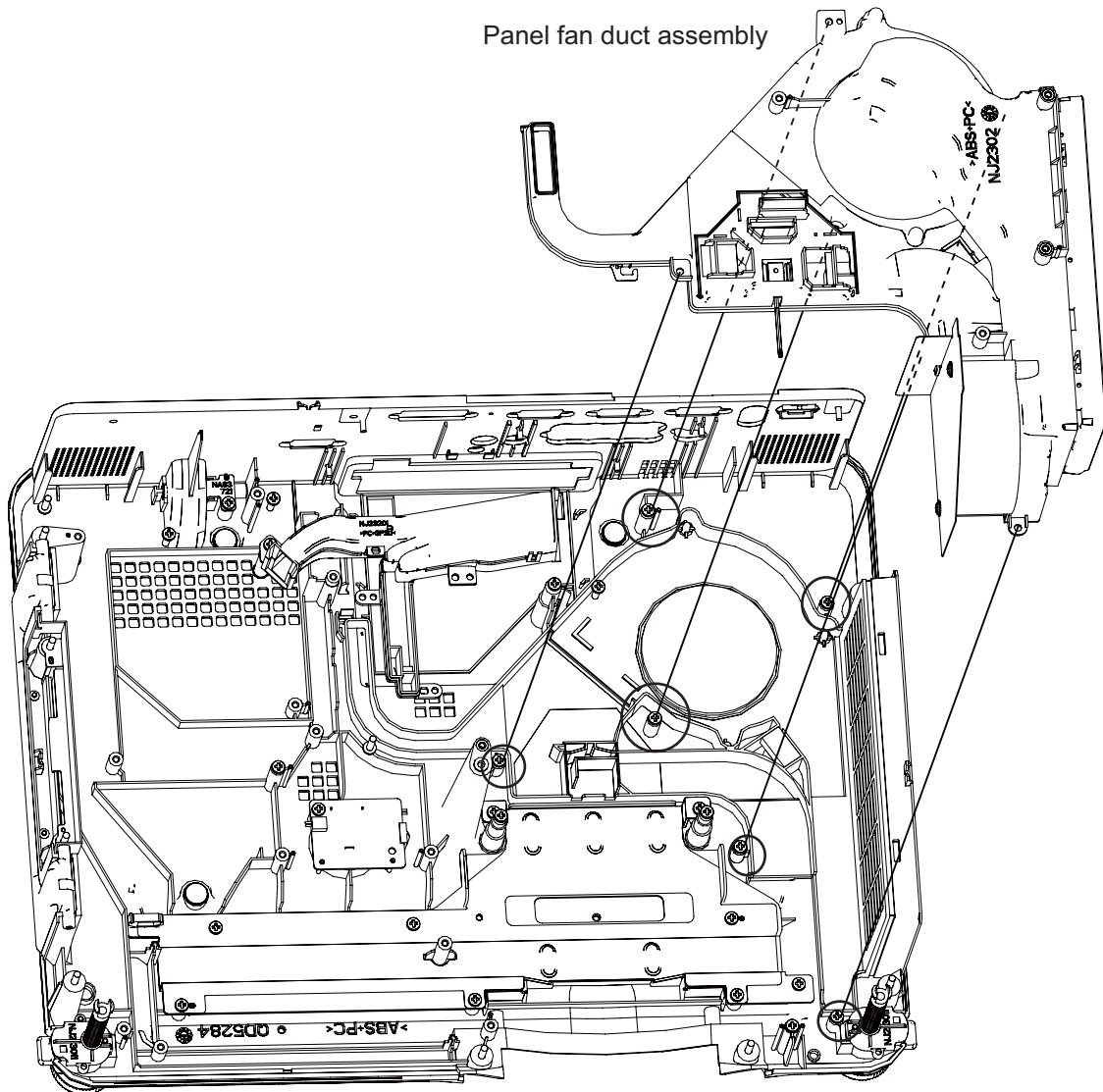
NOTE : One of screws is behind the duct.



3. Detaching and attaching the Panel Fan Duct assembly

When disassembling

Remove 6 screws and unhook the panel fan duct assembly as shown in the diagram.

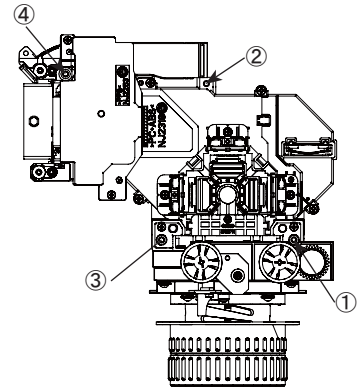


When assembling

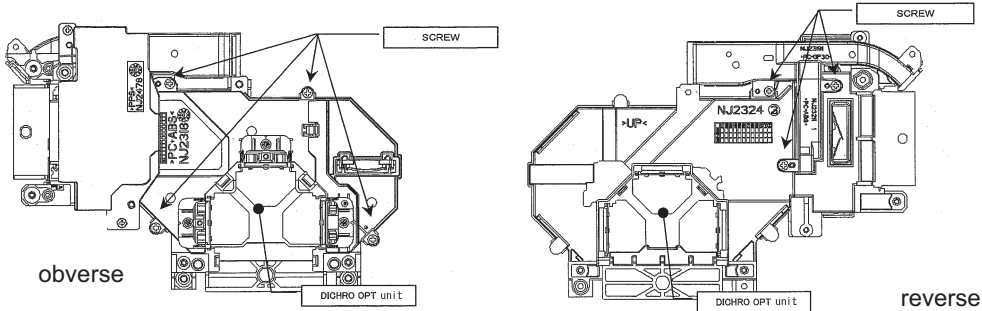
Tighten 6 screws and hook the panel fan duct assembly.

4. Attaching the dichroic optics unit

Put the dichroic optics unit on the bottom case, and tighten screws in order of 1, 2, 3 and 4 as shown in the diagram.



Never remove the 7 screws (4 screws on the obverse, 3 screws on the reverse) from DICHRO OPT unit. Otherwise, the screw holes will be damaged.

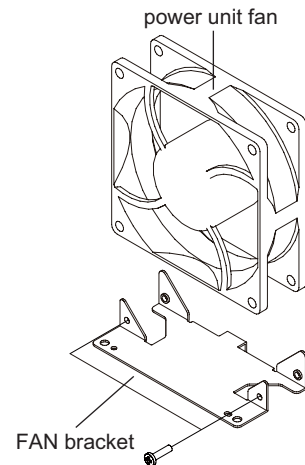


5. Replacing the power unit fan

Be sure to do the following works before changing the power unit fan.

a. Assemble the power unit fan and fan cushion as described below.

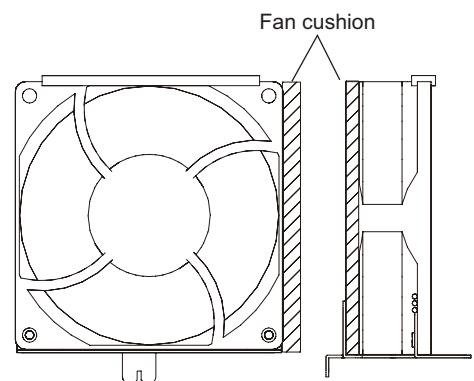
1) Attach the fan bracket to the new power unit fan using 2 screws.



2) Stick the Fan cushion along the right side of the fan as shown in the diagram.

Note:

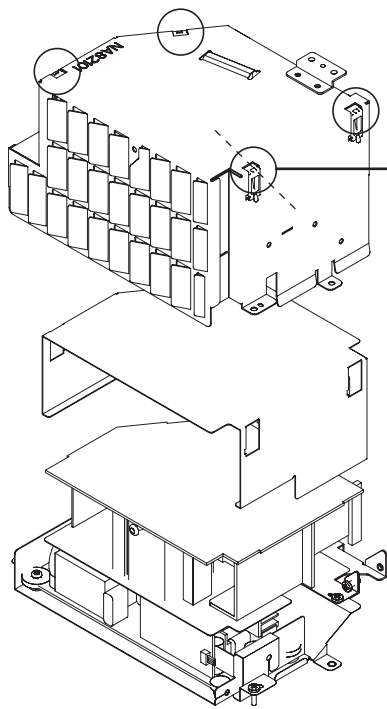
- If you install the new fan without the fan cushion, the fan vibration in operating might make noise.
- Be careful not to invert the fan when assembling the exhaust fan assembly.



6. Replacing the PWB assembly NETWORK

Attach the bracket to the PWB assembly NETWORK covering the LAN Jack completely.

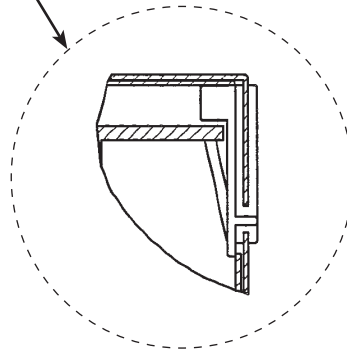
7. Assembling the power unit



⚠ CAUTION

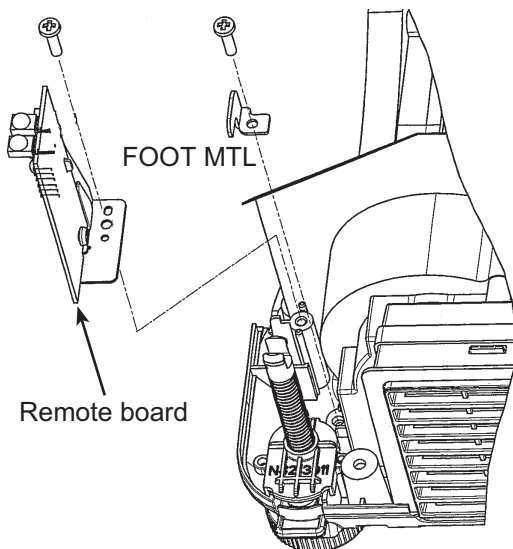
Make sure that power unit board was fixed by 4 hooks of PWB HOLDER.
Make sure that it is hard to remove.

Cross Section



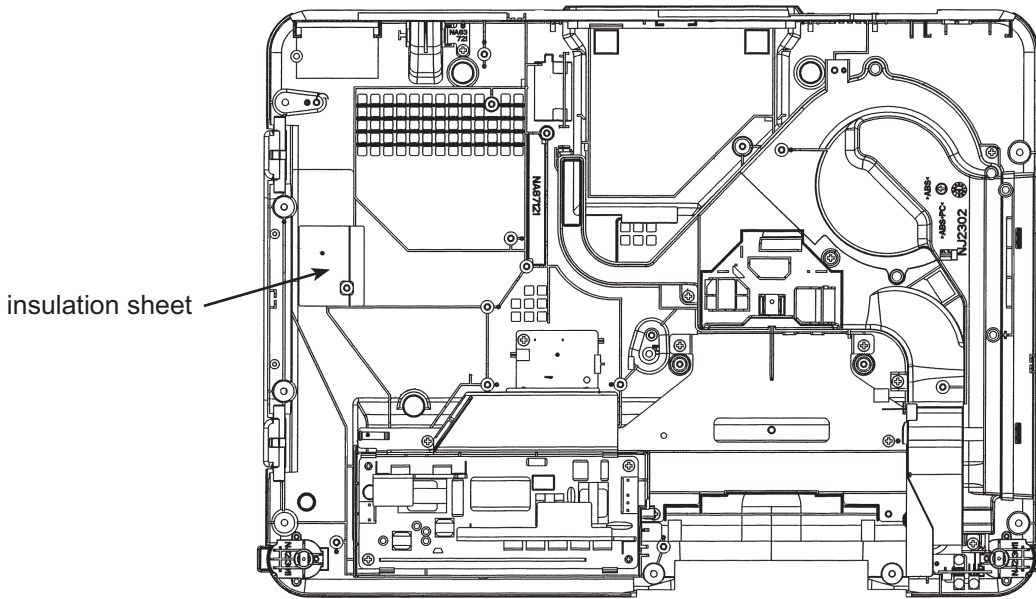
8. Assembling the FOOT MTL

Remove the remote board first when assembling the FOOT MTL.
This is necessary when replacing the FAN and so on.



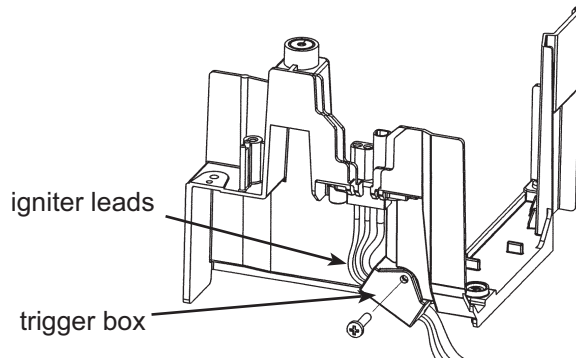
9. Attaching the LAMP HOUSE

Never forget the insulation sheet when you attach the LAMP HOUSE.



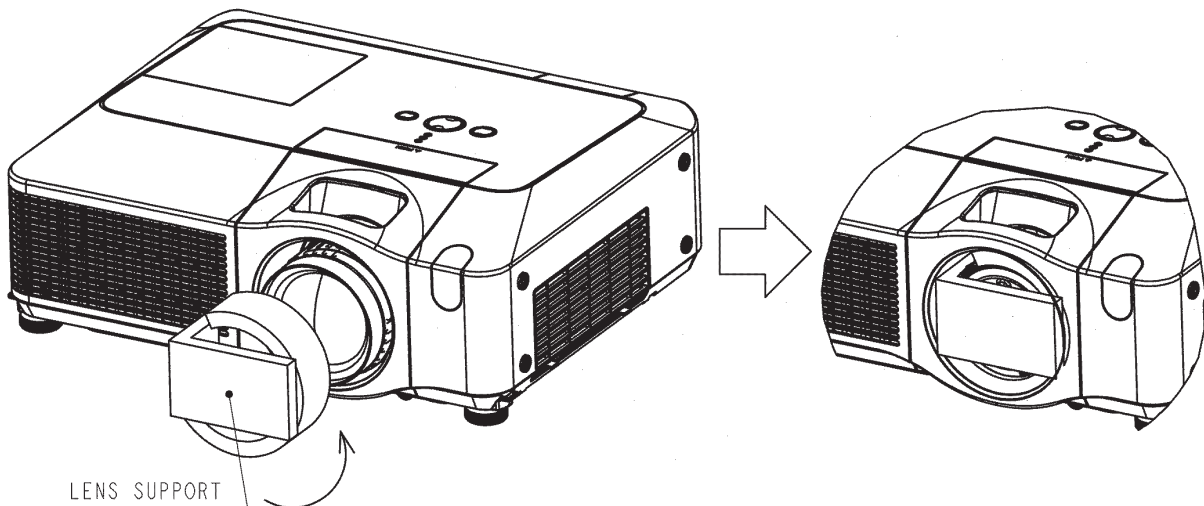
10. Replacing the BALLAST

Bundle the igniter leads with trigger box when you attach the BALLAST.



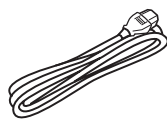
11. Attach the LENS SUPPORT

Attach the LENS SUPPORT (SU03921) to the projector when you transport the projector. Otherwise, the mechanical parts for the lens shift function might be damaged.

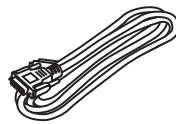


9. Replacement Parts list

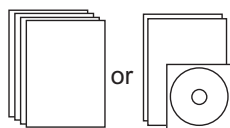
THE UPDATED PARTS LIST FOR THIS MODEL IS AVAILABLE ON ESTA



Power Cord



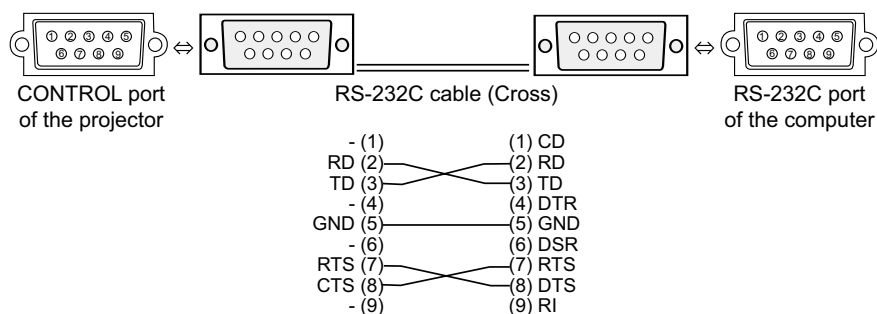
RGB Cable



Instruction manual



Remote Control



Connecting the cable

1. Turn off the projector and the computer.
2. Connect the CONTROL port of the projector with a RS-232C port of the computer by a RS-232C cable (cross). Use the cable that fulfills the specification shown in the previous page.
3. Turn the computer on, and after the computer has started up turn the projector on.

Communications setting

19200bps, 8N1

1. Protocol

Consist of header (7 bytes) + command data (6 bytes).

2. Header

BE + EF + 03 + 06 + 00 + CRC_low + CRC_high

CRC_low : Lower byte of CRC flag for command data

CRC_high : Upper byte of CRC flag for command data

3. Command data

Command data chart

byte_0	byte_1	byte_2	byte_3	byte_4	byte_5
Action		Type		Setting code	
low	high	low	high	low	high

Action (byte_0 - 1)

Action	Classification	Content
1	SET	Change setting to desired value.
2	GET	Read projector internal setup value.
4	INCREMENT	Increment setup value by 1.
5	DECREMENT	Decrement setup value by 1.
6	EXECUTE	Run a command.

RS-232C Communication (continued)

Requesting projector status (Get command)

- (1) Send the request code Header + Command data ('02H'+ '00H'+ type (2 bytes)+'00H'+ '00H') from the computer to the projector.
- (2) The projector returns the response code '1DH'+ data (2 bytes) to the computer.

Changing the projector settings (Set command)

- (1) Send the setting code Header + Command data ('01H'+ '00H'+ type (2 bytes) + setting code (2 bytes)) from the computer to the projector.
- (2) The projector changes the setting based on the above setting code.
- (3) The projector returns the response code '06H' to the computer.

Using the projector default settings (Reset Command)

- (1) The computer sends the default setting code Header + Command data ('06H'+ '00H'+ type (2 bytes) + '00H'+ '00H') to the projector.
- (2) The projector changes the specified setting to the default value.
- (3) The projector returns the response code '06H' to the computer.

Increasing the projector setting value (Increment command)

- (1) The computer sends the increment code Header + Command data ('04H'+ '00H'+ type (2 bytes) + '00H'+ '00H') to the projector.
- (2) The projector increases the setting value on the above setting code.
- (3) The projector returns the response code '06H' to the computer.

Decreasing the projector setting value (Decrement command)

- (1) The computer sends the decrement code Header + Command data ('05H'+ '00H'+ type (2 bytes) + '00H'+ '00H') to the projector.
- (2) The projector decreases the setting value on the above setting code.
- (3) The projector returns the response code '06H' to the computer.

When the projector cannot understand the received command

When the projector cannot understand the received command, the error code '15H' is sent back to the computer.

Sometimes the projector cannot properly receive the command. In such a case, the command is not executed and the error code '15H' is sent back to the computer. If this error code is returned, send the same command again.

When the projector cannot execute the received command.

When the projector cannot execute the received command, the error code '1CH' + 'xxxxH' is sent back to the computer. When the data length is greater than indicated by the data length code, the projector ignore the excess data code.

Conversely when the data length is shorter than indicated by the data length code, an error code will be returned to the computer.

NOTE • Operation cannot be guaranteed when the projector receives an undefined command or data.

- Provide an interval of at least 40ms between the response code and any other code.
- The projector outputs test data when the power supply is switched ON, and when the lamp is lit. Ignore this data.
- Commands are not accepted during warm-up.

Command Control via the Network

Communication Port

The following two ports are assigned for the command control.

TCP #23
TCP #9715

Command Control Settings

Configure the following items from a web browser when command control is used.

Port Settings		
Network Control Port1 (Port: 23)	Port open	Click the [Enable] check box to open [Network Control Port1 (Port: 23)] to use TCP #23. Default setting is "Enable".
	Authentication	Click the [Enable] check box for the [Authentication] setting when authentication is required. Default setting is "Disable".
Network Control Port2 (Port: 9715)	Port open	Click the [Enable] check box to open [Network Control Port2 (Port: 9715)] to use TCP #9715. Default setting is "Enable".
	Authentication	Click the [Enable] check box for the [Authentication] setting when authentication is required. Default setting is "Enable".

When the authentication setting is enabled, the following settings are required.

Security Settings		
Network Control	Authentication Password	Enter the desired authentication password. This setting will be the same for [Network Control Port1 (Port: 23)] and [Network Control Port2 (Port: 9715)] . Default setting is blank.
	Re-enter Authentication Password	

Command Format

[TCP #23]

1. Protocol

Consist of header (7 bytes) + command data (6 bytes)

2. Header

BE + EF + 03 + 06 + 00 + CRC_low + CRC_high

CRC_low: Lower byte of CRC flag for command data

CRC_high: Upper byte of CRC flag for command data

3. Command data

Command data chart

byte_0	byte_1	byte_2	byte_3	byte_4	byte_5
Action		Type		Setting code	
low	high	low	high	low	high

Action (byte_0 - 1)

Action	Classification	Content
1	Set	Change setting to desired value.
2	Get	Read projector internal setup value.
4	Increment	Increment setup value by 1.
5	Decrement	Decrement setup value by 1.
6	Execute	Run a command.

Requesting projector status (Get command)

(1) Send the following request code from the PC to the projector.

Header + Command data ('02H' + '00H' + type (2 bytes) + '00H' + '00H')

(2) The projector returns the response code '1DH' + data (2 bytes) to the PC.

Changing the projector settings (Set command)

(1) Send the following setting code from the PC to the projector.

Header + Command data ('01H' + '00H' + type (2 bytes) + setting code (2 bytes))

(2) The projector changes the setting based on the above setting code.

(3) The projector returns the response code '06H' to the PC.

Using the projector default settings (Reset Command)

(1) The PC sends the following default setting code to the projector.

Header + Command data ('06H' + '00H' + type (2 bytes) + '00H' + '00H')

(2) The projector changes the specified setting to the default value.

(3) The projector returns the response code '06H' to the PC.

Increasing the projector setting value (Increment command)

(1) The PC sends the following increment code to the projector.

Header + Command data ('04H' + '00H' + type (2 bytes) + '00H' + '00H')

(2) The projector increases the setting value on the above setting code.

(3) The projector returns the response code '06H' to the PC.

Decreasing the projector setting value (Decrement command)

(1) The PC sends the following decrement code to the projector.

Header + Command data ('05H' + '00H' + type (2 bytes) + '00H' + '00H')

(2) The projector decreases the setting value on the above setting code.

(3) The projector returns the response code '06H' to the PC.

When the projector cannot understand the received command

When the projector cannot understand the received command, the error code '15H' is sent back to the PC.

Sometimes the projector cannot properly receive the command. In such a case, the command is not executed and the error code '15H' is sent back to the PC. If this error code is returned, send the same command again.

When the projector cannot execute the received command.

When the projector cannot execute the received command, the error code '1CH' + 'xxxxH' is sent back to the PC.

When the data length is greater than indicated by the data length code, the projector ignore the excess data code. Conversely when the data length is shorter than indicated by the data length code, an error code will be returned to the PC.

When authentication error occurred.

When authentication error occurred, the error code the '1FH' + '0400H' is sent back to the PC.

NOTE • Operation cannot be guaranteed when the projector receives an undefined command or data.

- Provide an interval of at least 40ms between the response code and any other code.
- Commands are not accepted during warm-up.

[TCP #9715]**1. Protocol**

Consist of header (1 byte) + data length (1 byte) + command data (13 bytes) + check sum (1 bytes) + connection ID (1 byte).

2. Header

02, Fixed

3. Data Length

Network control commands byte length (0D, Fixed)

4. Command data

Network control commands that start with BE EF (13bytes).

5. Check Sum

This is the value to make zero on the addition of the lower 8 bits from the header to the checksum.

6. Connection ID

Random value from 0 to 255 (This value is attached to the reply data).

7. Reply Data

The connection ID (the data is same as the connection ID data on the sending data format) is attached to the Network control commands reply data.

ACK reply: '06H' + 'xxH'

NAK reply: '15H' + 'xxH'

Error reply: '1CH' + 'xxxxH' + 'xxH'

Data reply: '1DH' + 'xxxxH' + 'xxH'

Projector busy reply: '1FH' + 'xxxxH' + 'xxH'

Authentication error reply: '1FH' + '0400H' + 'xxH'

('xxH' : connection ID)

Automatic Connection Break

The TCP connection will be automatically disconnected after there is no communication for 30 seconds after being established.

Authentication

The projector does not accept commands without authentication success when authentication is enabled. The projector uses a challenge response type authentication with an MD5 (Message Digest 5) algorithm. When the projector is using a LAN, a random 8 bytes will be returned if authentication is enabled. Bind this received 8 bytes and the authentication password and digest this data with the MD5 algorithm and add this in front of the commands to send.

Following is a sample if the authentication password is set to "password" and the random 8 bytes are "a572f60c".

- 1) Select the projector.
- 2) Receive the random 8 bytes "a572f60c" from the projector.
- 3) Bind the random 8 bytes "a572f60c" and the authentication password "password" and it becomes "a572f60cpassword".
- 4) Digest this bind "a572f60cpassword" with MD5 algorithm.
It will be "e3d97429adffa11bce1f7275813d4bde".
- 5) Add this "e3d97429adffa11bce1f7275813d4bde" in front of the commands and send the data.
Send "e3d97429adffa11bce1f7275813d4bde"+command.
- 6) When the sending data is correct, the command will be performed and the reply data will be returned. Otherwise, an authentication error will be returned.

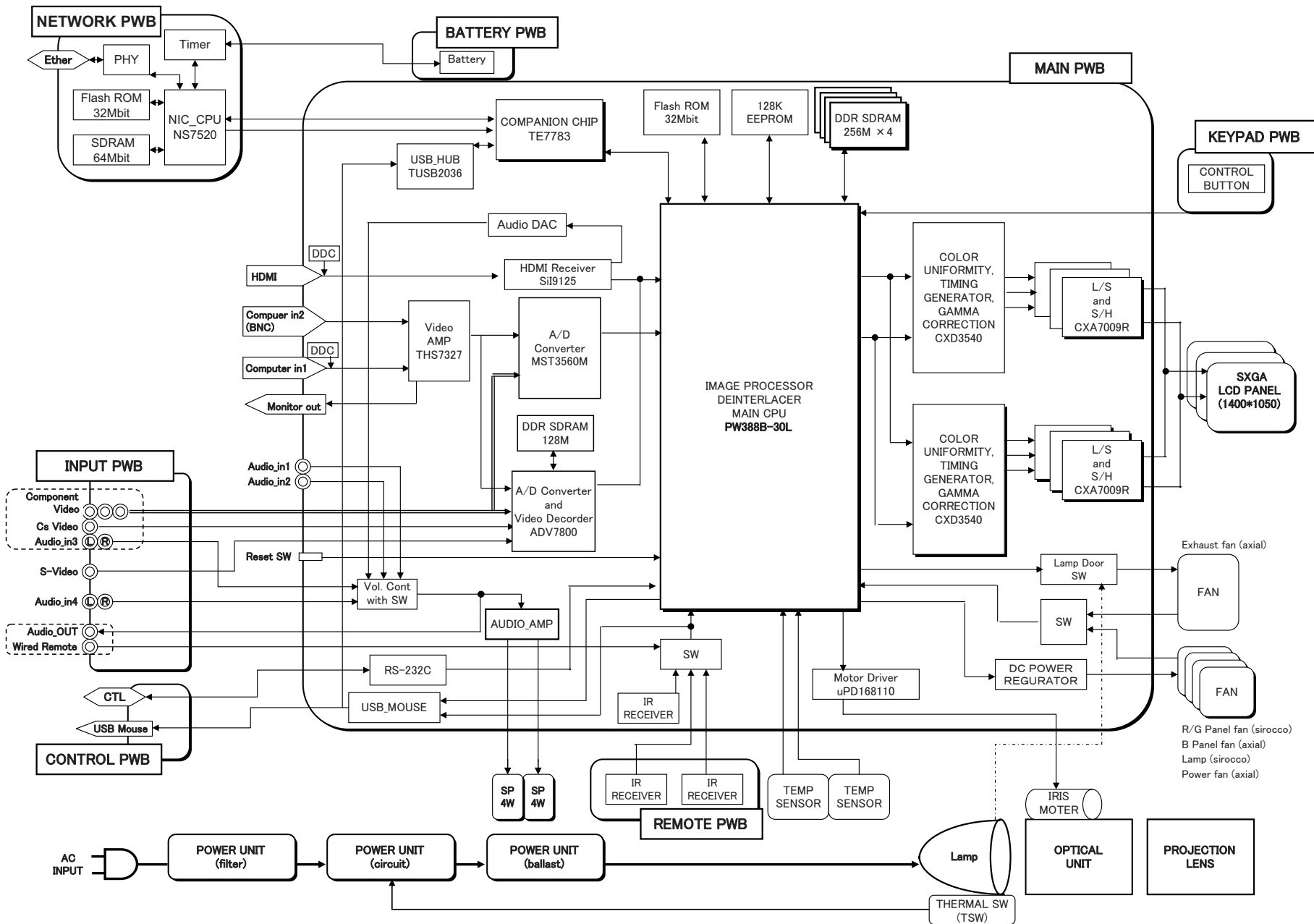
NOTE • As for the transmission of the second or subsequent commands, the authentication data can be omitted when the same connection.

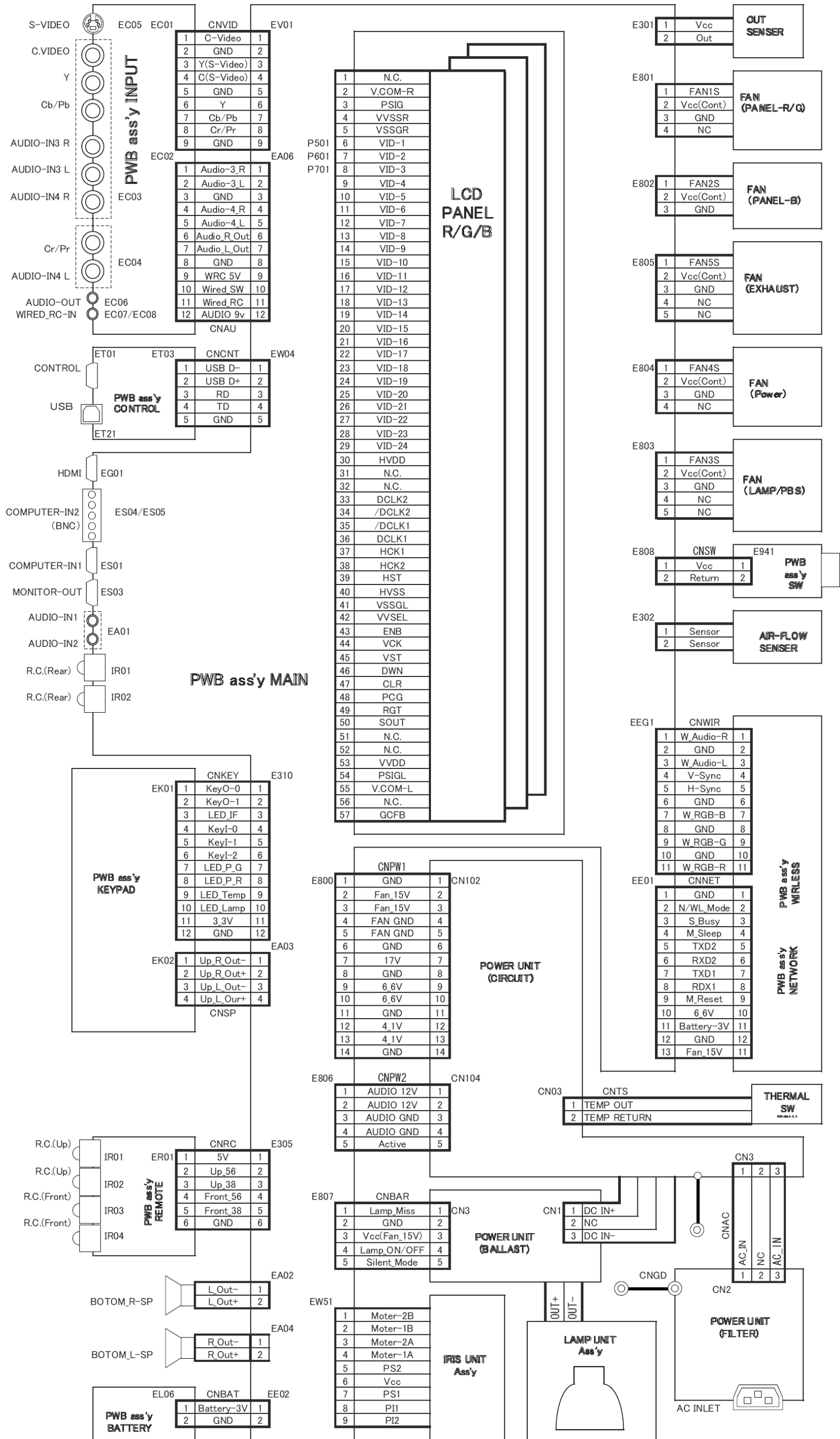
RS-232C Communication / Network command table

Names	Operation Type	Header				Command Data				
		CRC	Action	Type	Setting Code					
Power	Set	TURN OFF	BE EF	03 06 00	2A D3	01 00	00 60	00 00		
		TURN ON	BE EF	03 06 00	BA D2	01 00	00 60	01 00		
	Get	BE EF	03 06 00	19 D3	02 00	00 60	00 00			
(Example Return)										
			00 00	01 00	02 00					
			(Off)	(On)	(Cool Down)					
Input Source	Set	RGB1	BE EF	03 06 00	FE D2	01 00	00 20	00 00		
		RGB2	BE EF	03 06 00	3E D0	01 00	00 20	04 00		
		HDMI	BE EF	03 06 00	0E D2	01 00	00 20	03 00		
		COMPONENT	BE EF	03 06 00	AE D1	01 00	00 20	05 00		
		S-VIDEO	BE EF	03 06 00	9E D3	01 00	00 20	02 00		
		VIDEO	BE EF	03 06 00	6E D3	01 00	00 20	01 00		
		Get	BE EF	03 06 00	CD D2	02 00	00 20	00 00		
Error Status	Get	BE EF	03 06 00	D9 D8	02 00	20 60	00 00			
		(Example Return)								
			00 00	01 00	02 00	03 00				
			(Normal)	(Cover error)	(Fan error)	(Lamp error)				
			04 00	05 00	07 00	08 00				
			(Temp error)	(Air flow error)	(Cold error)	(Filter error)				
BRIGHTNESS	Get	BE EF	03 06 00	89 D2	02 00	03 20	00 00			
		Increment	BE EF	03 06 00	EF D2	04 00	03 20	00 00		
		Decrement	BE EF	03 06 00	3E D3	05 00	03 20	00 00		
BRIGHTNESS Reset	Execute	BE EF	03 06 00	58 D3	06 00	00 70	00 00			
CONTRAST	Get	BE EF	03 06 00	FD D3	02 00	04 20	00 00			
		Increment	BE EF	03 06 00	9B D3	04 00	04 20	00 00		
		Decrement	BE EF	03 06 00	4A D2	05 00	04 20	00 00		
CONTRAST Reset	Execute	BE EF	03 06 00	A4 D2	06 00	01 70	00 00			
PICTURE MODE	Set	NORMAL	BE EF	03 06 00	23 F6	01 00	BA 30	00 00		
		CINEMA	BE EF	03 06 00	B3 F7	01 00	BA 30	01 00		
		DYNAMIC	BE EF	03 06 00	E3 F4	01 00	BA 30	04 00		
		BOARD (BLACK)	BE EF	03 06 00	E3 EF	01 00	BA 30	20 00		
		BOARD (GREEN)	BE EF	03 06 00	73 EE	01 00	BA 30	21 00		
		WHITE BOARD	BE EF	03 06 00	83 EE	01 00	BA 30	22 00		
		DAY TIME	BE EF	03 06 00	E3 C7	01 00	BA 30	40 00		
		Get	BE EF	03 06 00	10 F6	02 00	BA 30	00 00		
		(Example Return)								
					00 00	01 00	04 00	10 00		
			(Normal)	(CINEMA)	(DYNAMIC)	(CUSTOM)				
			20 00	21 00	22 00	40 00				
			(BOARD(BLACK))	(BOARD(GREEN))	(WHITEBOARD)	(DAY TIME)				

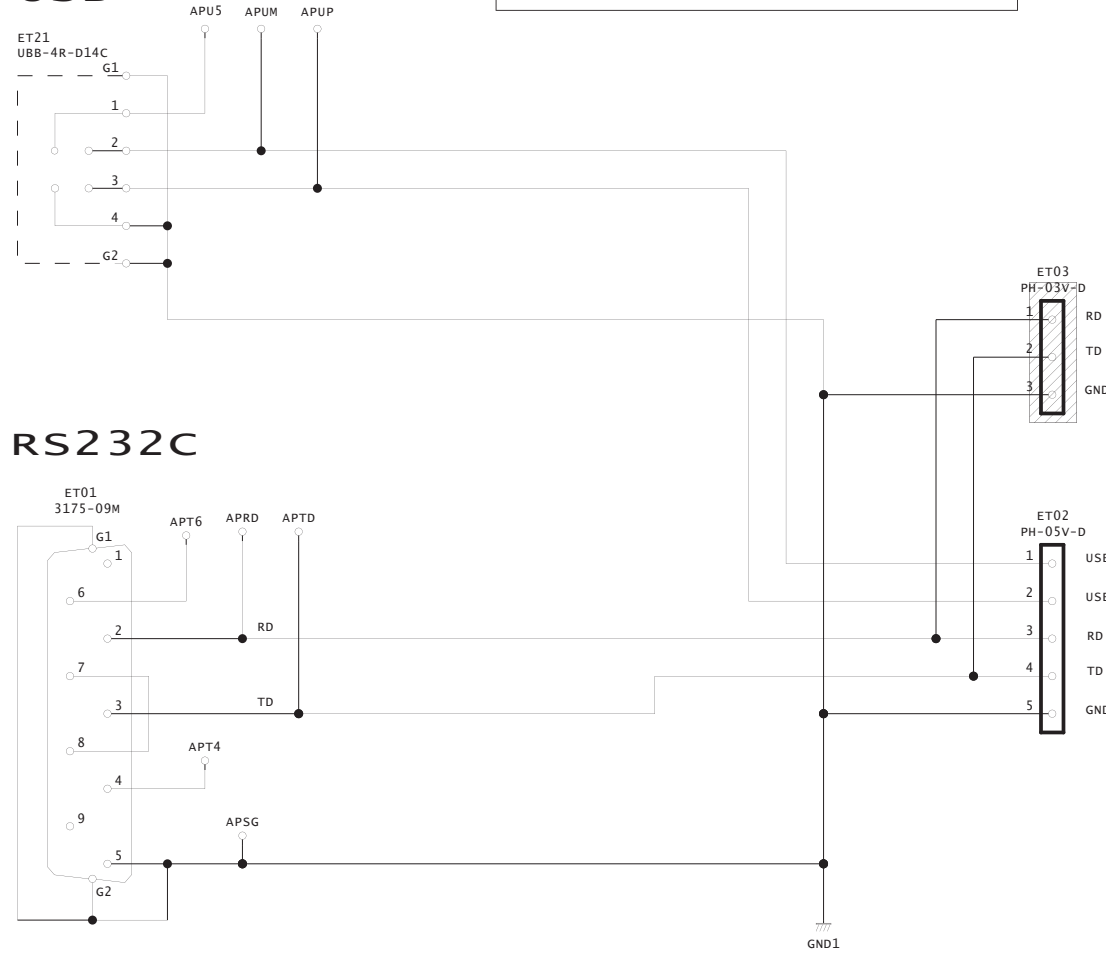
Names	Operation Type	Header				Command Data		
		CRC	Action	Type	Setting Code			
GAMMA	Set	#1 DEFAULT	BE EF	03 06 00	07 E9	01 00	A1 30	20 00
		#2 DEFAULT	BE EF	03 06 00	97 E8	01 00	A1 30	21 00
		#3 DEFAULT	BE EF	03 06 00	67 E8	01 00	A1 30	22 00
		#4 DEFAULT	BE EF	03 06 00	F7 E9	01 00	A1 30	23 00
		#5 DEFAULT	BE EF	03 06 00	C7 EB	01 00	A1 30	24 00
		#6 DEFAULT	BE EF	03 06 00	57 EA	01 00	A1 30	25 00
		#1 CUSTOM	BE EF	03 06 00	07 FD	01 00	A1 30	10 00
		#2 CUSTOM	BE EF	03 06 00	97 FC	01 00	A1 30	11 00
		#3 CUSTOM	BE EF	03 06 00	67 FC	01 00	A1 30	12 00
		#4 CUSTOM	BE EF	03 06 00	F7 FD	01 00	A1 30	13 00
		#5 CUSTOM	BE EF	03 06 00	C7 FF	01 00	A1 30	14 00
		#6 CUSTOM	BE EF	03 06 00	57 FE	01 00	A1 30	15 00
		Get	BE EF	03 06 00	F4 F0	02 00	A1 30	00 00
		User Gamma Pattern	Set	Off	BE EF	03 06 00	FB FA	01 00
9step Gray Scale	BE EF			03 06 00	6B FB	01 00	80 30	01 00
15step Gray Scale	BE EF			03 06 00	9B FB	01 00	80 30	02 00
Ramp	BE EF			03 06 00	0B FA	01 00	80 30	03 00
Get	BE EF	03 06 00	C8 FA	02 00	80 30	00 00		
User Gamma Point 1	Get	BE EF	03 06 00	08 FE	02 00	90 30	00 00	
		Increment	BE EF	03 06 00	6E FE	04 00	90 30	00 00
		Decrement	BE EF	03 06 00	BF FF	05 00	90 30	00 00
User Gamma Point 2	Get	BE EF	03 06 00	F4 FF	02 00	91 30	00 00	
		Increment	BE EF	03 06 00	92 FF	04 00	91 30	00 00
		Decrement	BE EF	03 06 00	43 FE	05 00	91 30	00 00
User Gamma Point 3	Get	BE EF	03 06 00	B0 FF	02 00	92 30	00 00	
		Increment	BE EF	03 06 00	D6 FF	04 00	92 30	00 00
		Decrement	BE EF	03 06 00	07 FE	05 00	92 30	00 00
User Gamma Point 4	Get	BE EF	03 06 00	4C FE	02 00	93 30	00 00	
		Increment	BE EF	03 06 00	2A FE	04 00	93 30	00 00
		Decrement	BE EF	03 06 00	FB FF	05 00	93 30	00 00
User Gamma Point 5	Get	BE EF	03 06 00	38 FF	02 00	94 30	00 00	
		Increment	BE EF	03 06 00	5E FF	04 00	94 30	00 00
		Decrement	BE EF	03 06 00	8F FE	05 00	94 30	00 00
User Gamma Point 6	Get	BE EF	03 06 00	C4 FE	02 00	95 30	00 00	
		Increment	BE EF	03 06 00	A2 FE	04 00	95 30	00 00
		Decrement	BE EF	03 06 00	73 FF	05 00	95 30	00 00
User Gamma Point 7	Get	BE EF	03 06 00	80 FE	02 00	96 30	00 00	
		Increment	BE EF	03 06 00	E6 FE	04 00	96 30	00 00
		Decrement	BE EF	03 06 00	37 FF	05 00	96 30	00 00
User Gamma Point 8	Get	BE EF	03 06 00	7C FF	02 00	97 30	00 00	
		Increment	BE EF	03 06 00	1A FF	04 00	97 30	00 00
		Decrement	BE EF	03 06 00	CB FE	05 00	97 30	00 00

11. Block diagram





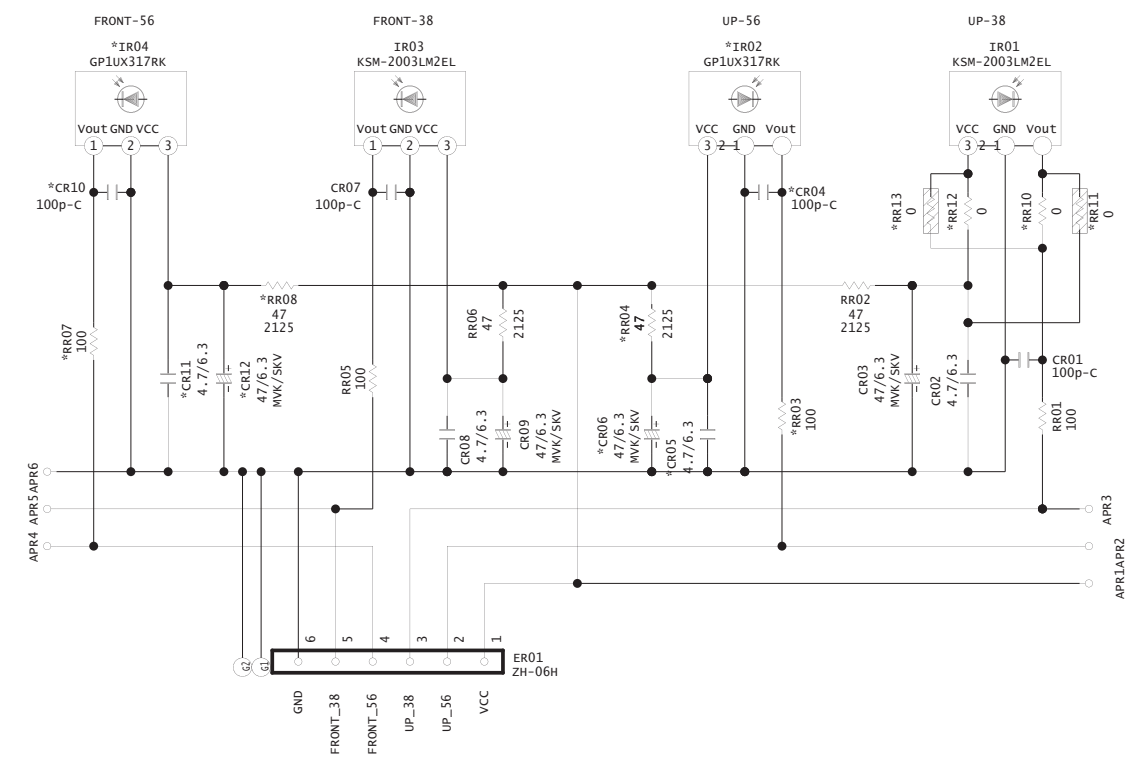
USB



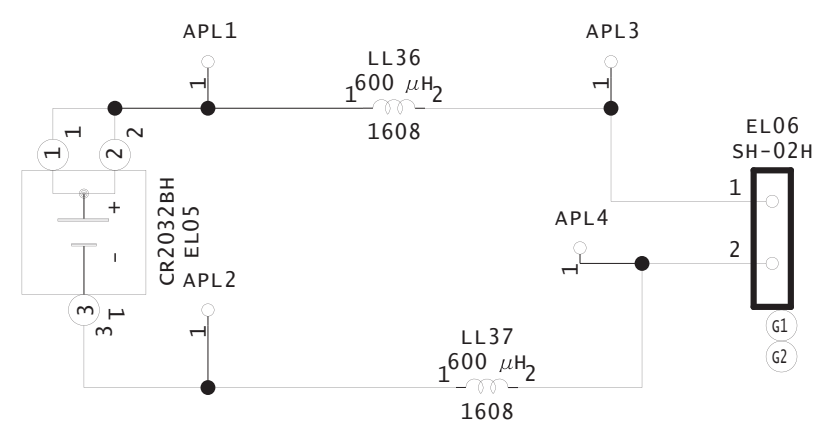
Parts with hatching are not mounted.

RS232C

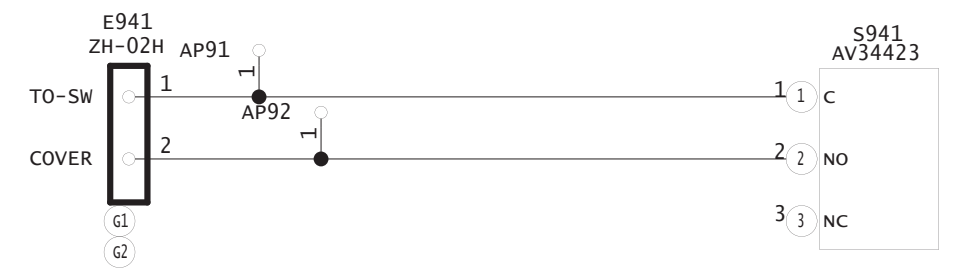
PWB assembly CONTROL



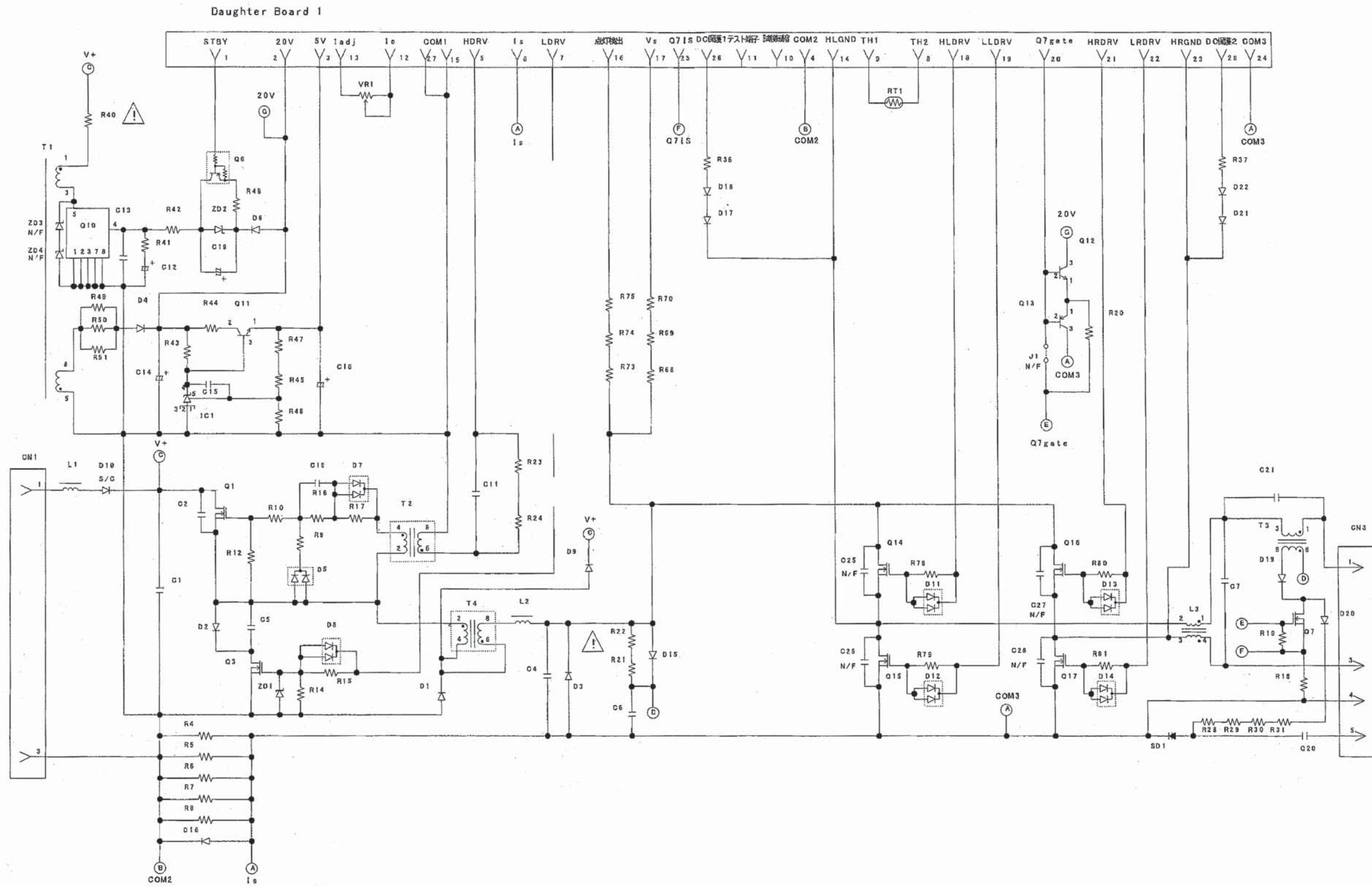
PWB assembly REMOTE



PWB assembly BATTERY



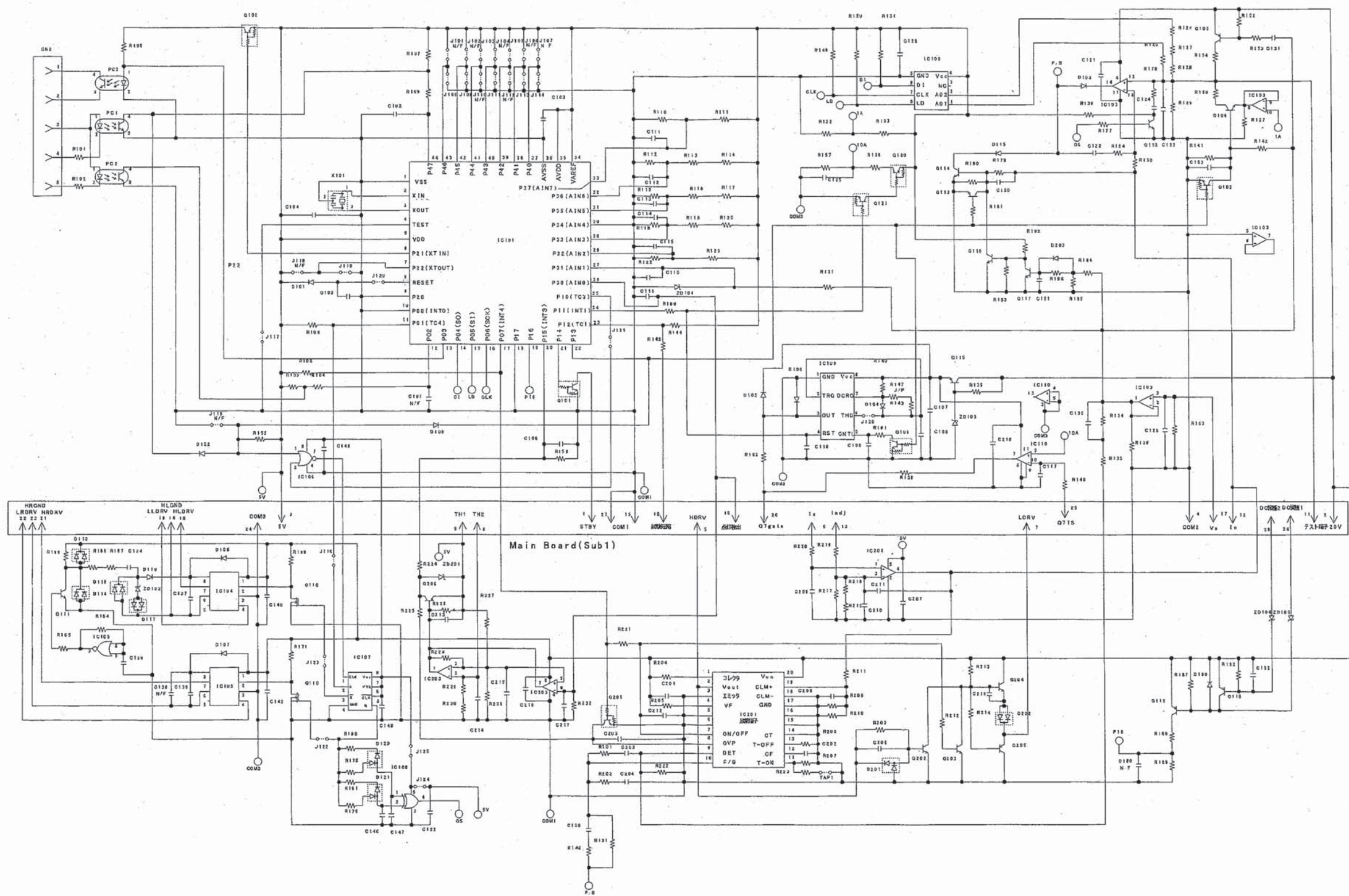
PWB assembly SW



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POWER UNIT (BALLAST) 1

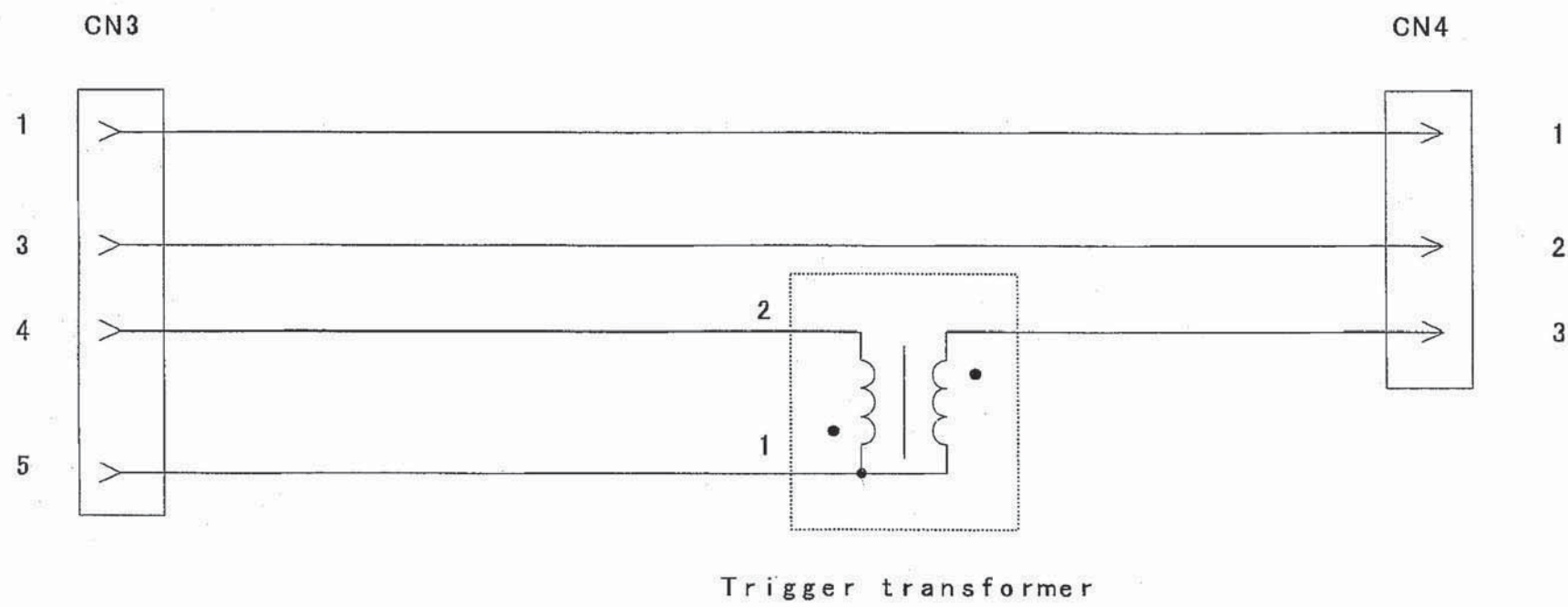
HITACHI

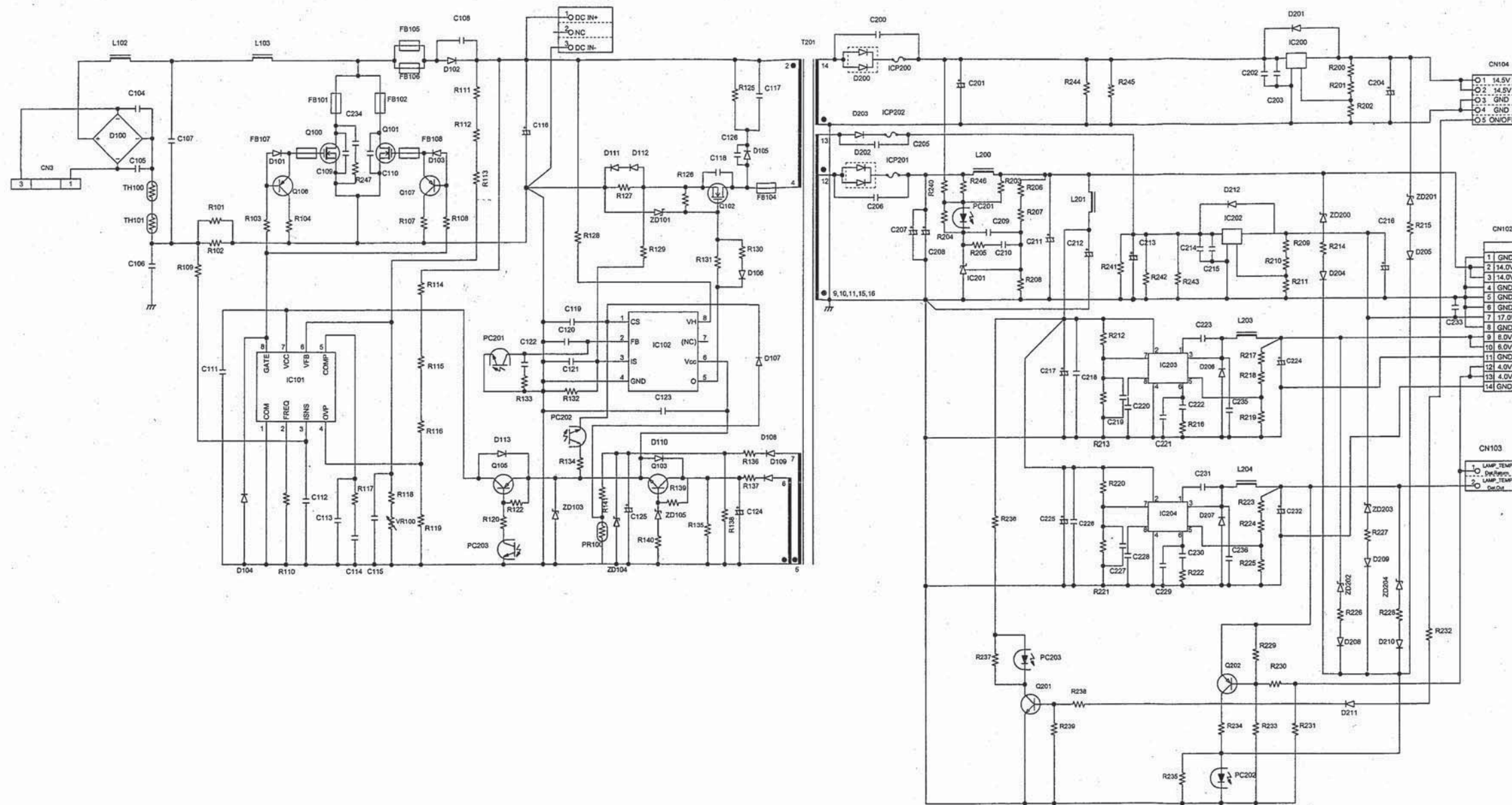


SM0321

POWER UNIT (BALLAST) 2

HITACHI

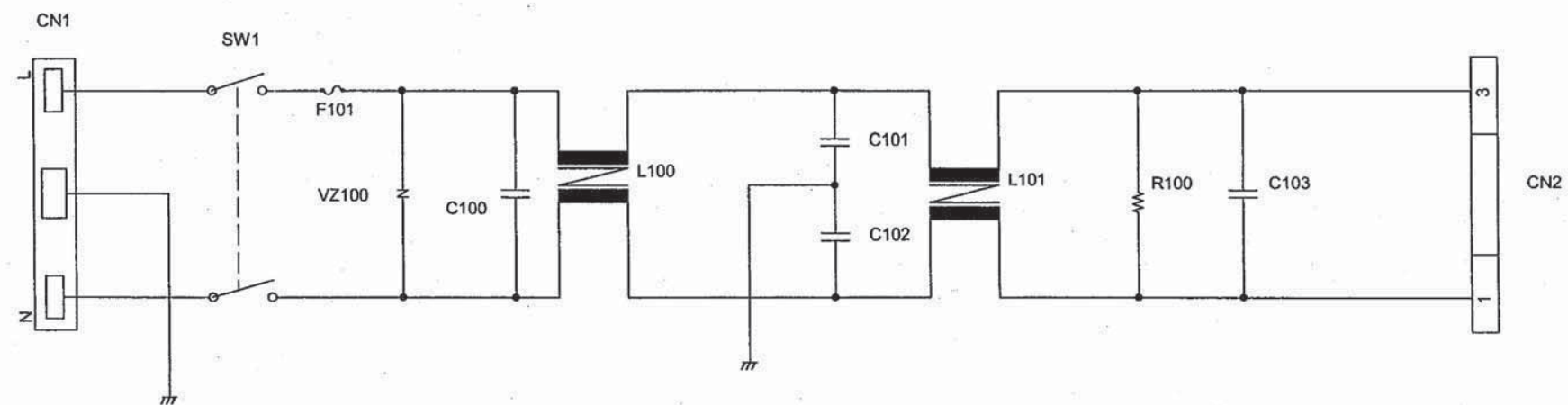


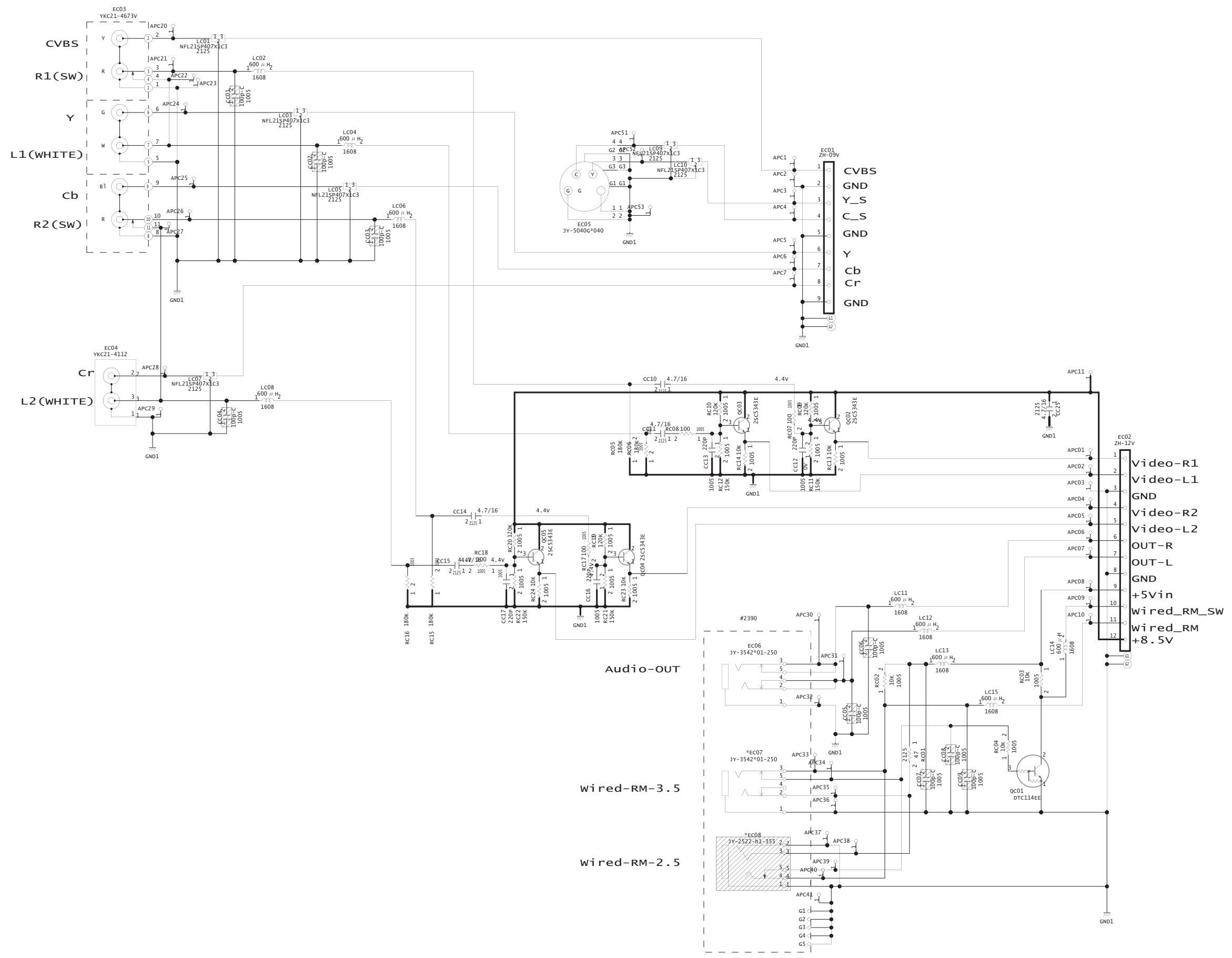


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POWER UNIT (CIRCUIT)

HITACHI

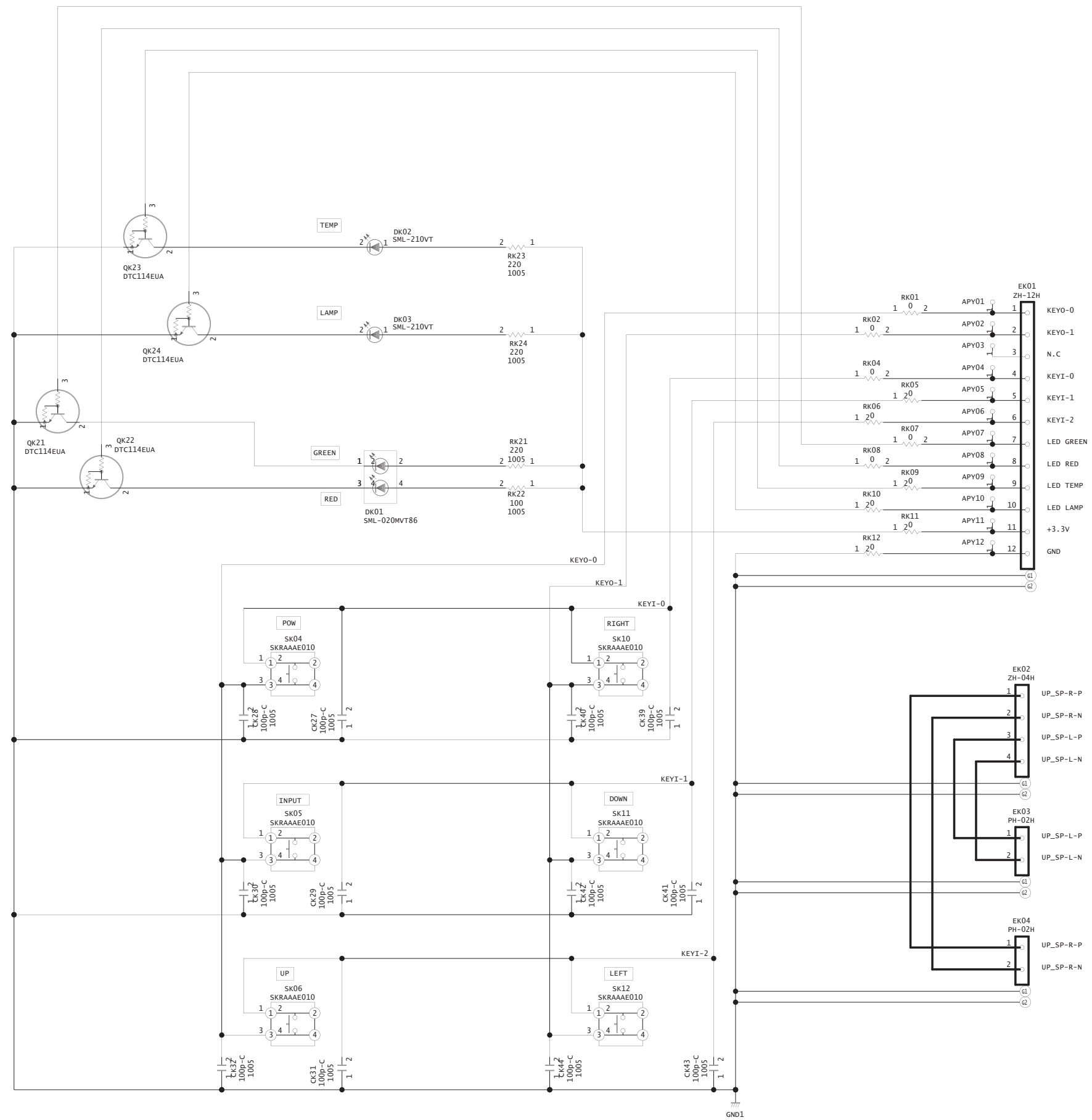




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PWB ASSEMBLY INPUTS

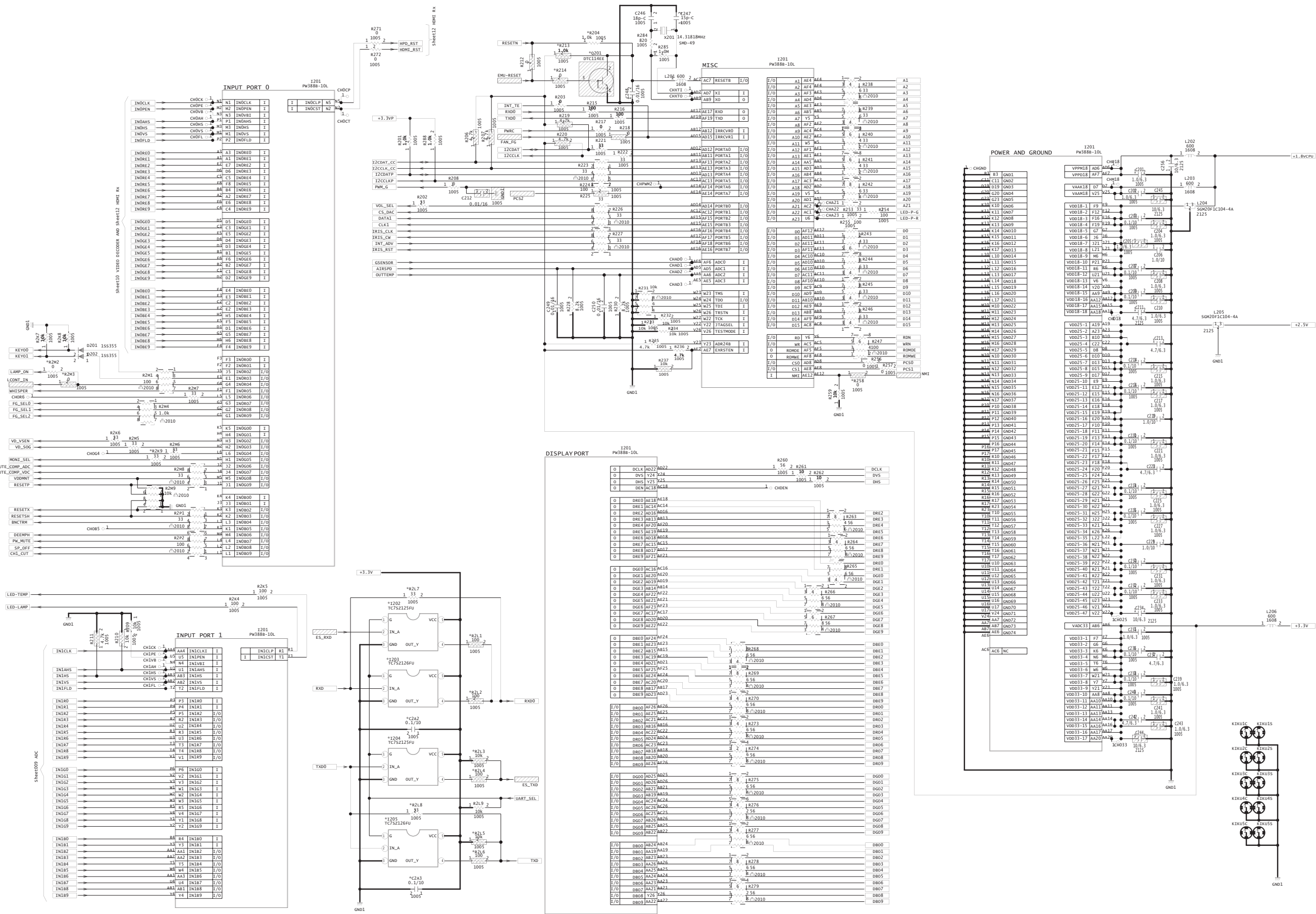
HITACHI



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PWB ASSEMBLY KEYPAD

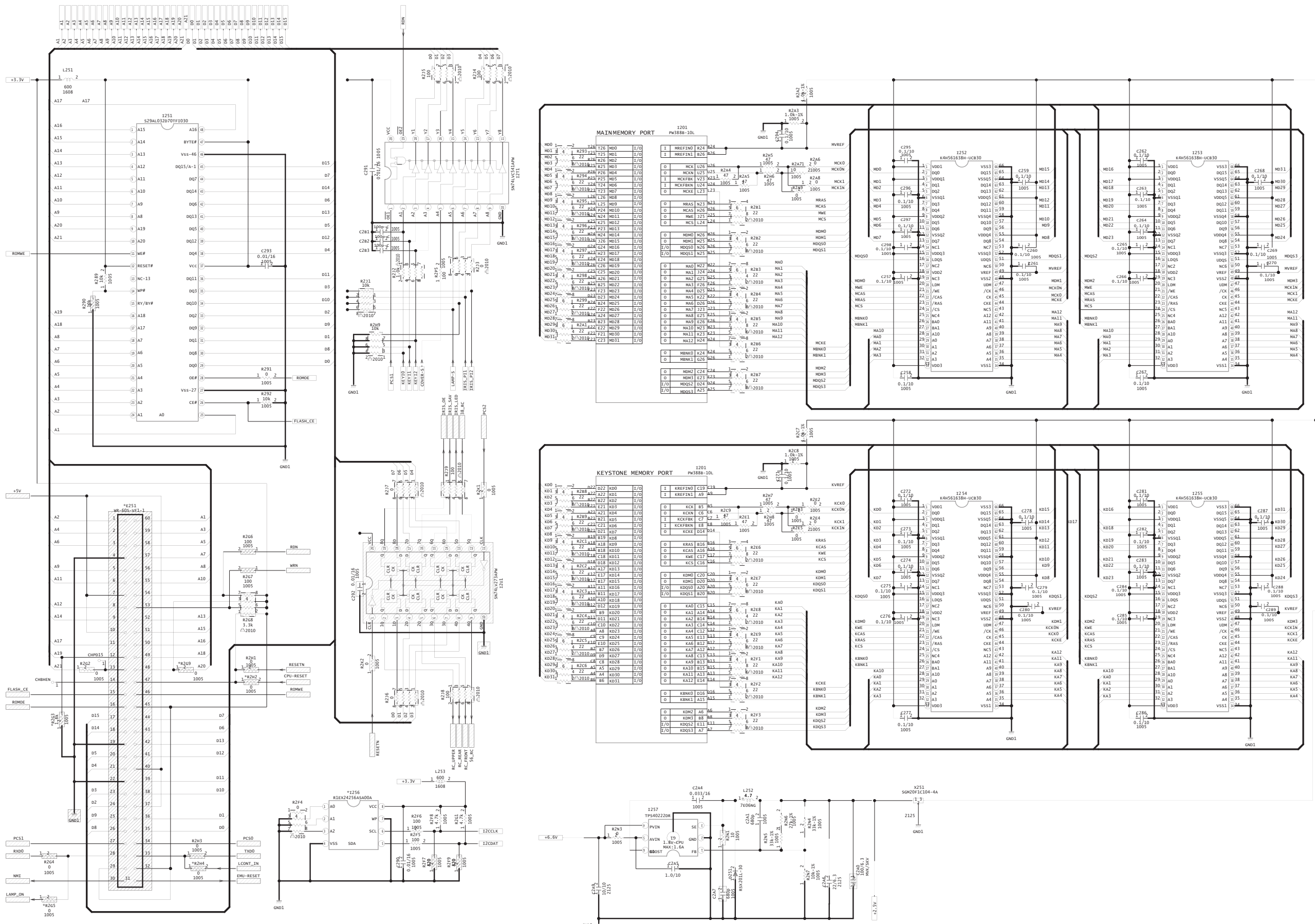
HITACHI

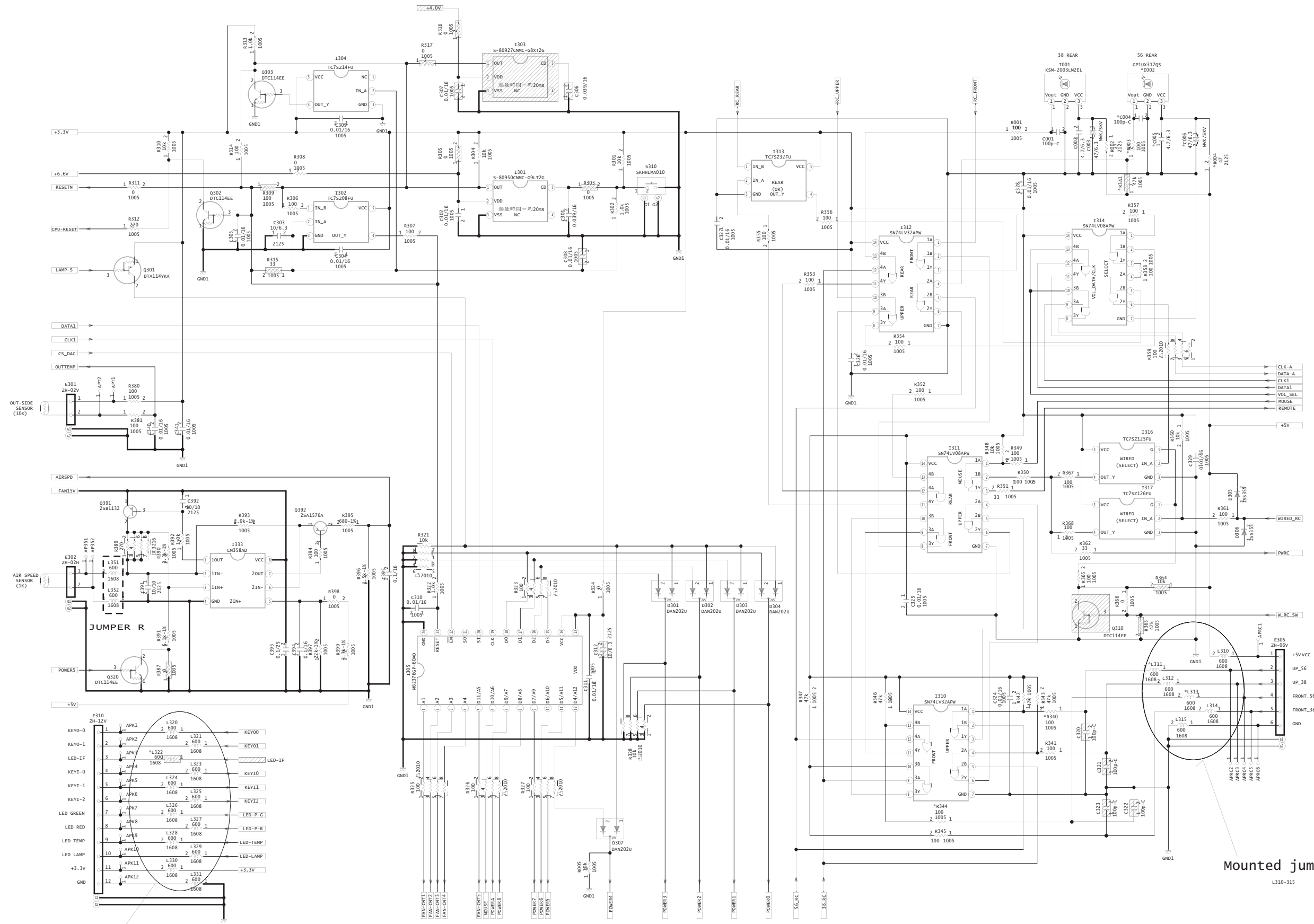


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PWB ASSEMBLY MAIN 1

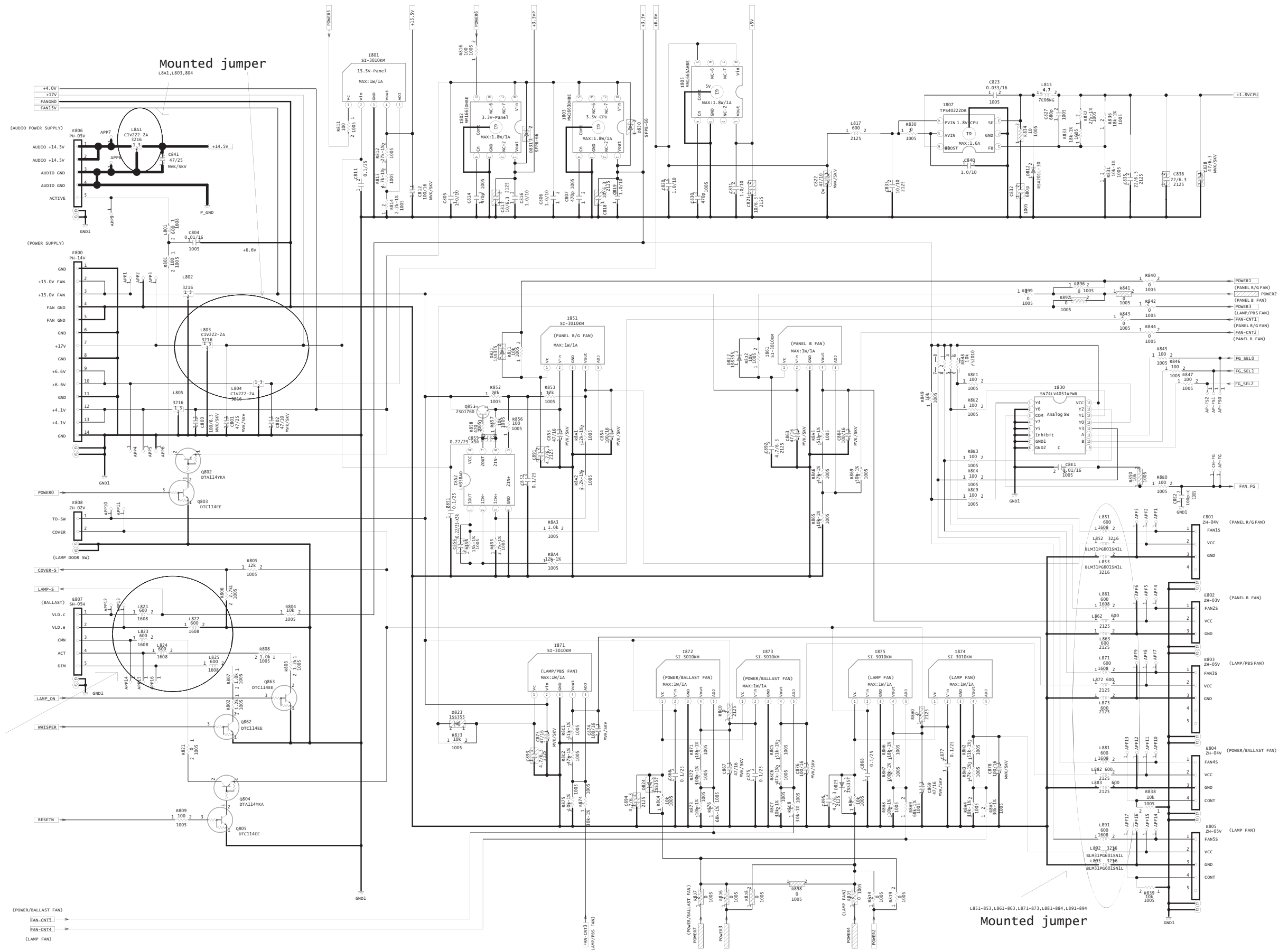
HITACHI





Mounted jumper
L320-331

Mounted jumper
L310-315

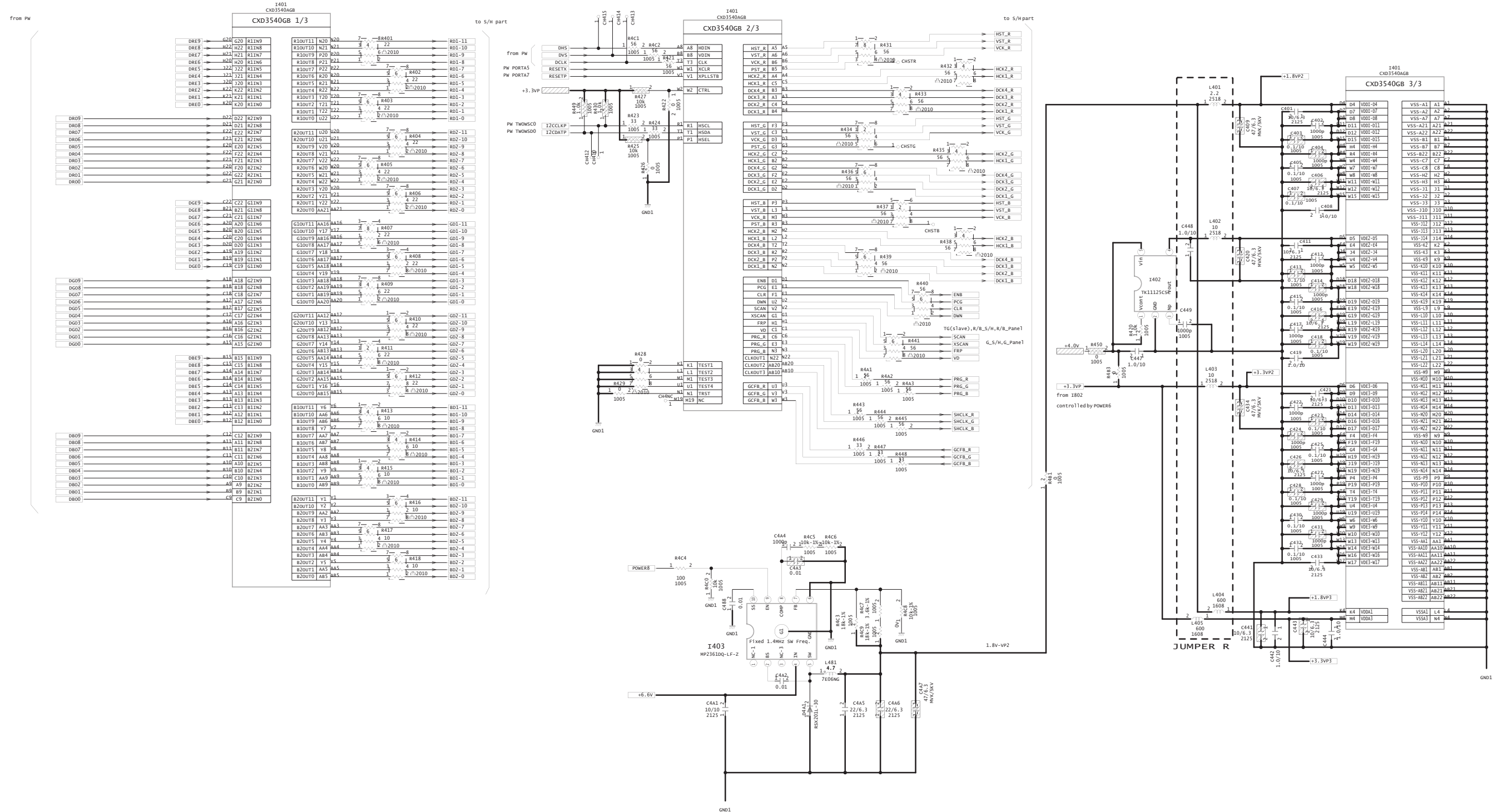


SM0321

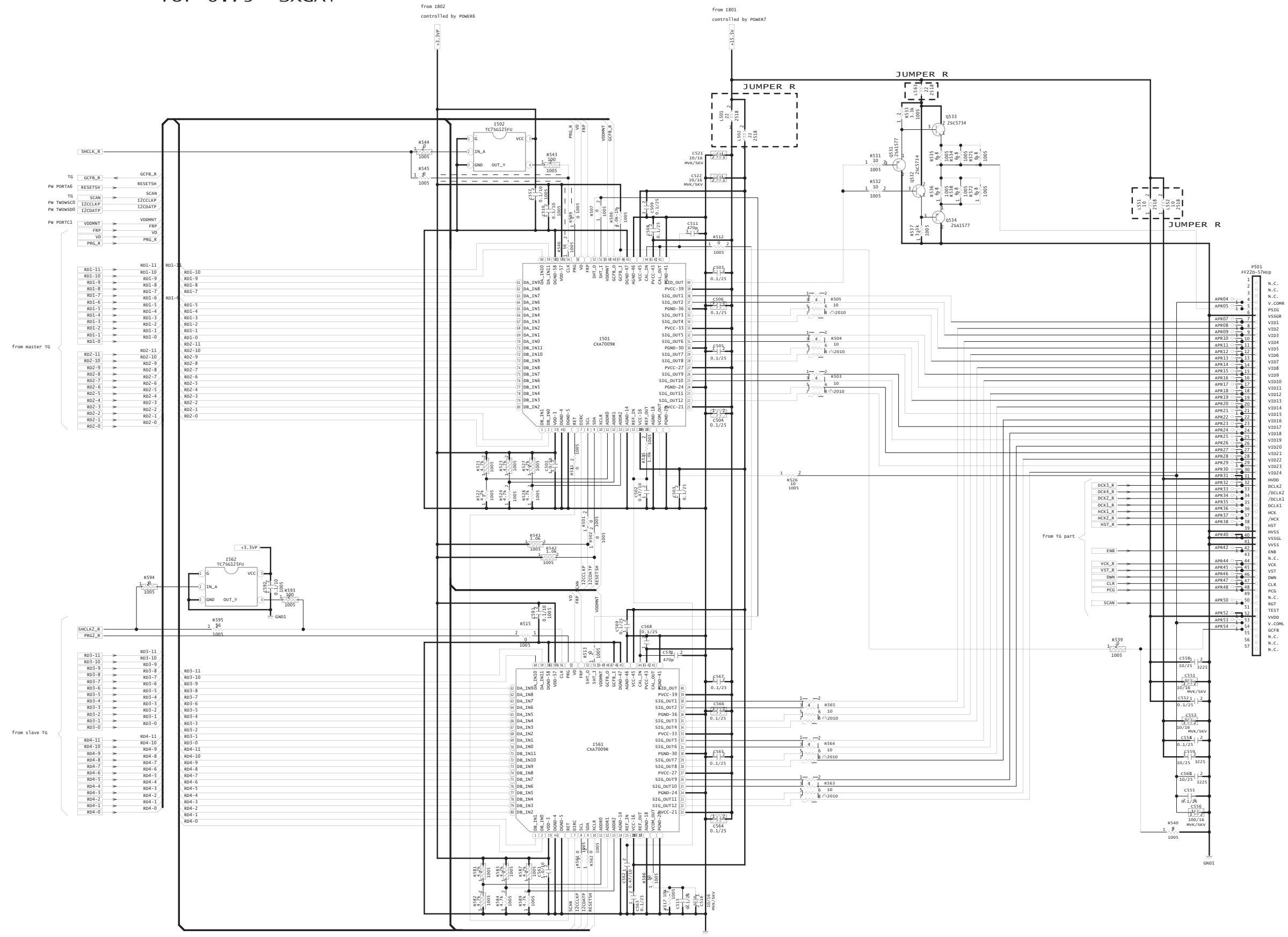
PWB ASSEMBLY MAIN 4

HITACHI

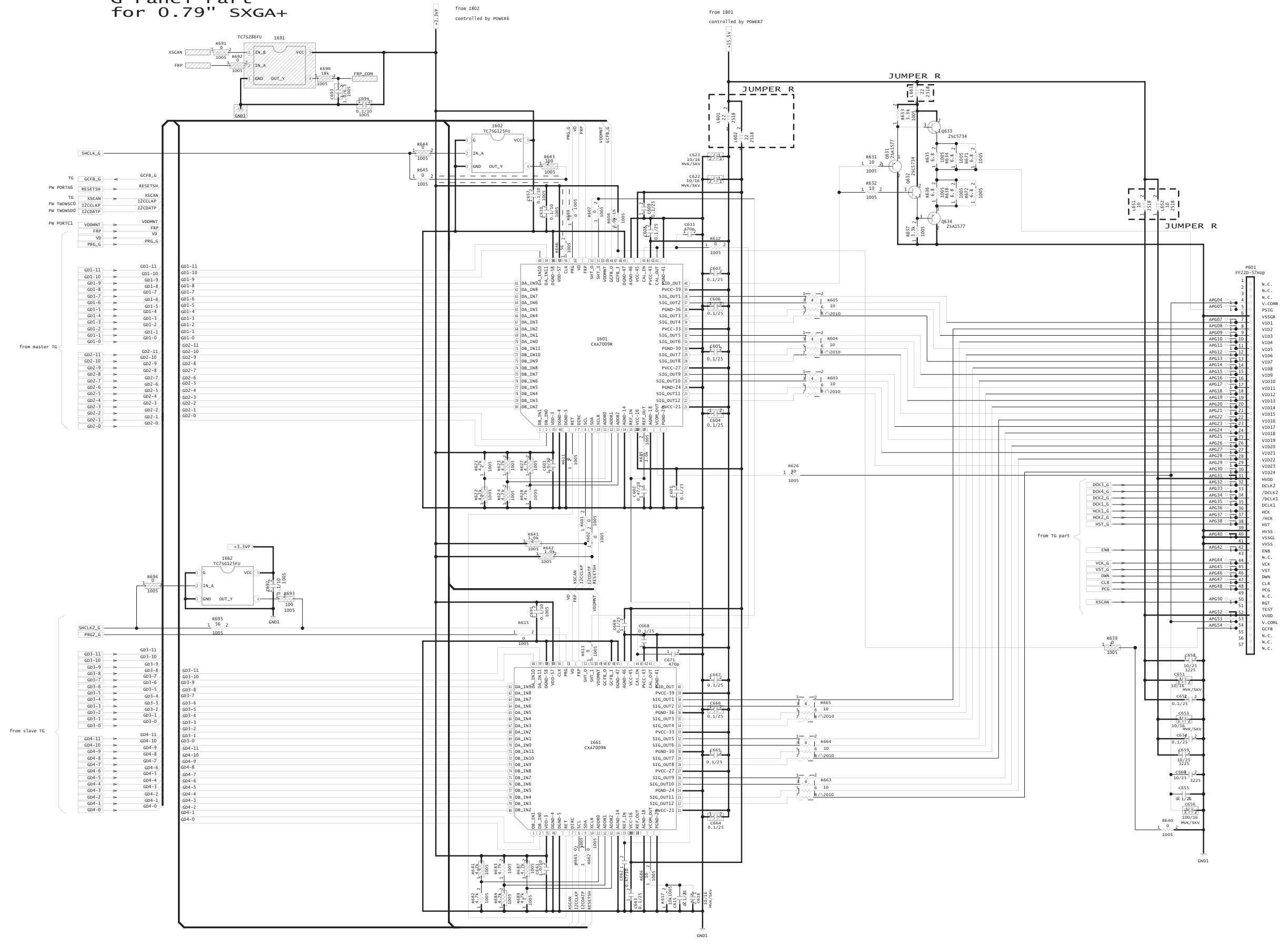
TG(Master) Part
for 0.79" SXGA



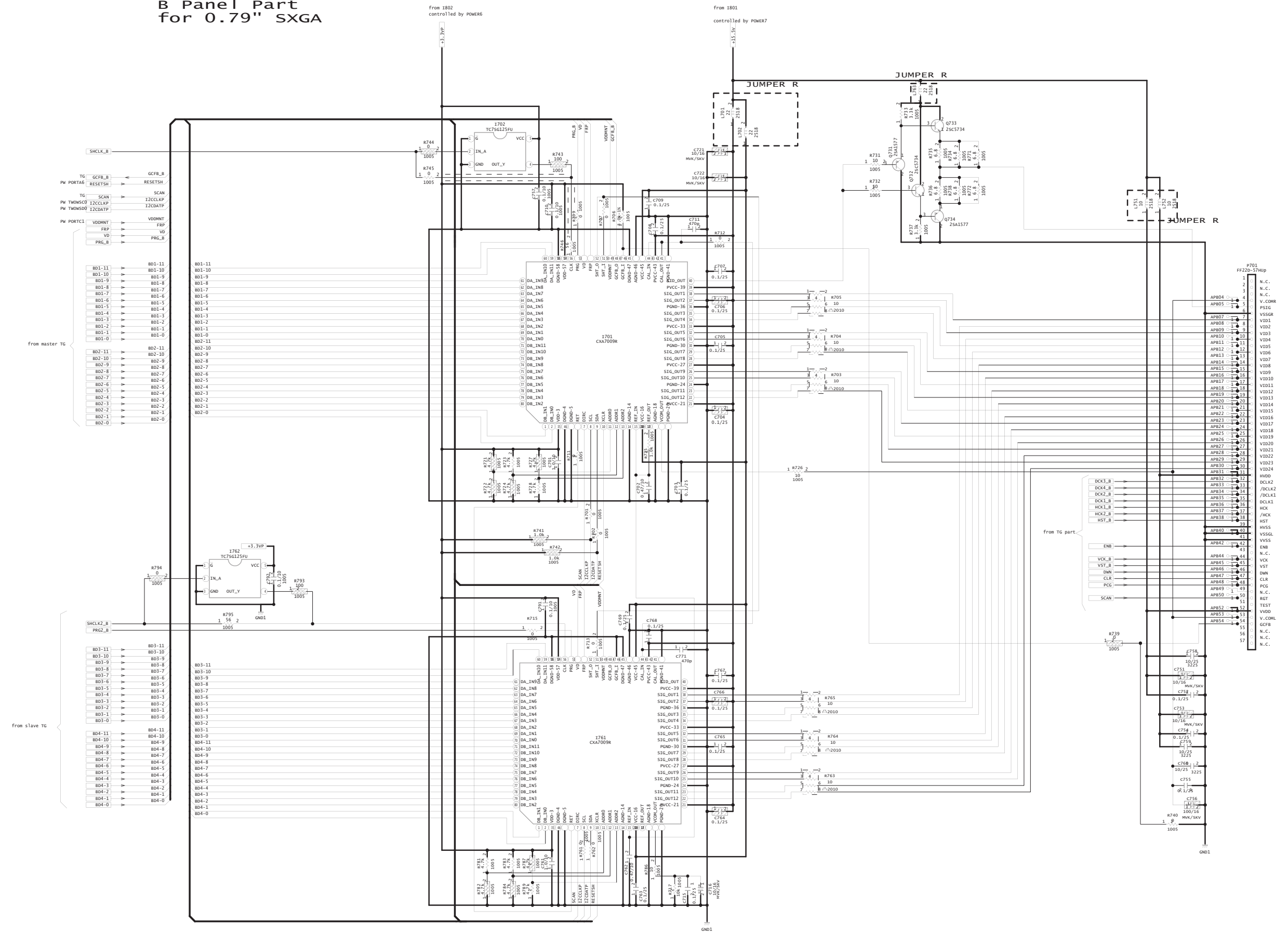
R Panel Part
for 0.79" SXGA+



G Panel Part
for 0.79" SXGA+



B Panel Part
for 0.79" SXGA

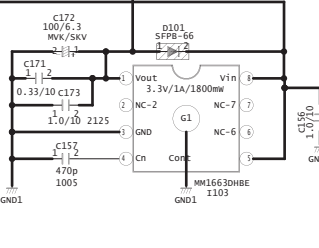
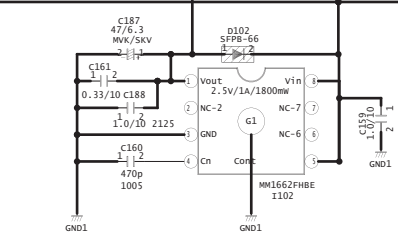


Sheet16 Analog MUX

Sheet16 Analog MUX

from Sheet3
CPU-RESET

ADD3_3V
ADD2_5V
+4.0V

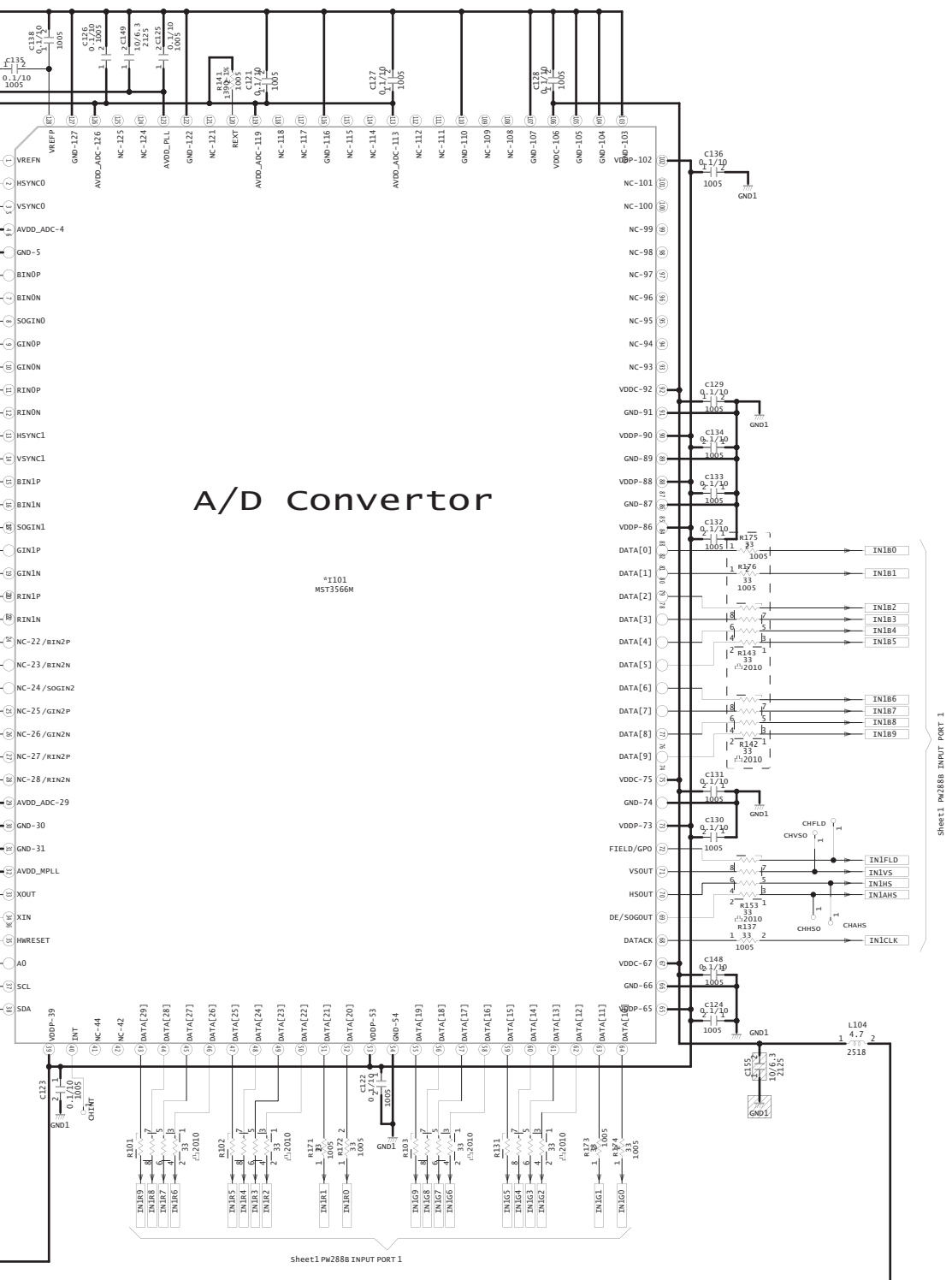


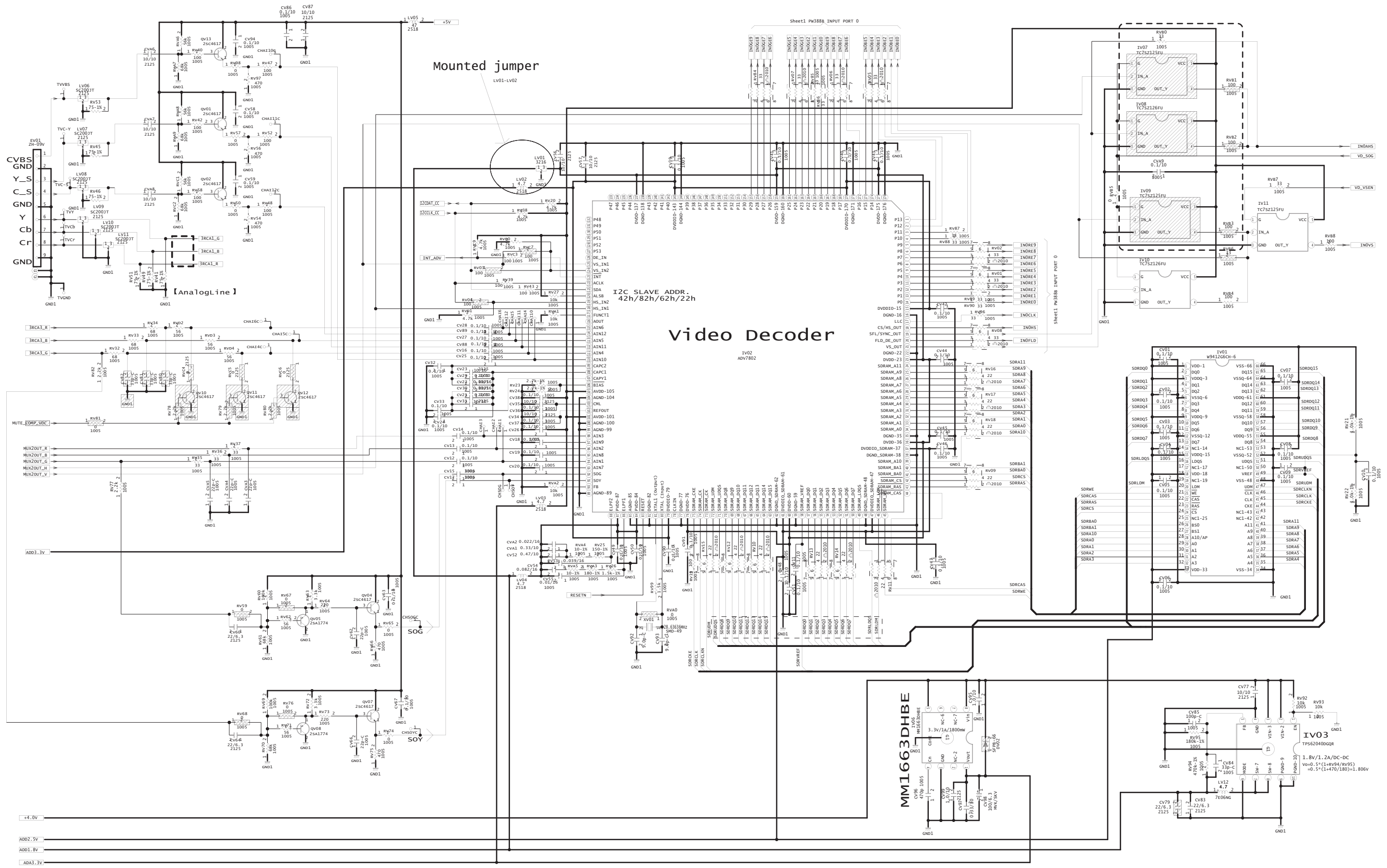
MUTE_COMP_ADC	
0	MUTE ON
1	MUTE OFF

Sheet11 PW2888 MISC
I2C SLAVE ADDR. 9Ch

A/D Converter

*I101
MST3566H

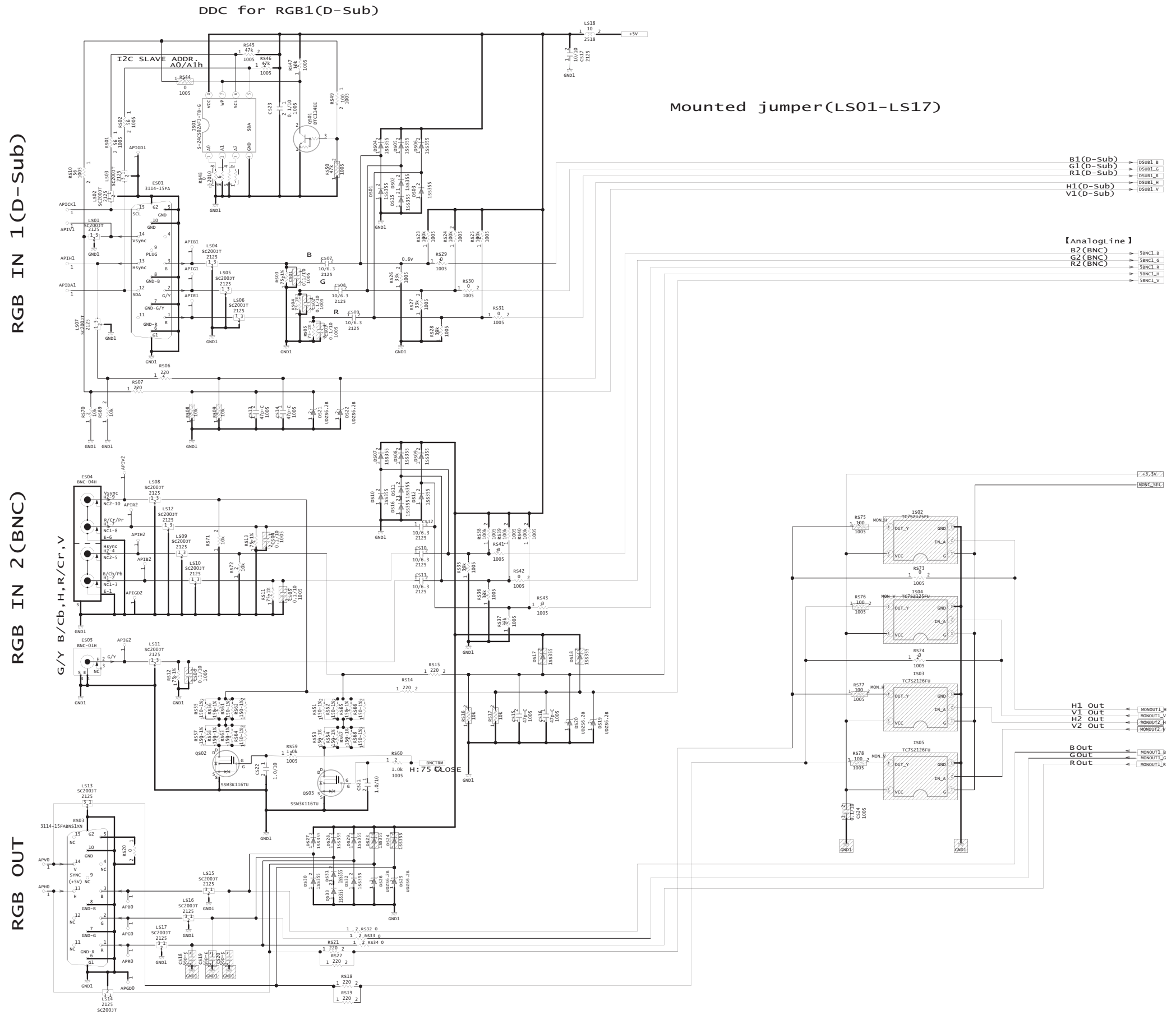


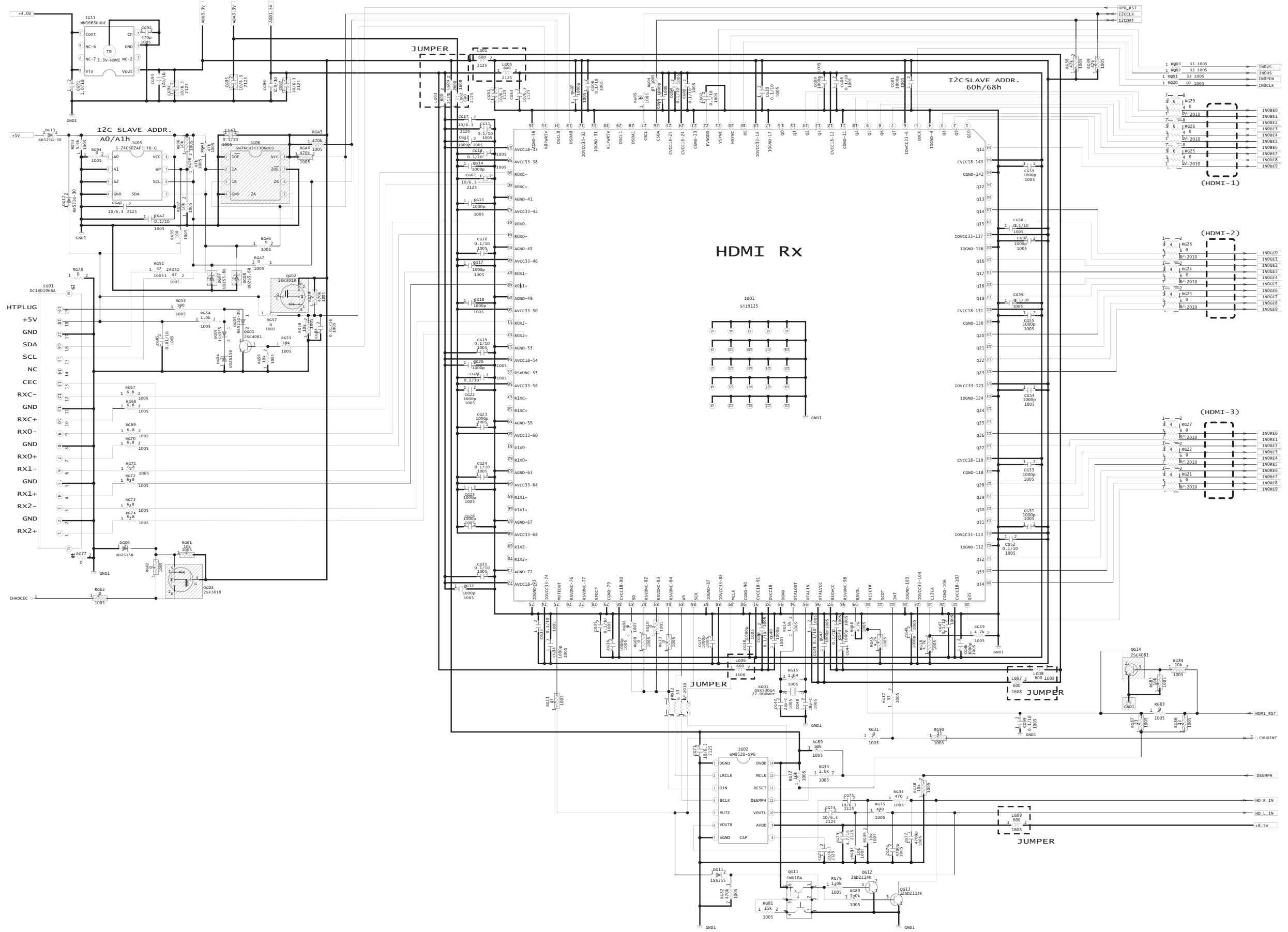


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PWB ASSEMBLY MAIN 10

HITACHI



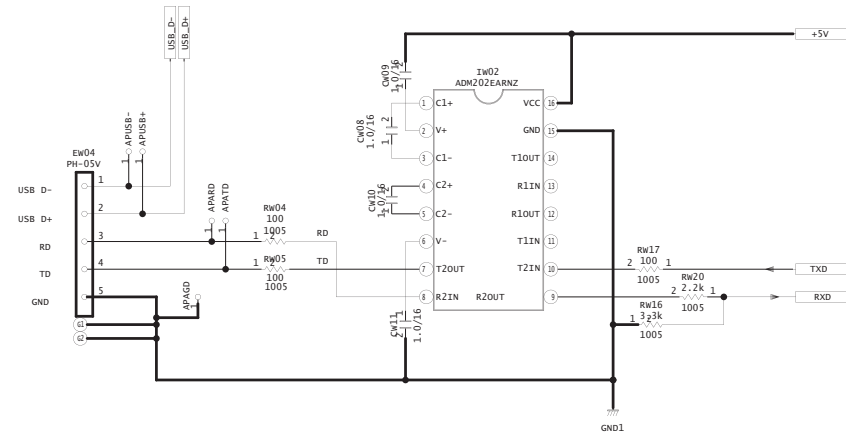


SM0321

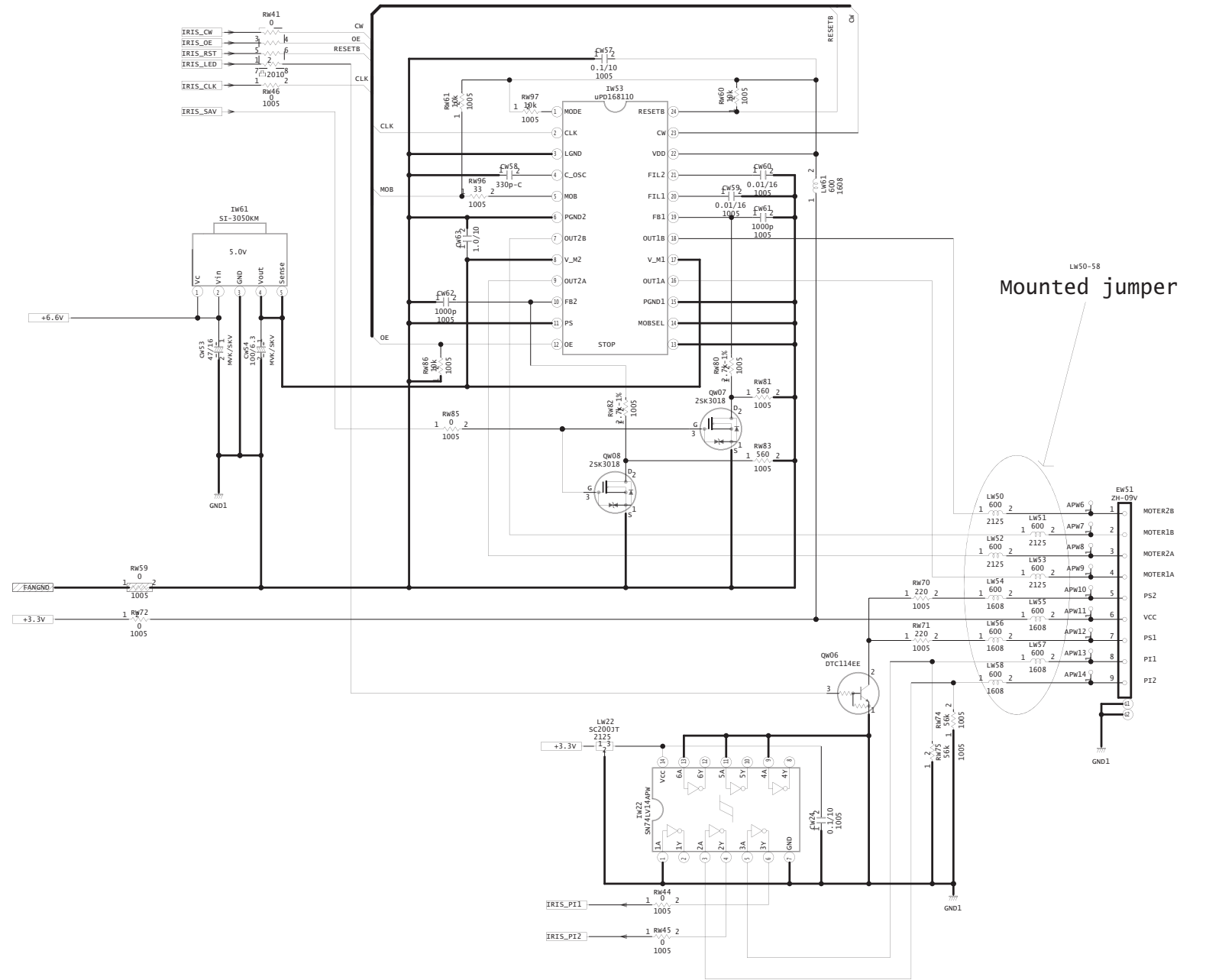
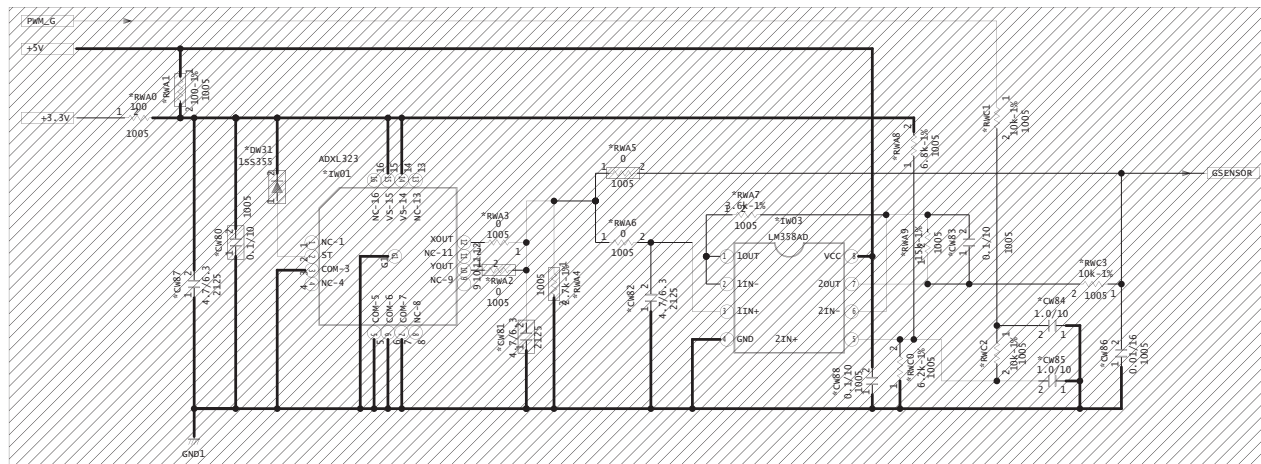
PWB ASSEMBLY MAIN 12

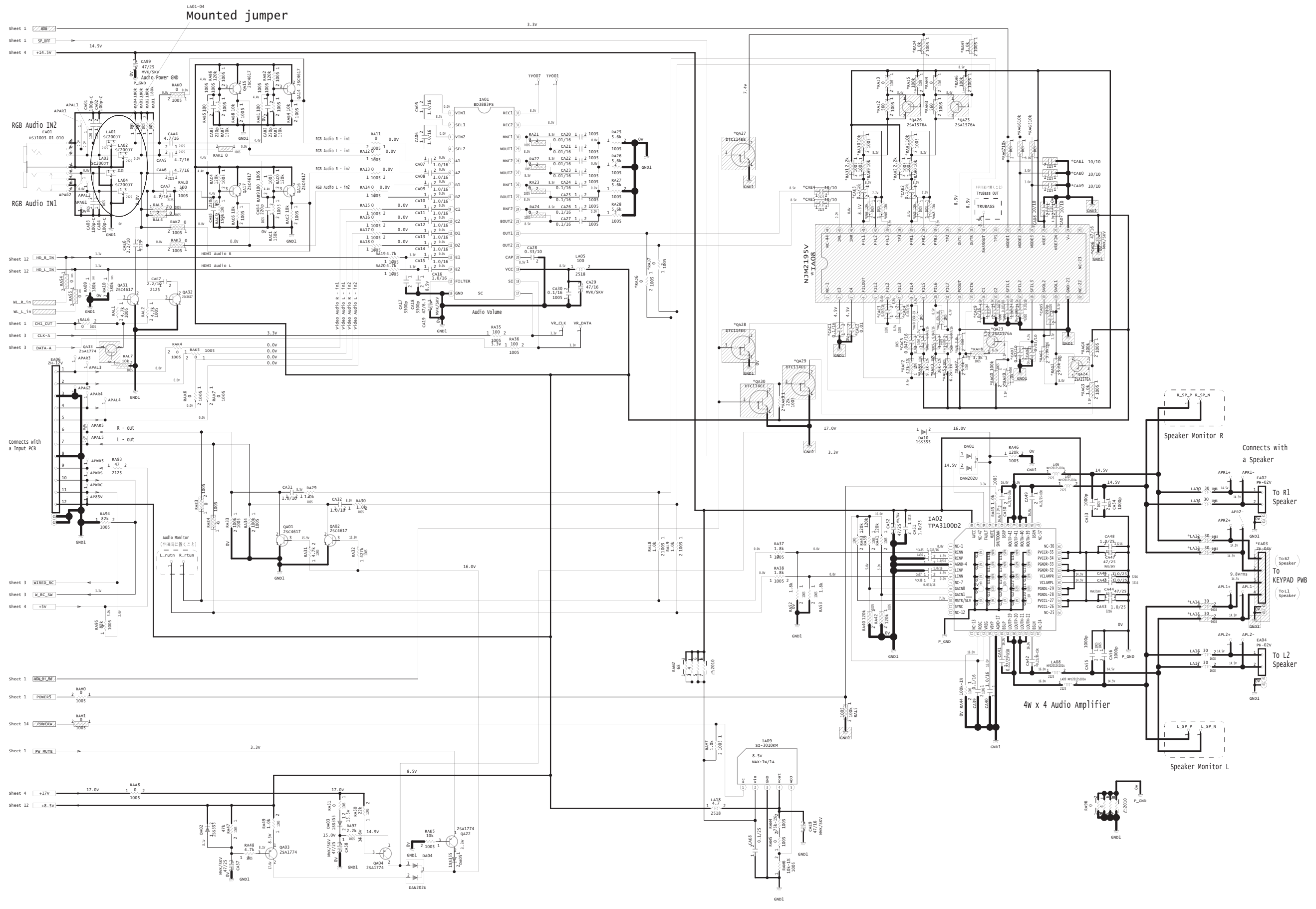
HITACHI

RS232C controller



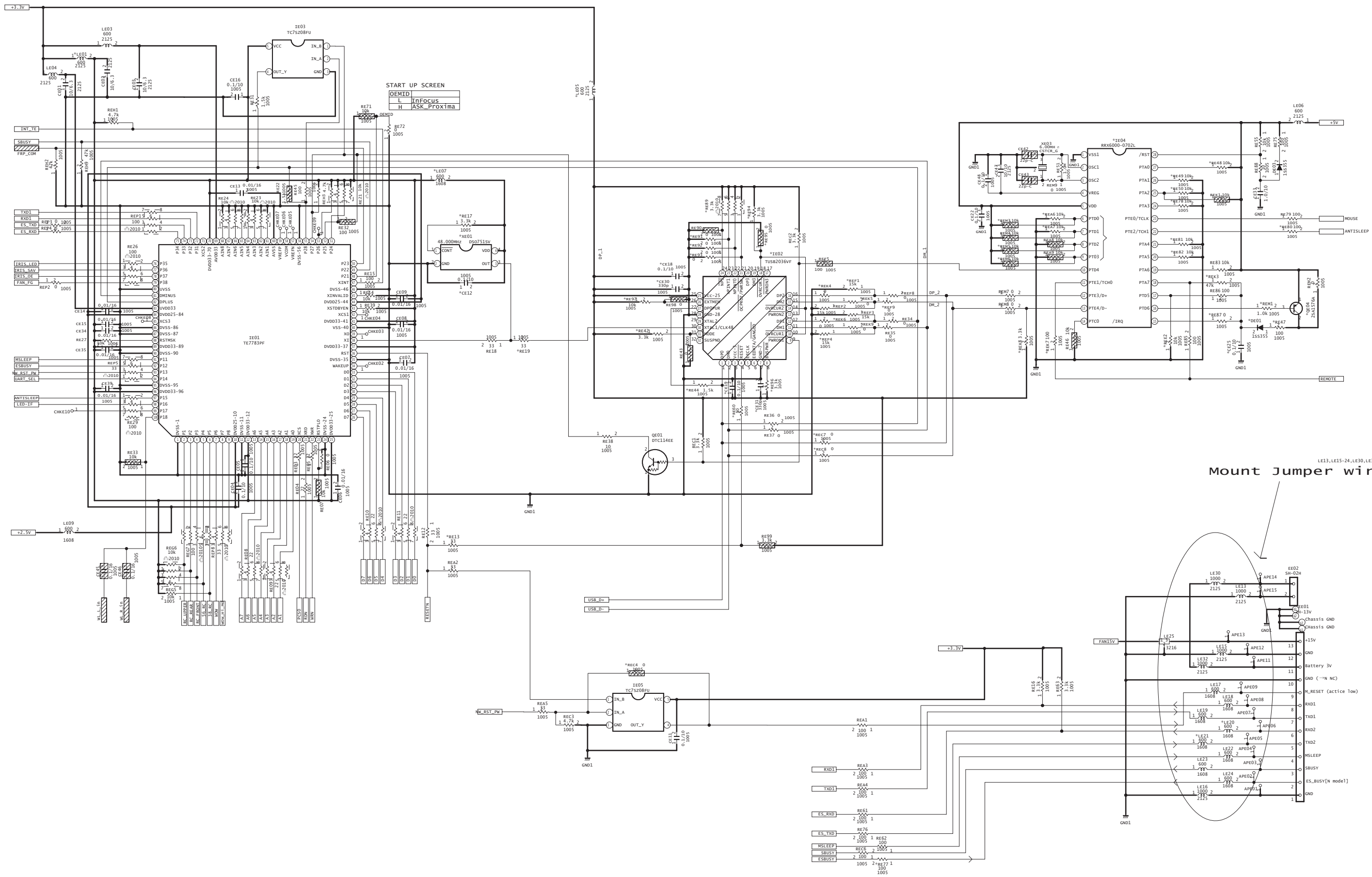
Gravity Sensor



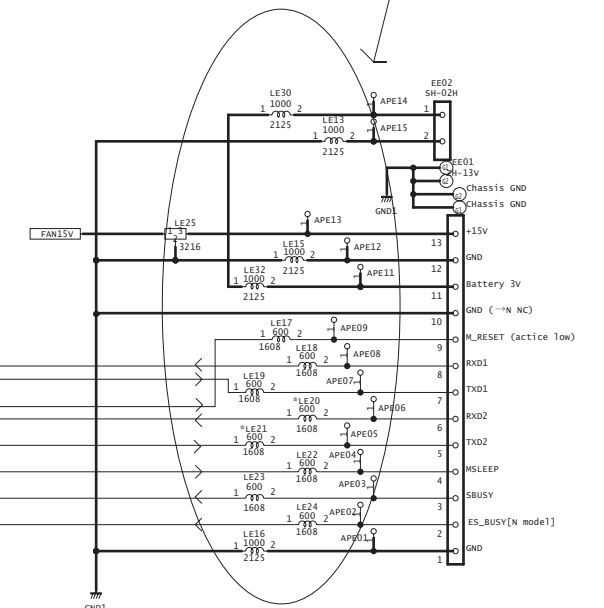


PWB ASSEMBLY MAIN 14

HITACHI



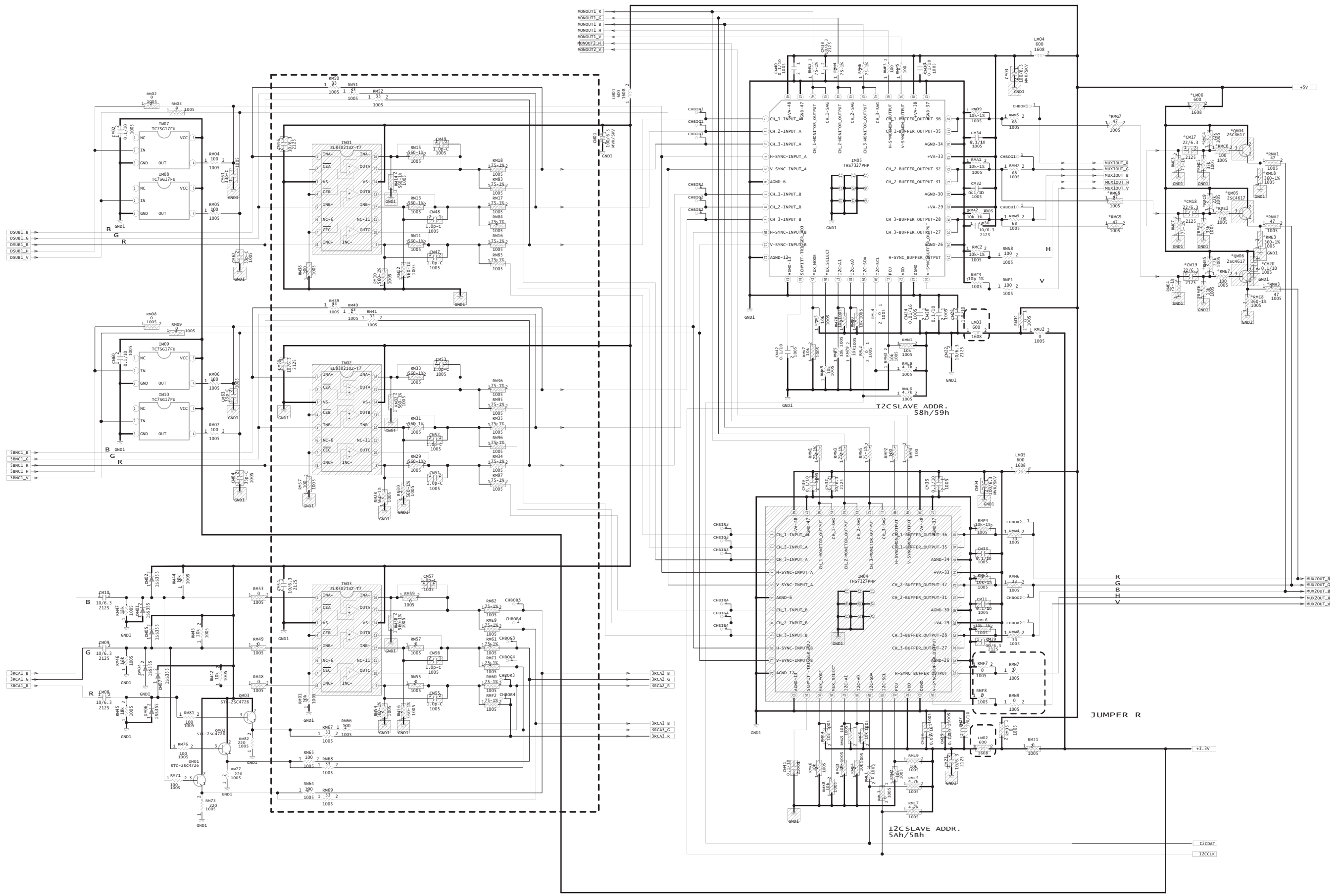
LE13, LE15-24, LE30, LE32
Mount Jumper wire



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PWB ASSEMBLY MAIN 15

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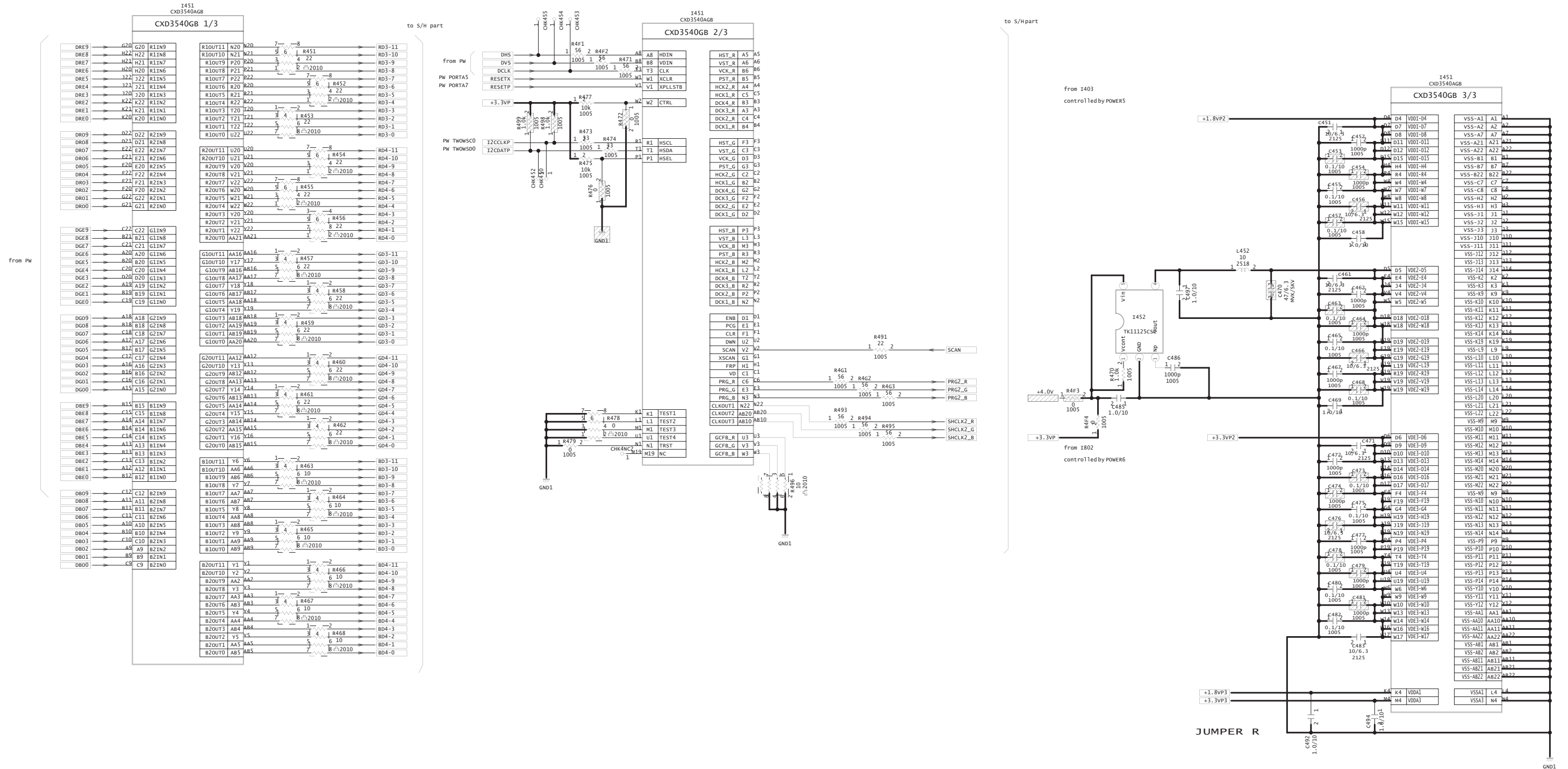


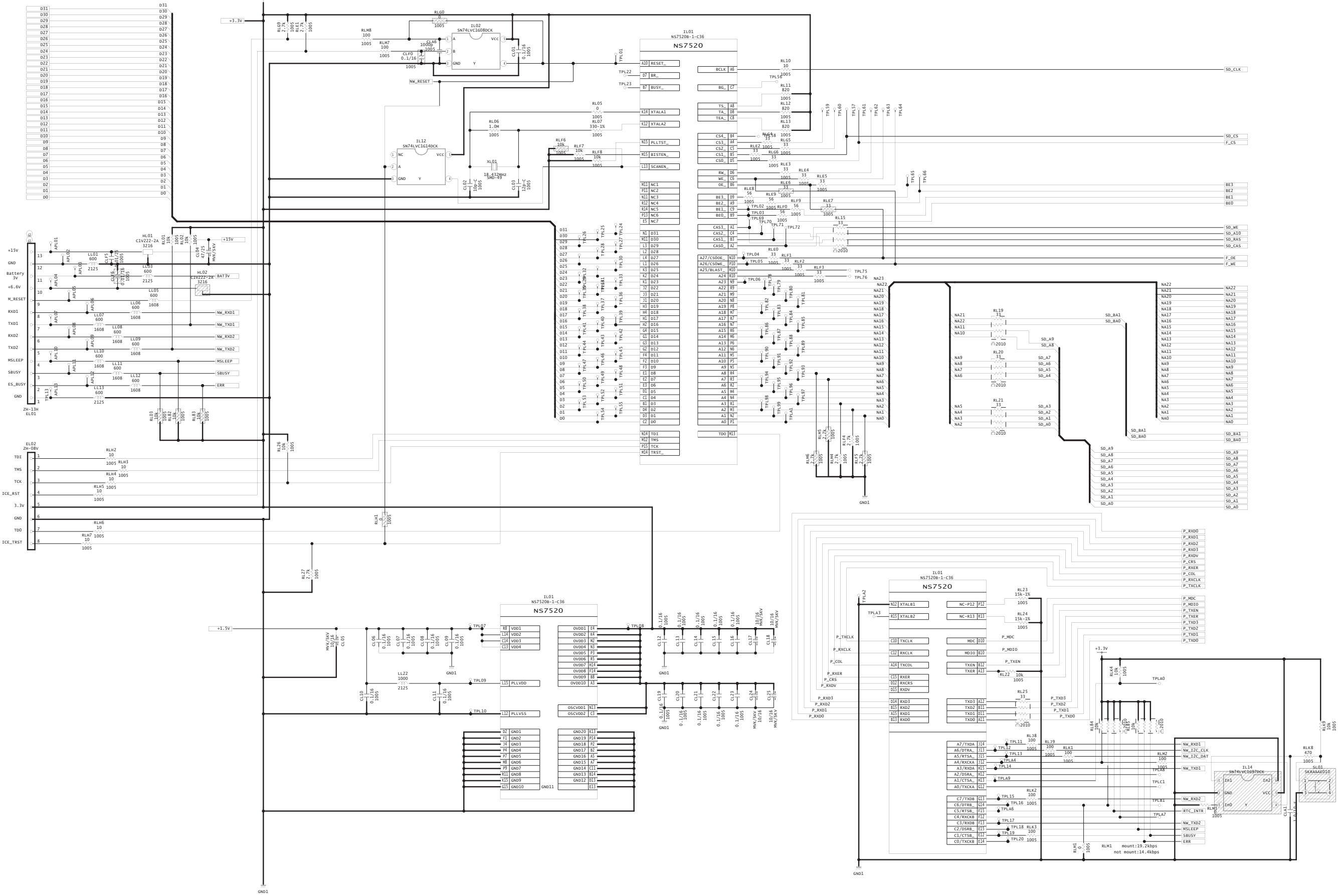
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PWB ASSEMBLY MAIN 16

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TG(Slave) Part
for 0.79" SXGA

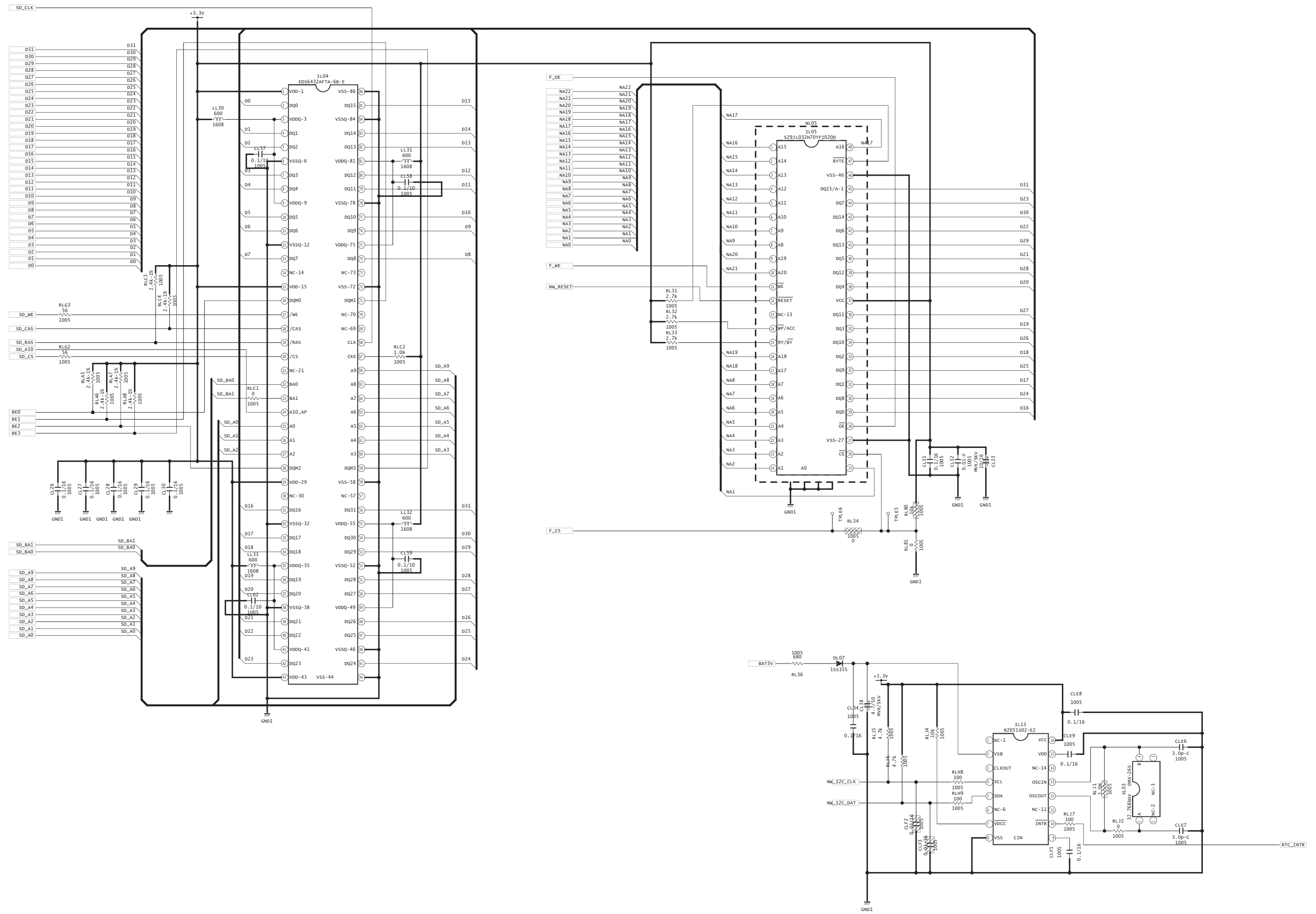


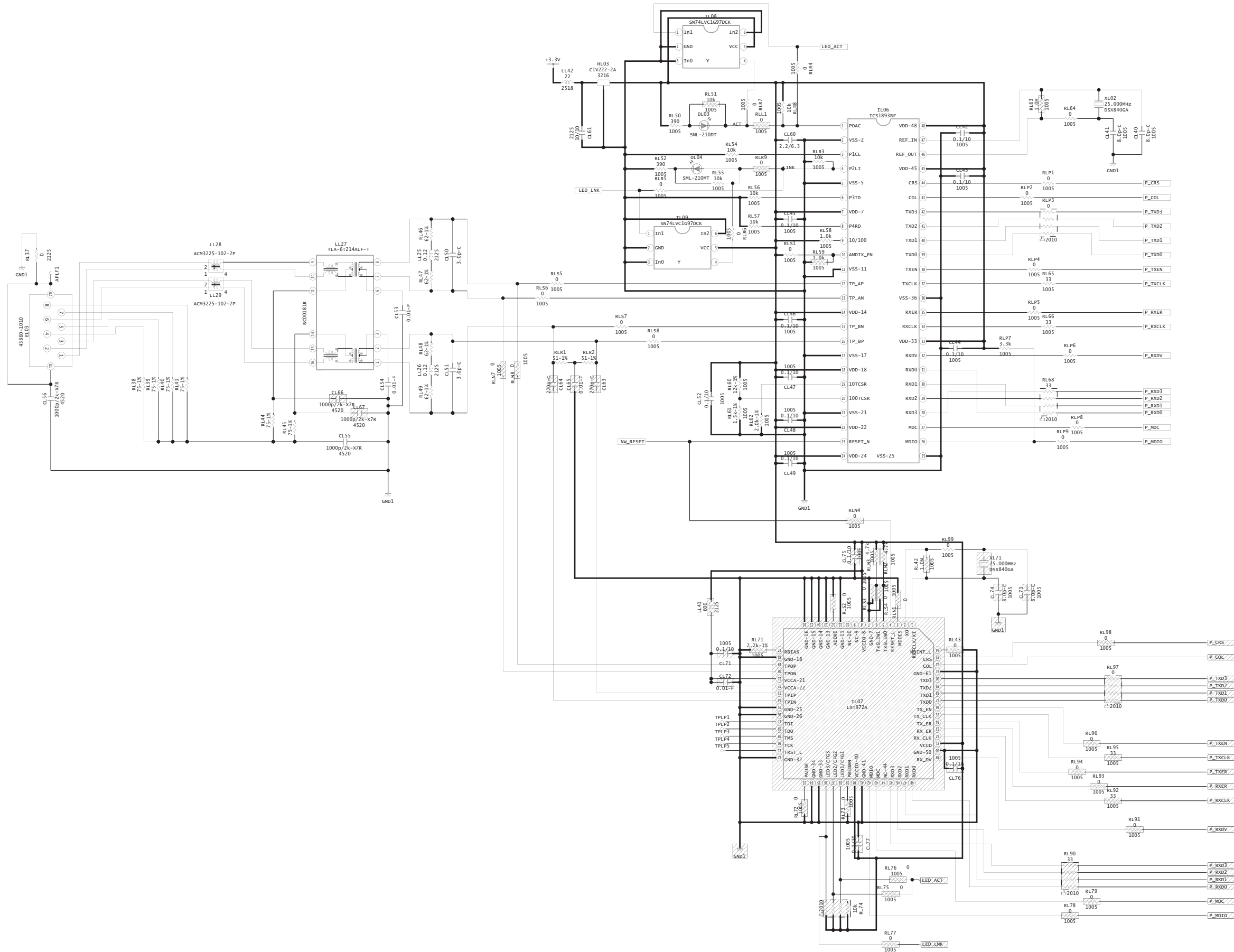


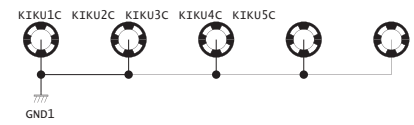
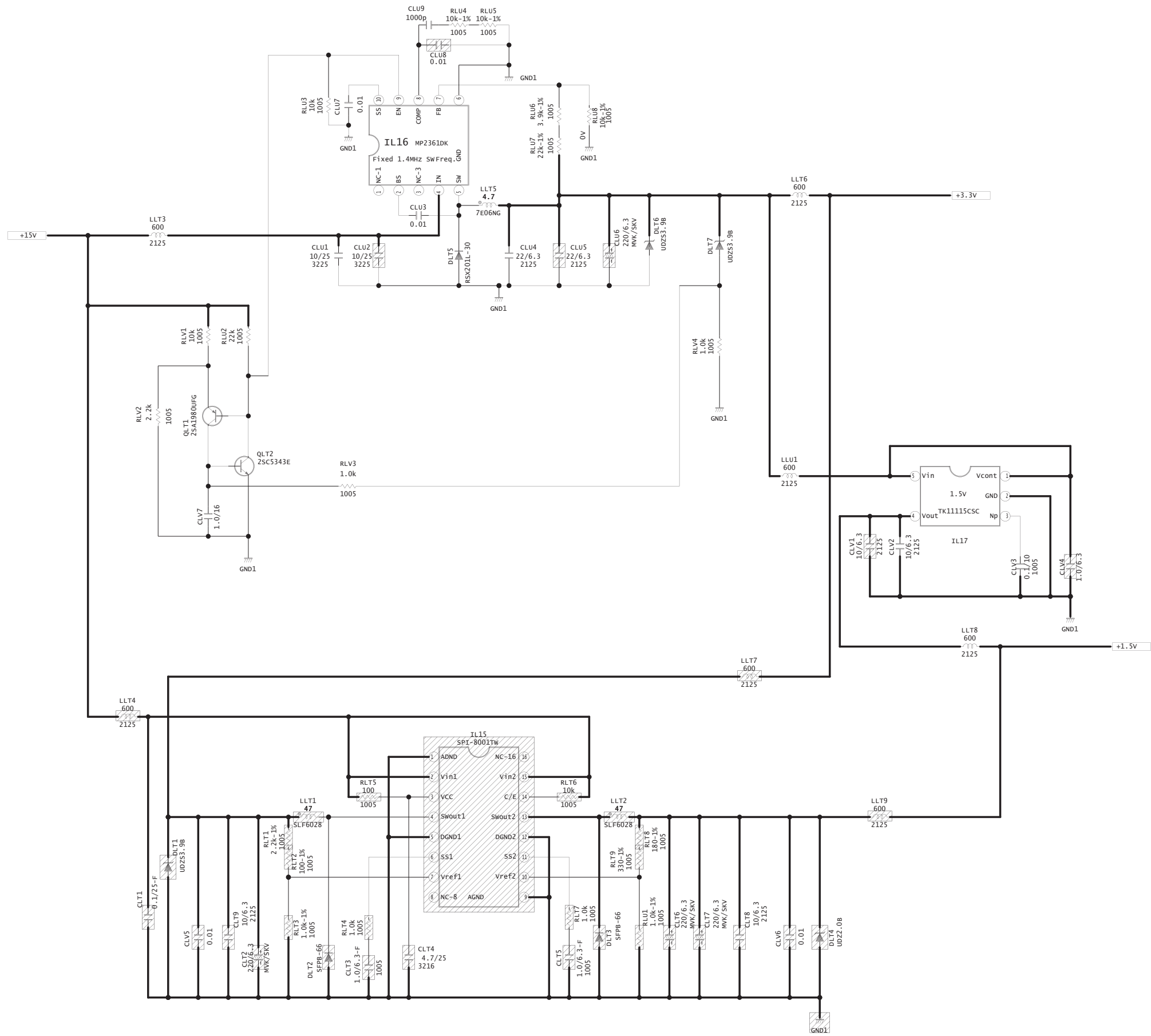
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PWB ASSEMBLY NETWORK 1

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PWB ASSEMBLY NETWORK 4

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Basic circuit diagram list

PWB assembly CONTROL	PWB assembly MAIN 6
PWB assembly BATTERY	PWB assembly MAIN 7
PWB assembly REMOTE	PWB assembly MAIN 8
PWB assembly SW	PWB assembly MAIN 9
POWER UNIT BALLAST 1	PWB assembly MAIN 10
POWER UNIT BALLAST 2	PWB assembly MAIN 11
POWER UNIT BALLAST 3	PWB assembly MAIN 12
POWER UNIT CIRCUIT	PWB assembly MAIN 13
POWER UNIT (FILTER)	PWB assembly MAIN 14
PWB assembly INPUT	PWB assembly MAIN 15
PWB assembly KEYPAD	PWB assembly MAIN 16
PWB assembly MAIN 1	PWB assembly MAIN 17
PWB assembly MAIN 2	PWB assembly NETWORK 1
PWB assembly MAIN 3	PWB assembly NETWORK 2
PWB assembly MAIN 4	PWB assembly NETWORK 3
PWB assembly MAIN 5	PWB assembly NETWORK 4

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