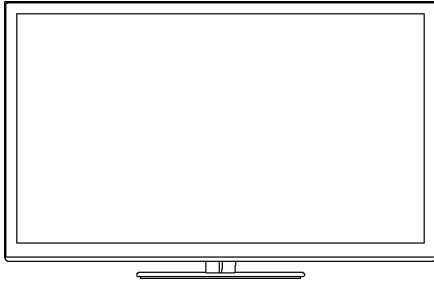


Service Manual

42 inch Class 1080p LCD HDTV

Model No. **TC-L42E6L**


LA41 Chassis



WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

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TABLE OF CONTENTS

	PAGE	PAGE
1 Safety Precautions	3	
1.1. General Guidelines	3	
2 Warning	4	
2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatically Sensitive (ES) Devices	4	
2.2. About lead free solder (PbF)	5	
3 Service Navigation	6	
3.1. PCB Layout	6	
4 Specifications	7	
5 Technical Descriptions	8	
5.1. Specification of KEY for DTCP-IP, WMDRM and Widevine	8	
6 Service Mode	9	
6.1. How to enter into Service Mode	9	
6.2. SRV-TOOL	10	
6.3. Hotel mode	11	
6.4. Data Copy by USB Memory	12	
7 Troubleshooting Guide	15	
7.1. Check of the IIC bus lines	15	
7.2. Power LED Blinking timing chart	16	
7.3. LCD Panel test mode	16	
8 Disassembly and Assembly Instructions	17	
8.1. Disassembly Flow Chart for the Unit	17	
8.2. Disassembly Procedure for the Unit	18	
9 Measurements and Adjustments	29	
9.1. Voltage chart of P-board	29	
9.2. Voltage chart of A-board	29	
10 Block Diagram	31	
10.1. Main Block Diagram	31	
10.2. Block (1/2) Diagram	32	
10.3. Block (2/2) Diagram	33	
11 Wiring Connection Diagram	35	
11.1. Caution statement	35	
11.2. Dressing Wire	35	

1 Safety Precautions

1.1. General Guidelines

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.
4. When conducting repairs and servicing, do not attempt to modify the equipment, its parts or its materials.
5. When wiring units (with cables, flexible cables or lead wires) are supplied as repair parts and only one wire or some of the wires have been broken or disconnected, do not attempt to repair or re-wire the units. Replace the entire wiring unit instead.
6. When conducting repairs and servicing, do not twist the Fasten connectors but plug them straight in or unplug them straight out.

1.1.1. Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be 100 Mohm and over. When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

1.1.2. Leakage Current Hot Check (See Figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5kohm, 10 watts resistor, in parallel with a 0.15 μ F capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

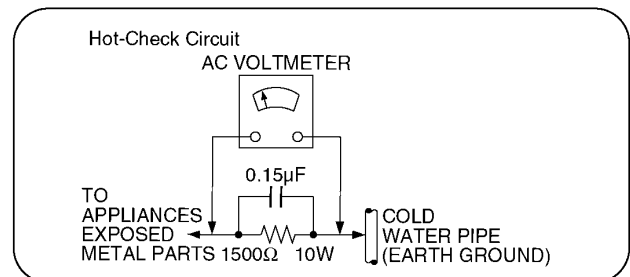


Figure 1

2 Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor [chip] components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as [anti-static (ESD protected)] can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise ham less motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

2.2. About lead free solder (PbF)

Note: Lead is listed as (Pb) in the periodic table of elements.

In the information below, Pb will refer to Lead solder, and PbF will refer to Lead Free Solder.

The Lead Free Solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).

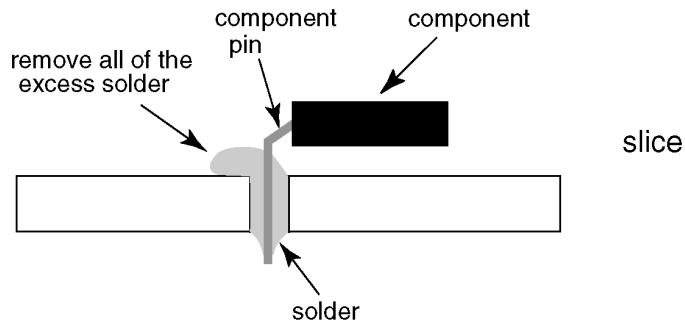
That is Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be used.

PCBs manufactured using lead free solder will have the PbF within a leaf Symbol **PbF** stamped on the back of PCB.

Caution

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30~40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C).
If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.
- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side. (see figure below)



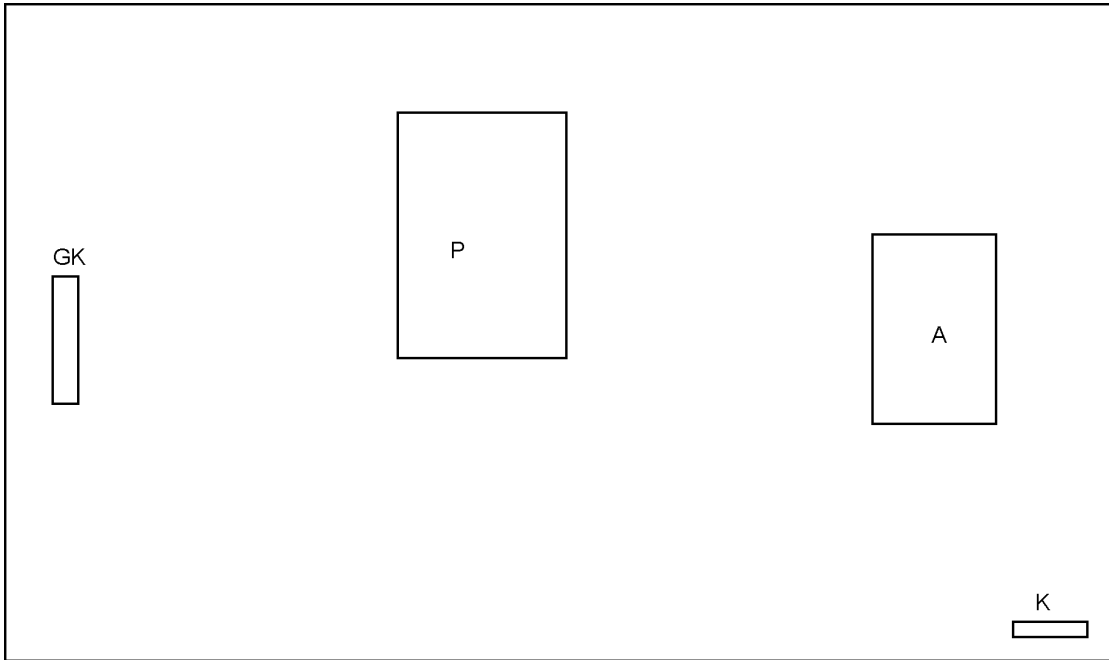
Suggested Pb free solder

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also be used.

0.3mm X 100g	0.6mm X 100g	1.0mm X 100g

3 Service Navigation

3.1. PCB Layout



Board Name	Function
A-Board	Main
K-Board	IR/LED/AI
P-Board	Power
GK-Board	SW

4 Specifications

Power Source	AC 110-220 V, 50/60 Hz	
Power Consumption		
Rated Power	70 W	
Standby Power	0.2 W	
Display Panel		
Panel System	LCD panel (LED backlight)	
Visible screen size (diagonal)	107 cm / 42 inches	
Number of pixels	1,920 × 1,080	
Speaker Output	20 W [10 W + 10 W] (10 % THD)	
Operating Conditions	Temperature: 0 °C - 35°C	
	Humidity: 20 % - 80 % RH (non-condensing)	
Connection Terminals		
VIDEO IN	RCA PIN (VIDEO, AUDIO-L, AUDIO-R)	
COMPONENT IN	RCA PIN (Y, PB, PR, AUDIO-L, AUDIO-R)	
HDMI IN 1/2/3	TYPE A Connector (supports [HDAVI Control 5] function)	
USB 1/2	USB 2.0 Type A connector	DC 5V, Max. 500mA
DIGITAL AUDIO OUT	PCM / Dolby Digital, Fiber Optic	
OTHERS	ETHERNET (10BASE-T/100BASE-TX)	
Dimensions (W × H × D)		
Including pedestal	957 mm × 619 mm × 217 mm	
TV Set only	957 mm × 564 mm × 49 mm	
Mass		
Including pedestal	15.0 kg NET	
TV Set only	13.5 kg NET	
Receiving systems / Band name	Digital TV :	6 MHz VHF / UHF free-to-air TV broadcast reception for Peru / Chile.

1. PAL-M 2. PAL-N 3. NTSC	Reception of broadcast transmissions and Playback from VCR or DVD
---------------------------------	---

Receiving channels (Analogue TV)	VHF BAND	2-13 (NTSC M USA)
	UHF BAND	14-69 (NTSC M USA)
	CATV	1-125 (USA CATV)

■ Wireless LAN

Standard Compliance and Frequency Range*	IEEE 802.11a/n:	5.15 GHz - 5.35 GHz, 5.47 GHz - 5.85 GHz
	IEEE 802.11b/g/n:	2.400 GHz - 2.4835 GHz
Security	WPA2-PSK (TKIP/AES)	
	WAP-PSK (TKIP/AES)	
	WEP (64bit/128bit)	

* The frequency and channel differ depending on the country.

Note

Design and Specifications are subject to change without notice. Mass and Dimensions shown are approximate.

5 Technical Descriptions

5.1. Specification of KEY for DTCP-IP, WMDRM and Widevine

5.1.1. General information:

1. NAND Flash (IC8900) for spare parts has the seed of KEY for each DTCP-IP for DLNA, WMDRM for Netflix and Widevine for CinemaNow.
2. The final KEY data will be generated by Main IC (IC8000) when SELF CHECK was done and are stored in both Main IC (IC8000) and NAND Flash (IC8900).

5.1.2. Replacement of ICs:

When Main IC is replaced, NAND Flash should be also replaced with new one the same time.

When NAND Flash is replaced, Main IC is not necessary to be replaced the same time.

After the replacement of IC, SELF CHECK should be done to generate the final KEY data.

How to SELF CHECK: While pressing [VOLUME (-)] button on the main unit, press [MENU] button on the remote control for more than 3 seconds.

TV will be forced to the factory shipment setting after this SELF CHECK.

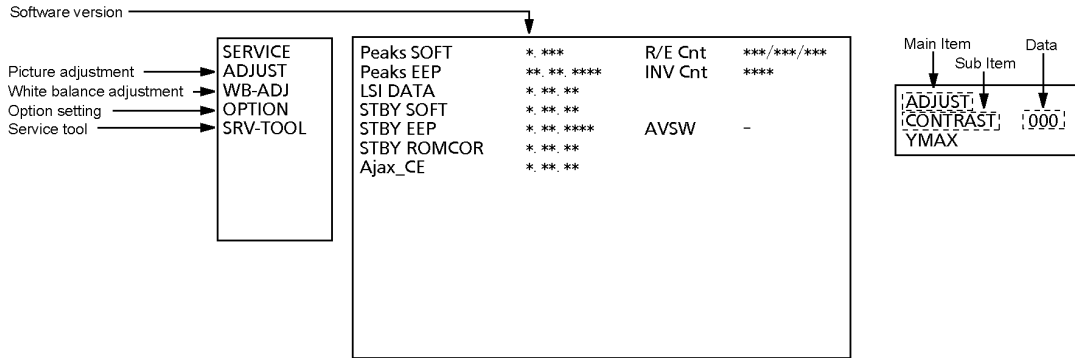
6 Service Mode

6.1. How to enter into Service Mode

6.1.1. Purpose

After exchange parts, check and adjust the contents of adjustment mode.

While pressing [VOLUME (-)] button of the main unit, press [INFO] button of the remote control three times within 2 seconds.



6.1.2. Key command

- [1] button...Main items Selection in forward direction
- [2] button...Main items Selection in reverse direction
- [3] button...Sub items Selection in forward direction
- [4] button...Sub items Selection in reverse direction
- [VOL] button...Value of sub items change in forward direction (+), in reverse direction (-)

6.1.3. How to exit

Switch off the power with the [POWER] button on the main unit or the [POWER] button on the remote control.

6.1.4. Contents of adjustment mode

- Value is shown as a hexadecimal number.
- Preset value differs depending on models.
- After entering the adjustment mode, take note of the value in each item before starting adjustment.

Main item	Sub item	Sample Data	Remark
ADJUST	CONTRAST	000	
	COLOR	3A	
	TINT	00	
	SUB-BRT	800	
	BACKLGT	FFF	
	B-Y-G	40	
	R-Y-A	00	
	V COM	000	
WB-ADJ	R-GAIN	80	
	G-GAIN	6F	
	B-GAIN	79	
	R-CENT	80	
	G-CENT	80	
	B-CENT	80	
OPTION	Boot	ROM	Factory Preset.
	STBY-SET	00	
	EMERGENCY	ON	
	CLK MODE	01	
	CLOCK	FFF	
	EDID-CLK	HIGH	
SRV-TOOL		00	See next.

6.2. SRV-TOOL

6.2.1. How to access

1. Select [SRV-TOOL] in Service Mode.
2. Press [OK] button on the remote control.

SRV-TOOL	
Display of TD2Microcode version →	TD2Microcode:00000000
Display of Flash ROM maker code →	Flash ROM : AD - DC
Display of SOS History →	PTCT : 00 . 00 . 00 . 00 . 00 .
	Time 000040:40 Count 0000049 ← POWER ON TIME/COUNT Press [MUTE] button (3 sec)

6.2.2. Display of SOS History

SOS History (Number of LED blinking) indication.

From left side; Last SOS, before Last, three occurrence before, 2nd occurrence after shipment, 1st occurrence after shipment. This indication except 2nd and 1st occurrence after shipment will be cleared by [Self-check indication and forced to factory shipment setting].

6.2.3. POWER ON TIME/COUNT

Note : To display TIME/COUNT menu, highlight position, then press MUTE for 3 sec.

Time : Cumulative power on time, indicated hour : minute by decimal

Count : Number of ON times by decimal

Note : This indication will not be cleared by either of the self-checks or any other command.

6.2.4. Exit

Disconnect the AC cord from wall outlet or press the [POWER] button on the main unit for 3 seconds to turn off and then turn on automatically.

6.3. Hotel mode

1. Purpose
Restrict a function for hotels.
2. Access command to the Hotel mode setup menu
In order to display the Hotel mode setup menu:
While pressing [VOLUME (-)] button of the main unit, press [INPUT] button of the remote control three times within 2 seconds.

Then, the Hotel mode setup menu is displayed.

Hotel Mode	
Mode	Off
Input	—
Channel	—
Volume	██████████ 25
Vol. Max	████████████████████ 100
OSD Ctrl	Off
FP Ctrl	Off
Pow Ctrl	Off

3. To exit the Hotel mode setup menu
Switch off the power with the [POWER] button on the main unit or the [POWER] button on the remote control.
4. Explain the Hotel mode setup menu

Item	Function
Mode	Select hotel mode On/Off
Input	Select input signal modes. Set the input, when each time power is switched on. Selection: -,RF,HDMI1,HDMI2,HDMI3,AV • Off: give priority to a last memory.
Channel	Select channel when input signal is RF. Set the channel, each time power is switched on. Selection: Any channel number or [-]. [-] means the channel when turns off.
Volume	Adjust the volume when each time power is switched on. Range: 0 to 100
Vol. Max	Adjust maximum volume. Range: 0 to 100
OSD Ctrl	Restrict the OSD. Selection: Off/Pattern1 • Off: No restriction • Pattern1: restriction
FP Ctrl	Select front key conditions. Selection: Off/Pattern1/All • Off: altogether valid. • Pattern1: only input key is valid. • All: altogether invalid.
Pow Ctrl	Select POWER-On/Off condition when AC power cord is disconnected and then connected. Off: The same condition when AC power cord is disconnected. On: Forced power ON condition.

6.4. Data Copy by USB Memory

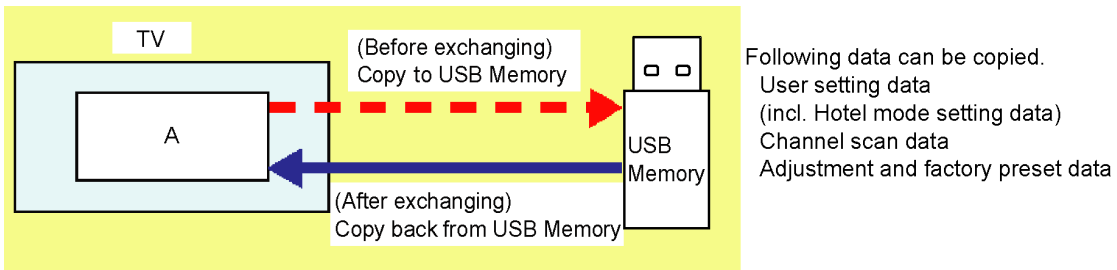
Note:

SD card can not be used for Data Copy.

6.4.1. Purpose

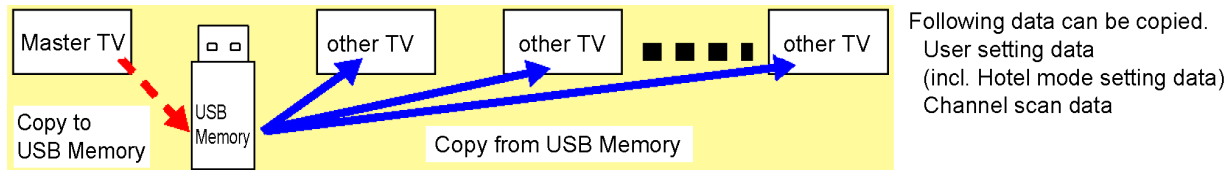
(a) Board replacement (Copy the data when exchanging A-board):

When exchanging A-board, the data in original A-board can be copied to USB Memory and then copy to new A-board.



(b) Hotel (Copy the data when installing a number of units in hotel or any facility):

When installing a number of units in hotel or any facility, the data in master TV can be copied to USB Memory and then copy to other TVs.



6.4.2. Preparation

Make pwd file as startup file for (a) or (b) in a empty USB Memory.

1. Insert a empty USB Memory to your PC.
2. Right-click a blank area in a USB Memory window, point to New, and then click text document. A new file is created by default (New Text Document.txt).
3. Right-click the new text document that you just created and select rename, and then change the name and extension of the file to the following file name for (a) or (b) and press ENTER.

File name:

- (a) For Board replacement : boardreplace.pwd
- (b) For Hotel : hotel.pwd

Note:

Please make only one file to prevent the operation error.
 No any other file should not be in USB Memory.

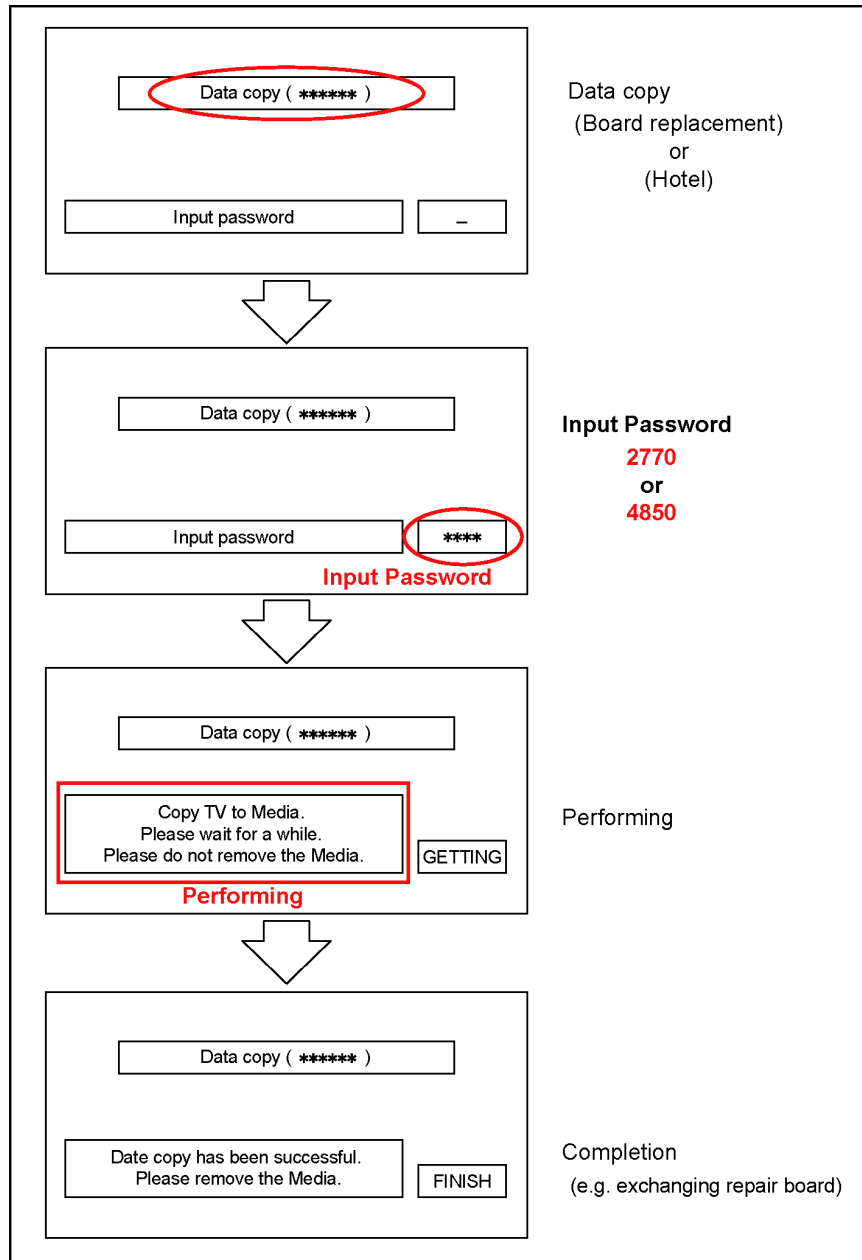
6.4.3. Data copy from TV set to USB Memory

1. Turn on the TV set.
2. Insert USB Memory with a startup file (pwd file) to USB terminal.
On-screen Display will be appeared according to the startup file automatically.
3. Input a following password for (a) or (b) by using remote control.
(a) For Board replacement : 2770
(b) For Hotel : 4850
Data will be copied from TV set to USB Memory.
It takes around 2 to 6 minutes maximum for copying.
4. After the completion of copying to USB Memory, remove USB Memory from TV set.
5. Turn off the TV set.

Note:

Following new folder will be created in USB Memory for data from TV set.

- (a) For Board replacement : user_setup
- (b) For Hotel : hotel

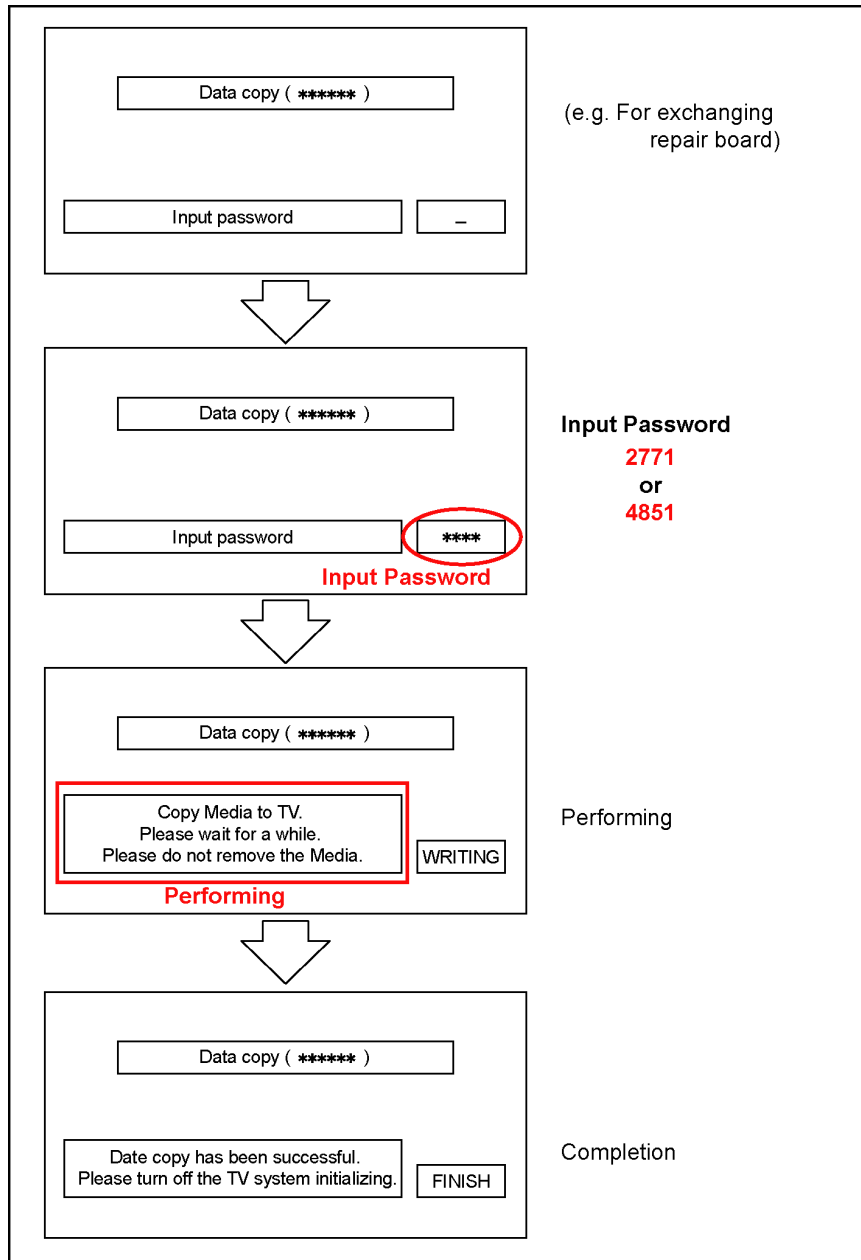


6.4.4. Data copy from USB Memory to TV set

1. Turn on the TV set.
2. Insert USB Memory with Data to USB terminal.
On-screen Display will be appeared according to the Data folder automatically.
3. Input a following password for (a) or (b) by using remote control.
(a) For Board replacement : 2771
(b) For Hotel : 4851
Data will be copied from USB Memory to TV set.
4. After the completion of copying to USB Memory, remove USB Memory from TV set.
(a) For Board replacement : Data will be deleted after copying (Limited one copy).
(b) For Hotel : Data will not be deleted and can be used for other TVs.
5. Turn off the TV set.

Note:

1. Depending on the failure of boards, function of Data copy for board replacement does not work.
2. This function can be effective among the same model numbers.



7 Troubleshooting Guide

Use the self-check function to test the unit.

1. Checking the IIC bus lines
2. Power LED Blinking timing

7.1. Check of the IIC bus lines

7.1.1. How to access

7.1.1.1. Self-check indication only:

Produce TV reception screen, and while pressing [VOLUME (-)] button on the main unit, press [OK] button on the remote control for more than 3 seconds.

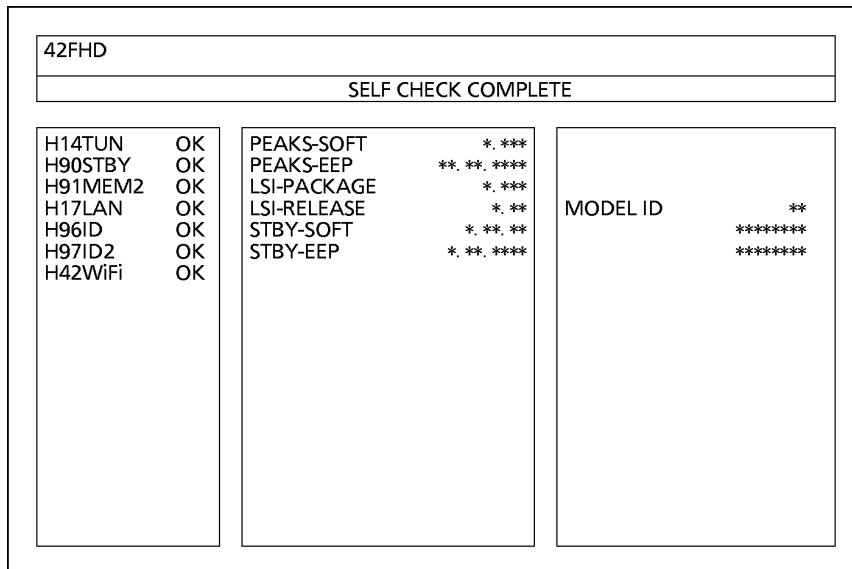
7.1.1.2. Self-check indication and forced to factory shipment setting:

Produce TV reception screen, and while pressing [VOLUME (-)] button on the main unit, press [MENU] button on the remote control for more than 3 seconds.

7.1.2. Exit

Disconnect the AC cord from wall outlet or press the [POWER] button on the main unit for 3 seconds to turn off and then turn on automatically.

7.1.3. Screen display



7.1.4. Check Point

Confirm the following parts if NG was displayed.

DISPLAY	Check Ref. No.	Description	Check Point
H14TUN	TU6706	TUNER	A-Board
H90STBY	IC8000	STM	A-Board
H91MEM2	IC8900	NAND FLASH	A-Board
H17LAN		LAN	LAN
H96ID		ID	
H97ID2		ID2	
H42WiFi		WiFi	WiFi Dongle

7.2. Power LED Blinking timing chart

1. Subject

Information of LED Flashing timing chart.

2. Contents

When an abnormality has occurred the unit, the protection circuit operates and reset to the stand by mode. At this time, the defective block can be identified by the number of blinks of the Power LED on the front panel of the unit.

Blinking Times	Contents	Check point
1	BACK LIGHT SOS	LCD PANEL P-Board
7	SUB 3.3V SENSE SOS	A-Board
9	SOUND SOS	A-Board Speaker
13	EMERGENCY SOS	A-Board

7.3. LCD Panel test mode

Purpose:

To find the possible failure point where in LCD Panel or Printed Circuit Board when the abnormal picture is displayed.

How to Enter:

While pressing [VOLUME (-)] button of the main unit, press [OPTION] button of the remote control three times within 2 seconds.

How to Exit:

Switch off the power with the [POWER] button on the main unit or the [POWER] button on the remote control.

How to confirm:

If the abnormal picture is displayed, go into LCD Panel test mode to display the several test patterns.

And then, judge by the following method.

Still abnormal picture is displayed: The cause must be in LCD Panel.

Normal picture is displayed: The cause must be in A board.

Remarks:

The test pattern is created by the circuit in LCD Panel.

In LCD Panel test mode, this test pattern is displayed unaffected by signal processing for RF or input signal.

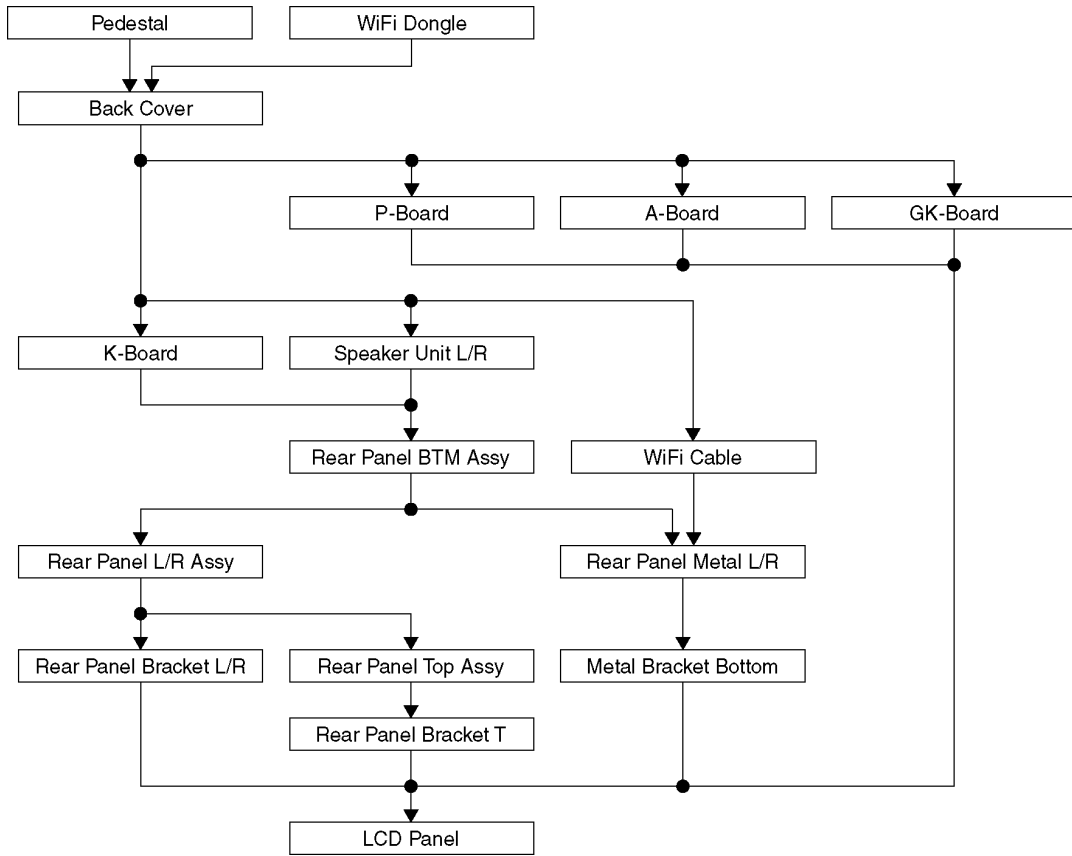
If the normal picture is displayed, LCD Panel must be okay and the cause of failure must be in A board.

8 Disassembly and Assembly Instructions

8.1. Disassembly Flow Chart for the Unit

This is a disassembly chart.

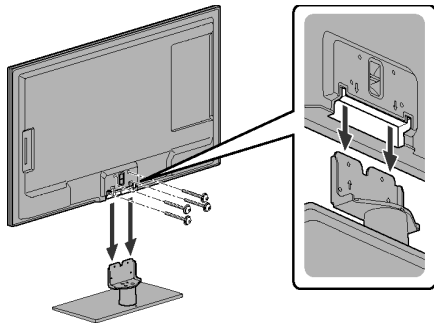
When assembling, perform this chart conversely.



8.2. Disassembly Procedure for the Unit

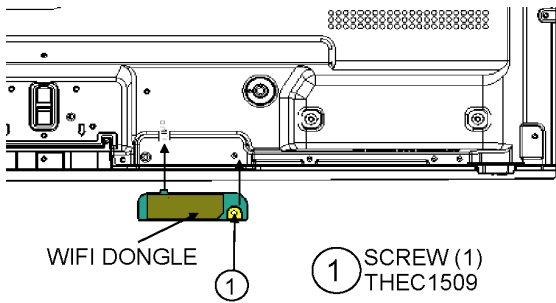
8.2.1. Pedestal

1. Lay down the unit so that the rear cover faces upward.
2. Remove the 4 screws.
3. Remove the pedestal.



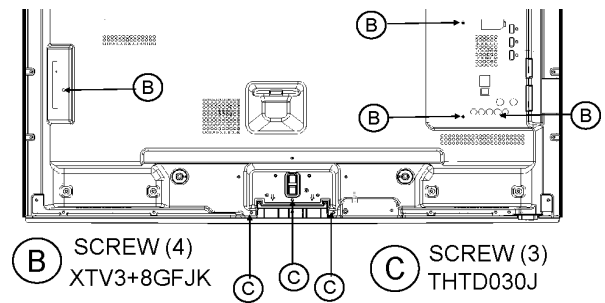
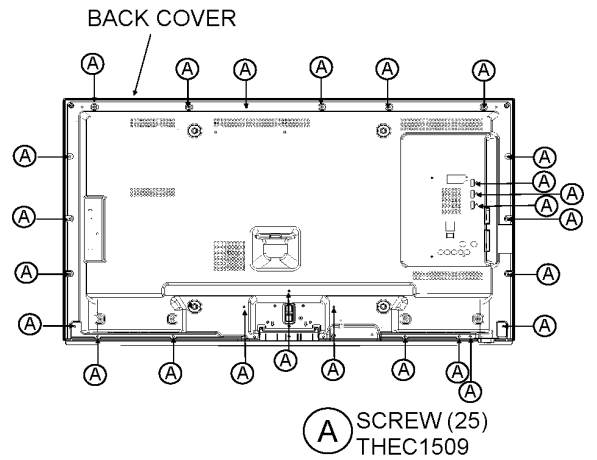
8.2.2. WiFi Dongle

1. Remove the 1 screw.
2. Remove the WiFi Dongle.



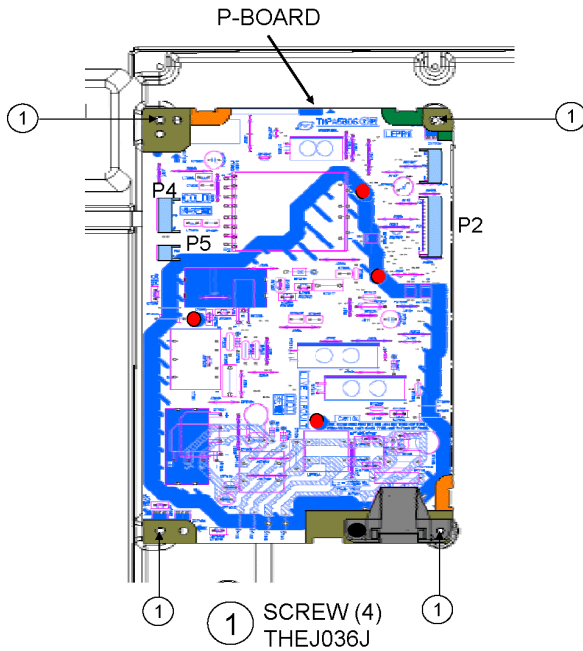
8.2.3. Back Cover

1. Remove the 25 screws (A).
2. Remove the 4 screws (B).
3. Remove the 3 screws (C).
4. Remove the Back Cover.



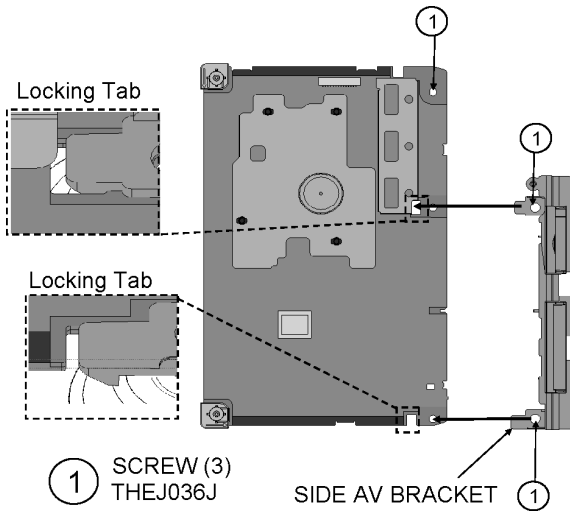
8.2.4. P-Board

1. Remove the 4 screws.
2. Disconnect the connectors (P2, P4 and P5).
3. Remove the P-Board.

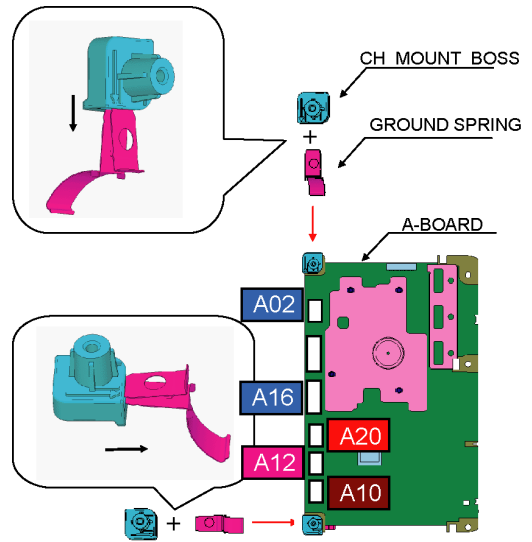


8.2.5. A-Board

1. Remove the 3 screws.
2. Remove the 2 locking tabs.
3. Remove the Side AV bracket.

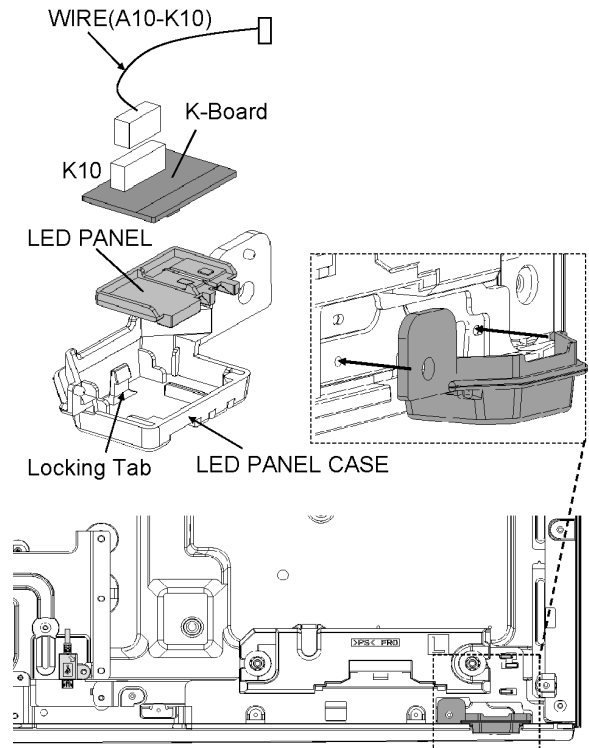


4. Remove the CH Mount Boss and Ground Spring.
5. Disconnect the connectors (A02, A10, A12, A16 and A20).
6. Remove the A-Board.



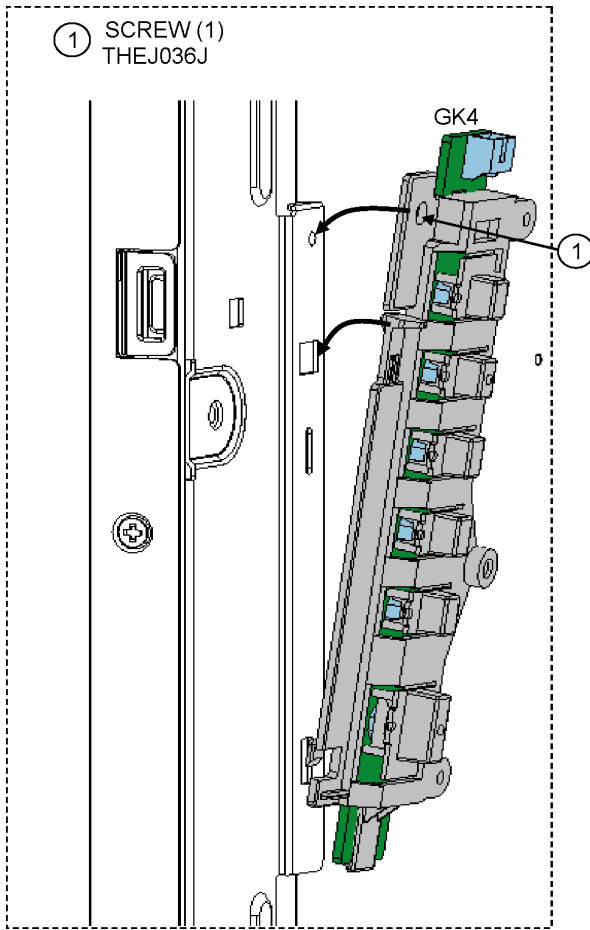
8.2.6. K-Board

1. Disconnect the connector (K10).
2. Remove the 1 locking tab.
3. Remove the K-Board.

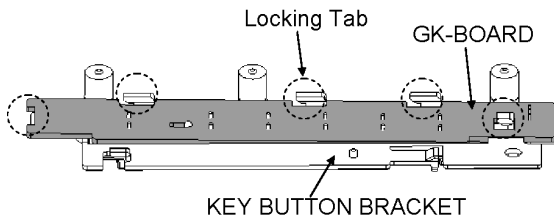


8.2.7. GK-Board

1. Disconnect the connector (GK4).
2. Remove the 1 screw.

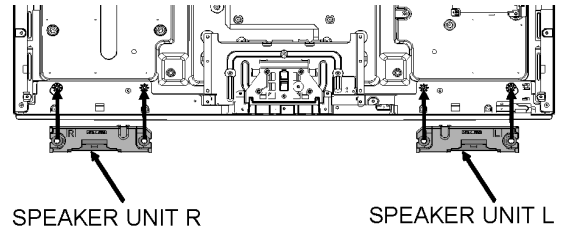


3. Remove the 5 locking tabs.
4. Remove the GK-Board and the Key Button Bracket.



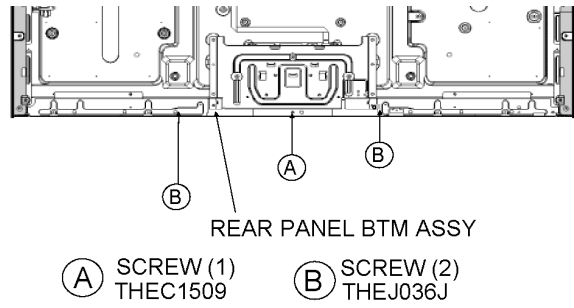
8.2.8. Speaker Unit L/R

1. Remove the 2 Speaker Unit L/R.



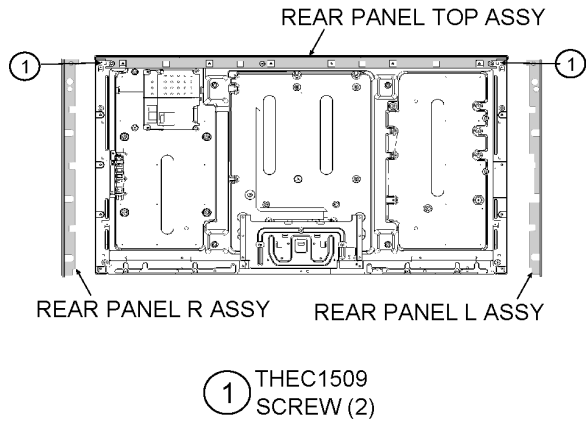
8.2.9. Rear Panel BTM Assy

1. Remove the 1 screw (A).
2. Remove the 2 screws (B).
3. Remove the Rear Panel BTM Assy.



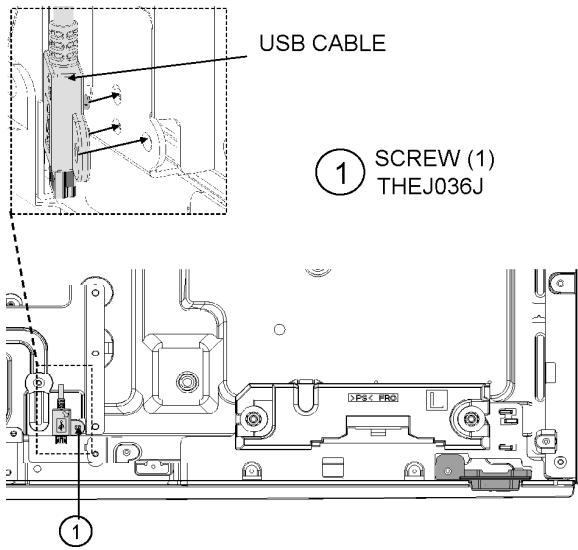
8.2.10. Rear Panel Top L/R Assy

1. Remove the 2 screws.
2. Remove the Rear Panel L/R Assy.
3. Remove the Rear Panel Top Assy.



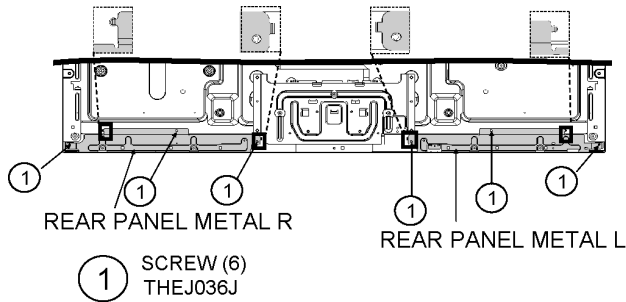
8.2.11. WiFi Cable

1. Remove the 1 screw.
2. Remove the WiFi Cable.



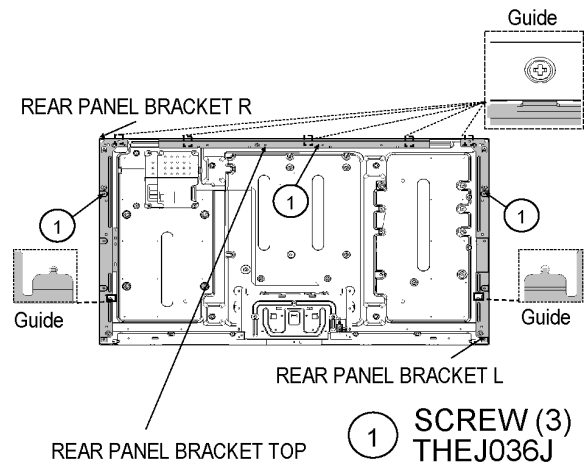
8.2.12. Rear Panel Metal L/R

1. Remove the 6 screws.
2. Remove the Rear Panel Metal L/R.



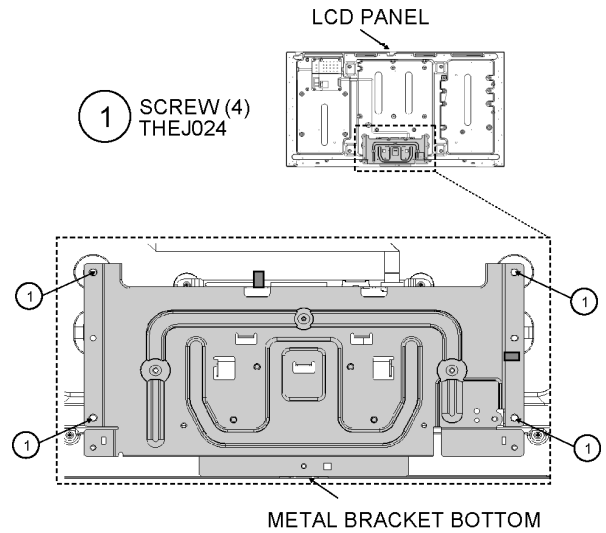
8.2.13. Rear Panel Bracket T/L/R

1. Remove the 3 screws.
2. Remove the Rear Panel Bracket T/L/R.

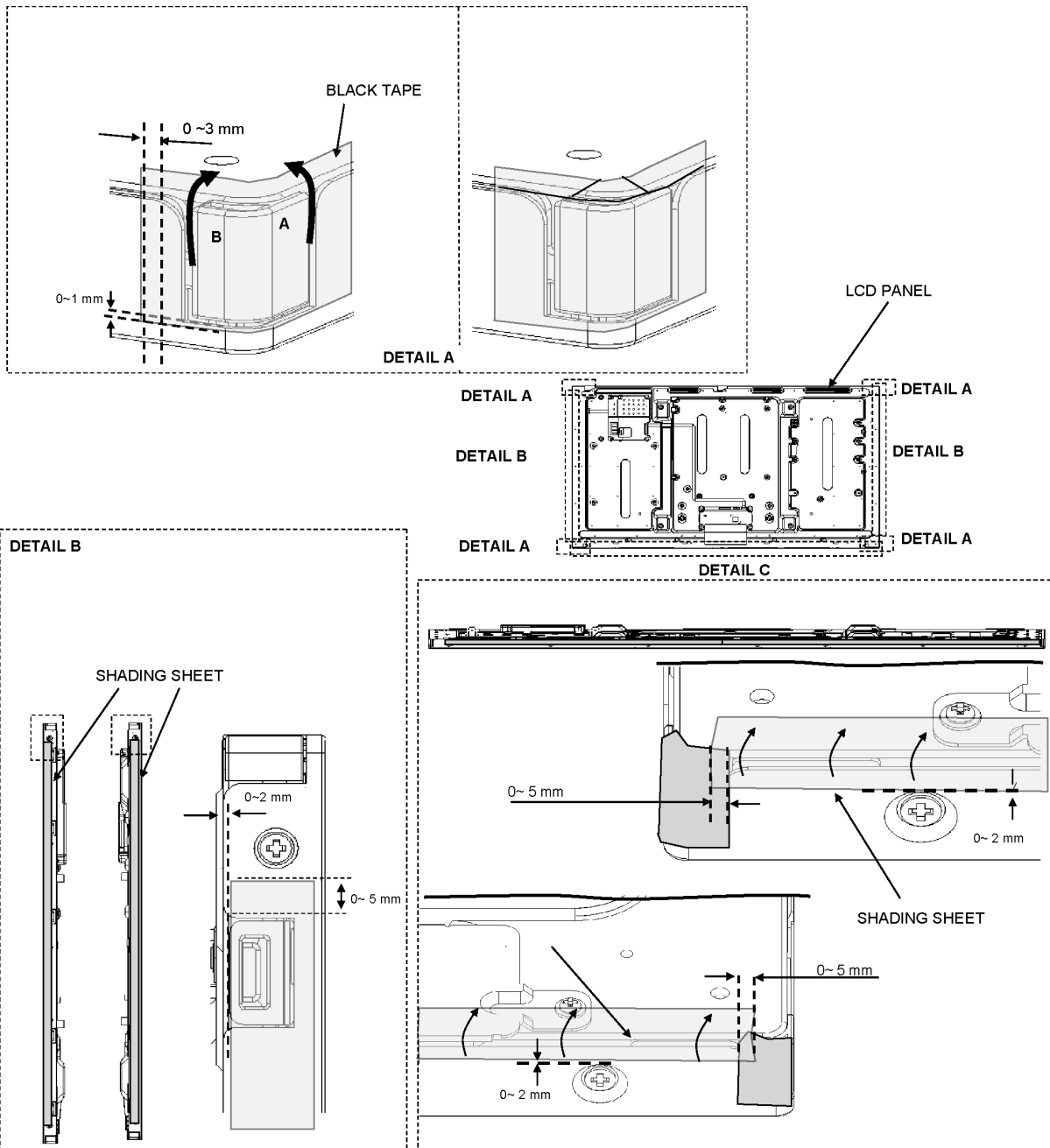


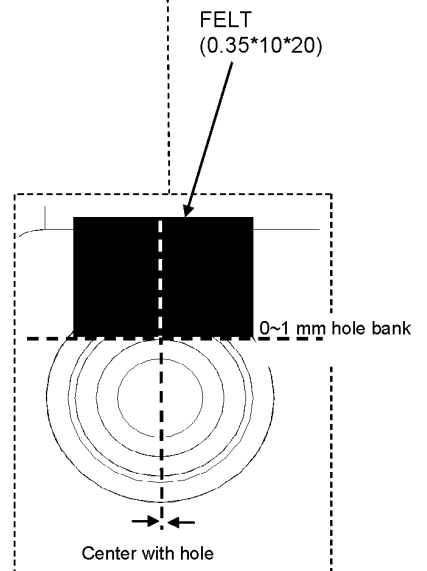
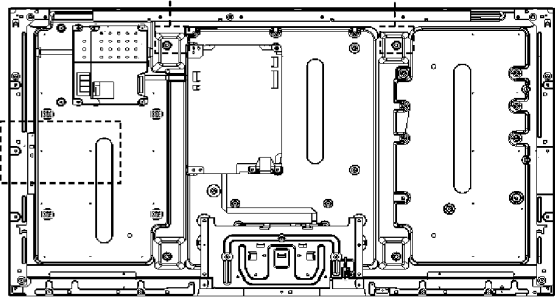
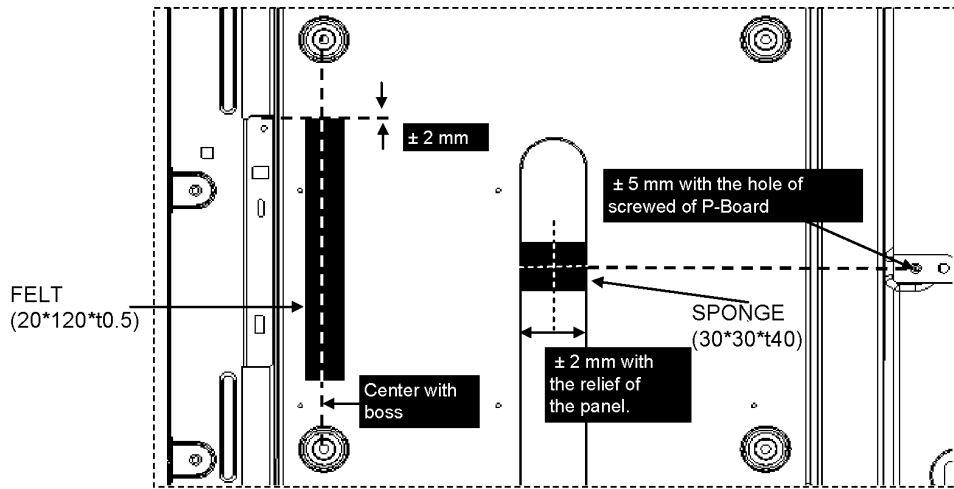
8.2.14. Metal Bracket Bottom and LCD Panel

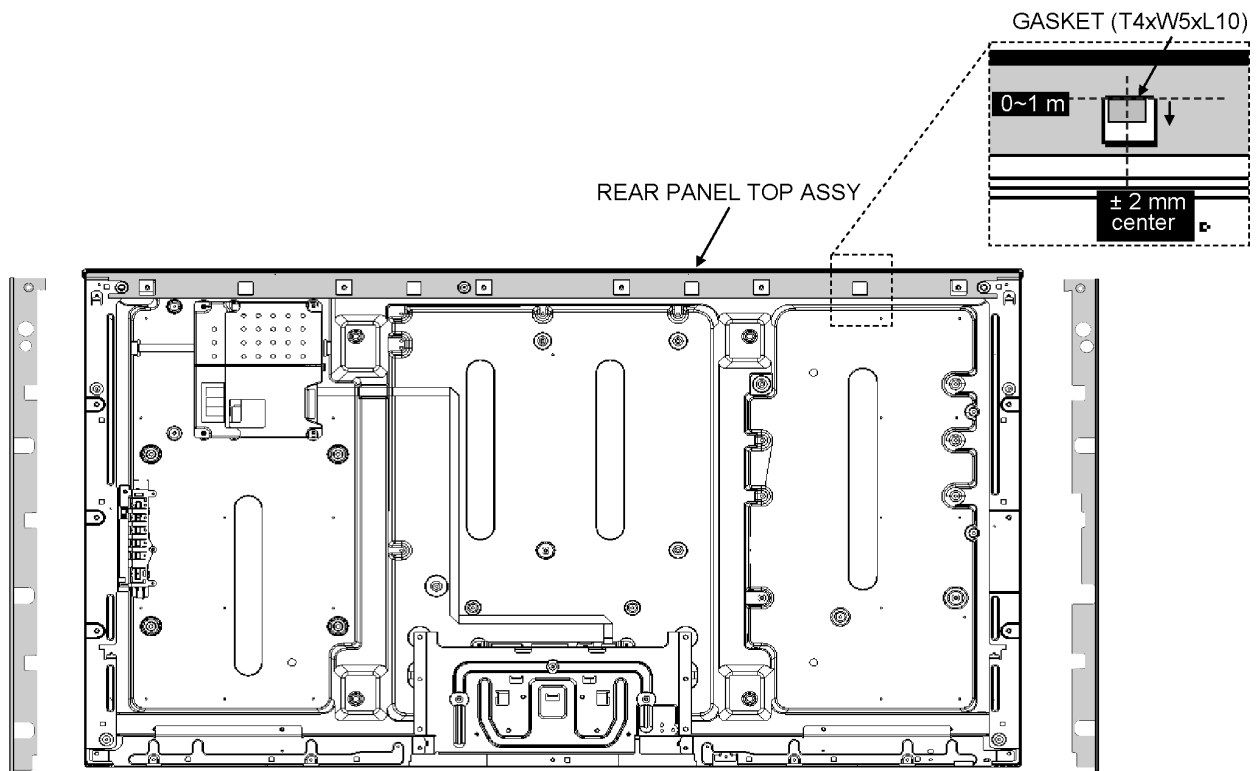
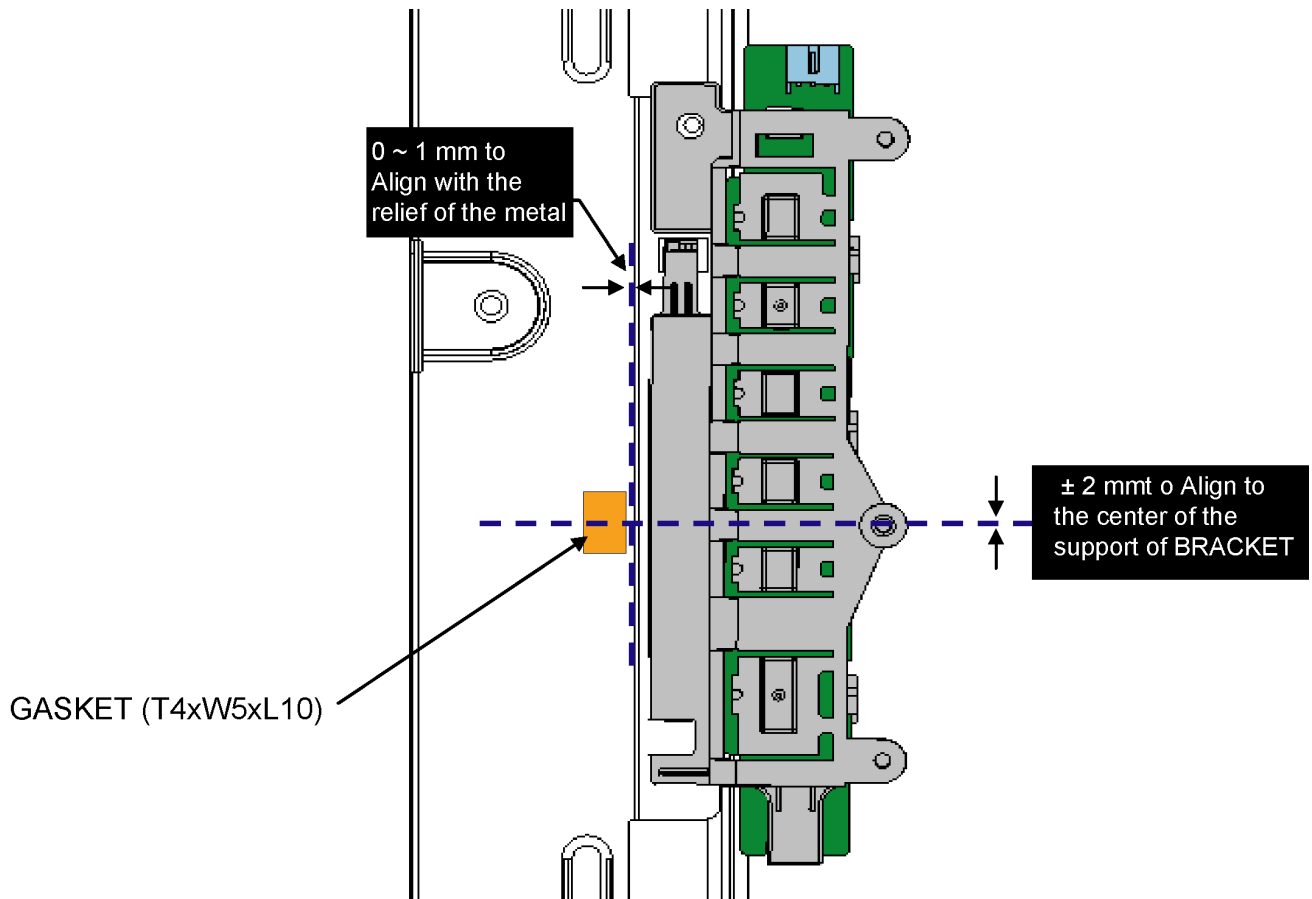
1. Remove the 4 screws.
2. Remove the Metal Bracket Bottom and LCD Panel.

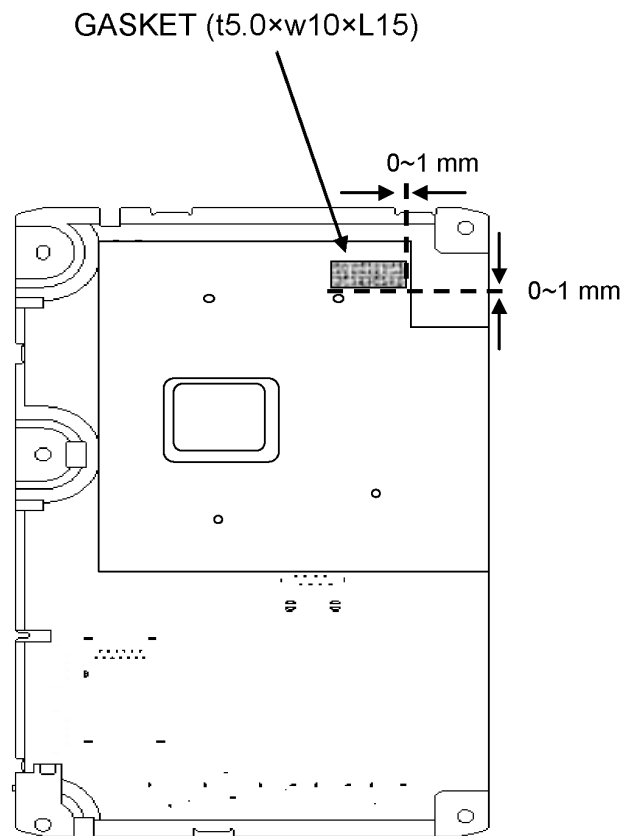
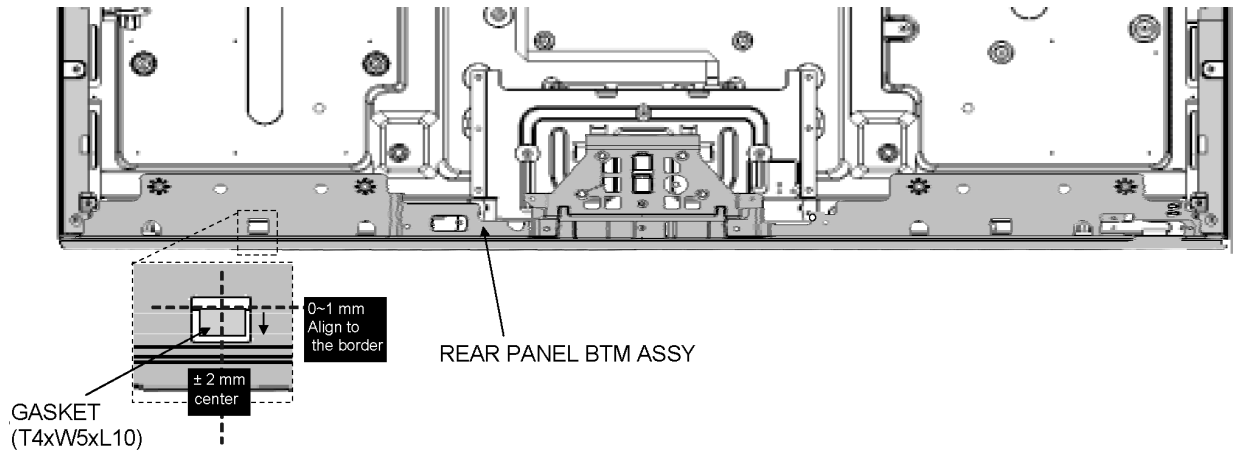


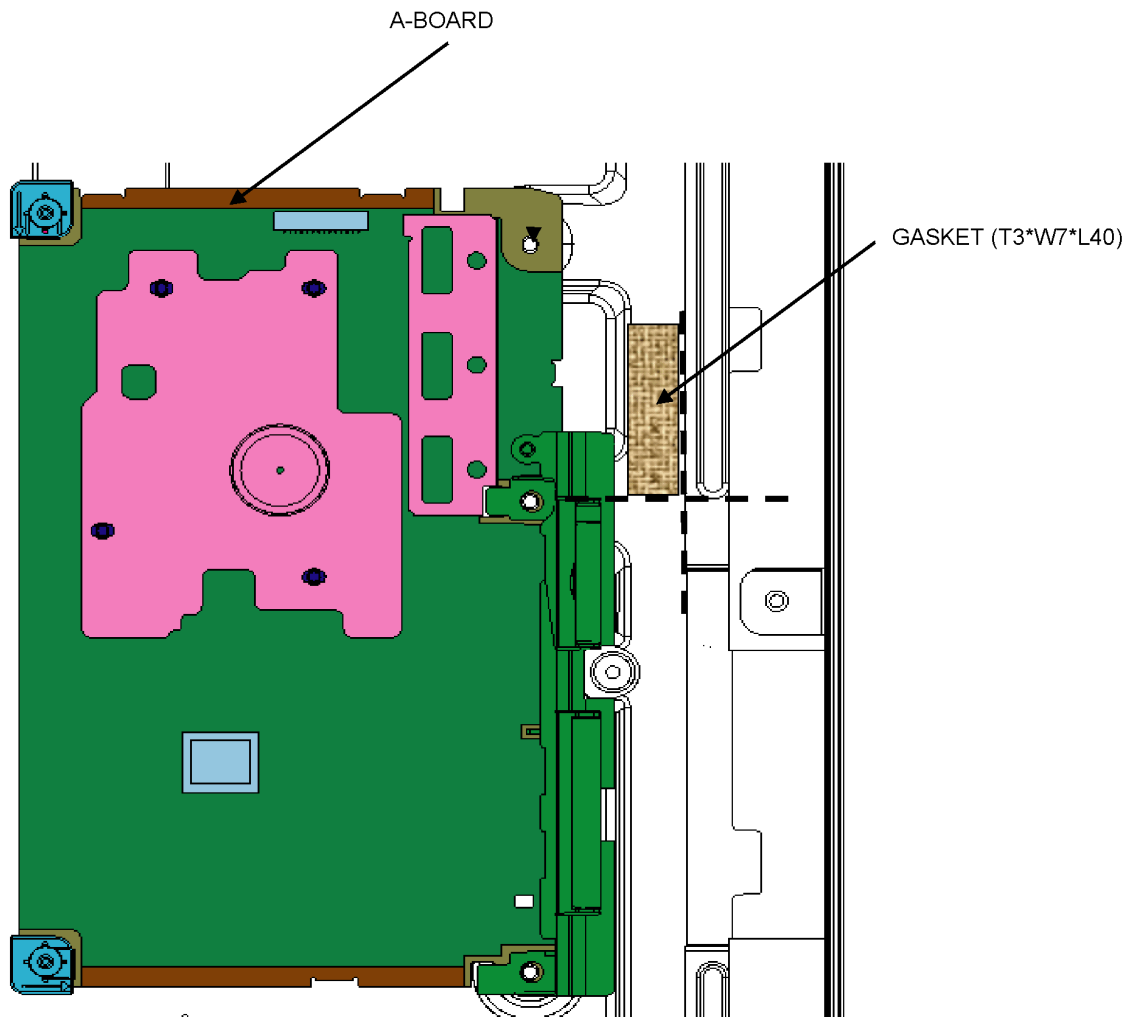
8.2.15. Felt, Sponge, and so on

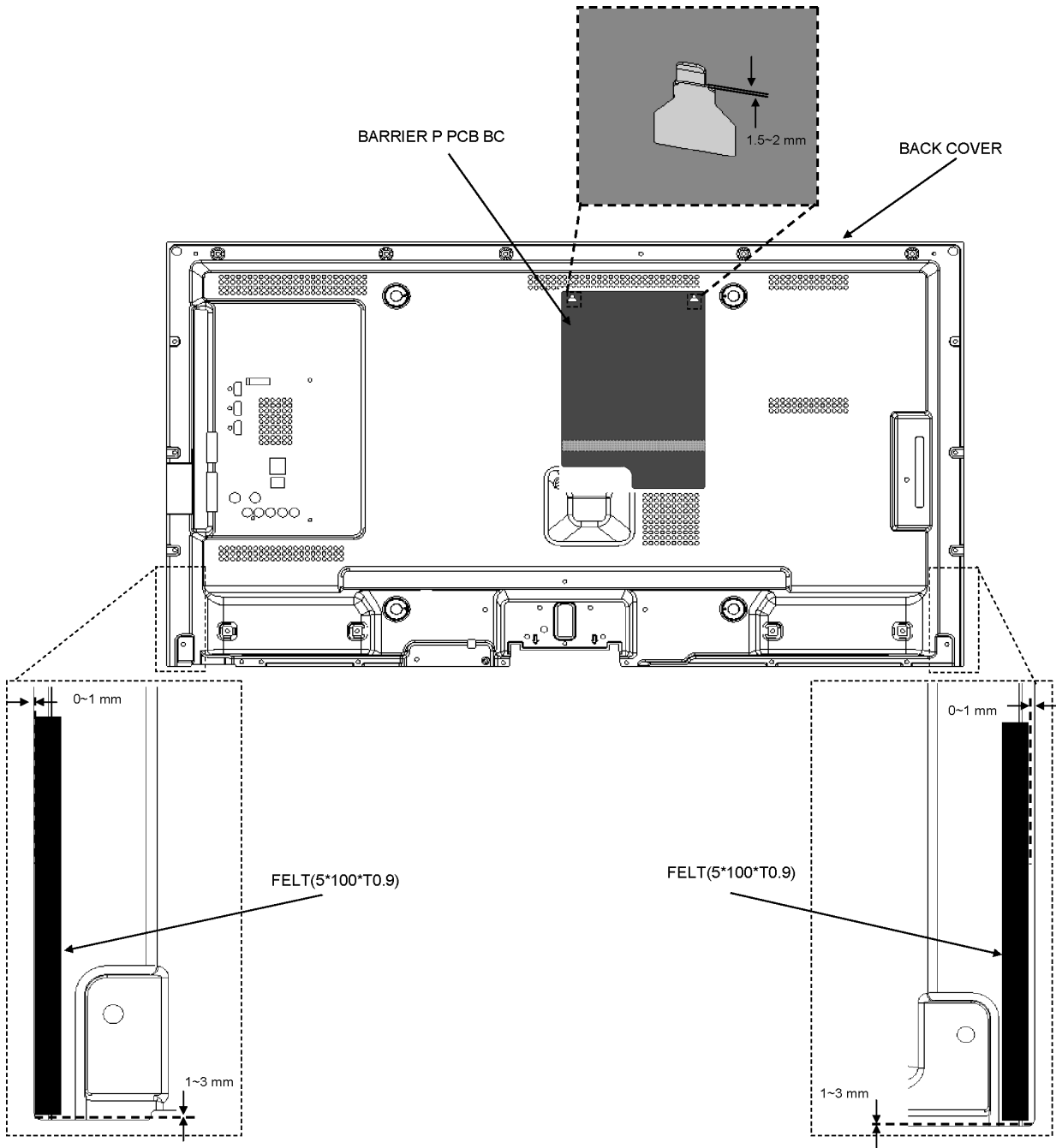


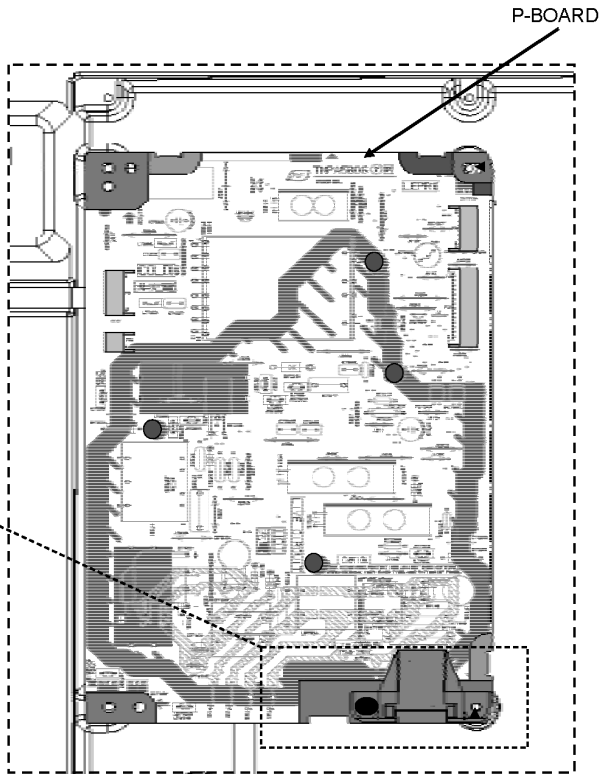
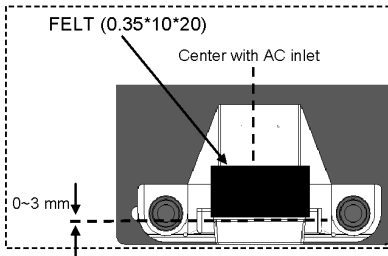
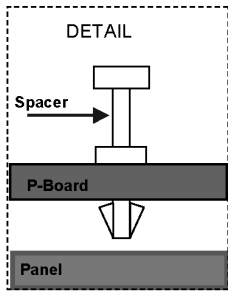
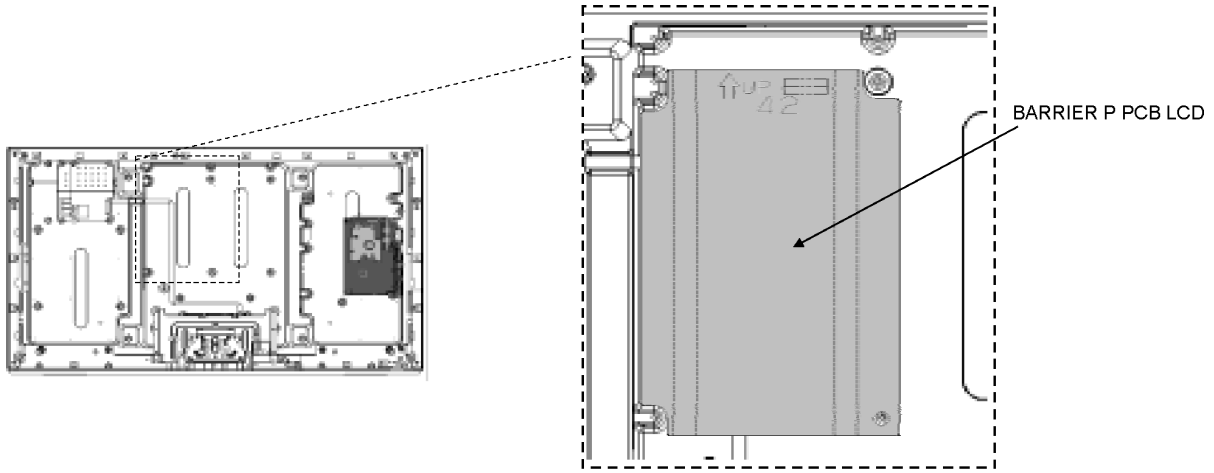












9 Measurements and Adjustments

9.1 Voltage chart of P-board

Power Supply Name	Test point	Spec
24V	TP7407	24±1.2V
16V	TP7410	15.7±0.6V
5VS	TP7501	5.3±0.2V
PFC	TP7201 or TP7202	390V ±15V

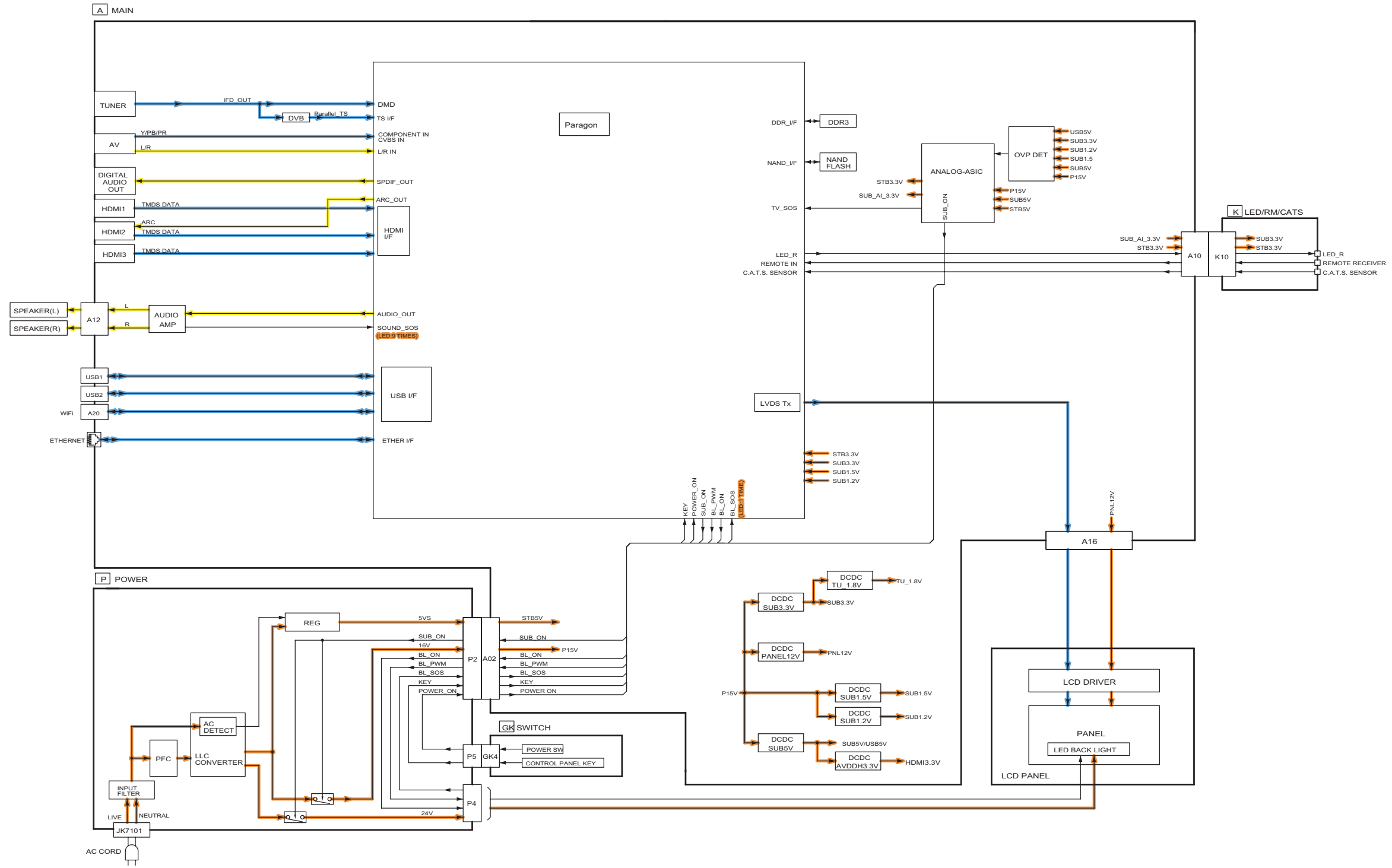
*HOT

9.2 Voltage chart of A-board

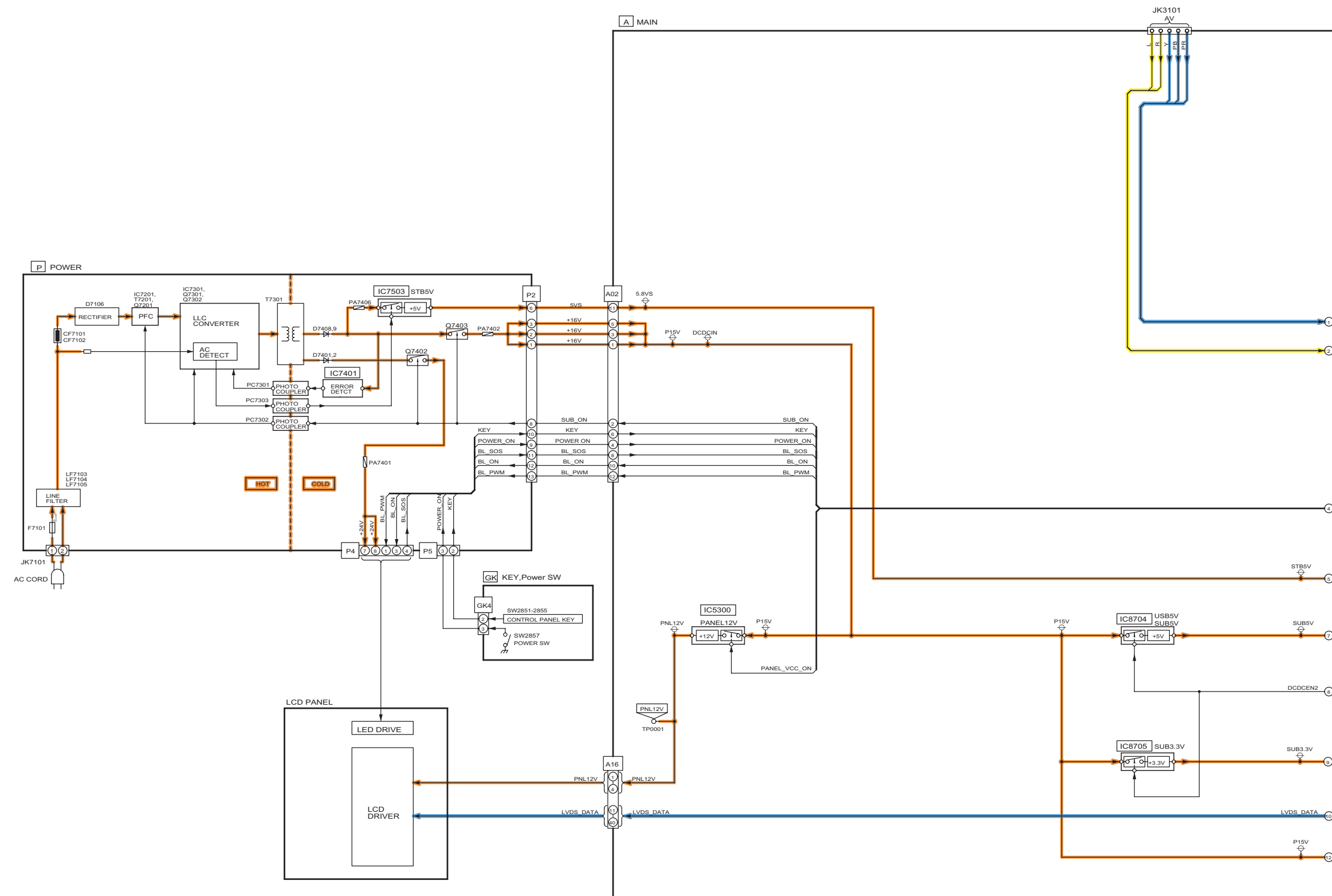
Power Supply Name	Test point	Spec
PANEL12V	TP4000/4001	11.50V - 12.50V
SUB5V	TP5420	4.95V - 5.40V
SUB3.3V	TP5400	3.17V - 3.43V
SUB1.5V	TP8100	1.435V - 1.585V
SUB1.2V	TP8101	1.140V - 1.260V
JP_TU_2.5V	TP5705	2.38V - 2.62V

10 Block Diagram

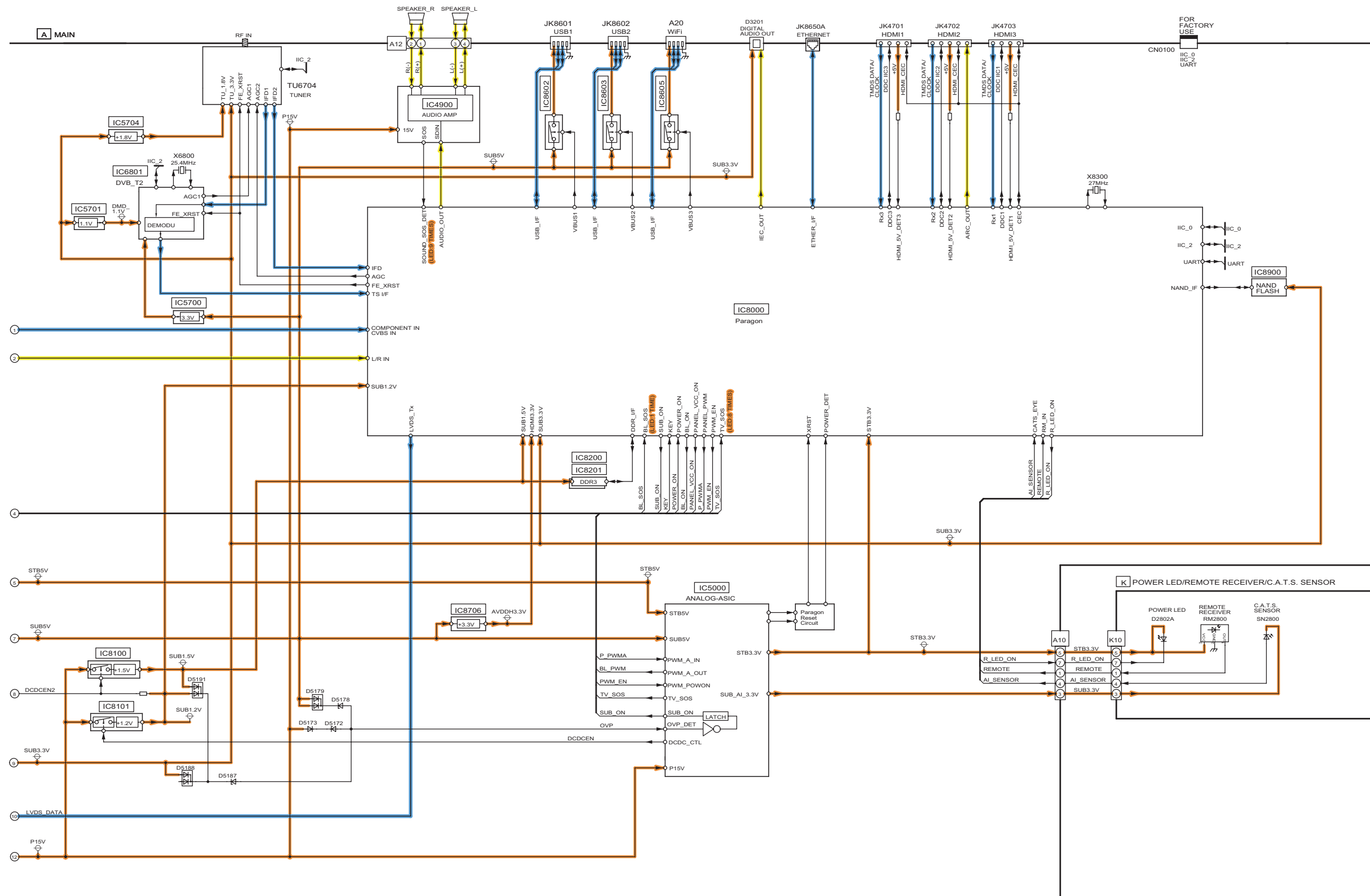
10.1. Main Block Diagram



10.2. Block (1/2) Diagram



10.3. Block (2/2) Diagram



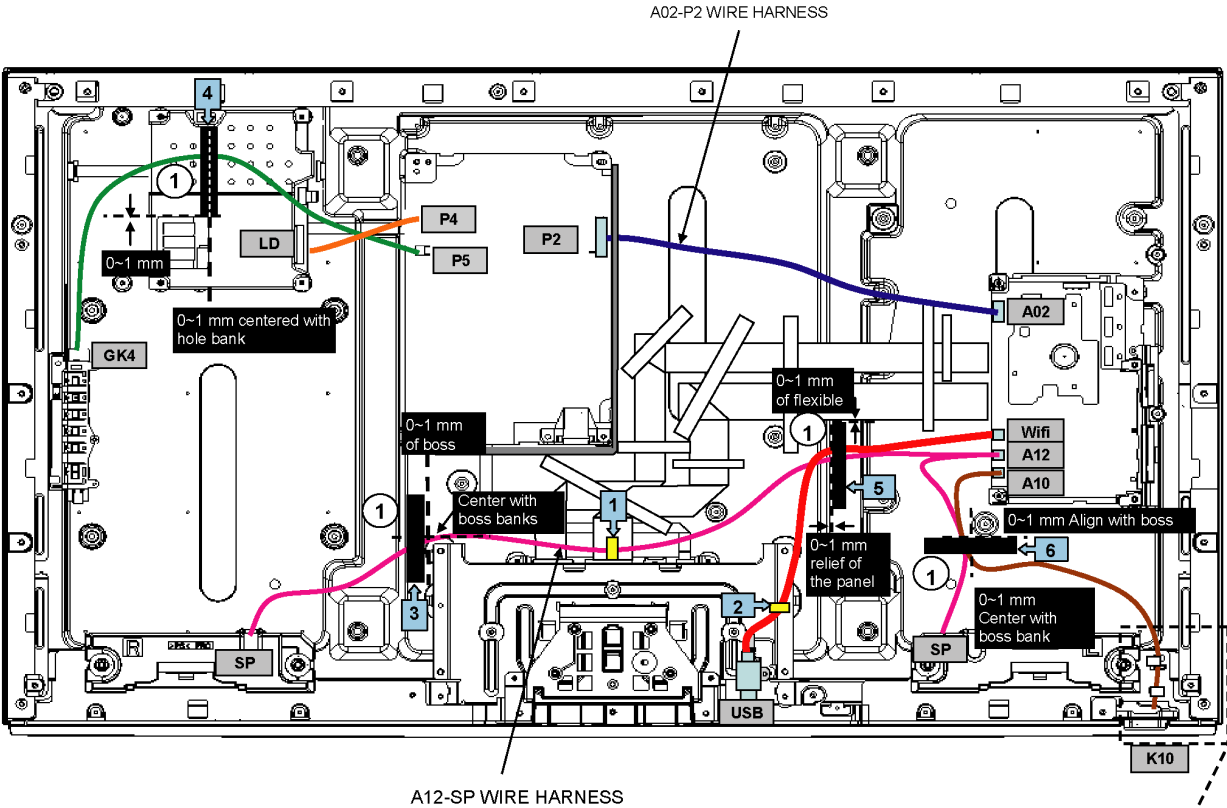
11 Wiring Connection Diagram

11.1. Caution statement.

Caution:

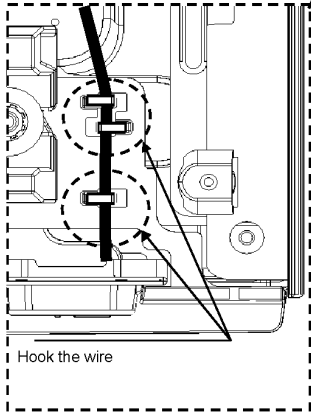
- Please confirm that all flexible cables are assembled correctly.
- Also make sure that they are locked in the connectors.
- Verify by giving the flexible cables a very slight pull.

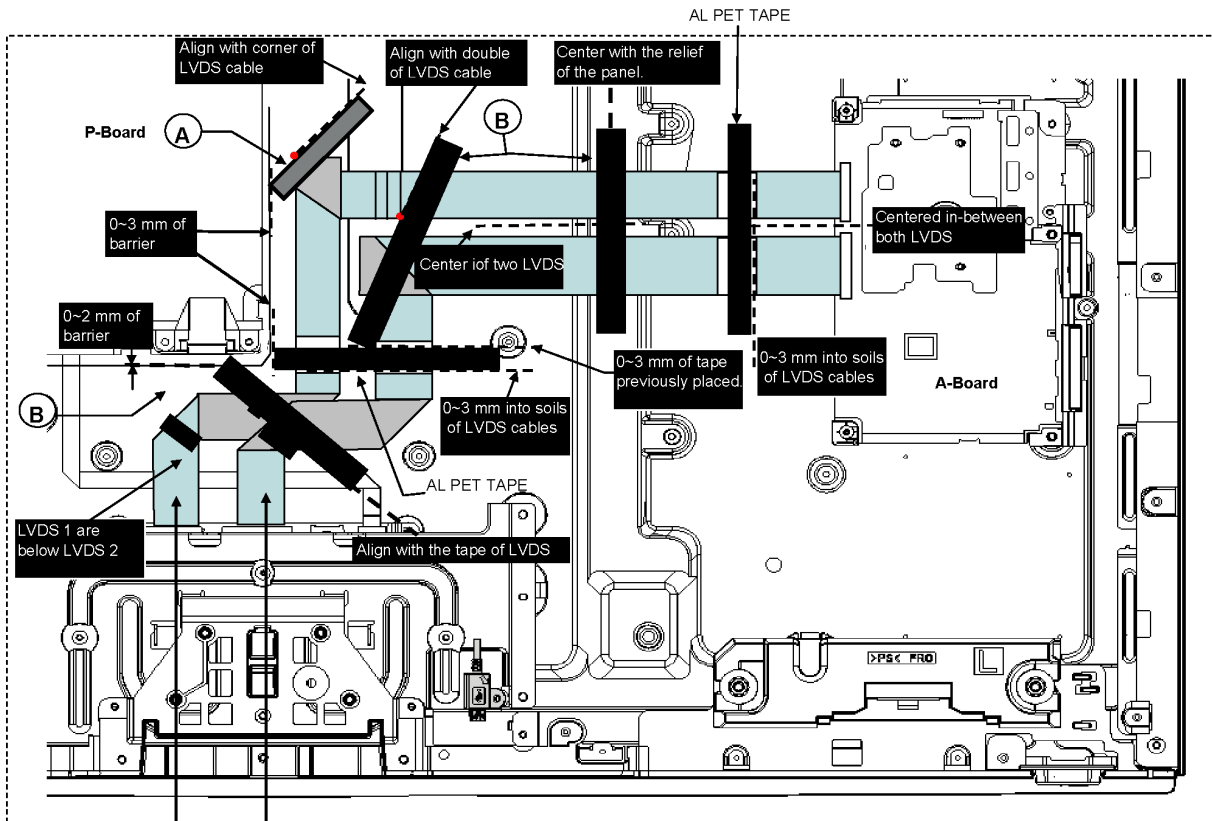
11.2. Dressing Wire



① PET TAPE
 4 ribbons (70 mm)

CONNECTORS	CLAMPER			TAPE		
	1	2	3	4	5	6
(A12-SPR)	●		●		●	
(A12-SPL)						●
WIRE(K10-A10)						●
WIRE(A-USB)		●			●	
WIRE (GK4-P5)				●		
WIRE (P2-A02)						





LVDS FFC CABLE (41 PINS) LVDS FFC CABLE (51 PINS)

POINT OF CARE:
Please refold 4 bellows points.

