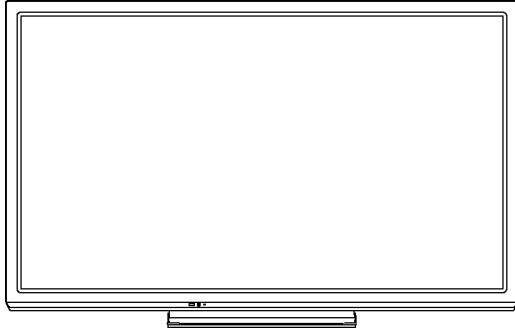


# Service Manual

42 inch Class 720p Plasma HDTV

Model No. **TC-P42X60**

GPH16DU Chassis



For detailed troubleshooting information and circuit explanations, refer to the "QSM/Service Hints/Troubleshooting Information(TI)" and Seminar/Training Manual/Technical Guide(TG) documents posted on the TSN web site.  
For information about this model, type TC-P2013 in the model box under "Direct Search".

## **⚠ 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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# 1 Safety Precautions

## 1.1. General Guidelines

1. When conducting repairs and servicing, do not attempt to modify the equipment, its parts or its materials.
2. 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.
3. When conducting repairs and servicing, do not twist the Fasten connectors but plug them straight in or unplug them straight out.
4. 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.
5. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
6. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

### 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 between 1Mohm and 5.2Mohm. When the exposed metal does not have a return path to the chassis, the reading must be  $\infty$ .

### 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 $\mu$ 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.

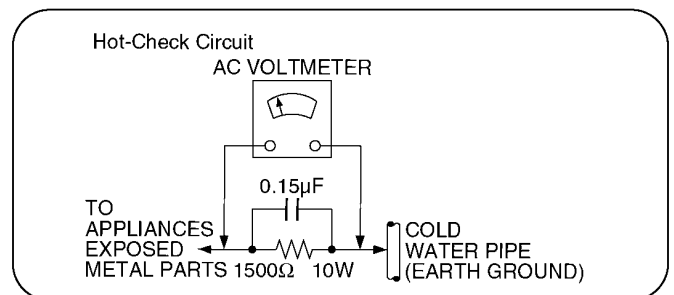


Figure 1

## 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).

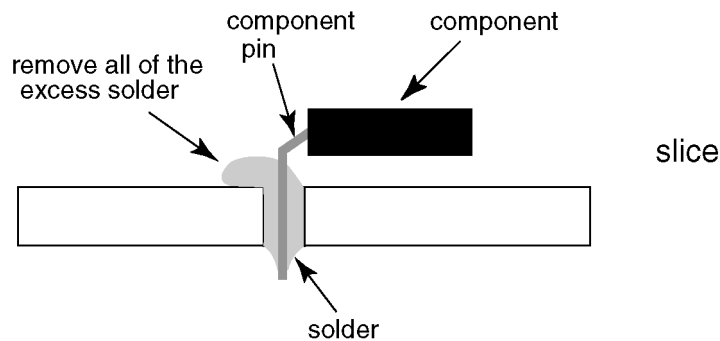
That is Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

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)



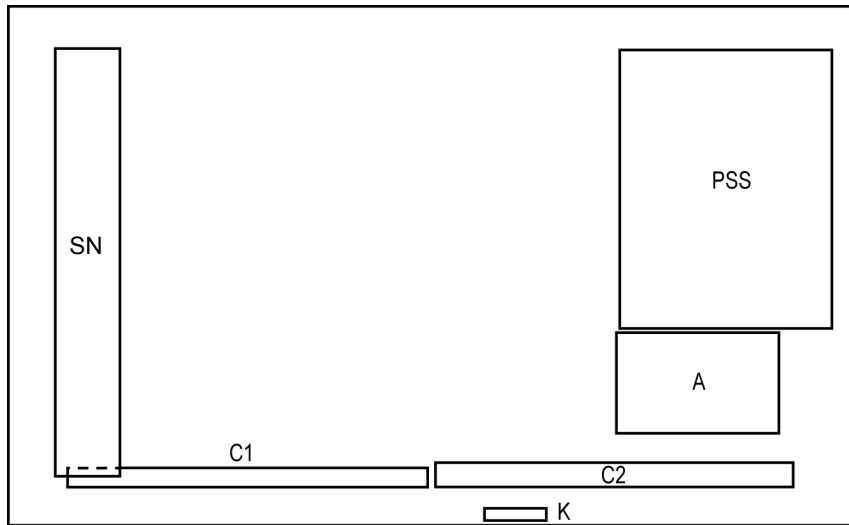
### Suggested Pb free solder

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
PSS	Power Supply, Sustain Drive Non serviceable. PSS-Board should be exchanged for service.
A	Main AV input, processing
K	Remote receiver, Power LED, C.A.T.S. sensor
C1	Data Driver (Lower Right)
C2	Data Driver (Lower Left)
SN	Scan Drive

## 3.2. Applicable signals

Applicable input signal for Component (Y, P<sub>B</sub>, P<sub>R</sub>), HDMI

	horizontal frequency (kHz)	vertical frequency (Hz)
525 (480) / 60i	15.73	59.94
525 (480) /60p	31.47	59.94
750 (720) /60p	45.00	59.94
1,125 (1,080) /60i	33.75	59.94
1,125 (1,080) /60p	67.43	59.94
1,125 (1,080) /60p	67.50	60.00
1,125 (1,080) /24p*	26.97	23.98
1,125 (1,080) /24p*	27.00	24.00

\*HDMI only

### Note

- Signals other than those shown above may not be displayed properly.
- The above signals are reformatted for optimal viewing on your display.

# 4 Specifications

## TV

<b>Power Source</b>	AC 120 V, 60 Hz
<b>Power Consumption</b>	
<b>Rated power</b>	212 W
<b>Standby power</b>	0.3 W
<b>Display Panel</b>	
<b>Panel System</b>	Plasma Display panel
<b>Screen size</b>	42 inch class (41.9 inches measured diagonally)
<b>W × H × Diagonal</b>	36.5 inch × 20.5 inch × 41.9 inch (929 mm × 522 mm × 1,066 mm)
<b>Number of pixels</b>	1.024 × 768
<b>Speaker Output</b>	20 W [10 W + 10 W] (10 % THD)
<b>Channel Capability (Digital/Analog)</b>	VHF/ UHF: 2 - 69, CATV: 1 - 135
<b>Operating Conditions</b>	
	Temperature: 32 °F - 104 °F (0 °C - 40 °C)
	Humidity: 20 % - 80 % RH (non-condensing)
<b>Connection Terminals</b>	
<b>VIDEO IN</b>	RCA PIN (VIDEO, AUDIO-L, AUDIO-R)
<b>COMPONENT IN</b>	RCA PIN (Y, PB, PR, AUDIO-L, AUDIO-R)
<b>HDMI IN 1/2</b>	TYPE A Connector
<b>USB</b>	USB2.0 Type A connector
<b>DIGITAL AUDIO OUT</b>	PCM / Dolby Digital, Fiber Optic
<b>OTHERS</b>	SD CARD slot
<b>Dimensions (W × H × D)</b>	
<b>Including pedestal</b>	39.7 inch × 25.9 inch × 9.1 inch (1,007 mm × 657 mm × 231 mm)
<b>TV Set only</b>	39.7 inch × 24.3 inch × 3.2 inch (1,007 mm × 615 mm × 81 mm)
<b>Mass</b>	
<b>Including pedestal</b>	36.4 lb. (16.5 kg) NET
<b>TV Set only</b>	34.2 lb. (15.5 kg) NET

## Note

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



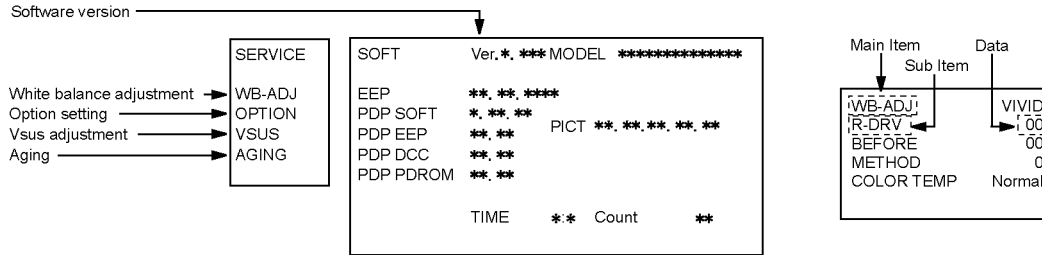
# 5 Service Mode

## 5.1. How to enter into Service Mode

### 5.1.1. 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



### 5.1.2. 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 ( - )

### 5.1.3. How to exit

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

### 5.1.4. 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
WB-ADJ	R-DRV	DF	
	G-DRV	FF	
	B-DRV	7C	
	ALL-DRV	FF	
OPTION	MIRROR	00 (See Option-Mirror)	Factory Preset
	Boot Loader	ROM	
VSUS		LOW	See Vsus selection
AGING	ALL WHITE		Built-in test patterns can be displayed.
	MIDDLE BLUE WITH MAGENTA OUTSIDE FRAME		
	MIDDLE STEP GREEN		
	MIDDLE STEP RED		
	LOW STEP WHITE		
	ALL BLUE		
	ALL GREEN		
	ALL RED		
	WHITE DIAGONAL STRIPE		
	RED DIAGONAL STRIPE		
	GREEN DIAGONAL STRIPE		
	BLUE DIAGONAL STRIPE		
	A-ZONE & B-ZONE		
	1% WINDOW		
	COLOR BAR		
	9 POINTS BRIGHT MEASURE		
	2 DOT OUTSIDE FRAME		
	DOUBLE FIXED 1% WINDOW		
	VERTICAL LINE SCROLL		
	ON/OFF		
R/G/B/W ROTATION			
HALF FIXED ALL WHITE			
ALL WHITE WITH COUNT DISPLAY			

## 5.2. Option - Mirror

Picture can be reversed left and right or up and down.

00 : Default (Normal picture is displayed)

01 : Picture is reversed left and right.

02 : Picture is reversed up and down.

00



01



02



Hint : If the defective symptom (e.g. Vertical bar or Horizontal bar) is moved by selection of this mirror, the possible cause is in A-board.

## 6 Troubleshooting Guide

For detailed troubleshooting information and circuit explanations, refer to the "QSM/Service Hints/Troubleshooting Information(TI)" and Seminar/Training Manual/Technical Guide(TG) documents posted on the TSN web site.

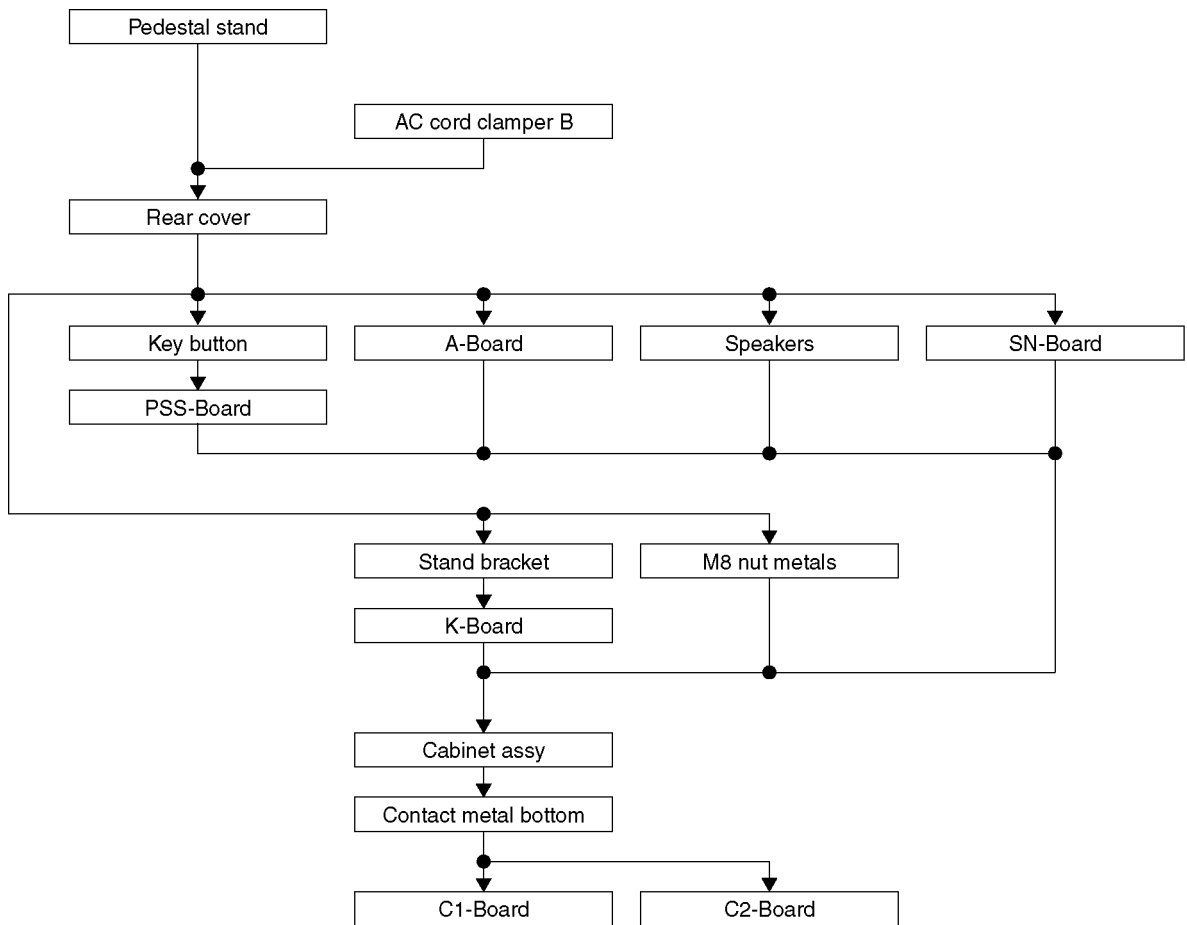
For information about this model, type TC-P2013 in the model box under "Direct Search".

# 7 Disassembly and Assembly Instructions

## 7.1. Disassembly Flow Chart for the Unit

This is a disassembly chart.

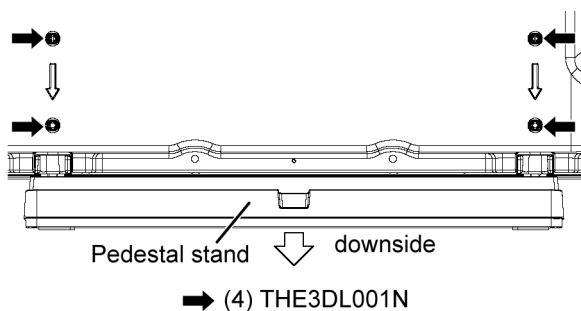
When assembling, perform this chart conversely.



## 7.2. Disassembly Procedure for the Unit

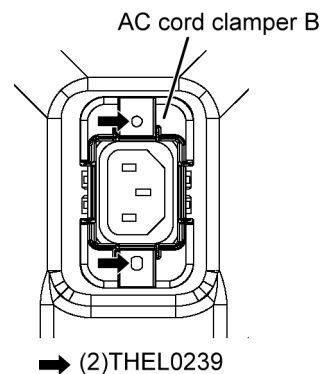
### 7.2.1. Remove the Pedestal stand

1. Remove the Plasma panel section from the servicing stand and lay on a flat surface such as a table (covered by a soft cloth) with the Plasma panel surface facing downward.
2. Remove the screws (×4 ➡).
3. Slide the Pedestal stand to the downside and remove the Pedestal stand.



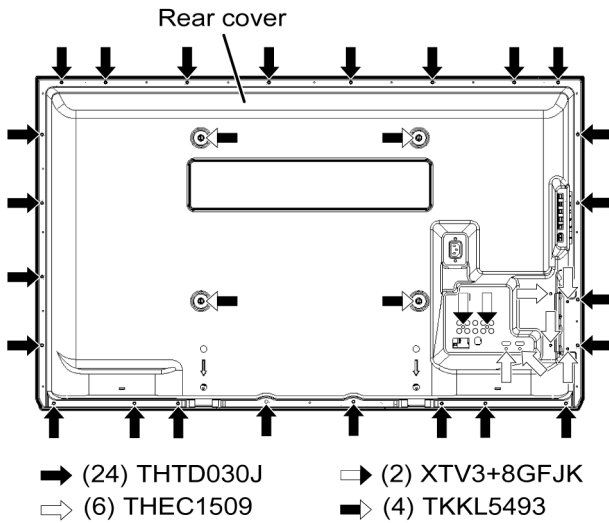
### 7.2.2. Remove the AC cord clamber B

1. Remove the screws (×2 ➡) and remove the AC cord clamber B.



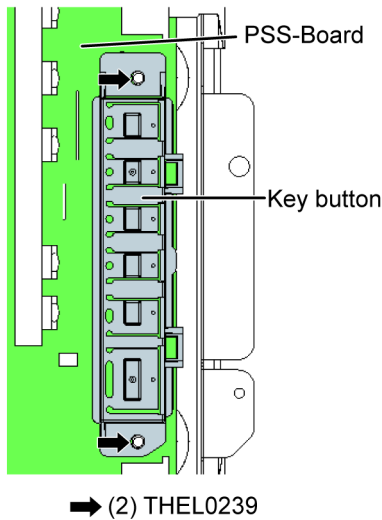
### 7.2.3. Remove the Rear cover

1. Remove the screws (×24 ➡, ×6 ⇨, ×2 ⇩).
2. Remove the M8 caps (×4 ➡).
3. Remove the Rear cover.



### 7.2.4. Remove the Key button

1. Remove the screws (×2 ➡).
2. Remove the Key button.

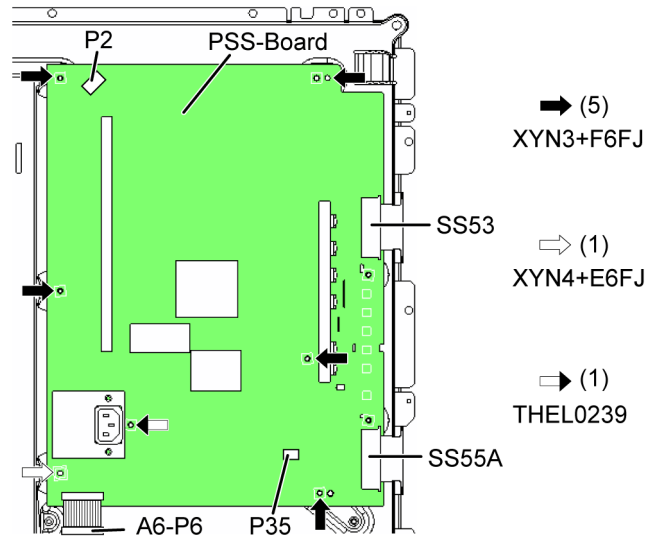


### 7.2.5. Remove the PSS-Board

**Caution:**

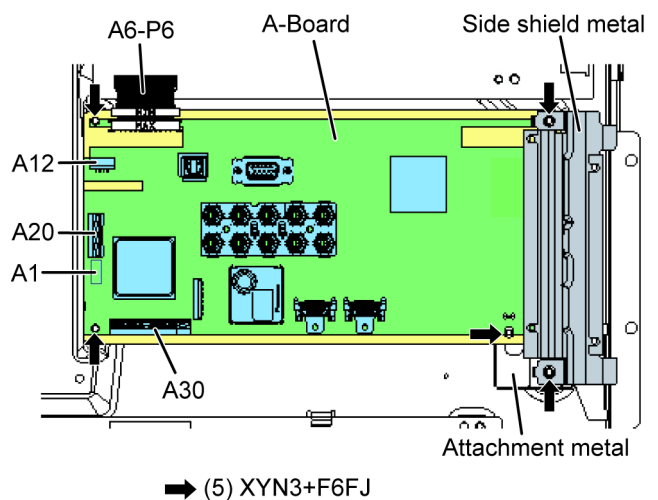
To remove P.C.B. wait 1 minute after power was off for discharge from electrolysis capacitors.

1. Disconnect the connectors (P2 and P35).
2. Disconnect the bridge connector (A6-P6).
3. Disconnect the flexible cables (SS53 and SS55A).
4. Remove the screws (×5 ➡, ×1 ⇨, ×1 ⇩) and remove the PSS-Board.



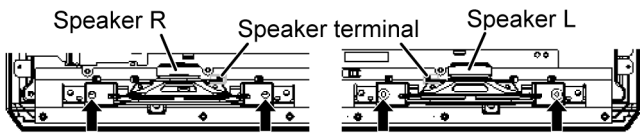
### 7.2.6. Remove the A-Board

1. Unlock the cable clampers and the tapes to free the cables.
2. Disconnect the connectors (A1 and A12).
3. Disconnect the bridge connector (A6-P6).
4. Disconnect the flexible cables (A20 and A30).
5. Remove the screws (×5 ➡) and remove the Side shield metal.
6. Remove the A-Board.
7. Remove the Attachment metal.



### 7.2.7. Remove the Speakers

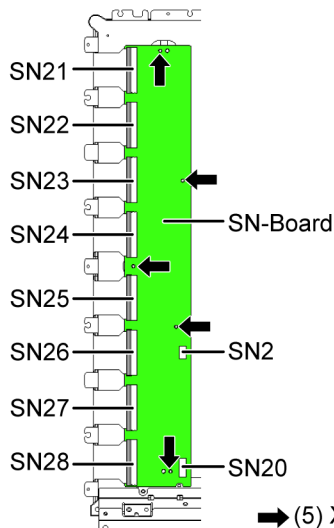
1. Unlock the cable clampers and the tapes to free the cables.
2. Disconnect the Speaker terminal.
3. Remove the screws (x2 ➡) and remove the Speakers (L, R).



➡ (4) THEC215J

### 7.2.8. Remove the SN-Board

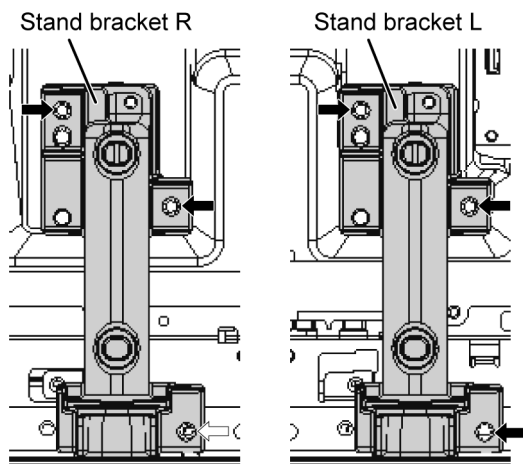
1. Remove the flexible cables (SN21, SN22, SN23, SN24, SN25, SN26, SN27 and SN28) connected to the SN-Board.
2. Disconnect the connector (SN2).
3. Disconnect the flexible cable (SN20).
4. Remove the screws (x5 ➡) and remove the SN-Board.



➡ (5) XYN3+F6FJ

### 7.2.9. Remove the Stand bracket

1. Remove the screws (x5 ➡, x1 ⇨) and remove the Stand brackets (L, R).

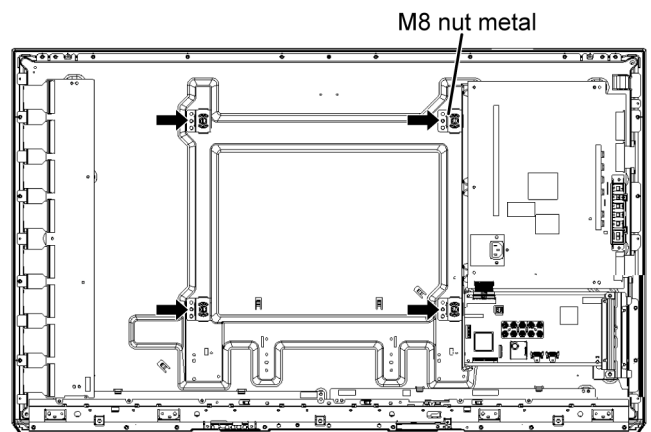


➡ (5) XYN4+F8FJ

⇨ (1) THTD030J

### 7.2.10. Remove the M8 nut metals

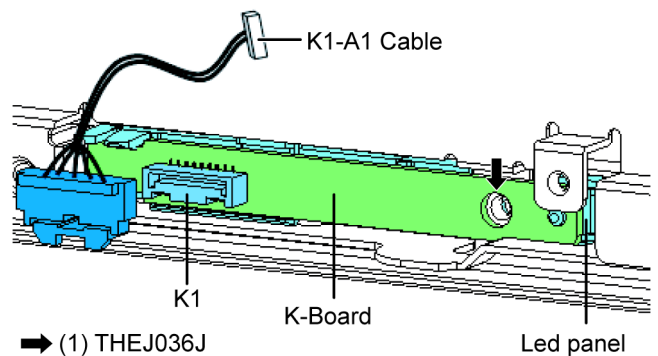
1. Remove the screw (x1 ➡) and remove the M8 nut metals.



➡ (4) XYN4+F8FJ

### 7.2.11. Remove the K-Board

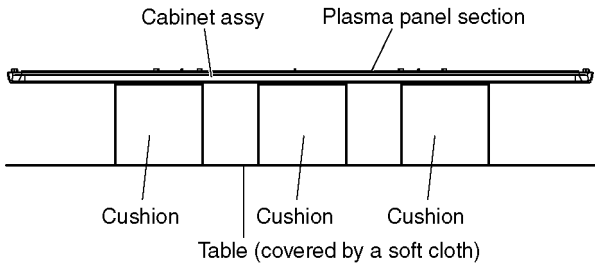
1. Remove the screw (x1 ➡).
2. Disconnect the connector (K1) and remove the K-Board from the LED panel.



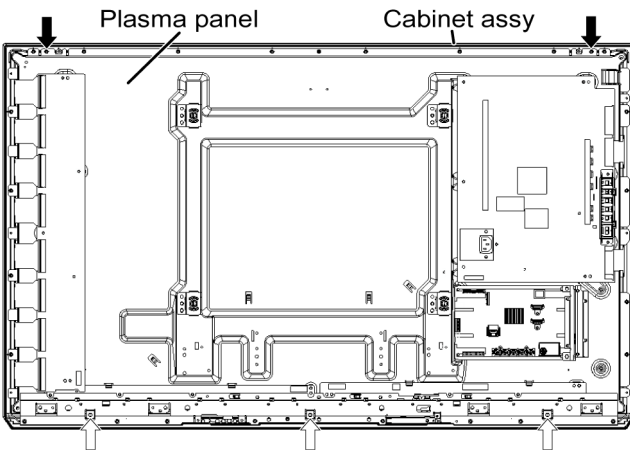
➡ (1) THEJ036J

### 7.2.12. Remove the Cabinet assy from the Plasma panel section.

1. Place the Cabinet assy on a flat surface of a table (covered by a soft cloth) and a cushion.

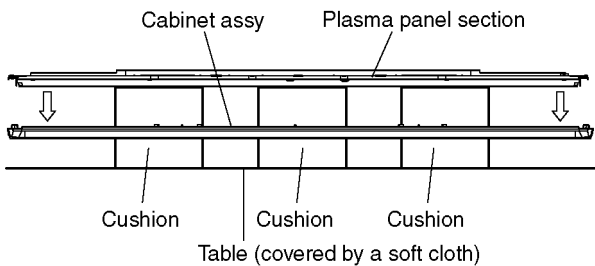


2. Remove the screws (x2 ➡, x3 ⇨).



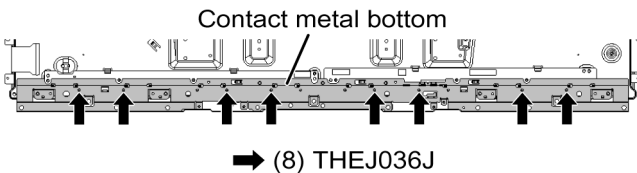
- ➡ (2) XTB4+8GFJ      ⇨ (3) THTD030J

3. Remove the Cabinet assy from the Plasma panel section.



### 7.2.13. Remove the Contact metal bottom

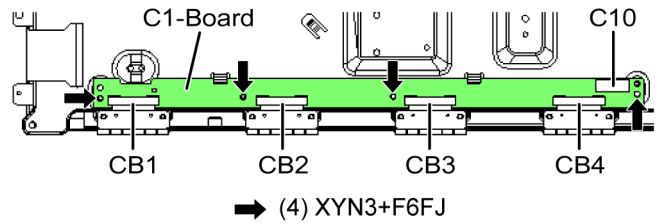
1. Remove the screws (x8 ➡) and remove the Contact metal bottom.



- ➡ (8) THEJ036J

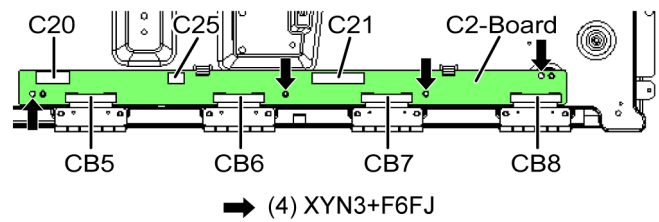
### 7.2.14. Remove the C1-Board

1. Disconnect the flexible cables (CB1, CB2, CB3 and CB4).
2. Disconnect the flexible cable (C10).
3. Remove the screws (x4 ➡) and remove the C1-Board.



### 7.2.15. Remove the C2-Board

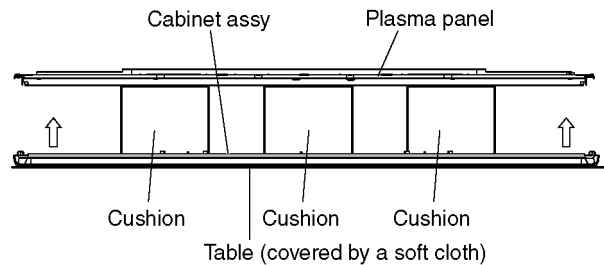
1. Disconnect the flexible cables (CB5, CB6, CB7 and CB8).
2. Disconnect the flexible cables (C20 and C21).
3. Disconnect the connector (C25).
4. Remove the screws (x4 ➡) and remove the C2-Board.



### 7.2.16. Replace the Plasma panel

#### Caution:

Place the Plasma panel on a flat surface of a table (covered by a soft cloth) and a cushion.

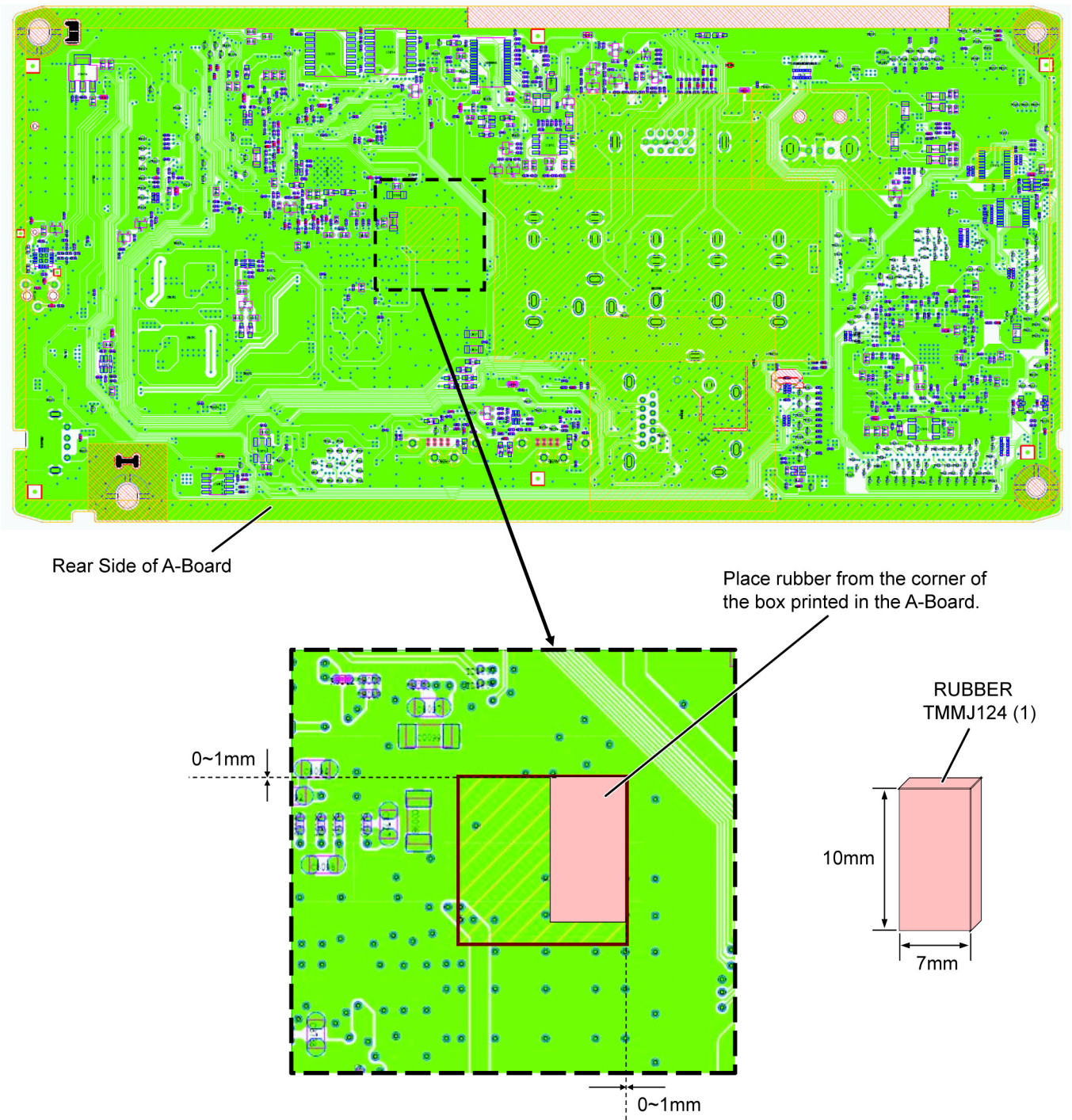


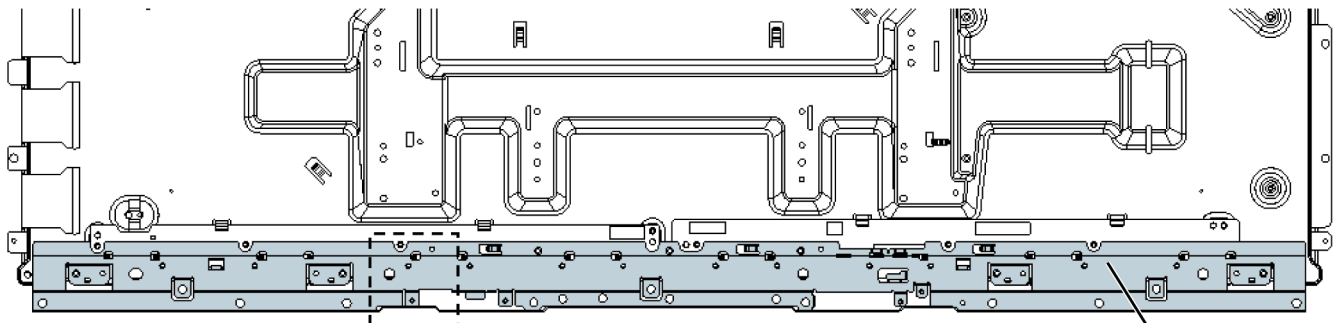
**A new Plasma panel itself without Contact metals is fragile. To avoid the damage to new Plasma panel, carry a new Plasma panel taking hold of the Contact metal bottom.**

1. Place a carton box packed a new Plasma panel on the flat surface of the work bench.
2. Open a box and without taking a new Plasma panel.
3. Attach the Cabinet assy and each P.C.Board and so on, to the new Plasma panel.

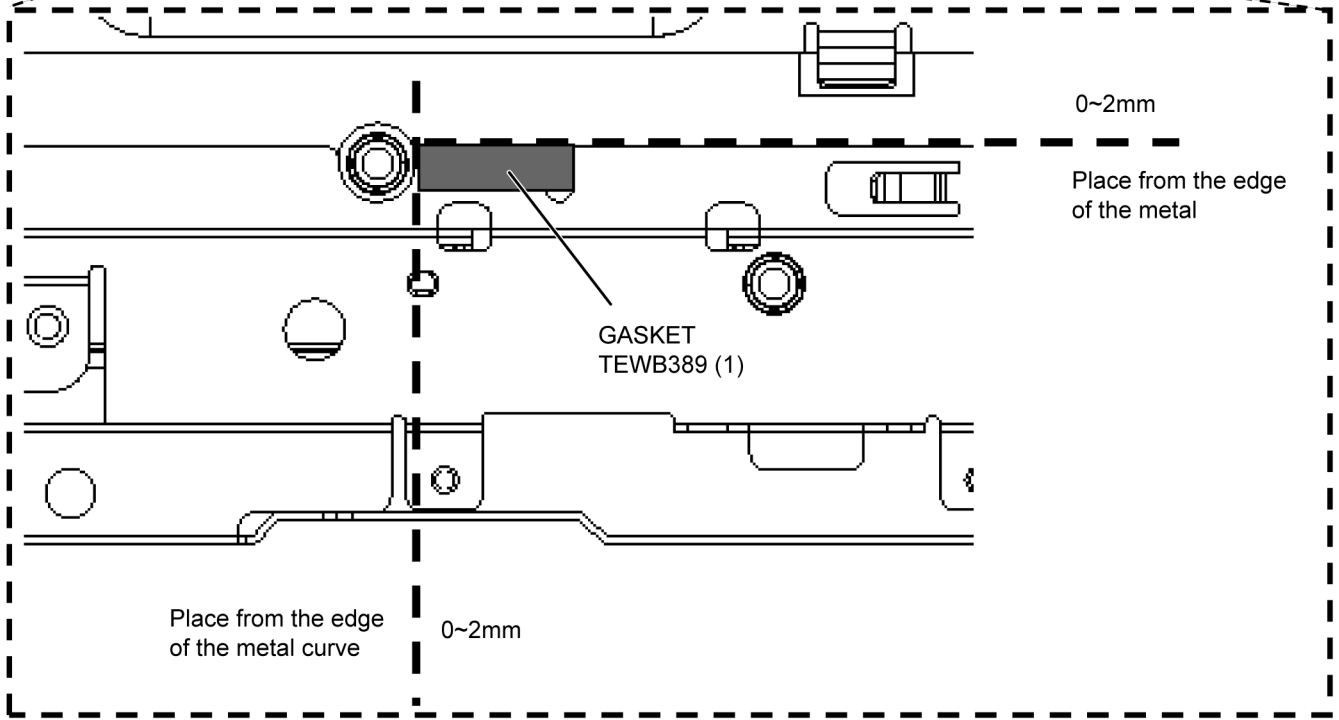


## 7.2.17. EMI processing





Contact metal bottom



0~2mm

Place from the edge of the metal

GASKET  
TEWB389 (1)

Place from the edge of the metal curve

0~2mm

# 8 Measurements and Adjustments

## 8.1. Adjustment

### 8.1.1. Vsus selection

**Caution:**

When Plasma panel or A-board is replaced, Vsus should be set to LOW or HIGH.

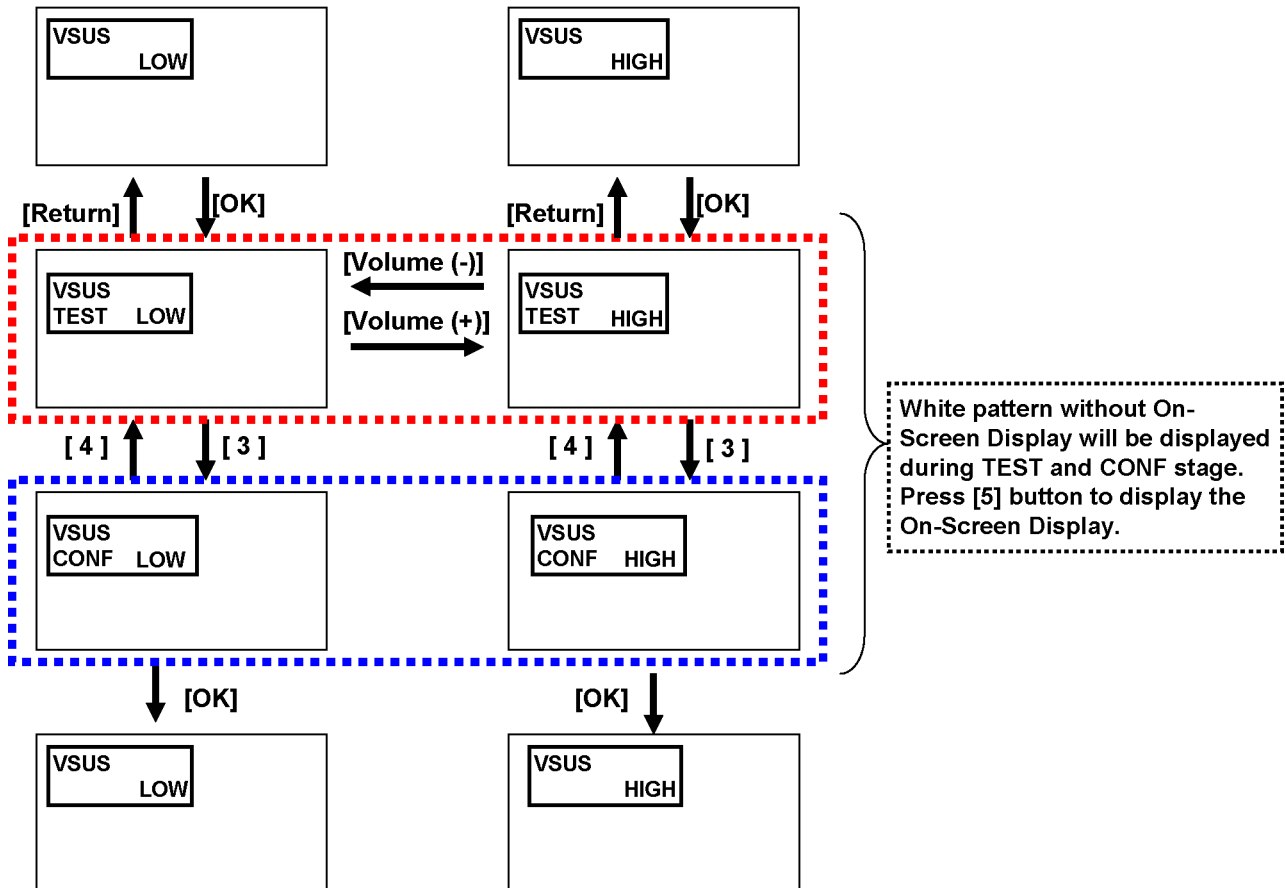
**Procedure**

1. Go into main item [VSUS] in Service Mode. LOW or HIGH will be displayed.
2. Press [OK] button to go to TEST stage.  
White pattern without On-Screen Display will be displayed during TEST and CONF stage. Press [5] button to display the On-Screen Display.
3. Press [VOL (-)] button to set to LOW.
4. In LOW setting
  - a. If no several dead pixel is visible remarkably in white pattern, press [3] button to go to CONF stage.
  - b. If the several dead pixels are visible remarkably in white pattern, Set to HIGH by press [VOL (+)] button. Press [3] button to go to CONF stage if the symptom is improved.
5. Press [OK] button in CONF stage to store LOW or HIGH.
6. Exit Service Mode by pressing [Power] button.

**Notes:**

Do not overwrite because data is written in Peaks-EEPROM after executing adjustment of V-SUS Voltage.

**Vsus selection in Service mode**

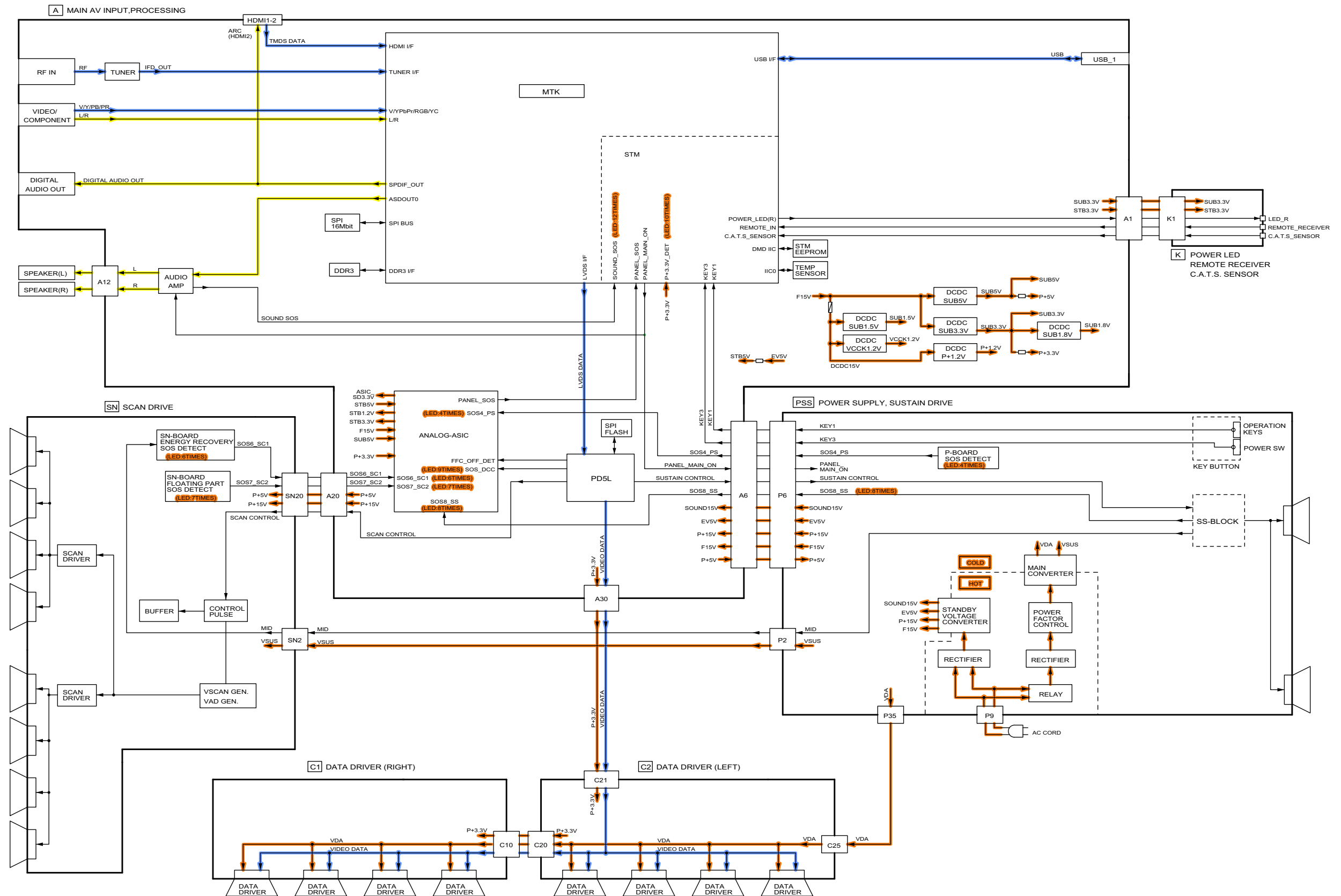


## 8.1.2. White balance adjustment

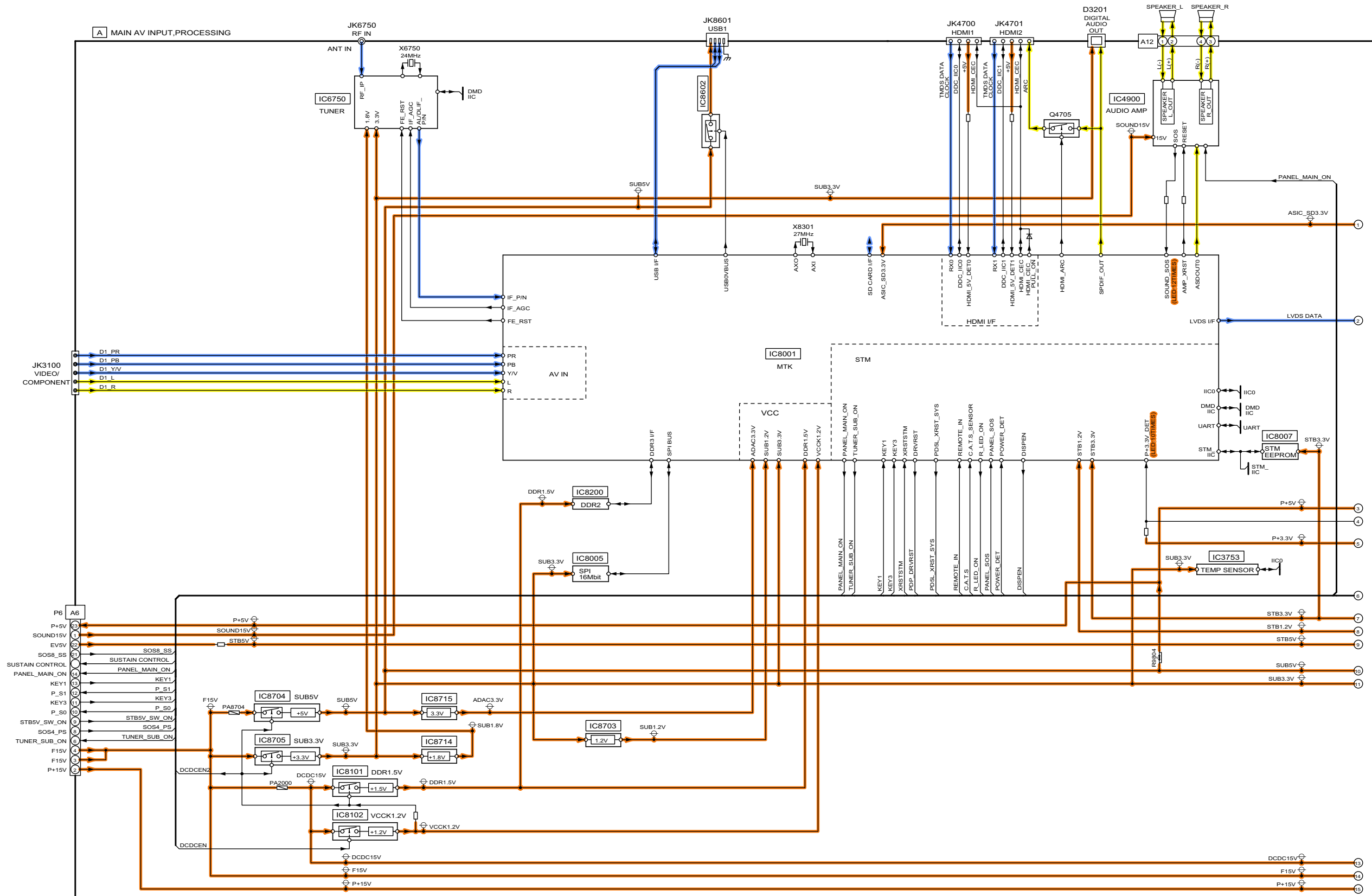
Name of measuring instrument	Remarks																				
Color analyzer (Minolta CS-1000 or equivalent)																					
Procedure	Remarks																				
<ol style="list-style-type: none"> <li>1. Enter the Service mode.</li> <li>2. Receive the Analog-RF (except for no signal) or set CVBS/YUV/HDMI (no signal is available).</li> <li>3. Select [WB-ADJ] by using [1] and [2] key in the remote controller.</li> <li>4. Check that the color temp and the picture mode is the values written in table1.</li> <li>5. [INNER PATTERN] is displayed by using [5] key by using [5] key in the remote controller.</li> <li>6. Select [G-CUTOFF] by using the [3] and [4] key in the remote controller, and set the value to [80] by using the volume [+] and [-] key. Also, [B-CUTOFF] and [R-CUTOFF] set to [80]</li> <li>7. Set [G-DRIVE] value to the initial data (ex. D0).</li> <li>8. Set the color analyzer and adjust color point to the values written in table1 by using [B-DRIVE] and [R-DRIVE]</li> <li>9. Increase RGB-DRIVE value so that the maximum drive value of one of R-DRIVE or G-DRIVE or B-DRIVE should become [FF] ([ALL-DRIVE] set to [FF].)</li> </ol> <p>Table 1 : White Balance Target value</p> <table border="1"> <thead> <tr> <th colspan="2">COOL</th> <th colspan="2">NORMAL</th> <th colspan="2">WARM</th> <th rowspan="2">adjust at;</th> </tr> <tr> <th>x</th> <th>y</th> <th>x</th> <th>y</th> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>0.266 ±0.005</td> <td>0.268 ±0.005</td> <td>0.288</td> <td>0.296</td> <td>0.313</td> <td>0.329</td> <td>color temp: Cool picture mode:Vivid</td> </tr> </tbody> </table>	COOL		NORMAL		WARM		adjust at;	x	y	x	y	x	y	0.266 ±0.005	0.268 ±0.005	0.288	0.296	0.313	0.329	color temp: Cool picture mode:Vivid	
COOL		NORMAL		WARM		adjust at;															
x	y	x	y	x	y																
0.266 ±0.005	0.268 ±0.005	0.288	0.296	0.313	0.329	color temp: Cool picture mode:Vivid															

# 9 Block Diagram

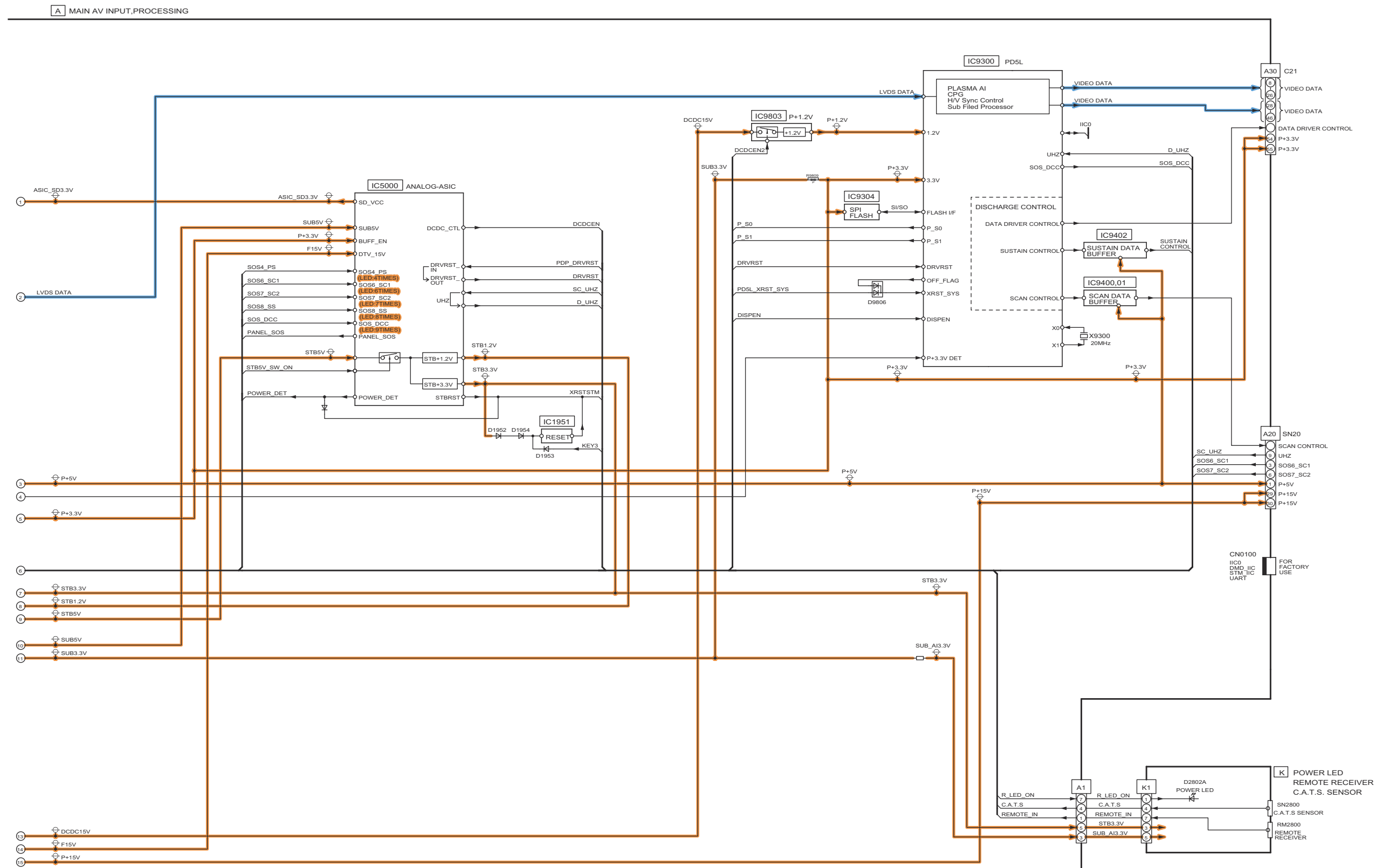
## 9.1. Main Block Diagram



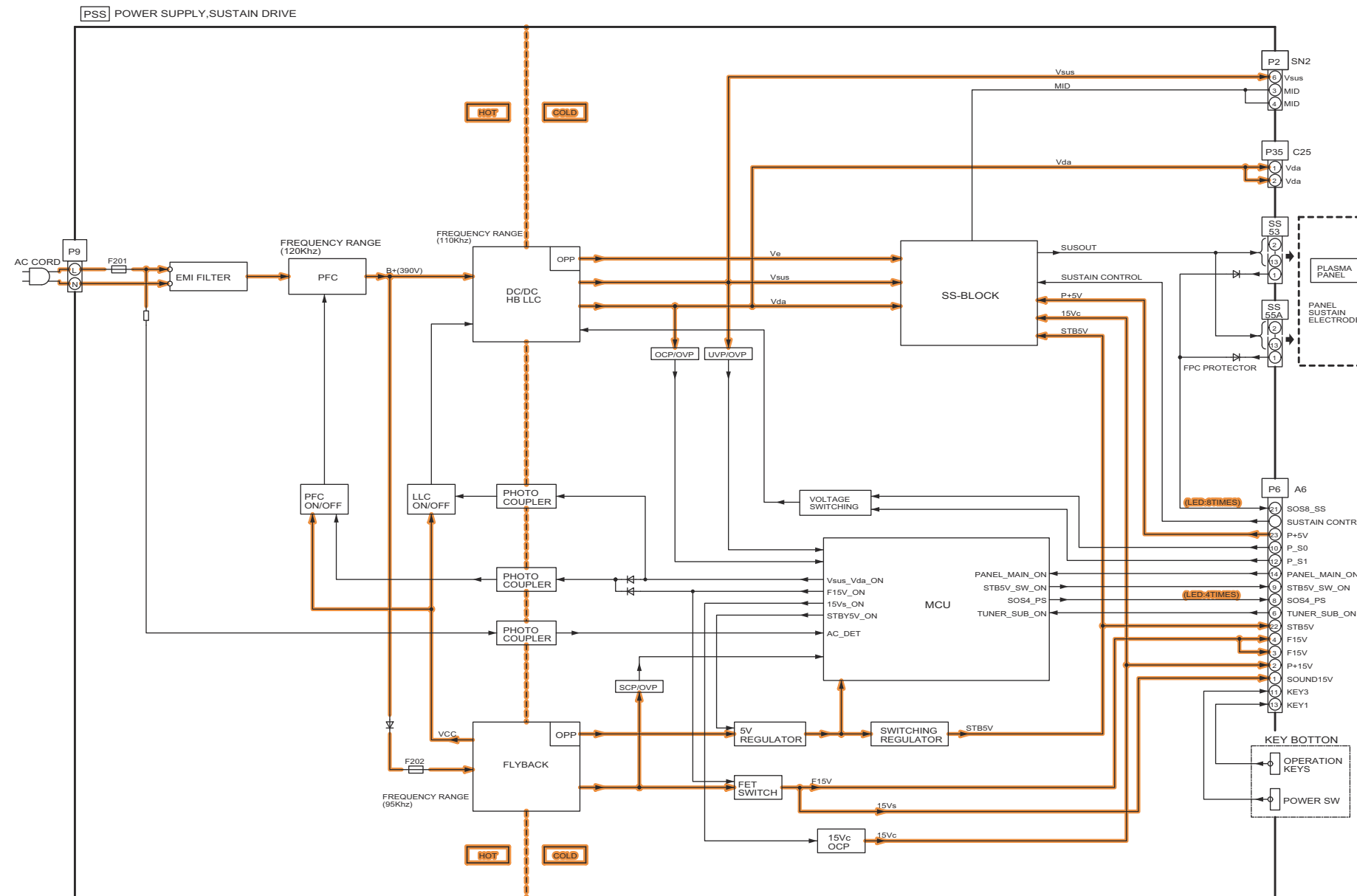
## 9.2. Block (1/4) Diagram



### 9.3. Block (2/4) Diagram

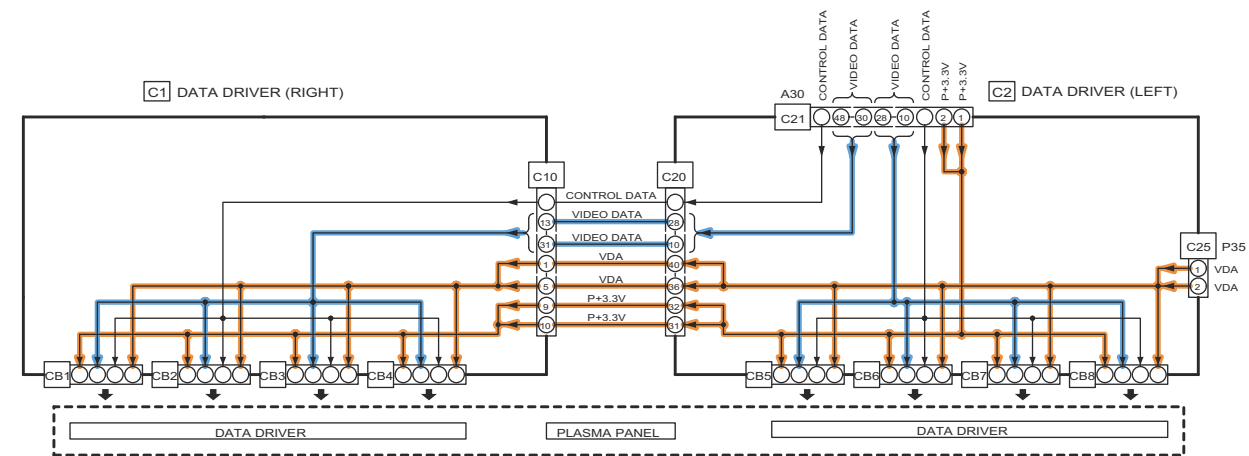
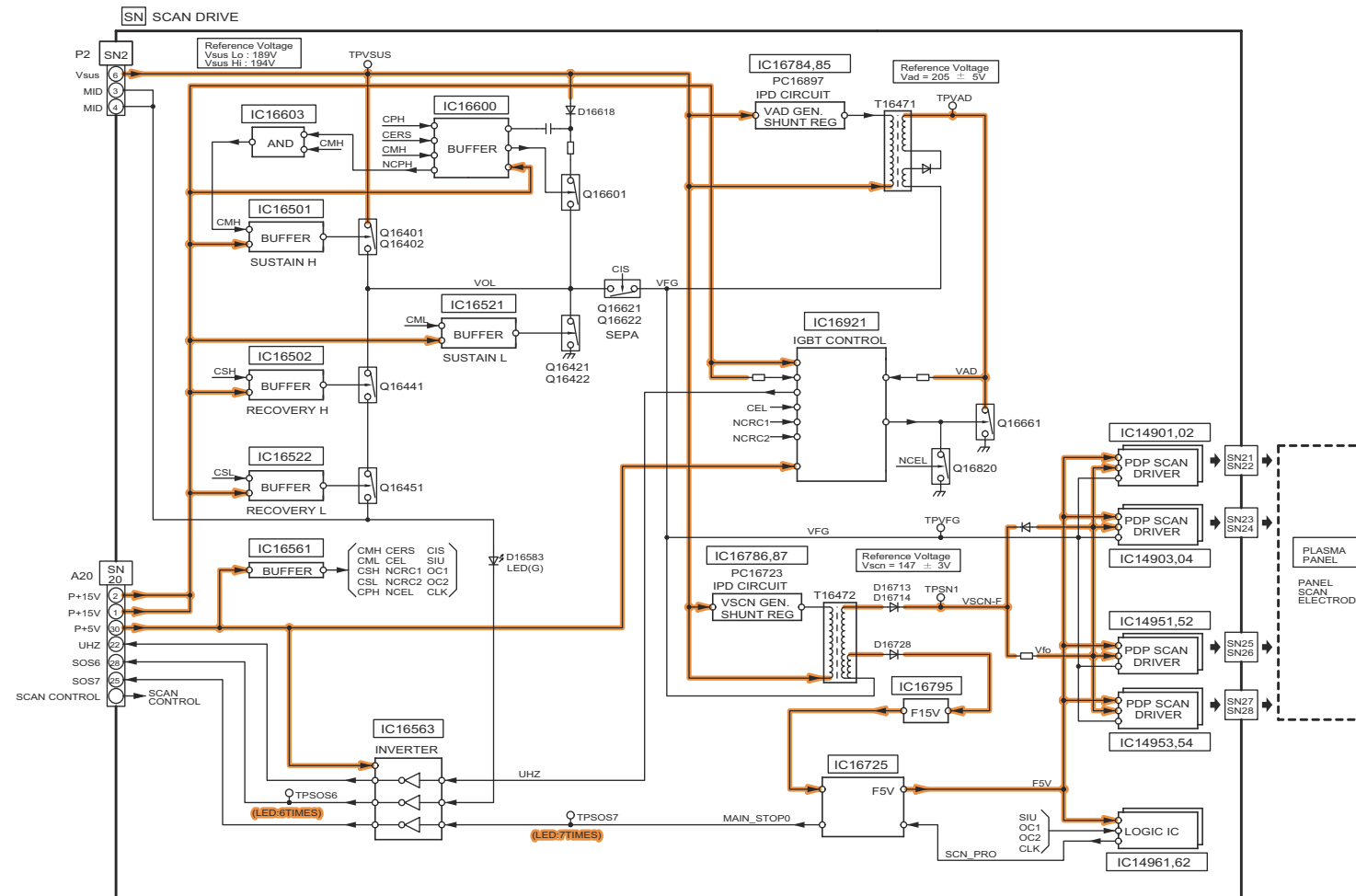


## 9.4. Block (3/4) Diagram





## 9.5. Block (4/4) Diagram



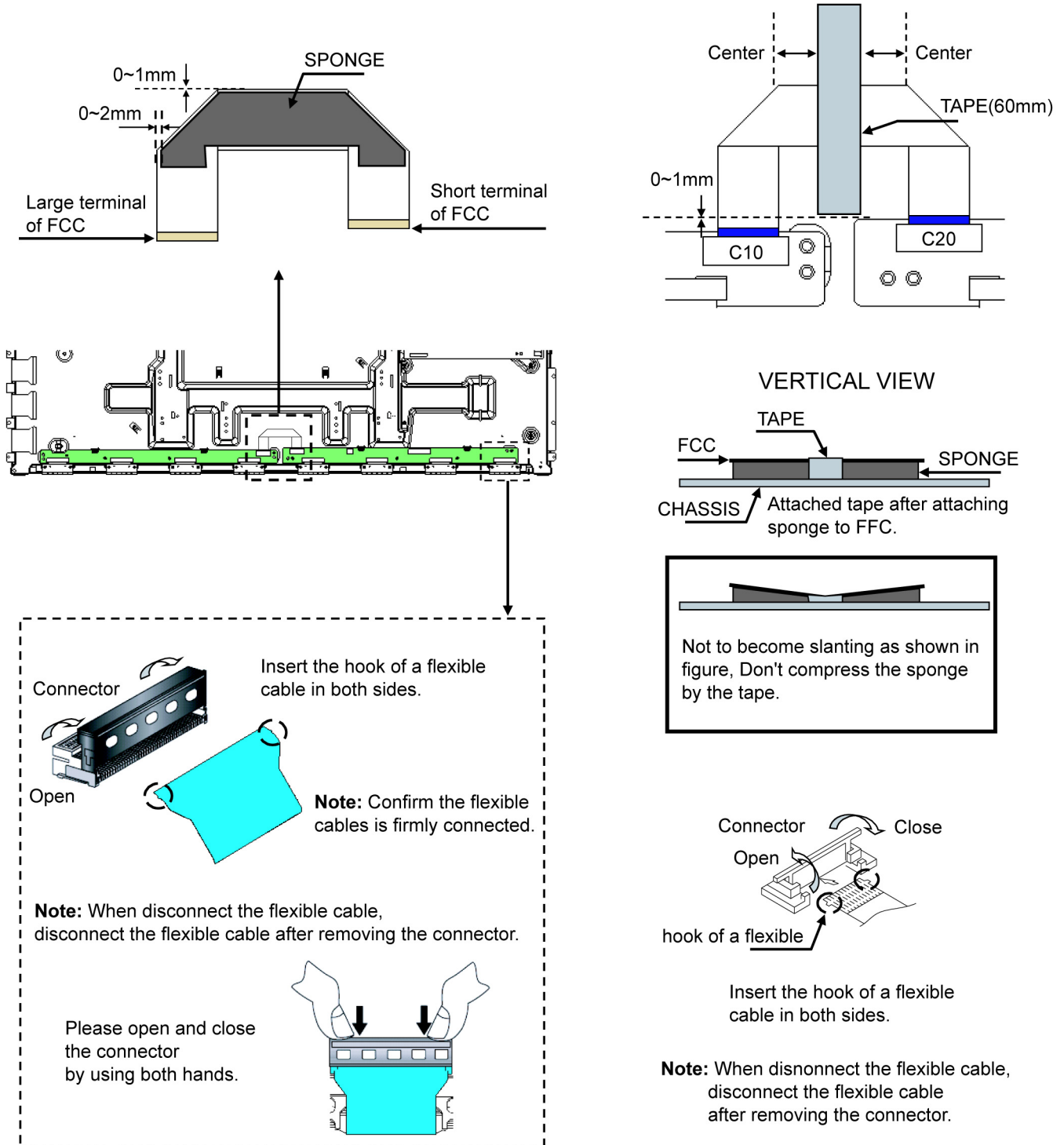
# 10 Wiring Connection Diagram

## 10.1. Caution statement.

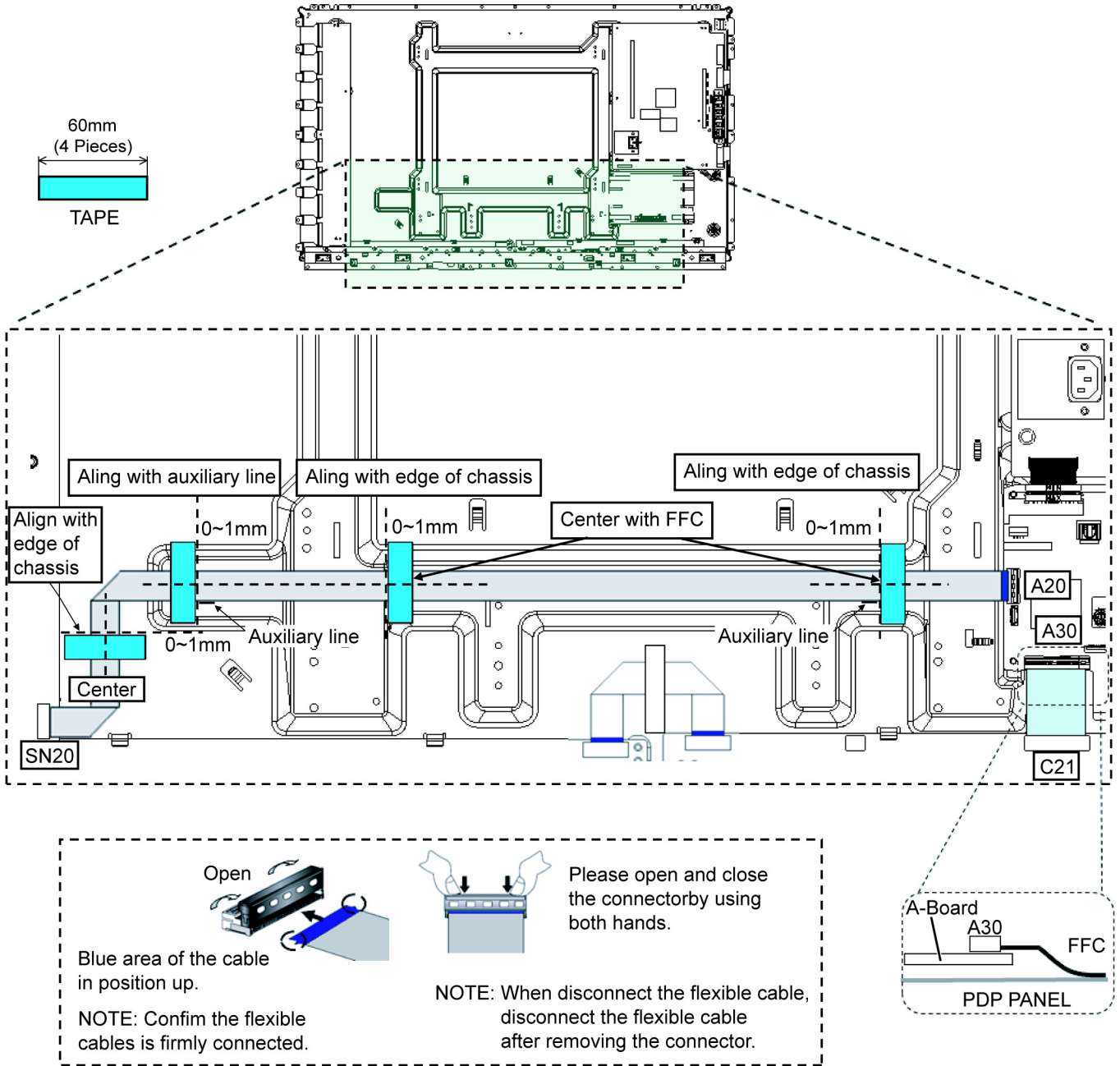
### Caution:

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.

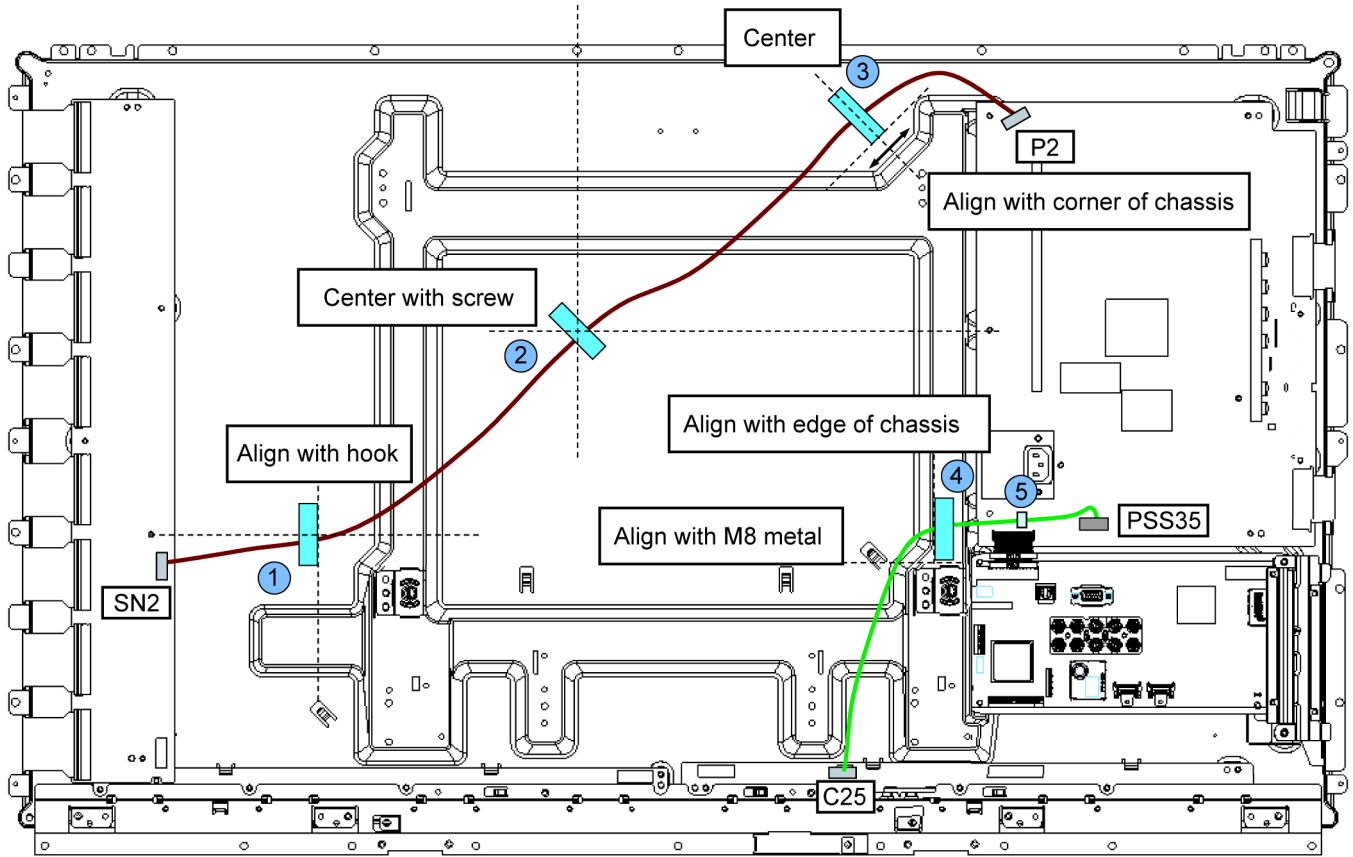
## 10.2. Wiring (1)



### 10.3. Wiring (2)

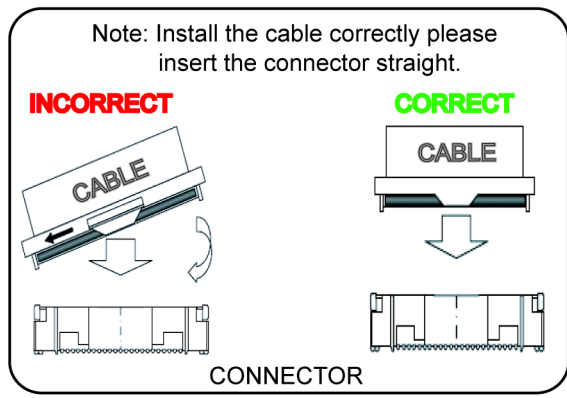


# 10.4. Wiring (3)

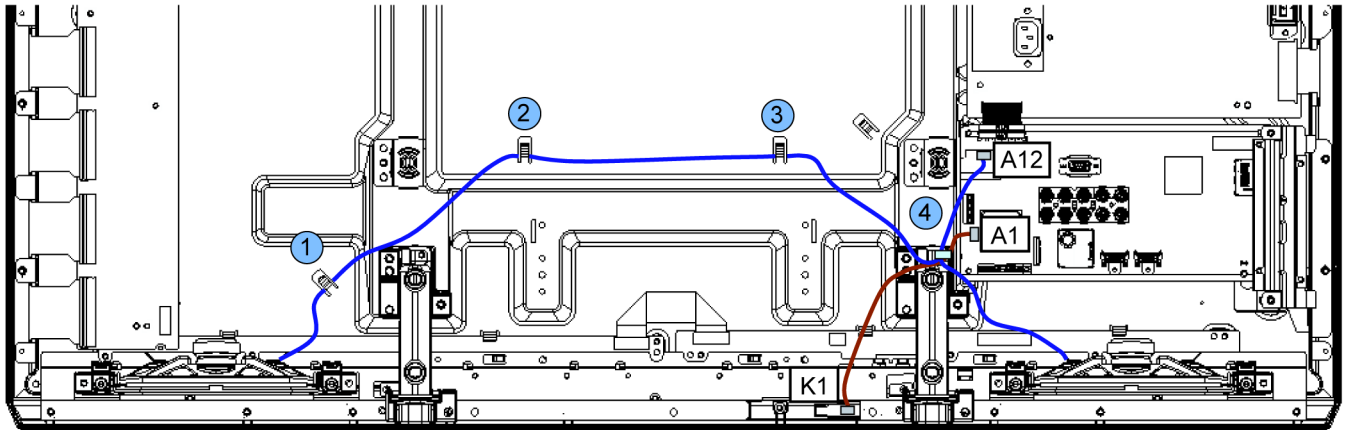


CABLES	TAPES					CLAMPER
	①	②	③	④	⑤	
C25 - PSS35				●	●	
SN2 - P2	●	●	●			

60mm  
(4 Pieces)



## 10.5. Wiring (4)



CABLES	HOOKS				CLAMPER
	①	②	③	④	
A12 - SPR	●	●	●	●	
A12 - SPL				●	
A1 - K1				●	

