

## HISTORY INFORMATION FOR THE FOLLOWING MANUAL:

# *SERVICE MANUAL (COMMON)*

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ITC2 CHASSIS  
Segment: BA

| Version | Date   | Subject                |
|---------|--------|------------------------|
| 1       | 6/2013 | 1 <sup>st</sup> Issue. |

LCD TV  
**SONY**<sup>®</sup>

**9-888-144-01**

For SM - Unique , please refer :

9-888-144-P1 ( Pan Asia )

9-888-144-A1 ( America )

9-888-144-E1 ( Europe )

# *SERVICE MANUAL (COMMON)*

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ITC2 CHASSIS  
Segment: BA

LCD TV

**SONY**<sup>®</sup>

# MODEL LIST

THIS SERVICE MANUAL CONTAINS COMMON INFORMATION FOR BELOW REGIONS AND MODELS:

## REGION

ASIA      AMERICA      EUROPE

## MODEL

|              |              |              |              |
|--------------|--------------|--------------|--------------|
| KL V-24R402A | KL V-32R402A | KL V-40R452A | KL V-46R452A |
| KL V-24R422A | KL V-32R407A | KL V-40R457A | KL V-46R472A |
|              | KL V-32R422A | KL V-40R472A | KDL-46R485A  |
|              | KDL-32R435A  | KDL-40R485A  |              |

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Please refer Service Manual – Unique for below information :

- Safety Warnings
- Wire Dressing
- Circuit Board Location
- Disassembly and Exploded View.

## SECTION 1 SAFETY NOTES

### 1-1. Warnings and Caution

- 1) These servicing instructions are for use by qualified service personnel only.
- 2) To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.
- 3) An isolation transformer should be used during any service to avoid Possible shock hazard, because of live chassis. The chassis of this receiver is directly connected to the ac power line.
- 4) Be sure to follow these guidelines to protect your property and avoid causing serious injury :
  - Carry the TV with an adequate number of people; larger size TVs require two or more people.
  - Correct hand placement while carrying the TV is very important for safety and to avoid damages.
- 5) Components identified by shading and  mark on the exploded views, and in the parts list are critical for safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in supplements published by Sony. Circuit adjustments that are critical for safe operation are identified in this manual. Follow these procedures whenever critical components are replaced or improper operation is suspected.

### 1-2. Caution Handling of LCD Panel

When repairing the LCD Panel, make sure you are grounded with a wrist band. When repairing the LCD Panel on the wall, the panel must be secured using the 4 mounting holes on the rear cover.

- 1) Do not press the panel or frame edge to avoid the risk of electric shock.
- 2) Do not scratch or press on the panel with any sharp objects.
- 3) Do not leave the module in high temperature or in areas of high humidity for an extended period of time.
- 4) Do not expose the LCD panel to direct sunlight.
- 5) Avoid contact with water. It may cause short circuit within the module.
- 6) Disconnect the AC power when replacing the backlight (CCFL) or inverter circuit. (High voltage occurs at the inverter circuit at 650Vrms)
- 7) Always clean the LCD panel with a soft cloth material.
- 8) Use care when handling the wires or connectors of the inverter circuit.  
Damaging the wires may cause a short circuit.
- 9) Protect the panel from ESD to avoid damaging the electronic circuit (C-MOS).
- 10) During the repair, DO NOT leave the Power On or Burn-in period for more than 1 hour while the TV is face down on a cloth.

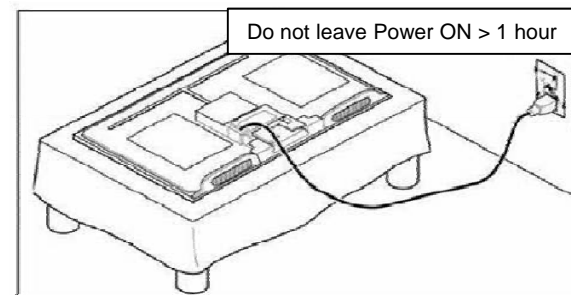


Figure 1. TV is faced down on a cloth during repair.

### 1-3 Safety Check-Out

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:-

- 1) Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.
- 2) Check the inter board wiring to ensure that no wires are pinched or contact high-wattage resistors.
- 3) Check all control knobs, shields, covers, ground straps and mounting hardware have been replaced. Be absolutely certain you have replaced all the insulators.
- 4) Look for unauthorized replacement parts, particularly transistors that were installed during a previous repair. Point them out to the customer and recommend their replacement.
- 5) Look for parts which, though functioning show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
- 6) Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
- 7) Check the antenna terminals, metal trim, metalized knobs, screws and all other exposed metal parts for AC leakage. Check leakage test as described next.
8. For safety reasons, repairing the Power board and/or Inverter board is prohibited.

### 1-4. Leakage Test

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis must not exceed 0.5mA (500 microamperes).

Leakage current can be measured by any one of the three methods:-

- 1) A commercial leakage tester such as the SIMPSON 229 or RCA WT540A. Follow the manufacturers instructions to use those instructions.
- 2) A battery-operated AC milliammeter The DATA PRECISION 245 digital multimeter is suitable for this job.
- 3) Measuring the voltage drop across a resistor by means of a VOM or battery operated AC voltmeter. The 'limit' indication is 0.75V so analog meters must have an accurate low voltage scale. The SIMPSON'S 250 and SANWA SH-63TRD are examples of passive VOMs that are suitable. Nearly all battery operated digital multimeter that have a 2 VAC range are suitable. (see Figure 2.)

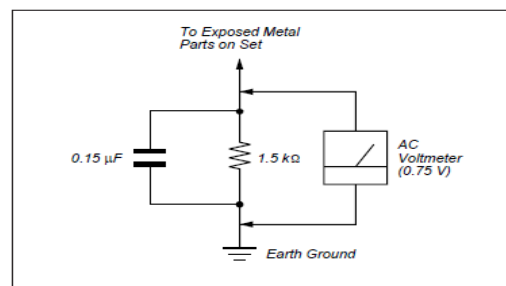


Figure 2. AC voltmeter to check AC leakage

### 1-5. How to Find a Good Earth Ground

- 1) A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground.
- 2) If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms.
- 3) If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble-light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure 3).

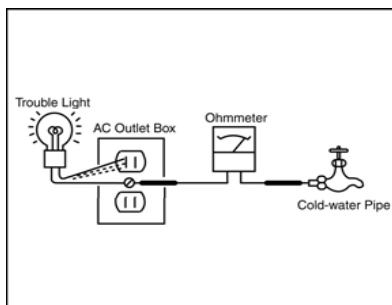


Figure B. Checking for earth ground.

Figure 3. Checking for earth ground.

### 1-6. Lead Free Information

The circuit boards used in these models have been processed using Lead Free Solder. The boards are identified by the LF logo located close to the board designation.



Figure 4: LF Logo

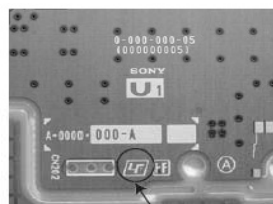


Figure 5: LF logo on circuit board

The servicing of these boards requires special precautions. It is strongly recommended to use Lead Free Solder material in order to guarantee optimal quality of new solder joints.

### 1-7. Handling the FLEXIBLE FLAT CABLE (FFC)

- When you insert / pull out FFC, please grasp a reinforcement board and main body of FFC.



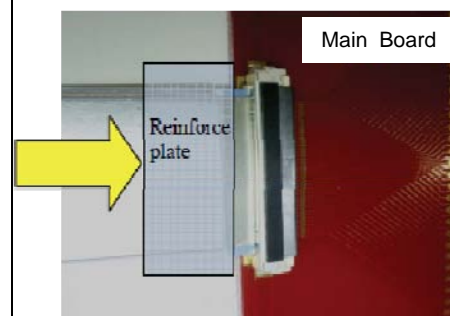
&lt;GOOD&gt;



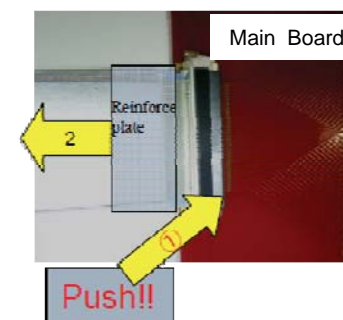
&lt;NG&gt;

Please hold reinforcement board and plunge it to the depths.

Please pull out FFC while pushing the bottom of both ends at the same time.



&lt; Insertion &gt;

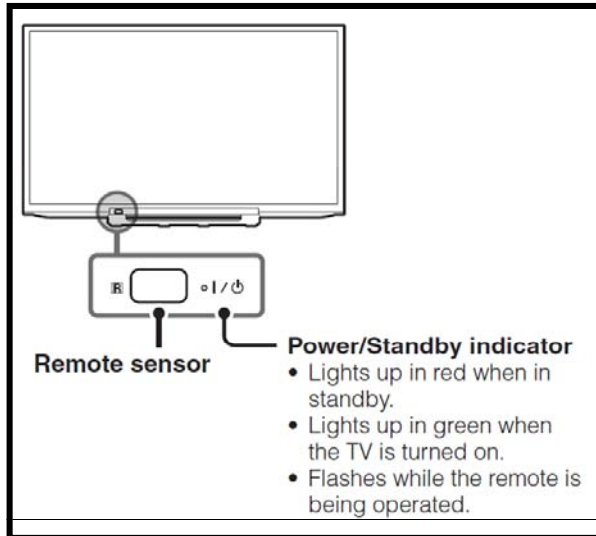


&lt;Pull out&gt;

## SECTION 2

### SELF DIAGNOSTIC FUNCTION

#### 2-1. Overview of Control Buttons



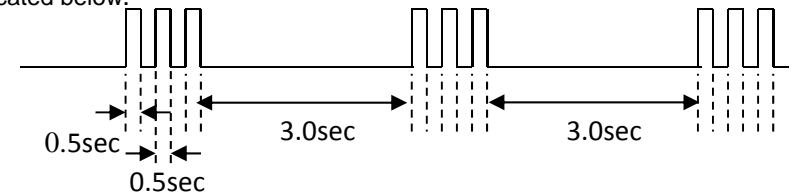
#### 2-2. LED Display Control

Amber = Red + Green

| Status                                    | LED Colour              | Remarks  |
|---|-------------------------|--|
| Power Off<br>( AC Off and *1)             | OFF                     | *1 power switch off (by touch button)                  |
| Power On                                  | Green                   |  |
| Standby<br>( by remote control off only ) | Red                     |  |
| Picture Off                               | Green                   |  |
| Set "Sleep Timer"                         | Amber                   |  |
| Set "On Timer"<br>( Power On )            | Amber                   |  |
| Set "On Timer"<br>( Standby )             | Amber                   |  |
| Picture Frame                             | Amber                   |  |
| Failure                                   | Red Blinking            | The number of LED blinking indicates cause of failure. |
| Error of panel ID                         | Amber/Green<br>Blinking | Blinking: 0.5sec Amber/<br>0.5sec Green                |
| Software Updating                         | Amber Blinking          | Blinking: 1sec On / 1sec Off                           |

#### 2-3. LED Pattern

When safety shutdown occurs, Standby LED display reports the cause by using the lightning patterns as indicated below.



Example: The figure above shows LED display when SHUTDOWN is caused by Audio Error. It repeats flashing for a specified number of times in 0.5sec/cycle and has a 3 seconds interval of lighting off. Please note that a 3 seconds interval of lighting off is fixed regardless of abnormal state types.

#### 2-4. Standby LED Error Display

| The Number of Standby LED (RED blinking) | Detection Items      | Board Error Item         |
|--|----------------------|--------------------------|
| 2  | Main Power Error     | AC adapter Error         |
| 3  | Audio Error          | BB board Error           |
| 4  | Panel Power Error    | BB board Error           |
| 5  | Panel I2C COMM Error | BB or Source board Error |
| 6  | Backlight Error      | BB board Error           |

## 2-5. Triage Chart

| Reference          | Blinking |   |   |   |   | No Picture |     |       |           |      |     | No Sound     |    |       |           |       |      |     |
|--------------------|----------|---|---|---|---|------------|-----|-------|-----------|------|-----|--------------|----|-------|-----------|-------|------|-----|
|                    | 2        | 3 | 4 | 5 | 6 | Tuner      | USB | Video | Component | HDMI | MHL | Main Speaker | HP | Video | Component | Tuner | HDMI | USB |
| BB Board           | ●        | ● | ● | ▲ | ● | ●          | ●   | ●     | ●         | ●    | ●   | ●            | ●  | ●     | ●         | ●     | ●    | ●   |
| Light Source Board |          |   |   |   | ● |            |     |       |           |      |     |              |    |       |           |       |      |     |
| Open Cell          |          |   |   | ● |   |            | ▲   | ▲     | ▲         | ▲    | ▲   |              |    |       |           |       |      |     |
| AC Adaptor         | ●        |   |   |   |   |            |     |       |           |      |     |              |    |       |           |       |      |     |
| Speaker Unit       |          | ▲ |   |   |   |            |     |       |           |      |     | ●            |    | ●     | ●         | ●     | ●    | ●   |
| LS Harness         |          |   |   |   |   |            |     |       |           |      |     |              |    |       |           |       |      |     |
| Main Harness       |          | ▲ |   |   |   |            |     |       |           |      |     | ▲            |    | ▲     | ▲         | ▲     | ▲    | ▲   |
| FFC Cable          |          |   |   | ▲ |   | ▲          | ▲   | ▲     | ▲         | ▲    | ▲   |              |    |       |           |       |      |     |

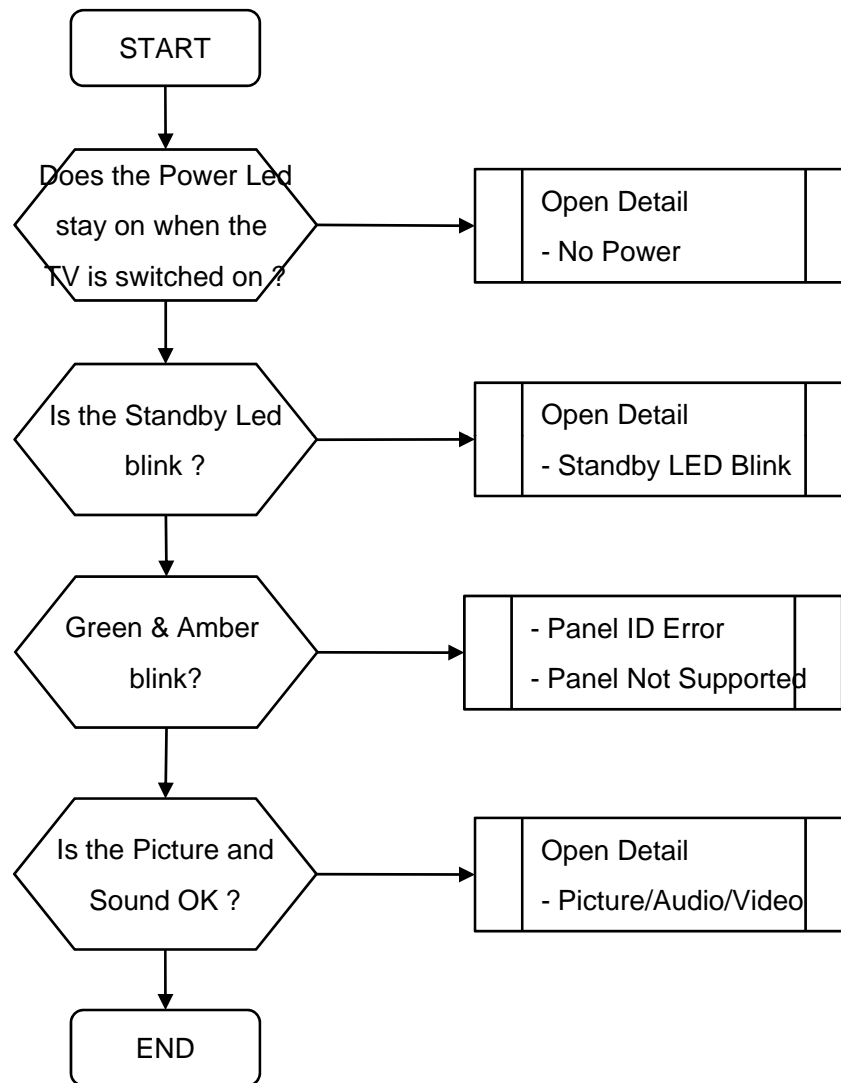
● Most likely defective part

▲ Secondary possible defective part

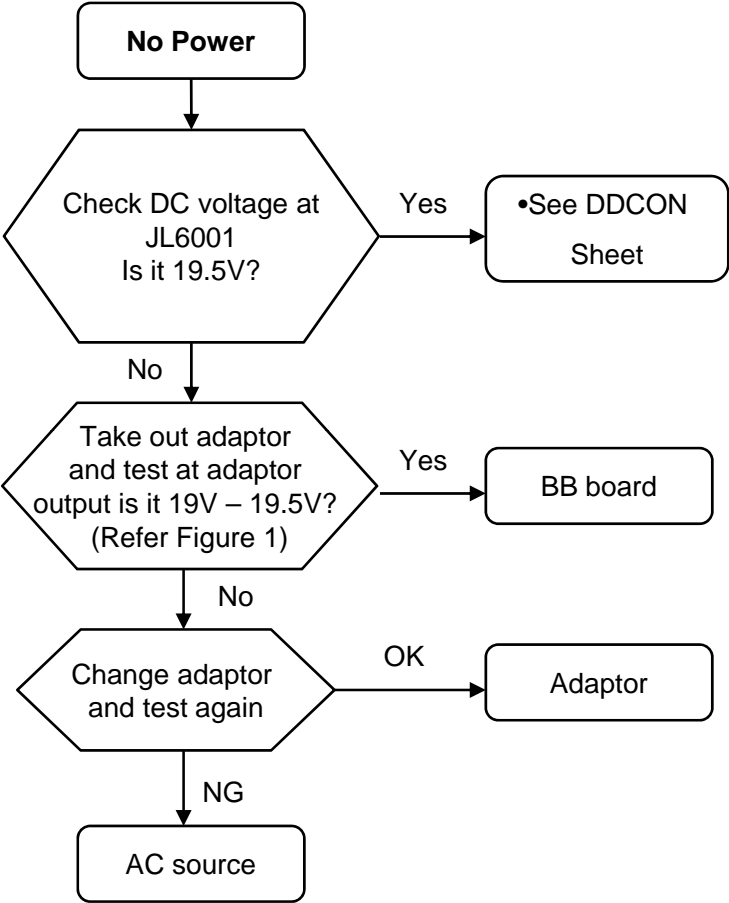
Note: Details refer to Troubleshooting Section.

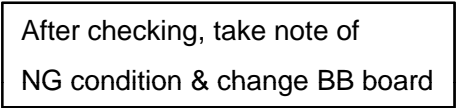
## SECTION 3 TROUBLESHOOTING

### 3-1. Troubleshooting Flow

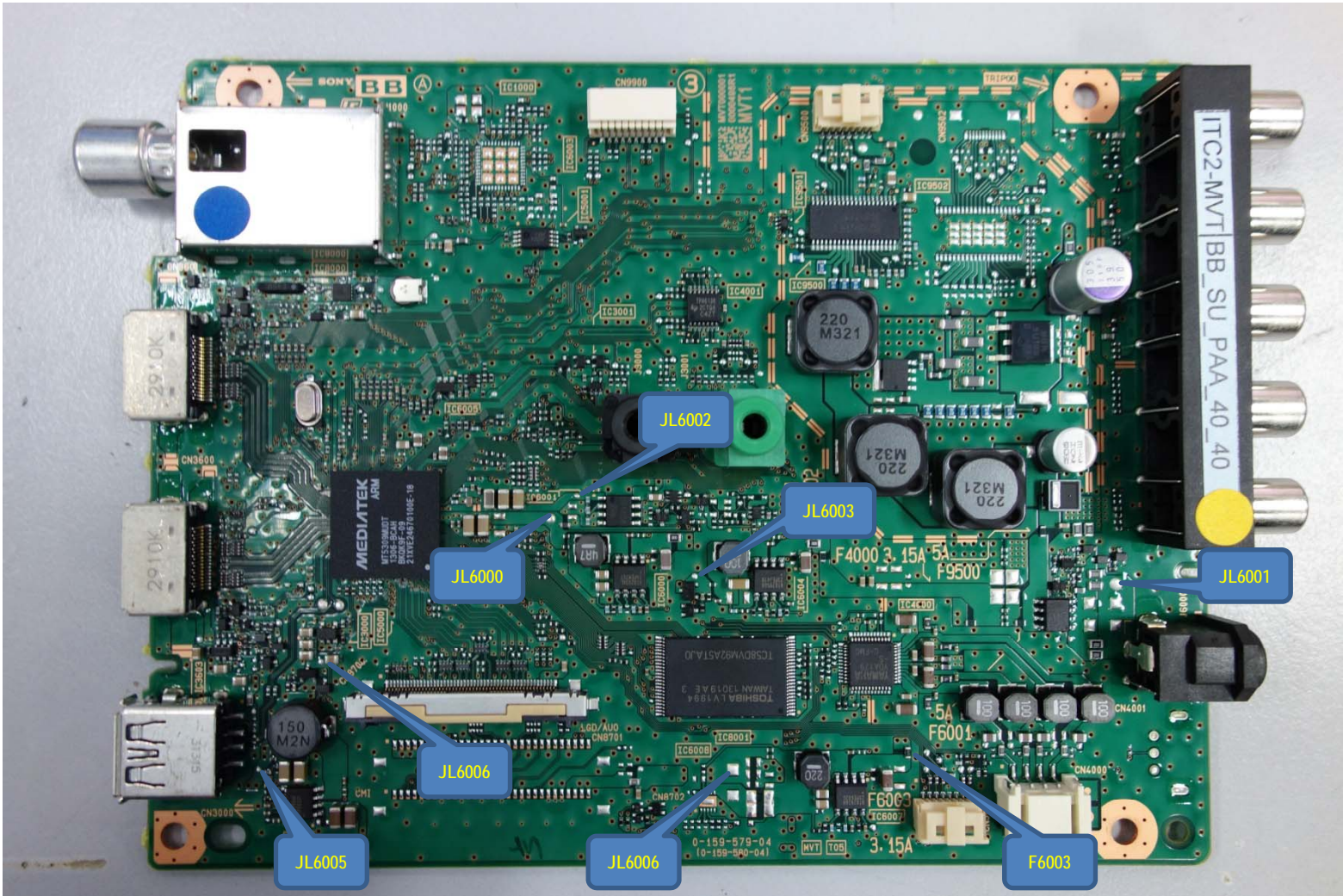


3-2. No Power



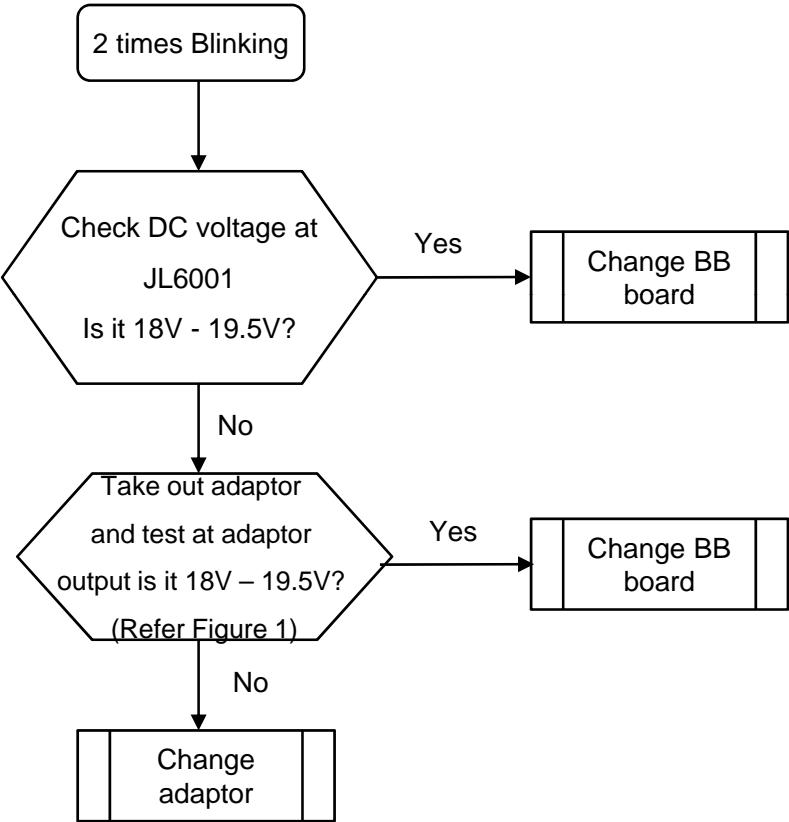


Troubleshooting References (BB Board)



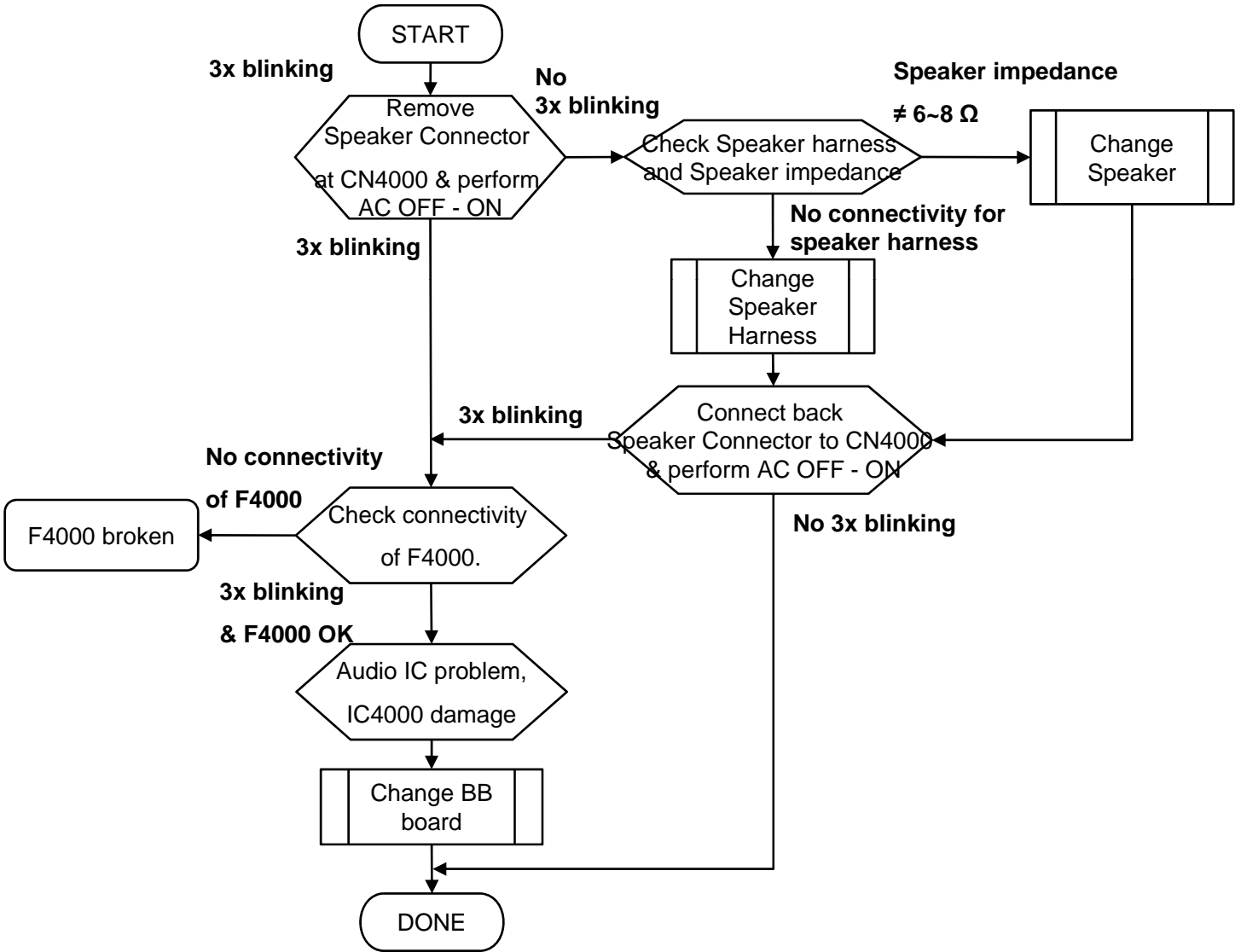
3-3. Standby LED Blinking

3-3-1. 2-times Blinking

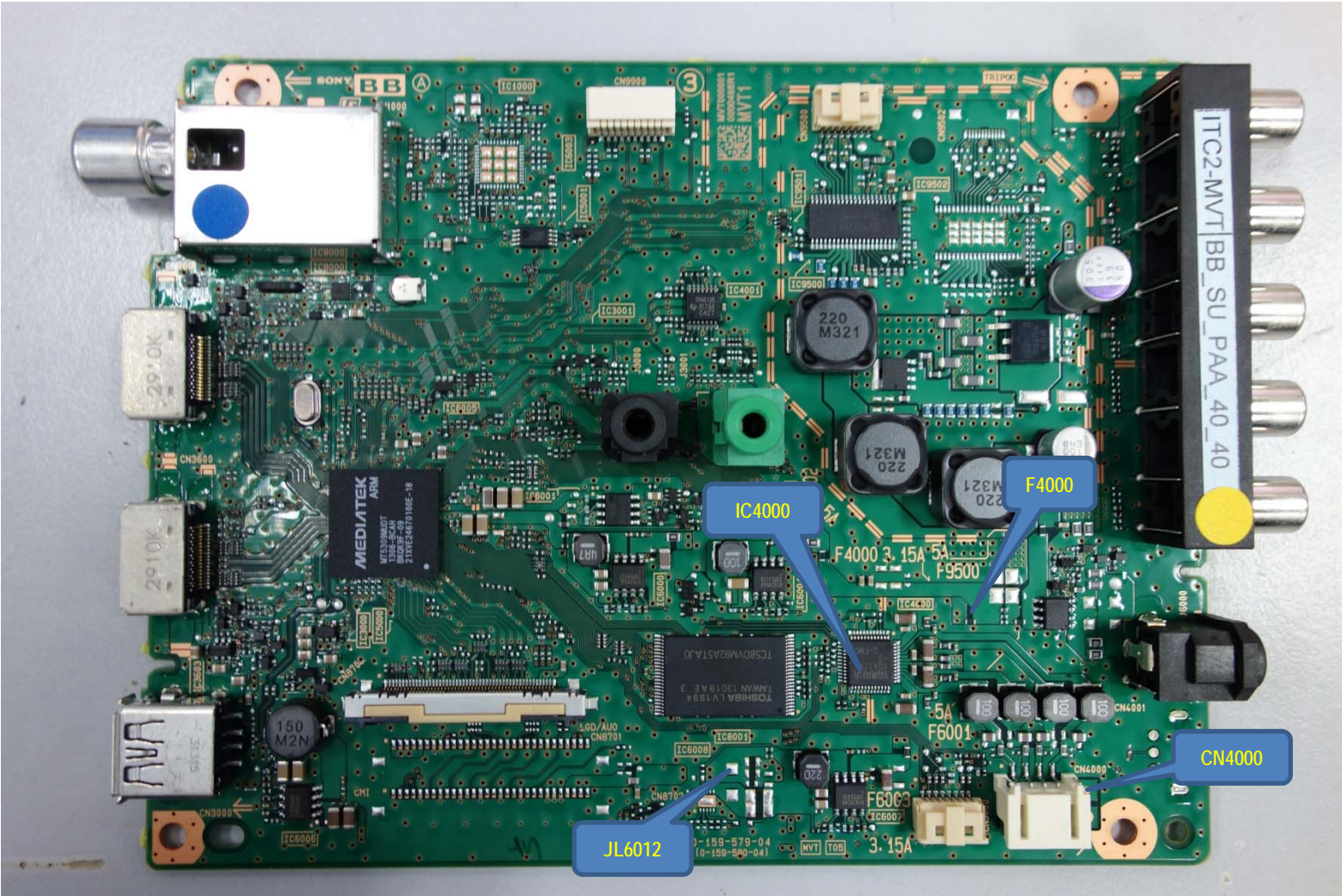


3-3. Standby LED Blinking

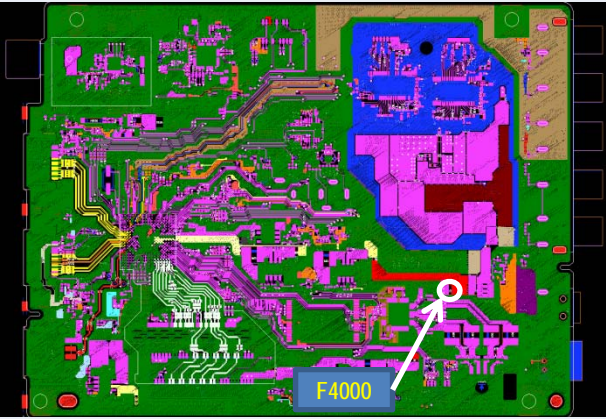
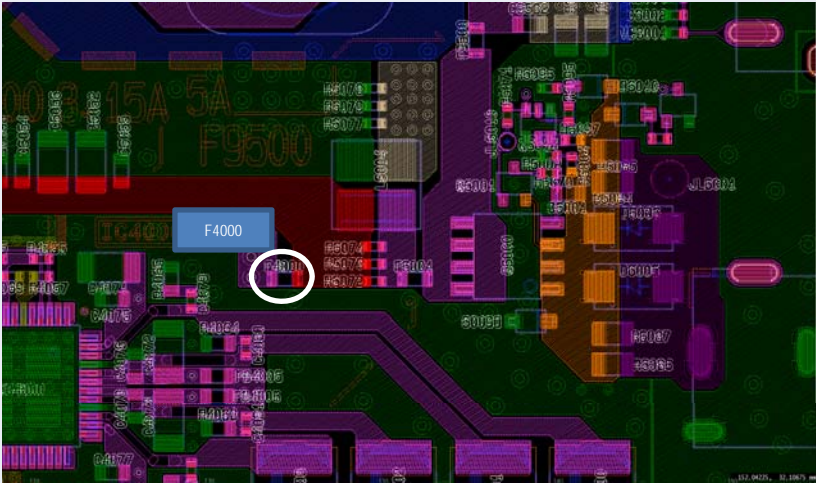
3-3-2. 3-times Blinking



Troubleshooting References (BB Board)

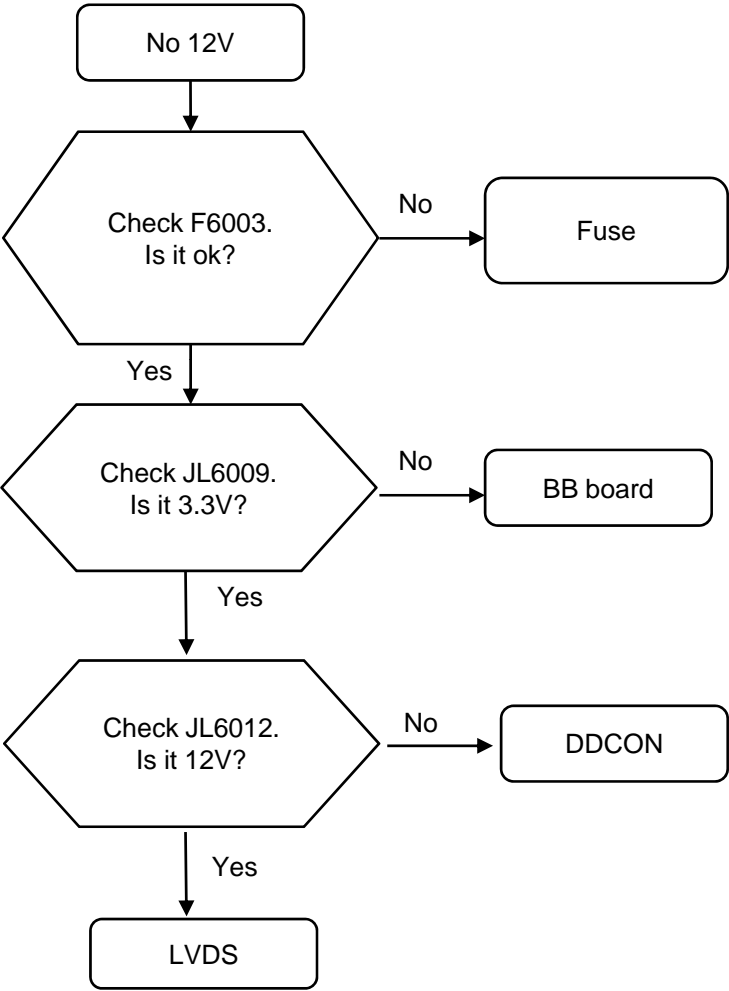


Troubleshooting References

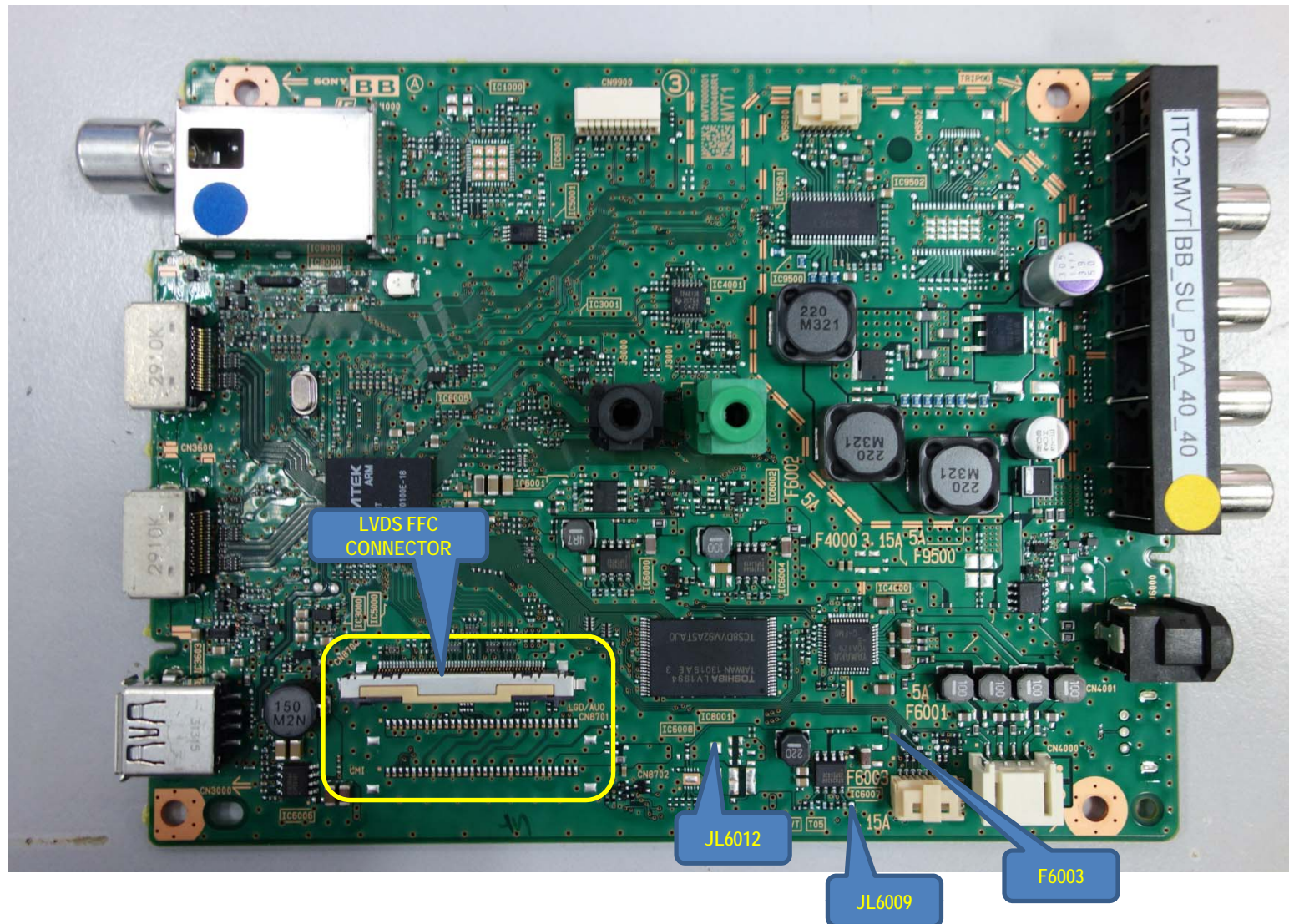
| Board Name   | Board PWB (A side)  | Detail   |
|--------------|---|--|
| BB<br>CN4000 |   |   |
| F4000        |  |  |

3-3. Standby LED Blinking

3-3-3. 4-times Blinking

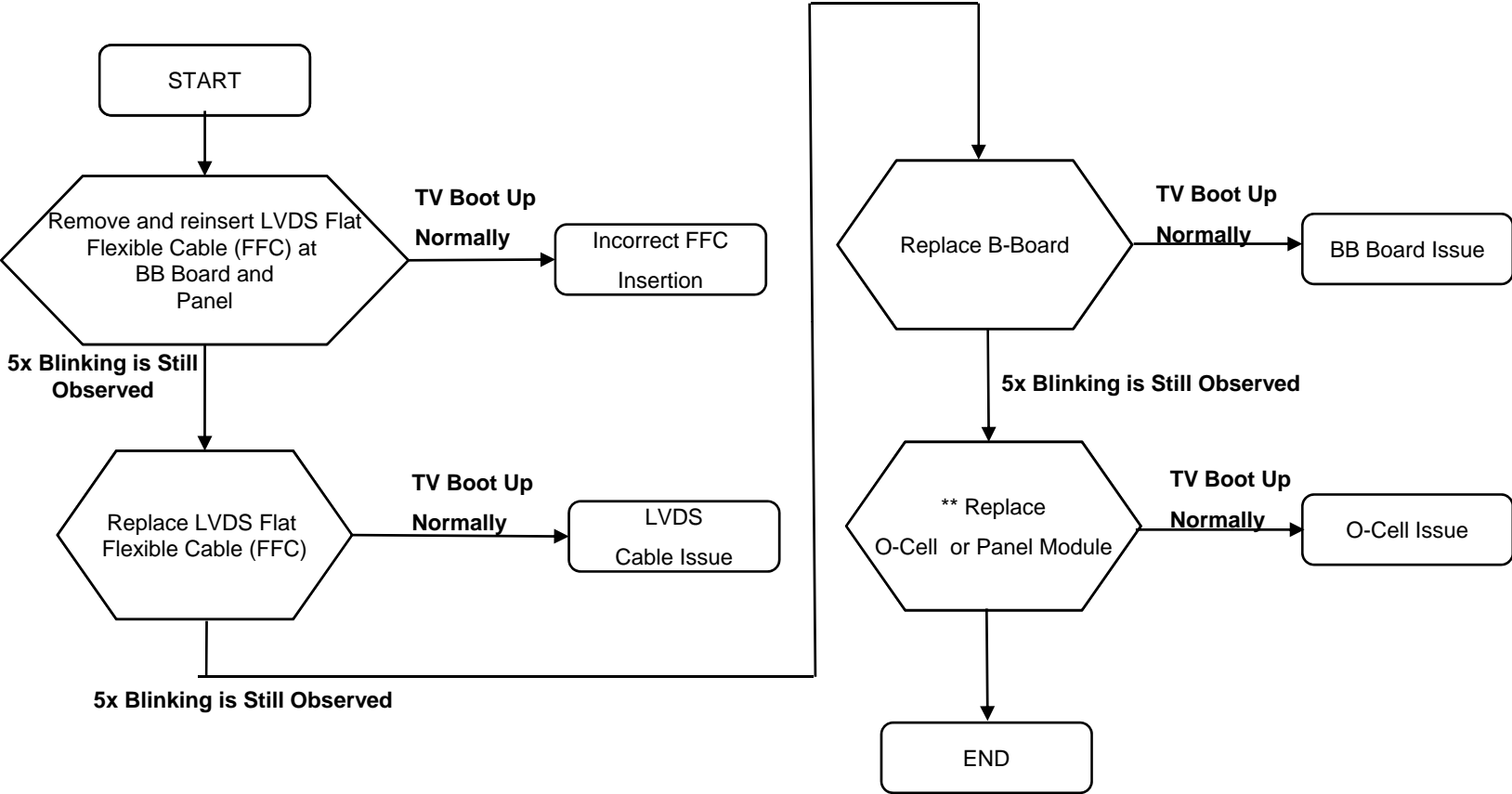



### Troubleshooting References (BB Board)



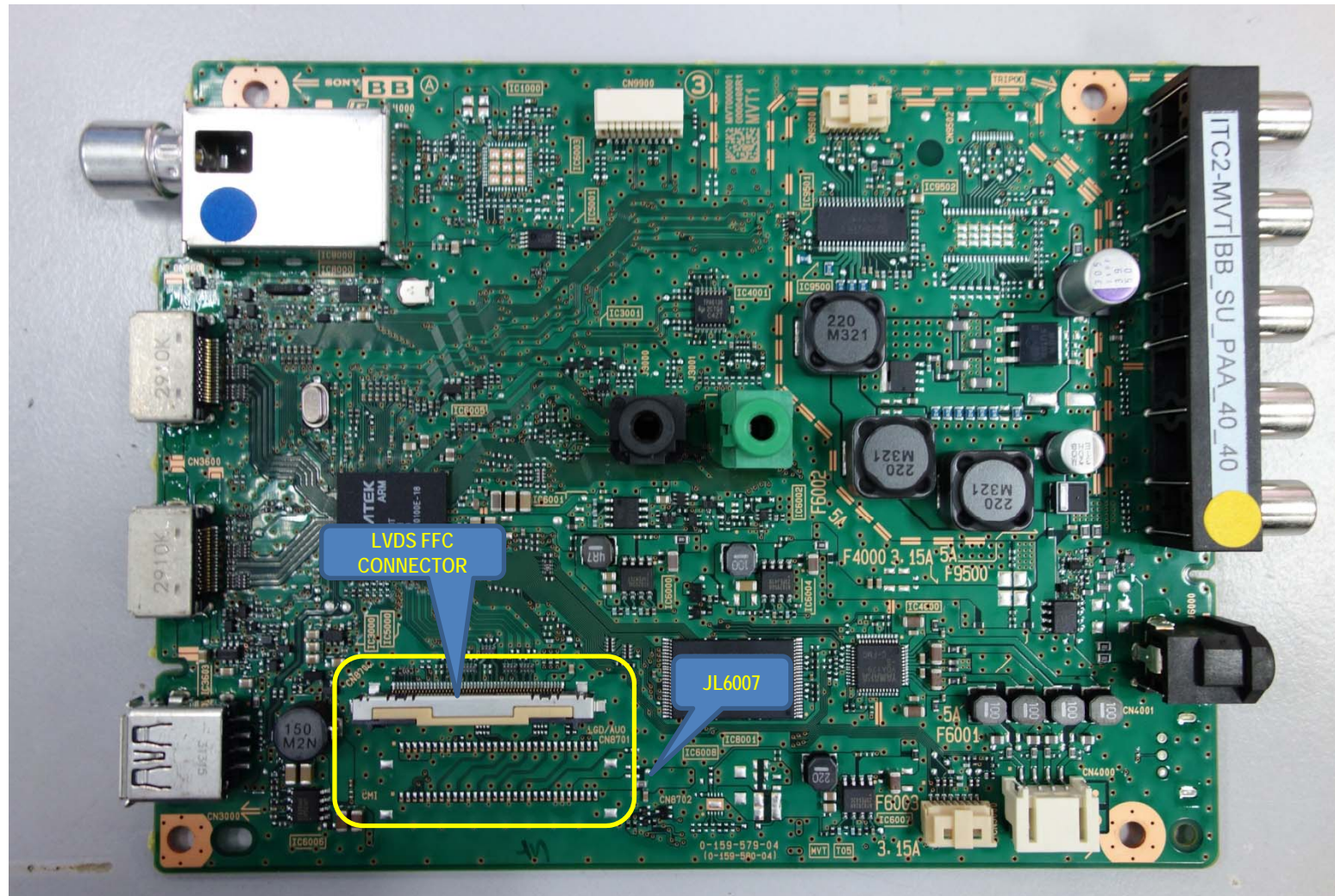
3-3. Standby LED Blinking

3-3-4. 5-times Blinking



 \*\* Not recommended at Service Side.

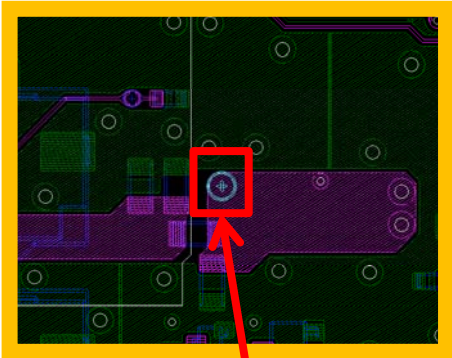
### *Troubleshooting References (BB Board)*



Troubleshooting References (BB Board)

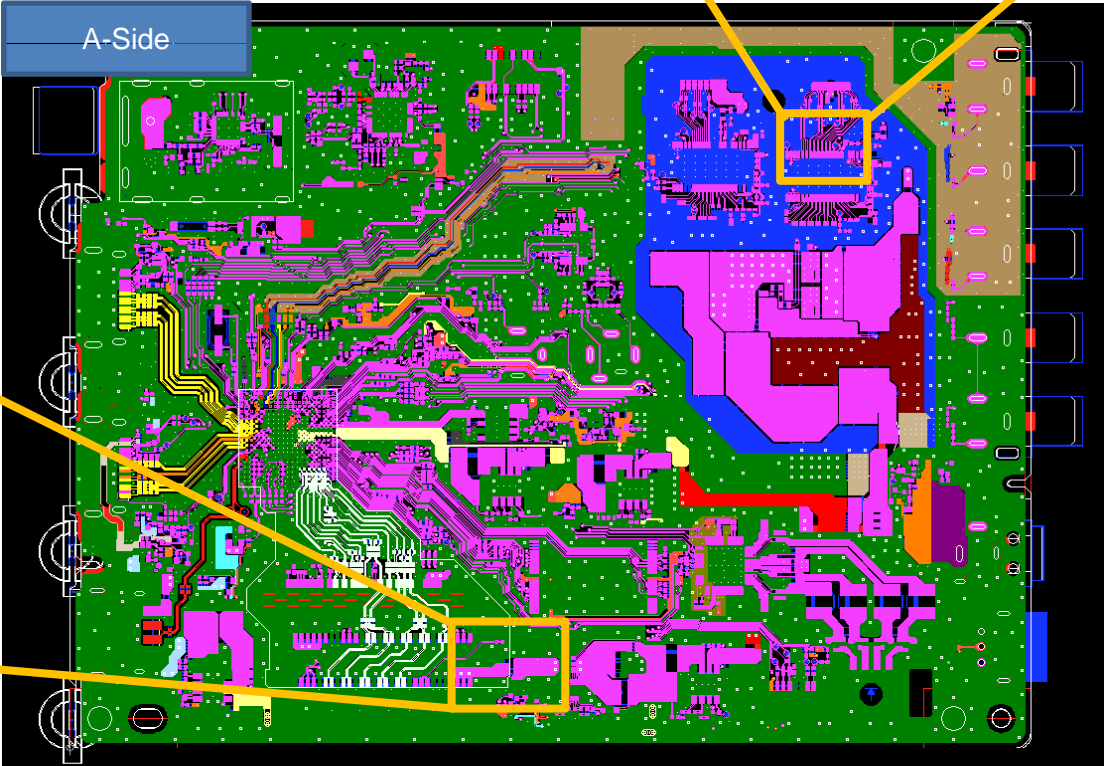
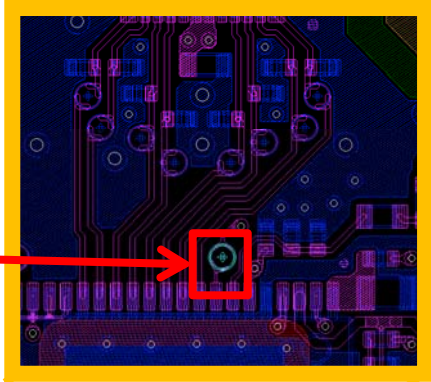
Probing Points

**Note :**  
PANEL\_VCC\_SW = 12V±0.8V



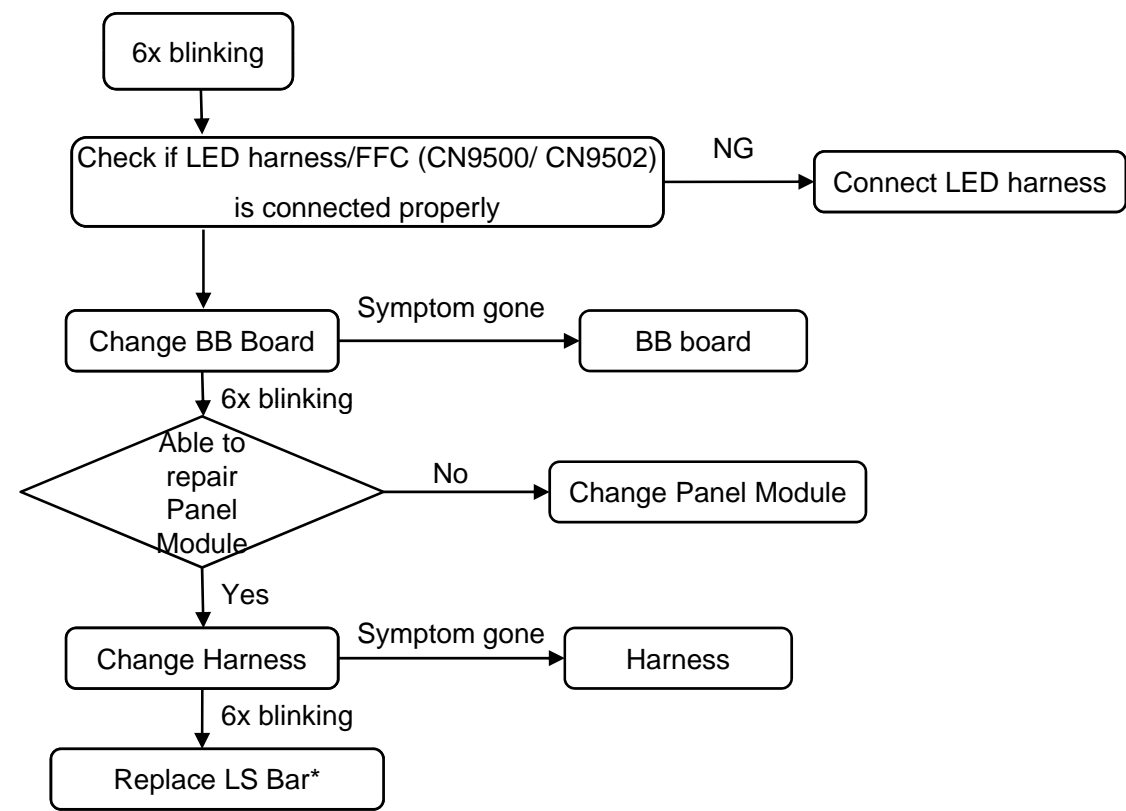
JL6007  
PANEL VCC SW


JL9522  
BL\_ON



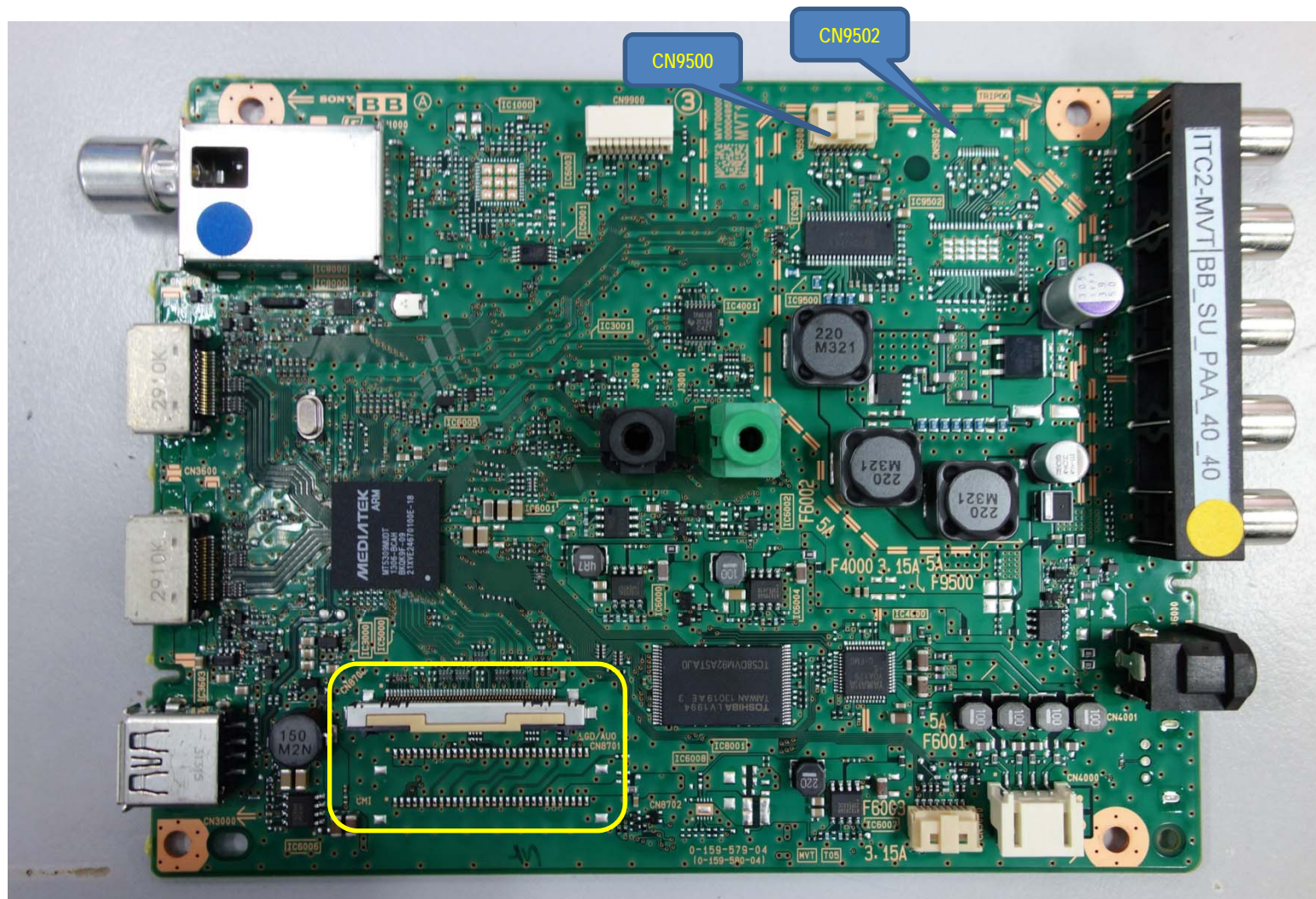
3-3. Standby LED Blinking

3-3-5. 6-times Blinking

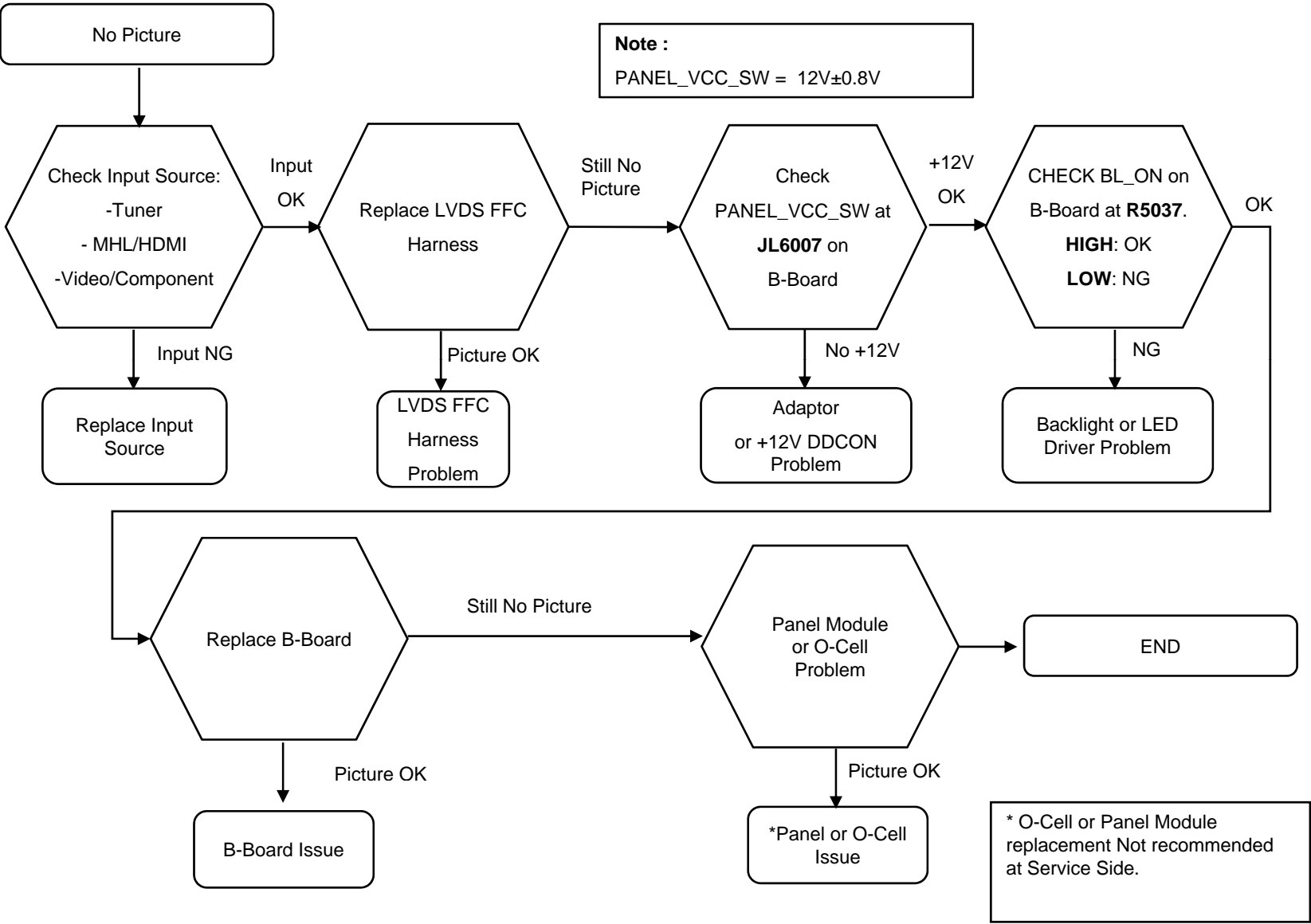


 \* Not recommended at Service Side.

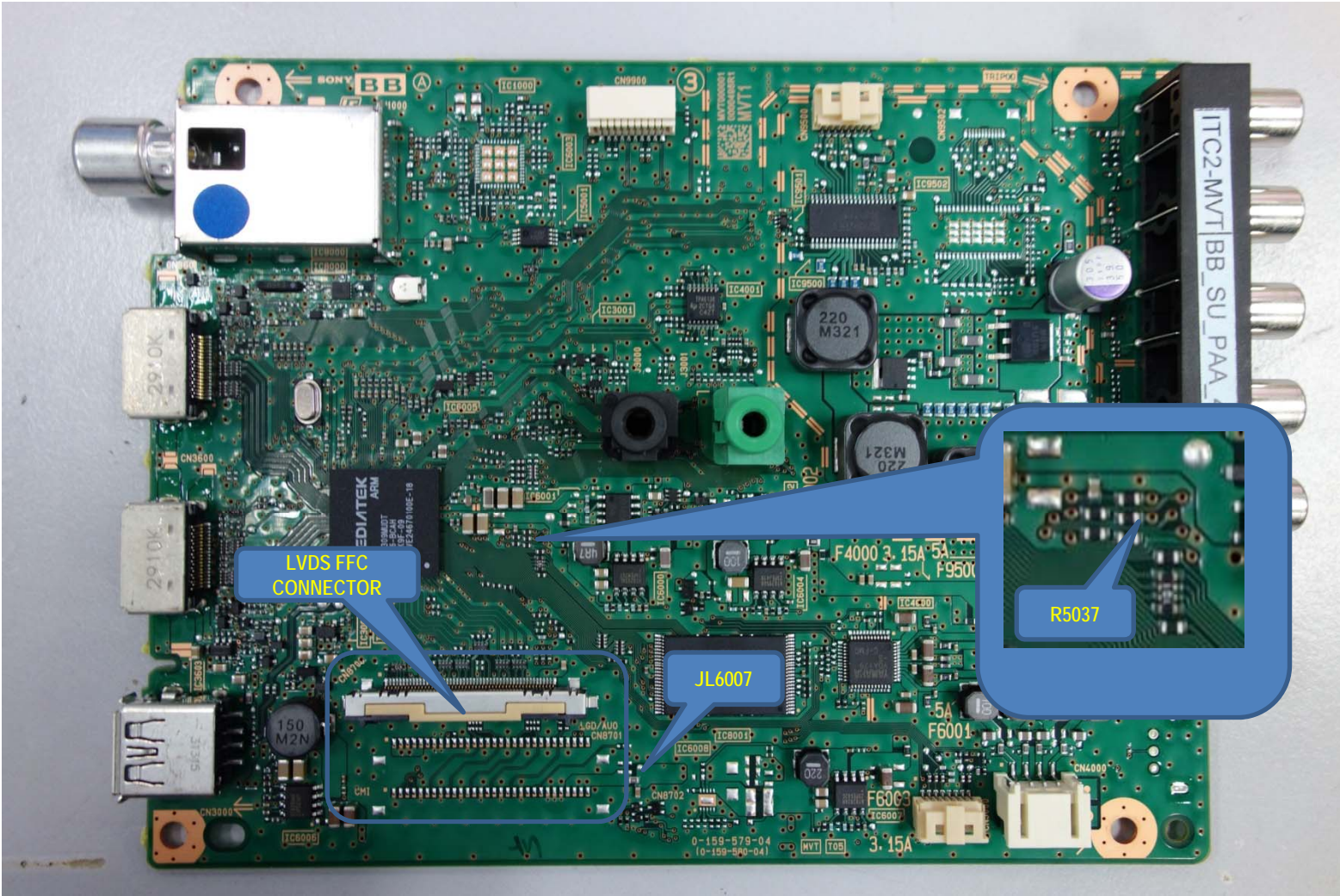
### Troubleshooting References (BB Board)



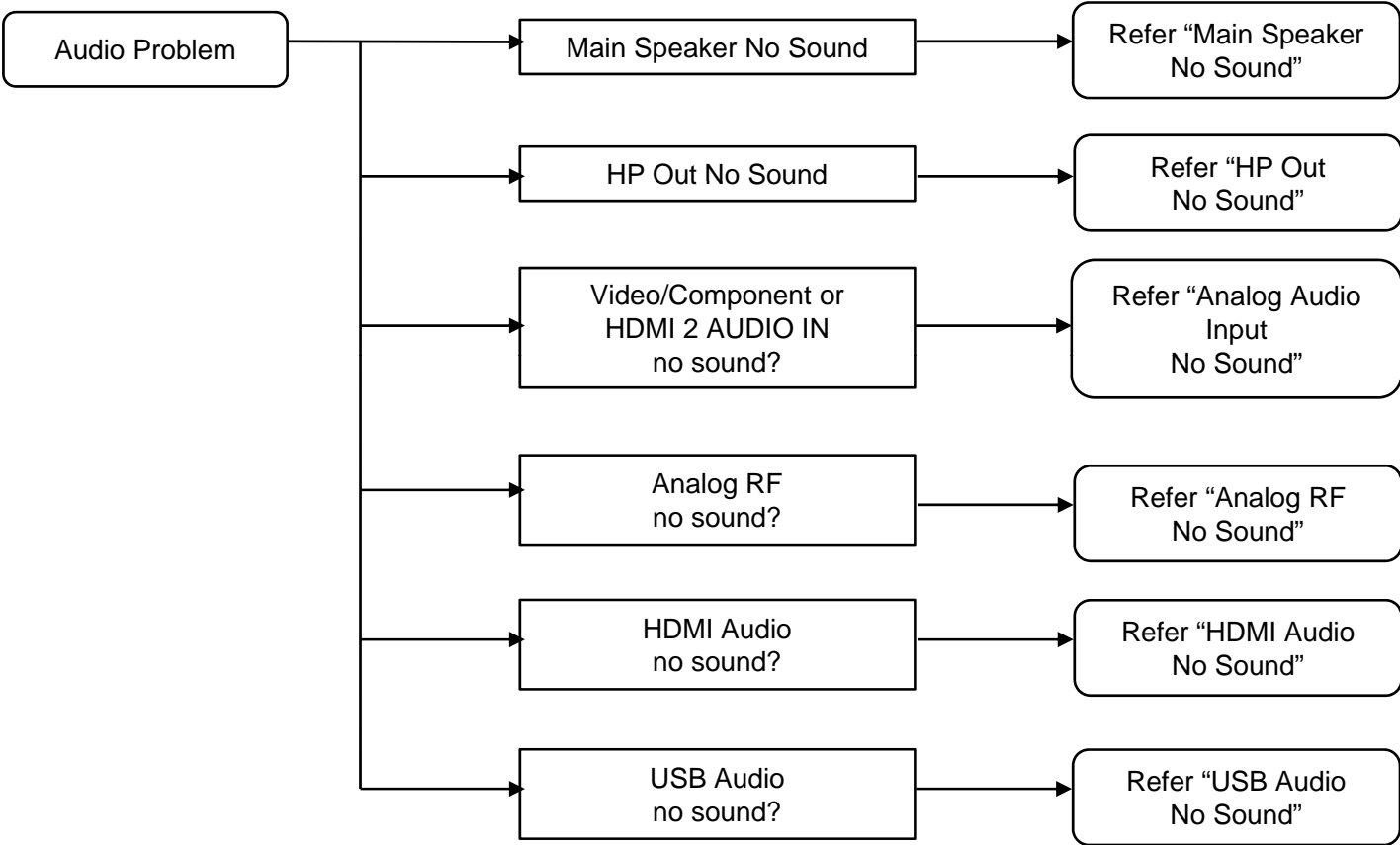
3-4. No Picture



Troubleshooting References (BB Board)

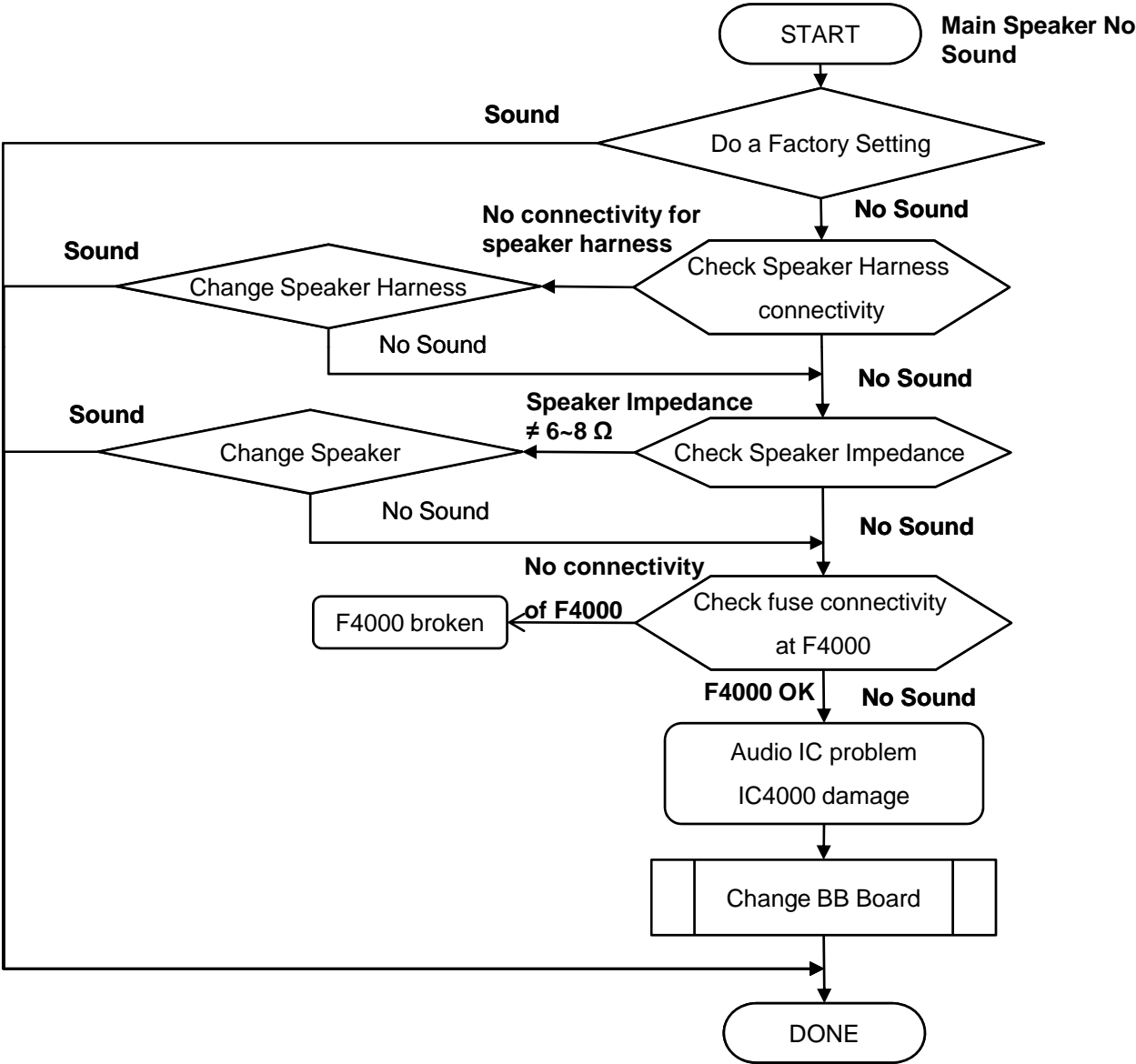


3-5. Audio Problem

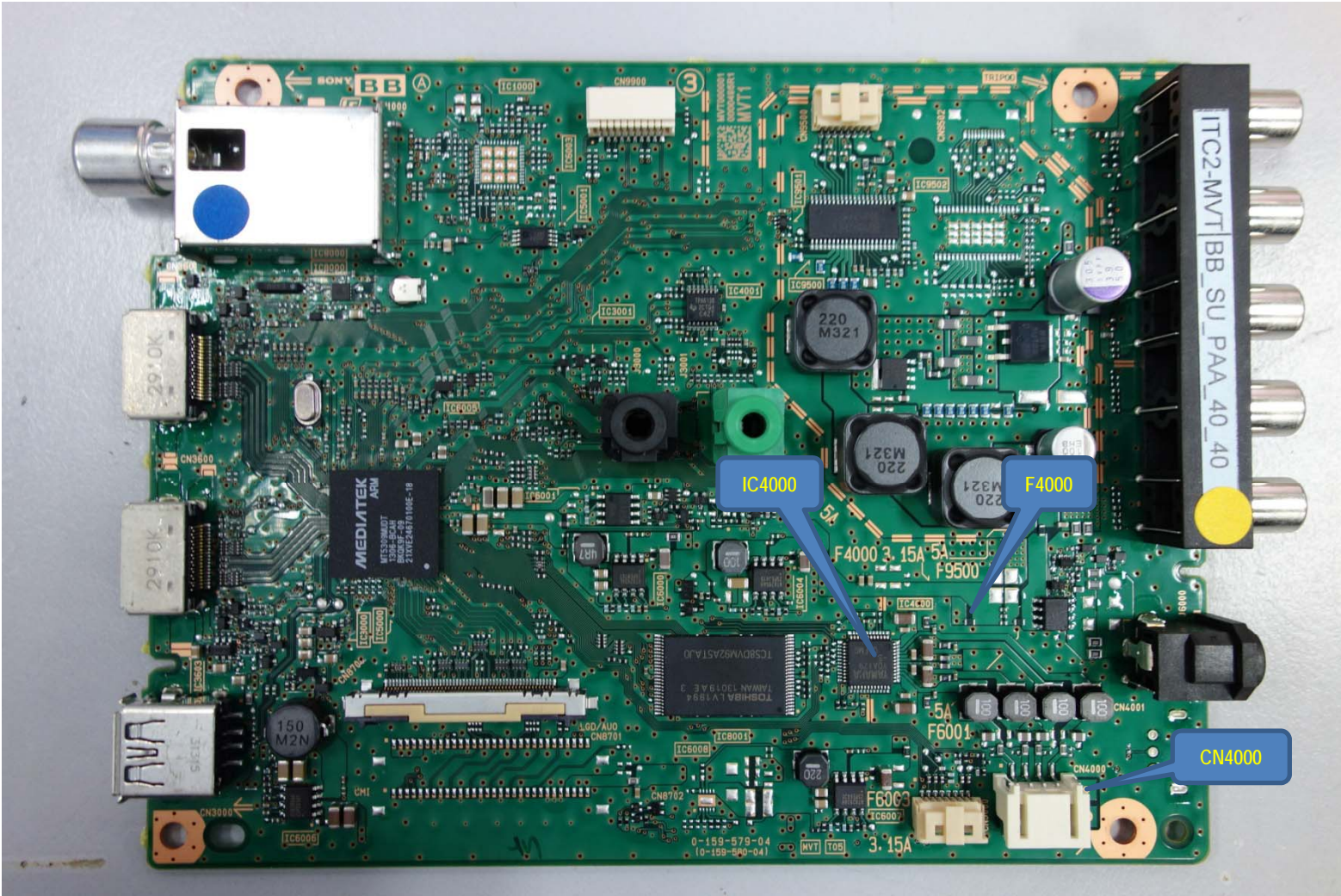


3-5. Audio Problem

3-5-1. Main Speaker No Sound

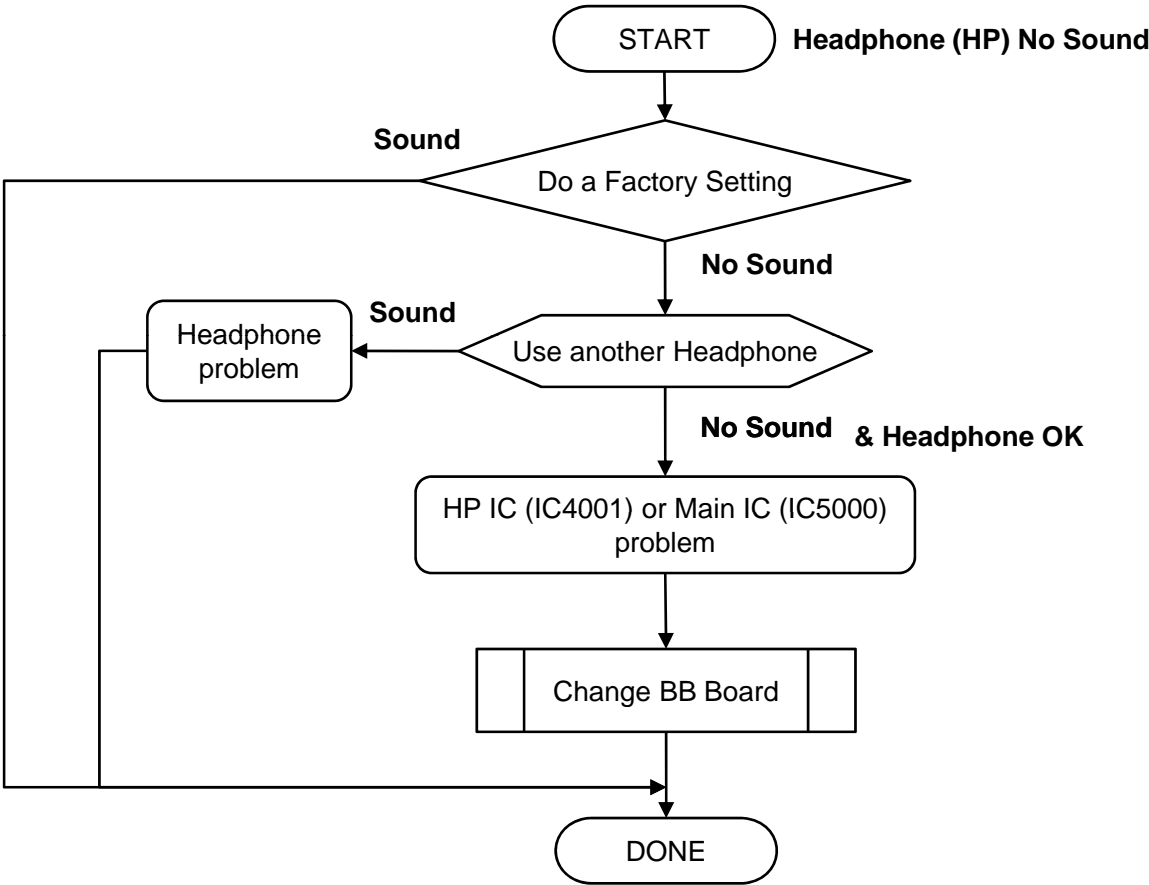


Troubleshooting References (BB Board)

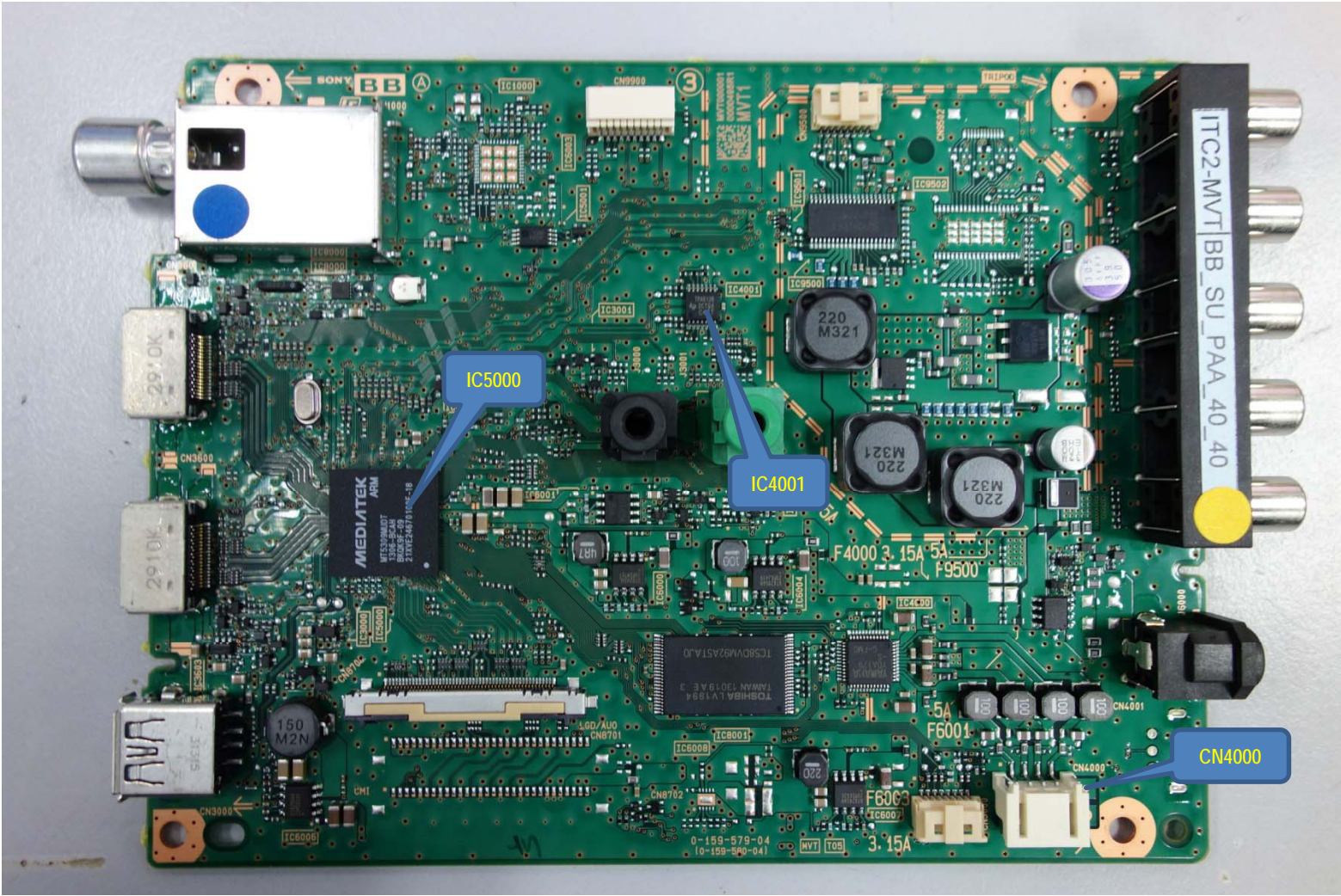


3-5. Audio Problem

3-5-2. Headphone (HP) Out No Sound

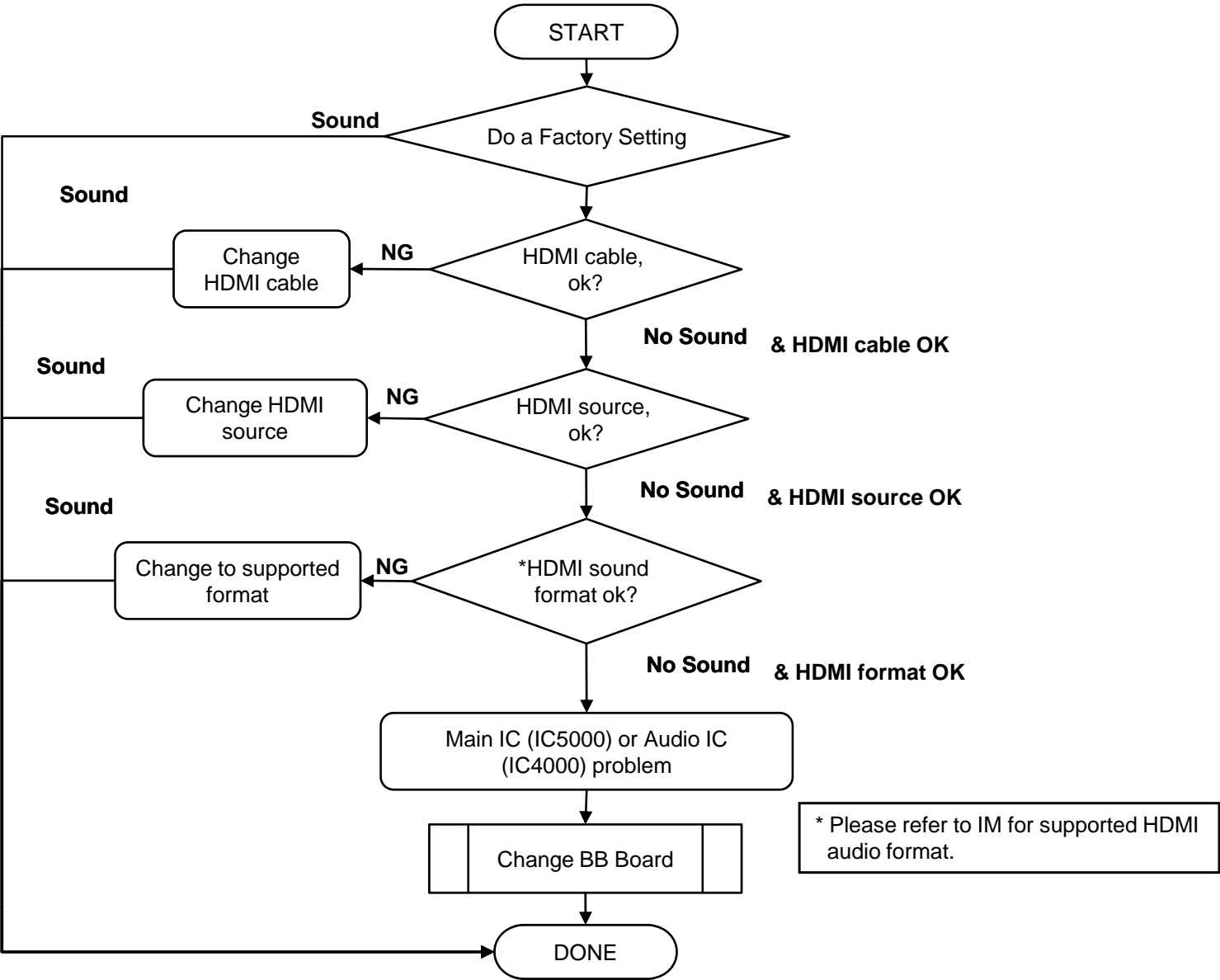


Troubleshooting References (BB Board)



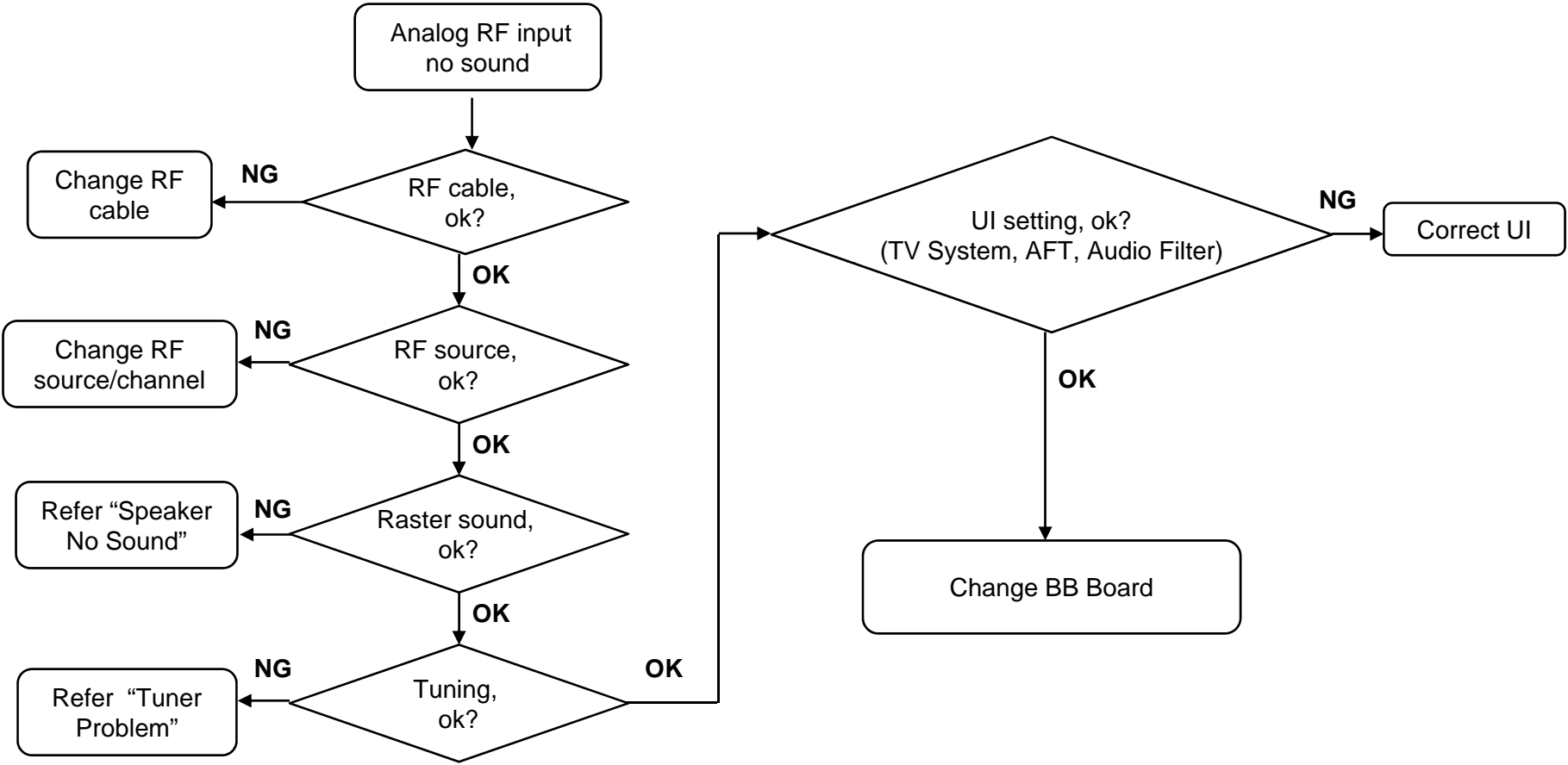
3-5. Audio Problem

3-5-3. HDMI Audio No Sound



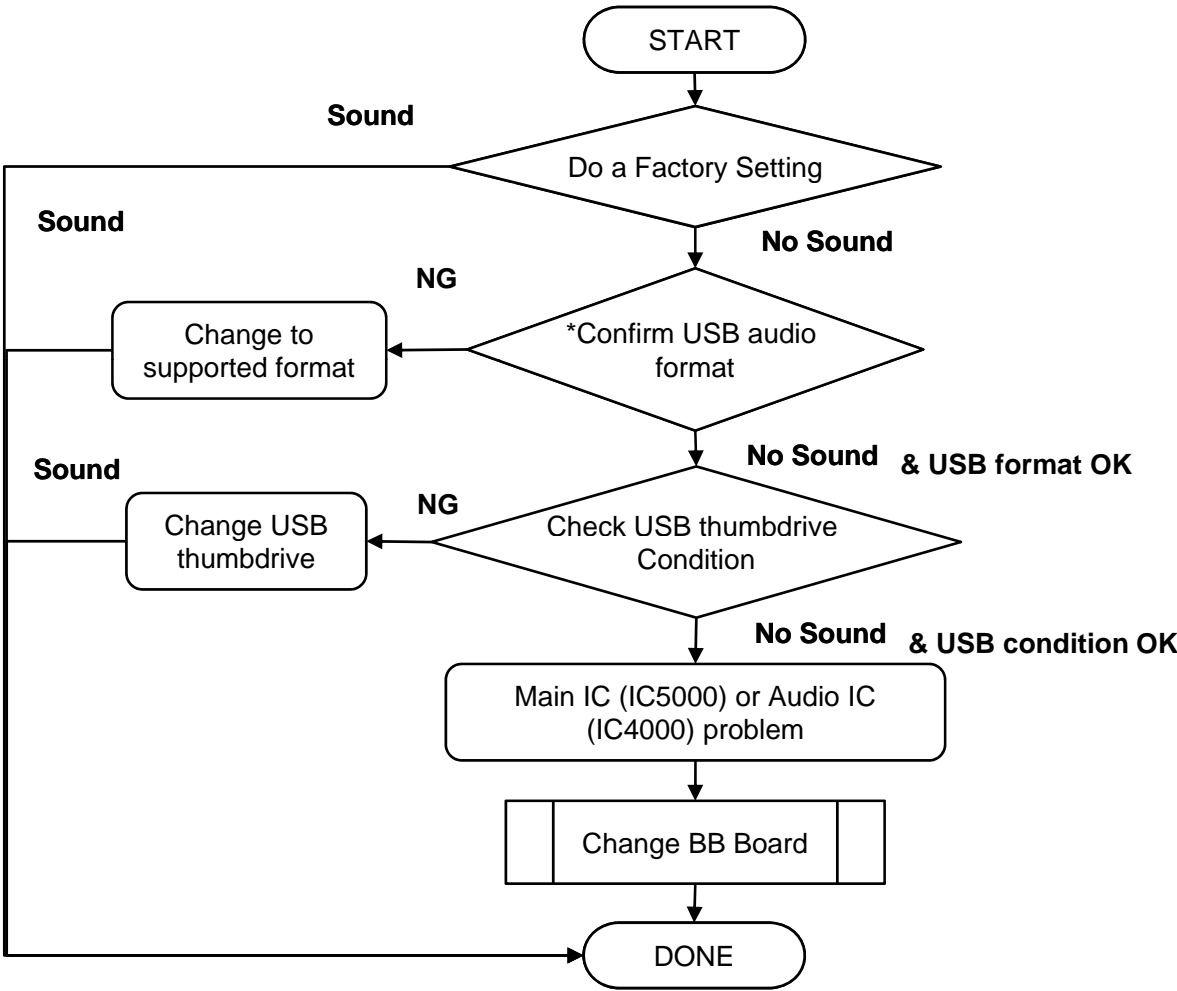
3-5. Audio Problem

3-5-4. Analog RF no sound



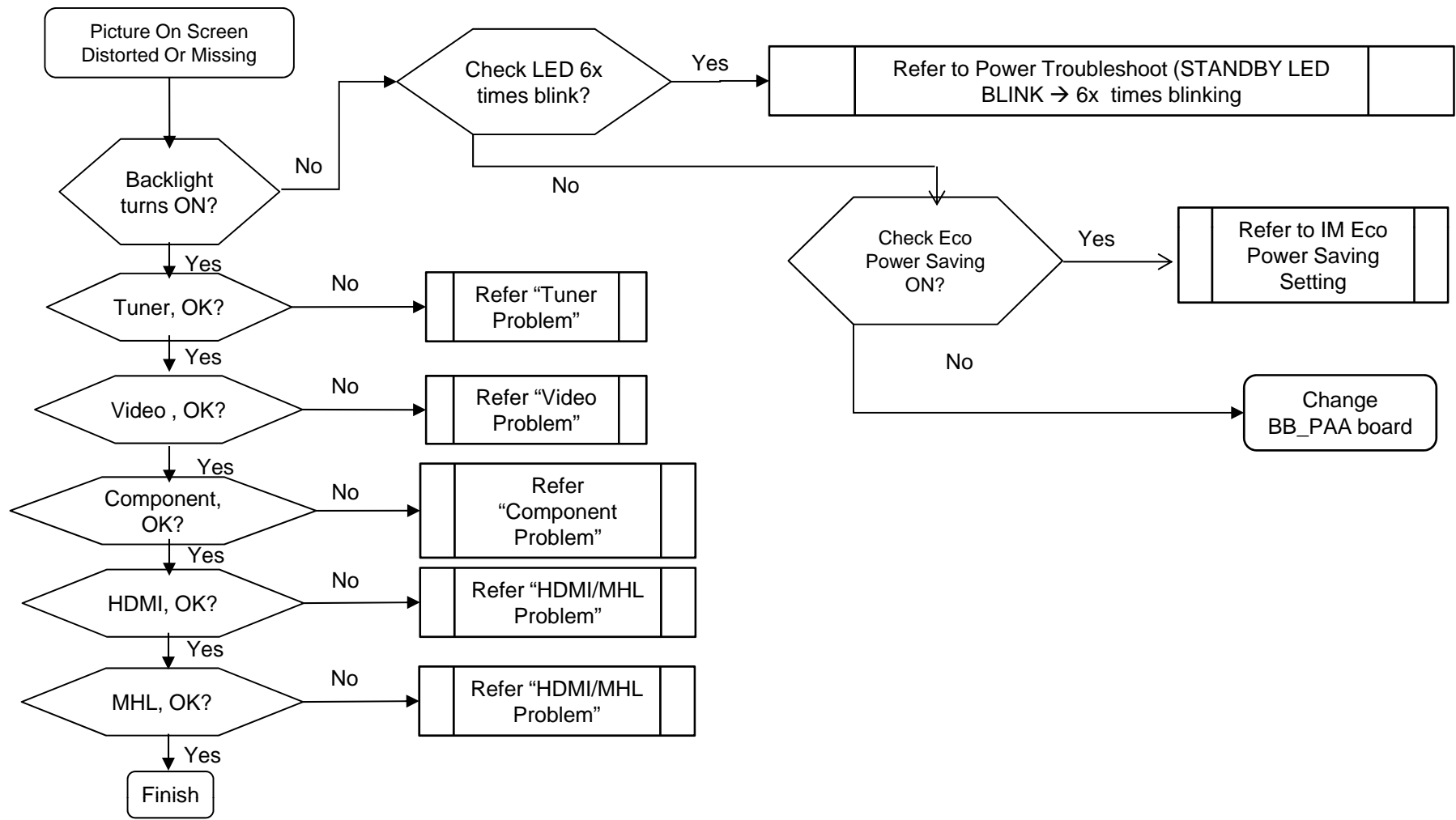
3-5. Audio Problem

3-5-5. USB no sound

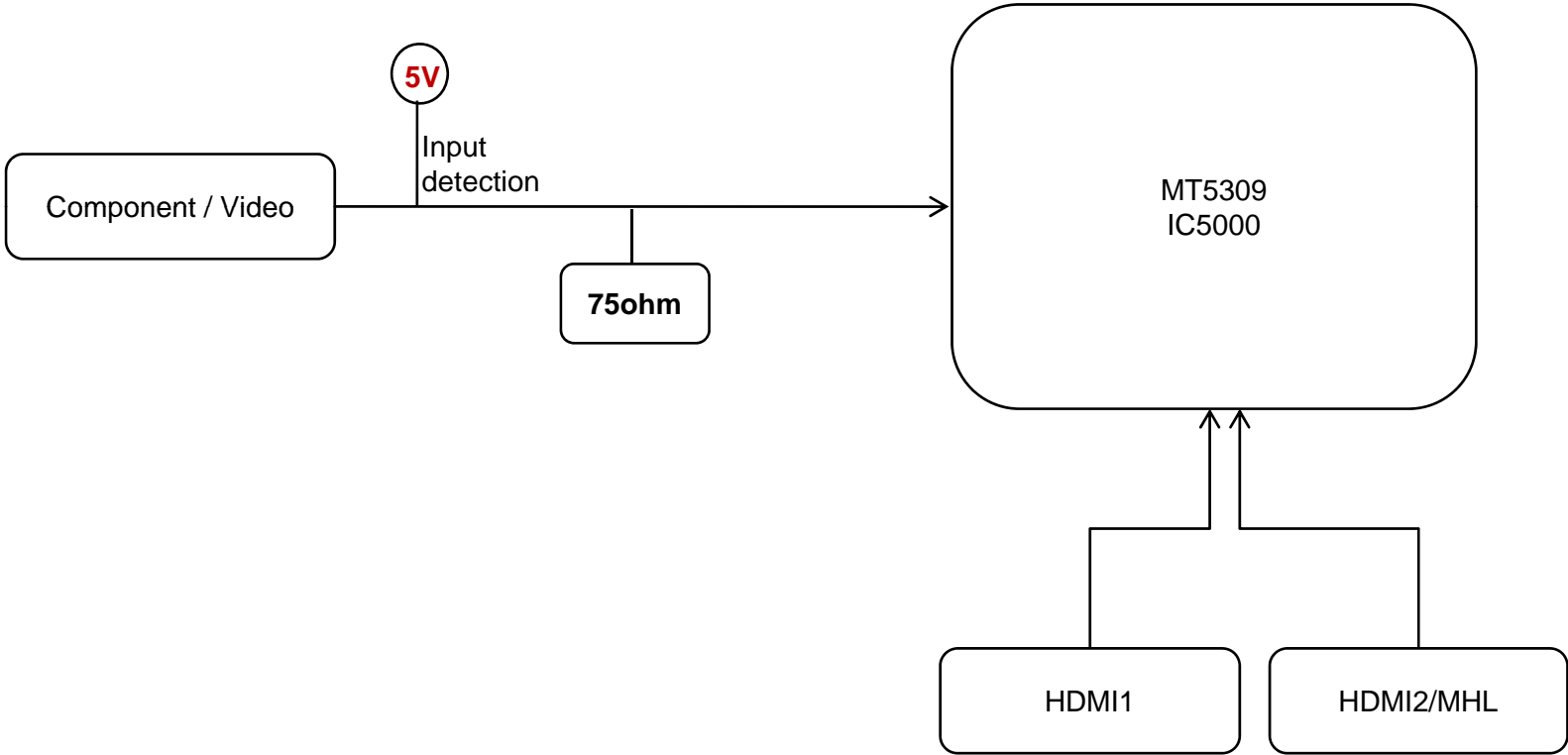


\*Confirm with OSD on bottom panel, if playback not support.  
\*Please refer to IM for detail supported USB audio format.

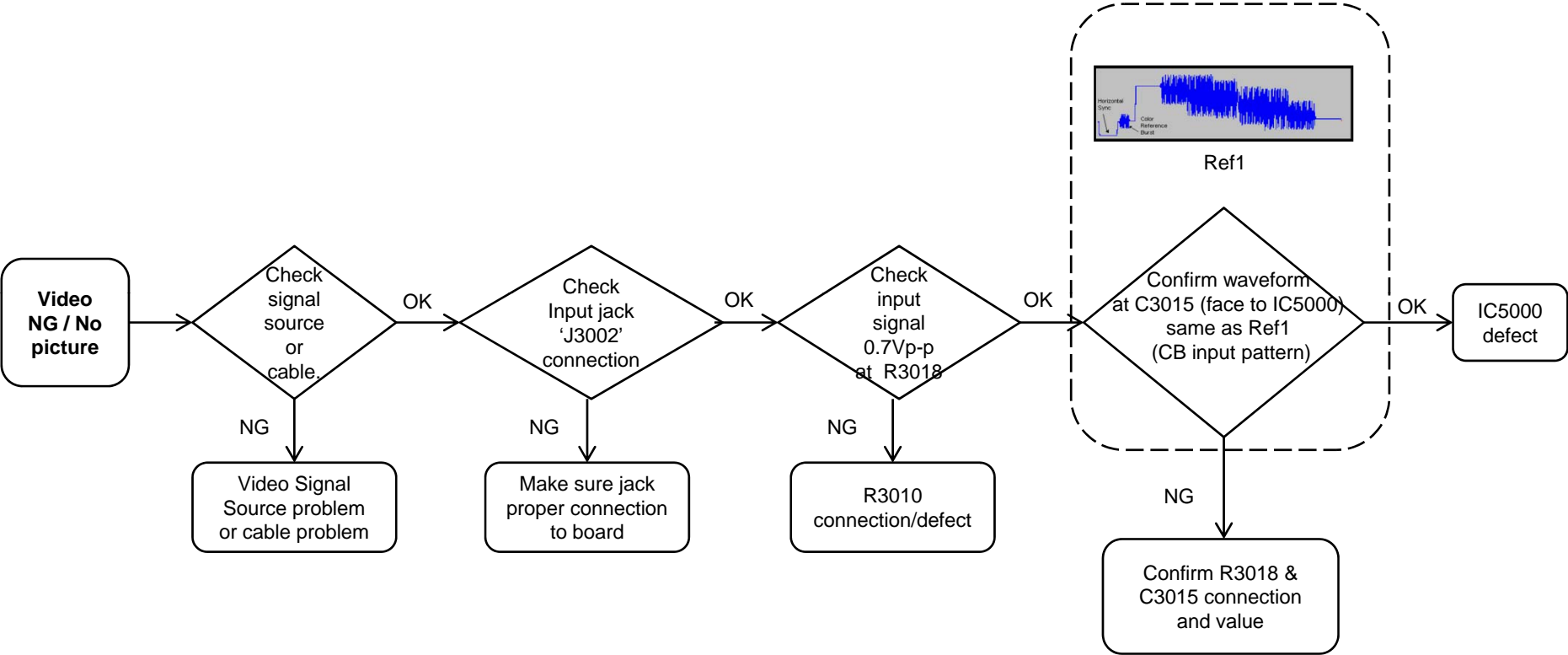
3-6. Troubleshooting Video Problem



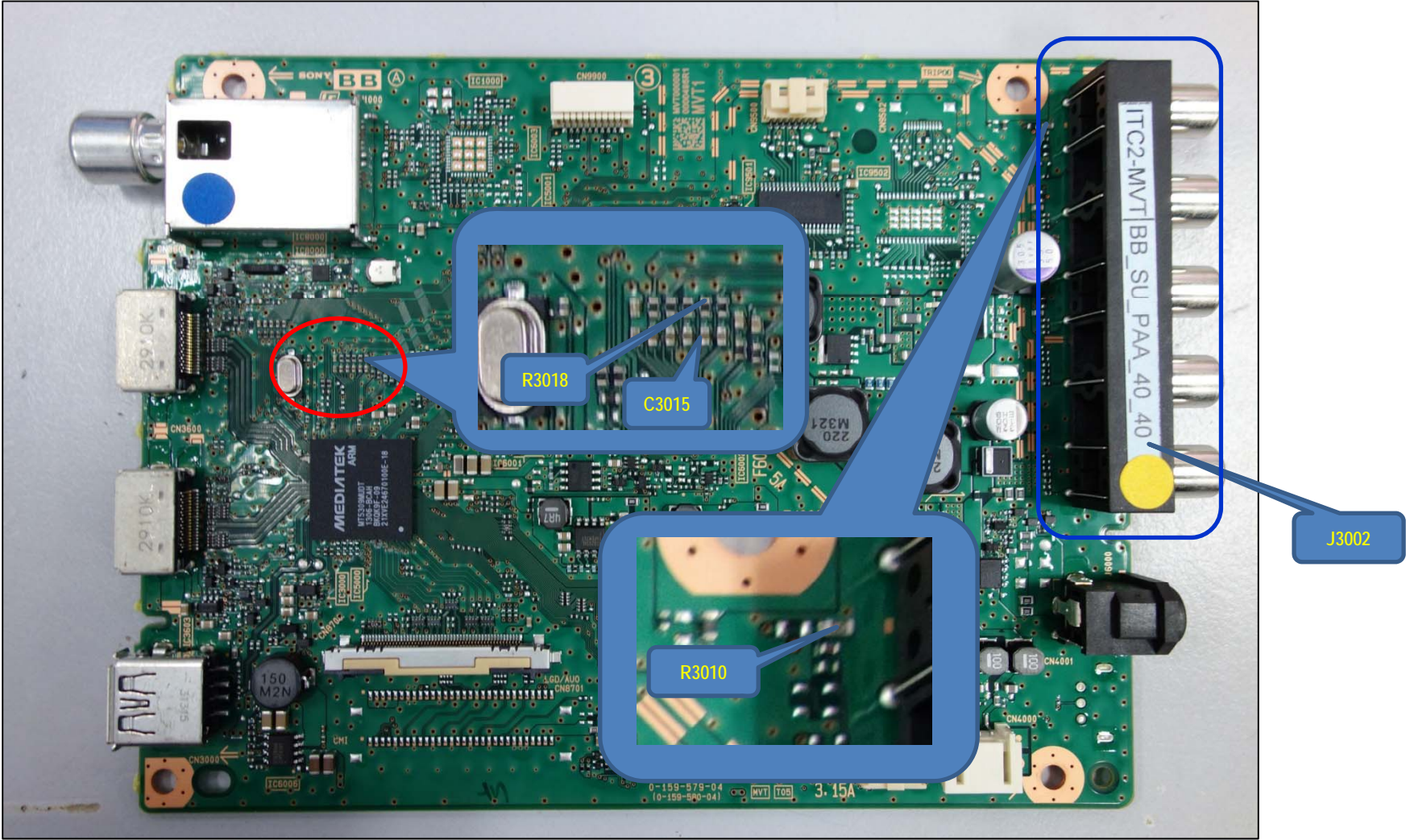
3-6-1. Component, Video & HDMI Block Diagram



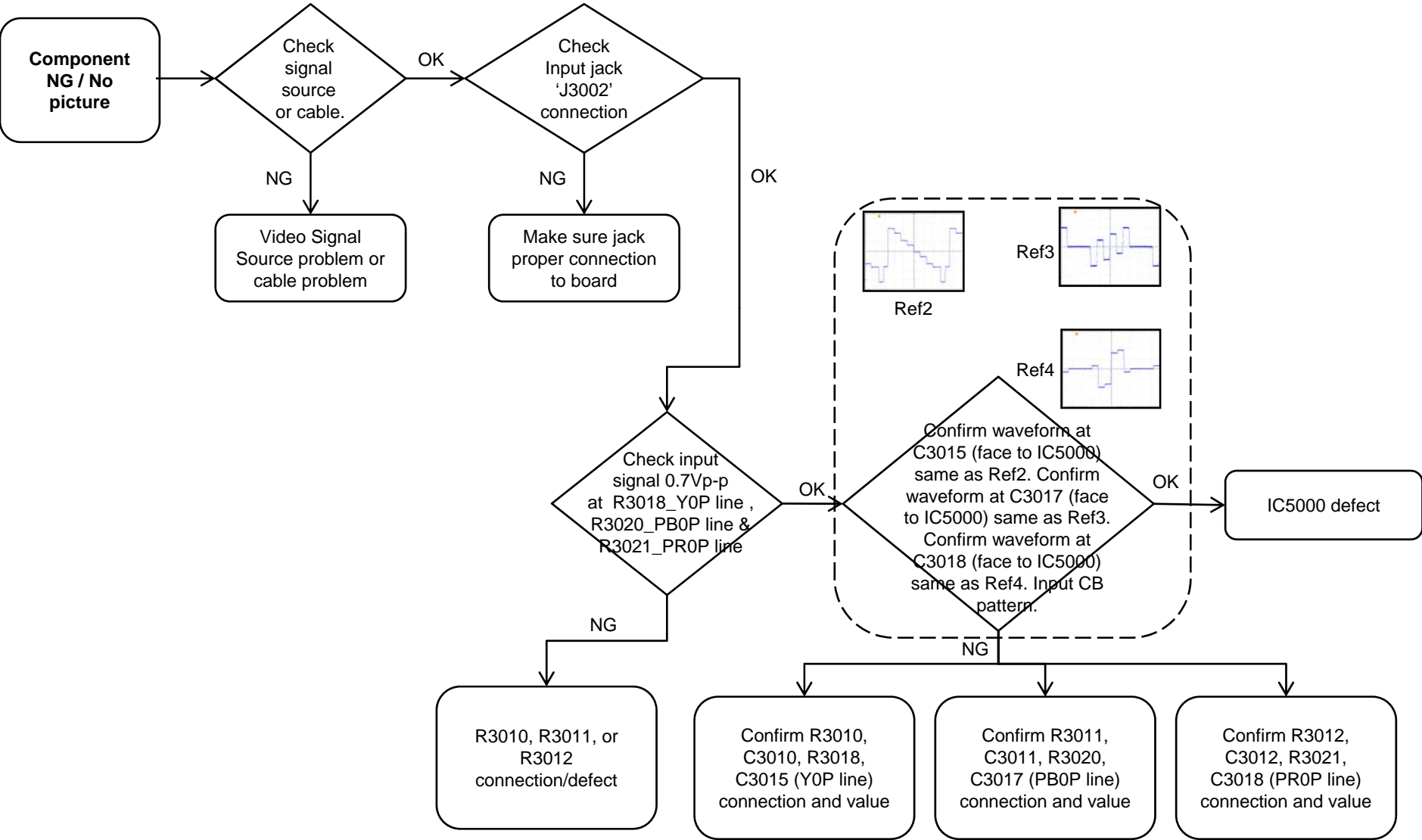
3-6-2. Video Troubleshooting Flow



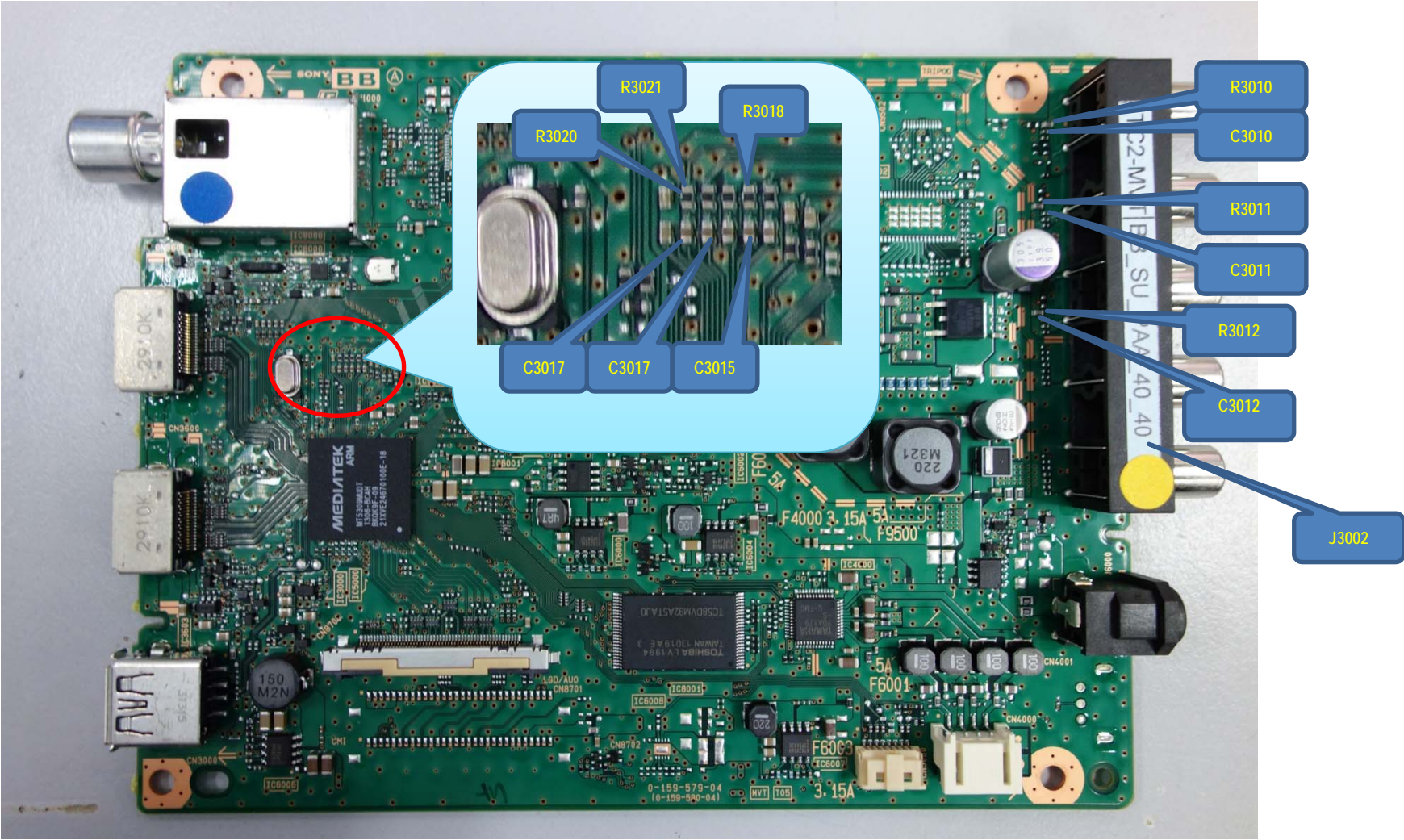
Troubleshooting References (BB Board)



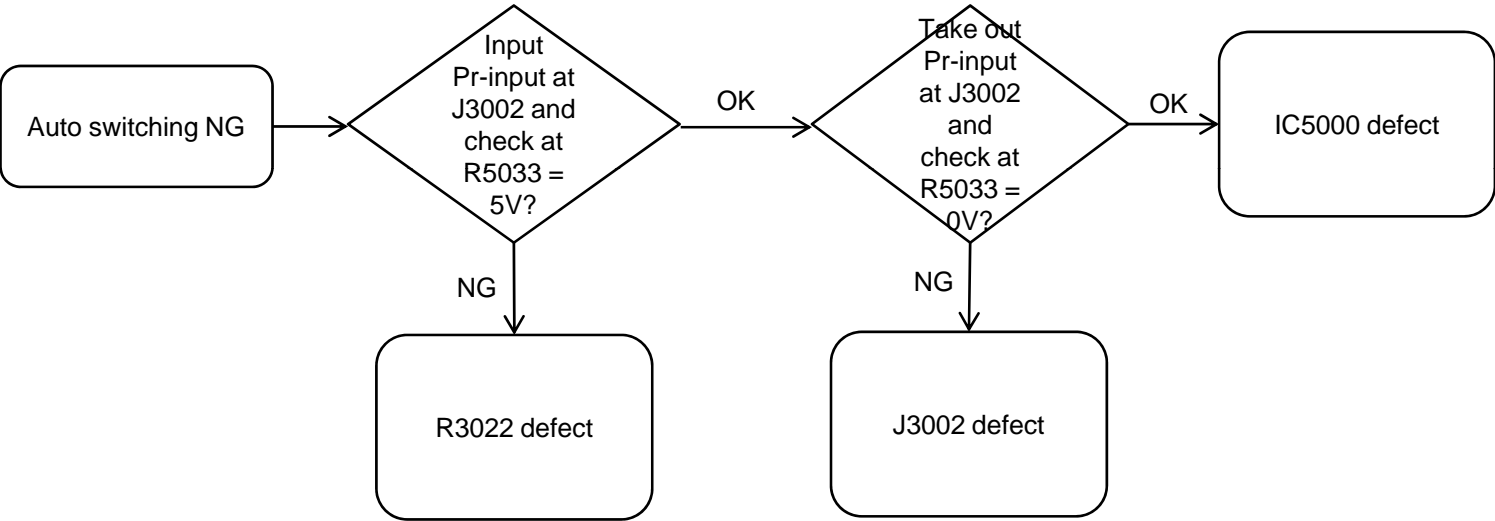
3-6-3. Component Troubleshooting Flow



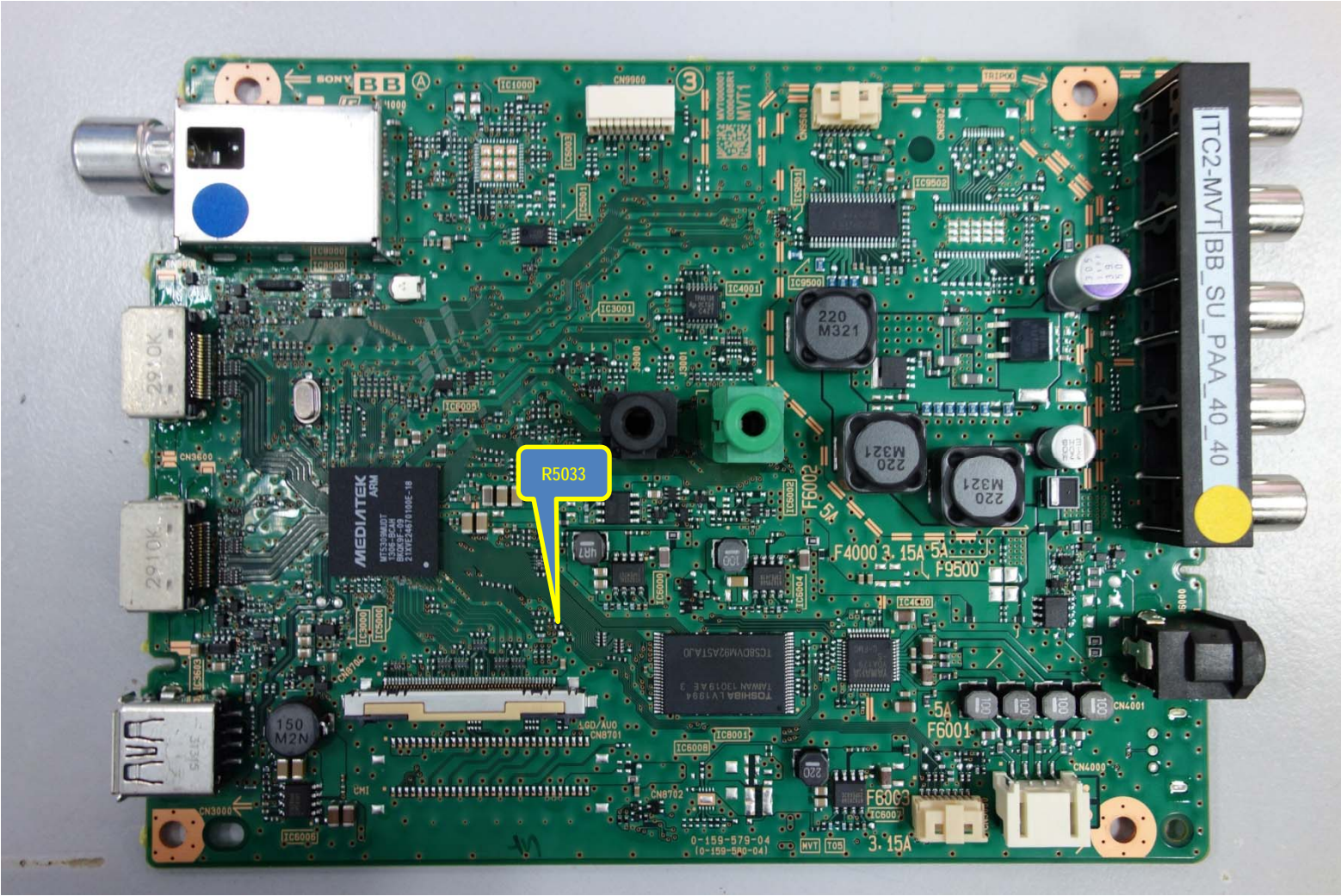
Troubleshooting References (BB Board)



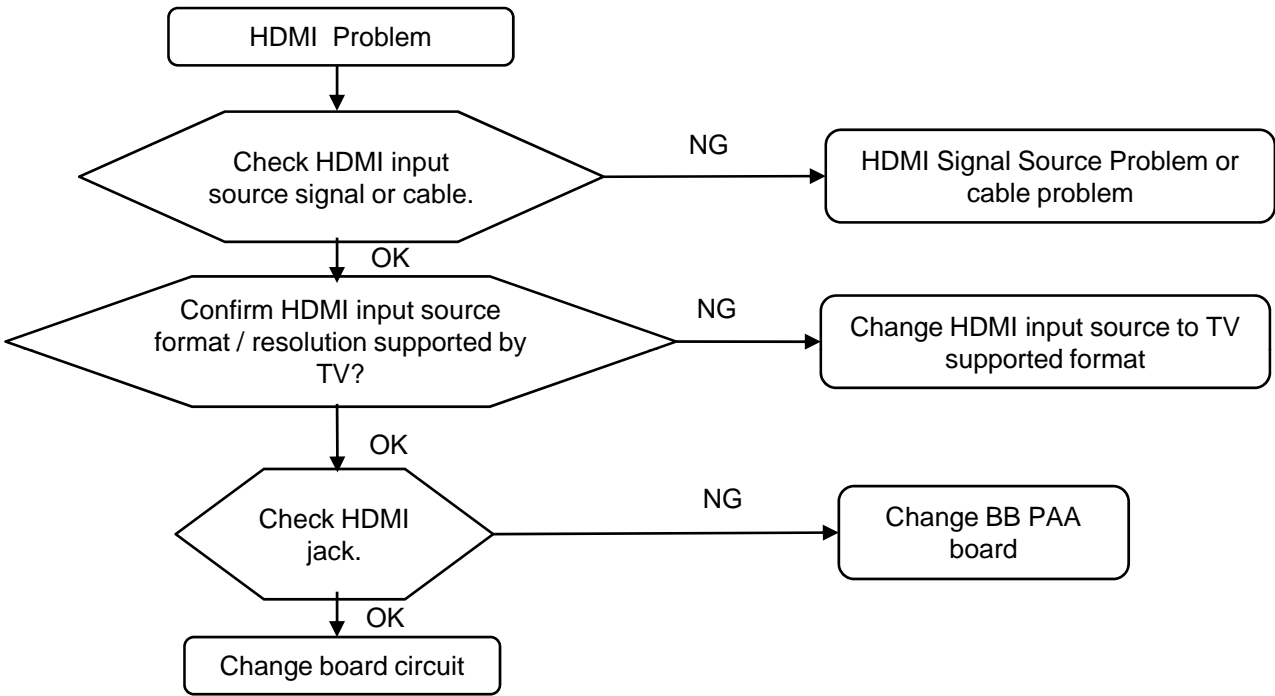
3-6-4. Auto Switching Component / Video Troubleshooting Flow



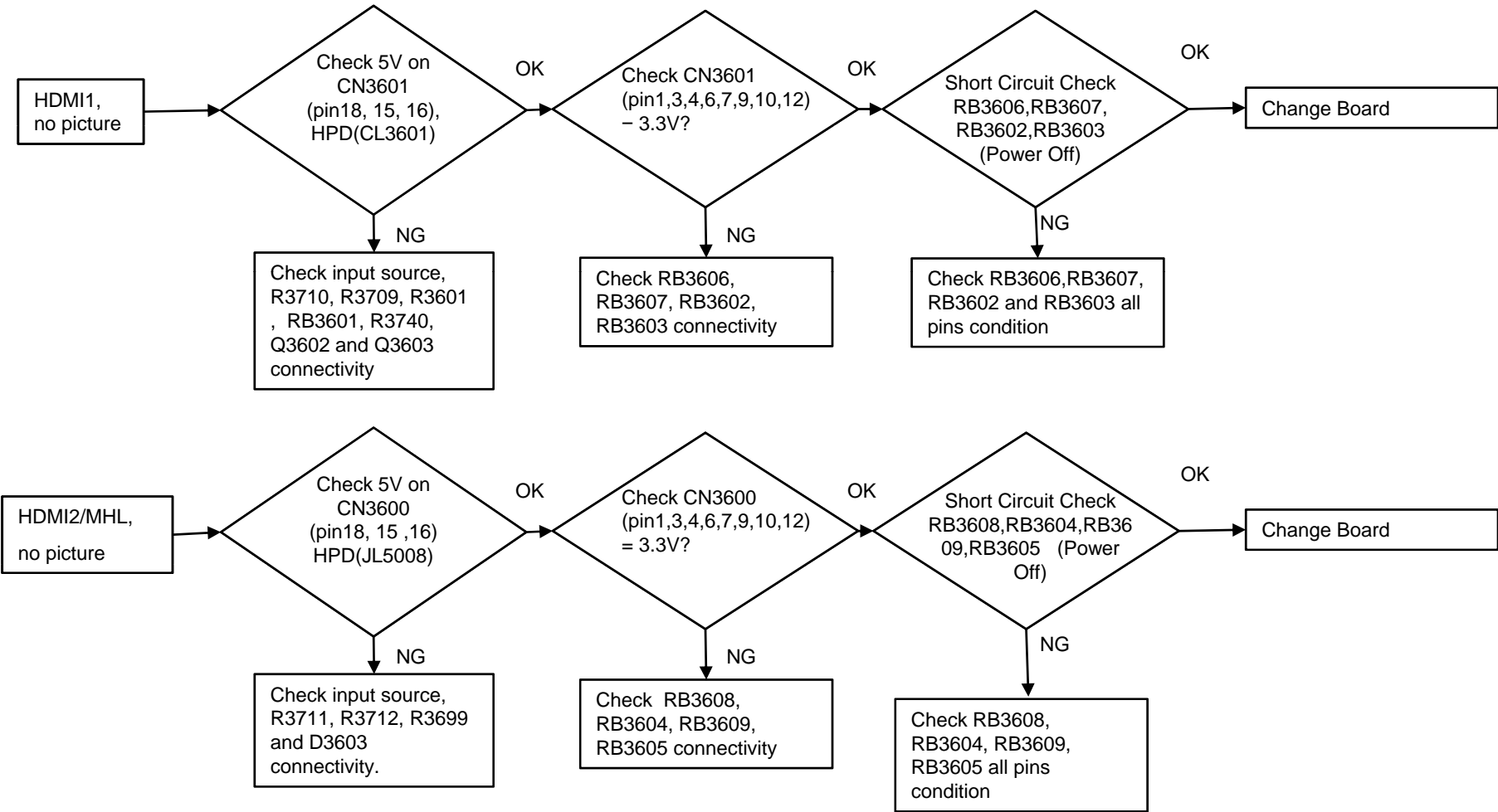
Troubleshooting References (BB Board)



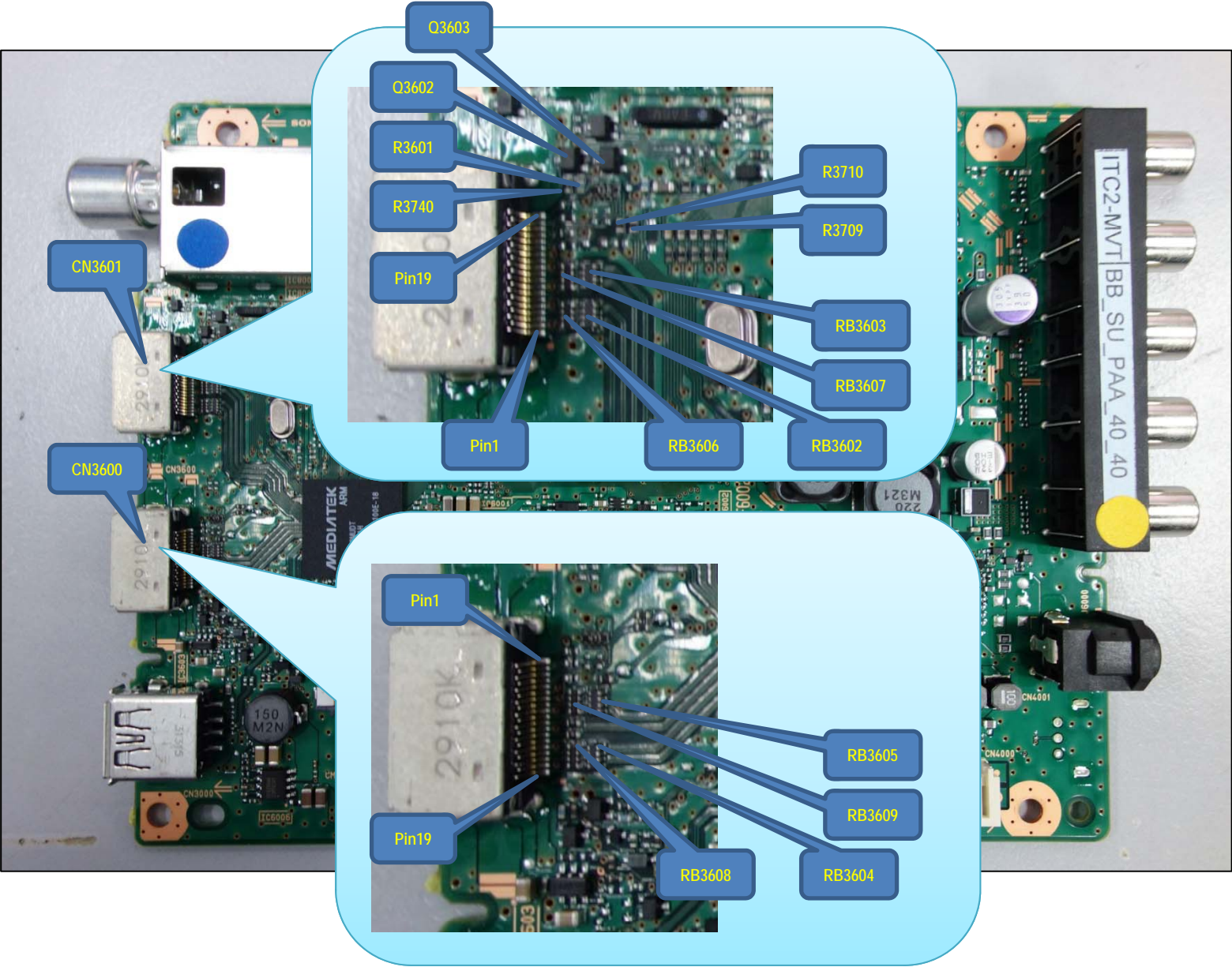
3-7. HDMI – Troubleshooting flow



3-7-1. HDMI 1/2 Troubleshooting



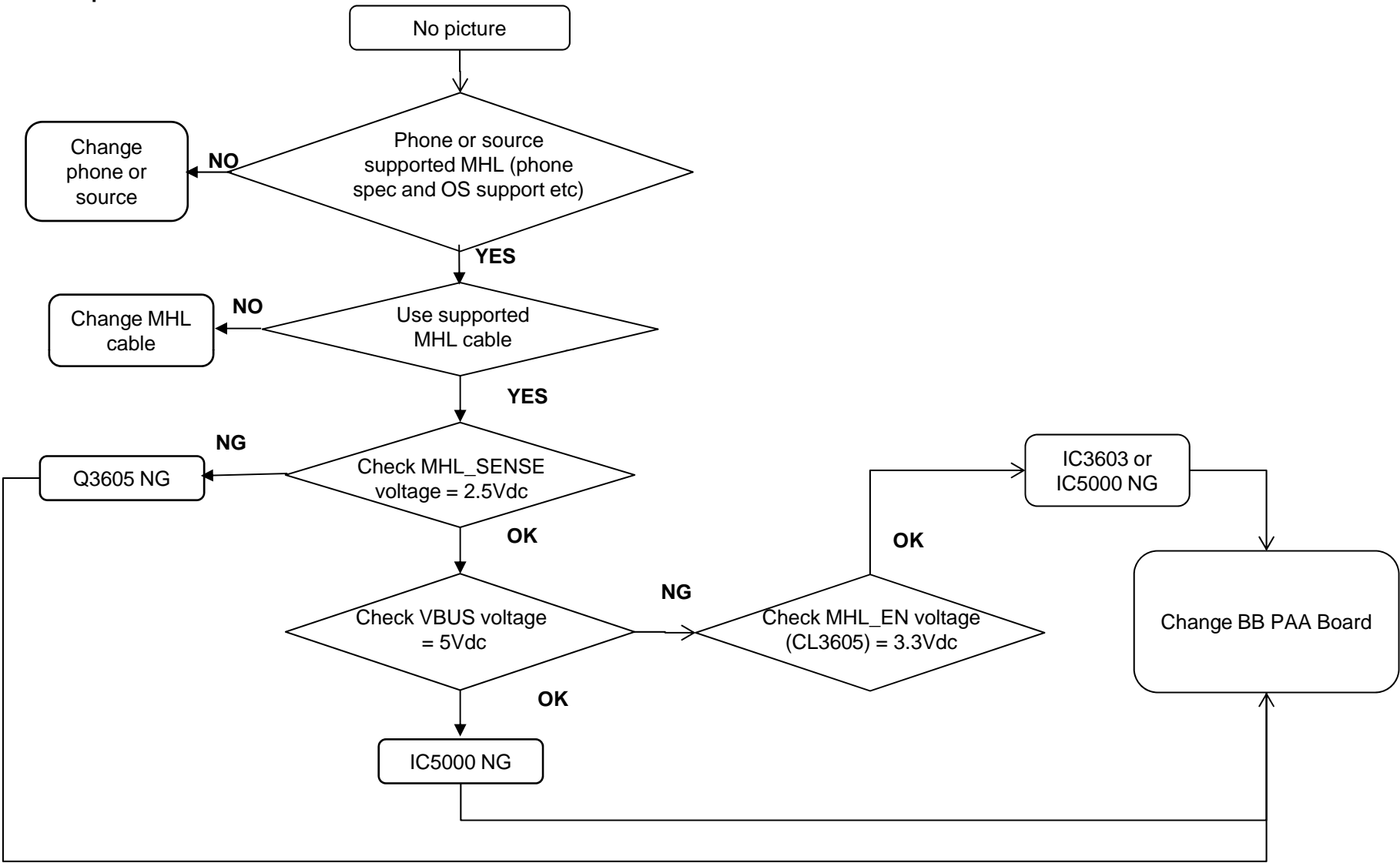
Troubleshooting References (BB Board)



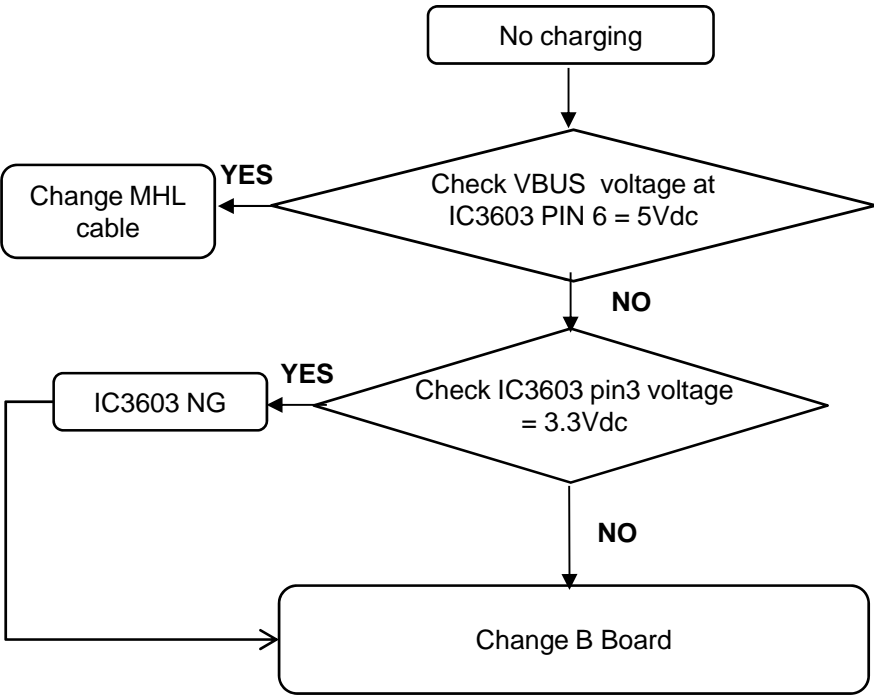
3-7-2. HDMI Power Off Checking

| HDMI    | Checking Item   | OK   | NG   |
|---------|---|--|--|
| 1 and 2 | <b>Check RB3602, RB3603, RB3606, RB3607, RB3604, RB3605, RB3608, RB3609</b><br>Pin 1 & Pin 2<br>Pin 2 & Pin 3<br>Pin 3 & Pin 4<br>Pin 5 & Pin 6<br>Pin 6 & Pin 7<br>Pin 7 & Pin 8 | No Short<br>No Short<br>No Short<br>No Short<br>No Short<br>No Short | Short<br>Short<br>Short<br>Short<br>Short<br>Short |

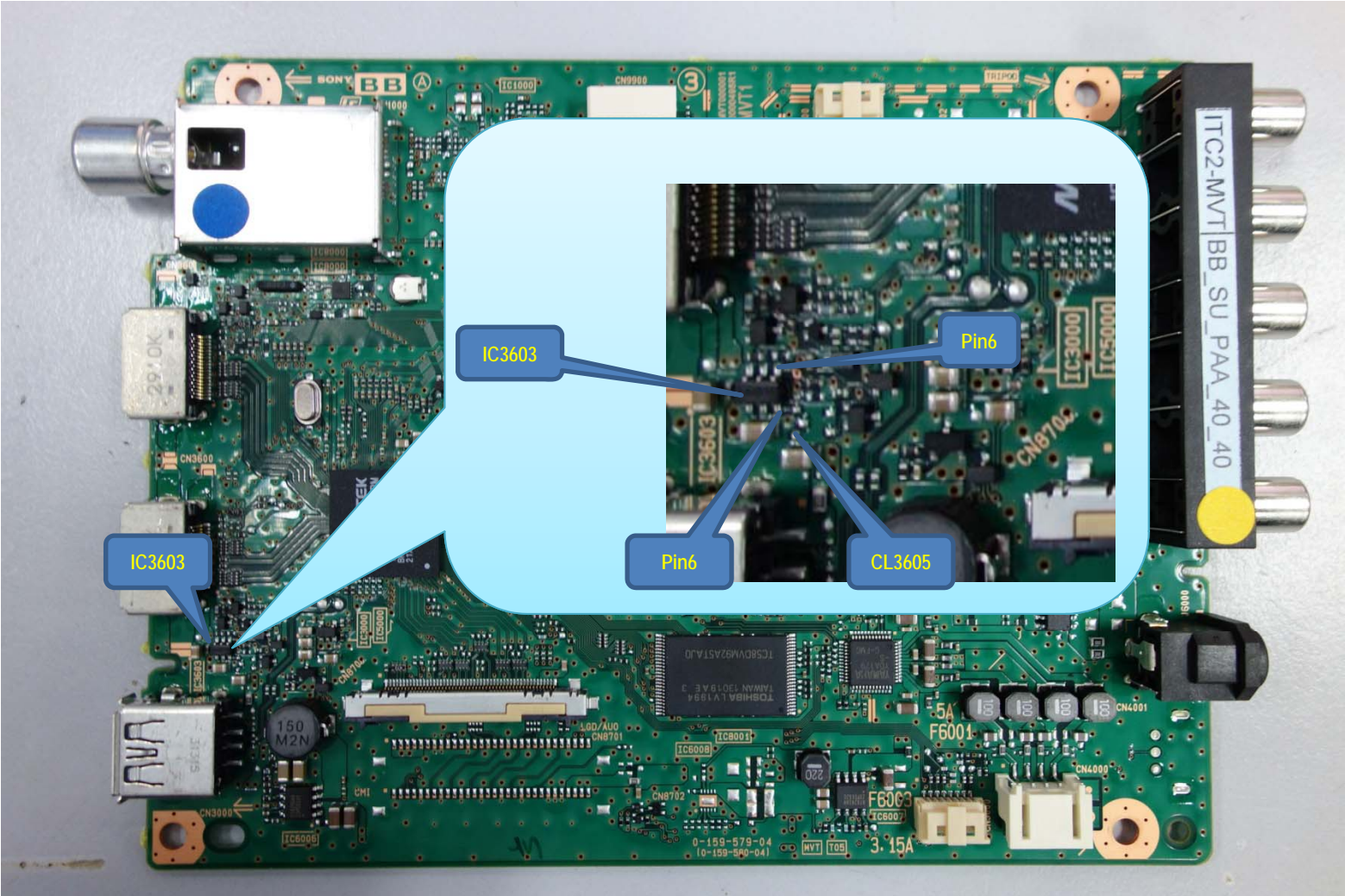
3-8. MHL No picture



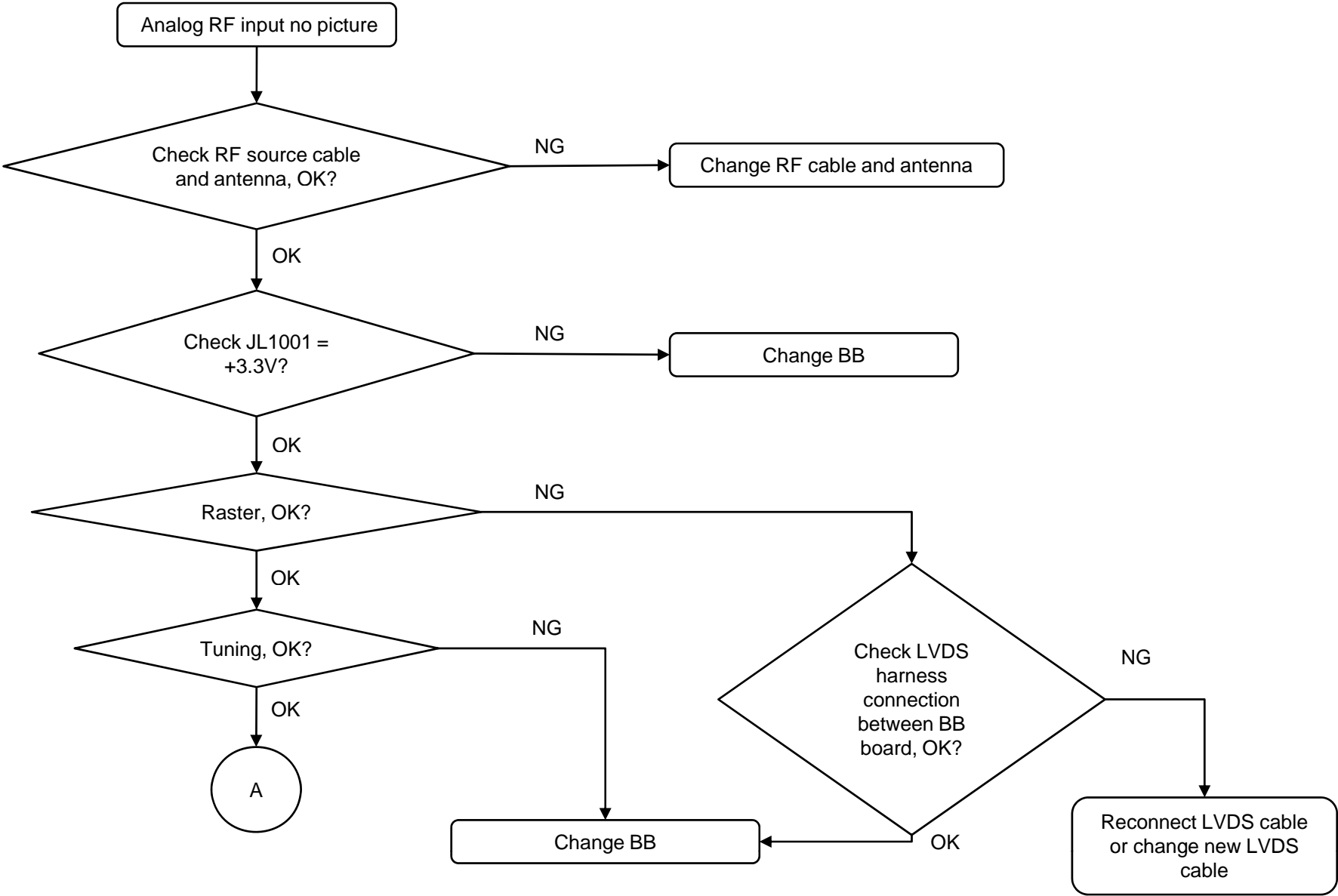
3-8-1. MHL Cannot charging



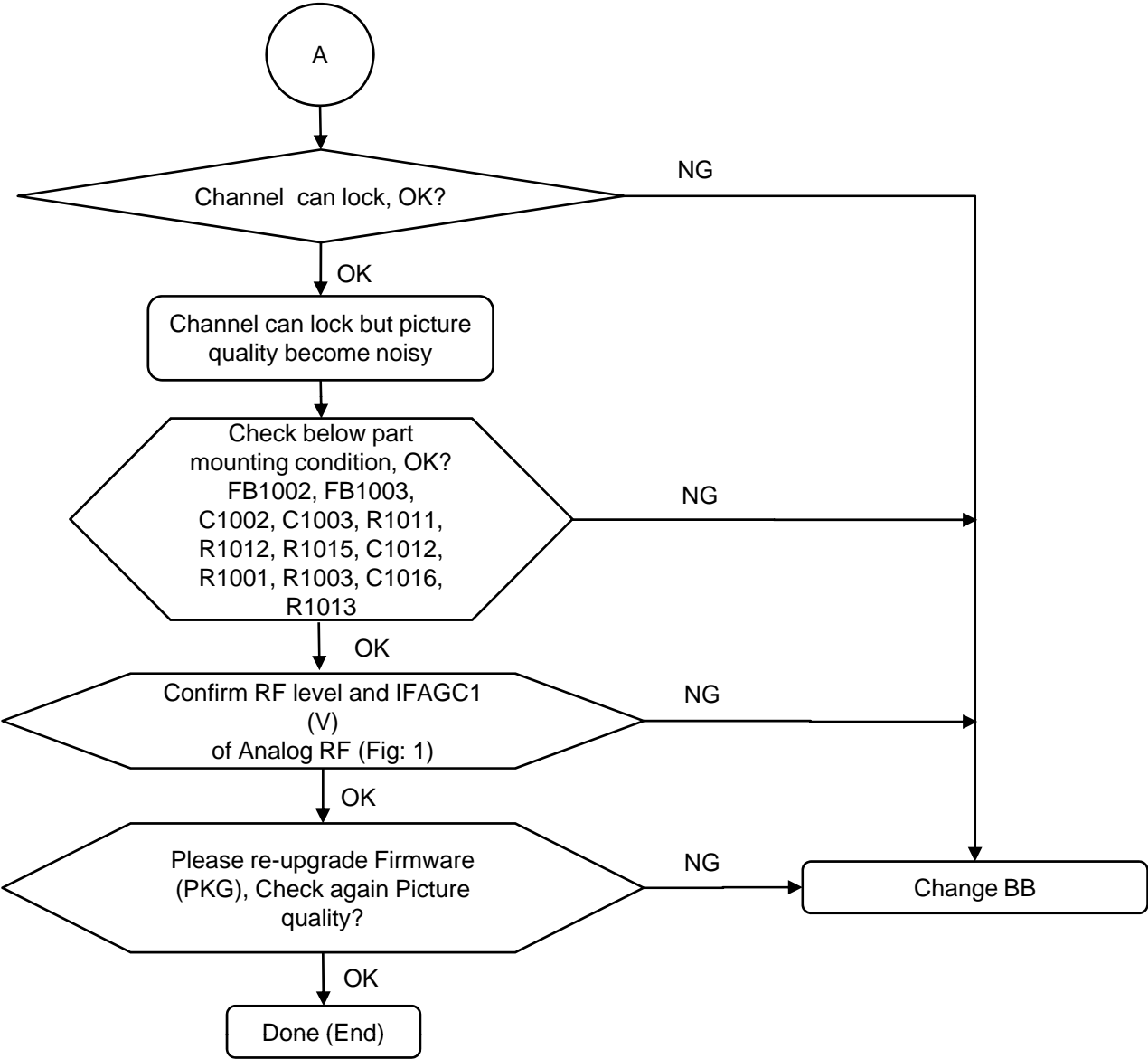
Troubleshooting References (BB Board)



3-9. Tuner – Troubleshooting flow



3-9. Tuner – Troubleshooting flow (continue)

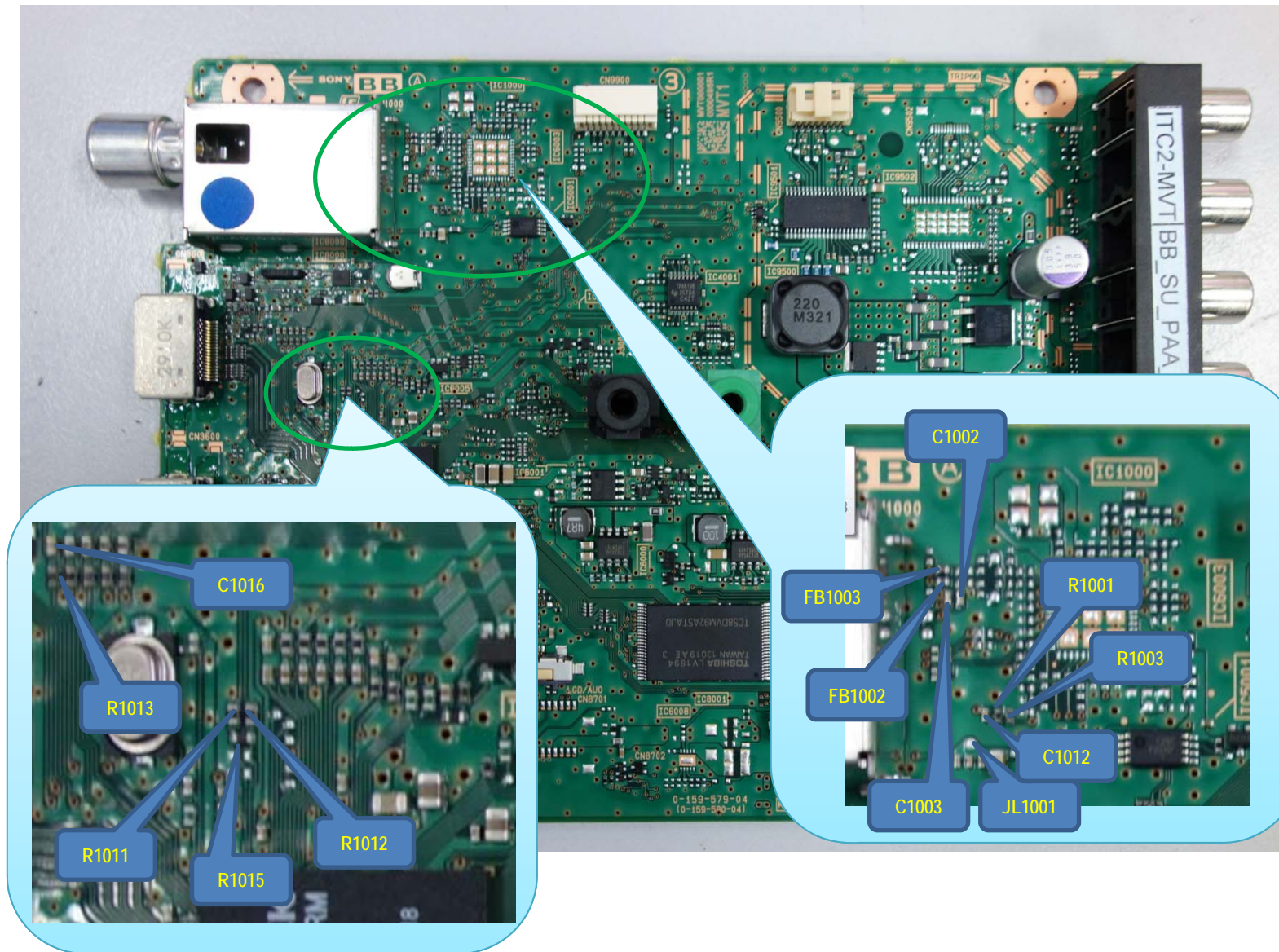


(Fig:1)

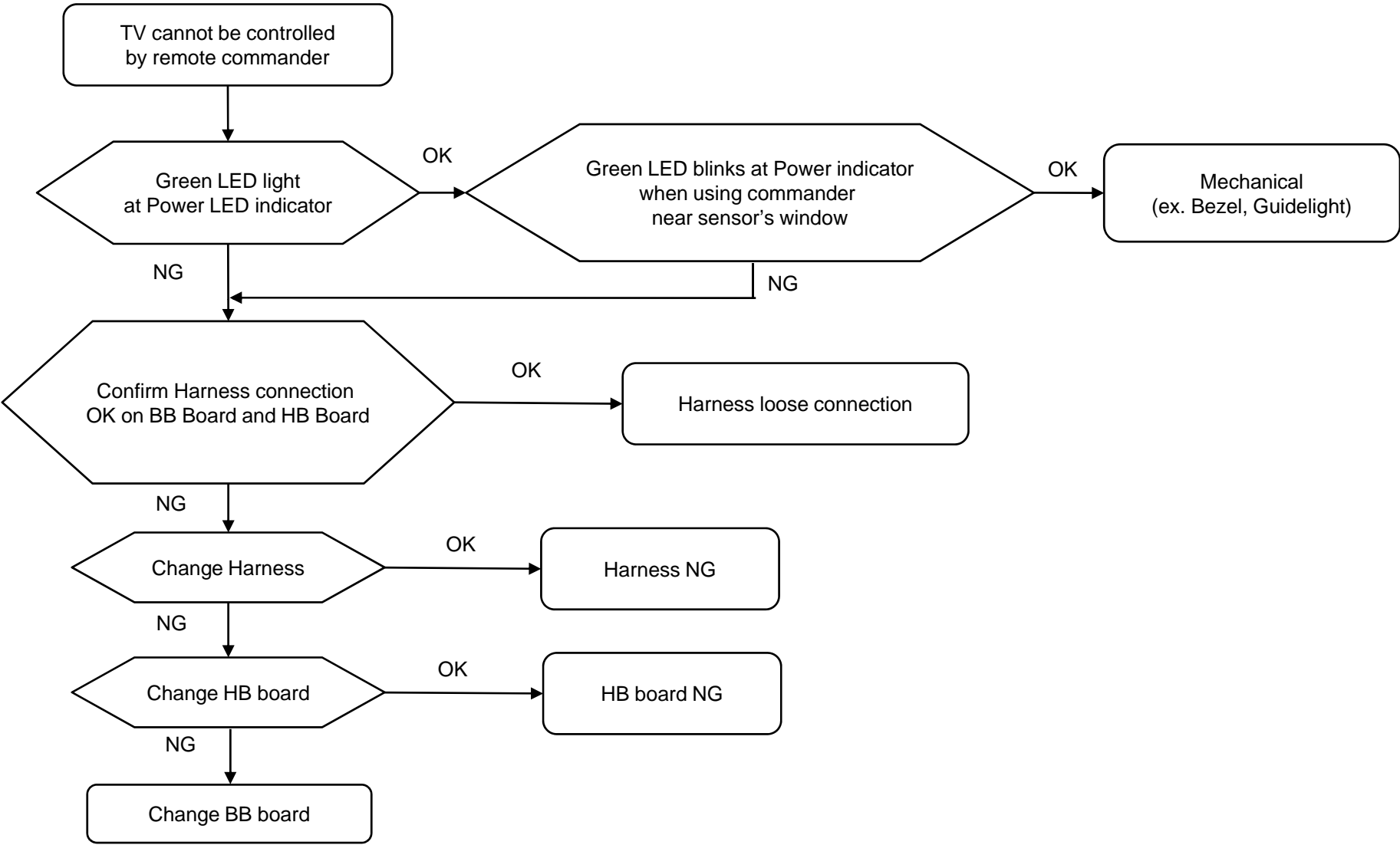
| RF level (dBm) | RF level (dBuV) | IFAGC1 (V) |
|----------------|-----------------|------------|
| -80            | 35              | 0.050      |
| -70            | 45              | 0.250      |
| -60            | 55              | 0.380      |
| -50            | 65              | 0.470      |
| -40            | 75              | 0.590      |
| -30            | 85              | 0.770      |
| -20            | 95              | 0.940      |
| -10            | 105             | 1.090      |

IFAGC1 (V) tolerance ±0.05

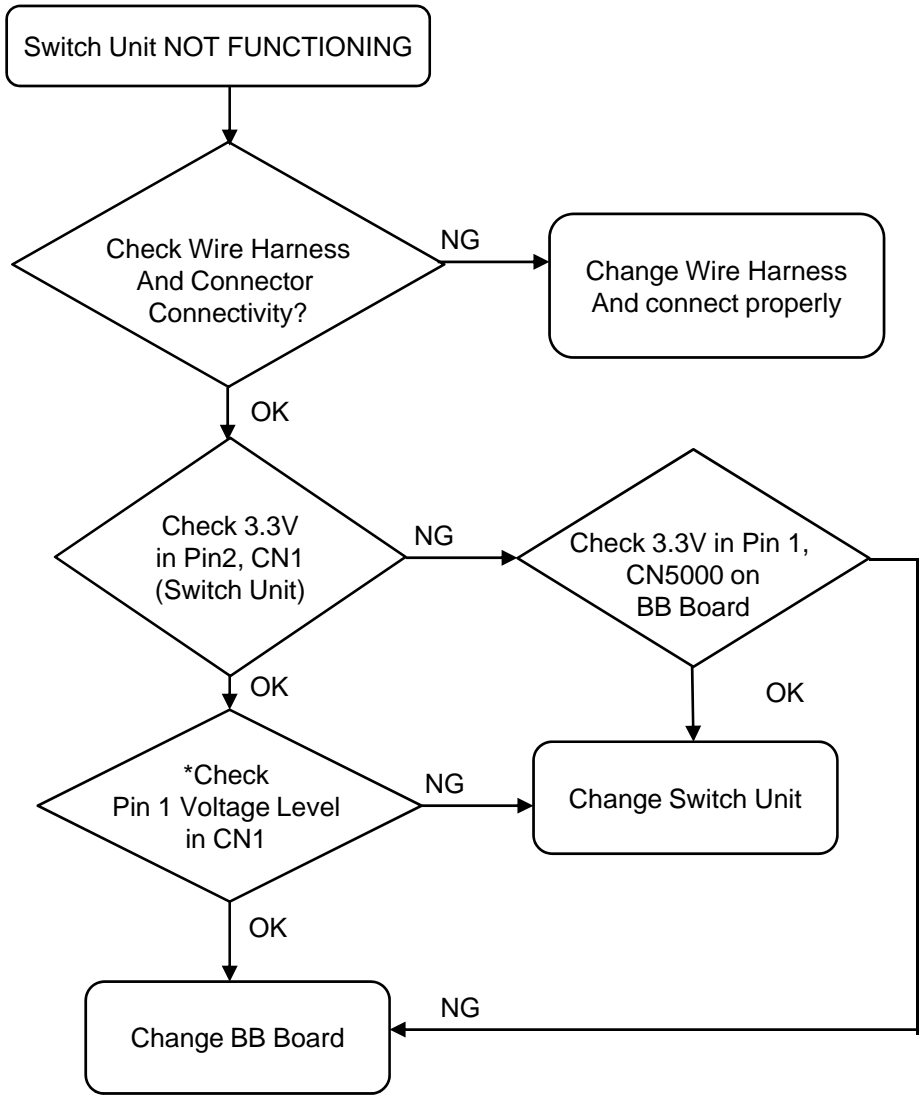
### Troubleshooting References (BB Board)



3-10. IR – Troubleshooting flow



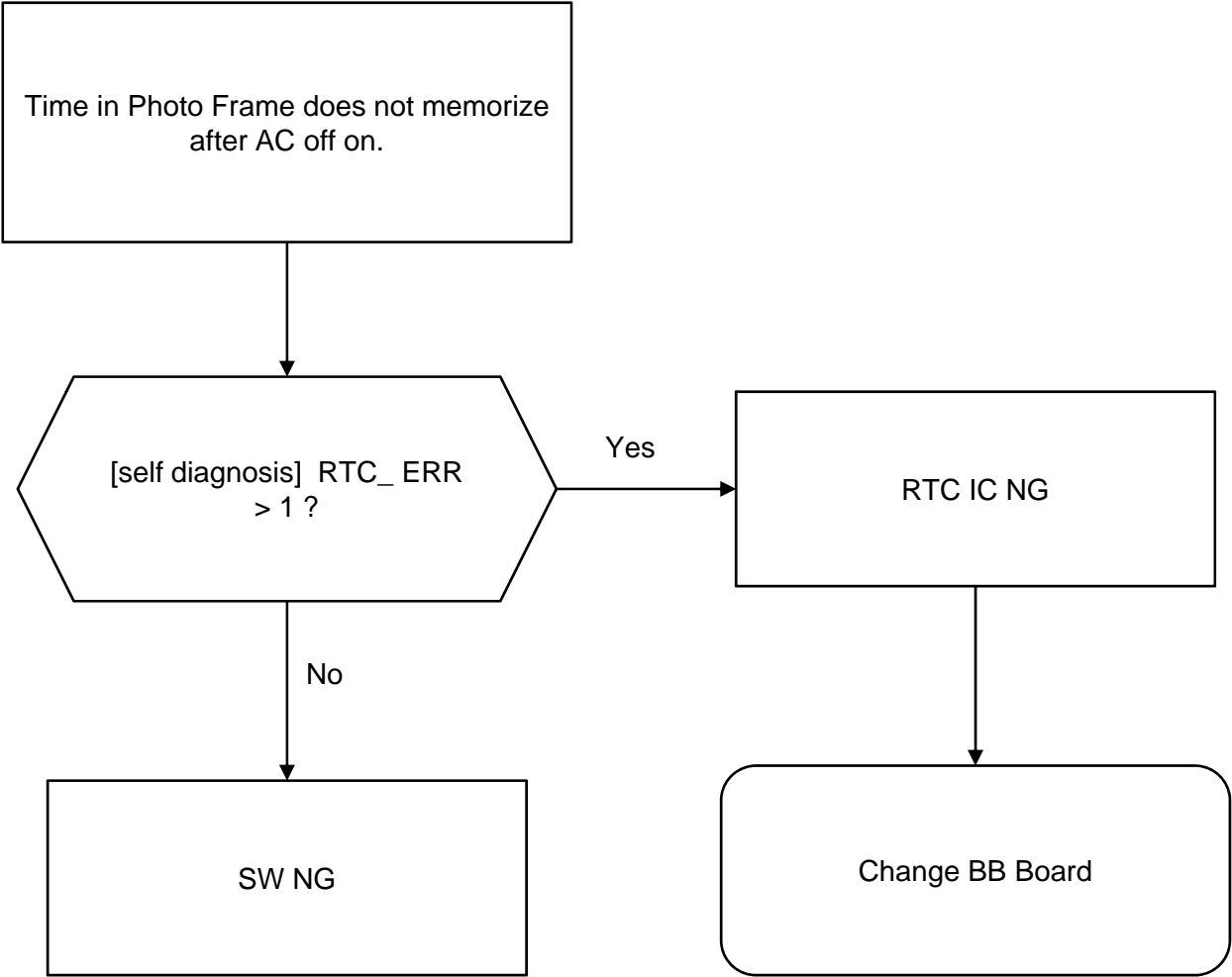
3-11. Switch Unit Buttons – Troubleshooting flow



\*VOLTAGE LEVEL FOR EACH PRESSED BUTTON

| KEY      | Voltage (average) | Voltage range      |
|----------|-------------------|--------------------|
| -        | 0.000             | 0.00000 – 0.82353  |
| +        | 1.114             | 0.83451 – 1.37255  |
| CH/Input | 1.693             | 1.383529 – 2.03137 |
| No Input | 2.420             | 2.04235 – 2.80000  |

3-12. RTC Troubleshooting Flow (SU model only)

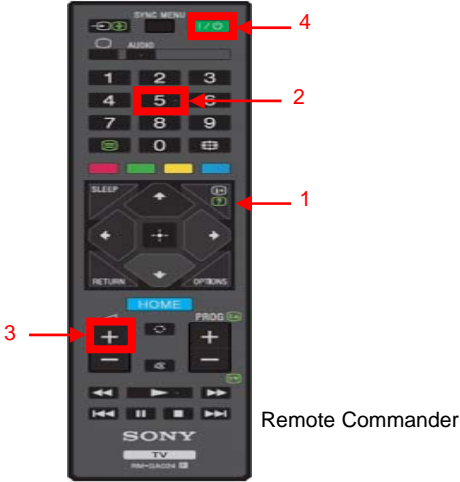


# SECTION 4

## SERVICE ADJUSTMENTS

### 4-1. Accessing Service Mode

- 1) Go to TV standby condition by remote commander.
- 2) Press “i+ (info)”, “5”, “Volume +” then “TV power” on remote.
- 3) You can see Service Mode on display.



| Service Mode           |    |      |    |
|------------------------|----|------|----|
| Status Information     | >> |      |    |
| Self diagnosis history | >> |      |    |
| NO_SIGNAL_MUTE         | <[ | Off  | >] |
| TUNING SYSTEM          | <[ | AUTO | >] |
| Low of HPD             | <[ | 5    | >] |
| UART Selection         | <[ | CLI  | >] |
| SERIAL NUMBER EDIT     |    |      |    |
| MODEL NAME EDIT        |    |      |    |
| TEST RESET             | <[ | Off  | >] |
| [</>]Set [Home]Exit    |    |      |    |

Service Mode Screen Sample

### 4-2. Accessing Software Version

- 1) Press (Enter) or button on Remote to enter status information.



Remote Commander

| Service Mode           |    |      |    |
|------------------------|----|------|----|
| Status Information     | >> |      |    |
| Self diagnosis history | >> |      |    |
| NO_SIGNAL_MUTE         | <[ | Off  | >] |
| TUNING SYSTEM          | <[ | AUTO | >] |
| Low of HPD             | <[ | 5    | >] |
| UART Selection         | <[ | CLI  | >] |
| SERIAL NUMBER EDIT     |    |      |    |
| MODEL NAME EDIT        |    |      |    |
| TEST RESET             | <[ | Off  | >] |
| [</>]Set [Home]Exit    |    |      |    |

Screen Sample

- 2) Press (Enter) button on Remote to back to Service Mode.



Remote Commander

| Main Micro     |          |
|----------------|----------|
| SW Version:    | 0.083    |
| NVM Version:   | TD1.000  |
| Boot Version:  | 0.083    |
| Panel Version: | PA0.008  |
| PQ Version:    | PQ0.027  |
| AQ Version:    | AQ0.0017 |

Screen Sample

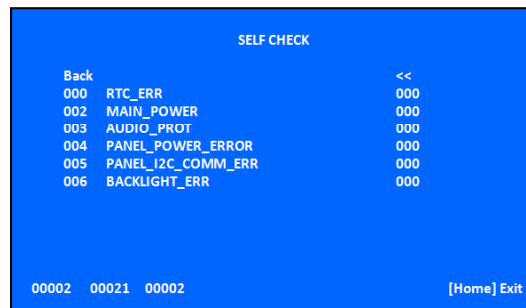
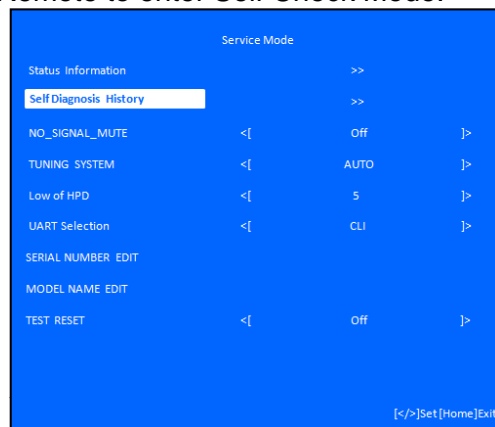
### 4-3. Accessing Self Diagnostic History

- 1) Press  (Enter) button on Remote to enter Self Check Mode.



Remote Commander

Screen Sample



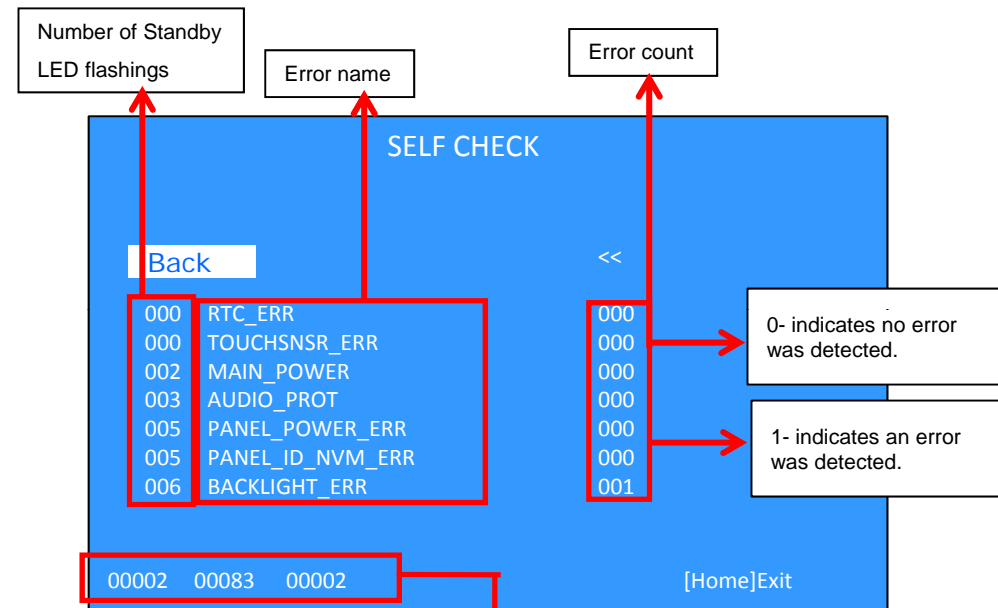
- 2) Press Enter button on Remote to back to Service Mode



Screen Sample

### 4-4. Accessing Self Diagnostic Menu

- 1) Go to TV standby condition by remote commander.
- 2) Press "i+ (info)", "5", "Volume -" then "TV power" on remote.
- 3) To Exit – Press Power Off & On.



Screen Sample

Total Operation Time [h] – Boot Count – Panel Operation Time [h]  
(max 65535) (max 65535) (max 65535)

•Total Operation Time and Panel Operation Time and is recorded every 1 h.

#### Remote function:

→Error history clear : <8> -> <0>

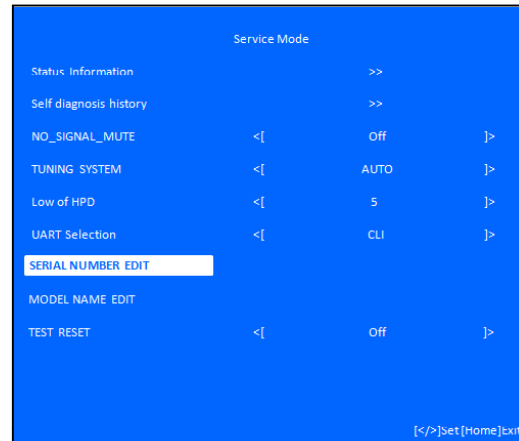
→Panel operation time clear: <7> -> <0>

**4-5. Accessing Serial Number Edit**

1) Press ➡ button on Remote to edit Serial Number.



Remote Commander



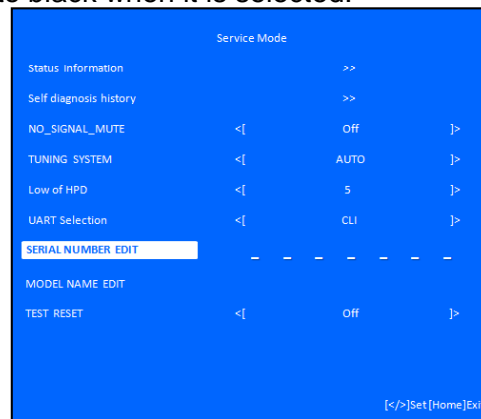
Screen Sample

2) Press ↑ or ↓ button to select number

\* The font color of YES is change to black when it is selected.



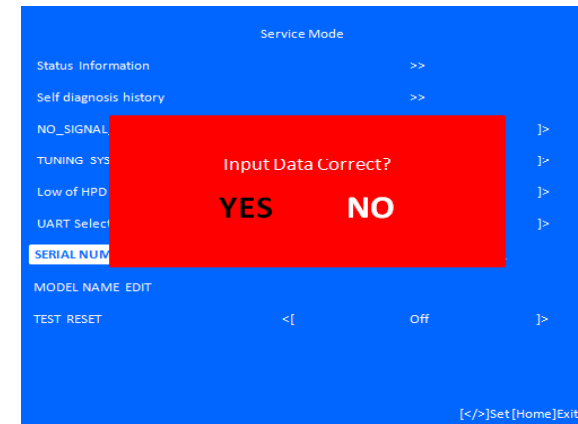
Remote Commander



Screen Sample

3) Serial Number can be set **ONLY ONCE**.

- After user input data , press <Enter>.
- Pop dialog will appear to inform user to confirm data.
- Press ➡ or ⬅ button to select YES or NO.
- Select YES if input data is correct.
- Select NO if input data is incorrect.
- Press <Enter> to save answer.

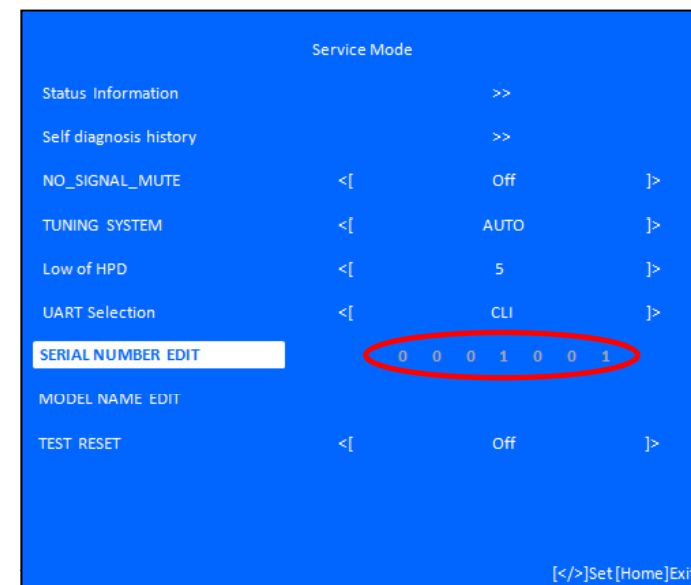


Screen Sample

Note: \* The font color of YES is change to black when it is selected.

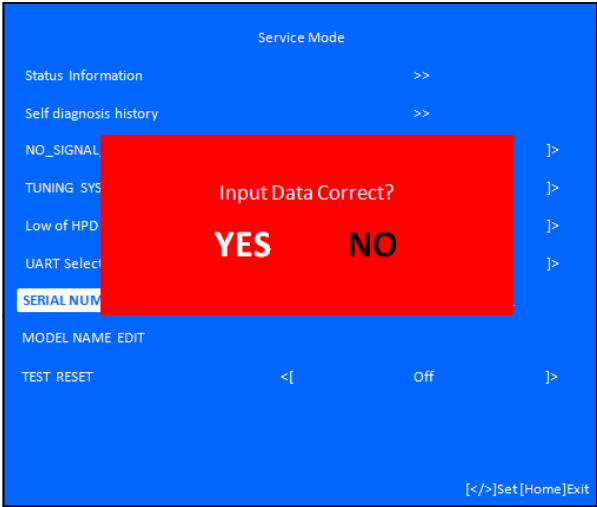
4) If **YES** is selected, the input data is saved into EEPROM.

- SERIAL NUMBER EDIT is grayed out and the serial number that has been input is displayed.
- User will **not able to edit** anymore.



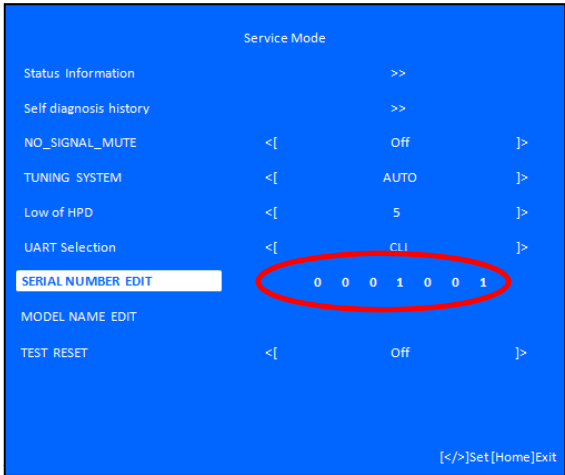
Note : \* The font color of SERIAL NUMBER is change to orange after YES is selected.

- 5) If **NO** is selected, the input data is not saved into EEPROM.
- The serial number that has been input is displayed.
  - User can still edit the Serial Number.



Screen Sample

Note : \* The font color of NO is change to black when it is selected.



Screen Sample

Note : \* The font color of SERIAL NUMBER is white after NO is selected.

4-6. Accessing Model Name Edit

- 1) Press **➡** button on Remote to edit Model Name.



Remote Commander

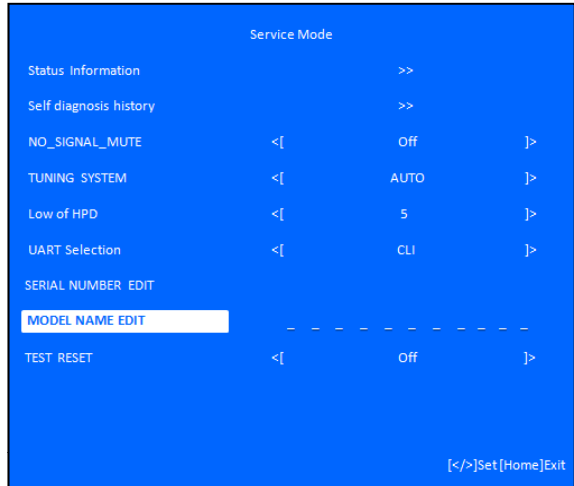


Screen Sample

- 2) Press **↑** or **↓** button on Remote to select character.



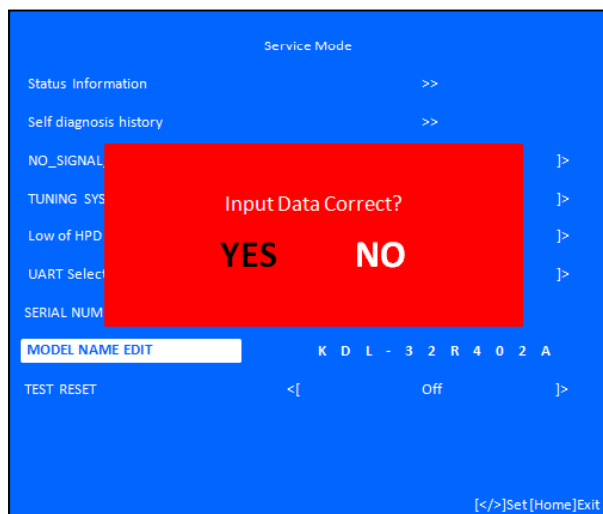
Remote Commander



Screen Sample

3) Model Name can be set **ONLY ONCE**.

- After user input data , press <Enter>.
- Pop dialog will appear to inform user to confirm data.
- Press **➡** or **⬅** button to select YES or NO.
- Select YES if input data is correct.
- Select NO if input data is incorrect.
- Press <Enter> to save answer.

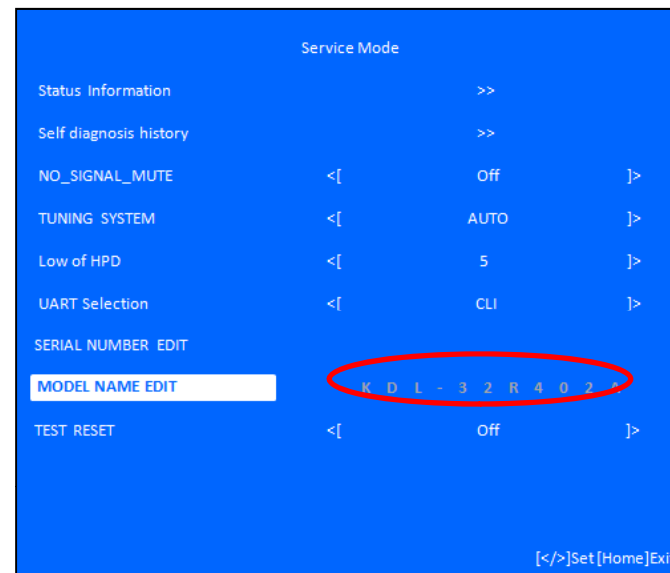


Screen Sample

Note : \* The font color of YES is change to black when it is selected.

4) If **YES is selected**, the input data is saved into EEPROM.

- Model Name EDIT is grayed out and the model name that has been input is displayed.
- User **will not able to edit** anymore

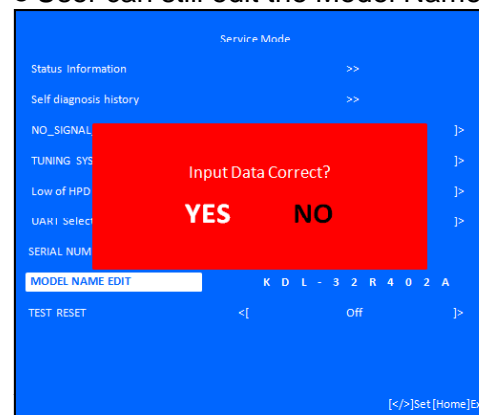


Screen Sample

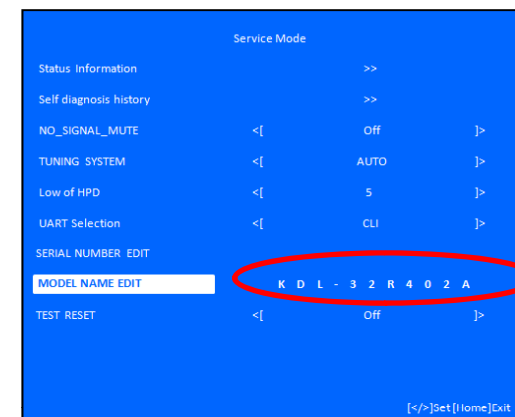
Note : \*The font color of MODEL NAME is change to orange after YES is selected.

5) If **NO is selected**, the input data is not saved into EEPROM.

- The model name that has been input is displayed.
- User can still edit the Model Name.



Note: \*The font color of NO is change to black when it is selected.



Note : \* The font color of MODEL NAME is white after NO is selected.

**4-7. Updating the software (For Asia Region Only)**

Note:

Software updates can be performed by:

1) System Update through the Internet which available only on Certain LCD models. Please check on i-manual or Operating Instruction whether the model is available with the system.

**OR**

2) Please check with Software Upgrade Manual in Service Website for the procedure and when it is require for the software updating.

3) The software updates may not be ready yet in the Website after the 1st Issue of Service Manual is released.

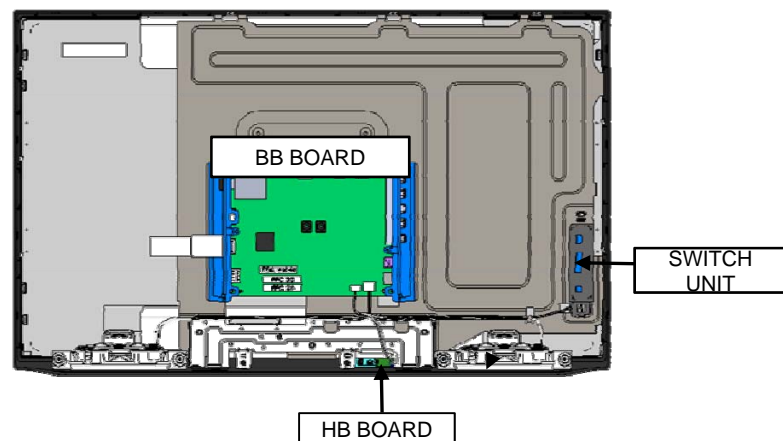
4) Do check and keep updated with the Service Website for any information and/or listed issues that are software related to avoid any discrepancy.

**→User Name and Password required to access to Service Website please check with Service Headquarters.**

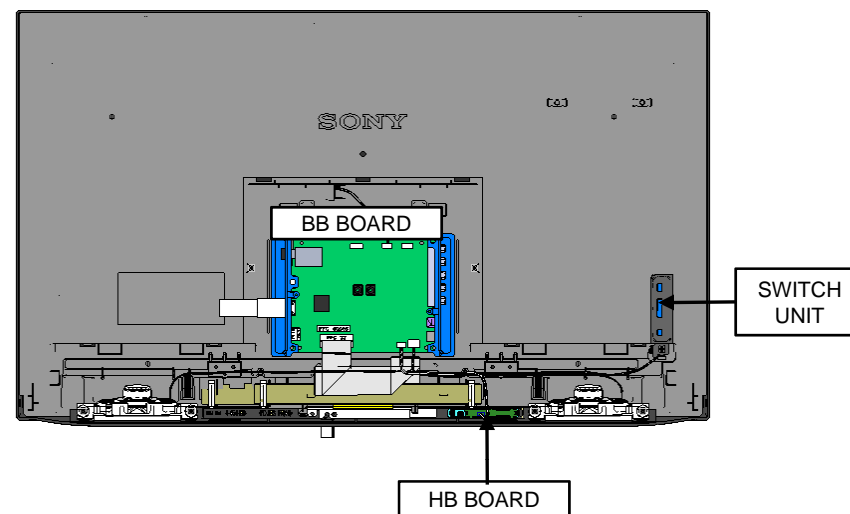
## SECTION 5 DIAGRAMS

### 5-1.CIRCUIT BOARD LOCATION

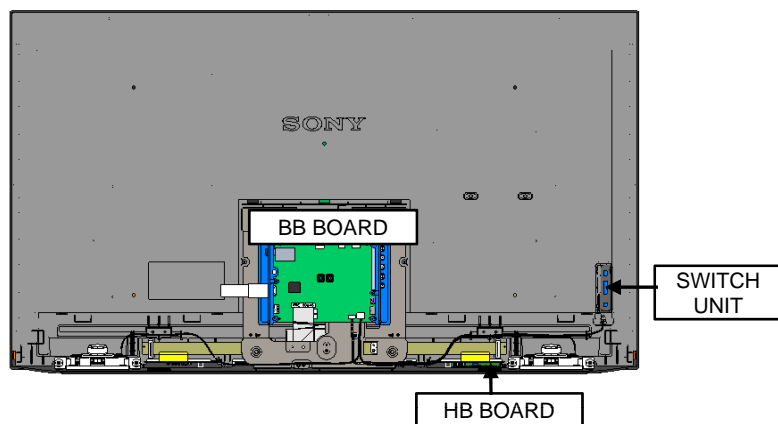
5-1-1. 24"



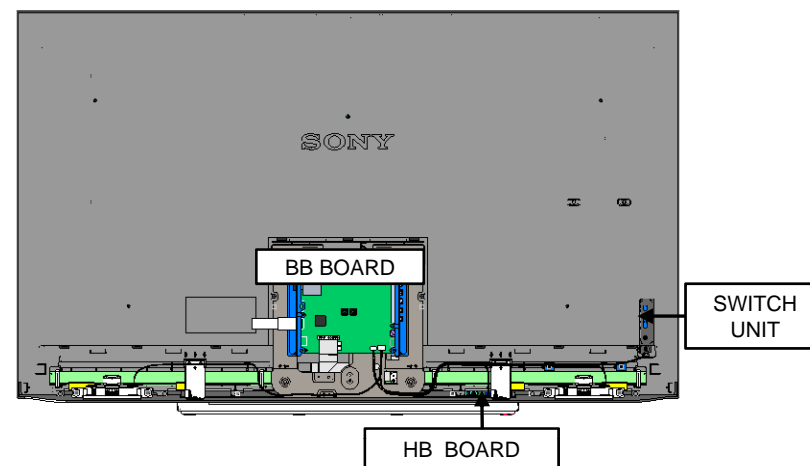
5-1-2. 32"



5-1-3. 40"

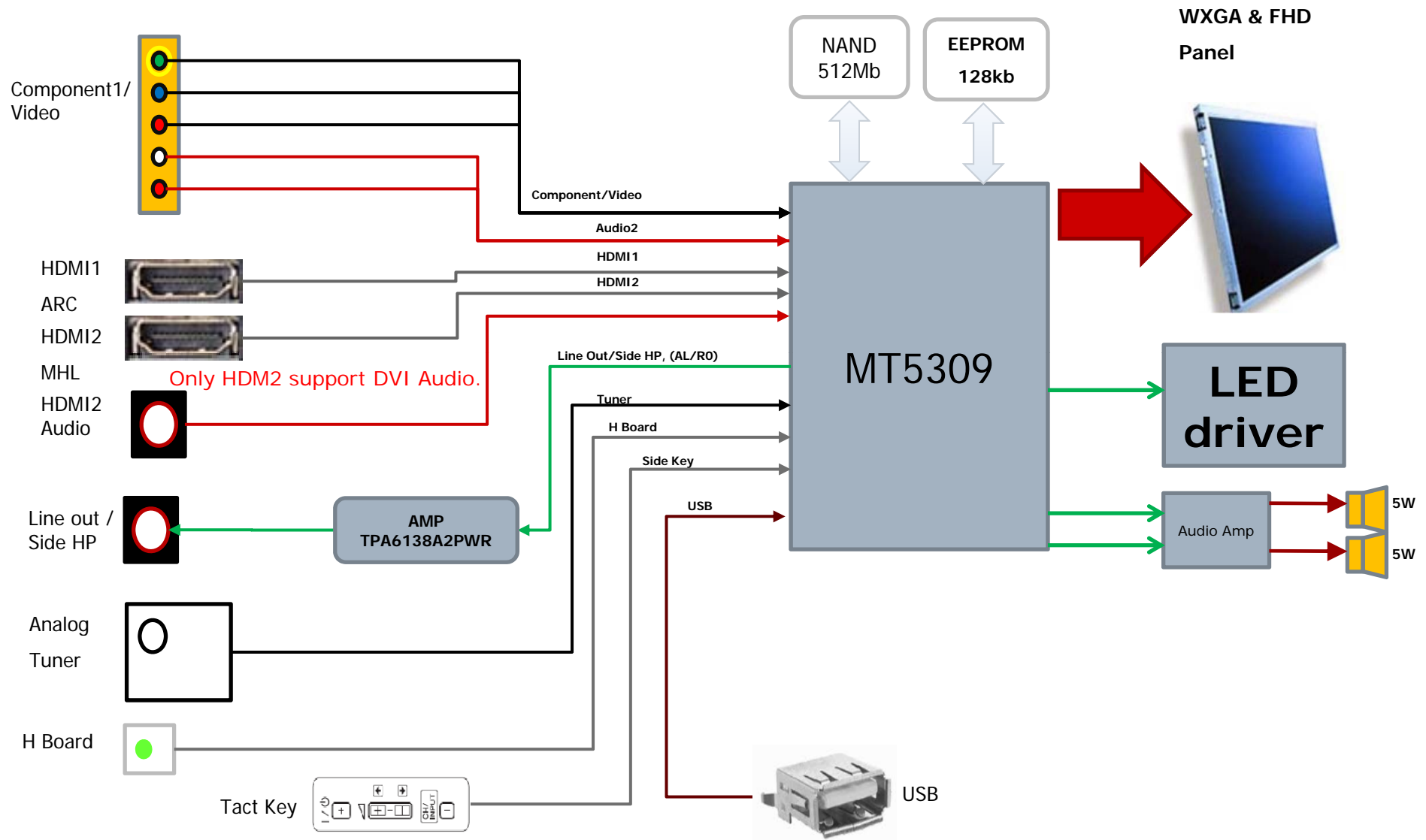


5-1-4. 46"



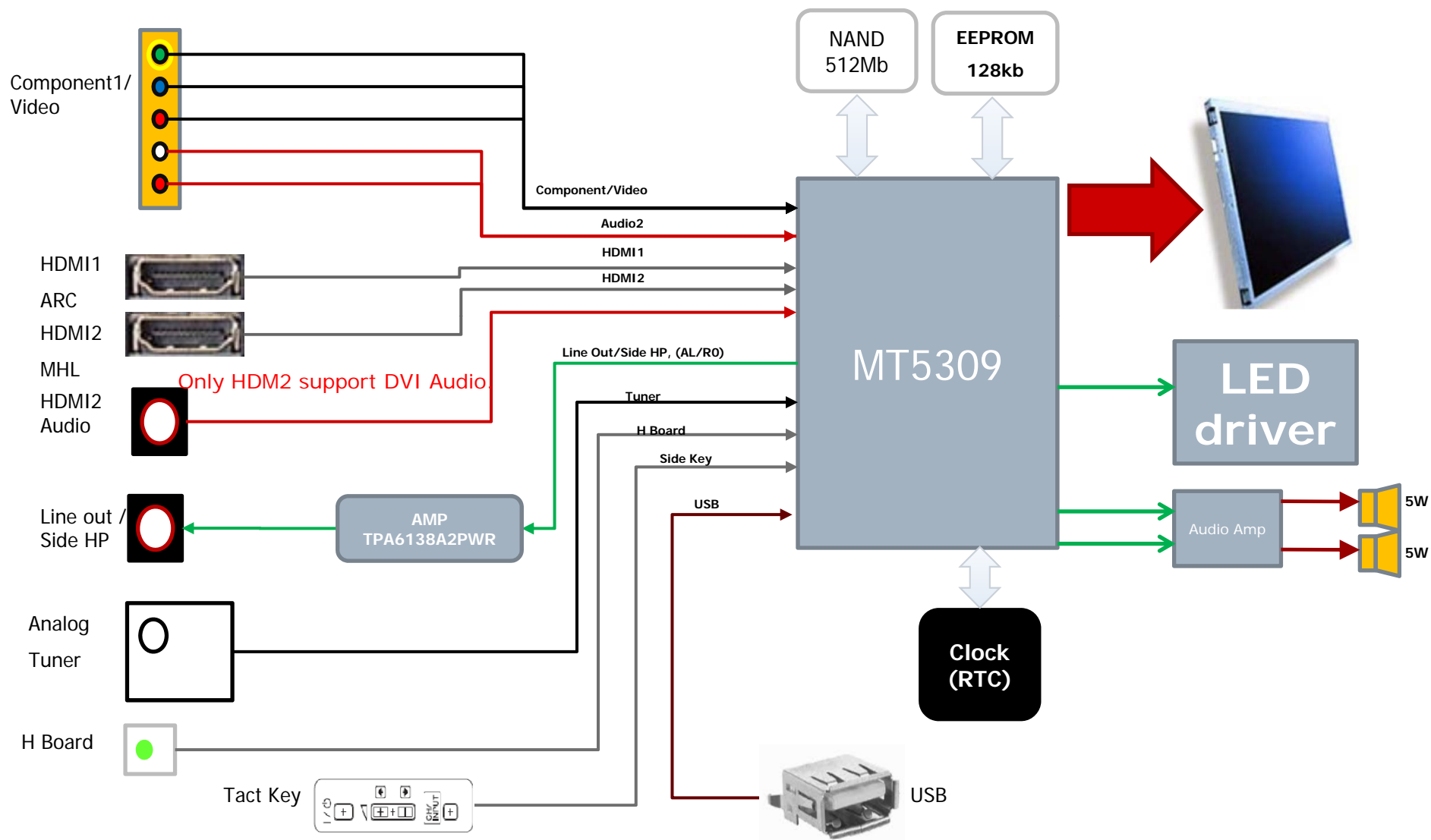
## 5-2. Block Diagram

### 5-2-1 Block Diagram - BA



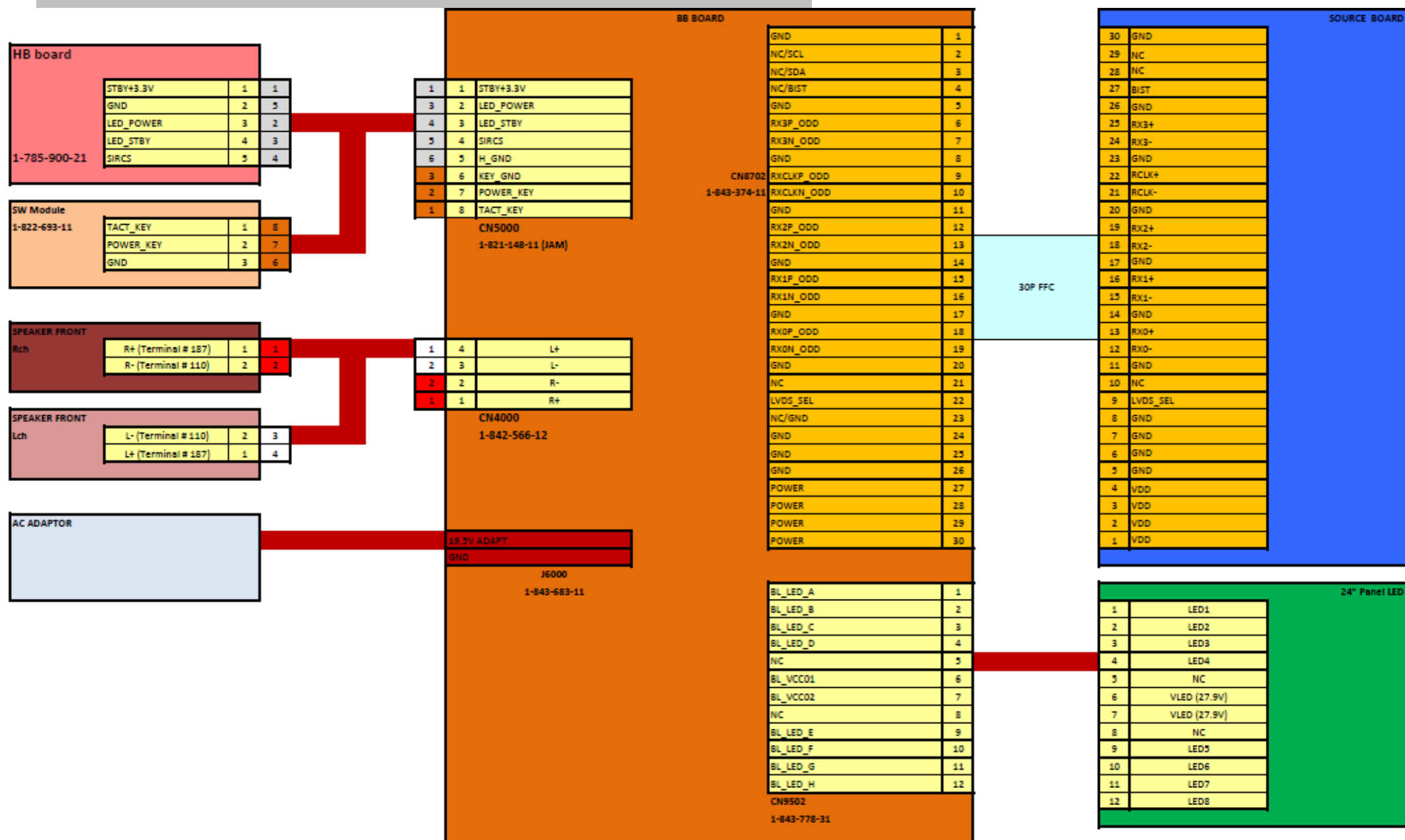
## 5-2. Block Diagram

### 5-2-2 Block Diagram – BA-SU



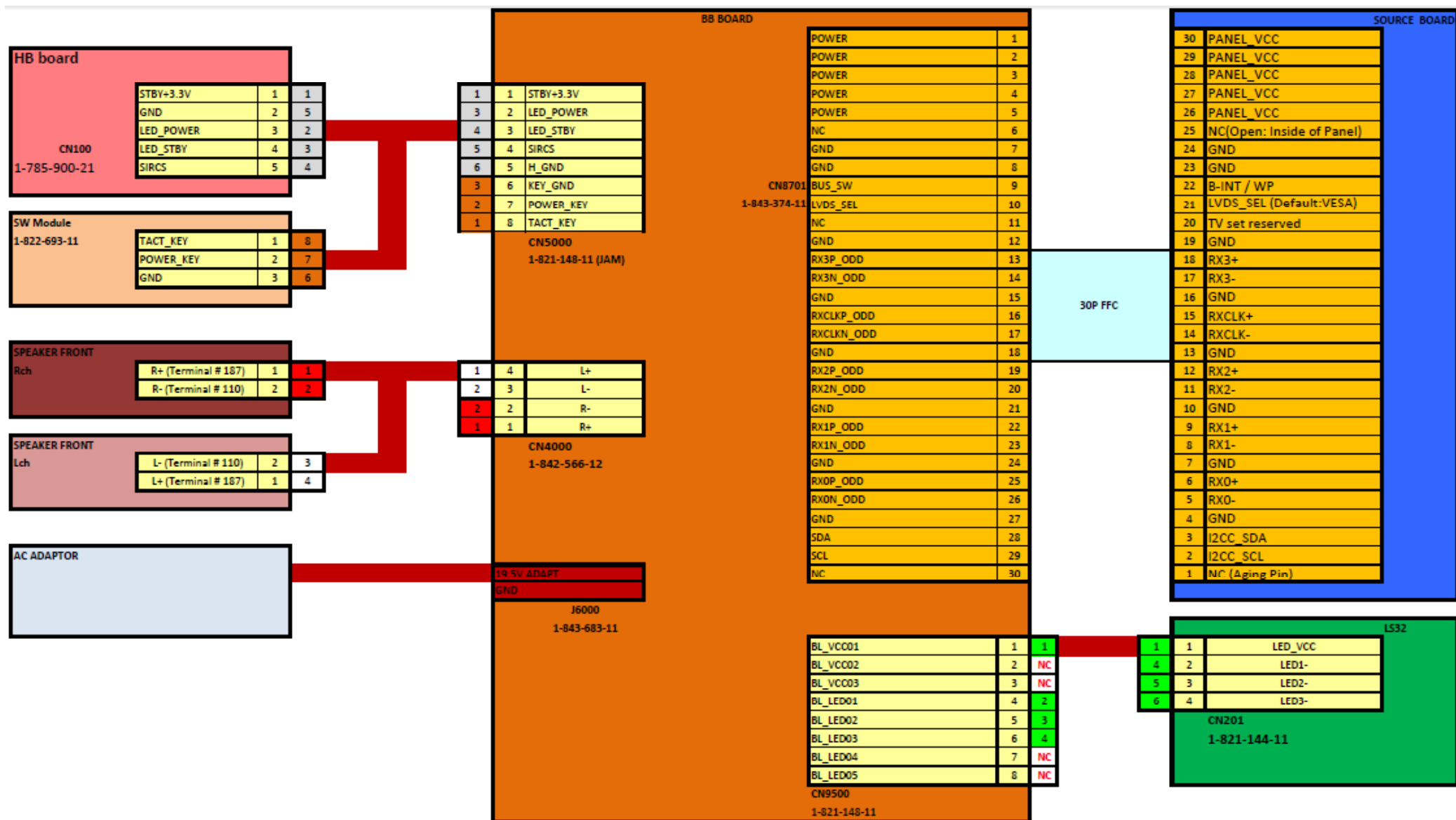
## 5-3. Connector Diagram

## 5-3-1. 24"



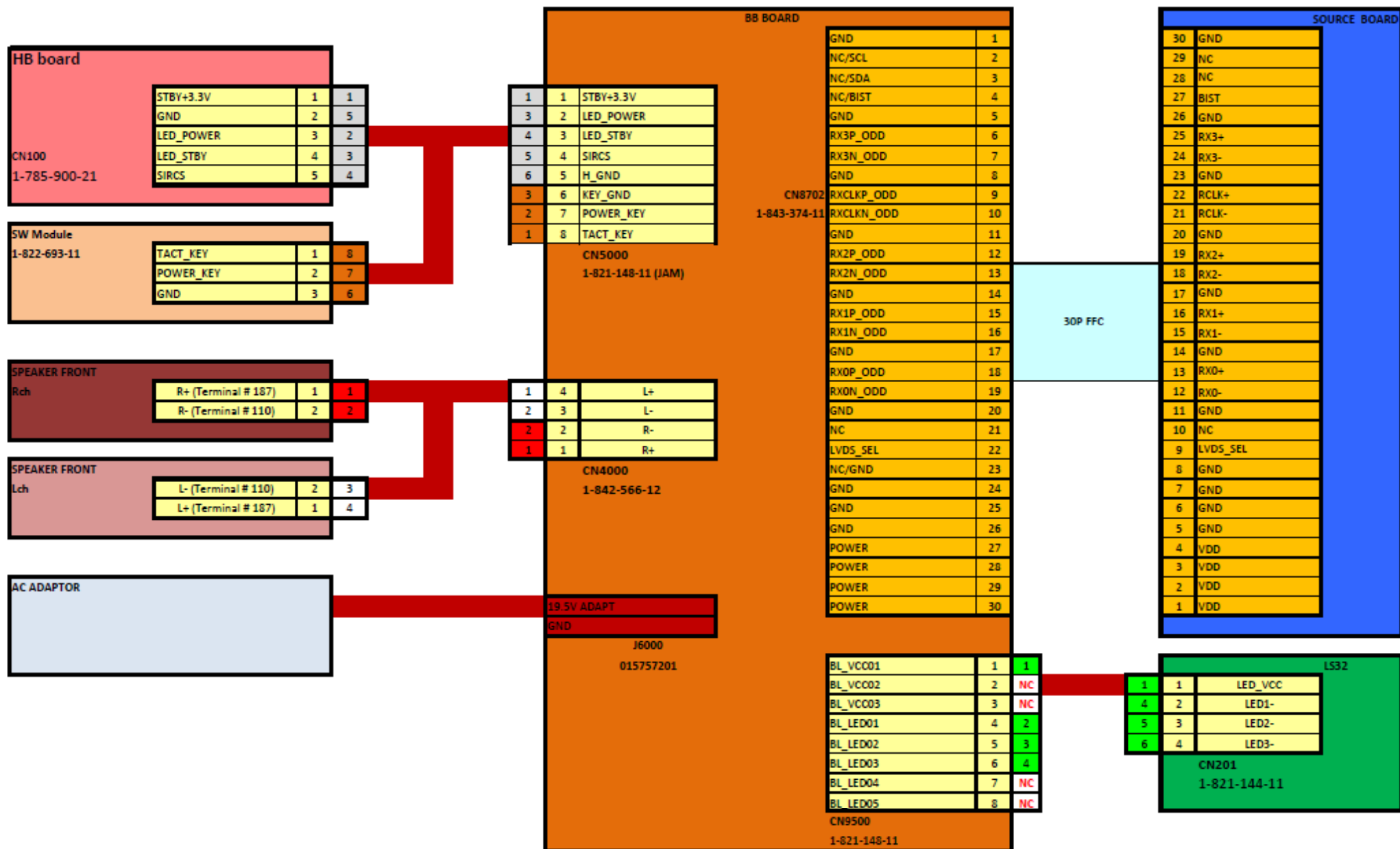
## 5-3. Connector Diagram

## 5-3-2. 32" (AUO)



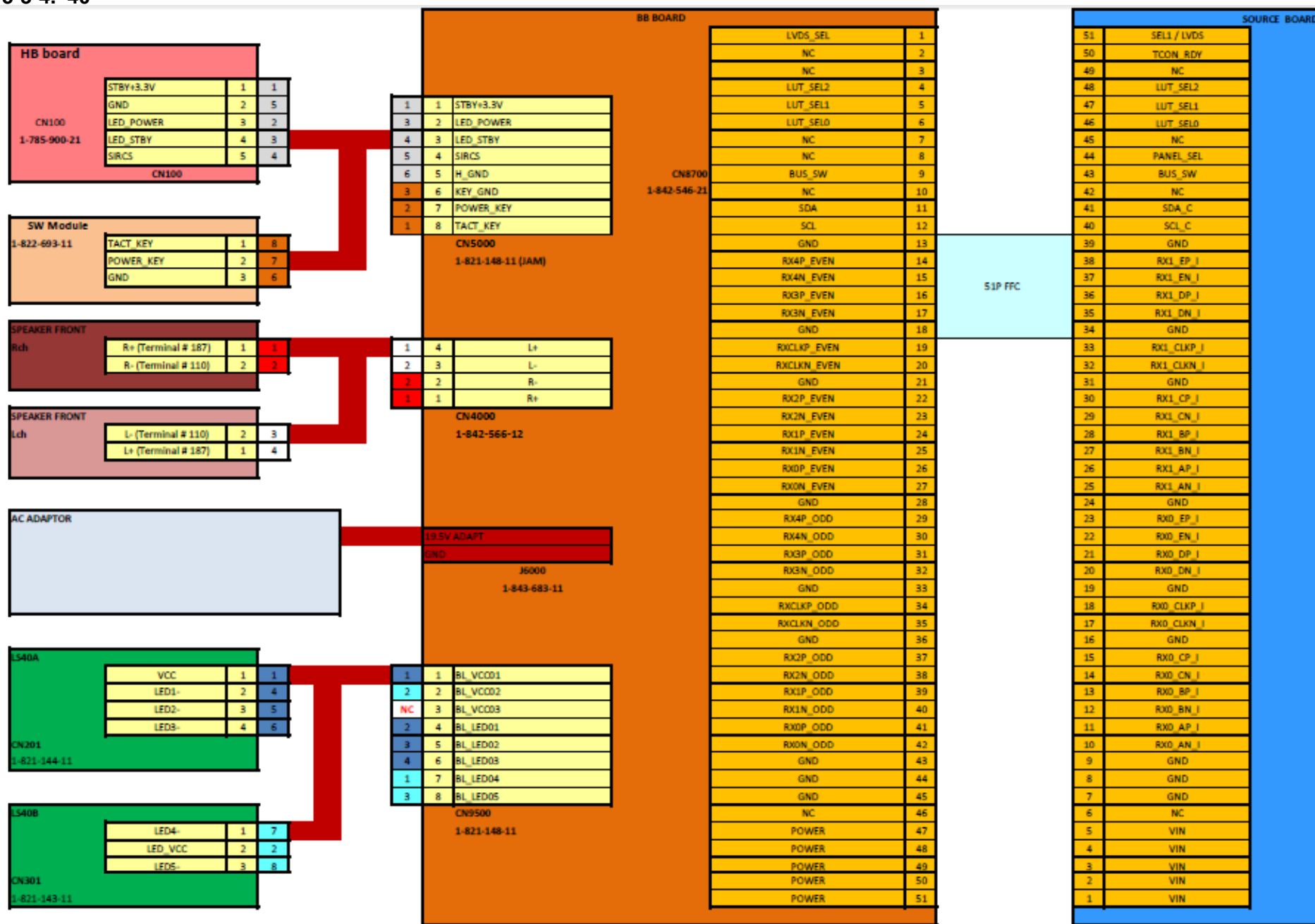
## 5-3. Connector Diagram

## 5-3-3. 32" (LGD)



## 5-3. Connector Diagram

## 5-3-4. 40"



## 5-3. Connector Diagram

## 5-3-5. 46"

