

# ***SERVICE MANUAL (COMMON)***

**ORIGINAL MANUAL ISSUE DATE: 2019.02**

(See next page (for revision )

**GN5UR CHASSIS**  
**Segment : SL**

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9-888-764-01

**LCD TV**

**SONY®**

Sony EMCS (M) Sdn. Bhd., SVPM

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## REVISION HISTORY

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Version	Date	Subject
1	2019.02	1. 1 <sup>st</sup> Issue

**SONY®**

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## MODEL LISTS

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



### REGION

ASIA

AMERICA

EUROPE

CHINA

JAPAN

### MODEL

KD-55X8\*G

KD-65X8\*G

KD-75X8\*G

KD- 85X8\*G

KD-55XG8\*

KD-65XG8\*

KD-75XG8\*

KD- 85XG8\*

XBR-55X8\*G

XBR-65X8\*G

XBR-75X8\*G

XBR-85X8\*G

KJ-55X8\*G

KJ-65X8\*G

KJ-75X8\*G

# TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1	SAFETY NOTES	5
2	SELF DIAGNOSTIC FUNCTION	13
3	TROUBLE SHOOTING	18
4	SERVICE ADJUSTMENT	105
5	DIAGRAMS	114

**Please refer Service Manual – Unique for below information :**

**-Dissassy and Removal Caution**

**-Wire Dressing**

**-Circuit Board Location**

**-Exploded Views and Parts List**

**Note: Pictures provided in this manual may have difference from actual sets.**

# SECTION 1

## SAFETY NOTES

### 1-1. Warnings and Caution

- 1) CAUTION :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) WARNING!! : 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.

The replaceable fuse could be in the neutral of the mains supply. When replacing the fuse, the mains shall be disconnected for de-energize the phase conductors.

(\*Except AC ADAPTOR, Because it does not carry out replacing an internal fuse.)

4) CARRYING THE TV : 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) SAFETY-RELATED COMPONENT WARNING!! : 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.

6) IMPORTANT REMINDER FOR TV MAINBOARD REPLACEMENT : It is mandatory for service centers to confirm the TV's system information after each repair carried out with Mainboard replacement.

Whenever a TV Main board is replaced, the correct TV Model and Serial number must be reinserted into memory.

This is a MANDATORY procedure that each service center must apply.

Please refer to the chapter of ADJUSTMENT in this service manual to find out how to set the model number and serial number in service mode.

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

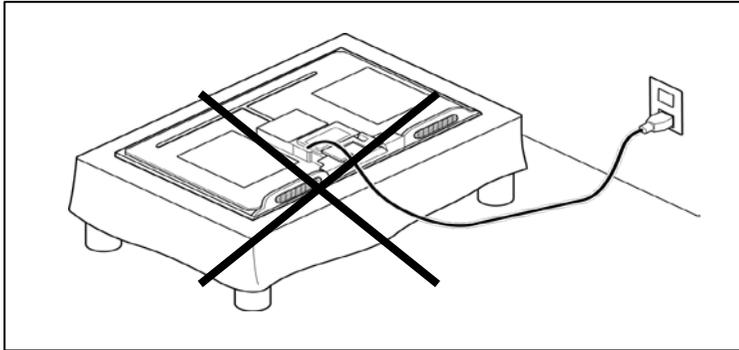
When repairing the LCD Panel, make sure you are grounded with a wrist band.

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. Refer Figure 1 .

Figure 1.



## 1-2-2. Caution for OLED Panel

### 1) Handling

When repairing the TV set, be sure you are grounded by using a wrist band.

- \*Do not press on the panel or frame edge to avoid the risk of electric shock.
- \*Do not scratch or press on the panel with any sharp objects.
- \*Do not leave the module in high temperatures or in areas of high humidity for an extended period of time.
- \*Do not expose the panel to direct sunlight.
- \*Avoid contact with water. It may cause a short circuit within the module.
- \*Disconnect the AC power when replacing.
- \*Always clean the panel with a soft cloth material.
- \*Use care when handling the wires or connectors. Damaging the wires may cause a short.
- \*Protect the panel from ESD to avoid damaging the electronic circuit.

\*Do not recommend power-on in the conditions which laid face down the panel, in repair activity. Refer Figure 1 .

\*When transporting by hand, do not put stress on the panel and the frame around the screen.

Refer to the panel handling chapter of each Service manual, or the "Transporting" information of the Reference Guide of each model for how to hold it.

### 2) OLED Screen

- Although the OLED screen is made with high-precision technology and 99.99% or more of the pixels are effective, black dots may appear or bright points of light (white, red, blue, or green) may appear constantly on the OLED screen. This is a structural property of the OLED screen and is not a malfunction.
- Do not push or scratch the front filter, or place objects on top of this TV set. The image may be uneven or the OLED screen may be damaged.
- The screen and cabinet get warm when this TV set is in use. This is not a malfunction.

### 3) Precautions to Protect the Screen from Damage

#### Image retention

OLED TV's are susceptible to image retention (burn-in) due to the characteristics of the materials used. Image retention may occur if images are displayed in the same location on the screen repeatedly or over extended periods of time. This is not a malfunction of the TV. Avoid displaying images that may cause image retention.

#### The following are examples of images that may cause image retention:

- Content with black bars either on the top and bottom and/or the left and right sides of the screen. (for example, Letterboxed, 4:3 screen, Standard definition)
- Static images such as photos.
- Video games that might have static content in some part of the screen.
- On-screen menus, program guides, channel logos etc.
- Static content from applications.
- On-screen tickers, such as those used for news and headlines.

### To reduce the risk of image retention:

- Fill the screen by changing [Wide mode] to eliminate the black bars. Select [Wide mode] other than [Normal].
  - Turn off the OSD (On Screen Display) by pressing the DISPLAY button, and turn off the menus from connected equipment. For details, refer to the instruction manuals for the connected equipment.
  - Avoid displaying static images with bright colours (including white), clocks or logos on any portion of the screen.
  - Set the picture settings based on the ambient conditions. The Standard Picture is recommended for home use and when viewing content that often displays the station logos, etc.
- The TV has following features to help reduce/ prevent image retention. Press the HOME button, then select [Settings] – [Picture & Display] – [Expert panel settings] – the desired option.

### Panel refresh

Panel refresh will automatically run to adjust the uniformity of the TV screen after it has been in use for long periods of time. Panel refresh can also be performed manually and should only be used if image retention is very noticeable or you see the following message: [Panel refresh did not finish...]

#### Caution:

- The Panel refresh function may affect the panel. As a reference, perform the Panel refresh only once a year, do not perform it more than once a year as it may affect the usable life of the panel.
- Panel refresh takes about one hour to complete.
- A white line may be displayed on the screen during the Panel refresh, this is not a malfunction of the TV.
- Panel refresh will only work when the room temperature is between 10 °C and 40 °C.

### Pixel shift

Automatically moves the image on the screen to prevent image retention.

### Other feature

The screen brightness is automatically reduced when displaying still images, clocks, bright colours or logos etc.

### IMPORTANT REMINDER FOR OLED PANEL REPLACEMENT

When carrying out OLED panel replacement, it is mandatory of a service center to confirm and record Panel ON time & Panel Refresh times.

It is because they are indispensable information in order to clarify responsibility for image retention after panel replacement.

Please refer to the chapter of SELF DIAGNOSIS FUNCTION in this service manual to find out how to confirm the Panel ON time & Panel Refresh times in service mode.

### 1-3. Caution\_for\_Board\_handling

Symptom : The following problems will occur due to handling of the IC mounted on the board

- Solder crack due to substrate handling (stress)
- IC breakdown due to static electricity (ESD)

When repairing the TV at the customer's home or service station or Repair of defect board, please pay attention to the handling of the board

#### ※Substrate that needs attention for handling

- Main Board (B\*\* - Board)
- Backend Board (D\*\* - Board)

※Things to prepare in advance

ESD wrist-strap



ESD cushion/sheet

Please use a bag containing the board or a special seat



ESD wrist-strap to be checked daily.  
Use Multi-meter to make sure resistance of ESD wrist-strap is OK.  
(R=750K Ohms to 35Mega Ohms)

1) Caution for Board handling(Stress)

Be sure to observe the following contents.

① Hold the board with both hands



② Do not hold/push Heat-Sink



③ Handle with care. Do not swing.



④ Regardless of Good board or Defective board, always put it on ESD cushion/sheet slowly.



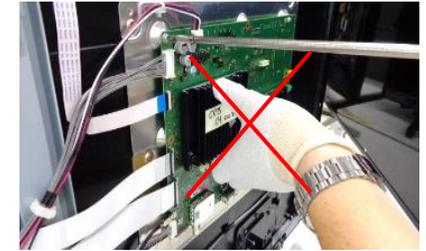
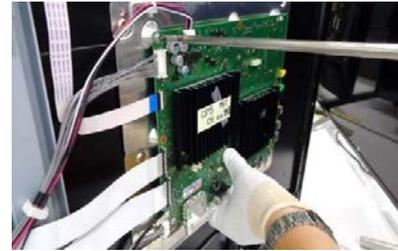
⑤ Do not stack up



⑥ Keep vertical position and put in/take out from Box.  
Always put in to ESD bag then place into Box/Container Box.



⑦ Do not hold Heat-Sink when take out or install it..



2) Caution for Board handling(ESD)

Be sure to observe the following contents.

① When take off Rear-Cover,  
do not touch to board



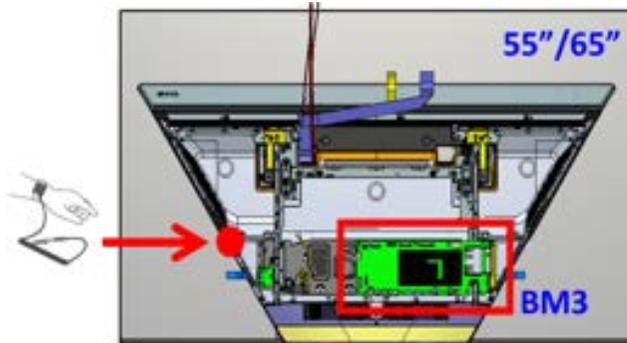
② Use ESD wrist-strap



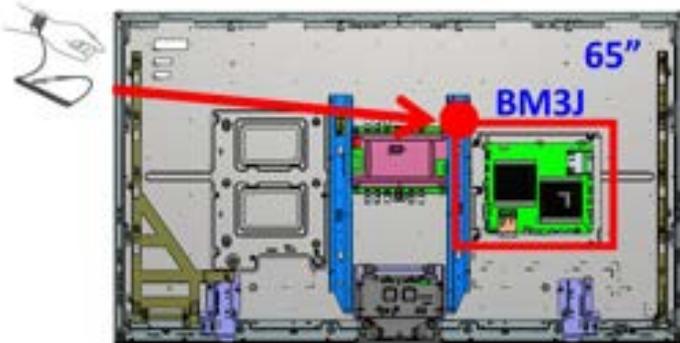
※Installation example of wrist-strap

Please connect the clip to the metal part of the chassis of the TV with the wristband grounded. Below is a grounding example of each model.

<K\*-55/65A9F>



<K\*-65Z9F>



※Caution

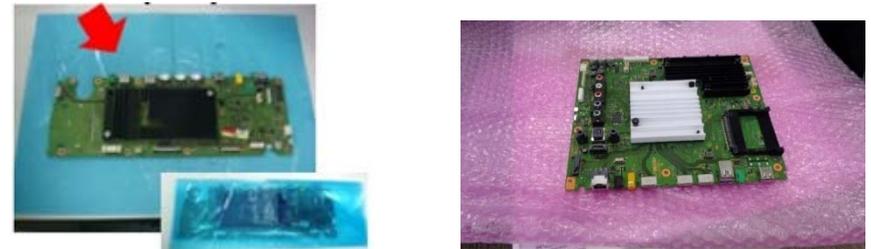
ESD wrist-strap to be checked daily.

Use Multi-meter to make sure resistance of ESD wrist-strap is OK. (R=750K Ohms to 35Mega Ohms)

③When holding board, do not hit/touch to Plastic part(s)



④After take defective board out from TV, put it into ESD bag. Do not place on floor mat/carpet direct. And, always put it on ESD cushion



#### 1-4. Caution About the Lithium Battery

- 1) Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.
- 2) Outer case broken battery should not contact to water.

#### 1-5. 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.

#### 1-6. Leakage Test

(To protect electric shock when customer touch the terminal.)  
Leakage current can be measured by V: Voltmeter or oscilloscope (r.m.s. or peak reading)

Stabilized power supply instrument and isolated voltage transformer:  
Use too much current capacity and isolated voltage transformer does not need to use stabilized power supply equipment.

Specification of RMS volt meter: Input resistance > 1 Mohm, Input capacitance < 200 pF, Frequency range: 15 Hz – 1MHz . Refer Figure 2. Isolated type volt -meter (FLUKE 8921A etc \*1)

\*1 Not use FLUKE 8920A that connected to protective earth by diode  
# Leakage current of measurement instrument is less than 10µArms when under test equipment AC plug is opened

# Set up the following condition and turn on the set. Applied voltage: Nominal input voltage (Description on Nameplate)

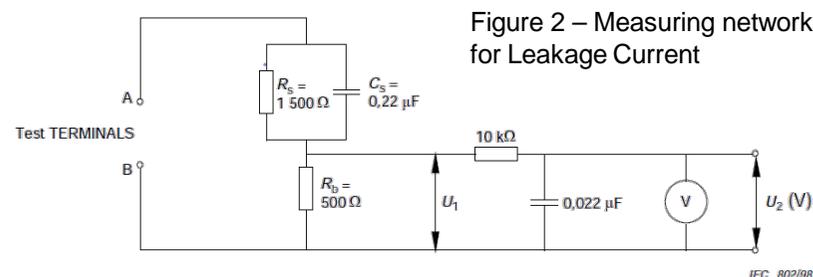
# Measure the leakage current between one phase conductor and neutral for terminal A and terminal B.

Read rms value, and then calculate to peak value PEAK VALUE = $\sqrt{2}$  RMS VALUE

Comply with the following requirement

Class II equipment (2-pin plug): for each terminal, the worst value of measurement must not exceed AC 350µA peak).

Note: including AC adaptor, AC adaptor/DC operated unit combination



### 1-7. 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).

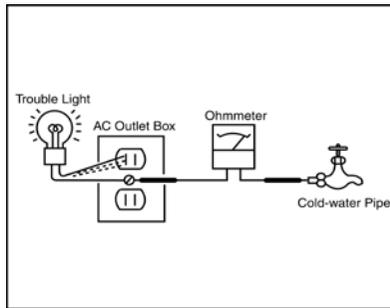


Figure 3. Checking for earth ground.

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.

### 1-8. 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

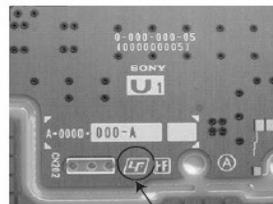


Figure 5: LF logo on circuit board

## SECTION 2 SELF DIAGNOSTIC FUNCTION

The units in this manual contain a self-diagnostic function. If an error occurs, the Smart Core Red LED will automatically begin to flash.

The number of times the LED flashes translates to a probable source of the problem.

A definition of the Smart Core Red LED flash indicators is listed in the instruction manual for the user's knowledge and reference.

If an error symptom cannot be reproduced, the remote commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

### DIAGNOSTIC TEST INDICATORS

When an error occurs, the Smart Core Red LED will flash a set number of times to indicate the possible cause of the problem.

If there is more than one error, the LED will identify the first of the problem areas.

Result for all of the following diagnostic items are displayed on screen.

If the screen displays a "0", no error has occurred .

### Self Diag. Quick Reference (LED blinking)

Smart Core RED LED blinking count	SL/SLL
2x	<B/G/A/LD> Main 12V over voltage [MAIN_POWER]
3x	<B> Main 5.0V failure [DC_ALERT]
	<B/S> Audio amp. protection [AUD_ERR]
5x	<P/T/G/LD/B> <i>Panel ID EEPROM I2C No ACK (Also panel power failure is a suspect) [P_ID_ERR]</i>
6x	<P/G/LD/B> Backlight failure [BACKLIGHT]
7x	<B> Over temperature protection [TEMP_ERR]

*Blue italic:* detect at startup sequence only.

<G>: Power supply board,

<B>: Main board,

<T>: T-con board,

<LD>: LD board,

<Tu>: Tuner board,

<A>: Power Adapter,

<P>: Panel module,

<S>: Speaker

Self Diag. Quick Reference (Not LED blinking [Record Only])

Error Item	SL/SLL
TU_DEMOD	<B/Tu> Tuner board set detect signal monitoring
TCON_ERR	<B/T> T-CON device I2C communication failure
FRCTC_I2C	<B> FRC device I2C communication failure
AUD_ERR_I2C	<B> Audio amp I2C communication failure
TEMP_ERR_I2C	<B> Temp sensor I2C communication failure
TU_DEMOD_I2C	<B/Tu> Tuner & Demodulator I2C communication failure
FRCTC_ERR	<B> <i>FRC device is not finished Initial sequence</i>
EARC_ERR_I2C	<B> eARC I2C communication failure

*Blue italic*: detect at startup sequence only.

<G>: Power supply board,

<B>: Main board,

<T>: T-con board,

<LD>: LD board,

<Tu>: Tuner board,

<A>: Power Adapter,

<P>: Panel module,

<S>: Speaker

## Self Diagnosis service menu

### Entry (Self Diagnosis Display)

- Go to the standby by a remote.
- Push the buttons sequentially:  
<Display><5><Vol-><Power>

### Exit

- If you want to finish service mode app, do **AC OFF/ON**  
→\*Service mode app is disable perfectly
- if you want to move home menu, push <HOME>button  
→\*Service mode app do background(not disable perfectly)

### Self Diagnosis Display

FY19 model (SL/SLL)

SELF CHECK					
Back					
002	MAIN POWER	050121081135	041231123456	031111182547	003
003	DC ALERT	000000000000	000000000000	000000000000	000
003	AUD ERR	000000000000	000000000000	000000000000	000
003	TU DEMOD	000000000000	000000000000	000000000000	000
003	AUD ERR I2C	000000000000	000000000000	000000000000	000
003	TU DEMOD I2C	000000000000	000000000000	000000000000	000
003	EARC ERR I2C	000000000000	000000000000	000000000000	000
005	TCON ERR	000000000000	000000000000	000000000000	000
005	P ID ERR	000000000000	000000000000	000000000000	000
005	FRCTC I2C	000000000000	000000000000	000000000000	000
005	FRCTC ERR	000000000000	000000000000	000000000000	000
006	BACKLIGHT ERR	000000000000	000000000000	000000000000	000
007	TEMP ERR	000000000000	000000000000	000000000000	000
007	TEMP ERR I2C	000000000000	000000000000	000000000000	000
00034	00231	00034			
			[Home]Exit	[Up/Down]Scroll	

# Self Diagnosis Display

## Format of error timestamps

YYMMDDhhmmss (in UTC)

Example:

120823132523 -> Aug 23 2012 13:25:23 UTC

\* Only when time is set, an error timestamp is saved.

Smart Core Red LED  
blinking count

## Panel Operation Time clear

<7> -> <0>

## Timestamps and Error Count clear

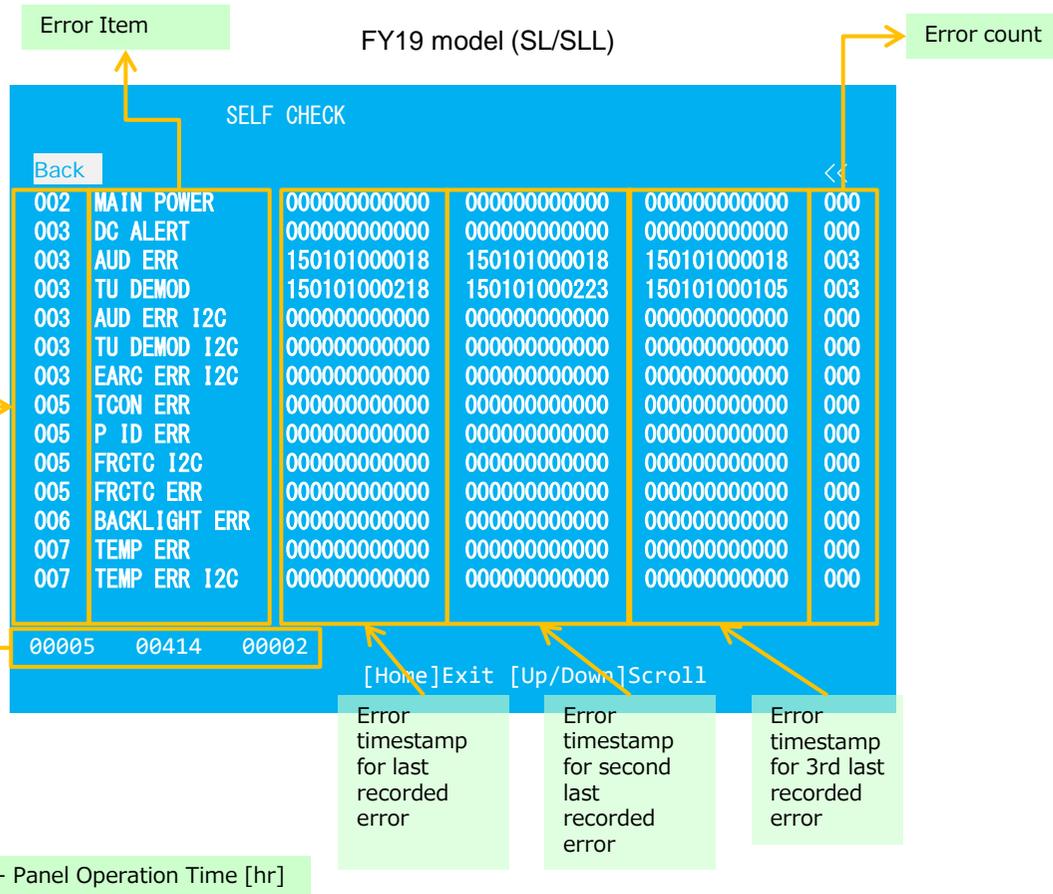
<8> -> <0>

## Total Operation Time and Boot Count clear

<9> -> <0>

•Panel Operation Time is recorded every 30 min, but Total Operation Time is recorded every 1 hr. Therefore, the panel op. time might become larger than the total op. time.

Total Operation Time [hr] - Boot Count - Panel Operation Time [hr]



## Retry Limitation by Remote/Power Key

Smart Core Red LED blinking count	Error Name	Retry Permission Times *1	Note
2x	MAIN_POWER	STDWN_RTRY_LIMIT_MAINPOWER = 1	
3x	DC_ALERT (5V)	STDWN_RTRY_LIMIT = 2	
	AUD_ERR	STDWN_RTRY_LIMIT = 2	
4x	LD_ERR	STDWN_RTRY_LIMIT = 2	
	BCM_ERR	STDWN_RTRY_LIMIT = 2	
5x	P_ID_ERR	STDWN_RTRY_LIMIT = 2	
6x	BACKLIGHT	STDWN_RTRY_LIMIT = 2	
7x	TEMP_ERR	STDWN_RTRY_LIMIT = 2	
8x	4KBE_ERR	STDWN_RTRY_LIMIT = 2	

Number of off/on action for MAIN\_POWER shutdown is recorded to STDWN\_OFFON\_CNT\_MAIN\_POWER.

Number of off/on action during the error shutdown is recorded to STDWN\_OFFON\_CNT.

\*1) If  $STDWN\_OFFON\_CNT \leq STDWN\_RTRY\_LIMIT$ , and  $STDWN\_OFFON\_CNT\_MAIN\_POWER \leq STDWN\_RTRY\_LIMIT\_MAINPOWER$ , you can turn the set on by a remote/power key. At this time, if the error occurs again, the  $STDWN\_OFFON\_CNT$  is incremented by 1.

\*2) When the main micro operates normally for  $STDWN\_OFFON\_CLR = 60$  minutes,  $STDWN\_OFFON\_CNT$  and  $STDWN\_OFFON\_CNT\_MAIN\_POWER$  are cleared.

## SECTION 3 TROUBLESHOOTING

### Triage Chart

#### Before you make the service call...

1. Confirm the symptom from the customer.
2. Select that symptom from the chart.
3. Bring all the boards and cables listed for that symptom.
4. Follow the troubleshooting charts in the technical guides to isolate the board.
5. Chart Colour Code

**RED DOT:** Most likely defective part

**BLUE TRIANGLE:** Secondary possible defective part

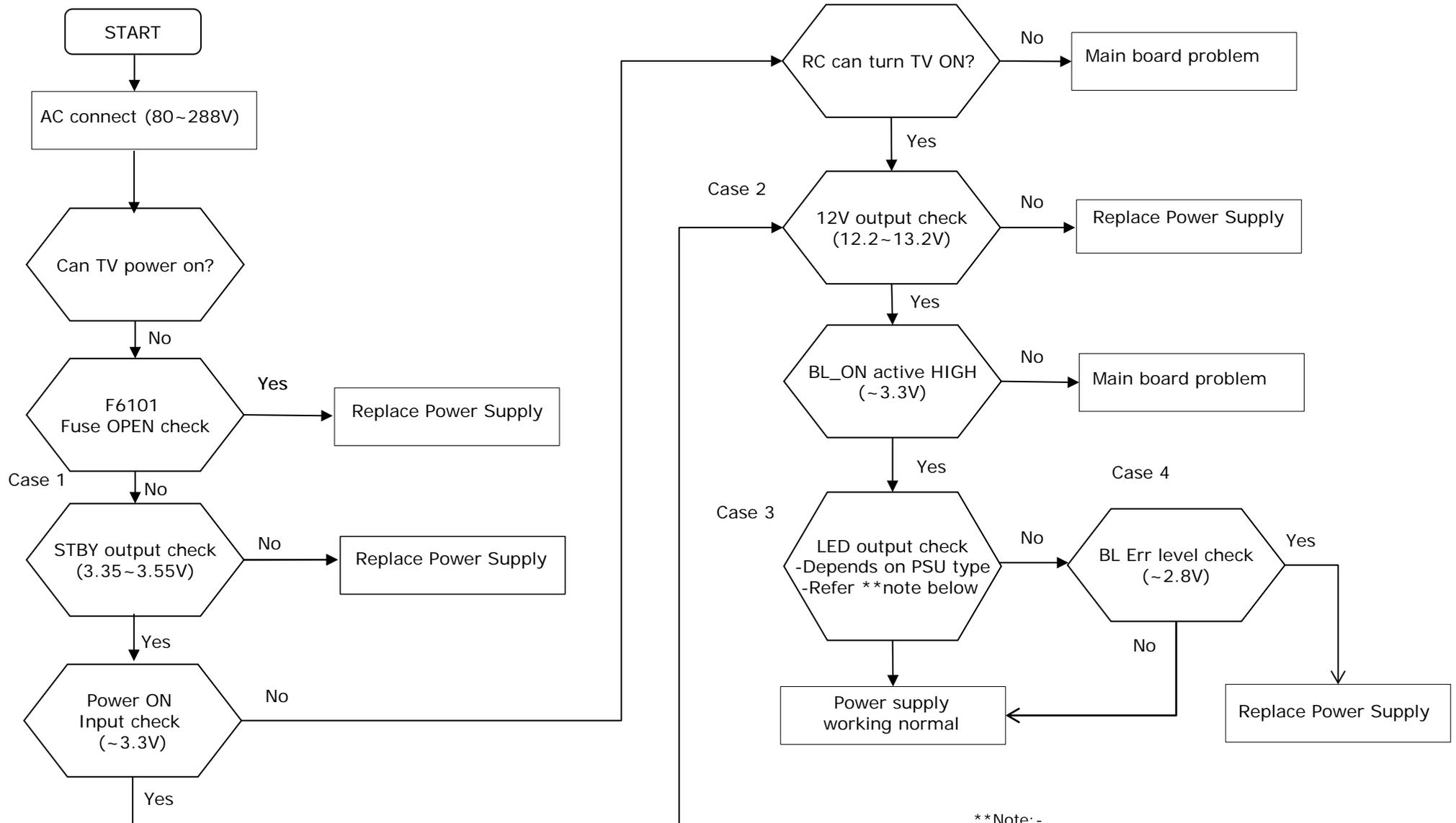
**GREEN SQUARE:** Tertiary possible defective part

**BLACK TEXT:** Board that may correct the symptom

## CHASSIS: SL

Reference	Symptoms - Shutdown. Power LED blinking red diagnostics sequences							Symptoms - no shutdown Error log record only							No Power	Video - missing or distorted				Remote	Network	Audio	Smart Core	Bluetooth (BT)	
	2	3	4	5	6	7	8	TU_DEMOD	TU_DEMOD_12C	TCON_ERR	FRC_TC_ERR	FRC_TC_12C	AUD_ERR_12C	TEMP_12C	EARC_ERR_12C	No White Power LED & does not response to remote (Dead Set)	Stationary colored lines or dots	No video One of Inputs	NO RF input	No video all Inputs	No Remote	Wireless can't connect	No Audio	Smart Core no LED (Set is still alive)	Bluetooth / One Step Remote (OSR) can't connect
B* Board	▲	●		■	▲	●		▲	▲	■	●	●	●	●	●	▲	▲	●	●	●	▲	▲	●	▲	▲
G* Board (SL 55"/65"/75"/85")	●	▲		■	●					■					●					▲		▲			
H* Board															▲						●		●		
LD* Board (SLL 43"/49")	●	▲			●										●					▲		▲			
Speaker		▲																				●			
Tuner board								●	●								▲	●							
Wifi & BT Module																						●			●
V By One FFC				▲						▲							▲			▲					
Tcon				●						●							▲			■					
LCD Panel				■	●					■						●				■					
Problem	Power	Power	LD	Panel (Communication)	Panel (Backlight)	TEMP	4KBE																		
		Audio	BCM																						

# 1.0 Overall Flow chart NO POWER G-Board

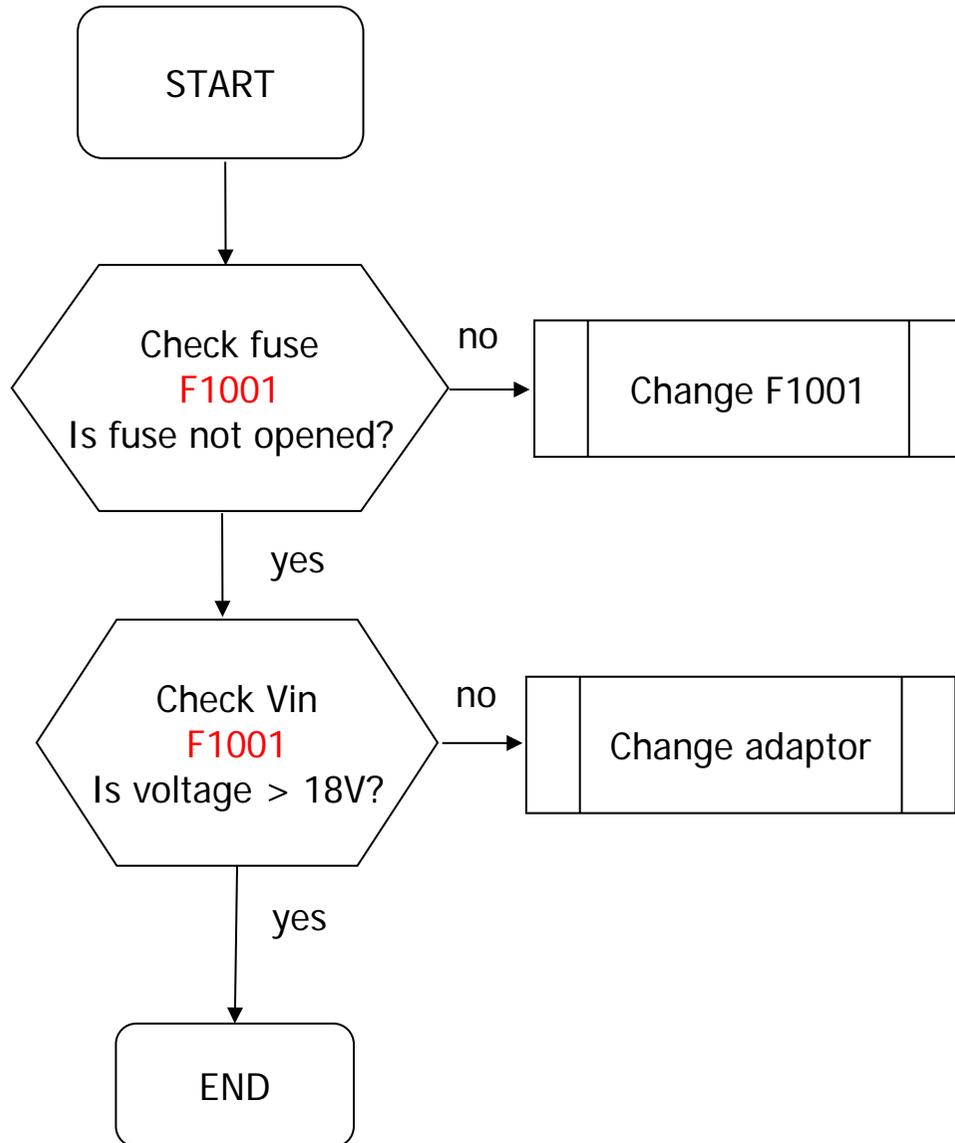


\*\*Note: -

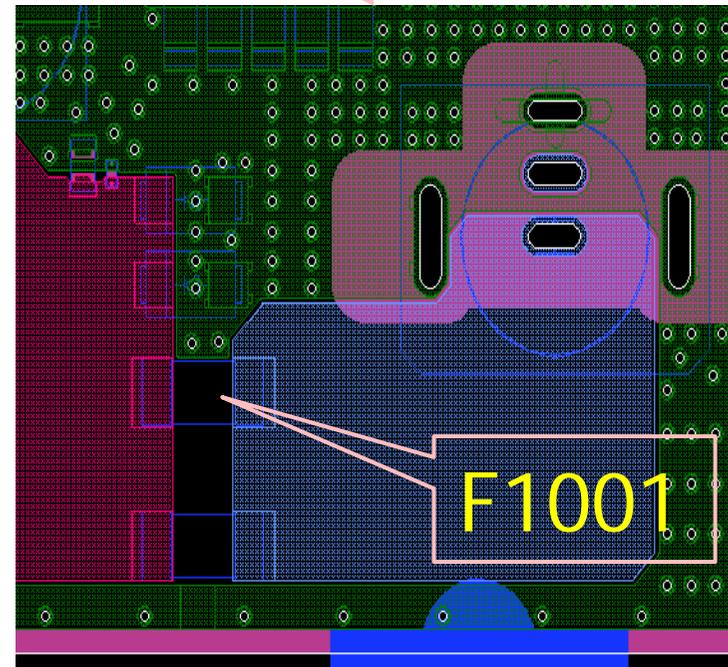
- 1. GL81 = (93.2V ~ 131.2V)
- 2. GL82 = (83.3V ~ 117.4V)
- 3. GL83 = (73.6V ~ 103.7V)

- 4. GL94 = (157.1V ~ 237.9)
- 5. GL93 = (187.1V ~ 237.9)

## 19.5V supply voltage check

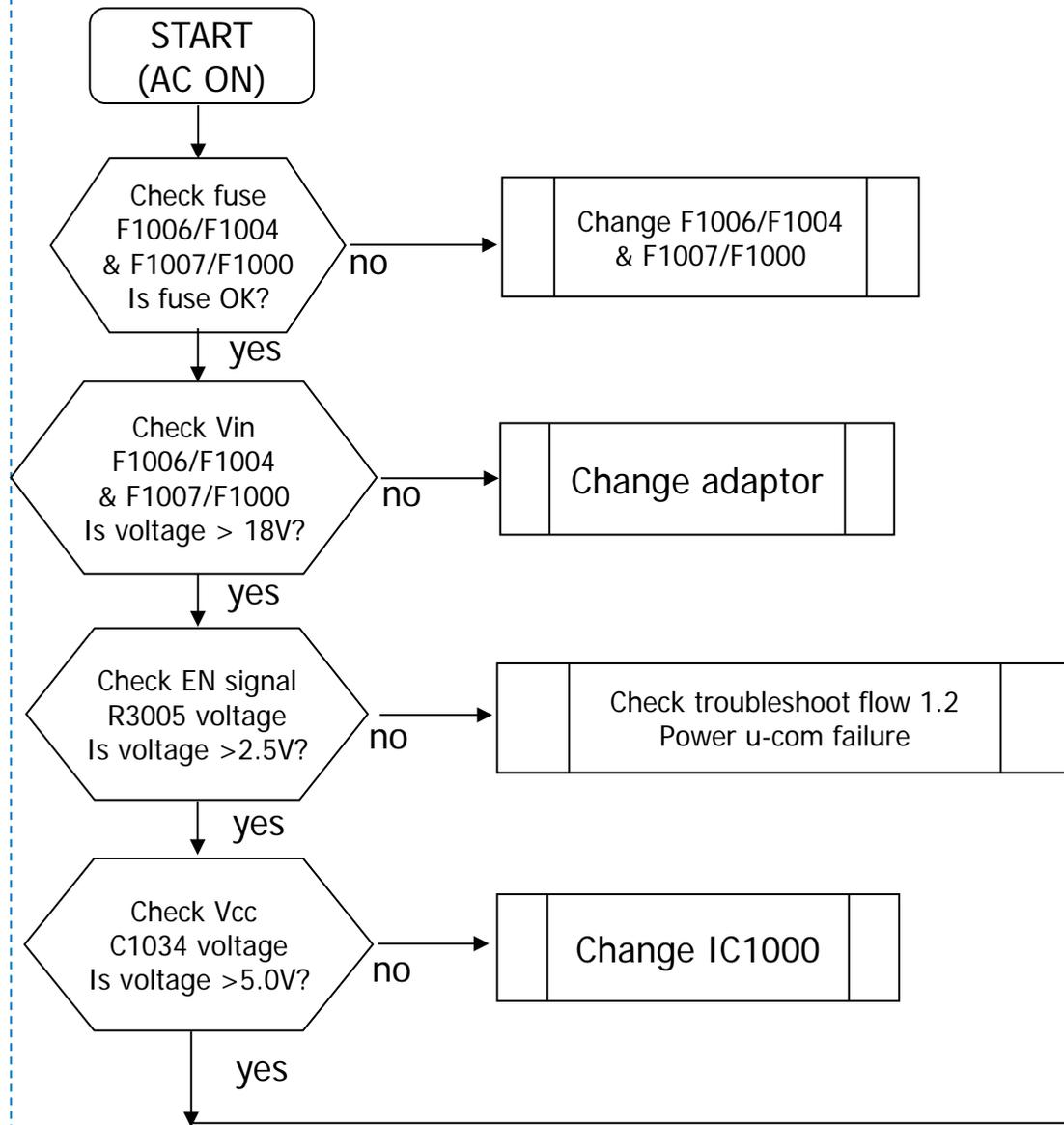


Board: LD2

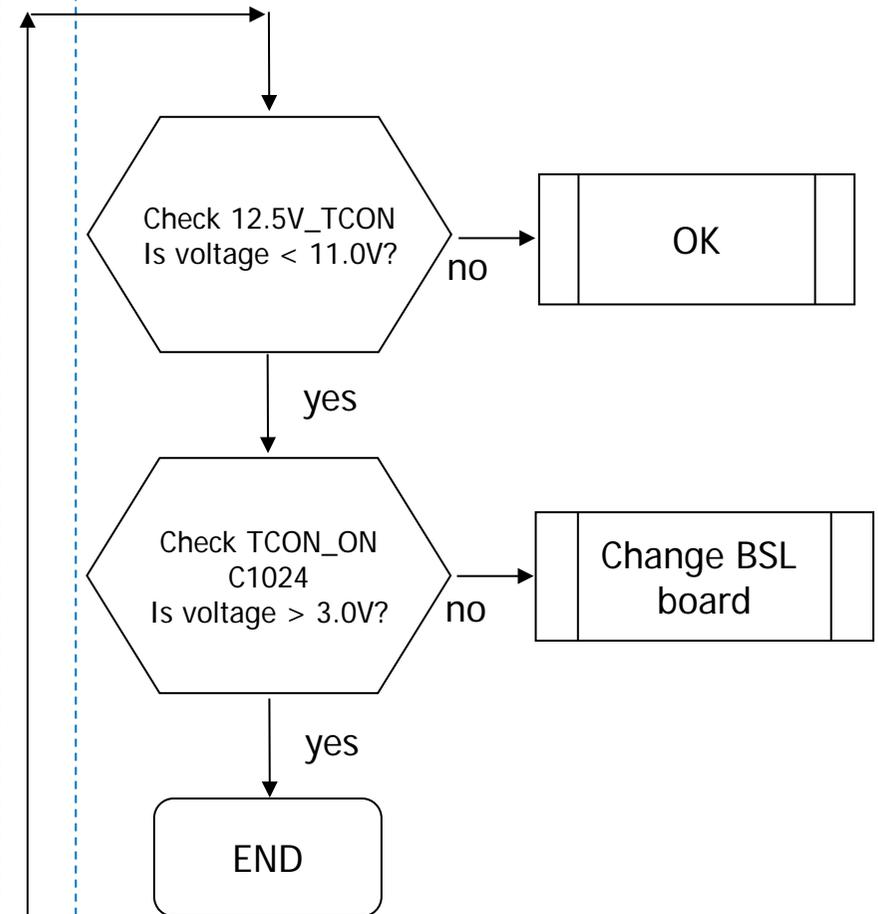


## 1.1 LD2 Troubleshooting Flow

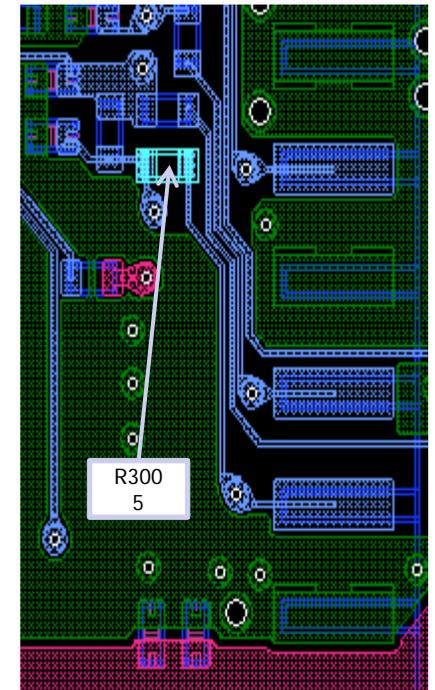
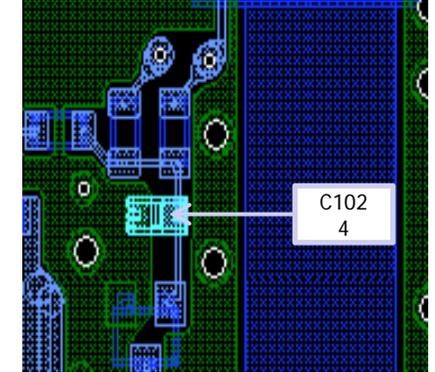
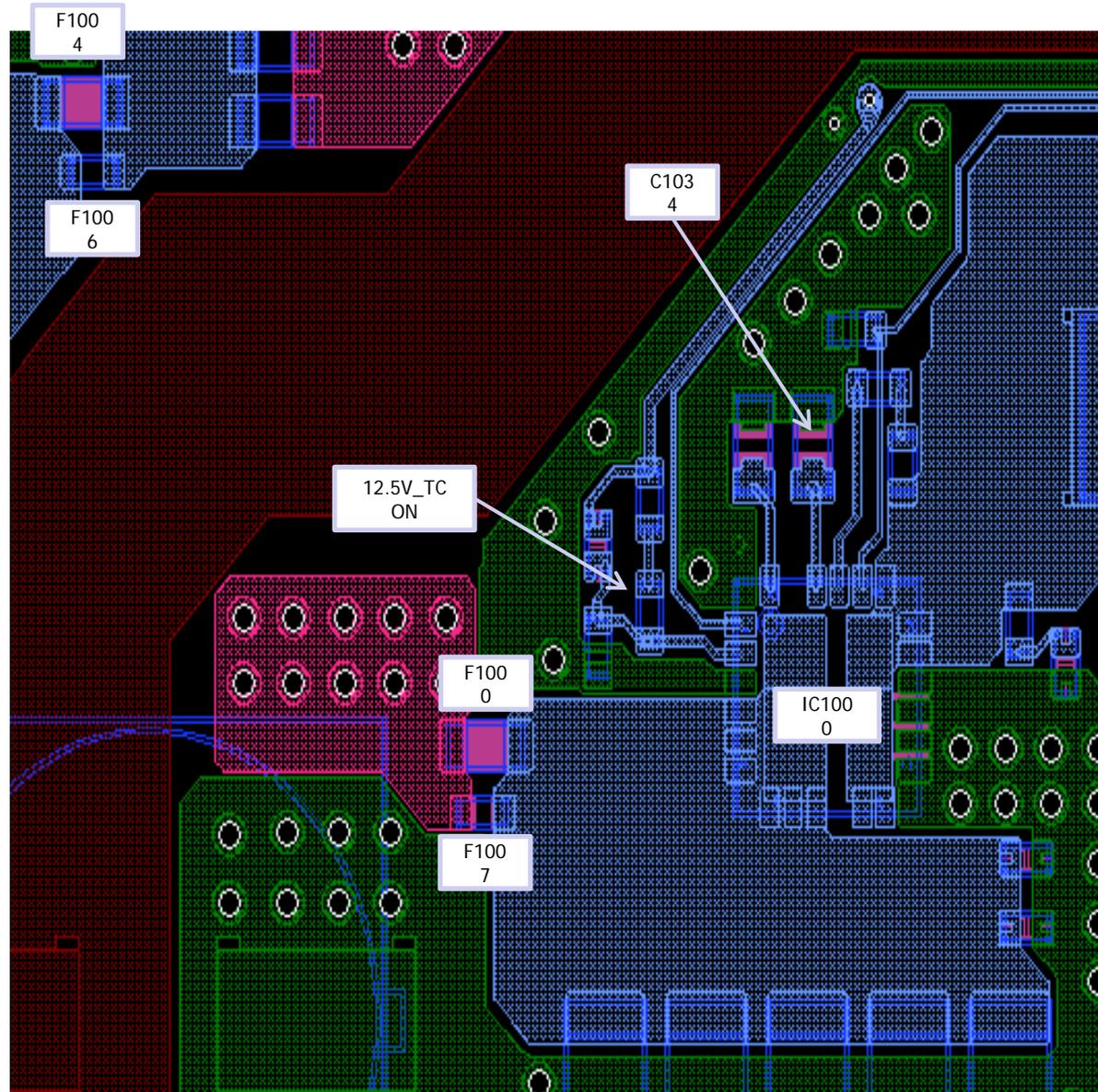
### 12V DDCON check



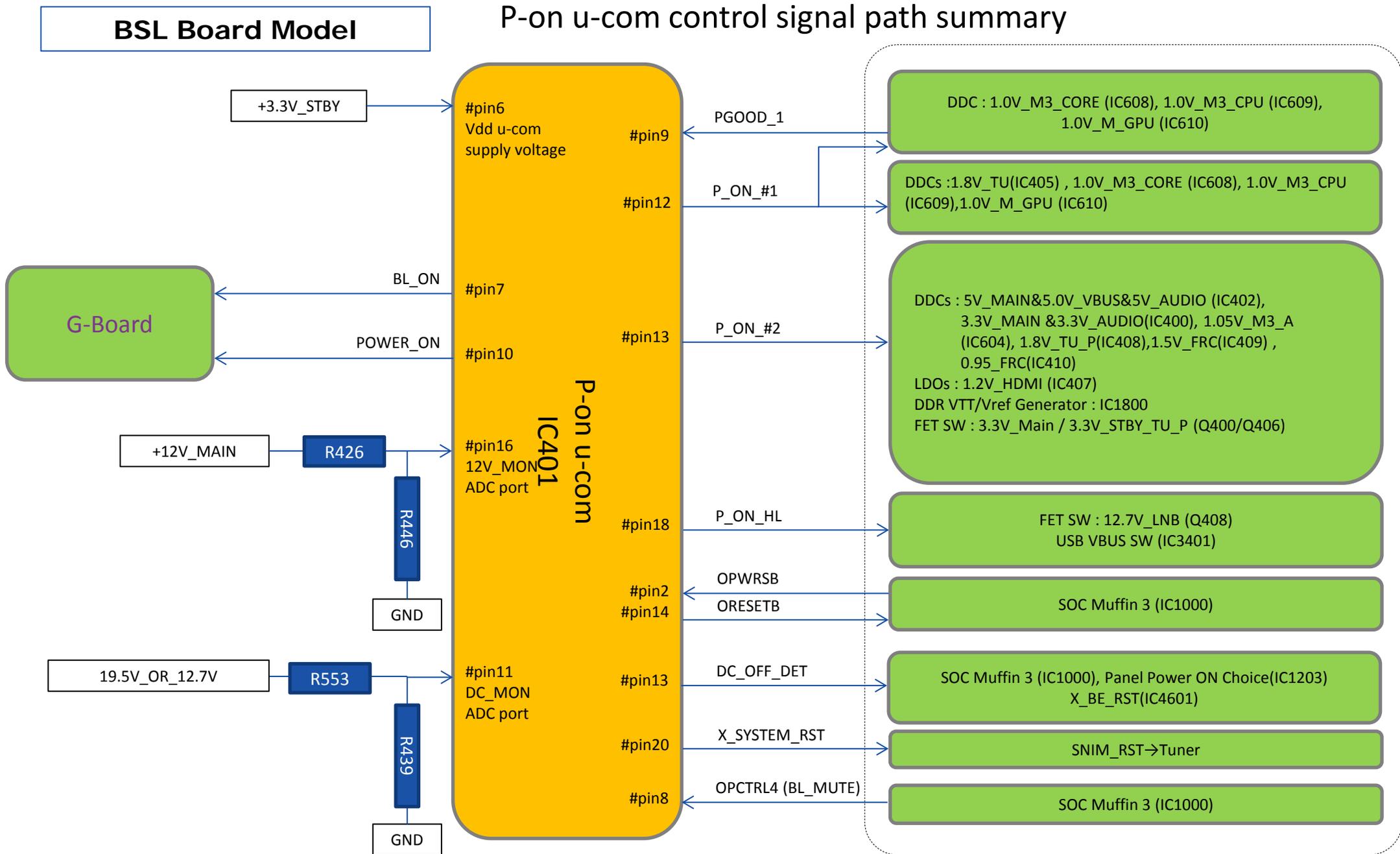
### 12.5V\_TCON check



## Board: LD2

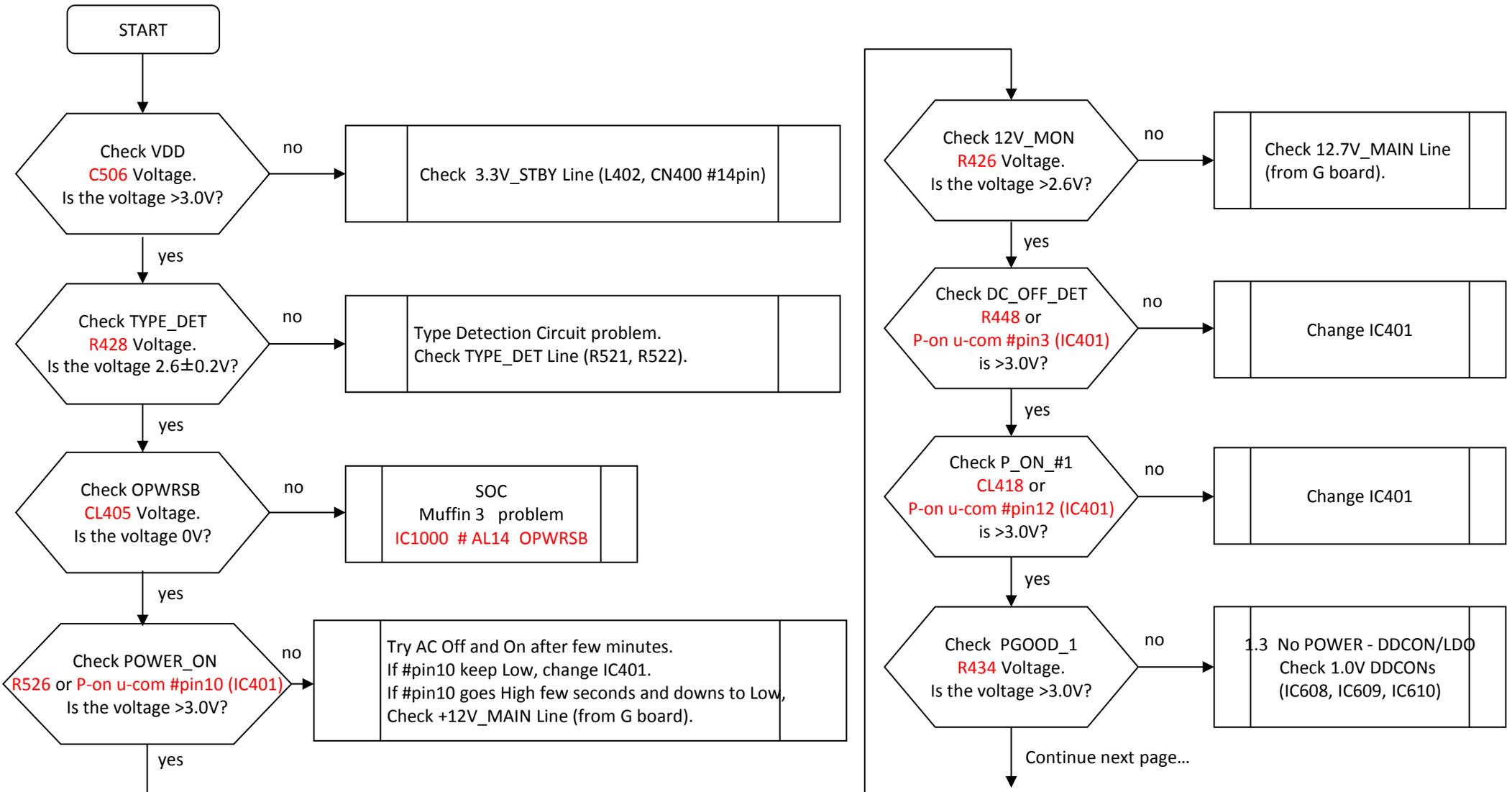


## 1.2 No Power u-com Failure

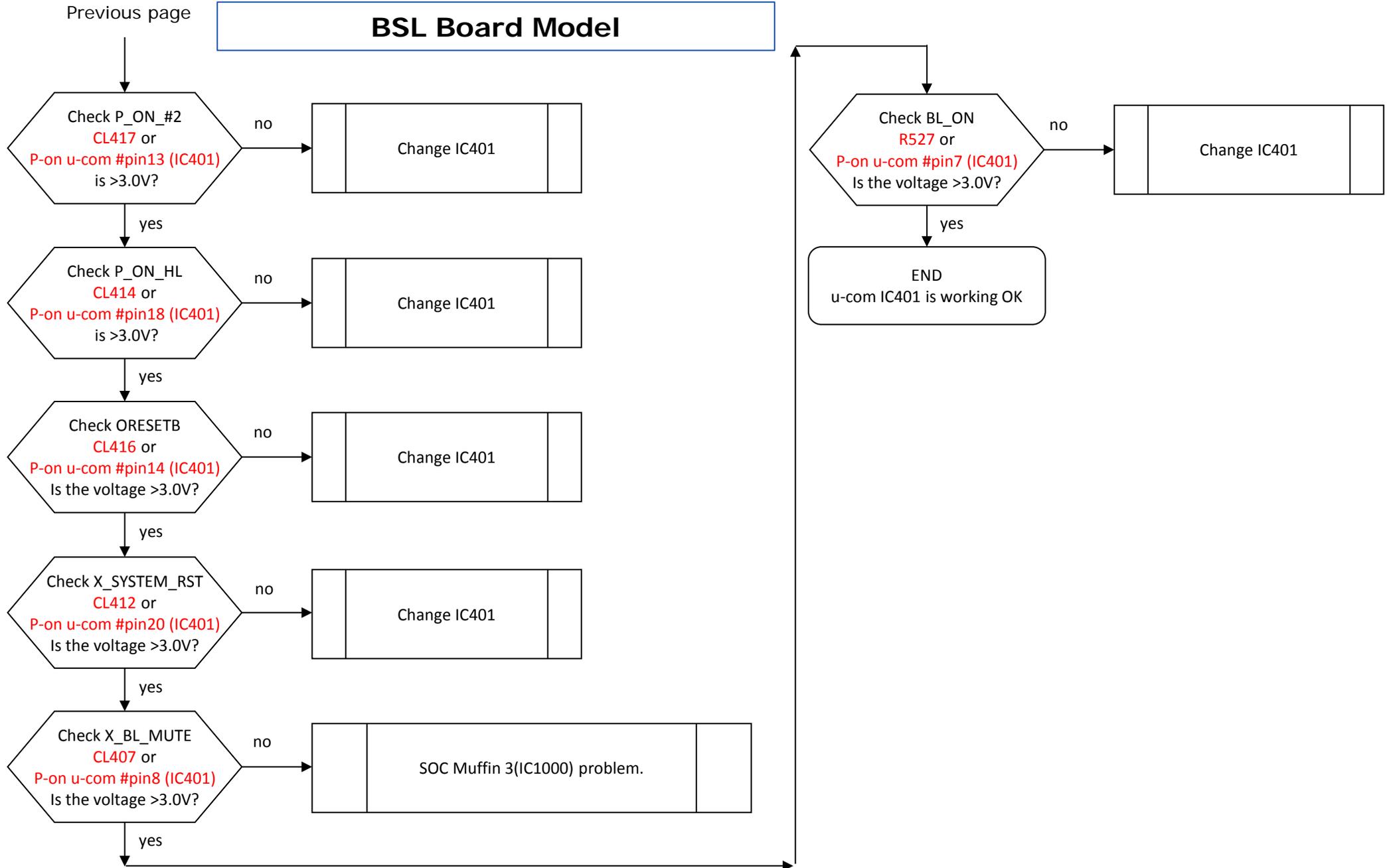


## 1.2 No Power u-com Failure

### BSL Board Model



## 1.2 No Power u-com Failure

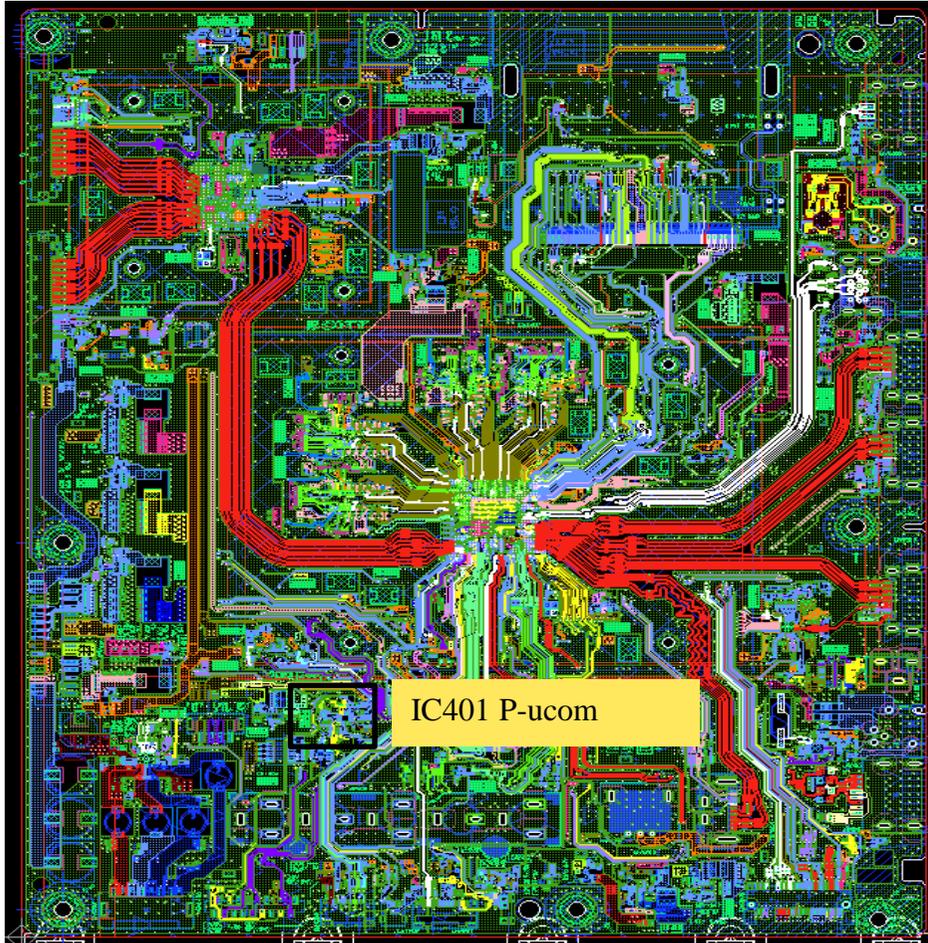


## 1.2 No Power u-com Failure

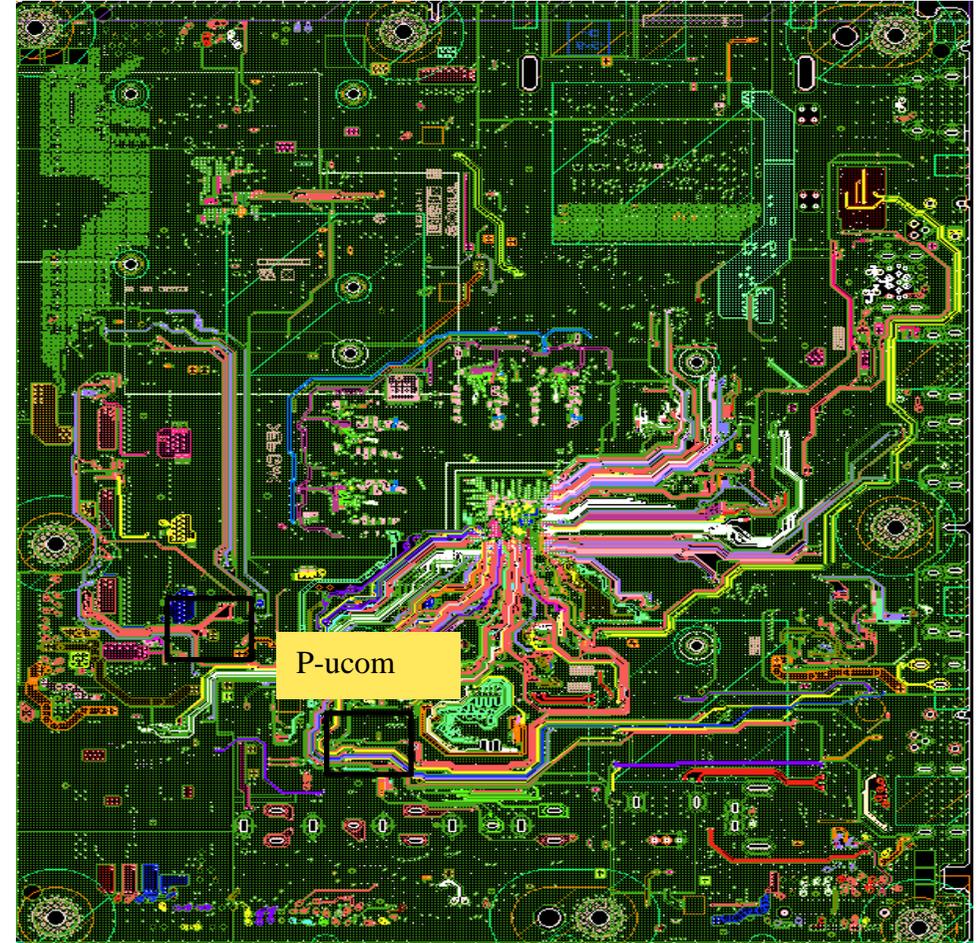
---

Condition	Actions to be taken						
<table border="1"><tr><td data-bbox="562 579 618 671">→</td><td data-bbox="618 579 943 671">Type Detection Circuit problem. Check TYPE_DET Line (R521, R522).</td><td data-bbox="943 579 999 671"></td></tr><tr><td data-bbox="562 703 618 796">→</td><td data-bbox="618 703 943 796">SOC Muffin 3 problem IC1000 # AL14 OPWRSB</td><td data-bbox="943 703 999 796"></td></tr></table>	→	Type Detection Circuit problem. Check TYPE_DET Line (R521, R522).		→	SOC Muffin 3 problem IC1000 # AL14 OPWRSB		Change B-board
→	Type Detection Circuit problem. Check TYPE_DET Line (R521, R522).						
→	SOC Muffin 3 problem IC1000 # AL14 OPWRSB						

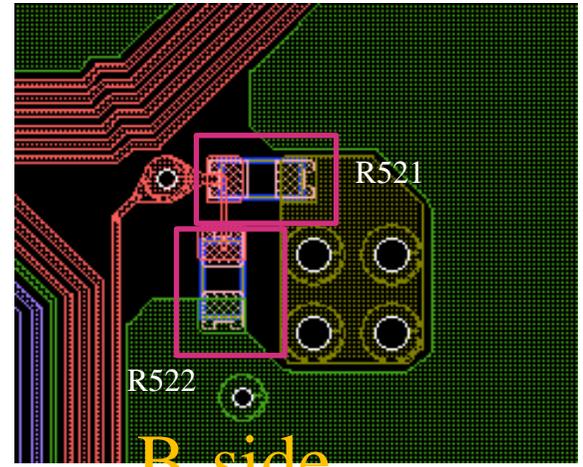
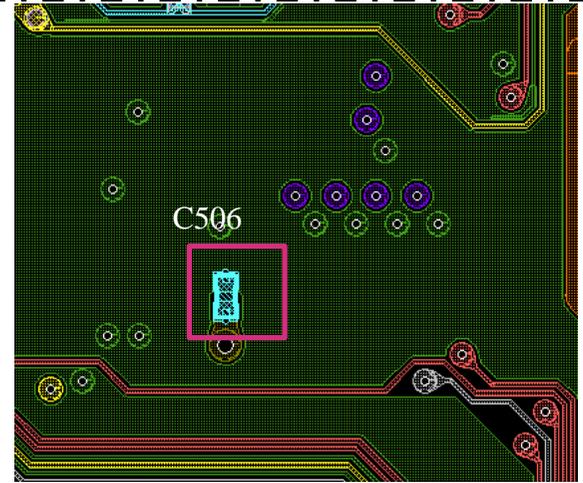
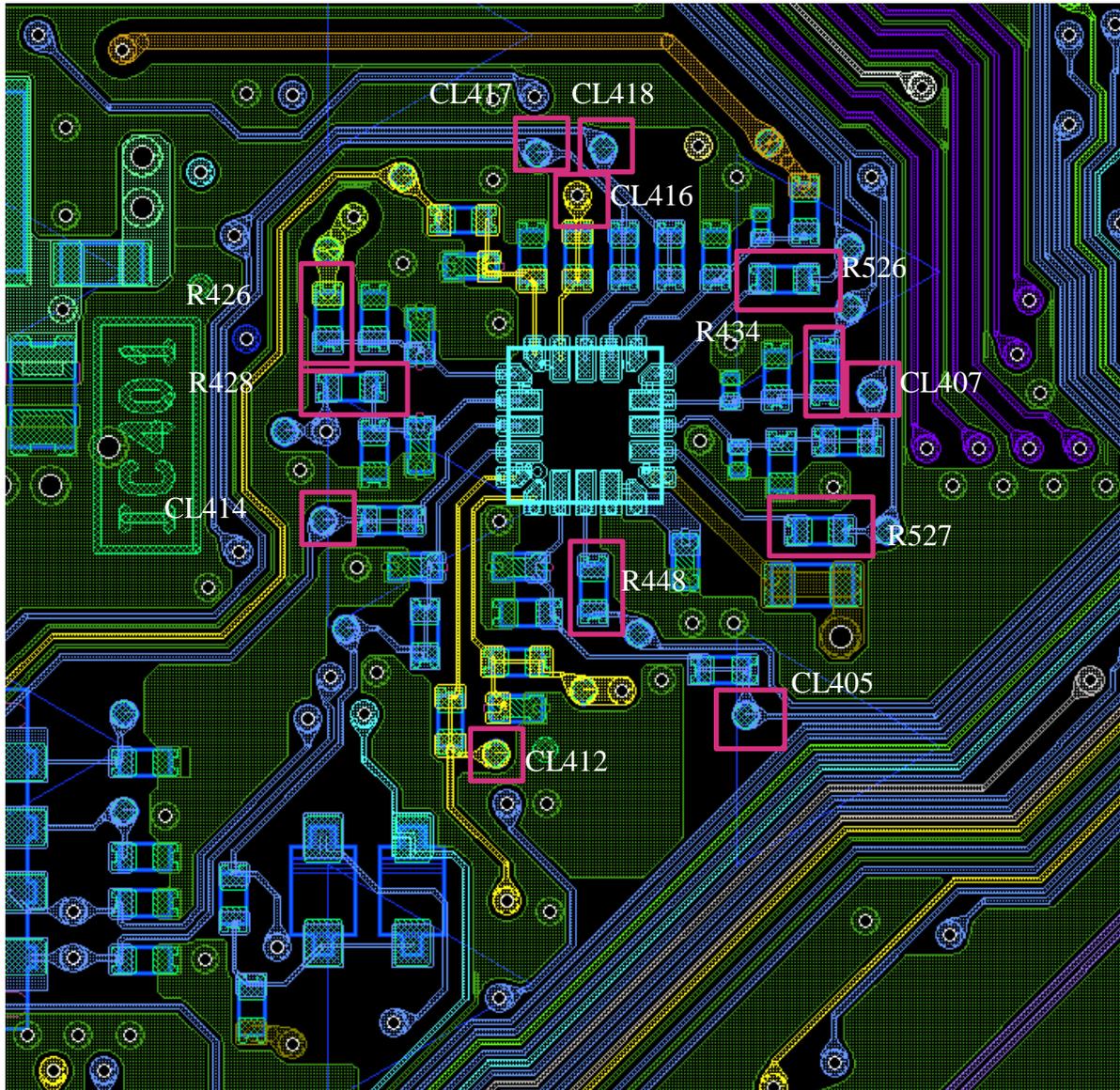
Top side



B-side



Checking point



B-side

**BSL Board Model****Check item summary**

Board	Operation	IC Ref	Voltage supply	Output ref.	Enable pin	Enable source	Fuse	Vin ref.
BSL	LDO	IC407	1.2V_HDMI	C442	IC407 #PIN3	P-on u-com IC401 #pin13	-	C441
BSL	DC/DC	IC408	1.8V_TU_P	C419	D402 cathode	P-on u-com IC401 #pin13	-	C417
BSL	DC/DC	IC402	5V_MAIN/5V_AUDIO	C430	R455	P-on u-com IC401 #pin13	F400	C423
BSL	DC/DC	IC400	3.3V_MAIN/3.3V_AUDIO	C454	R468	Vin	F402	C444
BSL	DC/DC	IC405	1.8V_TU	C463	IC405 #PIN5	P-on u-com IC401 #pin12	F403	C461
BSL	DC/DC	IC601	1.2V_M3_DDR	C609	C607	R605 (3.3V_STBY)	-	C603
BSL	LDO	IC602	1.05V_M3_STBY	C611	C610	C610 (3.3V_STBY)	-	C610
BSL	LDO	IC603	1.05V_M3_ST_ET	C613	IC603 #PIN3	M3 IC1000 #AJ11	-	C612
BSL	DC/DC	IC604	1.05V_M3_A	C616	IC604 #PIN5	P-on u-com IC401#pin13	F603	C615
BSL	LDO	IC606	2.5V_M3_DDR	C619	C618	C618 (3.3V_STBY)	-	C618
BSL	LDO	IC607	1.8V_EMMC	C622	C677	R616 (DDR_EMMC_EN )	-	C620
BSL	DC/DC	IC608	1.0V_M3_CORE	C634	R634	P-on u-com IC401 #pin12	F600	C623
BSL	DC/DC	IC609	1.0V_M3_CPU	C648	R644	P-on u-com IC401 #pin12	F601	C639
BSL	DC/DC	IC610	1.0V_M3_GPU	C662	R654	P-on u-com IC401 #pin12	F602	C653

pin12 : P\_ON\_#1  
pin13 : P\_ON\_#2

**BSL Board Model**

**Check item summary**

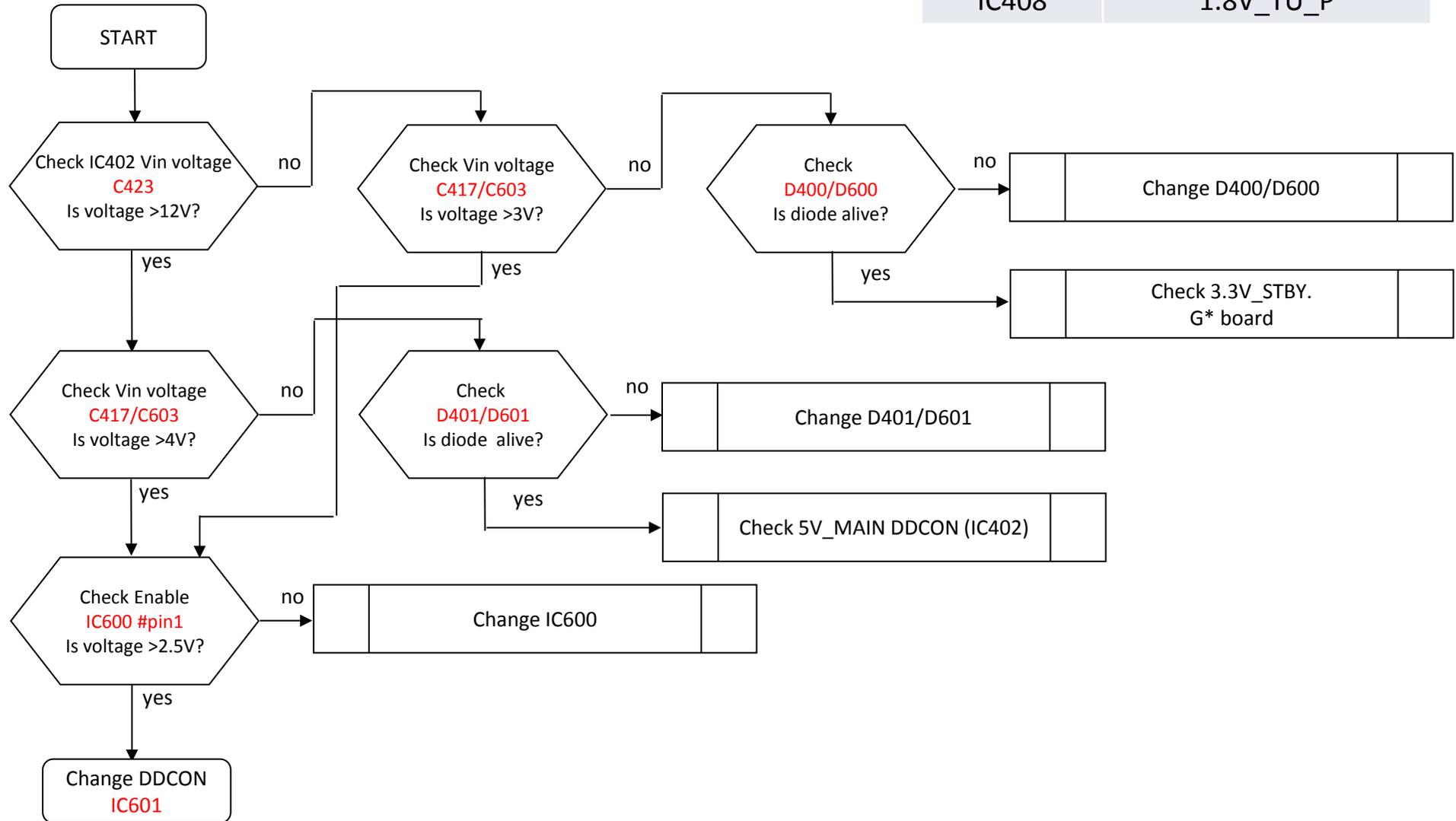
Board	Operation	IC Ref	Voltage supply	Output ref.	Enable pin	Enable source	Fuse	Vin ref.
BSL	DC/DC	IC409	1.5V_FRC	C478	IC409 #pin5	P-on u-com IC401 #pin13	F404	C475
BSL	DC/DC	IC410	0.95V_FRC	C493	R506	P-on u-com IC401 #pin13	F405	C482

pin12 : P\_ON\_#1  
pin13 : P\_ON\_#2

**BSL Board Model**

**DDCON check**

IC Ref	Voltage supply
IC601	1.2V_M3_DDR
IC408	1.8V_TU_P

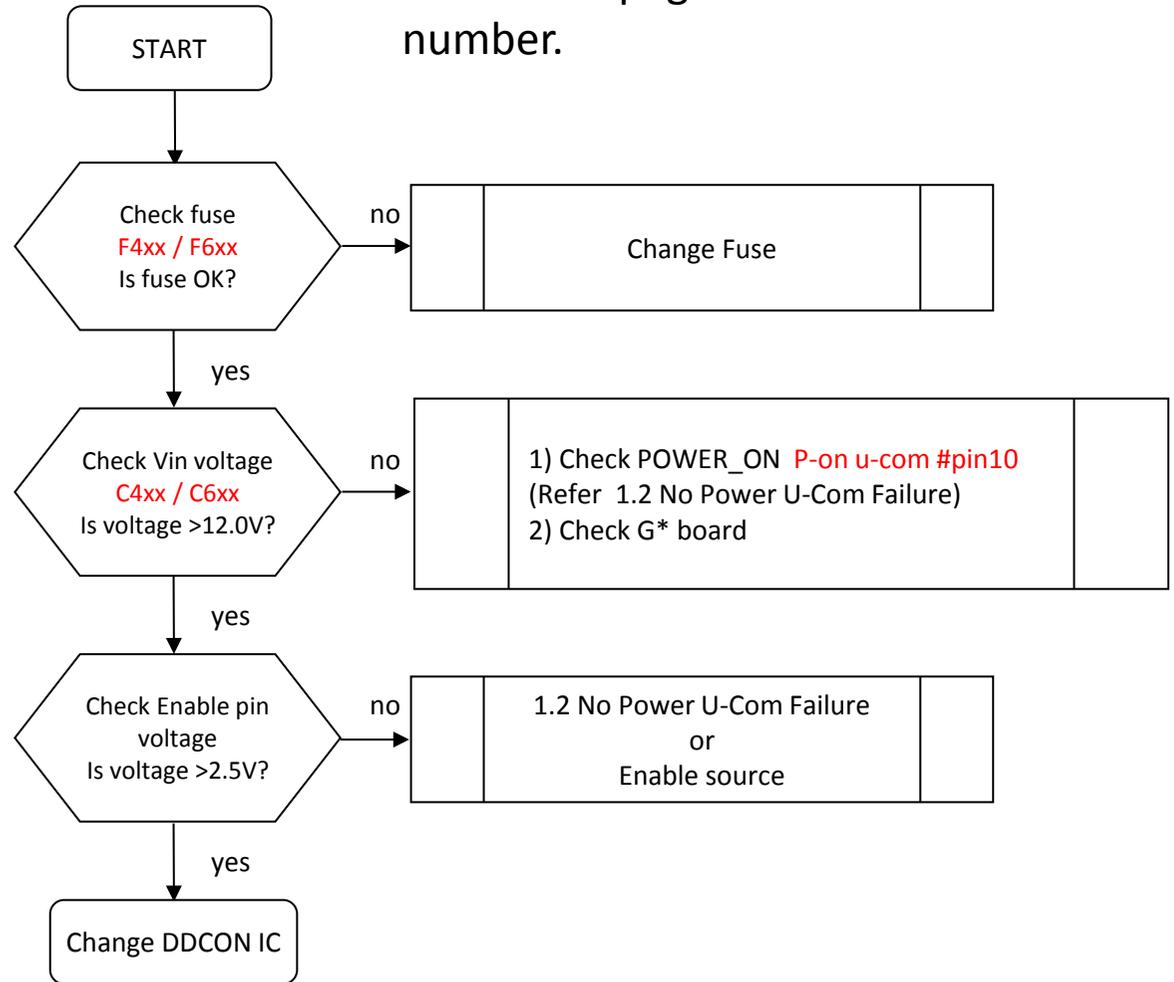


**BSL Board Model**

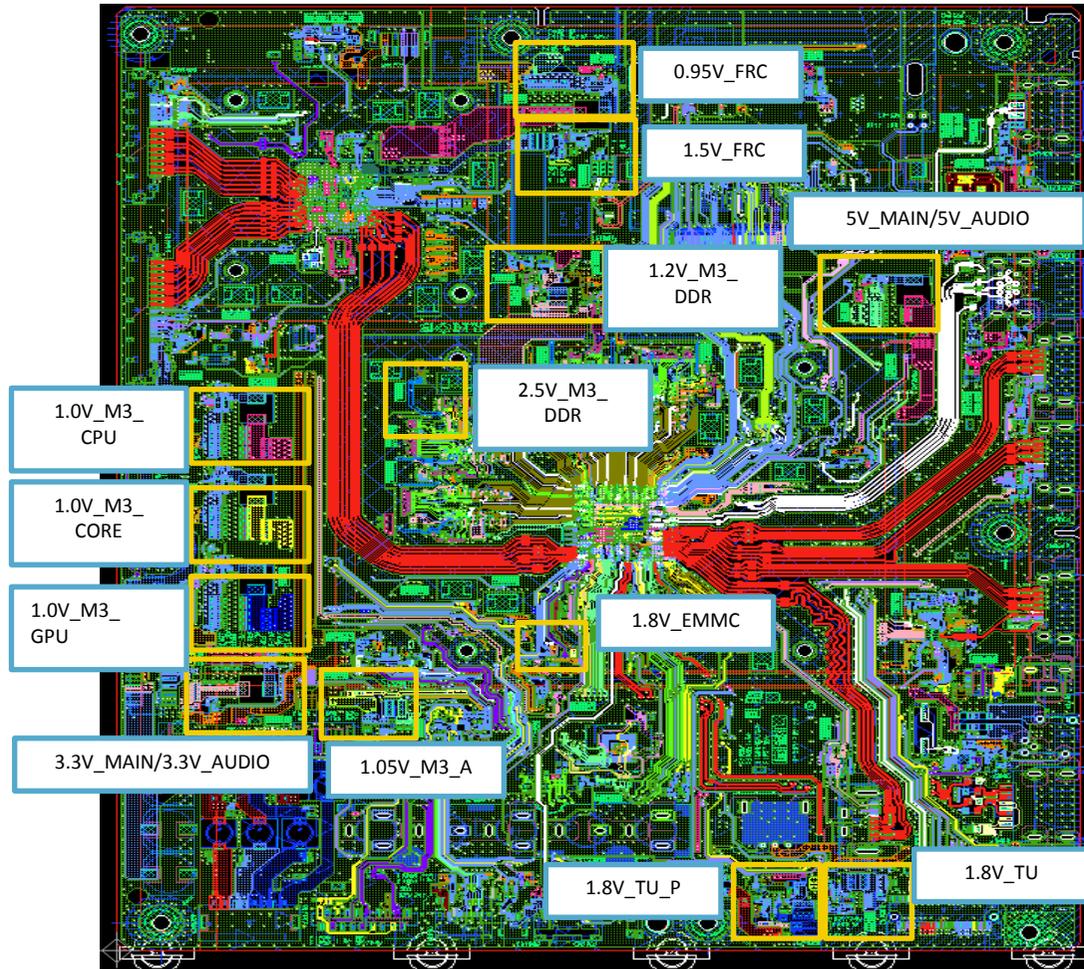
**DDCONs check**

Board	Operation	IC Ref	Voltage supply
BSL	DC/DC	IC408	1.8V_TU_P
BSL	DC/DC	IC402	5V_MAIN/5V_AUDIO
BSL	DC/DC	IC400	3.3V_MAIN/3.3V_AUDIO
BSL	DC/DC	IC405	1.8V_TU
BSL	DC/DC	IC601	1.2V_M3_DDR
BSL	DC/DC	IC604	1.05V_M3_A
BSL	DC/DC	IC608	1.0V_M3_CORE
BSL	DC/DC	IC609	1.0V_M3_CPU
BSL	DC/DC	IC610	1.0V_M3_GPU
BSL	DC/DC	IC409	1.5V_FRC
BSL	DC/DC	IC410	0.95V_FRC

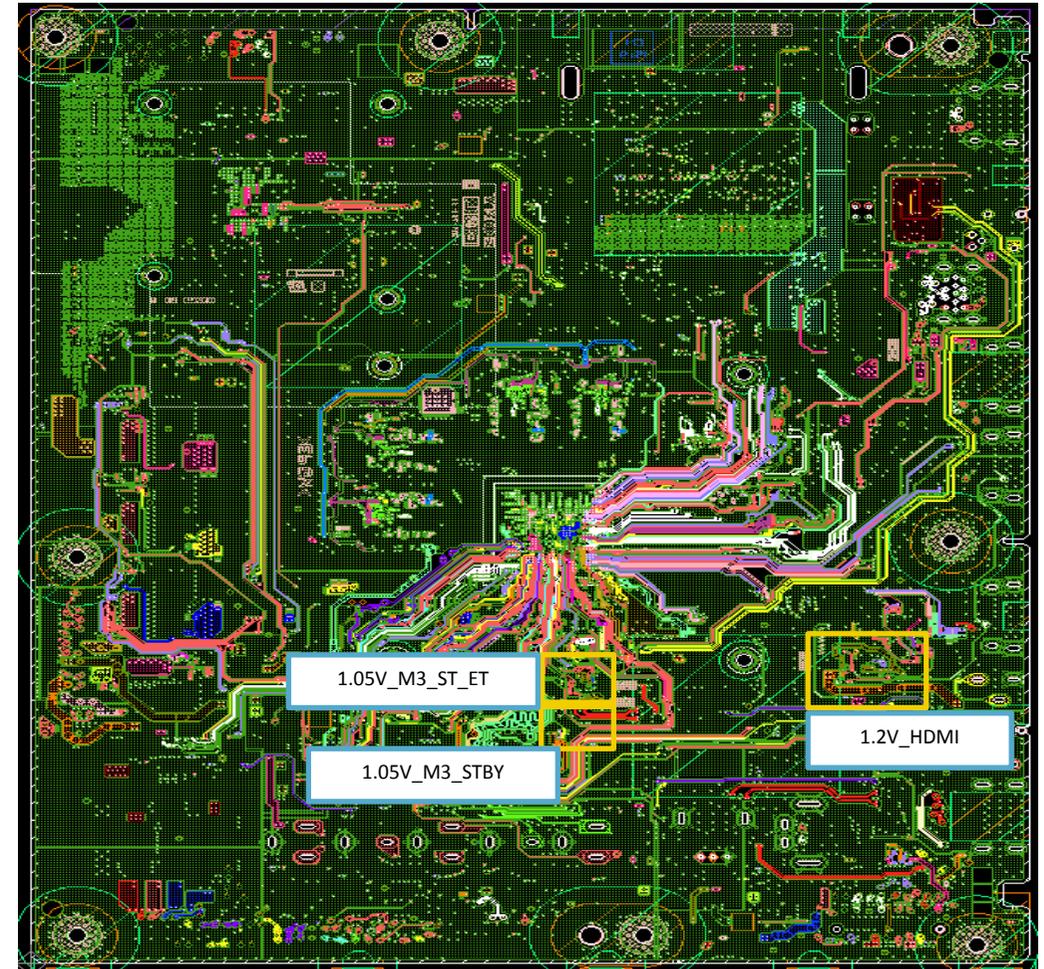
Pleas refer page-3~4 for Ref number.



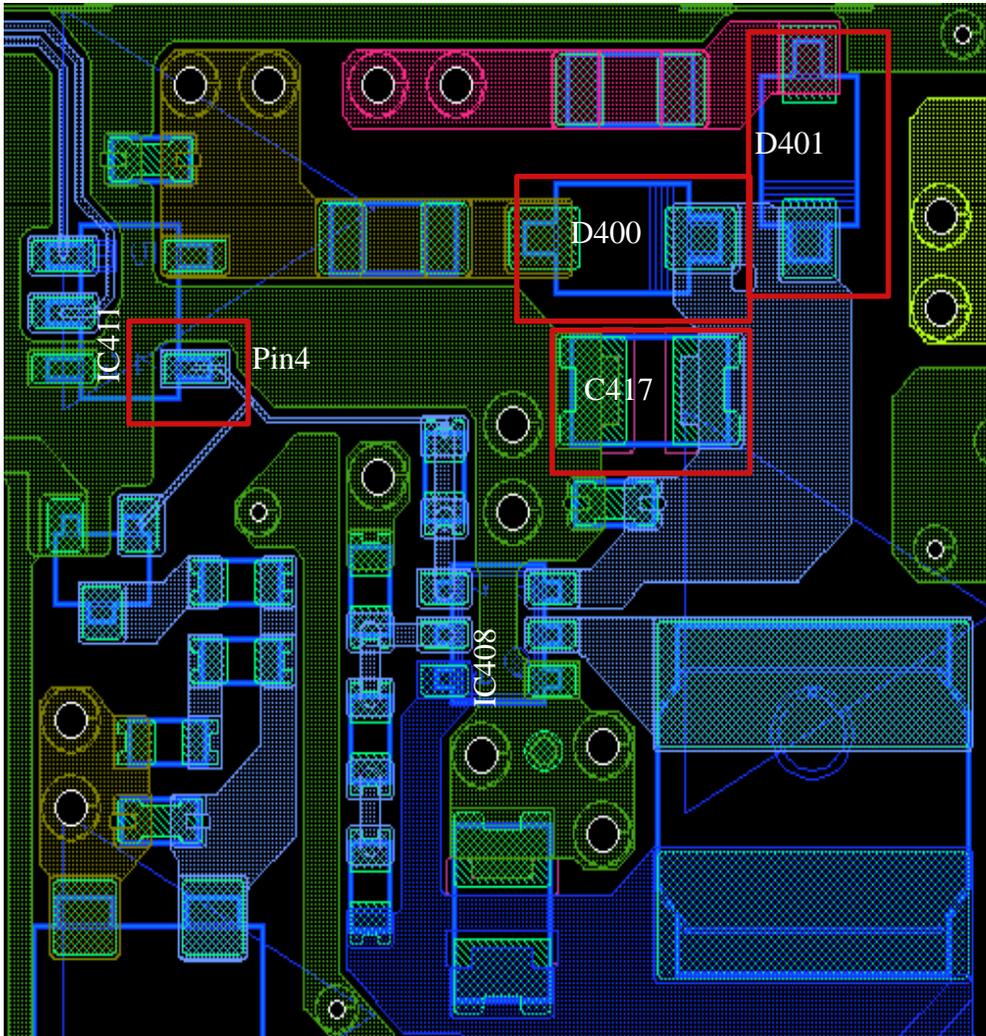
## Top-side



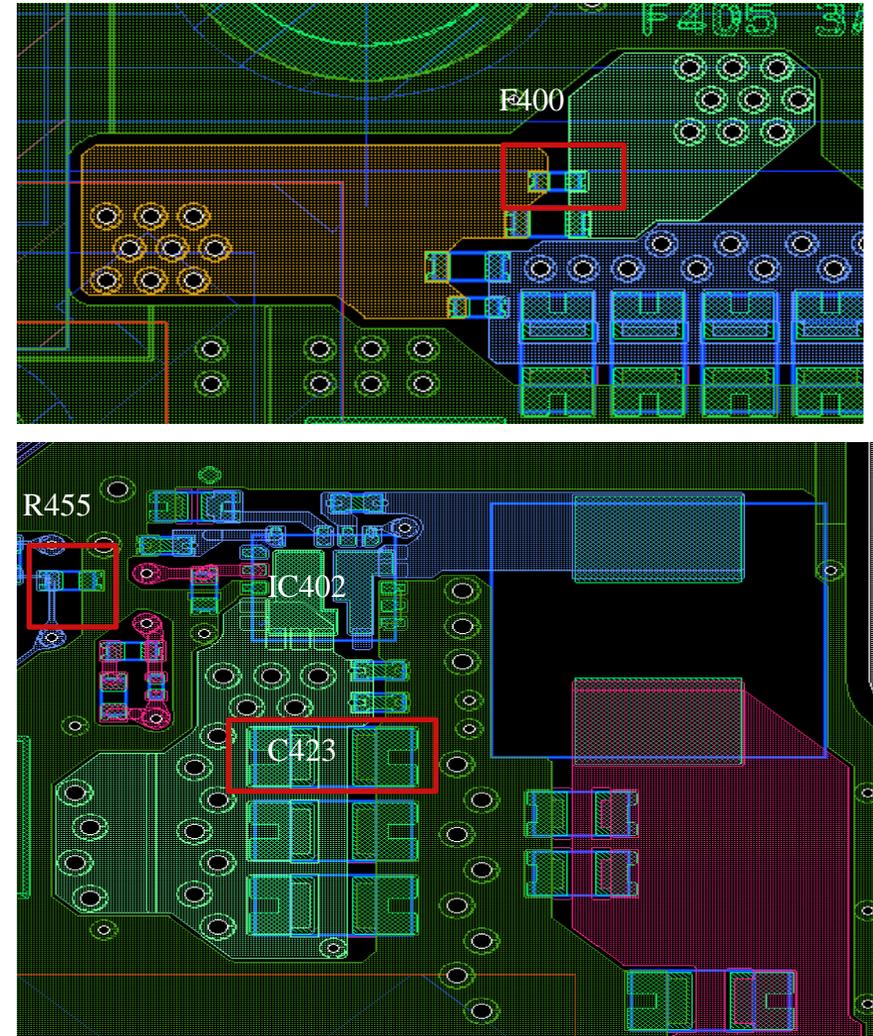
## B-side



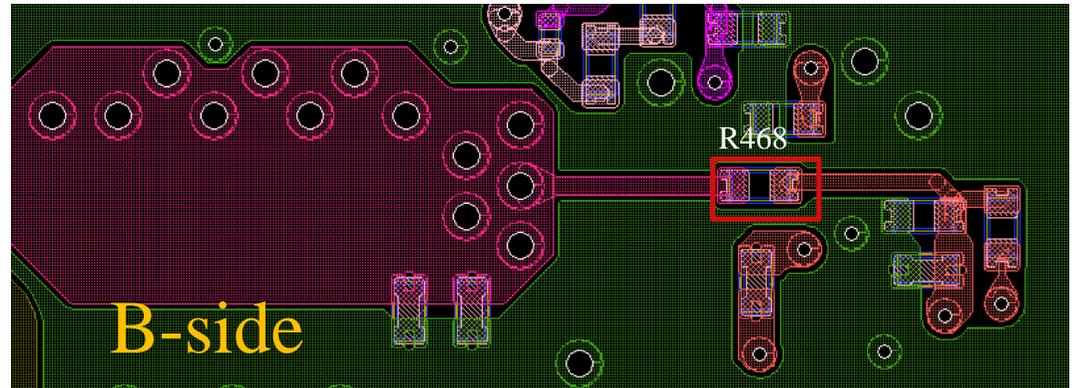
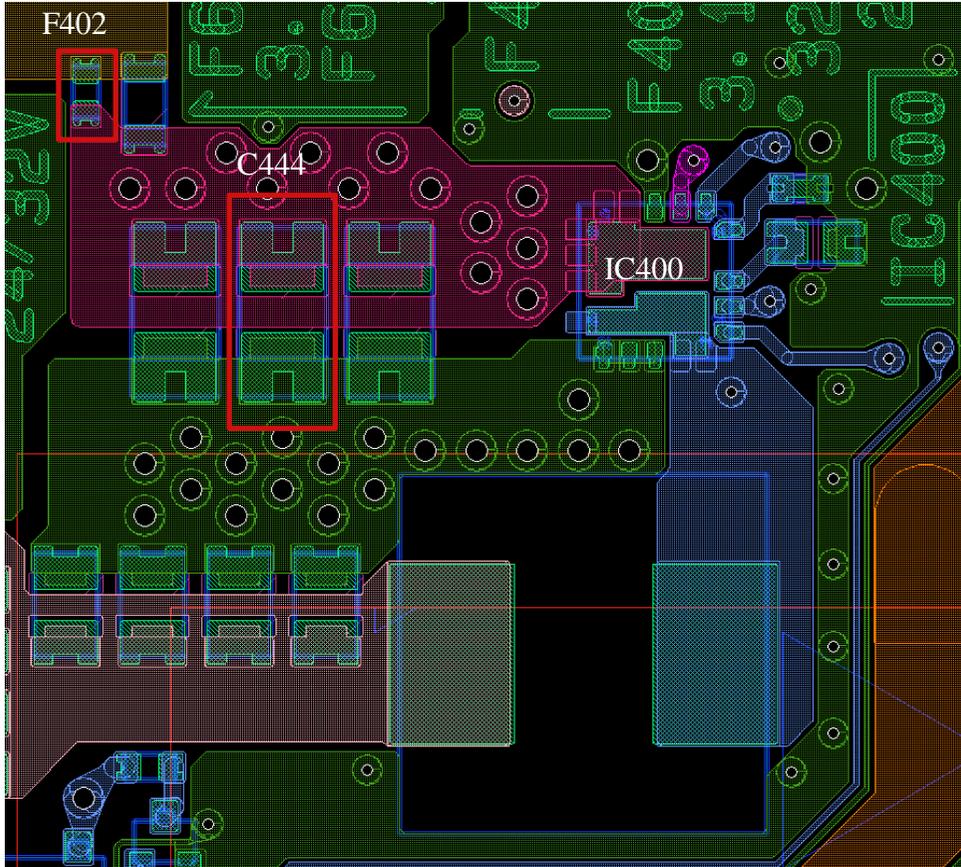
## 1.8V\_TU\_P



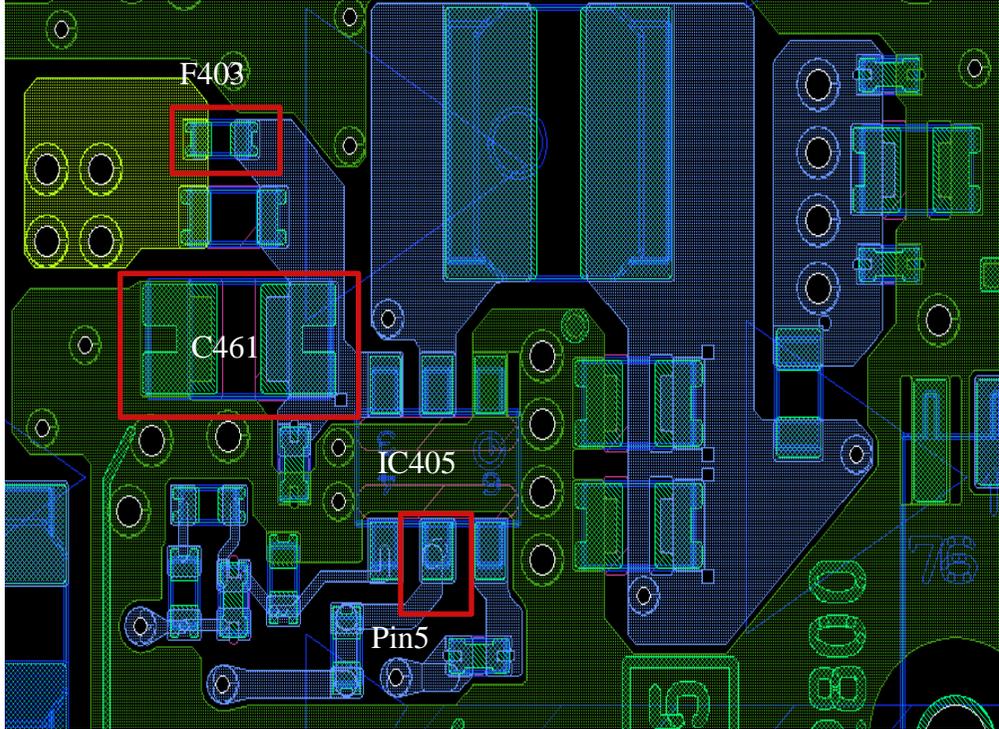
## 5V\_MAIN/5V\_AUDIO



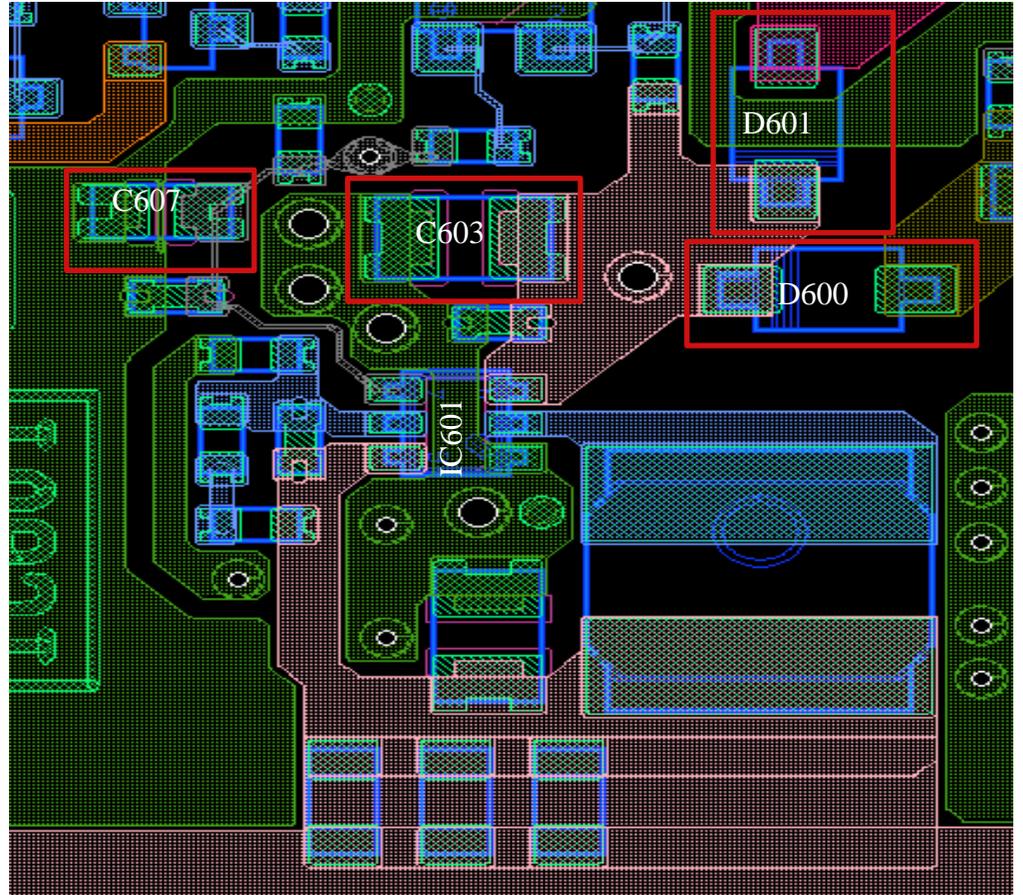
## 3.3V\_MAIN/3.3V\_AUDIO



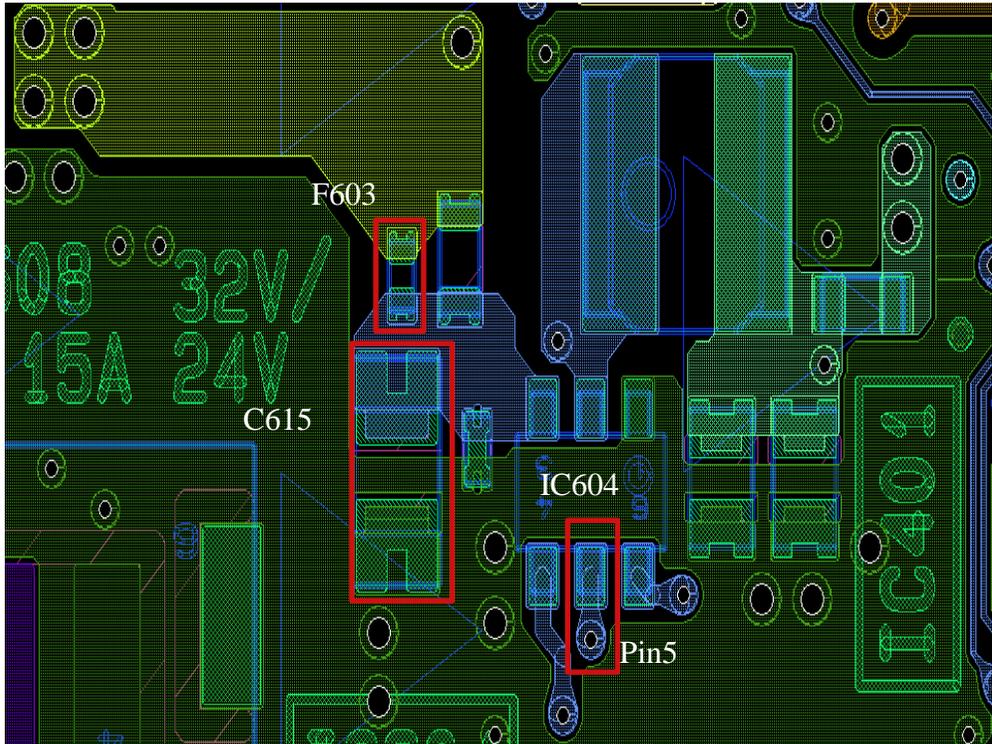
## 1.8V\_TU



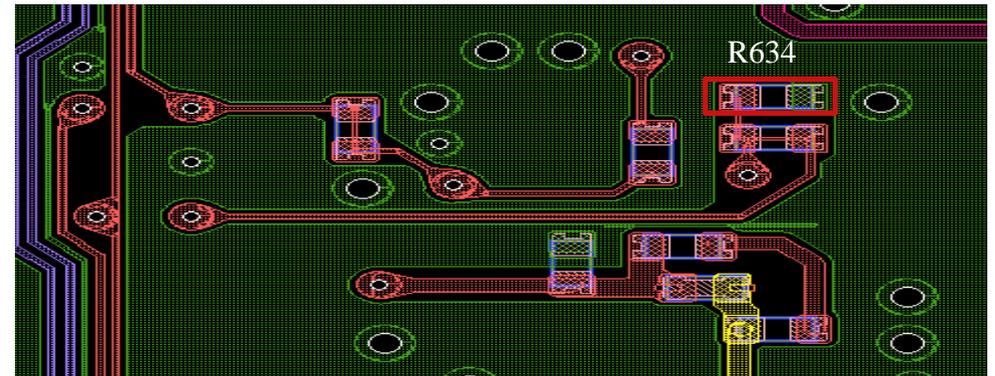
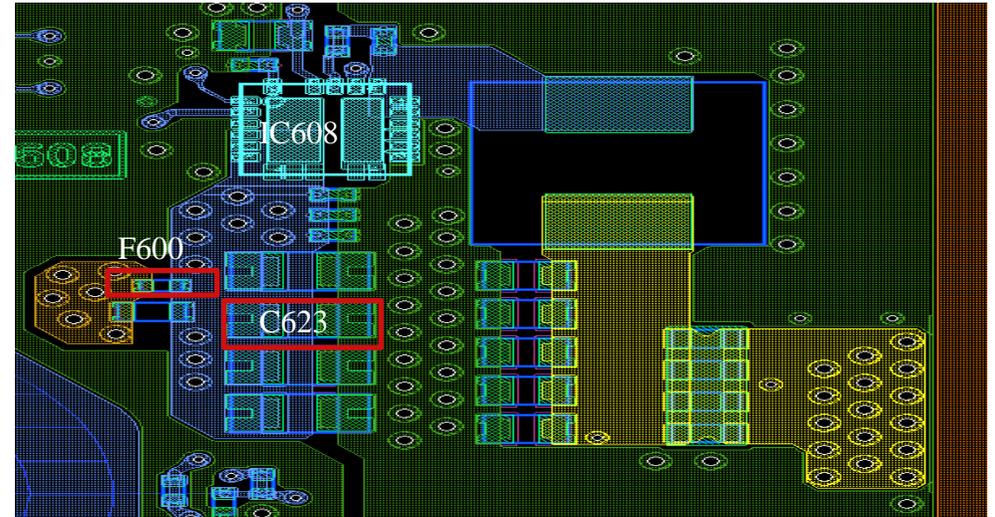
## 1.2V\_M3\_DDR



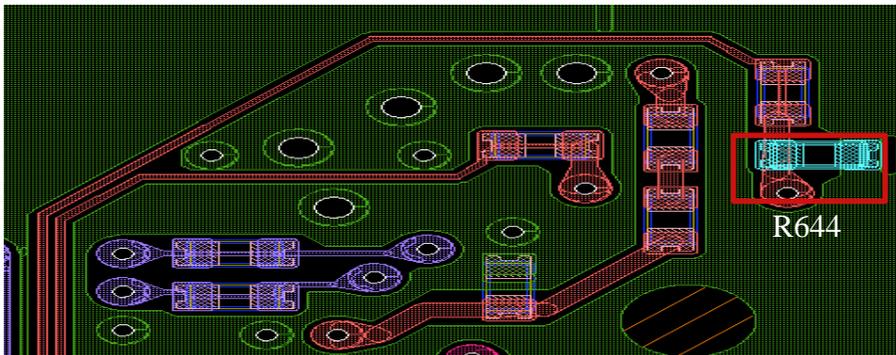
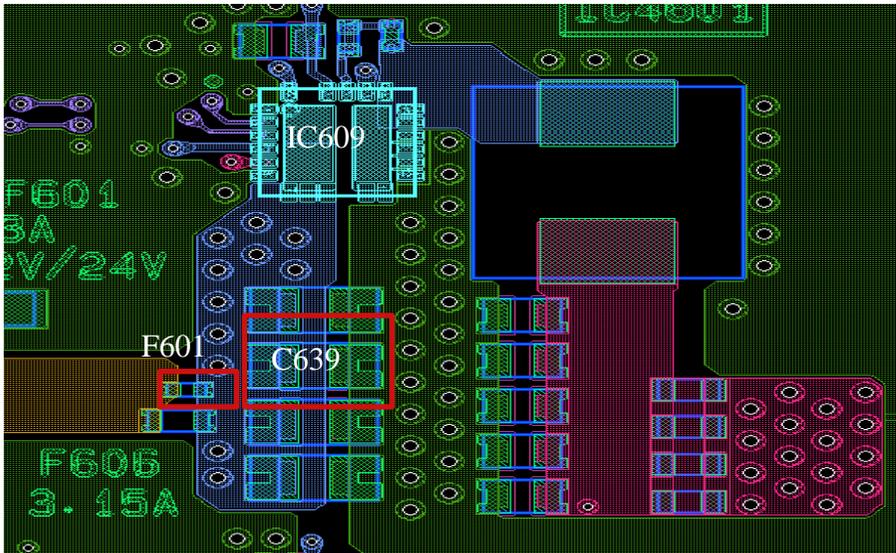
## 1.05V\_M3\_A



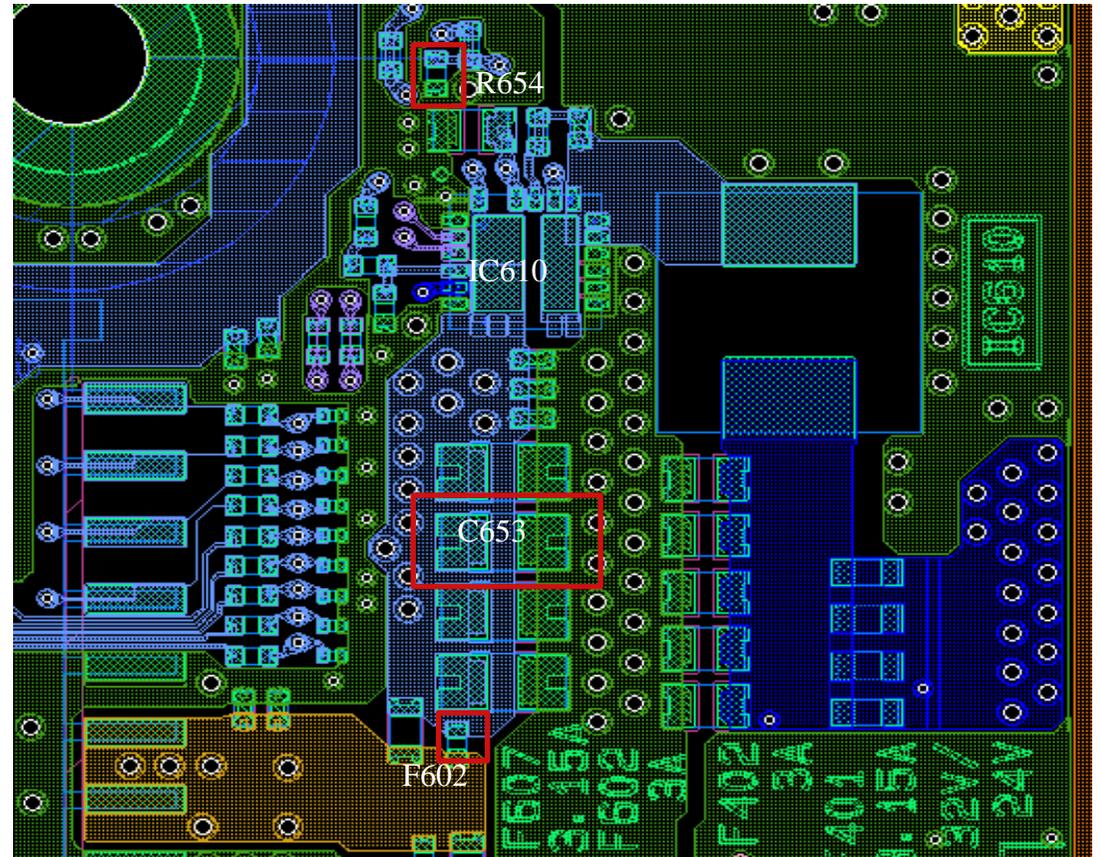
## 1.0V\_M3\_CORE



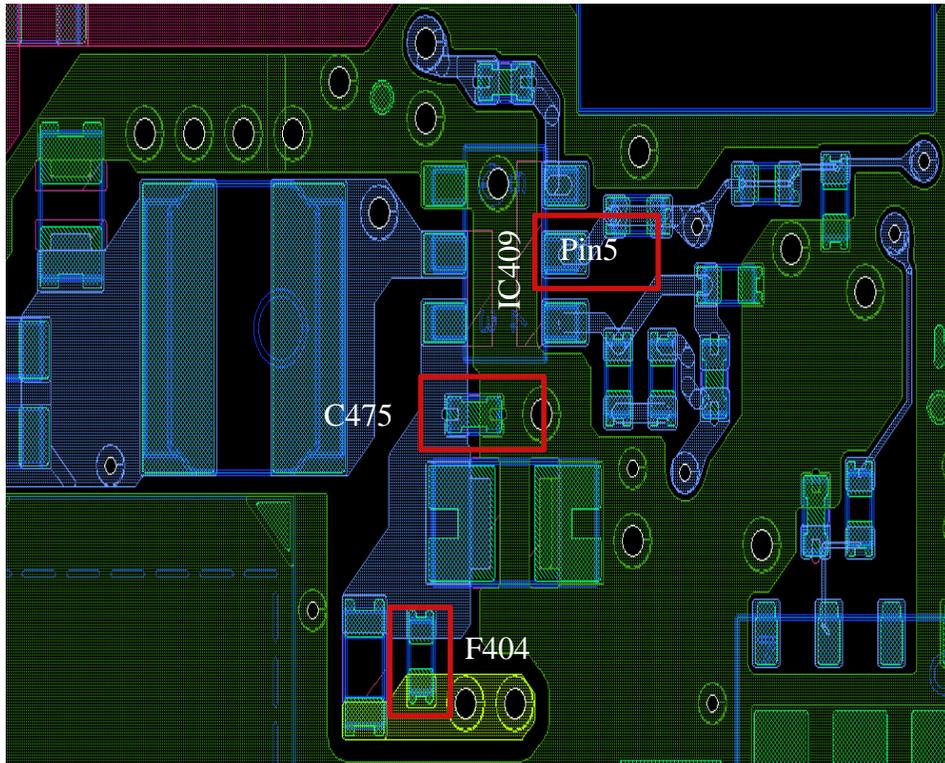
## 1.0V\_M3\_CPU



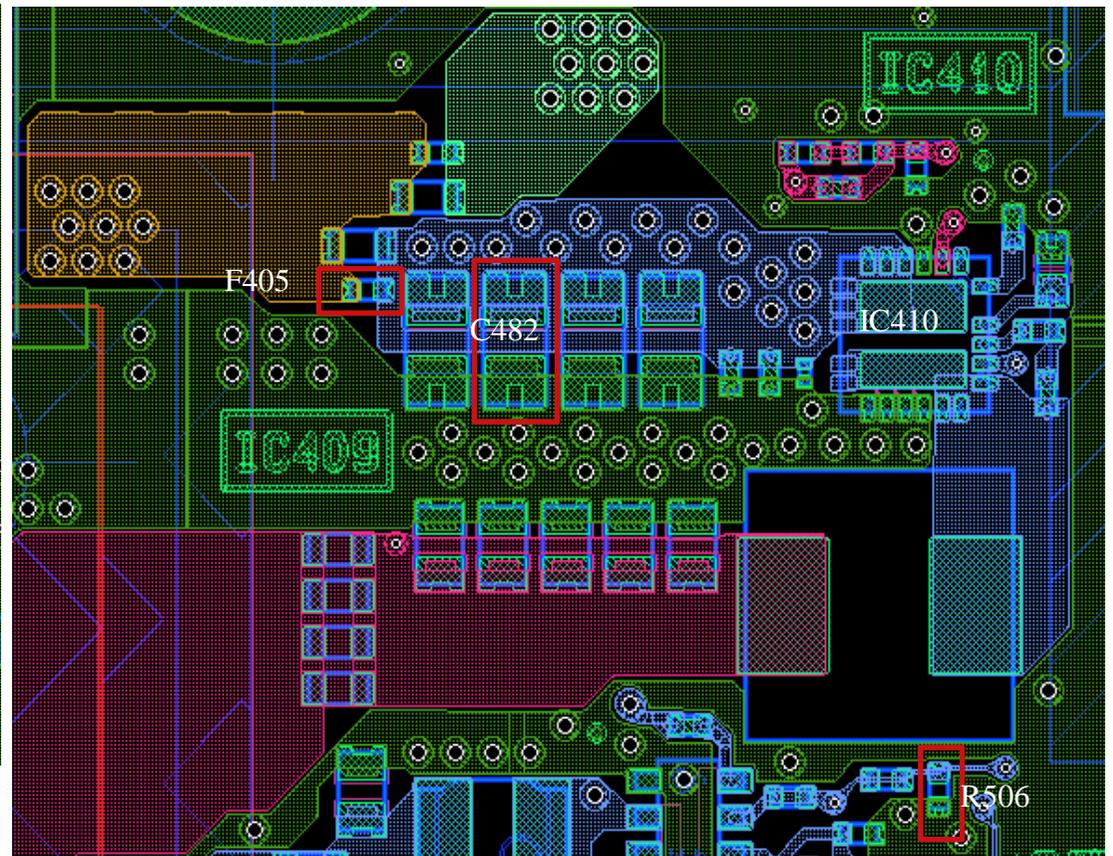
## 1.0V\_M3\_GPU



## 1.5V\_FRC



## 0.95V\_FRC

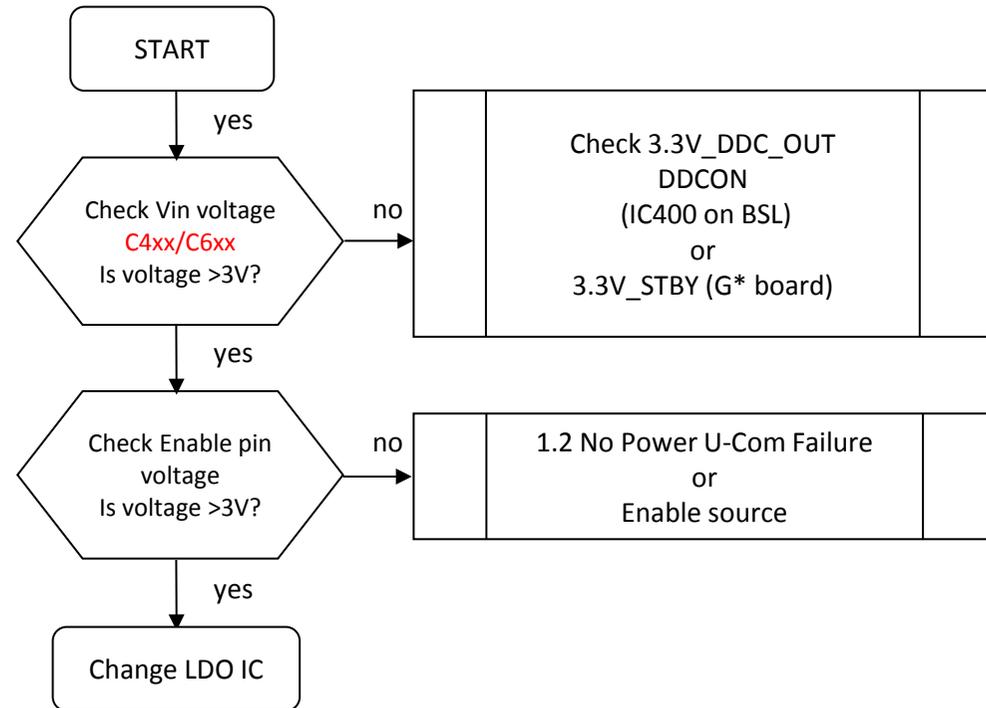


**BSL Board Model**

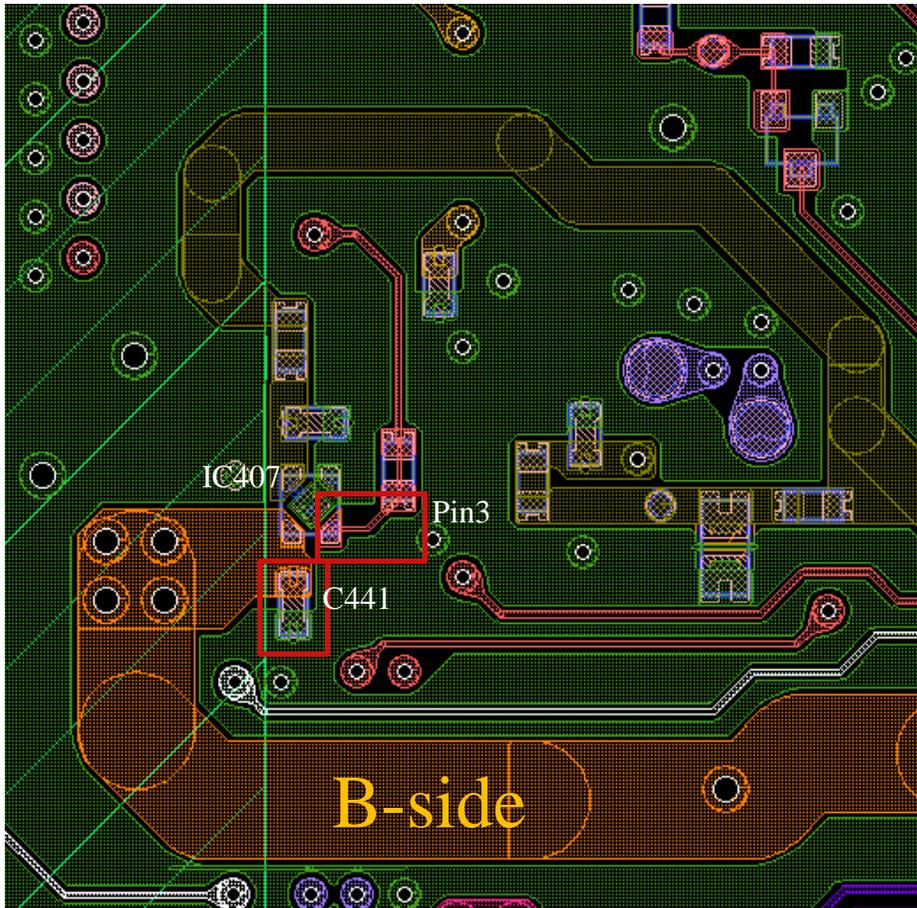
**LDOs check**

Board	Operation	IC Ref	Voltage supply
BSL	LDO	IC407	1.2V_HDMI
BSL	LDO	IC603	1.05V_M3_ST_ET
BSL	LDO	IC602	1.05V_M3_STBY
BSL	LDO	IC606	2.5V_M3_DDR
BSL	LDO	IC607	1.8V_EMMC

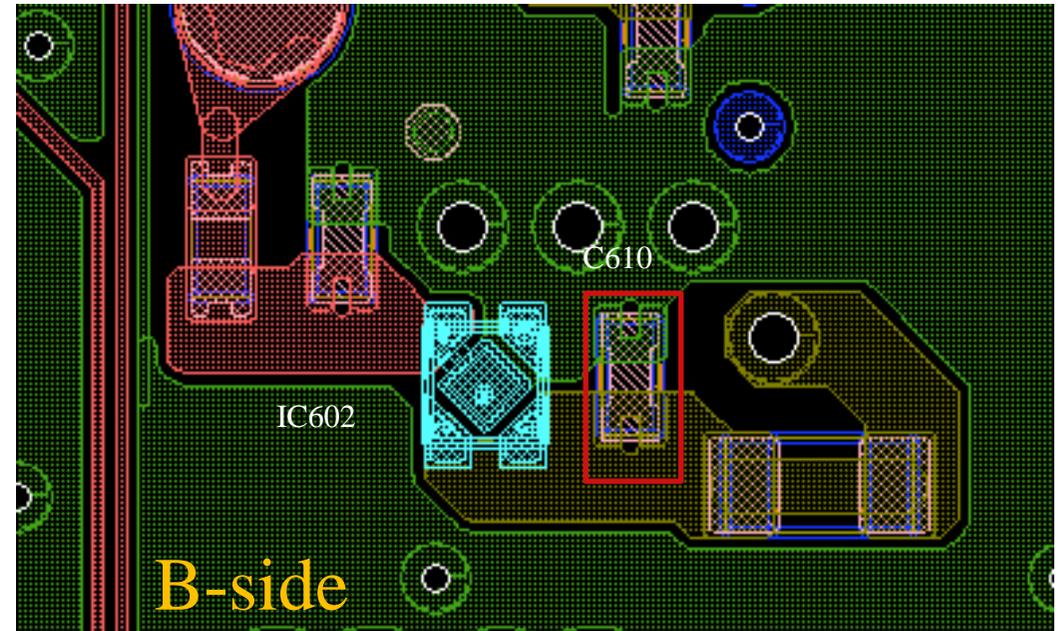
Pleas refer page-29 for Ref number.



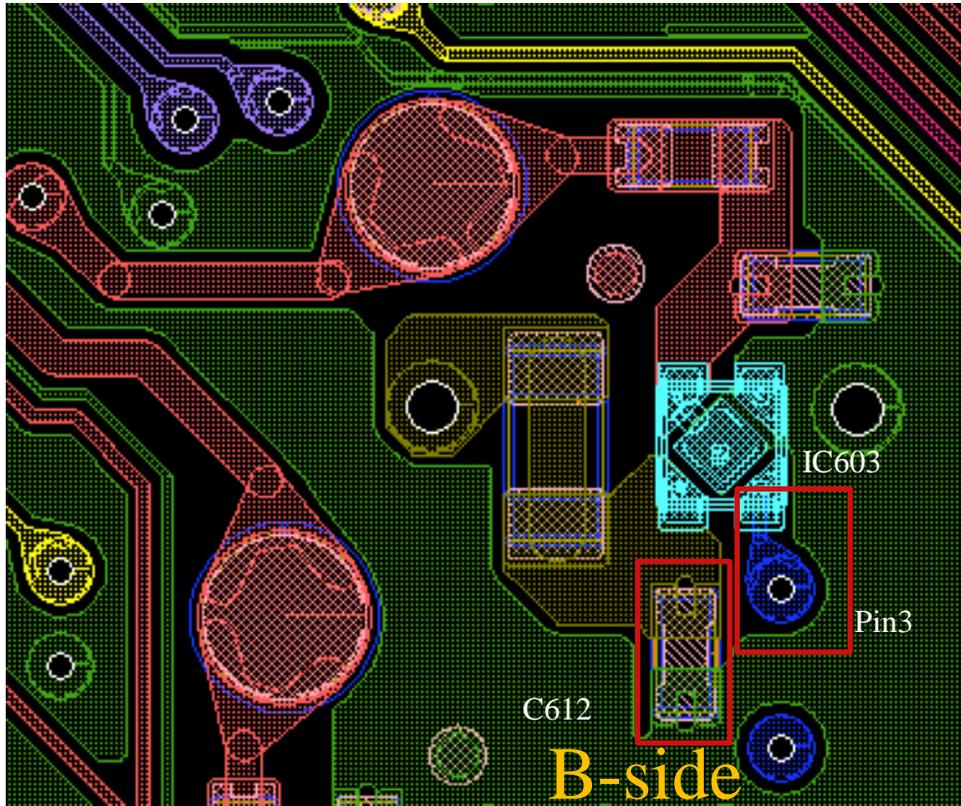
## 1.2V\_HDMI



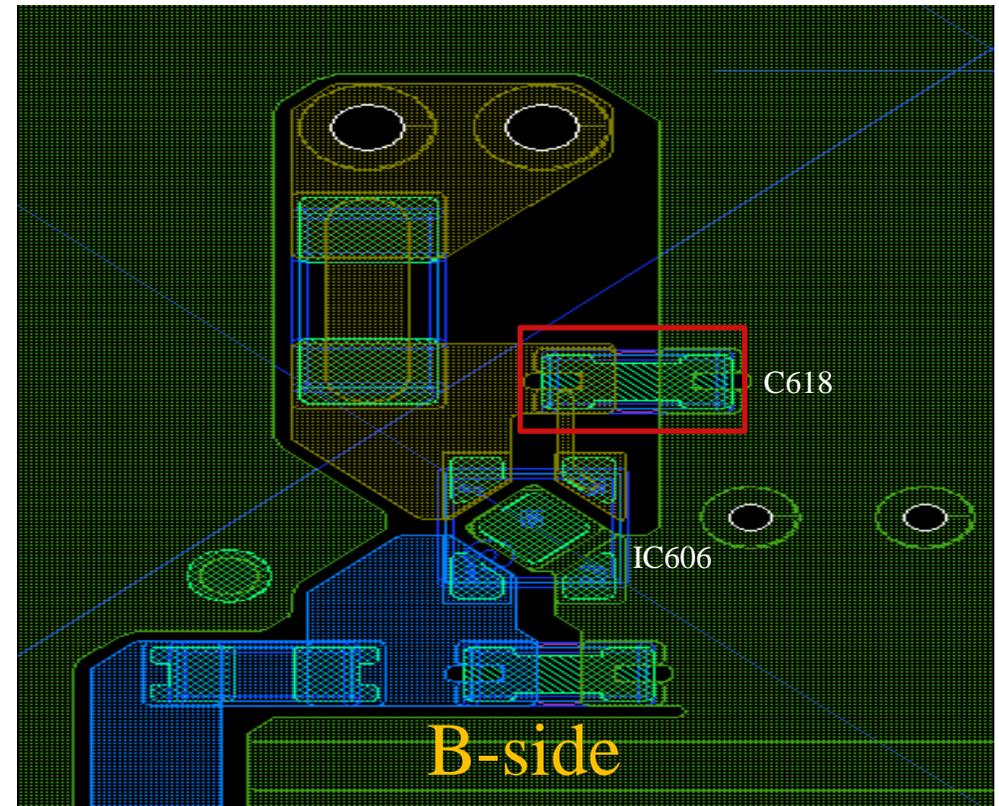
## 1.05V\_M3\_STBY



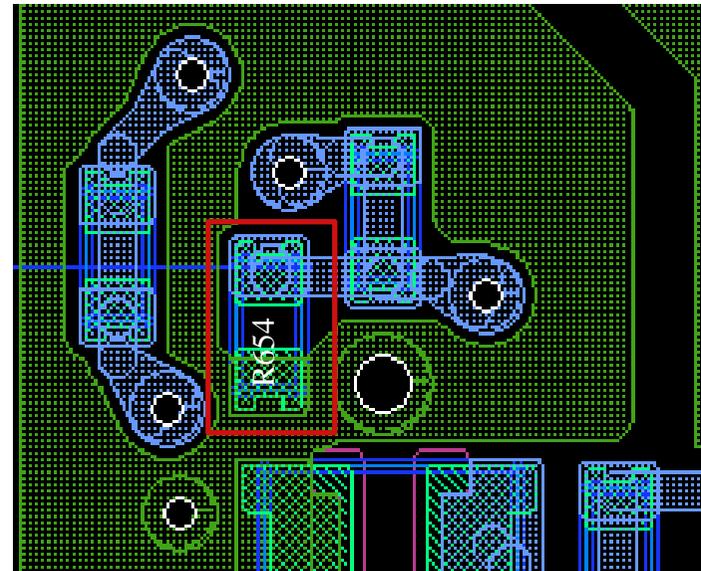
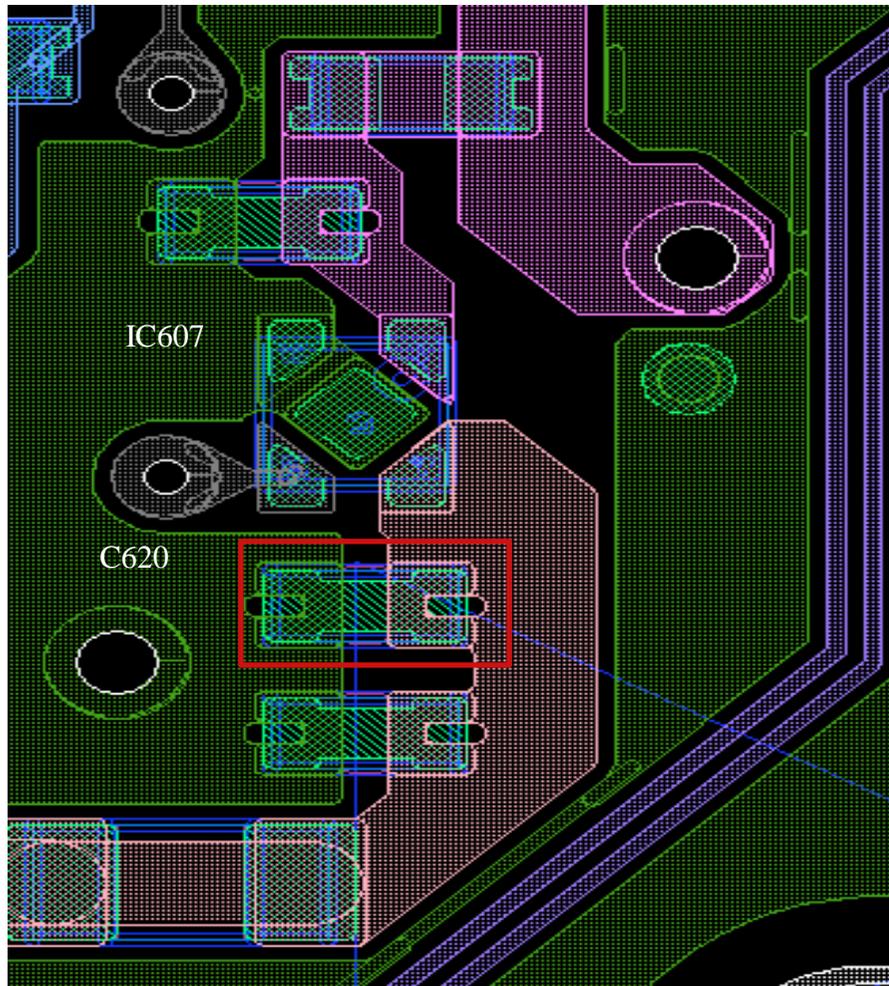
## 1.05V\_M3\_ST\_ET



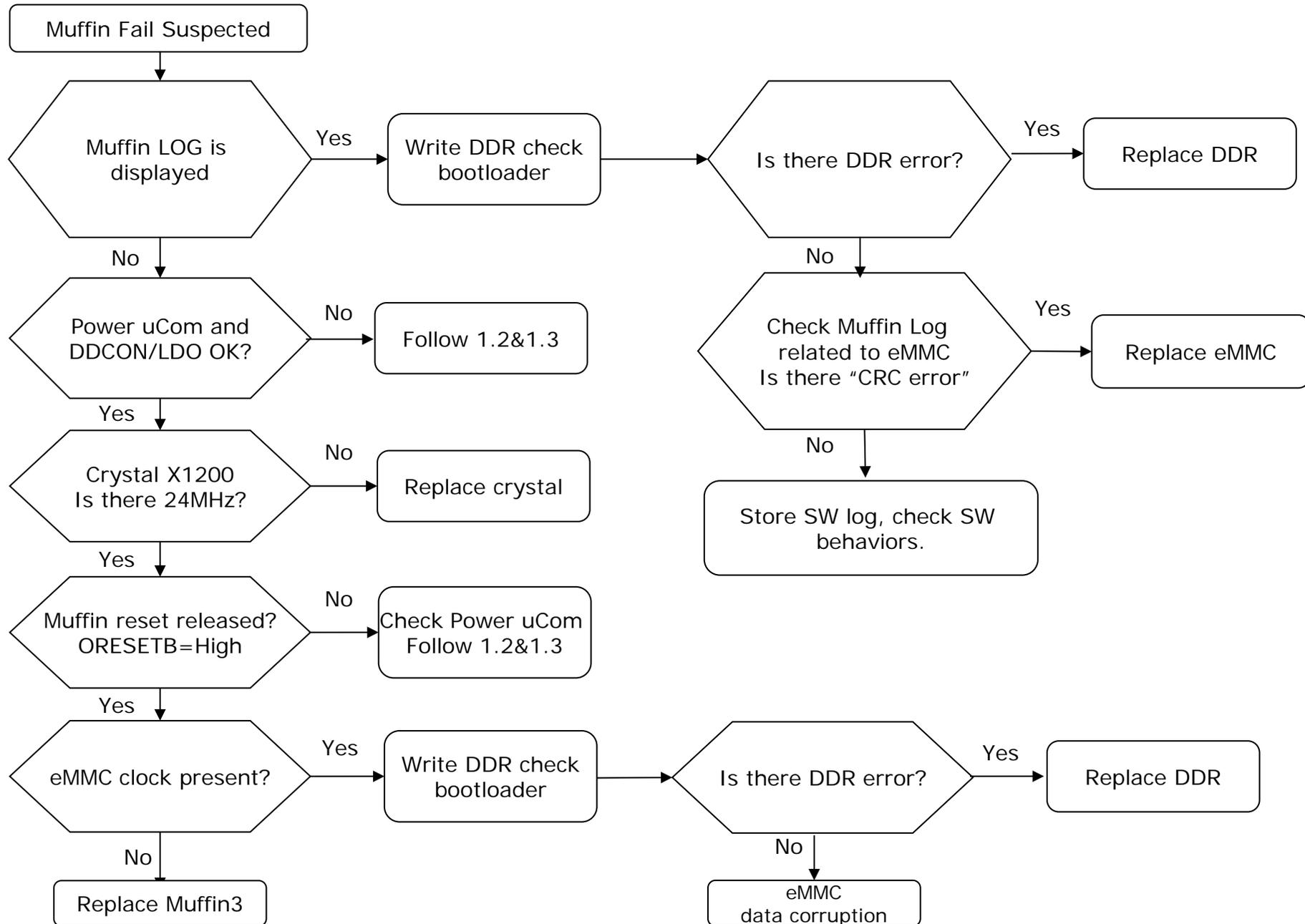
## 2.5V\_M3\_DDR



# 1.8V\_EMMC

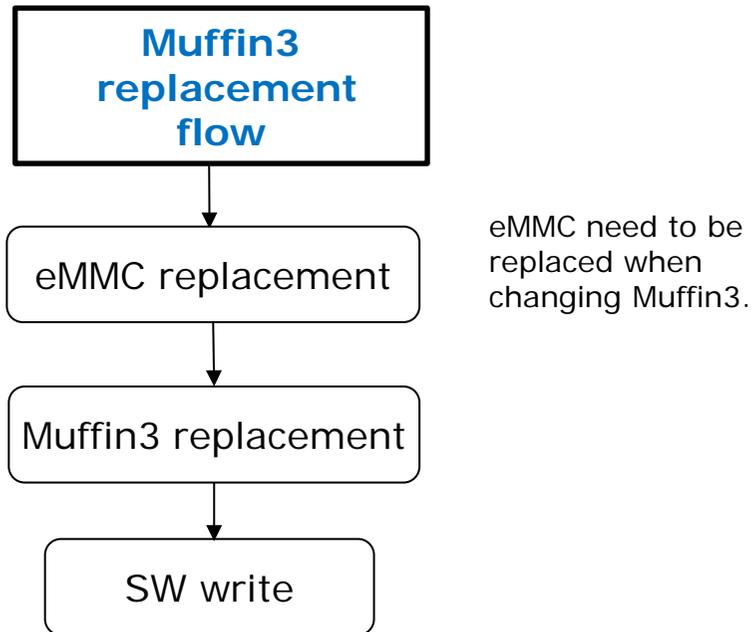


## 1.4 No Power - Muffin3 Failure

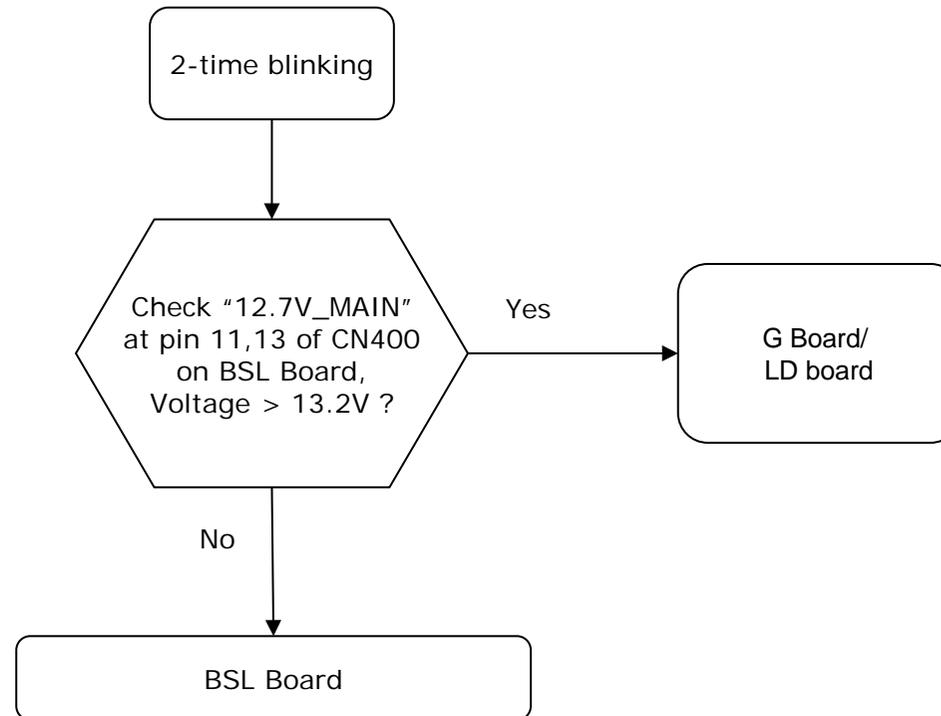


## 1.5 No Power - Muffin3 Replacement

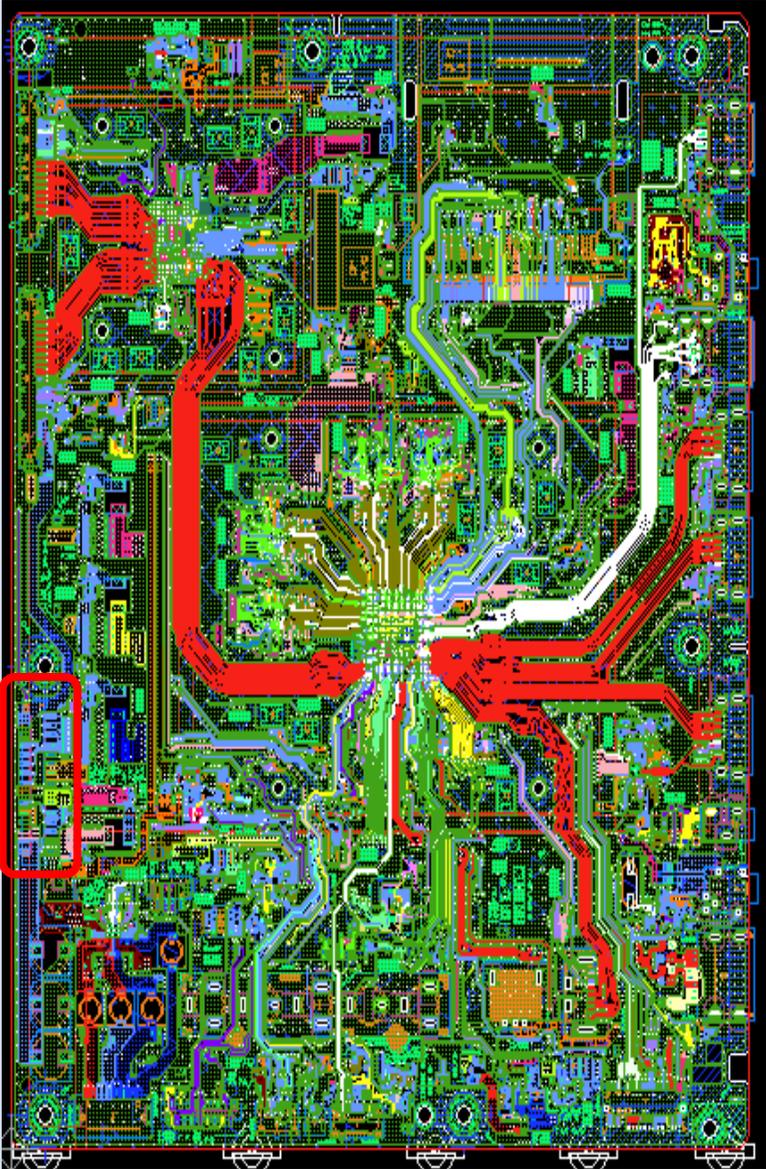
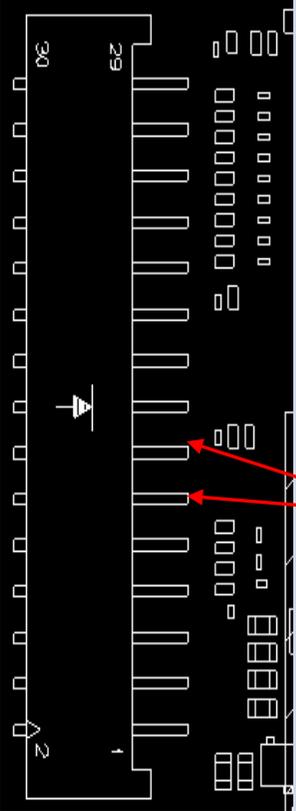
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## BSL



2.0 LED Blinking: 2x (Main power Error)

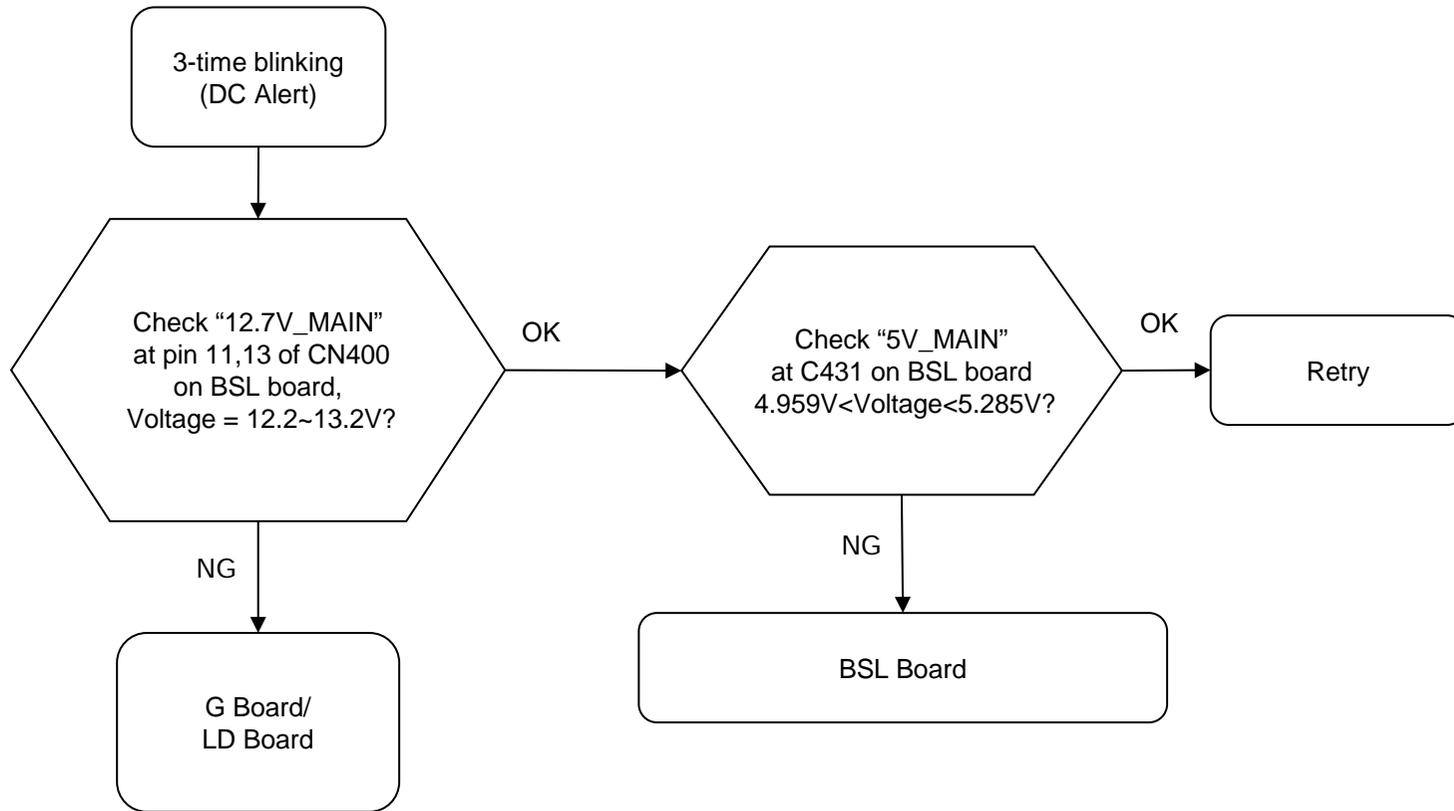
Name	Board PWB (A side)	Detail
BSL	 <p data-bbox="309 1198 439 1241">CN400</p>	 <p data-bbox="1895 890 2136 1015">CN400 11,13pin 12.7V_MAIN</p>

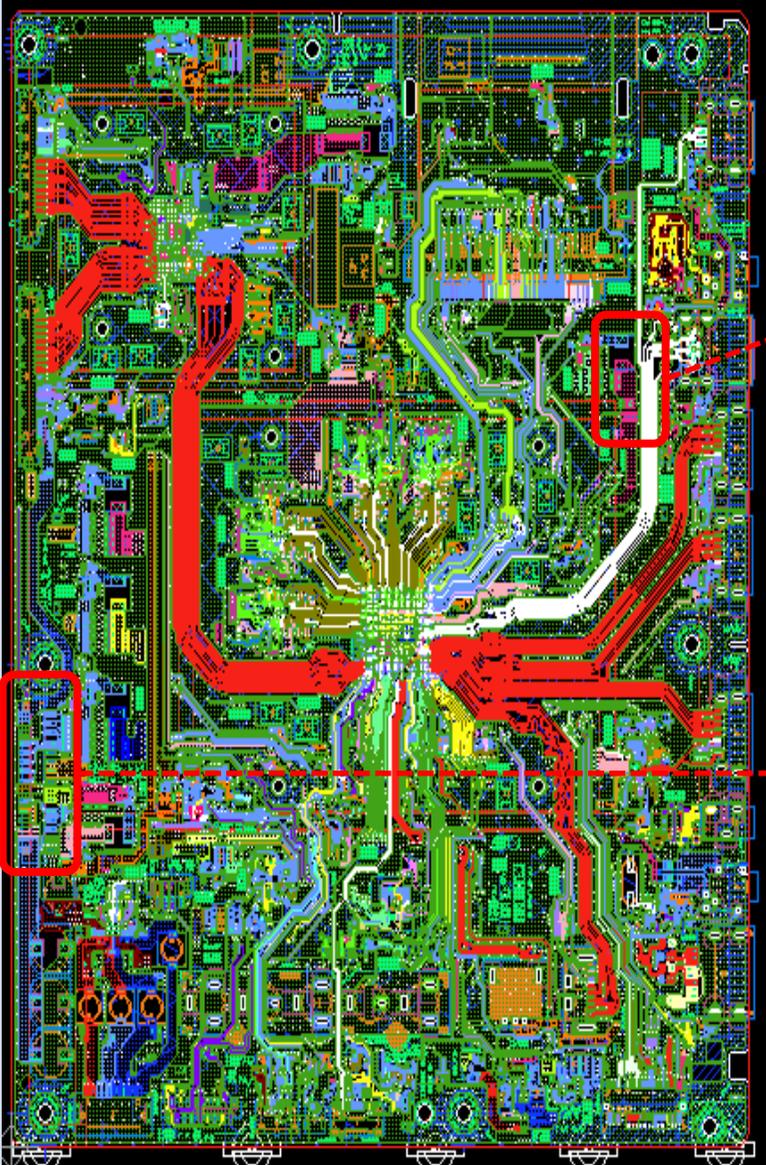
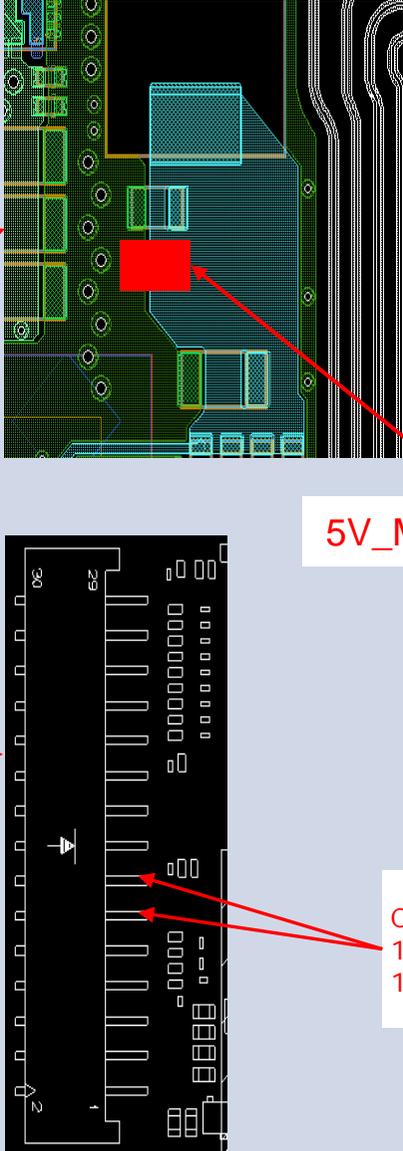
## 2.1 Detail of 3x LED Blinking

---

	Error Item	Number of STBY LED flashing	Description
Uroboros2	DC_ALERT	3	Main board 5V power rail monitoring
	AUD_ERR	3	Audio amp error detection

# BSL

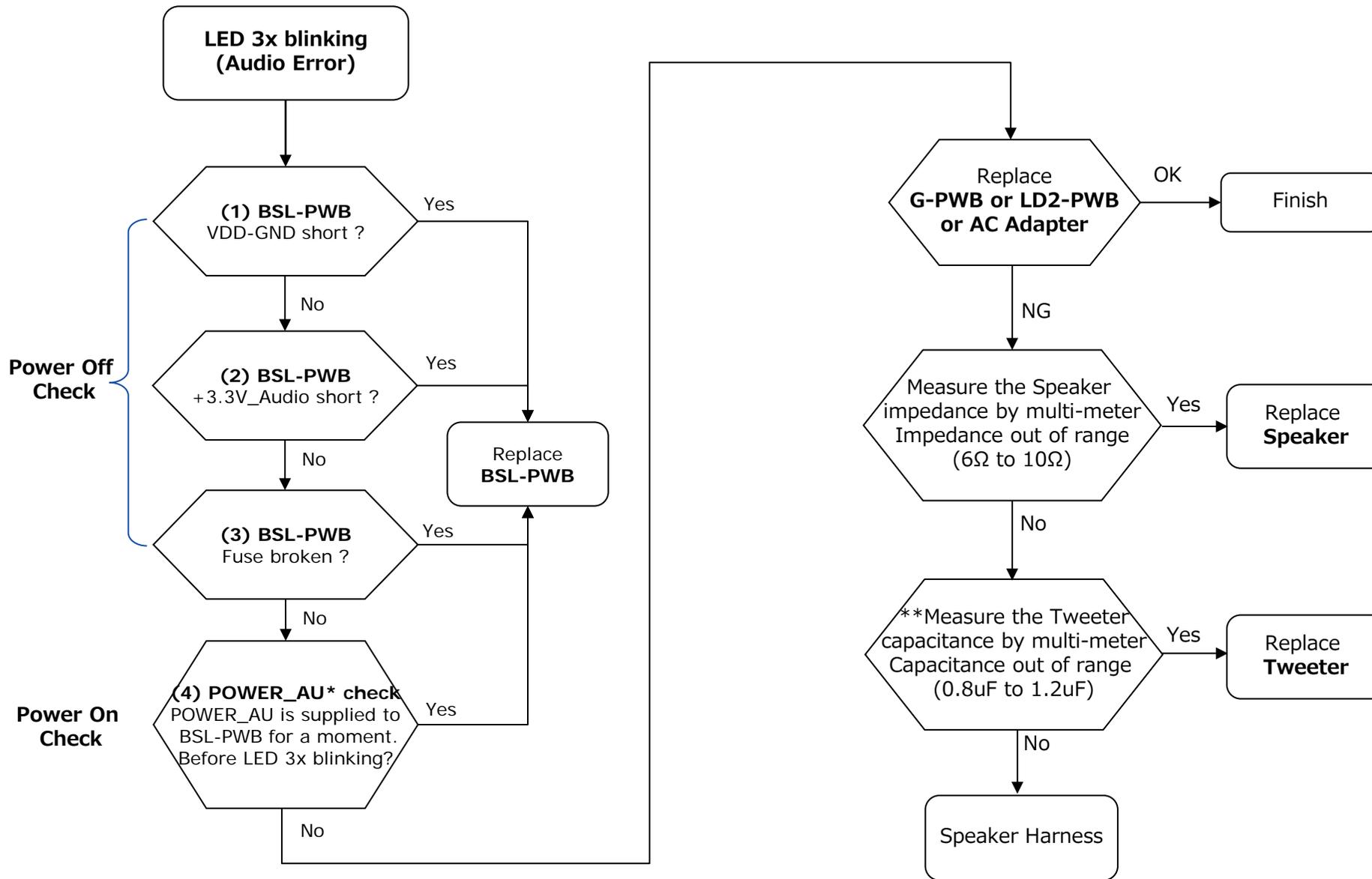


Name	Board PWB (A side)	Detail
BSL	 <p data-bbox="309 1209 439 1251">CN400</p>	 <p data-bbox="1783 842 2125 903">5V_MAIN at C431</p> <p data-bbox="1856 1209 2103 1362">CN400 11,13pin 12.7V_MAIN</p>

### Detail of 3x LED Blinking

	Error Item	Number of STBY LED flashing	Description
Uroboros2	DC_ALERT	3	Main board 5V power rail monitoring
	AUD_ERR	3	Audio amp error detection

## 2.2 LED Blinking: 3x (Audio Error)

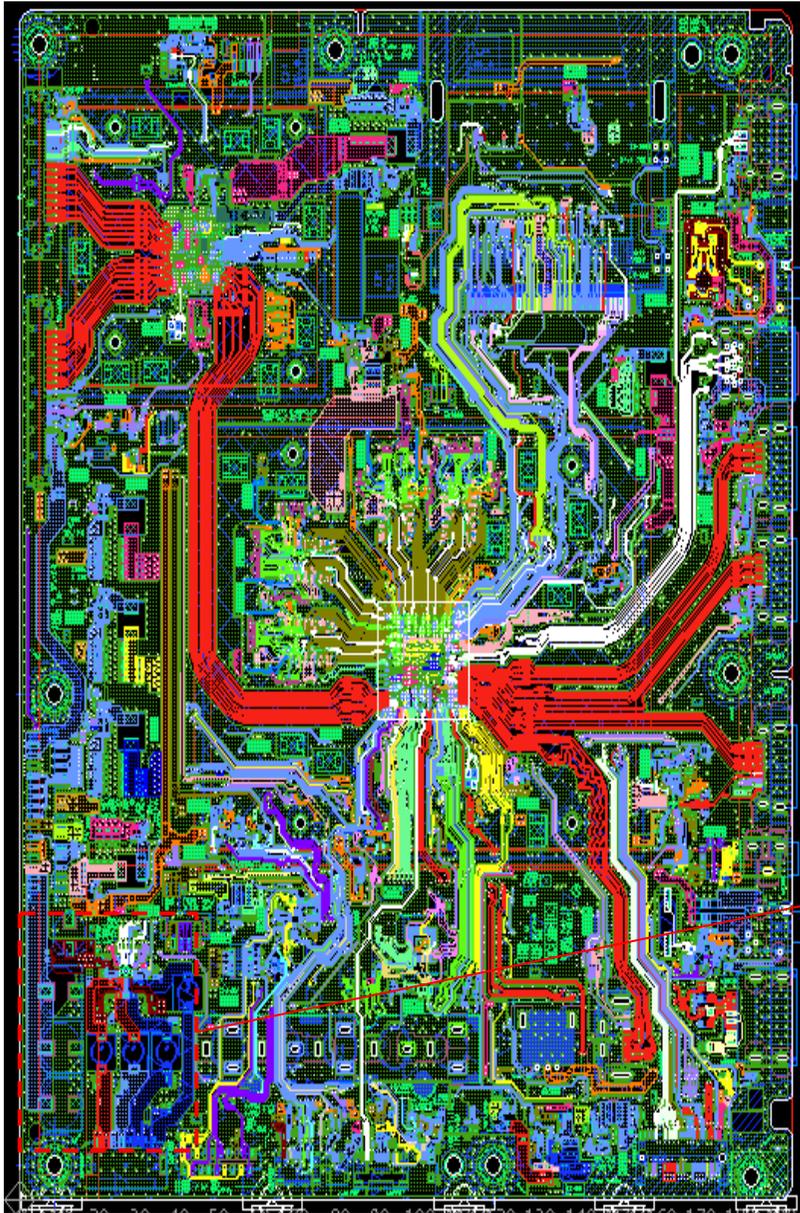


\*POWER\_AU is same as VDD

\*\*Only applicable for size 55, 65, 75, 85

## 2.2 LED Blinking: 3x (Audio Error)

### BSL-PWB

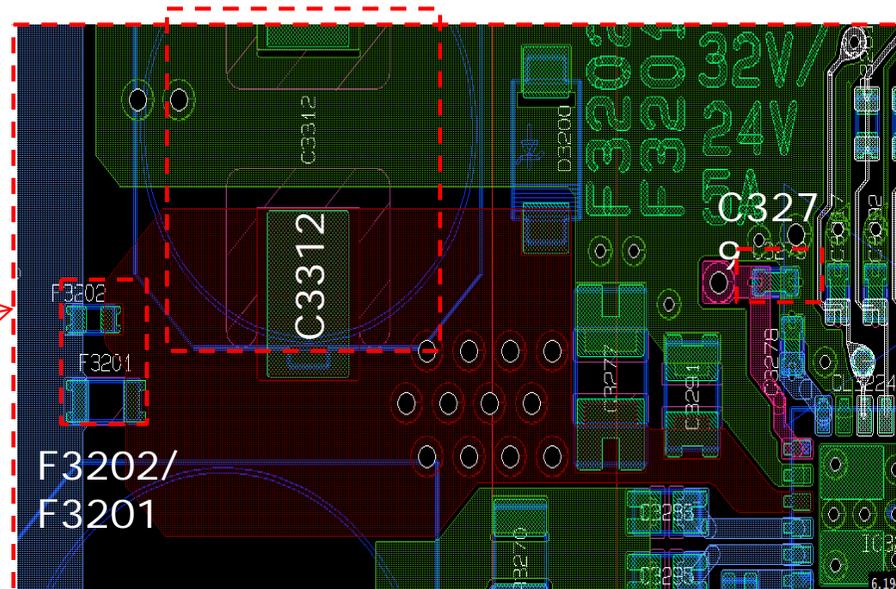


(1) VDD-GND short check  
Measure impedance between VDD and GND at capacitor C3312.  
impedance is  $<100\Omega$  → NG

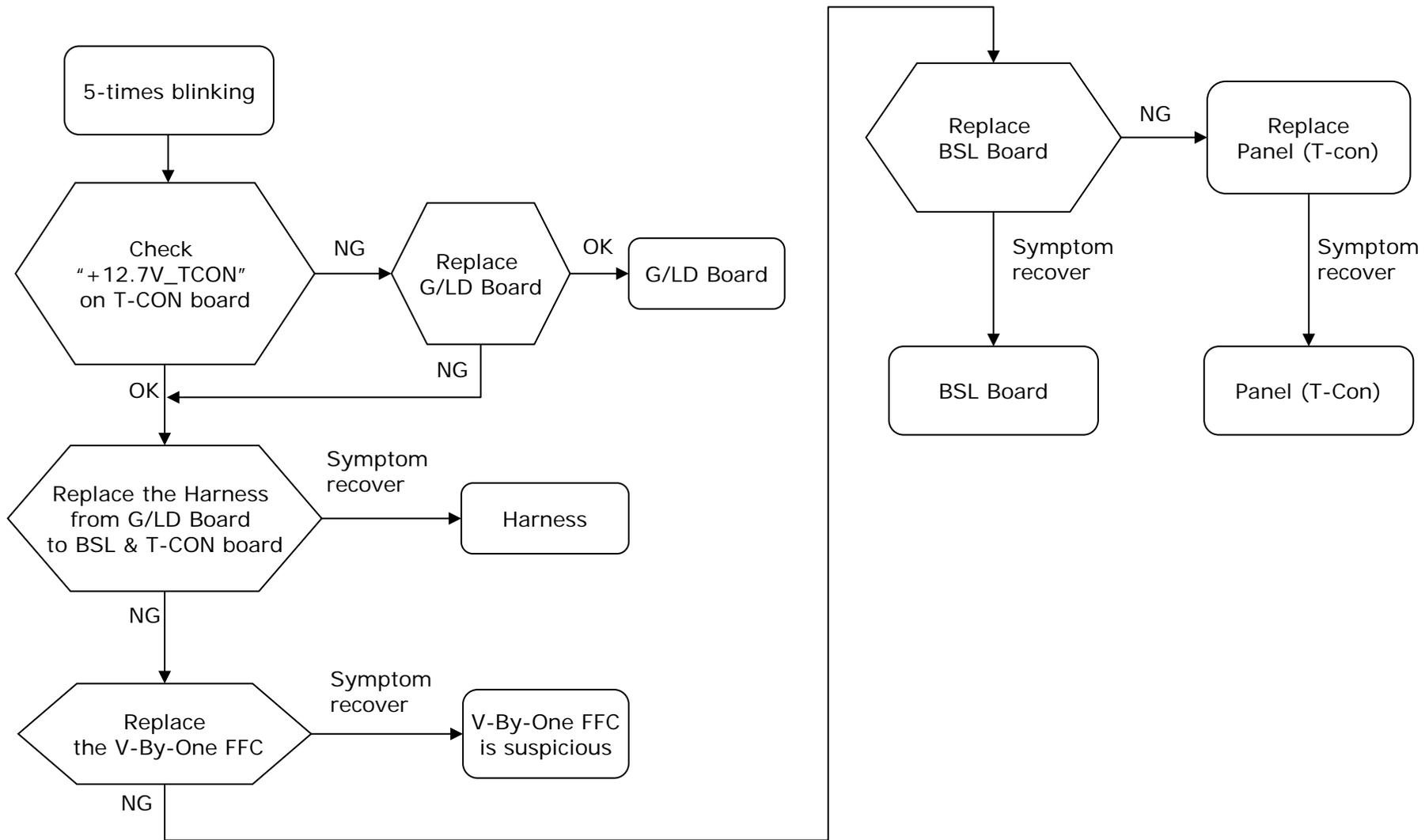
(2) 3.3V\_Audio short check  
Measure impedance between 3.3V and GND at C3279.  
impedance is  $<100\Omega$  → NG

(3) Fuse open check  
Measure impedance of fuse  
F3202/F3201 5A (12.7V or 19.5V)  
fuse open → NG

(4) POWER\_AU check  
Measure voltage at capacitor C3312.  
Voltage is  $<12.7V$  (G-Board) or  $19.5V$  (L-Board) → NG

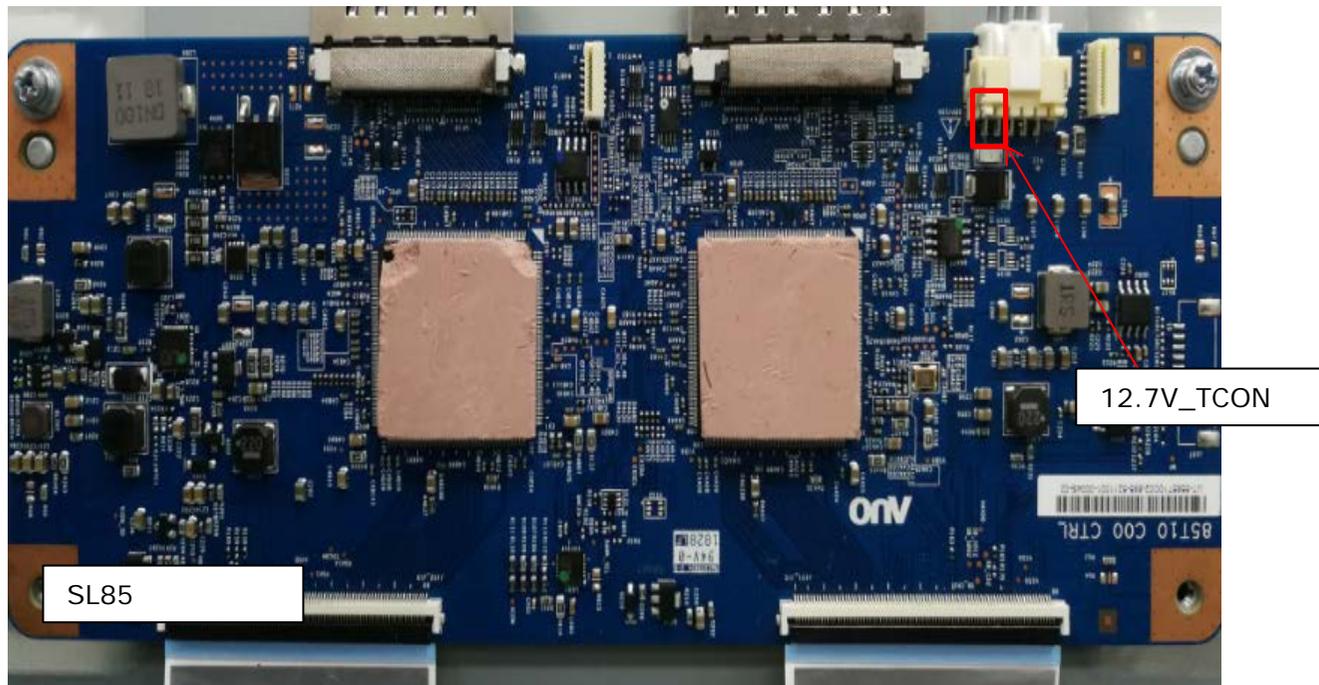
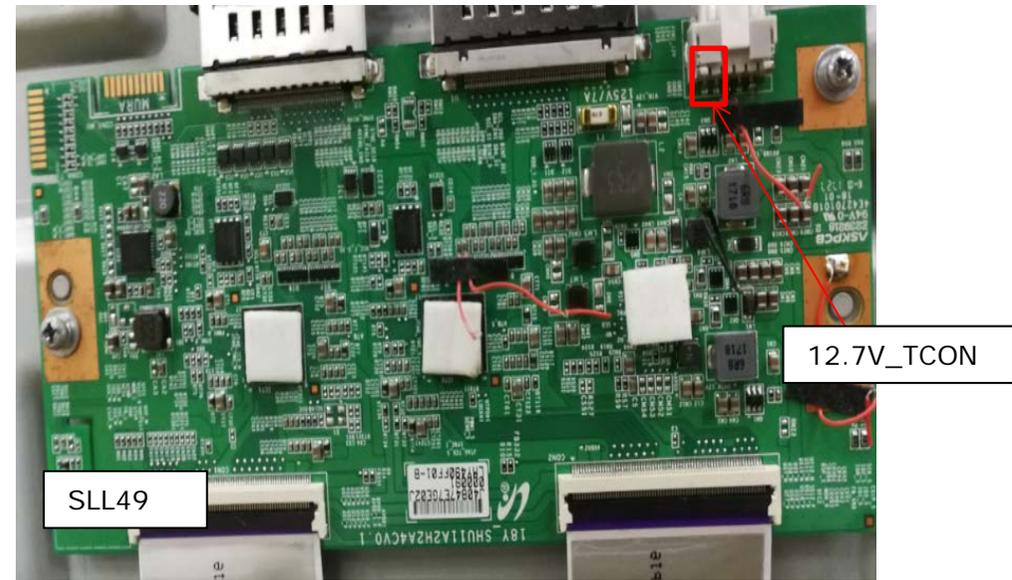
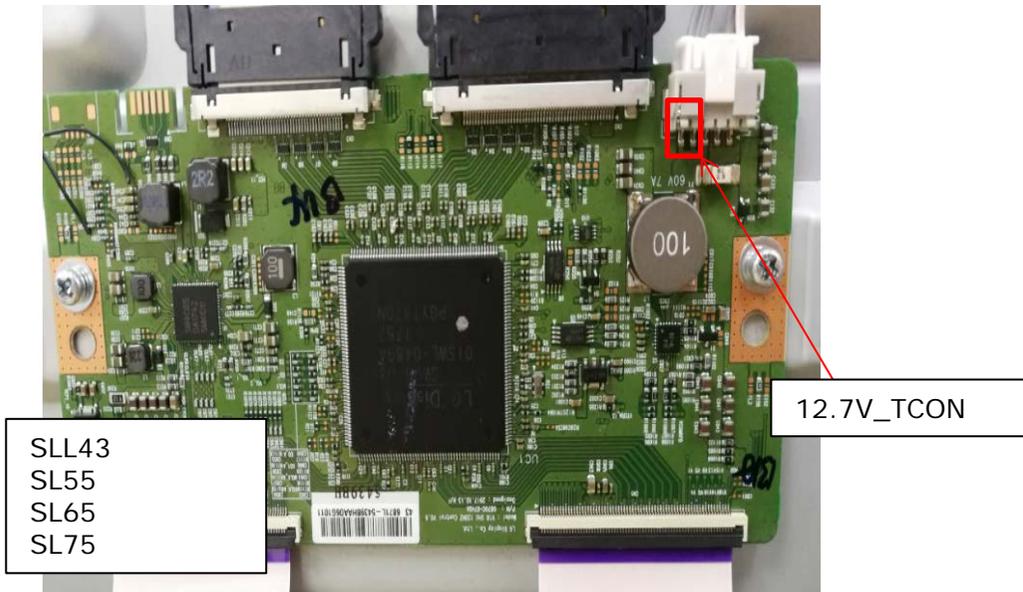


# BSL

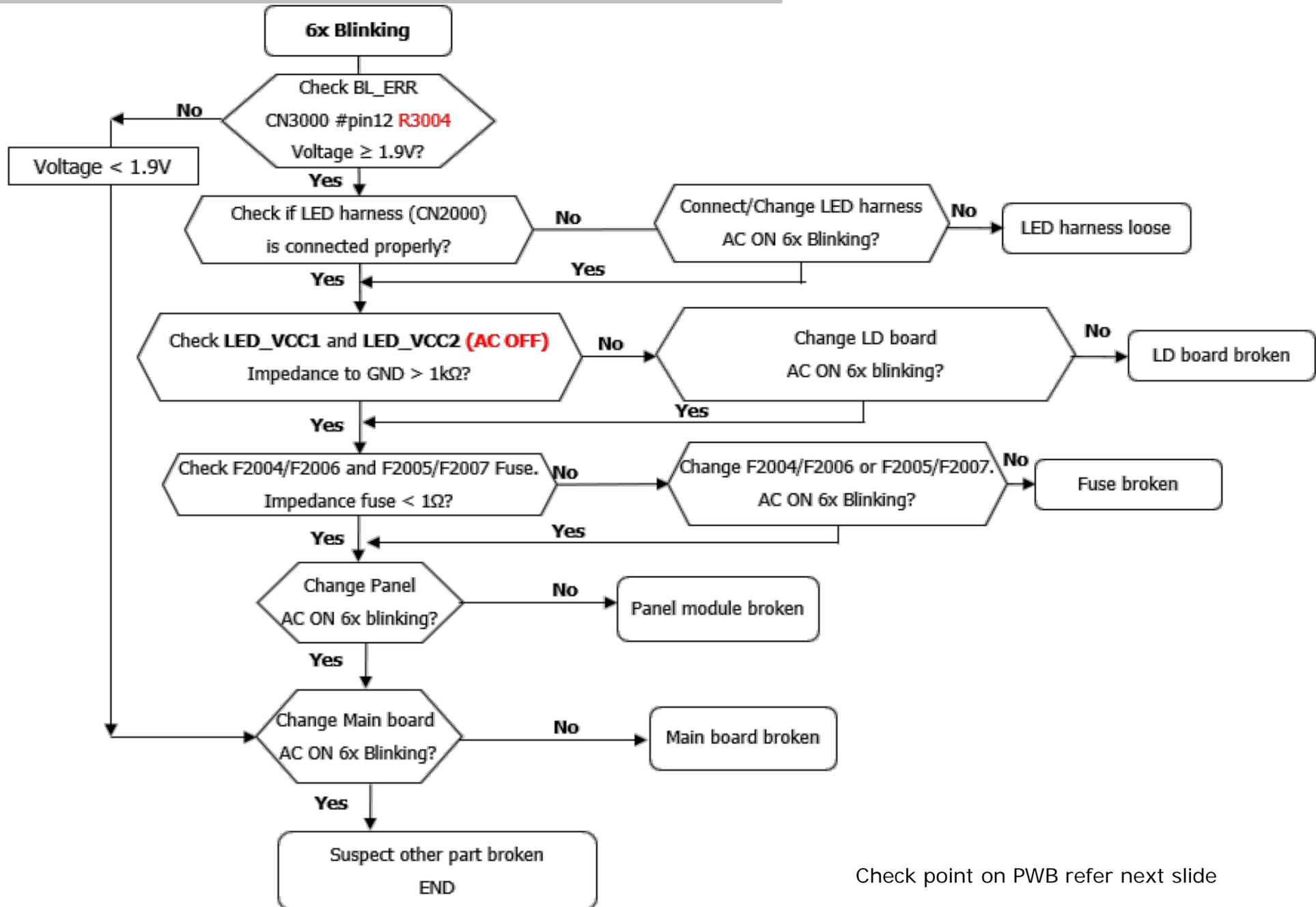


G/LD Board: G board or LD board

Location of +12.7V\_TCON on TCON board

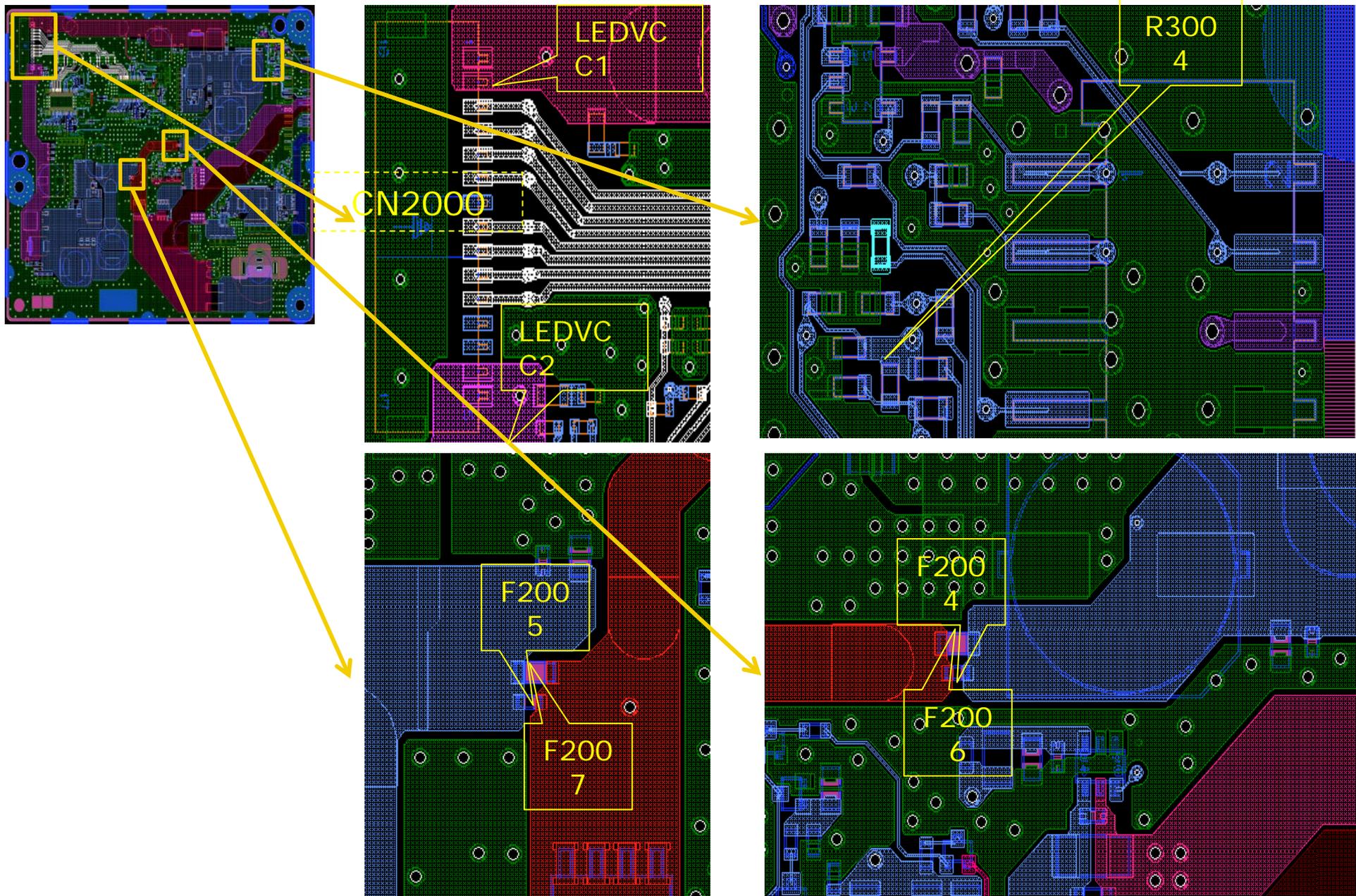


## 2.6 LED Blinking: 6x (Panel Backlight Error)

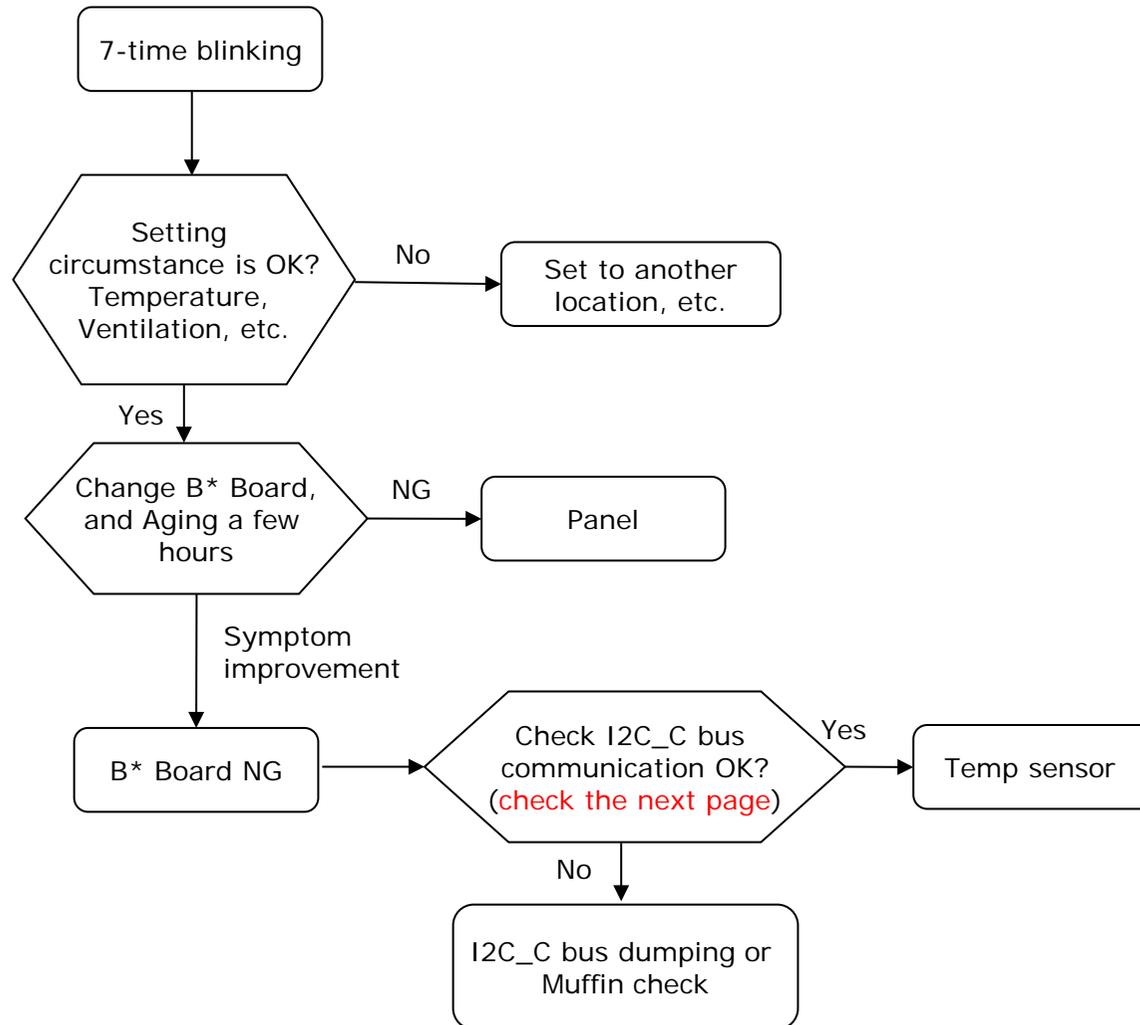


Check point on PWB refer next slide

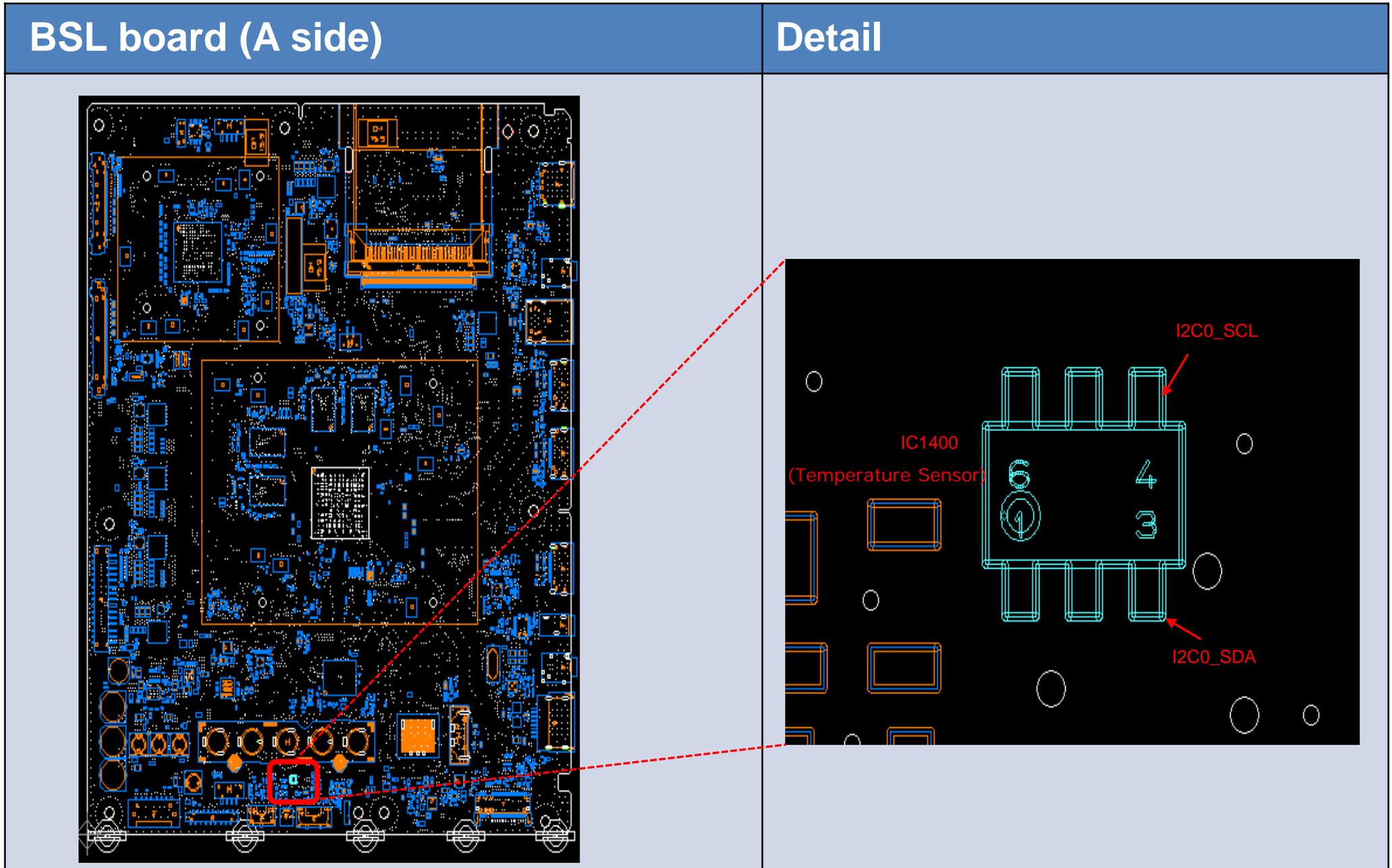
## 2.6 LED Blinking: 6x (Panel Backlight Error)



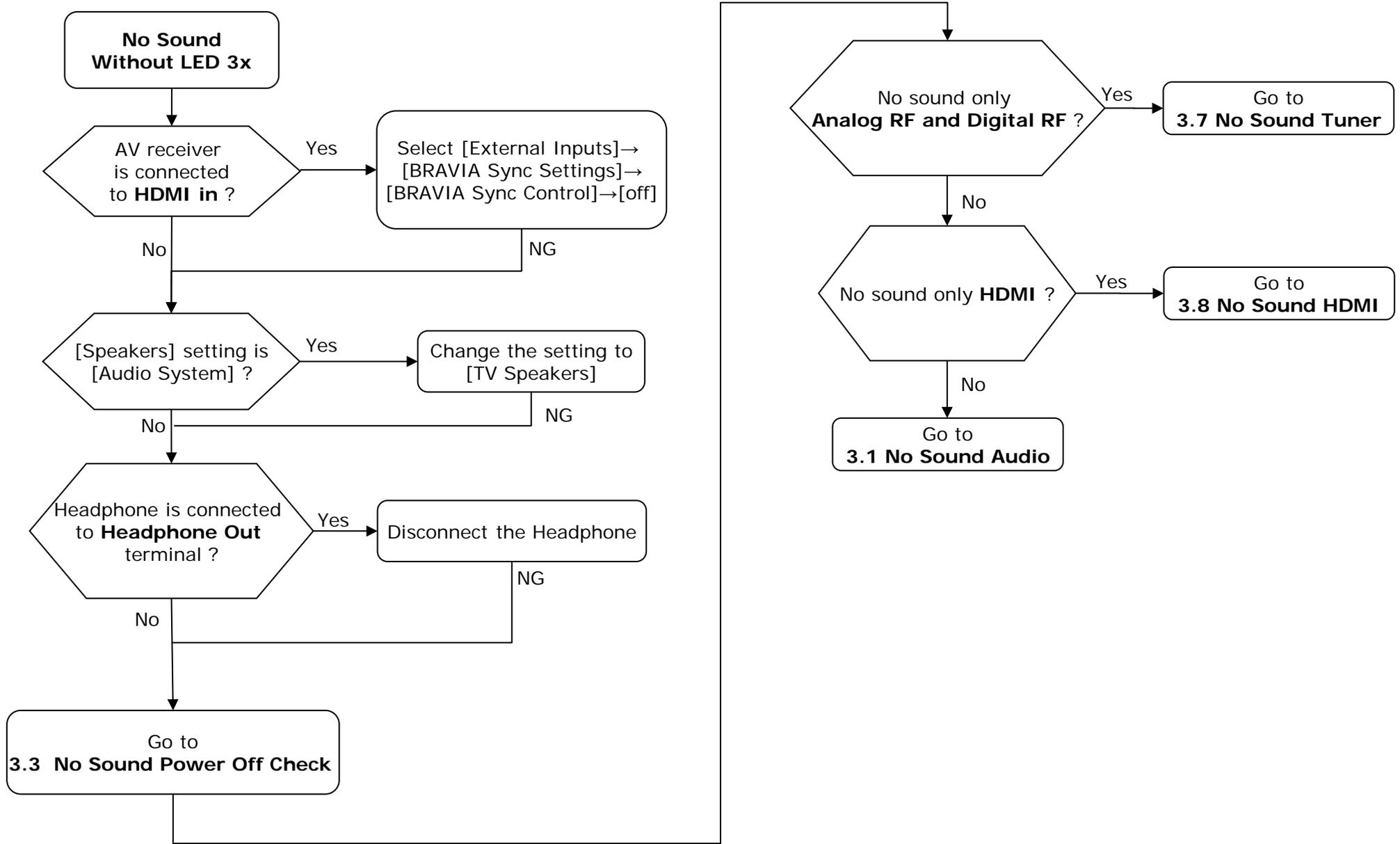
## 2.7 LED Blinking: 7x (Temperature Error)



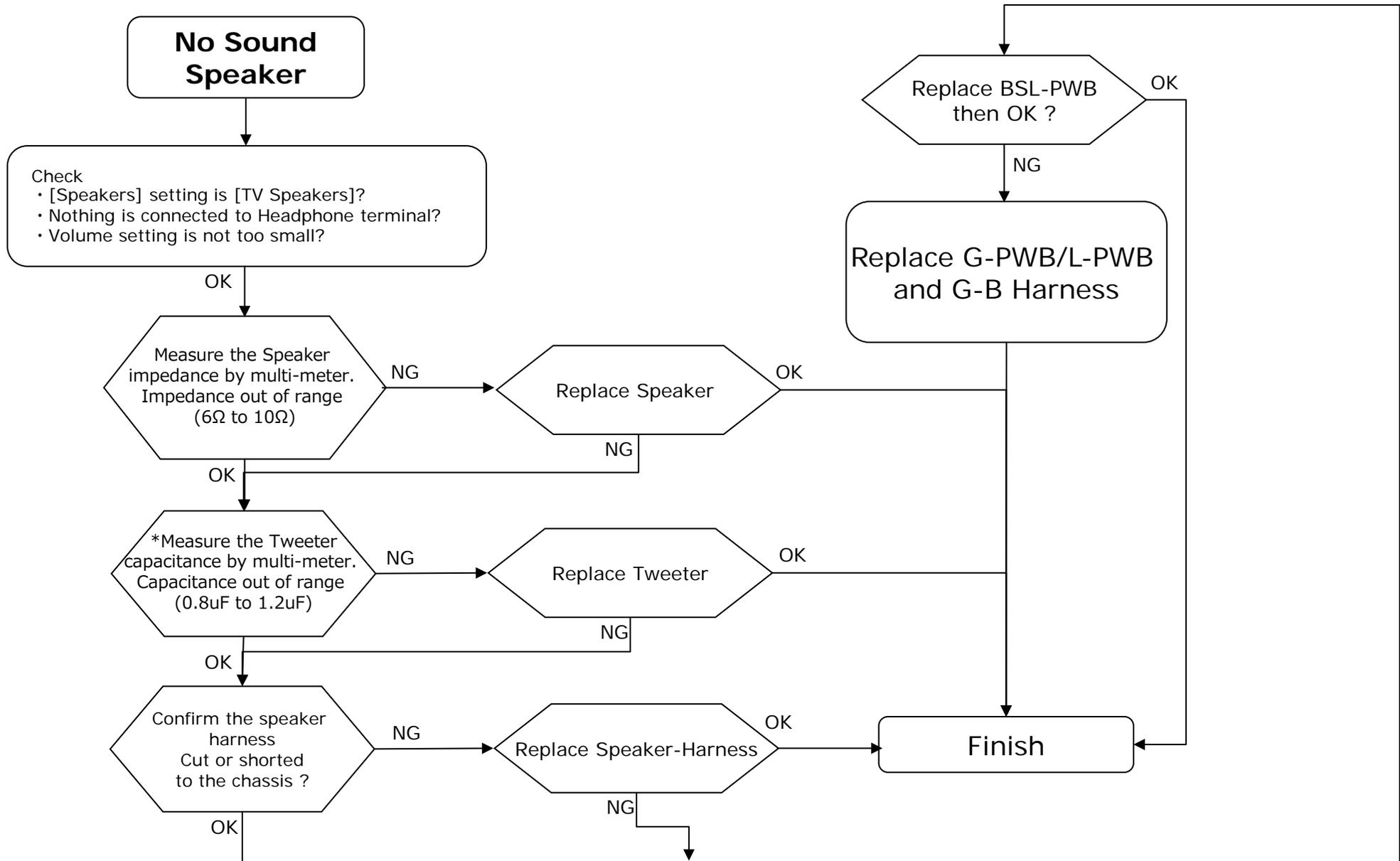
Check point for BSL



### 3.0 No Sound

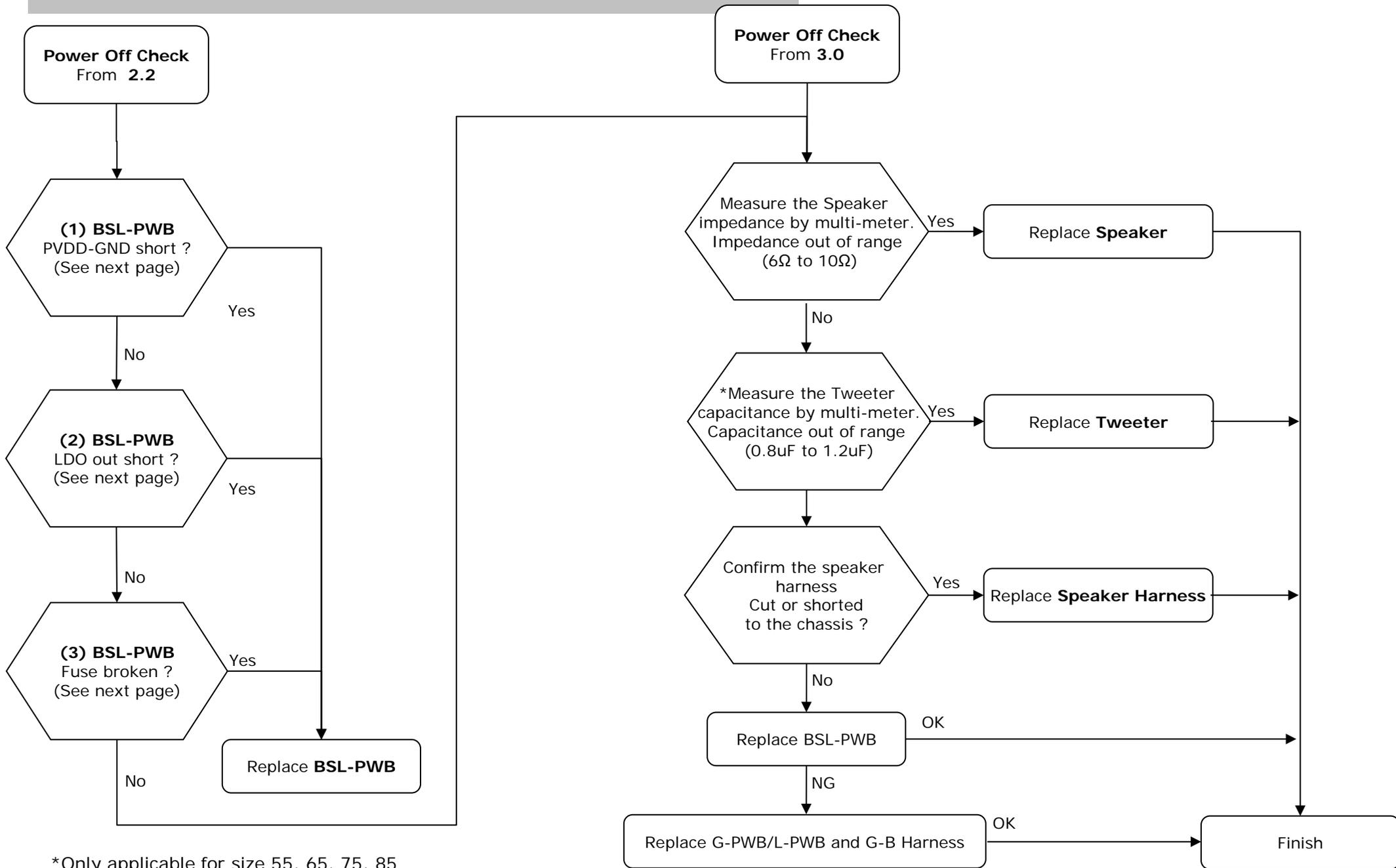


### 3.1 No Sound Audio



\*Only applicable for size 55, 65, 75, 85

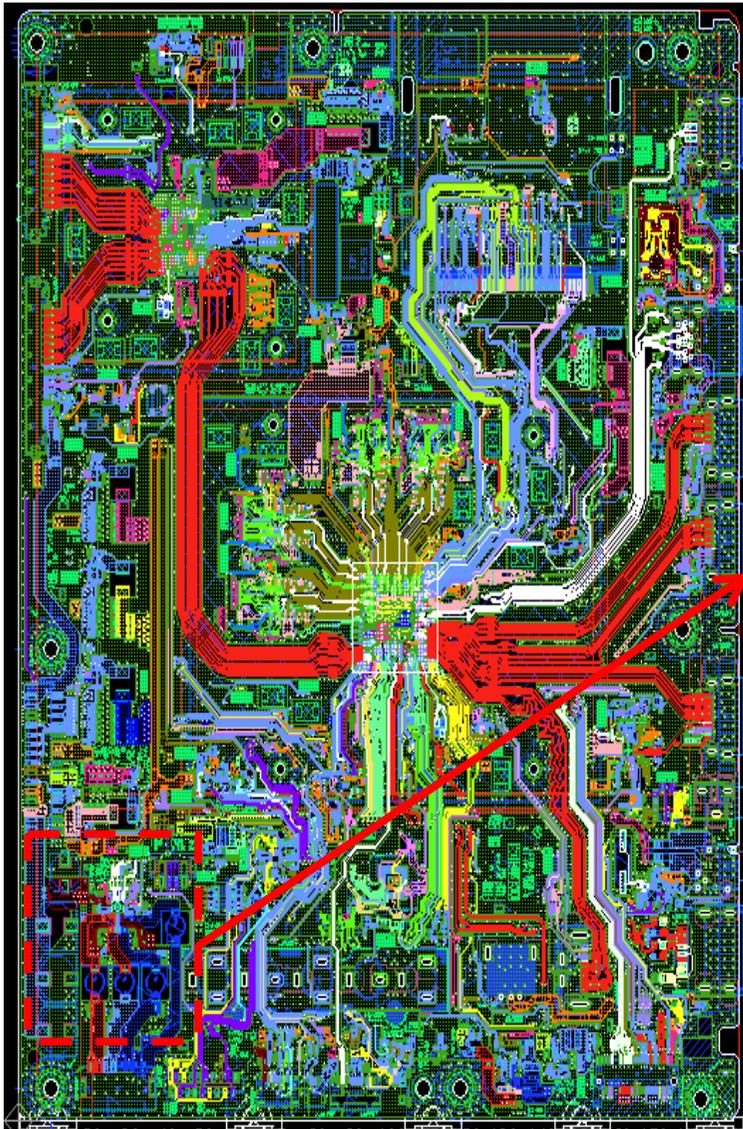
### 3.3 No Sound Power Off Check



\*Only applicable for size 55, 65, 75, 85

### 3.3 No Sound Power Off Check

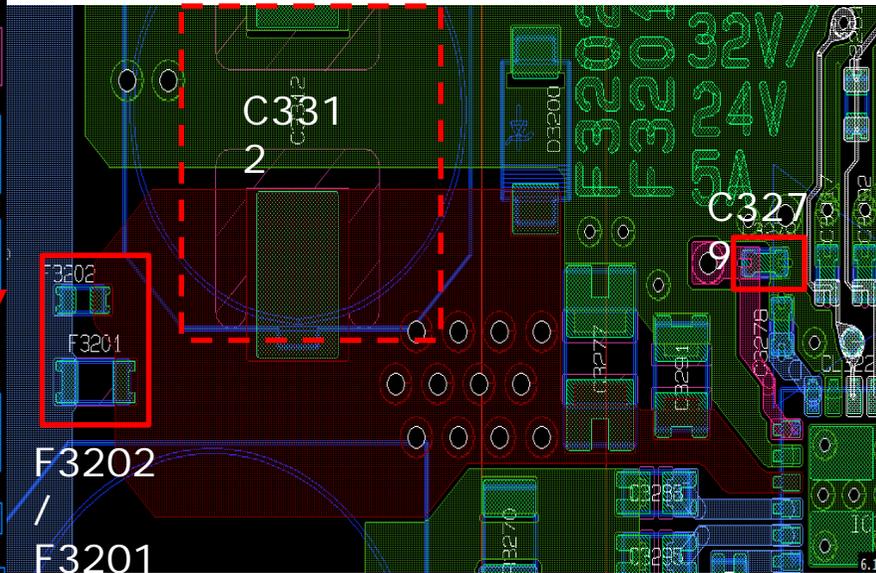
## BSL-PWB



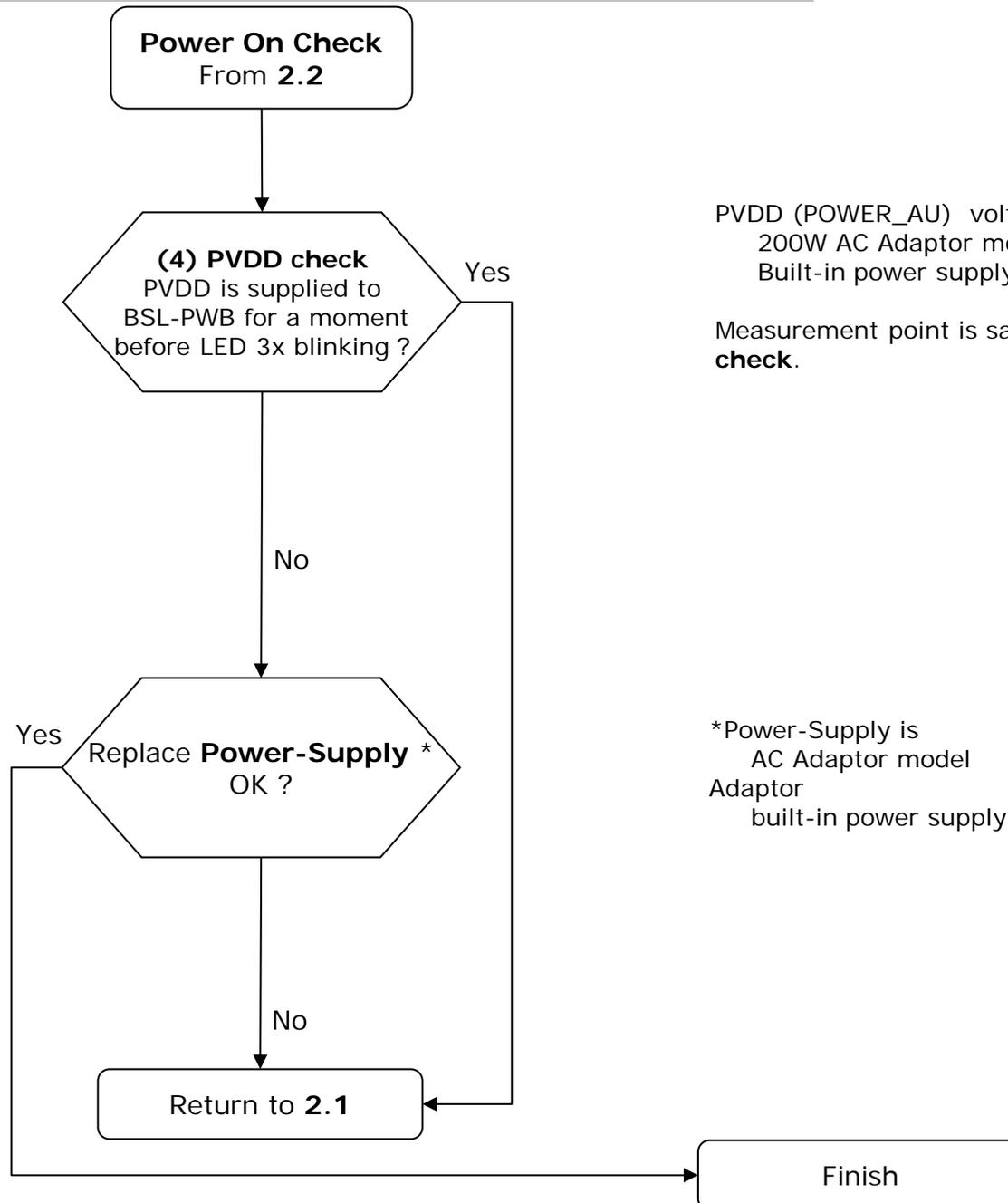
**(1) PVDD-GND short check**  
Measure impedance between PVDD and GND at capacitor C3312.  
if impedance is  $<100\Omega$  → NG

**(2) 3.3V short check**  
Measure 3.3V voltage at C3279.  
impedance is  $<100\Omega$  → NG

**(3) Fuse open check**  
Measure impedance of fuse F3202/F3201 5A .  
If fuse open → NG



### 3.4 No Sound Power On Check



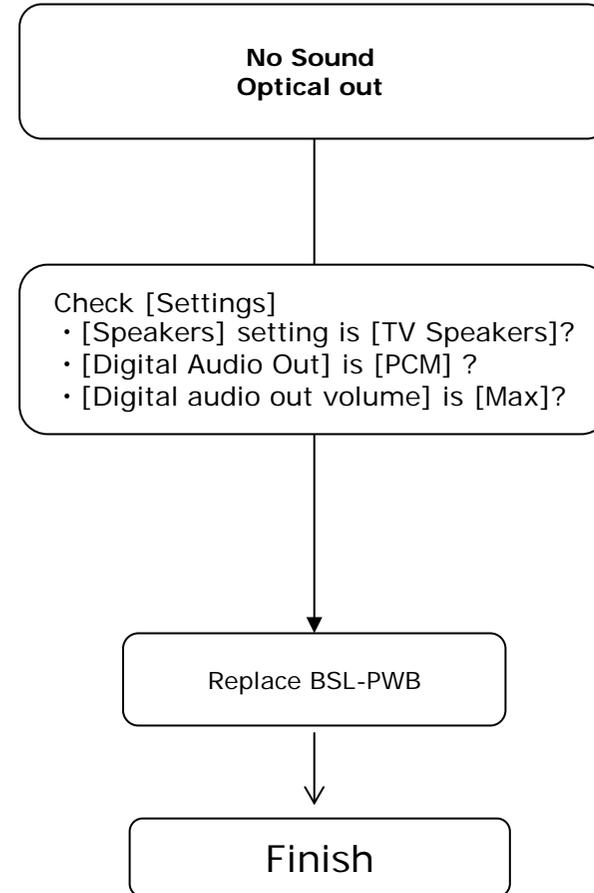
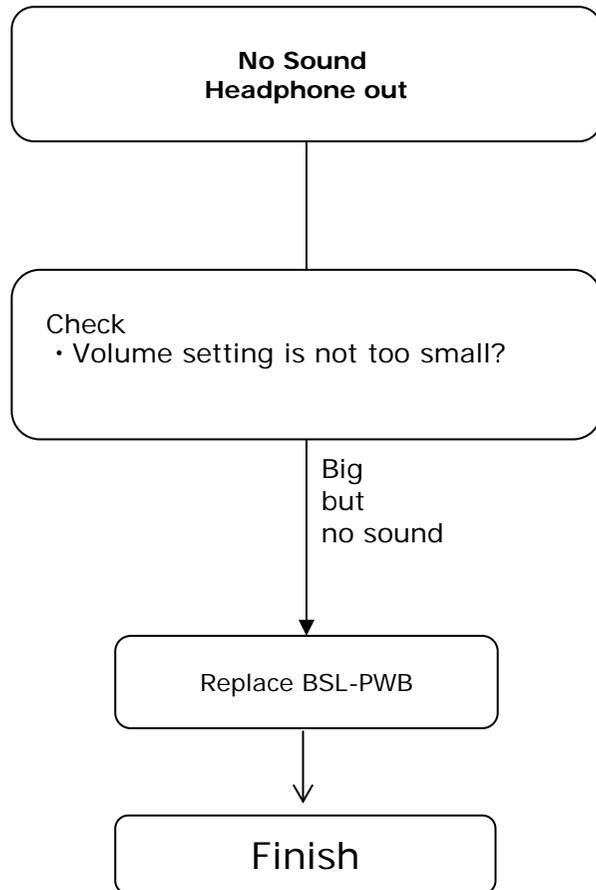
PVDD (POWER\_AU) voltage is  
200W AC Adaptor model : 19.5V  
Built-in power supply model : 12.7V

Measurement point is same as **3.3 (1) PVDD-GND short check.**

\*Power-Supply is  
AC Adaptor model : LD2-PWB & AC  
Adaptor  
built-in power supply model : G-PWB

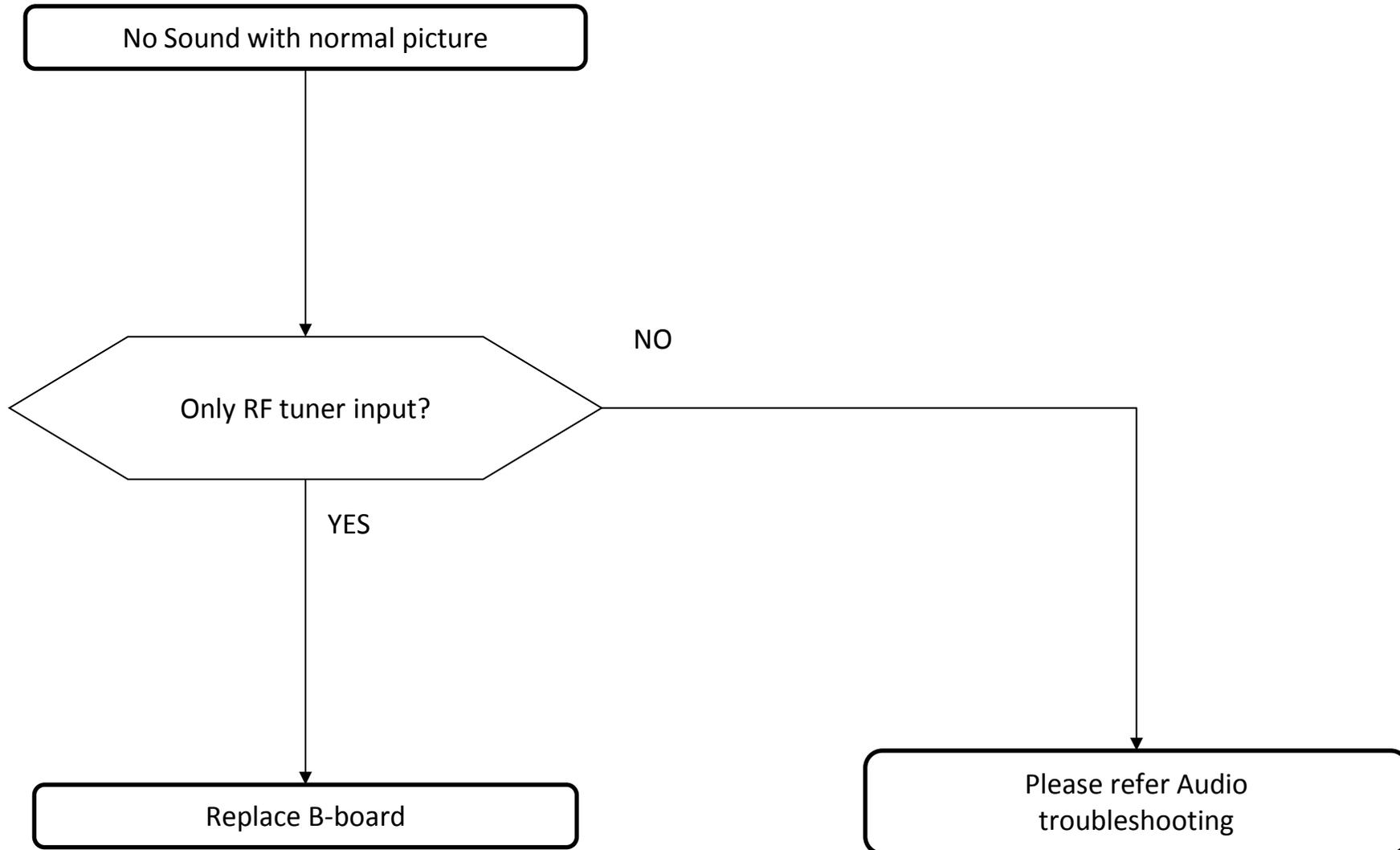
### 3.5 No Sound Audio Headphone out/Optical Out

---

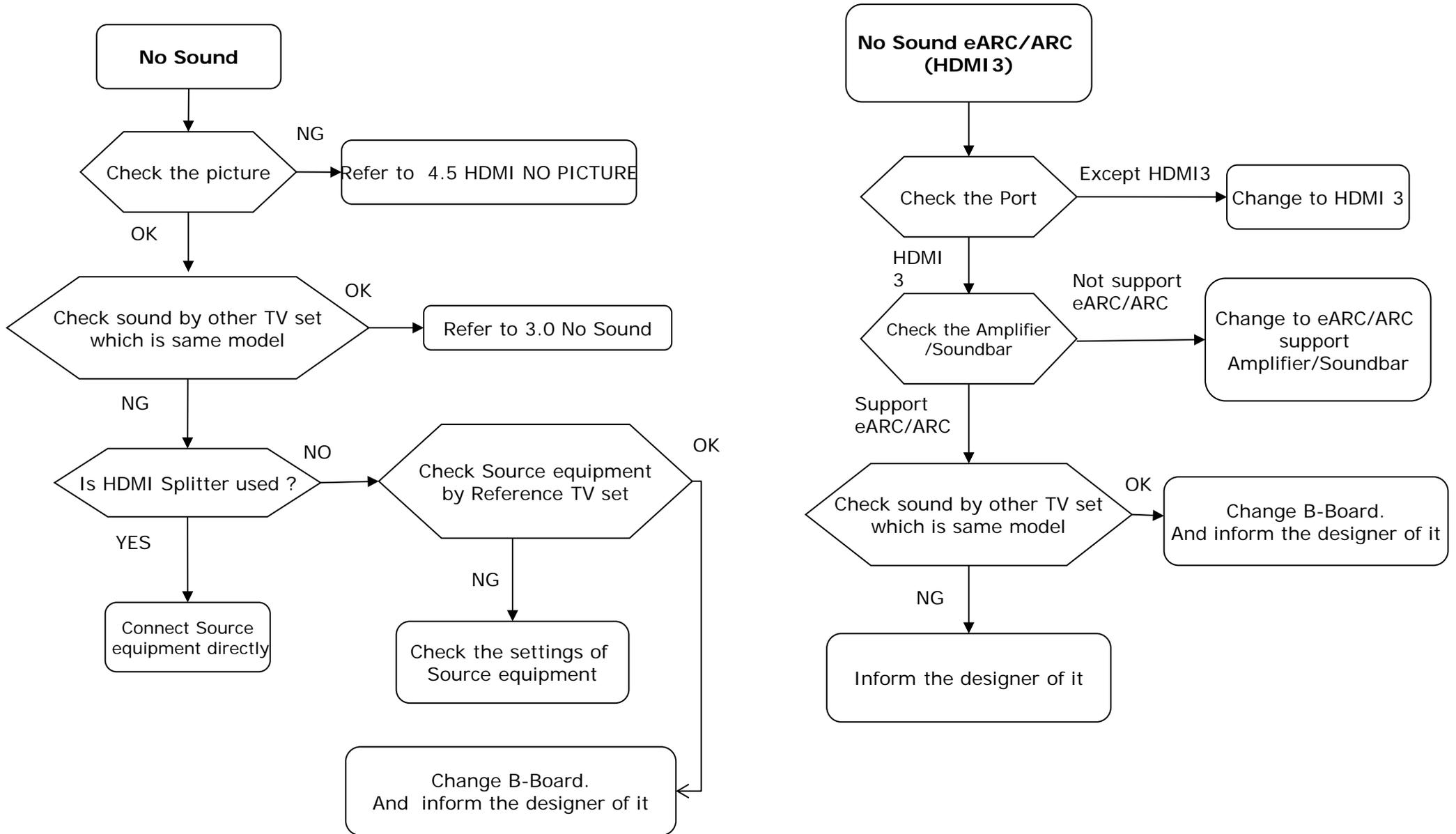


### 3.7 NO SOUND TUNER

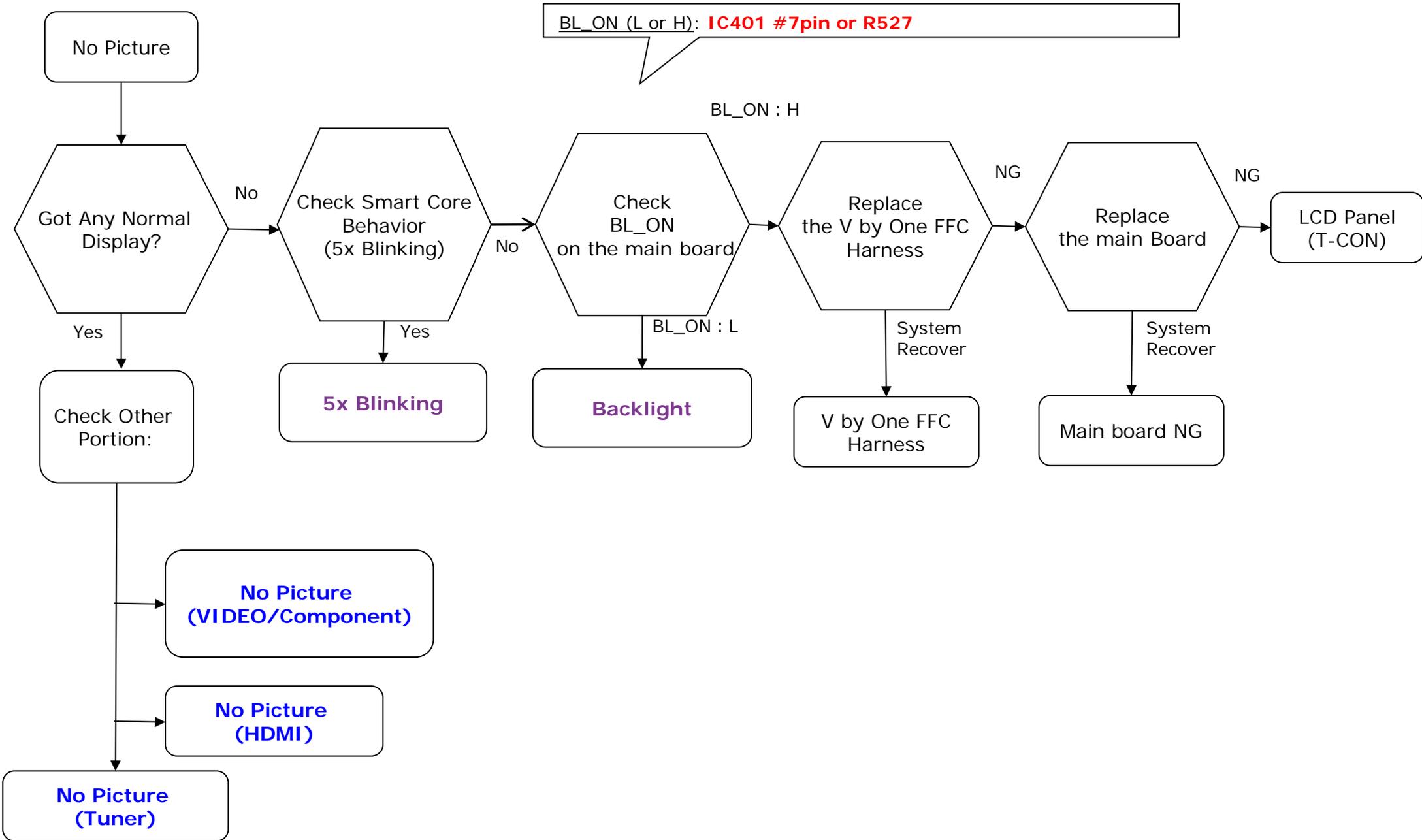
---



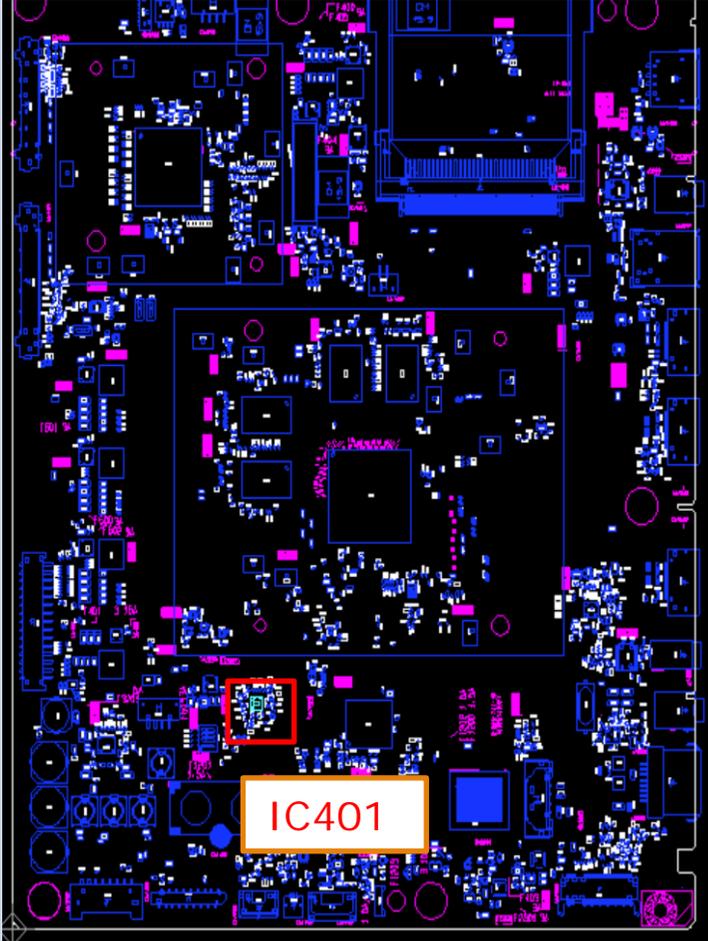
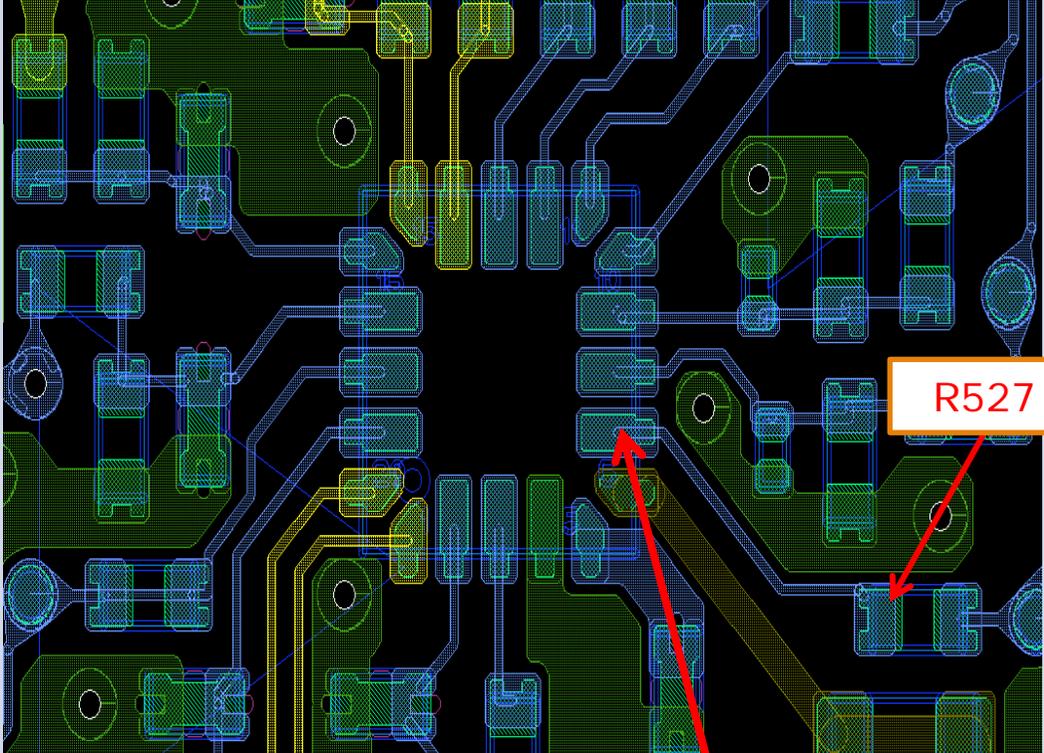
3.8 NO SOUND: HDMI 1/2/3/4



## 4.0 No Picture

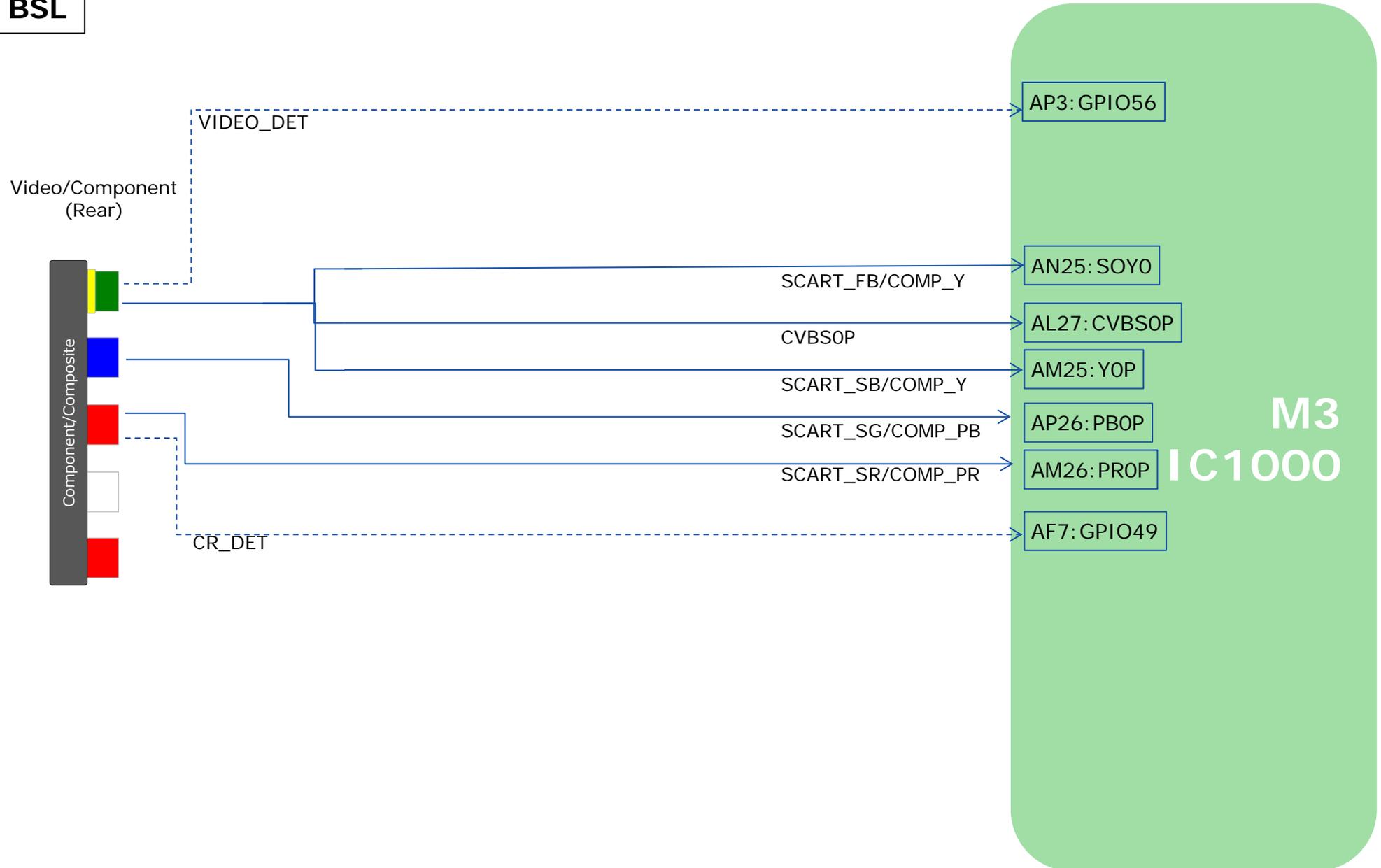


Check point for BSL BL\_ON (IC401 #7pin or R527)

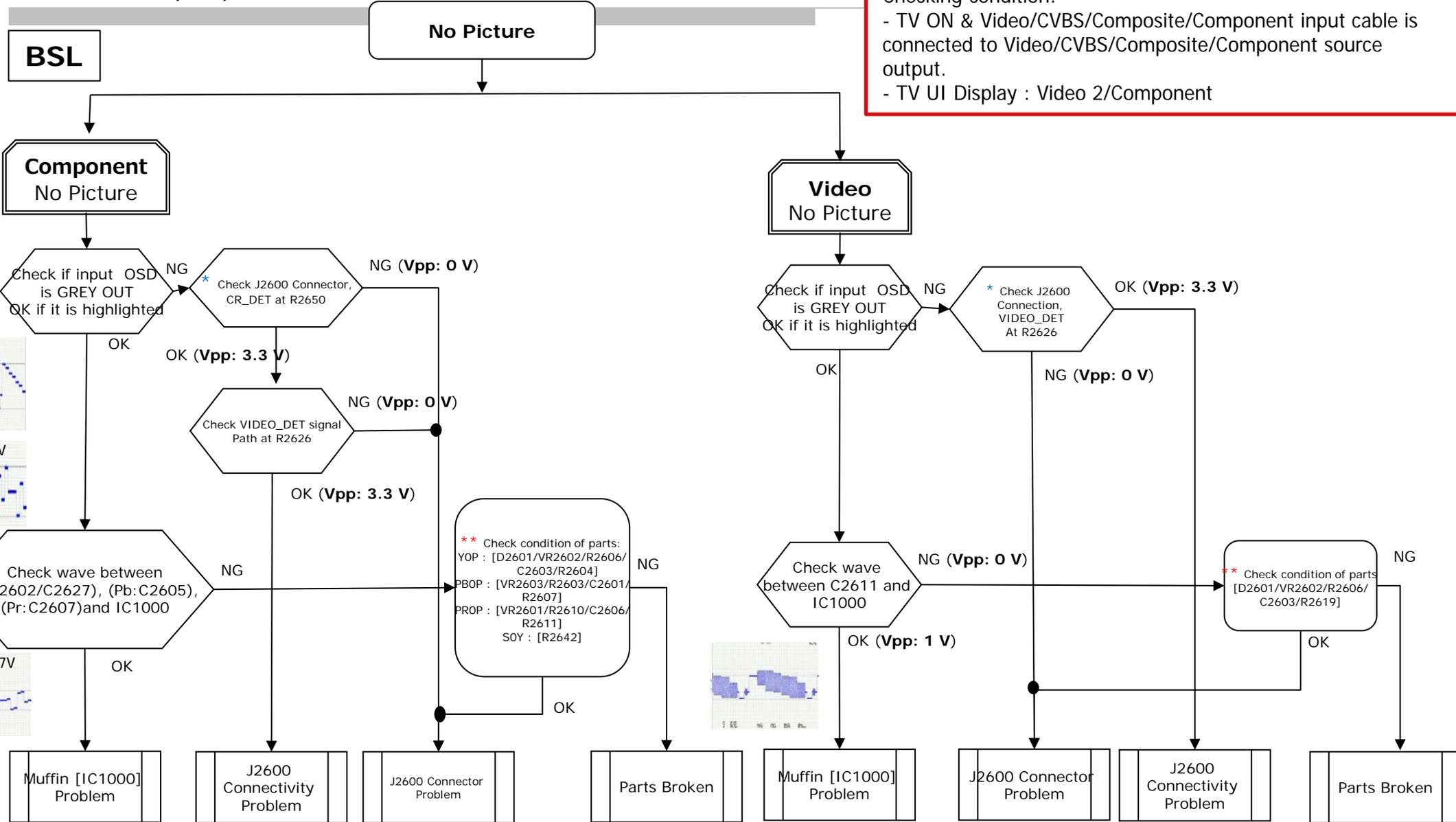
Name	Board PWB (A side)	Detail
BSL	 <p>IC401</p>	 <p>R527</p> <p>IC401 Pin#7</p>

## 4.1 Video Analog Signal Path (WW)

**BSL**



## 4.2 No Picture (WW)



Checking condition:  
 - TV ON & Video/CVBS/Composite/Component input cable is connected to Video/CVBS/Composite/Component source output.  
 - TV UI Display : Video 2/Component

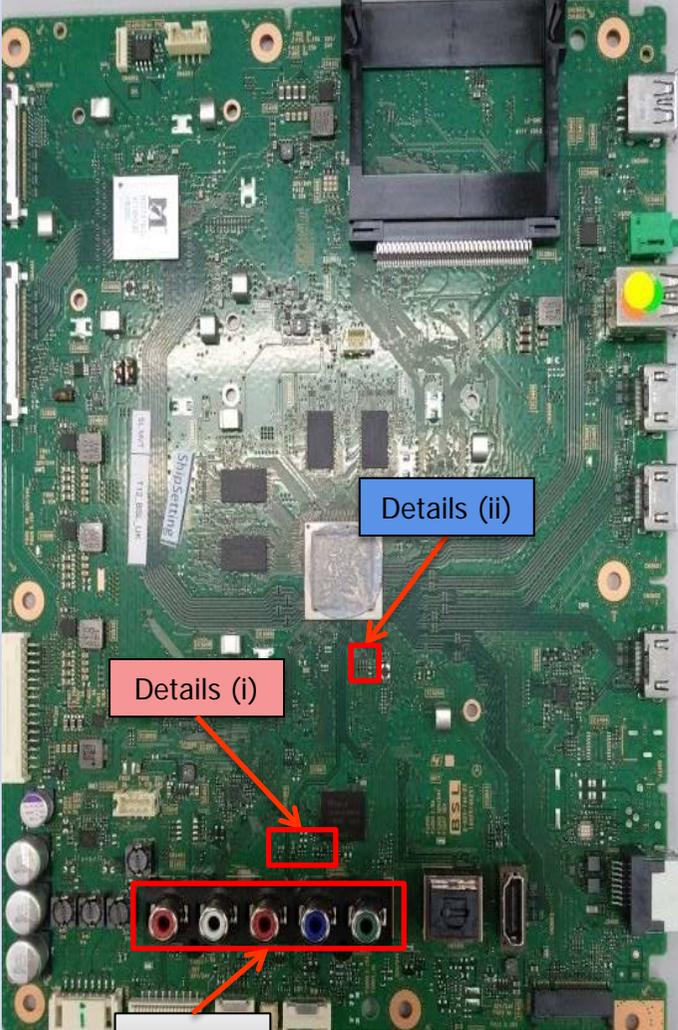
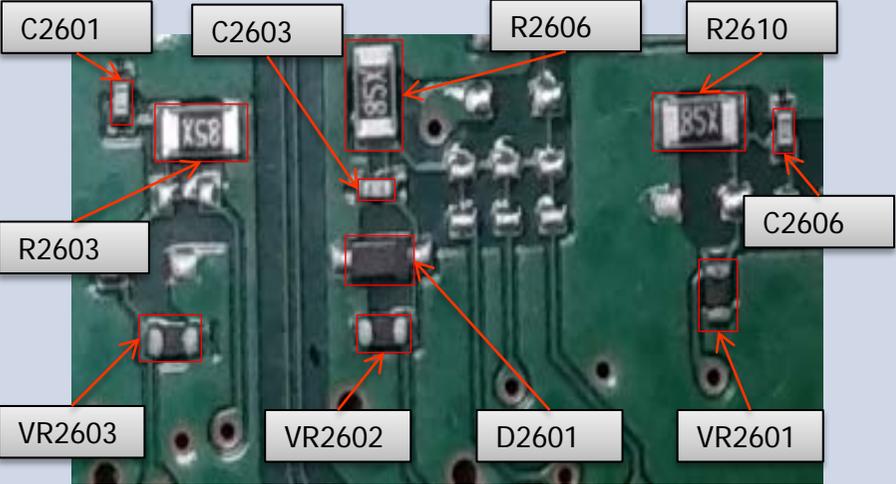
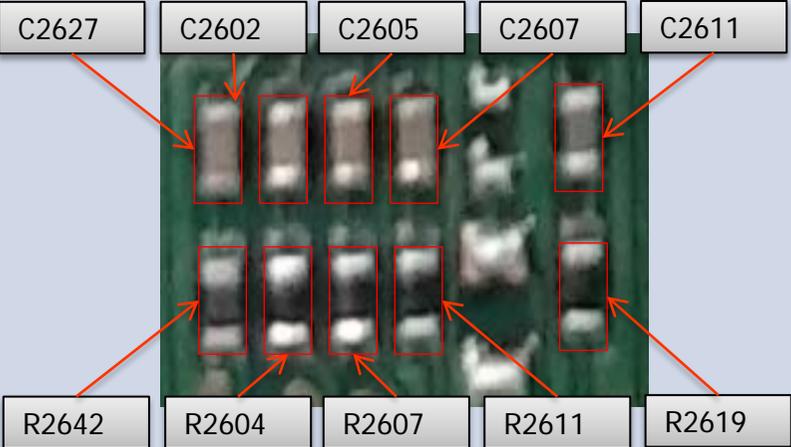
\* → OK Condition : No solder splash can be seen  
 → NG Condition : Solder splash can be seen

\*\* → OK Condition : No part short-circuited  
 → NG Condition : Part short-circuited

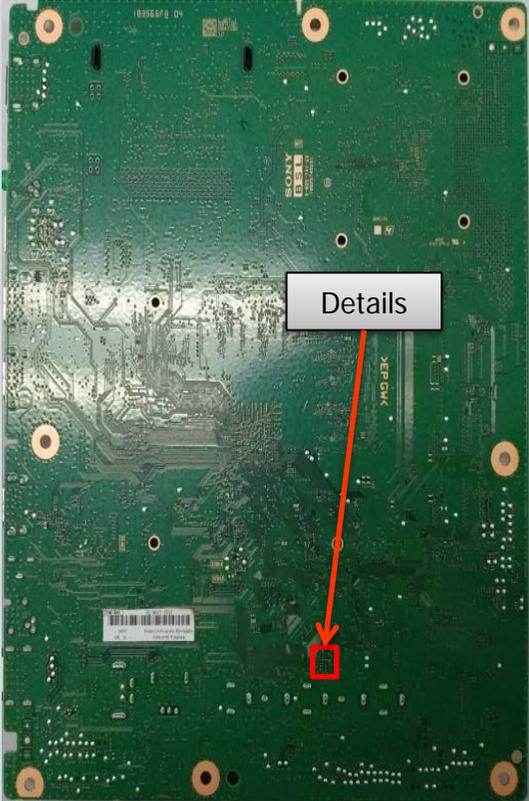
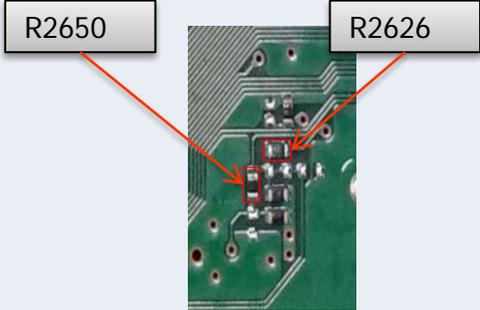
[All voltage measurement using Oscilloscope]

Condition	Actions to be taken
<div data-bbox="501 568 721 673" style="border: 1px solid black; padding: 5px; width: fit-content;"> Muffin [IC1000] Problem </div>	Change B-board
<div data-bbox="501 756 721 861" style="border: 1px solid black; padding: 5px; width: fit-content;"> J2600 Connector Problem </div> <div data-bbox="501 919 721 1024" style="border: 1px solid black; padding: 5px; width: fit-content;"> J2600 Connectivity Problem </div>	Change Connector
<div data-bbox="510 1150 730 1256" style="border: 1px solid black; padding: 5px; width: fit-content;"> Parts Broken </div>	Change Part according to remarks **

## 4.2 Video Analog Signal Path - Checking Point (BSL)

Board Name	Board PWB (A side)	Details
<p>BSL(A-Side)</p> <p>J2600 C2601 C2602 C2603 C2605 C2606 C2607 C2611 C2627 D2601 R2603 R2604 R2606 R2607 R2610 R2611 R2619 R2642 VR2601 VR2602 VR2603</p>	 <p>Details (i)</p> <p>Details (ii)</p> <p>J2600</p>	<p>Details (i)</p>  <p>C2601 C2603 R2606 R2610 R2603 C2606 VR2603 VR2602 D2601 VR2601</p> <p>Details (ii)</p>  <p>C2627 C2602 C2605 C2607 C2611 R2642 R2604 R2607 R2611 R2619</p>

## 4.2 Video Analog Signal Path - Checking Point (BSL)

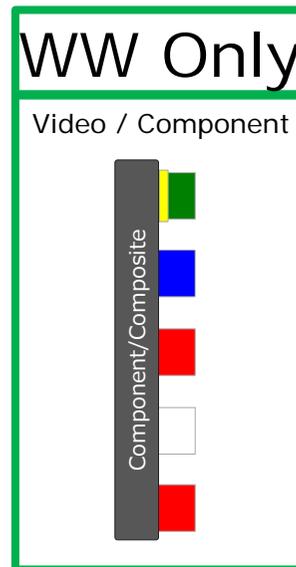
Board Name	Board PWB (A side)	Details
BSL(B-side)  R2626 R2650	 <p>The image shows the main PWB (A side) of the BSL(B-side) board. A red box highlights a component in the lower right quadrant, with an orange arrow pointing to a label 'Details'.</p>	 <p>The magnified view shows two resistors, R2650 and R2626, highlighted with red boxes and labeled with callouts. R2650 is on the left and R2626 is on the right.</p>

## 4.2 Input Skip function (BSL)

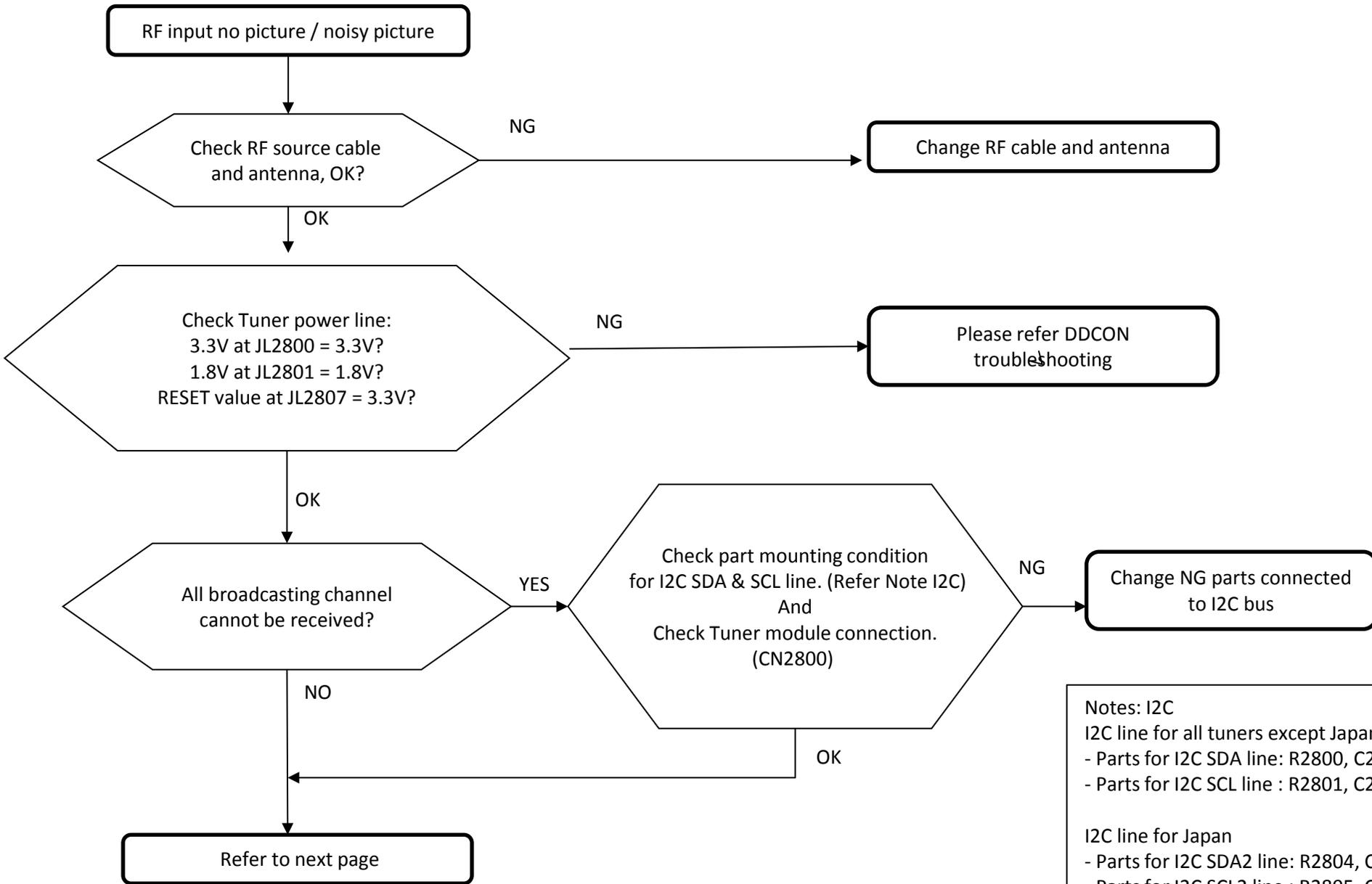
Under default condition:

If user insert analog video cables into video jacks, the Video/Component will be highlighted and can be selected. The detection mechanism is based on below tables.

Destination	Input	Signal	Non-Detect (Typical)	Detect (Typical)
WW	Video / Component	VIDEO_DET IC1000 AP3- GPIO56	0V	3.3V
		CR_DET IC1000 AF7- GPIO49	0V	3.3V



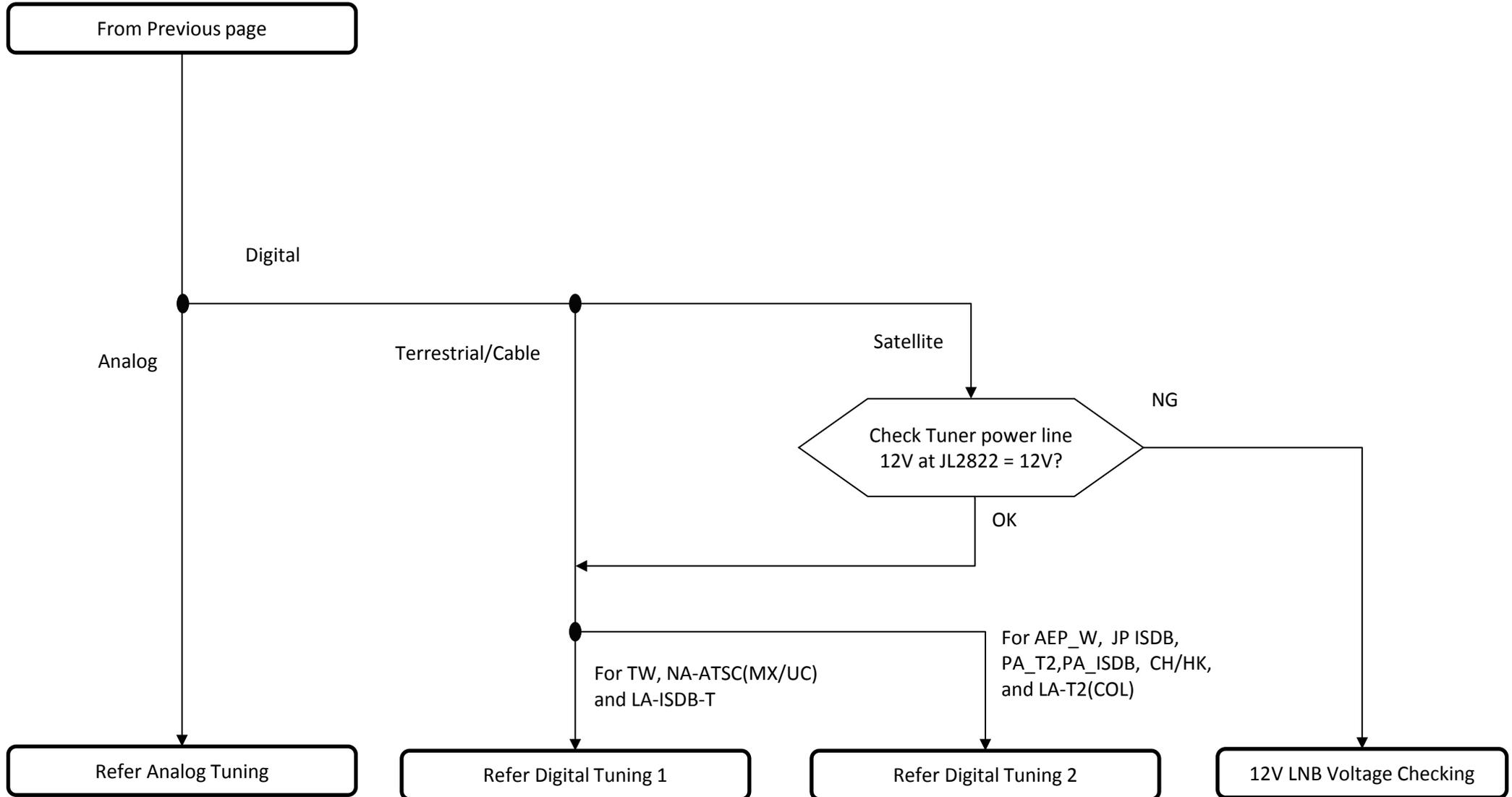
#### 4.4 No Picture Tuner



Notes: I2C  
I2C line for all tuners except Japan  
- Parts for I2C SDA line: R2800, C2803.  
- Parts for I2C SCL line : R2801, C2804.

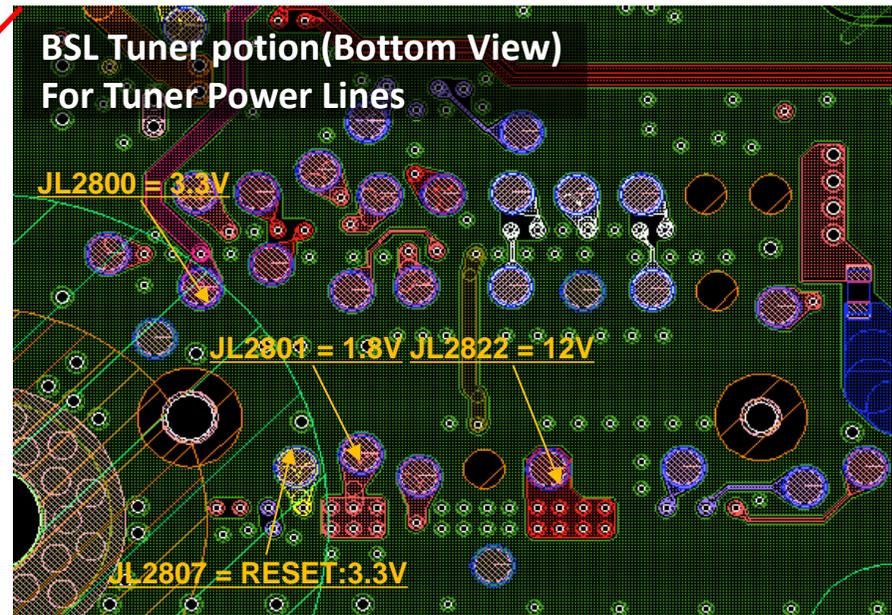
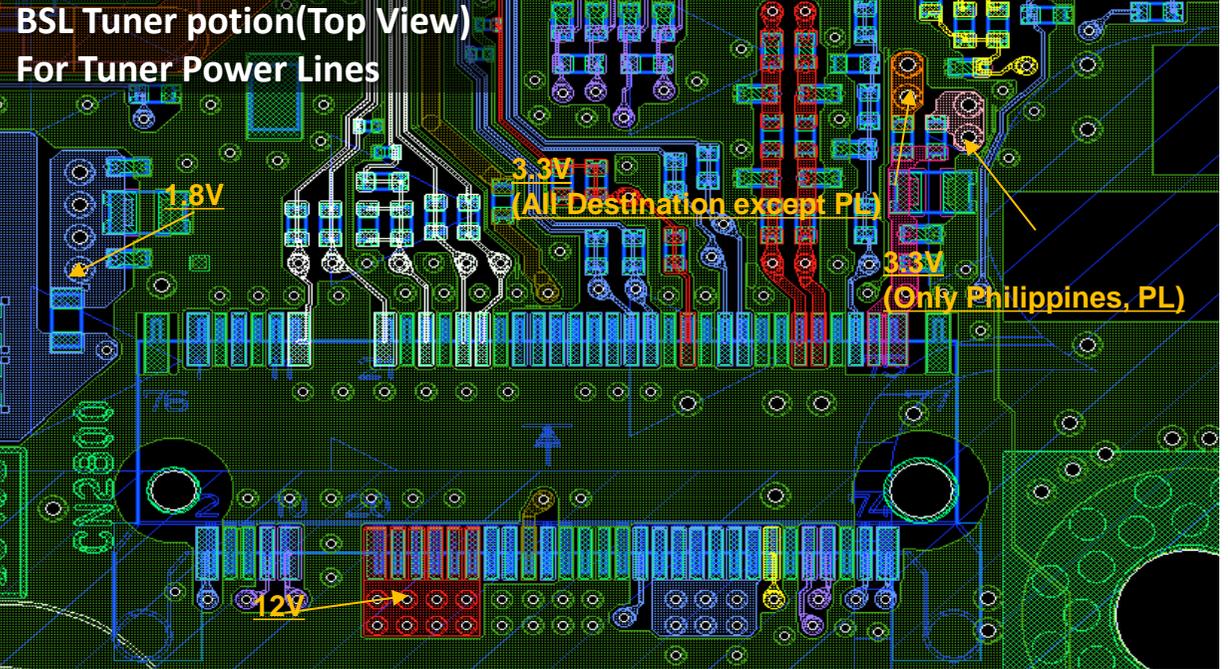
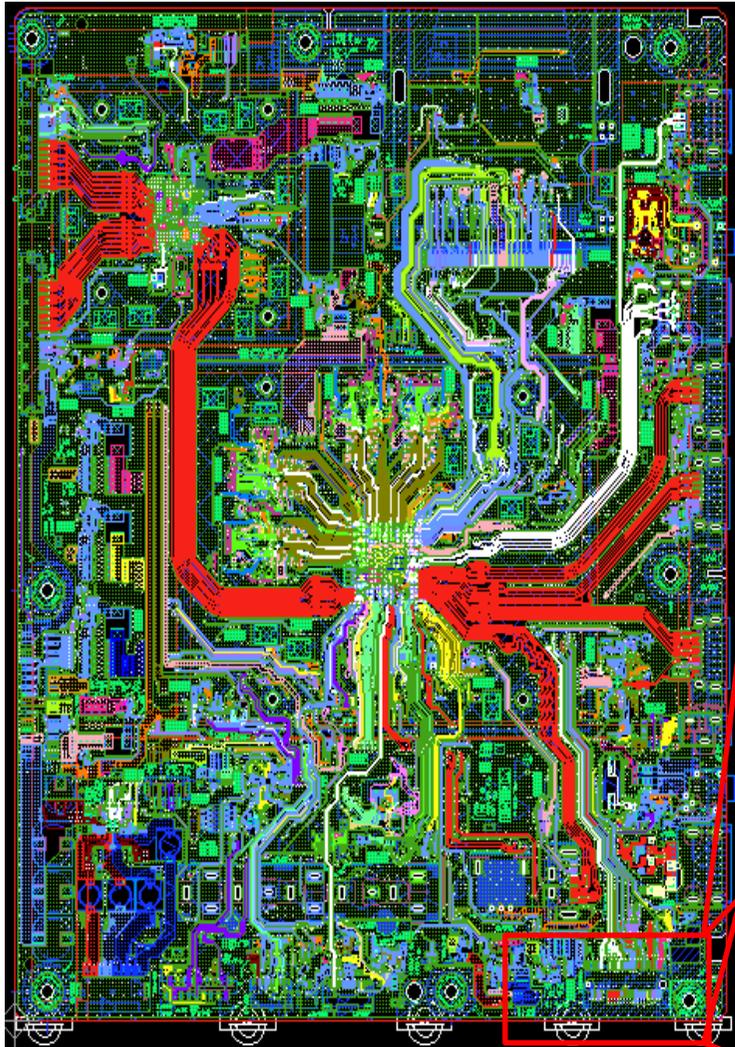
I2C line for Japan  
- Parts for I2C SDA2 line: R2804, C2805  
- Parts for I2C SCL2 line : R2805, C2806

## 4.4 No Picture Tuner

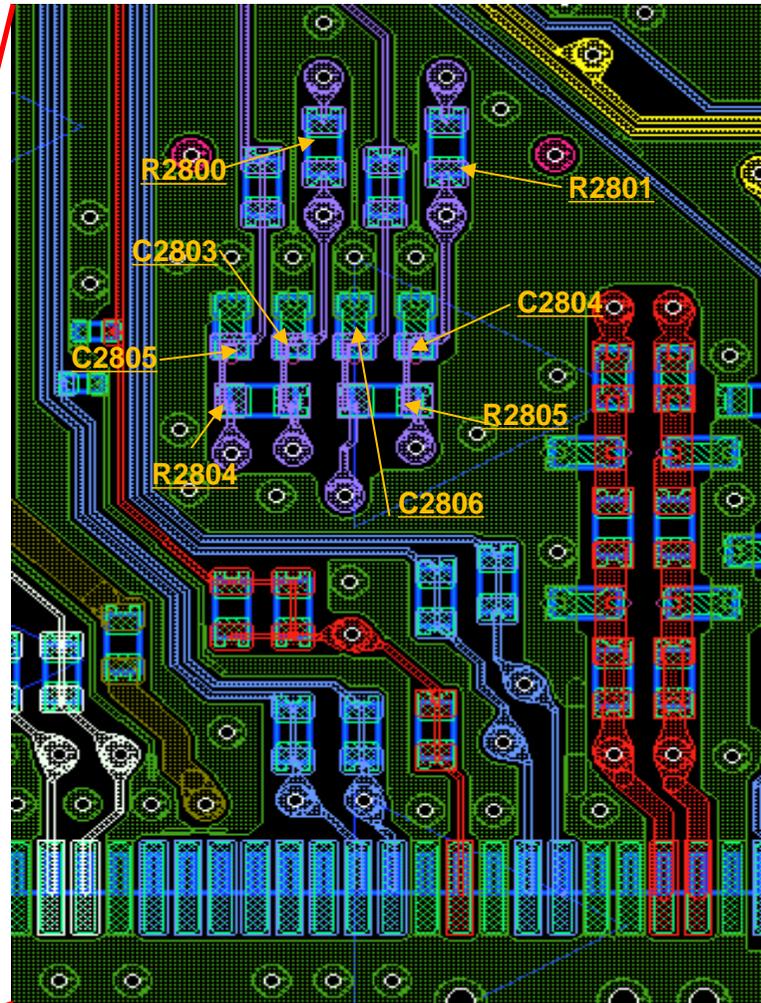
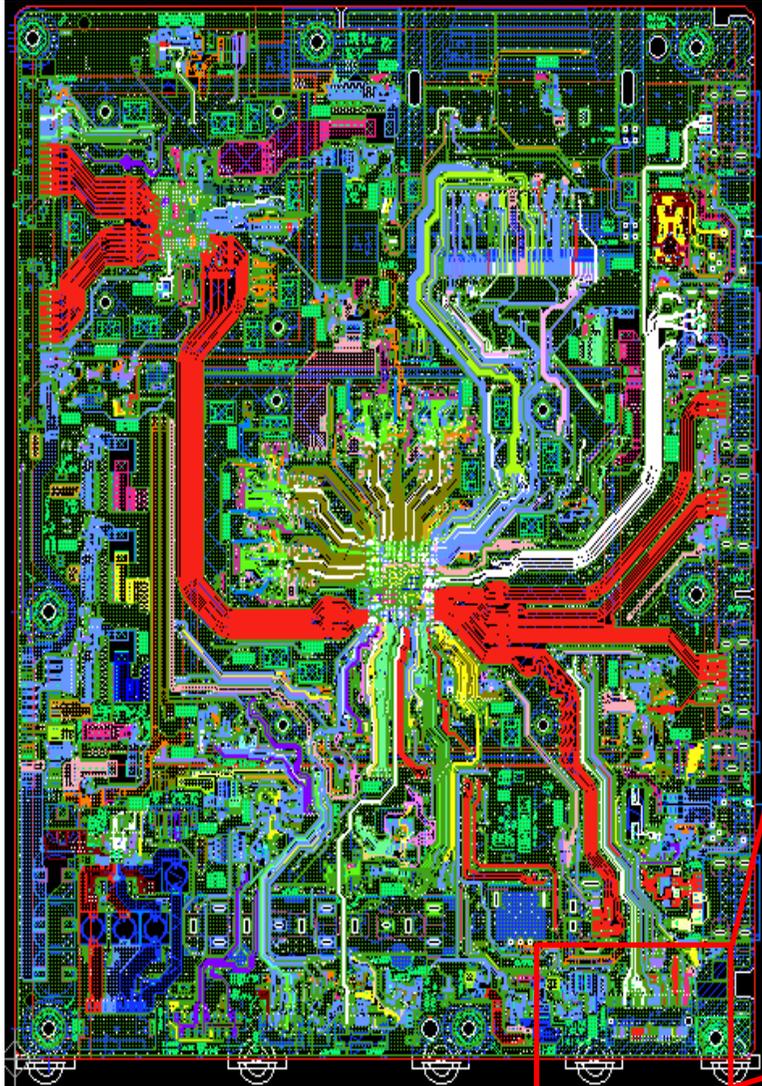


#### 4.4 No Picture Tuner

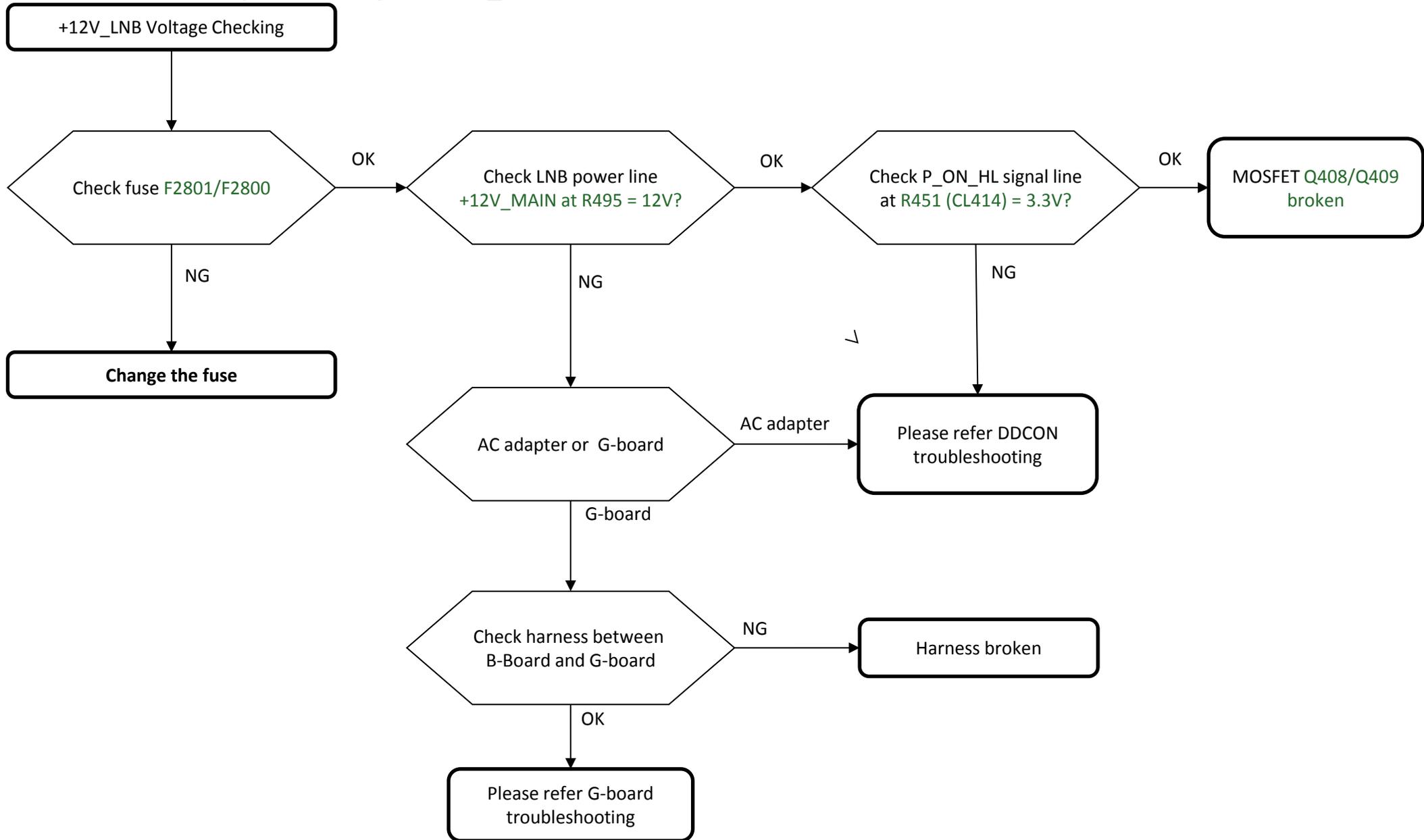
### BSL (Top View) For Tuner Power Lines



**BSL (Top View)  
For Tuner I2C line**

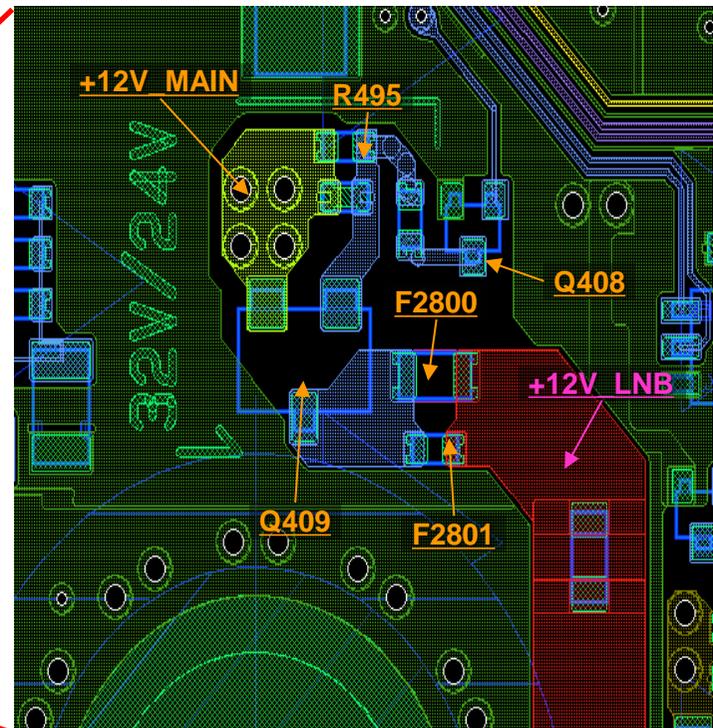
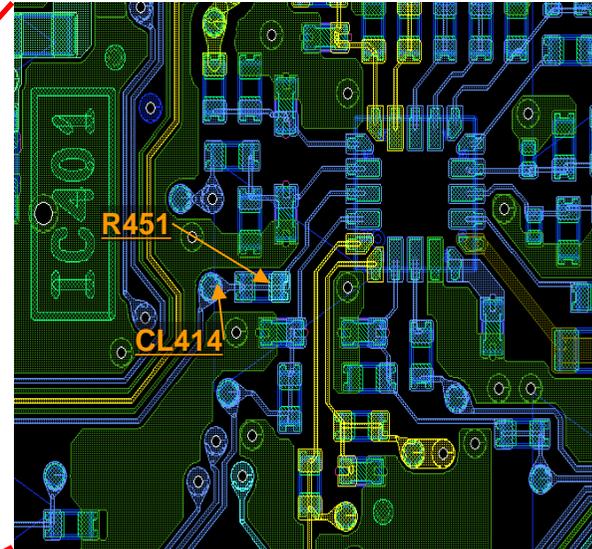
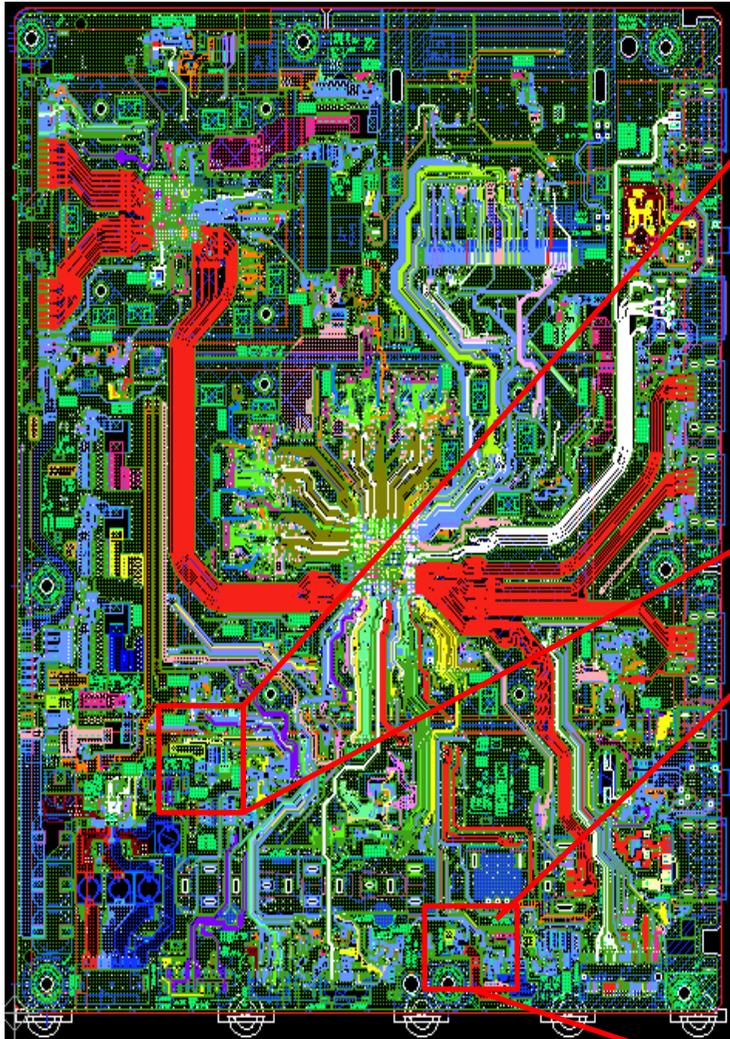


**FOR 12V LNB Voltage Checking: @ AEP\_W and JP ISDB**



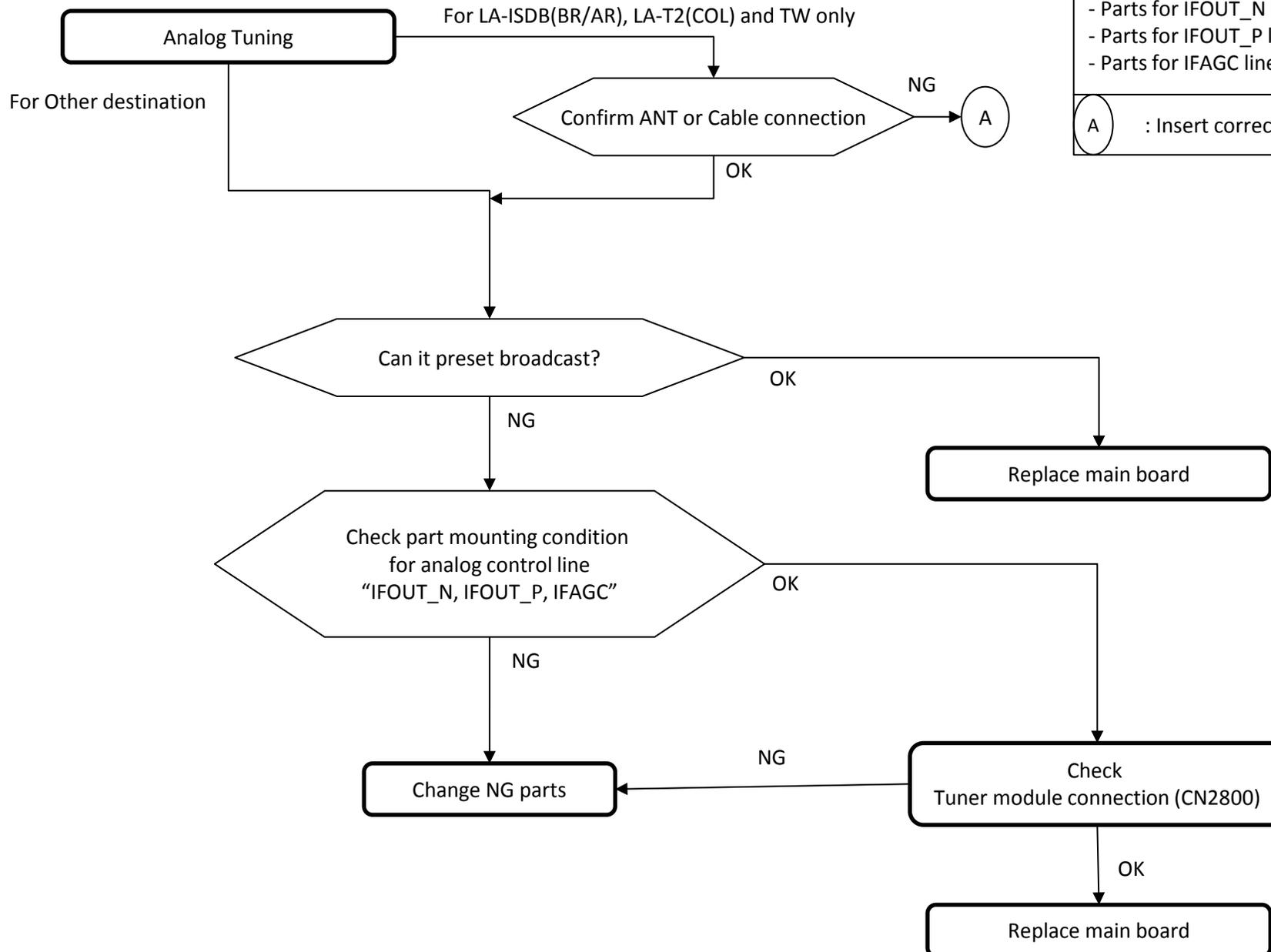
#### 4.4 No Picture Tuner

### BSL (Top View) 12V LNB Voltage line



4.4 No Picture Tuner

**FOR ANALOG TUNING: @ All destination except JP**



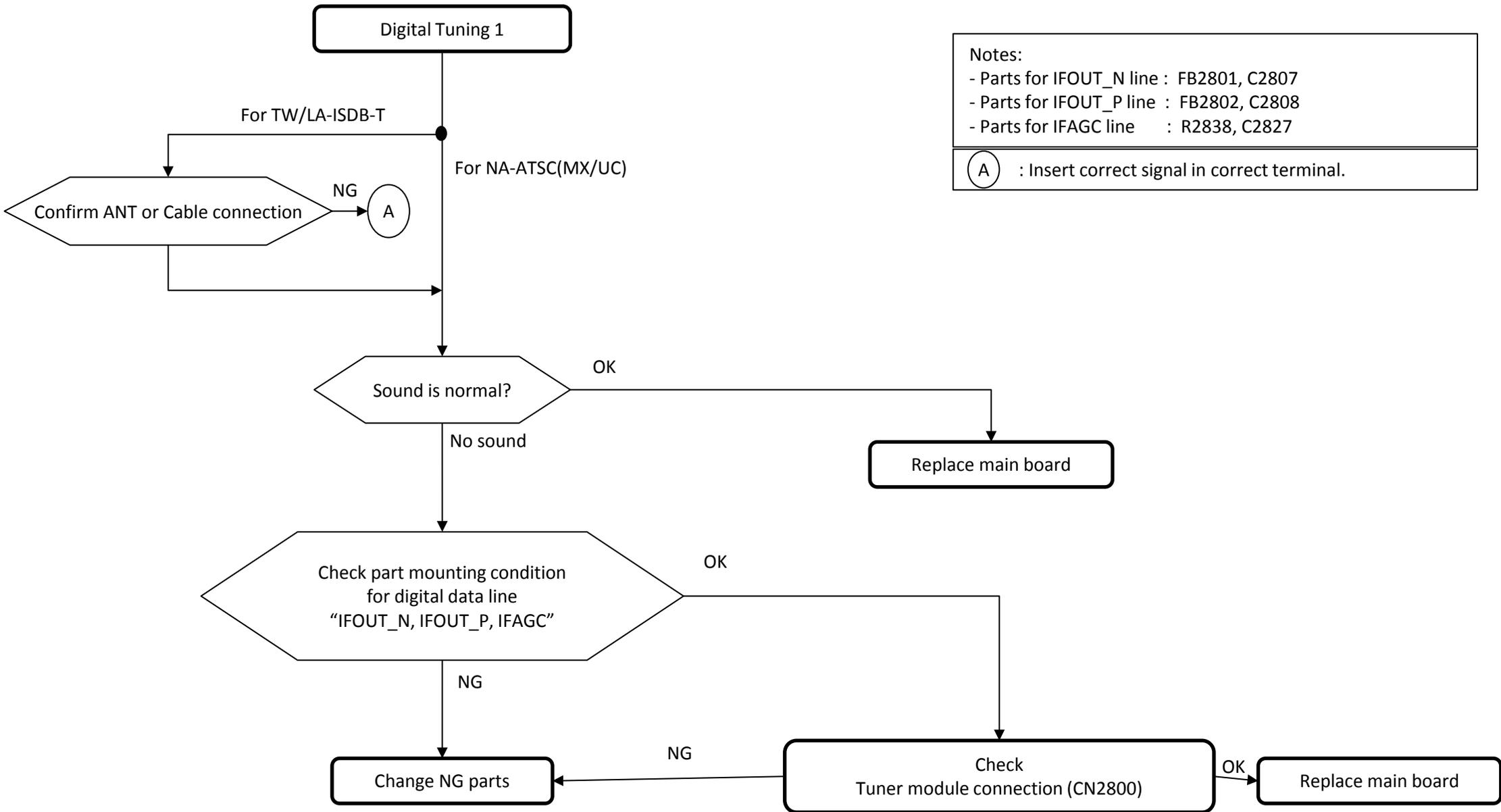
Notes:

- Parts for IFOUT\_N line : FB2801, C2807
- Parts for IFOUT\_P line : FB2802, C2808
- Parts for IFAGC line : R2838, C2827

(A) : Insert correct signal in correct terminal.

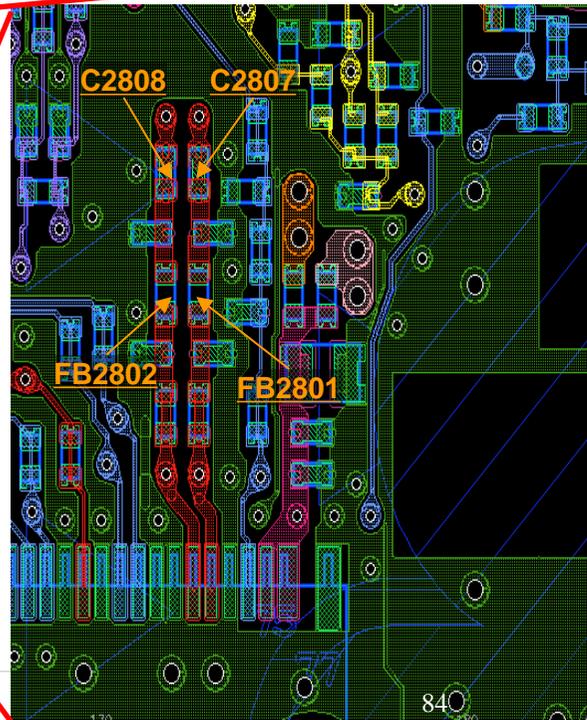
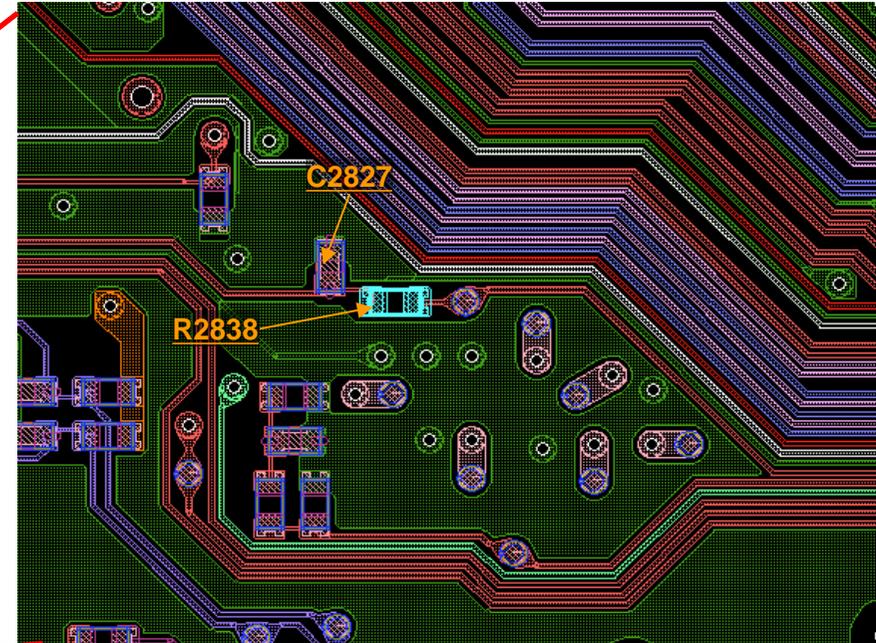
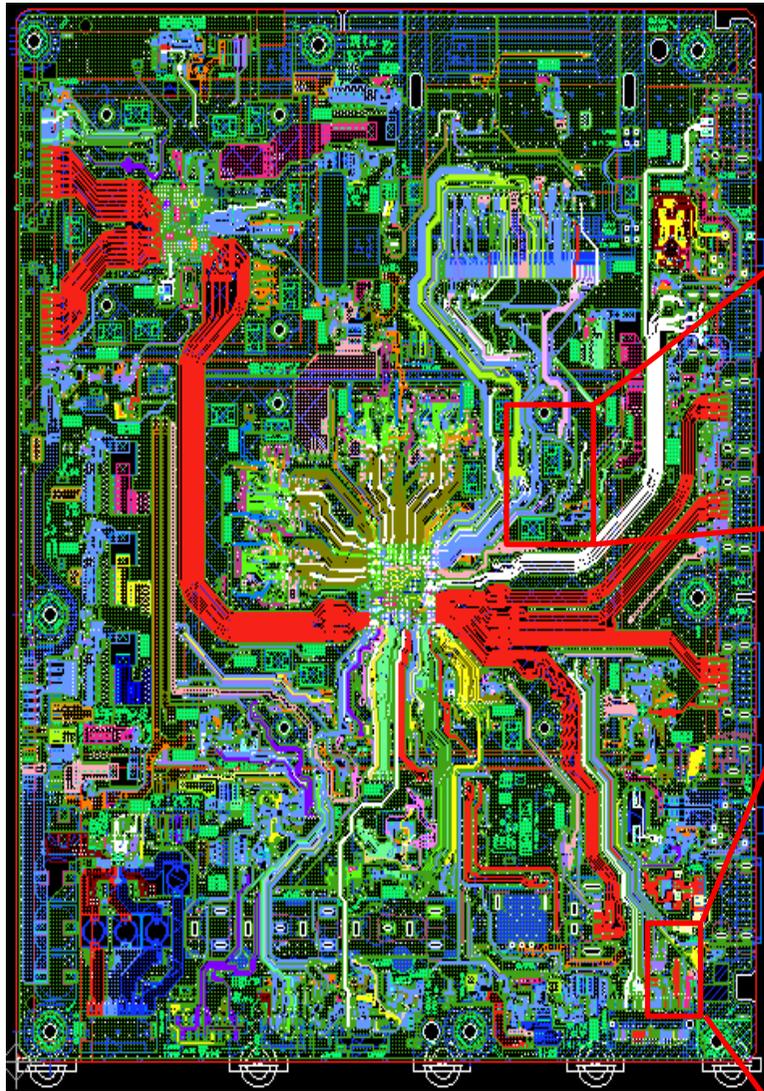
#### 4.4 No Picture Tuner

### FOR DIGITAL TUNING 1: @ TW, NA-ATSC(MX/UC) and LA-ISDB-T.



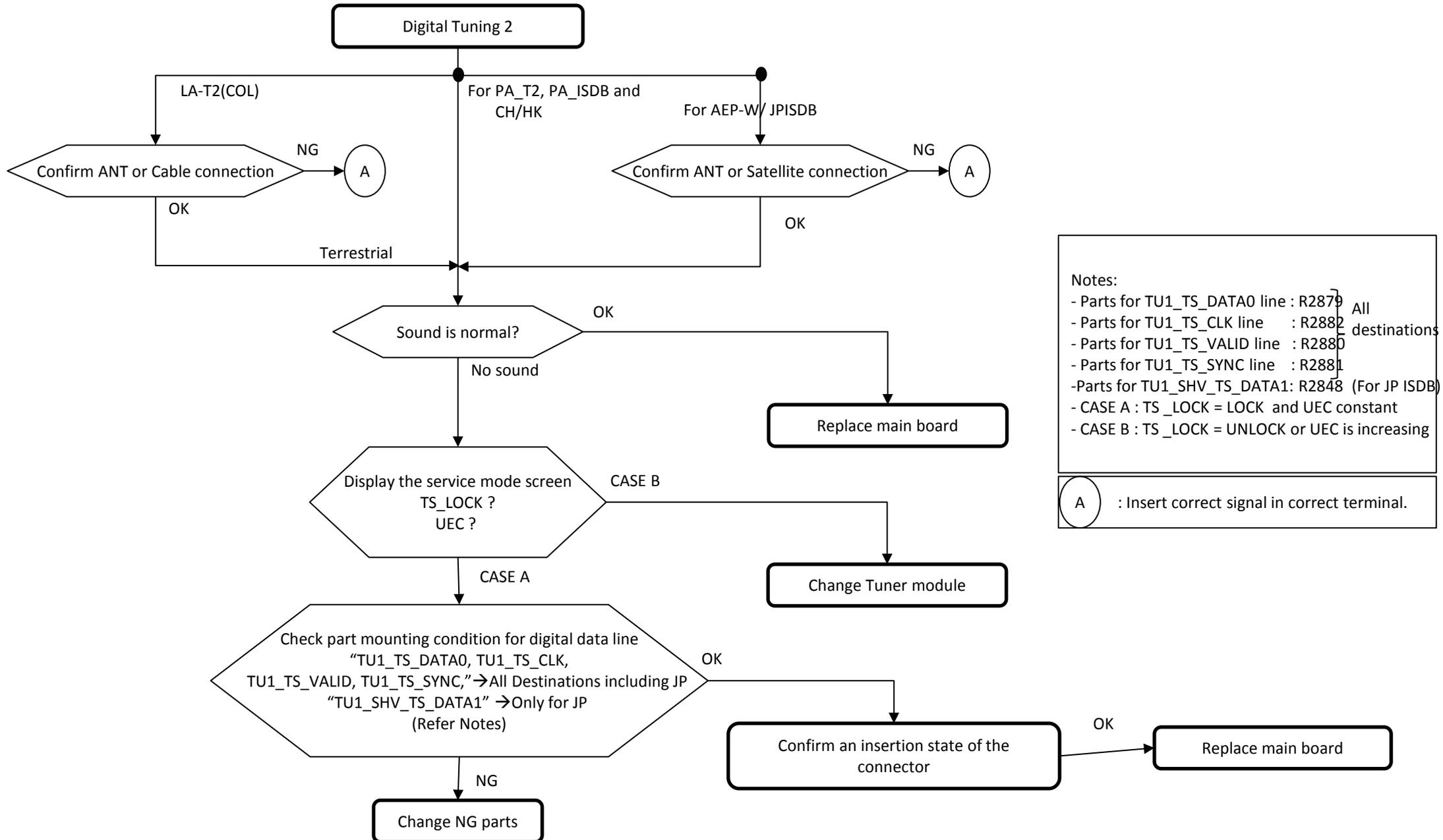
#### 4.4 No Picture Tuner

BSL(Top View)  
IF & IFAGC line



4.4 No Picture Tuner

**FOR DIGITAL TUNING 2: @ AEP\_W, JP ISDB , PA\_T2, CH/HK, and LA-T2(COL)**



Notes:

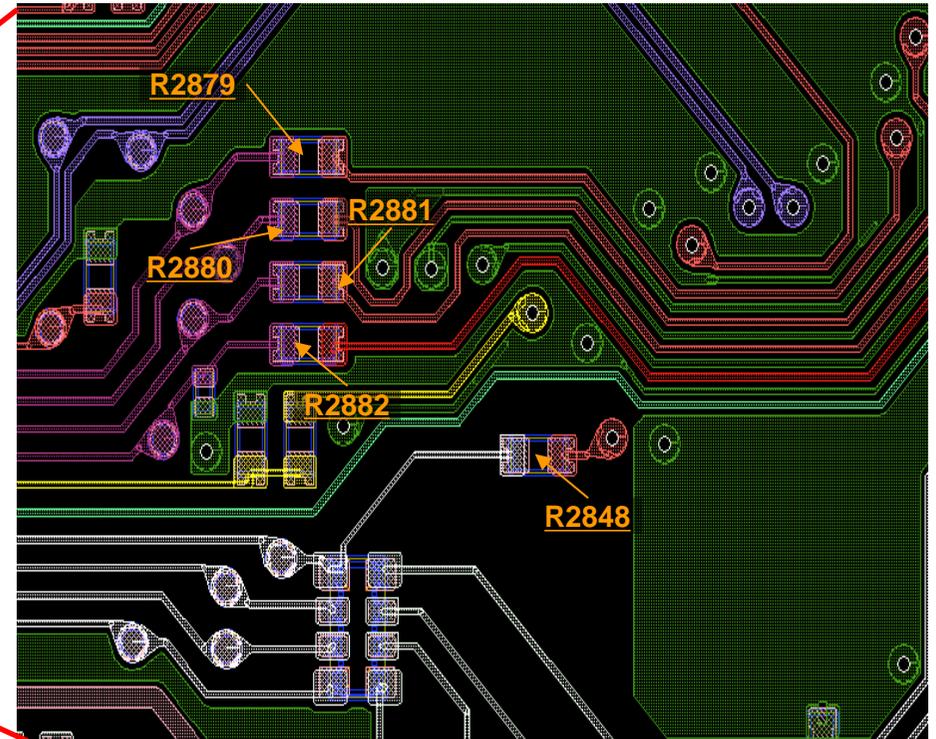
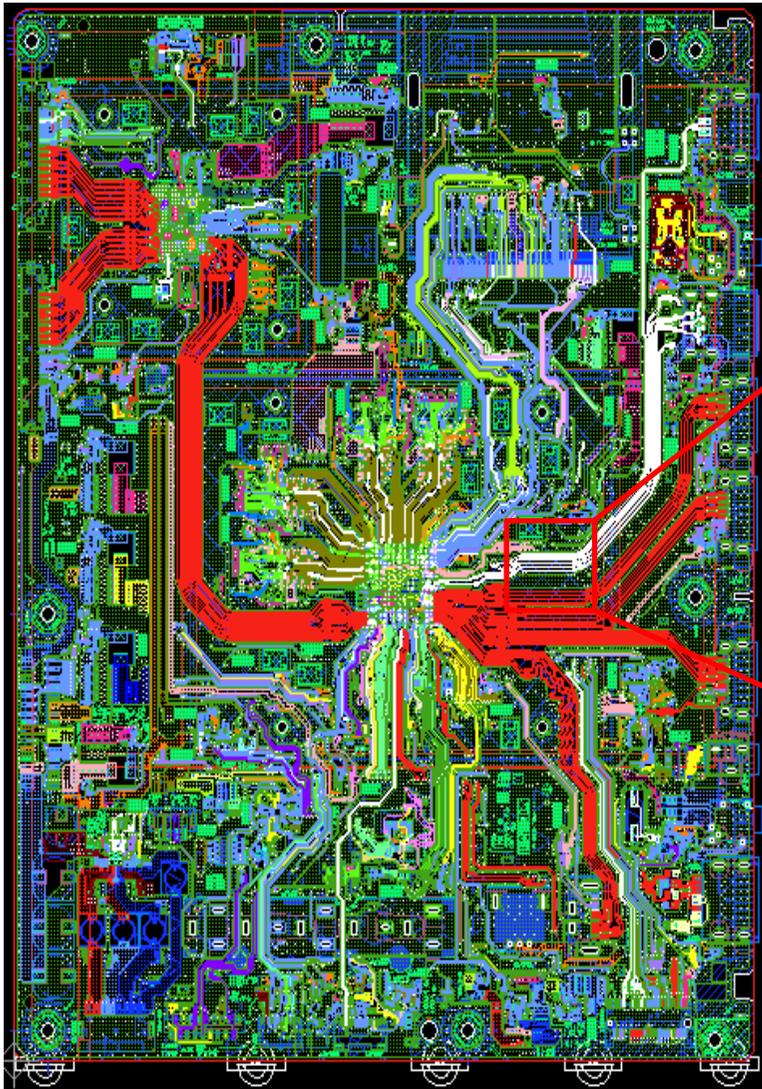
- Parts for TU1\_TS\_DATA0 line : R2879 } All destinations
- Parts for TU1\_TS\_CLK line : R2882 }
- Parts for TU1\_TS\_VALID line : R2880 }
- Parts for TU1\_TS\_SYNC line : R2881 }
- Parts for TU1\_SHV\_TS\_DATA1: R2848 (For JP ISDB)
- CASE A : TS\_LOCK = LOCK and UEC constant
- CASE B : TS\_LOCK = UNLOCK or UEC is increasing

(A) : Insert correct signal in correct terminal.

#### 4.4 No Picture Tuner

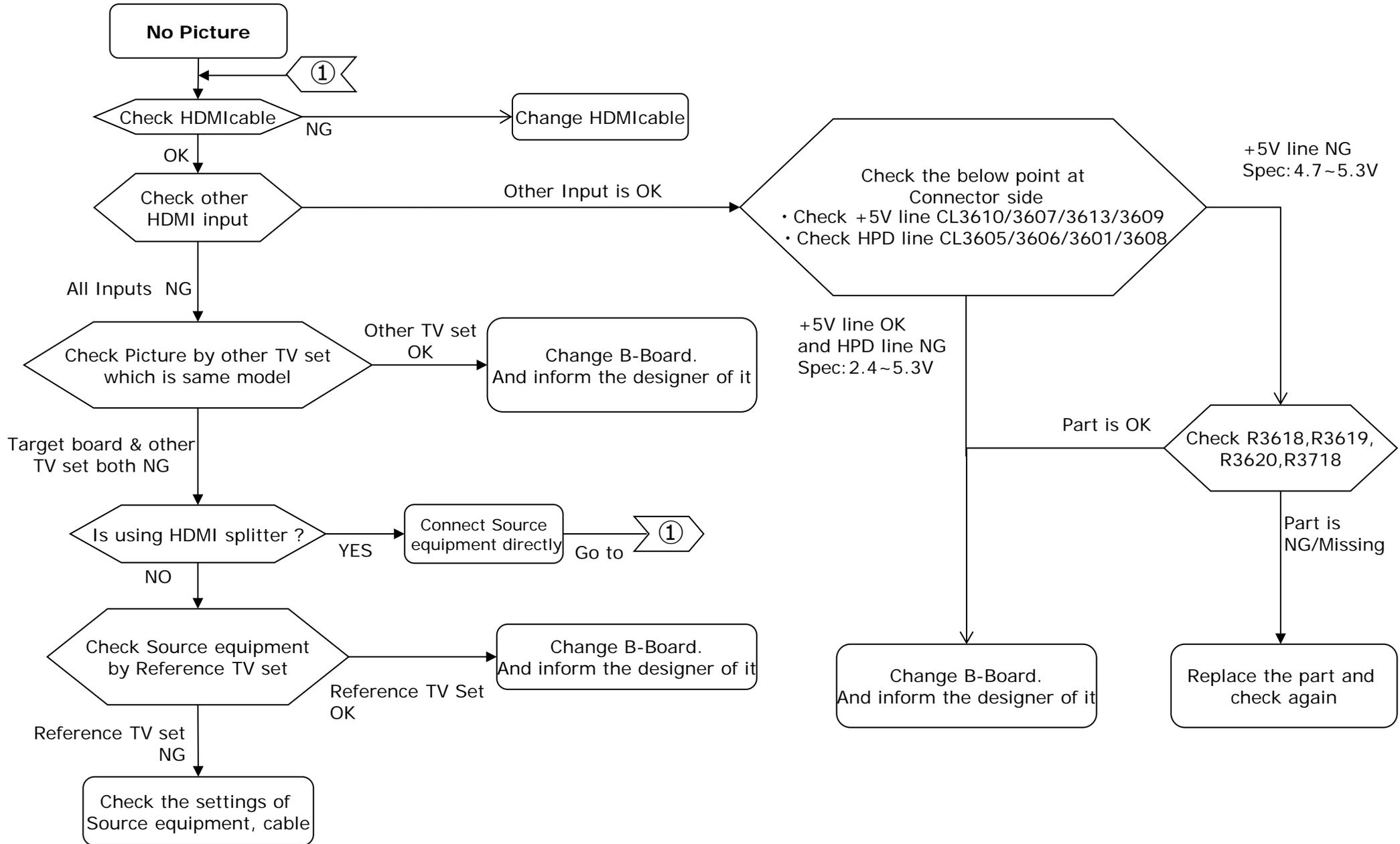
BSL(Top View)

TS1 line



(Under the heatsink)

## 4.5 NO PICTURE: HDMI 1/2/3/4



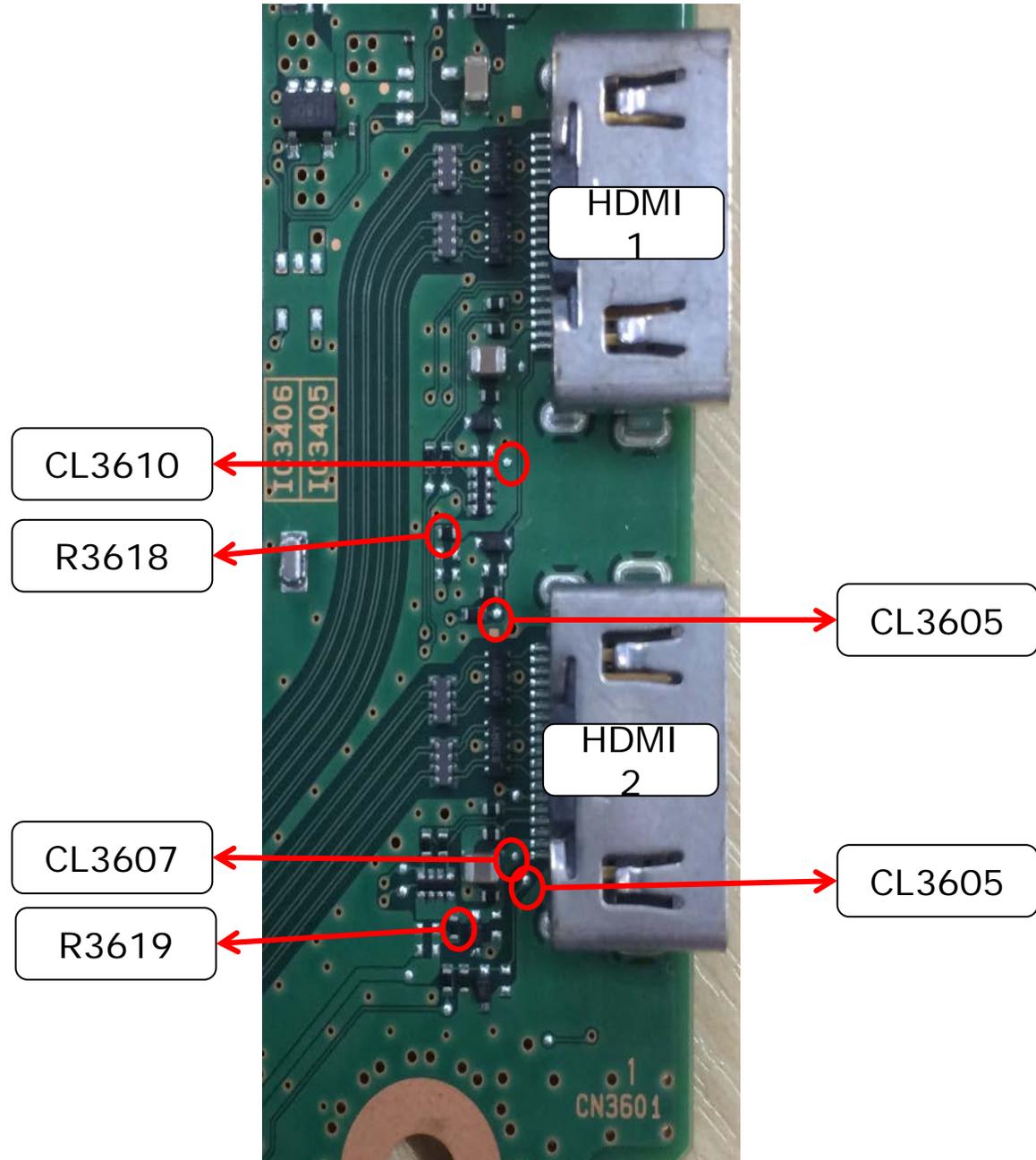
4.5 NO PICTURE: CHECK POINTS HDMI 1 & 2

HDMI 1

- +5V part :R3618
- +5V line :CL3610
- HPD line :CL3605

HDMI 2

- +5V part :R3619
- +5V line :CL3607
- HPD line :CL3606



4.5 NO PICTURE: CHECK POINTS HDMI 3 & 4

HDMI 3

+5V part :R3718

+5V line :CL3613

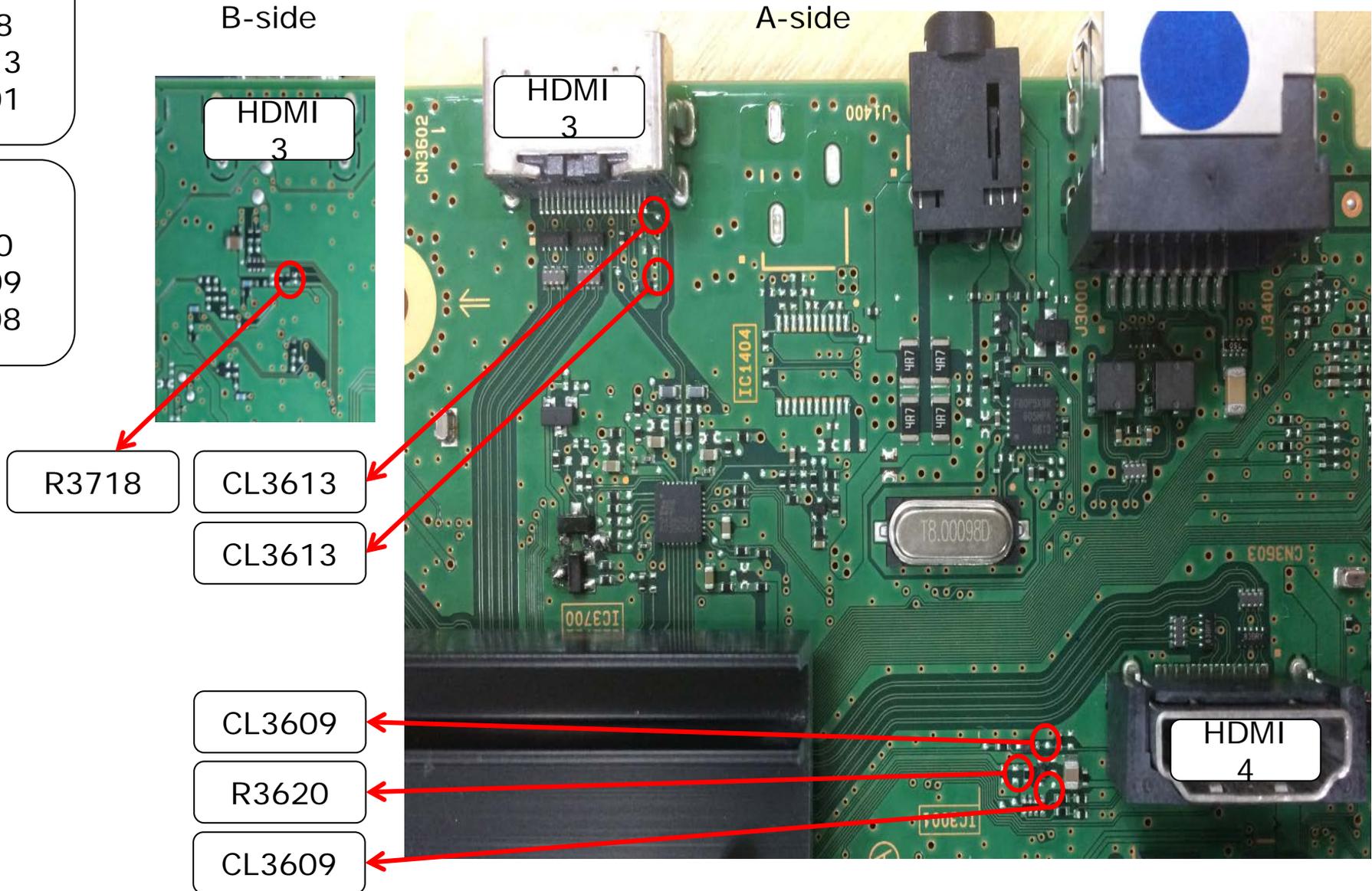
HPD line :CL3601

HDMI 4

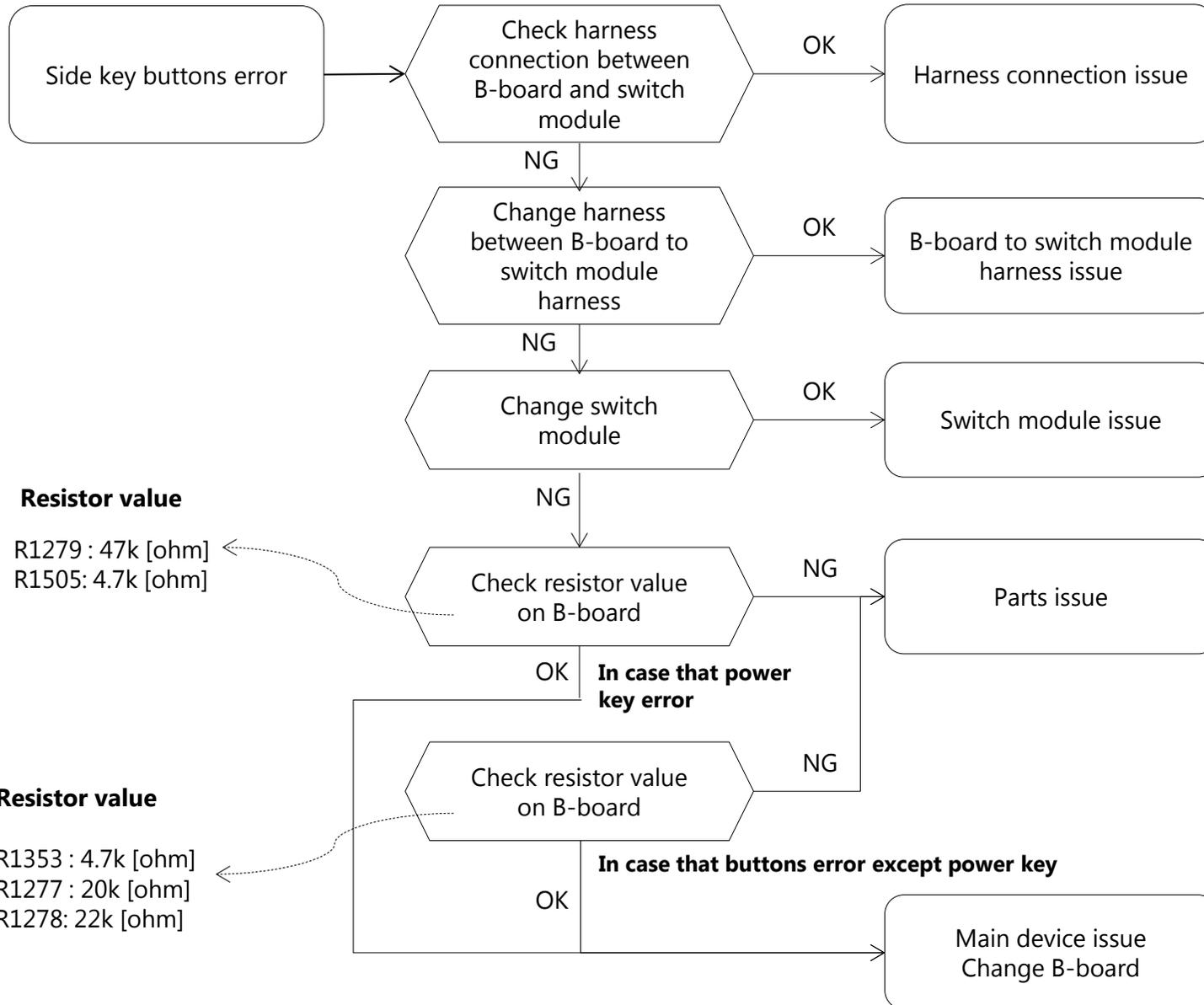
+5V part :R3620

+5V line :CL3609

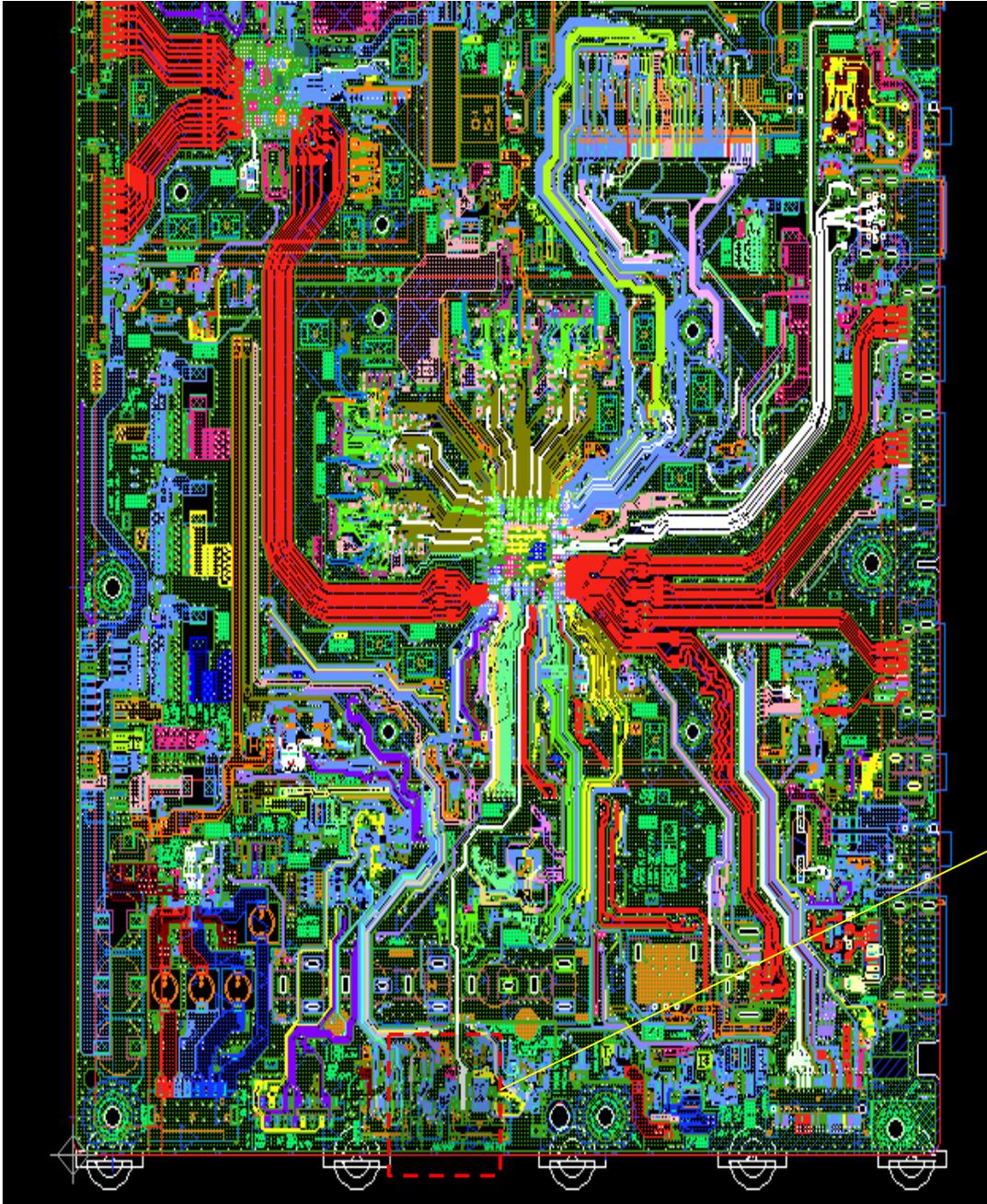
HPD line :CL3608



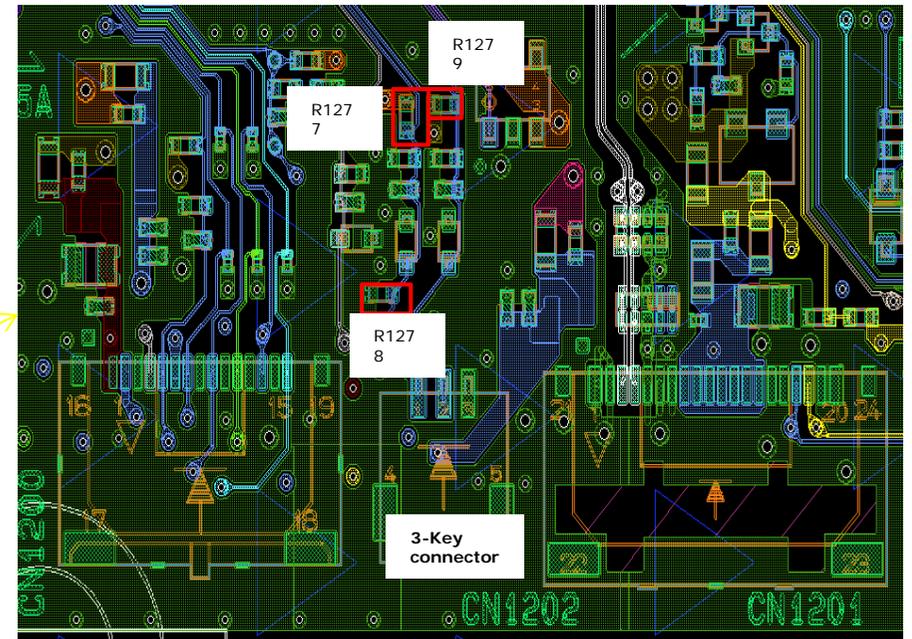
## 5.0 Key Switch Button Error



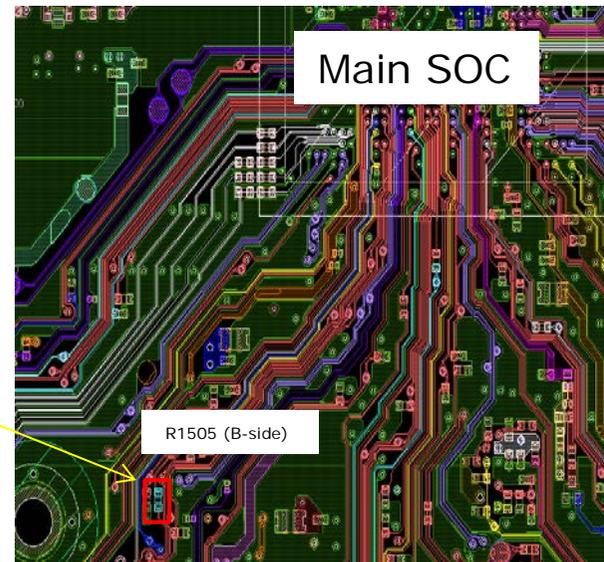
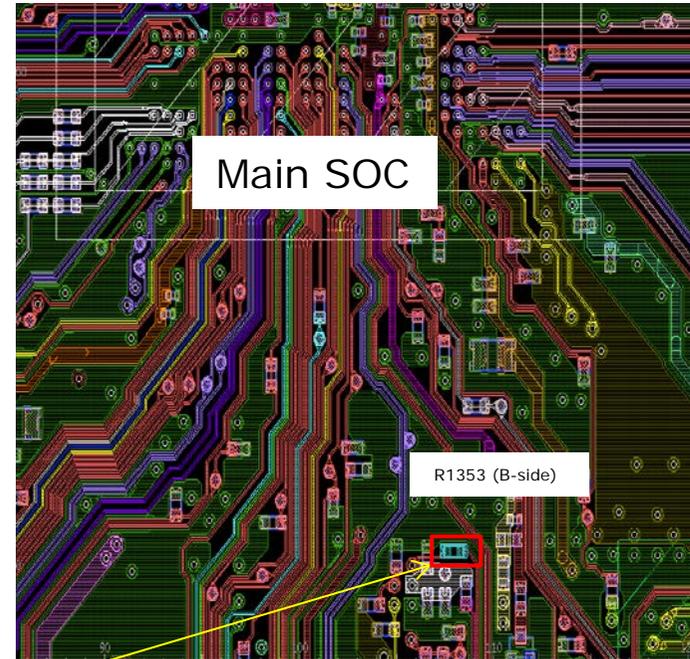
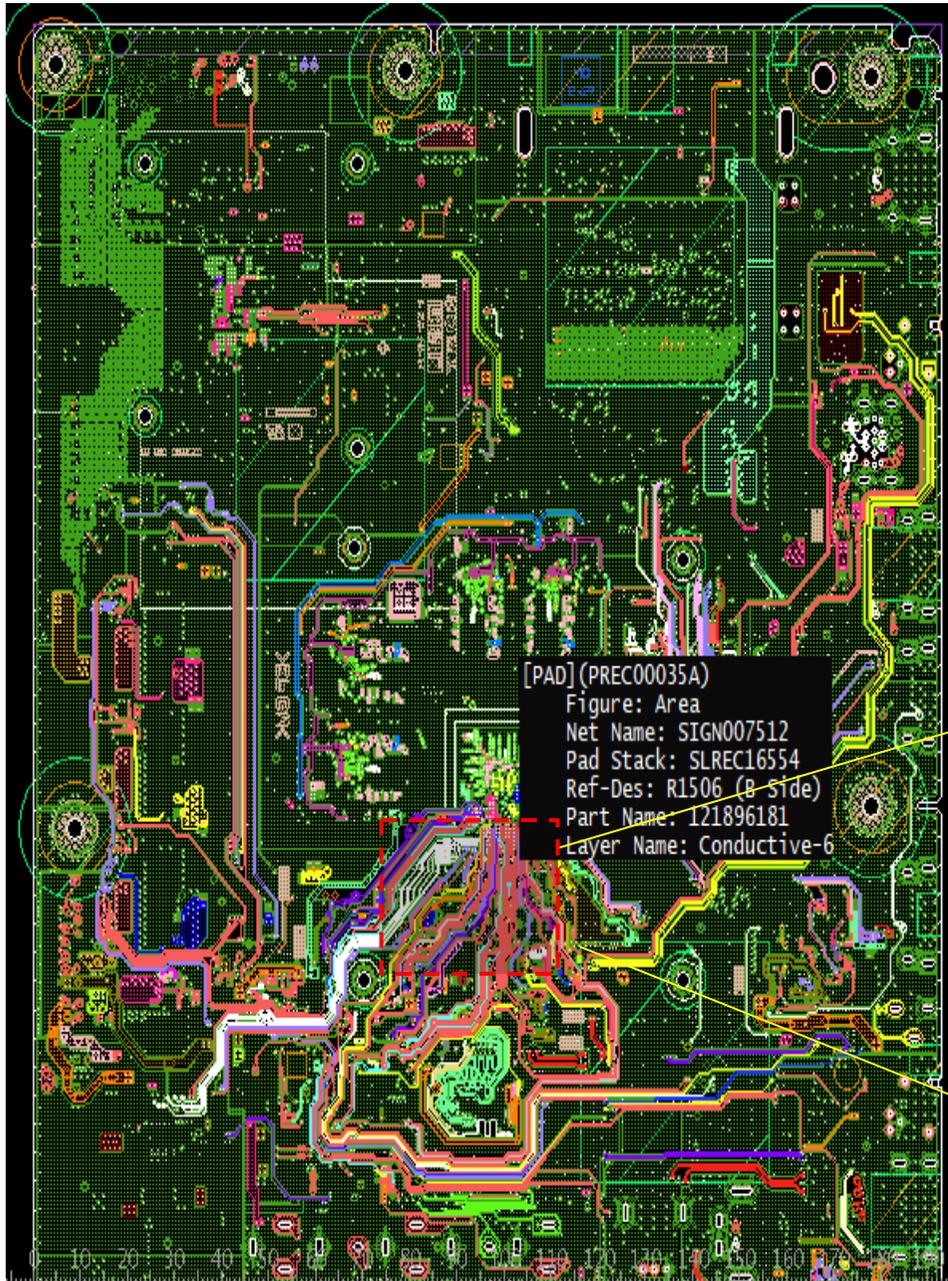
## Resistor location



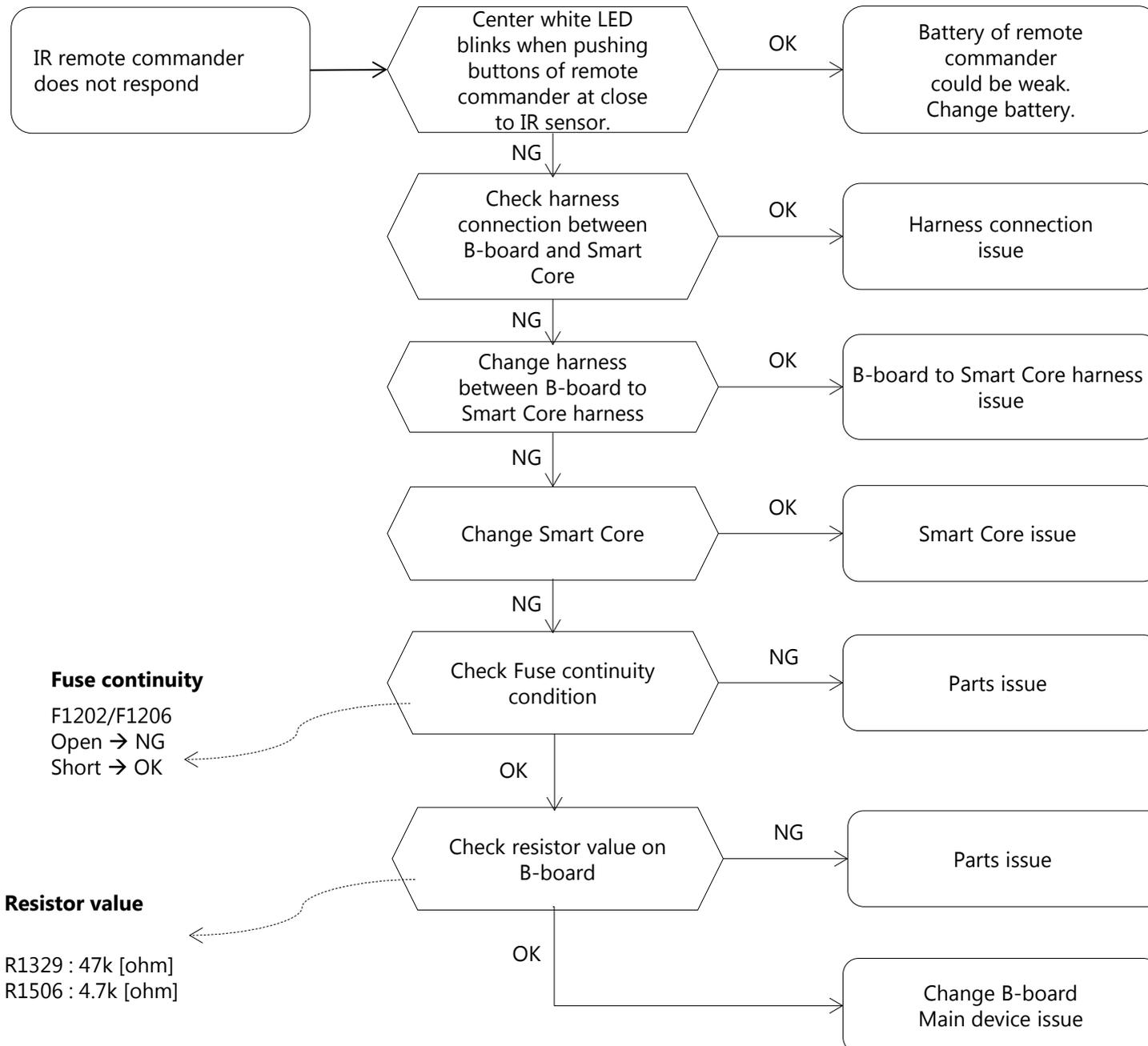
R1277, R1278, R1279 (A-side)



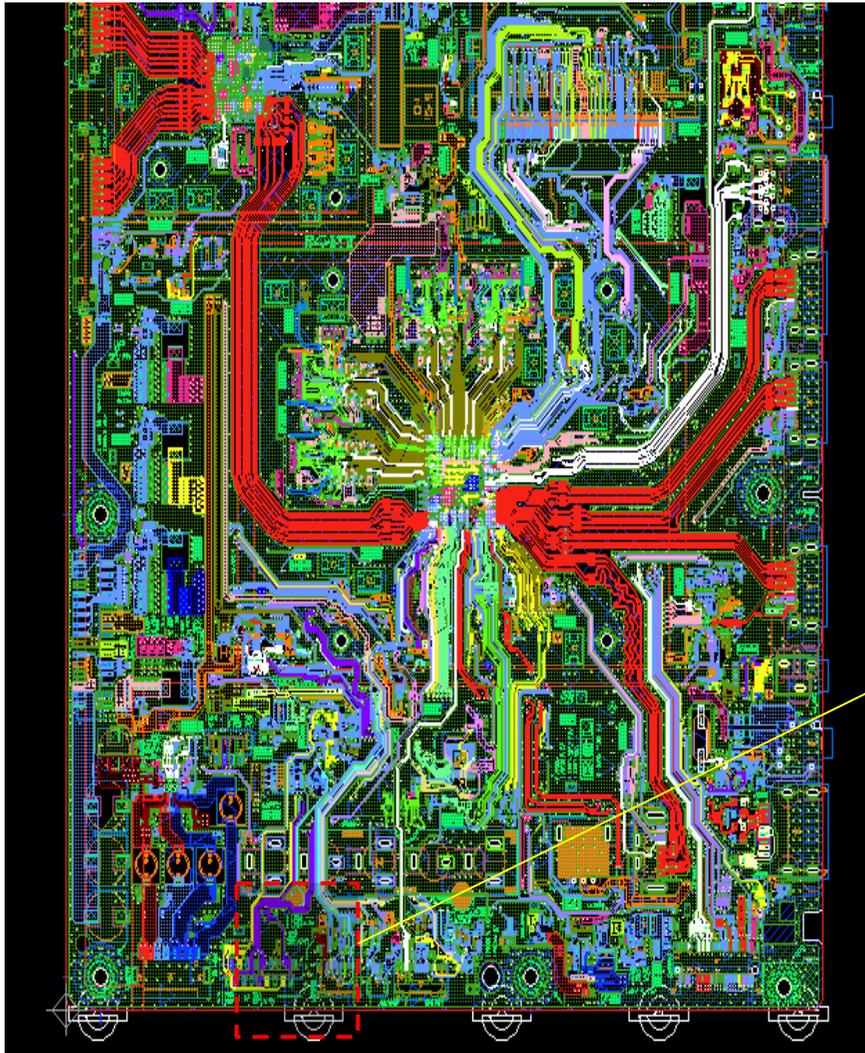
# Resistor location



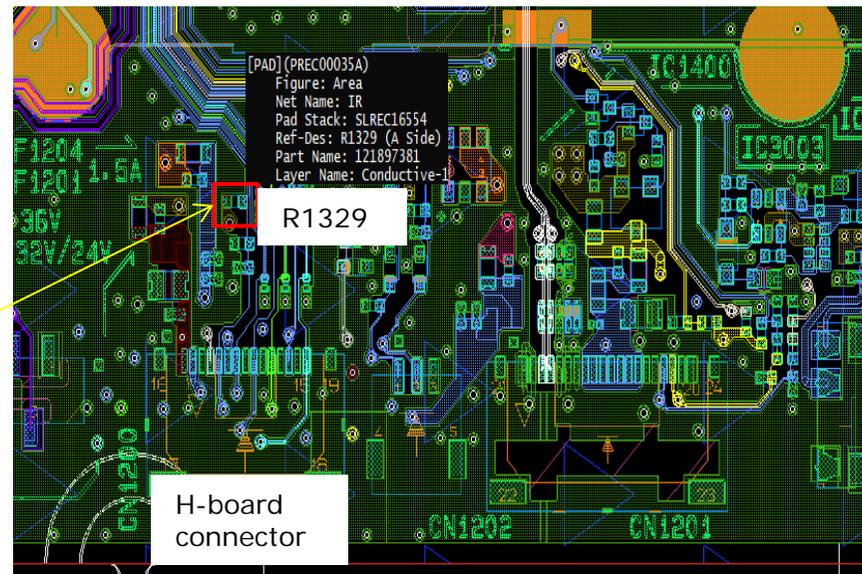
## 5.1 IR Remote Commander Error



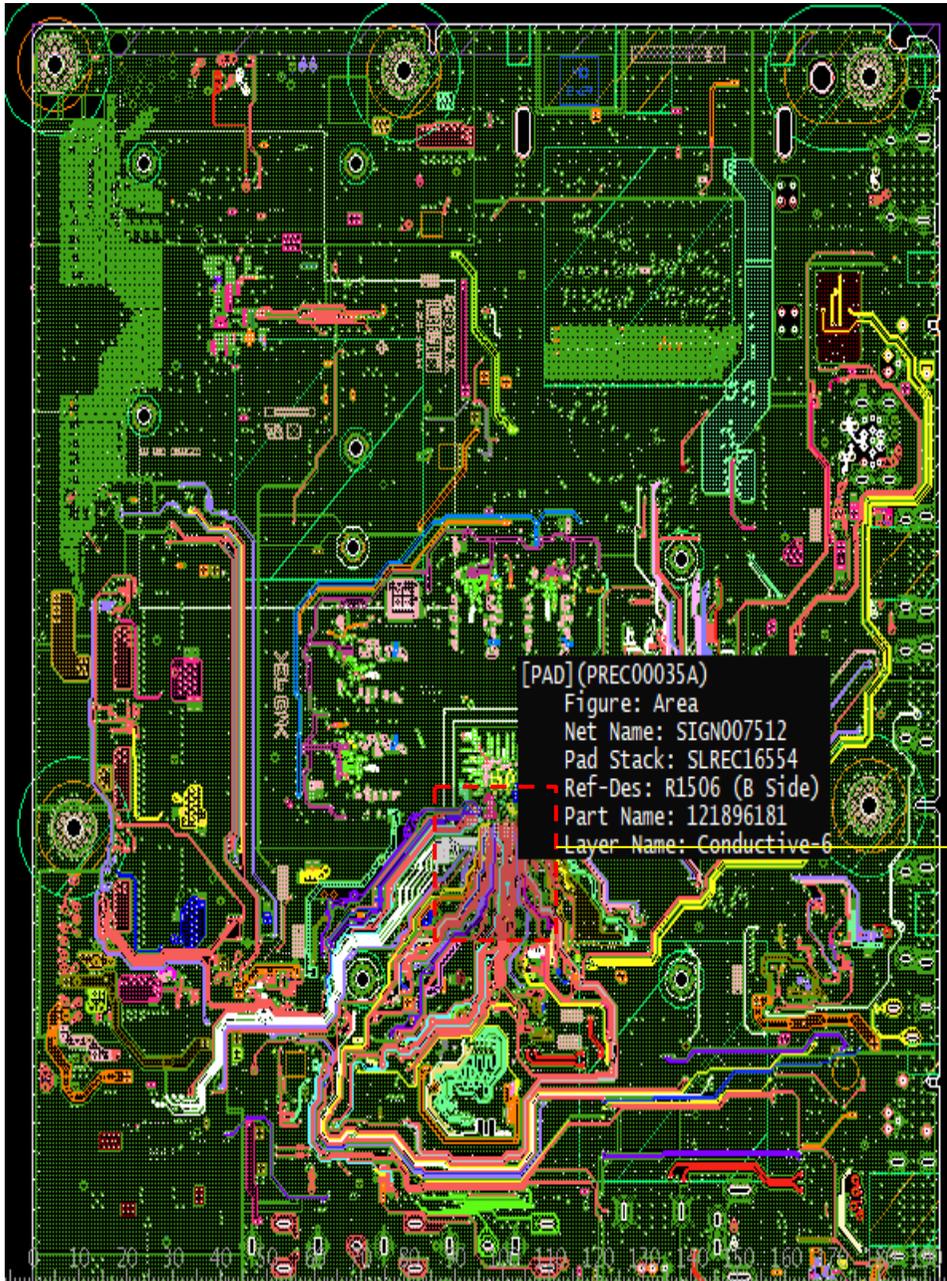
## Resistor location



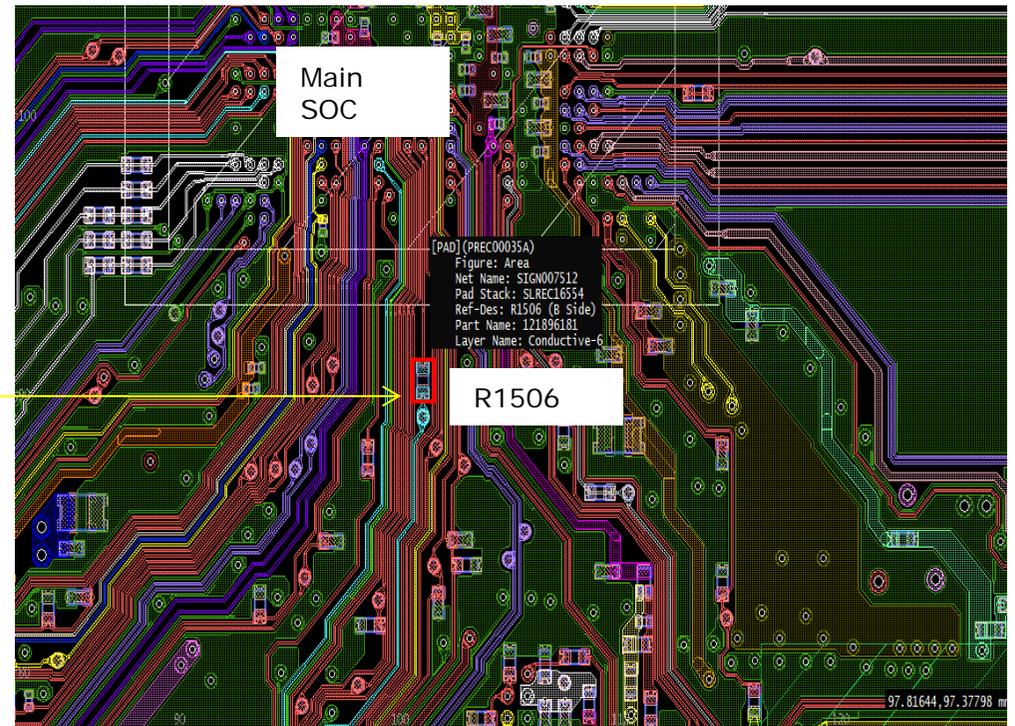
R1329 (A-side)



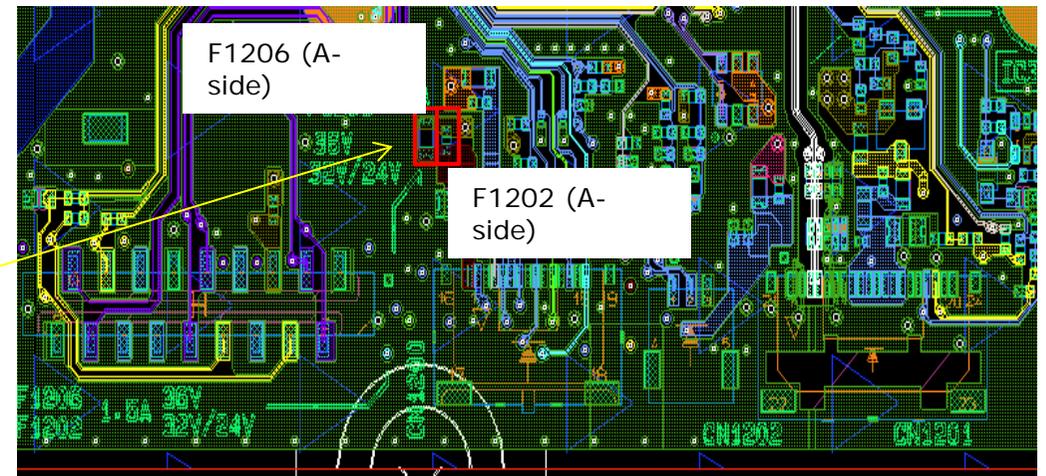
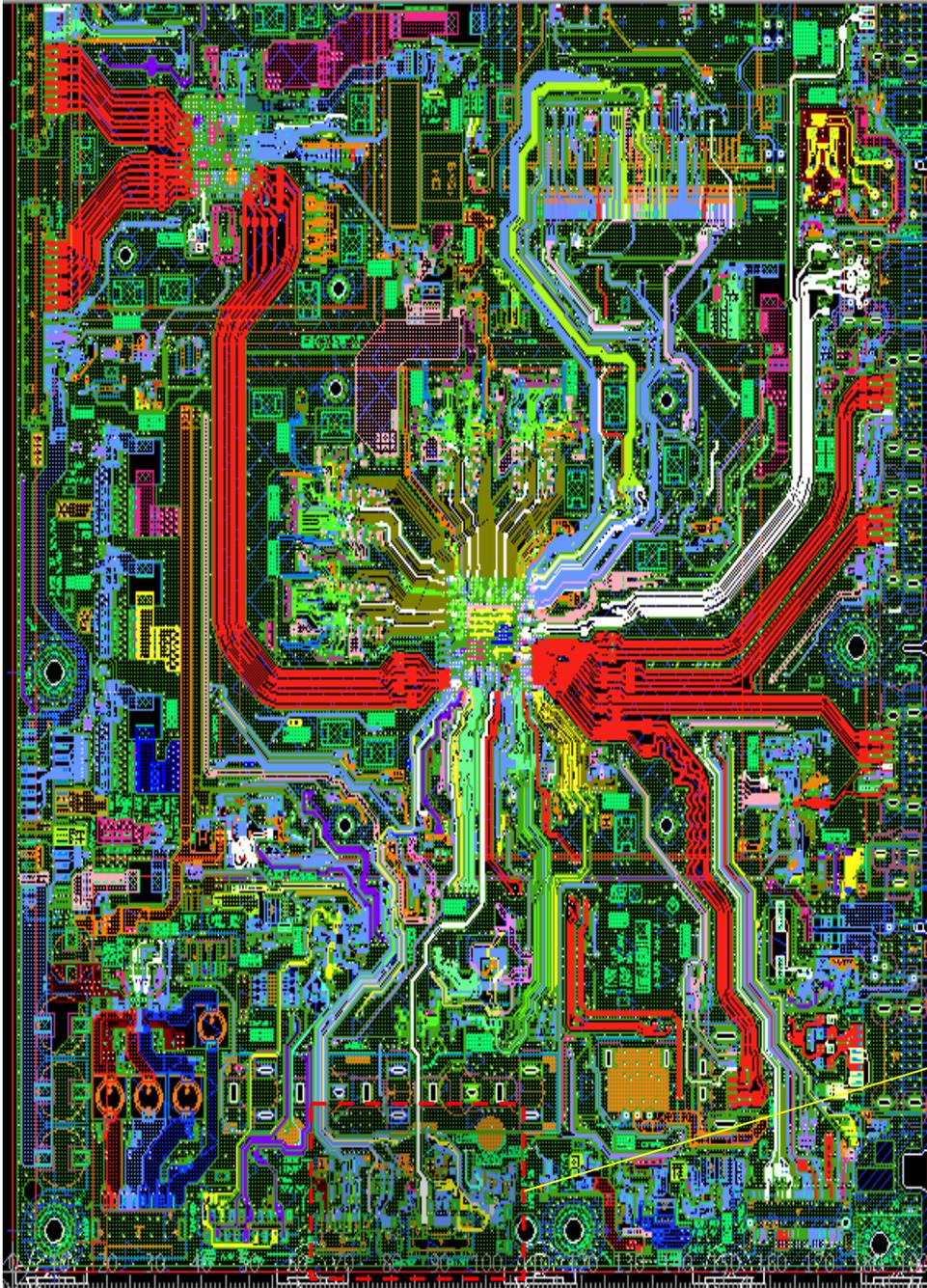
# Resistor location



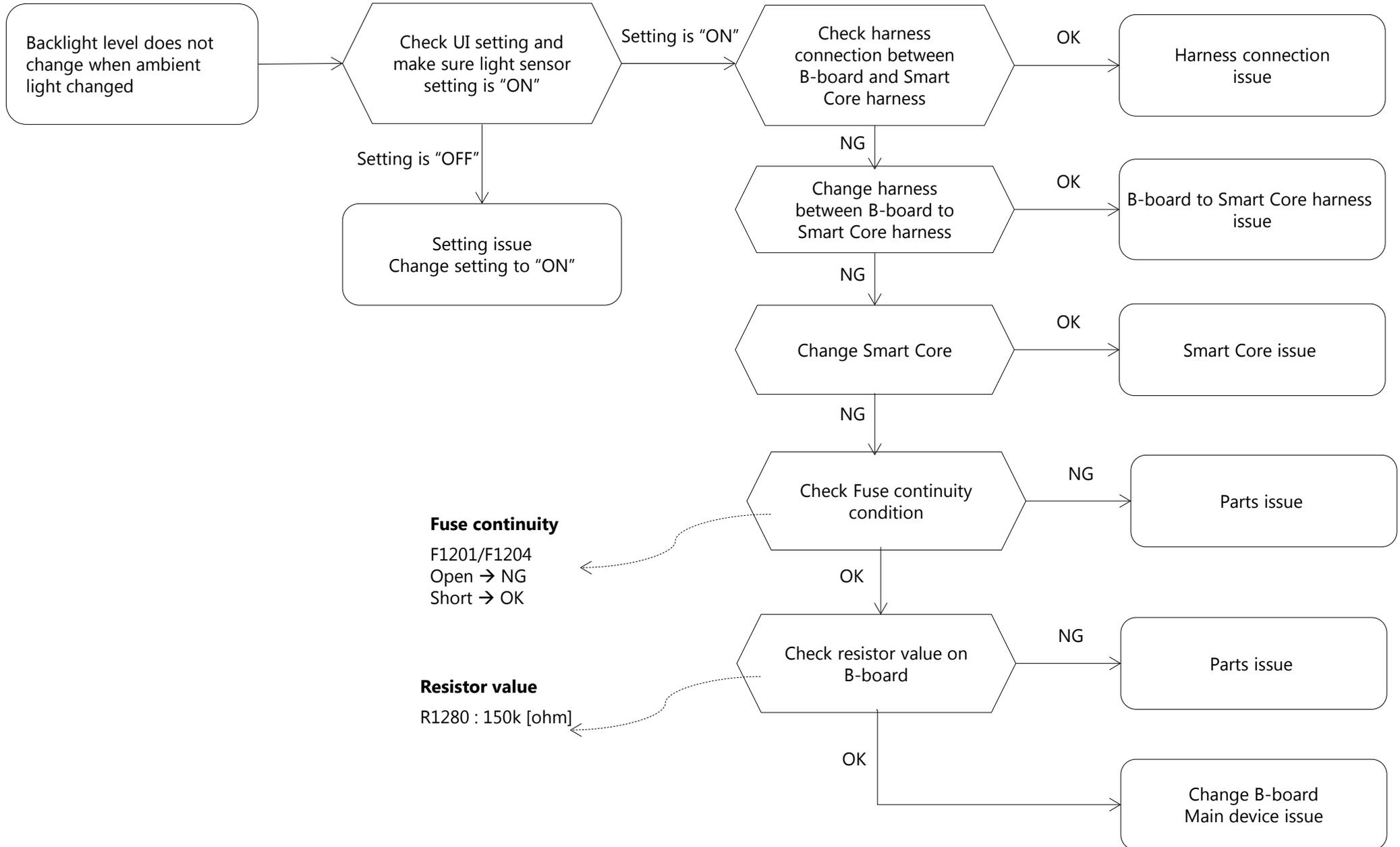
R1506 (B-side)



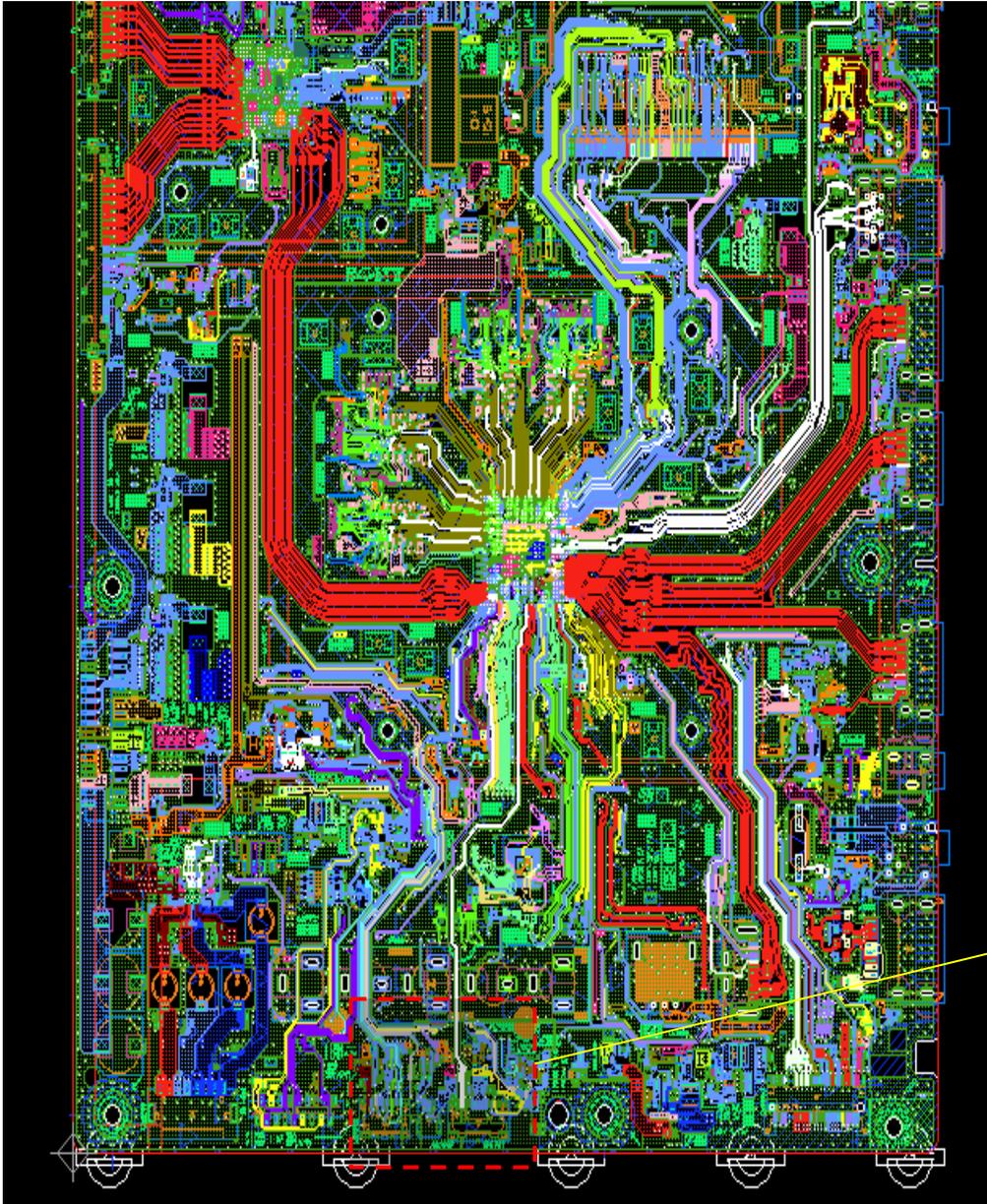
## Fuse location



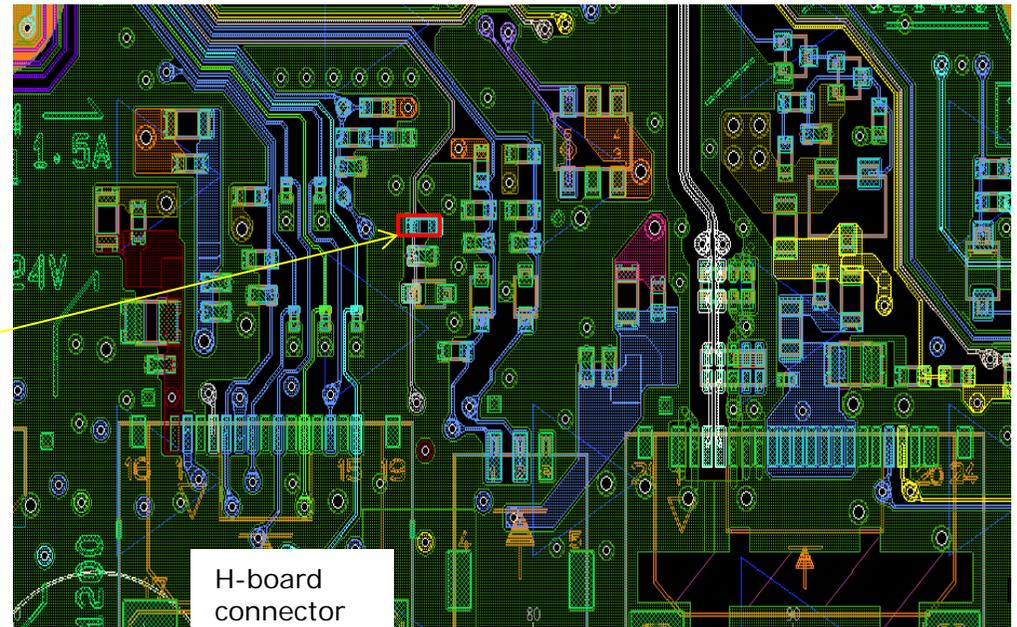
## 5.2 Light Sensor Error



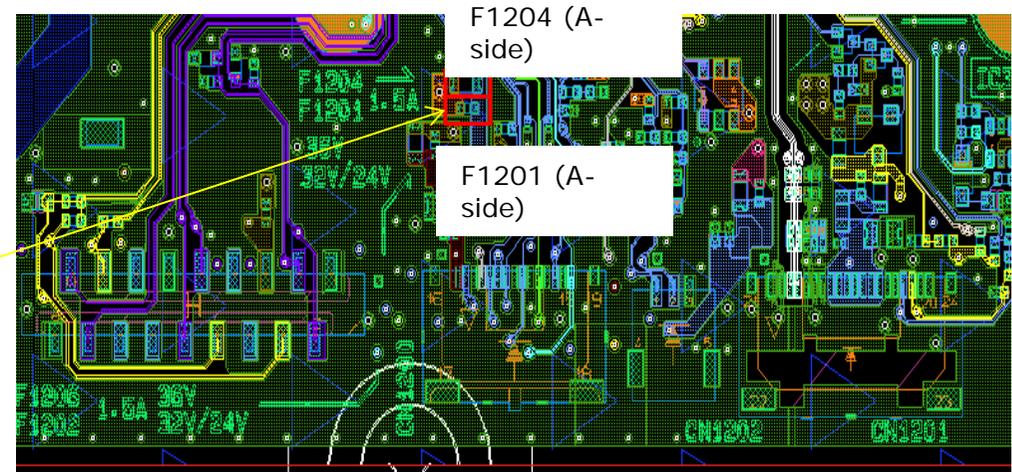
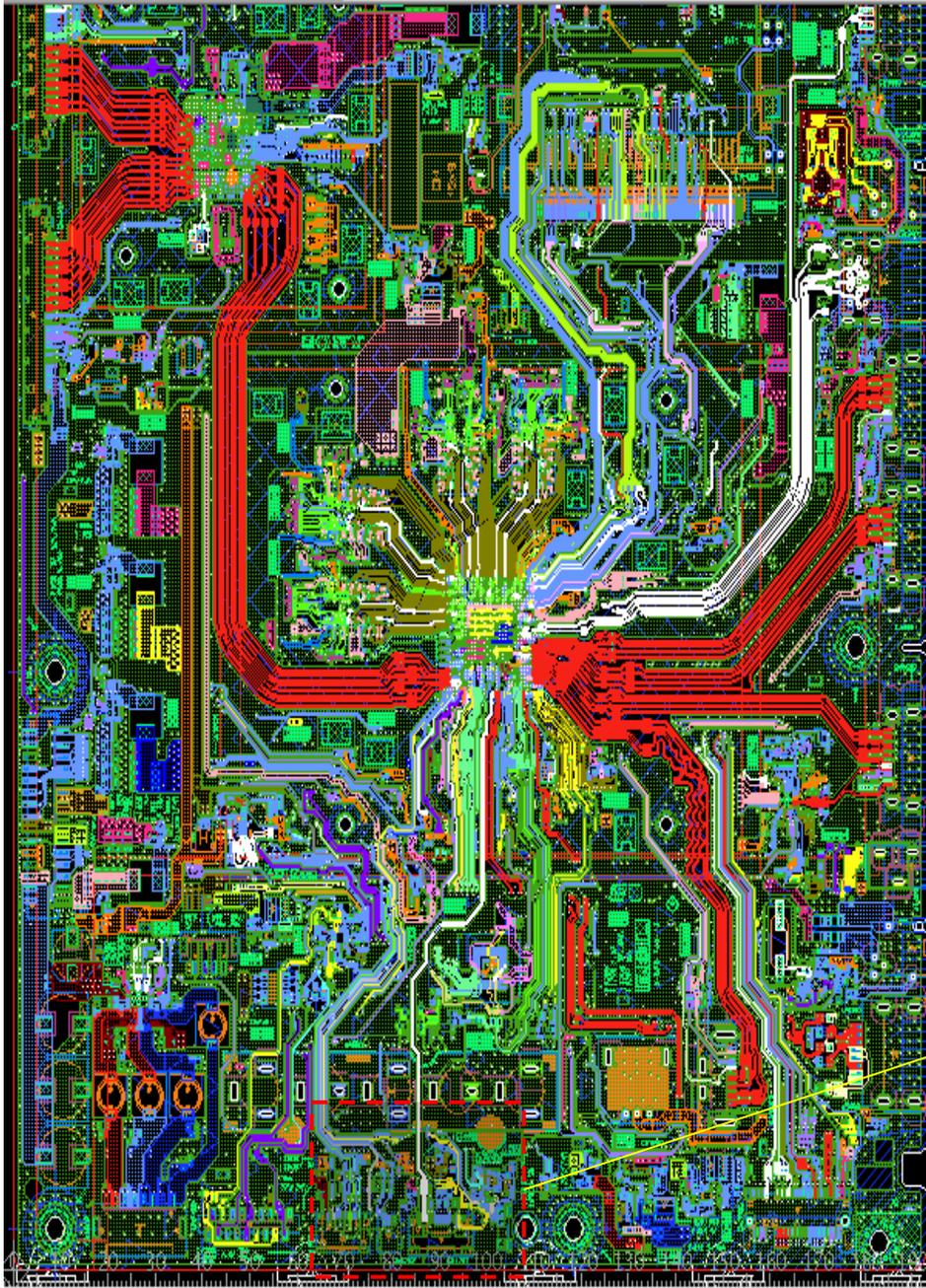
# Resistor location



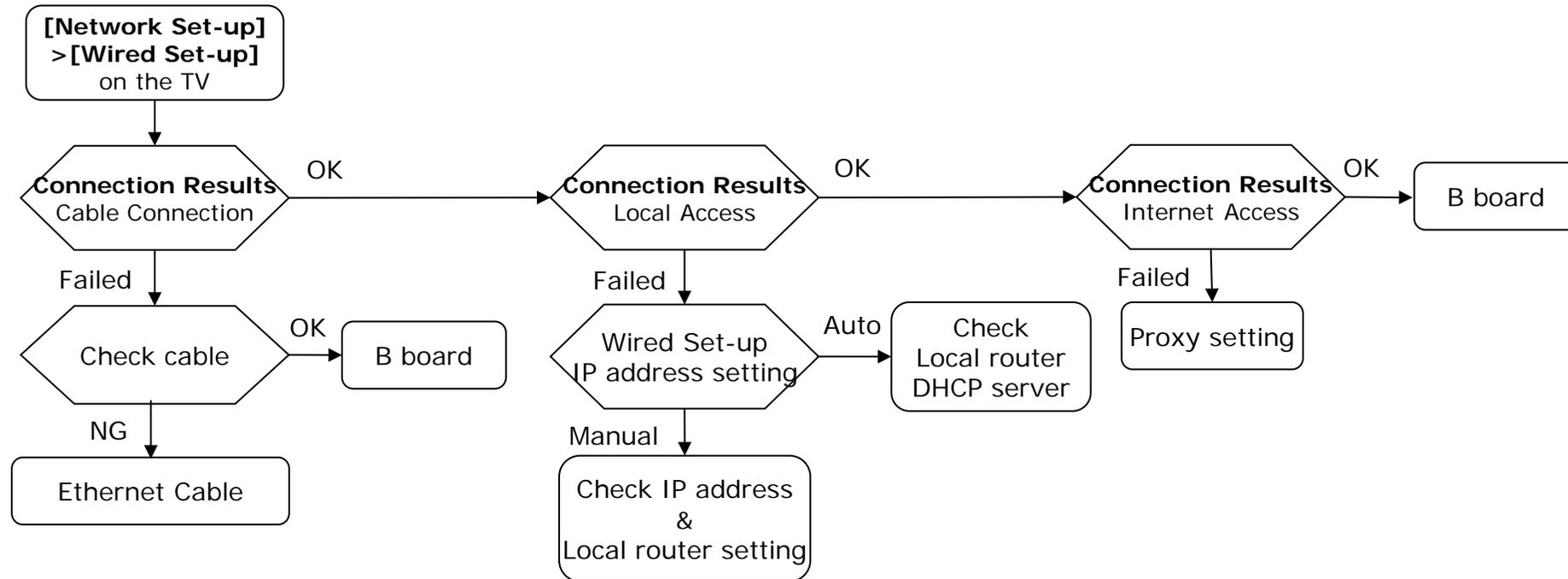
R1280 (A-side)



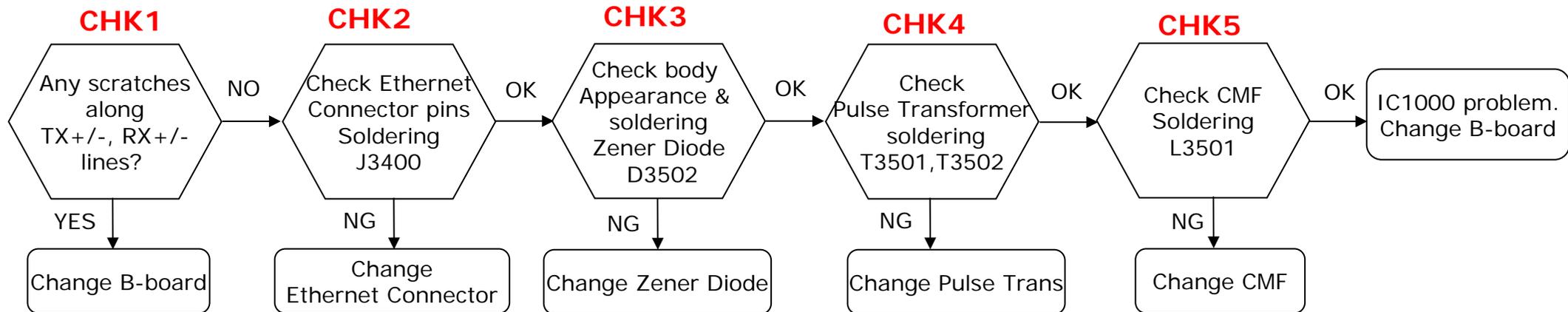
## Fuse location



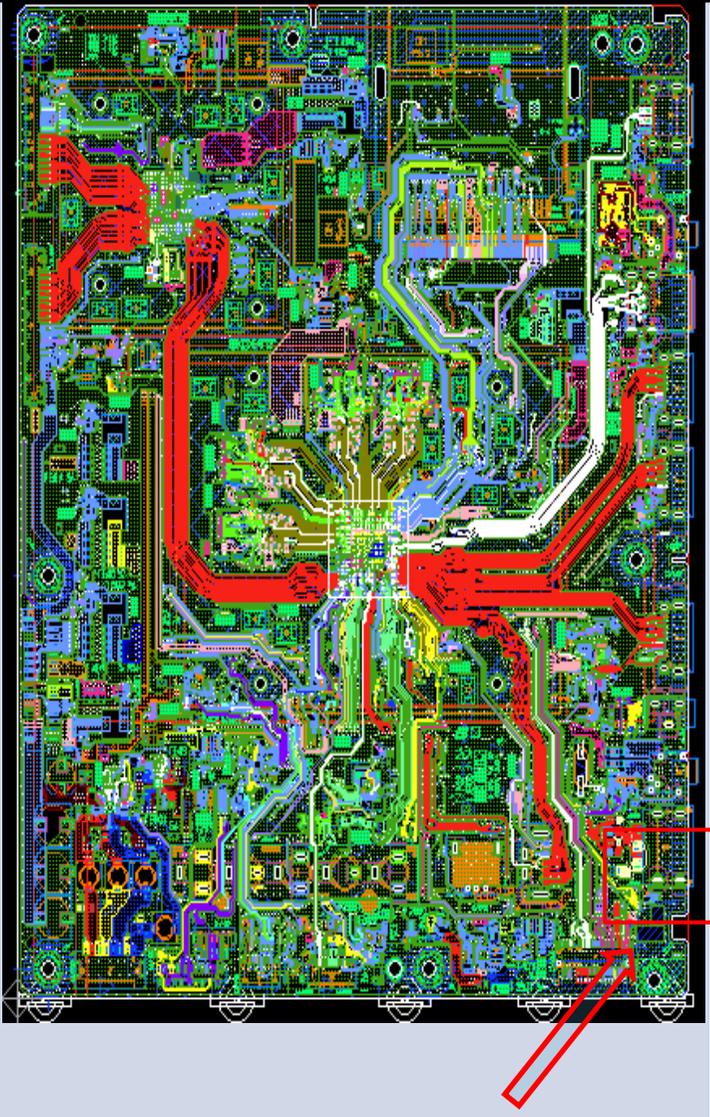
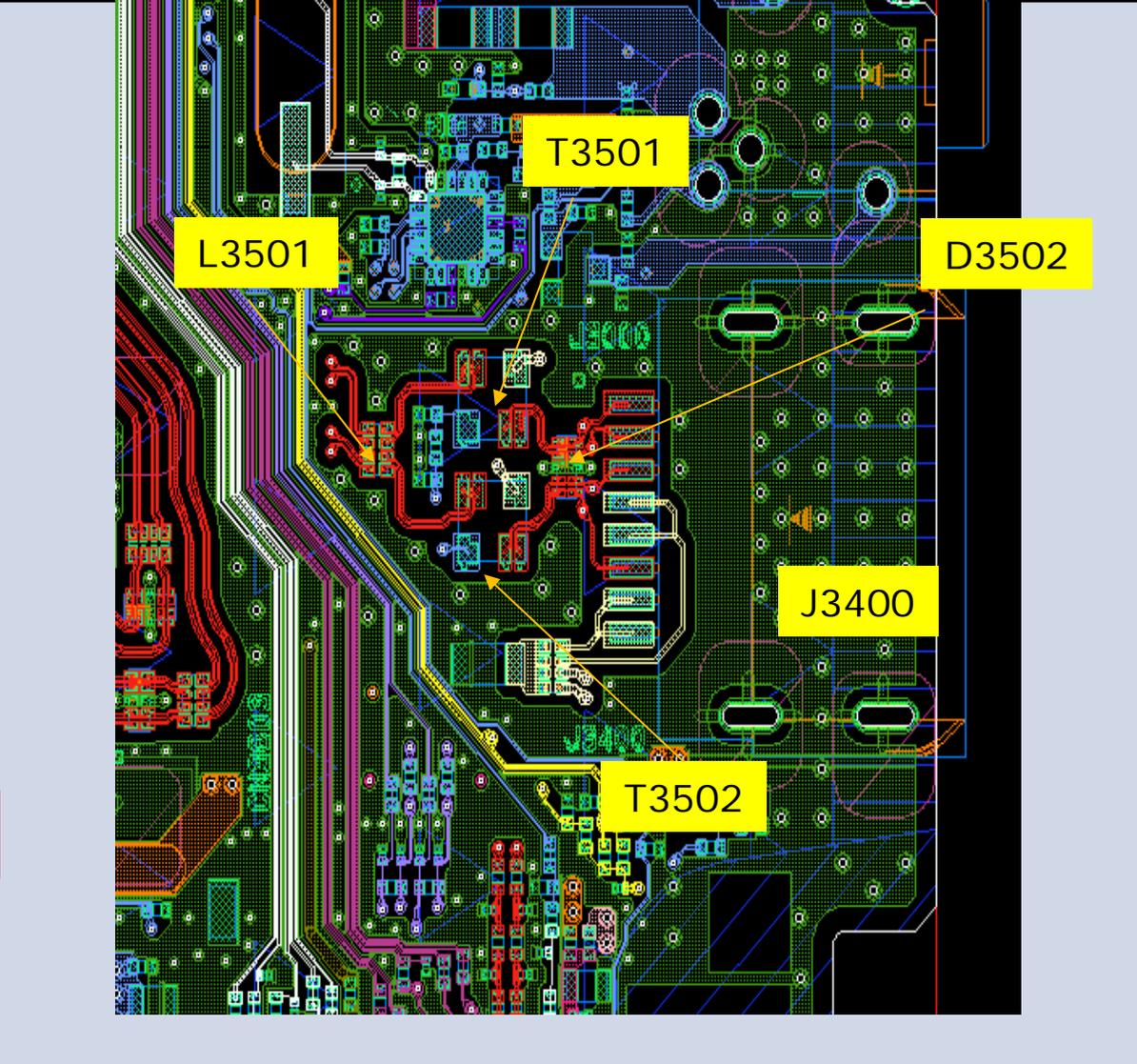
## 6.0 Network Malfunction: Ethernet (Wired)



### B Board

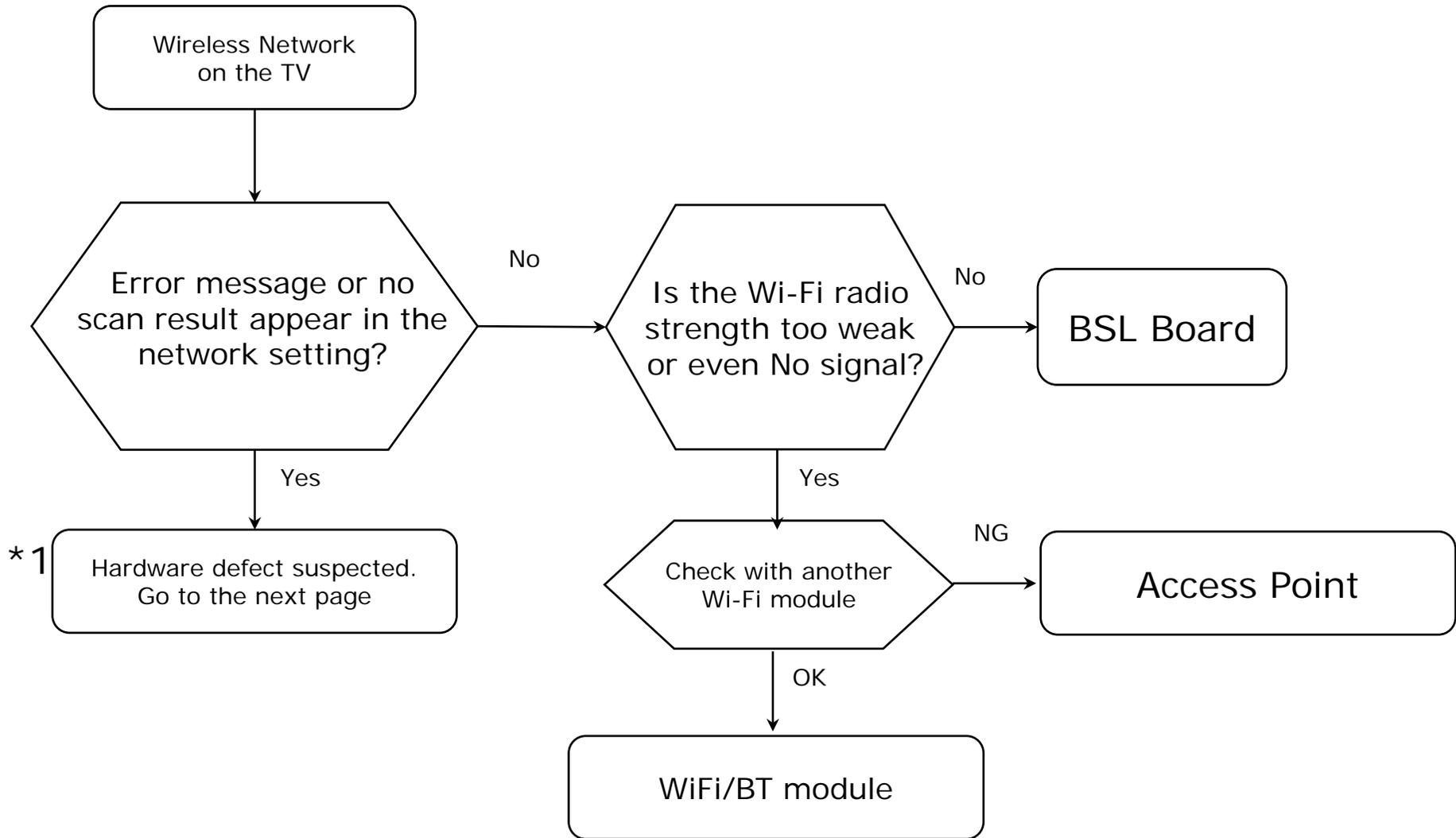


Check point for BSL

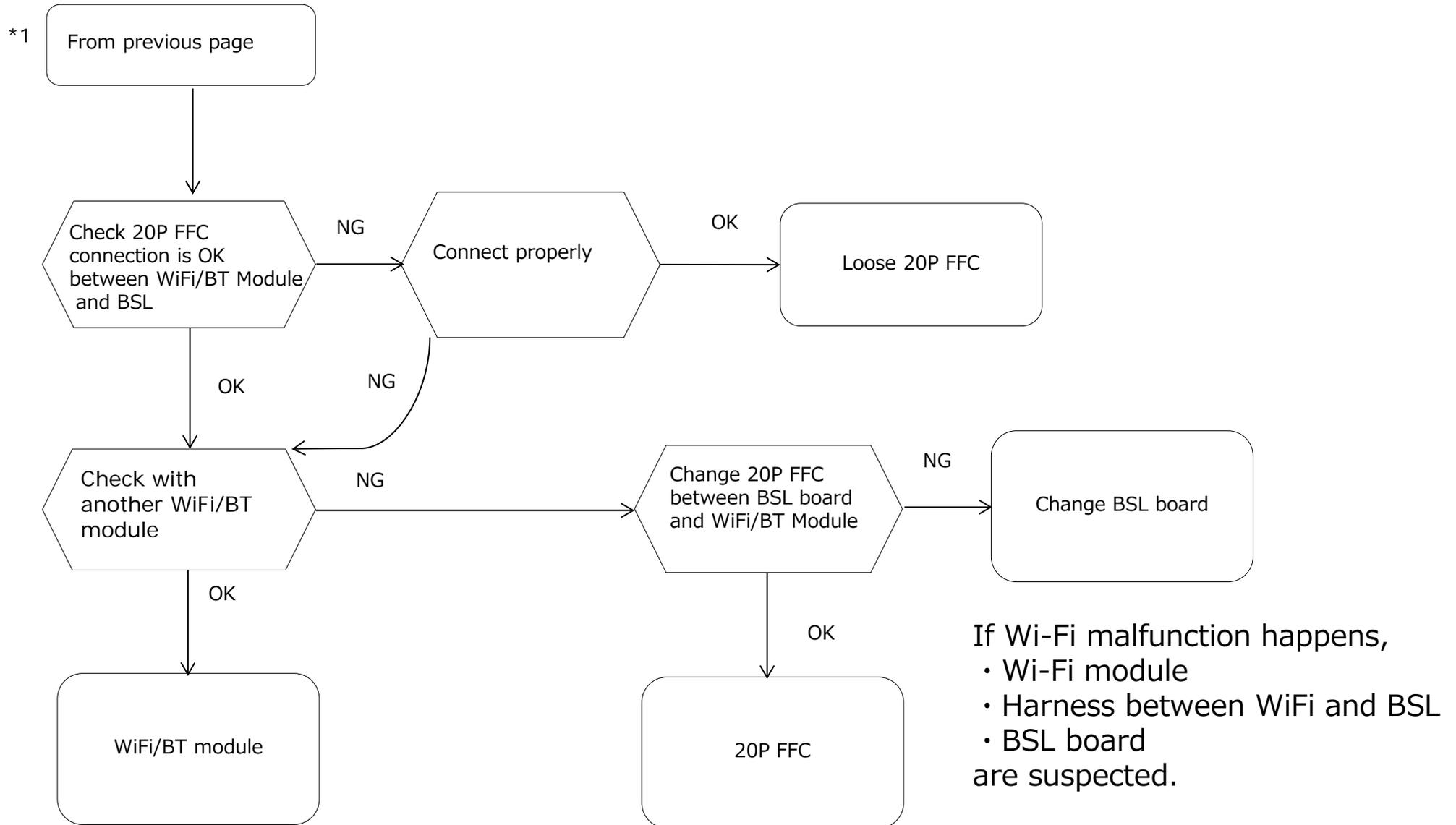
Name	Board PWB (A side)	Detail
BCH	 A detailed view of the entire printed wiring board (PWB) on the A side. The board is densely packed with components and traces, color-coded by layer. A red rectangular box highlights a specific area in the lower right quadrant of the board, which is magnified in the detail view.	 A magnified view of the area highlighted in the main board image. It shows a complex network of traces and components. Several components are labeled with yellow boxes and arrows: L3501 (an inductor), T3501 (a transformer), T3502 (another transformer), J3400 (a connector), and D3502 (a diode).

Screen Mirroring is not supported starting FY19

1) Internal Wireless Network malfunction

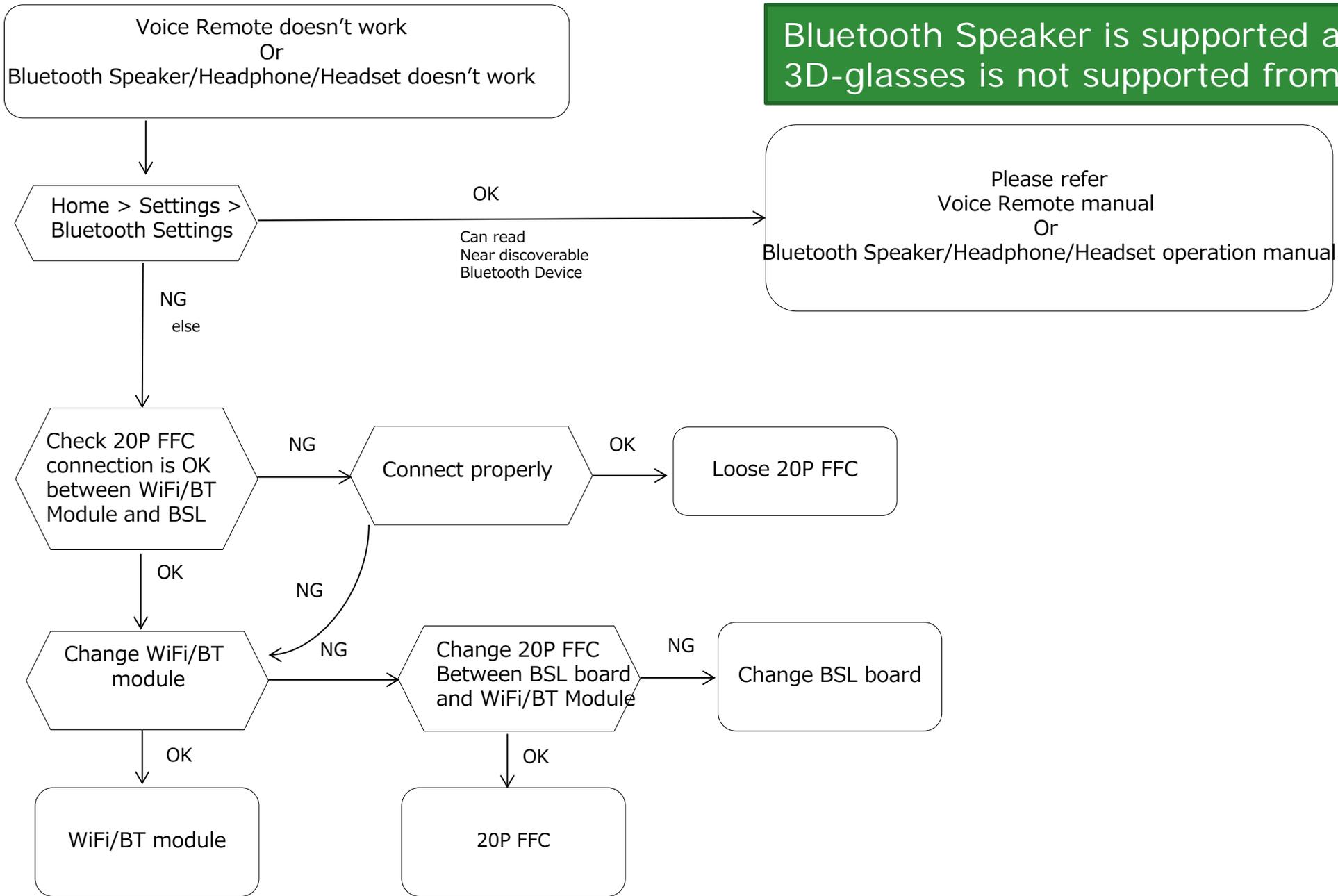


## 6.2 Wireless Network malfunction



### 6.3 Bluetooth malfunction

Bluetooth Speaker is supported and 3D-glasses is not supported from FY17



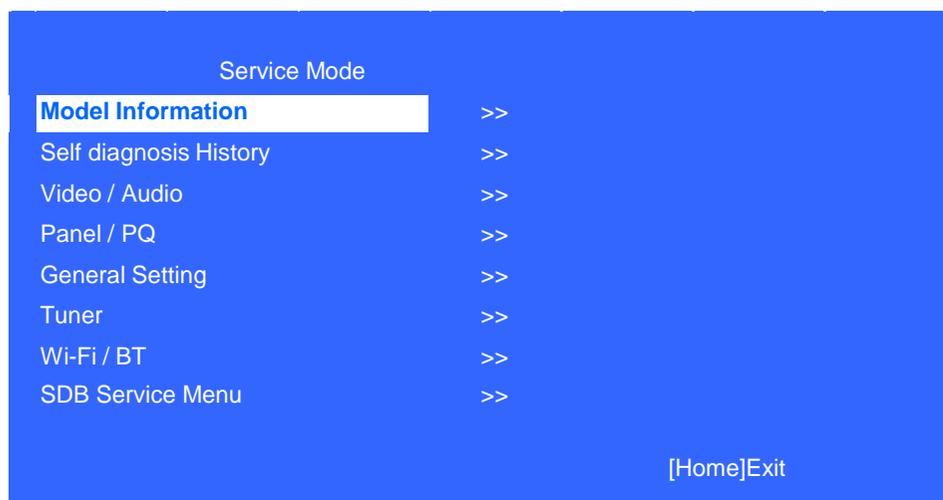
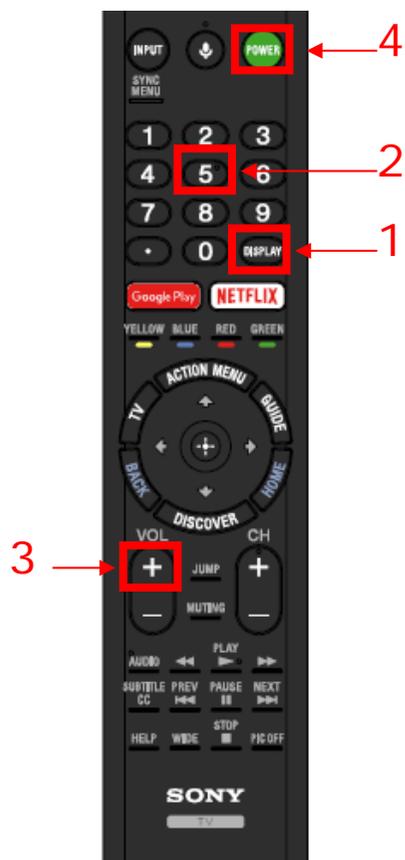
## SECTION 4 SERVICE ADJUSTMENT

When finished the operation of service mode , please AC Plug OFF/ON the TV set

\*If you don't do AC plug OFF/ON, remain the Service Mode App and user can see the Service Mode after RC ON.

### 4.1 How to Enter Service Mode From Standby Mode

1. Go to TV standby condition by remote commander.
2. Press "Display or i+ (info)", "5", "Volume+" then "TV power" on remote.
3. You can see Service menu on display.

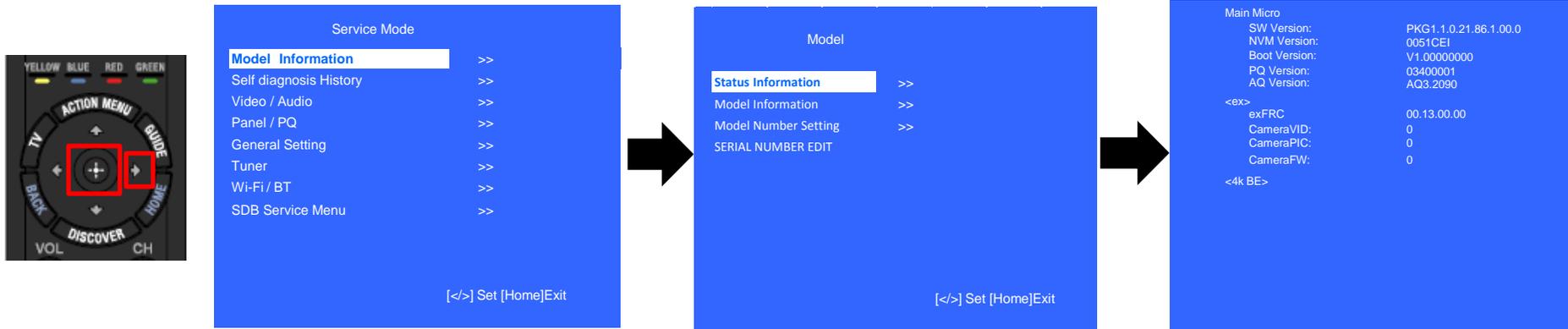


#### Summary of Service Control

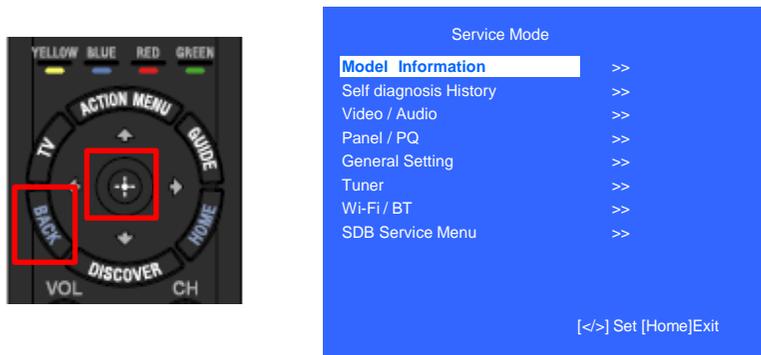
Function	The flow of control
Service mode on	<Display or i+ (info) > <5> <Vol. Up> <Power>
Close Service menu	<Home>
Service mode off	AC plug OFF
Item up / down	<↑> / <↓>
Item select left/right	<←> / <→>
Execute	<Enter>

## Software Version

- 1) In Service Mode, select "Model Information", press "Enter" or → button to enter **Status Information**

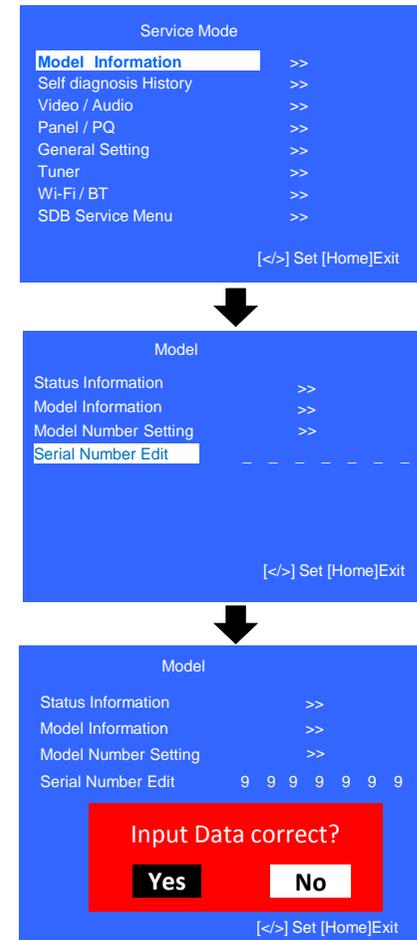


- 2) Press "Enter" or "BACK" button to return to Service Mode



## Serial Number Edit (1)

- 1) In "Service Mode", select "Model Information" by pressing "↑" or "↓" then pressing "Enter" or "→" button to enter inside.
- 2) Select "Serial Number Edit" by pressing "↑" or "↓" button then pressing "→" button
- 3) Press "↑" or "↓" to input numbers
- 4) After user input data , press <Enter>
  - Pop-up dialog appear to confirm input data correct
  - **Serial Number can be set ONLY ONCE**
- 5) 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.

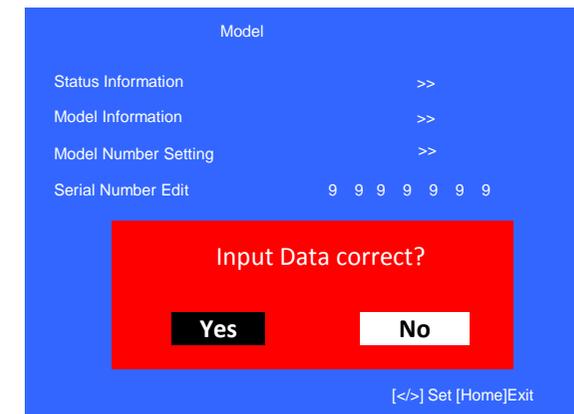
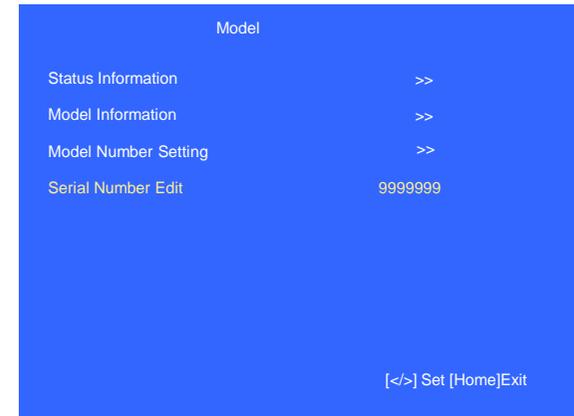


\* The font color of YES/NO is change to black when it is selected.

## Serial Number Edit (2)

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. Operator will **not able to edit** anymore.

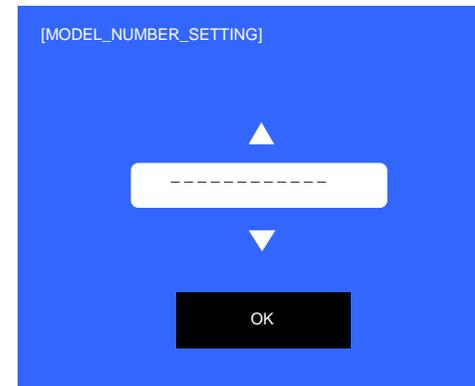
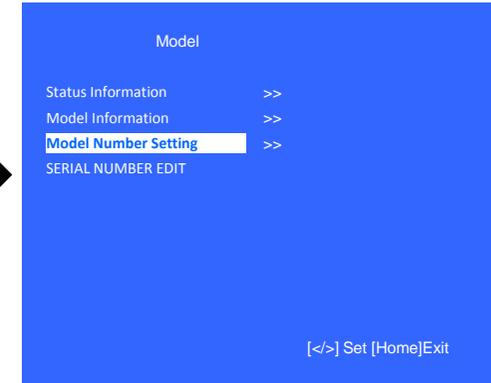
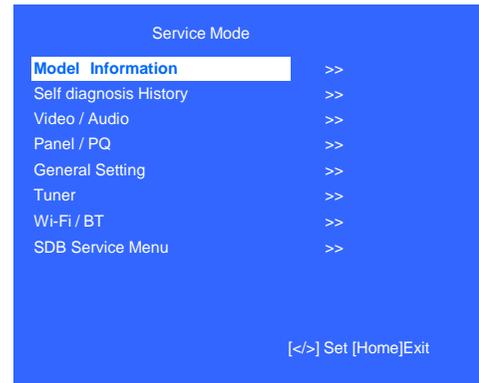
If **NO is selected**, the input data is not saved into EEPROM. The serial number that has been input is displayed. Operator can still edit the Serial Number.



\*The font color of YES/NO is change to black when it is selected.

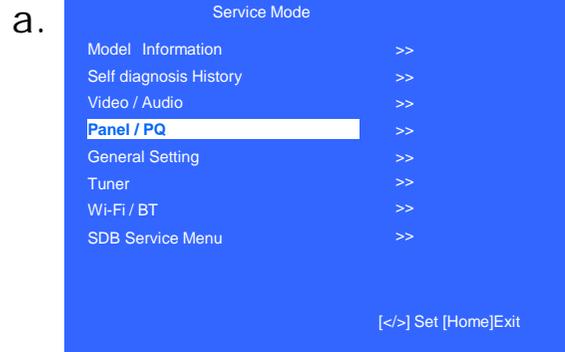
## Model Number Setting

- 1) In "Service Mode", select "Model Information" by pressing "↑" or "↓" then pressing "Enter" or "→" button to enter inside.
- 2) Select "Model Number Setting" by pressing "↑" or "↓" button then pressing "Enter" or "→" button
- 3) Press "↑" or "↓" arrow key to scroll Product Name Candidate. (e.g. KD-65XF9005 CEI)
- 4) Select one Product Name from the list. After that select "[OK]" and press "Enter" button.



## WB Adjustment (If necessary)

1. In "Panel/PQ" service mode
  - a. Go to "WB Adjustment" category by "↑" or "↓".
  - b. To select "WB Adjustment", press → button.
  - c. To change data , press "←" or "→" on remote commander.



b.



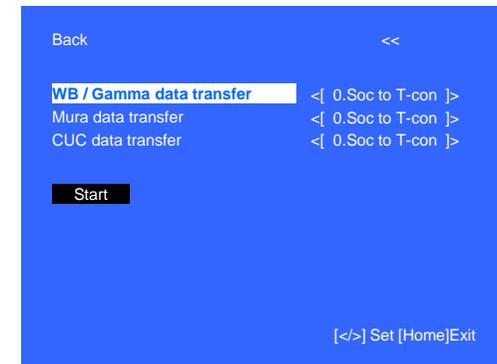
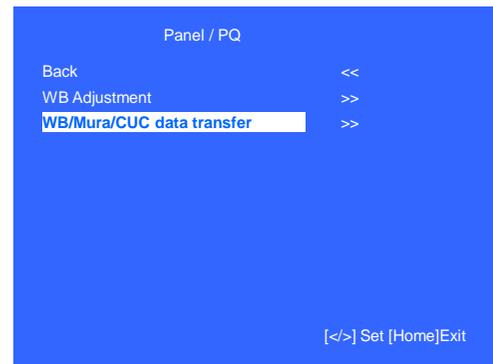
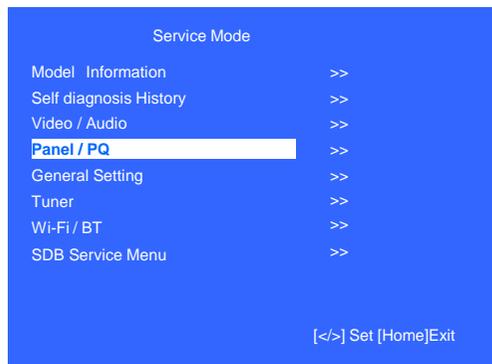
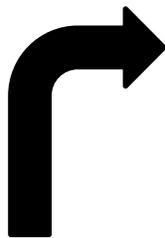
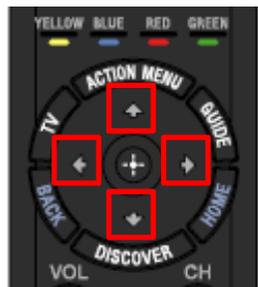
c.



## WB/Mura/CUC data transfer (LCD Model only)

Please apply Main board or panel is replaced.

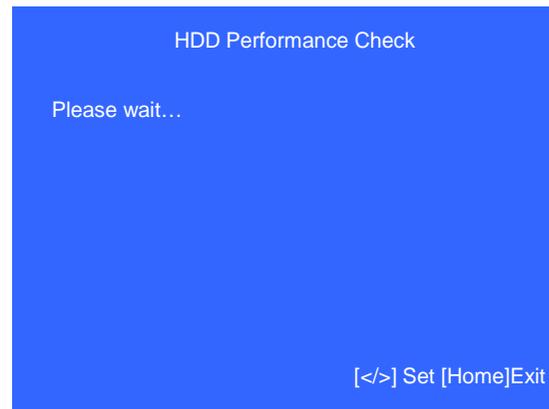
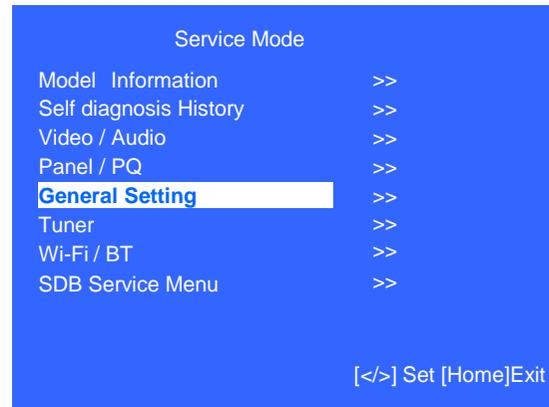
1. In "Panel/PQ" service mode
  - a. Go to "WB/Mura/CUC data transfer" category by "↑" or "↓".
  - b. To select "WB/Mura/CUC data transfer", press → button.
  - c. To change data , press "←" or "→" on remote commander.



2. In "WB/Mura/CUC data transfer"
  - a. Select "WB/Gamma data transfer" by pressing "↑" or "↓" on remote commander .
  - b. To change the items, press "←" or "→" on remote commander and press "Enter" button.  
Selectable items are:
    - 0. SoC to T-con
    - 1. T-con to SoC
    - 2. Not action
  - c. Similarly, to select the items in Mura and CUC data.
  - d. Select "[start]" and press "Enter" button to start transfer.

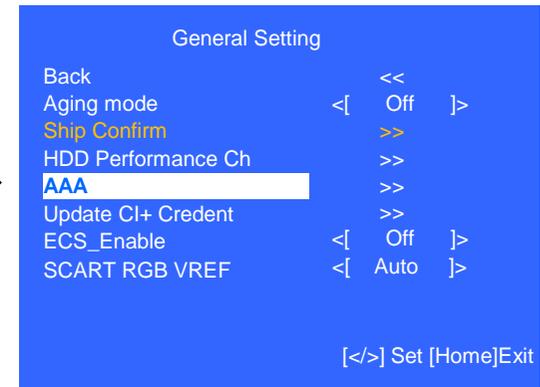
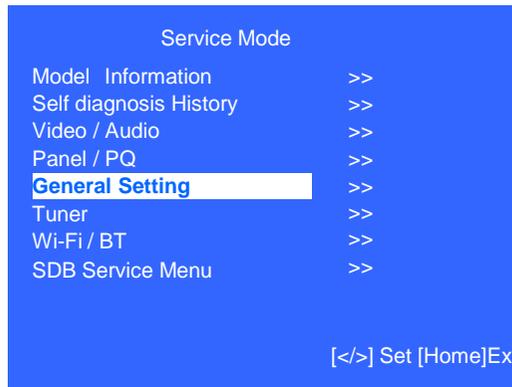
## HDD Performance Check (EU only)

- 1) In "Service Mode", select "General Setting" by pressing "↑" or "↓" then pressing "Enter" or "→" button to enter inside.
- 2) Select "HDD Performance check" by pressing "↑" or "↓" then pressing "Enter" or "→" button to enter inside.
- 3) A message "Please wait ..." is displayed during performance check processing.
- 4) Result **OK** or **NG** will be displayed after performance of HDD is checked



## HDD Re-Register (EU Only)

- 1) In "Service Mode", select "General Setting" by pressing "↑" or "↓" then pressing "Enter" or "→" button to enter inside.
- 2) Select "AAA" by pressing "↑" or "↓" then pressing "Enter" or "→" button to enter inside.
- 3) Result **OK** or **NG** will be displayed after HDD re-registration is succeed/failed

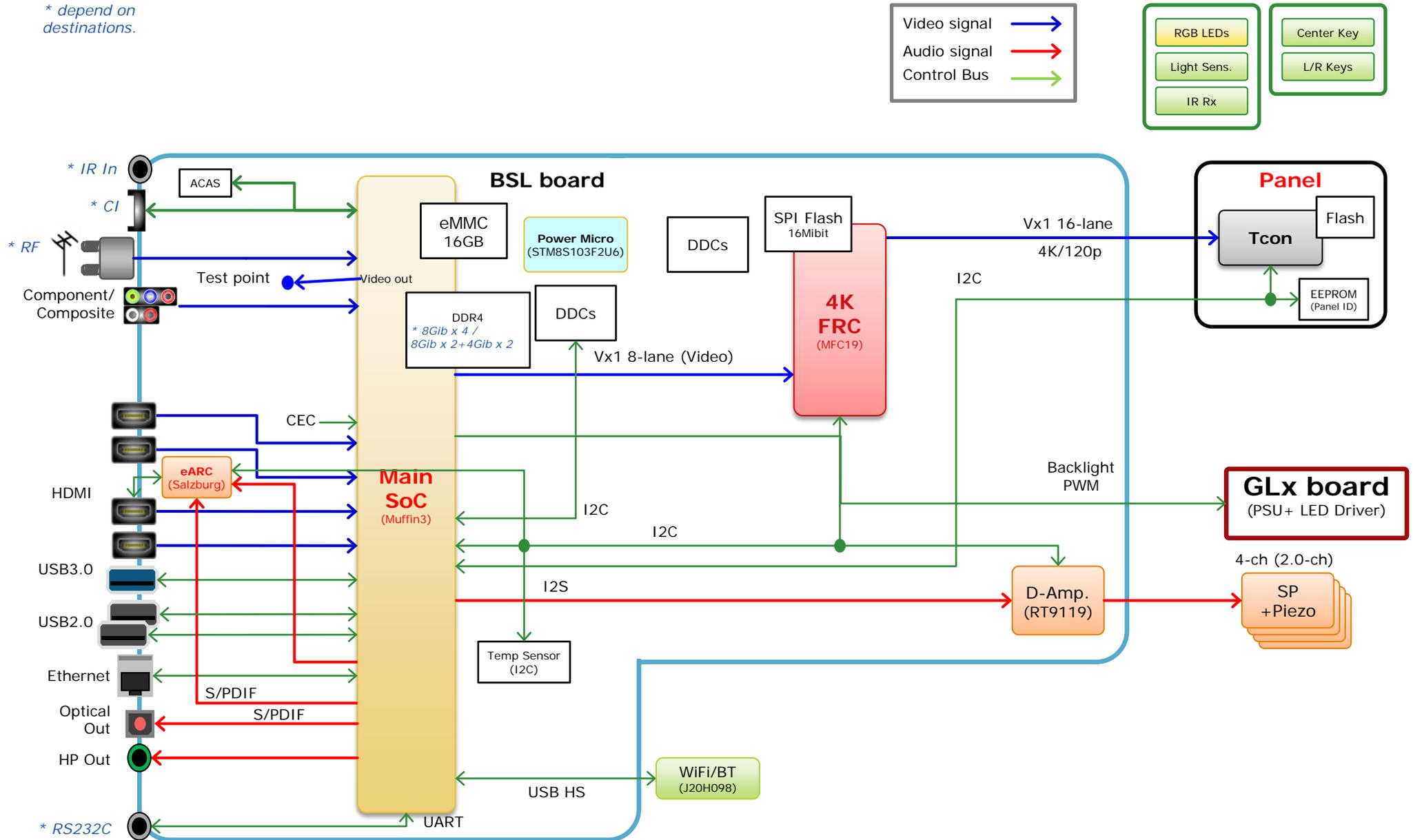


# SECTION 5 DIAGRAMS

## 5.1 SL Block Diagram

Some control lines are left out.

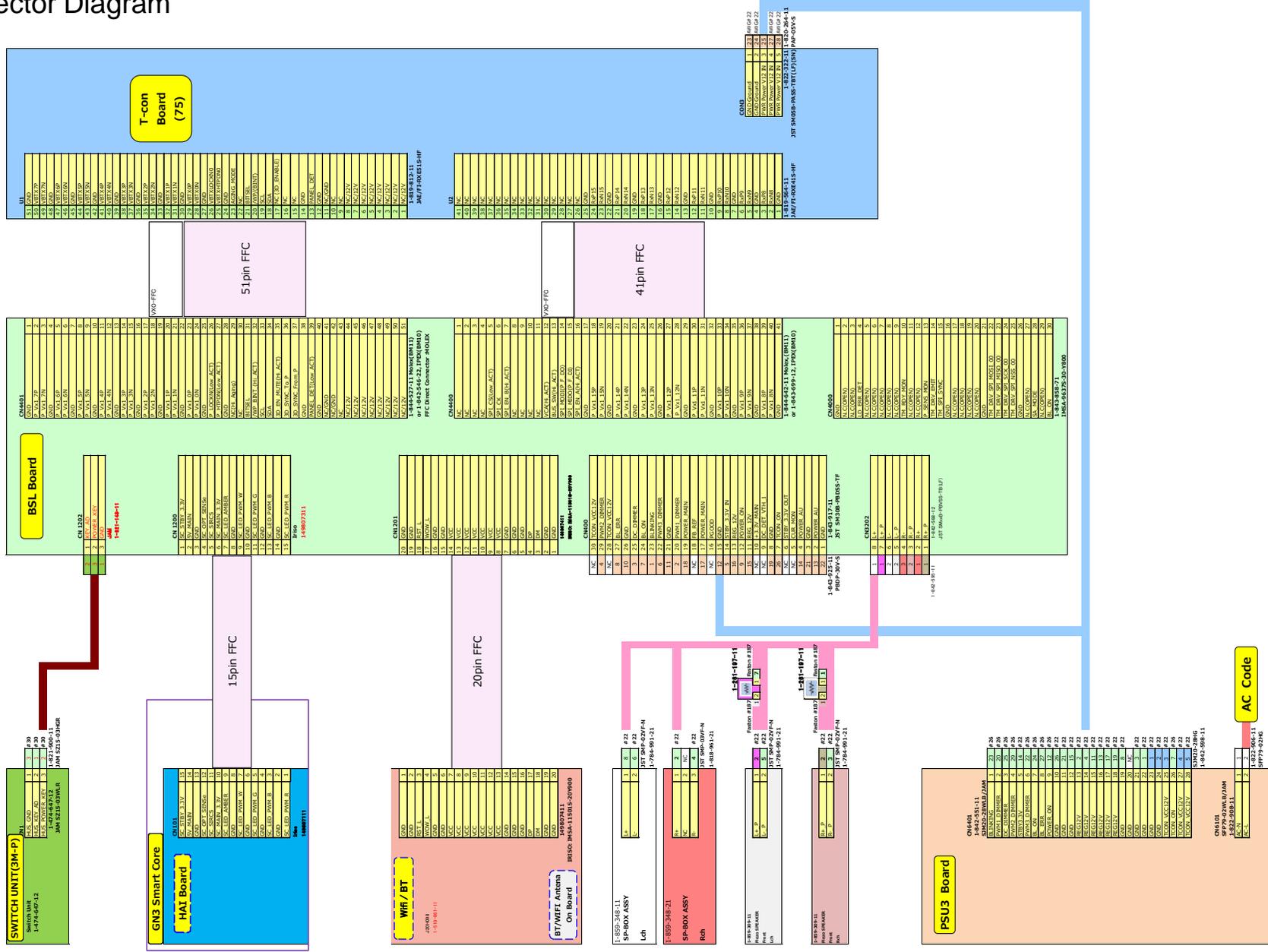
\* depend on destinations.







# 5.2 Connector Diagram 75 inch



## 5.2 Connector Diagram 85 inch

