SERVICE MANUAL (COMMON)

ORIGINAL MANUAL ISSUE DATE: 2021.02

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LCD TV

SONY

Sony EMCS (M) Sdn. Bhd., SHES-M

REVISION HISTORY

Version	Date	Subject
1	2021.02	1st Issue

SONY

MODEL LISTS

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

REGION

AMERICA ASIA CHINA

MODEL

KD-43X80J	KD-50X80J	KD-55X80J	KD-65X80J	KD-75X80J
KD-43X81J	KD-50X81J	KD-55X80CJ	KD-65X80CJ	KD-75X80CJ
KM-43X80J	KM-50X80J	KD-55X79J	KD-65X79J	KD-75X79J
		KD-55X81J	KD-65X81J	KD-75X80BJ
		KD-55X80AJ	KD-65X80AJ	
		KM-55X80J	KM-65X80J	

SONY

TABLE OF CONTENTS

Please refer Service Manual – Unique for below information :

- Disassembly and Removal Caution
- Wire Dressing
- Circuit Board Location
- Exploded Views and Part Lists

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

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)

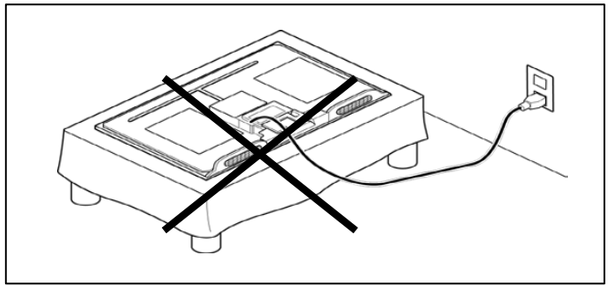
7) Always clean the LCD panel with a soft cloth material.

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.

SAFETY NOTES

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 ºC and 40 ºC.

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）

SAFETY NOTES

※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.

SAFETY NOTES

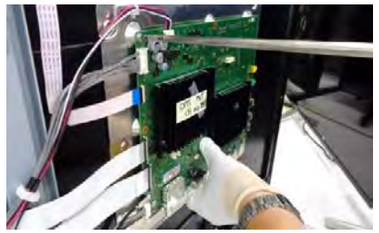
④Regardless of Good board or Defective board, always put it on ESD cushion/sheet slowly.

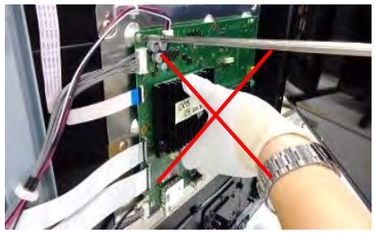
⑤Do not stack up

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

1) Caution for Board handling(Stress)
Be sure to observe the following contents

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





2) Caution for Board handling(ESD)
Be sure to observe the following contents.

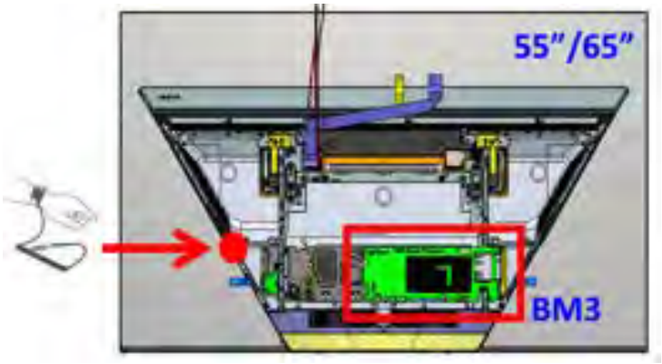
①When take off Rear-Cover, do not touch to board

②Use ESD wrist-strap

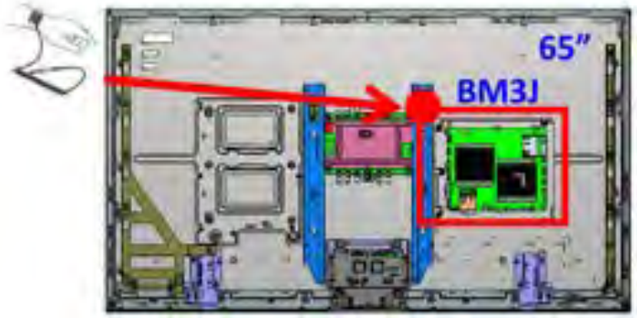
SAFETY NOTES

※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*-6579F＞



※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

SAFETY NOTES

1-4. Caution About the Lithium Battery

1) Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.
1) 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.

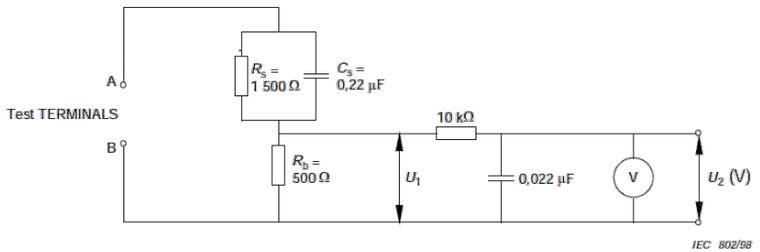
1-6. Leakage Test

(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 =√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 350uA peak).
Note: including AC adaptor, AC adaptor/DC operated unit combination

Figure 2 – Measuring network for Leakage Current



1-7. How to Find a Good Earth Ground

1)A cold-water pipe is a guaranteed earth ground; the cover-plate retaining
2)screw on most AC outlet boxes is also at earth ground.
3)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.
4)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.

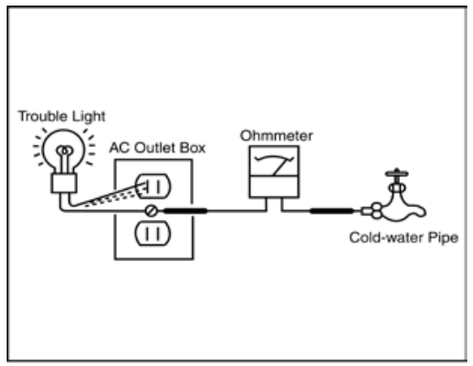


Figure B. Checking for earth ground.

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

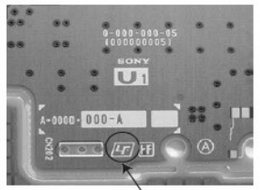


Figure 5: LF logo on circuit board

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.

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	Error Item	APH / APHB
2x	MAIN_POWER	<B/G> Main 12V over voltage
3x	DC_ALERT	<B/G> Main 5.0V failure
	AUD_ERR	<B/S> Audio amp. protection
4x	*LD_ERR*	*None*
	BCM_ERR	*None*
5x	*P_ID_ERR*	<B/T/P/G> *Panel ID EEPROM I2C No ACK (Also panel power failure is a suspect)*
6x	BACKLIGHT_ERR	<B/G/P/LD> Backlight failure
7x	TEMP_ERR	<B/H/P> Over temperature protection
8x	4KBE_ERR	*None*

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, <H>: H-board

SELF DIAGNOSTIC FUNCTION

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

Error Item	APH	APHB
TCON ERR	<T> T-CON device I2C communication failure	*None*
AUD_ERR_I2C	<B> Audio amp I2C communication failure	
TEMP_ERR_I2C	<B/H> Temp sensor I2C communication failure	
TU_DEMOD_I2C	<B> Tuner & Demodulator I2C communication failure	None

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, <H>: H-board

SELF DIAGNOSTIC FUNCTION

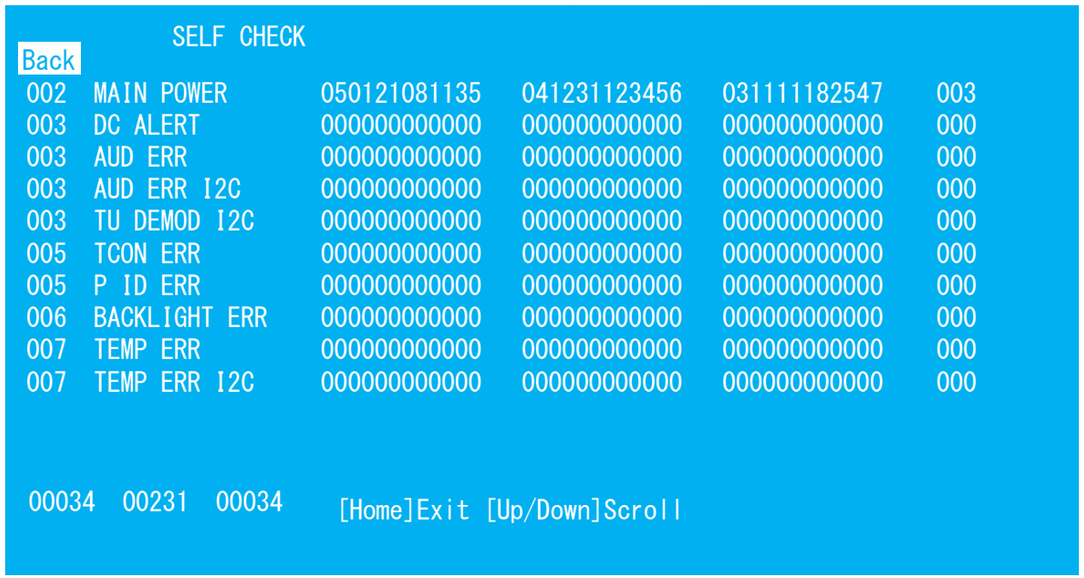
Self Diag. Service Menu

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

FY21 model (APH/APHB)



SELF DIAGNOSTIC FUNCTION

Self Diag. Display

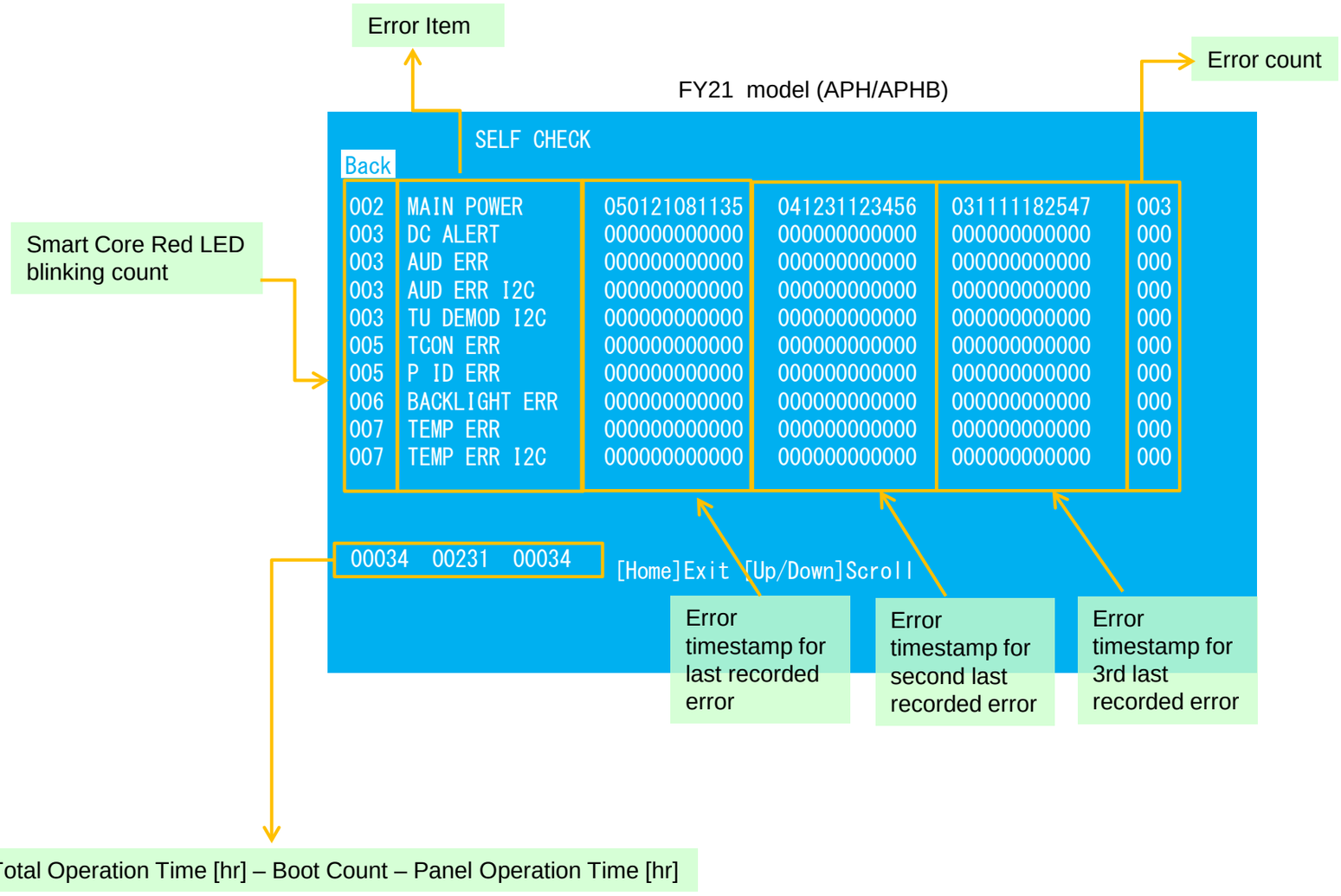
Format of error timestamps
YYMMDDhhmmss (in UTC)
Example:
120823132523 -> Aug 23 2012 13:25:23 UTC
* Only when time is set, an error timestamp is saved.

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.



Triage Chart

Sony KD-* Technical Triage Summary Sheet

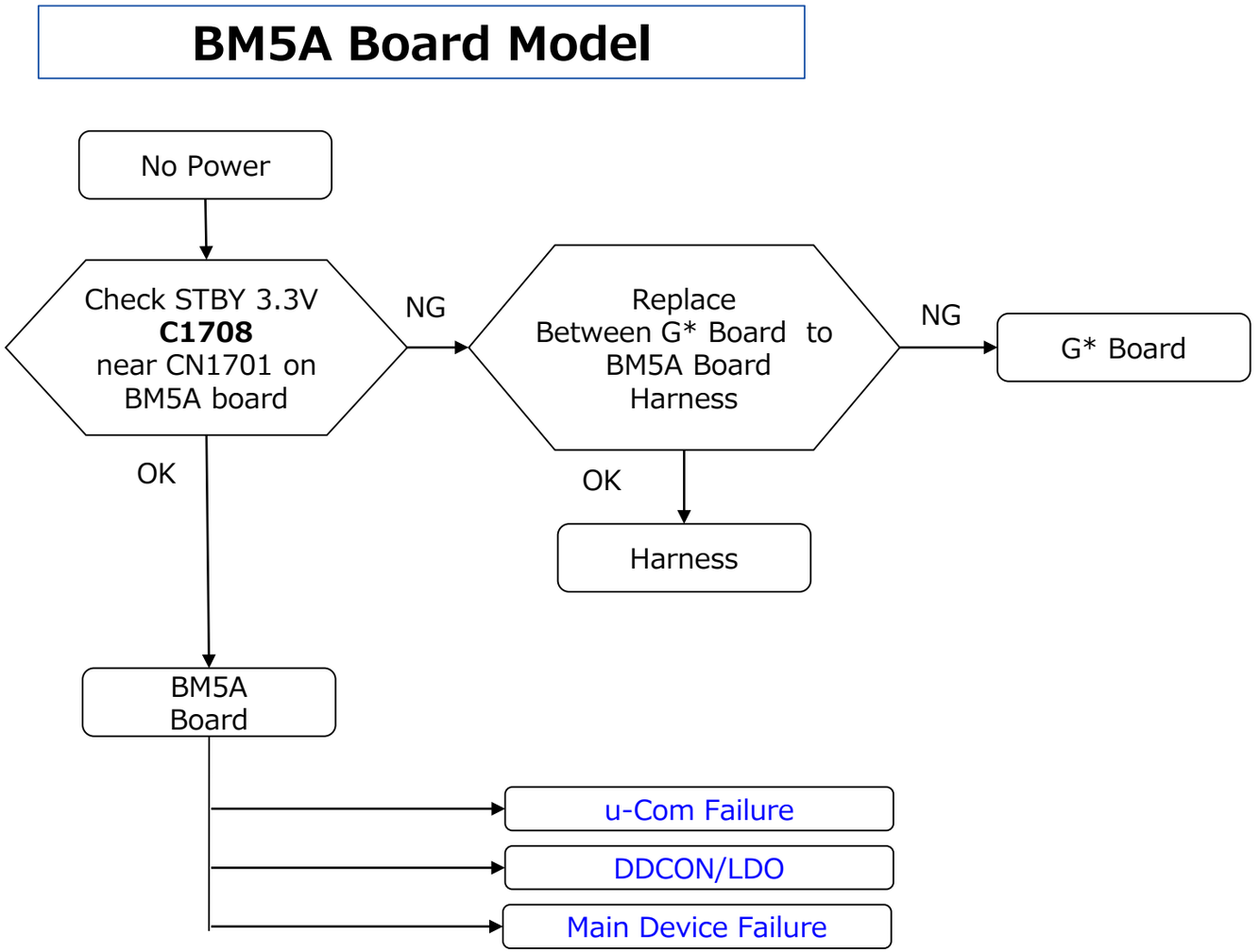
Before you make the service call…

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 Color Code

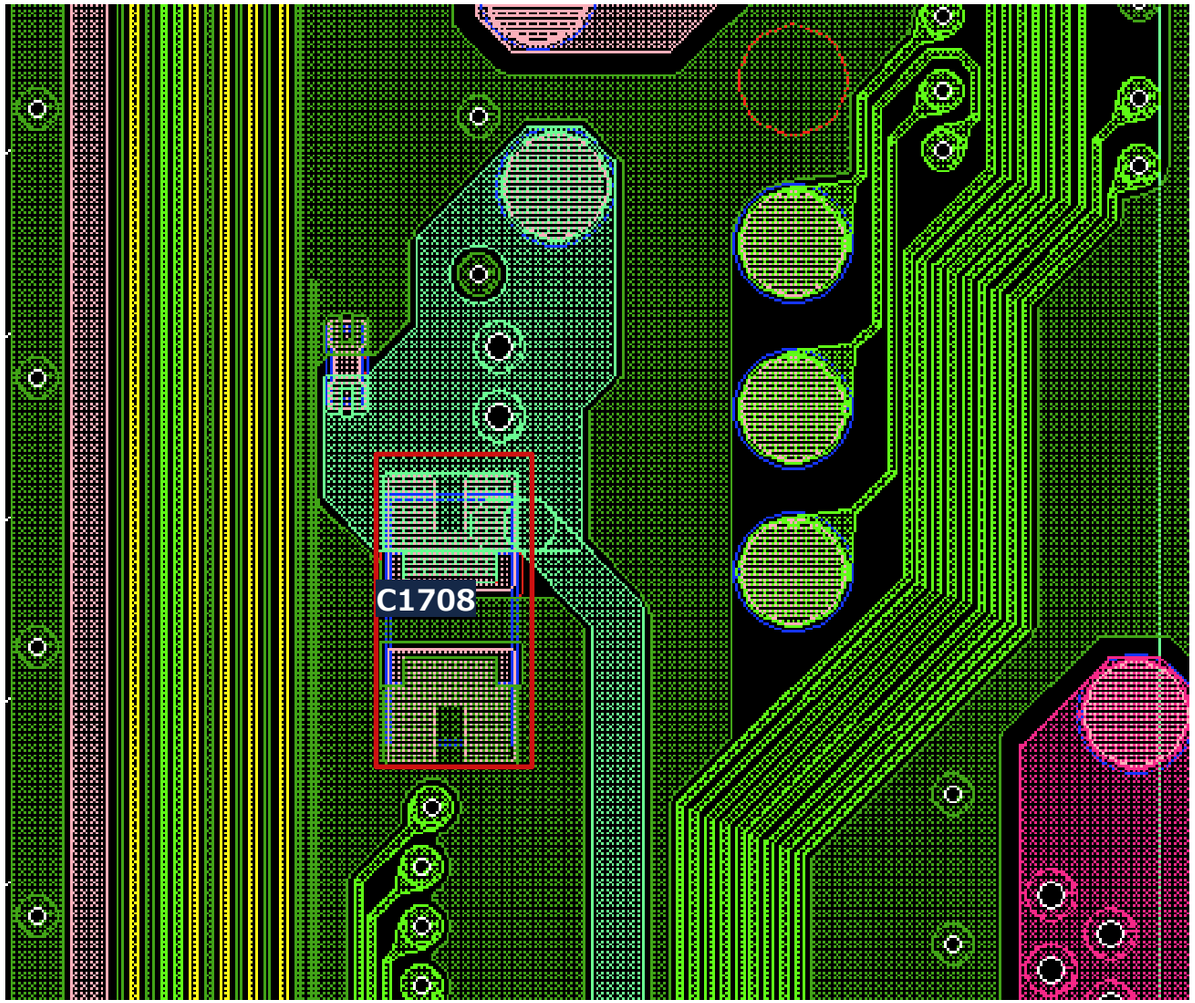
RED DOT: Most likely defective part
BLUE TRIANGLE: Secondary possible defective part
GREEN SQUARE: Tertiary possible defective part
BLACK TEXT: Board that may correct the symptom

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_I2C	TCON_ERR	FRCTC_I2C	AUD_ERR_I2C	4KPQ_ERR_I2C	TEMP_ERR_I2C	EARC_ERR_I2C	AMB_ERR_I2C	No White Power LED & does not reponse to remote (Dead Set)	Stationary colored lines or dots	No video One of Inputs	NO RF input	No video all Inputs	No Remote	Cannot connect to Wireless Network	No Audio	Smart Core no LED (Set is still alive)	Bluetooth / One Step Remote (OSR) can't connect
Main Board	▲	●		■	■	●			●	▲		●		▲			▲	▲	●	●	●	▲	▲	●	▲	▲
Power Board	●	▲		■	■												●				▲			▲		
Receiver Board														●			▲					●			●	
Speaker		▲																						●		
Wifi & BT Module																							●			●
Local Dimming Board (APHB 32")	●	▲		■	●					■							●				▲			▲		
V By One FFC				▲						▲								▲			▲					
Tcon				●						●								▲			■					
LCD Panel				▲	●	▲				■								●			■					
Problem	Power	Power	Panel	Panel (Communication)	Panel (Backlight)	TEMP	4KBE																			
		Audio	LD	Tcon																						

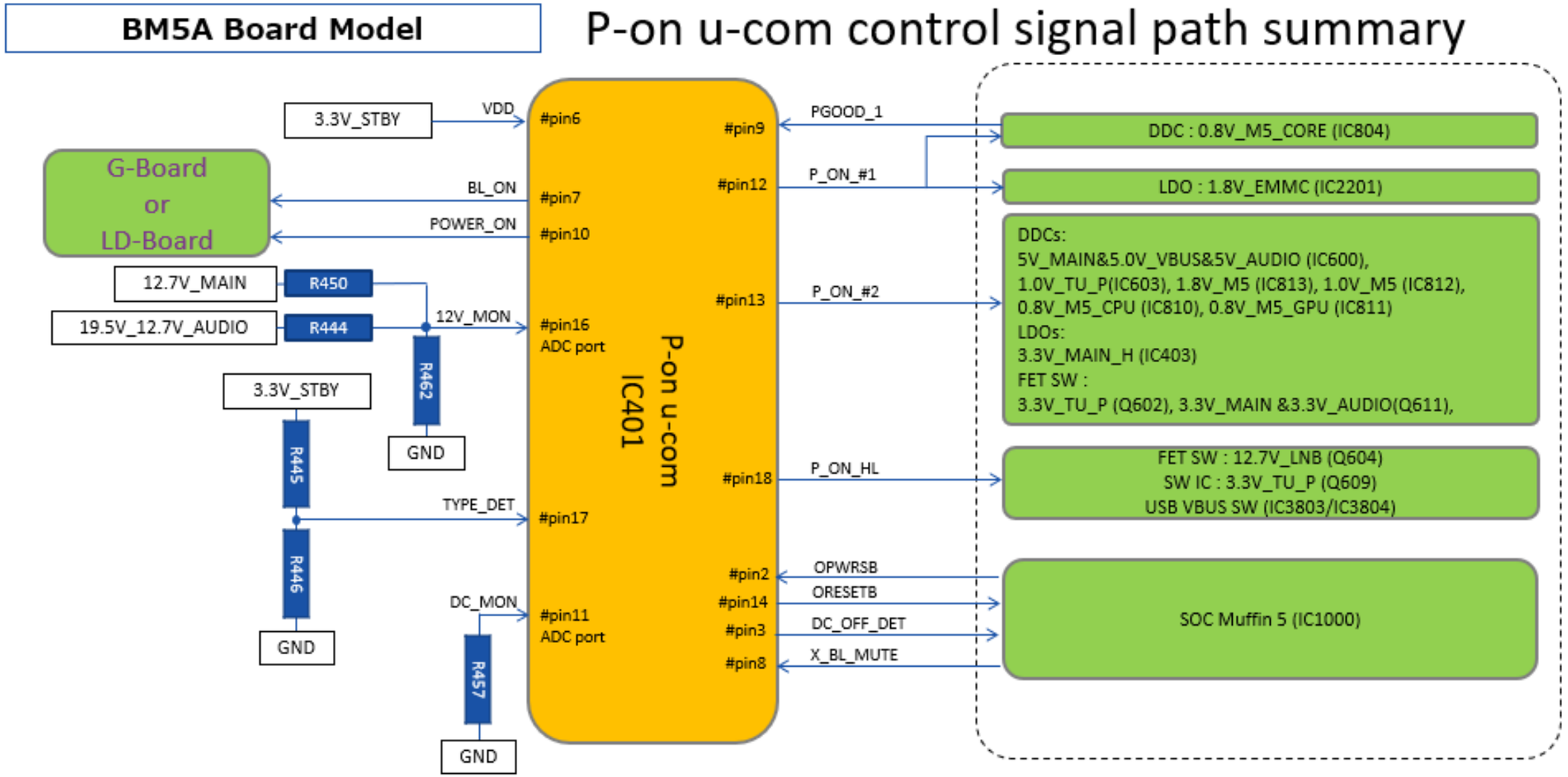
1.0 No Power - PSU



Checking Point (BM5A)

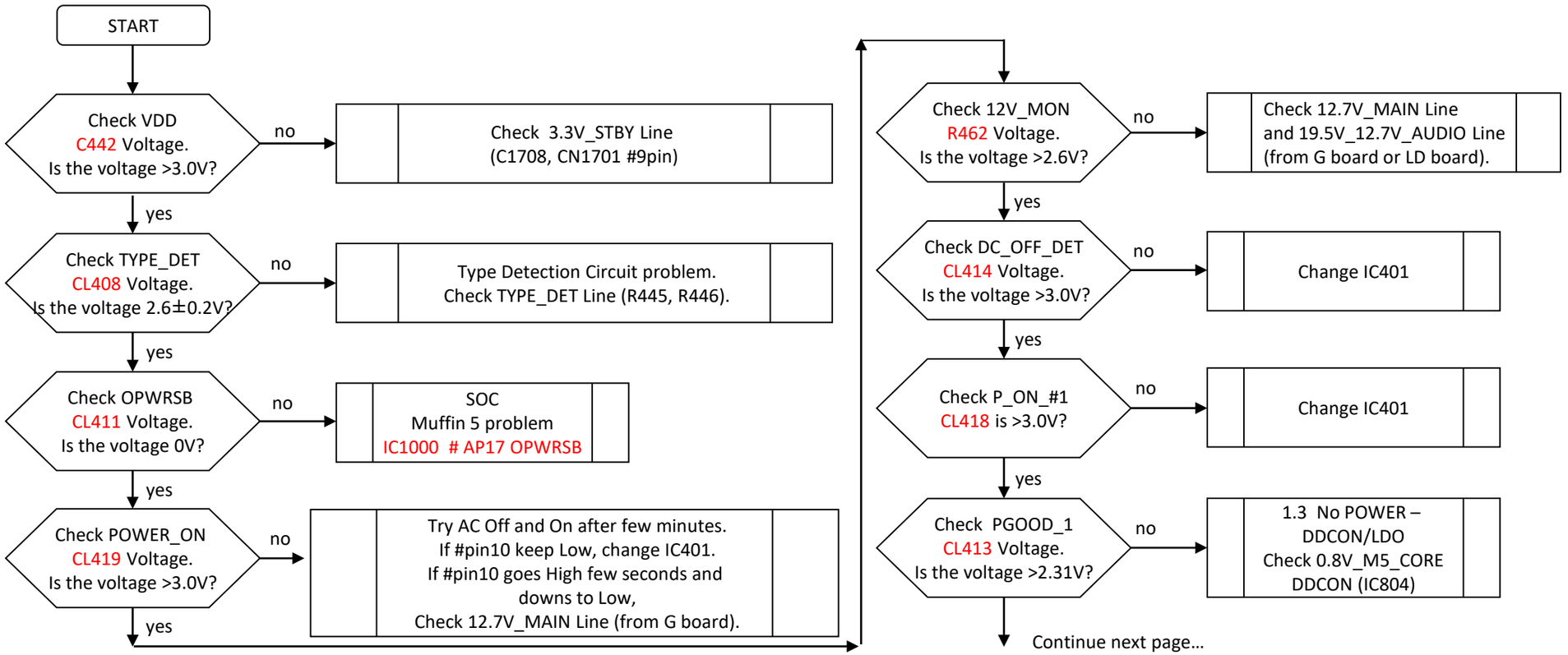


1.2 No Power u-com Failure



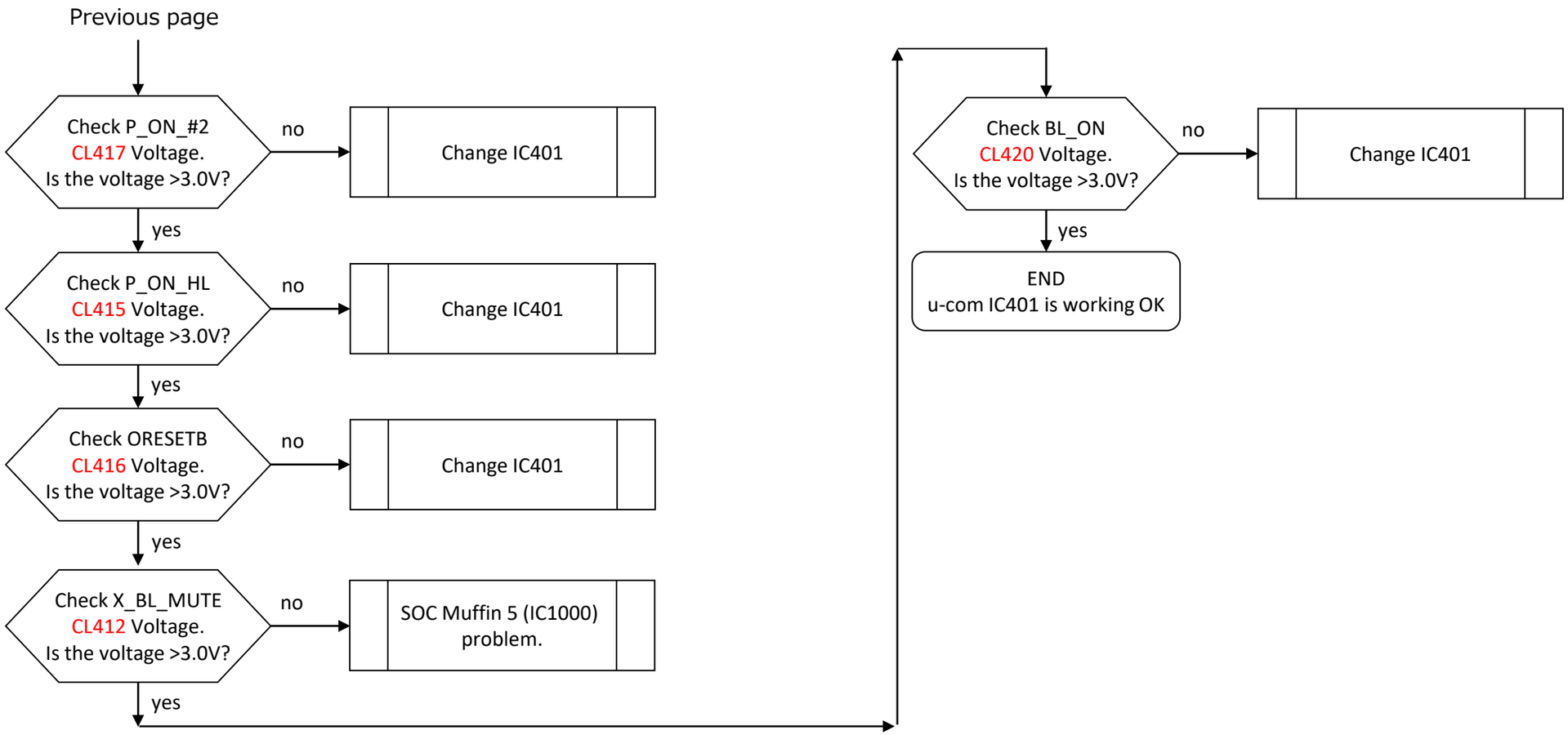
1.2 No Power u-com Failure

BM5A Board Model

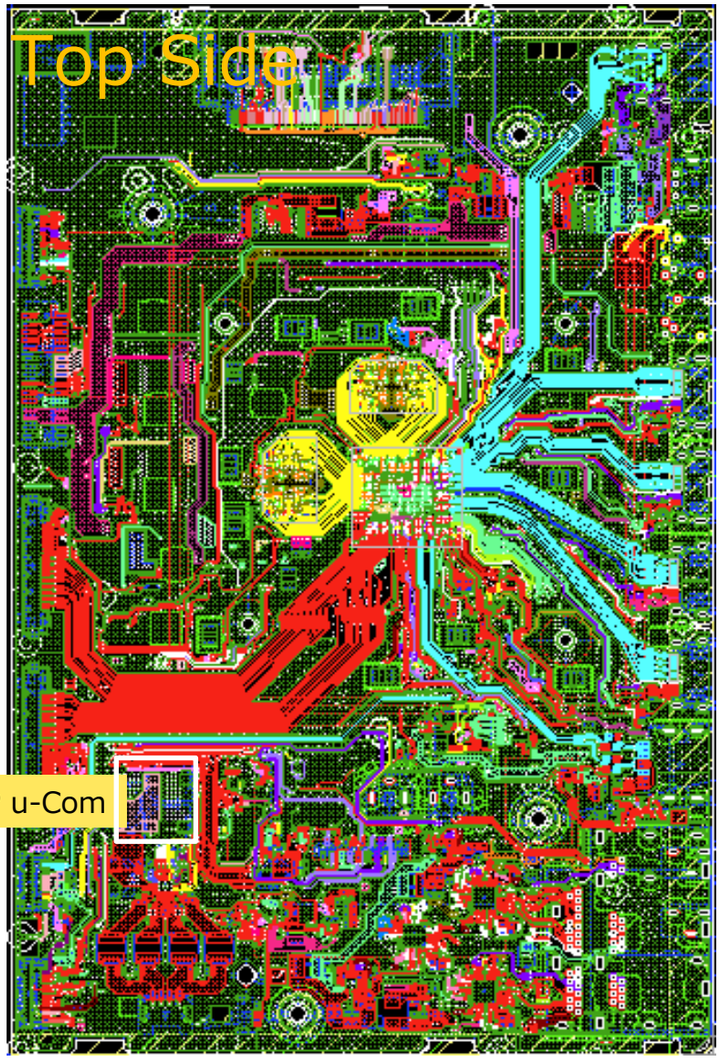


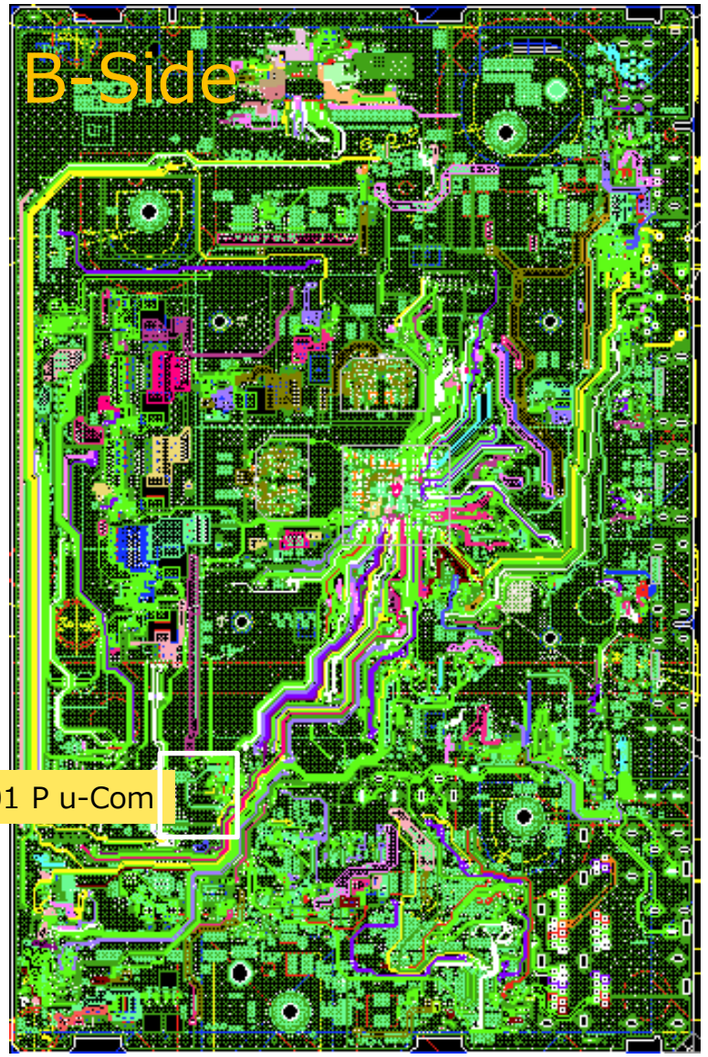
1.2 No Power u-com Failure

BM5A Board Model

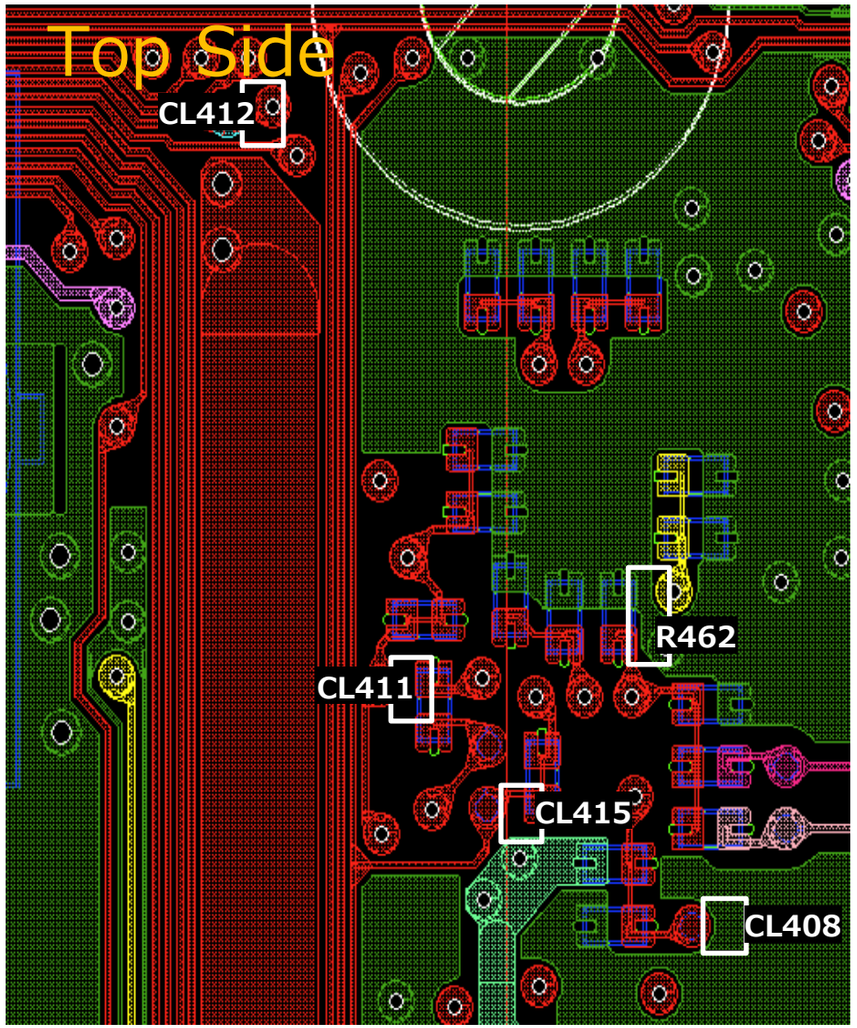


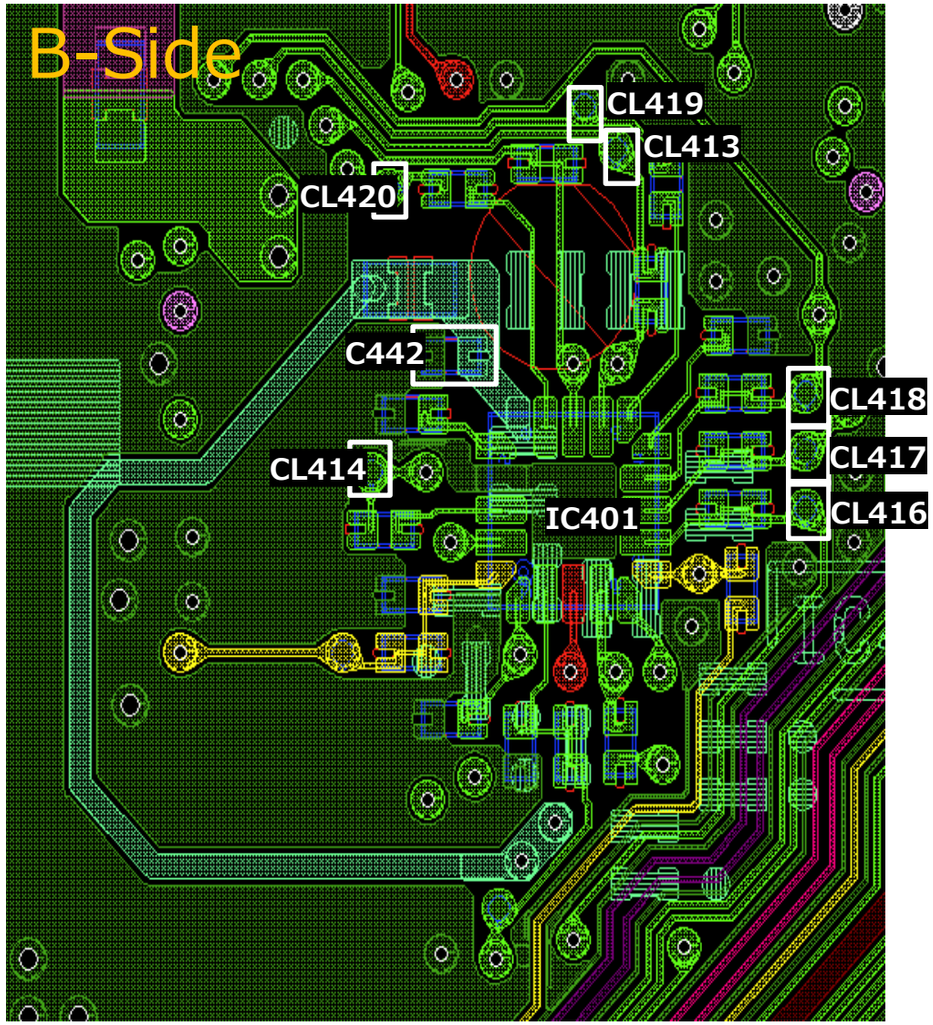
Board View (BM5A)





Checking Point (BM5A)





1.3 No Power DDCON/LDO

BM5A Board Model | **Check Item Summary**

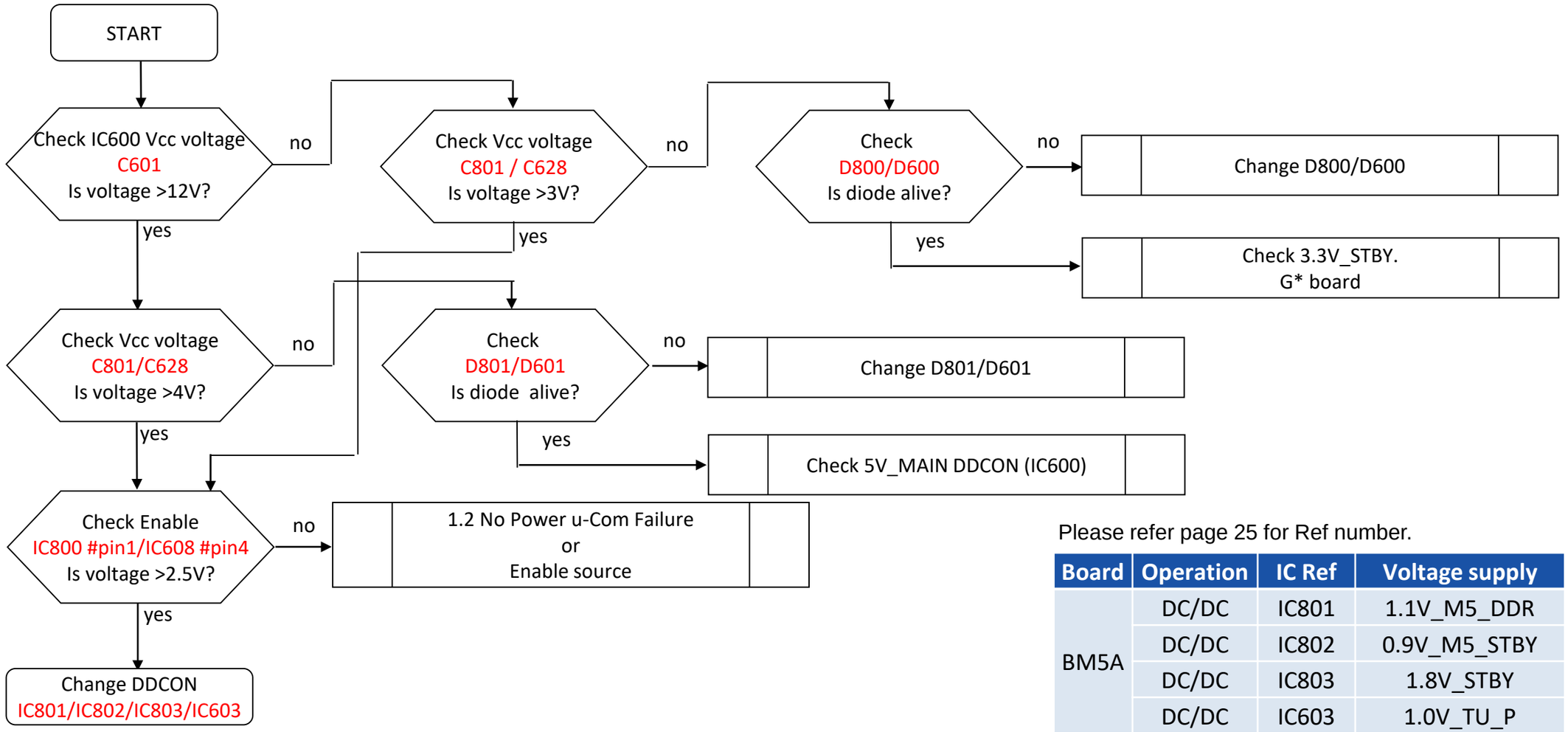
Board	Operation	IC Ref	Voltage supply	Output ref.	Enable pin	Enable source	Fuse	Vcc ref.
BM5A	DC/DC	IC414	5.0V_STBY_H	C482	R545	Vin	-	C479
	LDO	IC403	3.3V_MAIN_H	C416	IC403 Pin#3	P_ON_#2	-	C415
	DC/DC	IC600	5V_MAIN/5.0V_VBUS/5V_AUDIO	C610	IC600 Pin#15	P_ON_#2	F600	C601
	DC/DC	IC607	3.3V_DDC_OUT	C656	IC607 Pin#11	Vin	F604	C665
	DC/DC	IC603	1.0V_TU_P	C630	IC603 Pin#4	P_ON_#2 or IC1000 #AL18 (EWS_PWR_ON)	-	C628
	DC/DC	IC801	1.1V_M5_DDR	C806	IC801 Pin#4	R804/R907 (3.3V_STBY)	-	C801
	DC/DC	IC802	0.9V_M5_STBY	C809	IC802 Pin#4	R804/R907 (3.3V_STBY)	-	C807
	DC/DC	IC803	1.8V_STBY	C812	IC803 Pin#4	R804 (3.3V_STBY)	-	C810
	DC/DC	IC804	0.8V_M5_CORE	C846	IC804 Pin#8	P_ON_#1	F802	C831
	LDO	IC806	1.8V_M5_ET_STBY	C818	IC806 Pin#3	IC1000 #AN19 (ETHER_PWR_EN)	-	C817
	DC/DC	IC813	1.8V_M5	C904	IC813 Pin#4	P_ON_#2	F807	C902
	DC/DC	IC812	1.0V_M5	C898	IC812 Pin#4	P_ON_#2	F805	C896
	LDO	IC809	3.3V_M5_STBY	C816	R917	R917 (3.3V_STBY)	-	C815
	DC/DC	IC810	0.8V_M5_CPU	C861	IC810 Pin#19	P_ON_#2	F803	C855
	DC/DC	IC811	0.8V_M5_GPU	C874	IC811 Pin#19	P_ON_#2	F804	C868
	LDO	IC2201	1.8V_EMMC	C2216	IC2201 Pin#3	P_ON_#1 or ORESETB	-	C2214

P_ON_#1 : P-on u-com IC401 #pin12
P_ON_#2 : P-on u-com IC401 #pin13
ORESETB : P-on u-com IC401 #pin14

1.3 No Power DDCON/LDO

BM5A Board Model

DDCON check



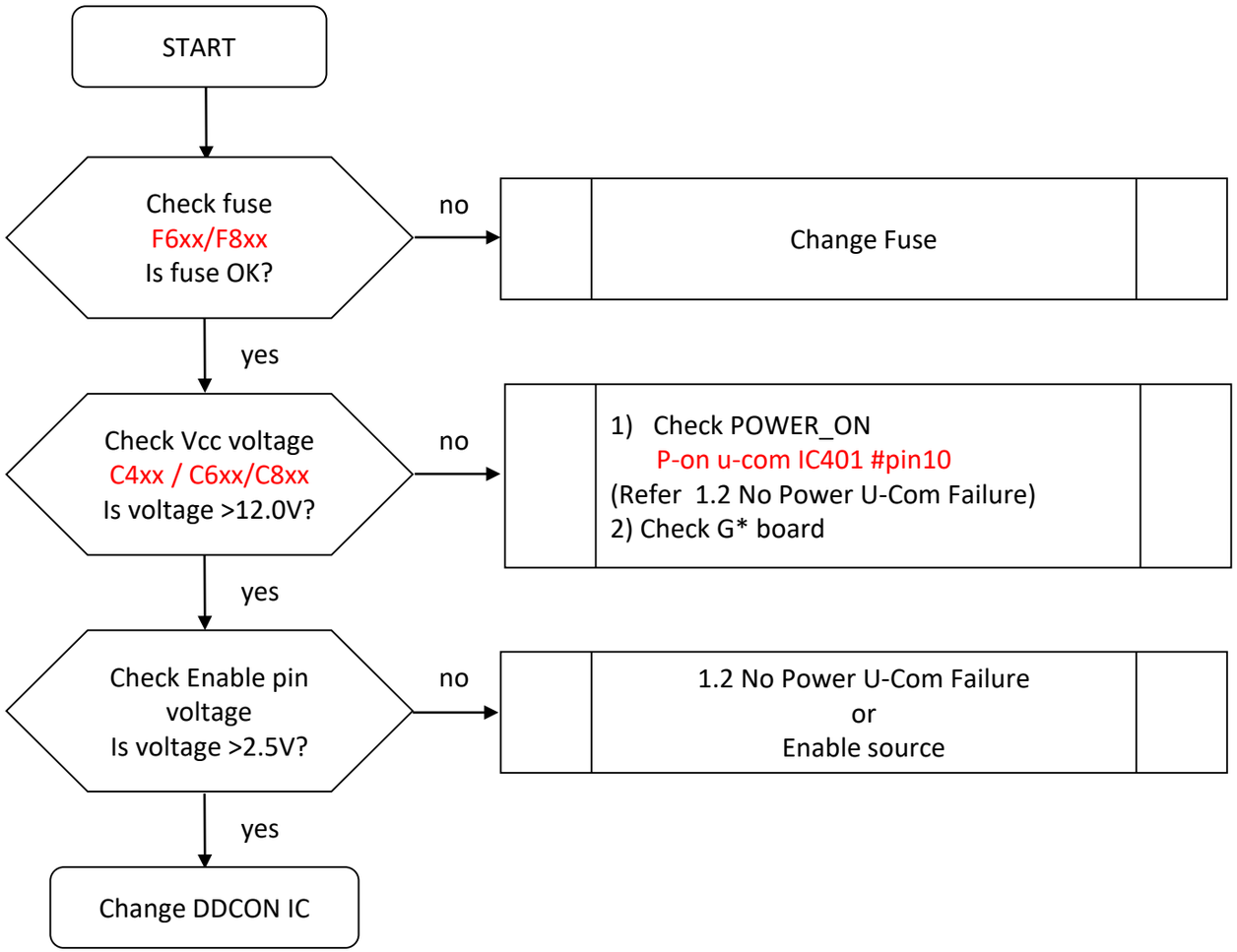
Please refer page 25 for Ref number.

Board	Operation	IC Ref	Voltage supply
BM5A	DC/DC	IC801	1.1V_M5_DDR
	DC/DC	IC802	0.9V_M5_STBY
	DC/DC	IC803	1.8V_STBY
	DC/DC	IC603	1.0V_TU_P

1.3 No Power DDCON/LDO

BM5A Board Model

DDCON check

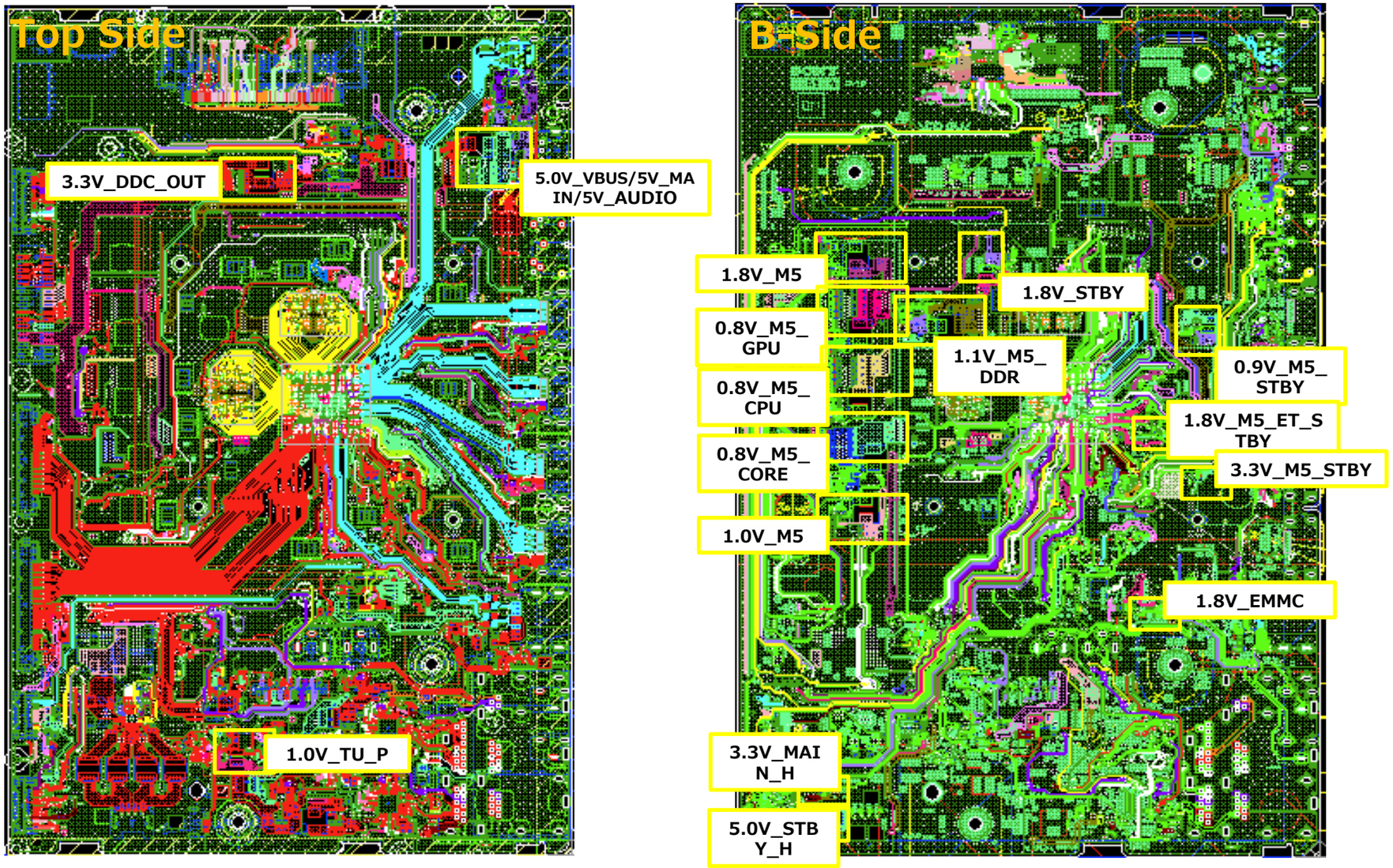


Please refer page 25 for Ref number.

Board	Operation	IC Ref	Voltage supply
BM5A	DC/DC	IC414	5.0V_STBY_H
	DC/DC	IC600	5V_MAIN/5V_AUDIO
	DC/DC	IC607	3.3V_DDC_OUT
	DC/DC	IC804	0.8V_M5_CORE
	DC/DC	IC813	1.8V_M5
	DC/DC	IC812	1.0V_M5
	DC/DC	IC810	0.8V_M5_CPU
	DC/DC	IC811	0.8V_M5_GPU

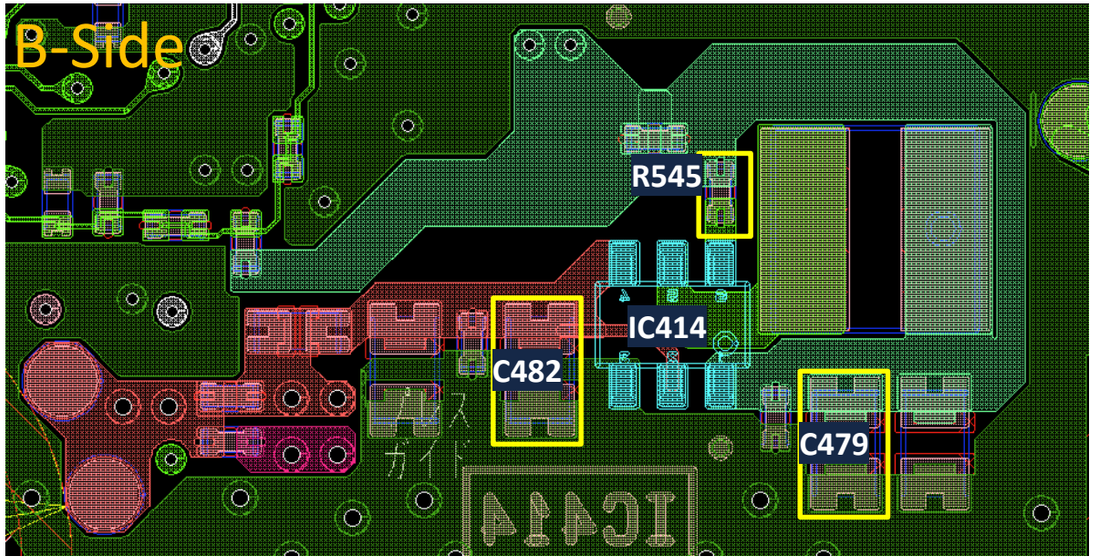
TROUBLESHOOTING

Board View (BM5A)

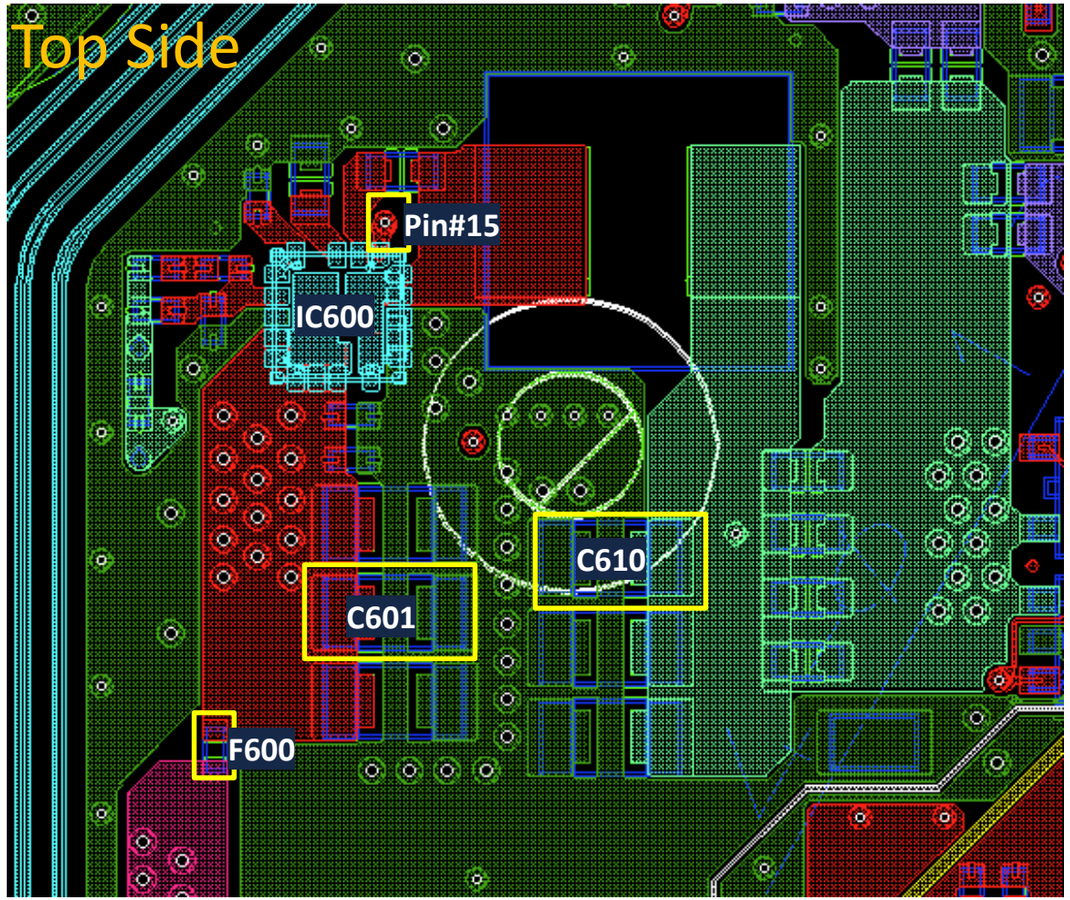


Checking Point (BM5A)

5.0V_STBY_H

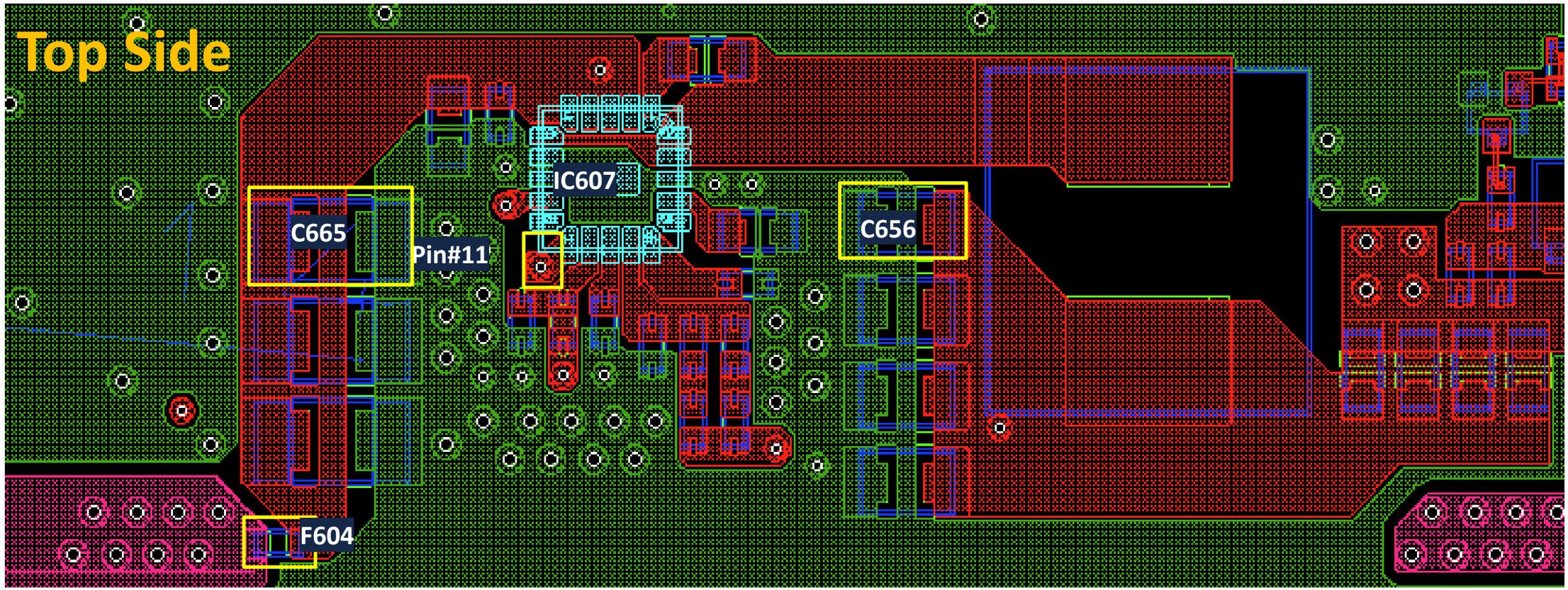


5.0V_VBUS/5V_MAIN/5V_AUDIO



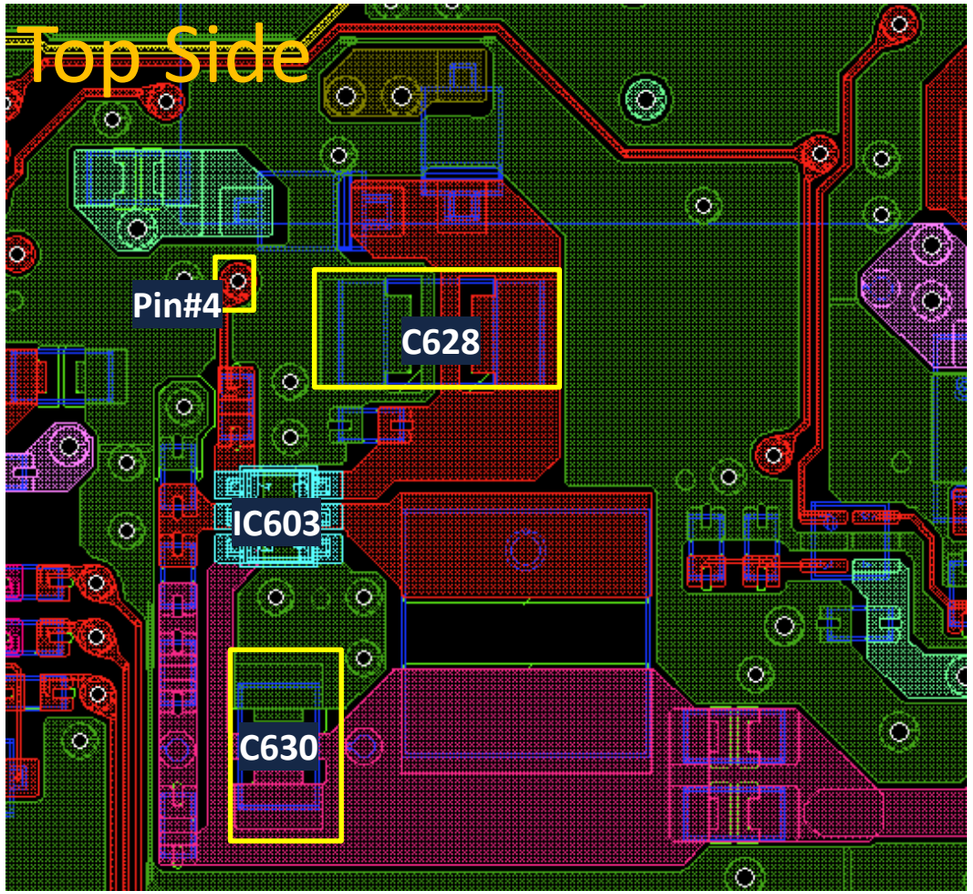
Checking Point (BM5A)

3.3V_DDC_OUT

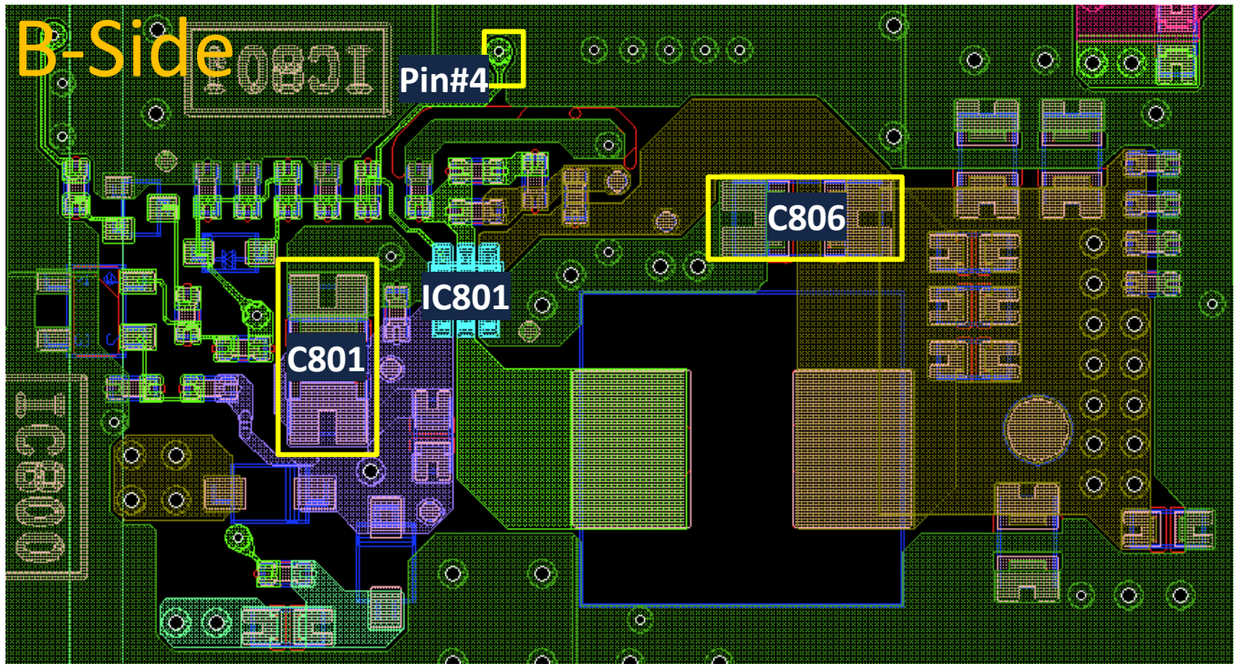


Checking Point (BM5A)

1.0V_TU_P

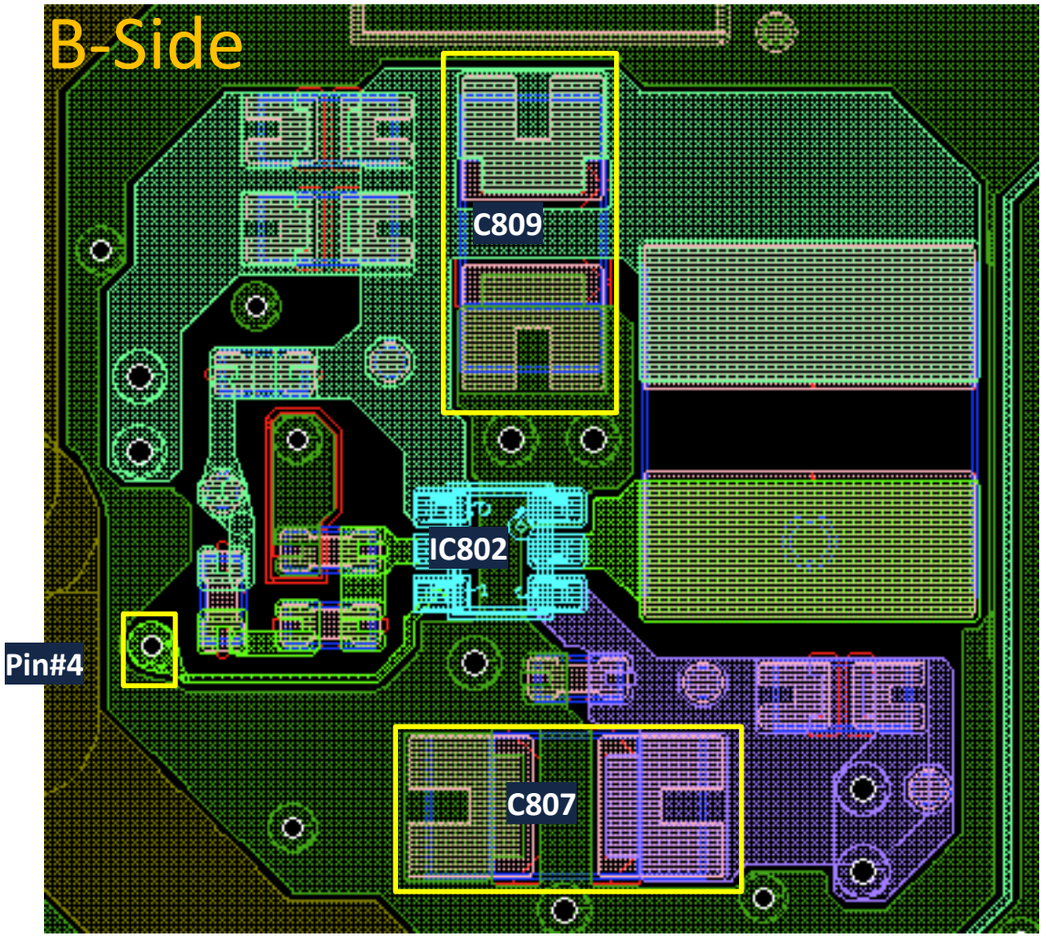


1.1V_M5_DDR

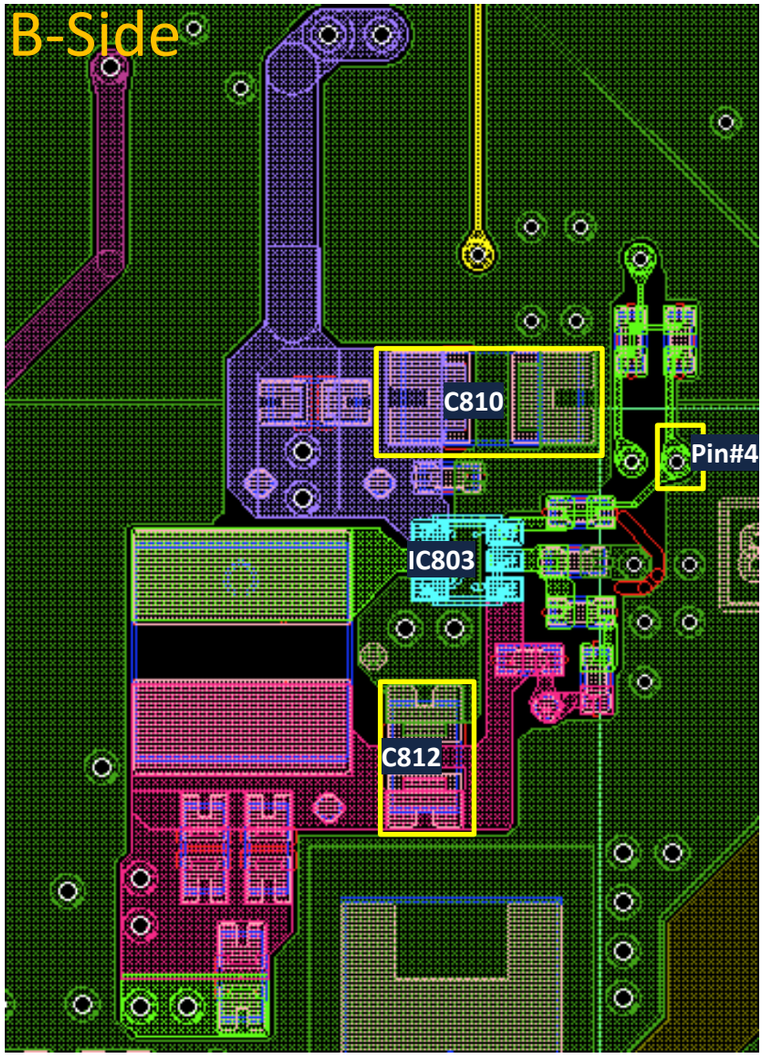


Checking Point (BM5A)

0.9V_M5_STBY

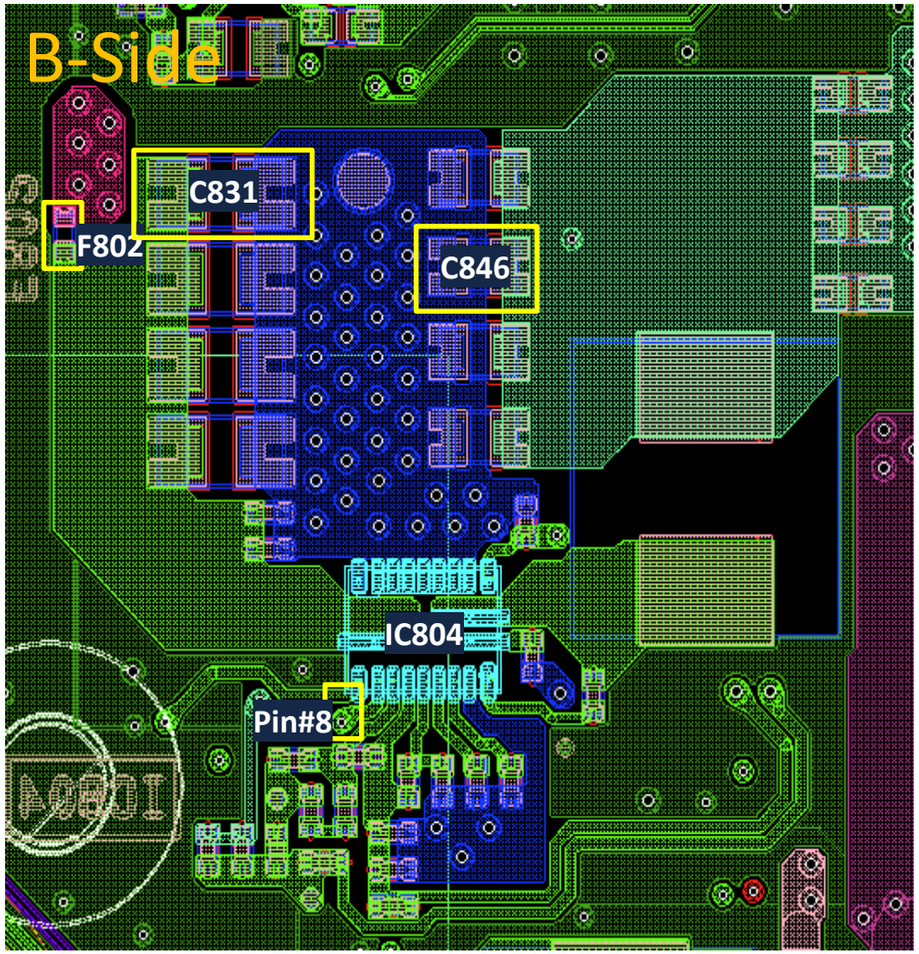


1.1V_M5_DDR

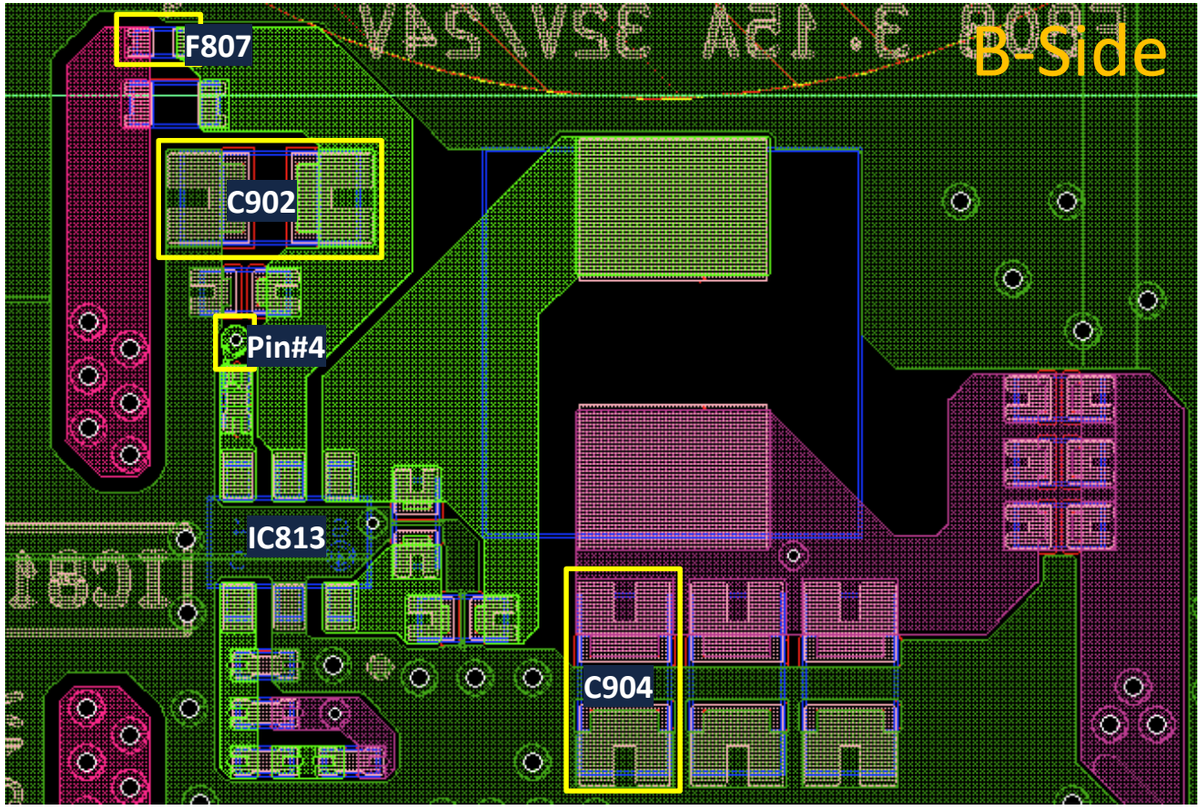


Checking Point (BM5A)

0.8V_M5_CORE

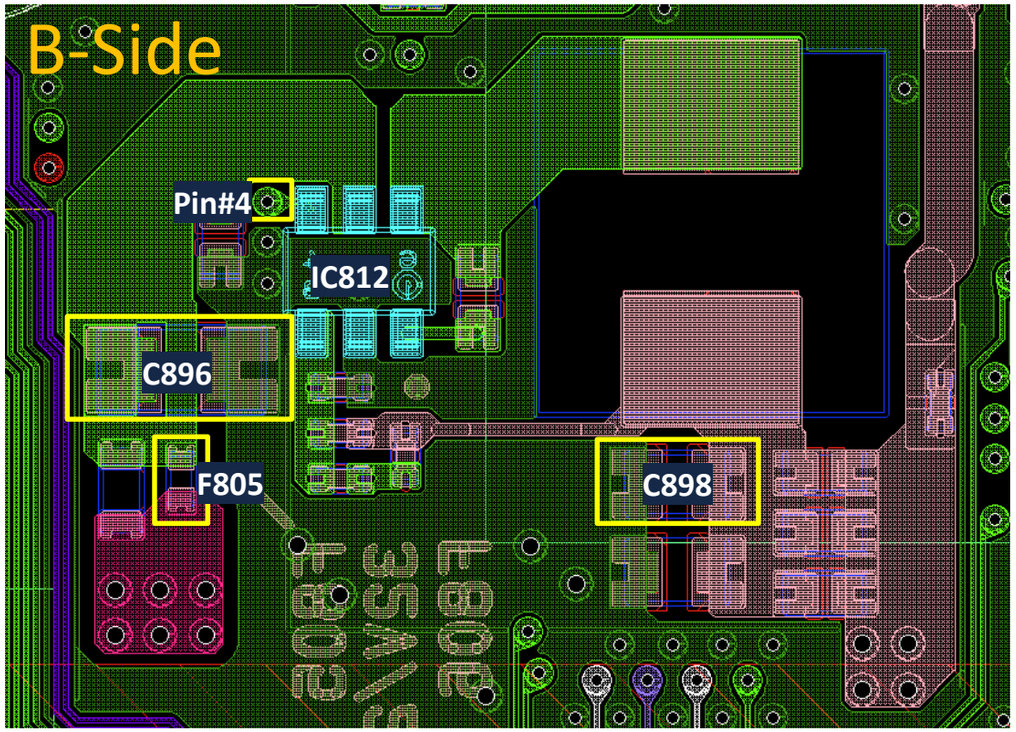


1.8V_M5

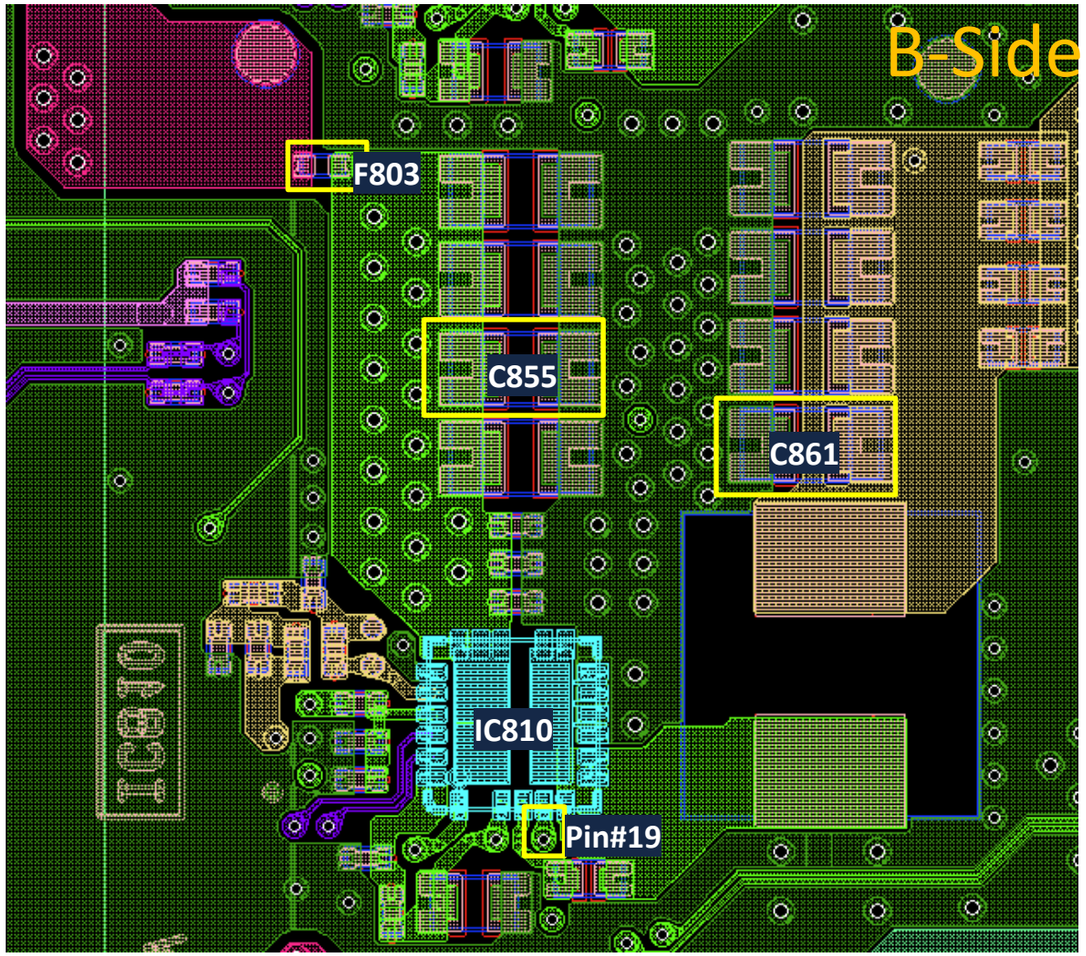


Checking Point (BM5A)

1.0V_M5

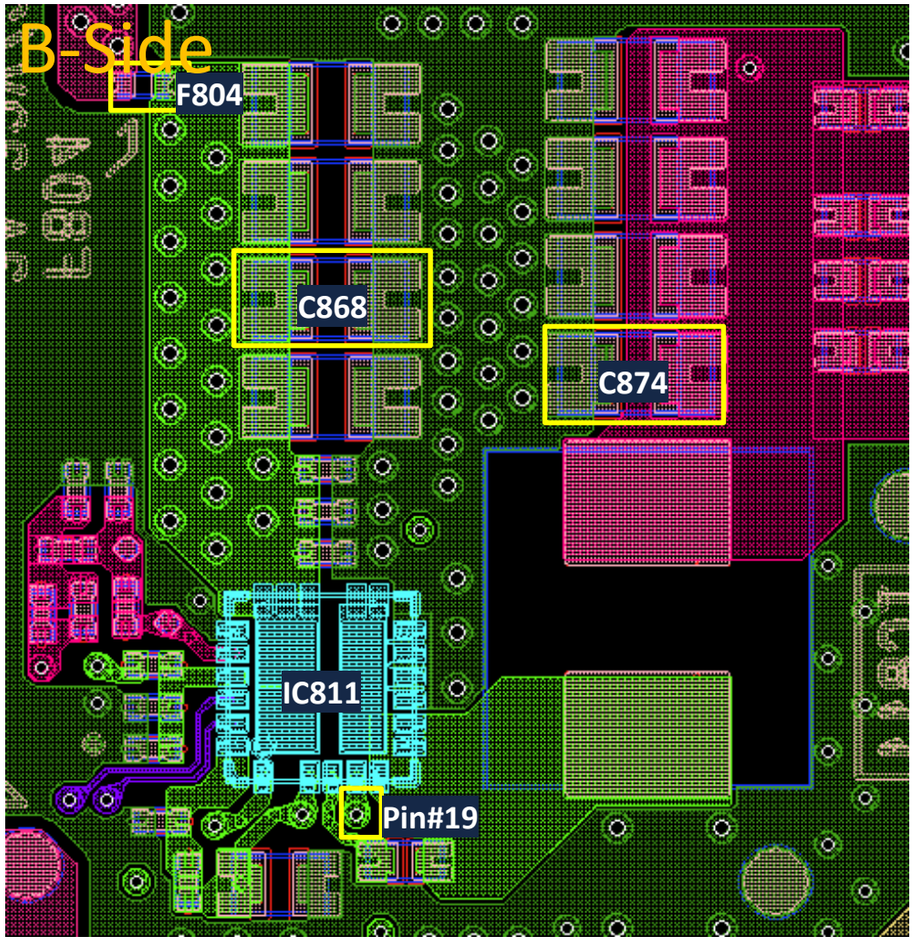


0.8V_M5_CPU



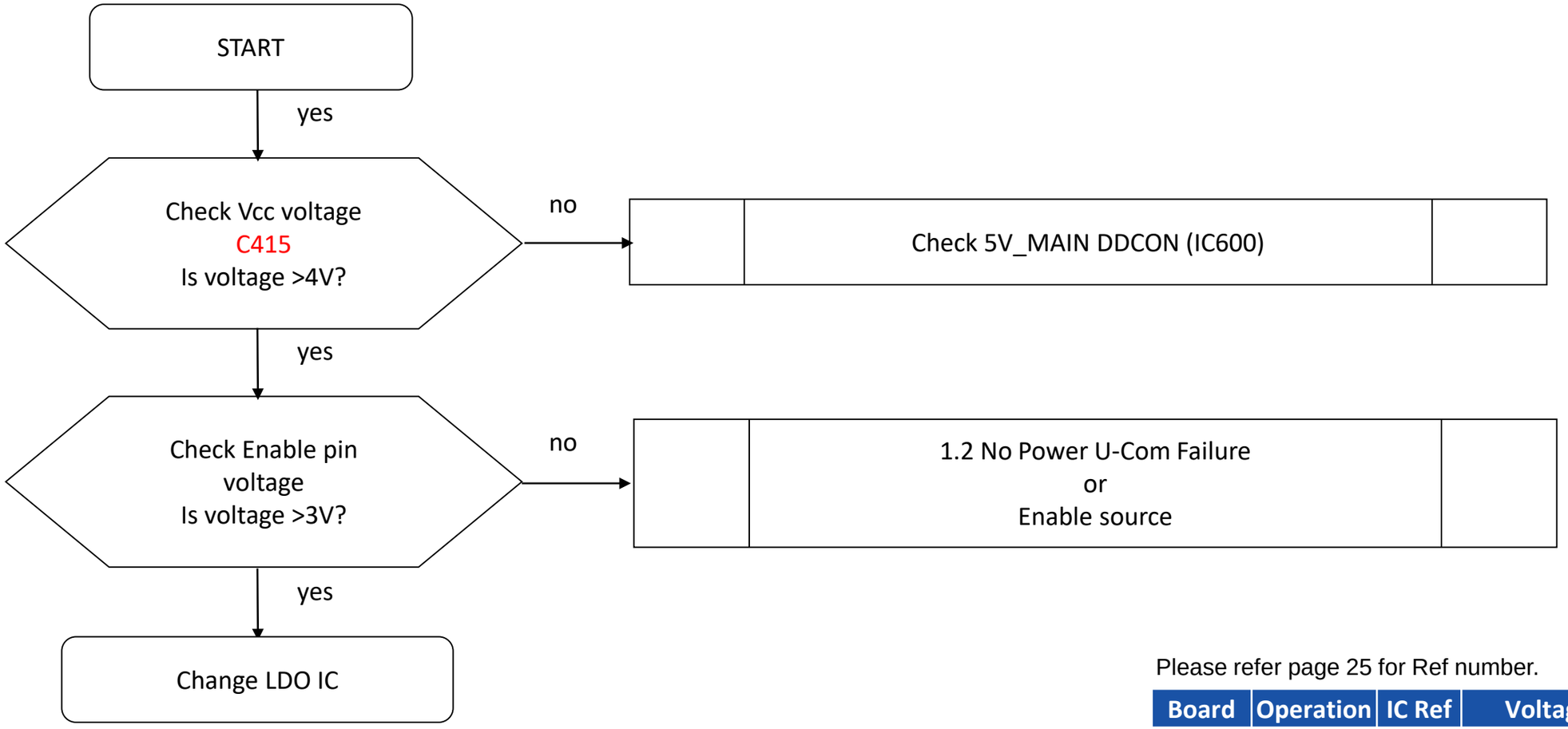
Checking Point (BM5A)

0.8V_M5_GPU



1.3 No Power DDCON/LDO

BM5A Board Model **LDO check**

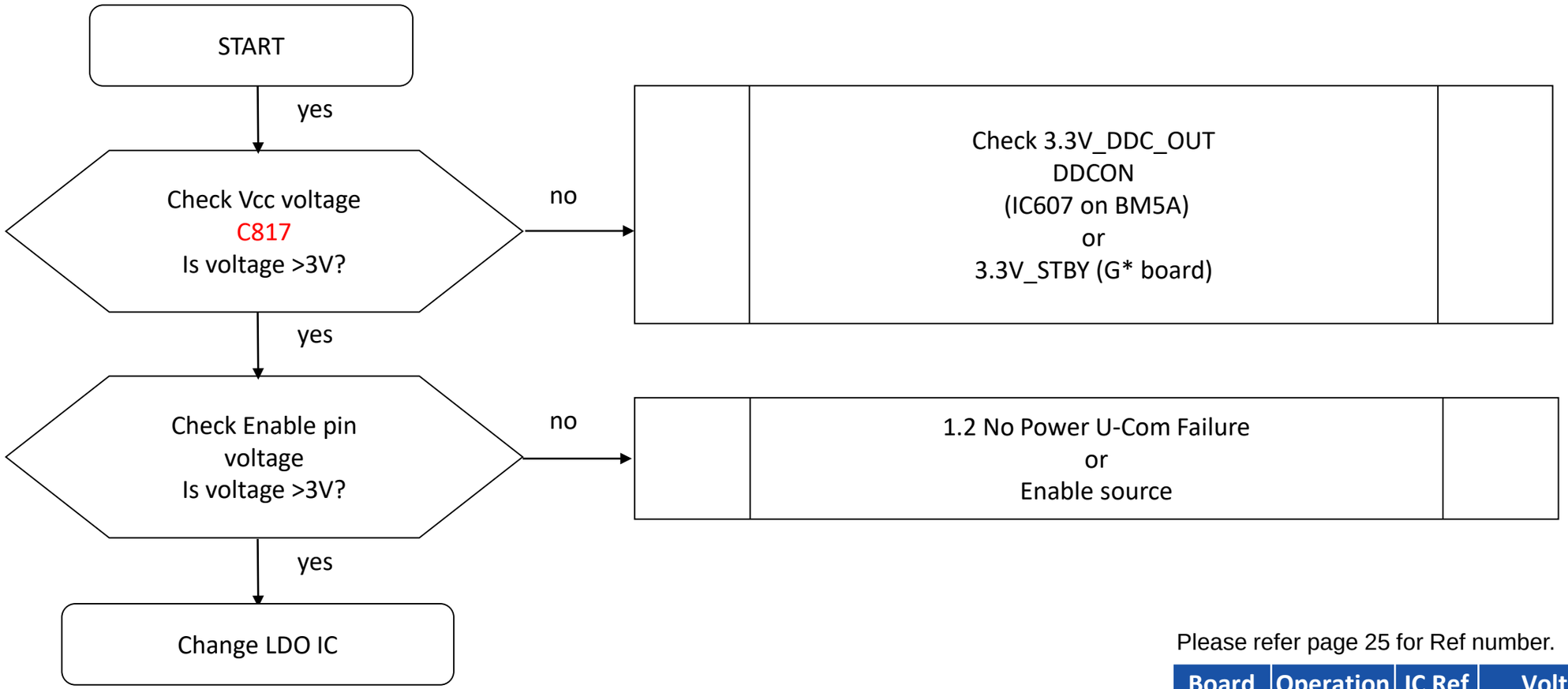


Please refer page 25 for Ref number.

Board	Operation	IC Ref	Voltage supply
BM5A	LDO	IC403	3.3V_MAIN_H

1.3 No Power DDCON/LDO

BM5A Board Model **LDO check**



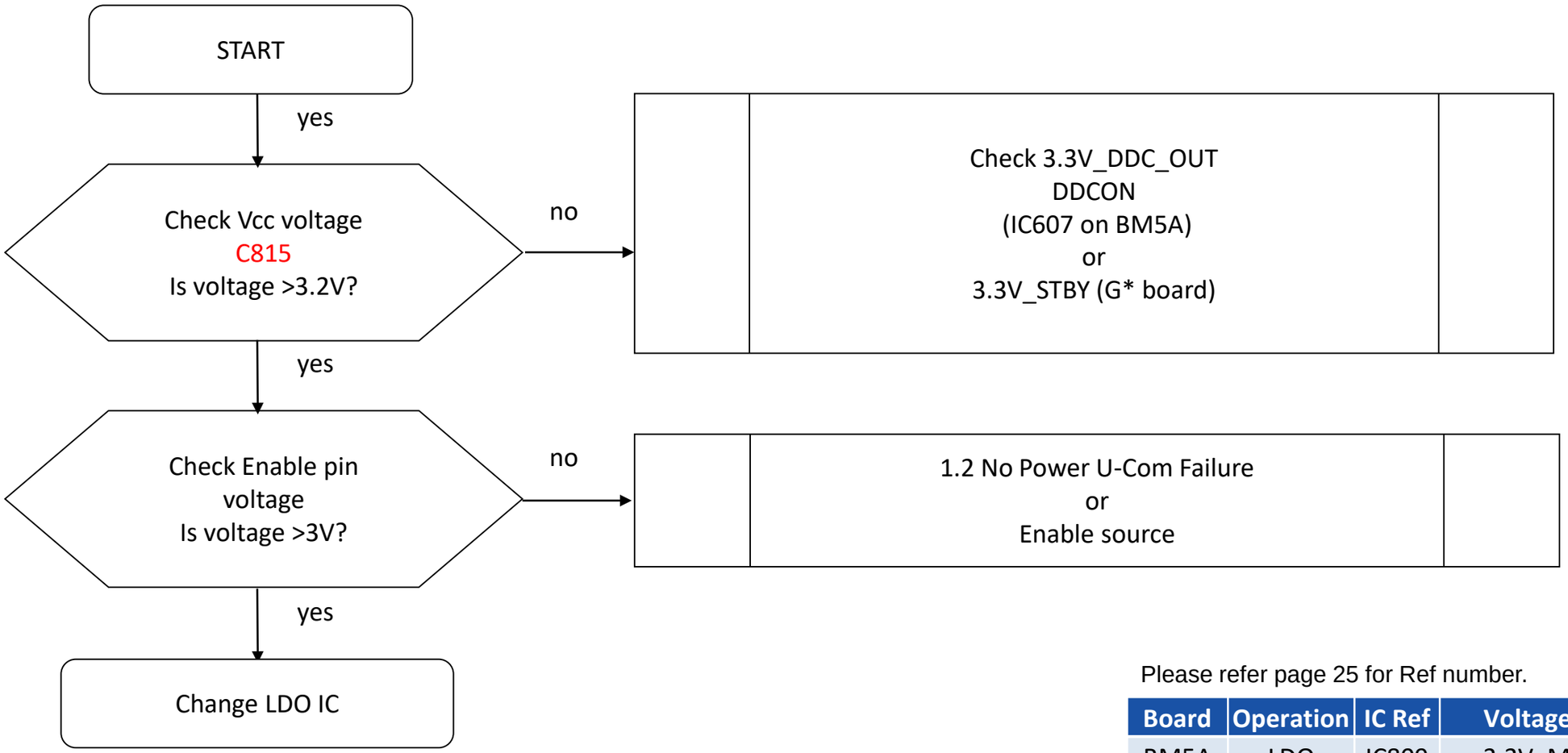
Please refer page 25 for Ref number.

Board	Operation	IC Ref	Voltage supply
BM5A	LDO	IC806	1.8V_M5_ET_STBY

1.3 No Power DDCON/LDO

BM5A Board Model

LDO check

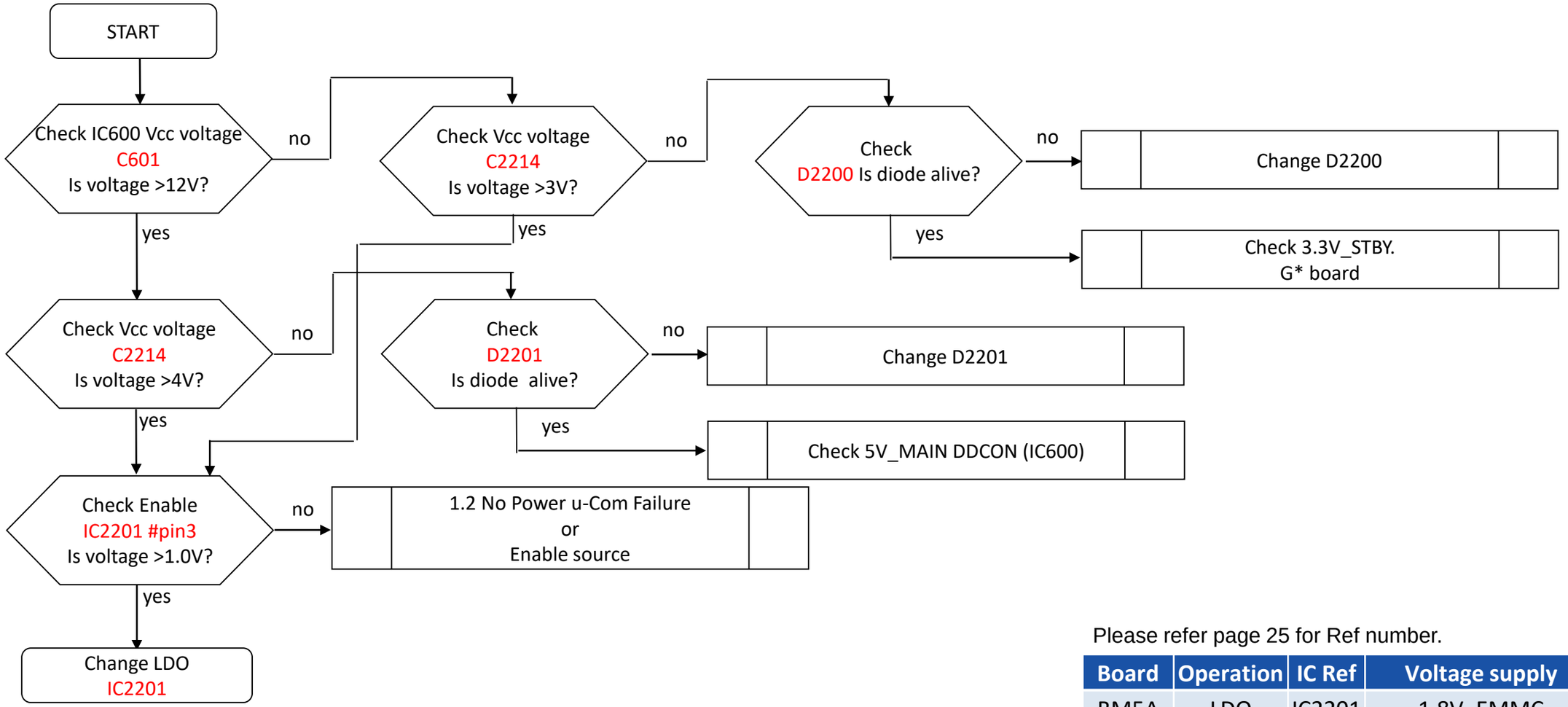


Please refer page 25 for Ref number.

Board	Operation	IC Ref	Voltage supply
BM5A	LDO	IC809	3.3V_M5_STBY

1.3 No Power DDCON/LDO

BM5A Board Model **LDO check**



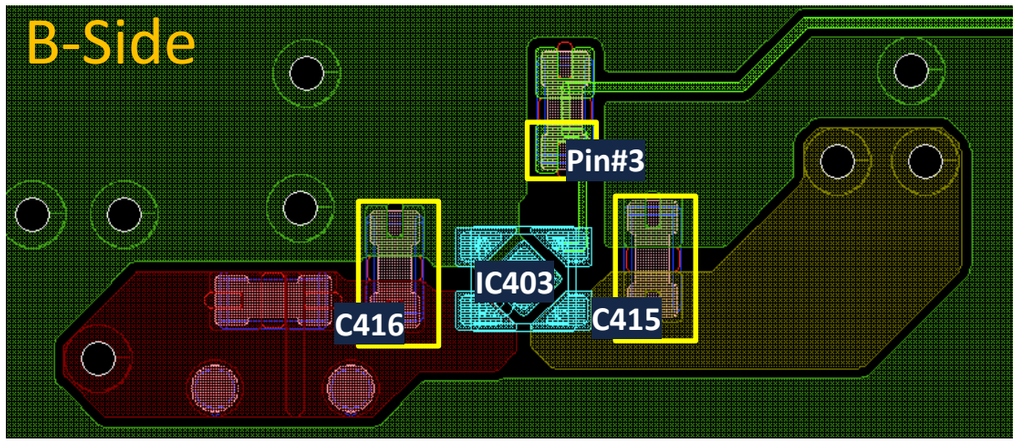
Please refer page 25 for Ref number.

Board	Operation	IC Ref	Voltage supply
BM5A	LDO	IC2201	1.8V_EMMC

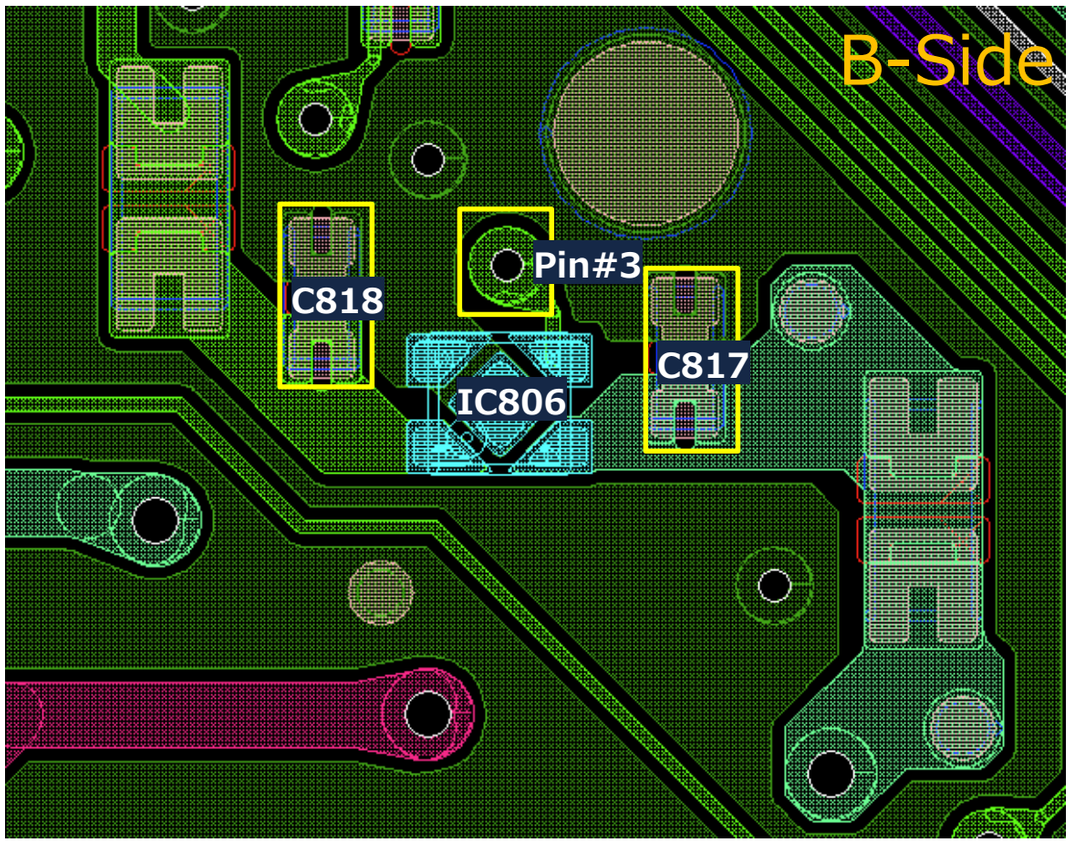
1.3 No Power DDCON/LDO

BM5A Board Model	LDO check

3.3V_MAIN_H



1.8V_M5_ET_STBY

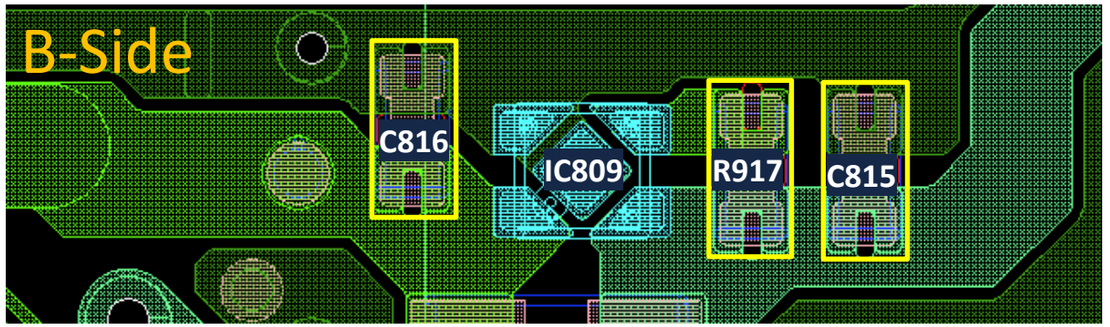


1.3 No Power DDCON/LDO

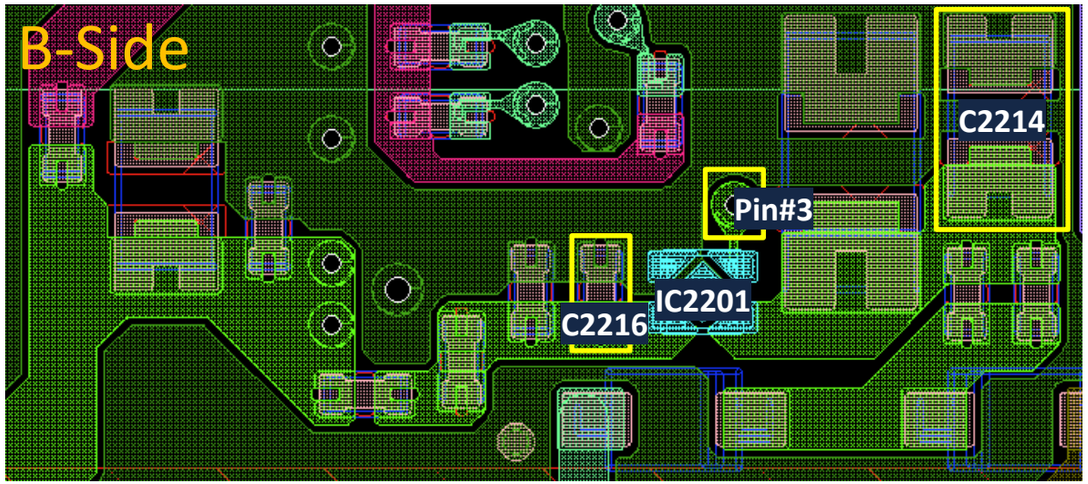
BM5A Board Model

LDO check

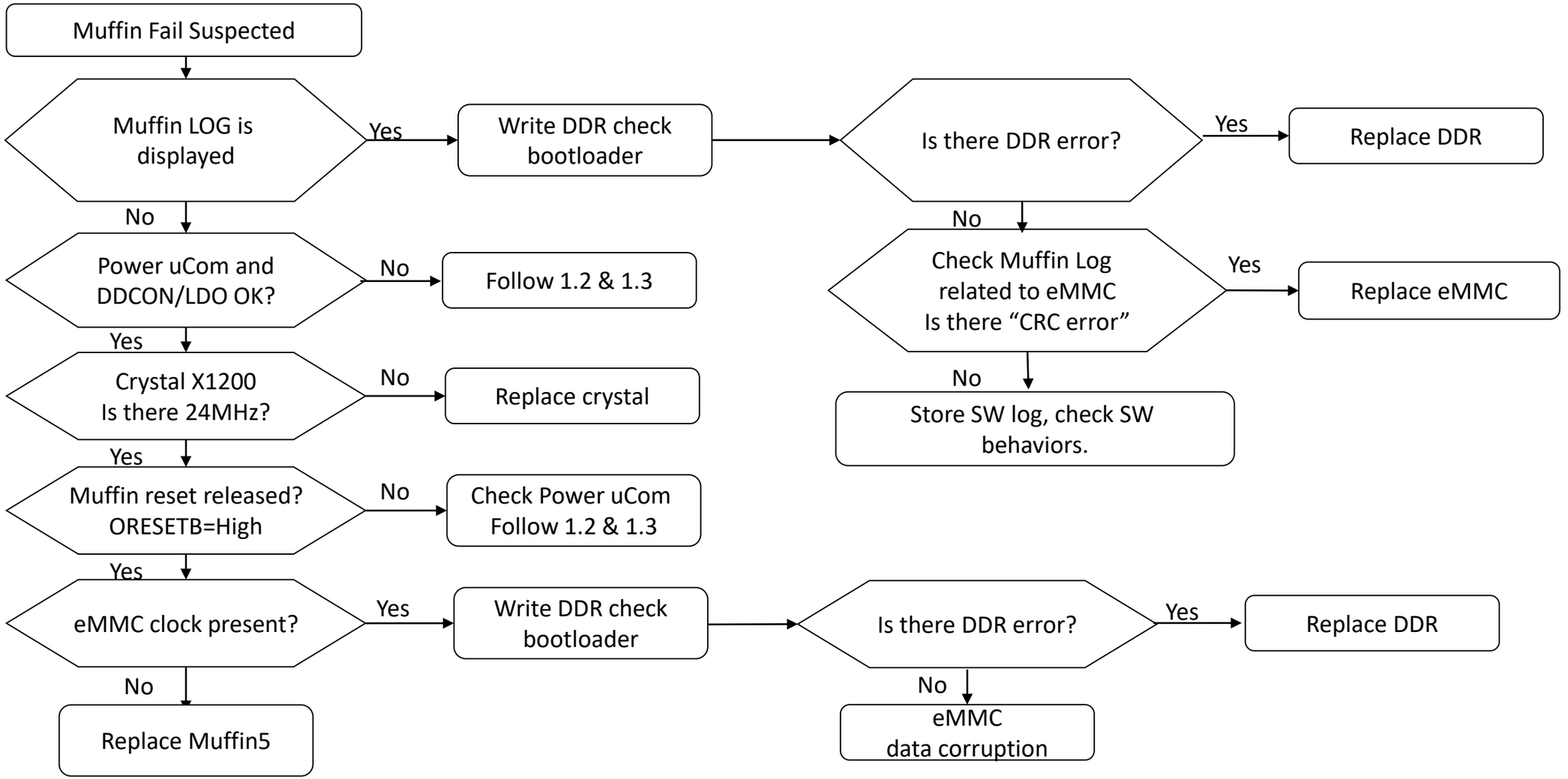
3.3V_M5_STBY



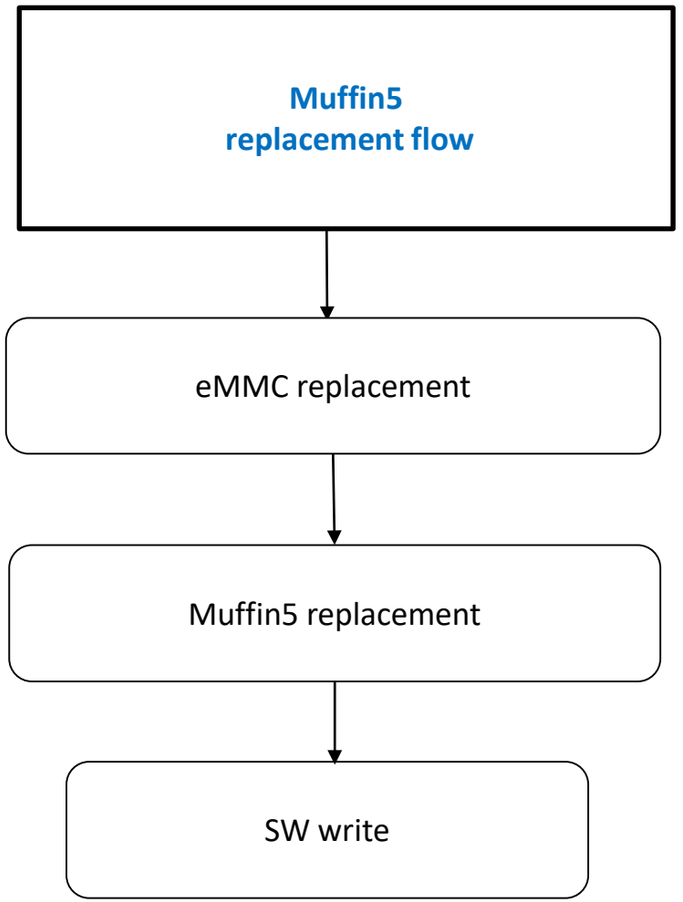
1.8V_EMMC



1.4 NO POWER – Muffin5 Failure



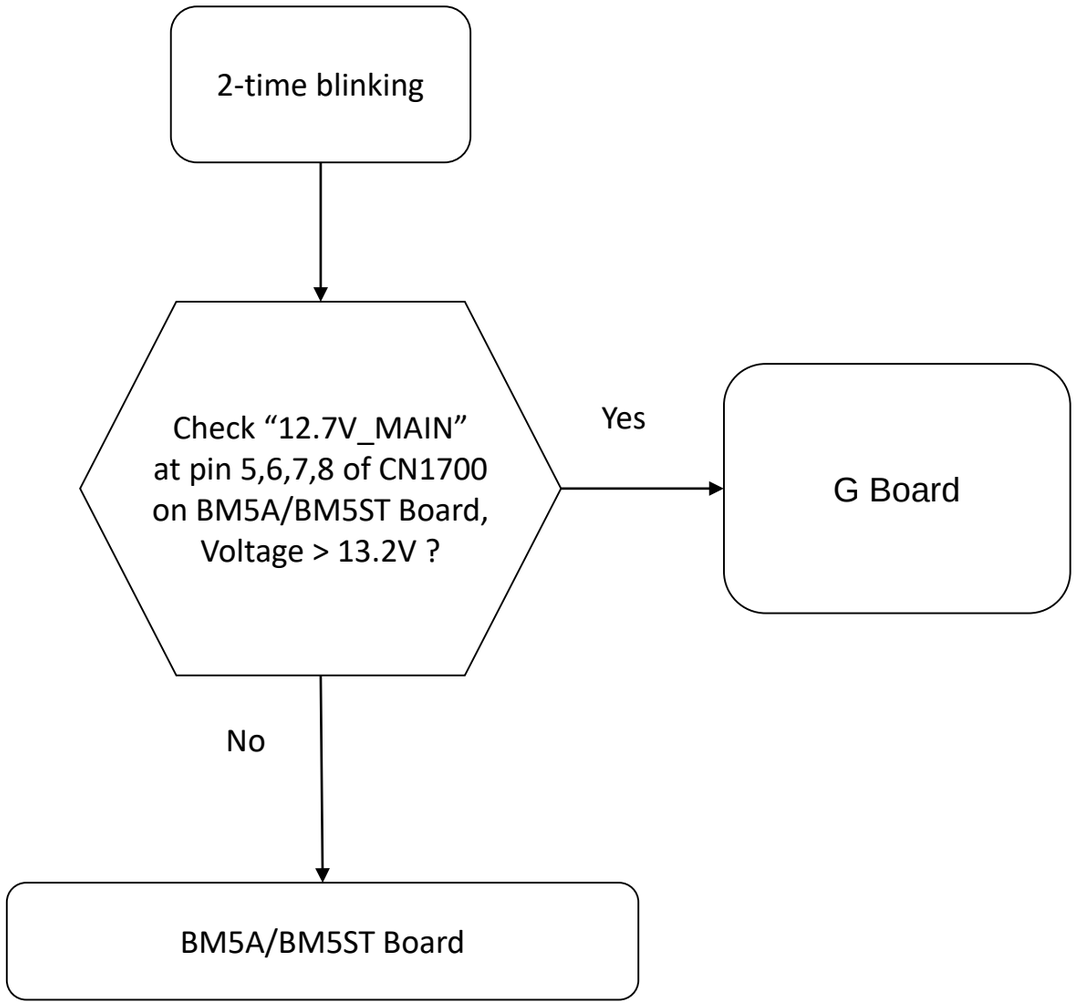
1.5 No Power – Muffin5 Replacement



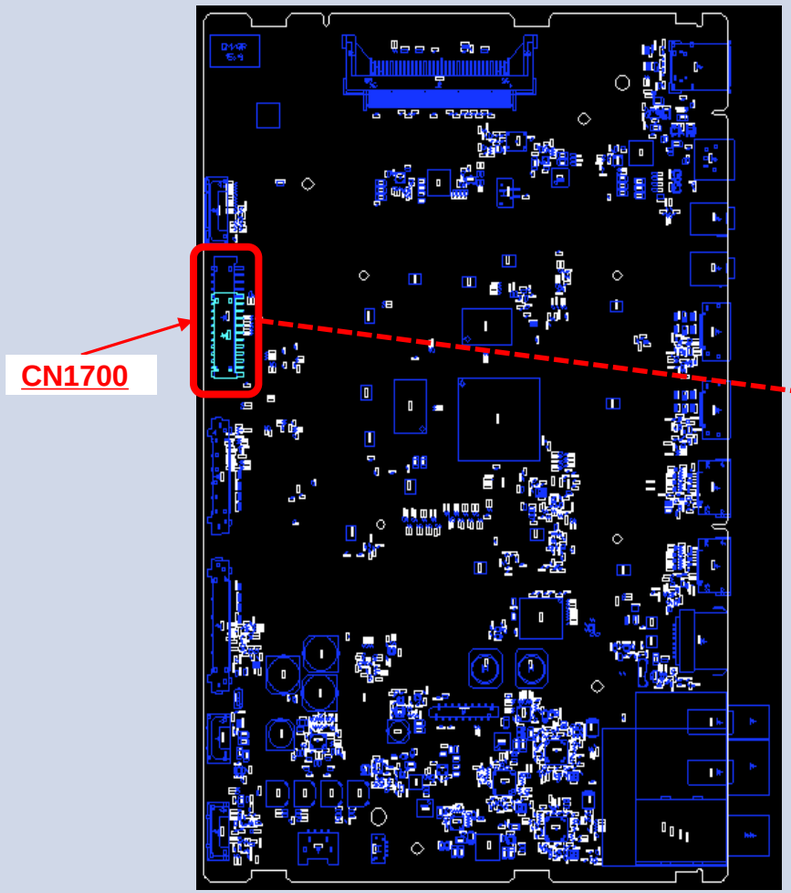
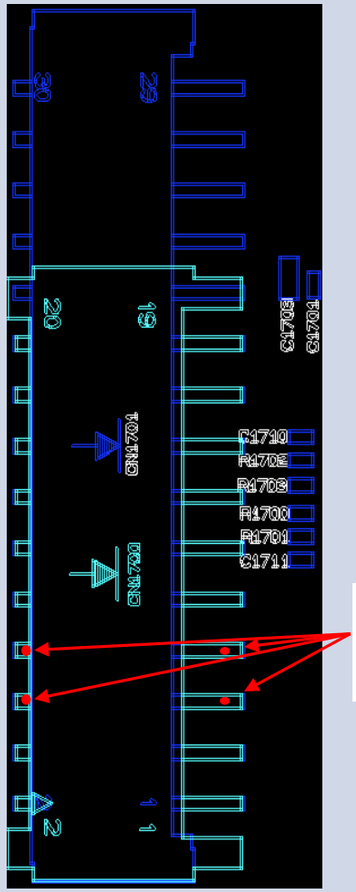
eMMC need to be replaced when changing Muffin5.

2.0 LED Blinking: 2x (Main power Error)

BM5A/BM5ST



Check point for BM5A

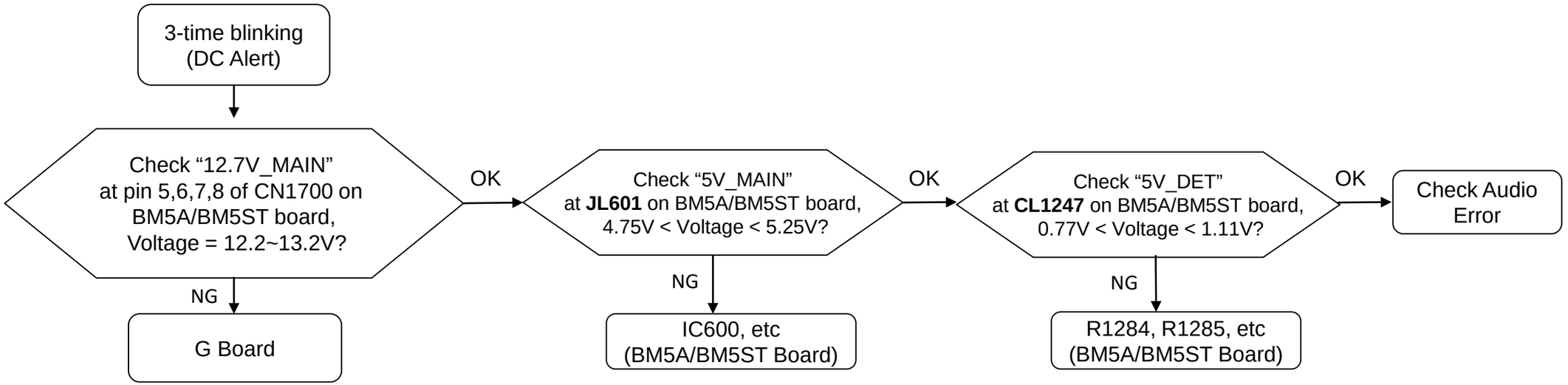
Board PWB (A side)	Detail
	

2.1 Detail of 3x LED Blinking

	Error Item	Number of STBY LED flashing	Description
Valhalla2	DC_ALERT	3	Main board 5V power rail monitoring
	AUD_ERR	3	Audio amp error detection

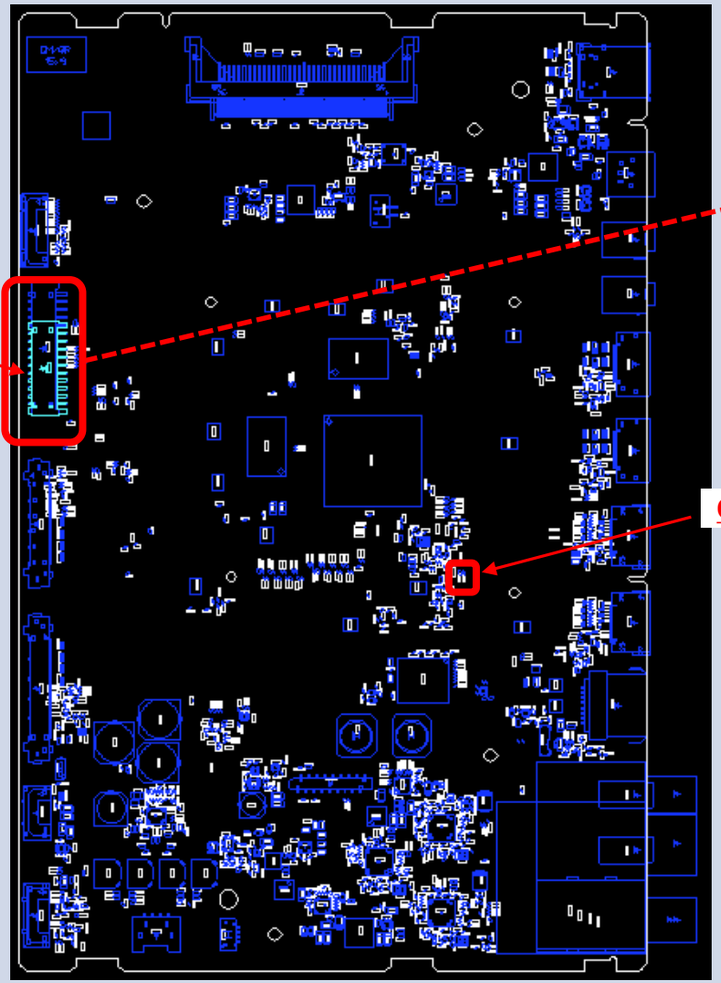
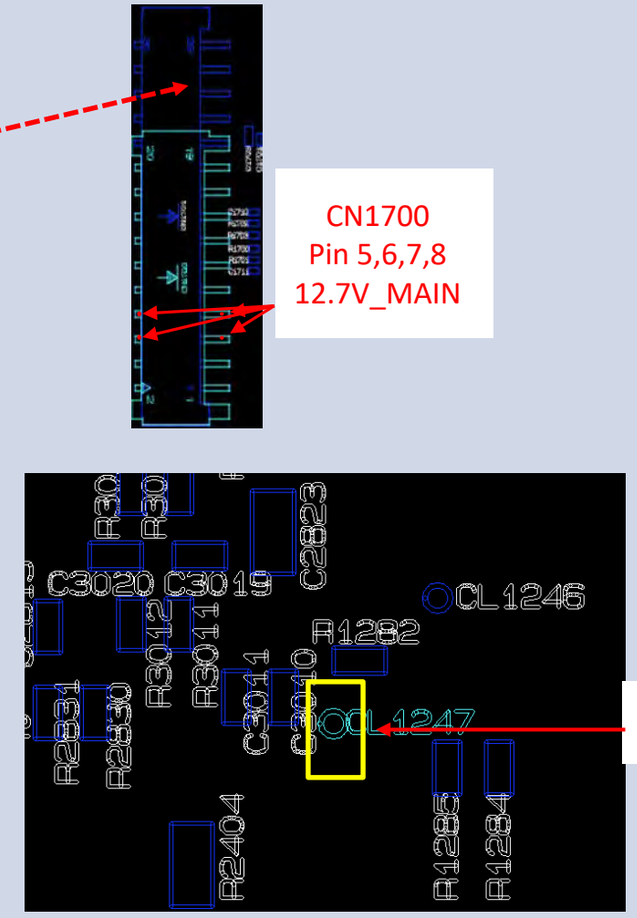
2.1 Detail of 3x LED Blinking

BM5A/ BM5ST



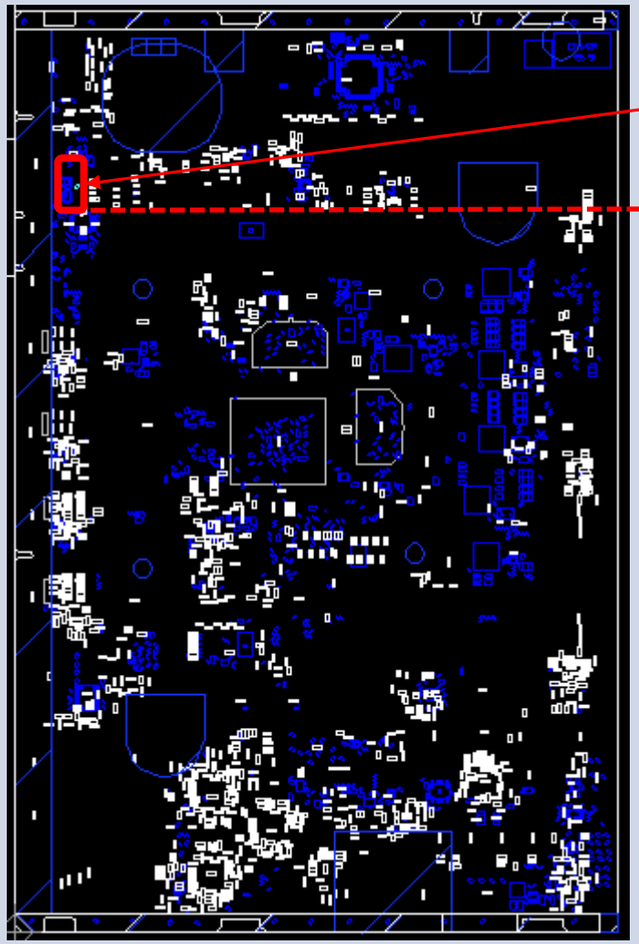
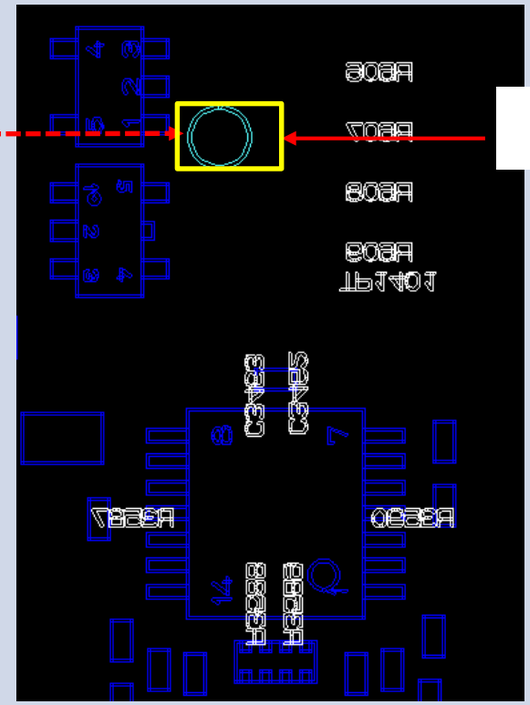
TROUBLESHOOTING

Check point for BM5A/BM5ST

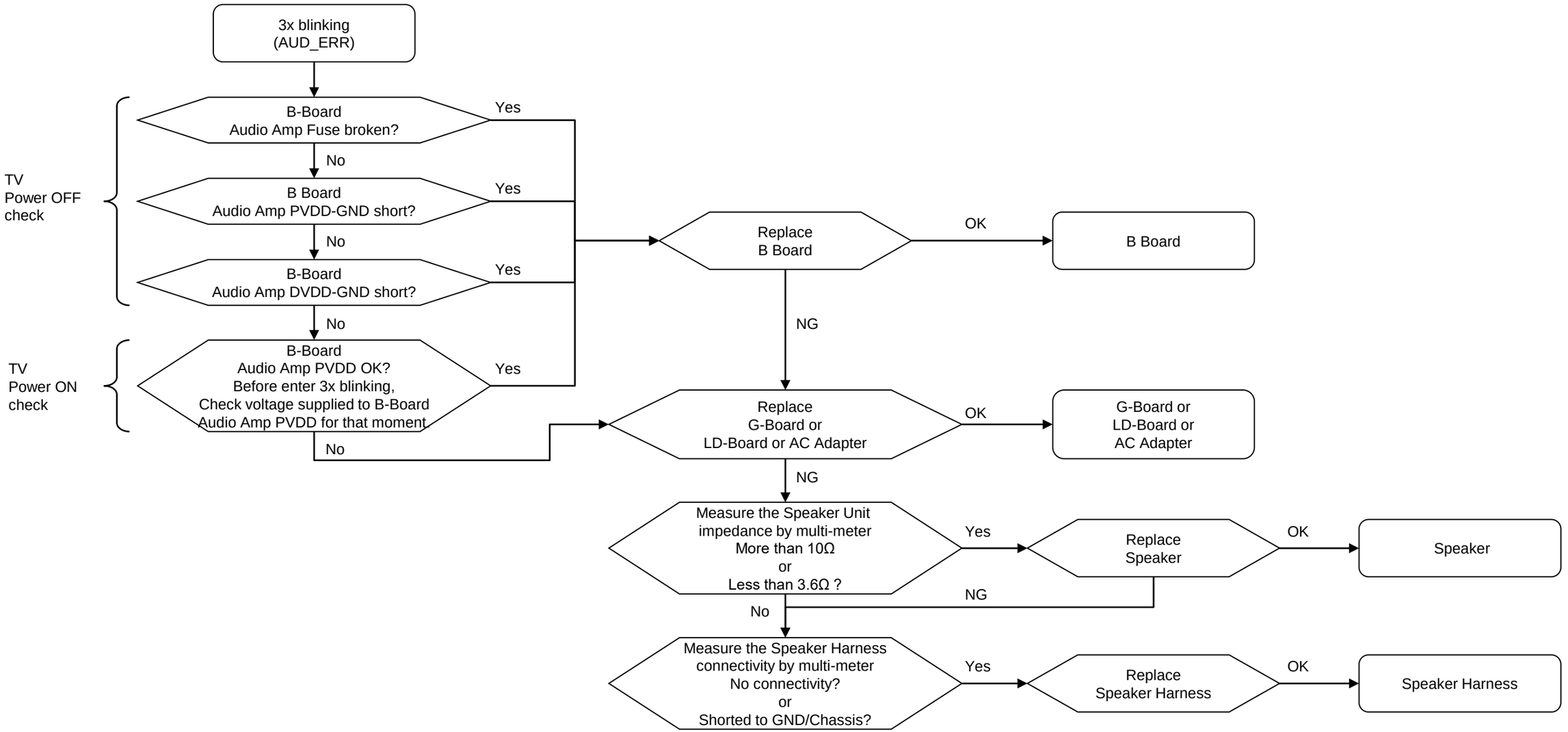
Board PWB (A side)	Detail
	

TROUBLESHOOTING

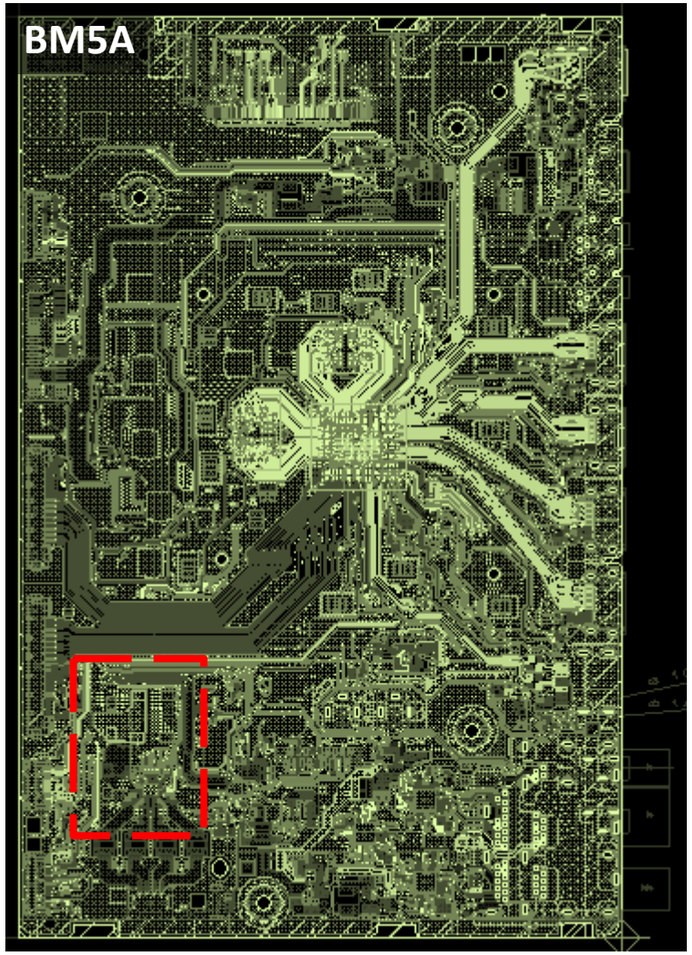
Check point for BM5A/BM5ST

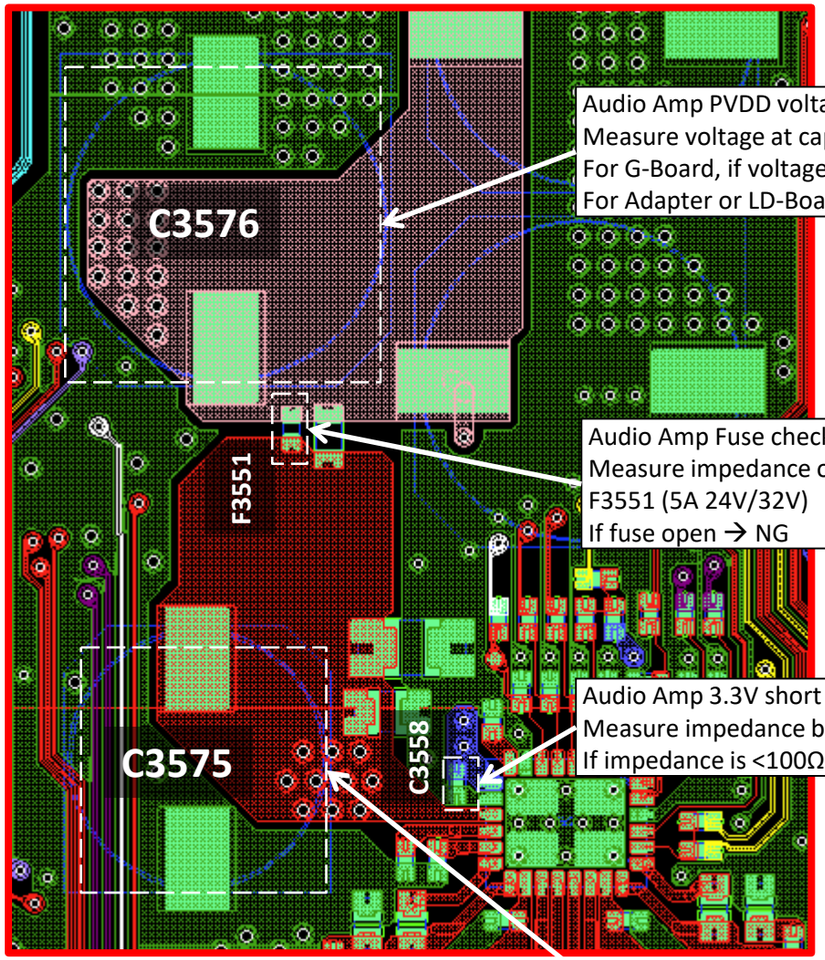
Board PWB (A side)	Detail
	

2.2 LED Blinking: 3x (AUD_ERR)



2.2 LED Blinking: 3x (AUD_ERR) – BM5A B-Board





Audio Amp PVDD voltage check
Measure voltage at capacitor C3576 before 3x blinking.
For G-Board, if voltage is <12.7V → NG
For Adapter or LD-Board, if voltage is <19.5V → NG

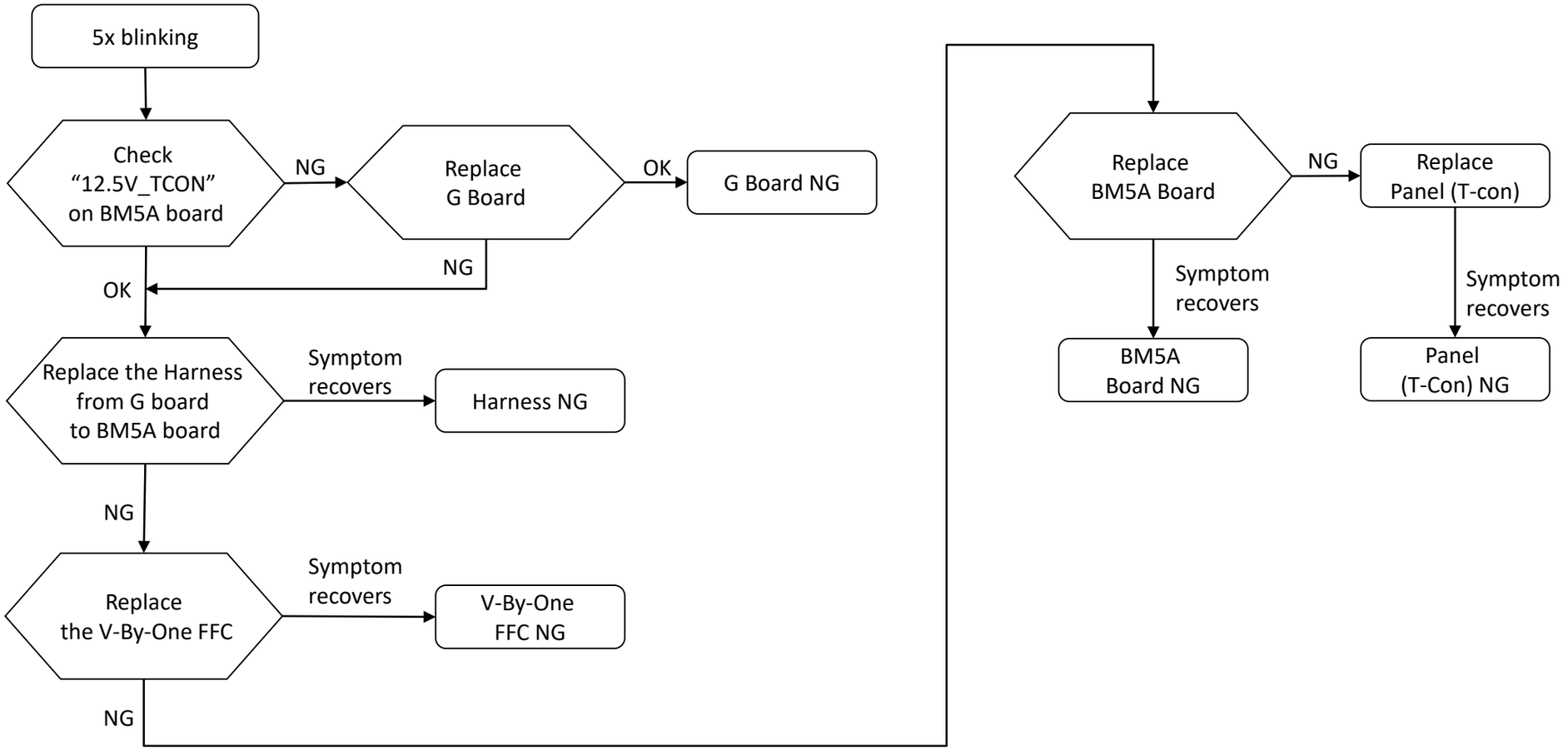
Audio Amp Fuse check
Measure impedance of fuse at F3551.
F3551 (5A 24V/32V)
If fuse open → NG

Audio Amp 3.3V short check
Measure impedance between 3.3V and GND at C3558.
If impedance is <100Ω → NG

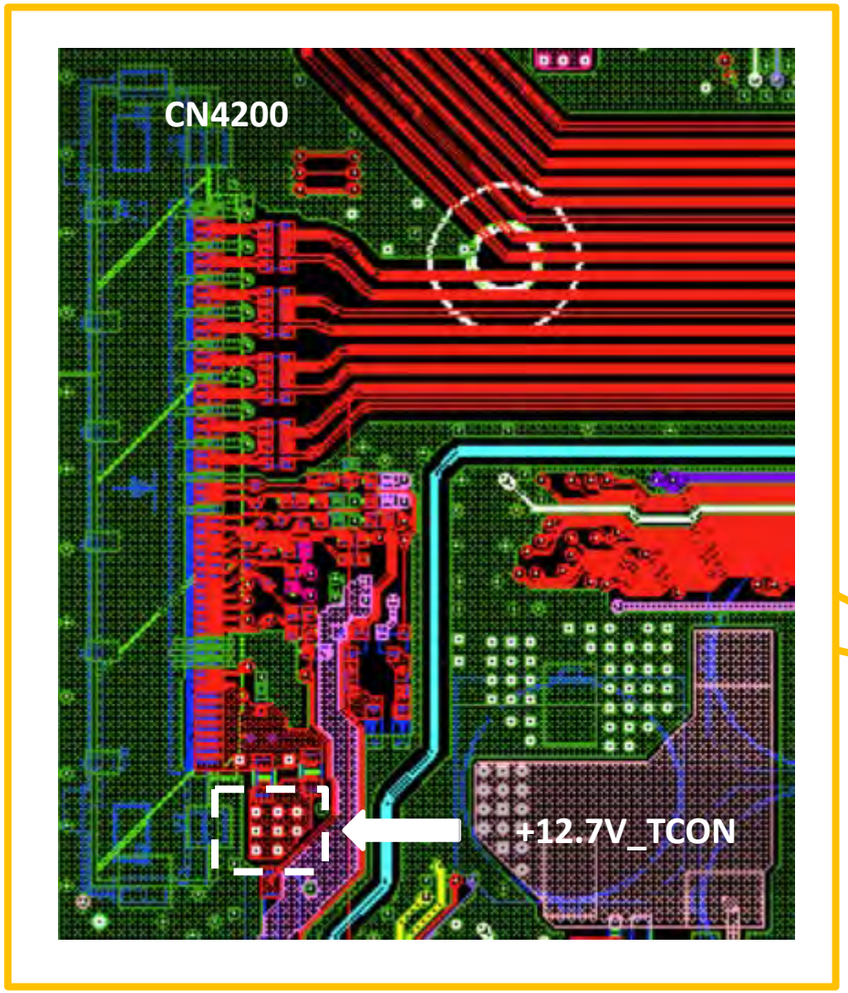
Audio Amp PVDD short check
Measure impedance between VDD and GND at capacitor C3575.
If impedance is <100Ω → NG

2.5 LED Blinking: 5x Panel ID Read Error

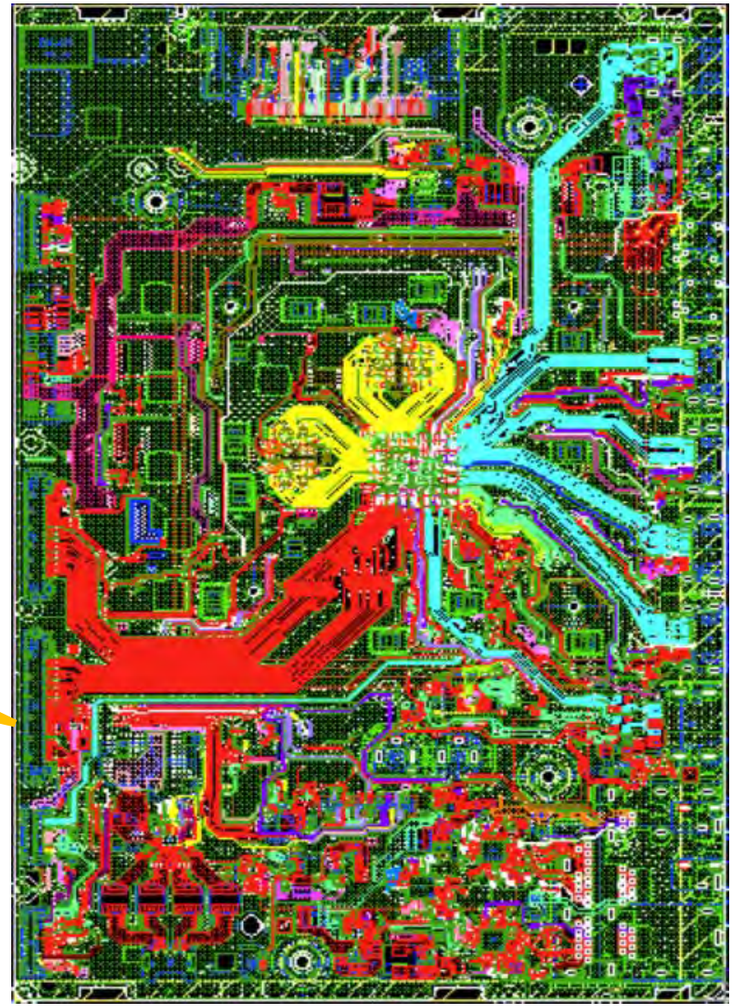
BM5 Board LCD Model



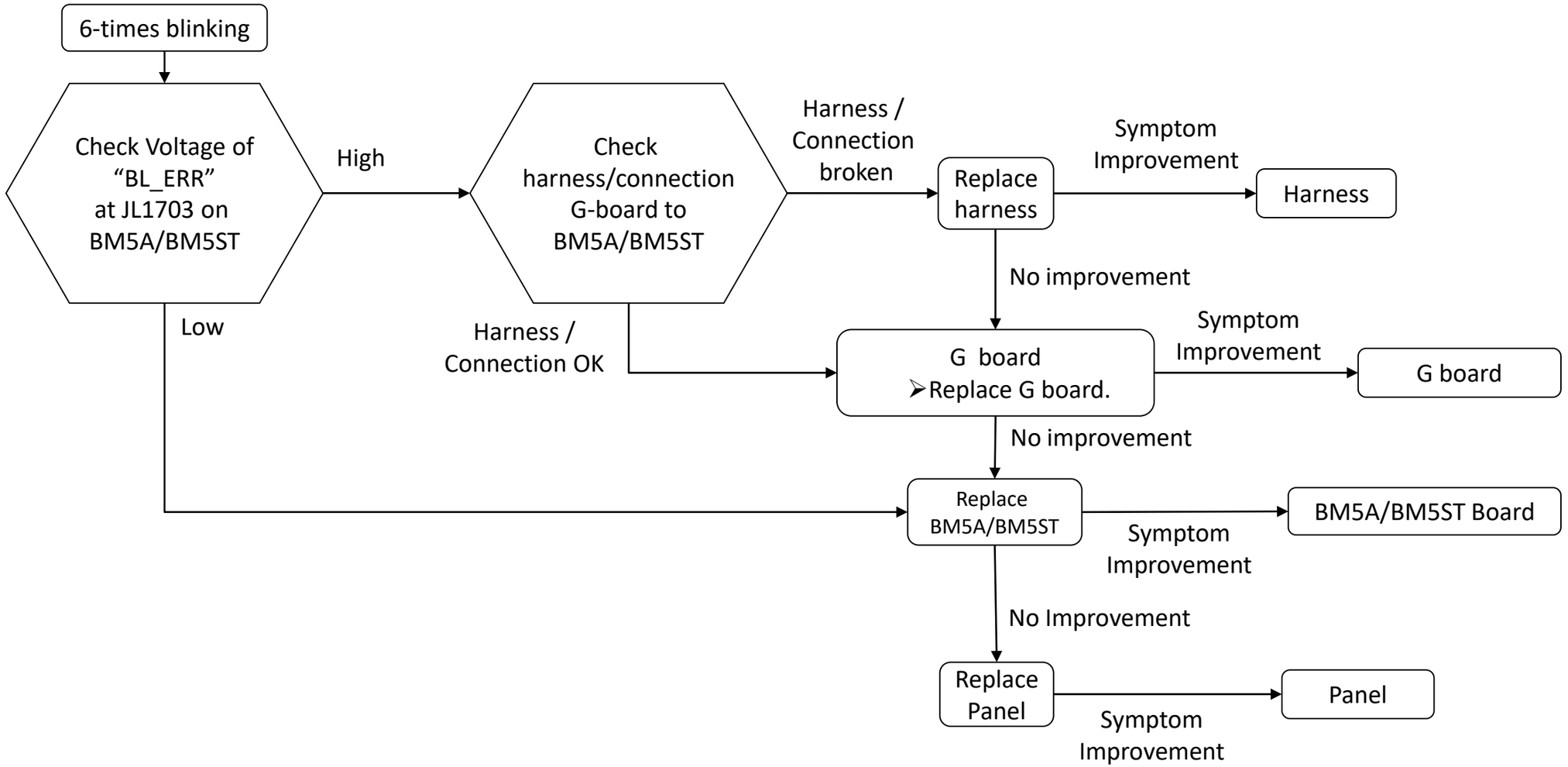
BM5A PWB Layout



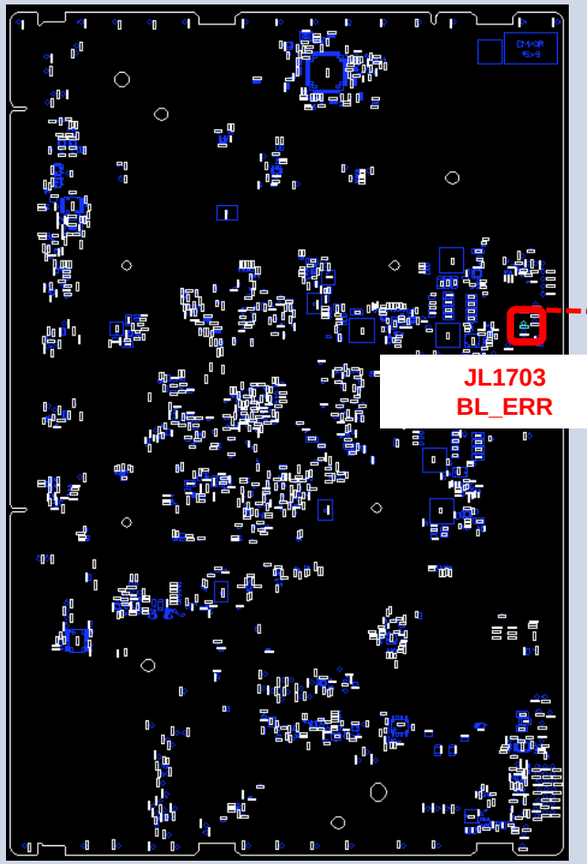
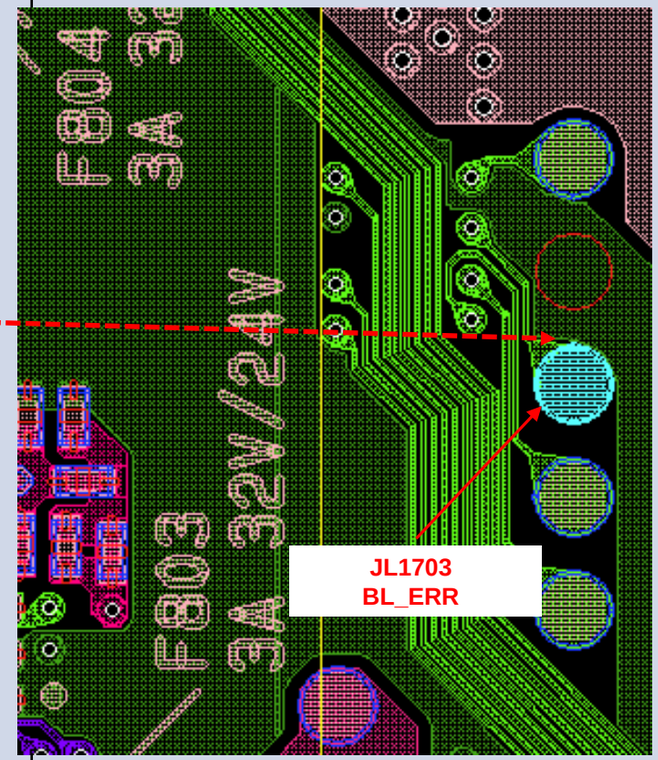
BM5A Full Layout



2.6 LED Blinking: 6x (Backlight Error)

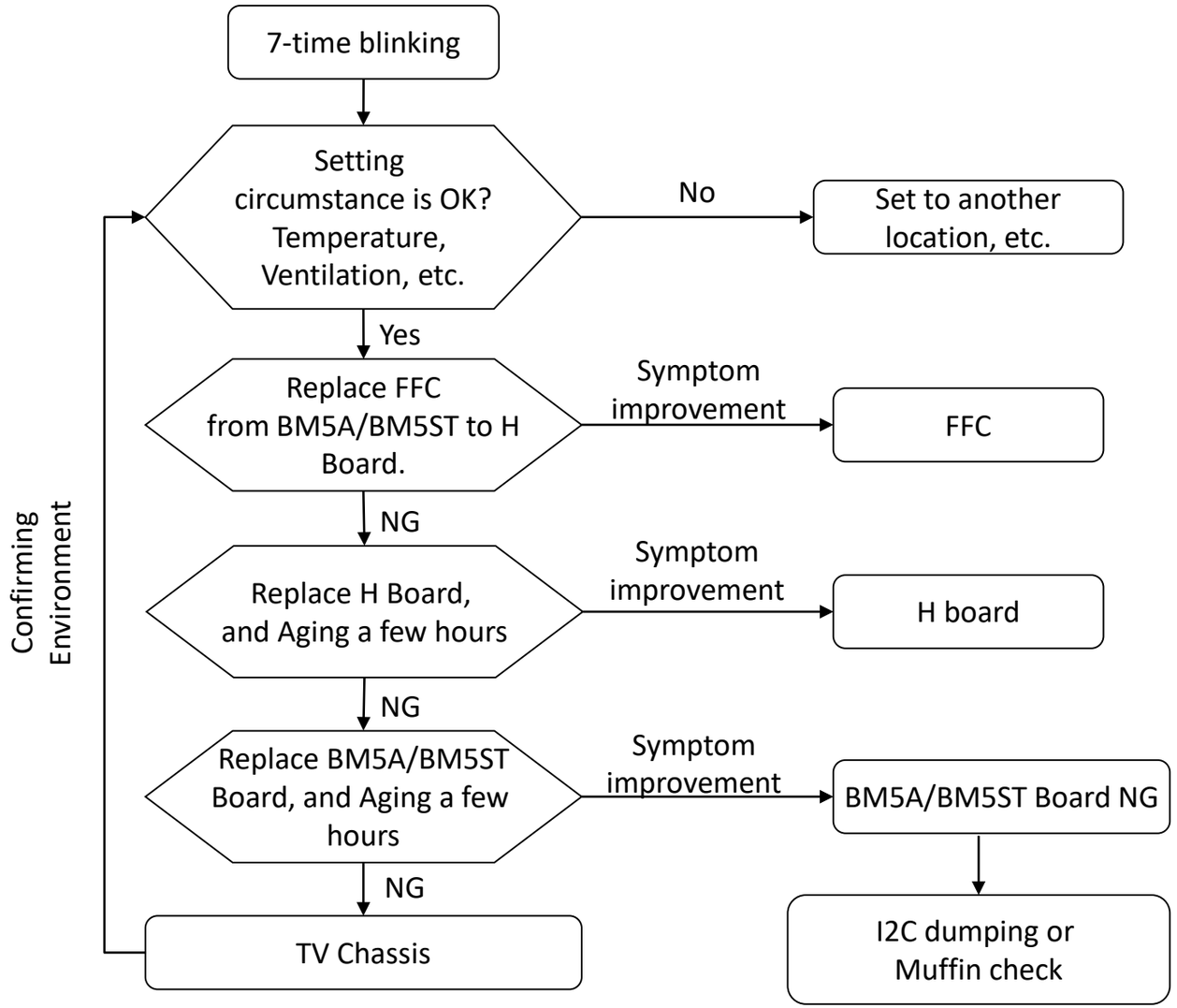


Check point for BM5A

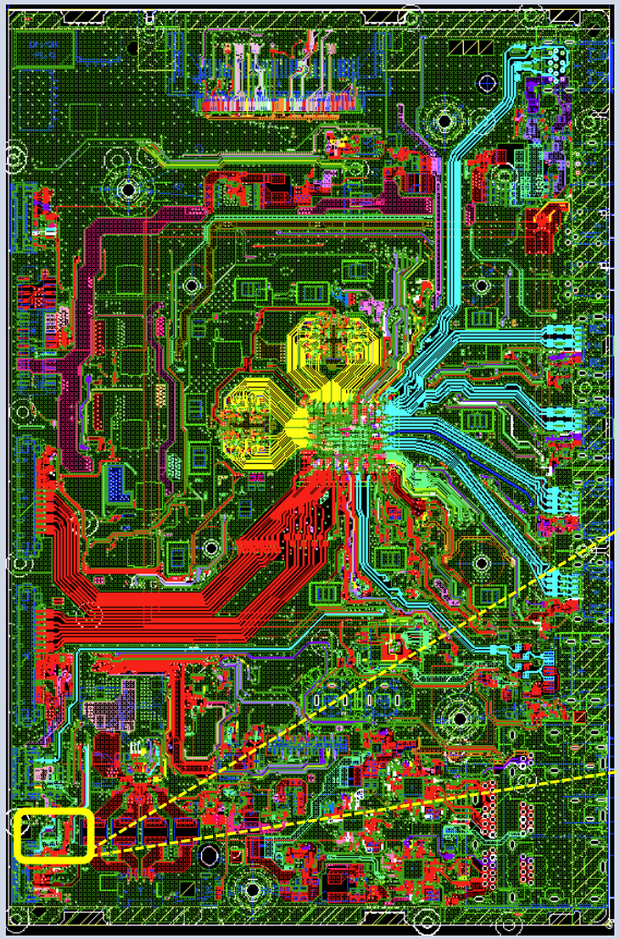
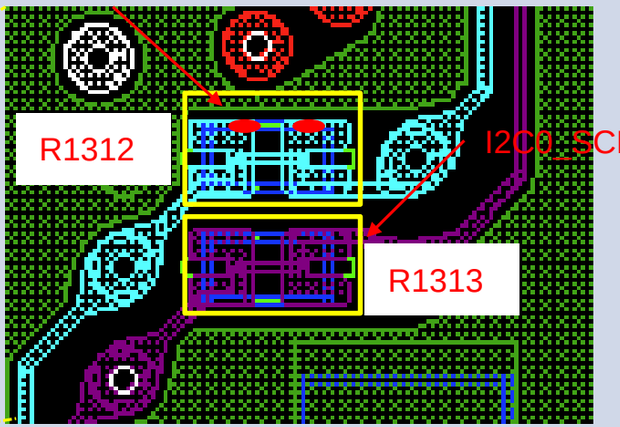
Name	Board PWB (B side)	Detail
BM5A/ BM5ST		

2.7 LED Blinking: 7x (Temperature Error)

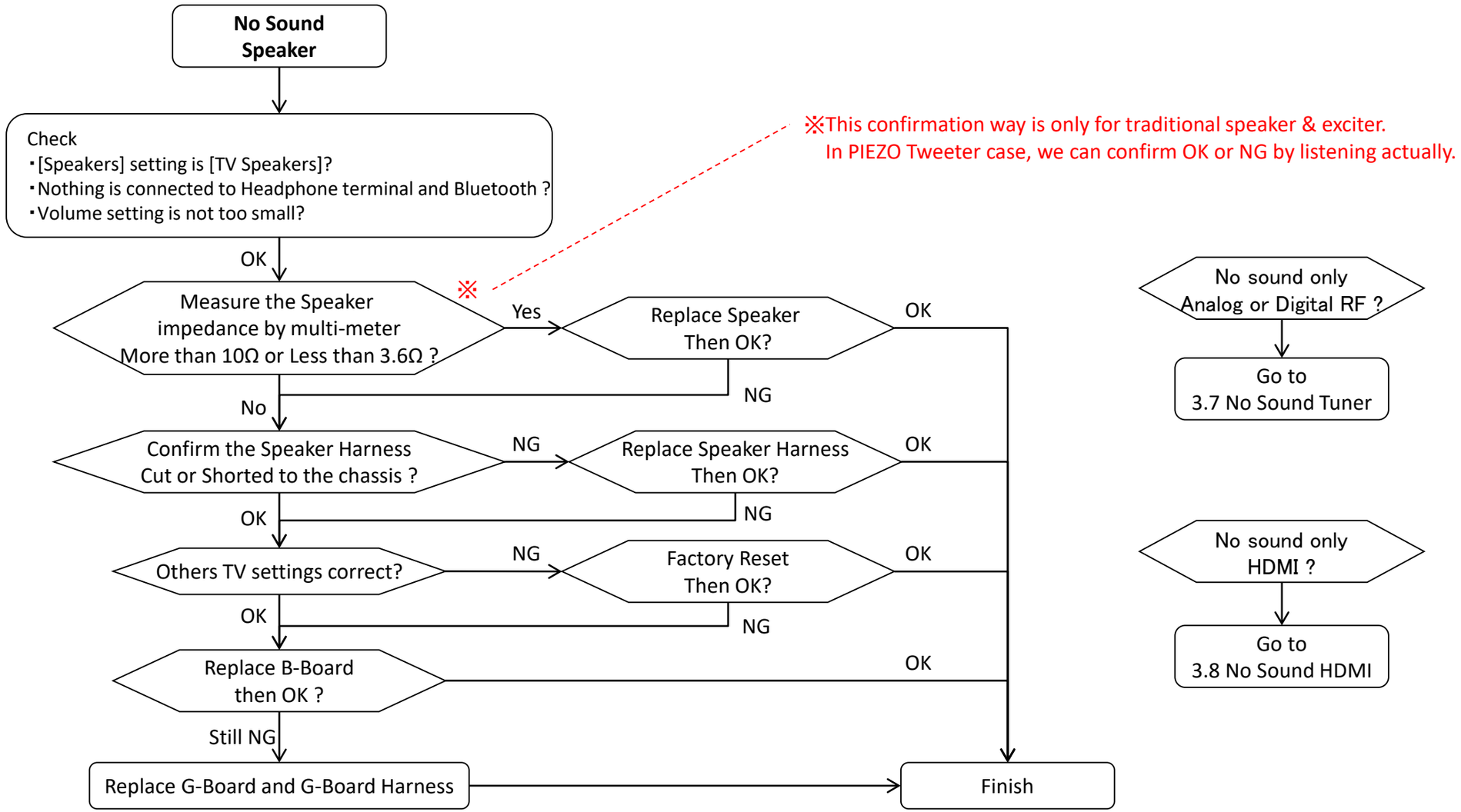
BM5A/BM5ST



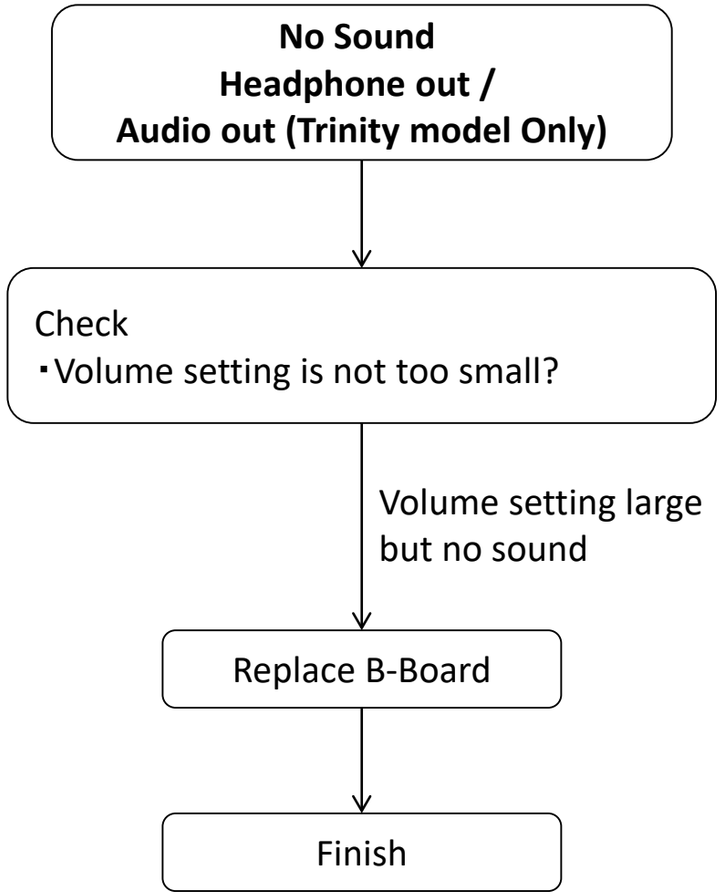
Check point for BM5A/BM5ST

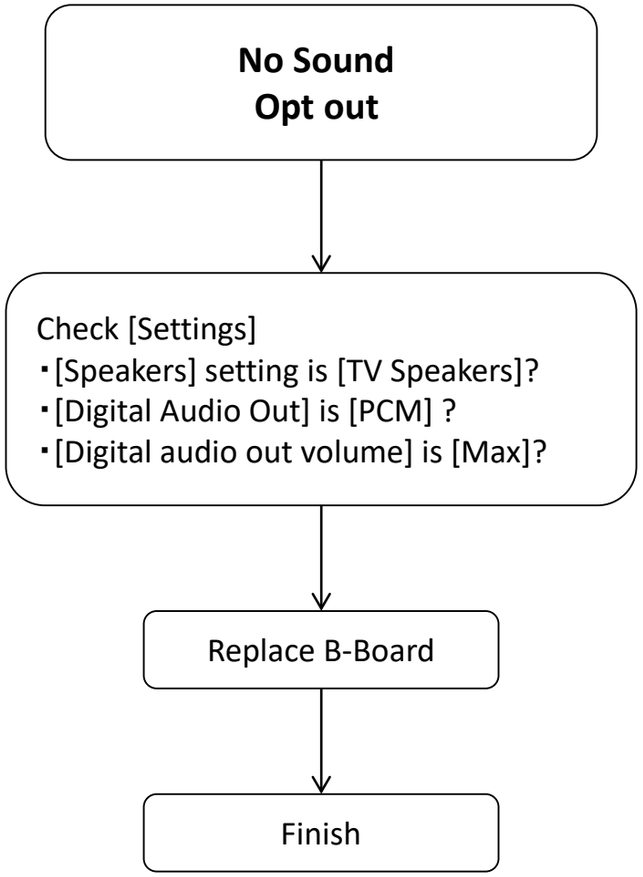
BM5A/BM5ST board (A side)	Detail
	

3.1 No sound for Speaker

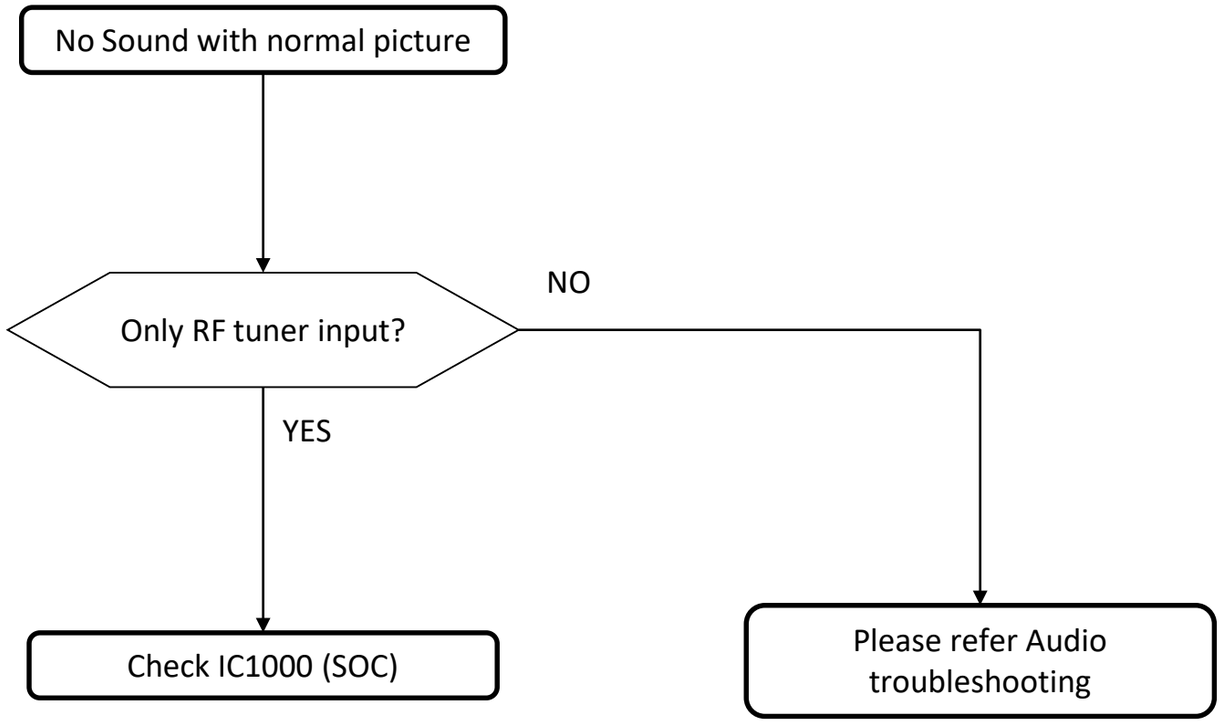


3.2 No sound for Headphone out / Audio out / Opt out

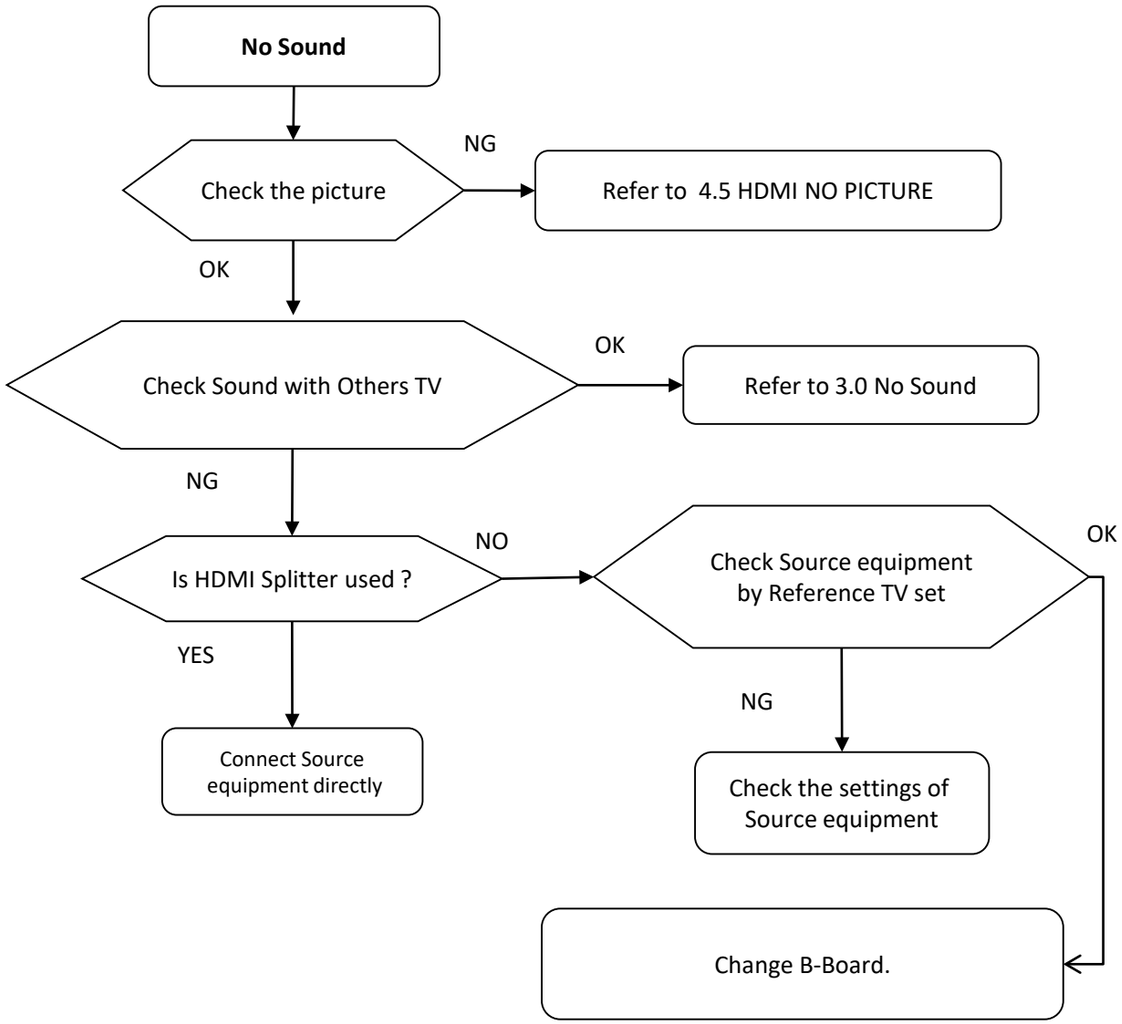


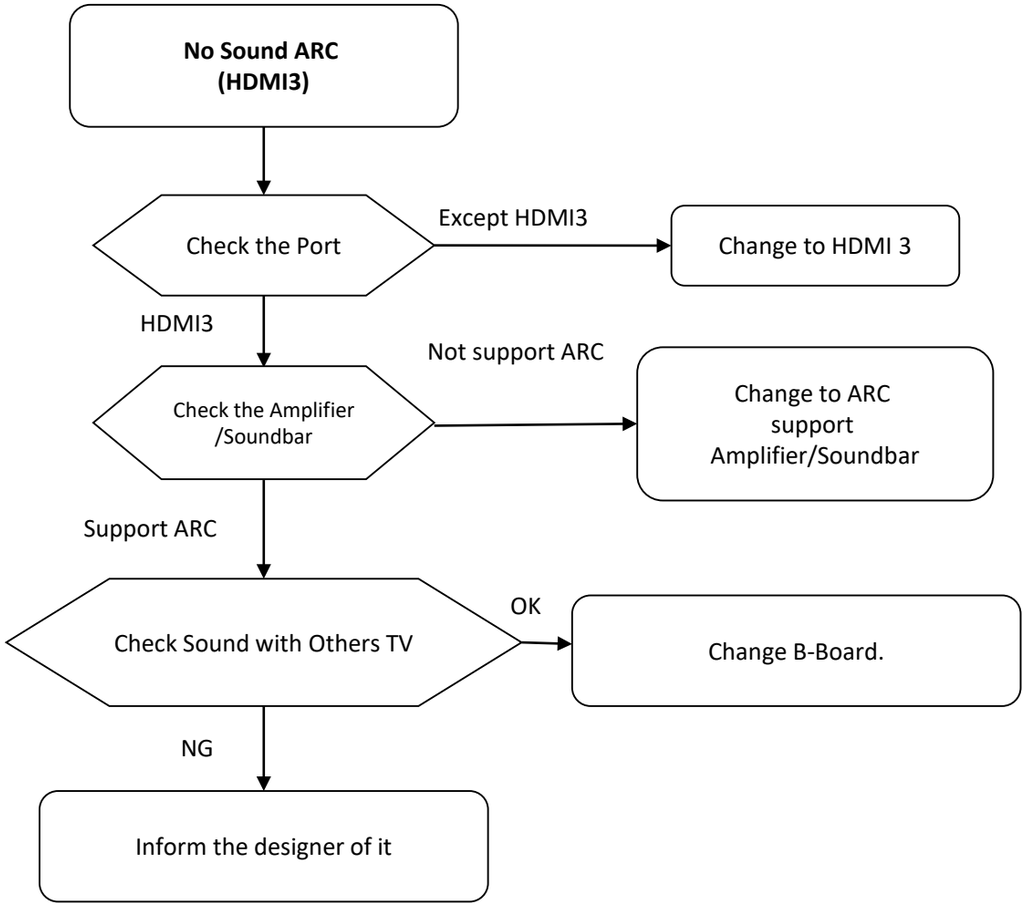


3.7 No Sound: @ Tuner



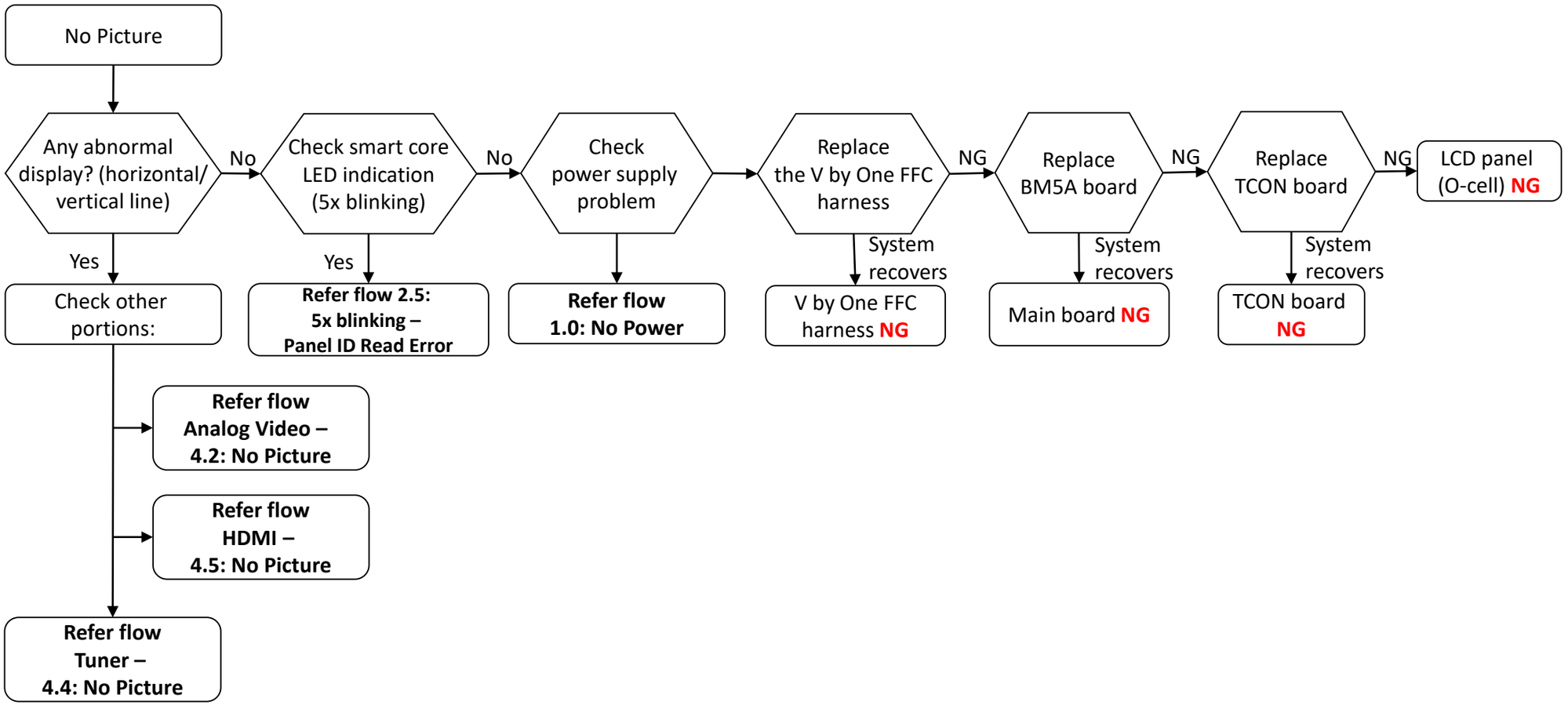
3.8 NO SOUND: HDMI 1/2/3/4





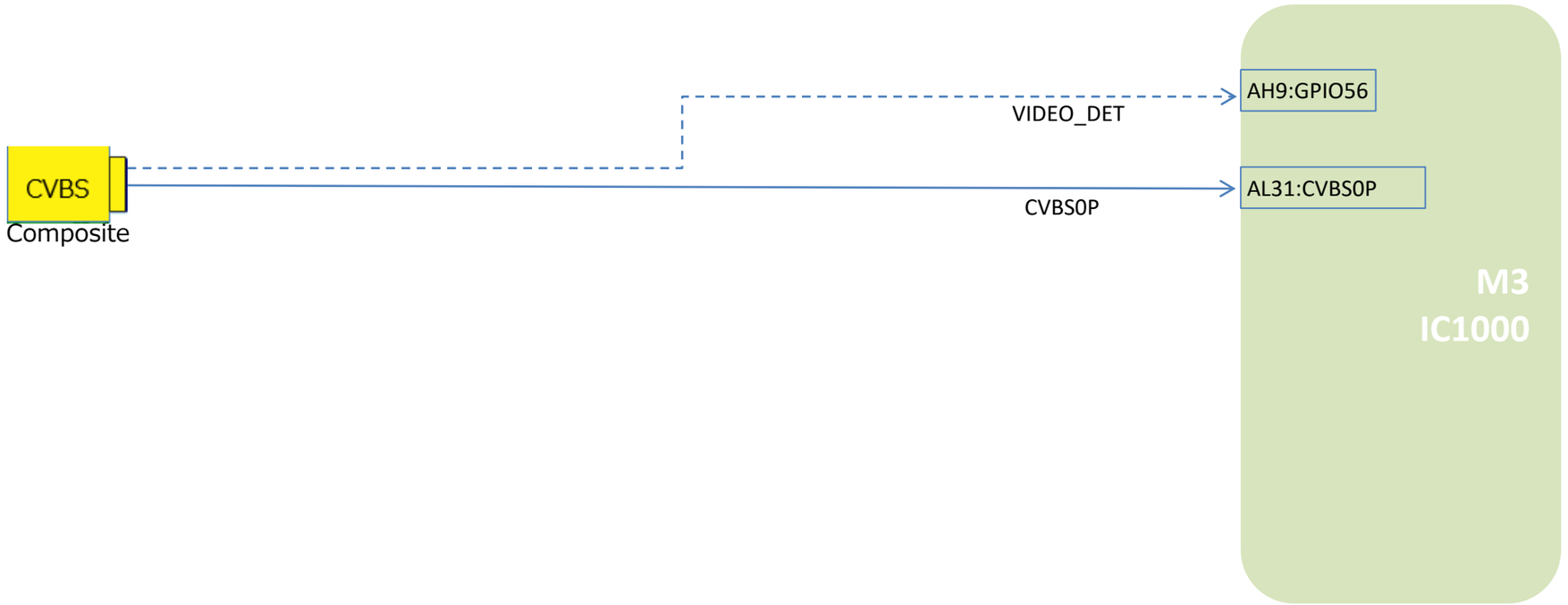
4.0 No Picture

BM5 Board LCD Model



4.1 Analog Video Signal Path (WW Destination)

BM5A



4.2 No Picture – Investigation flow (WW Destination)

BM5A

Checking condition:
- TV ON, *AV conversion cable is connected to conversion jack input (Yellow) at TV side. Composite input cable is connected to composite source output.
- TV UI Display : Video in(WW)/AV in(EU)

Video
No Picture

Check if Analog Video Input UI is selectable?

No

Check VIDEO_DET signal at R2841
Is it 3.3V?

OK (**Vpp: 3.3 V**)

J2800 Connectivity Problem.

NG (**Vpp: 0 V**)

Yes

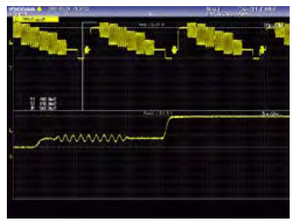
Check waveform between C2825 and IC1000.
Is it Vpp : 0.56V?

NG (**Vpp: 0 V**)

**Check all parts condition at CVBS0P line.
[D2800, VR2800, R2843, R2844, R2845, R2848, R2849, R2842, C2831]

OK

OK (**Vpp: 0.56 V**)



NG

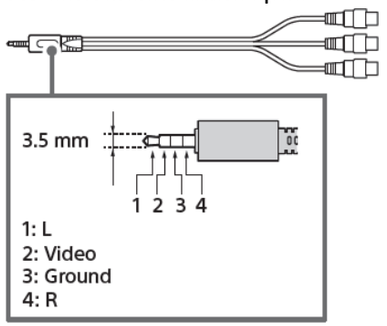
Parts Broken.
(Change Part)

J2800 Connector Problem.
(Change connector)

IC1000 Problem.
(Change B board)

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

*AV conversion cable spec

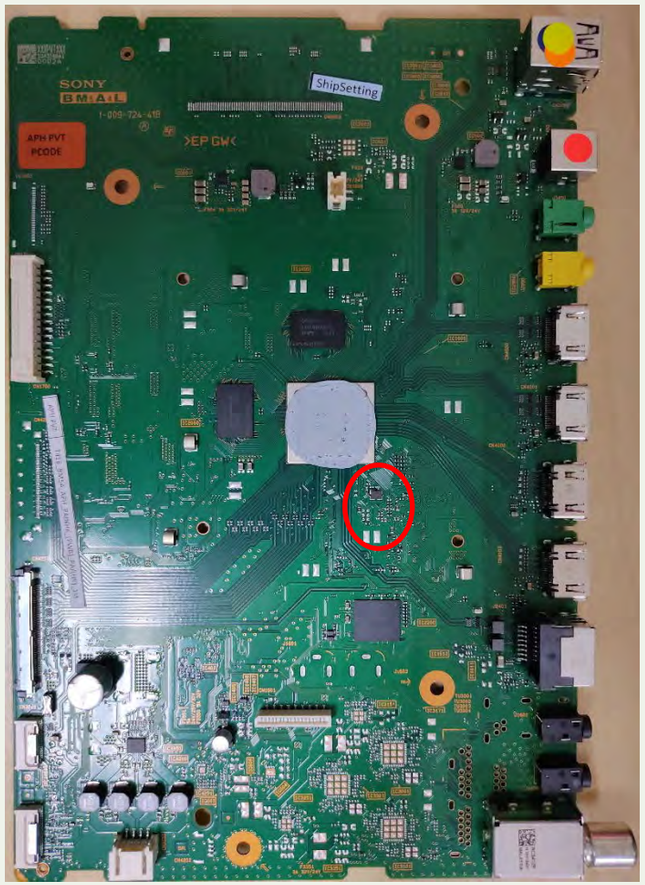
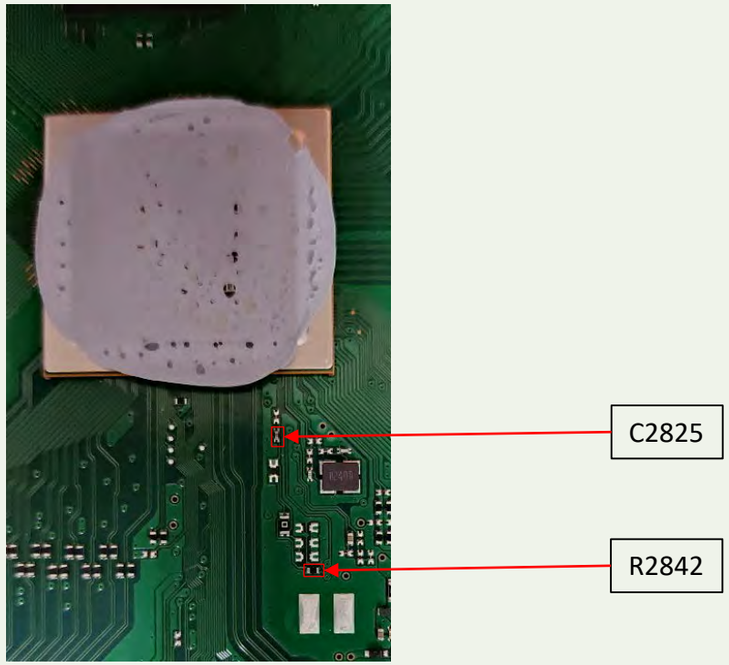


4.2 No Picture – Actions (WW Destination)

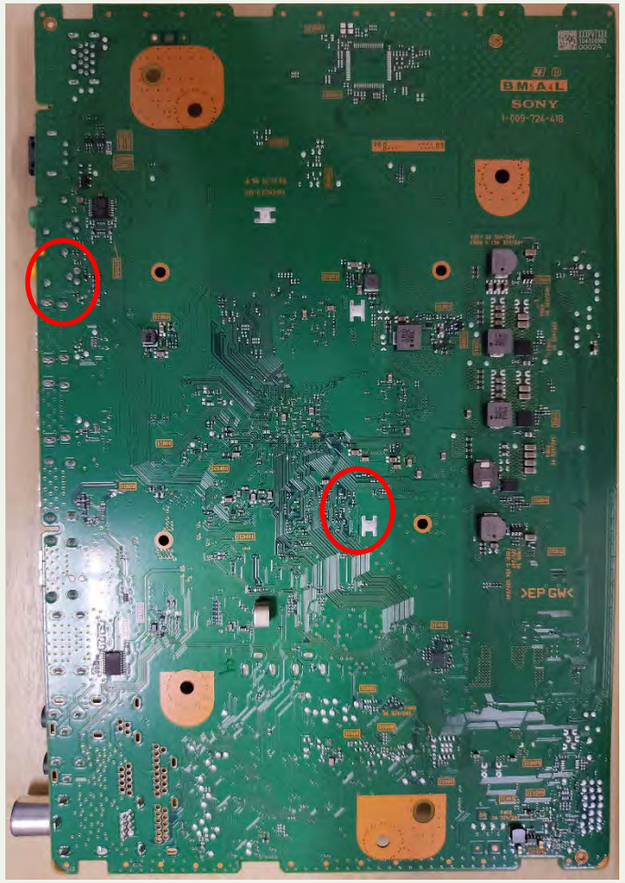
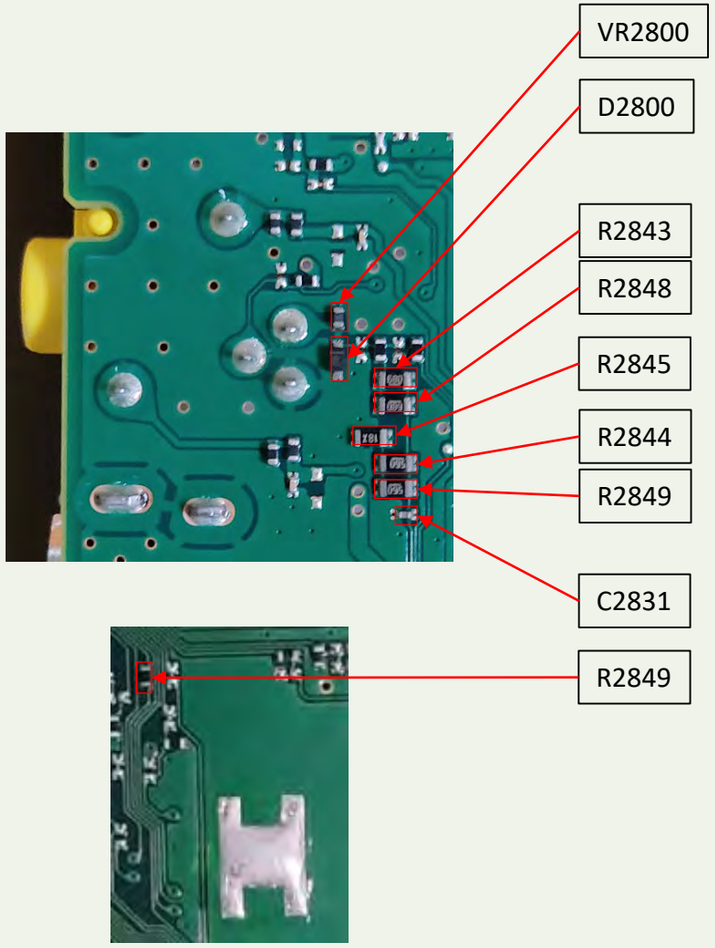
BM5A

Condition	Actions to be taken
Muffin [IC1000] Problem	Change B-board
Connector Problem	Change Connector
Connectivity Problem	
Parts Broken	Change Part according to ** remarks

4.2 No Picture – Parts location (WW Destination)

Board Name	Board PWB (A-side)	Details
BM5A (WW) R2842, C2825		

4.2 No Picture – Parts location (WW Destination)

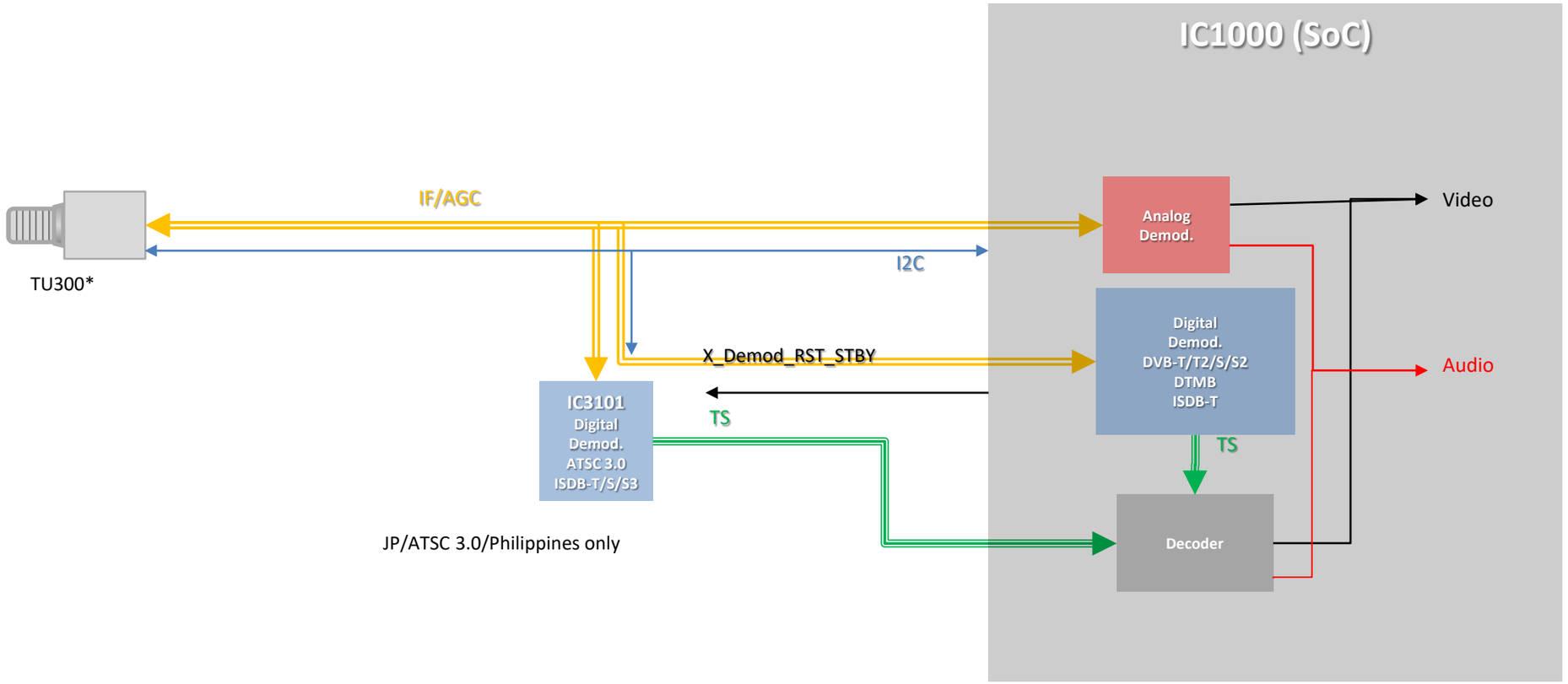
Board Name	Board PWB (B-side)	Details
BM5A (WW) D2800, VR2800, R2843, R2844, R2845, R2848, R2849, C2831, R2841		

4.3 Input Skip Function (BM5A)

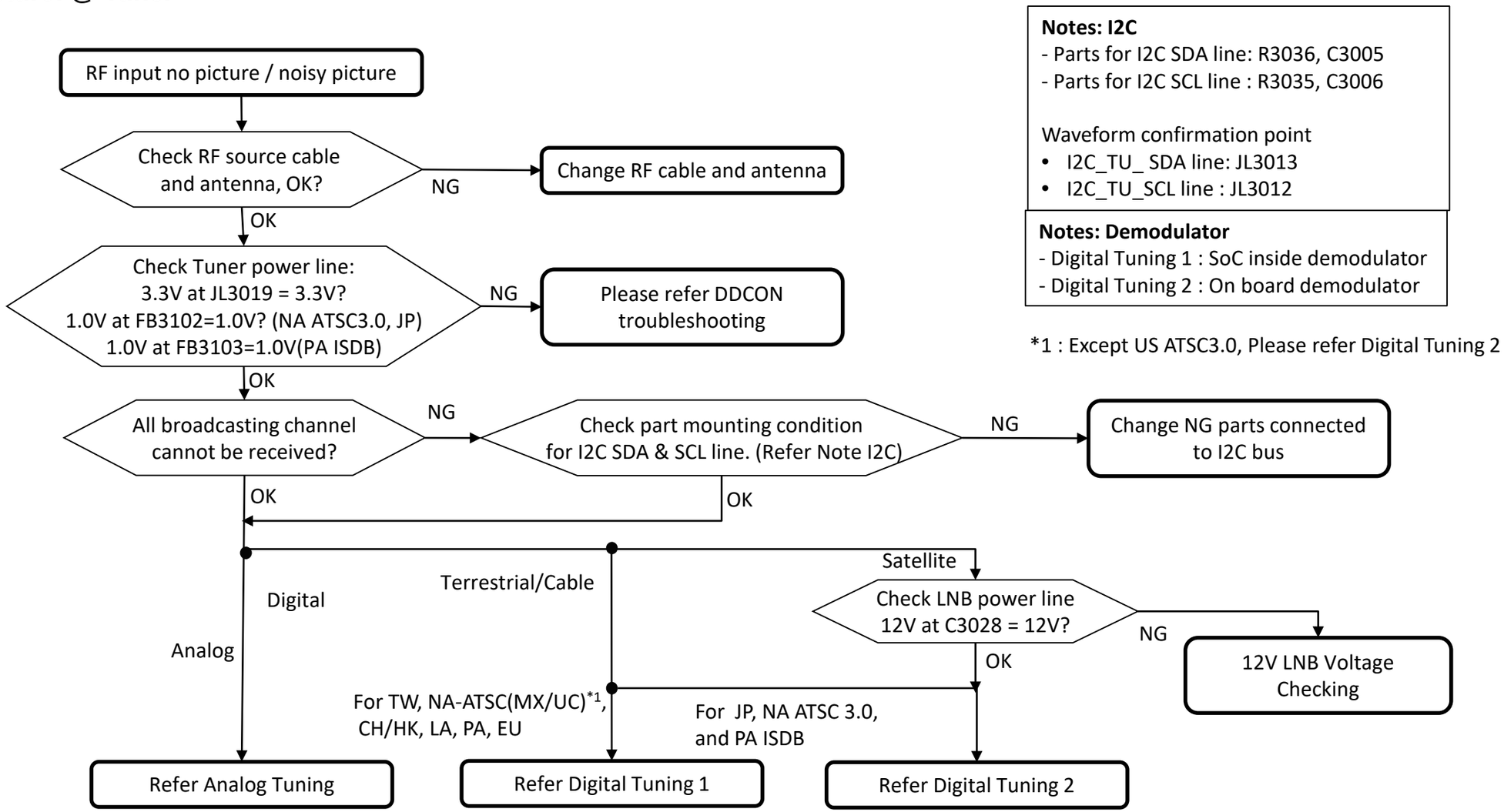
Under default condition;
If user insert analog video cables into video jacks, the Video/Component will be highlighted and can be selected.
The detection mechanism is based on below tables.

Destination	Input	Signal	Non-Detect (Typical)	Detect (Typical)
WW/EU	VIDEO IN/AV IN	VIDEO_DET IC1000 AH9-GPIO56	0V	3.3V

4.4 No Picture: @ Tuner



4.4 No Picture: @ Tuner



Notes: I2C
- Parts for I2C SDA line: R3036, C3005
- Parts for I2C SCL line : R3035, C3006

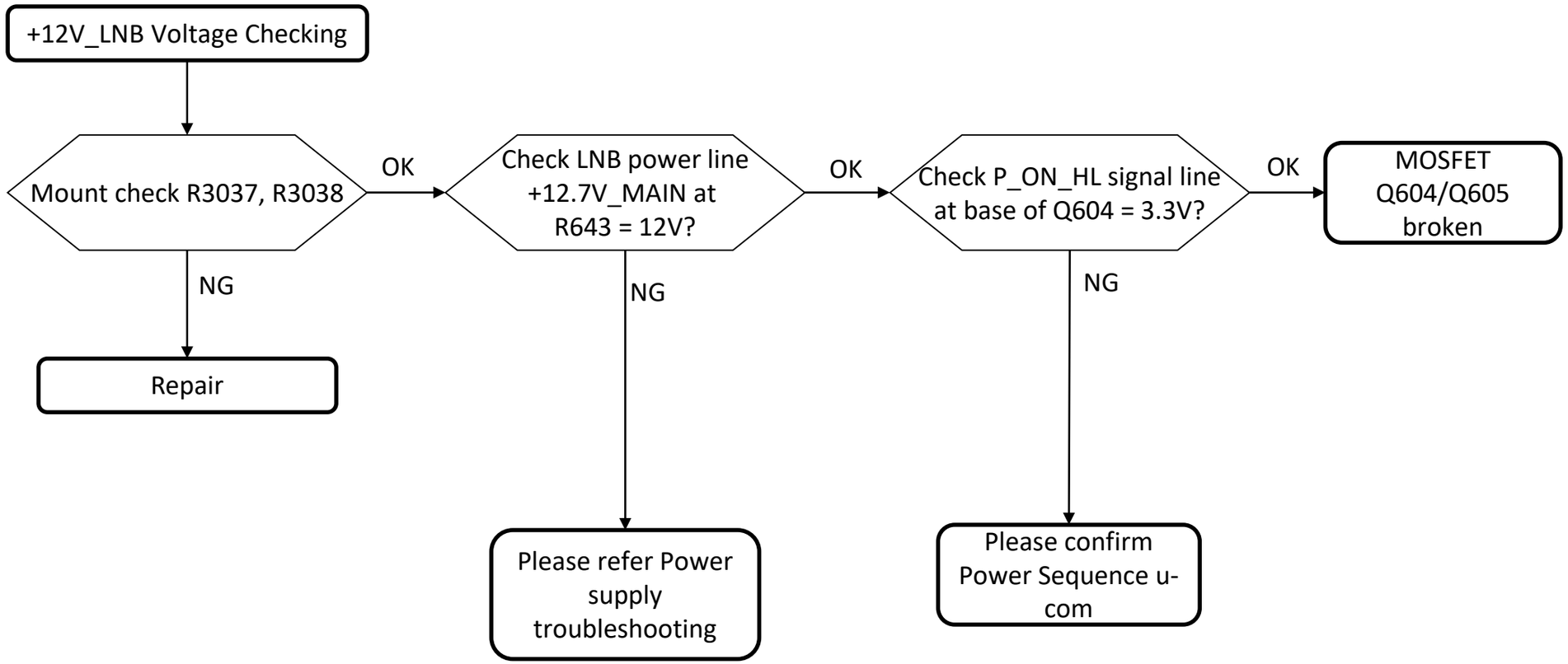
Waveform confirmation point
- I2C_TU_ SDA line: JL3013
- I2C_TU_SCL line : JL3012

Notes: Demodulator
- Digital Tuning 1 : SoC inside demodulator
- Digital Tuning 2 : On board demodulator

*1 : Except US ATSC3.0, Please refer Digital Tuning 2

4.4 No Picture: @ Tuner

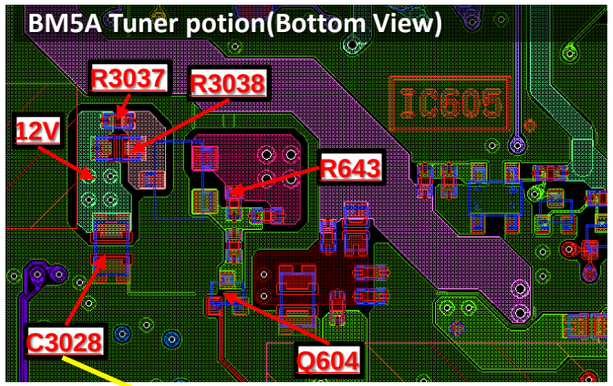
FOR 12V LNB Voltage Checking: @ AEP and JP

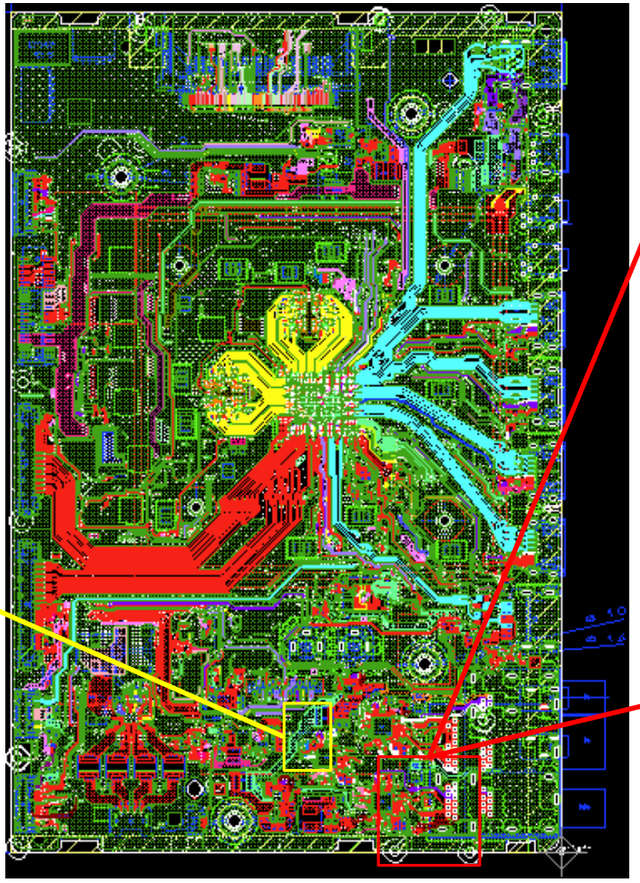


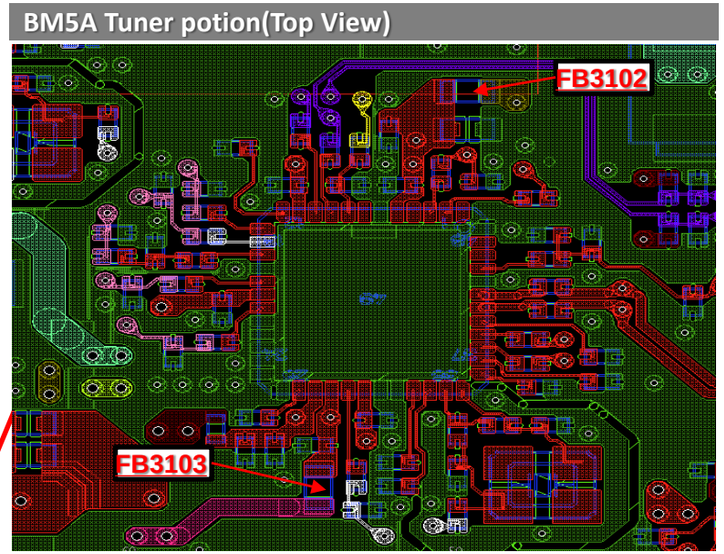
4.4 No Picture: @ Tuner (BM5A)

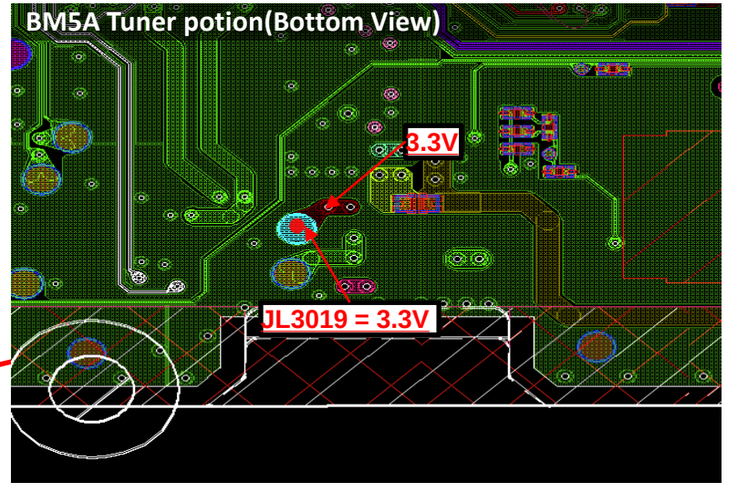
Tuner Power Lines: 3.3V, 12.0V, 1.0V

BM5A (Top View)







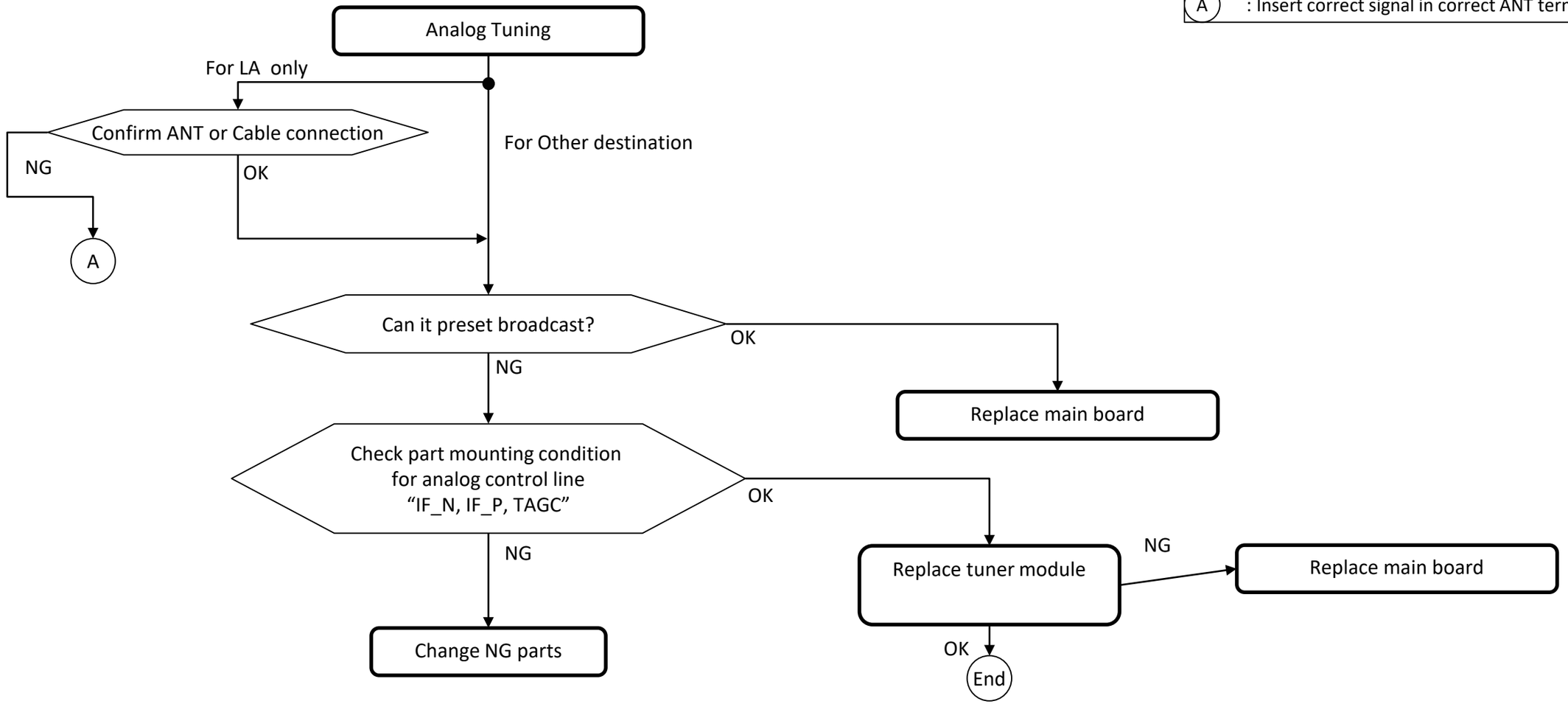


4.4 No Picture: @ Tuner

Notes:
- Parts for IF_N line : C3011
- Parts for IF_P line : C3010
- Parts for TAGC line: R3024, C3023, R3003,

(A) : Insert correct signal in correct ANT terminal.

FOR ANALOG TUNING: @ All destination except JP



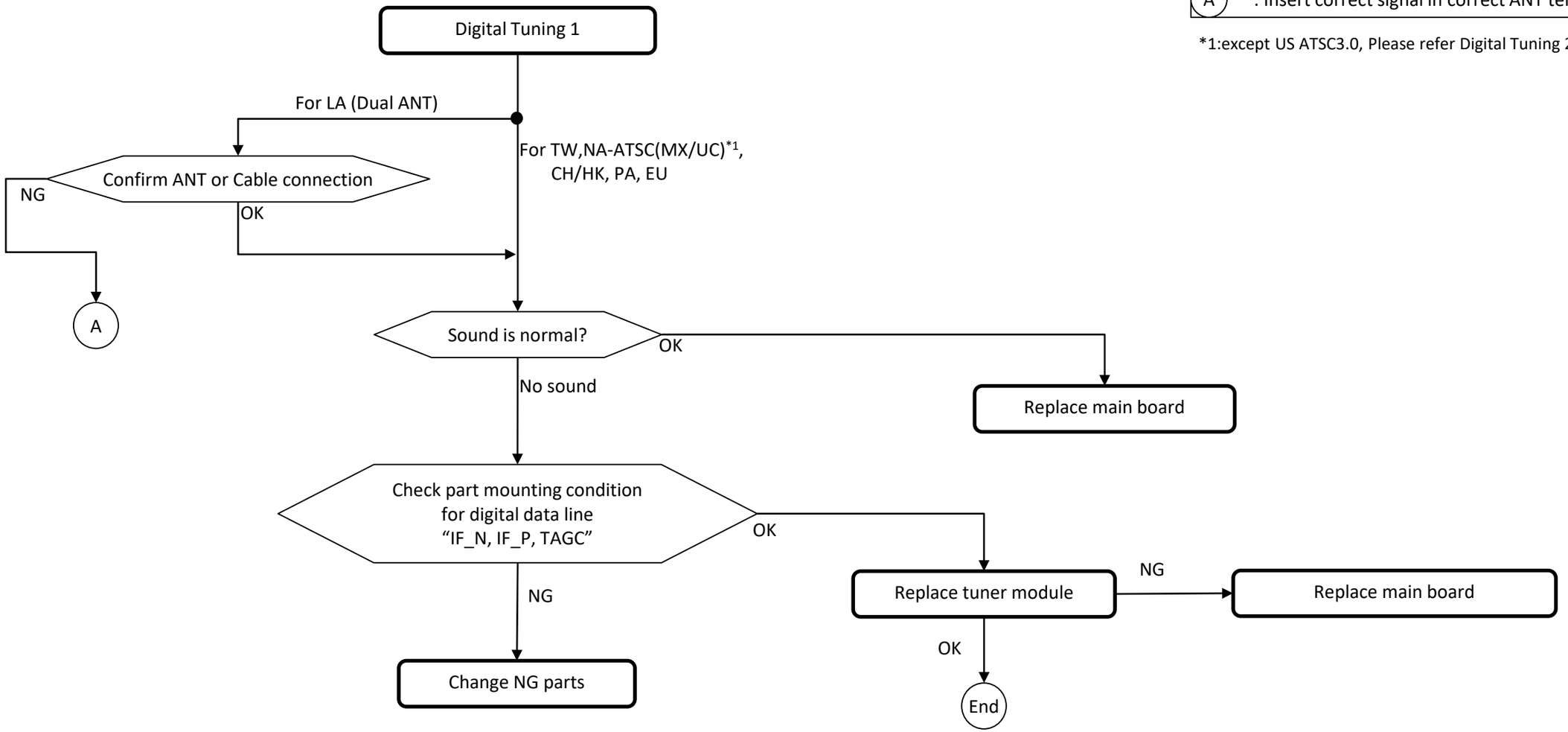
4.4 No Picture: @ Tuner

Notes:
- Parts for IF_N line : C3011
- Parts for IF_P line : C3010
- Parts for TAGC line: R3024, C3023, R3003,

(A) : Insert correct signal in correct ANT terminal.

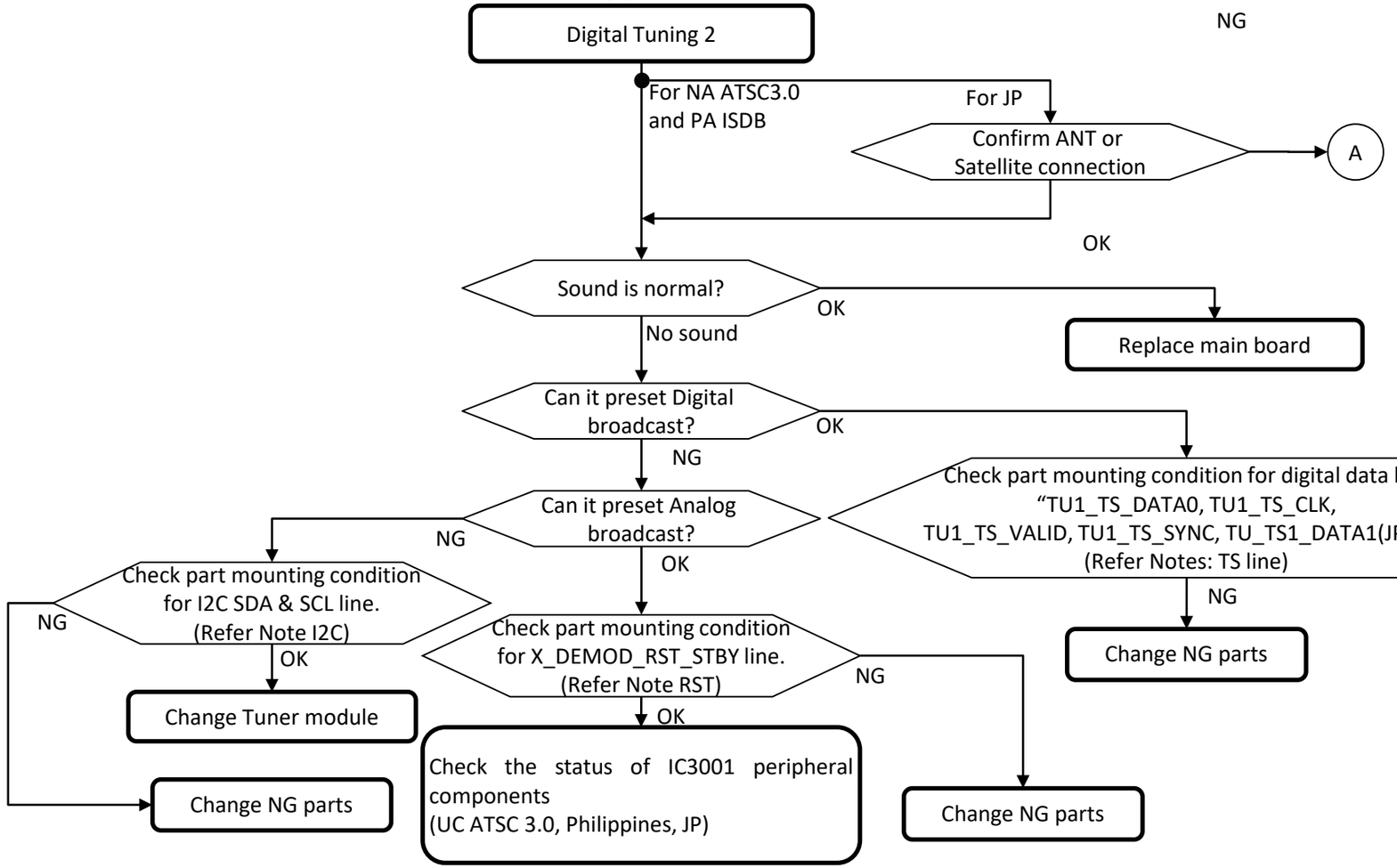
*1:except US ATSC3.0, Please refer Digital Tuning 2

FOR DIGITAL TUNING 1: @ For TW, NA-ATSC(MX/UC)*1, CH/HK, LA, PA, EU



4.4 No Picture: @ Tuner

FOR DIGITAL TUNING 2: @ JP, US ATSC3.0 and Philippines



Notes: I2C
- Parts for I2C SDA line: R3036, C3005
- Parts for I2C SCL line : R3035, C3006

Waveform confirmation point
- I2C_TU_ SDA line: JL3013
- I2C_TU_SCL line : JL3012

Notes: TS line
-TS line parts for NA ATSC3.0/PA ISDB
R3120/R3121/ R3122/ R3123/ R3114/ C3126/ R3116/R3117/RB3001
- TS line parts for JP :
R3113/R3120/R3121/ R3122/ R3123/ R3114/ C3126/ R3116/R3117/RB3001

A : Insert correct signal in correct ANT terminal.

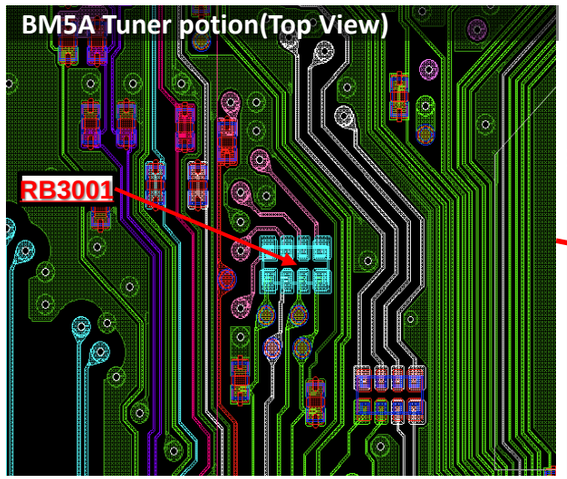
Notes: RST
- Parts for X_DEMOD_RST_STBY line:
R3109, C3117

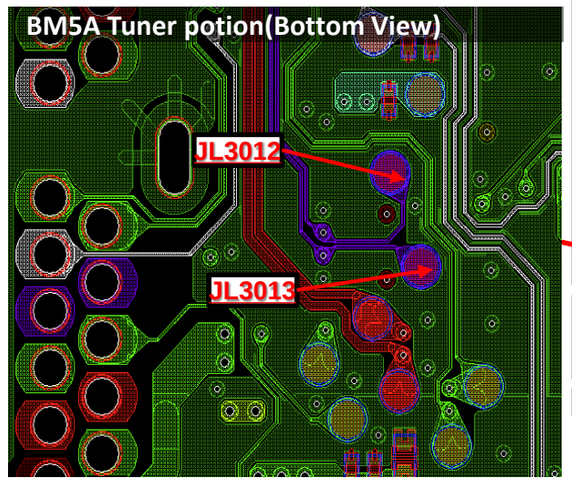
Voltage confirmation point
C3117 = 3.3V

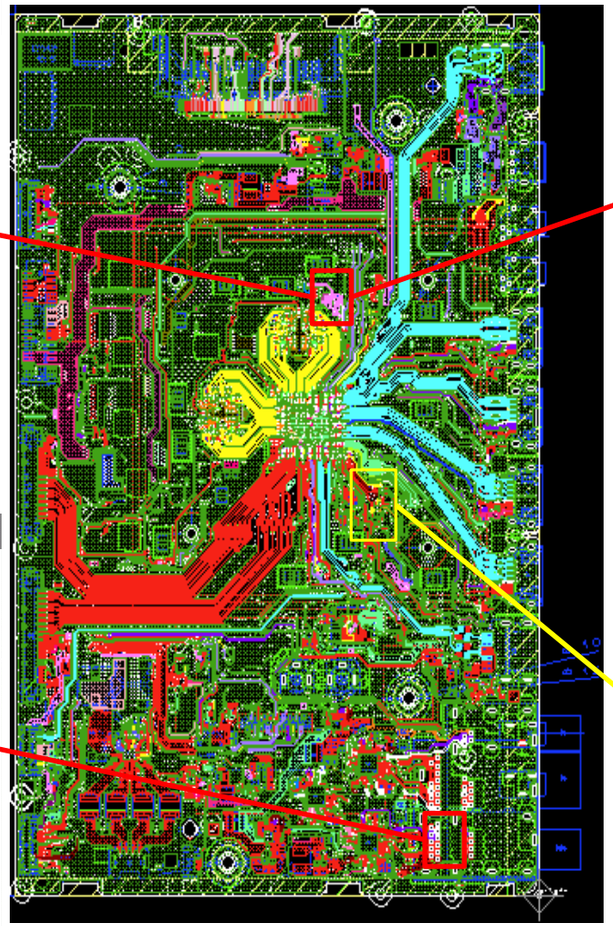
4.4 No Picture: @ Tuner (BM5A)

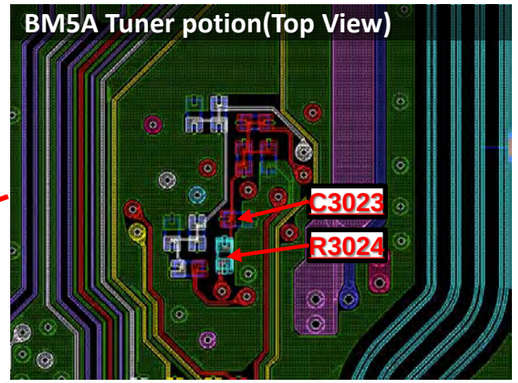
IF_N, IF_P, TAGC, TS Lines(Near SOC)

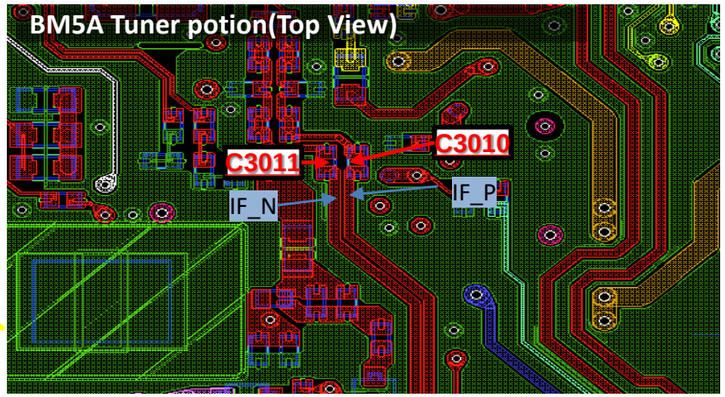
BM5A(Top View)







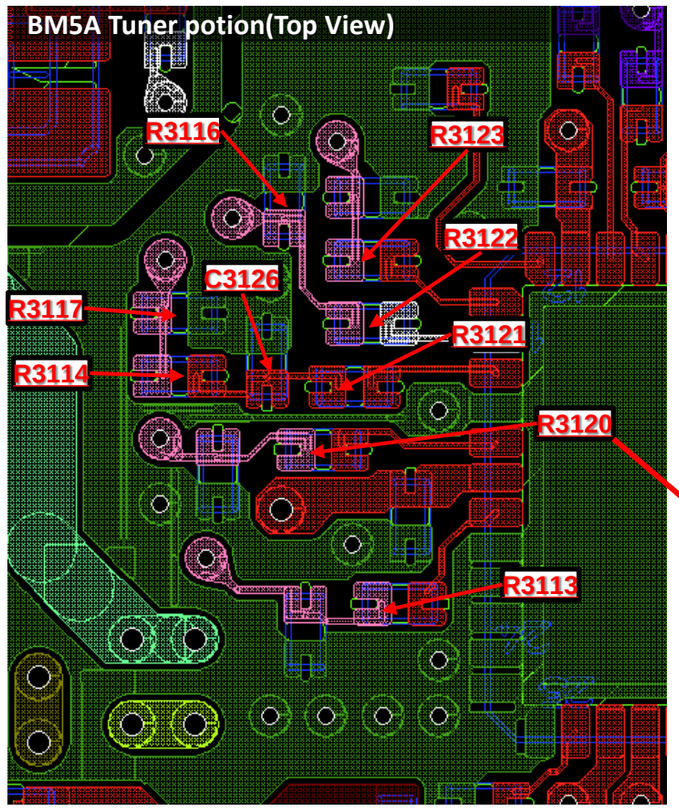


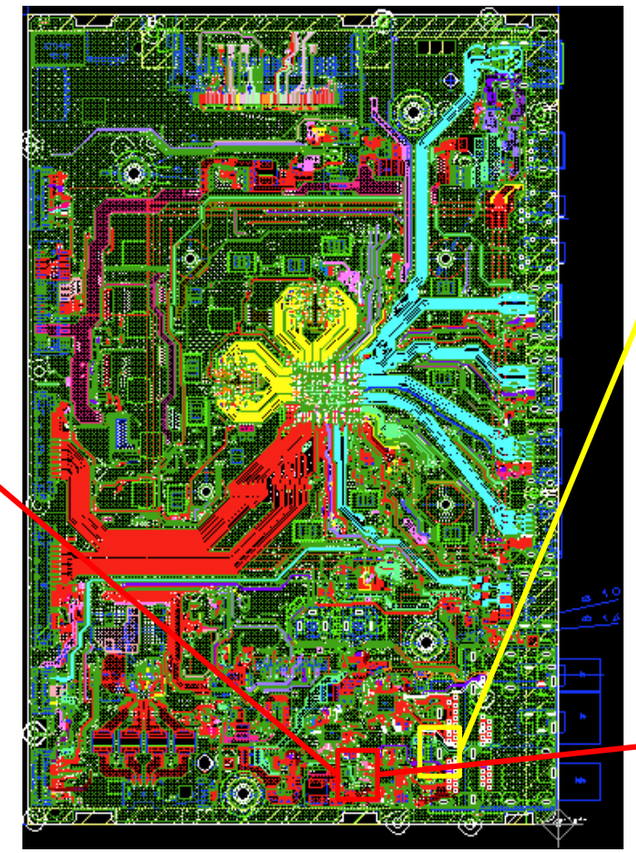


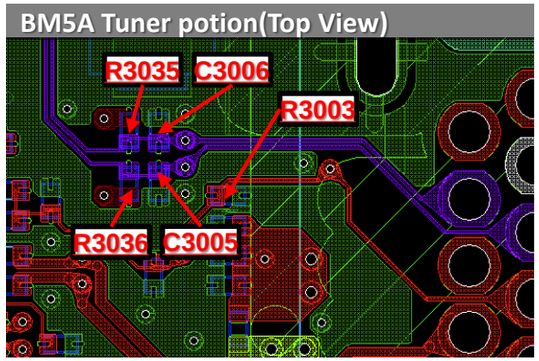
4.4 No Picture: @ Tuner (BM5A)

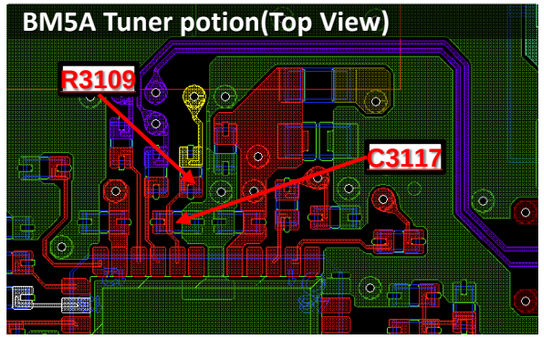
I2C_SDA, I2C_SCL, TS Lines(Near tuner), X_DEMOD_RST_STBY

BM5A(Top View)

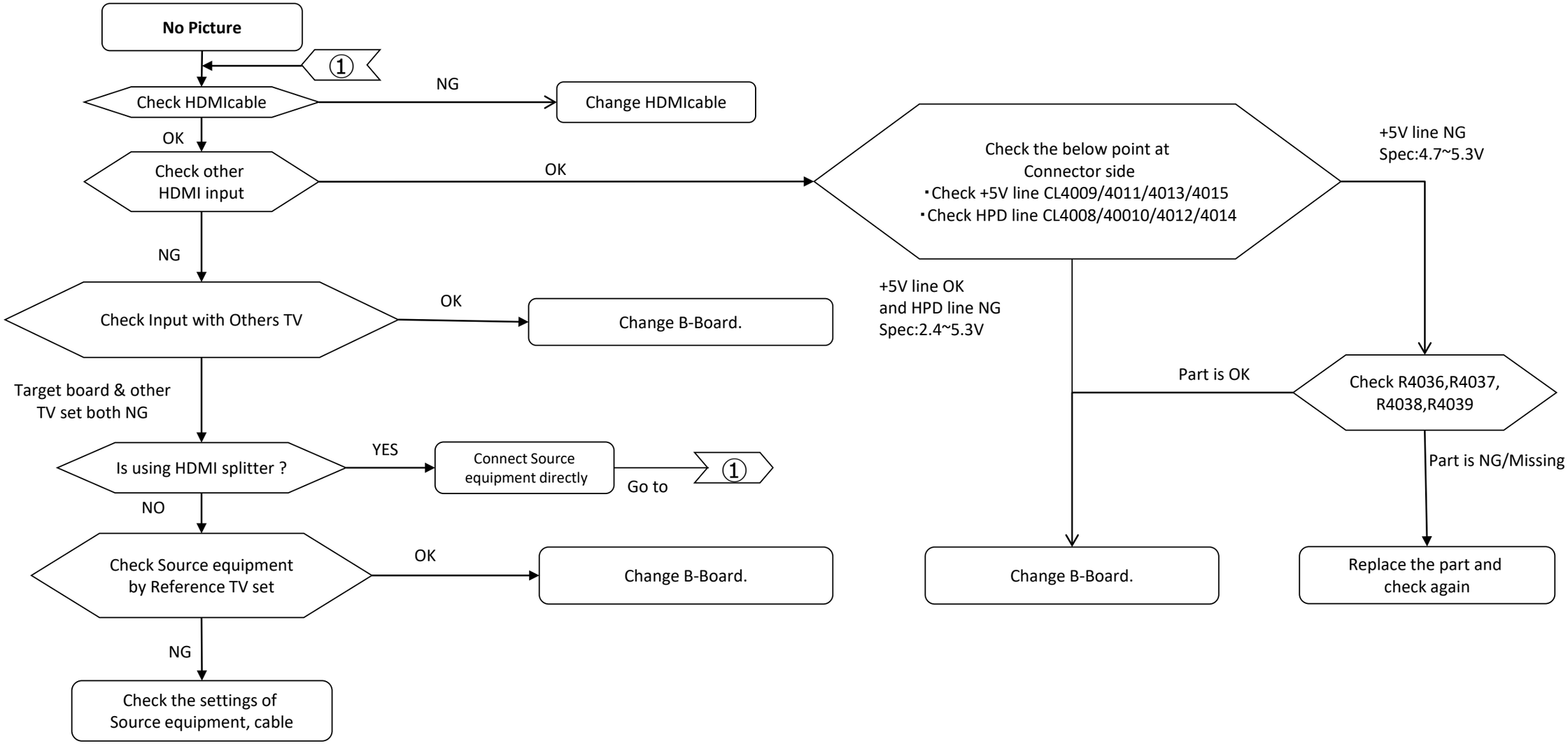








4.5 NO PICTURE: HDMI 1/2/3/4



TROUBLESHOOTING

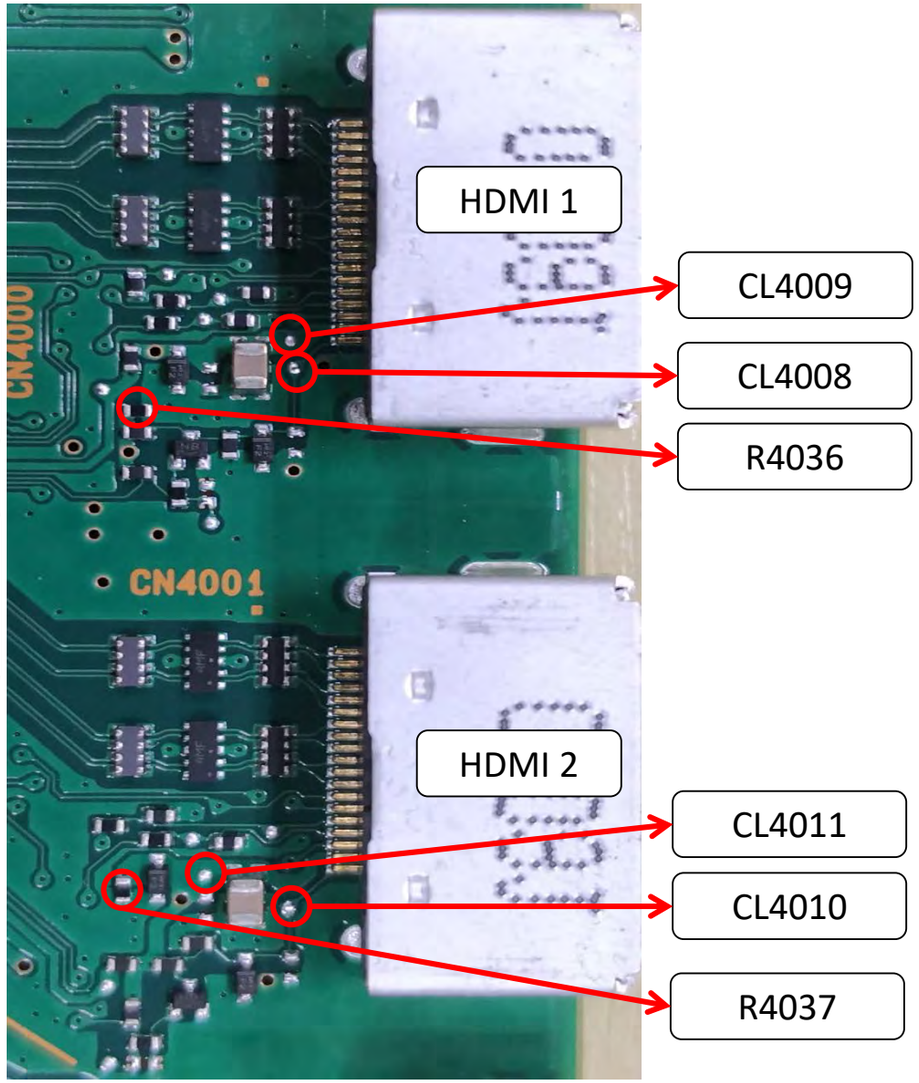
4.5 NO PICTURE: CHECK POINTS HDMI 1,2,3 & 4

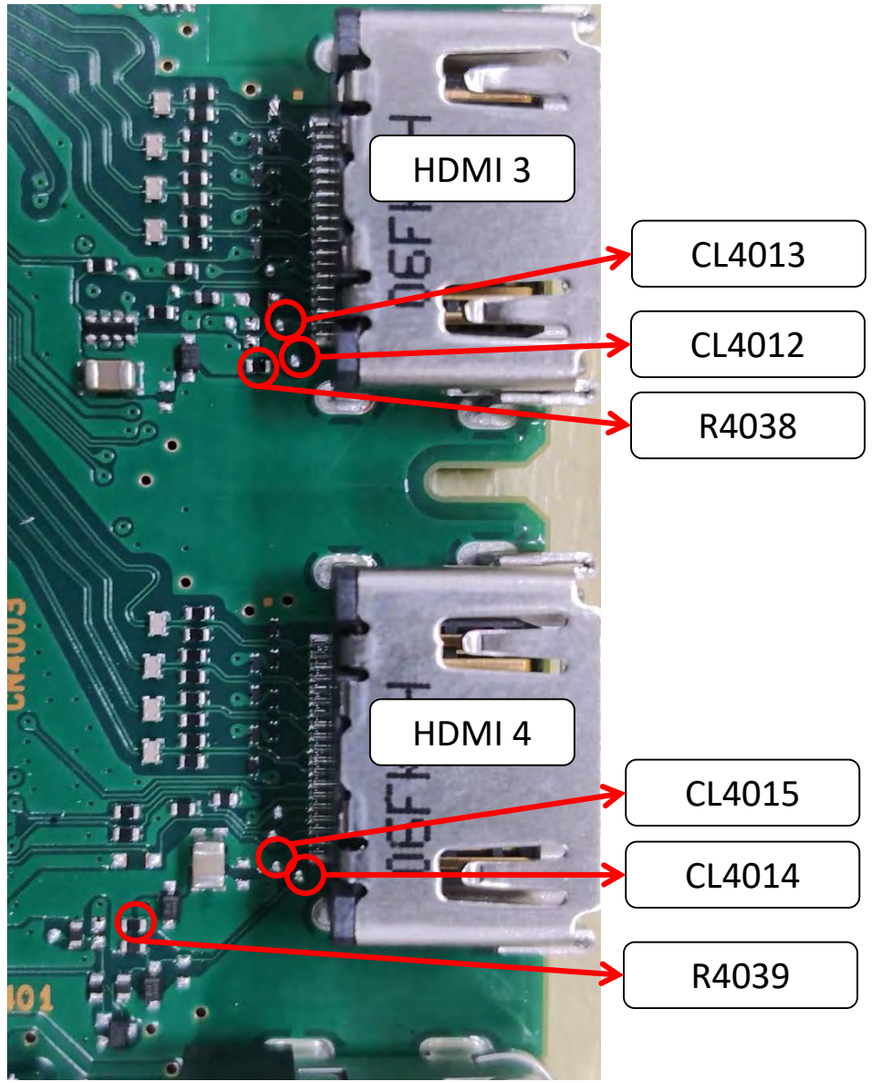
HDMI 1
+5V part :R4036
+5V line :CL4009
HPD line :CL4008

HDMI 2
+5V part :R4037
+5V line :CL4011
HPD line :CL4010

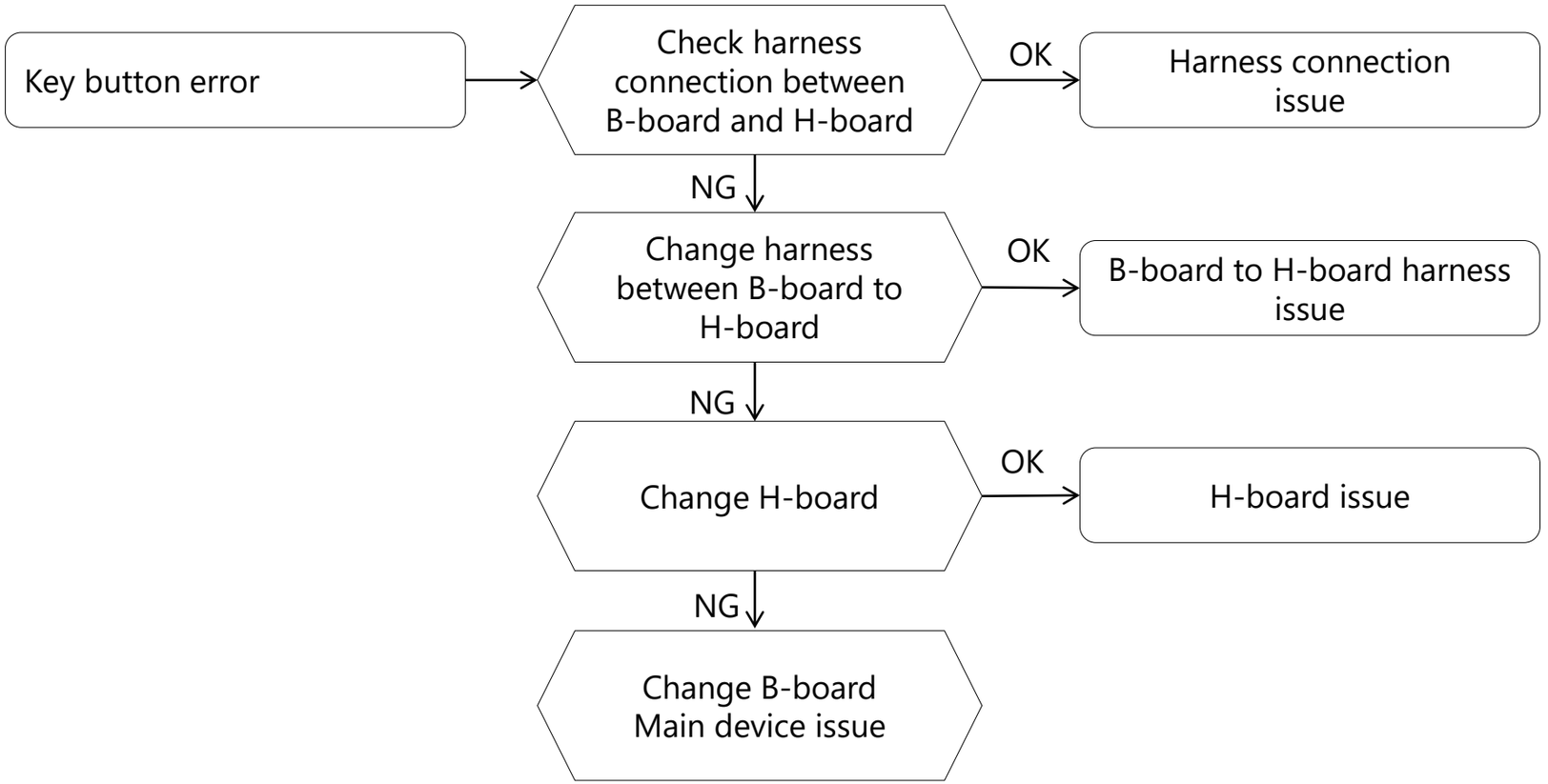
HDMI 3
+5V part :R4038
+5V line :CL4013
HPD line :CL4012

HDMI 4
+5V part :R4039
+5V line :CL4015
HPD line :CL4014

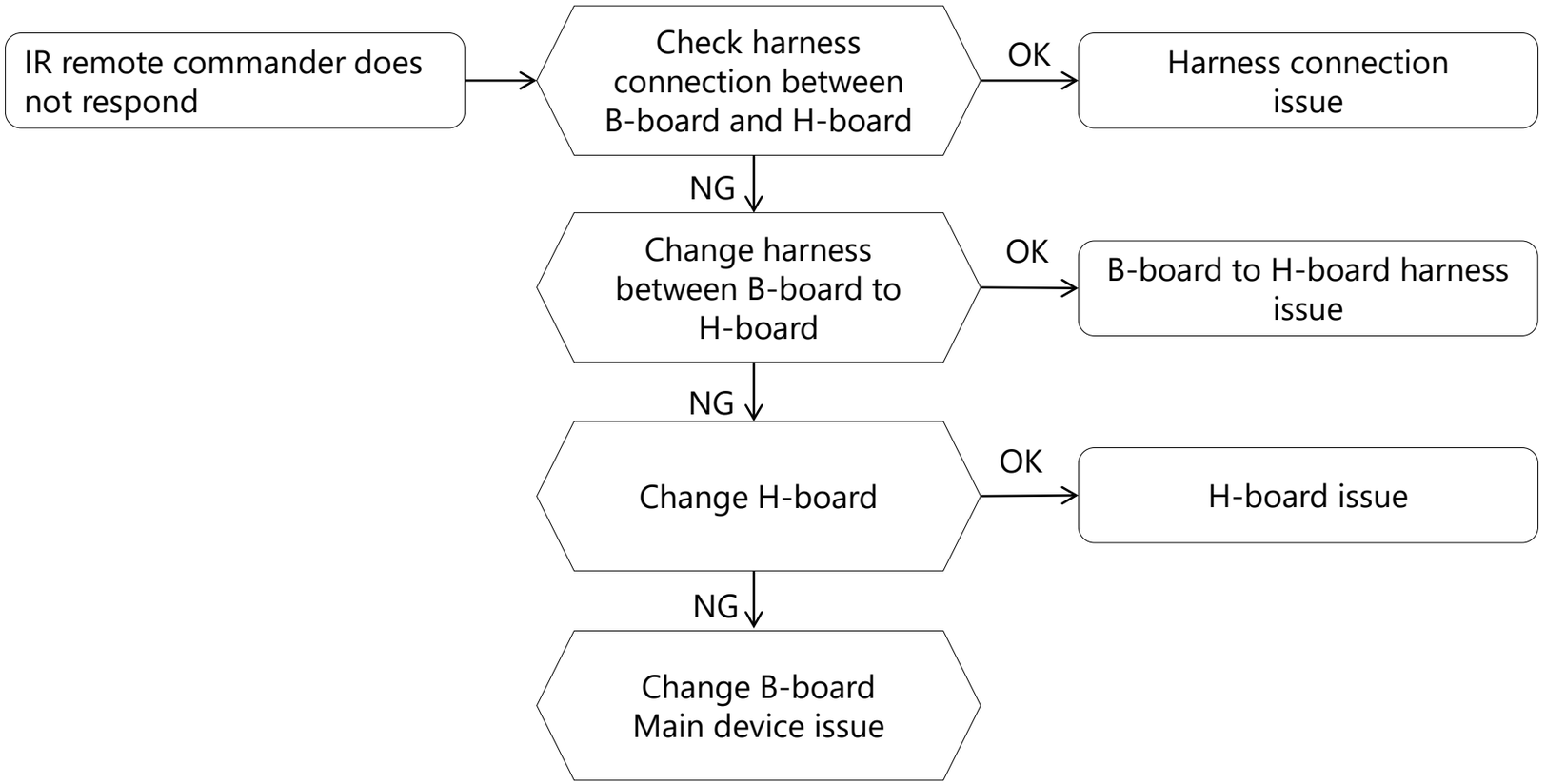




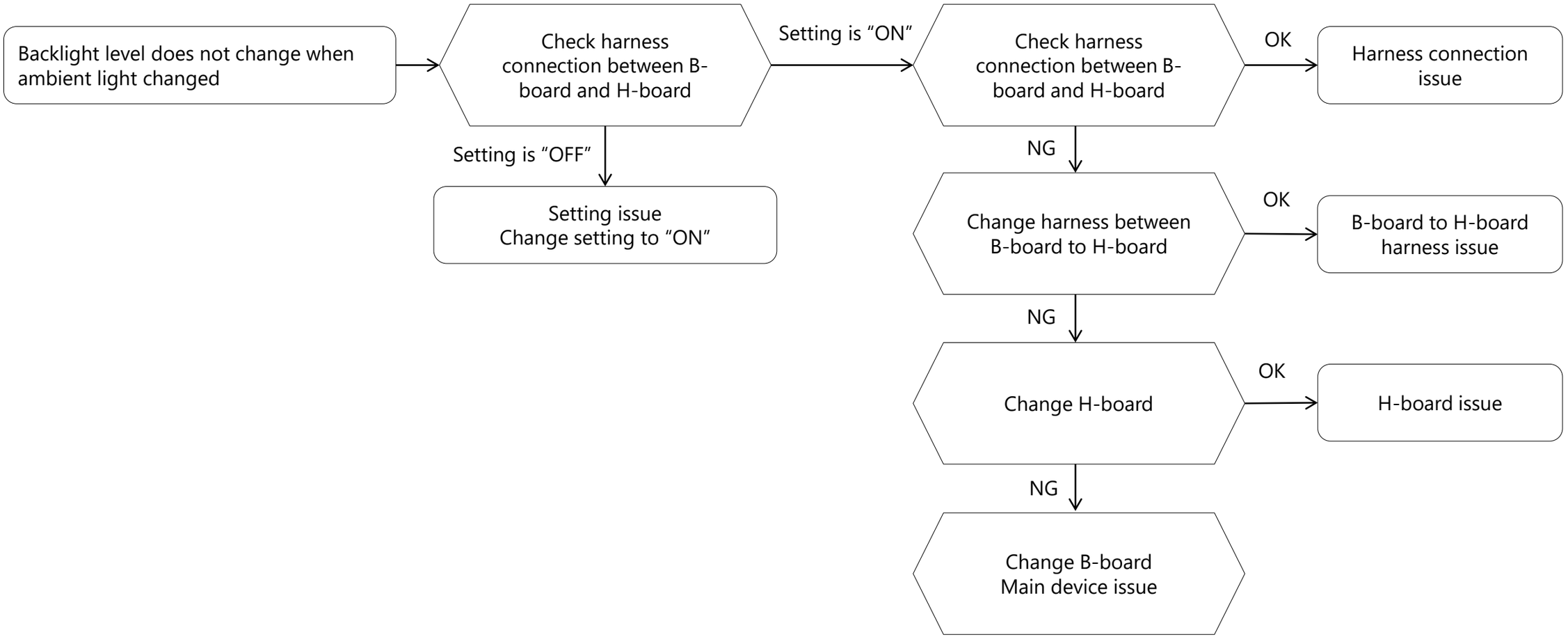
5.0 Key Switch Button Error



5.1 IR Remote Commander Error



5.2 Light Sensor Error



5.3 CAS ID unknown

Digital broadcasting (terrestrial / satellite) cannot be received. And the message of Fig1 or Fig2 is displayed on the screen.

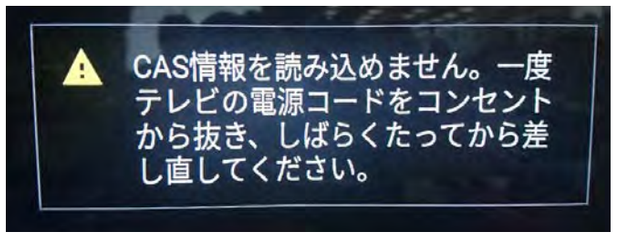


Fig1. CAS ID Error (Japanese)

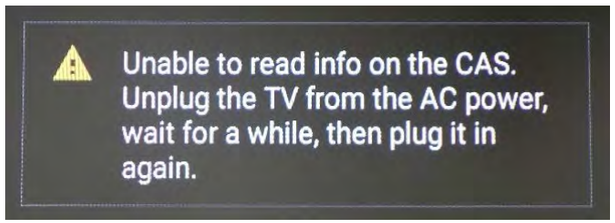
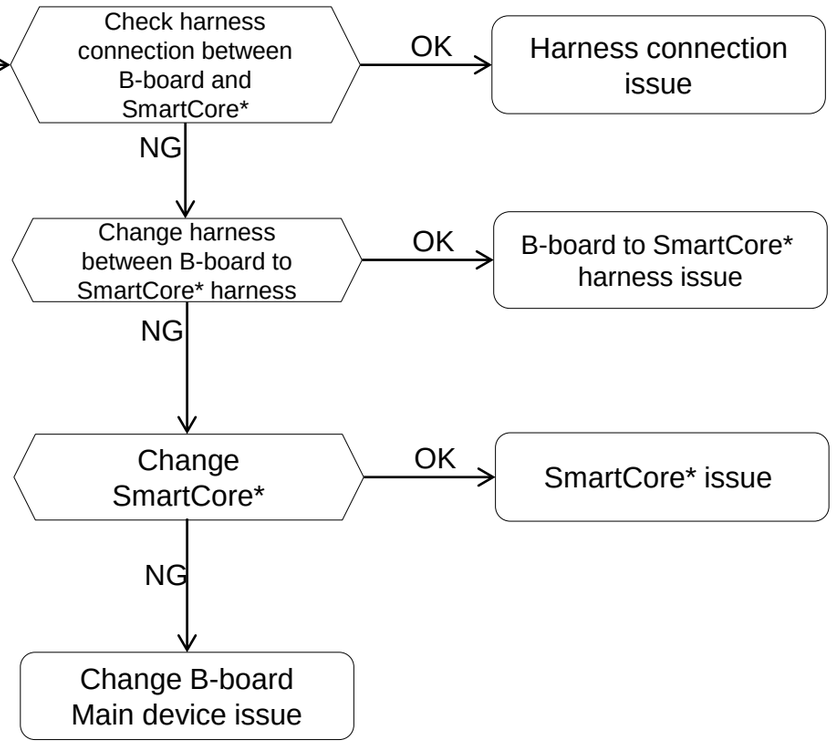
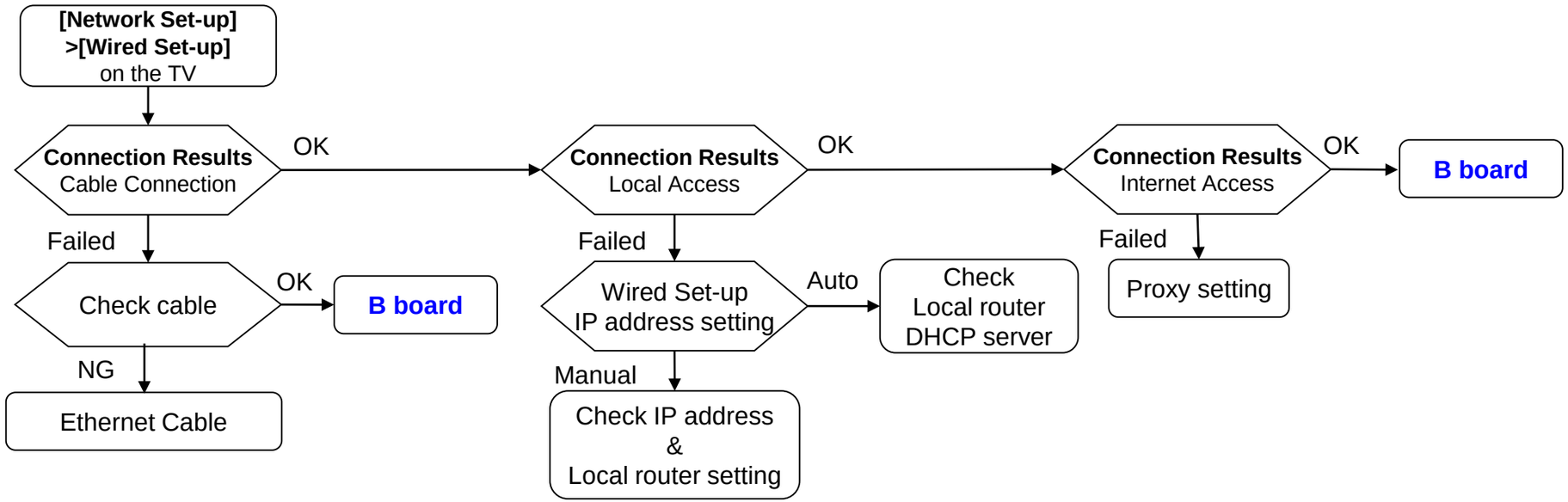


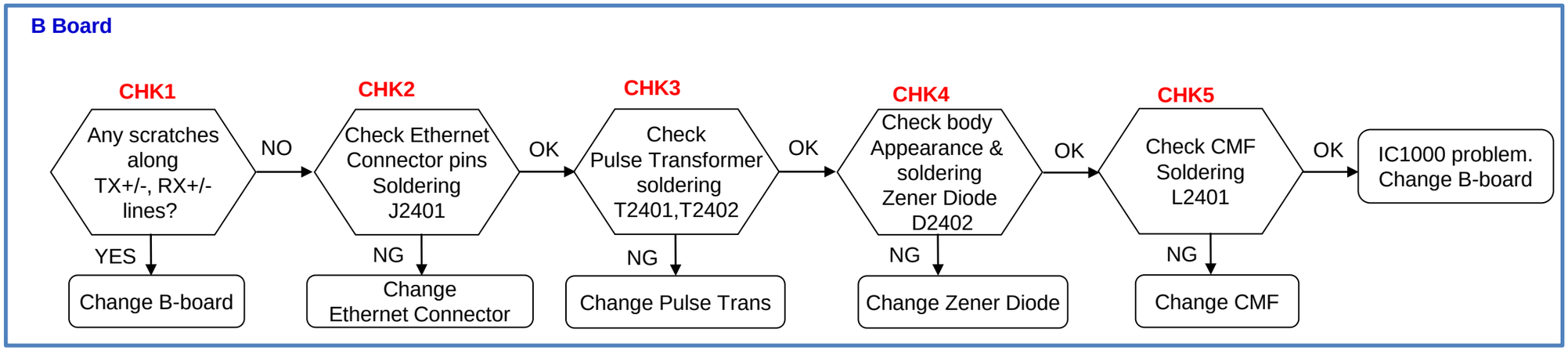
Fig2. CAS ID Error (English)



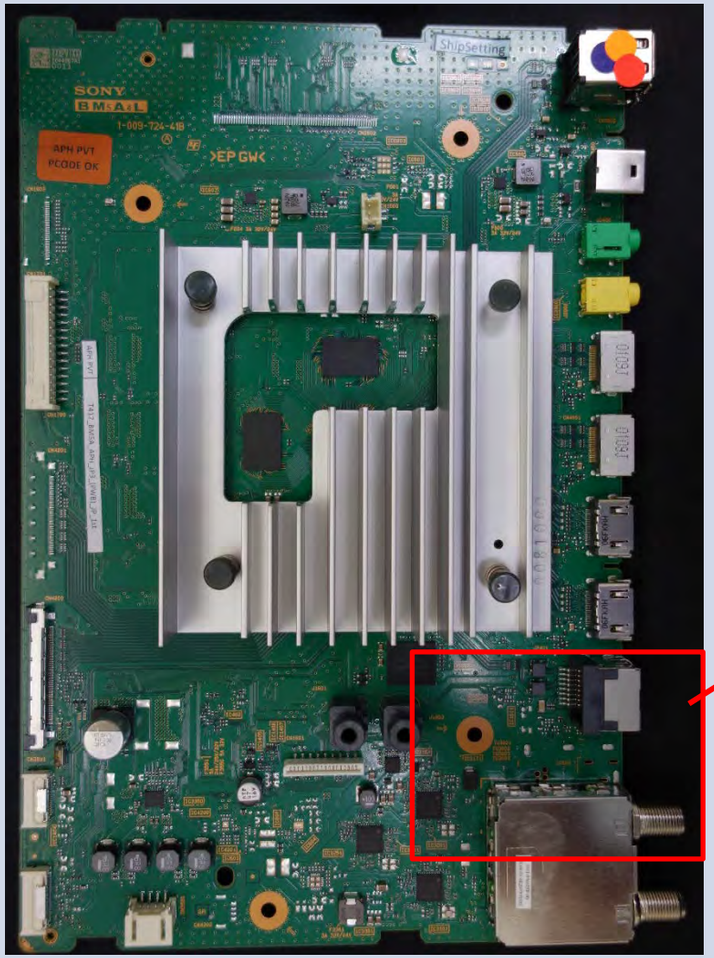
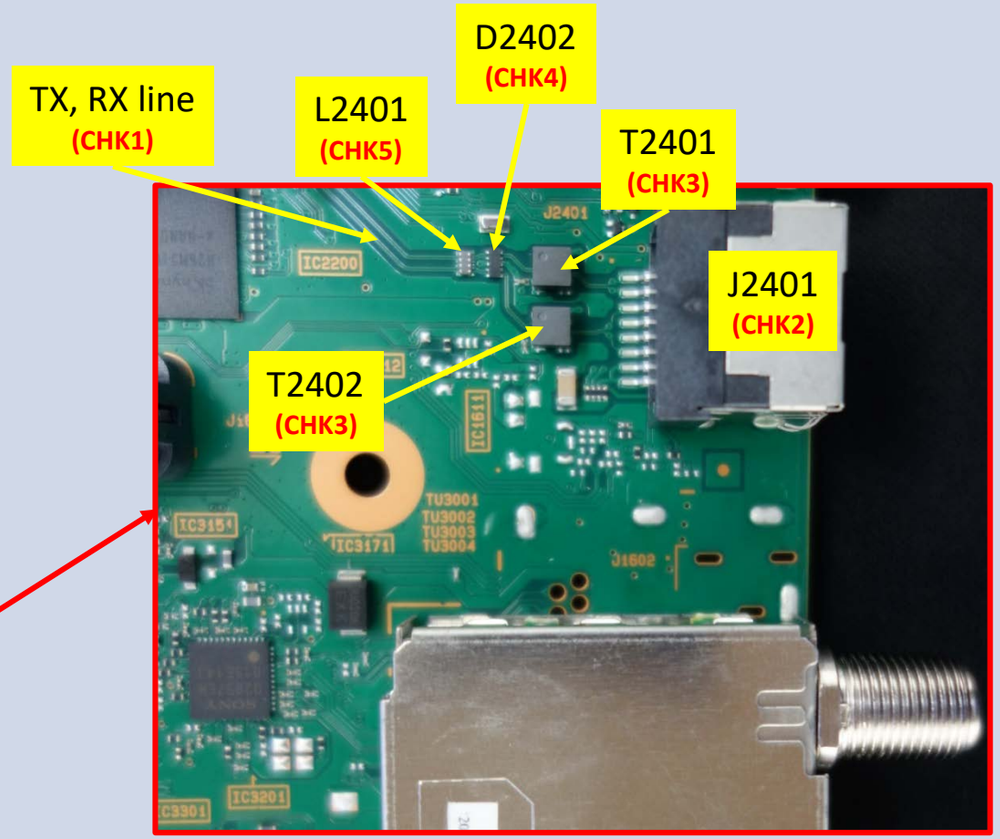
*SmartCore = Hboard (HT2)

6.0 Network Malfunction: Ethernet (Wired)

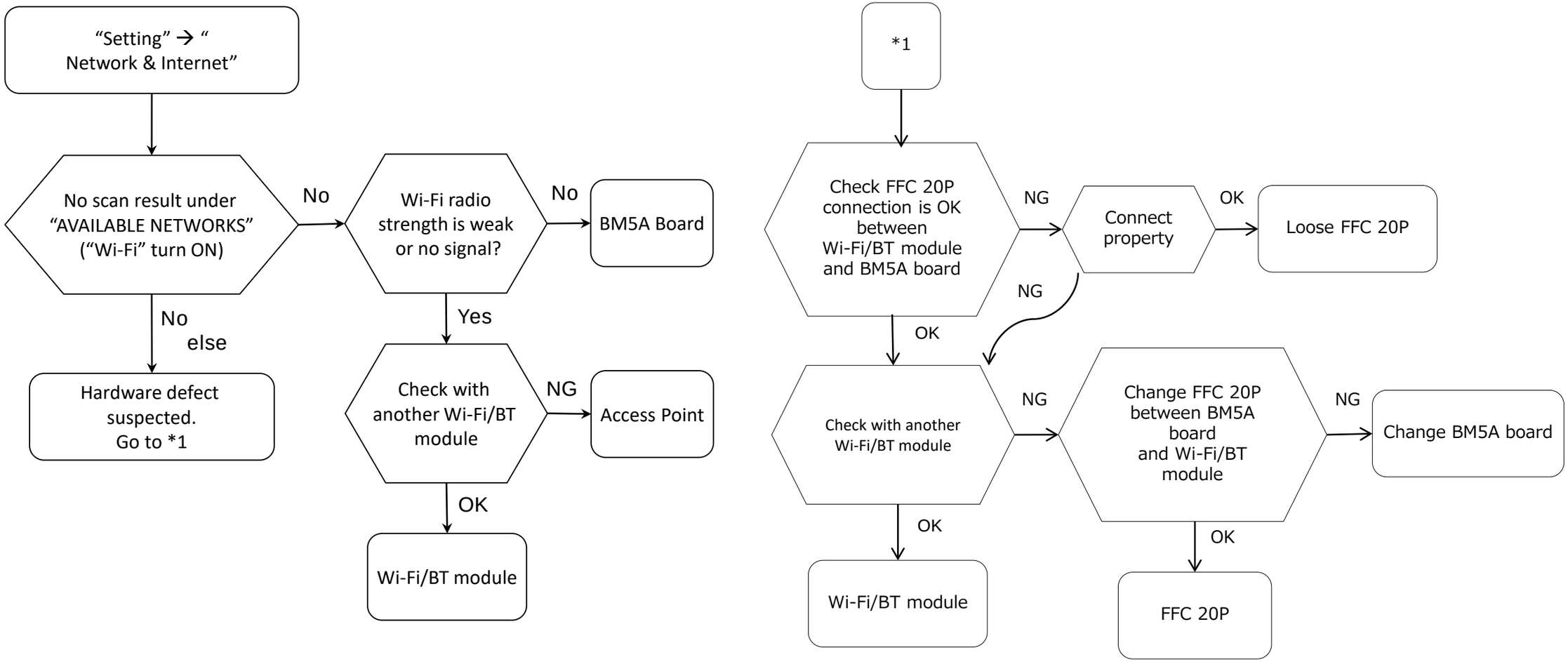




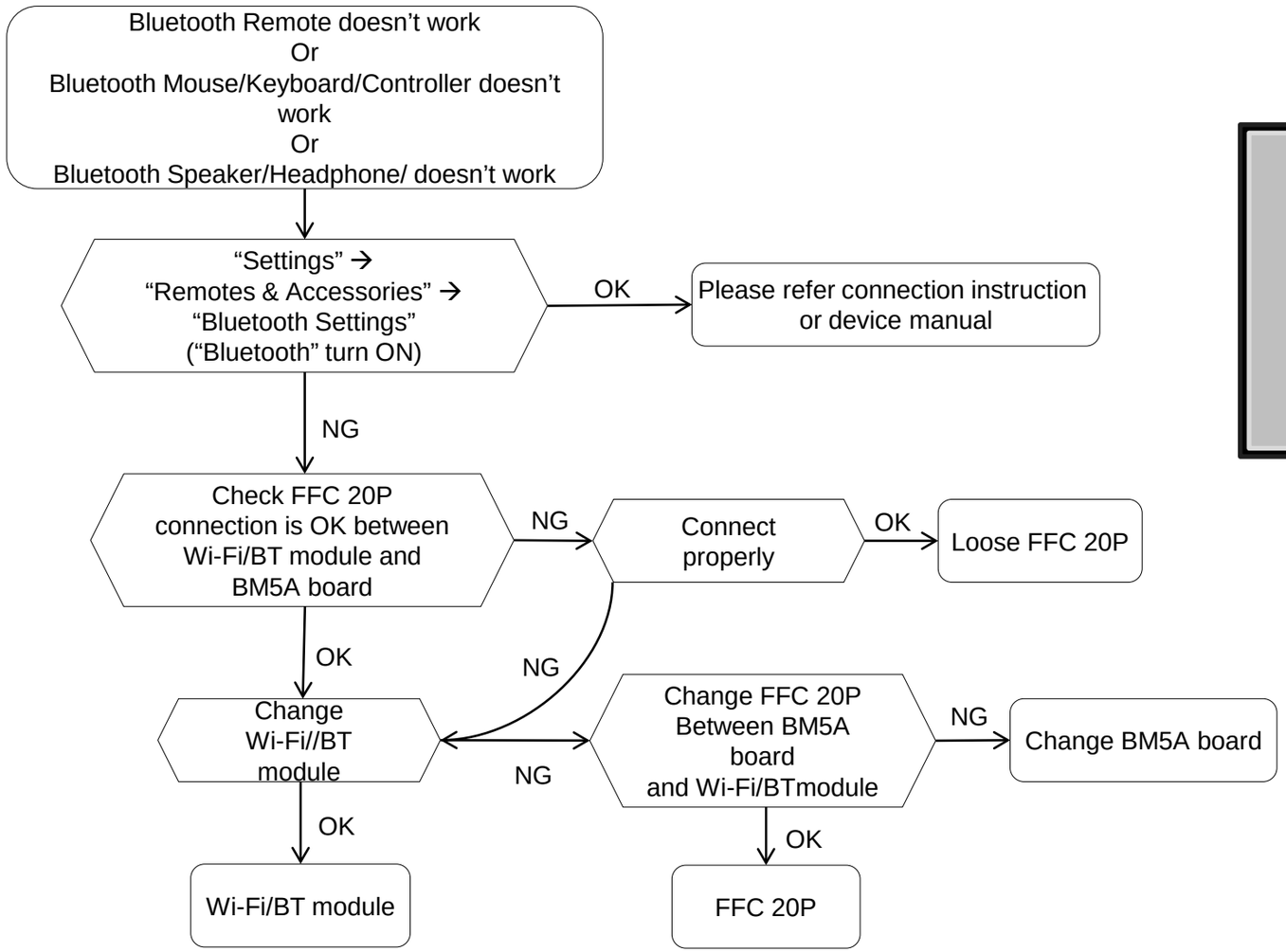
6.0 Network Malfunction: Ethernet (Wired)

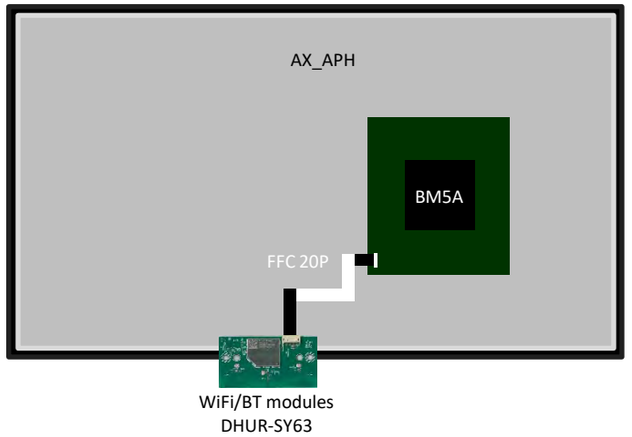
Name	Full Board (A side)	Zoomed in view
BM5A (Actual board)		

6.2 Wi-Fi_BT - Wireless Network malfunction



6.3 Wi-Fi_BT - Bluetooth malfunction





SERVICE ADJUSTMENT

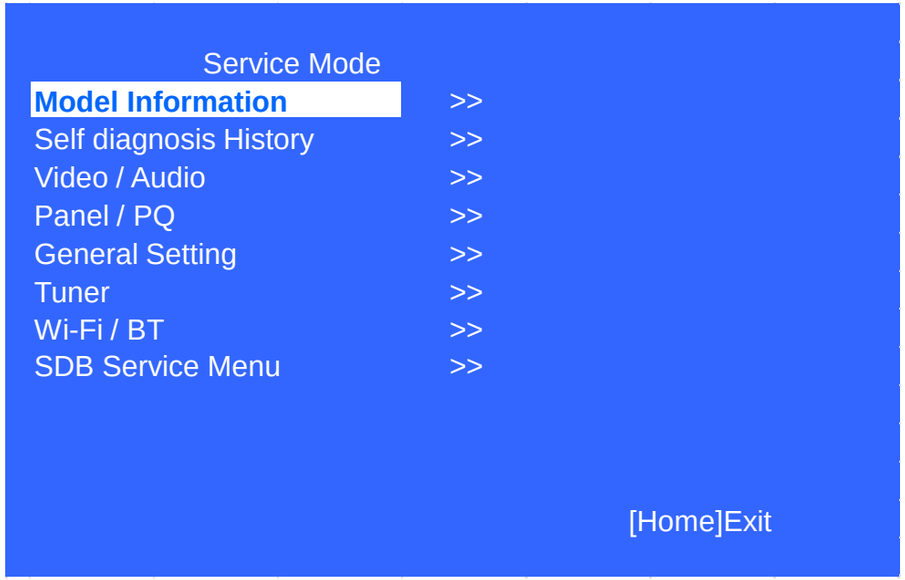
When finished the operation of service mode, please AC Plug OFF/ON the TV set. *If you don't do AC plug OFF/ON, remain the Service Mode App and user can see the Service Mode after RC ON.

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.

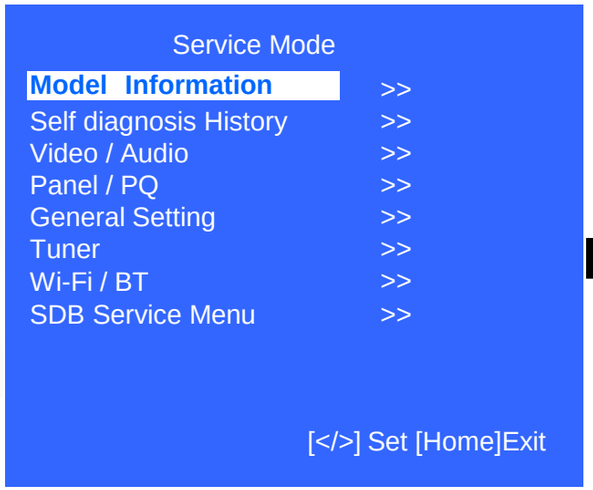
For China models:
Please use FY19 remote (or older) to enter to Service Mode.

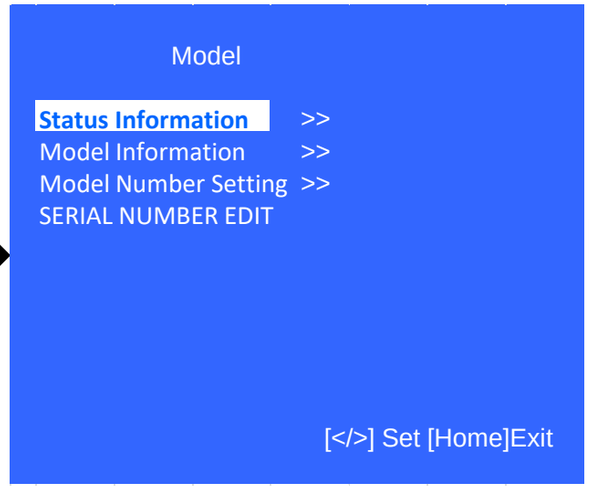


Function	The flow of control
Service mode on	<Display or i+(info)> <5> <Vol. Up> <Power>
Close Service menu	<Home>
Service mode off	AC plug OFF
Item up / down	<↑> / <↓>
Item select left/right	<←> / <→>
Execute	<Enter>

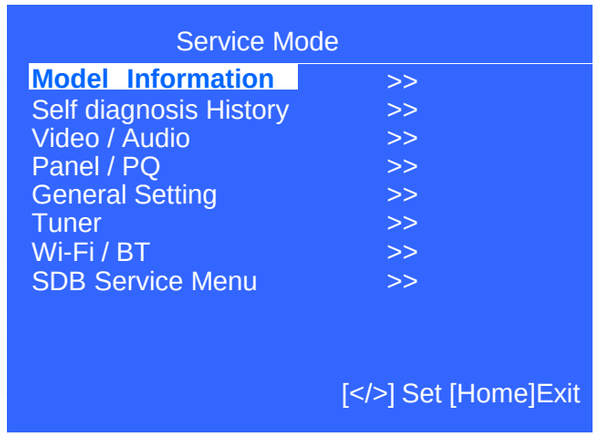
Software Version

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.

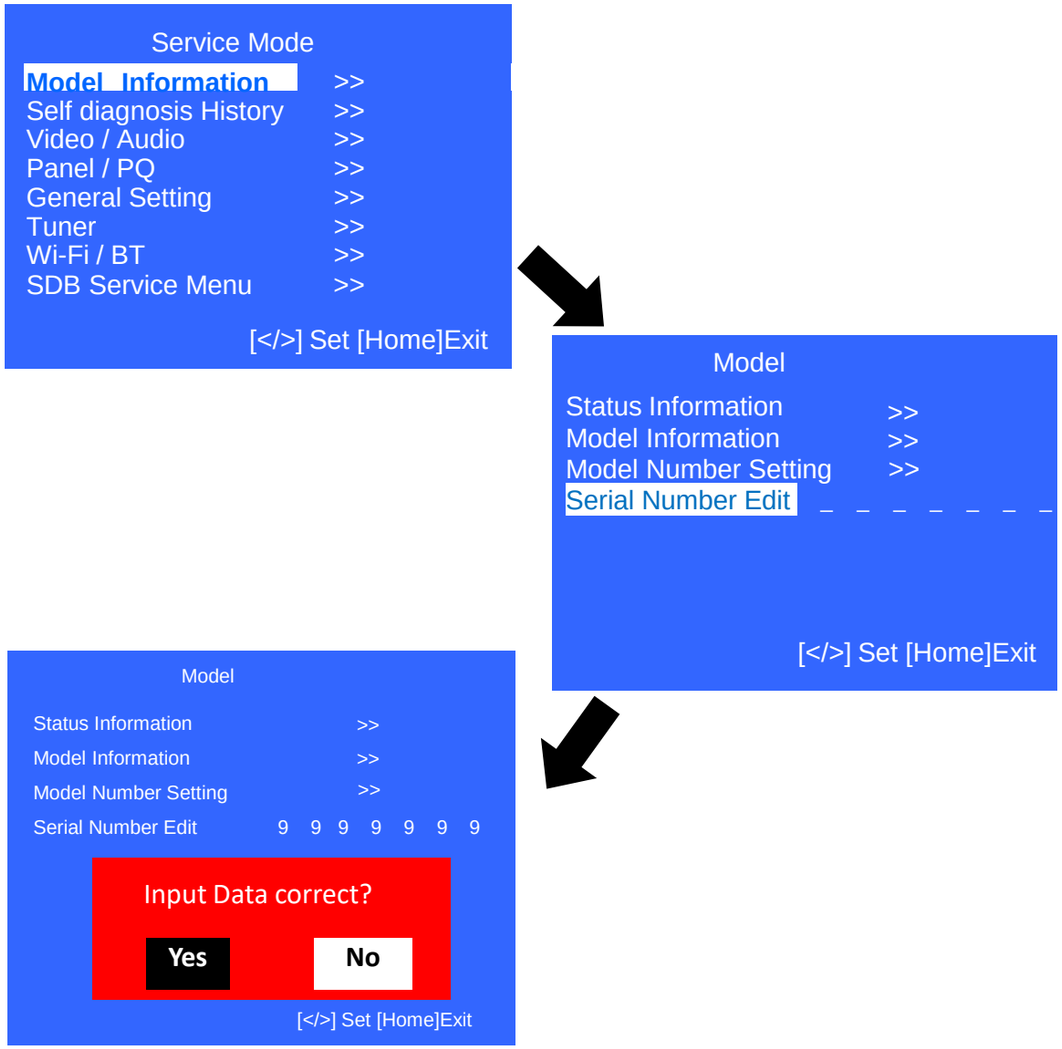
2) Select “Serial Number Edit” by pressing “↑” or “↓” button then pressing “→” button

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**

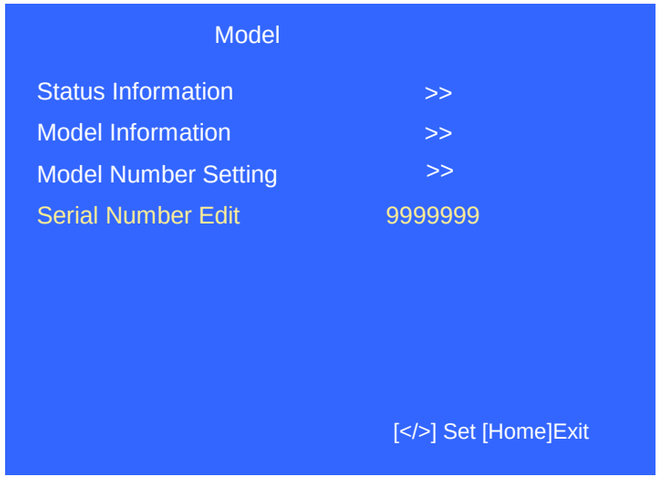
5) Press “→” or “←” button to select YES or NO. Select YES if input data is correct. Select NO if input data is incorrect. Press <Enter> to save answer.

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

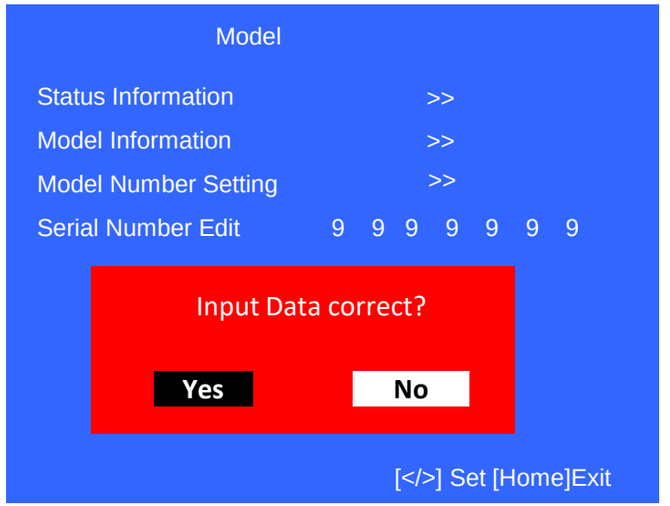


Serial Number Edit (2)

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.

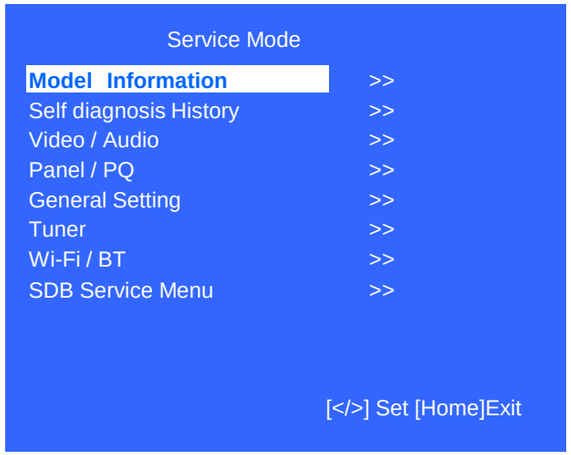


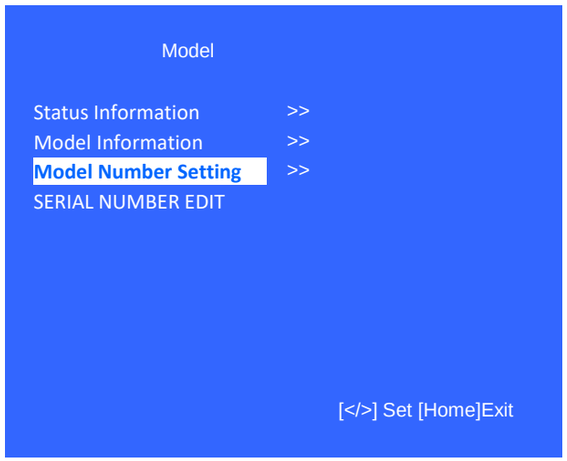
*The font color of YES/NO is change to black when it is selected.

SERVICE ADJUSTMENT

Model Number Setting

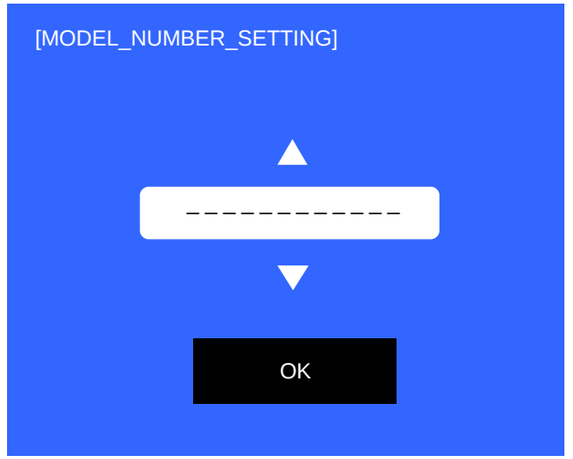
1) In “Service Mode”, select “Model Information” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.





2) Select “Model Number Setting” by pressing “↑” or “↓” button then pressing “Enter” or “→” button

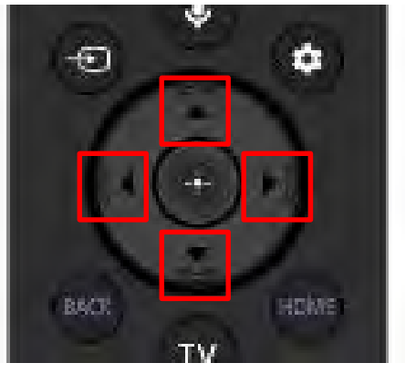
3) Press “↑” or “↓” arrow key to scroll Product Name Candidate. (e.g. KD-75XJ80 RU3)



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.



a.

Service Mode

Model Information	>>
Self diagnosis History	>>
Video / Audio	>>
Panel / PQ	>>
General Setting	>>
Tuner	>>
Wi-Fi / BT	>>
SDB Service Menu	>>

[</>] Set [Home]Exit

b.

Panel / PQ

Back	<<
WB Adjustment	>>
WB/Mura/CUC data transfer	>>

[</>] Set [Home]Exit

Back		<<	
R WB Gain	<[	512	]>
G WB Gain	<[	512	]>
B WB Gain	<[	512	]>
R WB Offset	<[	512	]>
G WB Offset	<[	512	]>
B WB Offset	<[	512	]>

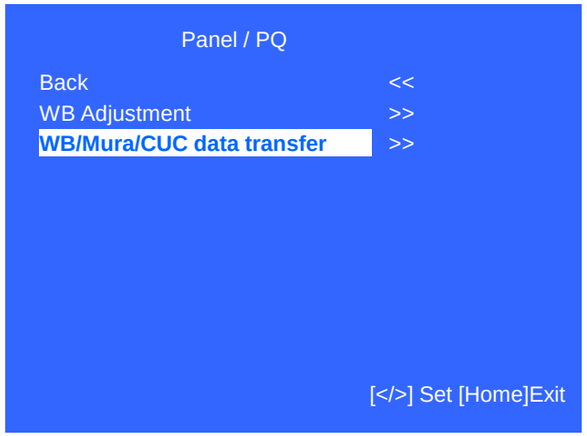
[</>] Set [Home]Exit

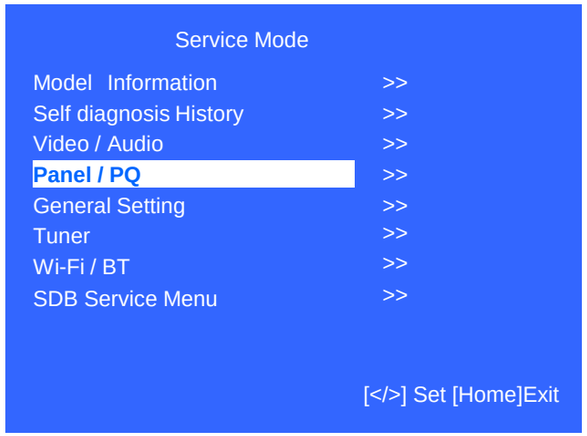
SERVICE ADJUSTMENT

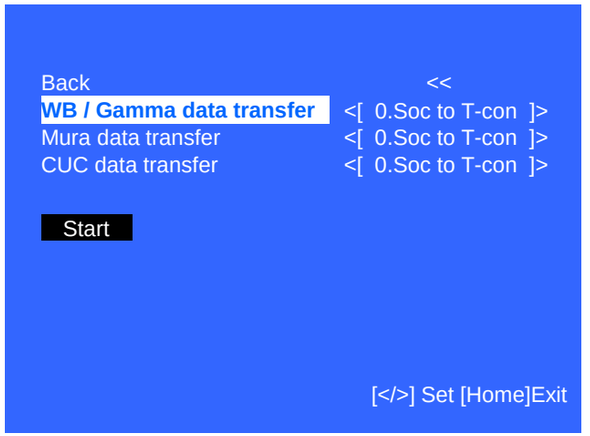
WB/Mura/CUC data transfer (LCD Model only)

Please apply when 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.

SERVICE ADJUSTMENT

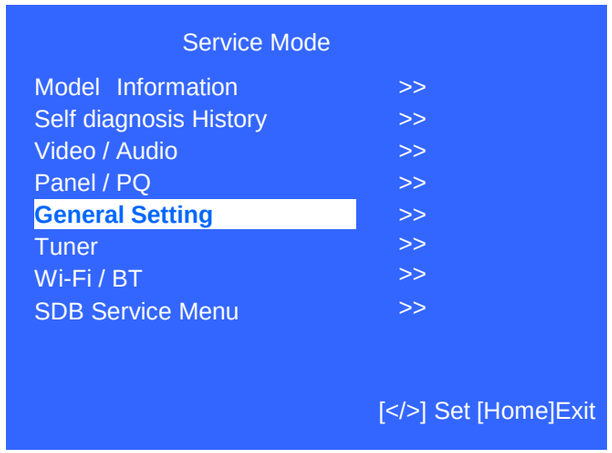
HDD Performance Check (EU ,JP, PA<APH> Only)

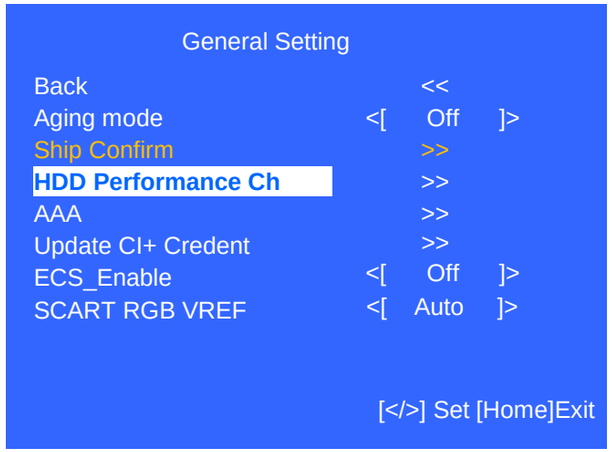
1) In “Service Mode”, select “General Setting” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.

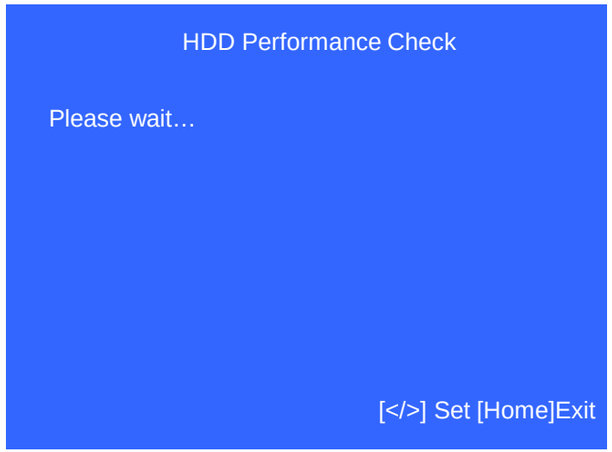
2) Select “HDD Performance check ” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.

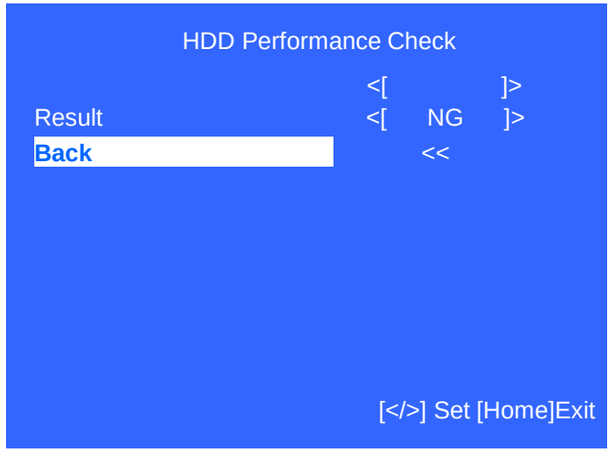
3) A message "Please wait ..." is displayed during performance check processing.

4) Result **OK** or **NG** will be displayed after performance of HDD is checked









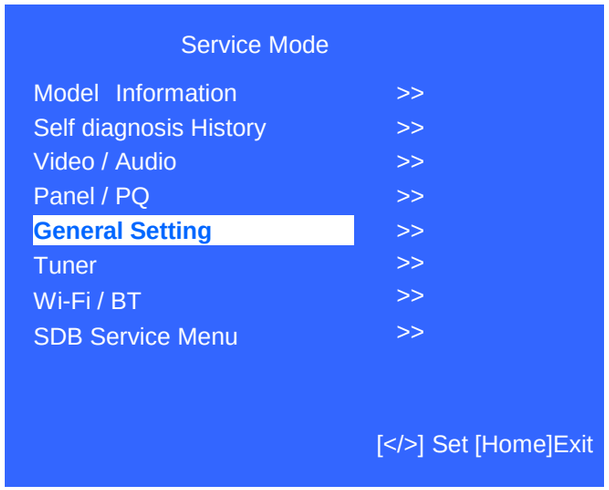
SERVICE ADJUSTMENT

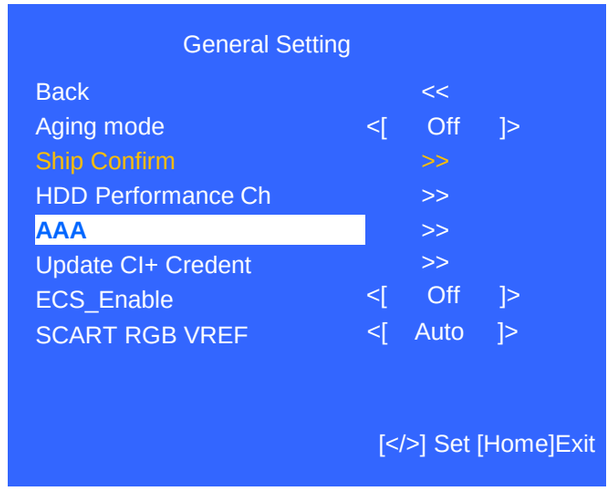
HDD RE-Register (EU ,JP, PA<APH> Only)

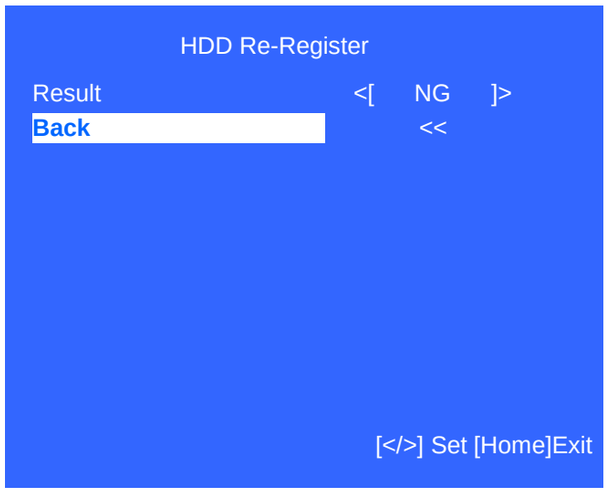
1) In “Service Mode”, select “General Setting” by pressing “↑” or “↓” then pressing “Enter” or “→” button to enter inside.

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



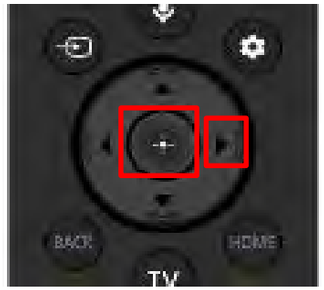


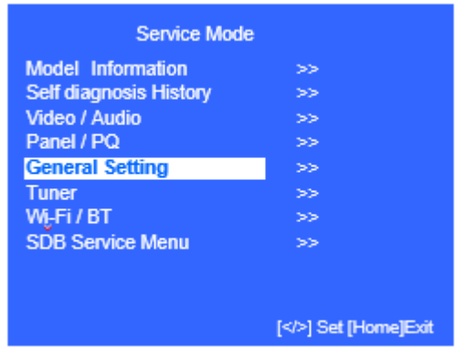


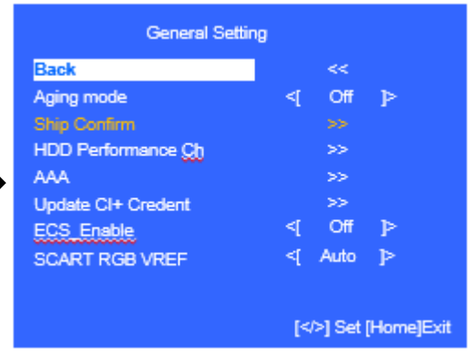
SERVICE ADJUSTMENT

How to enter Aging Mode

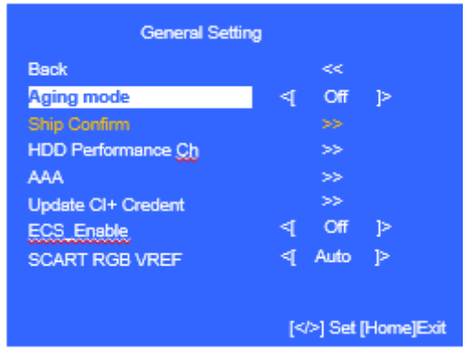
1) In Service Mode, select “General Setting”, press “Enter” or “→” button to enter **General Setting**







2) Press “↓” button to select Aging Mode and “←” button to enter Aging Mode



How to exit Aging Mode

1) In Aging mode, press “←” button to exit Aging Mode and return to Service Mode.
** Note : During Aging Mode, if black screen appears after press “Home” or “Return” button, please do AC Off/On to recover.

USB Update

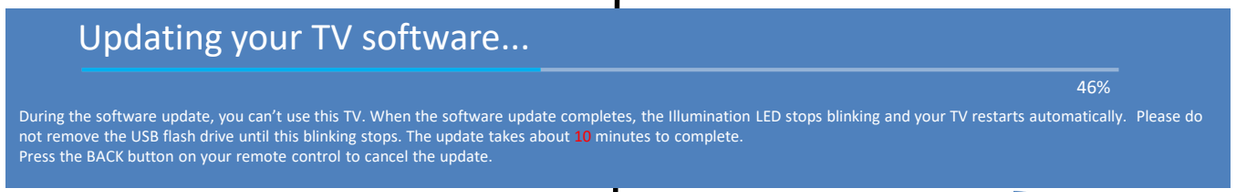
1:Download USB image and unzip file.

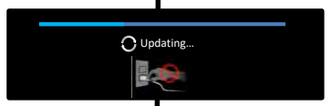
2: copy zip file to USB memory root folder.

3: USB memory insert TV.

Caution:
Do not power off while the update is in progress.

4-a:USB image is newer soft version.
Automatically show message and start update.
Please follow directions.





5: finished

4-b:USB image is not newer soft version.
Automatically show message.
Please follow directions.

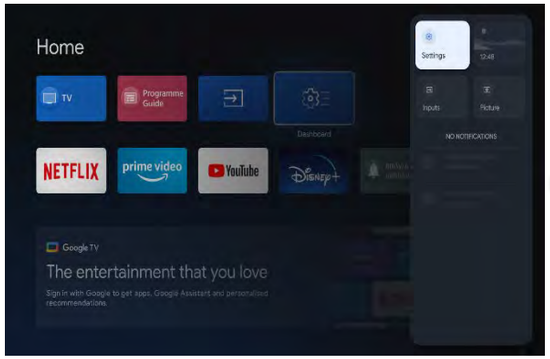
5: finished

The system reboot will happen once or twice

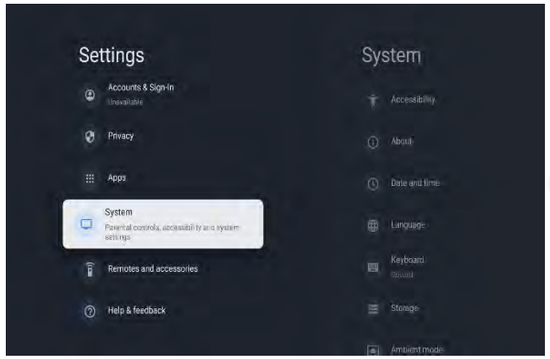
※ Display may change depending on the model / SW version.

Factory Data Reset – with UI method

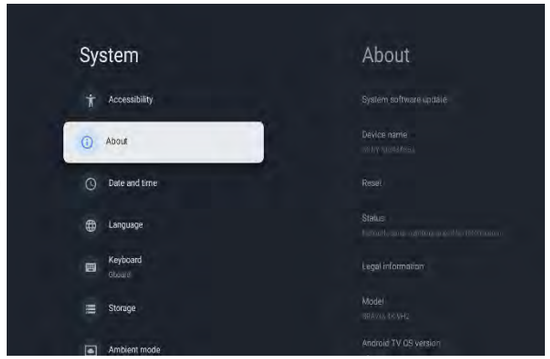
1) At Home Menu, go to Settings



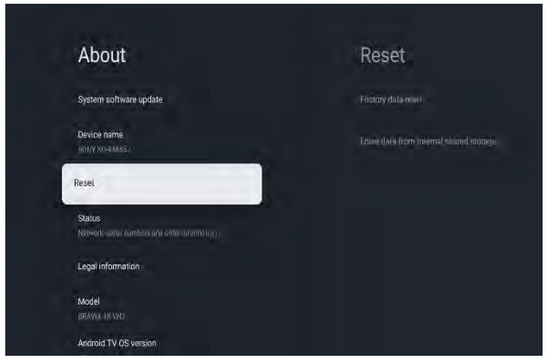
2) Select System/Device Preferences



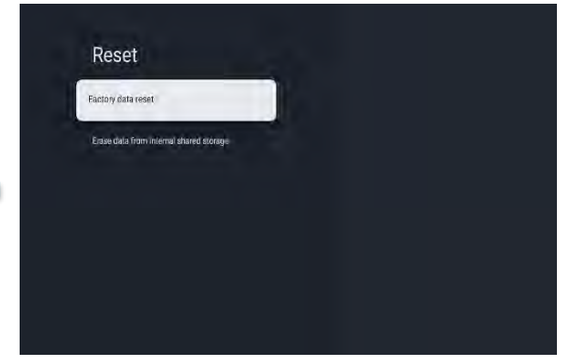
3) Select ‘About’



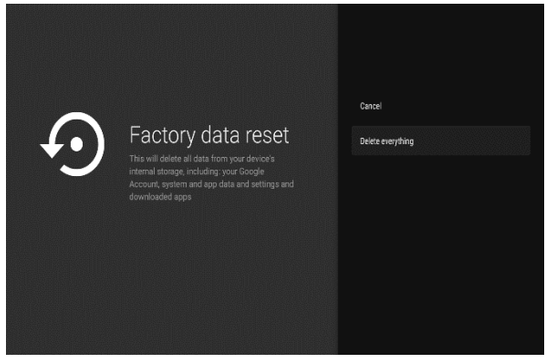
4) In About, Select ‘Reset’



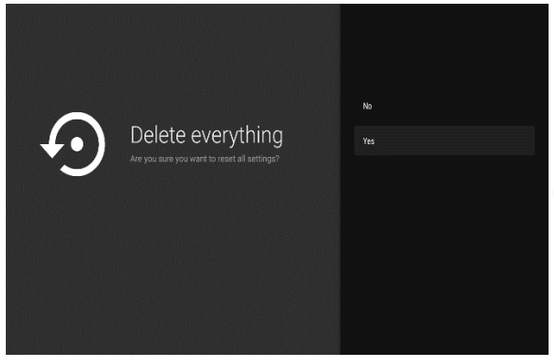
5) Select ‘Factory data reset’



6) Select ‘Delete everything’

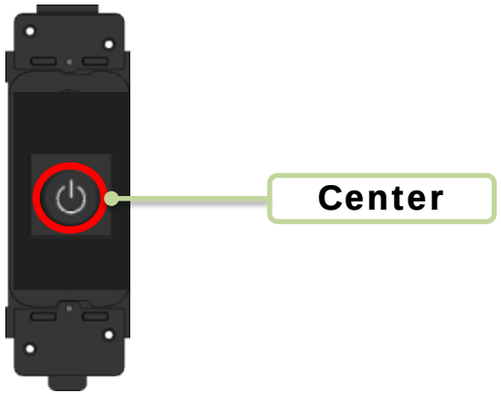


7) Select ‘Yes’



Factory Data Reset – force method (without UI)

1. Press “Center” key” key



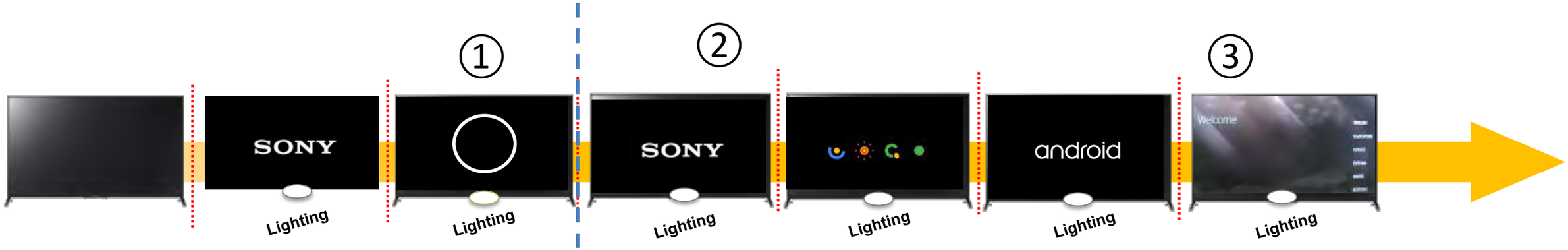
2. AC on (while holding “Center” keys) for more 5second

	1 Key
Key type	Center Key
Models	APH
Procedure	1) Press and hold **Center Key**. 2) AC ON. 3) Hold the button for more 5 seconds until the system starts FDR.

TV behavior during Factory Data Reset operation

SERVICE ADJUSTMENT

TV behavior during Factory Data Reset operation



① TV reboot with White LED

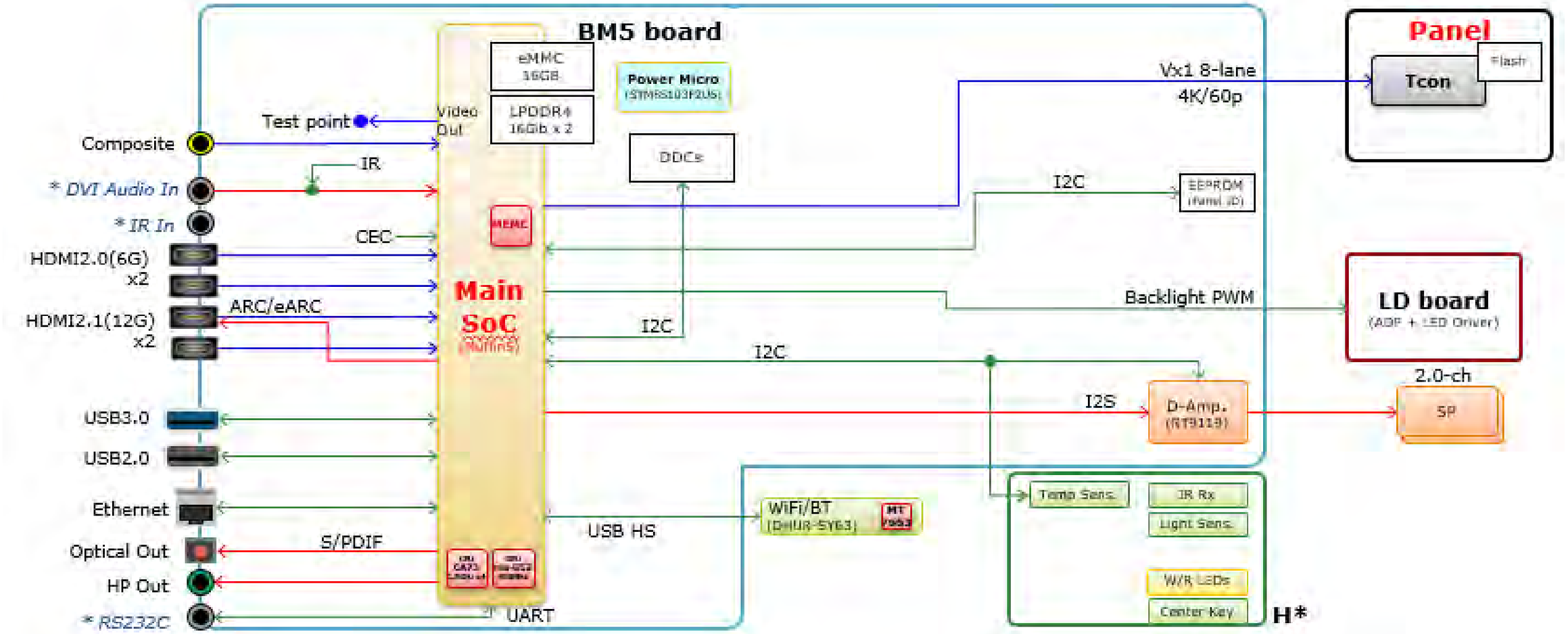
② Factory Reset logo start

③ TV start with Initial setup condition

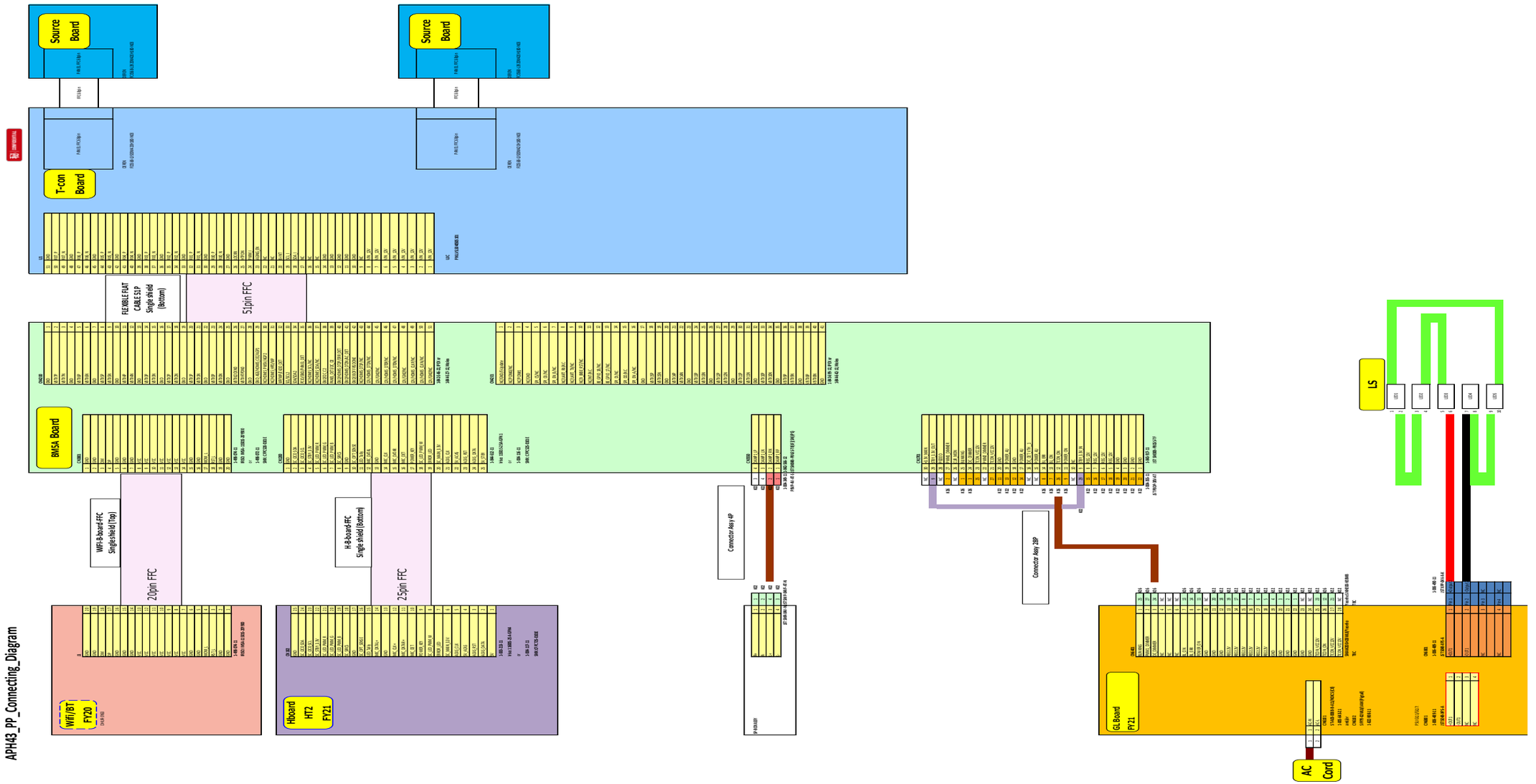
APH: M5 LCD Global Dimming 60Hz

Video signal
Audio signal
Control Bus

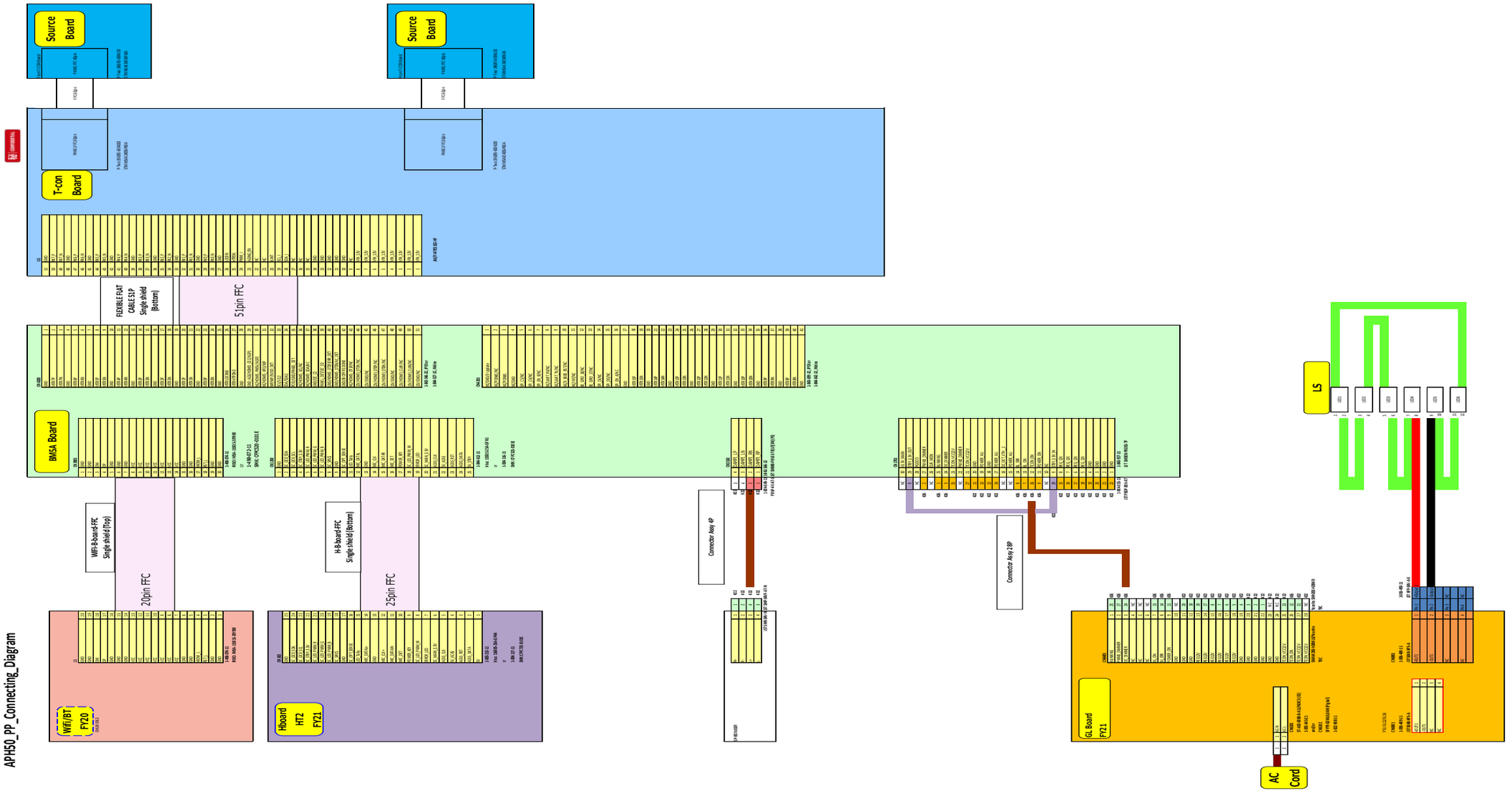
** depend on destinations.*



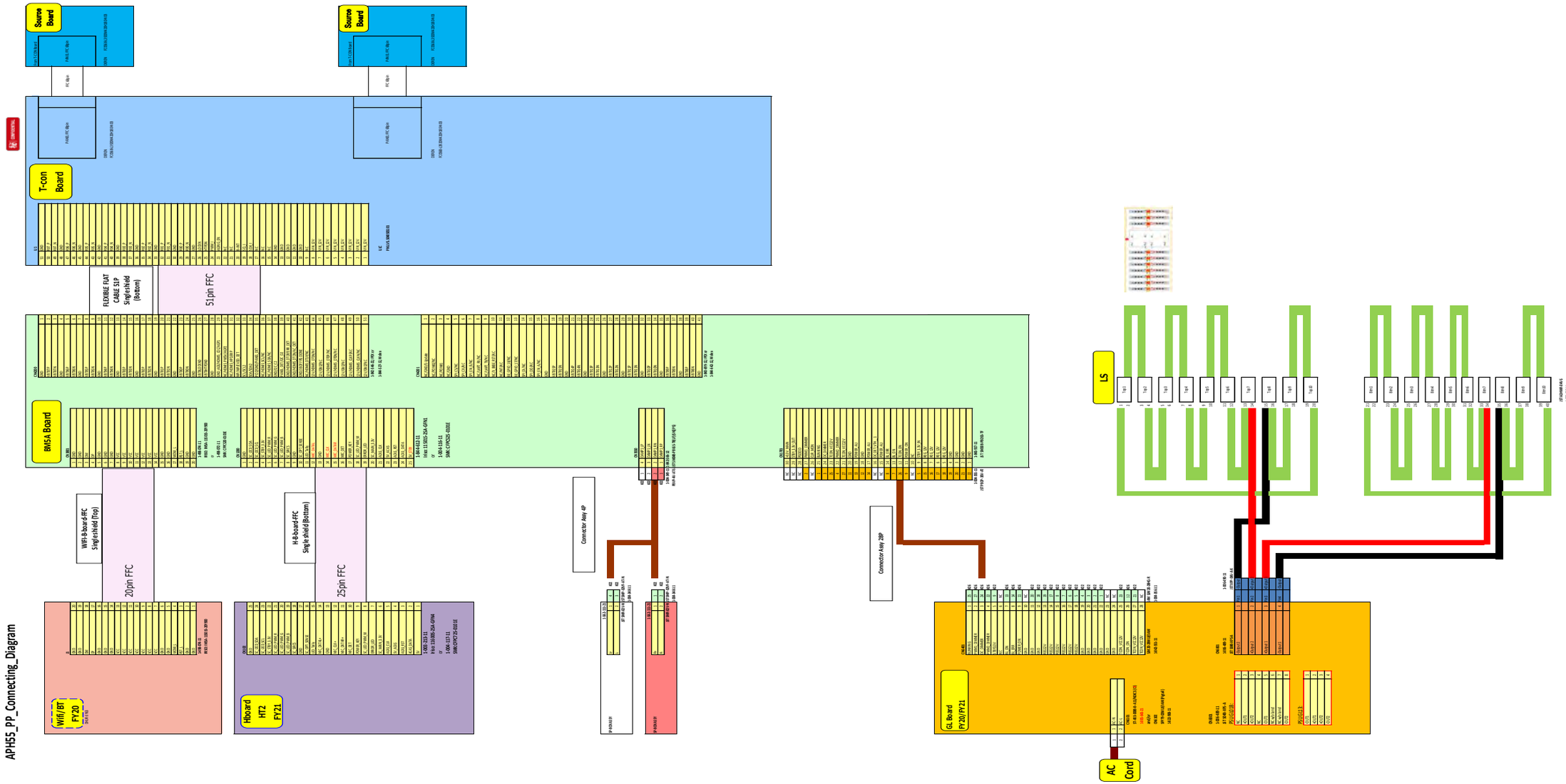
43 Connecting Diagram



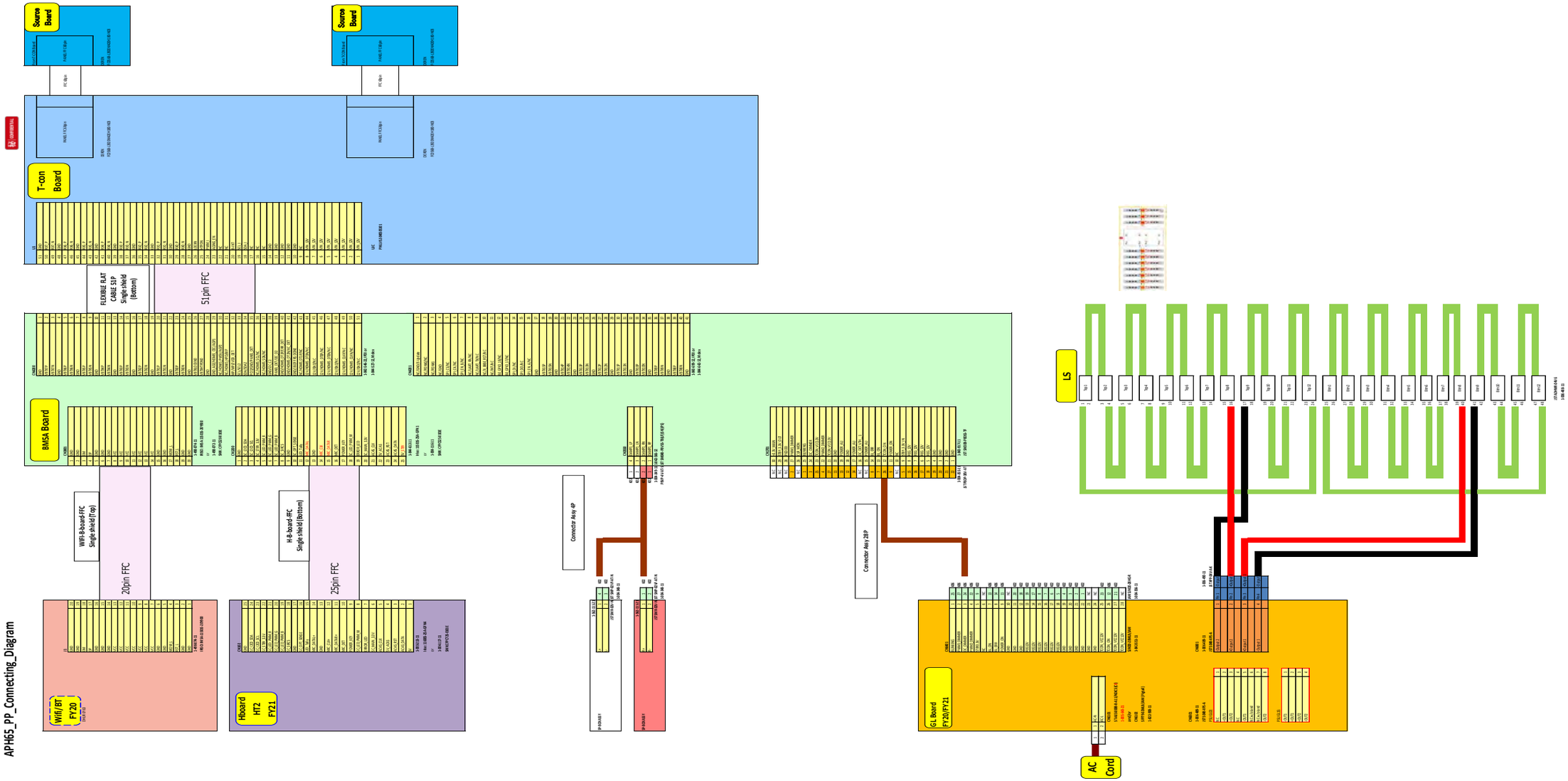
50 Connecting Diagram



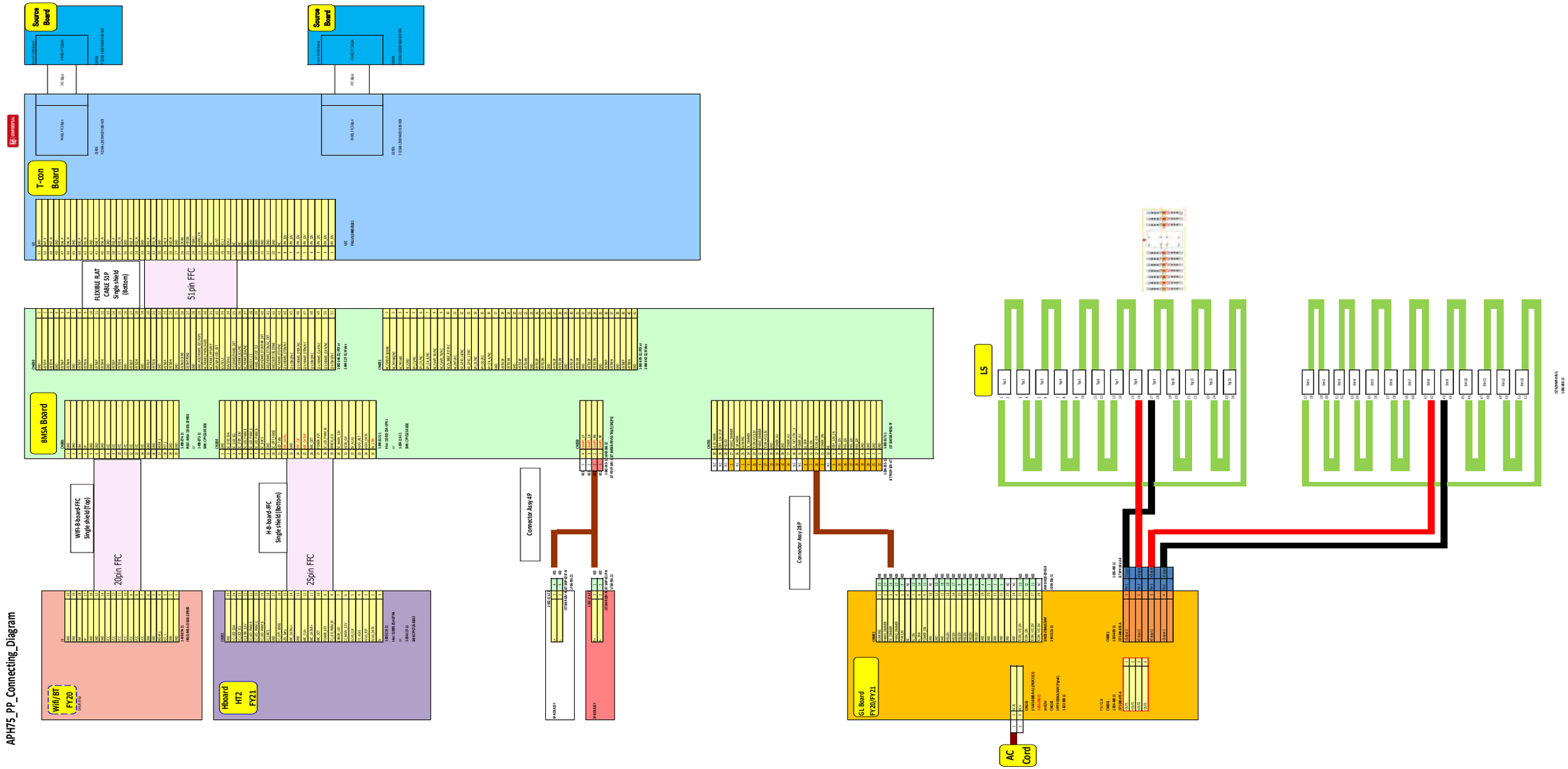
55 Connecting Diagram



65 Connecting Diagram



75 Connecting Diagram



Panel Handling Guide 1 – Holding Position

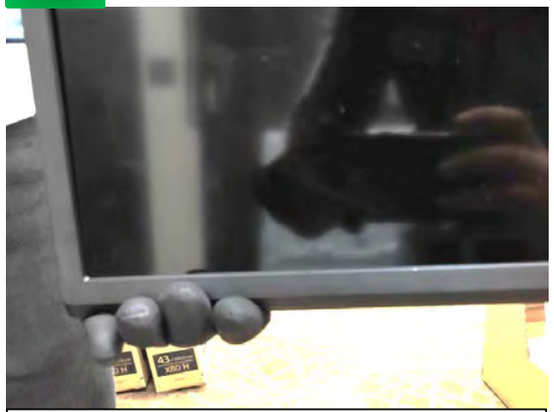
OK

Always wear gloves during P-mod handling

OK

Holding edge of Bezel without touching O-cell

OK



Support set at edge of Bezel without touching O-cell

NG

Hand pressing O-Cell

NG

Hand pressing O-Cell

Panel Handling Guide 2 – Carry Position

OK

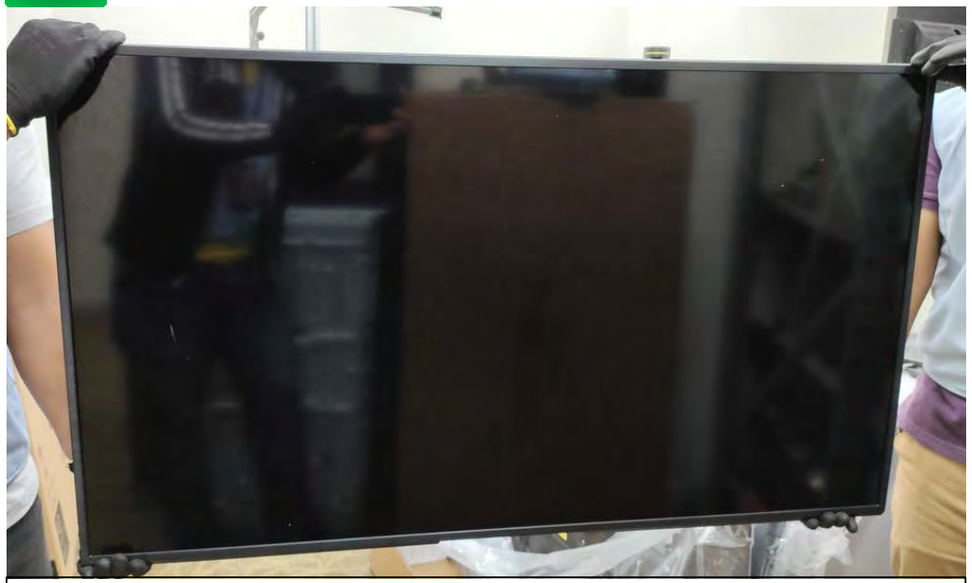
Carry P-mod by vertical position

NG

Carry P-mod by Horizontal position

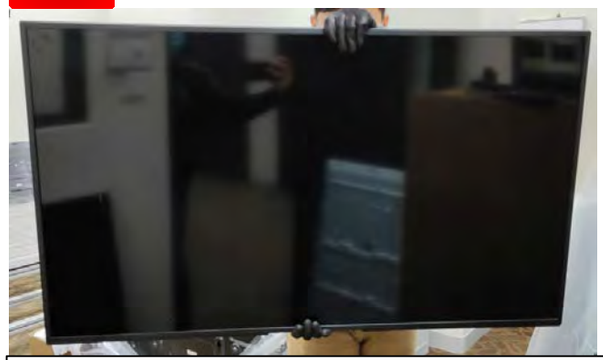
Panel Handling Guide 3 – Carry Condition

OK

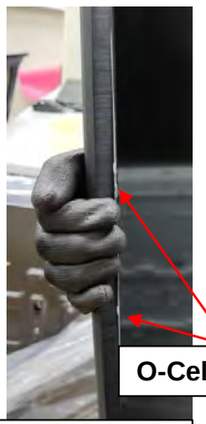


Carry P-mod by 2 person

NG



Carry P-mod by 1 person



O-Cell Pop out

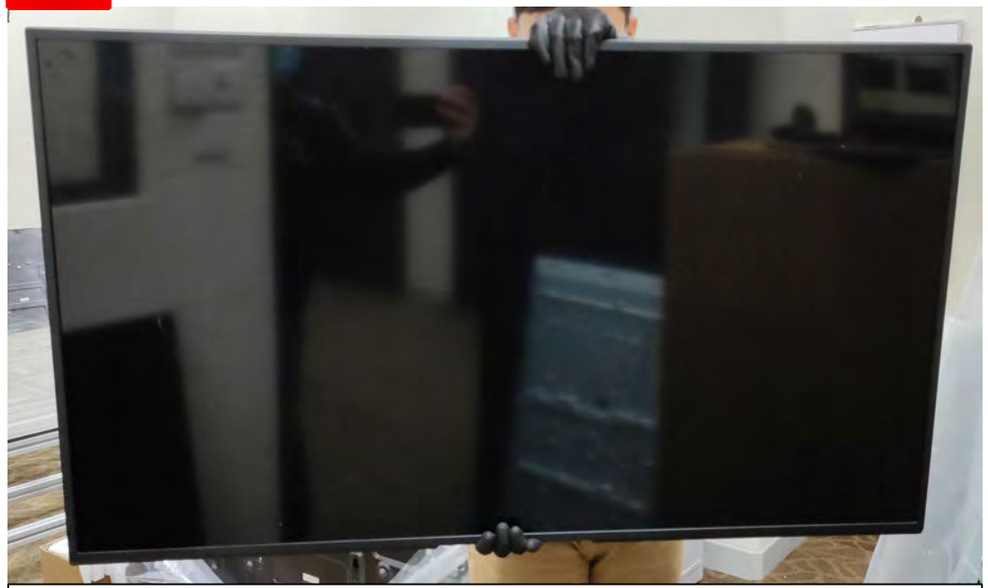
Do not apply force on Back Chassis and rotate the Bezel
→ Can cause O-cell to pop out

Panel Handling Guide 4 – Carry Condition

OK

Carry P-mod by Corner

NG



Carry P-mod at center area

Panel Handling Guide 5 – Resting condition

OK

Resting P-mod by 2 persons

Panel can be fully supported by table surface

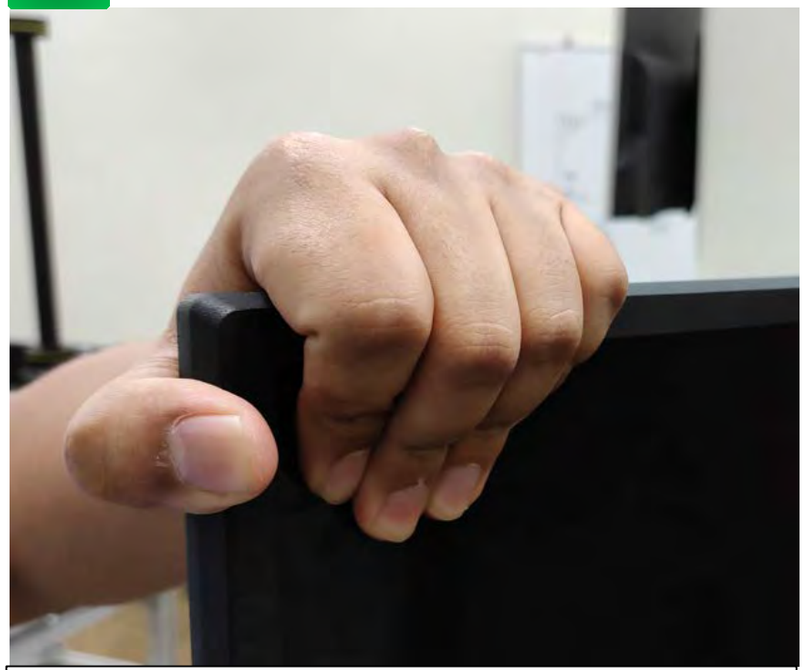
NG

Resting P-mod by 1 person

Panel is not fully supported by table surface (Corner / edge is hanging)

Panel Handling Guide 6 – Prohibited method

OK



Handle P-mod without gloves

NG

Press on P-mod during Assy & Disassy

Panel Handling Guide 7 – Restricted area

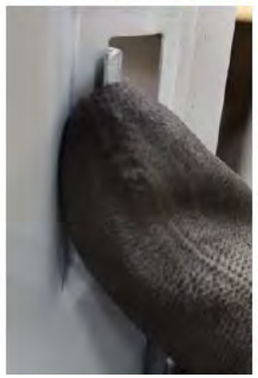
OK

RC hook

Piezo hook
(2
Positions
L/R)

NG

Touch on PIEZO hook



Touch on RC hemming

Avoid touch Piezo hook and rear cover hook during P-mod handling