

SERVICE MANUAL (COMMON)

ORIGINAL MANUAL ISSUE DATE: 2022.04

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GR2VH CHASSIS
Segment : FM

9-888-904-01

LCD TV
LCD MONITOR
SONY[®]

Sony EMCS (M) Sdn. Bhd., HES-M
© 2022.04

REVISION HISTORY

Version	Date	Subject
1.	2022.04	1 st Issue

SONY®

MODEL LISTS

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

Self Diagnosis
Supported model

REGION

AMERICA

CHINA

ASIA

MODEL

XR-65X95K

XR-75X95K

XR-85X95K

XR-65X95EK

XR-75X95EK

XR-85X95EK

XRM-65X95K

XRM-75X95K

XRM-85X95K

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Self Diagnosis
Supported model**Please refer Service Manual – Unique for below information :**

- Tools and Equipments
- FFC Precautions
- Disassembly and Removal Caution
- Wire Dressing
- Circuit Board Location
- Exploded Views and Part Lists
- Smart Core
- Appendix

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 stated 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 should be in the neutral of the mains supply. When replacing the fuse, the mains must be disconnected to 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 operations. 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 operations are identified in this manual. Follow these procedures whenever critical components are replaced or improper operation is suspected.

6) IMPORTANT REMINDER FOR TV MAIN BOARD REPLACEMENT:

It is mandatory for service centers to confirm the TV's system information after each repair is carried out with Main board 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. 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.
- 7) Always clean the LCD panel with a soft cloth material.
- 8) Handle the wires or connectors of the backlight circuit with care. Damaging the wires may cause a short circuit.
- 9) Protect the panel from ESD to avoid damaging the electronic circuit (C-MOS).

SAFETY NOTES

10) During the repair, DO NOT leave the POWER ON or Burn-in period for more than 1 hour while the TV is facing down on a cloth. Refer Figure 1.

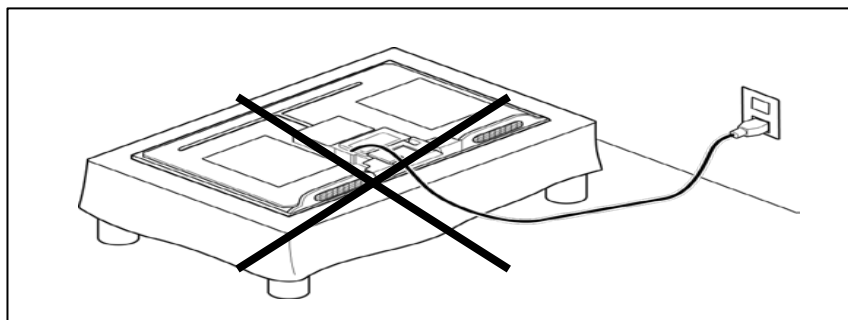


Figure 1.

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.

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.

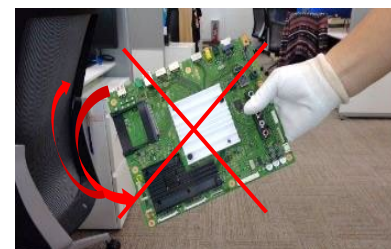
① Hold the board with both hands.



② Do not hold/push Heat-Sink.



③ Handle with care. Do not swing.



SAFETY NOTES

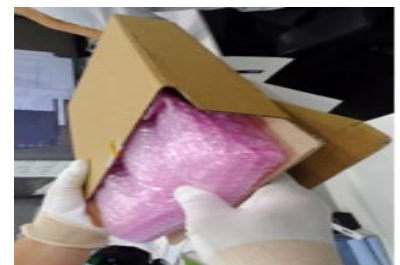
- ④ Regardless of Good board or Defective board, always put it on ESD cushion/sheet slowly.



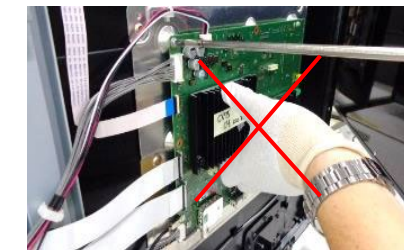
- ⑤ Do not stack up.



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



- ⑦ Do not hold Heat-Sink when dis-assembly or assembly it.



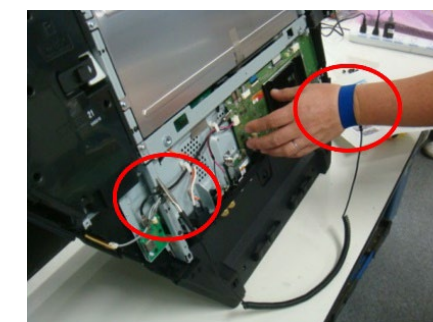
- 2) Caution for Board handling(ESD).

Be sure to observe the following contents.

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



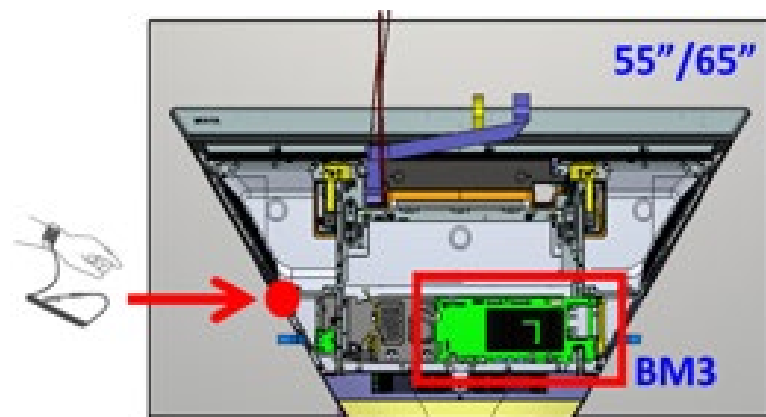
- ② Use ESD wrist-strap.



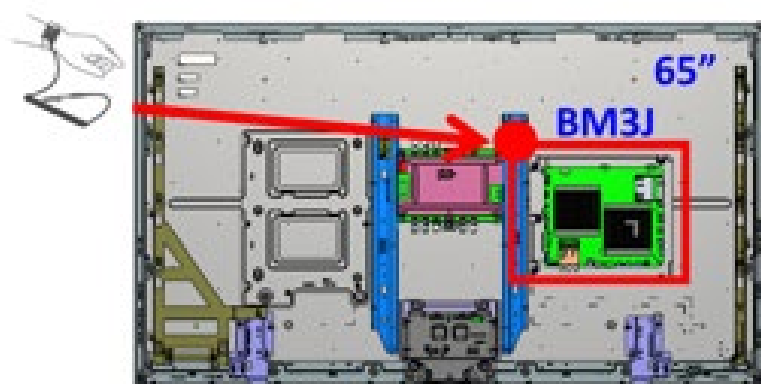
SAFETY NOTES

※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*-65Z9F>



※**Caution**

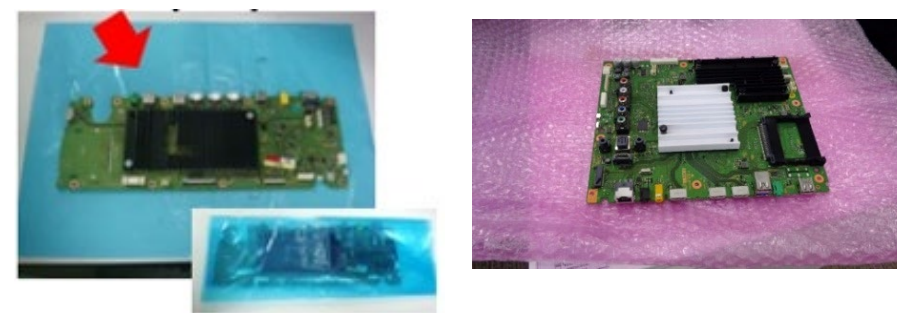
ESD wrist-strap to be checked daily.

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

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



④ After 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.

SAFETY NOTES

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 show obvious signs of deterioration even though functioning. Point them to the customer and recommend for 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 350uA peak).

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

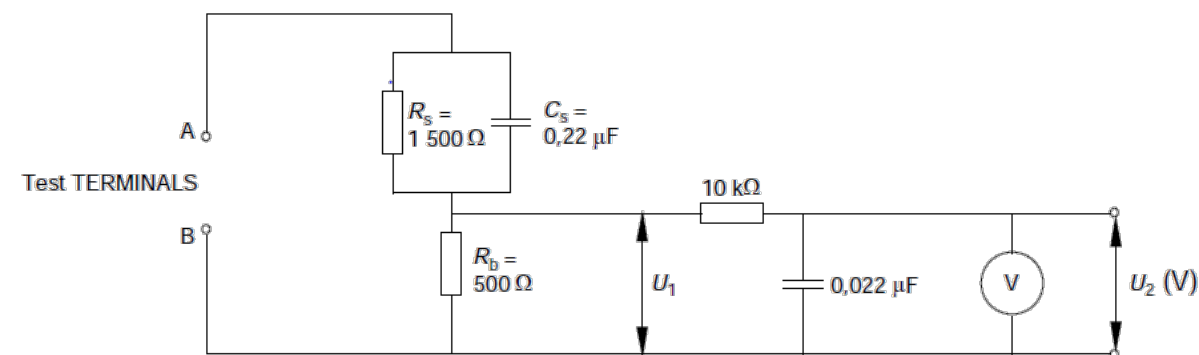


Figure 2 – Measuring network for Leakage Current

IEC 802/98

SAFETY NOTES

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).

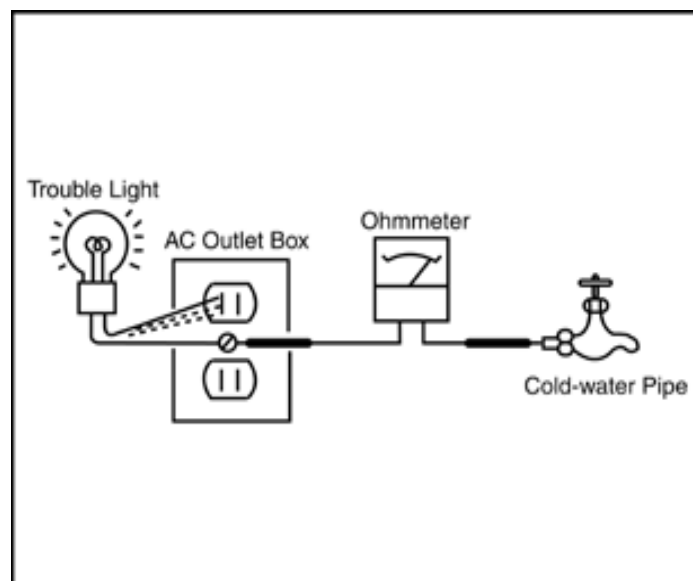


Figure 3. Checking for earth ground.

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

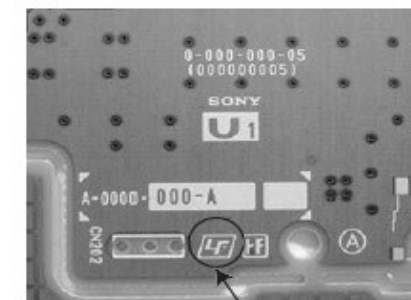


Figure 5: LF logo on circuit board

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 DIAGNOSIS 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	FM
2x	<B/G> Main 12V over voltage [MAIN_POWER]
3x	<B/G> Main 5.0V failure [DC_ALERT]
	<B/S/G> Audio amp. protection [AUD_ERR]
4x	<P/LD/B/G> LED driver failure/LED voltage protection [LD_ERR]
	<LD/P/B> <i>Error detection of the I2C communication between the Main device and the LD IC.[BCM_ERR]</i>
5x	<P/T/G/B> <i>Panel ID EEPROM I2C No ACK (Also, panel power failure is a suspect) [P_ID_ERR]</i>
6x	<P/G/B> Backlight failure [BACKLIGHT_ERR]
7x	<P/B> Over temperature protection [TEMP_ERR]
8x	 4KBE failure (4KBE WDT) [4KBE_ERR]

Notes :

Blue italic: detect at startup sequence only.

<G>: Power supply board, : Main board,

<T>: T-con board, <LD>: LD board

<P>: Panel module, <S>: Speaker

SELF DIAGNOSIS FUNCTION

Self Diagnosis Quick Reference (Not LED blinking) – Record Only

Error Item	FM
TU_DEMOD	None
T-CON ERR	<T> T-CON device I2C communication failure
AUD_ERR_I2C	 Audio amp I2C communication failure
TEMP_ERR_I2C	<B/H> Temp sensor I2C communication failure
TU_DEMOD_I2C	 Tuner & Demodulator I2C communication failure
EARC_ERR_I2C	None
8KBE_COM_ERR	None
8KSHV_ERR	None
AMB_ERR_I2C	<B/H> Ambient sensor I2C communication failure

Notes :

: Main board, <T>: T-con board, <H>: LED / IR & sensor board, <8>: 8KBE Board

SELF DIAGNOSIS FUNCTION

Self Diagnosis Service Menu

Entry (Self Diagnosis Display)

1. Go to TV standby condition by remote commander.
2. Press keys on remote sequentially as right table.
3. You can see Service menu on display.

Conventional Key Sequence	New Key Sequence from Valhalla2.1 (to Support "Simple Remote")
<Display> or <i+(info)> ⇒ <5> ⇒ <Vol-> ⇒ <Power>	<Home> ⇒ <Enter(DpadCenter)> ⇒ <Vol-> ⇒ <Power>

< Self Diagnosis Display [Example] >

(displaying item is depends on each Model, refer to previous page)

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	AUD ERR I2C	000000000000	000000000000	000000000000	000
003	TU DEMOD I2C	000000000000	000000000000	000000000000	000
003	AMB ERR I2C	000000000000	000000000000	000000000000	000
004	LD ERR	000000000000	000000000000	000000000000	000
004	BCM ERR	000000000000	000000000000	000000000000	000
005	T-CON ERR	000000000000	000000000000	000000000000	000
005	P ID 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
008	4KBE ERR	000000000000	000000000000	000000000000	000
00034 00231 00034			[Home]Exit [Up/Down]Scroll		

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 FUNCTION

Self Diagnosis Display

Format of error timestamps

YYMMDDhhmmss (in UTC)

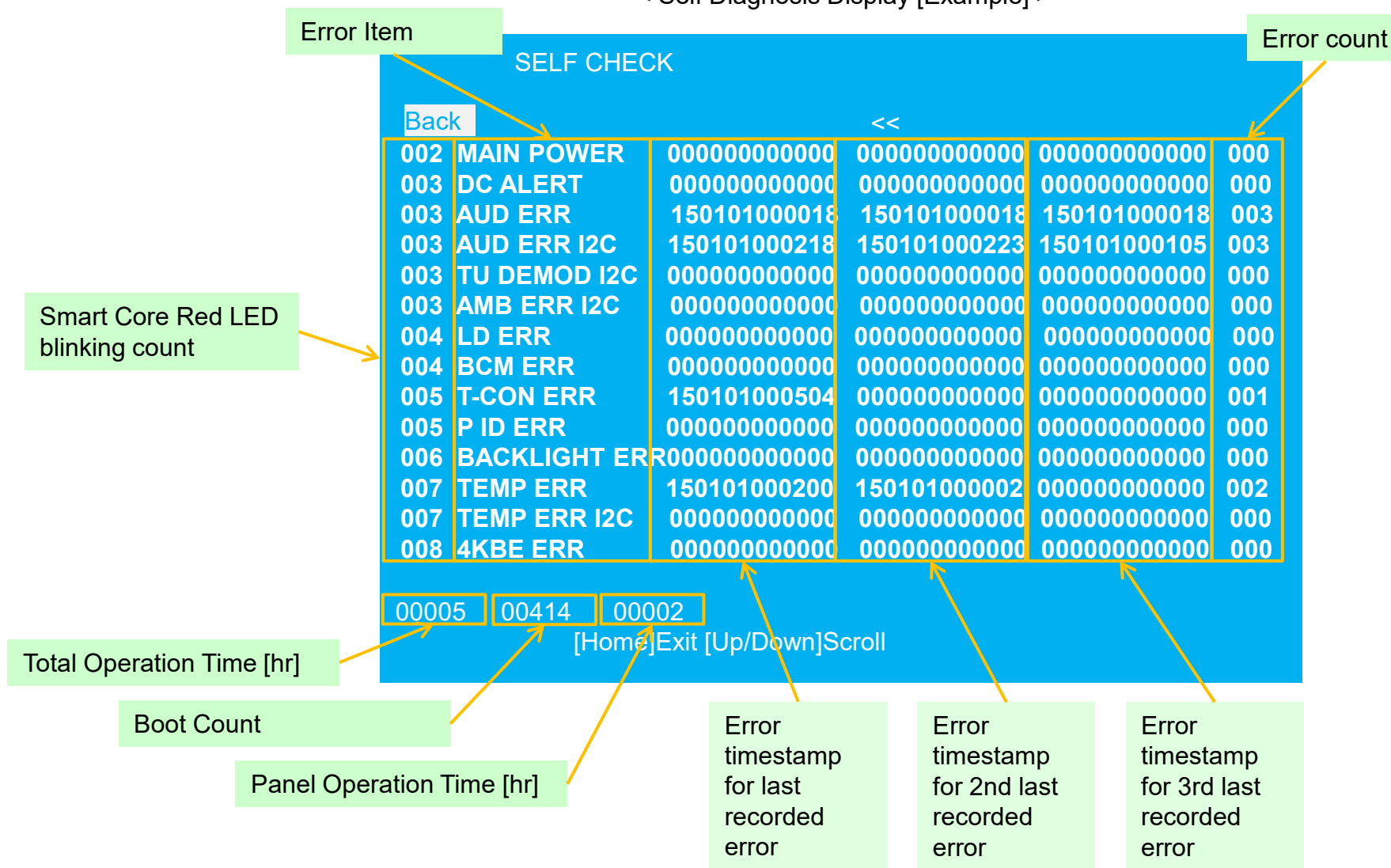
Example:

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

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

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.

< Self Diagnosis Display [Example] >



SELF DIAGNOSIS FUNCTION

Self Diagnosis Display (To Clear History)

< Self Diagnosis Display [Example] >

[Notice]
Please move cursor position other than "Back" by <↑> / <↓> before do "New Key Sequence" to avoid misoperation.

SELF CHECK

Back <<

002	MAIN POWER	000000000000	000000000000	000000000000	000
003	DC ALERT	000000000000	000000000000	000000000000	000
003	AUD ERR	150101000018	150101000018	150101000018	003
003	AUD ERR I2C	150101000218	150101000223	150101000105	003
003	TU DEMOD I2C	000000000000	000000000000	000000000000	000
003	AMB ERR I2C	000000000000	000000000000	000000000000	000
004	LD ERR	000000000000	000000000000	000000000000	000
004	BCM ERR	000000000000	000000000000	000000000000	000
005	TCON ERR	150101000504	000000000000	000000000000	001
005	P ID ERR	000000000000	000000000000	000000000000	000
006	BACKLIGHT ERR	000000000000	000000000000	000000000000	000
007	TEMP ERR	150101000200	150101000002	000000000000	002
007	TEMP ERR I2C	000000000000	000000000000	000000000000	000
008	4KBE ERR	000000000000	000000000000	000000000000	000

[Home]Exit [Up/Down]Scroll

Function	Conventional Key Sequence	New Key Sequence from Valhalla2.1 (to Support "Simple Remote")
Panel Operation Time clear	<7> ⇒ <0>	<→> x 9times ⇒ <Enter(DpadCenter)>
Timestamps and Error Count clear	<8> ⇒ <0>	<<→> x 9times ⇒ <Enter(DpadCenter)>
Total Operation Time and Boot Count clear	<9> ⇒ <0>	

SELF DIAGNOSIS FUNCTION

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_MAINPOWR = 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 $STDWN_OFFON_CNT_MAIN_POWER \leq STDWN_RTRY_LIMIT_MAINPOWR$, 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.

TROUBLESHOOTING

Triage Chart

Before you make the service call:

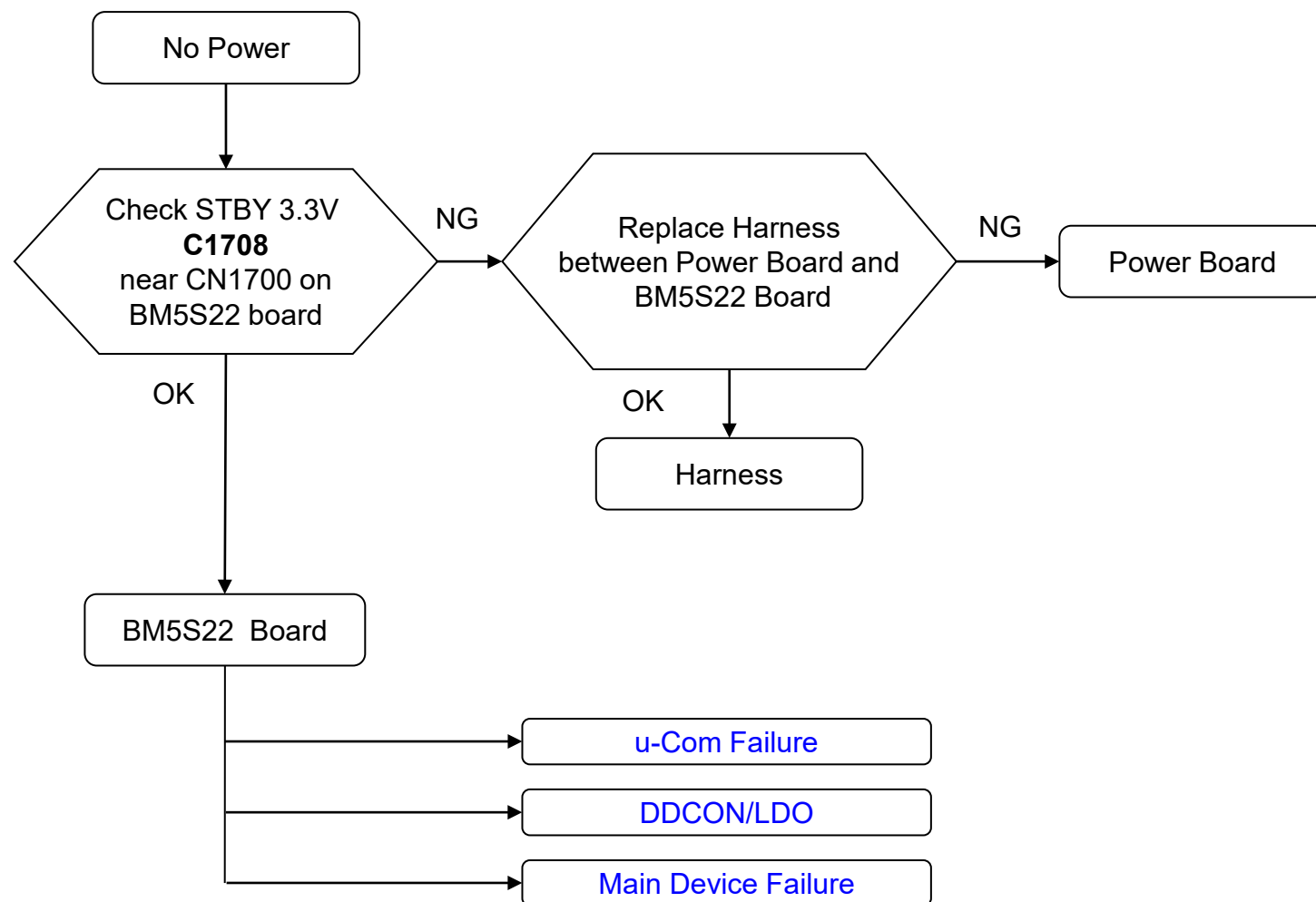
1. Confirm the symptom from the customer.
2. Select that symptom from the chart.
3. Bring all the boards and cables listed for that symptom.
4. Follow the troubleshooting charts in the technical guides to isolate the board.

5. Chart Color Code: ● : Most likely defective part ■ : Tertiary possible defective part
▲ : Secondary 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	8KBE_COM_ERR	AMB_ERR_I2C	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 of Camera	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		▲																								●			
Wi-fi & BT Module																									●			●	
LD* Board			▲		▲																		▲						
V By One FFC				▲						▲									▲				▲						
Tcon				●						●									▲				■						
LCD Panel			●	▲	●	▲				■									●				■						
Camera (bundle or accessory)																						●							
Problem	Power	Power	Panel	Panel (Communication)	Panel (Backlight)	TEMP	4KBE																						
		Audio	LD	Tcon																									

TROUBLESHOOTING

1.0 No Power

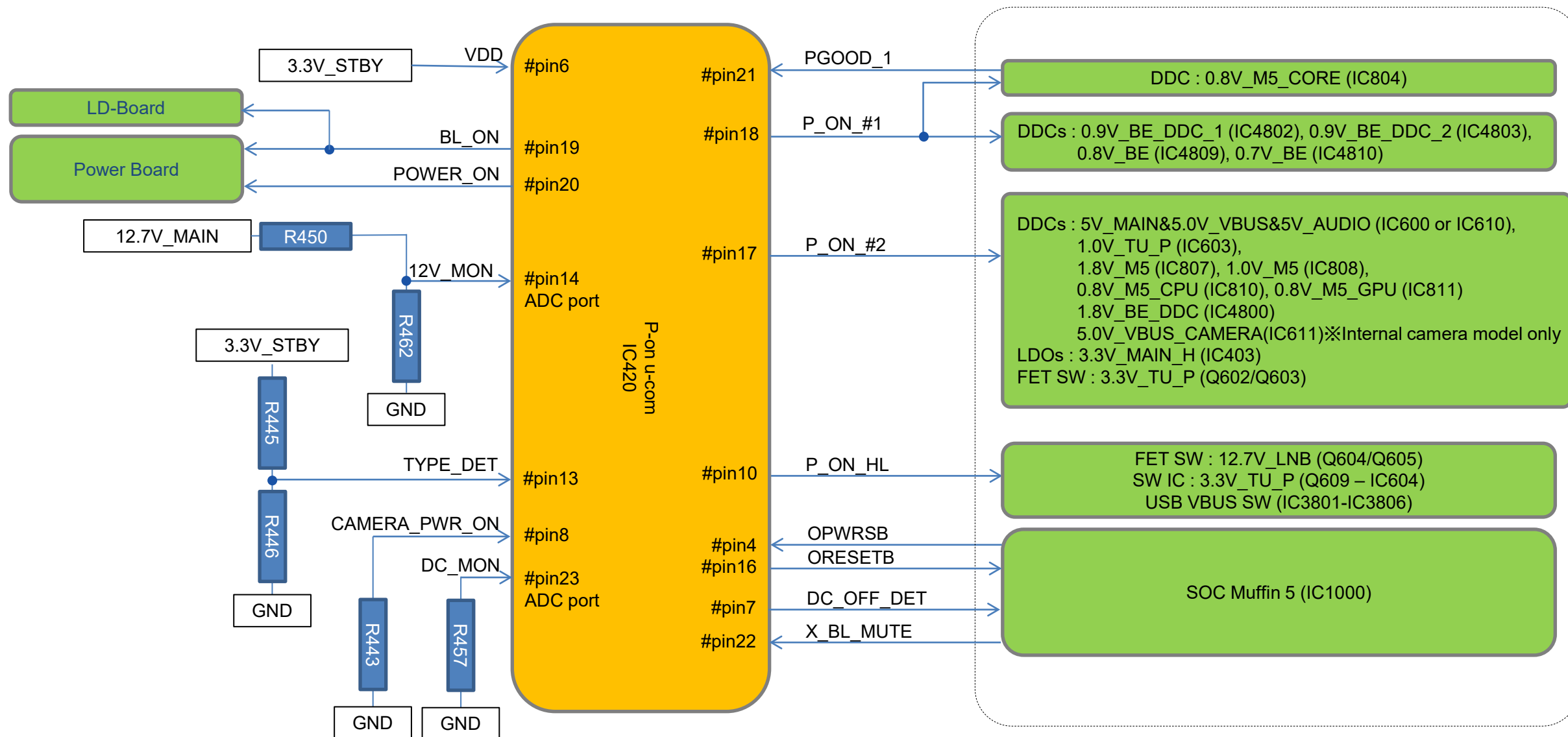


TROUBLESHOOTING

1.2 No Power U – com Failure

BM5S22 Board LCD Model when mounted on IC420

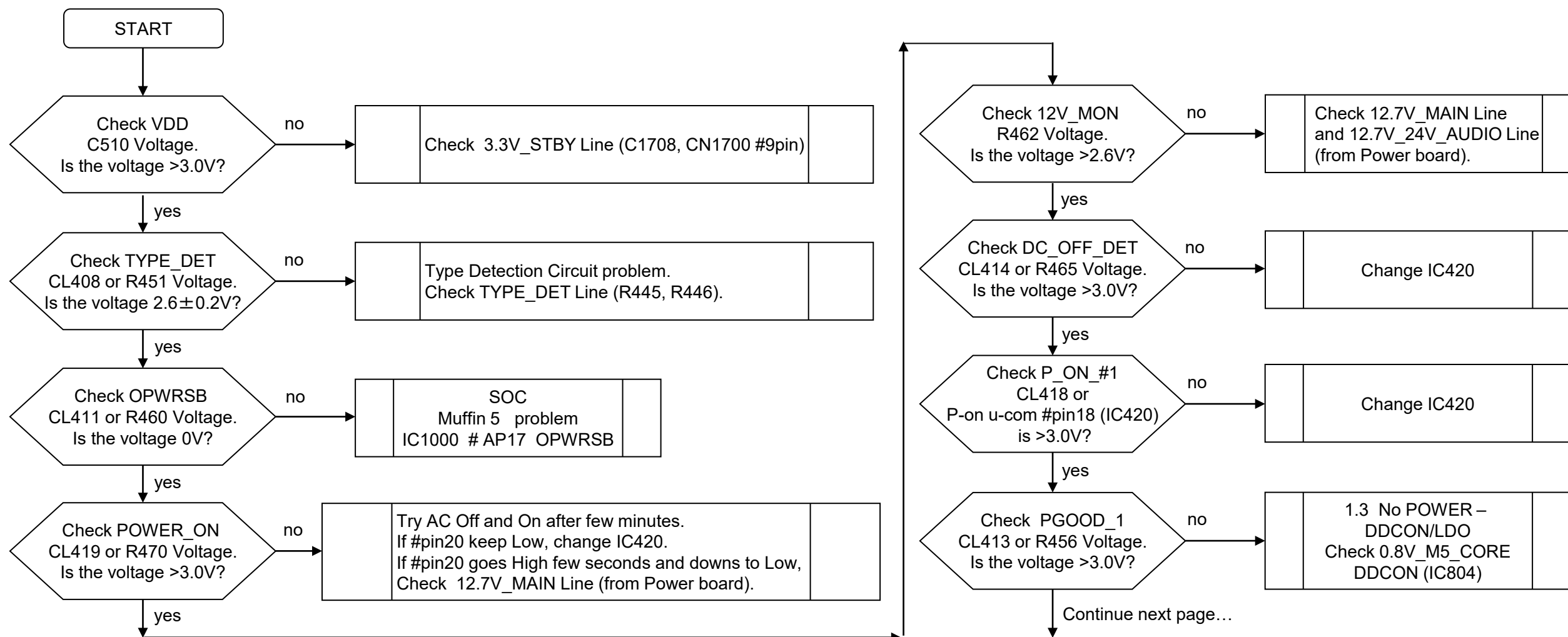
P-on u-com control signal path summary



TROUBLESHOOTING

1.2 No Power U – com Failure

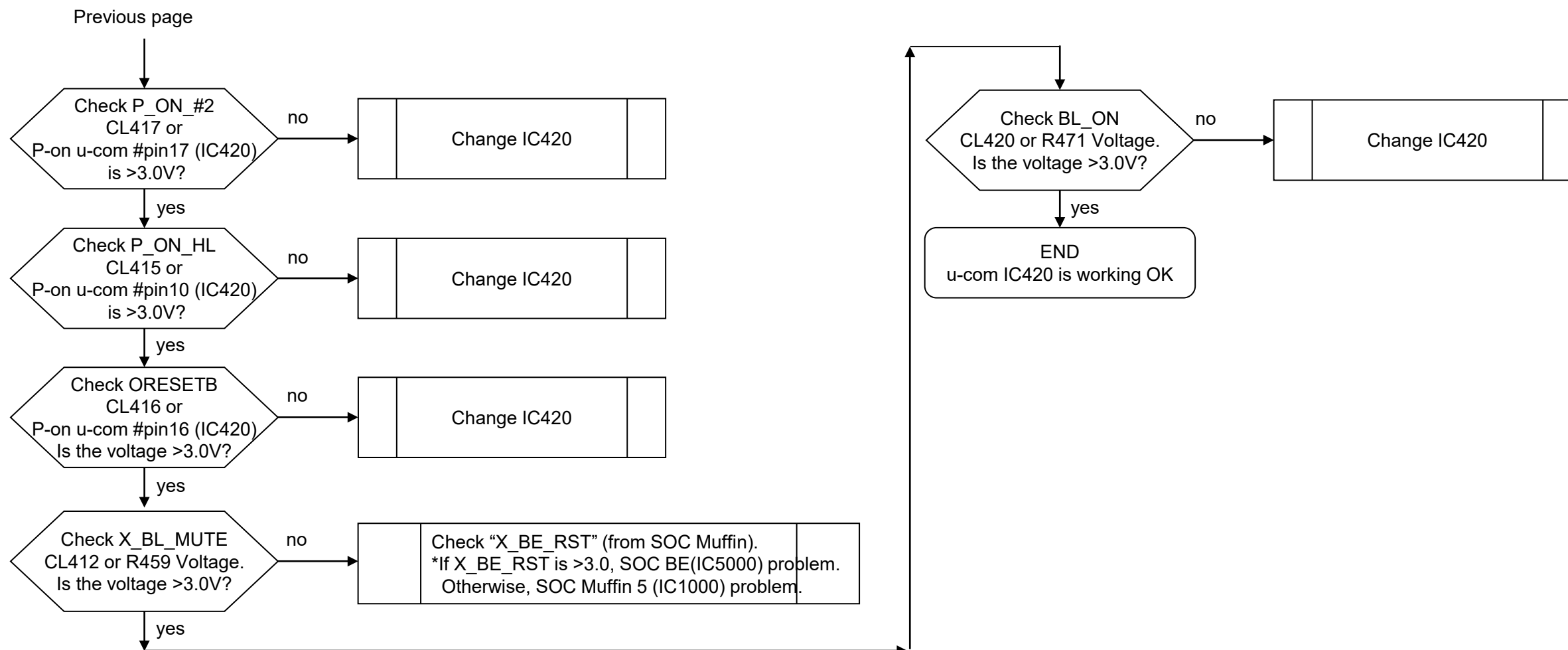
BM5S22 Board LCD Model when mounted on IC420



TROUBLESHOOTING

1.2 No Power U – com Failure

BM5S22 Board LCD Model when mounted on IC420

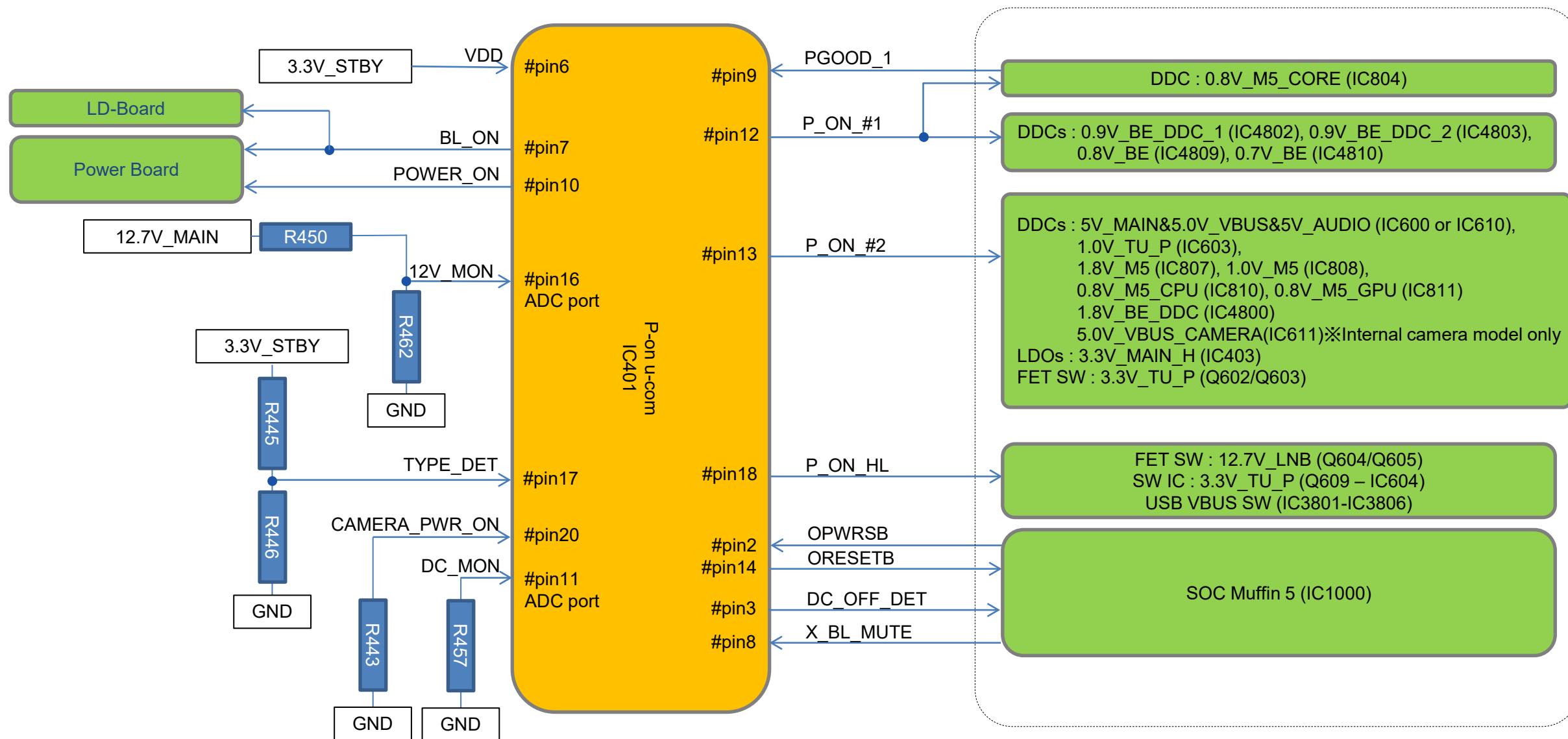


TROUBLESHOOTING

1.2 No Power U – com Failure

BM5S22 Board LCD Model when mounted on IC401

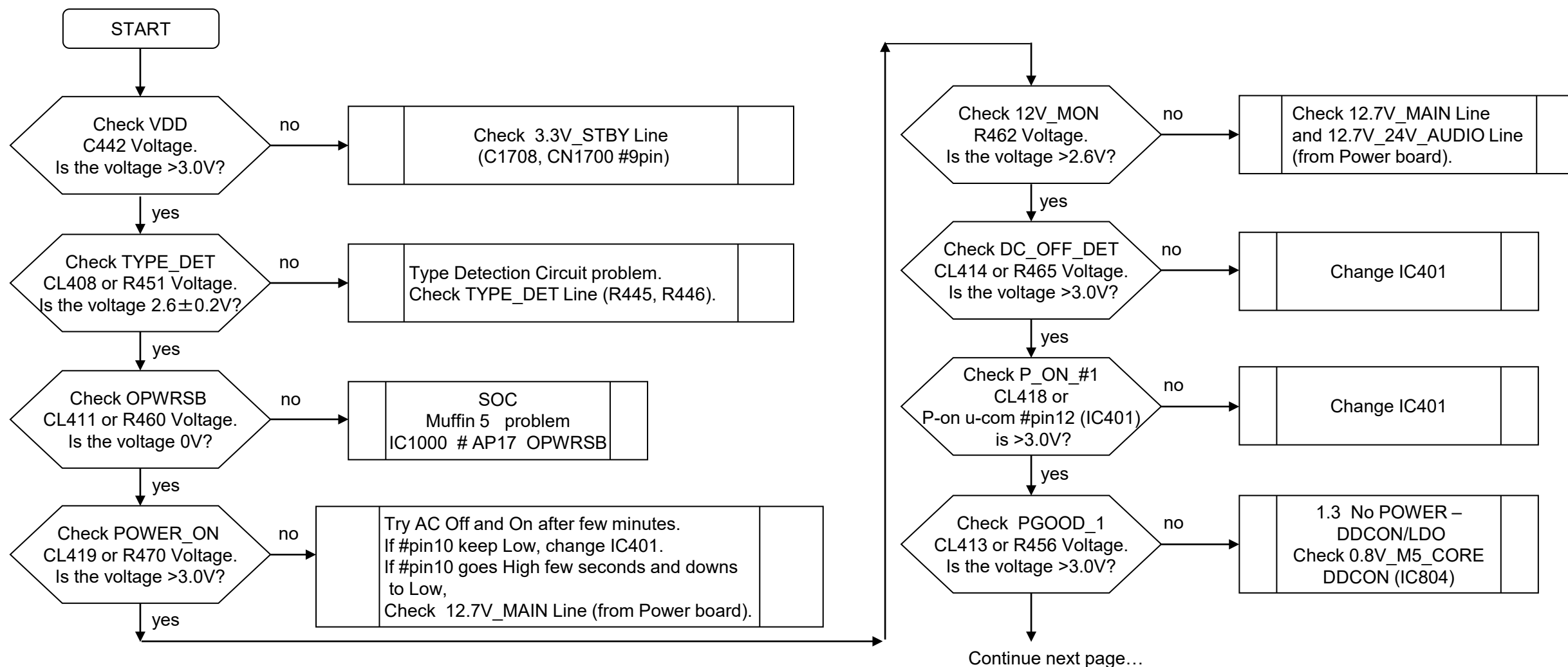
P-on u-com control signal path summary



TROUBLESHOOTING

1.2 No Power U – com Failure

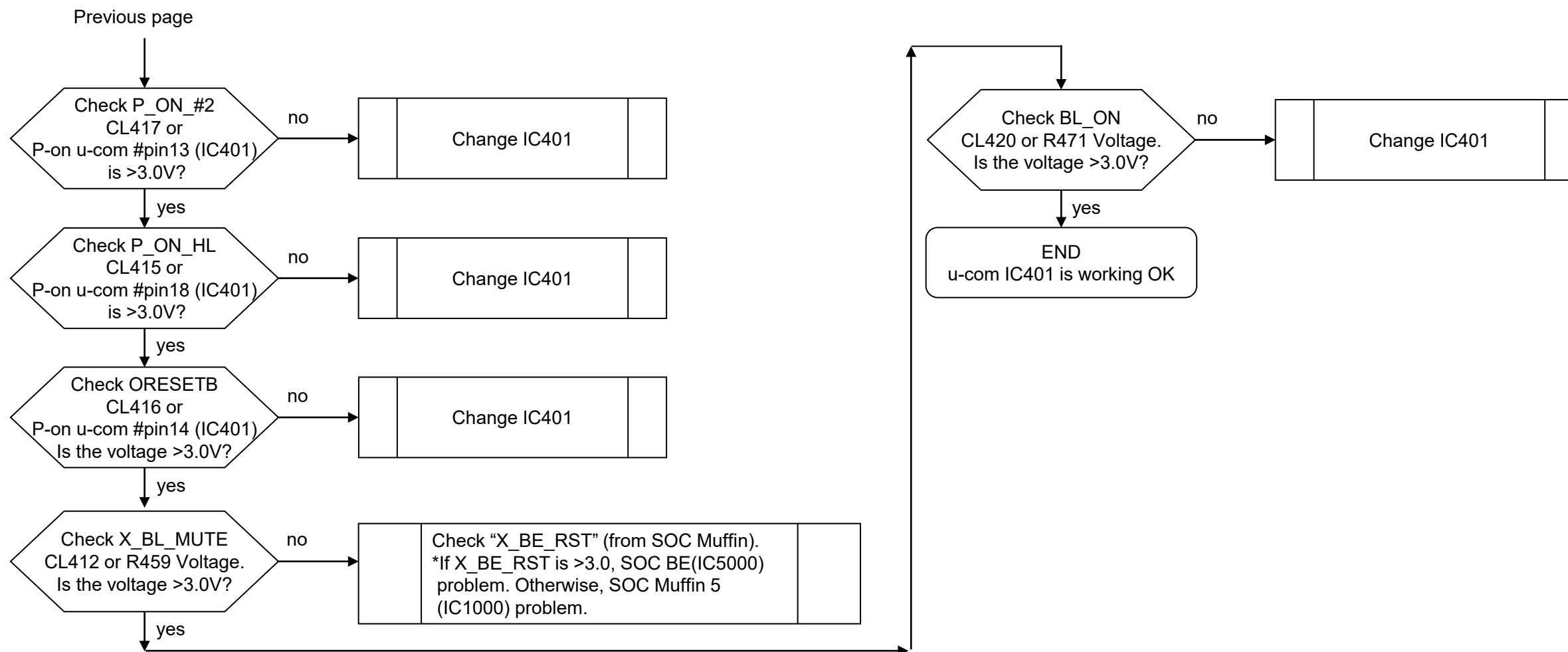
BM5S22 Board LCD Model when mounted on IC401



TROUBLESHOOTING

1.2 No Power U – com Failure

BM5S22 Board LCD Model when mounted on IC401



TROUBLESHOOTING

1.3 No Power – DDCON / LDO

P_ON_#1 : P-on u-com IC401 #pin12

P_ON_#2 : P-on u-com IC401 #pin13

Check item summary

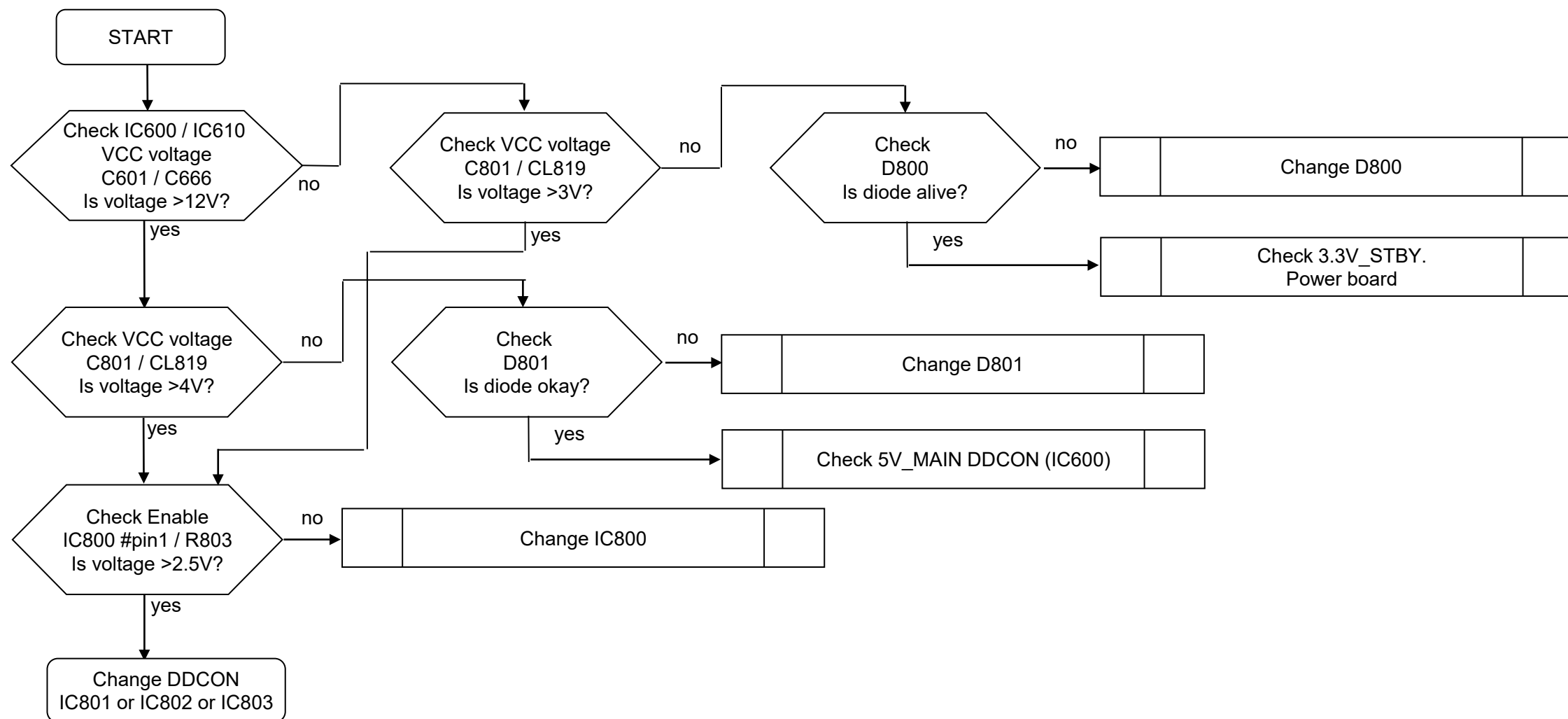
Board	Operation	IC Ref	Voltage supply	Output ref.	Enable pin	Enable source	Fuse	Vcc ref.
BM5S22	DC/DC	IC418 or IC419	5.0V_STBY_H	C508 or C514 /JL1212	R557	R557(3.3V_STBY)	-	C505 or C511
BM5S22	LDO	IC403	3.3V_MAIN_H	C416/CL402	R413(shorted)	P_ON_#2	-	C415
BM5S22	DC/DC	IC600 or IC610	5V_MAIN/5V_AUDIO	C610 or C673/JL601	R600 or R670/CL604 or CL615	P_ON_#2	F600 or F602	C601 or C666
BM5S22	DC/DC	IC601	3.3V_MAIN/3.3V_AUDIO	C619/JL603	R658/CL605	R658(1.8V_BE_DDC)	F601	C618
BM5S22	DC/DC	IC603	1.0V_TU_P	C630/CL607	R631(shorted)/JL607	P_ON_#2 or IC1000 #AL18 (EWS_PWR_ON)	-	C628
BM5S22	DC/DC	IC611	5.0V_VBUS_CAMERA	C682/JL635	R681/CL616	P_ON_#2	F603	C681
BM5S22	DC/DC	IC801	1.1V_M5_DDR	C806/JL801	R913(shorted)	R804/R907 (3.3V_STBY)	-	C801/CL819
BM5S22	DC/DC	IC802	0.9V_M5_STBY	C809/CL803	R908(shorted)	R804/R907 (3.3V_STBY)	-	C807/CL822
BM5S22	DC/DC	IC803	1.8V_STBY	C812/CL811	R822(shorted)	R804 (3.3V_STBY)	-	C810/CL824
BM5S22	DC/DC	IC804	0.8V_M5_CORE	C846/JL803	R849(shorted)/CL816	P_ON_#1	F802	C831
BM5S22	LDO	IC806	1.8V_M5_ET_STBY	C818/JL808	R832(shorted)	IC1000 #AN19 (ETHER_PWR_EN)	-	C817/CL826
BM5S22	DC/DC	IC807	1.8V_M5	C823/JL811	R833(shorted)/CL827	P_ON_#2	F800	C822
BM5S22	DC/DC	IC808	1.0V_M5	C829/JL813	R839(shorted)/CL828	P_ON_#2	F801	C828
BM5S22	LDO	IC809	3.3V_M5_STBY	C816/CL831	R917	R917(3.3V_STBY)	-	C815
BM5S22	DC/DC	IC810	0.8V_M5_CPU	C861/JL816	R914/CL829	P_ON_#2	F803	C855
BM5S22	DC/DC	IC811	0.8V_M5_GPU	C874/JL818	R915/CL830	P_ON_#2	F804	C868
BM5S22	DC/DC	IC4800	1.8V_BE_DDC	C4805/JL4801	R4801(shorted)/CL4816	P_ON_#2	F4800	C4803
BM5S22	DC/DC	IC4801	1.1V_BE	C4813/JL4803	R4907/CL4817	R4907(1.8V_BE_DDC)	F4801	C4812
BM5S22	DC/DC	IC4802	0.9V_BE_DDC_1	C4820/JL4805	R4819(shorted)/CL4818	P_ON_#1	F4802	C4819
BM5S22	DC/DC	IC4803	0.9V_BE_DDC_2	C4828/JL4807	R4827(shorted)/CL4819	P_ON_#1	F4803	C4827
BM5S22	DC/DC	IC4809	0.8V_BE	C4860/JL4819	R4849(shorted)/CL4808	P_ON_#1	F4804	C4845
BM5S22	DC/DC	IC4810	0.7V_BE	C4878/JL4821	R4865(shorted)/CL4811	P_ON_#1	F4805	C4863

SAFETY NOTES	SELF DIAGNOSIS FUNCTION	TROUBLESHOOTING	SERVICE ADJUSTMENT	DIAGRAM	HANDLING GUIDE
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TROUBLESHOOTING

1.3 No Power – DDCONs check

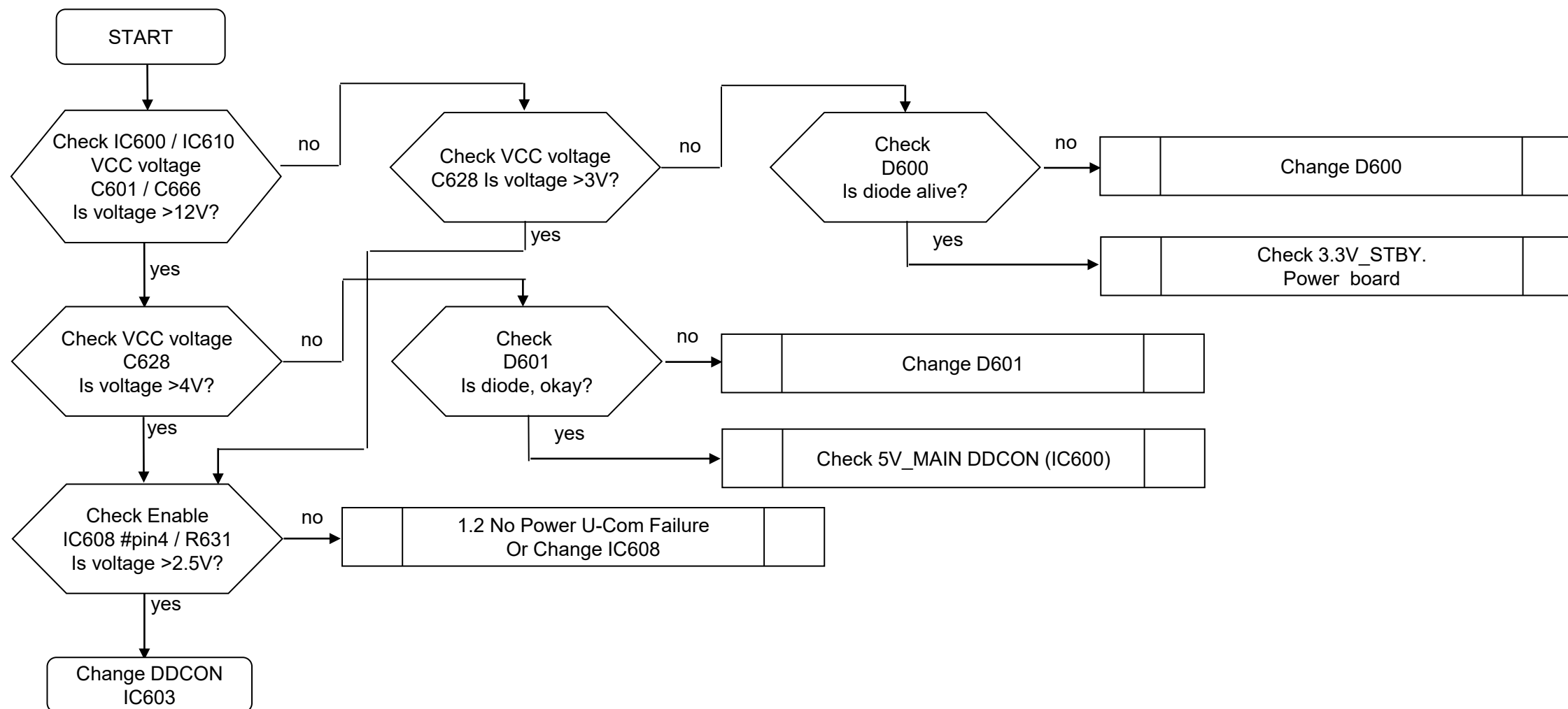
Please refer page 26 for Reference Number.



TROUBLESHOOTING

1.3 No Power – DDCONs check (Philippines Only)

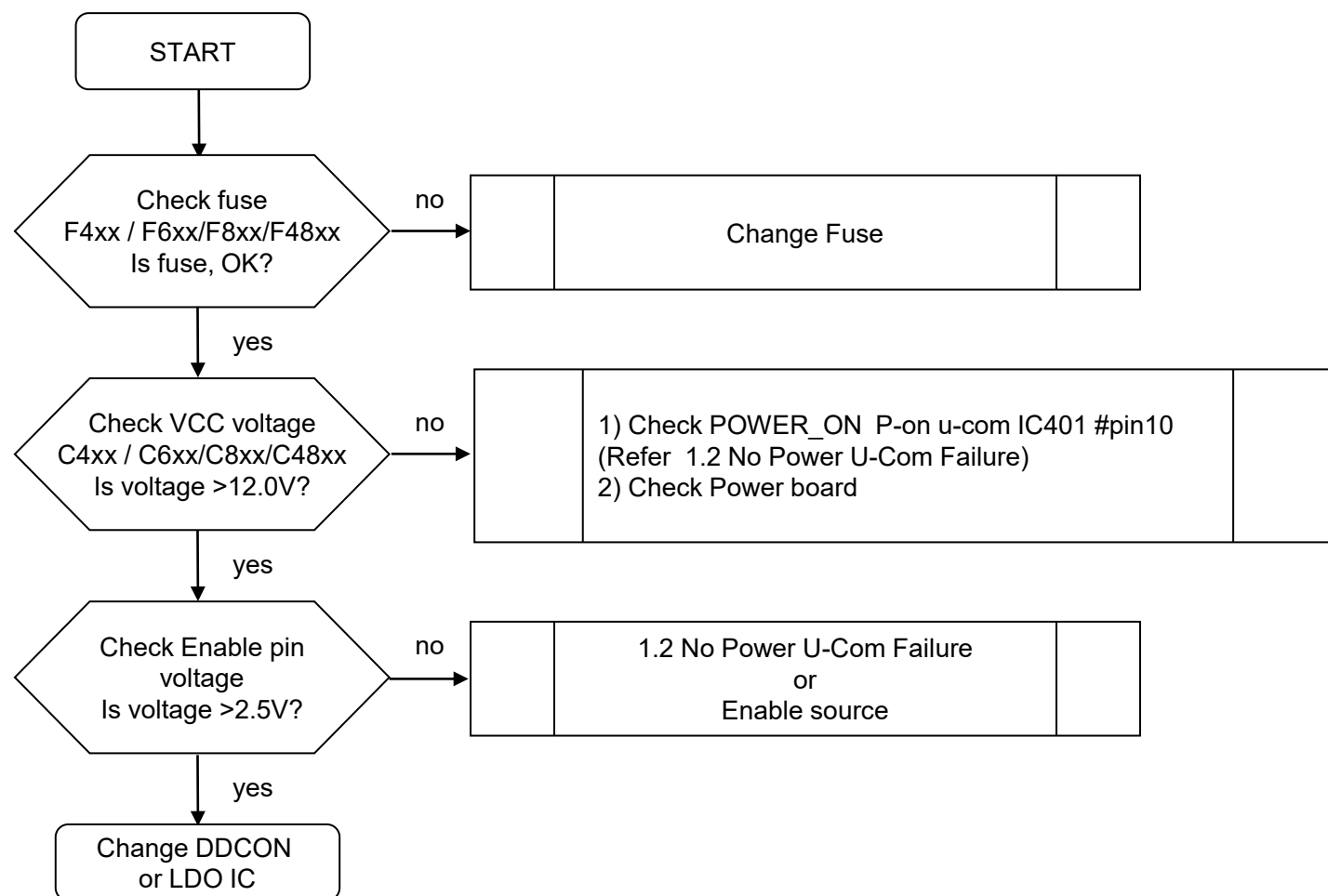
Please refer page 26 for Reference Number.



TROUBLESHOOTING

1.3 No Power – DDCONs & LDO check

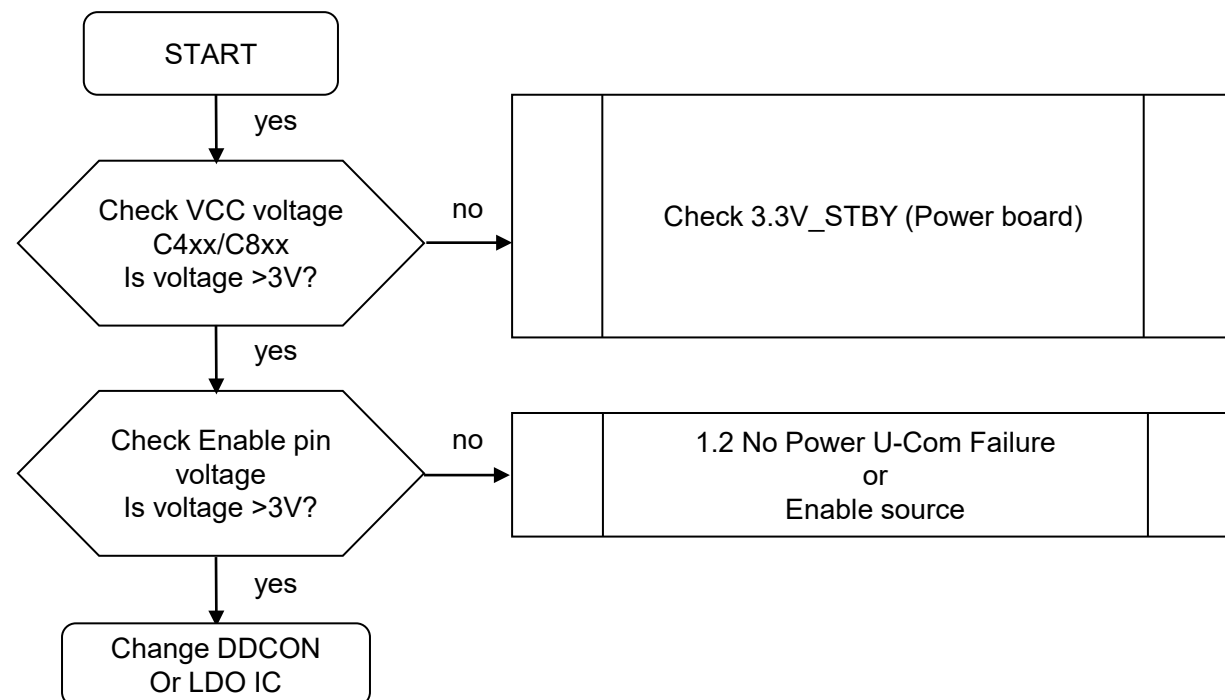
Please refer page 26 for Reference Number.



TROUBLESHOOTING

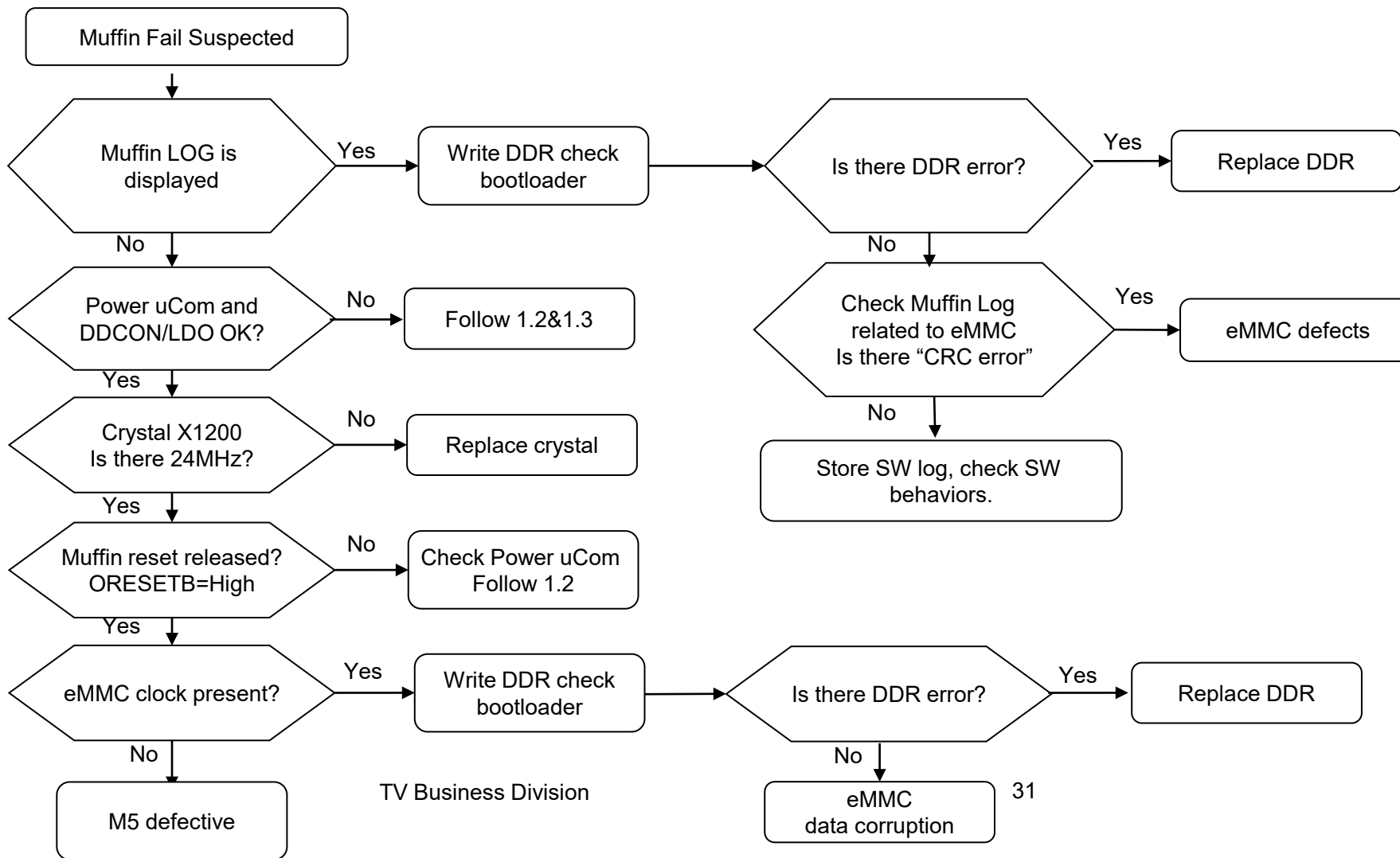
1.3 No Power – DDCONs & LDO check

Please refer page 26 for Reference Number.



TROUBLESHOOTING

1.4 No Power – Muffin5 Failure

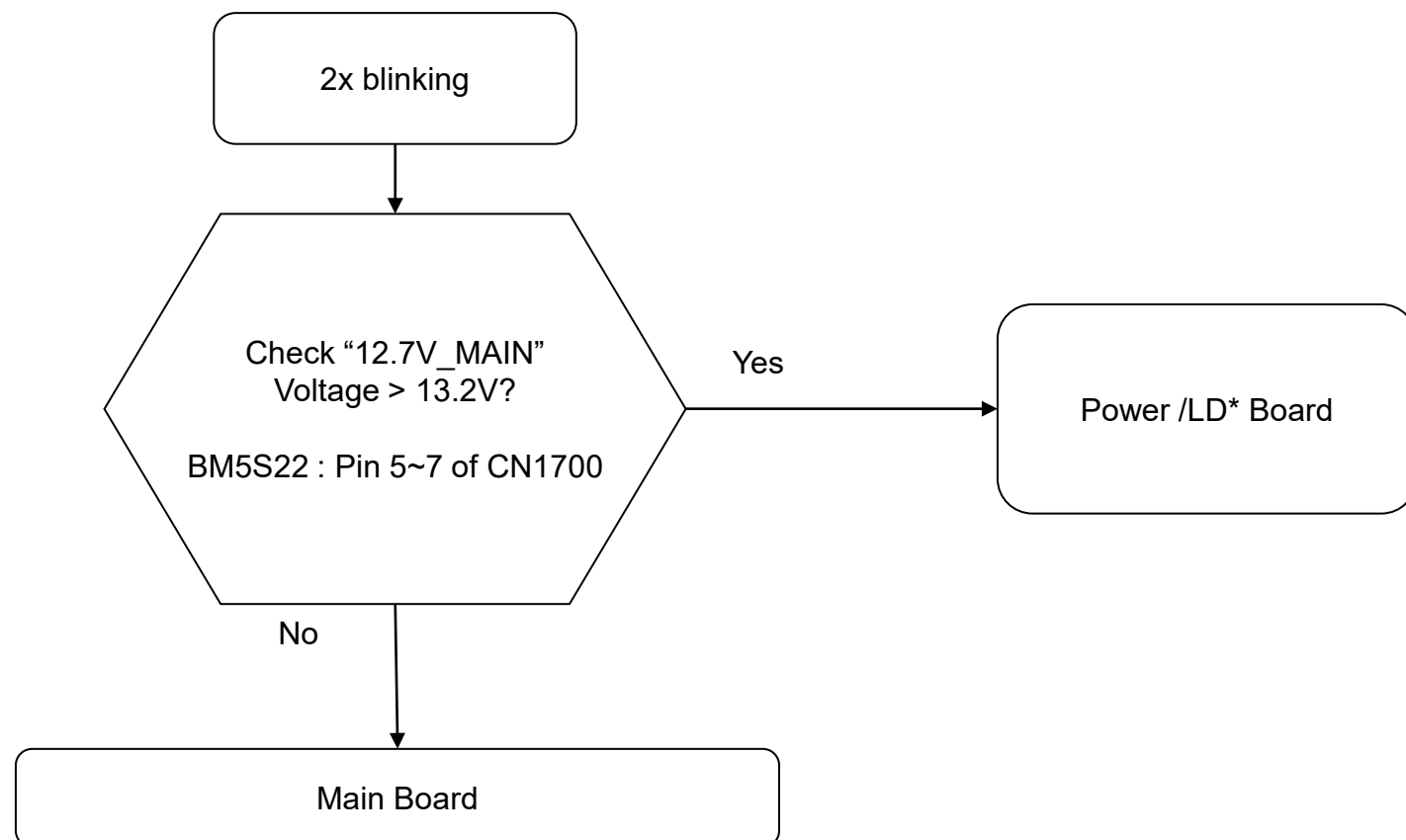


TV Business Division

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TROUBLESHOOTING

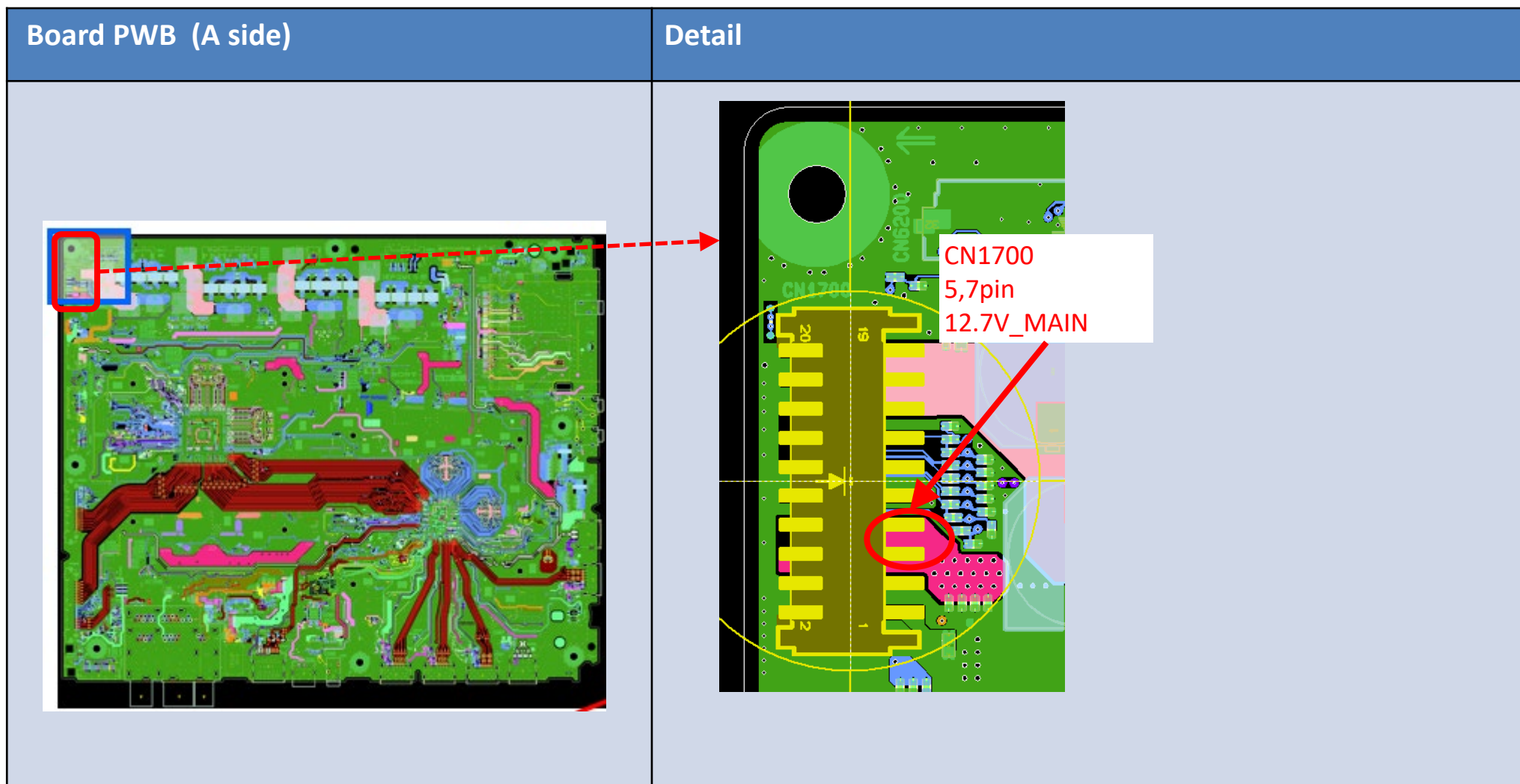
2.0 2x LED Blinking – Main Power Error



TROUBLESHOOTING

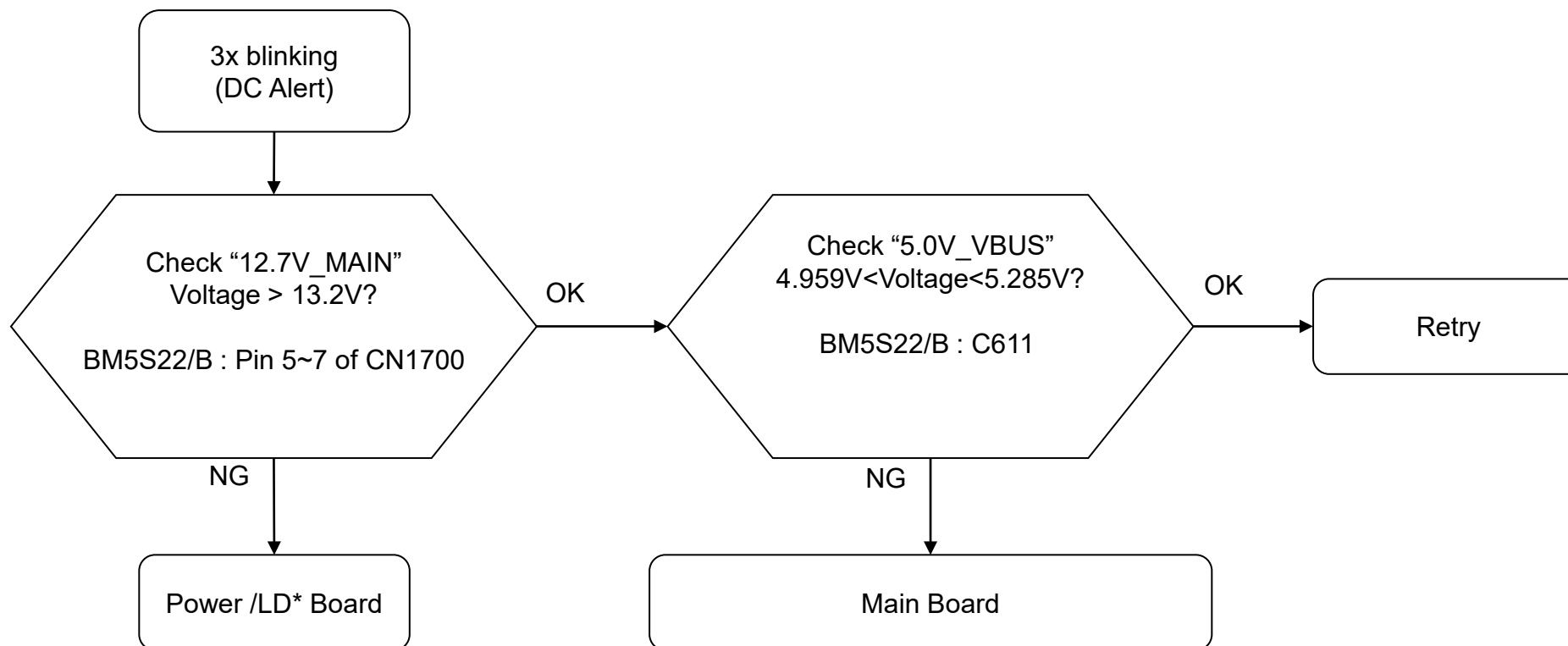
2.0 2x LED Blinking – Main Power Error

Check Point for BM5S22



TROUBLESHOOTING

2.1 3x LED Blinking – DC Alert

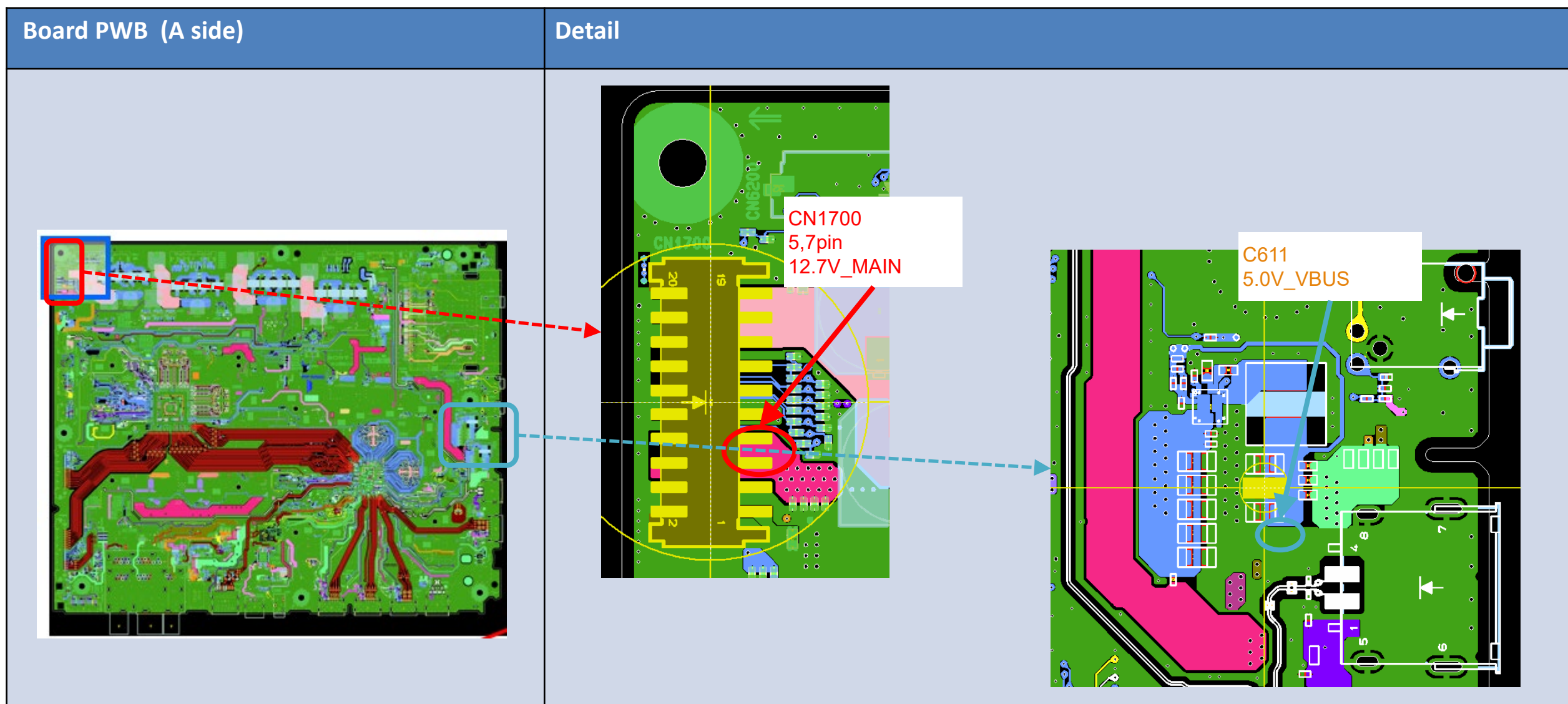


	Error Item	Number of STBY LED Blinking	Description
Valhalla	DC_ALERT	3	Main 5V power failure
	AUD_ERR	3	Audio amp. protection

TROUBLESHOOTING

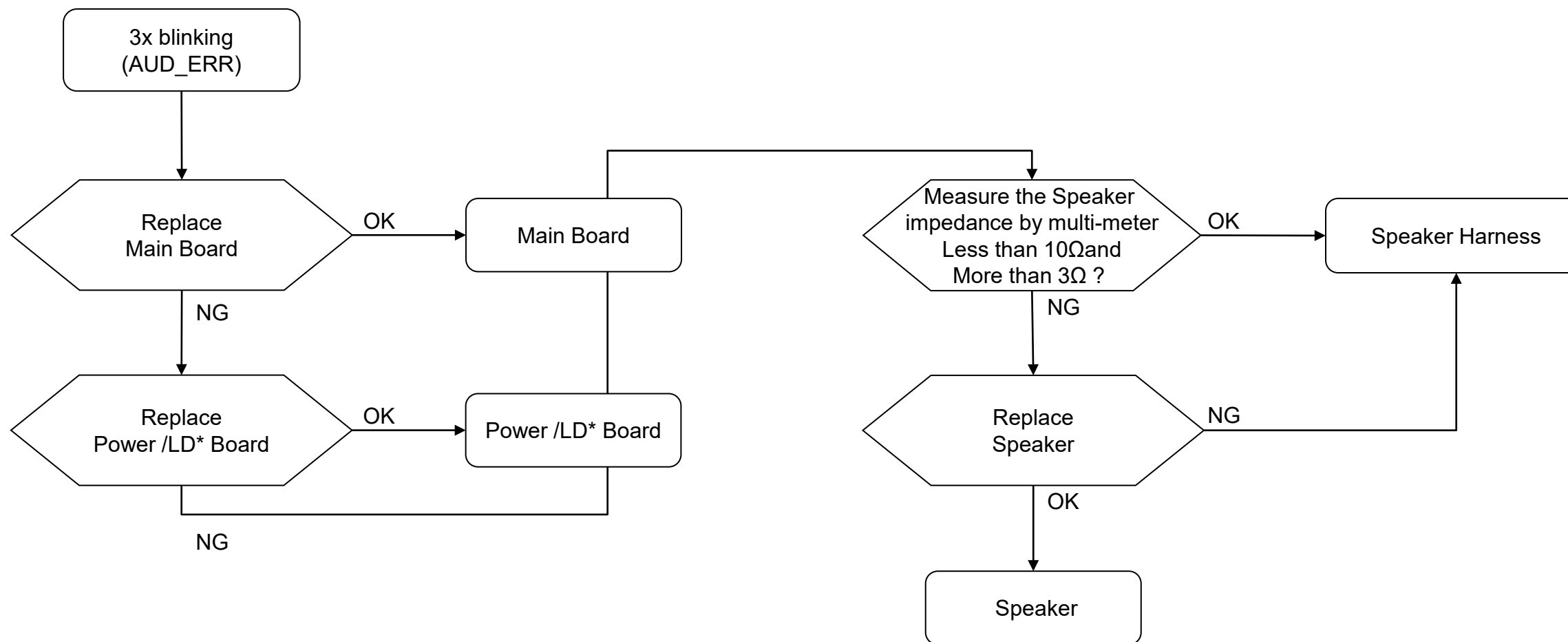
2.1 3x LED Blinking – DC Alert

Check Point for BM5S22



TROUBLESHOOTING

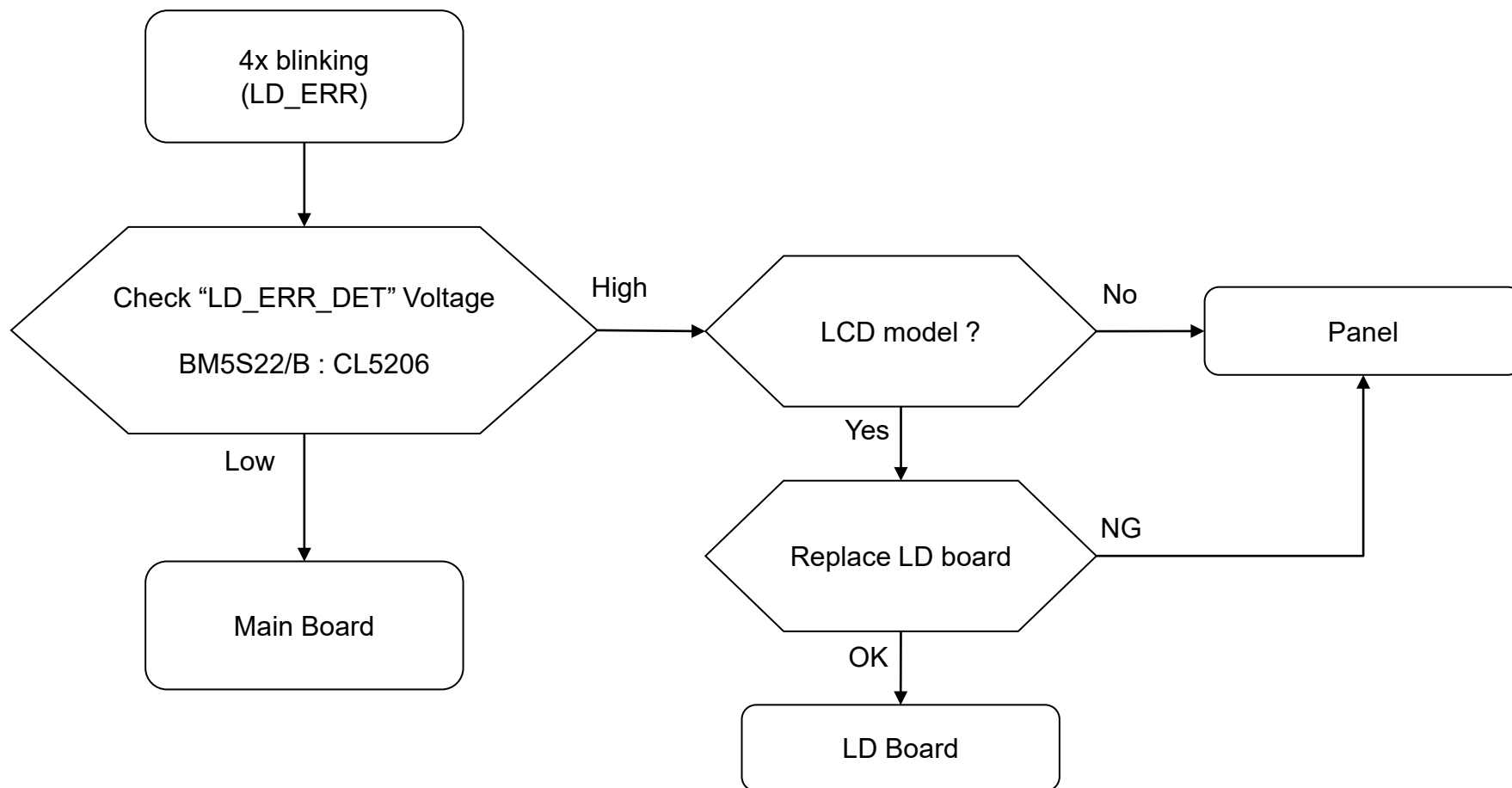
2.2 3x LED Blinking – AUD_ERR



	Error Item	Number of STBY LED Blinking	Description
Valhalla	DC_ALERT	3	Main 5V power failure
	AUD_ERR	3	Audio amp. protection

TROUBLESHOOTING

2.3 4x LED Blinking – LD_ERR

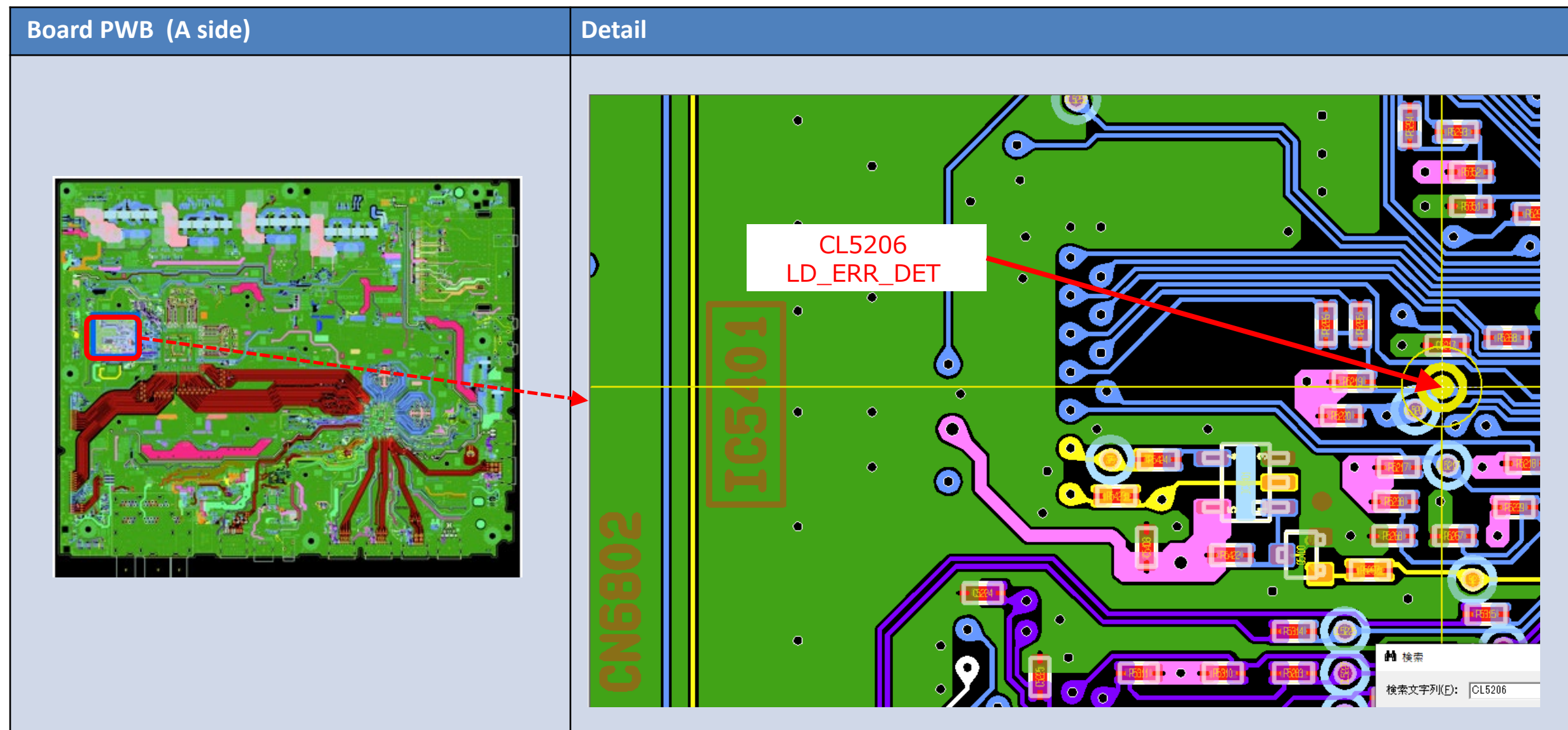


	Error Item	Number of STBY LED Blinking	Description	
Valhalla	LD_ERR	4	LCD	LED driver failure/LED voltage protection
			OLED	TCON internal or I2C communication failure

TROUBLESHOOTING

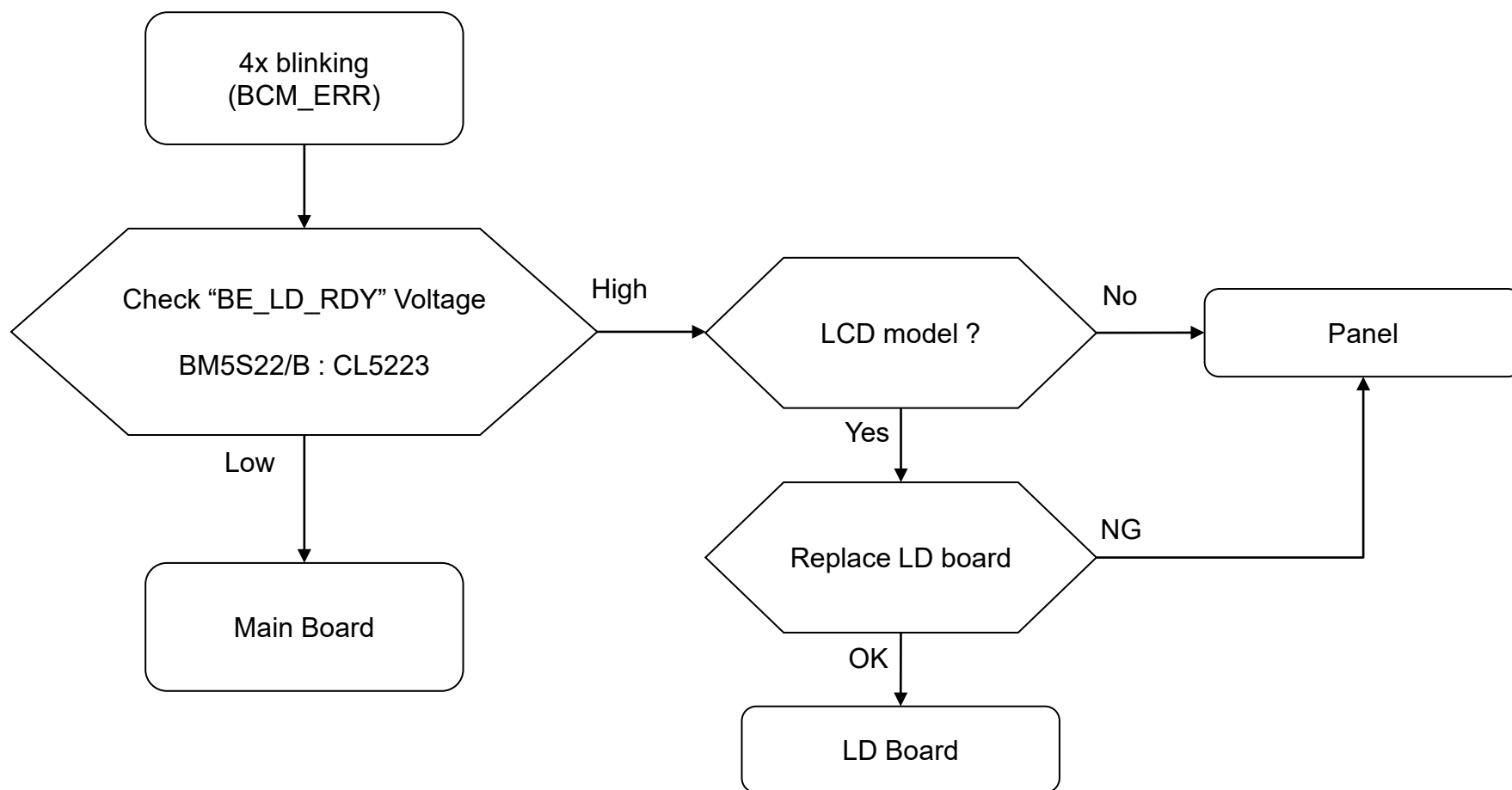
2.3 4x LED Blinking – LD_ERR

Check Point for BM5S22



TROUBLESHOOTING

2.4 4x LED Blinking – BCM_ERR

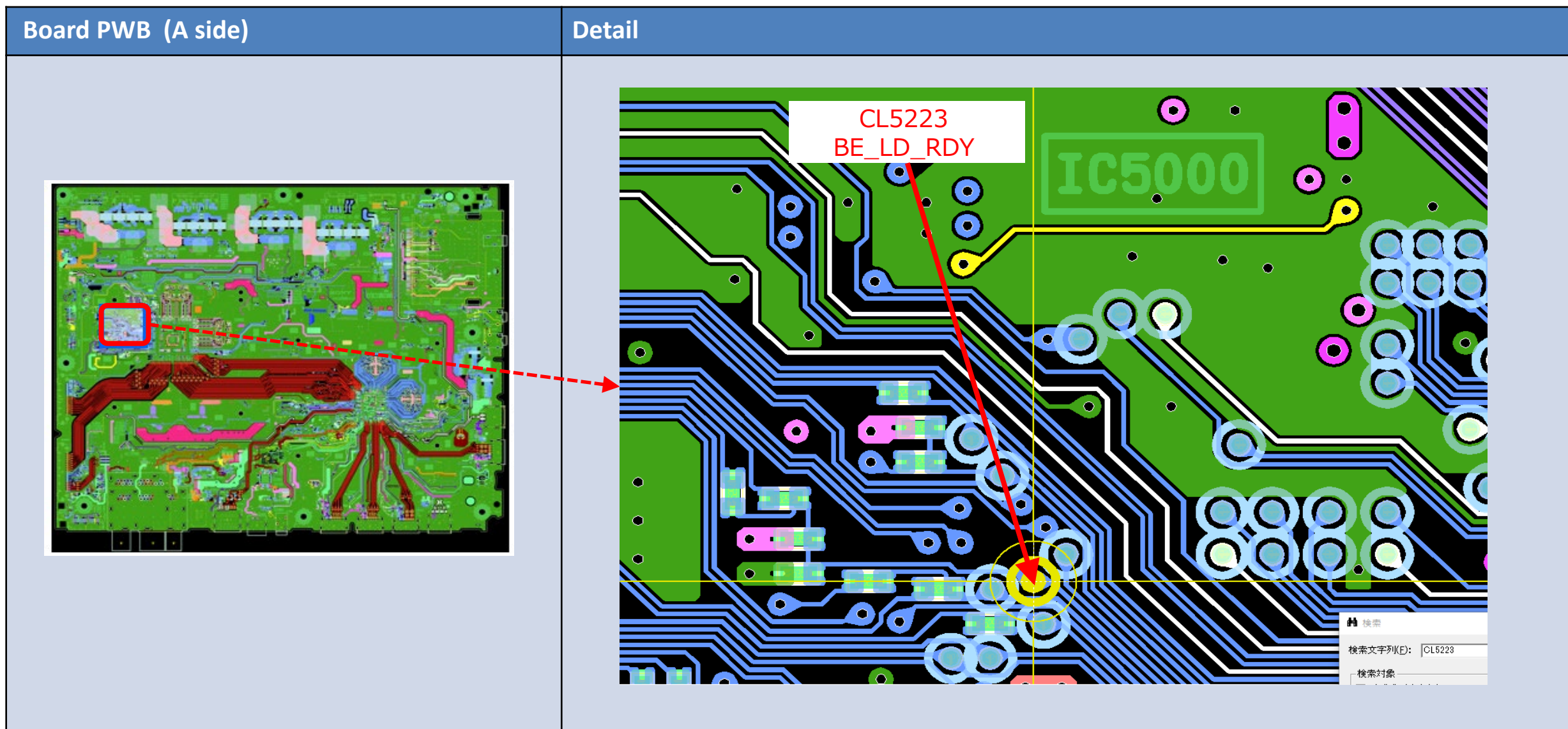


	Error Item	Number of STBY LED Blinking	Description	
Valhalla	BCM_ERR	4	LCD	LD IC initialize or I2C communication failure
			OLED	Panel power failure

TROUBLESHOOTING

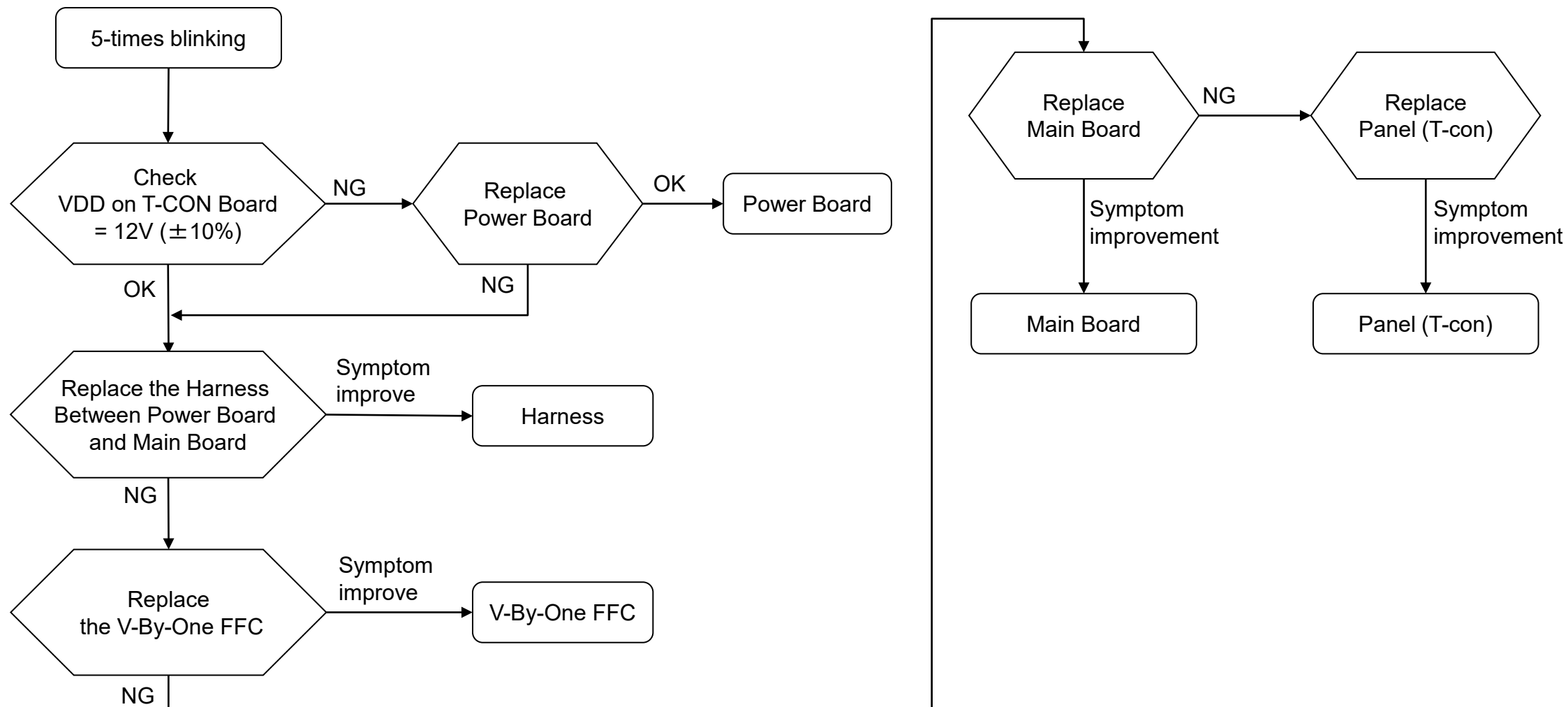
2.4 4x LED Blinking – BCM_ERR

Check Point for BM5S22



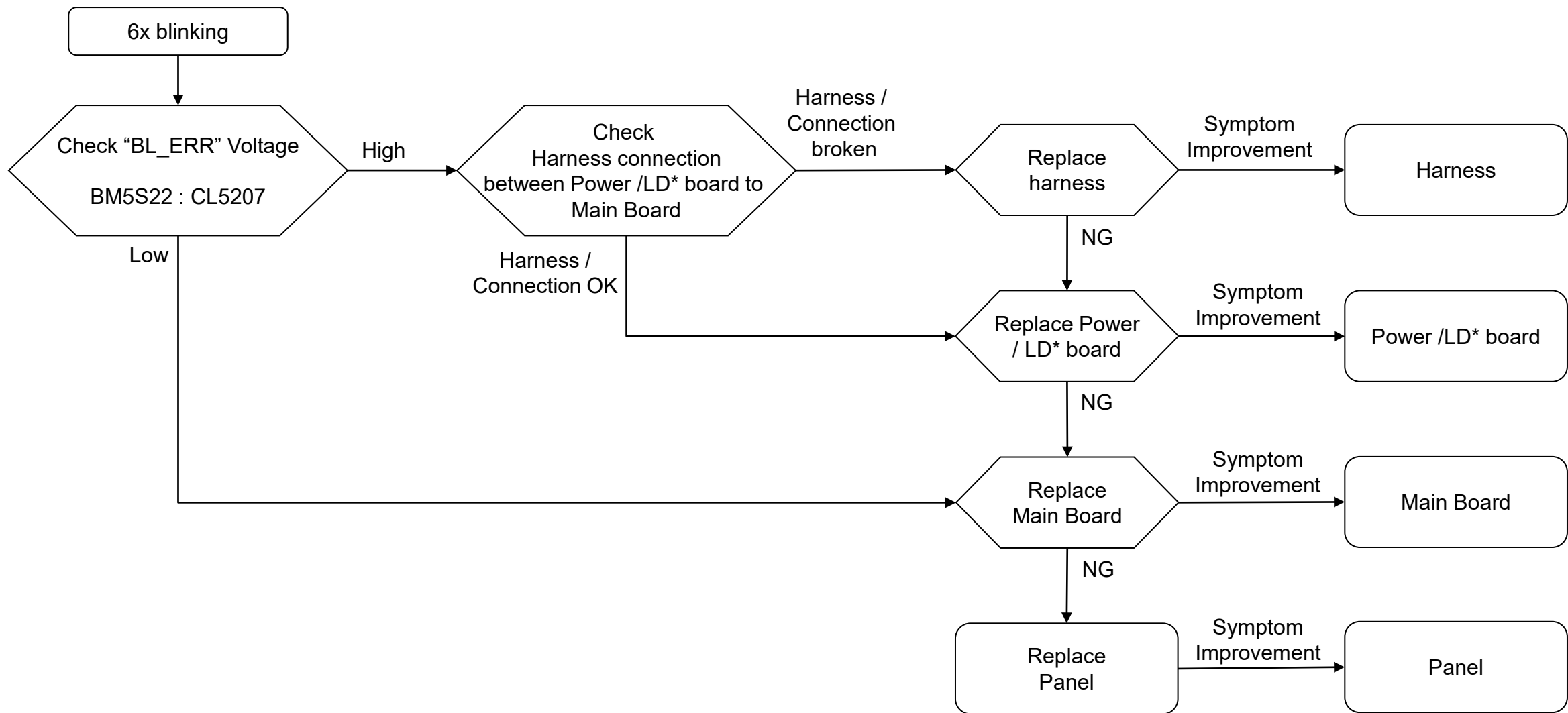
TROUBLESHOOTING

2.5 5x LED Blinking – P_ID_ERR



TROUBLESHOOTING

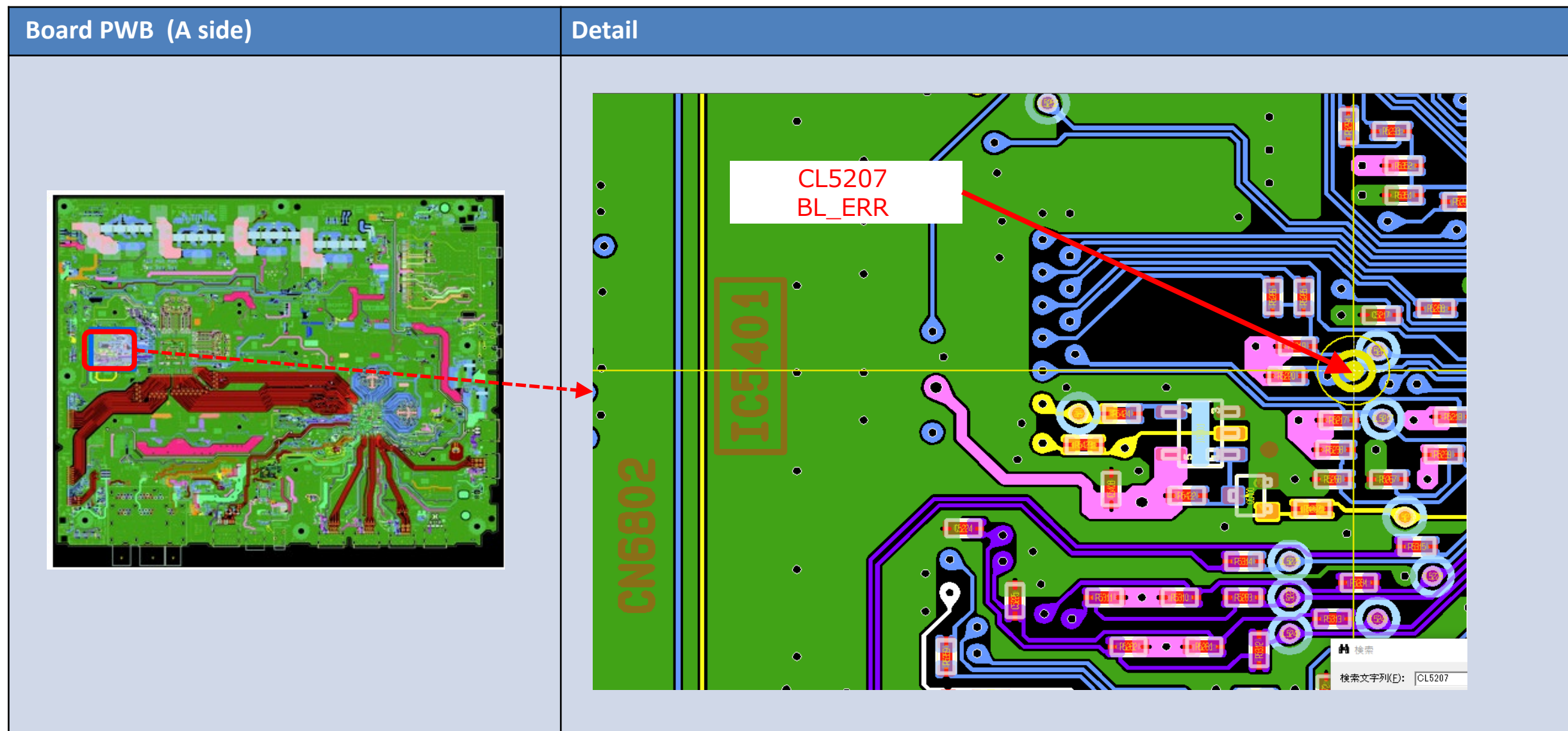
2.6 6x LED Blinking – Backlight_ERR



TROUBLESHOOTING

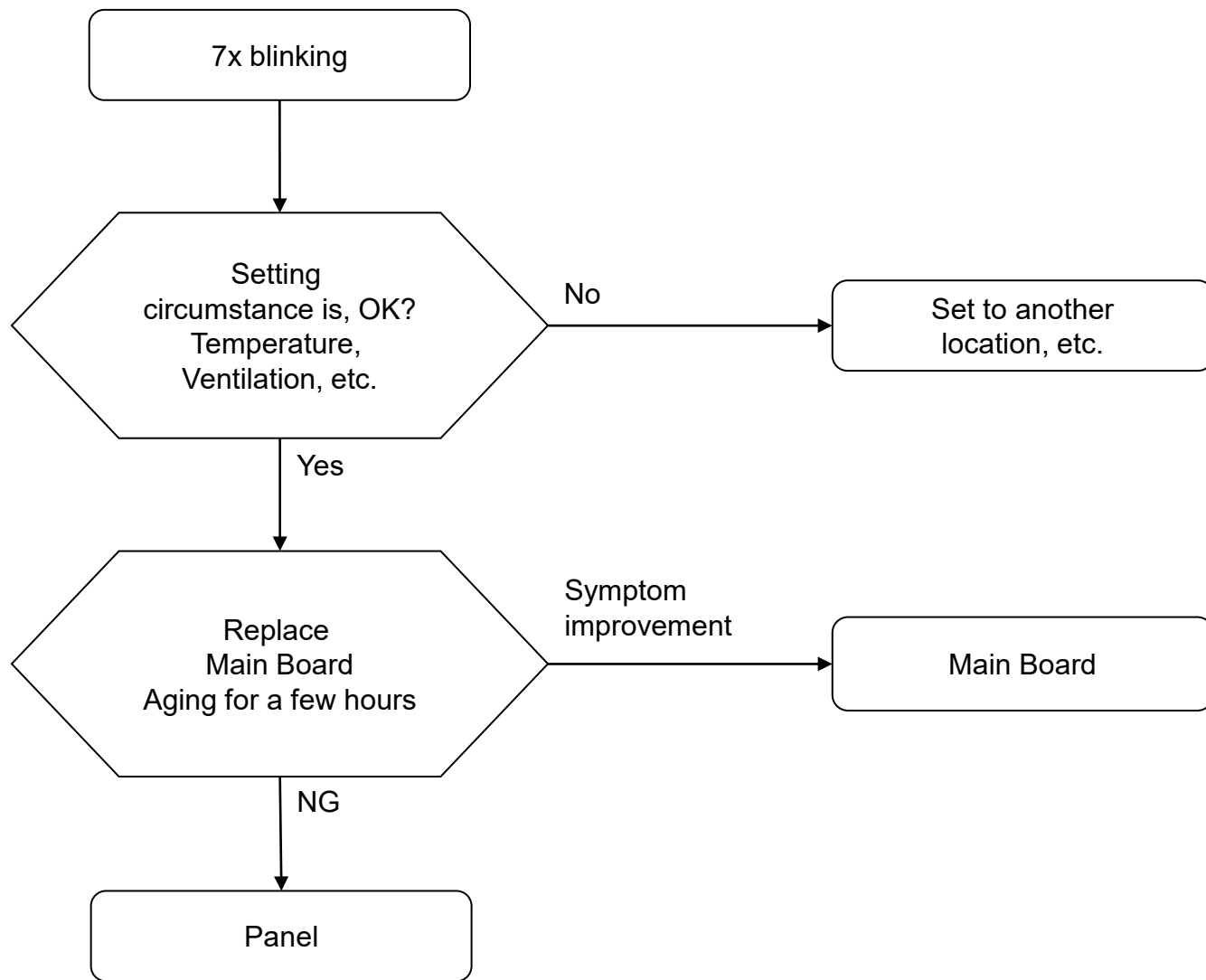
2.6 6x LED Blinking – Backlight_ERR

Check Point for BM5S22

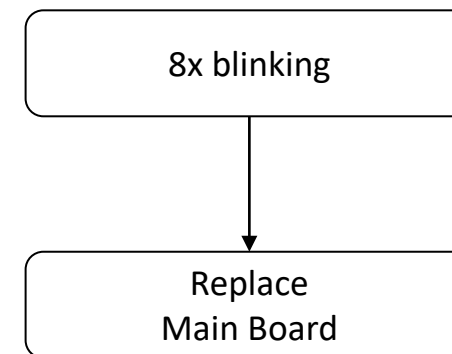


TROUBLESHOOTING

2.7 7x LED Blinking – TEMP_ERR

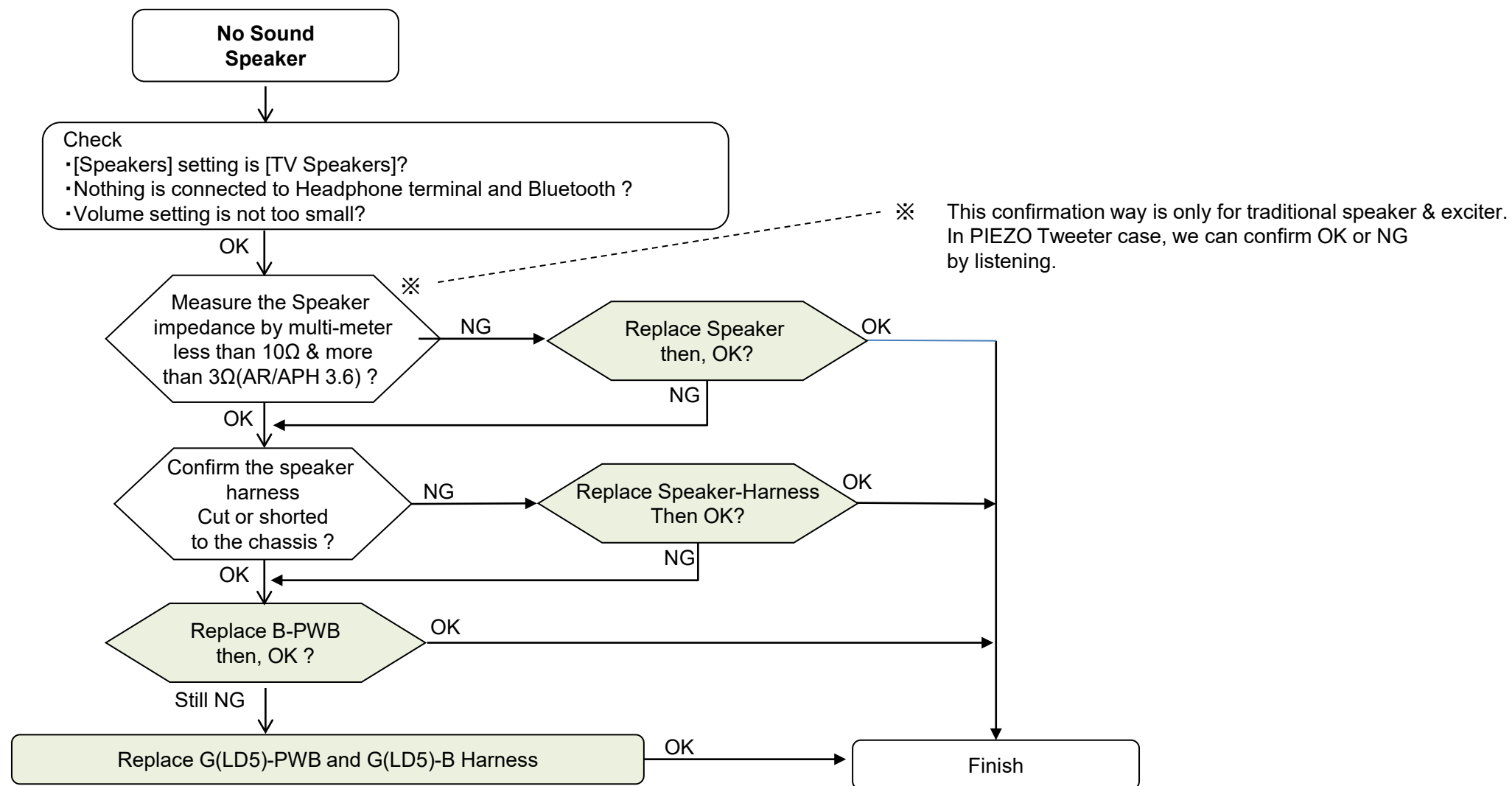


2.8 8x LED Blinking – 4KBE_ERR



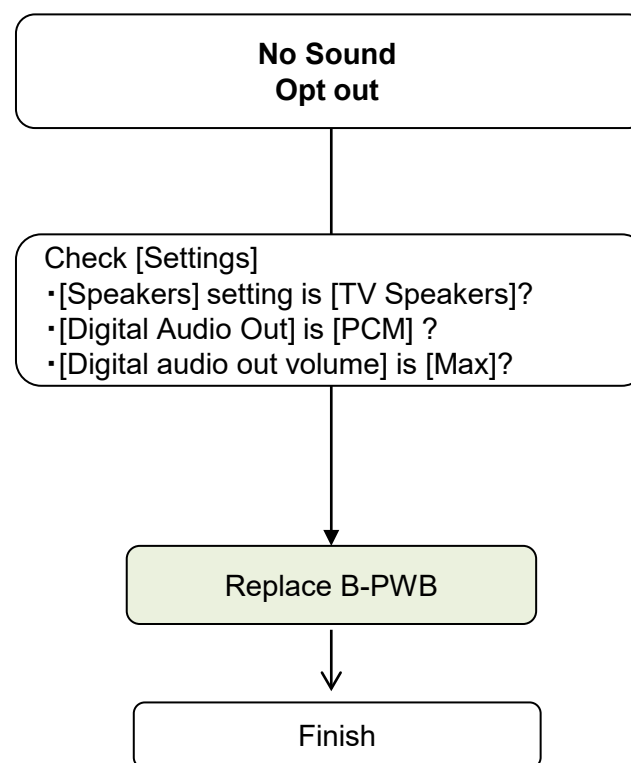
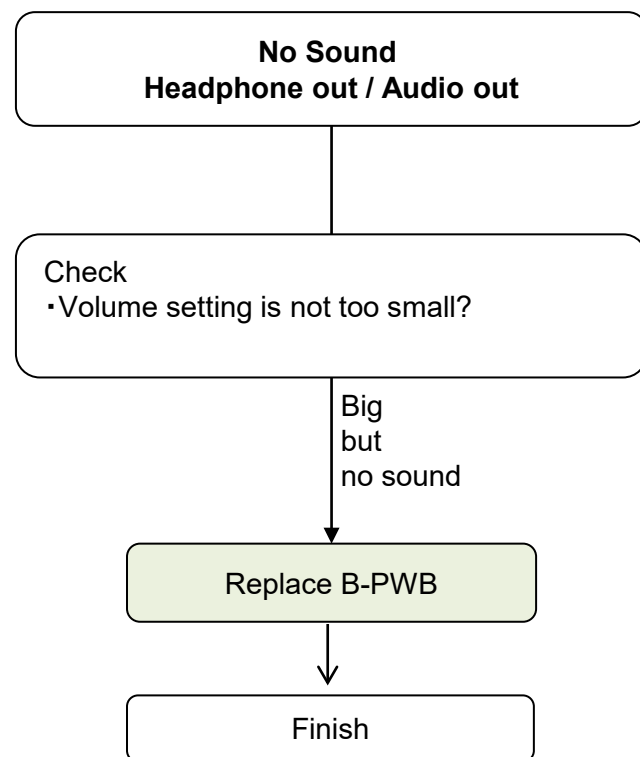
TROUBLESHOOTING

3.1 No Sound – Speaker



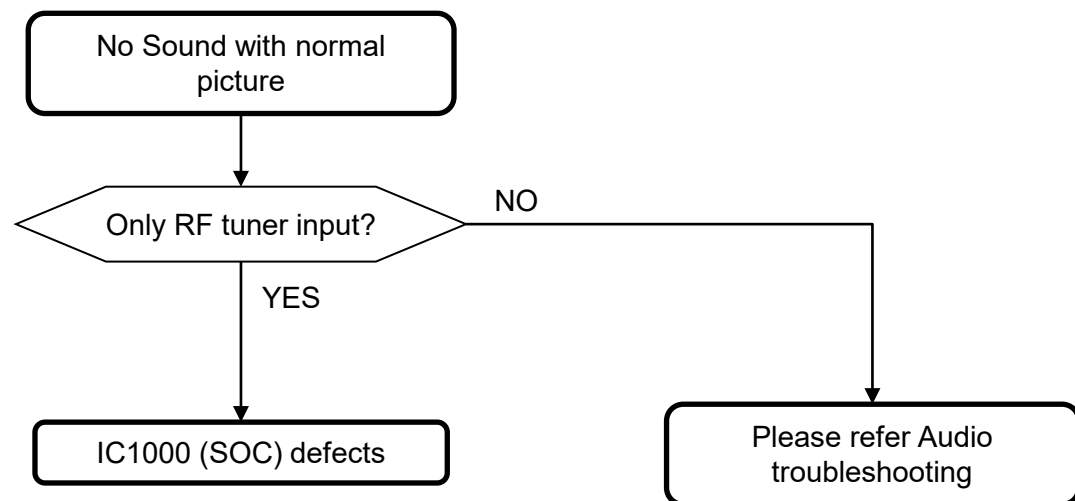
TROUBLESHOOTING

3.2 No Sound – Headphone / Audio / Opt Out

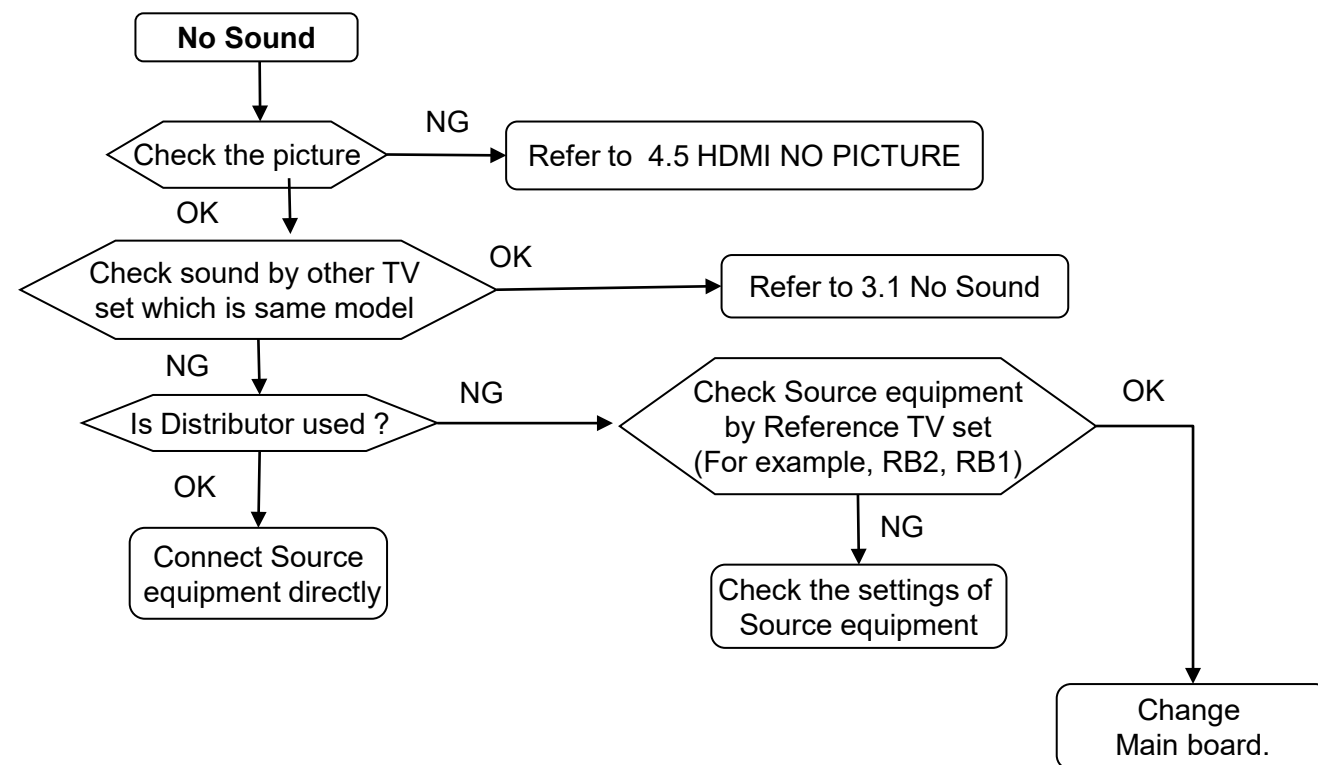


TROUBLESHOOTING

3.7 No Sound – Tuner

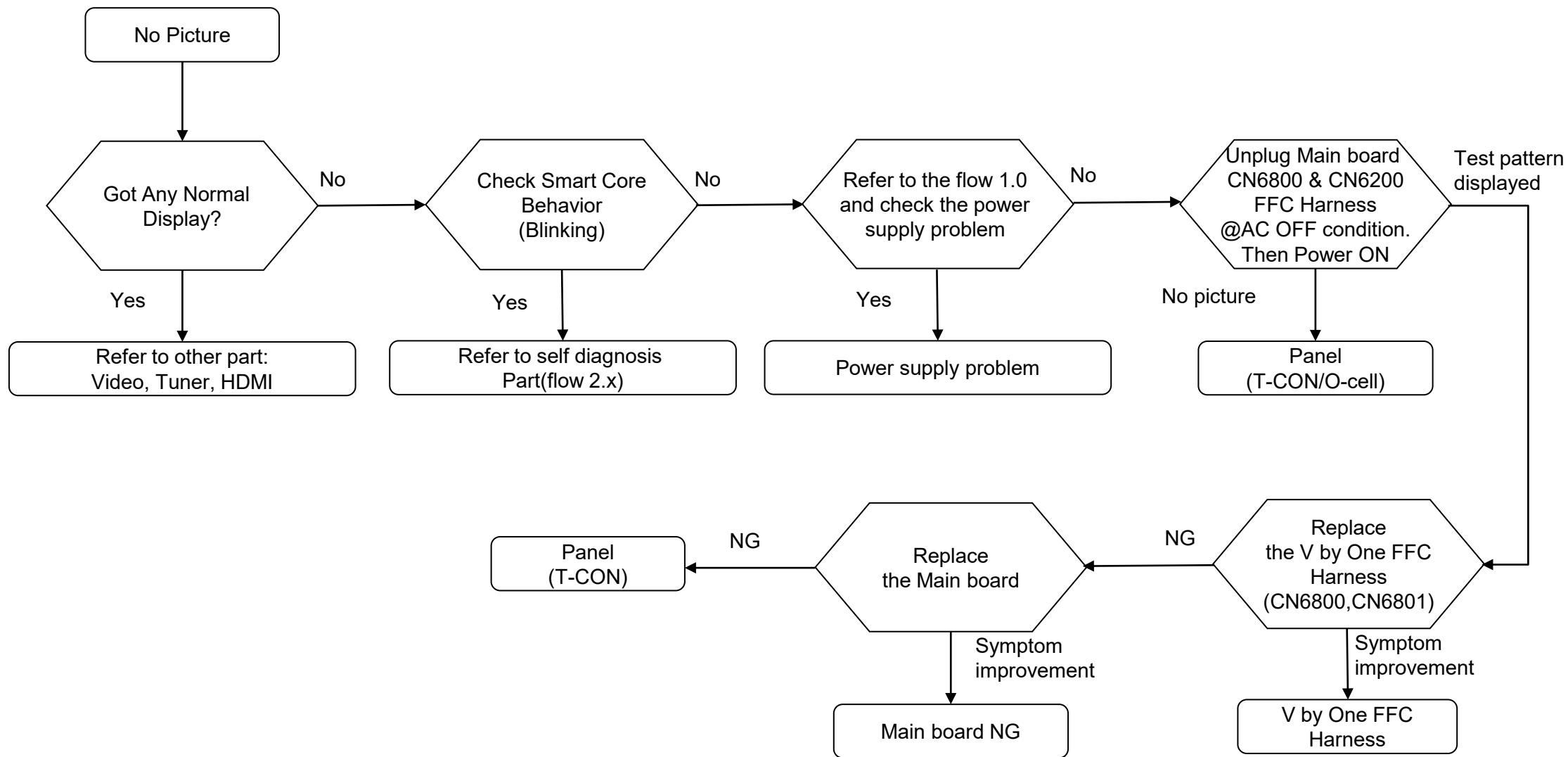


3.8 No Sound – HDMI 1/2/3/4



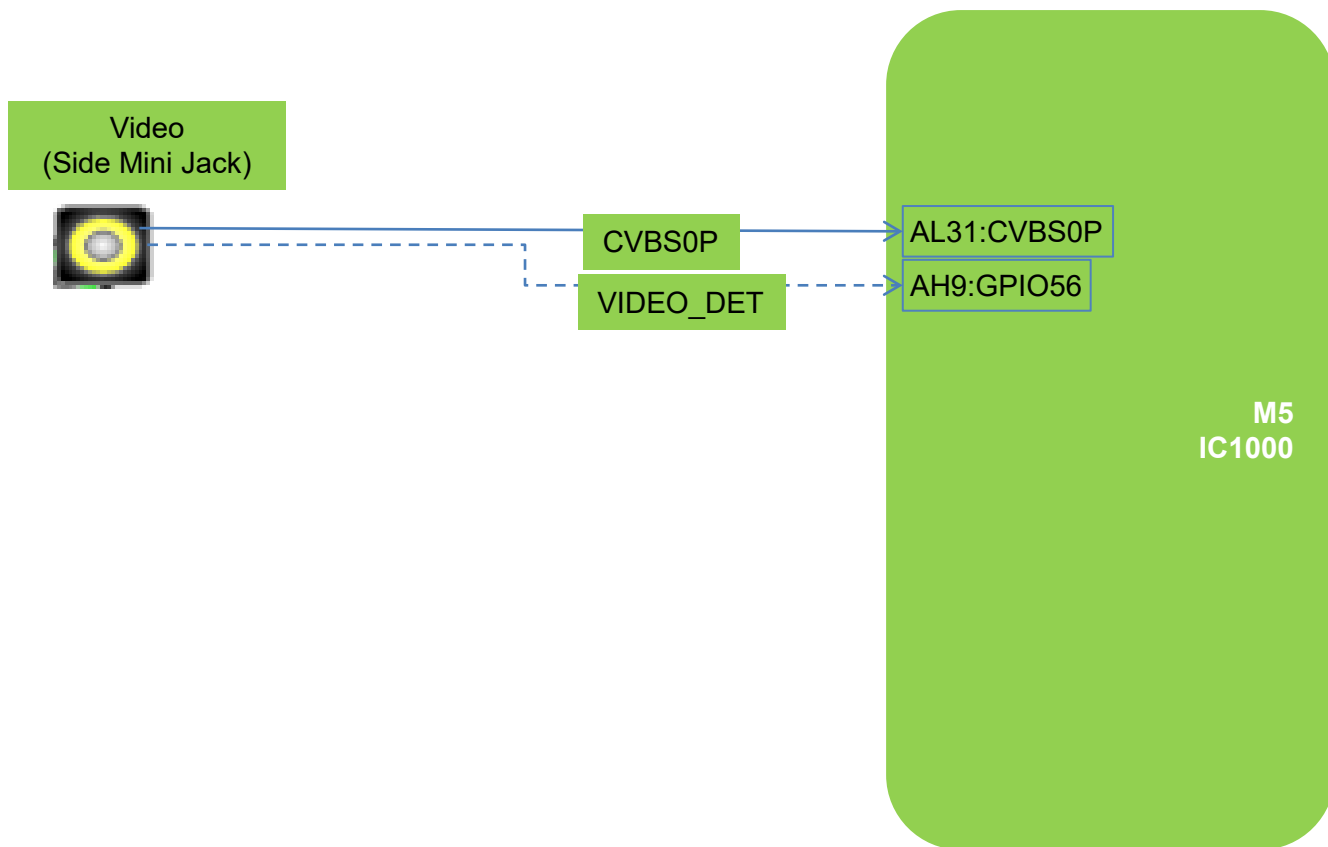
TROUBLESHOOTING

4.0 No Picture



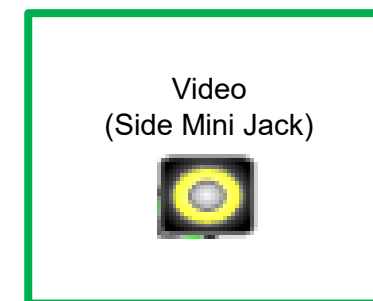
TROUBLESHOOTING

4.1 Video Analog Signal Path



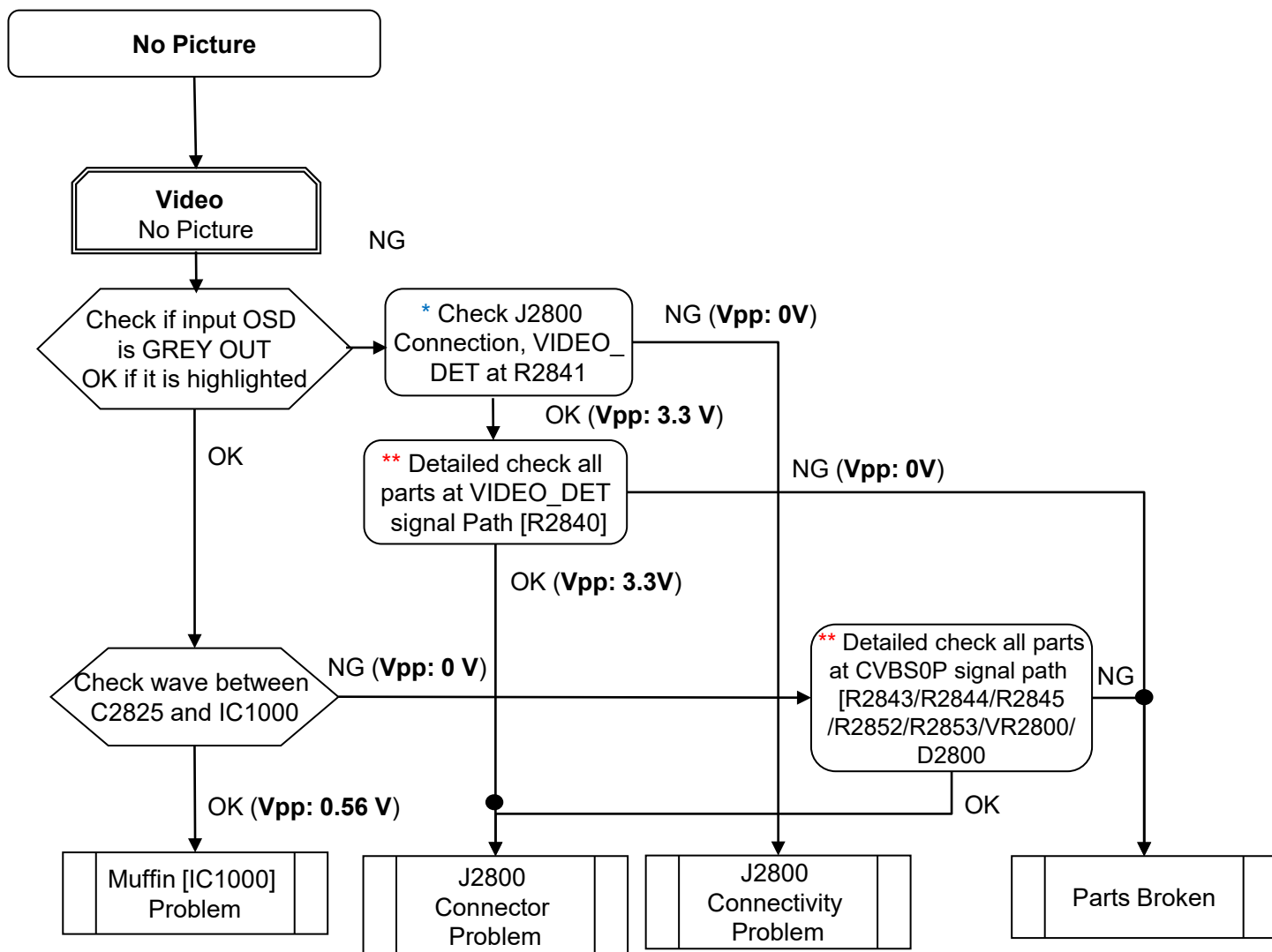
Input Skip Function

Input	Signal	Non-Detect (Typical)	Detect (Typical)
Video	VIDEO_DET IC1000 AH9-GPIO56	0V	3.3V



TROUBLESHOOTING

4.2 No Picture



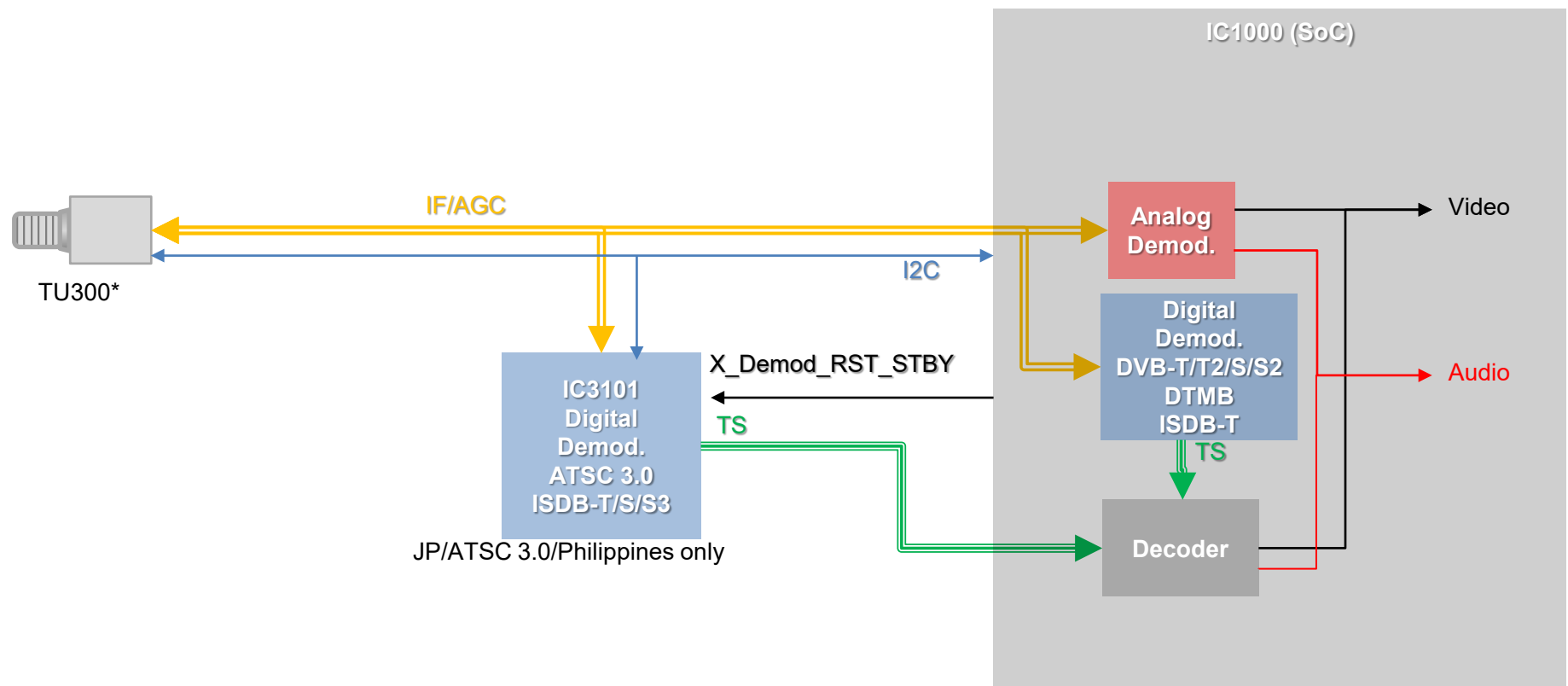
Condition	Actions to be taken
Muffin [IC1000] Problem	Refer to IC troubleshooting for further investigation
J2800 Connector Problem	Change Connector
J2800 Connectivity Problem	
Parts Broken	Change Part

* → 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

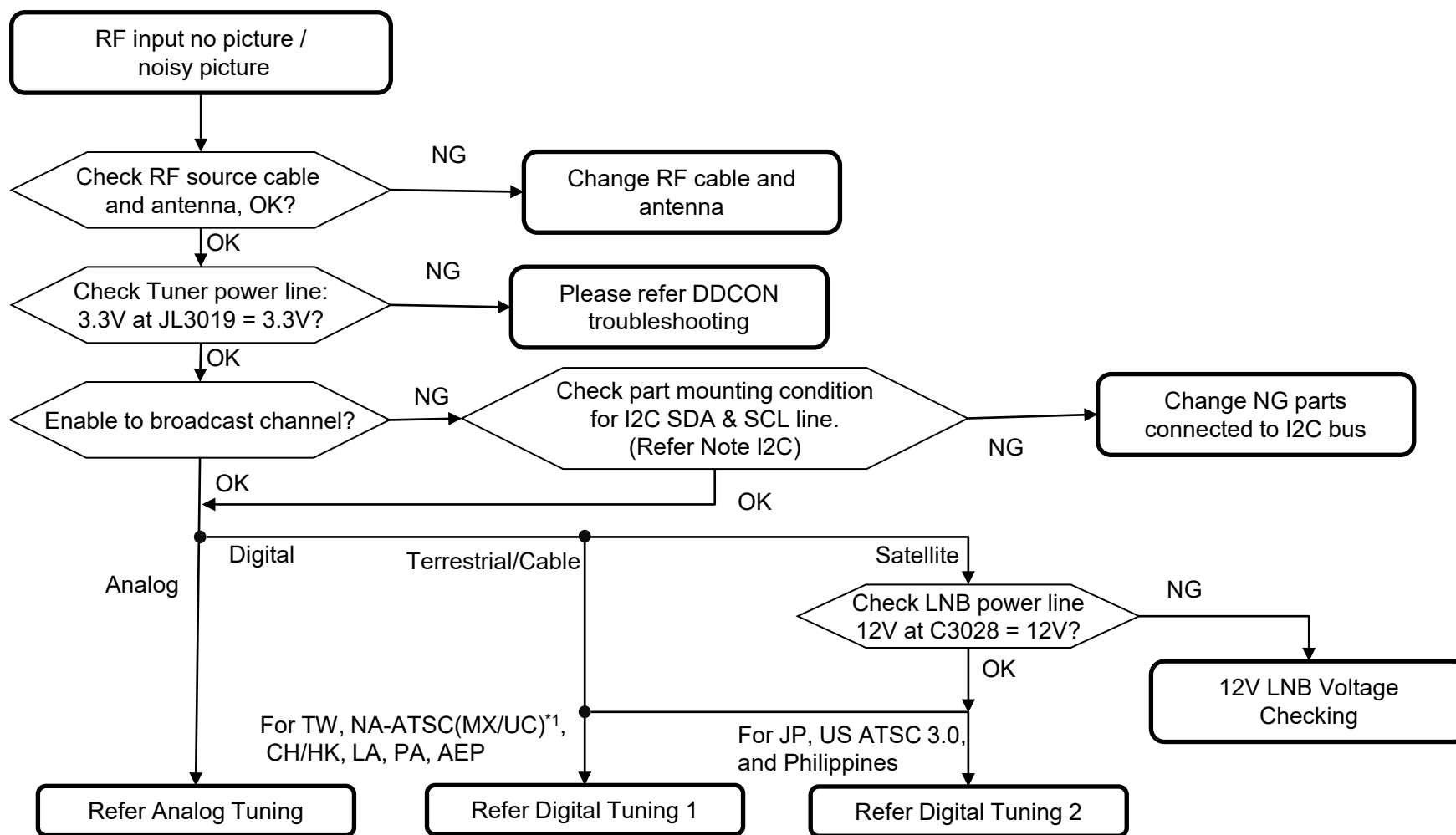
TROUBLESHOOTING

4.4 No Picture - Tuner



TROUBLESHOOTING

4.4 No Picture - Tuner



Notes: I2C
 - Parts for I2C SDA line: R3036, R3040, C3005
 - Parts for I2C SCL line : R3035, R3039, 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

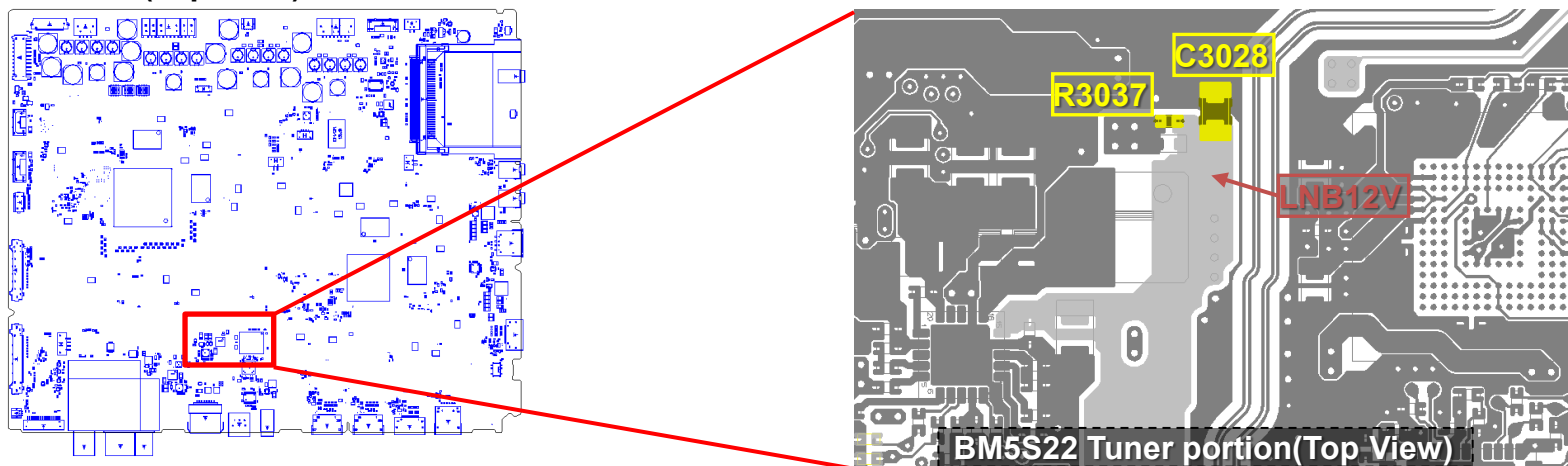
*1 : Except US ATSC3.0, Please refer Digital Tuning 2

TROUBLESHOOTING

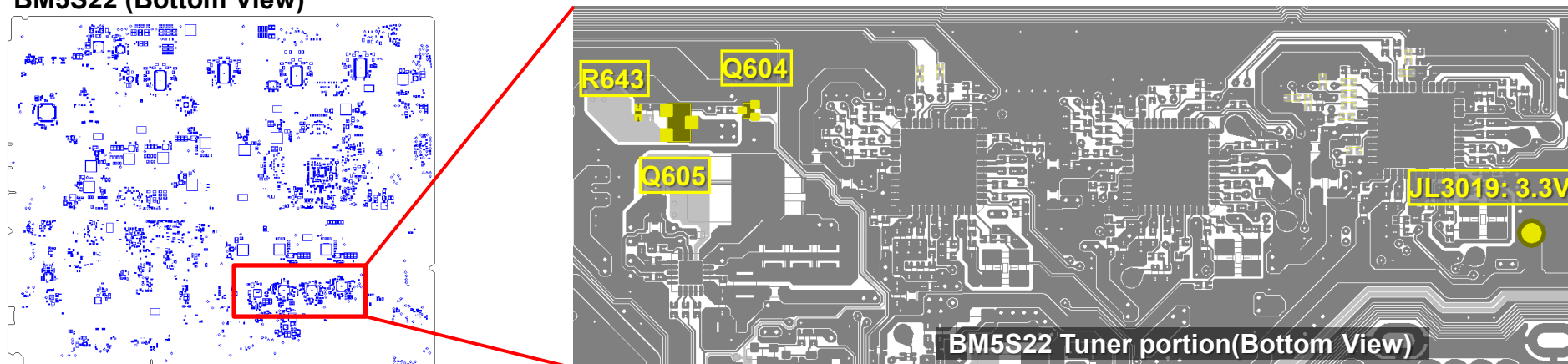
4.4 No Picture - Tuner

*I2C: Please refer Digital Tuning

BM5S22 (Top View)



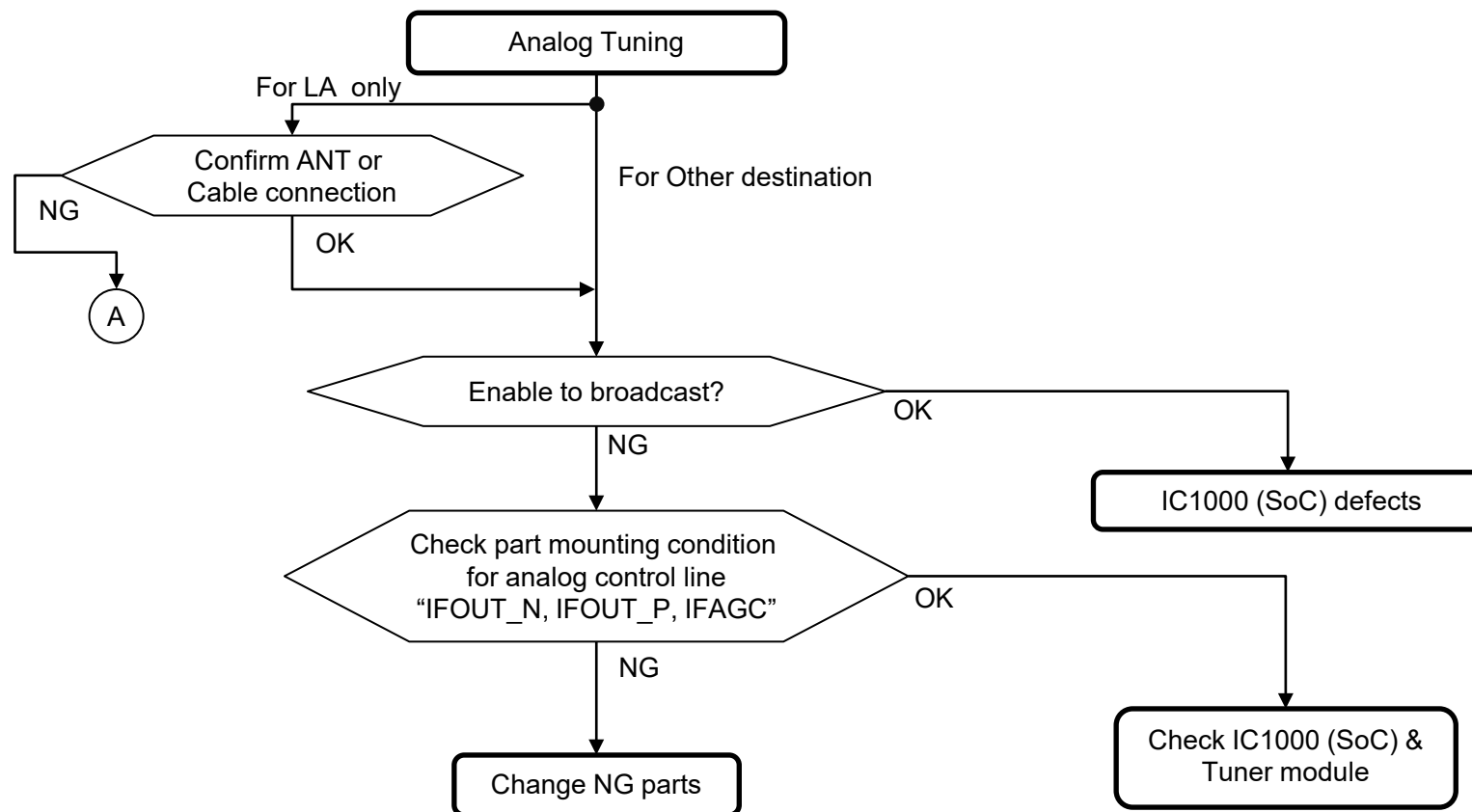
BM5S22 (Bottom View)



TROUBLESHOOTING

4.4 No Picture - Tuner

FOR ANALOG TUNING



Notes:

- Parts for IFOUT_N line : C3011
- Parts for IFOUT_P line : C3010
- Parts for IFAGC line : R3003 ,R3024, C3023

(A) Insert correct signal in correct ANT terminal.

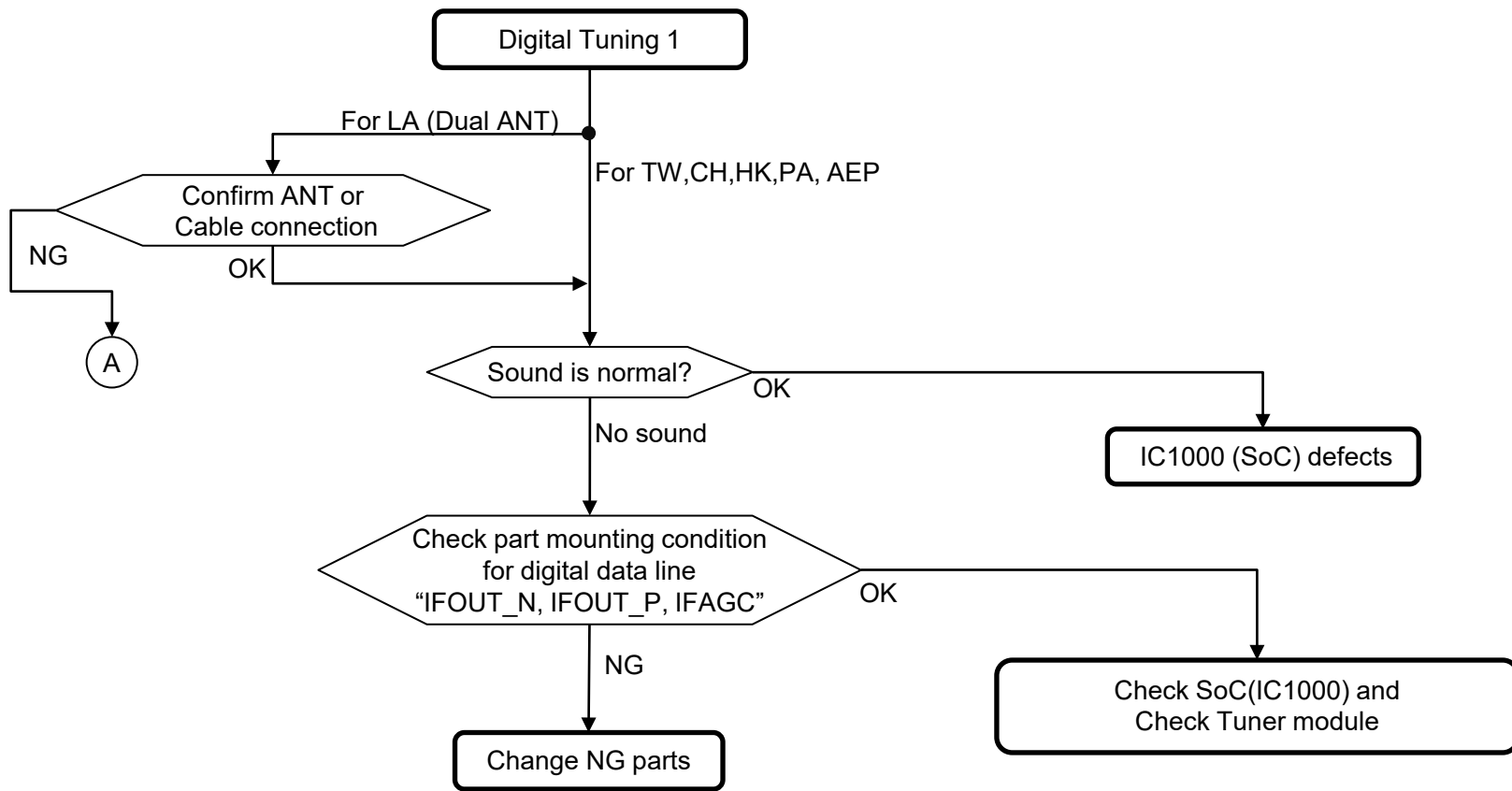
TROUBLESHOOTING

4.4 No Picture - Tuner

FOR DIGITAL TUNING 1: @ For TW,CH,HK,LA,PA

Notes:
 - Parts for IFOUT_N line : C3011
 - Parts for IFOUT_P line : C3010
 - Parts for IFAGC line : R3003 ,R3024, C3023

(A) Insert correct signal in correct ANT terminal.



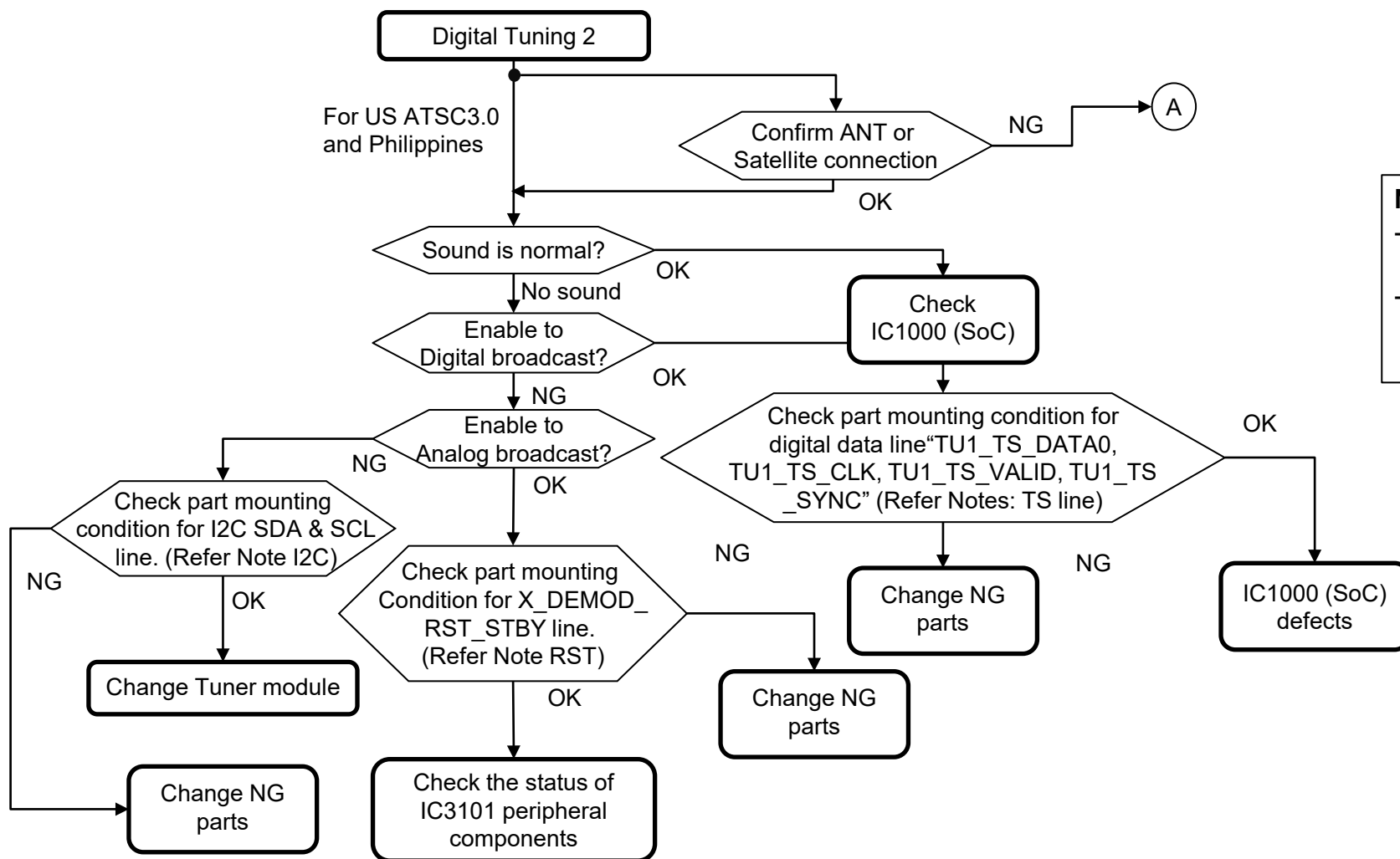
TROUBLESHOOTING

4.4 No Picture - Tuner

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

Notes: I2C
 - Parts for I2C SDA line:
 R3036, R3040, C3005
 - Parts for I2C SCL line :
 R3035, R3039, C3006

 Waveform confirmation point
 • I2C_TU_SDA line: JL3013
 • I2C_TU_SCL line : JL3012



Notes: TS line
 -TS line parts for US ATSC3.0/Philippines
 R3114/R3116/R3117/R3120/R3121/R3122/R3123/RB3001
 - TS line parts for JP :
 R3113/R3114/R3116/R3117/R3120/R3121/R3122/R3123/
 R3027/RB3001

(A) Insert correct signal in correct ANT terminal.

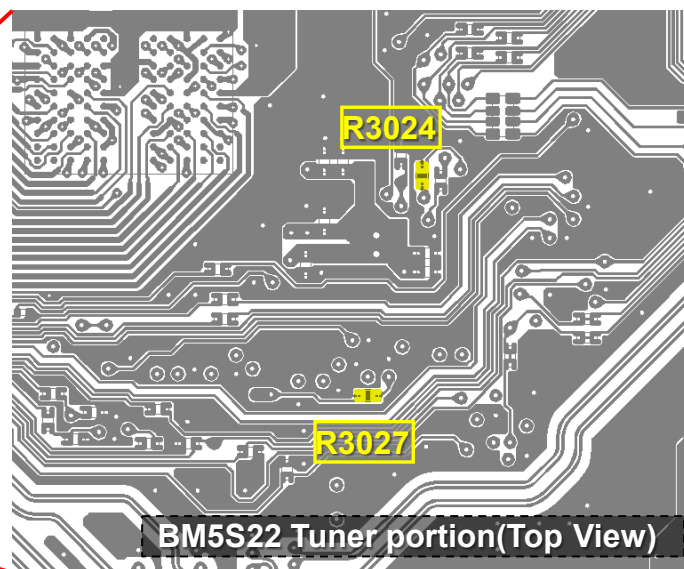
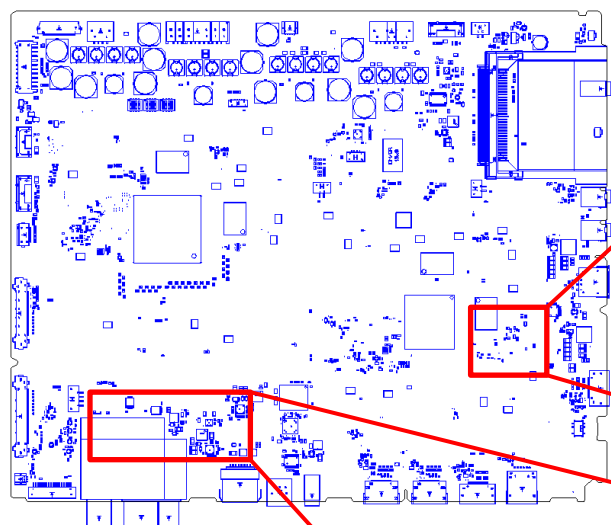
Notes: RST
 - Parts for X_DEMOD_RST line:
 R3109, C3117

 Voltage confirmation point
 C3117 = 3.3V

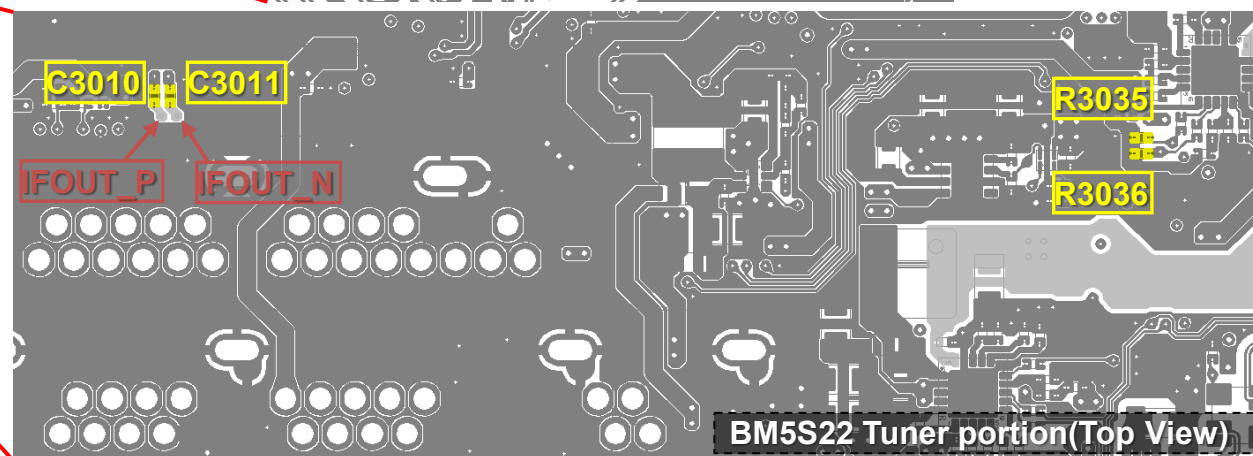
TROUBLESHOOTING

4.4 No Picture - Tuner

BM5S22 (Top View)



BM5S22 Tuner portion(Top View)

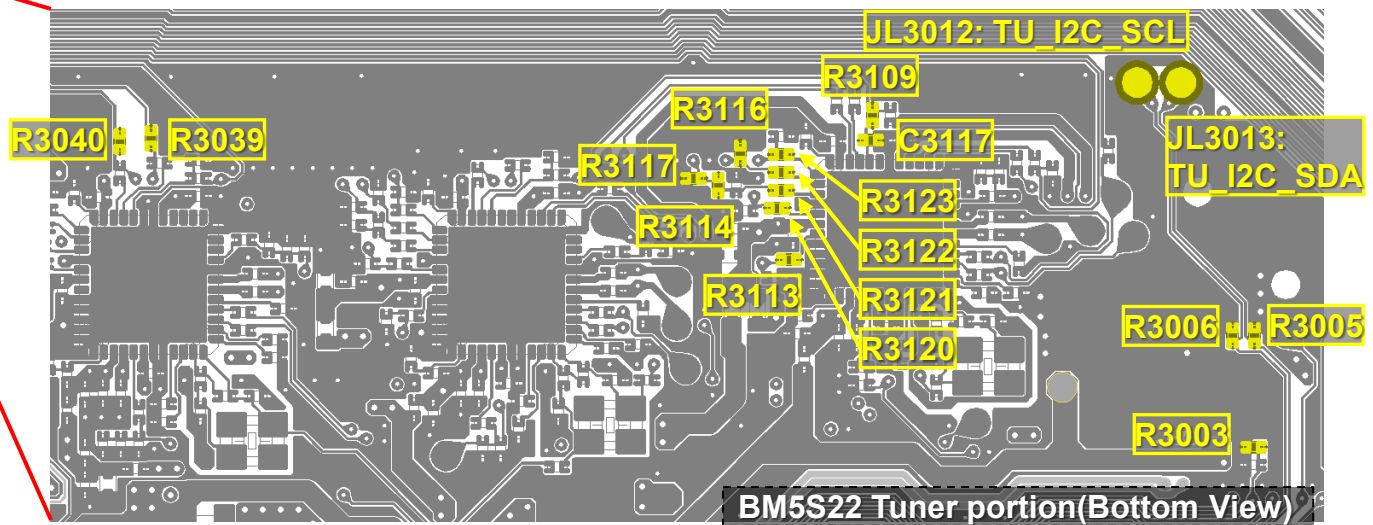
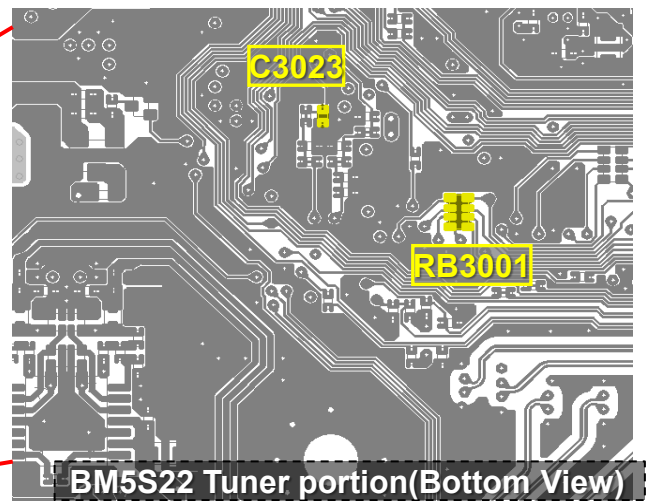
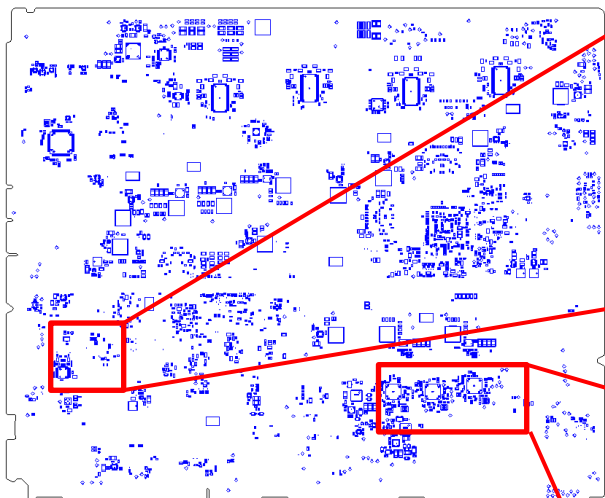


BM5S22 Tuner portion(Top View)

TROUBLESHOOTING

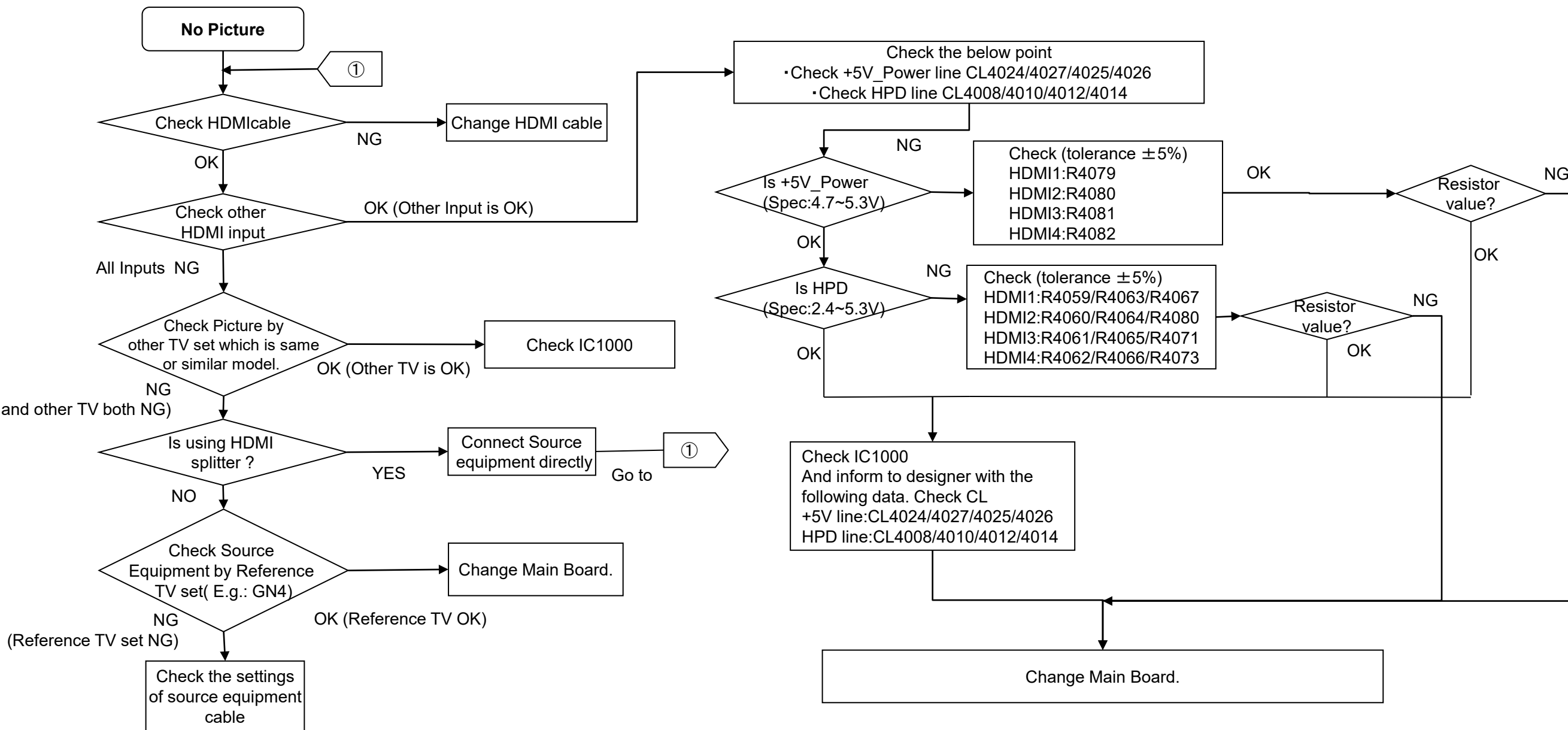
4.4 No Picture - Tuner

BM5S22 (Bottom View)



TROUBLESHOOTING

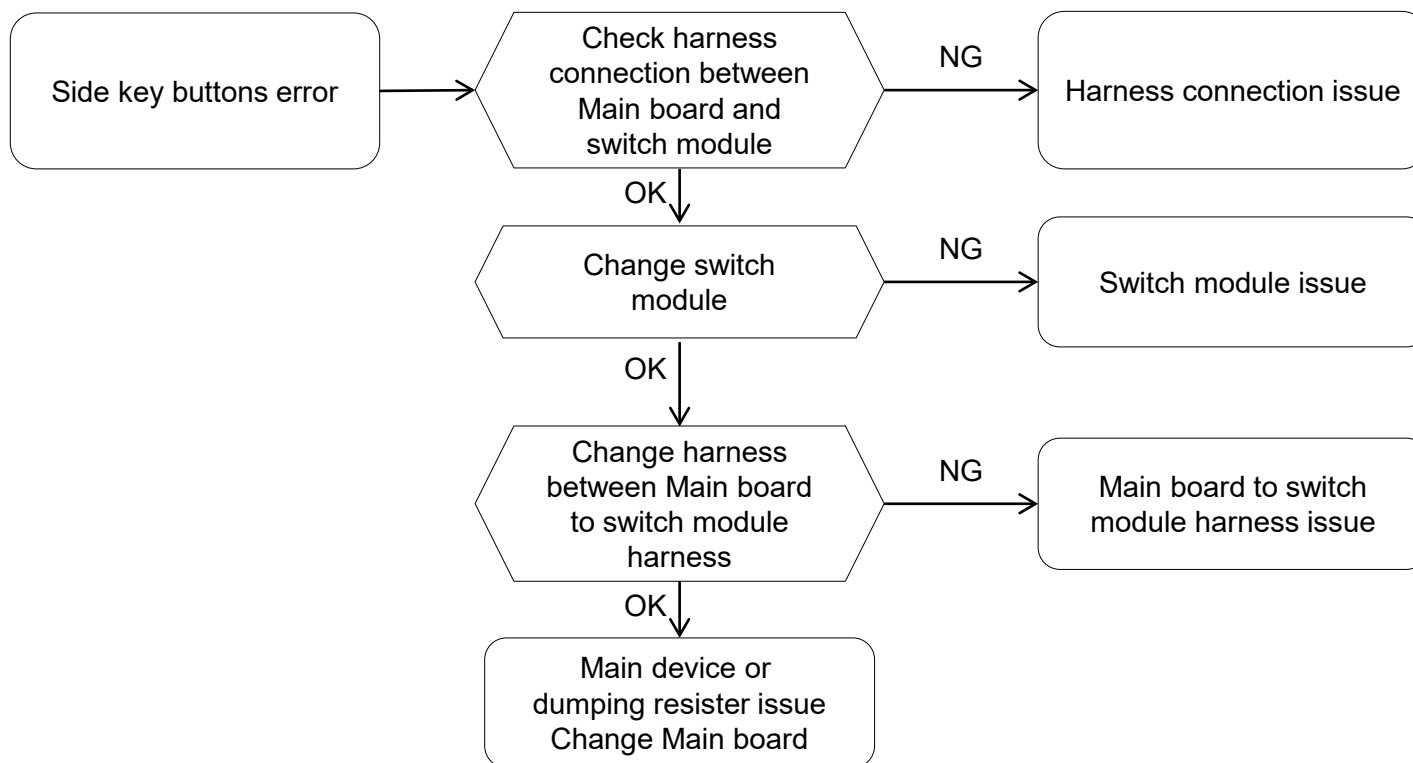
4.5 No Picture – HDMI 1/2/3/4



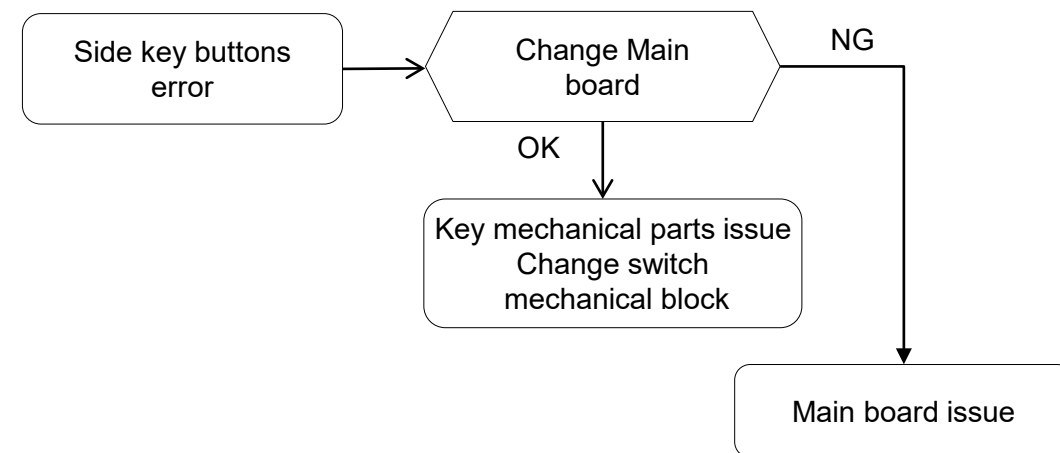
TROUBLESHOOTING

5.0 Key Switch – Buttons Error

Switch Module Type

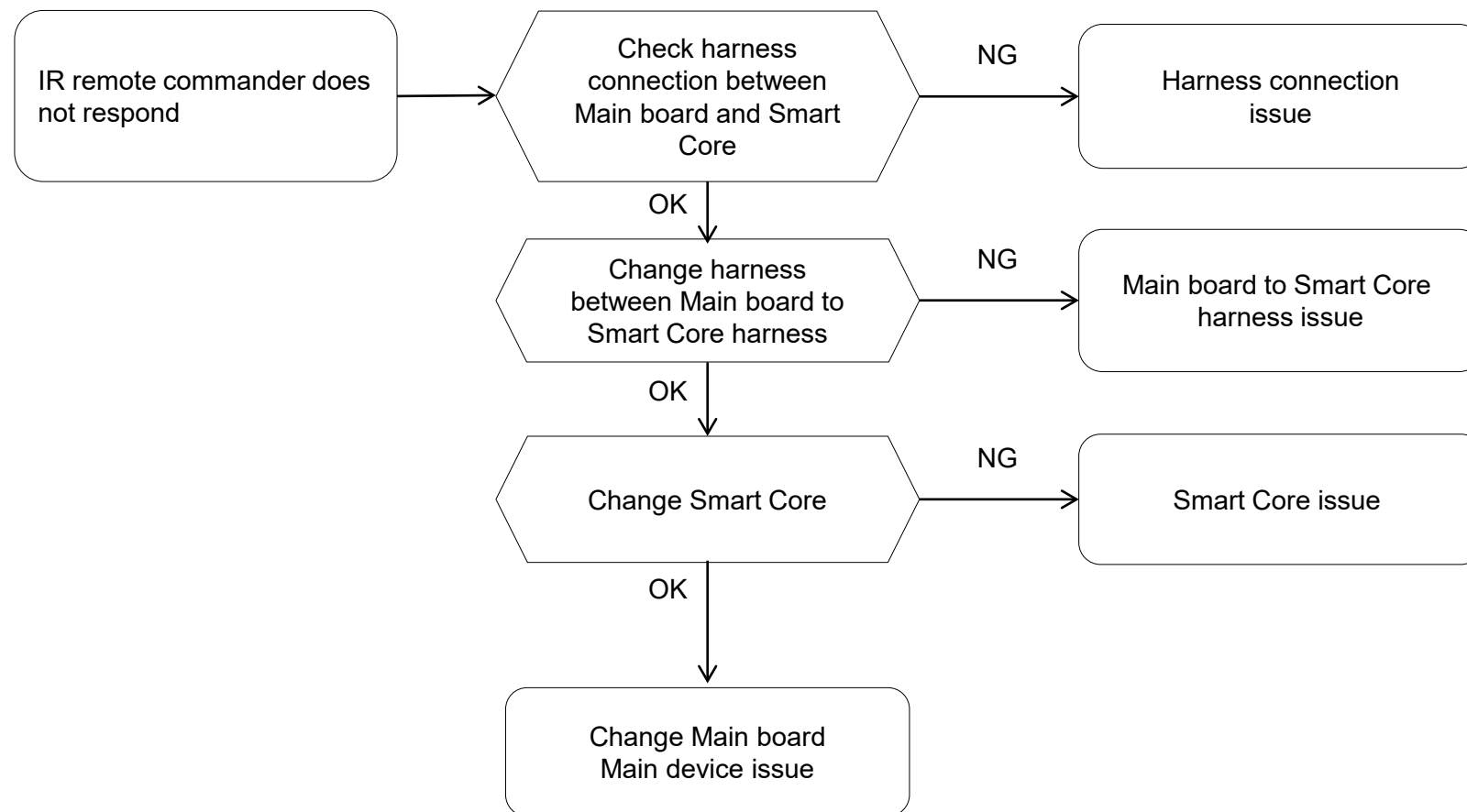


On Board Switch Type



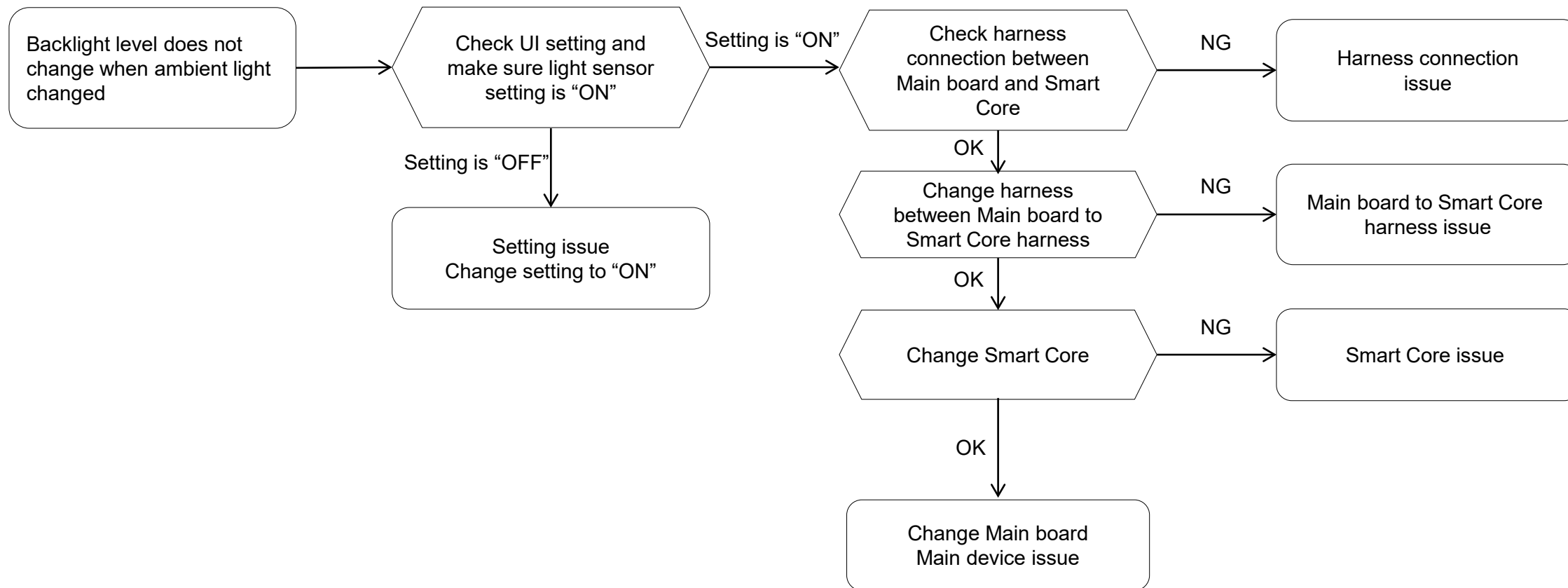
TROUBLESHOOTING

5.1 IR Remote Commander Error



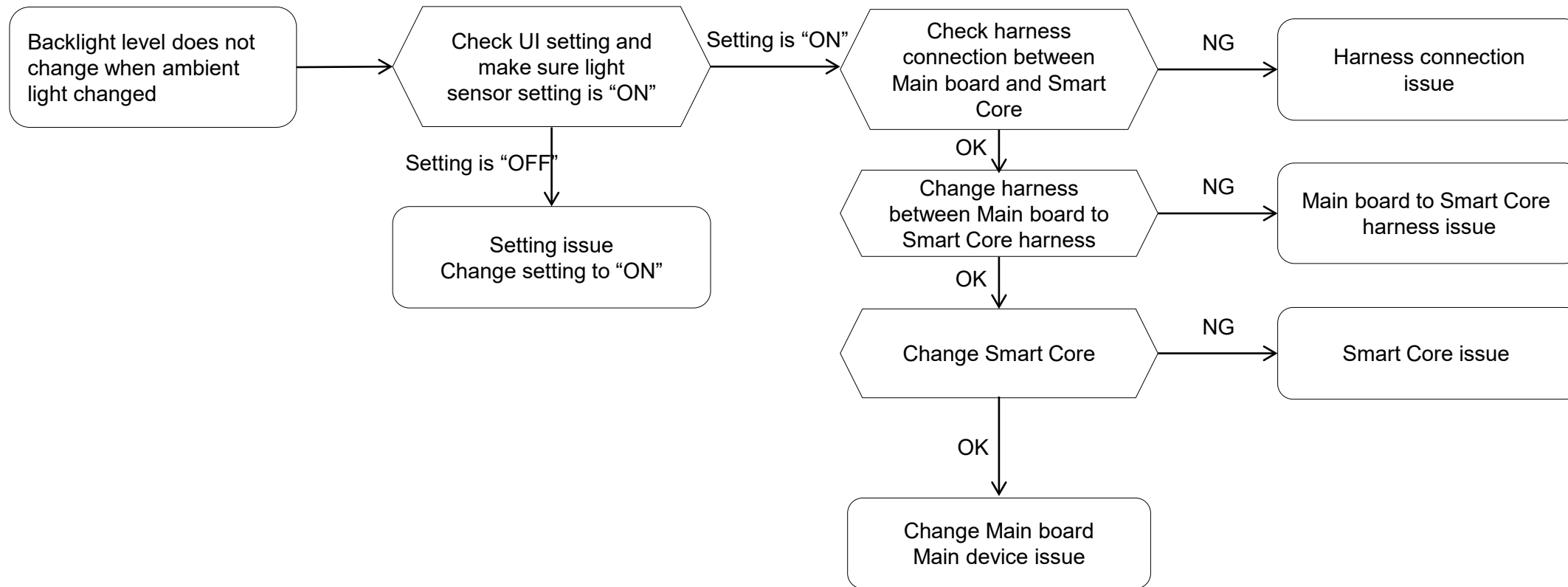
TROUBLESHOOTING

5.2 Light Sensor Error



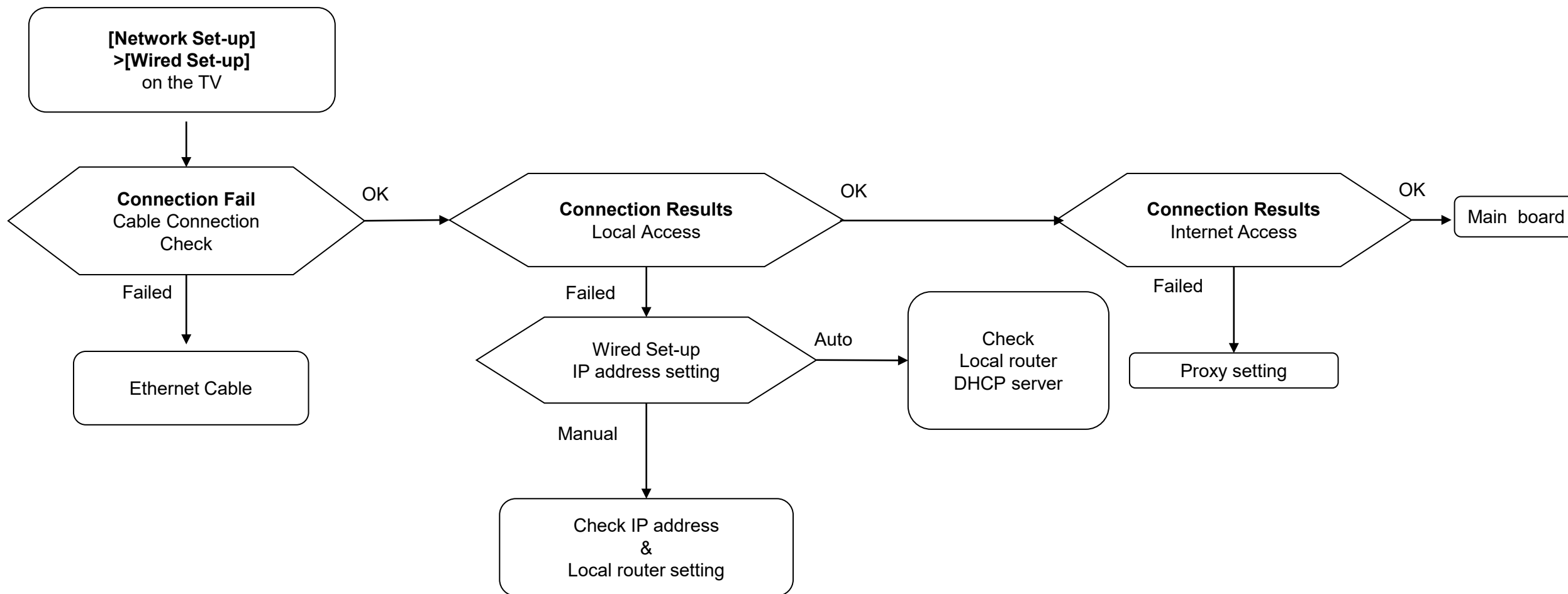
TROUBLESHOOTING

5.3 CAS ID Unknown



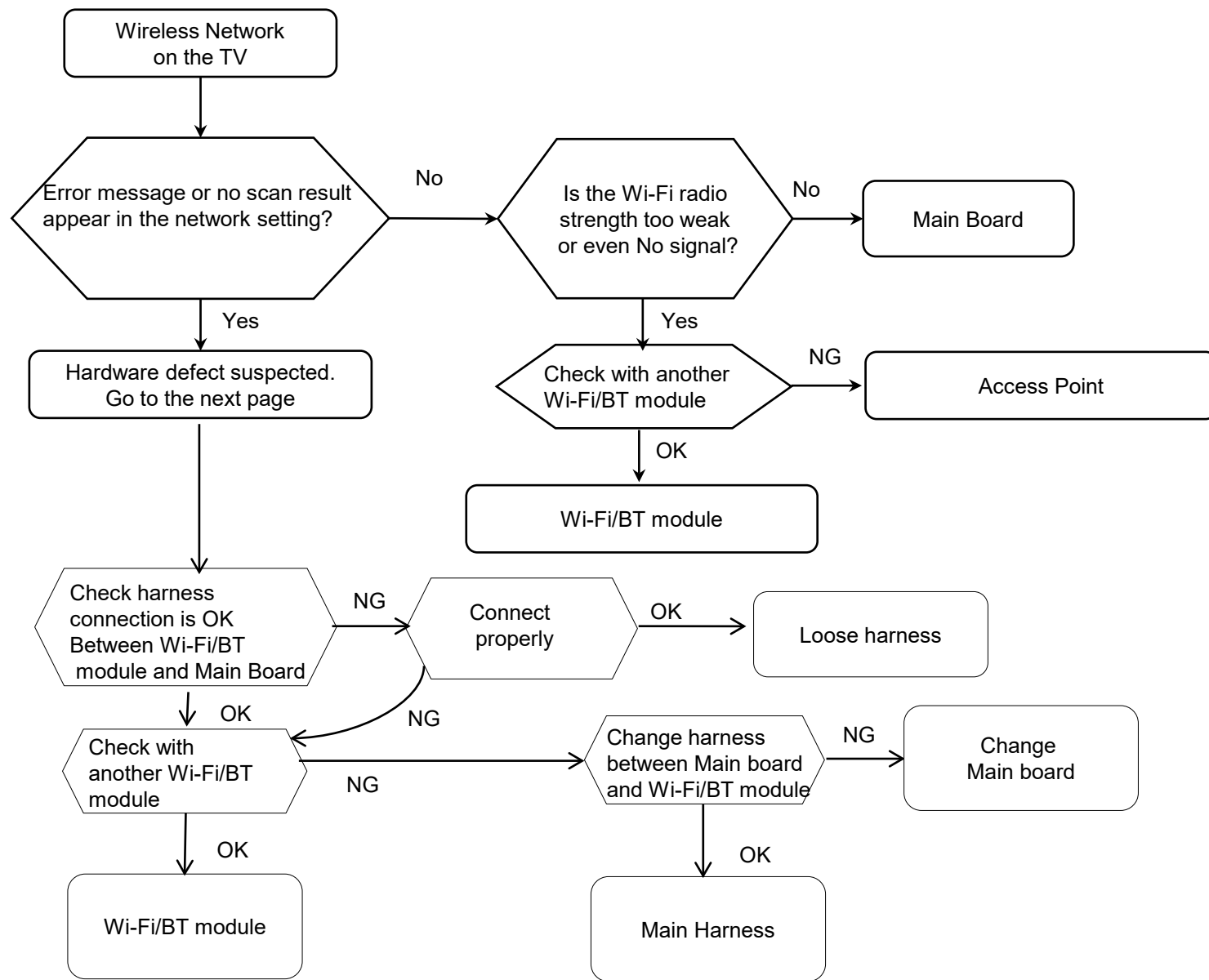
TROUBLESHOOTING

6.0 Network Malfunction – Ethernet Wired



TROUBLESHOOTING

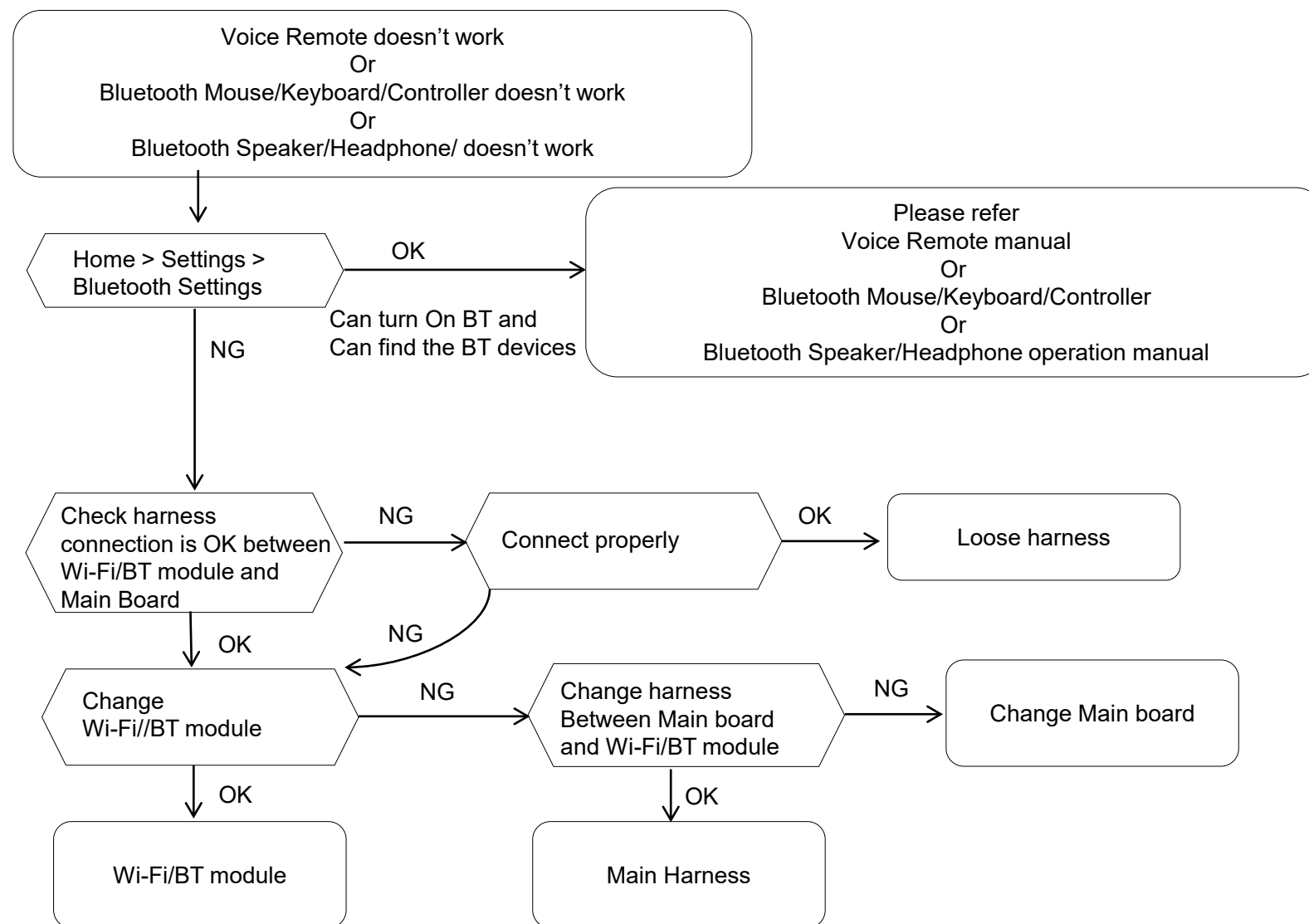
6.2 Wireless Network Malfunction



If Wi-Fi malfunction happens,
 • Wi-Fi/BT module
 • Harness between Wi-Fi/BT and Main Board are suspected.

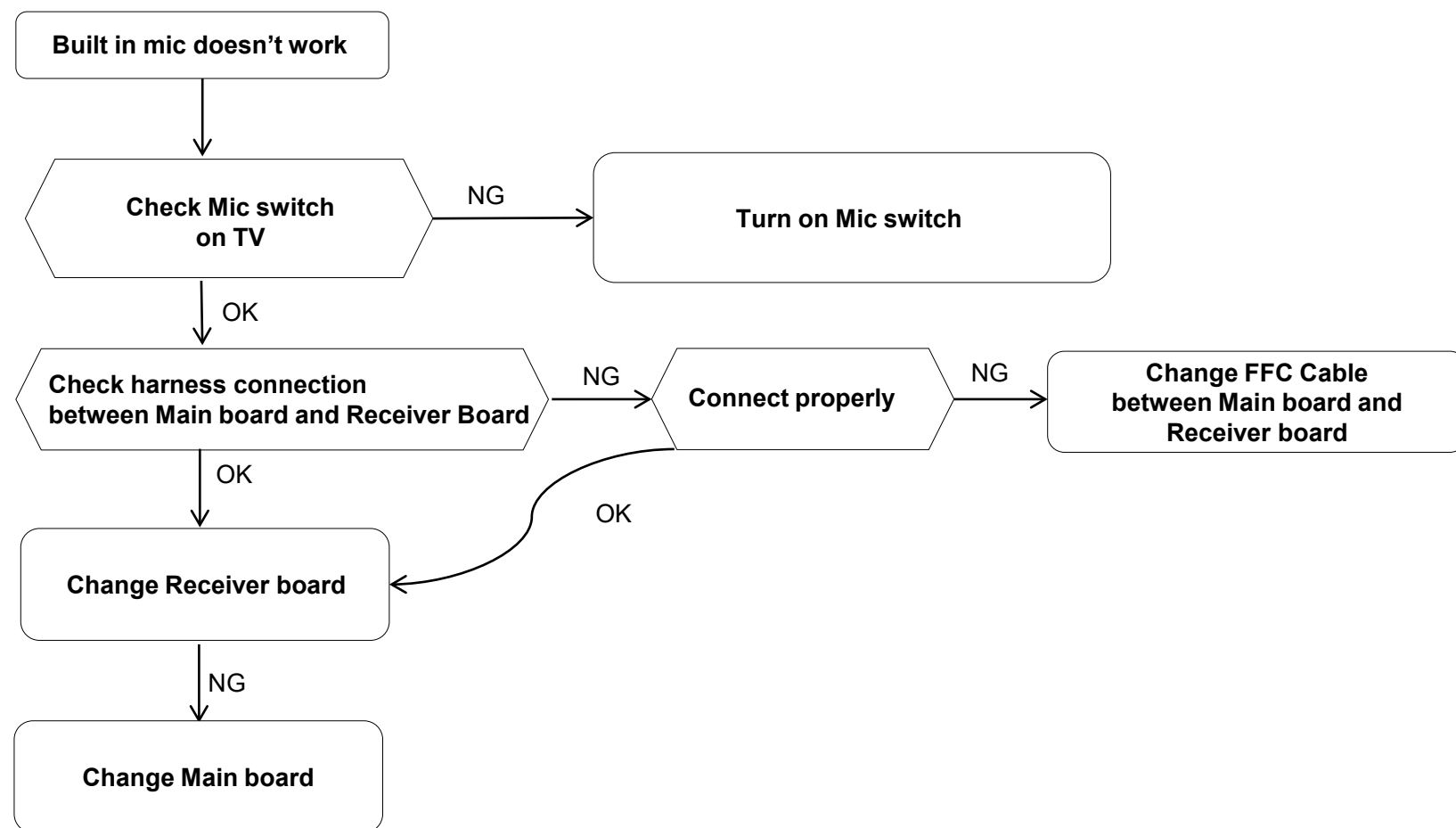
TROUBLESHOOTING

6.3 Bluetooth Malfunction



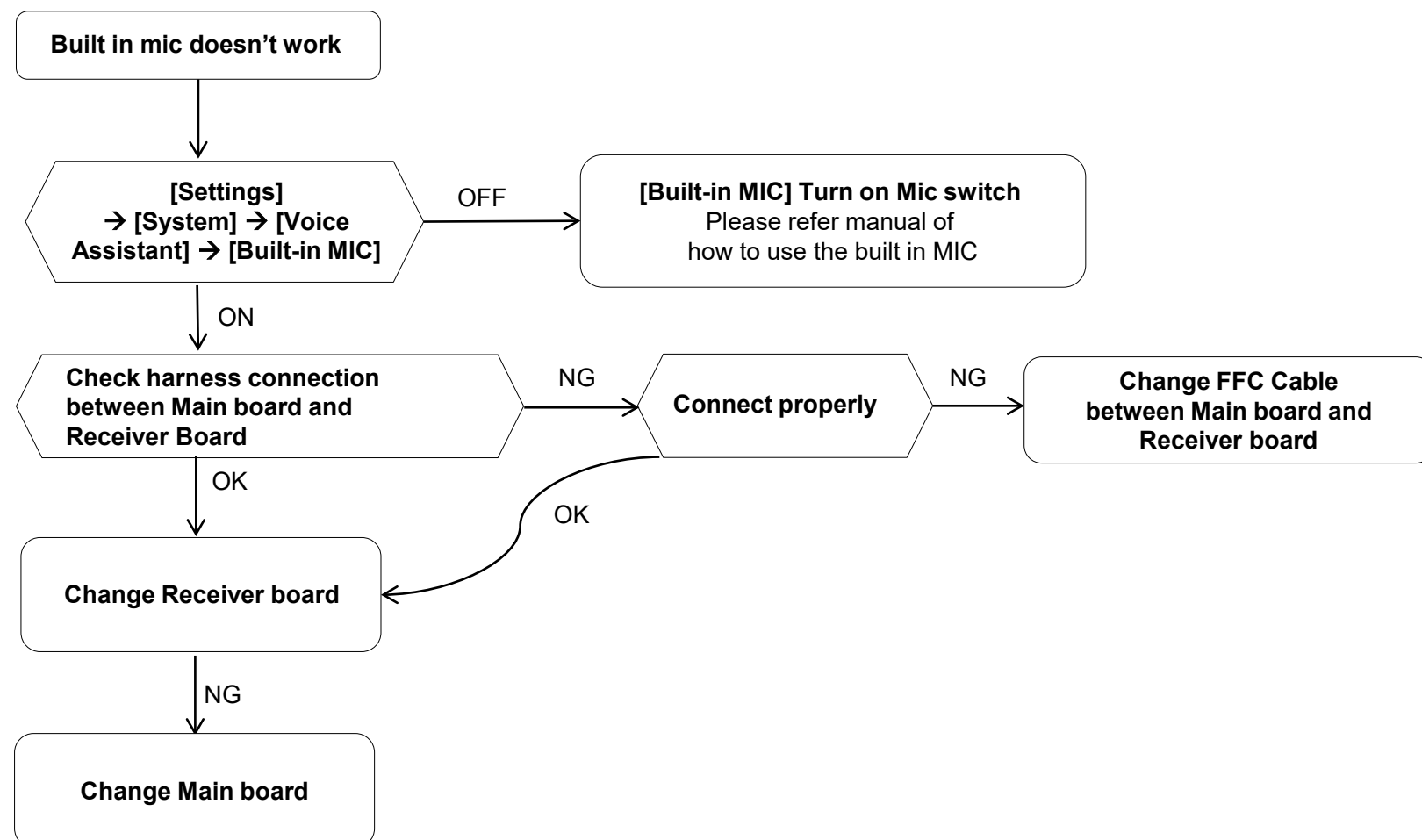
TROUBLESHOOTING

6.4 Built in MIC Malfunction



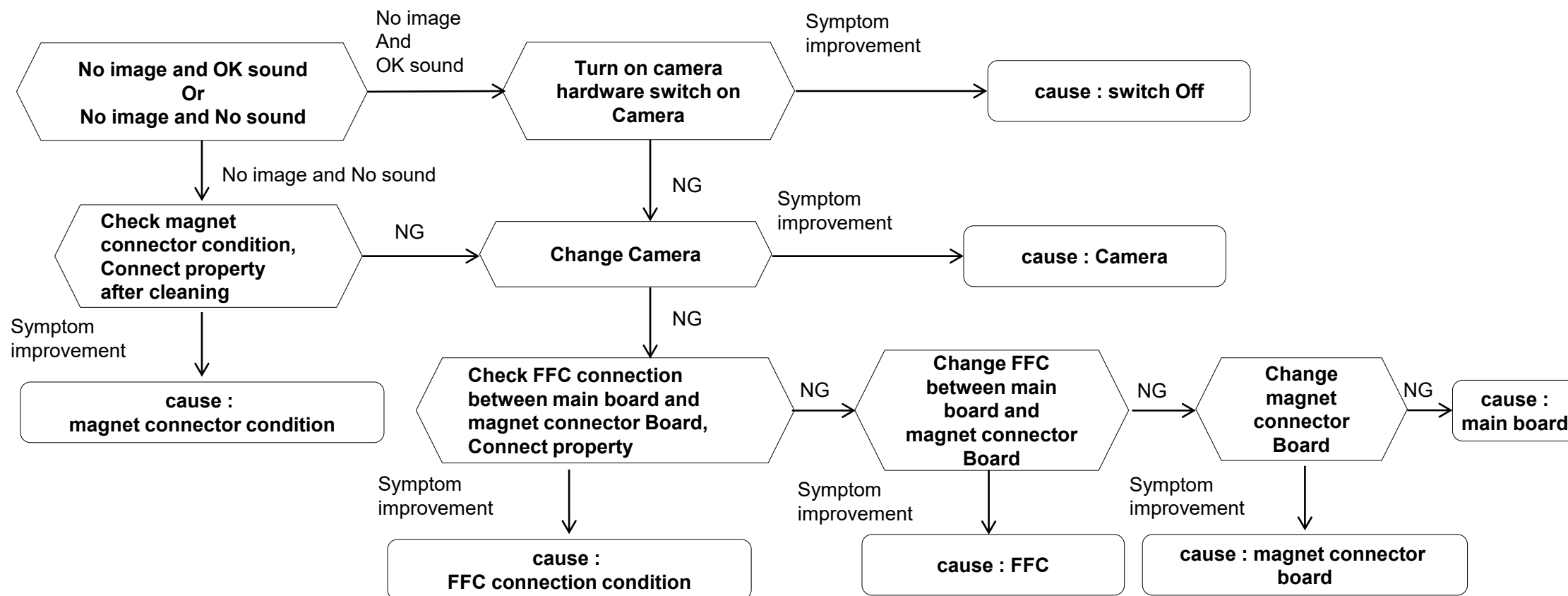
TROUBLESHOOTING

6.4 Built in MIC Malfunction (CN)



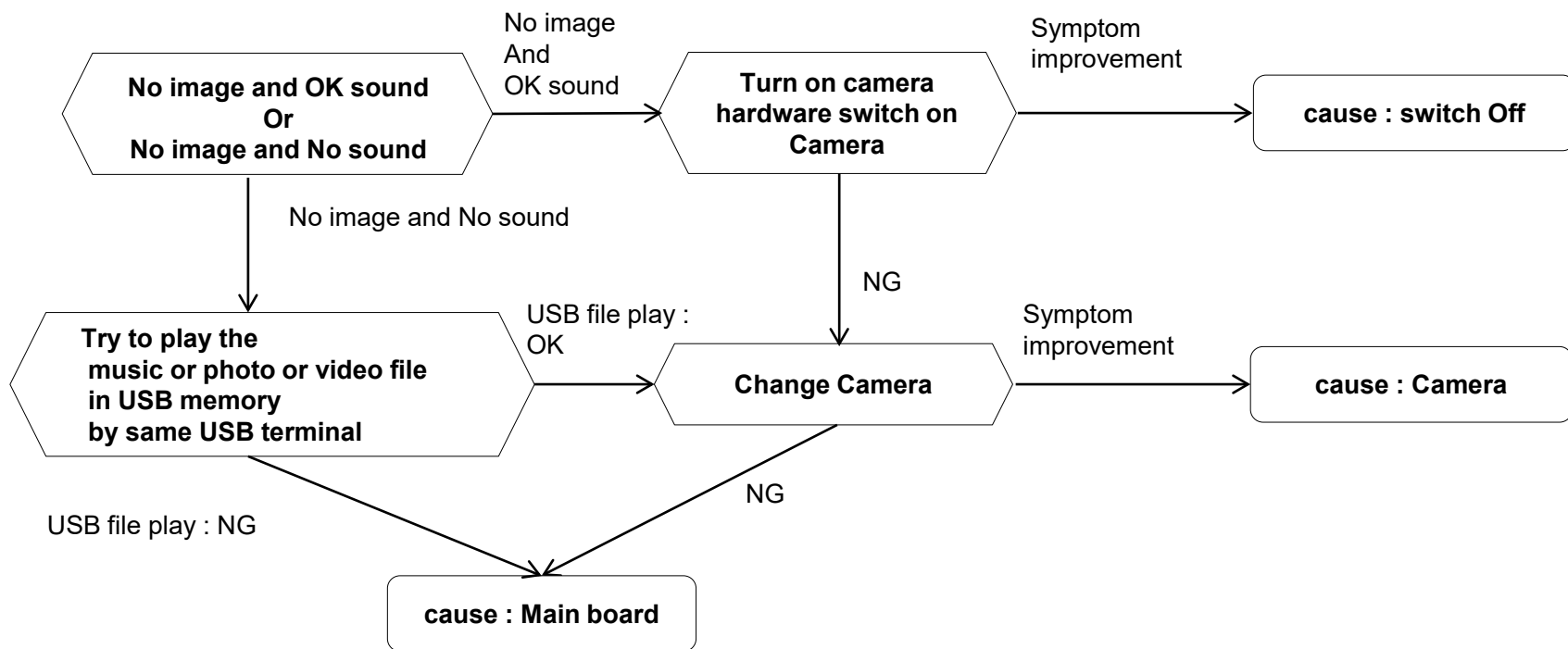
TROUBLESHOOTING

6.5 Magnet connector type Camera (Bundle)



TROUBLESHOOTING

6.5 USB connector type Camera (Accessory)



SERVICE ADJUSTMENT

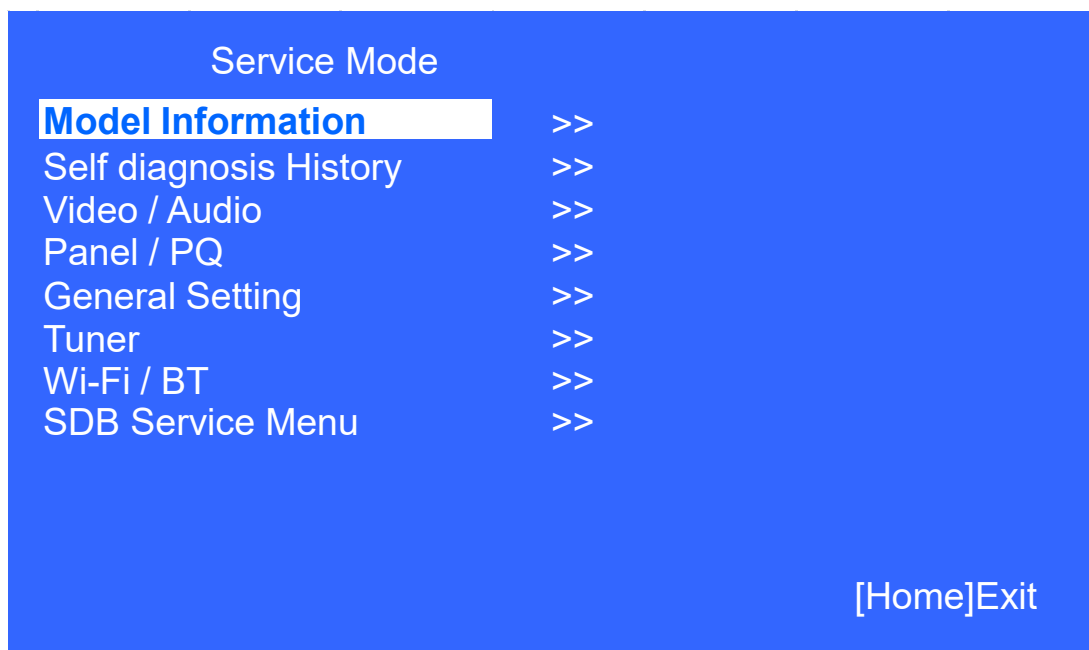
Notes: When finished the operation of service mode, please do AC Plug OFF/ON to the TV set.

*If you do not plug AC OFF/ON, the Service Mode App will be remained, and user can see the Service Mode after RC ON

How to enter service mode :

1. Go to TV standby condition by remote commander.
2. Press keys on remote sequentially as right table.
3. You can see Service menu on display.

Conventional Key Sequence	New Key Sequence from Valhalla2.1 (to Support "Simple Remote")
<Display> or <i+(info)> ⇒ <5> ⇒ <Vol+> ⇒ <Power>	<Home> ⇒ <Enter(DpadCenter)> ⇒ <Vol+> ⇒ <Power>



(example of "Not Simple" (Conventional) Remote)



(example of "Simple Remote")

SERVICE ADJUSTMENT

Summary of Service Control

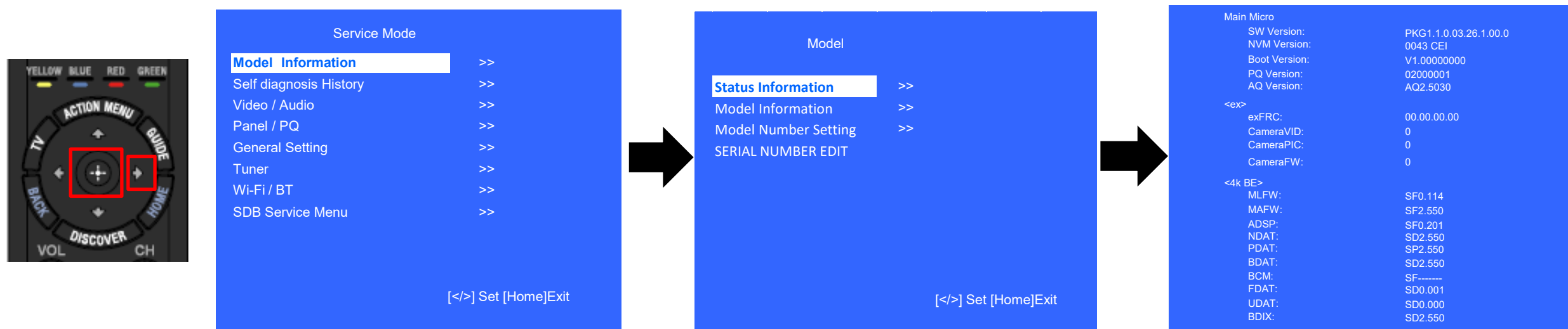
Function	The flow of control (< > : Key of Remote Commander)		Reference
	Conventional Key Sequence	New Key Sequence from Valhalla2.1 (to Support "Simple Remote")	
Service mode on	<Display> or <i+(info)> ⇒ <5> ⇒ <Vol+> ⇒ <Power>	<Home> ⇒ <Enter(DpadCenter)> ⇒ <Vol+> ⇒ <Power>	This document (Previous Page)
Close Service menu	<Home>		
Service mode off	AC plug OFF		
Item up / down	<↑> / <↓>		
Item select left/right	<←> / <→>		
Execute	<Enter>		
Enter Self Diagnosis Display (directly)	<Display> or <i+(info)> ⇒ <5> ⇒ <Vol-> ⇒ <Power>	<Home> ⇒ <Enter(DpadCenter)> ⇒ <Vol-> ⇒ <Power>	"Self_Diagnosis_QuickRef"
Panel Operation Time clear	<7> ⇒ <0>	<→> x 9times ⇒ <Enter(DpadCenter)>	
Timestamps and Error Count clear	<8> ⇒ <0>	<←> x 9times ⇒ <Enter(DpadCenter)>	
Total Operation Time and Boot Count clear	<9> ⇒ <0>		

- When you use "Simple Remote" : Please use "New Key Sequence" because some key of "Conventional Key Sequence" are nothing.
- When you use "Not Simple" (Conventional) Remote : both Key Sequence are available

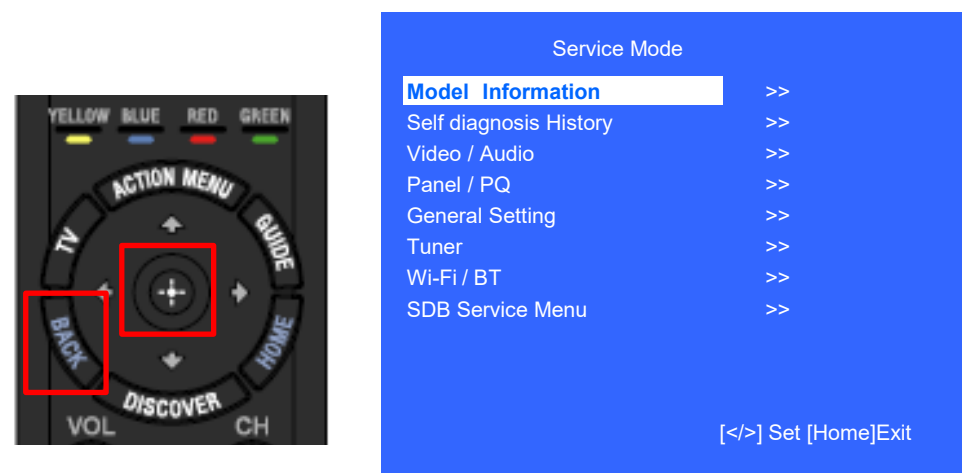
SERVICE ADJUSTMENT

Software Version

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



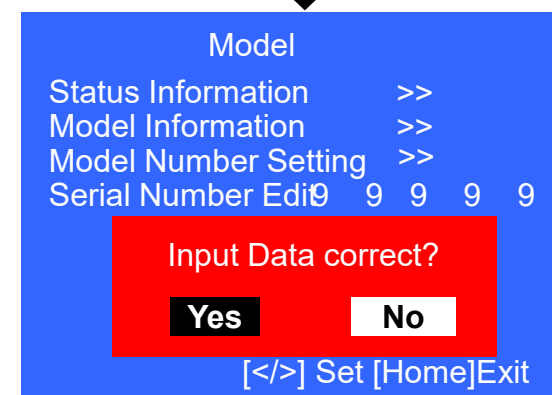
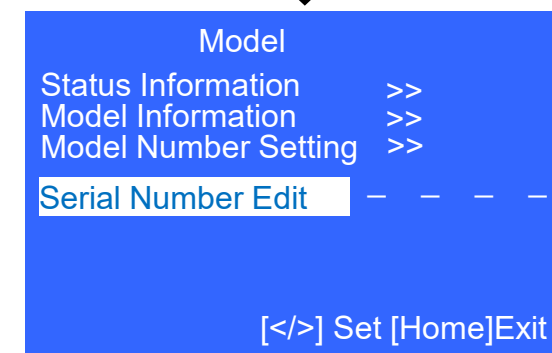
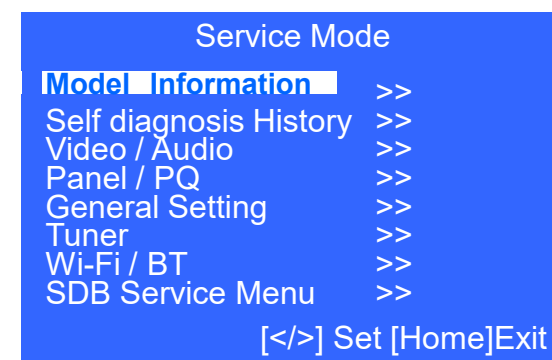
- 2) Press “Enter” or “BACK” button to return to Service Mode



SERVICE ADJUSTMENT

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.



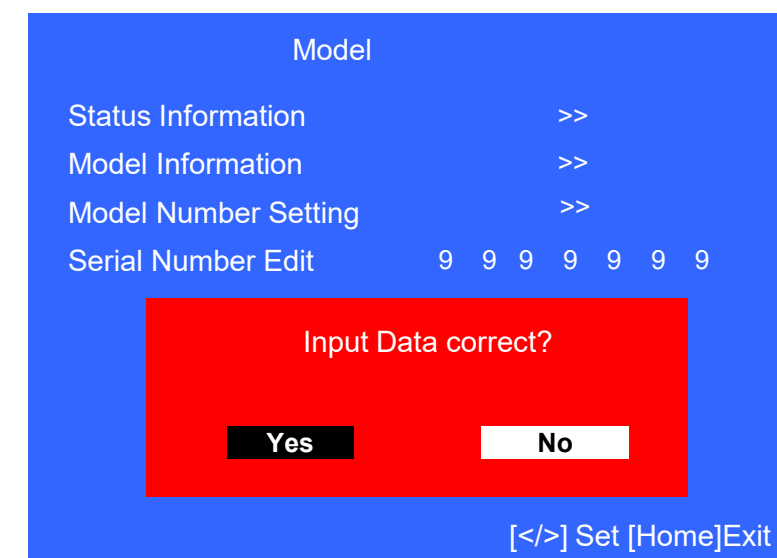
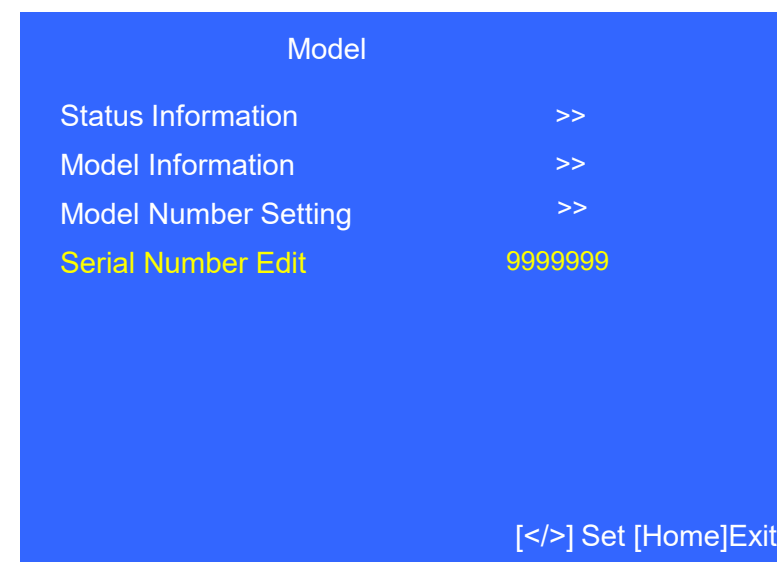
* The font color of YES/NO is change to black when it is selected.

SERVICE ADJUSTMENT

Serial Number Edit (2)

If **YES is selected**, the input data is saved into EEPROM. SERIAL NUMBER EDIT is greyed out and the serial number that has been input is displayed. Operator will **not be 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.

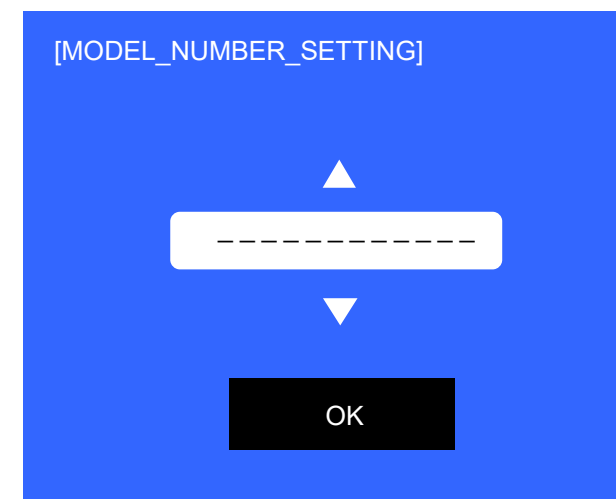
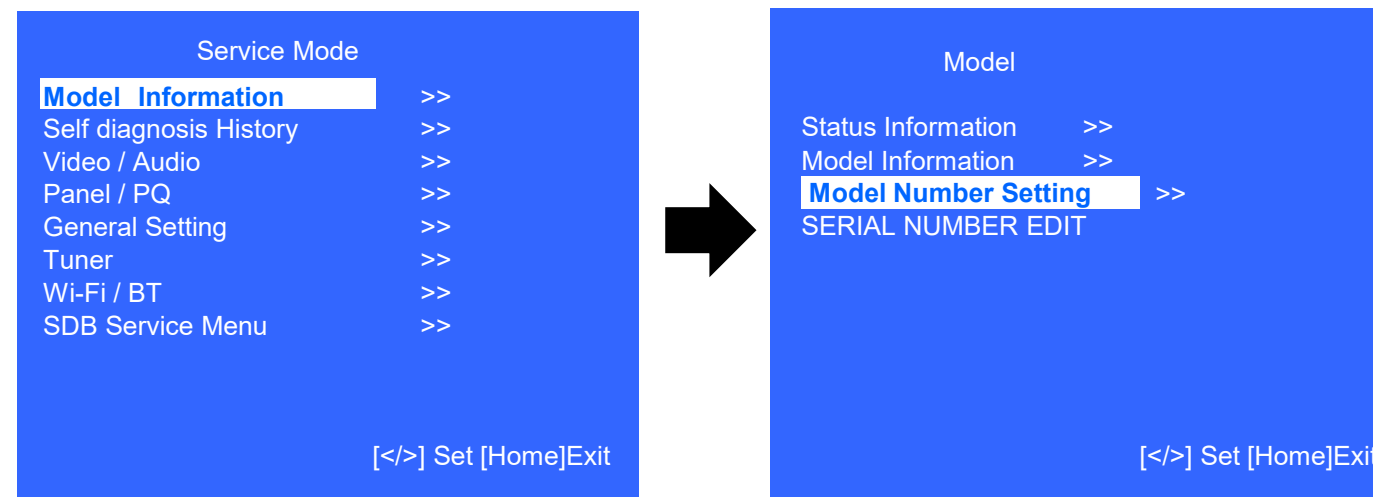


*The font color of YES/NO is change to black when it is selected.

SERVICE ADJUSTMENT

Model Number Setting

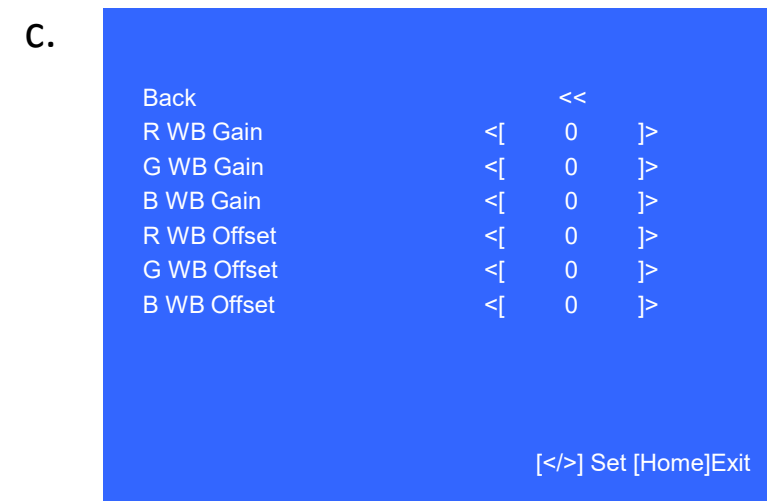
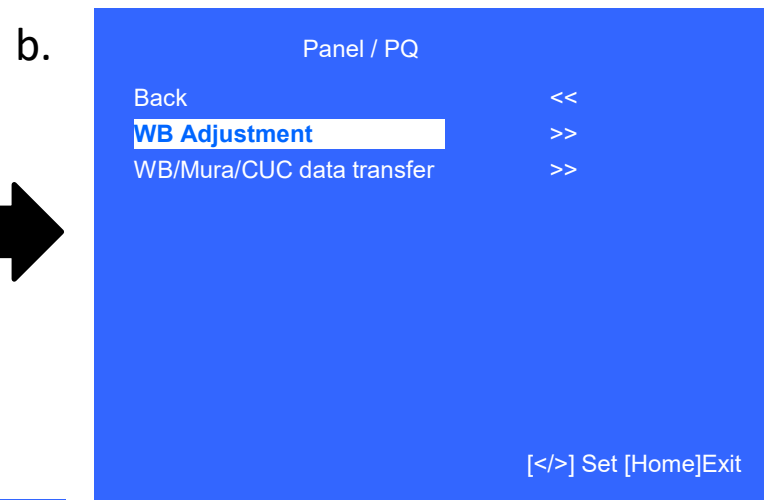
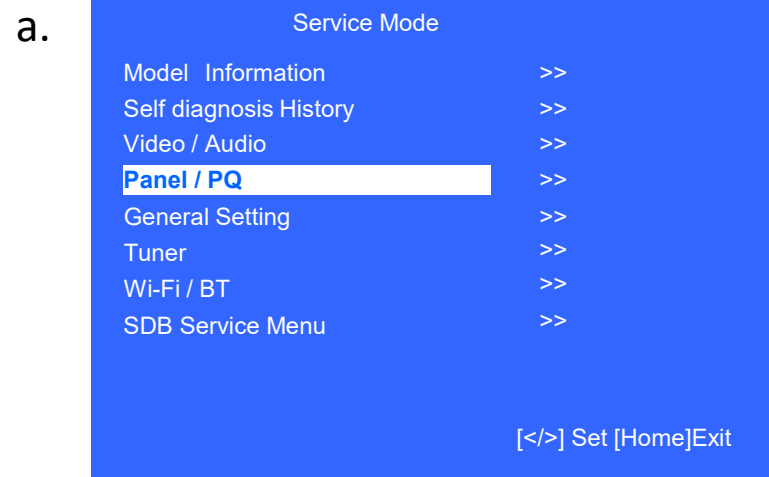
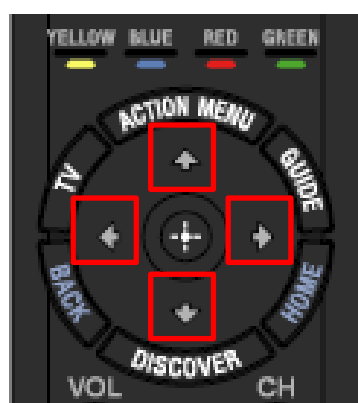
- 1) In "Service Mode", select "Model Information" by pressing "↑" or "↓" then pressing "Enter" or "→" button to enter inside.
- 2) Select "Model Number Setting" by pressing "↑" or "↓" button then pressing "Enter" or "→" button
- 3) Press "↑" or "↓" arrow key to scroll Product Name Candidate.
(e.g., XR-55A90J CEI)
- 1) Select one Product Name from the list. After that select "[OK]" and press "Enter" button.



SERVICE ADJUSTMENT

WB Adjustment

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.

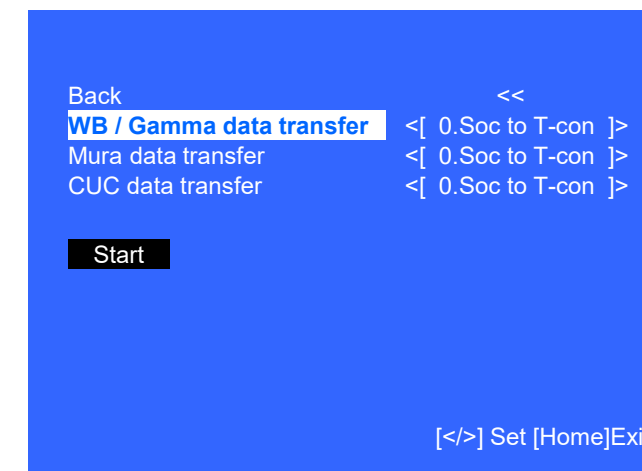
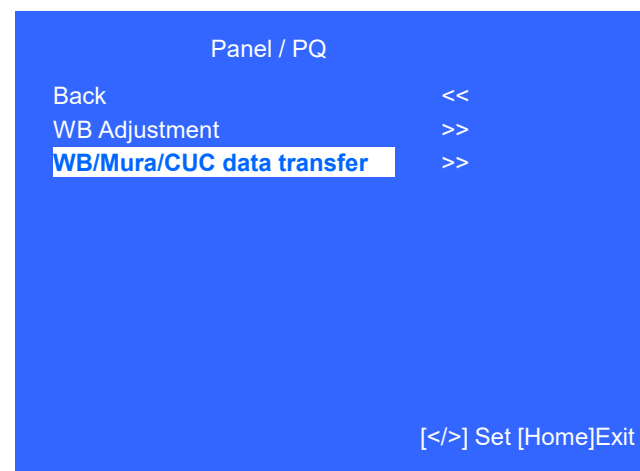
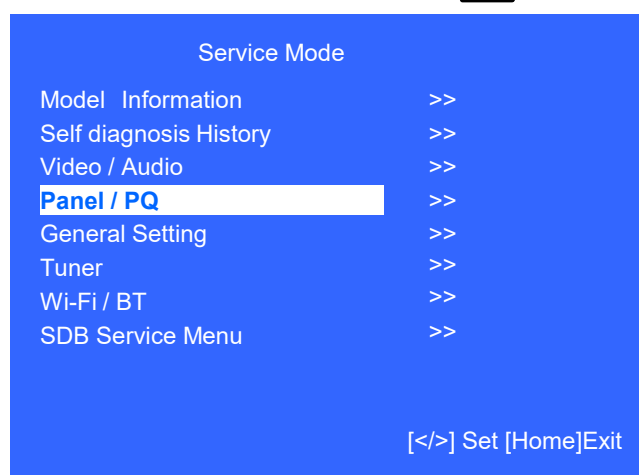
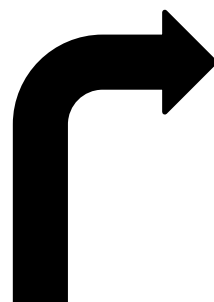
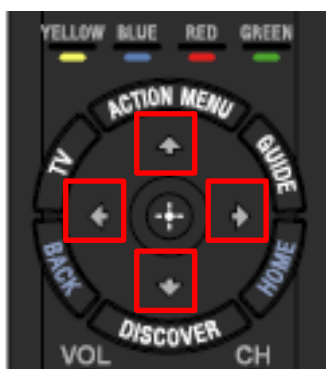


SERVICE ADJUSTMENT

WB MURA / CUC / Data Transfer

Please apply Main board when 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.

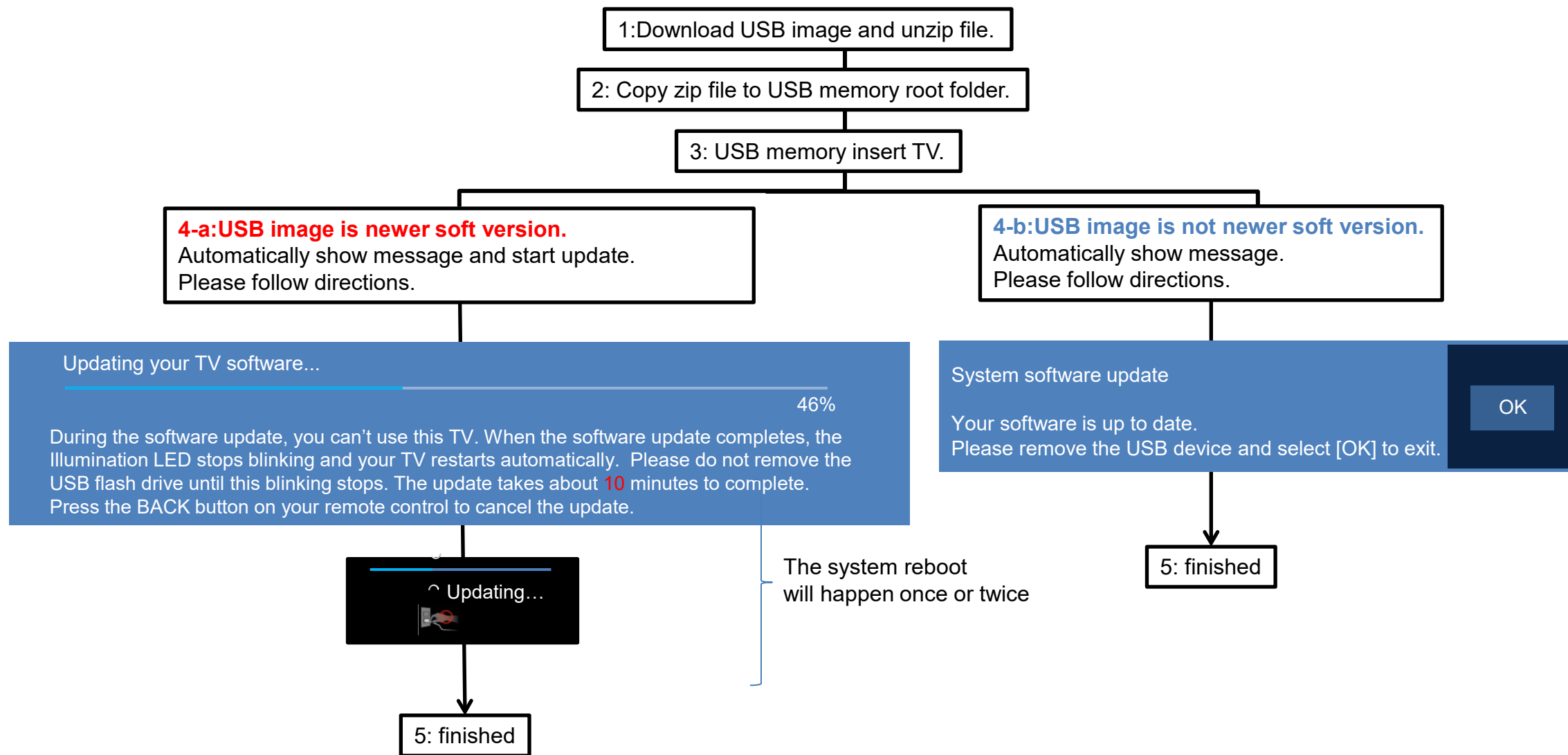


2. In **“WB/Mura/CUC data transfer”**
 - a. Select **“WB/Gamma data transfer”** by pressing “↑” or “↓” on remote commander .
 - b. To change the items, press “←” or “→” on remote commander and press “Enter” button.
Selectable items are:
 - 0. SoC to T-con (Only T-con is replaced)
 - 1. T-con to SoC (Main board or Panel is replaced)
 - 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

USB Update

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

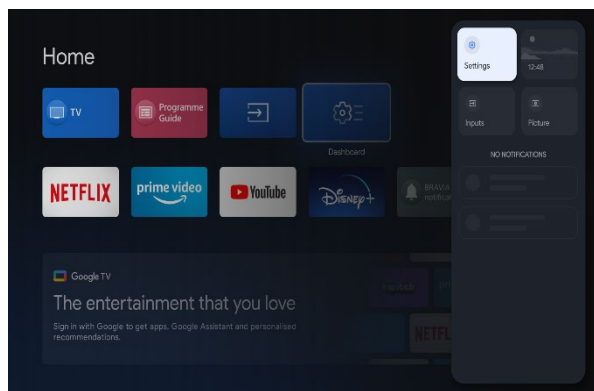


※ Display may change depending on the model / SW version.

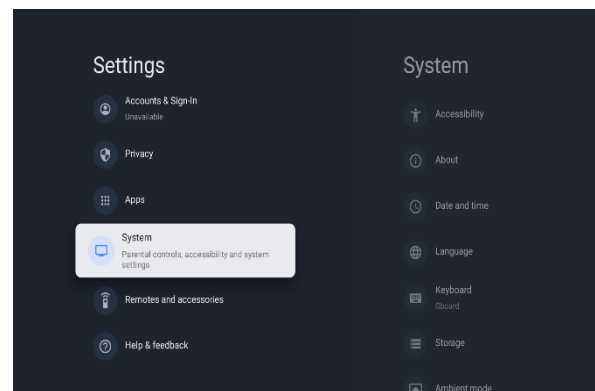
SERVICE ADJUSTMENT

How to do Factory Data Reset – with UI Method

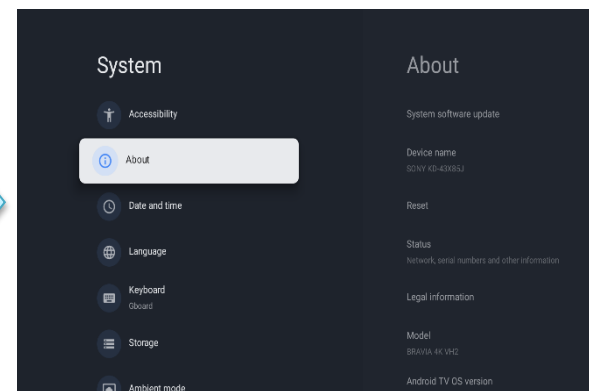
1) At Home Menu, go to Settings



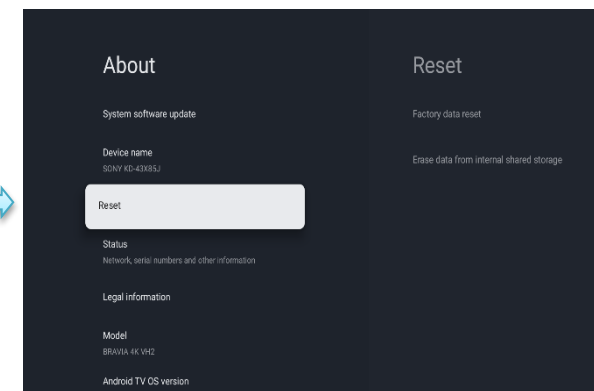
2) Select System/Device Preferences



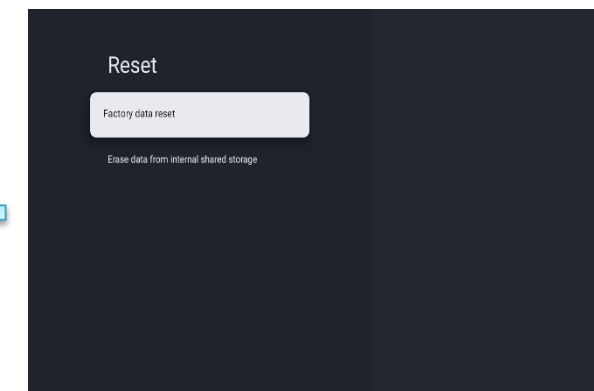
3) Select 'About'



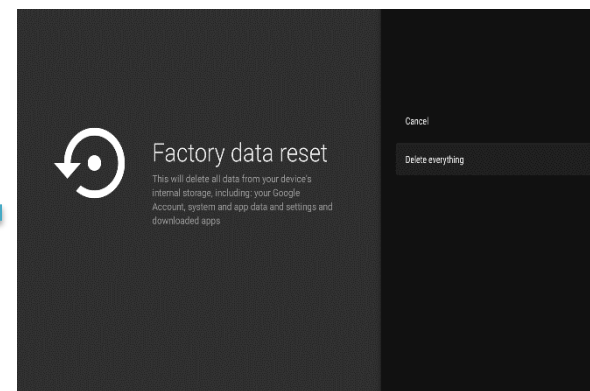
4) In About, Select 'Reset'



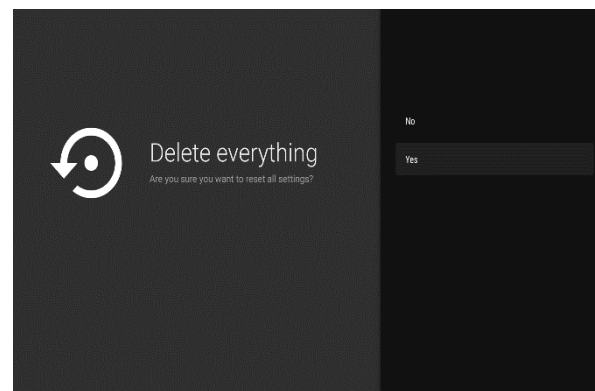
5) In Reset, Select 'Factory data reset'



6) Select 'Delete everything'



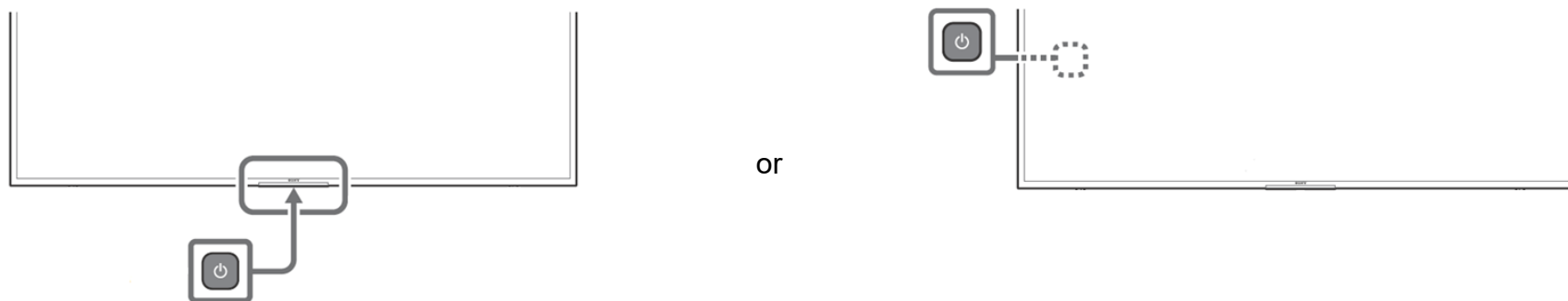
7) Select 'Yes'



SERVICE ADJUSTMENT

How to do Factory Data Reset – force method without UI

1. Press and hold the Power button. (The position of the Power button depends on the model.)



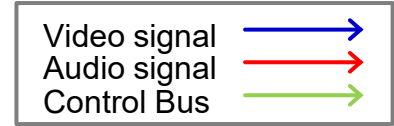
2. AC ON.

3. Hold the Power button down for several seconds until the system starts Factory Data Reset.

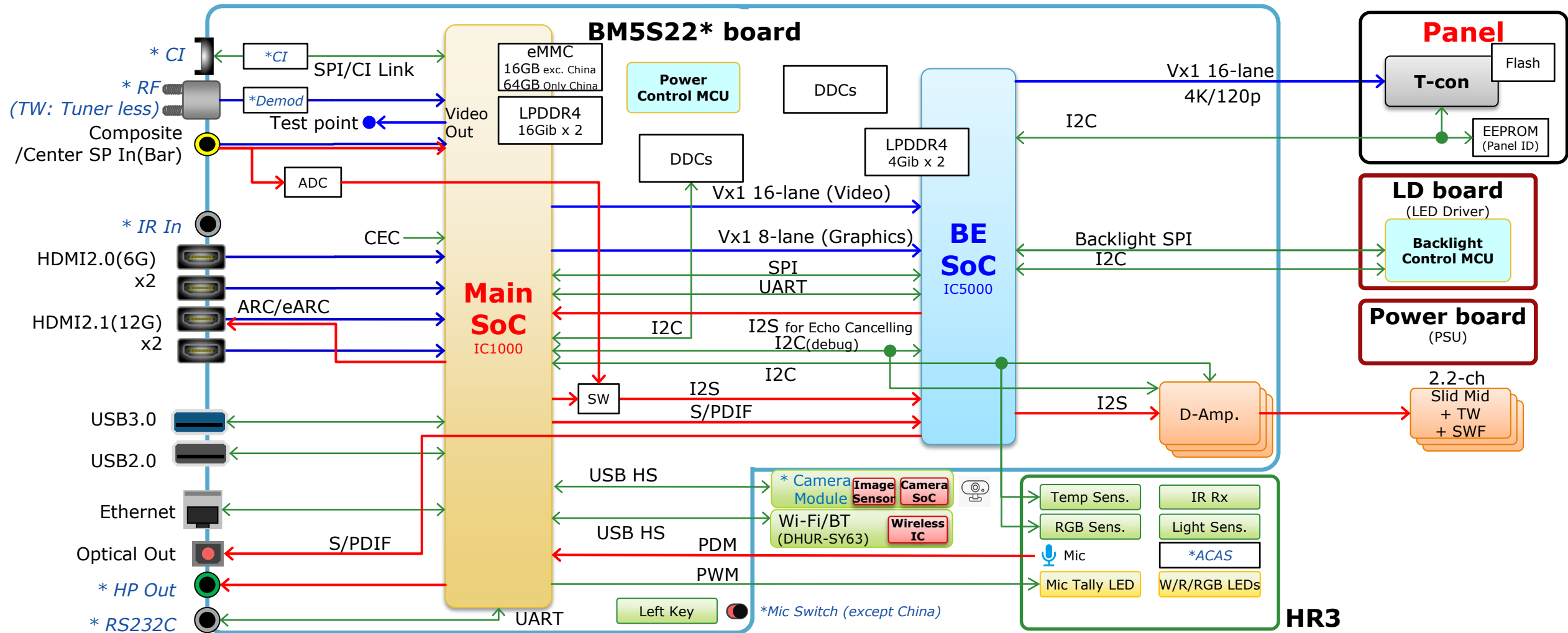
DIAGRAM

Block Diagram: FM M5 LCD Local Dimming

Some control lines are left out.

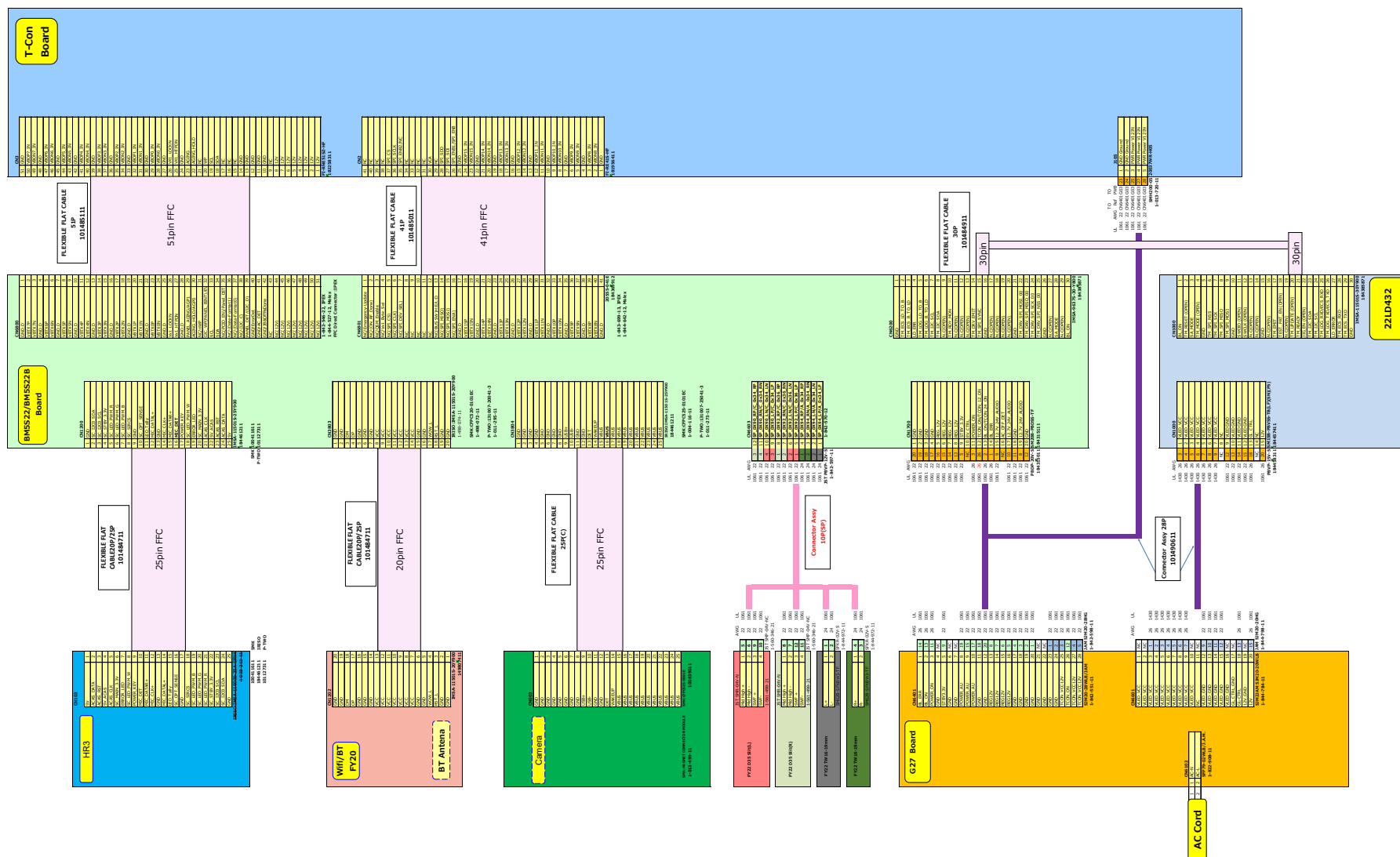


* depend on destinations.



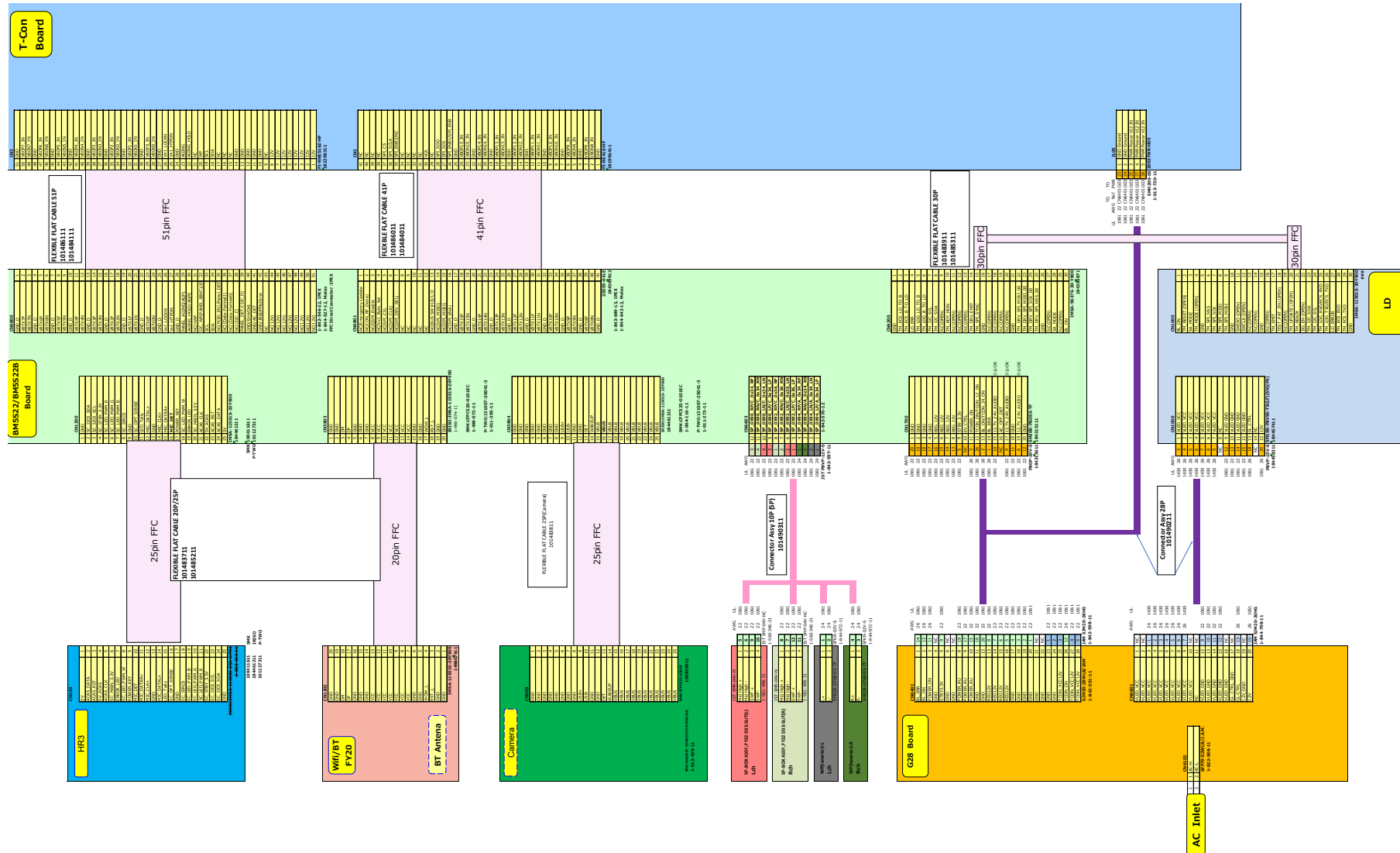
DIAGRAM

65" Connecting Diagram



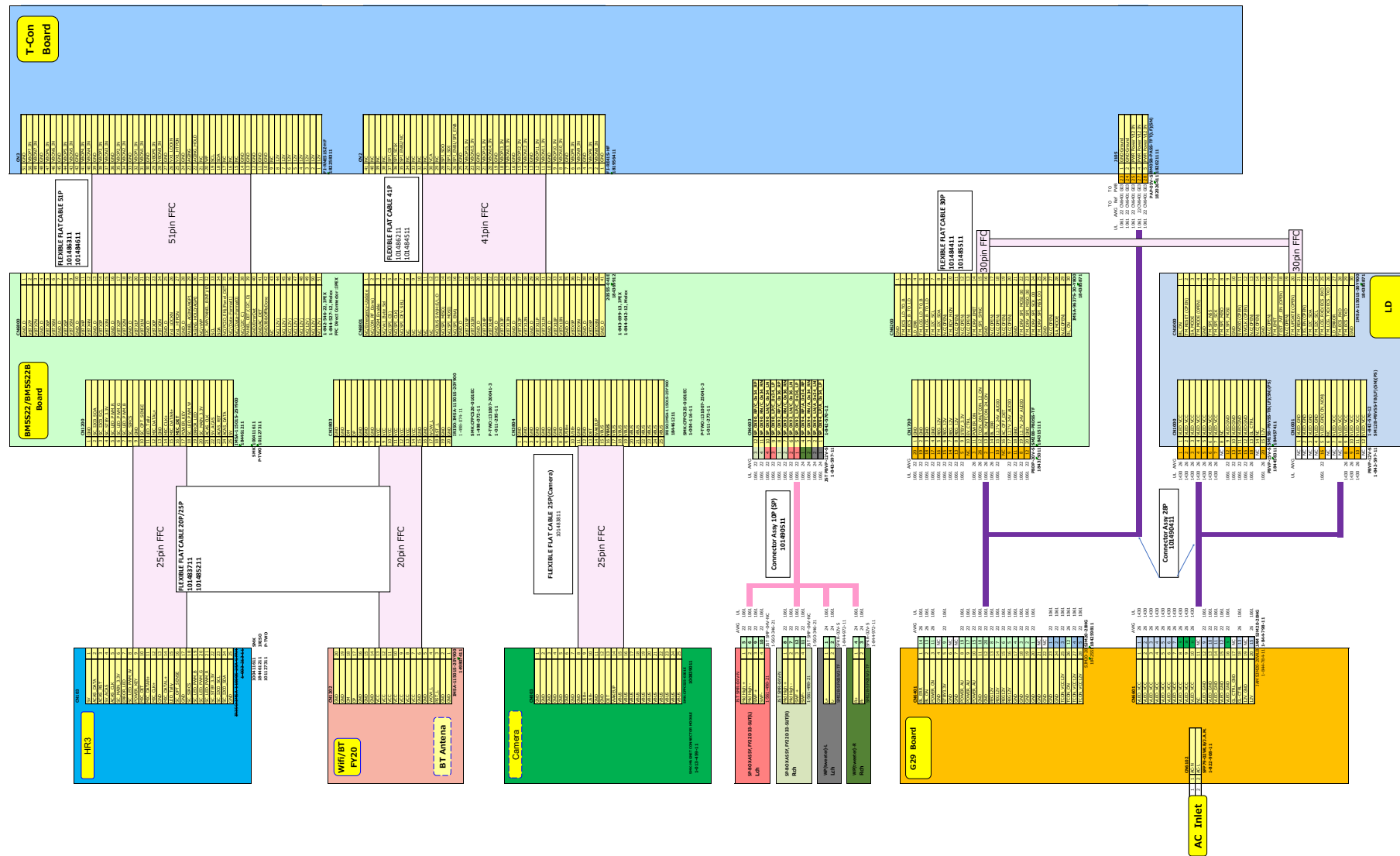
DIAGRAM

75" Connecting Diagram



DIAGRAM

85" Connecting Diagram



HANDLING GUIDE

1. Holding Position



Always wear gloves during P-mod handling



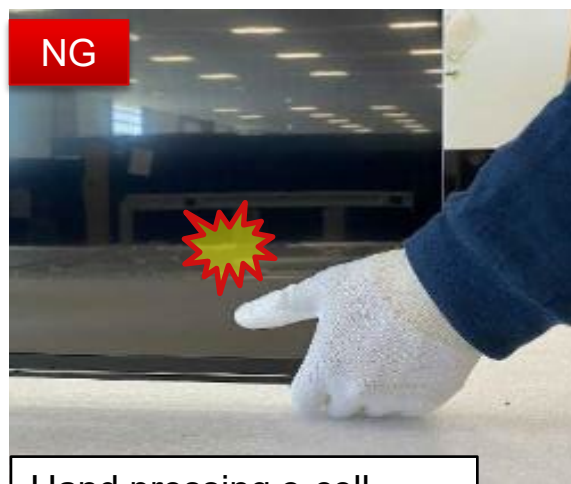
Holding edge of Bezel without touching O-cell



Support set at edge of Bezel without touching O-cell



Hand pressing O-cell



Hand pressing o-cell

HANDLING GUIDE

2. Carry Position



Carry P-mod by vertical position



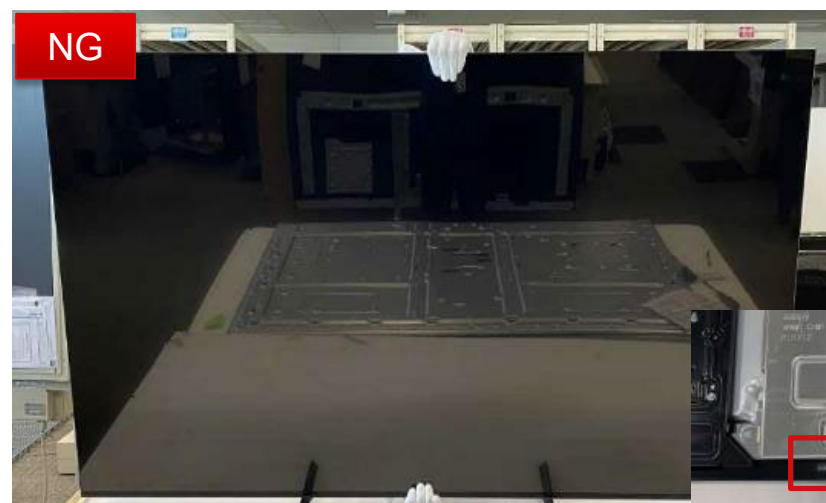
Carry P-mod by 2 persons



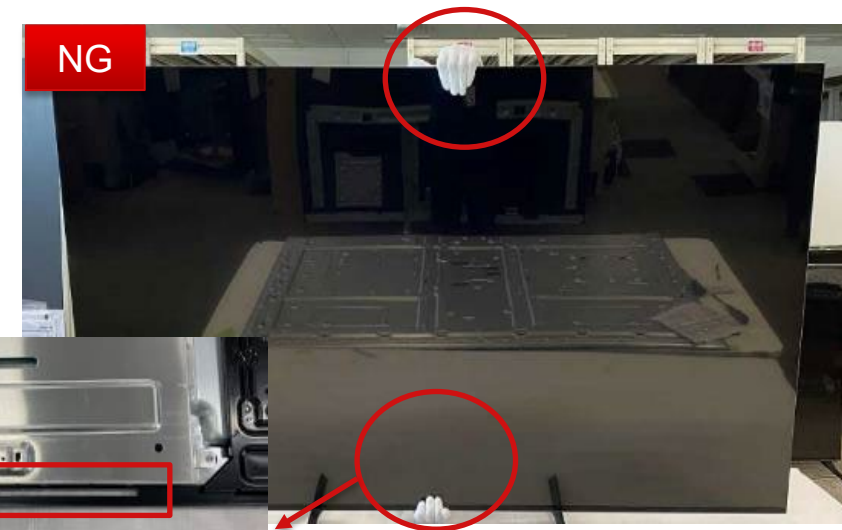
Carry P-mod by corners



Carry P-mod by horizontal position



Carry P-mod by 1 person



It is easy to deform by holding in this area

Carry P-mod at center area

HANDLING GUIDE

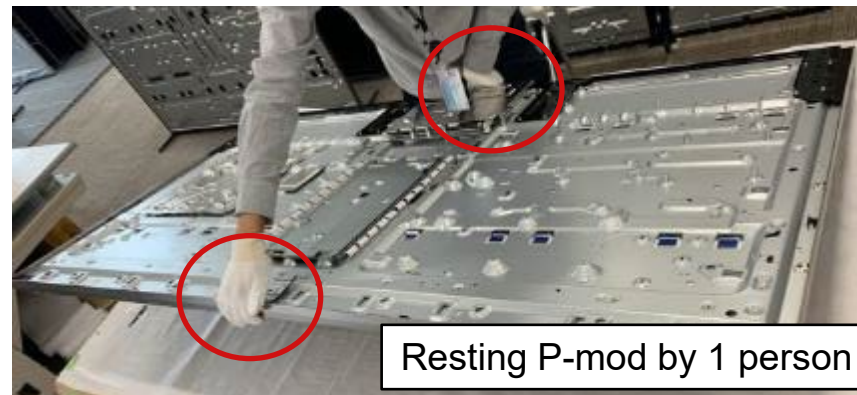
3. Resting Position

OK



Resting P-mod by 2 persons
(Hold **long** sides)

NG



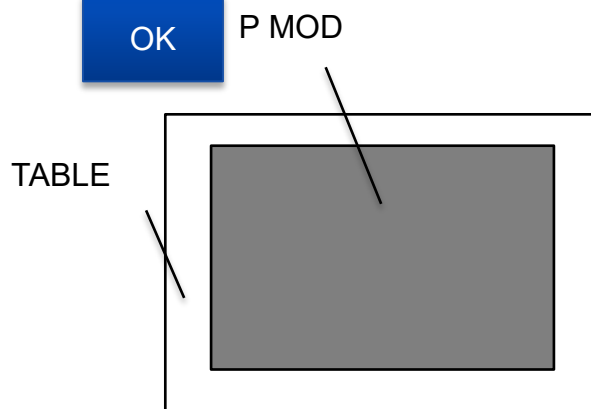
Resting P-mod by 1 person



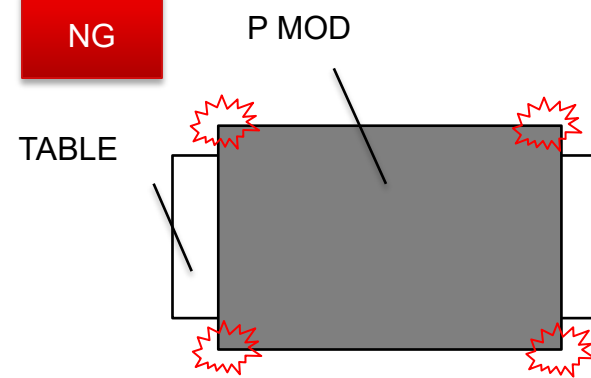
Resting P-mod by 2 persons
(Hold **short** sides)

Top of View when panel pun on top of table

OK



NG



HANDLING GUIDE

4. Prohibited Method



Handle P-mod without gloves



Press on P-mod during Assy & Disassy

HANDLING GUIDE

5. Restricted Area



Avoid touch Rear cover hook during P-mod handling

