E-tab 4

Service Manual

R2.0

THINKWARE SYSTEMS CORPORATION

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- HW compositions
- How to repair
- Frequently happening problem

HW spec

Main components

CPU - SC54412ACD-A040 [SAMSUNG]

ARM Cortex-A9 Quad core, 1.4GHz

LPDDR2 1GB, 400MHz (POP)

Capacity - KLMAG4FE3B-A001 [SAMSUNG]

MoviNAND, 16GB

Wi-Fi / BT Combo - WM-BAN-BM-07-S [USI]

802.11a/b/g/n, BT Class 4.0+ HS

GPS – UBX-G6010 [Ublox]

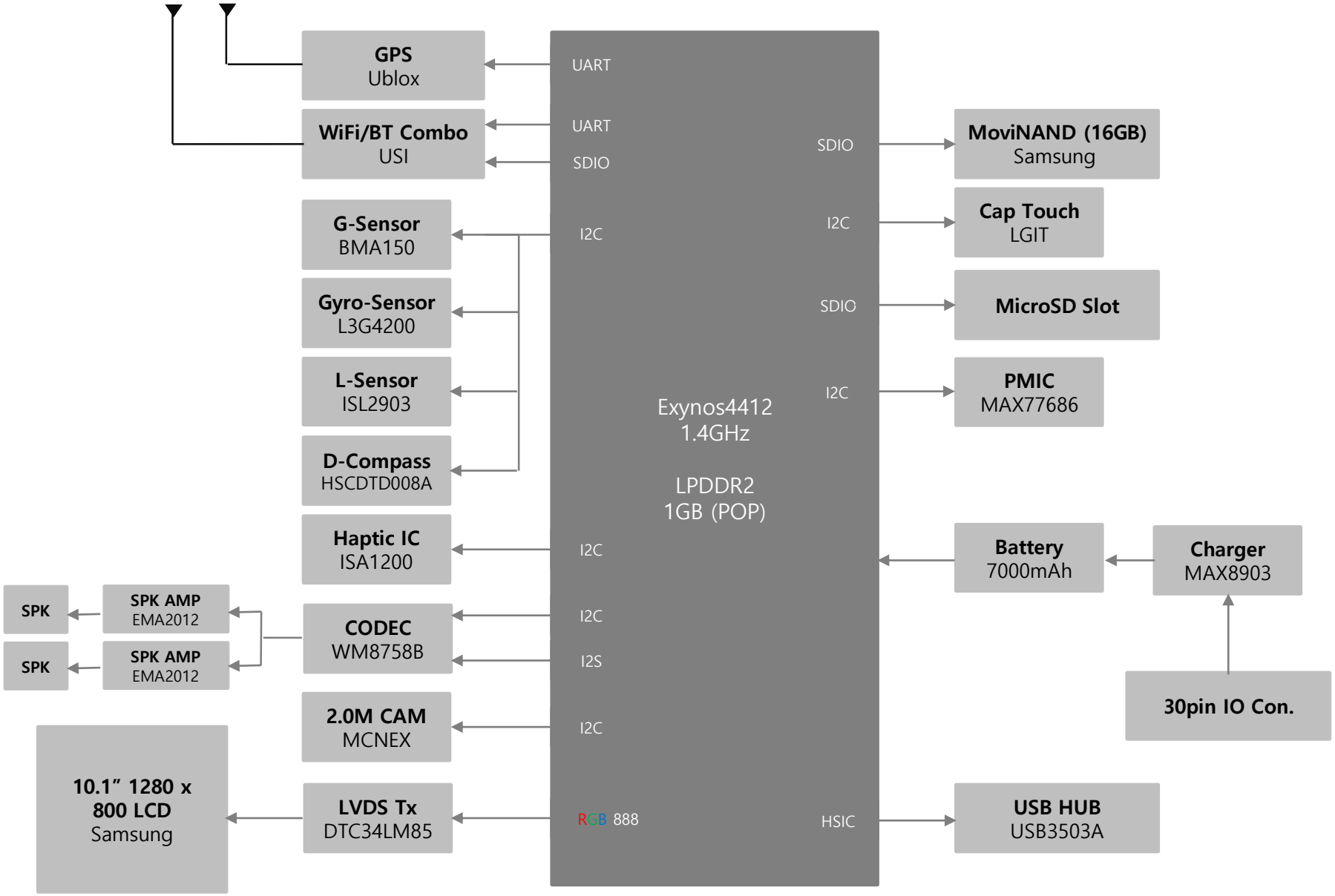
Single RF & Baseband IC, A-GPS

Main components

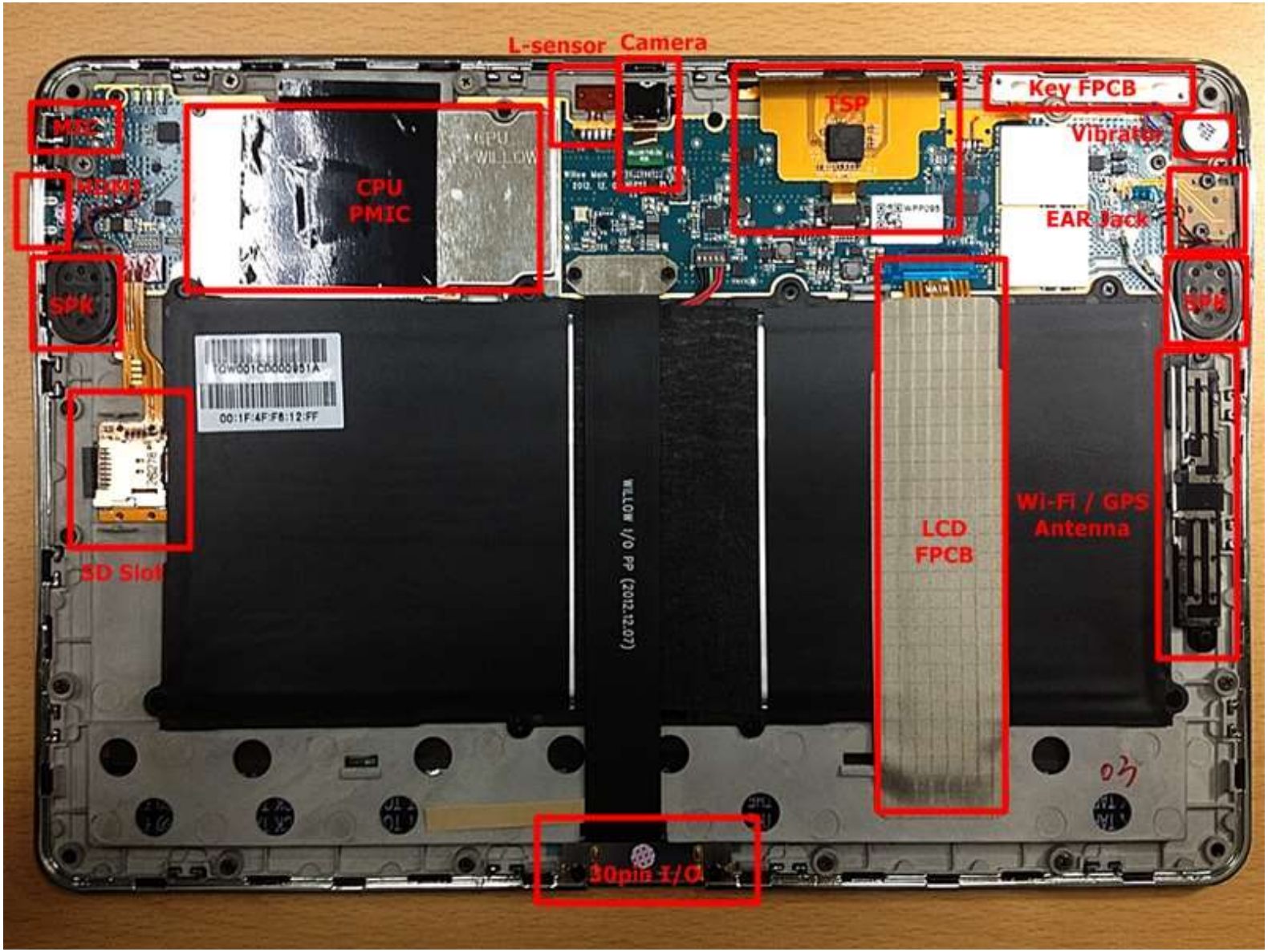
Item	Part #	Supplier
PMIC	MAX77686	MAXIM
Charger	MAX8903CETI+	MAXIM
Codec	WM8758BGEFL/V	Wolfson
Fuel Gauge	MAX17040G+	MAXIM
Haptic	ISA1200	Imagis
G-Sensor	BMA150	BOSCH
Gyro-Sensor	L3G4200	ST Micro
D-Compass	HSCDTD008A	ALPS
L-Sensor	ISL9203IROZ-T7	Intersil
LCD	LTN101AL03-801	SAMSUNG
Camera	WILLOW_2M	MCNEX
Speaker	HSO-2014BL20	Hea-Sung Techbig (혜성테크빅)
Battery	PR-37849N	TCL
Adaptor	SDCII10A	Shun Shing

HW Compositions

Block Diagram

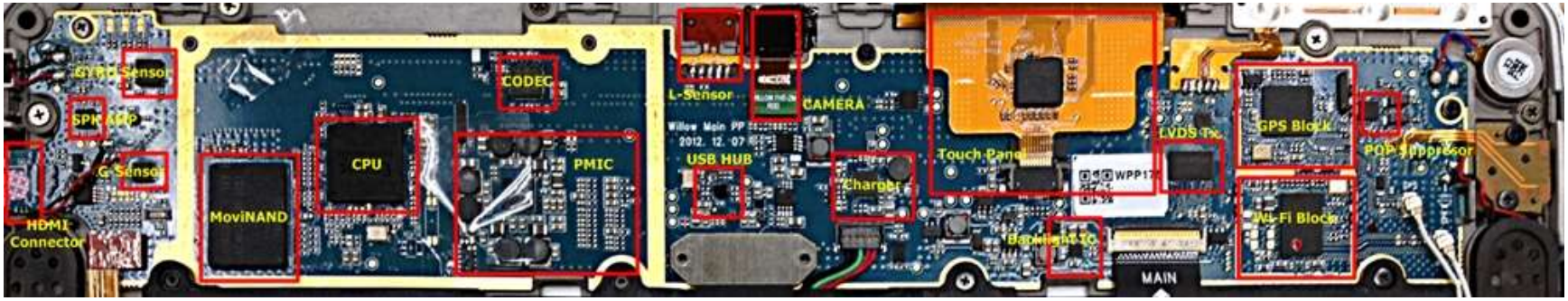


Composition



How to repair

Main Block of main board



Main faulty

1. In case Power doesn’t turn on
2. In case LCD doesn’t turn on
3. In case a device is not charging
4. In case a Touch Screen doesn’t work
5. In case a Speaker doesn’t work
6. In case an Earphone doesn’t work
7. In case a MiC doesn’t work
8. In case a Micro SD doesn’t work
9. In case a Camera doesn’t work
10. In case Wi-Fi isn’t connected
11. In case GPS doesn’t work
12. In case sensors don’t work

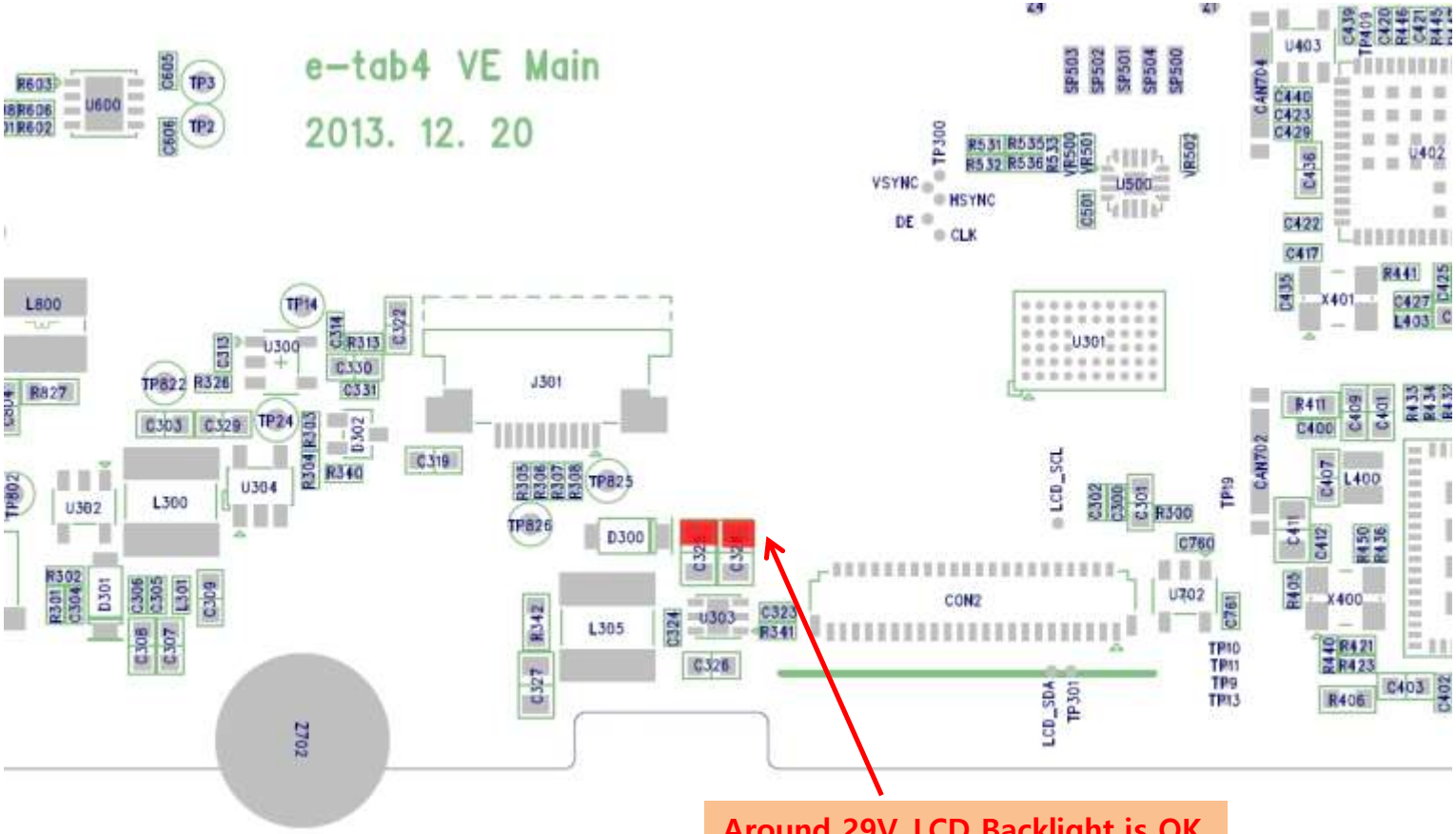
1. In case Power doesn't turn on

Is the battery power over 3.5v?	Check if the battery connector is working well and if the battery power is **lower than 3.5v**, charge it more.
Isn't there any DOMEKEY FPCB crack?	Check if there is any crack in the FPCB or and cold-soldering part in the MAIN PCB and DOMEKEY FPCB.
Check if only LCD doesn't turn on.	Check the LED Driver IC **(U303)** power. It should be around **29V**.
Is power supply ok?	Check the PMIC**(U700)** power.
Clock is normal?	X100 should be **24MHz.** PMIC should be **32.768kHz.** Check the both side of the R118.
Firmware is normal?	Check if it's booting without a problem and if there is a problem, update the firmware again.

Set only power on with adaptor. Set is not power on without adaptor.
→ This problem is that Battery Connector is not properly connected.

Check if only LCD doesn't turn on.

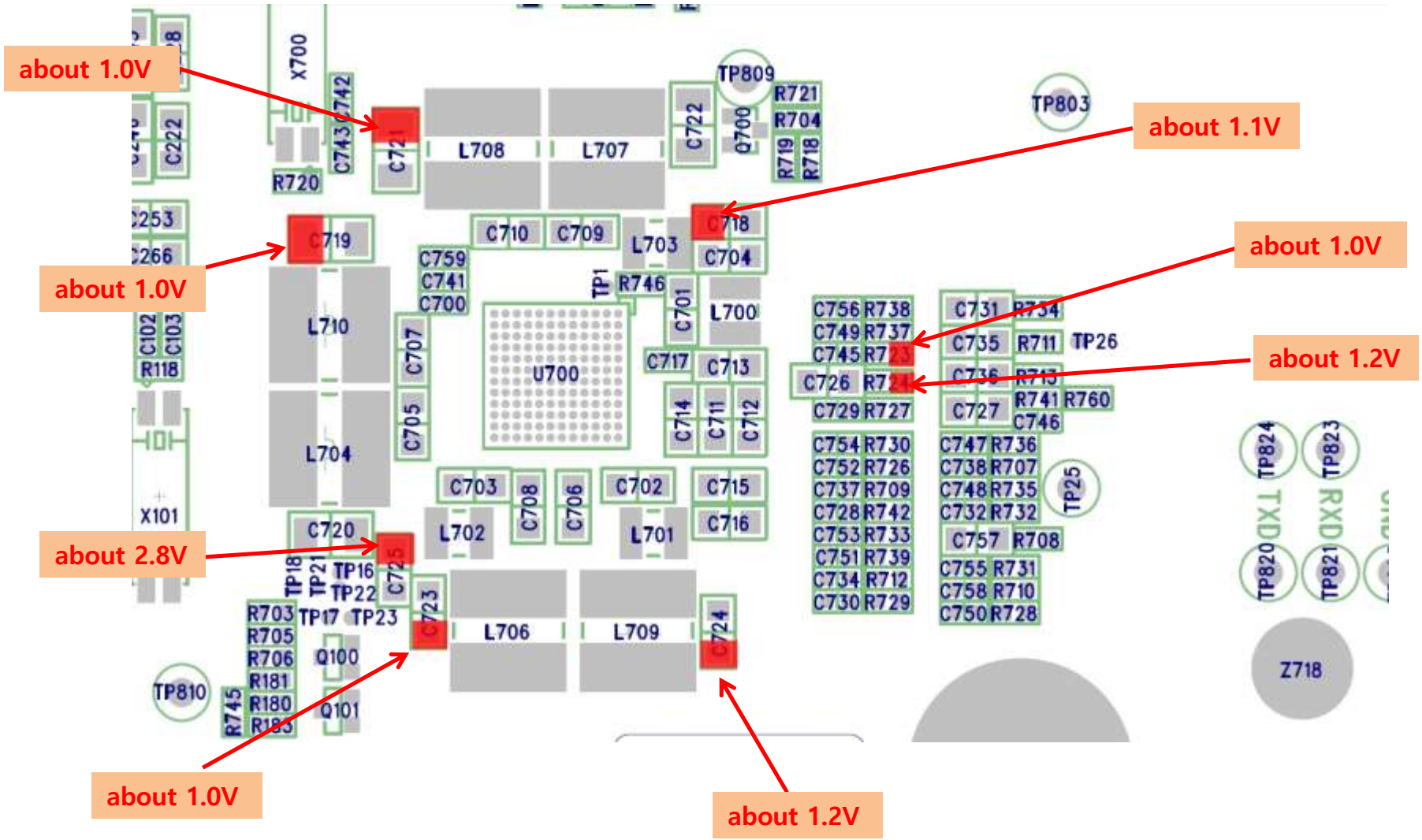
Check the LED Driver IC **(U303)** power.
It should be around **29V**.



Around 29V, LCD Backlight is OK.

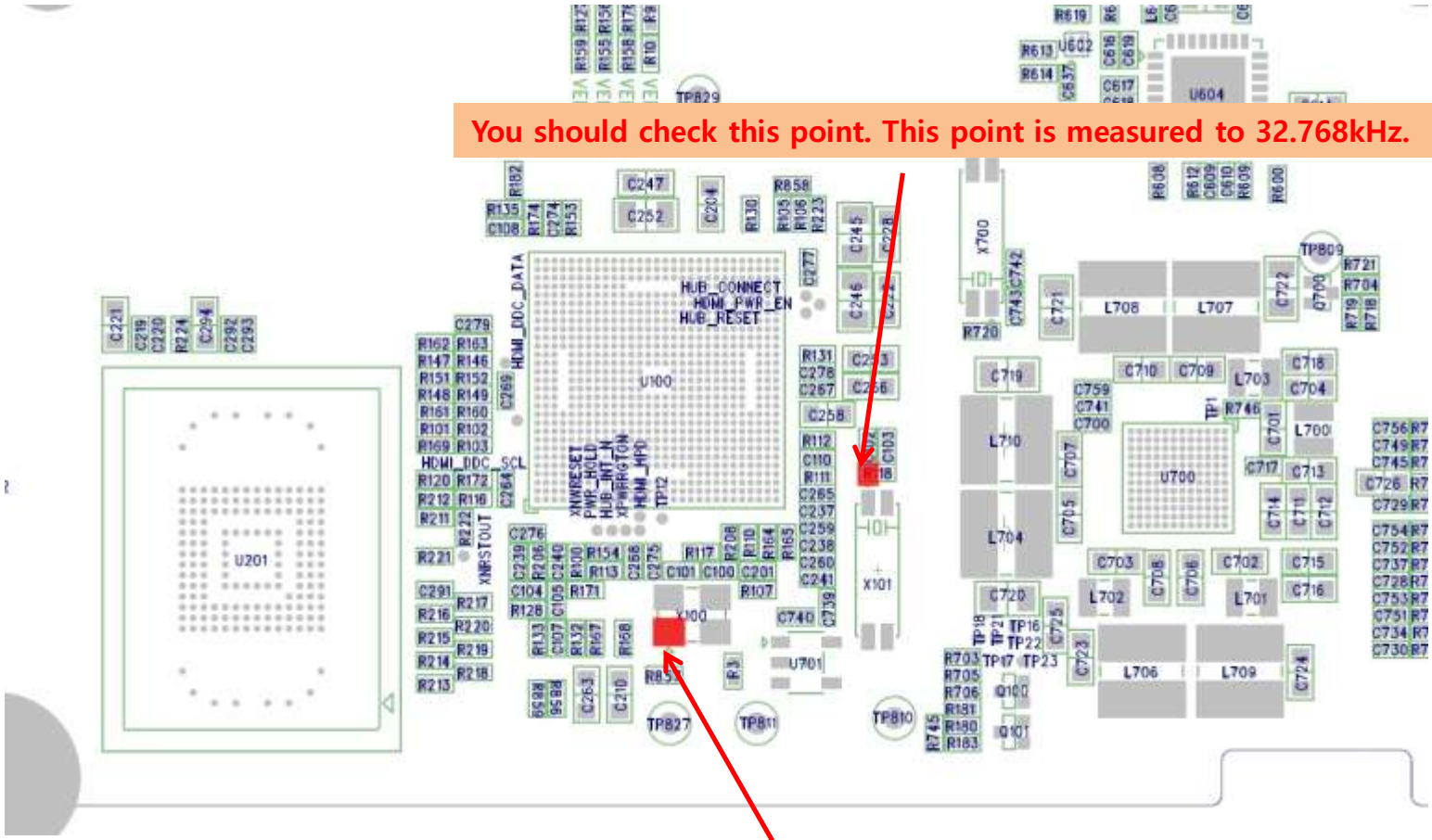
Is power supply ok?

Check the PMIC**(U700)** power.



Clock is normal?

X100 should be **24MHz.**
PMIC should be **32.768kHz.**
Check the both side of the R118.

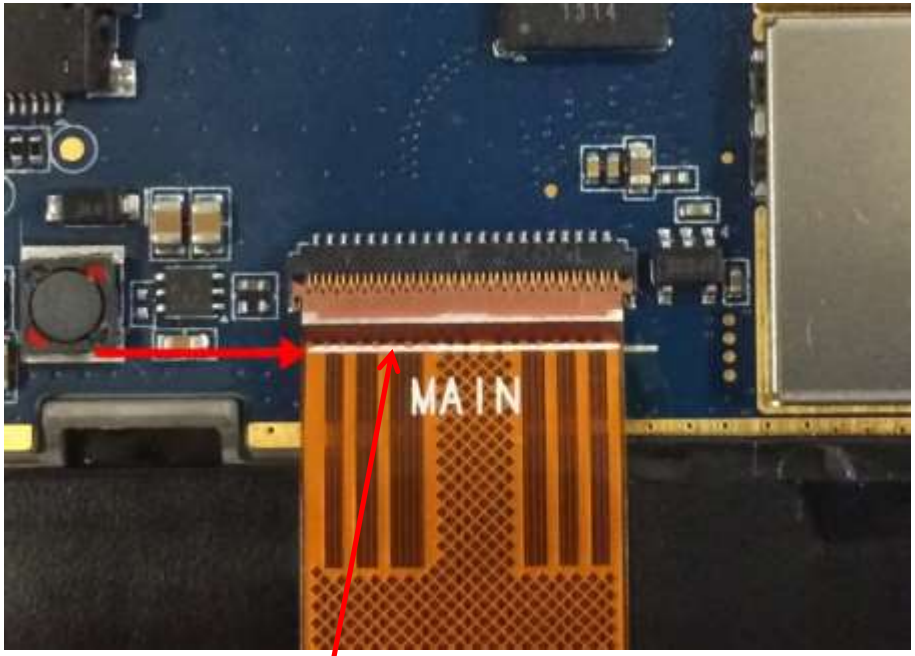


2. In case LCD doesn't turn on

LCD FPCB is normal?	Check if there's any crack on the connector and LCD FPCB is connected well.
LED power is normal?	Check the power of the LED Driver IC **(U303).** It should be around **29V**.
Clock is normal?	Check the output of the LCD Pixel Clock (**68MHz**) and Vsync, Hsync.
LCD module power is normal?	Check if the output of the R708 is **3.3V**.
LCD is normal?	Change the LCD and check it works fine. Check only the FPCB connecting the other LCD rather than disassembling the device.

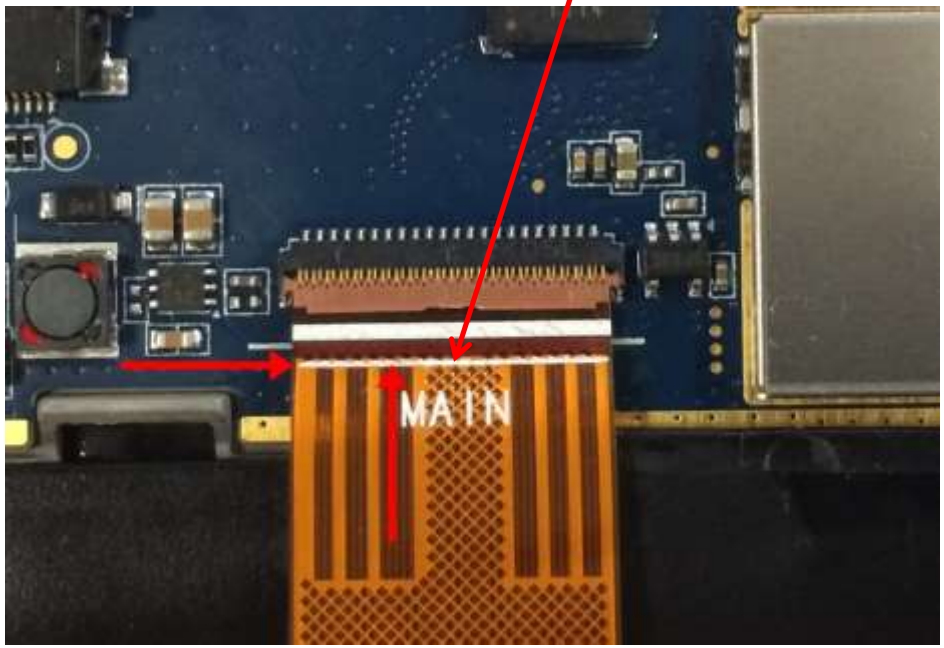
LCD FPCB is normal?

Check if there's any crack on the connector and LCD FPCB is connected well.



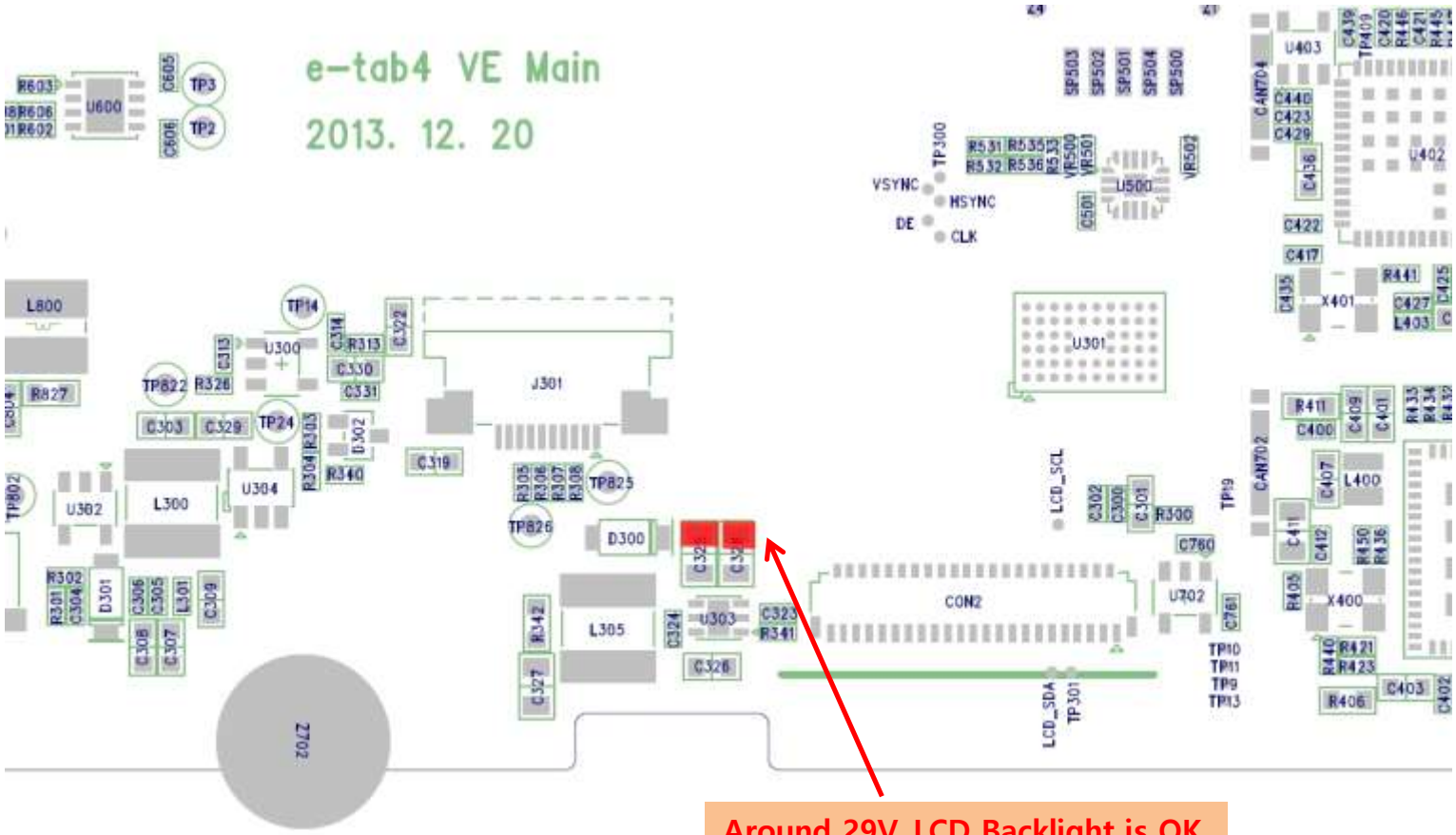
This is normal.

This is fail.



LED power is normal?

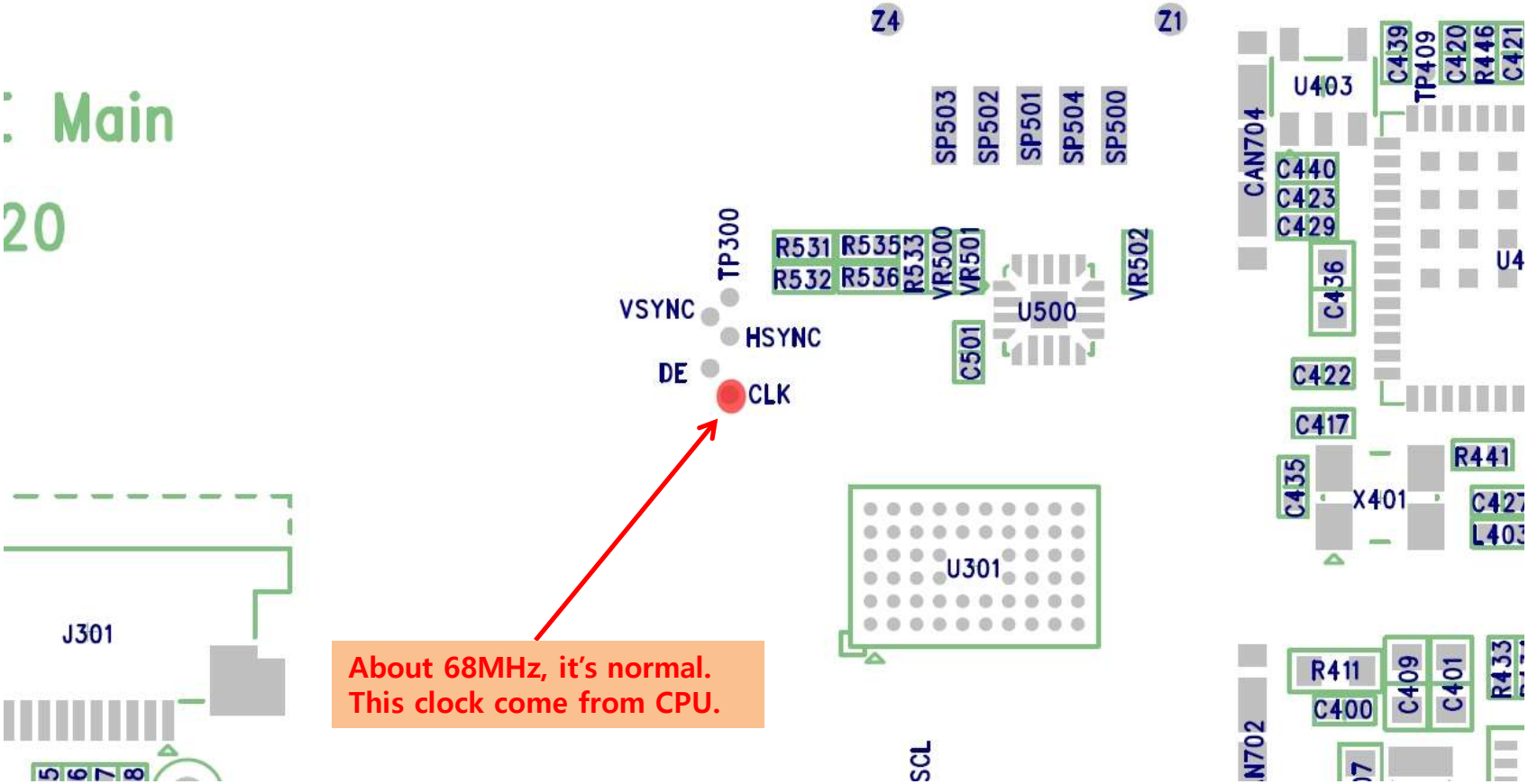
Check the power of the LED Driver IC **(U303).**
It should be around **29V**.



Around 29V, LCD Backlight is OK.

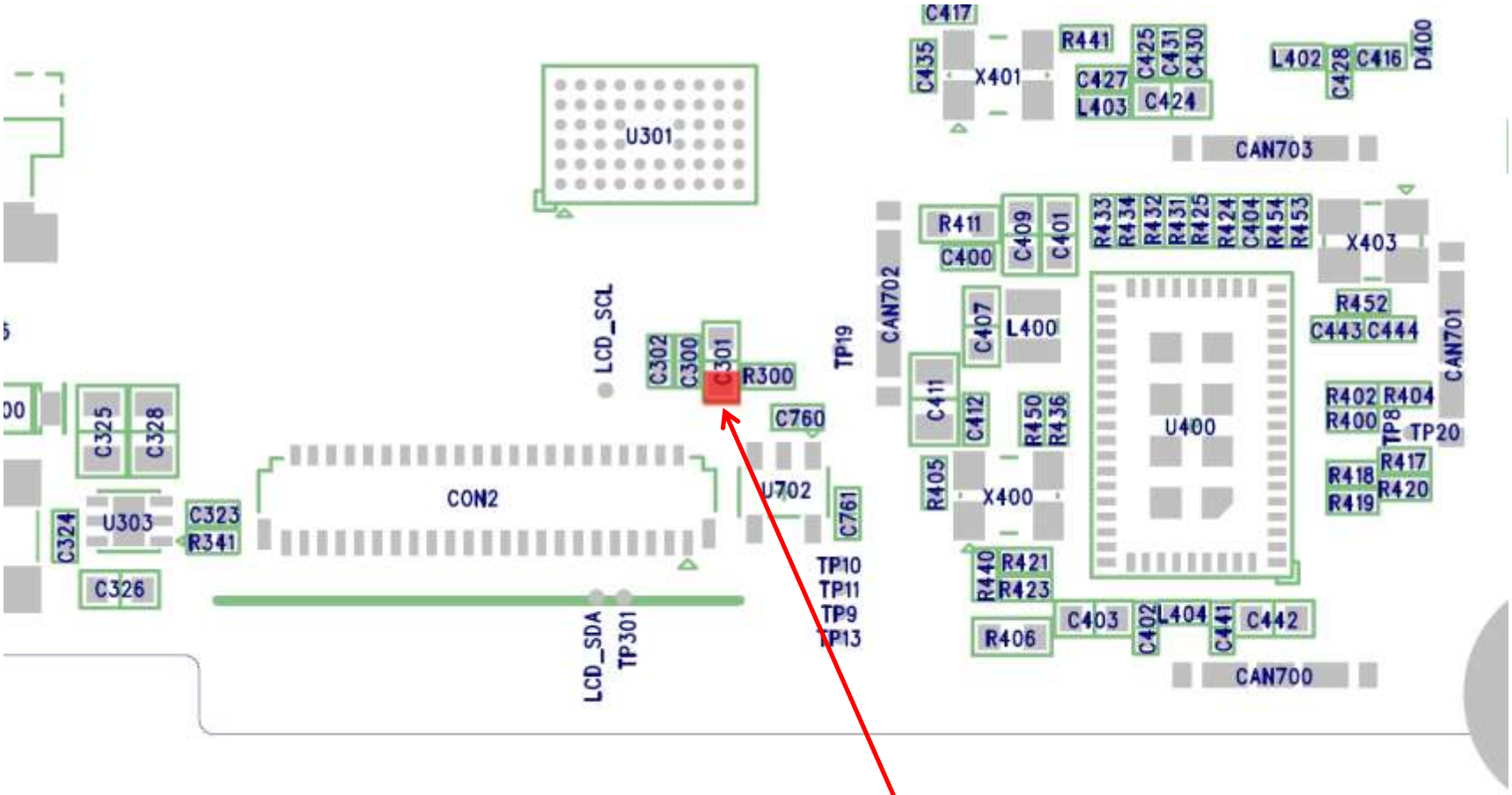
Clock is normal?

Check the output of the LCD Pixel Clock (**68MHz**) and Vsync, Hsync.



LCD module power is normal?

Check if the output of the R708 is **3.3V**.



Around 3.3V, LCD power is OK.
This point is equal to R708 point.

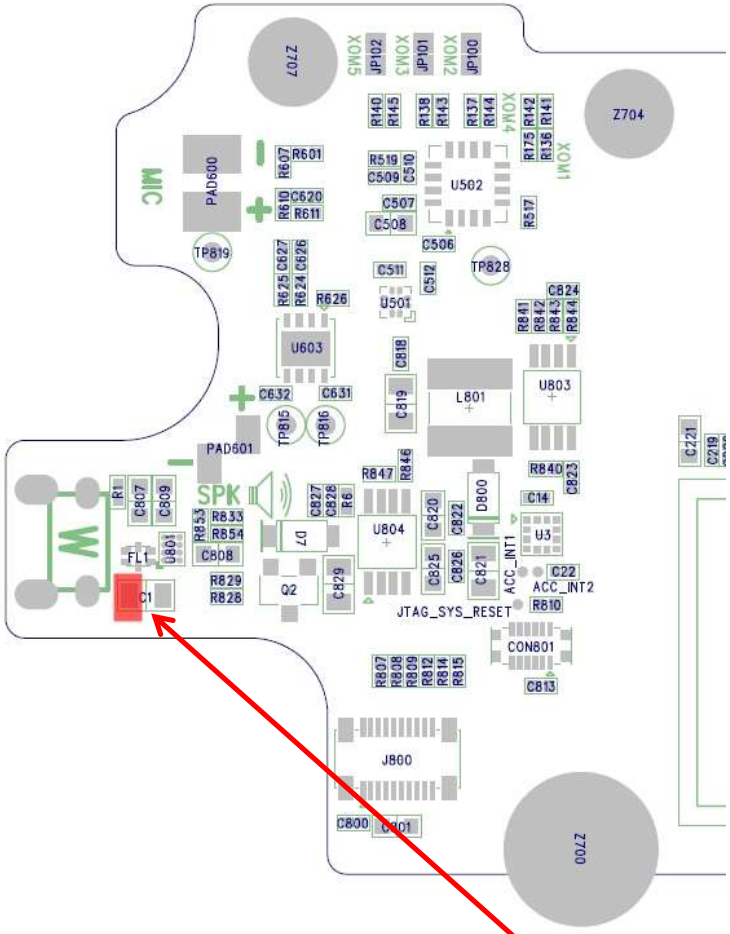
3. In case a device is not charging

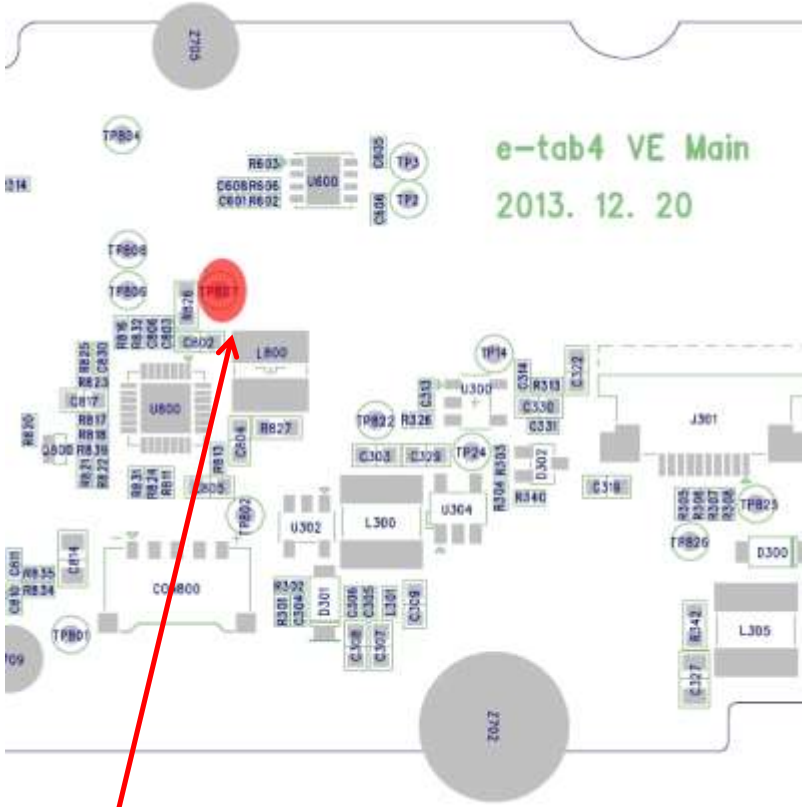
Input power of the charger is permitted?	Check there is '5V' indication mark in input of the Charger(U800) when you insert the cable. Check the U801, 50pin IO FPCB and connector as well.
Charger's nCHG pin is normal?	Check the nCHG pin of Charger. When charging, it is "Low" Not charging, it is "high"
Does Battery voltage increase?	Check that battery voltage increase.
Battery is normal?	Check if the battery wire is not disconnected and check the PCM after removing the black tape.
USB Detector is normal?	Check between R854 & R853. Adaptor, that point should be 1.8V USB (PC), that point should be 0V.
Check if only LCD doesn't turn on.	Check the LED Driver IC **(U303)** power. It should be around **29V**.

Check 6,7,8pin of U804. If there is strange voltage at that point, U804 is defective. It would be cause Not Charging.

Input power of the charger is permitted?

Check there is '5V' indication mark in input of the Charger(U800) when you insert the cable. Check the U801, 50pin IO FPCB and connector as well.

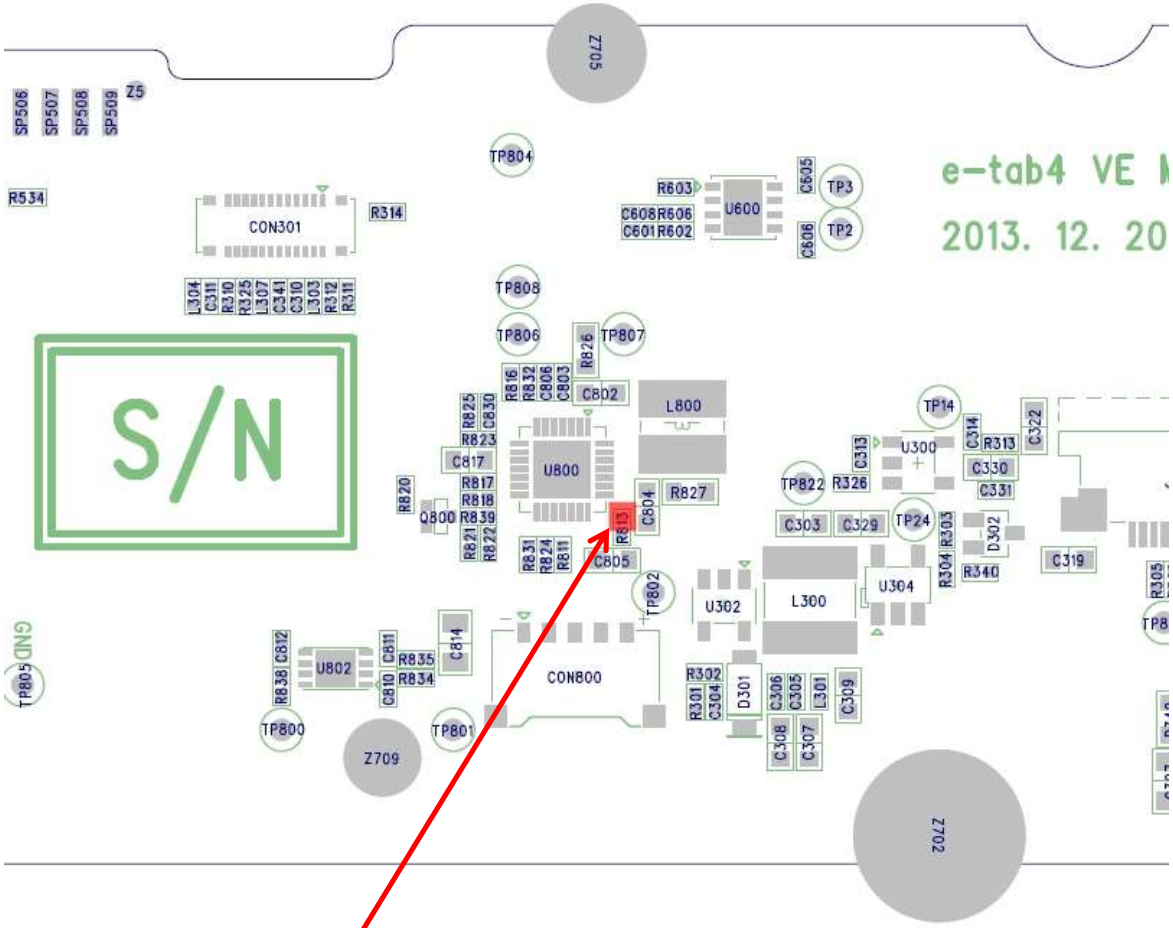




This point should be around 5V.

Charger's nCHG pin is normal?

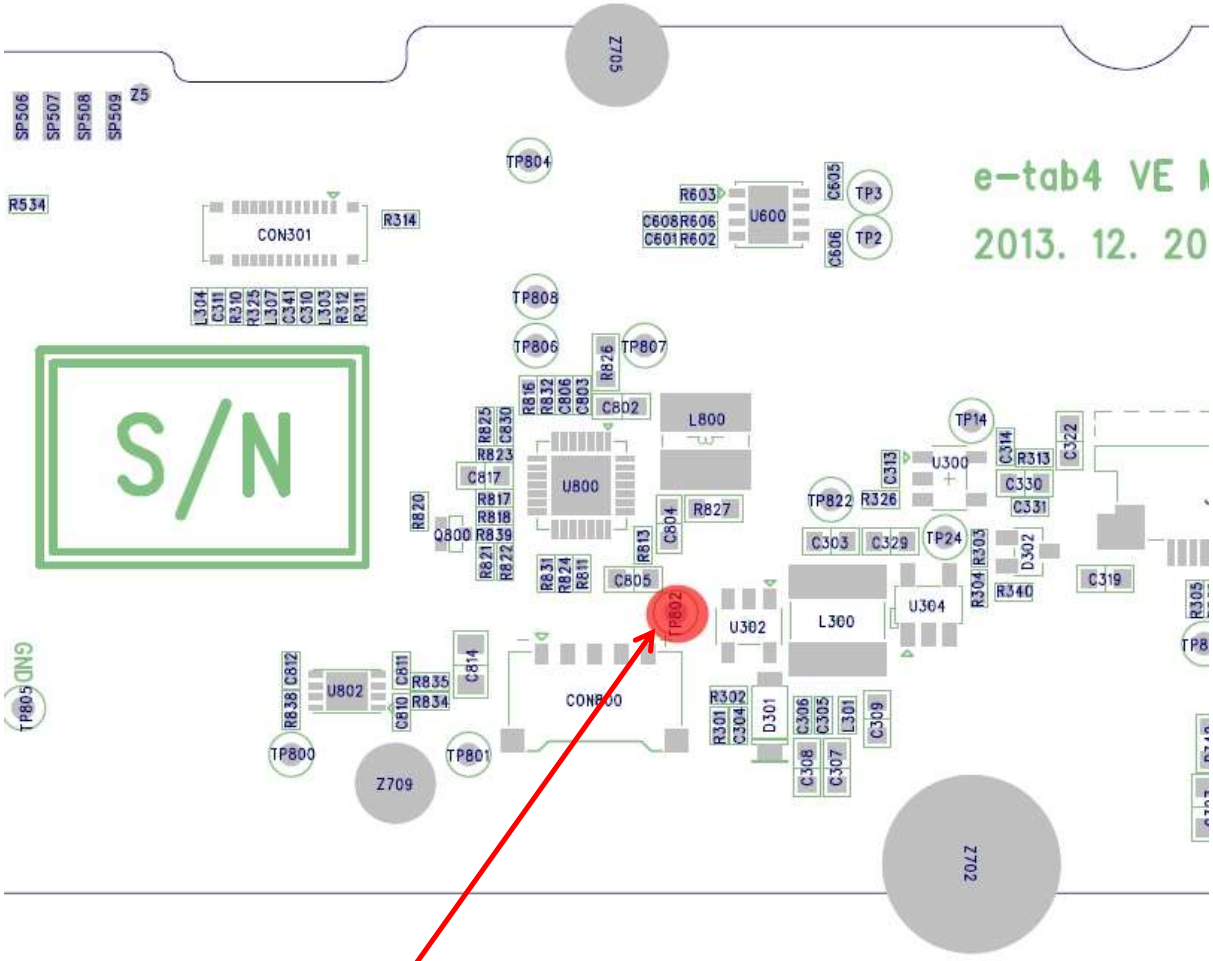
Check the nCHG pin of Charger.
When charging, it is "Low"
Not charging, it is "high"



This point should be around 0V.

Does Battery voltage increase?

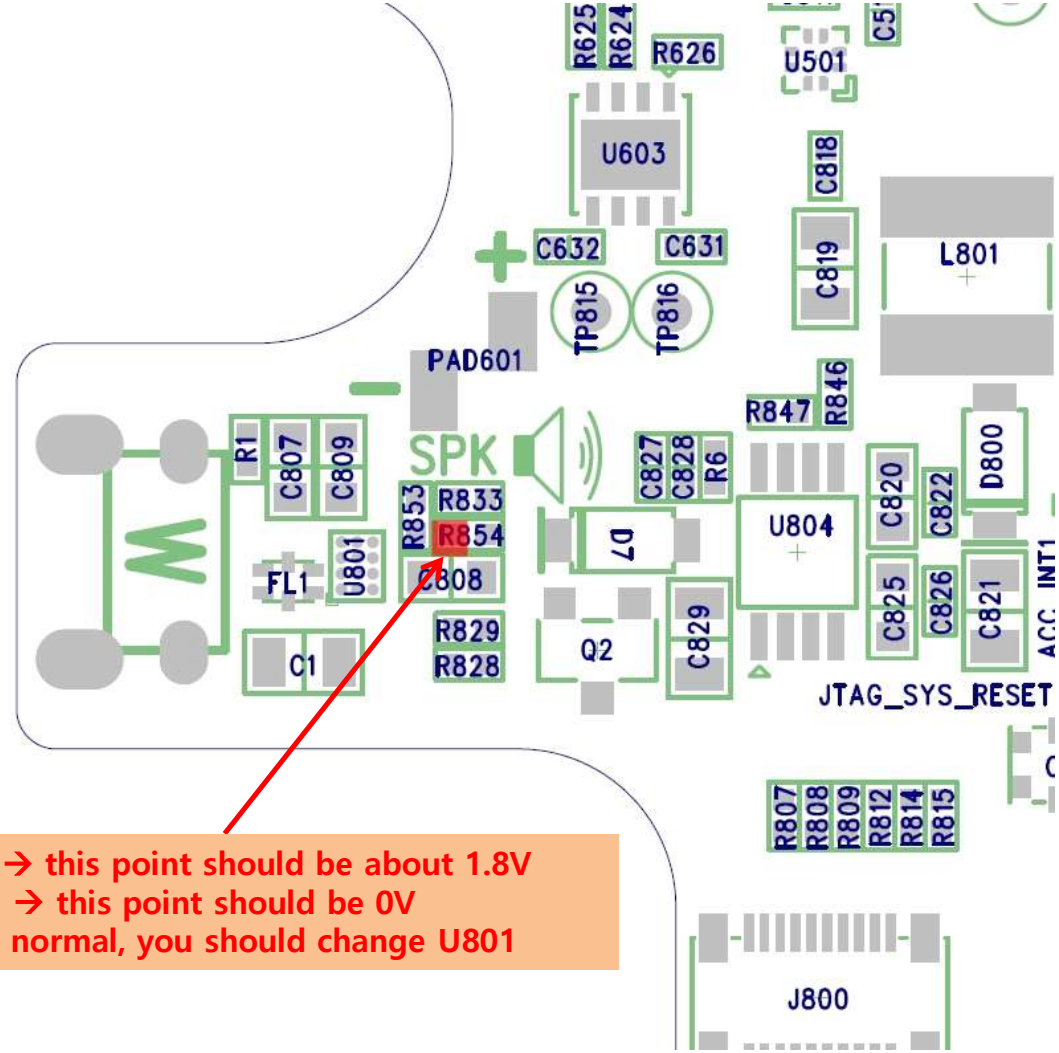
Check that battery voltage increase.



This point voltage should increase.

USB Detector is normal?

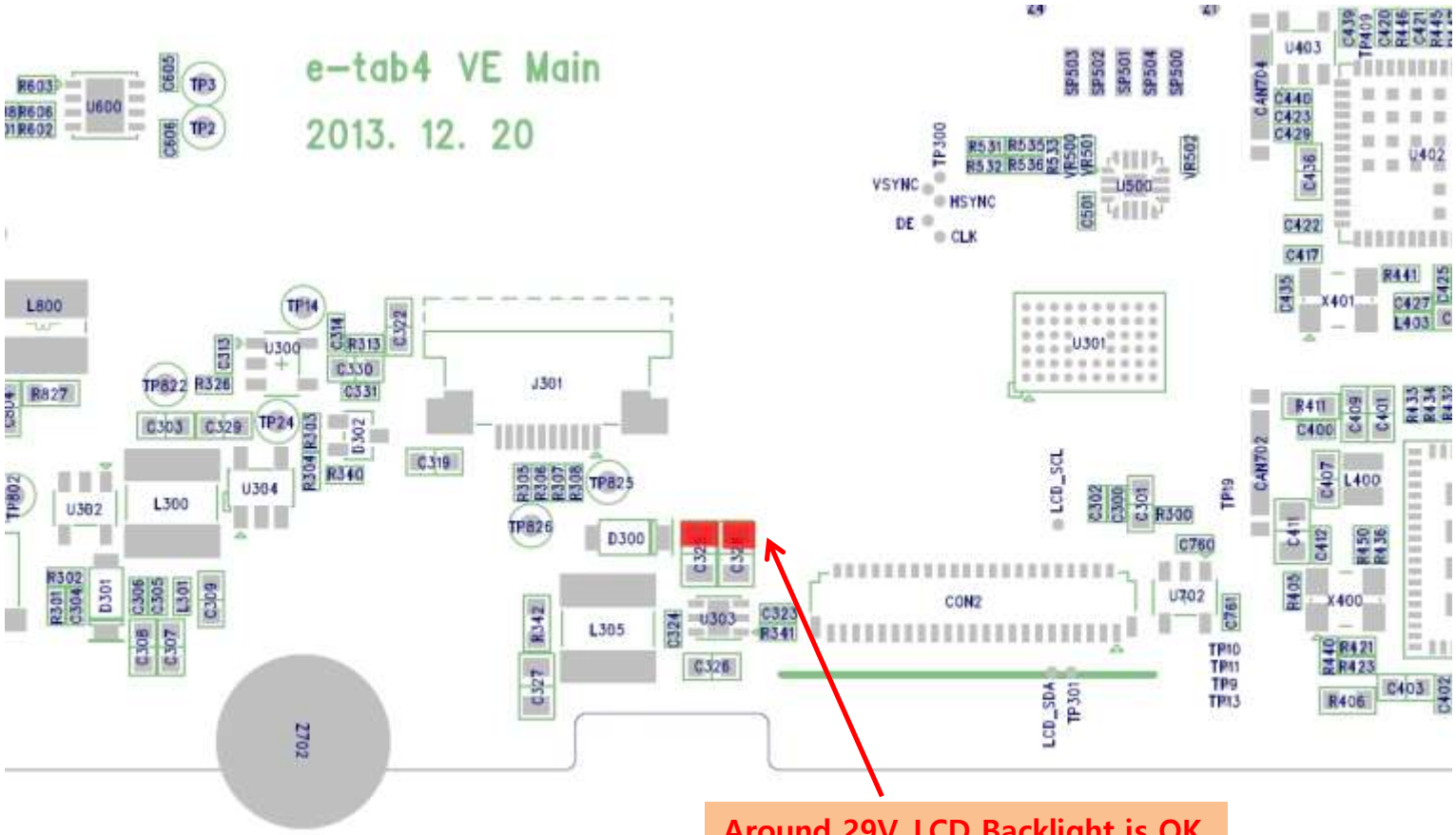
Check between R854 & R853.
Adaptor, that point should be 1.8V
USB (PC), that point should be 0V.



Adaptor charging → this point should be about 1.8V
USB (PC) charging → this point should be 0V
If this point is not normal, you should change U801

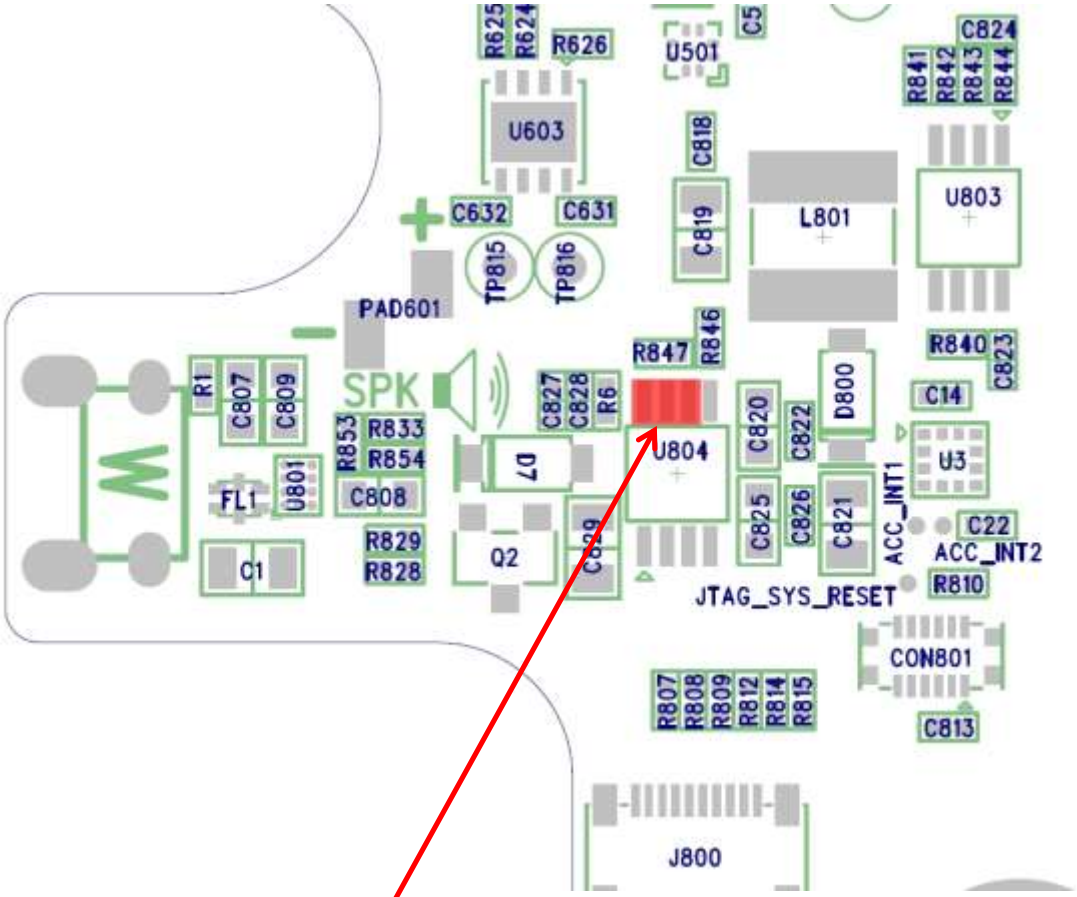
Check if only LCD doesn't turn on.

Check the LED Driver IC **(U303)** power.
It should be around **29V**.



Around 29V, LCD Backlight is OK.

Check 6,7,8pin of U804. If there is strange voltage at that point, U804 is defective. It would be cause Not Charging.



This point must be 0V.
This point is 5V only USB HOST Mode.
When charging, if this point is strange voltage, U804 is defective.
Change U804.

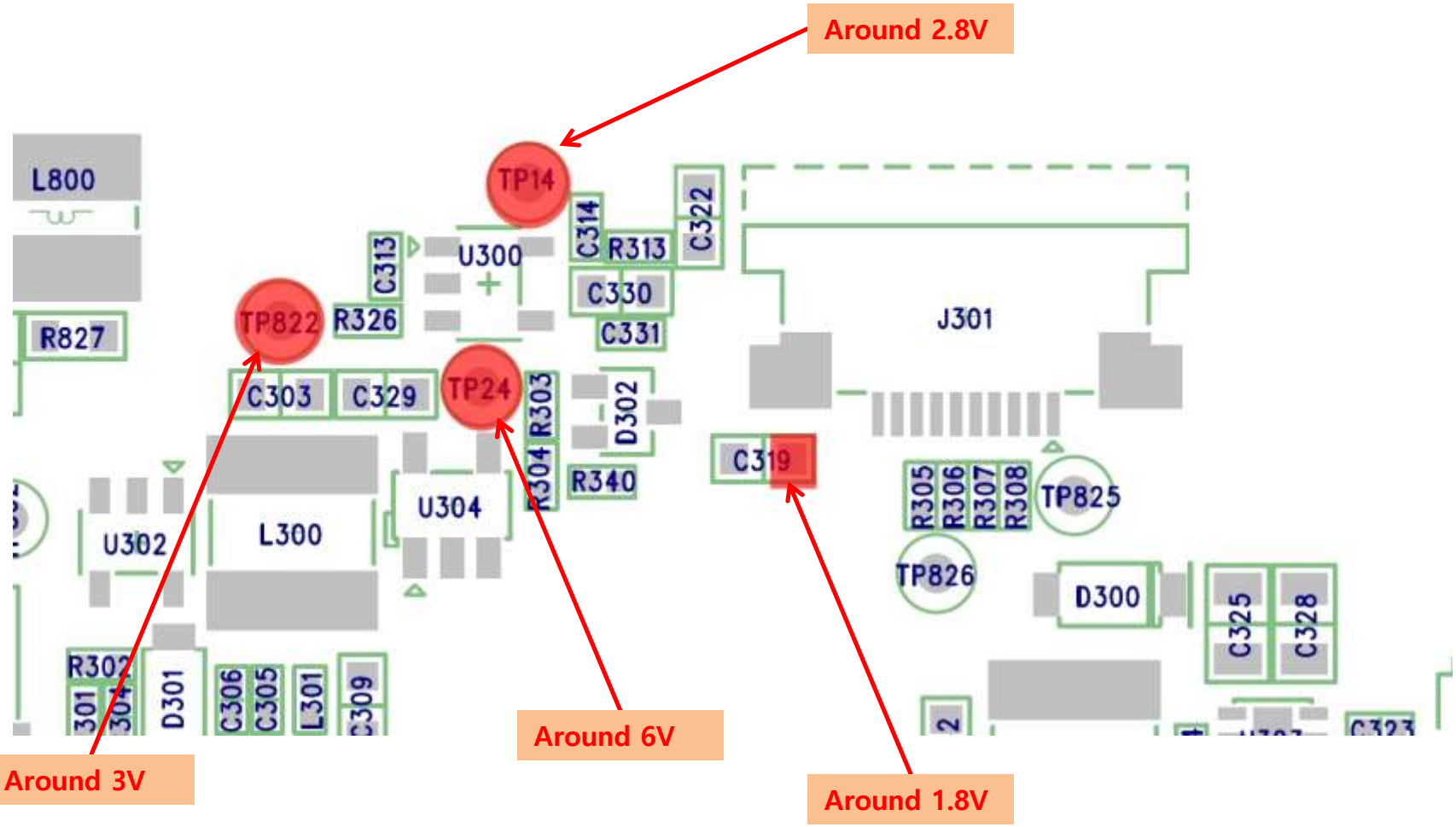
4. In case a Touch Screen doesn't work

Touch power is normal?	Check the all power related to touch, 6V,3V,2.8V,1.8V.
Touch Interrupt is normal?	Check the TOUCH_INT line (R305) is changed to "Low" when touch the screen,
Touch Reset is normal?	Check the TOUCH_RST line (R306) is **High**.
I2C line in normal?	Check whether the R307, R308 is cold-solder joint or not and also check the communication is working properly with OSC scanning.
Touch Panel is normal?	Check whether there isn't crack on the Touch Panel FPCB and also check it is working properly or not connecting the other Touch Panel.

If only you touch two times, touch panel detect.
In this case, you should upgrade to MPTEST firmware.
And one more check.

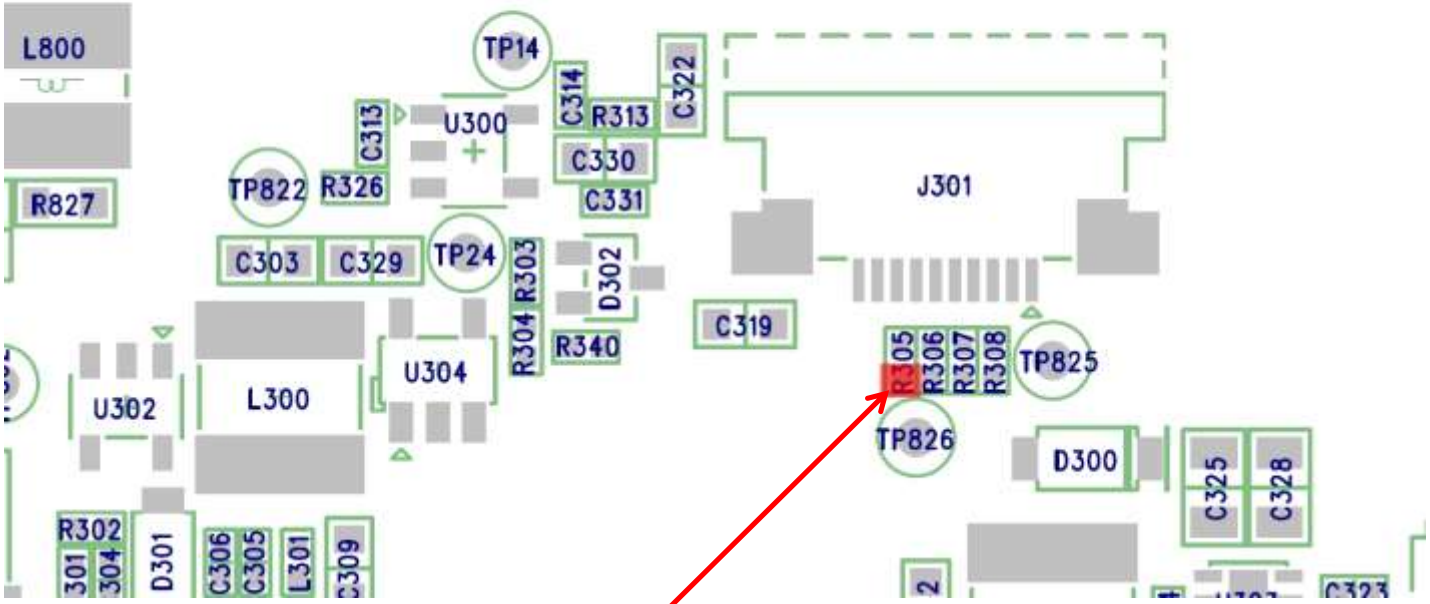
Touch power is normal?

Check the all power related to touch, 6V,3V,2.8V,1.8V.



Touch Interrupt is normal?

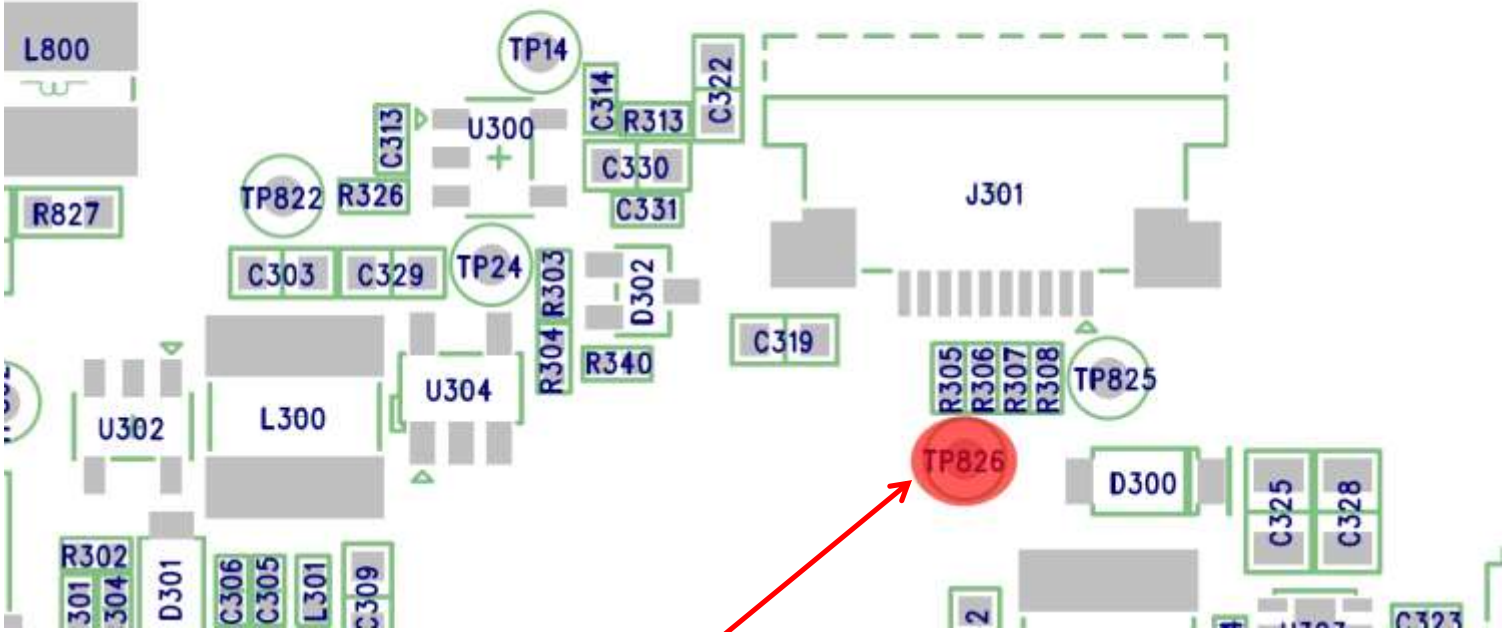
Check the TOUCH_INT line (R305) is changed to "Low" when touch the screen,



When not touch, this point keep 1.8V.
When touch, this point is changed Low.

I2C line in normal?

Check whether the R307, R308 is cold-solder joint or not and also check the communication is working properly with OSC scanning.



This point is I2C data line.
When booting complete, this point should keep 1.8V.
If this point continuously change, you should upgrade MPTEST firmware.

5. In case a Speaker doesn’t work

Codec voltage is normal?	Check the input power of the Codec(U604) is 1.8V and 3.3V.
SPK AMP voltage is normal?	Check the input power of Speaker AMP (U603, U600) is connected to the current battery power (VBAT).
SPK AMP input is normal?	Check the C626, C608’s input signal using OSC. (over 1kHz is good.)
SPK is connected properly?	Check if the Speaker Wire isn’t disconnected or shorted with other part of the PC.

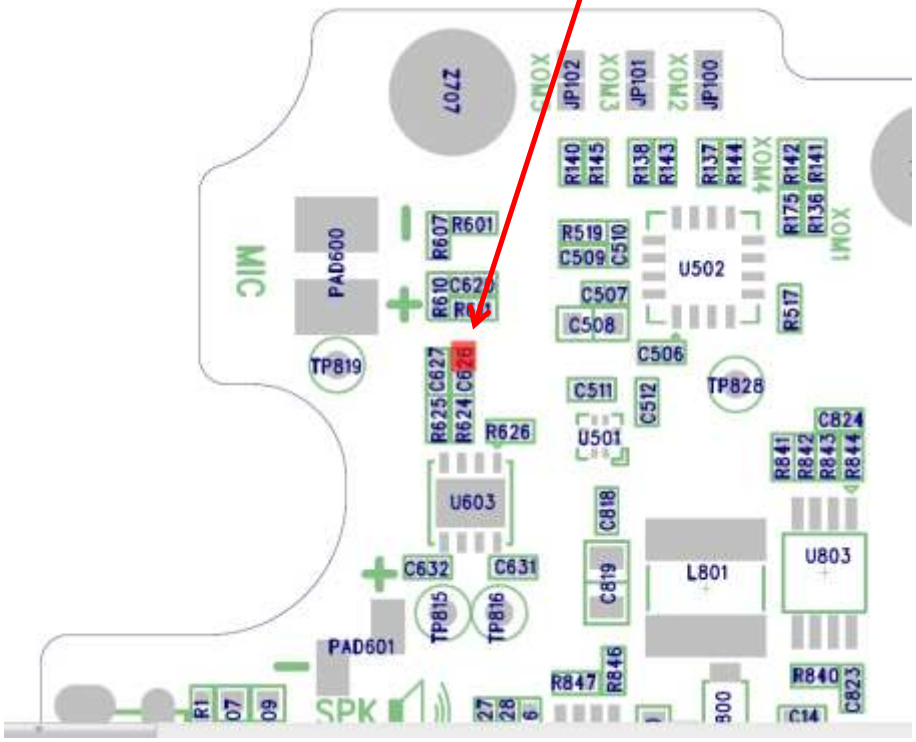
Codec voltage is normal?

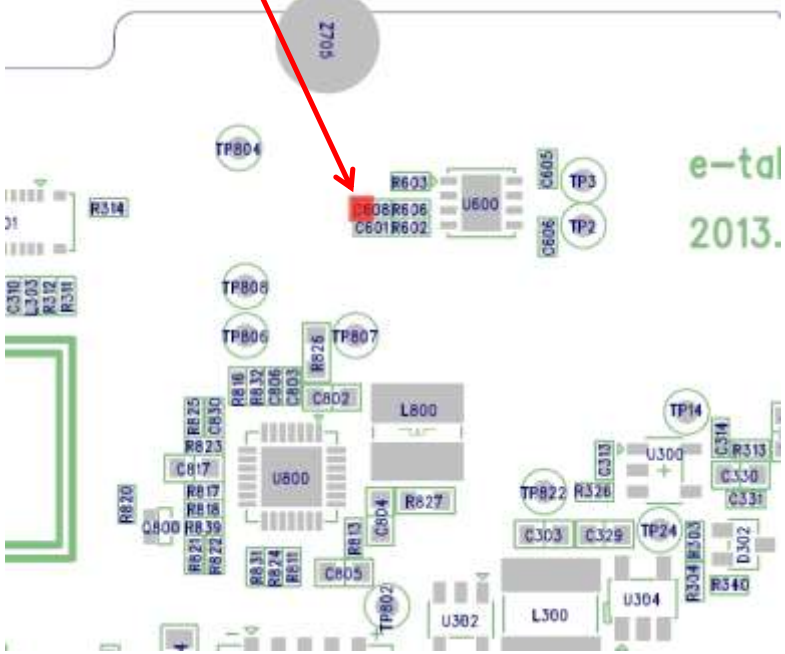
Check the input power of the Codec(U604) is 1.8V and 3.3V.

SPK AMP input is normal?

Check the C626, C608's input signal using OSC.
(over 1kHz is good.)

Check input signal of SPK Amp.





6. In case an Earphone doesn’t work

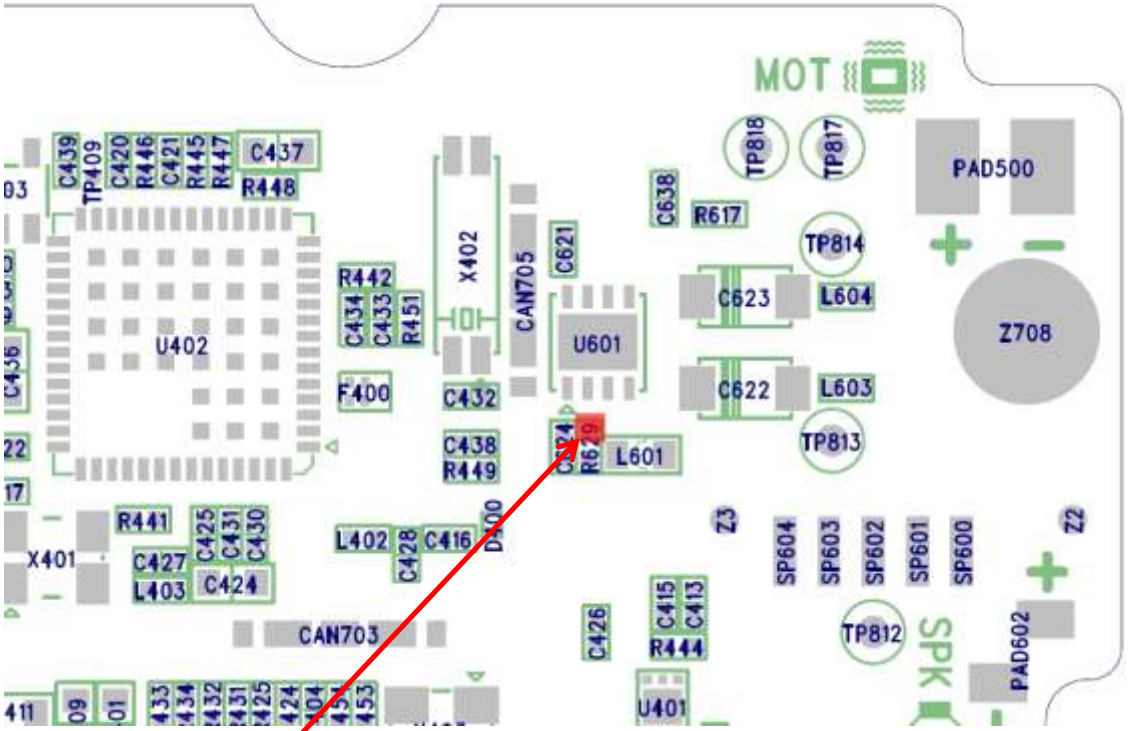
Codec power is normal?	Check the Codec (U604)’s input power is 1.8V and 3.3V.
Isn’t the POP Disabled?	Check if there is output signal and also check the U601 isn’t SHDN.
Isn’t the EAR_GND detached?	Check the EAR_GND pin is not detached. Check 601. (It could make strange sound.)
JACK_DET is normal?	Check there is “High” indication on R623 when an earphone is inserted and the soldering condition.
EARJack_FPCB is normal?	Check if there isn’t any crack on the EARJack FPCB and check if it’s been soldered properly.

Codec voltage is normal?

Check the input power of the Codec(U604) is 1.8V and 3.3V.

Isn't the POP Disabled?

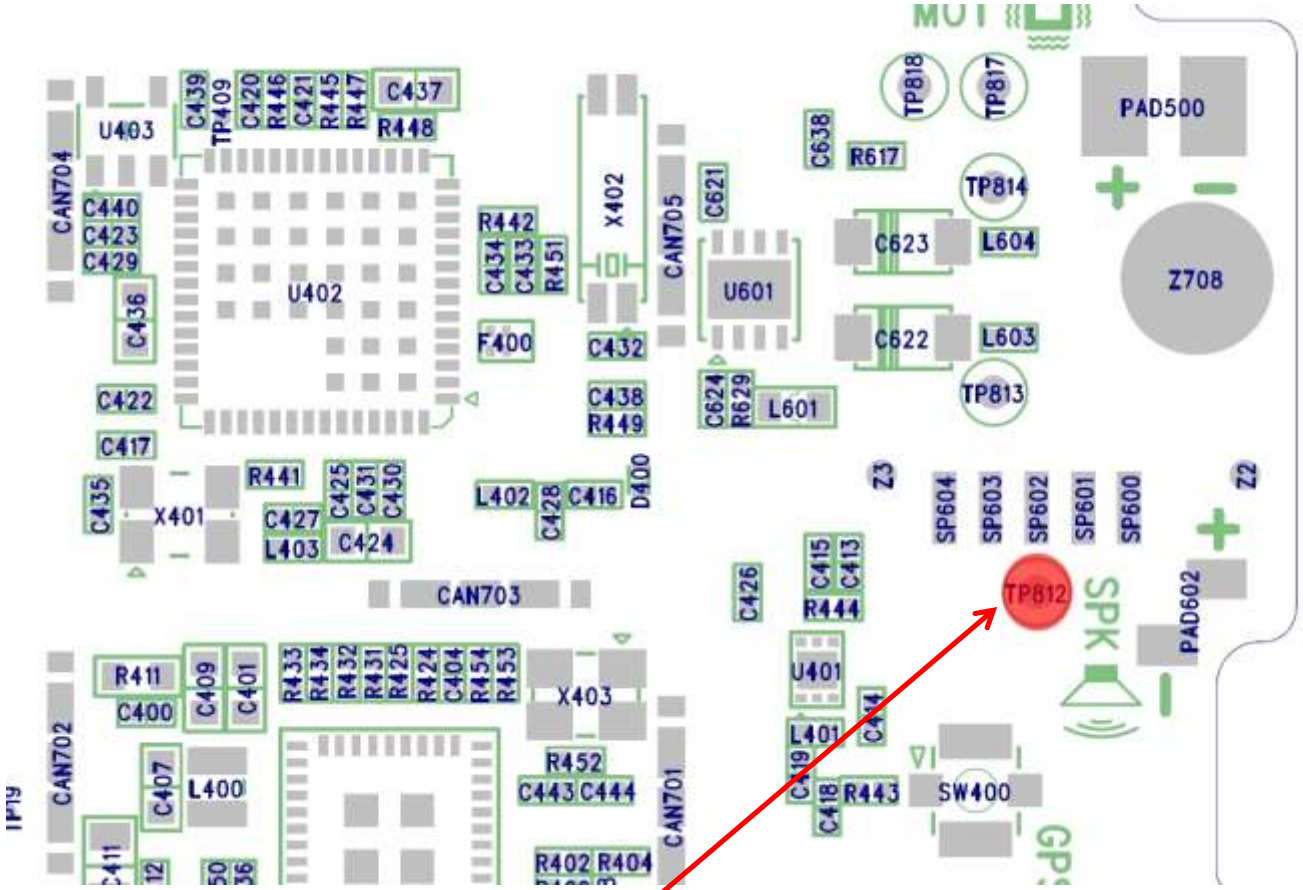
Check if there is output signal and also check the U601 isn't SHDN.



When playing music, this point is about 1.8V

JACK_DET is normal?

Check there is “High” indication on R623 when an earphone is inserted and the soldering condition.



When earphone is connected, this point is about 1.8V.
If it is not normal, you should check Earjack FPCB.

7. In case a MiC doesn’t work

MIC is normal?

Check the MIC has been soldered well and there’s no disconnected wire.

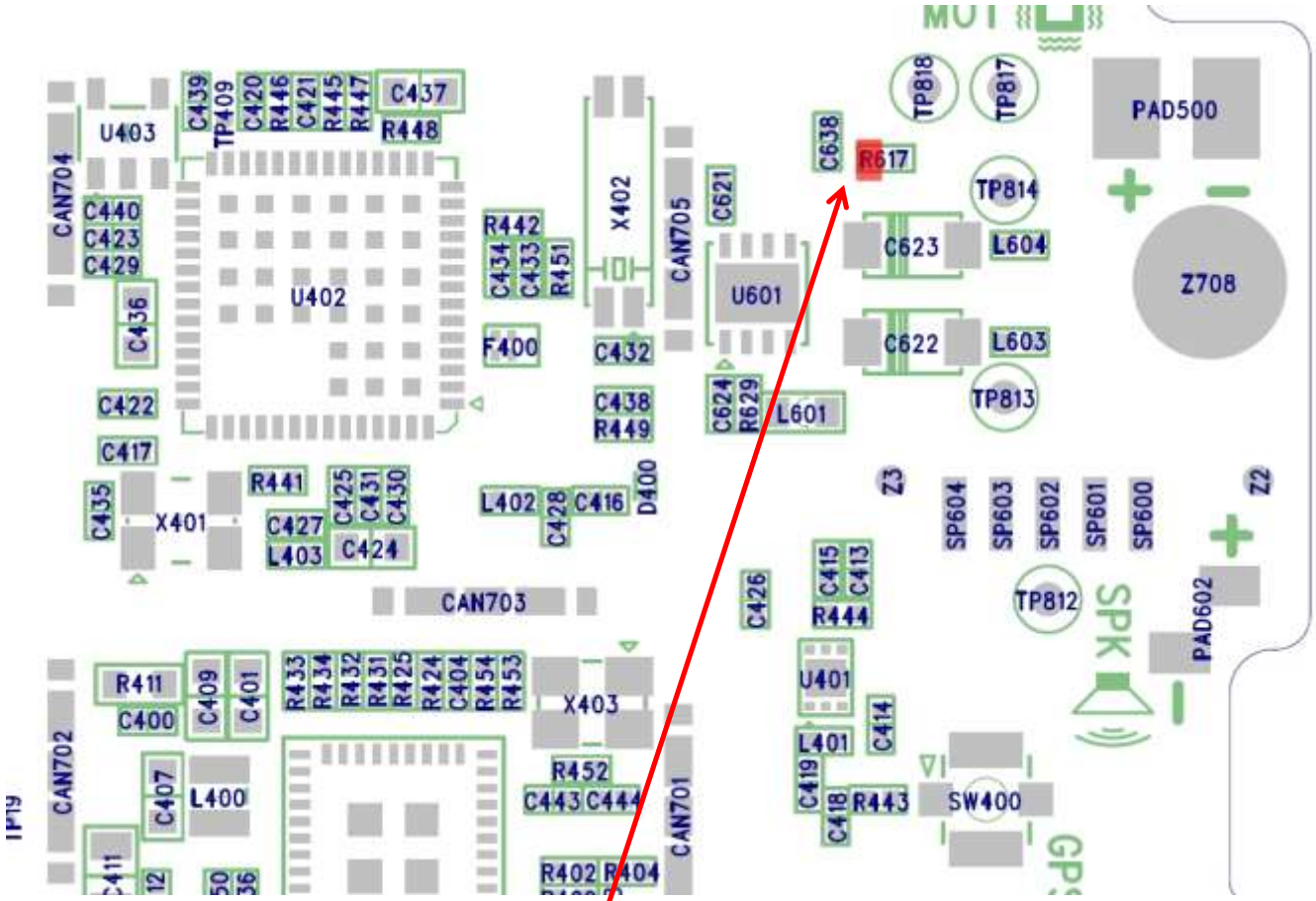
↓

MIC BIAS is normal?

Check the MIC Bias power is 2.8V when recording. If it’s not, check if there is any cold-solder joint or short on the circuit and Code’s Block.

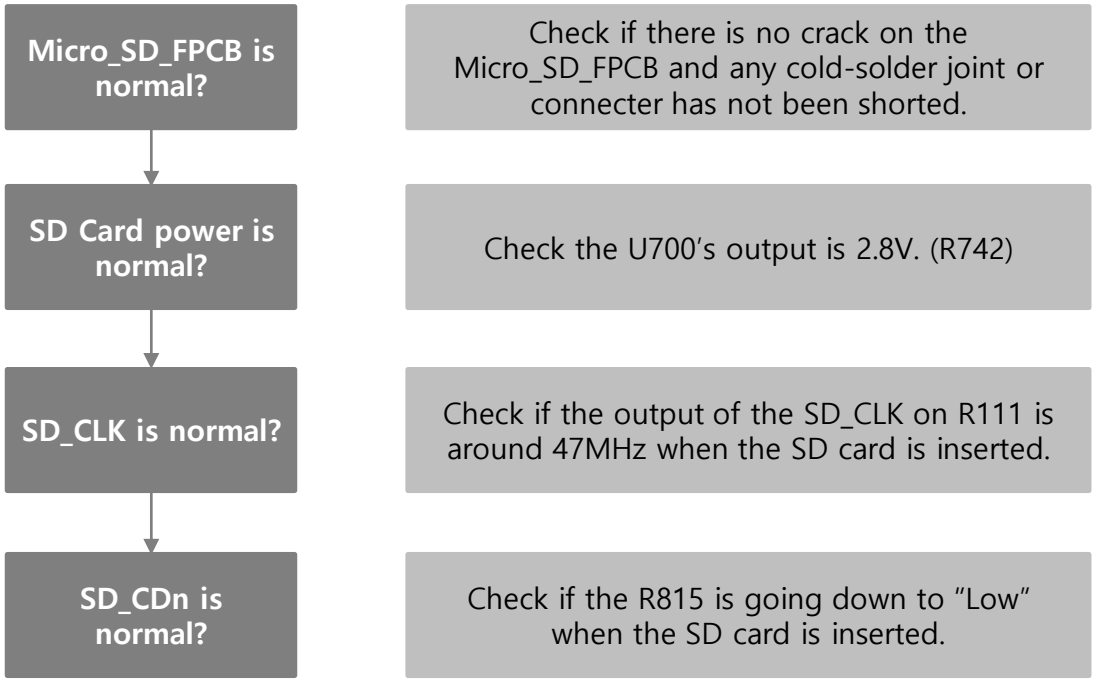
MIC BIAS is normal?

Check the MIC Bias power is 2.8V when recording. If it's not, check if there is any cold-solder joint or short on the circuit and Code's Block.



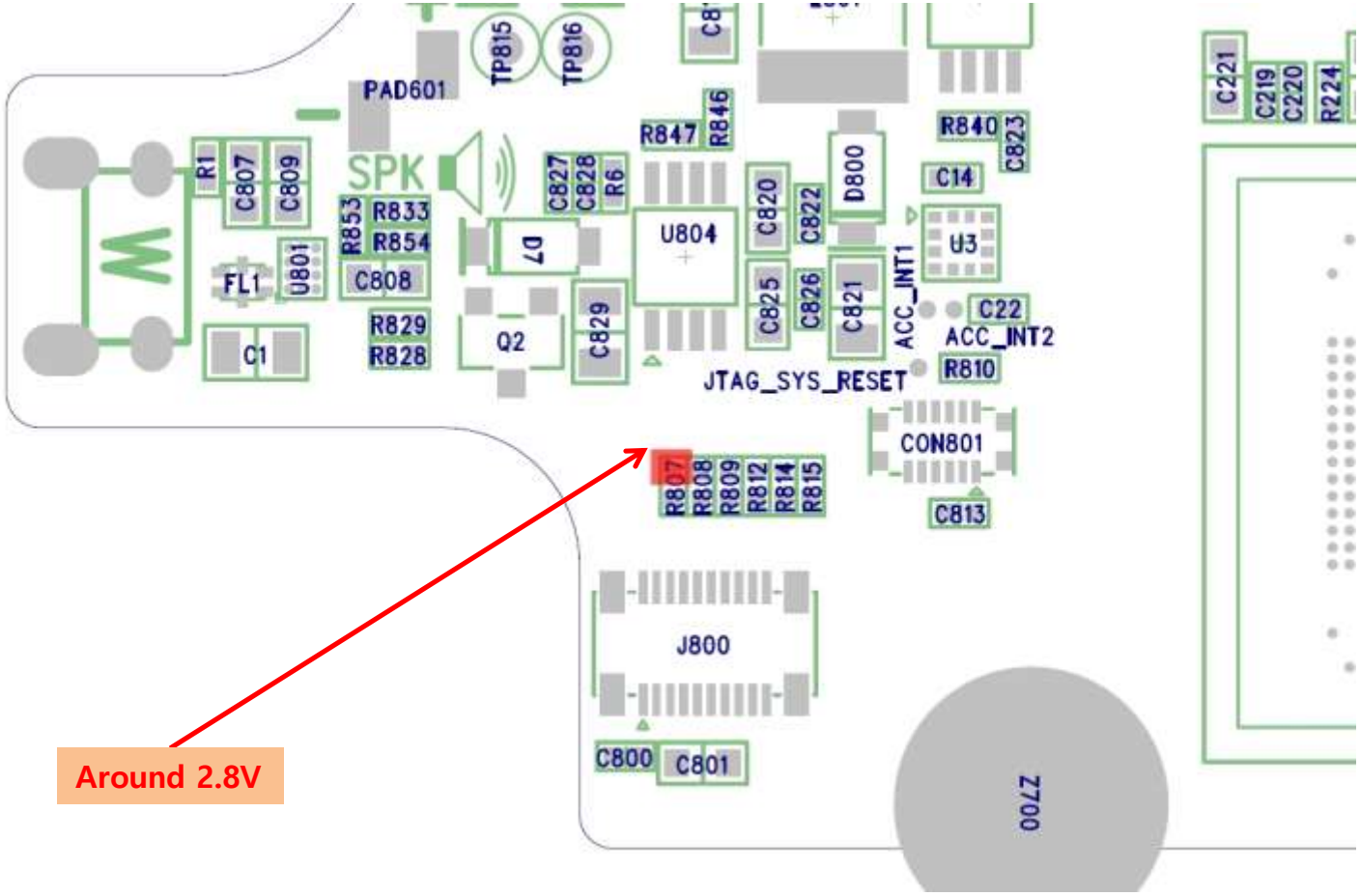
Around 2.8V
If this point is not normal, you should check Codec.

8. In case a Micro SD doesn’t work



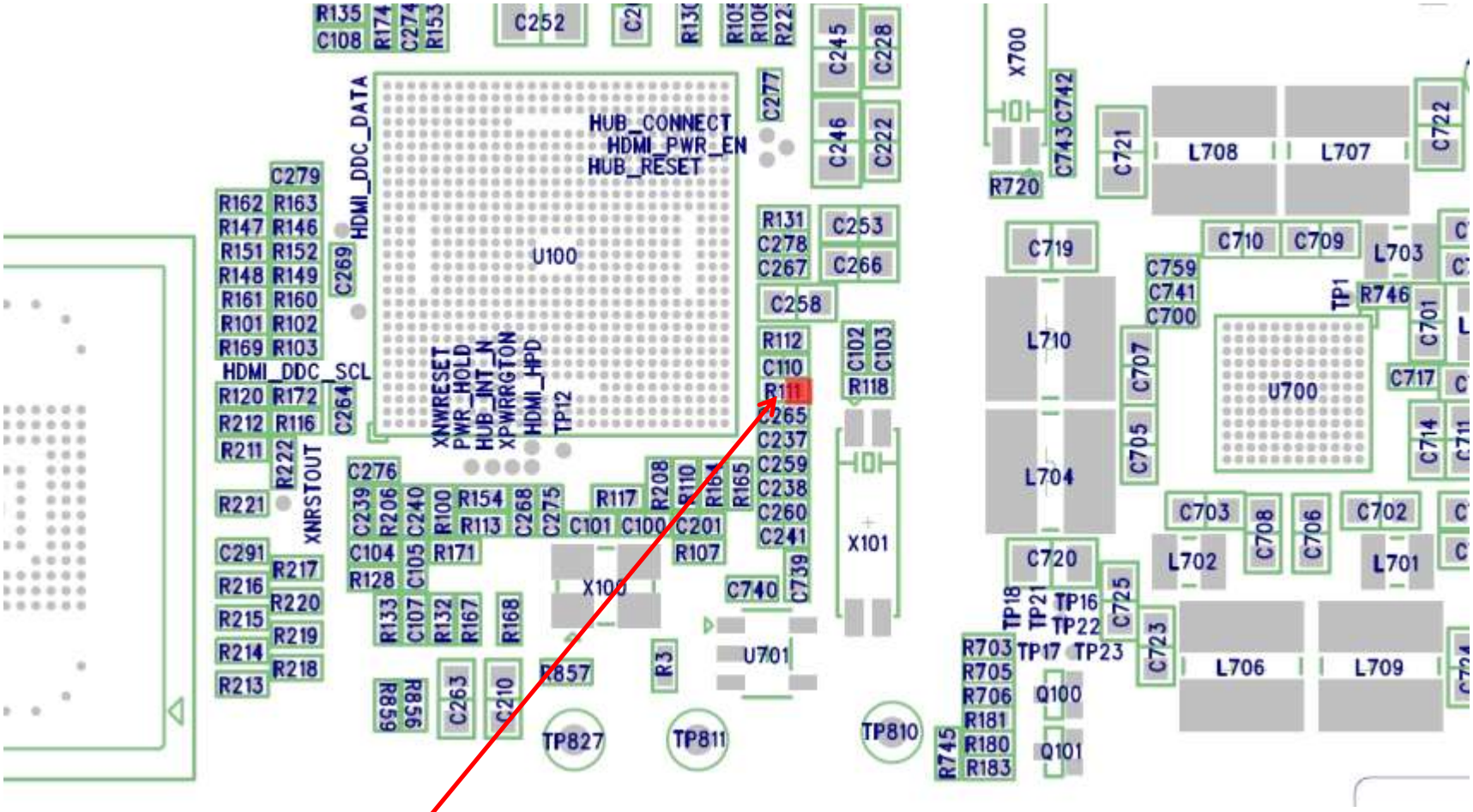
SD Card power is normal?

Check the U700's output is 2.8V. (R742)



SD_CLK is normal?

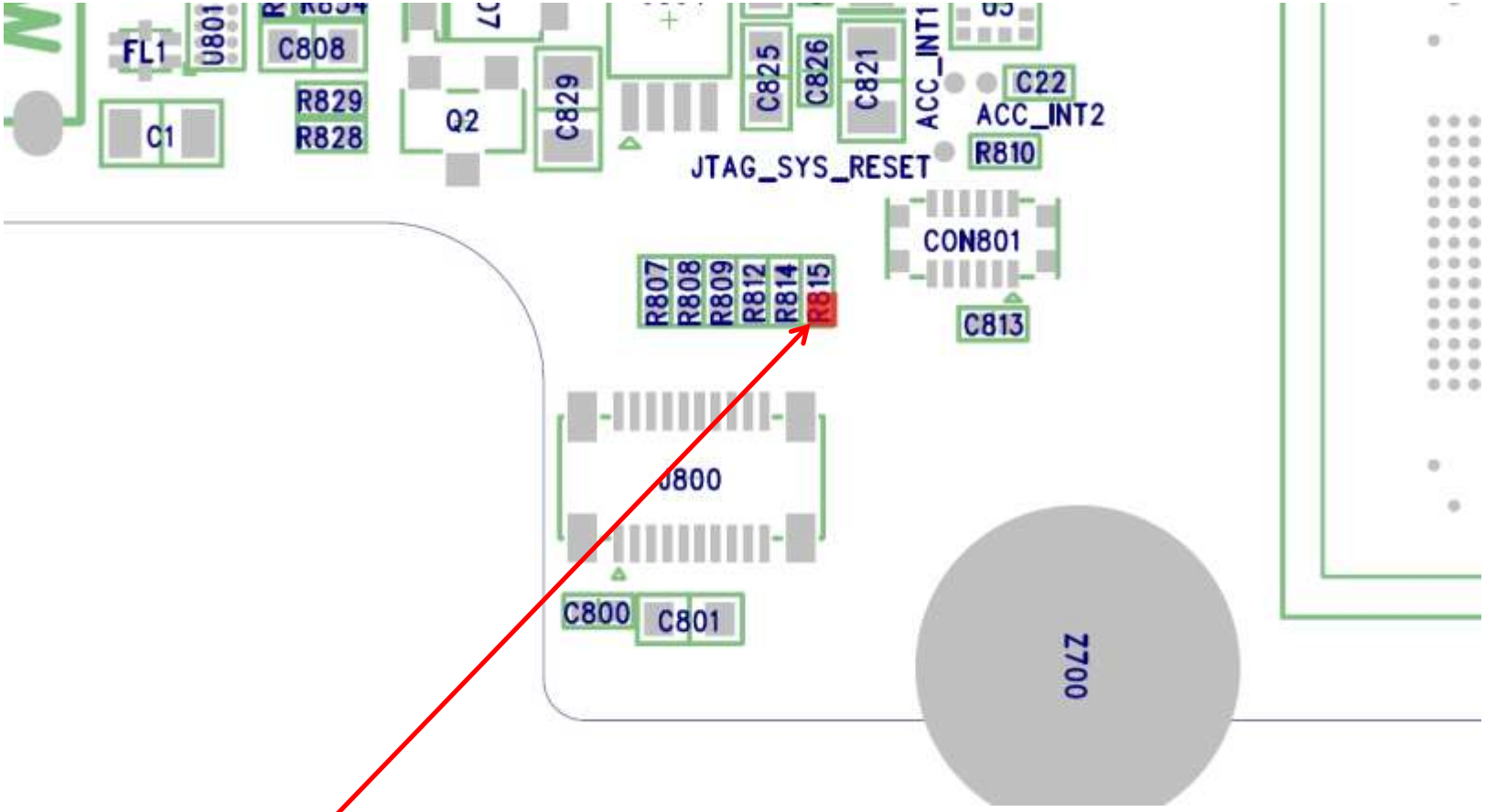
Check if the output of the SD_CLK on R111 is around 47MHz when the SD card is inserted.



About Clock is 47MHz

SD_CDn is normal?

Check if the R815 is going down to “Low” when the SD card is inserted.



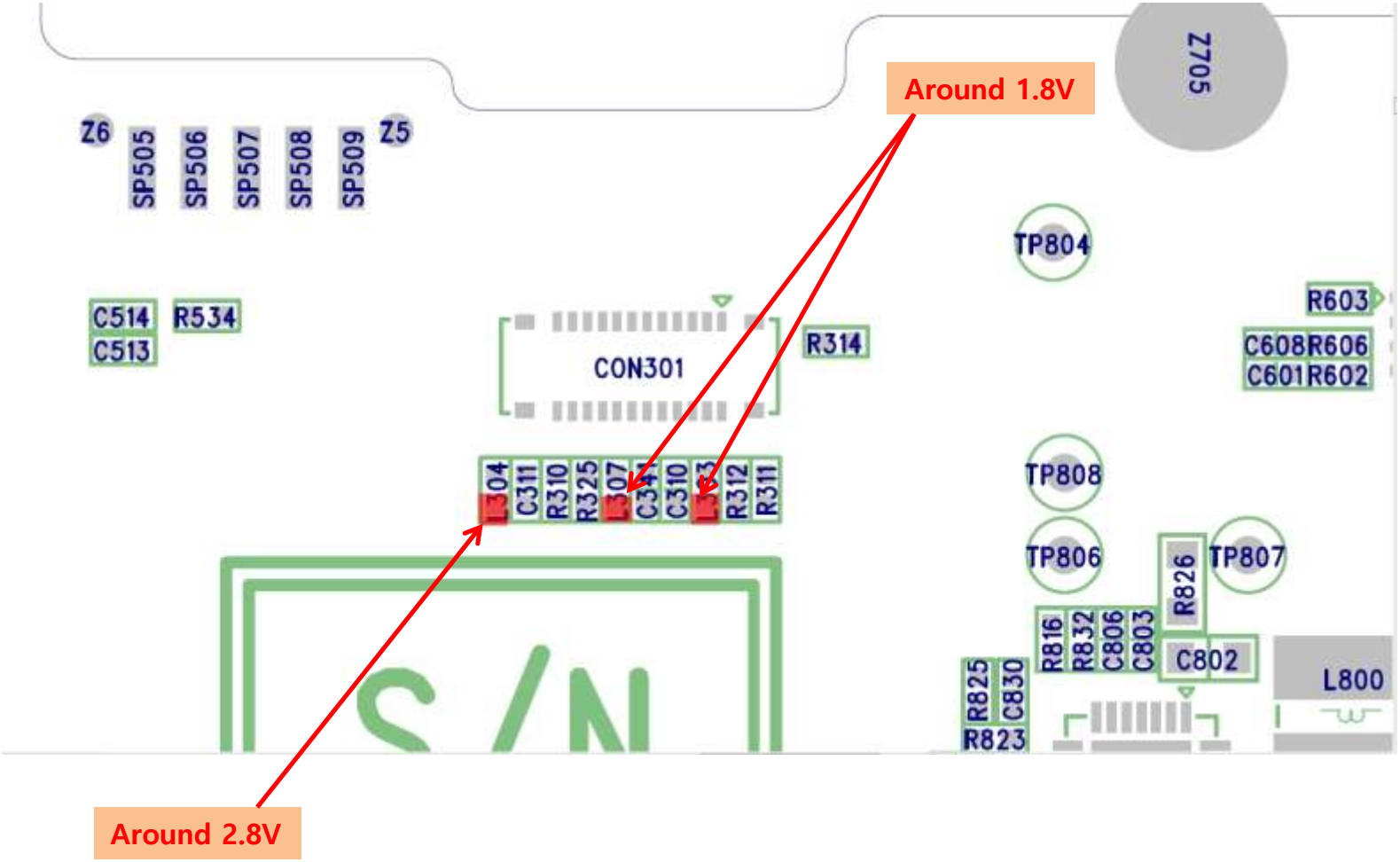
When the SD Card is inserted, this point is 0V

9. In case a Camera doesn’t work

Camera FPCB is normal?	Check if the Camera FPCB is sticking properly and there’s no crack on the FPCB.
Camera power is normal?	Check the power of the CAMERA, **1.8V(L303, L307), 2.8V(L304).**
Camera CLK is normal?	Check if the output is 12MHz on MCLK(R223).
Camera RST is normal?	Check if the CAM RESETn (R310) is “High”.

Camera power is normal?

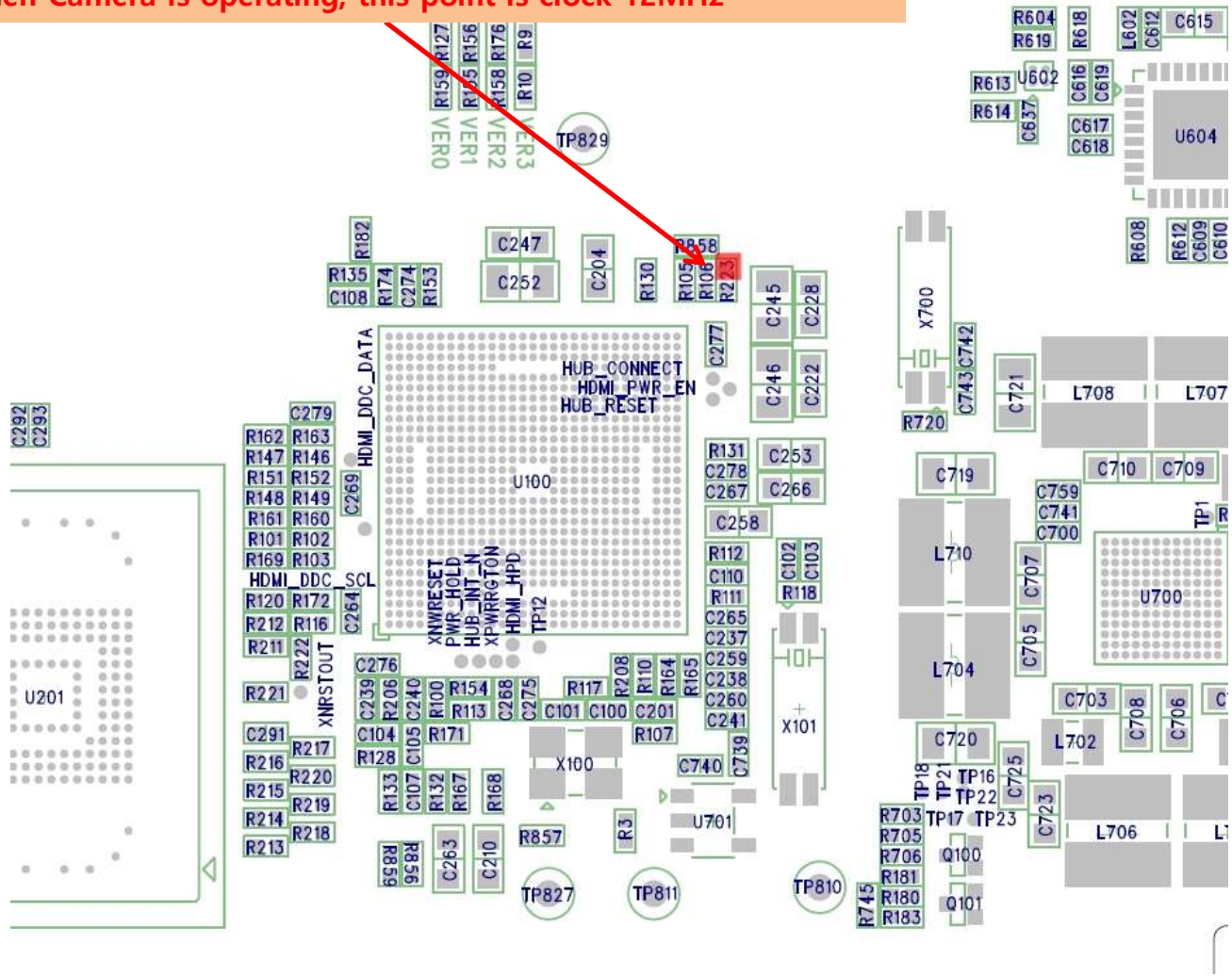
Check the power of the CAMERA, **1.8V(L303, L307), 2.8V(L304).**



Camera CLK is normal?

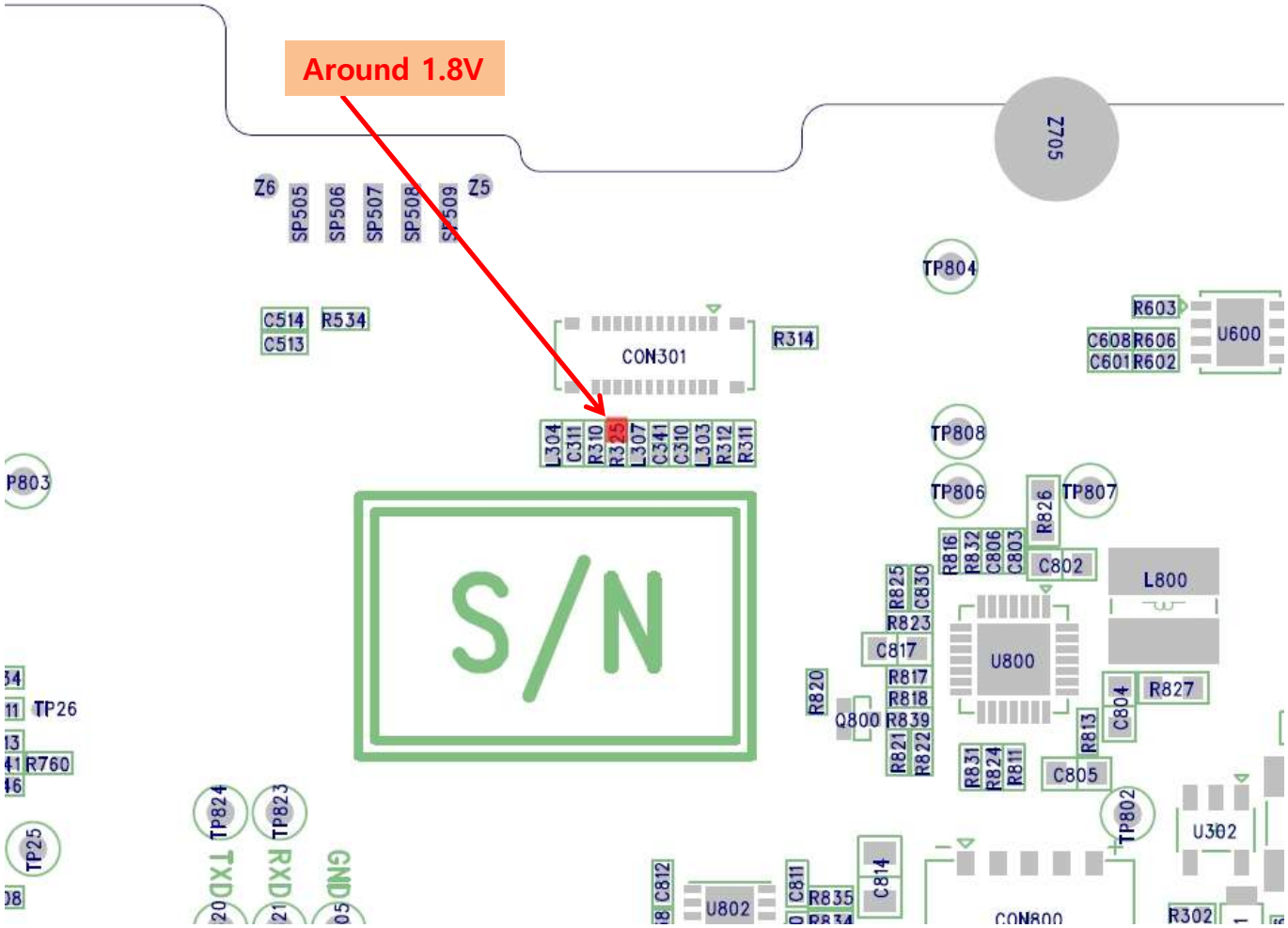
Check if the output is 12MHz on MCLK(R223).

When Camera is operating, this point is clock 12MHz



Camera RST is normal?

Check if the CAM RESETn (R310) is “High”.



10. In case Wi-Fi isn’t connected

Module power is normal?

Check if the power is supplied properly.
Wi-Fi 3.3V(R406) and 1.8V(R424).

↓

Module CLK is normal?

Check if the 32.768kHz clock is normal. (R450)
And check if the WIFI_CLK (R112) is **47MHz.**

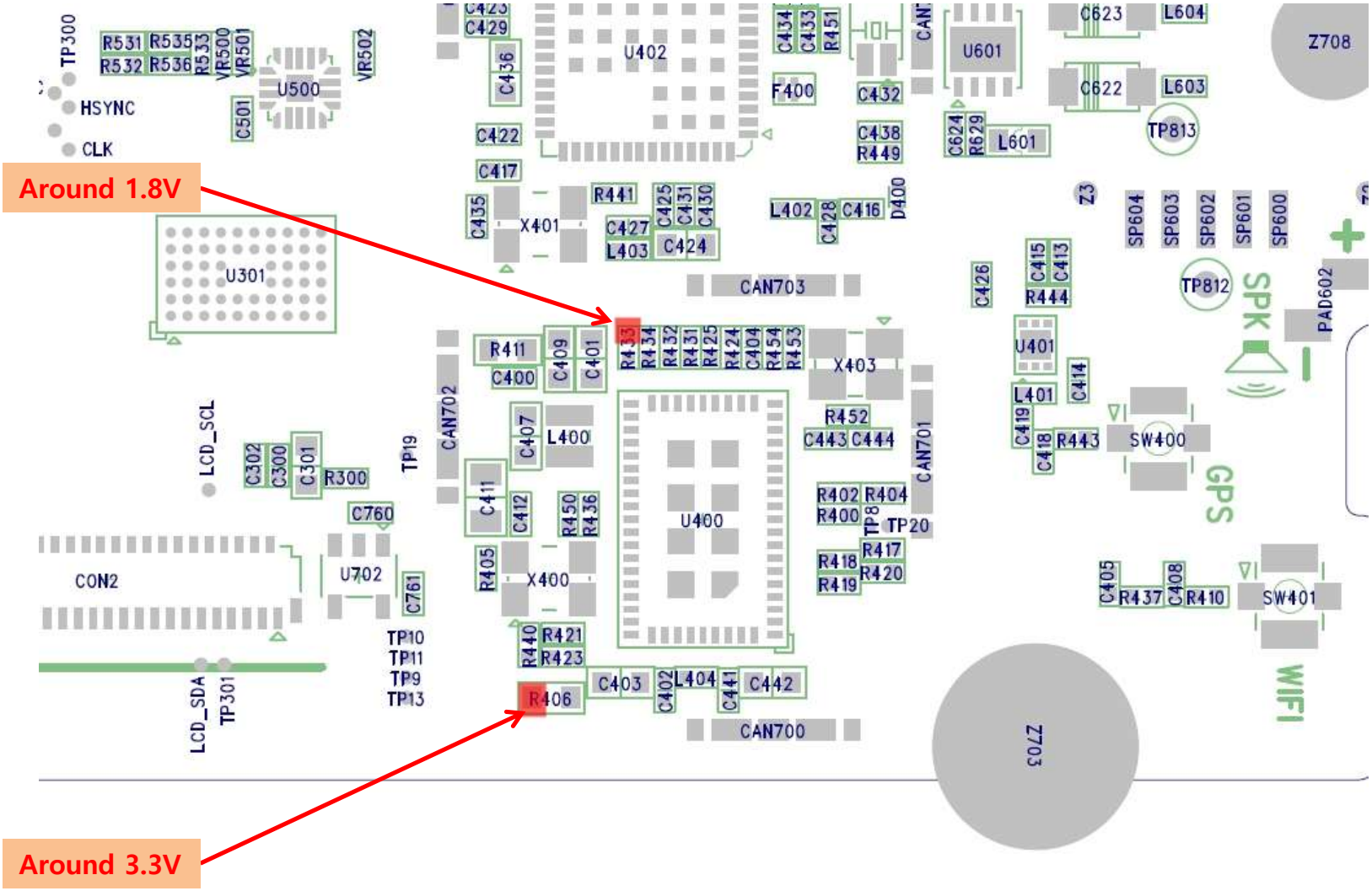
↓

WiFi antenna is normal?

Check if the contacted Clip has not not collapsed when separate the Wi-Fi/GPS antenna.
And also check if there is no cold-solder joint on the line from the module to antenna.

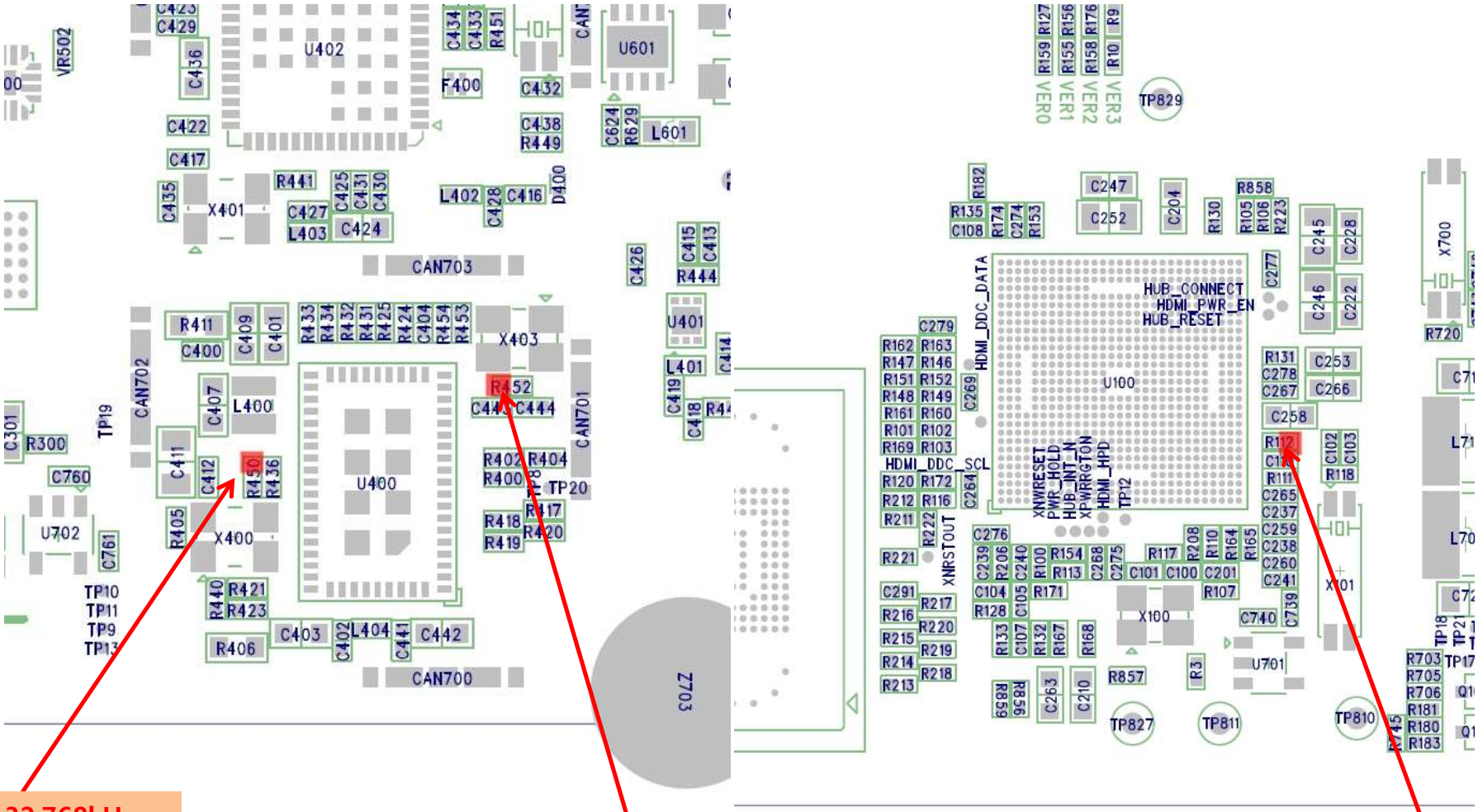
Module power is normal?

Check if the power is supplied properly.
Wi-Fi 3.3V(R406) and 1.8V(R424).



Module CLK is normal?

Check if the 32.768kHz clock is normal. (R450)
And check if the WIFI_CLK (R112) is **47MHz.**



32.768kHz From PMIC

37.4MHz From Crystal (X403)

47MHz From CPU

11. In case GPS doesn’t work

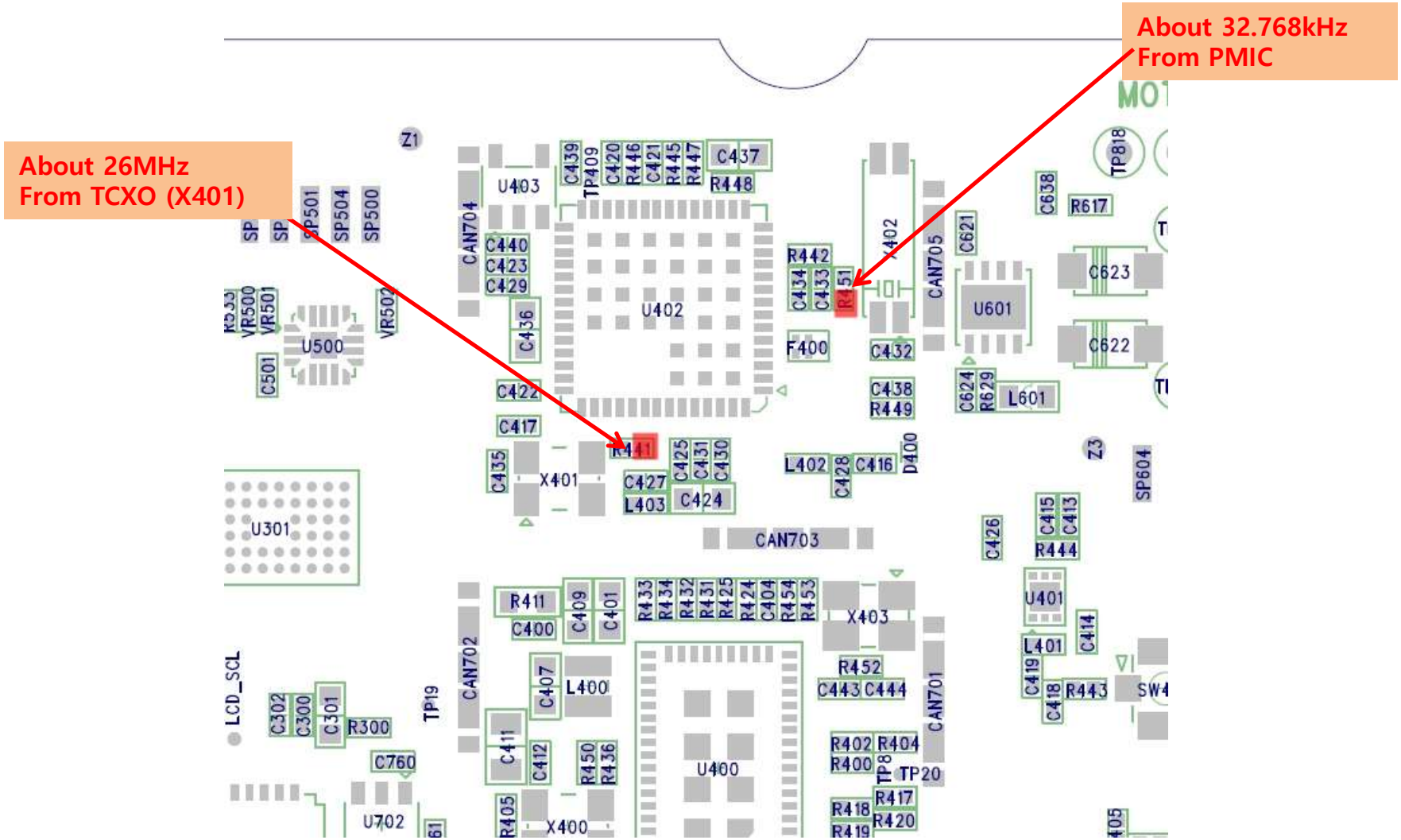
GPS power is normal?	Check if the power that GPS 2.8V(C420) and 1.8V(C422) is supplied properly and U403’s output is 3.0V.
GPS antenna is normal?	Check if the contacted Clip has not not collapsed when separate the Wi-Fi/GPS antenna. And also check if there is no cold-solder joint on the line from the module to antenna.
GPS CLK is normal?	Check if the X402 output is **32.768kHz** and X401 output is **26MHz**.
UART communication is normal?	Check if the communication of GPS Tx, Rx (R446, R447) is normal and there’s no cold-solder joint.

GPS power is normal?

Check if the power that GPS 2.8V(C420) and 1.8V(C422) is supplied properly and U403's output is 3.0V.

GPS CLK is normal?

Check if the X402 output is **32.768kHz** and X401 output is **26MHz**.



12. In case sensors don’t work

	G-Sensor BMA150 (U3)	D-Compass HSCDTD008A (U501)	GYRO-Sensor L3G4200D (U502)	L-Sensor ISL9203
Are the power of sensors normal?	Check the power of the 3V(C22), 1.8V(C14).	Check the power of the 3V(C512), 1.8V(C511).	Check the power of the 3V(C508), 1.8V(C506).	Check the power of the 3V(C514), 1.8V(R534).
Is I2C communication normal?	Check whether there’s cold-soldering joint of IC’s 6, 8pin or it has been shorted or not. And check it’s possible to be communicated through OSC.	Check whether there’s cold-soldering joint of IC’s 7, 8pin or it has been shorted or not. And check it’s possible to be communicated through OSC.	Check whether there’s cold-soldering joint of IC’s 2, 3pin or it has been shorted or not. And check it’s possible to be communicated through OSC.	Check whether there’s cold-soldering joint of L-Sensor FPCB or not. And check it’s possible to be communicated through OSC.