



A3100 Troubleshooting Guide



Service Engineering & Optimization

Level 3 , Rev.1.0



Agenda



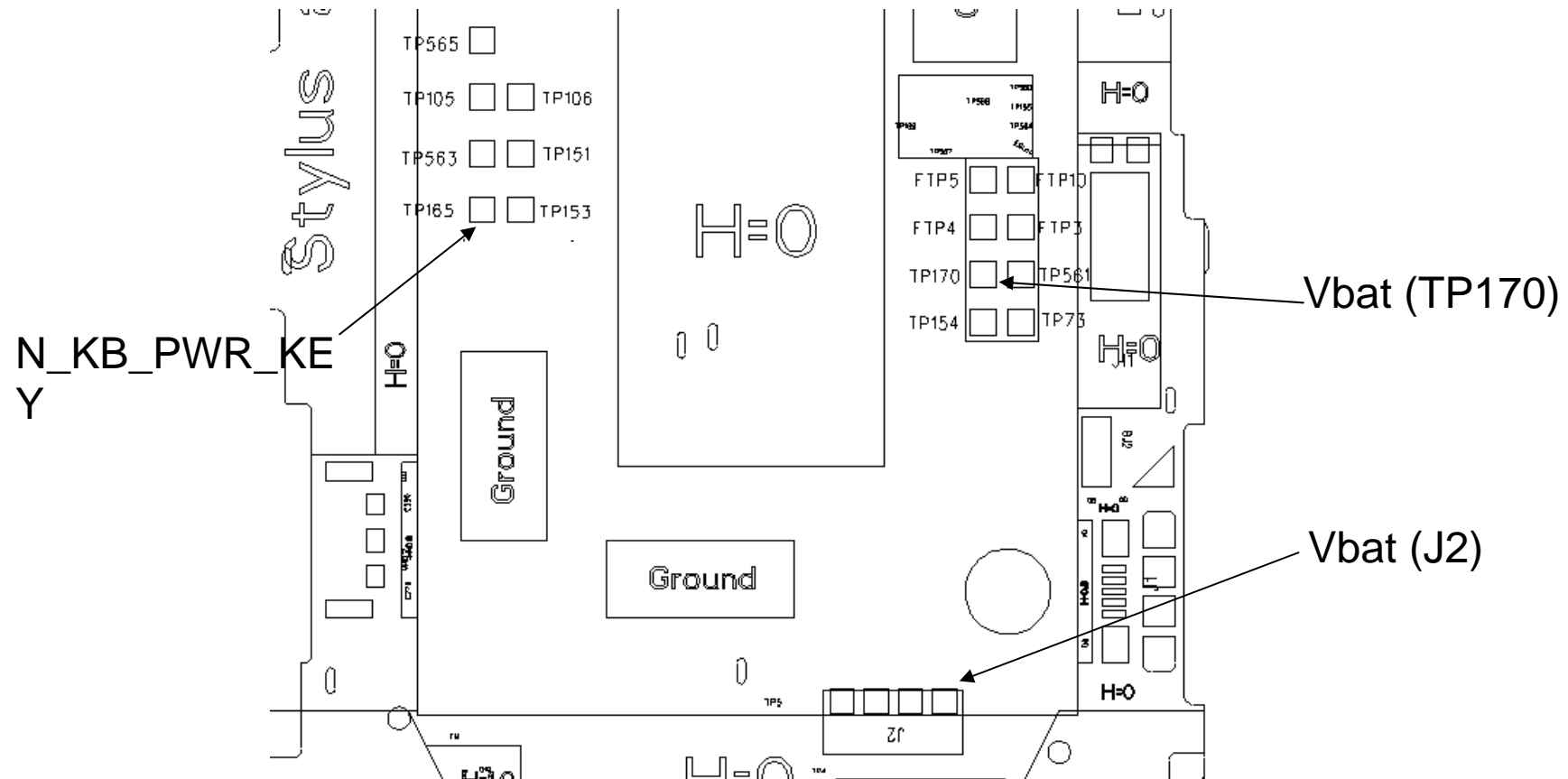
- A. Cannot Power On
- B. SIM Card Not Found
- C. Display Abnormal
- D. No Keypad Backlight
- E. No LCM Backlight
- F. Flash Light No Function
- G. Light Sensor No Function
- H. Cannot Charge
- I. Keypad No Function
- J. Touch No Function
- K. Jog Ball No Function
- L. Can't Access MicroSD Card
- M. Vibrator Out of Control
- N. ActiveSync No Function
- O. Earphone Malfunction
- P. Microphone Malfunction
- Q. Receiver No Key Tone
- R. Speaker No Function
- S. RTC failed
- T. Can't Take Picture
- U. Phone Hang Up
- V. Auto Power On
- W. Auto Power Off
- X. Cannot Call Out
- Y. WIFI Can't Turn On and Test
- Z. BT Can't Turn On and Test



Can't Power On (1)



1. Check the voltage of the Battery
Vbat (TP170) > 3.8V
2. Check the battery connector J2





Can't Power On (2)



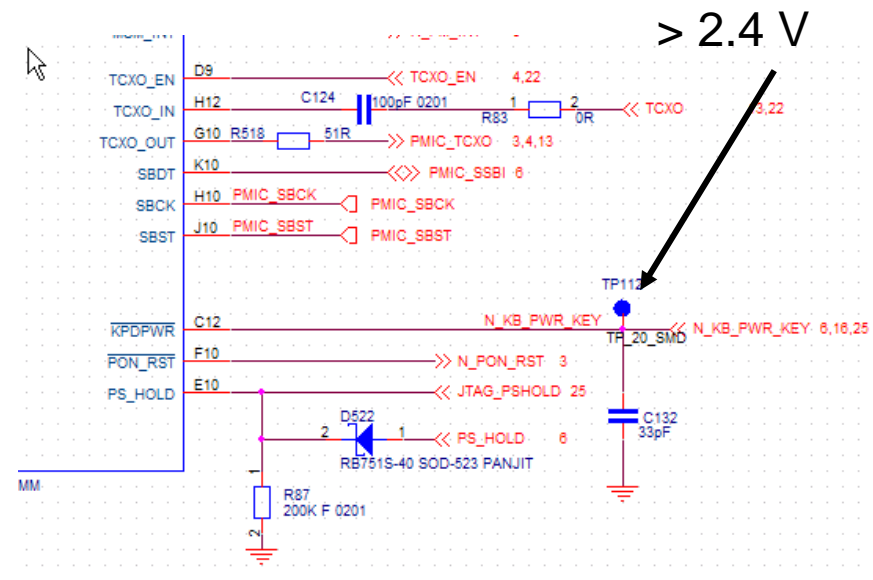
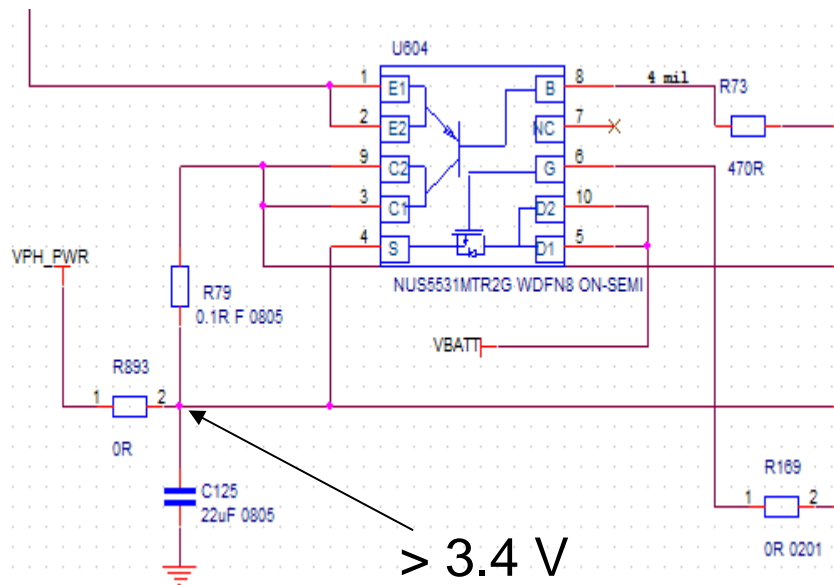
3. Check the voltage of R79

$$R79 > 3.4V$$

4. Check the power-on key path

$$N_KB_PWR_KEY (TP165) > 2.6V$$

If N_KB_PWR_KEY is low, the unit will power on.





Can't Power On (3)



5. Check PM7540(U2) regulator voltage

A. VREG_MSMC1_1.2V on C4923

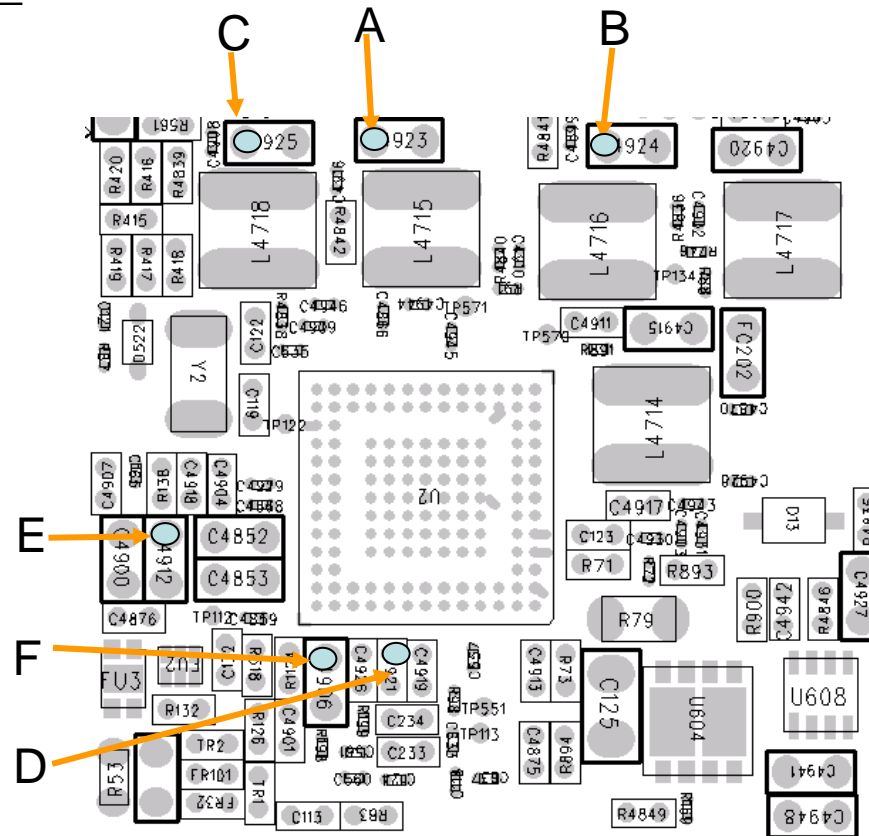
B. VREG_MSMC2_1.2V on C4924

C. VREG_MSME_1.8V on C4925

D. VREG_MSME2_2.8V on C4921

E. VREG_MSMP_2.6V on C4912

F. VREG_MSMA_2.6V on C4906





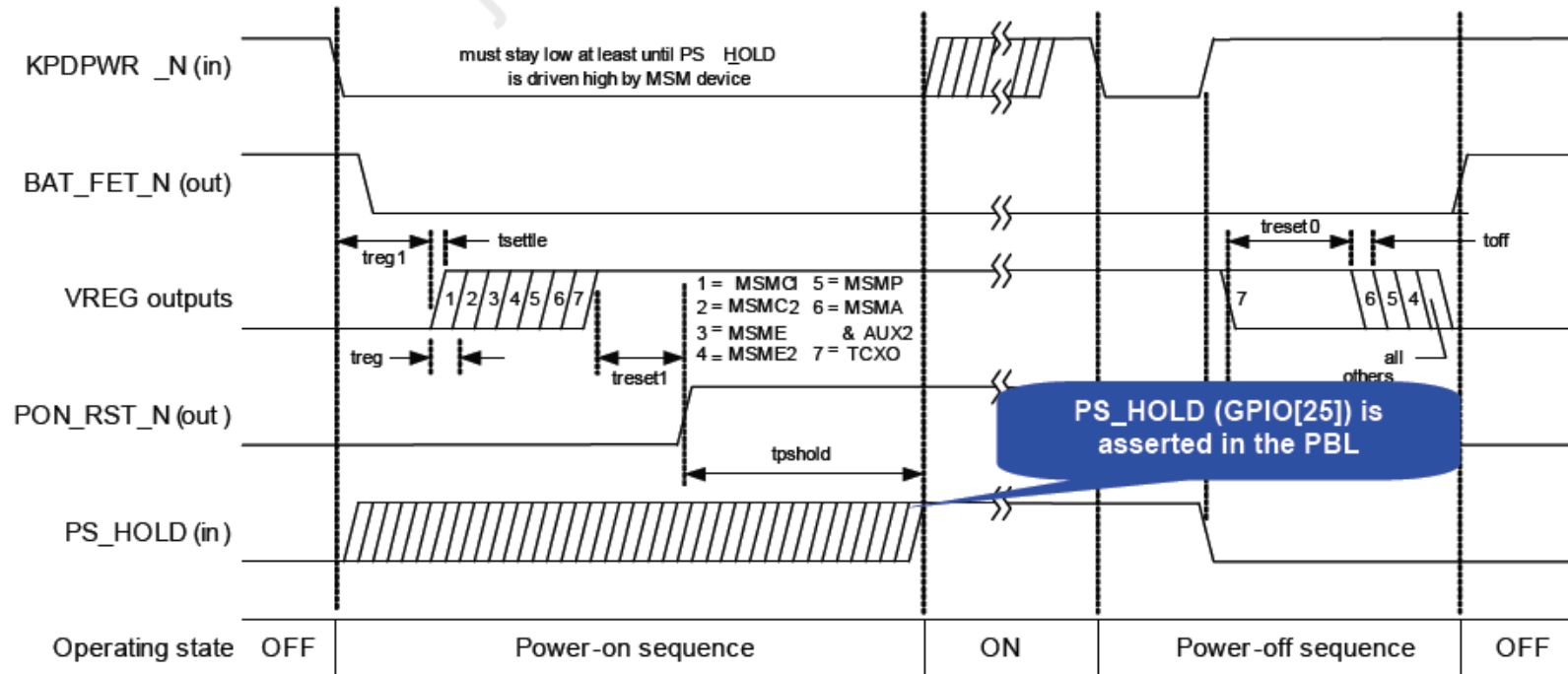
Can't Power On (4)



6. Check Power On Sequence

After the voltage rails are brought up, PON_RST_N is asserted by PM7540 IC, and then the MSM7200A IC asserts **PS_HOLD** signal.

– **PS_HOLD should be high after power on (on D522)**





Can't Power On (5)



7. Try to check the external DDR and Nand Flash

1. External DDR check _ Check the External DDR by ram test tool

Pass=> The External DDR is workable

Fail => a) MSM7201A can find the memory

b) U3 is damaged

2. Flash check _ Dump the image from the damaged unit

Pass=> The External flash is workable

Fail => a) MSM7201A can find the flash

b) U3 is damaged

8. Redownload the SW

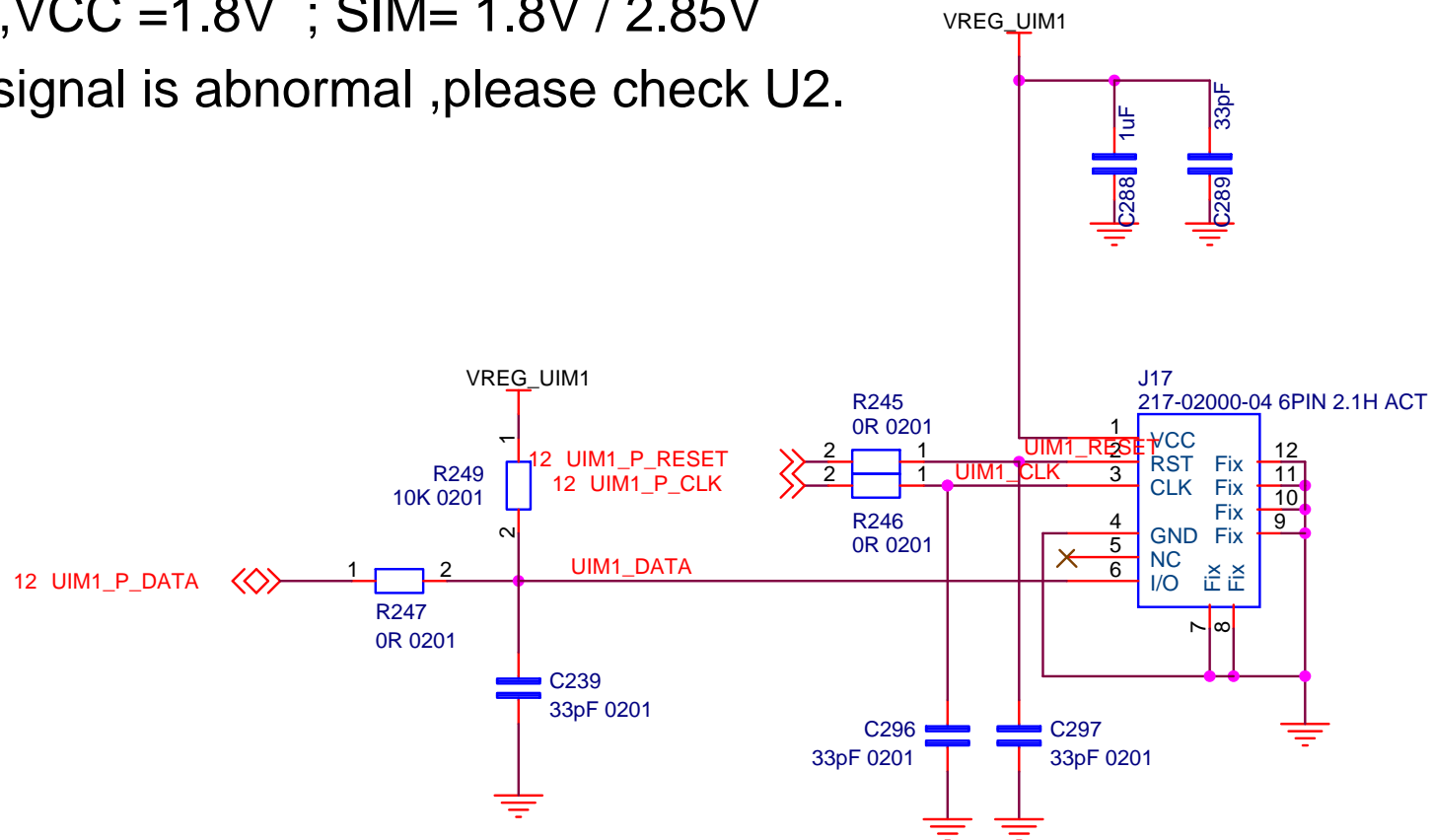
Try to redownload the SW if the main code image is damaged



SIM Card Not Found



1. Do the clean boot (Mater Clear)
2. Exam whether the contact between SIM and connector is ok
3. Check the Signal of SIM interface (VCC, RST ,and Clock)
USIM ,VCC =1.8V ; SIM= 1.8V / 2.85V
4. If the signal is abnormal ,please check U2.

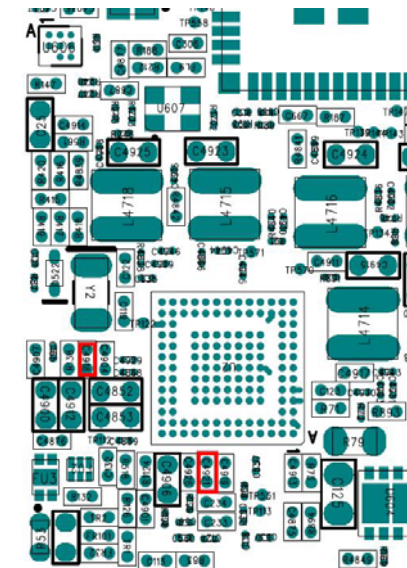
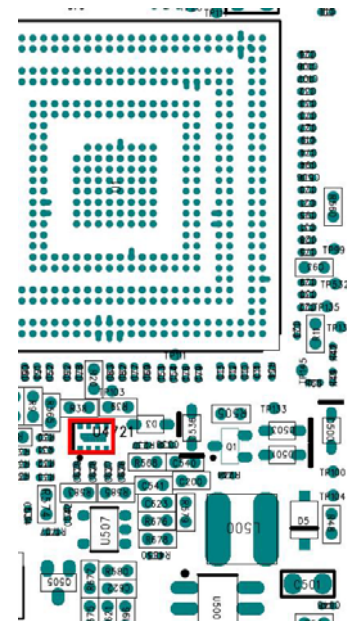
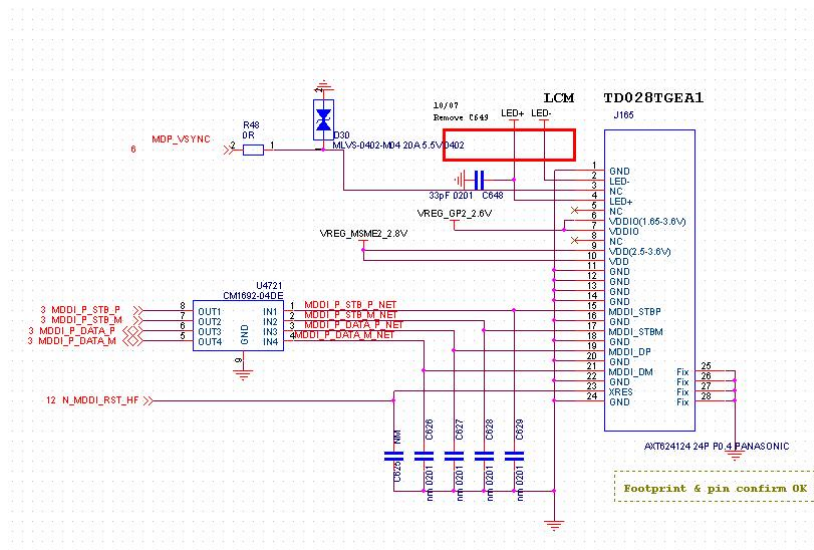




Display Abnormal



- White screen:
 - Check LCM damage or not
 - Check EMI filter (U4721) SMT
 - Check panel voltage VDD 2.8V(C4921_1) & VDDIO 2.6V(C4918_1)

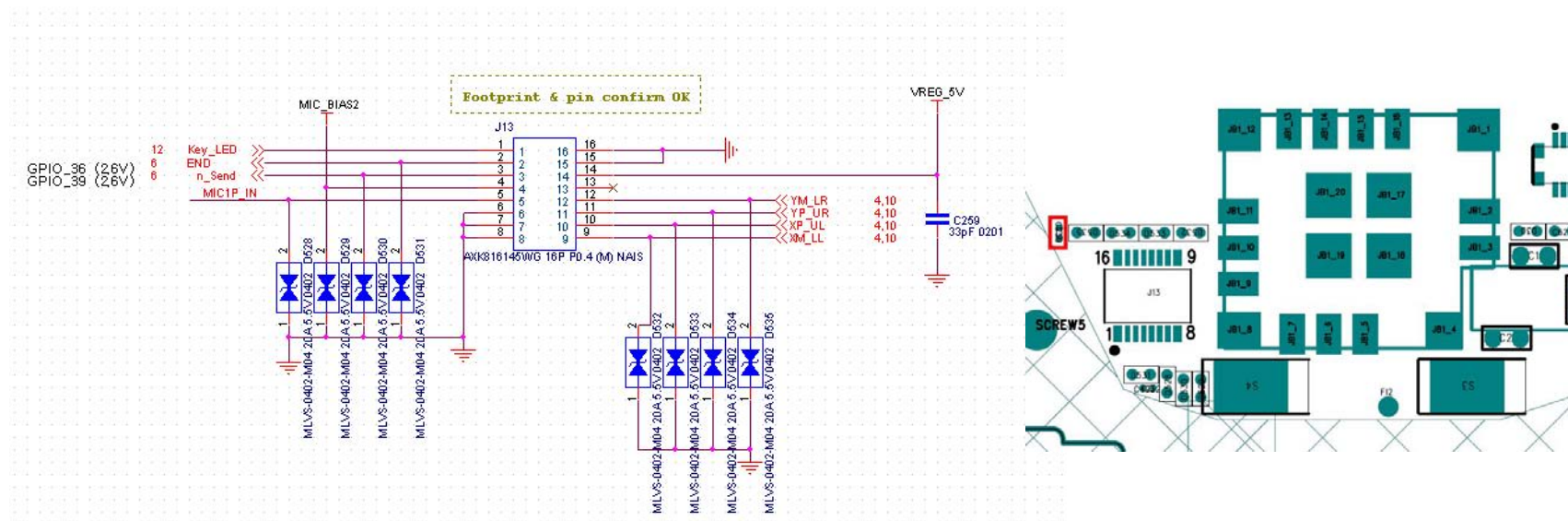




No Keypad Light



- Check keypad LED voltage VREG_5V(C259 pin2)
- Check LED damage or not

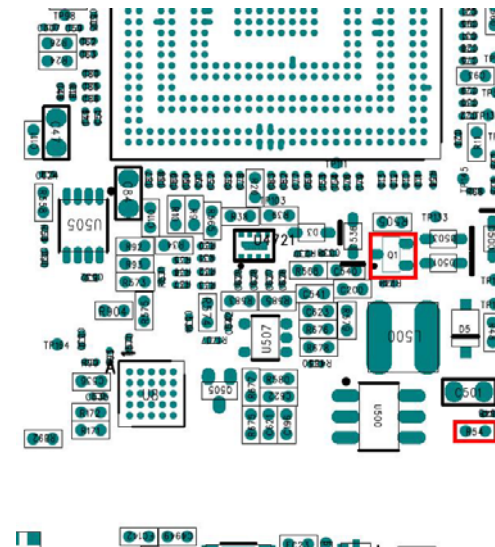
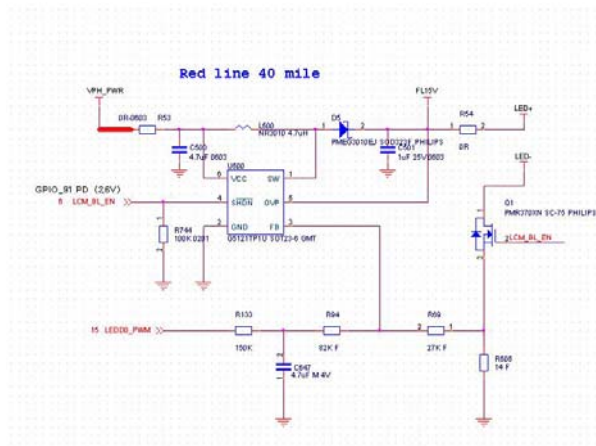




No LCM backlight



- **No backlight:**
 1. LCM backlight damage
 2. Measure R54 voltage: 15V
 3. Backlight enable GPIO(Q1_2) pulled high 2.6V

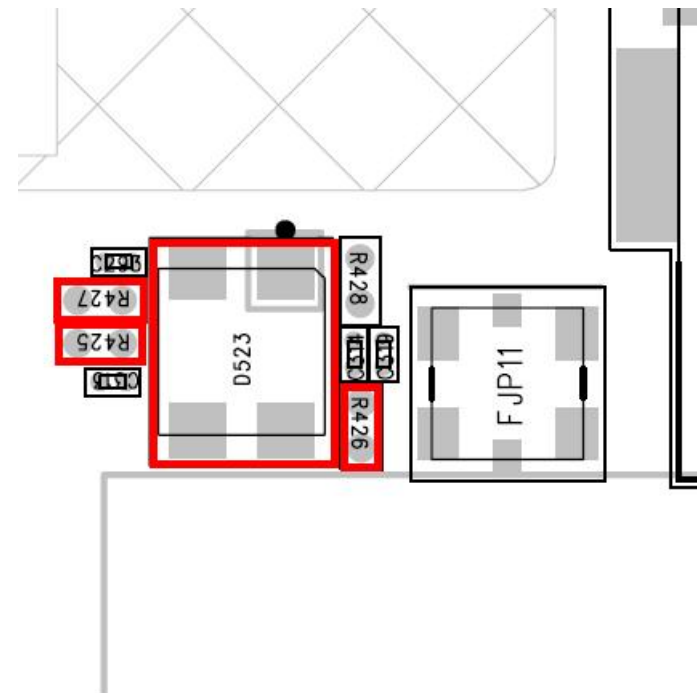
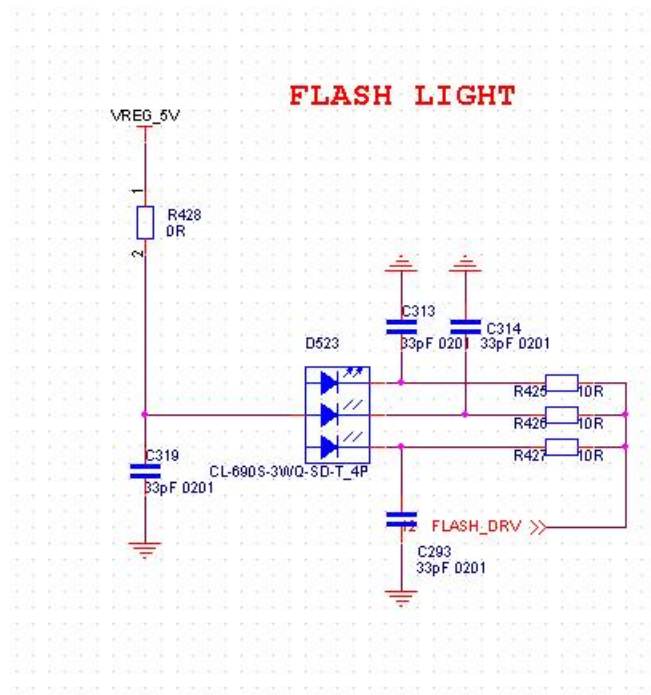




Flash Light No Function



- **Can't turn on flash light:**
 1. Check flash LED (**D523**) SMT and damage or not
 2. Check D523_pin1 voltage: 5V
 3. R425_1 & R426_1 & R427_1 pulled to low when turn on flash led.

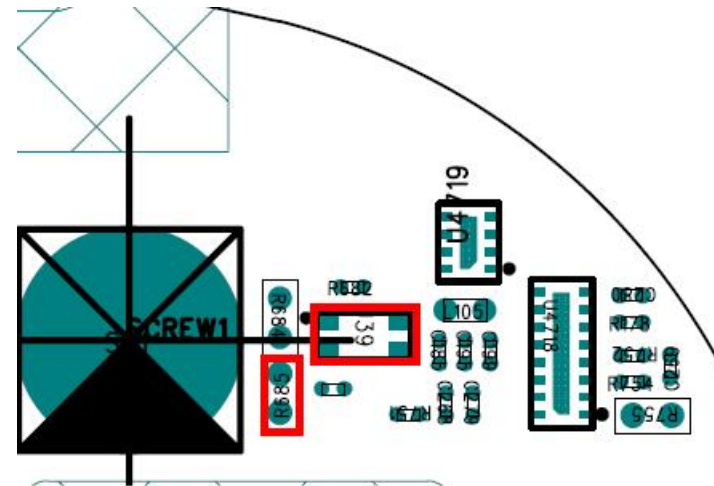
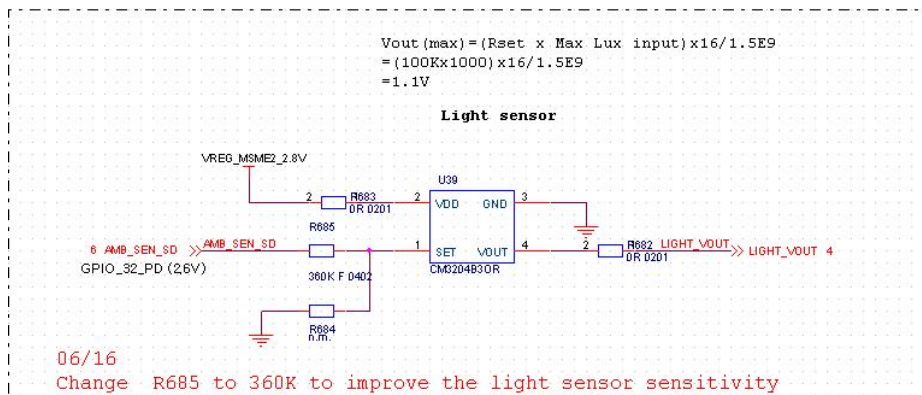




Light Sensor No Function



- Check U39_2 voltage: 2.8V
- Check R685_1 signal pulled to low
- Measuring Vout voltage (U39_4) was change or not when light sensor putting on different Lux environment.



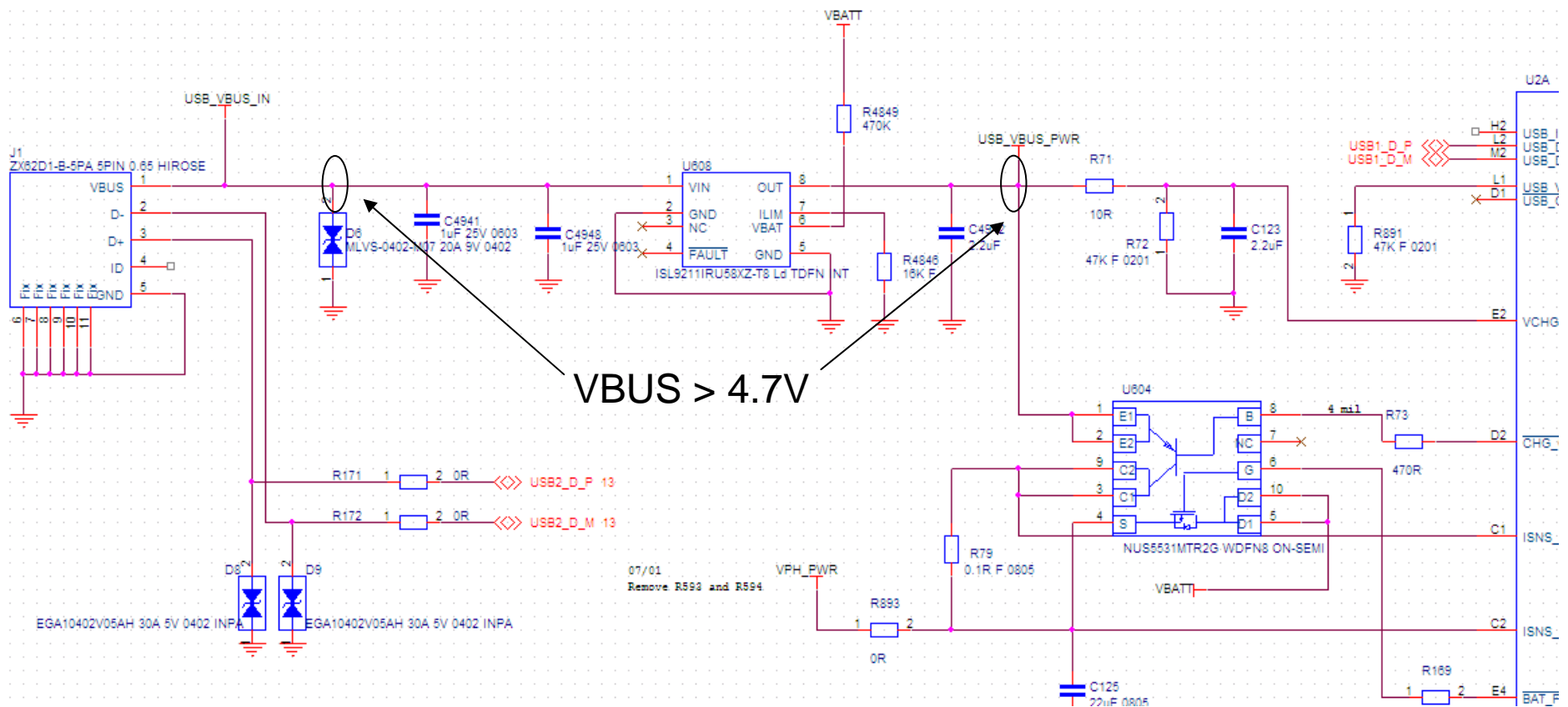


Cannot Charge (1)



1. Check the battery and the charger ; Only support BT-60 battery
2. Dial #06# to check the Charging status and the charging type
Power Source should be USB or Charger
Battery ID : Readable

If Power source is “No external power”, please check the charging path

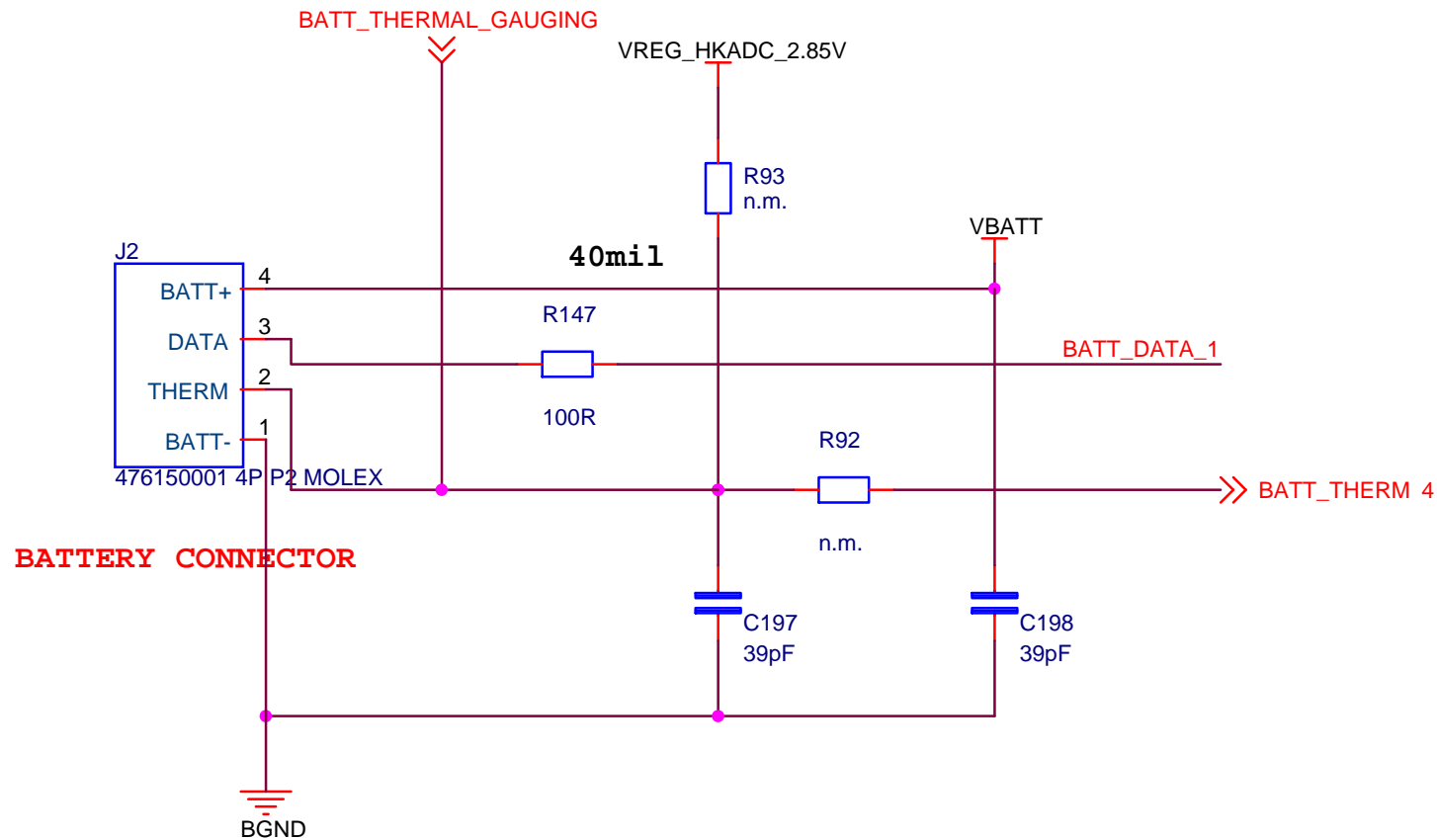




Cannot Charge (2)



- If Battery ID is not the readable , please check whether battery is BT60 and contact to PIN3 OF J2
-

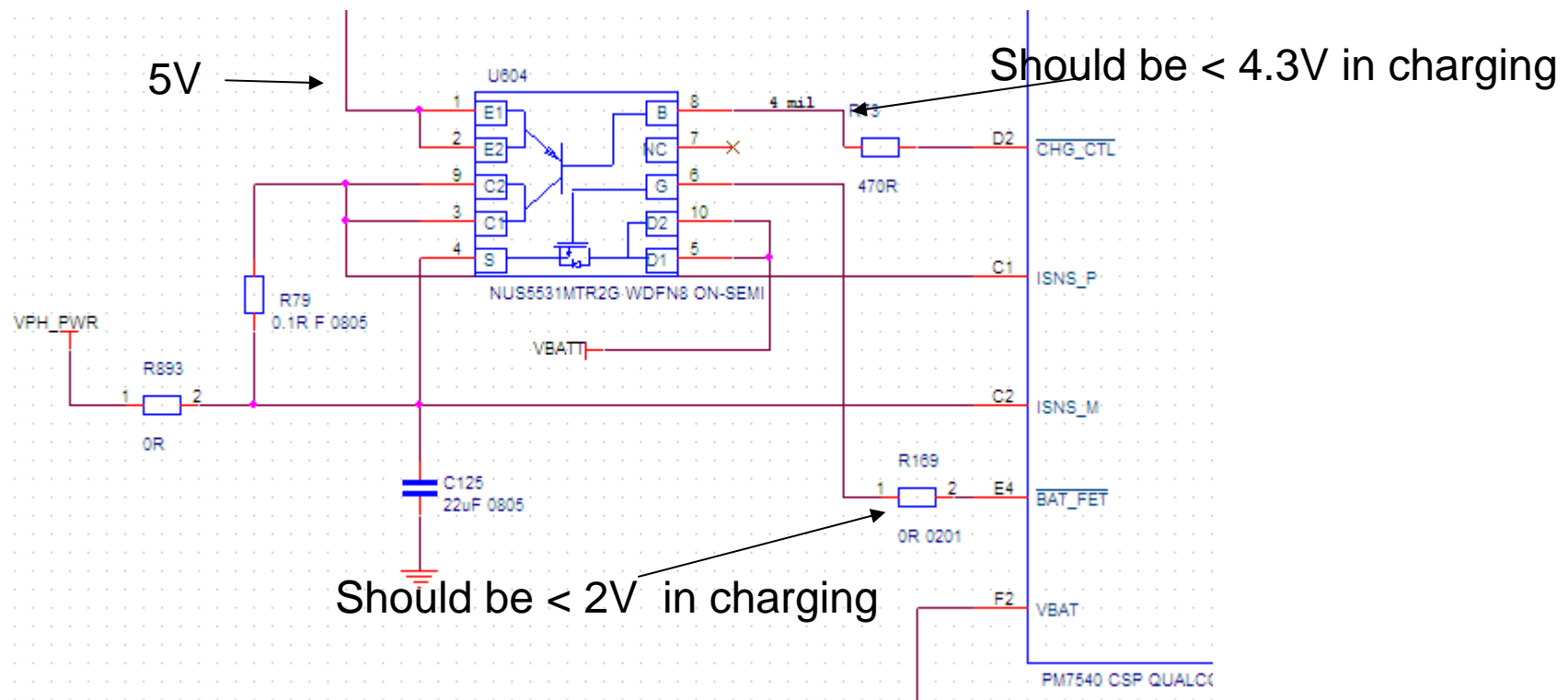




Cannot Charge (3)



3. Dial #77704# to check the gas gauge Status
AC Line : On (Has detect the charger)
Flag : Charging (The charger driver is active)
The current is minus, please check U604 circuit.

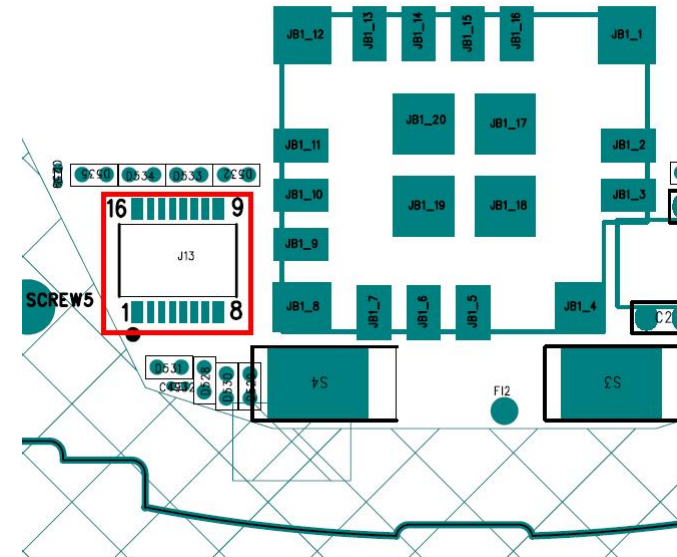
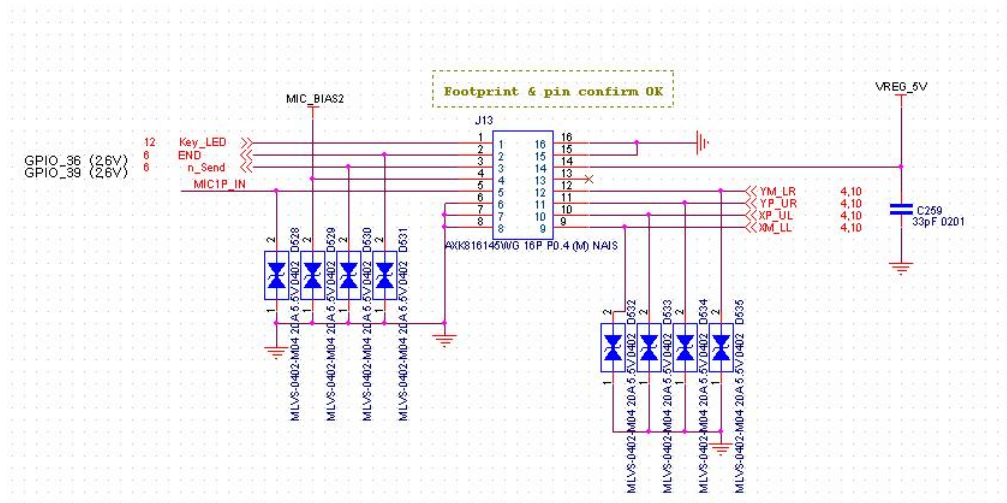




Keypad No Function



1. Check S/B connector J13

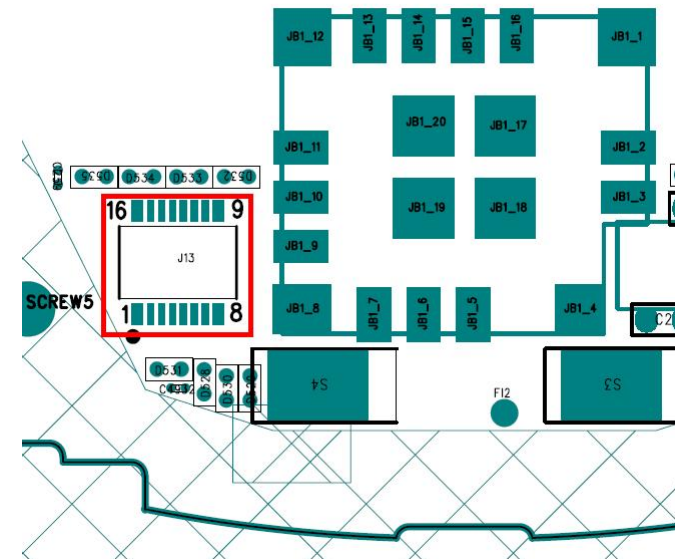
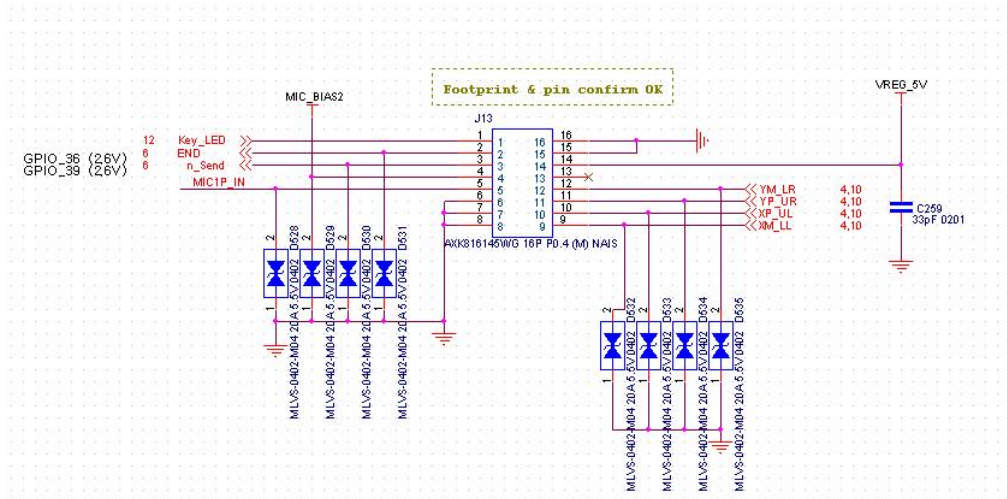




Touch No Function



- Check TP damage or not
- Check assembly between main PCB and sub PCB
- Check J13 SMT

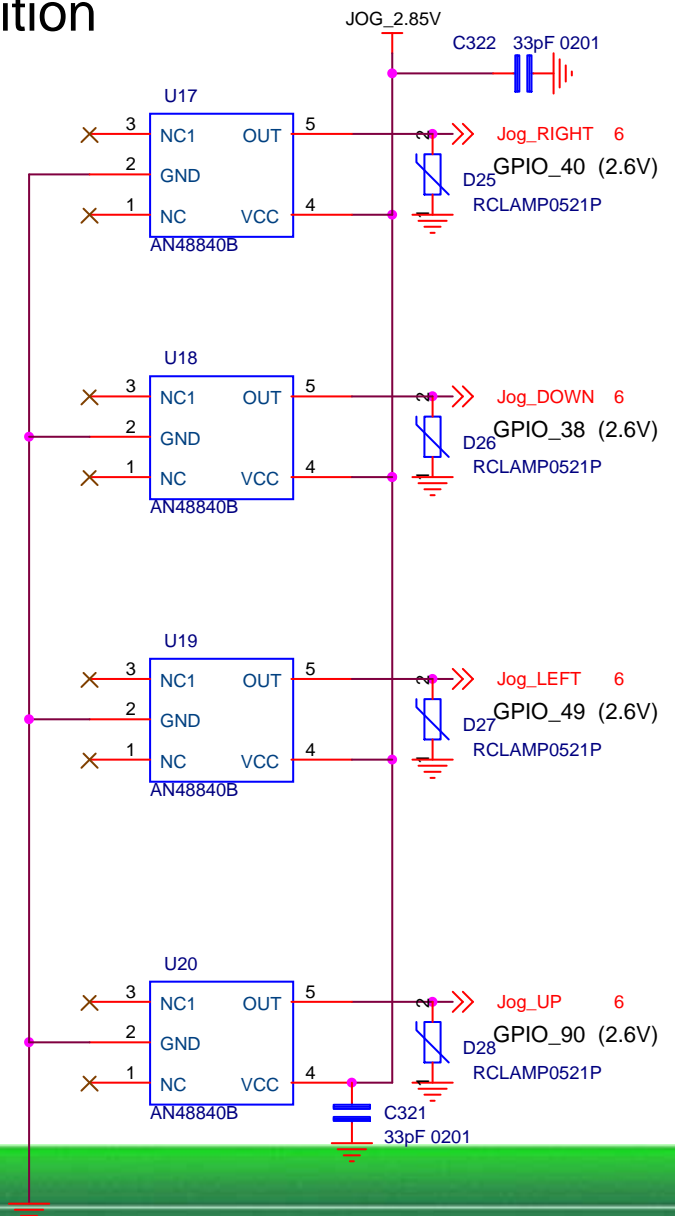
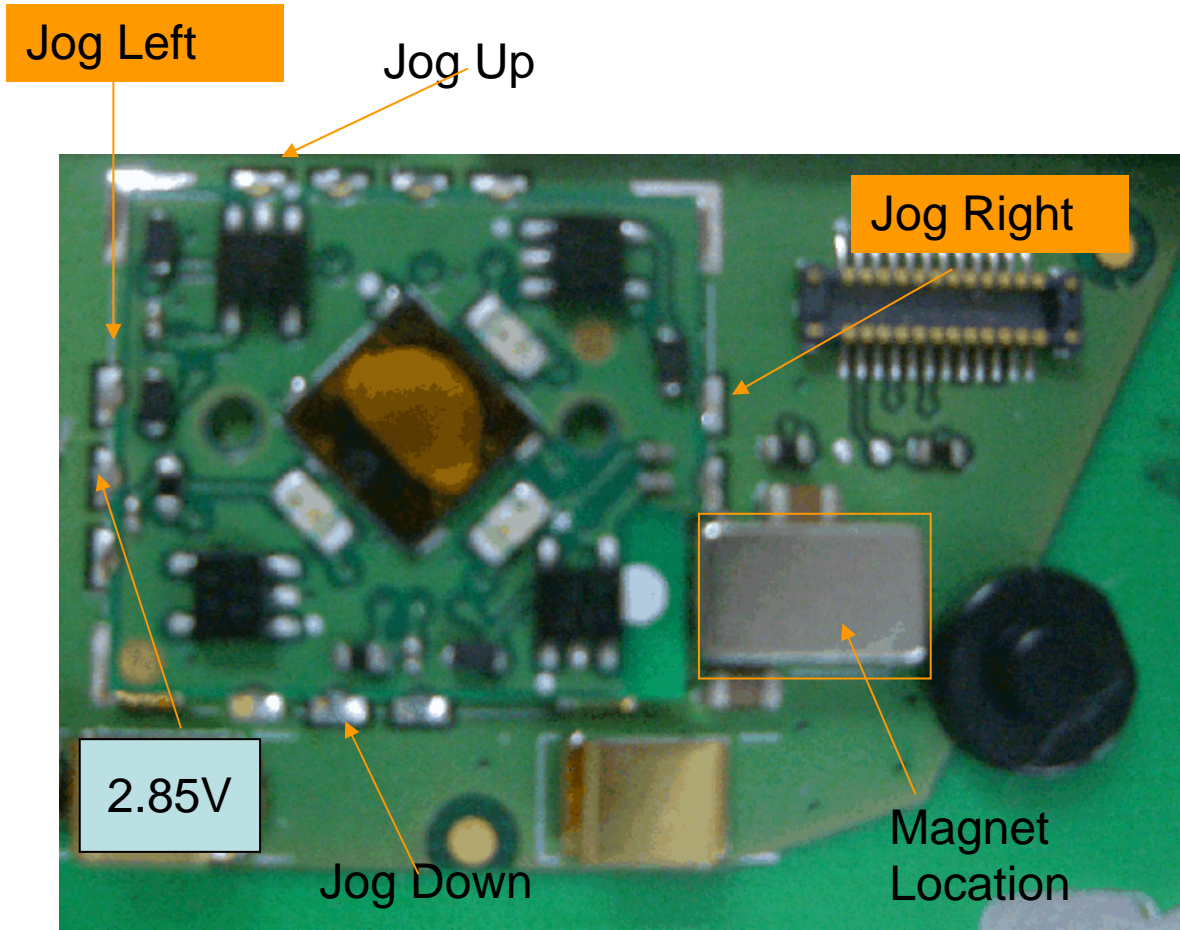




Jog Ball No Function



- 1. Check the magnet is at the correct position
- 2. Check the voltage (JB1-10 =2.85V)
- 3. Check the related circuit

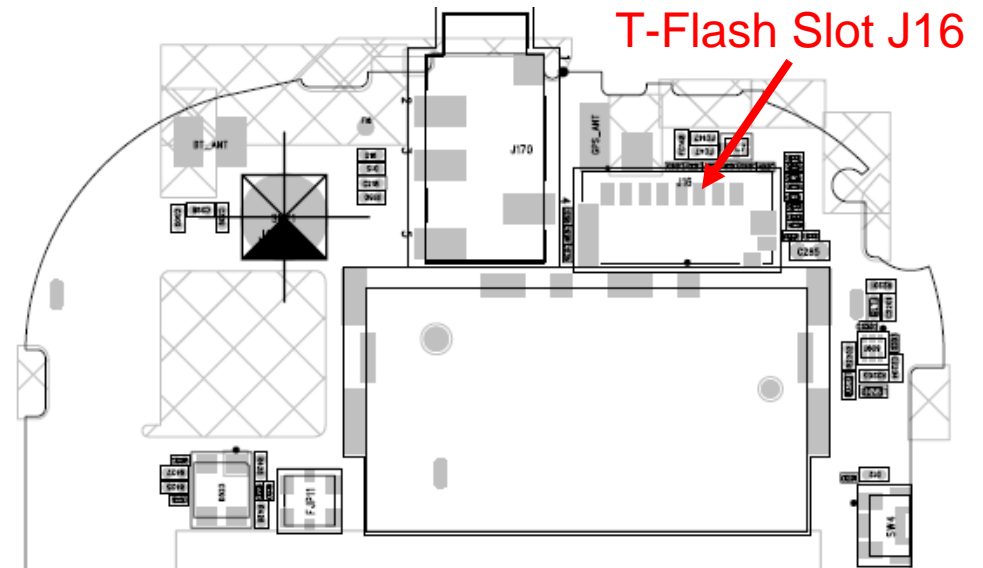
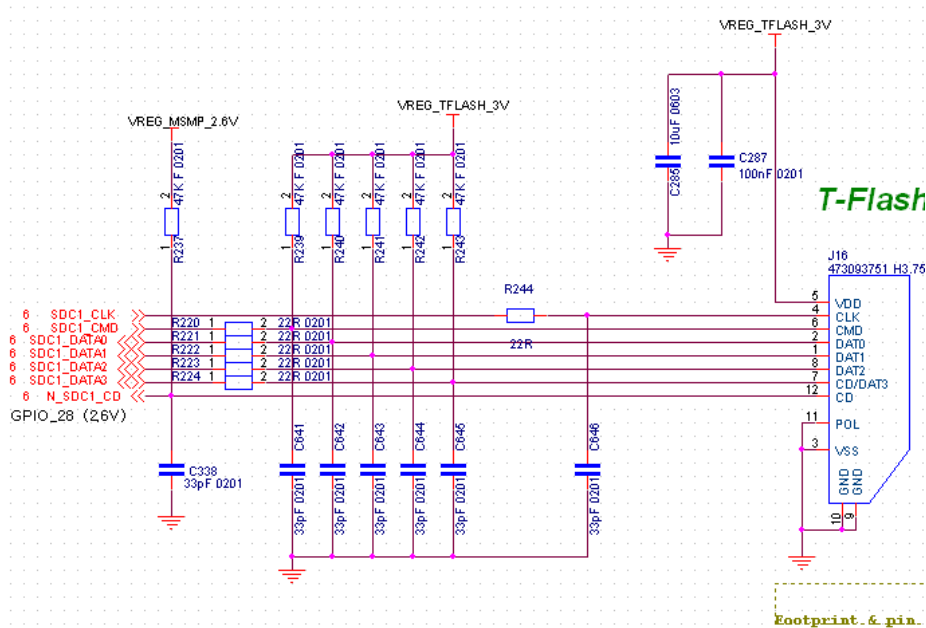




Can't access the Micro SD Card



- If the T-Flash card can not be detected, check if the pin12 of J16 is low. If not, check if J16 is OK.
- If pin12 of J16 is low when inserted, check if pin5 of J16 is 3V. If not, check U2.
- Check if all the clock and data pins are normal. If not, check U1.

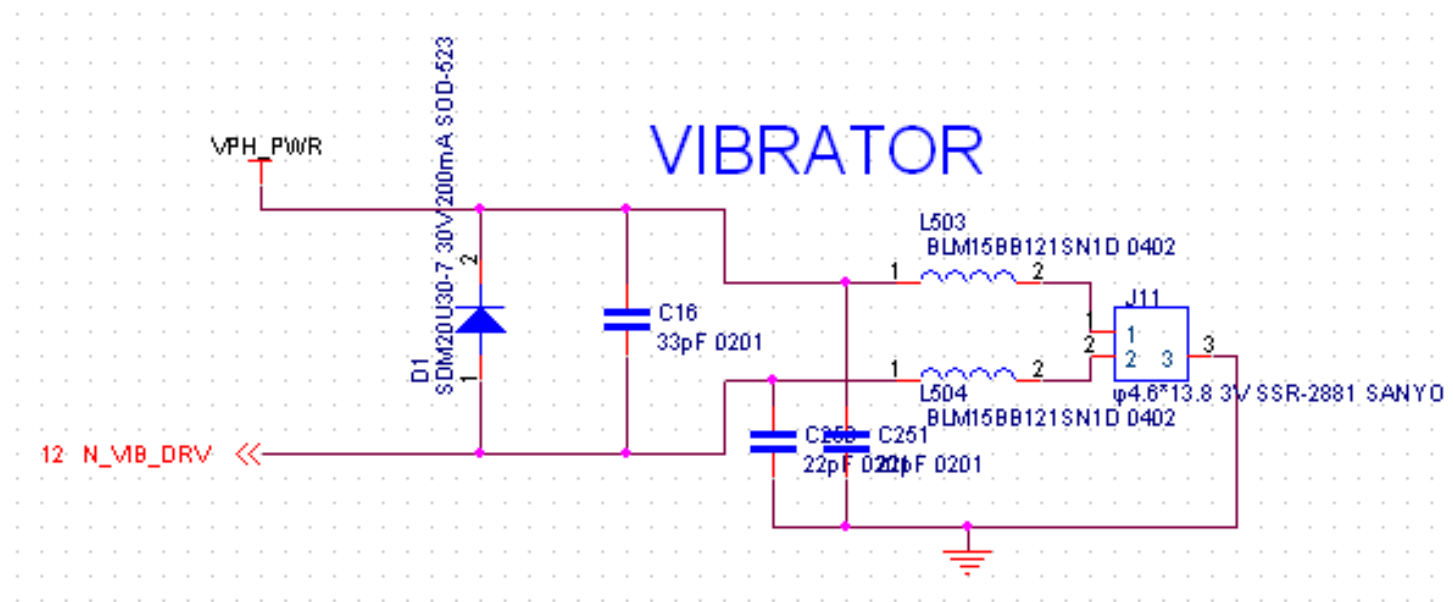




Vibrator Out Of Control



- Remove the lower case and have the vibrator exposed, then retest.
- If retest OK after removing the case, reassemble and check if it is interfered by the case.
- If retest still fail, check if pin1 of J11 is 5V. If not, check if U2 is working normally.
- Check if there is PWM signal on pin2 of J11. If not, check if U2 is working normally.

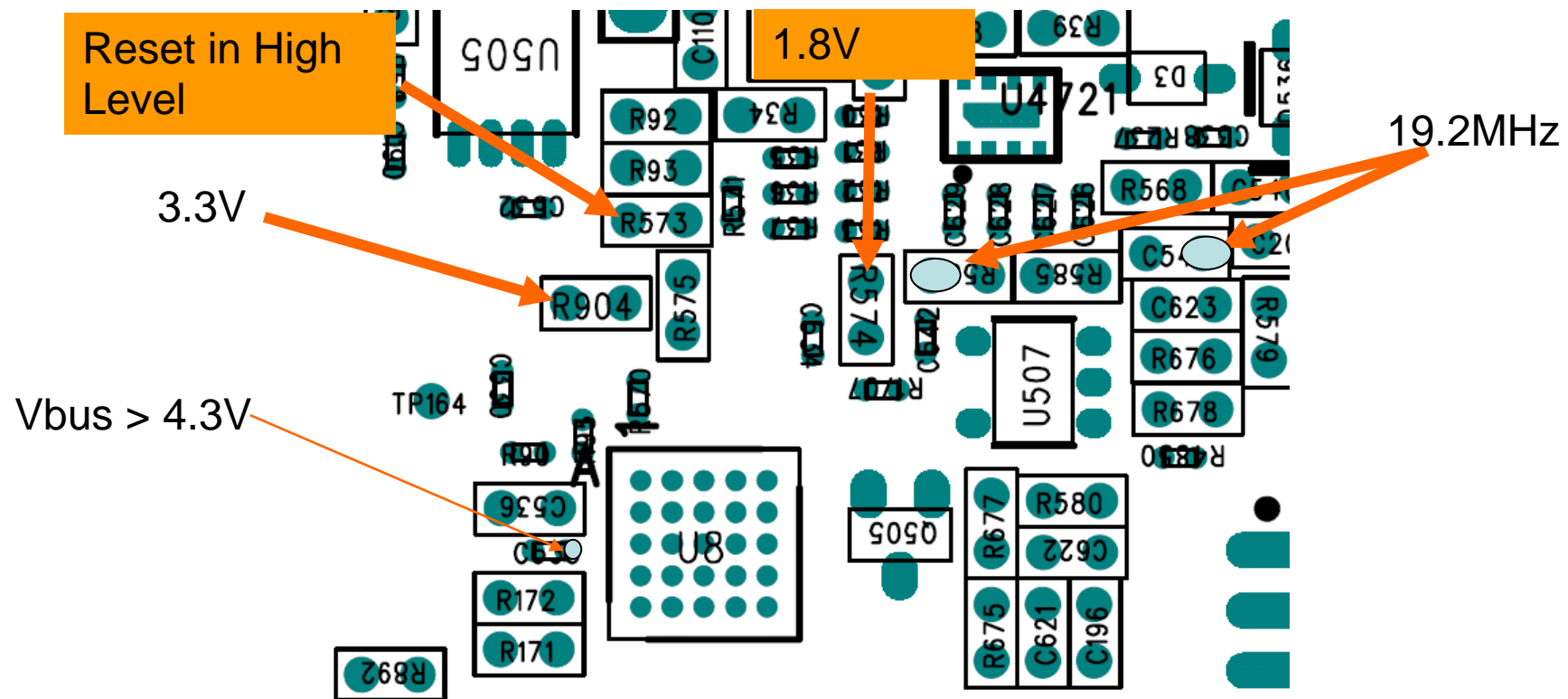




ActiveSync No Response



- 1. Do the clean boot (Master Clear)
- 2. Check the USB transceiver circuit while the unit has connected to PC

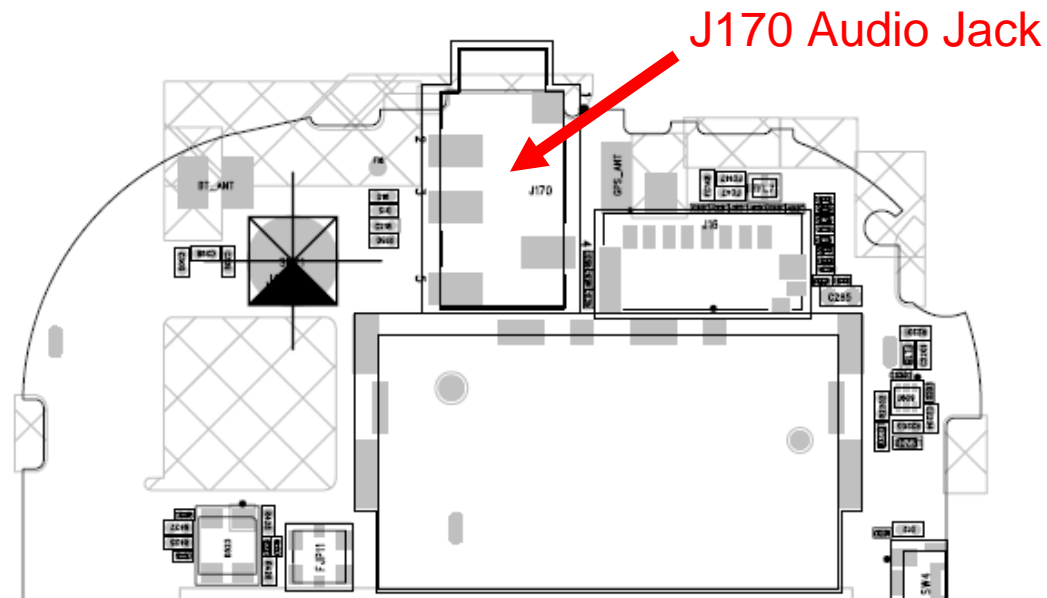




Earphone Malfunction (1)

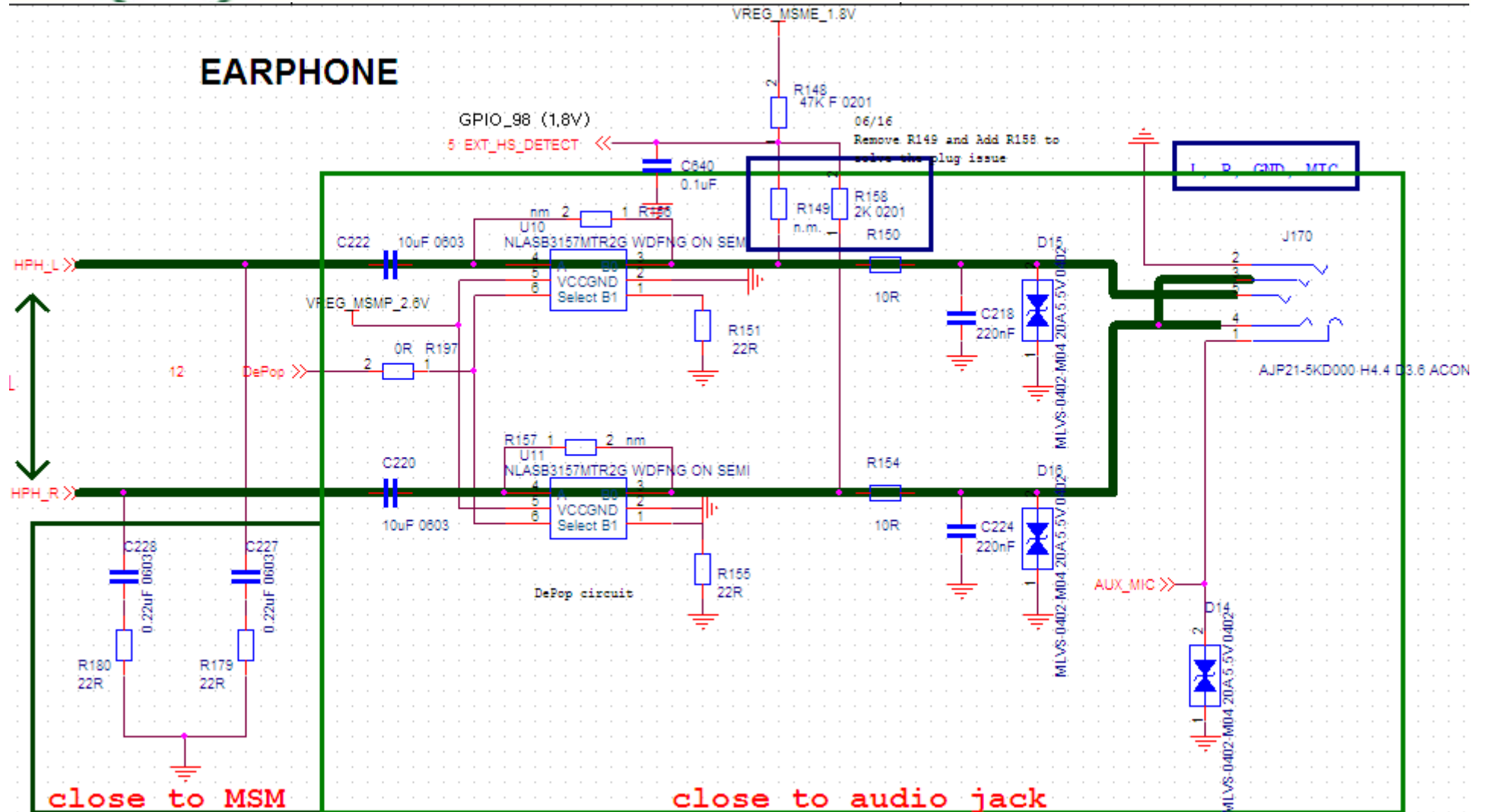


- Check if the voltage at Pin 1 of R148 is logic low, if not, check the audio jack J170 is OK and well-contacted with the main board.
- Using the oscilloscope to see if the waveform is visible at U10 or U11, if visible at pin 4 but not pin 3, replace U10 or U11 with new chips.
- If not visible at both pin 4 and pin 3, replace U1 with a new chip.





Earphone Malfunction (2)





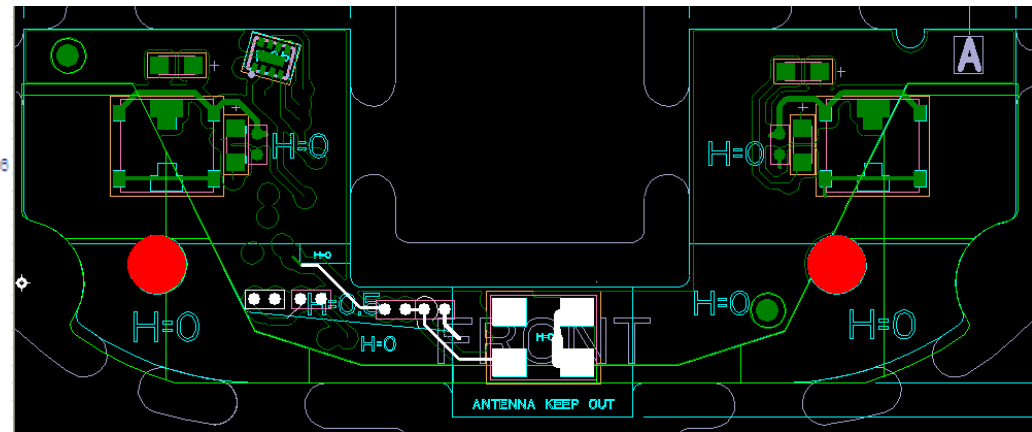
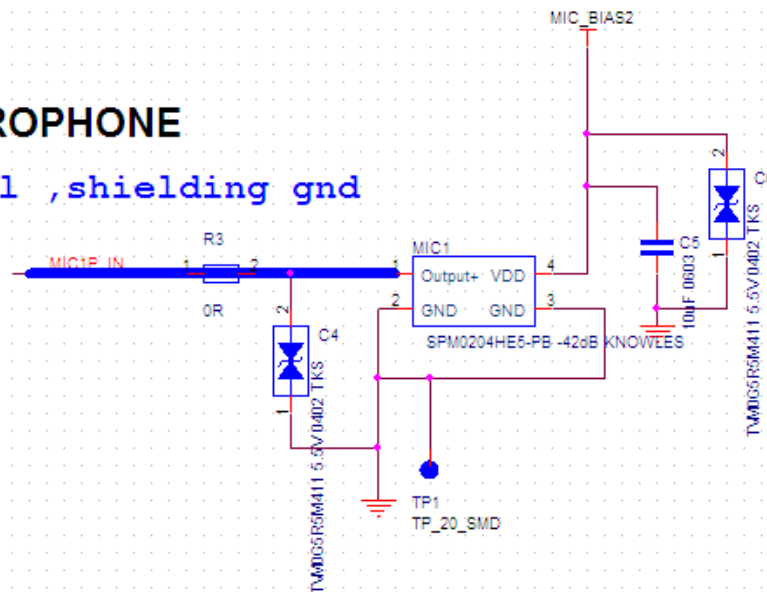
Microphone Malfunction



- Check if the voltage at C113 is 2V, if not, replace U2 with a new chip.
- Check if the voltage at Pin 4 of J3 on sub board is 2V, if not, check if the sub board is well-contacted with the main board, and if male and female BTB connectors are robust and clean.
- Using the oscilloscope to see if the waveform is visible at R3 on sub board, if not, replace the microphone.

MICROPHONE

6 mil ,shielding gnd

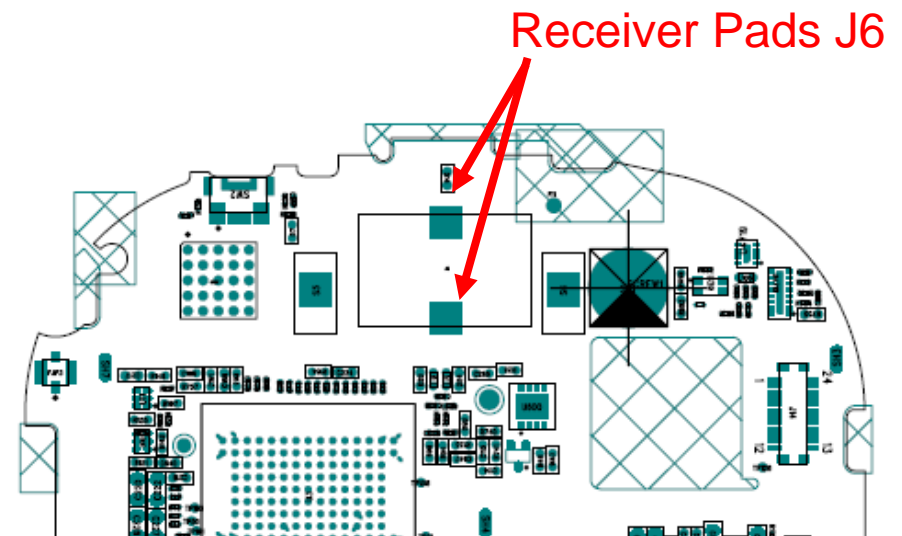
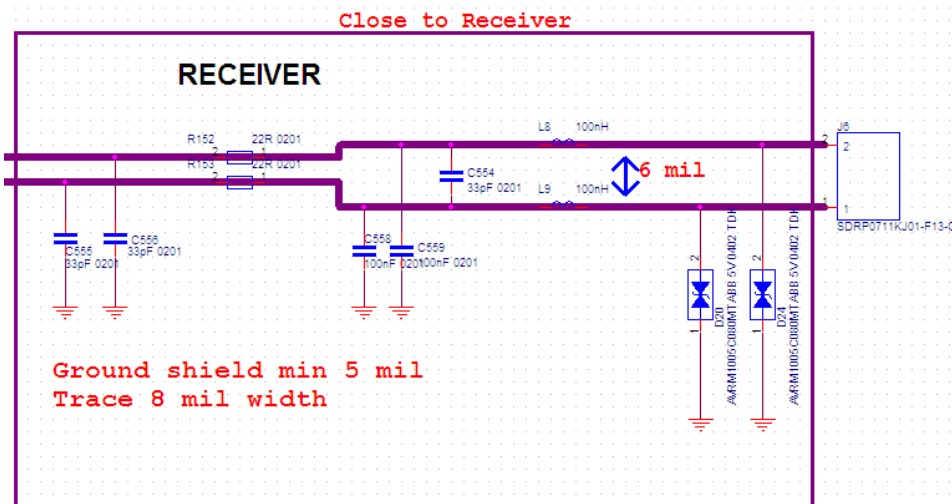




Receiver Malfunction



- Check if J6 is blocked by anything.
- Using the oscilloscope to see if the waveform is visible at J6, if not, replace U1 with a new chip.
- If the waveform is visible at J6, replace the receiver.





Speaker Malfunction (1)

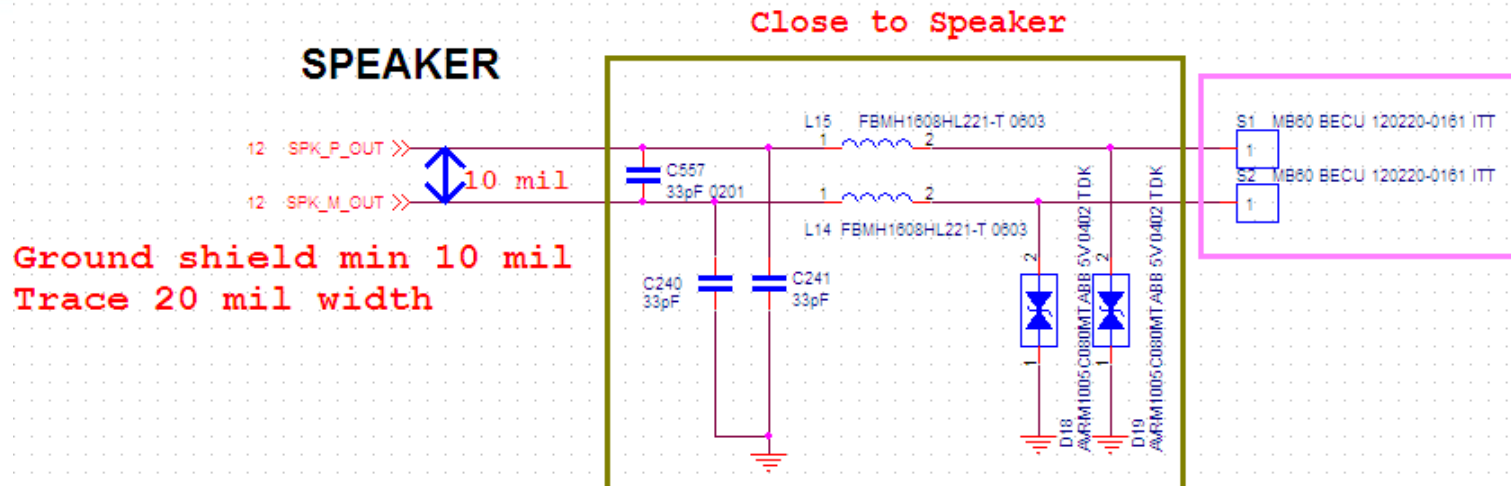


- Using the oscilloscope to see if the waveform is visible at C233, if not, replace U1 with a new chip.
- Using the oscilloscope to see if the waveform is visible at L15 & L14, and the two waveforms should be out of phase with each other, if not, replace U2 with a new chip.
- Using the oscilloscope to see if the waveform is visible at S1 & S2, If yes, check if the sprints of S1 & S2 are distorted.
- If the sprints are in good shape, replace the speaker.

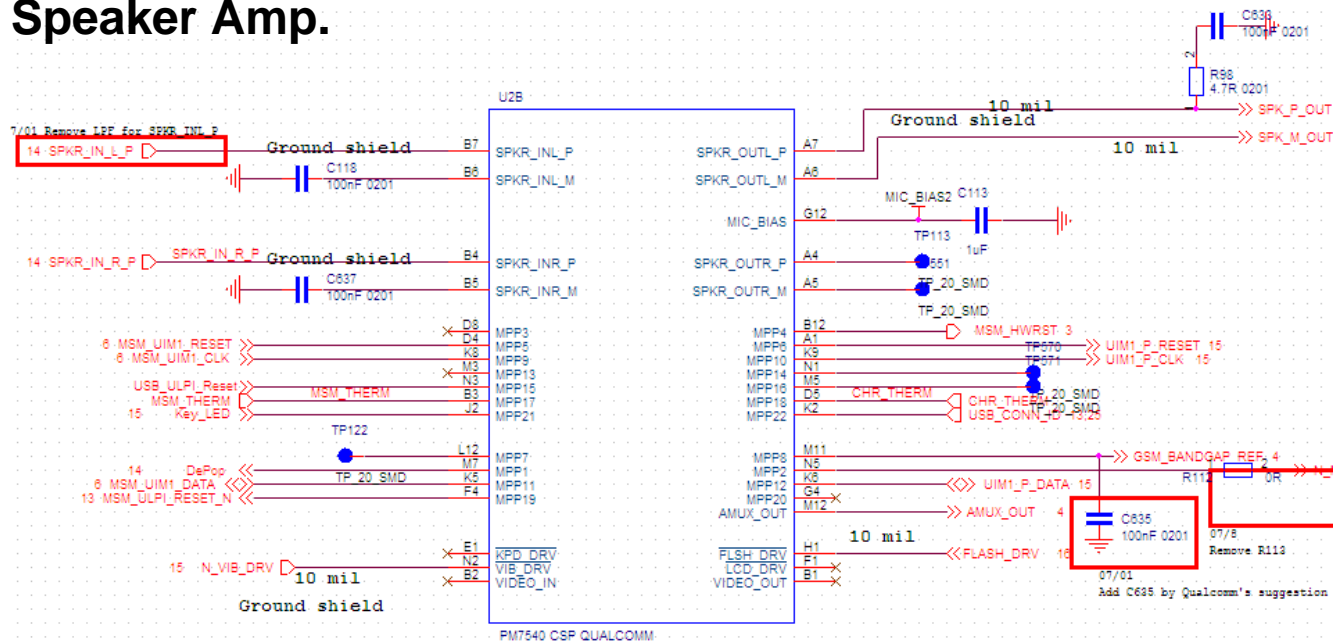




Speaker Malfunction (2)



Speaker Amp.

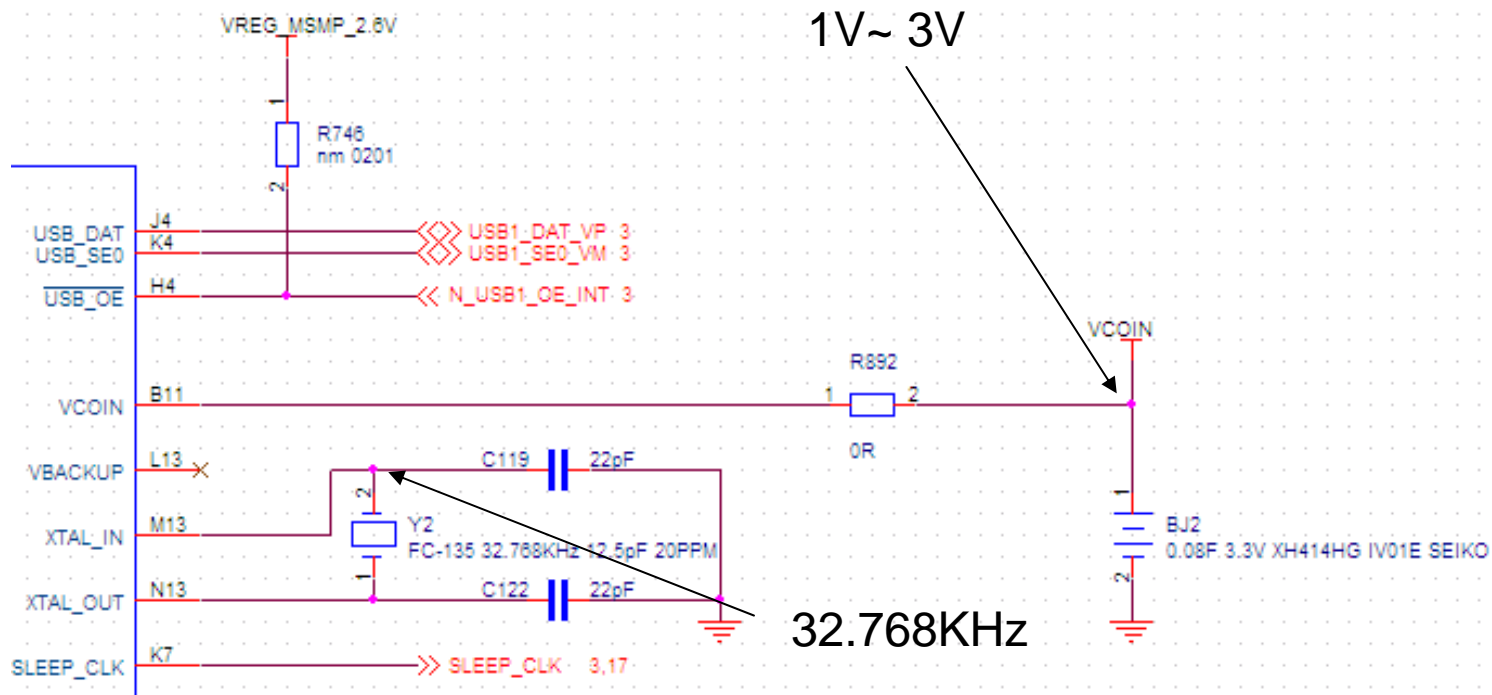




RTC failed



- 1, Do a power cycle with the unit
- 2. Check the Vcoin Voltage (BJ2)
- 3. Check the 32KHz oscillator





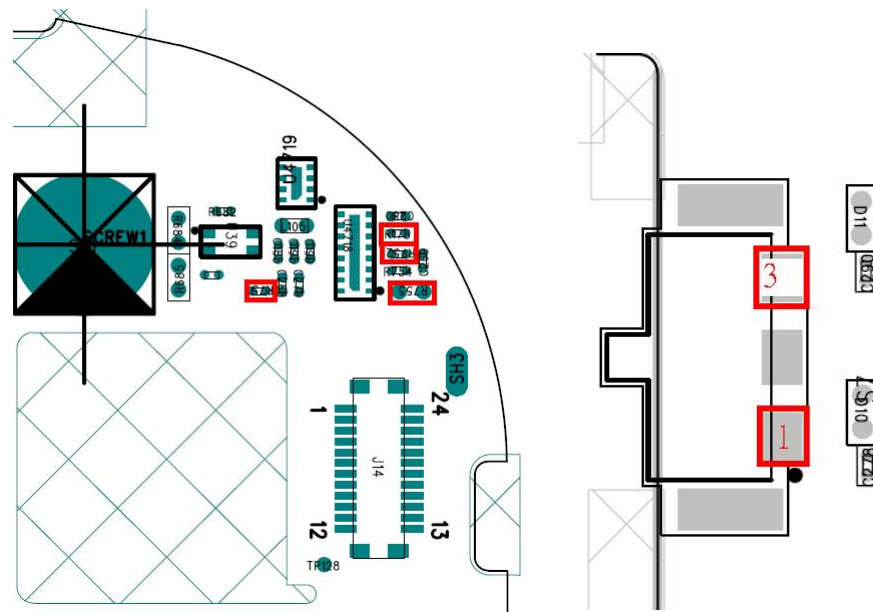
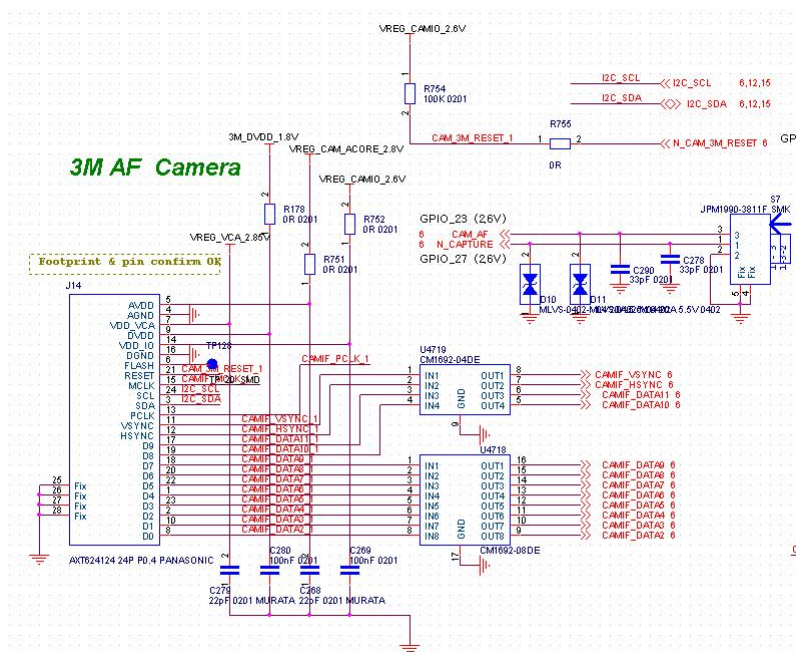
Can't Take Picture



- Can't turn on:
 - Check Camera damage or not
 - Check camera module assembly
 - I2C interface working normally (you could verify this by LCD backlight level adjustment or turn on VGA camera)
 - Check camera power when turn on (R178_1.8V, R751_2.8V, R752_2.6V)
 - Check camera reset pin (R755) signal should pull high after turn on camera
- AF no function:
 - Check S7 SMT
 - Check S7_pin3 signal from 2.6V to GND when you press the capture key to the half.
 - Check camera module AF pad short with shielding case or not.
- Capture key no function:
 - Check S7 SMT
 - Check S7_pin1 signal from 2.6V to GND when you press the capture key.



3M Camera schematic and placement





Phone Hang Up



- 1. Dump the image
- 2. Copy the log in my device
- 3. Perform the clean boot
(press the end key and Jog ball before the power key in off mode)
- 4. If the unit can not into windows mobile, please redownload SW image to the damaged unit.
- 5. If the issue isn't solved ,please use Ram test tool to check U3.
If any error message , the U3 may be damaged.



Auto Power On



1. Please check the follow Power on event
 - a) Press the power key ->Pull N_KB_PWR_KEY to low (TP112)
On Page 4
 - b) Plug the USB charger /USB cable -> Detect VBUS
Page 14, Page 15 , Page 16
2. Check the SW2(power key) and the rubber with upper case
3. Try to Dump the image
4. Copy the Log in my device with Today mode to SW team for further analysis
5. Redownload the new image to the damaged unit



Auto Power off



1. Check the leakage current ($< 0.4\text{mA}$)
2. if the power off is triggered by the power key, the vibrator will active for a while and then the unit is off.
=> Please check the SW2 power key.
3. If the unit is off without any vibration, please measure the power on current ($< 450\text{mA}$)
=> Copy the Log in my device with Today mode to SW team for further analysis



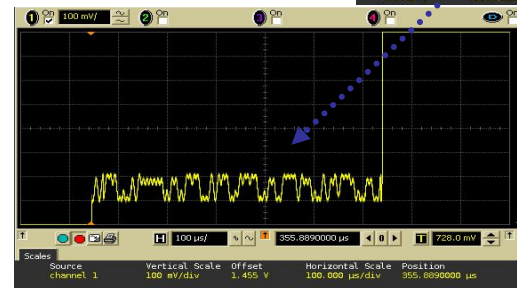
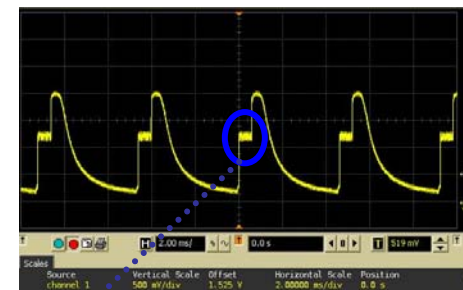
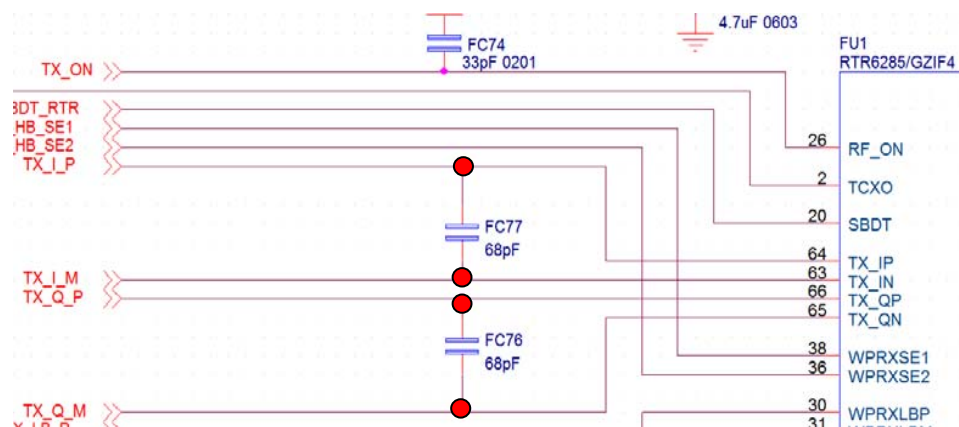
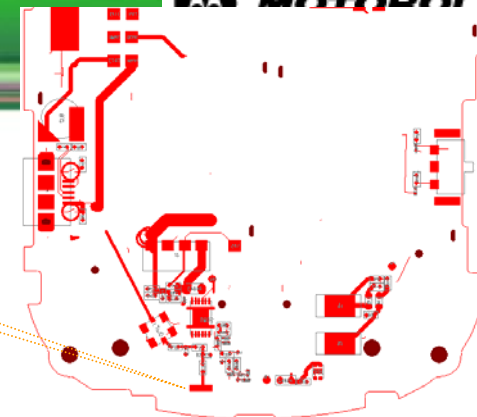
Can't call out (1)

GSM



- Check the metal contact of antenna
- Try to make call
- Setup BS/MS parameter
 - Set HP8960, operating mode: test mode, test function: BCH+TCH, cell power:-60dBm
 - Set MS GSM900/850 ch62/189 PL=5; DCS/PCS ch699/ch661 PL=0
- Check transmitter path
 - Check the I/Q path
 - Use oscilloscope probe to touch red point and check waveform

Antenna pad



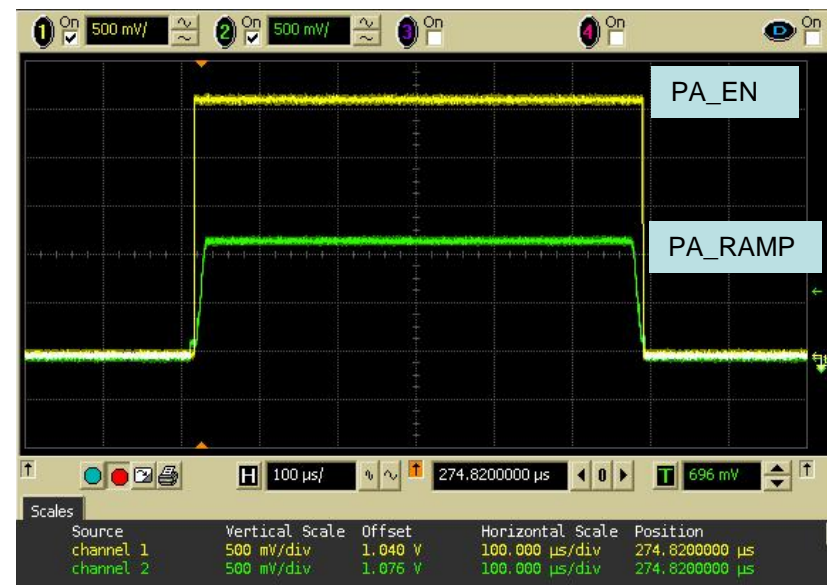
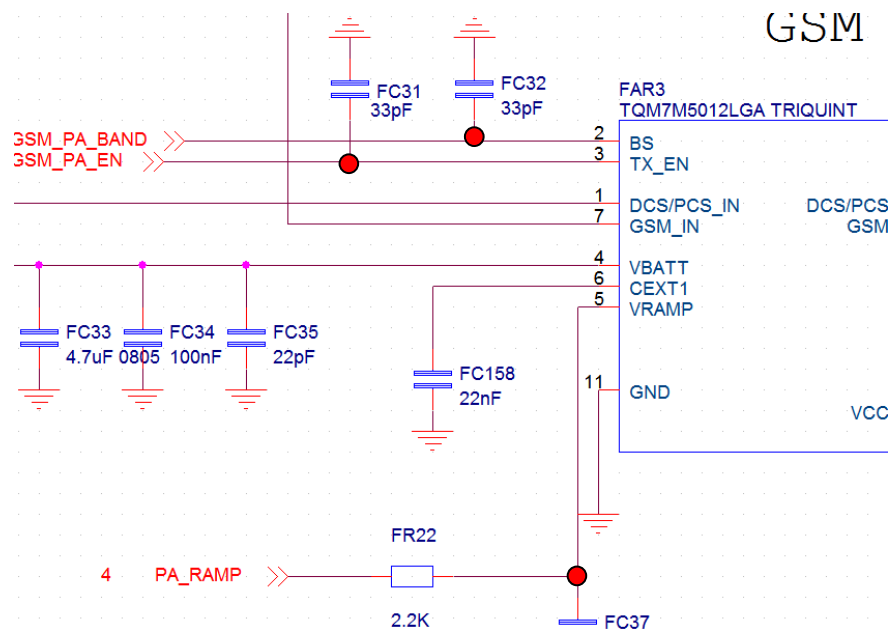


Can't call out (2)

GSM



- Check transmitter path
 - Check PA control signal
 - Use oscilloscope probe to touch red point and check waveform



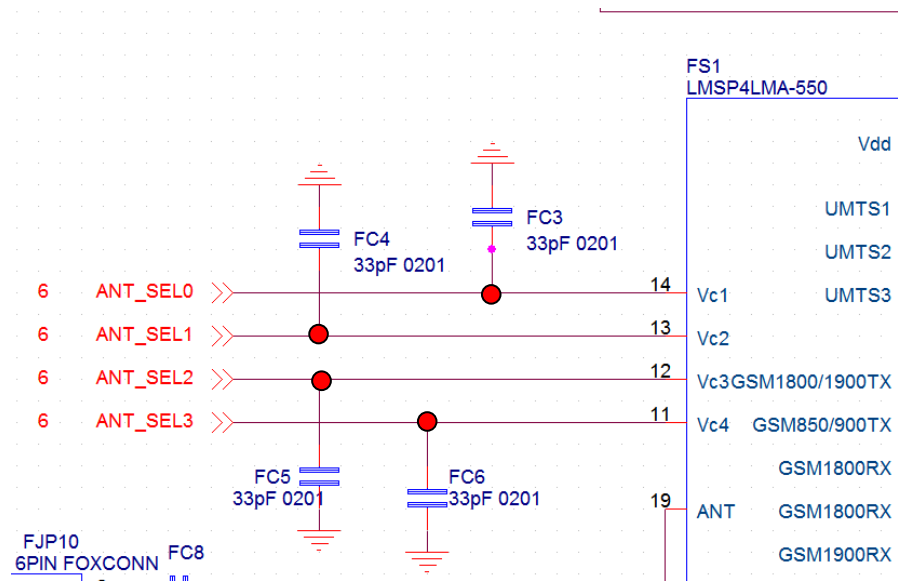


Can't call out (3)

GSM



- Check transmitter path
 - Check ASM control signal
 - Use oscilloscope probe to touch red point and check control table



MODE	ANT_SEL0	ANT_SEL1	ANT_SEL2	ANT_SEL3
GSM850/EGSM TX	H	H	L	L
DCS/PCS TX	H	L	L	L
GSM850 RX	L	H	H	L
EGSM900 RX	L	H	L	L
DCS1800 RX	L	L	H	L
PCS1900 RX	L	L	L	L

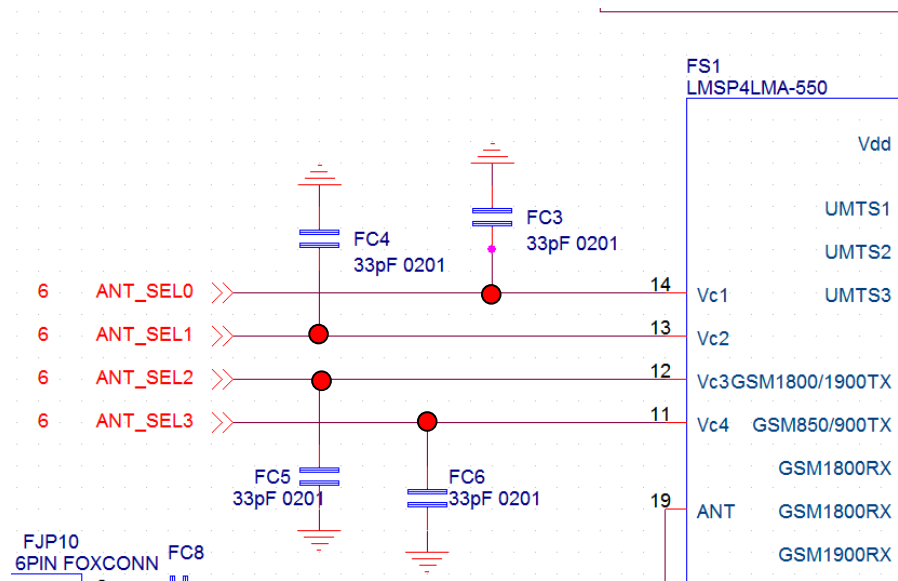


Can't call out (5)

GSM



- Check receiver path
 - Check ASM control signal
 - Use oscilloscope probe to touch red point and check control table



MODE	ANT_SEL0	ANT_SEL1	ANT_SEL2	ANT_SEL3
GSM850/EGSM TX	H	H	L	L
DCS/PCS TX	H	L	L	L
GSM850 RX	L	H	H	L
EGSM900 RX	L	H	L	L
DCS1800 RX	L	L	H	L
PCS1900 RX	L	L	L	L



Can't call out (6)

GSM



- Check receiver path
 - Check RF signal power
 - Use spectrum probe to touch red point and check output power in spectrum analyzer

● High band RF signal
● Low band RF signal





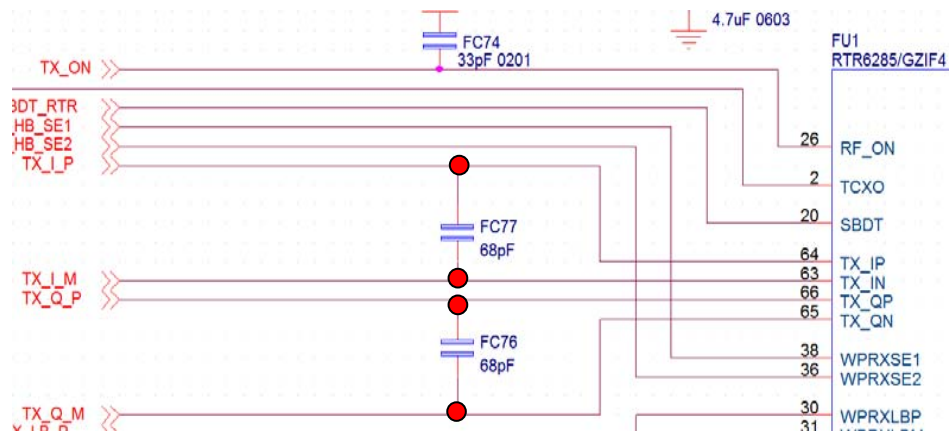
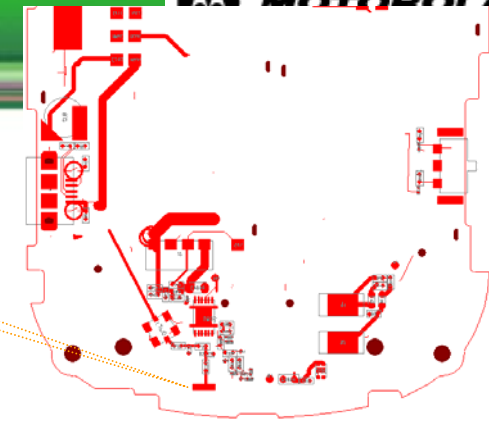
Can't call out (1)

WCDMA



- Check the metal contact of antenna
- Try to make call
- Setup BS/MS parameter
 - Set MT8820, operating mode: test mode, cell power:-60dBm
 - Set MS WCDMA BC1 ch9750, BC2 ch9400 and BC5 ch4183
- Check transmitter path
 - Check the I/Q path
 - Use oscilloscope probe to touch red point and check waveform

Antenna pad



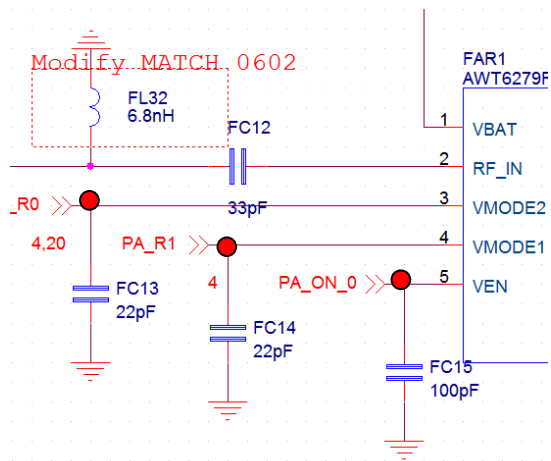


Can't call out (2)

WCDMA

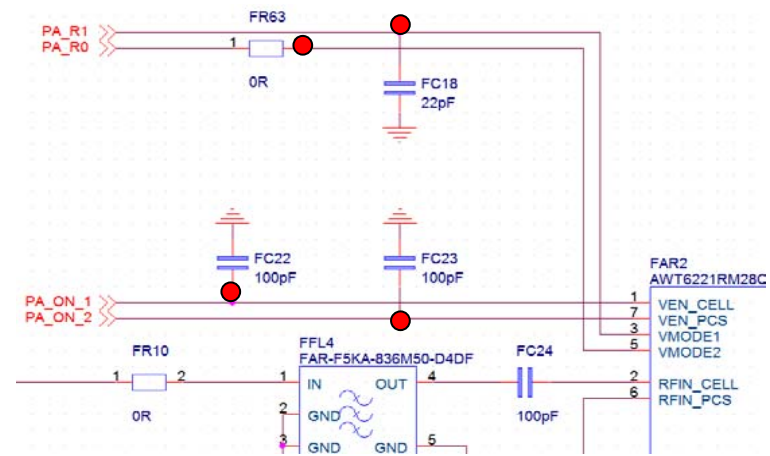


- Check transmitter path
 - Check PA control signal
 - Use oscilloscope probe to touch red point and check control table



BC1

	BC1	BC5	BC2
PA STATE	PA_ON_0	PA_ON_1	PA_ON_2
LOW POWER	H	H	H
MEDIUM POWER	L	L	L
HIGH POWER	H	H	H



BC2/5

	PA_R0	PA_R1
POWER MODE	PA_R0	PA_R1
LOW POWER	H	H
MEDIUM POWER	L	H
HIGH POWER	L	L

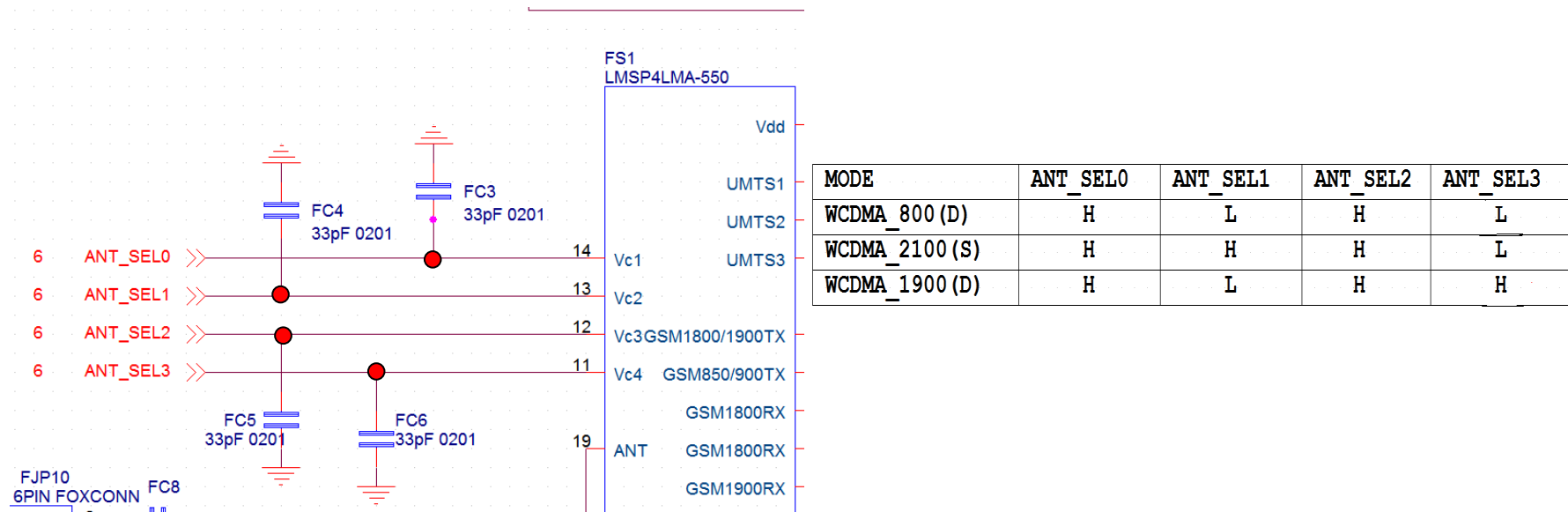


Can't call out (3)

WCDMA



- Check transmitter path
 - Check ASM control signal
 - Use oscilloscope probe to touch red point and check control table



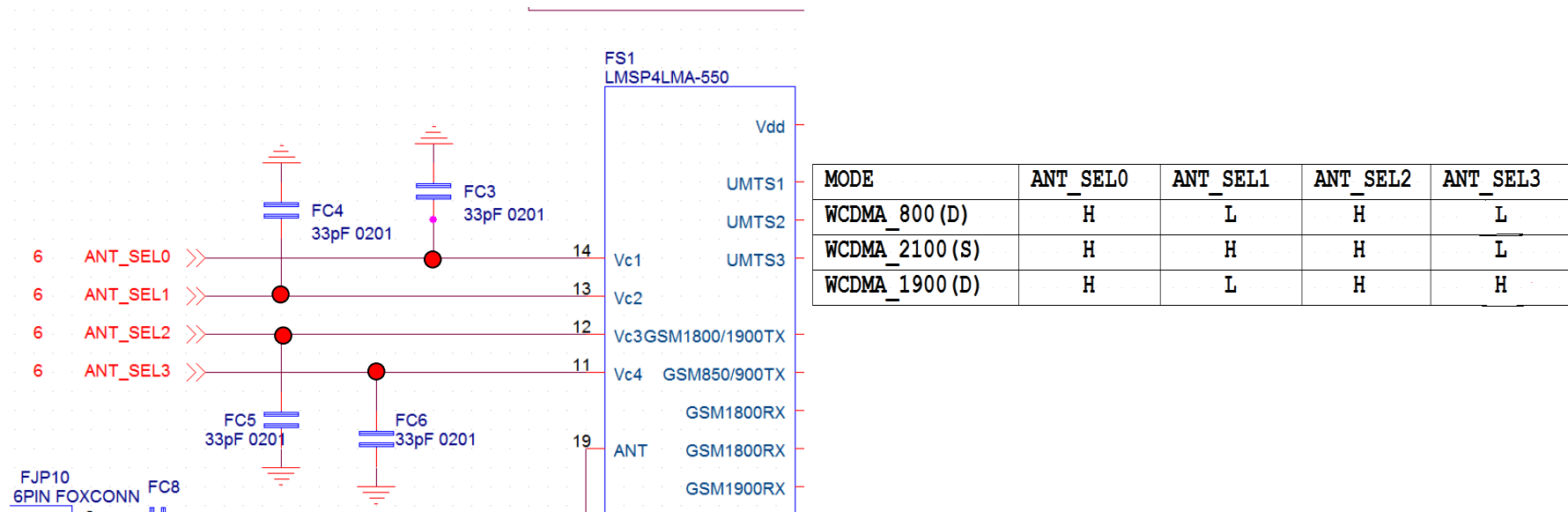


Can't call out (5)

WCDMA



- Check receiver path
 - Check ASM control signal
 - Use oscilloscope probe to touch red point and check control table





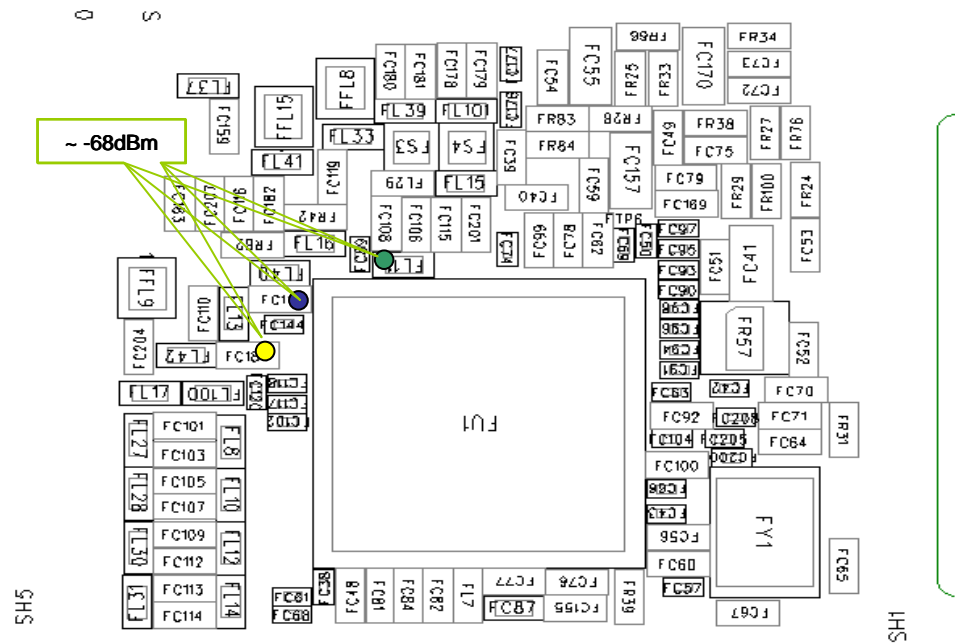
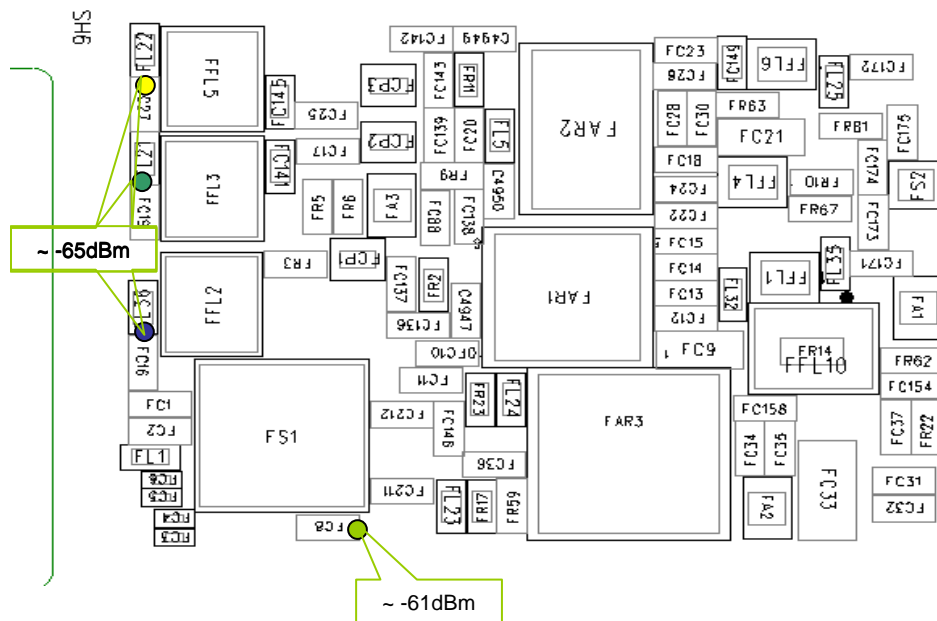
Can't call out (6)

WCDMA



- Check receiver path
 - Check RF signal power
 - Use spectrum probe to touch red point and check output power in spectrum analyzer

- BC1 RF signal
- BC2 RF signal
- BC5 RF signal

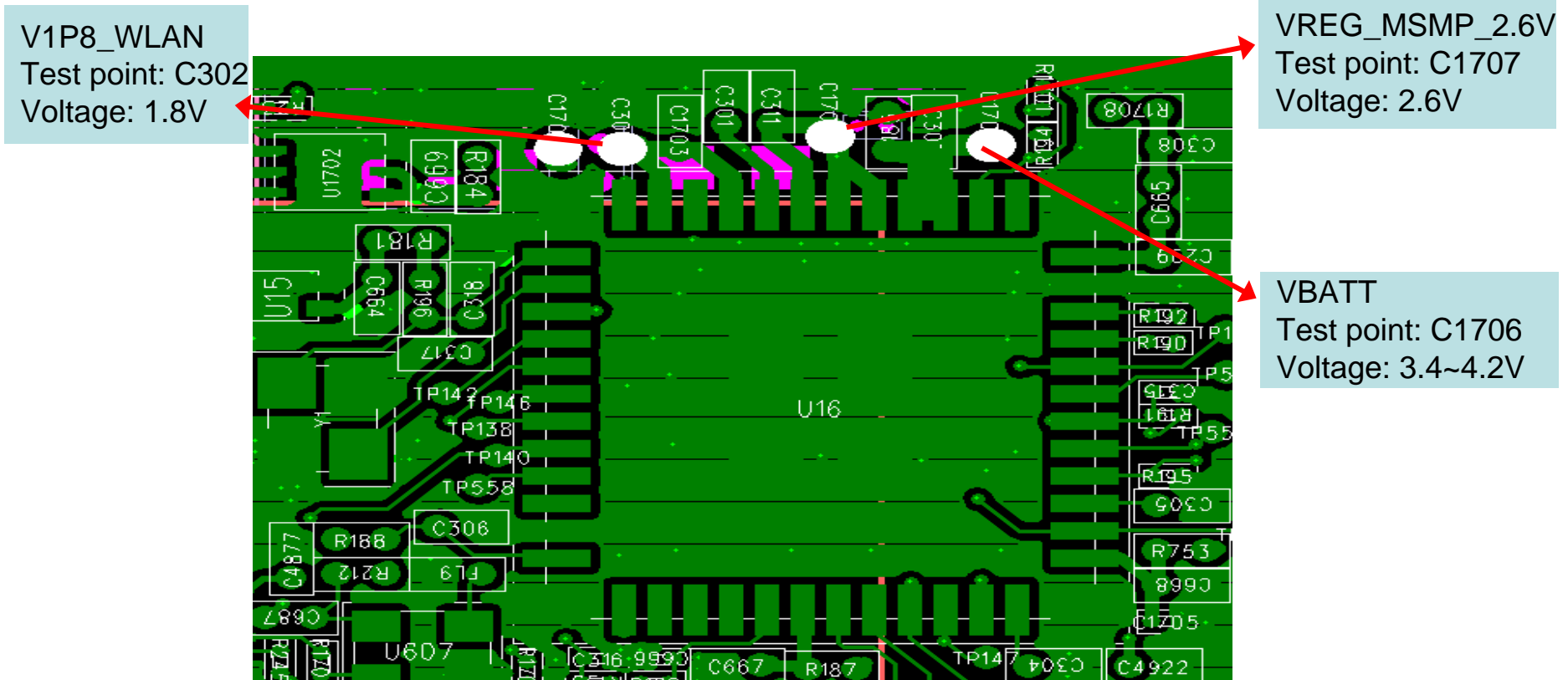




Bluetooth cannot turn on and test (1)



- Check the voltages: VBATT, VREG_MSMP_2.6V, and V1P8_WLAN

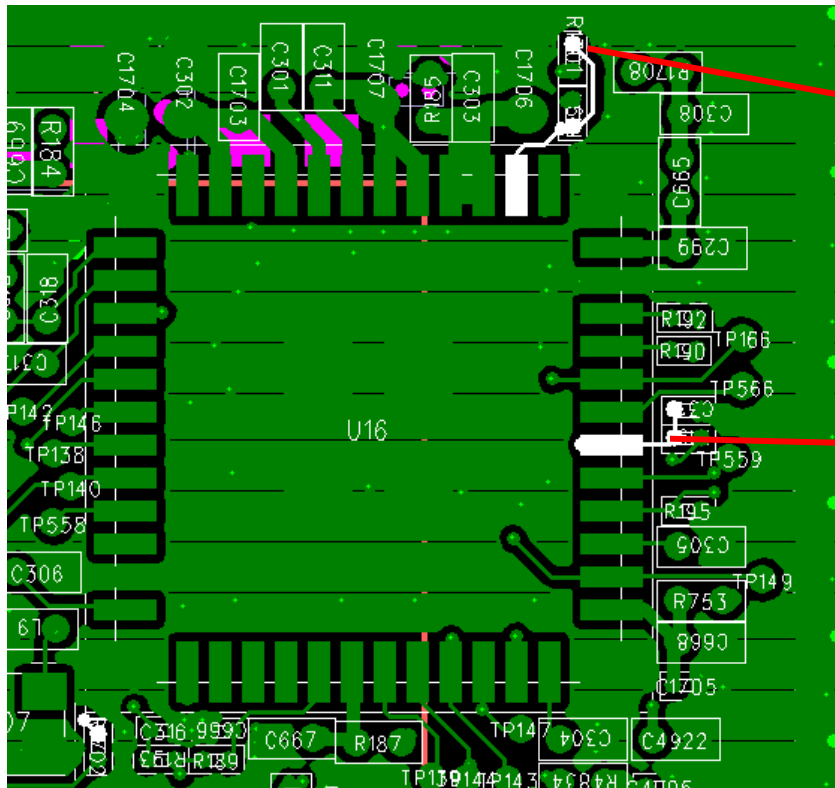




Bluetooth cannot turn on and test (2)



- Check BT_REQ_OUT pin voltage.
- When BT_REQ_OUT pulls high, OSC will have 19.2MHz clock.



Test point: R1701 or R194
Voltage: 2.6V
When BT turns on or is working,
BT_REQ_OUT pin needs to
pull high.

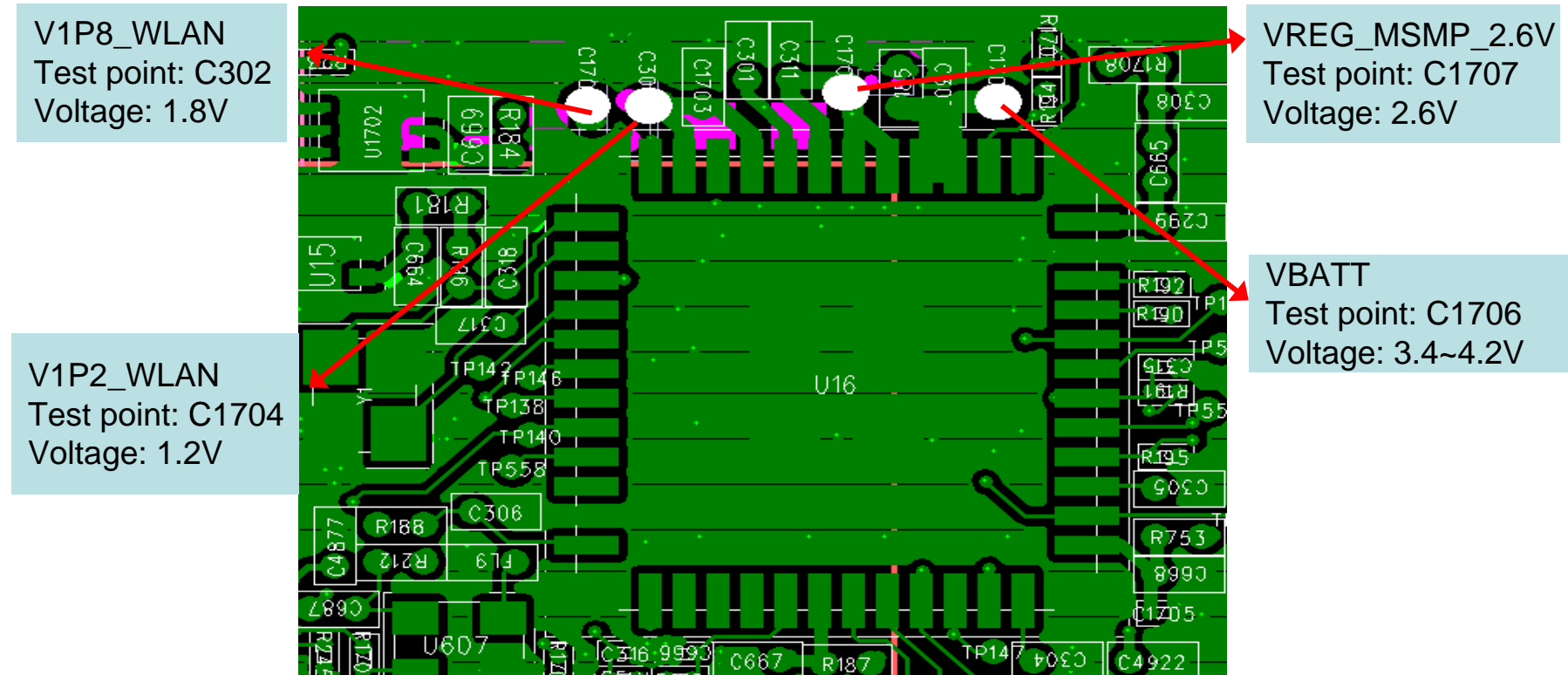
Test point: R191 or C315
Clock voltage: 0.5~0.9Vpp
Clock frequency: 19.2MHz



Wi-Fi cannot turn on and test (1)



- Check the voltages: VBATT, VREG_MSMP_2.6V, V1P2_WLAN, and V1P8_WLAN





Wi-Fi cannot turn on and test (2)



- Check the reference clock 26MHz.

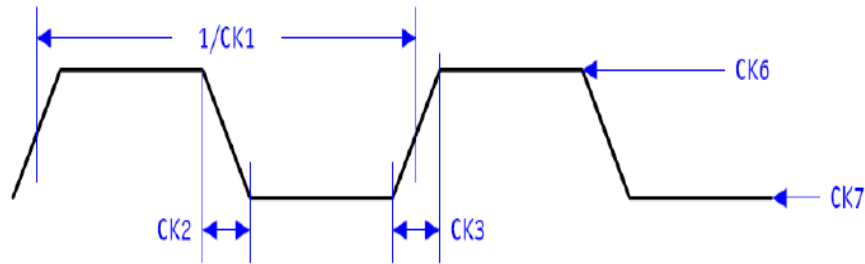
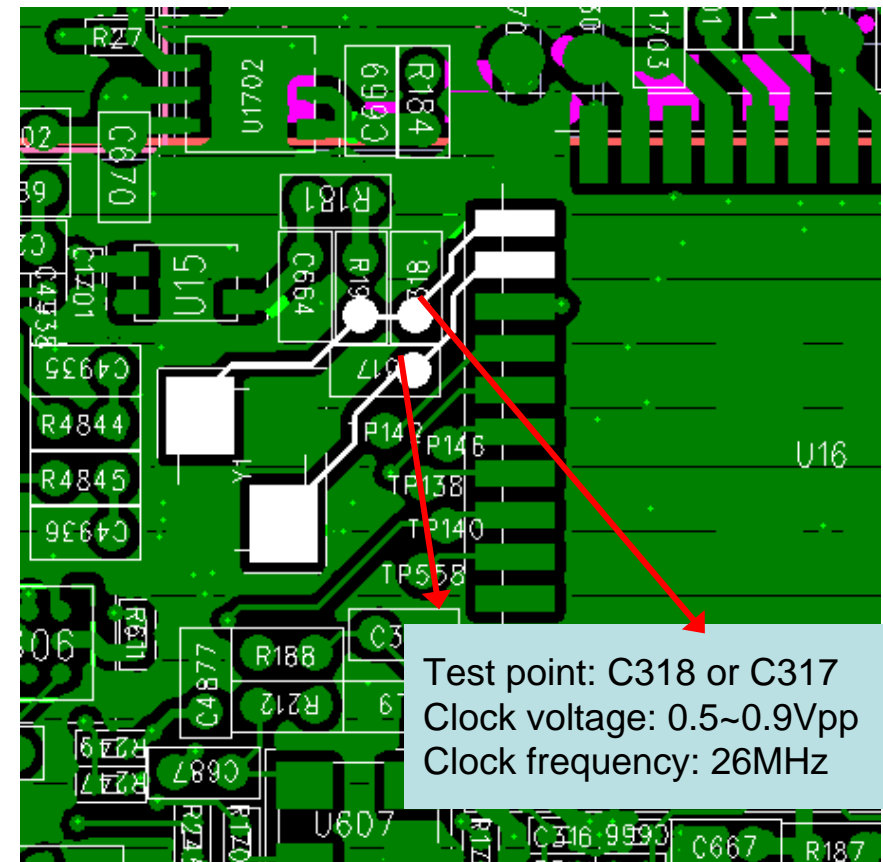


Figure 7-5 External reference clock option or Host reference drive option

Symbol	Description	Min.	Nom.	Max.	Unit
CK2	Fall Time	-	-	0.1*Period	ns
CK3	Rise Time	-	-	0.1*Period	ns
CK4	Duty Cycle (High-to-Low Ratio)	40	-	60	%
CK5	Frequency Stability	-20	-	20	ppm
CK6	Input High Voltage	1.14	-	3.46	V
CK7	Input Low Voltage	-0.1	-	0.3	V



Test point: C318 or C317
 Clock voltage: 0.5~0.9Vpp
 Clock frequency: 26MHz



Wi-Fi cannot turn on and test (3)



- Check the pin states of the module.

Pin #	Pin Name	Description	Type	Circuit	Reset	Supply
9	CHIP_PWD_L	AR6002 Reset	I	DI	PD	DVDD_SDIO
8	SYS_RST_L	AR6002 Reset	I	DI	PU	DVDD_SDIO
5	WOW	wake-on-wireless(WOW)	O	DO	PD	DVDD_GPIO1

WOW
Test point: U16 pin 5
Clock voltage: 2.6V

SYS_RST_L
Test point: TP140
Clock voltage: 2.6V

CHIP_PWD_L
Test point: TP558
Clock voltage: 2.6V

