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# **ASUS ZE500KL CMCC sku**

## **RF Hardware Trouble Shooting Guide**

# Outline

(\*) Debug Tool Required

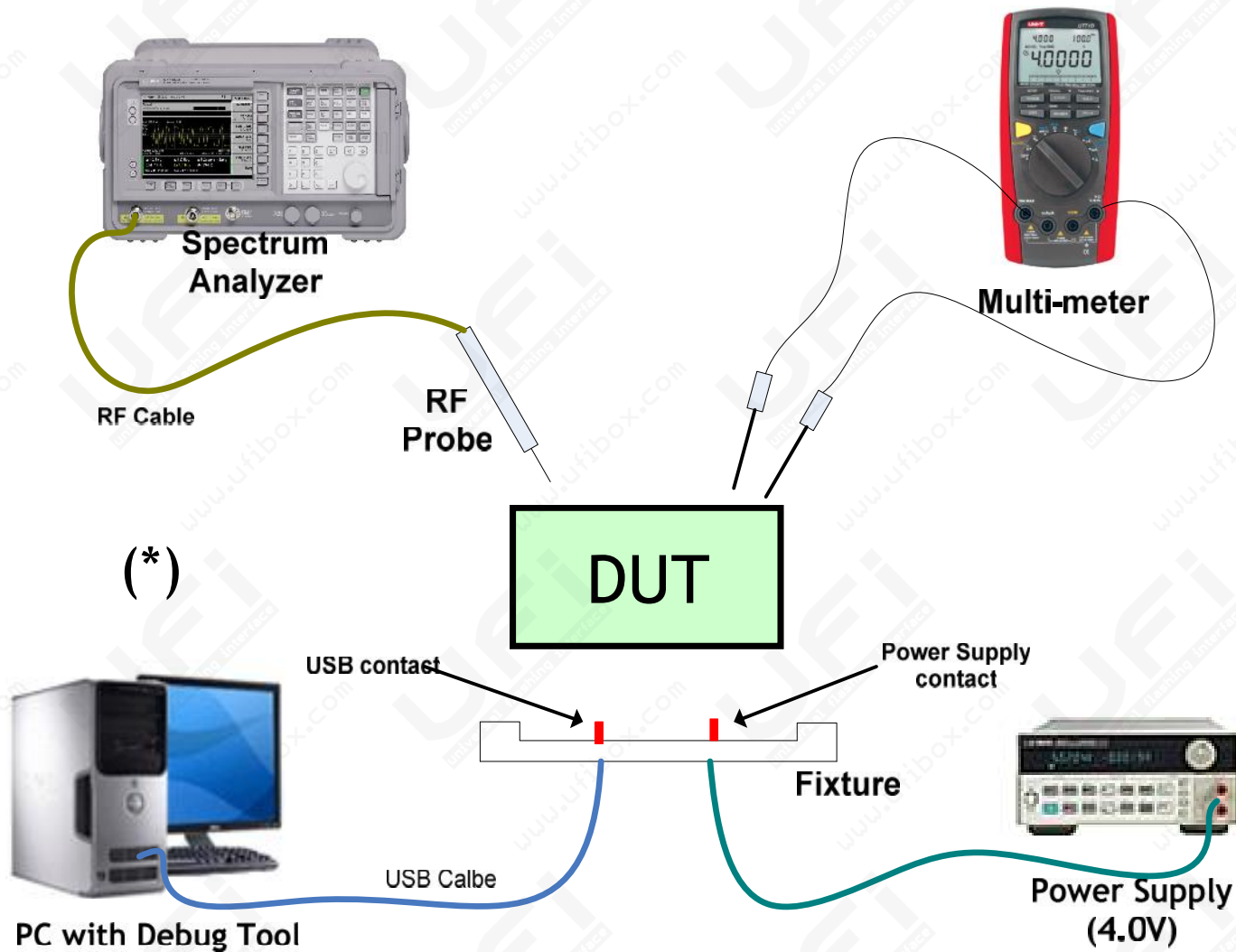
- Repair and Test Environment (\*)
- RF Block Diagram
- RF Calibration Repair Guide (\*)
  - GSM Quad-bands Block Diagram
  - GSM EGSM and GSM850
  - GSM DCS and PCS
  - WCDMA Quad-bands Block Diagram
  - WCDMA Band1/Band2/Band5/Band8
  - LTE Quad-bands Block Diagram
  - LTE Band3/Band7/Band8/Band20/Band28
  - LTE Div. Rx Block Diagram
  - LTE Div. Rx Band3/Band7/Band8/Band20/Band28
- RF Test Trouble Shooting
  - 2G RF Test
  - 3G RF Test
  - 4G RF Test
- GPS Repair Guide
- BT/WiFi Repair Guide

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# Repair and Test Environment

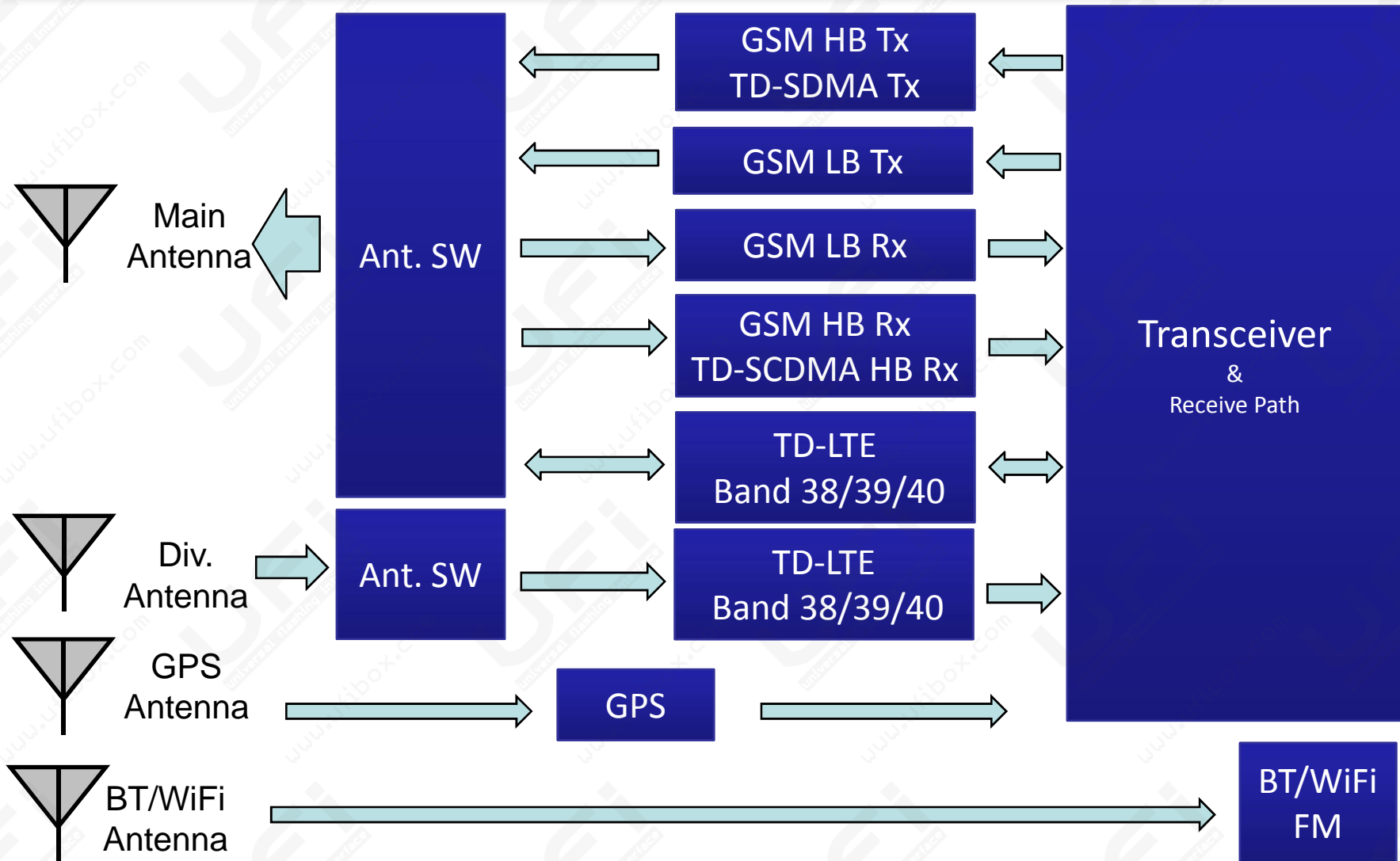


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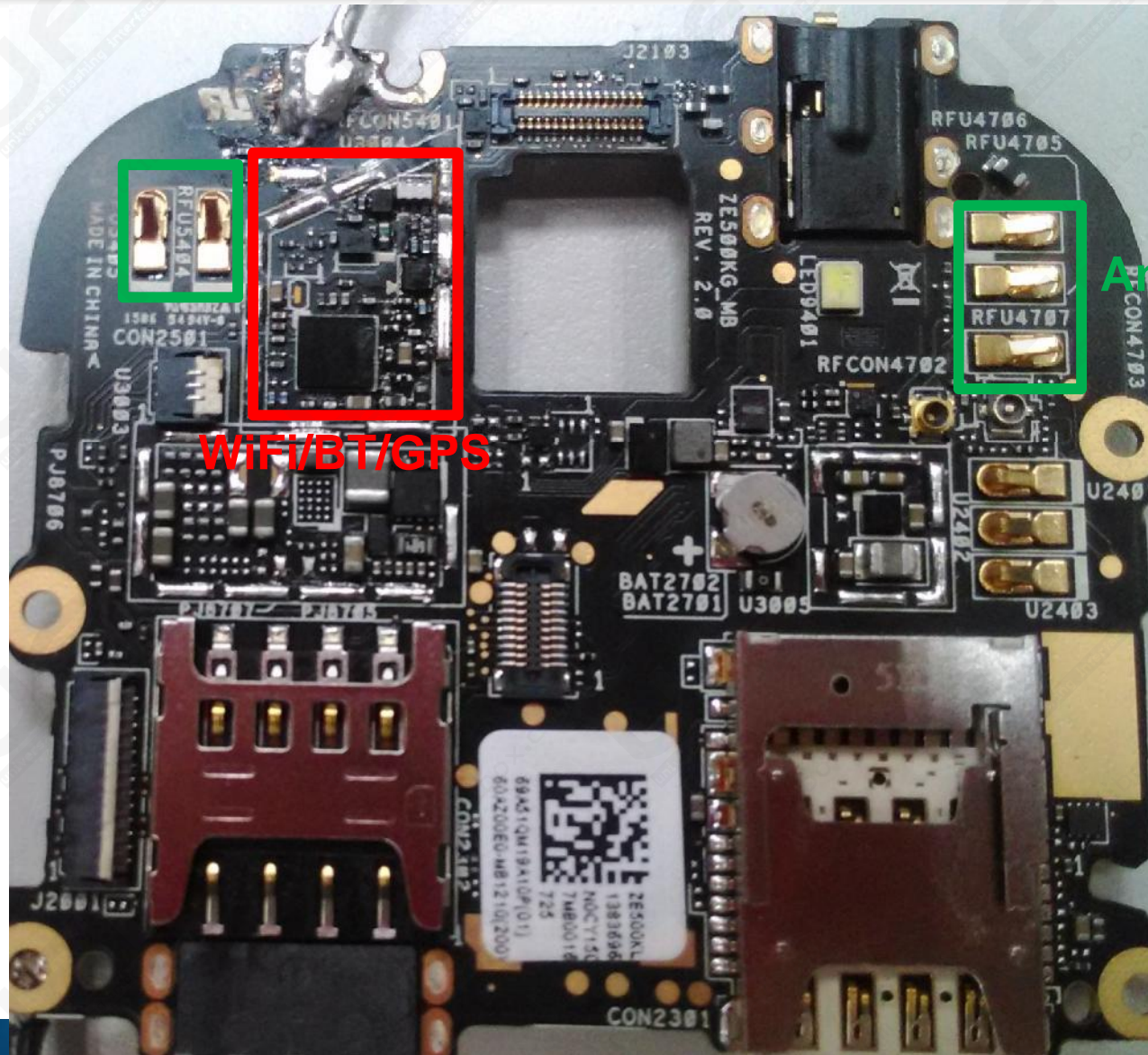
# RF Block Diagram







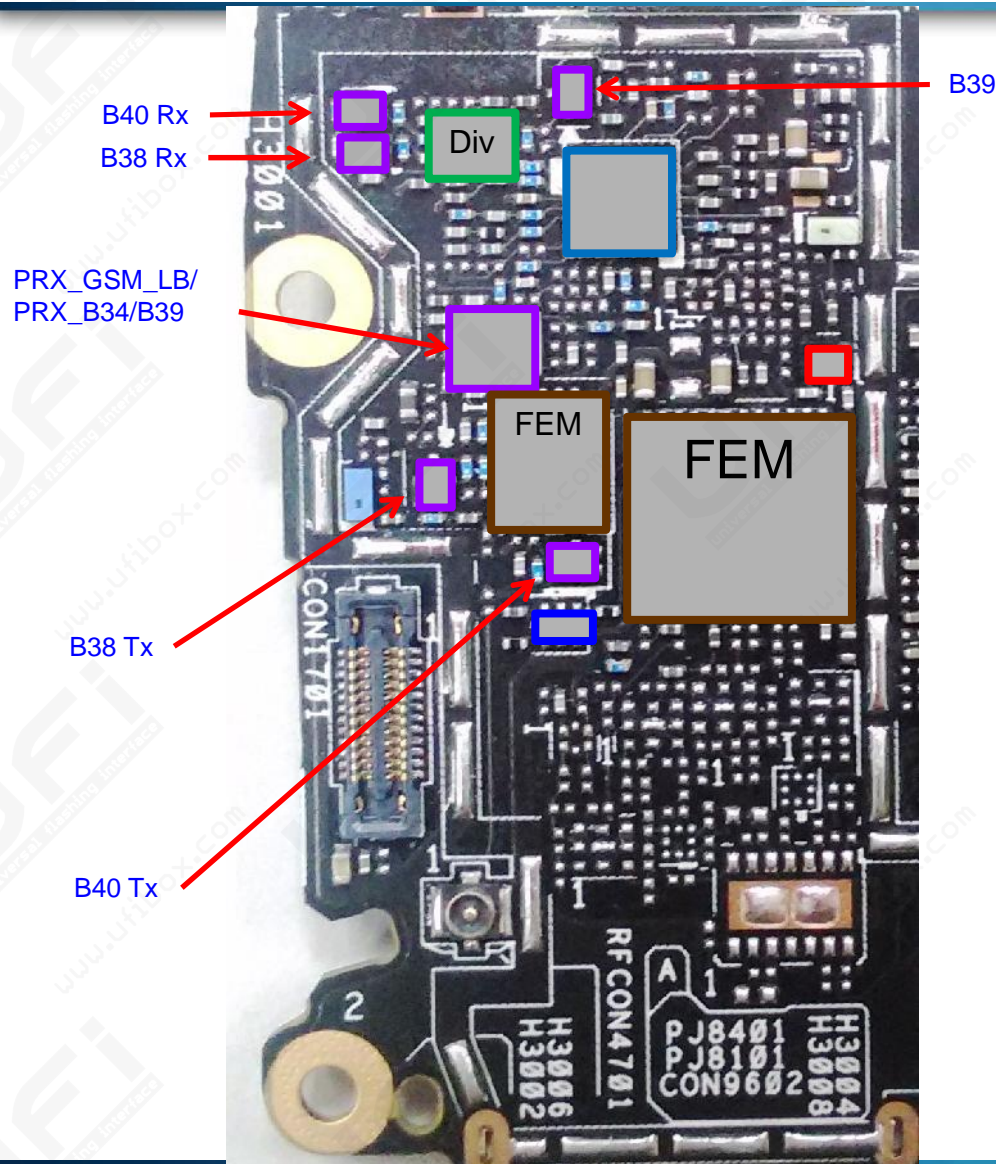
# ZE500KL RF Areas Bottom Side

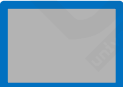


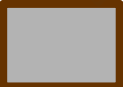





4G Div.  
Ant. Spring






# Key components locations(Top)



-  Transceiver
-  Band Switch
-  Ant. Switch
-  PA
-  Duplexer
-  SAW
-  Coupler

## Key components locations(Bot)



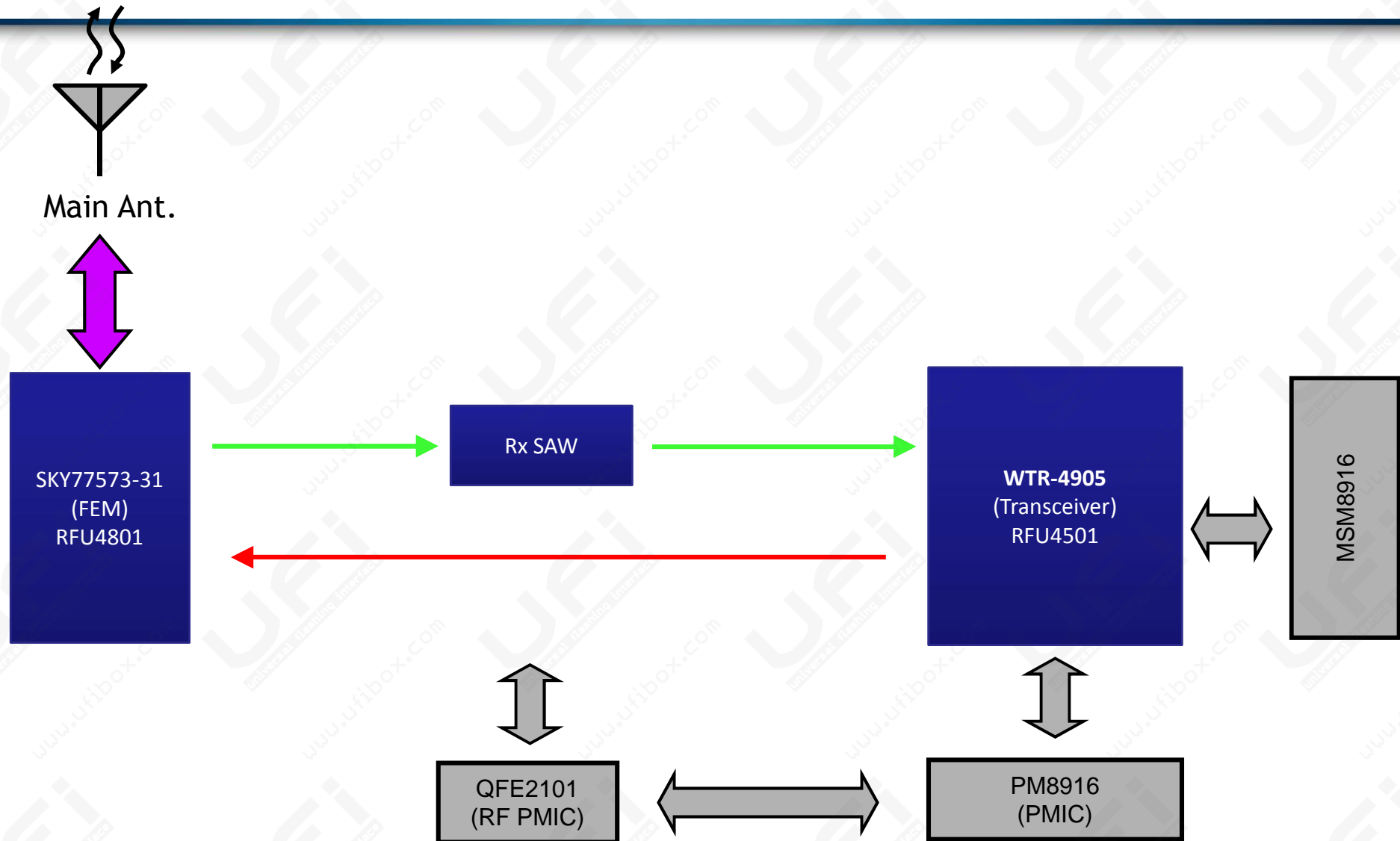
-  LNA
-  Diplexer
-  SAW

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  - LTE Main Tx/Rx
  - LTE Div. Rx Block Diagram
  - LTE Div. Rx
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# GSM/TD-SCDMA Block Diagram



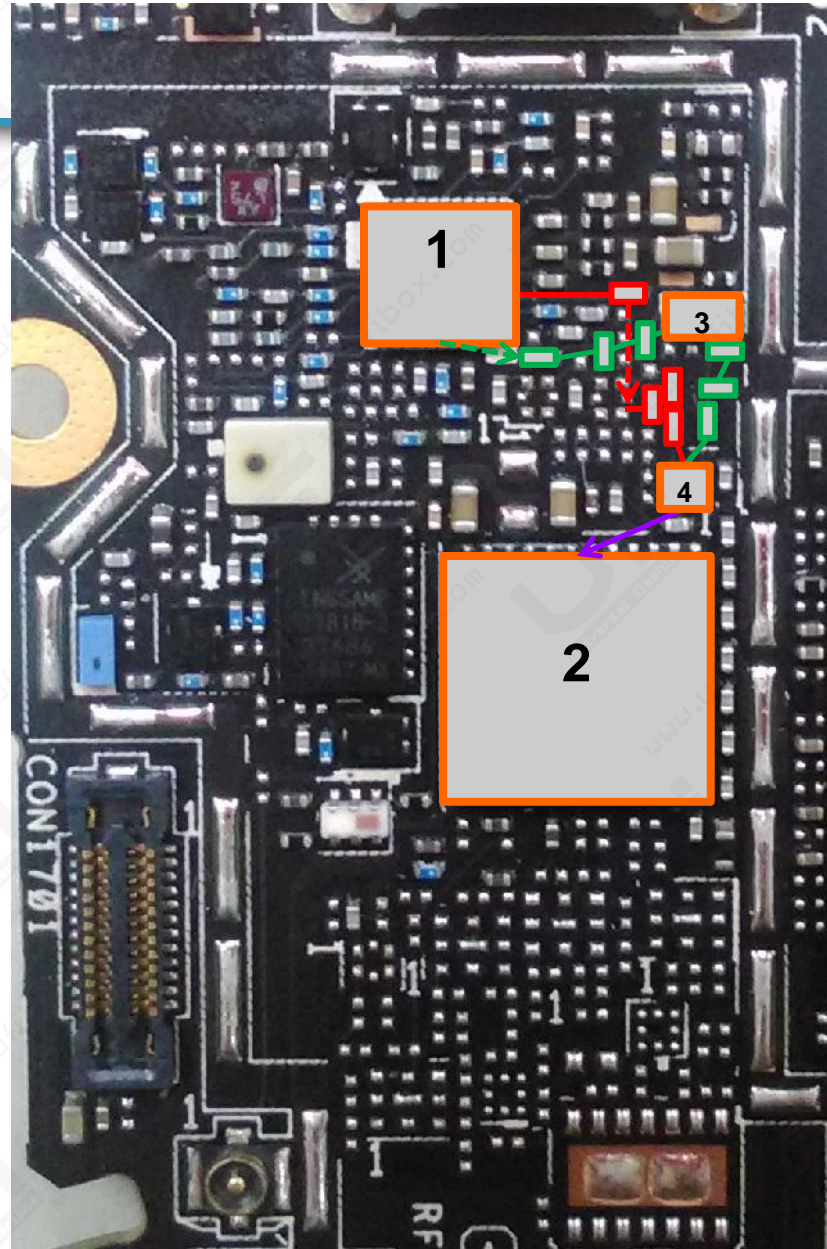
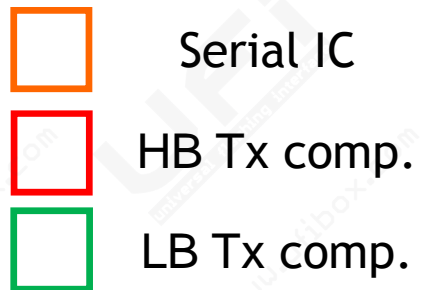


# 2G TD-SCDMA

Tx  
Tx

Top

1. RFU4501 : Transceiver  
WTR1625L
2. RFU4801 : FEM.  
SKY77573-31
3. RFU4808 : Switch
4. RFU4806 : Low pass filter






2G High Band/ TD-SCDMA use the same path

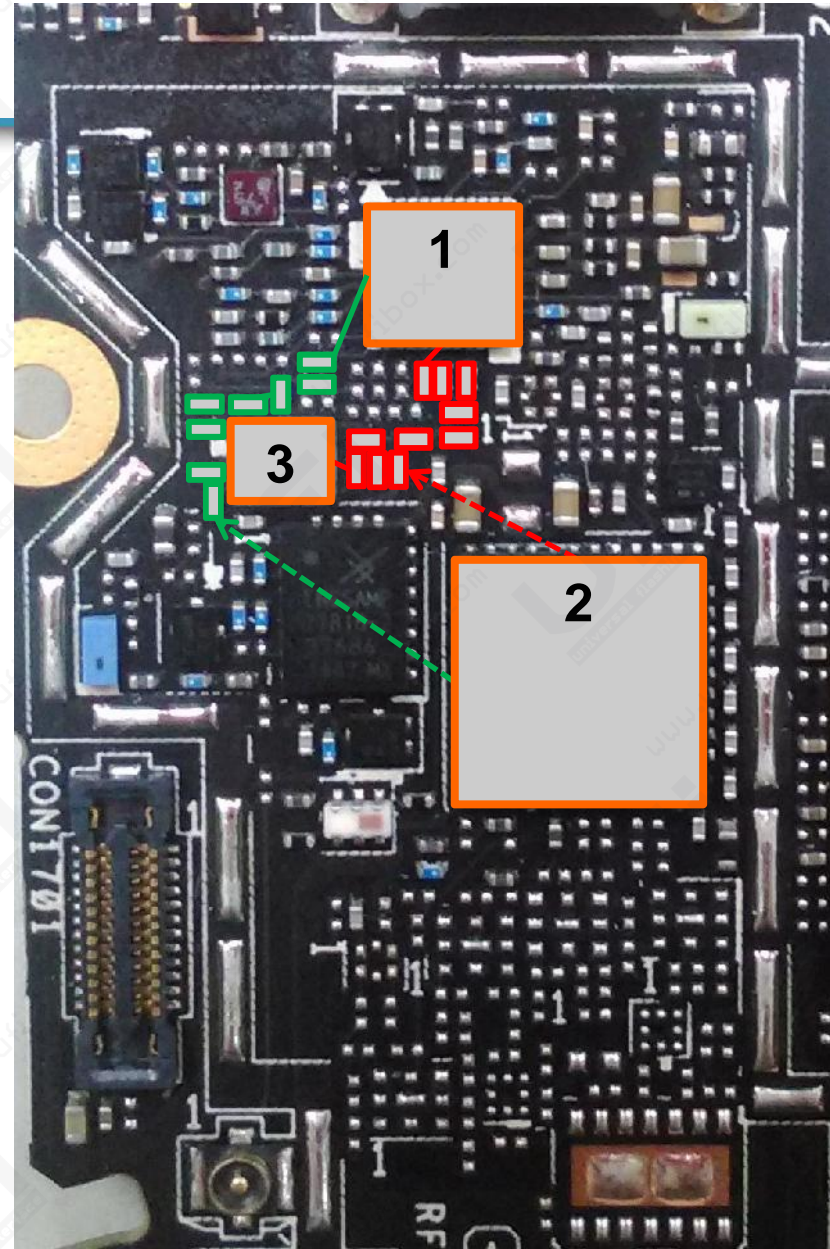
# 2G TD-SCDMA

Rx  
Rx

Top

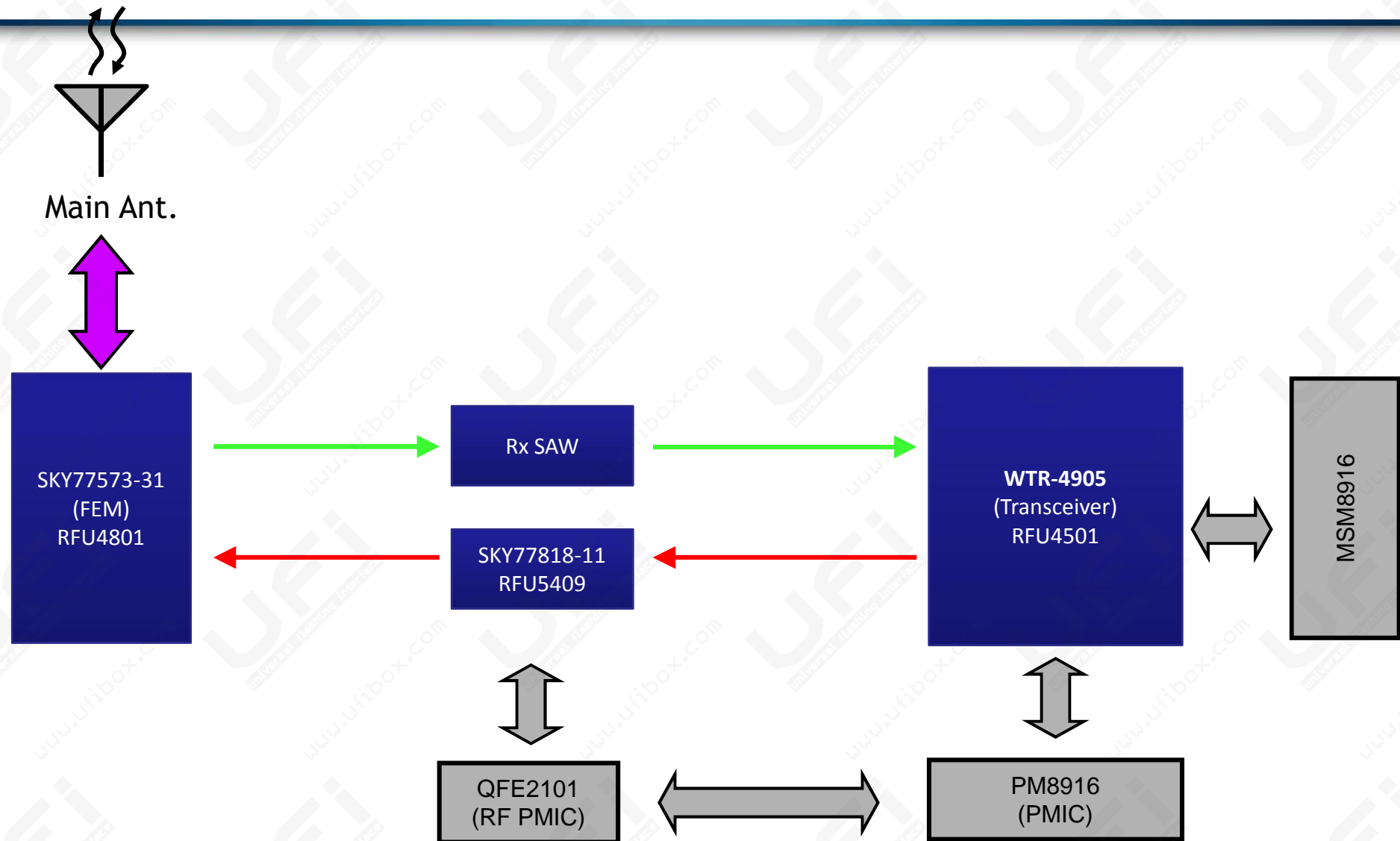
1. RFU4501 : Transceiver  
WTR1625L
2. RFU4801 : FEM.  
SKY77573-31
3. RFU4805: Saw

-  Serial IC
-  HB Tx comp.
-  LB Tx comp.



2G High Band/ TD-SCDMA use the same path

# TD-LTE Block Diagram

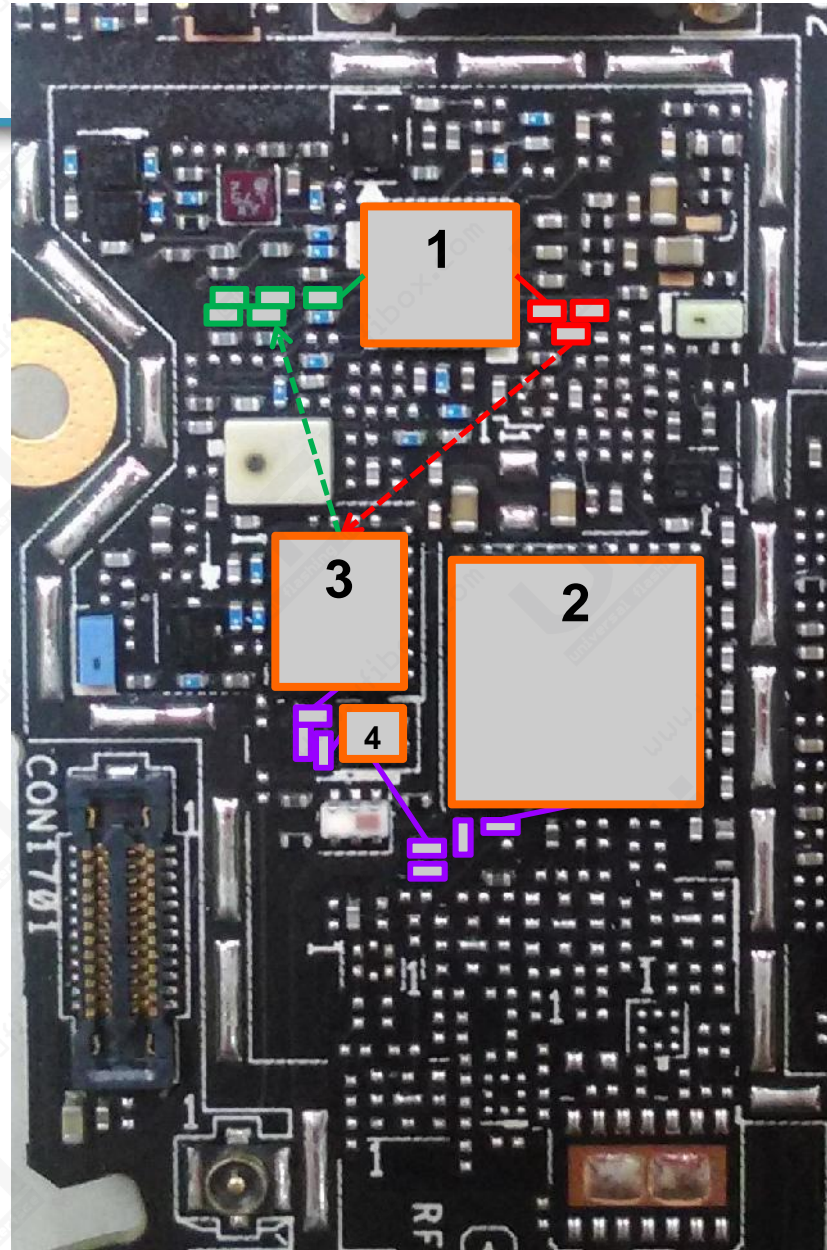
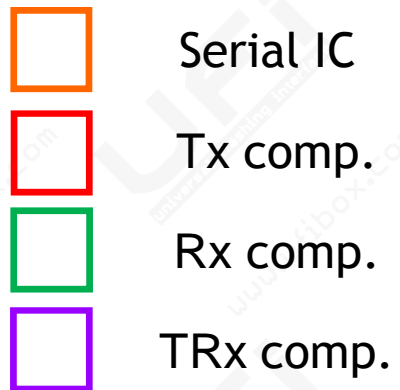




# TD-LTE B40 Tx/Rx

Top

1. RFU4501 : Transceiver  
WTR1625L
2. RFU4801 : FEM.  
SKY77573-31
3. RFU5409 : PA
4. RFU5004: Saw

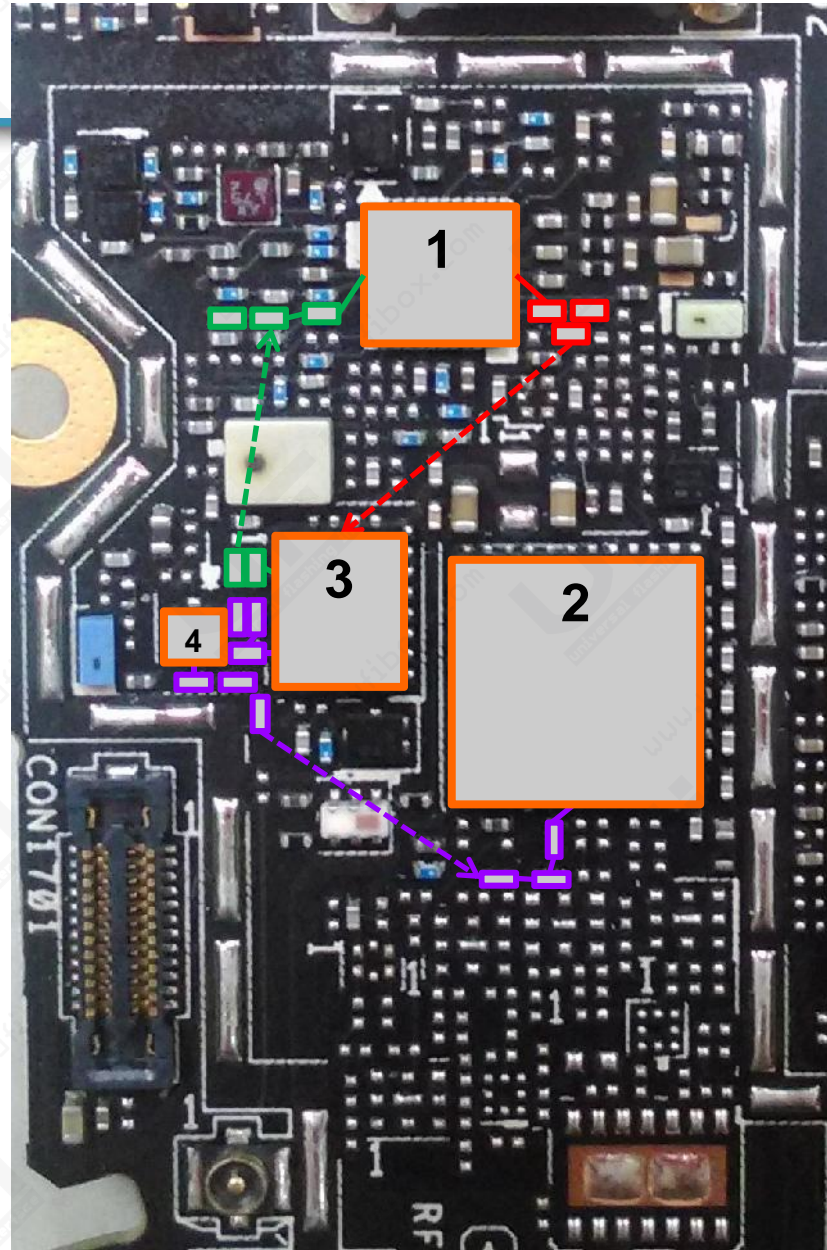
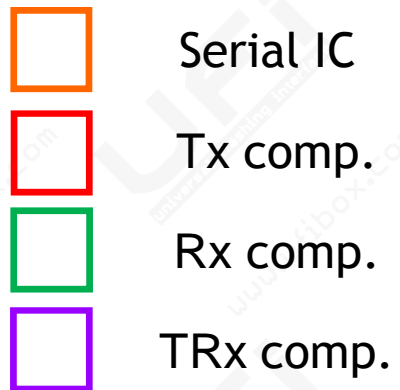




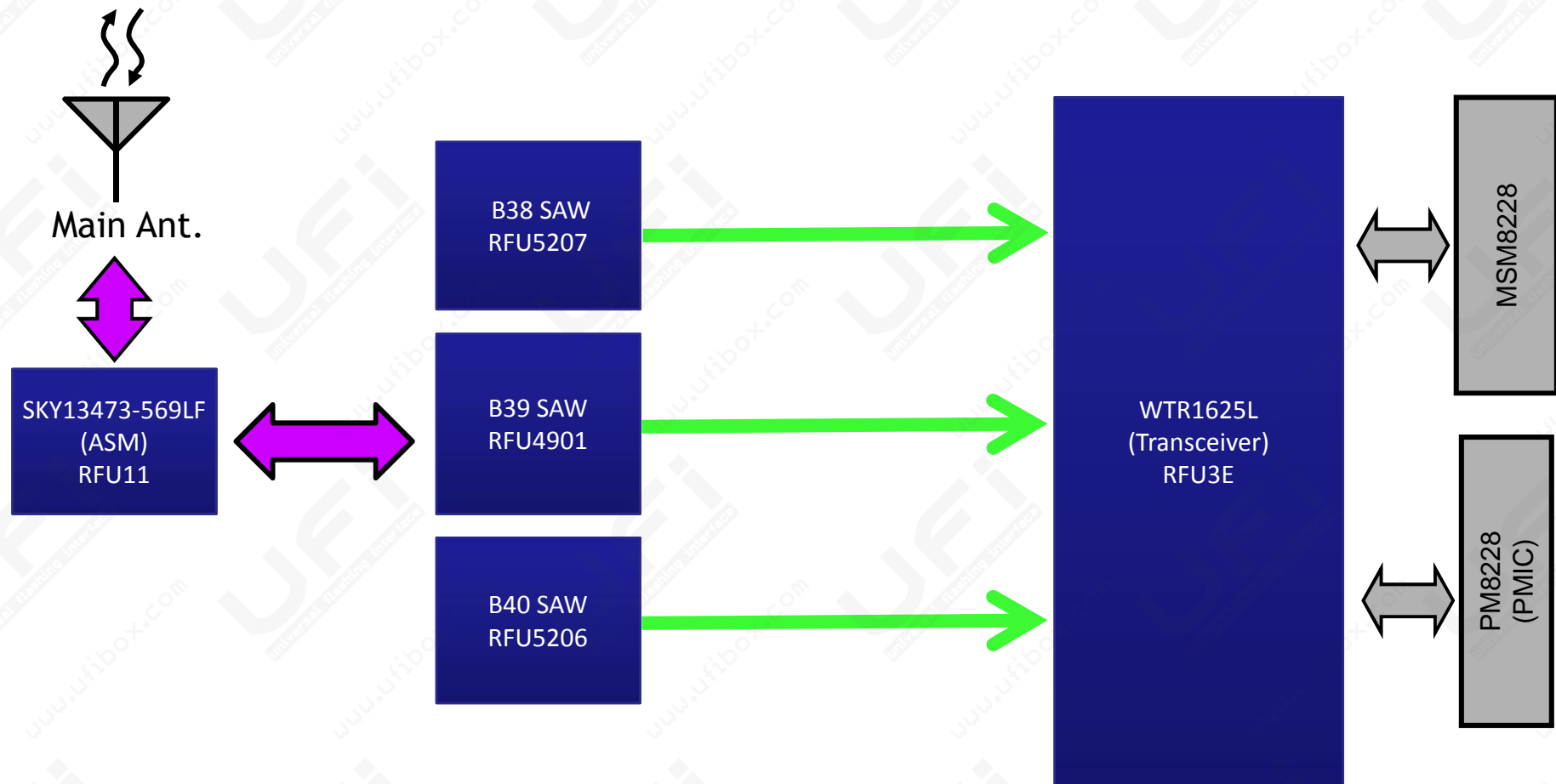
# TD-LTE B38 Tx/Rx

Top

1. RFU4501 : Transceiver  
WTR1625L
2. RFU4801 : FEM.  
SKY77573-31
3. RFU5409 : PA
4. RFU5004: Saw



# LTE Div. Rx Block Diagram



# TD-LTE B38 DRx

Top

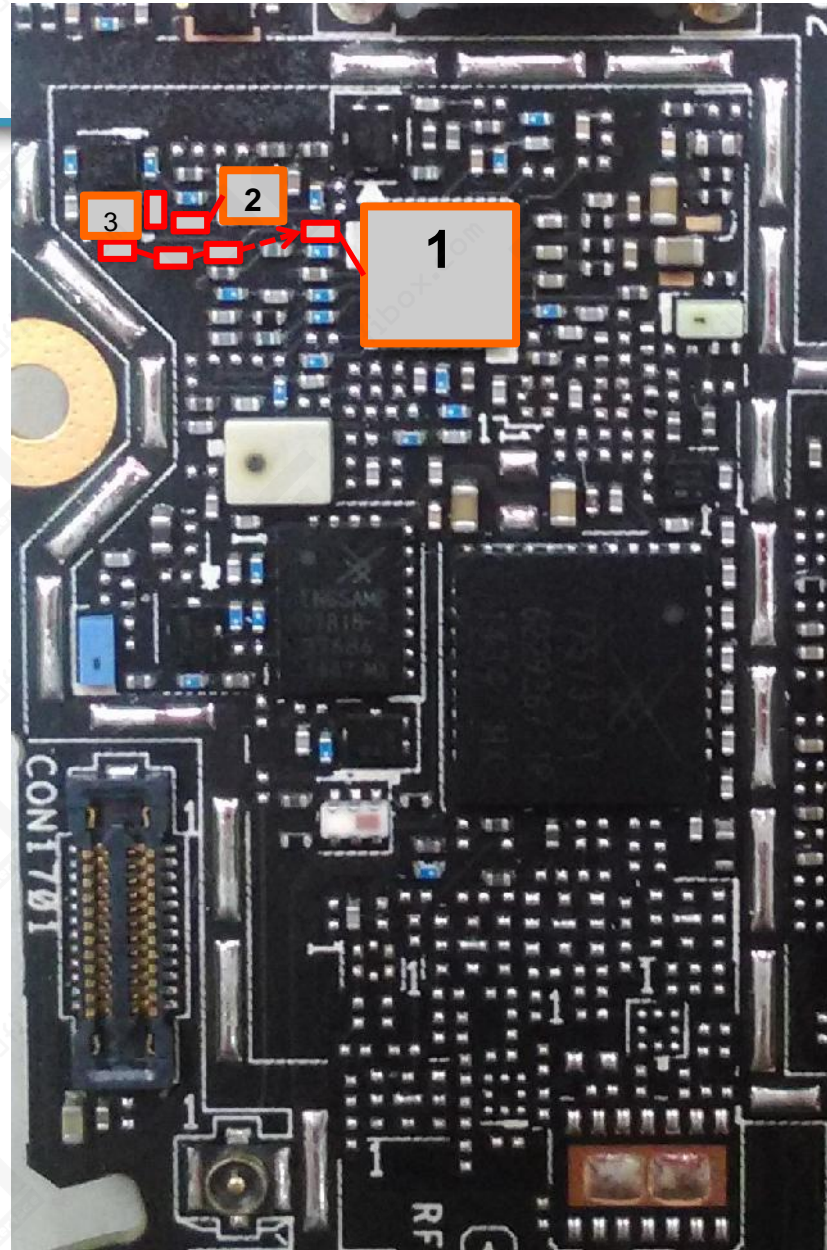
1. RFU4501 : Transceiver  
WTR1625L
2. RFU4702: Diversity switch  
CXA2973GC-T9
3. RFU5207: SAW



Serial IC



Rx comp.





# TD-LTE B39 DRx

Top

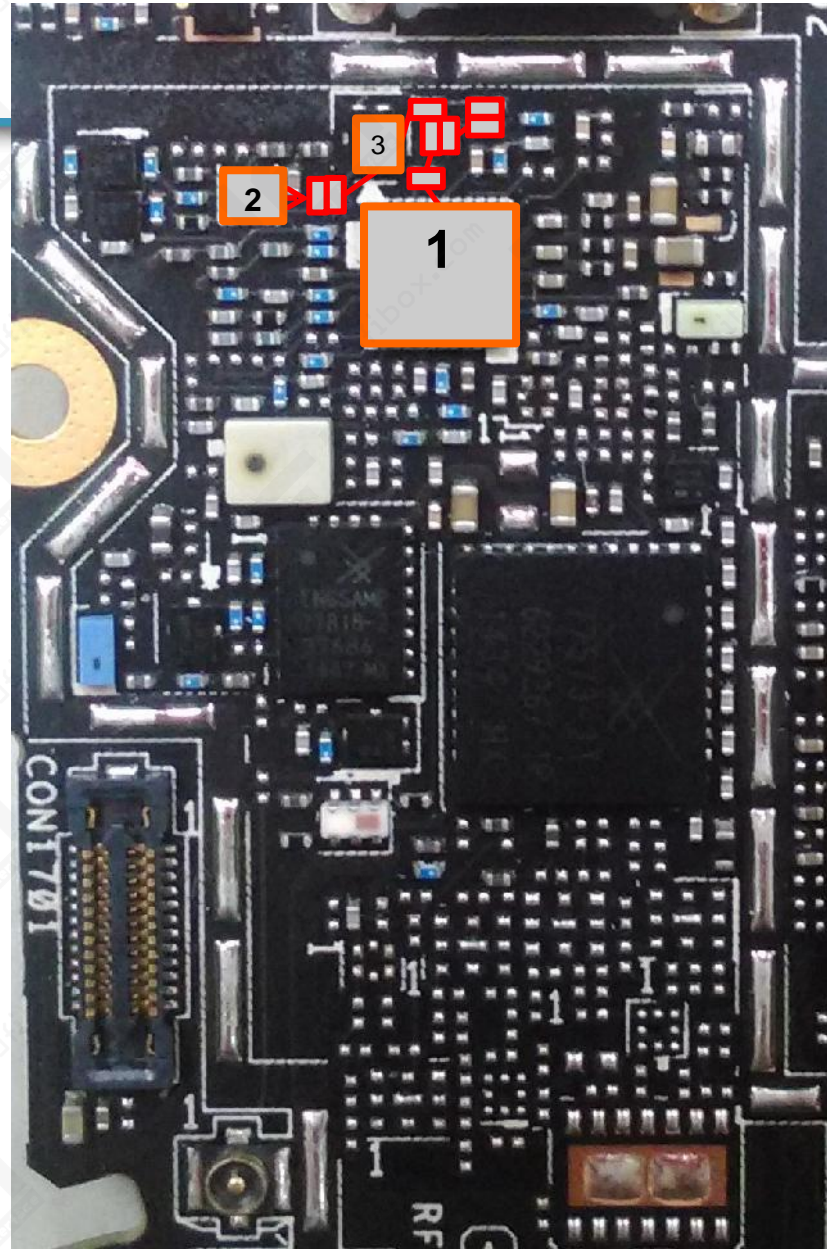
1. RFU4501 : Transceiver  
WTR1625L
2. RFU4702: Diversity switch  
CXA2973GC-T9
3. RFU4901: SAW



Serial IC



Rx comp.





# TD-LTE B40 DRx

Top

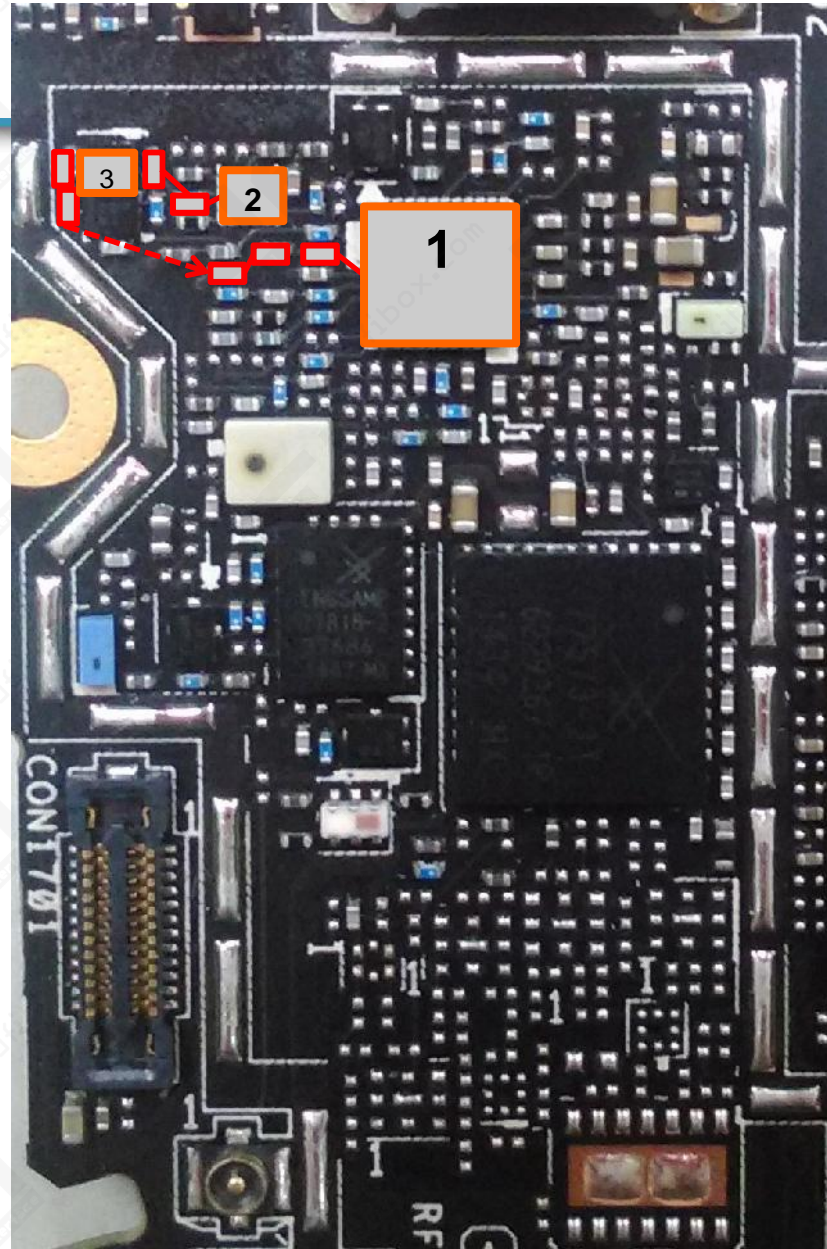
1. RFU4501 : Transceiver  
WTR1625L
2. RFU4702: Diversity switch  
CXA2973GC-T9
3. RFU4901: SAW



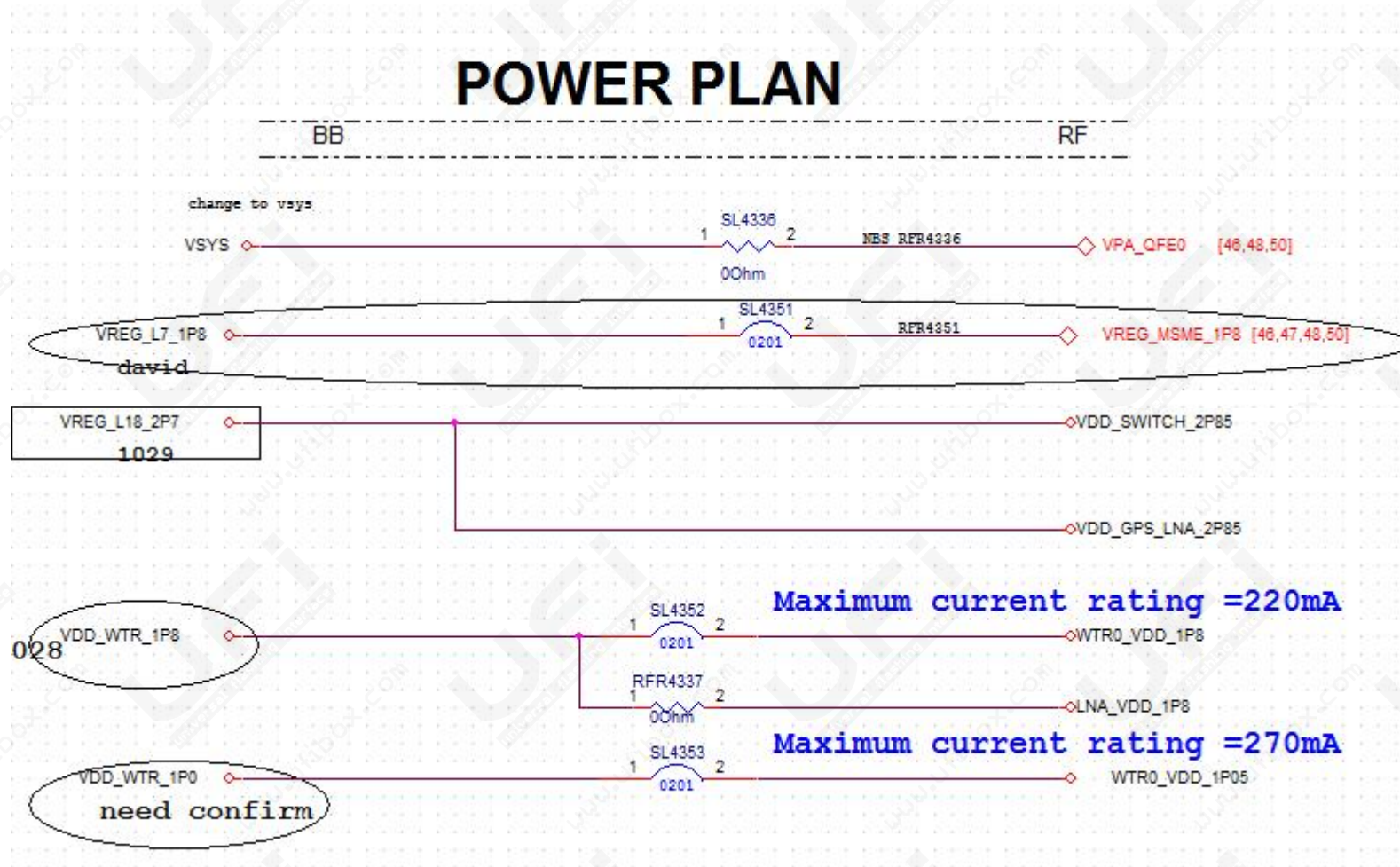
Serial IC



Rx comp.



# Voltage Setup



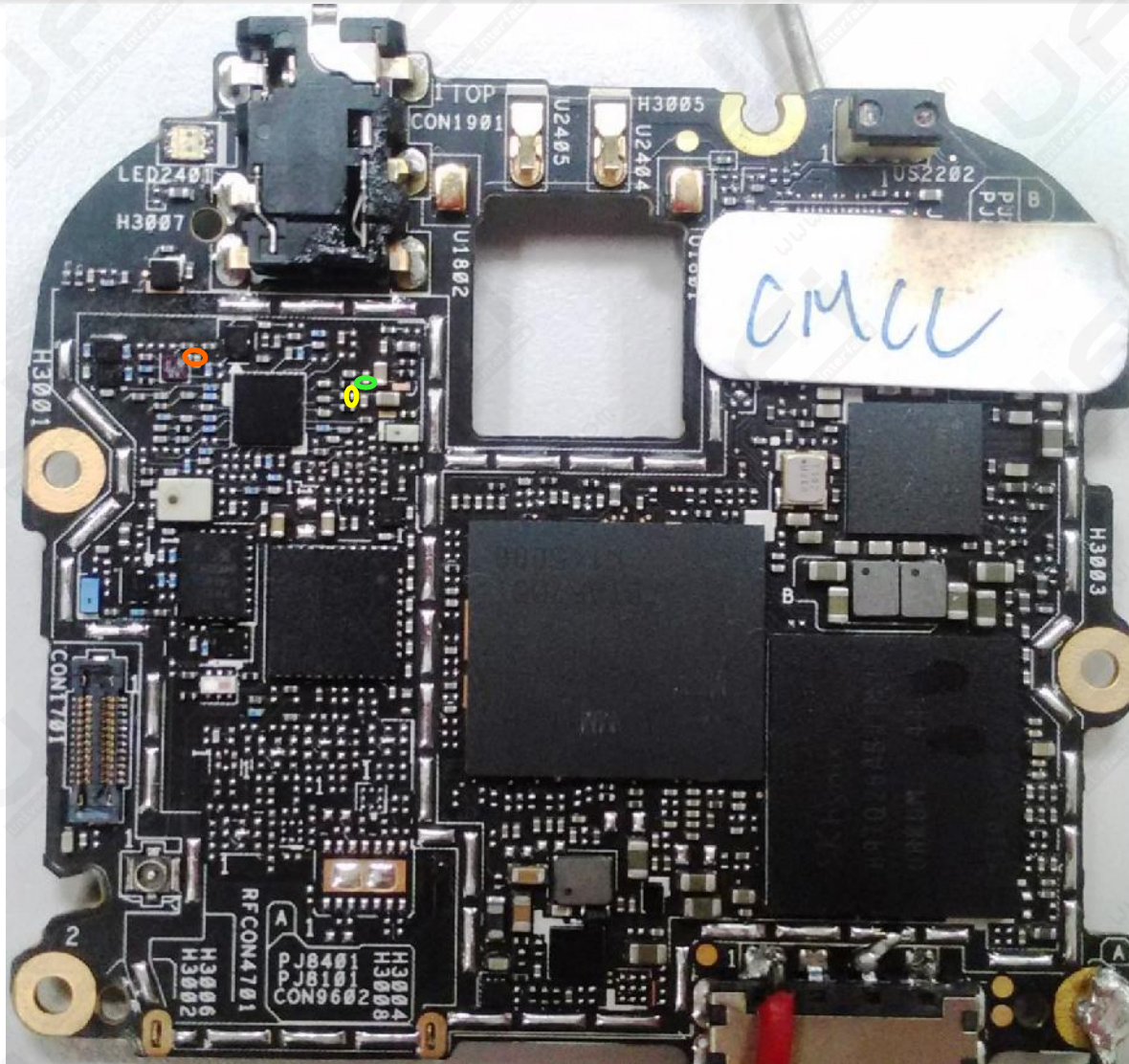


# Voltage Setup

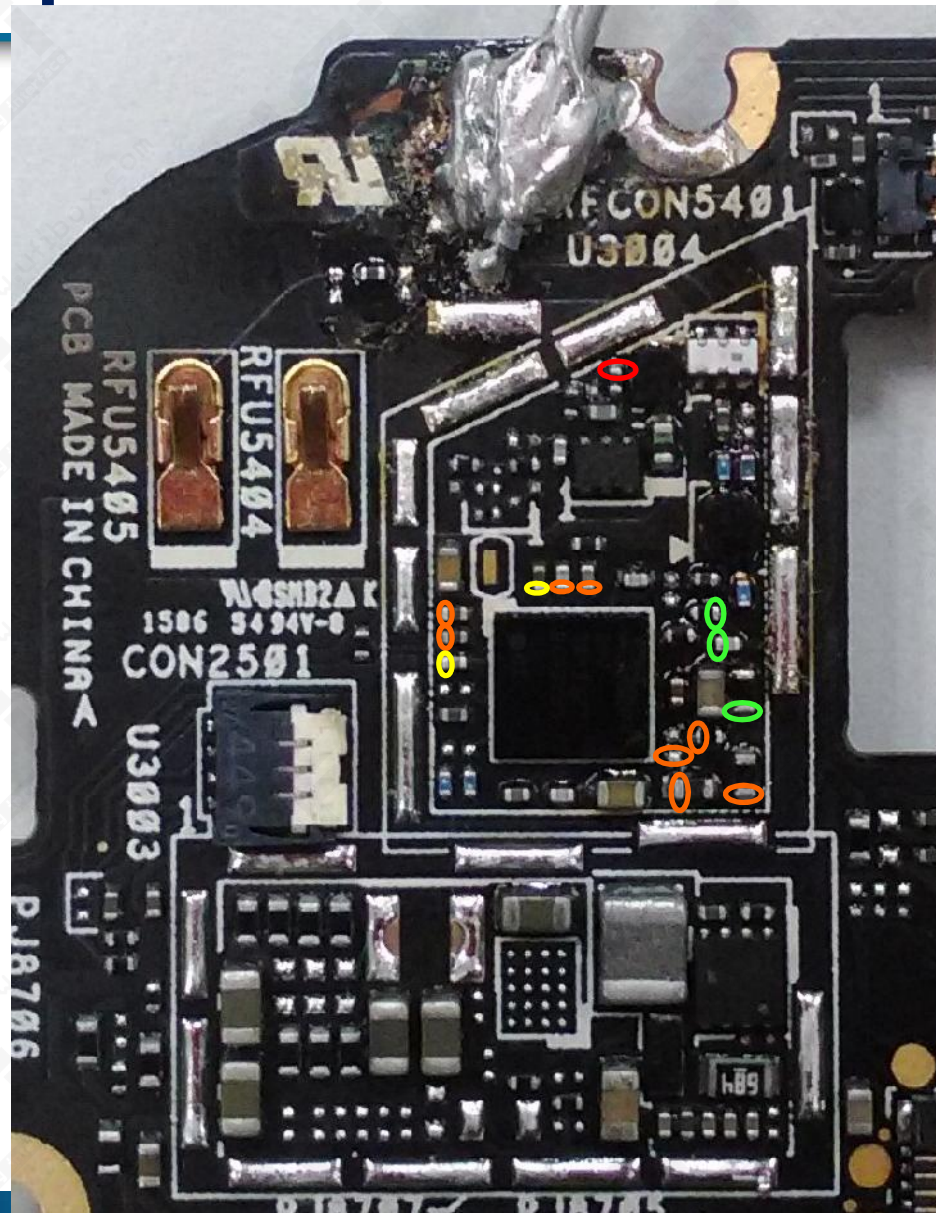
2.85V

1.05V

1.8V



# Voltage Setup



1.3V

2.85V

3.0V

1.8V



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## 2G RF Test

Error Code	Action
Tx Power	<ol style="list-style-type: none"><li>1. Re Calibration</li><li>2. Check Tx Path</li><li>3. Change PA</li></ol>
ORFS/ Power vs. Time	<ol style="list-style-type: none"><li>1. Check/change test station fixture</li><li>2. Check/change calibration station fixture</li><li>3. Check Tx Path</li><li>4. Change PA</li></ol>
Frequency Error/ Phase Error	<ol style="list-style-type: none"><li>1. Check/change PMIC</li></ol>
Sensitivity/RSSI	<ol style="list-style-type: none"><li>1. Check/Change PMIC</li><li>2. Check/Change crystal</li><li>3. Check Rx Path</li></ol>

## 3G RF Test

Error Code	Action
Tx Power/ACLR/ SEM/OBW/EVM	1. Re calibration 2. Check Tx Path 3. Change PA
Sensitivity/RSCP	1. Re calibration 2. Check Rx Path
Frequency Error	1. Check/Change PMIC 2. Check/Change crystal

## 4G RF Test

Error Code	Action
Tx Power/ACLR/ SEM/OBW/EVM	1. Re calibration 2. Check Tx Path 3. Change PA
Sensitivity/RSRP	1. Re calibration 2. Check Rx Path
Frequency Error	1. Check/Change PMIC 2. Check/Change crystal



# System level RF Test Trouble Shooting

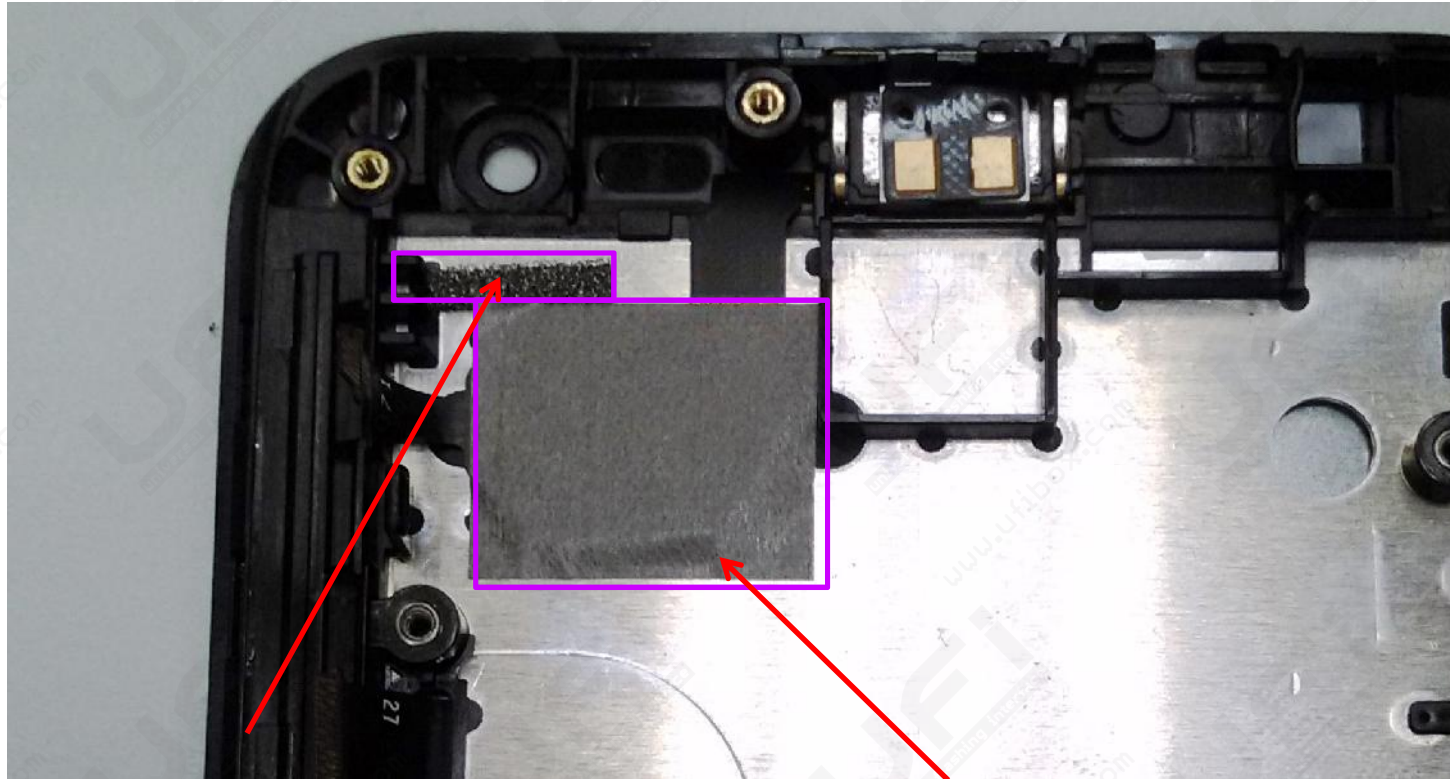
**DCS power too low**  
Check ME

**TX power too low**  
Check gasket

**BER/RSRP/  
RSCP/RSSI**  
Check gasket



## System level RF Test Trouble Shooting

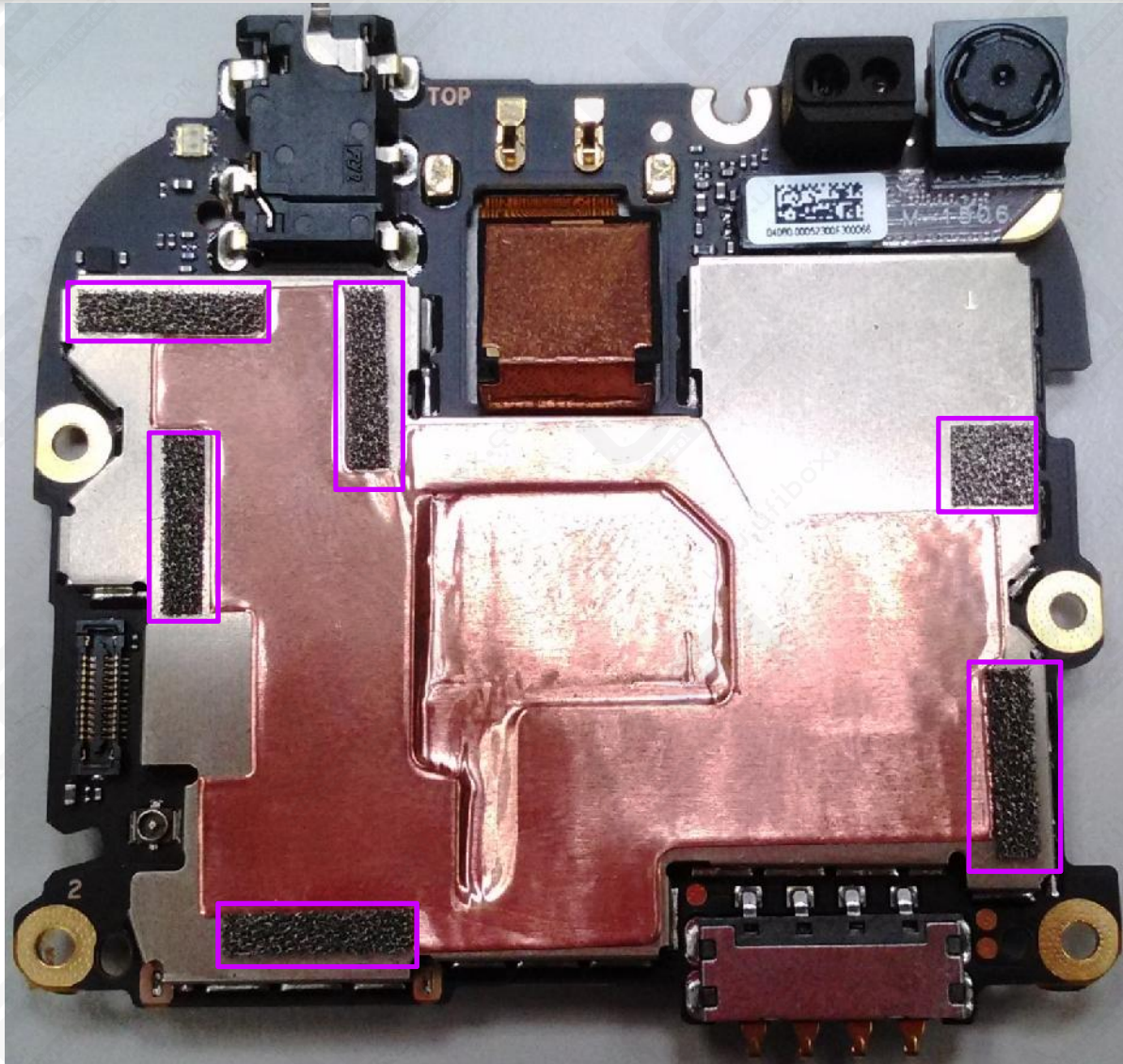


**RX fail /GPS CN too low**  
Check gasket

**RX fail /GPS CN too low**  
Check the gasket location



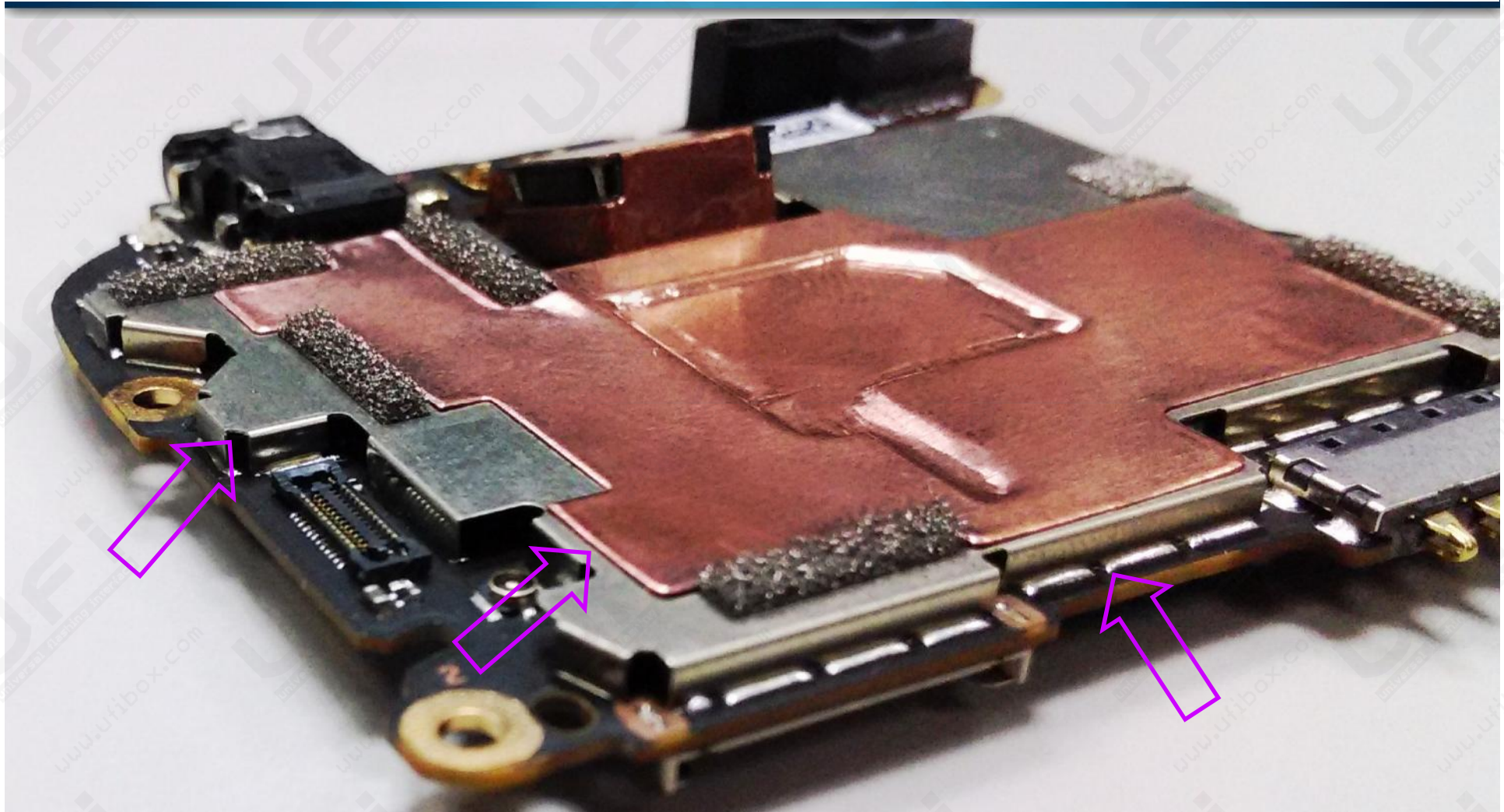
## System level RF Test Trouble Shooting



**All RX test item  
include BT/WIFI/GPS**



## System level RF Test Trouble Shooting

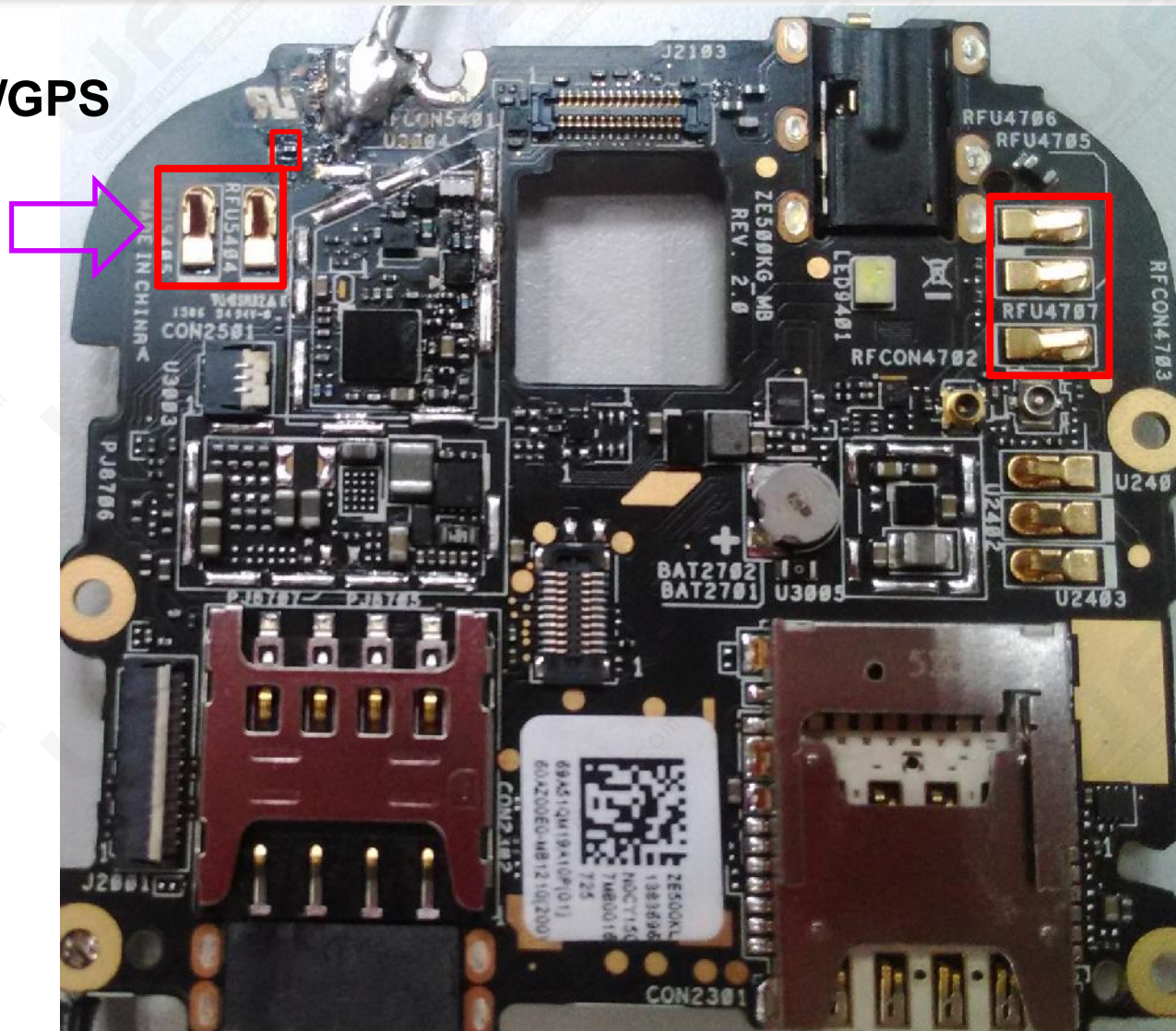


**All RX test item include BT/WIFI/GPS**  
Check the shielding case & gasket

# System level RF Test Trouble Shooting

**BT/WIFI/GPS**

Power/CN



**Diversity RX**



## If following parts are moved, to be re-done Calibration (PHONE)

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1. Transceiver: RFU4501 FEM: RFU4801

2. PA: RFU5409 ASM: RFU4702

3. SAW: RFU5003 RFU5004 RFU4805 RFU4901 RFU5206  
RFU5207

4. Coupler: RFU4703

5. Switch: RFU4808

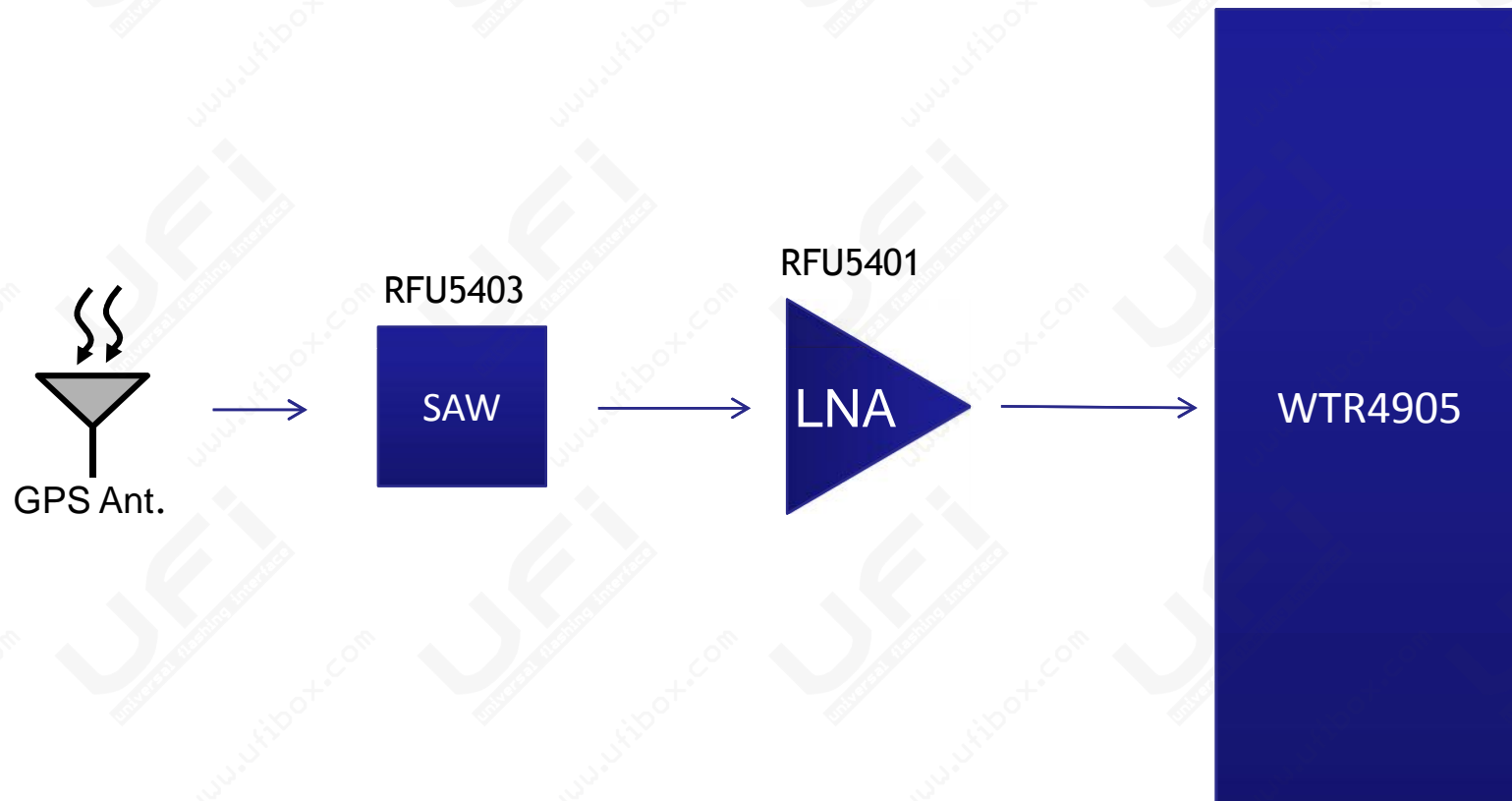


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# GPS Ant Block Diagram



# GPS



GPS Antenna area

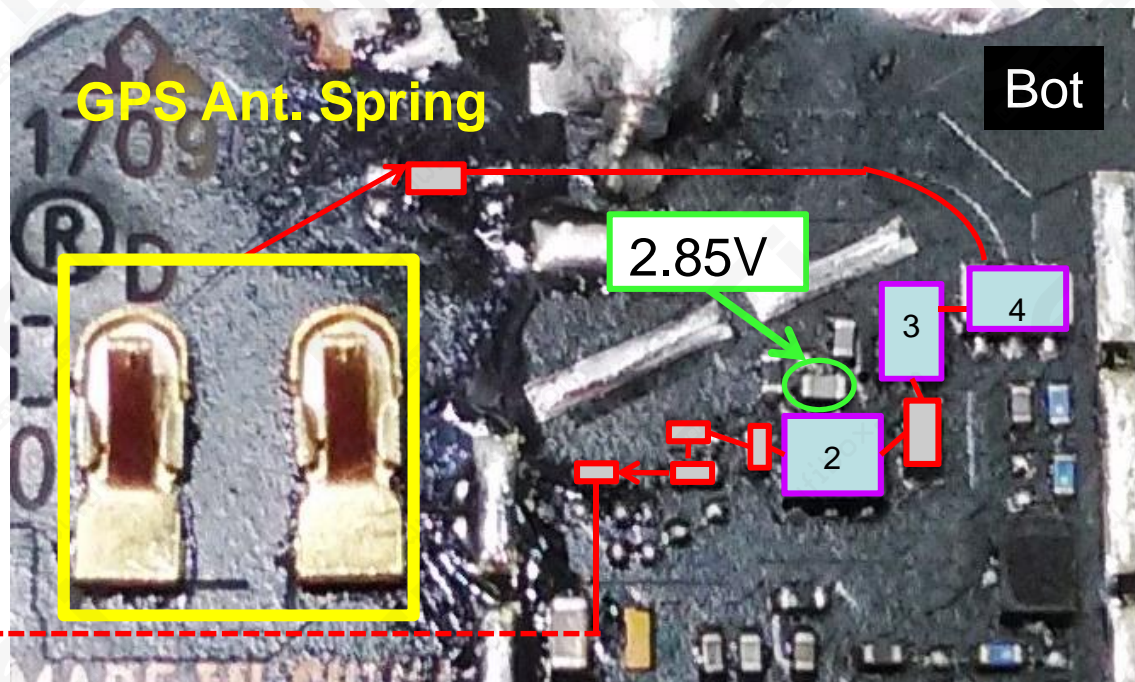
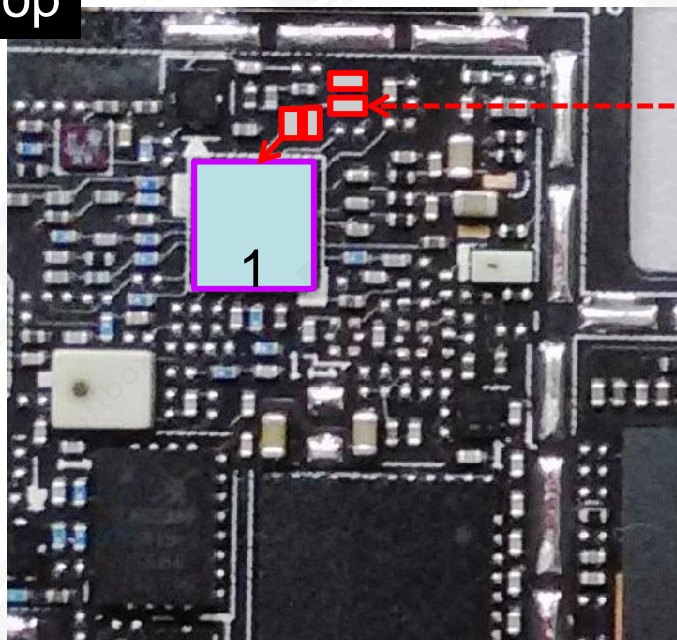


Serial comp.  
with orientation



Serial comp. without  
orientation

Top



1. RFU4501 : Transceiver  
WTR4905
2. RFU5401: GPS LNA
3. RFU5403: GPS SAW Filter
4. RFU5407: Diplexer



# GPS Function Test Procedure

---

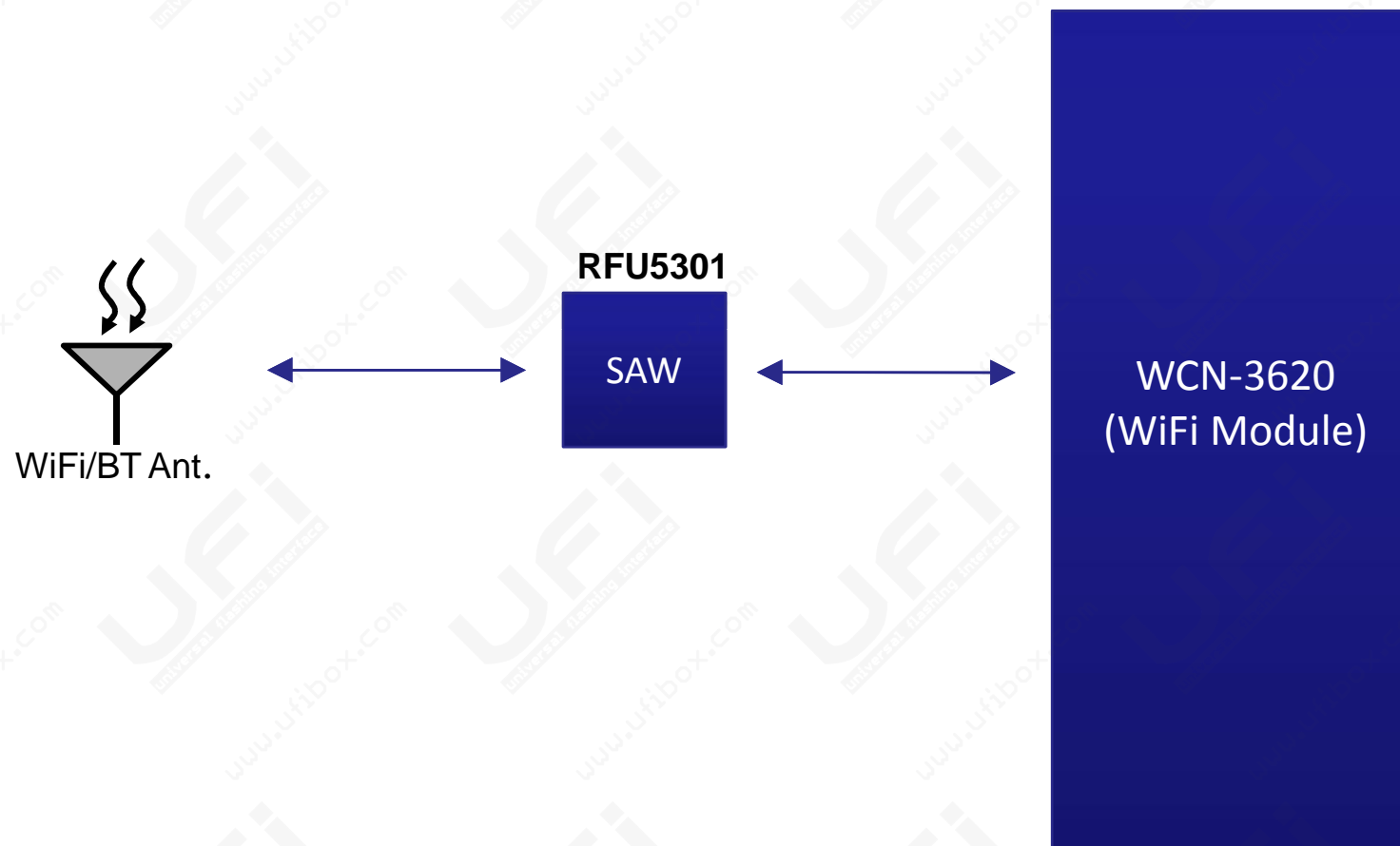
- **Check GPS function with GPS Test Tool.**
- **Check the GPS feed point.**
- **Check RFU5403 and surrounding components**
- **Check the 2.85V supply voltage of GPS LNA**
- **Check the RFC5402**

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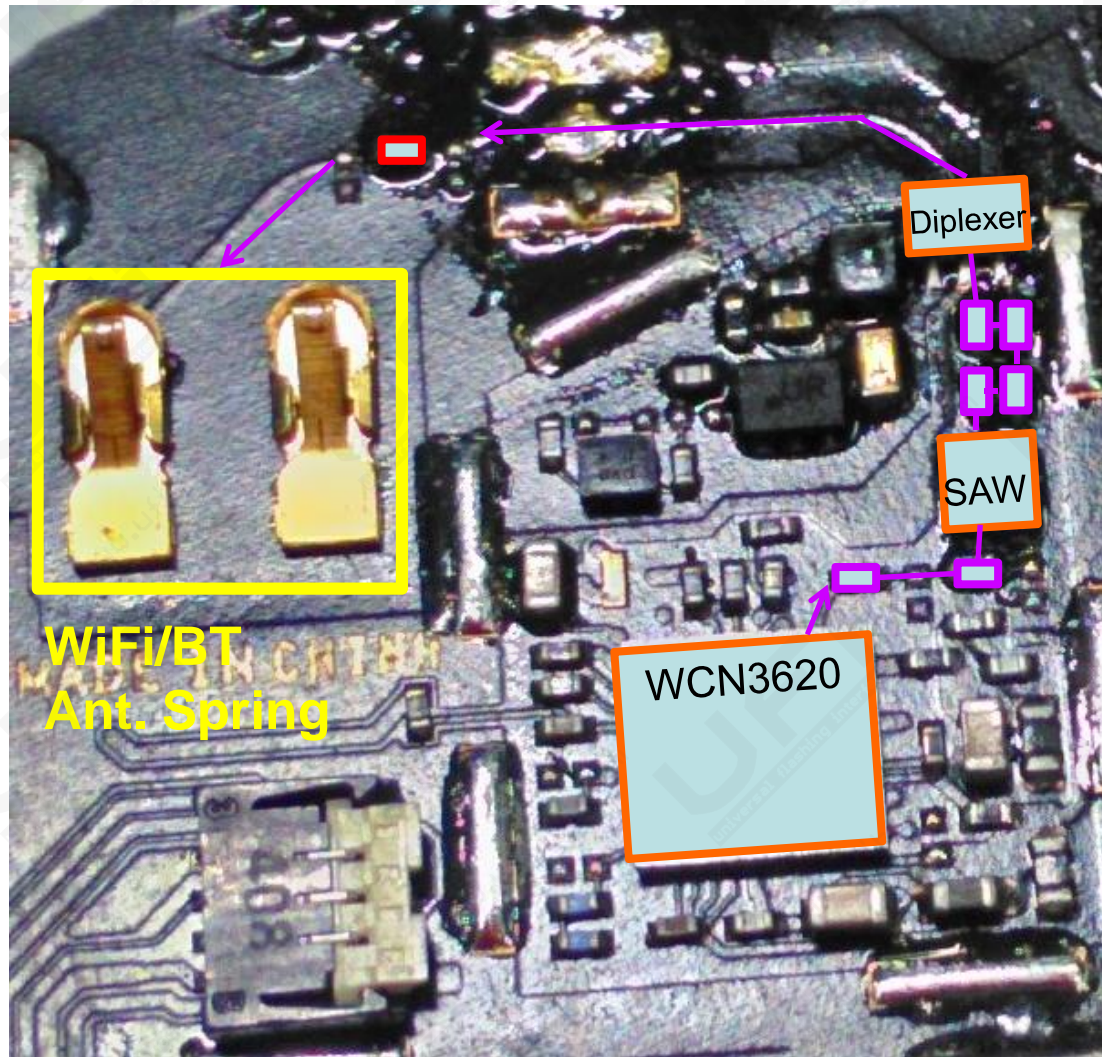
# WiFi/BT Ant Block Diagram





# WiFi/BT

-  WiFi Antenna area
-  Serial comp. without orientation
-  Serial comp. with orientation



# BT/WLAN Function Test Procedure

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## Board level

- Check the BT/WLAN feed point
- Check WCN3620 and surrounding components

## System level

- Change antenna
- Check the RFC5402

# Thanks for Your attentions !

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