Moto G 2nd Generation
TROUBLESHOOTING GUIDES

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SNAPSHOTS OF ANTENNAS

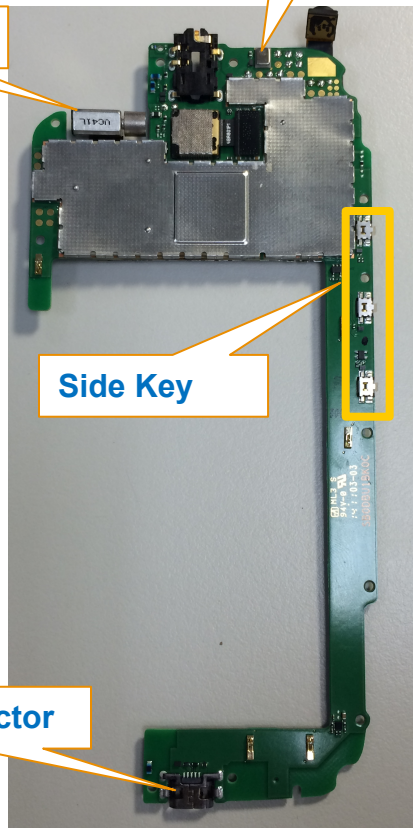
Antenna and Antenna Feed Locations

SNAPSHOTS OF MAIN BOARD

Snapshots of Main PCB – Top and Bottom

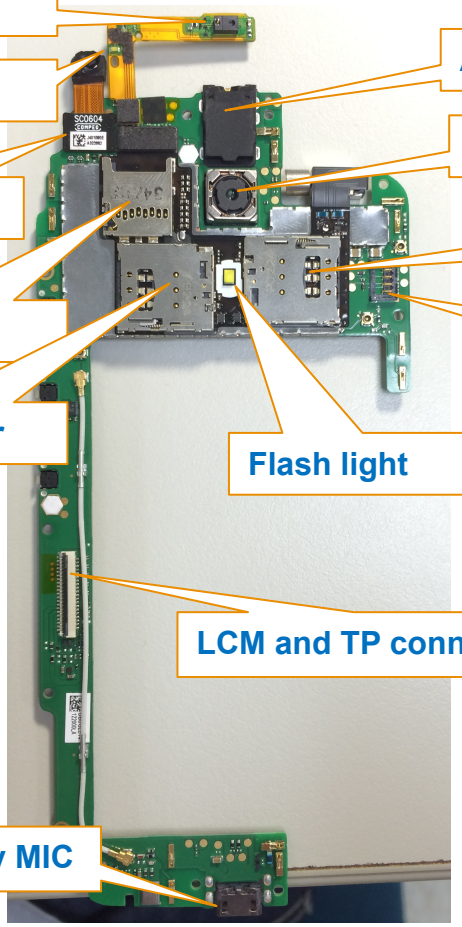
Top Side

(Battery side)

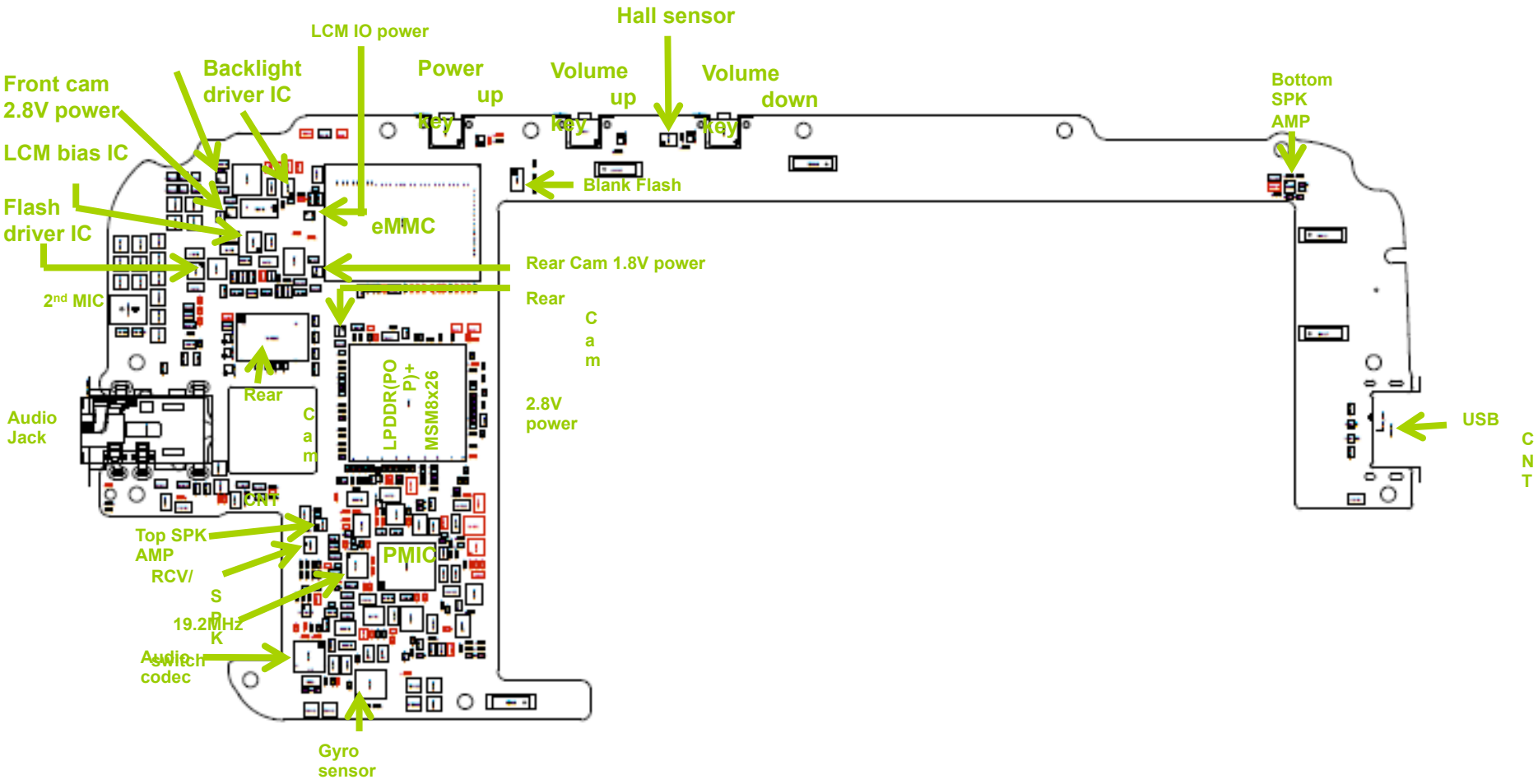


Bottom Side

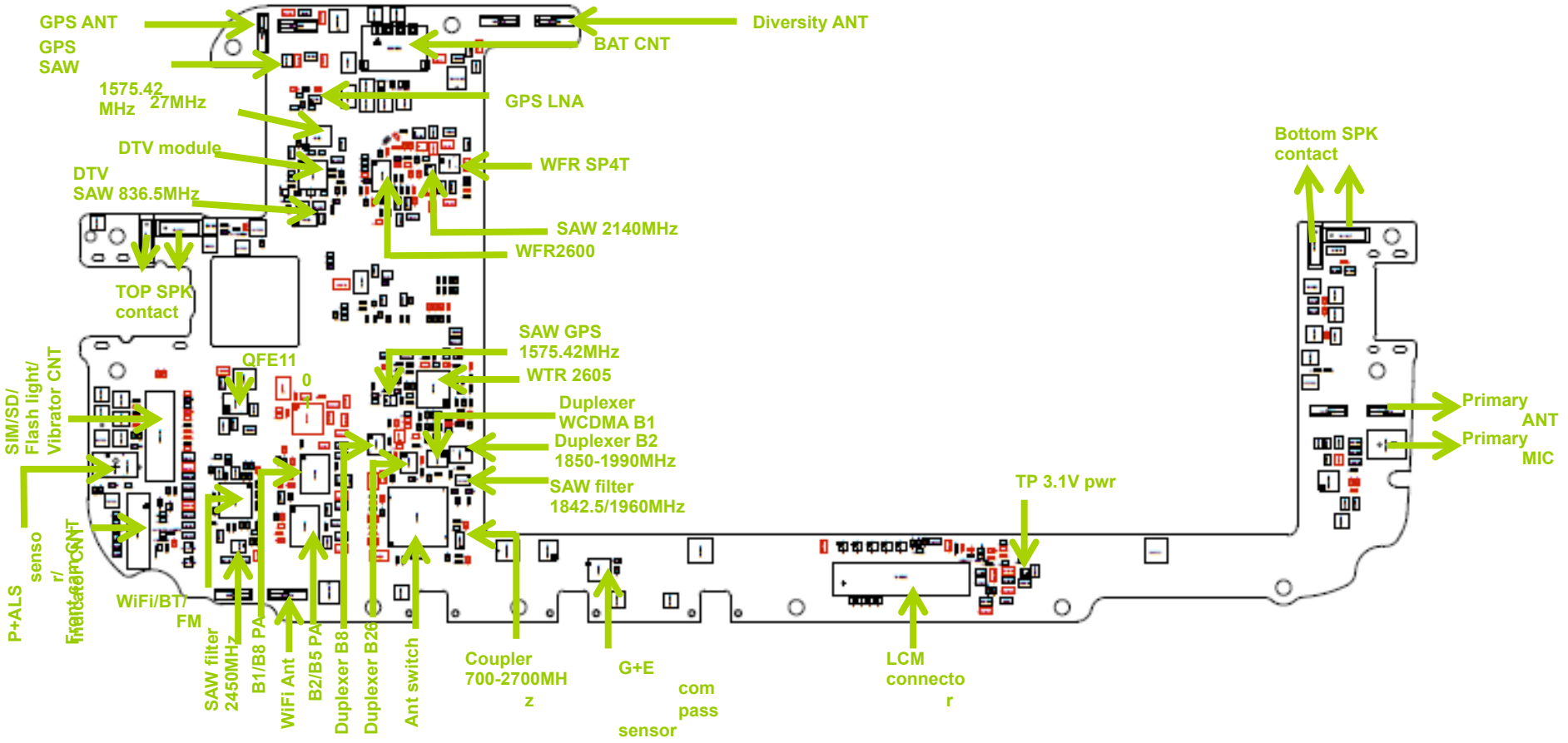
(Display side)



Main Board – Top Placement



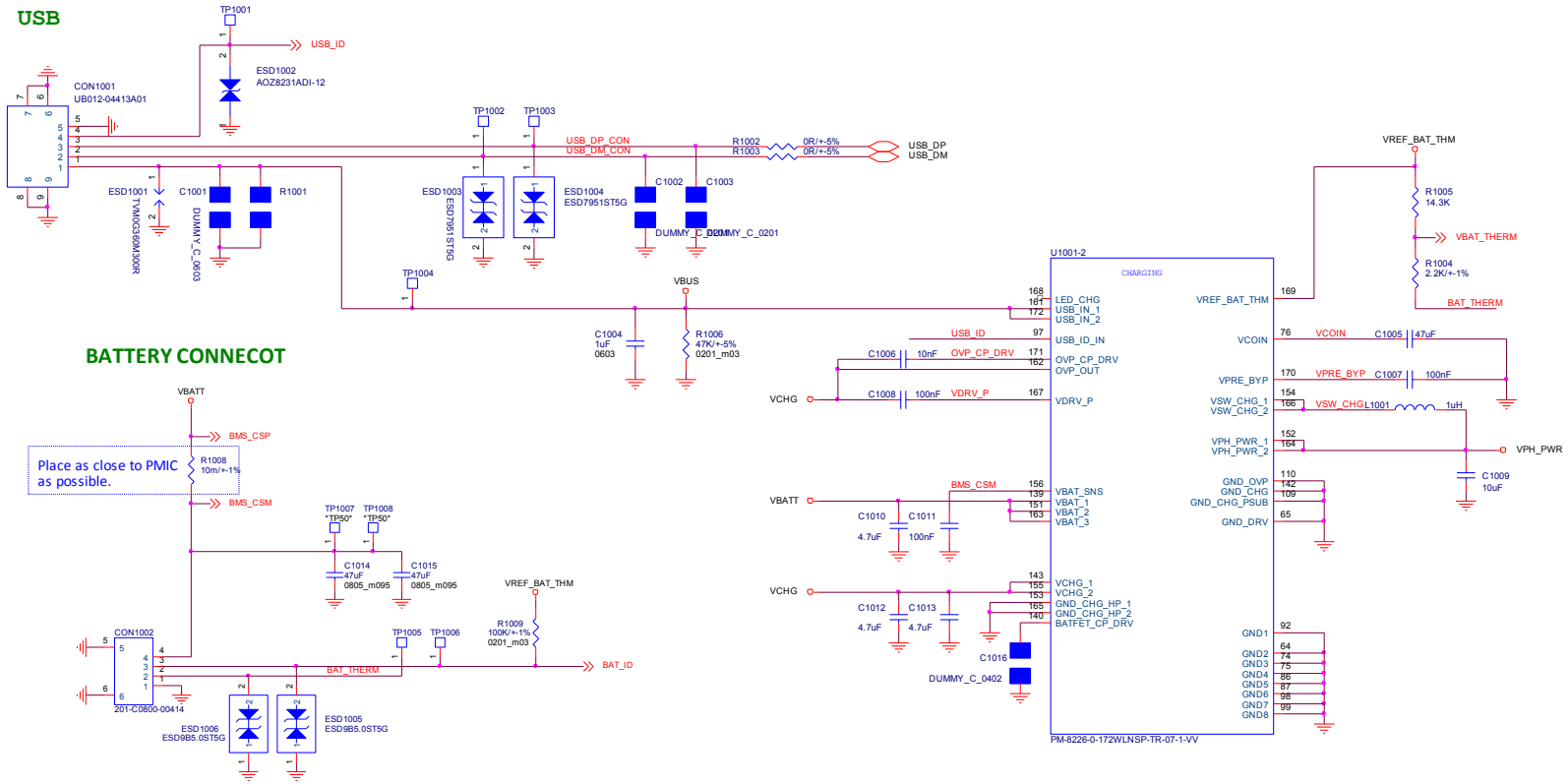
Main Board – Bottom Placement



CHARGING TROUBLESHOOTING

Charging Troubleshooting

Charge path: USB connector CON1001 pin 1-> U1001 (pin 161, 172) -> U1001 (pin 162) -> U1001 (pin 143,155) -> U1001 (pin 154,166) -> L1001 -> U1001 (pin 152, 164) -> U1001 (pin 139, 151, 163) -> R1008 -> CON1002 (pin 4)



Charging Troubleshooting

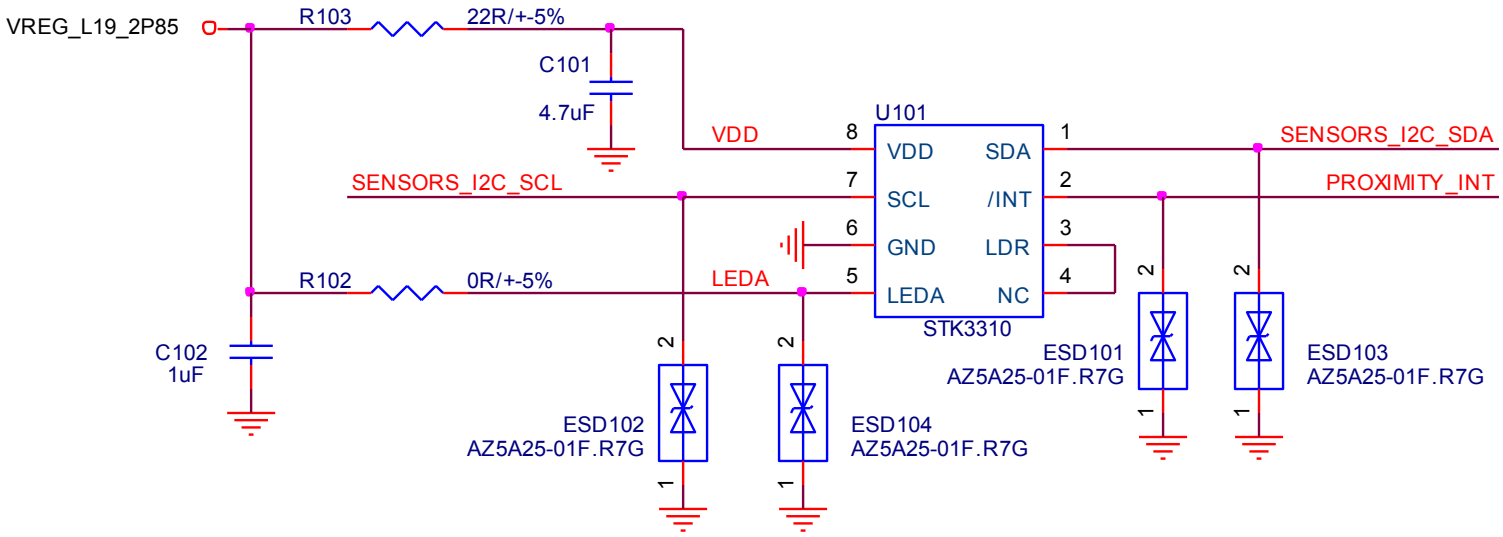
In the event of charging issues, check charging voltages along the charging path:

- Check the battery is inserted the CON1002 or not
  - Check battery ID voltage at TP1006 about 1V
  - Check thermistor voltage at TP1005 about 0.63V
- Measure USB_PWR charger input voltage at TP1004. The voltage should be between 4.75V~5.25V.
- Measure VCHG voltage at C1012. The voltage should be lower the USB_PWR.
- Check battery voltage at CON1002 pin4. It should be 4.35V or lower. If battery is 2.1 or 0, there maybe a short in the circuit somewhere. The battery fault safe circuit is triggered.

ALS + PROXIMITY SENSOR/ INDICATOR LED/ MICRO-SD/ MICRO-SIM/ TROUBLESHOOTING

ALS + Proximity sensor

- ALS + proximity sensor are built into U101
- MSM8226 U401 uses I2C bus to communicate to U101



I2C address: 0x48

ALS + Proximity sensor (cont.)

sensor wrong reading

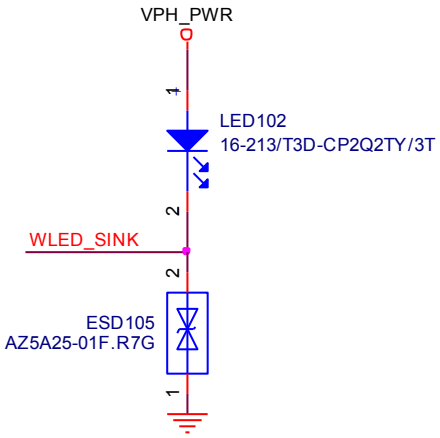
- Check I2C bus activities during ALS + proximity sensor access (SENSORS_I2C_SDA, SENSORS_I2C_SCL)
- Check CON101 on ALS + Proximity sensor FPC and CON2101 on phone board are corrected soldering

In the event of ALS + proximity sensor issue at phone level:

- Check for missing/missed alignment of rubber seal
- Missing/missed alignment of rubber seal can cause ALS + proximity sensor wrong reading

Indicator LED

- Status white LEDs is driven by U1001 PM8226 MPP_4 (pin 157)

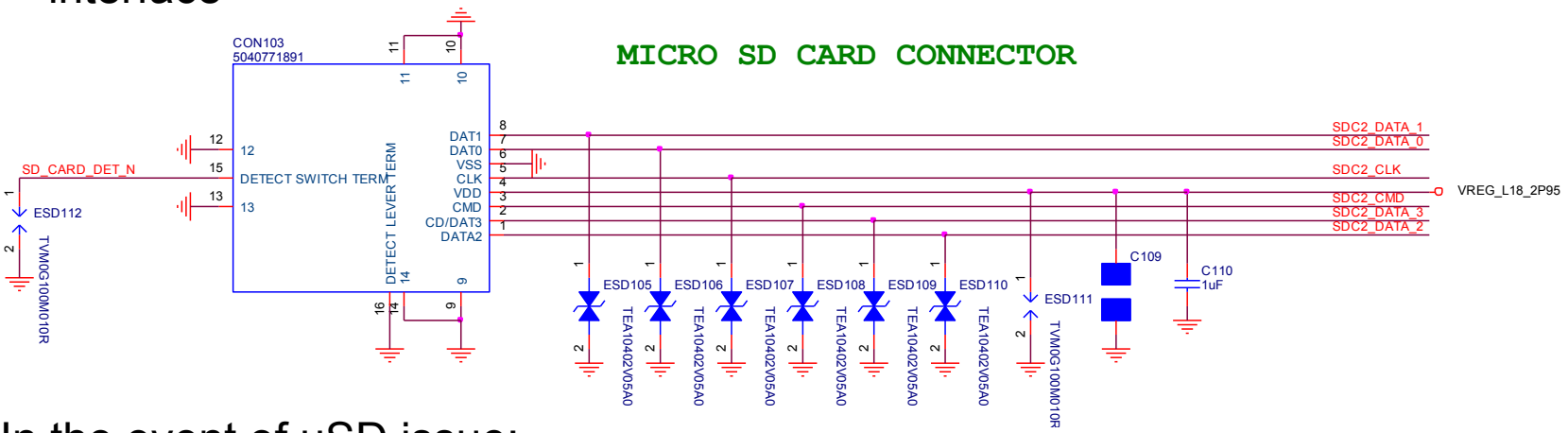


In the event of white status LED issue:

- Check voltage at LED Anode (pin 2) and Cathode (pin 1) of LED102
- LED Anode voltage = VPH_PWR and Cathode voltage = VPH_PWR –
  In the event of white status LED issue:

Micro-SD

- uSD connector is operated with its own power, detection and SDC bus interface



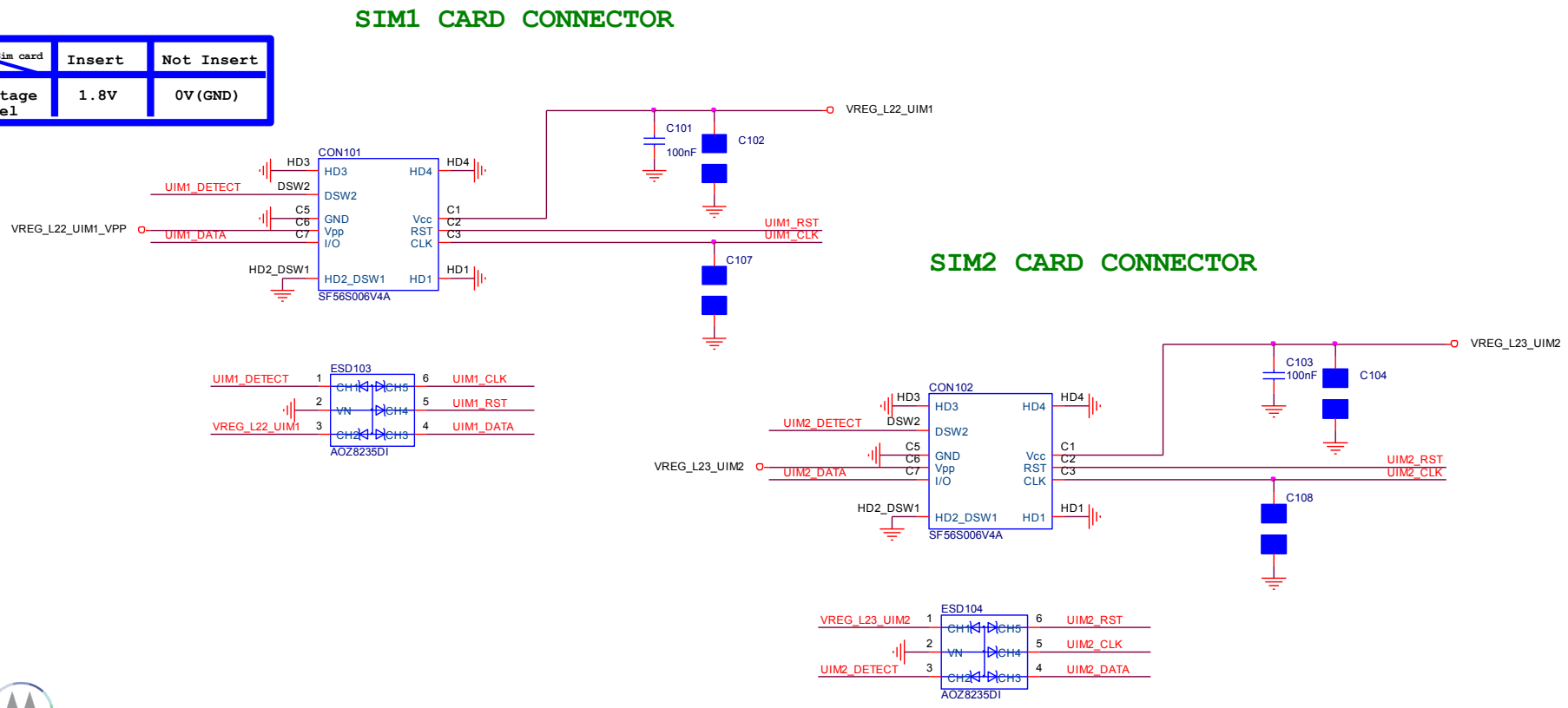
In the event of uSD issue:

- Do a through visual check on uSD connector CON103 for any sign of mechanical contact issues
- Insert uSD and detected SD_CARD_DET_N=low at TP1711
- Check the voltage VREG_L18_2P95 at TP1712 on board level
- Check uSD bus interface signal activities during uSD access (SDC_CLK, SDC_CMD, uSD_DATA)

SIM

- Depending on the PCB board variant, there are up to 2 SIM connectors on PCB board
- Each SIM connector is operated independently with its own power, detection and SIM bus interface

Sim card / Sim Det	Insert	Not Insert
Voltage Level	1.8V	0V(GND)



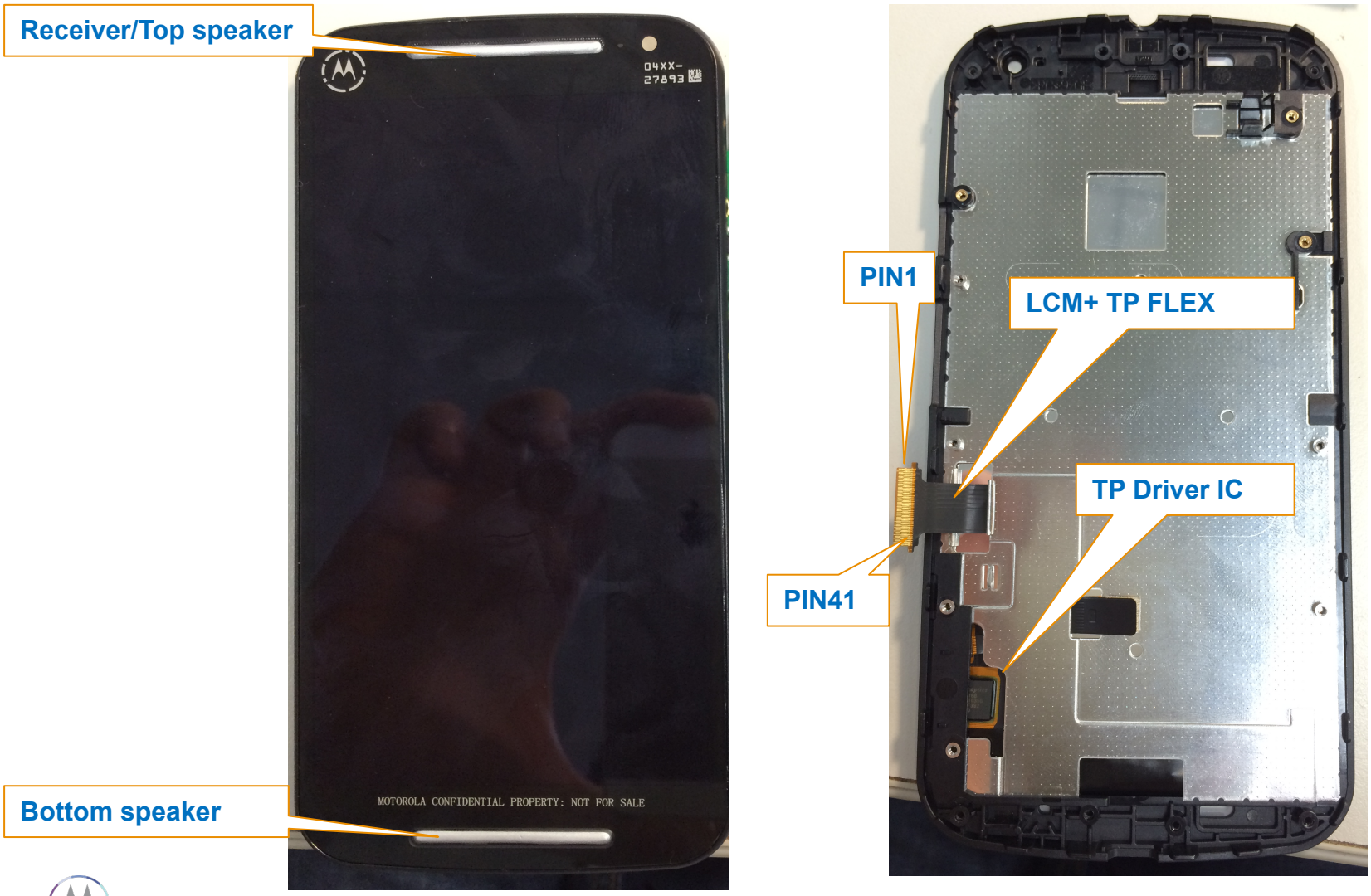
SIM (cont.)

In the event of SIM issue:

- Do a through visual check on SIM connector CON101/CON102 for any sign of mechanical contact issues
- Check SIM power at TP1701/ TP1714 and SIM card detection signal TP1705/ TP1718 (active HIGH when SIM card is inserted)
- Check SIM bus interface signal activities during SIM access (UIMx_RST, UIMx_CLK, UIMx_DATA)

TOUCH AND DISPLAY TROUBLESHOOTING

Module Shape



Assembly


MOTOROLA
ED30
Li-ion
SNN5932A
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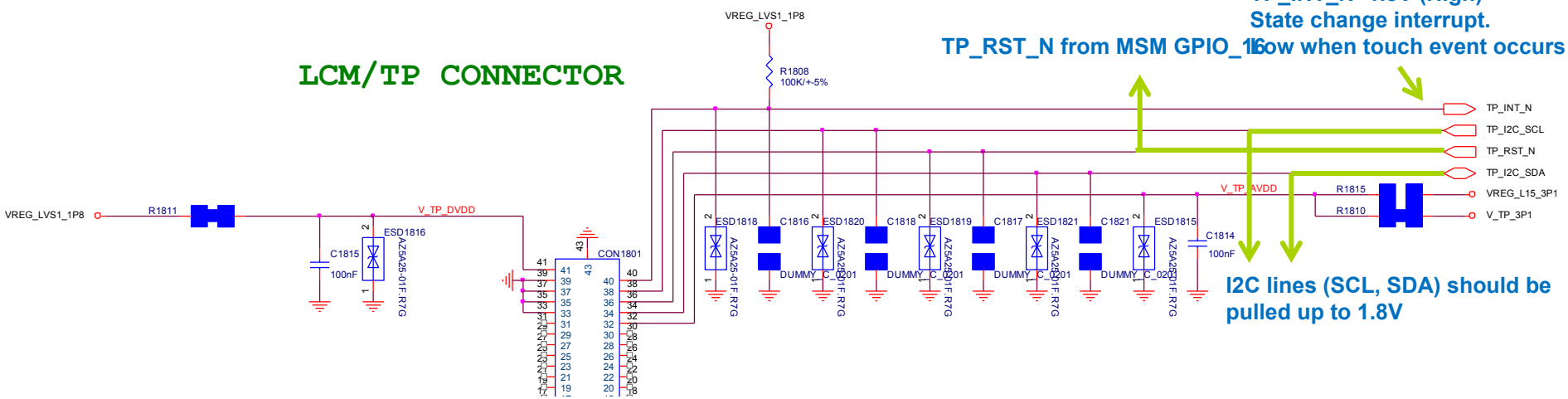
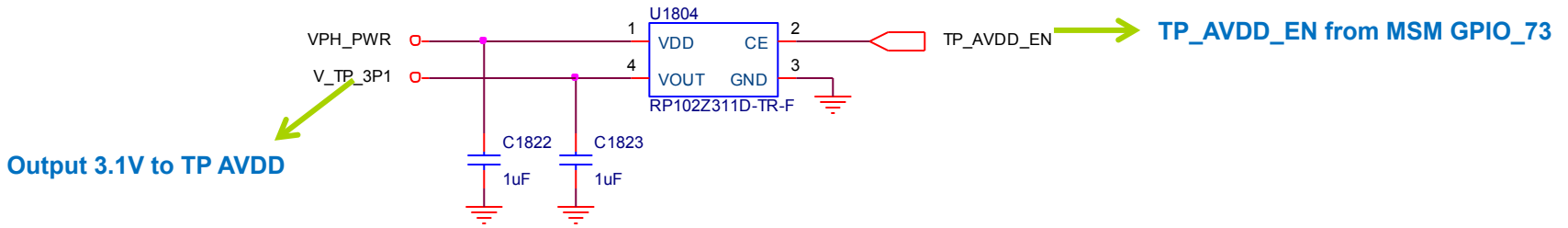
MFR: PRO-POWER COMMUNICATION CO. LTD
MOTOROLA CONFIDENTIAL PROPERTY: NOT FOR SALE

Schematic on Touch Panel Connector

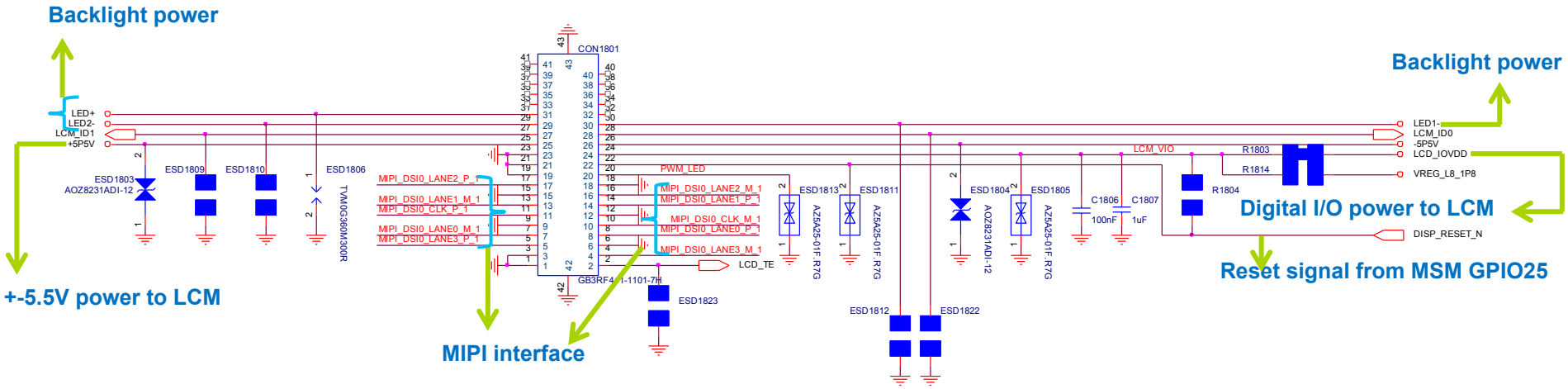




Troubleshooting

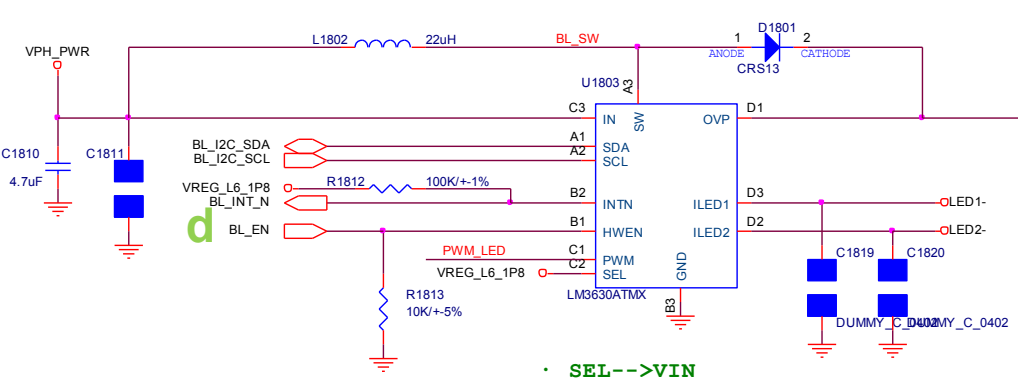
- No touch:
  1) Check touch connector and flexes on display flex and board level connector CON1801
  2) Check power supply voltages;
     a. V_TP_3P1(C1823) = 3.1V
     b. VREG_LVS1_1P8 (C1815) = 1.8V
  3) Measure INT, RST,I2C signal are correct

Schematic on LCM Connector



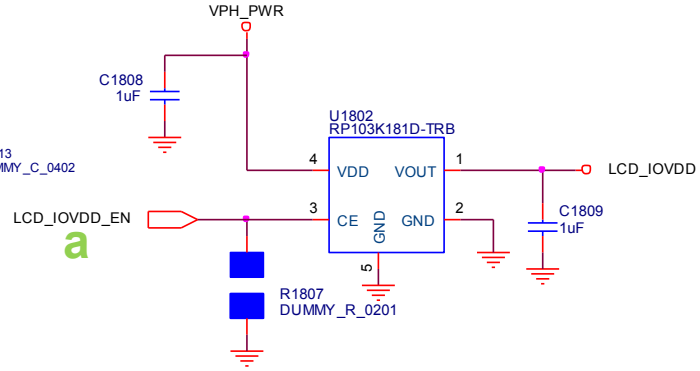
Schematic on LCM Power (+/-5.5V, LED+,LED-,LED2-,LCD_IOVDD)

Back Light IC(Boost)



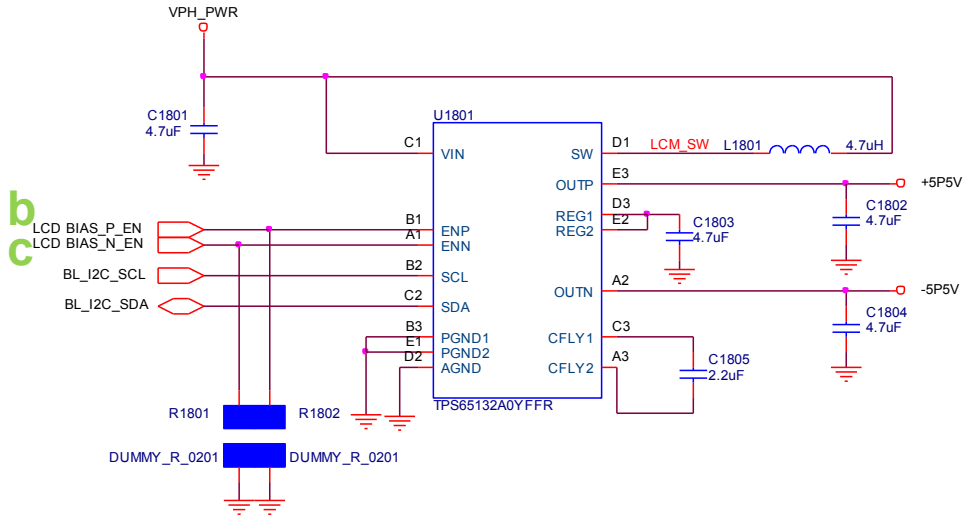
- SEL-->VIN
  I2C address: 0x38
- SEL-->GND
  I2C address: 0x36

LCM IO POWER



Troubleshooting Tips:

a. LCD_IOVDD_EN GPIO_10 (R1807)
b. LCD BIAS_P_EN GPIO_12 (R1802)
c. LCD BIAS_N_EN GPIO_13 (R1801)
d. BL_EN GPIO_5 (R1813)
   above signal are from MSM when the LCM on, enable signal should be pull up to 1.8V
e. I2C lines (SCL, SDA) should be pulled up to 1.8V



Troubleshooting

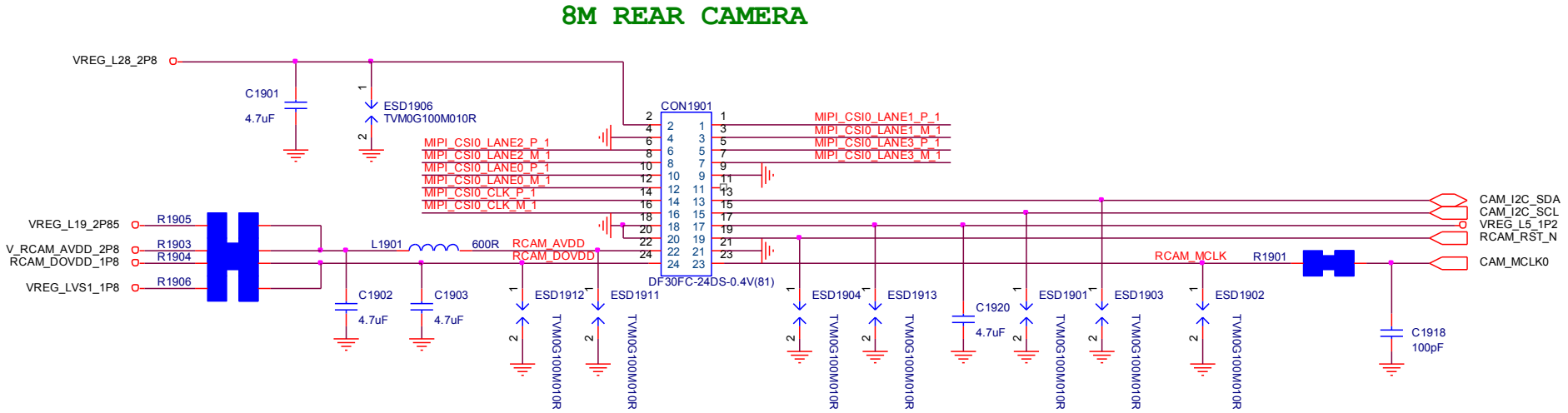
- No display:
  1. Check Backlight Power Supply voltages:
     a. LED+ (C1812)
     b. LED1- (C1819)
     c. LED2- (C1820)
  2. Check LCM Power Supply voltages:
     a. +5.5V (C1802)
     b. -5.5V (C1804)
     c. LCD_IOVDD (C1809)
- Check to make sure there is data activity on all MIPI differential pair lines while display is on (TP1801,TP1802,TP1803,TP1804).
- Check reset line CON1801 pin 22. It should be set high (1.8V) after power on.

CAMERA TROUBLESHOOTING

Rear Camera

- The image sensor is a diagonal 5.7 mm (Type 1/3.2) CMOS active pixel type image sensor with a square pixel array and 8.08M effective pixels.
- The sensor consists of a minimum of 3280 active horizontal pixels and 2464 active vertical pixels.
- This module has an Auto Focus (AF) module with integrated driver (VCM).
- Data interface: (1 pair-clk, 4 pair-data) mobile industry processor interface (MIPI). I2C is used for control.
- Analog Supply regulator (2.8V) located on Main PCB.

Rear Camera (cont.)



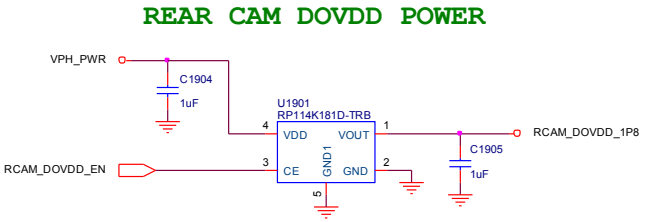
When rear camera assemble correctly and app turn on, there is no function

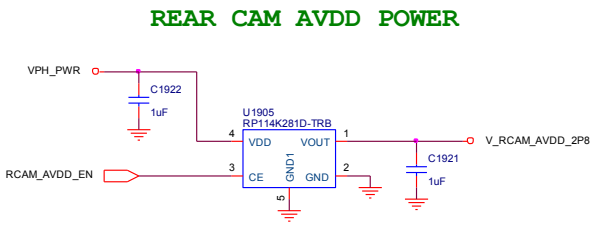
Troubleshooting Tips1:

a. Check Main reference clk = 24Mhz
b. Check MIPI data/clk exist on all lines
   After imager APP is launched.
c. Check VREG_L5_1P2 is high (1.2V), C1920
d. Check V_RCAM_AVDD_2P8= 2.8V, L1901
e. Check RCAM_DOVDD_1P8 = 1.8V, C1903
f. Check VREG_L28_2P8 = 2.8V, C1901
g. Check I2C clk/sda activity is present.
h. Check reset is high (1.8V), CON1901 pin19

Troubleshooting Tips2:

a. RCAM_AVDD_EN (GPIO_27)
b. RCAM_DOVDD_EN (GPIO_33)
   above signal are from MSM when the LCM on,
   enable signal should be pull up to 1.8V

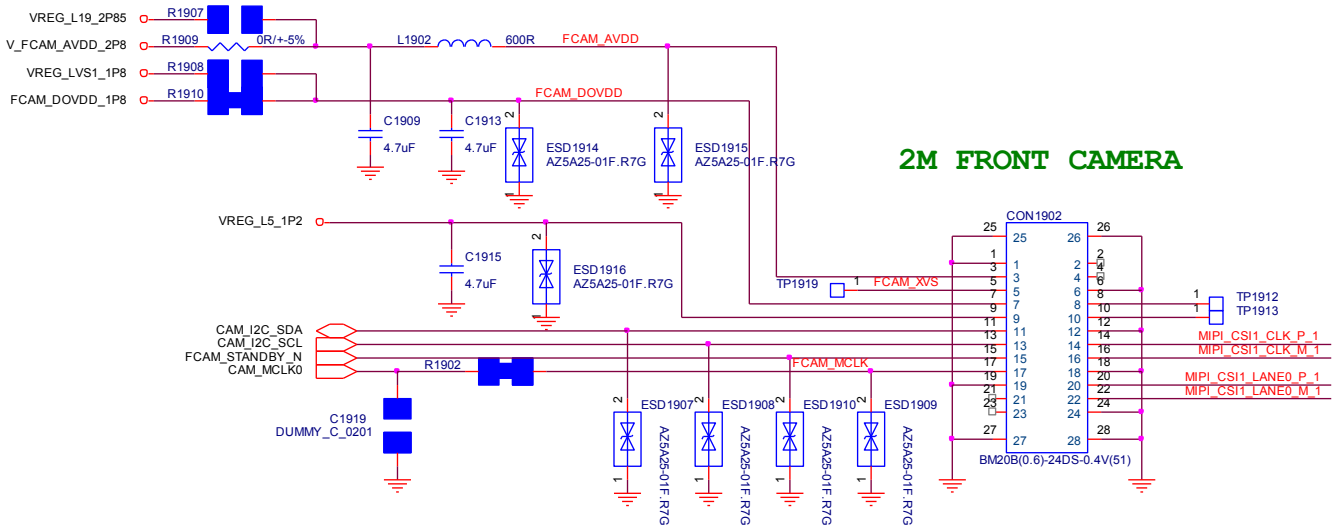




Front Camera

- The sensor is a diagonal 2.59 mm (Type 1/6.95) back-illuminated type CMOS image sensor with a square pixel array and approx. 2.4 M effective pixels.
- The sensor consists of a minimum of 1976 active horizontal pixels and 1200 active vertical pixels.
- The Module is capable of auto exposure, white balance, color correction, and color conversion.
- This device provides a finished image at up to 30 fps (frames per second) image data at 1976x1200 full resolution on a mobile device to enable image capture and video clip capture.
- Analog Supply regulator (2.8V) located on PCB.

Front Camera (cont.)



When front camera assemble correctly and app turn on, there is no function

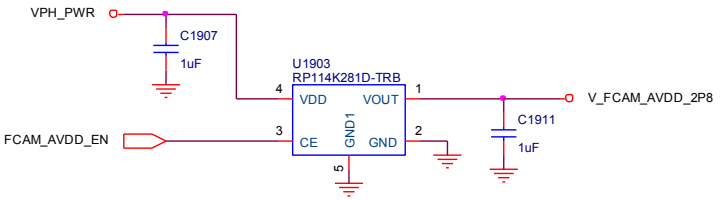
Troubleshooting Tips1:

a. Check CAM_MCLK0 = 24Mhz, C1919
b. Check MIPI data/clk exist on all lines
After imager APP is launched.
c. Check VREG_L5_1P2 is high (1.2V), C1915
d. Check V_FCAM_AVDD_2P8= 2.8V, L1902
e. Check FCAM_DOVDD_1P8= 1.8V, C1913
f. Check I2C clk/sda activity is present.
g. Check reset is high (1.8V), CON1902 pin15

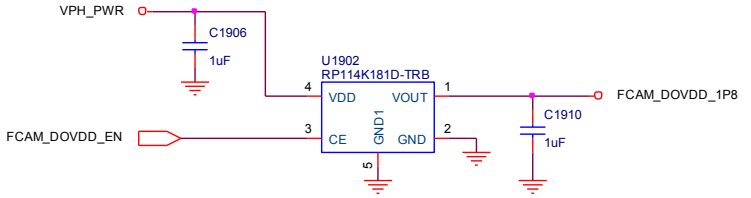
Troubleshooting Tips2:

a. FCAM_AVDD_EN (GPIO_34)
b. FCAM_DOVDD_EN (GPIO_36)
above signal are from MSM when the LCM on, enable signal should be pull up to 1.8V

FRONT CAM AVDD POWER



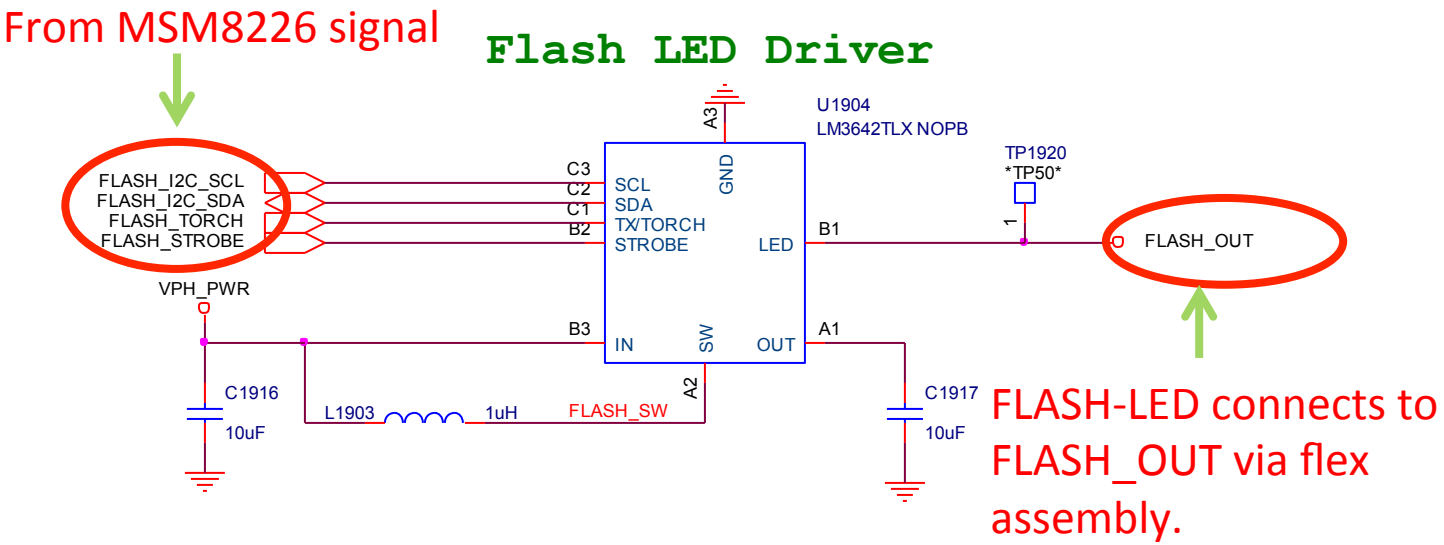
FRONT CAM DOVDD POWER



FLASH-LED

- Flash LED Driver used for camera flash
- Still image flash controlled via SW control programming MSM8226 GPIOs.
- Torch Mode (LED continuously on in video mode) controlled via MSM8226 GPIOs.
- Flash duration and brightness configured via I2C.
- Low current torch mode used for image pre-capture.

FLASH-LED



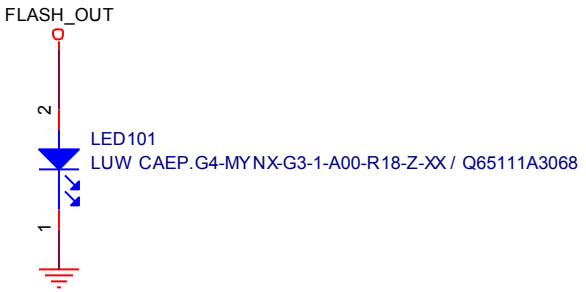
Troubleshooting Tips:

Check VPH_PWR supply (always on).

Check output voltage on FLASH_OUT is about 3.0V at TP1920 when FLASH event is enabled.

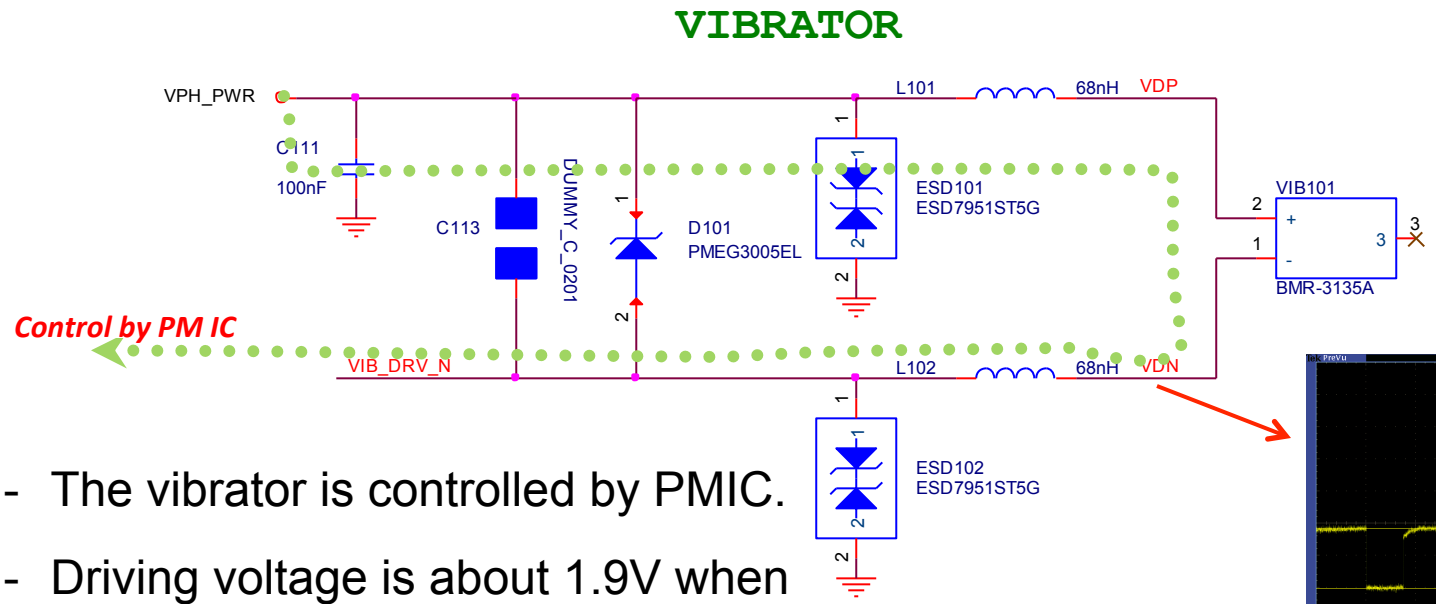
Check CON1701 are making good connection with FLASH-LED assembly.

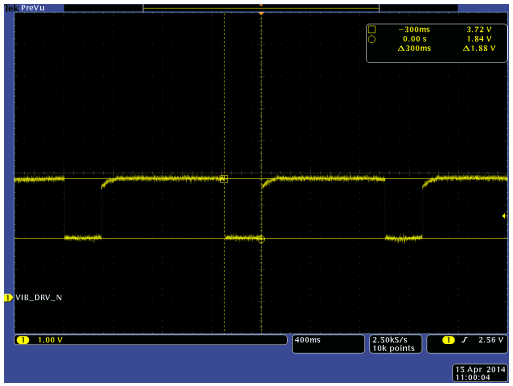
FLASH LED



VIBRATOR AND SENSORS TROUBLESHOOTING

Vibrator

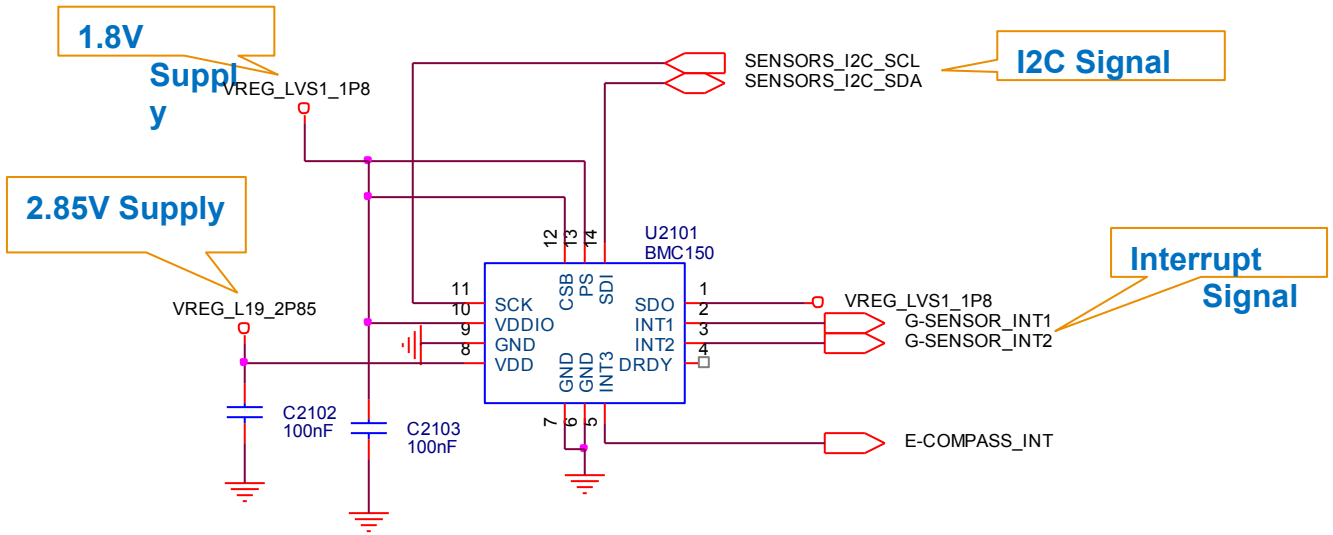




- The vibrator is controlled by PMIC.
- Driving voltage is about 1.9V when alert operation event occur.

- Troubleshooting tips
  - No operation: Check driving voltage and check if vibrator shaft is bent.
  - Noisy operation: Check if vibrator shaft is bent.

Sensor – G + E-Compass

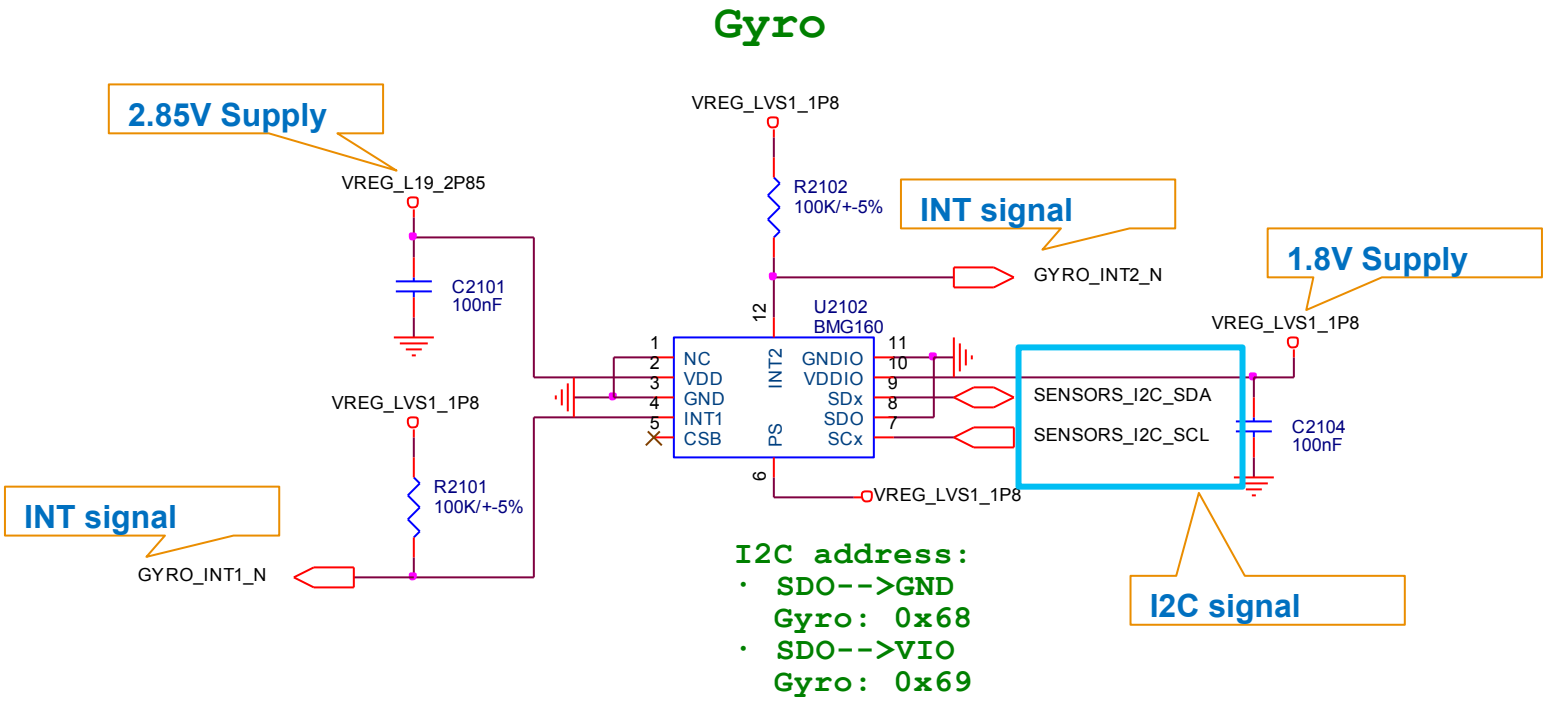


I2C address:

- SDO-->VIO
  G-Sensor: 0x11 E-Compass: 0x13
- SDO-->GND
  G-Sensor: 0x10 E-Compass: 0x12

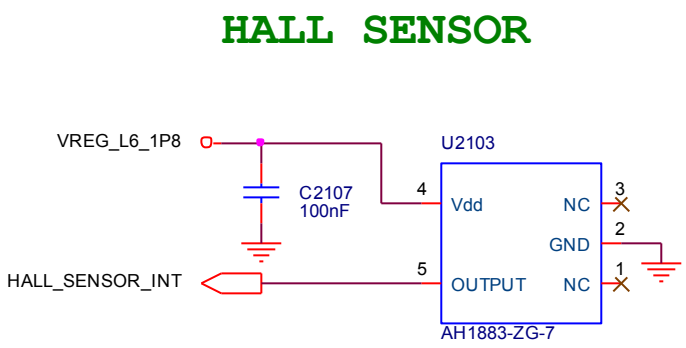
- Troubleshooting tips
  - No operation: Check if supply voltages (VREG_LVS1_1P8=1.8 and VREG_L19_2P85= 2.85) are correct.
  - Check if I2C and interrupt signals are operating when the sensor is in operation mode.

Sensor – Gyro



- Troubleshooting tips
  - No operation: Check if supply voltages (VREG_LVS1_1P8=1.8 and VREG_L19_2P85= 2.85) are correct.
  - Check if I2C and interrupt signals are operating when the sensor is in operation mode.

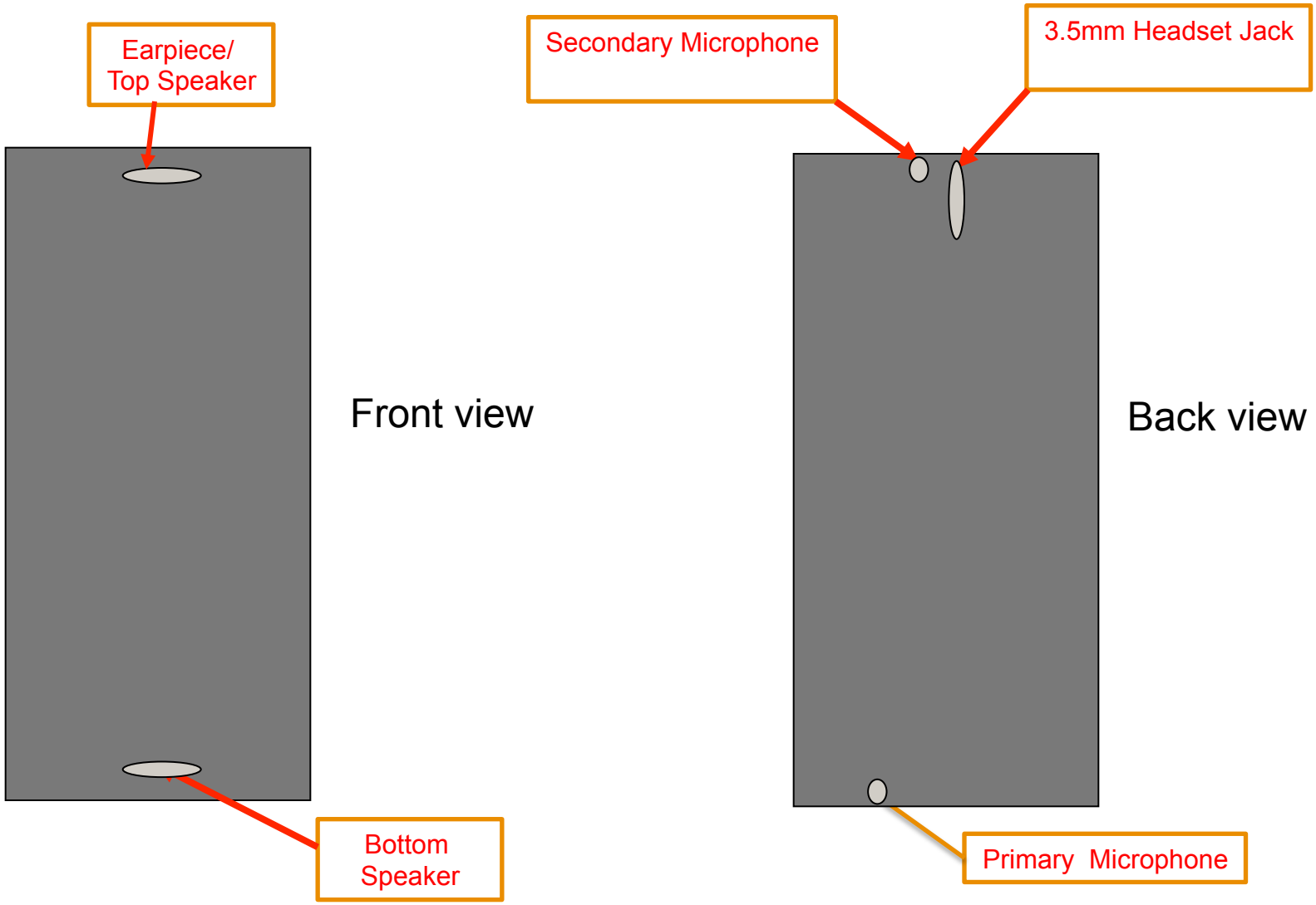
Sensor – Hall Effect Sensor



- Troubleshooting tips
  - No operation: Check supply voltage VREG_L6_1P8 = 1.8
  - Check if HALL_SENSOR_INT goes low when a magnetic is closed.

AUDIO TROUBLESHOOTING

Audio Devices

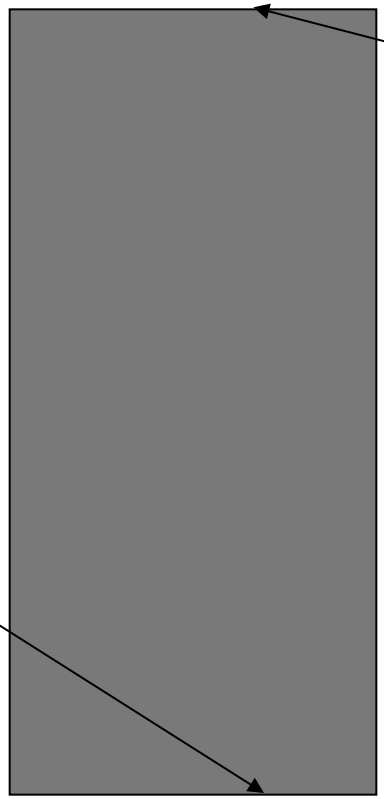


Mic Locations and Functions

Functional Name: Secondary Microphone

Factory Nomenclature: Noise cancelling mic, mic 2

Uses:
- Noise suppression for voice calls
- Multimedia audio recording



Functional Name: Main Microphone

Factory Nomenclature: Primary, mic 1

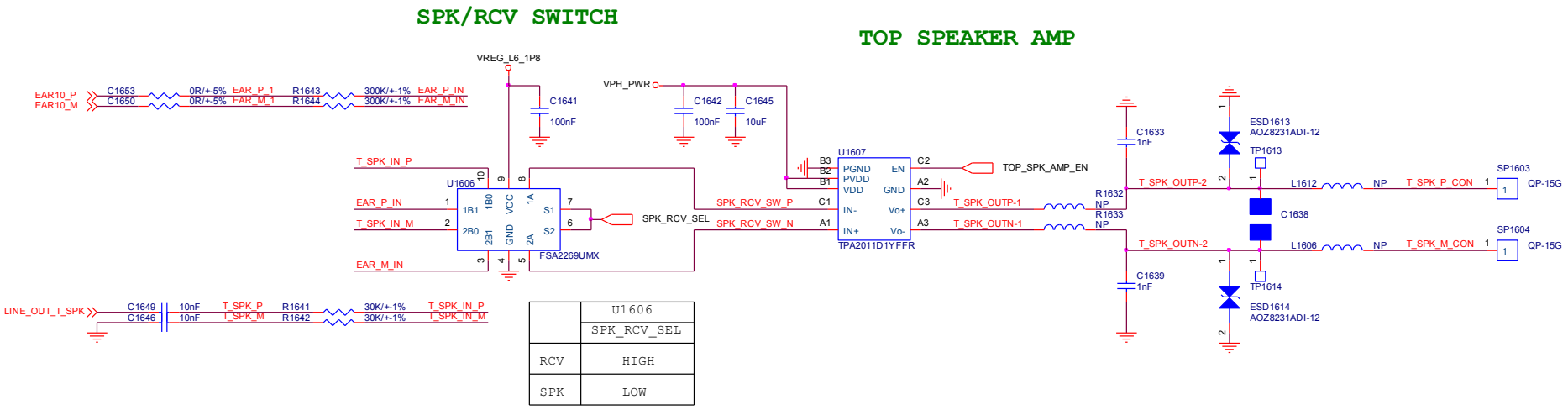
Uses:
- Speech in handset and speakerphone modes

Front view

“No Audio” Complaints

- The FQC mode can be used to verify a broken audio path.
  - The “Receiver Test” for receiver function testing
  - The “Speaker Test” for speaker function testing
  - The “Headset loopback Test” for headset function testing
  - The “Mic1 Headset loopback Test” for MIC1 function testing
  - The “Mic2 Headset loopback Test” for MIC2 function testing
- If someone function is not work, this function may be damaged.

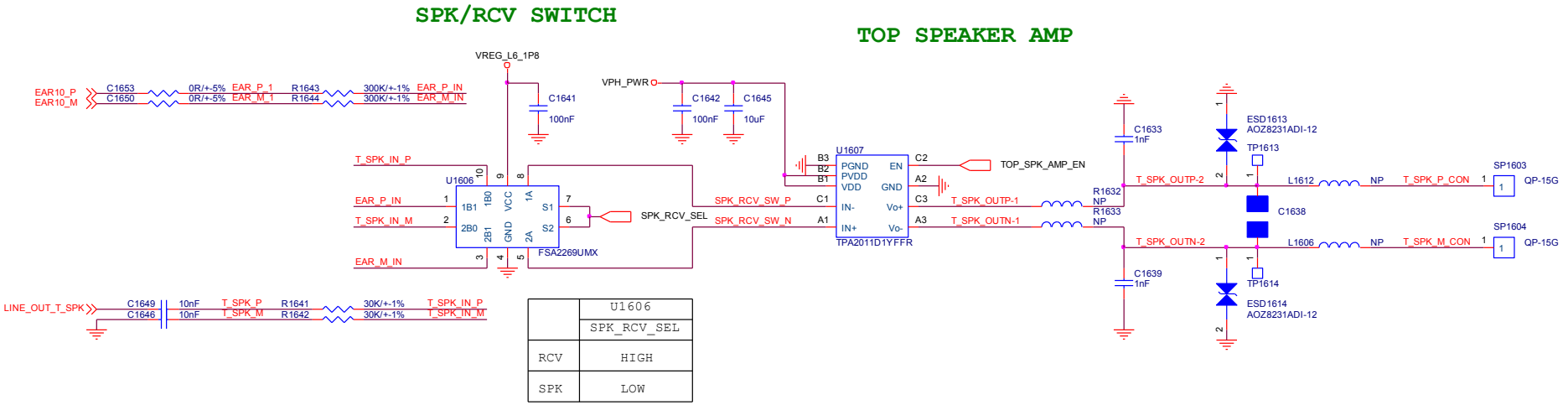
Earpiece Speaker (Receiver)



	U1606
	SPK_RCV_SEL
RCV	HIGH
SPK	LOW

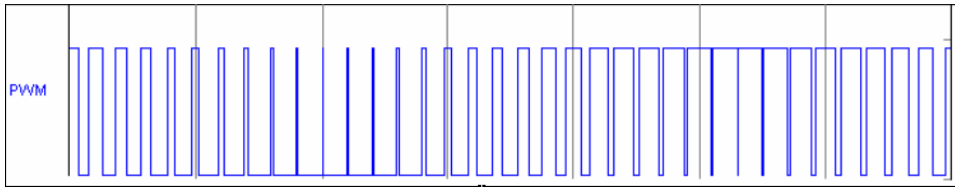
- Checking if any open happened on the earpiece speaker series components.
- Checking if any short to ground happened in the shunt components

Top Speaker

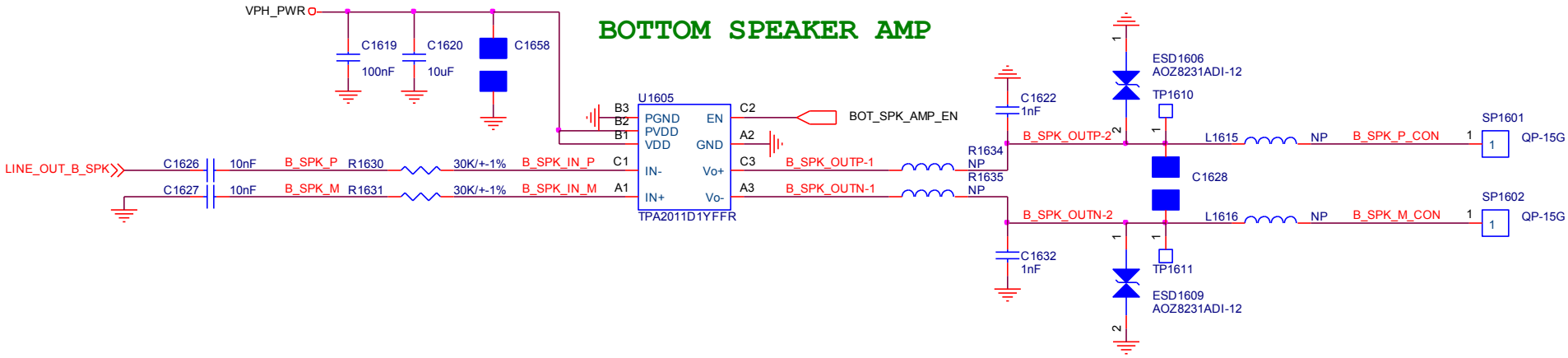


	U1606
	SPK_RCV_SEL
RCV	HIGH
SPK	LOW

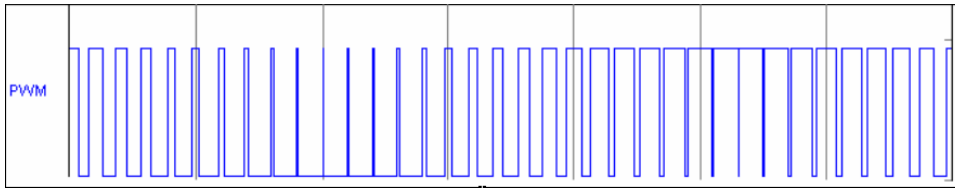
- Checking if any open happened on the speaker series components
- Checking if any short to ground happened in shunt components
- The loudspeaker can be probed at TP1613 and TP1614
- The impedance of the loudspeaker should be around 8Ω when probing on component
- The output is a class D waveform (sample wave shown below)



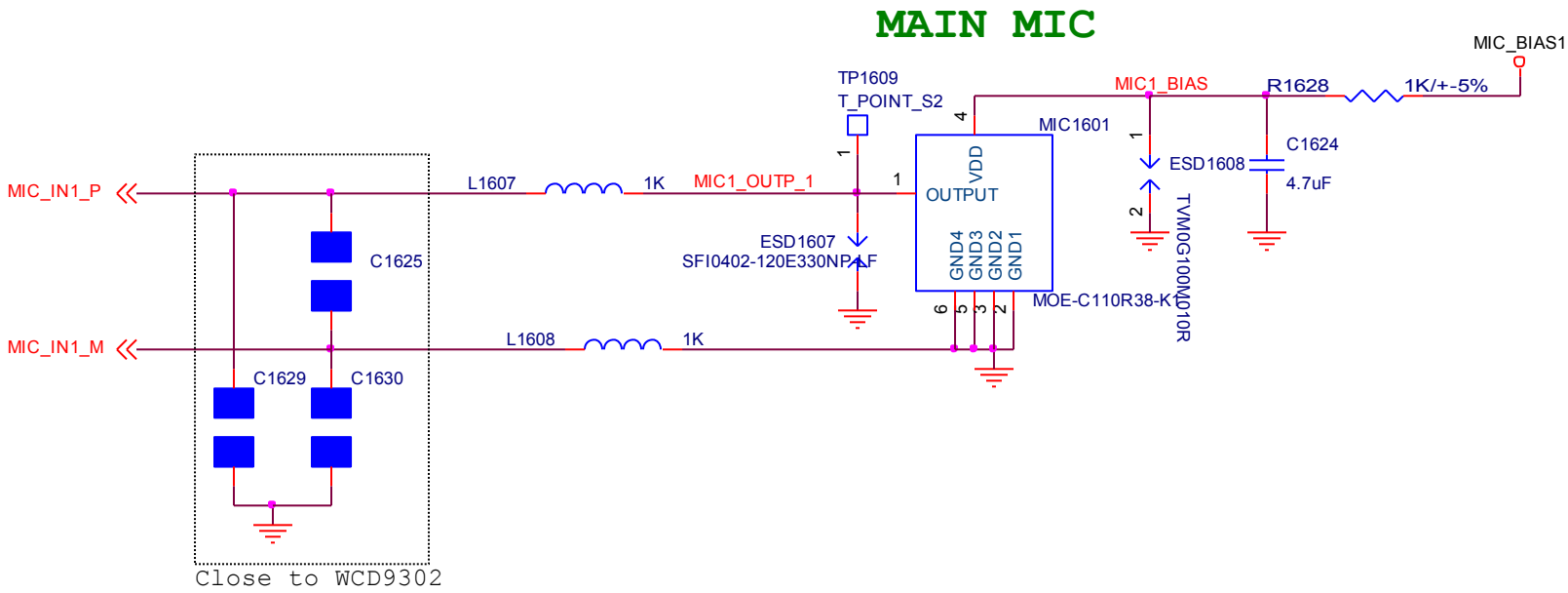
Bottom Speaker



- Checking if any open happened on the speaker series components
- Checking if any short to ground happened in the shunt components
- The loudspeaker can be probed at TP1610 and TP1611
- The impedance of the loudspeaker should be around 8Ω when probing on component
- The output is a class D waveform (sample wave shown below)



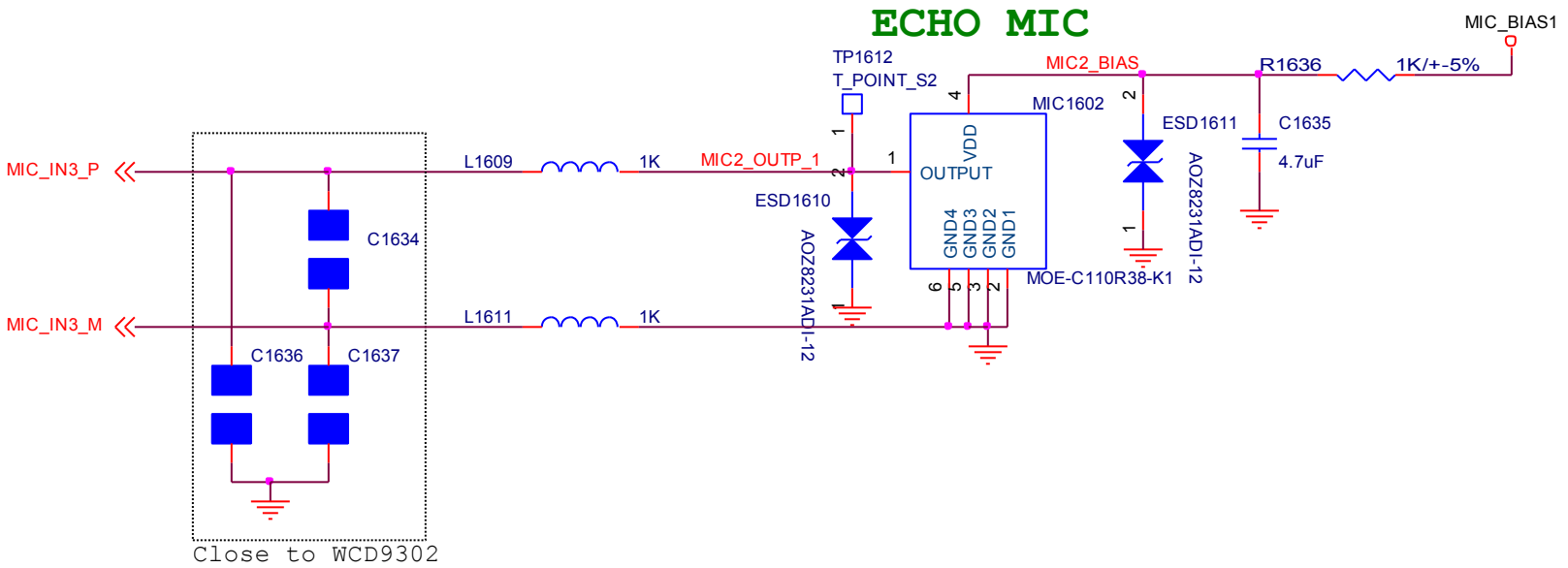
Primary Microphone



If the Primary mic is not functioning…

- Check mic bias at C1624. This should be 1.8V when the microphone is enabled.
- Check the microphone assembly to make certain it is not damaged, which may indicate a broken diaphragm

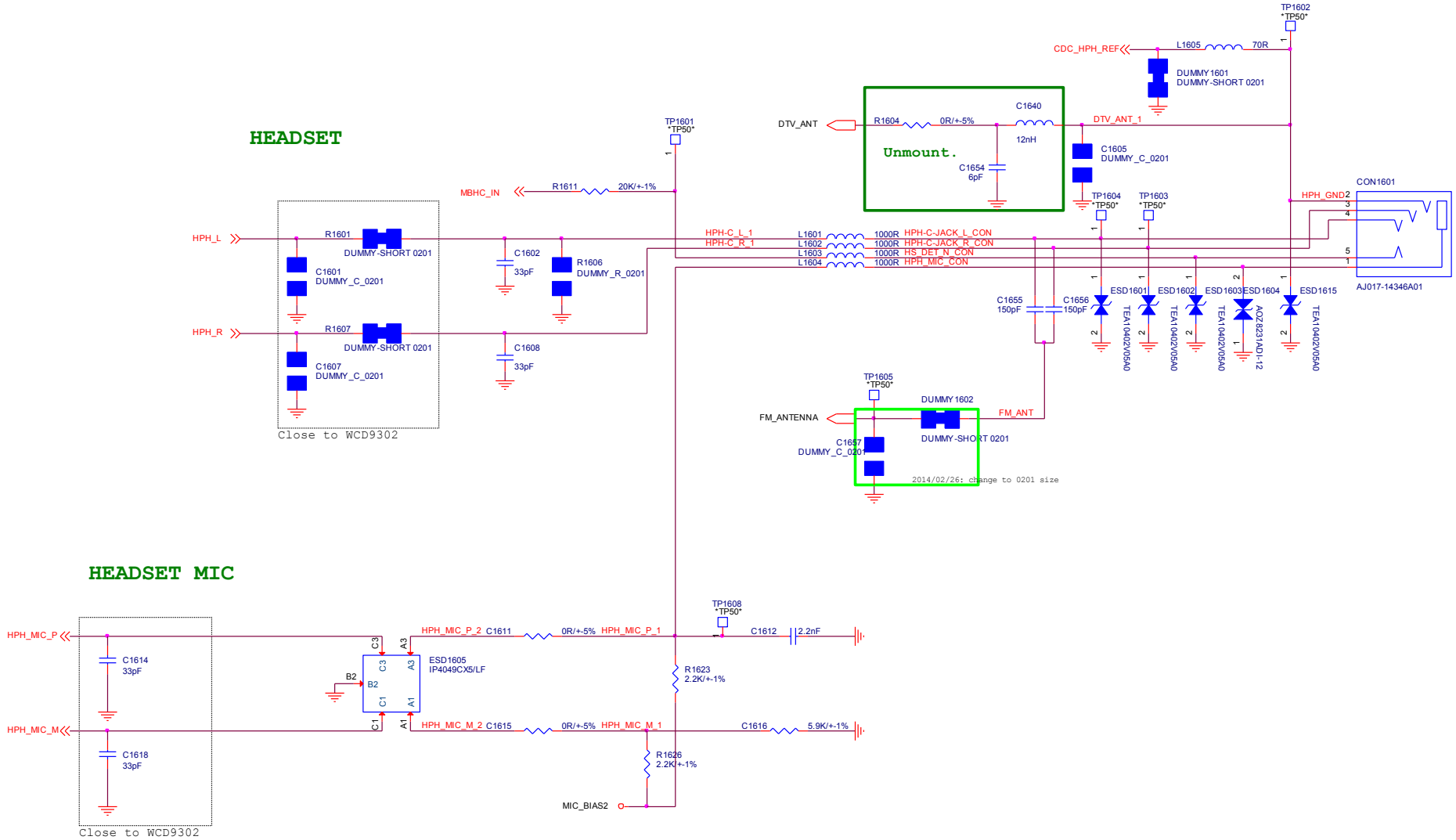
Secondary Microphone



If the Secondary mic is not functioning…

- Check mic bias at C1635. This should be 1.8V when the microphone is enabled.
- Check the microphone assembly to make certain it is not damaged, which may indicate a broken diaphragm

3.5mm Headset

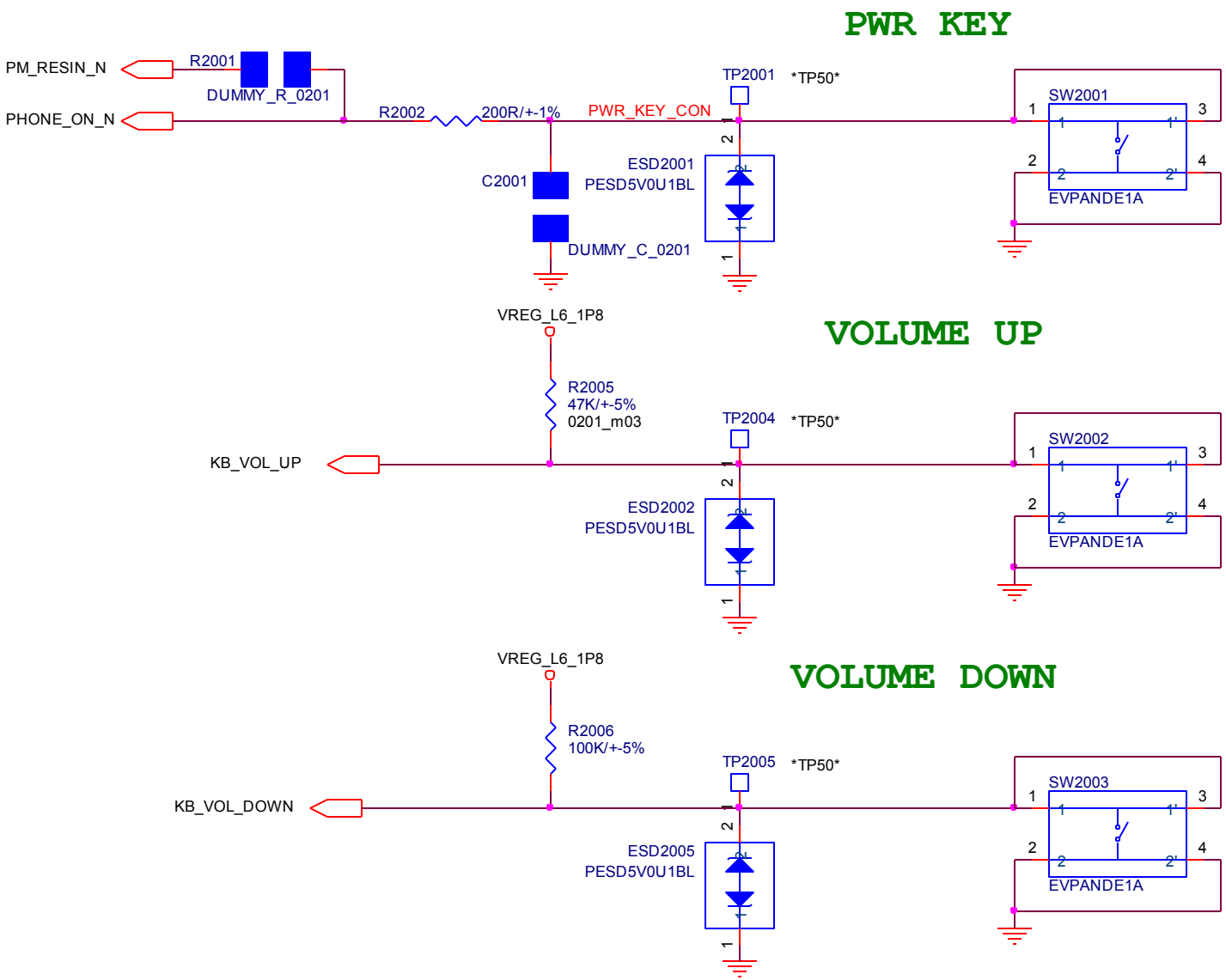


Debug Procedure: Headset

- **At built level:**
- Check the pins on the headset jack for any bent pins or missing pins.

- **On the PCB:**
- Checking if any open happened on the earpiece speaker series components.
- Checking if any short to ground happened in the shunt components

Key TROUBLESHOOTING


PWR KEY
PM_RESIN_N
R2001
DUMMY_R_0201
PHONE_ON_N
R2002
200R/+-1%
PWR_KEY_CON
TP2001
TP50
SW2001
C2001
ESD2001
PESD5V0U1BL
DUMMY_C_0201
EVPANDE1A
VOLUME UP
VREG_L6_1P8
R2005
47K/+-5%
0201_m03
KB_VOL_UP
TP2004
TP50
SW2002
ESD2002
PESD5V0U1BL
EVPANDE1A
VOLUME DOWN
VREG_L6_1P8
R2006
100K/+-5%
KB_VOL_DOWN
TP2005
TP50
SW2003
ESD2005
PESD5V0U1BL
EVPANDE1A

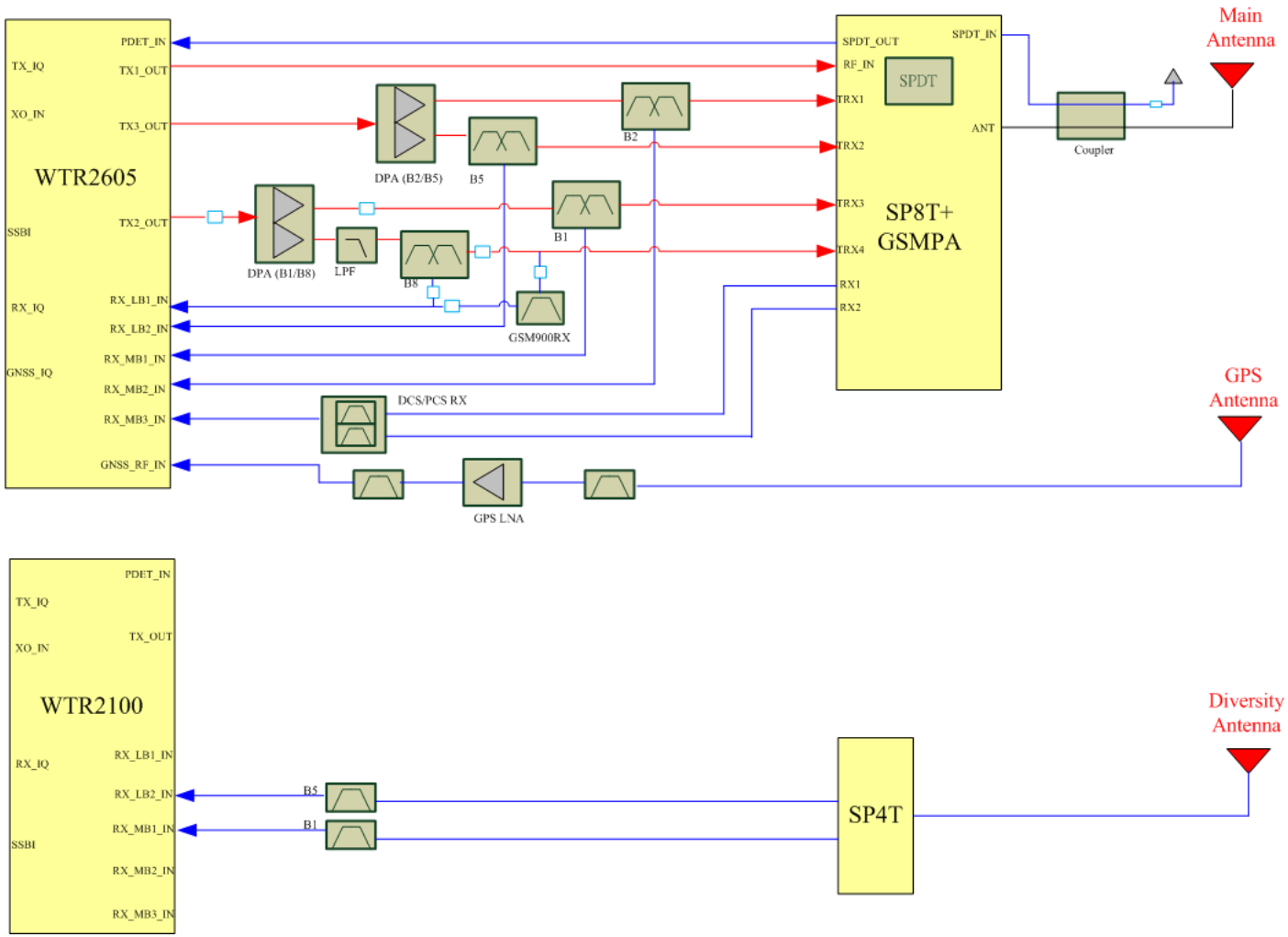
Debug Procedure

- **At built level:**
- Check the pins on the keys for any bent or missing pins.

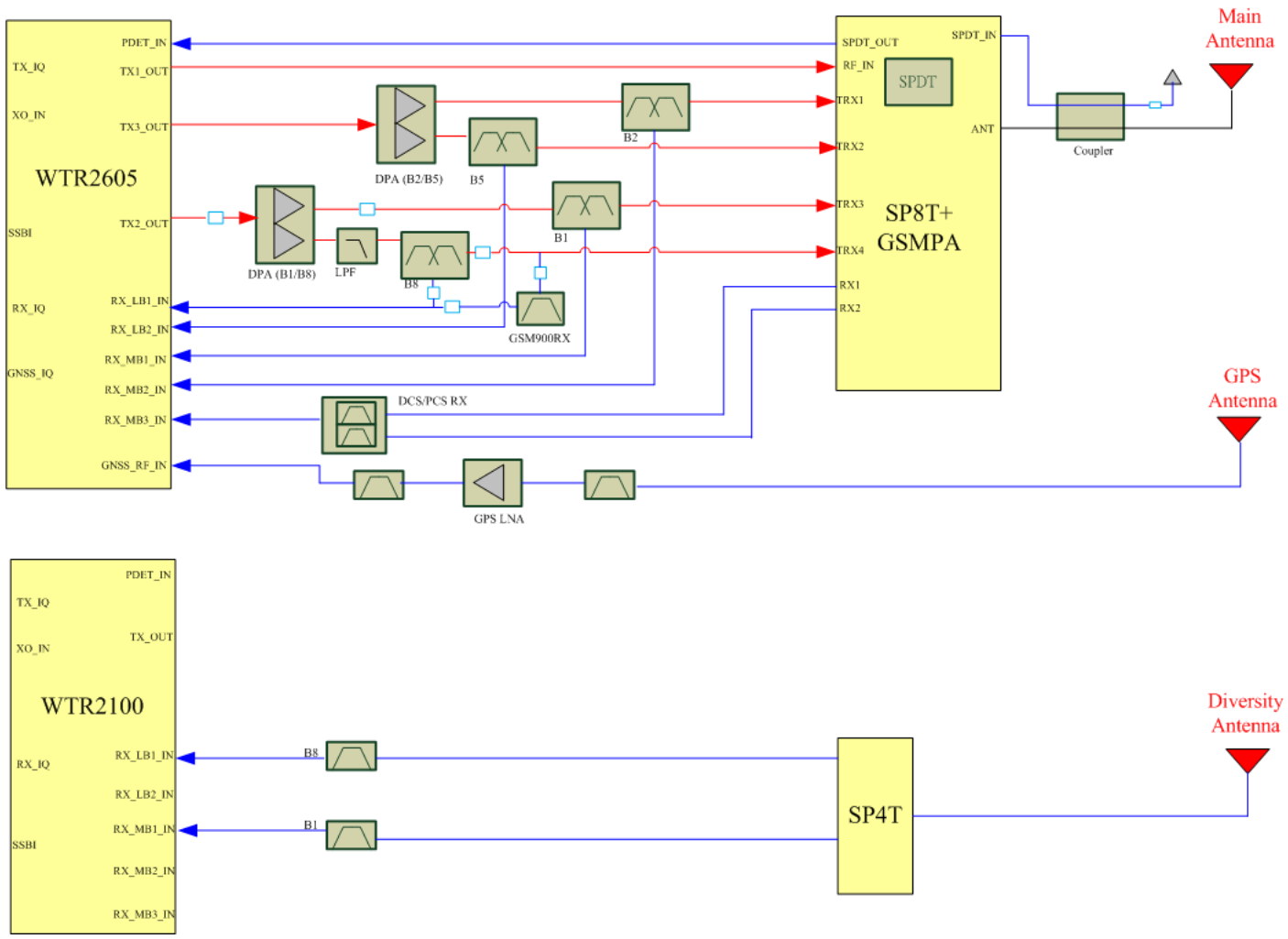
- **On the PCB:**
- Checking if any open happened on the key series components.
- Checking if any short to ground happened in the shunt components

WCDMA / GSM TROUBLESHOOTING

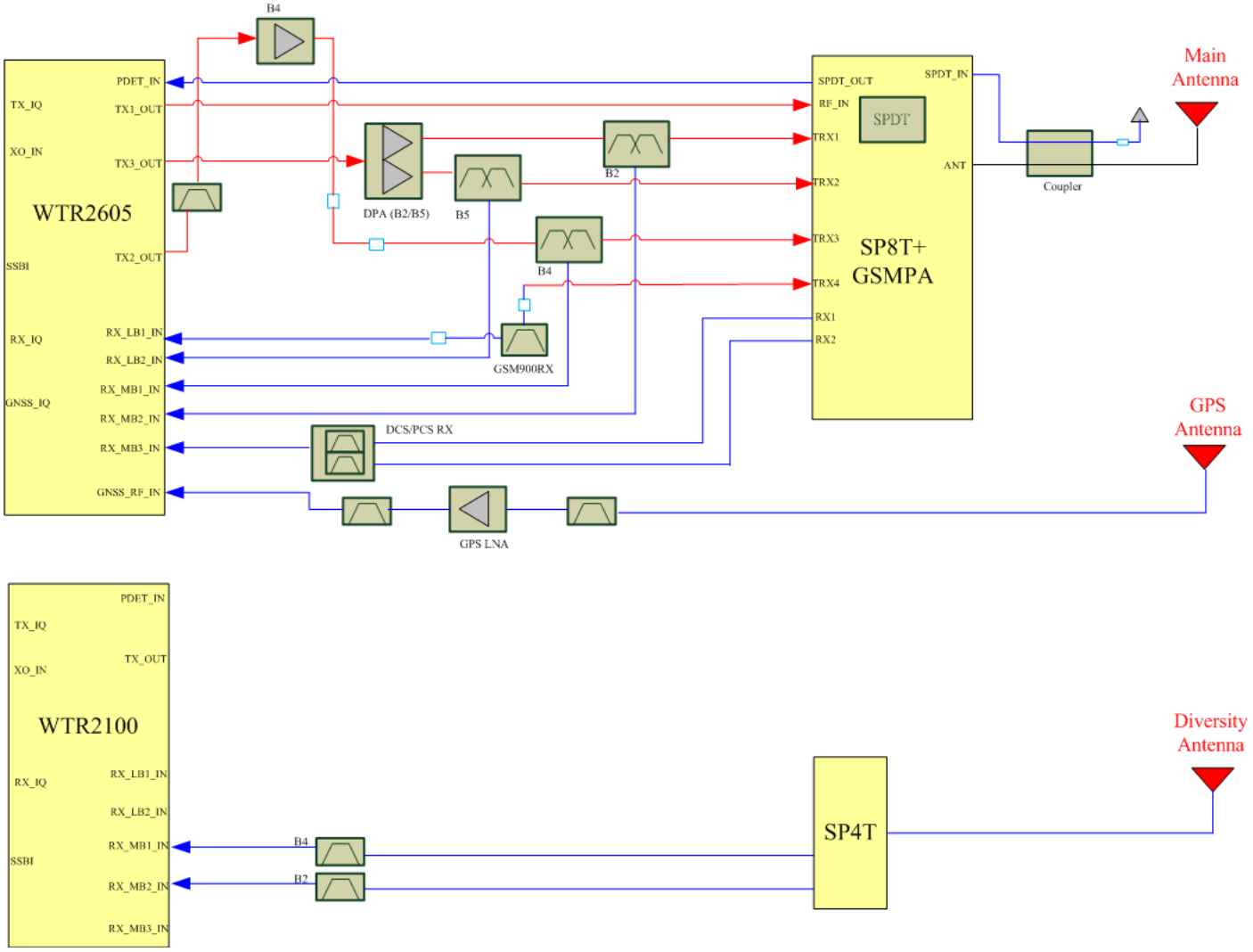
UMTS DTV BLOCK DIAGRAM



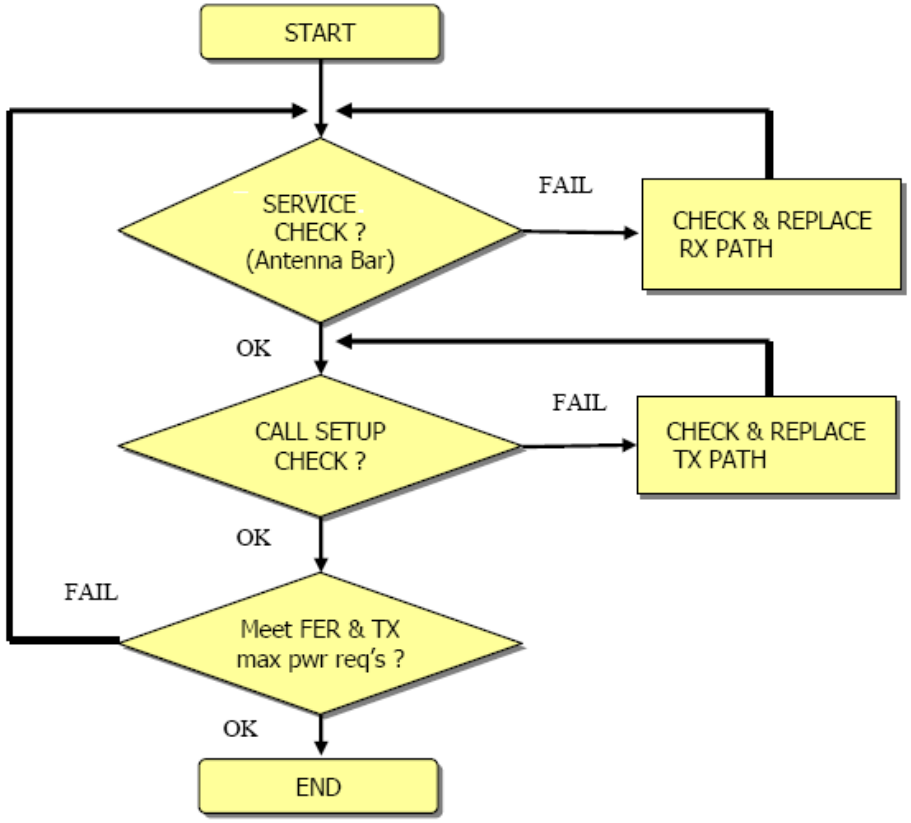
UMTS DS/SS BLOCK DIAGRAM



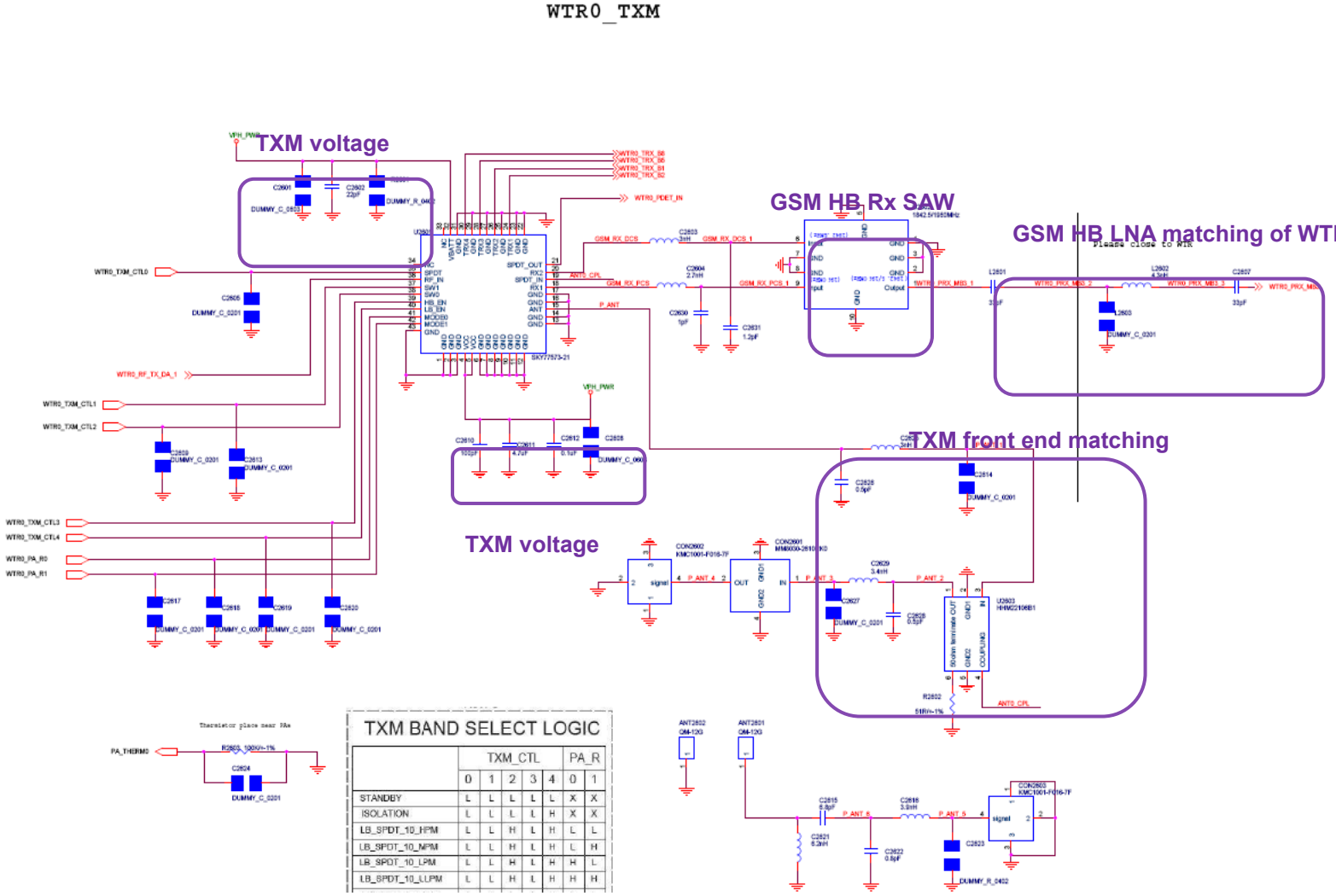
UMTS AWS BLOCK DIAGRAM



WCDMA/GSM RADIO CHECK



TXM Schematic

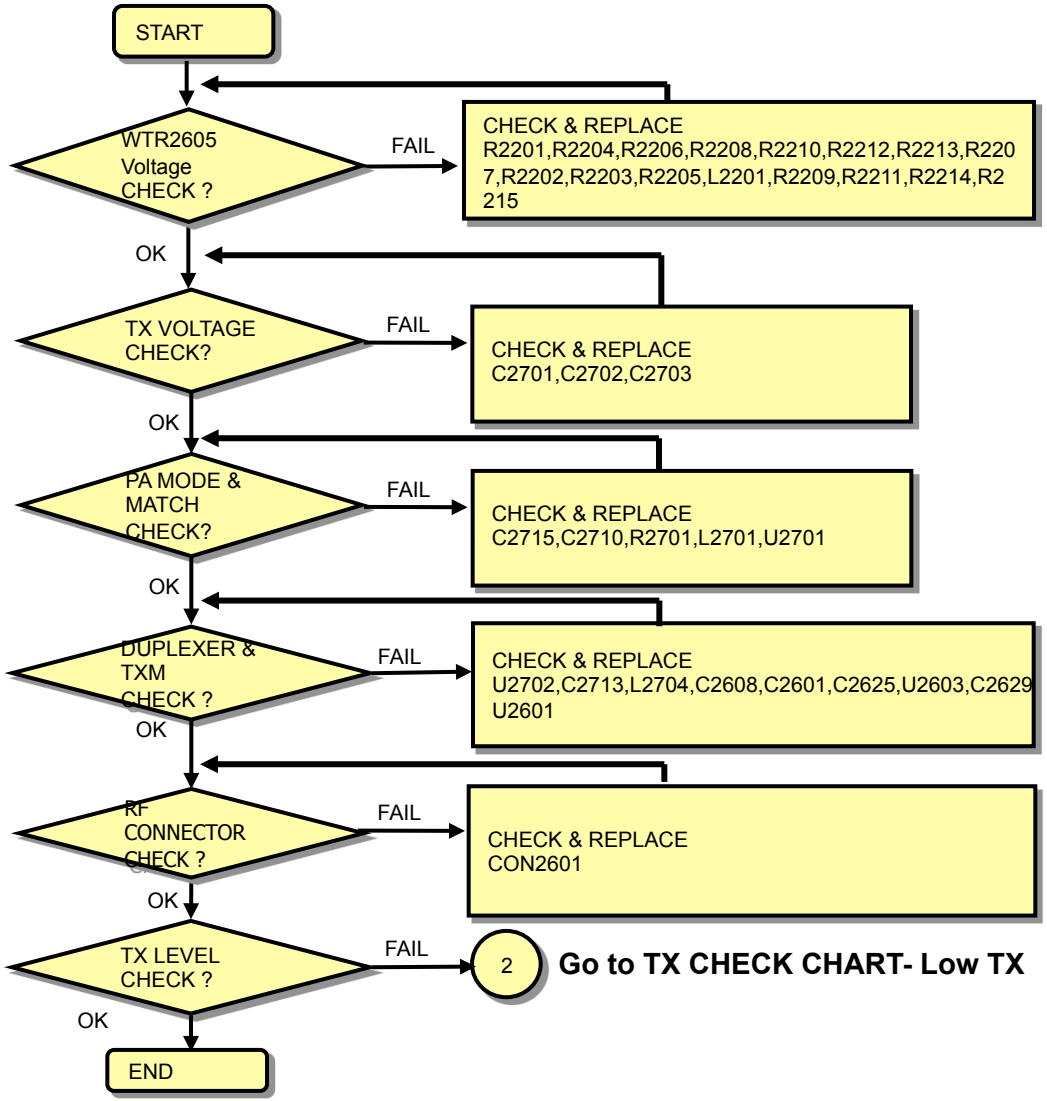


TXM BAND SELECT LOGIC

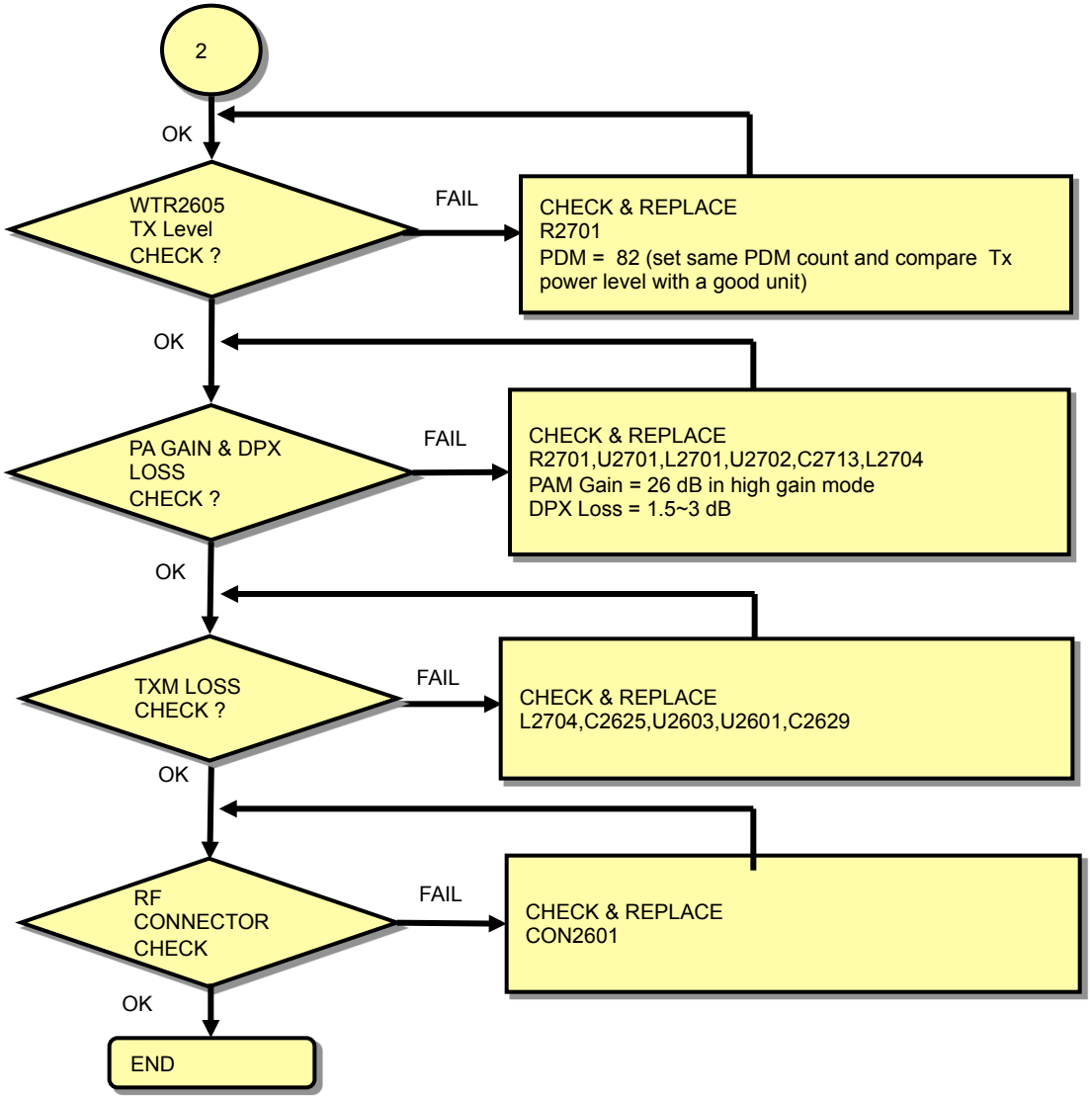
	TXM_CTL				PA_R	
	0	1	2	3	4	0	1
STANDBY	L	L	L	L	L	X	X
ISOLATION	L	L	L	L	H	X	X
LB_SPDT_10_HPM	L	L	H	L	H	L	L
LB_SPDT_10_MPM	L	L	H	L	H	L	H
LB_SPDT_10_LPM	L	L	H	L	H	H	L
LB_SPDT_10_LLPM	L	L	H	L	H	H	H

WCDMA B1 Tx and Rx

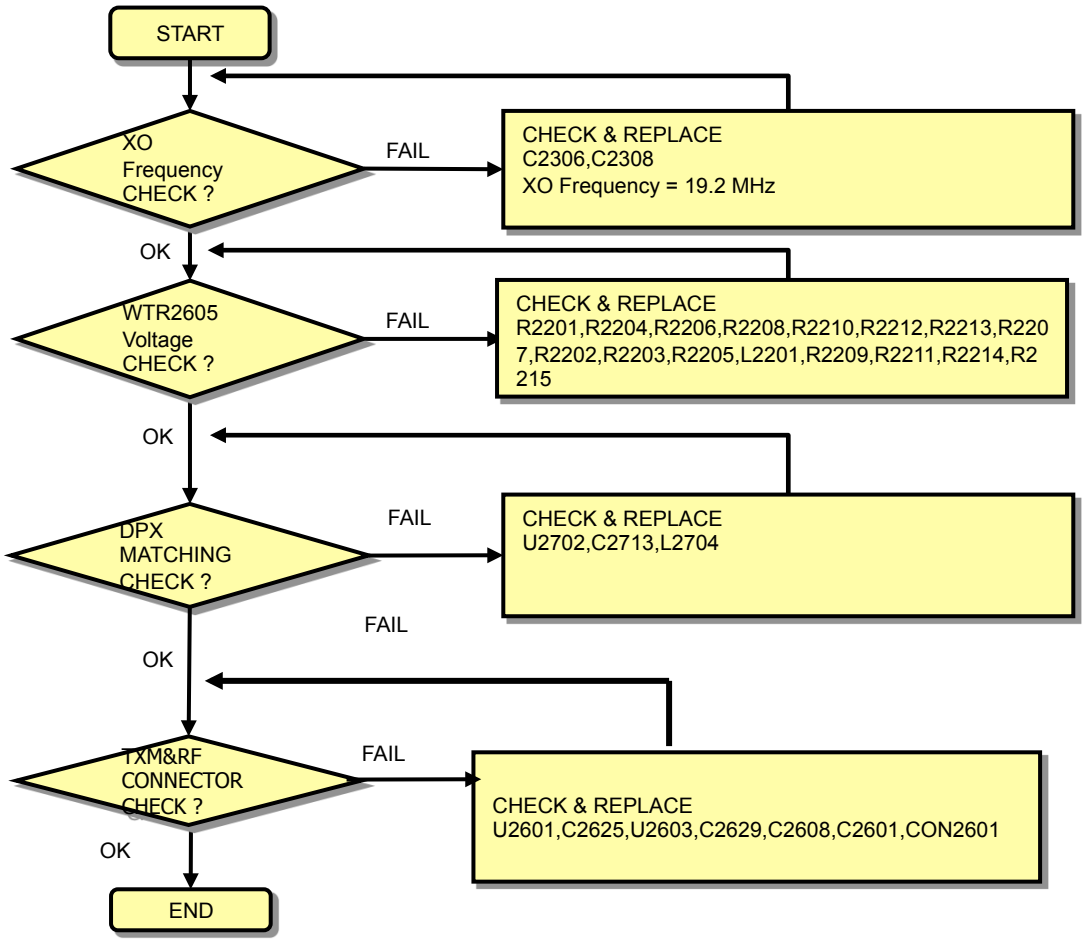
WCDMA B1 TX Check Chart – No TX



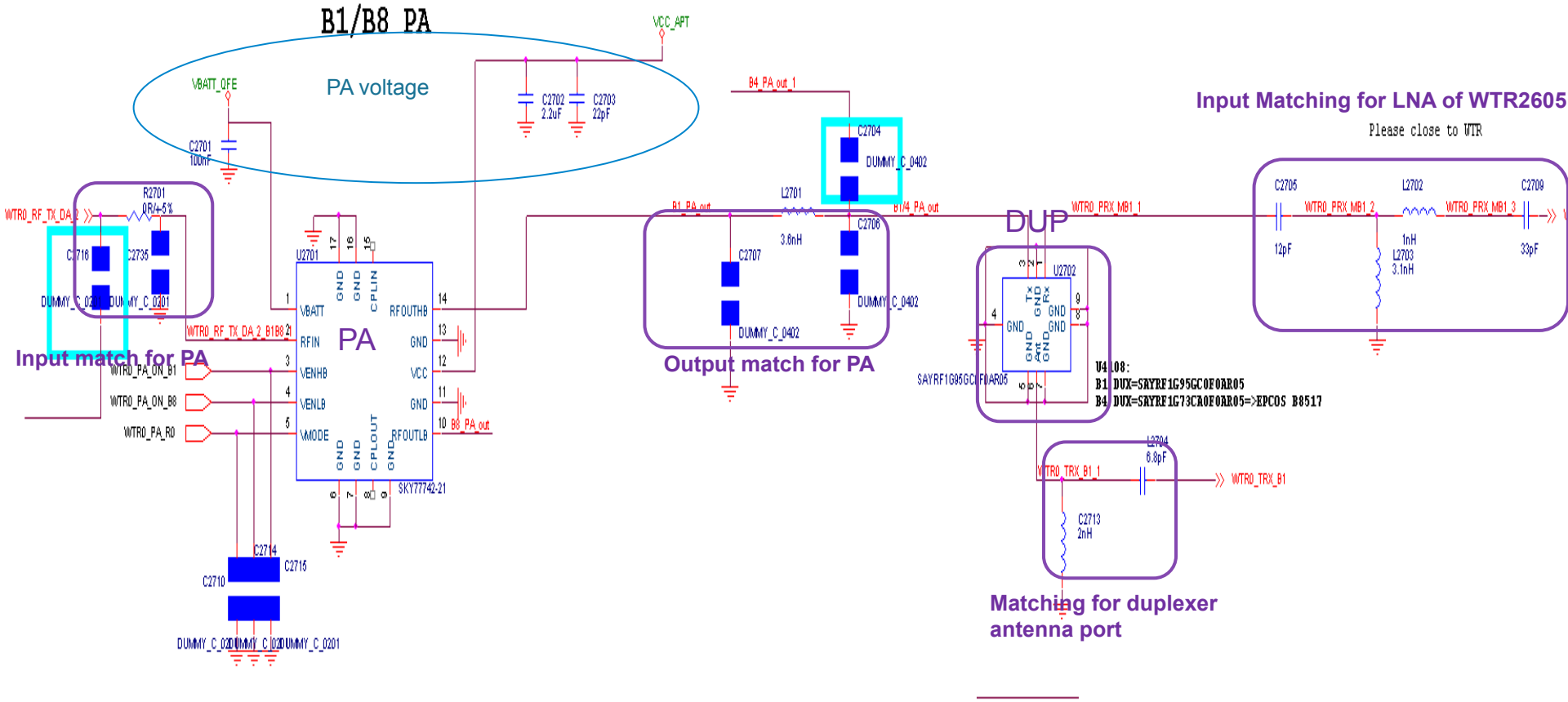
WCDMA B1 TX Check Chart – Low TX



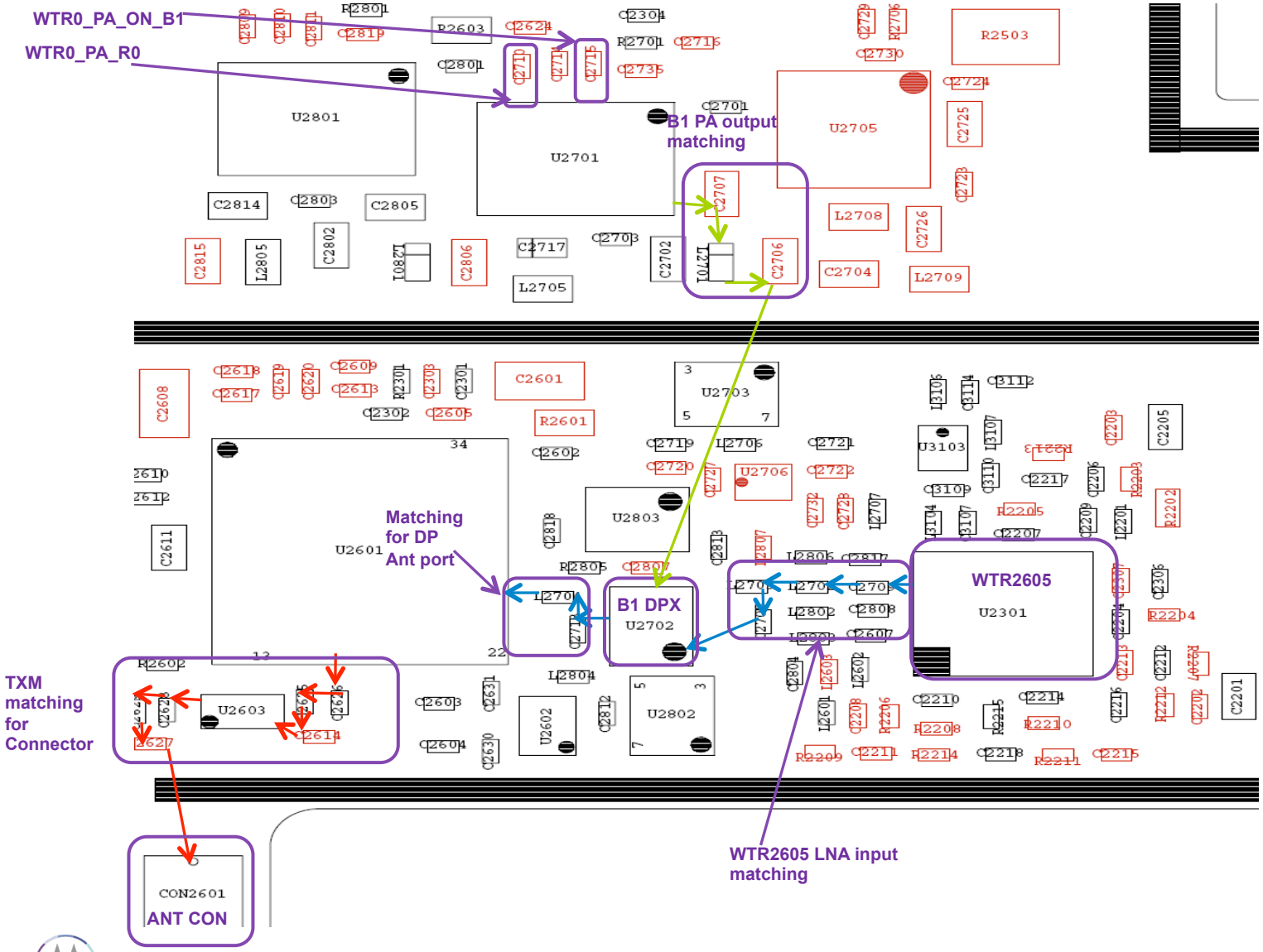
WCDMA B1 RX Check Chart



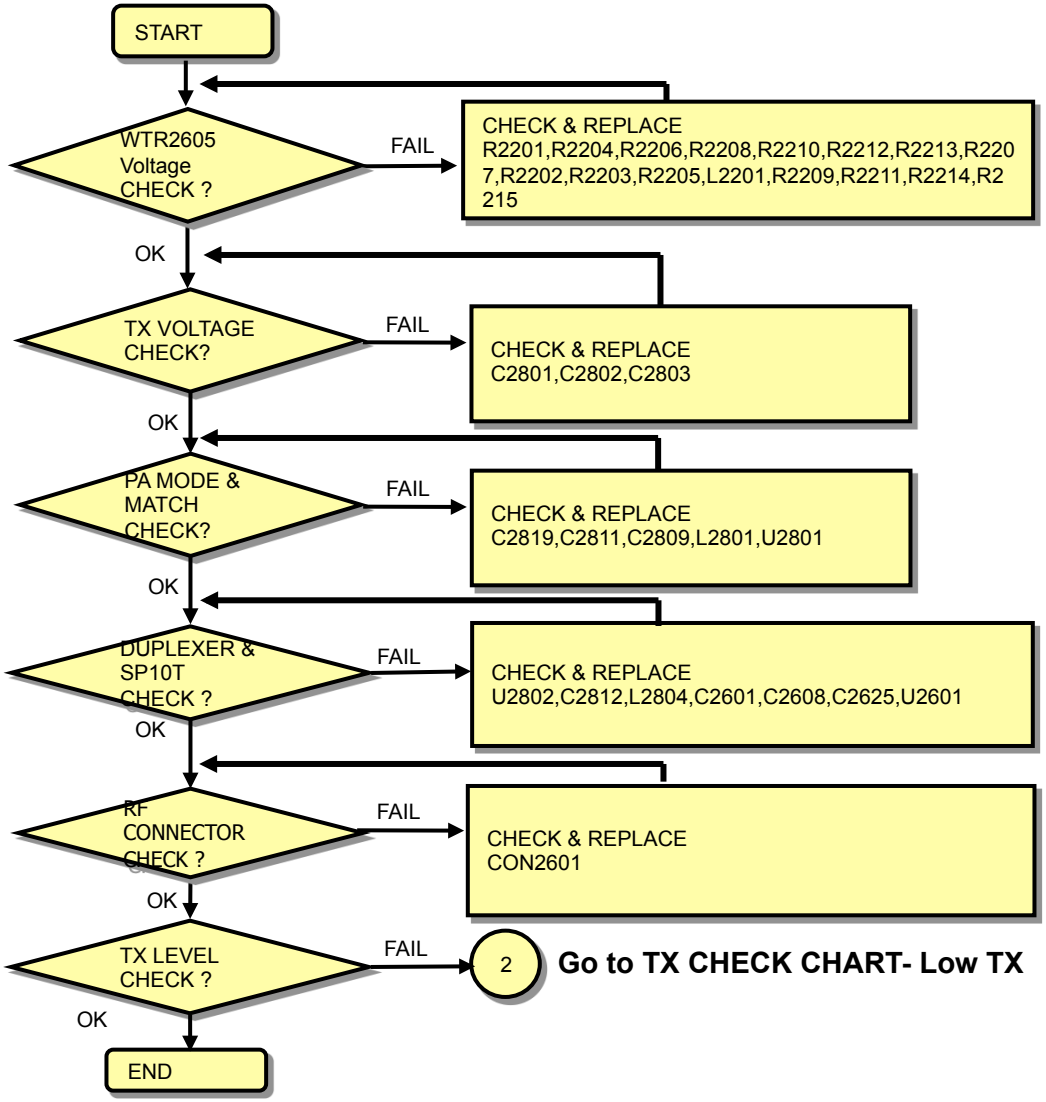
B1 TRX Circuits (PA + DPX)



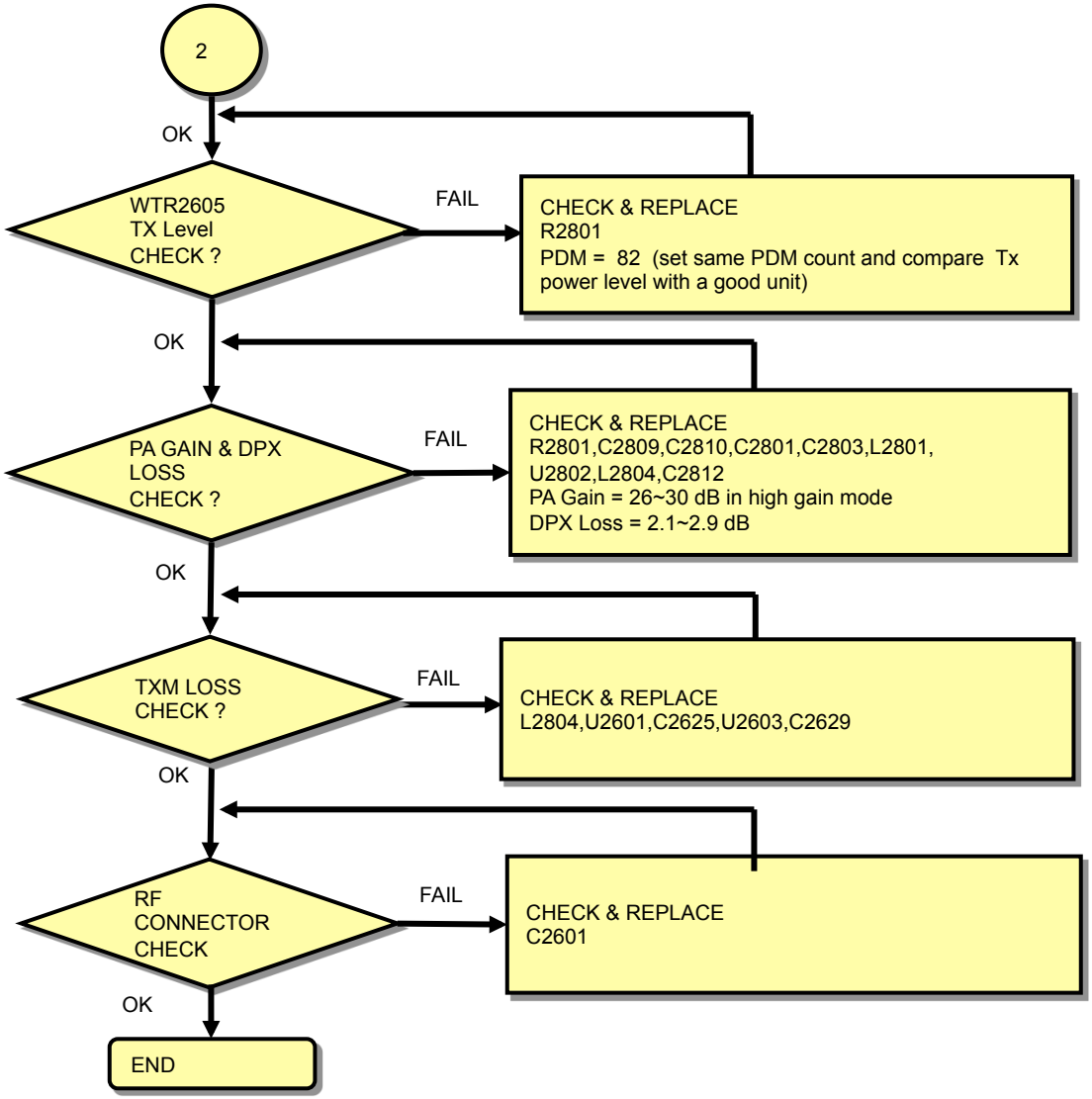
B1 TRX Circuits (WTR + PA + DPX + TXM) Layout



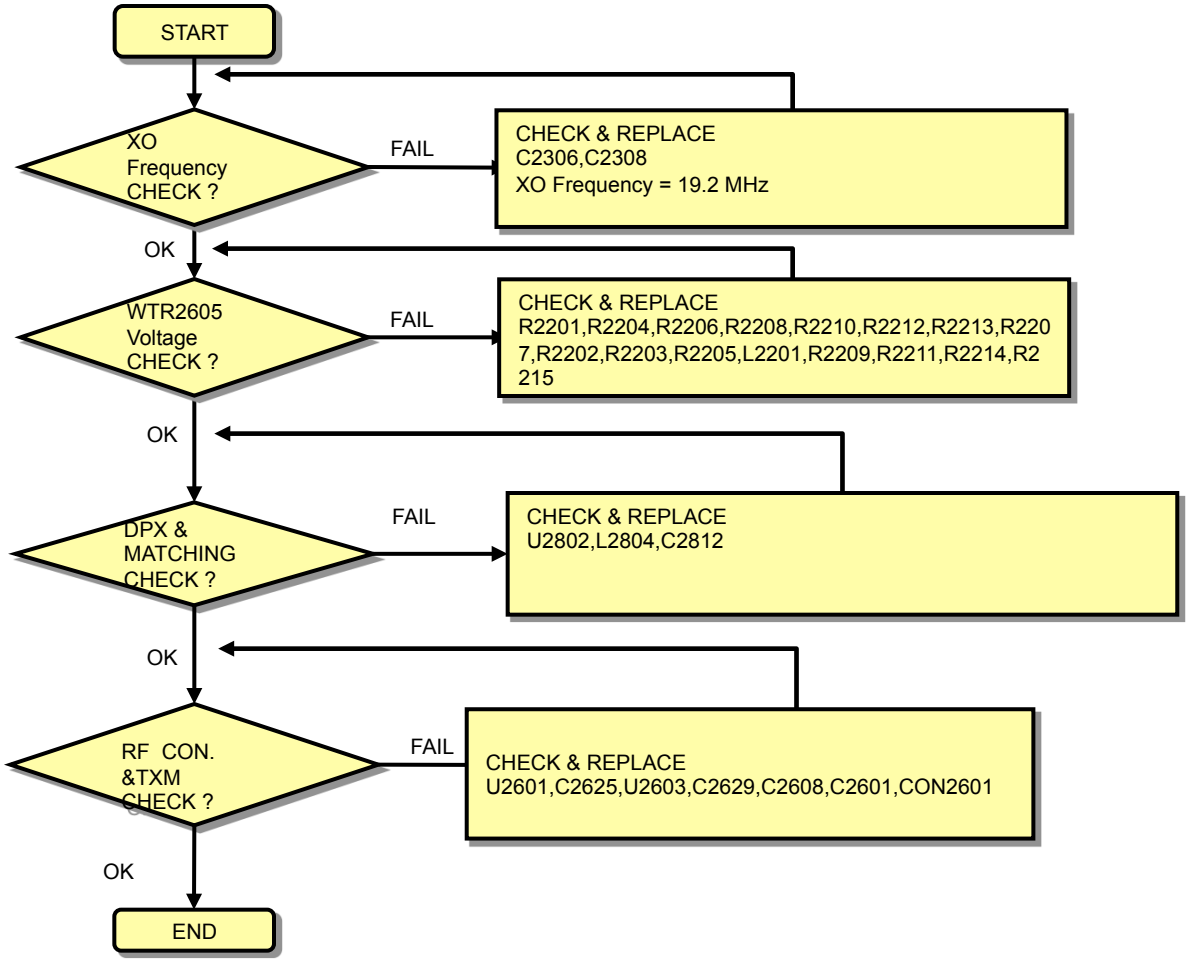
WCDMA B2 TX Check Chart – No TX



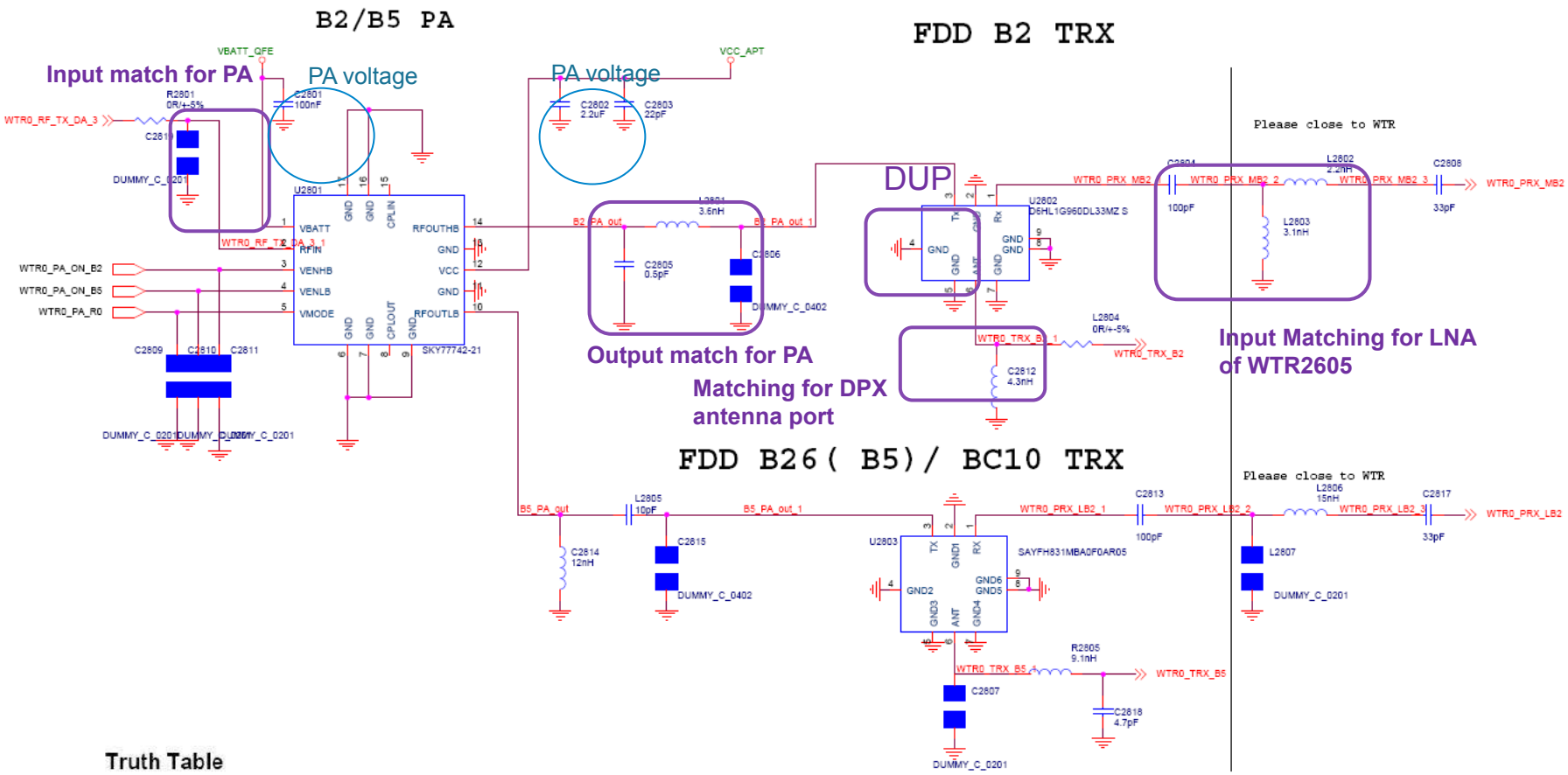
WCDMA B2 TX Check Chart – Low TX



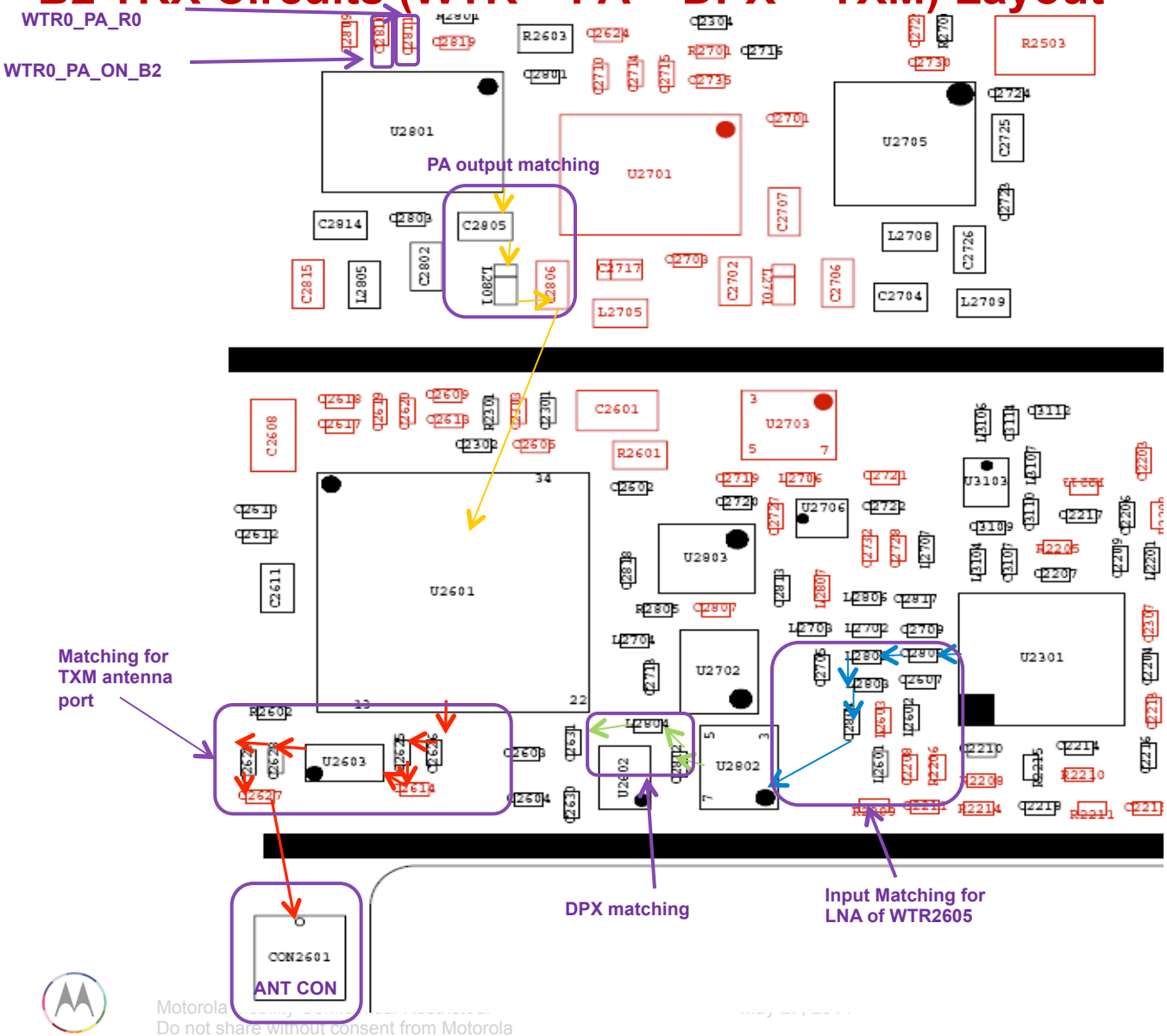
WCDMA B2 RX Check Chart



B2 TRX Circuits (PA + DPX)

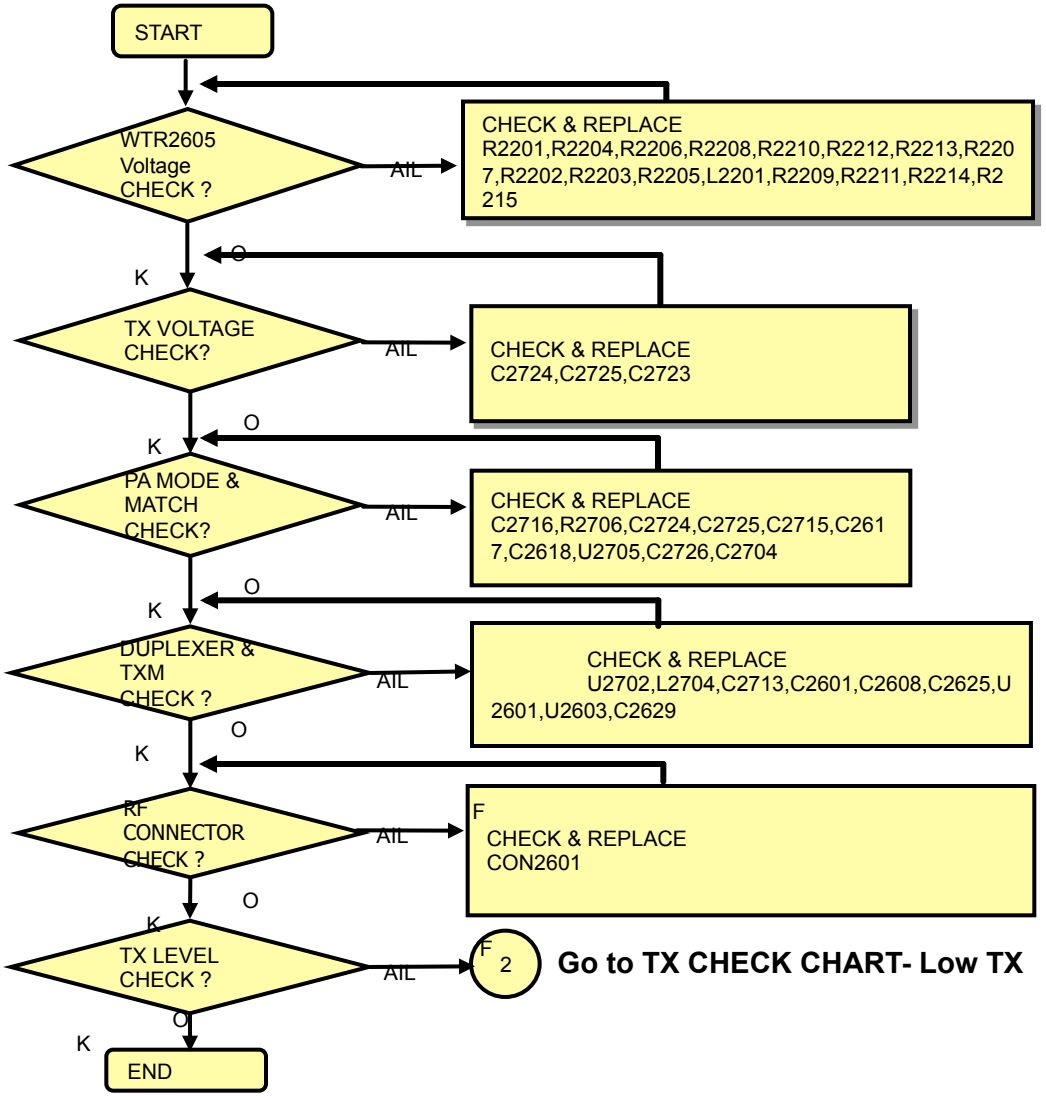


B2 TRX Circuits (WTR + PA + DPX + TXM) Layout

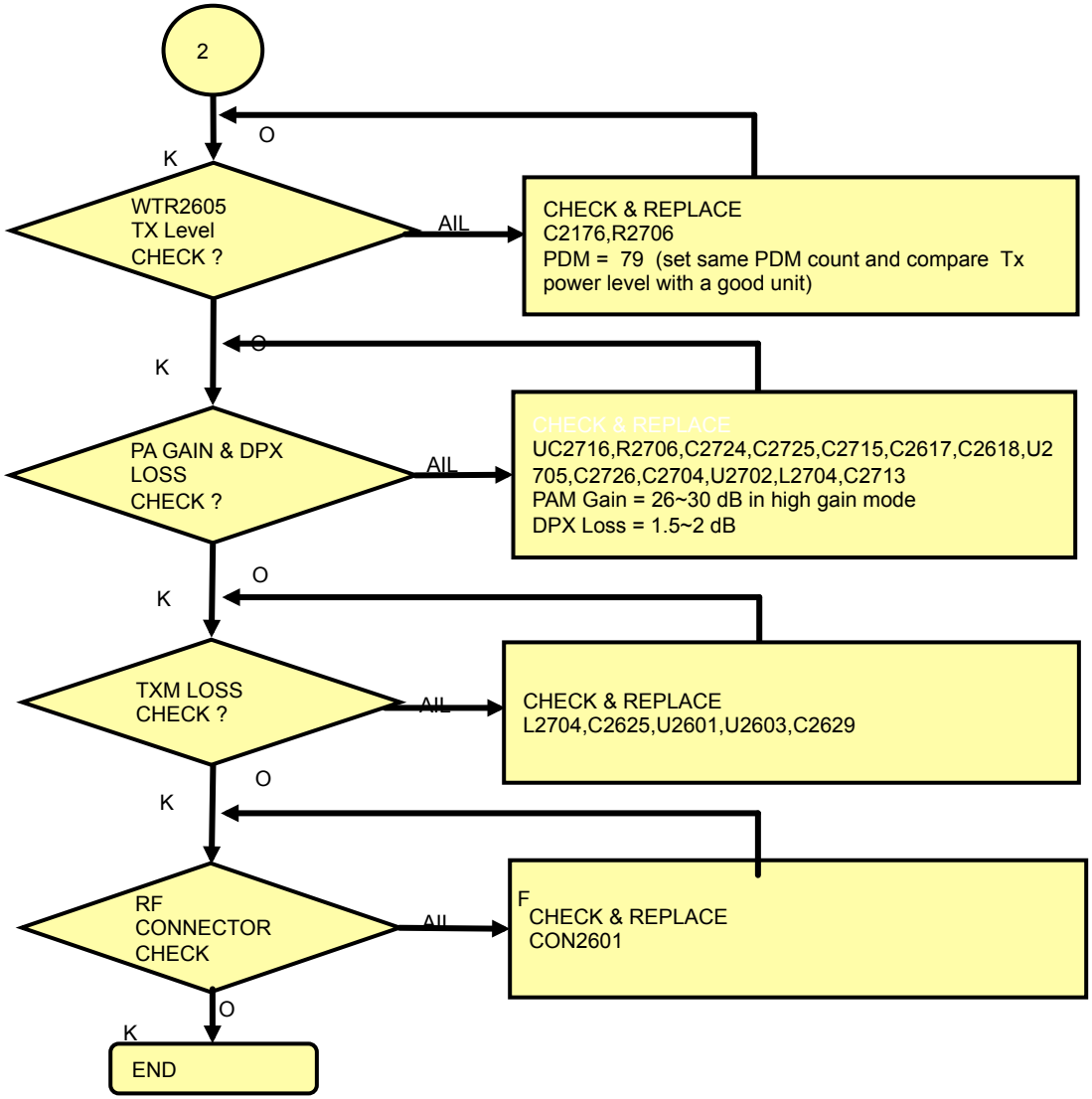


WCDMA B4 Tx and Rx

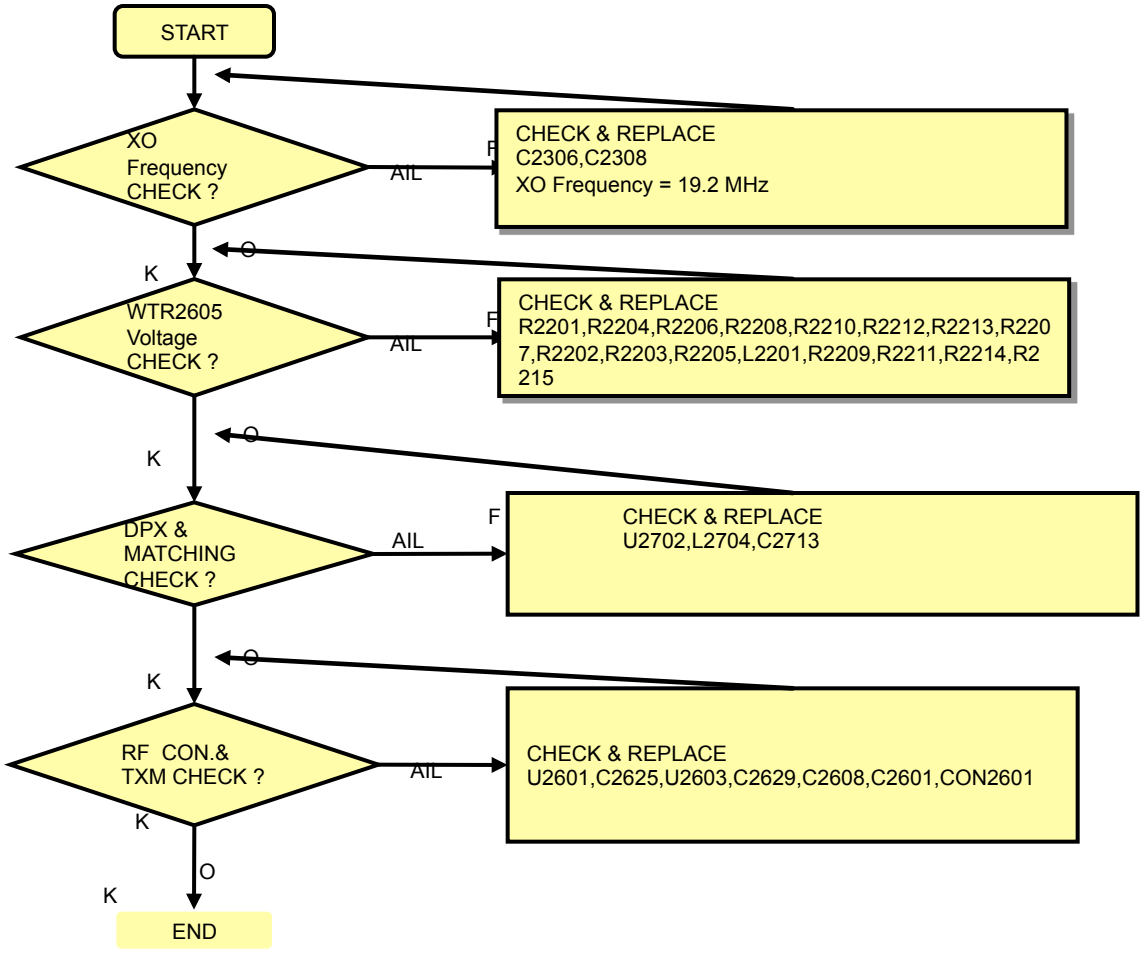
WCDMA B4 Tx Check Chart – No TX



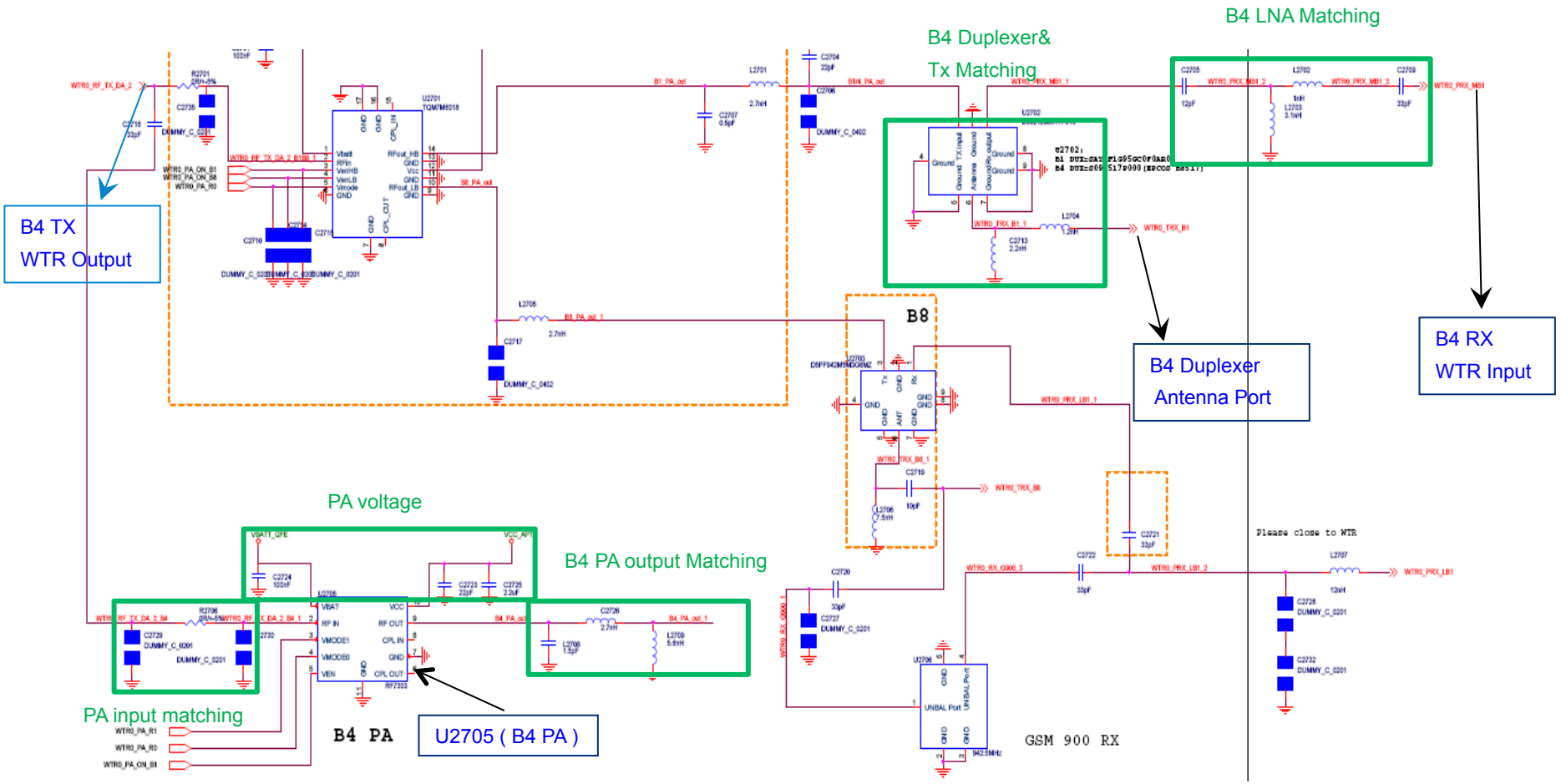
WCDMA B4 Tx Check Chart – Low TX



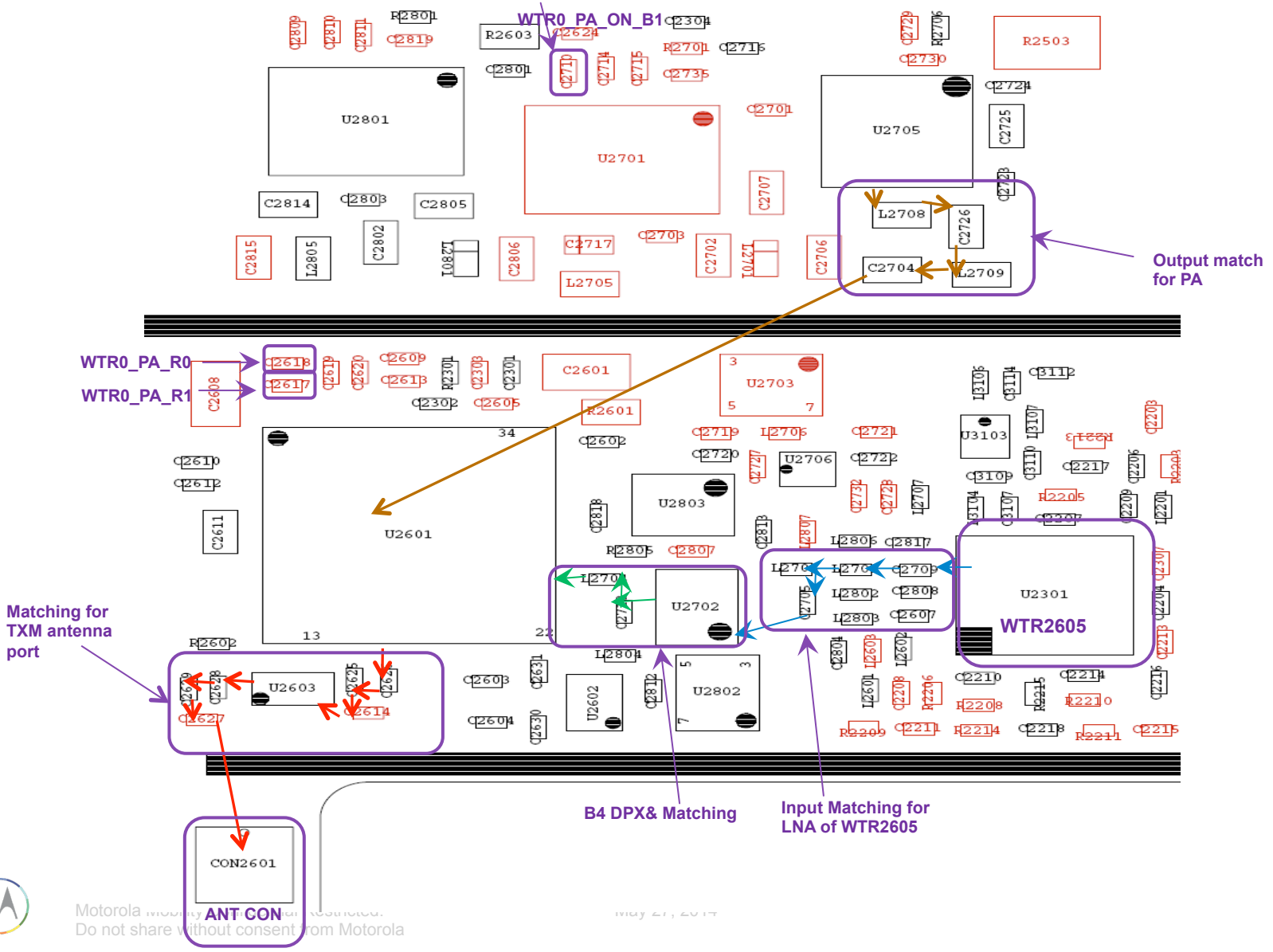
WCDMA B4 RX Check Chart



WCDMA B4 TX AND RX

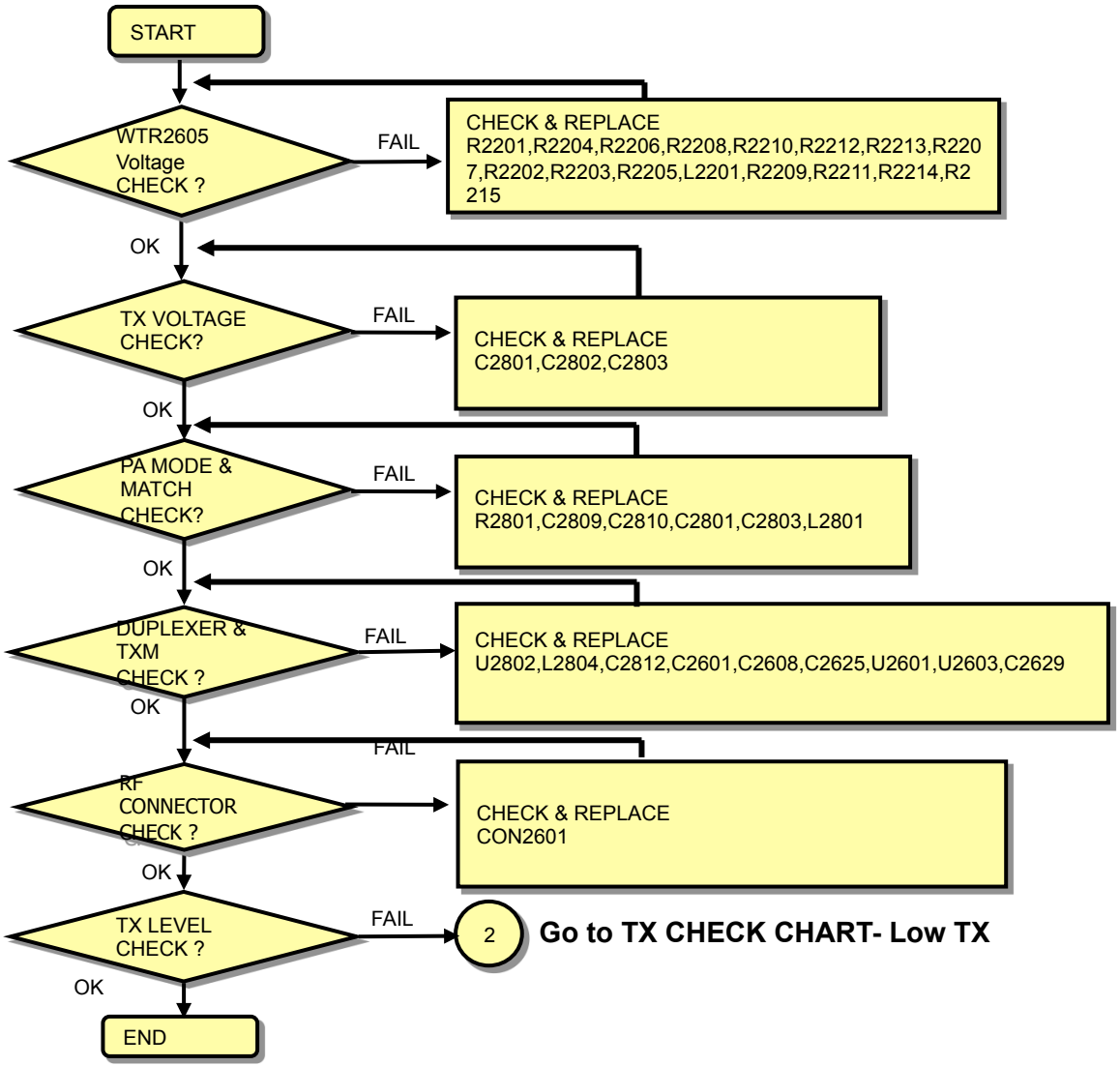


WCDMA B4 TRX LAYOUT (WTR + PA + DPX +TXM)

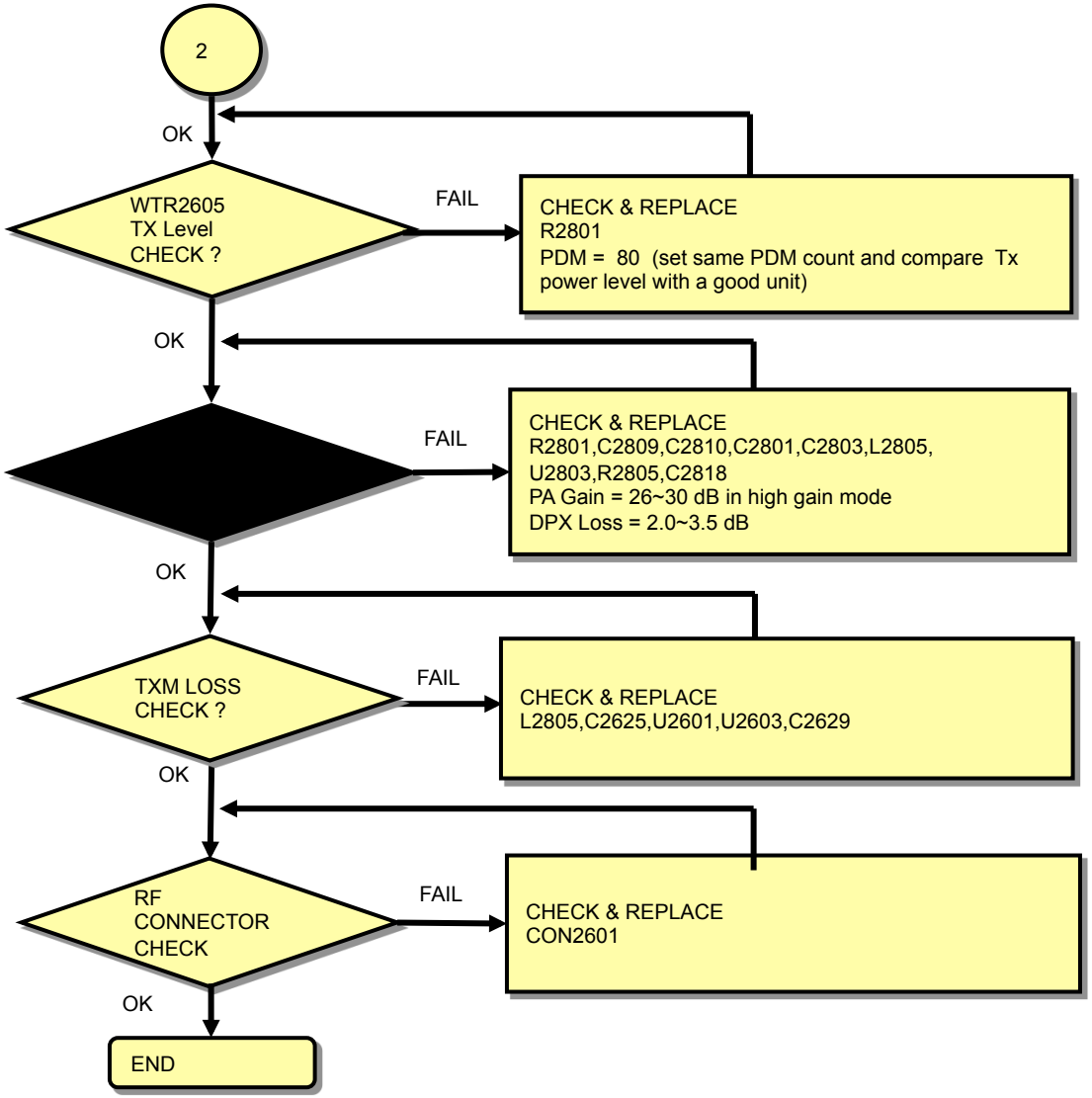


WCDMA B5 Tx and Rx

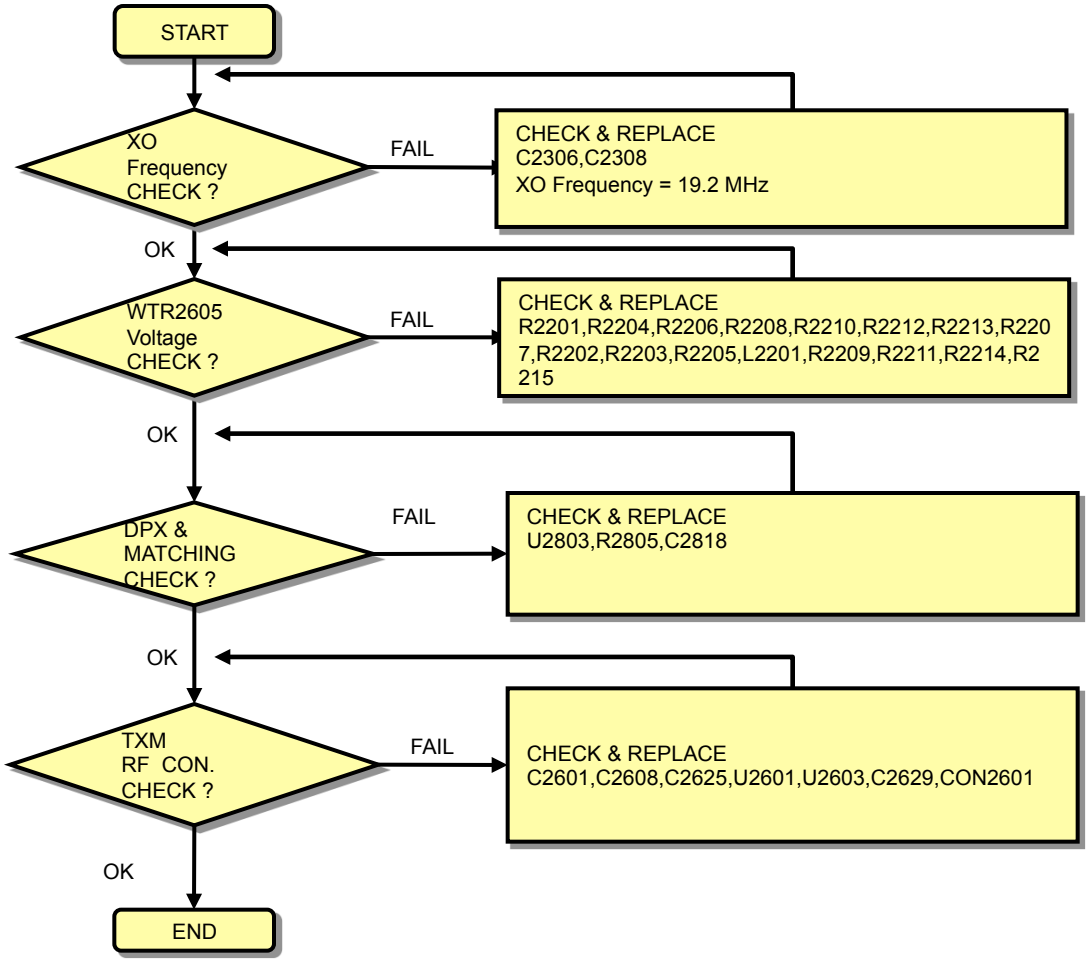
WCDMA B5 TX Check Chart – No TX



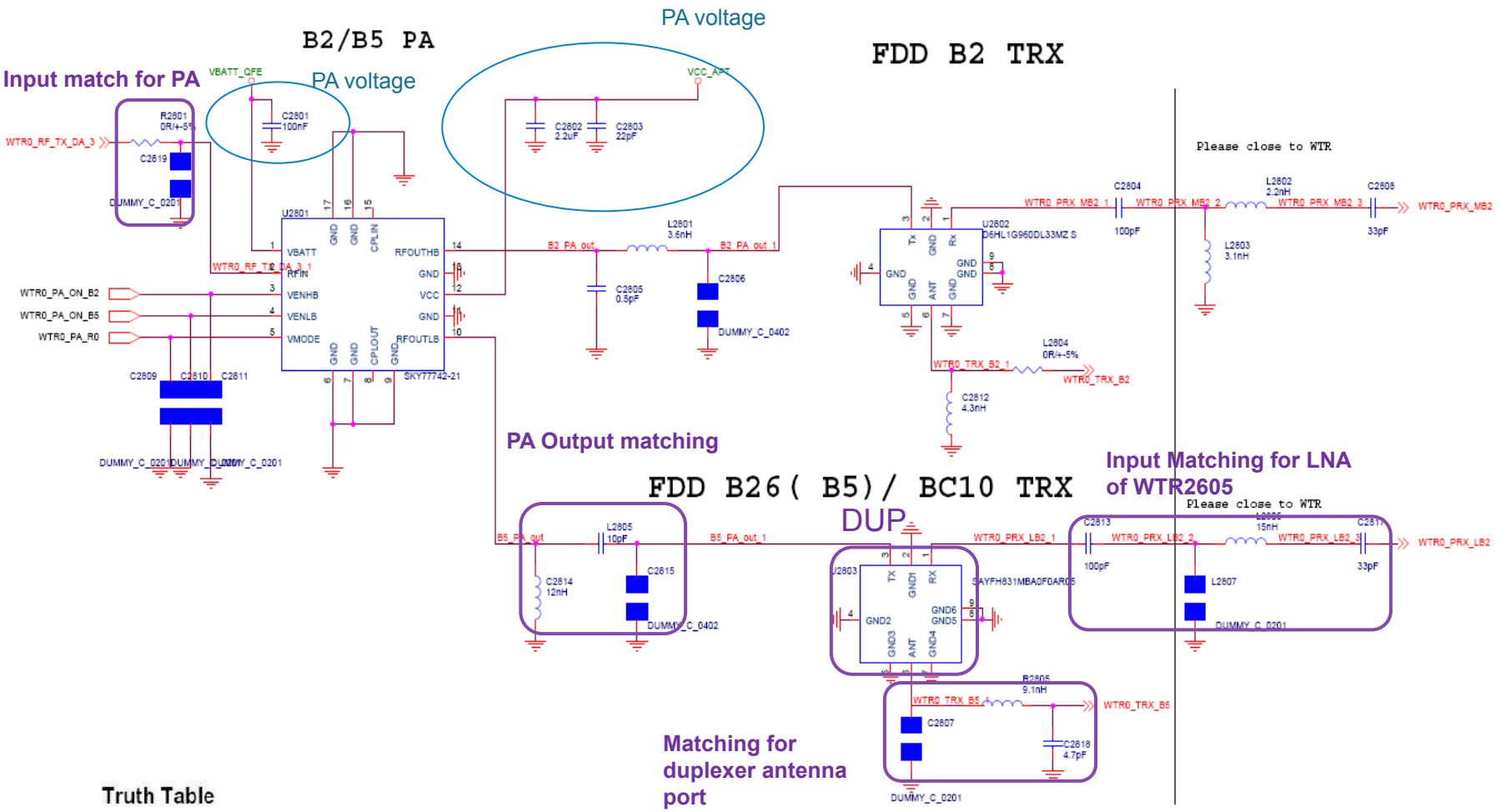
WCDMA B5 TX Check Chart – Low TX



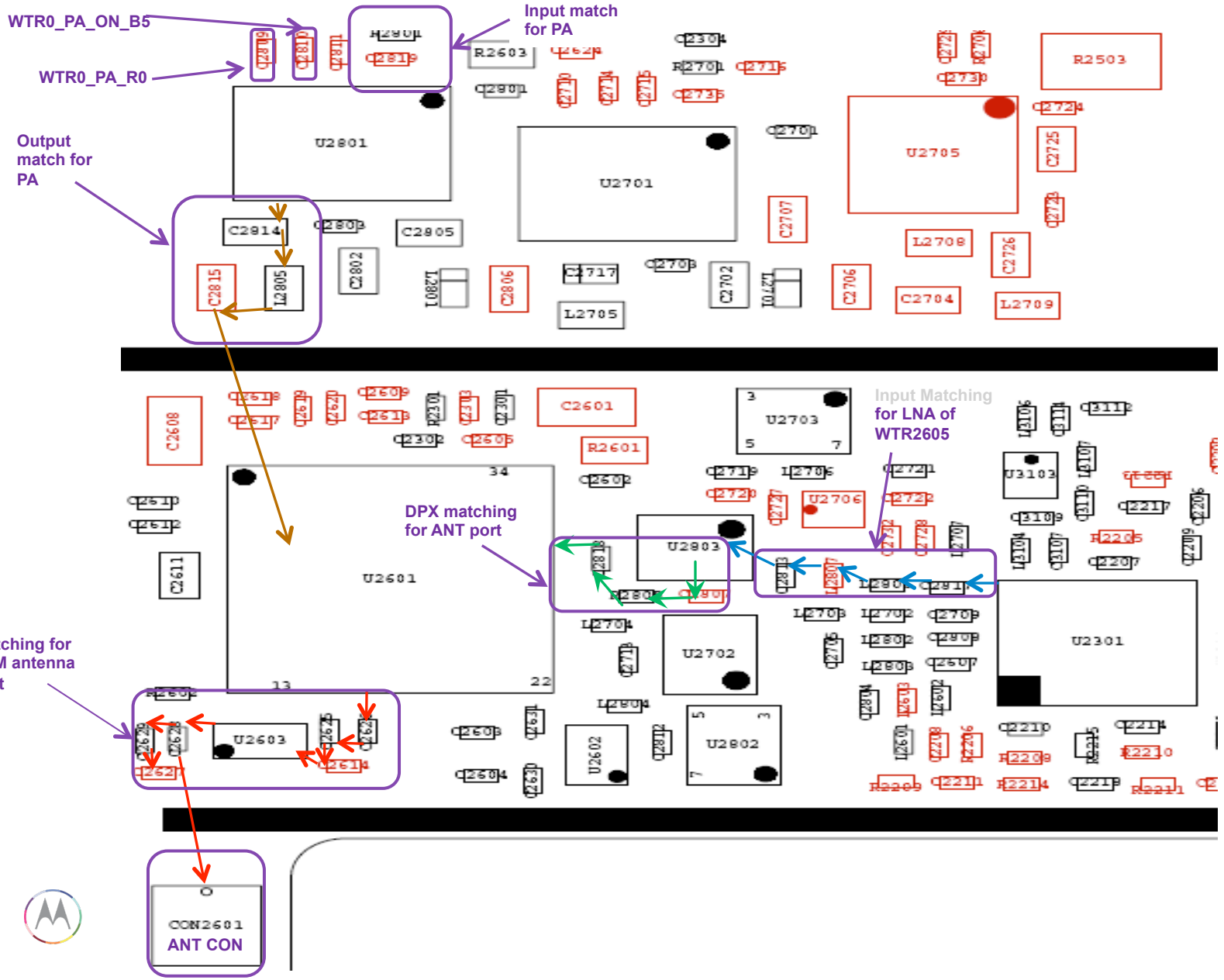
WCDMA B5 RX Check Chart



B5 TRX Circuits (PA + DPX)

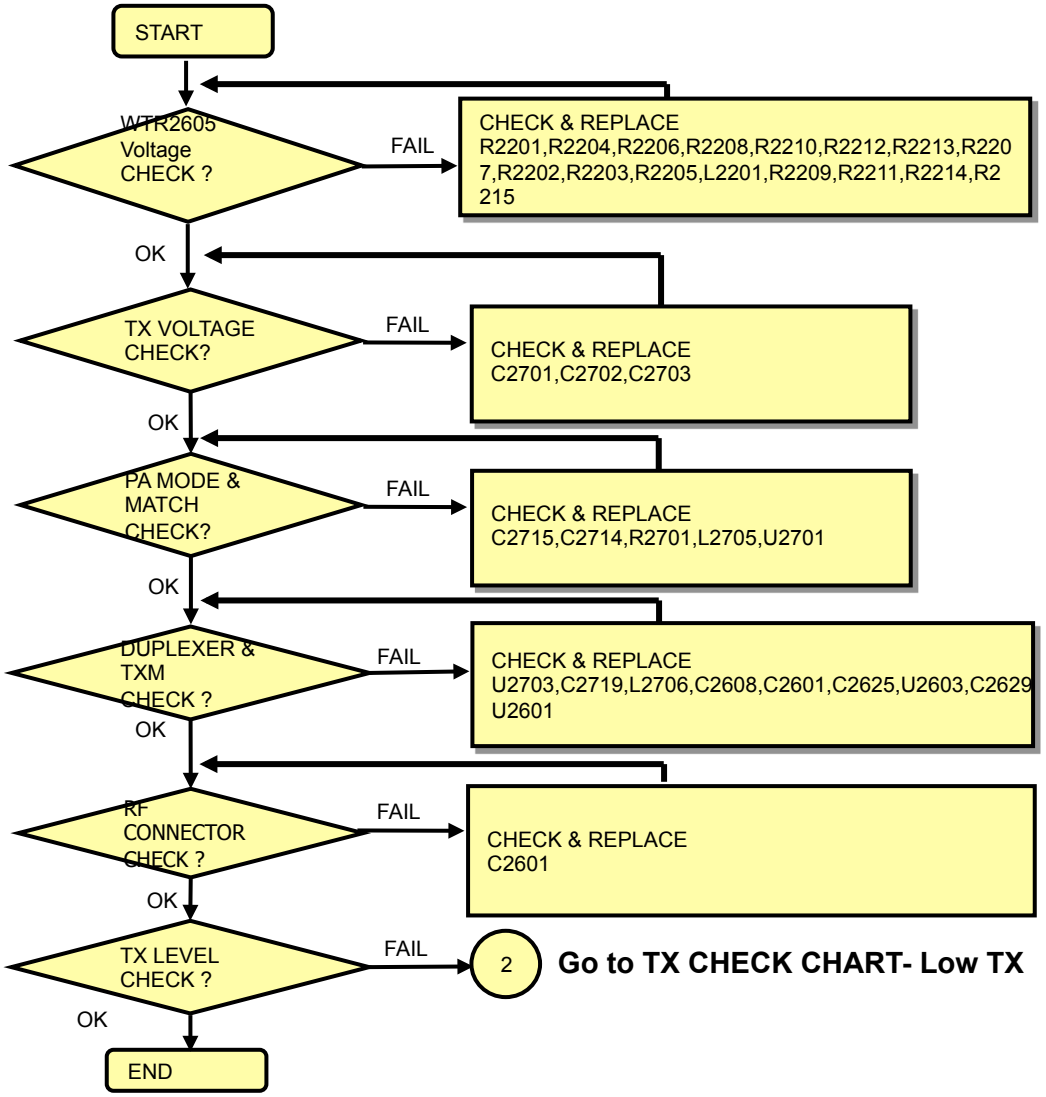


B5 TRX Circuits (WTR + PA + DPX + TXM) Layout

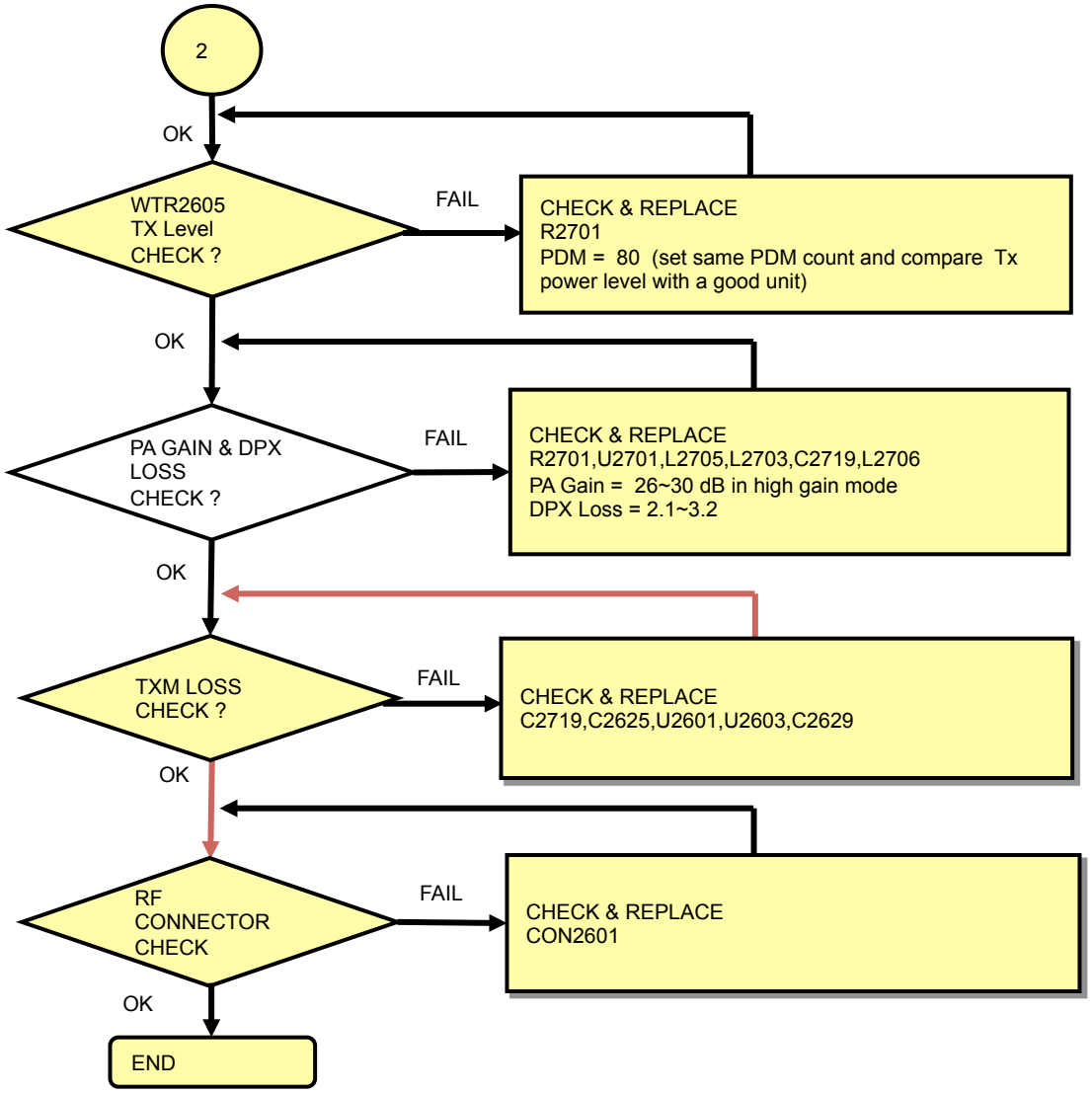


WCDMA B8 Tx and Rx

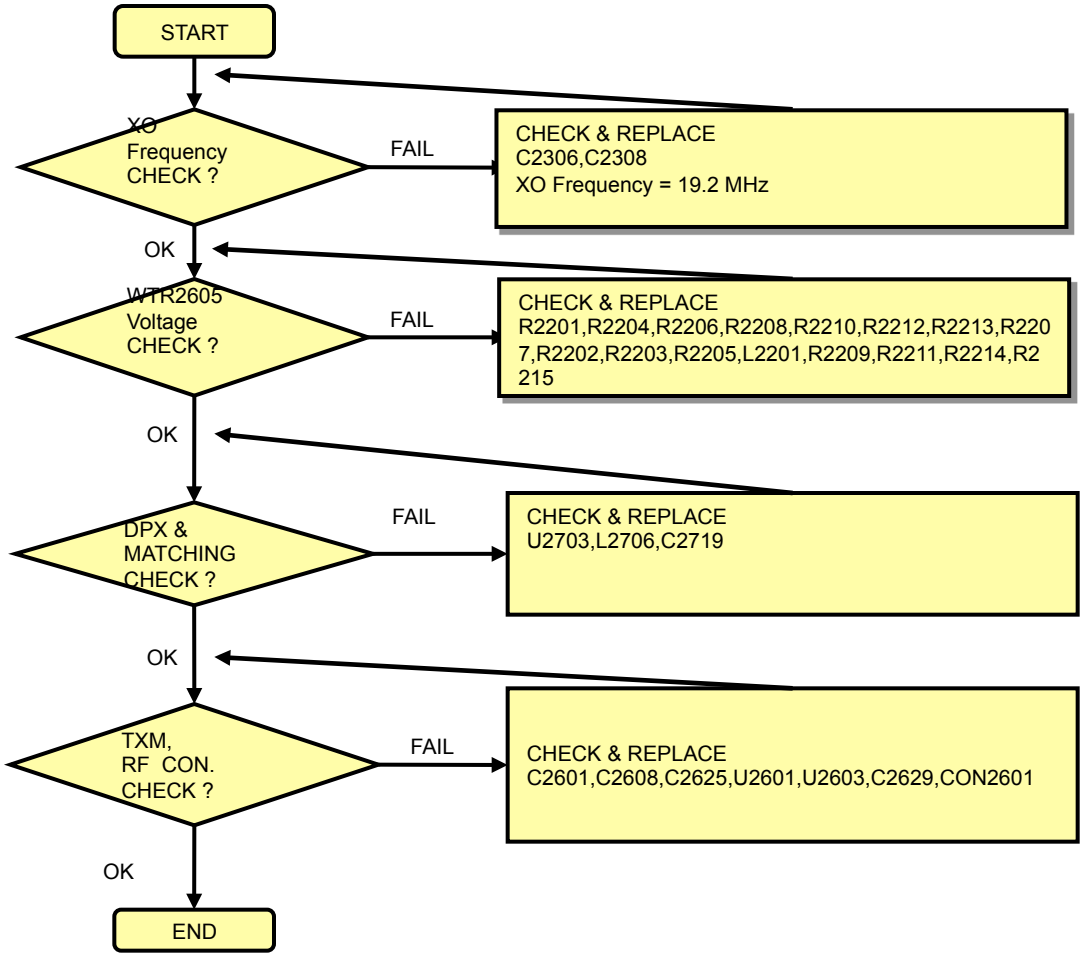
WCDMA B8 TX Check Chart – No TX



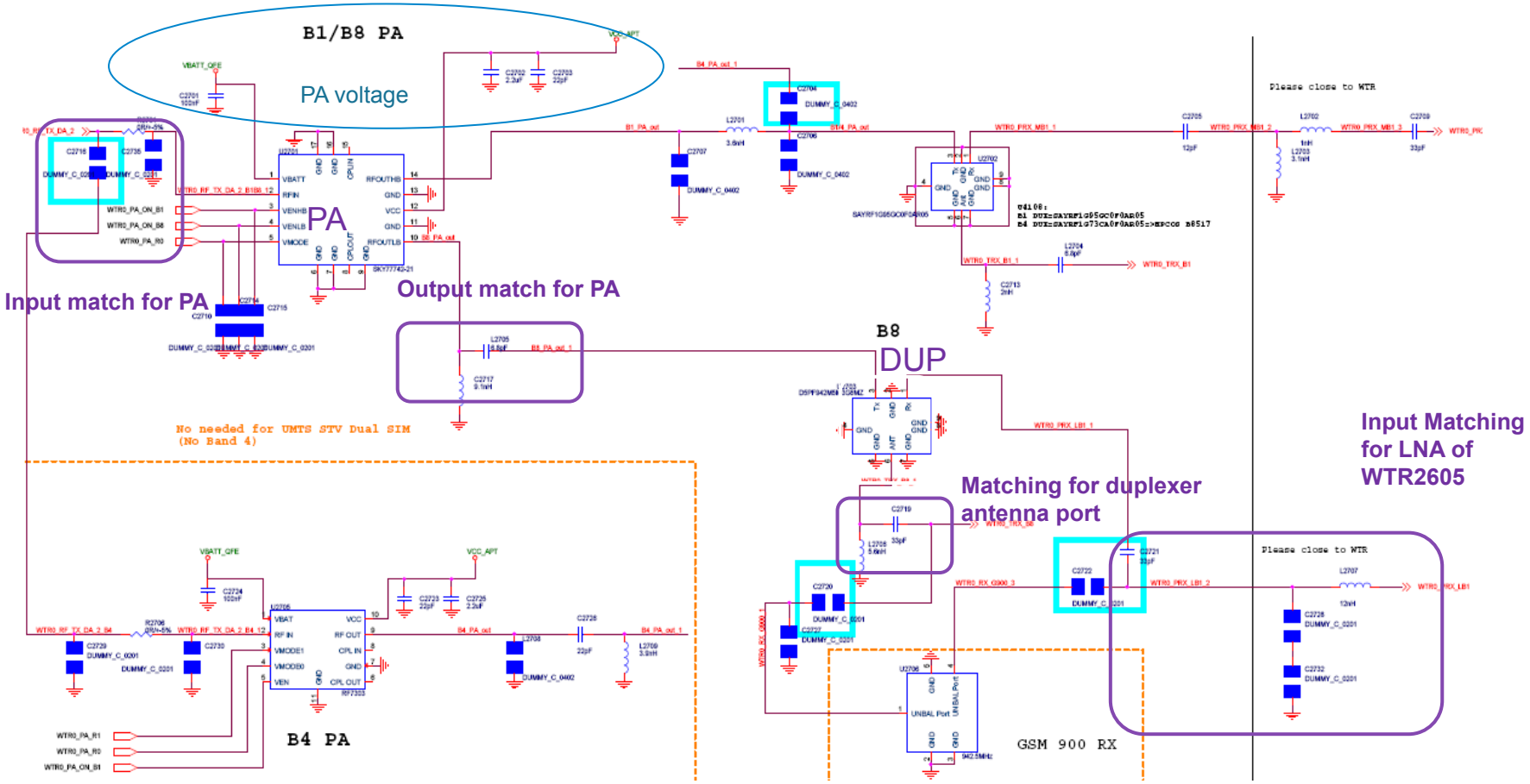
WCDMA B8 TX Check Chart – Low TX



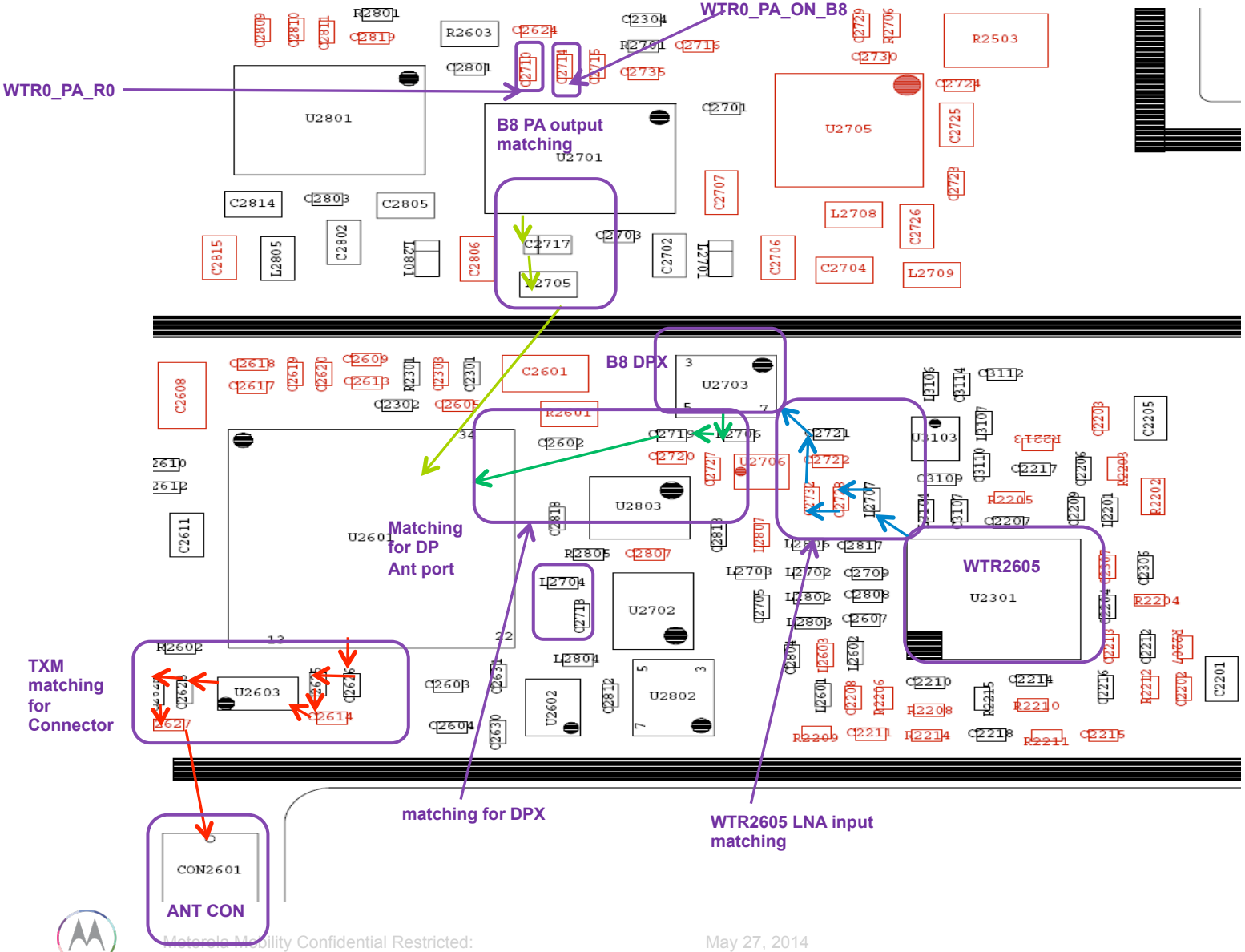
WCDMA B8 RX Check Chart



B8 TRX Circuits (PA + DPX)

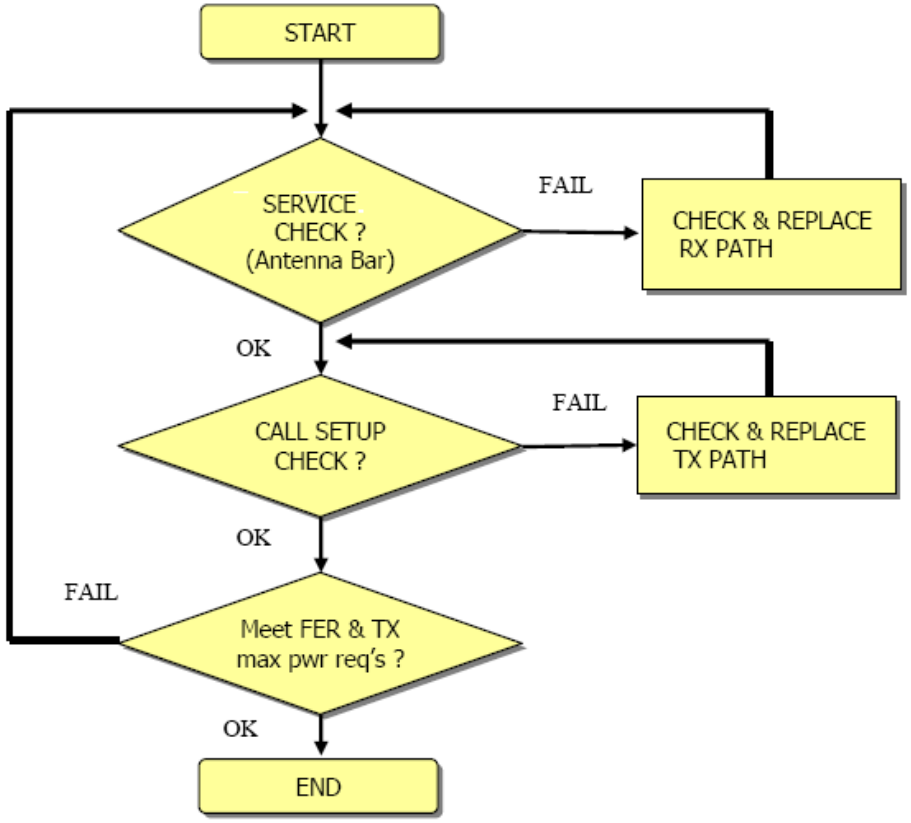


B8 TRX Circuits (WTR + PA + DPX + TXM) Layout

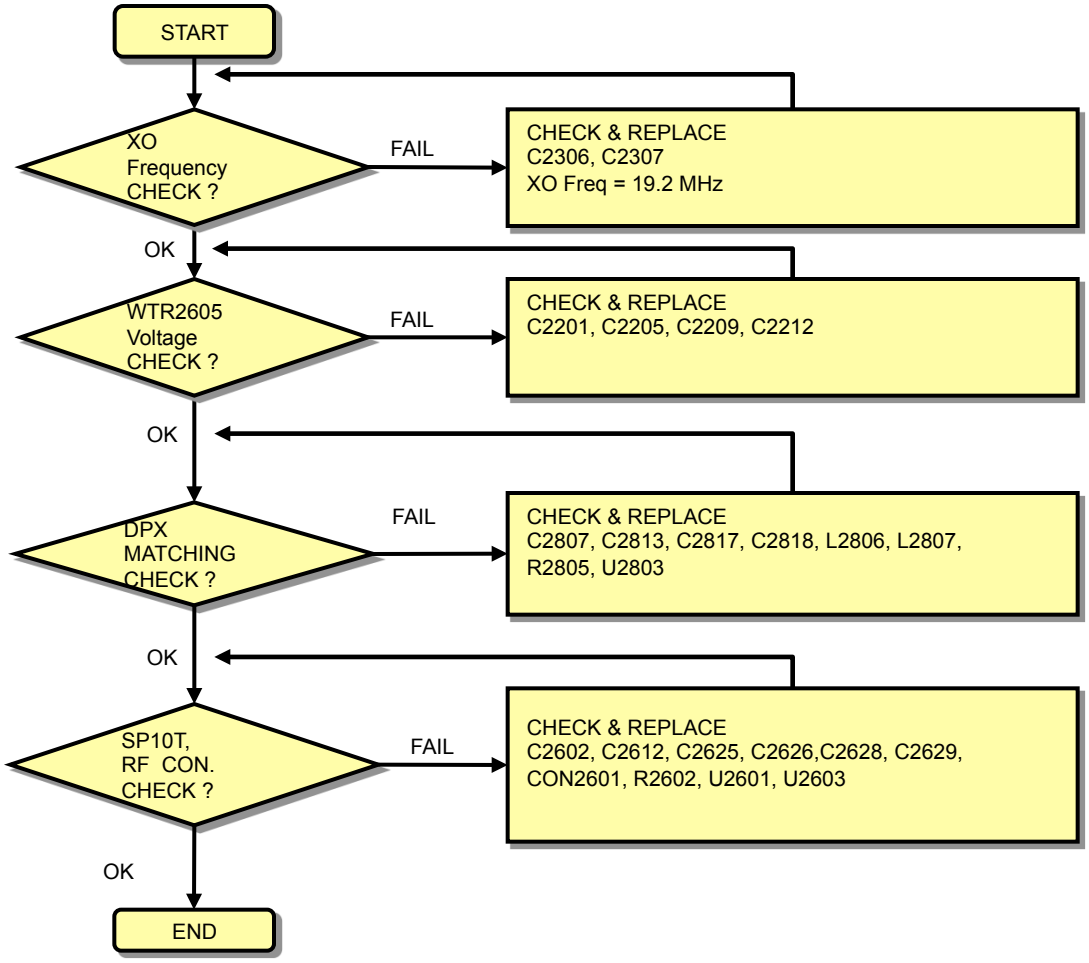


GSM Quad Band Rx

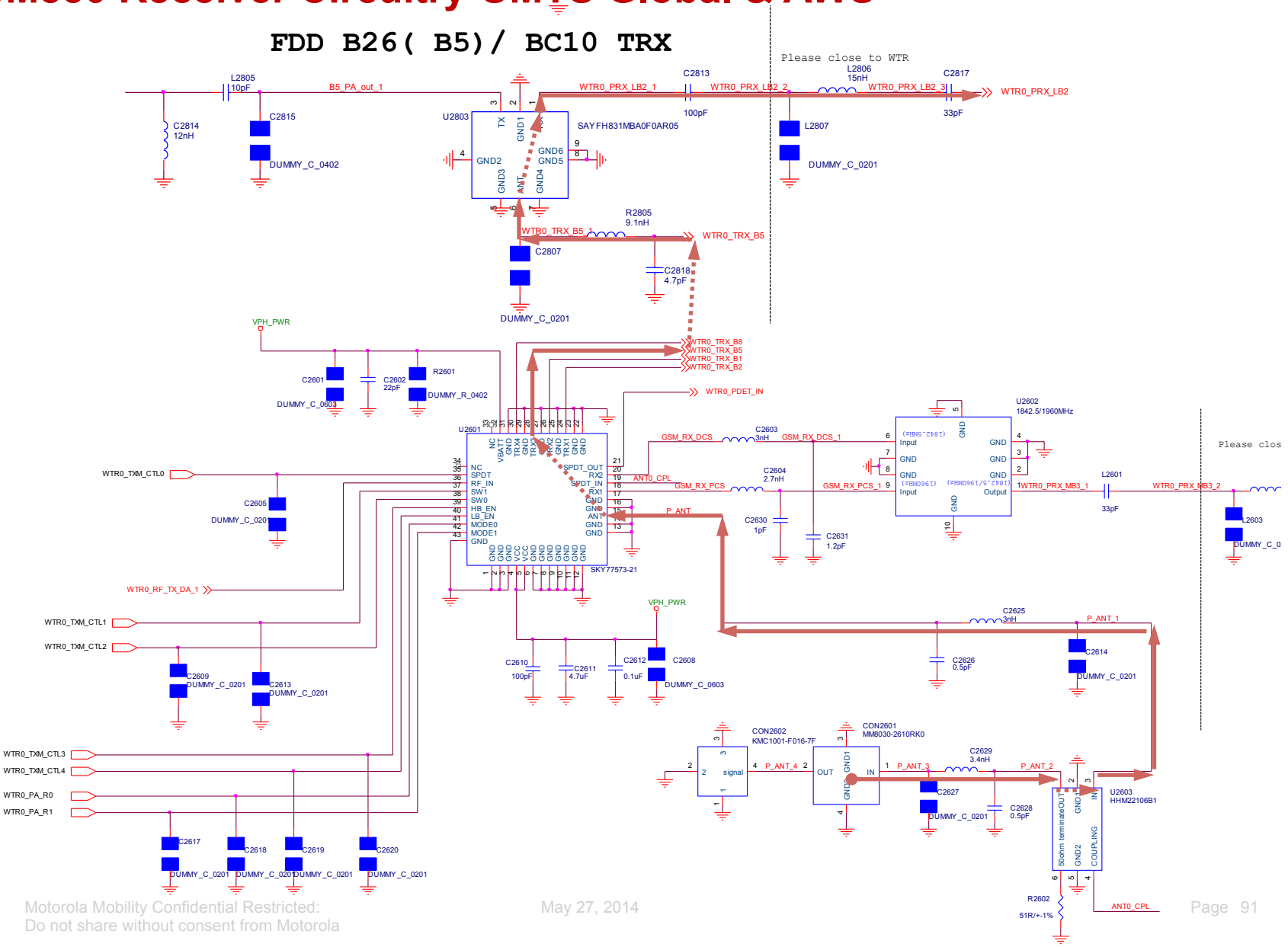
WCDMA/CDMA/GSM RADIO CHECK



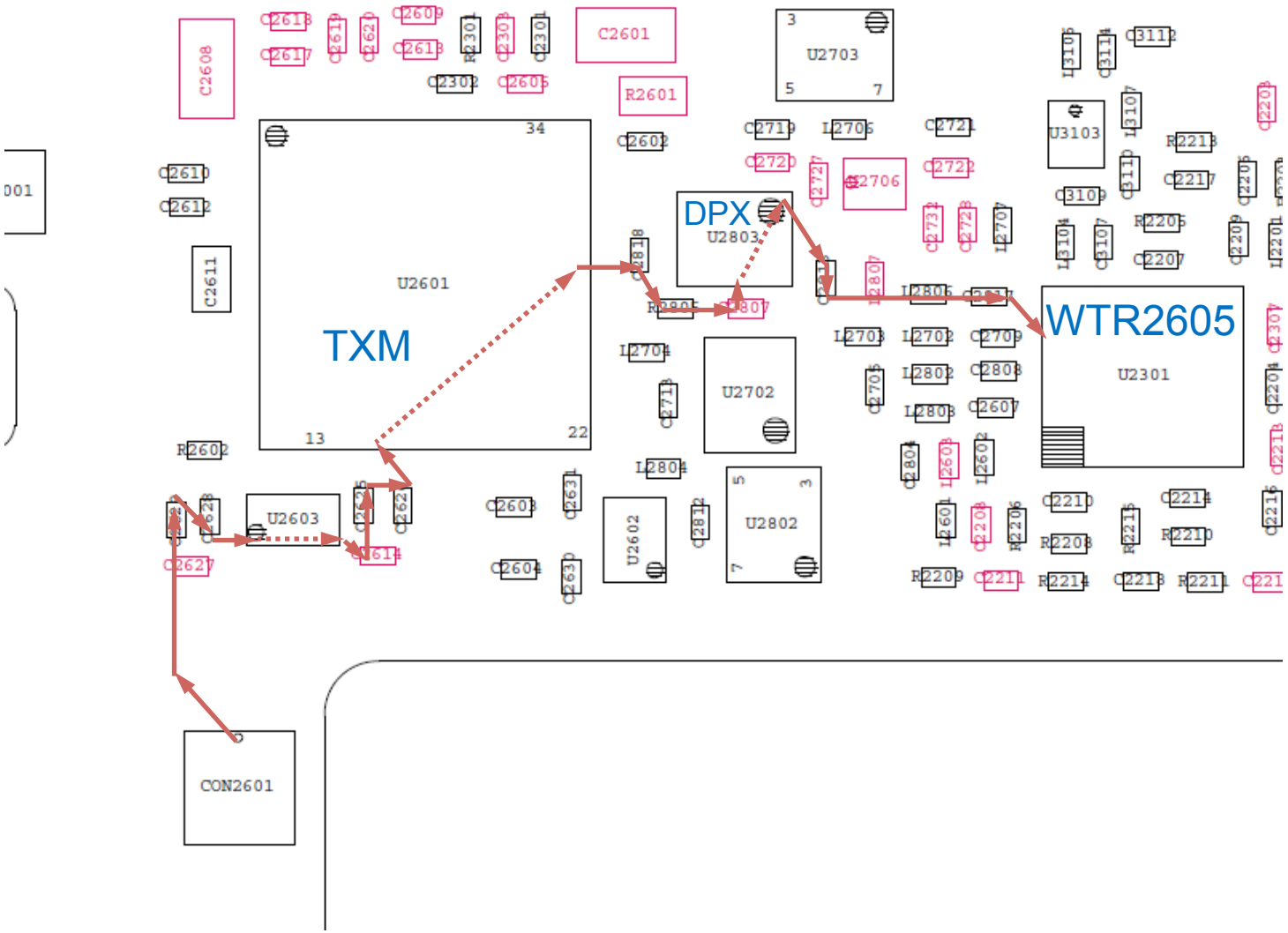
GSM850 Receiver UMTS Global & AWS Check Chart



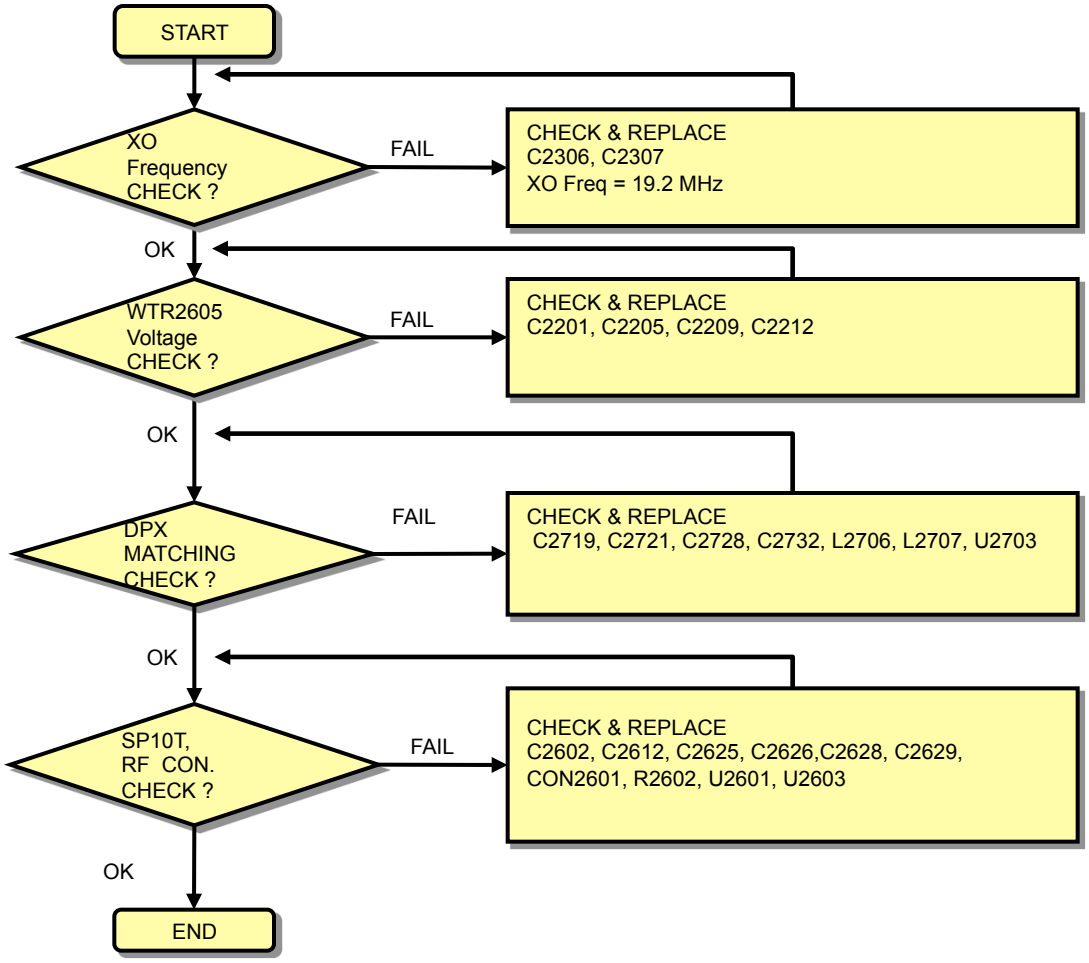
GSM850 Receiver Circuitry-UMTS Global & AWS



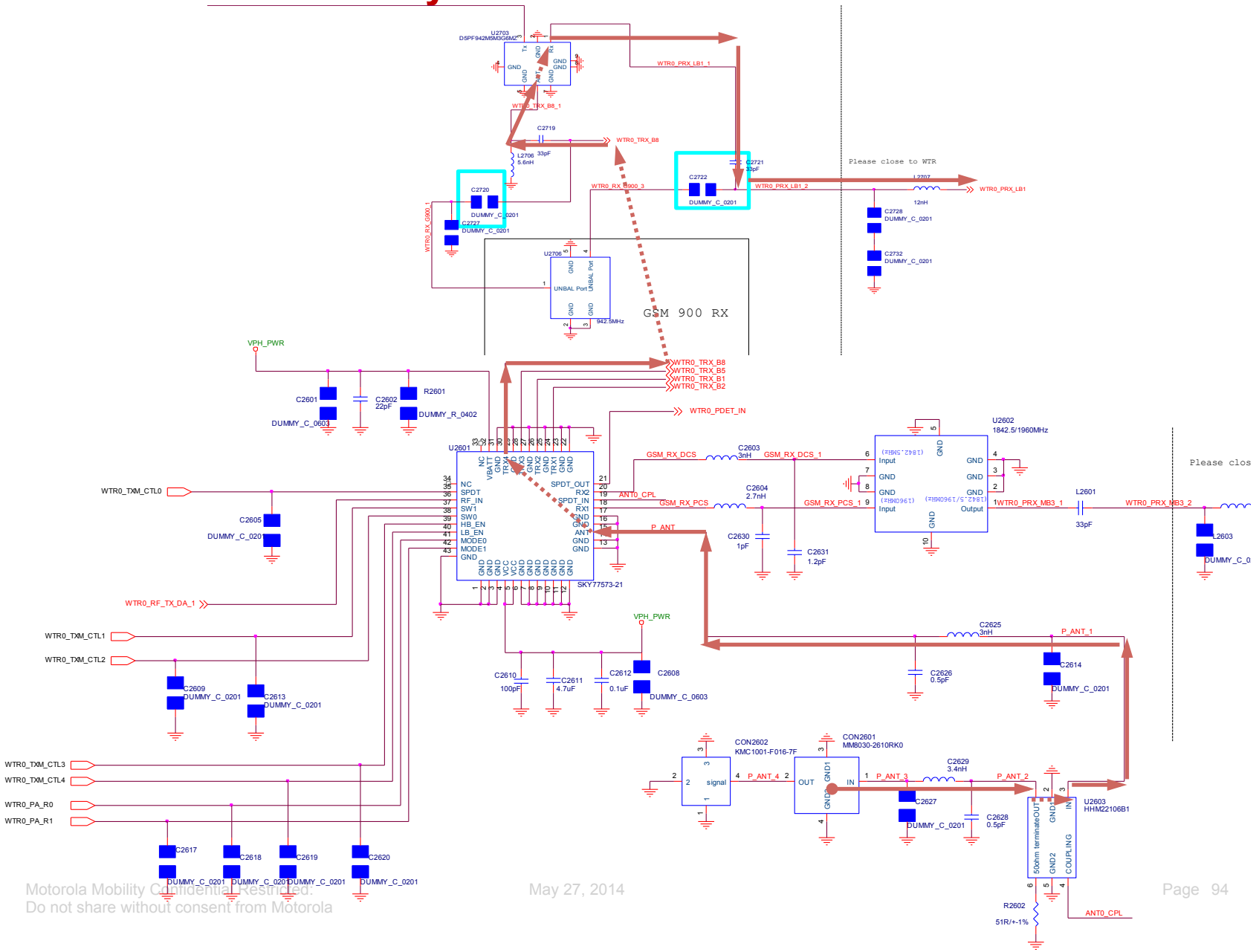
GSM850 Receiver Circuitry-UMTS Global & AWS



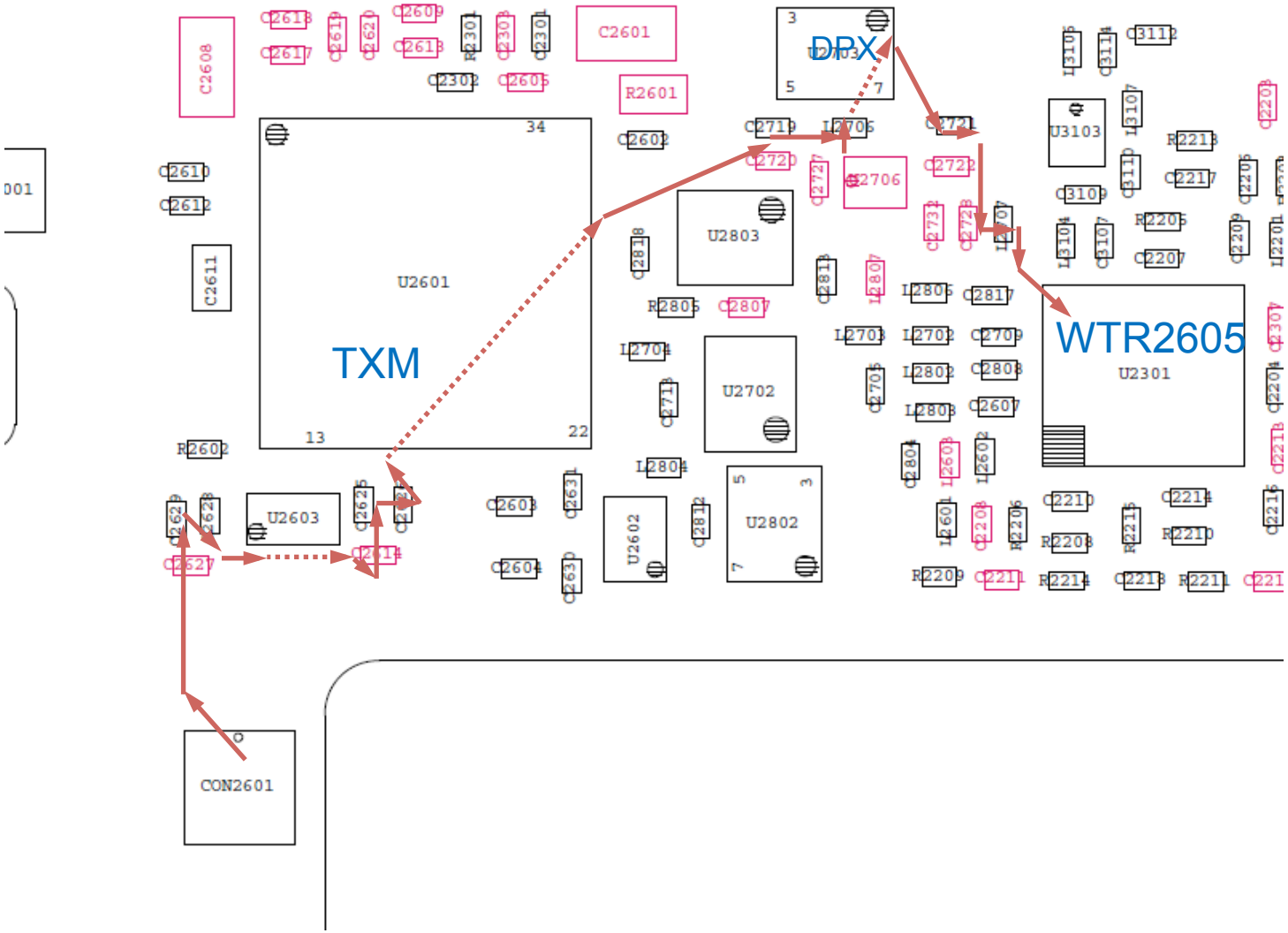
GSM900 Receiver UMTS Global Check Chart



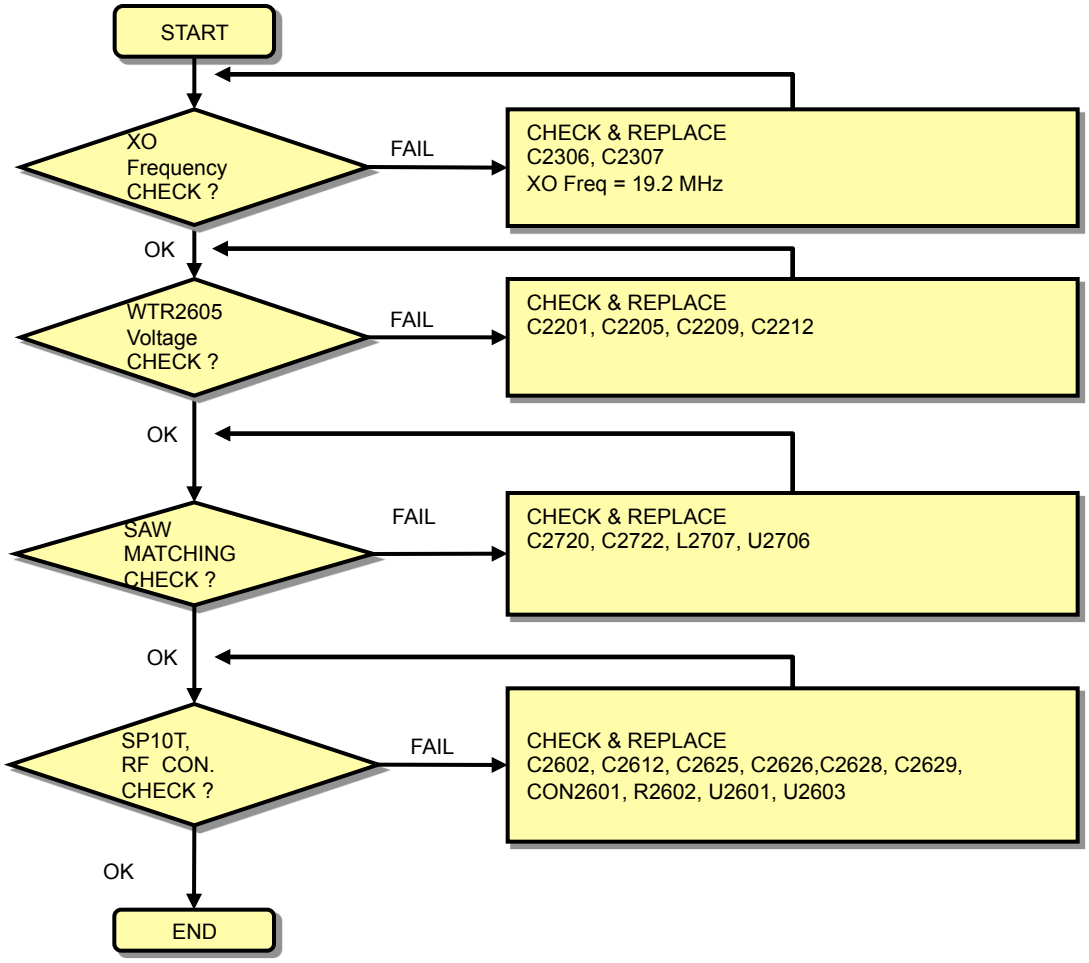
GSM900 Receiver Circuitry-UMTS Global



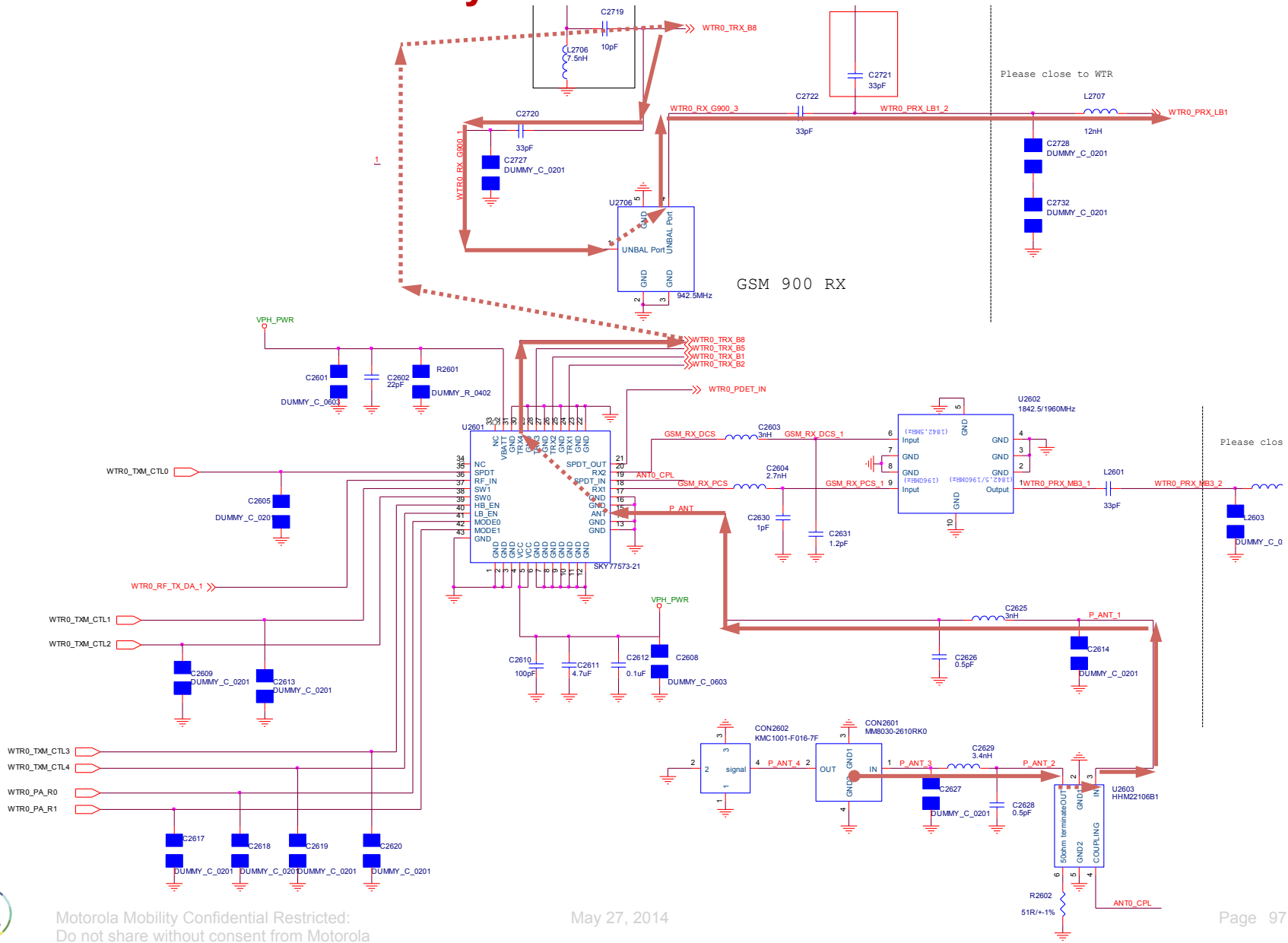
GSM900 Receiver Circuitry-UMTS Global



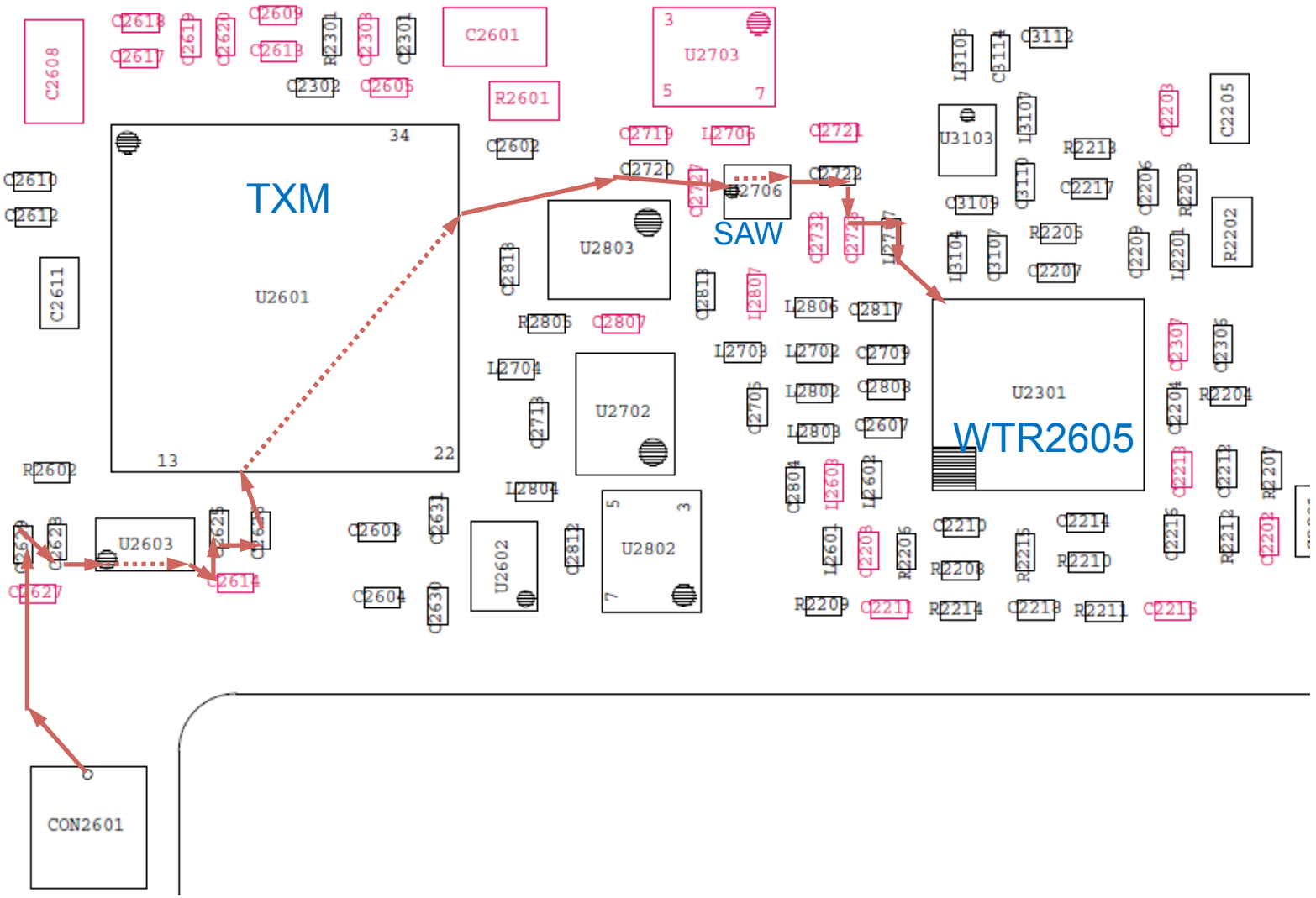
GSM900 Receiver UMTS AWS Check Chart



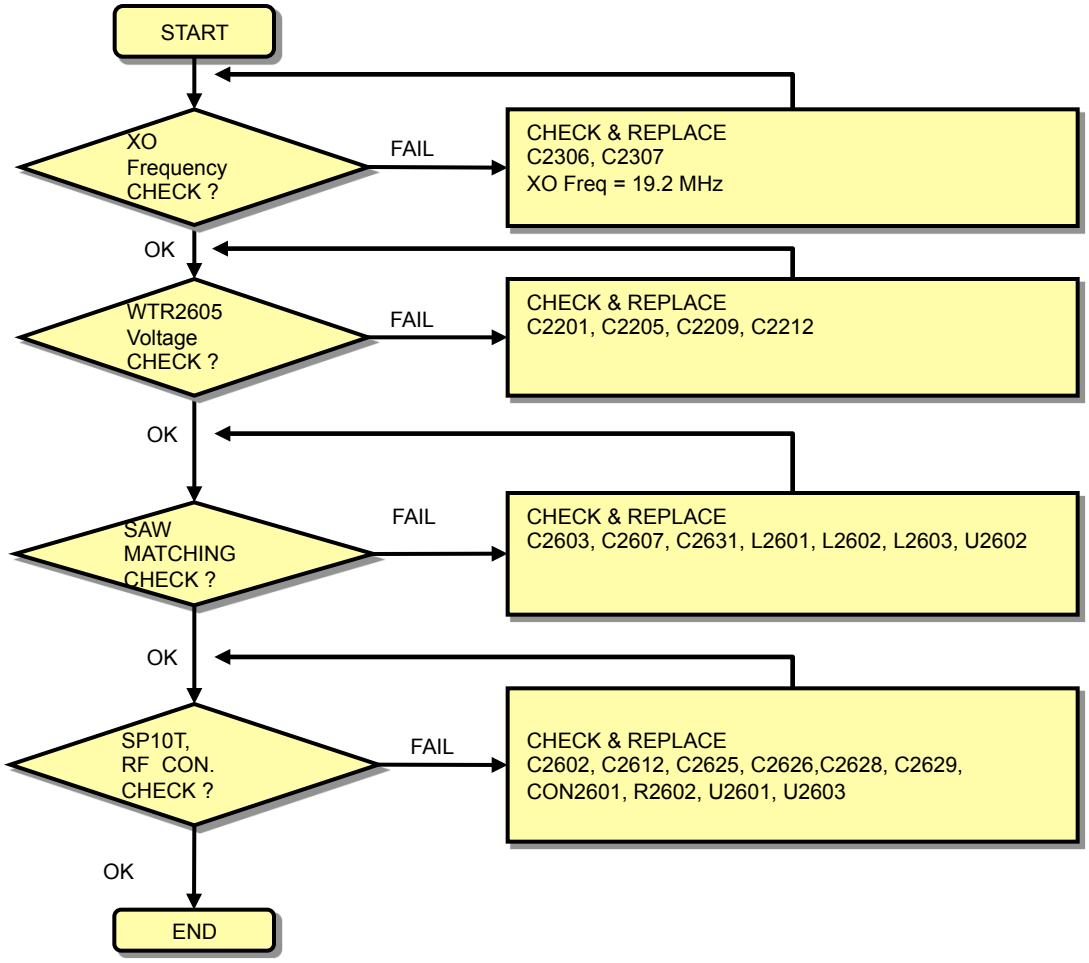
GSM900 Receiver Circuitry-UMTS AWS



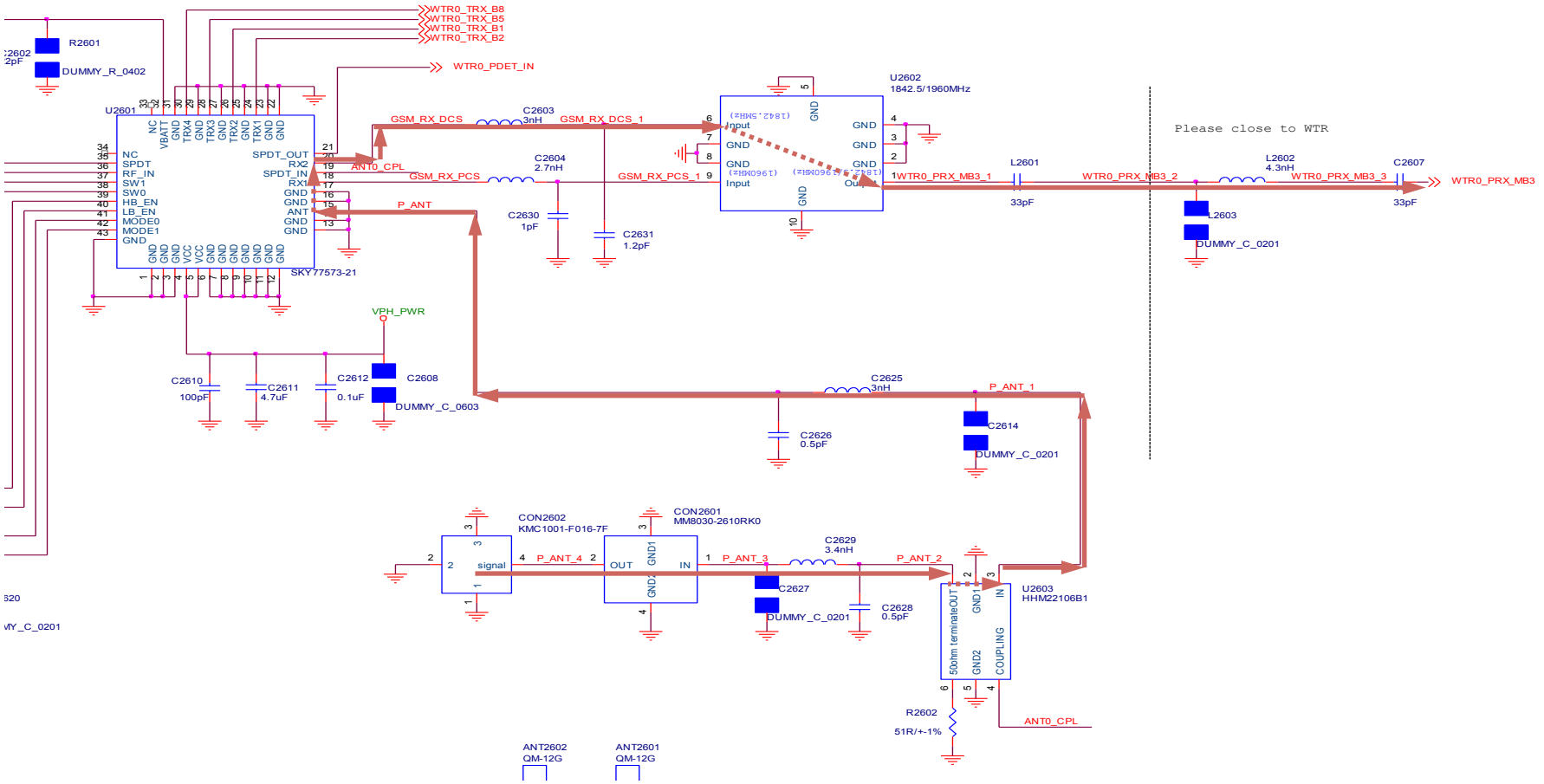
GSM900 Receiver Circuitry-UMTS AWS



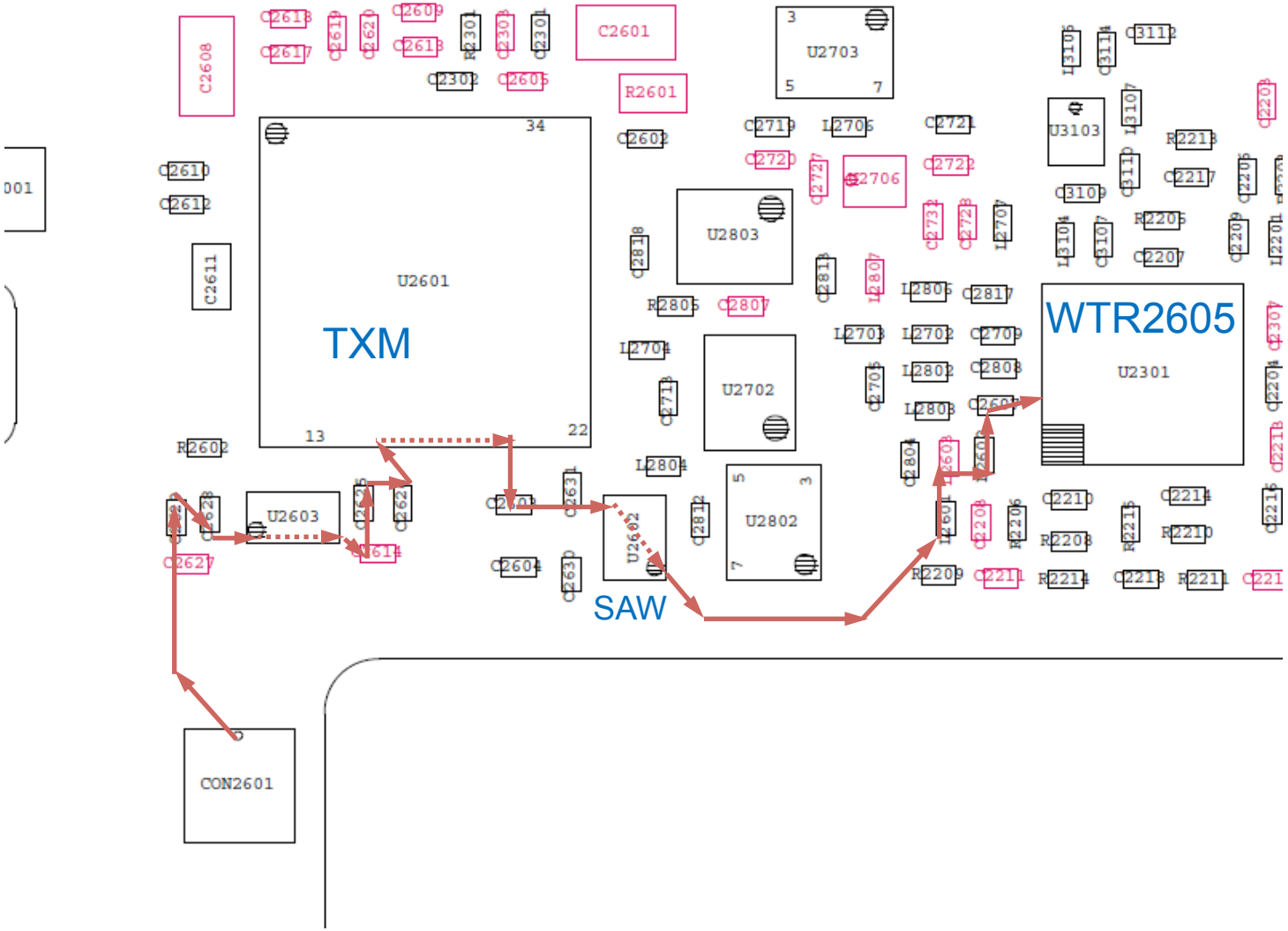
GSM1800 Receiver UMTS Global & AWS Check Chart



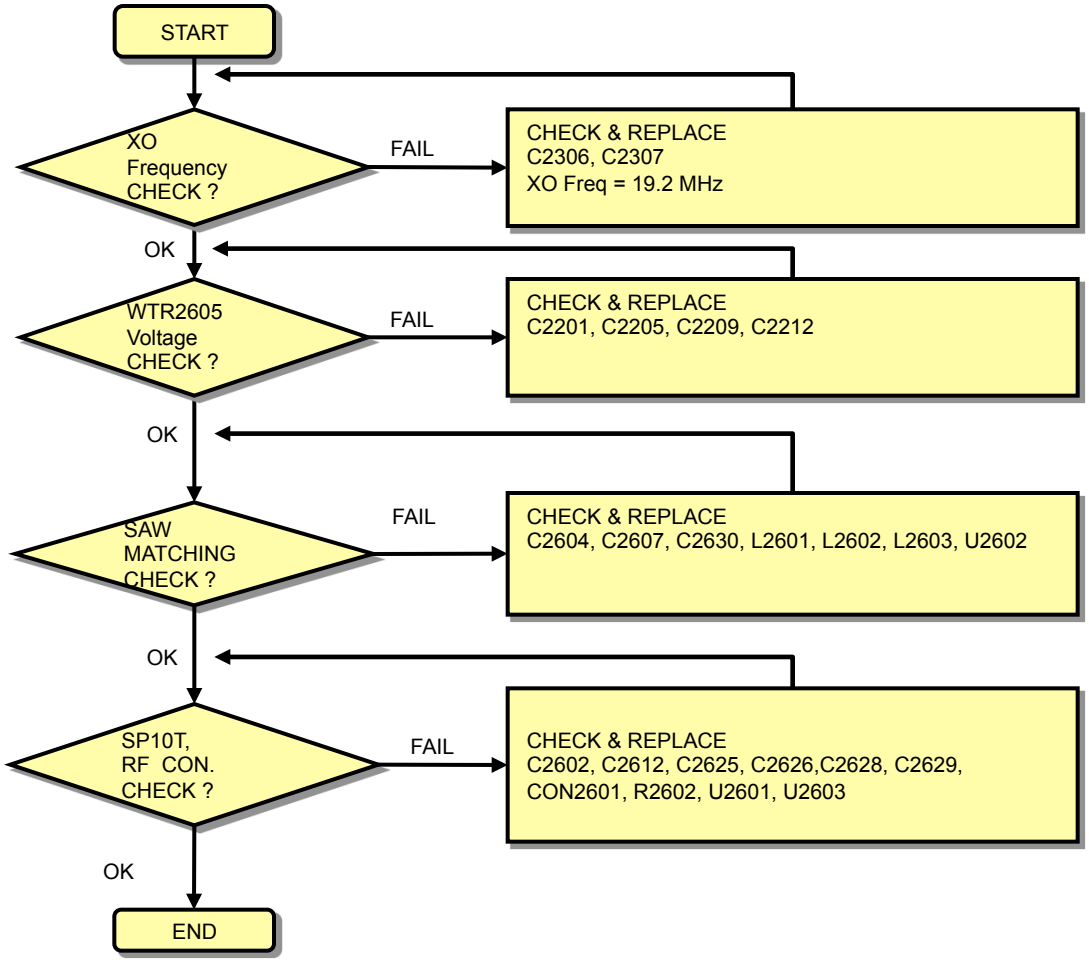
GSM1800 Receiver Circuitry-UMTS Global & AWS



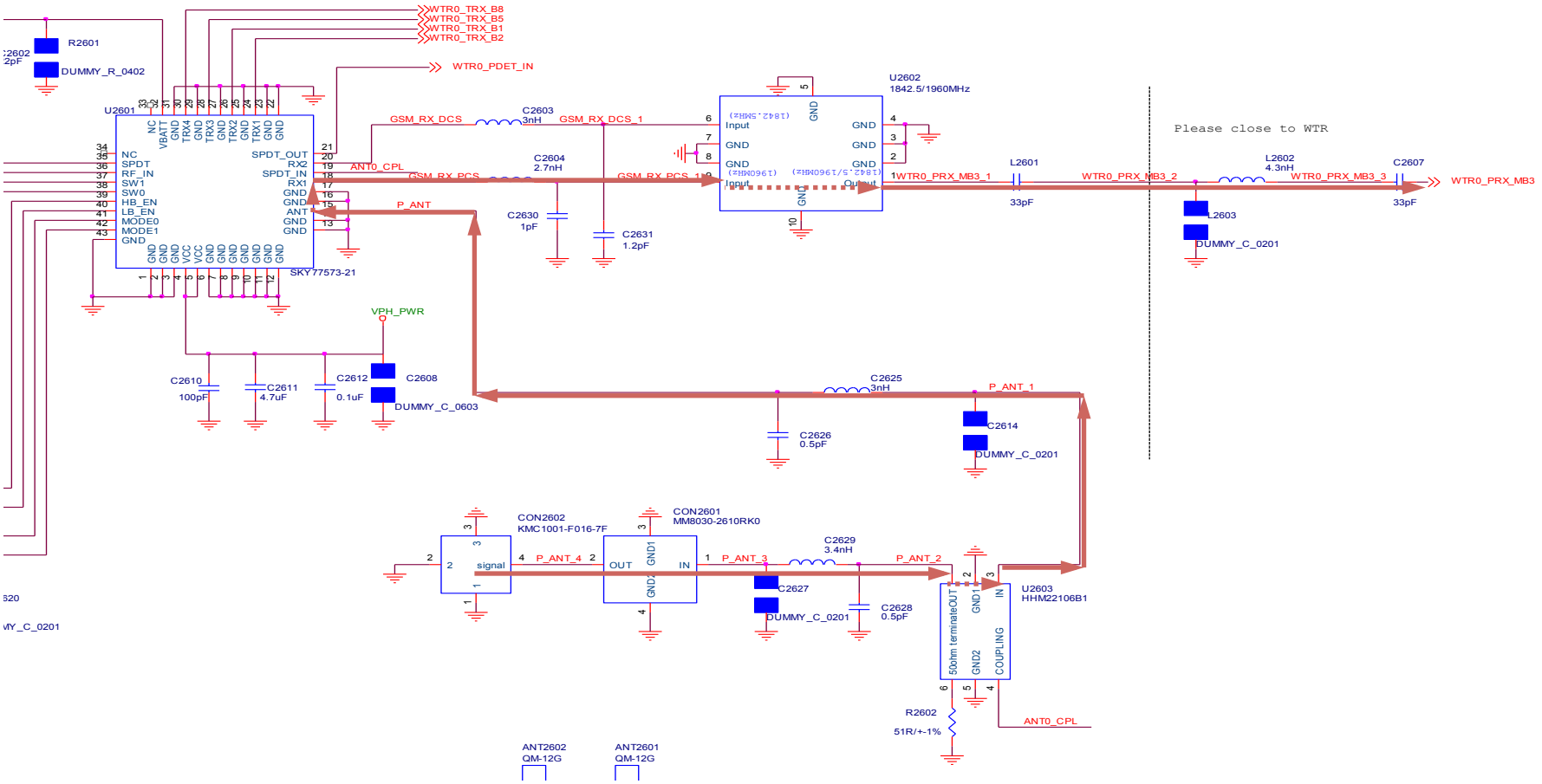
GSM1800 Receiver Circuitry-UMTS Global



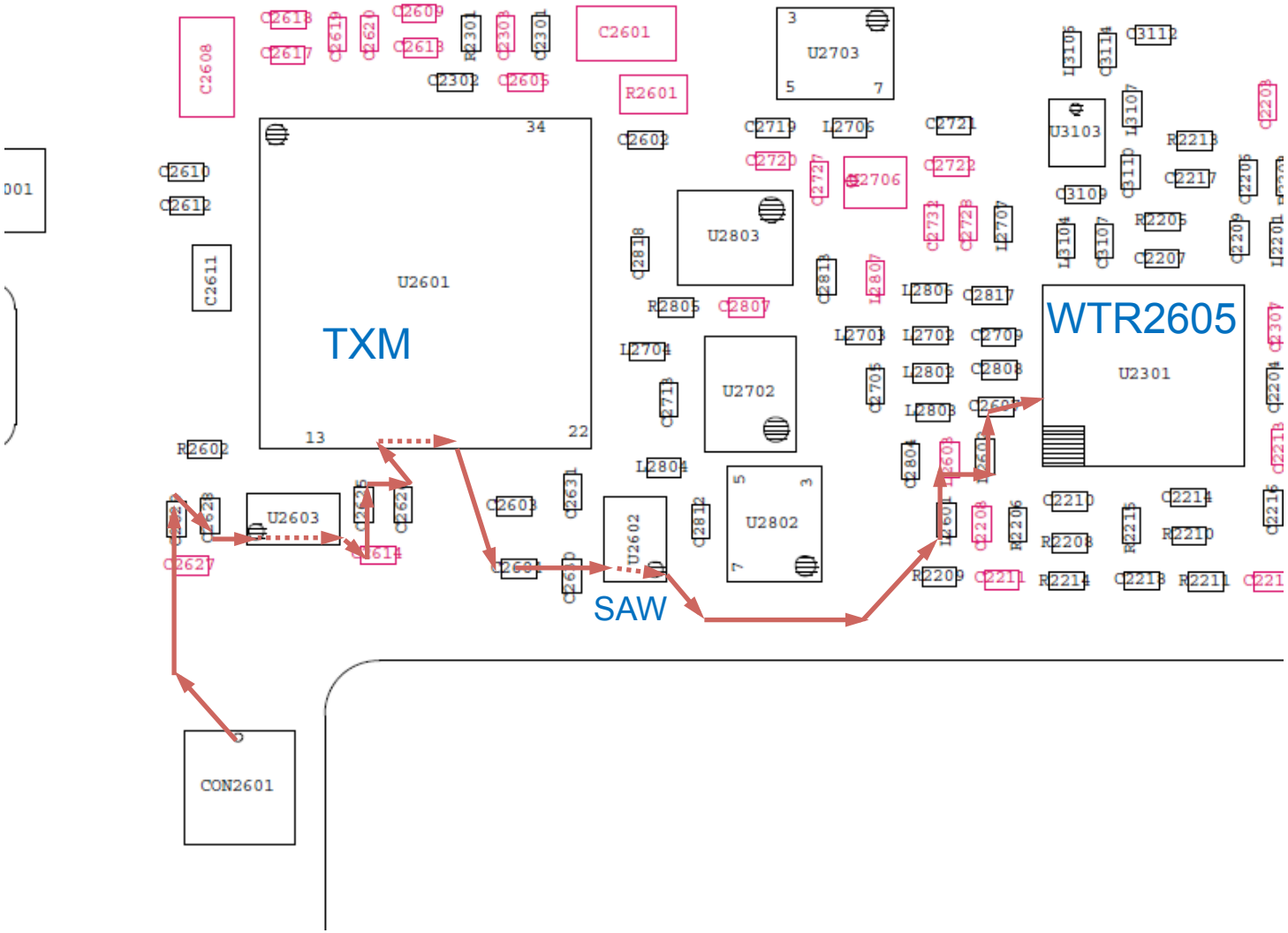
GSM1900 Receiver UMTS Global & AWS Check Chart



GSM1900 Receiver Circuitry-UMTS Global & AWS

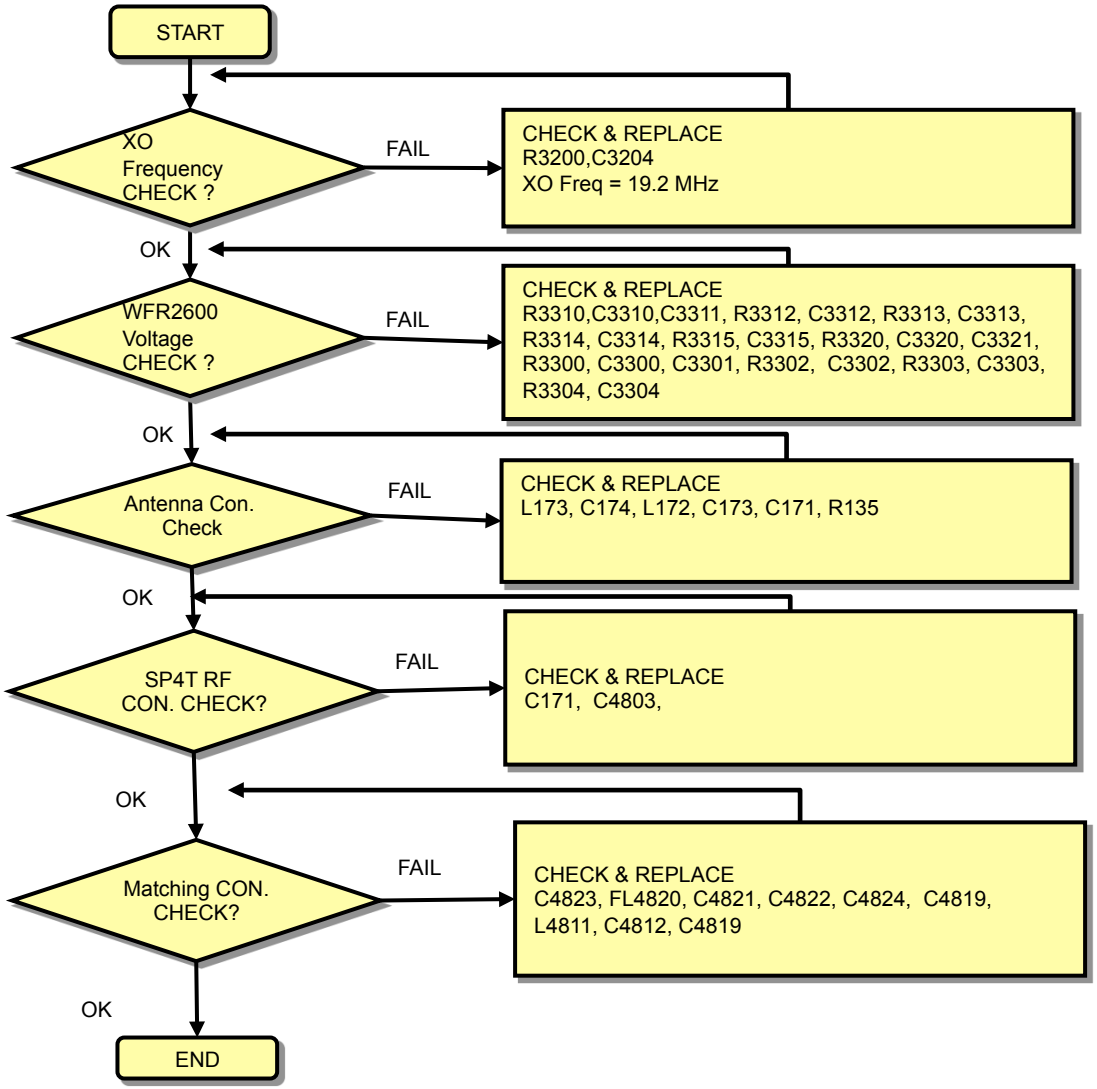


GSM1900 Receiver Circuitry-UMTS Global

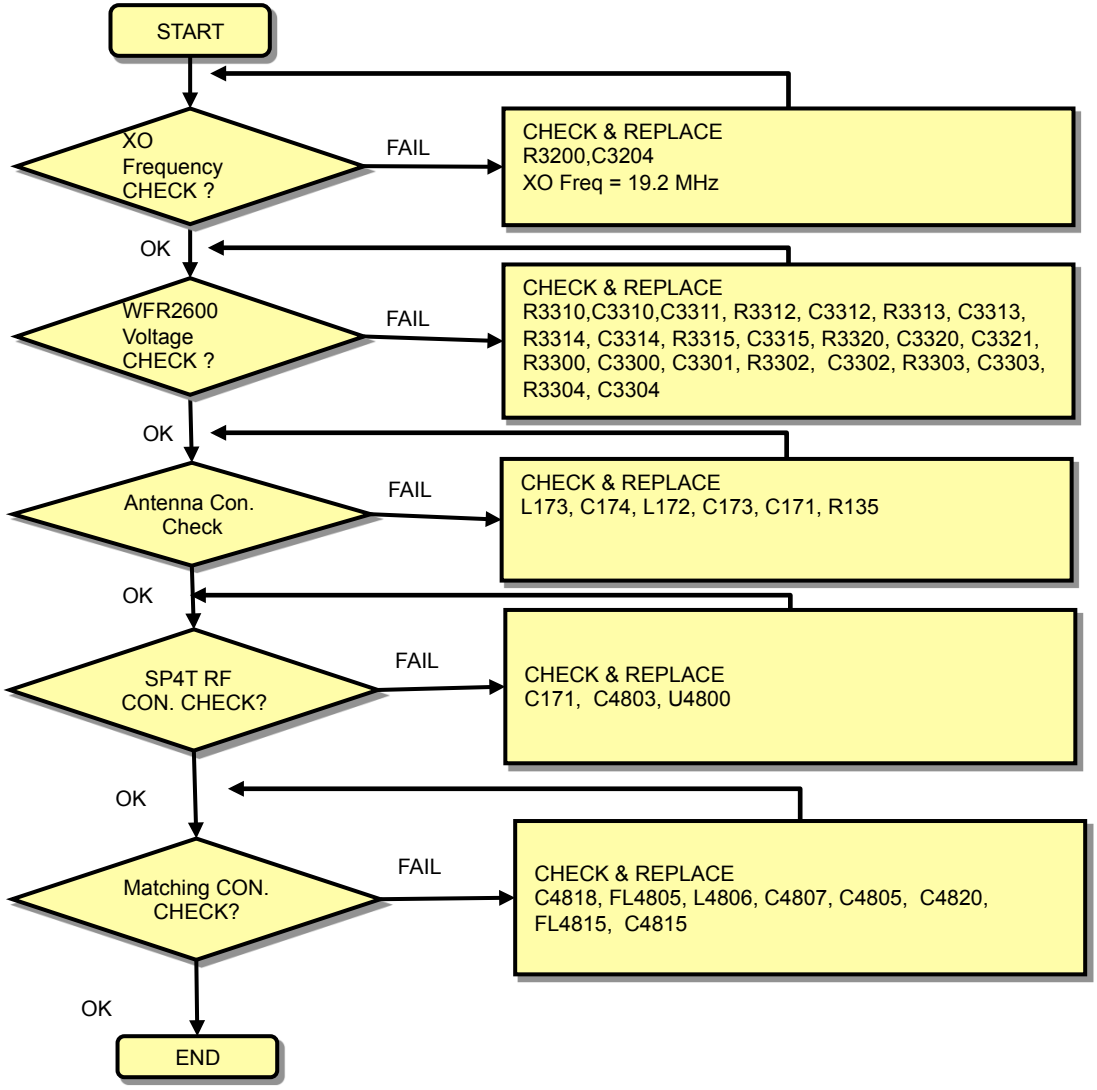


WCDMA B1/B2/B4/B8 and CDMA BC0/BC1/BC10 Diversity Rx

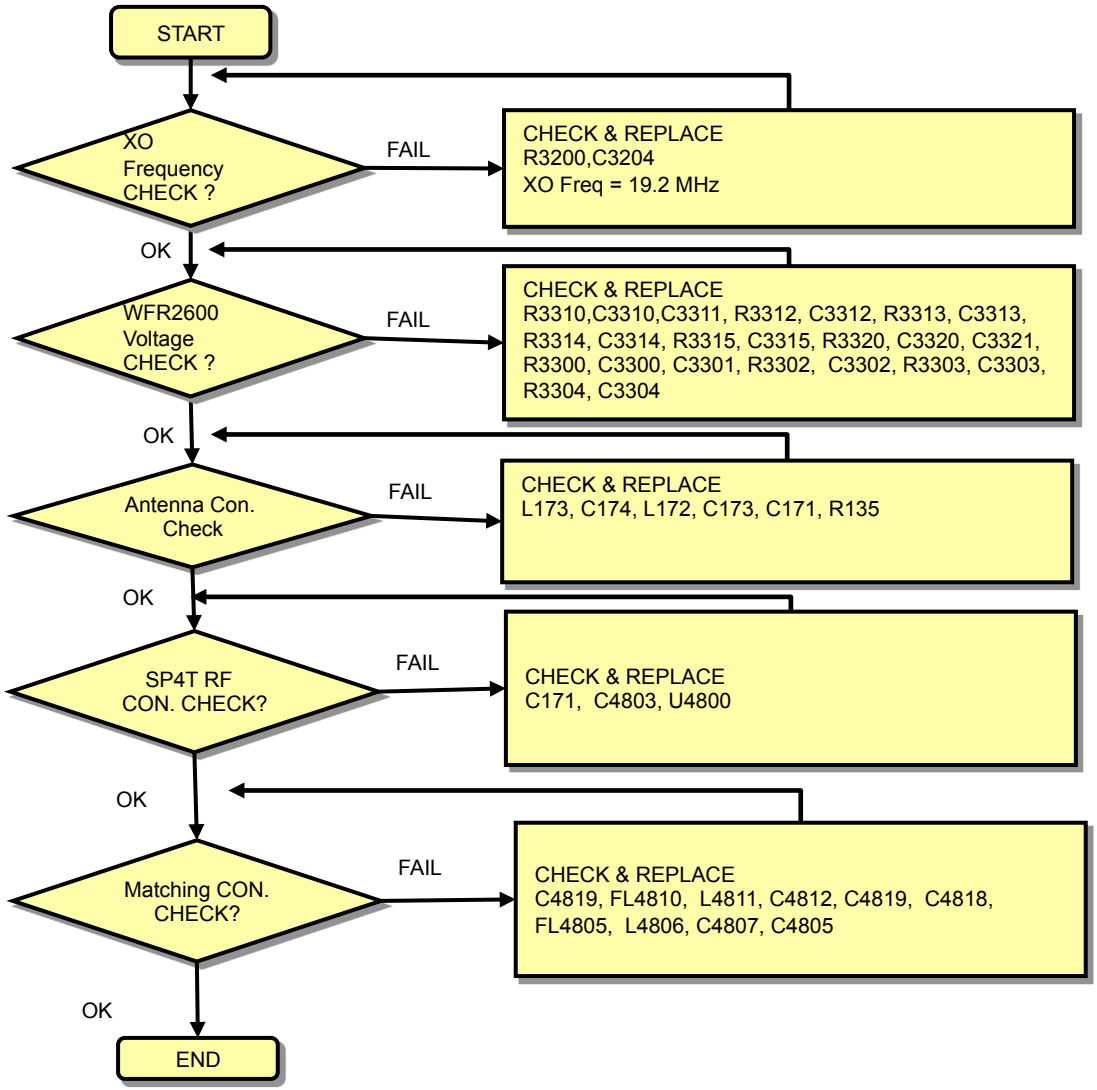
Diversity RX Check Chart For CDMA BC0, BC1, BC10



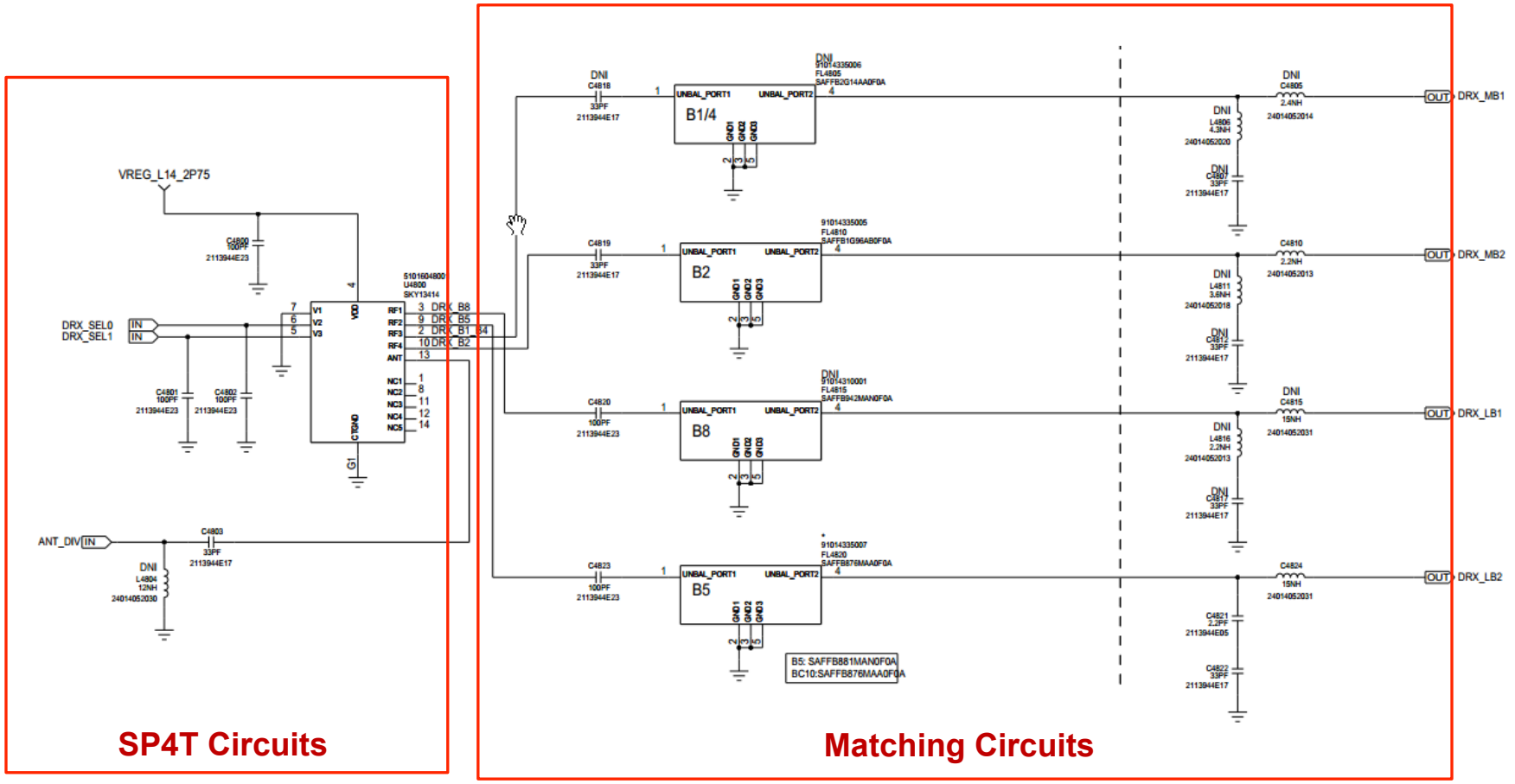
Diversity RX Check Chart For UMTS Global B1, B8



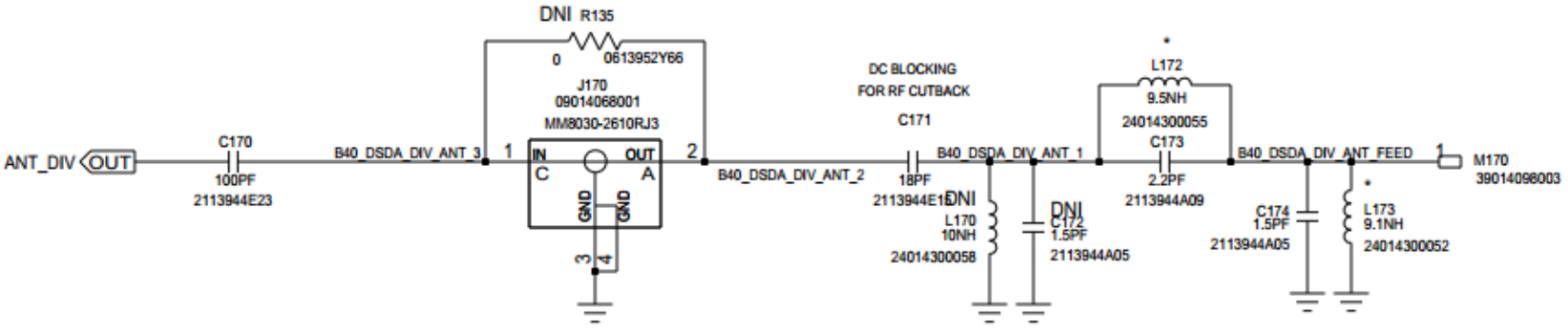
Diversity RX Check Chart For UMTS AWS B2, B4



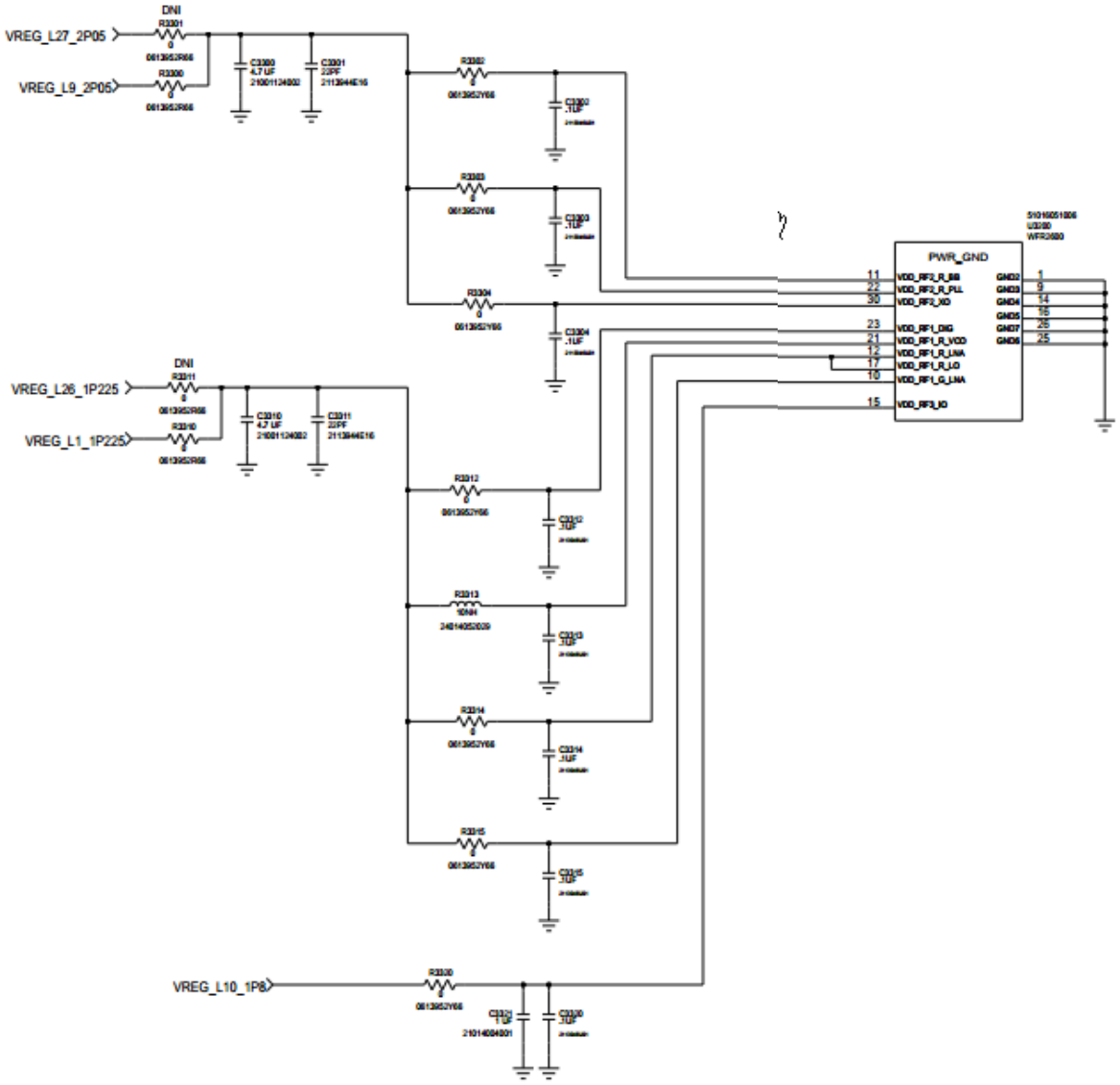
SP4T and Matching Circuits



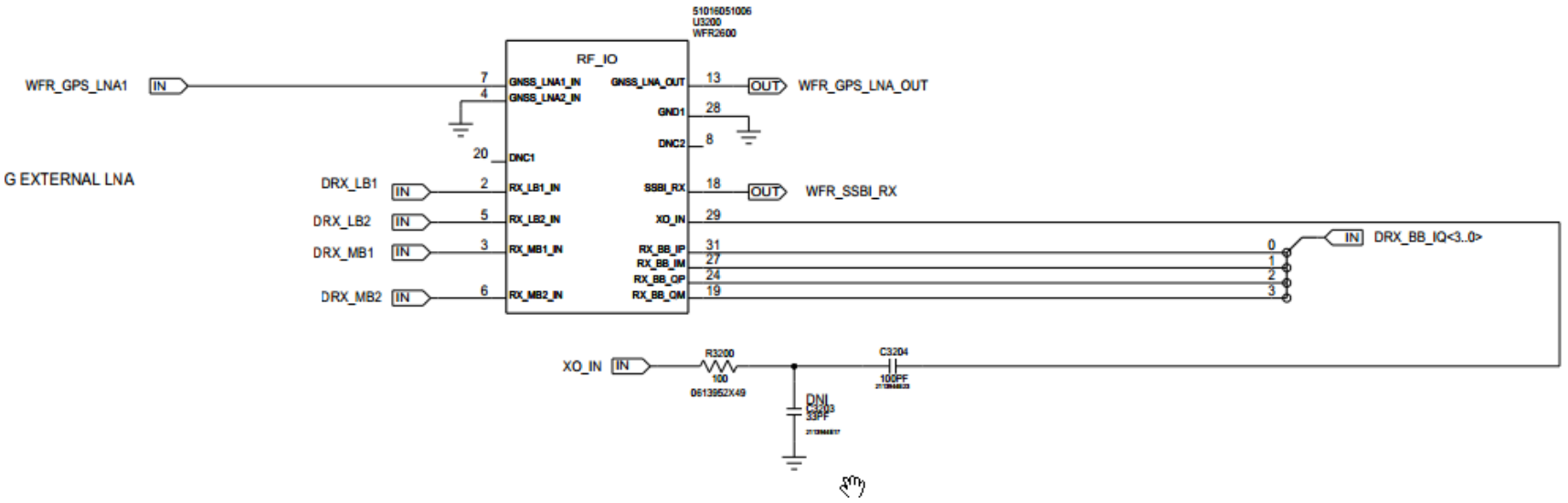
Antenna Circuits



WFR2600 Voltage Supply Circuits

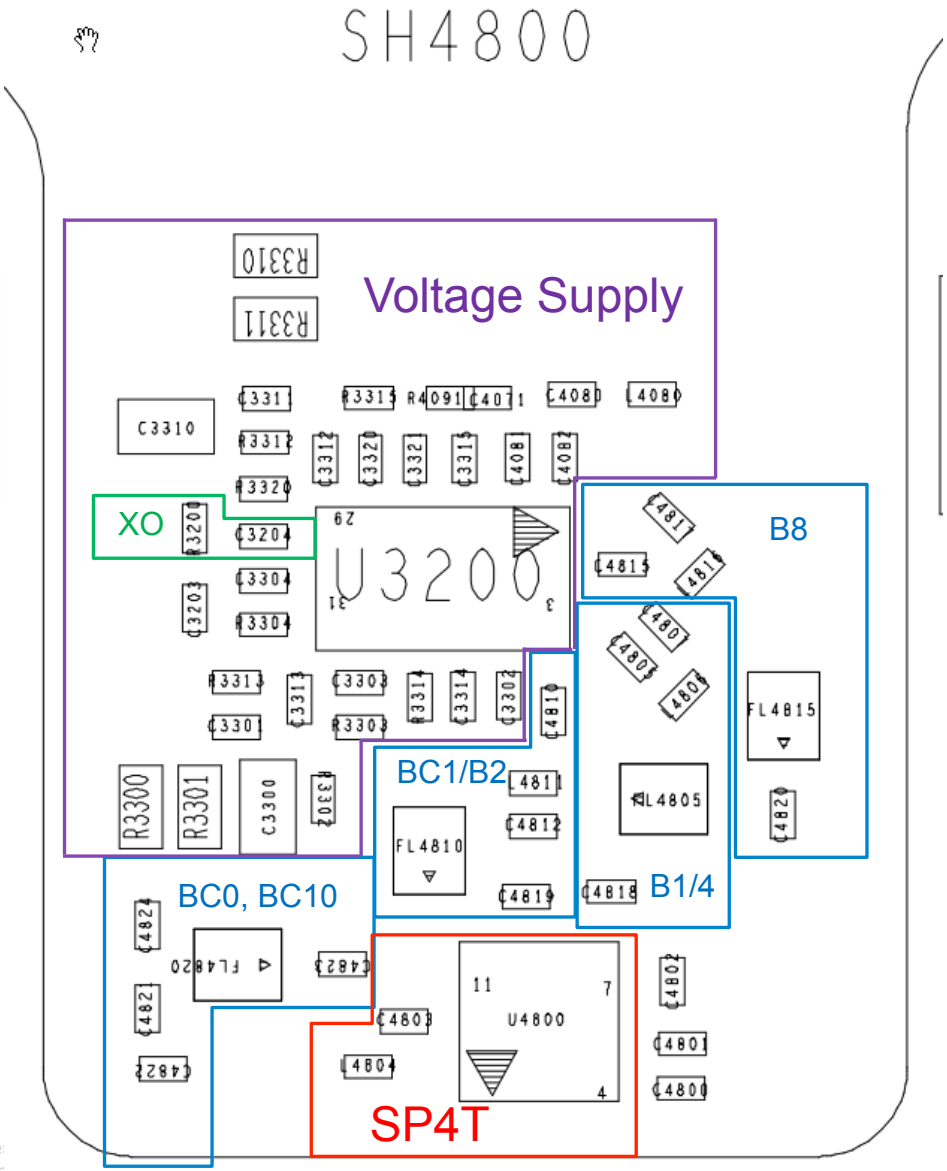


XO Supply Circuit

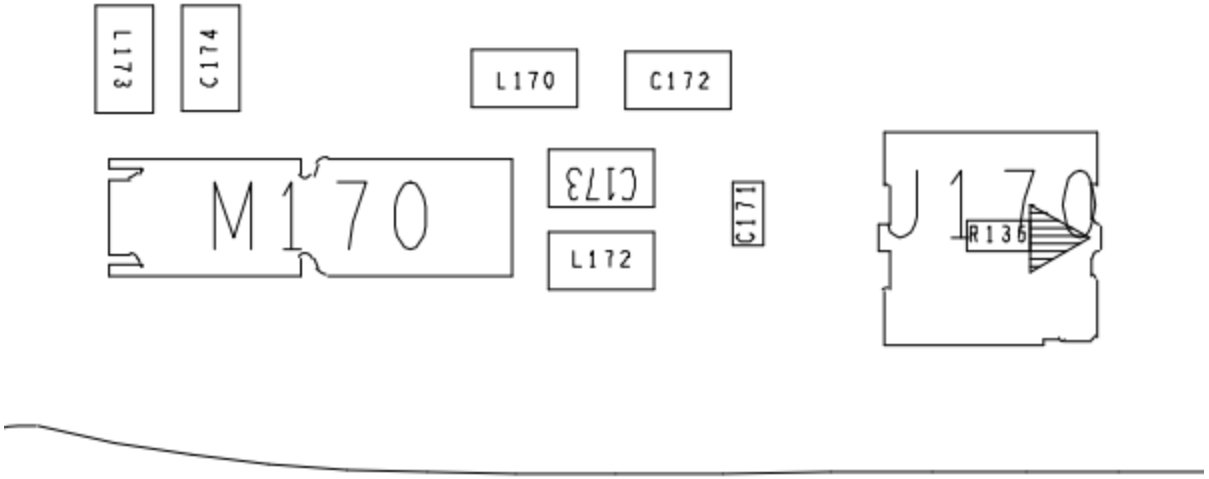


SP4T, Voltage Supply, XO, and Matching Circuits Layout

Matching

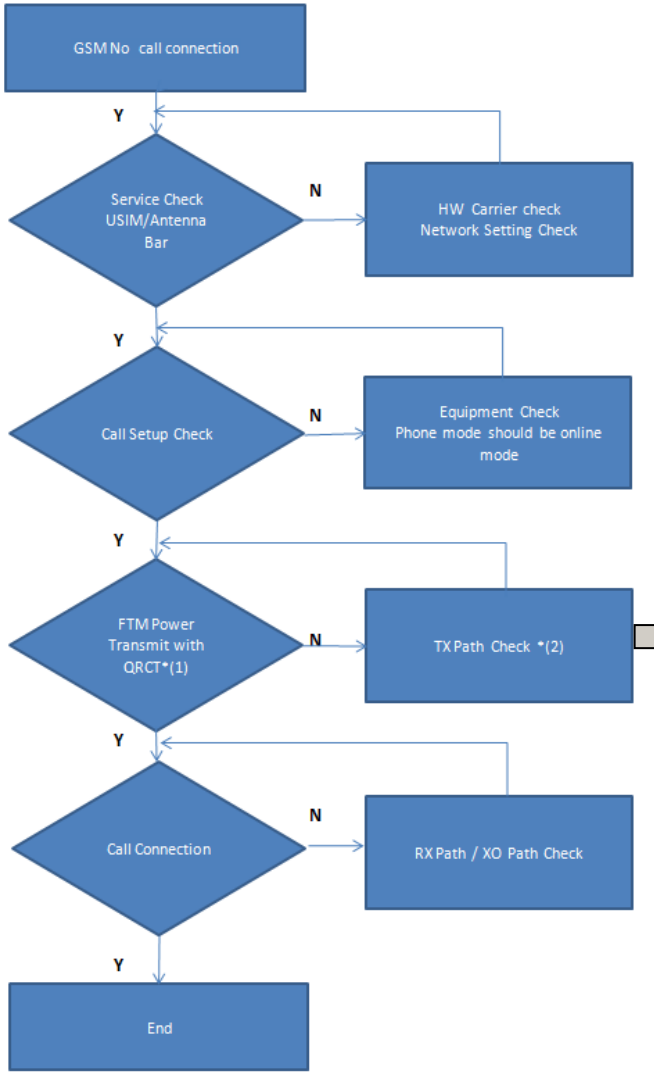


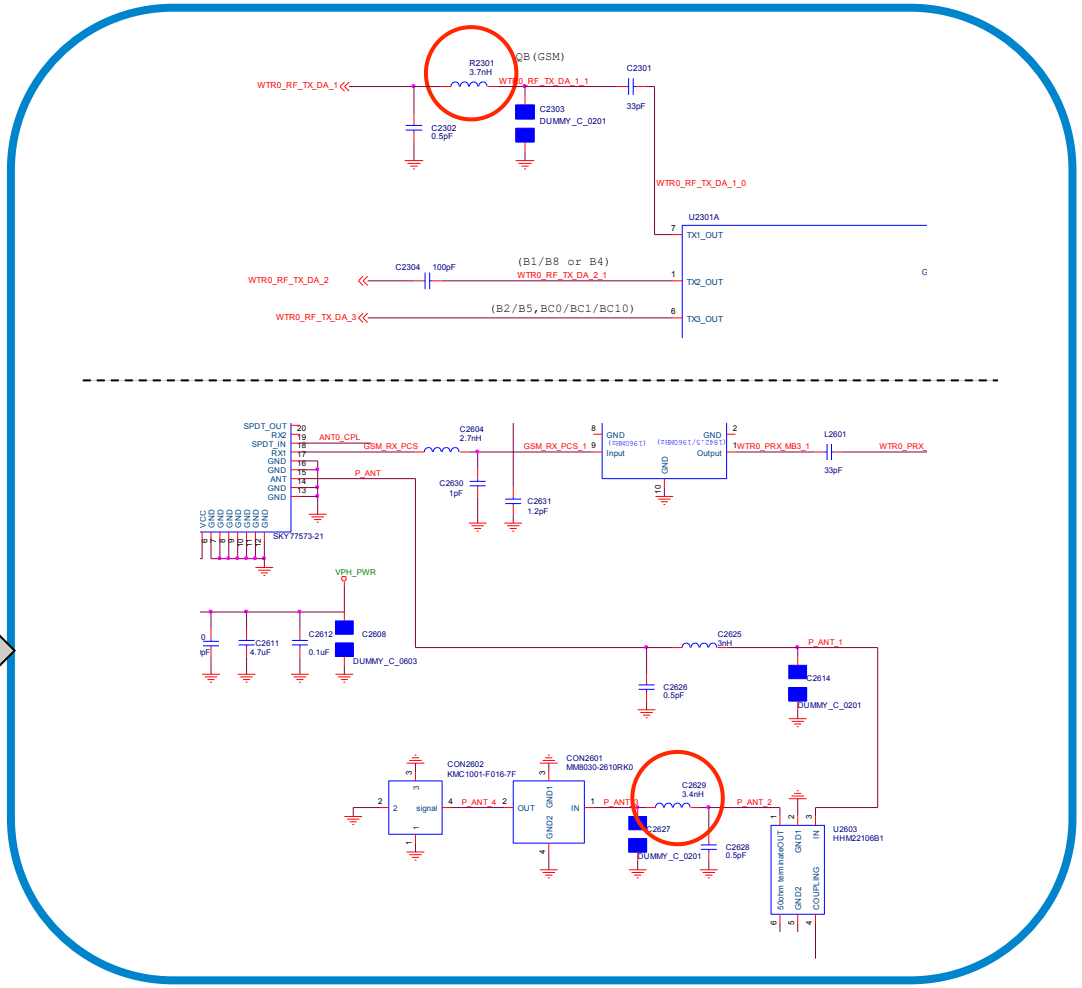
Antenna Matching Circuit Layout



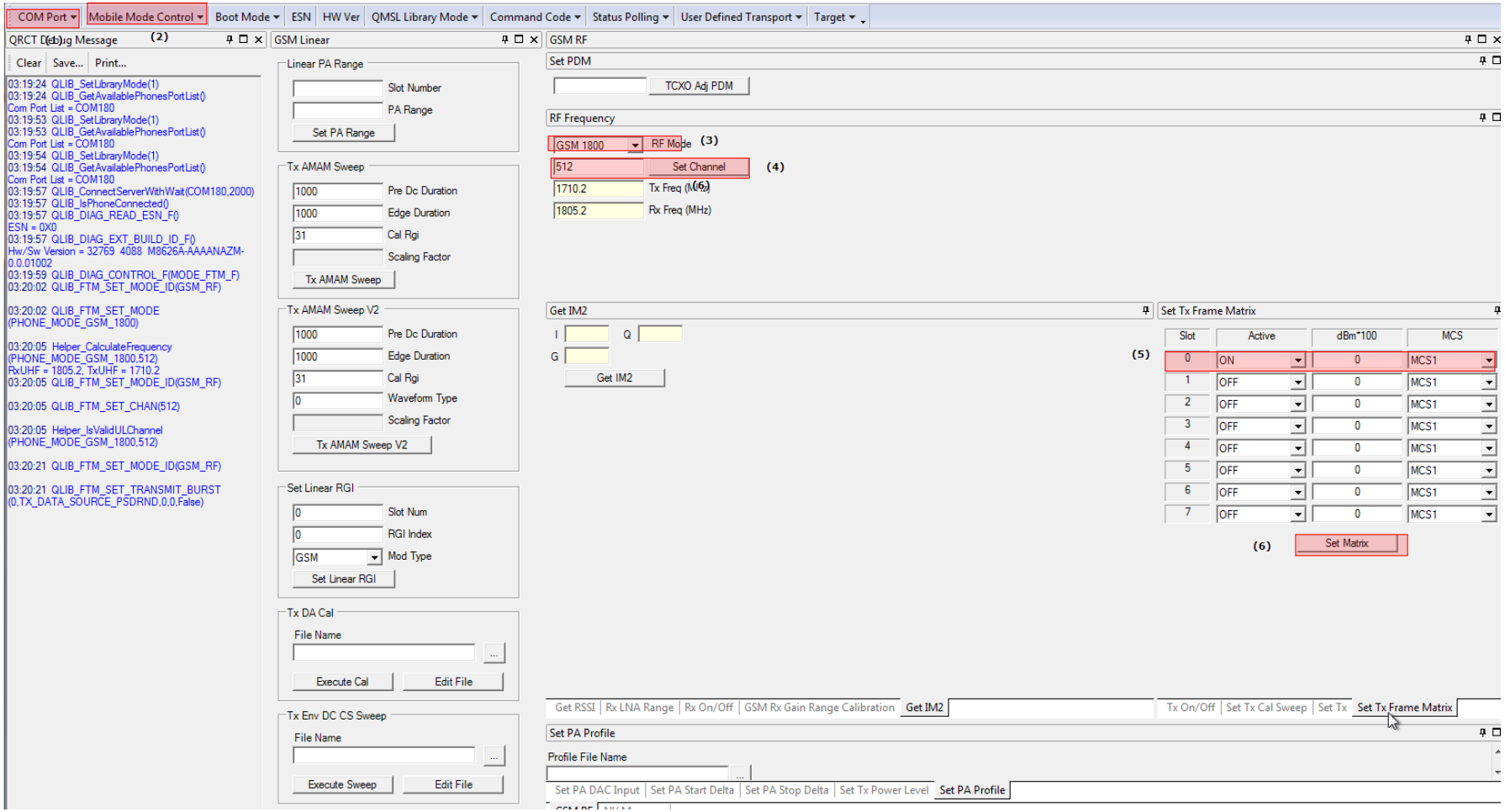
GSM Quad Band Tx

GSM QUAD BAND TX CHECK CHART – NO TX

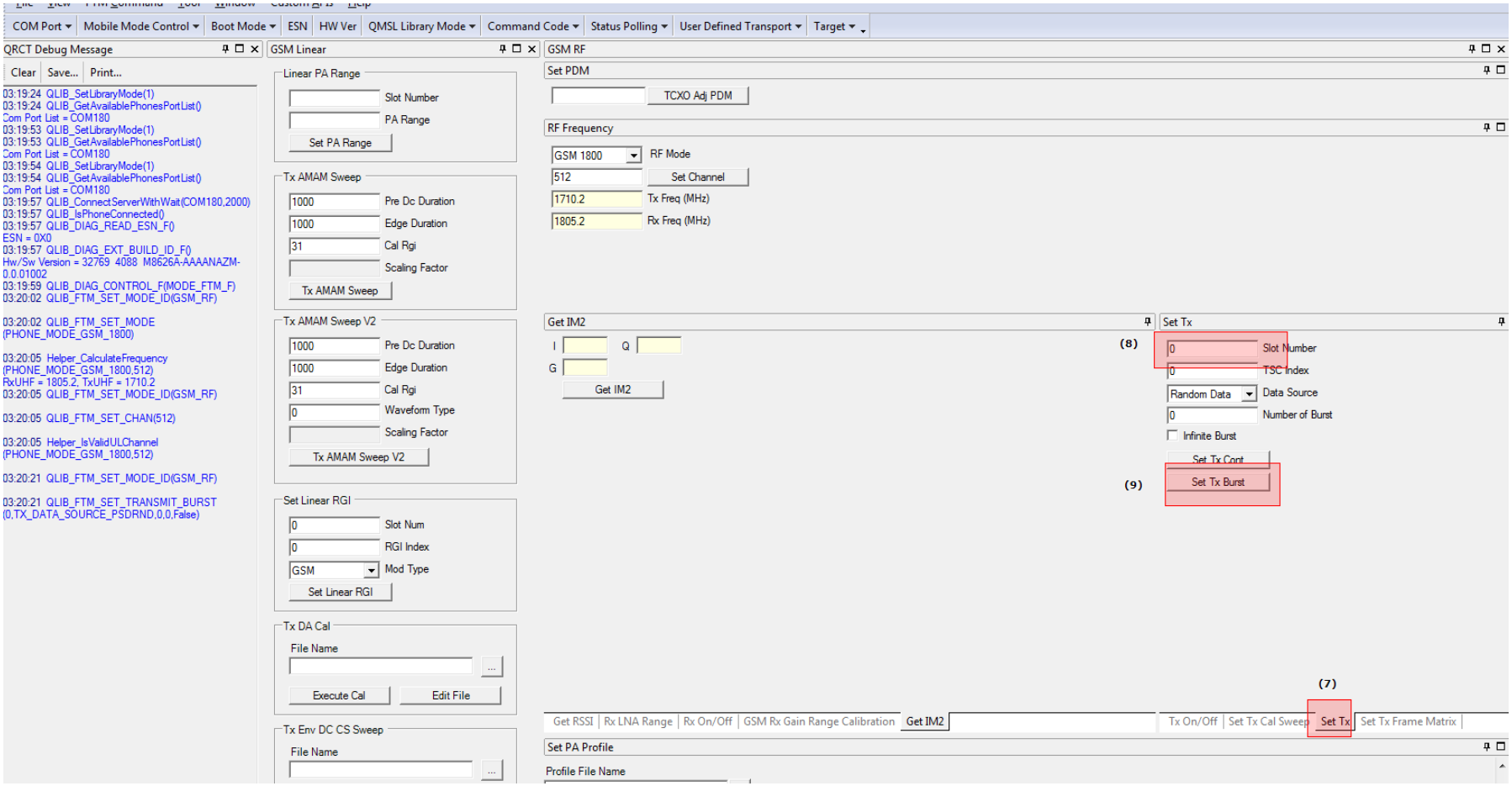




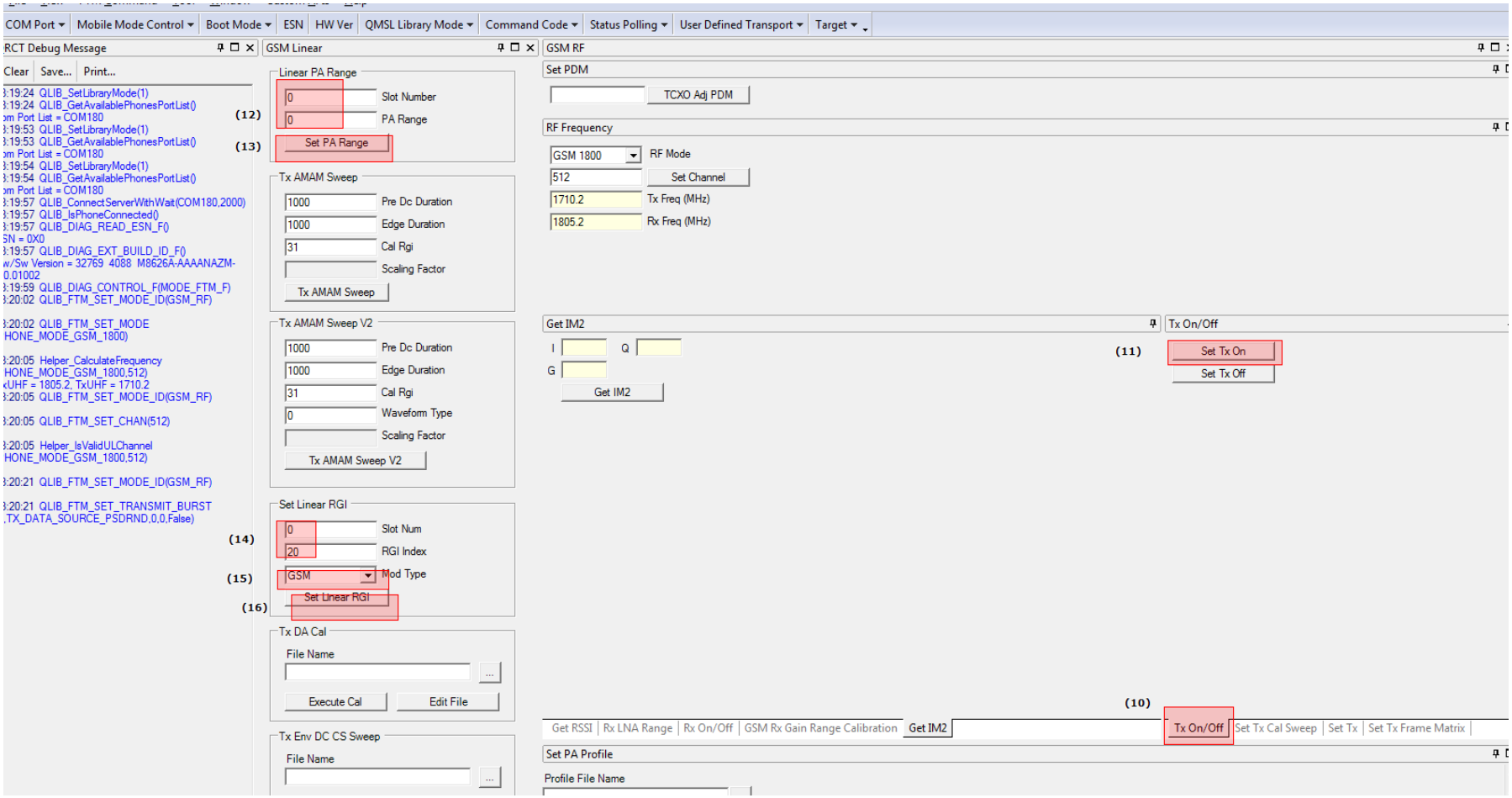
QRCT GSM POWER TRANSMIT



QRCT GSM POWER TRANSMIT



QRCT GSM POWER TRANSMIT



WLAN / BT / FM TROUBLESHOOTING

Bluetooth/WiFi Power-On Failure

WLAN/BT power-on failure Symptoms:

WLAN DL test firmware test commands fail

Bluetooth power-on test commands fail

Step 1 for BT/Wi-Fi Power-On Failure

- Check if the other functionality fails as well, e.g. check WLAN “power on” if Bluetooth can not be powered on. Check Bluetooth “power on” if WLAN can not be powered on.

- Both WLAN and Bluetooth share the same IC and most of the circuit, so if one of the BT/Wi-Fi fails, the other should fail as well. If only one of them fails, it is highly likely that it is not a hardware problem and it could just that the BT/Wi-Fi is turned on through the UI already and the test commands can not turn it on again.

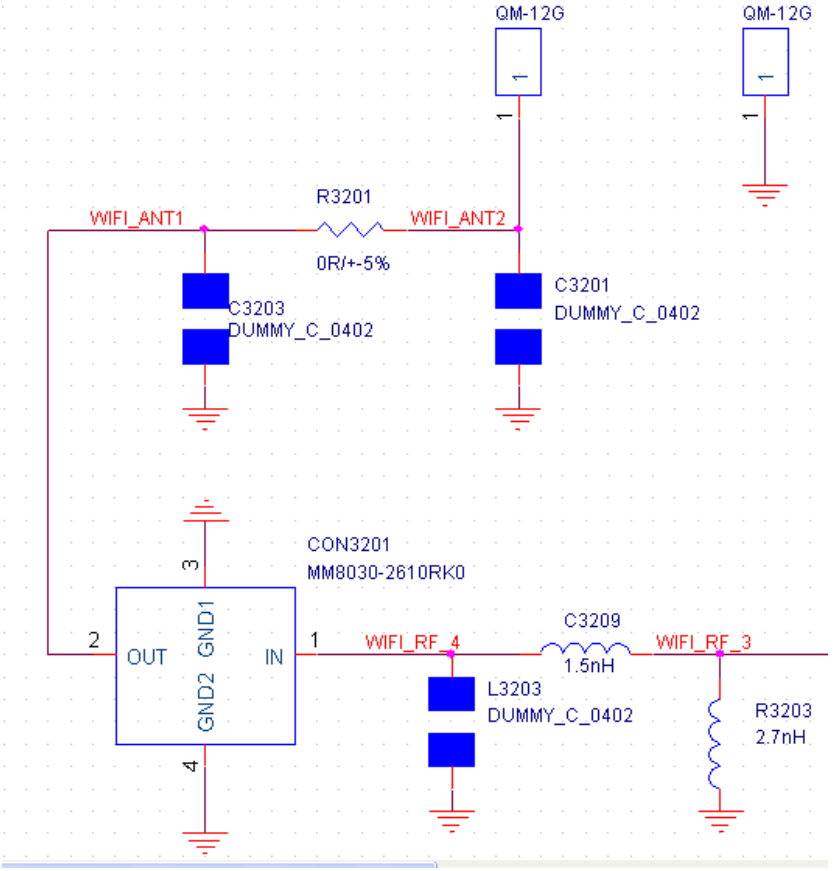
Step 2 for BT/Wi-Fi Power-On Failure

If both BT and WLAN fails, it is highly indicative of a hardware failure.

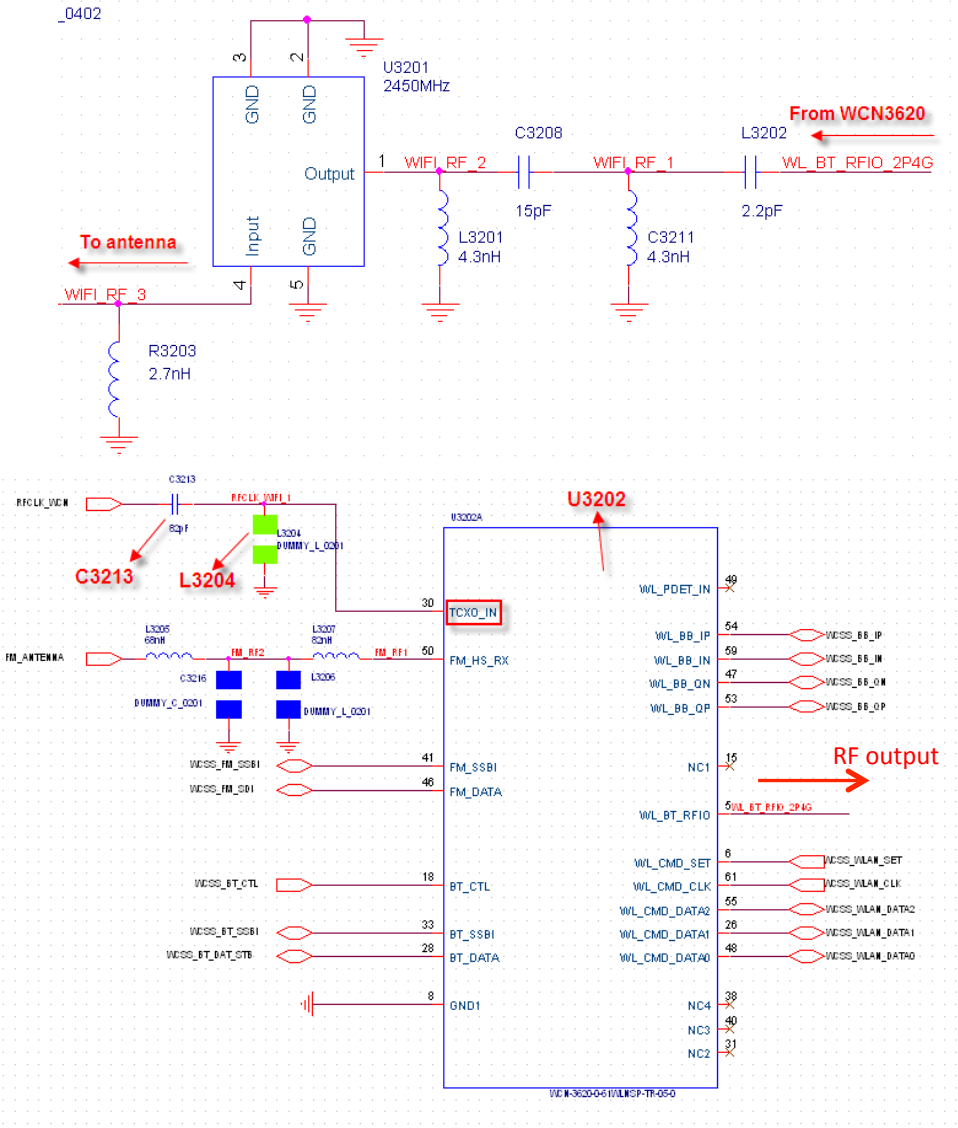
Location of the Bluetooth and WLAN circuit (Shown on the next few pages)

Check for any visible damage around the BT/WLAN antenna/IC area.

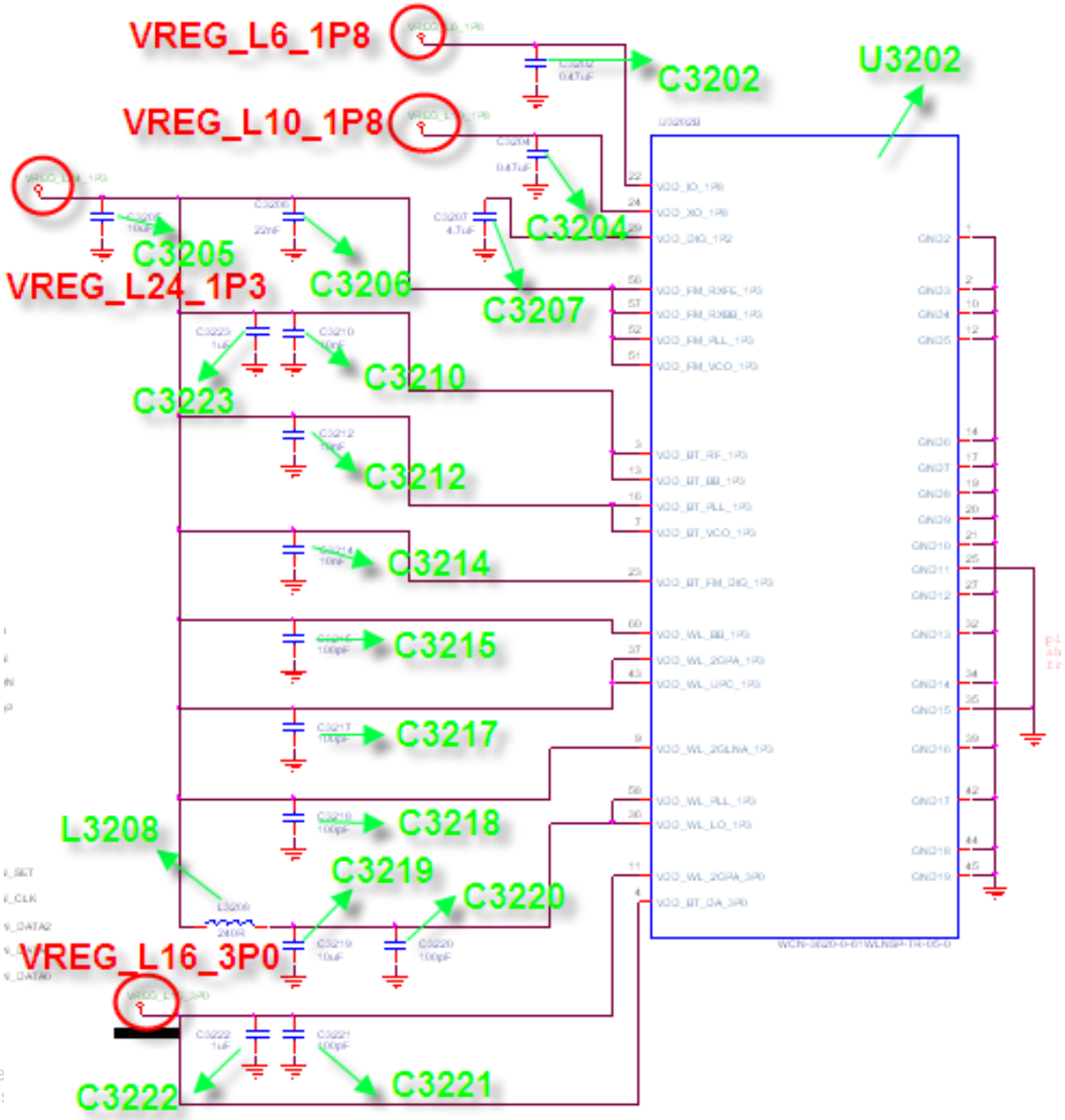
BT/Wi-Fi Antenna Schematic



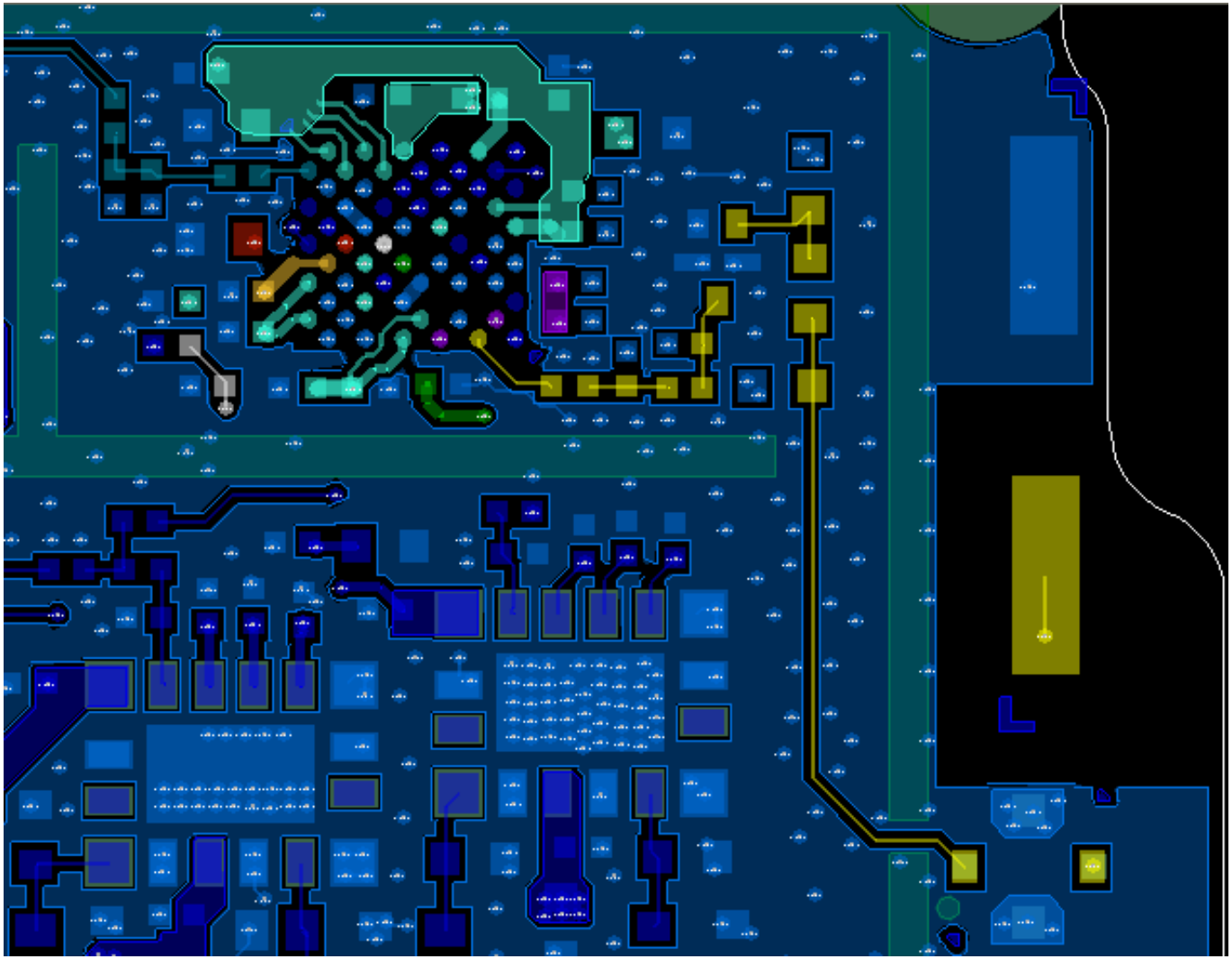
RF & 19.2MHz TCXO Input Schematic



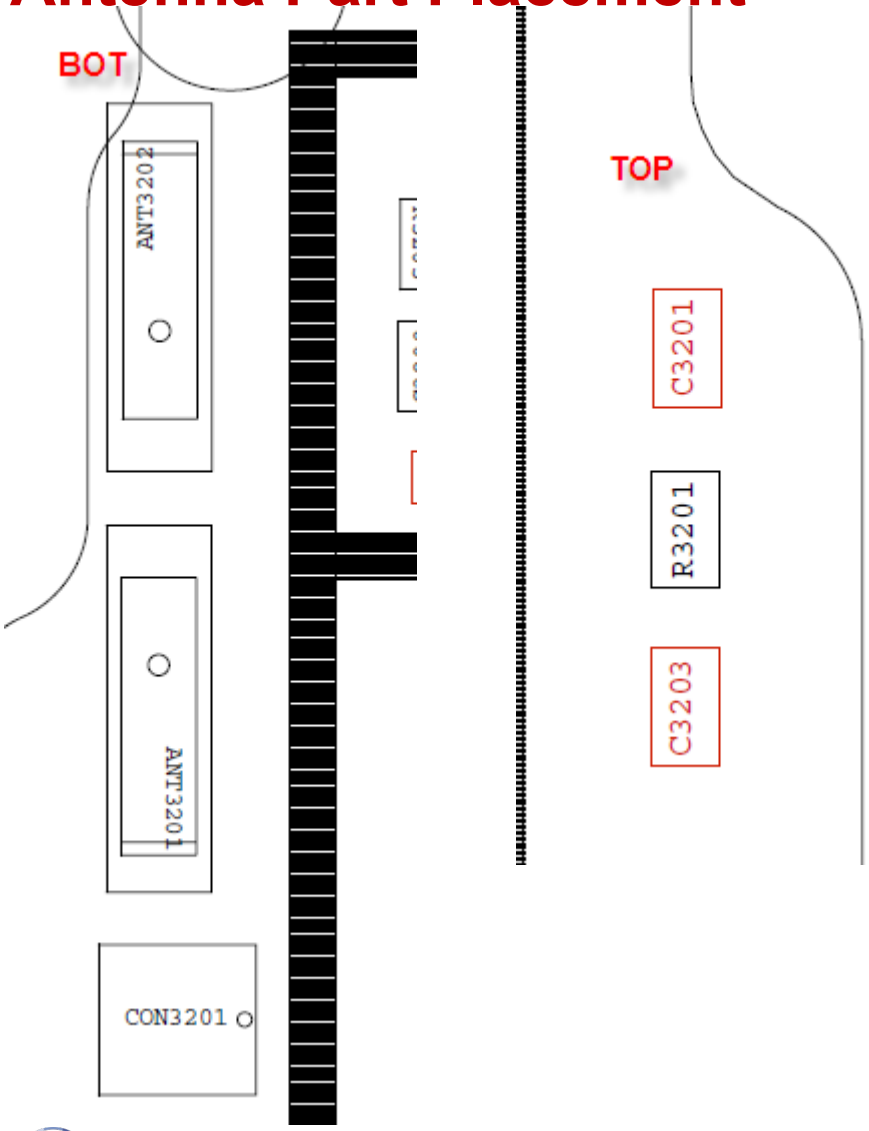
Power Supply Schematic

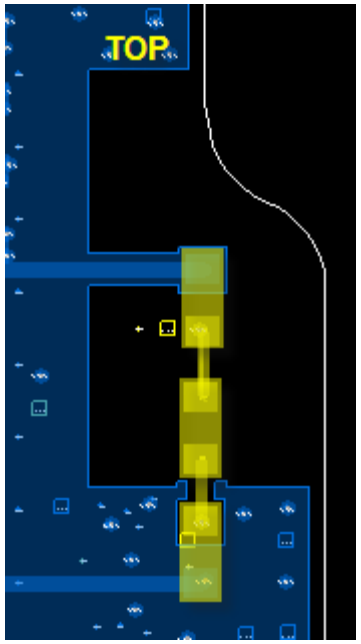


Part Placement

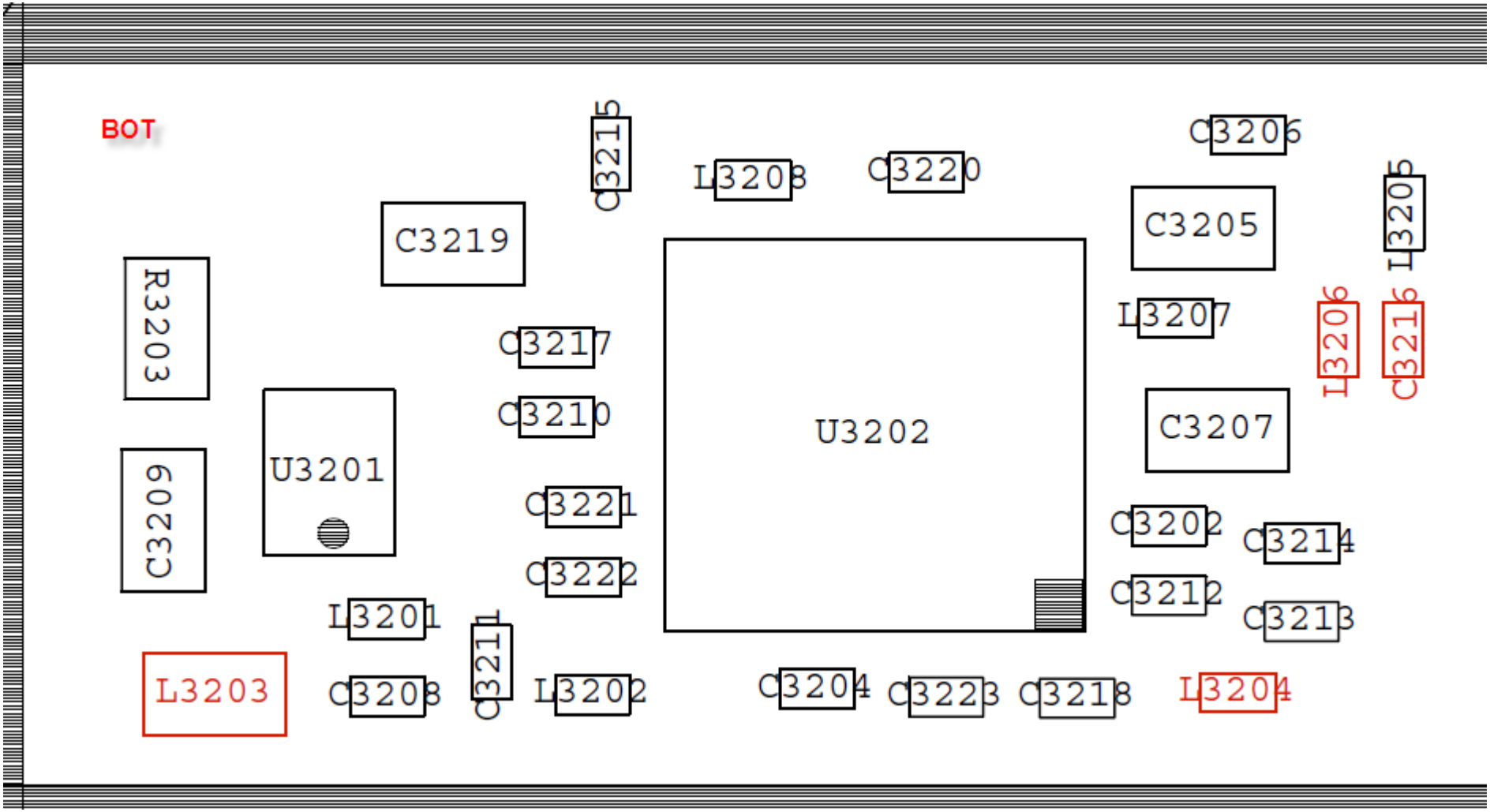


Antenna Part Placement





Part Placement - 1



Part Placement - 2

RF Components

VREG_L16_3P0 Components

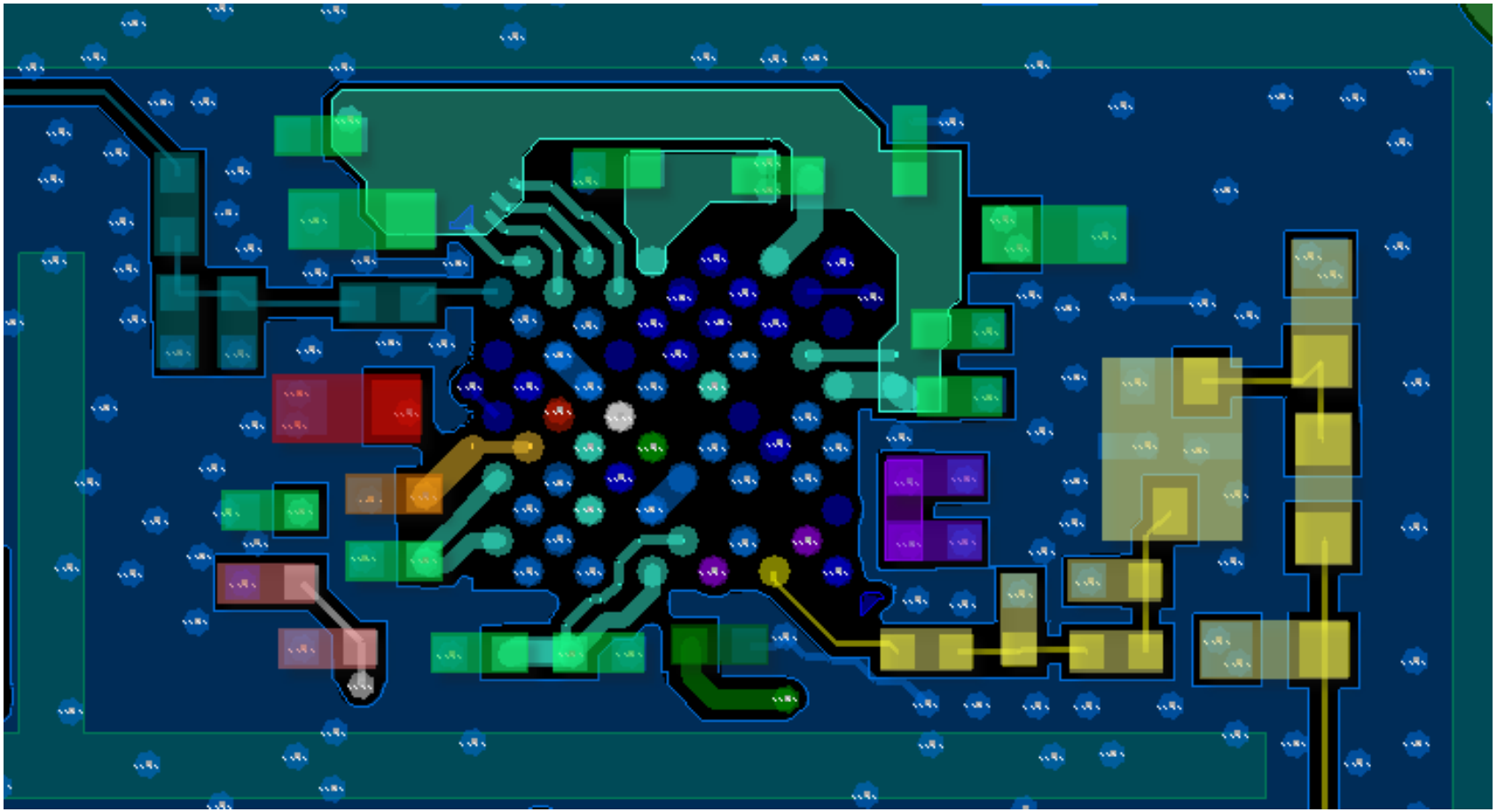
VREG_L24_1P3 Components

19.2MHz TCXO Components

C3207

VREG_L10_1P8 Component

VREG_L6_1P8 Component



Step 3 for BT/Wi-Fi Power-On Failure

- If no visible damage can be seen, check for any visible damage on the IC and components. Look for misplaced or damaged components.

Debugging BT / WLAN Power-Up Failure

- Check clock supplies
  - 19.2MHz Clock: NET RFCLK_WCN check at component C3213
- Check DC Voltages:
  - Typical DC voltages in WCN3620 (U3202) area
    - C3205, C3206, C3223, C3210, C3212, C3214, C3215, C3217, C3218, L3208, C3219 and C3220 should be 1.3V.
    - C3222 and C3221 should be 3.3V.
    - C3202 and C3204 should be 1.8V.

Debugging BT / WLAN Power-Up Failure

- Check connections WCN3620 and MSM8226:
  - WLAN: no probing point – use x-ray or other means to make sure following is soldered properly
    - Pins 54, 59, 47, and 53 of U3202 (these are connection points of IQ lines)
    - Pins 55, 26, and 48 of U3202(these are connection points of DATA lines)
  - Bluetooth: no probing point – use x-ray or other means to make sure following is soldered properly
    - Pins 18, 33, and 28 of U3202 (these are connection points of control, SSBI and data lines)

Debugging BT/WLAN Low TX Power

- Probe and measure the output power at the antenna contact area and see in a spectrum analyzer if you see if the phone is transmitting any power
- For WiFi, please measure the output power in FTM(PD terminal).
- For BT, please measure the output power in FTM mode(PD terminal).

BT test mode command:

Bluetooth Module On

Bluetooth Settxmode Channel39 DH1 PRBS9 Class1

WiFi test mode command:

WiFi module on

WiFi setchannel 7

WiFi setdatarate 11B_LONG_11_MBPS

WiFi settxpower 18

WiFi txmode on

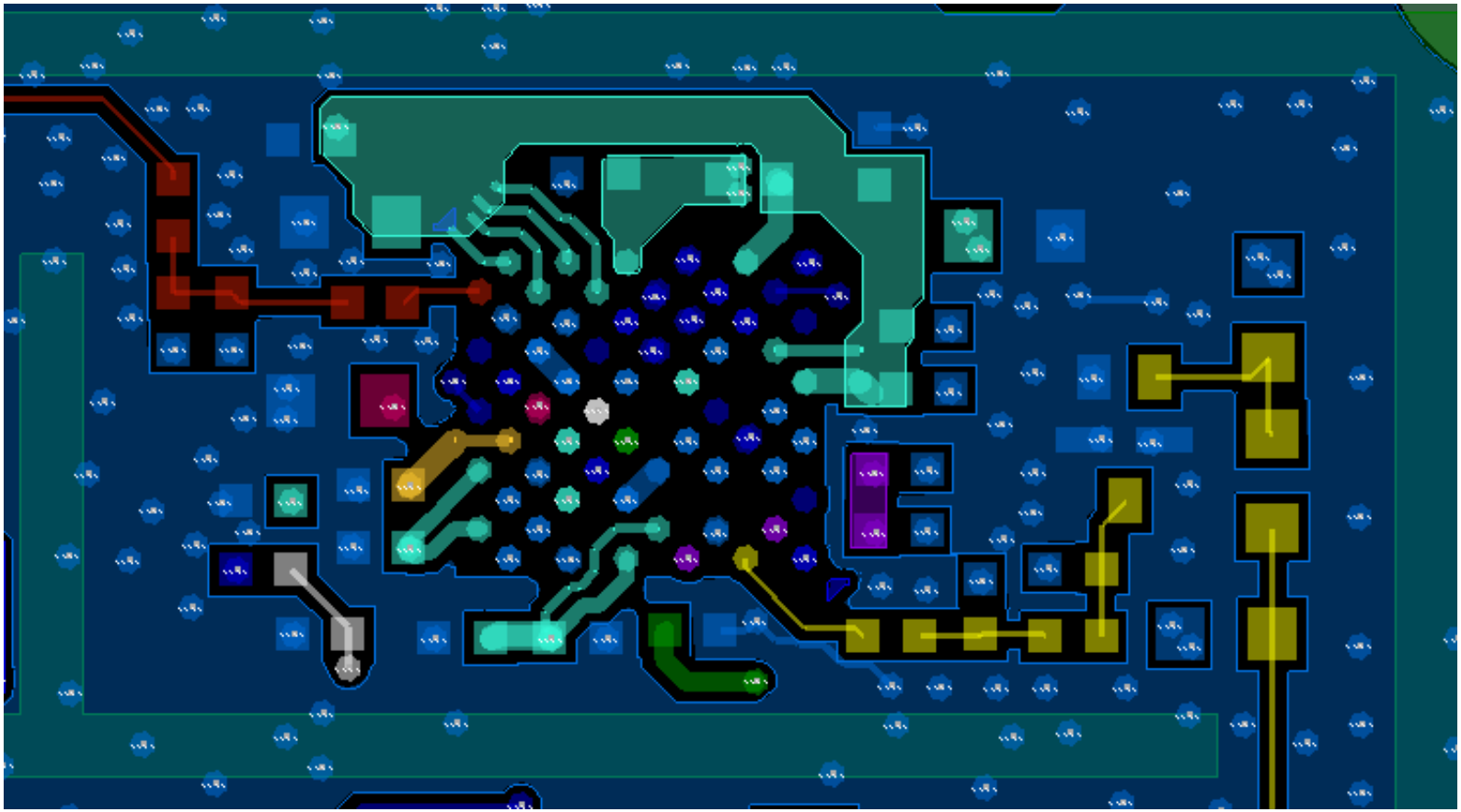
WiFi txmode off

Bluetooth/WiFi TX/RX RF Failure

- BT/Wi-Fi TX/RX RF failure
  - Symptoms:
    - Wi-Fi Radiated TX test value out of limits
    - Bluetooth radiated TX test value out of limits
    - Wi-Fi scan test fails
    - Bluetooth ping test fails

Step 1 for BT/Wi-Fi TX/RX RF Failure

- Look for visible damage of the BT/WiFi Antenna, Antenna Contacts and BT/WiFi circuits



Step 2 for BT/Wi-Fi TX/RX RF Failure

- If there is no visible sign of antenna damage and antenna contacts damage, its most likely something wrong in the BT/Wi-Fi chips or circuits.
- Look for misplaced or damaged RF front-end components. Please refer to the previous slide describing the layout of the WLAN circuit.
- It is recommended to probe the amplitude of the TX signal along the RF path to look for the failure component.

Debugging FM RSSI Failure

- **If FM RSSI is out of limits**

➢ Check whether the headset connection between the phone and the FM signal generator are correctly done

➢ Check and make sure that the headset jack is not damaged

➢ Then check for any visible damage around the FM antenna/Antenna matching components

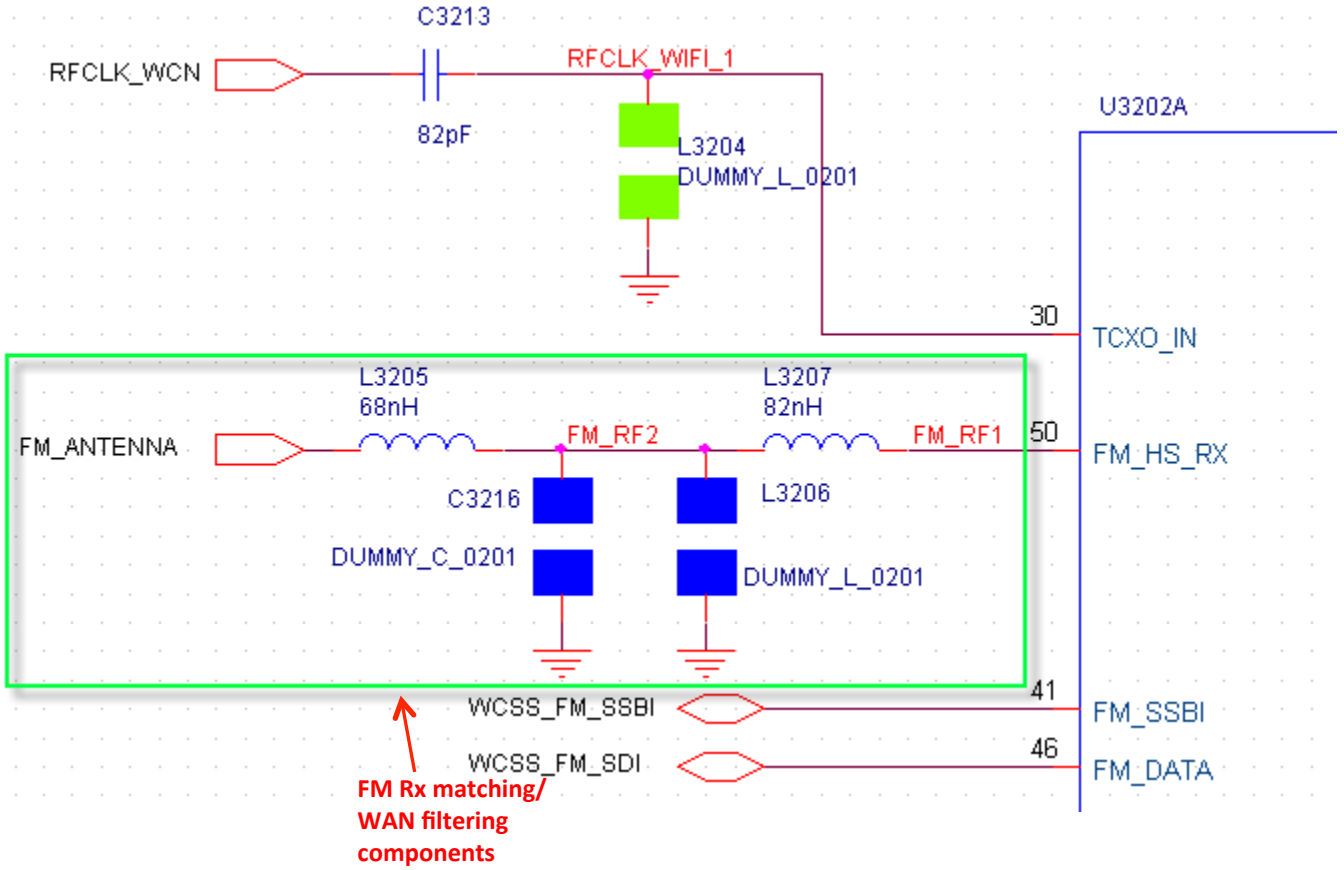
➢ Check whether the FM Rx matching components placed correctly/damaged

➢ Then Check connections between WCN3620 and MSM8226:

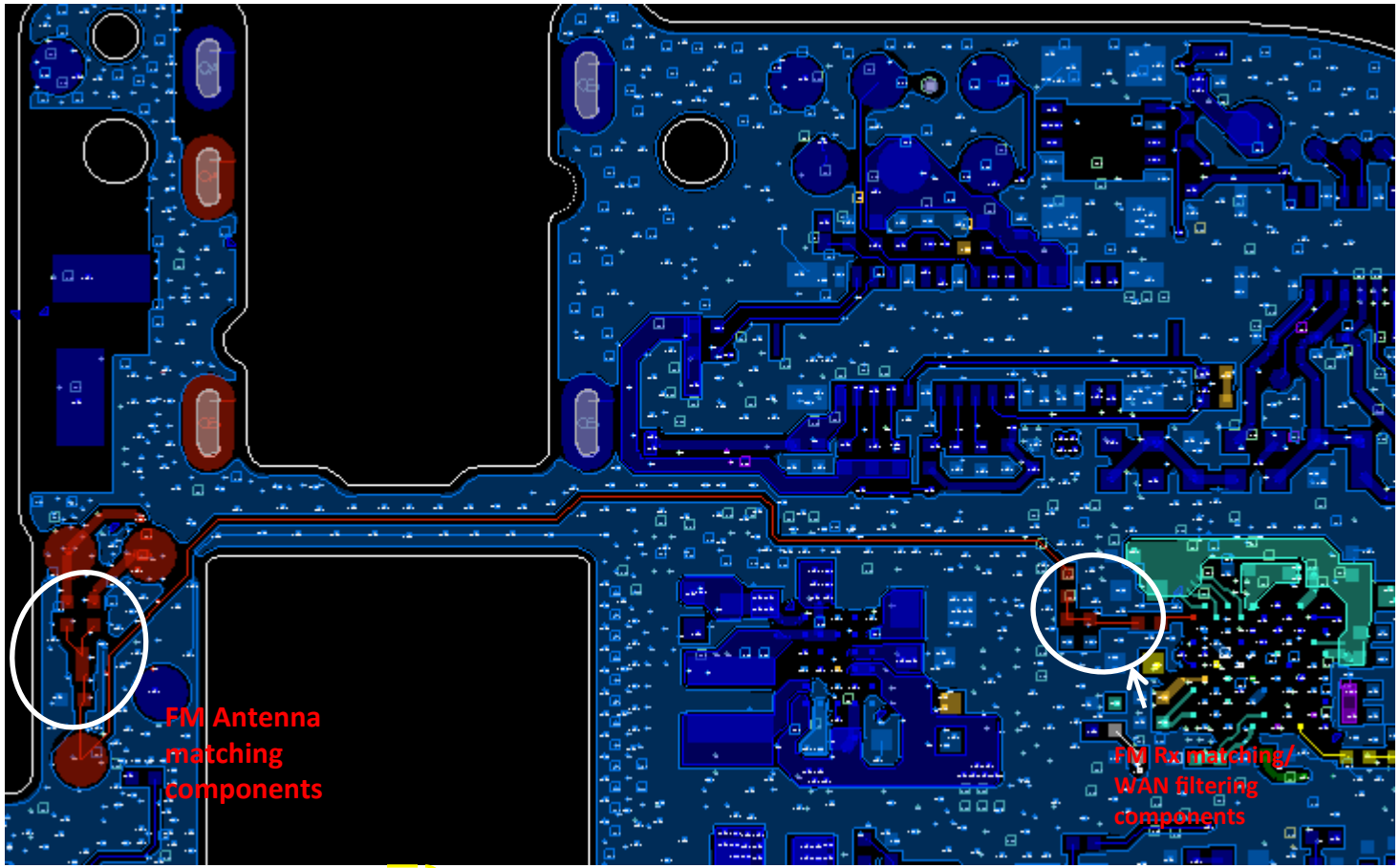
– FM: no probing point – use x-ray or other means to make sure following is soldered properly

  - Pins 50 of U3202 (FM Rx RF line)
  - Pins 41 and 46 of U3202 (these are connection points of SSBI and DATA lines)

FM Rx Matching/WAN Filtering Components



FM Part Placement/Routing

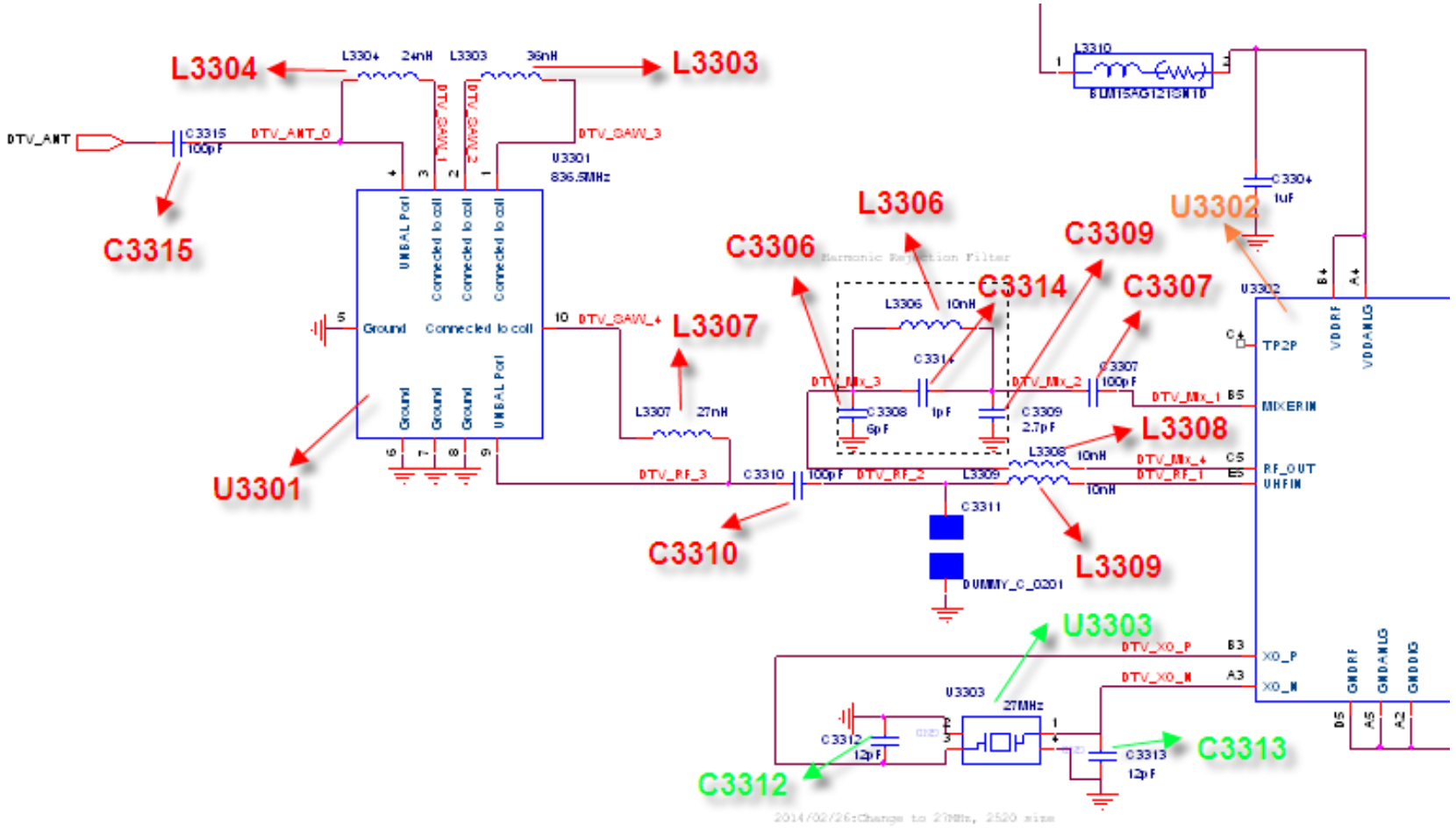


DTV TROUBLESHOOTING

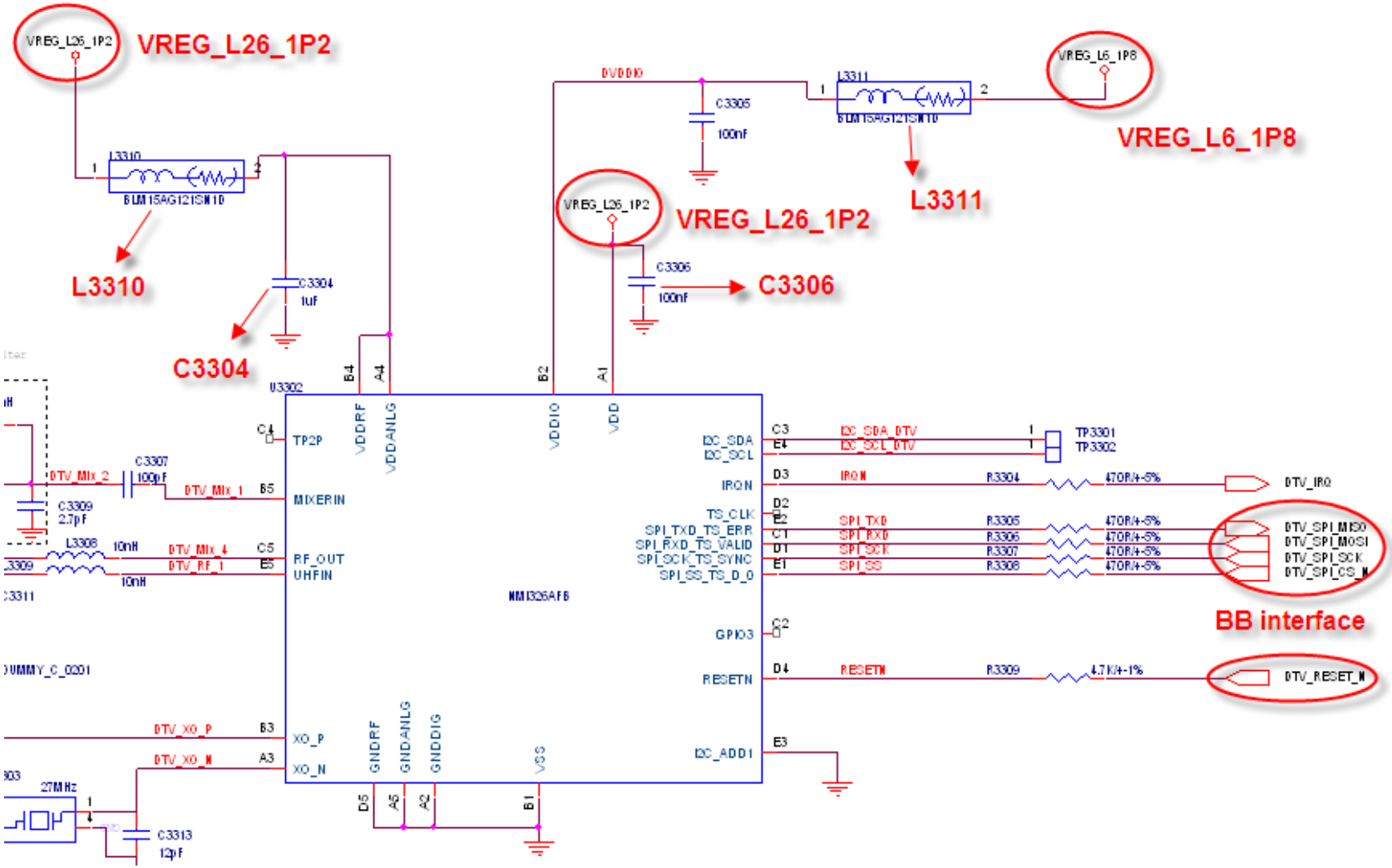
Step 1 for DTV Power-On Failure

DTV using external antenna
Check for any visible damage around the DTV area.

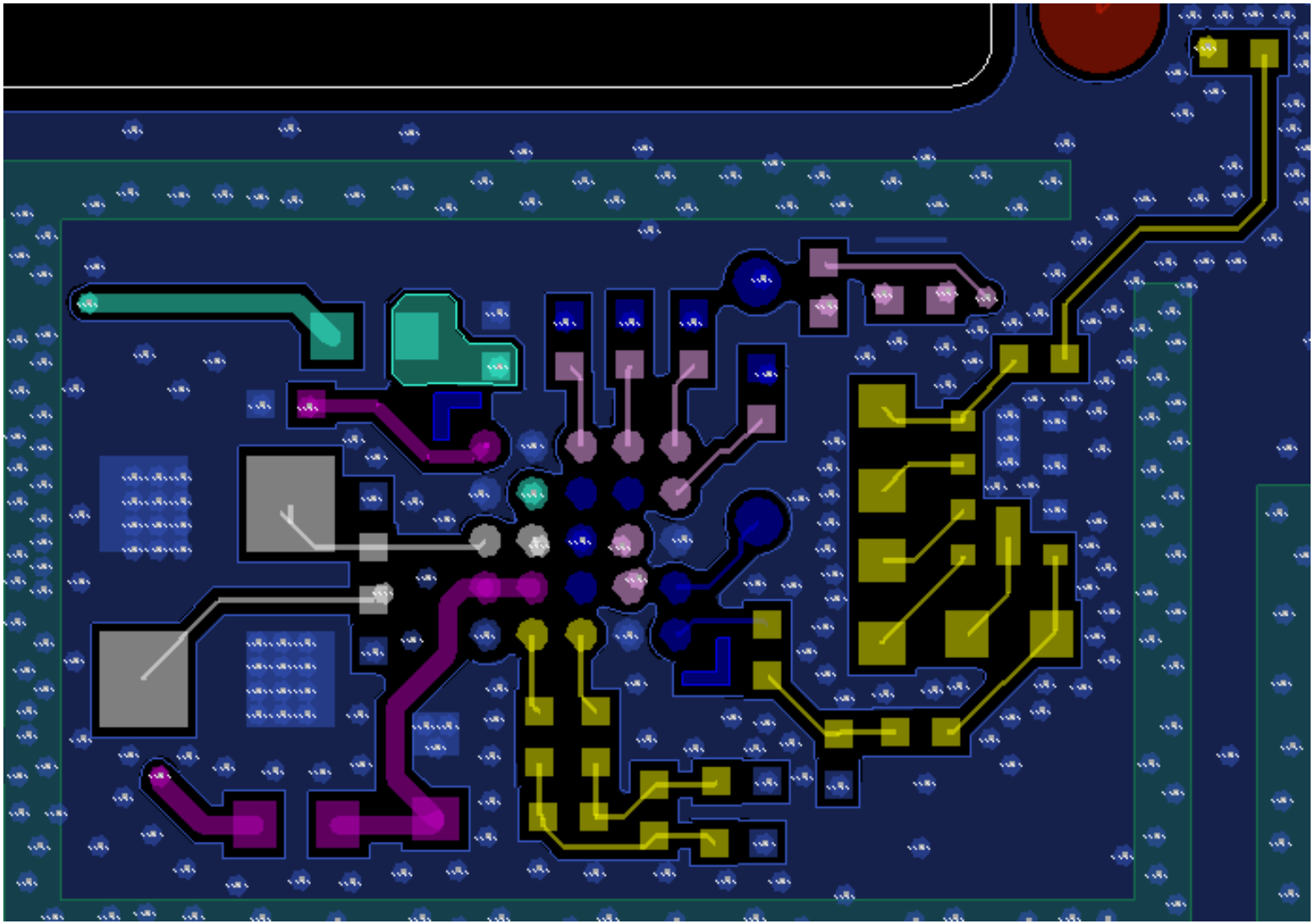
RF & 27MHz TCXO Input Schematic



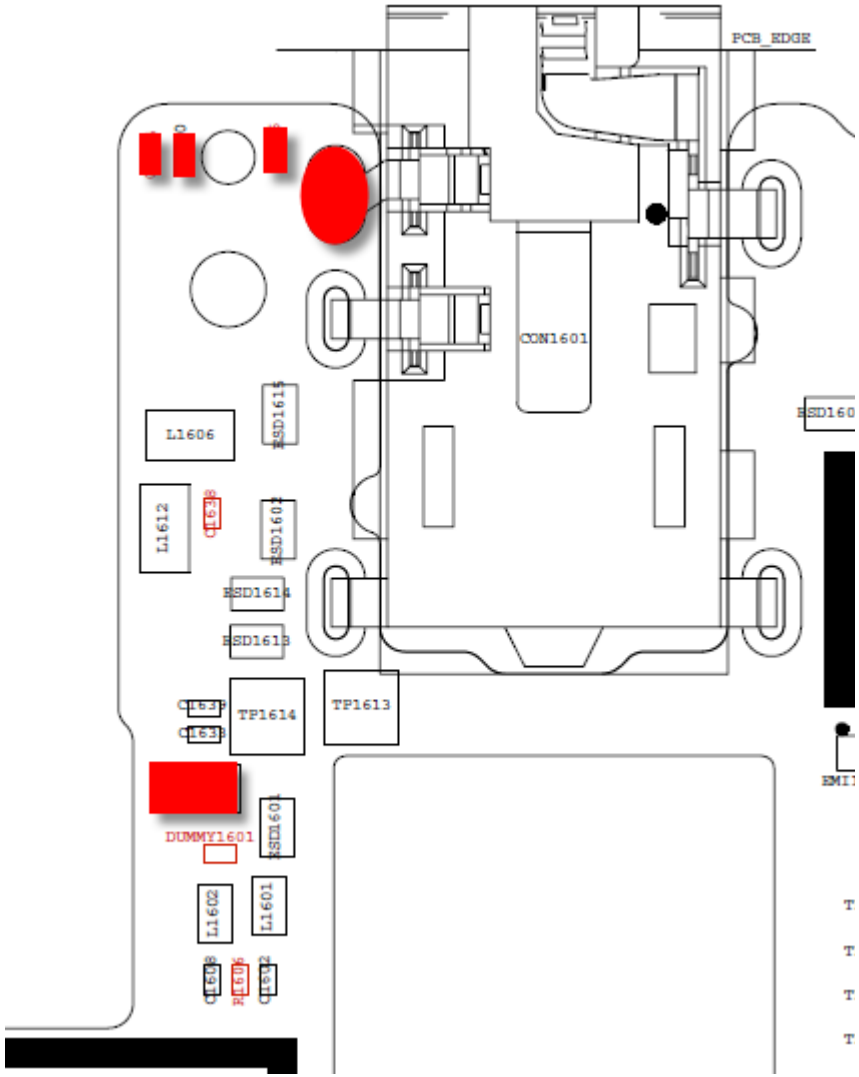
Power supply & BB Interface Schematic

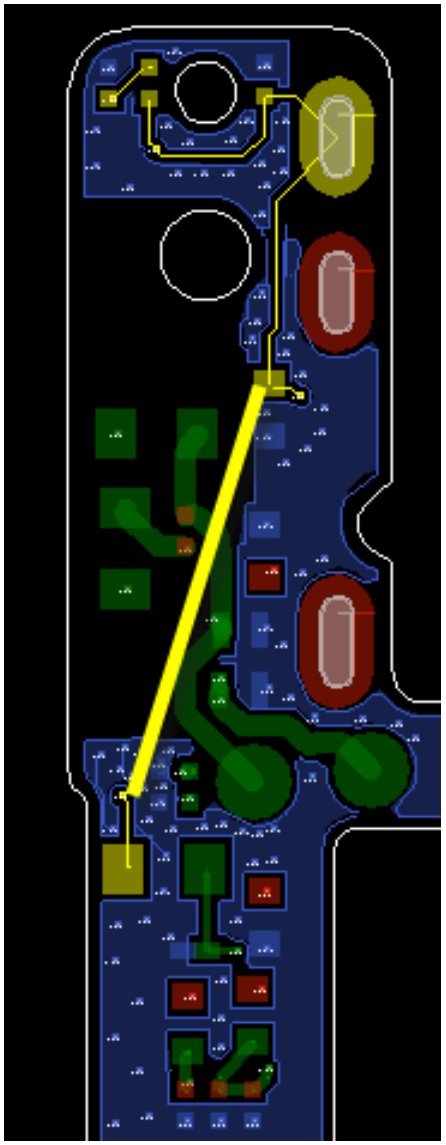


Part Placement

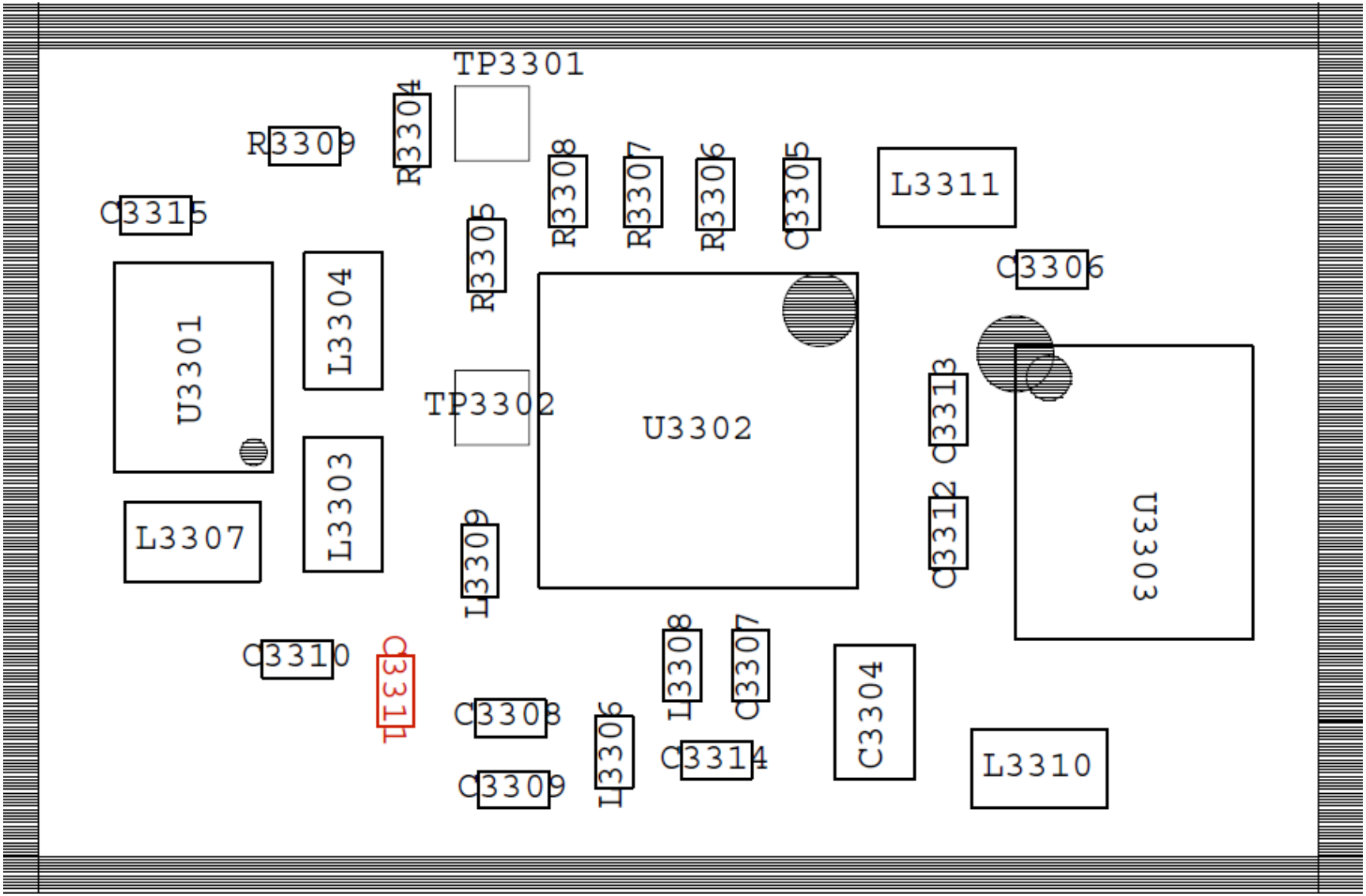


Antenna Part Placement





Part Placement - 1



Part Placement - 2

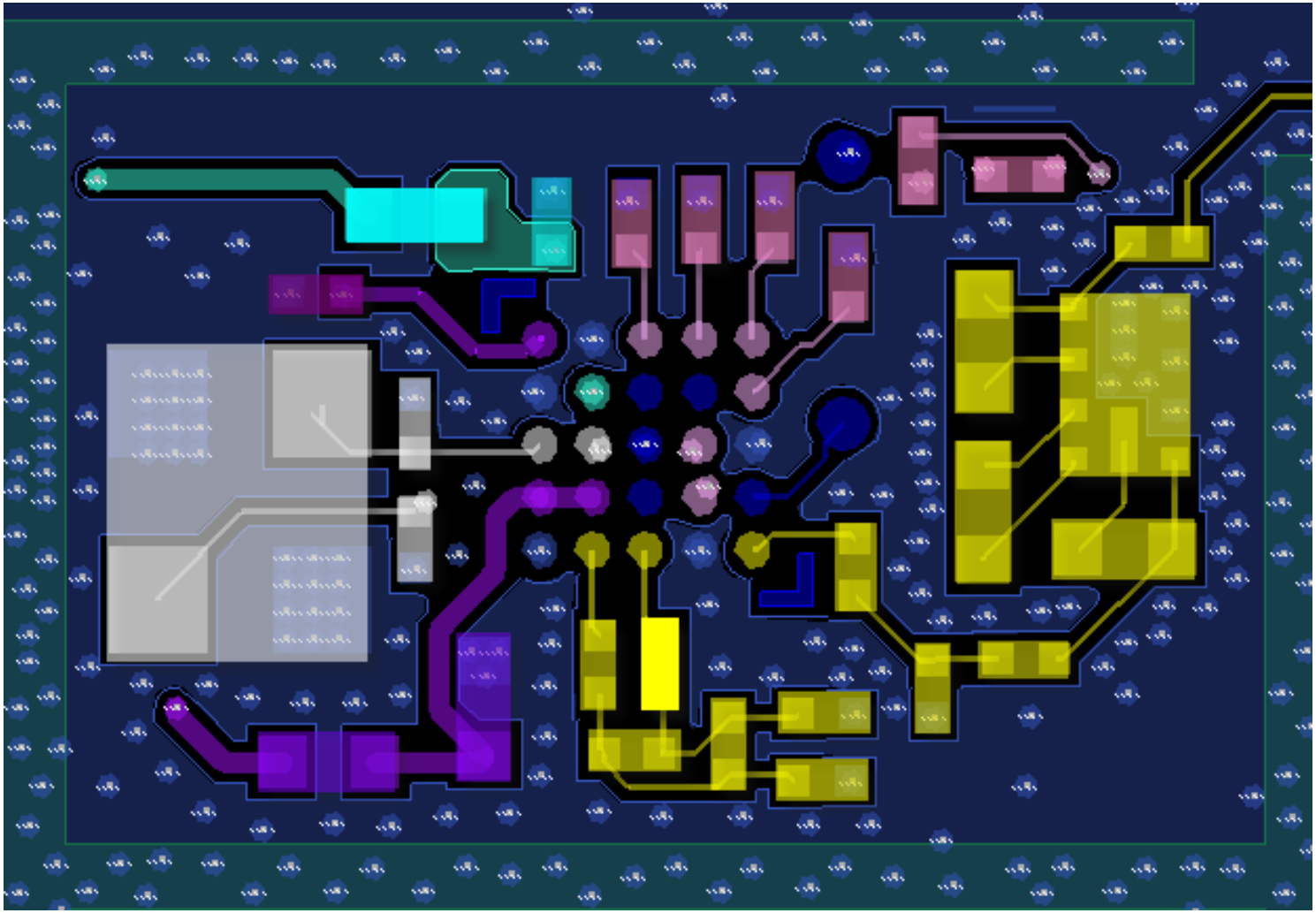
RF Components

VREG_L26_1P2 Components

VREG_L6_1P8 Components

27MHz XO Components

BB interface Components



Step 3 for DTV Power-On Failure

- If no visible damage can be seen, check for any visible damage on the IC and components. Look for misplaced or damaged components.

Debugging DTV Power-Up Failure

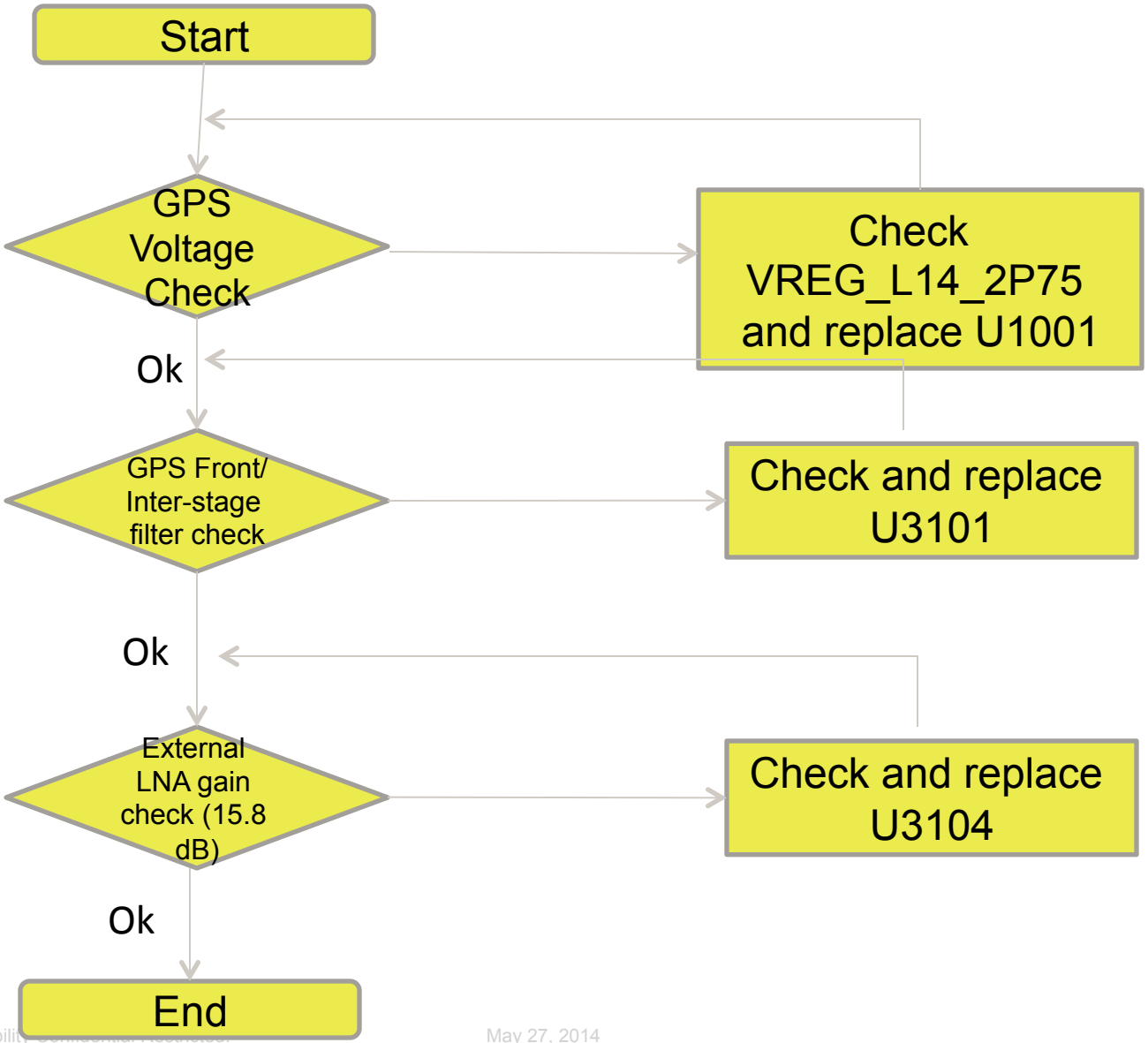
- If no visible damage can be seen, check for any visible damage on the IC and components. Look for misplaced or damaged components.
- Check clock supplies
  - 27 MHz Clock: NET DTV_XO_P/DTV_XO_N check at component C3212/ C3313
- Check DC Voltages:
  - Typical DC voltages in NMI326AFB (U3302) area
    - L3310, C3304, and C3306 should be 1.2V.
    - C3311 and C3305 should be 1.8V.
- Check connections NMI326AFB and MSM8226:
  - Make sure following is soldered properly
    - R3304, R3305, R3306, R3307, R3308 and R3309. (these components are connect to data and signal lines)

DTV RF Failure

- It is most likely something wrong in the DTV chips or circuits.
- Look for misplaced or damaged RF front-end components. Please refer to the previous slide describing the layout of the DTV circuit.
- It is recommended to using the signal generator and probe the amplitude of the RF signal along the RF path to look for the failure component.

GPS TROUBLESHOOTING

GPS TROUBLESHOOT FLOW CHART



GPS FRONT END BLOCK