

Troubleshooting Manual

Aino - U10



ABOUT

General information

The purpose of this document is to provide enhanced technical information for Sony Ericsson repair technicians in order to assist during service, repair and troubleshooting operations on Sony Ericsson mobile phones. It should be used as a complement to other repair instructions and tools as notified by the local Sony Ericsson representative.

To search for components throughout the entire document use the “search” function in Adobe Acrobat Reader 7.0 (or later version) and enter the component name or other word. Use zoom to enlarge.

For easier navigation of the document you can use the bookmarks that appear in the Bookmarks tab on the left side of the Adobe Acrobat Reader window. Each bookmark jumps to a page in the document.

Disclaimer

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Note

When disassembling and reassembling the phone the instructions and processes described in the Mechanical Working Instructions, the Generic Repair Manual and the Repair Center Handbook must be followed.

Revision History

Rev.	Date	Changes / Comments
1	11/20/2009	Initial revision.

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Aino, U10a, U10i Equipment List

Info: More information about the equipment used for TRS can be found in the following location:
CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf or matrix.xls – U Model Tab.

Troubleshooting Fixture

Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf
Part number: 1230-5666

Note! More information about the TRS Fixture Kit can be found in the Trouble Shooting Fixtures Setup Instructions document which is included at the end of this TRS Manual.

Dummy Battery

Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf
Part number: NTZ 112 533

Note! The resistance between GND and BDATA should be approximately 120K Ohm.

Instruments

Power Supply Channel 1 (VBATT)

Agilent 6632B or similar
Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf

Instrument Settings:
Voltage: **3.8 Volt**
Limiter: **2.0 A**

Note! Maximal cable length between the Power Supply Channel 1 VBATT and the dummy battery must be maximum 1m. The cable must have a capacity for at least 16A.

Power Supply Channel 2 (DCIO/SEPI)

Agilent 6632B or similar
Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf

Instrument Settings:
Voltage: **5.0 Volt**
Limiter: **2.0 A**

Oscilloscope

Agilent DSO7052A or similar
Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf

Digital Multimeter (DMM)

Fluke 83 or similar
Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf

Note! The 0,64 mm Test Probes is recommended by Sony Ericsson when the DMM is used.
See Picture 1.

Picture 1



Spectrum Analyzer

R&S FSL 9 kHz – 3 GHz or similar
Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf

RF Probe

HP 85024A or similar
Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf

RF Probe Snap-in

Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf
Part number: 1230-5894

FM Signal Generator

R&S SMC100A or similar
Location: -

PC Package & PC Software

PC Package (Computer)

Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf

Urquell Fault Trace SW with project file

Location: CSPN – Repair Instructions – Electrical – *Aino, U10a, U10i* – Trouble Shooting Application
– Project File: *Aino_U10a_U10i_Project_R1A*

Drivers

SEPI BOX Drivers
Location: <http://emma.extranet.sonyericsson.com> /– Drivers – DSS / SEPI / SEMUTS

SE Communication Interface SEPI BOX

Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf
Part number: LTN 214 1484
See Picture 2.

Picture 2



Cables

USB Computer Cable

Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf
See Picture 3.

Picture 3



DSU-60/USB Cable

Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf
Part number: KRY 101 1413
See Picture 4.

See Picture 4



RF Test Cable Flexible

Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf
Part number: RPM 119 885
See Picture 5.

Picture 5



SEPI Interface Cable – A1

Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf
Part number: KRY 101 1119/1
See Picture 6.

Picture 6



Power Cable RED to Power Supply Channel 1 (VBATT)

Maximum Length: 1m
Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf

Power Cable BLACK to Power Supply Channel 1 (VBATT)

Maximum Length: 1m
Location: CSPN – Repair Instructions – Mechanical – Tool Catalogue – RepairToolsCatalogue.pdf

Customized Power Supply Channel 2 Cable (DCIO/SEPI)

Customize the cable according to the instructions below:

(Step 1, Step 2, Step 3 and Step 4)

Step 1:

Take the CST-75 battery charger and cut off the charger according to Picture 7.

Picture 7



Note! The Cable length must be exactly 1.3m.

Step 2:

Connect the CST-75 charger Red or White wire to the Plus Output and the Black wire to the Minus (GND) Output at backside of the Power Supply Channel 2 (DCIO/SEPI) according to Picture 8.

Picture 8



Step 3:

Cut off insulating material from the inside of the charger plug according to Picture 9.

Picture 9



Step 4:

Connect DCIO Cable and SEPI Interface Cable – A1 according to Picture 10.

Picture 10



Picture 11



Note! This setup is wrong.

Connection Instructions for the Dummy Battery

This is the correct setup when the Dummy Battery is used.
See Pictures 12 and 13.

Picture 12



Picture 13



Test Cards

Local SIM

Any functional Local SIM Card

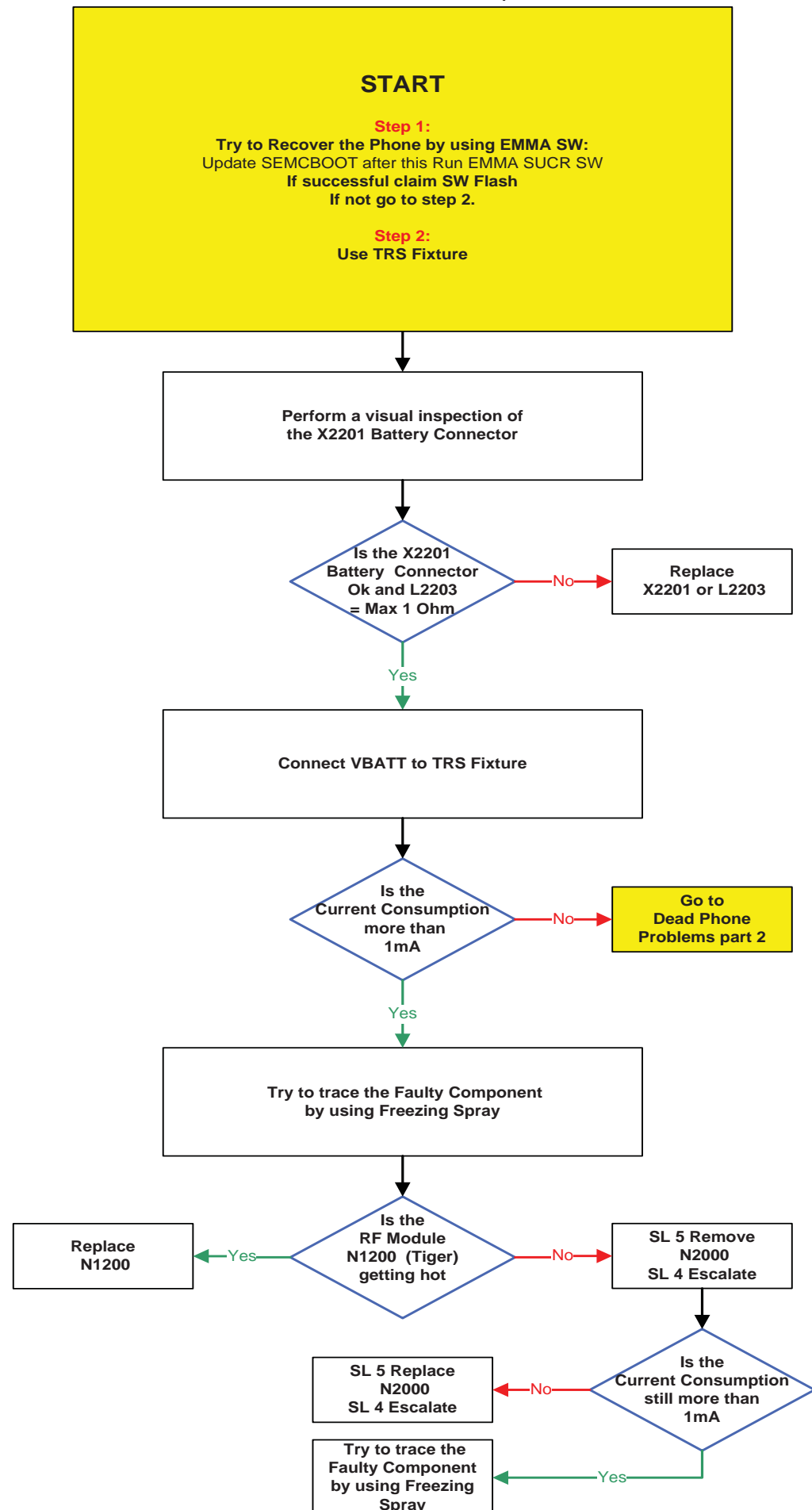
Memory Card

SanDisk microSD™
See picture 14.

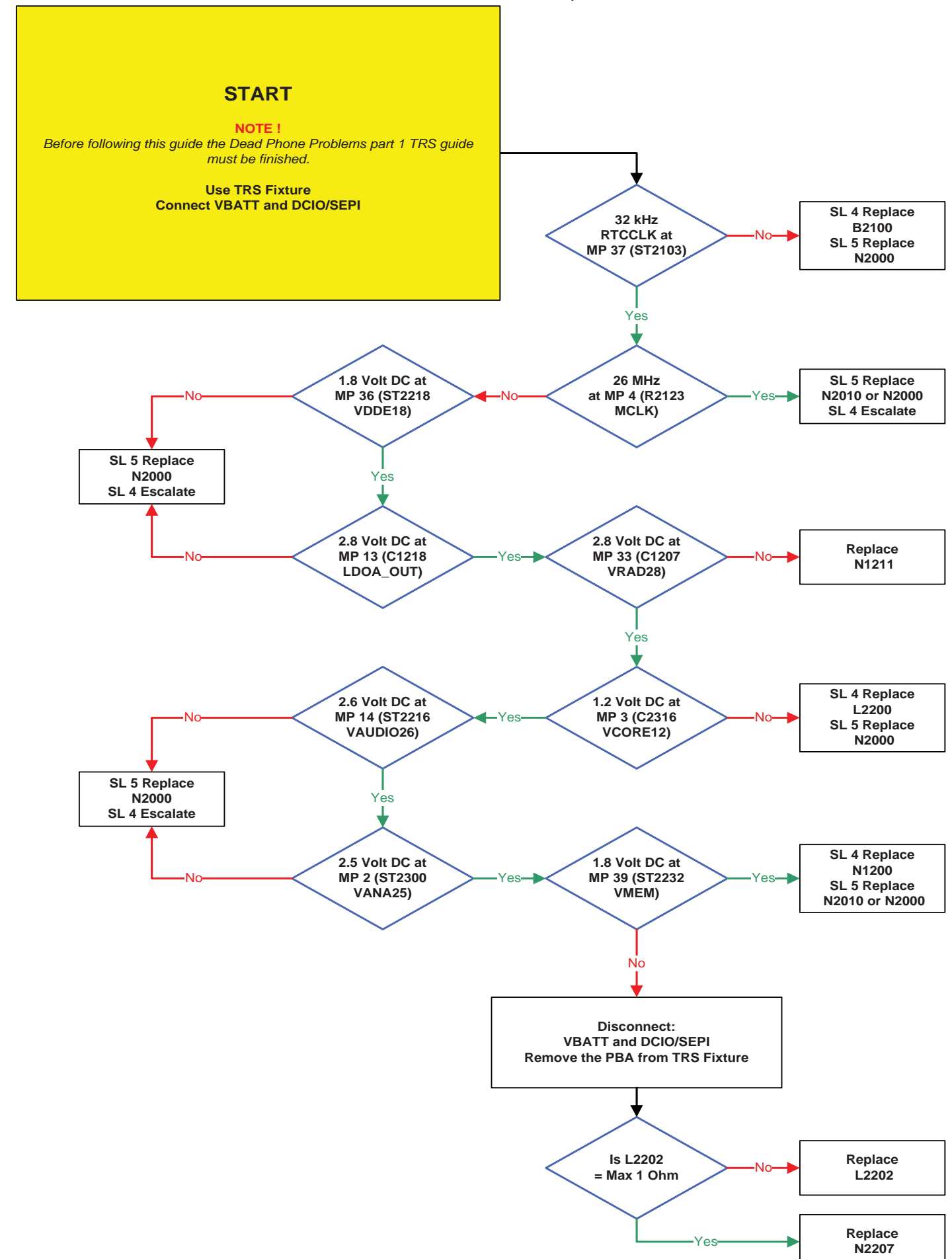
Picture 14



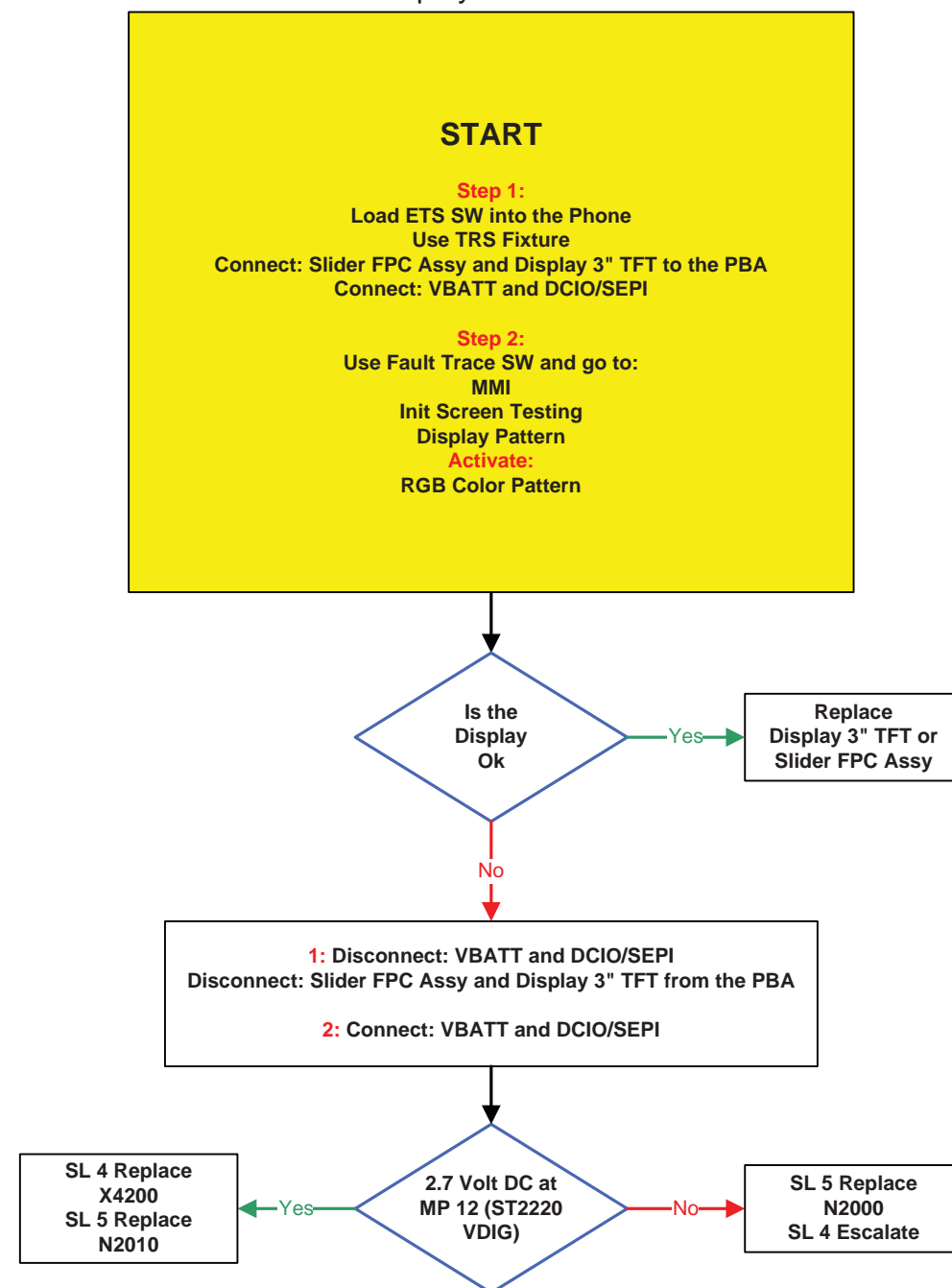
Dead Phone Problems part 1



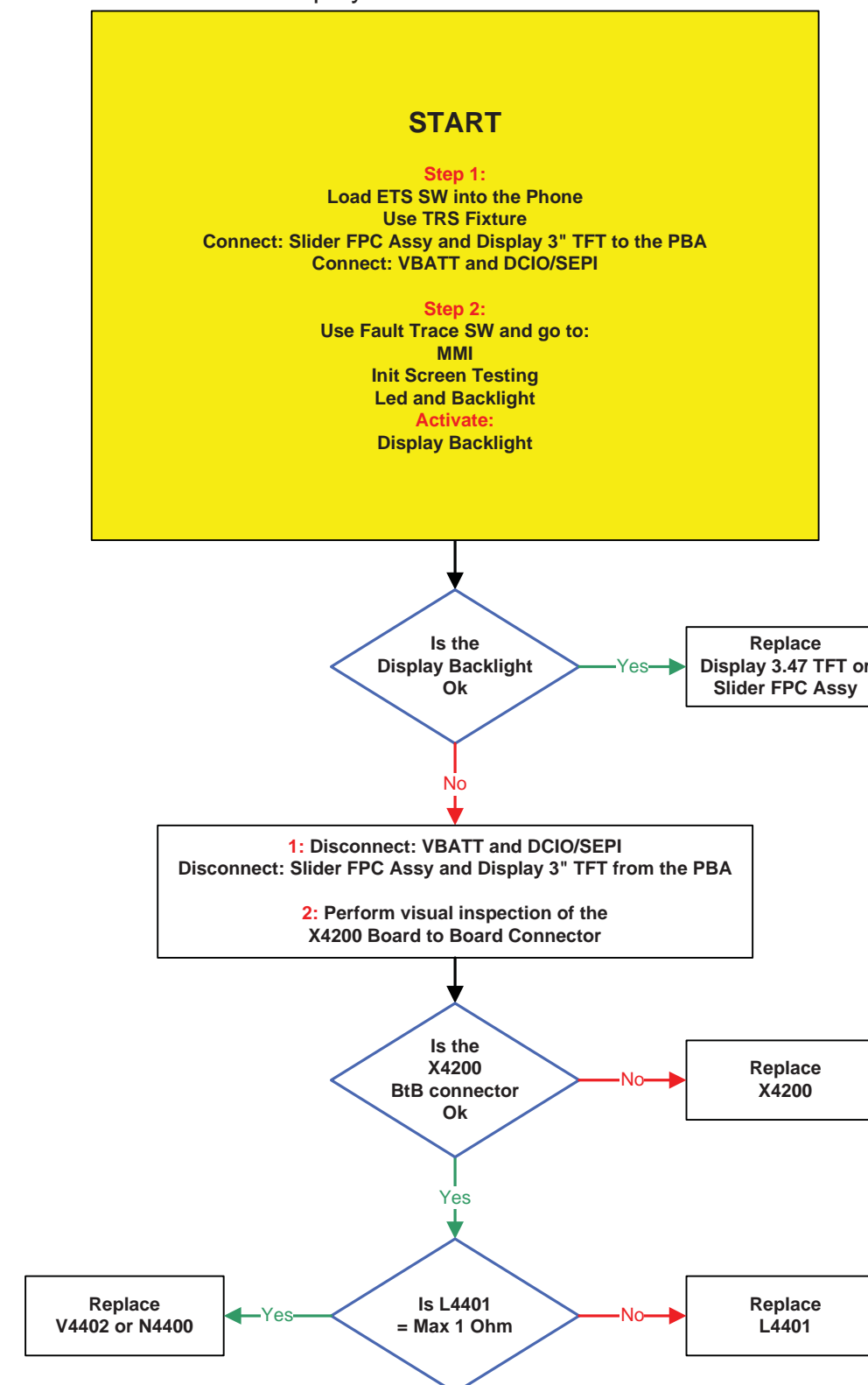
Dead Phone Problems part 2



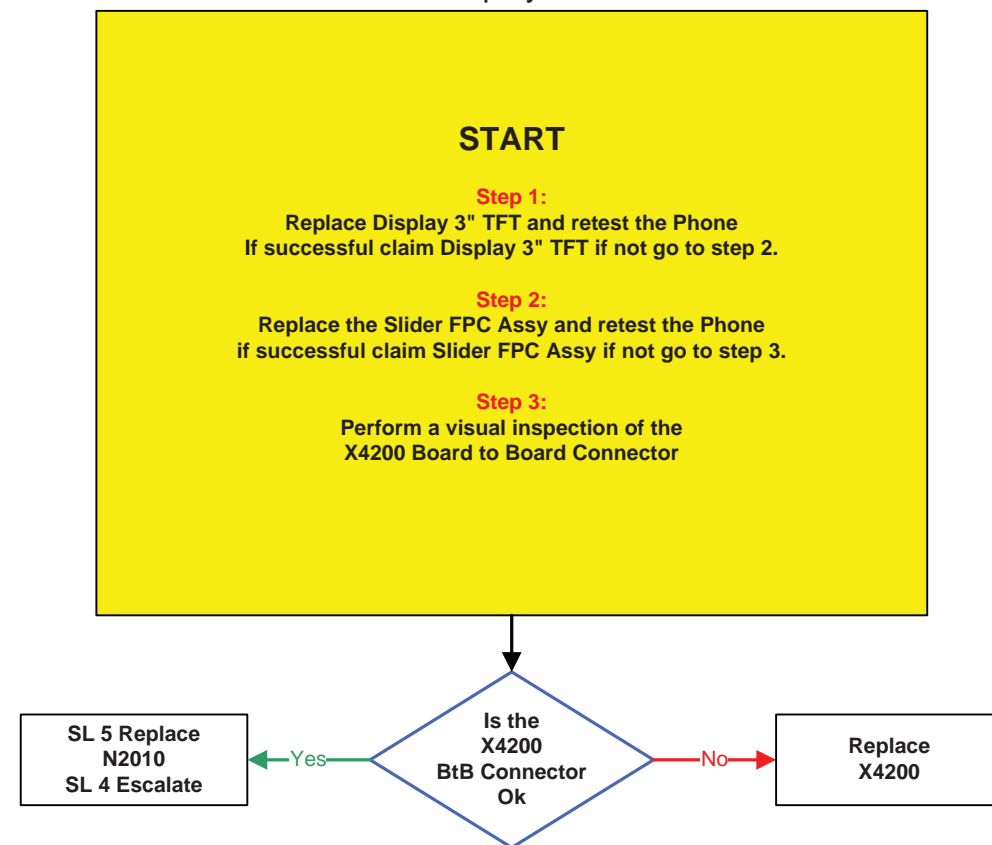
Display Problems



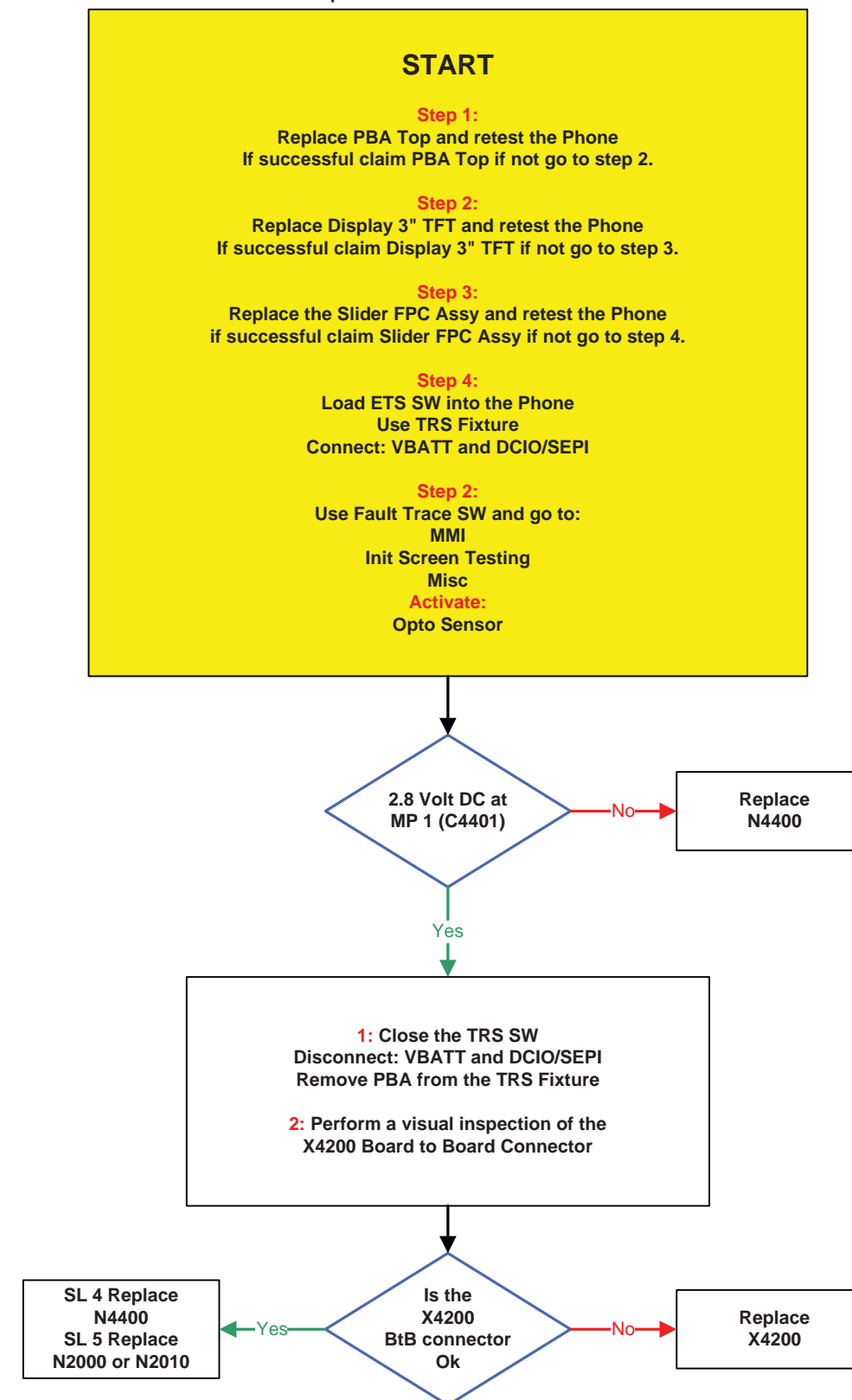
Display illumination Problems



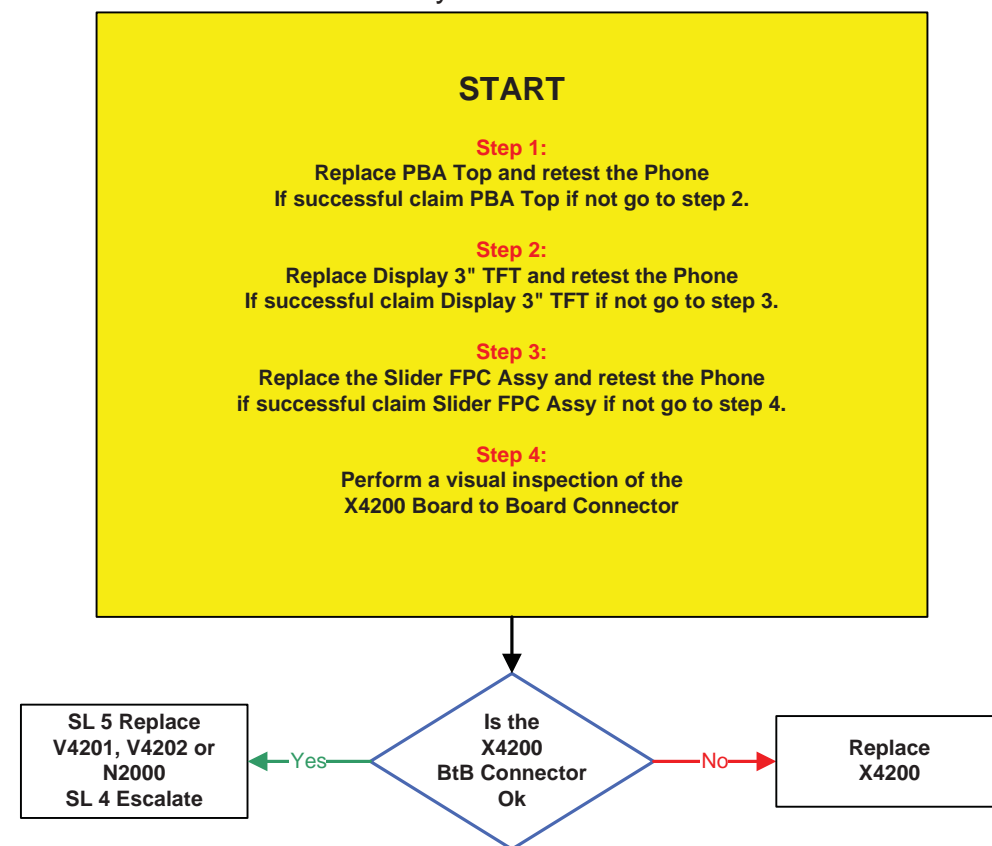
Touch Display Problems



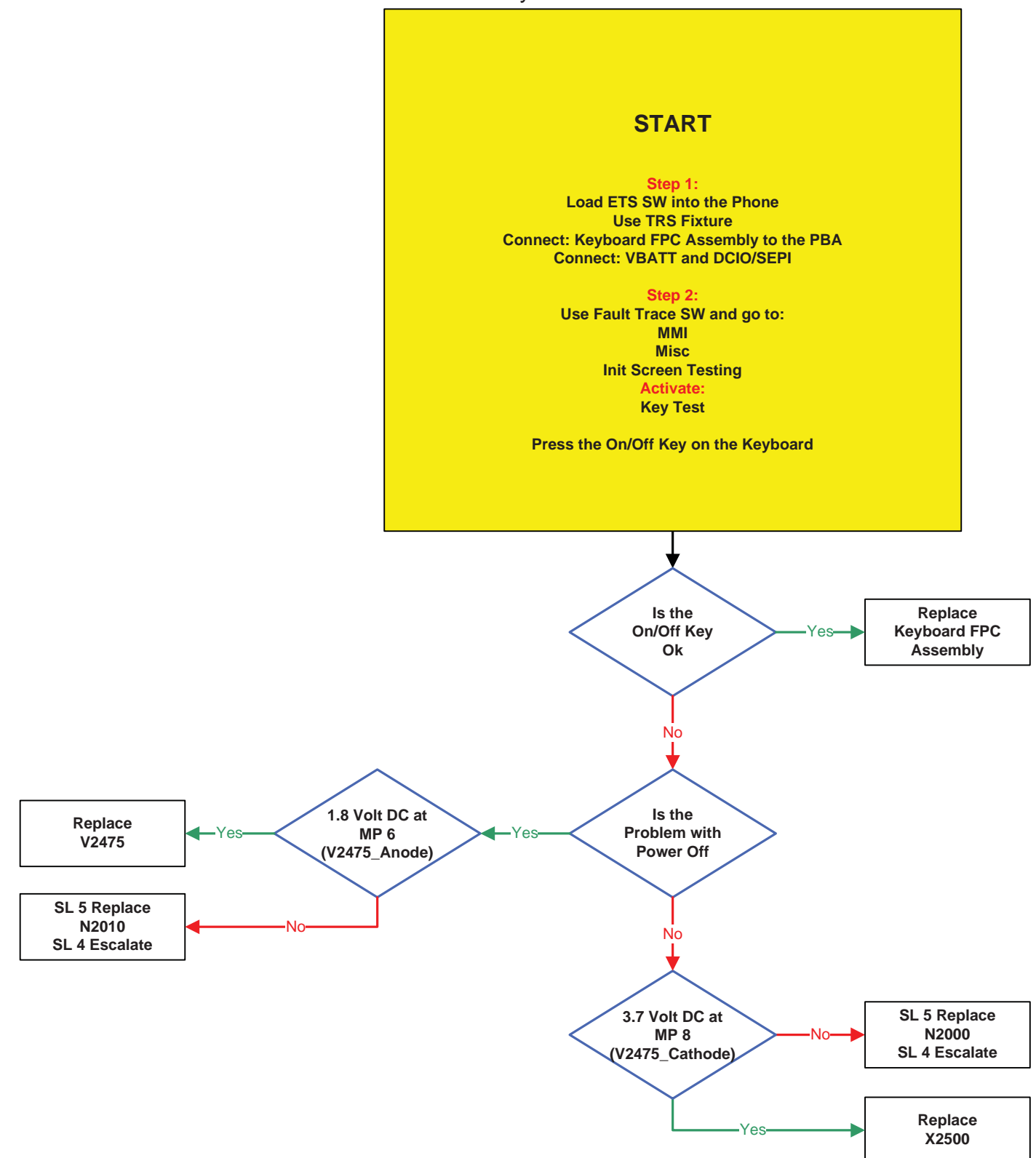
Opto Sensor Problems



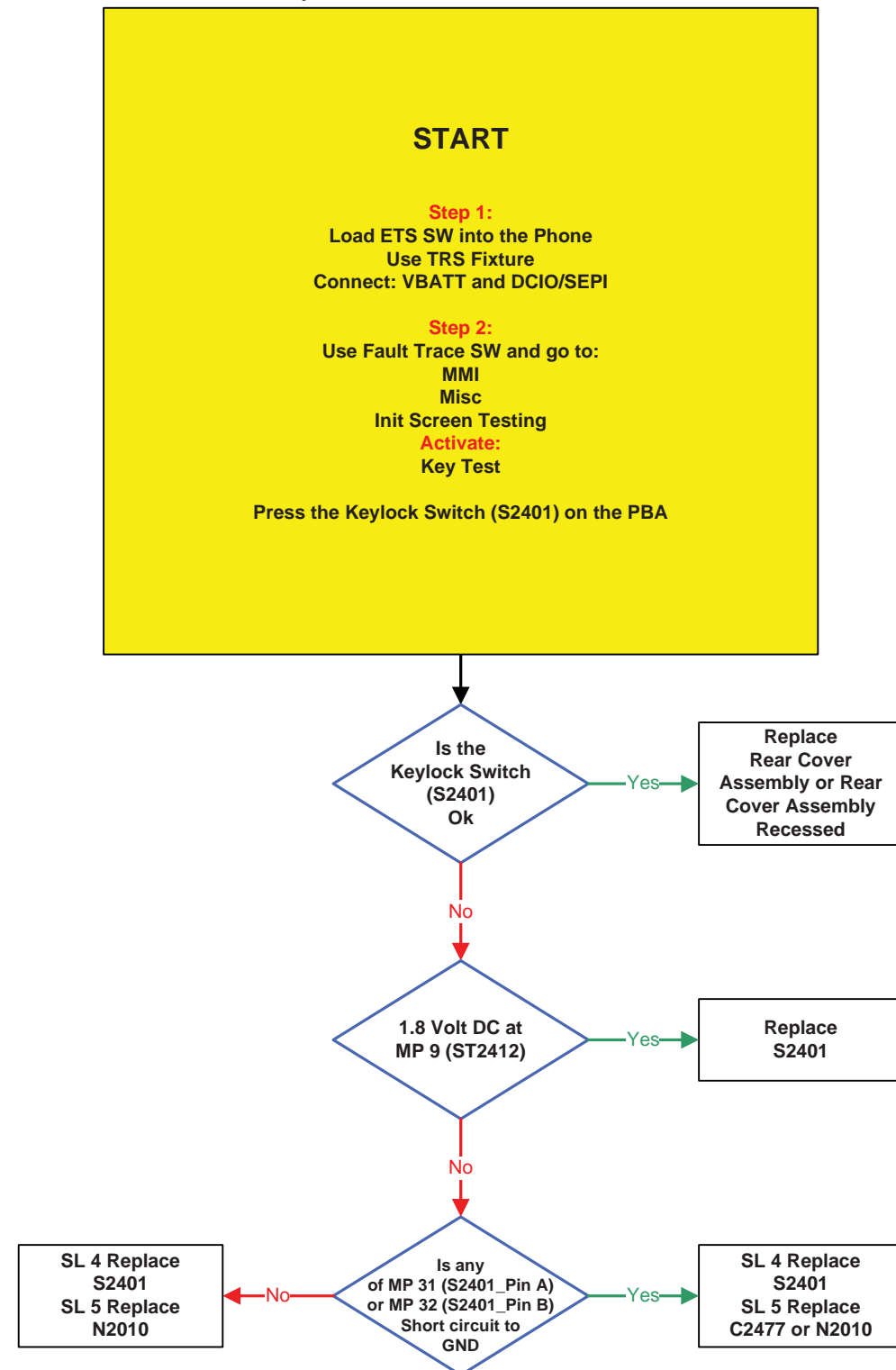
Proximity Sensor Problems



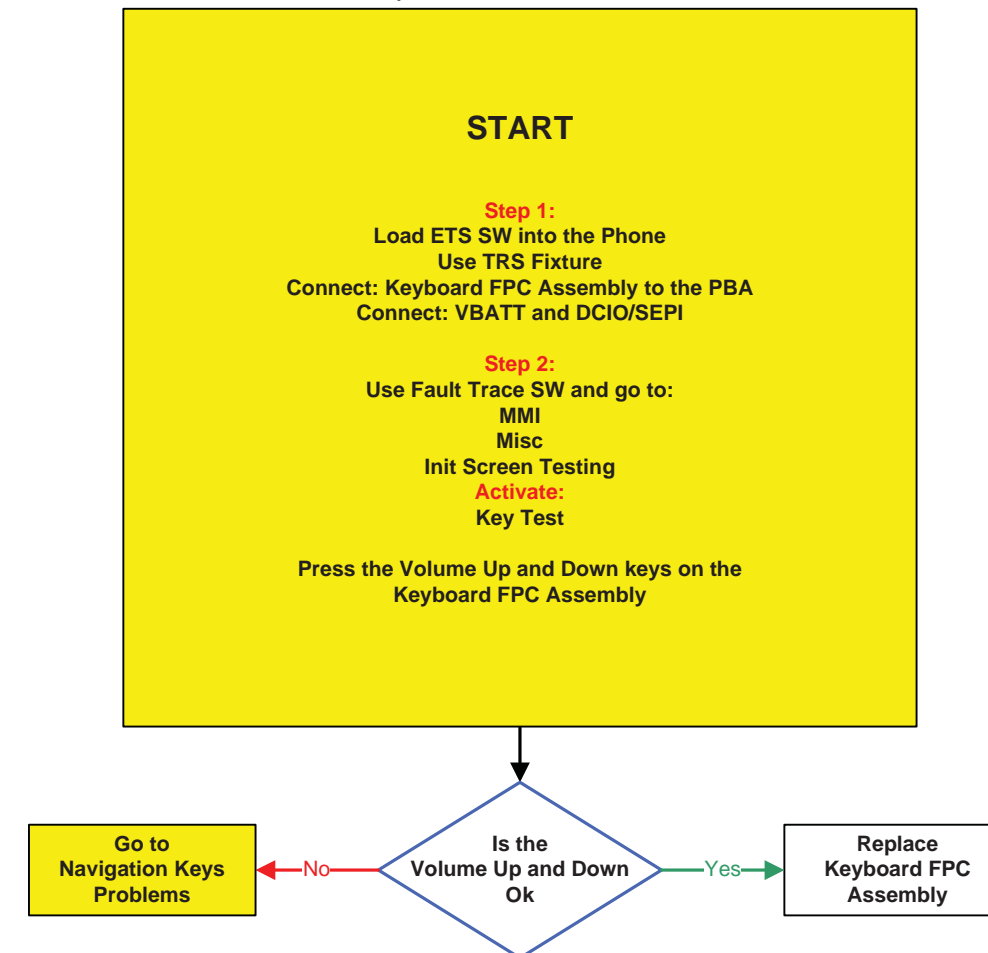
On/Off Key Problems



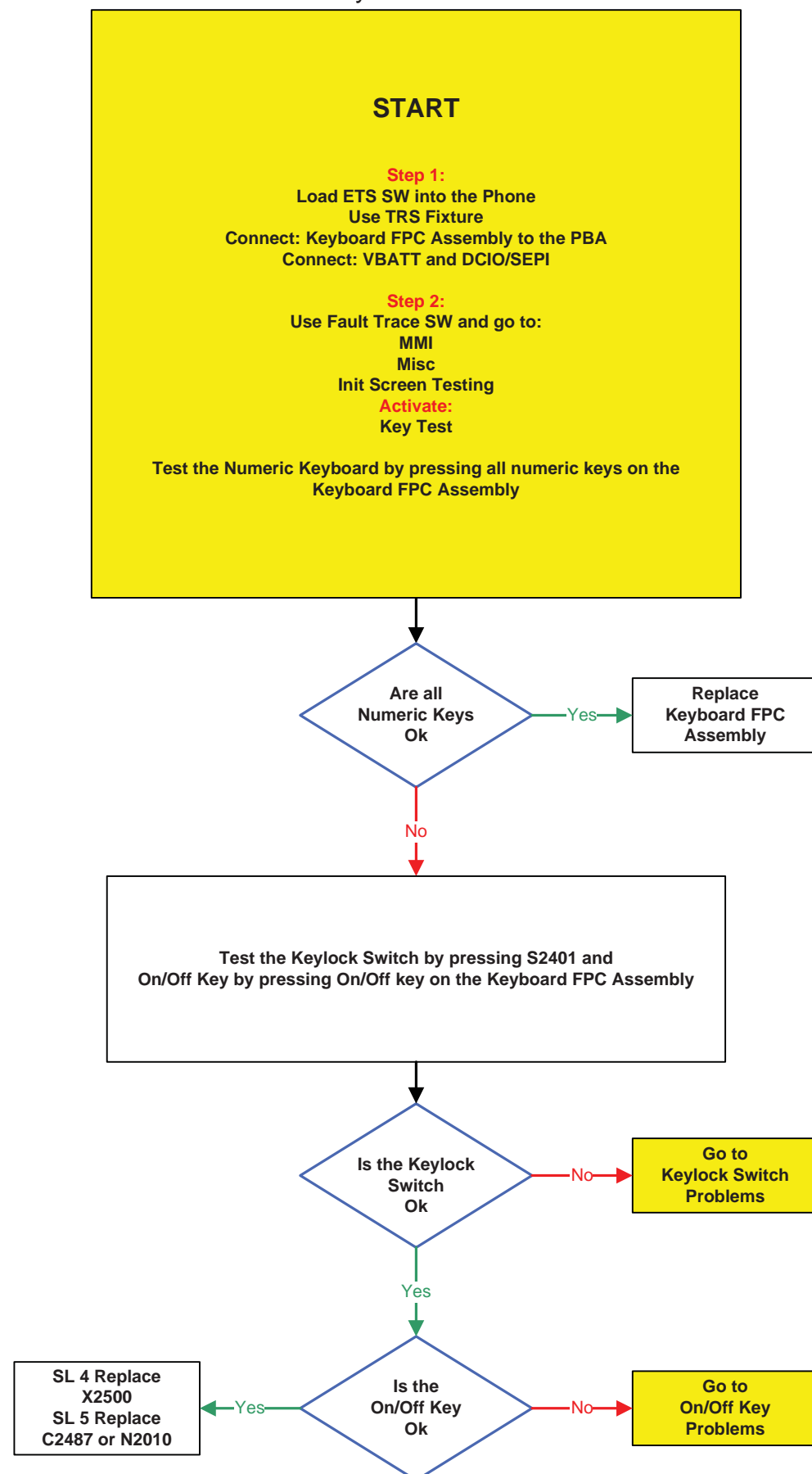
Keylock Switch Problems



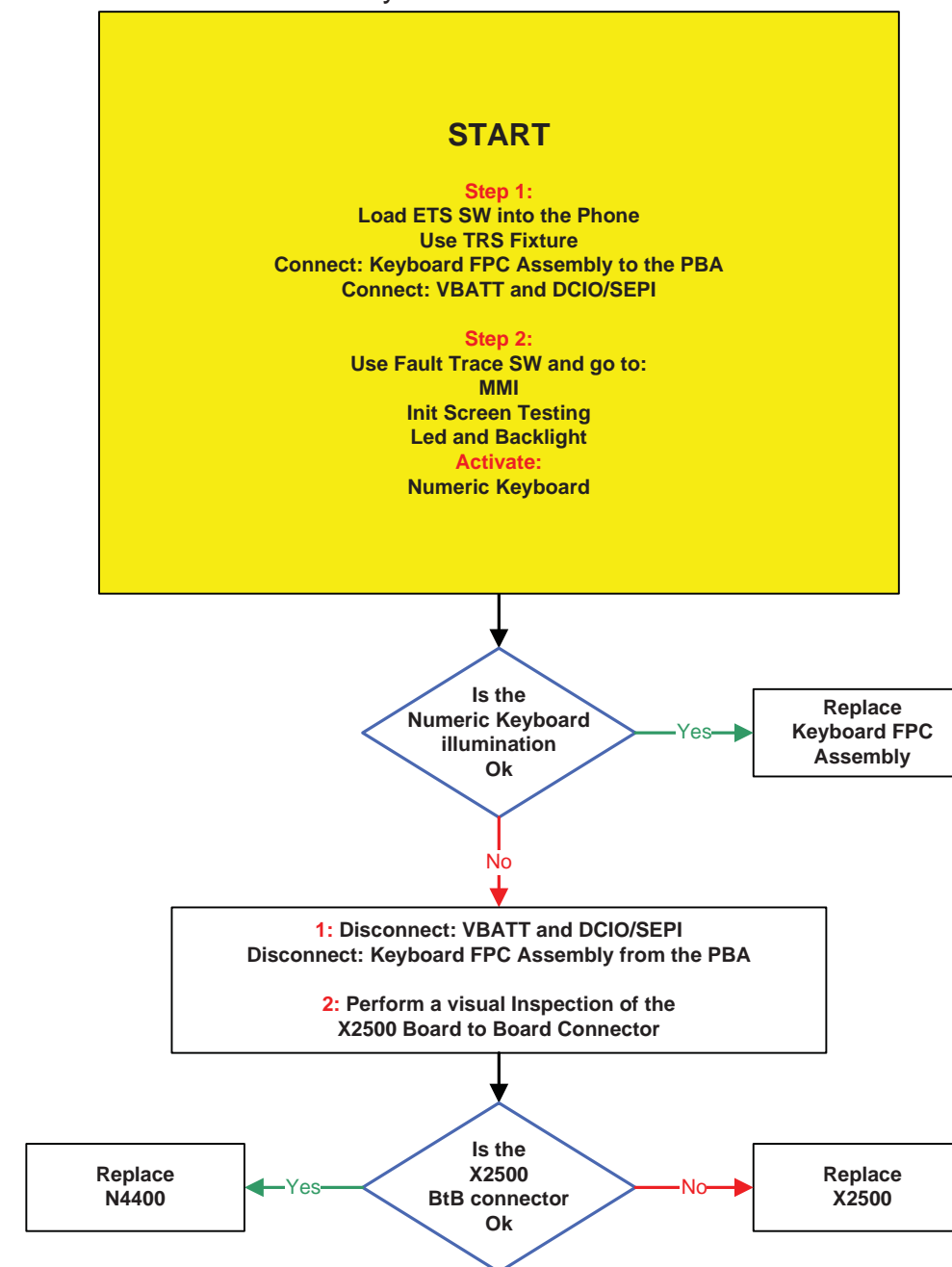
Volume Up and Down Problems



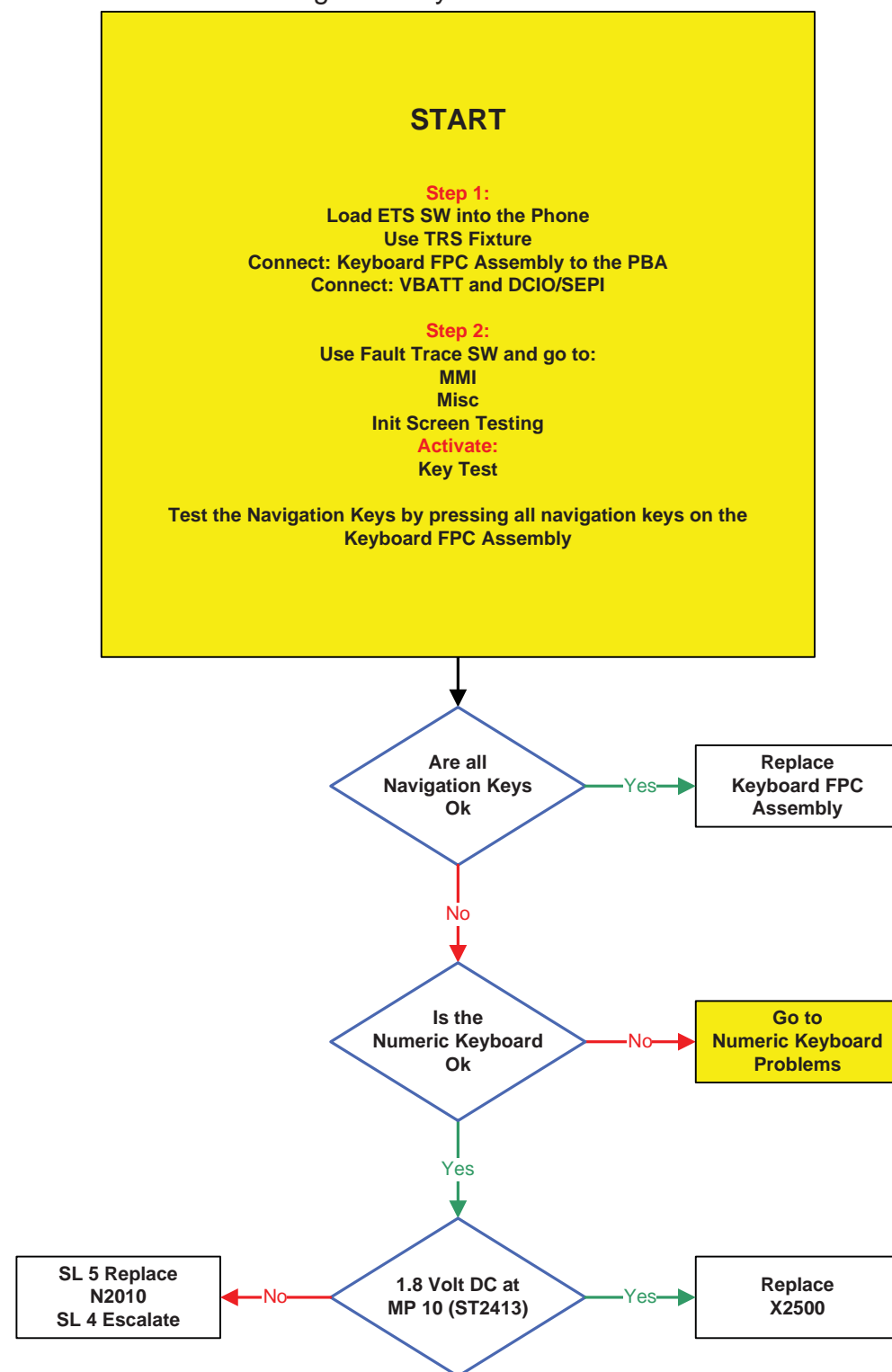
Numeric Keyboard Problems



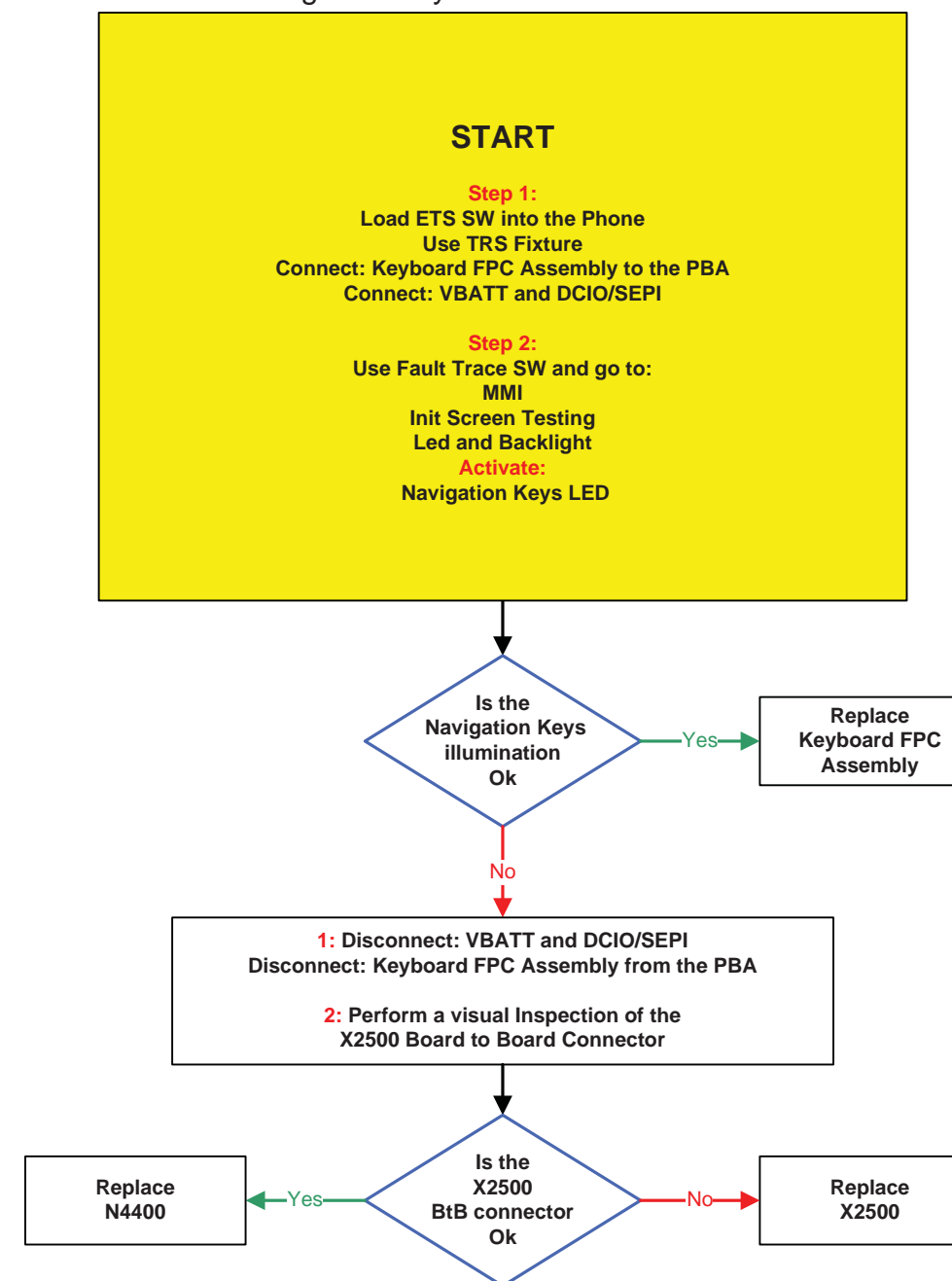
Numeric Keyboard illumination Problems



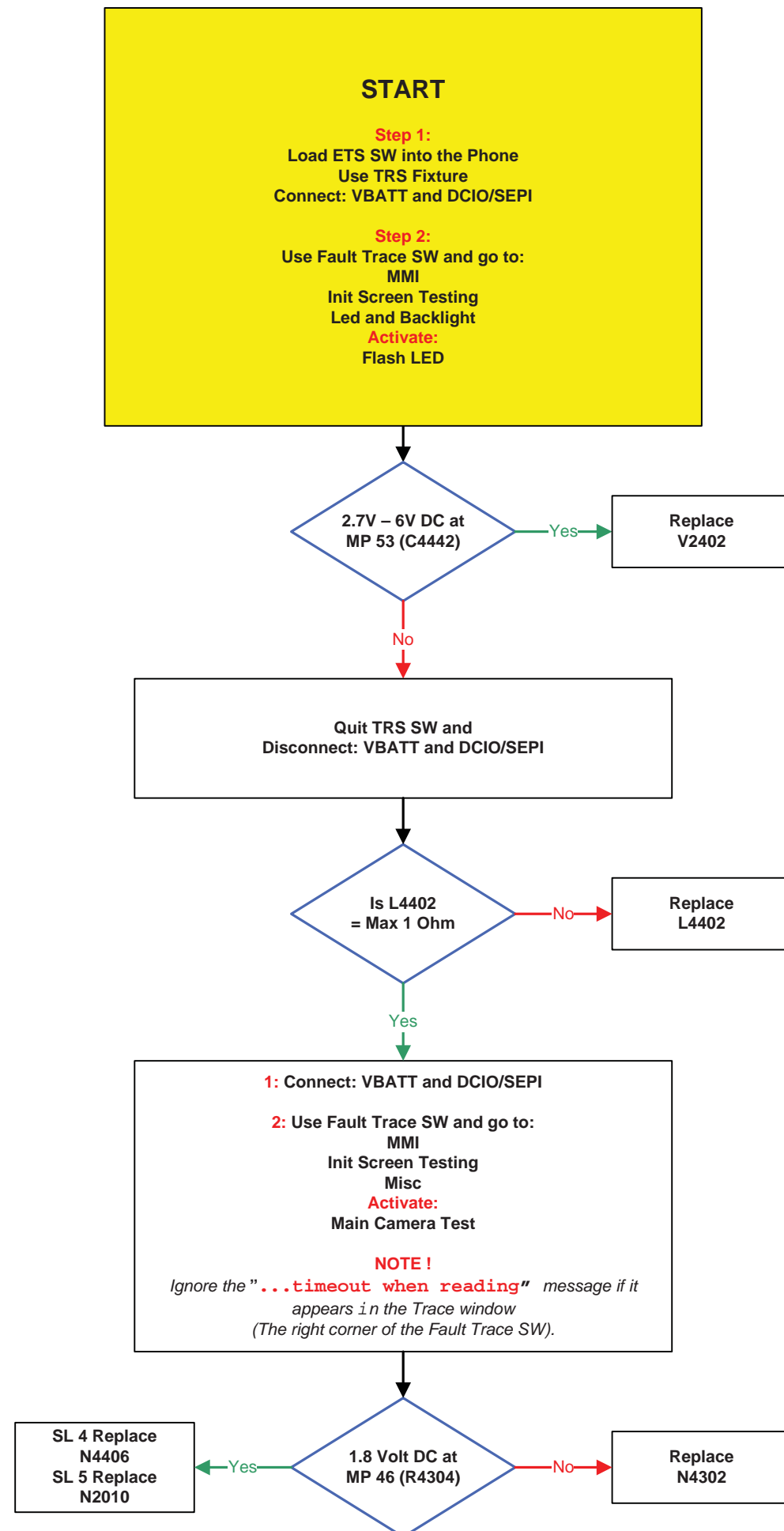
Navigation Keys Problems



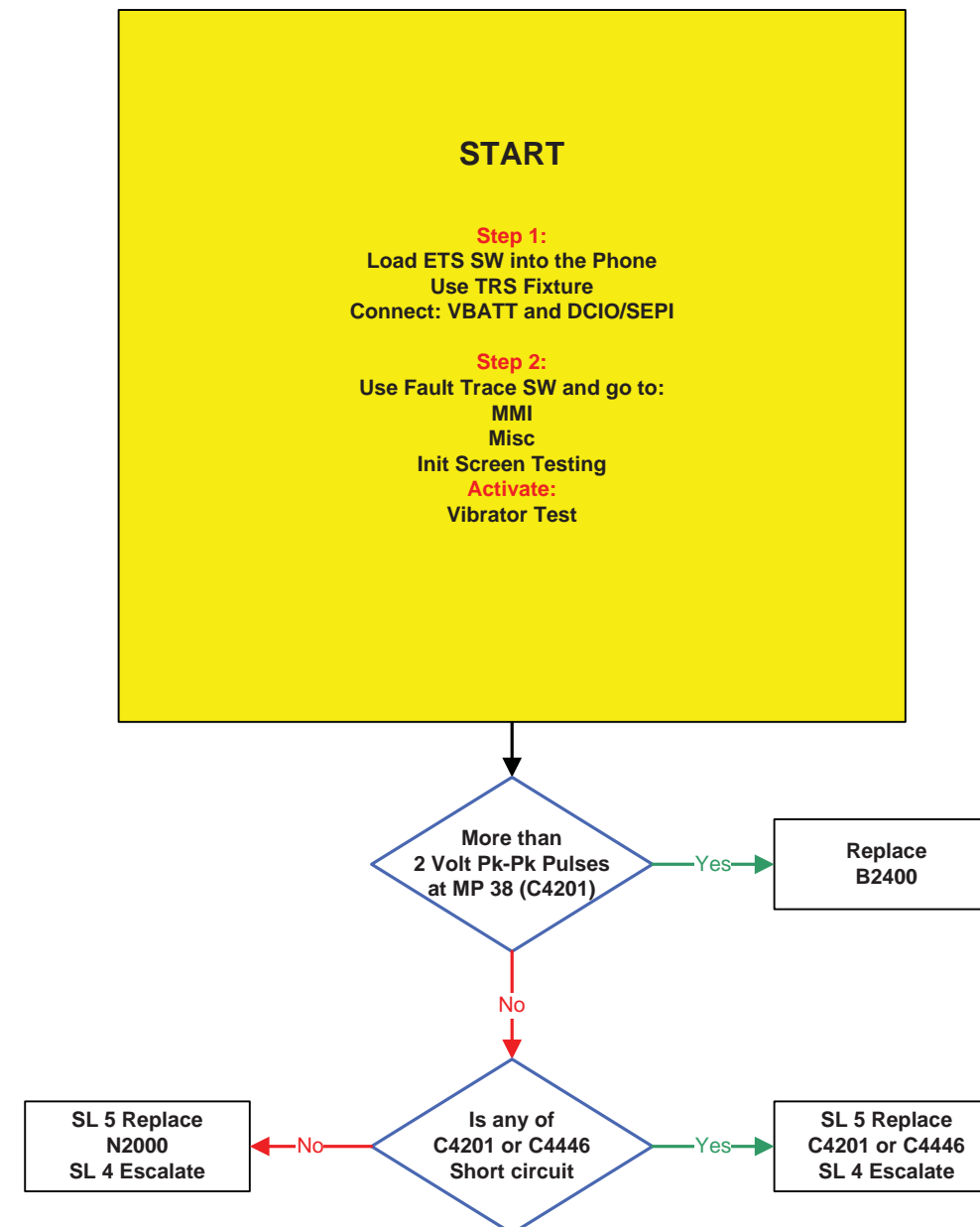
Navigation Keys illumination Problems



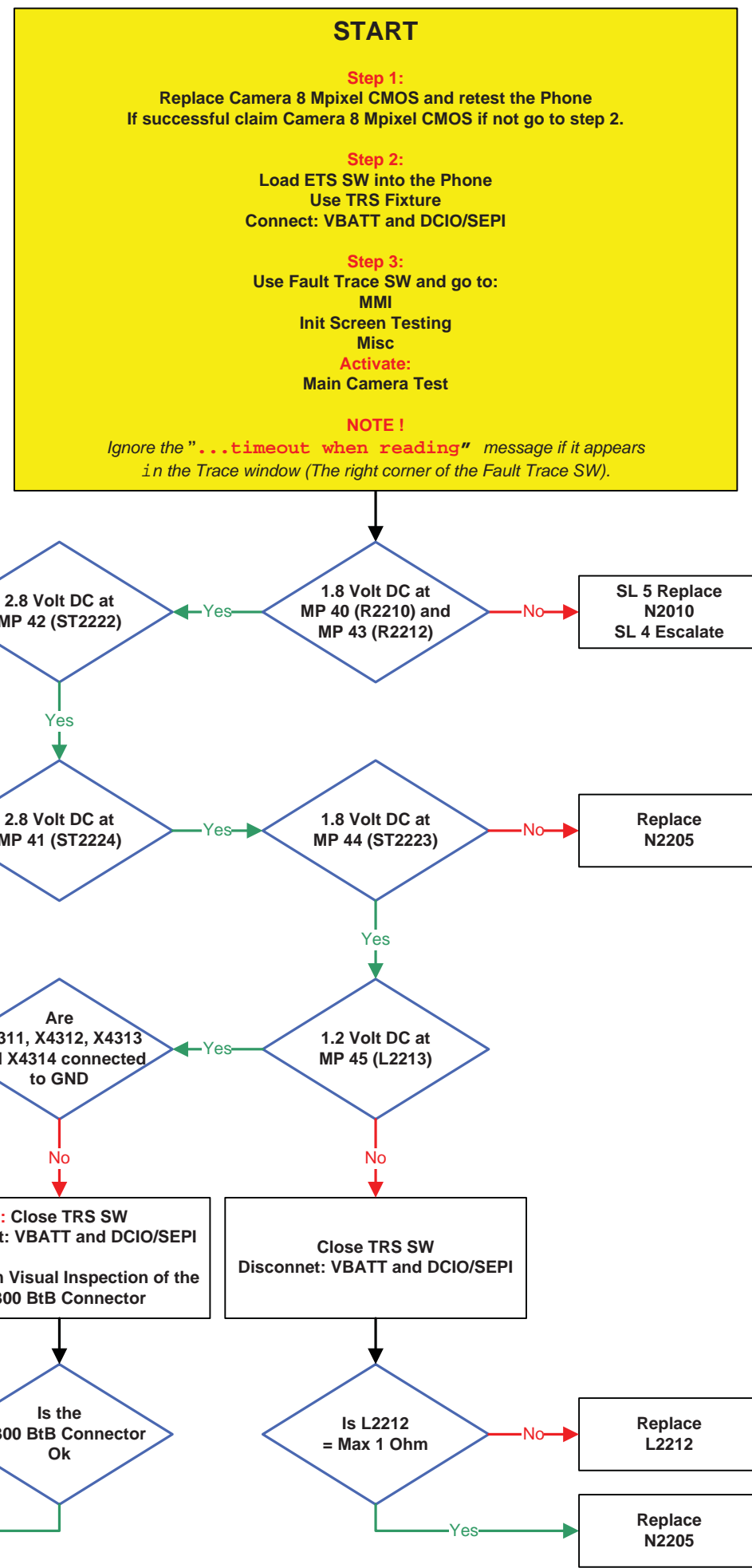
Flash LED Problems



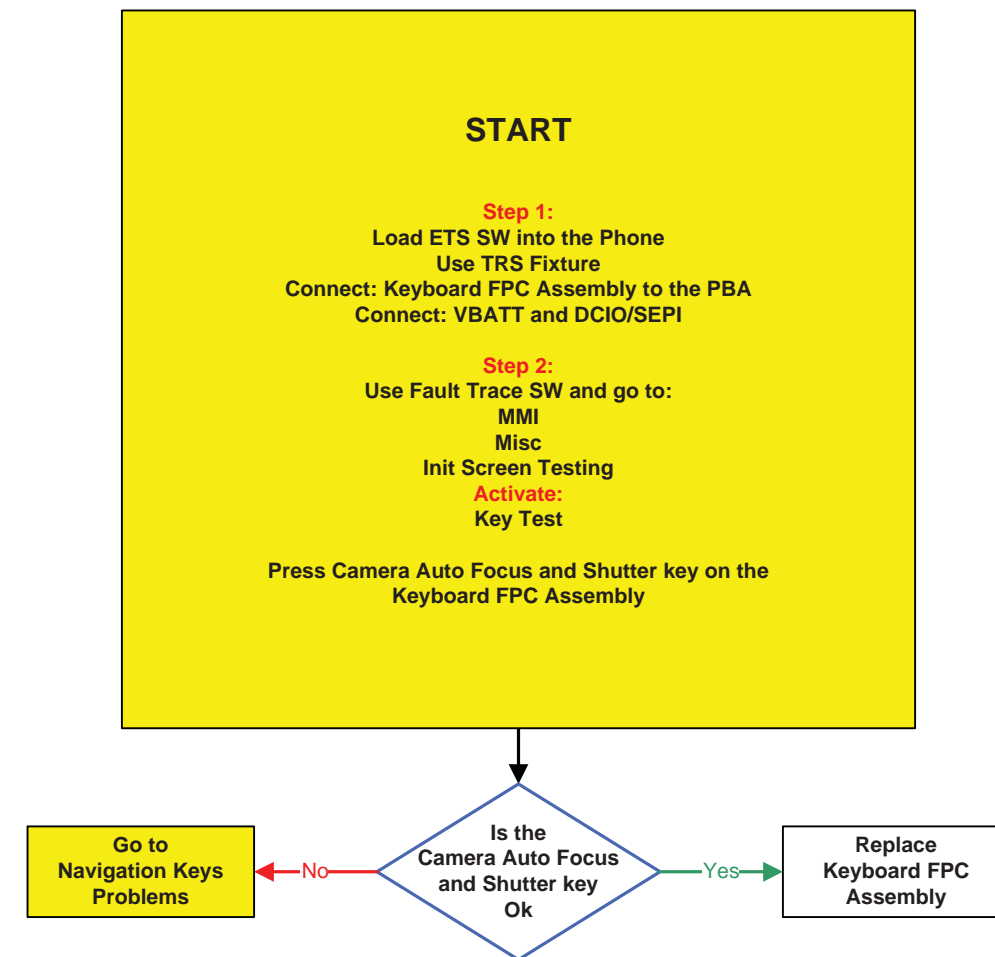
Vibrator Problems



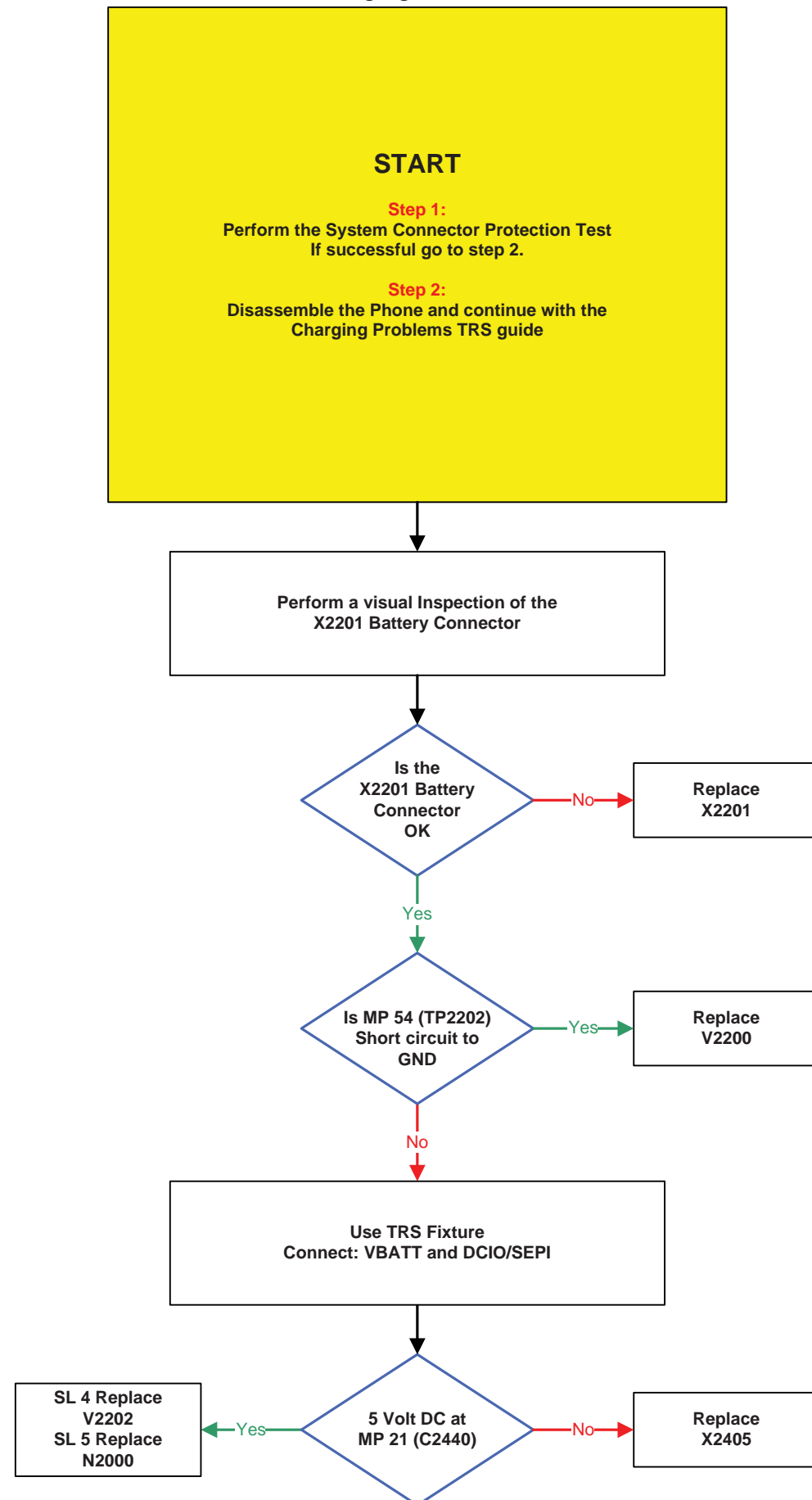
Camera Problems



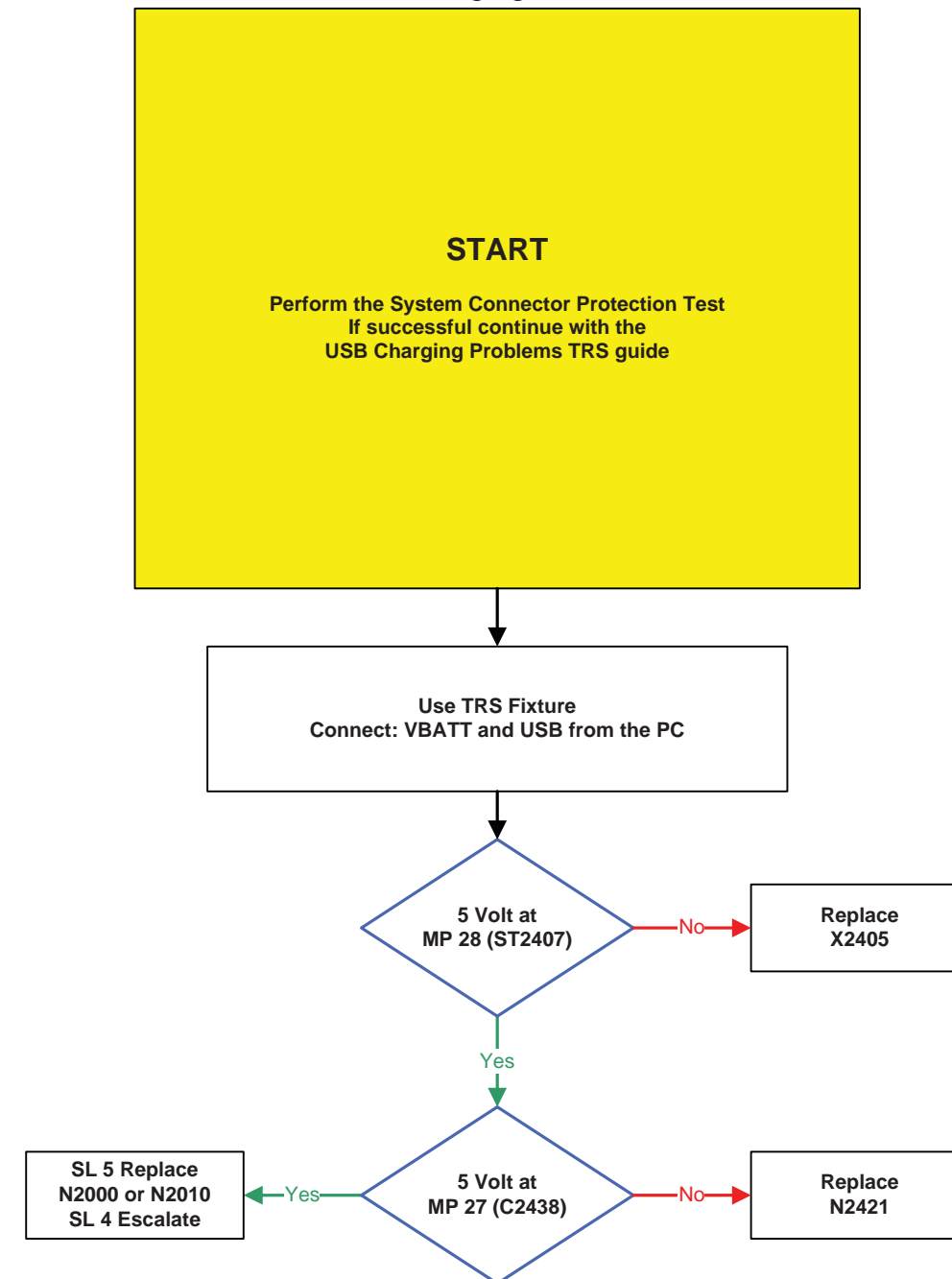
Camera Auto Focus and Shutter Problems



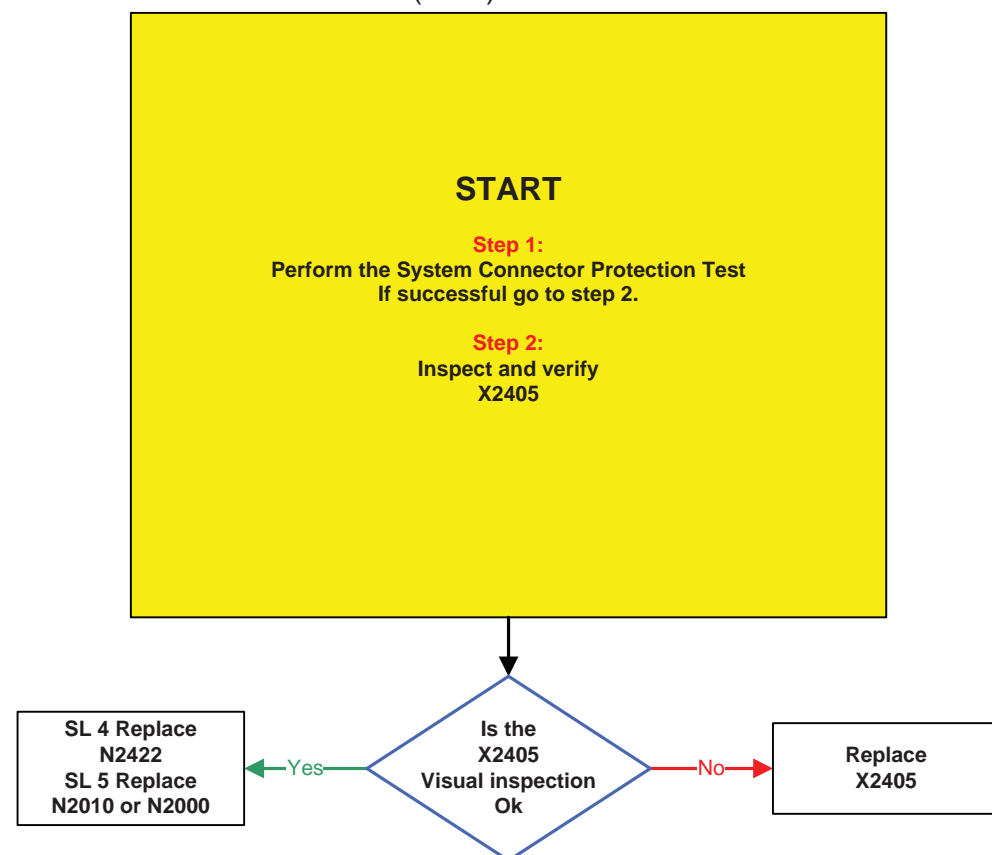
Charging Problems



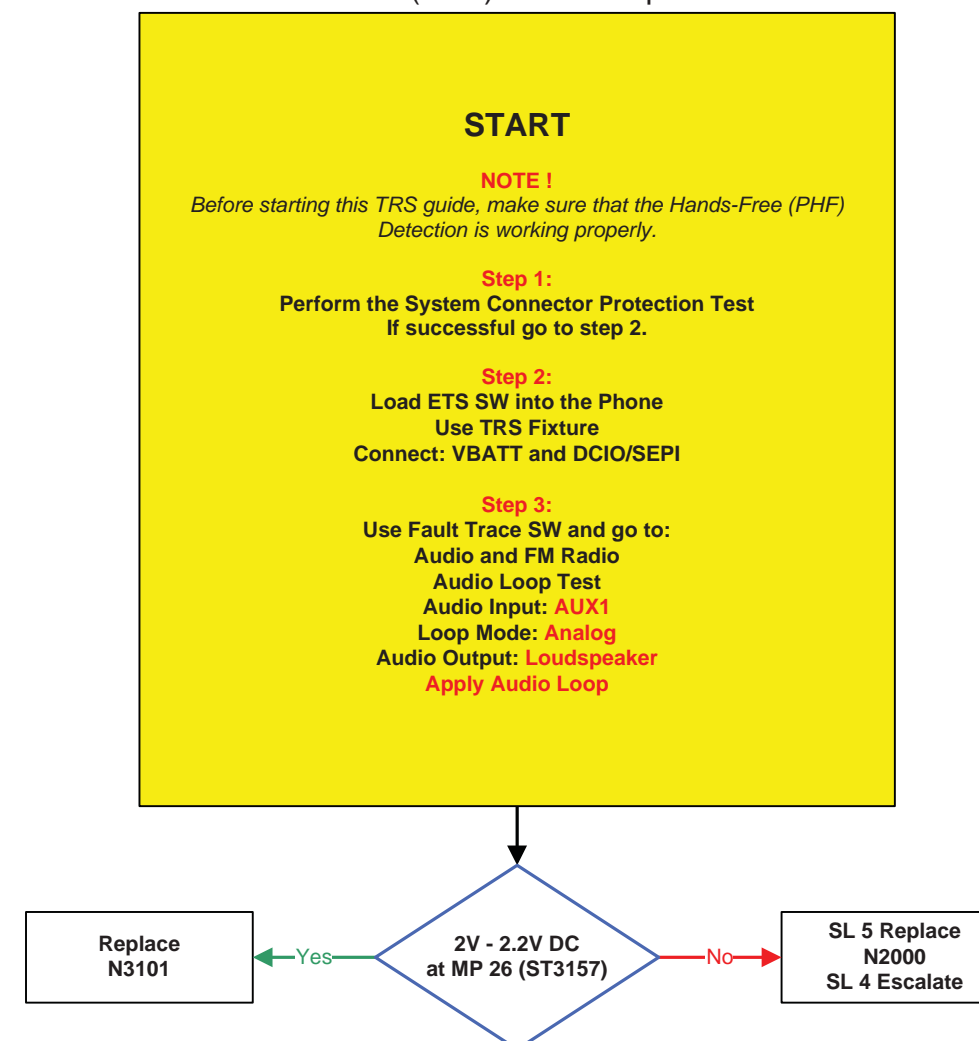
USB Charging Problems



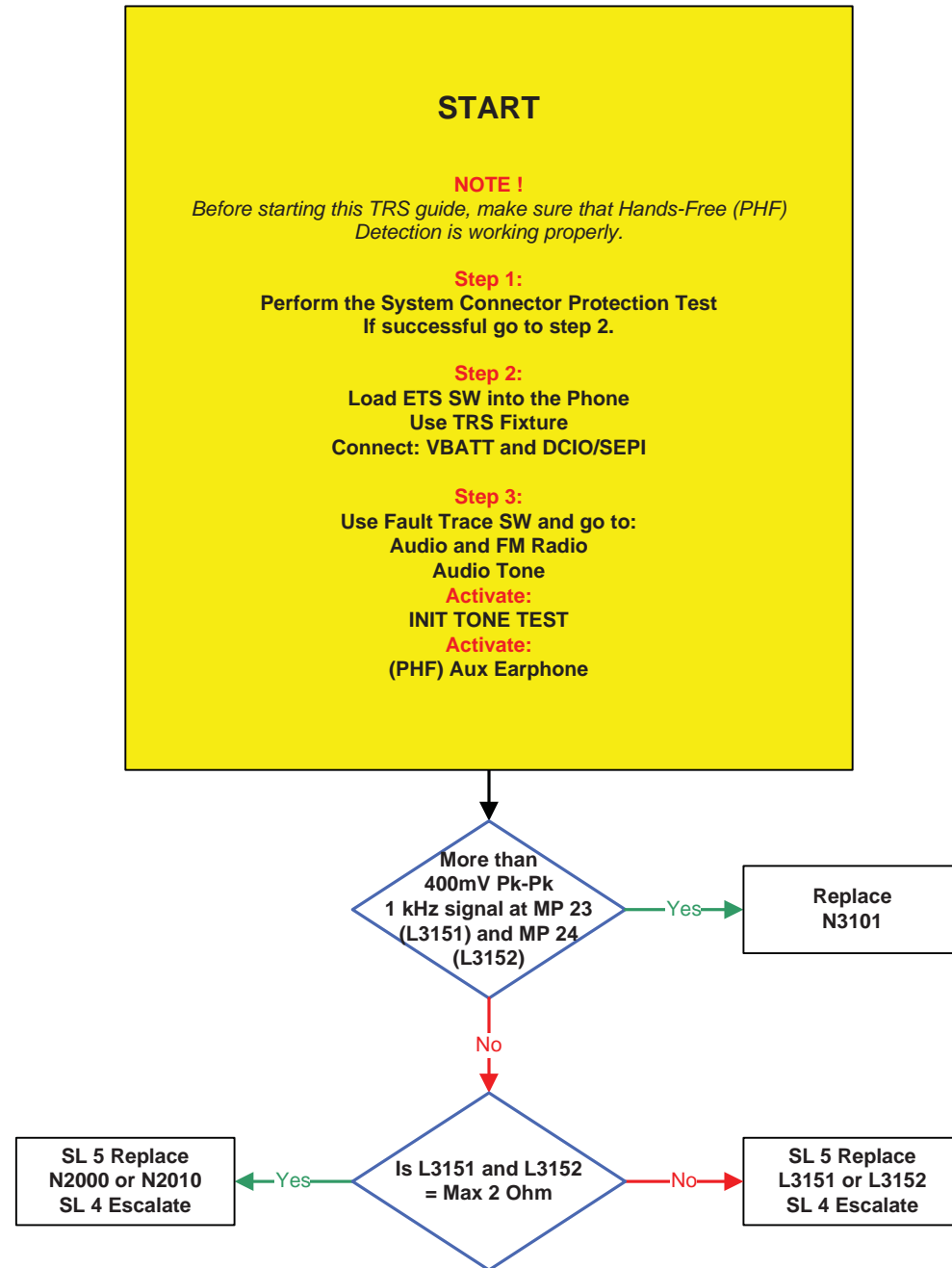
Hands-Free (PHF) Detection Problems



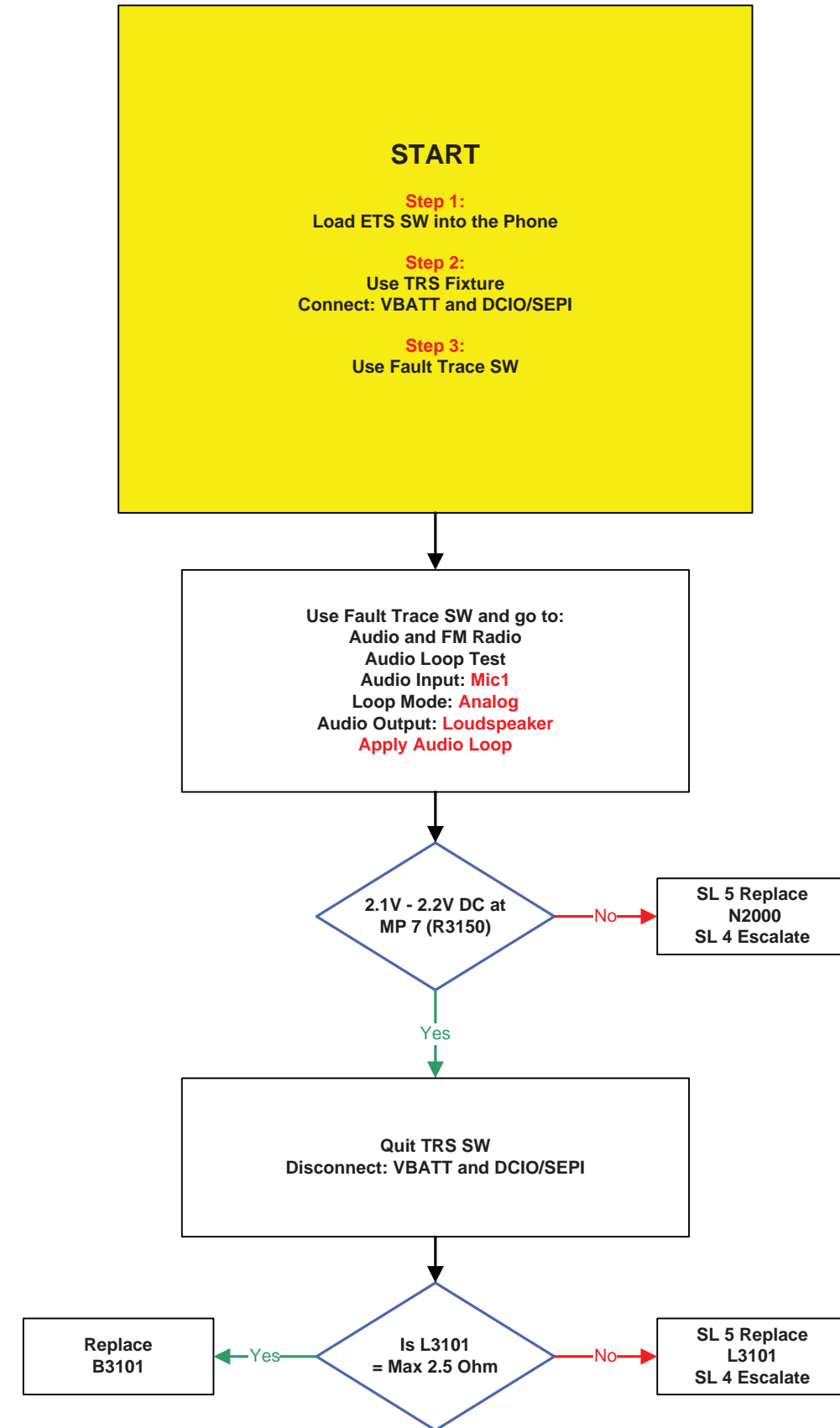
Hands-Free (PHF) Aux Microphone Problems



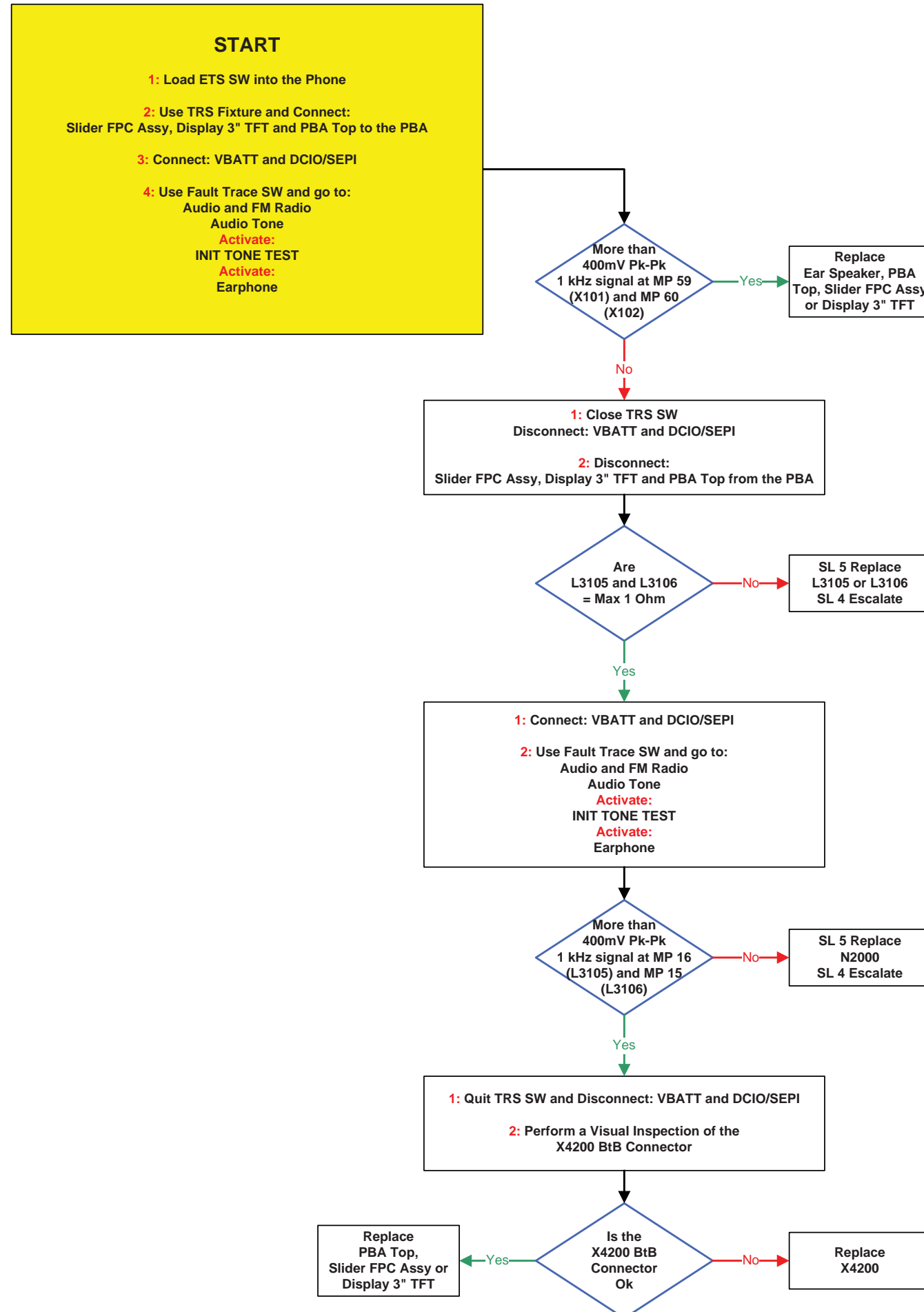
Hands-Free (PHF) Aux Earphone Problems



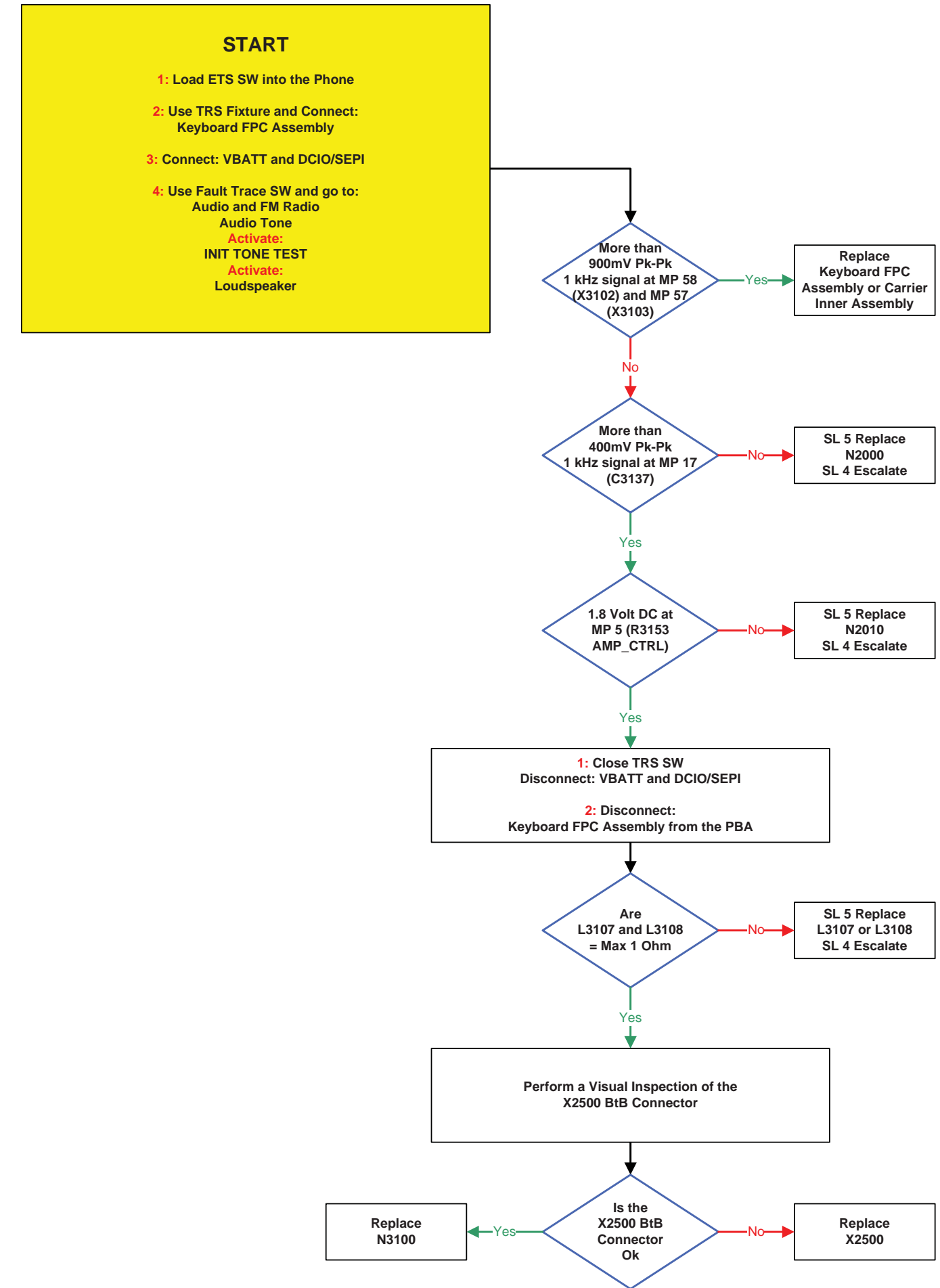
Microphone Problems



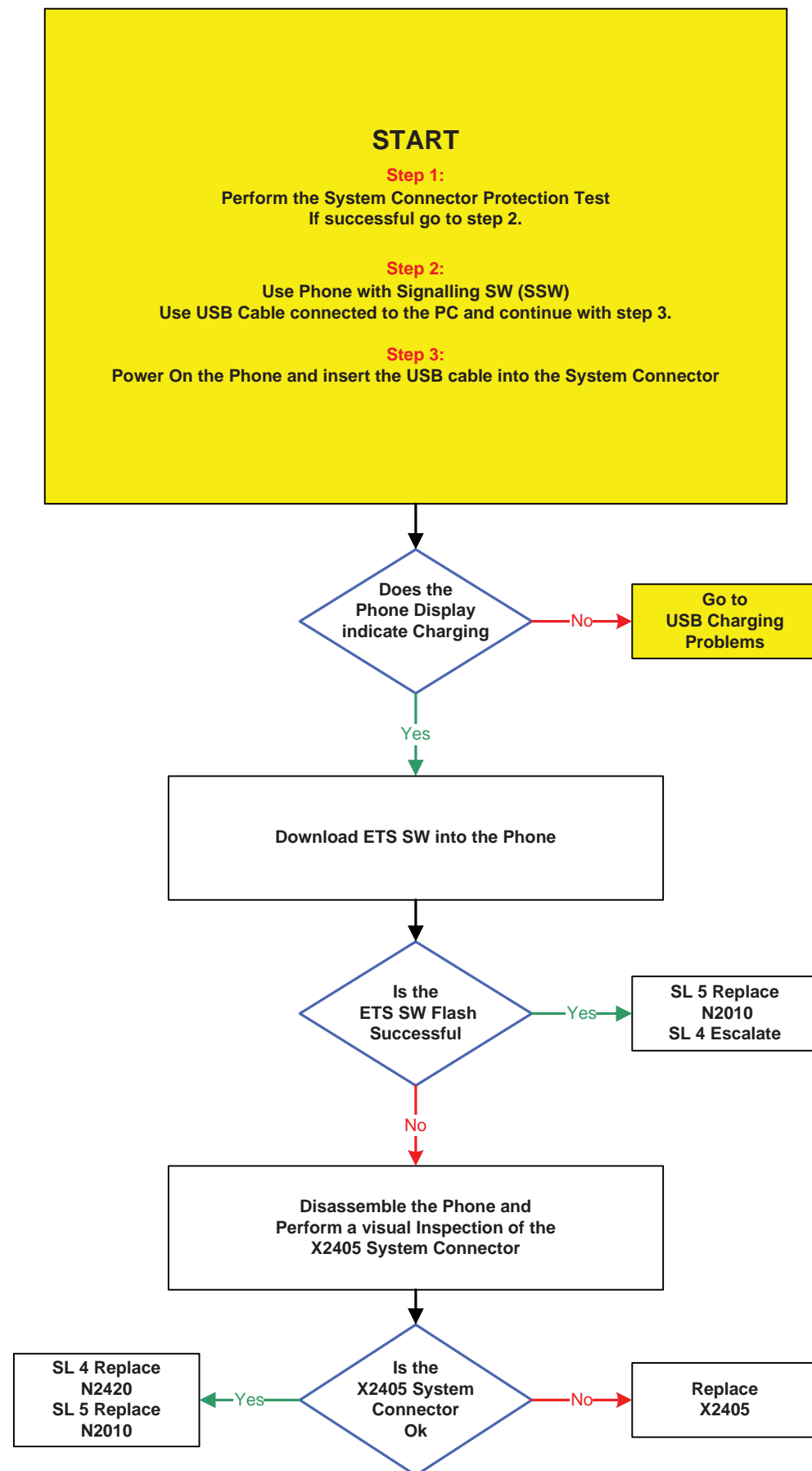
Earphone Problems



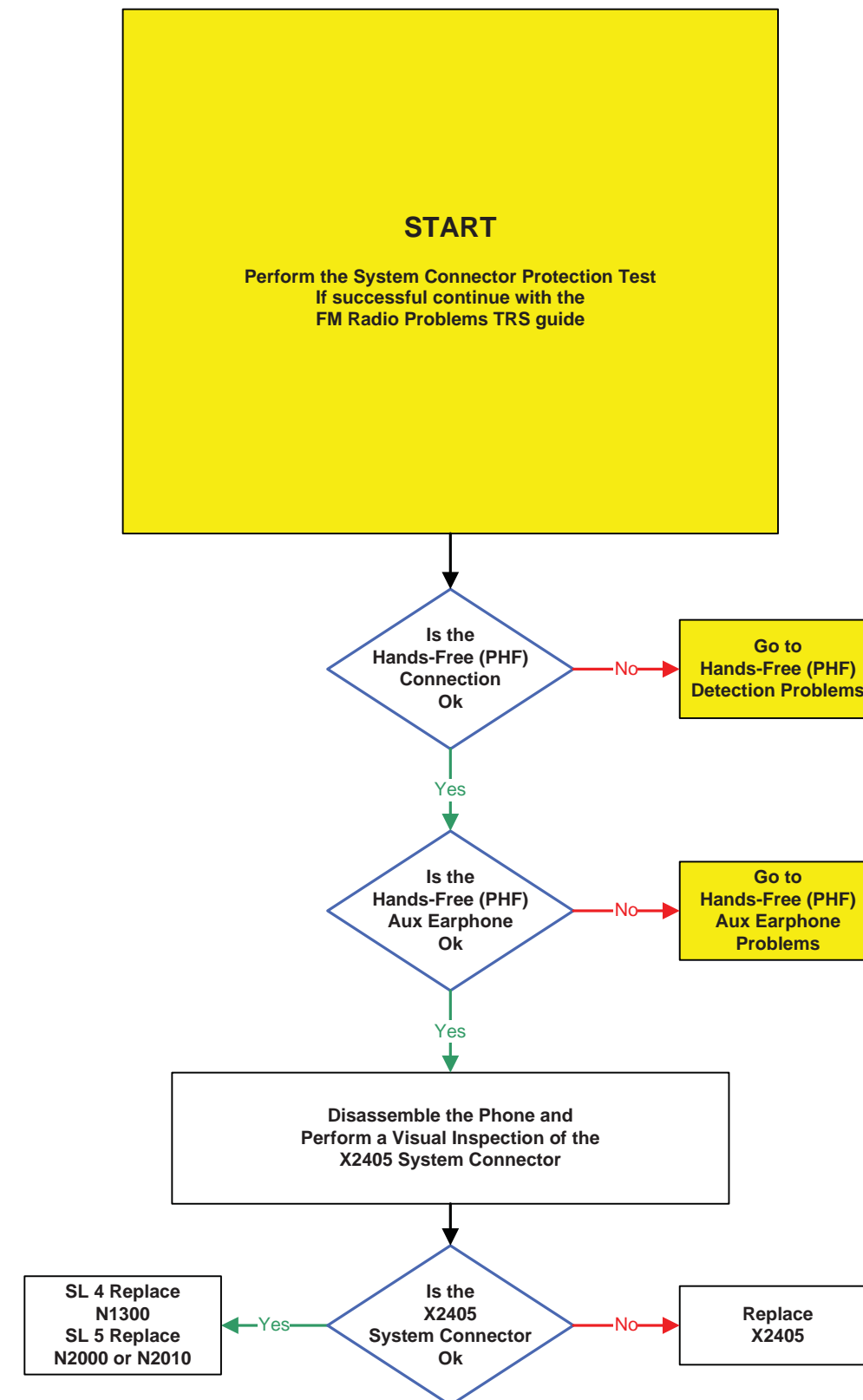
Loudspeaker Problems



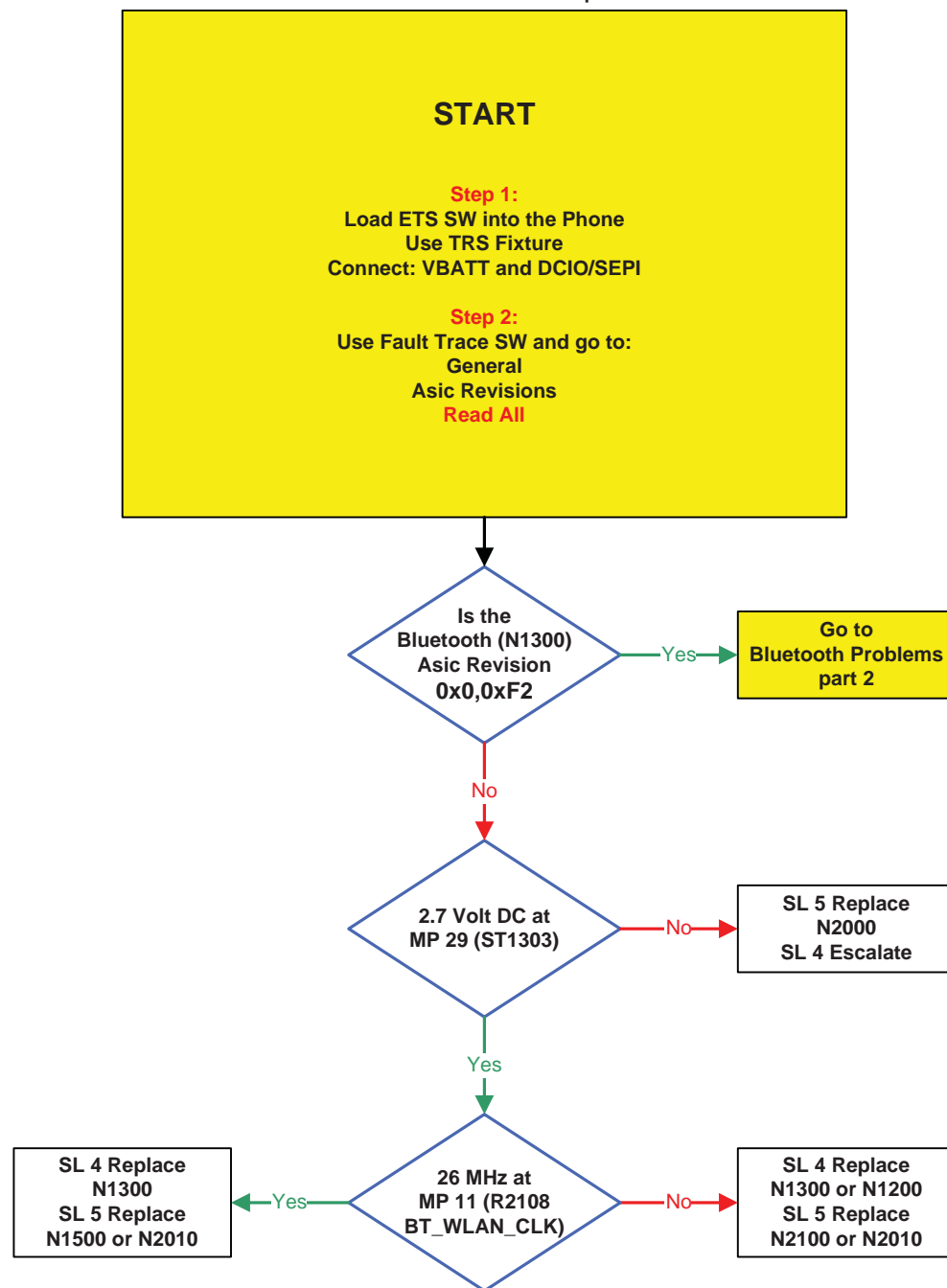
Data Communication Problems



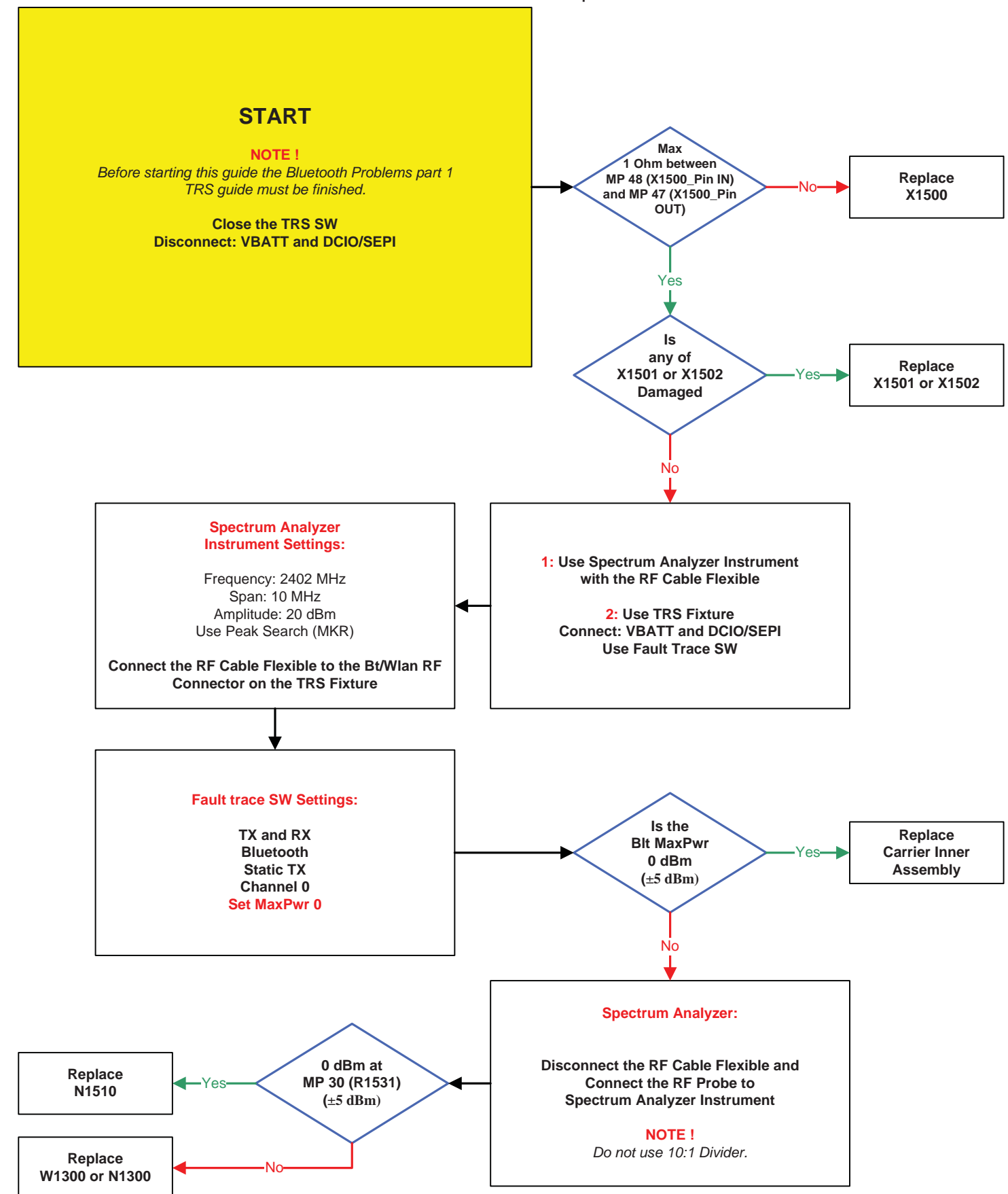
FM Radio Problems



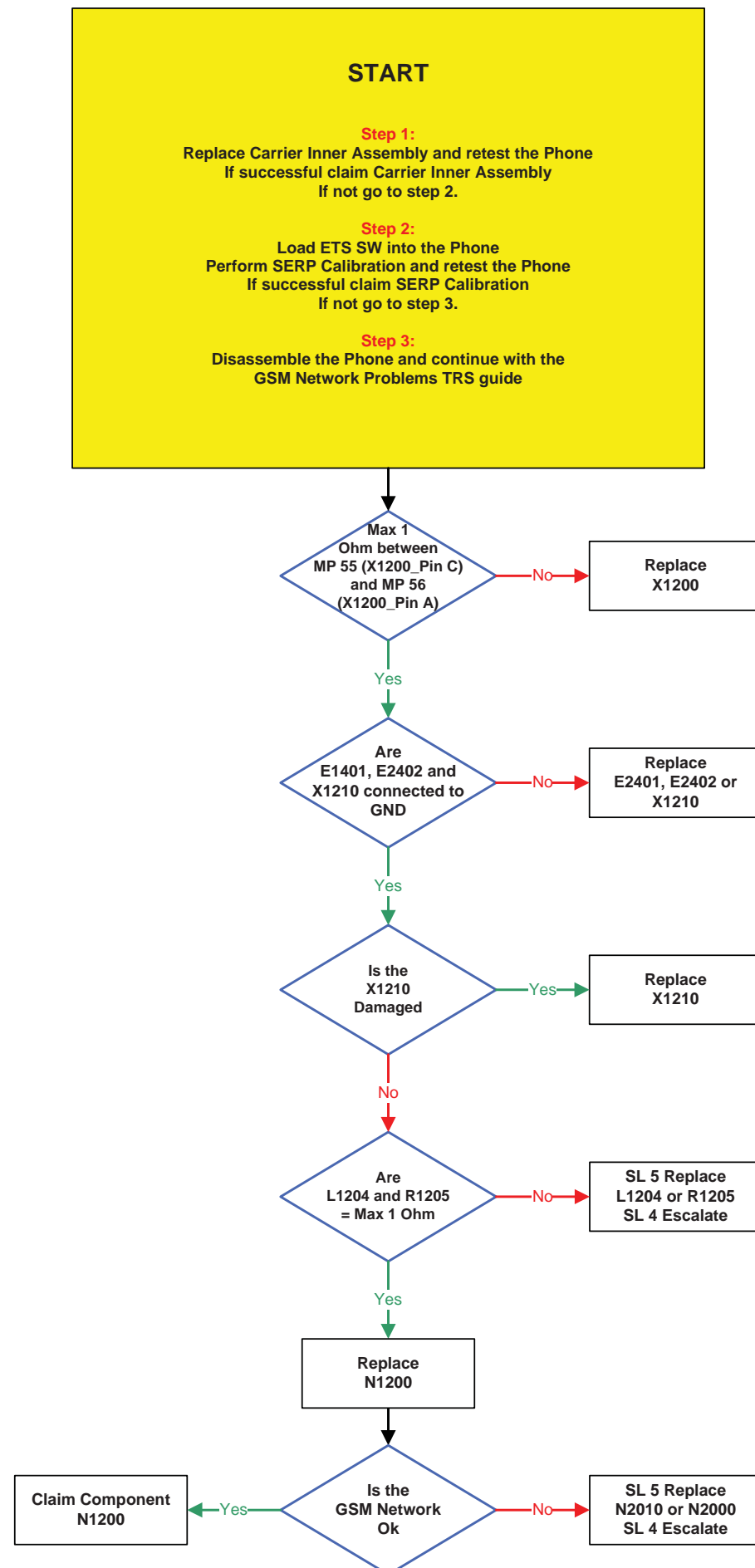
Bluetooth Problems part 1



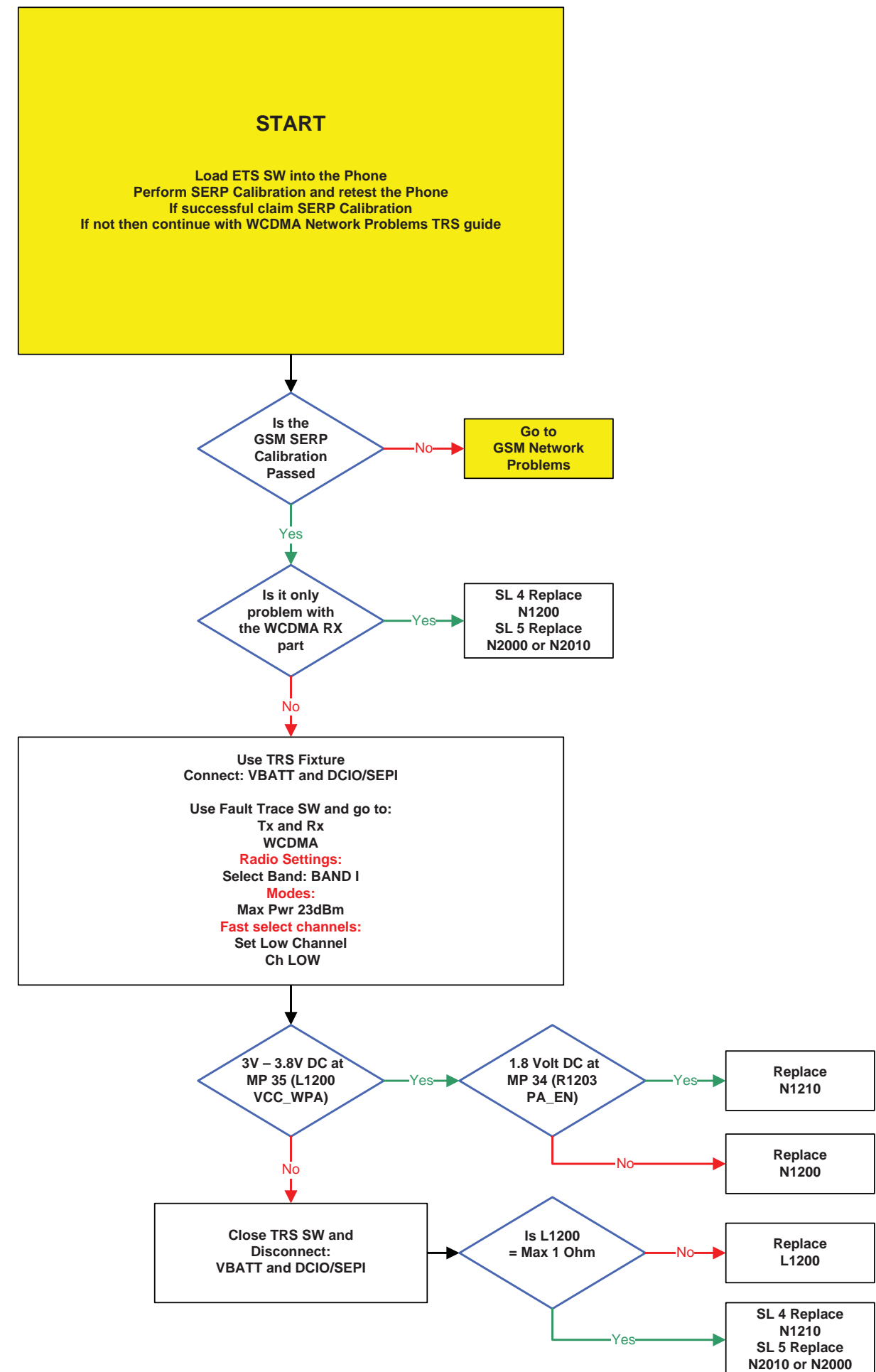
Bluetooth Problems part 2



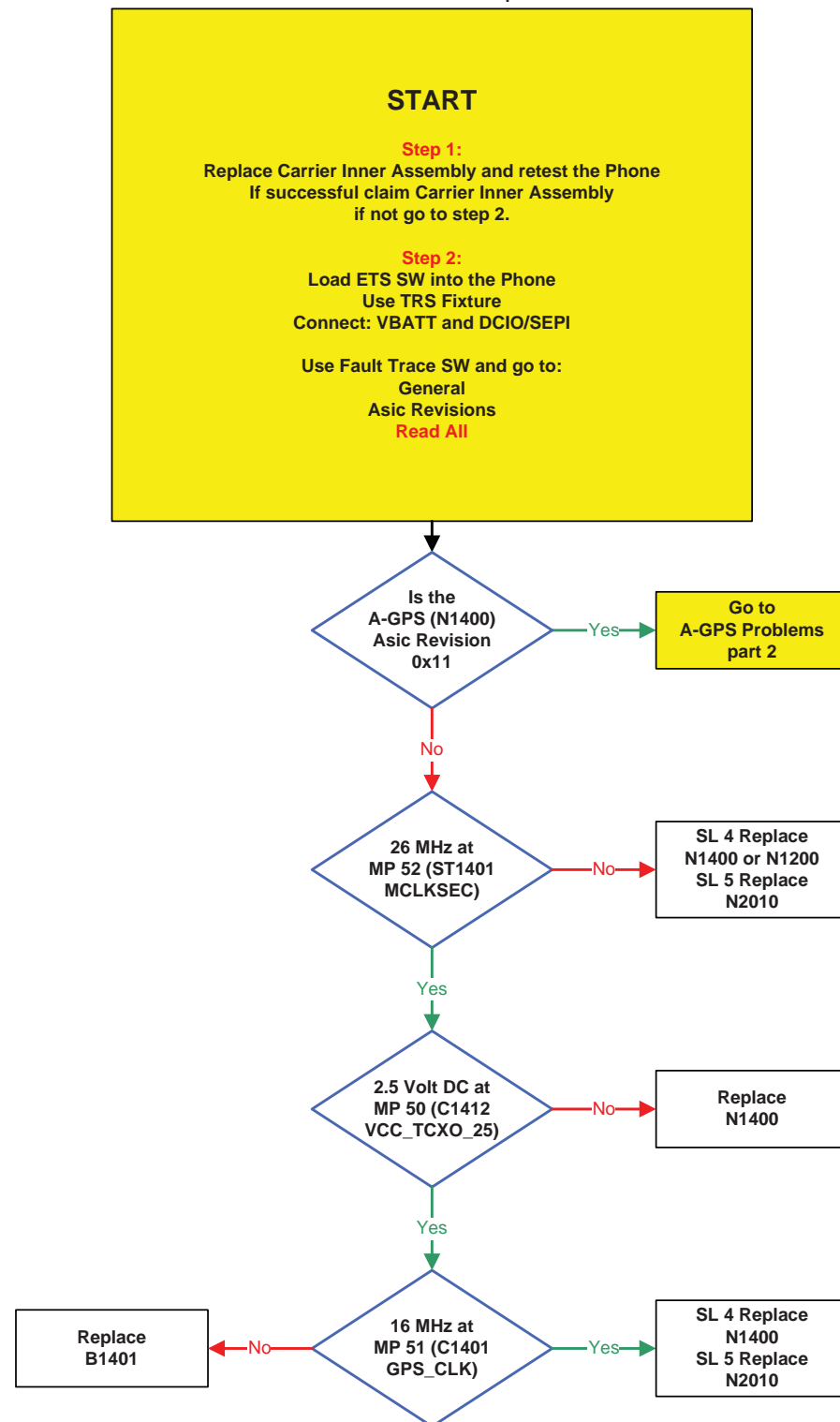
GSM Network Problems



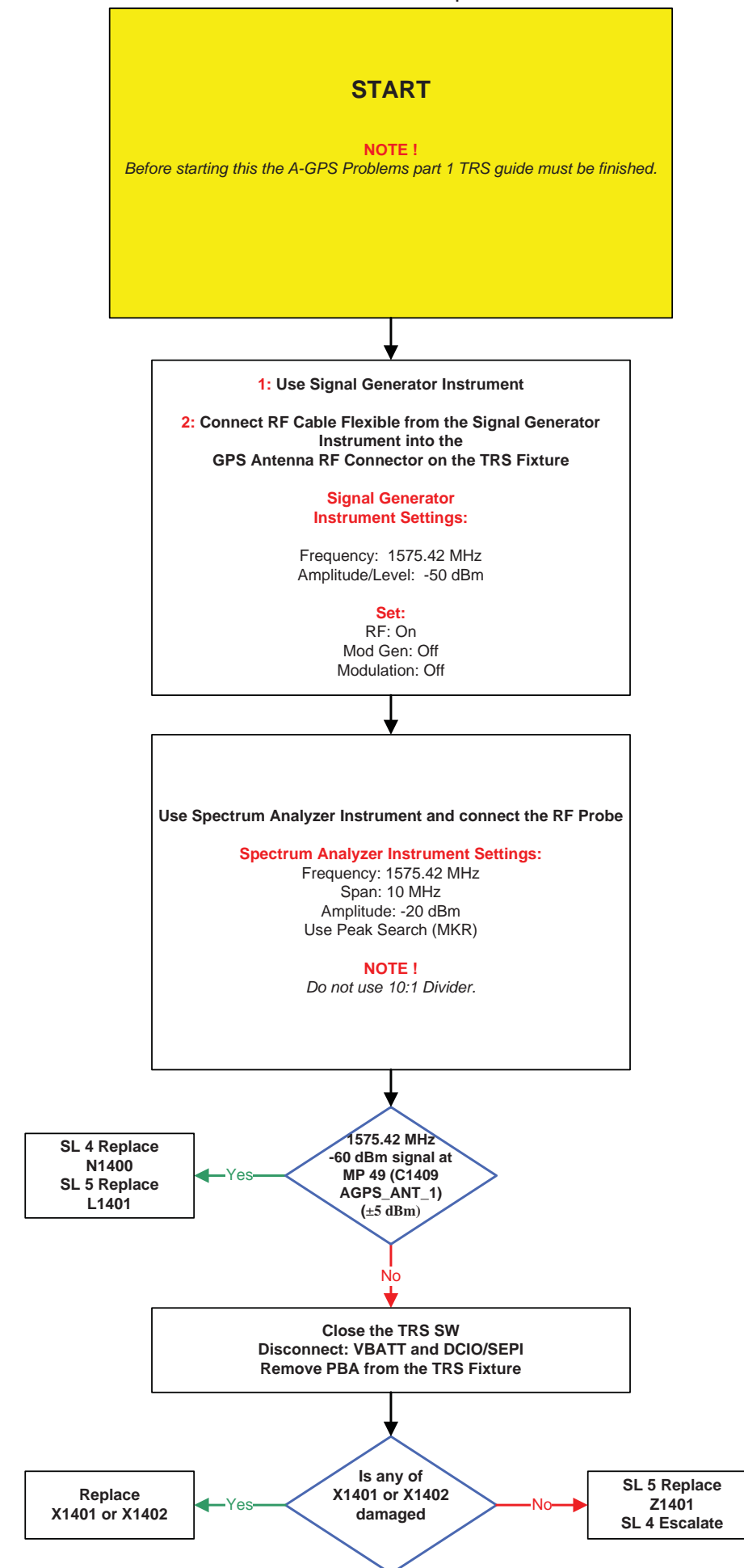
WCDMA Network Problems



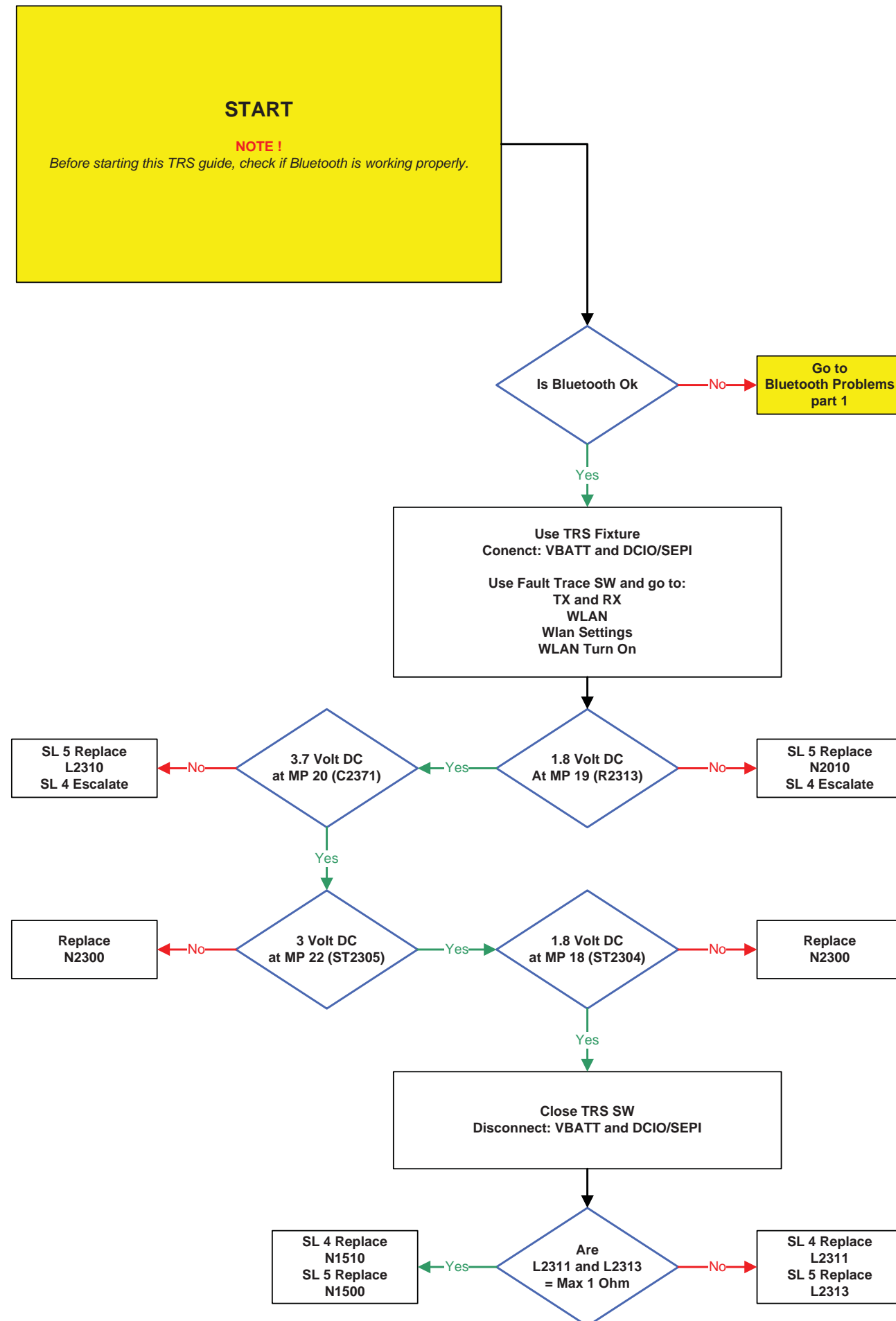
A-GPS Problems part 1



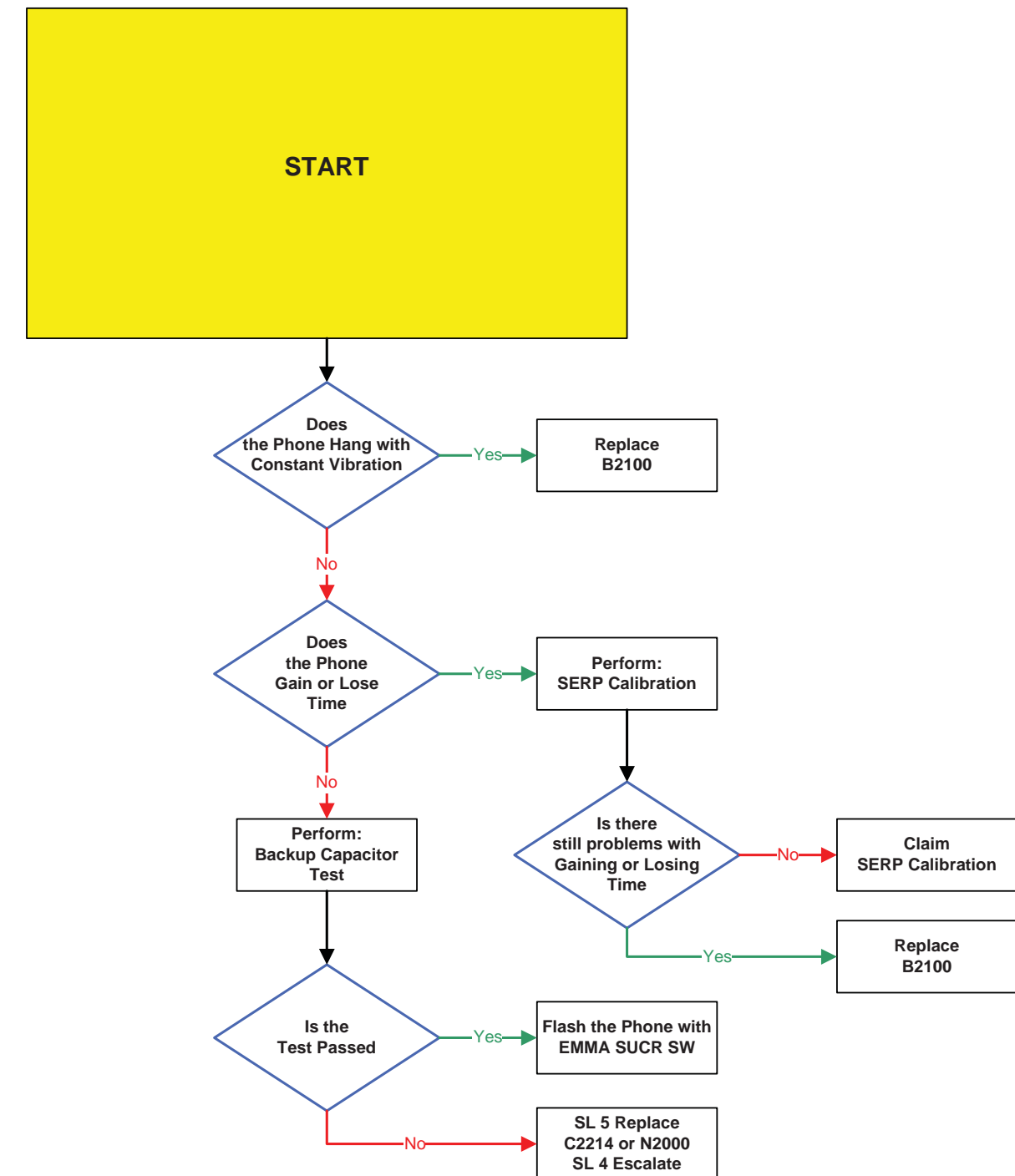
A-GPS Problems part 2



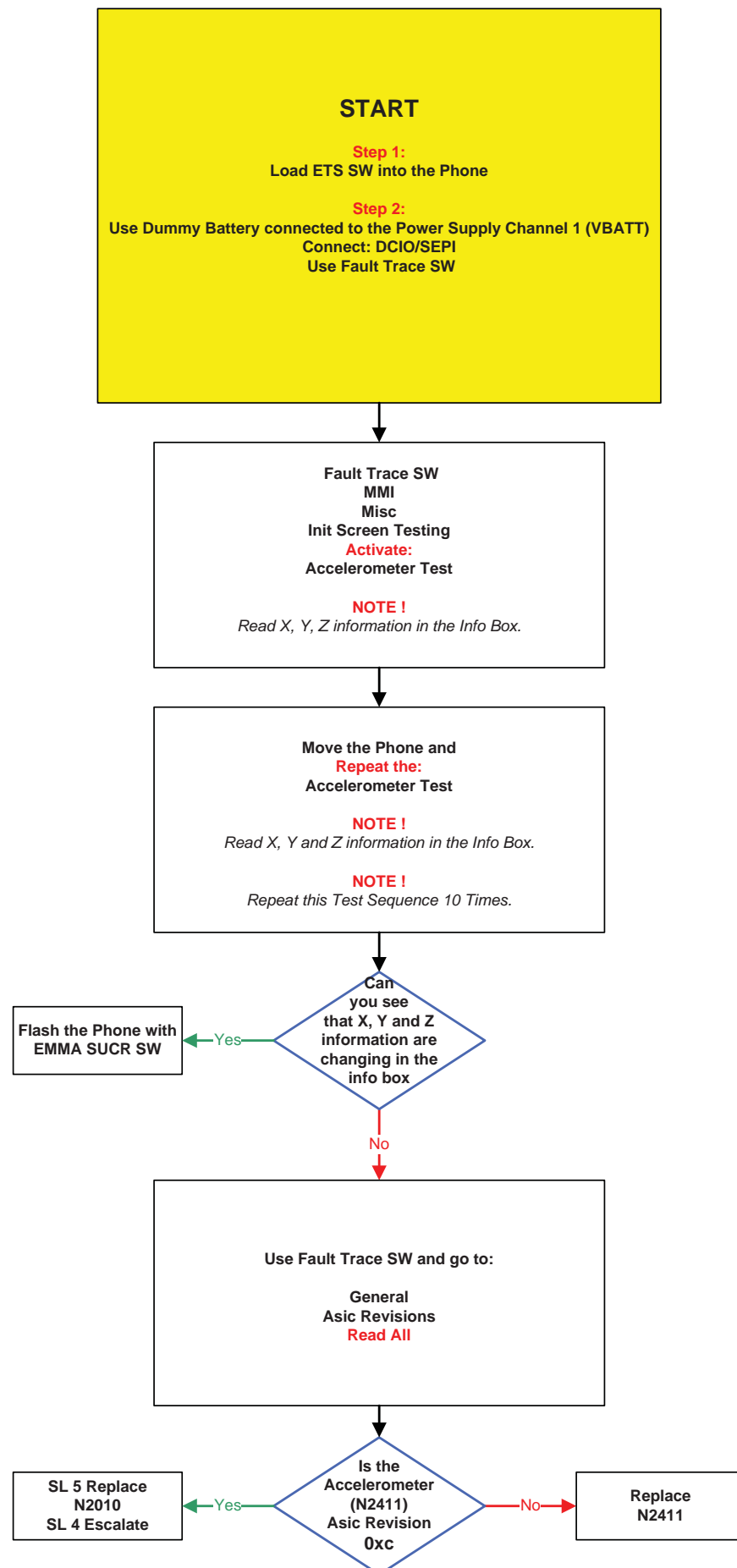
WLAN Problems



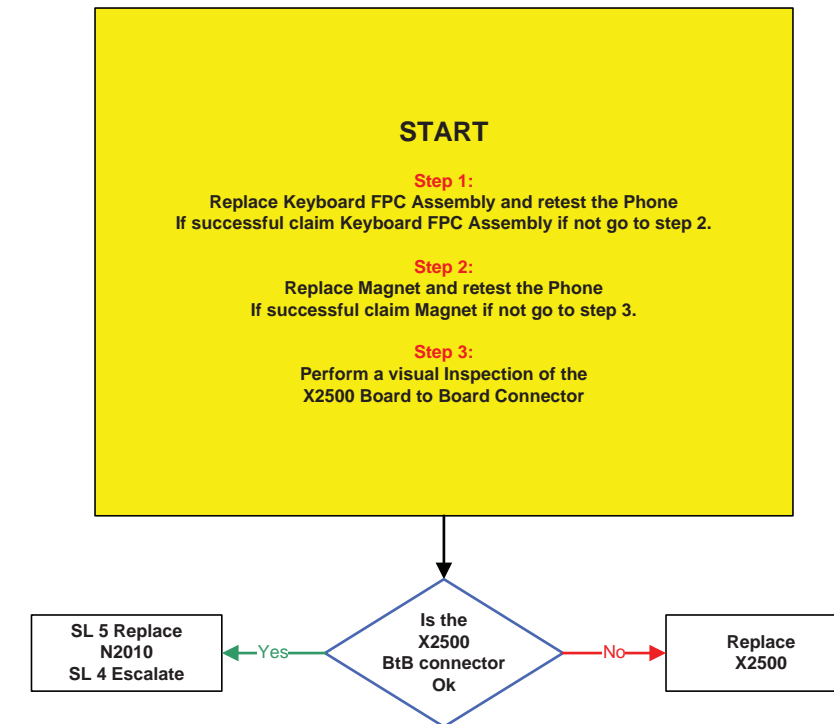
Alert and Real Time Clock Problems



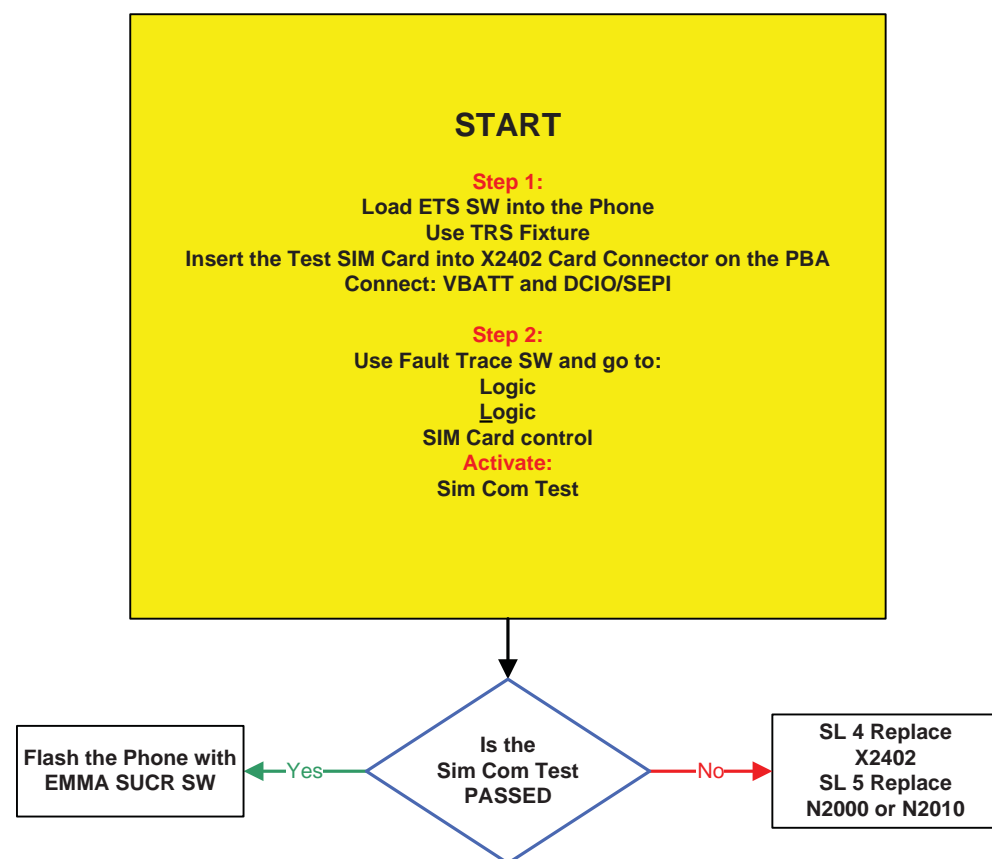
Accelerometer Problems



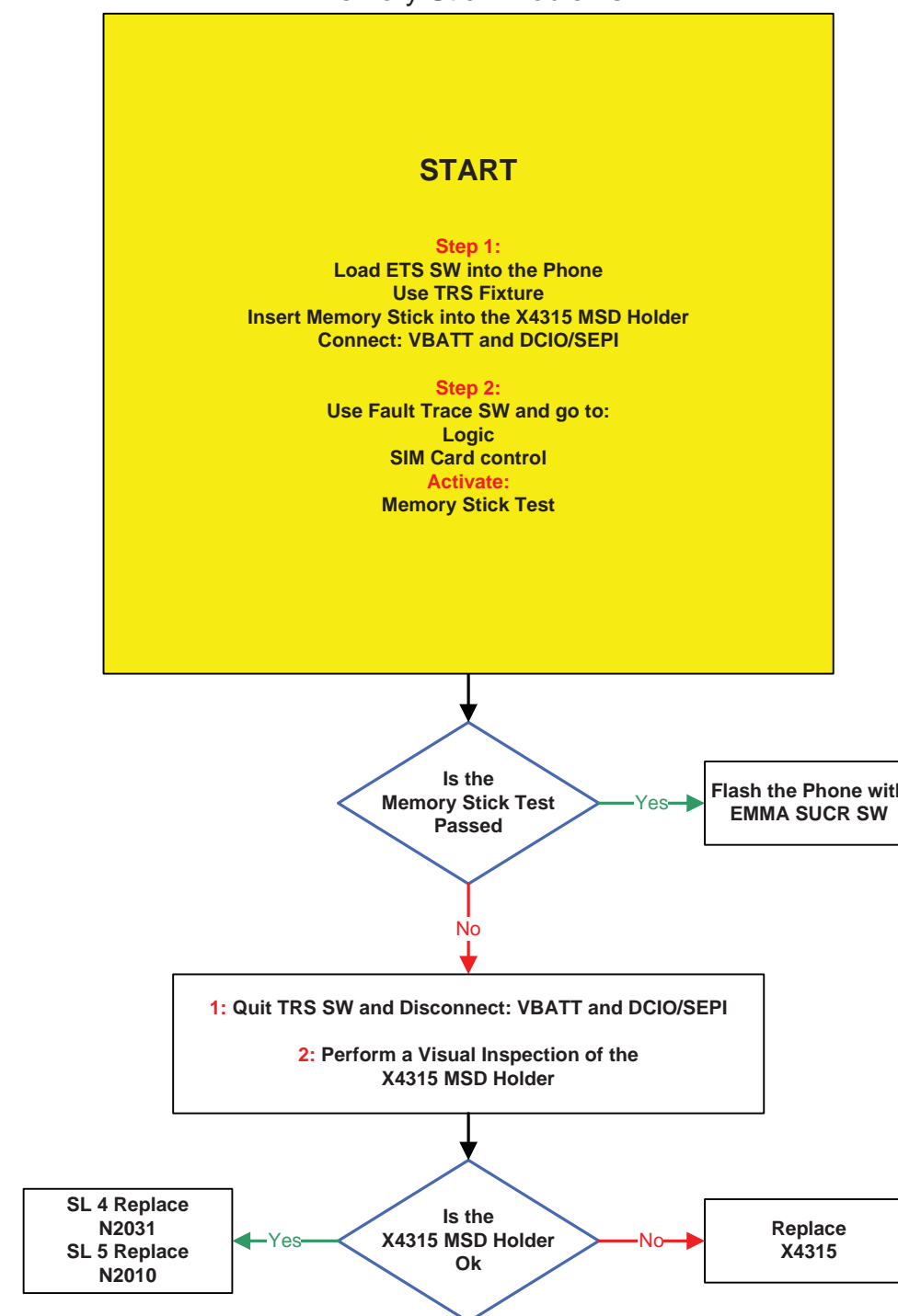
Slide Sensor Problems



SIM Problems



Memory Stick Problems

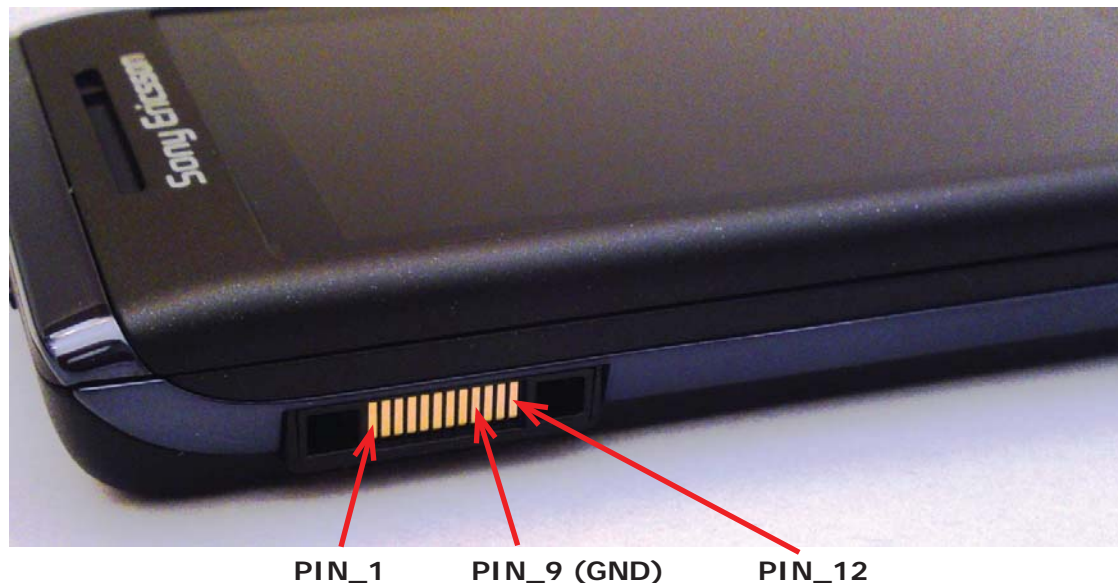


System Connector Protection Test

Perform the Ohm measurements by using the DMM instrument (Fluke).

Note! The Battery must be removed from the Phone during this test.

Note! Connect the Black probe to X2405_PIN 9 (GND).



System Conn. X2405 (PIN Position)	Measurement Limits (Ohm)	SL 4 (Repair Action)	SL 5 (Repair Action)
1	1.2M	X2405 if higher C2439 if lower N2421 if lower	No Action
2	0	X2405 if higher L2406 if higher	No Action
3	7.5k - 13k	X2405 if higher L2401 if higher N3101 if lower or higher	No Action
4	900 - 999	X2405 if higher L2402 if higher N3101 if lower or higher	No Action
5	9k - 10k	X2405 if higher L2403 if higher N3101 if lower or higher	C2448 if lower
6	9k - 10k	X2405 if higher L2404 if higher N3101 if lower or higher	C2447 if lower
7	Not Connected	No Action	No Action
8	500k - 600k	X2405 if higher V2417 if lower N2422 if lower or higher	R2434 if higher R2438 if higher
9	GND	X2405 if higher	No Action
10	350k - 650k	X2405 if higher Z2400 if higher V2415 if lower N2420 if lower or higher	No Action
11	350k - 650k	X2405 if higher Z2400 if higher V2416 if lower N2420 if lower or higher	No Action
12	70k - 110k	X2405 if higher L2408 if higher V2412 if lower C2440 if lower V2202 if higher	C2441 if lower

Backup Capacitor Test

To perform this test use:

- Phone with the ETS SW
- Power Supply Channel 1 VBATT: Instrument settings: Voltage: 3.8V, Limiter: 2A
- Power supply Channel 2 DCIO/SEPI (Voltage: 5V, Limiter: 2A)
- Fault Trace SW

This test should be performed in 3 steps:

Step1:

Use Fault Trace SW and go to: Logic - ADC Values – Read ADC Value (**Reading 1**).

Step2:

This step should be made **30 seconds** after Step 1.

Use Fault Trace SW and go to: Logic - ADC Values – Read ADC Value (**Reading 2**).

Step3:

Compare the difference between **Reading 1** and **Reading 2** with the reference table below. If Reading 1 value is between 50 and 680 go to Interval 1, if between 681 and 800 go to Interval 2, if between 801 and 880 go to Interval 3 and compare with the **Reading 2 – Reading 1** Min and Max Limits.

Reference Table:

	Min	Max	Unit
Absolute readout Reading 1	50	880	Dec

Reading 1 (Dec)	Reading 2 – Reading 1 (Dec)	
	Min	Max
Interval 1 (50 – 680)	20	210
Interval 2 (681 – 800)	5	30
Interval 3 (801 – 880)	0	15

Note! The upper table contains the absolute limits for the readouts. The lower table contains the allowed delta between the first and the second readout, separated in time with 30 seconds.

Note! If the readings are out of limits then **SL 5 Replace C2214 SL 4 Escalate**.
If still problem then **SL 5 Replace N2000 SL 4 Escalate**.

ASIC Revision Test

Note! *The Key Test must be deactivated during this test.*

The purpose of this test is to verify:

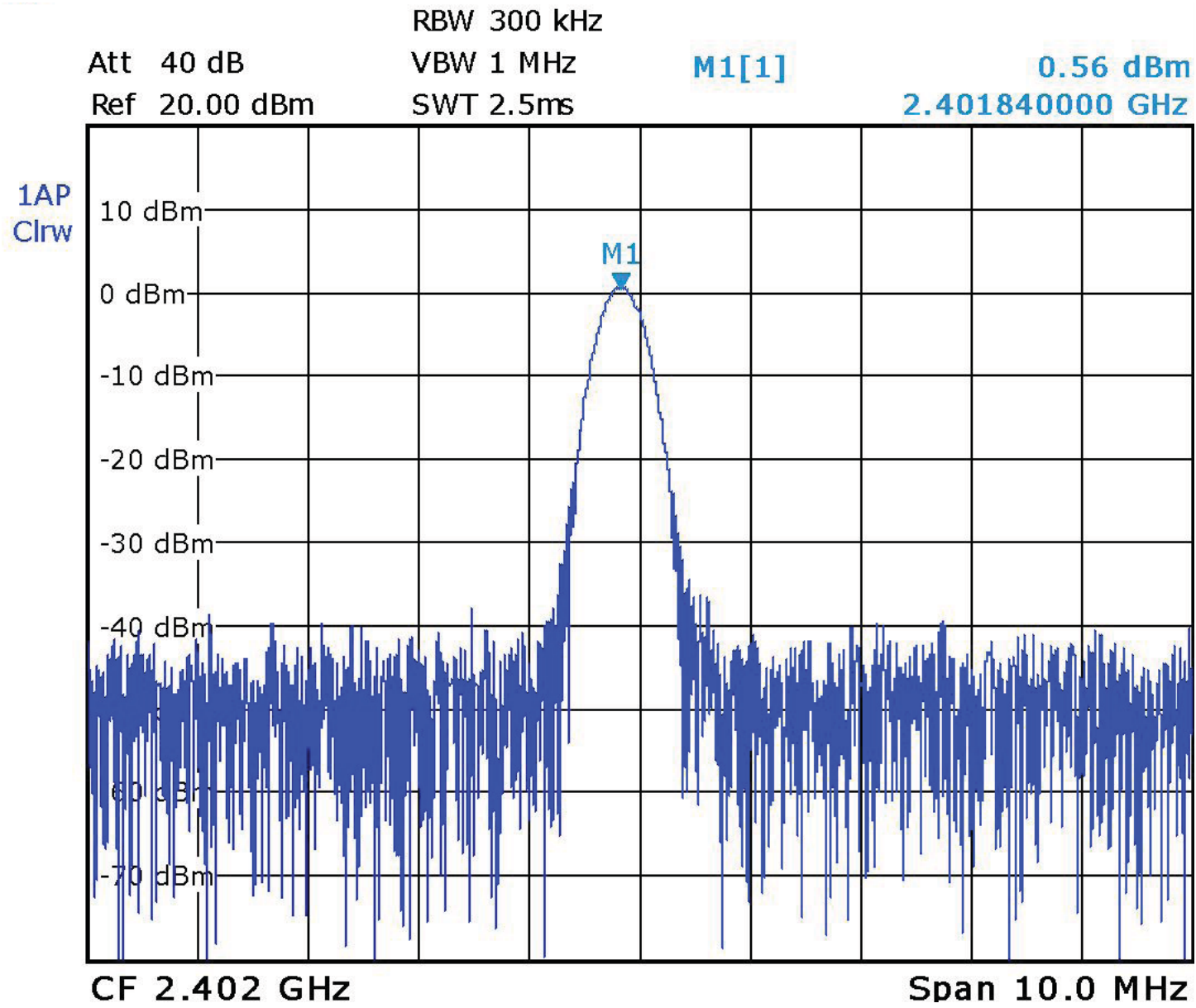
- That the ASICs are correctly mounted,
- That communication is OK,
- That the ASIC revisions are correct.

To perform this test use:

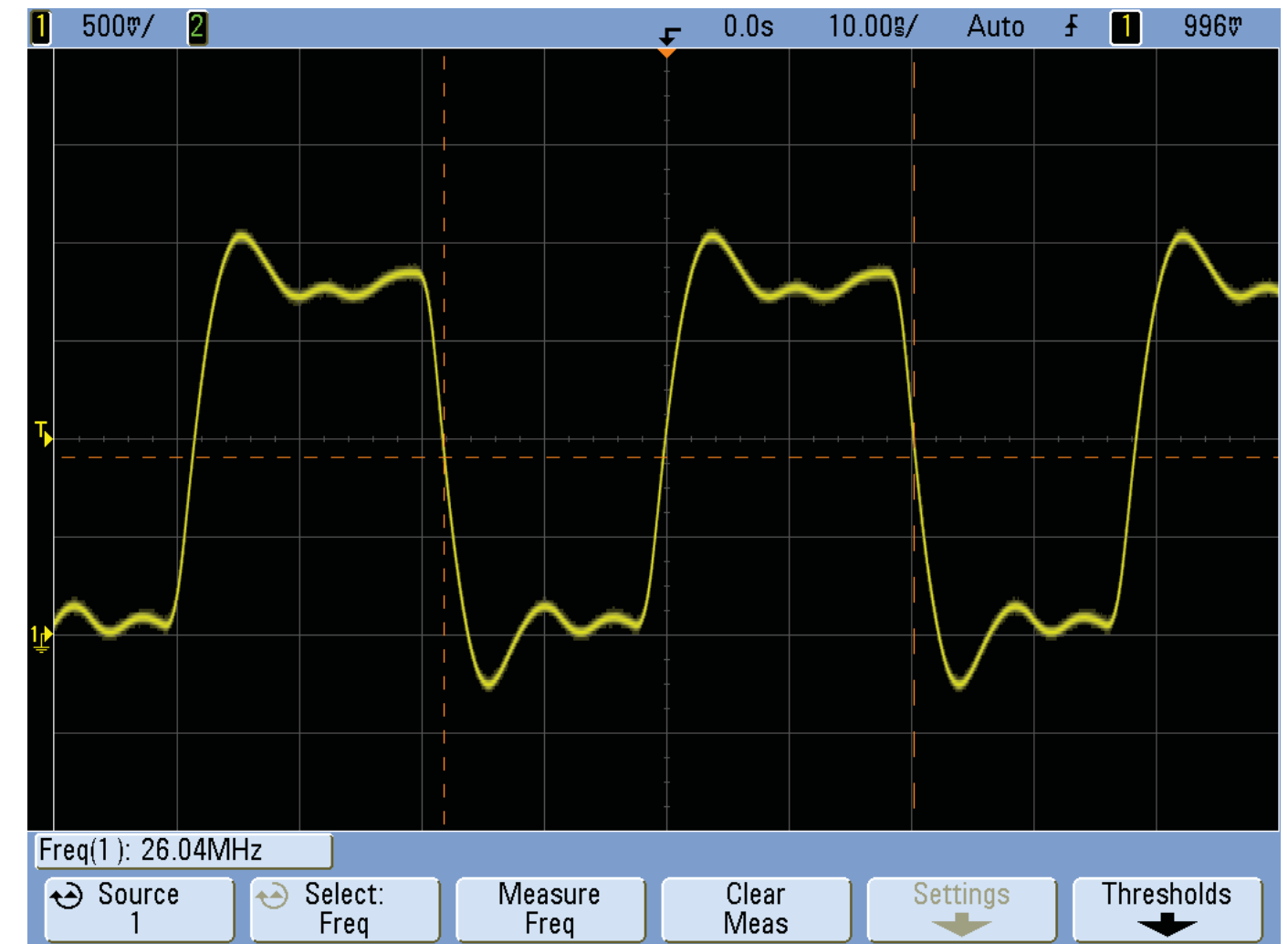
- Phone with the ETS SW
- TRS Fixture
- Power Supply Channel 1 VBATT (Voltage: 3.8V, Limiter: 2A)
- Power supply Channel 2 DCIO/SEPI (Voltage: 5V, Limiter: 2A)
- Use Fault Trace SW and go to: General – Asic Revisions – Read All

Reference Table:

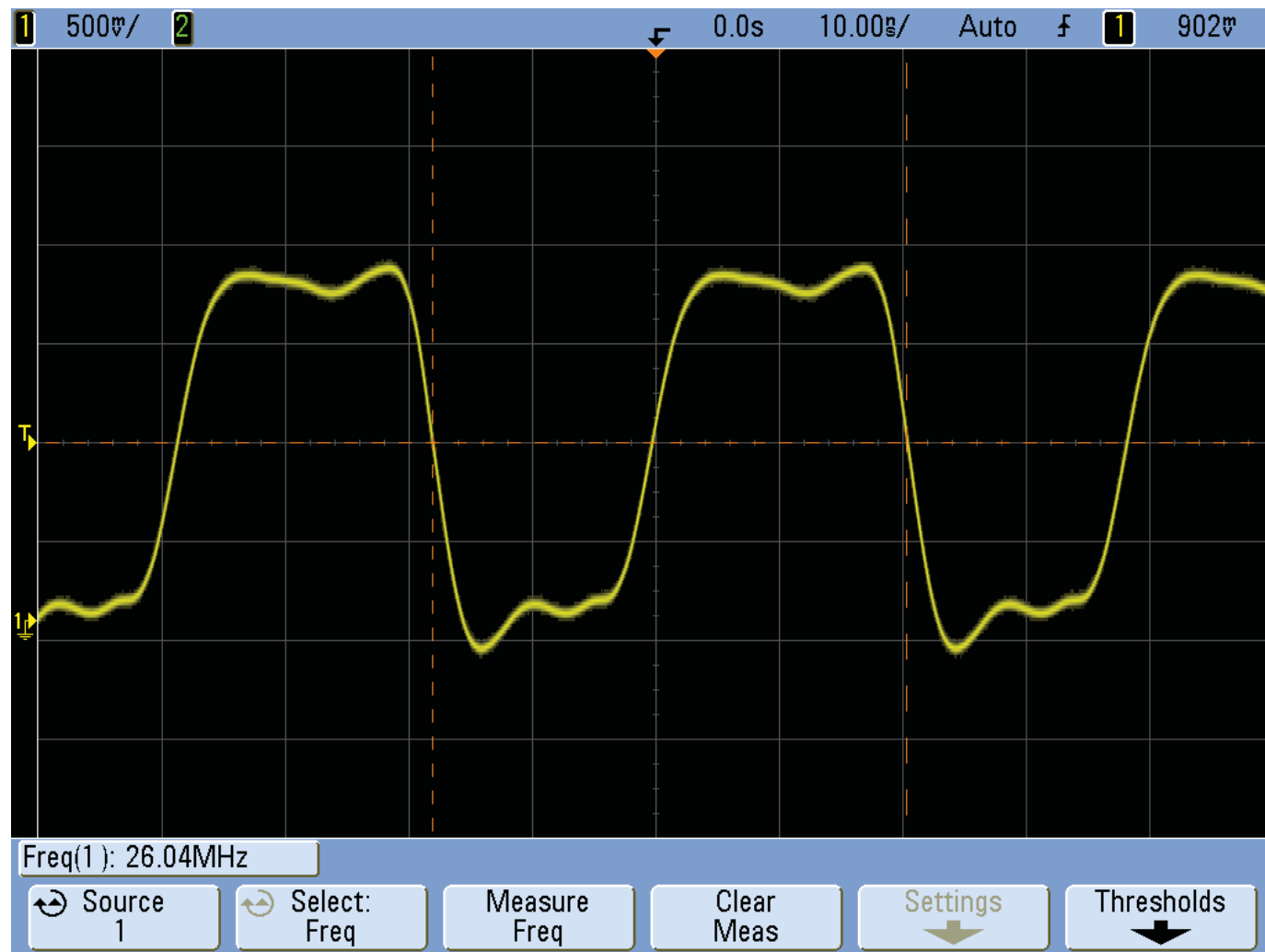
ASIC	Part Number	Description	Return Value
N2010	1211-0997	Carolina POP	0x2F0
N2000	1208-9490	Vera	0xC8
N1300	1222-5304	Bluetooth	0x0,0xF2
N2411	1211-3461	Accelerometer	0xc
N1400	1201-7557	GPS	0x11
N1300	1222-5304	FM Radio	0x1253



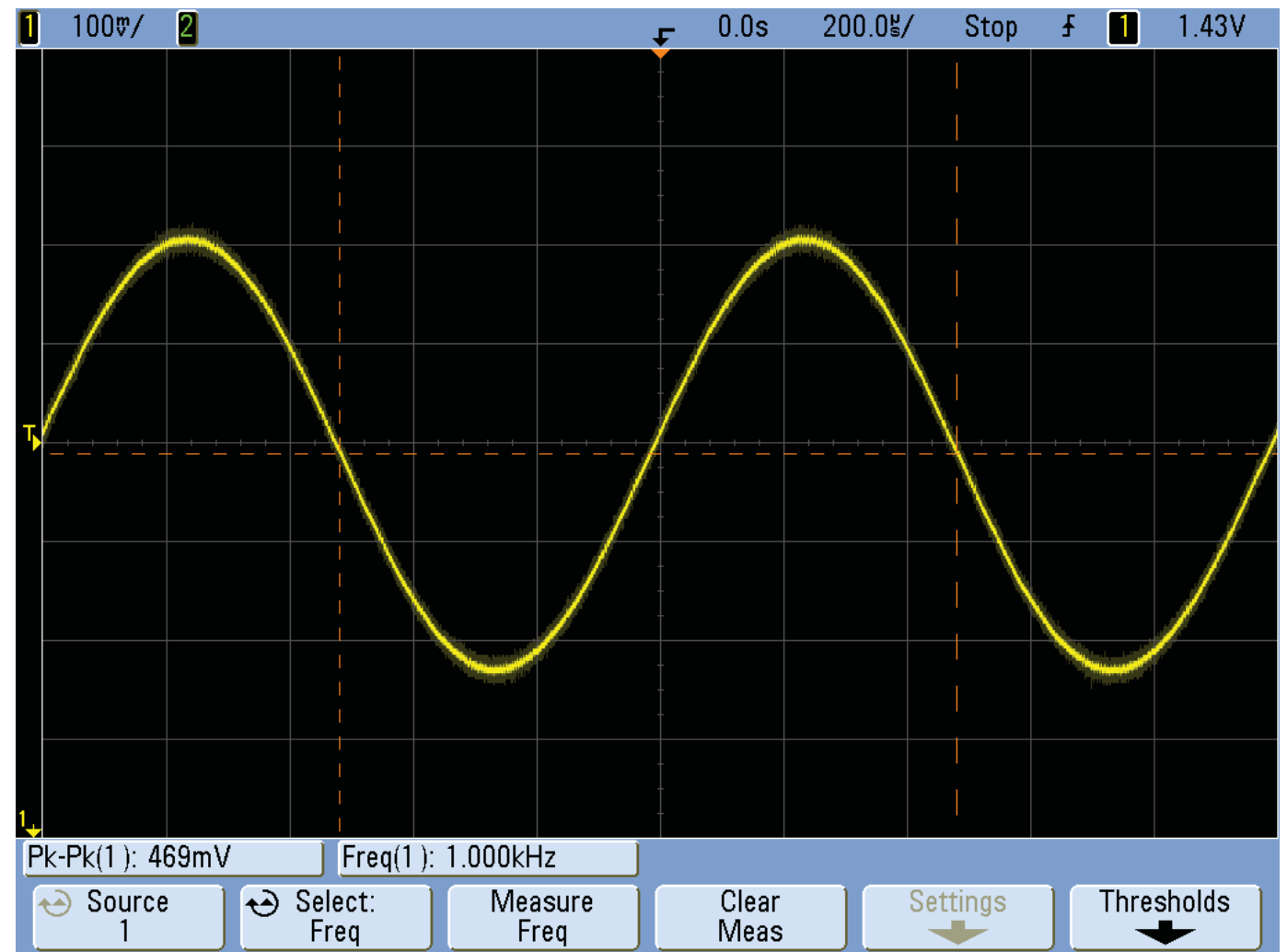
Blt MaxPwr 0 dBm



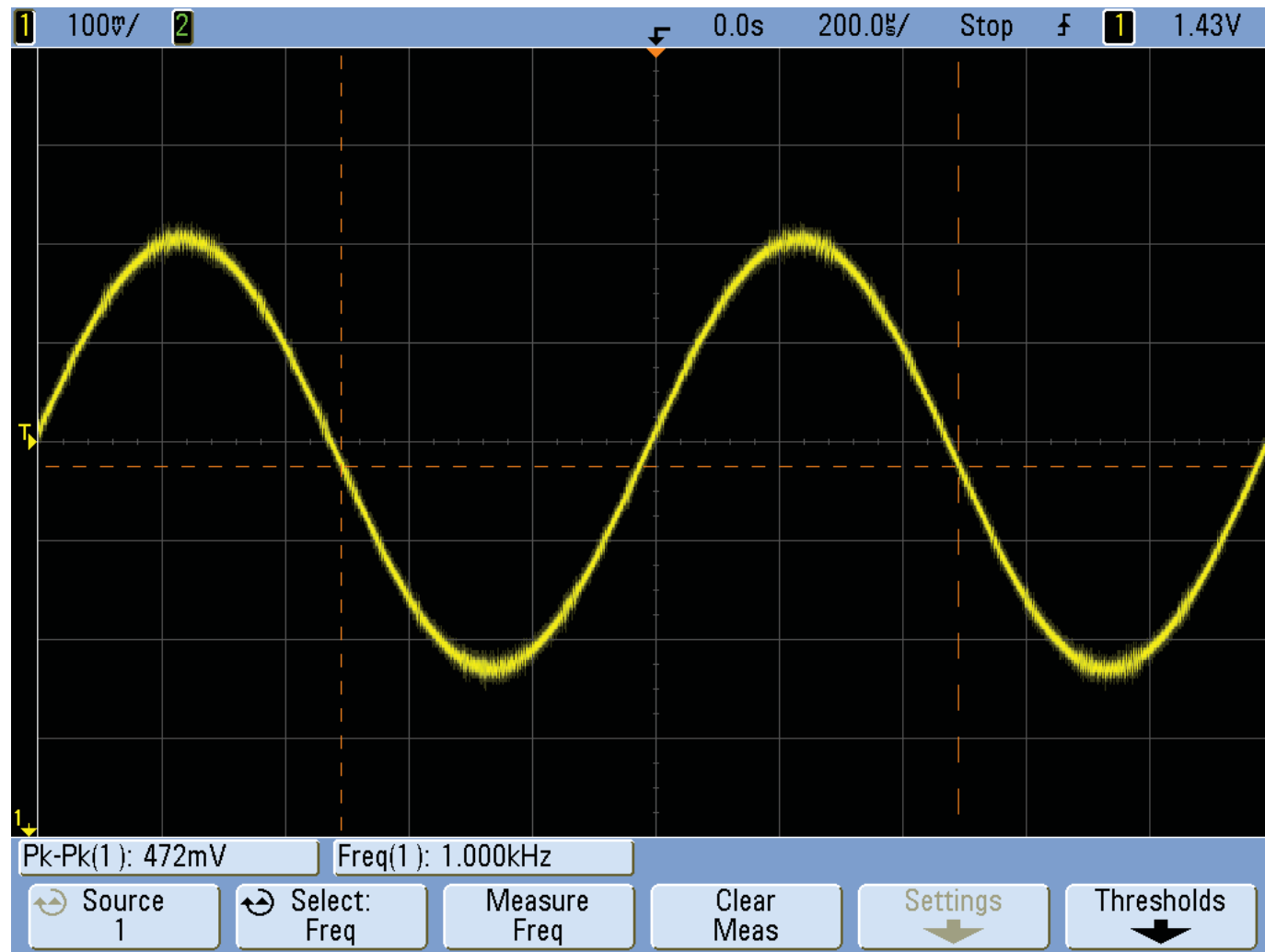
MP 4 - R2123 (26 Mhz MCLK)



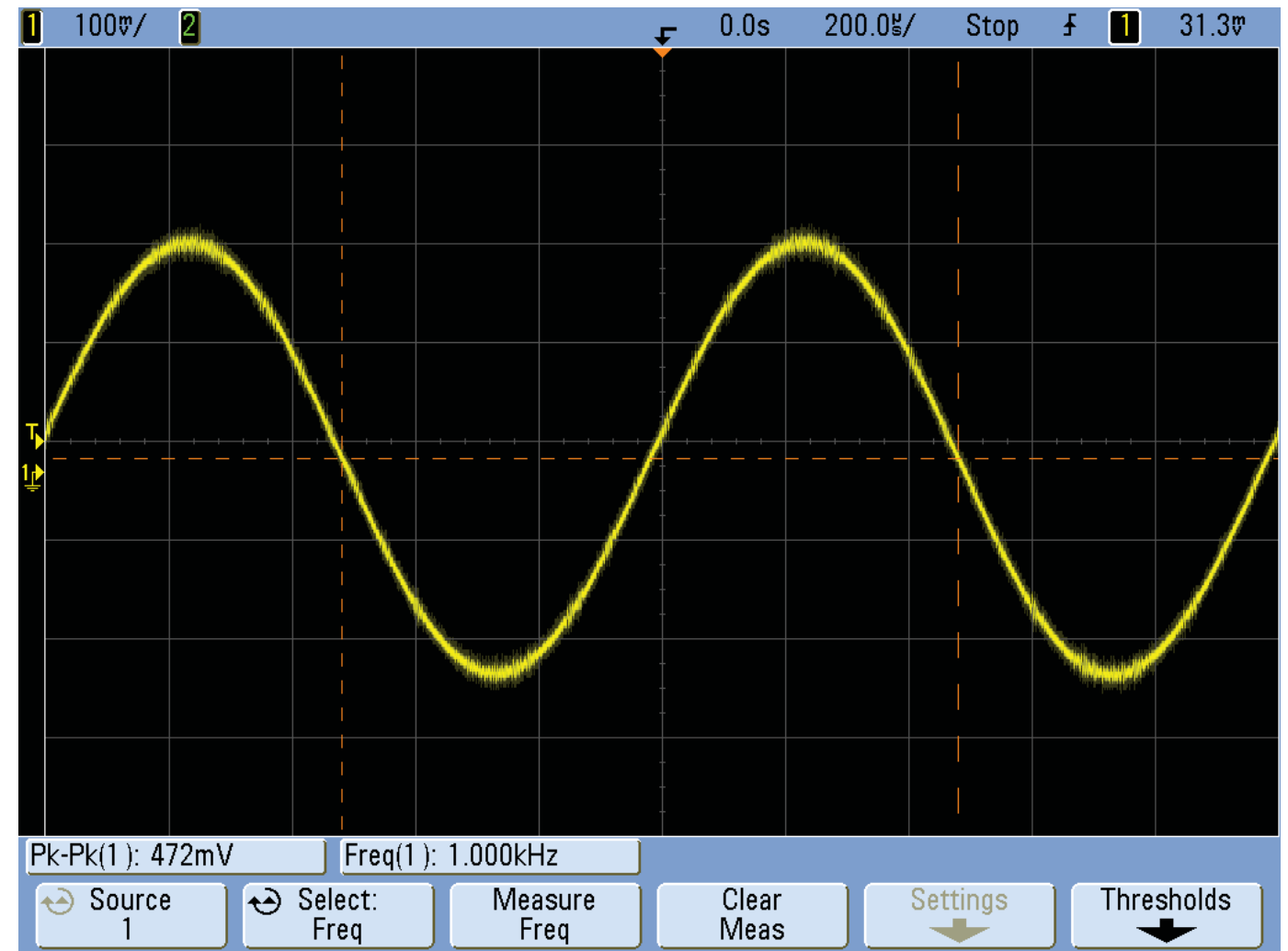
MP 11 - R2108 (26 MHz BT_WLAN_CLK)



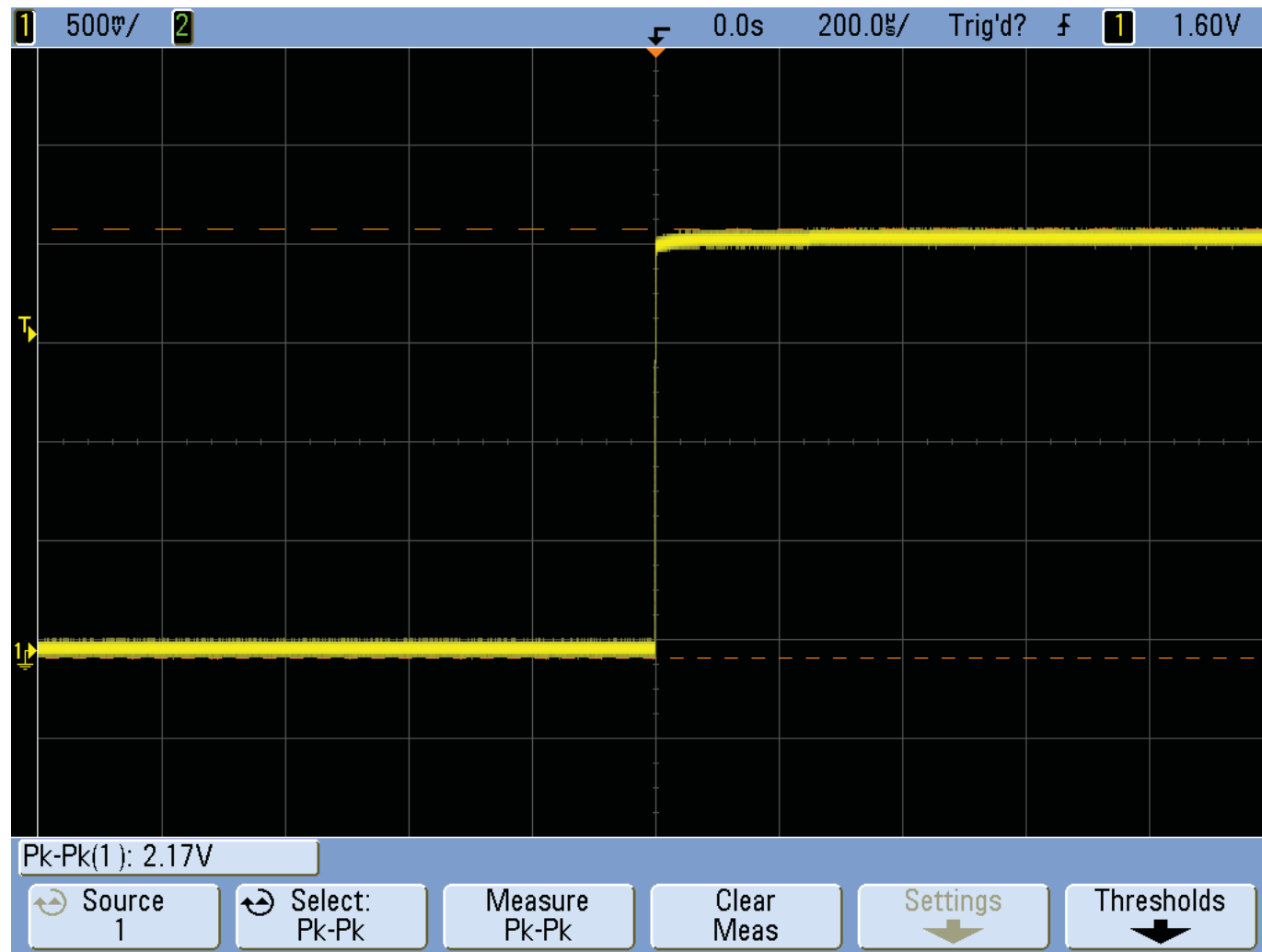
MP 15 - L3106, MP 16 - L3105, MP 59 - X101 and MP60 - X102



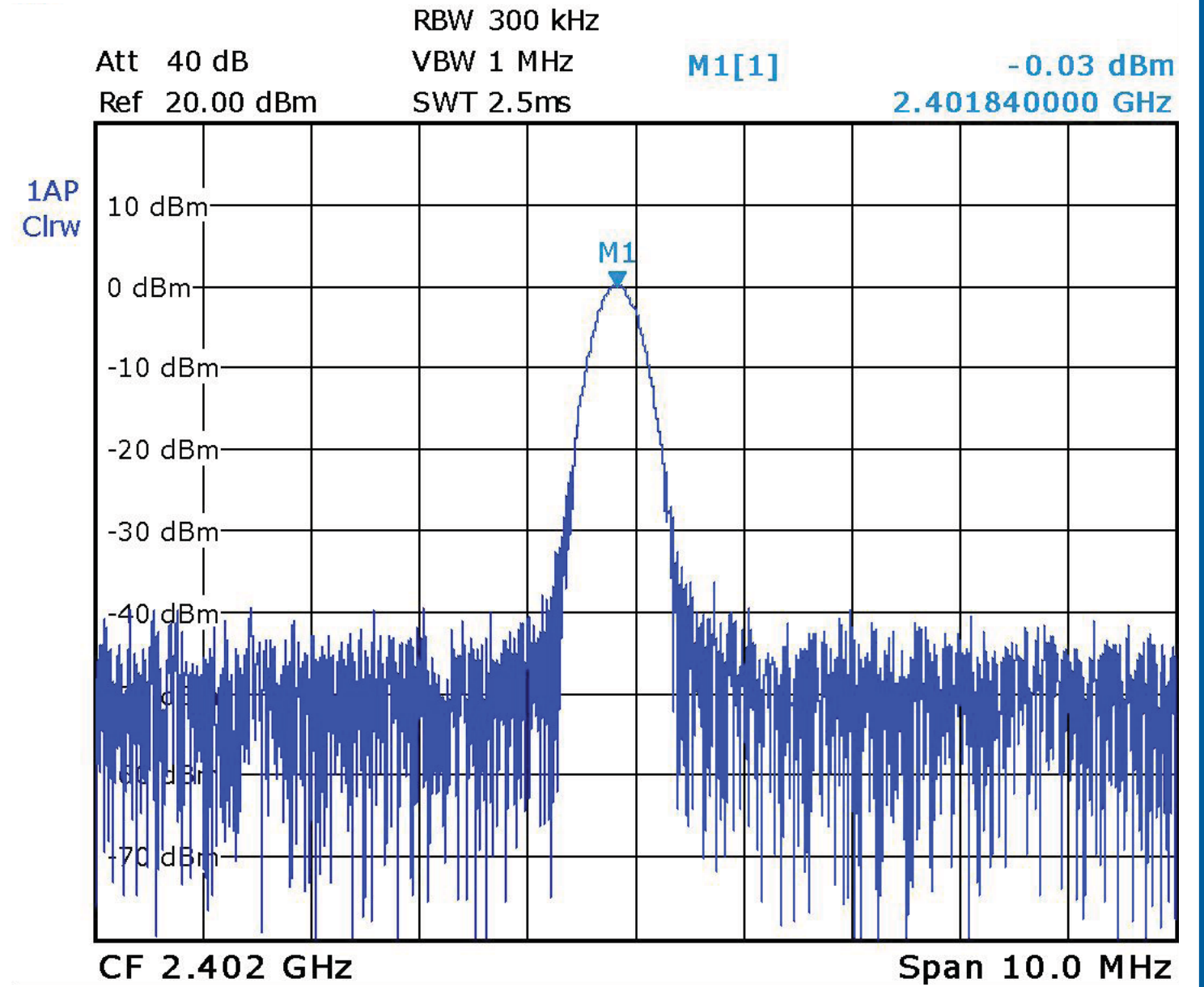
MP 17 - C3137



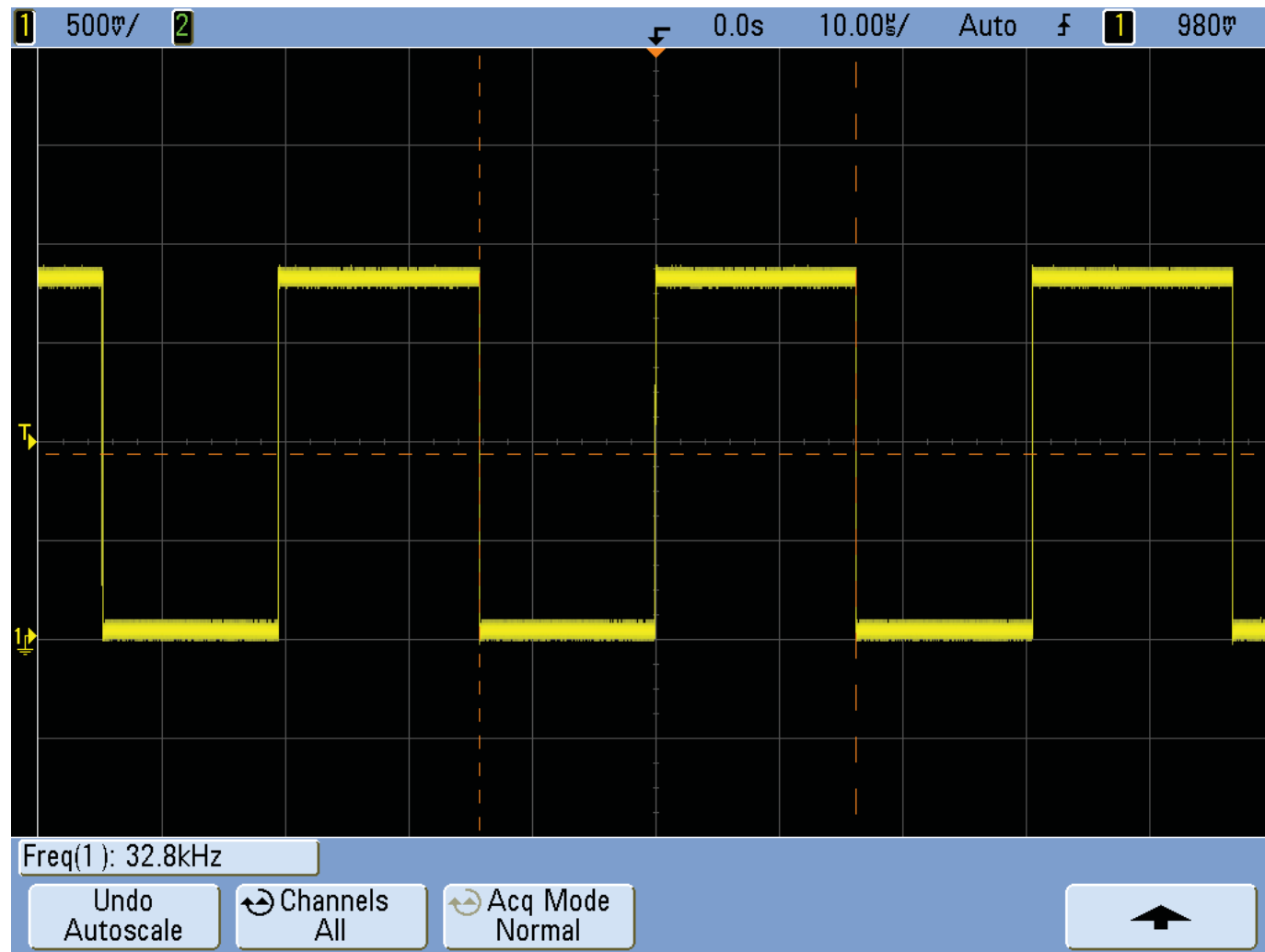
MP 23 - L3151 and MP 24 - L3152



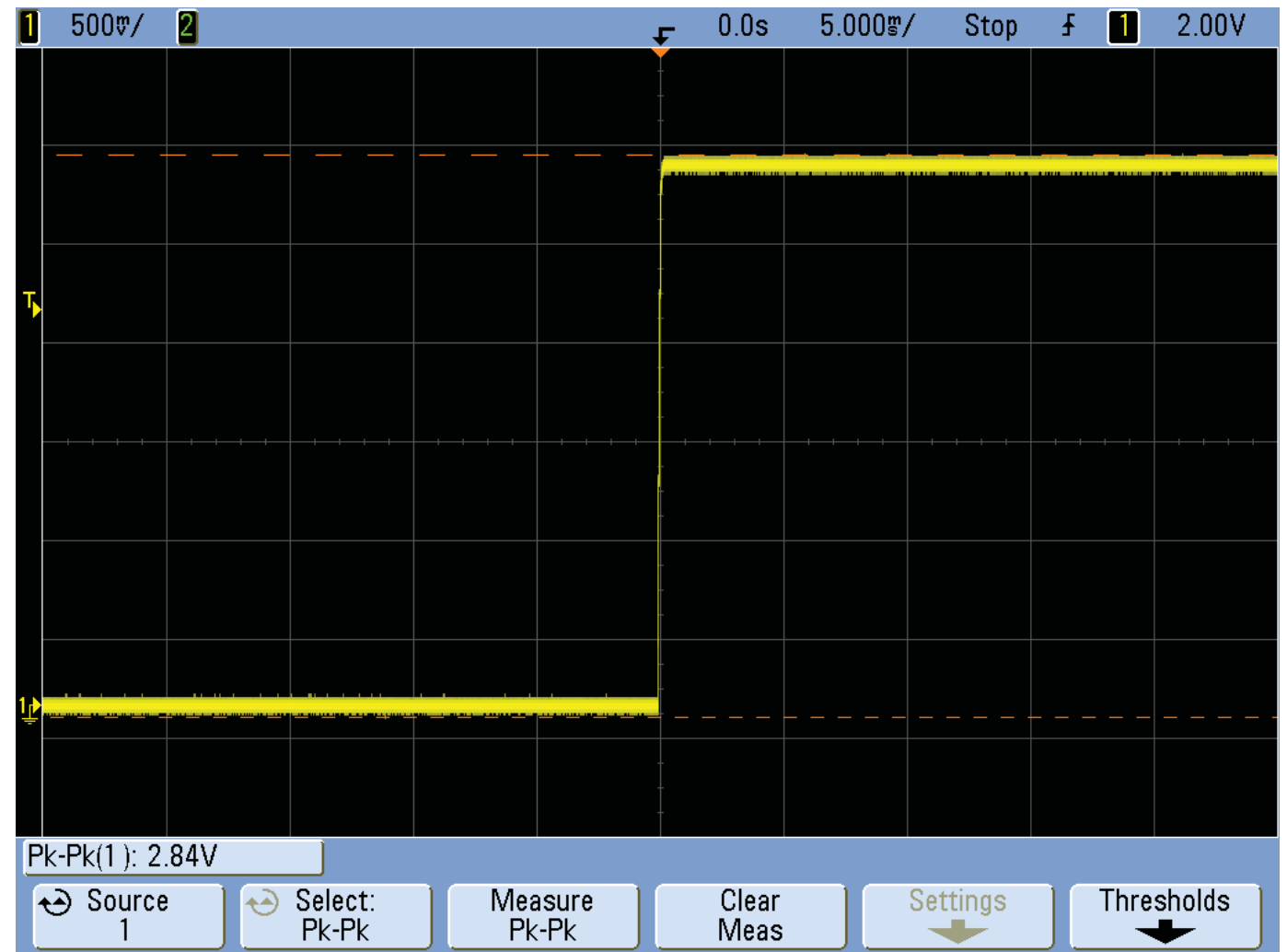
MP 25 - V2417_CATHODE



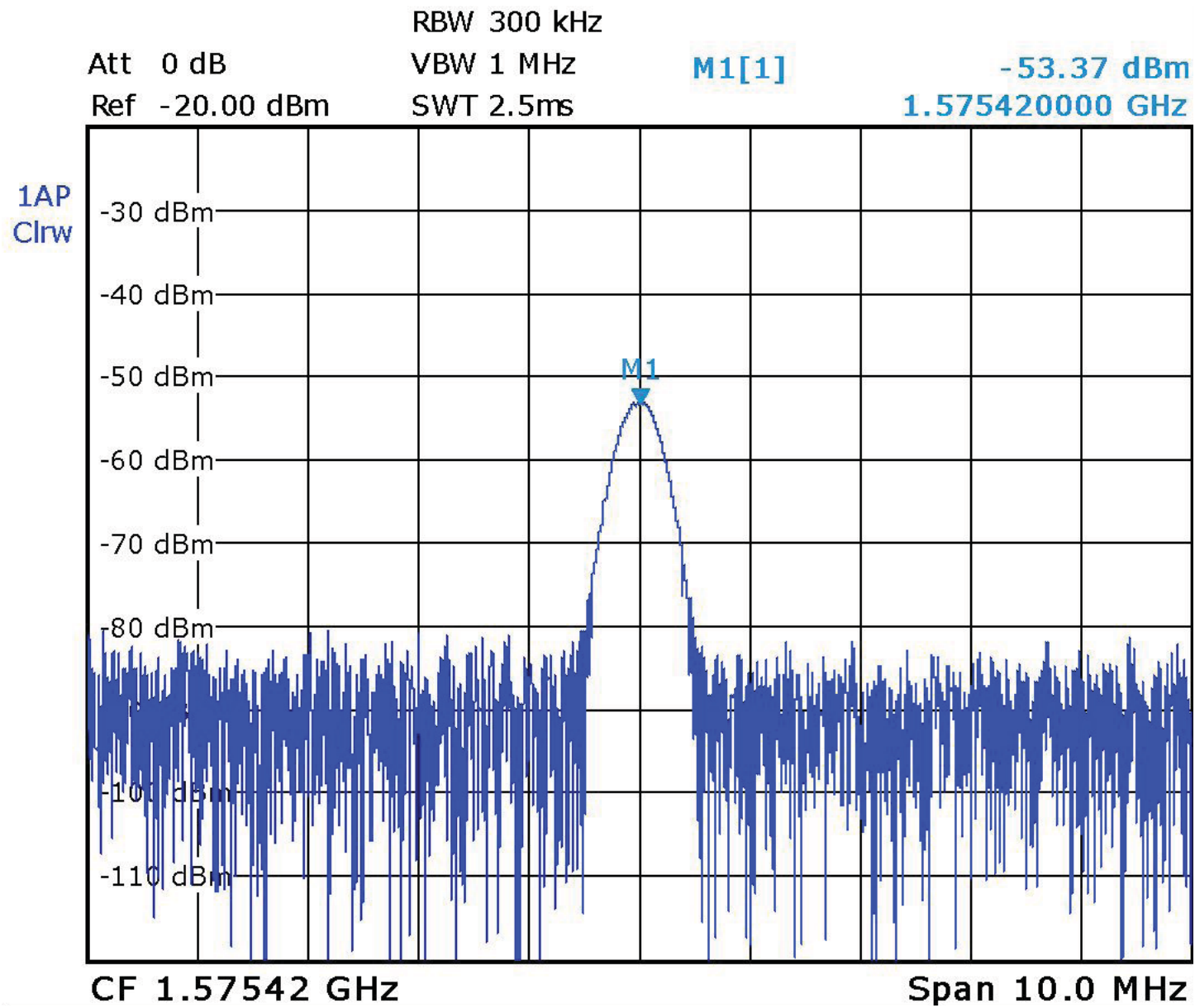
MP 30 - R3151



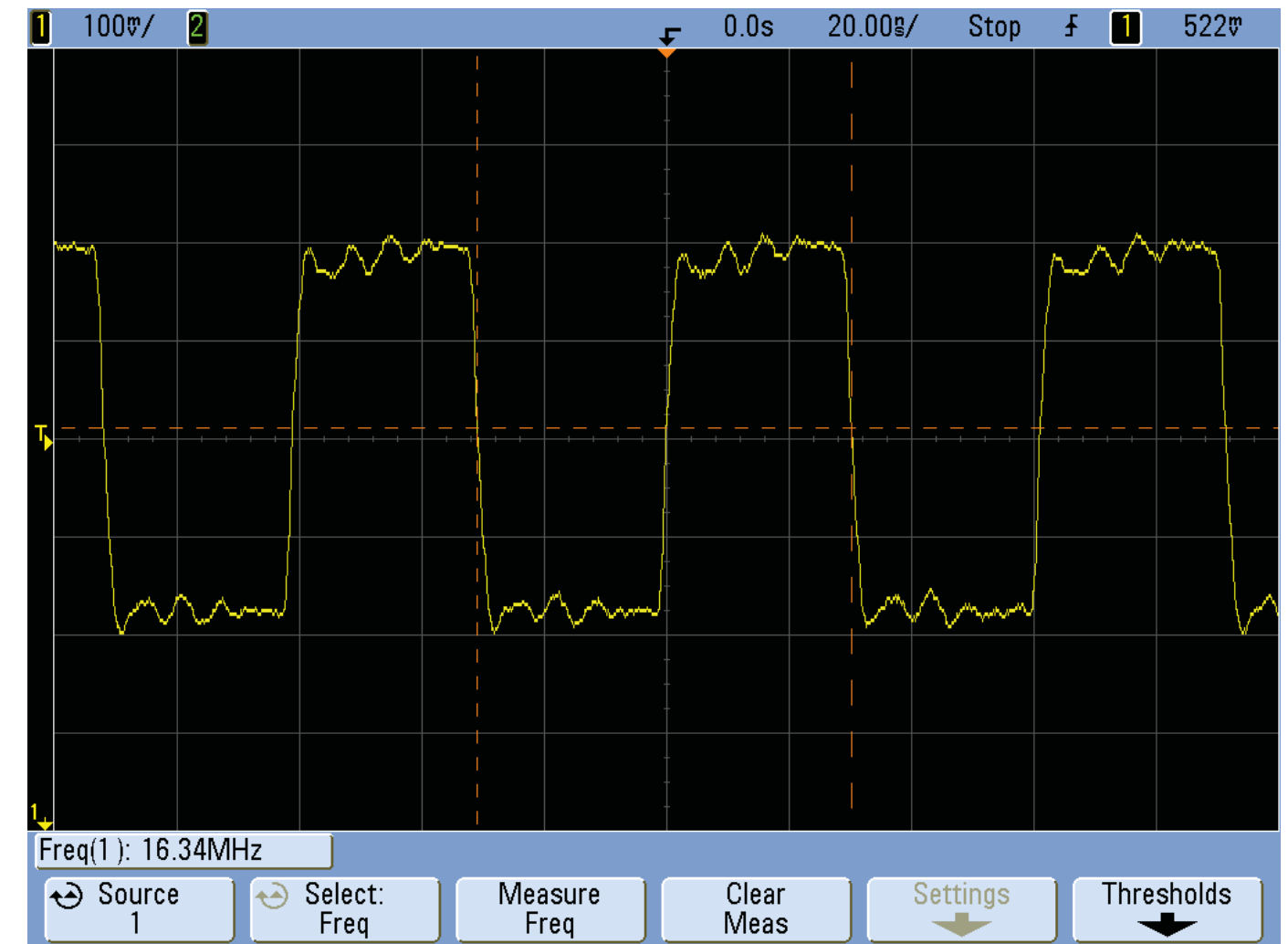
MP 37 - ST2103 (32 kHz RTCCLK)



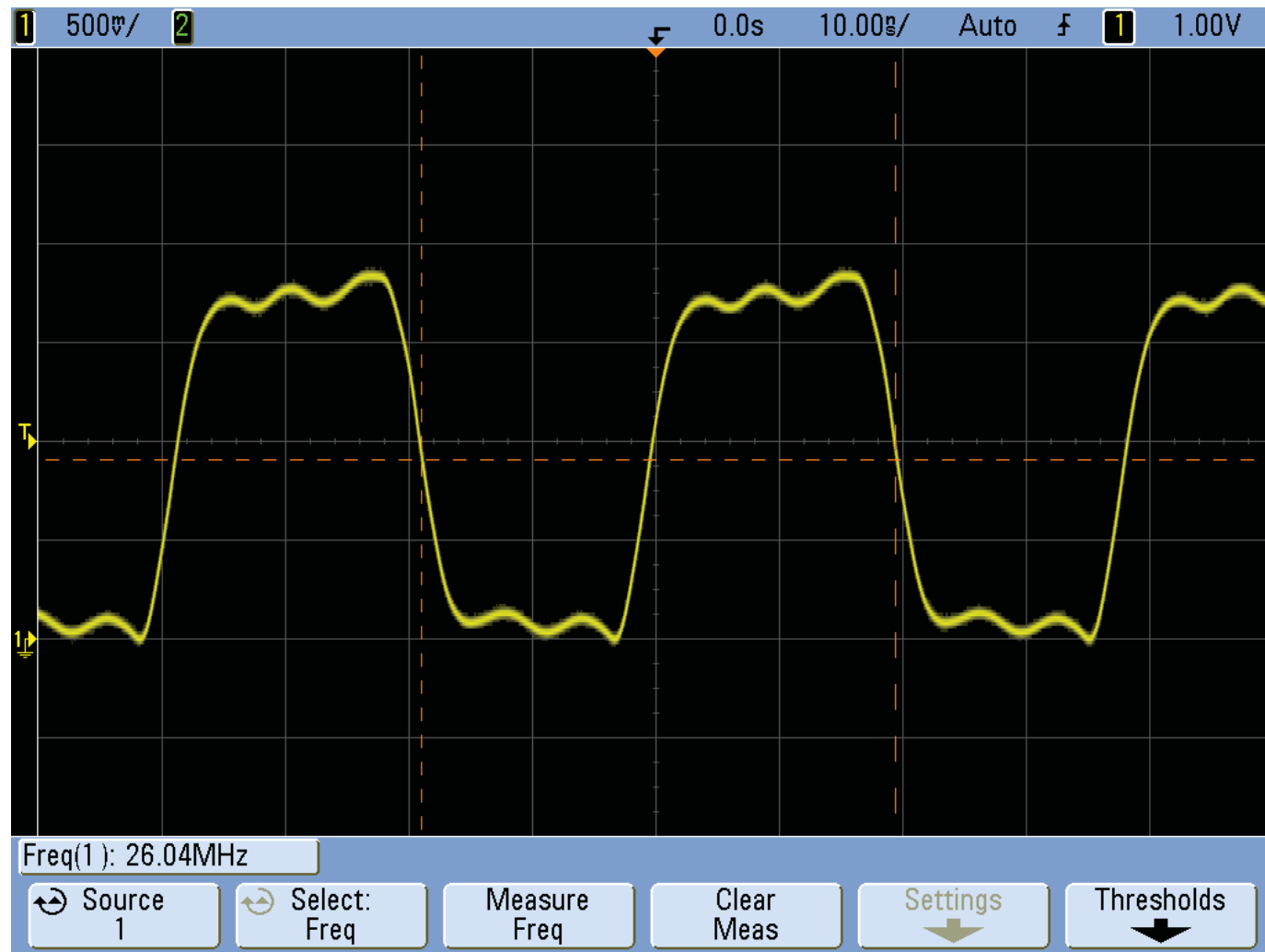
MP 38 - C4201 (VIBR_OUT)



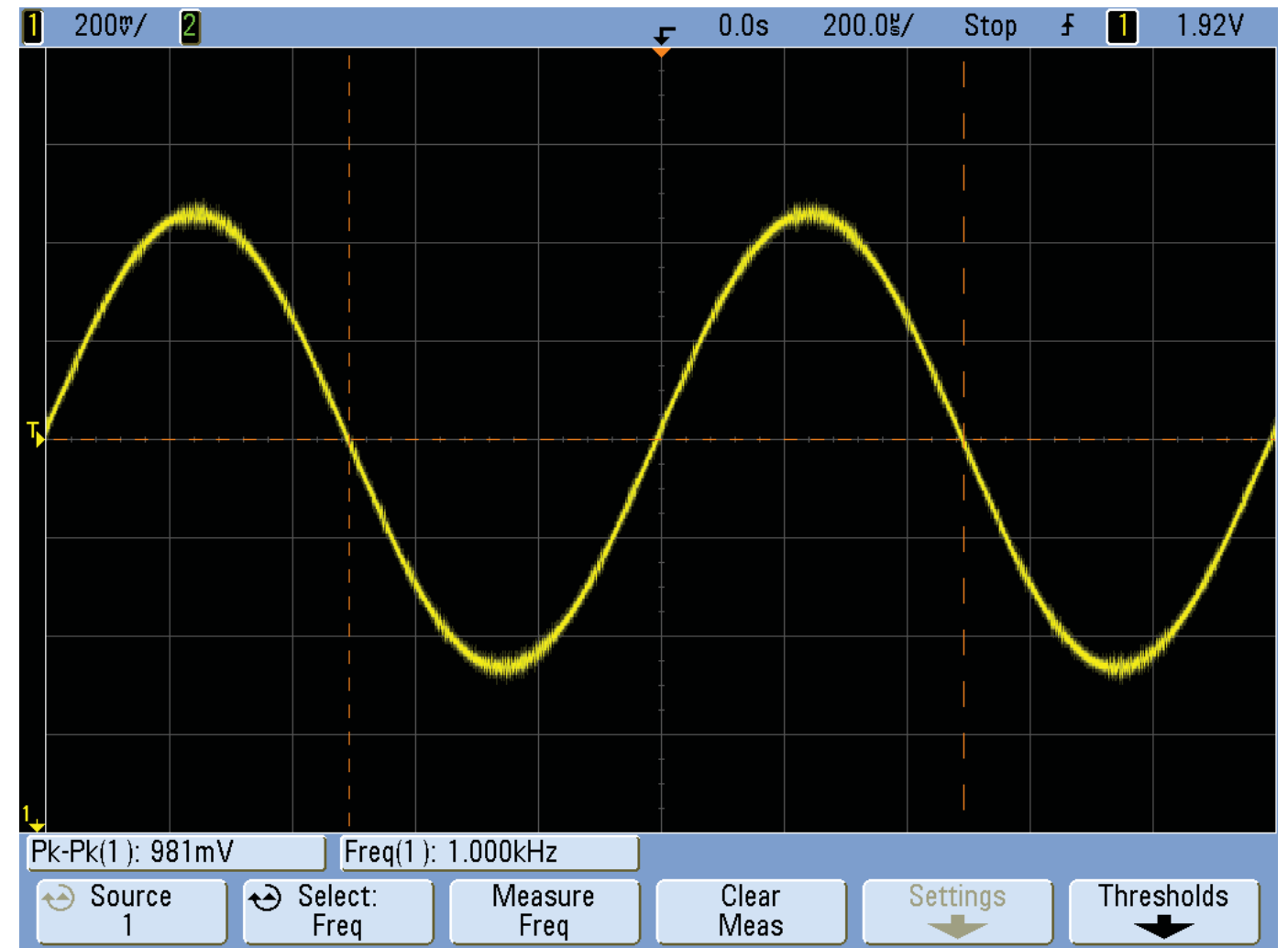
MP 49 - C1409 (AGPS_ANT_1)



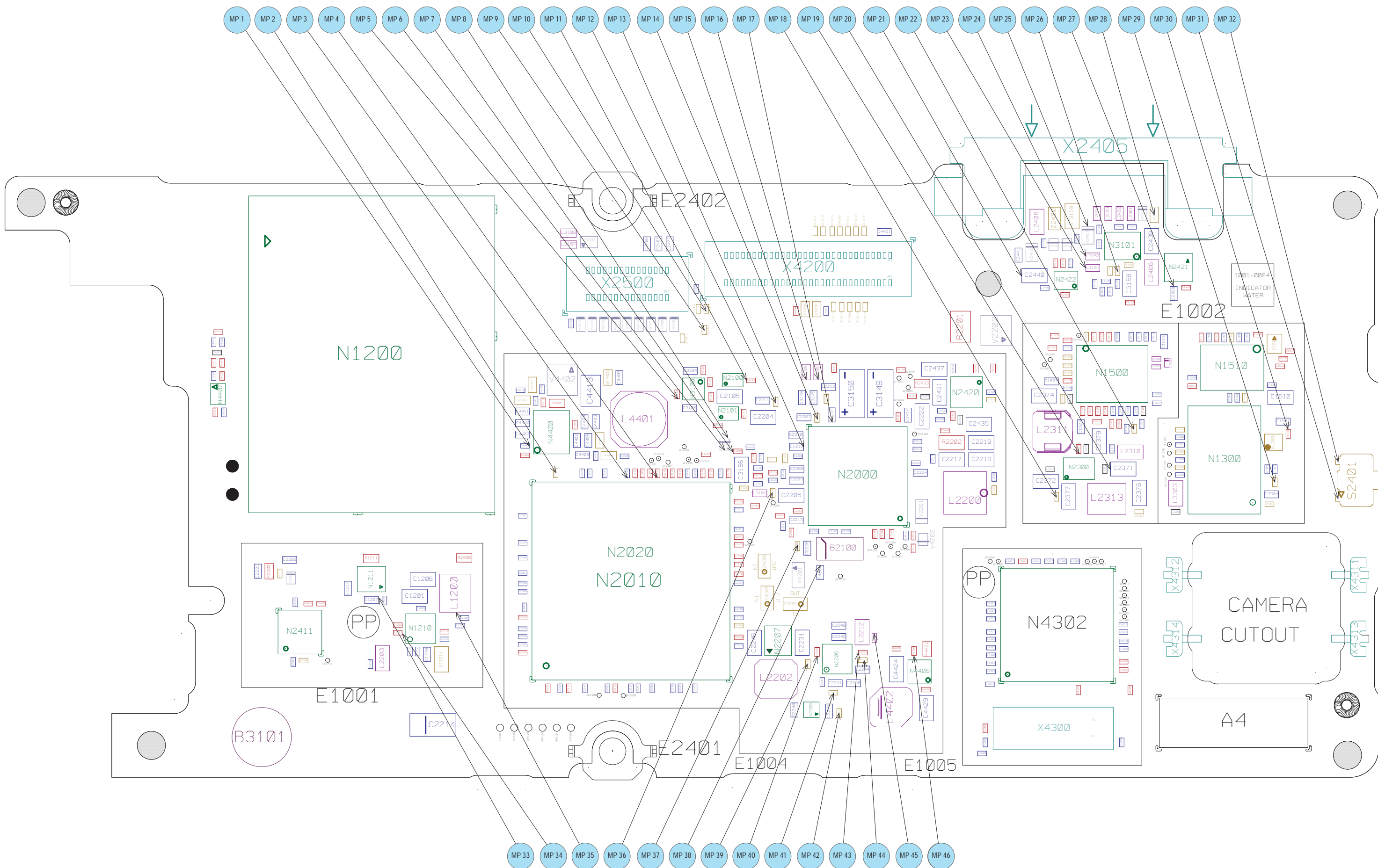
MP 51 - C1401 (16 MHz GPS_CLK)

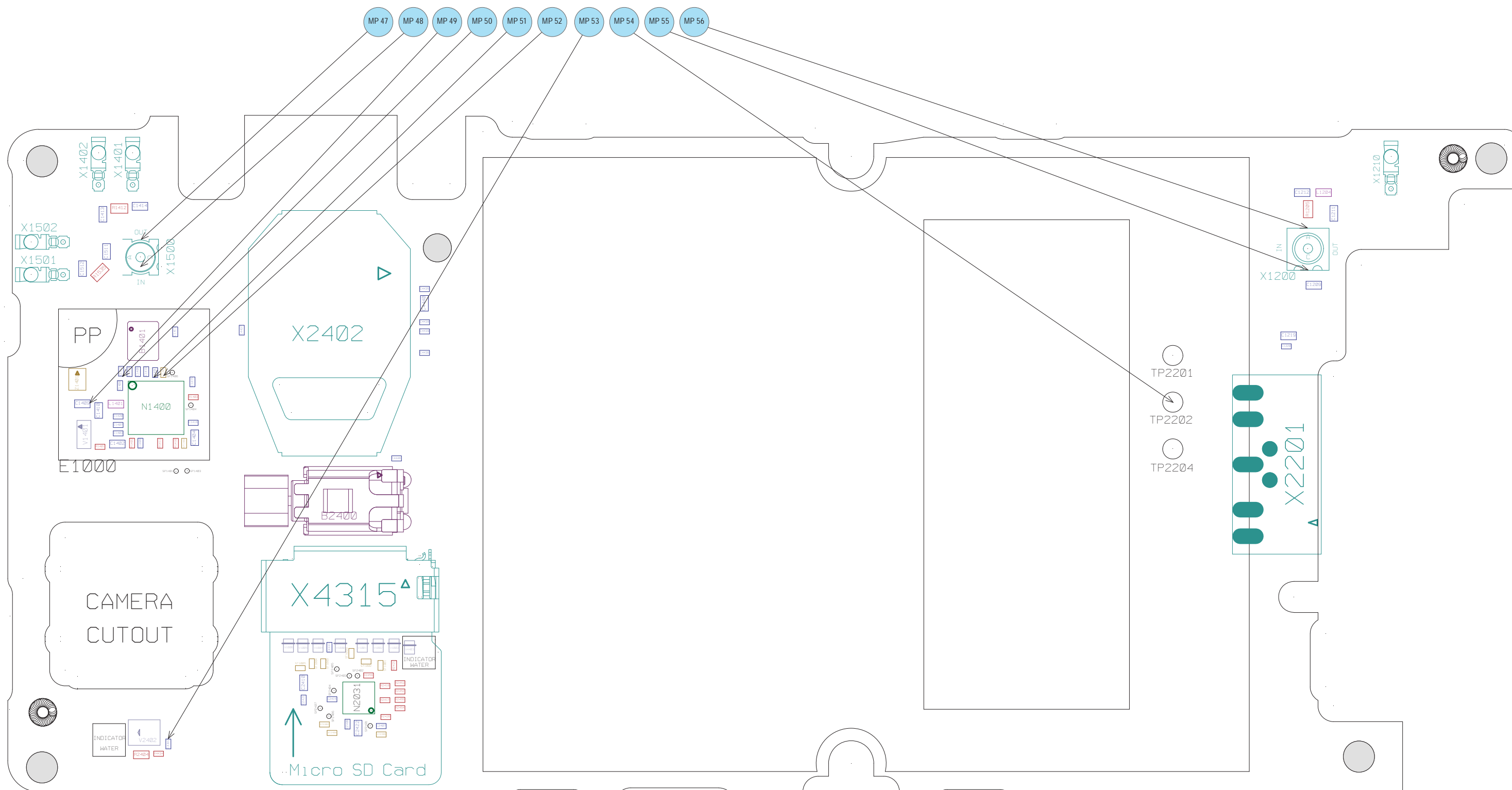


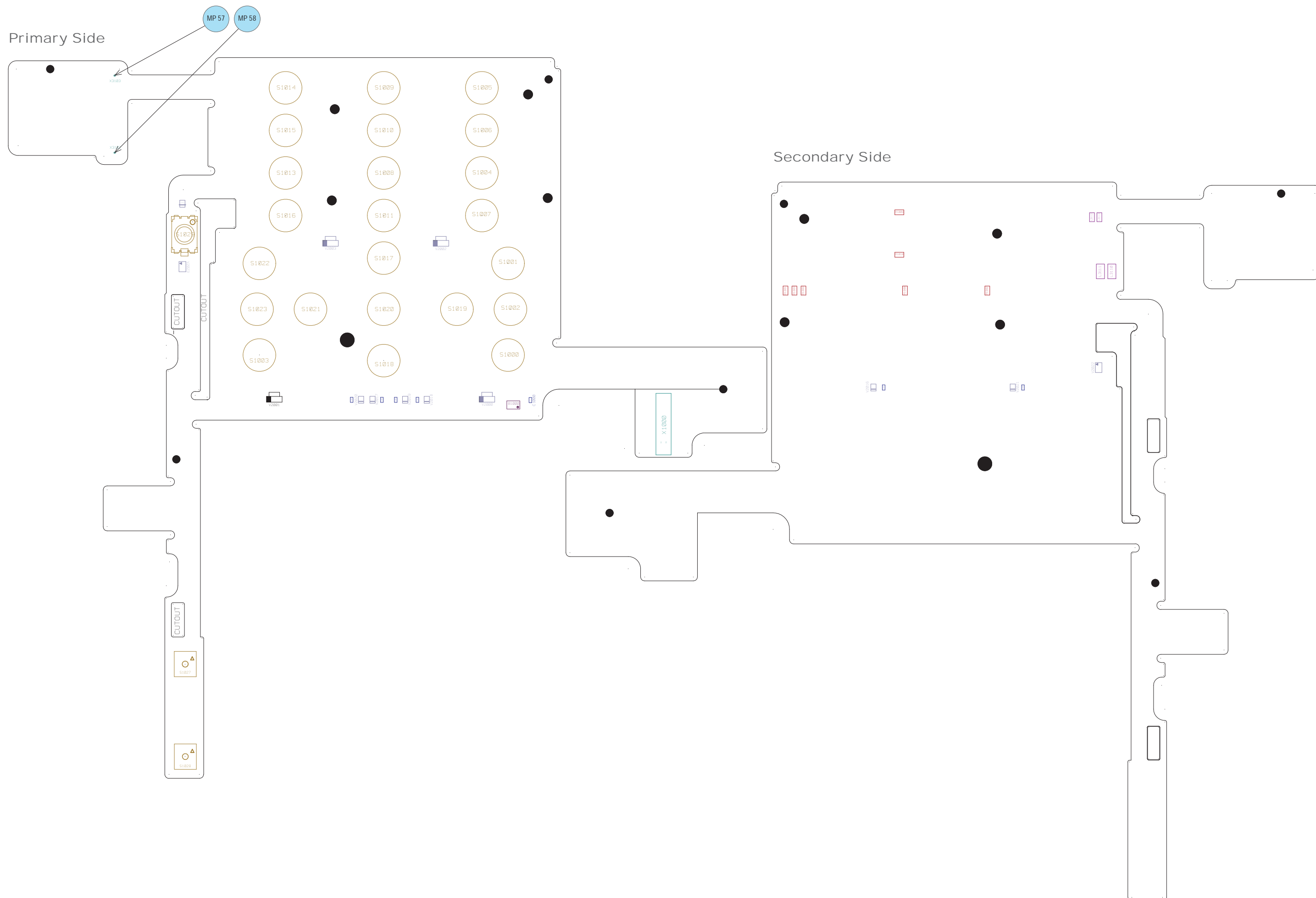
MP 52 - ST1401 (26 MHz MCLKSEC)

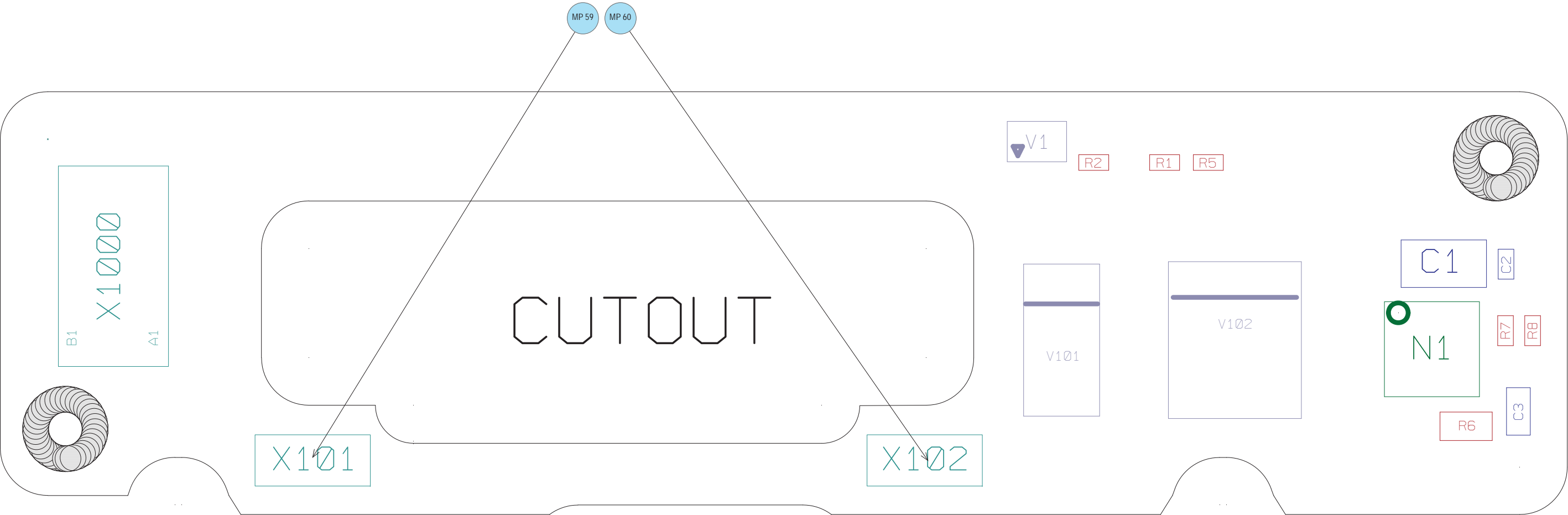


MP 57 - X3103 and MP 58 - X3102



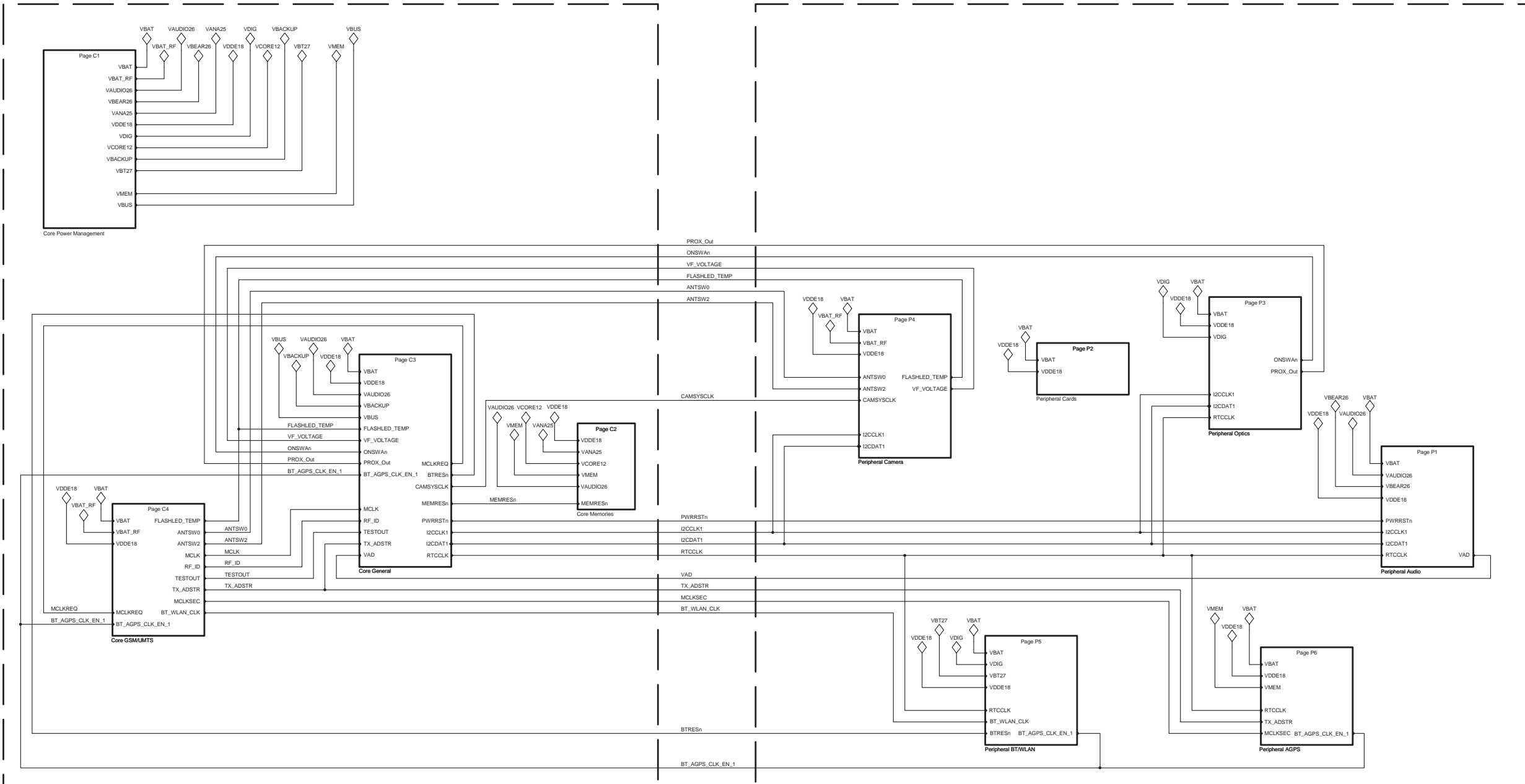






Core

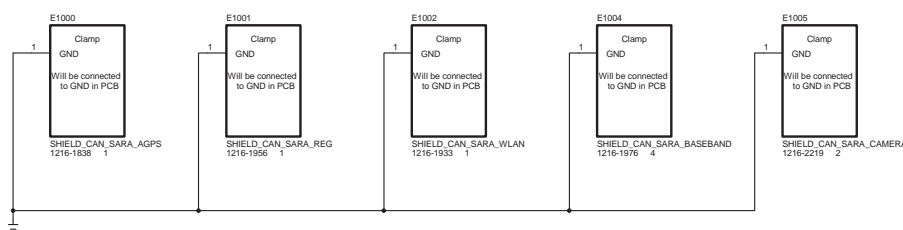
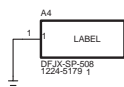
Peripheral



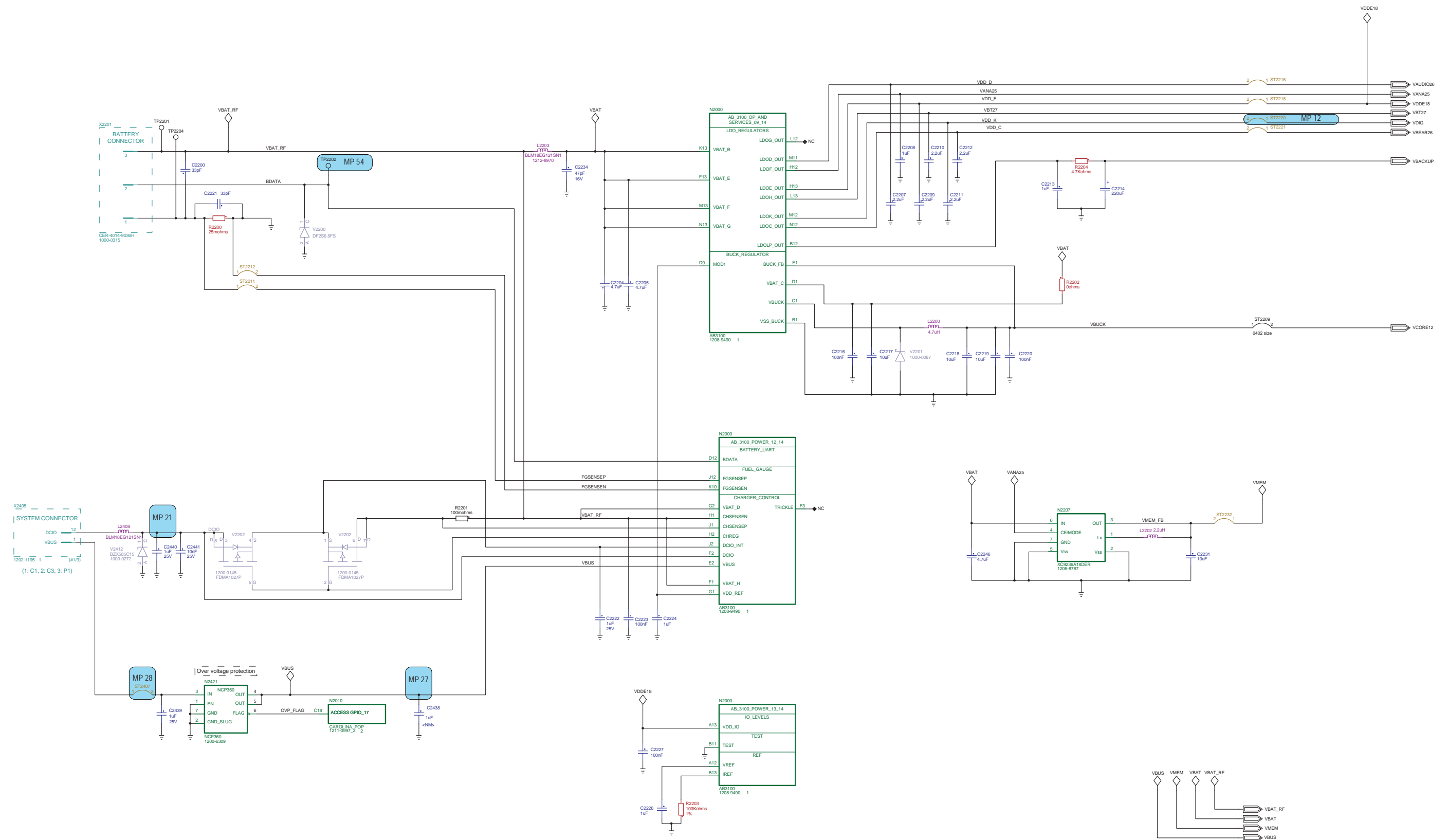
Access side GPIO mapping		
Port	Usage	Page
AccGPIO00	USB_HSATA3	C3
AccGPIO01	USB_HSATA4	C3
AccGPIO02	USB_HSATA5	C3
AccGPIO03	USB_HSATA6	C3
AccGPIO04	USB_HSATA7	C3
AccGPIO05	USB_HSTP	C3
AccGPIO06	USB_HSDIR	C3
AccGPIO07	USB_HSNXT	C3
AccGPIO08	USB_HSINCLK	C3
AccGPIO09	NOT USED	Top
AccGPIO10	NOT USED	Top
AccGPIO11	NOT USED	Top
AccGPIO12	AGPS_EN_RSTn	P6
AccGPIO13	NOT USED	Top
AccGPIO14	AGPS_UART1_TX	P6
AccGPIO15	AGPS_UART1_RX	P6
AccGPIO16	USB_HSCHIP_SEL	C3
AccGPIO17	OVP_FLAG	C1
AccGPIO18	WLAN_SPI_CSn	P5
AccGPIO19	BT_SPI_CSn	P5
AccGPIO20	NOT USED	Top
AccGPIO21	ACC_SPI_DIBT	P5
AccGPIO22	ACC_SPI_DO(BT)	P5
AccGPIO23	ACC_SPI_CLK(BT)	P5
AccGPIO24	AGPS_DSLEEPn	P6
AccGPIO25	NOT USED	Top
AccGPIO26	NOT USED	Top
AccGPIO27	AGPS_SYNC	P6
AccGPIO28	FLASH_DRIVER_RST	P4
AccGPIO29	WLAN_SPI_INT	P5
AccGPIO30	BT_SPI_INT	P5
AccGPIO31	NOT USED	Top
AccGPIO32	B2B_TEST_OUT	P3
AccGPIO33	B2B_TEST	P2

Application side GPIO mapping		
Port	Usage	Page
AppGPIO00	CTMS	C3
AppGPIO01	CFMS	C3
AppGPIO02	AMP_CTRL	P1
AppGPIO03	MCDATA_INT	P2
AppGPIO04	TOUCH_SPI_CSn	P3
AppGPIO05	VCAMSD18_EN	P4
AppGPIO06	NOT USED	Top
AppGPIO07	APP_SPI_DI	P3
AppGPIO08	APP_SPI_DO	P3
AppGPIO09	APP_SPI_CLK	P3
AppGPIO10	NOT USED	Top
AppGPIO11	uSD_CLK_FB_A	P2
AppGPIO12	SD_DETECT	P2
AppGPIO13	NOT USED	Top
AppGPIO14	Accelerometer_INT	C3
-----	-----	xxx
AppGPIO16	FM_INT_1	P1
AppGPIO17	CAMERA_ISP_INT	P4
AppGPIO18	TOUCH_SPI_INT	P3
AppGPIO19	NOT USED	Top
AppGPIO20	NOT USED	Top
AppGPIO21	uSD_2B_ENABLE	P2
AppGPIO22	NOT USED	Top
AppGPIO23	VCAM_LDO_EN	P4
AppGPIO24	SLIDE_SENSE	P3
AppGPIO25	WLAN_P0n	P5

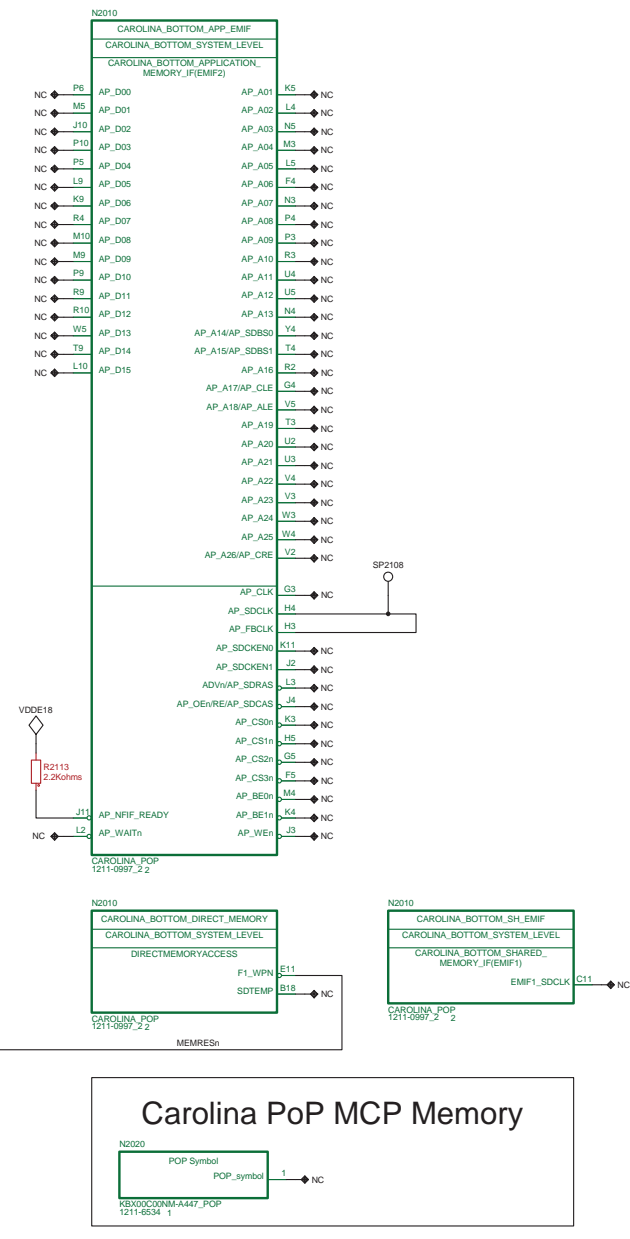
BT-chip GPIO mapping		
Port	Usage	Page
BTGPIO0	WLAN_CONFIRMn	P5
BTGPIO6	WLAN_BT_STATE	P5
BTGPIO9	NOT USED	P5
BTGPIO10	NOT USED	P5
BTGPIO11	WLAN_BT_PRIORITY	P5
BTGPIO16	NOT USED	P5



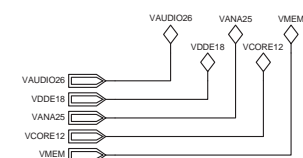
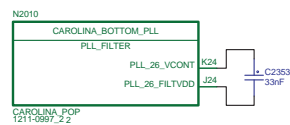
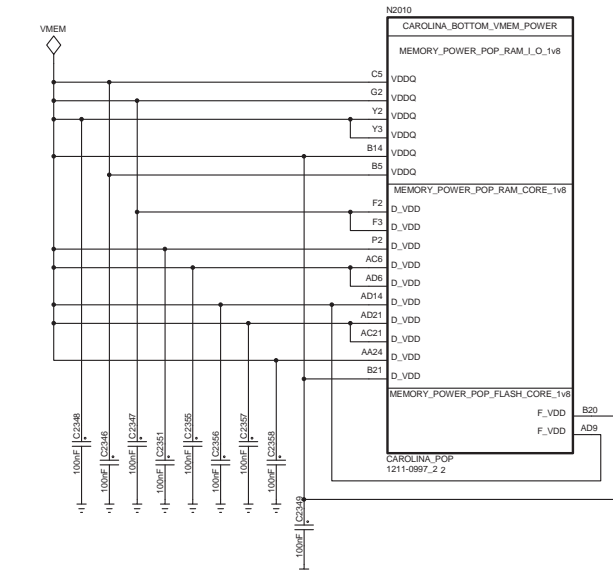
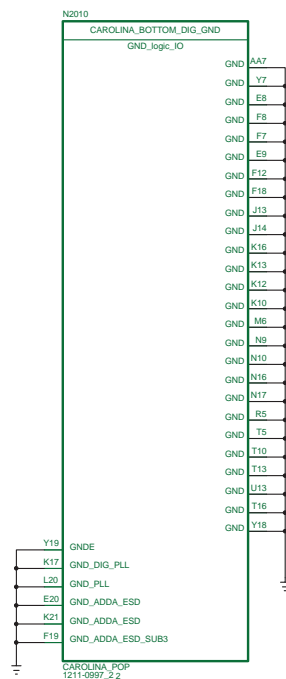
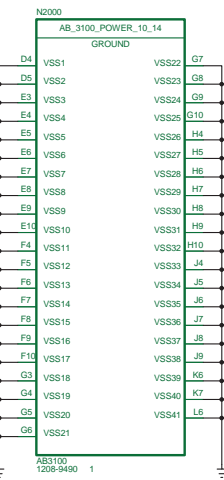
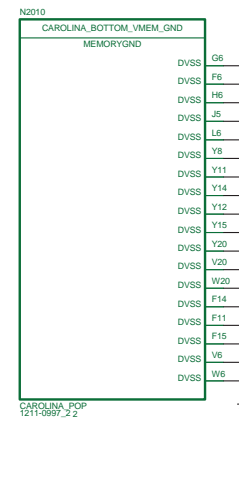
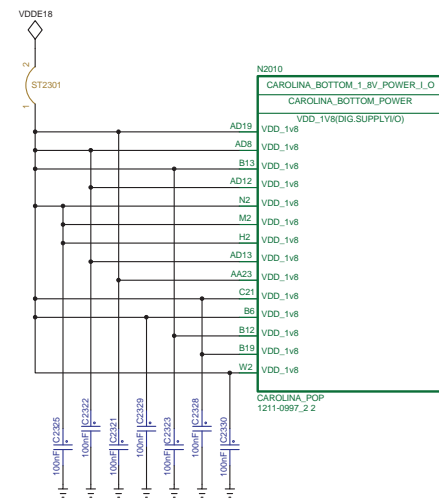
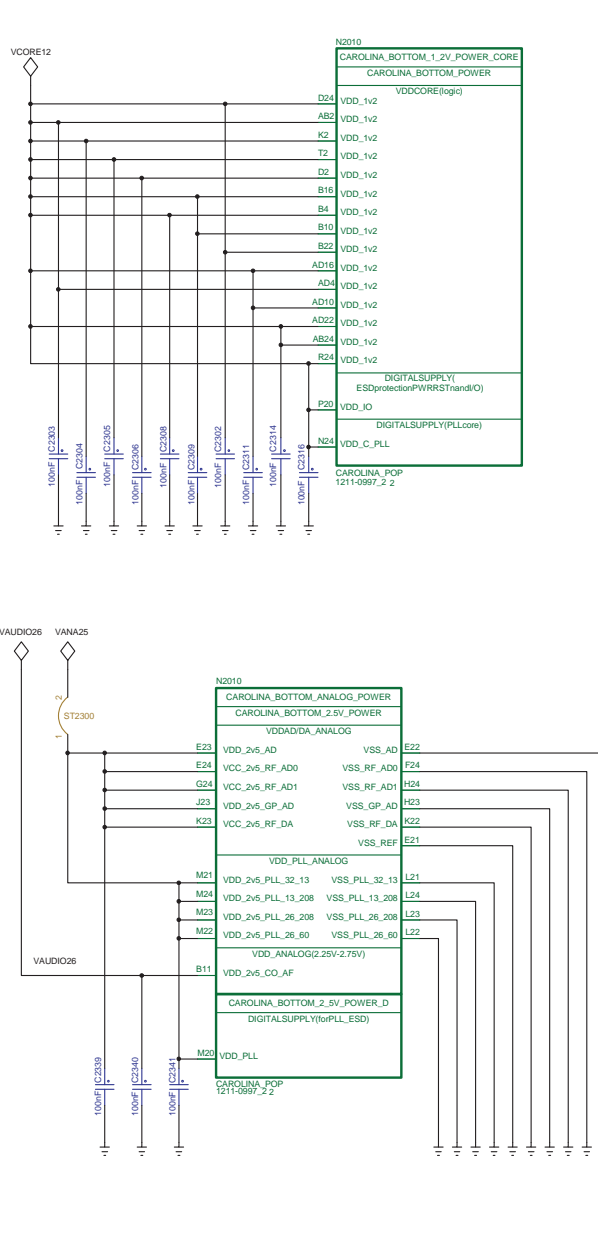
Made for	
Mainboard Schematic Top	
Document Nr	Revision
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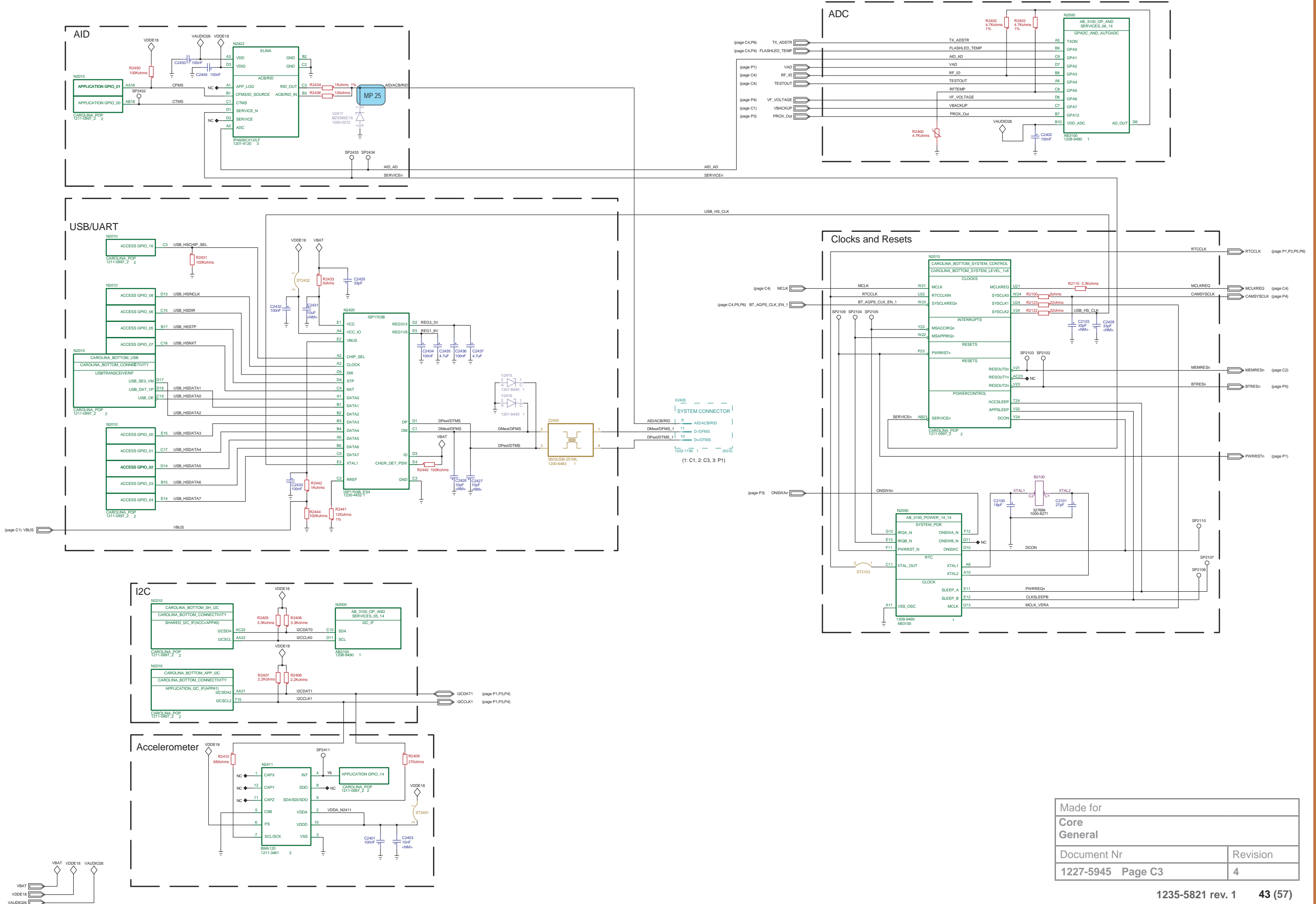
Memories



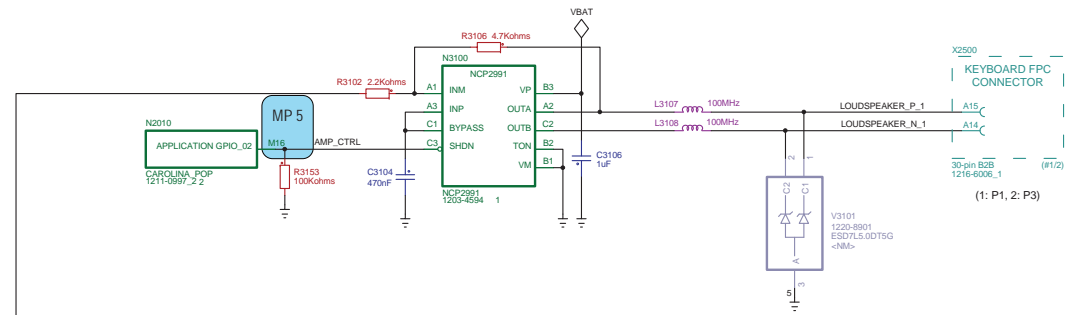
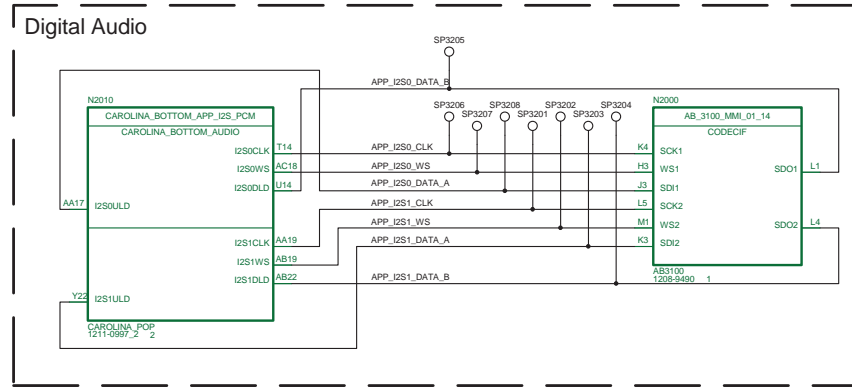
Power ASICS

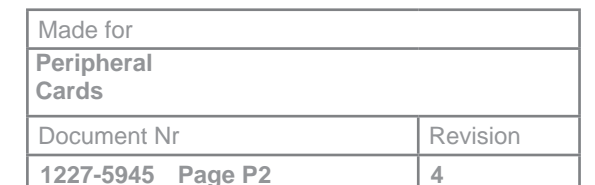
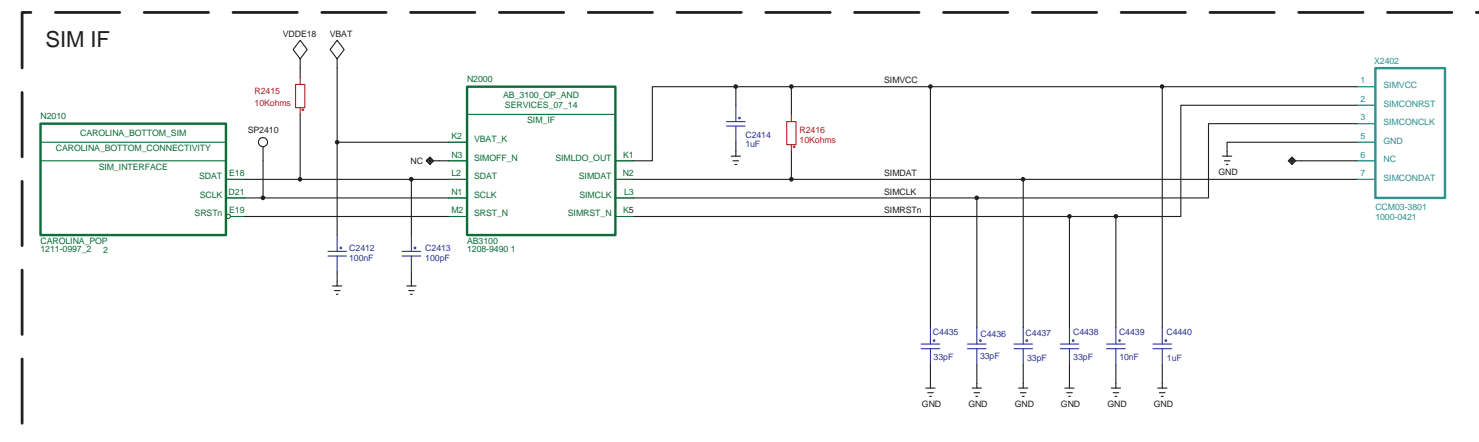


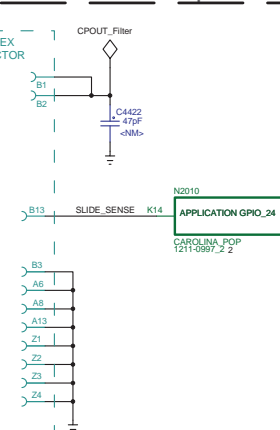
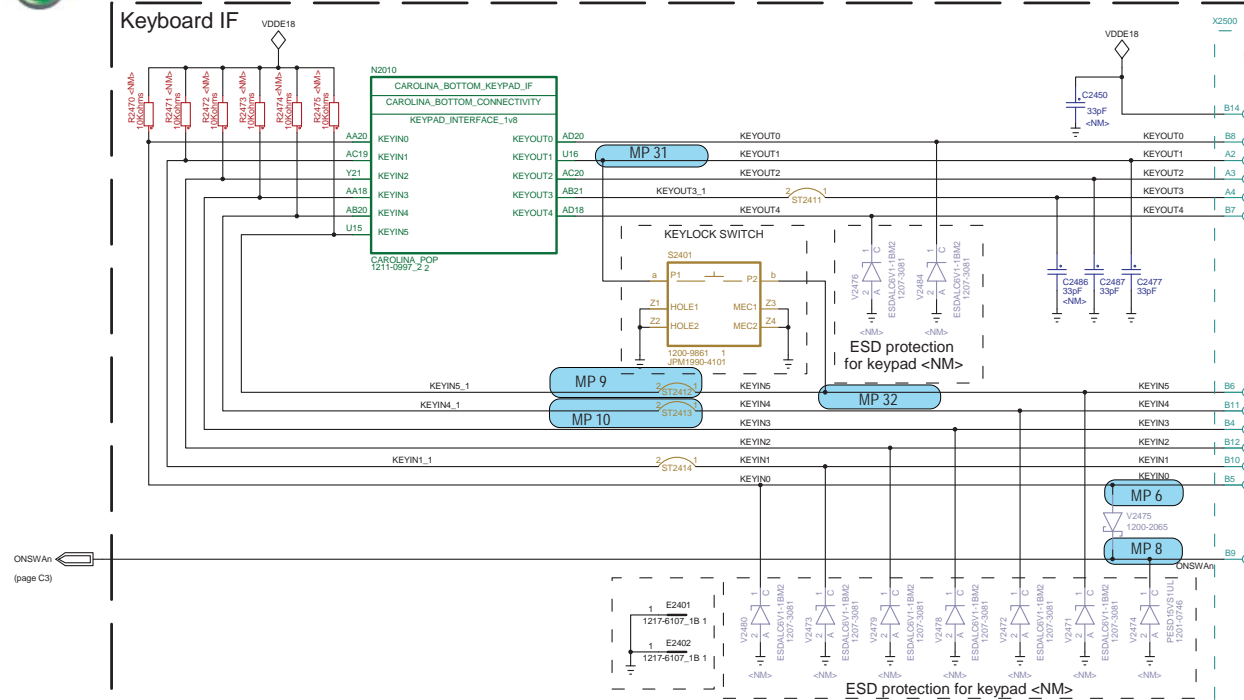
Made for	
Core Memories	
Document Nr	Revision
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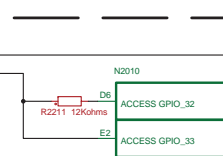
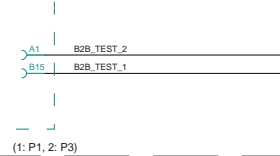
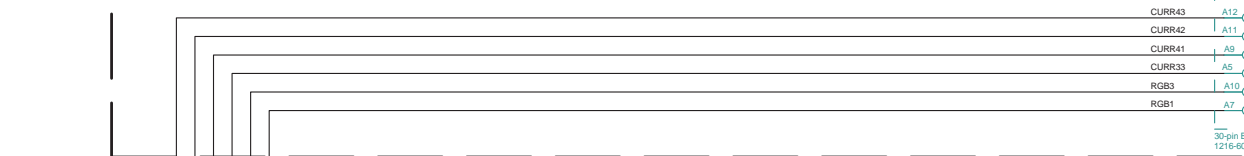
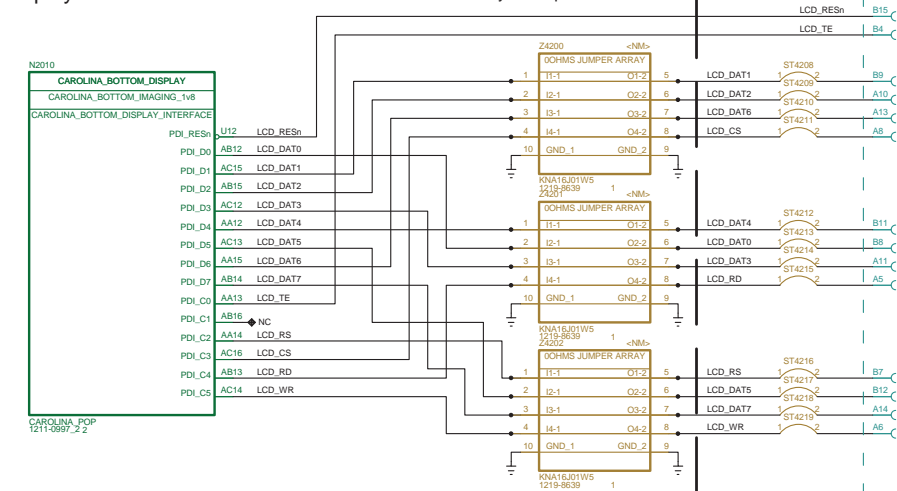




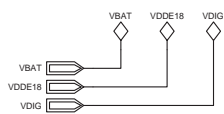
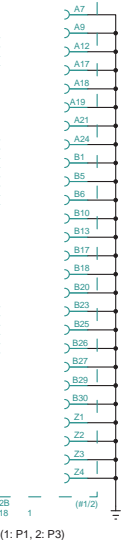
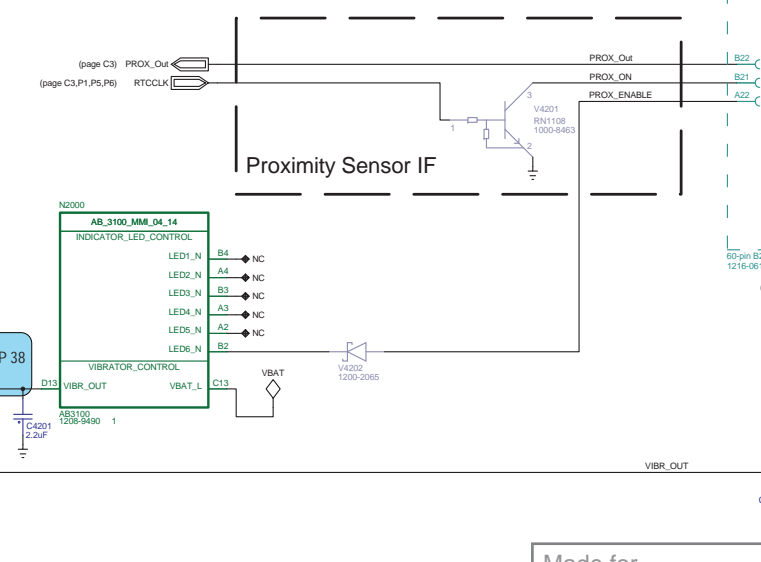
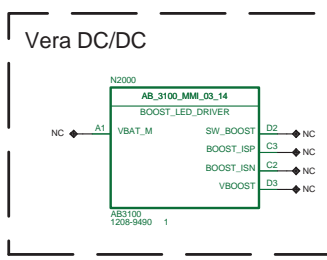
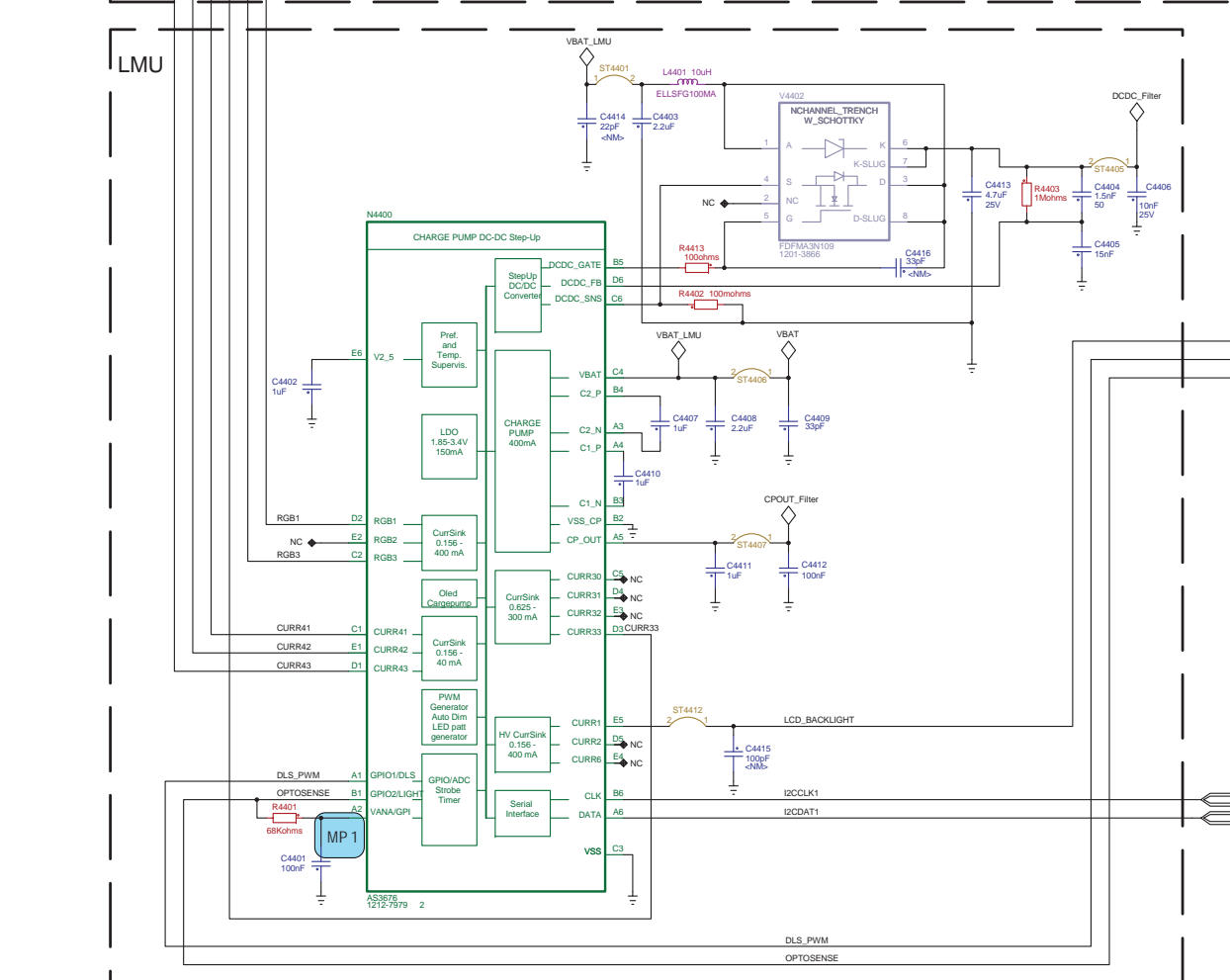
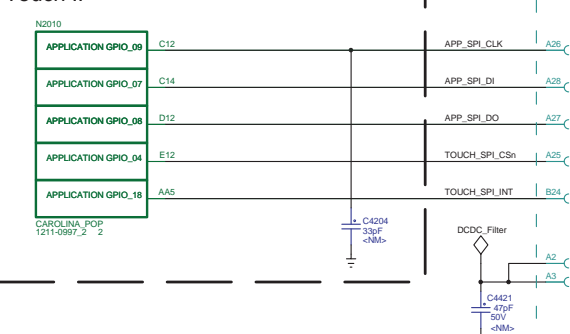



Display IF

NOTE: Z4200-Z4202 are set as <NM> and they are replaced with traces



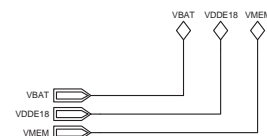
Touch IF

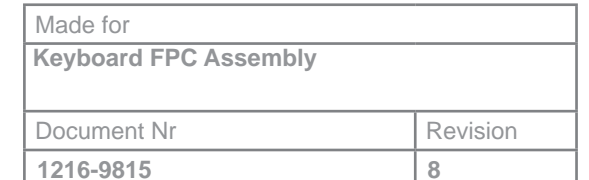


Made for	 GND
Peripheral Optics	
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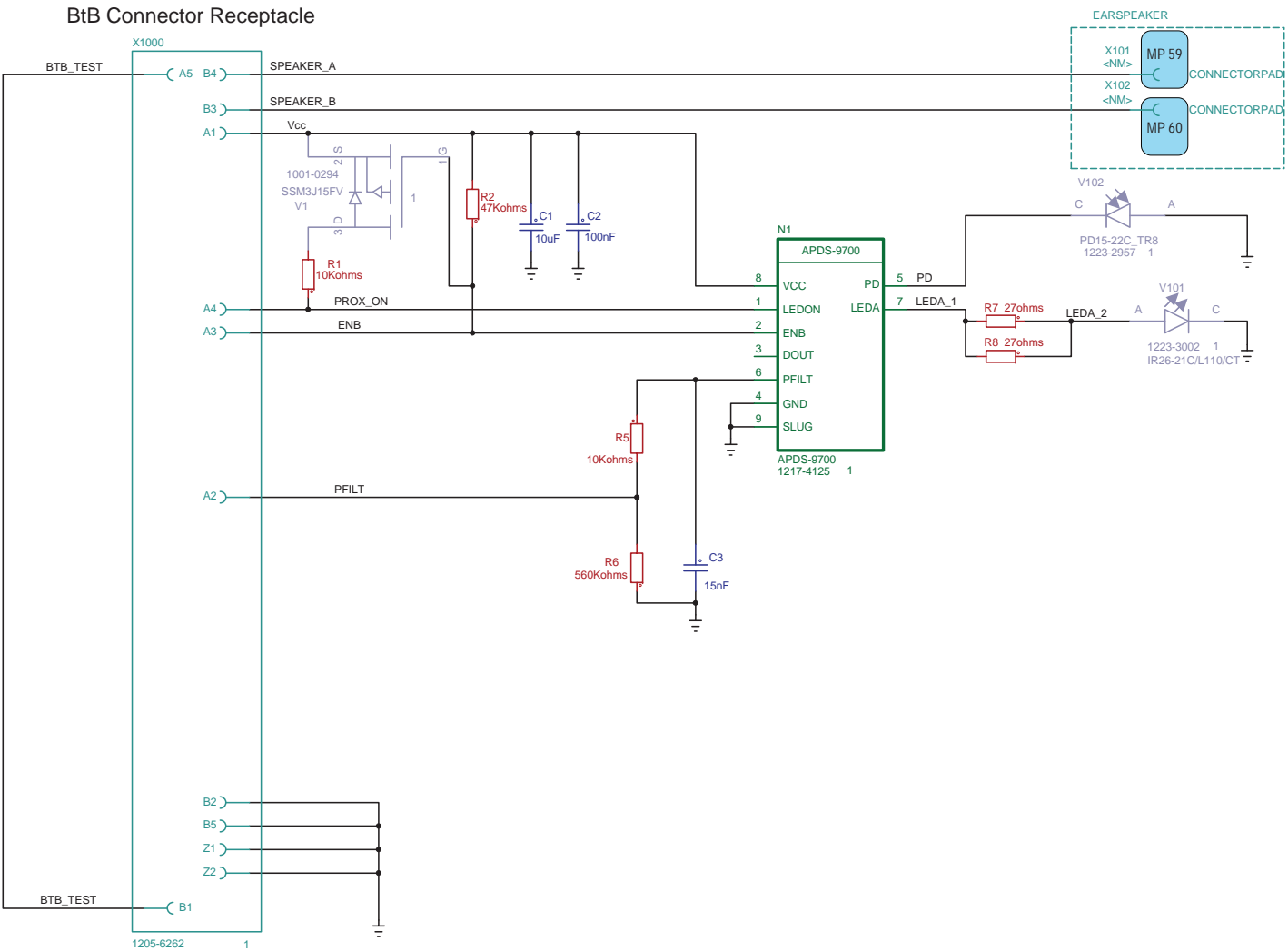








TOP BTB	DISPLAY BTB	SIGNAL
A1	1	VCC
A2	2	DOUT
A3	3	ENB
A4	4	PROX_ON
A5	5	BTB_TEST
B5	6	GND
B4	7	SPEAKER_A
B3	8	SPEAKER_B
B2	9	GND
B1	10	BTB_TEST



Made for Top PBA	
Document Nr 1218-7124	Revision 4

Troubleshooting Fixture Setup Instructions

Top-part overview of the TRS Fixture, see picture 1.

Picture 1



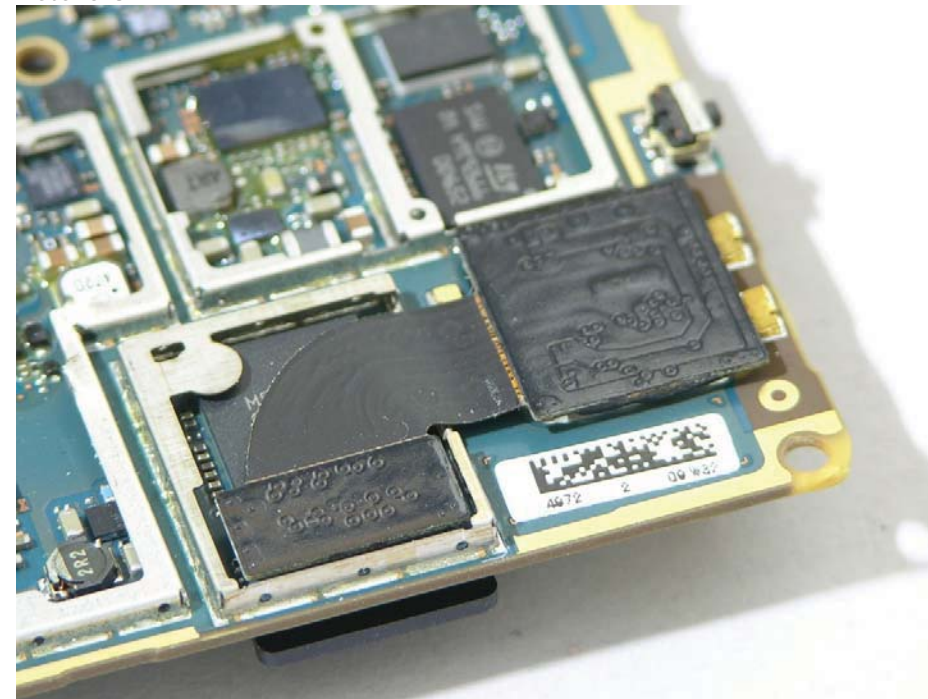
Bottom-part overview of the TRS Fixture, see picture 2.

Picture 2



Connect Main Camera 8 MPixel CMOS to the X4300 BtB connector on the PBA according to picture 3.

Picture 3



Insert a SIM Card into X2402 SIM Card Holder and a Memory Card into X4315 Memory Card Holder on the PBA according to picture 4.

Picture 4



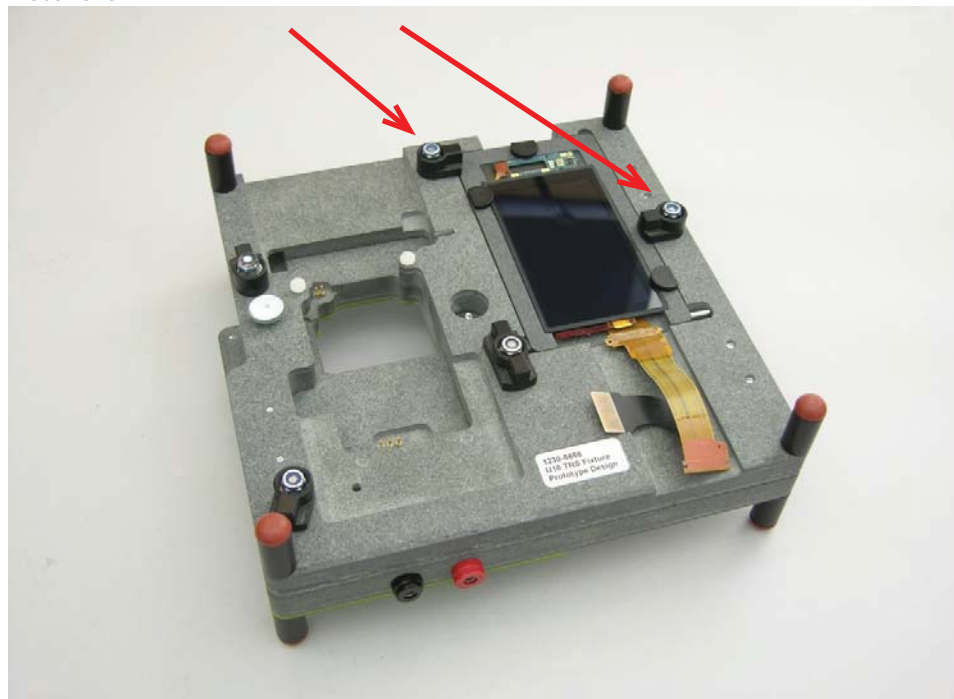
Connect Slider FPC Assy, Display 3" TFT and PBA Top and place them into TRS Fixture Display Holder. Secure them by using the locking screws according to picture 5.

Picture 5



Place the TRS Fixture Display Holder on the TRS Fixture and secure it by using the locking screws according to picture 6.

Picture 6



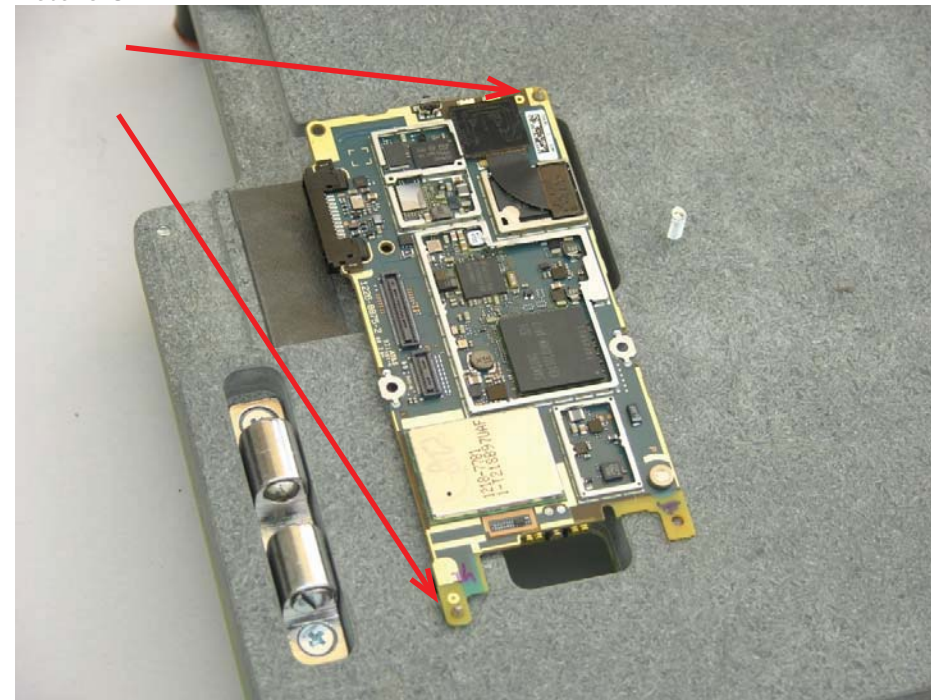
Open the TRS Fixture according to picture 7.

Picture 7



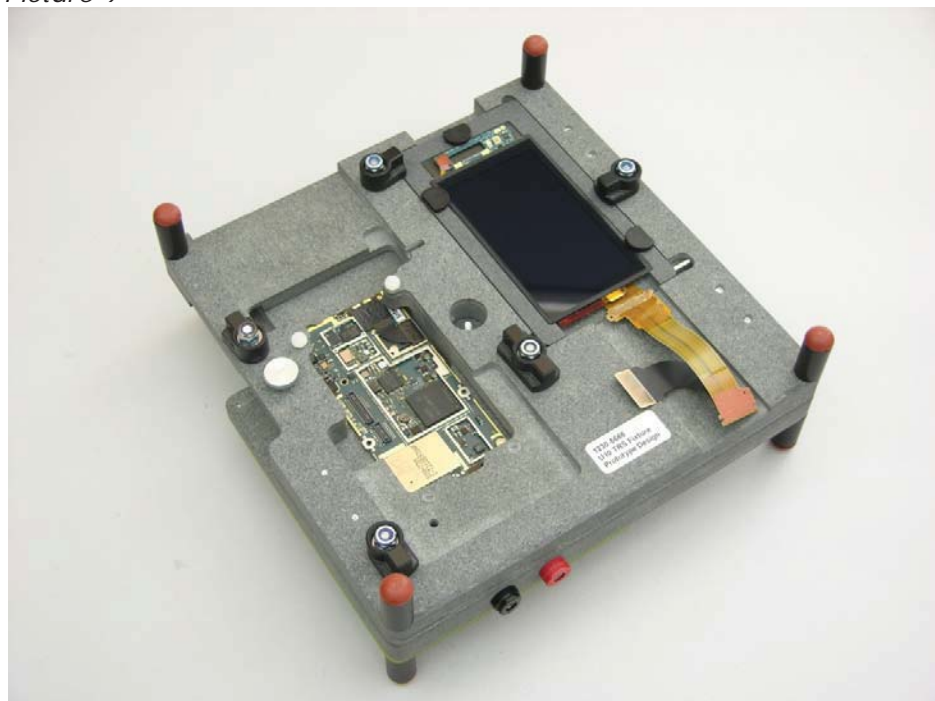
Place the PBA on the TRS Fixture by using the Guiding Pins according to picture 8.

Picture 8



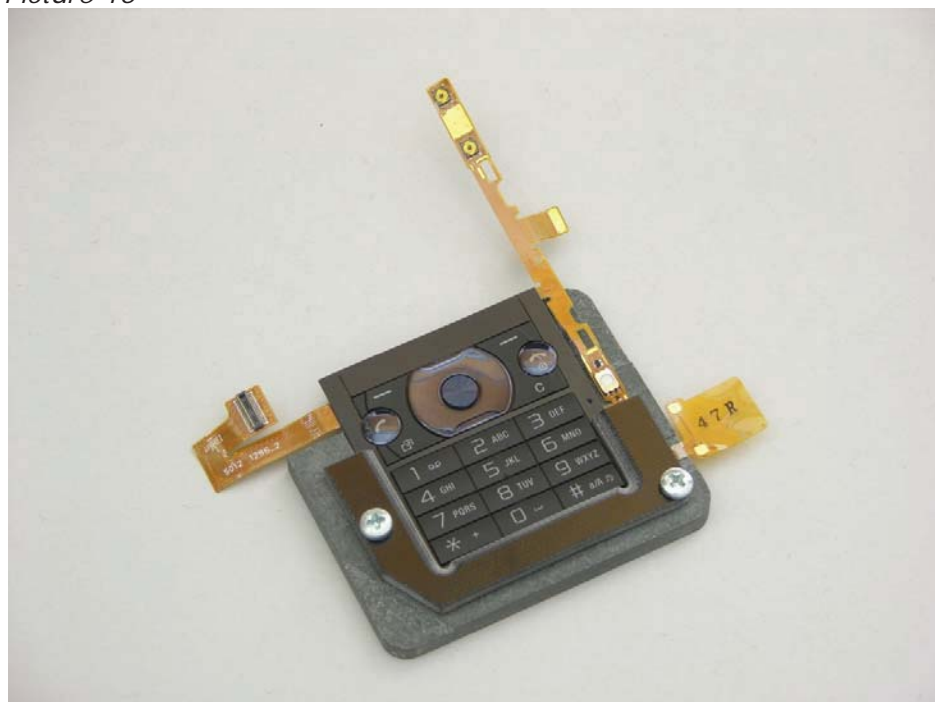
Close the TRS Fixture according to picture 9.

Picture 9



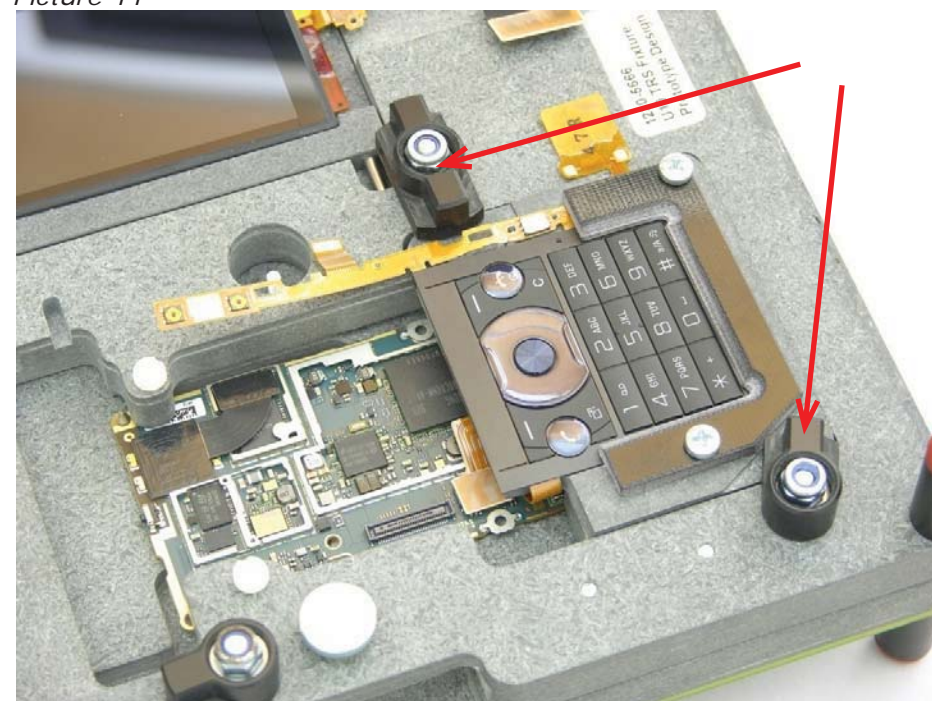
Insert Keyboard FPC Assembly and Keyboard into the TRS Fixture Keyboard Holder according to picture 10.

Picture 10



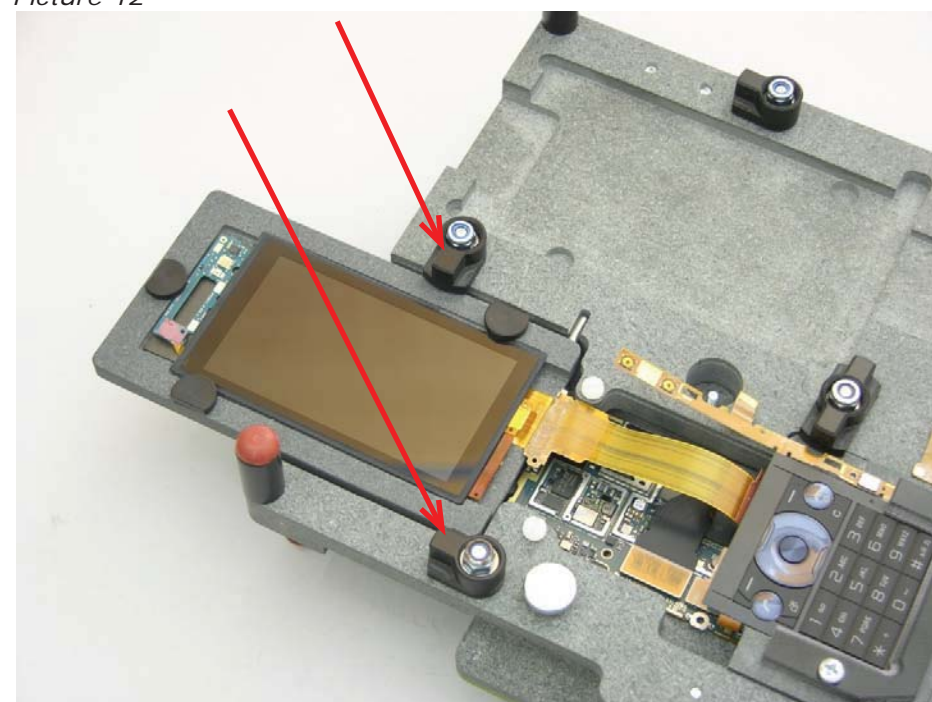
Connect the Keyboard FPC Assembly to X2500 BtB connector and secure it by using the locking screws according to picture 11.

Picture 11



Connect Slider FPC Assy to X4200 BtB connector and secure it by using the locking screws according to picture 12.

Picture 12



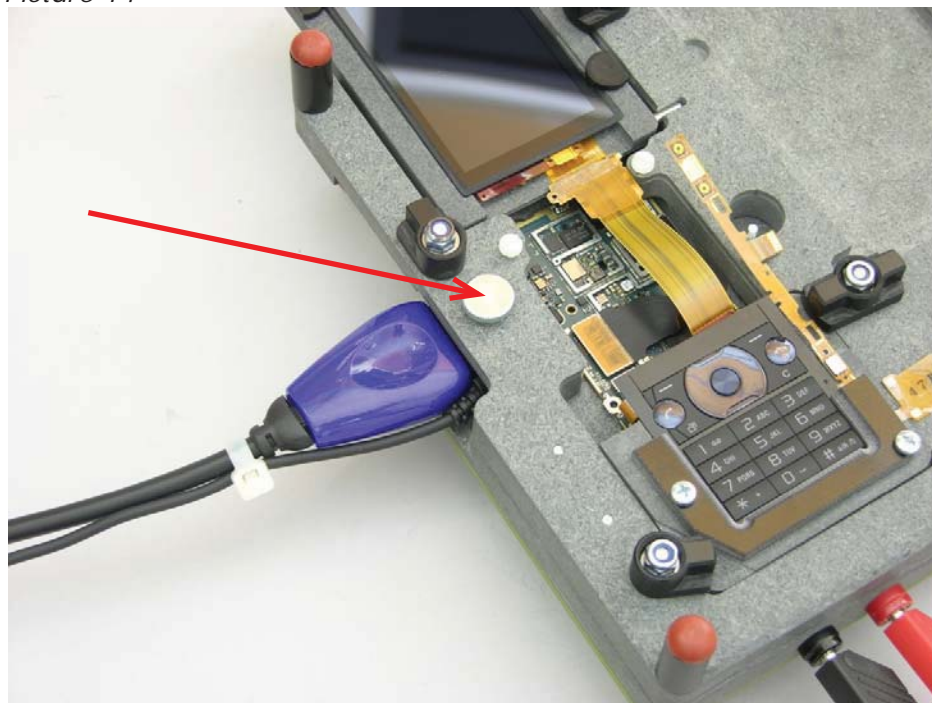
Connect Power Supply Channel 1 (VBATT) Black and Red Lab Plugs to the TRS Fixture according to picture 13.

Picture 13



Connect the Power Supply Channel 2 Cable (DCIO/SEPI) and secure it by using the locking screw according to picture 14.

Picture 14



Connect the RF Cable Flexible to the GPS RF Connector on the TRS Fixture according to picture 15.

Picture 15



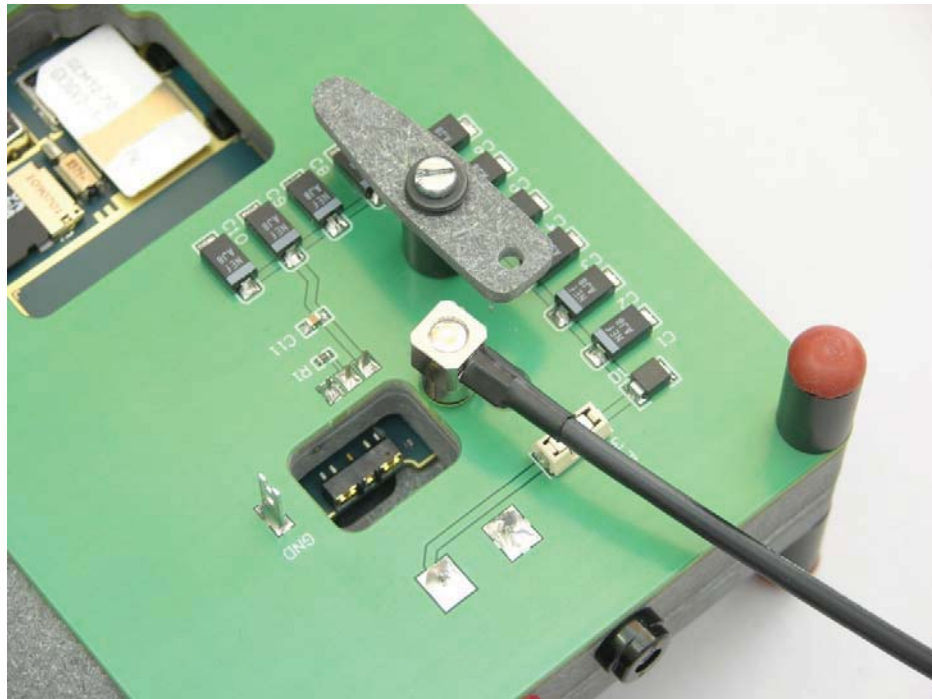
Connect the RF Cable Flexible to the BT/WLAN RF Connector on the TRS Fixture according to picture 16.

Picture 16



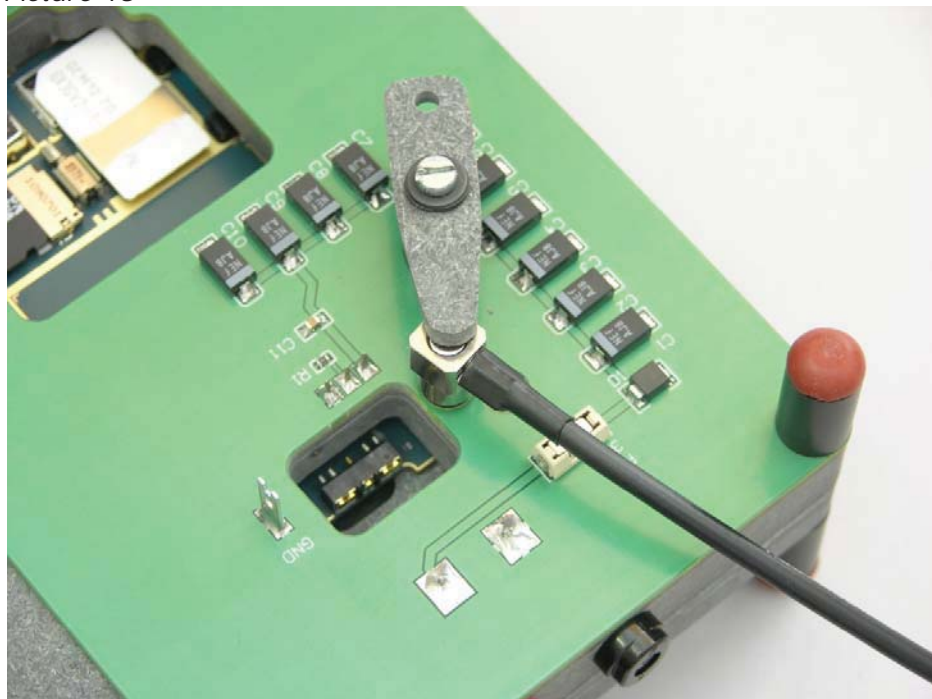
Connect the RF Cable Flexible with RF Probe to the X1200 RF Switch according to picture 17.

Picture 17



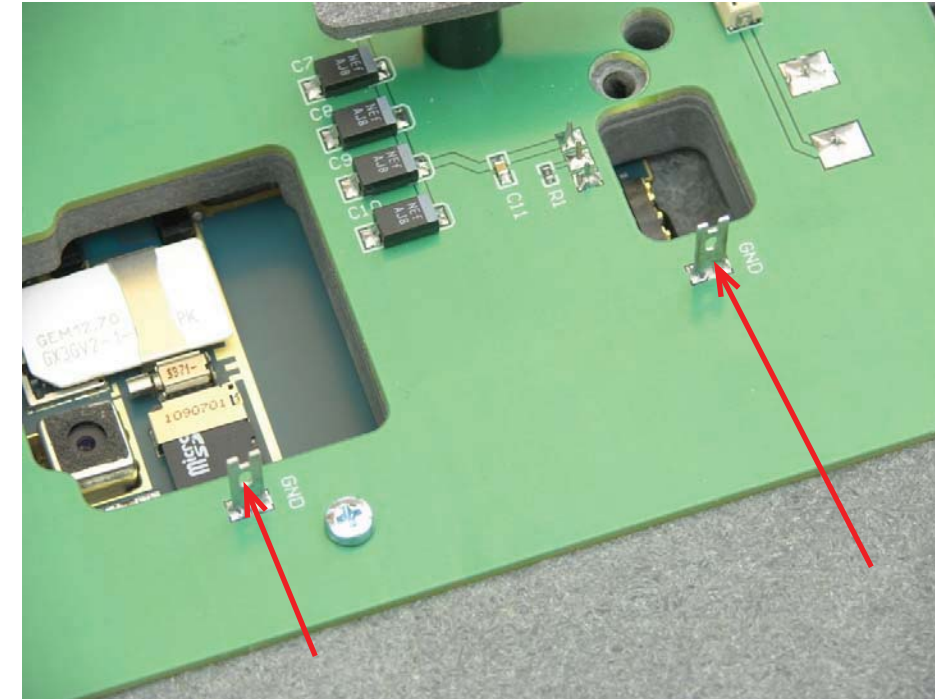
Secure the RF Probe with the RF Probe locking device according to picture 18.

Picture 18



The PIN marked with the GND text on the Top-part of the TRS Fixture can be used as an MP TRS Fixture GND or as grounding for the oscilloscope probe, see picture 19.

Picture 19



The PIN mounted inside the TRS Fixture can be used as an MP TRS Fixture GND or as grounding for the oscilloscope problem, see picture 20.

Picture 20

