Mendelssohn Trouble Shooting Guide

T-000-0000

V 1.0

2004-4-13

© 2004 Chi Mei Communication Systems
Company Confidential
Unauthorized Copy Not Allowed

History

Table of Contents

1. GENERAL DESCRIPTION OF MENDELSSOHN CIRCUITS

1.1 MENDELSSOHN ARCHITECTURE DIAGRAM …..……..5

1.2 MENDELSSOHN BASEBAND MAINLY COMPONENT…… …….6

1.2.1 OMAP330 (PROCESSOR)……..7

1.2.2 TPS65011 (PMU) ……..……8

1.2.3 KAG00J007M-FGGV (NAND FLASH + SDRAM)……10

1.2.4 TSC2101 (CODEC)…….11

1.2.5 BC213143AXX-XB-E4 (BLUETOOTH)…….12

2. BASEBAND TEST POINT…… ……13

3. KEY COMPONENTS LOCATION…..……15

4. EACH FAULTS FINDING CHART FOR LOWER PCB……..……20

4.1 "PHONE IS DEAD"

4.1.1CAUSES OF "PHONE IS DEAD"……21

4.1.2 FAULTING FINDING CHART OF "PHONE IS DEAD"……..……22

4.2 "CAN'T BOOT UP

4.2.1 'CAN'T BOOT UP"…… ……23

4.2.2 FAULTING FINDING CHART OF 'CAN'T BOOT UP'……24

4.3"DOWNLOAD FAILED"

4.3.1 CAUSES OF "DOWNLOAD FAILED"…….…..25

4.3.2 FAULT FINDING CHART OF "DOWNLOAD FAILED"……...26

4.4 SIM CARD DETECTION ERROR

4.4.1 FAULT FINDING CHART OF "SIM DETECTION FAILED"…….27

4.5 AUDIO FAULT

4.5.1 HEADSET FAIL……28

4.5.2 SPEAKER FAIL……29

4.5.3 RECEIVER FAIL……..30

4.5.4 MICROPHONE FAIL…….31

4.6 CHARGER FAULTS……..32

4.7 BLUETOOTH FAIL……..33

4.8 CAN NOT COMMUNICATE WITH FLEMMING……..……..34

5. EACH FAULTS FINDING CHART FOR UPPER PCB……35

5.1 UPPER BOARD TEST-POINTS……...36

5.2"MAIN-LCD OR SUB-LCD IS DEAD"

5.2.1 CAUSES OF "MAIN-LCD OR SUB-LCD IS DEAD"……....37
5.2.2 FAULTING FINDING CHART OF "MAIN-LCD IS DEAD"……..38
5.2.3 FAULTING FINDING CHART OF "SUB-LCD IS DEAD"……...39
5.3 CAMERA IS DEAD……..40
5.4 BACKLIGHT IS DEAD……41
5.5 FLASHLIGHT IS DEAD……...……42
5.6 "SPEAKER IS DEAD"
5.6.1 CAUSES OF SPEAKER IS DEAD"……..……..43
5.6.2 FAULTING FINDING CHART OF "SPEAKER IS DEAD"……...……..44
5.7 "RECEIVER IS DEAD"
5.7.1CAUSES OF "RECEIVER IS DEAD"…….……45
5.7.2 FAULTING FINDING CHART OF "RECEIVER IS DEAD"……..……46
5.8 "VIBRATOR IS DEAD"
5.8.1 CAUSES OF "VIBRATOR IS DEAD"……..…48
5.8.2 FAULTING FINDING CHART OF "VIBRATOR IS DEAD"……..…..….49

1. General Description OF Mendelssohn CIRCUITS

Generally, the Mendelssohn circuits are divided into TWO parts: Baseband (BB) circuits and Radio Frequency (Fleming).

In this trouble-shooting guide, we describe Mendelssohn BB circuit from component to signal trace. Because Mendelssohn is a clamshell type of handset, therefore we will see there are three PCB boards inside the Mendelssohn.

1.1 Mendelssohn architecture diagram

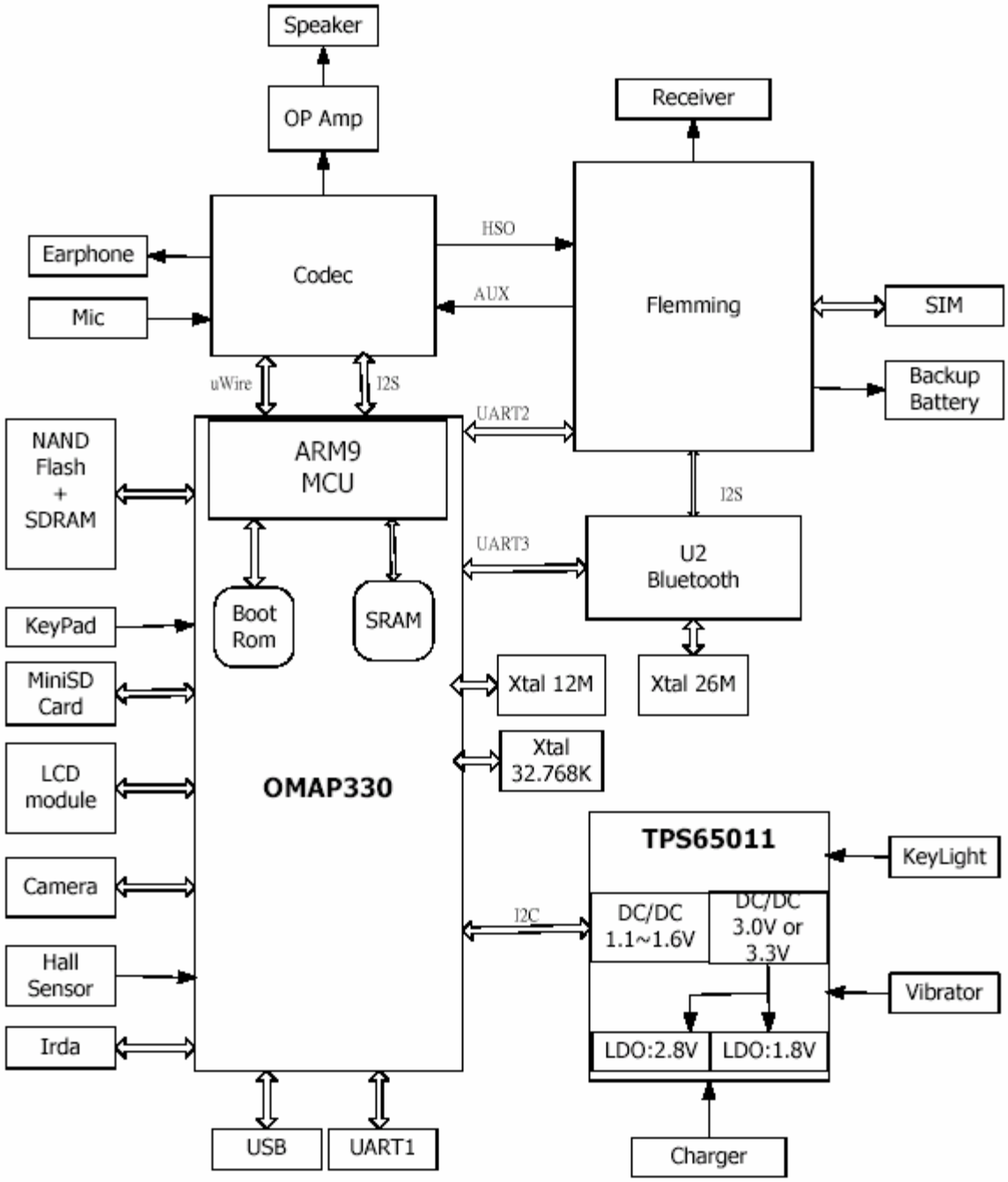


Fig. 01. Block Diagram of Mendelssohn architecture.

1.2 Mendelssohn Baseband mainly components

The Mendelssohn circuits mainly consist of 5 chips

1.2.1 OMAP330 (Processor).

1.2.2 TPS65011 (PMU) .

1.2.3 AG00J007M-FGGV (Nand flash+SDRAM)

1.2.4 TSC2101 (Codec)

1.2.5 BC213143AXX-XB-E4 (Bluetooth)

1.2.1

OMAP330 (U330) is a version of the baseband TI Wireless Platform Application Processor OMAP1611.It can be programmed to perform all personal communication system tasks, including call manager, Internet access, personal digital assistant (PDA).□□.

The OMAP330 chip is composed of several subsystems:

- MPU subsystem:
  The MPU subsystem is based on an ARM926EJ Megacell able to perform most Current operations on the chip.
- Internal memory subsystem:
  This subsystem is composed of a single port SRAM
- System DMA : This component is mainly used to help the MPU perform data memory
  transfer specific tasks.
- Memory interfaces
- Peripheral subsystem
- USB & modem interface

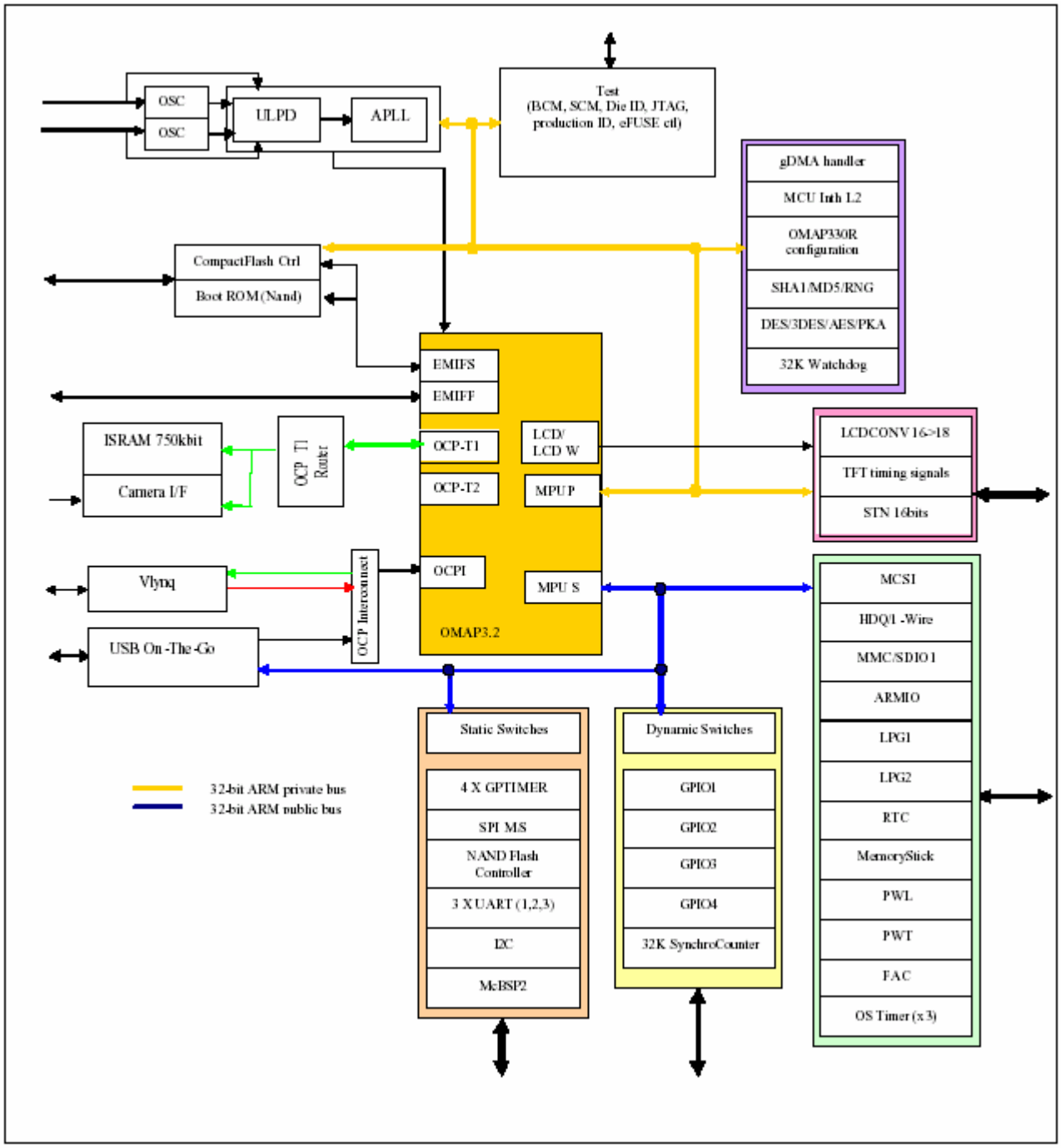


Fig. 02. Block Diagram of OMAP330.

1.2.2

The TPS65011 (U0102) is a power manage IC,

It includes:

1□ Charger manage circuit (USB & Adaptor).

2□ Two sets DC to DC converter . Vcore supply for the power of OMAP core. Vmain(VCC-3V3) supply for LDO1(2.8V)□LDO2(1.8V)□Bluetooth(U2)□Analog Swith(U1107).

3□ Two sets LDO, LDO1 supply for system I/O and Flash,
LDO2(1.8V) supply for SDRAM interface of OMAP □SDRAM.□Core of Codec(U0902).

4□ Four GPIOs □Vibrator driver□LED driver.

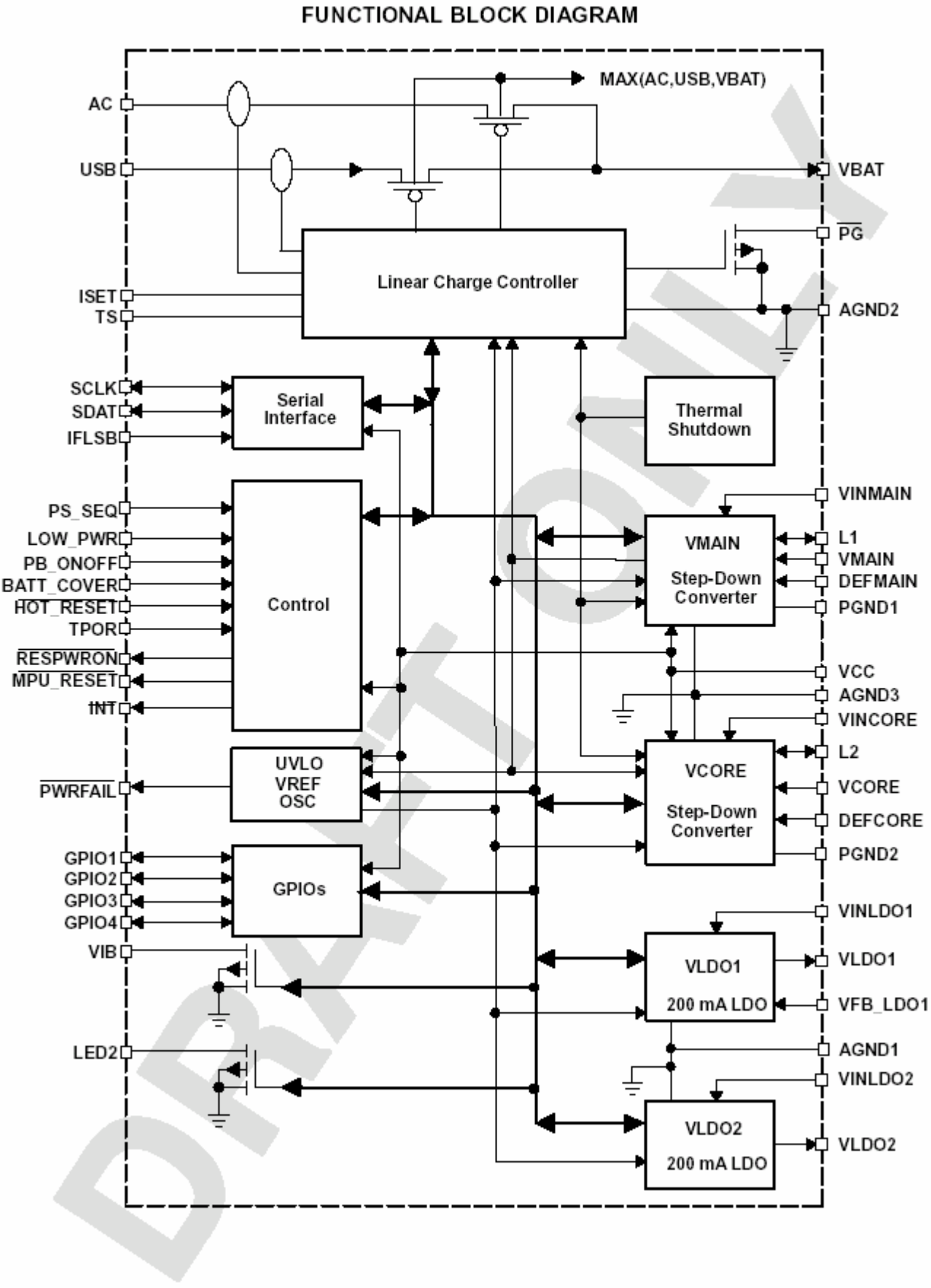


Fig. 03. Block Diagram of TPS65011.

1.2.3

The Mobile SDRAM(U03) is used for temporary data stack for code running.

Flash memory (U03) is used to store code and personal data.

FUNCTIONAL BLOCK DIAGRAM

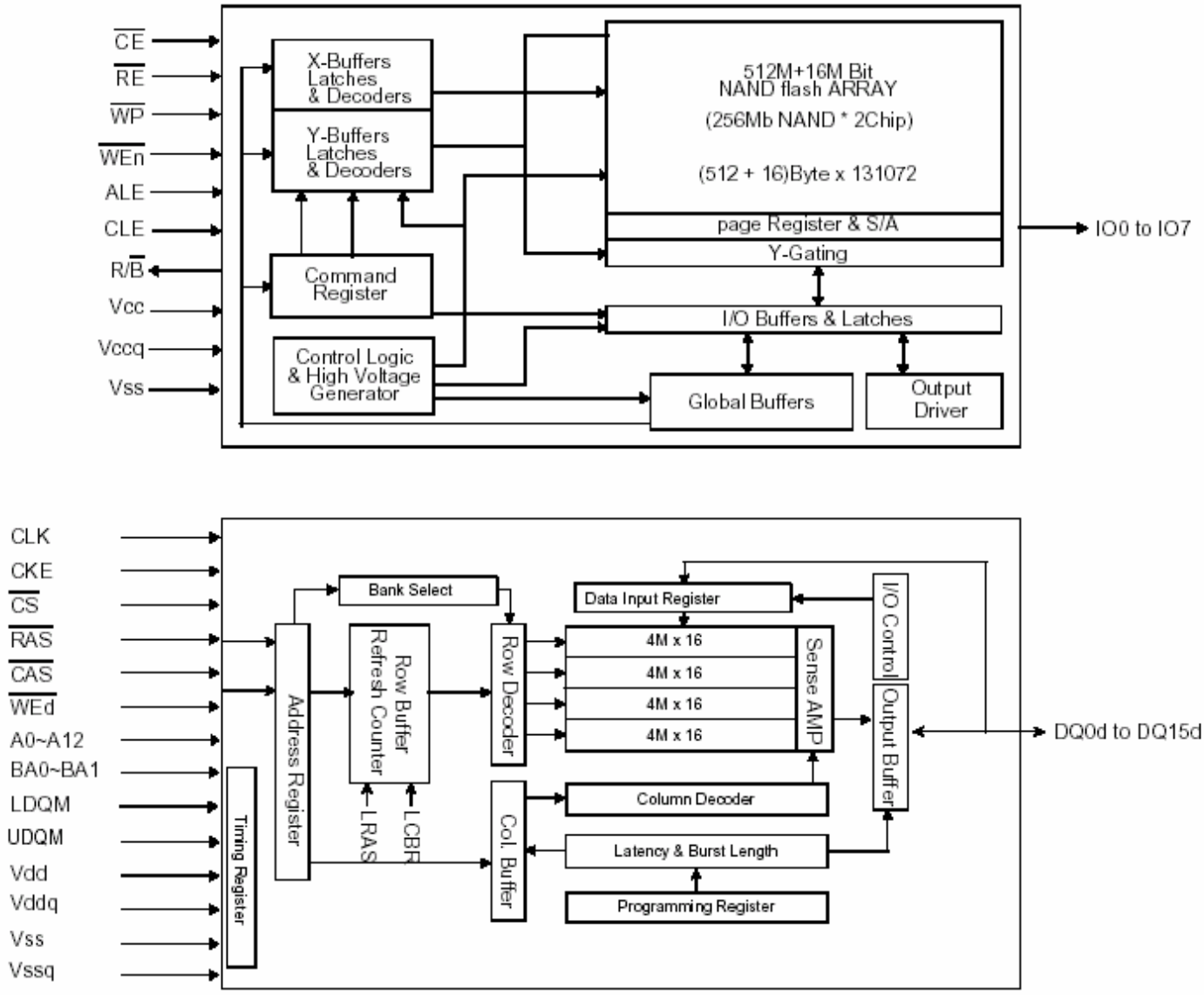


Fig. 04. Block Diagram of SDRAM & NAND flash .

1.2.4

The TSC2101 (U0902) is a low-power highly integrated high performance codec , which supports stereo audio DAC, mono-aural Voice ADC□Battery measurement.

FUNCTIONAL BLOCK DIAGRAM

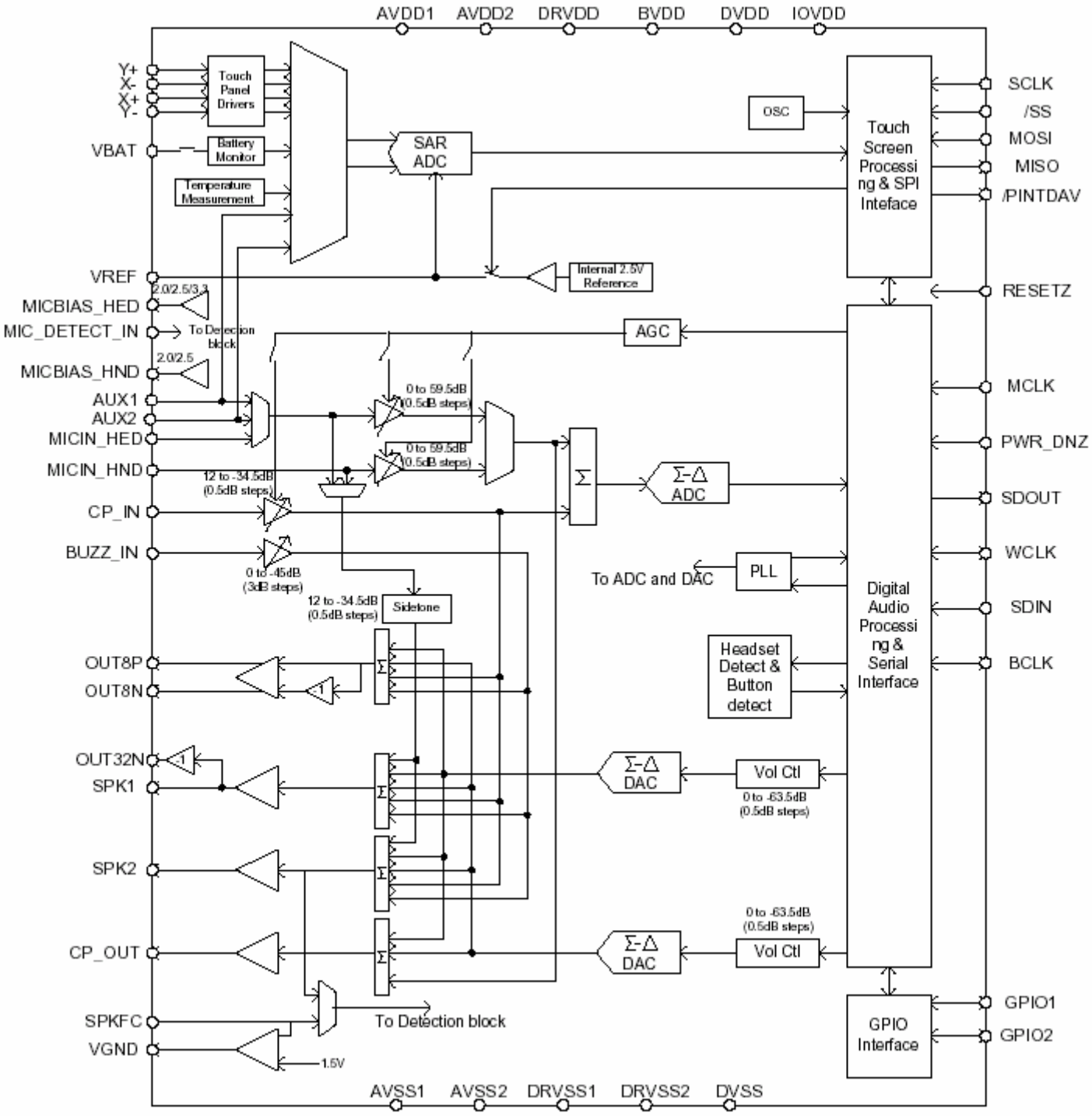
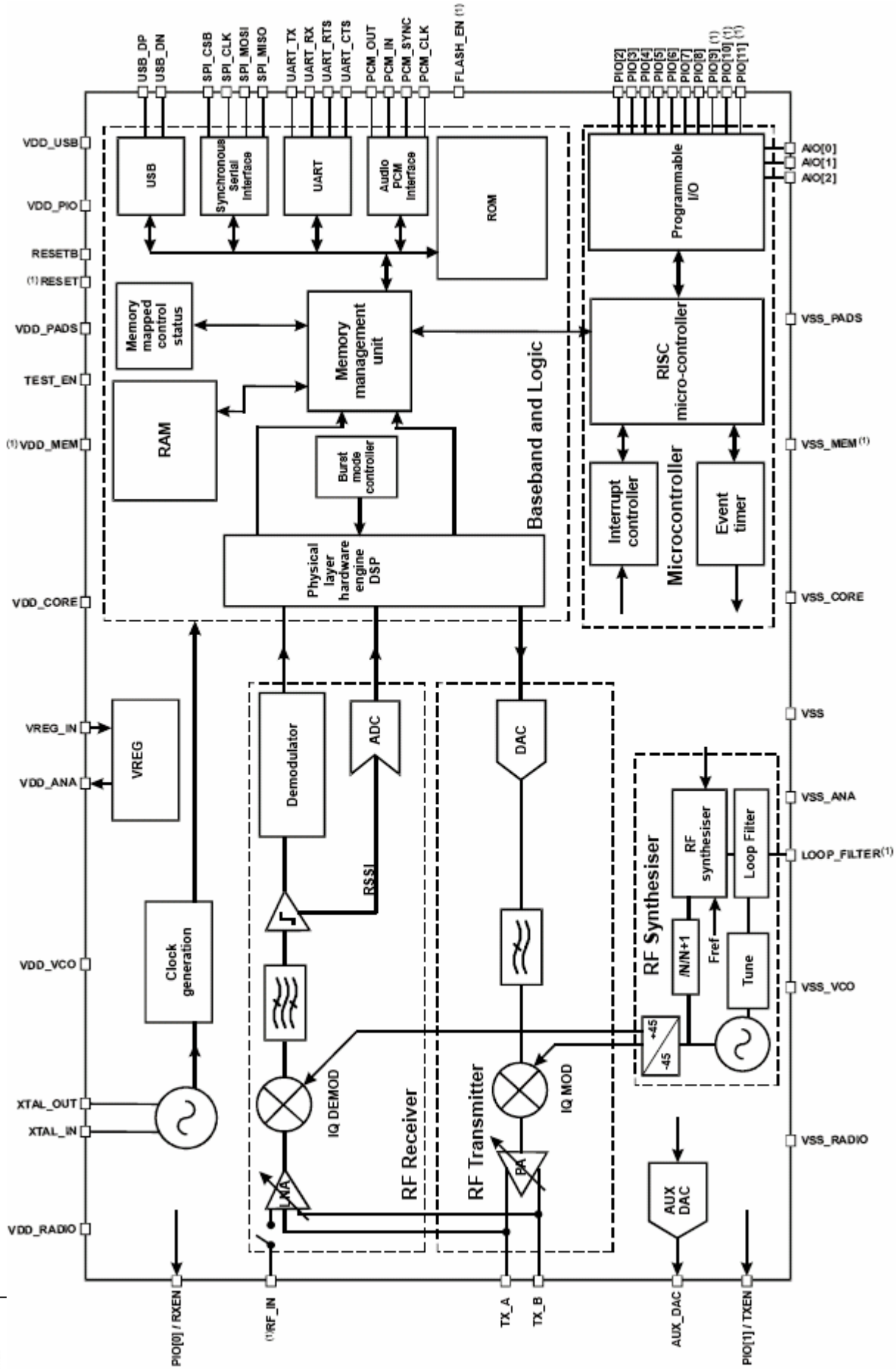


Fig. 05. Block Diagram of TPS2101

1.2.5

The BC213143AXX-XB-E4(U2) is a single chip radio and baseband chip for Bluetooth wireless technology 2.4GHz.



2. Base-band Test-points

Test-point	*Net*	*Name*	*Condition*	*DC-level*	*Note*
Power supplies (Lower board)					
C0118	Vbat	Vbat	Power on	Nominal 3.6V Min 3.2V Max 4.2V	Supply for System power
C0117	VCC-3V3	Vmain	Active state	Nominal 3.3V Min V Max V	Supply for LDO1(2.8V) □ LDO2(1.8V □ Bluetooth(U2) □ Analog Swith(U1107)
C0124	VCC-1V8	LDO2	Active state	Nominal 1.8V Min 1.65V Max 1.95V	Supply for SDRAM interface of OMAP □ SDRAM. □ Core of Codec(U0902).
C0123	VCC-2V75	LDO1	Active state	Nominal 2.85V Min 2.7V Max 3.0V	Supply for system I/O and Flash
C0119	VCC-CORE	VCORE	Active state	Nominal 1.5V Min 1.1V (sleep) Max 1.6V	Supply for the power of OMAP core
C0404	Vcodec	Vcodec	Active state	Nominal 3.3V Min 3.2V Max 3.4V	Supply for codec(U0902)
C0429	Vcc-ntc	3.3V	Active state	Nominal 3.3V Min 3.2 Max 3.4	Supply for U1110
C0488	Vusb-3V3	3.3V	Active state	Nominal 3.3V Min 3.2 Max 3.4	Supply for USB interface of OMAP
C0450	MIC-bias	2.5V	Active state	Nominal 2.5V Min 2.4 Max 2.6	Supply for headset Microphone bias.
T0401 (pin5□6)	USB_Power	USB_VBUS	Charging state	Nominal 5.0V Min 4.5	
T0401 (pin7□8)	AC-power	Adapter	Charging state	Nominal 5V Min 4.5V	

Power supplies (upper board)					
C402	Vcmos	2.5V	Active state	Nominal 2.5V Min 2.4 Max 2.6	Supply for CMOS core
C401	2V75	2.8V	Active state	Nominal 2.8V Min 2.65V Max 2.95V	Supply for Main LCD Sub LCD CMOS IO
C1620	VLED	VLED	Active state	Nominal 10.5V Min V	Supply for LCM backlight
C1624	Vflash	Vflah	Active state	Nominal 10.5V Min V	Supply for Flashlight
Power supplies (Daughter board)					
C1613	VCC-SD	2.8V	Active state	Nominal 2.8V Min 2.65V Max 2.95V	Supply for MiniSD card
Clock					
U0201	OSC1-in	OSC1_in	Active State 12Mhz		For OMAP system clock
U0202	OSC32K-out	CLK32K_out	Active State 32.768Khz		For OMAP RTC
U1208	XTAL_in	XTAL-in	Active State 26Mhz		For Bluetooth
General					
TP0501	TX1	TX (UART1)	Download		
TP0502	RX1	RX (UART1)	Download		
TP0503	USBDM	DM	Download		
TP0504	USBDP	DP	Download		
TP0136	nMPU-RESET	/MPU_RESET	Active State	Pulsed DC (0V ~ 2.8V)	Reset OMAP
TP0120	RESPWONZ	/RESPWON	Active State	Pulsed DC (0V ~ 2.8V)	Reset OMAP
TP0164	/HOT_RESET	/HOT_RESET			Reset TPS65011

3. Base-band Key Component Placement

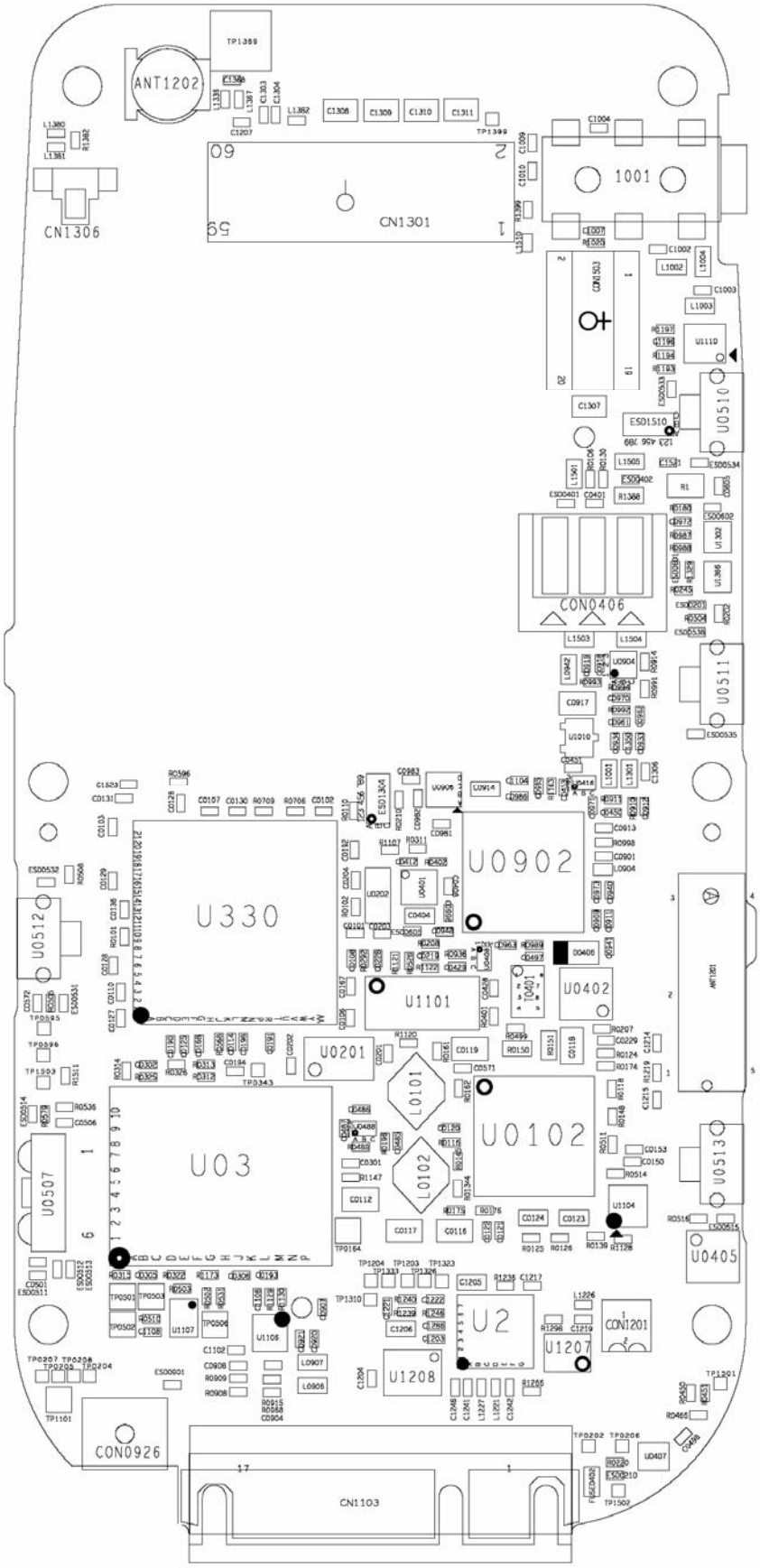


Fig06 Mendelssohn Key Component Placement(lower board top view)

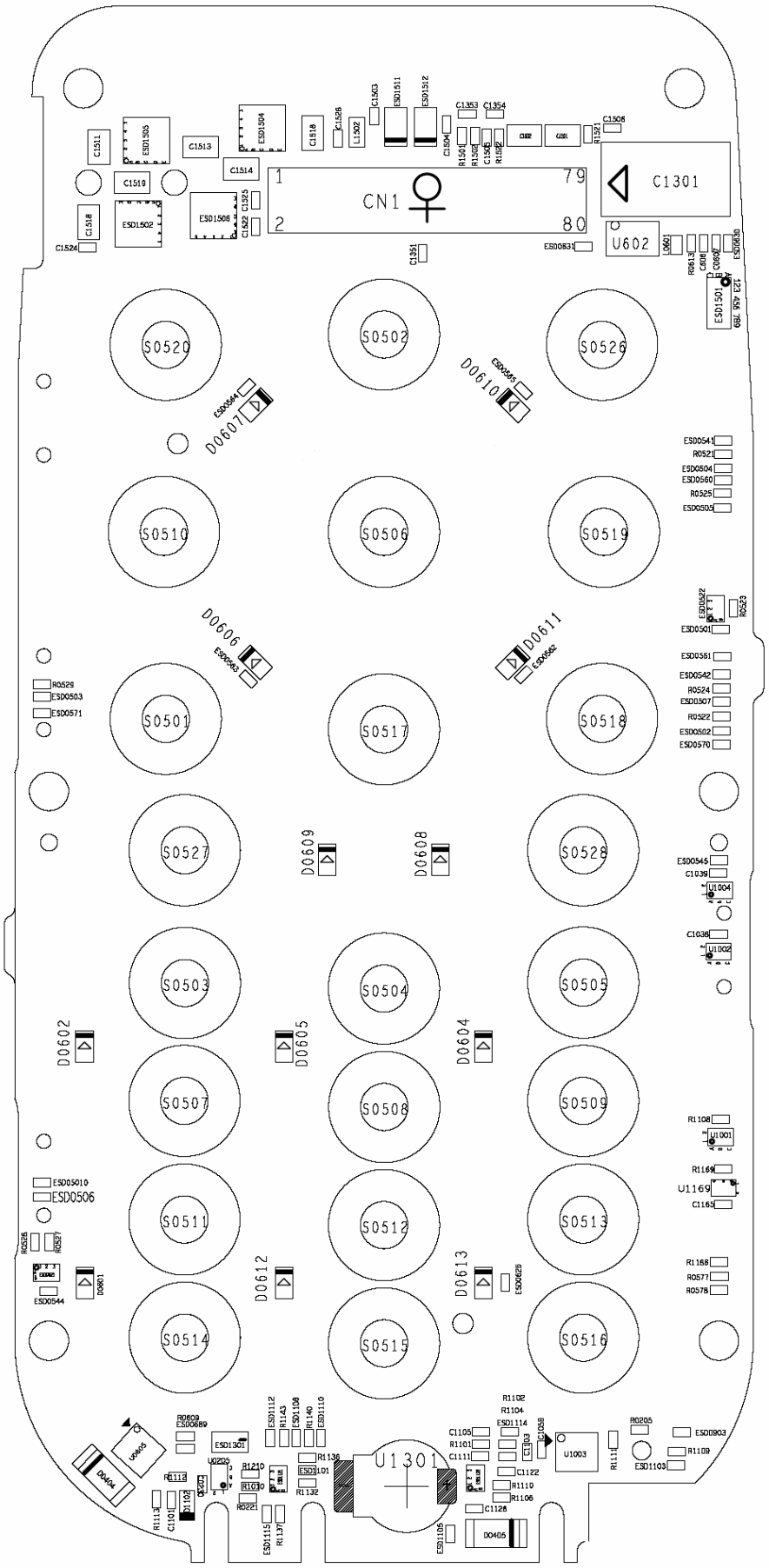


Fig07 Mendelssohn Key Component Placement (lower board bottom view)

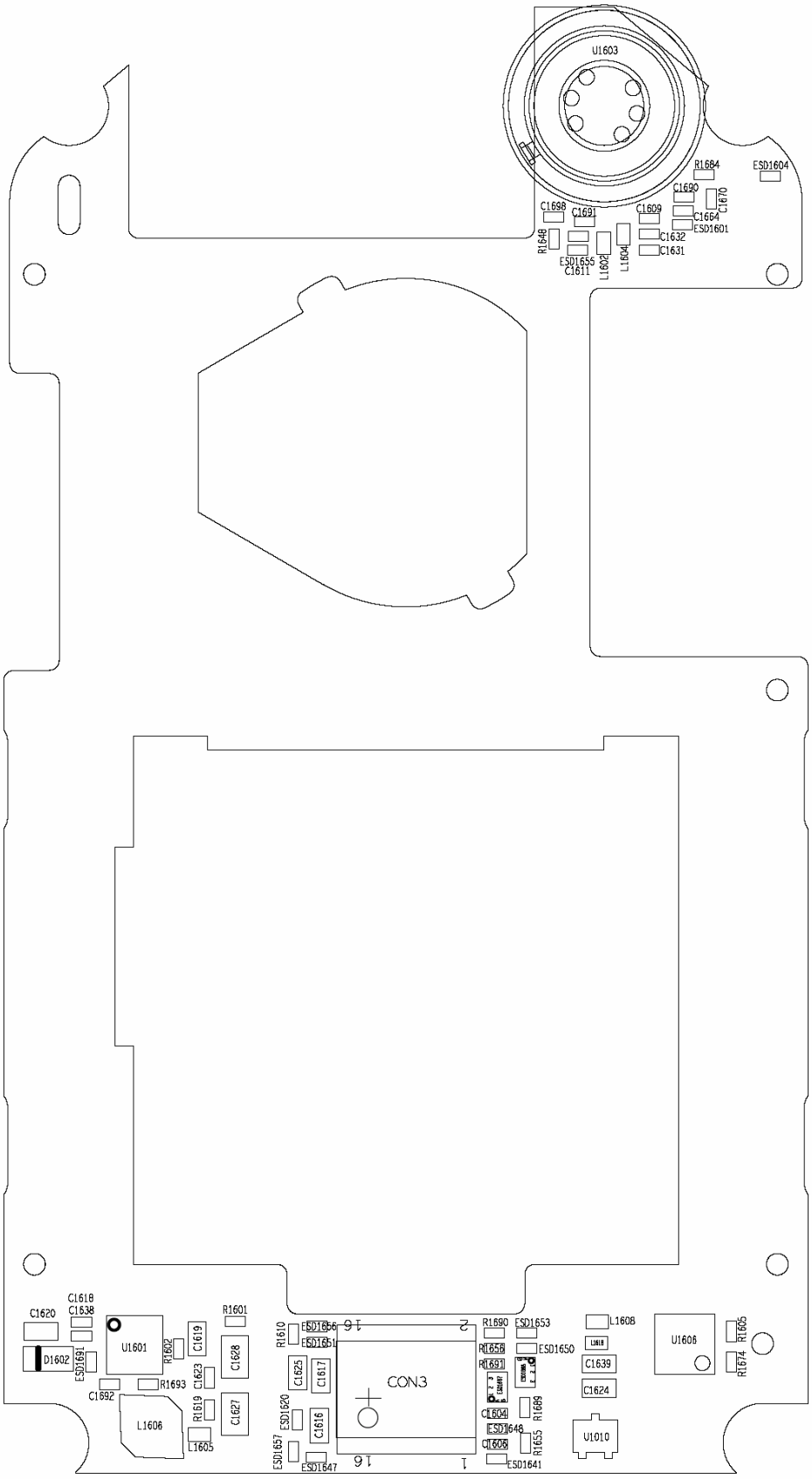


Fig08 Mendelssohn Key Component Placement (Upper board top view)

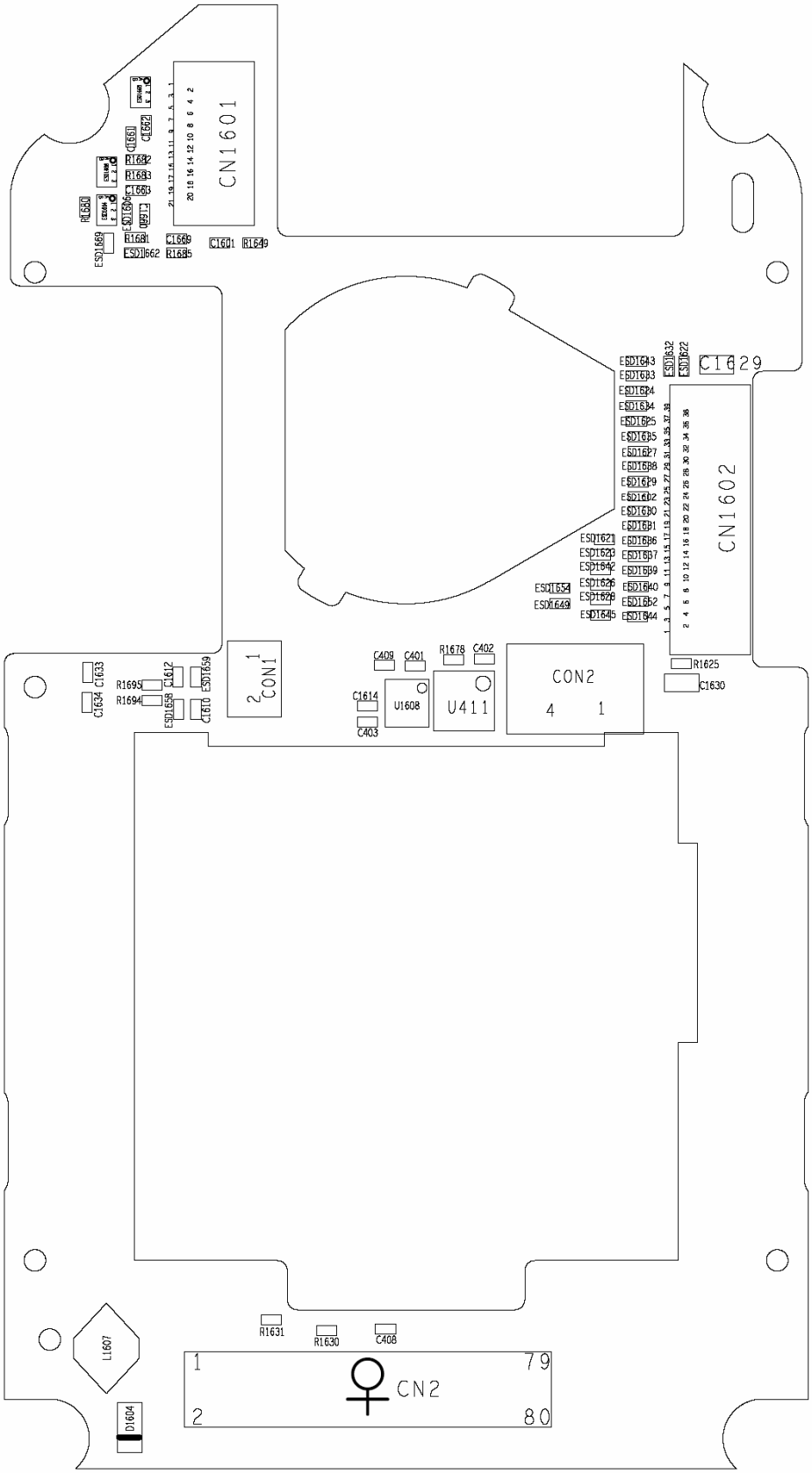


Fig09 Mendelssohn Key Component Placement (Upper board bottom view)

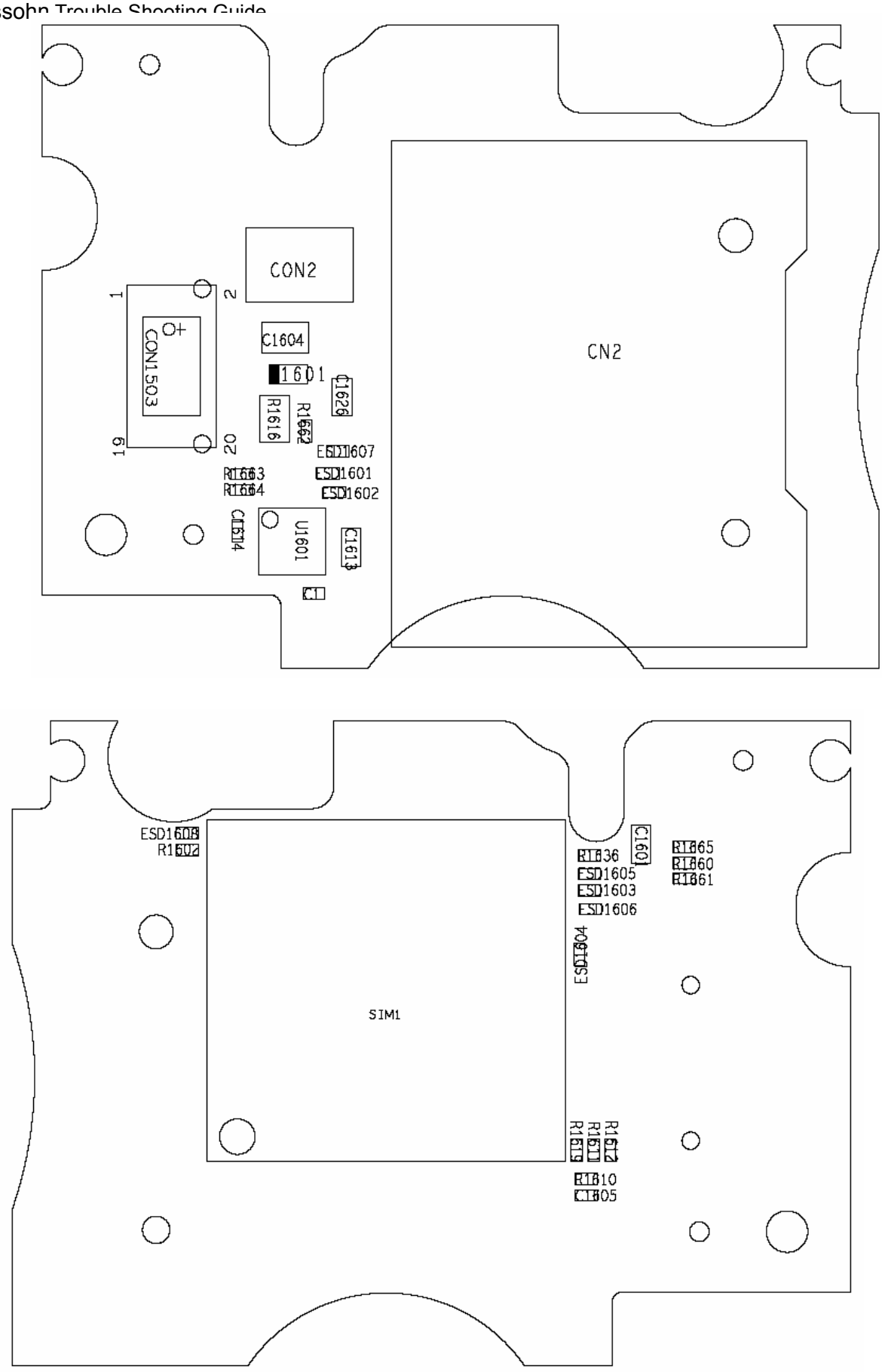


Fig10 Mendelssohn Key Component Placement (Daughter board)

4. Each Faults Finding Chart for lower PCB

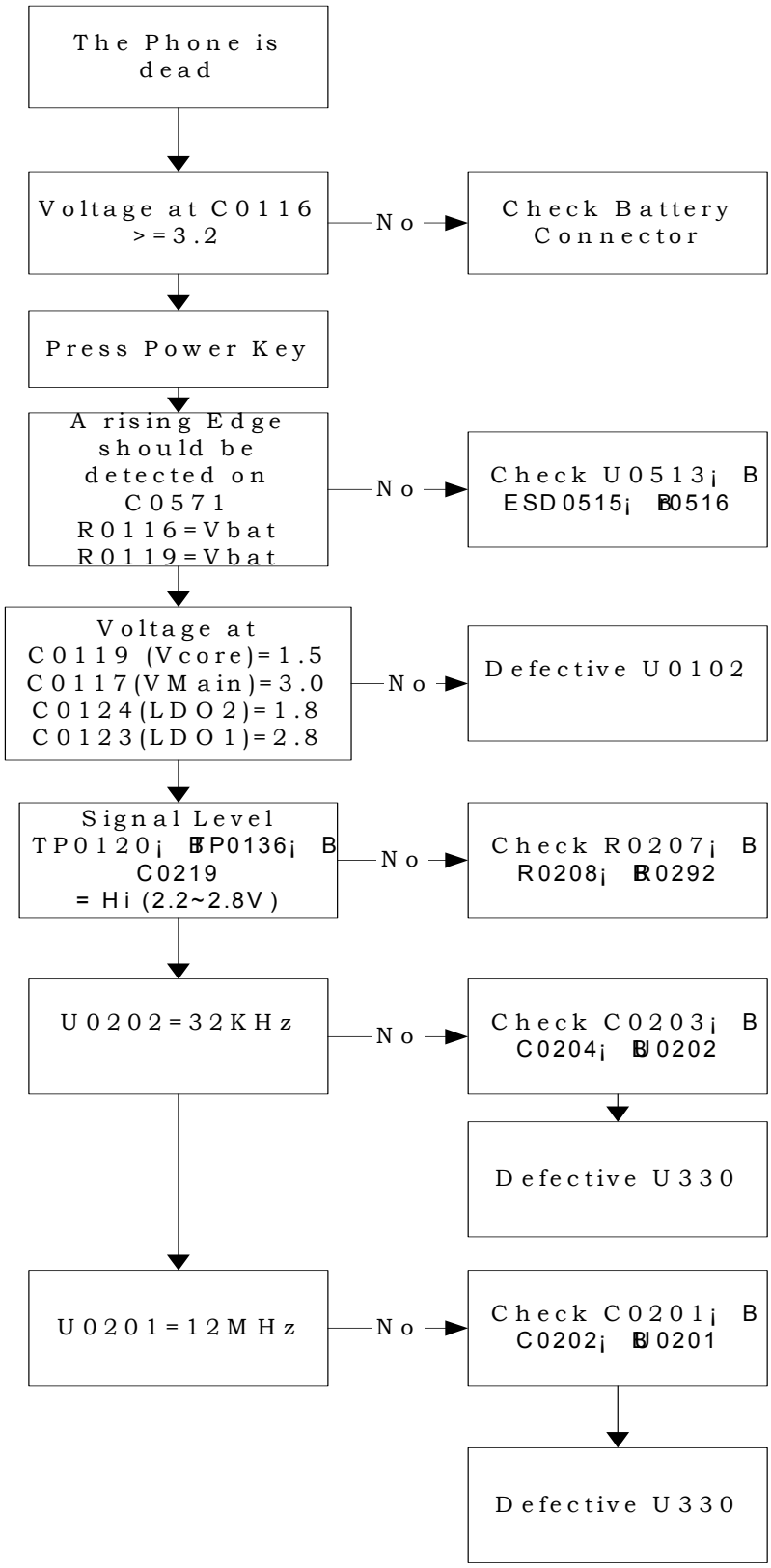
4.1 “Phone is Dead”

4.1.1Causes of “Phone is Dead”

‘Phone is dead’ means that the phone can not be powered on when the power has been supplied to it. Nominal supply voltage to the phone is 3.6V. If the main supply voltage is lower than 3.2V, the phone does not start the power-on sequence. The causes of “Phone is Dead” could be one of the following reasons:

- Defective Power Switch Component: U0513
- Defective TPS65011: U0102
- Defective OMAP330: U330
- Defective PCB

4.1.2 Faulting Finding Chart of “Phone is Dead”



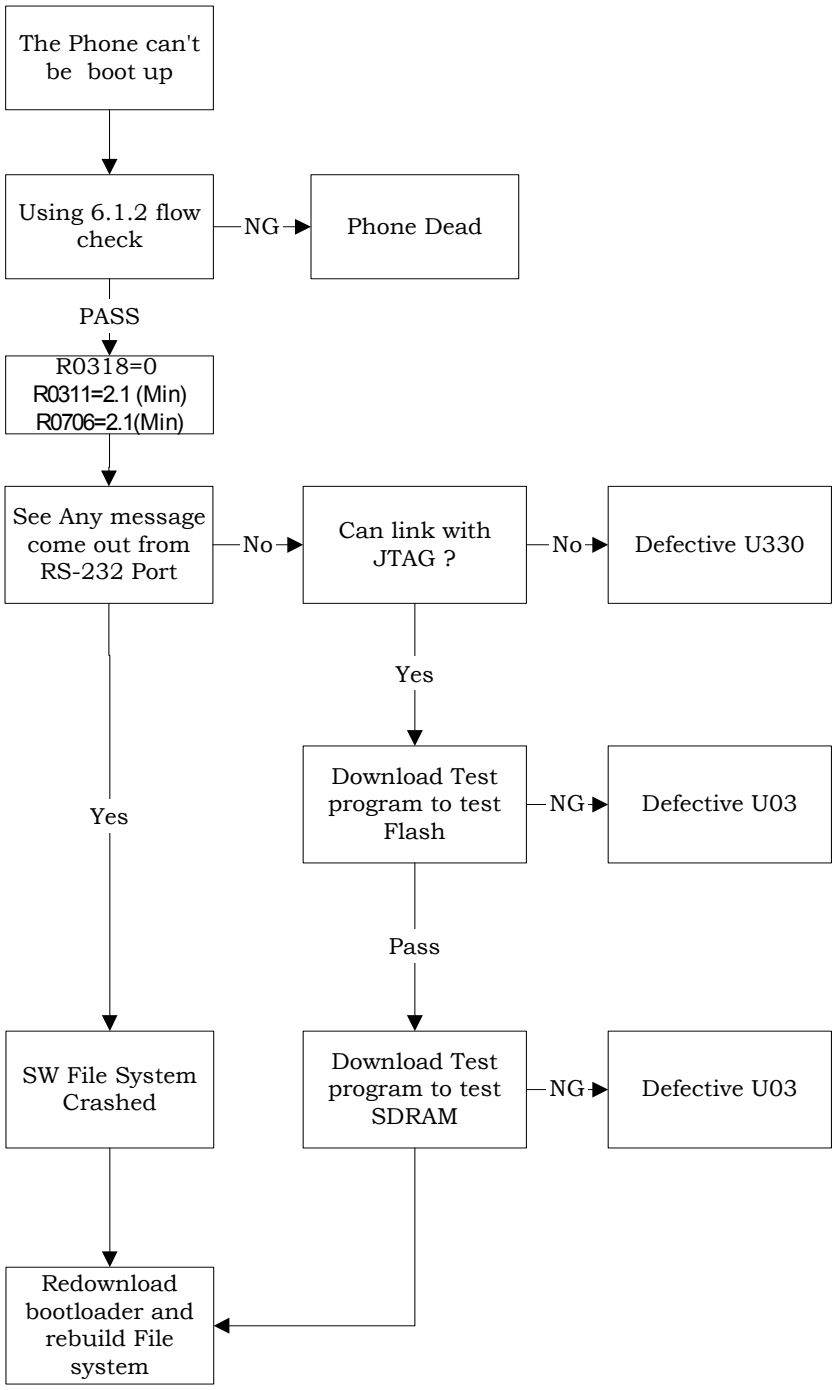
4.2.1 ‘Can’t boot up

Can’t boot up means the phone can pass 6.1.2-check flow but system still can’t run to OS welcome screen.

The root causes of “Can’t boot up” can be one of the following reasons:

- Defective Perseus1 (U330)
- Defective Flash or SDRAM (U03)
- Defective Crystal (U0201, U0202)
- SW was crashed in Flash.

4.2.2 Faulting Finding Chart of 'Can't Boot Up'



4.3“Download Failed”

4.3.1 Causes of “Download Failed”

The causes of Download failed could be one of the following reasons:

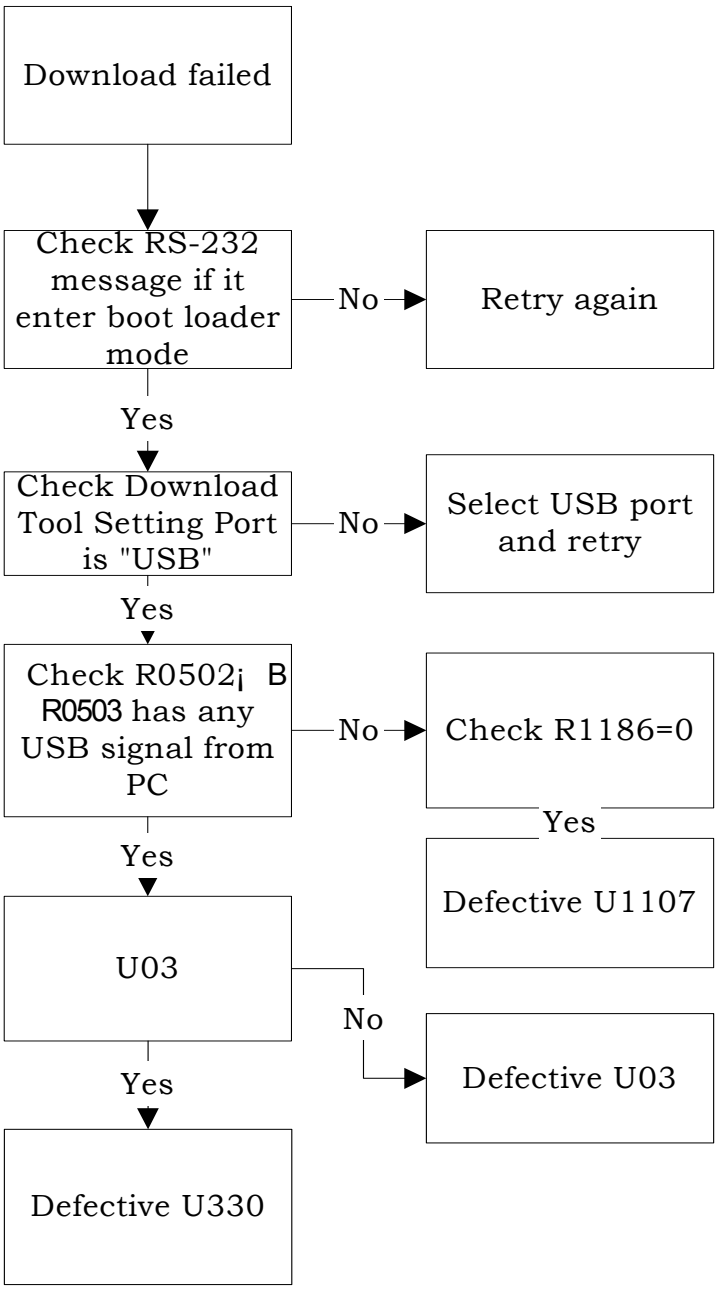
1 System does not enter boot loader mode

2 Defective PMU: U0102

3 Defective OMAP: U330

4 Defective Flash Memory: U03

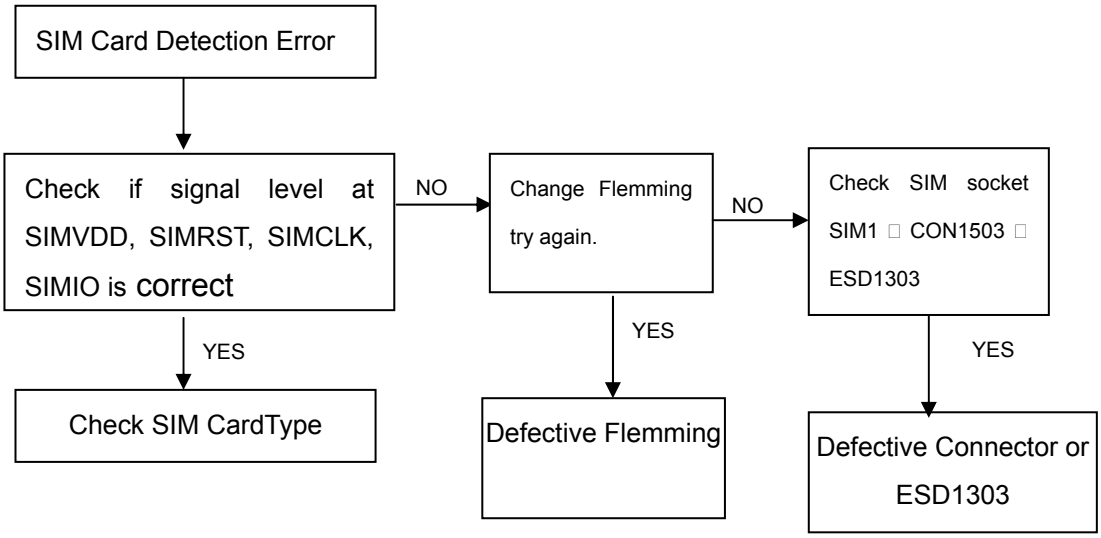
4.3.2 Fault Finding Chart of “Download Failed”



4.4 SIM Card Detection Error

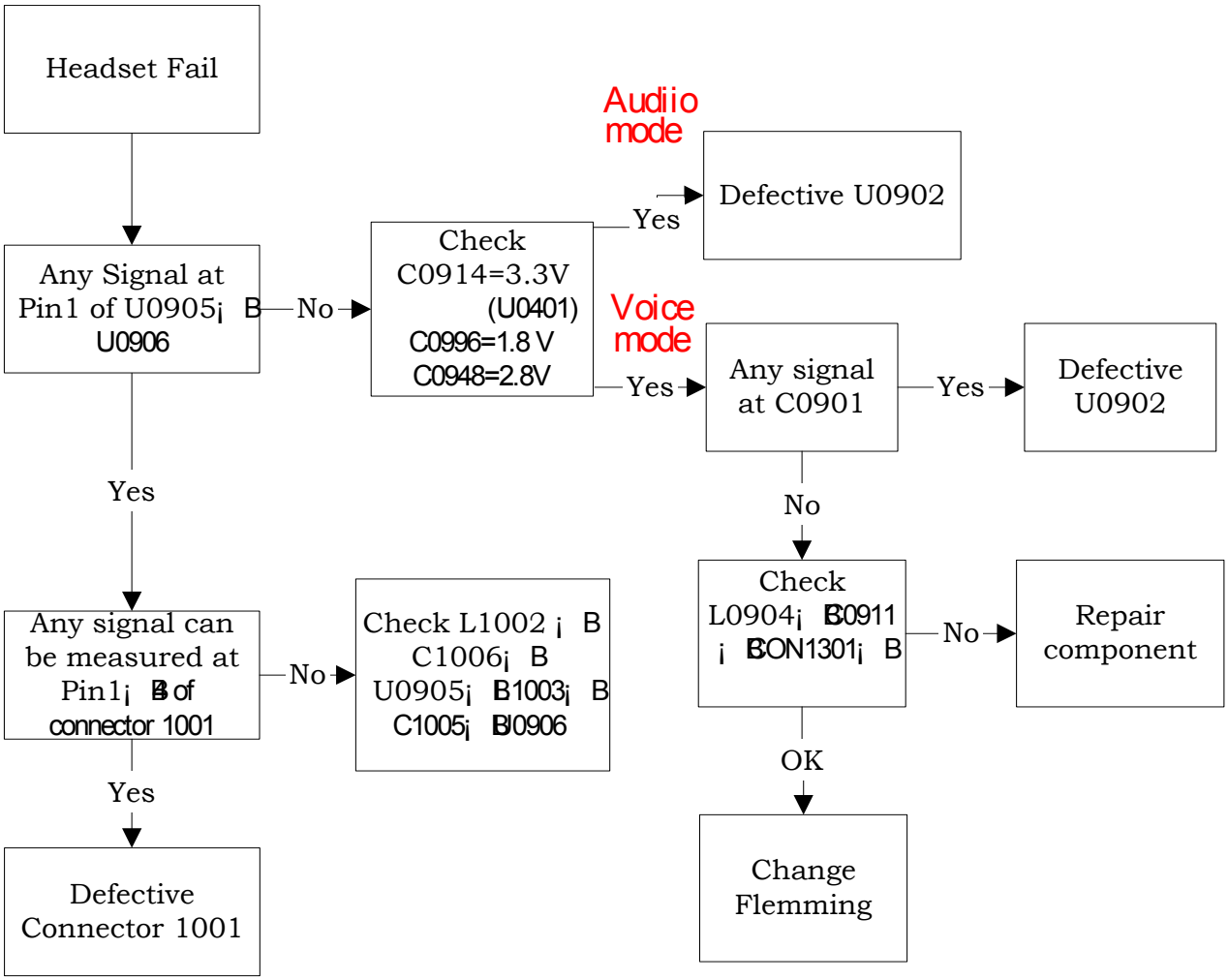
The SIM interface can be checked tested without a SIM Card. When the phone is switched on, all interface lines (SIMVDD, SIMRST, SIMCLK, SIMIO) rises. From checking those responses, it is possible to find errors in the SIM interface without a SIM Card.

5.4.1 Fault Finding Chart of “SIM detection Failed”

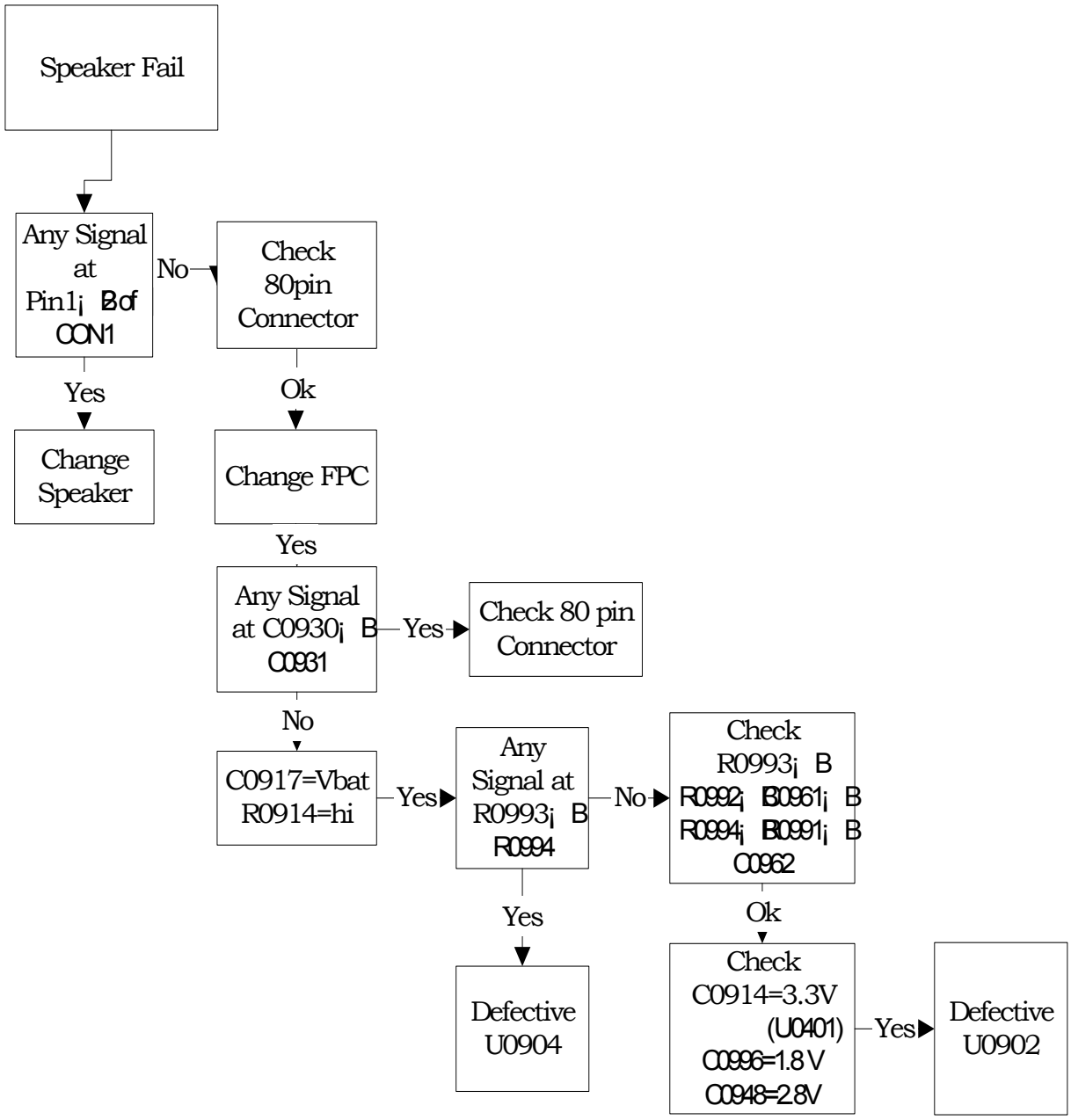


4.5 Audio Fault

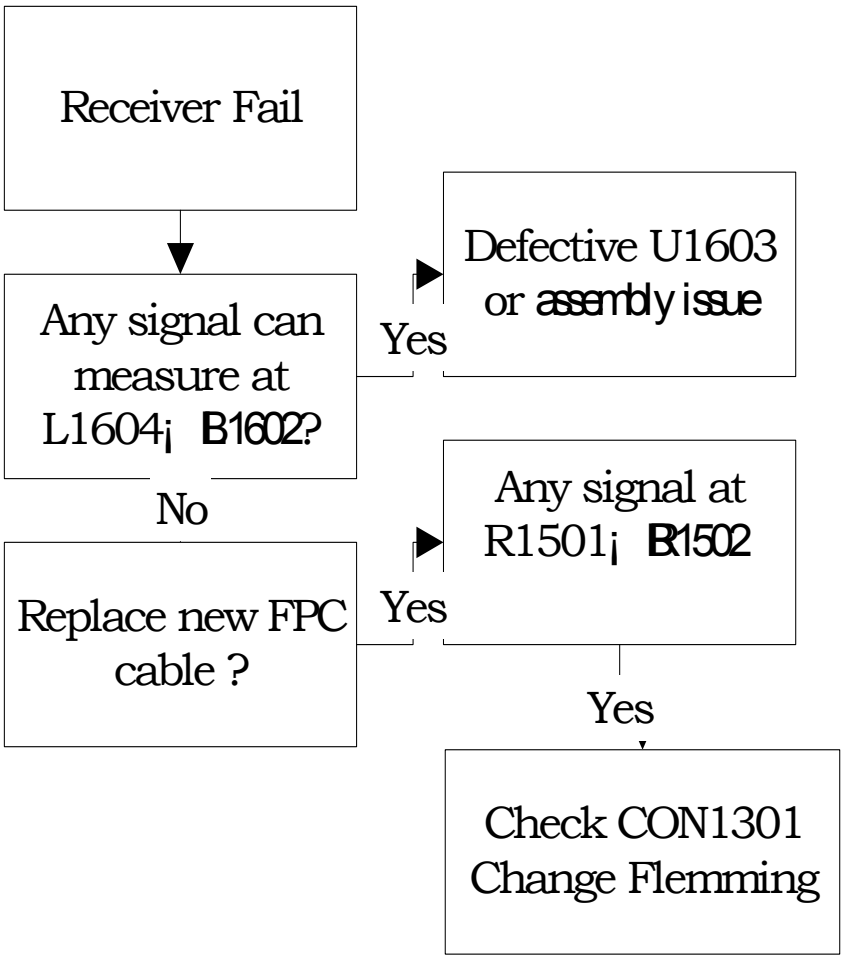
4.5.1 Headset fail



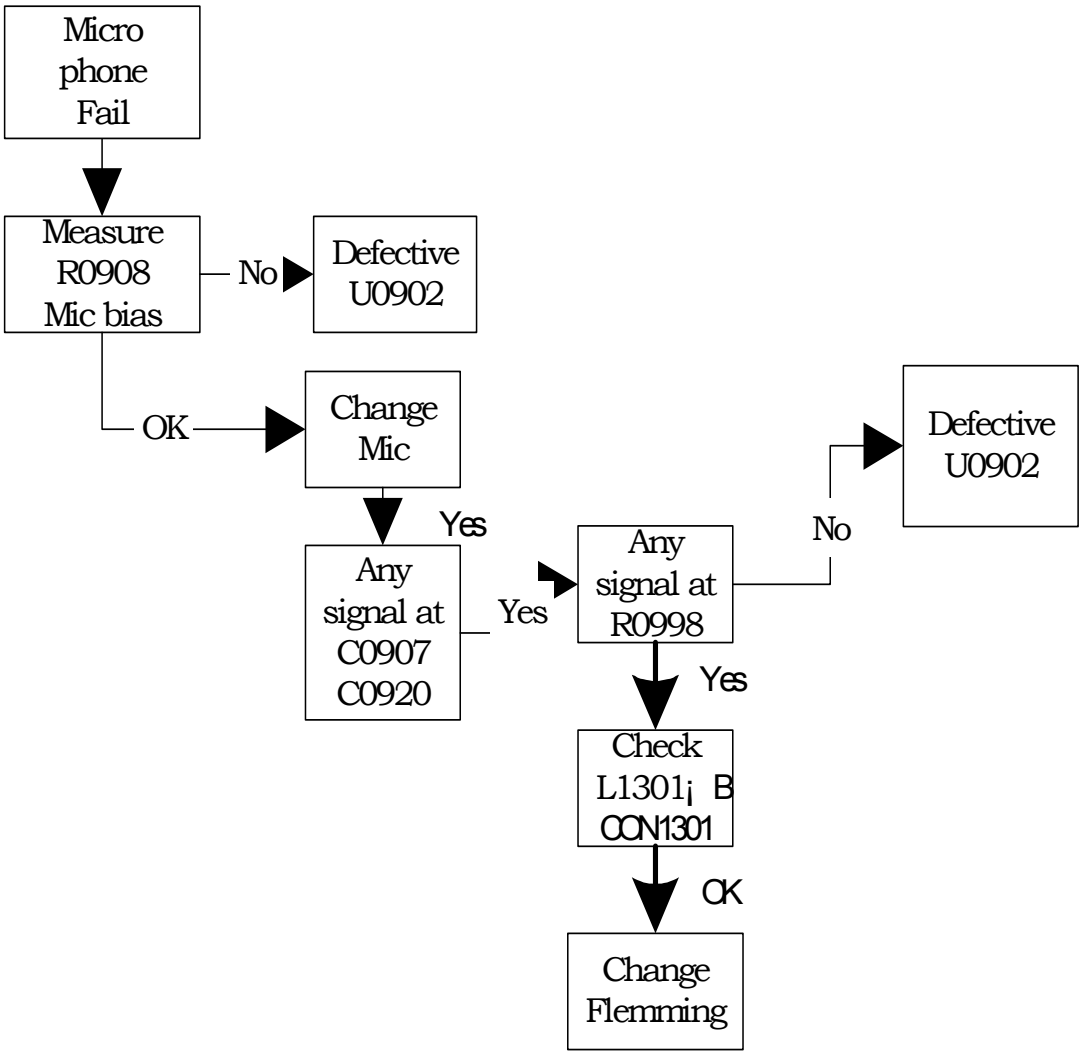
4.5.2 Speaker fail

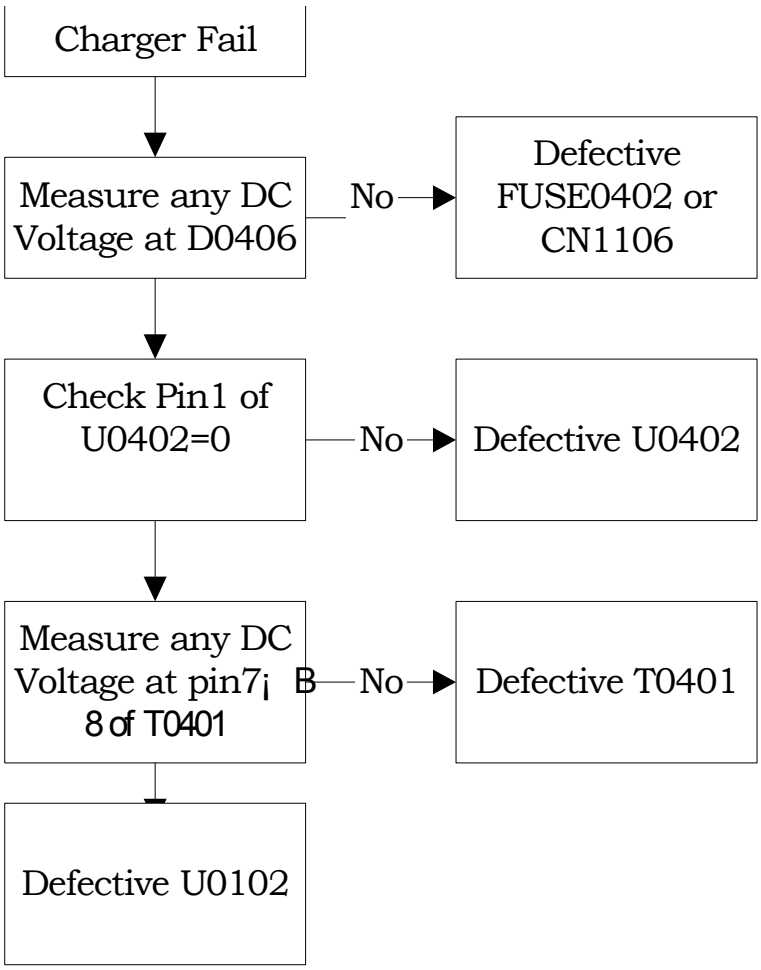


4.5.3 Receiver fail

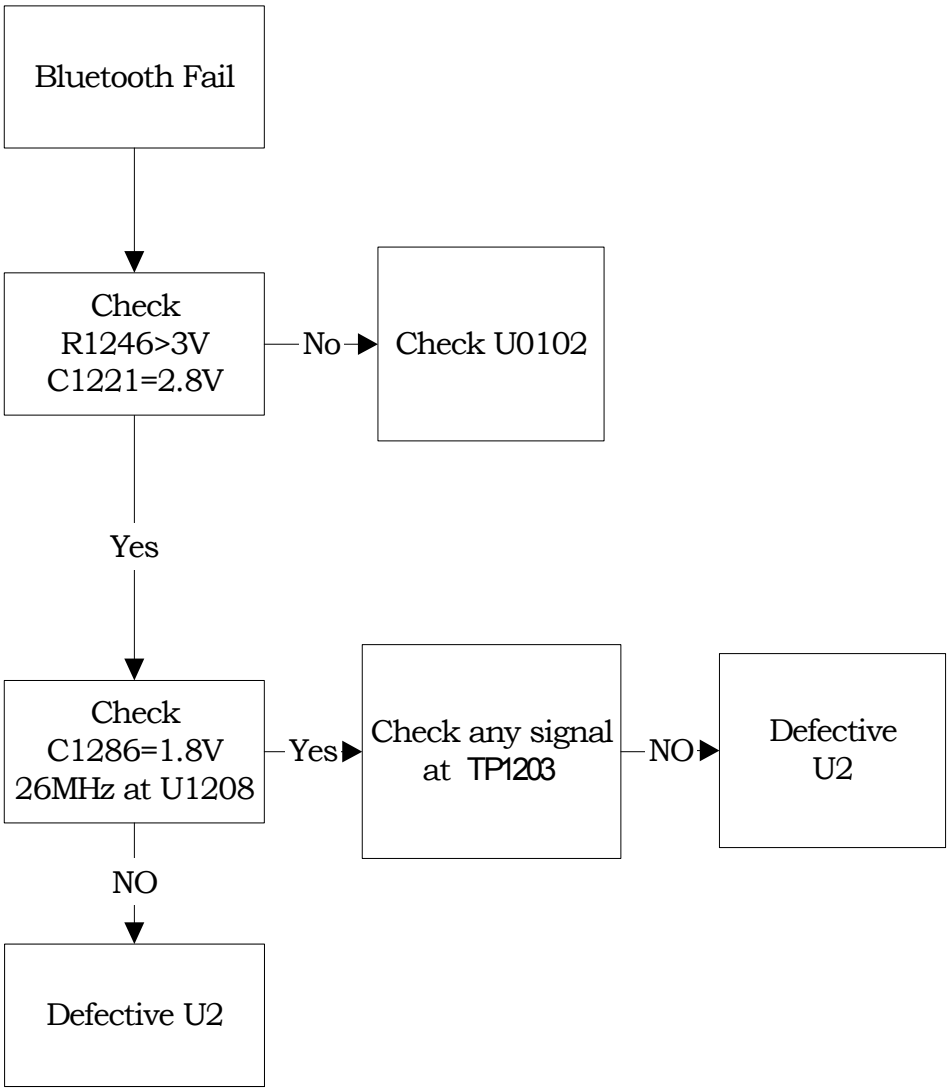


4.5.4 Microphone fail

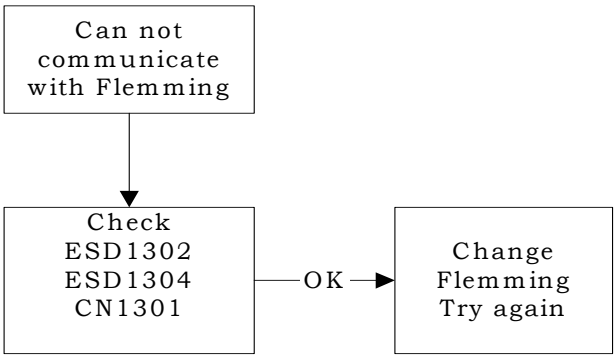



Charger Fail
Measure any DC Voltage at D0406
No
Defective FUSE0402 or CN1106
Check Pin1 of U0402=0
No
Defective U0402
Measure any DC Voltage at pin7¡ B 8 of T0401
No
Defective T0401
Defective U0102

4.7 Bluetooth fail



4.8 Can not communicate with Flemming

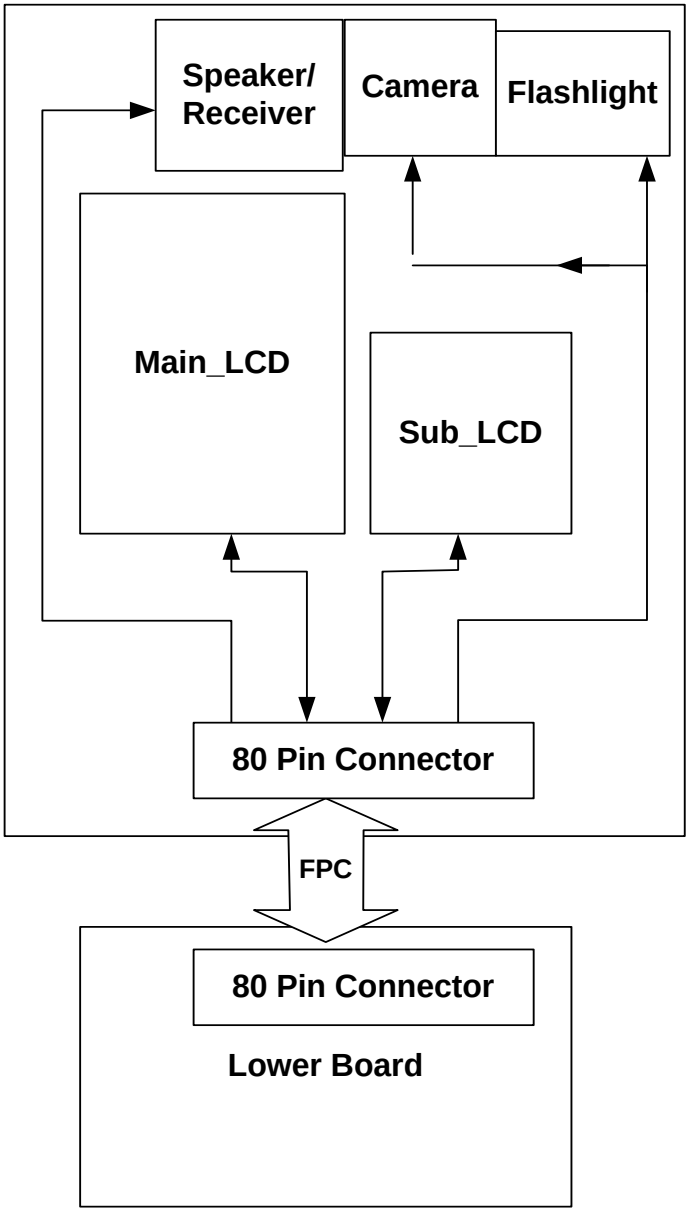


5 Each Faults Finding Chart for Upper PCB

The upper board for Mendelssohn circuit mainly consists of 5 parts: Main-LCD, Sub-LCD, Speaker/Receiver ,Camera and Flashlight.

The Main-LCD and Sub-LCD function are to show real time image or text message. The Speaker/Receiver function is to play real-time sound message about melody and voice.

The following block diagram of upper board for Mendelssohn



5.1 Upper board Test-points

Power supplies (upper board)					
C402	Vcmos	2.5V	Active state	Nominal 2.5V Min 2.4 Max 2.6	Supply for CMOS core

C401	2V75	2.8V	Active state	Nominal 2.8V Min 2.65V Max 2.95V	Supply for Main LCD Sub LCD CMOS IO
C1620	VLED	VLED	Active state	Nominal 10.5V Min V	Supply for LCM backlight
C1624	Vflash	Vflah	Active state	Nominal 10.5V Min V	Supply for Flashlight
Power supplies (Daughter board)					
C1613	VCC-SD	2.8V	Active state	Nominal 2.8V Min 2.65V Max 2.95V	Supply for MiniSD card

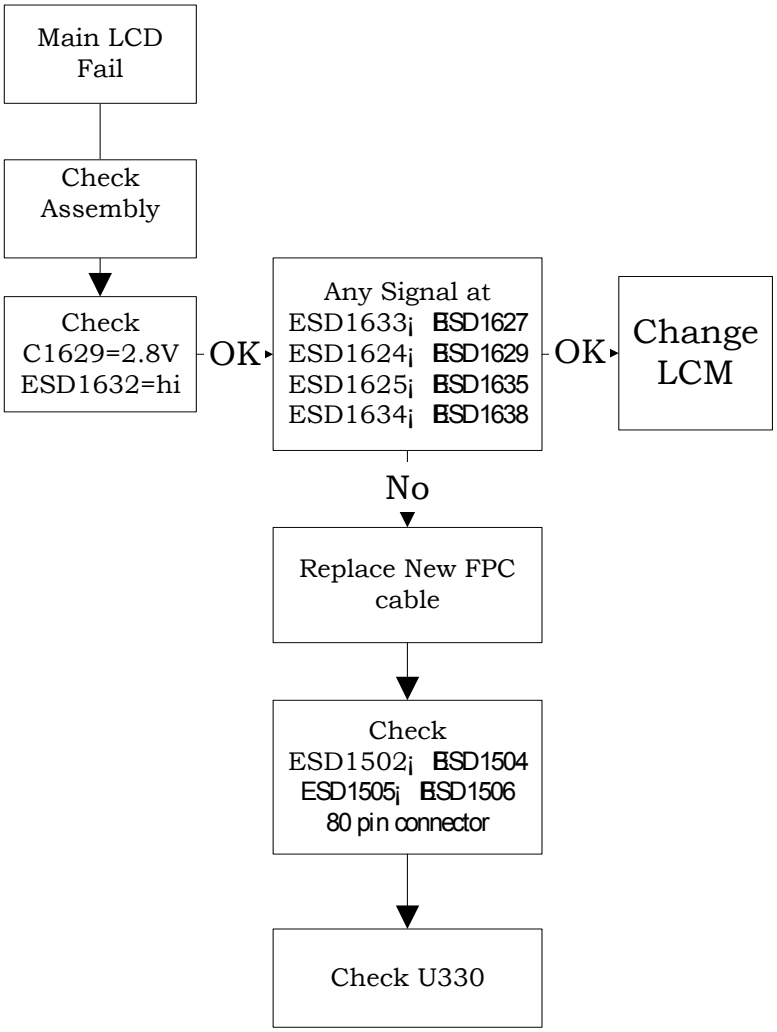
5.2 “Main-LCD or Sub-LCD is Dead”

5.2.1 Causes of “Main-LCD or Sub-LCD is Dead”

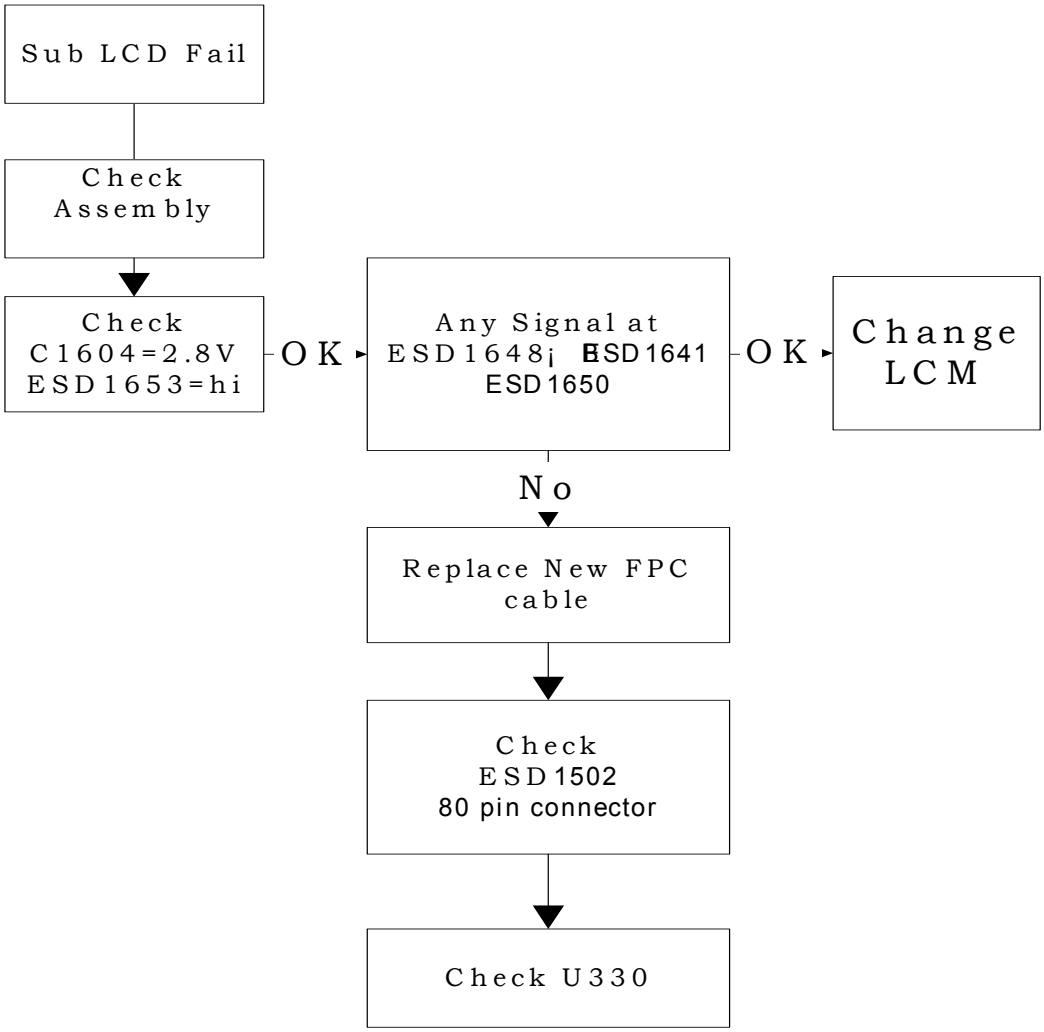
“Main-LCD or Sub-LCD is dead” means that the Main-LCD or Sub-LCD image when the power has been supplied to it. The causes of “Main-LCD or Sub-LCD is Dead” could be one of the following reasons:

- Defective 2.8V at U411 or C402
- Defective Main-LCD or Sub-LCD .
- Defective 80 Pin Connector for upper board
- Defective PCB

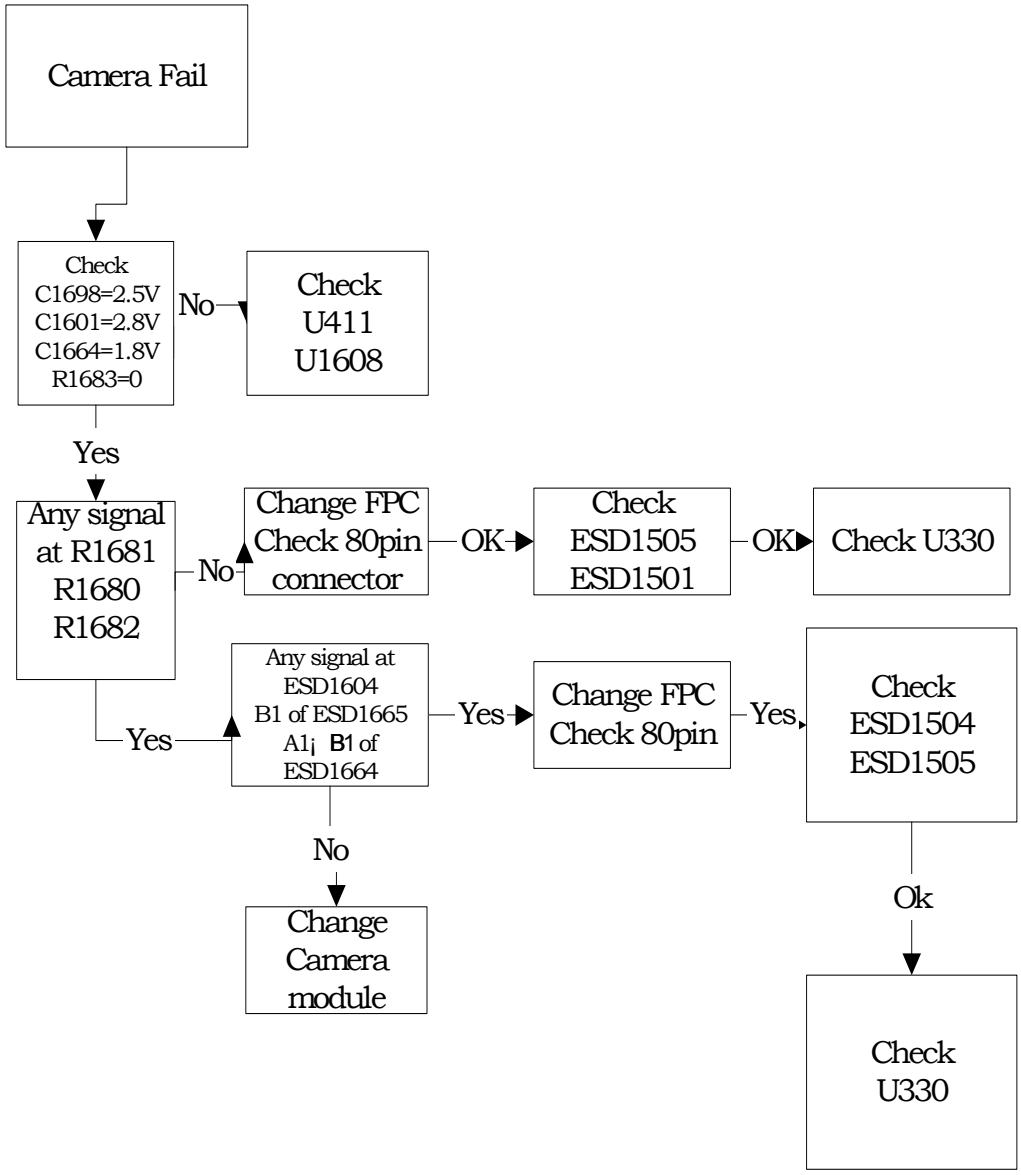
5.2.2 Faulting Finding Chart of “Main-LCD is Dead”



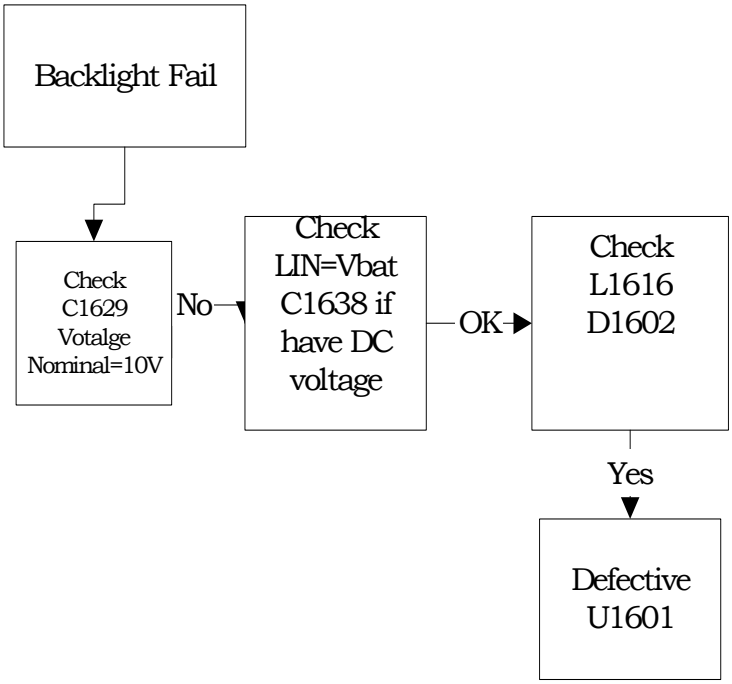
5.2.3 Faulting Finding Chart of “SUB-LCD is Dead”



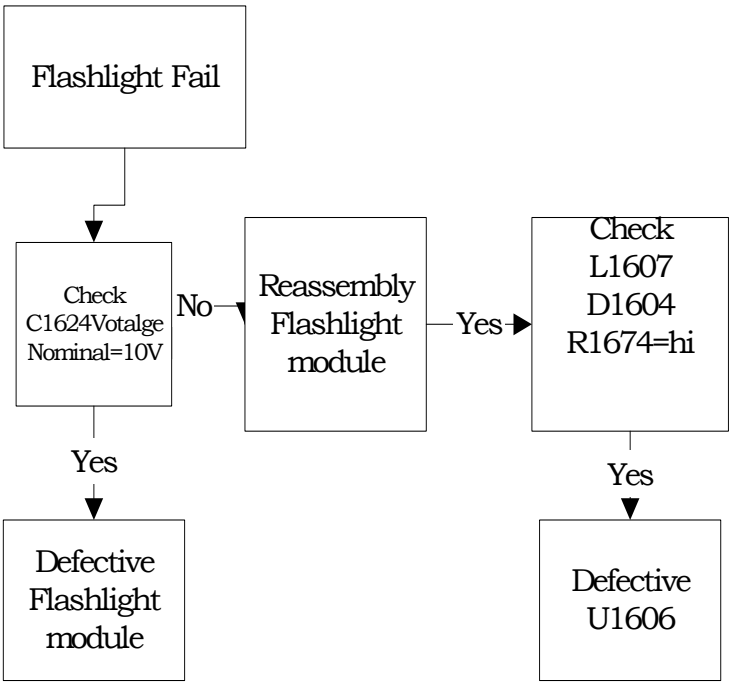
5.3 Camera is Dead



.4 Backlight is Dead



5.5 Flashlight is Dead



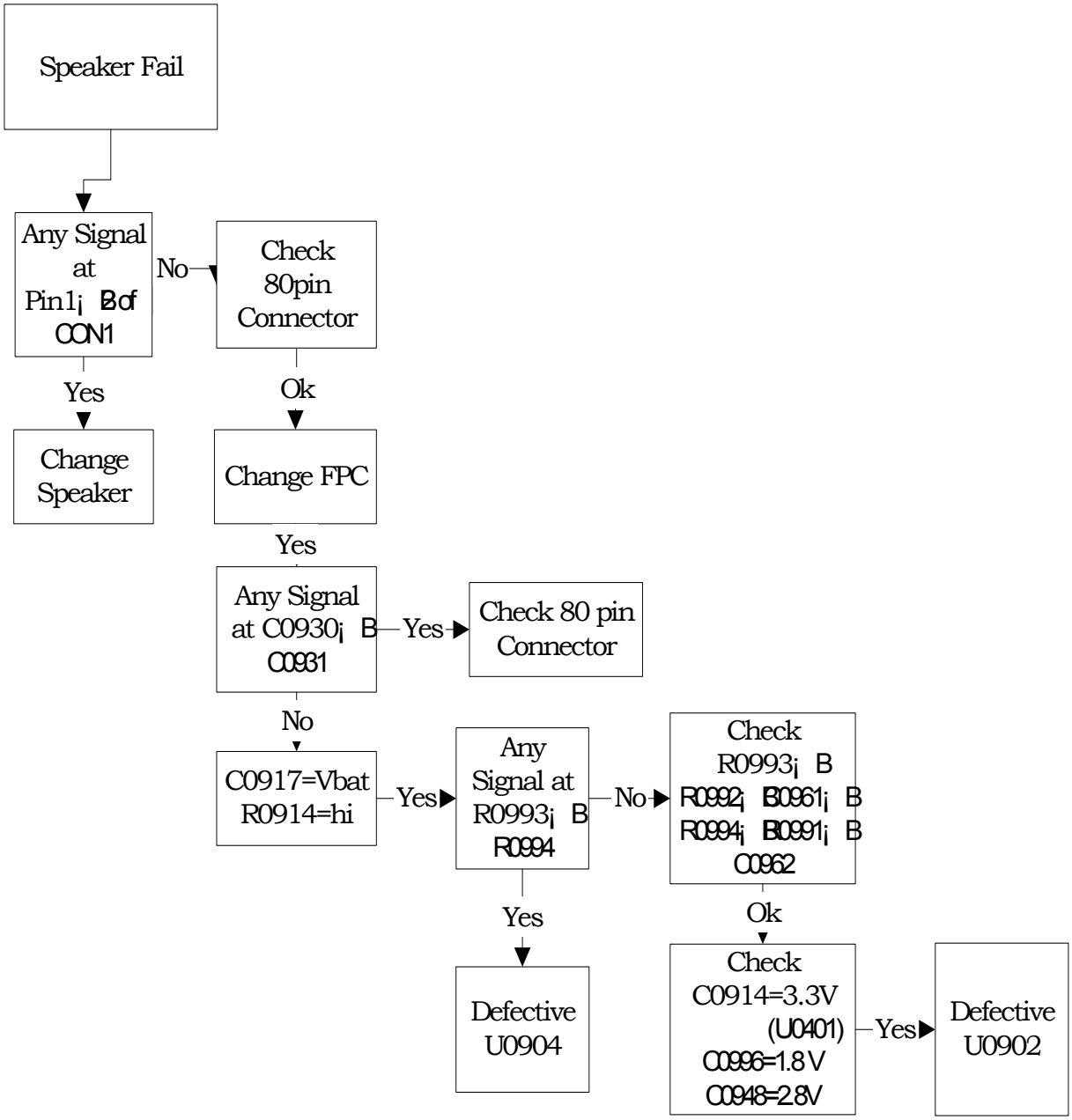
5.6 “Speaker is Dead”

5.6.1 Causes of Speaker is Dead”

Speaker is dead” means that the Speaker can’t play media audio, speech and melody when the power has been supplied to it. The causes of Speaker is Dead could be one of the following reasons:

- Defective Speaker connector cable fault.
- Defective Speaker Internal loop fault.
- Defective 80 Pin Connector for upper board.
- Defective OP Amp
- Defective Codec
- Defective PCB

5.6.2 Faulting Finding Chart of “Speaker is Dead”



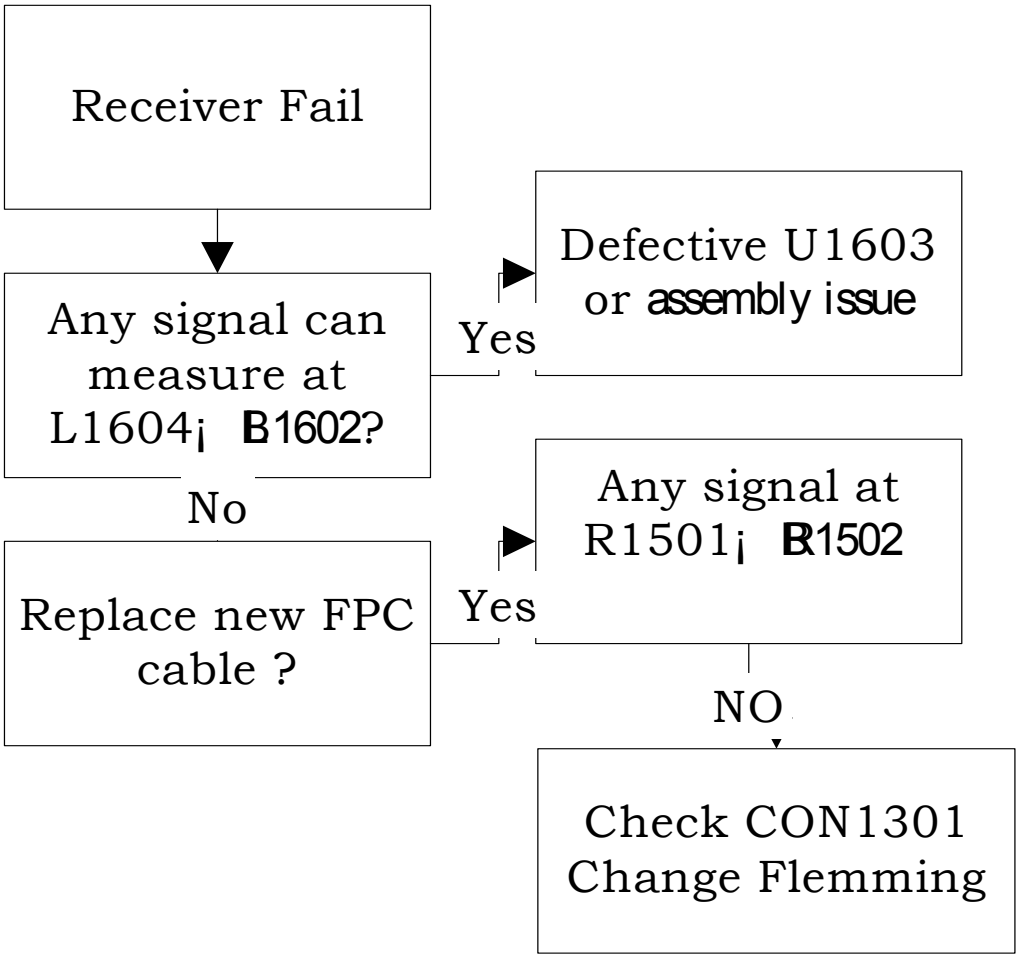
5.7 “Receiver is Dead”

5.7.1Causes of “Receiver is Dead”

“Receiver is dead” means that the Receiver can’t play, speech. The causes of “Receiver is Dead” could be one of the following reasons:

- Defective FPC cable fault.
- Defective Receiver Internal loop fault.
- Defective 80 Pin Connector for upper board.
- Defective Fleming.

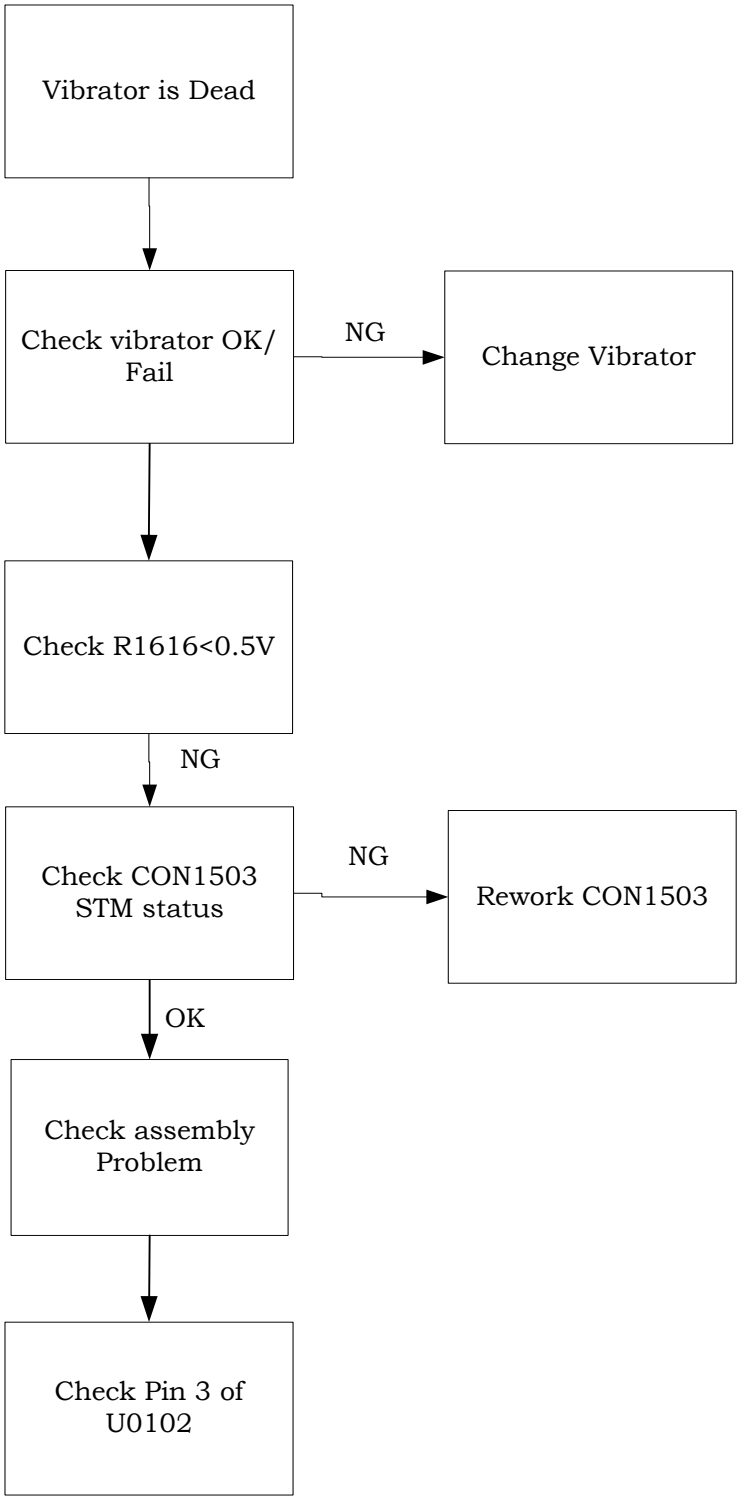
5.7.2 Faulting Finding Chart of “Receiver is Dead”



5.8 “Vibrator is Dead”

5.8.1 Causes of “Vibrator is Dead”

“Vibrator is Dead” means that the vibrator cannot vibrate when the mobile phone setting on vibrate mode. The causes of “Vibrator is Dead” could be one of the following reasons:

- Defective Vibrator fault.
- Defective U0102.
- Defective 20 Pin Connector for Daughter board.
- Defective PCB

5.8.2 Faulting Finding Chart of “Vibrator is Dead”