

ZE60xKL

CSC Training Guide



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ZE60xKL Outline

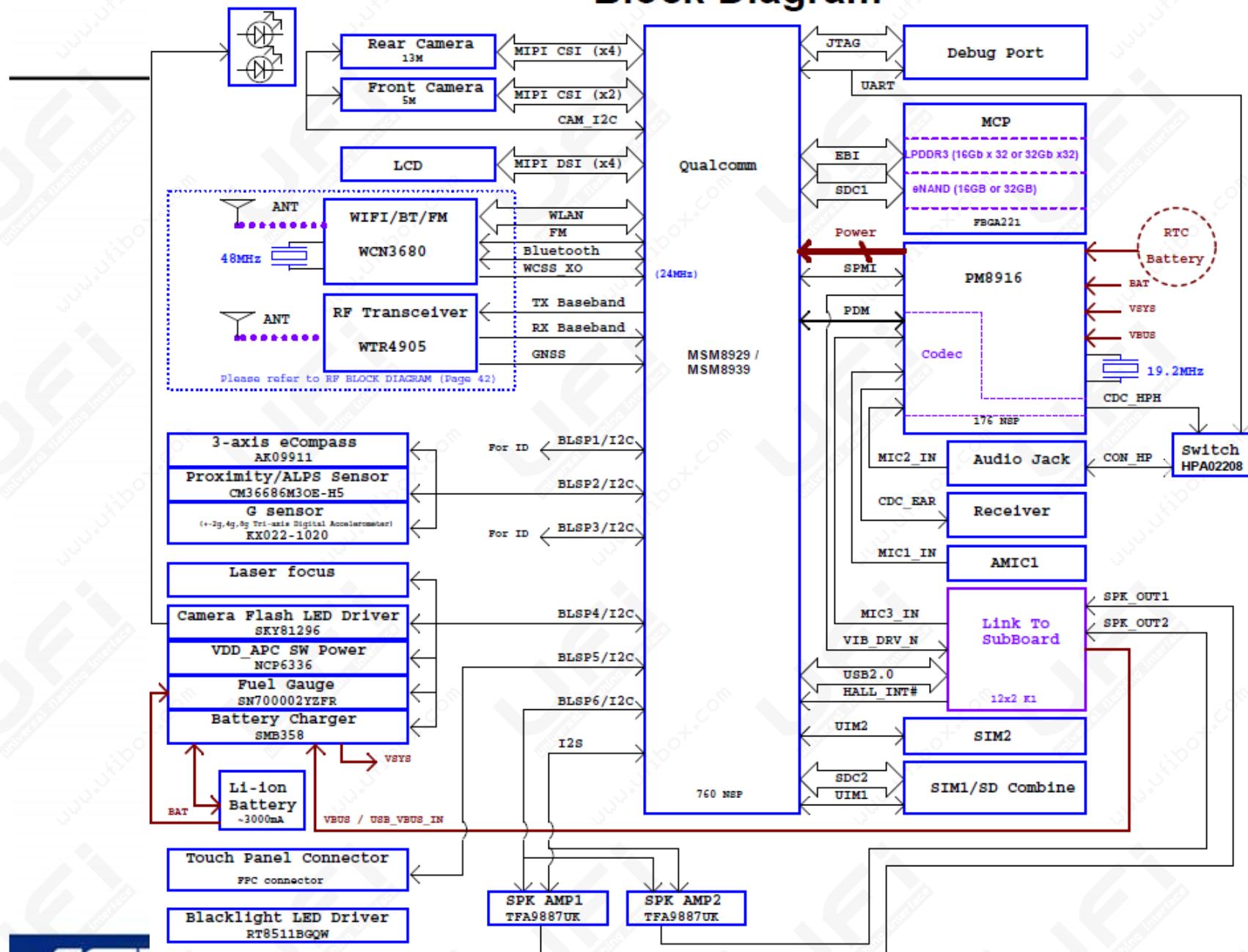
- System Block Diagram
- Component and PCB Board Introduction
- Power On Sequence
- Trouble Shooting Guide



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Block Diagram



ZE60xKL Outline

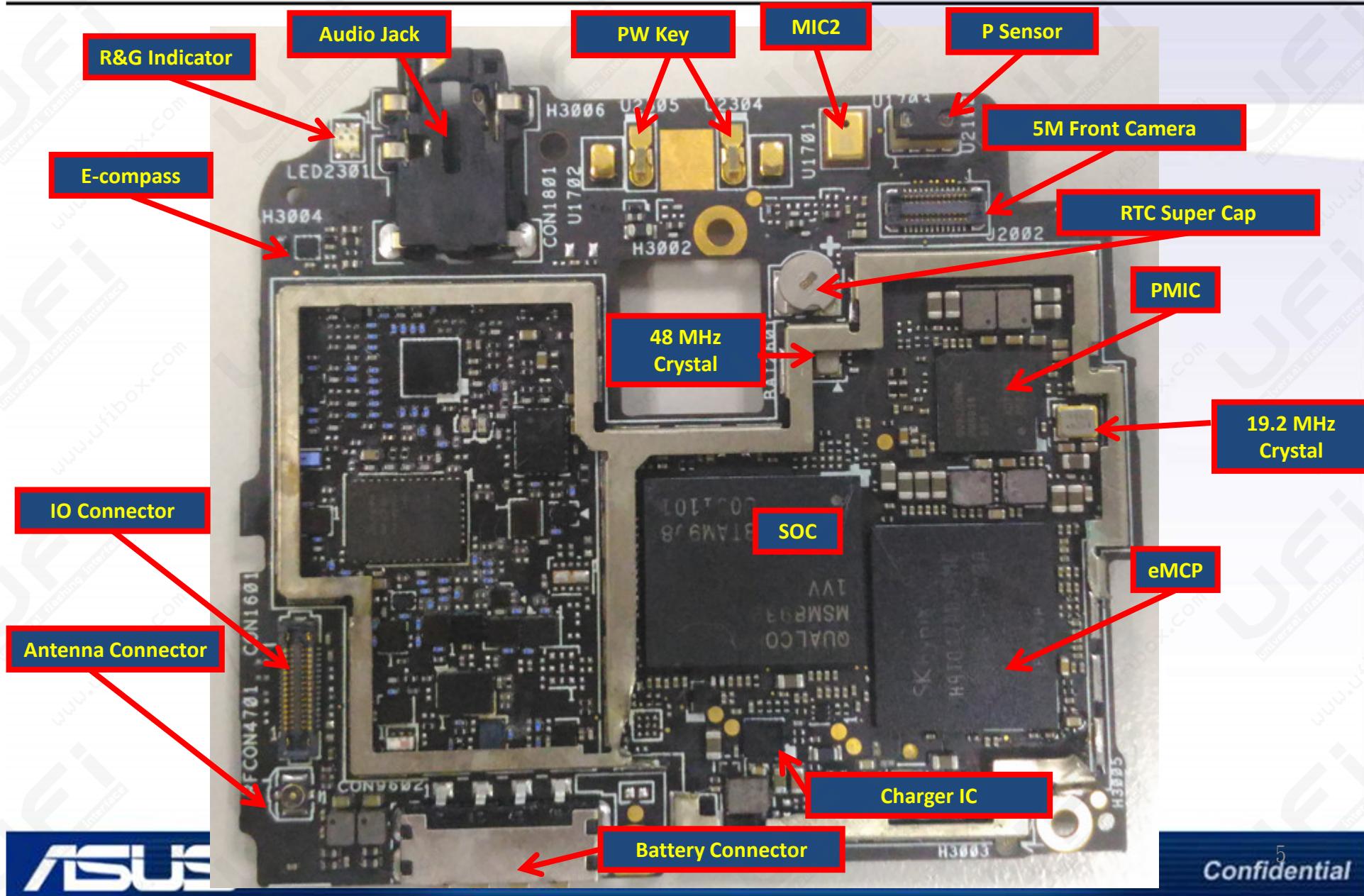
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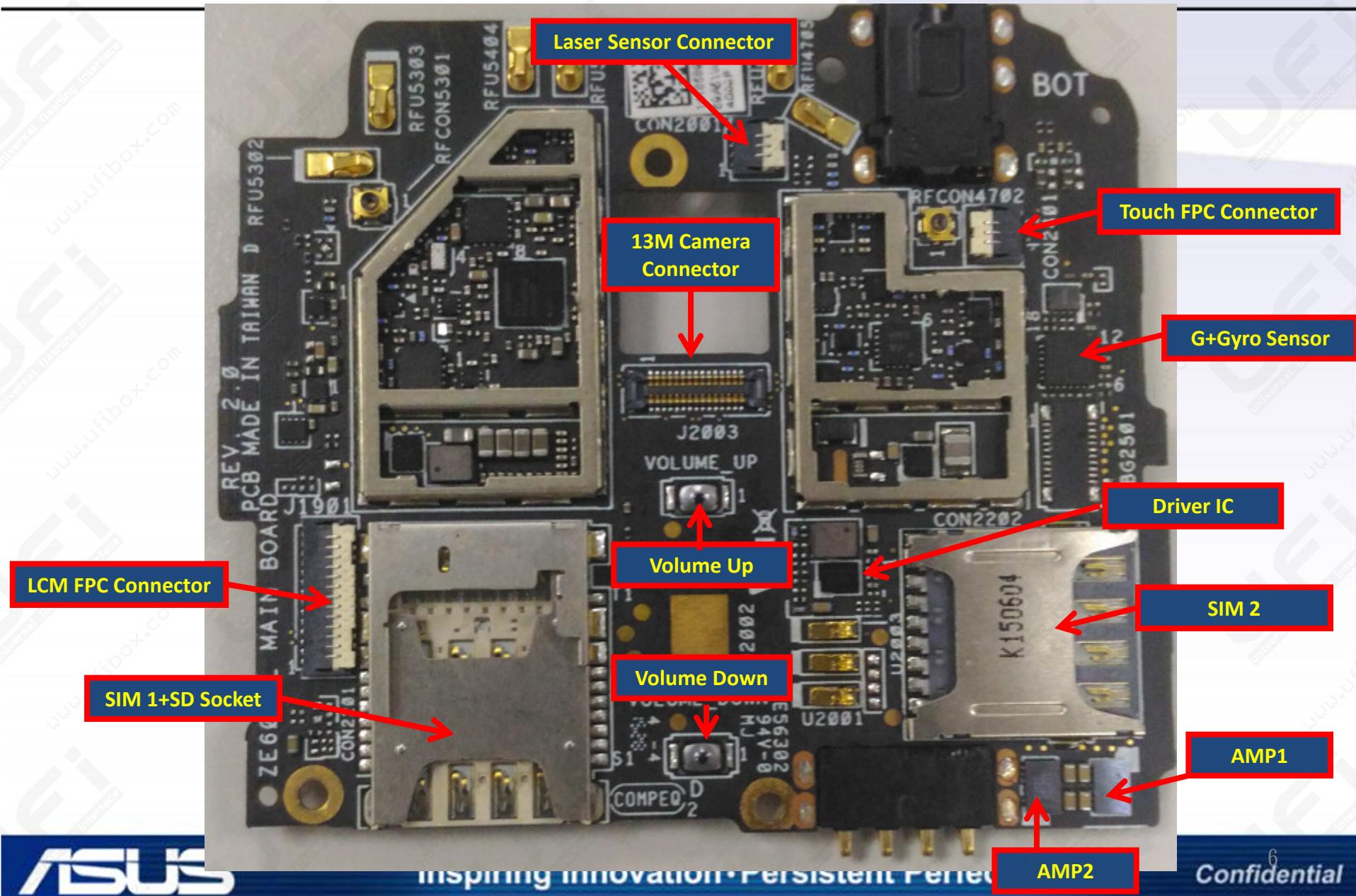
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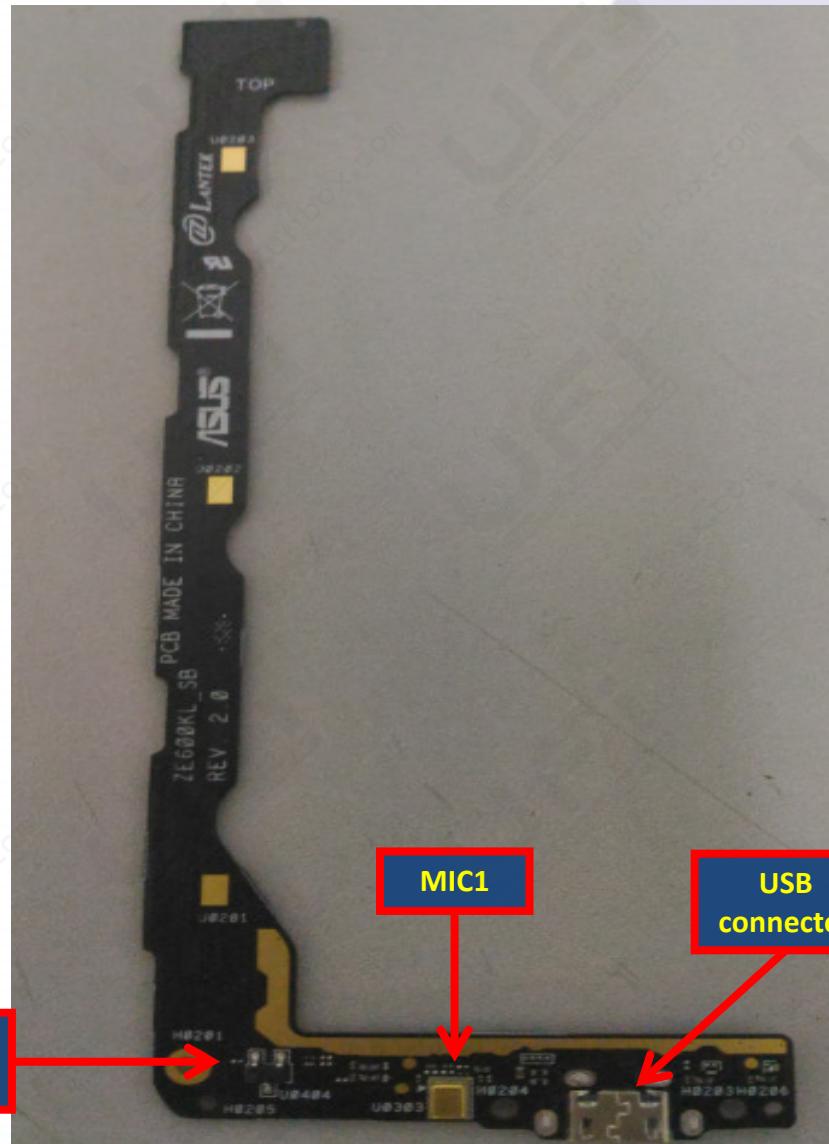
ZE60xKL 主要元件位置圖(TOP View)



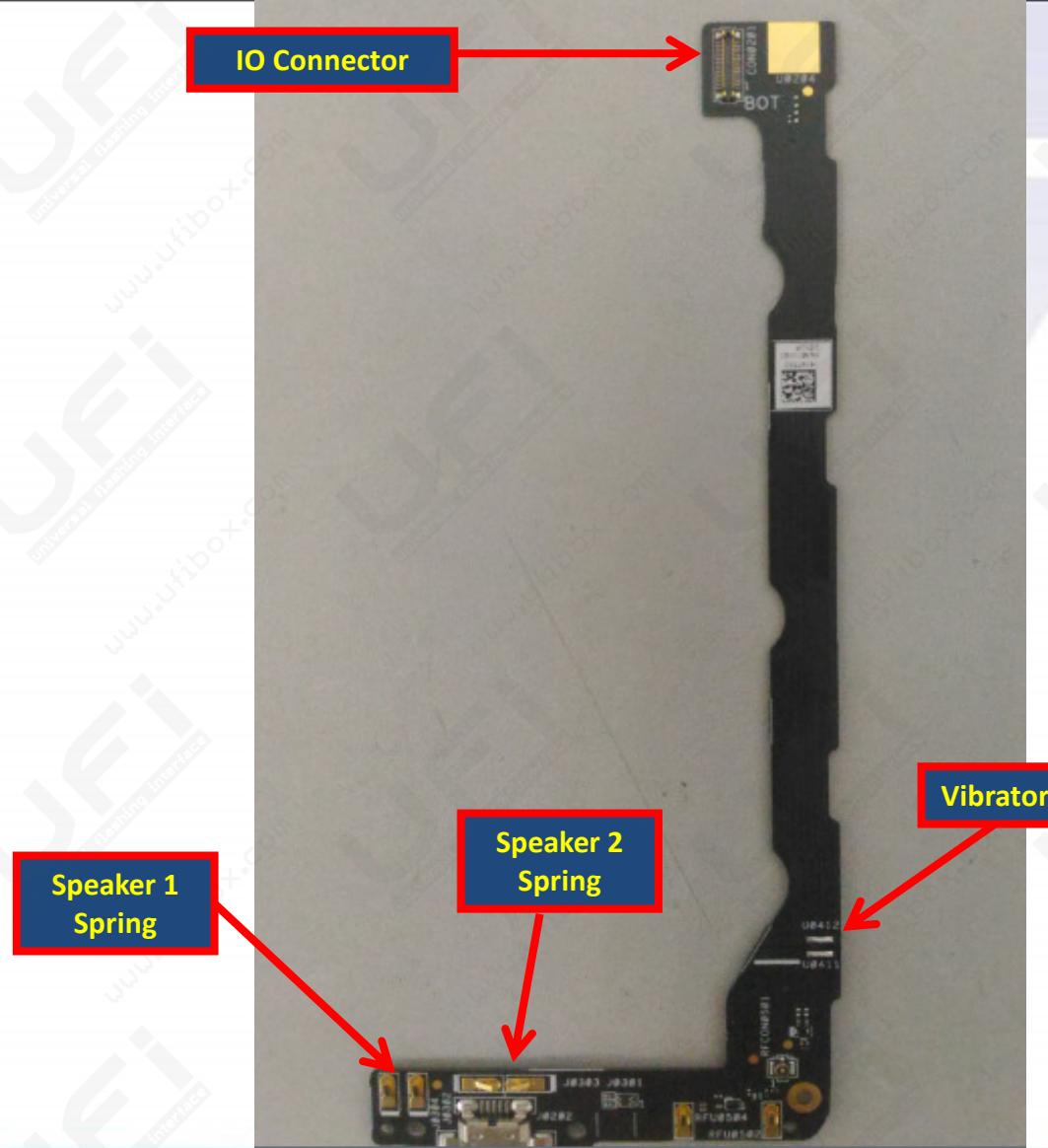
ZE60xKL 主要元件位置圖(BOT View)



ZE60xKL S/B 主要元件位置圖(TOP View)



ZE60xKL S/B 主要元件位置圖(BOT View)



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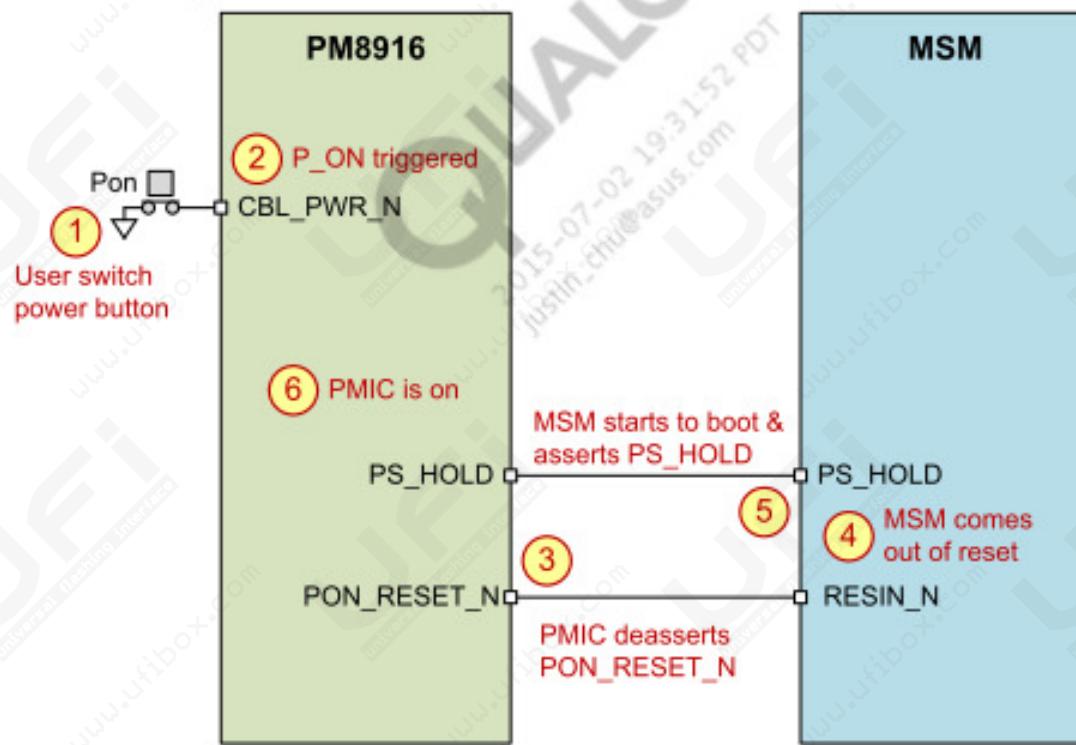
ZE60xKL Power Sequence

Power sequence

1. **VSYS**
1 -> 1.1 : > 0 ms
(Depend on GPIO (LCD_BL_EN))
1 -> 1.2 : > 0 ms
(Depend on GPIO (CAM_FLASH_EN))
1 -> 1.3 : > 0 ms
(Depend on SW setting (RFFE1_DATA & RFFE1_CLK))
1 -> 2 : > 0 ms
 1.1 **V_LED**
 1.2 **FLED_DRIVER_FLED**
 1.3 **VPH_PWR_RF_VCC**
2. **KPD_PWR_N**
2 -> 3 : > 0 ms
(80-nk808-1 Rev.F / P.67)
3. **VREG_S4_2P1**
3 -> 4 : = 4 ms
(80-nk808-1 Rev.F / P.67)
4. **VREG_S3_1P3**
4 -> 5 : = 2.4 ms
(80-nk808-1 Rev.F / P.67)
5. **VREG_L3_1P15**
5 -> 6 : = 340 us
(80-nk808-1 Rev.F / P.67)
6. **VREG_S1_1P15**
6 -> 7 : = 1.8 ms
(80-nk808-1 Rev.F / P.67)
7. **VREG_S2_1P15**
7 -> 8 : = 1.6 ms
(80-nk808-1 Rev.F / P.67)
8. **GPIO4 DO (VPH_PWR)
(+EXT-BUCK-S5)**
8 -> 9 : = 6.7 ms
(80-nk808-1 Rev.F / P.67)
9. **MPP1**
9-> 10 : = 725 us
(80-nk808-1 Rev.F / P.67)
10. **VREG_L5_1P8**
10 -> 11 : = 125 us
(80-nk808-1 Rev.F / P.67)
11. **VREG_L7_1P8**
11 -> 12 : = 25 ms
(80-nk808-1 Rev.F / P.67)
12. **BBCCLK1**
12 -> 13 : = 510 us
(80-nk808-1 Rev.F / P.67)
13. **VREG_L6_1P8
(+BMS Enable)**
13 -> 14 : = 210 ms
(80-nk808-1 Rev.F / P.67)
14. **VREG_L2_1P2**
14 -> 15 : = 350 us
(80-nk808-1 Rev.F / P.67)
15. **VREG_L13_3P075**
15 -> 16 : = 350 us
(80-nk808-1 Rev.F / P.67)
16. **VREG_L8_2P9**
16 -> 17 : = 350 us
(80-nk808-1 Rev.F / P.67)
17. **VREG_L12_SDC**
17 -> 18 : = 350 us
(80-nk808-1 Rev.F / P.67)
18. **VREG_L11_SDC**
18 -> 18.1 : = 25 us
(UP0108JDS4-33 / P.6)
- 18.1 **SD_EXT_LDO**
19. **PON_RESET_N**
19-> 20 : = 450 us
(80-nk808-1 Rev.F / P.67)
20. **PS_HOLD**

Power ON Sequence

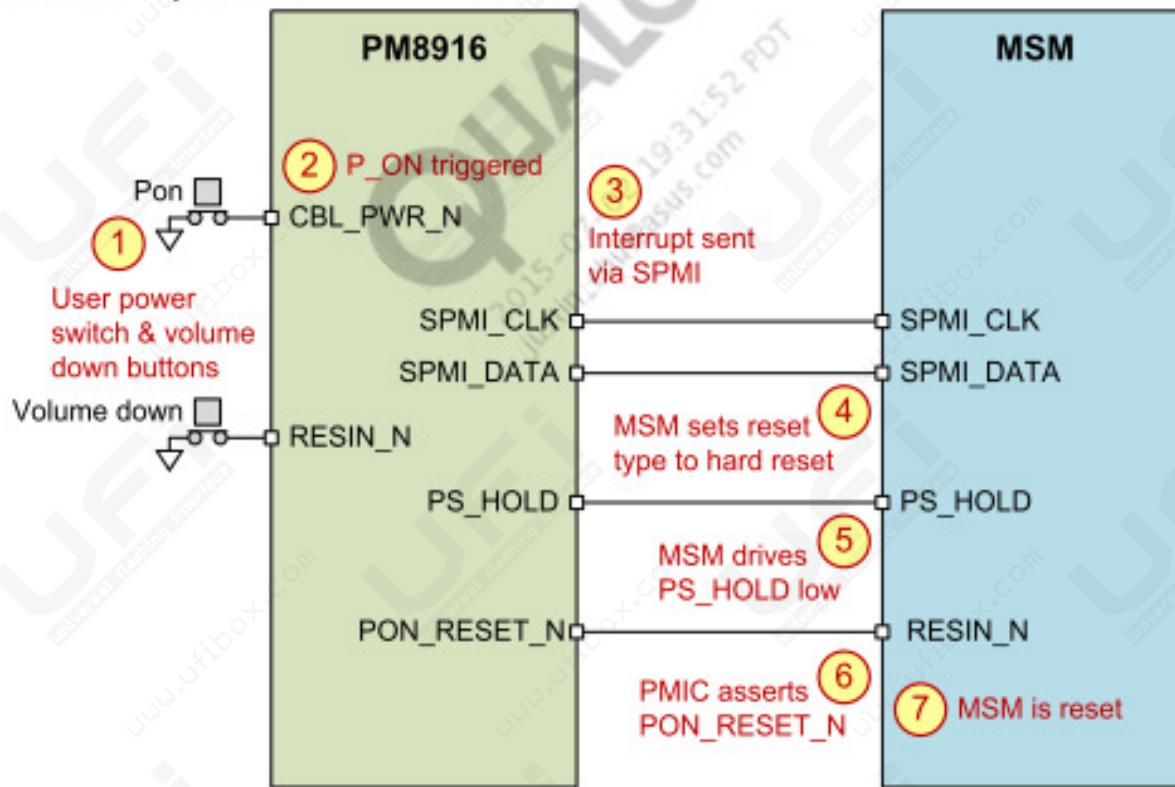
- Power-on sequence
- See *PM8916 Power Management Design Guidelines/Training Slides* (80-NK808-5) for more information.



Power Sequence - Hard Reset

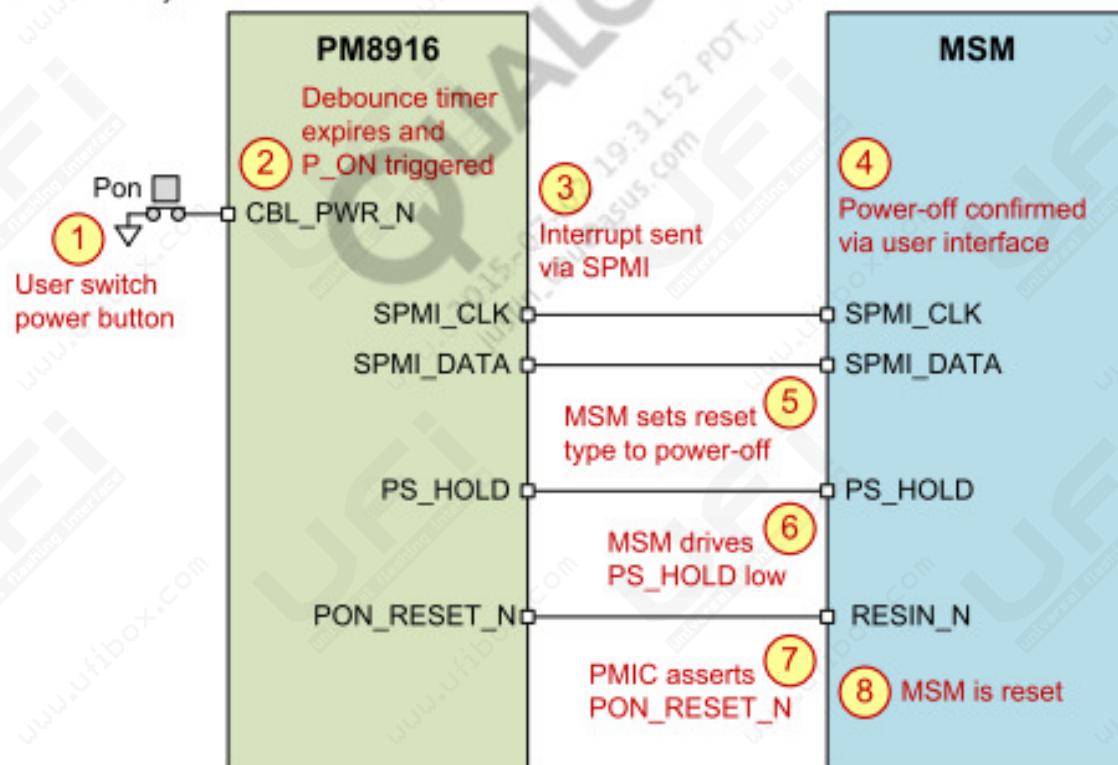
Hard reset

See PM8916 Power Management Design Guidelines/Training Slides
(80-NK808-5) for more information.



Power OFF Sequence

- Power-off sequence
- See *PM8916 Power Management Design Guidelines/Training Slides* (80-NK808-21) for more information.



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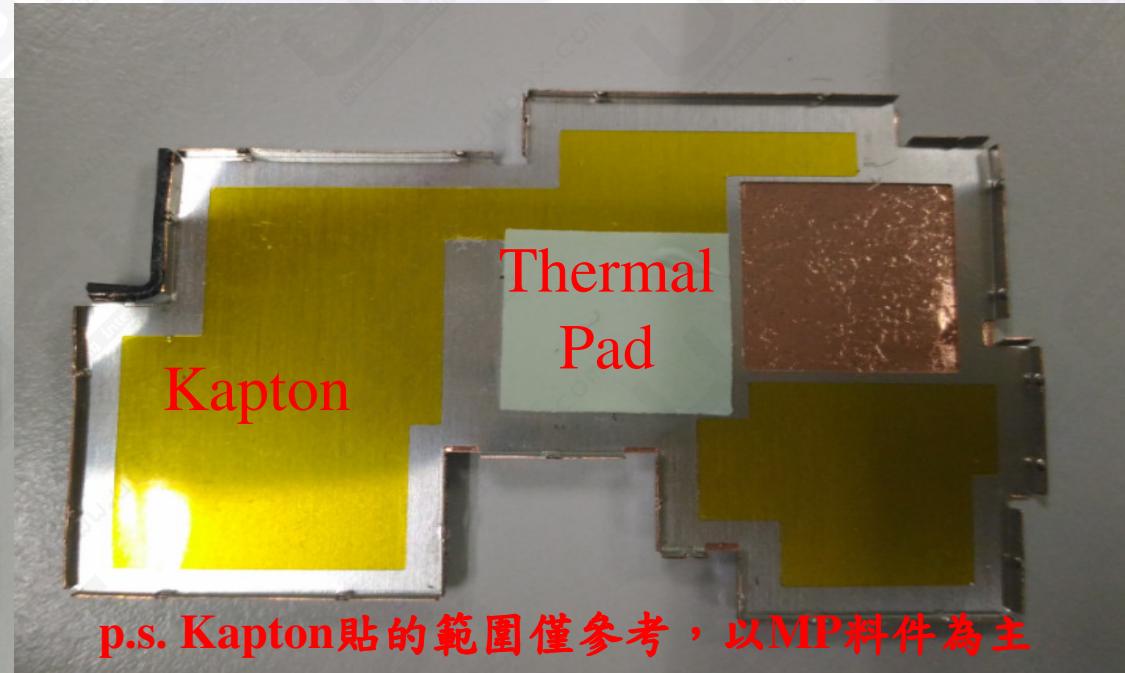


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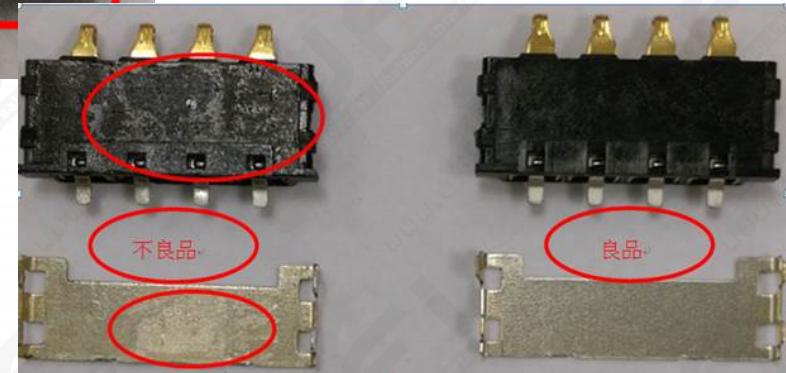
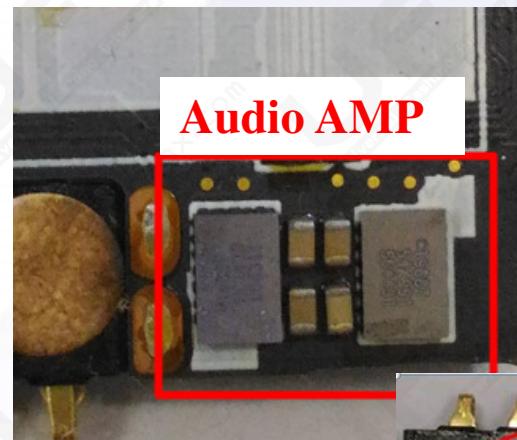
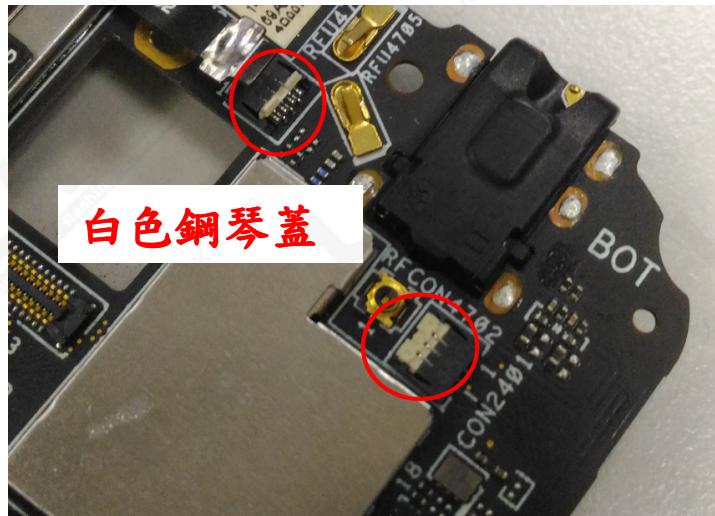
維修注意事項

1. Shielding 為一次性，**拆開後請更換新的**
2. Shielding 請確認內部有如右下貼黃色 Kapton & Thermal Pad
3. Shielding 蓋回時，請確保**密合完全**



維修注意事項

1. 維修時請特別注意TP/Laser Connector，避免鋼琴蓋掉落
2. 請特別注意U2701、U2702**容易破裂**，非維修此兩顆晶體時，
請套上rubber保護
3. Rework時**請務必清洗助焊劑**，且避免流入Battery Connector
或其他元件中



Trouble Shooting Guide

1. 無法開機
2. LCM Display異常
3. Touch Panel觸屏異常
4. Camera異常
5. Audio相關不良
6. USB無法識別
7. Sensor
8. SD & SIM
9. Flash LED異常
10. 瞬間掉電 or reboot
11. Vibrator震感不對
12. 手機無法充電
13. 音量鍵/電源鍵按壓異常



1. 無法開機



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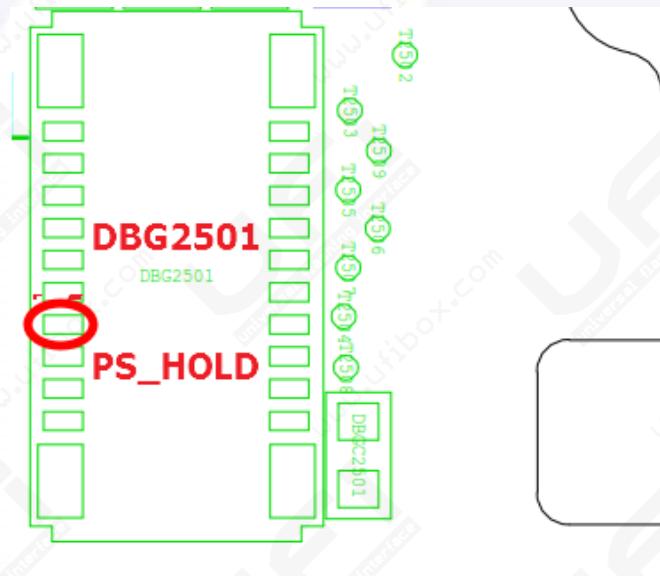
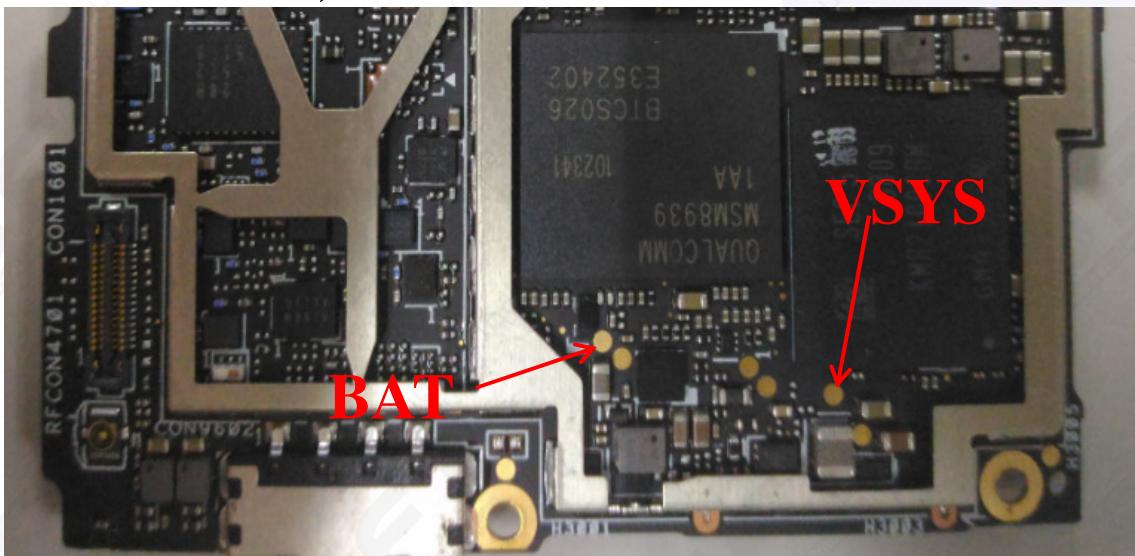
無法開機 Check List

1. 檢查**電池電量**是否充足，可插USB Cable充電開機測試
2. 量測電池電壓需為3.5~4.5V，**低於3.5V會無法開機**
3. Check Power Key FPC組裝是否異常或是FPC斷裂
4. 有振無顯 →check 是否LCD沒接好或是損壞
5. 按下power key，進入ASUS log後，黑屏，進不了系統
 - 重新燒錄image，如無法燒錄檢查eMCP (U1501) 本體及周邊元件，可以重新加熱U1501
 - 若無效，更換eMCP (U1501) or 更換WIFI IC (RFU4401)
 - 接上PC，若無法偵測的到，加熱SOC，如不行再更換SOC



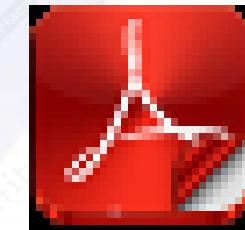
無法開機 Check List

1. 以電表量測量測power rail **是否有短路**(先量測BAT或VSYS)
2. Check **PS_HOLD** (DBG2501.13)是否有拉high(1.8V) , 此pin 拉 high 代表PMIC的Power rail 都有給電出來；如PS_HOLD 沒拉起，按照Power On sequence ，check 那組power fail
3. 量測PMIC的Crystal(X8501.1) , Clock 訊號是否正確(19 .2 MHz)
4. 量測WIFI的Crystal(RFX4401.1) , Clock 訊號是否正確(48 MHz)



無法開機 Check List

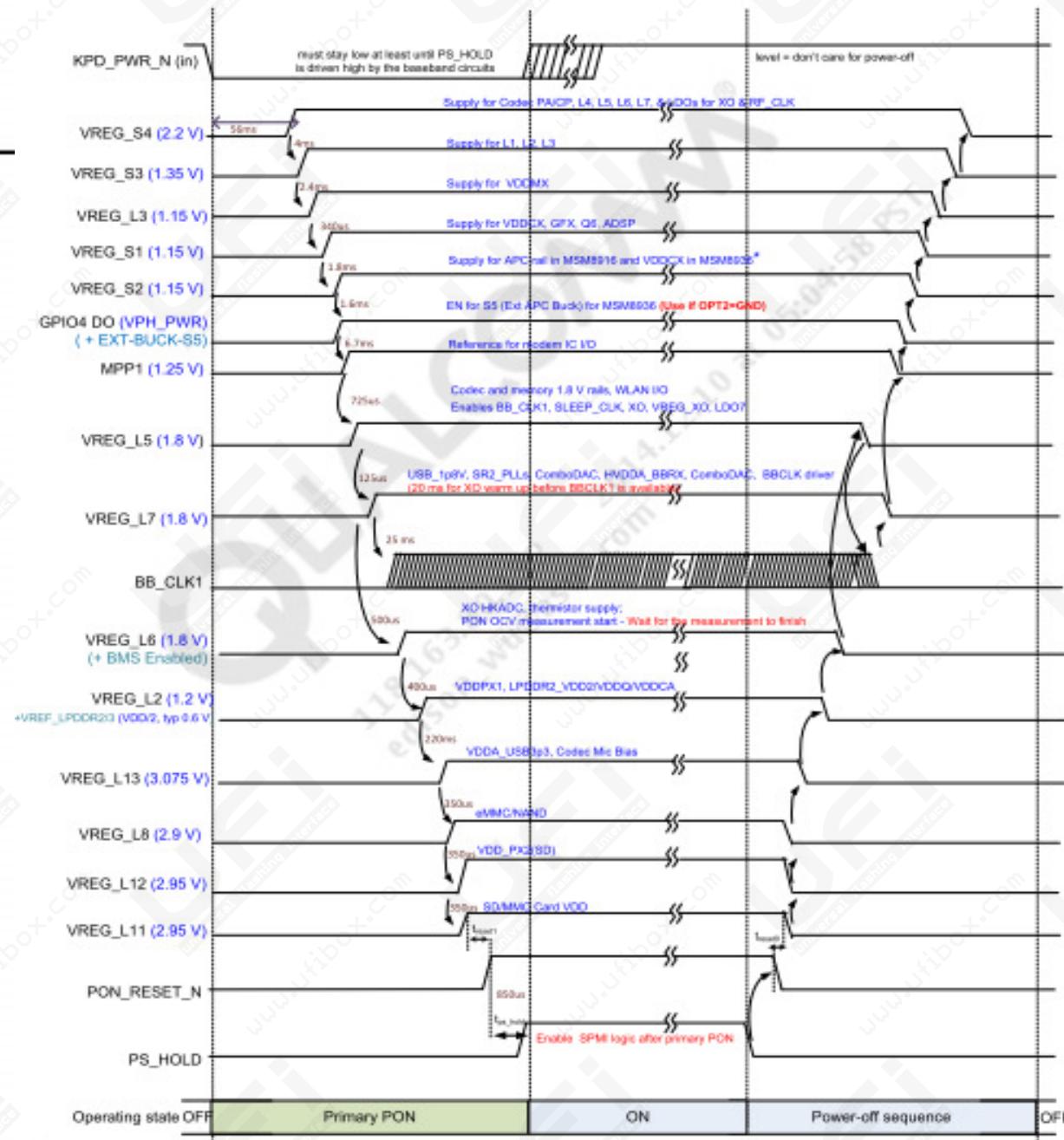
- 檢查以下Power Sequence是否對GND**短路**，若有短路請檢查該迴路元件
- 若沒有跟GND短路則依照順序確認電壓是否有起來
 1. VSYS (3.7~4.3V)
 2. KPD_PWR_N
 3. VREG_S4_2P1 (2.1V)
 4. VREG_S3_1P3 (1.3V)
 5. VREG_L3_1P15 (1.15~1.21V)
 6. VREG_S1_1P15 (1.15V)
 7. VREG_S2_1P15 (1.15V)
 8. EXT_BUCK_EN_GPIO_4(=>VREG_S5_1P15)
 9. VREG_L5_1P8 (1.78~1.8V)
 10. VREG_L7_1P8 (1.78~1.8V)
 11. VREG_L6_1P8 (1.78~1.8V)
 12. VREG_L2_1P2 (1.2V)
 13. VREG_L13_3P075 (3.075V)
 14. VREG_L8_2P9 (2.89~2.9V)
 15. VREG_L12_SDC (2.9V)
 16. VREG_L11_SDC (2.9V)
 17. SD_EXT_LDO (無SD 0V，有SD卡3V)
 18. PS_HOLD (1.78V~1.8V)



Power 位置圖

點擊開啟

Power Sequencing



2. LCM display 異常



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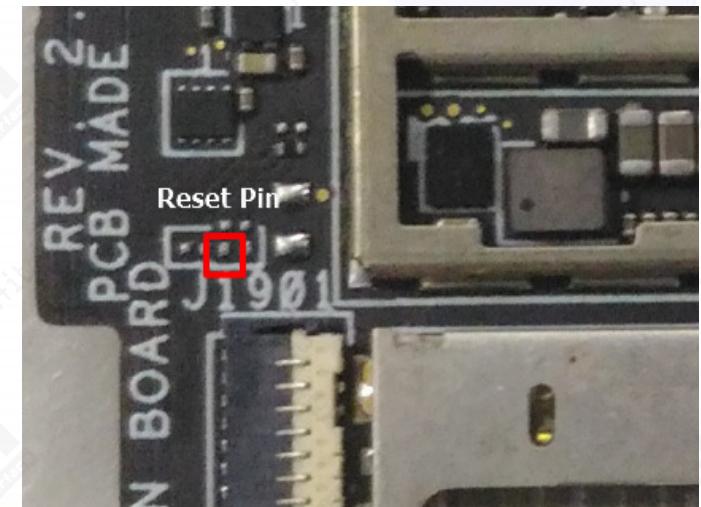
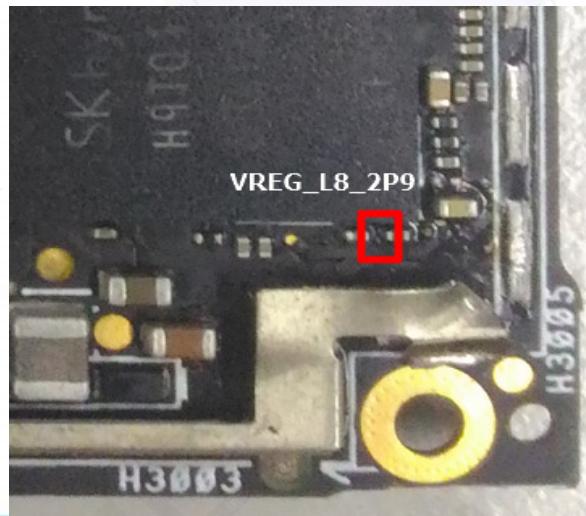
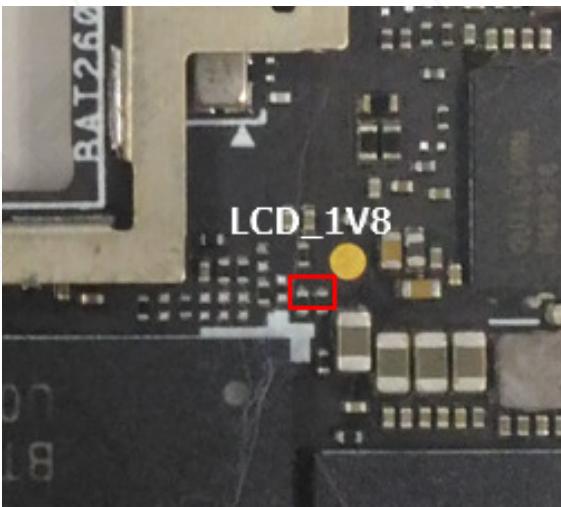
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LCM Display 異常

1. Check **LCM Connector** (J1901)是否正常
2. Check LCM FPC上的**金手指**是否有異常或斷裂
3. 更換LCD單體，確認是否為單體不良
4. 螢幕顏色異常或花屏，請確認 LCM connector是否接觸不良
5. 重新燒錄Image，**HD與FHD的image不可混用**(ZE600KL-HD, ZE601KL-FHD)，混用亦會造成無顯

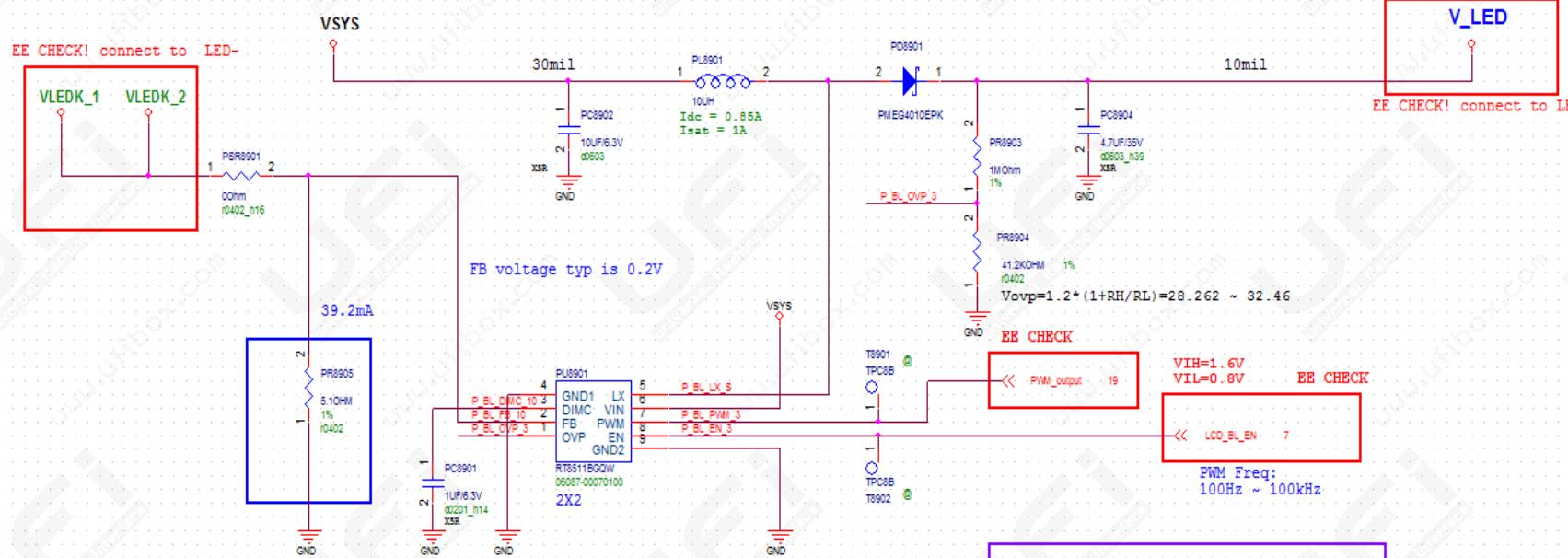
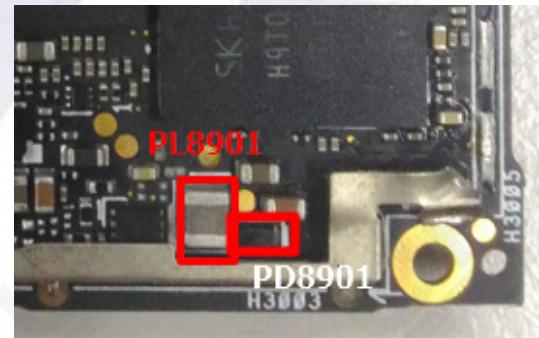
LCM Display 異常

1. Check LCD_1V8 是否有1.8V
2. Check VREG_L8_2P9 是否有2.85V
3. Check Reset Pin(D1901.1)是否有1.8V，若一直拉著low，請確認路徑上是否有異常
4. 若為BlackLight亮度不夠，請確認PR8905是否為5.1 Ohm



LCM Display 異常

- 確認V_LED電壓是否正常，升壓後電壓需>10V
- 確定LCD_BL_EN為high，且PWM_output有PWM輸入
- 確認PL8901與PD8901有無損壞



3. Touch Panel觸屏異常

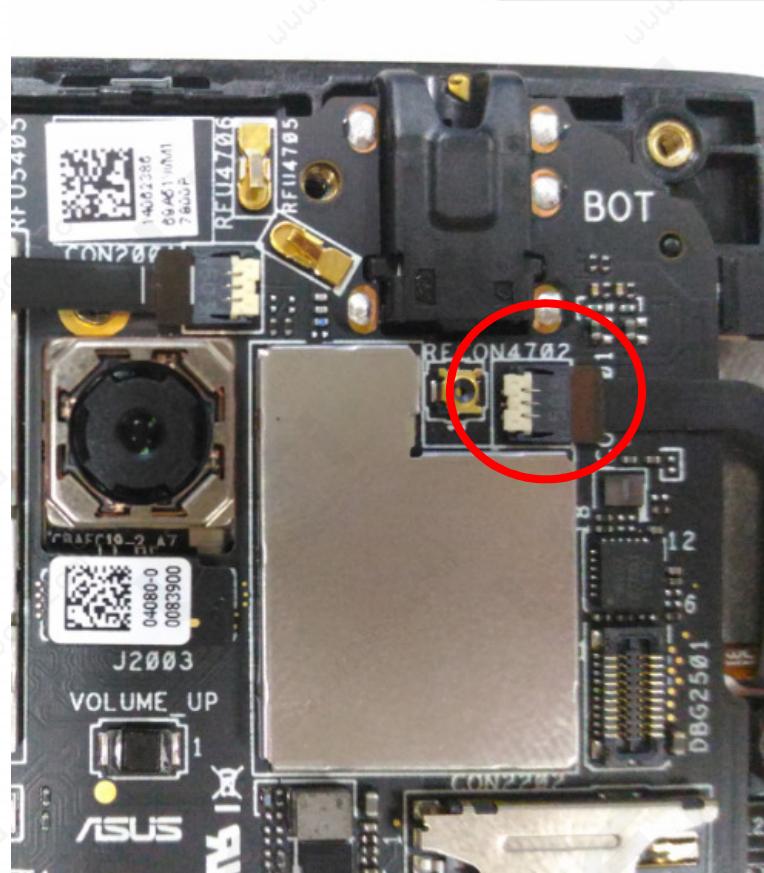


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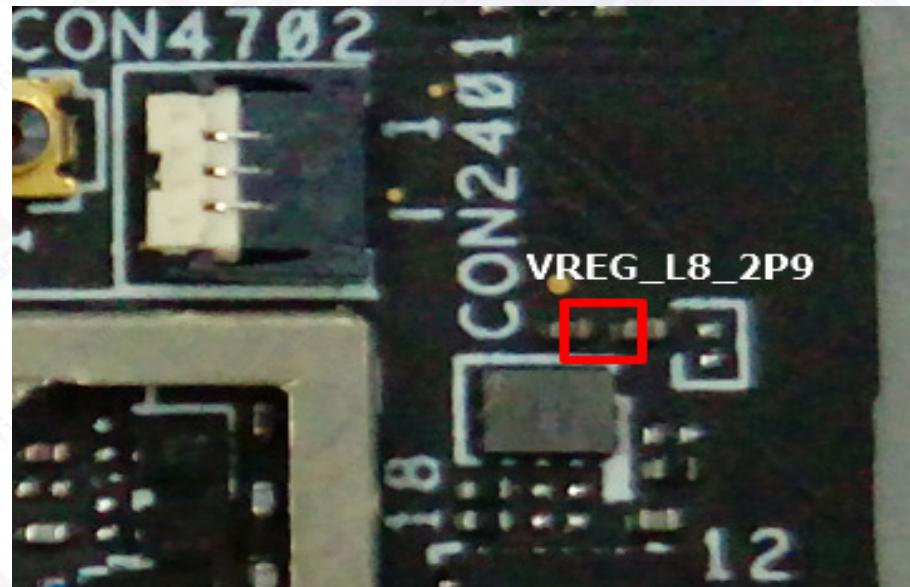
Touch 異常 or 無法觸屏

1. Check Touch Connector(CON2401) 是否正常，鋼琴蓋是否脫落(黑色易脫落)
2. 交換Panel確認TP正常



Touch 異常 or 無法觸屏

1. Check **VREG_L8_2P9** (C2406.1)是否為2.85V
2. Check **TP_I2C_SDA,TP_I2C_SCL**電壓準位是否為1.8V
3. Check Reset pin(T2402)是否為1.8V,如果一直拉low就Check TP_RST_N路徑是否有異常
4. 觸碰螢幕時TP_INT_N路徑是否有High-Low變化



4. Camera 異常



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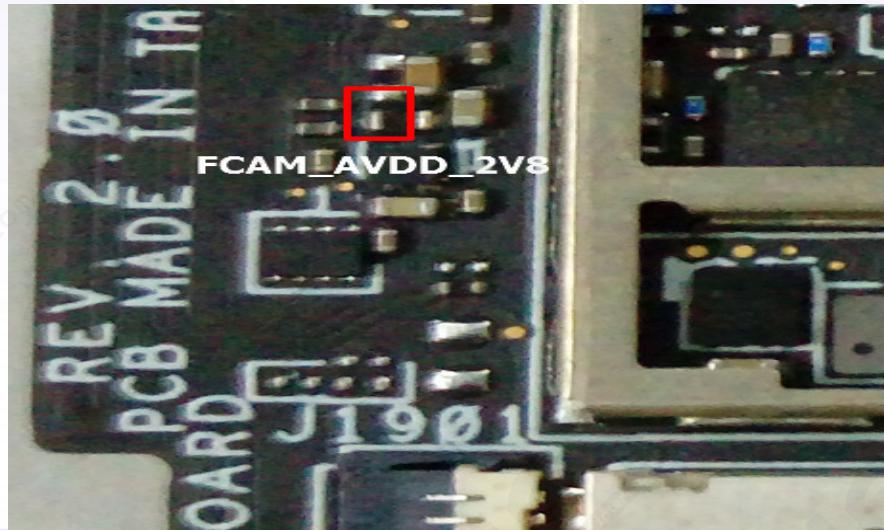
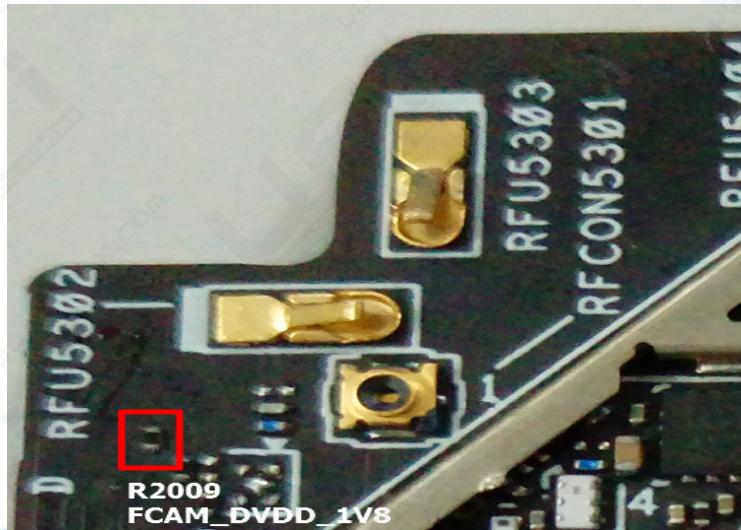
5M/13M Camera

1. 重新組裝5M/13M Camera Module確認是否有**接觸不良**
2. Check 5M/13M Camera module的**FPC**是否斷裂
3. 更換5M/13M Camera Module確認是否為Camera Module**本體不良**
4. Check **週邊零件**是否有**缺件,破裂**
5. Check 5M/13M **Camera Connector**(J2002/J2003)外觀是否異常

- module單體有問題時，只會有其中一個camera無法開啟
- 如果**同時5M and 13M camera無法開啟**時，請check camera相關power及I2C訊號(FCAM_AVDD_2V8、FCAM_1V2、FCAM_DVDD_1V8、CAM_I2C_SCL & CAM_I2C_SDA)

5M Camera

1. Check FCAM_AVDD_2V8電壓是否為2.8V,如無電壓請確認CAR2002/CAU2001有無上件
2. Check FCAM_1V2電壓是否為1.2V,如無電壓請確認CAR2001/CAU2002有無上件
3. Check FCAM_DVDD_1V8電壓是否為1.8V,如無電壓請確認R2009有無上件
4. 檢查CAM_I2C_SCL, CAM_I2C_SDA電壓準為是否為1.8V



13M Camera

1. Check MCAM_AVDD_2V8 電壓是否為2.8V,如無電壓請確認 CAR2002/CAU2001/R2007有無上件
2. Check MCAM_1V2 電壓是否為1.2V,如無電壓請確認 CAR2001/CAU2002有無上件
3. Check MCAM_DVDD_1V8 電壓是否為1.8V,如無電壓請確認 R2008/R2009有無上件
4. 檢查CAM_I2C_SCL, CAM_I2C_SDA 電壓準為是否為1.8V
5. 拔掉 **Laser sensor FPC** , 如果拔掉FPC後13M Camera可開啟，表示Laser IC異常



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5. Audio 相關不良

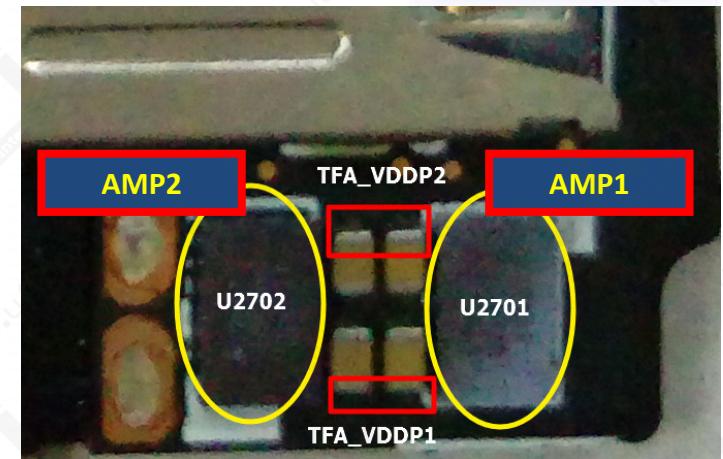
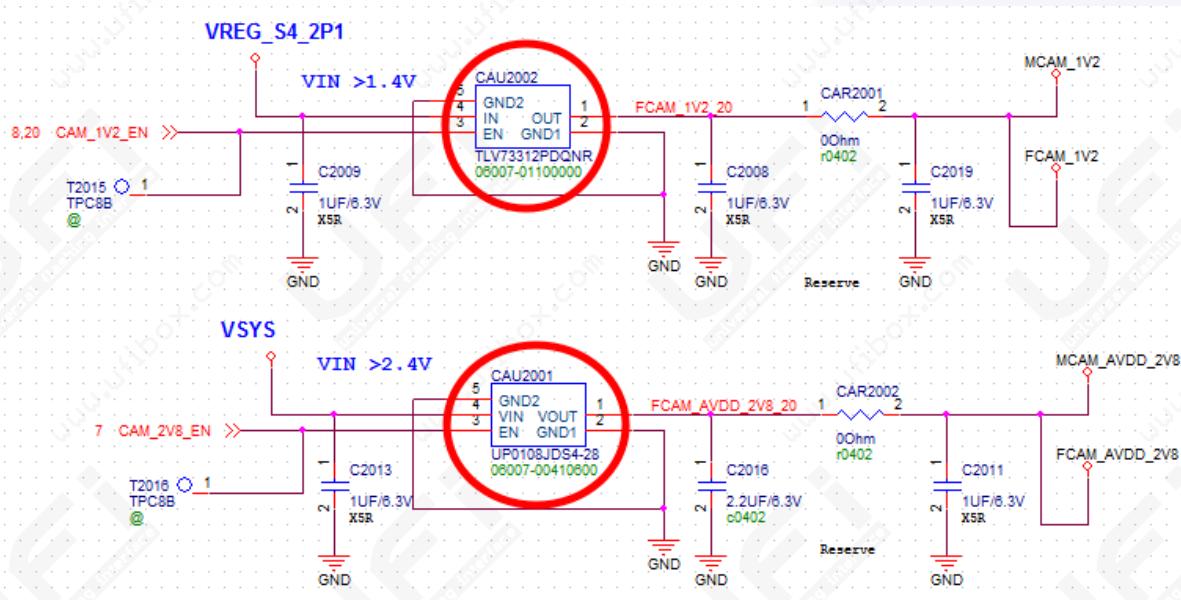


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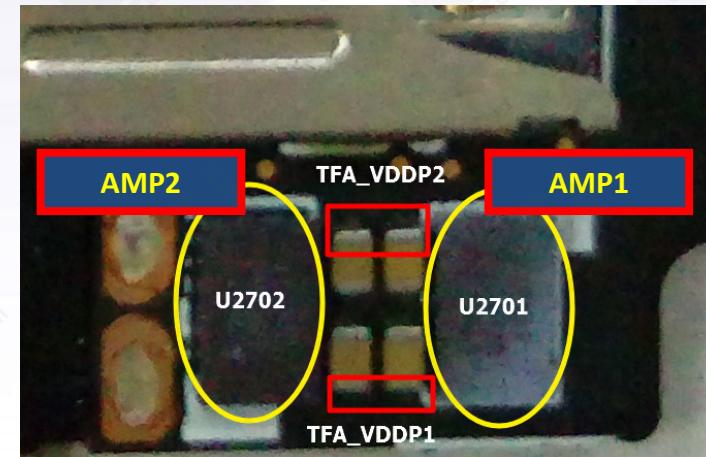
Speaker無聲AMP不良

1. Check AMP晶體(U2701,U2702)外觀是否有損件或置件歪斜
2. Check TFA_VDDP1(C2703.1), TFA_VDDP2(C2705.1)是否有約3.6~3.8V的電壓
3. Check R2701是否有上件
4. Check TFA_I2C_SDA,TFA_I2C_SCL是否都有1.8V
5. 確認CAU2001、CAU2002是否極性反



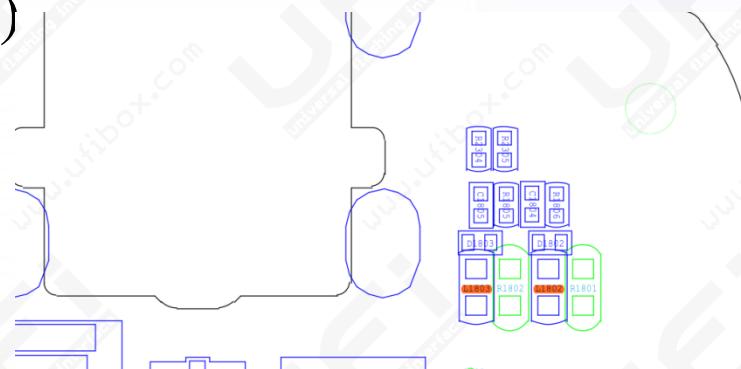
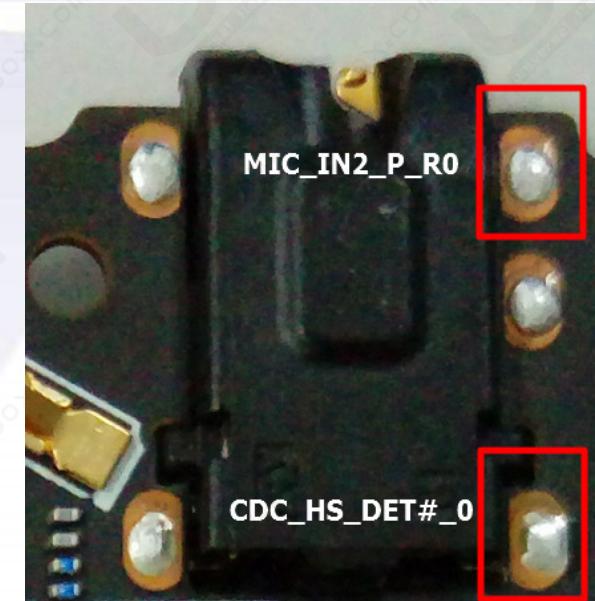
Speaker無聲AMP不良

1. Check AMP晶體(U2701,U2702)外觀是否有損件或置件歪斜
2. 可使用如下tool確認是哪個speaker沒聲音，優先更換對應的Amp晶體，以減少不必要的更換



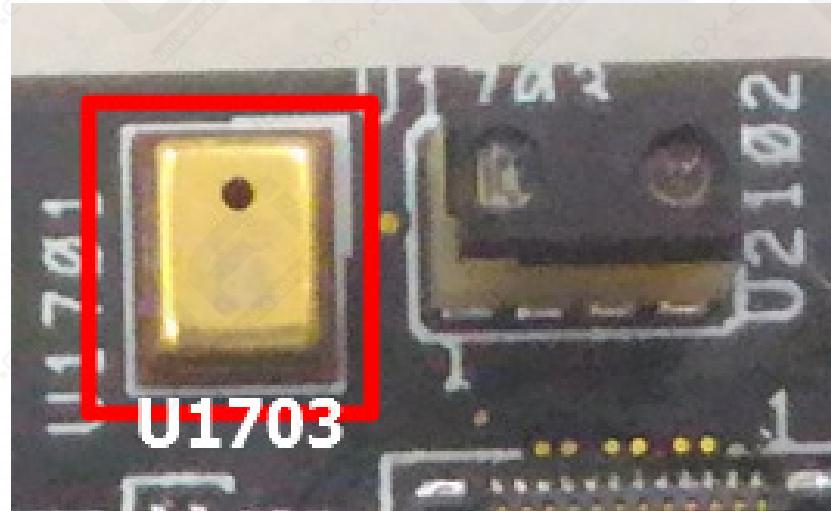
Headset test

1. Check **Audio Jack**(CON1801) 置件是否有**歪斜、空焊或內部推件**是否異常
2. Check 週邊零件是否有**缺件、破裂**
3. 確認是否將Debug Mode關閉
4. 確認L1802、L1803是否有SMT不良
5. 量測**CDC_HS_DET#_0** (CON1801.5)
 1. 有插耳機=>0V
 2. 沒插耳機=>1.8V
6. 量測**MIC_IN2_P_R0** (CON1801.1)
 1. 有插耳機麥克風=>1.8~2.2V
 2. 没插耳機=>0V



MIC1 and MIC2 test

1. Check 小卡**MIC1**(U0303) 置件是否有損毀或有異物
2. Check **MIC2**(U1703) 置件是否有損毀或有異物
3. Check 週邊零件是否有**缺件、破裂**
4. Check 小卡MIC 是否有**氣泡**



6. USB無法識別



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USB無法辨識

1. Check小板與主板有扣好，不可有金屬露出
2. Check小板本體是否有彎折/斷裂情況
3. Check **IO Connector** (CON1601) 置件是否有**歪斜,空焊,黏錫**
4. 交叉驗證USB小板
5. 量測小板的**USB Connector**(J0202) 是否與主板相通
(USB1_DN_R、USB1_DP_R、USB_ID、USB_VBUS_IN)
6. 若以上仍無法辨識，換SOC



7. Sensor異常

(E-compass、G+Gyro sensor、P+L sensor、Hall sensor &
Laser sensor)

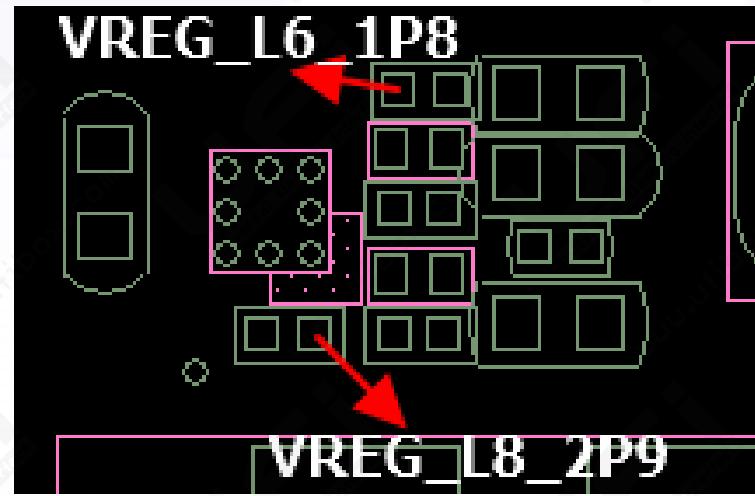


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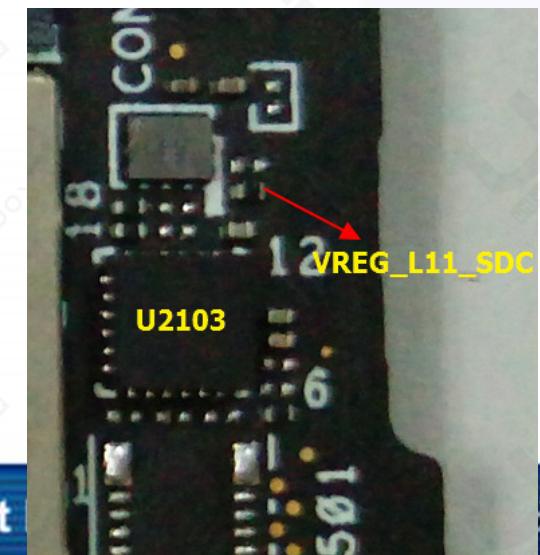
E-COMPASS(G-sensor)異常

1. Check **U2101** 置件是否有**歪斜、損件**
2. Check 週邊零件是否有**缺件、損件**
3. Check I2C(AUX_DA, AUX_CL)電壓是否為1.8V
4. Check VREG_L6_1P8電壓準位是否為1.8v
5. Check VREG_L8_2P9電壓準位是否為2.85V
6. **Reheat U2101** 以確認是否有空焊
7. 如上述皆無異常請**更換U2101**



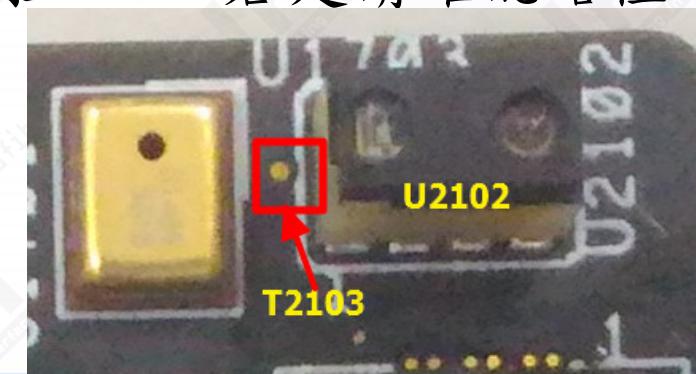
G+Gyro sensor異常

1. 將手機中旋轉功能ON/OFF再測試
2. Check **U2103**置件是否有**歪斜,損件**
3. Check 週邊零件是否有**缺件,損件**
4. Check VREG_L11_SDC (R2103.2)是否為2.9V
5. Check SENSOR_I2C_SCL, SENSOR_I2C_SDA電壓是否為1.8V
6. Check **interrupt pin** (T2104)是否一直拉low，若是，請確認路徑上是否有異常
7. **Reheat U2103**以確認是否有空焊
8. 如上述皆無異常請**更換U2103**



P+L sensor異常

1. 下指令檢查P and L sensor是否正常讀值
2. 檢查P-sensor rubber是否歪斜、有異物，並重新組裝Rubber測試
3. Check **P+L Sensor(U2102)** 置件是否有**歪斜、空焊或損件**
4. Check 週邊零件是否有**缺件、破裂**
5. Check VREG_L8_2P9 是否為2.89V
6. Check SENSOR_I2C_SCL,SENSOR_I2C_SDA電壓準為是否為1.8V
7. Check **interrupt pin(T2103)**是否一直拉low，若是請確認路徑上是否有異常



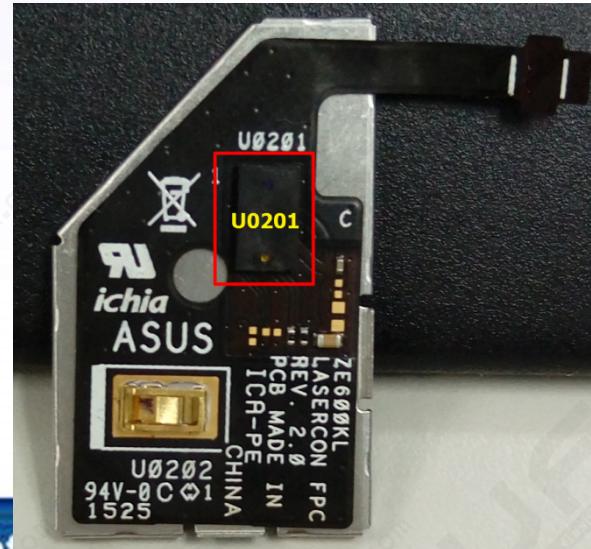
Hall sensor test

1. 檢查小板上**Hall Sensor**(U0302)置件是否有**歪斜、空焊或損毀**
2. Check **VREG_L11_SDC** 否為2.9V
3. 檢查週邊零件是否有**缺件、破裂**



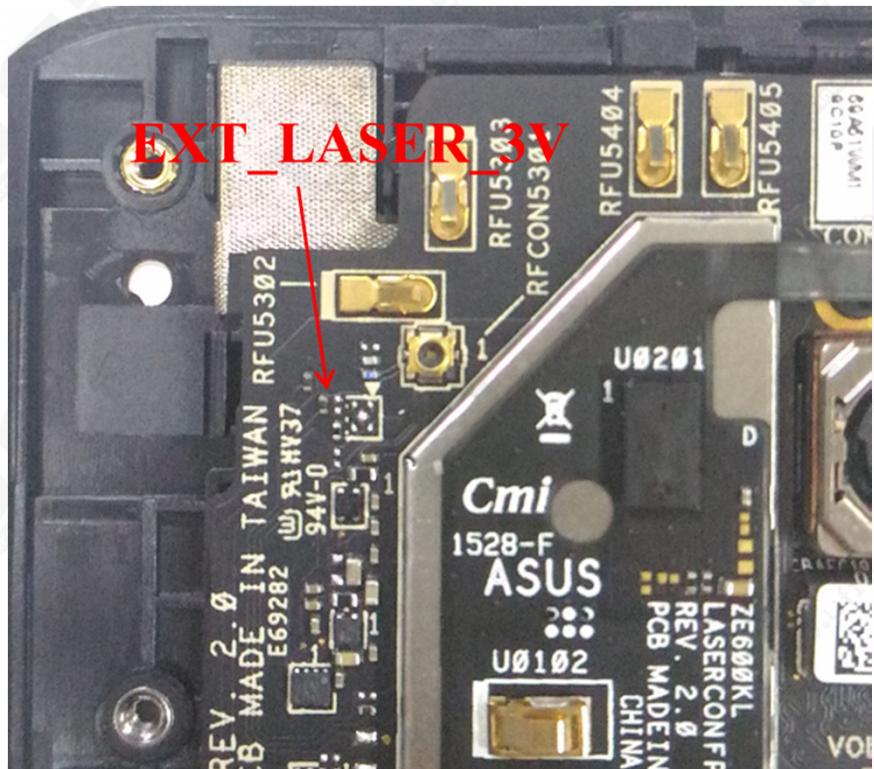
Laser Sensor FPC

1. Check 開啟 Rear Camera 時，Laser Lens 有 **紅光閃爍** 代表 Laser sensor 有 work
2. 檢查 **Laser Lens** 是否有異物或是刮痕
3. Check FPC 是否斷裂
4. Check FPC 上的點位 **U0201** 置件是否有 **歪斜, 空焊或損件**
5. 如重新更換 Laser FPC，需 **重新校正 Laser IC**



Laser Sensor FPC

1. Check **EXT_LASER_3V**(R2005.2)對地是否有2.8V
2. Check **CAM_I2C_SCL, CAM_I2C_SDA**電壓準為是否為**1.8V**



Indicator不亮

1. Check **LED2301.1**、**LED2301.2**是否有**2.85V**
2. 用電表二極體供電看是否為本體不良
3. 更換LED2301



8. SD & SIM



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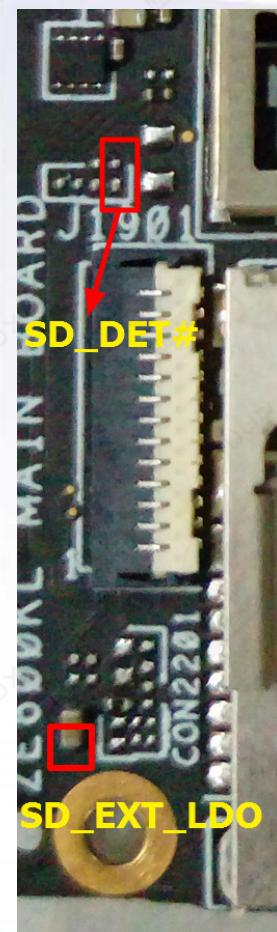
SD or SIM卡讀不到

1. 確認SIM Connector外觀是否有異常

- Check MB 上 VREG_L14_UIM1, VREG_L15_UIM2 對地是否有 1.8V

2. SD 卡

- Check MB 上的 **SD_DET#** 在插入 SD 卡後，點位 D2208.1 對地是否由 1.8V 轉 0V
- Check MB 已插入 SD 卡後 SD_EXT_LDO (點位 C2214.1) 對地是否有 3V (若沒有，檢查 SD_EN 為 high)
- 若有 3V 輸出但又 turn off，請檢查 DATA0~3/CMD/CLK 是否斷線



9. Flash LED

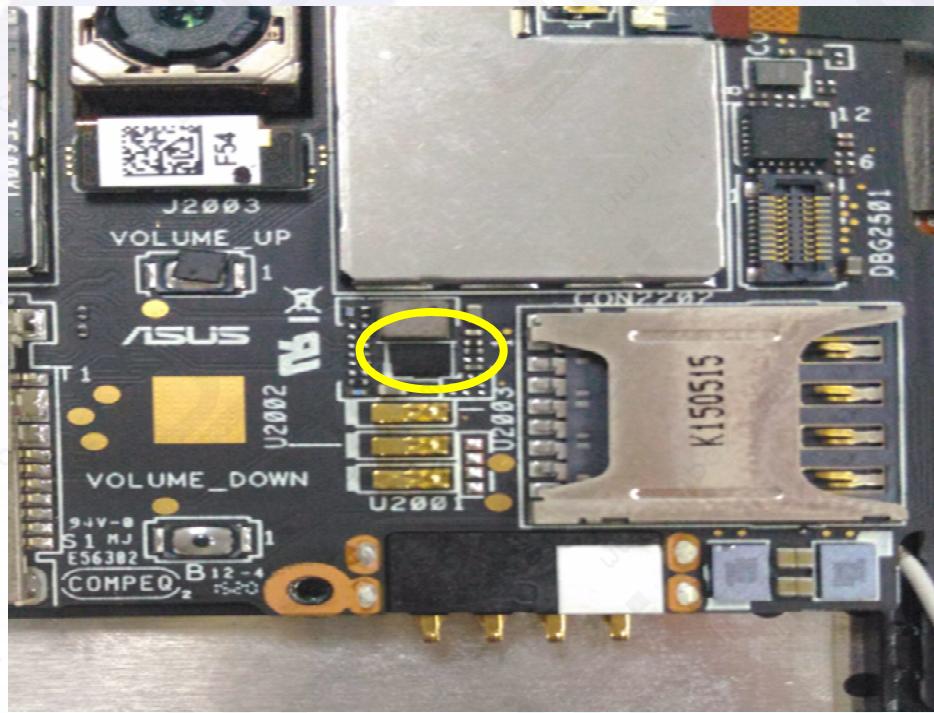
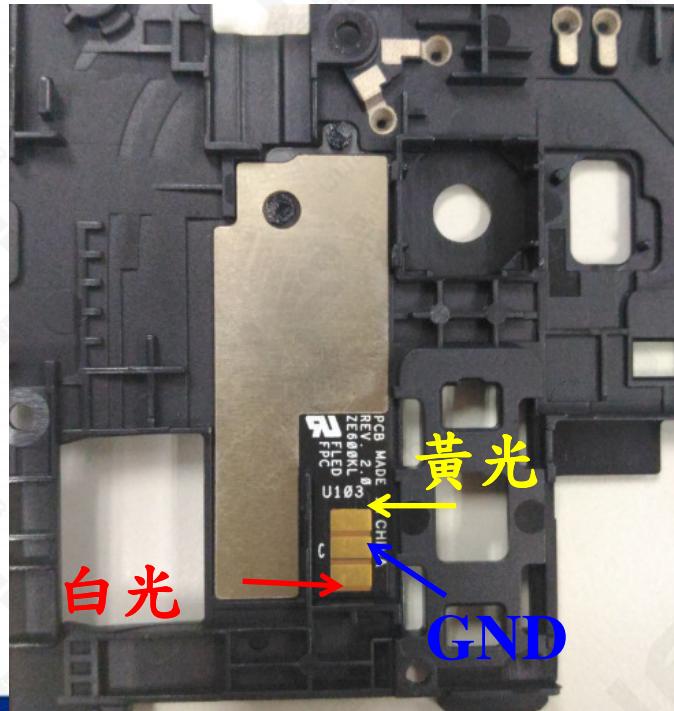


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Flash LED不亮

1. 先用電表的二極體檔位點中框上的LED pin(測點如下圖，依序為**黃光、GND、白光**)，判斷LED本體是否可亮。
2. 若LED本體正常，但用手機無法控制LED打開，請更換LED的Driver IC(黃框圓處)。



Flash LED

-
1. 手電筒模式：只亮白燈
 2. 拍照 & 錄影模式: 根據環境顏色調整白燈&黃燈電流，拍照對焦時就可能亮燈，且可能只亮一顆或是兩顆都亮



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10. 瞬間掉電 or reboot



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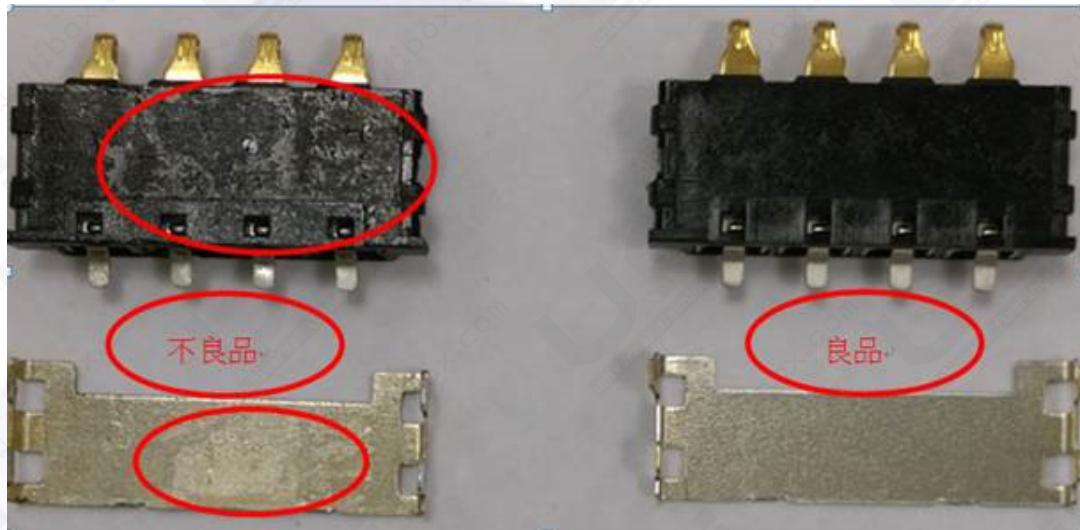
瞬間掉電 or reboot

1. 拿到疑似掉電手機 → 先用手拍打手機看是否掉電
2. 硬體方面可檢查兩部分

A. 電池connector

吃錫不良

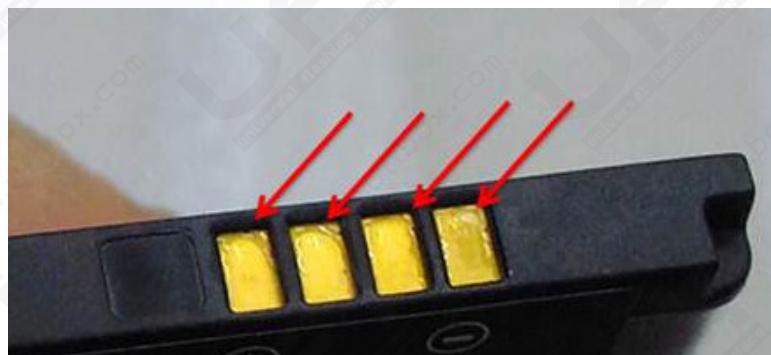
Flux/異物滲入



B. 電池本體

有油漬，雜質

使用副廠電池



11. Vibrator震感不對

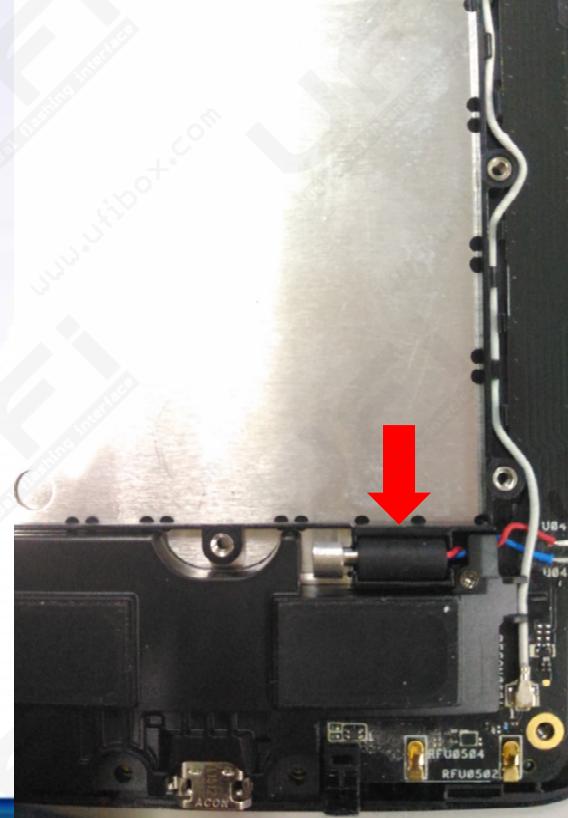


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Vibrator震感不對

1. 若有用戶反應震感異常(震感不足)，可以先檢查組裝是否有鬆動，若組裝檢查沒有問題，直接更換vibrator給用戶。
2. 組裝異常
如：背蓋or中框卡榫沒卡到位、缺螺絲、螺絲沒鎖、Vibrator沒正確扣在固定座



12. 手機無法充電



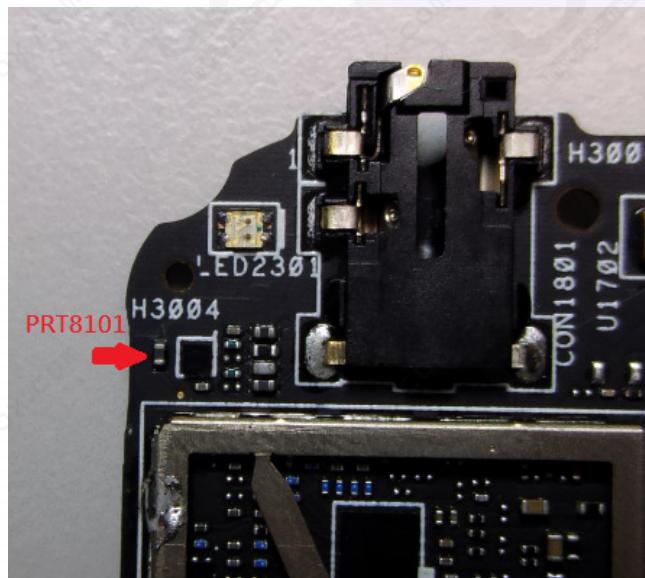
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手機無法充電

1. 手機無法充電

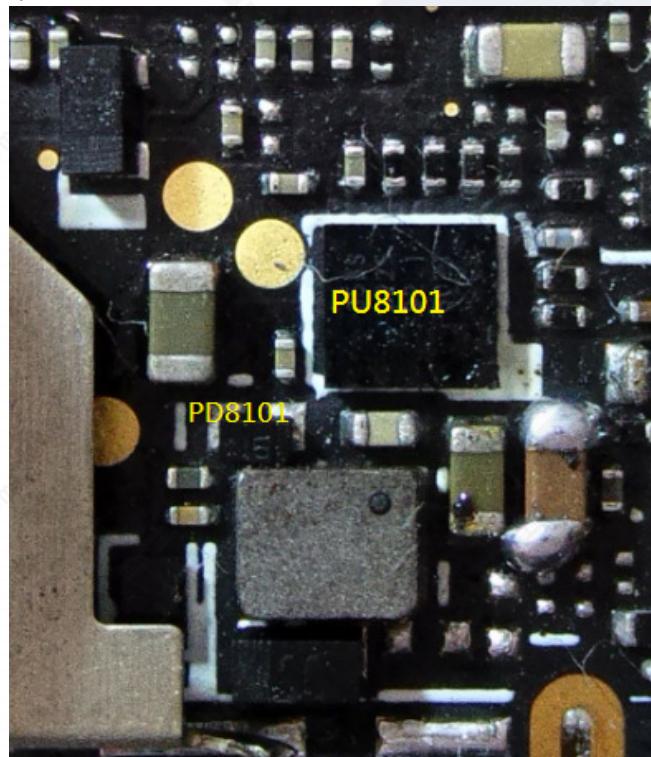
- AC進來就會充電，不需要控制訊號。如果確定adapter有電和電池有插，仍先檢查小板外觀。
- 檢查PRT8101是否為9k~11k Ohm，不是則更換PRT8101。



手機無法充電

1. 手機無法充電

- 量測PD8101二極體偏壓是否為0.5V~0.7V，不是則更換PD8101
- 更換PU8101.



13. 音量鍵/電源鍵按壓異常



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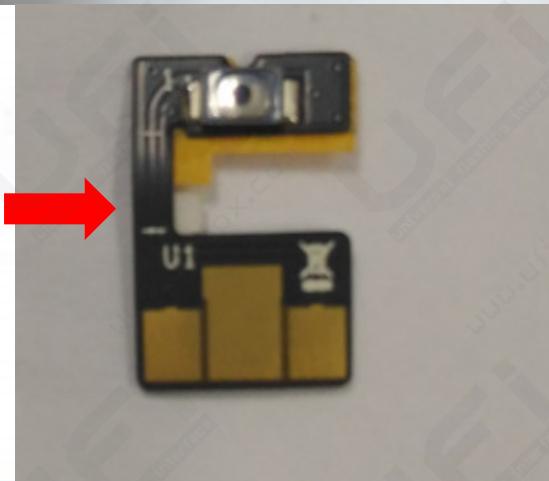
音量鍵按壓異常

1. 拆機檢查Volume key上是否有黑色貼片，如沒有請協助貼上
2. 中框音量鍵壓合不良，請重新按壓確認



電源鍵按壓異常

1. 請確認power switch上**黑點**是否脫落
2. 檢查power key FPC是否折損



Thank You!
