

# LV81-LV82 Trouble Shooting

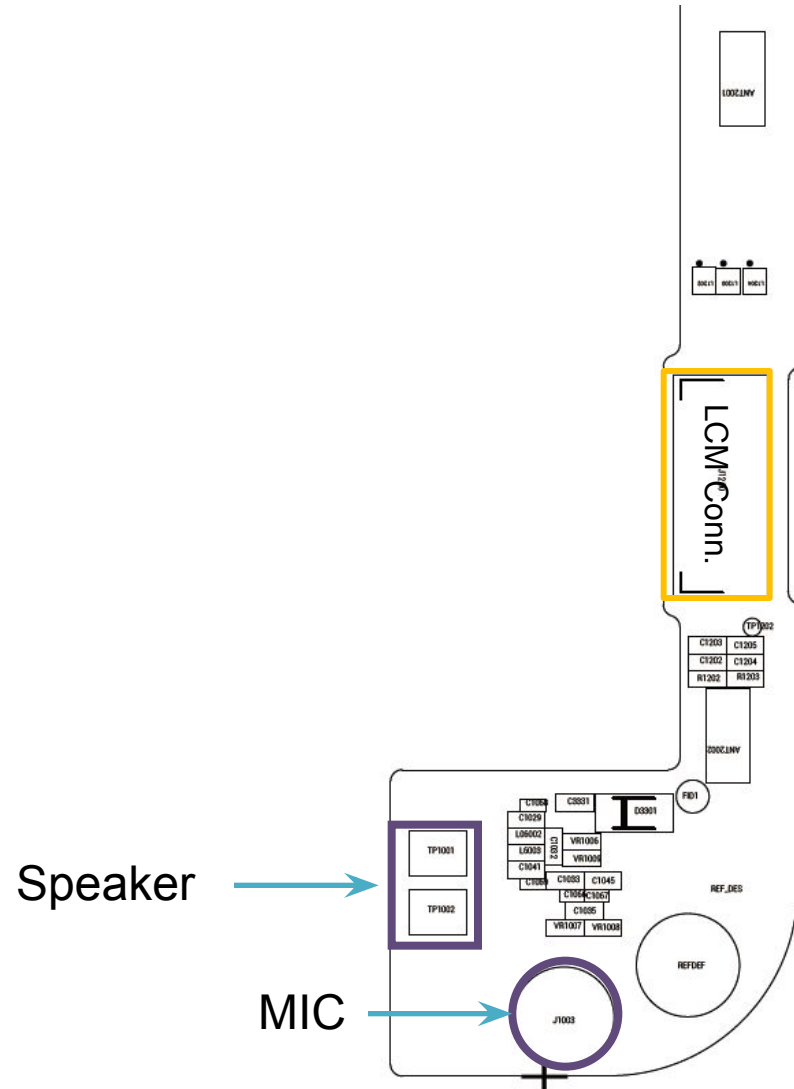
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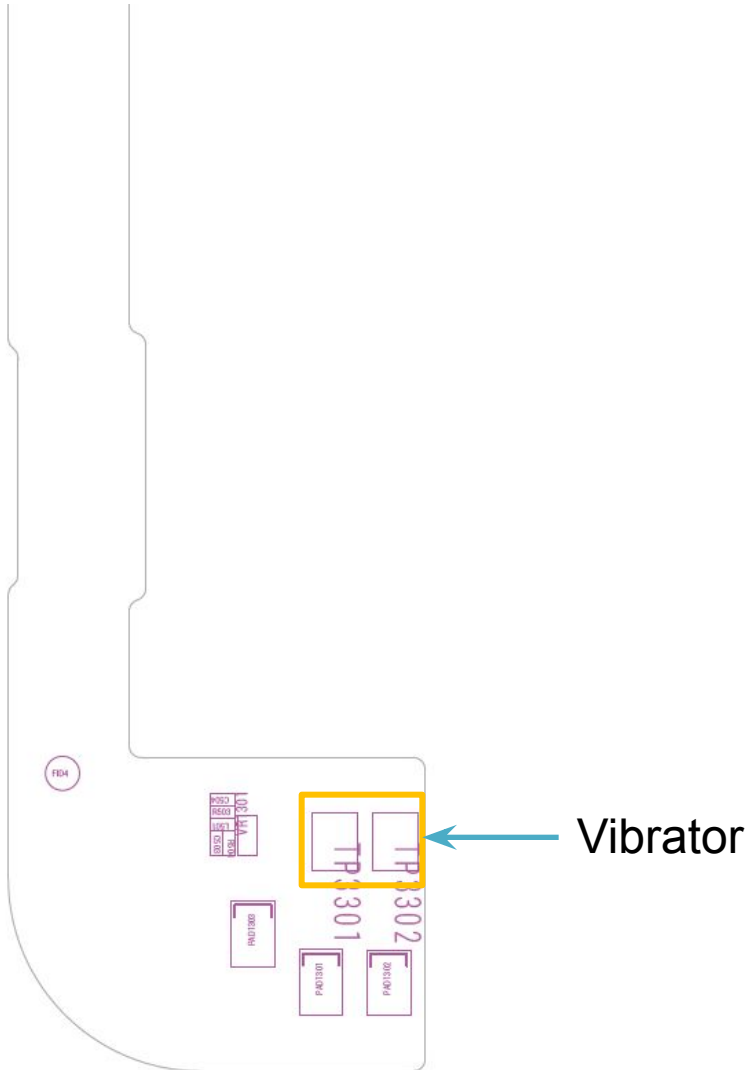


# M/B Top Placement #2





# M/B Bottom Placement #2



# BB Common Question

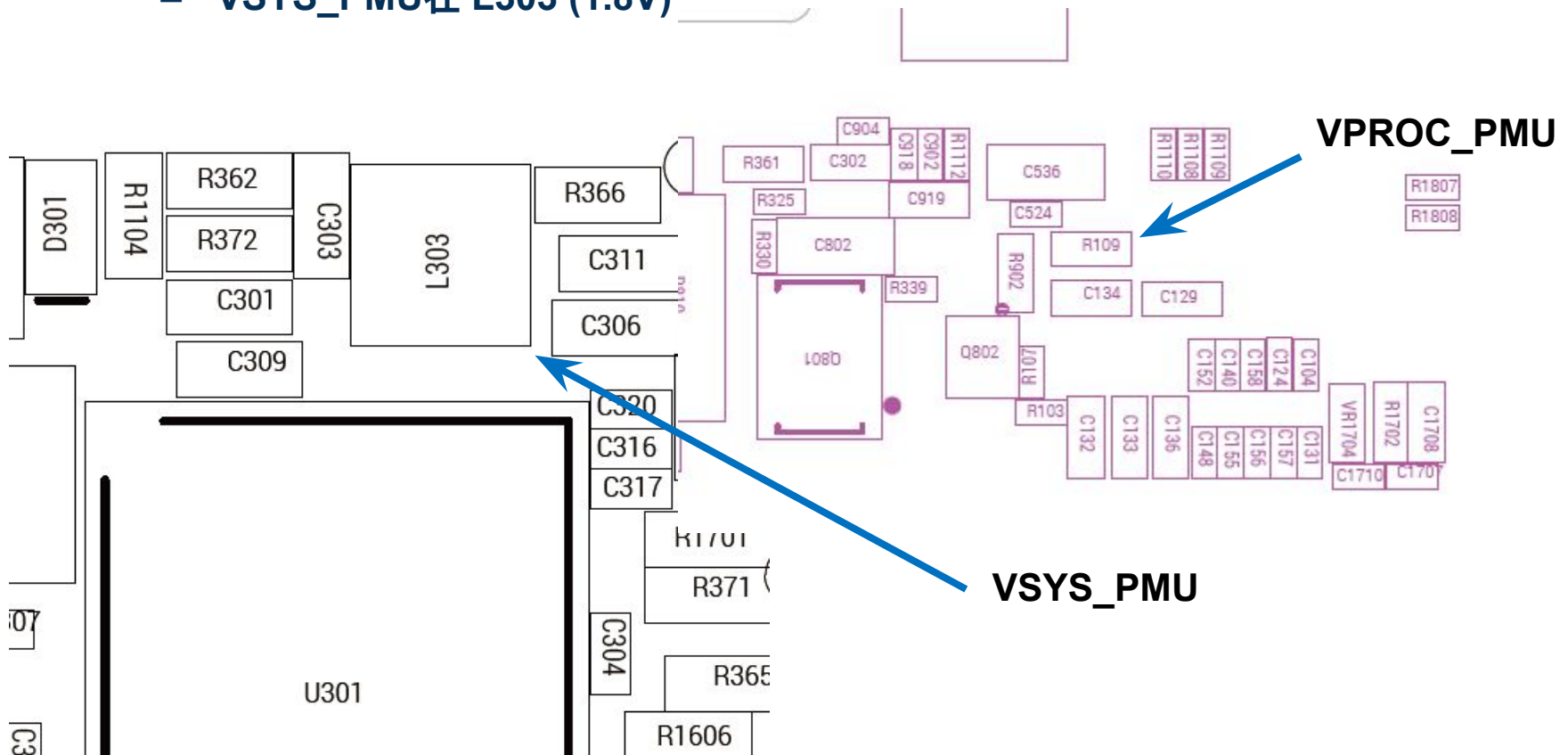
- **BB-1 Can not power on (無法開機)**
- **BB-2 Can not download (無法更新軟件)**
- **BB-3 Can not charging (無法充電)**
- **BB-4 SIM Card Identification error (SIM卡無法識別)**
- **BB-5 Can not display (畫面無法顯示或顯示異常)**
- **BB-6 sensor function fail (感測器不良)**
- **BB-7 Touch Panel no function (無法觸屏)**
- **BB-8 Vibrator no function (馬達無振動)**
- **BB-9 Camera can not turn on (無法攝像)**
- **BB-10 MIC no function (麥克風無作用)**
- **BB-11 Speaker no function (喇叭無聲)**
- **BB-12 Audio function fail (Audio 不良)**
- **BB-13 SD Card no function (SD Card無作用)**





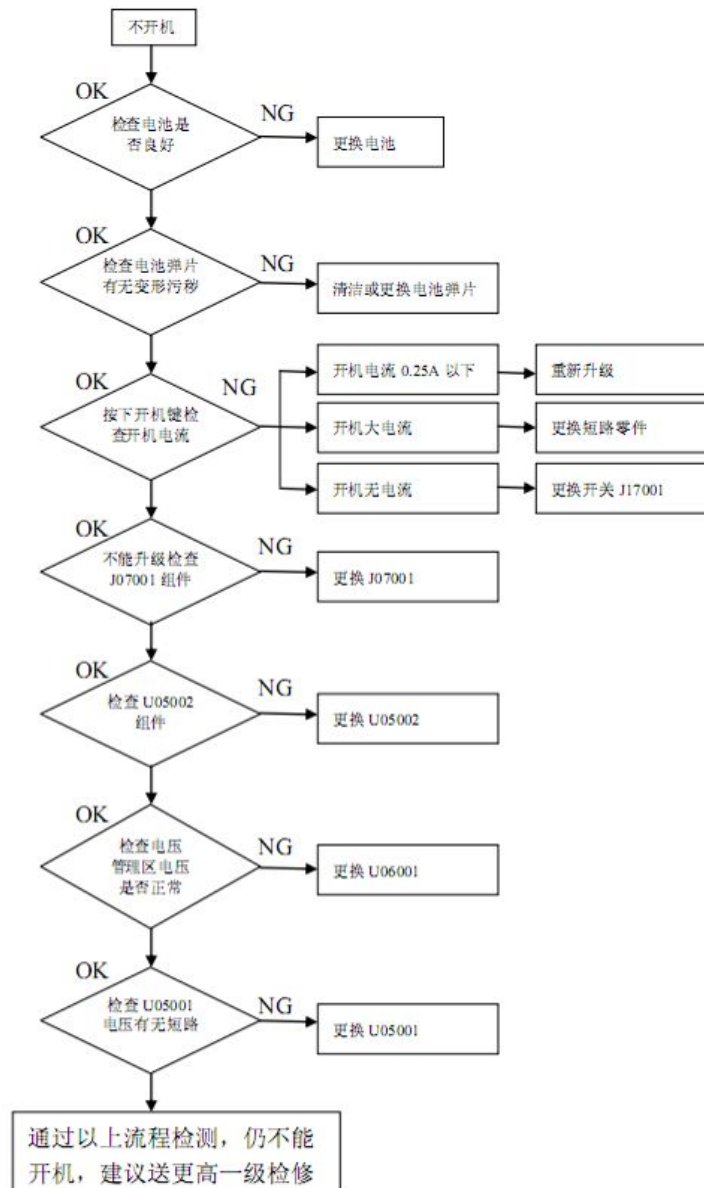
# BB-1 Can not power on (無法開機) (2/4)

- 5. 請確認MT6323周圍電壓是否正常?
  - VPROC\_PMU在 R109 (0.9V~1.1V)
  - VSYS\_PMU在 L303 (1.8V)



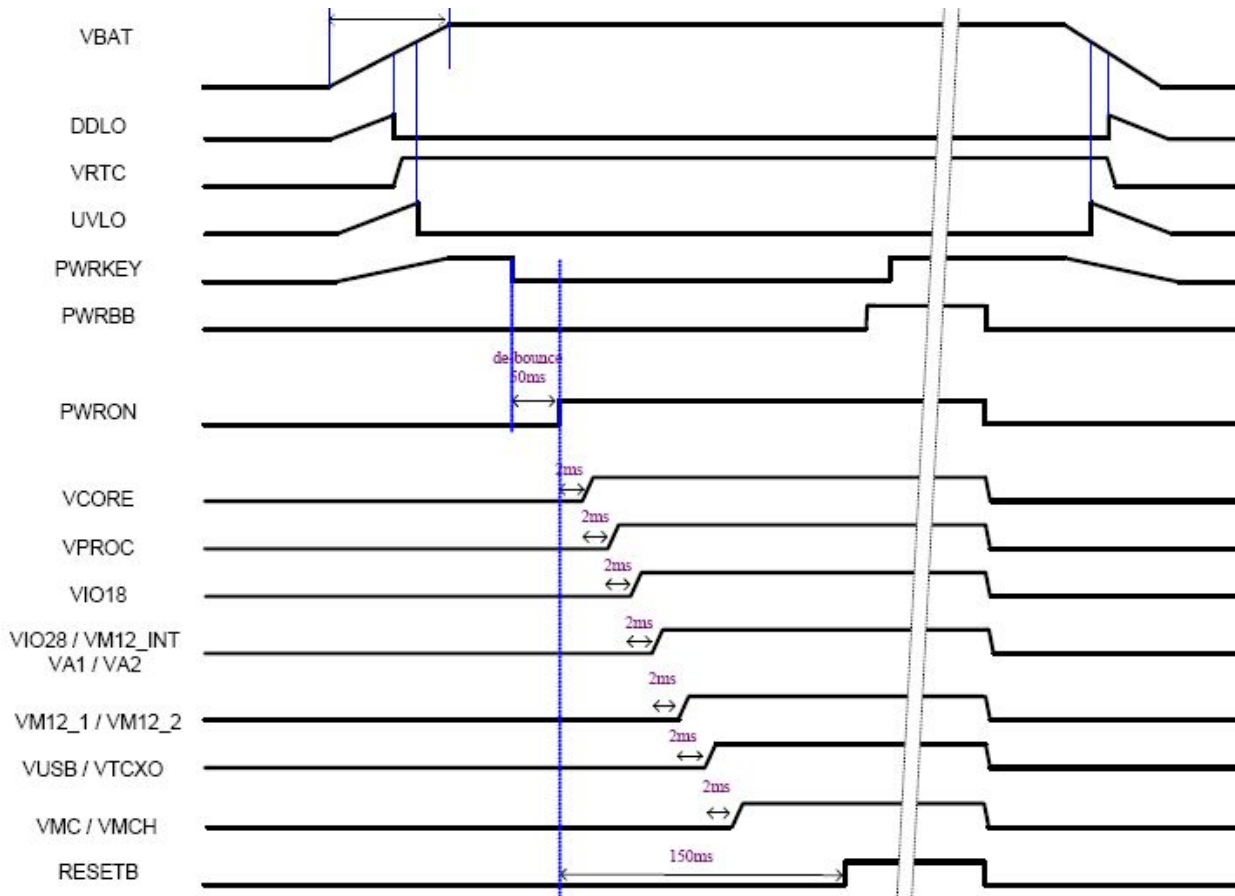
# BB-1 Can not power on (無法開機) (3/4)

## Debug Flowchart



# BB-1 Can not power on (無法開機) (4/4)

## MT6323 Power On/Off sequence



VCORE≈0.7V~1.3V  
VPORC≈0.7V~1.3V  
VIO18=1.8V  
VIO28=2.8V  
VM12\_INT=1.2V  
VA1=2.5V  
VA2=2.5V  
VUSB=3.3V  
VTCXO=2.8V  
VMC=3.3V  
VMCH=3.3V  
RESET=1.8V

6. 若以上行為均正常，可使用電源供應器供應3.6V電源，並由開機電流狀態來判斷手機狀態。

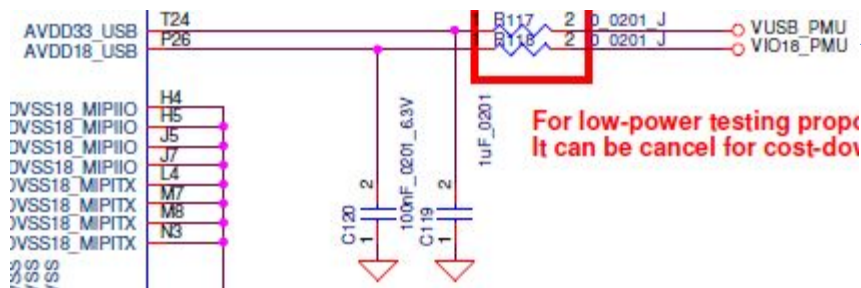
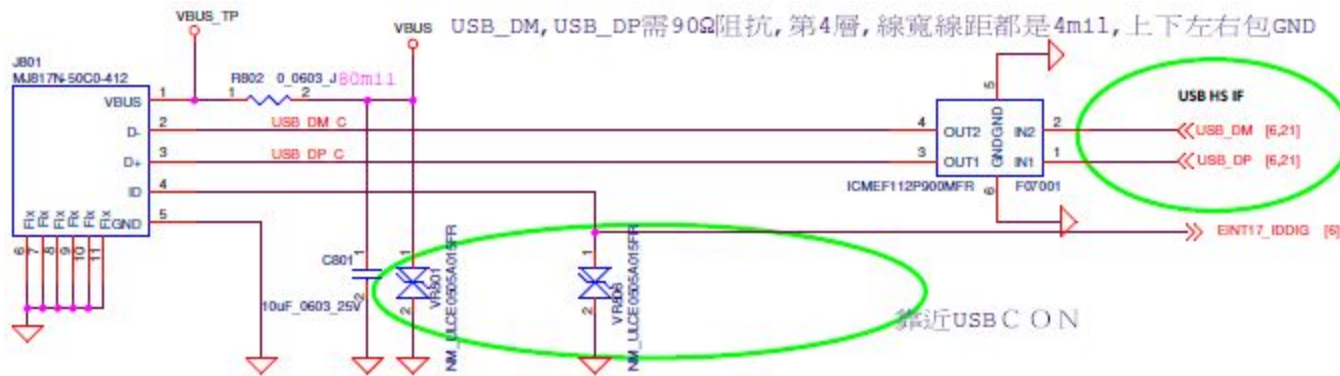
正常啟動，電池電流約可操作在250~300mA左右的開機電流。

若有開機大電流，表示板端有零件短路，檢查零件做交叉驗證，找出短路點。

若開機電流過低，表示軟體啟動失敗，更新軟體或對MCP進行更換。

# BB-2 Can not download (無法更新軟件) (1/3)

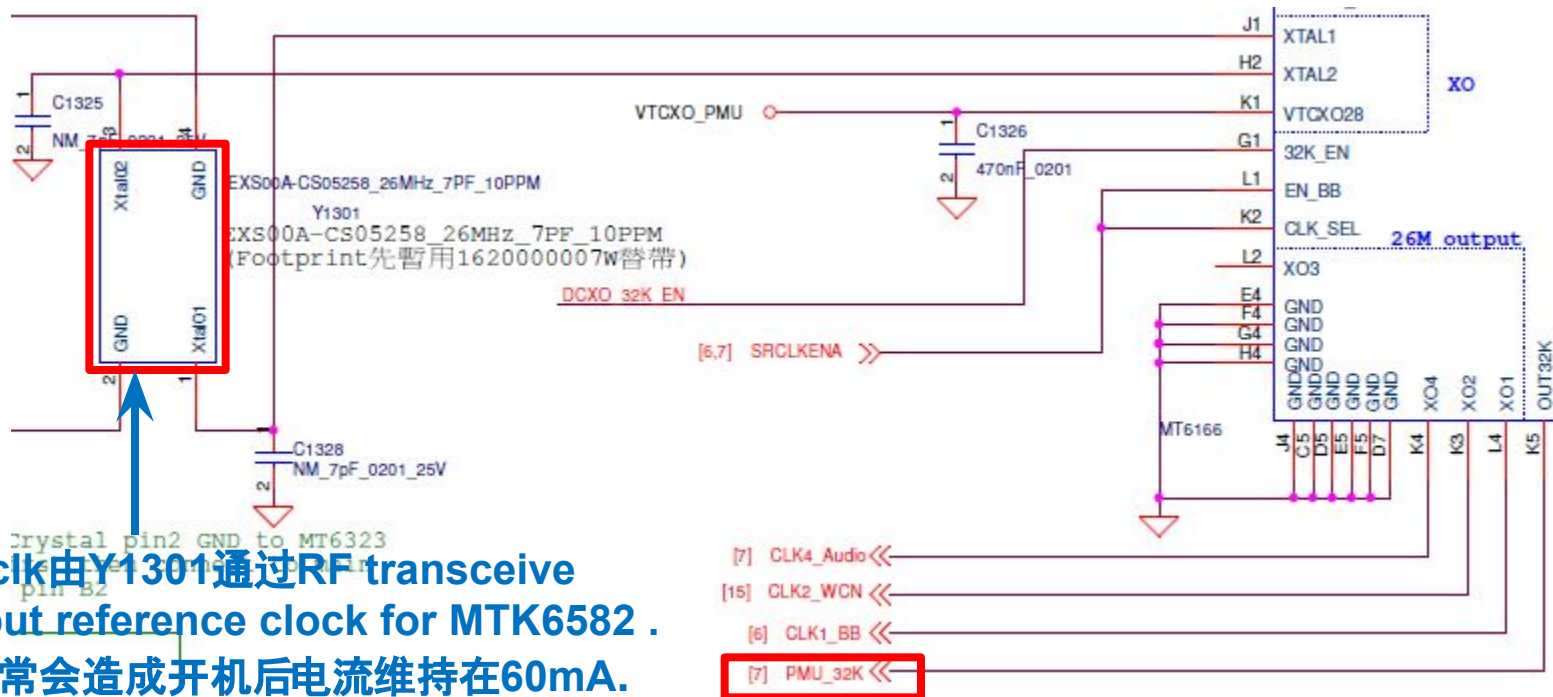
- 1. 確認開機後電流起跳正常。(記憶體中無代碼時，電池電流約在0.109A左右)
- 2. 開機過程中如果電流過大或過小，會造成USB port無法識別。
- 3. 檢查F07001是否空焊



提供CPU内部USB驱动电路供电电源,电压为3.3V左右

# BB-2 Can not download (無法更新軟件) (2/3)

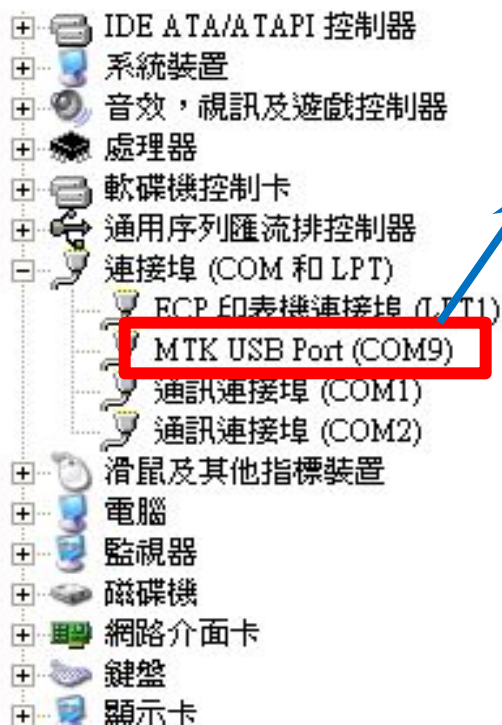
- 4. 若可以正常DL, 但無法進入META mode, 檢查RF transceiver 26MHz及RF chip是否異常。



**Sysclk由Y1301通过RF transceiver output reference clock for MTK6582. 此异常会造成开机后电流维持在60mA.**

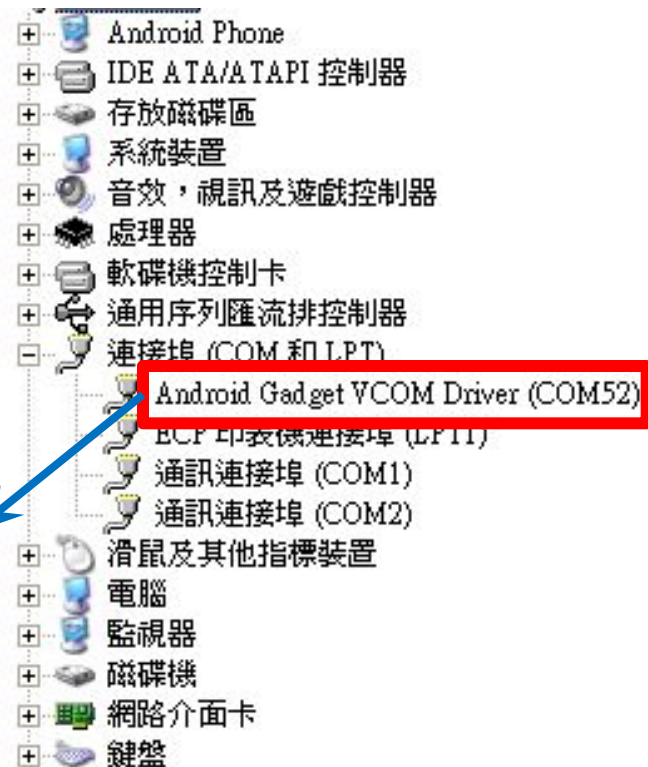
# BB-2 Can not download (無法更新軟件) (3/3)

- 5. 確認com port是否正確



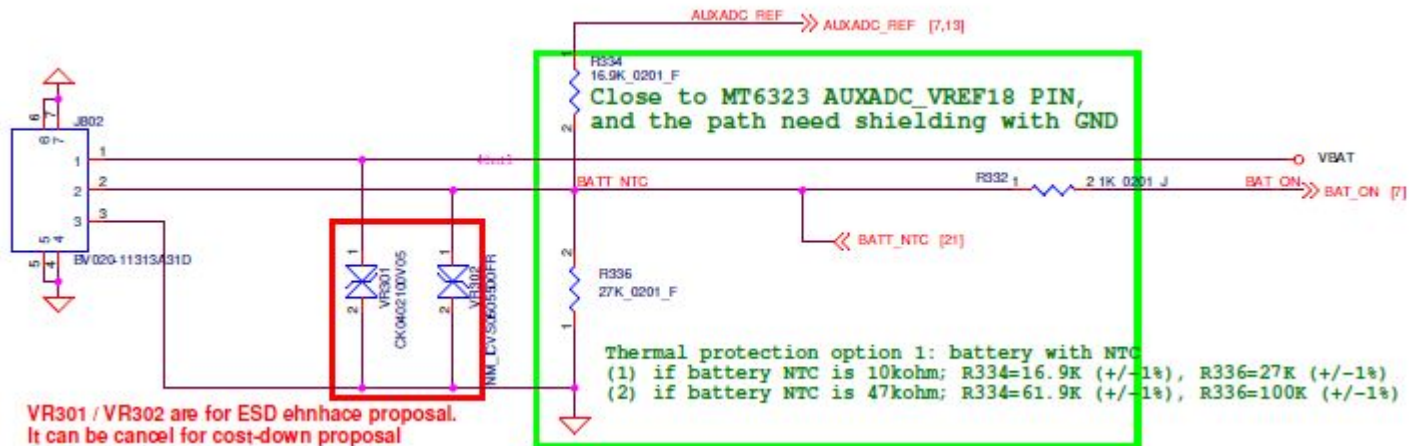
1:DL時在无code情況下show MTK USB Port

2:DL完img后,在BB/RF META tool开启下应show META mode



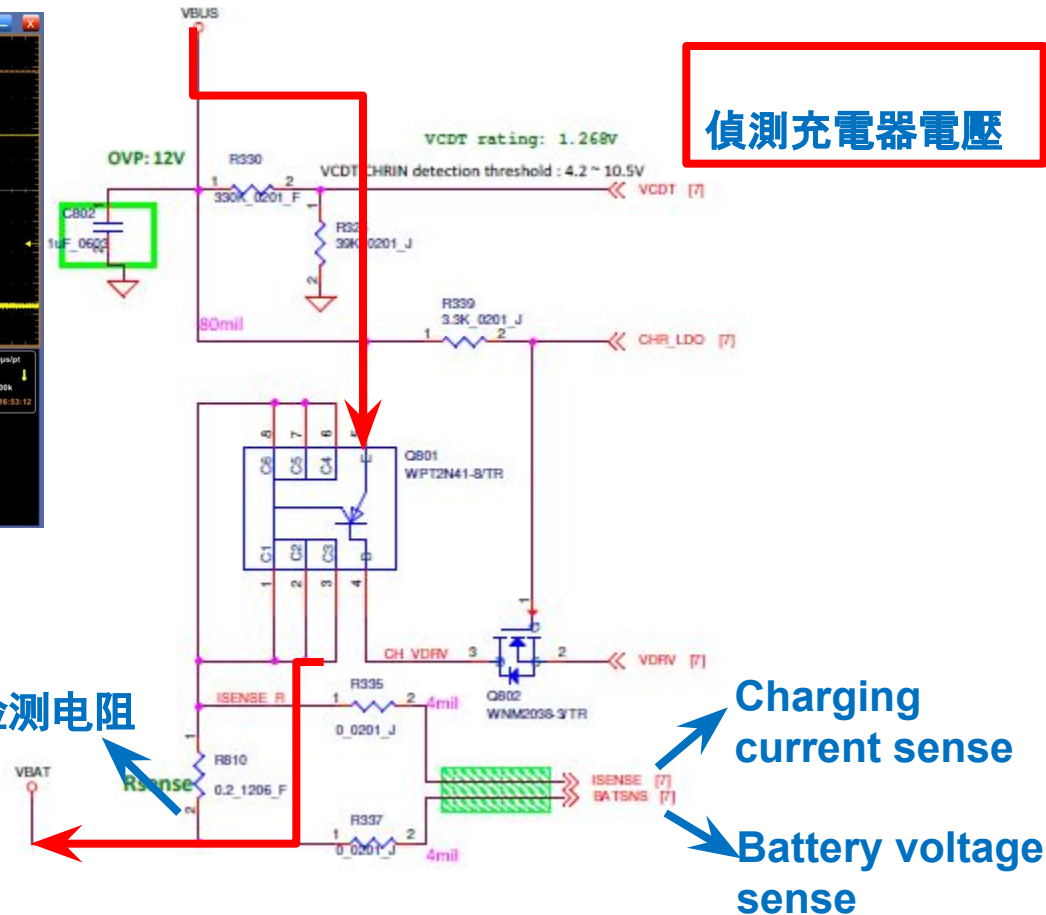
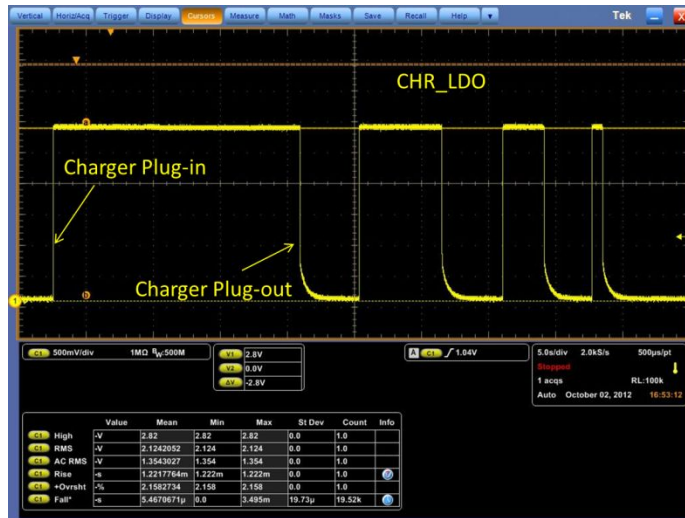
# BB-3 Can not charging (無法充電) (1/2)

- 1. 確認電池內阻R332 Pin1 (BAT\_ID), 當接上電池後阻抗應該約10kΩ.
- 2. 確認電池電壓是否為正常, 異常為0V (開路)
- 3. 確認J801 USB connector是否有異狀?



# BB-3 Can not charging (無法充電) (2/2)

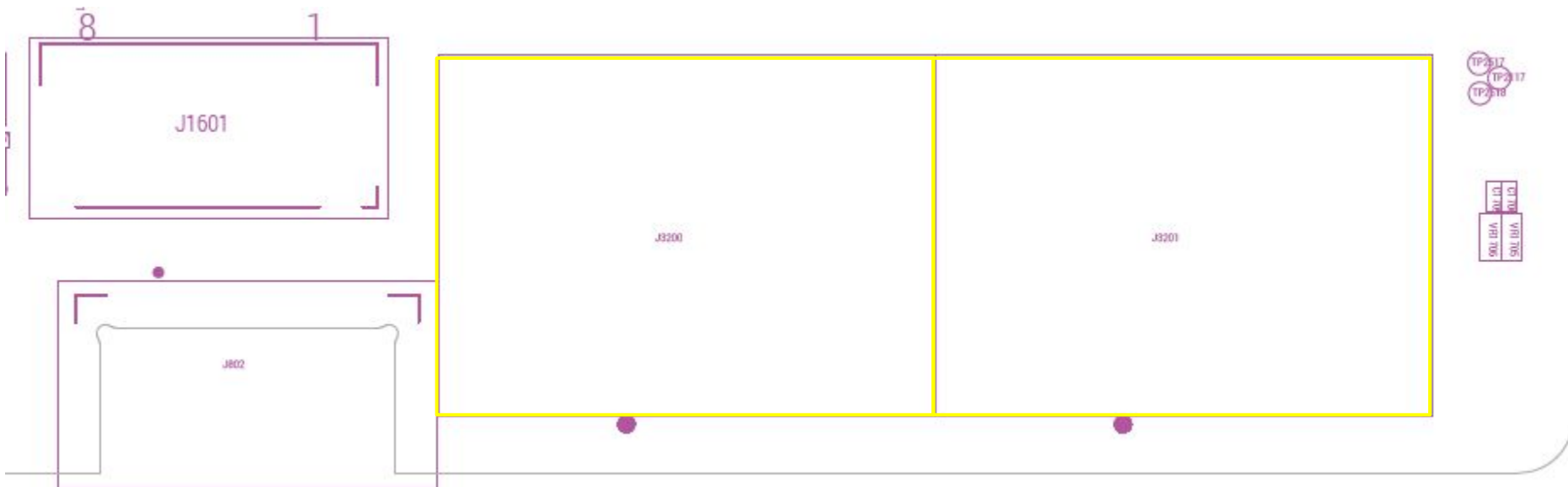
- 4. 確認充電電路行為是否正常。
  - CHR\_LDO在USB插入時，會拉高準位



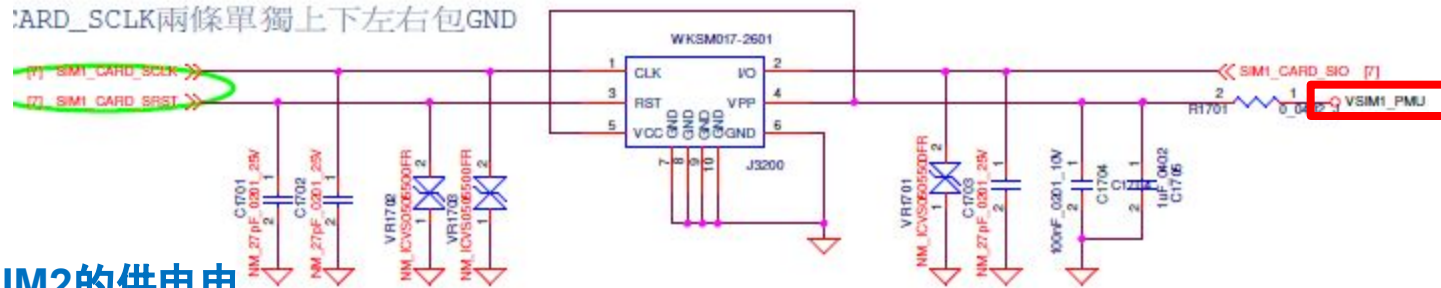


# BB-4 SIM Card Identification error (SIM卡無法識別) (1/2)

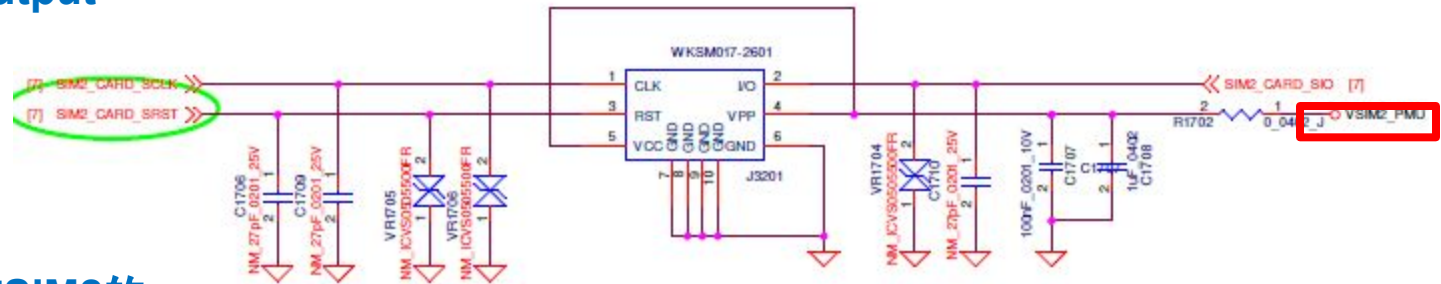
- 1. 更換SIM卡, 確認卡片是否正常
- 2. 確認J3200, J3201吃錫狀況是否正常?
- 3. 確認SIM 相關訊號
  - SRST, VSIM,SIO and SCLK



# BB-4 SIM Card Identification error (SIM卡無法識別) (2/2)



SIM1/SIM2的供电电压各来自PMU的两组LDO output



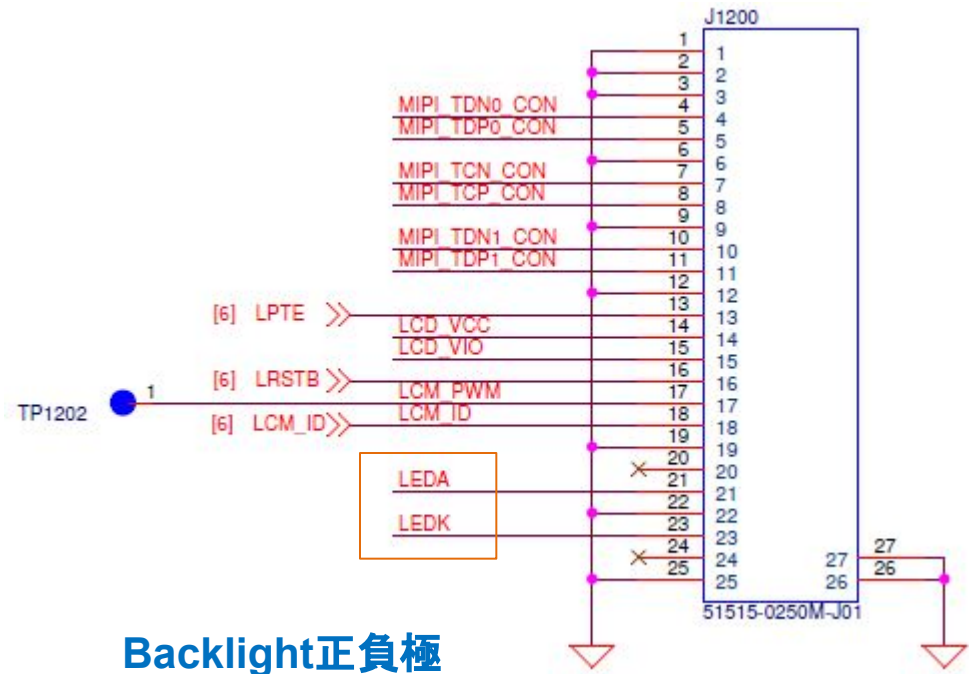
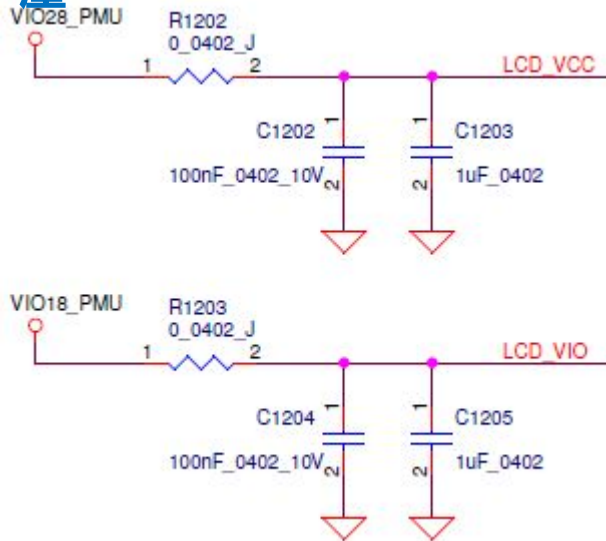
SIM1和SIM2的DATA/RST/CLOCK单独分开使用

# BB-5 Can not display (畫面無法顯示或顯示異常) (1/2)

- 1. 確認J1200是否有異狀[錫短 or 空焊]?
- 2. 更換LCM.
- 若更換良品後, 現象還存在,
- 3. 檢查R1202, R1203及L1202, L1203, L1204否有異狀?
- 4. 確認LCM 電壓 (VIO28\_PMU及VIO18\_PMU)位準是否正確?
- 5. 若無背光, 確認U901, R1914, R915, D901, R903

## LCM兩組工作電

壓

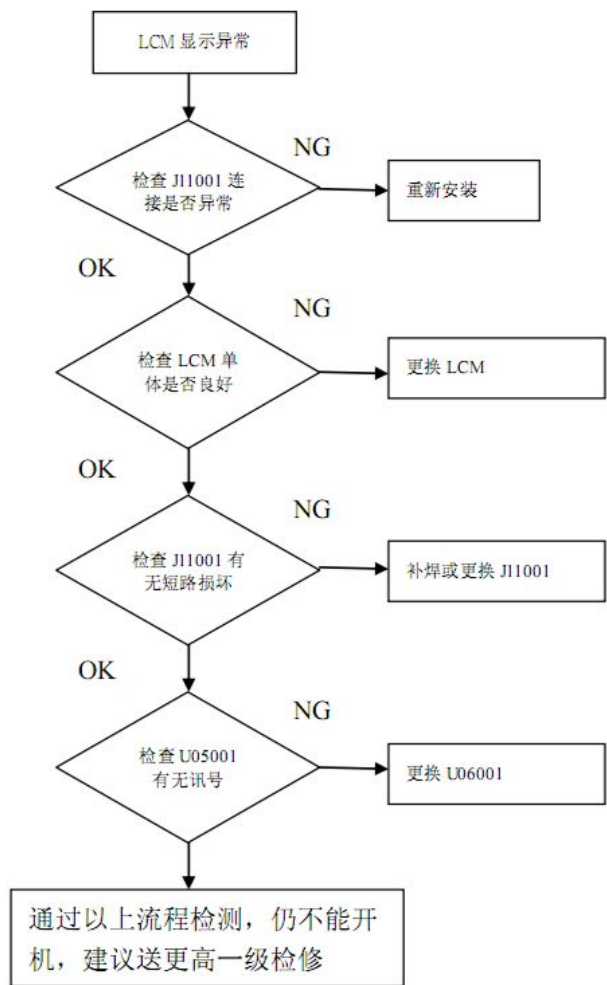


Backlight正負極

# BB-5 Can not display (畫面無法顯示或顯示異常) (2/2)

- 分析流程圖

LCM 显示异常故障分析流程图



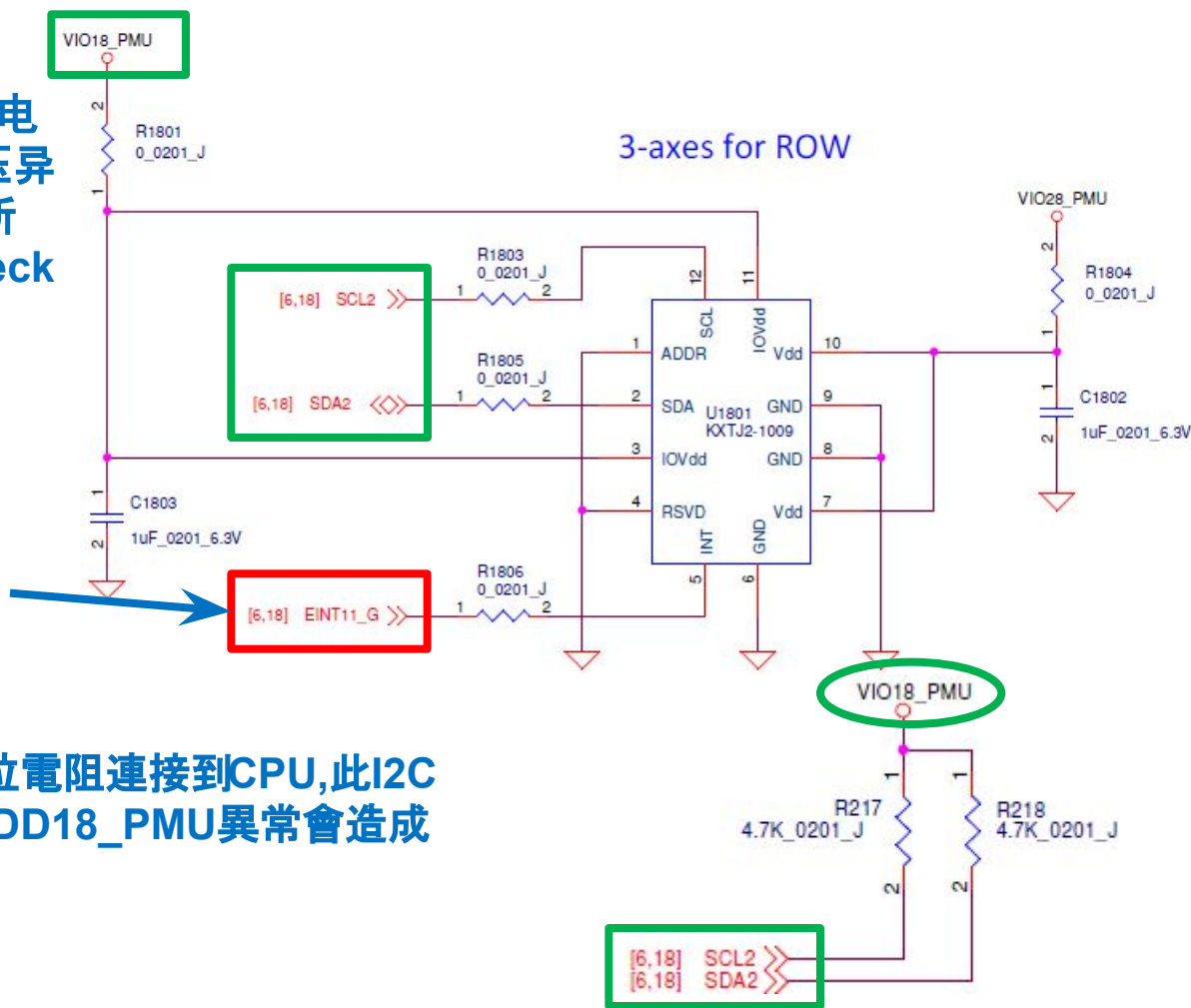
# BB-6 sensor function fail (感測器不良)

- 所有的sensor都是由I2C總線,中斷信號,電源組成.I2C總線上sensor間會相互影響,所以維修某個 sensor不良時需要同步檢查其他sensor路徑.
- G-sensor

G-sensor供电电压.该电压等同于VIO18,该电压异常系统就无法开起来,所以sensor不良不用check此电位

G-sensor中斷信號

G-sensor I2C通過上拉電阻連接到CPU,此I2C與touch panel共用,VDD18\_PMU異常會造成所有sensor fail

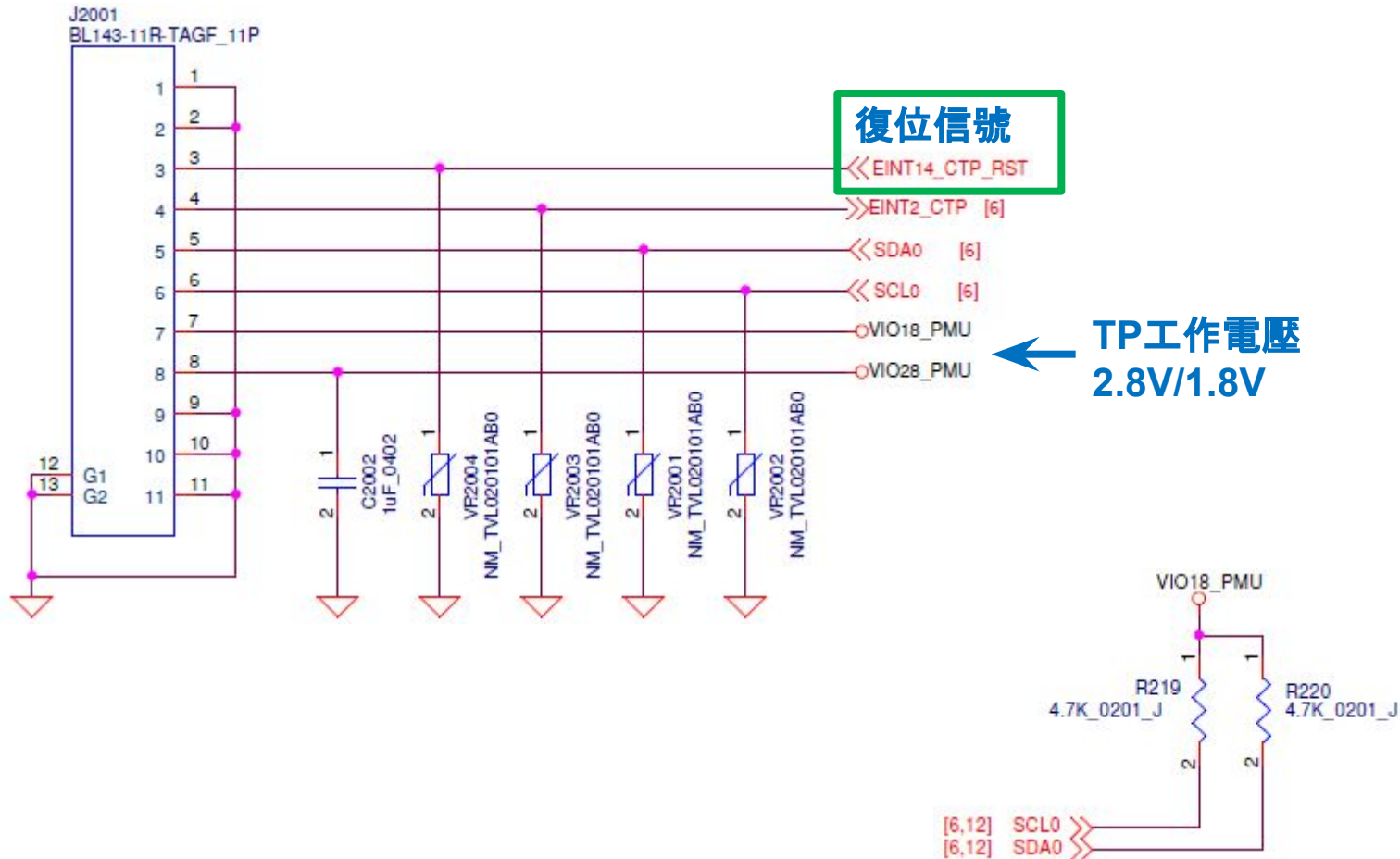


# BB-7 Touch Panel no function (無法觸屏) (1/2)

- 1. 確認TP Connector 是否鬆脫?
- 2. 更換TP.
- 若更換後良品後, 現象還存在,
- 3. 確認J2001是否有異狀[錫短 or 空焊]?
- 4. 確認TB 電壓 (VDD28\_PMU及VDD1V8\_PMU)位準是否正確?
- 5. 確認控制訊號 I2C, Reset, INT動作是否正常?

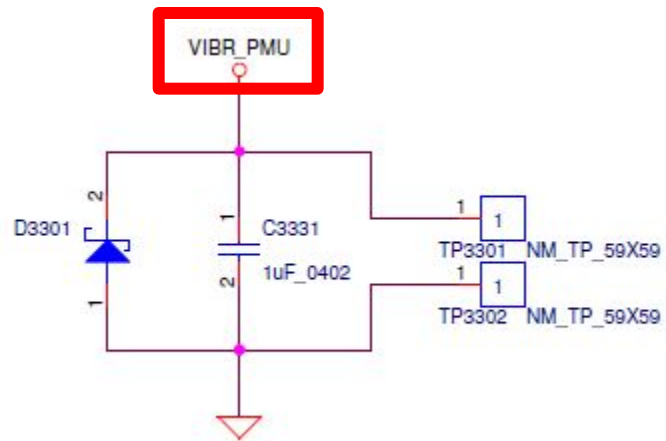
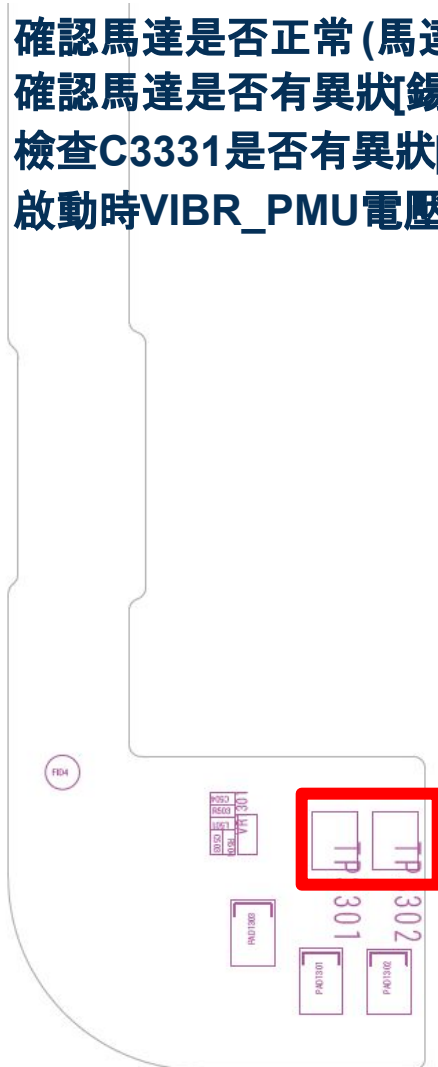
# BB-7 Touch Panel no function (無法觸屏) (2/2)

- TP circuit



# BB-8 Vibrator no function (馬達無振動)

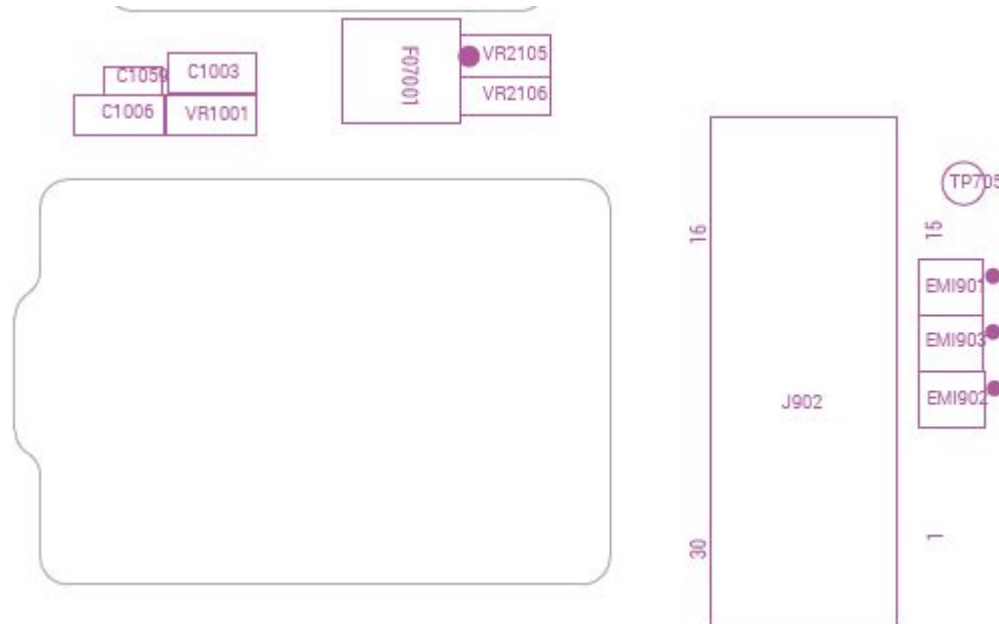
- 1. 確認馬達是否正常 (馬達阻抗約30Ω)
- 2. 確認馬達是否有異狀[錫短 or 空焊]?
- 3. 檢查C3331是否有異狀[錫短 or 空焊]?
- 4. 啟動時VIBR\_PMU電壓是否正常





# BB-9 Camera can not turn on (無法攝像) (1/3)

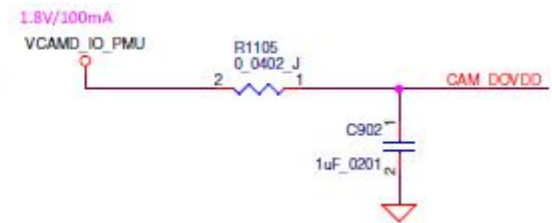
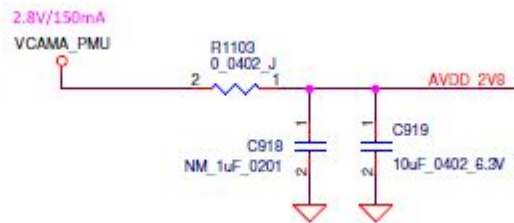
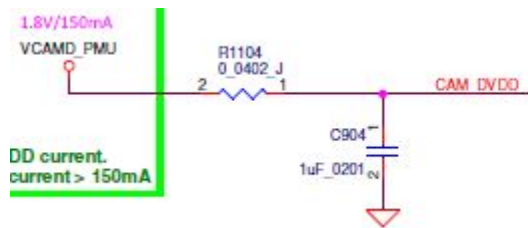
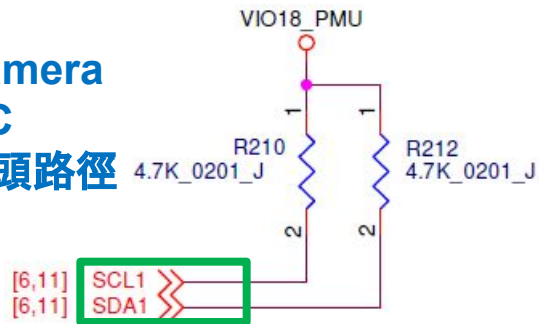
- 1. 確認組裝是否到位?
- 2. 更換Camera module.
- 若更換後良品後, 現象還存在,
- 3. 確認J902是否有異狀[錫短 or 空焊]?
- 4. 確認EMI901, EMI902, EMI903是否有異狀[錫短 or 空焊]?
- 5. 確認Camera 電壓 (VCAMD\_IO\_PMU, VCAMA\_PMU)位準是否正確?



# BB-9 Camera can not turn on (無法攝像) (2/3)

- 主camera的2組工作電壓均是由PMU LDO輸出通過0Ω電阻給camera.

## Camera I2C 源頭路徑



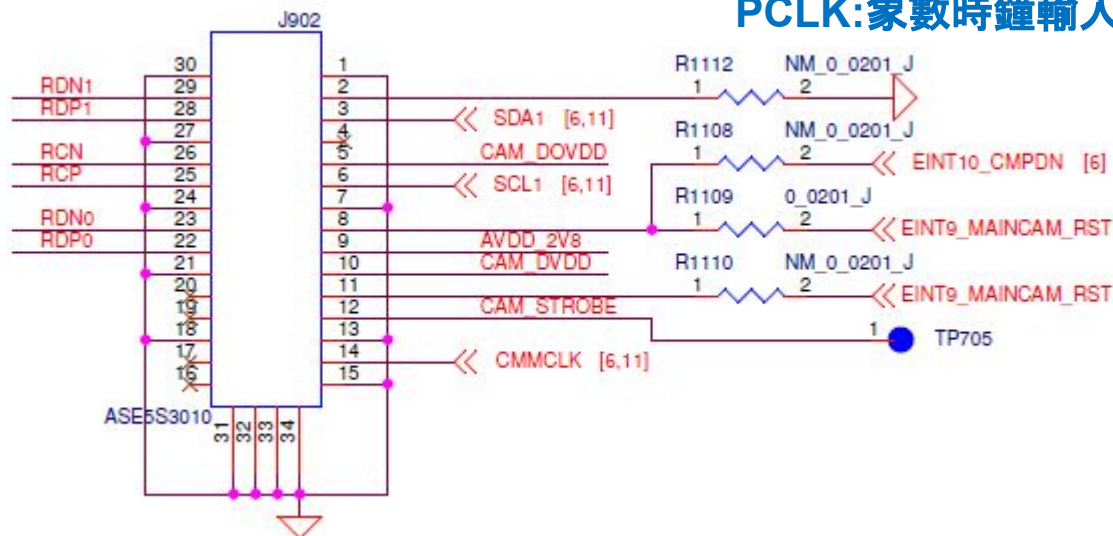
# BB-9 Camera can not turn on (無法攝像) (3/3)

- 1:無法進入拍攝模式,此為camera無法通過I2C信號被CPU正常識別造成,此不良主要查供電/reset/CLK/PWD是否正常
- 2:拍攝黑屏/油畫:此現象為手機進入拍攝模式后,但無法讀取景物,此類不良主要是camera無法通過DATA路徑將信號傳給CPU正常處理造成,此類不良主要檢查camera的DATA。

VREF/HREF: Sensor垂直/水平參考信號

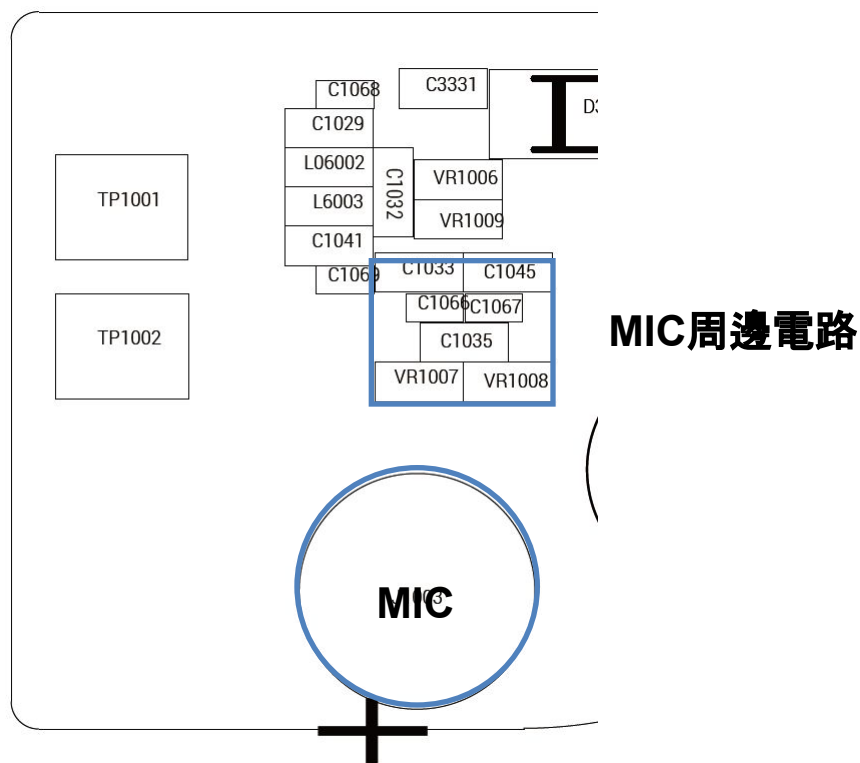
MCLK:來自CPU的主時鐘輸出

PCLK:象數時鐘輸入



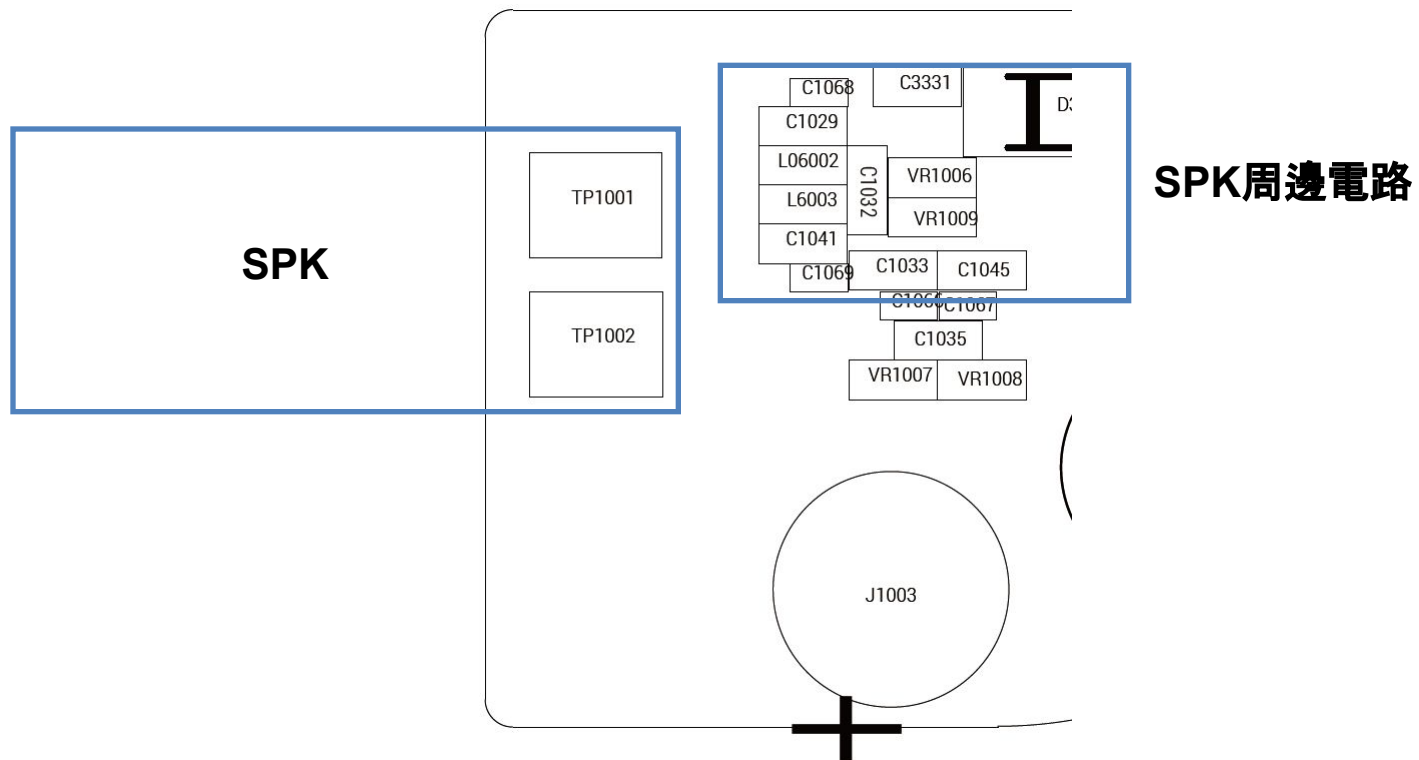
# BB-10 MIC no function (麥克風無作用)

- 1. 確認J1003 Microphone是否正常 (正常Mic阻抗約0.95K $\Omega$ )
- 2. 確認MIC 周邊電路是否有異狀[錫短 or 空焊]?



# BB-11 Speaker no function (喇叭無聲)

- 1. 確認Speaker彈腳及阻抗是否正常 (正常阻抗約8Ω)
- 2. 確認Speaker周邊電路是否異常?[錫短 or 空焊]?



# BB-12 Audio function fail (Audio 不良) (1/4)

**Audio类不良针对不同测试项fail,检查不同的路径.**

**1:wave play back fail □测的是SPK路径.**

**2:receiver fail □测的是手机听筒路径.**

**3:headset fail □测的是耳机左右声道路径.**

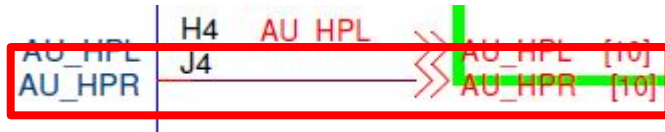
**4:phone mic to headset fail □测的是手机MIC路径.**

**5:headsetmic to headset fail □测的是耳机MIC路径.**

**以上面不同fail项目对audio电路拆解分析:**

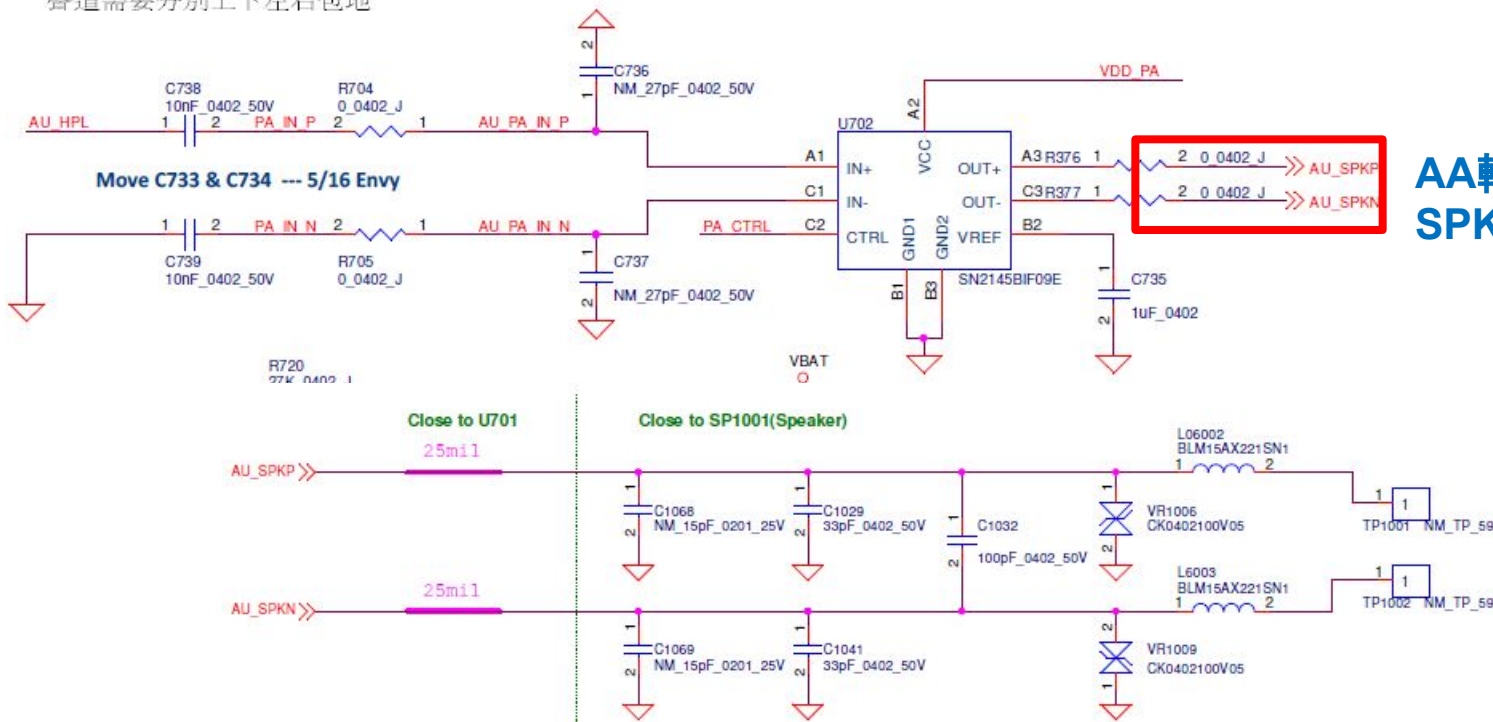
# BB-12 Audio function fail (Audio 不良) (1/4)

## Speaker路徑:



PMU給出SPK信號進入AA進行放大處理

聲道需要分別上下左右包地

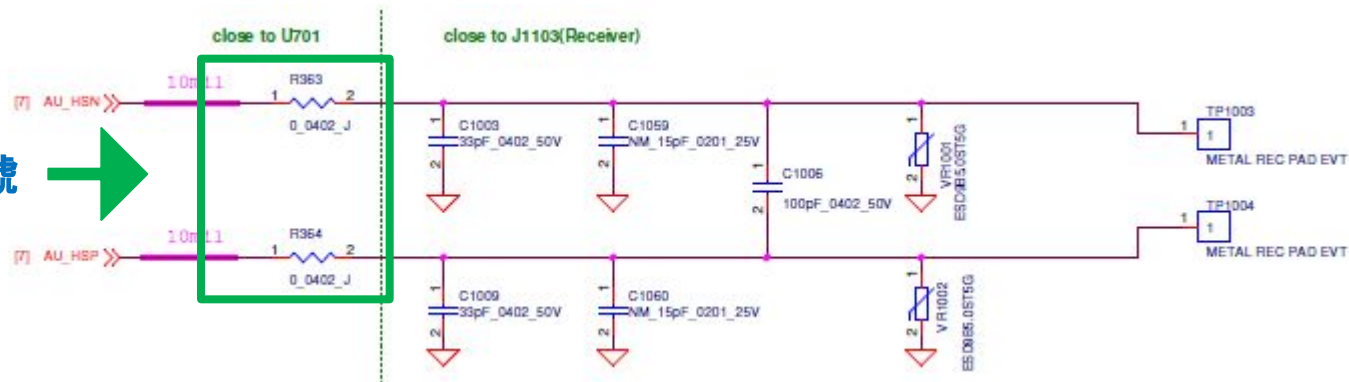


AA輸出放大后的SPK信號

# BB-12 Audio function fail (Audio 不良) (2/4)

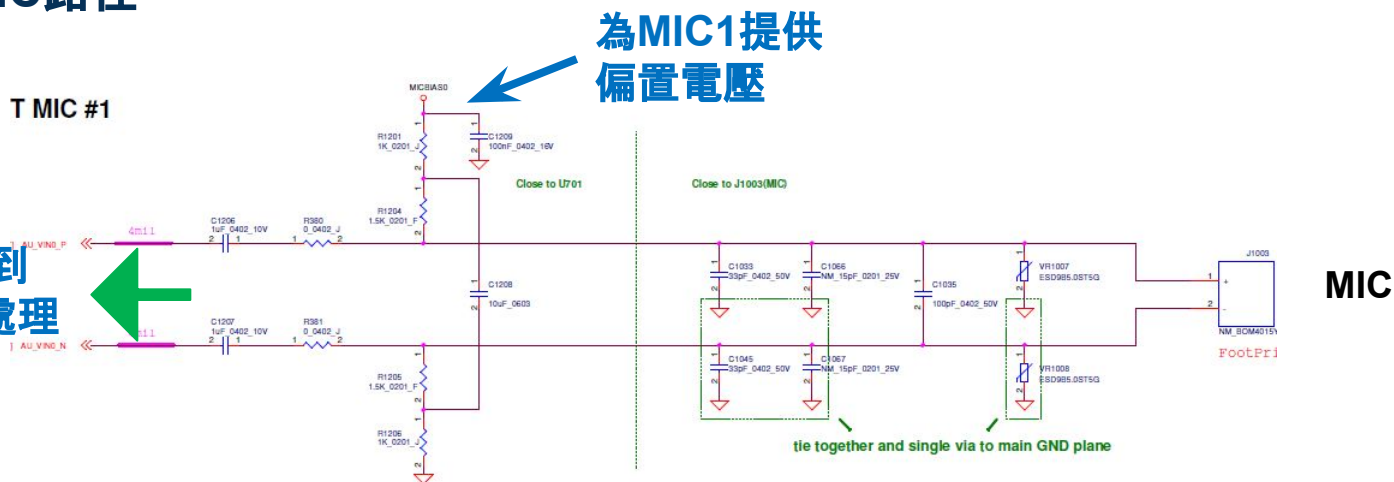
- receiver 路徑: 聽筒無聲, 優先check 0om是否導通

CPU輸出音頻信號



- 手機MIC路徑

MIC1信號輸入到 CPU進行音頻處理



為MIC1提供偏置電壓

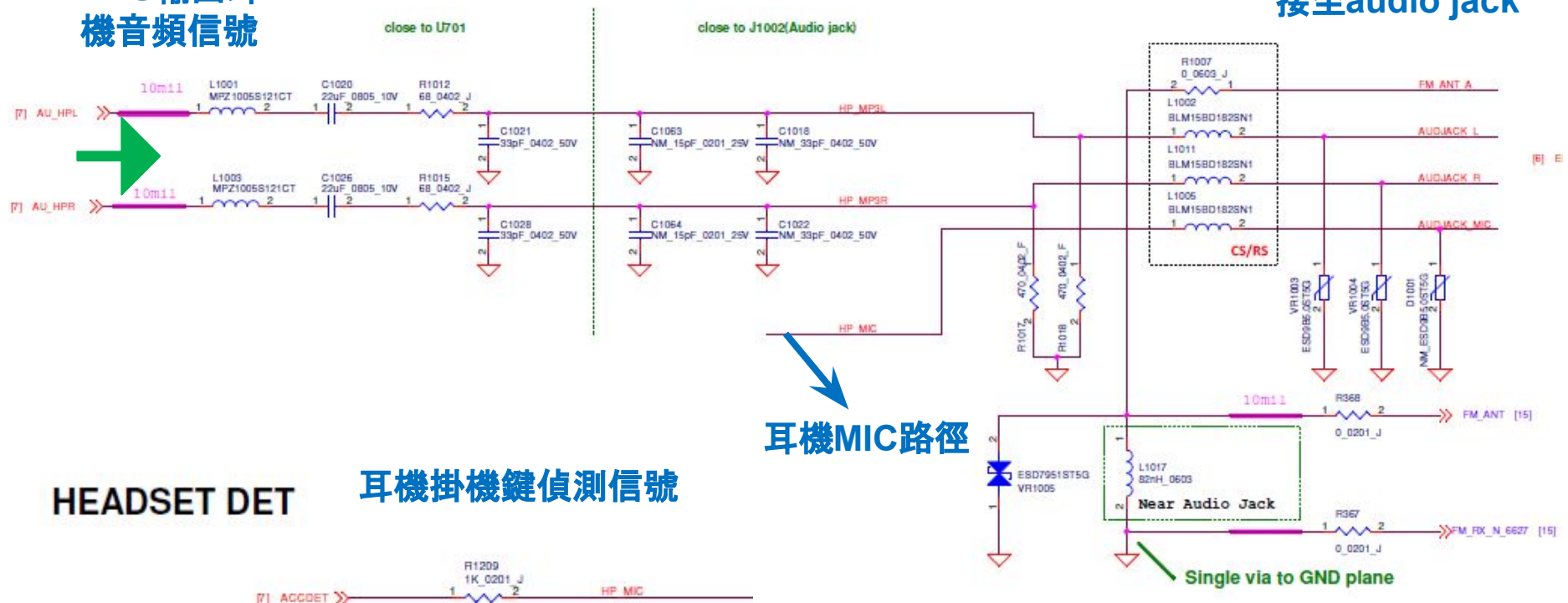


# BB-12 Audio function fail (Audio 不良) (3/4)

## 耳機左右聲道電路:

CPU輸出耳機音頻信號

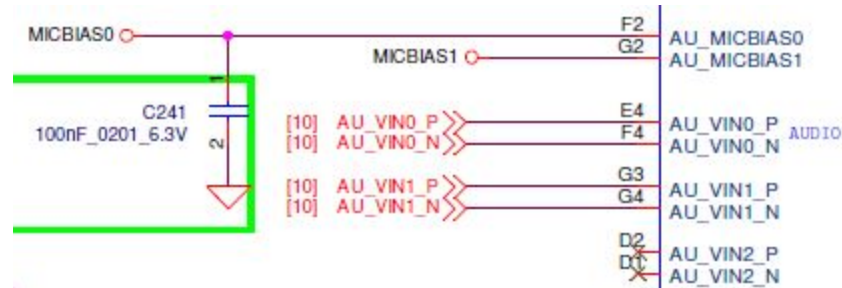
耳機左右聲道連接至audio jack



# BB-12 Audio function fail (Audio 不良) (4/4)

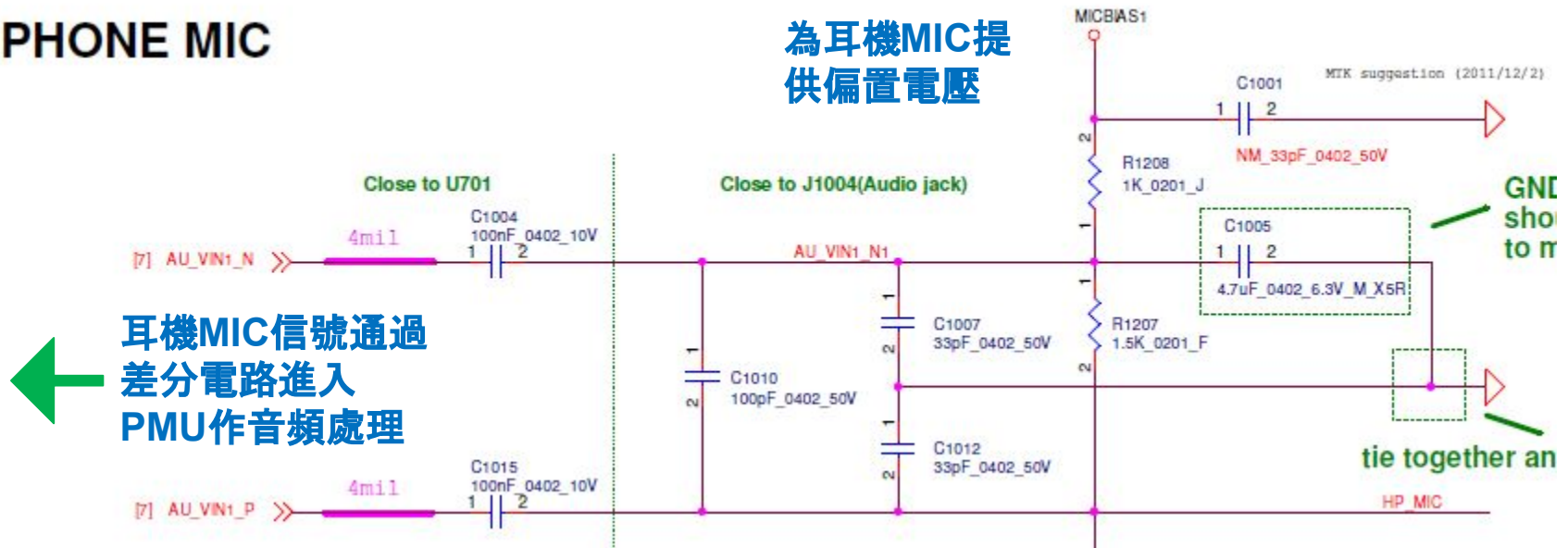
## 耳機MIC電路:

### PMU 處理Audio信號路徑



## EARPHONE MIC

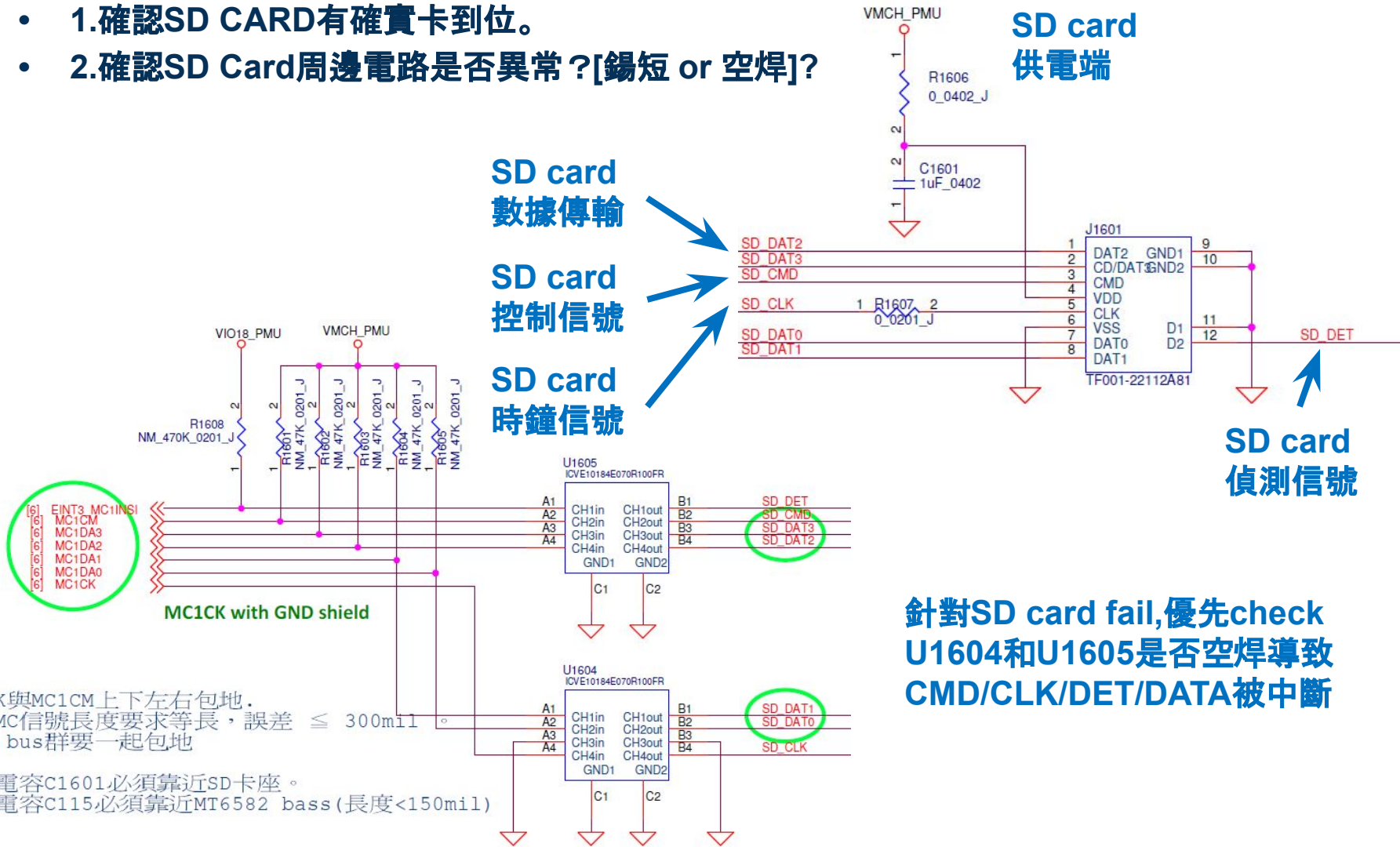
### 為耳機MIC提供偏置電壓



耳機MIC信號通過  
差分電路進入  
PMU作音頻處理

# BB-13 SD Card no function (SD Card無作用)

- 1. 確認SD CARD有確實卡到位。
- 2. 確認SD Card周邊電路是否異常？[錫短 or 空焊]？

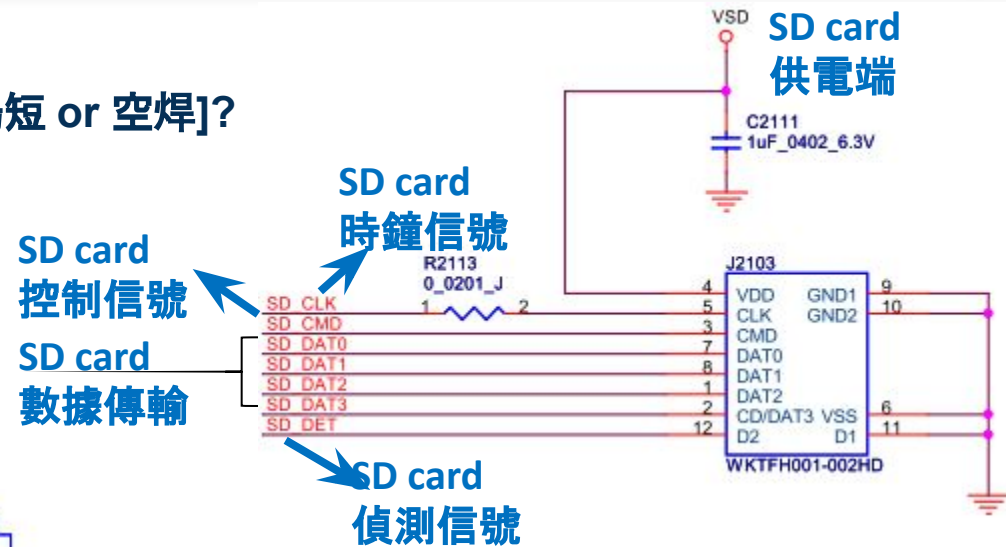


MC1CK與MC1CM上下左右包地。  
所有MC信號長度要求等長，誤差  $\leq 300\text{mil}$ 。  
Data bus群要一起包地

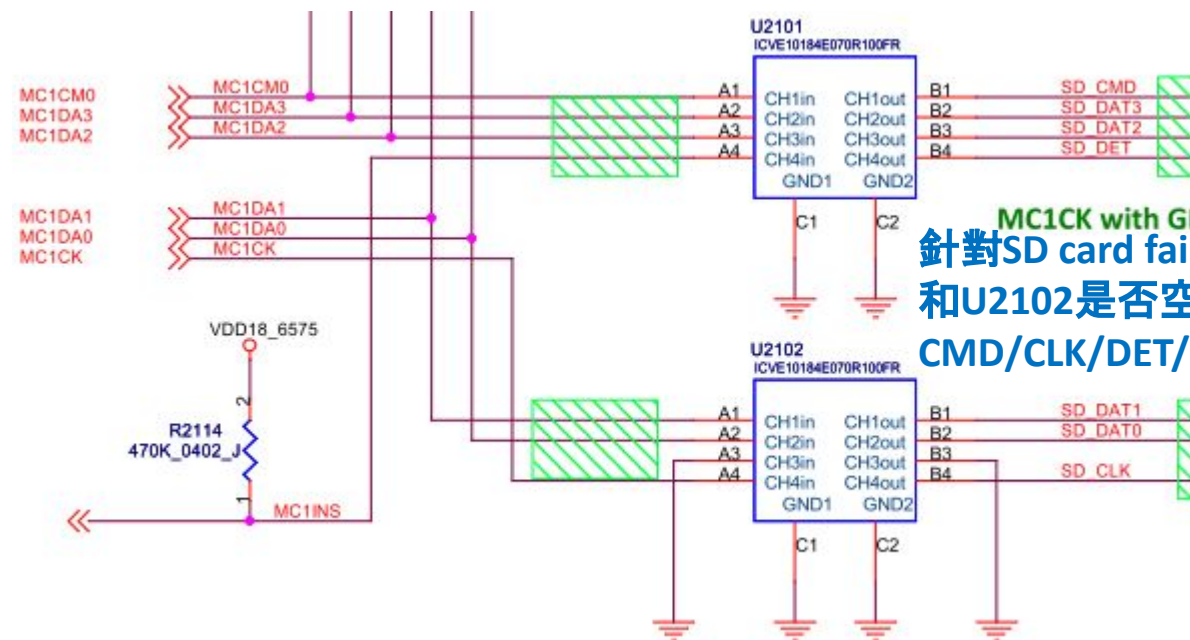
濾波電容C1601必須靠近SD卡座。  
濾波電容C115必須靠近MT6582 bass (長度 $<150\text{mil}$ )

# BB-13 SD Card no function (SD Card無作用)

- 1. 確認SD CARD有確實卡到位。
- 2. 確認SD Card周邊電路是否異常？[錫短 or 空焊]？

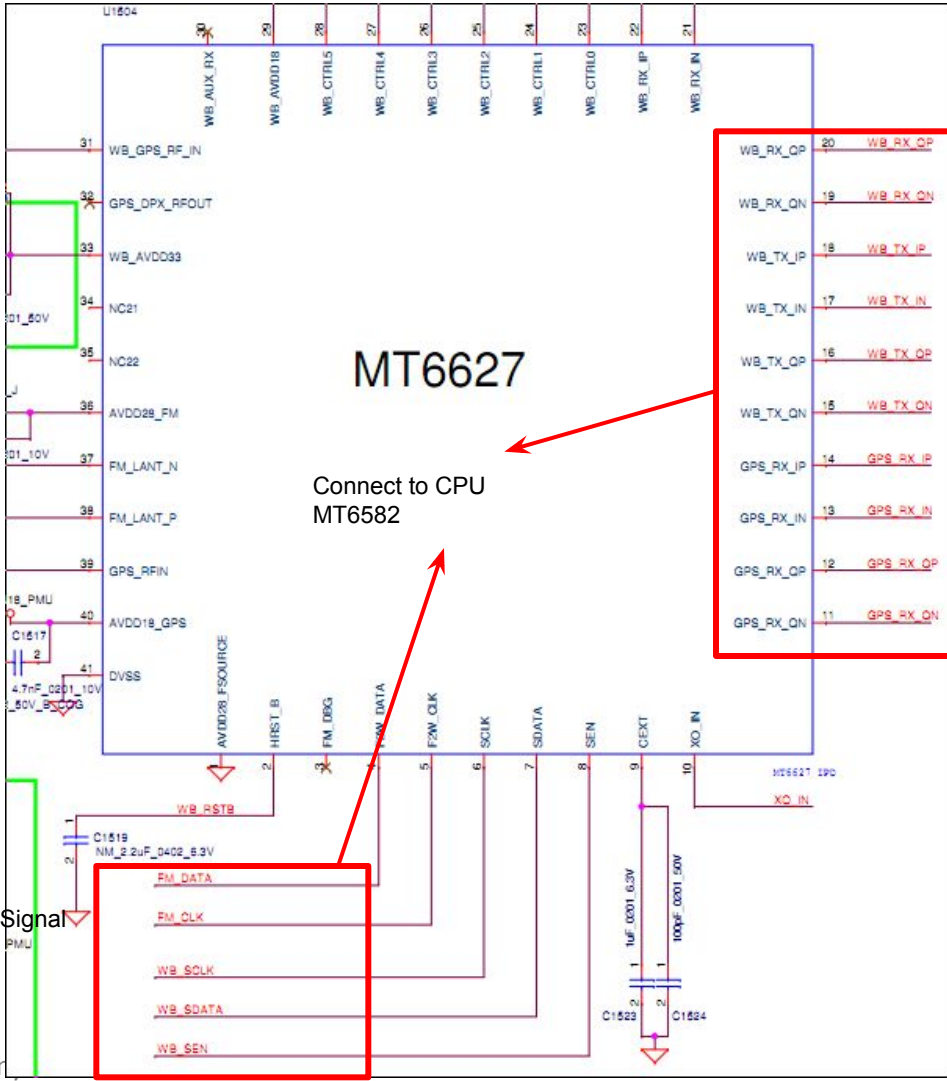


針對SD card fail, 優先check U2101 和U2102是否空焊導致 CMD/CLK/DET/DATA被中斷

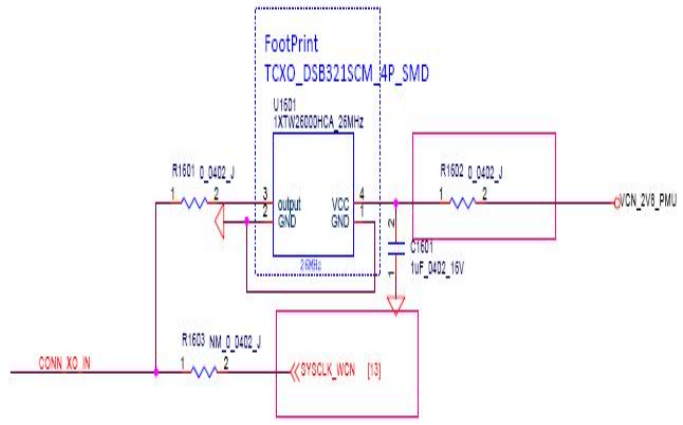


# WIFI/BT/GPS

## WIFI/BT/GPS 功能使用的IC為MTK MT6627

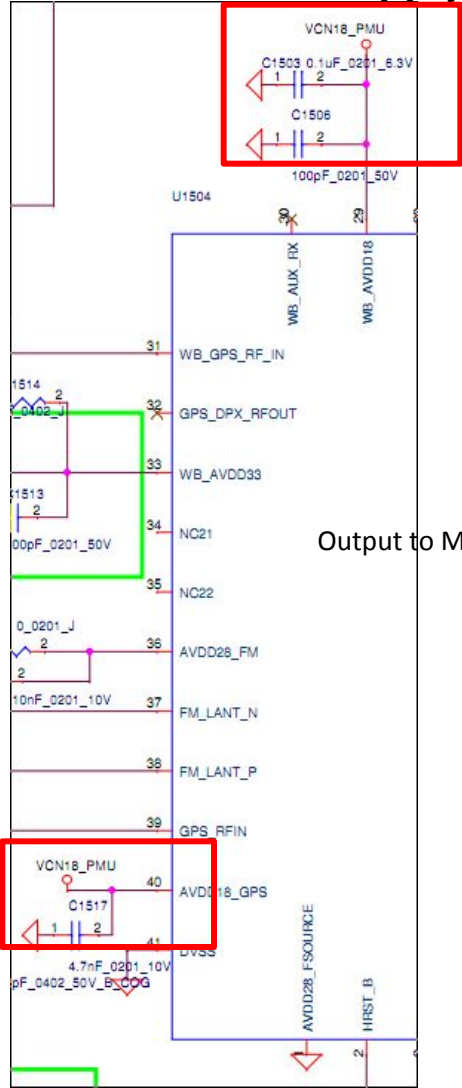


I/Q Signal

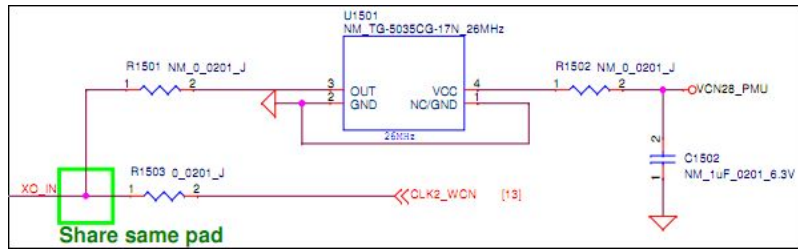


獨立的26M TCXO, Output Clock to MT6627

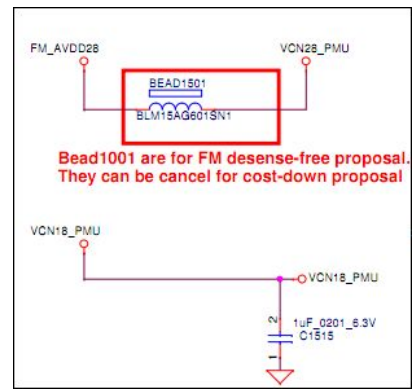
## MT6627 Power supply



Output to MT6627



Share same pad

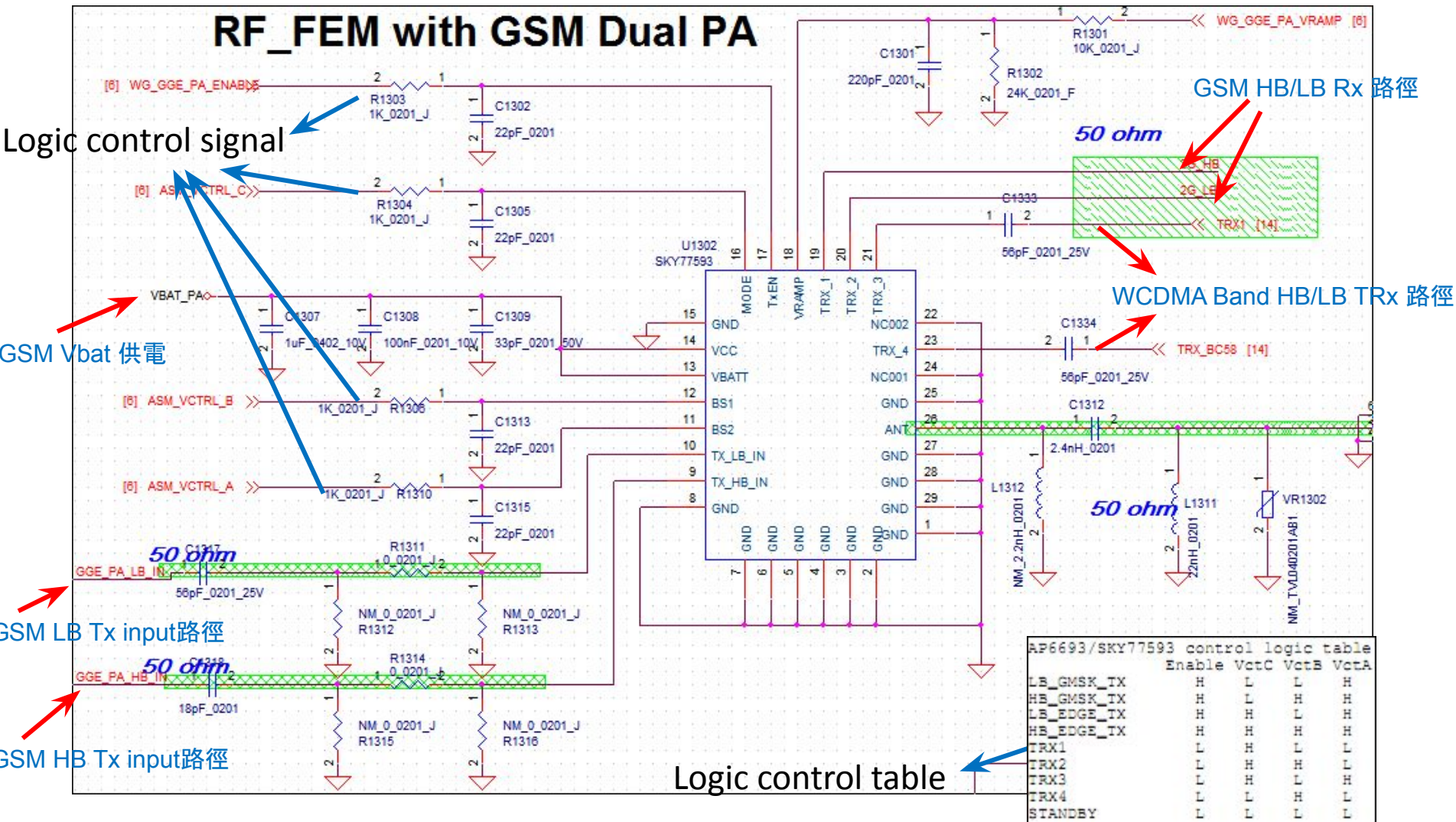


Bead1001 are for FM desense-free proposal. They can be cancel for cost-down proposal

From PMU MT6323



# GSM PA + Switch

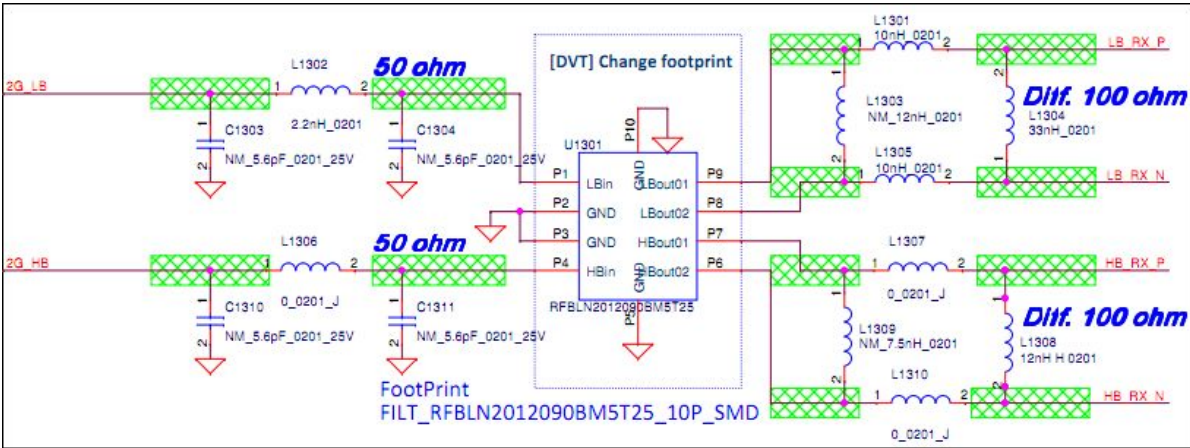


# GSM RX

## GSM HB/LB 電路:

2G LB Rx

2G HB Rx



Balance output to transceiver LB Port

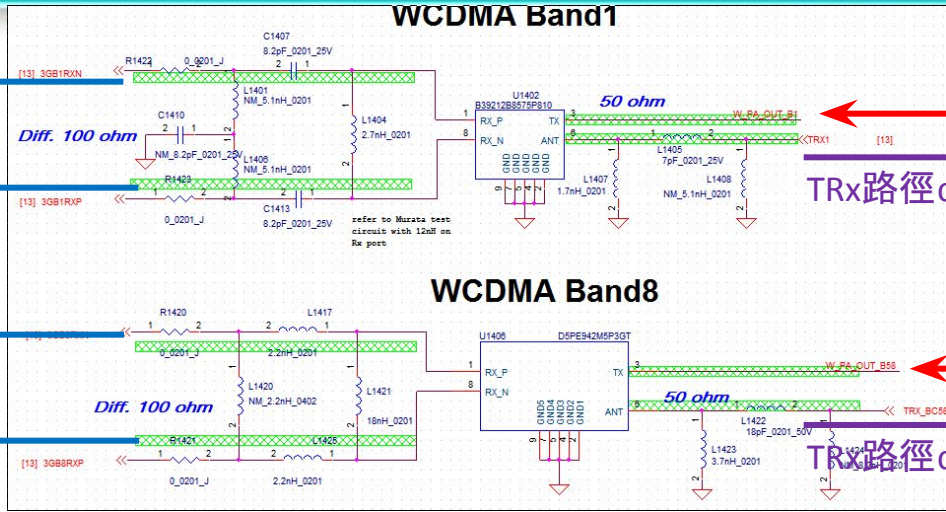
Balance output to transceiver HB Port



# WCDMA Band1/8 TRx (LV82)

Rx 路徑 balance to transceiver

Rx 路徑 balance to transceiver



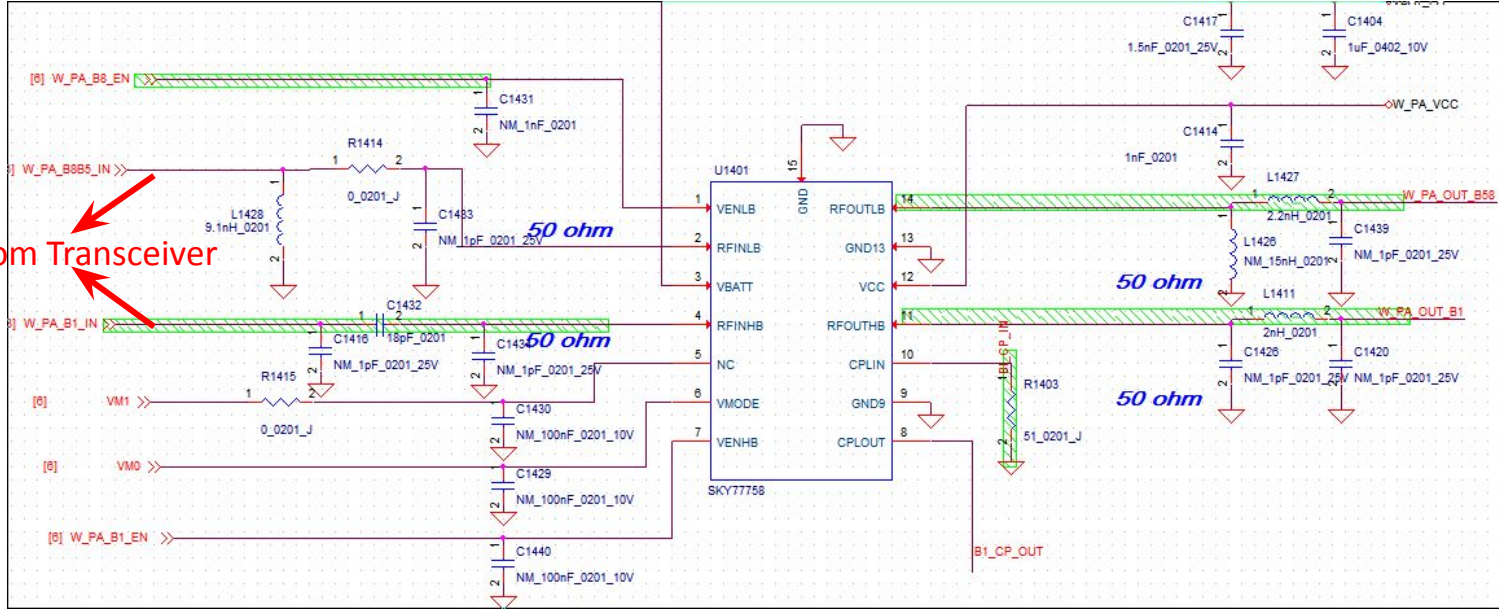
TRx路徑 connect with ANT Switch

TRx路徑 connect with ANT Switch

Tx 路徑 from Transceiver

Band 8 Tx 路徑

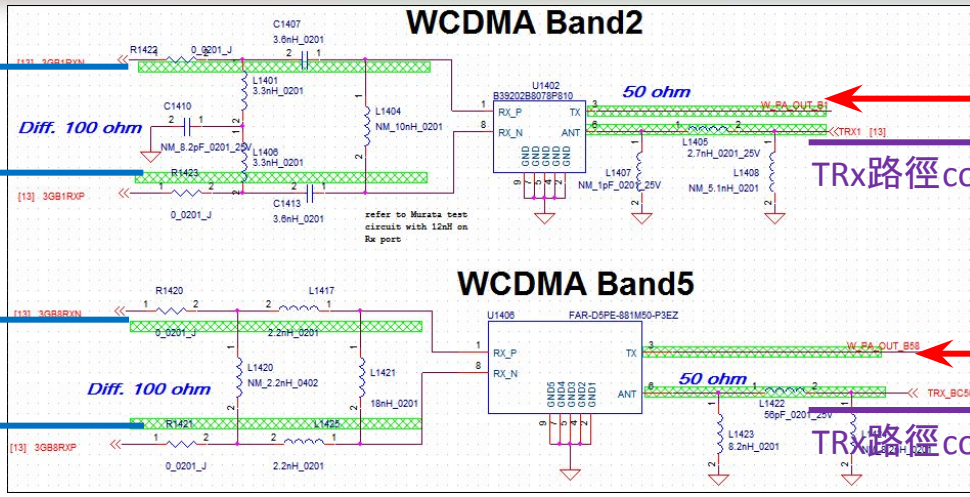
Band 1 Tx 路徑



# WCDMA Band2/5 TRx (LV81)

Rx 路徑 balance to transceiver

Rx 路徑 balance to transceiver



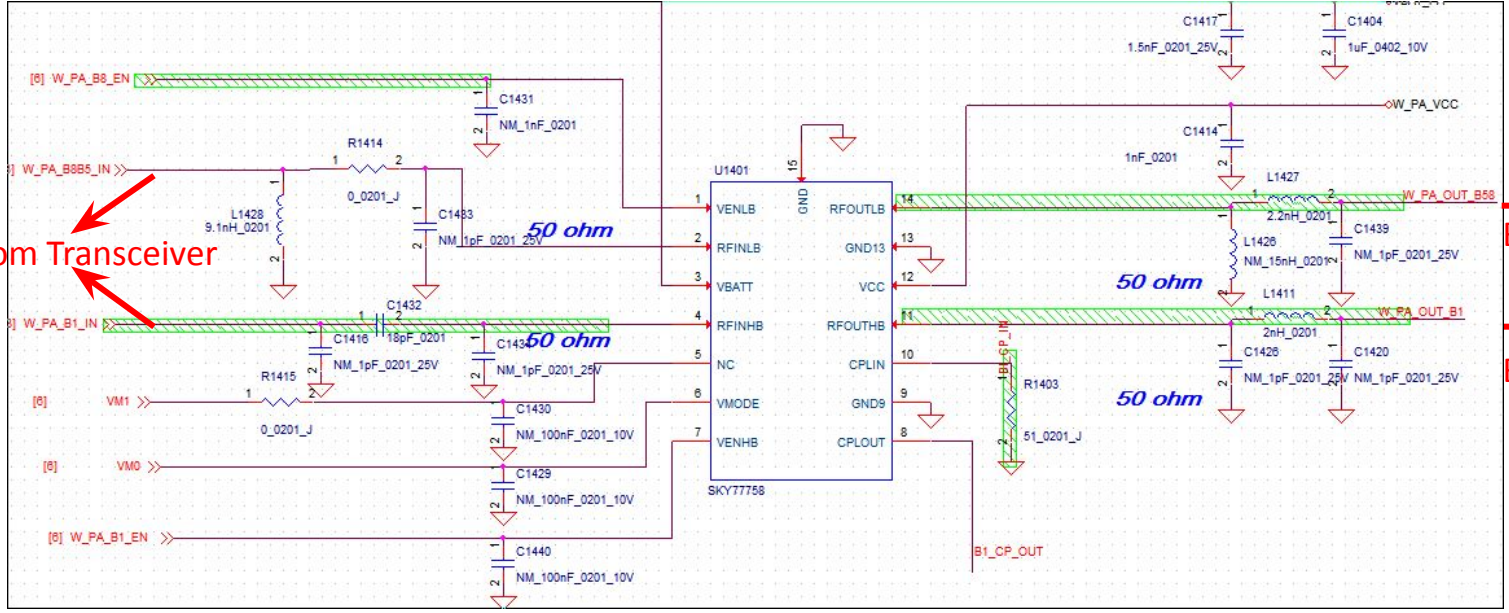
TRx路徑 connect with ANT Switch

TRx路徑 connect with ANT Switch

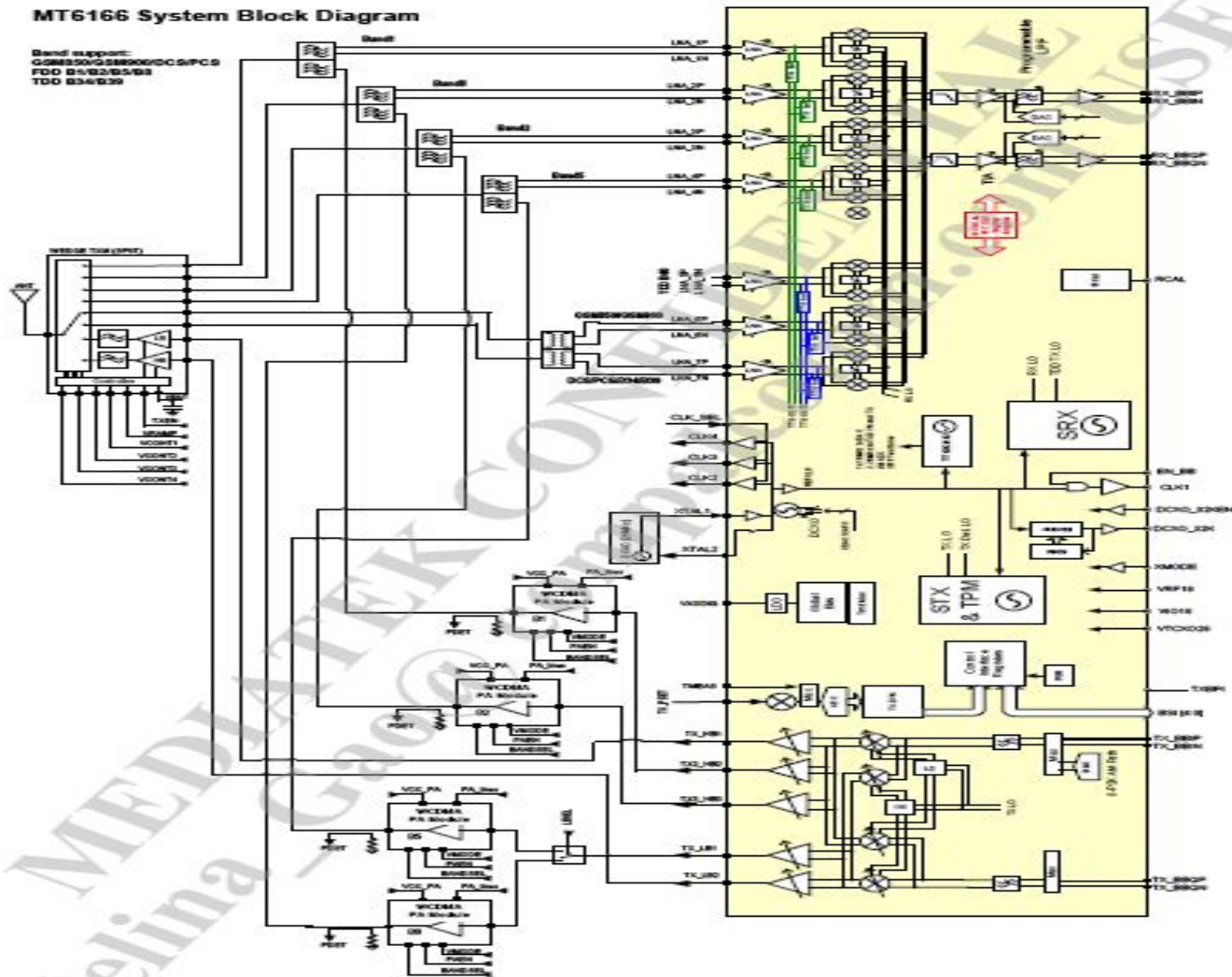
Tx 路徑 from Transceiver

Band 5 Tx 路徑

Band 2 Tx 路徑

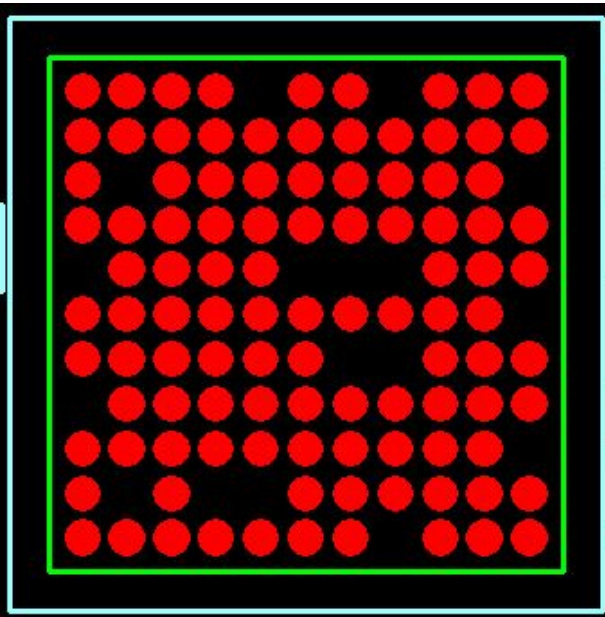


# RF introduction: MT6166 Function Block



# RF introduction: MT6166 Pin assignment

Ball Assignment

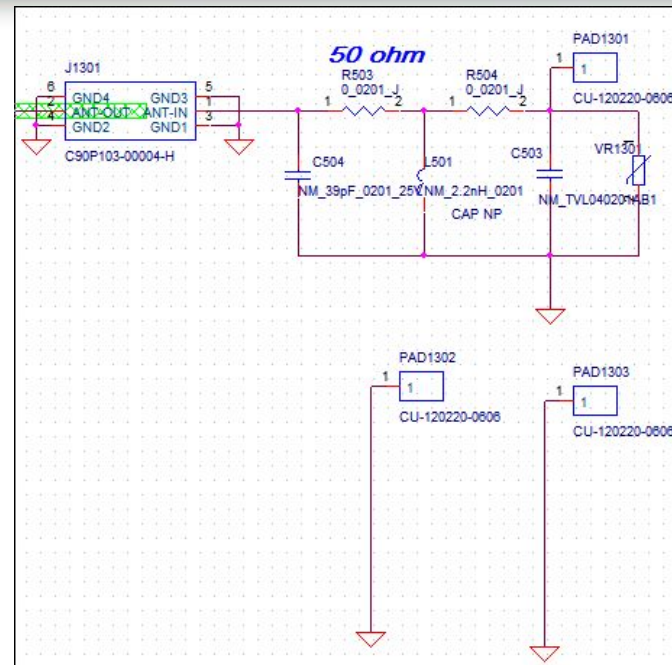


	1	2	3	4	5	6	7	8	9	10	11	
A	B40_RXP	3GB1_RXP	3GB1_RXN		3GB2_RXP	3GB8_RXP		3GH1_TX	3GH2_TX	3GL5_TX	2GLB_TX	A
B	B40_RXN		3GB5_RXP	3GB5_RXN	3GB2_RXN	3GB8_RXN	GND	2GHB_TX		GND	VTXHF	B
C	LB_RXP	GND	GND	GND	GND	GND	GND	GND	GND	GND	TMEAS	C
D	LB_RXN		GND	GND	GND	GND	GND	GND	GND	DETGND	DET	D
E	HB_RXP		GND	GND	GND	GND	GND	GND	GND	V28		E
F	HB_RXN	VRXHF	GND	GND	GND	GND		BSI_DATA0	GND	3GTX_QP	3GTX_QN	F
G	32K_EN	RFVCO_M0N	GND	GND		BSI_EN		BSI_DATA2	GND	3GTX_IP	3GTX_IN	G
H		XTAL2	GND	GND		BSI_CLK		BSI_DATA1	GND	TXBPI		H
J	XTAL1	GND	GND	GND	GND	GND	GND	GND	GND	RCAL	VTXLF	J
K	VTXO28	CLK_SEL	XO2	XO4	OUT32K	AVDD_VIO18	VXODIG	RX_IN	RX_QN	RX_QP	TST2	K
L	EN_BB	XO3		XO1	XMODE		VRXLF	RX_IP		TST1	TXVCO_M0N	L
	1	2	3	4	5	6	7	8	9	10	11	

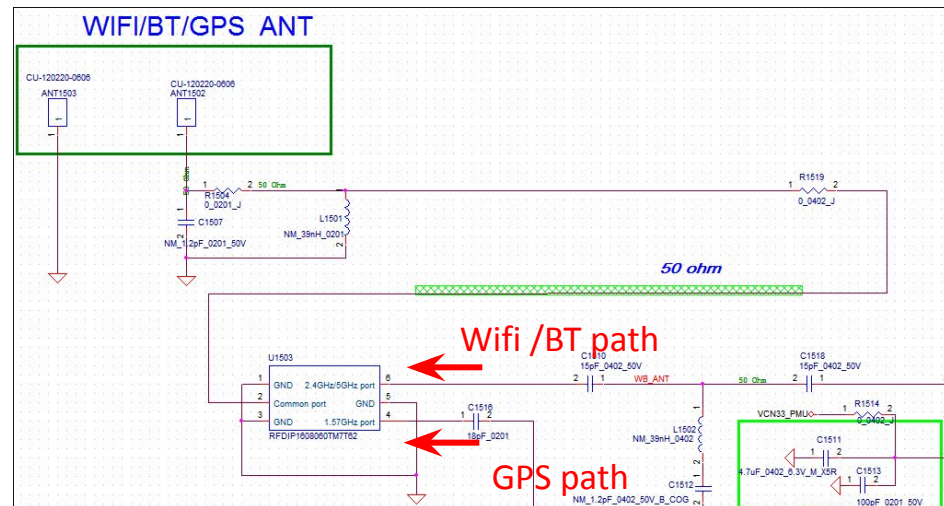
# RF introduction: Antenna Circuit

- Antenna Circuit
- RF天線主要包含了 2G/3G/WIFI/GPS, 其原理電路分別描述如下

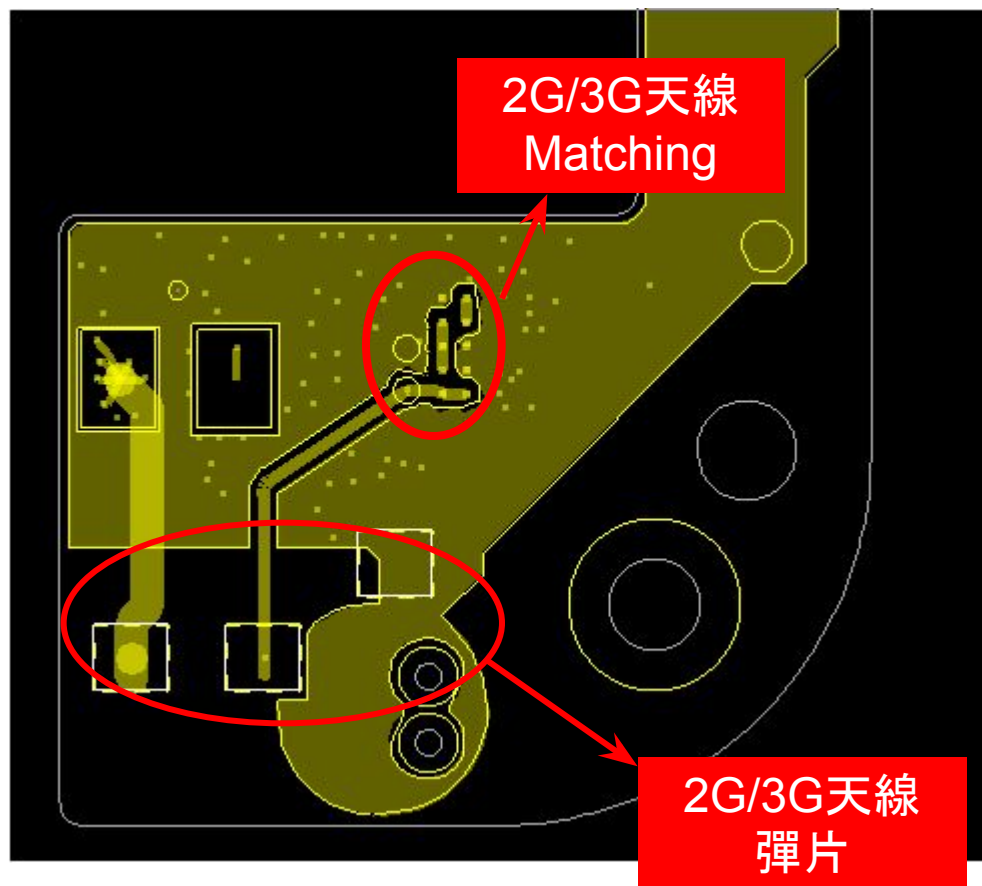
## Main ANT RF Paths



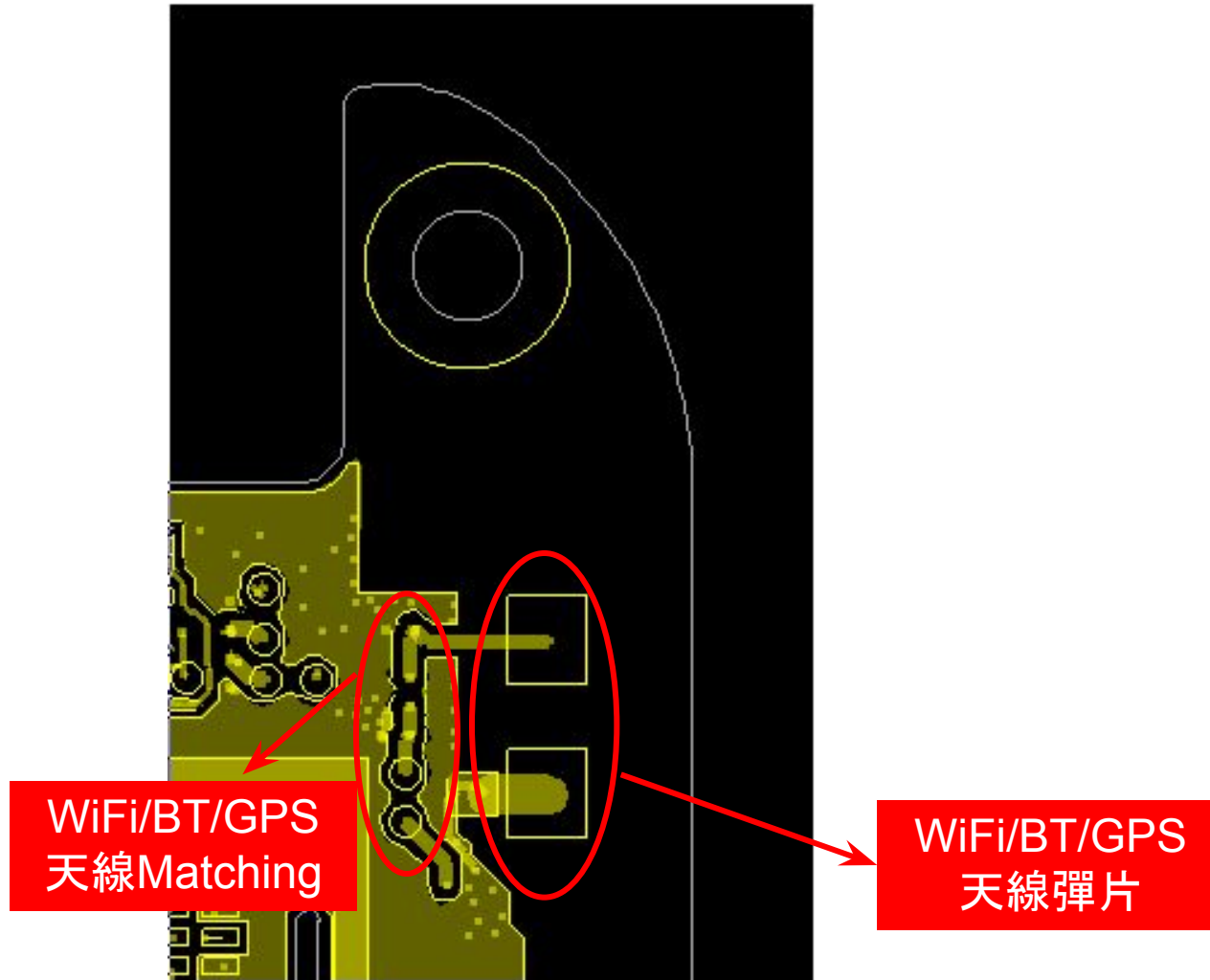
## WIFI ANT RF Paths



# RF introduction:2G/3G Main Antenna Position



# RF introduction: WIFI Antenna Position



# RF常見問題

**RF-1:網路功能異常**

**RF-2:GSM problem**

**RF-3:WCDMA problem**

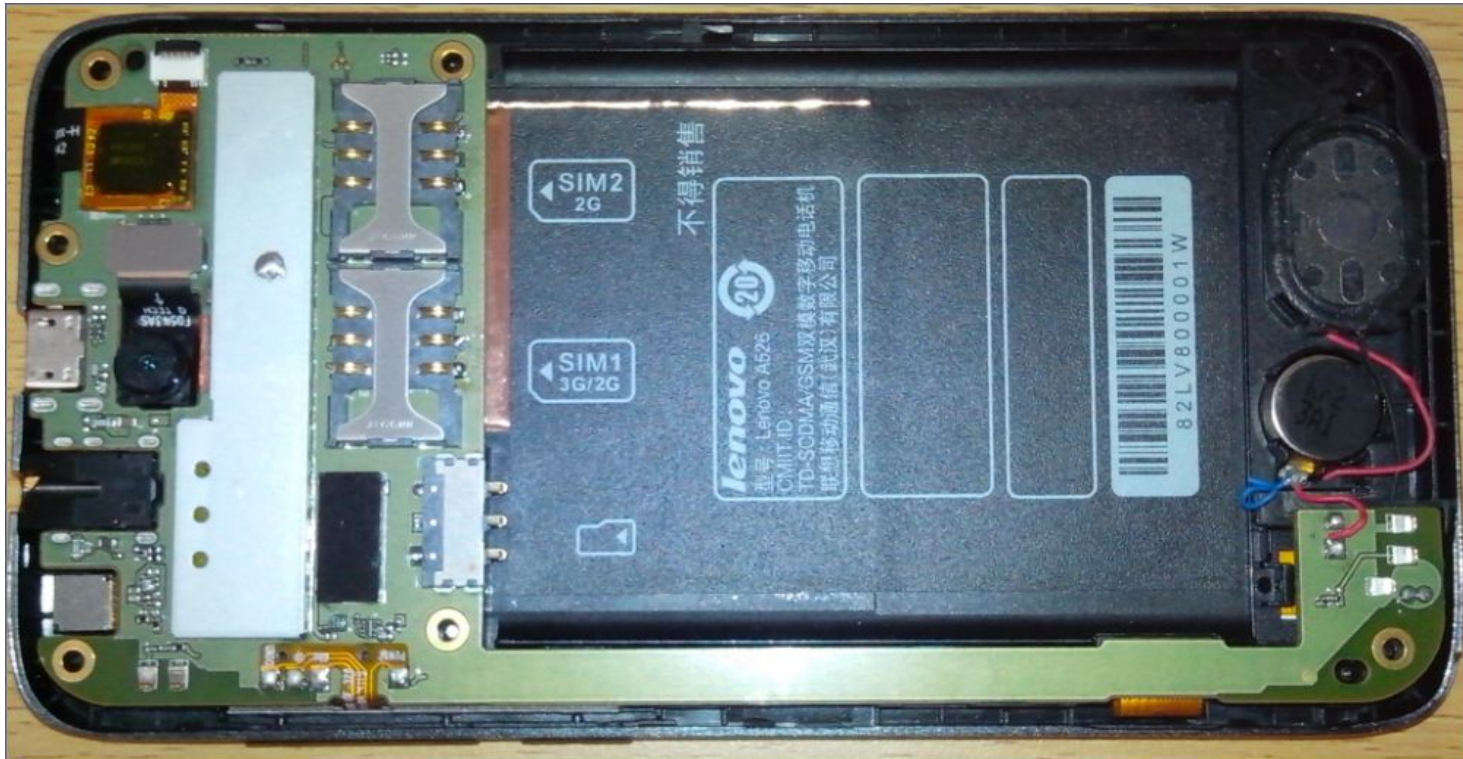
**RF-4:GSM/WCDMA Rx有問題**

**RF-5:WIFI problem**



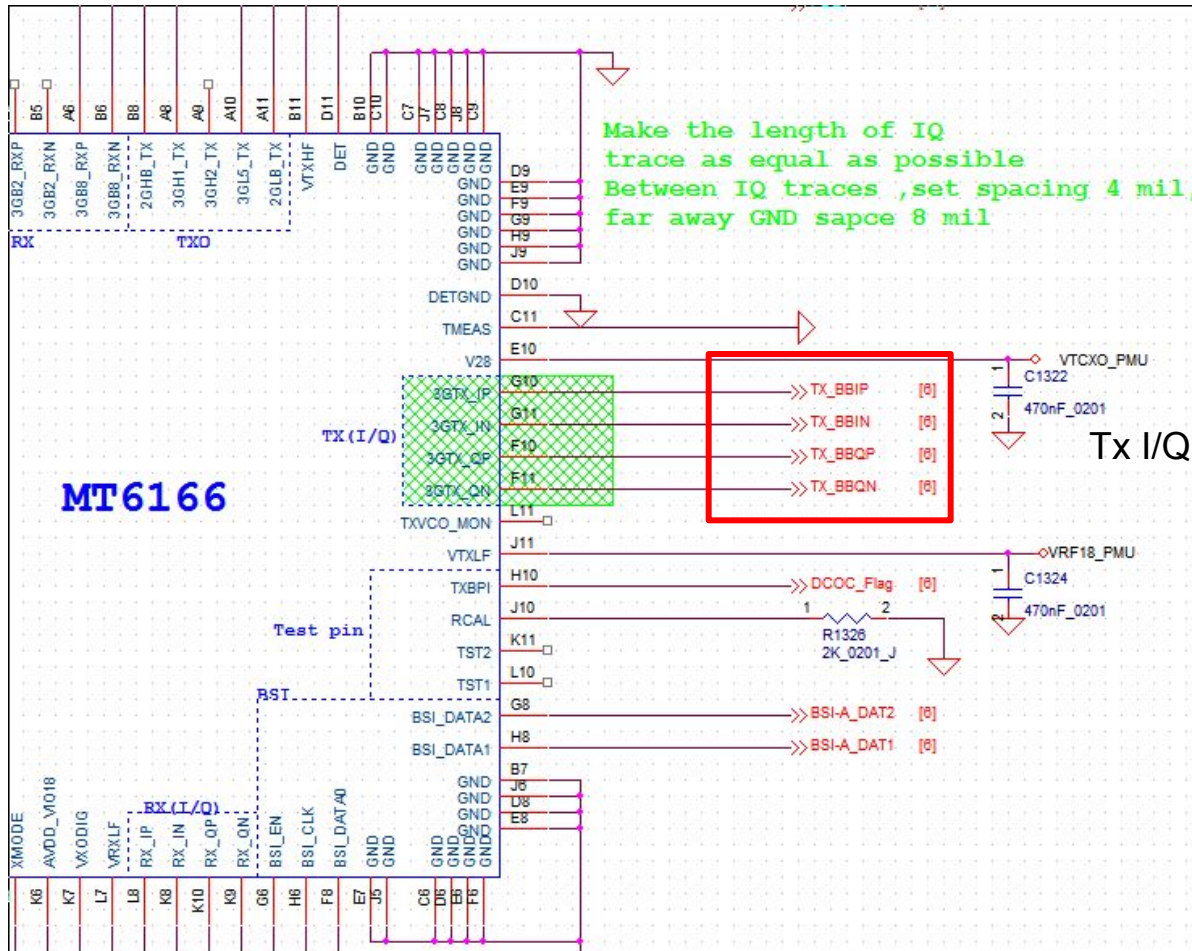
# RF-1:網路功能異常

- 若2G/3G 網路功能異常,請檢查螢幕天線格數,SIM card是否裝好? Coaxial cable和是否組好?



# RF-2:GSM Trouble shooting (1/3)

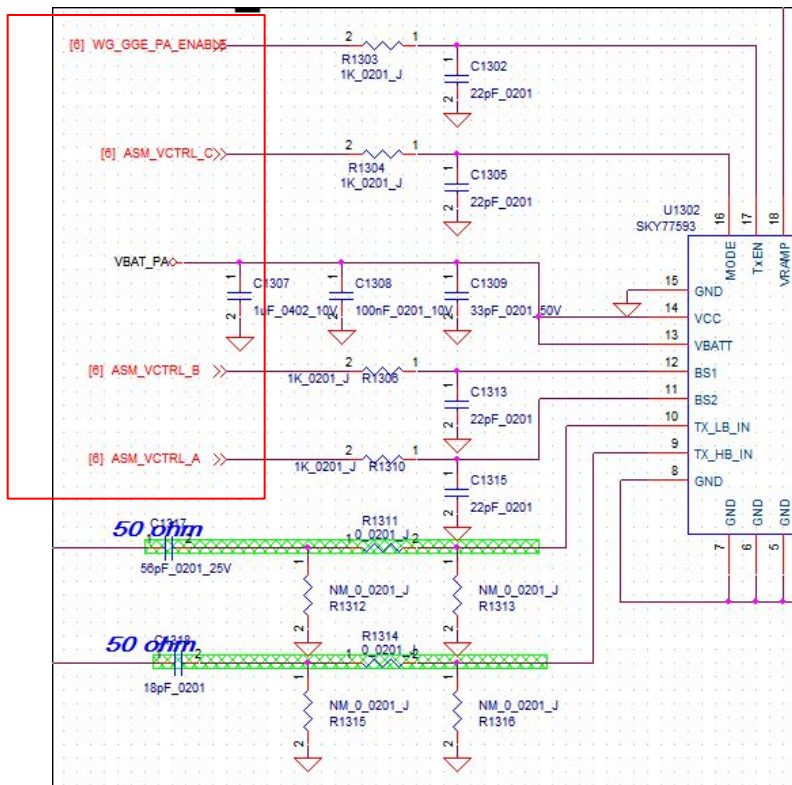
- 檢查GSM發射路徑



# RF-2:GSM Trouble shooting (2/3)

## • GSM發射路徑

- 由於2G PA和ASM整合在U1302,檢查發射時對應邏輯控制電壓是否正確?
- 使用示波器量測下圖所標腳位的電壓是否符合右下列表

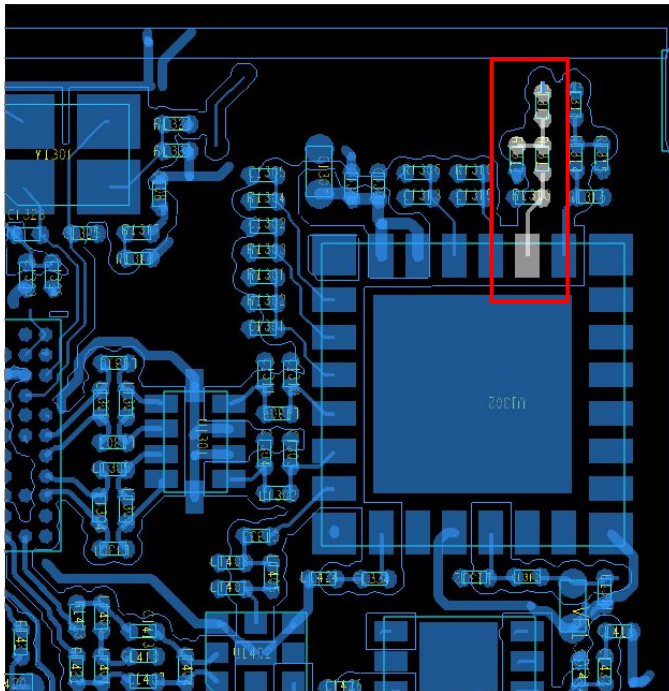


AP6693/SKY77593 control logic table				
	Enable	VctC	VctB	VctA
LB_GMSK_TX	H	L	L	H
HB_GMSK_TX	H	L	H	H
LB_EDGE_TX	H	H	L	H
HB_EDGE_TX	H	H	H	H
TRX1	L	H	L	L
TRX2	L	H	H	L
TRX3	L	H	L	H
TRX4	L	L	H	L
STANDBY	L	L	L	L

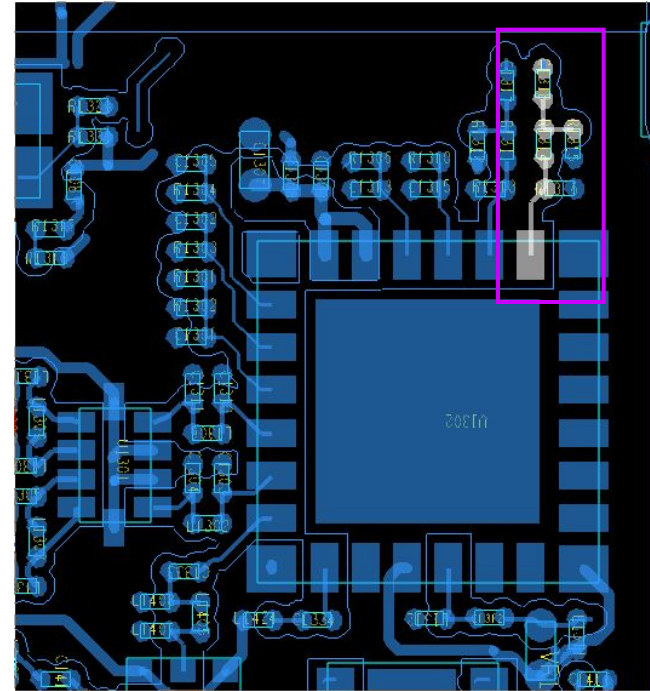
# RF-2:GSM Trouble shooting (3/3)

- **GSM發射路徑**

- 檢查發射路徑的功率
- 使用spectrum probe量測下列標駐點,測量其功率



□ Low band GSM signal

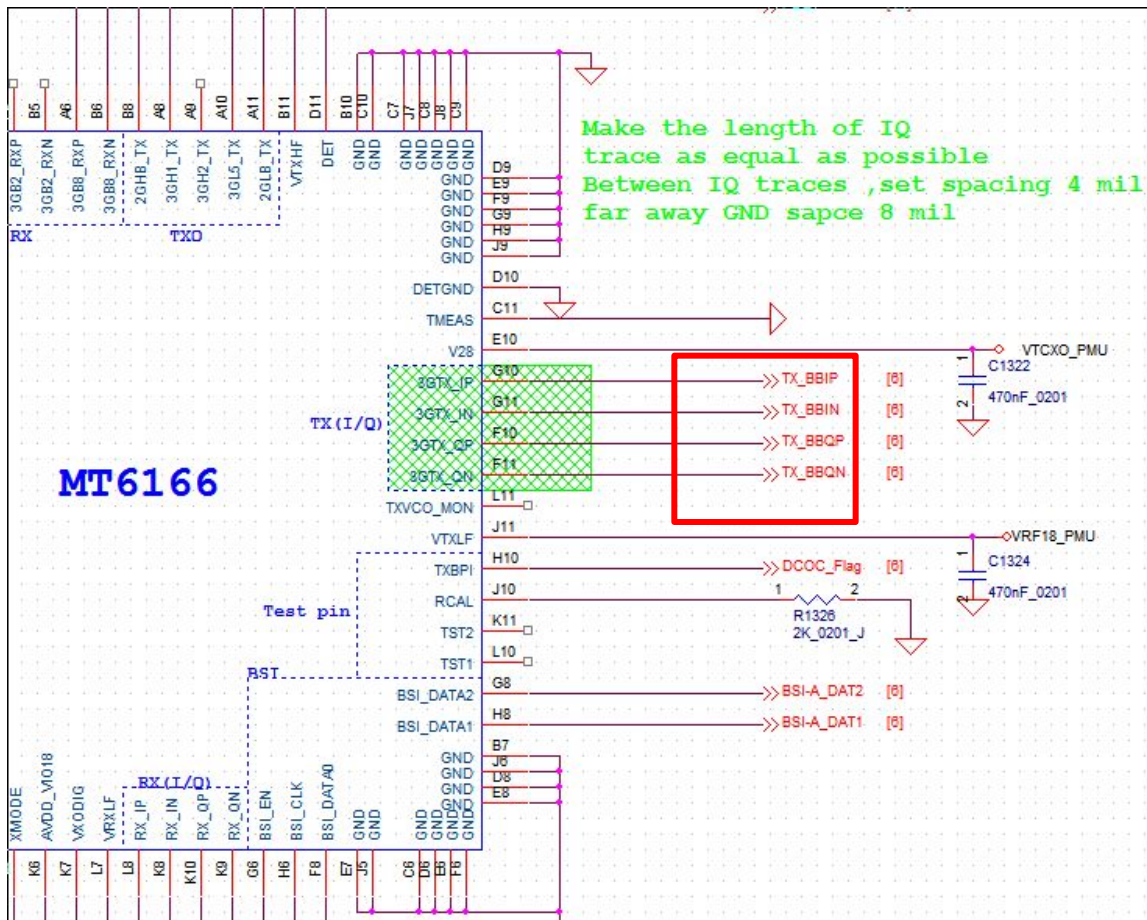


□ High band GSM signal

# RF-3:WCDMA Trouble shooting (1/5)

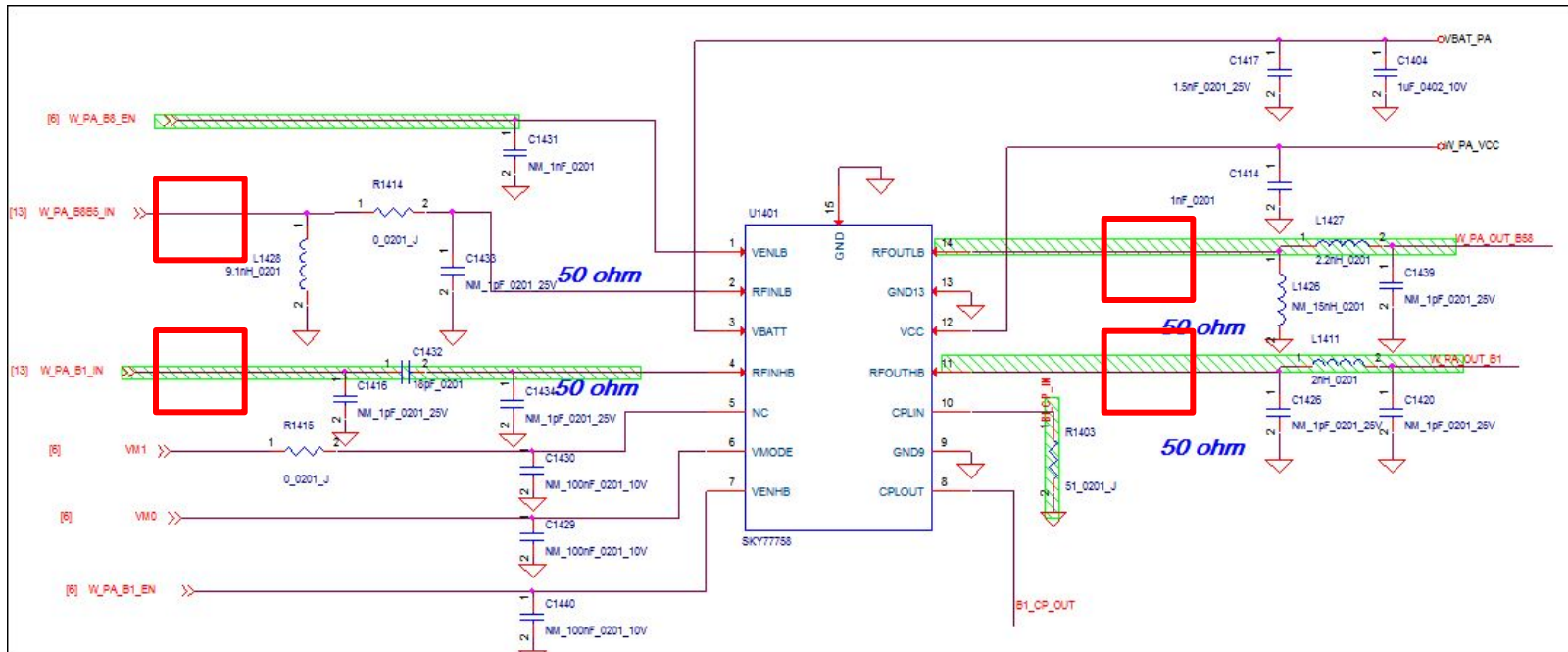
## • WCDMA發射路徑

- 確認IQ路徑
- 使用示波器量測下圖所標之腳位,檢視其波形



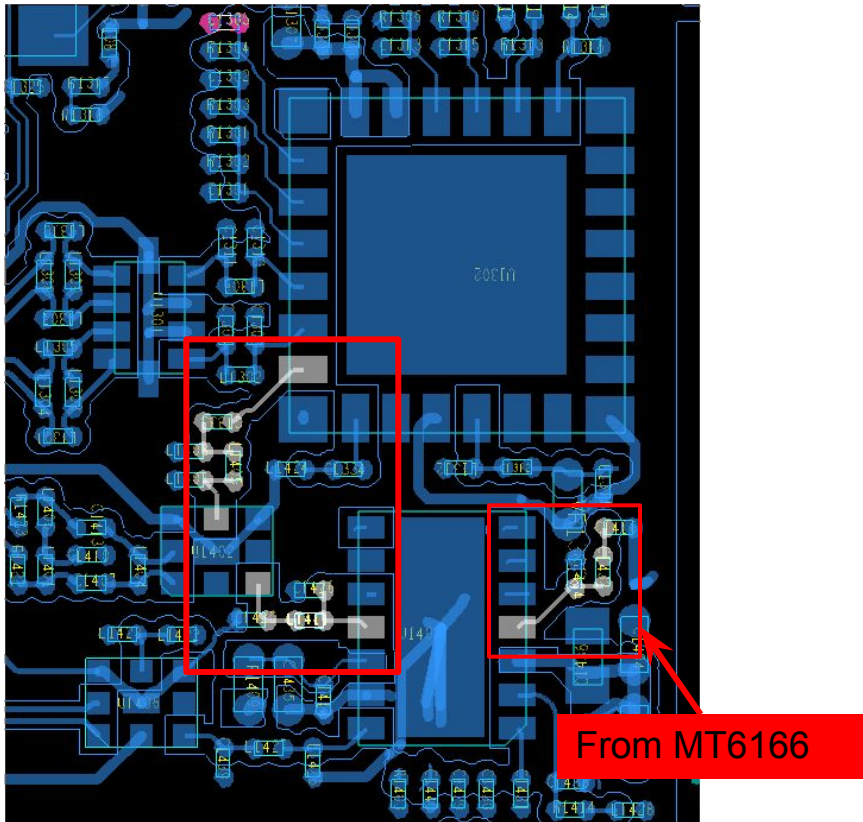
# RF-3:WCDMA Trouble shooting (2/5)

- WCDMA發射路徑
  - 確認發射路徑
  - 使用示波器量測下圖所標之腳位,檢視其波形

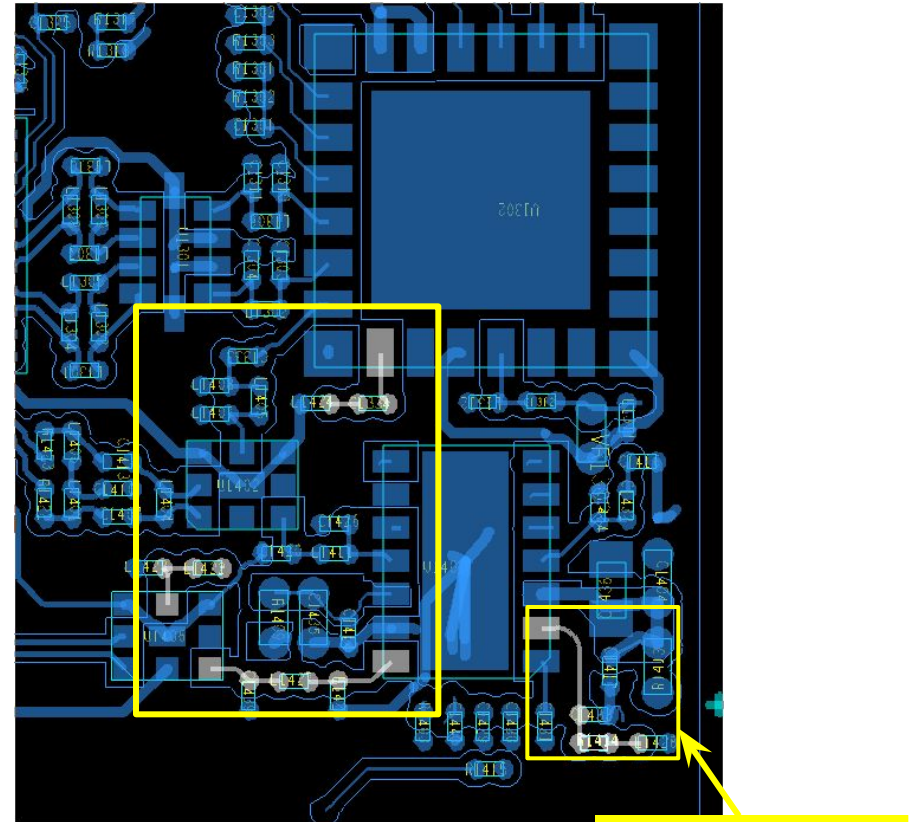


# RF-3:WCDMA Trouble shooting (3/5)

- WCDMA發射路徑
  - Transceiver-3G PA, PA-Duplexer



□ WCDMA BAND 1/2 signal



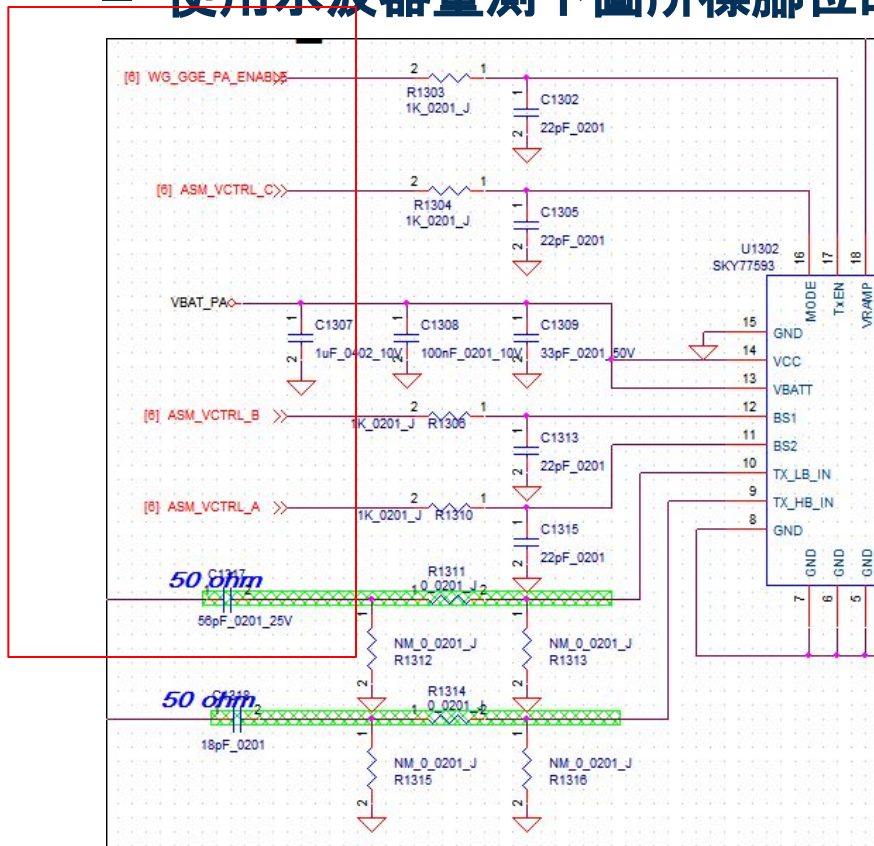
□ WCDMA BAND 1/2 signal

From MT6166

# RF-3:WCDMA Trouble shooting (4/5)

## WCDMA發射路徑

- 檢查ASM 邏輯控制電壓
- 使用示波器量測下圖所標腳位的電壓,是否符合右下列表

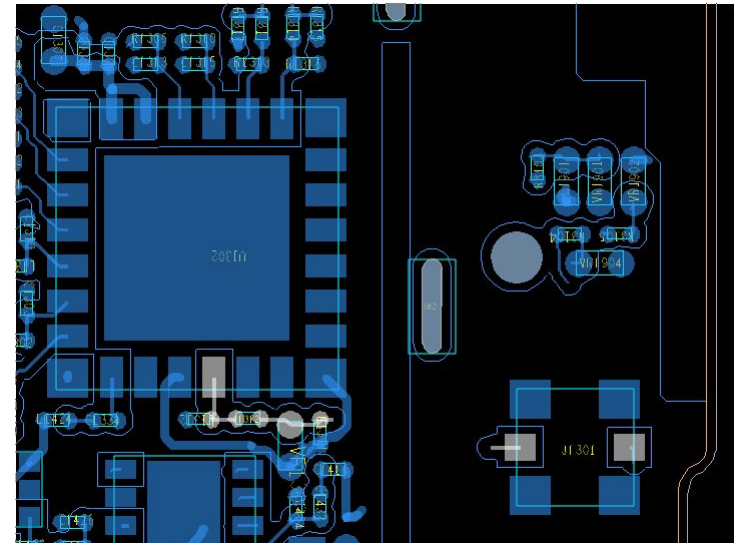
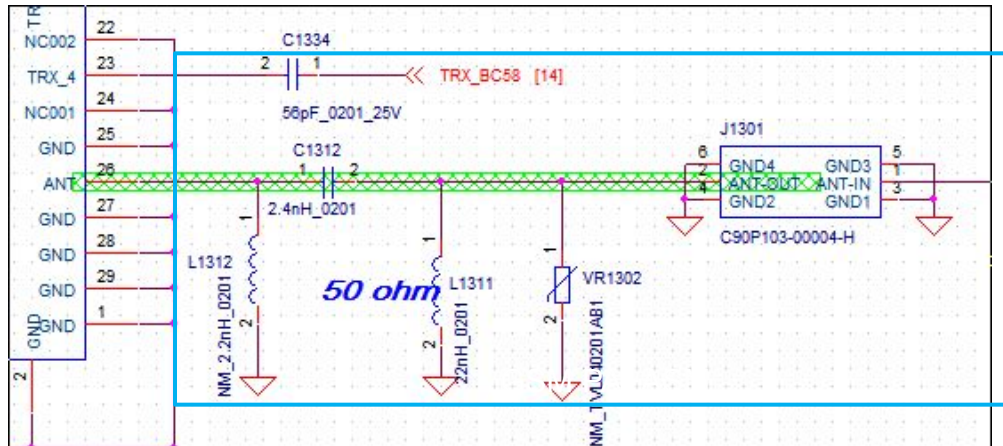


AP6693/SKY77593 control logic table				
	Enable	VctC	VctB	VctA
LB_GMSK_TX	H	L	L	H
HB_GMSK_TX	H	L	H	H
LB_EDGE_TX	H	H	L	H
HB_EDGE_TX	H	H	H	H
TRX1	L	H	L	L
TRX2	L	H	H	L
TRX3	L	H	L	H
TRX4	L	L	H	L
STANDBY	L	L	L	L



# RF-3:WCDMA Trouble shooting (5/5)

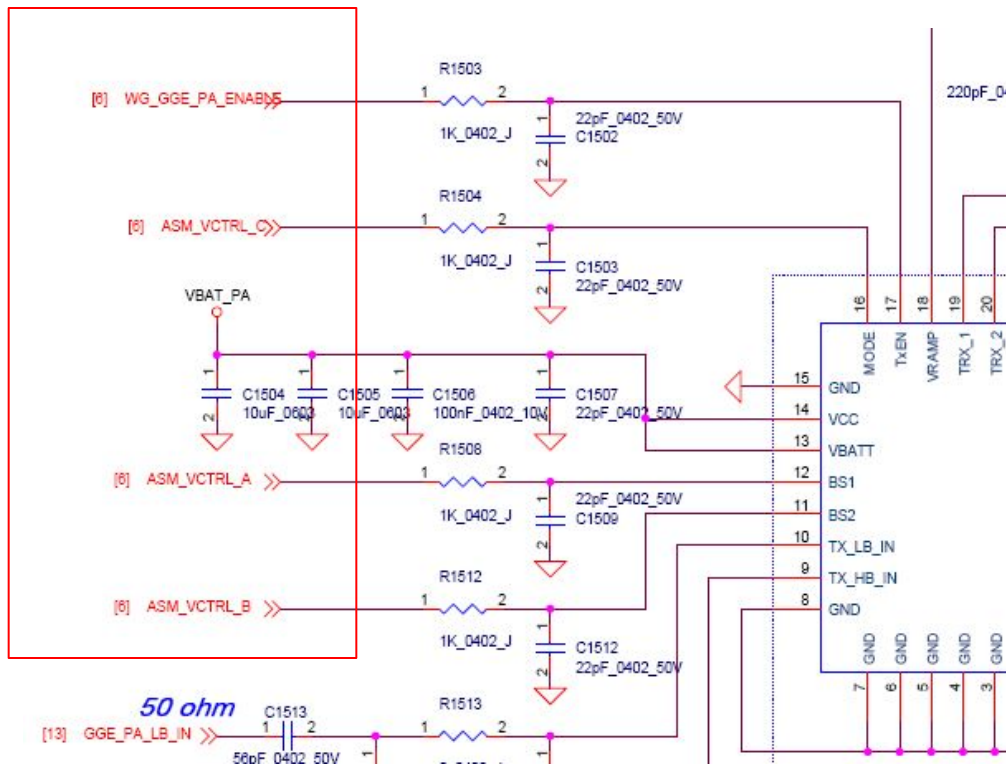
- 發射路徑 ASM-RF Con (GSM + WCDMA)



# RF-4:GSM/WCDMA Trouble shooting

## • 接收路徑

- 檢查 Antenna switch Module邏輯控制電壓
- 使用示波器量測下圖所標腳位的電壓是否符合右下列表

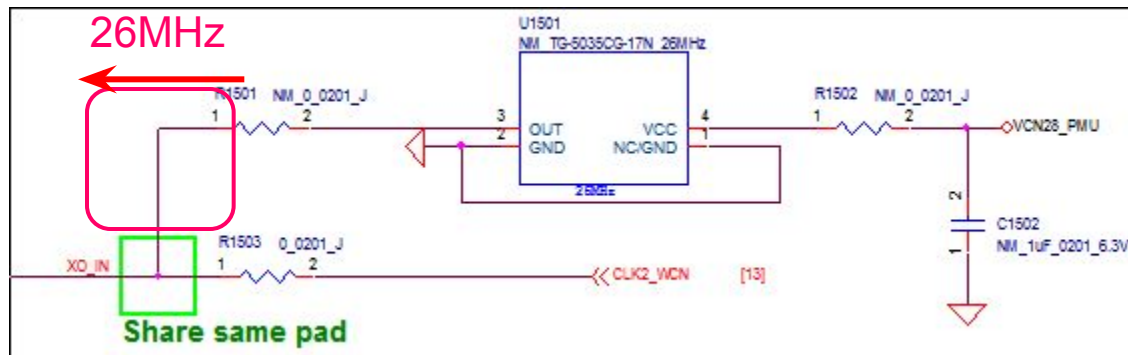
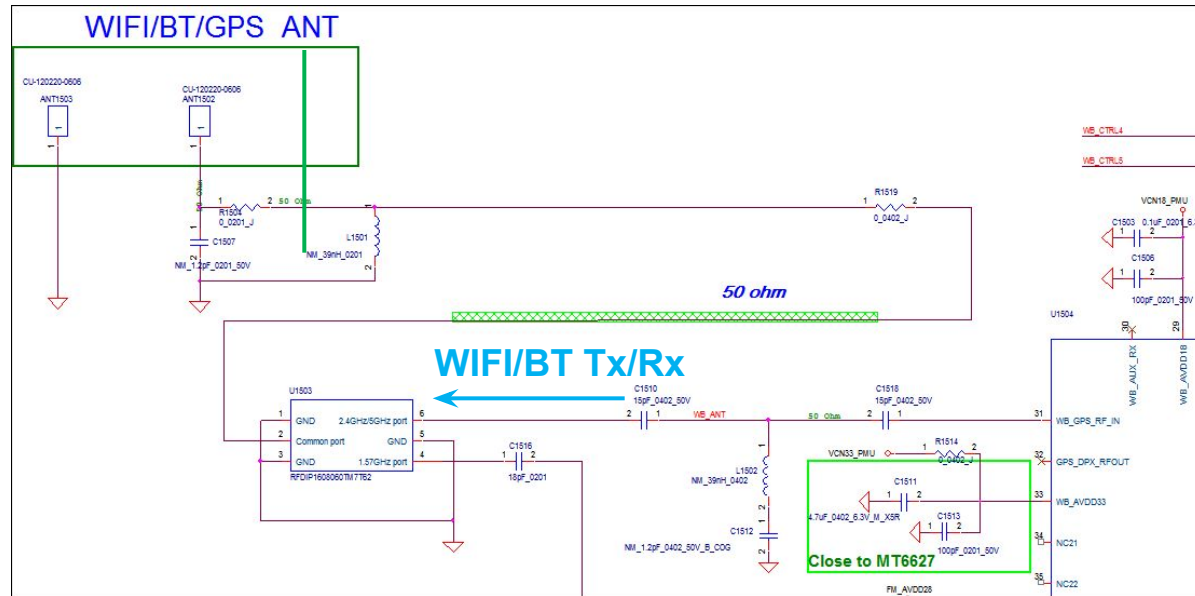


SKY77590 control logic table

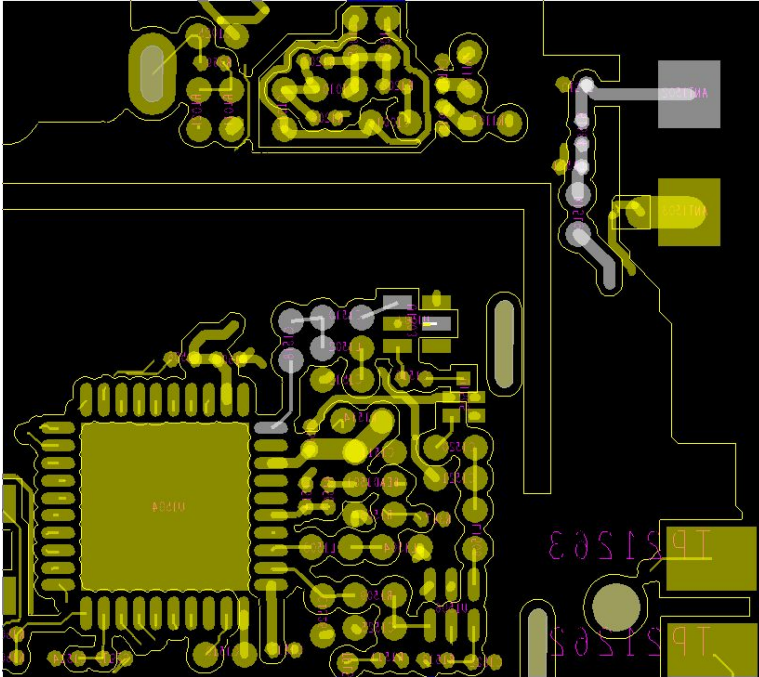
	Enable	VctC	VctA	VctB
LB_GMSK_TX	H	L	L	H
HB_GMSK_TX	H	L	H	H
LB_EDGE_TX	H	H	L	H
HB_EDGE_TX	H	H	H	H
TRX1 [2G_HB]	L	H	L	L
TRX2 [2G_LB]	L	H	H	L
TRX3 [3G_B1]	L	H	L	H

# RF-5:WIFI/BT Trouble shooting(1/3)

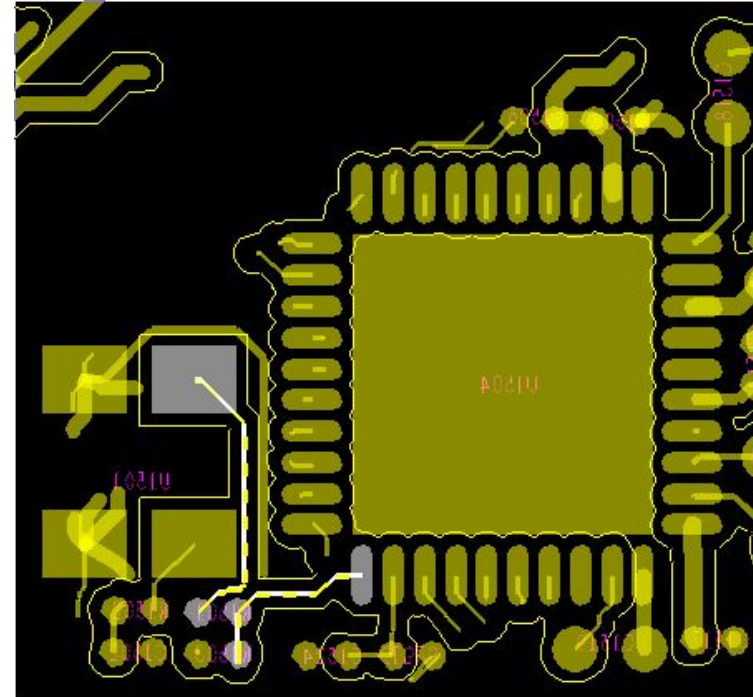
- 確認U1501是否有26MHz 輸出



# RF-5:WIFI/BT Trouble shooting(2/3)



WIFI Tx/Rx



26MHz

# RF-5:GPS Trouble shooting(3/3)

- 除確認U1501是否有26MHz 輸出外，還要檢查GPS xLNA是否有輸出。

