

A

A

B

B

C

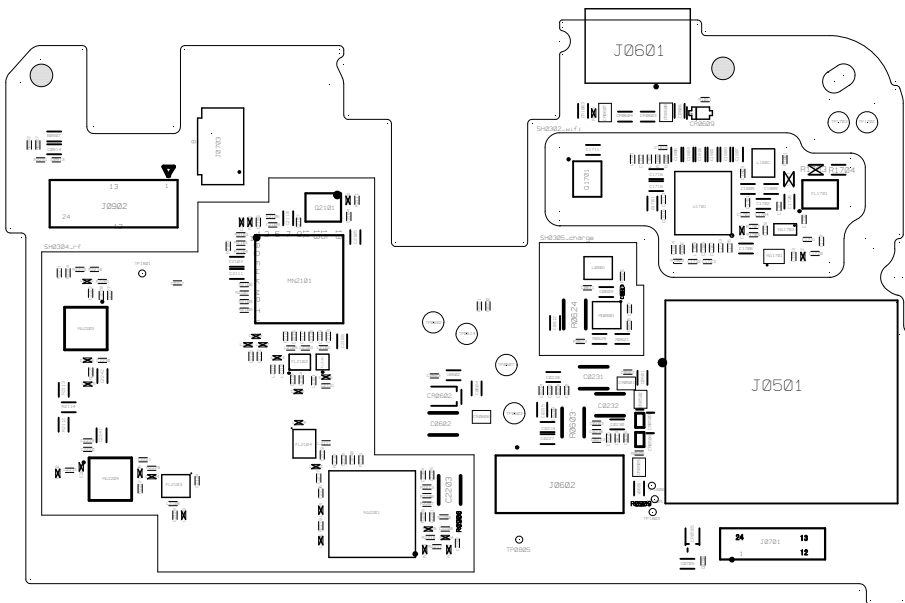
C

D

D

E

E



BAND1,8 Version_SBA32T00001D

GEN TOL



ED DATE 04 2012-12-19

CHANGE NOTE

APPRO.AUTHO.

ORIGINATOR Yao Lanping



top

DIABLO HD MAIN BOARD LOT0

UNIT

mm

1/2

A

A

B

B

C

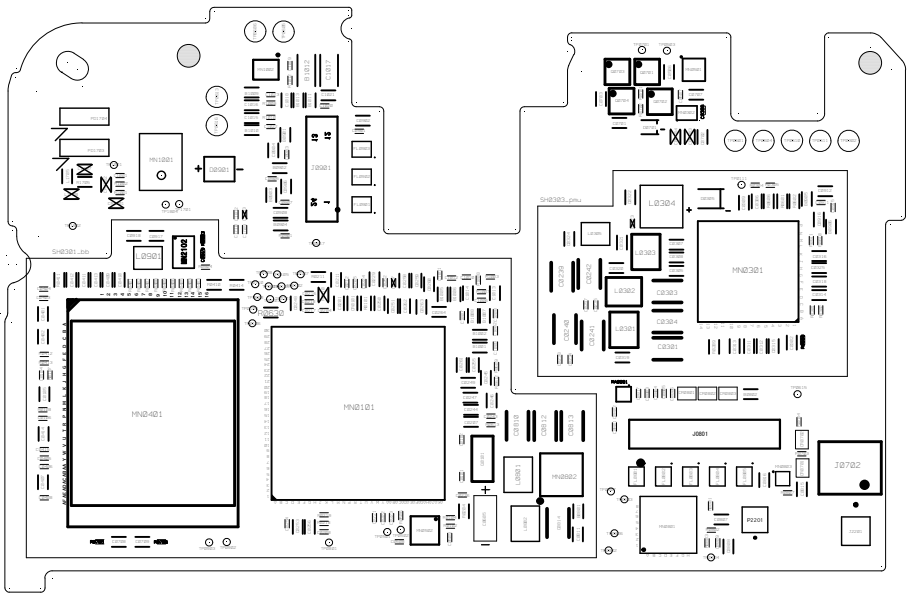
C

D

D

E

E



MAT

BAND1,8 Version_SBA32T00001D

GEN TOL



ED	DATE	04	2012-12-19				
CHANGE NOTE							
APPRO.AUTHO.							
ORIGINATOR							
Yao Lanping							
bottom							
DIABLO HD MAINBOARD LOT0							
UNIT	mm						2/2

1

2

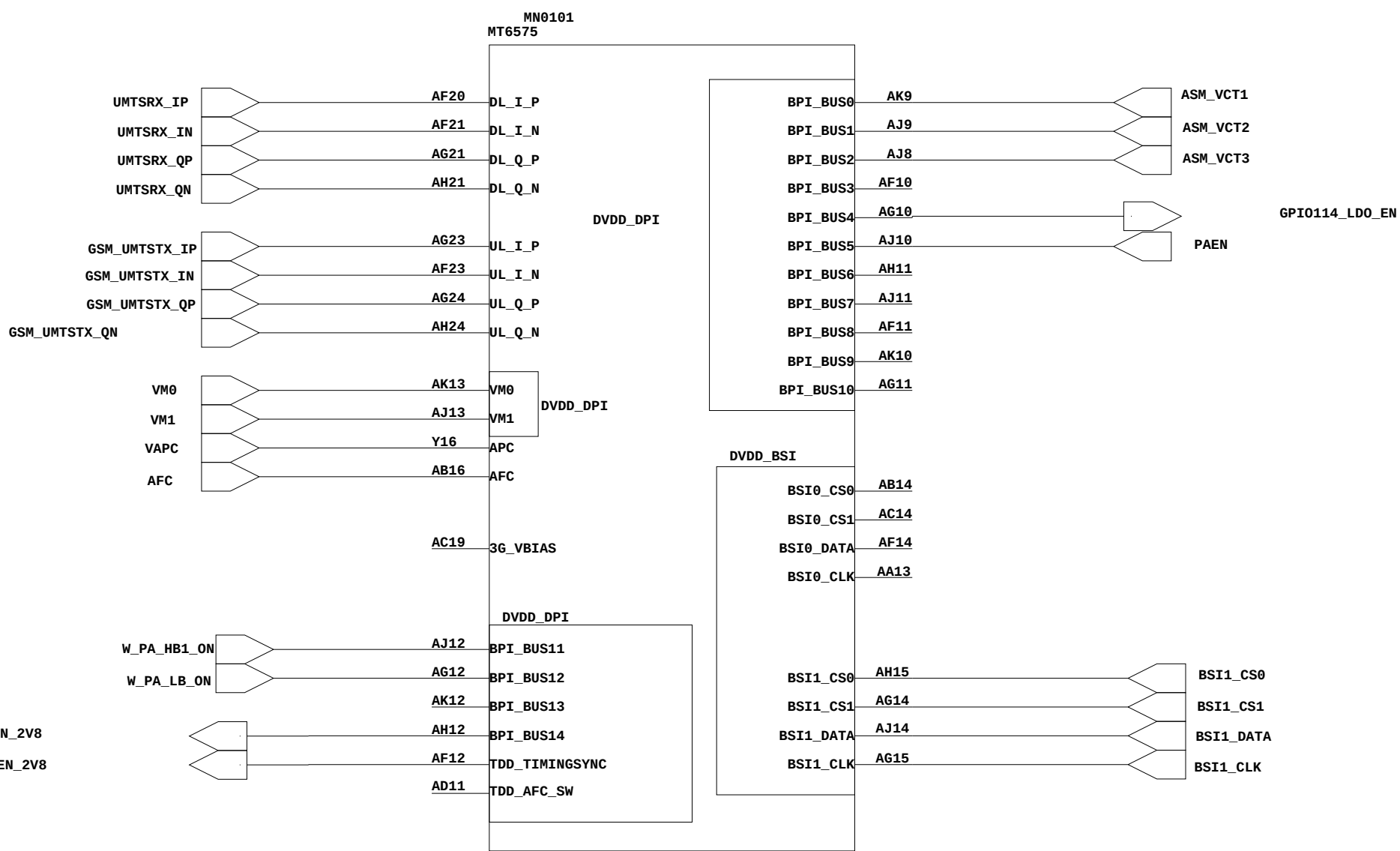
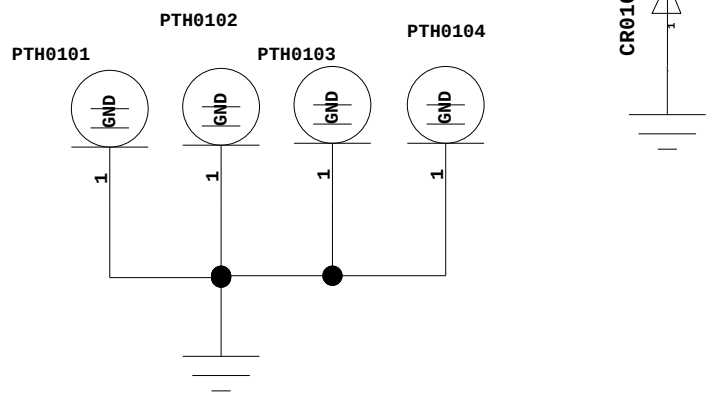
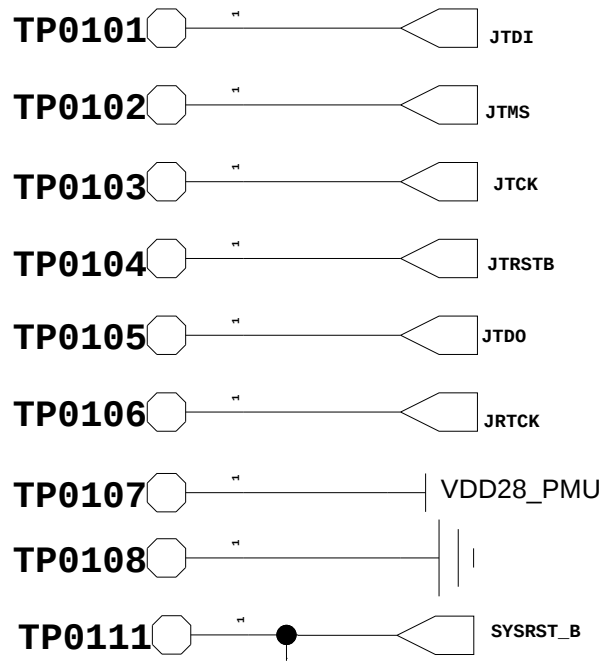
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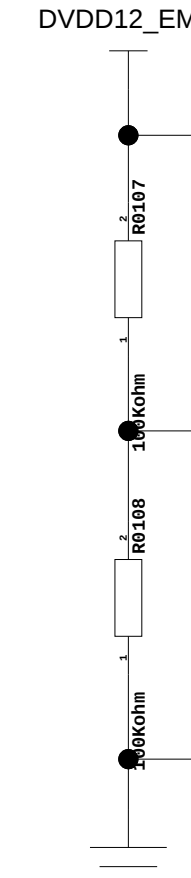
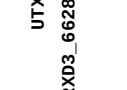
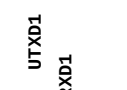
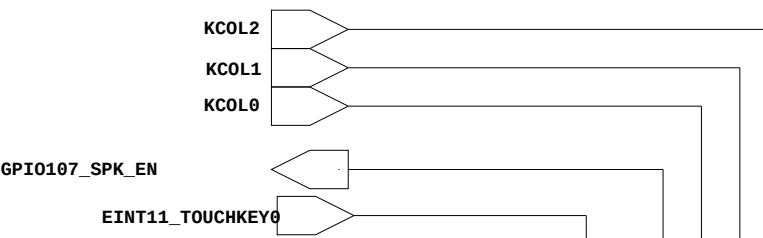
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1AA 00014 0007 (9007) A4

JTAG



GPI0124_6628_PWR_EN_2V8
GPI0122_GPS_LNA_EN_2V8



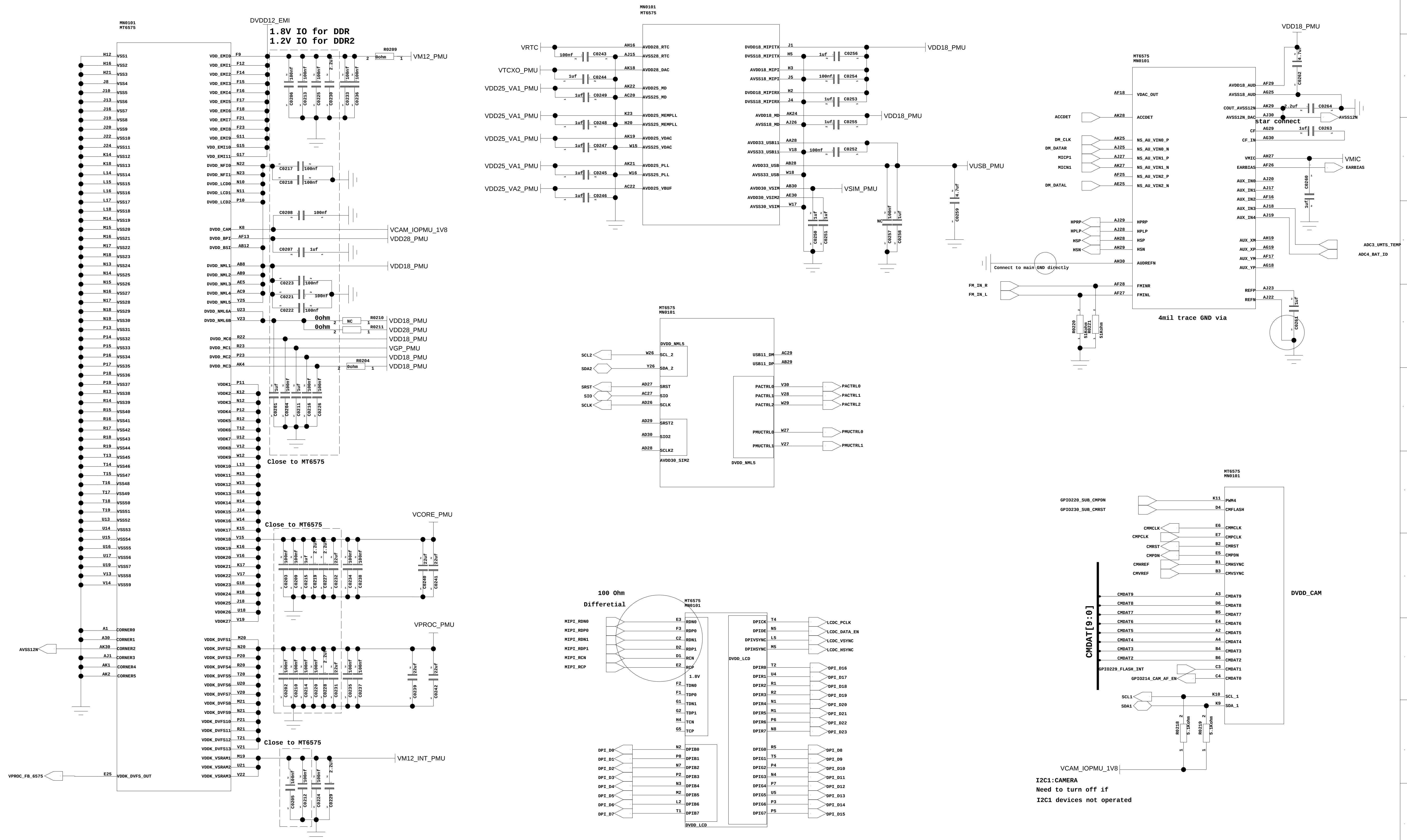
ED[31:0]

EA[9:0]

EINT0: G sensor
EINT1: Touch Key 1
EINT2: ALS&PS
EINT3: G SENSOR
EINT4: G SENSOR
EINT5: COMPASS
EINT6: CTP
EINT7: SIM Card detect
EINT8: HEADPHONE (NA)
EINT9: MT6529 Watchdog
EINT11: Touch Key 0
EINT12: Touch Key 3
EINT14: 6628 BGF
EINT18: 6628 WIFI
UART1: Download
UART3: 6628
UART4: Debug
I2C0: G/PS/COMPASS/CTP/Fast charge
I2C1: Camera
I2C2: PMIC
I2S0: MHL(NA)
I2S1: MT6628
MSDC0: eMMC
MSDC1: T-Card(Support SD3.0) (NA)
MSDC2: GPIO
MSDC3: MT6628
PWM0,1,2,6 can be used for sleep mode
PWM1: Indicator
PWM2: Flash control
PWM3: RGB to MIPI Bridge IC

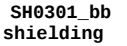
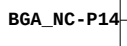
CONFIDENTIAL

ED	DATE	20120716	REV	V0.1
CHANGE NOTE	YF	GU ZHAN		
APPROA AUTHO		ZH LIN		
ORIGINATOR				
tcl & catel	BASEBAND	Diablo HD		01
mobile phones				
Sheet type	C0008			01



CONFIDENTIAL

ED1	DATE	20120716	YF	REV	V0.1
CHANGE NOTE			GU ZHAN		
APPROAUTHORIGINATOR			ZH LIN		
tcl & catel mobile phones			BASEBAND		Diablo HD 02
Brand type COVER			02		



VPA	
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Designation Folio :
Nis. Fachkabinettion C&M

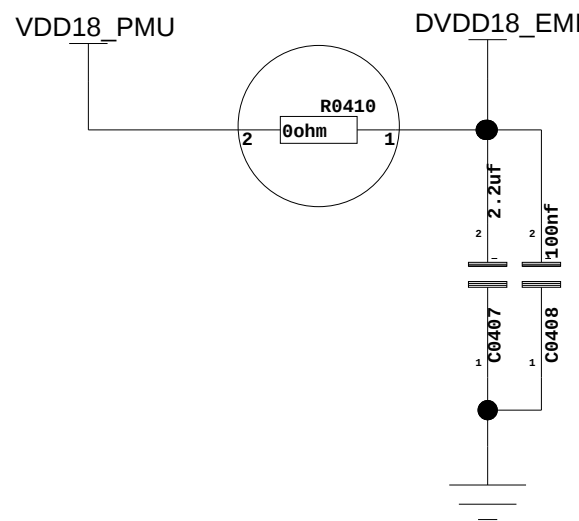
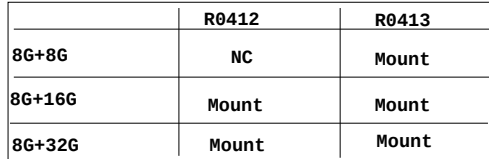
MT6329

Diablo HD

03

03

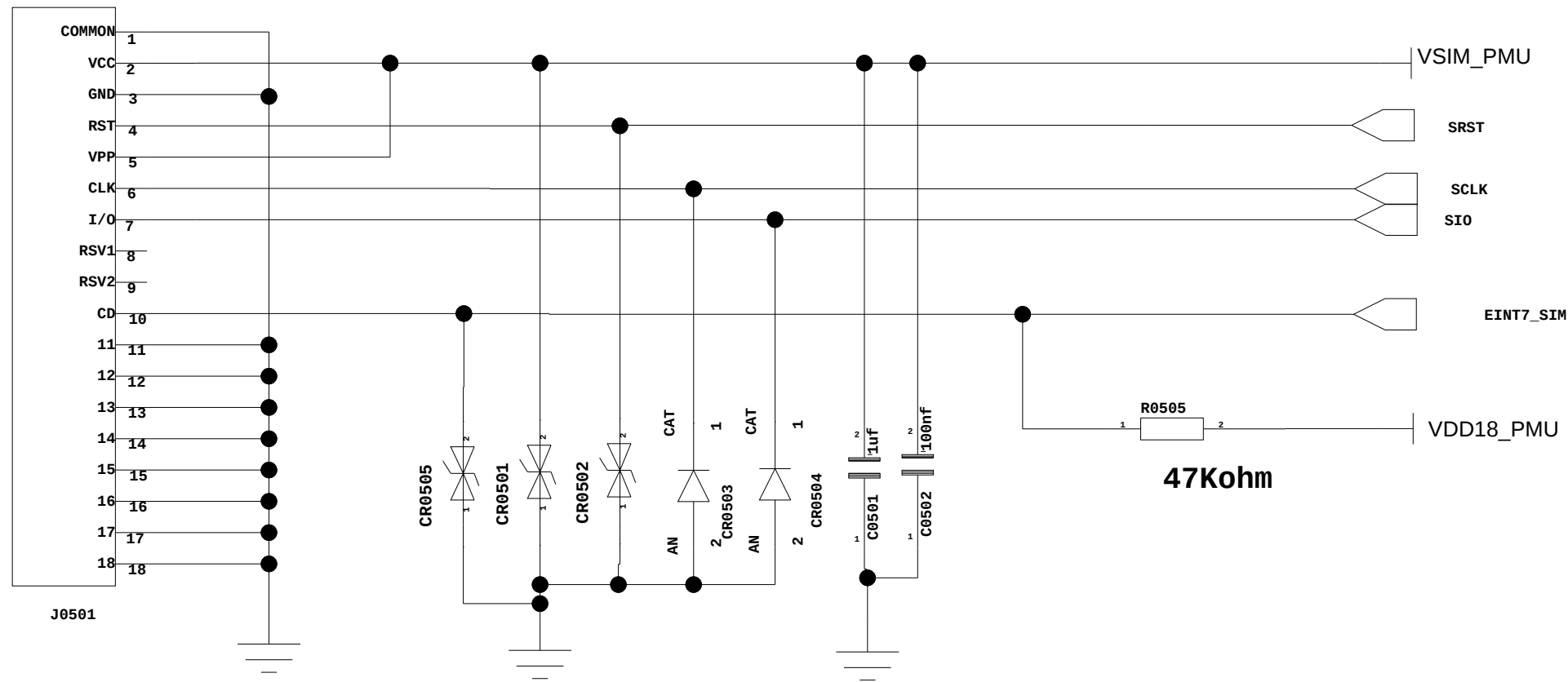
MEMORY



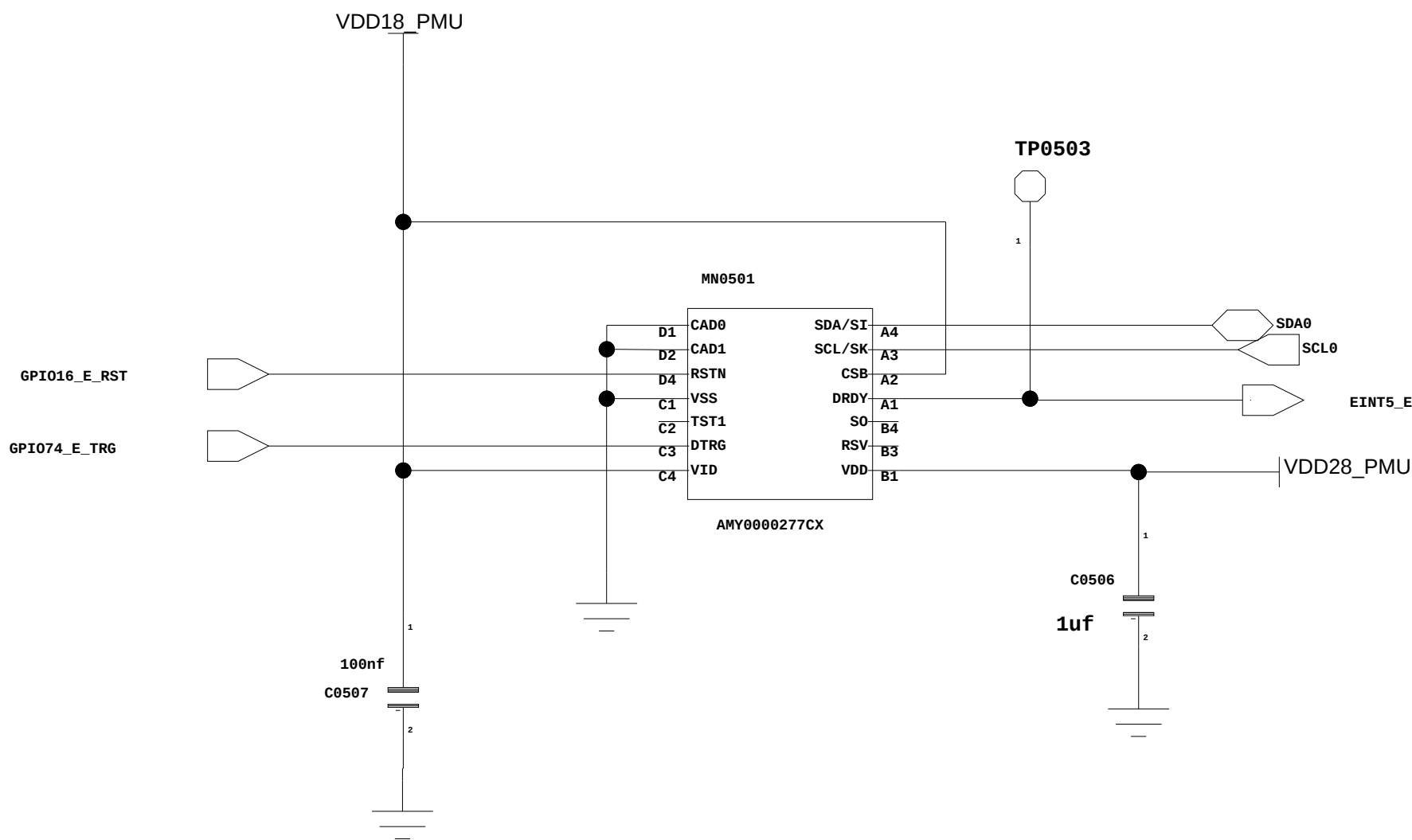
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END	DATE	20120716	YF	REV	V0.1
CHANGE NOTE					
APPRO.AUTHOR			GU ZHAN		
ORIGINATOR			ZH LIN		
tcl 镓calatel mobile phones		MEMORY		Diablo HD 04	
Sheet type	COVER				04

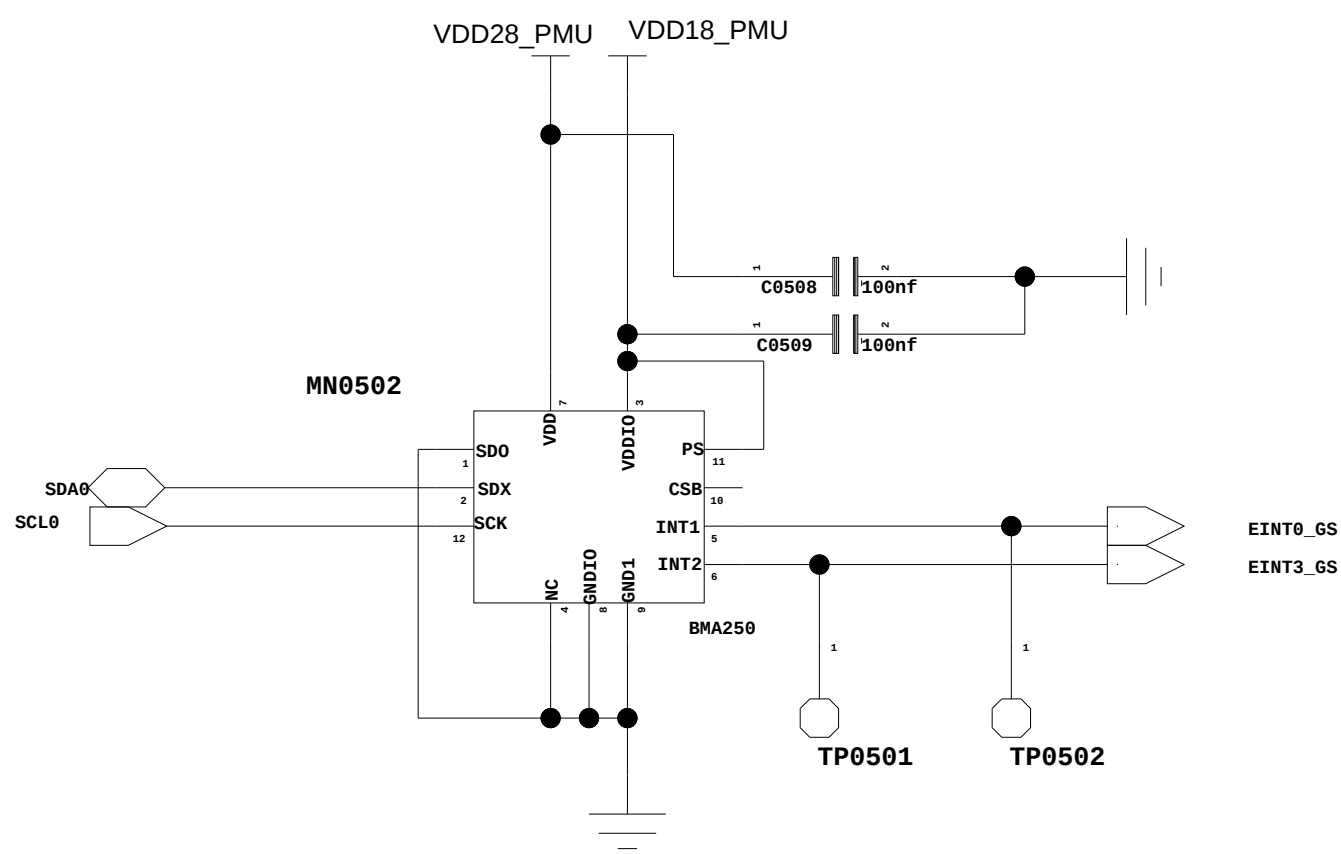
Micro-SIM CARD



E - COMPASS



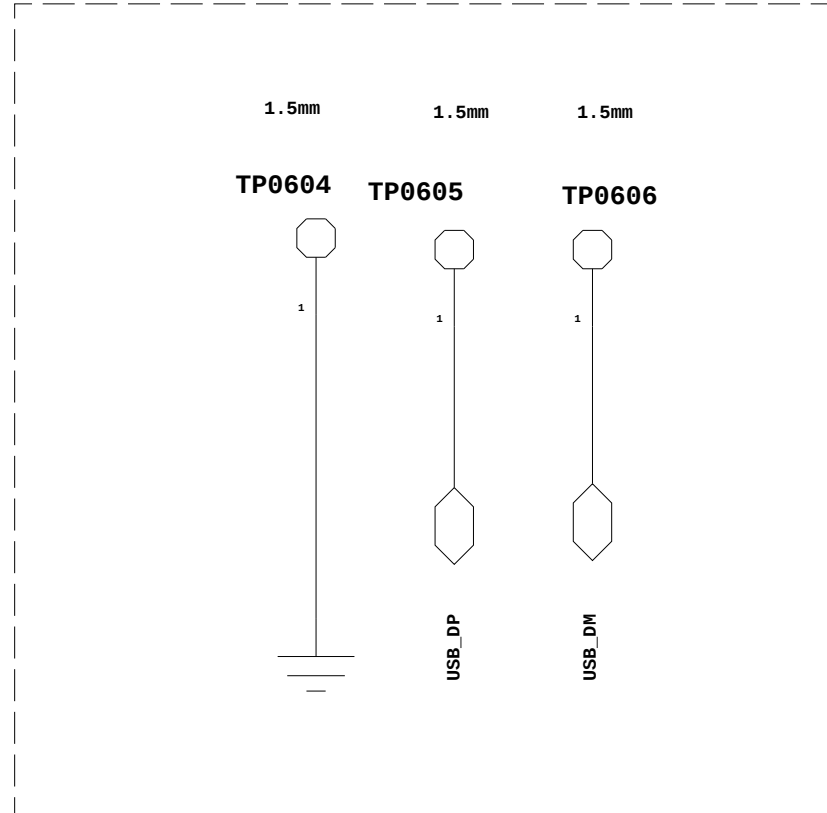
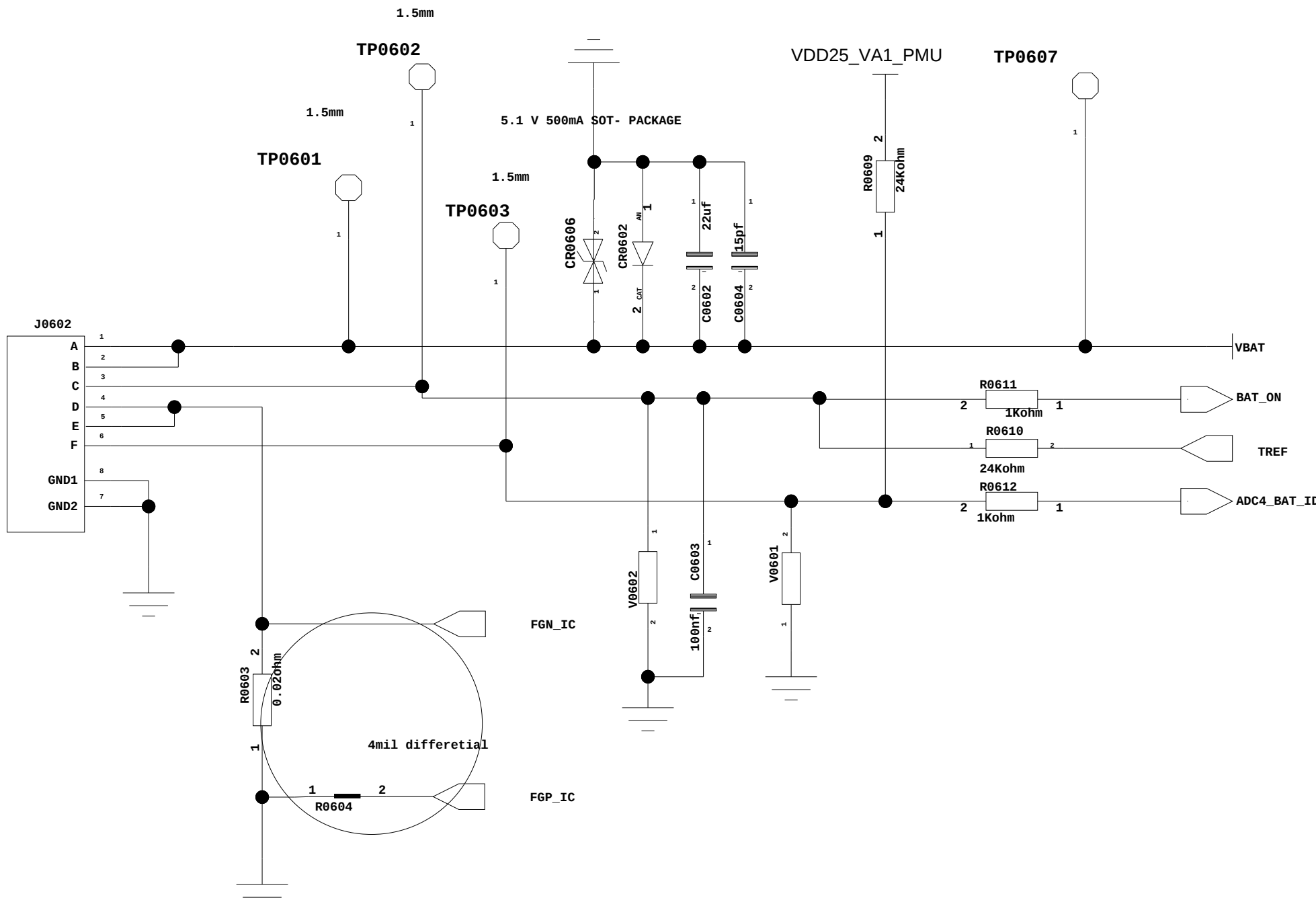
G - SENSOR



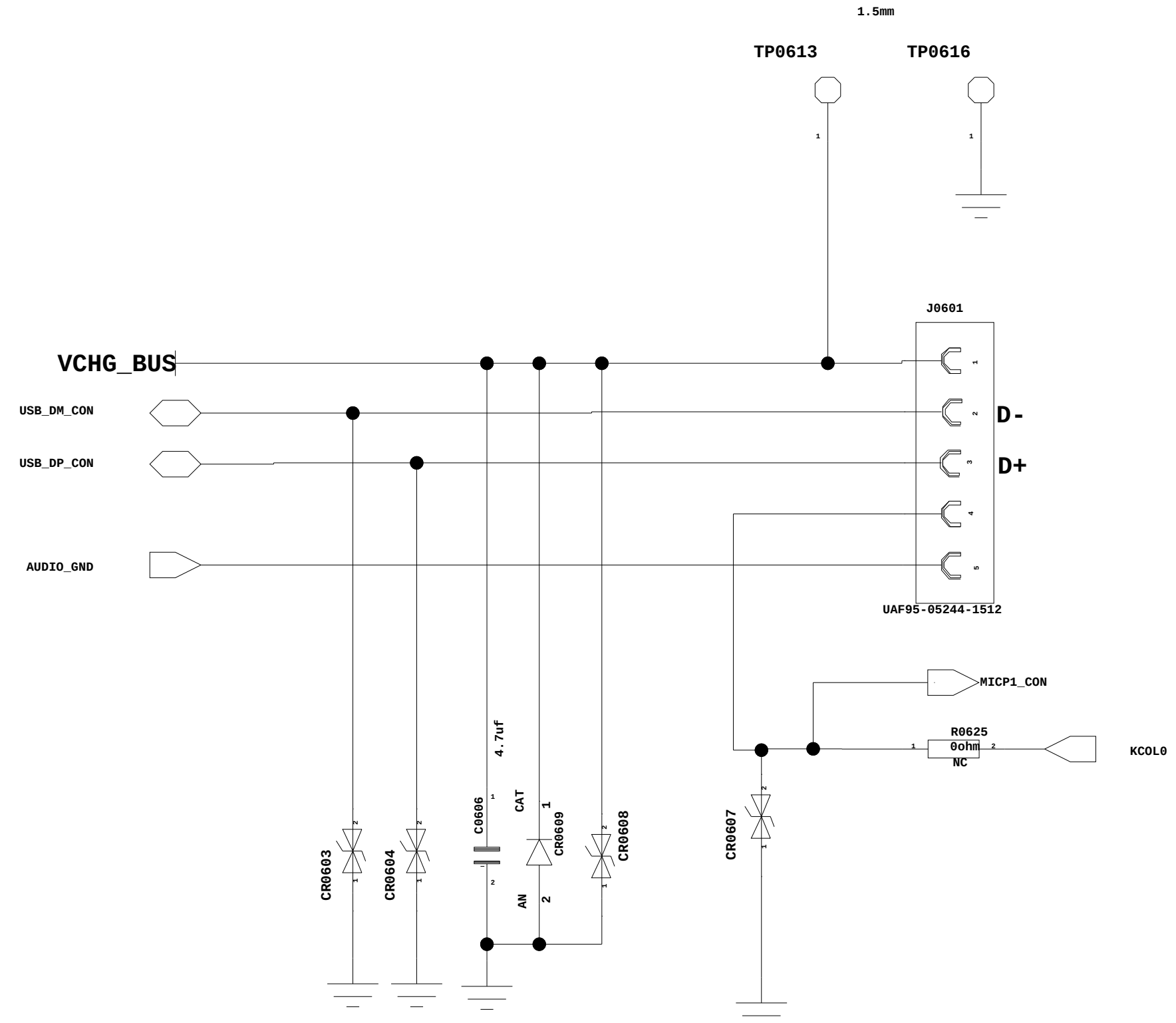
CONFIDENTIAL

ED	DATE	20120716	YF	REV	V0.1
CHANGE NOTE					
APPRO AUTHO			GU ZHAN		
ORIGINATOR			ZH LIN		
tcl alcatel mobile phones		SIM_Sensors	Diablo HD	05	
Sheet type	COVER				05

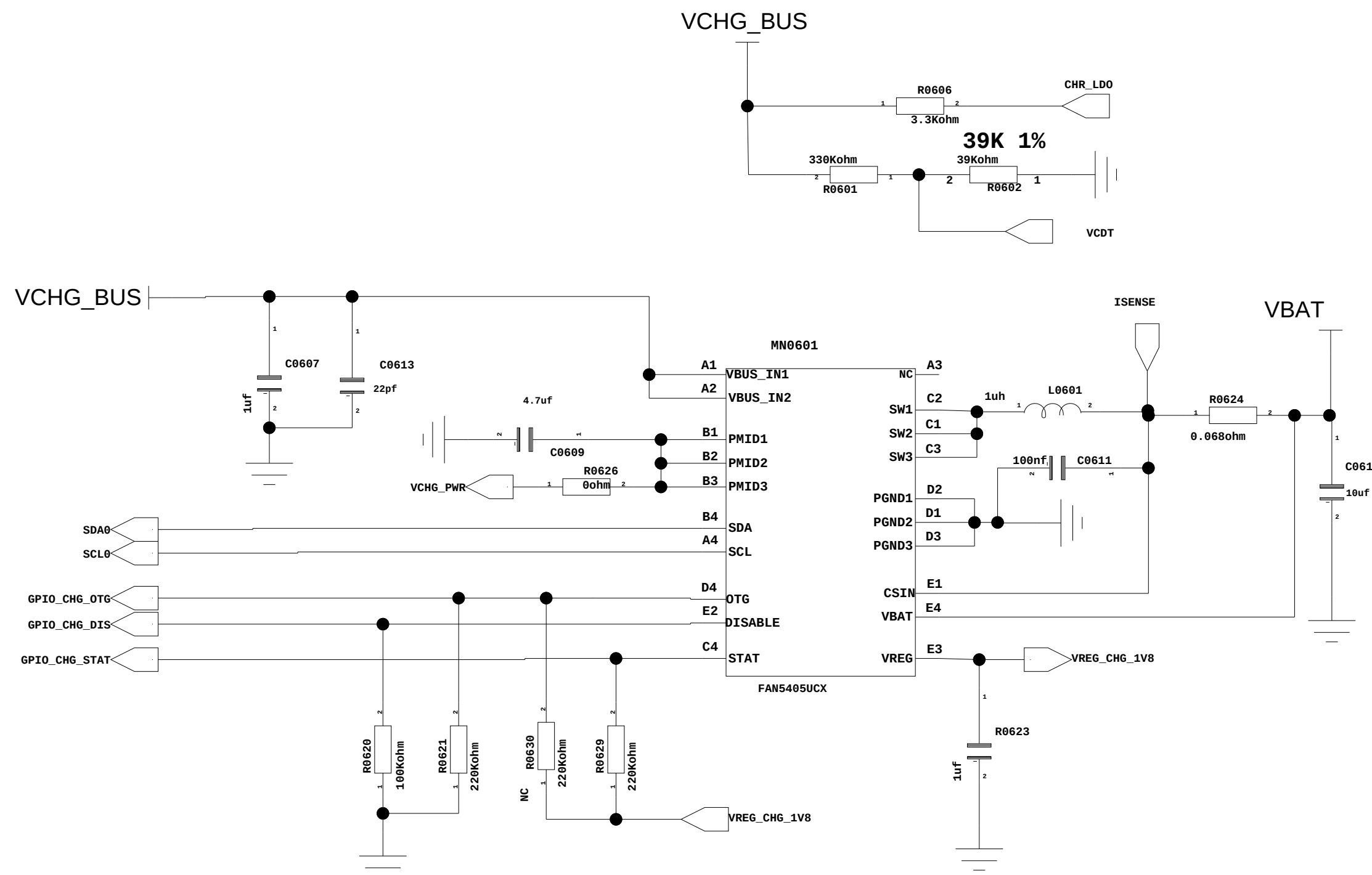
BATTERY CONNECTOR



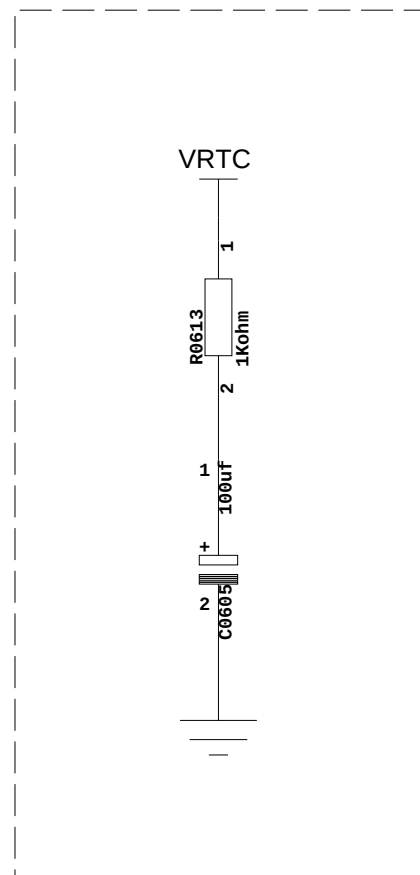
MICRO USB (CHARGE/USB)



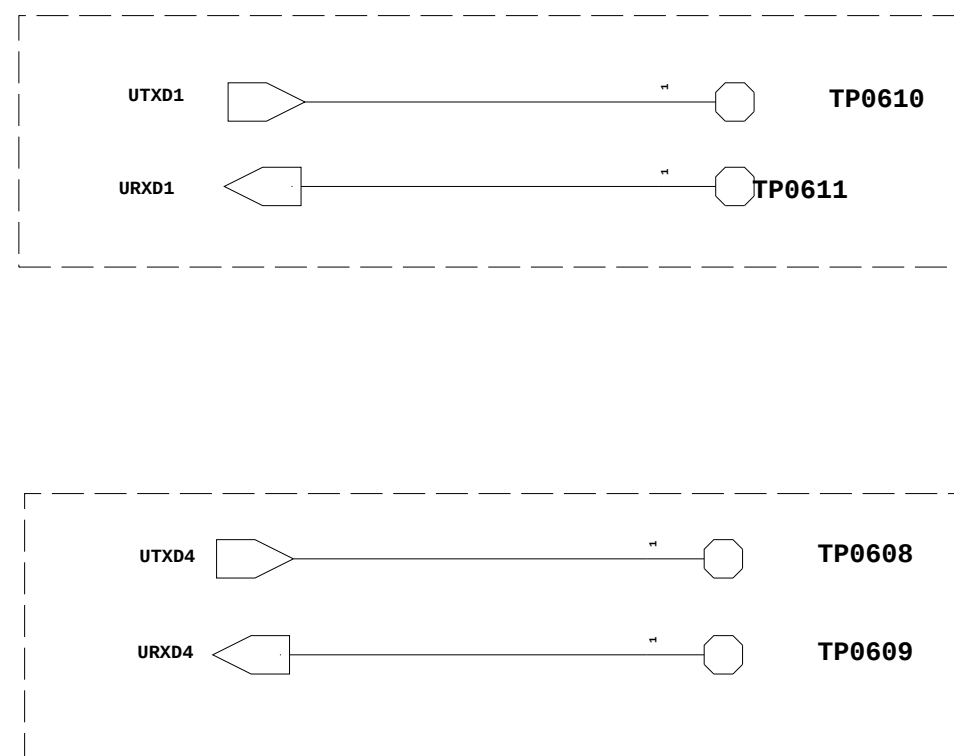
CHARGE CIRCUIT(change to Fast Charge)



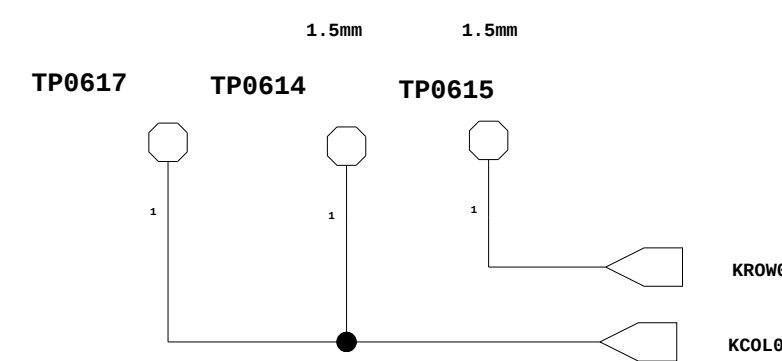
BACK UP BAT



UART1 for Board download



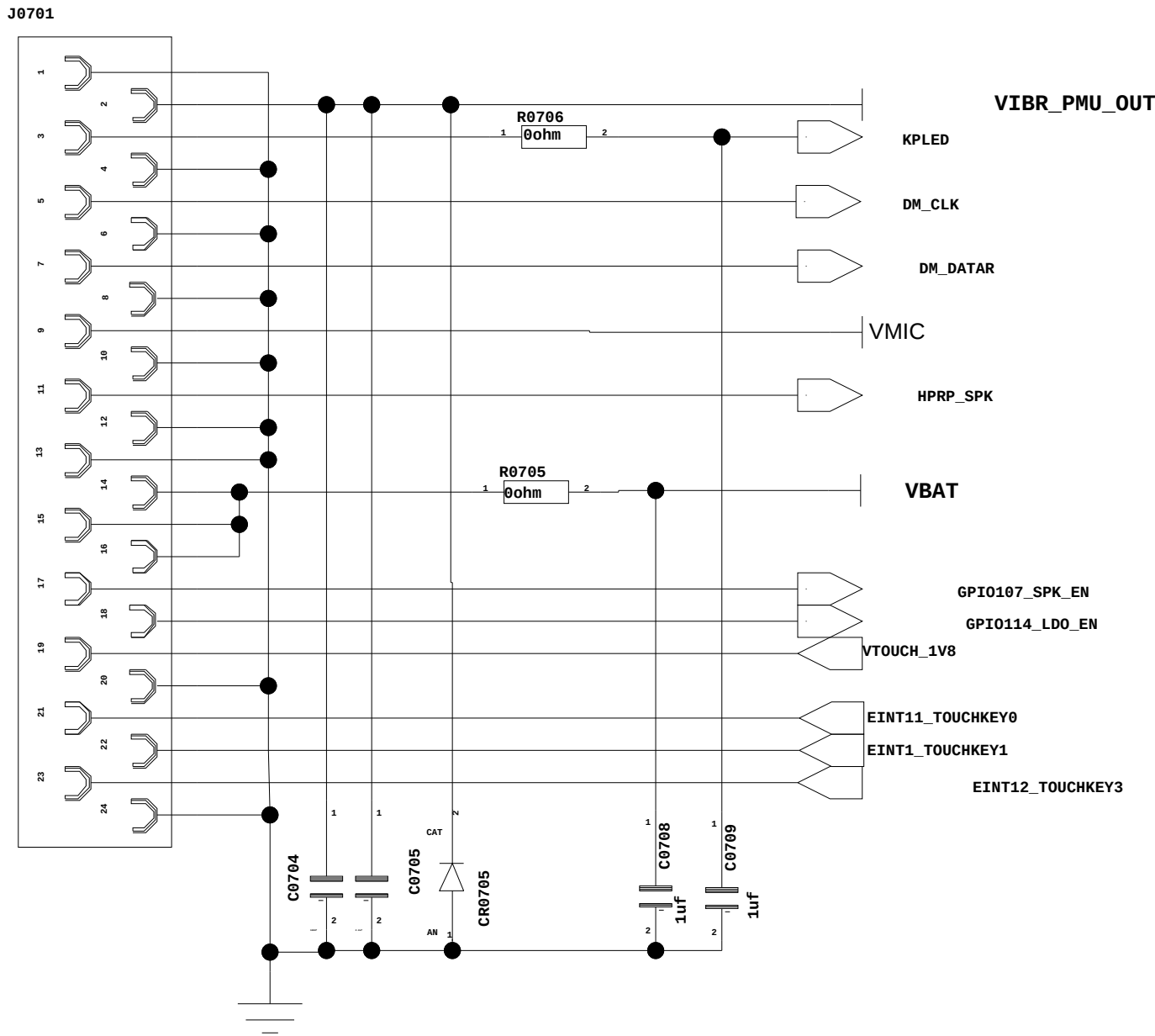
USB Download Mode



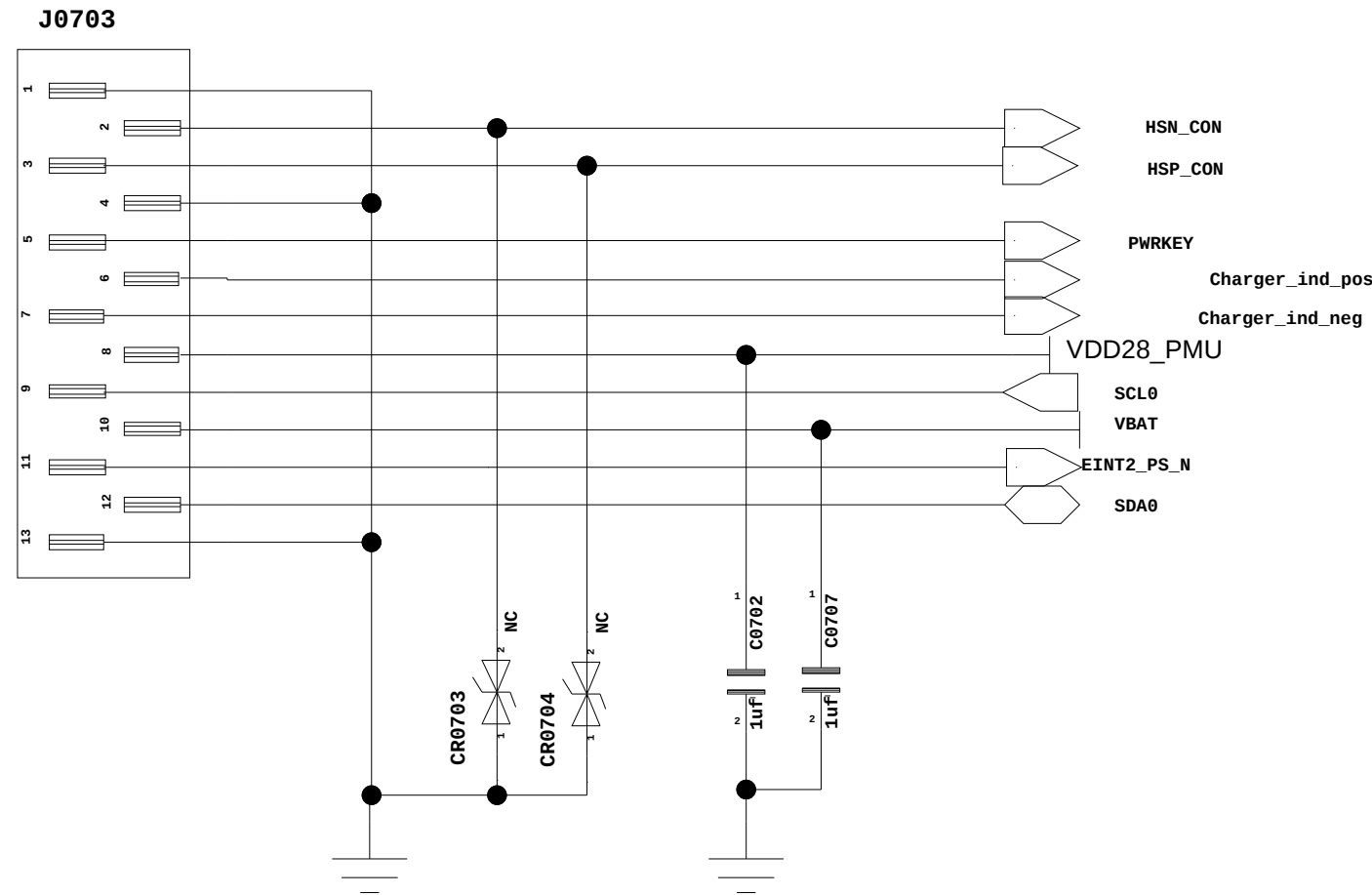
CONFIDENTIAL

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CHANGE NOTE				GU ZHAN							
APPPRA-AUTHO ORIGINATOR				ZH LIN							
tcl alcatel mobile phones				USB_Battery CON_Fast charge				Diablo HD			
Sheet type: COVER								06			

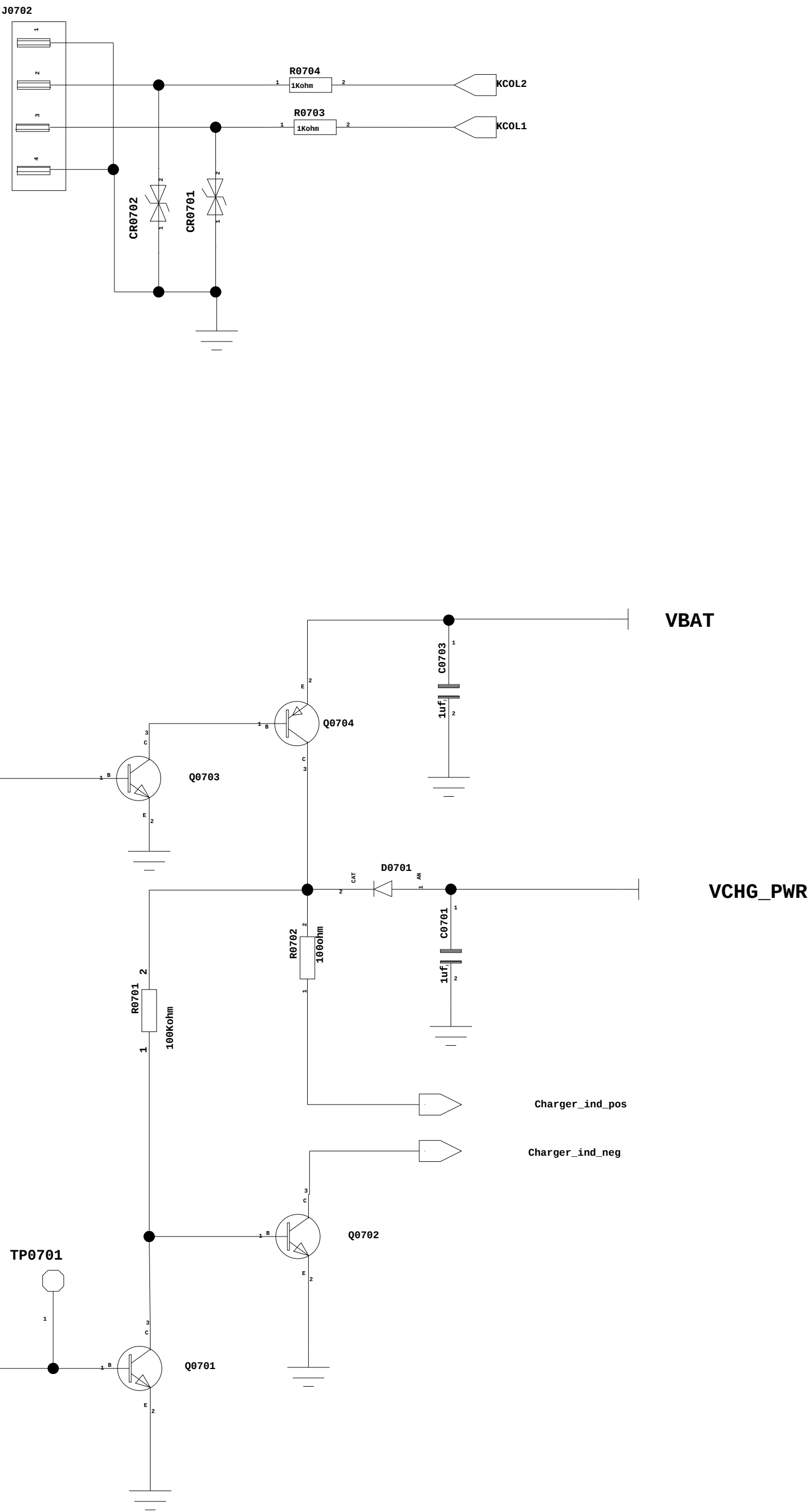
SUB Board CON



FPC CON



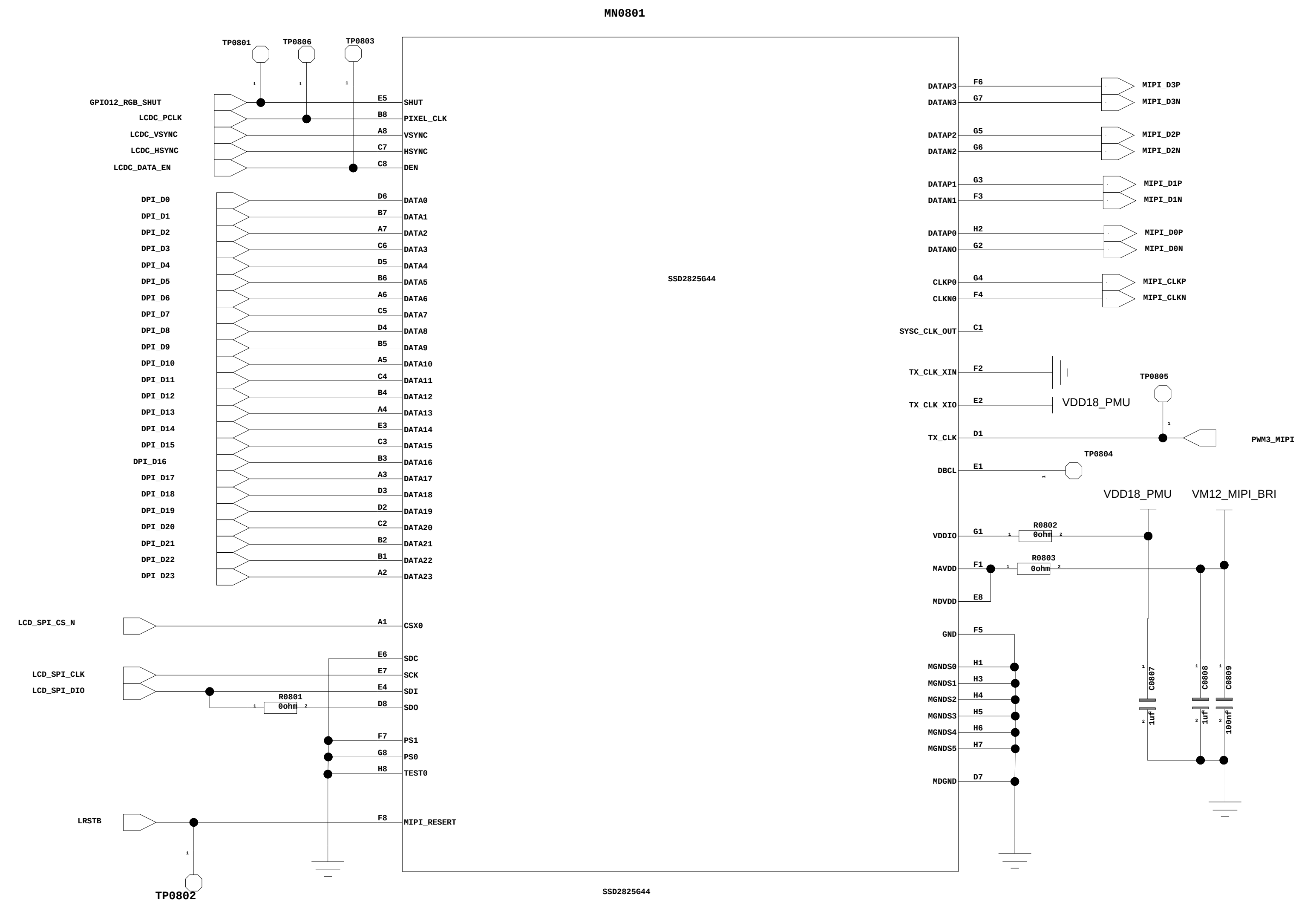
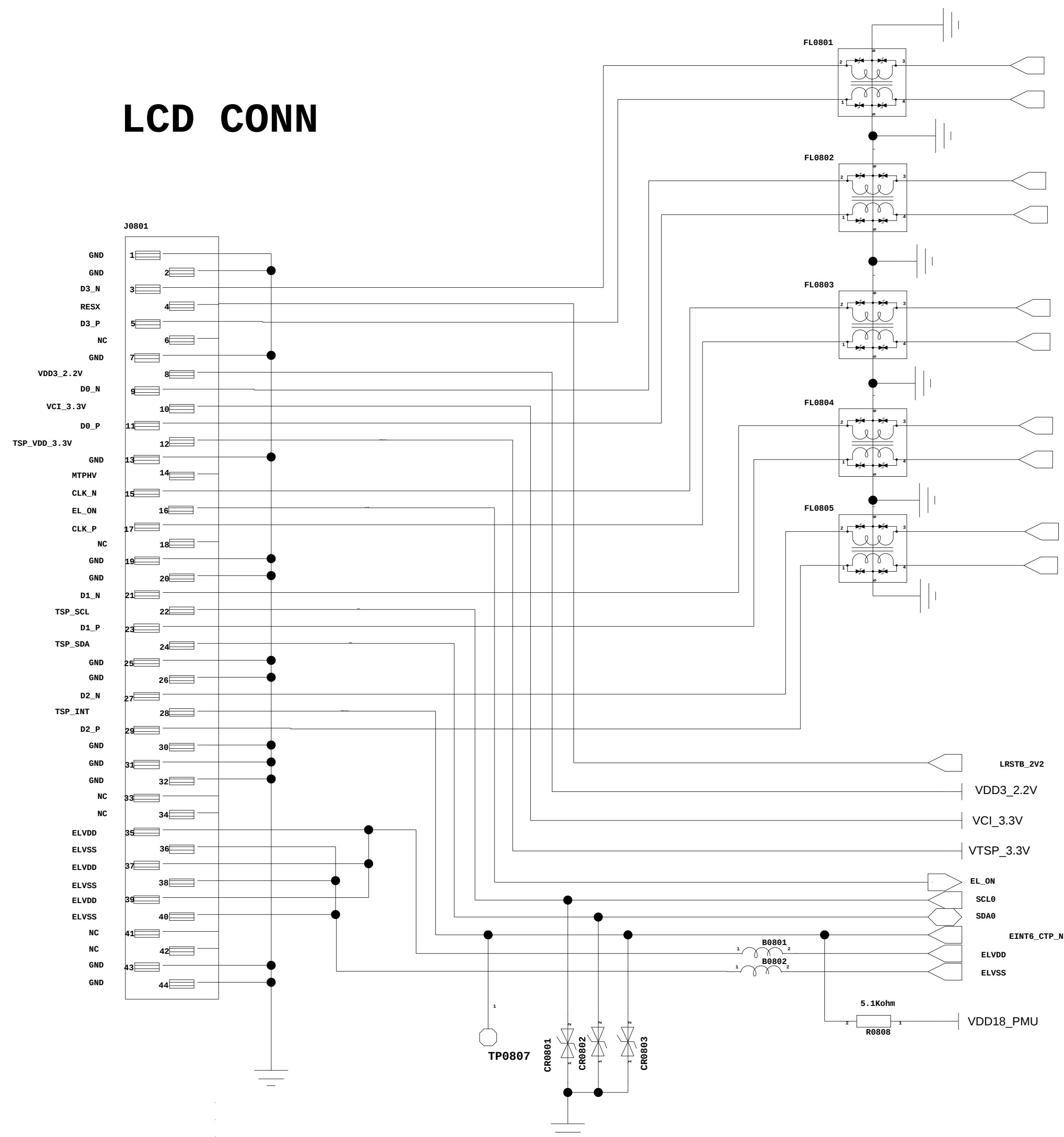
Volume SIDE KEY



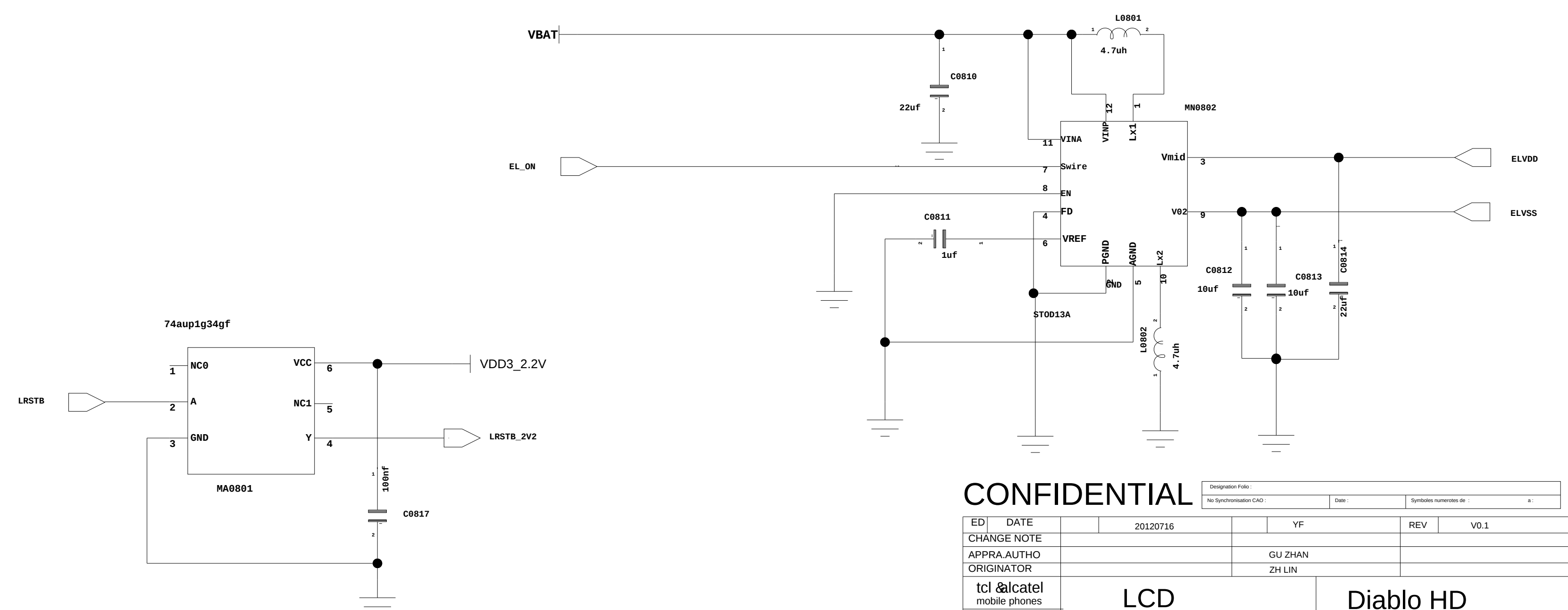
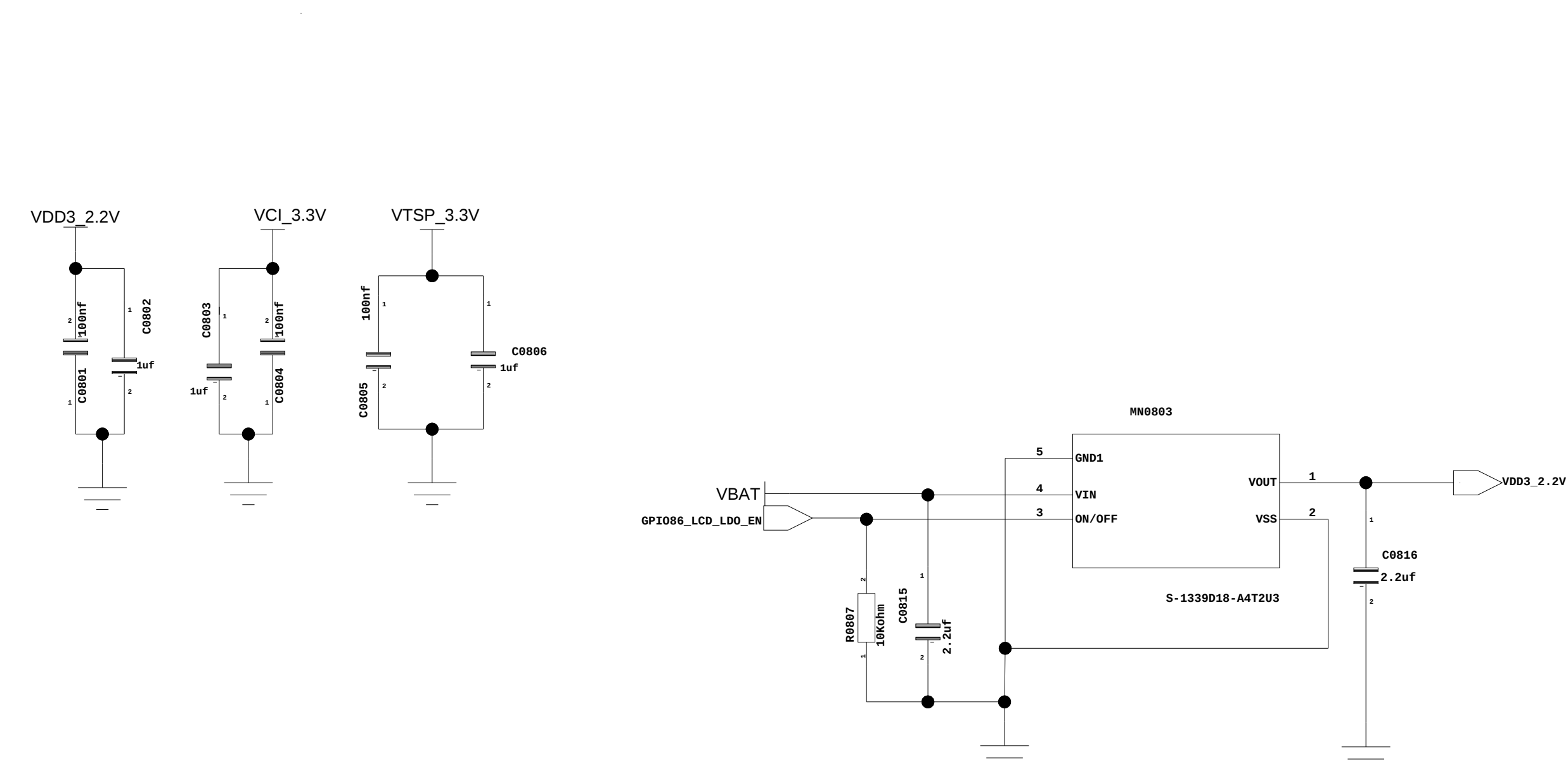
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ED	DATE	20120716	YF	REV	V0.1
CHANGE NOTE					
APPRO AUTHO			GU ZHAN		
ORIGINATOR			ZH LIN		
tcl & catel mobile phones	CON_KEY_Others		Diablo HD		
Sheet type	COVER				07

LCD CONN



DC/DC Converter

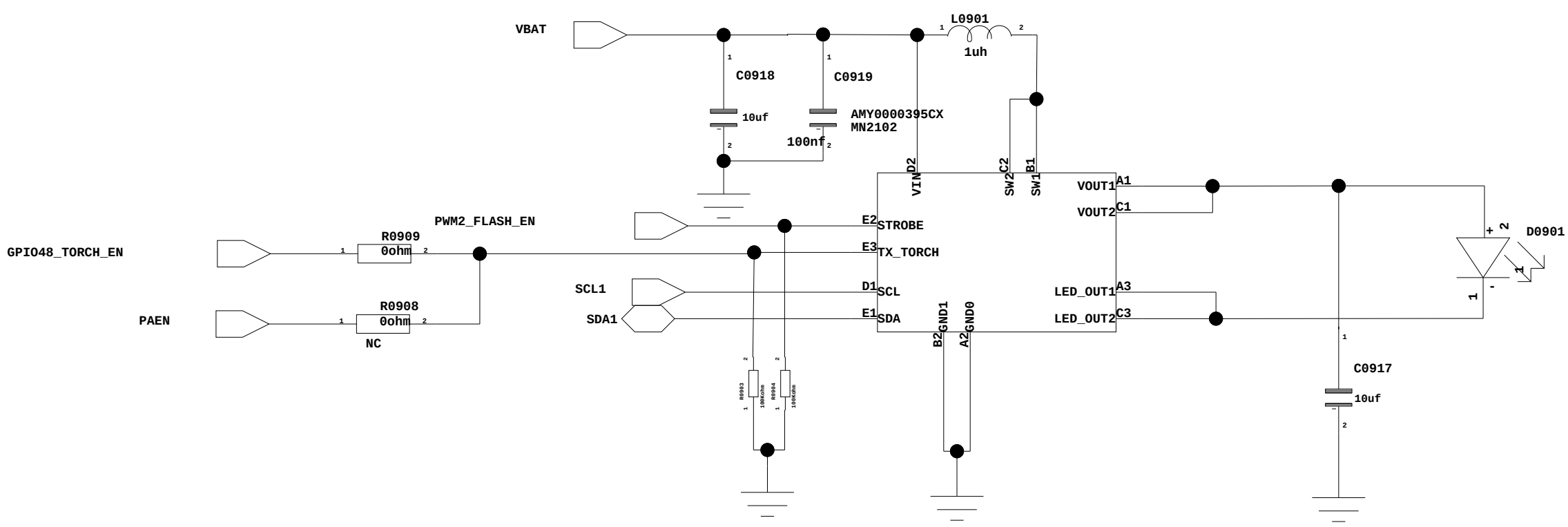
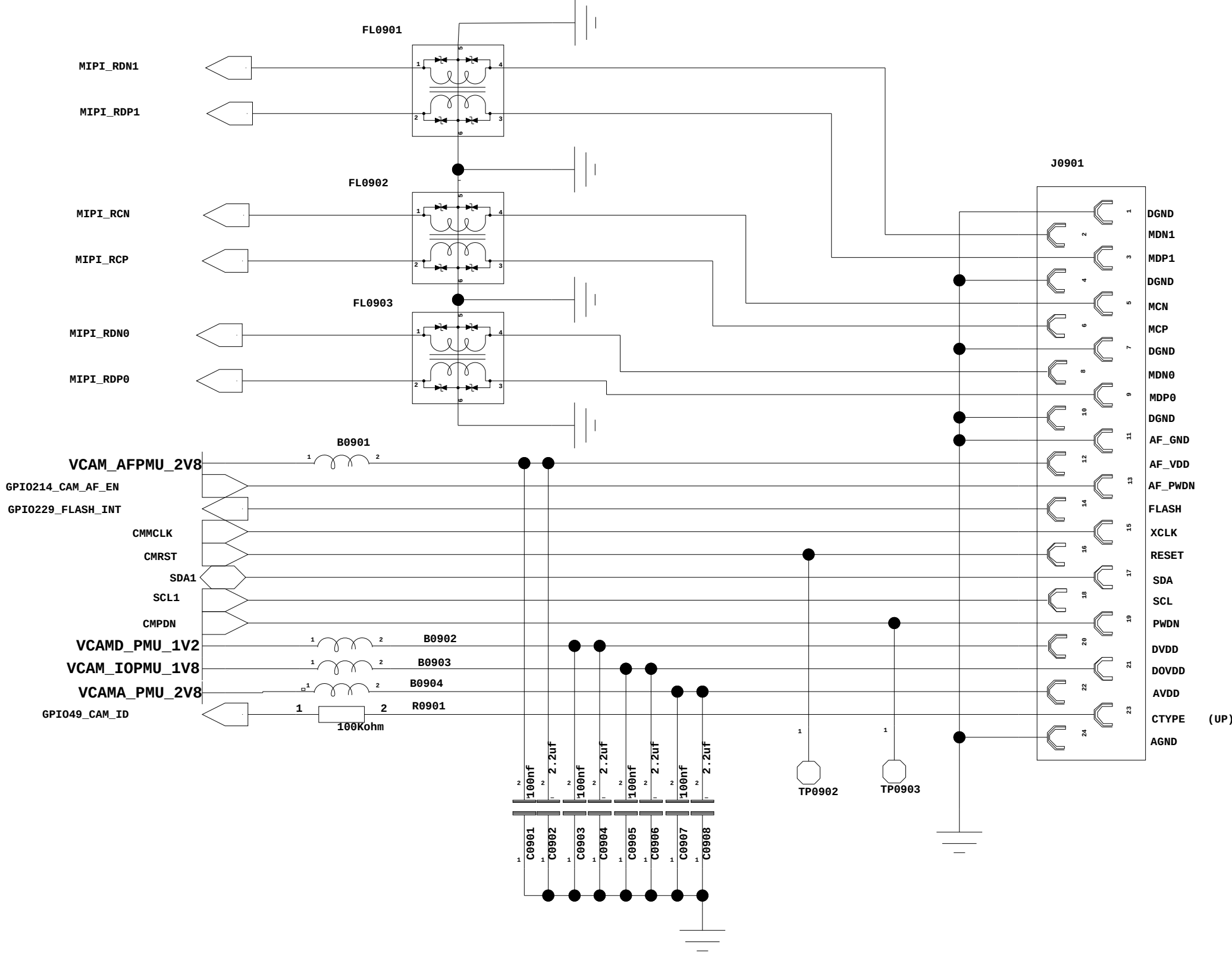
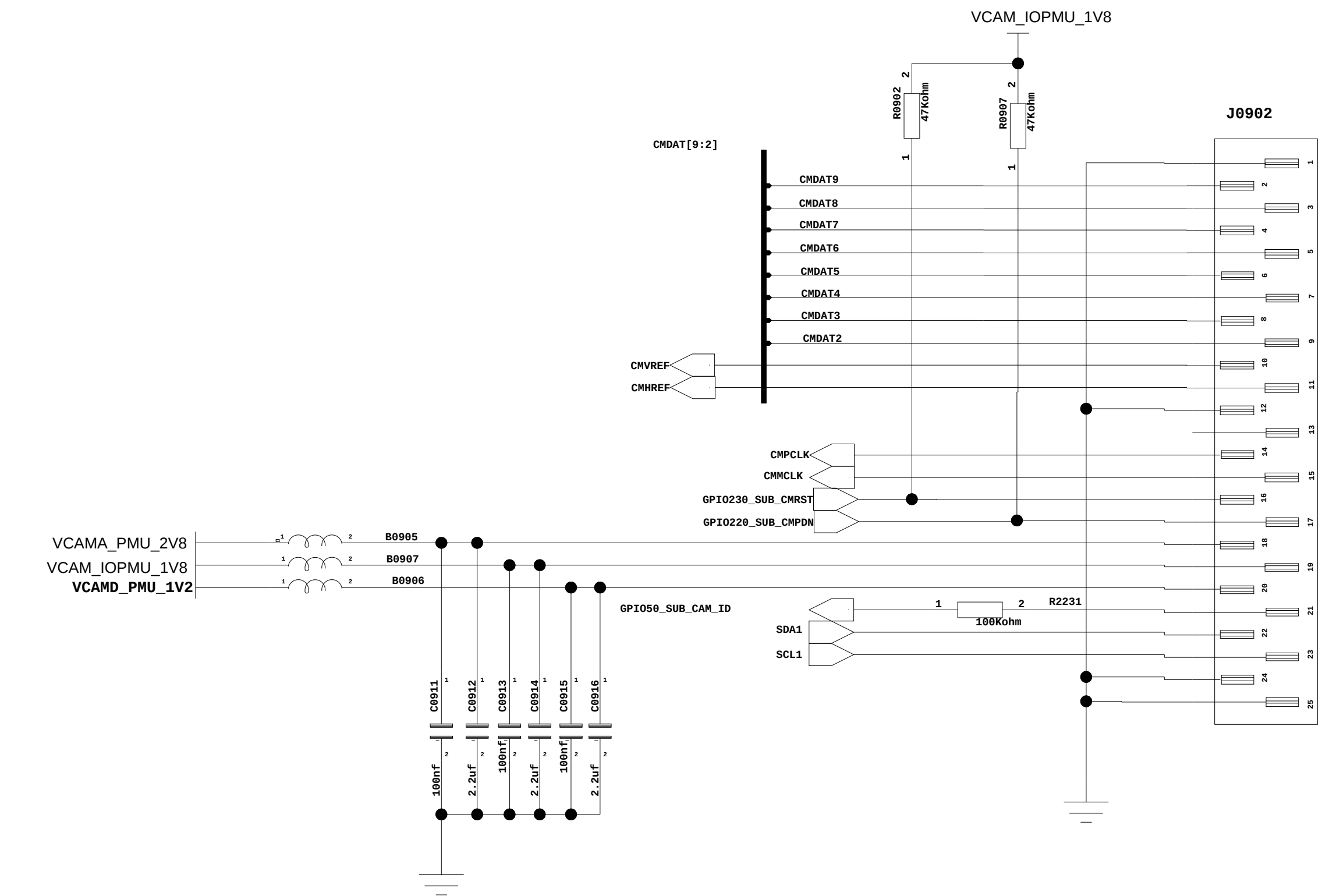


CONFIDENTIAL

ED	DATE	20102716	YF	REV	V0.1
CHANGE NOTE					
APPRO AUTHO		GU ZHAN			
ORIGINATOR		ZH LIN			
tcl & catel mobile phones		LCD		Diablo HD	
Sheet type		COVER			
				08	

SUB CAMERA

MAIN CAMERA



100mA Torch current

CONFIDENTIAL					Designation: P010	
					No Synchronization CNO	
					Date:	Symbol: numerals de 1
ED	DATE	20120716	YF	REV	V0.1	
CHANGE NOTE						
APPROA.AUTHO					GU ZHAN	
ORIGINATOR					ZH LIN	
tcl alcatel mobile phones					Camera	
Sheet type: COVER					Diablo HD	
					09	

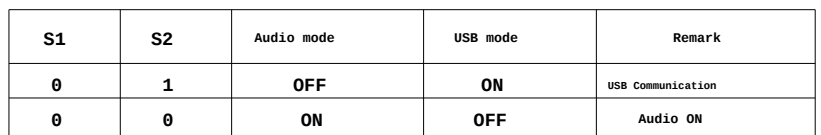


close to audio jack

RECEIVER



USB/Audio Jack SWITCH

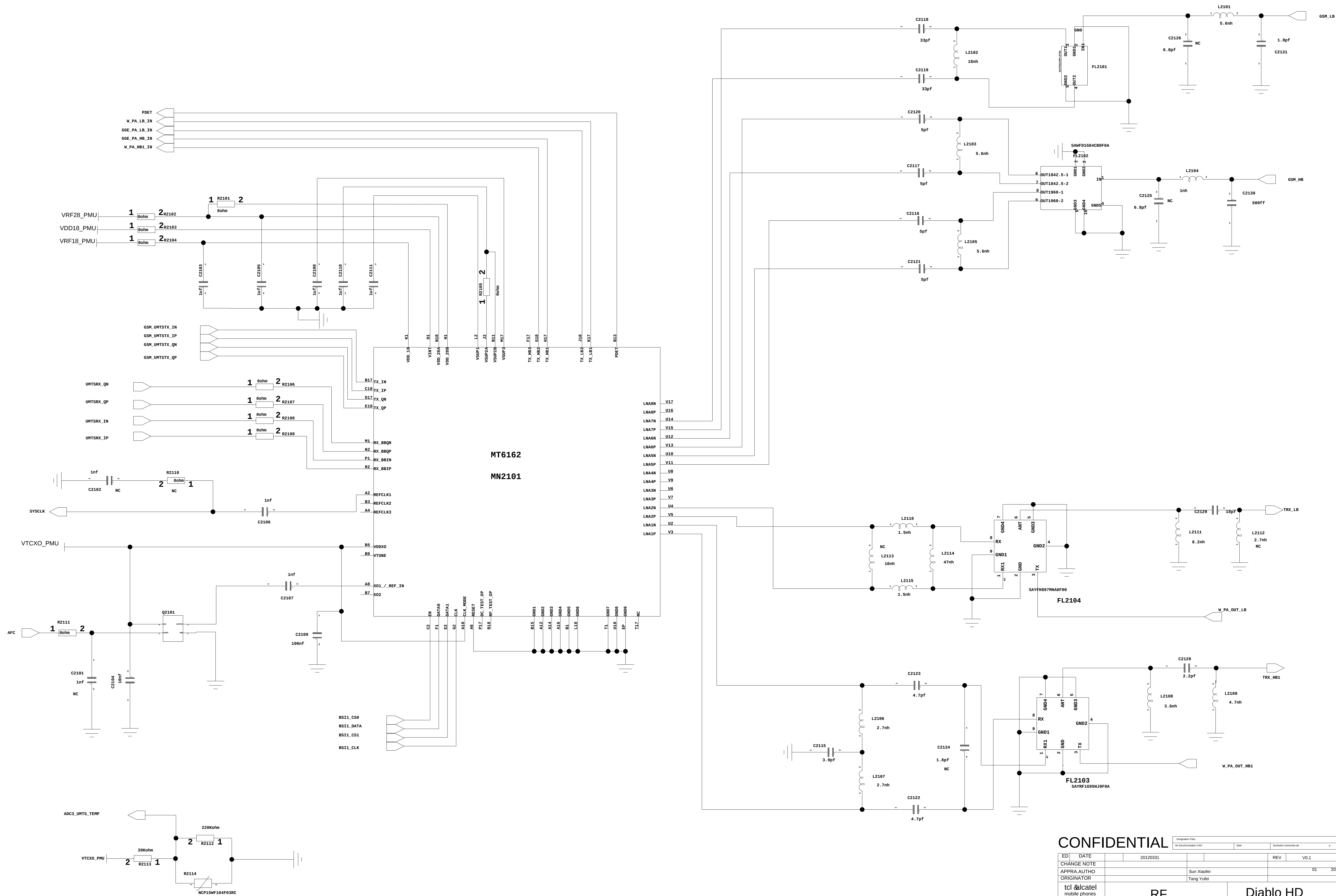


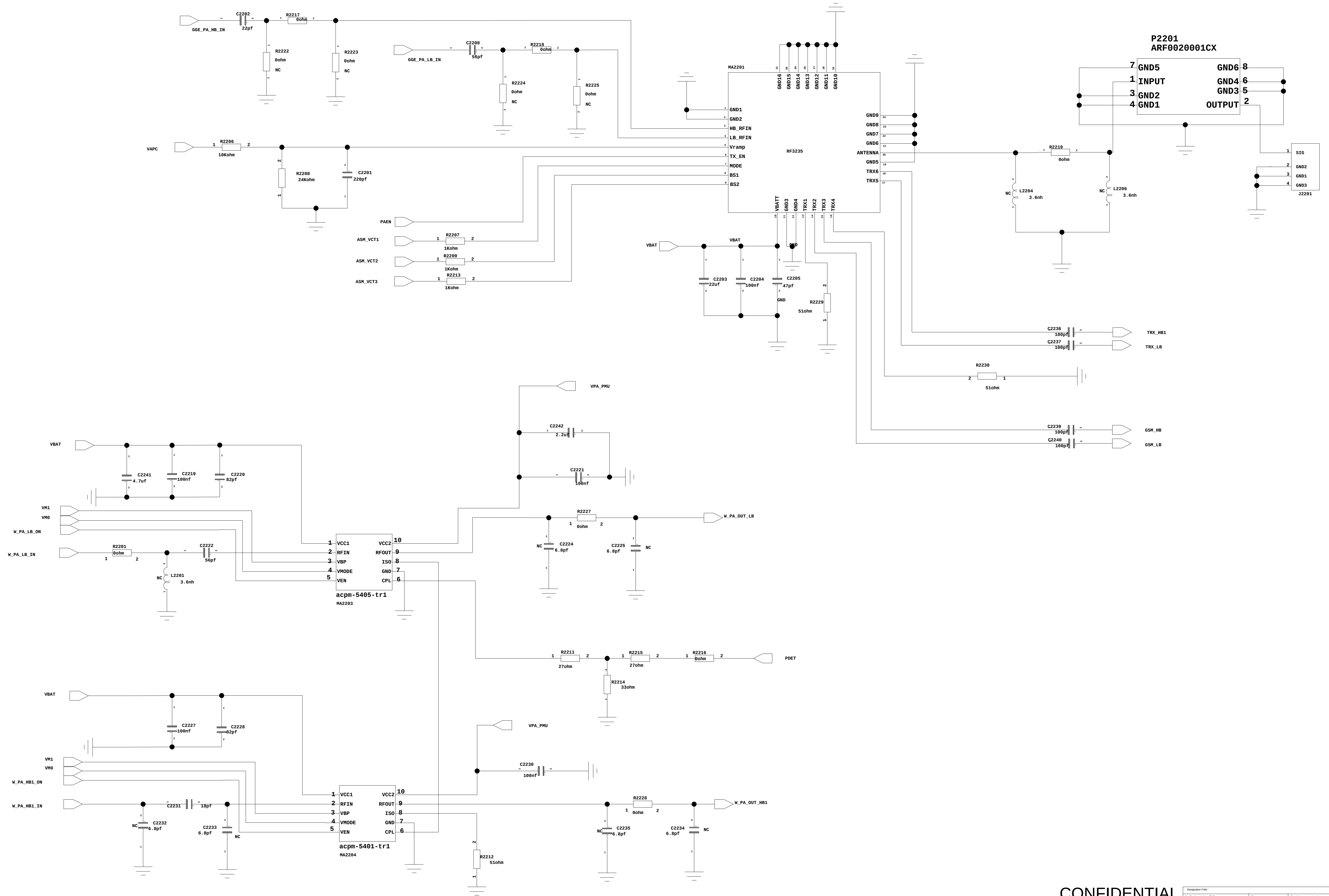
VCHG_BUS



CONFIDENTIAL

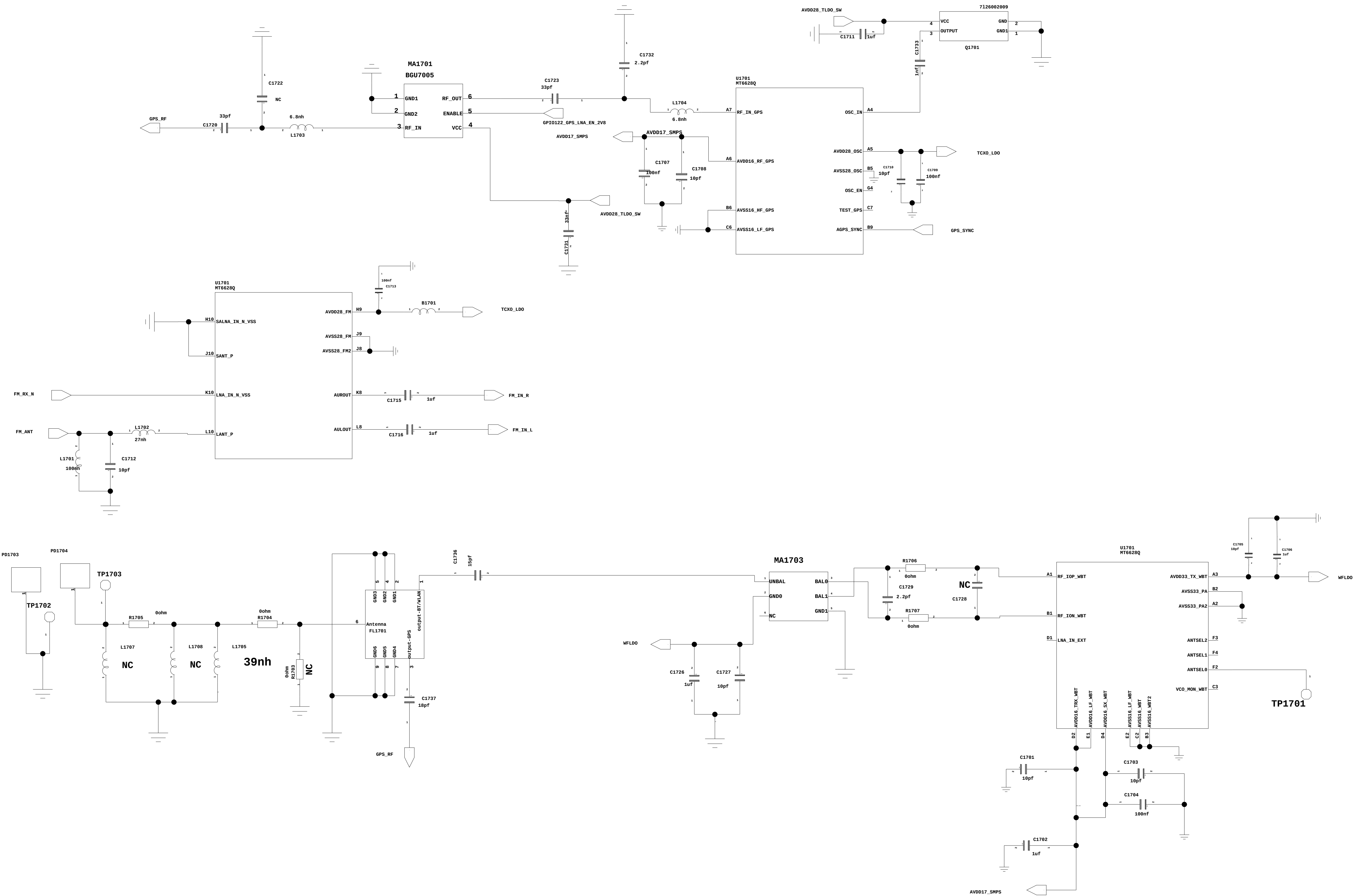
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CHANGE NOTE					
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ORIGINATOR		Liu Zhong			
tcl & catel mobile phones		AUDIO		Diablo HD	
Sheet type		COVER			
				10	





CONFIDENTIAL

CONFIDENTIAL				Origination File: _____ No Synchrostar CAG _____			
ED		DATE		Date		Synchrostar numbers of _____	
CHANGE NOTE		20120331				REV	
APPRO AUTHO				Sun Xiaofei		V0.1	
ORIGINATOR				Tang Yufei			
tcl & catel mobile phones		RF		Diablo HD			
Drawn by: COWIE						12	



CONFIDENTIAL

ED	DATE						
CHANGE NOTE							
APPRO AUTHO							
ORIGINATOR							
tcl @catel mobile phones							
Shopper name	COURSE						



Designation File :			
No Synchronisation CAD :	Date :	Symboles numérotés de :	a :

14

Version	Date	Page	Description
Proto	20120921	6	Change CR0607 from AEM to NXP ALB0000027CX;
	20120921	8	Add test point TP0805 at PWM3_MIPI Change MN0901 from SGM3140 to BD7704; Change D0901 form EVERLIGHT to OSRAM;
	20121008	9	Add L0901 1UH inductor; Add GPIO201&GPIO196 ; Change R0904 from 57.6K to 100K; Change R0905 from 0.50HM to 24K; Change C0917 from 1UF to 4.7UF; Change C0918 from 4.7UF to 2.2UF; Delete C0909,C0910;
	20121009	7	add R0705,R0706,C0708,C0709 for VBAT&KPLED
	20121009	8	Add TP0806,TP0807;
	20121011	8	Add CR0801,CR0802,CR0803
PIO	20121030	3	Change R0304 from 0ohm to 5.1K; Add MN0302/C0326 for Reset function; (NC both)
	20121030	8	Add B0801,B0802at ELVDD,ELVSS for RF; Delete GPIO196&GPIO201;
	20121031	9	Delete R0905; Change C0918,C0917 to 10Uf; Change MN0901 from BD7704 to AS3647;
	20121106	8	Add MA0801 C0817 for LCD RST level shift; Add R0808 for TP INT pull up
	20121106	6	Change C0609 from 0603 to 0402;
	20121107	5	Delete R0501,R0502,R0503,R0504; Change CR0501,CR0502,CR0505 from AEM to PHLIP Change CR0503,CR0504 from AEM to semi
	20121113	8	Delete R0805,R0806,R0804 for EL_ON option Delete GPIO112_LCD_DCDC_SWIRE
	20121114	6	Add C0613 for charge IC
	20121114	8	Change CR0801,CR0802,CR0803 from AEM to Philp Change C0802,C0803,C0806 from 0402 to 0201
	20121116	7	Change CR0701,CR0702 from AEM to Philp

CONFIDENTIAL

Designation File:

No Synthesizable CAD:

Date:

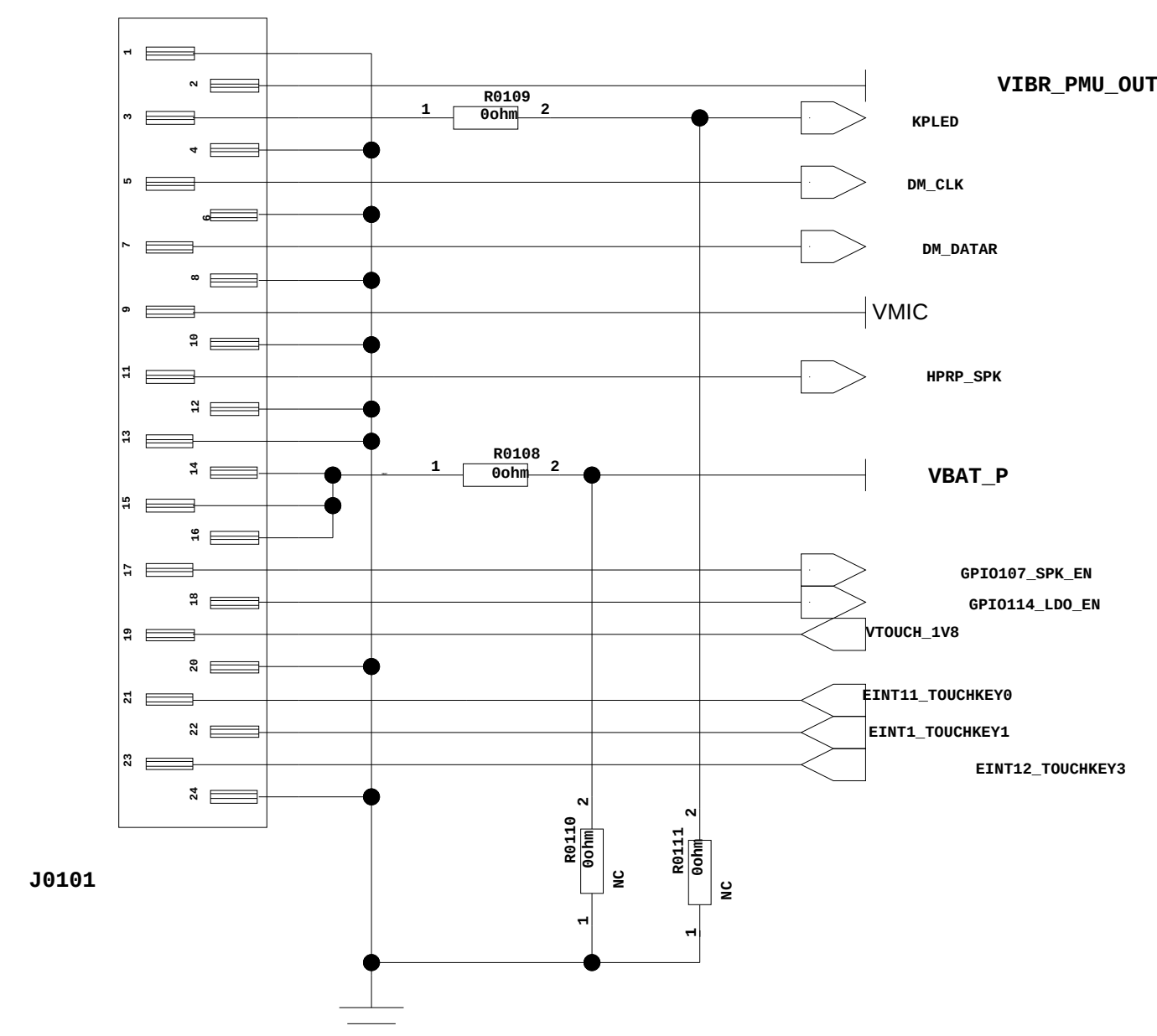
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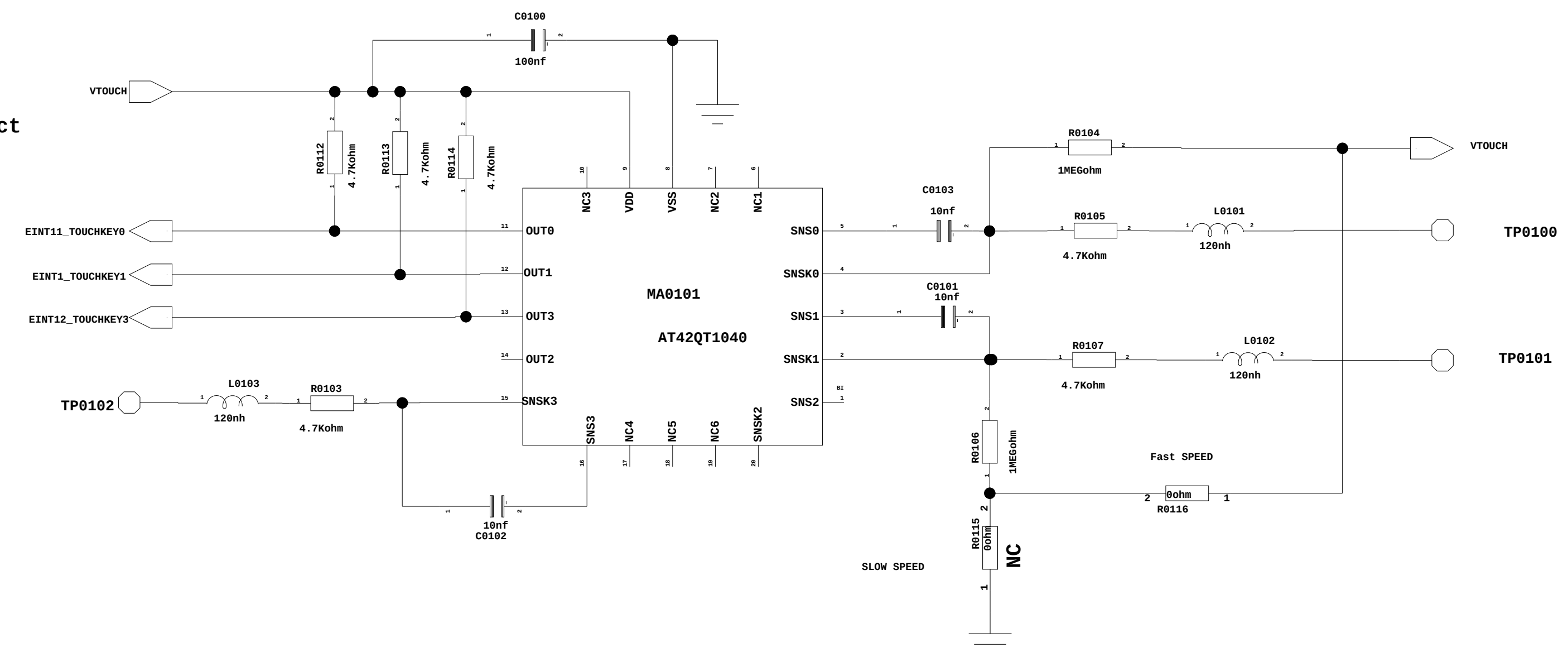
ED	DATE			YF	REV	V0.1
CHANGE NOTE						
APPRO AUTHO		GU ZHAN				
ORIGINATOR		ZH LIN				
tcl & alcatel mobile phones						
Sheet type:		COVER				
		Change list				Diablo HD
						15

Version	Date	Page	Description
PIO	20121117	9	Add C0919 for Falsh LED driver;
	20121119	18	Add TP1805,TP1806 for MT6628 UART;
	20121120	7	Change J0702 to ZIF connector
LOT0	20121211	6	Add R0630/NC for GPIO_CHG_OTG
	20121211	9	Add R0909,R0908/NC of PA_EN for flash driver ic;

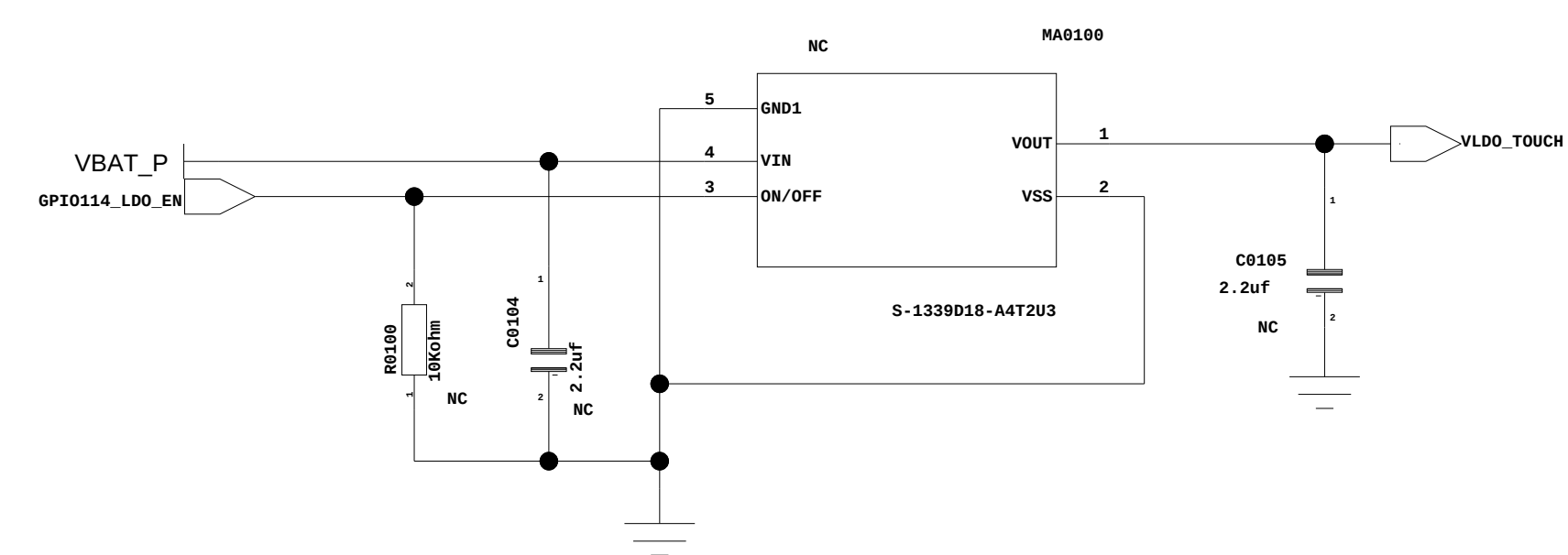
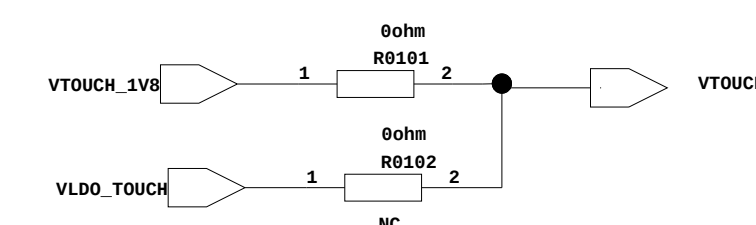
SUB Board CON



VTOUCH should be well protect



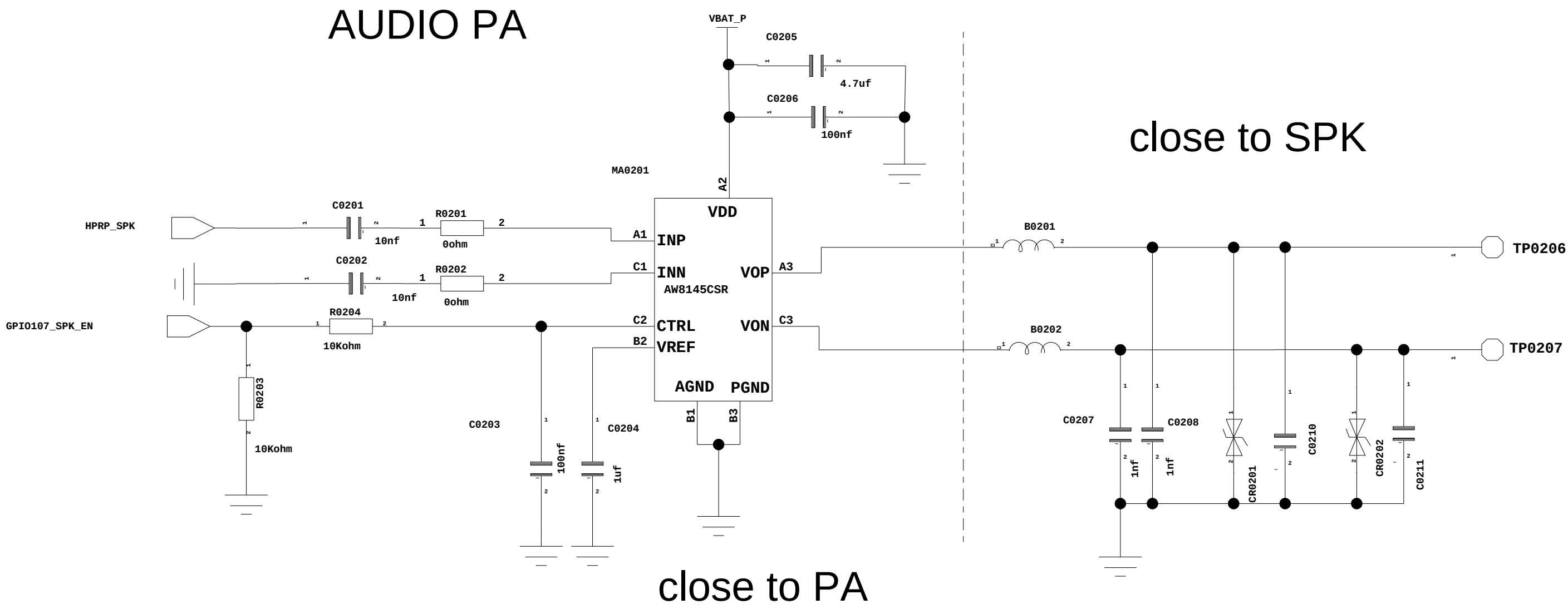
Note: Do NOT run any tracks under the body of the IC



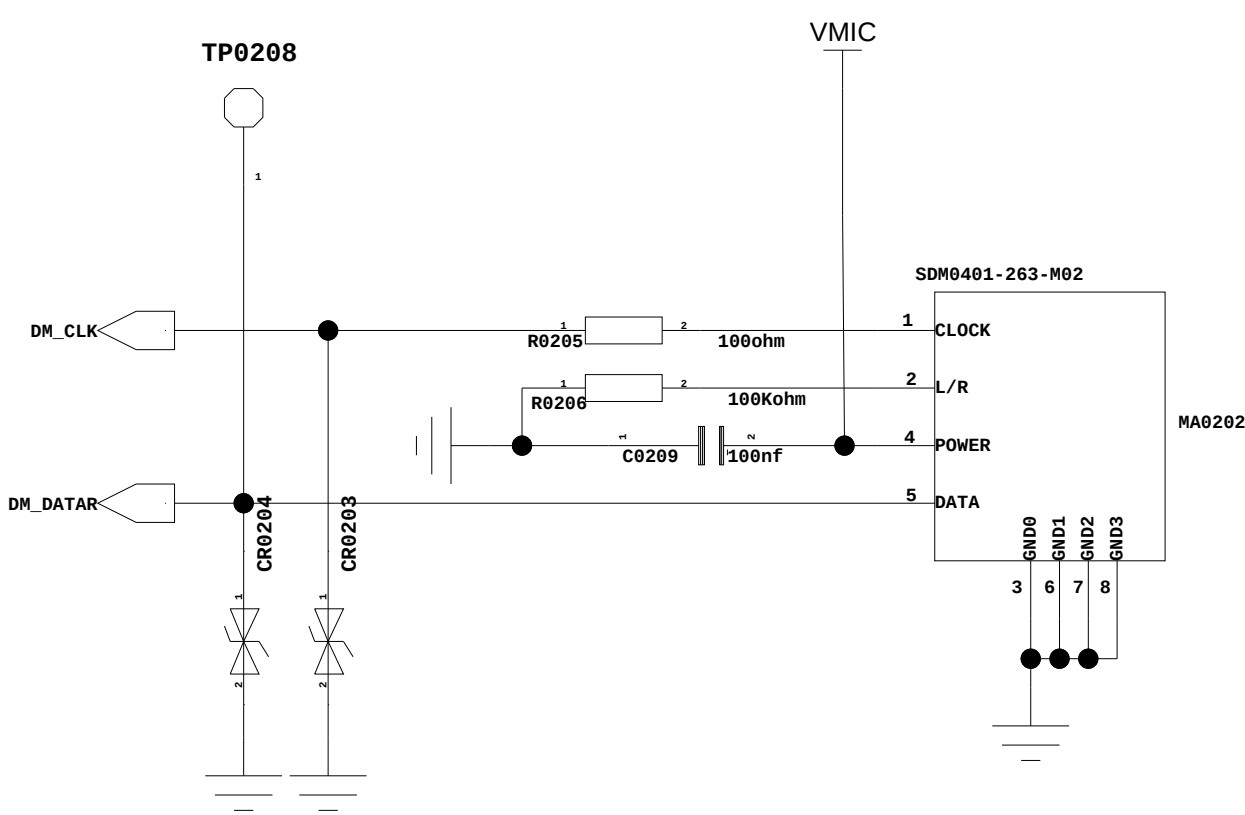
CONFIDENTIAL 

ED	DATE	01	20120916				
CHANGE NOTE							
APPRO AUTHO							
ORIGINATOR							
tcl & calcatel mobile phones		SUB CONNECTOR			Diablo HD		
Brand type: COVER							
						1/2	

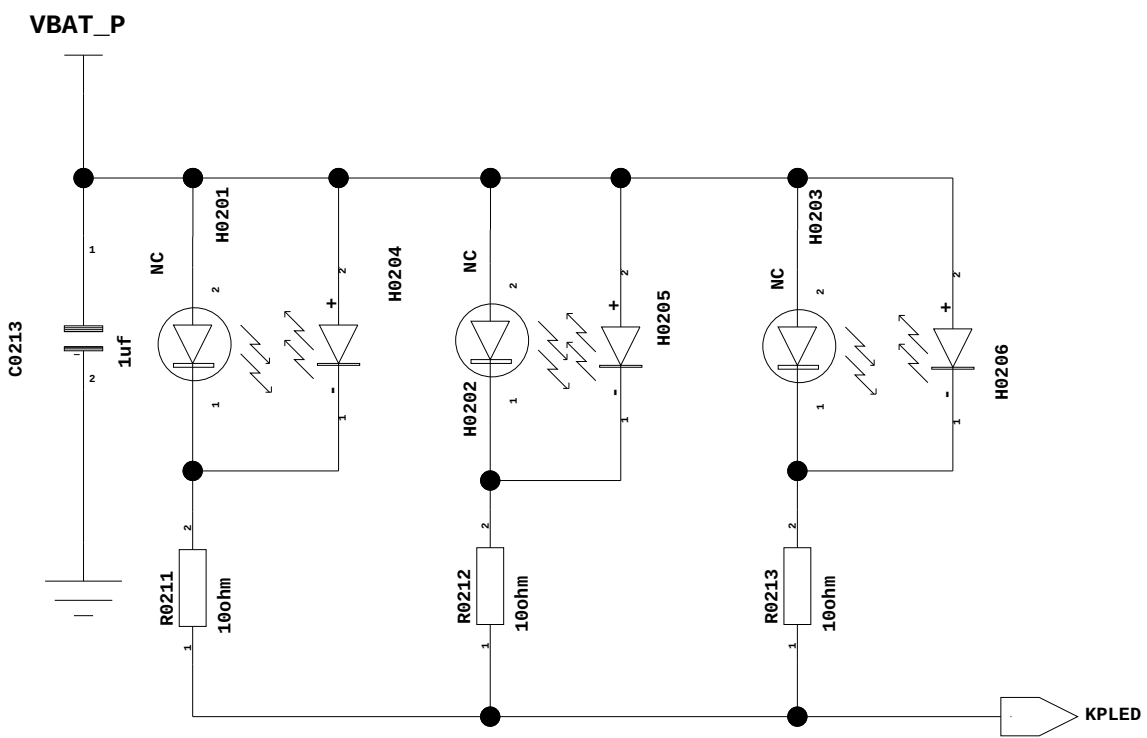
AUDIO PA



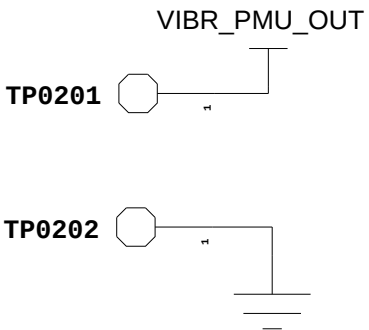
MAIN MIC



KEY LED



VIBRATOR



Version	Date	Page	Description
Proto	20121105	01	Add R0115,R0116 to do the option for Touch IC slow or fast mode

目 录

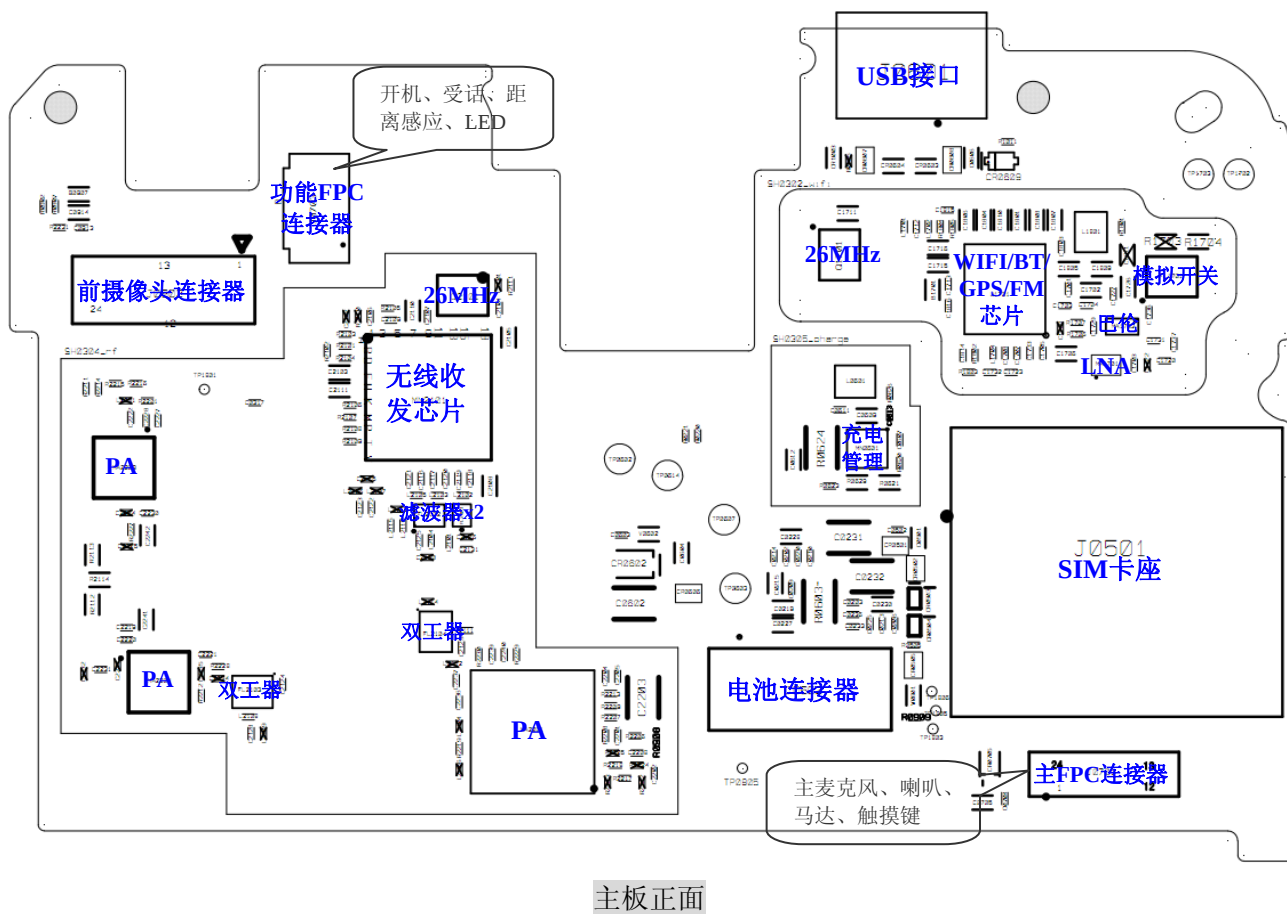
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1 机型图片

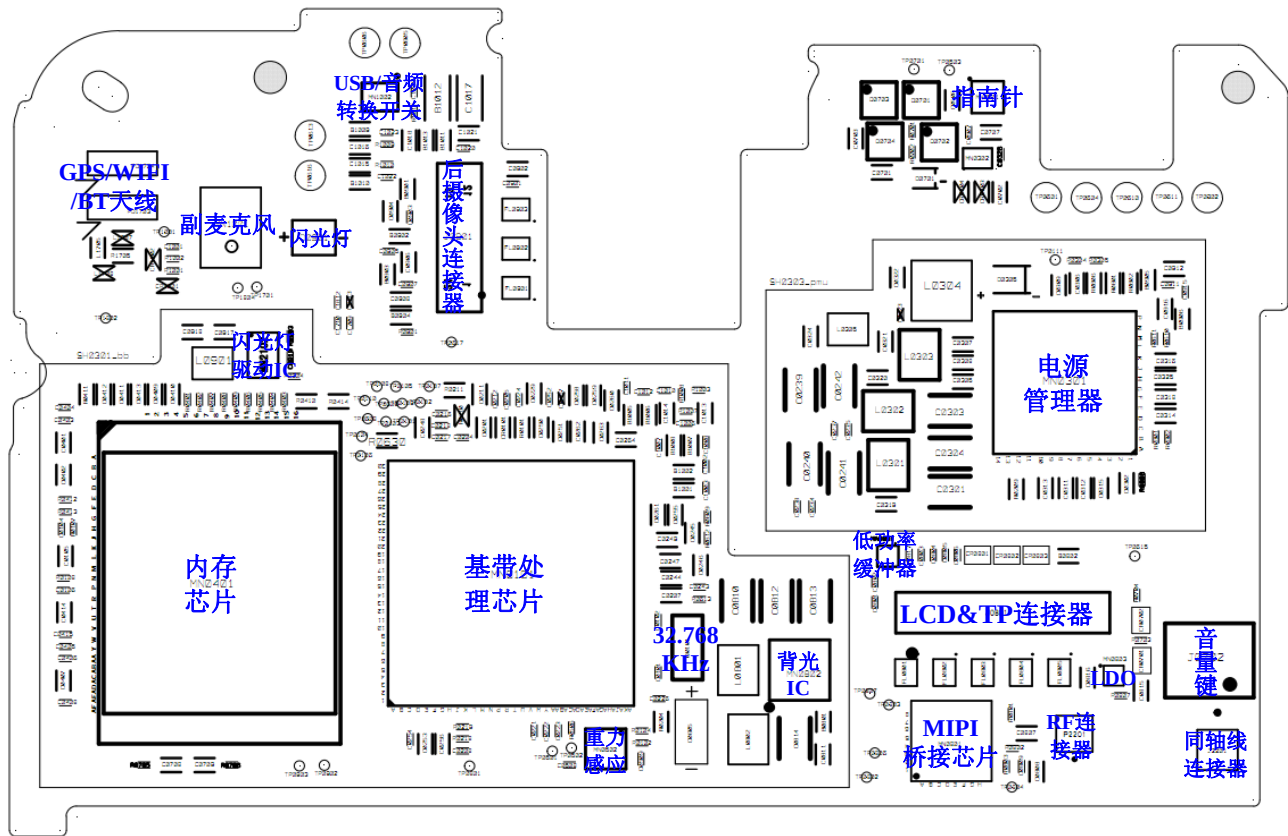
1.1 手机外观图片



1.2 手机 PCB 板图片

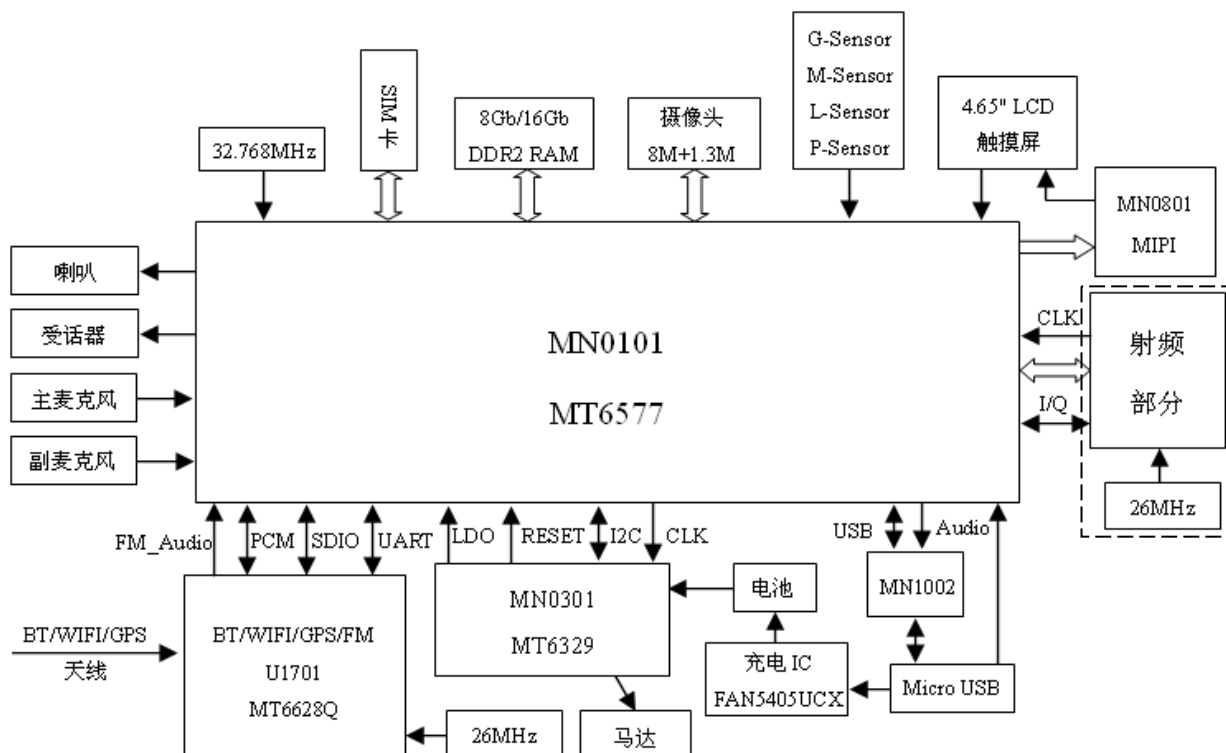


主板正面



主板反面

1.3 系统硬件框图



2 逻辑电路

2.1 电源管理

电源管理部分主要由电源管理MN0301 (MT6329BA) 及其它电路组成。

2.1.1 MN0301 管脚定义

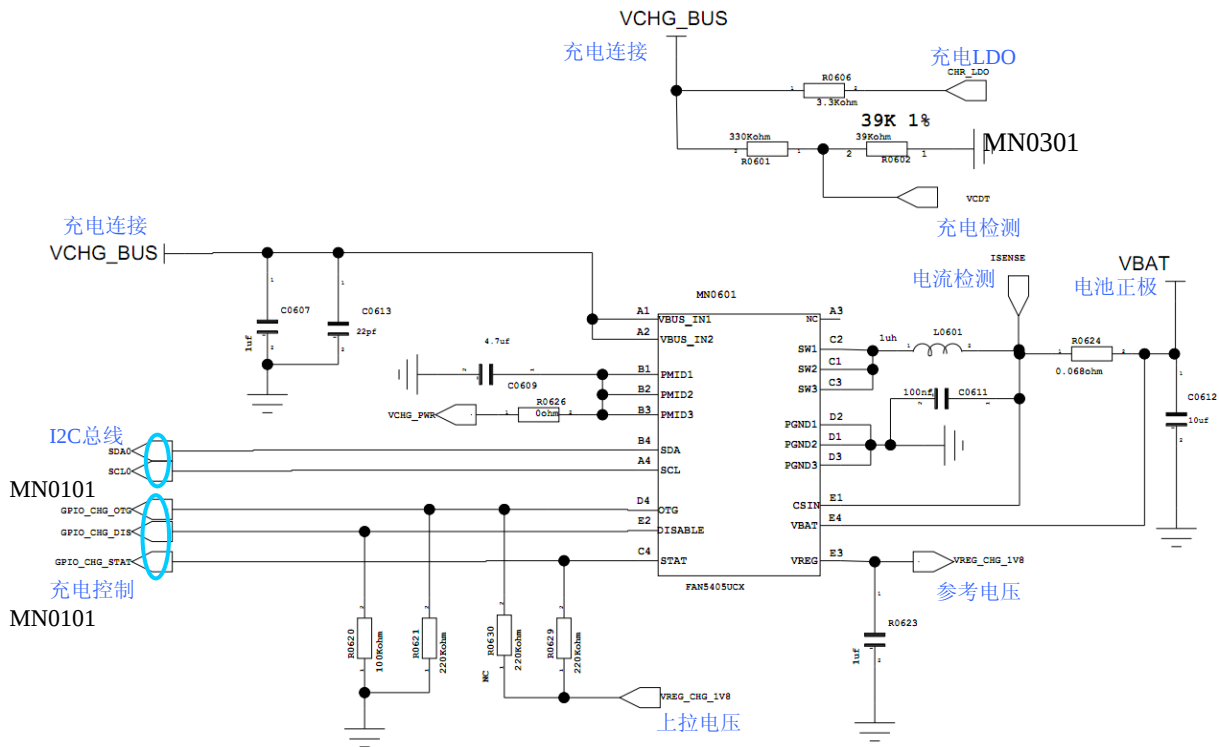
管脚	定义	描述	管脚	定义	描述
A1	BGA_NC_A1	NC	H1	ISENSE	Charging current sense input
A2	SRCLKEN	Source clock enabling signal	H2	BATSES	Battery voltage sense input
A3	BL_PWM	External backlight CABP PWM control input signal	H3	CHG_DM	USB D- for BC1.1 standard
A4	FSOURCE	Connects to AVDD 18_DIG in normal mode	H5	CHR_LDO	Charger LDO output bypass pin
A5	VCAM_IO	LDO output used for camera IO	H6	GND_LDO	GND for LDO
A7	VCAM_AF	LCD output used for camera auto-focus	H7	GND_LDO	GND for LDO
A8	VSIM	LDO output used for SIM card	H8	GND_VOCRE	GND for VCORE
A10	VM12_1	LDO output used for 1.2V DRAM	H9	GND_VIO18	GND for VIO18
A11	VMCH	LDO output used for SD 3.0 memory card	H10	GND_VIO18	GND for VIO18
A13	VIO_18_FB	VIO18 feedback input	H12	VRF18	VRF18 switching output
A14	VBAT_VPROC	VBAT for VPROC	H13	VBAT_VRF18	VBAT for VRF18
B1	PA_SEL2	PA output voltage selection	H14	VBAT_VIO18	VBAT for VIO18
B2	PA_SELO	PA output voltage selection	J2	VREF	Internal reference bypass
B3	INT	Interrupt output	J3	TREF	Battery thermal detection reference voltage
B4	SYSRSTB	External system reset input pin(active low)	J5	CHG_DP	USB D+ for BC1.1 standard
B5	VCAMD	LDO output used for camera digital	J6	GND_LDO	GND for LDO
B6	VIBR	LCD output used for vibrator]	J7	GND_LDO	GND for LDO
B7	VGP	LDO output reserved for further system use	J8	GND_VIO18	GND for VIO18
B8	VUSB	LDO output used for USB	J9	GND_VRF18	GND for VRF18
B9	VIO28	LDO output used for 2.8V IO	J10	GND_VRF18	GND for VRF18
B10	VM12_INT	LDO output used for 1.2V SRAM	J12	GND_VPA	GND for VPA
B11	VGP2	LDO output reserved for further system use	J13	VPA	VPA switching output
B12	VCORE_FB	VCORE feedback input	J14	VBA_VPA	VBAT for VPA
B13	VBAT_VPROC	VBAT for VPROC	K1	BATON	Battery thermal detection input
B14	VBAT_VPROC	VBAT for VPROC	K2	GND_VREF	GND for reference
C1	DVS1	VPROC output voltage selection	K3	USB_DLN	SUB download key
C3	PA_SEL1	PA output voltage selection	K5	32K_IN	RTC 32K input used for fuel gauge operation
C4	DVS2	VPROC output voltage selection	K6	GND_LDO	GND for LDO
C5	VBAT_LD03	VBAT for VIBR,VCAM_IO,VCAMD, VRTC and IBAS_DLDO1	K7	GND_SPK2	GND for speaker channel 2
C6	VBAT_LD03	VBAT for VIBR,VCAM_IO,VCAMD, VRTC and IBAS_DLDO1	K8	GND_LDO	GND for LDO
C7	VBAT_LD02	VBAT for VIO28,VSIM,VSIM2,VUSB,VGP and VCAM_AF	K9	BST_GDRV	Boost controller gate drive output
C8	VSIM2	LDO output used for 2nd SIM card	K10	GND_ISINK	GND for ISINK
C9	VM12_2	LDO output for 1.2V DRAM or AST3002	K12	GND_VPA	GND for VPA
C10	VMC	LDO output for memory card	K13	VPA	VPA switching output
C11	VBAT_LD04	VBAT for VMC, VMCH, VGP2 and IBIAS_DLDO2	K14	VBA_VPA	VPA for VPA
C12	VPA_FB	BPA feedback input	L1	VDRV	Charger current drive output
C13	VBAT_VPROC	VBAT for VPROC	L2	RESETB	Reset output

C14	VPROC	VPROC switching output	L3	USB_DLP	USB download key
D1	VBAT_LD05	VBAT for VA1, VA2, VCAMA, VTCX0, VRF28 and IBIAS_ALDO	L12	GND_DRV	GND for flashligh keypad LDO drivers
D2	SDA	I2C serial data	L13	FLASH	Flashlight open drain output
D3	SCK	I2C serial clock	L14	KPLED	Keypad LED open drain output
D12	VRF18_FB	VRF18 feedback input	M2	PCH_DET	Charging indicator current sink output
D13	VRPOC	VPROC switching output	M3	PWRBB	Power on RTC domain latch signal
D14	VPROC	VPROC switching output	M4	PMU_TESTMODE	Test mode input(normal function should tie to GND)
E1	VRF28	LDO output for RF	M5	BYPASS	SPK common mode voltage bypass
E2	VBAT_LD05	VBAT for VA1, VA2, VCAMA, VTCX0, VRF28 and IBIAS_ALDO	M6	GND_LDO	GND for LDO
E3	VA1	LDO output for analog baseband	M7	GND_SPK2	GND for speaker channel 2
E5	AVDD18_DIG	LDO output bypadd pin	M8	GND_SPK1	GND for Speaker channel 1
E6	HOMEKEY	Homekey	M9	GND_SPK1	GND for speaker channel 1
E7	VRTC	LDO output for RTC	M10	ISINK4	Current sink channel 4 output
E8	VBAT_LD02	VBAT for VIO28, VSIM, VSIM2, VUSB, VGP and VCAM_AF	M11	GND_ISINK	GND for ISINK
E9	AVDD18	1.8V power input for VM12_1, VM12_2 and VM12_INT	M12	GND_DRV	GND for flashligh keypad LDO drivers
E10	VPROC_FB	VPROC feedback input	M13	ISINK0	Current sink channel 0 output
E12	VCORE	VCORE switching output	N1	VCDT	Ratioed charger input voltage
E13	VBAT_VCORE	VBAT for VCORE	N2	PWRKEY	Power key
E14	VBAT_VCORE	VBAT for VCORE	N3	AUD1_P	Audio channel 1 differential input(positive)
F2	VCAMA	LDO output for camaera analog	N4	AUD1_N	Audio channel 1 differential input(negative)
F3	VCAMA_S	Sense input for VCAMA LDO	N5	VBI_N	Voice differential input(negative)
F5	VTCX0	LDO output for TCX0	N6	ASW_OUT	Analog switch output
F6	AVDD18_IO	1.8V IO power input for internal GPIO	N7	ASW_IN1	Analog switch input 1
F7	GND_LDO	GND for LDO	N8	ASW_IN2	Analog switch input 2
F8	GND_VPROC	GND for VPROC	N9	VBAT_MISC	VBAT for buck,driver and speaker controller
F9	GND_VPROC	GND for VPROC	N11	ISINK5	Current sink channel 5 output
F10	GND_VPROC	GND for VPROC	N12	ISINK3	Current sink channel 3 output
F12	VCORE	VCORE switching output	N13	ISINK2	Current sink channel 2 output
F13	VCORE	VCORE switching output	N14	ISINK1	Current sink channel 1 output
G1	CS+	Fuel gauge positive current sense point	P1	BGA_NC_P1	NC
G2	CS-	Fuel gauge negative current sense point	P2	AUD2_P	Audio channel 2 differential input(positive)
G3	VA2	LDO output for analog baseband	P3	AUD2_N	Audio channel 2 differential input(negative)
G5	VA2_BUF	LDO output for analog baseband	P5	VBI_P	Voice differential input(positive)
G6	GND_LDO	GND for LDO	P7	VBAT_SPK2	VBAT for speaker channel 2
G7	GND_LDO	GND for LDO	P8	VBAT_SPK1	VBAT for speaker channel 1
G8	GND_VCORE	GND for VCORE	P10	SPK2_P	Speaker channel 2 differential output(positive)
G9	GND_VCORE	GND for VCORE	P11	SPK2_N	Speaker channel 2 differential output(negative)
G10	GND_VCORE	GND for VCORE	P12	SPK1_N	Speaker channel 1 differential output(negative)
G12	VIO18	VIO18 switching output	P13	SPK1_P	Speaker channel 1 differential output(positive)
G13	VIO18	VIO18 switching output	P14	BGA_NC_P14	NC

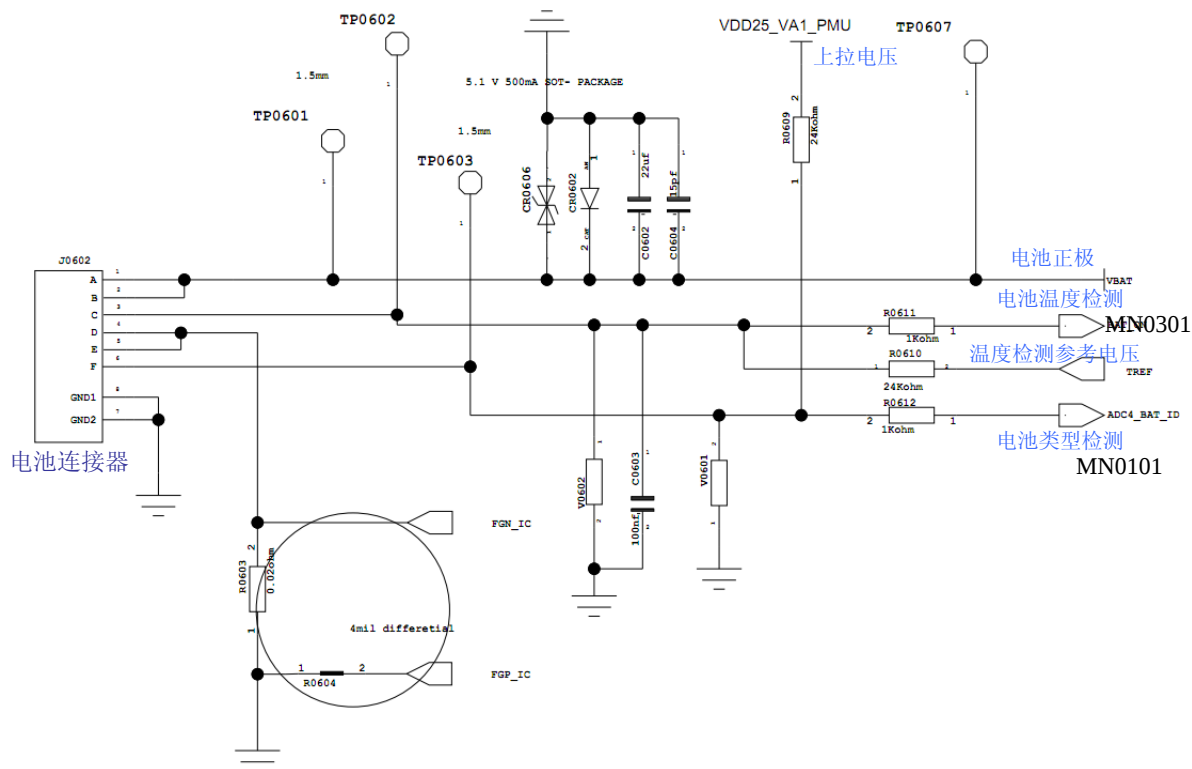
G14	VBAT_VIO18	VBAT for VIO18			
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2.1.2 充电电路

充电电路是由电源管理芯片MN0301 (MT6329BA)、充电管理芯片MN0601 (FAN5405UCX) 及其外围电路来完成。



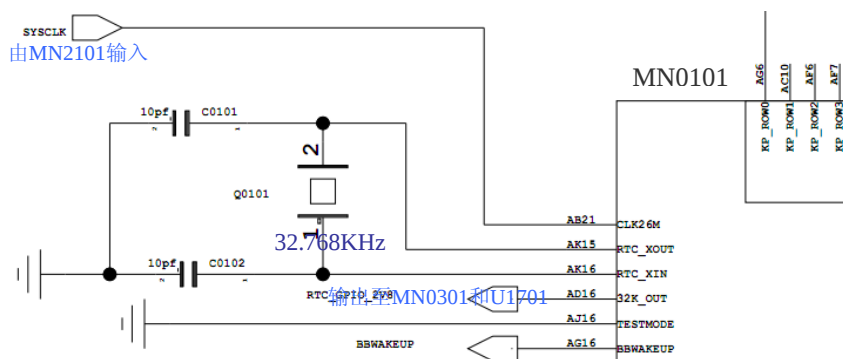
充电电路 (主板)



电池连接器 (主板)

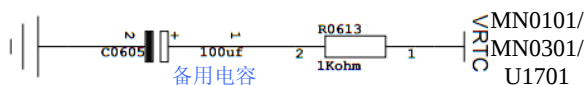
2.1.3 备用电源

实时时钟电路的作用是向手机提供时间、日期、通话计时、闹钟等功能。它由基带处理芯片MN0101、时钟晶振Q0101和备用电容C0605等组成。Q0101内部的振荡电路产生标准的32.768KHz实时时钟信号，直接提供给MN0101。



实时时钟电路（主板）

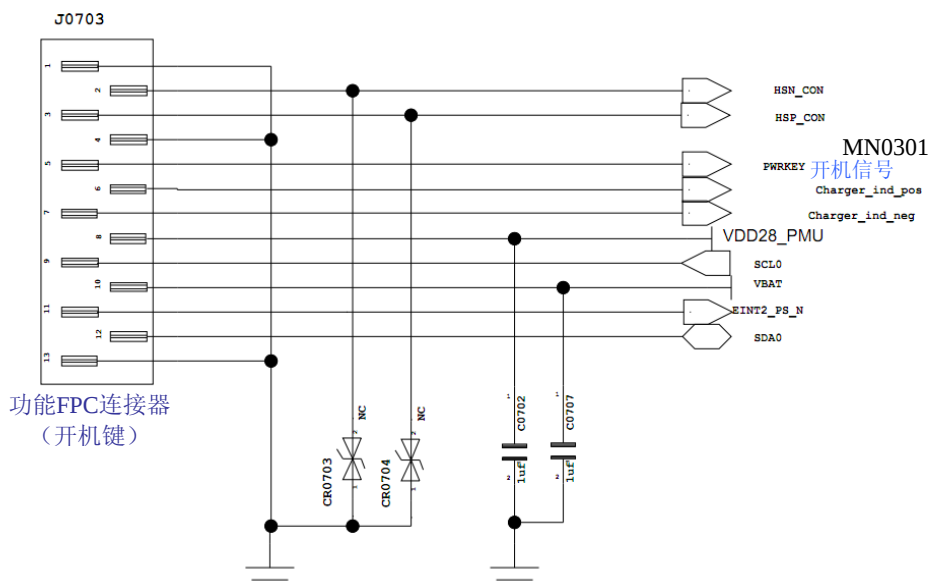
C0605为备用电容，当有电池供电时，电源管理器MN0301的E7脚（VRTC）直接输入MN0101的AH16脚，使系统保持时间设置，维持实时时钟，同时MN0301经过R0613为备用电容充电，直到备用电容被充满；而当电池电压不足或电池没有电压供电时，C0605作为备用电源，经过R0613输入MN0101的AH16脚，使系统保持时间设置，维持实时时钟。



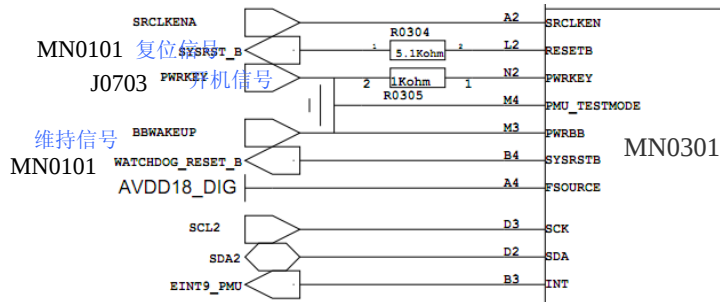
备用电源（主板）

2.2 开机过程

当按下开关机键时，MN0301的PWRKEY（N2脚）由高电平变为低电平，MN0301开始工作，MN0301内部LDO产生VCORE_PMU、VI018_PMU、VI028_PMU、VTCXO_PMU、VMC_PMU、VMCH_PMU等电压信号为MN0101等提供工作电源。

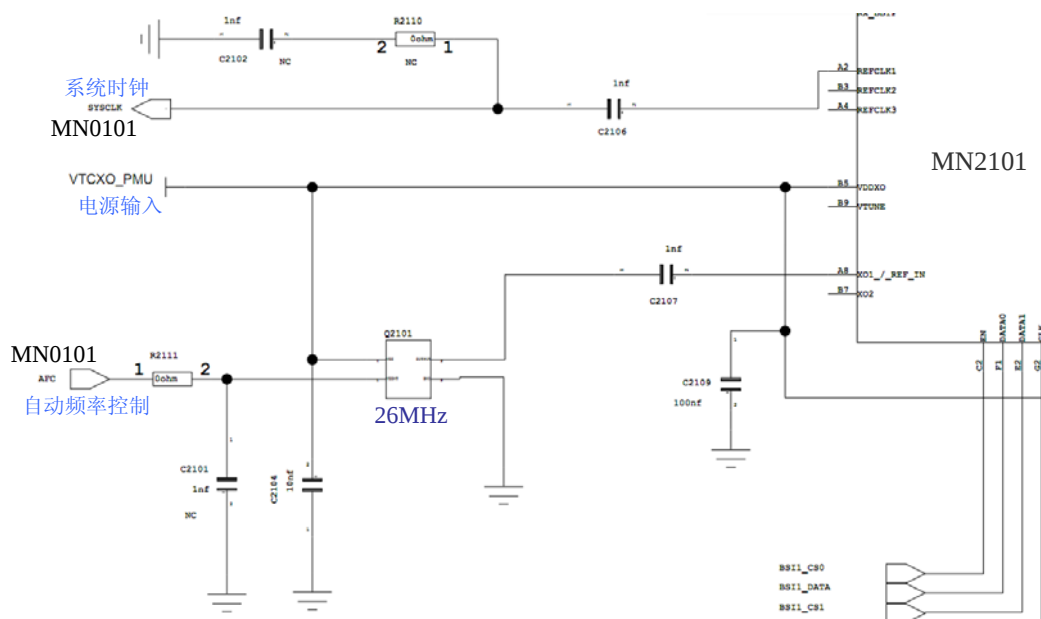


开机键（主板）



开关机电路 (主板)

VTCXO_PMU为Q2101 (26MHz晶体振荡器) 提供电源, Q2101产生频率为26MHz系统时钟 (受MN0101的B4脚控制), 经C2107送入MN2101的A8脚, 经MN2101内部放大后从A2脚输出, 经C2106输入MN0101 (AB21脚)。而Q0101产生32.768KHz实时时钟, 经MN0101内部处理后从32K_OUT (AD16脚) 输出至MN0301和U1701。



时钟电路 (主板)

MN0301的SYSRST_B (L2脚) 产生复位信号, 使MN0101 (W30脚) 复位后, eMMC_RST (L29脚) 产生复位信号, 使MN0401 (F4脚) 复位, MN0101再从MN0401中启动开机程序, 手机开机。

当按键维持一定的时间, MN0101的WATCHDOG_B (AF5脚) 产生高电平, 并输入MN0301 (B4脚), 维持手机的正常供电。

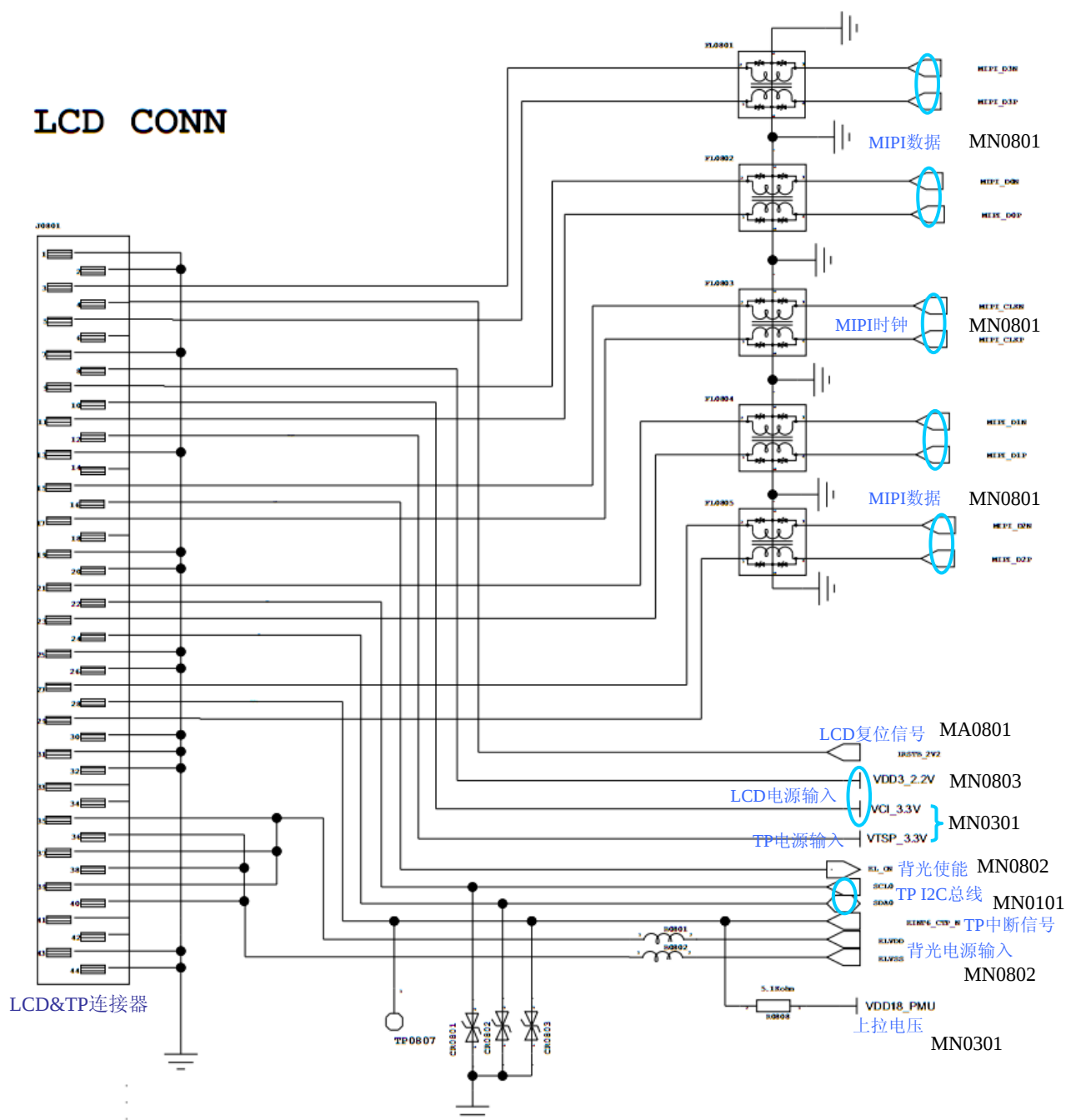
2.3 显示和触摸屏电路

2.3.1 显示和触摸屏电路

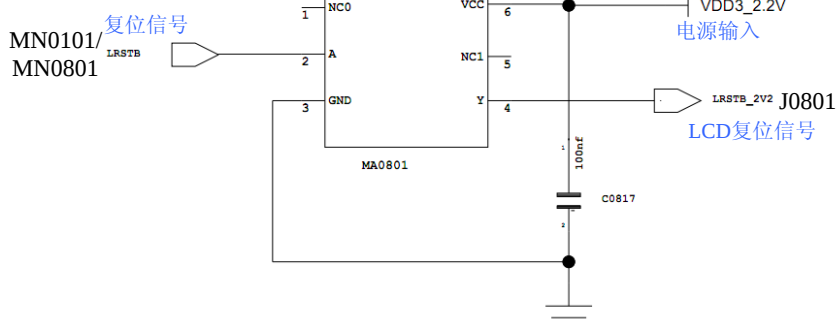
LCD液显模块是采用4.65"、16.7M色、720x1280像素的TFT屏。TFT (Thin Film Transistor) 即薄膜场效应晶体管, 属于有源矩阵类型液晶显示器AM-LCD 中的一种, TFT在液晶的背部设置特殊光管, 可以“主动的”对屏幕上的各个独立的像素进行控制, 这也就是所谓的主动造成矩阵TFT (active-matrix-TFT) 的来历, TFT彩屏比STN彩屏反应速度快、画质好, 完全能满足多媒体处理的要求, 一般TFT的反应时间约为80ms, 可视角度一般可达130度左右。

触摸屏的控制信号经J0801受MN0101控制, MN0301为触摸屏提供工作电源 (VTSP_3.3V), 其中VDD18_PMU

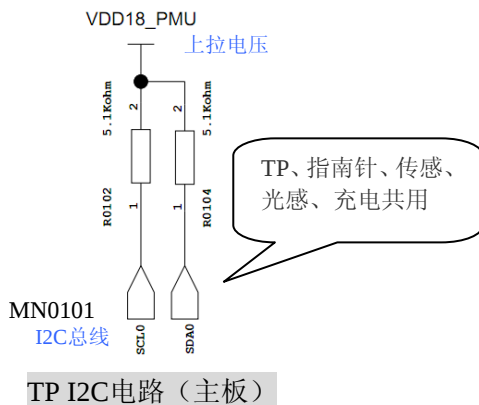
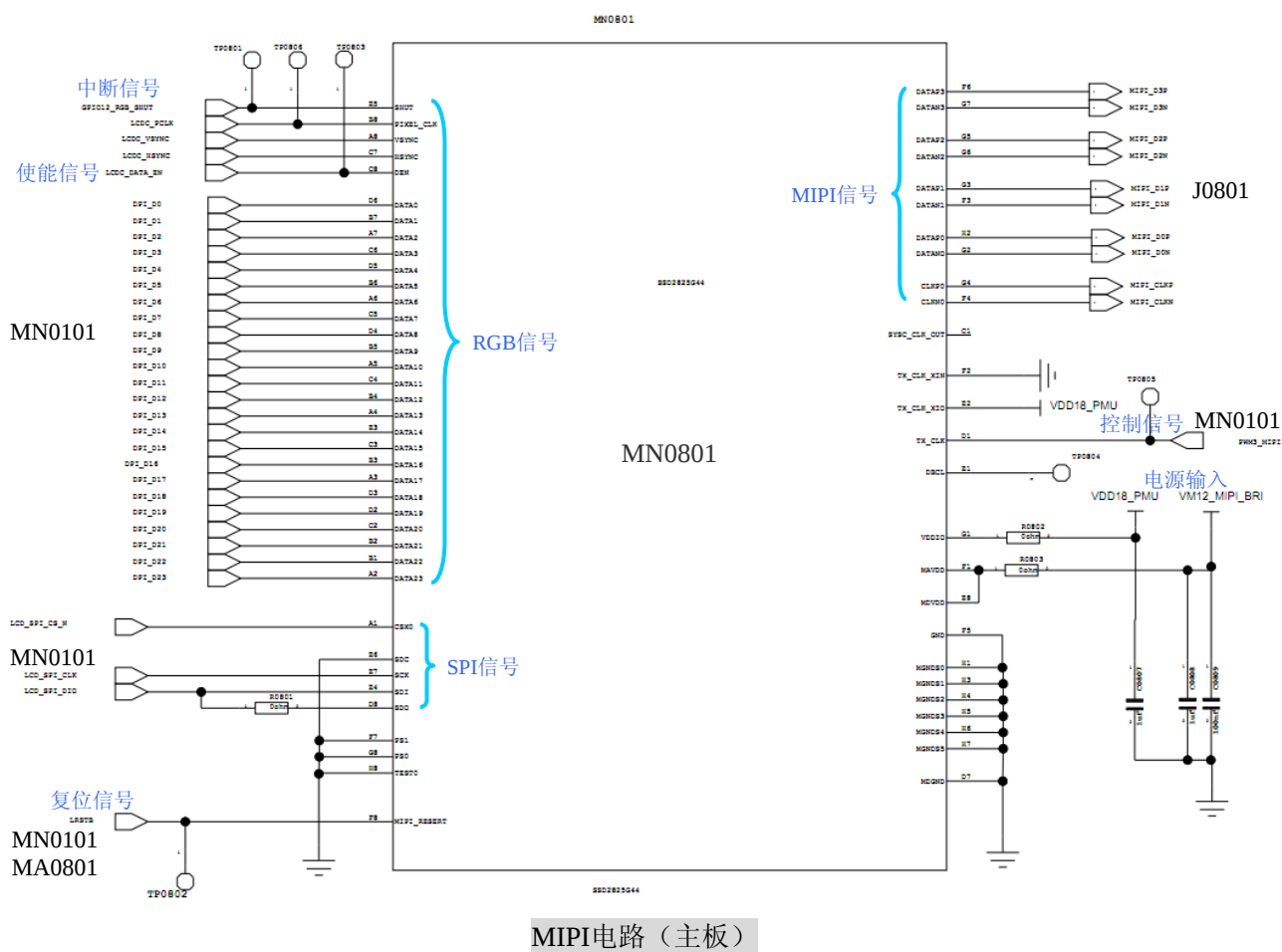
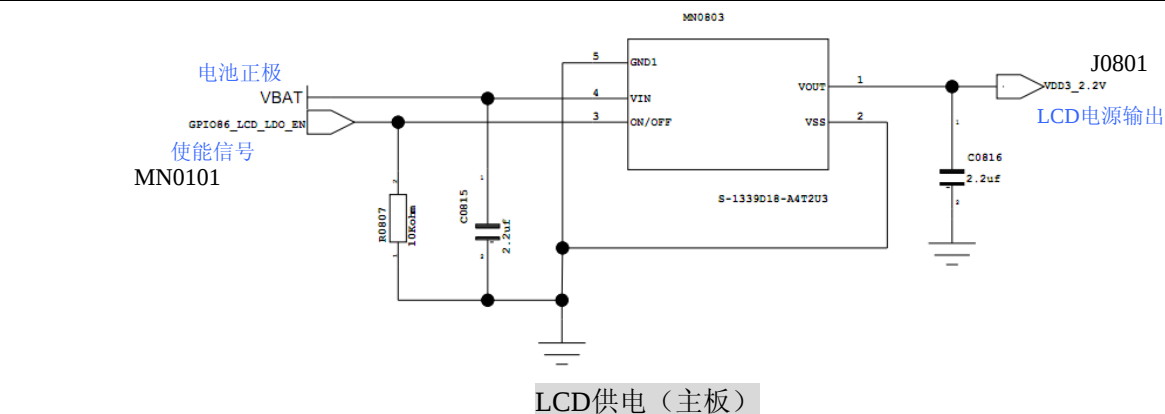
经过R0808为EINT6_CTP_N提供上拉电压, 经过R0102、R0104为SCL0和SDA0提供上拉电压。



显示&TP电路 (主板)

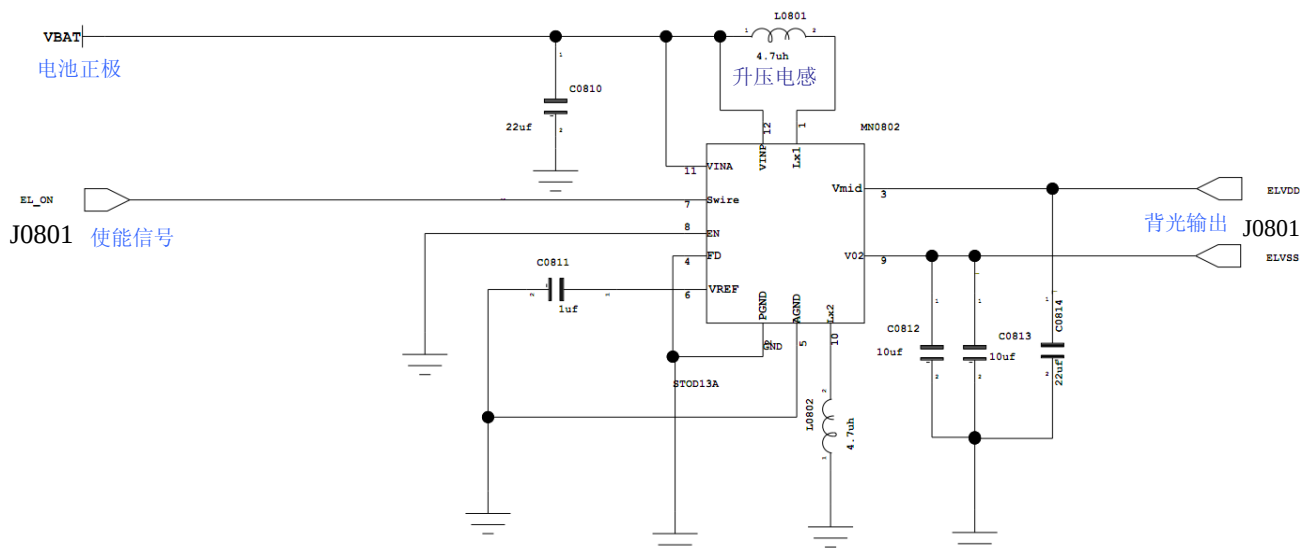


LCD复位 (主板)



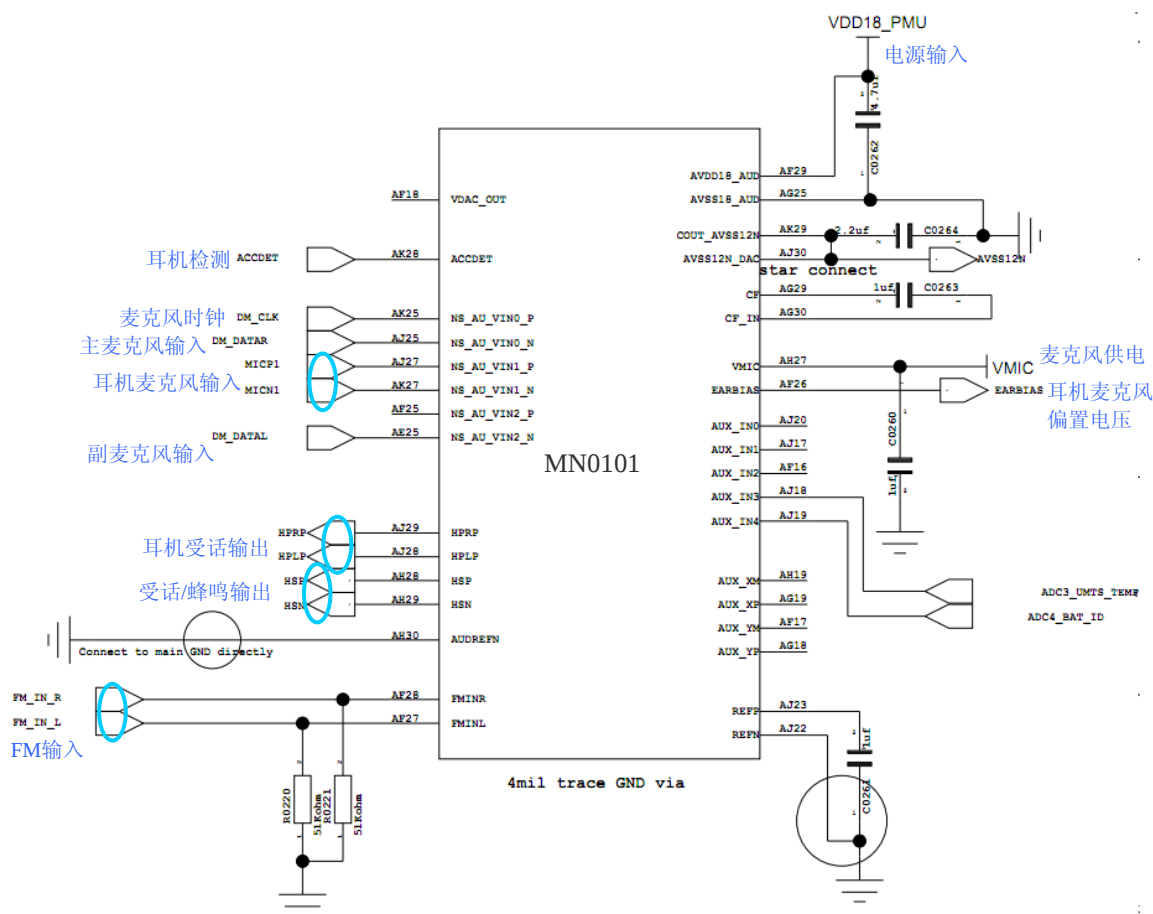
2.3.2 背光电路

LCD背光电路由MN0802控制，当Swire脚为高电平时，MN0802开始工作，将VBAT升压点亮LCD液晶模块上的LED。



背光电路 (主板)

2.4 音频电路

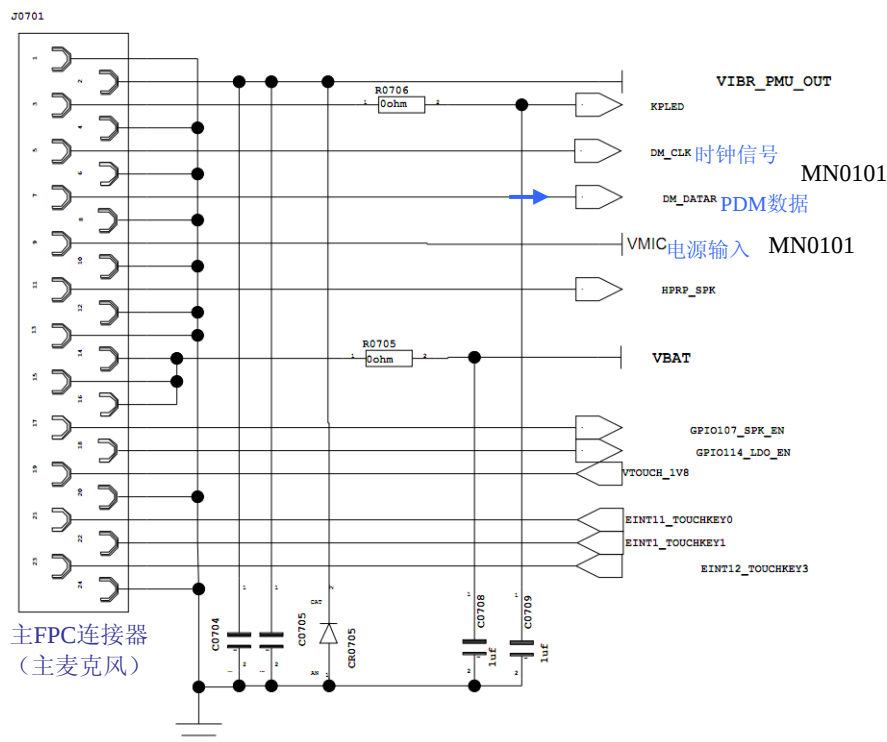


音频电路 (主板)

2.4.1 主机发受话

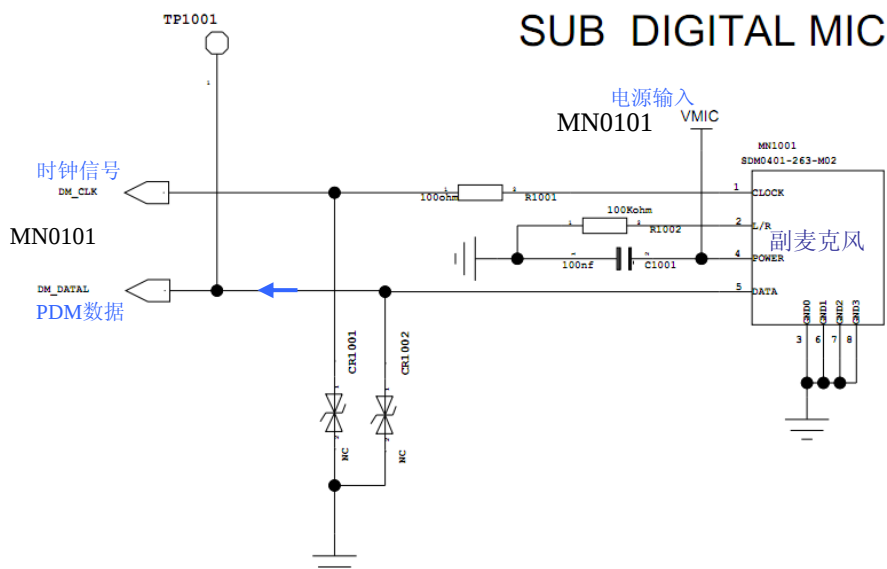
1) 发话

主麦克风将语音信号转化为电压信号后，经过主FPC组件、J0701（主板）送入MN0101的AJ25脚进行相应的放大、滤波等处理。其中MN0101的AK25脚经J0701为麦克风提供时钟信号，MN0101的AH27脚经J0701为麦克风提供电源。



主麦克风电路（主板）

副麦克风（MN1001）将语音信号转化为电压信号后，送入MN0101的AE25脚进行相应的放大、滤波等处理。其中MN0101的AK25脚经R1001为麦克风提供时钟信号，MN0101的AH27脚为麦克风提供电源。

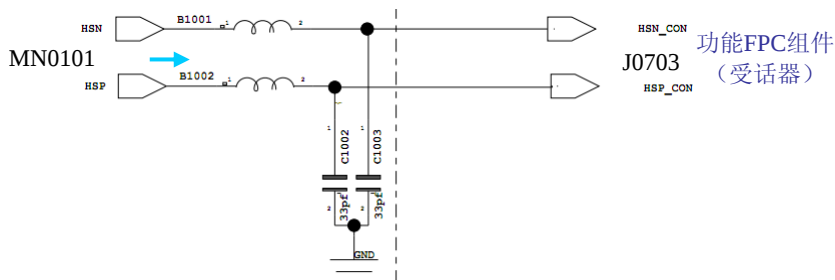


副麦克风电路（主板）

MN0101处理后的语音信号通过GSM_UMTSTX_IP、GSM_UMTSTX_IN、GSM_UMTSTX_QN、GSM_UMTSTX_QP送入射频部分发射出去，从而实现发话。

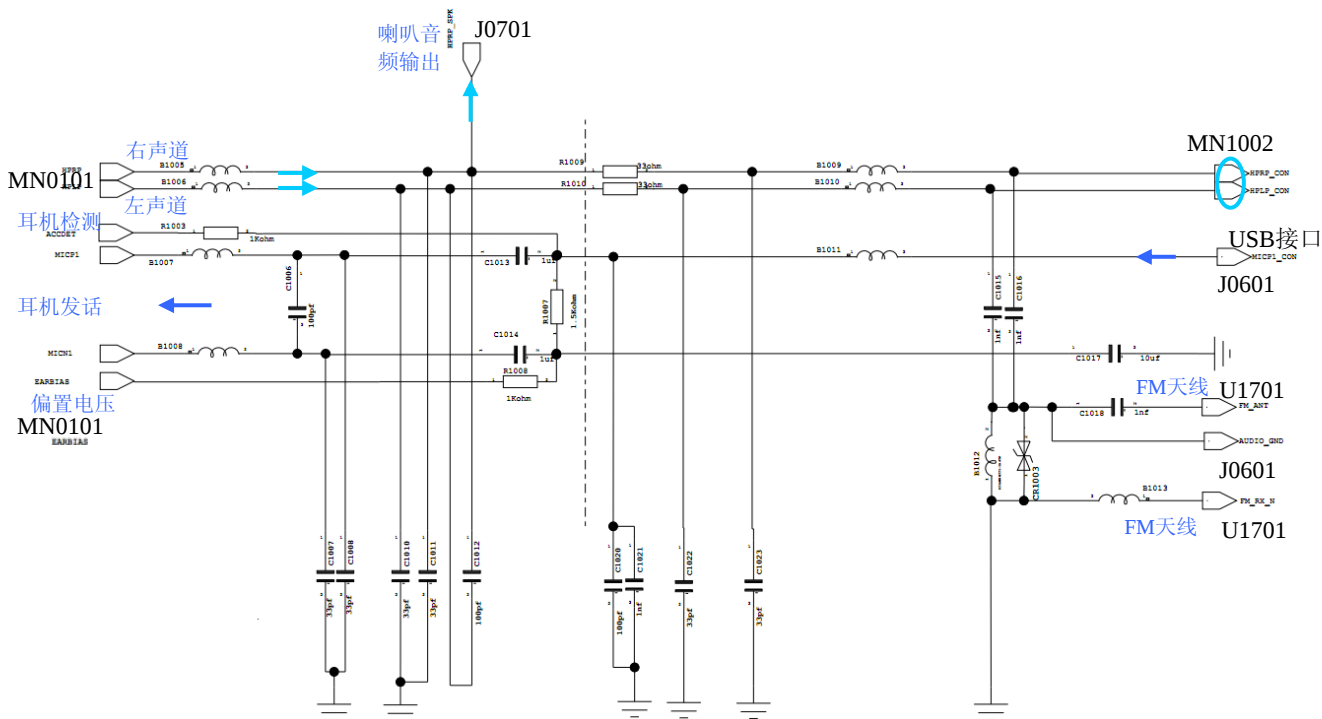
2) 受话

从射频部分收到的信号通过UMTSRX_IP、UMTSRX_IN、UMTSRX_QP、UMTSRX_QN送入MN0101进行相应处理后，从AH28脚、AH29脚输出正负两组相位相反的语音电压信号，经过B1001、B1002、J0703（1、2脚）、功能FPC组件等的滤波后驱动受话器工作。



受话电路 (主板)

2.4.2 耳机发受话



耳机插入USB接口（J0601）后，ACCDDET由高电平变为低电平，MN0101检测到AK28脚为低电平时，经过MN0101内部处理，将主机发受话等切换到耳机部分；MN1002第8脚为低电平时，（MN1002）转换到音频通道上。

1) 耳机发话

耳机上的麦克风将语音信号转化为电压信号后，经过J0601、B1011、C1017、C1013、C1014、B1007、B1008等滤波后，将语音信号传至MN0101的AJ27和AK27脚，其中MN0101的AF26脚经R1008、R1007为耳机麦克风提供偏置电压。处理后的信号通过GSM_UMTSTX_IP、GSM_UMTSTX_IN、GSM_UMTSTX_QN、GSM_UMTSTX_QP送入射频部分发射出去，从而实现耳机发话。

2) 耳机受话

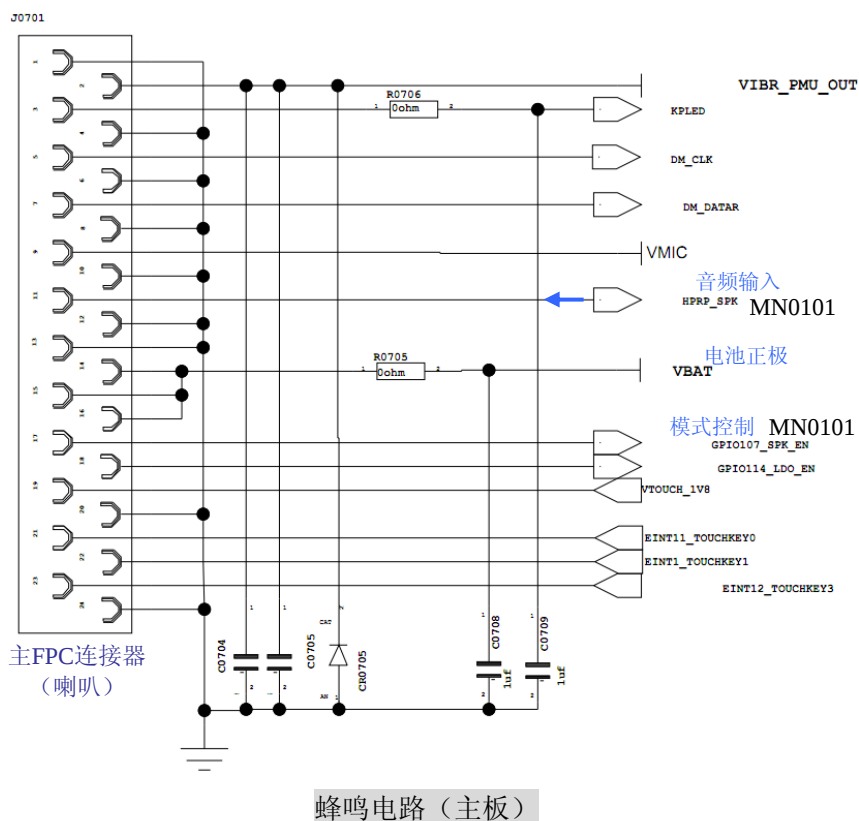
当耳机插入USB接口，从射频部分收到的信号通过GSM_UMTSTX_IP、GSM_UMTSTX_IN、GSM_UMTSTX_QN、GSM_UMTSTX_QP送入MN0101进行相应处理后，从AJ28脚、AJ29脚输出正负两组相位相反的语音电压信号，经过B1005、B1006、R1009、R1010、B1009、B1010、MN1002、J0601等滤波处理后，驱动受话器工作。

3) 耳机开关

当按下耳机上的按钮，USB接口的第4脚与第5脚短接，第4脚由高电平变为低电平，MN0101的AK28脚检测到此变化，经MN0101内部处理后，作相应的动作，如：接通电话、挂断电话等。

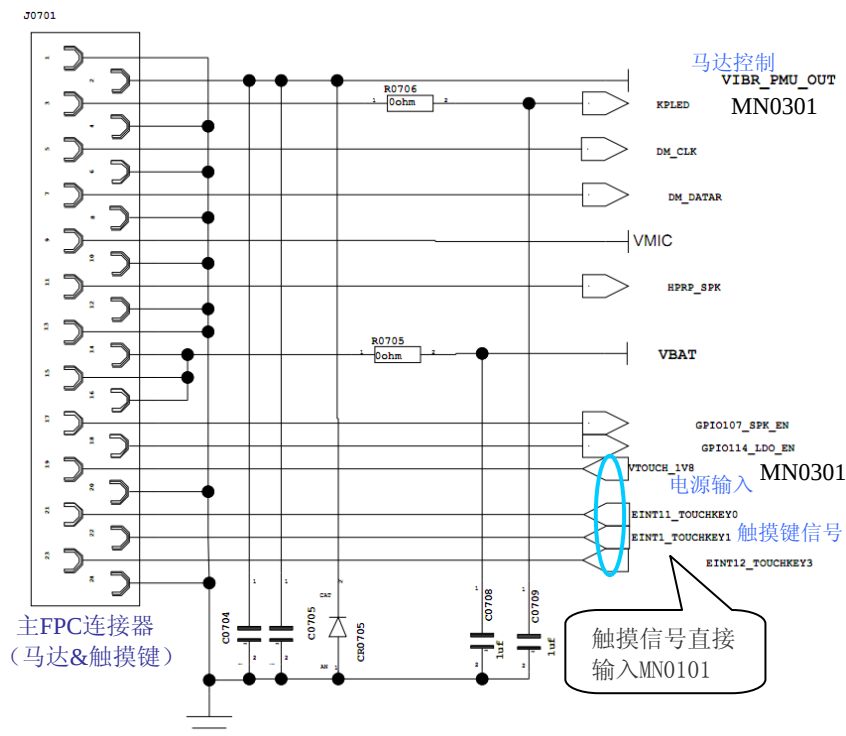
2.4.3 蜂鸣电路

扬声器的音频信号从MN0101的AJ29脚输出，经B1005送入J0701-11脚，经过主FPC组件音频放大（受MN0101的AK7脚控制）后，最终输出正负两组相位相反的音频电压信号，驱动蜂鸣器工作。



2.5 触摸键和马达电路

MN0301的B6脚为外部马达控制脚，经J0701-2控制马达的振动。CR0705为防止马达反感应电动势传递给MN0301，起到续流保护作用。

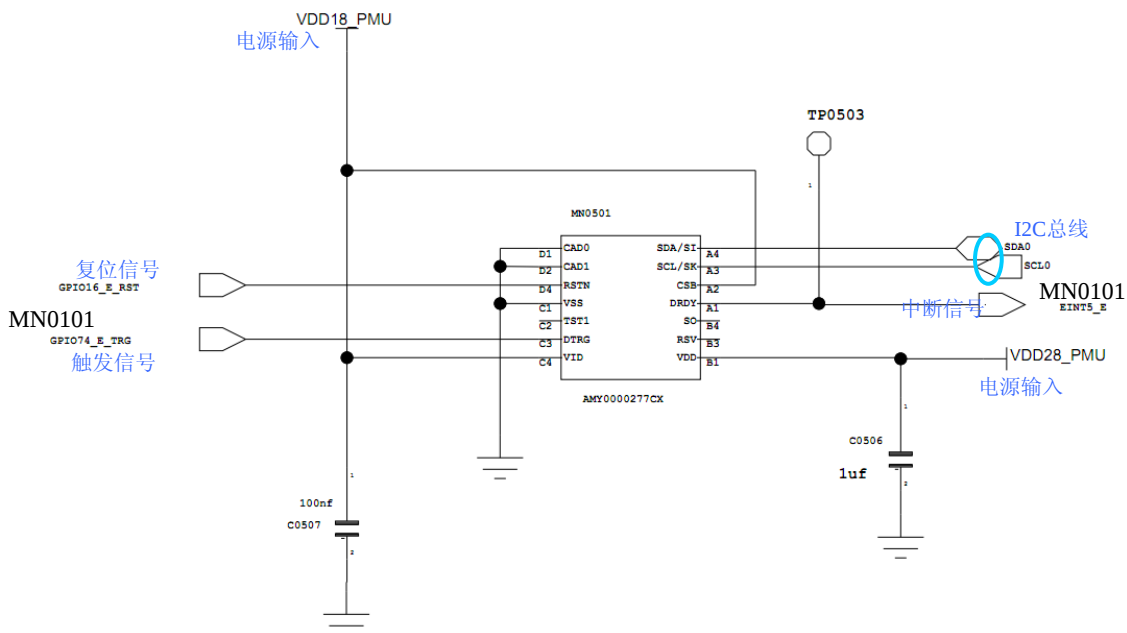


触摸键和马达电路（主板）

2.6 Sensor 电路

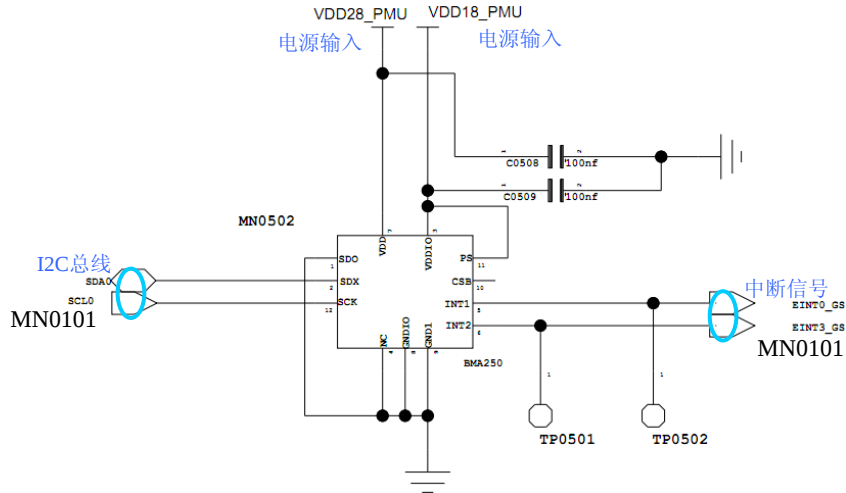
Sensor电路为三部分：指南针、重力感应、光感&距离感应。3个Sensor供电电压为VDD28_PMU和VDD18_PMU，光感&距离感应还有一组电池正极供电。

2.6.1 指南针电路



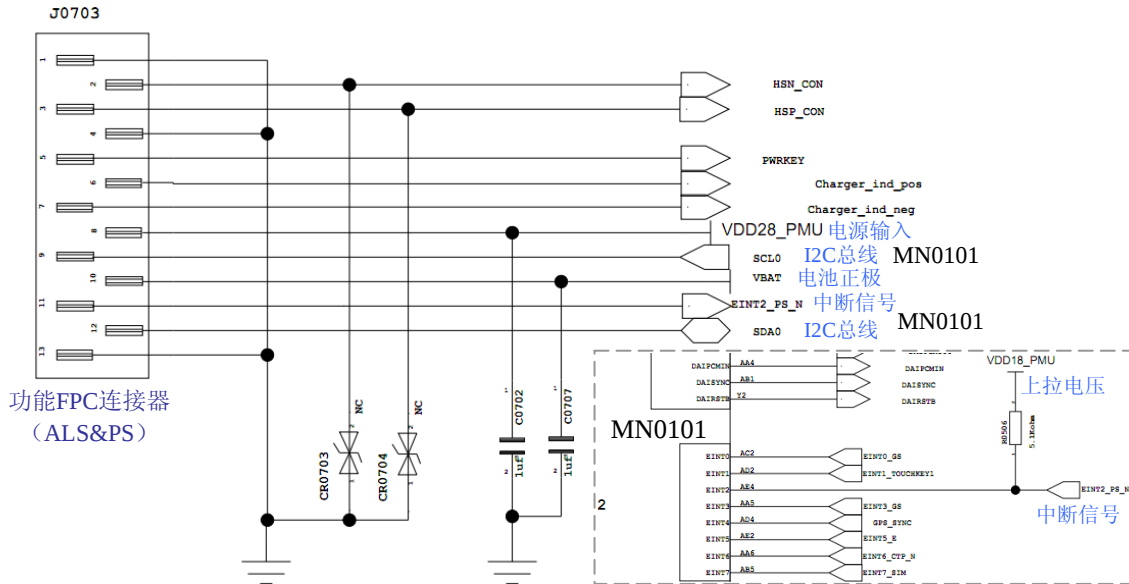
指南针电路（主板）

2.6.2 重力感应电路



传感电路（主板）

2.6.3 光感&距离感应电路



光感电路（主板）

2.7 BT、WIFI、GPS、FM 电路

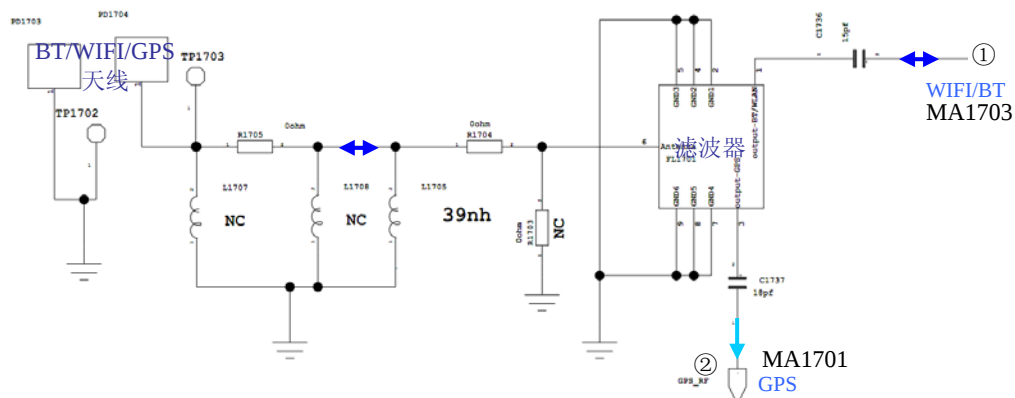
BT、WIFI、GPS、FM使用的是MT6628Q芯片（U1701），MT6620是BT、WIFI、GPS、FM四合一的模块。

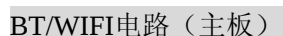
2.7.1 U1701 管脚定义

管脚	定义	描述	管脚	定义	描述
G5	DVDD	1.2V core power	B1	RF_ION_WBT	WiFi/BT RF port
E6	DVDD	1.2V core power	D1	LNA_IN_EXT	External LNA input
C9	DVDD	1.2V core power	A3	AVDD33_TX_WBT	WiFi/BT RF power
G6	DVSS	Ground	D2	AVDD16_TRX_WBT	WiFi/BT RF power
F7	DVSS	Ground	D4	AVDD16_SX_WBT	WiFi/BT RF power
C10	DVSS1	Ground	E1	AVDD16_LF_WBT	WiFi/BT RF power
C8	DVDDIO	I/O power	A2	AVSS33_PA	Ground
H4	DVDDIO_SDIO	SDIO I/O power	B2	AVSS33_PA	Ground
G3	PMU_EN	PMU enable	B3	AVSS16_WBT	Ground
H3	PMU_DSB	Disable PMU deep sleep mode	C2	AVSS16_WBT	Ground
L1	VREF	Refernce bandgap voltage	E2	AVSS16 LF WBT	Ground
L2	AVDD55_MISC	VBAT for internal circuit	C3	VCO_MON_WBT	WiFi/BT power

K1	AVSS55_MISC	MISC ground	A4	OSC_IN	XTAL input
G2	AVDD25_V2P5	Internal 2.5V power	A5	AVDD28_OSC	XTAL power
J3	AVDD25_V2P5NA	Internal 2.5V power	B5	AVSS28_OSC	Ground
L3	LXBK	Switching node of buck	G8	FSOURCE_WR	eFuse power pin
K3	AVDD55_SMPS	Battery voltage	B8	XTEST	Test mode enable
J4	AVSS55_SMPS	Switching regulator ground	L7	SYSREST_B	External system reset active low
J2	AVDD17_CLDO_IN	1.7V CLDO input	F3	ANTSEL2	ANTSEL_2:Antenna select no.2
H1	AVDD28_TLDO_SW	Power source for TCX0	F4	ANTSEL1	ANTSEL_1:Antenna select no.1
K2	CLDO	1.2V core power LDO output	F2	ANTSELO	ANTSEL_0:Antenna select no.0
J1	AVDD28_TLDO	2.8V TCX0 LDO output	F1	RF_I_CAL	EXT_INT_N:External interrupt input from Host
L4	WFLDO	3.3V WiFi LDO output	G4	OSC_EN	OSC_EN:OSC enable in clock daisy chain
H2	AUX_REF	ADC top reference voltage input	H7	SDIO_CLK	SDIO_CLK:SDIO interface
L5	AVDD28_PLL	2.8V PLL power	J7	SDIO_CMD	SD_CMD:SDIO interface
K5	AVSS28_PLL	2.8V PLL ground	J6	SDIO_DAT3	SDIO_DAT3:SDIO interface
F10	RTCCLK	RTC 32kHz clock input	H5	SDIO_DAT2	SDIO_DAT2:SDIO interface
E10	RTCCLK_0	RTC 32kHz clock output	J5	SDIO_DAT1	SDIO_DAT1:SDIO interface
G9	VCCRTC	RTC power	H6	SDIO_DAT0	SDIO_DAT0:SDIO interface
G7	AVSSRTC	RTC ground	F9	UART_RXD	UART_RXD:UART RX data
A6	AVDD16_RF_GPS	GPS RF power	E8	UART_TXD	UART_TXD:UART TX data
B6	AVSS16_HF_GPS	Ground	D9	UART_RTS	UART_RTS:UART flow control
C6	AVSS16_LF_GPS	Ground	E9	UART_CTS	UART_CTS:UART flow control
A7	RF_IN_GPS	GPS RF input	A10	PCM_CLK	PCM_CLK:PCM interface clock
C7	TEST_GPS	GPS RF test pin	D10	PCM_SYNC	PCM_SYNC:PCM interface sync
J10	SANT_P	Short antenna FM RF input	B10	PCM_OUT	PCM_OUT:PCM interface output data
H10	SALNA_IN_N_VSS	Short antenna FM RF input	A9	PCM_IN	PCM_IN:PCM interface input data
L10	LNA_IN_N_VSS	Long antenna FM RF input	B9	AGPS_SYNC	SYNC:AGPS SYNC
K8	AUROUT	FM anudio output	F8	I2S_CLK	I2S_CLK:FM I2S interface clock
L8	AULOUT	FM anudio output	E7	I2S_WS	I2S_WS:FM I2S word select
H9	AVDD28_FM	FM power	D7	I2S_DATA_OUT	I2S_DATA_OUT:FM I2S data output
J8	AVSS28_FM	Ground	H8	WIFI_INT_B	WIFI_INT_B:WLAN host interrupt
J9	AVSS28_FM	Ground	K7	BGF_INT_B	BGF_INT_B:BT, GPS&FM host interrupt
A1	RF_IOP_WBT	WiFi/BT RF port			

2.7.2 BT、WIFI、GPS 电路

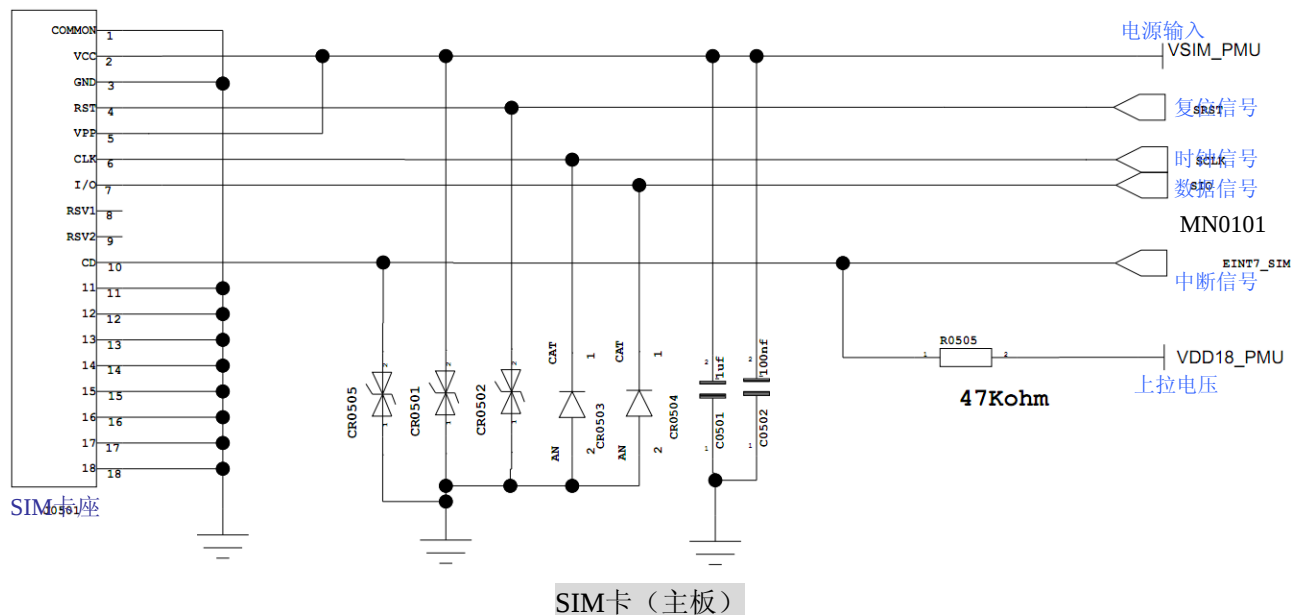






2.8 SIM 卡电路

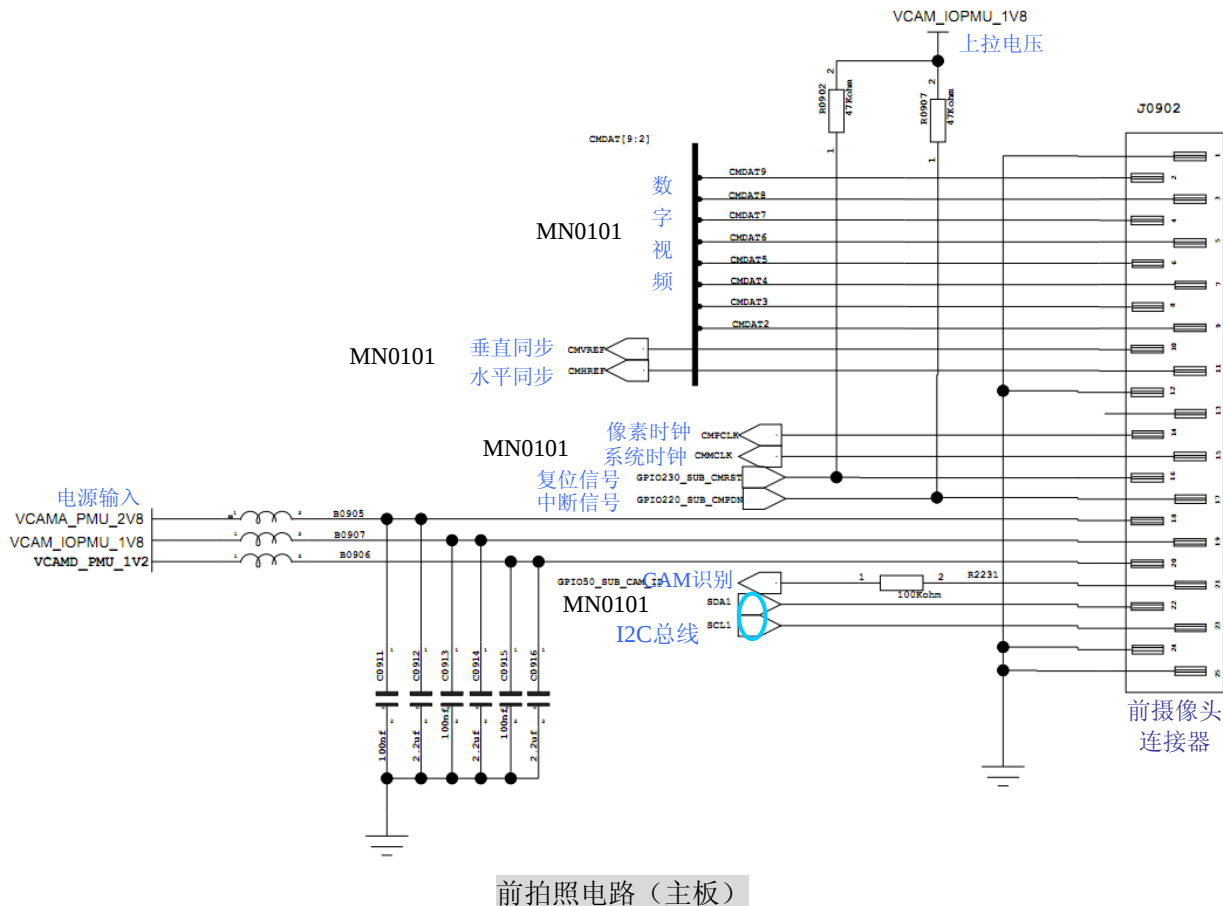
SIM卡是通过SIM卡座 (J0501) 与MN0101的SIM卡接口进行通信。

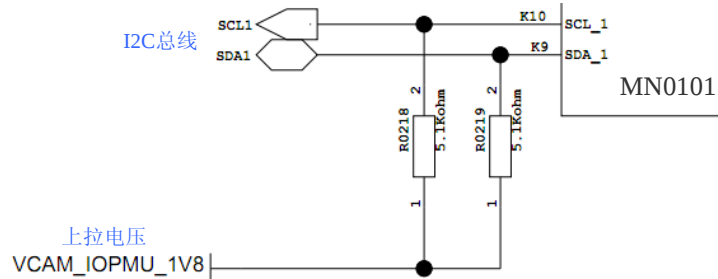


2.9 摄像电路

摄像电路分为1.3M、8M两个摄像头，供电分别有两组电压：VCAM_IOPMU_1V8、VCAMA_PMU_2V8和VCAMD_PMU_1V2，同时，8M还有两组VCAMD_PMU_1V2、VCAM_AFPMU_2V8供电电压。

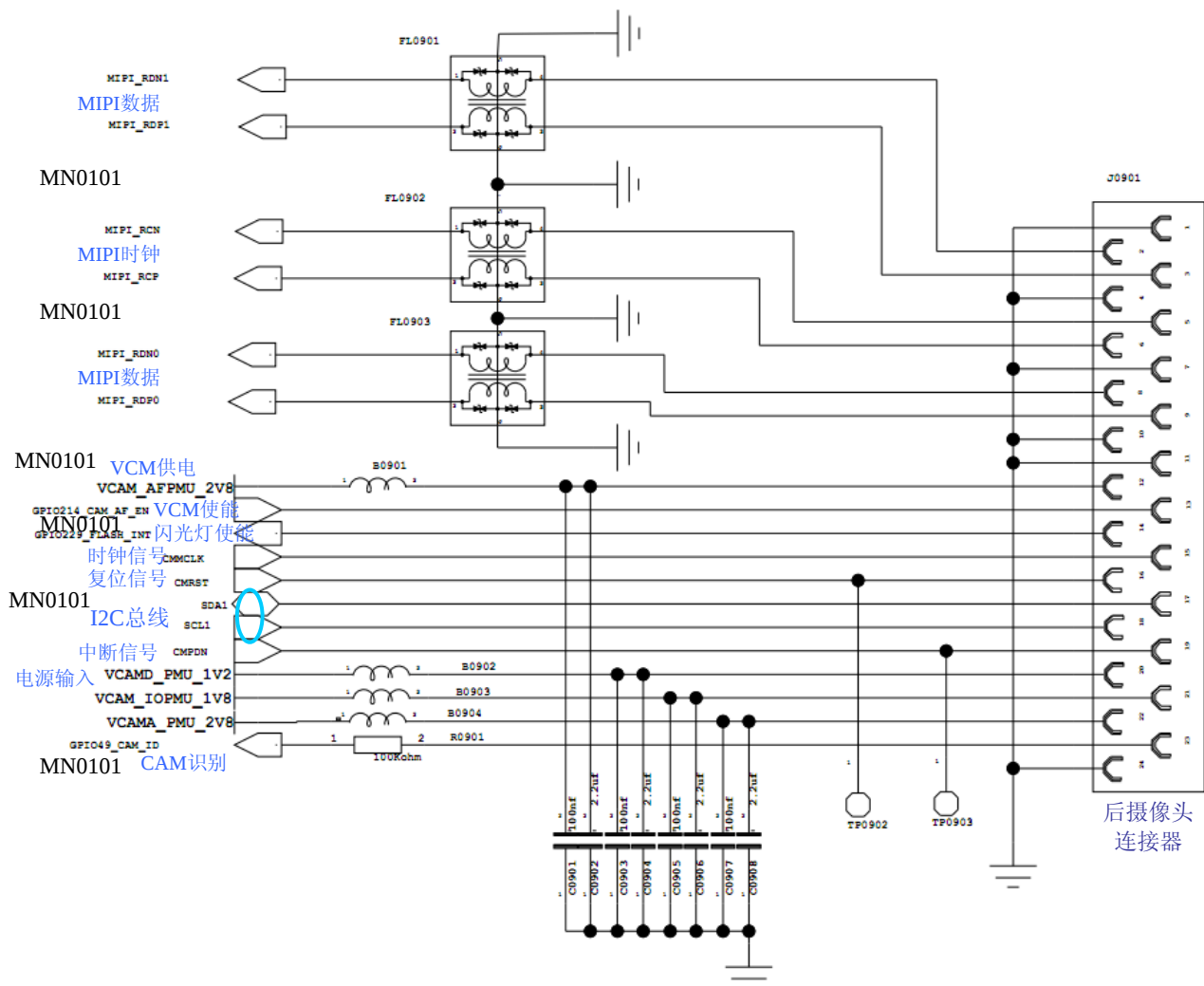
2.9.1 前摄像控制电路





拍照I2C电路 (主板)

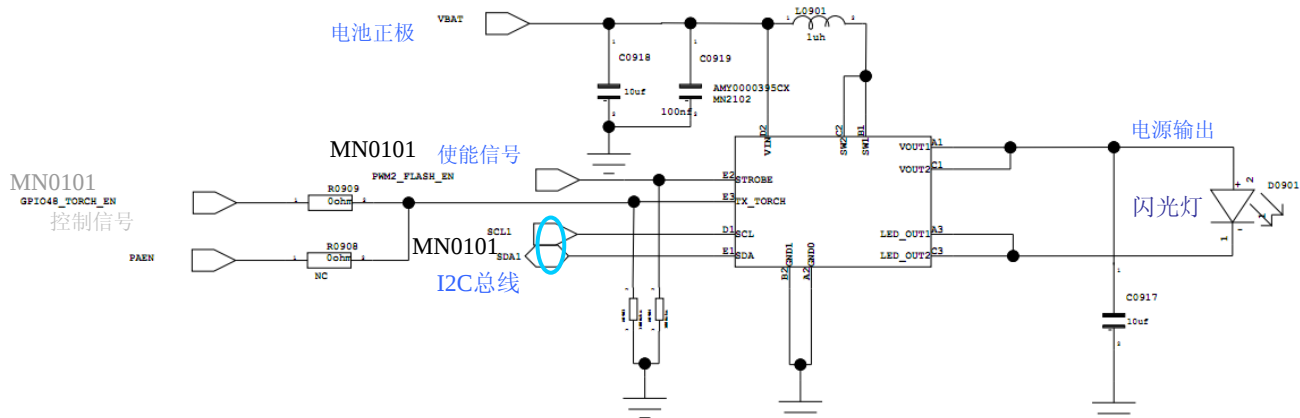
2.9.2 后摄像控制电路



后拍照电路 (主板)

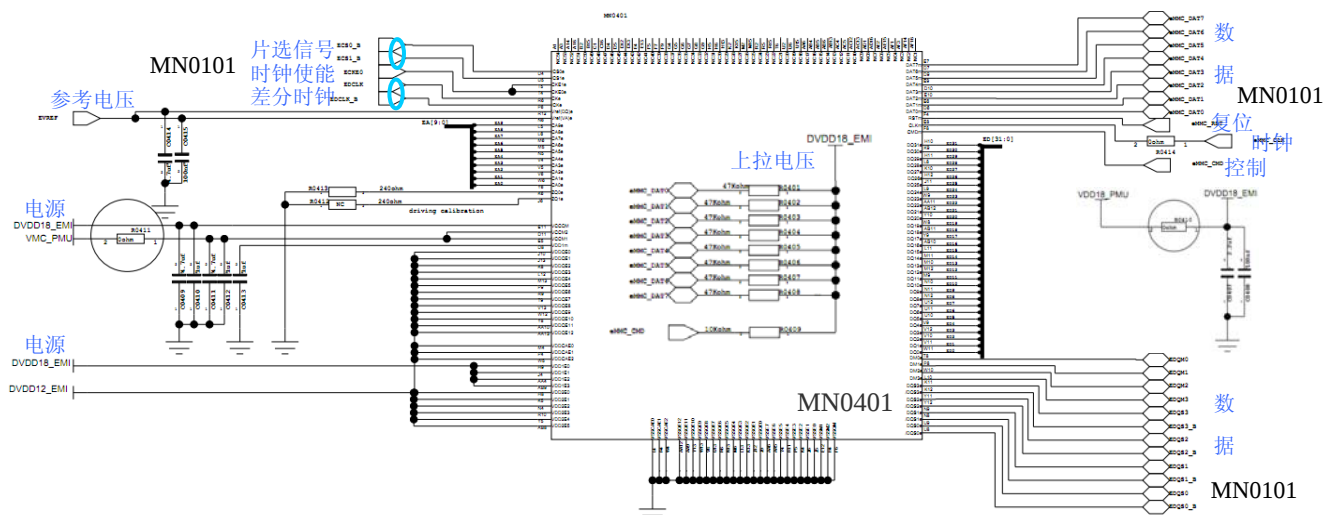
2.10 闪光灯电路

为了减少自然环境对摄像效果的影响，手机配备了内置的闪光灯，闪光灯驱动芯片使用的是AS3647芯片 (MN2102)



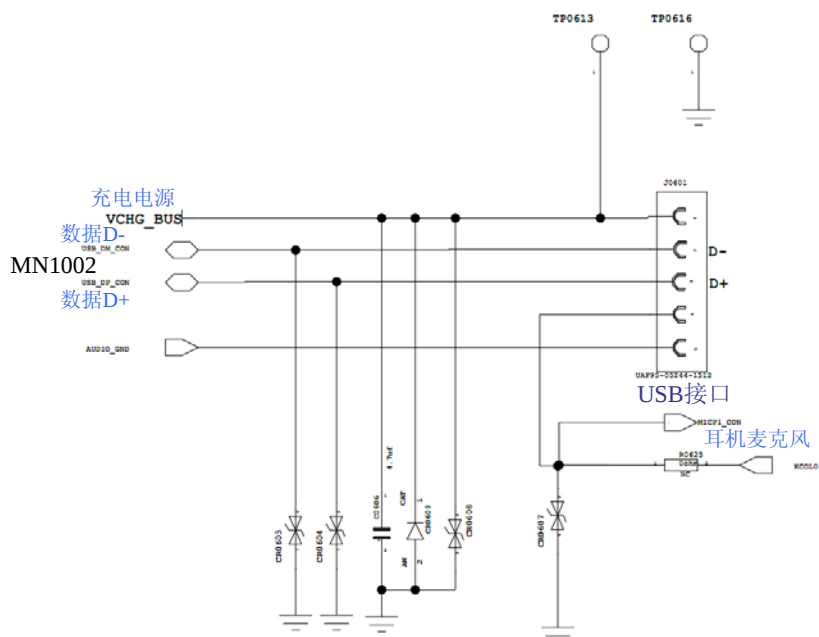
闪光灯电路 (主板)

2.11 Memory 电路

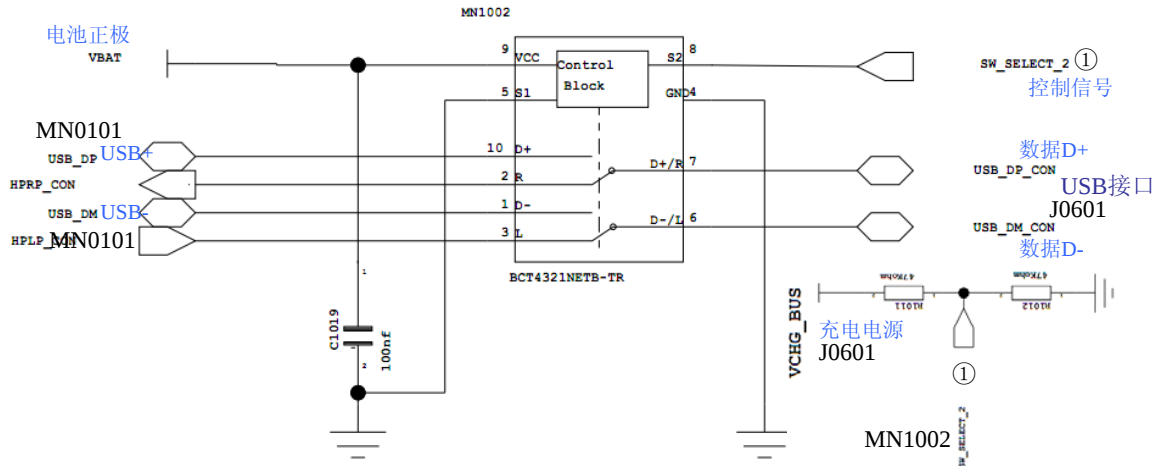


Memory电路 (主板)

2.12 USB 接口电路



USB接口 (主板)



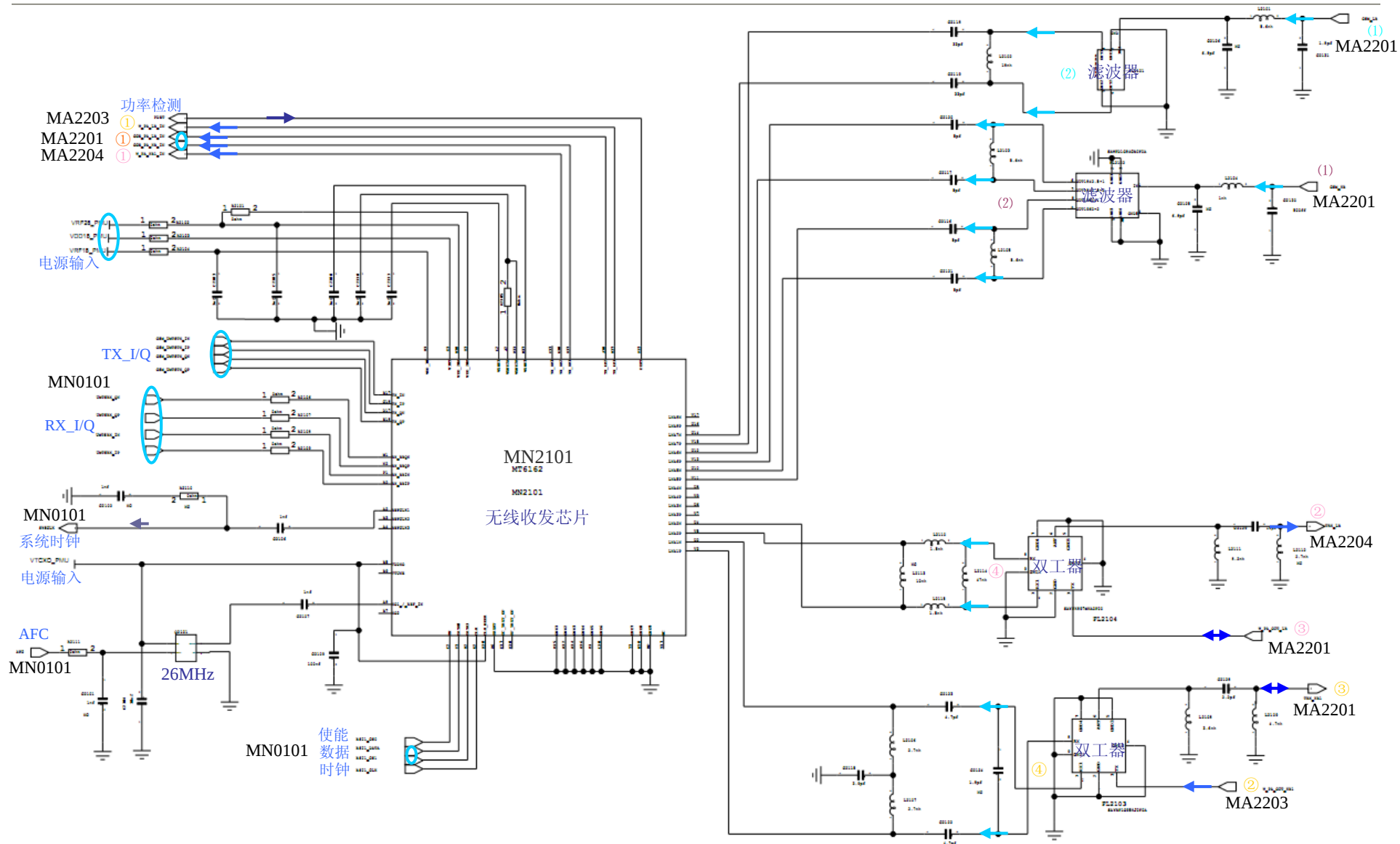
USB和音频转换 (主板)

3 射频电路

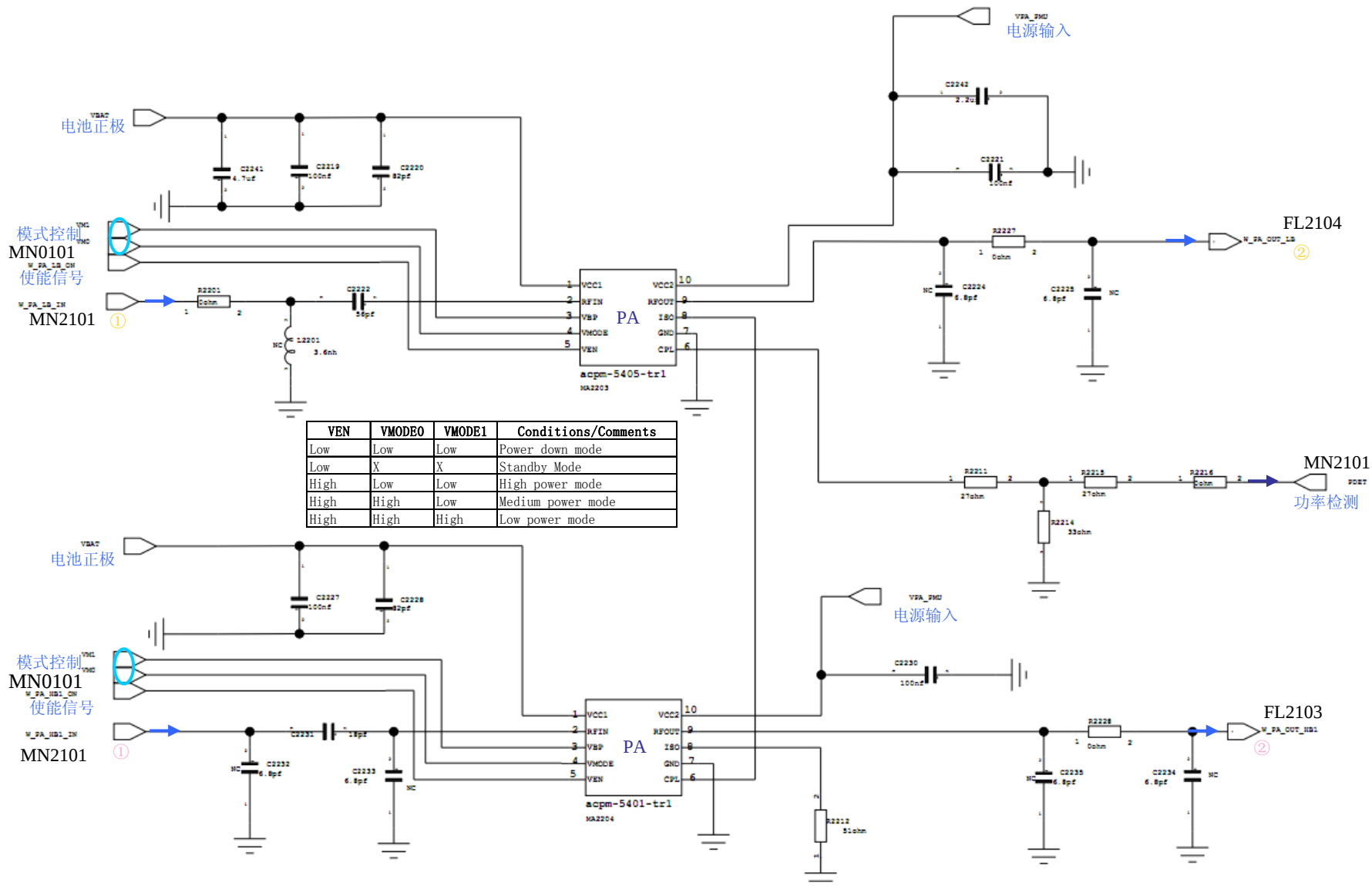
3.1 MN2101 管脚定义

管脚	定义	描述	管脚	定义	描述
A2	REFCLK1	Reference Clock Buffer #1 main for digital baseband	K1	VDD_18	Regulated supply for IC
A4	REFCLK3	Reference Clock Buffer #3	K17	TX_LB1	Tx Low band Driver #1
A6	NC	No connect	L2	VSUP1	Internal Supply (ext. cap)
A8	XO1/REFIN	Crystal Pin #1 or Ref Clock Input	L18	GND	Ground; connect to GND plane on PCB
A10	CLK_MOD	Select DCX0 or VCTCX0	M1	RX_BBQN	Rx Baseband Output - Q Channel
A12	GND	Ground; connect to GND plane on PCB	M17	VSUP3	Internal Supply (ext. cap)
A14	GND	Ground; connect to GND plane on PCB	N2	RX_BBQP	Rx Baseband Output - Q Channel
A16	GND	Ground; connect to GND plane on PCB	N18	VDD_28a	Regulated supply for IC
B1	GND	Ground; connect to GND plane on PCB	P1	RX_BBIN	Rx Baseband Output - I Channel
B3	REFCLK2	Reference Clock Buffer #2	P17	NC	No connect
B5	VDDX0	Regulated supply for VCX0/DCX0	R2	RX_BBIP	Rx Baseband Output - I Channel
B7	XO2	Crystal Pin #2	R18	NC	No connect
B9	VTUNE	AFCDAC Output	T1	GND	Ground; connect to GND plane on PCB
B11	VSUP2b	Internal Supply (ext. cap)	T17	NC	No Connect
B13	PDET	Power Detector Input	U2	LNA1N	Rx Path #1 Input
B15	GND	Ground; connect to GND plane on PCB	U4	LNA2N	Rx Path #2 Input
B17	TX_IN	Tx Baseband Input - I Channel	U6	LNA3N	Rx Path #3 Input
C2	EN	Serial Interface Enable (BSI)	U8	LNA4N	Rx Path #4 Input
C18	TX_IP	Tx Baseband Input - I Channel	U10	LNA5N	Rx Path #5 Input
D1	VINT	Serial interface control logic	U12	LNA6N	Rx Path #6 Input
D17	TX_QN	Tx Baseband Input - Q Channel	U14	LNA7N	Rx Path #7 Input
E2	DATA1	Serial Data I/O (BSI)	U16	LNA8P	Rx Path #8 Input
E18	TX_QP	Tx Baseband Input - Q Channel	U18	GND	Ground; connect to GND plane on PCB
F11	DATA0	Serial Data I/O (BSI)	V3	LNA1P	Rx Path #1 Input
F17	TX_HB3	Tx High band Driver #3	V5	LNA2P	Rx Path #2 Input
G2	CLK	Serial Interface Clock (BSI)	V7	LNA3P	Rx Path #3 Input
G18	TX_HB2	Tx High band Driver #2	V9	LNA4P	Rx Path #4 Input
H1	VDD_28b	Regulated supply for IC	V11	LNA5P	Rx Path #5 Input
H17	TX_HB1	Tx High band Driver #1 (2G only)	V13	LNA6P	Rx Path #6 Input
J2	VSUP2a	Internal Supply (ext. cap)	V15	LNA7P	Rx Path #7 Input
J18	TX_LB2	Tx Low band Driver #2 (2G only)	V17	LNA8N	Rx Path #8 Input

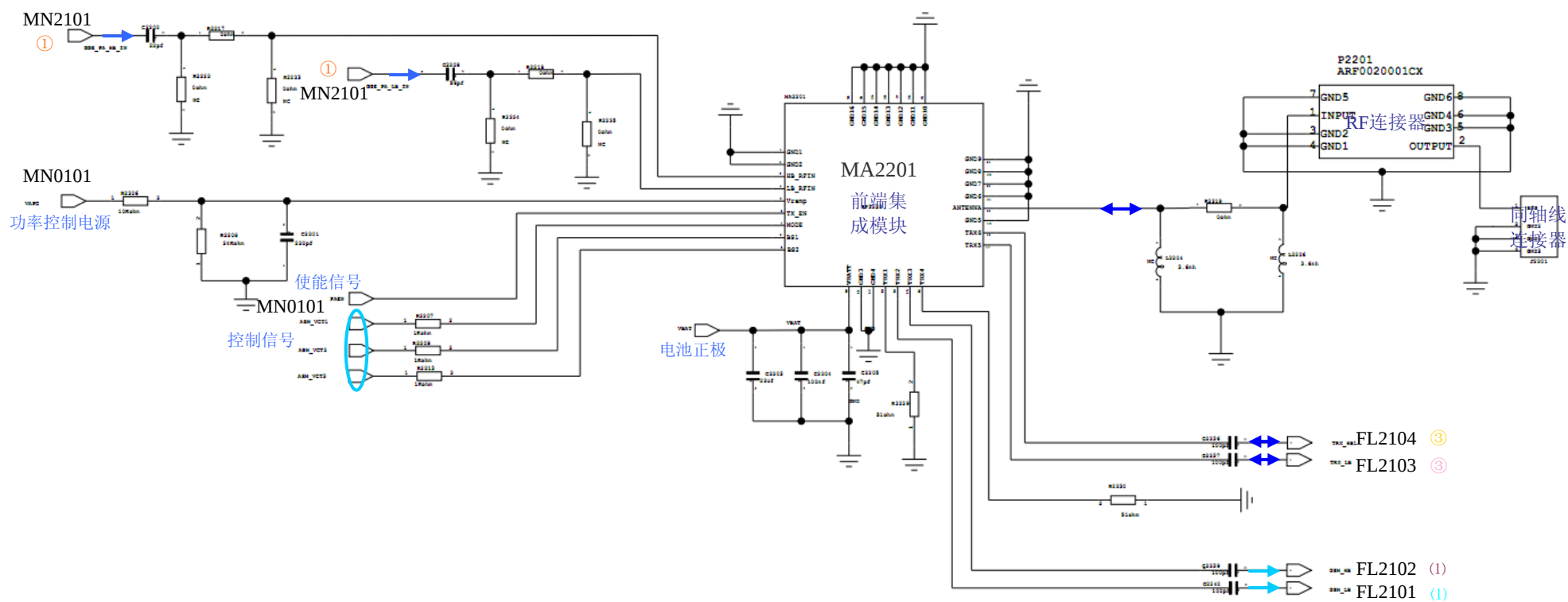
3.2 射频电路



无线收发电路 (主板)

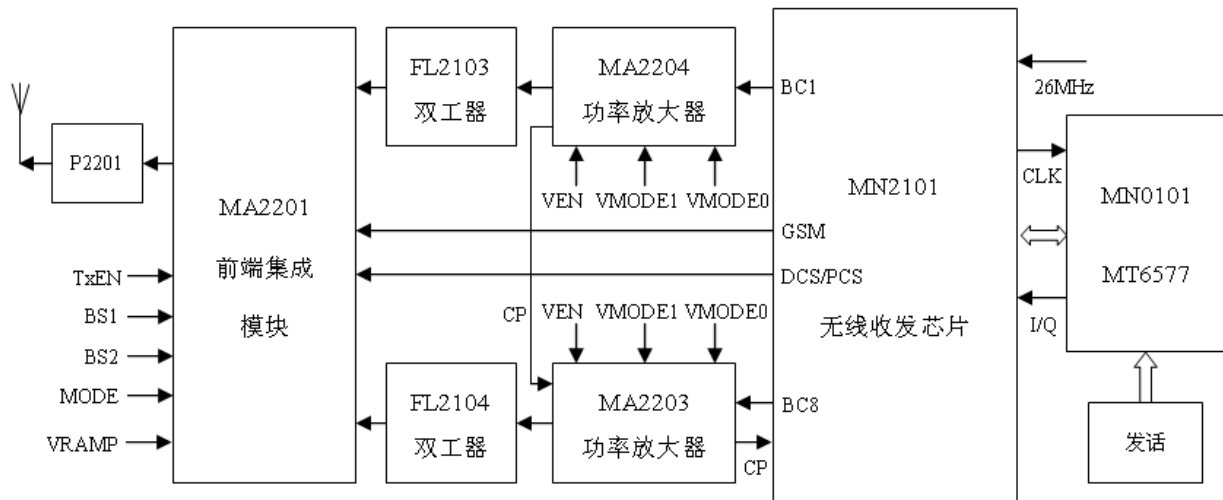


TX电路 (主板)



TRX电路 (主板)

3.2.1 发射电路



语音信号由MN0101进行编码、交织、加密等处理后，再通过GSM_UMTSTX_IP（AH24脚）、GSM_UMTSTX_IN（AG24脚）、GSM_UMTSTX_QP（AF23脚）、GSM_UMTSTX_QN（AG23脚）送入MN2101的C18、B17、E18、D17脚，进行放大、混频、调制等处理后，分四路输出（MN2101-J18、H17、G18、K17脚）：

一路(GSM)：直接输入MA2201的4脚（前端集成模块，由MN0101控制）进行功率放大、滤波等处理。

二路(DCS/PCS)：直接输入MA2201的3脚（前端集成模块，由MN0101控制）进行功率放大、滤波等处理。

三路(BC8)：经过MA2203（功率放大，由MN0101控制）、FL2104（双工器），再输入MA2201的17脚（前端集成模块，由MN0101控制）进行功率放大、滤波等处理。

四路(BC1)：经过MA2204（功率放大，由MN0101控制）、FL2105（双工器），再输入MA2201的18脚（前端集成模块，由MN0101控制）进行功率放大、滤波等处理。

MA2203/MA2204工作模式

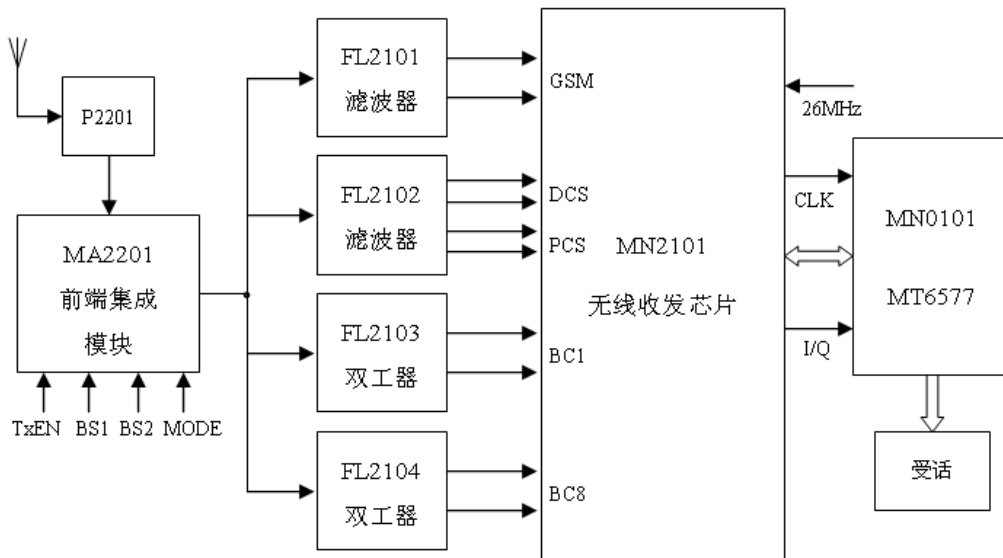
POWER MODE	VEN	VMODE0	VMODE1
Power Down	L	L	L
Standby	L	X	X
High Power	H	L	L
Medium Power	H	H	L
Low Power	H	H	H

处理后的信号，MA2201在MN0101控制下选择相应的频率通道从第20脚输出，经同轴线、P2201（射频连接器）、匹配电路、同轴线和天线发射出去。

MA2201工作模式

Mode	TXEN	MODE	BS1	BS2
Off	0	0	0	0
WTRx1	0	1	0	1
WTRx2	0	0	1	0
WTRx3	0	0	0	1
WTRx4	0	0	1	1
WTRx5	0	1	1	0
WTRx6	0	1	0	0
Low Band GMSK	1	0	1	0
High Band GMSK	1	0	0	1

3.2.2 接收电路



从天线接收到信号，经过同轴线、射频连接器（P2201）、匹配电路、同轴线，从MA2201的20脚输入，MA2201在MN0101控制下选择相应的频率通道分四路输出（MA2201-14、15、17、18脚）：

一路 (GSM)：经FL2101滤波处理后，把单端非均衡信号变为双端均衡信号，从U14、V15脚输入MN2101。

二路 (DCS、PCS)：经FL2102滤波处理后，分两个频段（DCS、PCS）输出，并把单端非均衡信号变为双端均衡信号，从U12、V13脚和U10、V11脚输入MN2101。

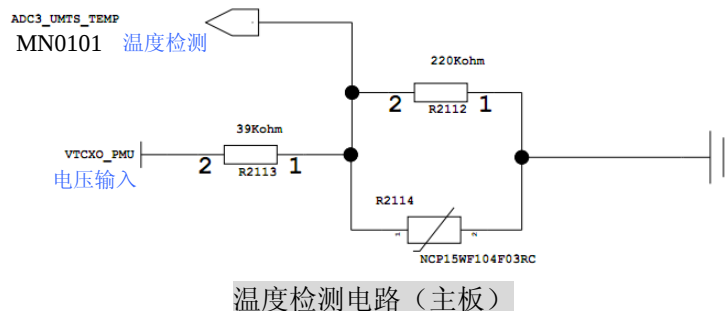
三路 (BC8)：经FL2104滤波处理后，把单端非均衡信号变为双端均衡信号，从U6、V7输入MN2101。

四路 (BC1)：经FL2105滤波处理后，把单端非均衡信号变为双端均衡信号输入，从U4、V5脚MN2101。

信号经MN2101放大、解调等处理后，通过UMTSRX_IP（R2脚）、UMTSRX_IN（P1脚）、UMTSRX_QP（N2脚）、UMTSRX_QN（M1脚）送入MN0101的AH21、AG21、AF21、AF20脚，进行解密、去交织、解码等处理，再经受话器将电信号转化为语音信号，驱动受话器发话。

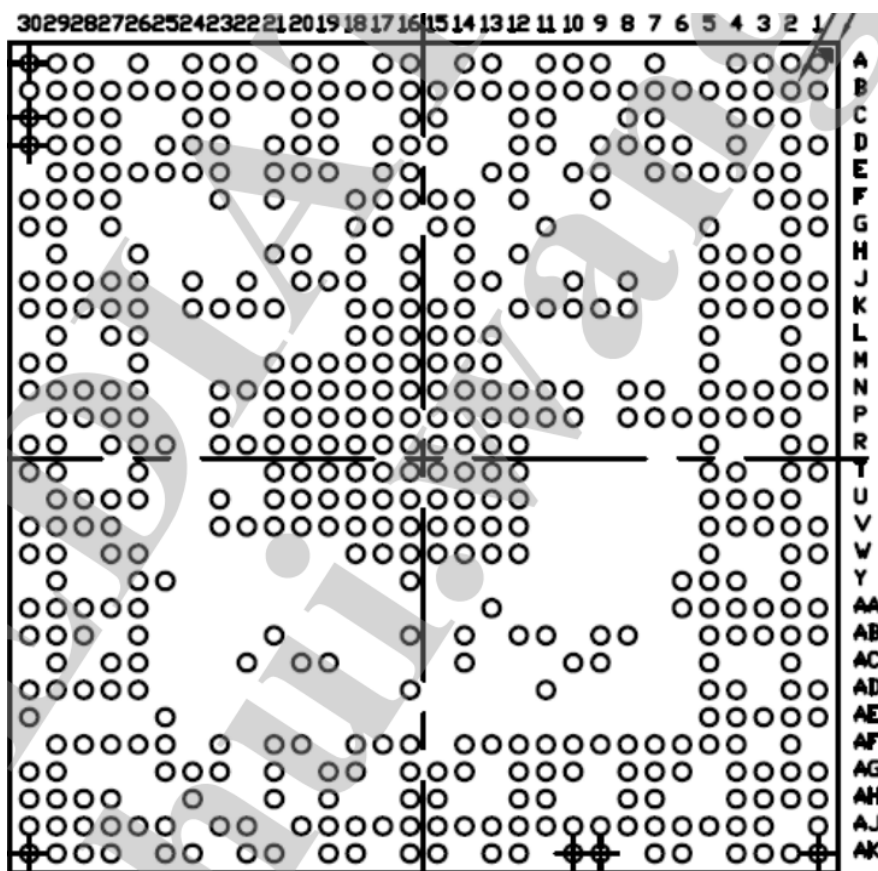
3.3 温度检测

温度检测电路由R2112、R2113和热敏电阻R2114组成。温度的变化会使R2114的阻值发生变化，从而使ADC3_UMTS_TEMP的电压发生变化，这个变化的电压输入MN0101的AJ18，MN0101根据ADC3_UMTS_TEMP的变化运行相应的程序。



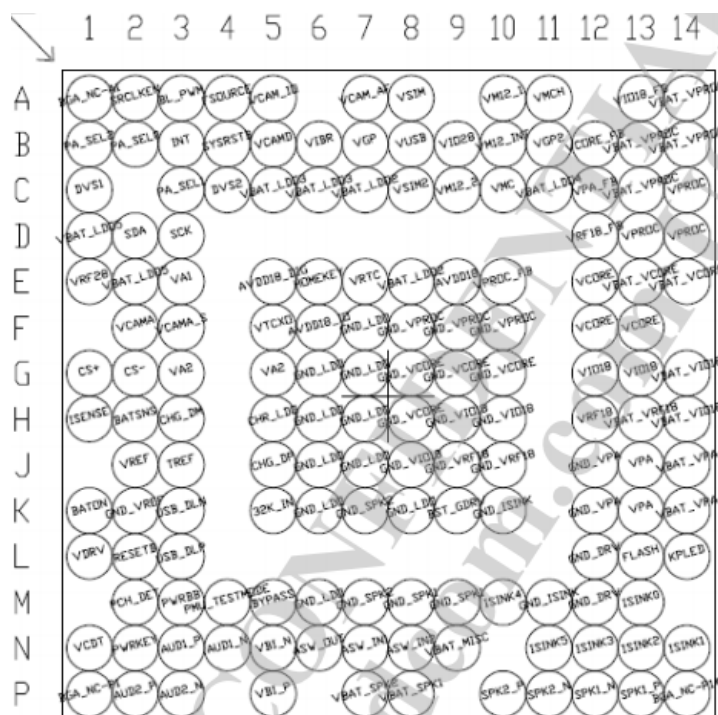
4 主要芯片管脚构造

4.1 MN0101 管脚构造



MN0101管脚构造 (BOTTOM)

4.2 MN0301 管脚构造



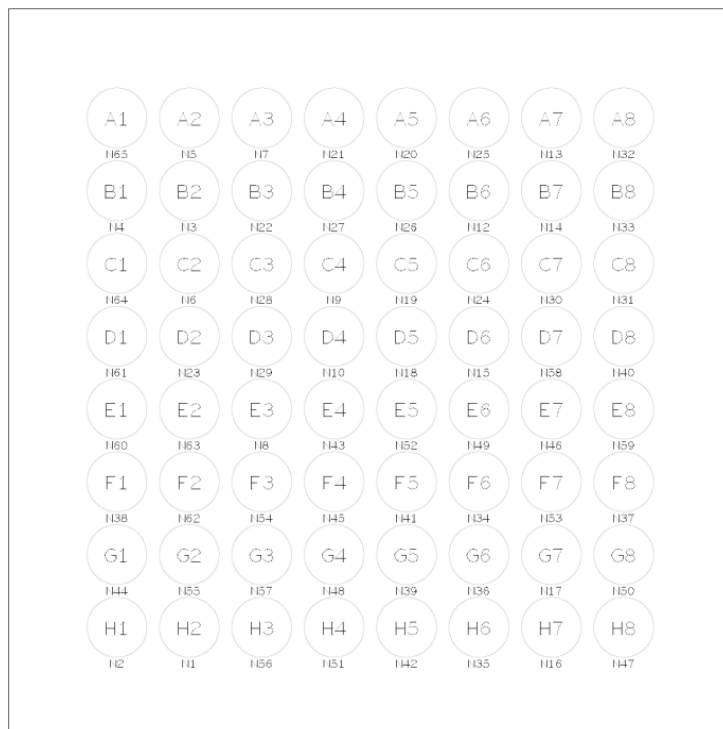
MN0301管脚构造 (TOP)

4.3 MN0401 管脚构造

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A	DNU		DNU											DNU		DNU
B		DNU												DNU		
C	DNU															DNU
D				DNU	DNU	DAT0n	DAT6n	VDDn	DAT5n	DAT3n	VDDn		DNU	DNU		
E				DNU	VDDn	DAT1M	DAT7n	CLKn	DAT4n	DAT2n	VDDn	VSSn		DNU		
F				RETn	NC	VSSQn	NC	DMDn	NC							
G				NC	NC	NC	NC	NC	NC							
H				VSSn	NC	NC		VDDn	VDDn	DQ1n	DQ3n	DQ5n	DQ7n	DNU		
J				VDDn	VSSn	DQ1n		VSSn	VSSn	VDDn	DQ3n	DQ5n	VSSn	VDDn		
K		DNU		VSSn	VDDn	DQ1n		VDDn	DQ3n	DQ5n	DQ7n	DQ9n	VSSn		DNU	
L				VSSn	DQ1n	DQ3n		DQ5n	DQ7n	DQ9n	DQ11n	VDDn	VSSn			
M		DNU		VDDn	DQ1n	DQ3n		VSSn	DQ11n	DQ13n	DQ15n	DQ17n	VDDn		DNU	
N				VDDn	DQ1n	VDDn		DQ3n	DQ5n	DQ7n	DQ9n	DQ11n	VSSn			
P				VDDn	VSSn	DQ1n		DQ3n	VDDn							
R		DNU		VSSn	NC	DQ1n		VSSn	VDDn	VDDn	VSSn	VDDn	VSSn		DNU	
T				DQ3n	DQ5n	NC		DQ7n	VDDn							
U		DNU		DQ3n	DQ5n	NC		DQ7n	DQ9n	DQ11n	DQ13n	DQ15n	VSSn		DNU	
V				DQ3n	DQ5n	DQ7n		VSSn	DQ9n	DQ11n	DQ13n	DQ15n	VDDn			
W				VSSn	VDDn	DQ1n		DQ3n	DQ5n	DQ7n	DQ9n	VDDn	VSSn			
Y				VSSn	VDDn	DQ1n		VDDn	DQ3n	DQ5n	DQ7n	DQ9n	VSSn			
AA				VDDn	VSSn	NC		VSSn	VSSn	VDDn	DQ3n	VSSn	VDDn			
AB				DNU	NC	NC		VDDn	VDDn	DQ3n	DQ5n	DQ7n	DNU			
AC				DNU	DNU								DNU	DNU		
AD	DNU															DNU
AE		DNU													DNU	
AF	DNU		DNU											DNU		DNU

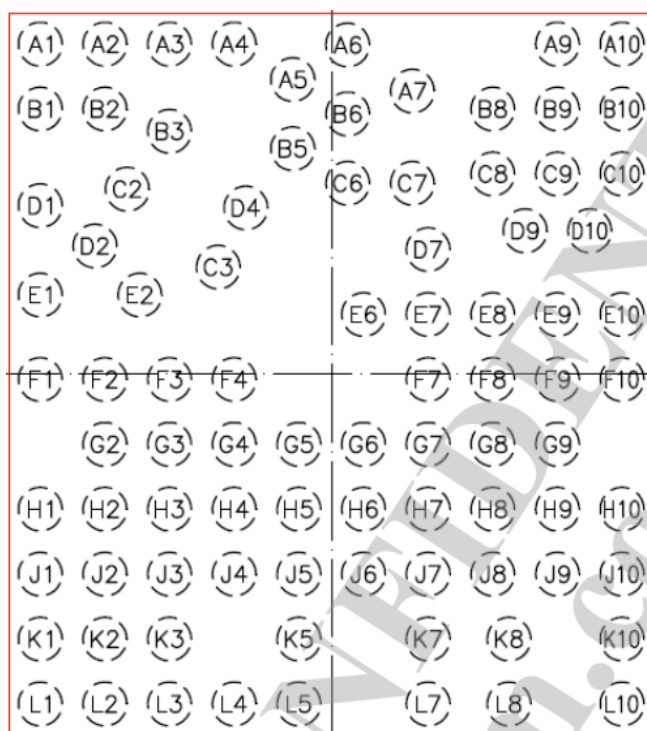
MN0401管脚构造 (TOP)

4.4 MN0801 管脚构造



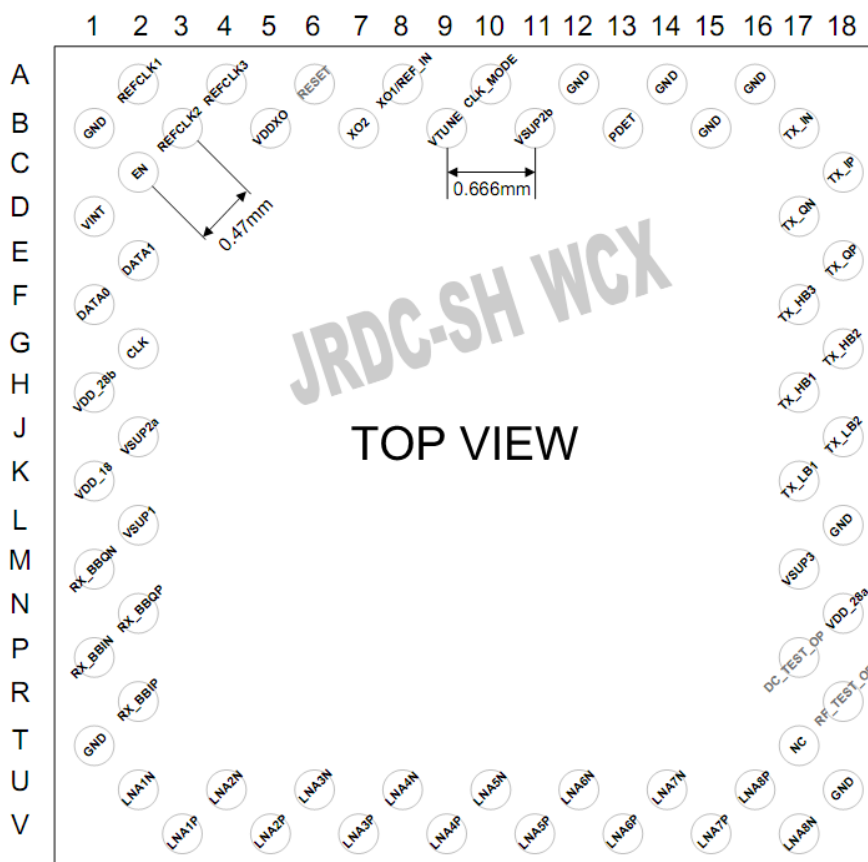
MN0801管脚构造 (TOP)

4.5 U1701 管脚构造



U1701管脚构造 (TOP)

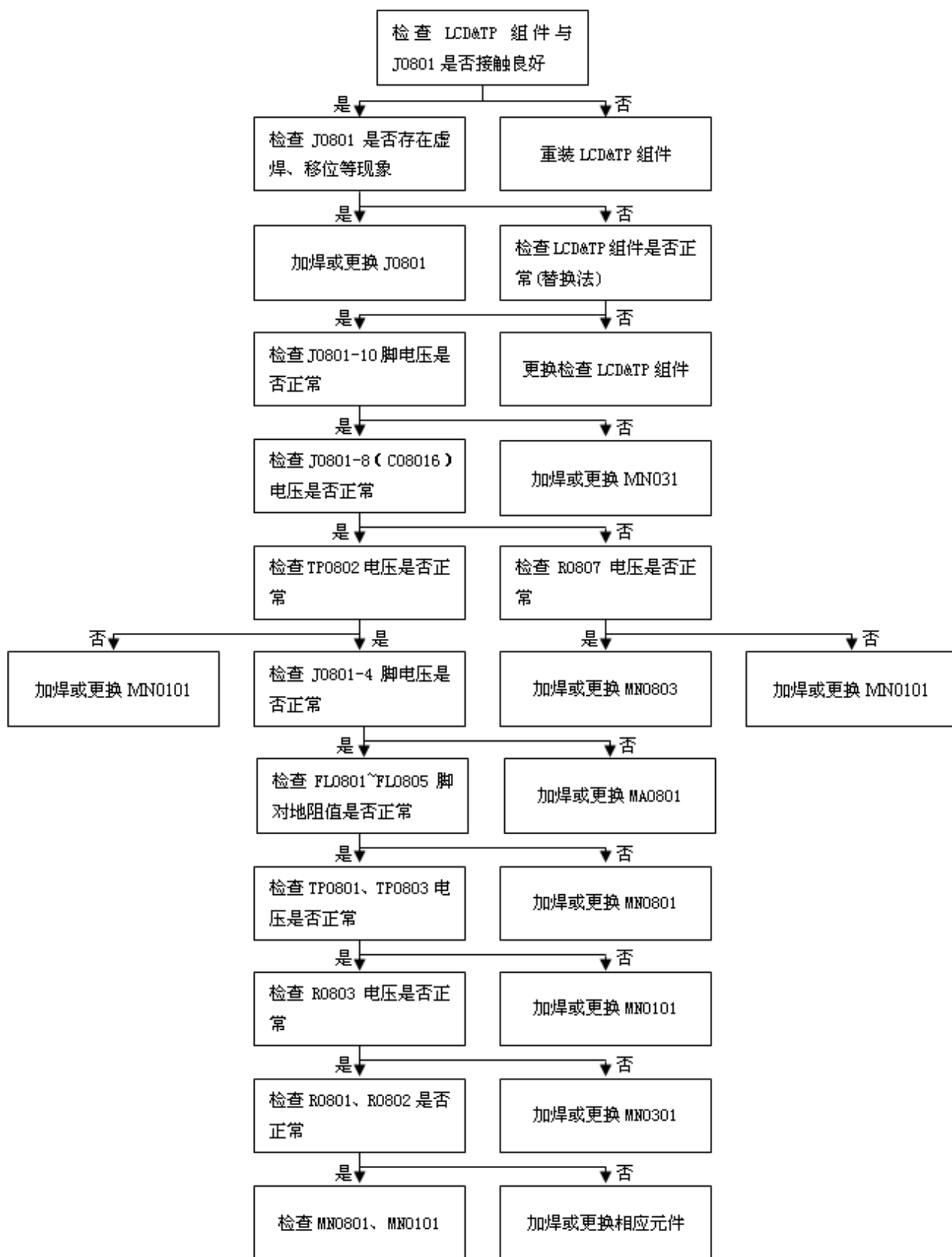
4.6 MN2101 管脚构造



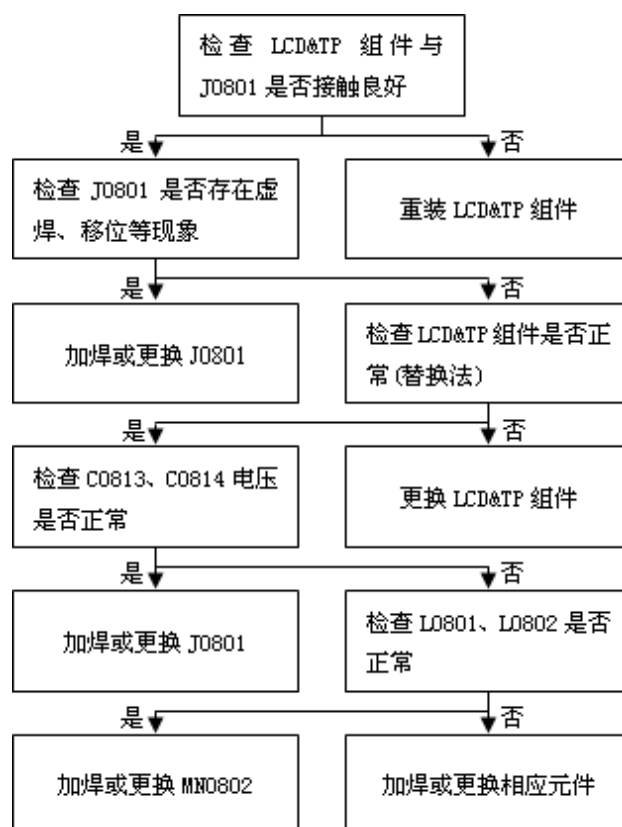
MN1501管脚构造 (TOP)

5 常见故障维修思路

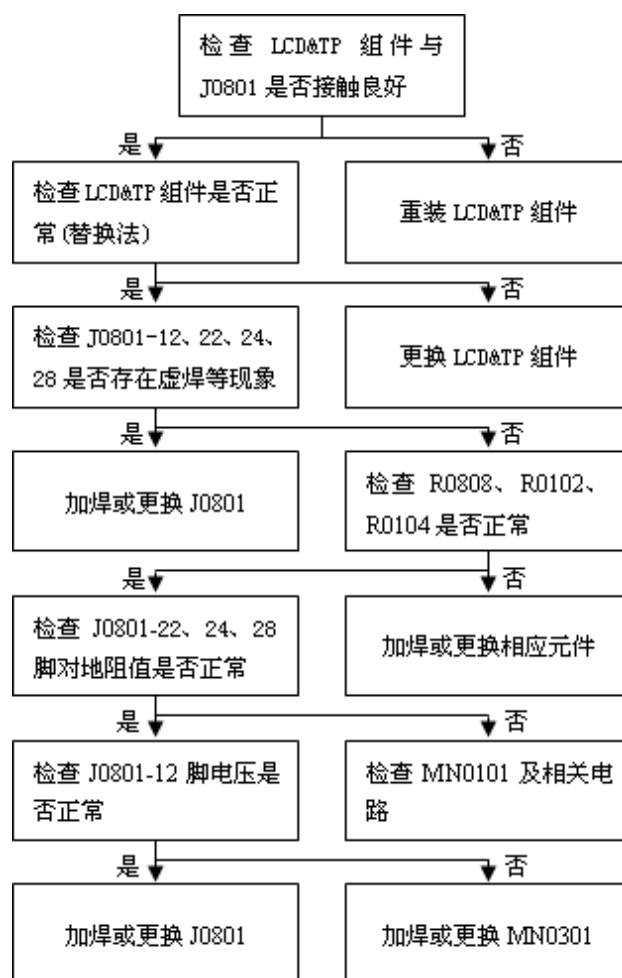
5.1 无显示



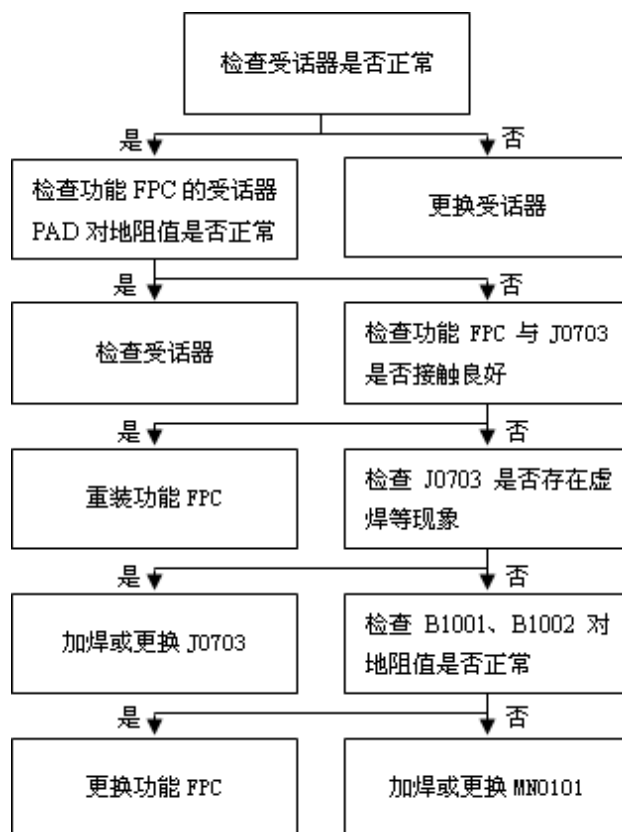
5.2 无背光



5.3 触摸屏无效

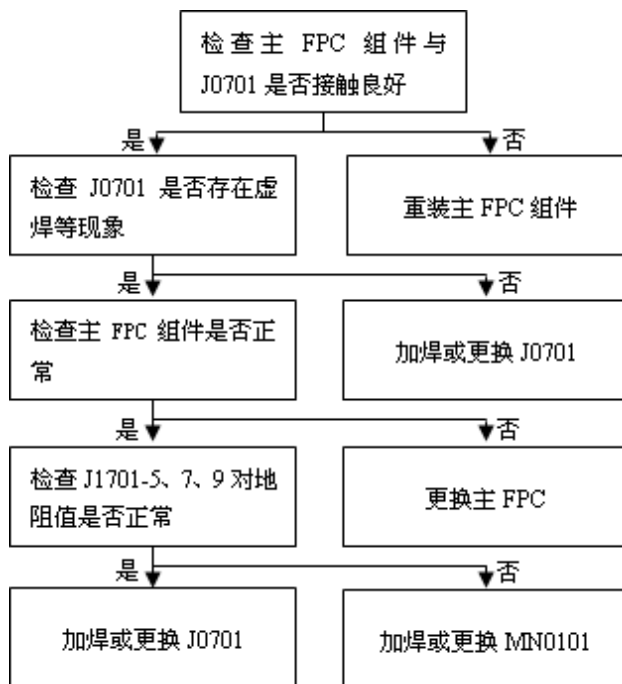


5.4 无受话

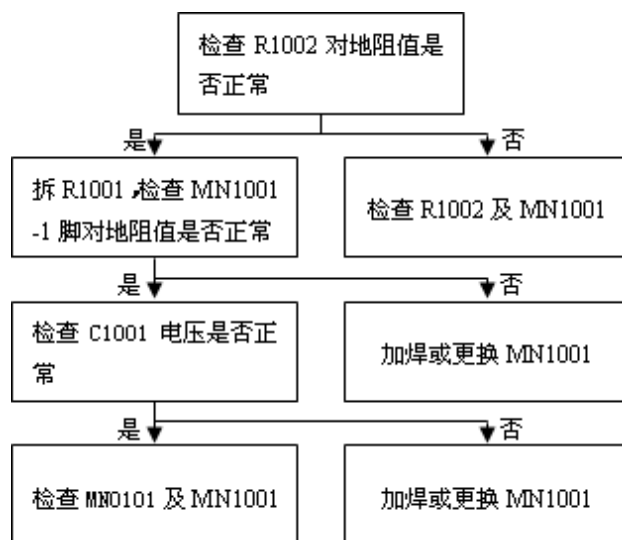


5.5 无发话

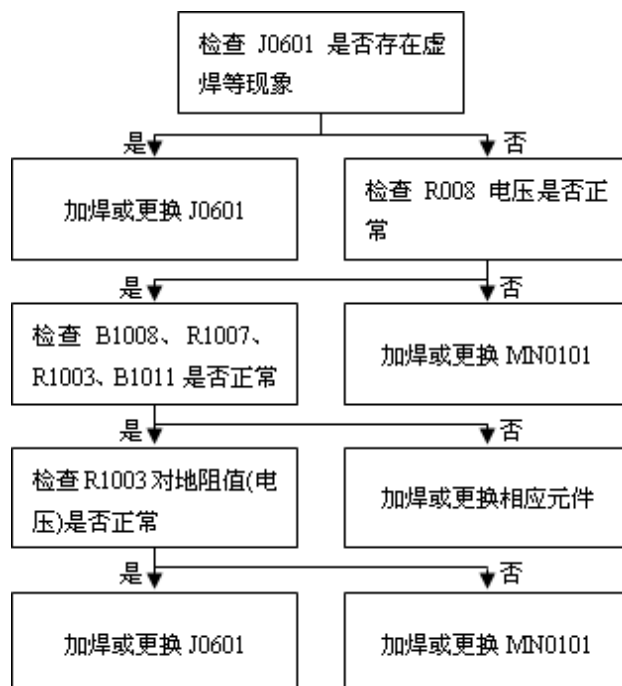
5.5.1 主咪头无发话



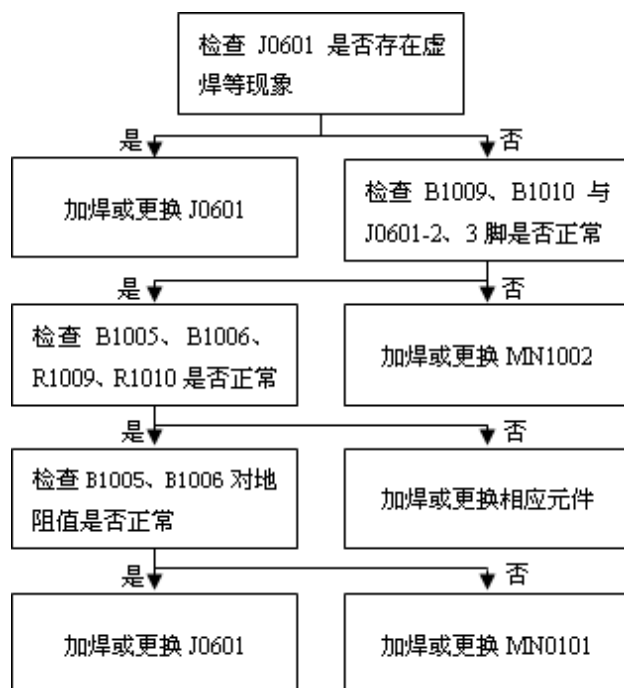
5.5.2 副咪头无发话



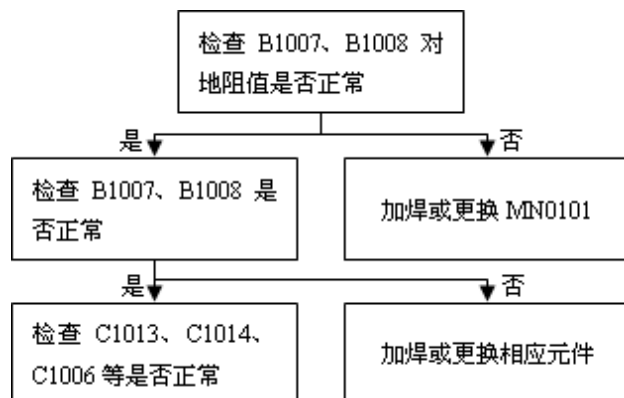
5.6 无耳机功能



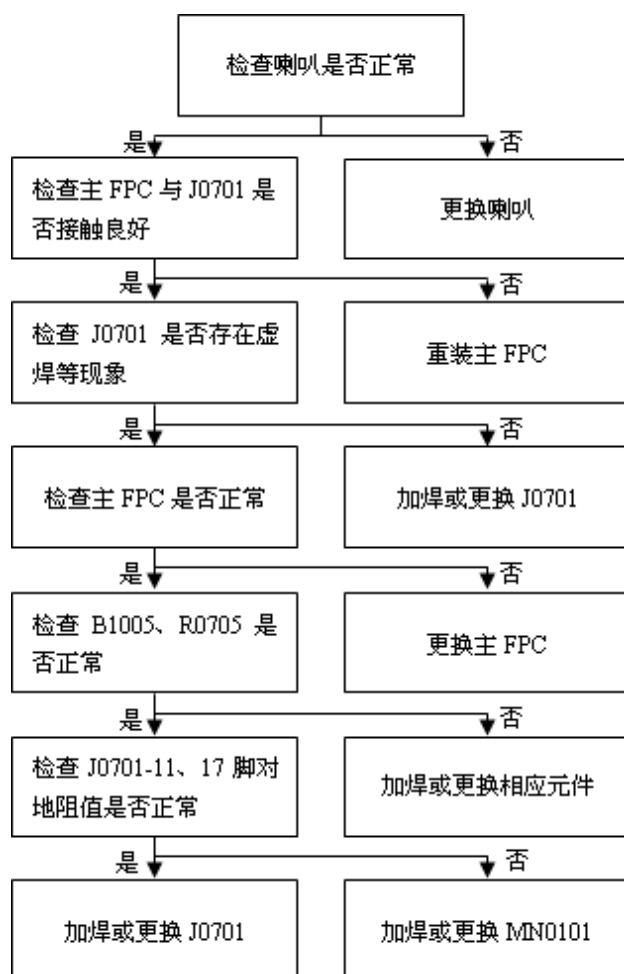
5.7 耳机无受话



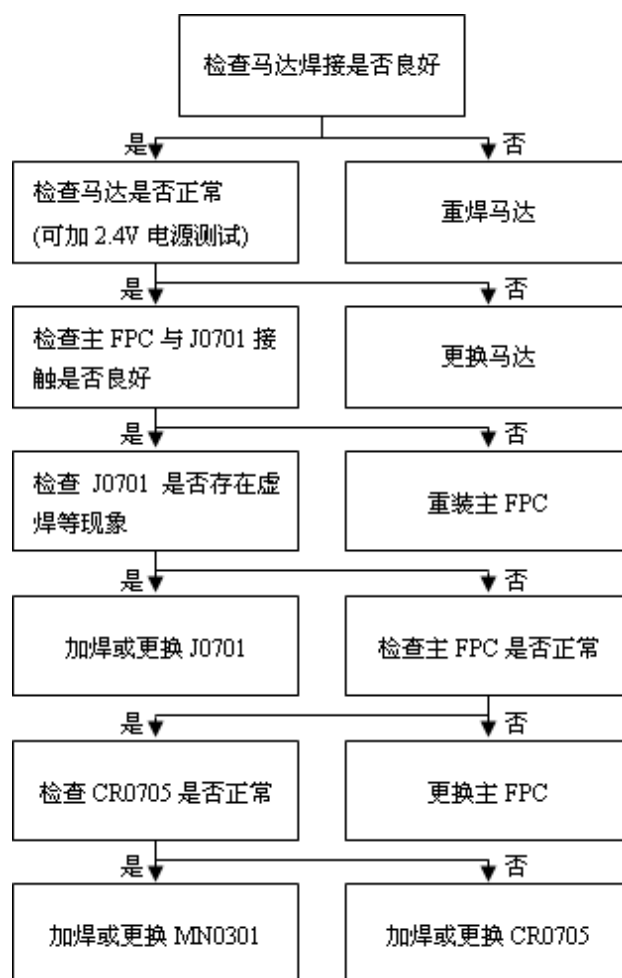
5.8 耳机无发话



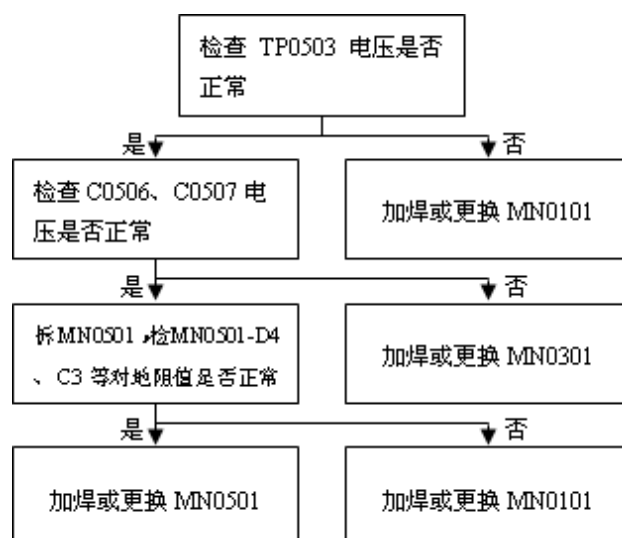
5.9 无铃声



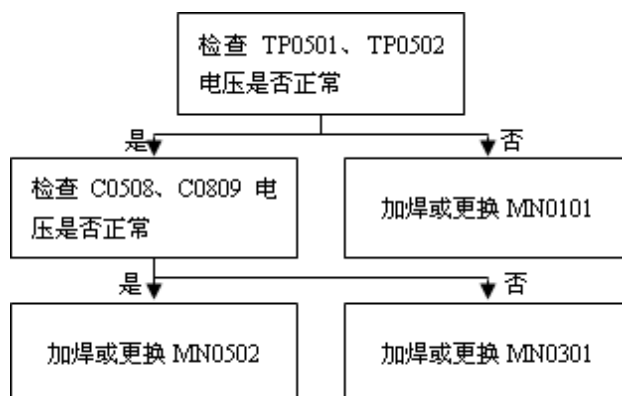
5.10 无振动



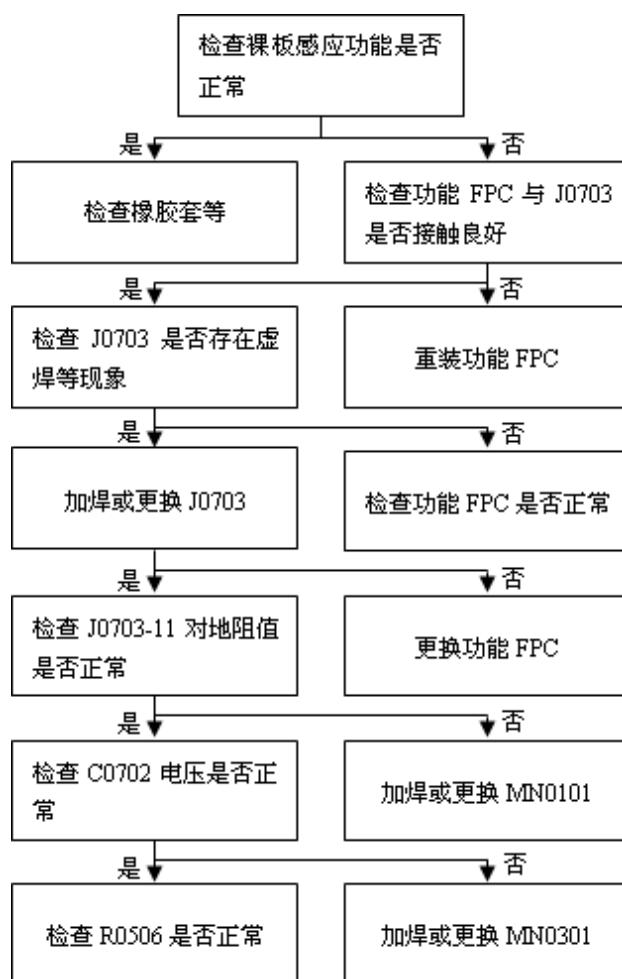
5.11 无指南针功能



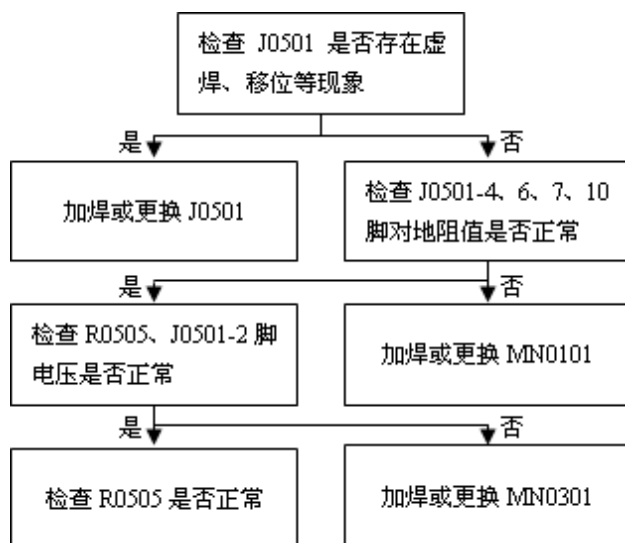
5.12 无传感功能



5.13 无距离感应功能

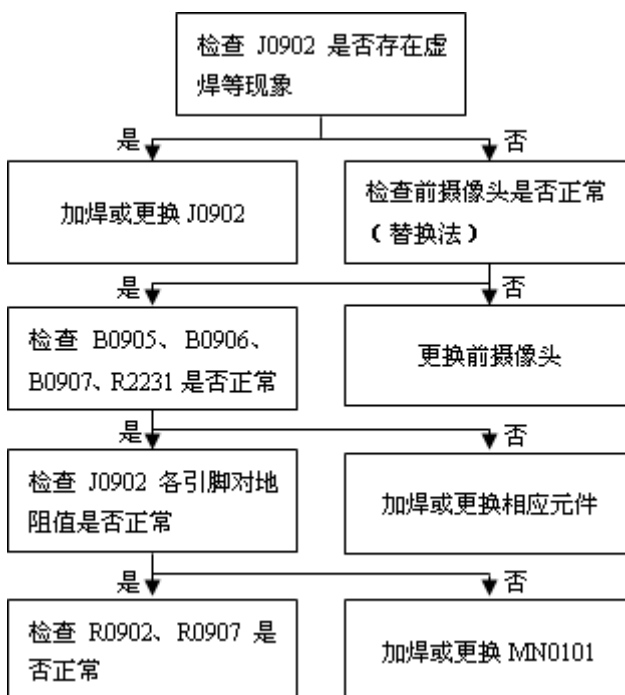


5.14 不识SIM卡

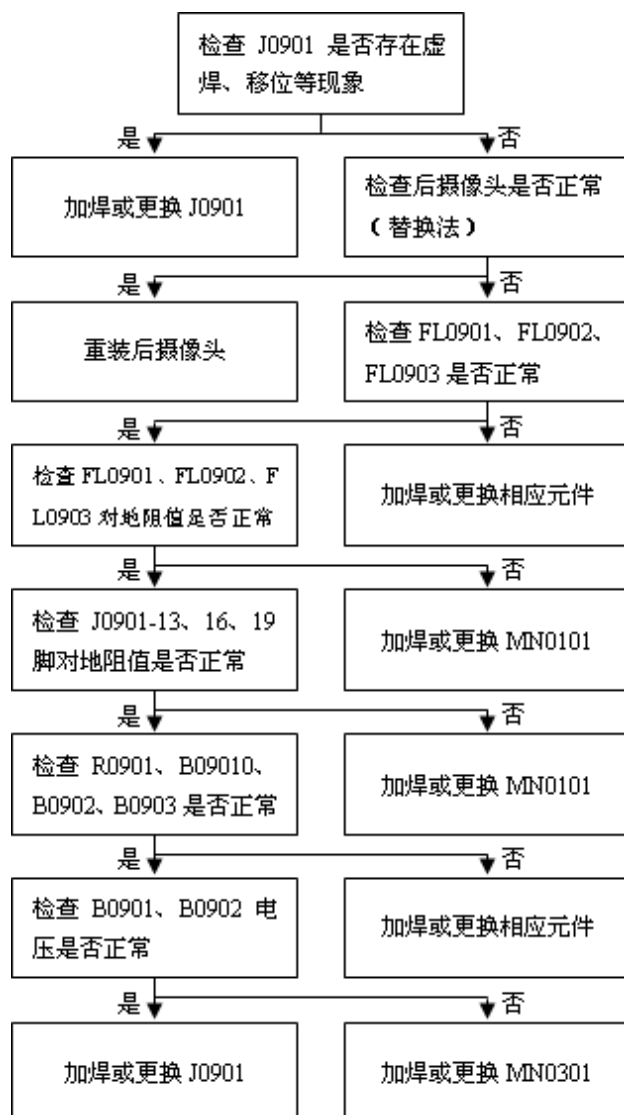


5.15 无法拍照

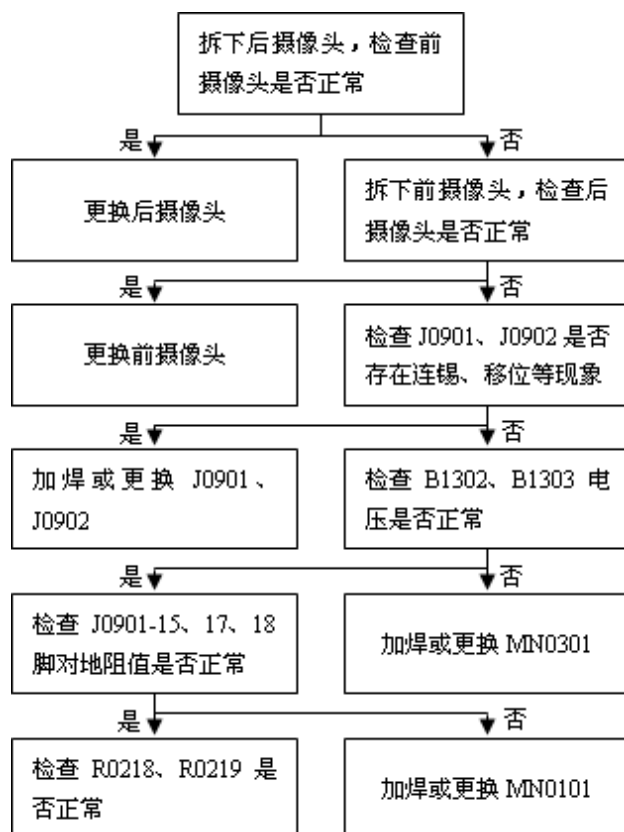
5.15.1 前无法拍照



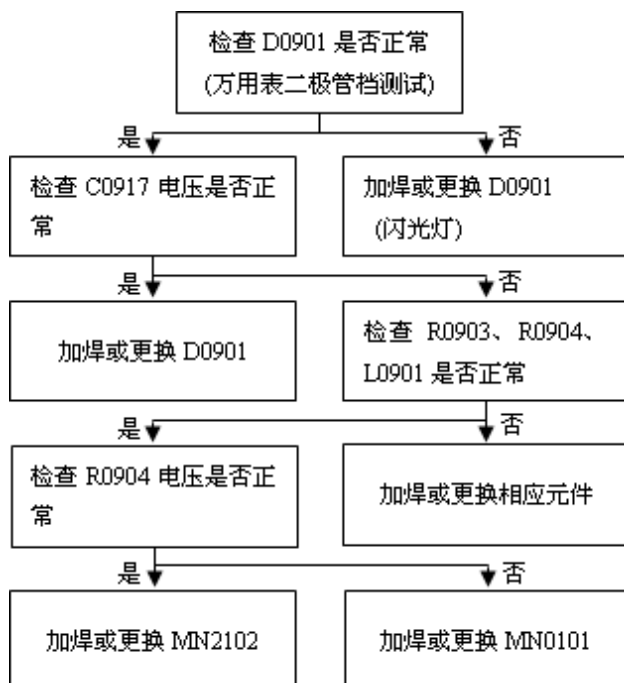
5.15.2 后无法拍照



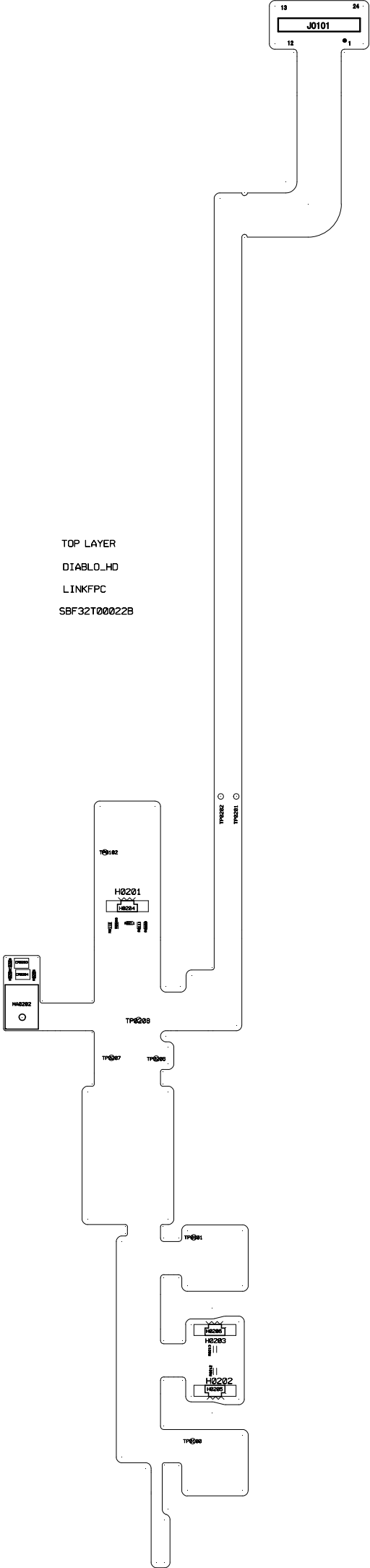
5.15.3 前后无法拍照

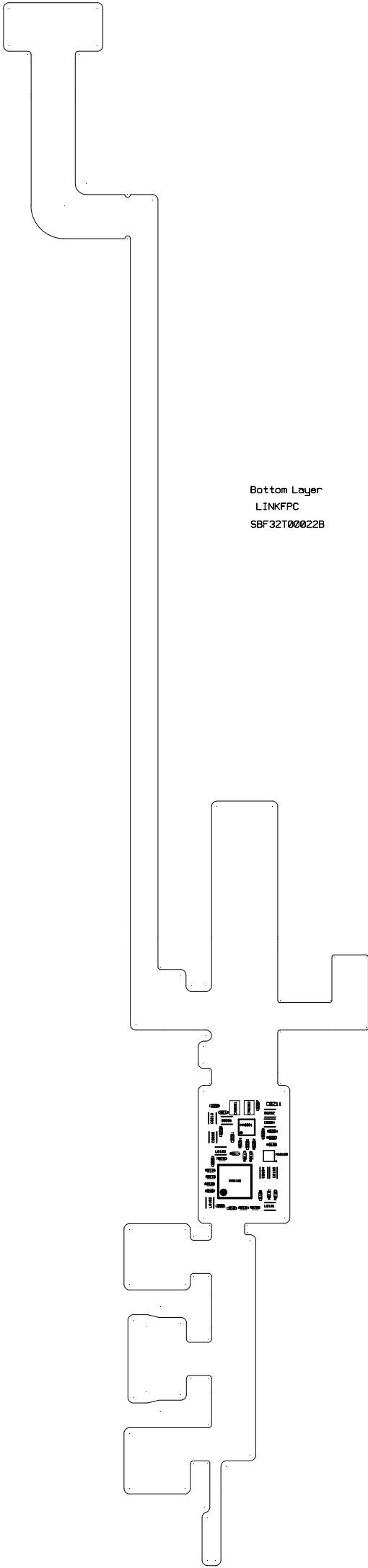


5.16 无闪光灯



TOP LAYER
DIABLO_HD
LINKFPC
SBF32T000228





Bottom Layer
LINKFPC
SBF32T00022B