

# Compal Confidential

## PAZ00 Schematics Document

**Nvidia(T20) + four x4 DDRII**

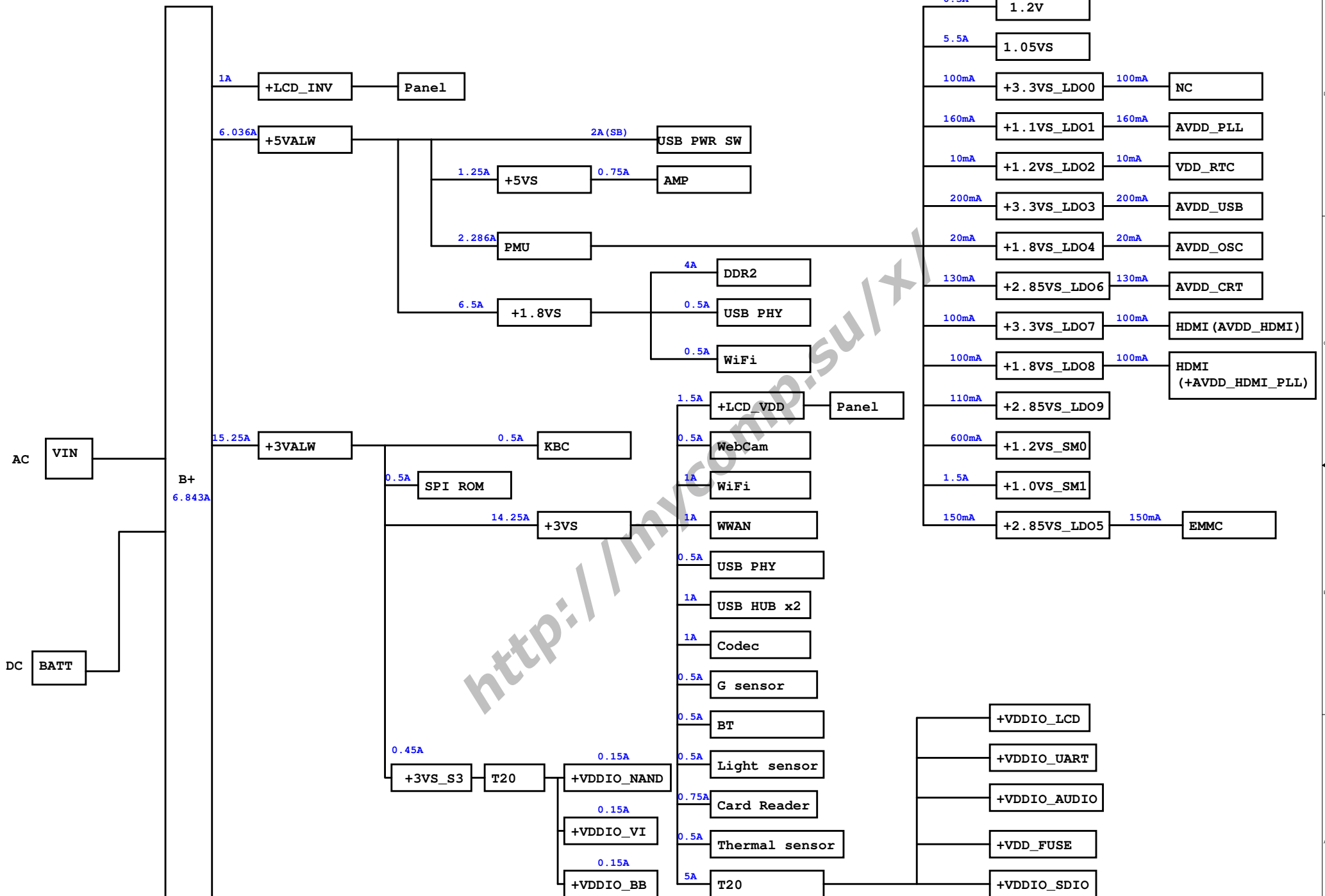
2010-07-15

REV: 1.0a

<http://mycompal.com/x/>

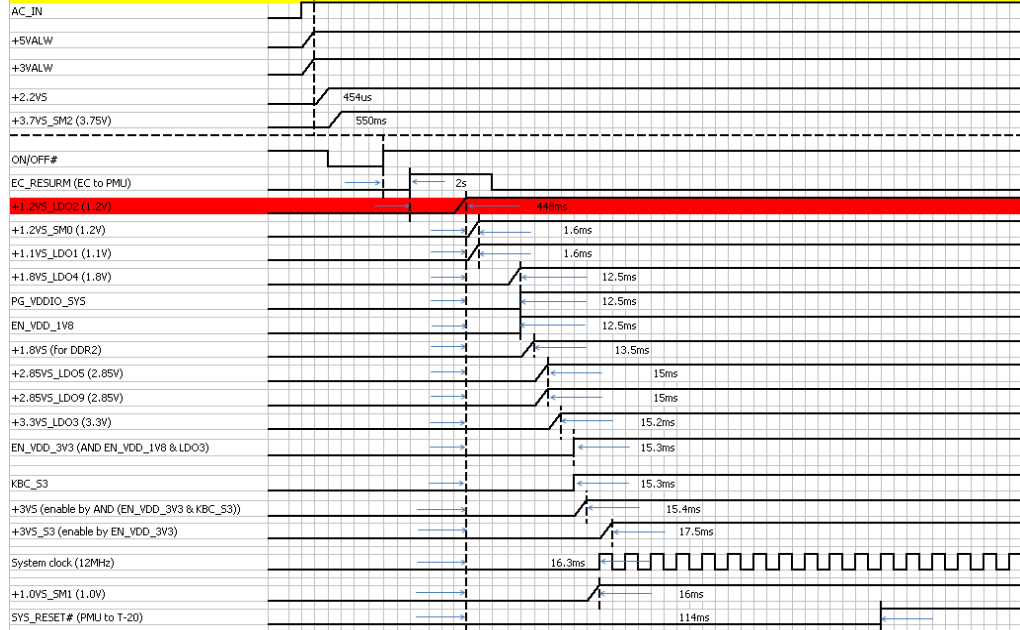
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Size	T20 schematic		0.1		
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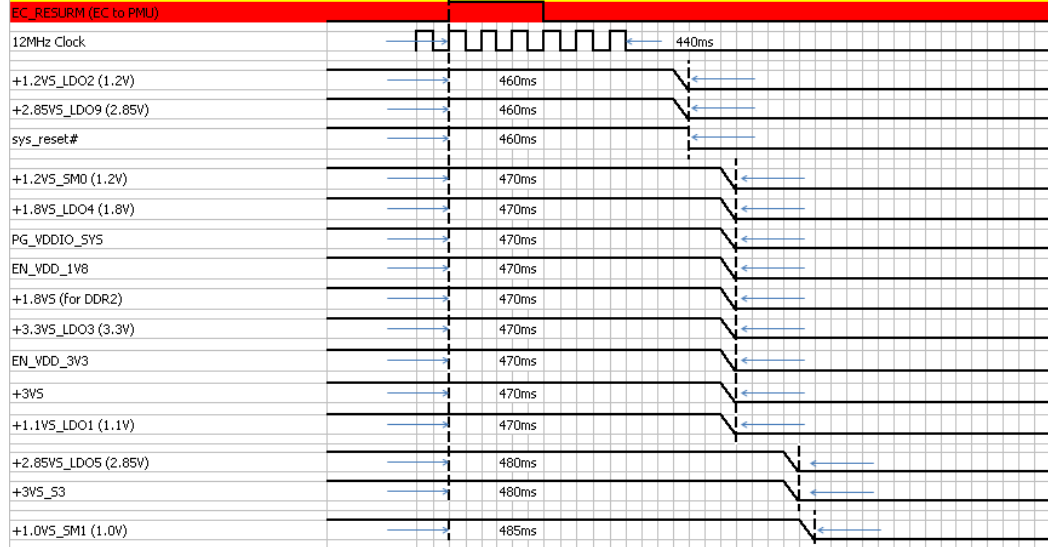


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Rev	0.1			

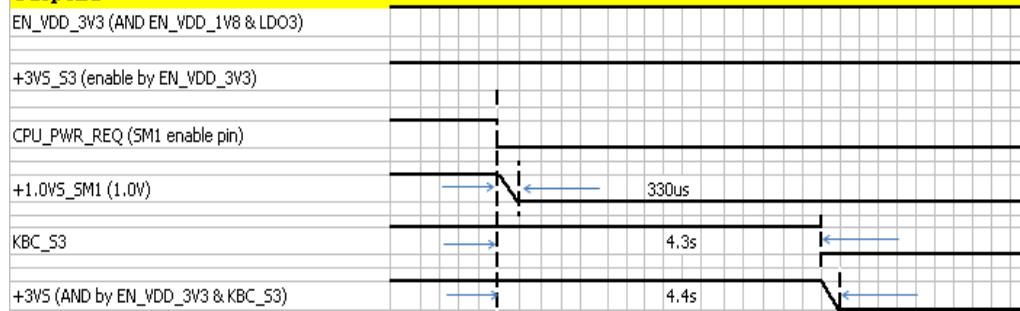
### Power on



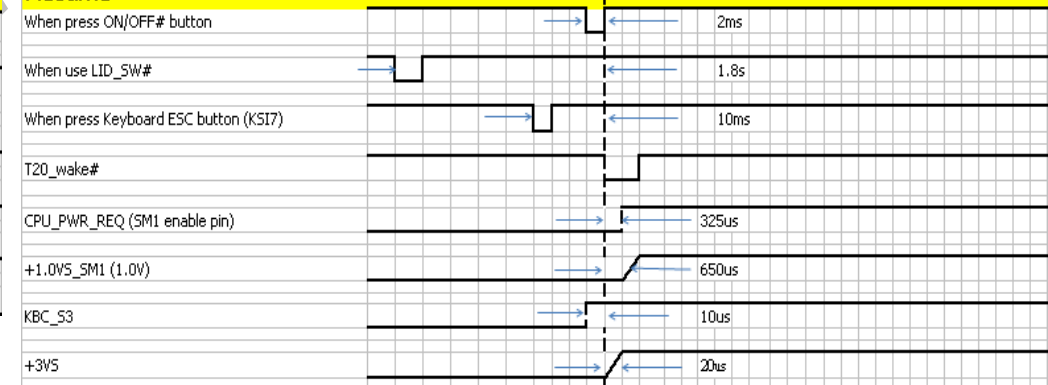
### Power Off



### Suspend



### Resume



## Voltage Rails

Power Plane	Description	S1	S3	S5
VIN	Adapter power supply (19V)	N/A	N/A	N/A
B+	AC or battery power rail for power circuit.	N/A	N/A	N/A
+VDD_CPU	Core voltage for CPU	ON	OFF	OFF
+1.8V	1.8V power rail for DDR	ON	ON	OFF
+VDD_CORE	VCCP switched power rail	ON	OFF	OFF
+RTCVCC	RTC power	ON	ON	ON
+3VS_S3	3.3V switched power rail	ON	ON	OFF
+3VALW	3.3V always on power rail	ON	ON	ON*
+3VS	3.3V switched power rail	ON	OFF	OFF
+5VALW	5V always on power rail	ON	ON	ON*
+5VS	5V switched power rail	ON	OFF	OFF

## BOM configuration

@ : For reserve.  
 45@ : For 45 level.  
 PR@ : For Procyon sku only  
 SI@ : For Sirius sku only

Note : ON\* means that this power plane is ON only with AC power available, otherwise it is OFF.

## I2C/SM BUS Control

Table	SOURCE	T-20	EC KB926	Battery	PMIC	Thermal Sensor	Audio Codec	G sensor	TPM	Light sensor	HDMI	LCD Panel
EC_SMB_CK1 EC_SMB_DA1 (3.3V)	KB926			V (3.3V)								
DDC_SCL_3P3 DDC_SDA_3P3 (3.3V)	T-20										V (3.3V)	
CAM_I2C_SCL CAM_I2C_SDA (3.3V)	T-20		V (3.3V)									
GEN1_I2C_SCL GEN1_I2C_SDA (3.3V)	T-20						V (3.3V)	V (3.3V)	V (3.3V)	V (3.3V)		V (3.3V)
PWR_I2C_SCL PWR_I2C_SDA (1.8V)	T-20				V (1.8V)	V (3.3V)						

ZZZ1



X76 Hynix

X7624051L02

ZZZ



PCB\_LA-6352P

DAZ0EF00100

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For USB detect issue (PVT2)

USB1\_ID1: From Connector

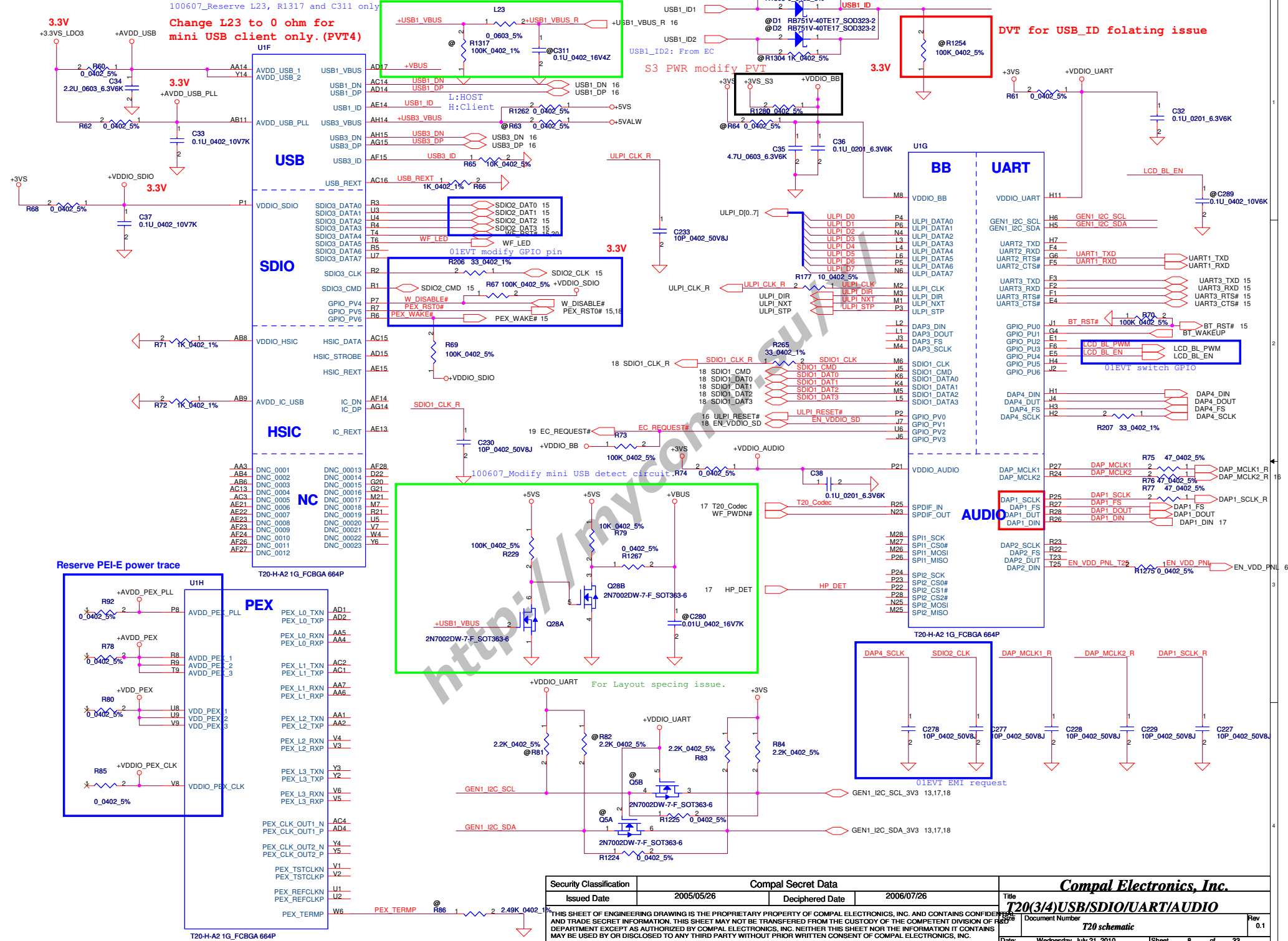
Add R1303 and remove D1,D2 for mini USB client only.

100607\_Reserve L23, R1317 and C311 only

Change L23 to 0 ohm for mini USB client only. (PVT4)

DVT for USB\_ID floating issue

S3 PWR modify PVT

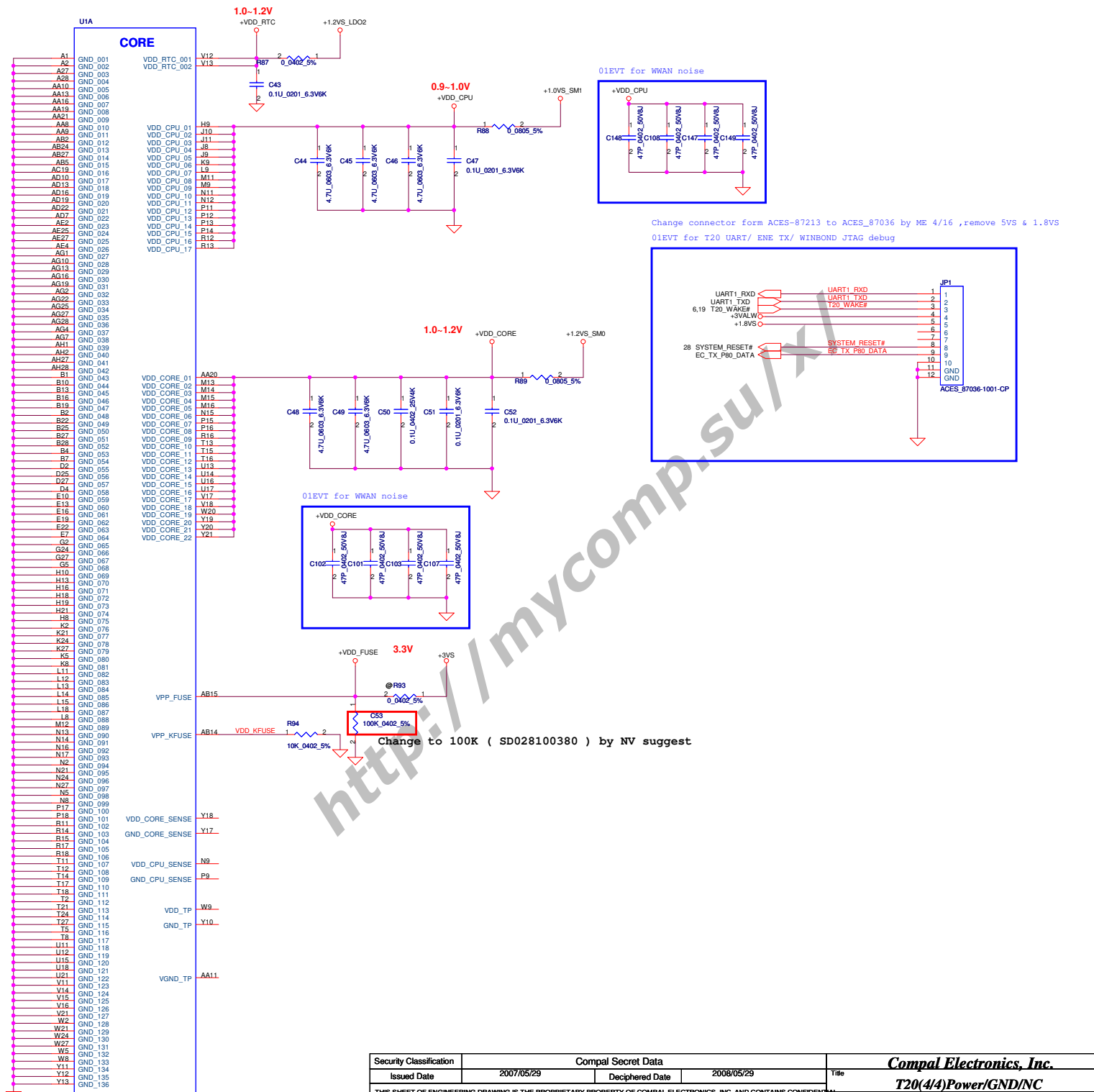


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<b>Compal Electronics, Inc.</b>	
<b>T20(3/4)USB/SDIO/UART/AUDIO</b>	
T20 schematic	
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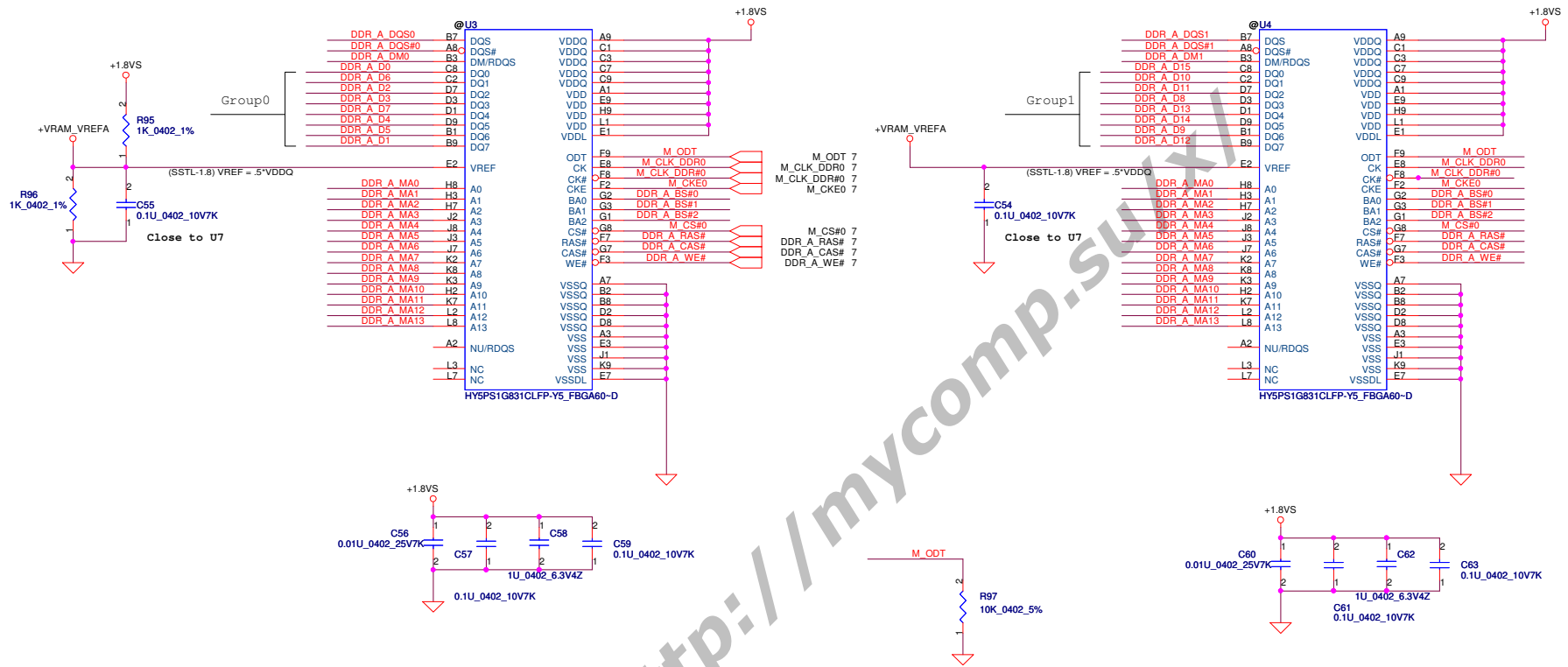


Change connector form ACES-87213 to ACES\_87036 by ME 4/16 ,remove 5VS & 1.8VS  
 01EVT for T20 UART/ ENE TX/ WINBOND JTJAG debug

Change to 100K ( SD028100380 ) by NV suggest

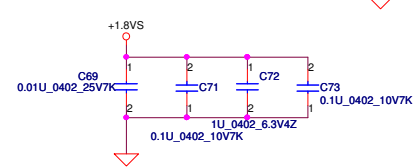
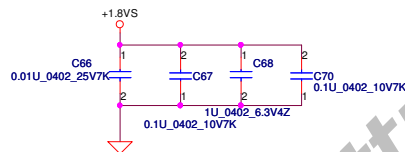
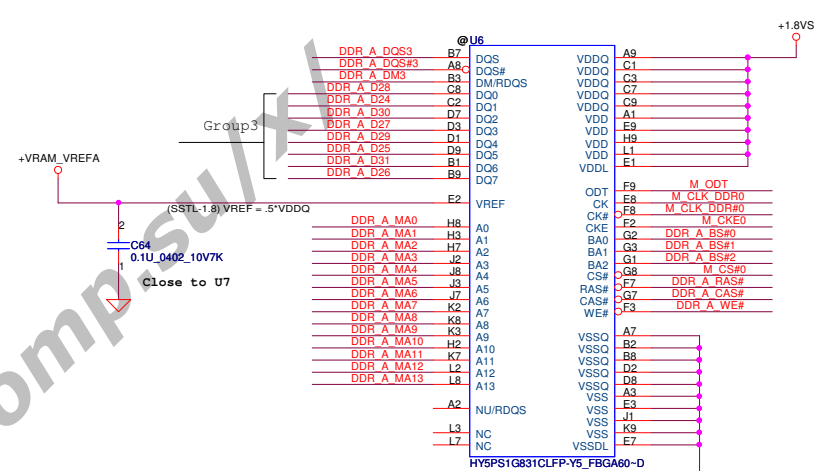
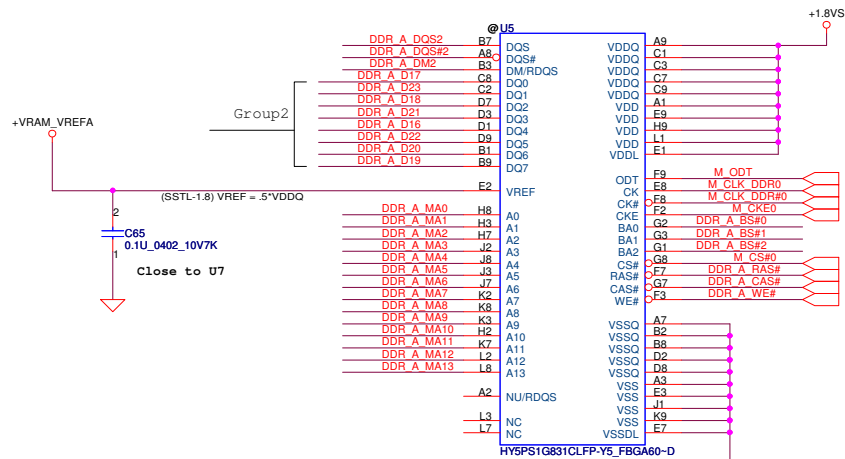
Security Classification		Compal Secret Data		Compal Electronics, Inc.	
Issued Date	2007/05/29	Deciphered Date	2008/05/29	T20(4/4)Power/GND/NC	
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				T20 schematic	0.1
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- 7,11 DDR\_A\_BS#[0..2]
- 7 DDR\_A\_D[0..15]
- 7 DDR\_A\_DQS[0..1]
- 7 DDR\_A\_DQS#[0..1]
- 7,11 DDR\_A\_MA[0..13]
- 7 DDR\_A\_DM[0..1]



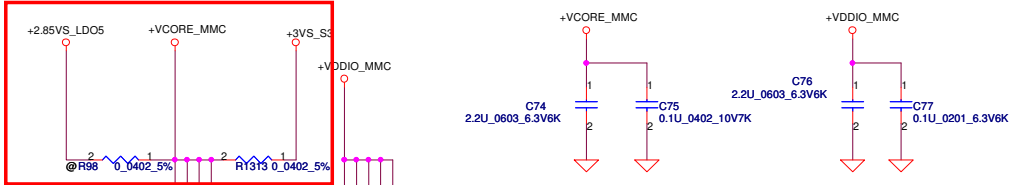
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- 7,10 DDR\_A\_BS#[0..2]
- 7 DDR\_A\_D[16..31]
- 7 DDR\_A\_DOS[2..3]
- 7 DDR\_A\_DOS#[2..3]
- 7,10 DDR\_A\_MA[0..13]
- 7 DDR\_A\_DM[2..3]

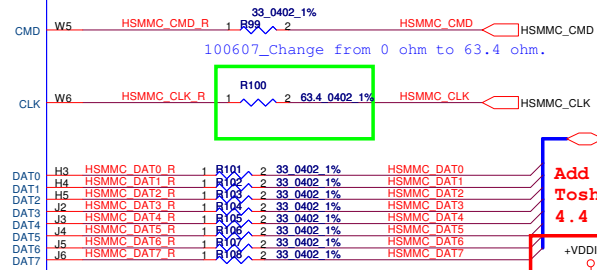
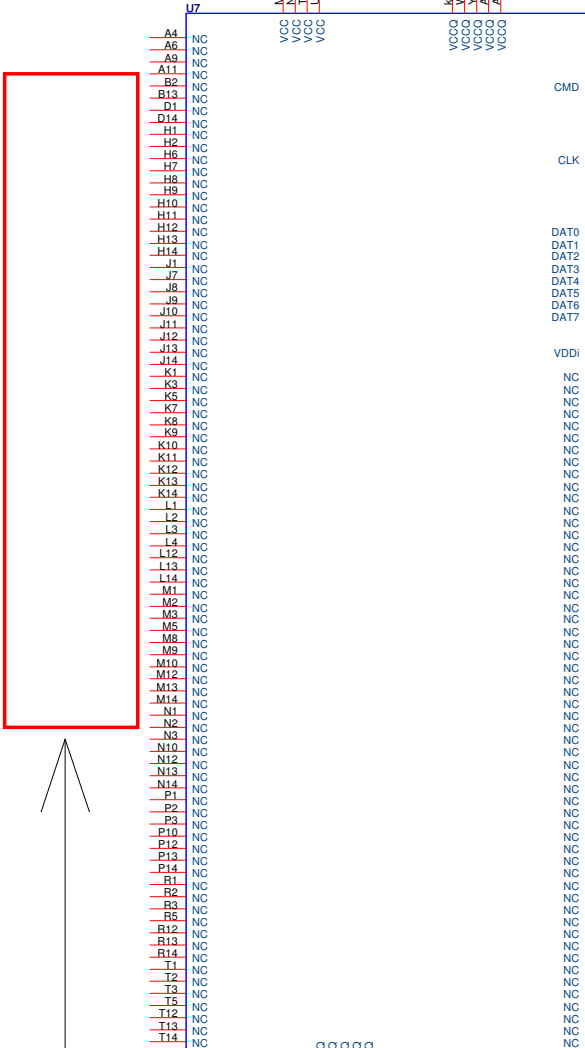
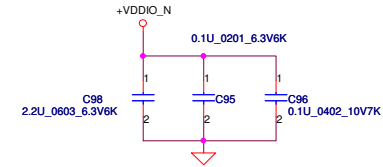


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				T20 schematic	0.1
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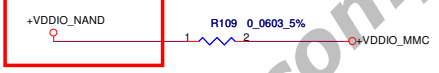
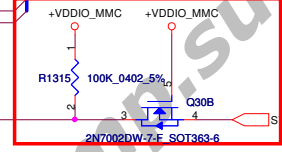
Change PWR to +3VS\_S3 for eMMC cold boot issue (Pre-MP 7/8)



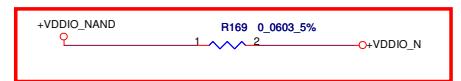
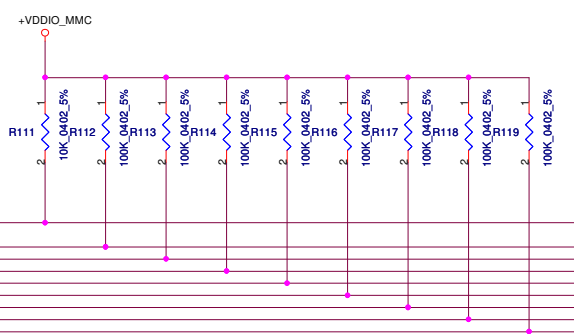
Y4 must connector to Y3 & AA2 for with out use 3.5 mil trace



Add reset Pin for Toshiba eMMC 4.4 interface (PVT2)



Remove EN\_VDDIO\_MMC



Change +3VS to +VDDIO\_NAND 4/29

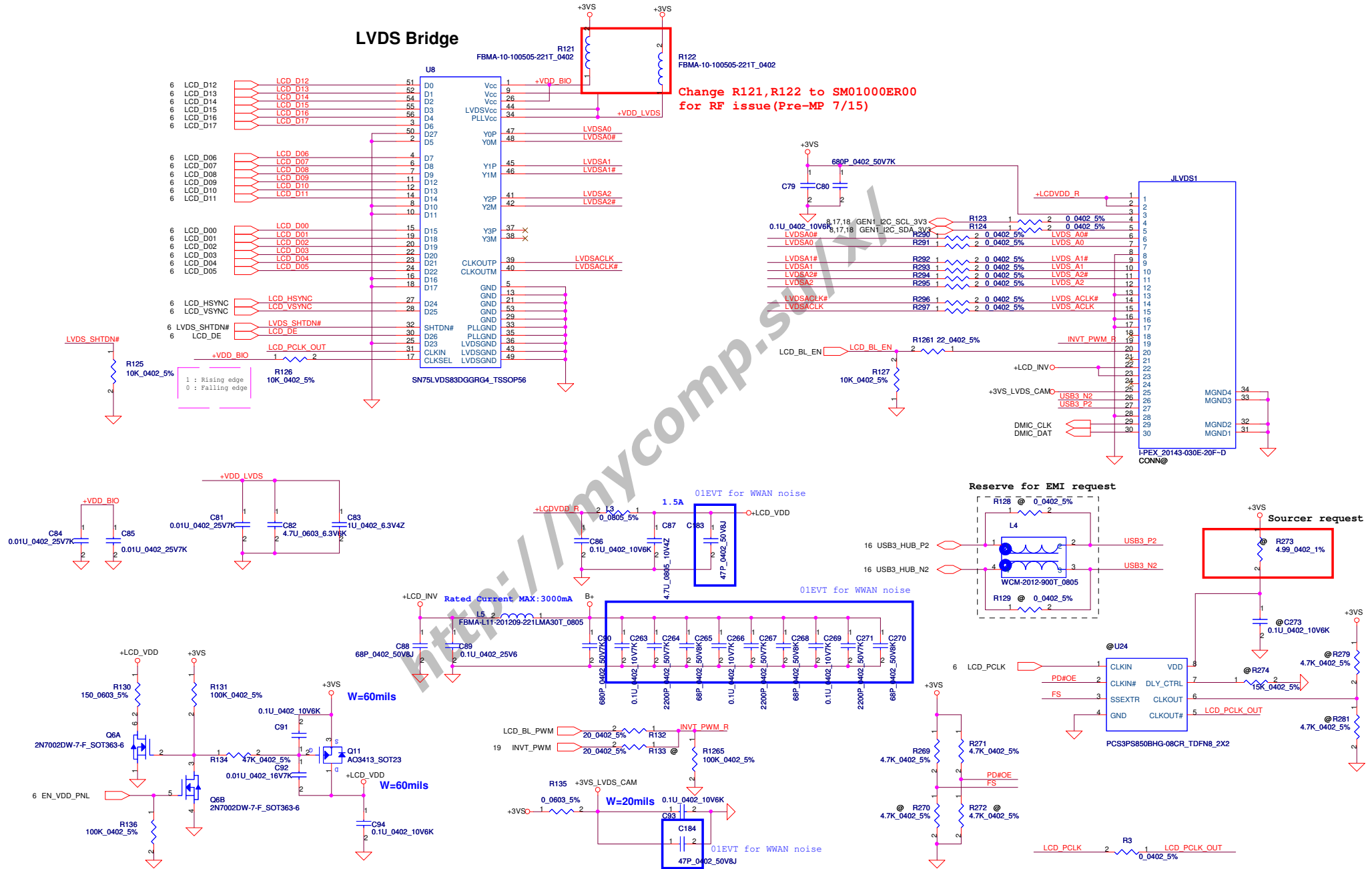
Y2 must connector to AA2 for with out use 3.5 mil trace

Y5 must connector to Y6 & Y7 & AA7 for with out use 3.5 mil trace

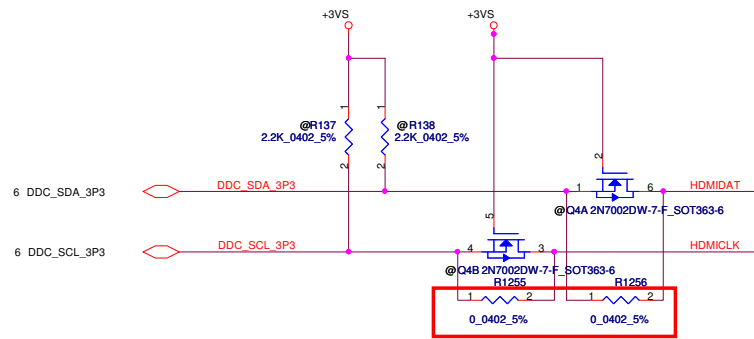
Change to 3 mil for Toshiba eMMC 4.4 interface. (PVT 2nd build)

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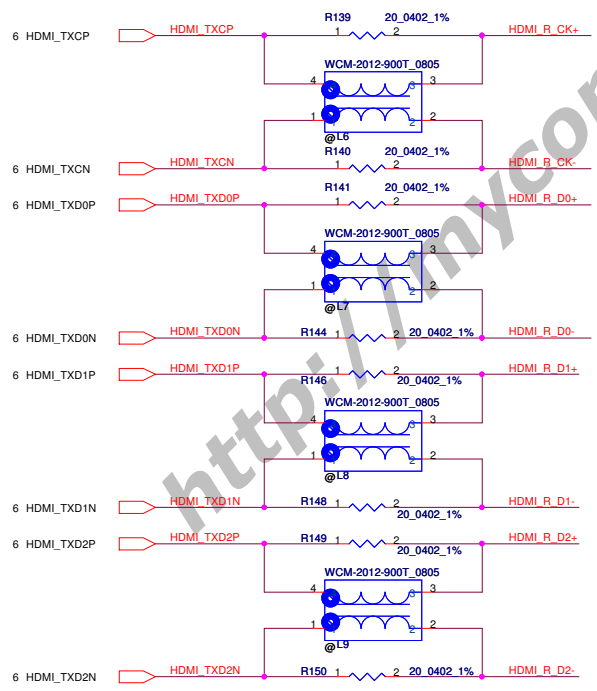
# LVDS Bridge



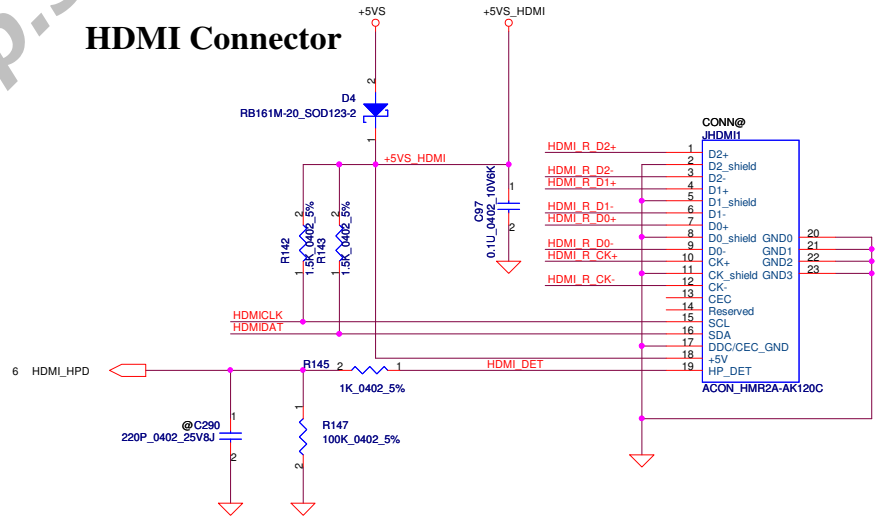
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DVT reserve R for NV suggestion 4/16



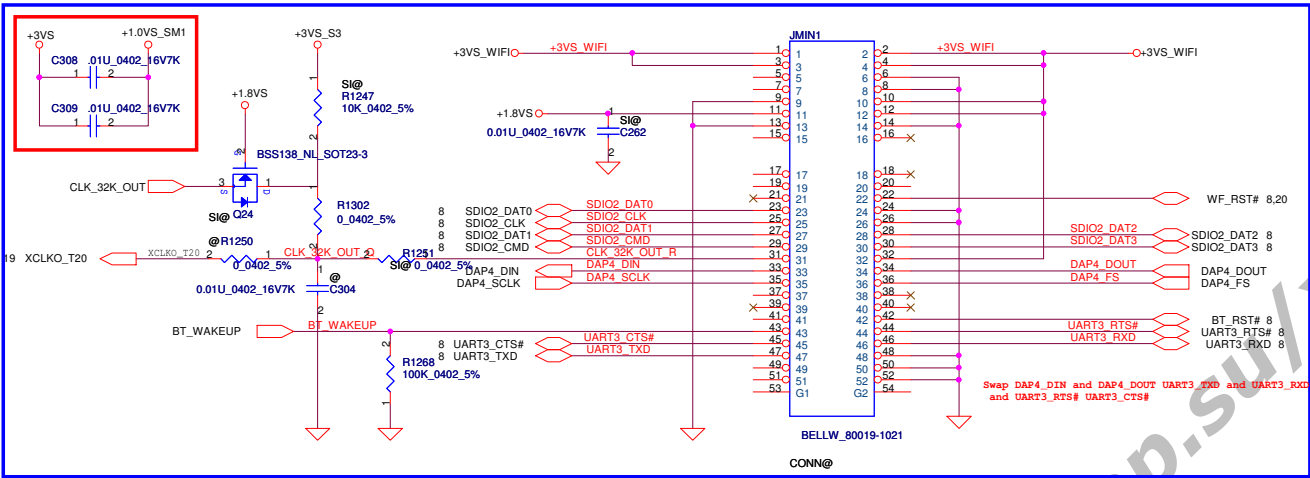
### HDMI Connector



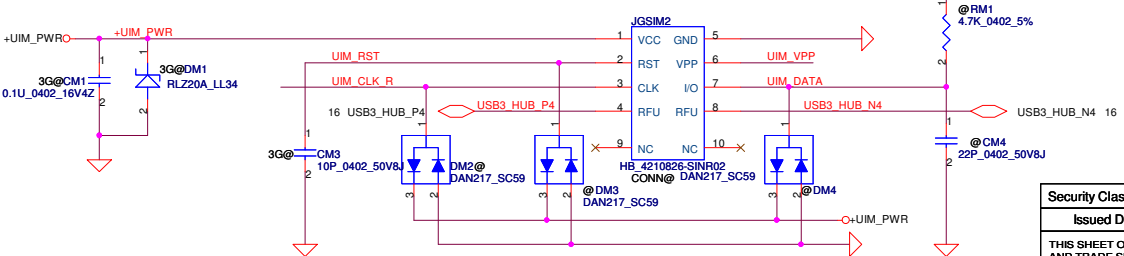
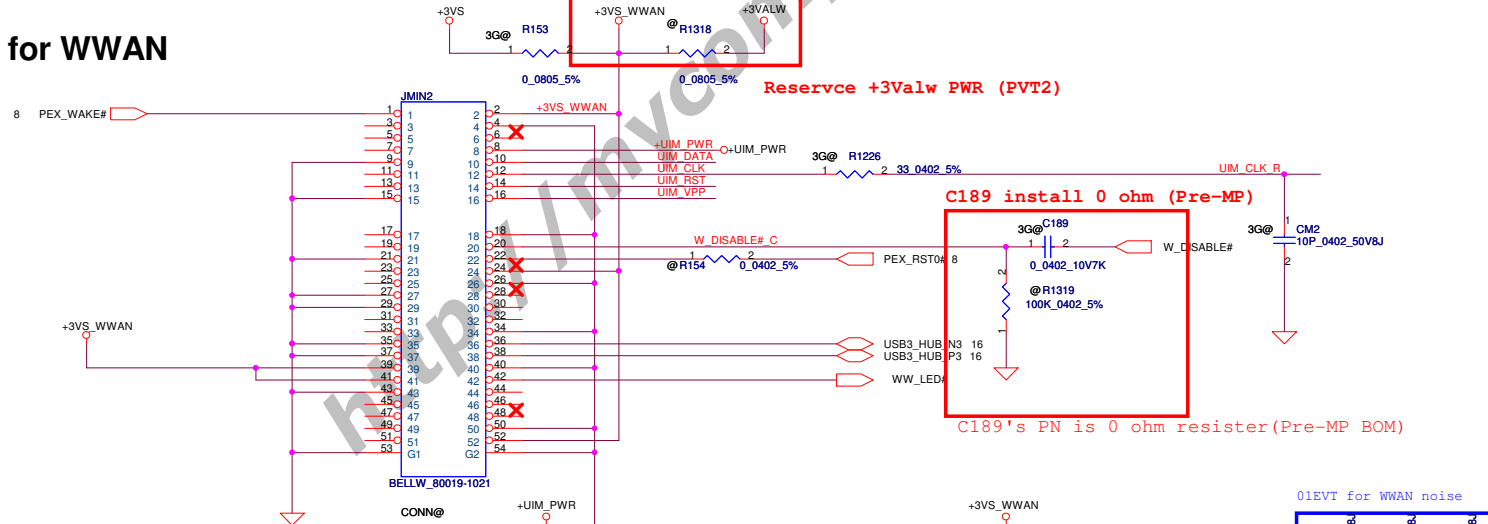
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# Mini-Express Card for WiFi

Add C\*2 for 32.768KHz cross moat issue on PVT 5/5.



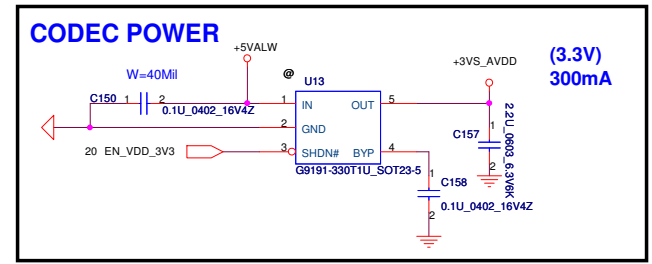
# Mini-Express Card for WWAN



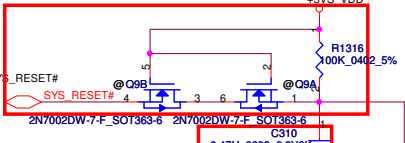
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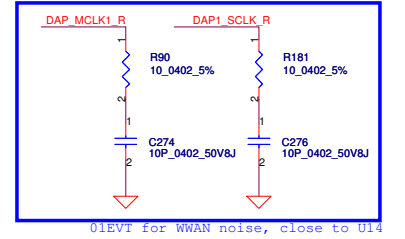
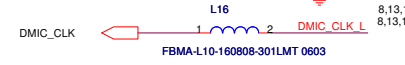




Remove Q9, add C310 (0.47UF) audio "bo" noise when system trun off on battery mode. (Pre-MP 7/8)

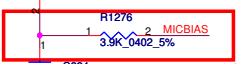
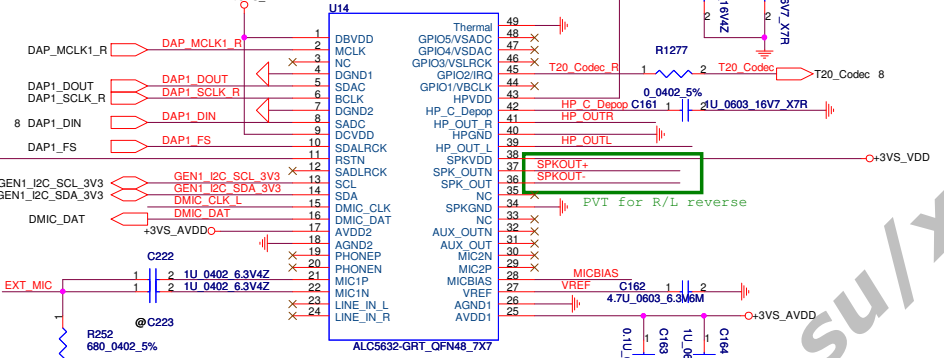
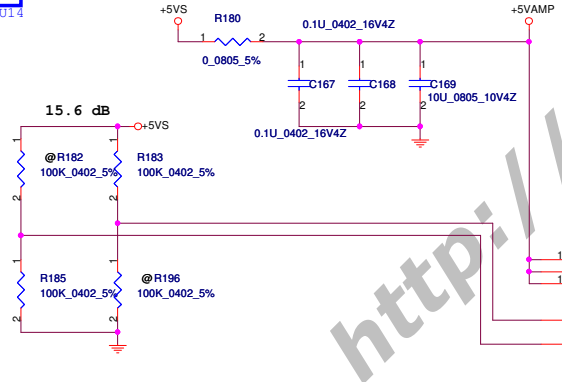


Change to 0.47UF for Bobo noise (Pre-MP)

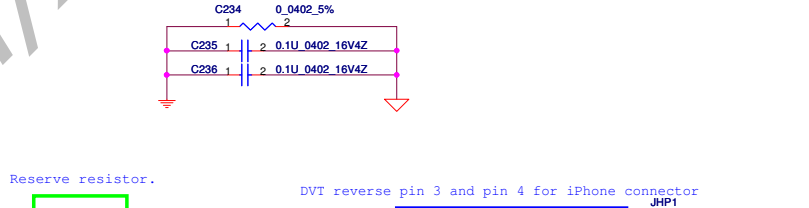


**TI TPE6017A2**

GAIN0	GAIN1	Av
0	0	6dB
0	1	10dB
1	0	15.6dB
1	1	21.6dB

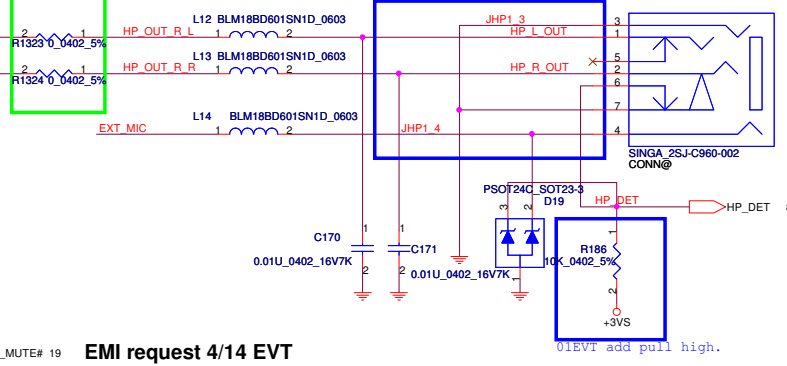


Add R1276 for Microphone short current FVT 04/21

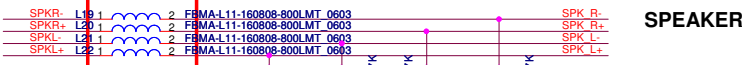


Reserve resistor.

DVT reverse pin 3 and pin 4 for iPhone connector

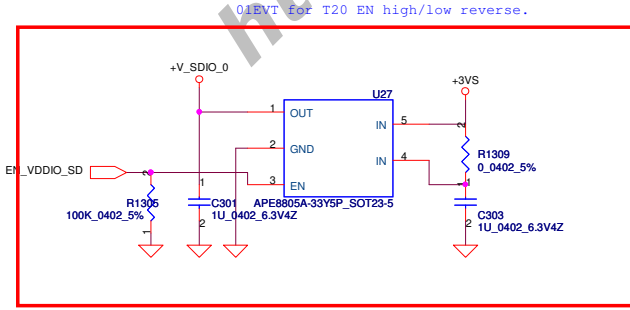
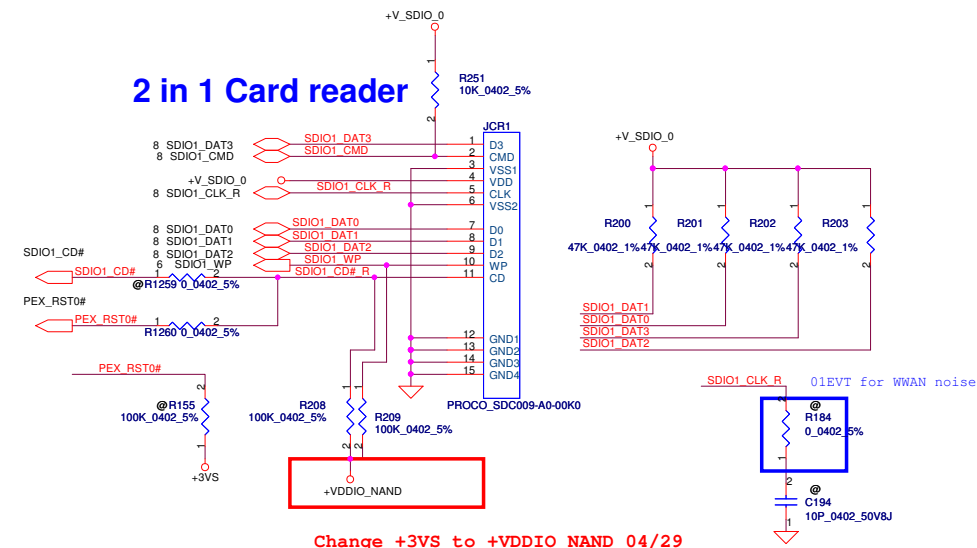
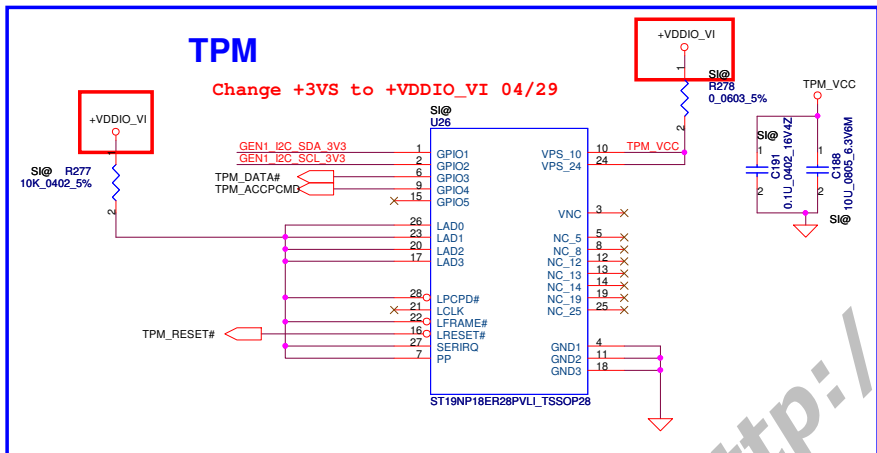
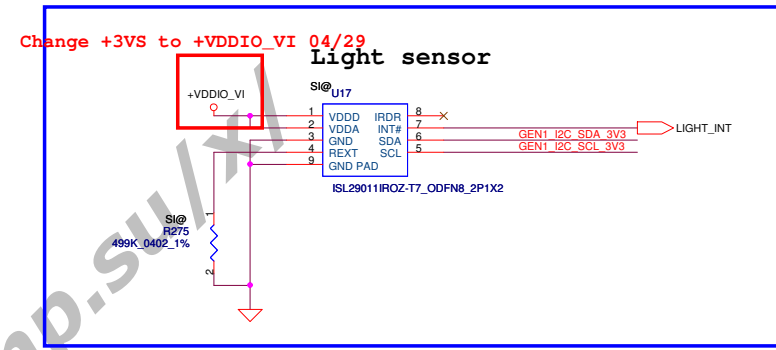
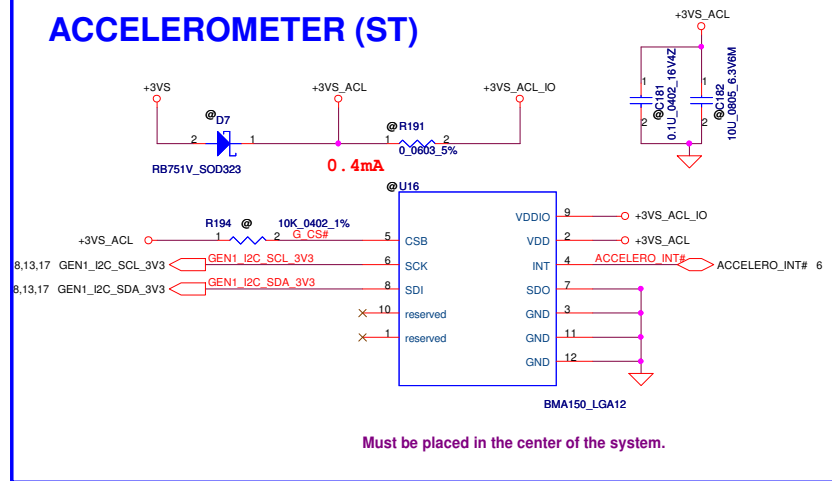


EMI request 4/14 EVT



SPEAKER

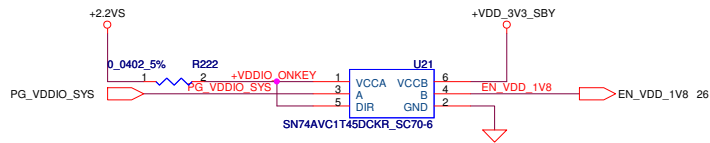
# ACCELEROMETER (ST)



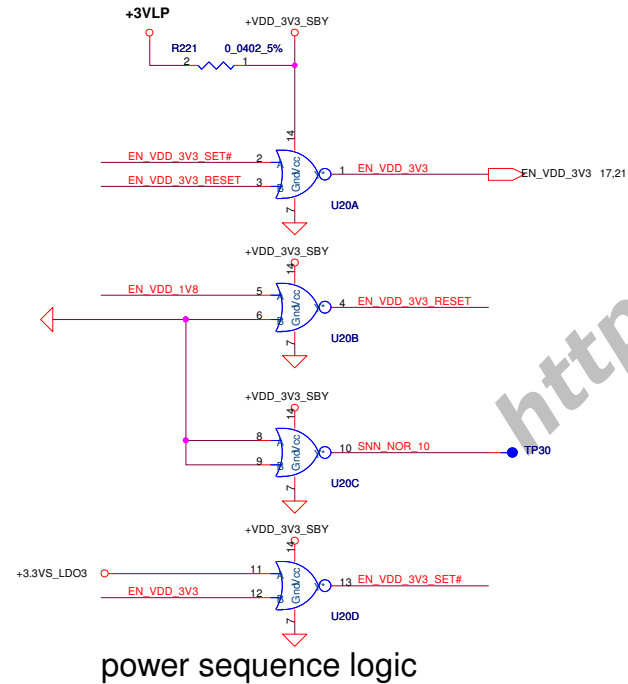
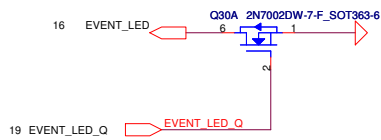
**Use SOT23-5 footprint/CIS symbol for SA00003AR00 4/30**

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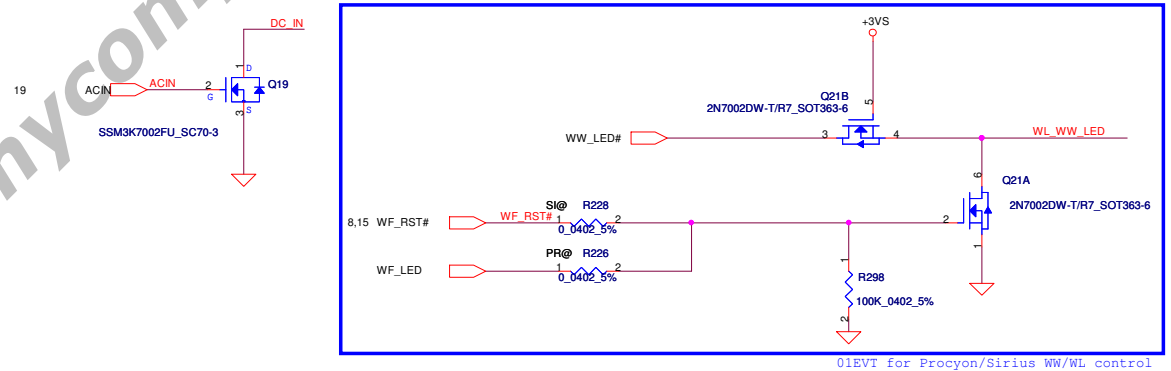
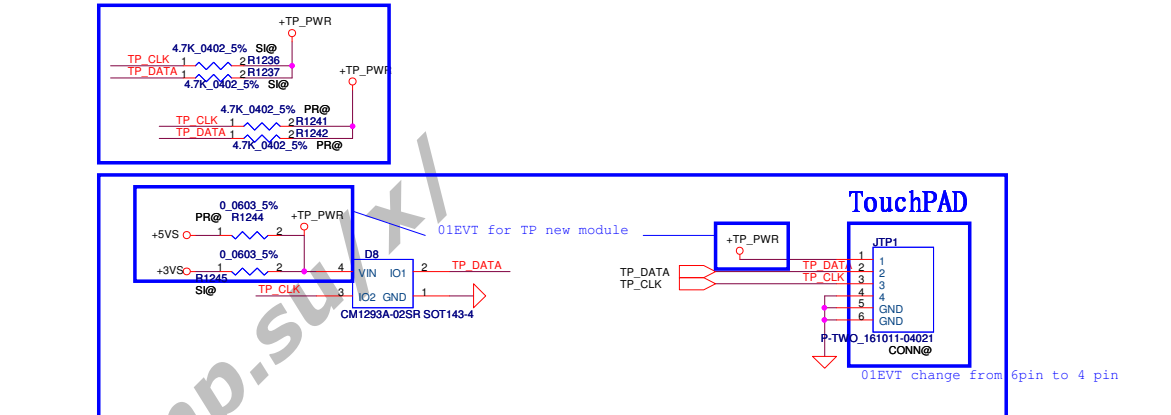




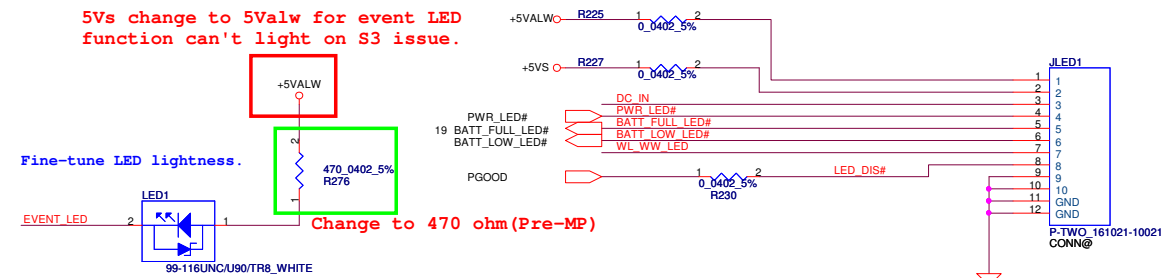
For 2.2V to 3.3V level shift



power sequence logic



01EVT for Procyon/Sirius WW/WL control

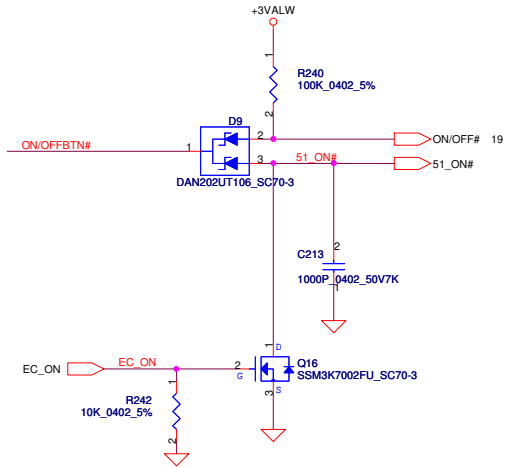


Fine-tune LED lightness.

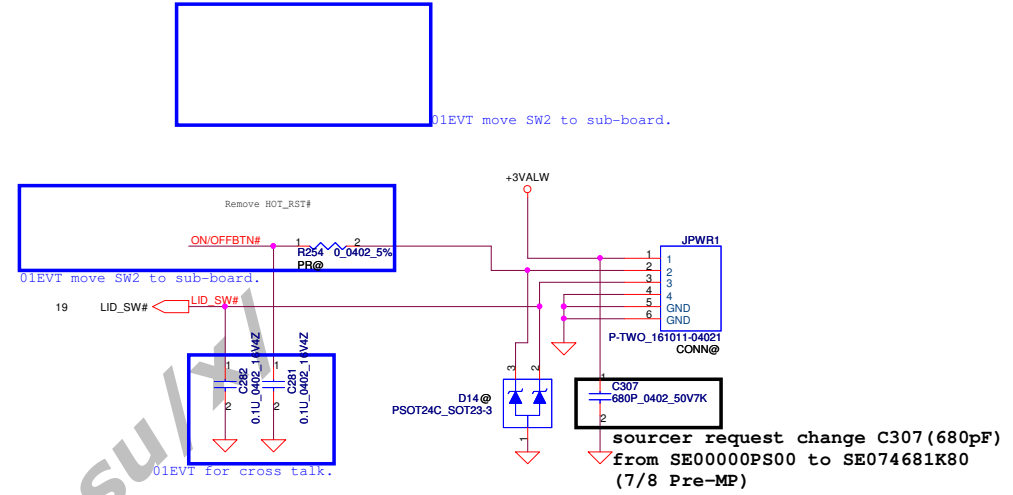
Change to 470 ohm (Pre-MP)

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				T20 schematic	
				Date:	Wednesday, July 21, 2010
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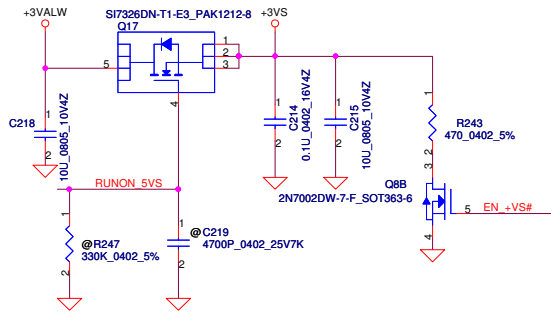
### Power on circuit



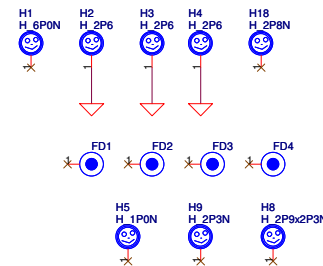
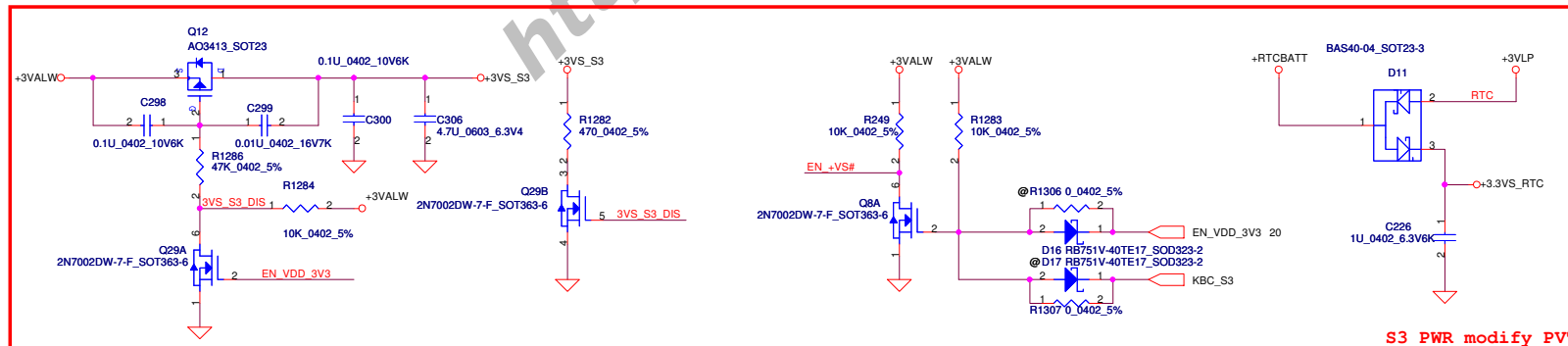
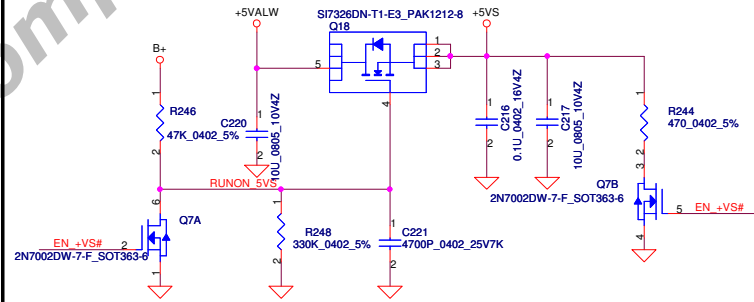
### Platform reset



### +3VALW to +3VS

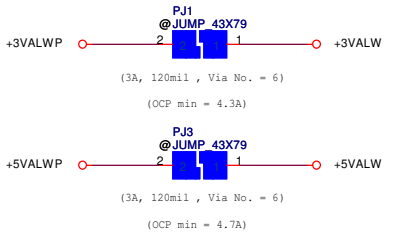
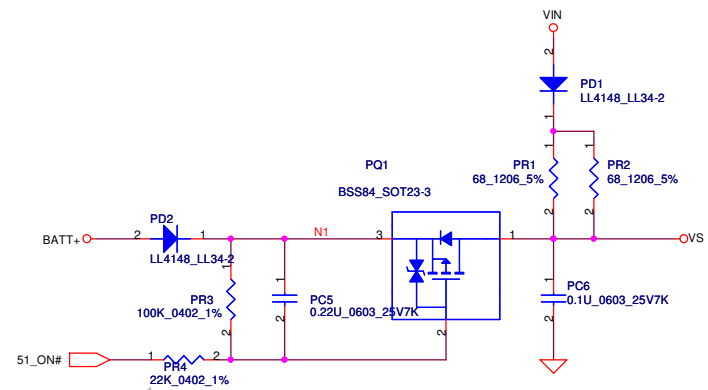
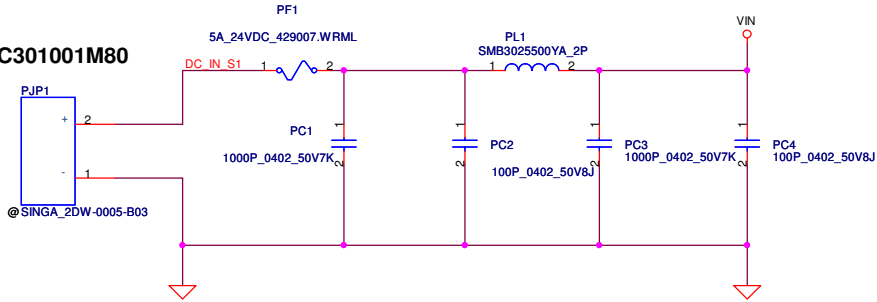


### +5VALW to +5VS

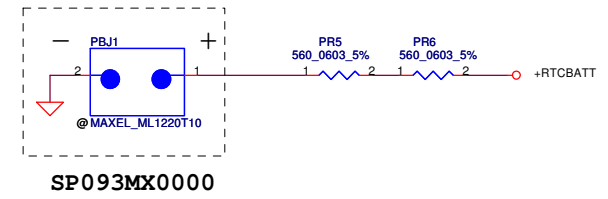


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**DC301001M80**



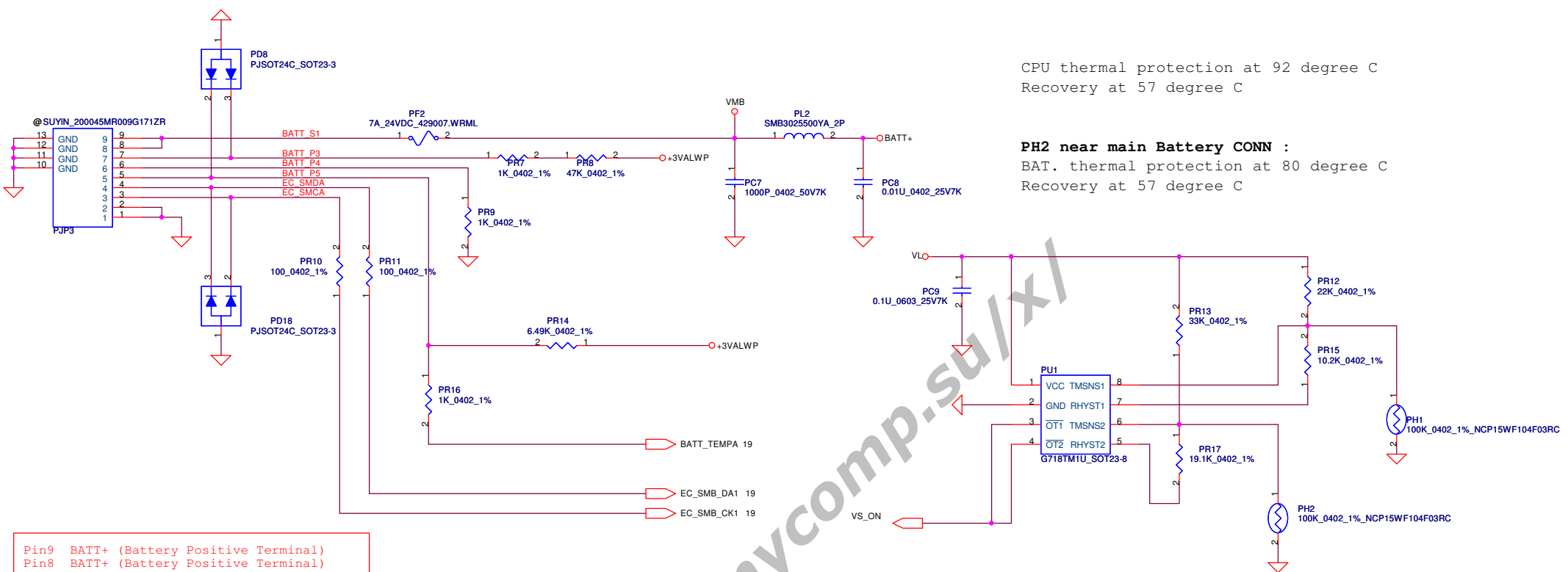
**RTC Battery**



SP093MX0000

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- Pin9 BATT+ (Battery Positive Terminal)
- Pin8 BATT+ (Battery Positive Terminal)
- Pin7 ID (Identify Pin)
- Pin6 B/I (Battery-In Pin)
- Pin5 TS (Connect to thermister)
- Pin4 SMD (SMBus data interface I/O pin)
- Pin3 SMC (SMBus clock interface I/O pin)
- Pin2 GND (Battery Negative Terminal)
- Pin1 GND (Battery Negative Terminal)

PH1 under CPU botten side :

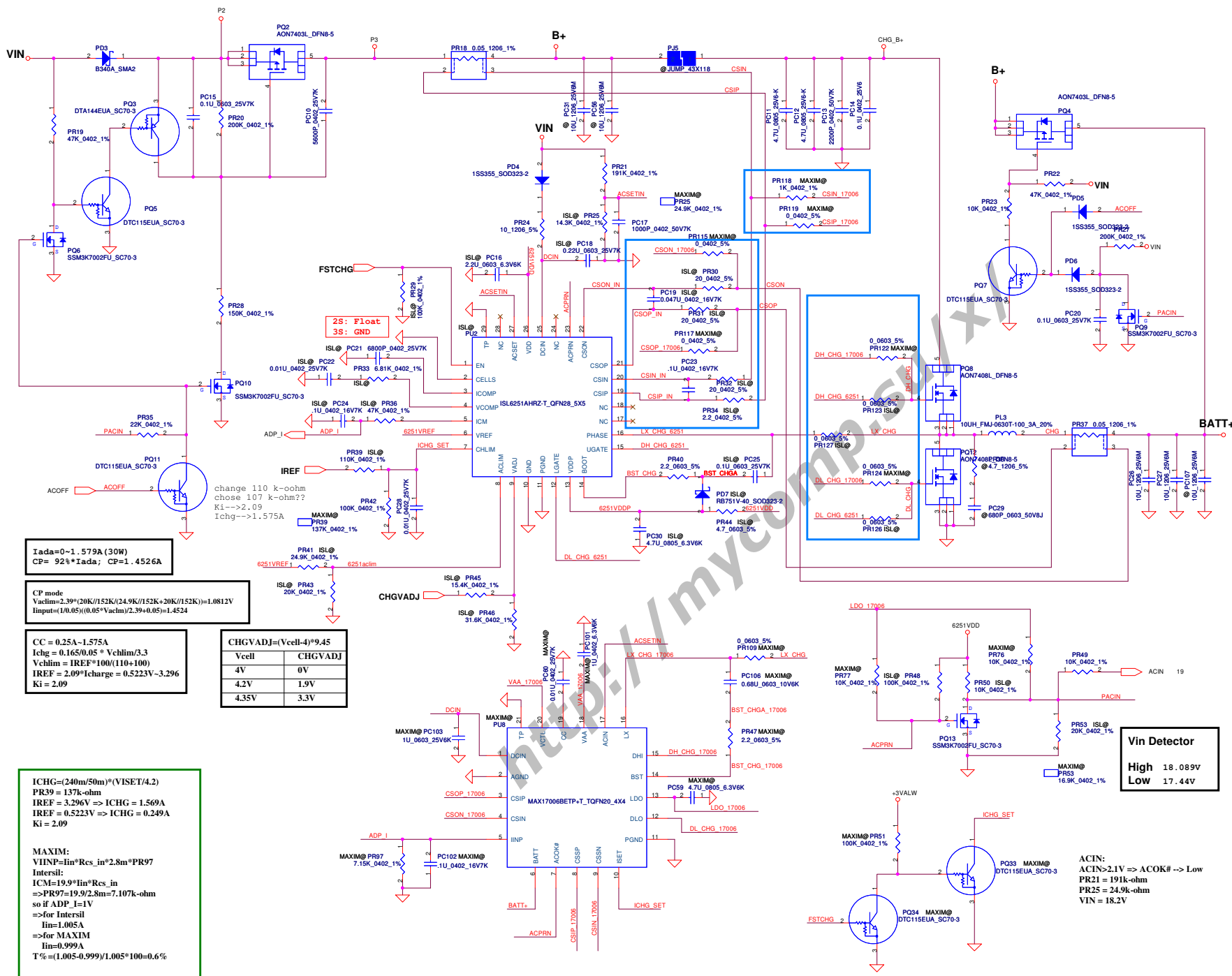
CPU thermal protection at 92 degree C  
Recovery at 57 degree C

PH2 near main Battery CONN :

BAT. thermal protection at 80 degree C  
Recovery at 57 degree C

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				Size	Document Number
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I<sub>ada</sub>=0~1.579A (30W)  
 CP= 92%\*I<sub>ada</sub>; CP=1.4526A

CP mode  
 V<sub>acim</sub>=2.39\*(20K/152K)/(24.9K/152K+20K/152K)=1.0812V  
 Input=(1/0.05)\*(0.05\*V<sub>acim</sub>)/2.39+0.05=1.4524

CC = 0.25A~1.575A  
 I<sub>chg</sub> = 0.165/0.05 \* V<sub>chlim</sub>/3.3  
 V<sub>chlim</sub> = IREF\*100/(110+100)  
 IREF = 2.09\*I<sub>charge</sub> = 0.5223V~3.296  
 K<sub>i</sub> = 2.09

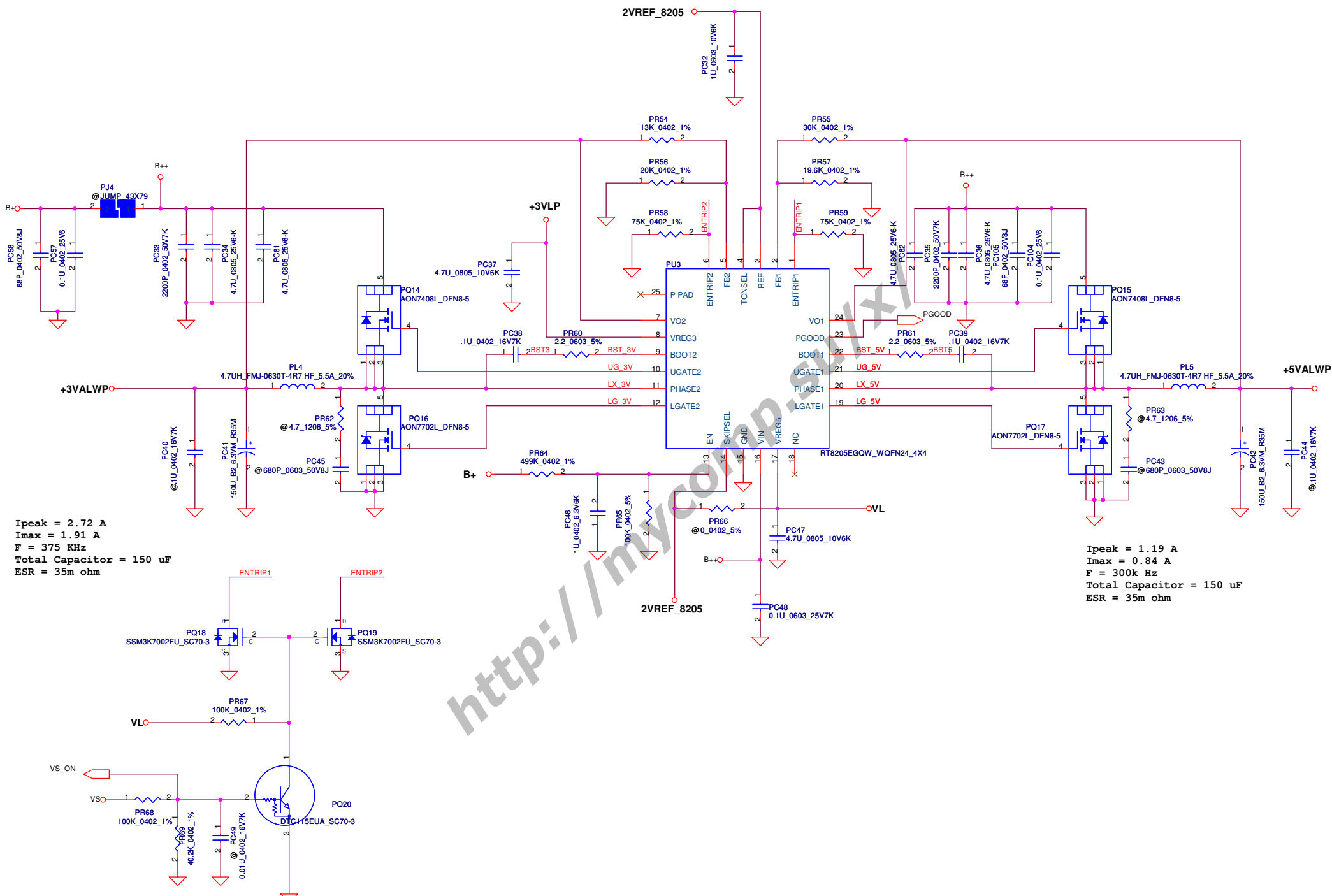
CHGVADJ=(V <sub>cell</sub> -4)*9.45	
V <sub>cell</sub>	CHGVADJ
4V	0V
4.2V	1.9V
4.35V	3.3V

I<sub>CHG</sub>=(240m/50m)\*(V<sub>ISET</sub>/4.2)  
 PR39 = 137k-ohm  
 IREF = 3.296V => I<sub>CHG</sub> = 1.569A  
 IREF = 0.5223V => I<sub>CHG</sub> = 0.249A  
 K<sub>i</sub> = 2.09

MAXIM:  
 V<sub>INP</sub>=lin\*Res<sub>in</sub>\*2.8m\*PR97  
 Intersil:  
 I<sub>CM</sub>=19.9\*lin\*Res<sub>in</sub>  
 =>PR97=19.9/2.8m=7.107k-ohm  
 so if ADP<sub>I</sub>=1V  
 =>for Intersil  
 lin=1.005A  
 =>for MAXIM  
 lin=0.999A  
 T%=(1.005-0.999)/1.005\*100=0.6%

Vin Detector  
 High 18.089V  
 Low 17.44V





**I<sub>peak</sub> = 2.72 A**  
**I<sub>max</sub> = 1.91 A**  
**F = 375 KHz**  
**Total Capacitor = 150 uF**  
**ESR = 35m ohm**

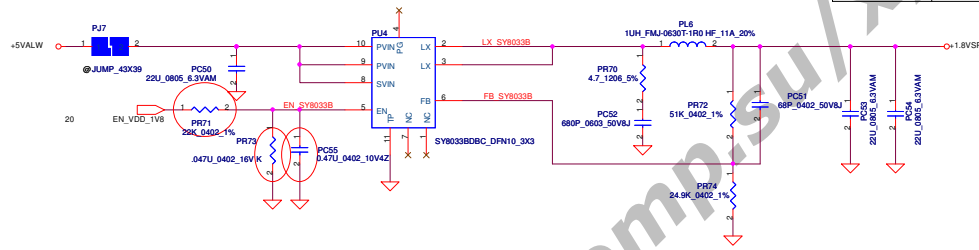
**I<sub>peak</sub> = 1.19 A**  
**I<sub>max</sub> = 0.84 A**  
**F = 300k Hz**  
**Total Capacitor = 150 uF**  
**ESR = 35m ohm**

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				3VALW MBP/5VALWP	
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$$VO=0.6(1+51/24.9)=1.83V$$

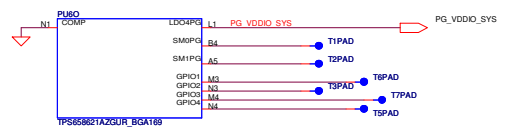
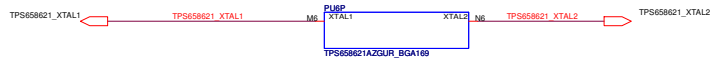
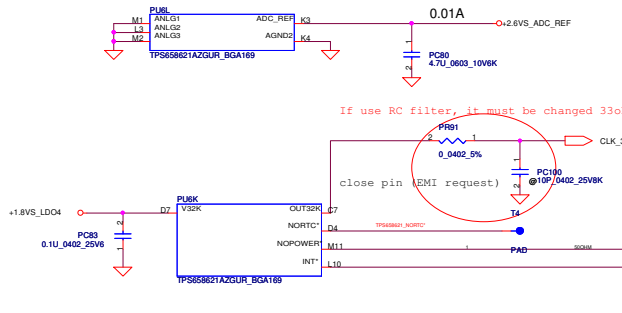
EN_VDD_1V8	+1.8V8
L	OFF
H	ON



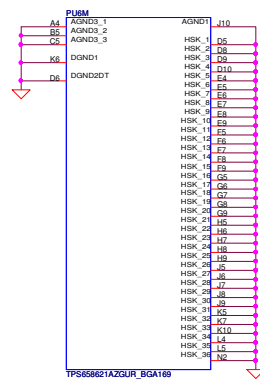
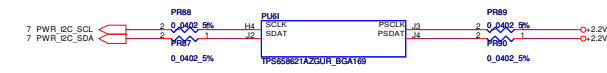
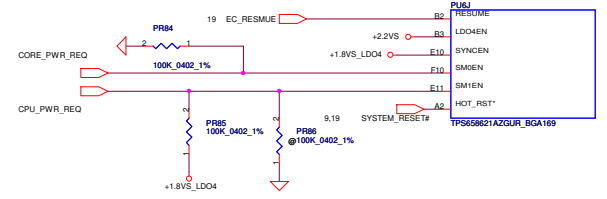
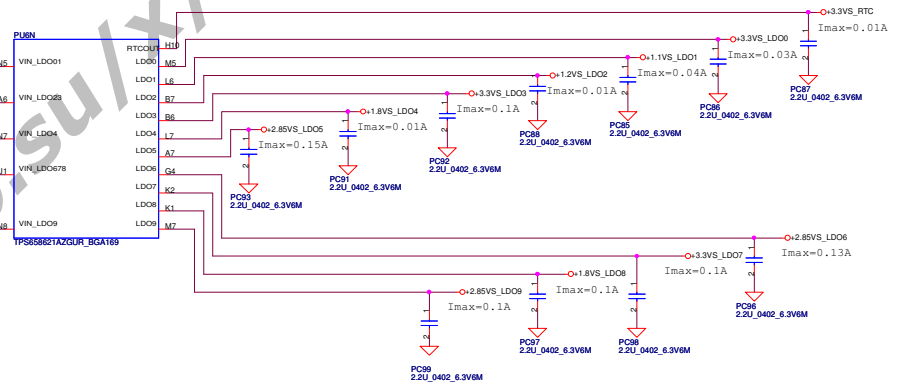
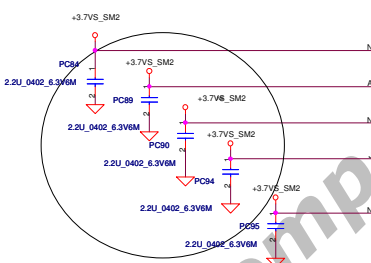
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PMU #2

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Version change list (P.I.R. List)

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
1		Change smaller MOS	0.1	24	change PQ2 PQ4 from AO4435 to AON7403	3/28	DVT
2		EMI request	0.1	24,25	change PR40 PR47 R60 PR61 ot 2.2 ohm	3/28	DVT
3		Design change	0.1	25	change PR58 PR59 from 120K ot 75K	3/28	DVT
4		Modify clock precision	0.1	28	change PC81 and PC82 from 22P to 15P	4/7	DVT
5		Remove them to HW circuit	0.2	28	delete PC81,PC82 and Y1	4/20	PVT
6		Design change	0.2	26	change PR72 from 127K to 51K	4/20	PVT
7		Design change	0.2	26	change PR74 from 61.9K to 24.9K	4/20	PVT
8		Design change	0.2	26	change PC51 from 22P to 68P	4/20	PVT
9		Design change	0.2	28	change PR91 from 33 to 0 ohm	4/20	PVT
10		ME height limit	0.2	25	change 10U 1206 to 4.7U 0805 X2	4/20	PVT
11		Thermal request	0.2	23	change PR12 to 22K, PR13 to 33K	4/29	PVT
12		Thermal request	0.2	23	change PR15 to 10.2K, PR17 to 19.1K	4/29	PVT
13		Modify power sequence	0.3	26	change PR71 to 22KK PC55 to 0.47U, PR73 to 0.47U	6/15	PreMP
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							

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Item	Fixed Issue (Reason for change)	PAGE	Modify List	Date	Phase
1	recovery button	4	add R1238, remove R253, D15	2010/03/15	01EVT
2	T20 GPIO	6	modify SDIO GPIO.	2010/03/15	01EVT
3	T20/ KBC debug	7	modify JP1 pin define	2010/03/15	01EVT
4	new US1 WIFI/BT module	13	modify JMIN11 pin define	2010/03/15	01EVT
5	USB power switch over current detect pin	14, 17 28	modify JUSB1.3 from +3VS to USB_OC#	2010/03/15	01EVT
6	Sirius Spec.	28	add WINBOND KBC	2010/03/15	01EVT
7	EC common design	17	add KS01/KS02 pull high, debug TX pull down, TP CLK/DAT pull high.	2010/03/15	01EVT
8	for S5 HDMI_IN detect	17, 28	add HDMI_HPD	2010/03/15	01EVT
9	TP new module	17, 18	reserve both +5V and +3V for TP_PWR, change JTP1 from 6 pin to 4 pin.	2010/03/15	01EVT
10	SMSC 2514 to 2512	14	swap USB port for cost.	2010/03/15	01EVT
11	T20 CardReader power enable pin reverse	16	add F1, change Q15 to Q22 and pull low.	2010/03/15	01EVT
12	WWAN noise prevention	5, 6, 7, 11, 13, 14, 16, 17	add C39-C42, R90, R179, R181, C101-103, C107, C108, C147-C149, C183-C187, C192, C193, C208, R184, C225, R223, C274-C276	2010/03/15	01EVT
13	DDR change from x16 to x8	5, 8, 9	four 64x16 change to four 128x8.	2010/03/16	01EVT
14	two EVENT_LED driving current	16, 19, 20 21	add Q23	2010/03/16	01EVT
15	WWAN noise prevention	13	add C263-C271	2010/03/16	01EVT
16	HP_DET pull high	17	add R186	2010/03/19	01EVT
17	WW/WL LED control	21	add Q21, R226, R268, R298	2010/03/19	01EVT
18	Keyboard LED	19, 20	add C272, R224	2010/03/19	01EVT
19	Thermal shutdown pin	7, 19, 20	add TEMP_THERM#	2010/03/19	01EVT
20	0201 change to 0402.	all	capacitor x27, resistor x27	2010/03/19	01EVT
21	Thermal sensor I2C level shift MOS can't turn on	7	change to low voltage MOSFET Q20/ Q25	2010/03/19	01EVT
22	move SW2 to sub-board	19, 22	remove SW2, add R254, R255	2010/03/19	01EVT
23	PR/SI A/B type USB co-lay	16	add R197-199, R204	2010/03/19	01EVT
24	EMI request	8	add R206, C277, C278, R207	2010/03/19	01EVT
25	Nvidia request	16	add R299	2010/03/19	01EVT
26	SW1 pin 1 floating.	6	remove pull high.	2010/03/24	01EVT
27	cross talk	19, 22	add C281, C282, C283, C284	2010/03/24	01EVT
28	AUDIO connector two types	17	follow iPhone pin define.	2010/03/24	01EVT

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Item	Fixed Issue (Reason for change)	PAGE	Modify List	Date	Phase
29	USB power soft start	8	add R79, R229, C279, C280	2010/04/12	PVT
30	Speaker R/L reserve	17	swap U14.36 and 37	2010/04/12	PVT
31	EVENT_LED control by PWM signal	19	change from pin 93 to pin 21	2010/04/12	PVT
32	Y1 change to 9B03200413	7	Y1 change to 9B03200414 by sharing	2010/04/14	PVT
33	Card reader PWR issue	18	+V_SDIO_0 Enable circuit follow PAZ02	2010/04/14	PVT
34	HP issue	17	DVT reserve pin 3 and pin 4 for iPhone connector	2010/04/14	PVT
35	EMI request	17	Change R187, R188, R189, R190 to L	2010/04/14	PVT
36	eMMC trace 3.5mil issue	12	Connector to NC pin for 3.5 mil trace issue	2010/04/15	PVT
37	Follow Sirius design (WF_RST#)	8	Change WF_RST# form U1.R25 to U1.T4	2010/04/15	PVT
38	EMI request	6	Add 33 ohm on LCD_PCLK.	2010/04/15	PVT
39	ME request	9	Change connector form ACES-87213 to ACES_87036 by ME 4/16, remove 5VS & 1.8VS	2010/04/16	PVT
40	USB_ID folating issue	8	USB1_ID folating need add 100K pull-low	2010/04/16	PVT
41	Q4 Update	14	DVT reserve for MOS	2010/04/16	PVT
42	U21 Update	21	For 2.2V to 3.3V level shift	2010/04/16	PVT
43	R219 no need	19	Bypass R219	2010/04/16	PVT
44	SD-Card detect issue	18	Use PEX_RST0# to replace SD101_CD#, reserve SD101_CD#	2010/04/16	PVT
45	Vendor Suggest	16	C146 change to USB3315 Pin17 for vendor suggest(SMSC)	2010/04/16	PVT
46	SMT Suggest	18	Change R/ C 0201 to 0402	2010/04/16	PVT
47	SMT Suggest	6	Change resister 0201 to 0402	2010/04/16	PVT
48	KBC LED issue	19	Change LED PER form +3VS to +5VS	2010/04/16	PVT
49	WiFi / BT module issue	15	Exchange DAP4_DIN & DAP4_DOUT	2010/04/16	PVT
50	WiFi LED contorl issue	8 20	Use GPIO (T20 SD103_DATA5) to control it.	2010/04/16	PVT
51	HDMI connector issue	19	Change DC232000M00 to DC232000000 for HDMI ME issue	2010/04/16	PVT
52	change +3Vs enable pin to +5Vs	21	Change Q12 to Q8A	2010/04/17	PVT
53	BK_OFF soft start	13	Add R1261 & C289	2010/04/17	PVT
54	USB leakage issue	8	Uninstall R63 ,add R1262 and checge Voltage to +5Vs for USB leakage issue	2010/04/19	PVT
55	NVIDIA suggest	15	BT_WAKEUP pull low 100K.	2010/04/19	PVT
56	Key board ON/OFFBTN batton on need	19	remove ON/OFFBTN Pin on JKBI site	2010/04/19	PVT

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Item	Fixed Issue (Reason for change)	PAGE	Modify List	Date	Phase
57	NVIDIA suggest	18 13	NV review result(EM_VDD10_SD add pull down R1266, GP10_PU3 add pull down R1265 100K ohm	2010/04/19	PVT
58	WIFI /BT vendor suggest	15	Swap DAP4_DIN and DAP4_DOUT UART3_TXD and UART3_RXD	2010/04/19	PVT
59	D13	19	D13 reserve resister	2010/04/19	PVT
60	NVIDIA suggest	14	C290 reserve for EMI	2010/04/19	PVT
61	Crosstalk can't move	19	Add C after crosstalk trace	2010/04/20	PVT
62	WIFI /BT vendor suggest	15	exchange RTS / CTS for Wifi vendor suggest	2010/04/20	PVT
63	NVIDIA suggest	06	Reverse T20.T25 to EM_VDD_PNL , T20.V25 to LVDS_SHTDN#	2010/04/20	PVT
64	EC PWR	19	Reserve 3VL for EC	2010/04/20	PVT
65	Microphone short current	17	MICBIAS add R1276 3.9K Microphone short current	2010/04/21	PVT
66	Codec status pin	8 17	Add T20.R25 to codec T20_codec (R1277)	2010/04/21	PVT
67	S3 PWR modify PVT	6 8 21	S3 PWR modify PVT	2010/04/21	PVT
68	NVIDIA debug Pin	20	Add SYSTEM_RESET# to JP1 for NVIDIA debug	2010/04/22	PVT
69	Reserve HSB2 to WiFi only trace	16	Reserve HSB2 to WiFi only trace	2010/04/26	PVT
70	NVIDIA suggest	19	Add D18 - reserve R1295 - R1296 - R1297.	2010/04/27	PVT
71	NVIDIA suggest	14	Change PWR for S3	2010/04/29	PVT
72	SD PWR change	16	SD PWR LDO change to SA00003AR00	2010/04/30	PVT
73	EMI suggest	14	Add R between HDMI CLK & Date.	2010/04/30	PVT
74	Thermal status on S3	7	Tharmal TEMP_THERM# Pull to +3Valw	2010/05/03	PVT
75	Add PWR to JP1 for debug	9	Add PWR to JP1 for debug	2010/05/03	PVT
76	HDMI & LVDS have same I2C address.	13	Change LVDS I2C form DDC channel to GEN1 channel	2010/05/04	PVT
77	WiFi PWR.	14	Change SD10 PWR to +3VS_S3	2010/05/04	PVT
78	ME LED issue	20	Change LED to SC500005000	2010/05/05	PVT
79	EMI issue	21	Add 680P on JPWR1 for EMI issue	2010/05/05	PVT
80	Cost down	19	KBC_S3 change to KBC Pin6 (OC) for cost plan.	2010/05/06	PVT
81	NV suggest	09	C53 change to 100K ( SD028100380 ) , remove R93	2010/05/26	PVT
82	EVENT_LED issue	20	EVENT_LED change PWR form +5Vs to +5Valw,R276 change to 100 ohm for EVENT_LED can't light on S3 issue.	2010/05/26	PVT
83	ESD suggest	17	Add Diode on Audio jack Pin 4 for ESD issue	2010/05/26	PVT
84	Camera short to B+ issue	22	Change JLVDS Pin24 to NC	2010/05/26	PVT

Security Classification	Compal Secret Data		Title	
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Item	Fixed Issue (Reason for change)	PAGE	Modify List	Date	Phase
85	Cost down	7	R238 & R239 change to 0402 part	2010/05/26	PVT
86	Toshiba eMMC vendor suggest	12	Add reset Pin to reset eMMC.	2010/05/27	PVT
87	Toshiba eMMC vendor suggest	12	Signal Pin can't connect to NC Pin for eMMC 4.4 interface.	2010/05/27	PVT
88	Add +3VS_S3 to eMMC	12	Add +3VS_S3 to eMMC for current support back up solution	2010/05/27	PVT
89	Audio reset Pin	17	Add level shift circuit to reset Pin for Audio reset.	2010/05/27	PVT
90	eMMC clock overshoot and undershoot issue	12	Change R100 to 63.4 ohm	2010/05/27	PVT
91	Power consumption	19	Reserve R1322 for +3VL PWR to KBC ROM.	2010/06/04	Pre-MP
92	Toshiba suggest	17	Reserve 0 ohm resister on HP_OUT_L / R	2010/06/04	Pre-MP
93	EMI issue	17	Change D19 to SCA00001A00	2010/06/04	Pre-MP
94	3G W_DISABLE# issue	15	Change C189 to 0 ohm	2010/06/04	Pre-MP
95	eMMC cold boot hang issue	12	Change PWR to +3VS_S3 (remove R93, install R1313 )for eMMC cold boot issue (Pre-MP 7/8)	2010/07/08	Pre-MP
96	Audio "bo" noise when system trun off on battery mode.	17	Remove Q9, add C310(0.47uF)	2010/07/08	Pre-MP
97	ESD issue	7	Change R50 to SM01000D100	2010/07/08	Pre-MP
98	Mini USB change to client only.	8	Add R1303 and remove D1,D2,R1317,C311 ,change L23 to 0 ohm	2010/07/08	Pre-MP
99	power LED flash one time while unplug/plug AC	20	Add R230 and connect to 3V/5V PGOOD to discharge LED power.	2010/07/08	Pre-MP
100	AC in event LED flash issue	19	Add C312 on EVENT_LED_Q.	2010/07/08	Pre-MP
101	LED lightness issue	20	Change R276 to 470 ohm for LED lightness issue	2010/07/08	Pre-MP
102	RF issue	21	Change R121 · R122 to SM01000ER00	2010/07/15	Pre-MP
103	RoHS issue	21	Change R1253 to SM01000ER01	2010/07/15	Pre-MP