

# Compal Confidential

## PAV70 DDR3 Schematics Document

### Intel Pineview Processor with Tigerpoint + DDRIII

2010-06-25

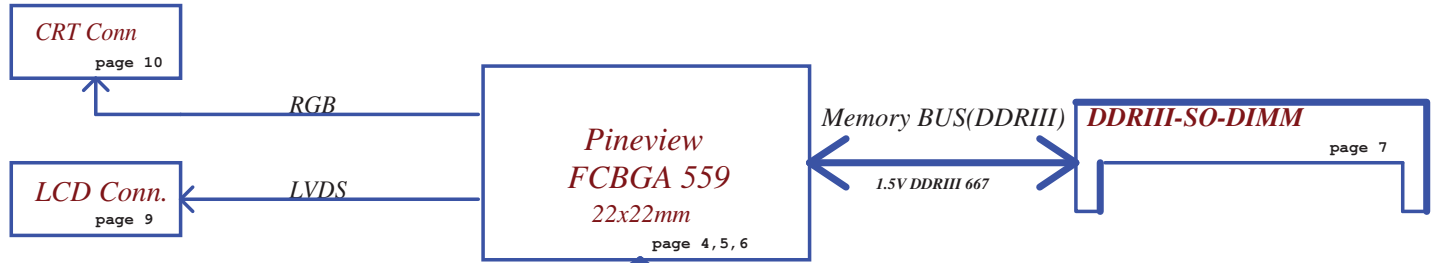
REV: 1.0

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				Size B	Document Number	Rev
				Date:	Friday, June 25, 2010	Sheet 1 of 39

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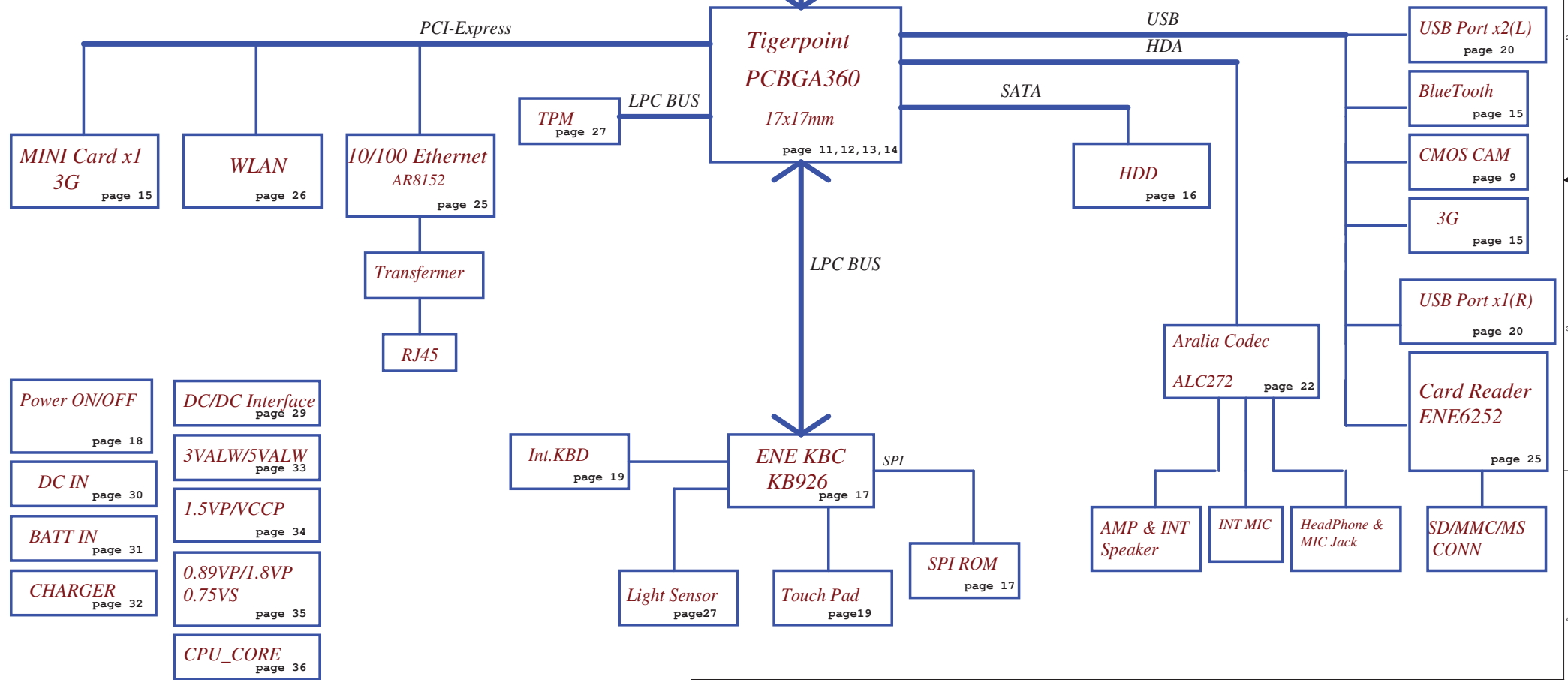
Model Name : PAV50  
File Name : LA-6421P

Clock Generator  
CK505  
page 8



Thermal Sensor  
EMC1402  
page 5

DMI  
X2 mode  
GEN1



Security Classification	Compal Secret Data	
Issued Date	2006/08/18	Deciphered Date 2007/8/18

Compal Electronics, Inc.		
Title Block Diagrams		

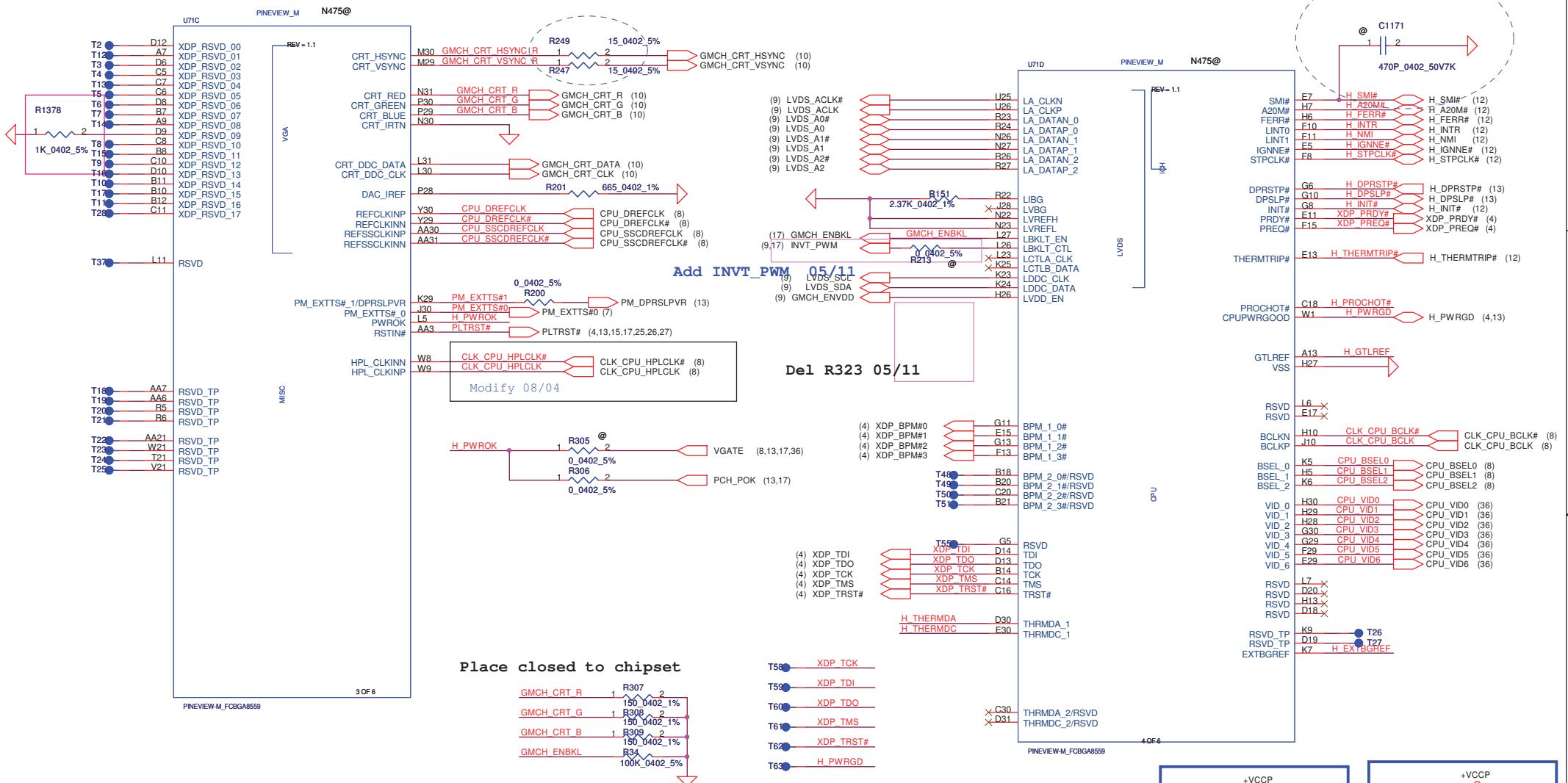
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Size B	Document Number LA-6421P	Rev 0.1
Date:	Friday, June 25, 2010	Sheet 2 of 39

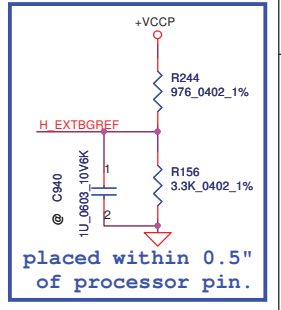
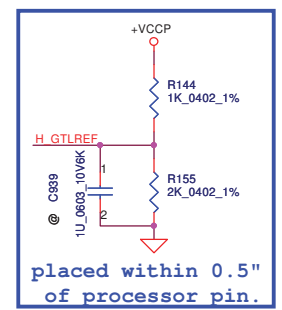
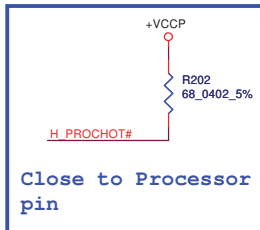
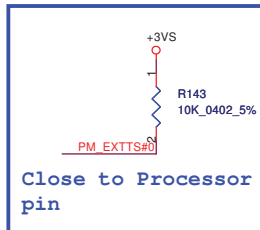
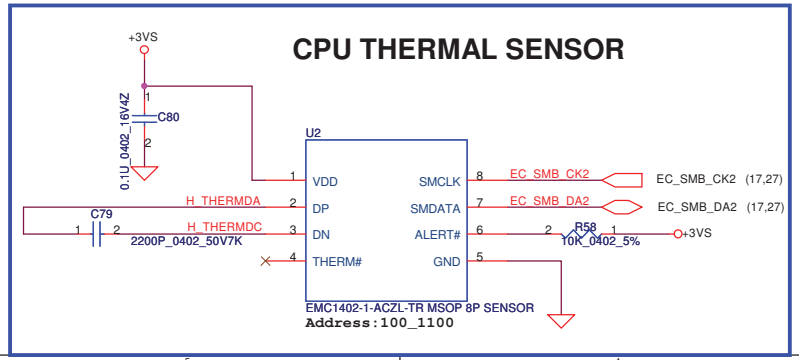




Add 470PF on H\_SMI# for known issue 07/08



H\_THERMDA, H\_THERMDC routing together.  
Trace width / Spacing = 10 / 10 mil



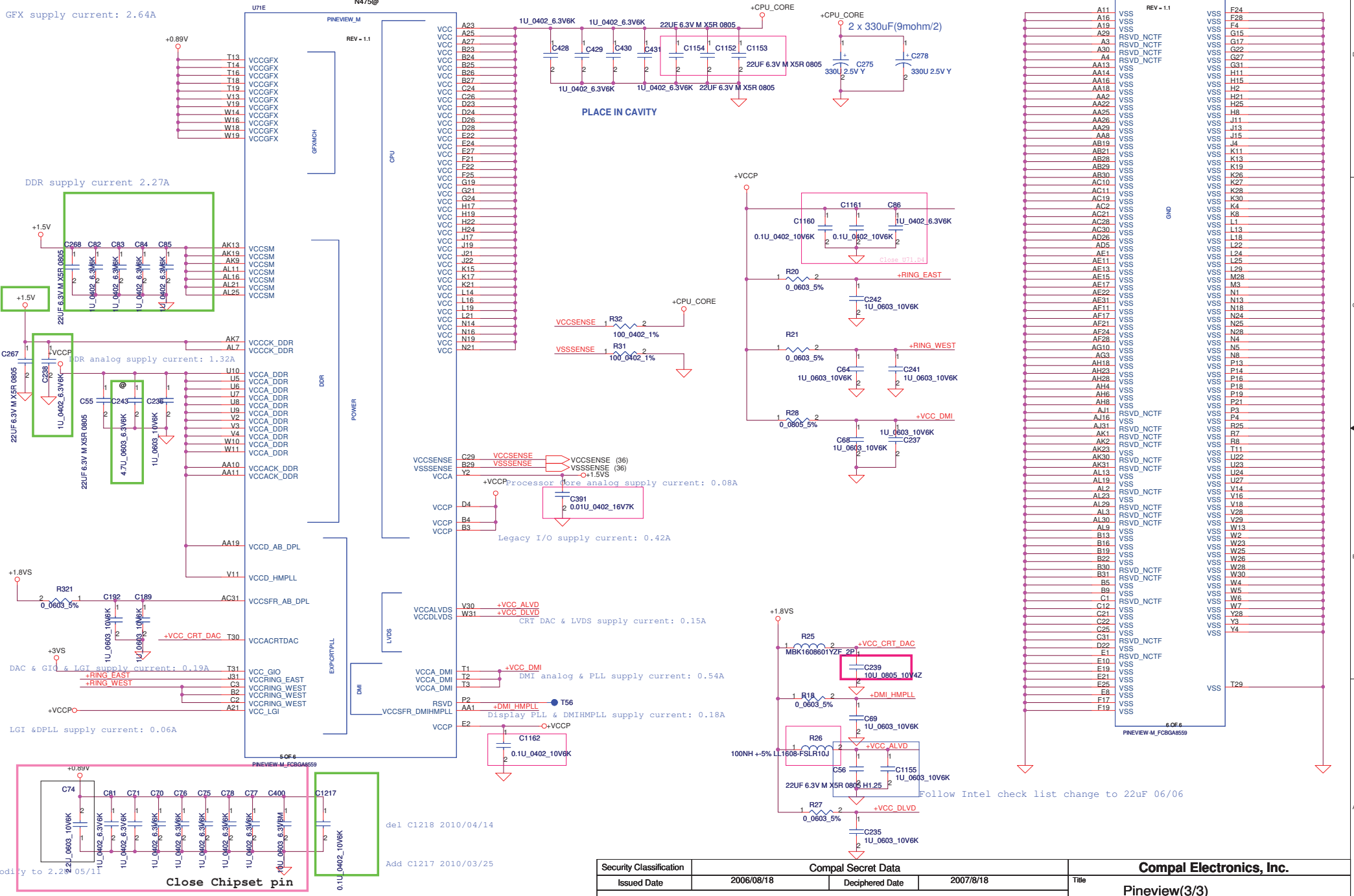
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Size B	Document Number	LA-6421P		Rev	0.1
Date:	Thursday, June 03, 2010	Sheet	5	of	39

GFX supply current: 2.64A

DDR supply current 2.27A

DAC & LGI supply current: 0.19A

LGI & PLL supply current: 0.06A



Modify to 2.28 05/11

Close Chipset pin

del C1218 2010/04/14

Add C1217 2010/03/25

PLACE IN CAVITY

Processor core analog supply current: 0.08A

Legacy I/O supply current: 0.42A

CRT DAC & LVDS supply current: 0.15A

DMI analog & PLL supply current: 0.54A

Display PLL & DMIIHPLL supply current: 0.18A

Follow Intel check list change to 22uF 06/06

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Pineview(3/3)		
Title	Size	Rev
Custom	Document Number	0.1
	LA-6421P	
Date:	Tuesday, June 22, 2010	Sheet 6 of 39

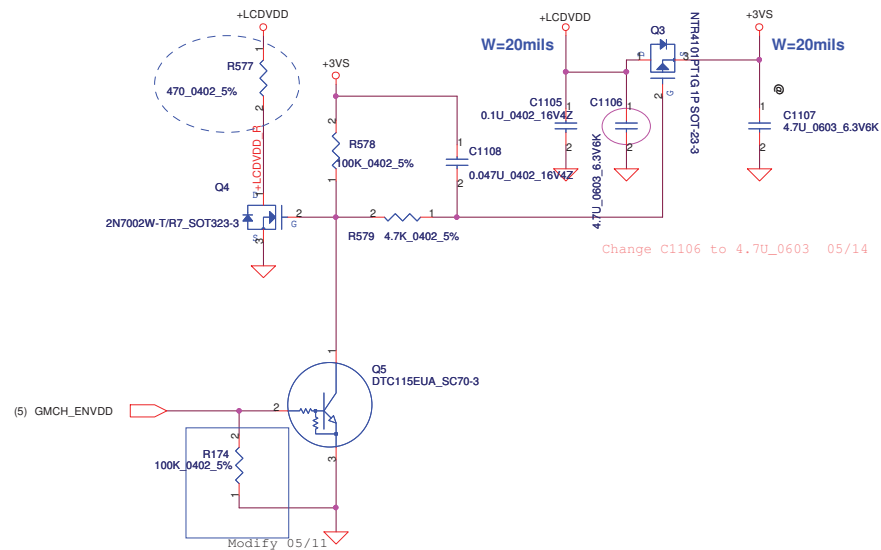






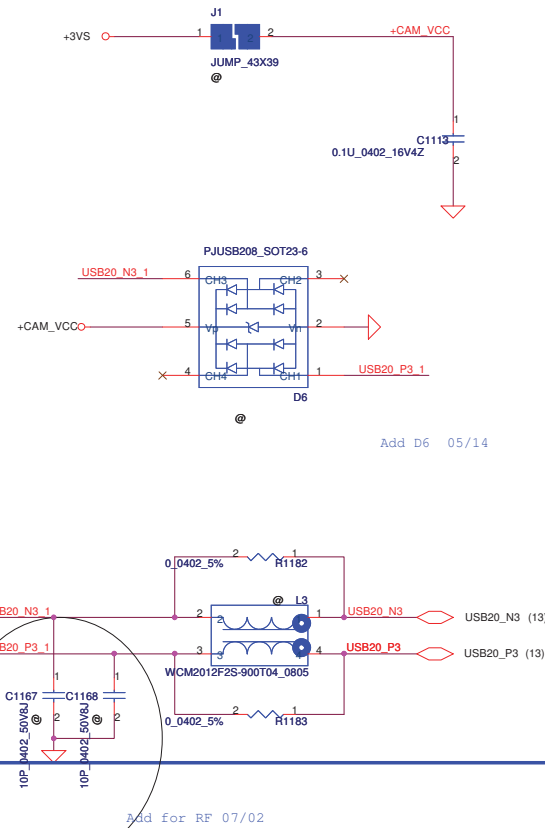
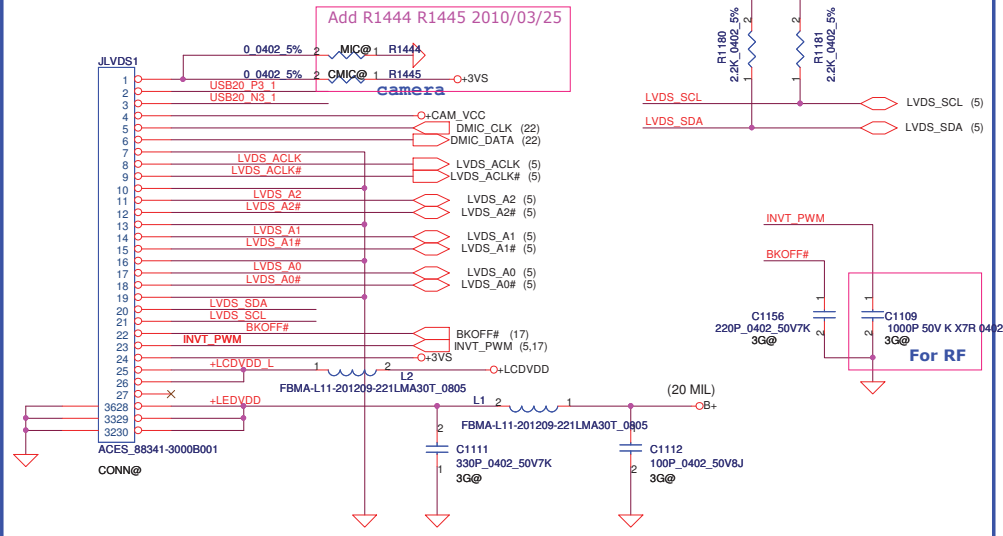
### LCD POWER CIRCUIT

Change R577 to 0402 SIZE 06/16

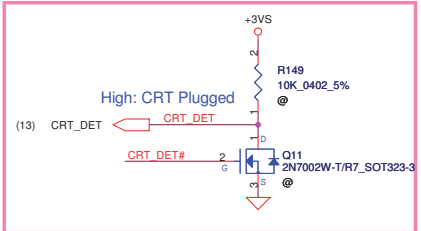
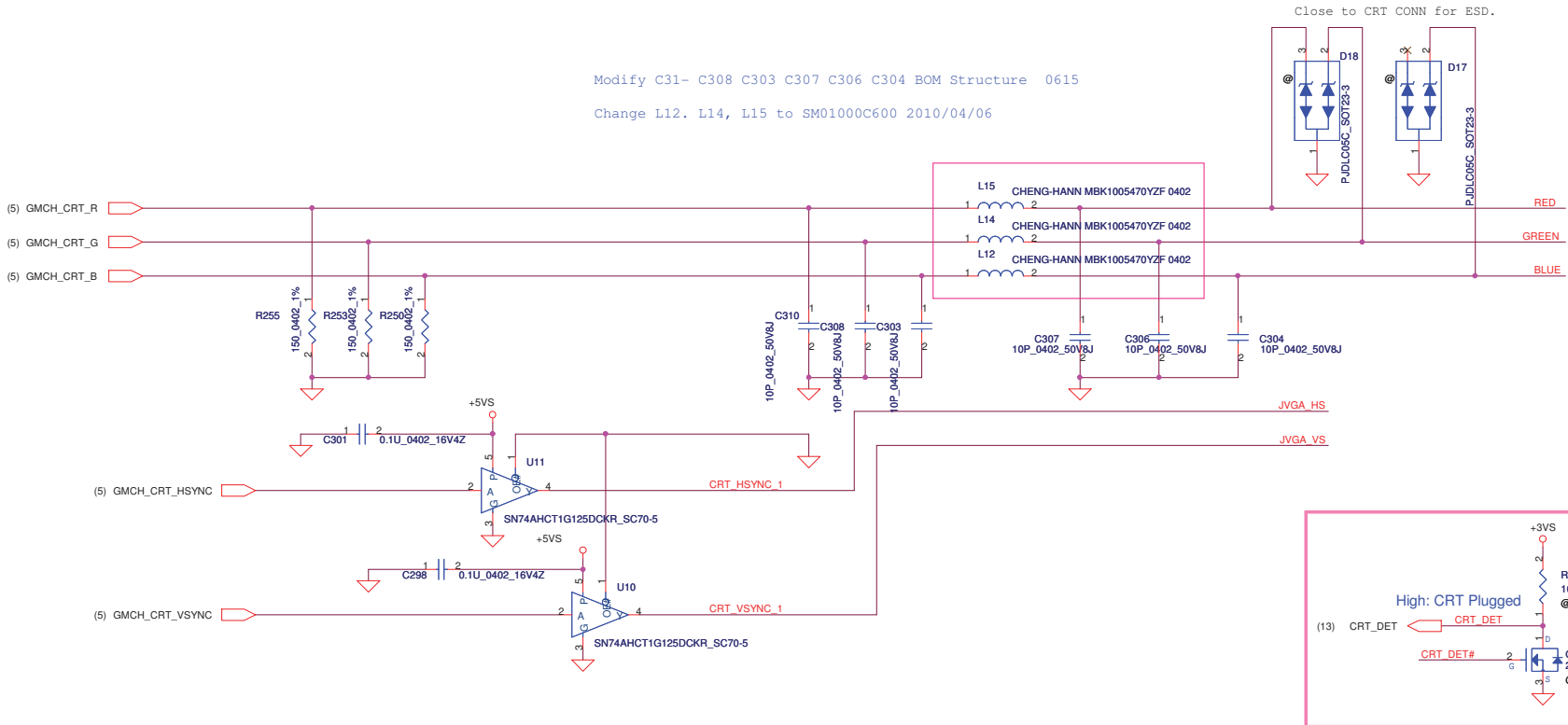


### CMOS & LCD/PANEL BD. Conn.

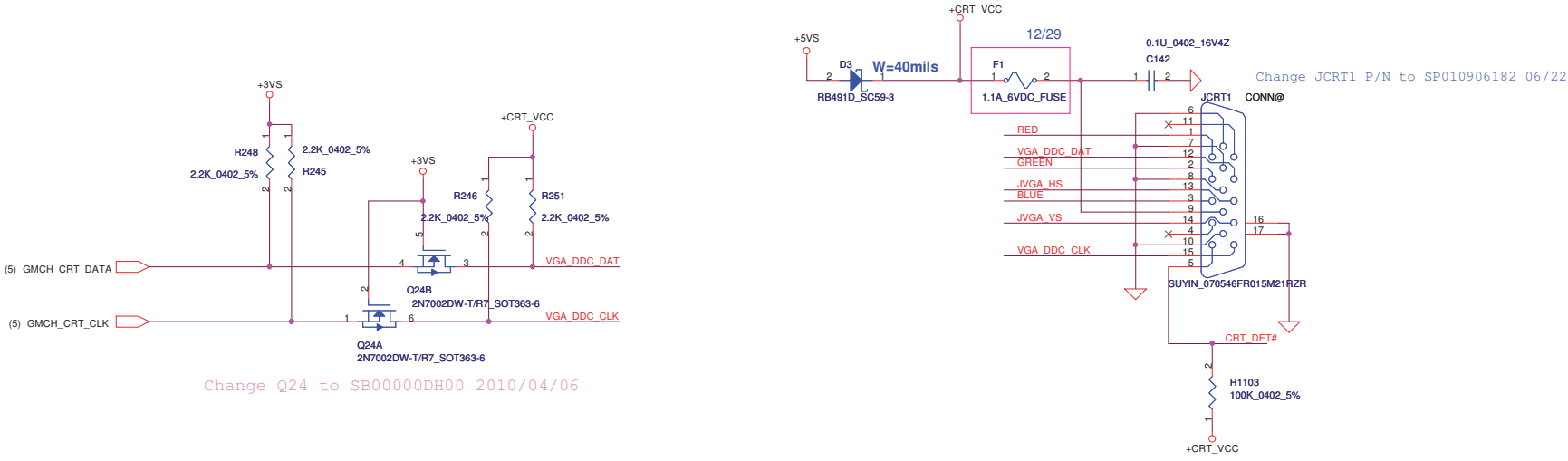
Modify JLVDS1 08/04



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				LVDS /INVERTER		
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				LA-6421P		
				Date:	Friday, June 25, 2010	Sheet 9 of 39

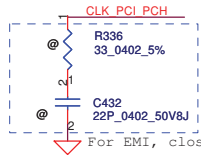


**CRT PORT**

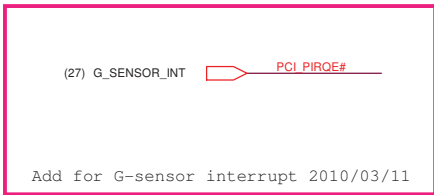


Change Q24 to SB00000DH00 2010/04/06

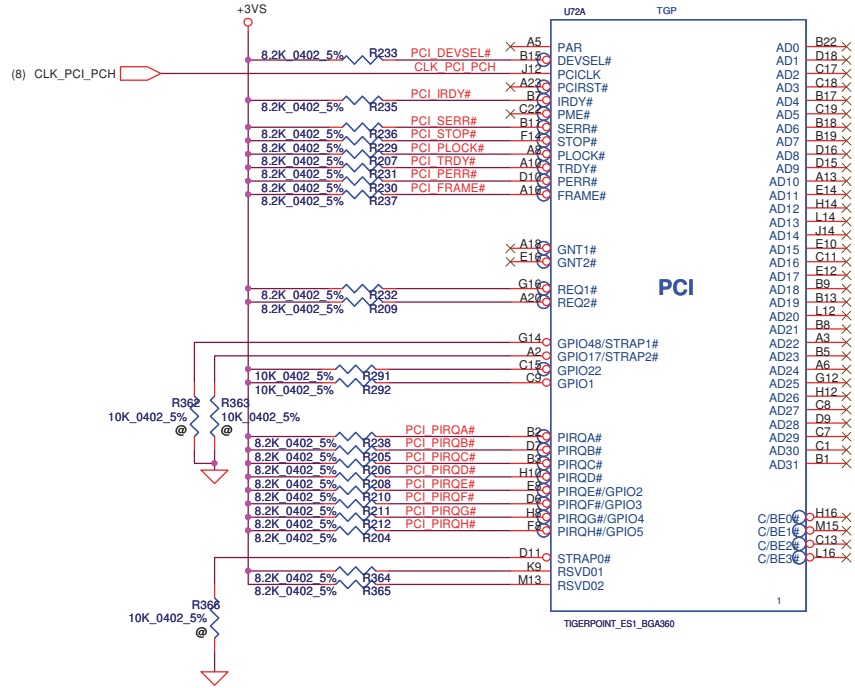
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Size B	Document Number			Rev 0.1	
				LA-6421P	
Date: Tuesday, June 22, 2010				Sheet 10 of 39	



For EMI, close to TigerPoint

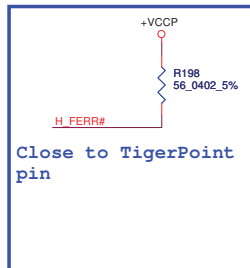
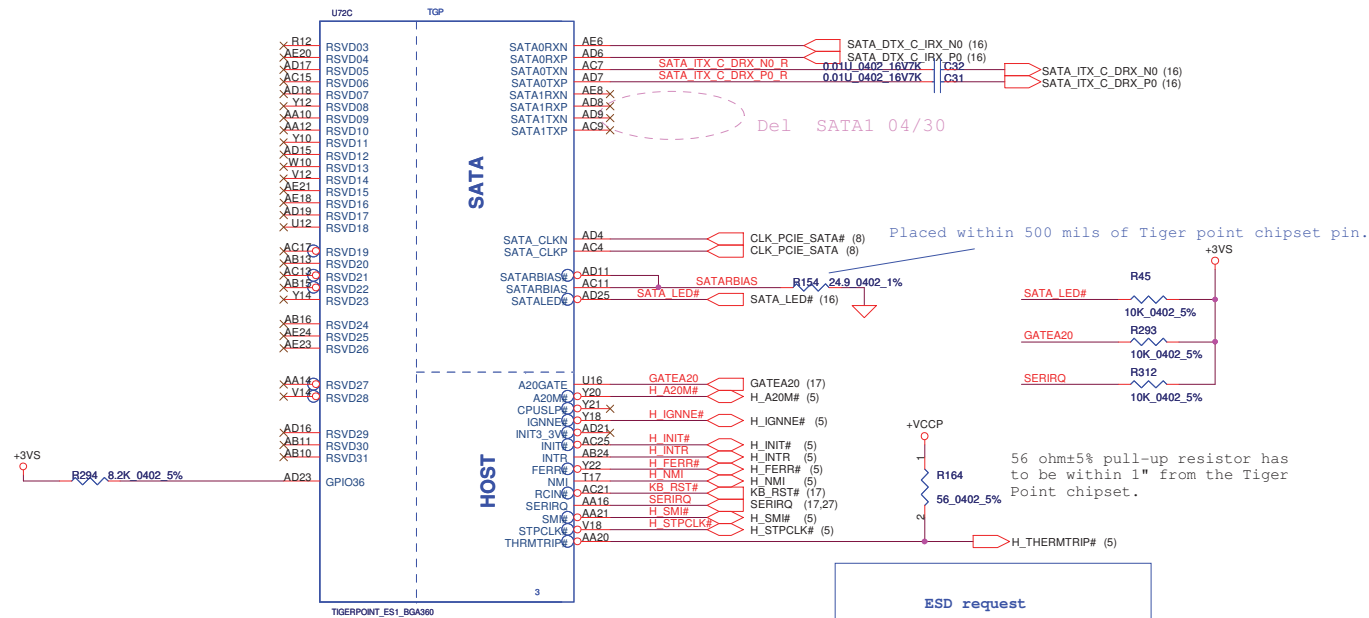


Add for G-sensor interrupt 2010/03/11



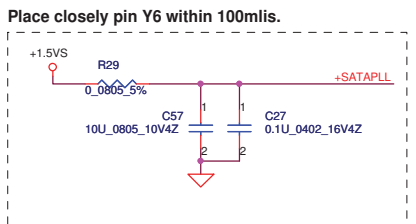
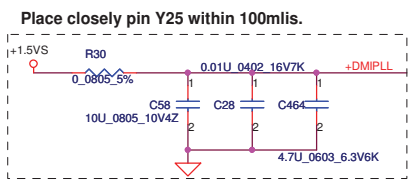
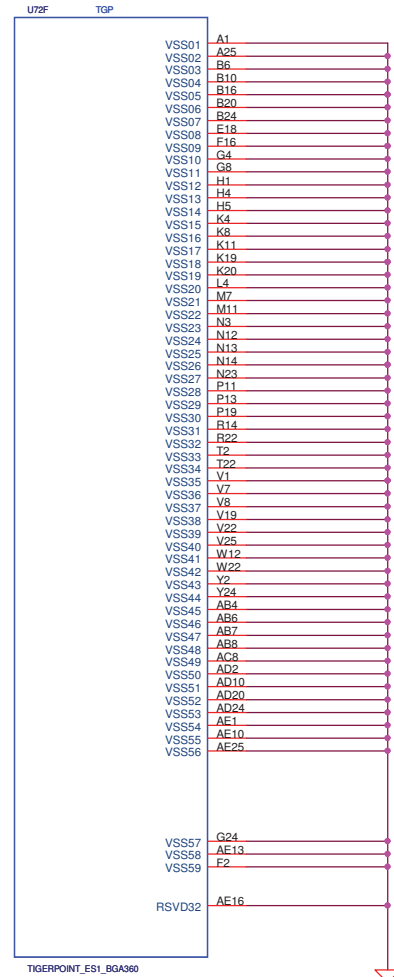
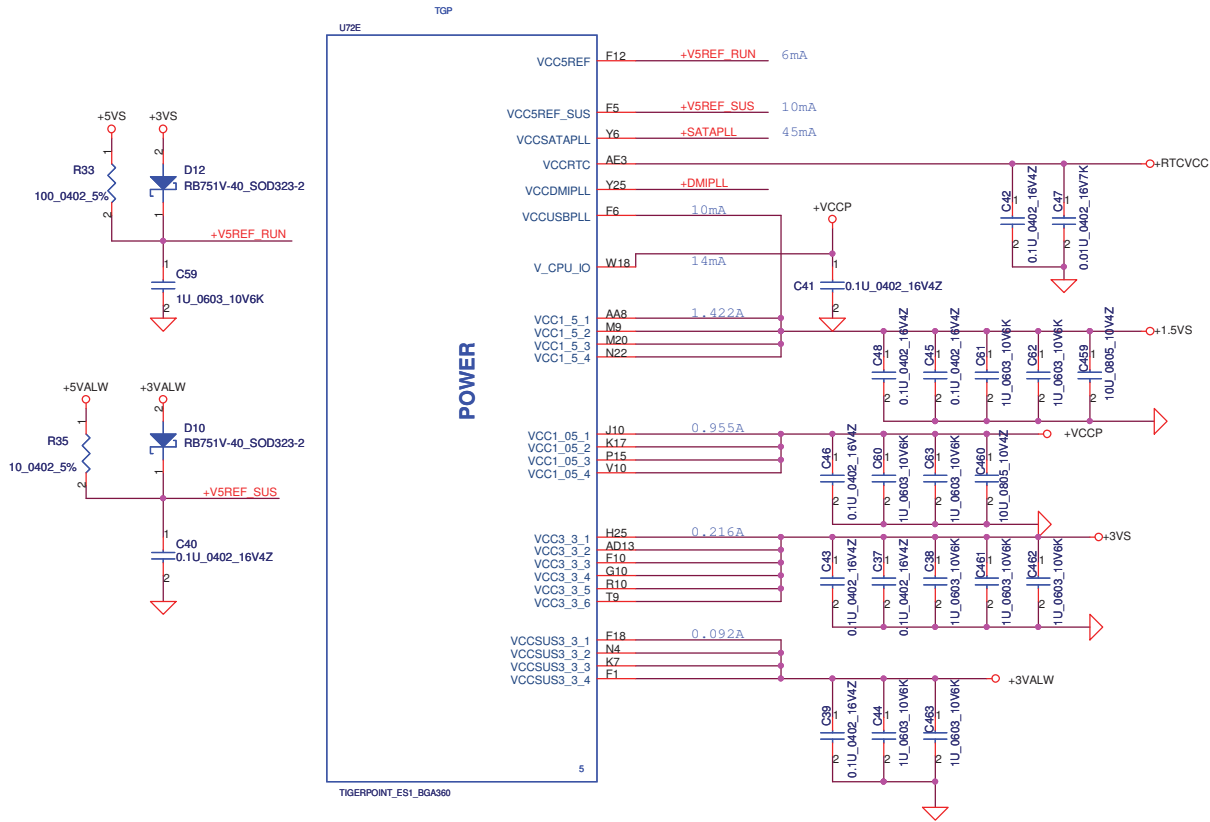
STRAP2# GPIO17	STRAP1# GPIO48	Boot BIOS
0	1	SPI
1	0	PCI
1	1	LPC

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				Date:	Thursday, June 03, 2010
				Sheet	11 of 39
				Rev	0.1



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				Date	Thursday, June 03, 2010
				Sheet	12 of 39
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				Document Number	LA-6421P
				Date:	Thursday, March 25, 2010
				Sheet	14 of 39

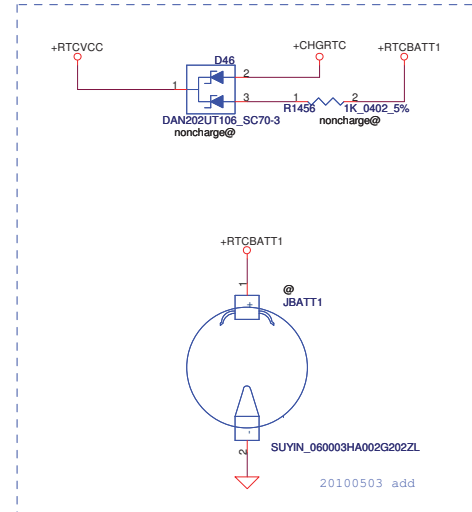
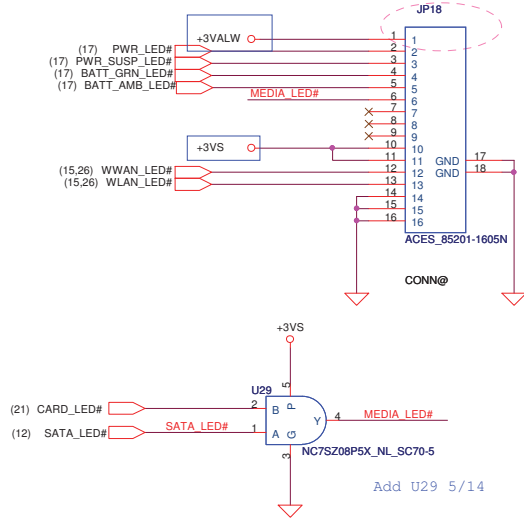


ADD LED PCB CONN 06/12

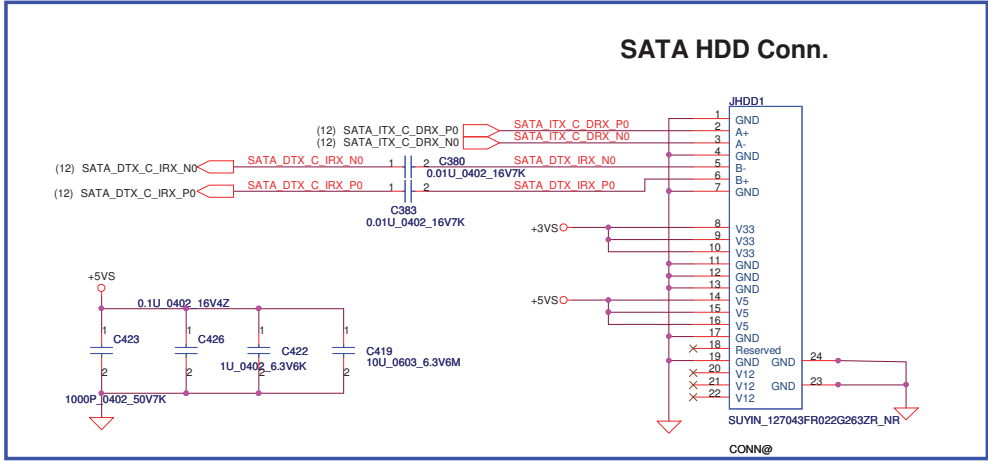
Change JP18 to NEW P/N 06/23

09/03 Change +5VALW , +5VS to +3VALW +3VS

LED PCB CONN



SATA HDD Conn.

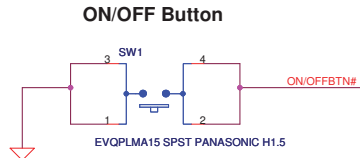
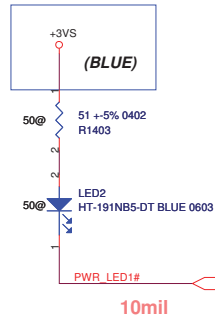


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				Date: Thursday, June 03, 2010	Sheet 16	of 39

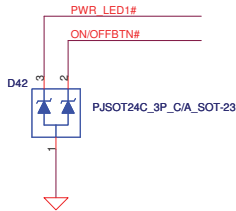
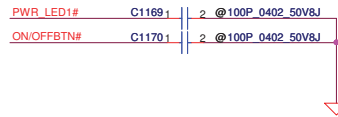




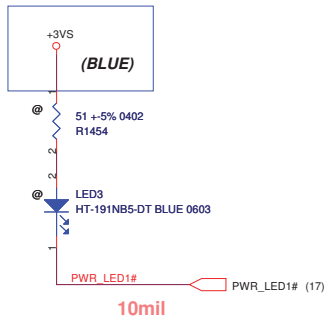
Add For NAV50 07/06  
09/03 Change +5VS to +3VS



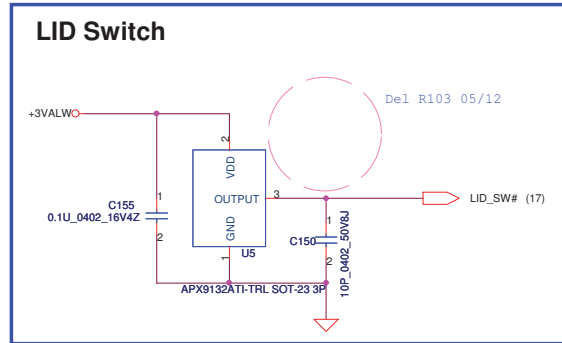
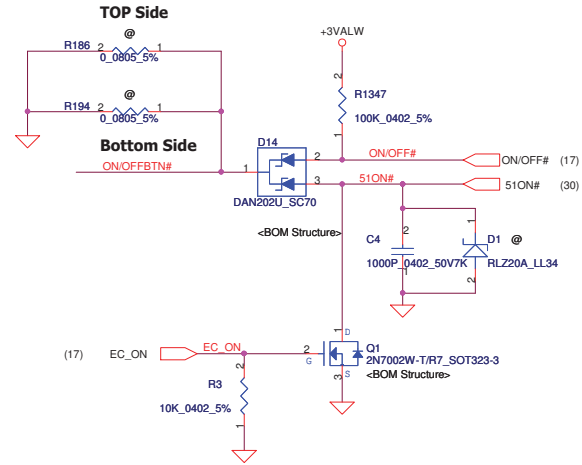
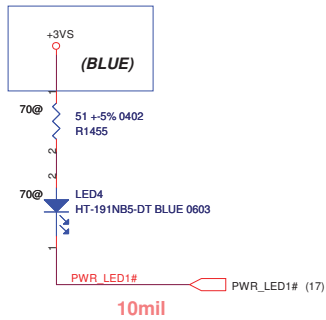
**FOR EMI**



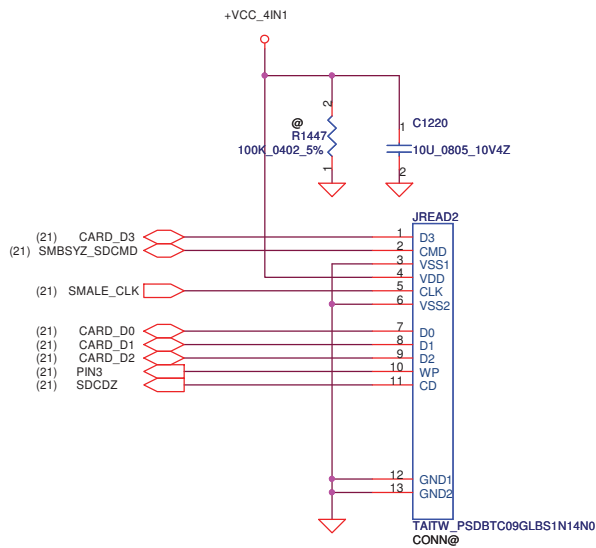
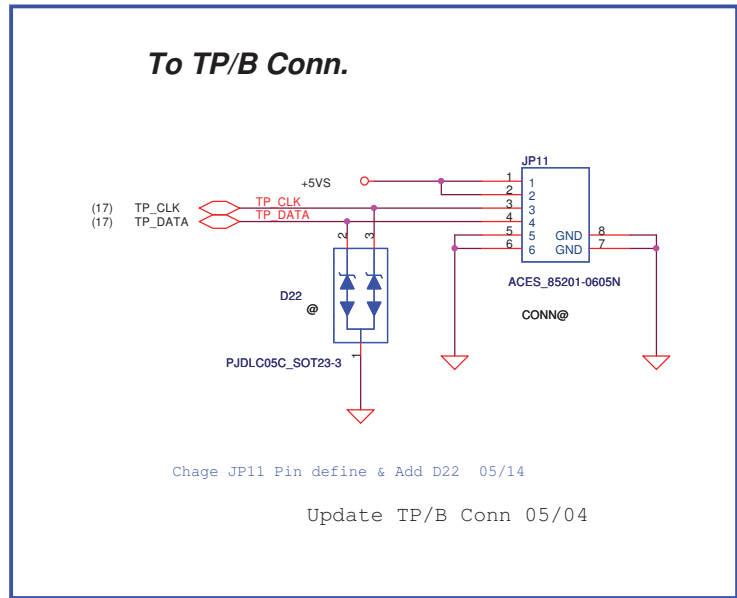
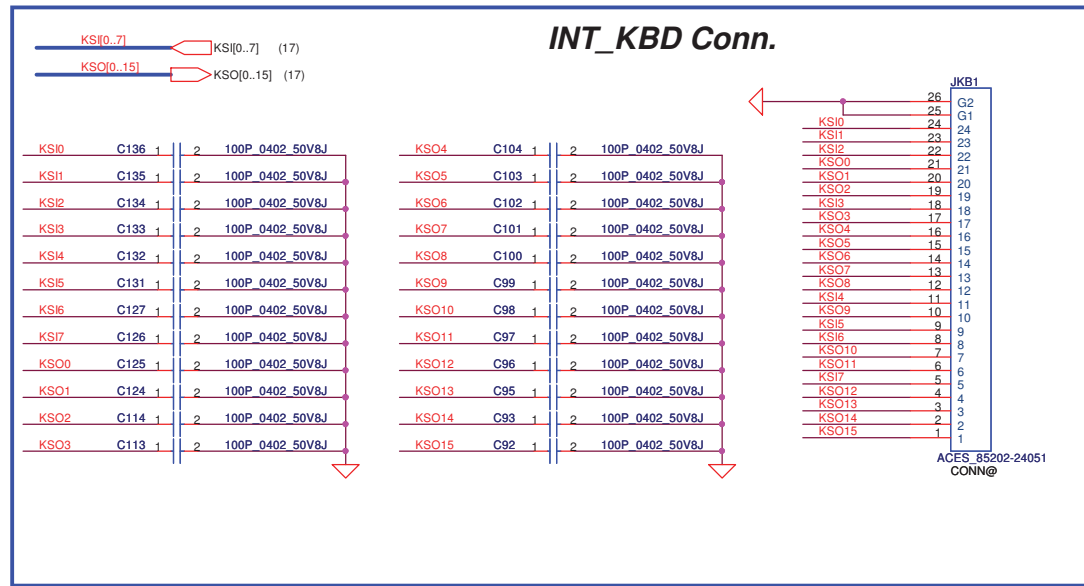
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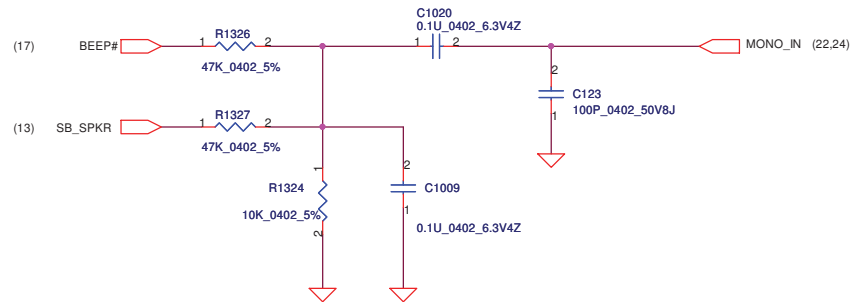
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Size	Document Number		Rev	
B	LA-6421P		0.1	
Date:	Thursday, June 03, 2010	Sheet	18	of 39

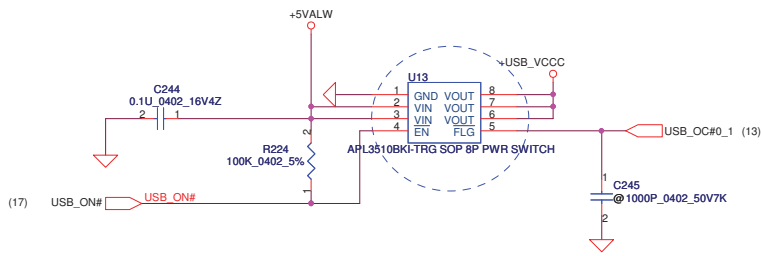


### 6/26 Add circuit



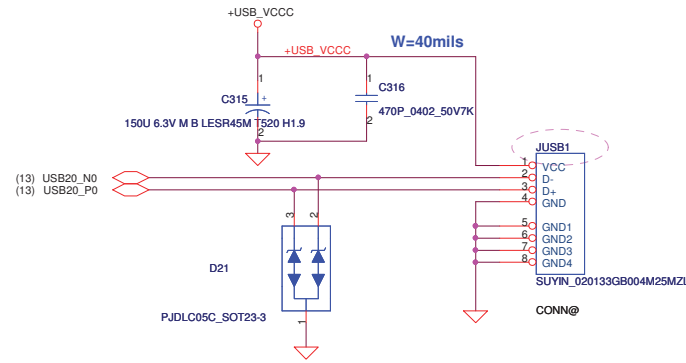
Modify MONO\_IN schematic, move some parts to I/O Board, Add the MONO\_IN\_R on M/B 06/25

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				KB Conn/TP/CR Conn	
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Size	Document Number			Rev	
B	LA-6421P			0.1	
Date:	Tuesday, June 22, 2010		Sheet	19	of 39

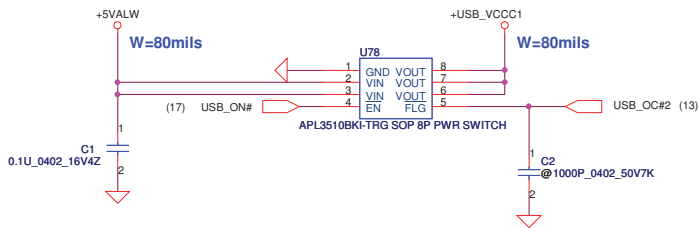
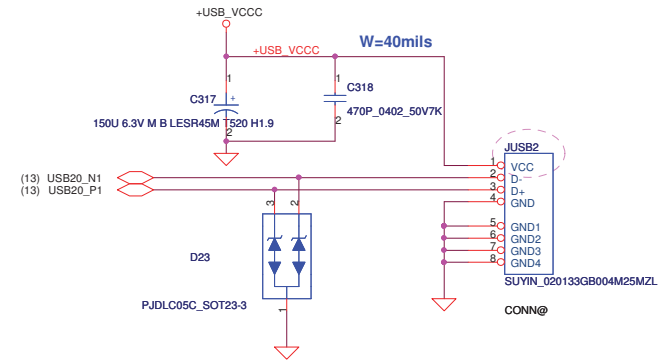


Change JUSB1 JUSB2 to NEW P/N SP010906181 06/23

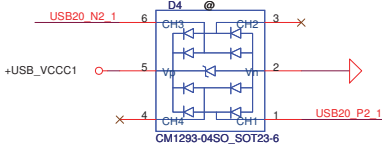
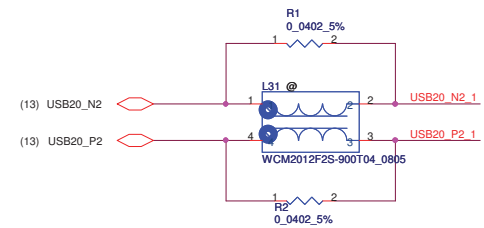
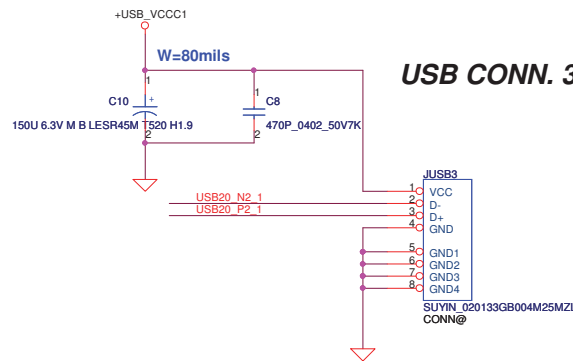
### USB CONN.1



### USB CONN.2

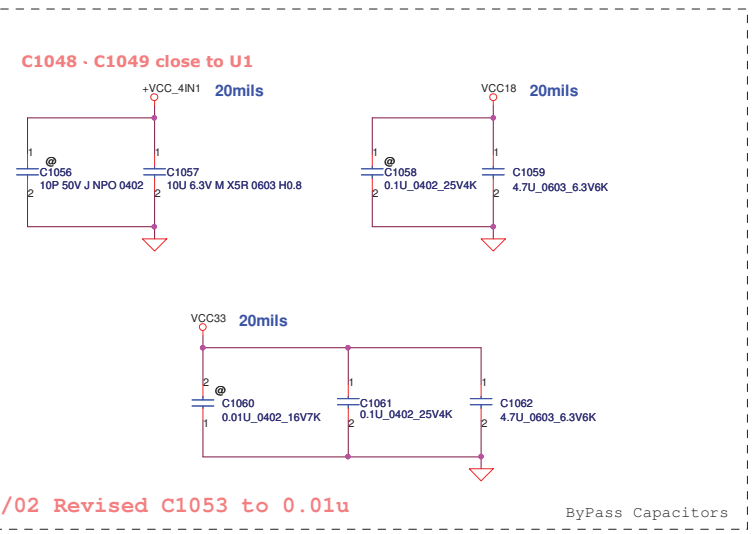
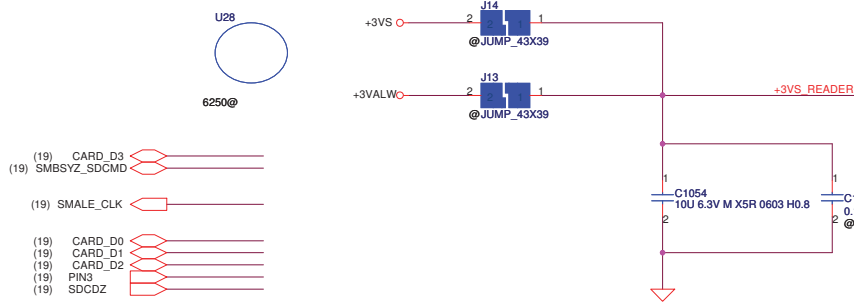


### USB CONN. 3

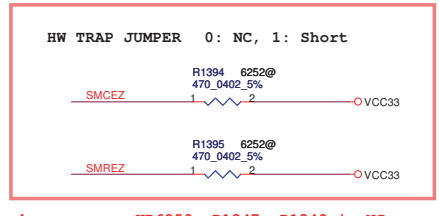


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				Size B	Document Number	Rev 0.1
				LA-6421P		
				Date:	Thursday, June 03, 2010	Sheet 20 of 39

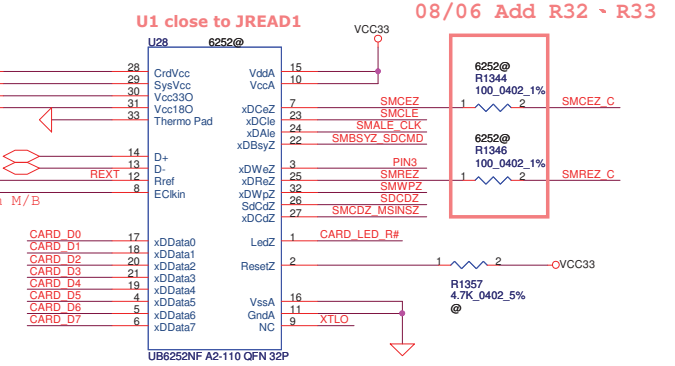
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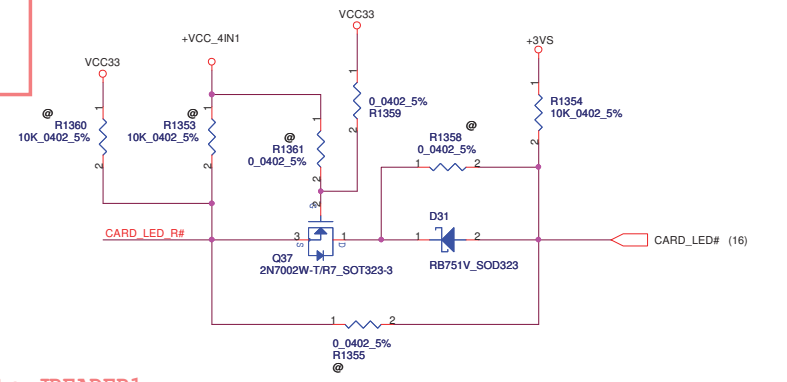
08/06 Add R1347 ~ R1348



08/06 Add R32 ~ R33

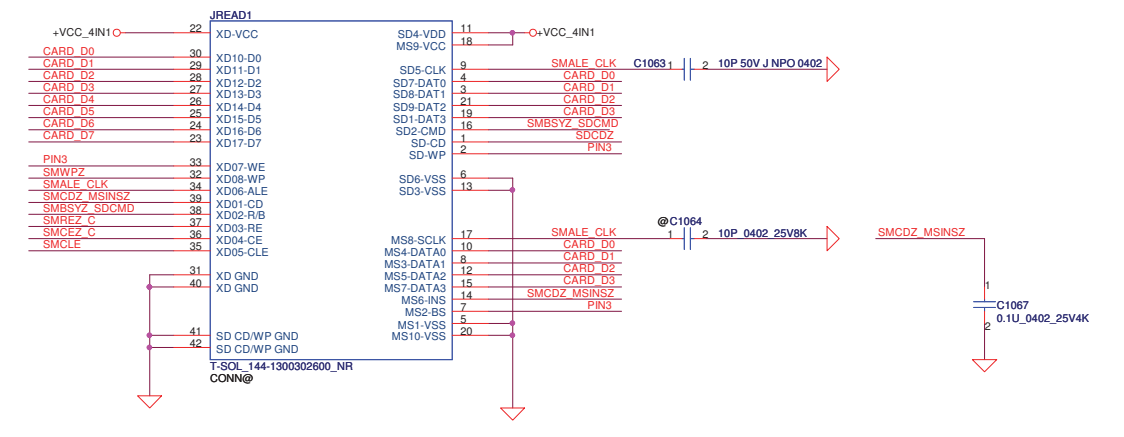


If use external crystal (Y4), U1 will change UB6252

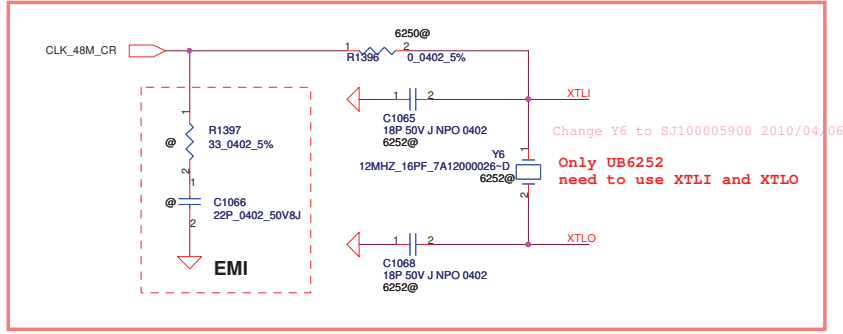


07/02 Update JREADER1

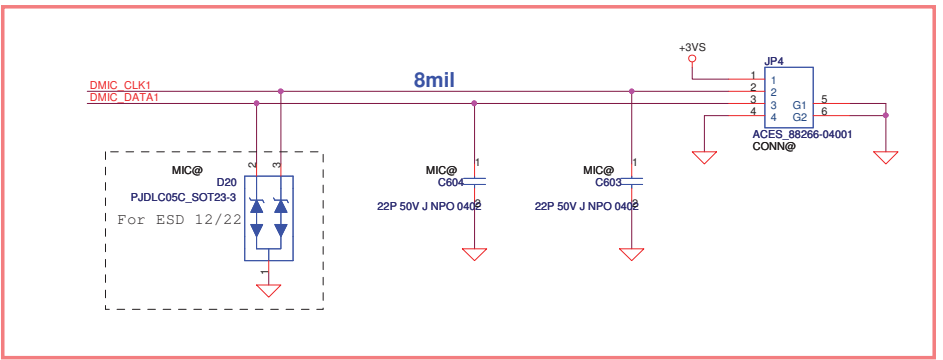
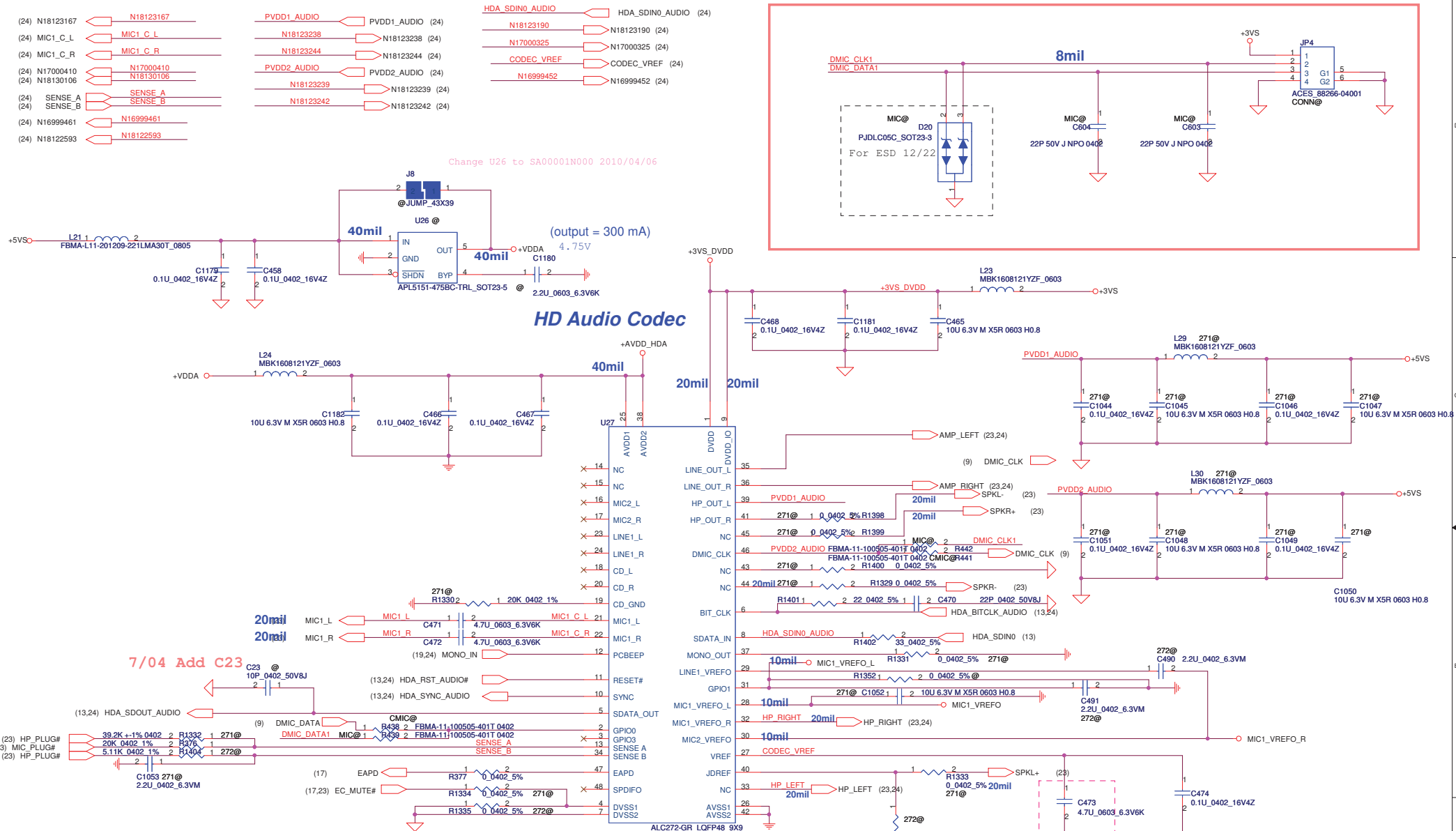
Card Reader Connector



4/30 Add CLK\_SD\_48M



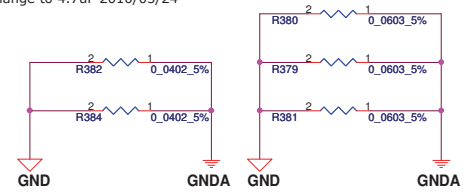
Security Classification	Compal Secret Data			Title		
Issued Date	2009/01/22	Deciphered Date	2009/11/20	Card reader		
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				Custom	LA-6421P	0.1
				Date:	Thursday, June 03, 2010	1 Sheet 21 of 39

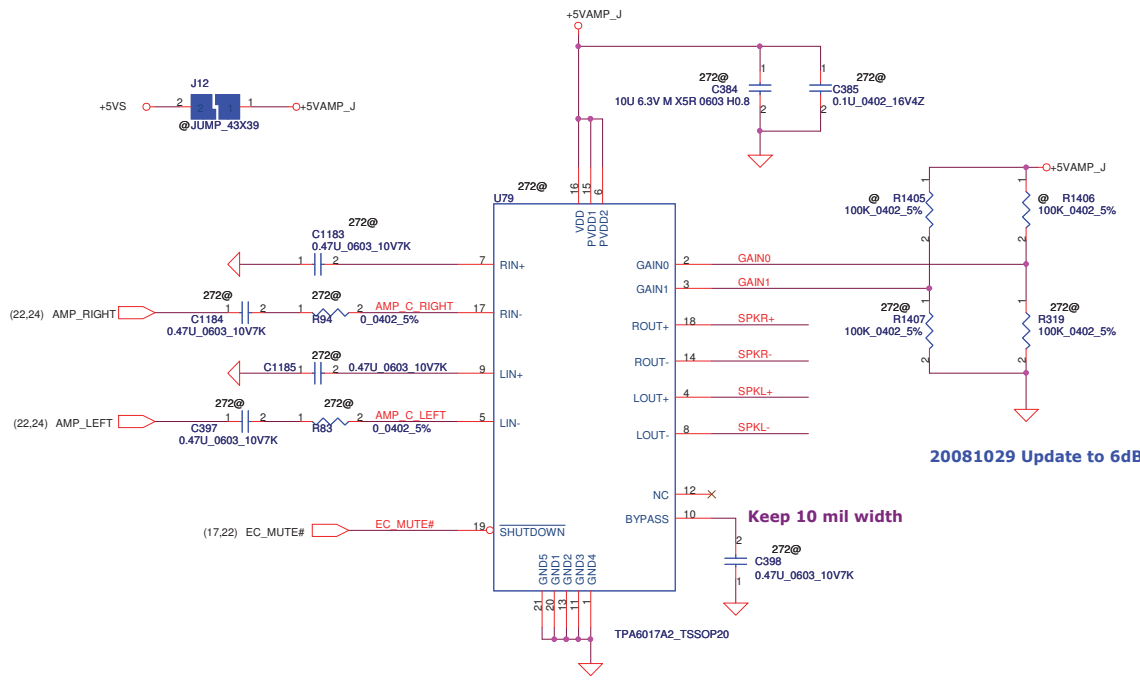


Sense Pin	Impedance	Codec Signals
SENSE A	39.2K	PORT-A (PIN 39, 41)
	20K	PORT-B (PIN 21, 22)
	10K	PORT-C (PIN 23, 24)
	5.1K	PORT-D (PIN 35, 36)
SENSE B	39.2K	PORT-E (PIN 14, 15)
	20K	PORT-F (PIN 16, 17)
	10K	PORT-G (PIN 43, 44)
	5.1K	PORT-H (PIN 45, 46)

Change to SA00002CI20 ALC272-VA2-GR

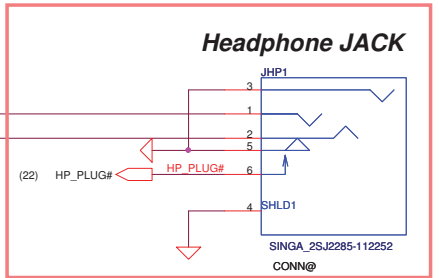
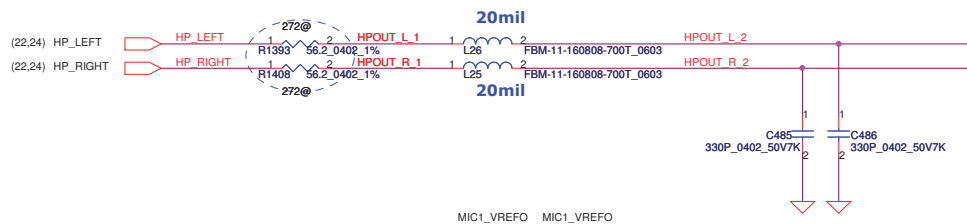
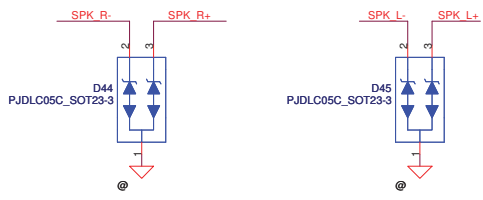
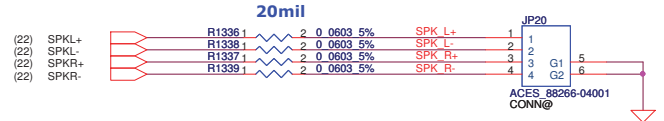
Follow Vendor check change to 4.7uF 2010/05/24



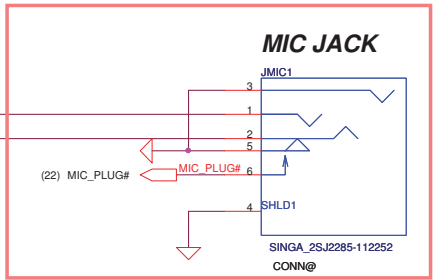
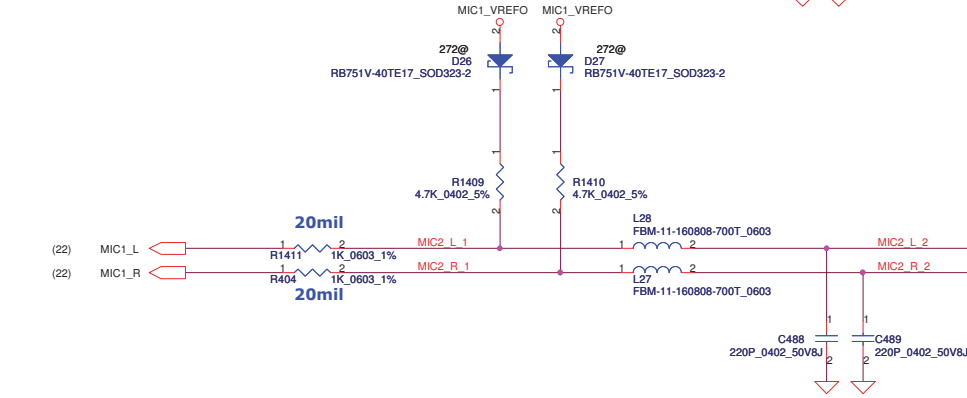


20081029 Update to 6dB

### Int. Speaker Conn.



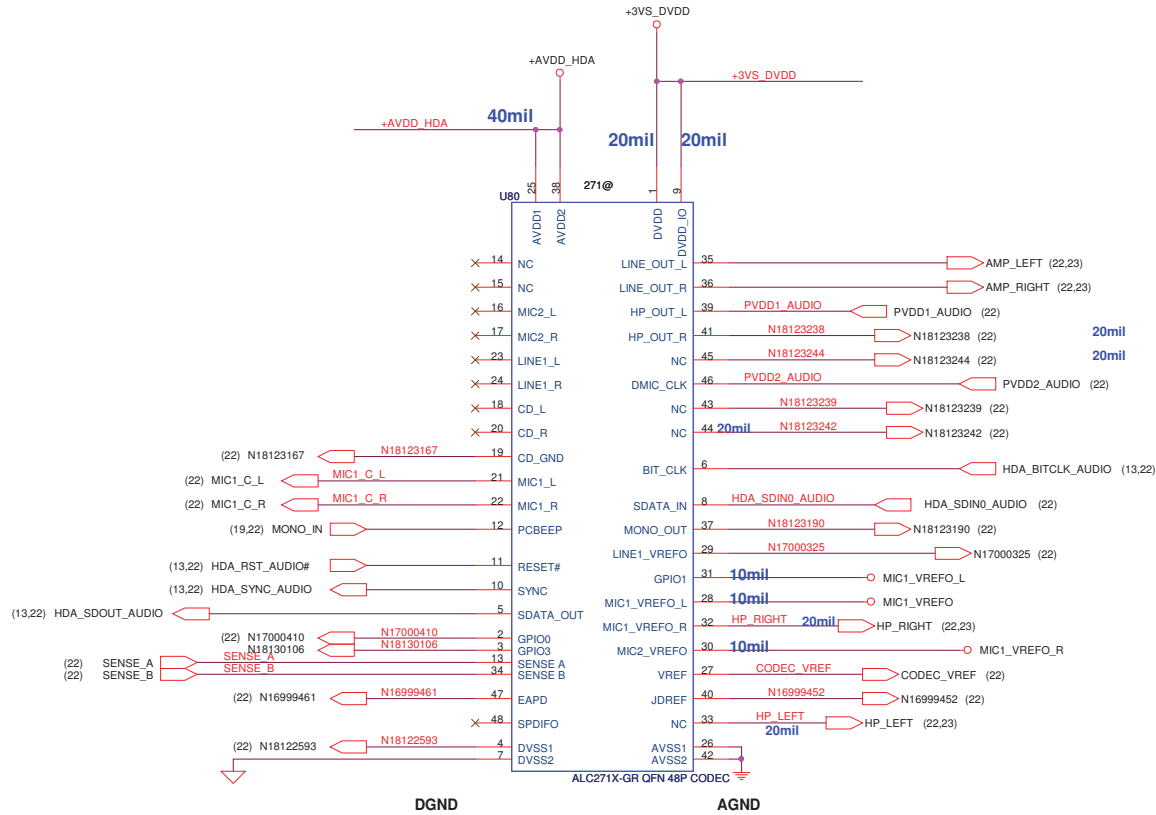
6/19 Update Headphone connector



6/19 Update MIC connector

<b>Compal Electronics, Inc.</b>			
Title	<Title>	<b>Amplifier &amp; Audio Jack</b>	
Size	Document Number		
Customer	LA-6421P	LA-6222P	Rev 0.1
Date:	Tuesday, June 22, 2010	Sheet 23	of 39

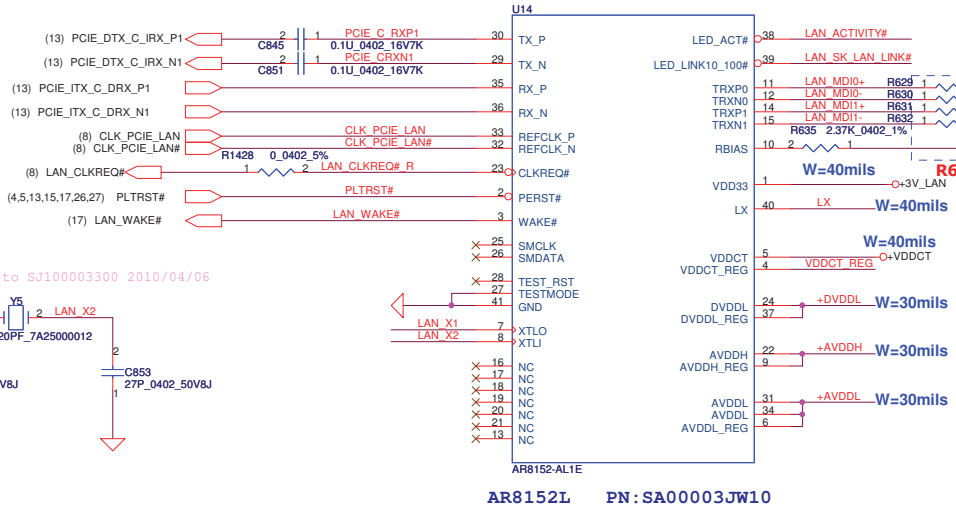
# HD Audio Codec



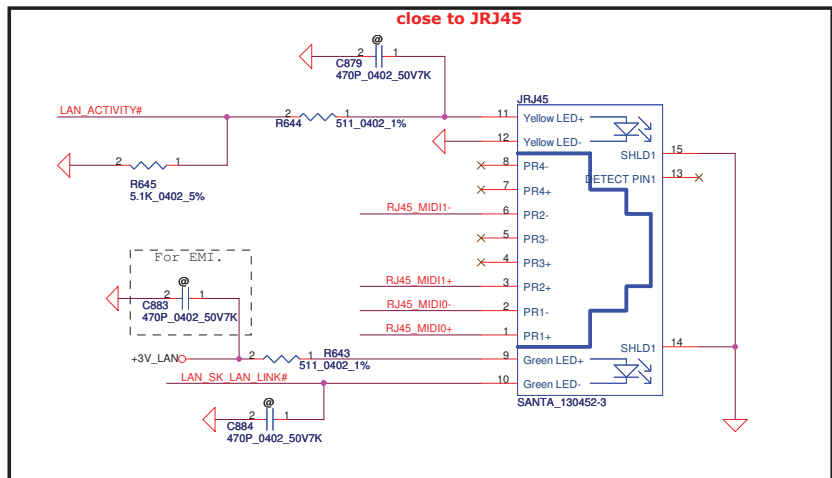
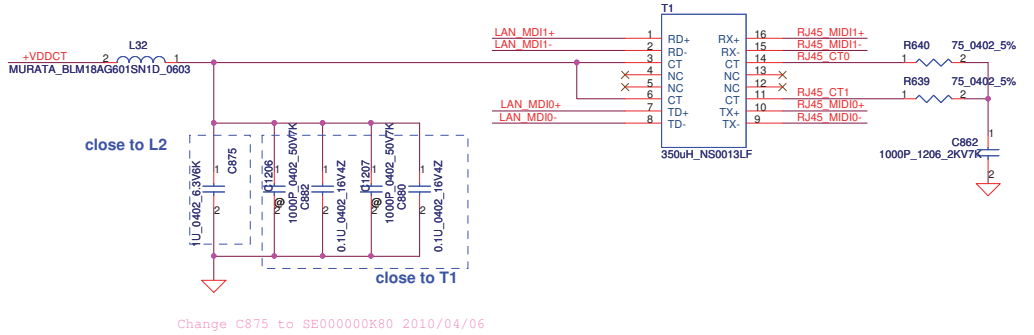
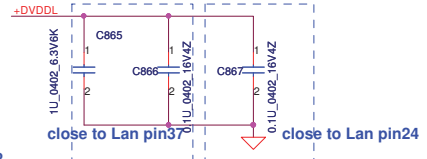
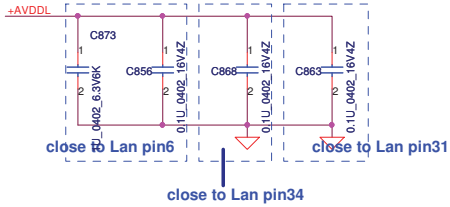
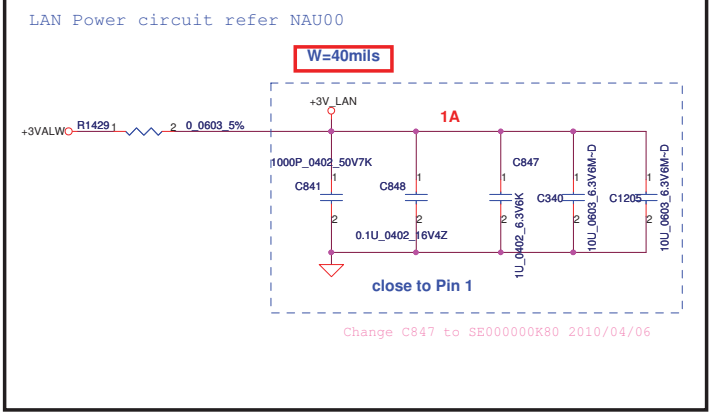
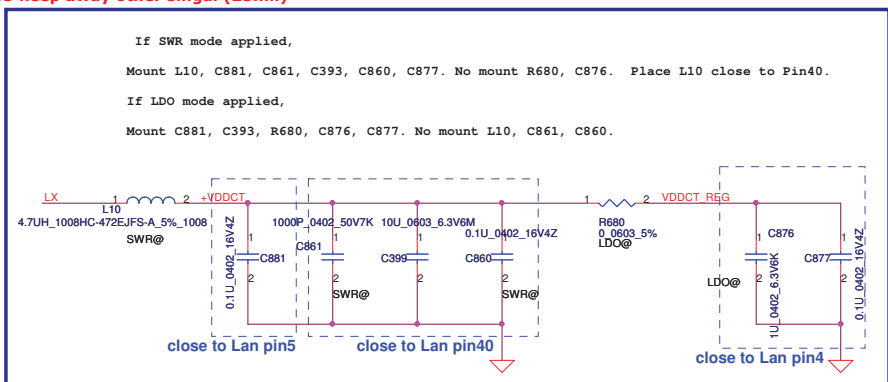
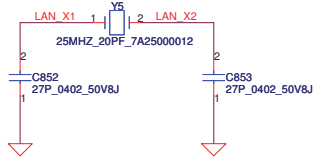
Sense Pin	Impedance	Codec Signals
SENSE A	39.2K	PORT-A (PIN 39, 41)
	20K	PORT-B (PIN 21, 22)
	10K	PORT-C (PIN 23, 24)
	5.1K	PORT-D (PIN 35, 36)
SENSE B	39.2K	PORT-E (PIN 14, 15)
	20K	PORT-F (PIN 16, 17)
	10K	PORT-G (PIN 43, 44)
	5.1K	PORT-H (PIN 45, 46)



Change LAN chip to AR8152-L for NAV70/80 DDR3 2010/01/22

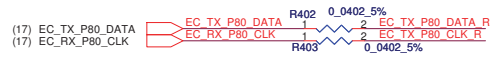


Change Y5 to SJ100003300 2010/04/06

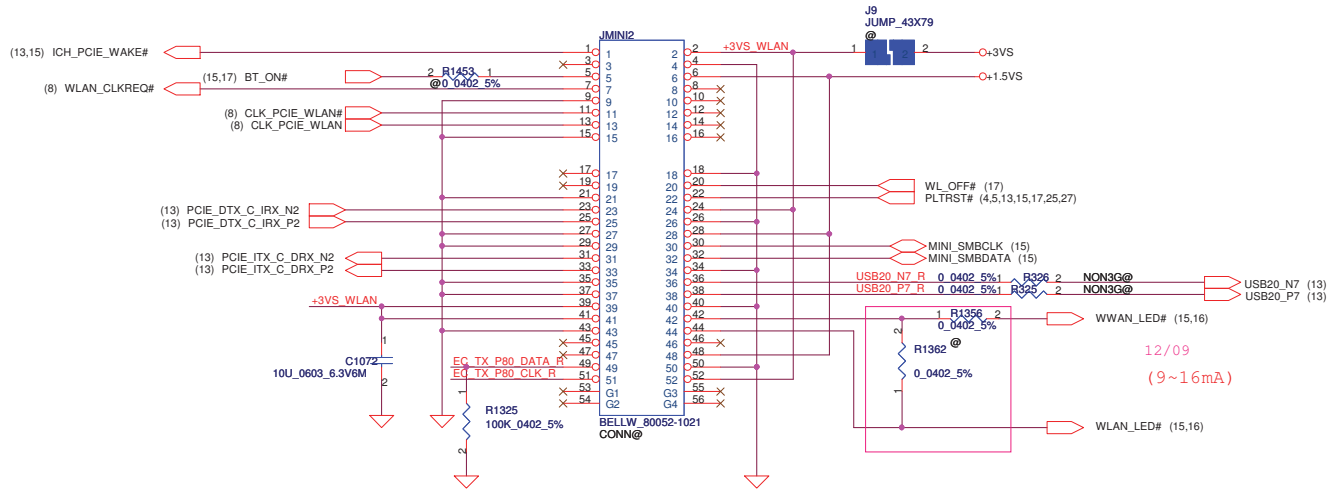
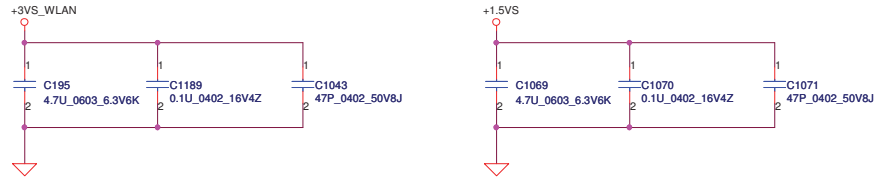


Security Classification	Compal Secret Data		Title	
Issued Date	2009/7/7	Deciphered Date	2010/7/7	LAN AR8152
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Date:	Thursday, June 03, 2010	Sheet	25	of 39

# Mini-Express Card for WWAN



# Mini-Express Card for WLAN

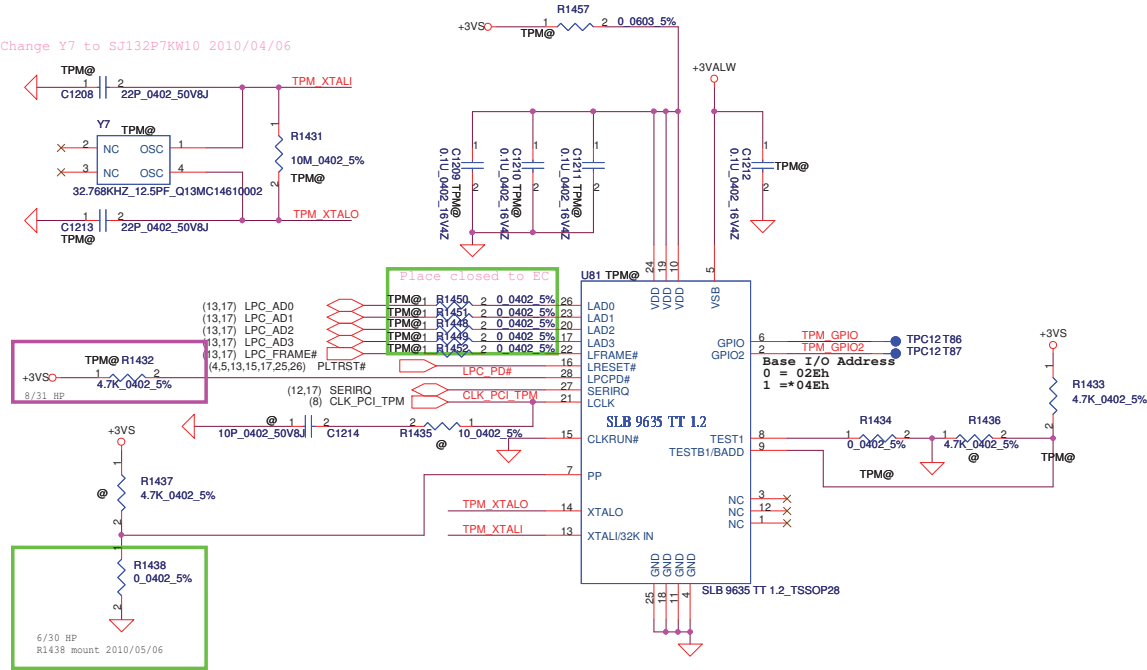


- 5/12 Update WLAN connector(the same as KAV60)
- 6/1 Revised 37、39、41、42、43 to NC
- 6/12 Update connector to DC040006S00
- 6/26 Update JMINI1 footprint
- 7/01 update pin 23,25,31,33

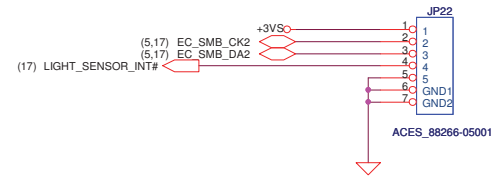
<b>Compal Electronics, Inc.</b>		
Title	WLAN	
Size	Document Number	Rev
Customer	LA-6222P	0.1
Date:	Monday, June 07, 2010	Sheet 26 of 39

# TPM1.2 on board

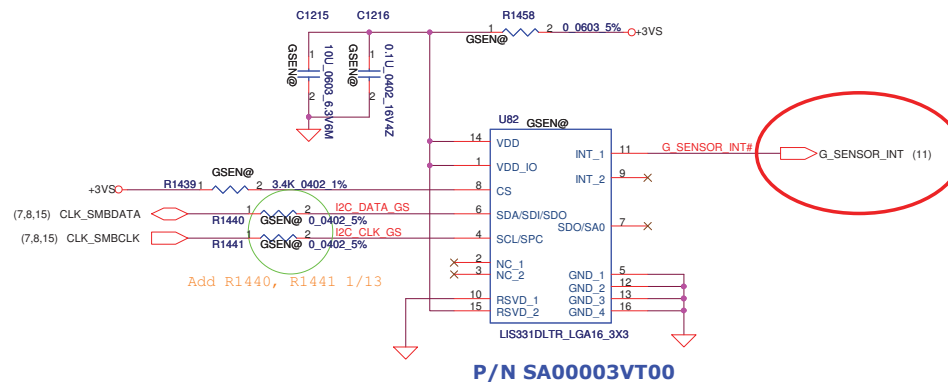
Change Y7 to SJ132P7KW10 2010/04/06



# ALS (Ambient Light Sensor)



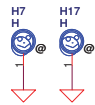
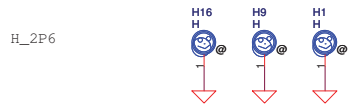
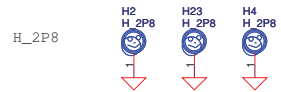
# ST LIS33DE(G-Sensor)



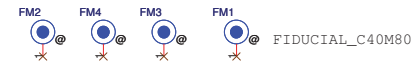
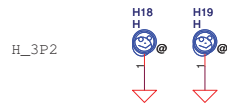
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Issued Date	2008/09/15	Deciphered Date
		2009/12/31
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Compal Electronics, Inc.		
Title		
TPM/G-Sensor/Light sensor		
Size	Document Number	Rev
	LA-6421P	0.1
Date:	Thursday, June 03, 2010	Sheet 27 of 39

Modify Hole location by (ME Drawing 06/12) 0615



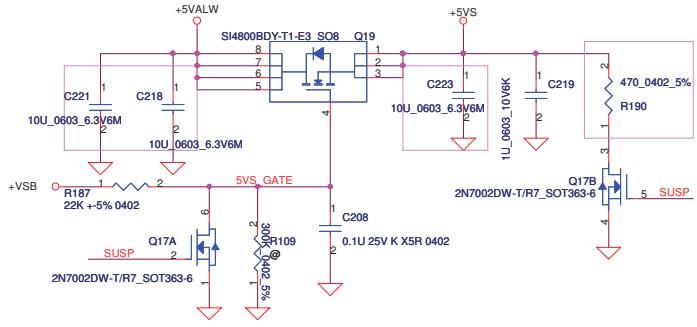
09/03 Del H12



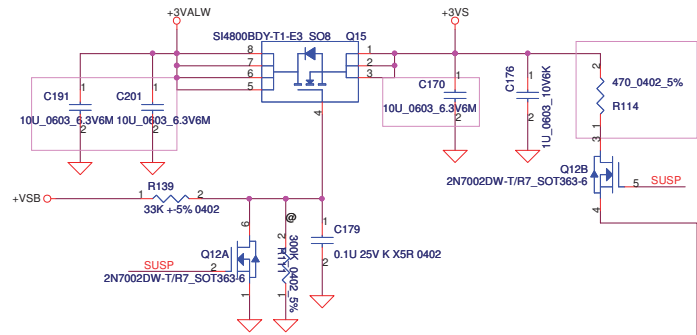
Security Classification	Compal Secret Data			Compal Electronics, Inc.		
Issued Date	2006/08/18	Deciphered Date	2007/8/18	Title Screw		
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				Date: Thursday, March 25, 2010	Sheet 28	of 39

Change R51 R57 R70 R63 R317 R114 R190 to 0402 SIZE 04/30  
 Change C221 C218 C223 C 191 C201 C170 C392 C393 C394 to 0603 SIZE 04/30

**+5VALW TO +5VS**

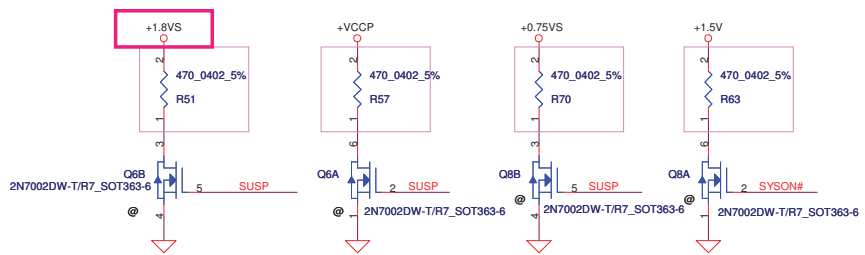
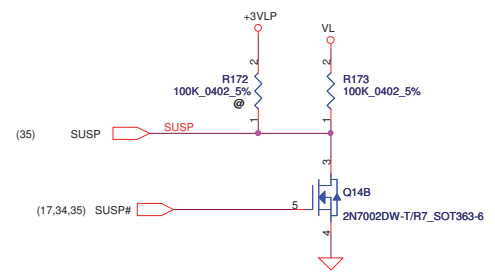
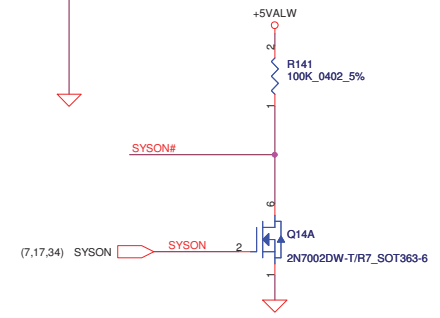
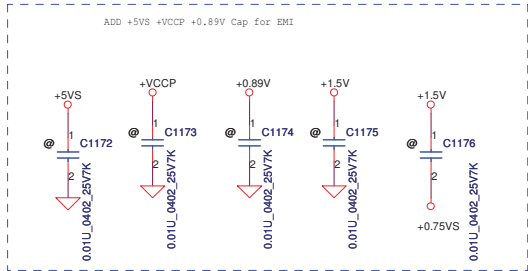
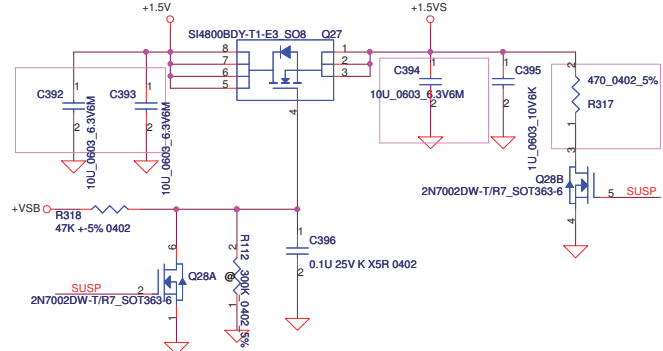


**+3VALW TO +3VS**



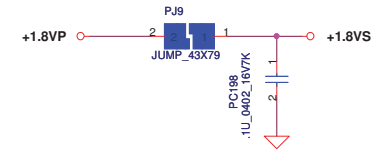
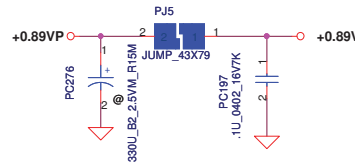
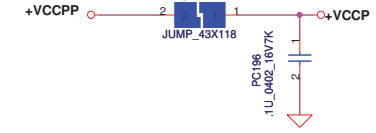
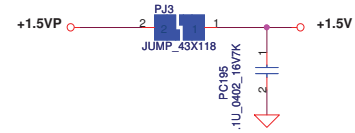
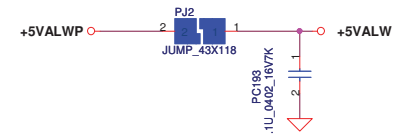
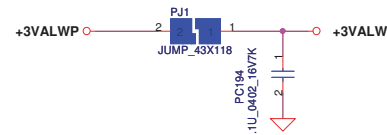
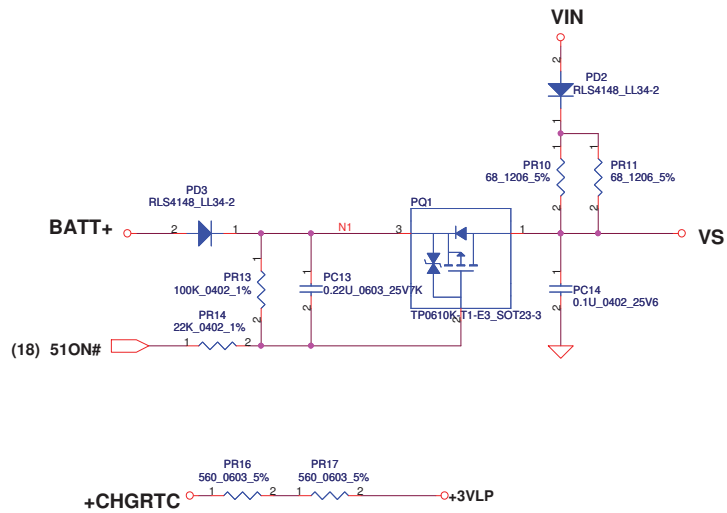
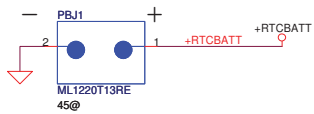
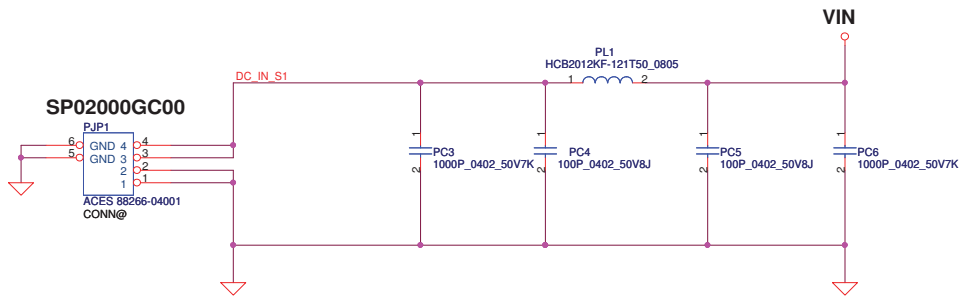
Change Q12, Q14, Q17, Q28 to SB00000DH00 2010/04/06  
 Change C176, C219, C395 to SE080105K80 2010/04/06

**+1.5V to +1.5VS**



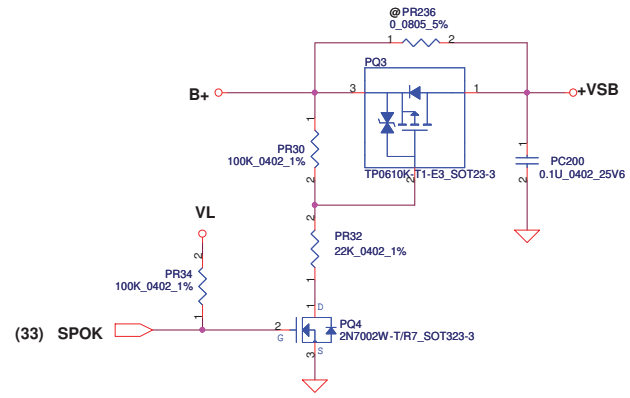
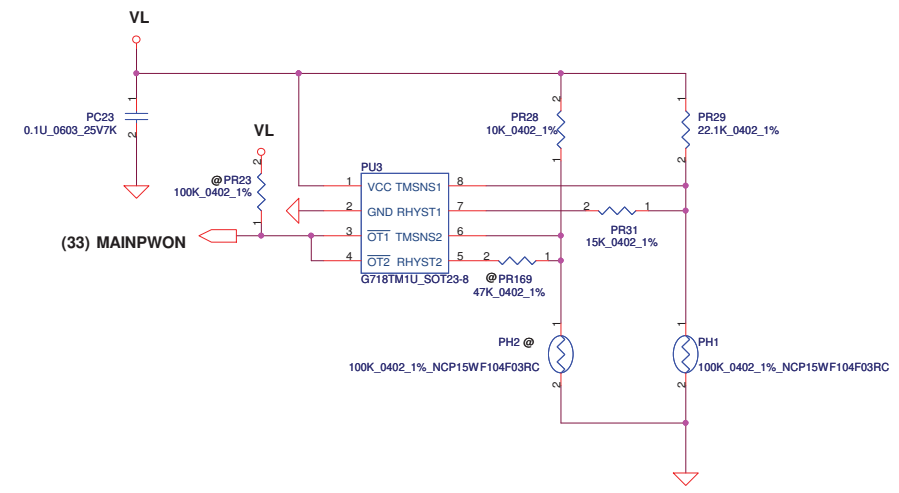
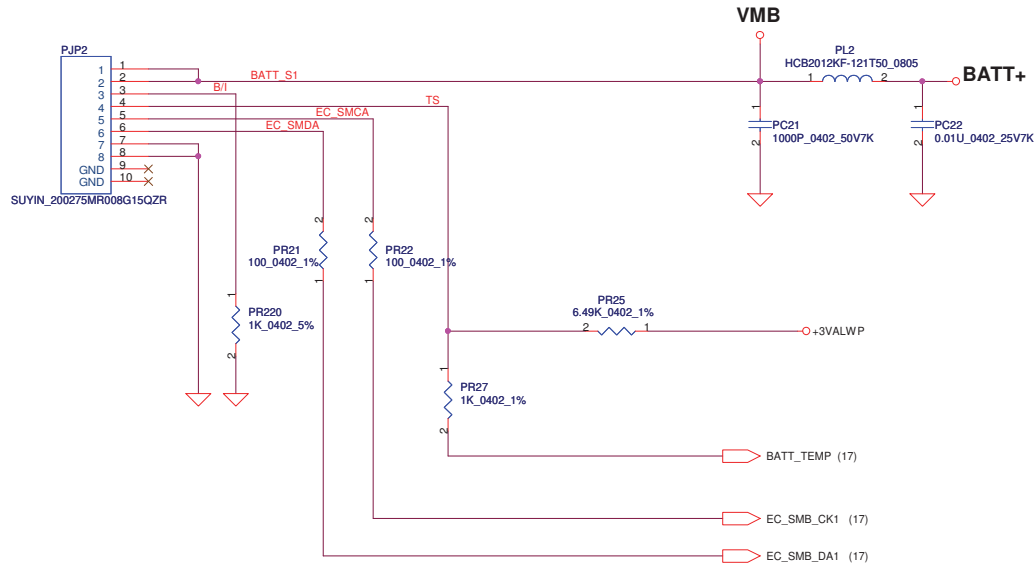
Change Q6, Q8 to SB00000DH00 2010/04/06

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Issued Date	2006/08/18	Deciphered Date	2007/8/18	Title	
				DC INTERFACE	
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				LA-6421P	
				Date:	Thursday, June 03, 2010
				Sheet	29 of 39
				Rev	0.1

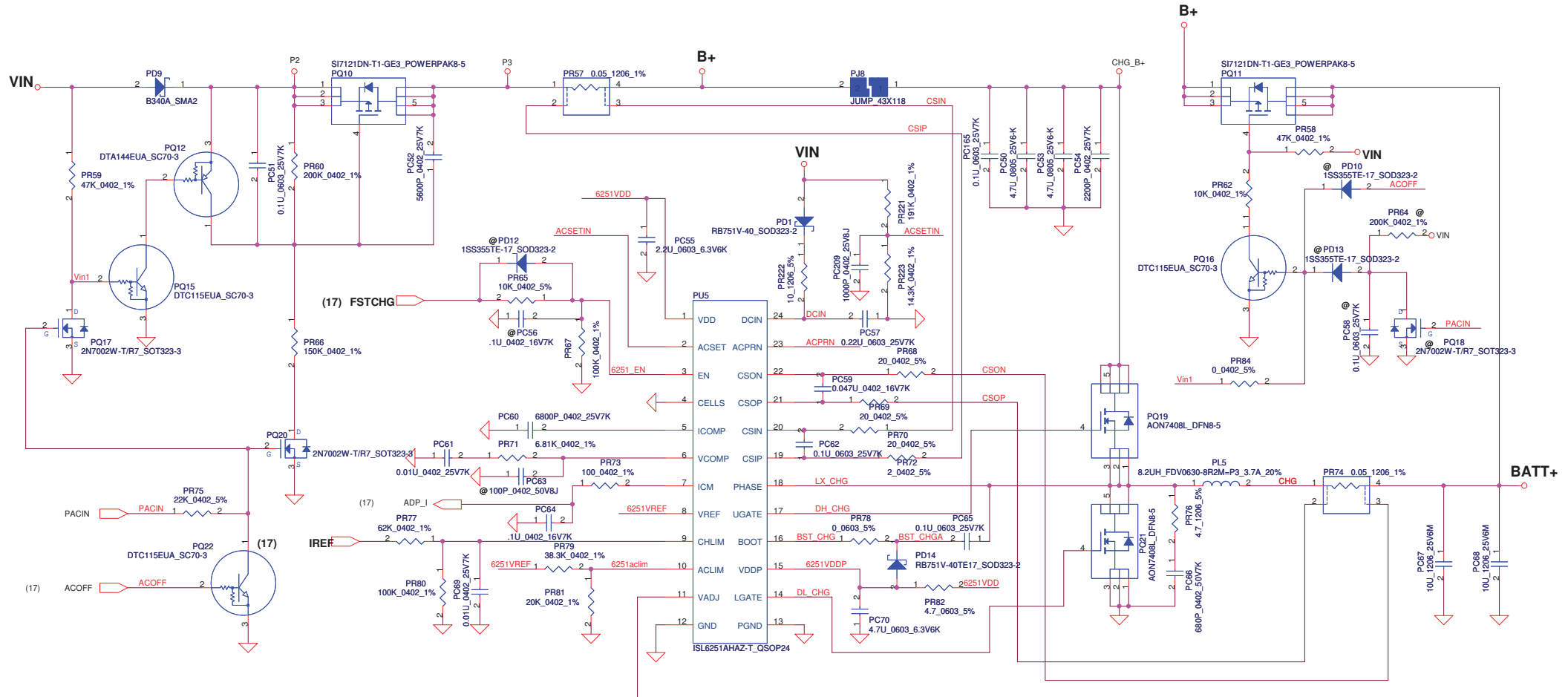


Security Classification		Compal Secret Data		Compal Electronics, Inc.	
Issued Date	2007/09/20	Deciphered Date	2008/09/20	Title	DCIN & DETECTOR
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Size	Document Number	Rev			
Custom	LA-6421P	0.1			
Date:	Tuesday, June 22, 2010	Sheet	30	of	39

PH1 under CPU botten side :  
 CPU thermal protection at 92 degree C  
 Recovery at 72 degree C



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Size	Custom	Document Number	LA-6421P	Rev	0.1
Date:	Tuesday, June 22, 2010	Sheet	31	of	39



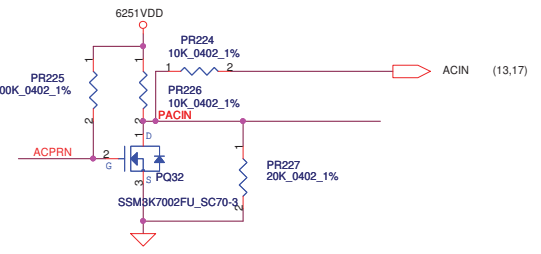
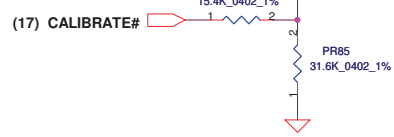
$I_{ada} = 0 \sim 1.58A (30W)$   $CP = 85\% * I_{ada}$  ;  $CP = 1.343A$

CP mode  
 $V_{aclim} = 2.39 * (20K / (20K + 38.3K)) = 0.8199V$   
 $I_{input} = (1 / 0.05) * ((0.05 * V_{aclim}) / 2.39 + 0.05)$   
 where  $V_{aclim} = 0.8199V$ ,  $I_{input} = 1.343A$

$CC = 0.3 \sim 1.76A$   
 $I_{REF} = 1.62 * I_{charge}$   
 $I_{REF} = 0.486V \sim 2.85V$   
 $3.24V \implies 2A$

BATT Type	Charging Voltage (0x15)	CV mode
Normal 3S LI-ON Cells	12600mV	12.60V

$V_{ADJ} \rightarrow V_{REF} \rightarrow 4.41V$   
 $V_{ADJ} \rightarrow \text{Ground} \rightarrow 3.59V$   
 $V_{cell} = (0.175 * V_{ADJ} + 3.99)$



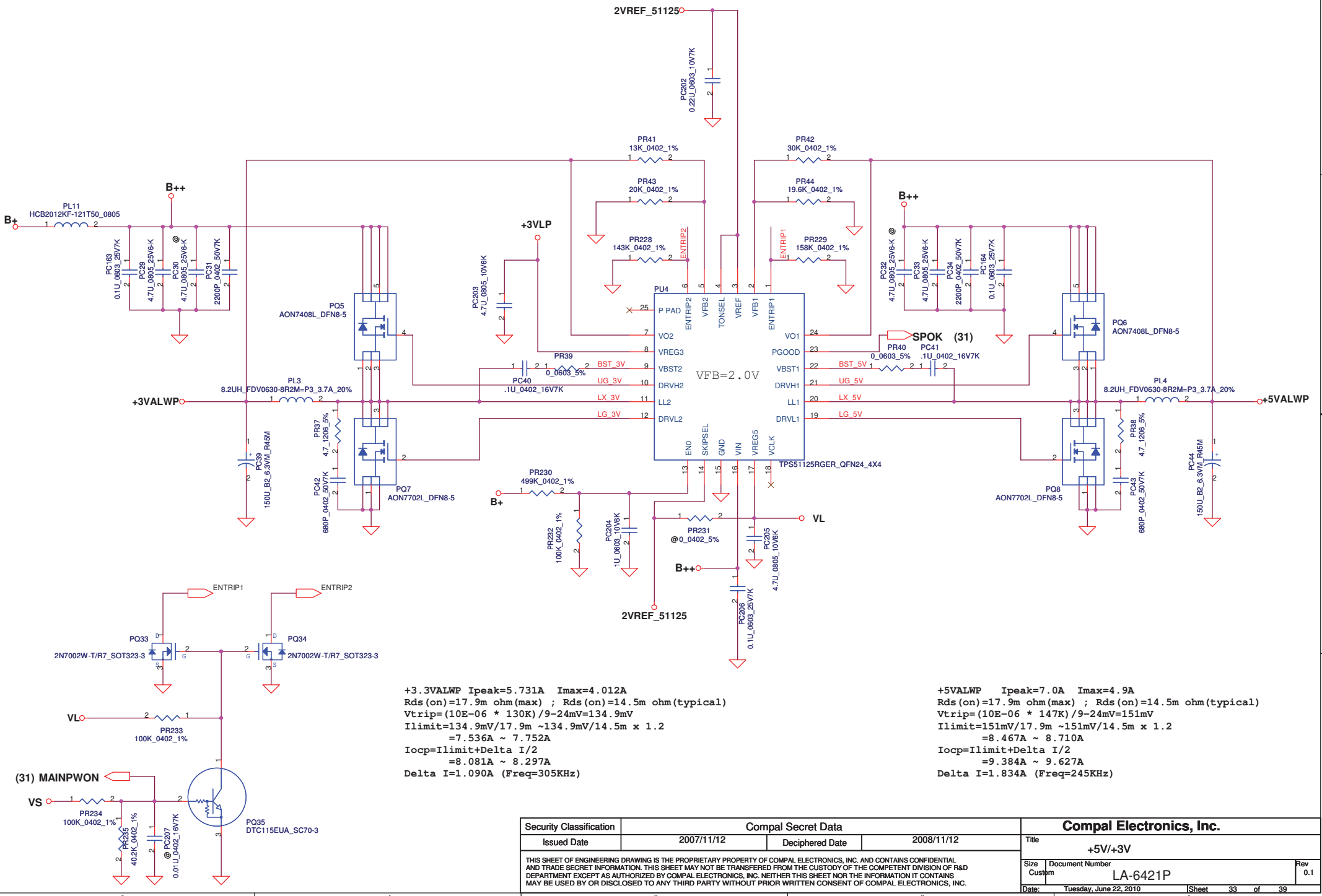
$V_{th, rise (typical)} = ((191K / 14.3K) + 1) * 1.26$   
 $= 18.89V$   
 $V_{th, fall (typical)} = ((191K / 14.3K) + 1) * 1.26 - 3.4\mu A * 191K$   
 $= 17.43V$

Security Classification		Compal Secret Data	
Issued Date	2007/09/20	Deciphered Date	2008/09/20

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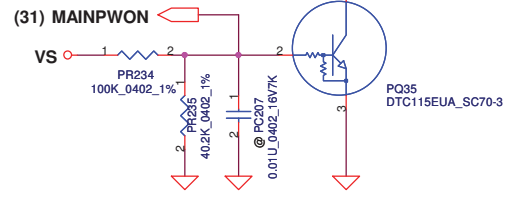
Compal Electronics, Inc.			
<b>CHARGER</b>			
Size	Document Number	Rev	
Custom	LA-6421P	0.1	
Date:	Tuesday, June 22, 2010	Sheet	32 of 39



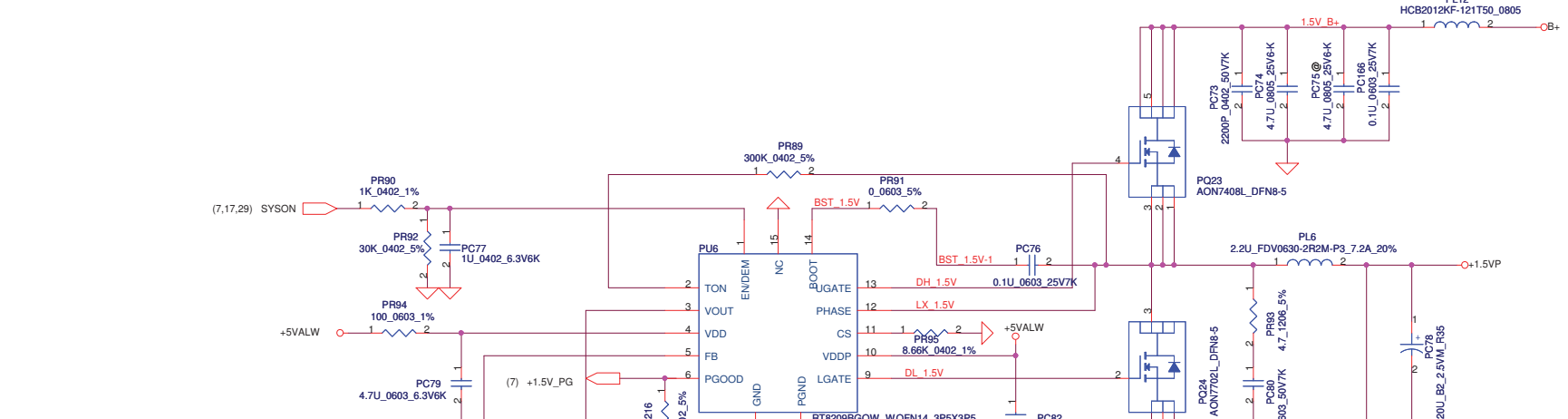


+3.3VALWP Ipeak=5.731A Imax=4.012A  
 Rds(on)=17.9m ohm(max) ; Rds(on)=14.5m ohm(typical)  
 Vtrip=(10E-06 \* 130K)/9-24mV=134.9mV  
 Ilimit=134.9mV/17.9m ~134.9mV/14.5m x 1.2  
 =7.536A ~ 7.752A  
 Iocp=Ilimit+Delta I/2  
 =8.081A ~ 8.297A  
 Delta I=1.090A (Freq=305KHz)

+5VALWP Ipeak=7.0A Imax=4.9A  
 Rds(on)=17.9m ohm(max) ; Rds(on)=14.5m ohm(typical)  
 Vtrip=(10E-06 \* 147K)/9-24mV=151mV  
 Ilimit=151mV/17.9m ~151mV/14.5m x 1.2  
 =8.467A ~ 8.710A  
 Iocp=Ilimit+Delta I/2  
 =9.384A ~ 9.627A  
 Delta I=1.834A (Freq=245KHz)

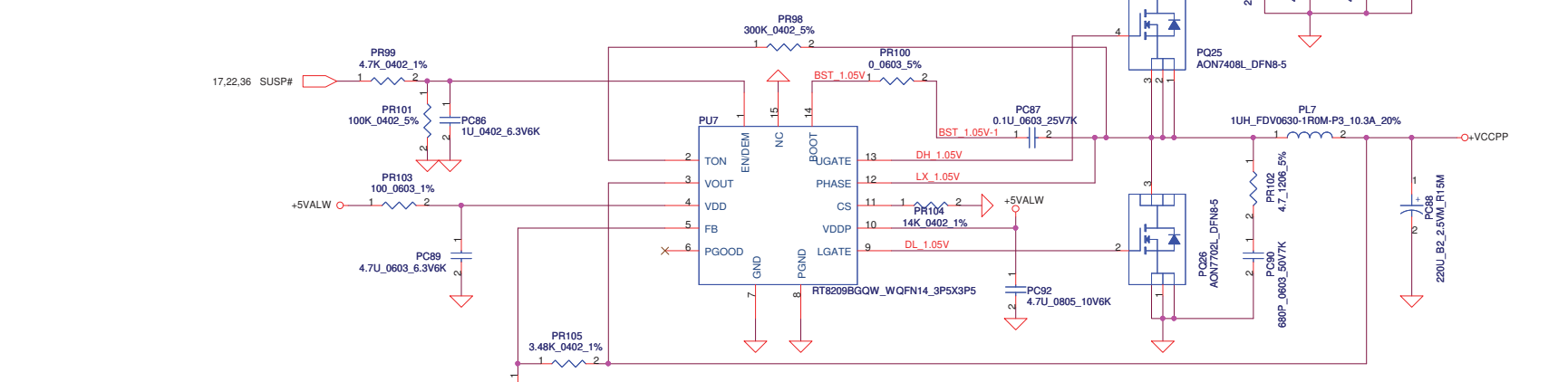


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Size	Document Number			Rev	0.1
Custom	LA-6421P			Date:	Tuesday, June 22, 2010
			Sheet	33	of 39



$\langle V_o=1.5V \rangle$   $V_{FB}=0.75V$   
 $V_o=V_{FB} \cdot (1+PR96/PR97)=0.75 \cdot (1+3.48K/3.48K)=1.5V$   
 $F_{sw}=328KHz$   
 $C_{out} ESR=15m\ \Omega$   
 $R_{dson(max)}=17.9m$   $R_{dson(typical)}=14.5m$   
 $I_{peak}=4.97A$ ,  $I_{max}=3.479A$ ,  $I_{ocp}=5.964A$   
 $\Delta I=(19-1.8) \cdot (1.8/19)/(2.2u \cdot 328K)=2.259A$   
 $\Rightarrow 1/2 \Delta I=1.129A$   
 $V_{trip}=R_{trip} \cdot 10uA=8.66K \cdot 10uA=0.0866V$   
 $I_{ocpmin}=V_{trip}/(R_{dsonmax})+1.129$   
 $=0.0866/(0.0179)+1.129=5.967A$   
 $I_{ocpmax}=(0.0866/(0.0145 \cdot 1.2))+1.129A=6.106A$   
 $I_{ocp}=5.967A \sim 6.106A$

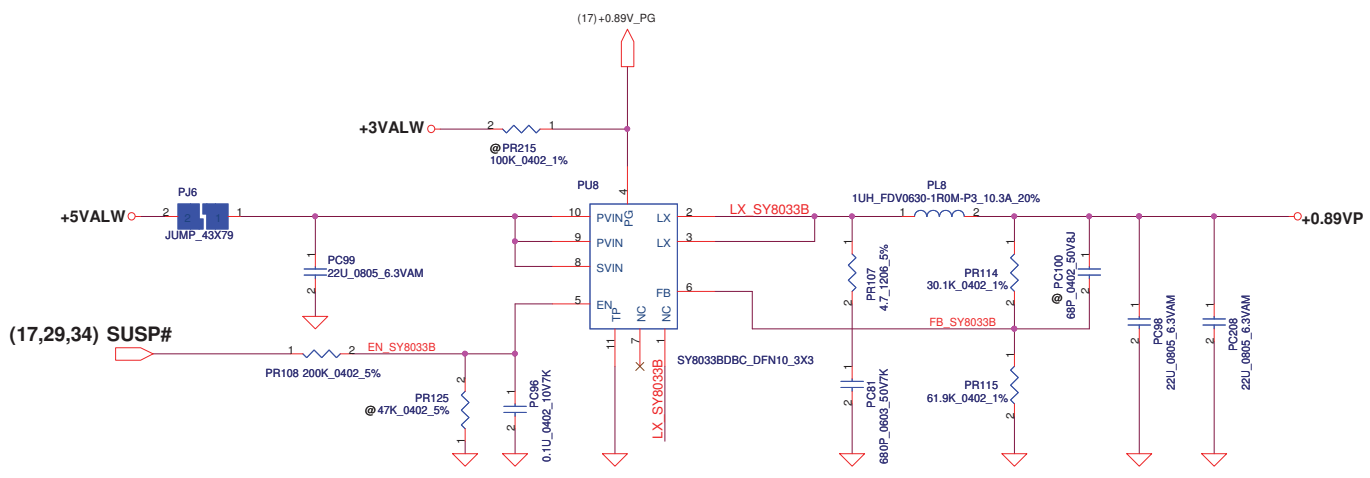
$\langle V_o=1.05V \rangle$   $V_{FB}=0.75V$   
 $V_o=V_{FB} \cdot (1+PR105/PR106)=0.75 \cdot (1+3.48K/8.25K)=1.05V$   
 $F_{sw}=280KHz$   
 $C_{out} ESR=15m\ \Omega$   $R_{dson(max)}=17.9m$   $R_{dson(typical)}=14.5m$   
 $I_{peak}=3.124A$ ,  $I_{max}=2.187A$ ,  $I_{ocp}=3.749A$   
 $\Delta I=(19-1.05) \cdot (1.05/19)/(1.5u \cdot 280K)=3.549A$   
 $\Rightarrow 1/2 \Delta I=1.774A$   
 $V_{trip}=R_{trip} \cdot 10uA=14K \cdot 10uA=0.14V$   
 $I_{ocpmin}=V_{trip}/(R_{dsonmax})+1.774$   
 $=0.14/(0.0179)+1.774=9.596A$   
 $I_{ocpmax}=(0.14/(0.0145 \cdot 1.2))+1.774A=9.820A$   
 $I_{ocp}=9.596A \sim 9.820A$



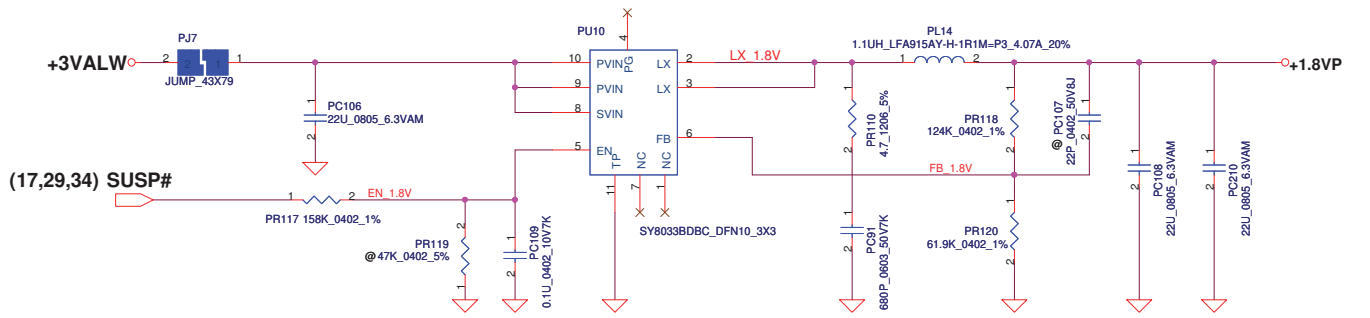
$\langle V_o=1.05V \rangle$   $V_{FB}=0.75V$   
 $V_o=V_{FB} \cdot (1+PR105/PR106)=0.75 \cdot (1+3.48K/8.25K)=1.05V$   
 $F_{sw}=280KHz$

$C_{out} ESR=15m\ \Omega$   $R_{dson(max)}=17.9m$   $R_{dson(typical)}=14.5m$   
 $I_{peak}=3.124A$ ,  $I_{max}=2.187A$ ,  $I_{ocp}=3.749A$   
 $\Delta I=(19-1.05) \cdot (1.05/19)/(1.5u \cdot 280K)=3.549A$   
 $\Rightarrow 1/2 \Delta I=1.774A$   
 $V_{trip}=R_{trip} \cdot 10uA=14K \cdot 10uA=0.14V$   
 $I_{ocpmin}=V_{trip}/(R_{dsonmax})+1.774$   
 $=0.14/(0.0179)+1.774=9.596A$   
 $I_{ocpmax}=(0.14/(0.0145 \cdot 1.2))+1.774A=9.820A$   
 $I_{ocp}=9.596A \sim 9.820A$

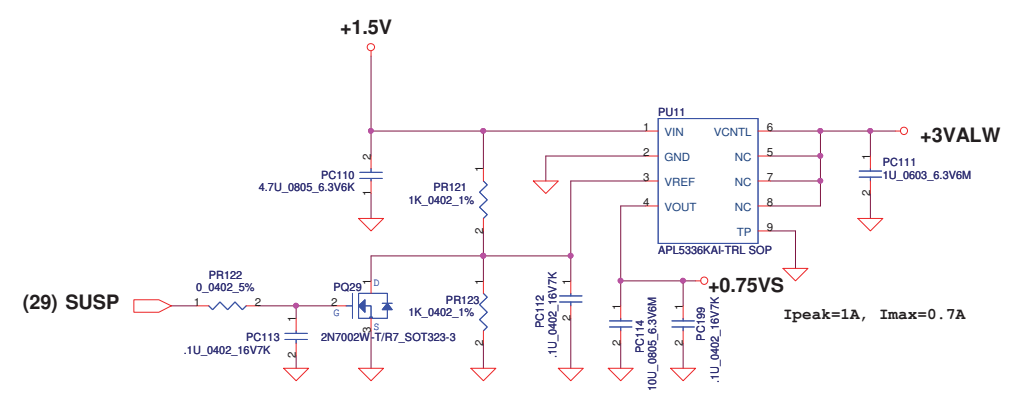
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Size	Document Number	Rev		
Custom	LA-6421P	0.1		
Date:	Tuesday, June 22, 2010	Sheet	34	of 39



<Vo=0.89V> VFB=0.6V  
 $Vo = VFB * (1 + PR114 / PR115) = 0.6 * (1 + 30.1K / 61.9) = 0.89V$   
 Ipeak=2.64A, Imax=1.848A

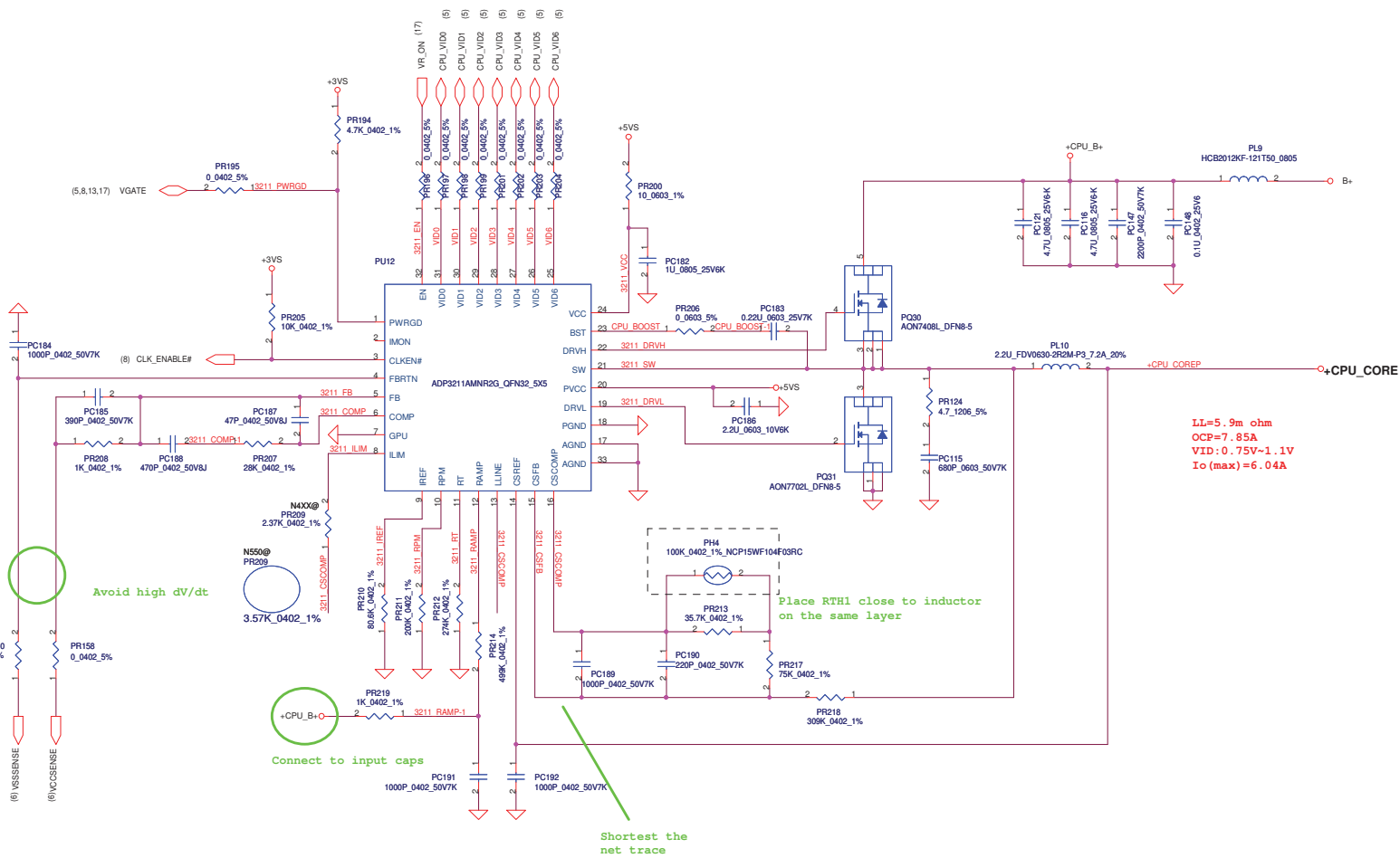


<Vo=1.8V> VFB=0.6V  
 $Vo = VFB * (1 + PR118 / PR120) = 0.6 * (1 + 124K / 61.9) = 1.8V$   
 Ipeak=0.318A, Imax=0.223A



Ipeak=1A, Imax=0.7A

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Date:	Tuesday, June 22, 2010	Sheet	35	of 39



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Issued Date	2007/09/20	Deciphered Date	2008/09/20	Title
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Size	C	Sheet	36	of 39

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
1	Change power solution	For design change	0.1	34	Change PU7 from SA000031D00(S IC RT8209BGQW WQFN 14P PWM) to SA00003RU00(S IC SY8033BDBC DFN 10P SINGLE BUCK)	2010.5.03	DVT
2	Change PU8 SY8033B Pin1 net	For design change	0.1	34	Change PU8 SY8033B Pin1 connect Pin2 & Pin3	2010.5.03	DVT
3	Change PC100	For design change	0.1	34	Change PC100 to SE071680J80 (S CER CAP 68P 50V J NPO 0402)	2010.5.03	DVT
4	Change PR105	For design change	0.1	32	Change PR105 from SD034100200(S RES 1/16W 10K +-1% 0402) to SD034100280 (S RES 1/16W 10K +-1% 0402 )	2010.5.13	DVT
5	Change PC30 & PC32 to non-pop	For cost down plan	0.1	33		2010.6.2	PVT
6	Change PL3,PL4,PL5,PL6,PL7,PL8, PL10,PL14	For TMP choke shortage issue	0.1		Change PL3,PL4,PL5 from SH00000JI00 to SH00000BS00 Change PL6,PL10 from SH00000FD10 to SH00000700 Change PL7,PL8 from SH00000J300 to SH000007N00 Change PL14 from SH00000IS00 to SH00000HY00	2010.6.2	PVT
7	Change power solution	For design change	0.1	34	Change PU7 from SA00003RU00(S IC SY8033BDBC DFN 10P SINGLE BUCK) to SA000031D00(S IC RT8209BGQW WQFN 14P PWM)	2010.6.8	PVT
8	Change PD10.PD13.PC58.PR64. PQ18 to non-pop Change PR84 to pop	For cost down plan	0.1	33		2010.6.10	PVT
9	Modify CPU CORE OCP for N550	Design change for N550 CPU	0.1	32	Add PR209 = SD034357180 (3.57K_0402_1%) @N550 PR209 = SD034357180 (2.37K_0402_1%) @N4XX series	2010.6.10	PVT
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				PIR (PWR)	
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				Date: Tuesday, June 22, 2010	Rev 0.1
				Sheet 37 of 39	

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
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				Custom	LA-6421P	Rev	0.1
				Date:	Tuesday, June 22, 2010	Sheet	38 of 39

<2010/03/25>  
. P06 - Add C1217, C1218 for +0.89V  
. P08 - Add R1442, R1443  
. P09 - Add R1444, R1445 for DMIC  
. P10 - L12, L14, L15 change to SM010000200  
. P23 - Add JP24 for cardreader connector

<2010/06/28>  
. P04 - Change C239 BOM structure to 3G@  
. P17 - Change C528, C530, C531 BOM structure to 3G@

<2010/03/26>  
. P27 - Add R1448, R1449, R1450,R1451,R1452  
JP22 change to SP02000H500

<2010/04/06>  
. P10 - Change L12. L14, L15 to SM01000C600  
. P26 - Add R1453  
. P21 - Change Y6 to SJ100005900  
. P25 - Change Y5 to SJ100003300  
Change C847,C865,C870,C873,C875,C876 SE000000K80  
. P13 - Change X1,Y3,Y7 to SJ132P7KW10  
. P22 - Change U26 to SA00001N000  
. P29 - Change Q6,Q8,Q10,Q12,Q14,Q17,Q24,Q28 to SB000000DH00  
Change C176,C219,C230,C395 to SE080105K80  
. P07 - Change C116,C141 to SE076104K80

<2010/04/14>  
. P06 - Del C1218 2010/04/14  
. P08 - Del C1219, R1442 change Y1 to SJ100009H00  
. P27 - Add TPM@ GSEN@ for PAV70

<2010/05/03>  
. P04 - R354, R347, R348 nu-mount  
. P13 - Change R152 to SD034226A80(22.6ohm\_0402)  
. P13 - Change R241 to SD028100280(10Kohm\_0402)  
. P13 - R1376, R1377 nu-mount  
. P16 - Add JBATT1 CONN.  
. P17 - Change U76 to SA00001V400  
. P17 - Change R1292 to SD028820180

<2010/05/04>  
. P16 - Change JBATT1 NET to +RTCBATT1  
. P27 - Add J15, J16

<2010/05/06>  
. P10 - Change L12, L14 and L15 footprint  
. P27 - Del J15, J16 ; Add R1457, R1458  
. P27 - U81.15 connect to GND

<2010/05/24>  
. P04 - Change U71 to SA00003WBA0(N475@) and SA00003WAB0(N455@)  
. P08 - Change C161, C164 to SE071330J80(33P 50V J NPO 0402)  
. P08 - Change C388 to SE071100J80(10P 50V J NPO 0402)  
. P22 - Change C473 to SE107475K80(4.7U 6.3V K X5R 0603)

<2010/06/01>  
. P13 - Add NET: EC\_CLK  
. P17 - Add R1459, R1460 for Reserve EC\_CLK  
. P17 - Change U6.36 NET to PWR\_LED1#  
. P18 - Change NET from PWR\_LED# to PWR\_LED1#

<2010/06/07>  
. P06 - Change C239 footprint to 0805 size  
. P17 - Del JP23  
. P26 - Change R1325 to 100k-ohm

<2010/06/25>  
. P04 - Change C311 BOM configure to un-mount  
. P09 - Change C1109, C1111, C1112, C1156 BOM configure to 3G@  
. P15 - Change C1163~C1166, C504~C508, C850 BOM configure to MCP@  
. P17 - Change C528, C530, C531 BOM configure to un-mount  
. P10 - Change D17, D18 BOM configure to un-mount  
. P22 - Change D22 BOM configure to un-mount  
. P23 - Change D44, D45 BOM configure to un-mount

Title		
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Size	Document Number	Rev
CustomLA-6421P		0.1
Date:	Monday, June 28, 2010	Sheet 39 of 39