

Compal Confidential

PAV70 DDR3 Schematics Document

Intel Pineview Processor with Tigerpoint + DDRIII

2010-06-25

REV: 1.0

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Issued Date	2006/08/18	Deciphered Date	2007/8/18	Title	Cover Page
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File Name : LA-6421P



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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
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF
+0.75VS	0.75V switched power rail for DDR terminator	ON	OFF	OFF
+VCCP	VCCP switched power rail	ON	OFF	OFF
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+1.5V	1.5V power rail for DDR	ON	ON	OFF
+0.89V	Graphic core power rail	ON	OFF	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
+VSB	VSB always on power rail	ON	ON	ON*
+RTCVCC	RTC power	ON	ON	ON

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

STATE \ SIGNAL	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON	HIGH	HIGH	HIGH	ON	ON	ON	ON
S1 (Power On Suspend)	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	ON	OFF	OFF	OFF

BOARD ID Table(Page 17)

	VCC	3.3V				
	Ra	100K				
	ID	BRD ID	Rb	Vab-Min	Vab-Typ	Vab-Max
PAV50	0	R01 (EVT)	0	0V	0V	0V
	1	R02 (DVT)	8.2K	0.216V	0.250V	0.289V
	2	R03 (PVT)	18K	0.436V	0.503V	0.538V
	3	R10A (MP)	33K	0.712V	0.819V	0.875V
	4	R01 (EVT)	56K	1.036V	1.185V	1.264V
	5	R02 (DVT)	100K	1.453V	1.650V	1.759V
	6	R03 (PVT)	200K	1.935V	2.200V	2.341V
	7	R10A (MP)	NC	2.500V	3.3V	3.3V

External PCI Devices

DEVICE	IDSEL #	REQ/GNT #	PIRQ
--------	---------	-----------	------

No PCI Device

EC SM Bus1 address

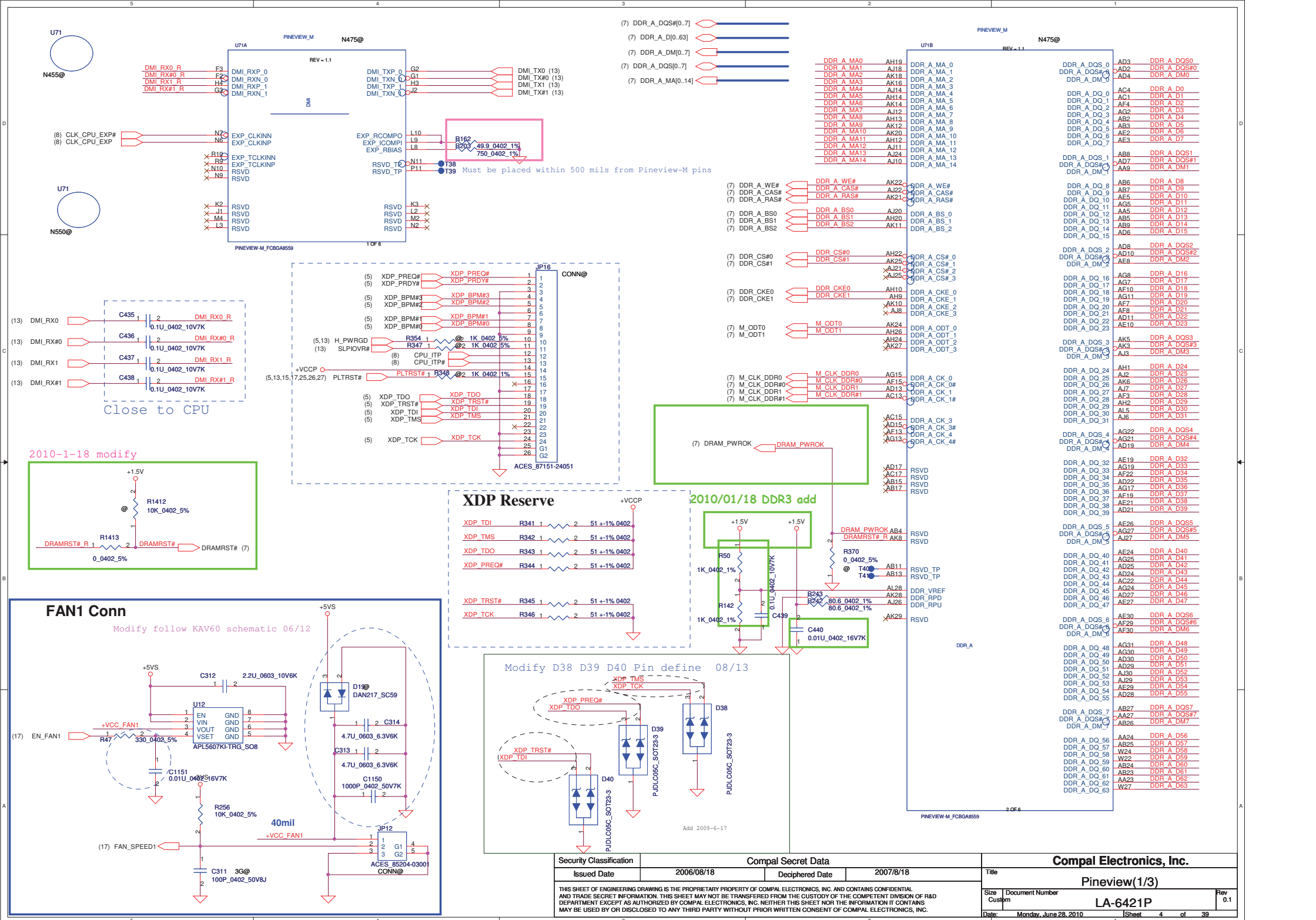
EC SM Bus2 address

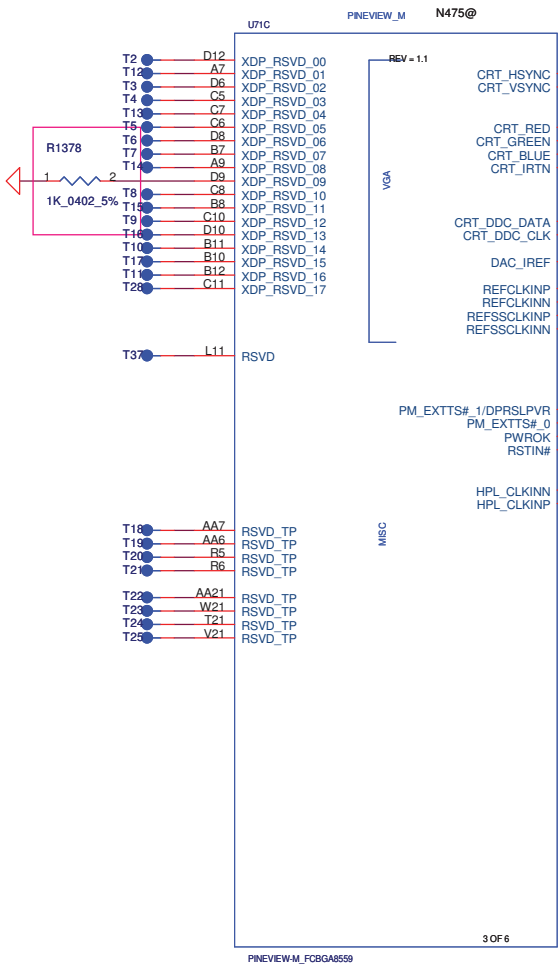
Device	Address	Device	Address
Smart Battery	0001 011X b	EMC1402	100_1100

ICH7M SM Bus address

Device	Address
Clock Generator (SLG8SP556VTR)	1101 001Xb
DDR DIMMA	1010 000Xb

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2010/01/18 DDR3 modify

The diagram illustrates a circuit modification for DDR3. It features two NPN transistors, Q38 and Q39, both of type MMBT3904_SOT23. The base of Q38 is connected to the PM_SLP_S4# signal (pin 13.17) through a 1K_0402_1% resistor (R1421). The base of Q39 is connected to the SYSON signal (pins 17, 29, 34) through a 1K_0402_1% resistor (R1422). The emitter of Q38 is connected to ground, and the emitter of Q39 is connected to a +5VALW power source. The collector of Q38 is connected to the base of Q39 through a 1K_0402_1% resistor (R1416). The collector of Q39 is connected to the DRAM_PWROK pin (4) and the +1.5V_PG pin (34) through a 10K_0402_5% resistor (R1415). A 0.0402_5% resistor (R1417) is connected between the collector of Q39 and the +1.5V_PG pin. A 1u_0402_5% capacitor (C1191) is connected between the +1.5V_PG pin and ground. A 0.1u_0402_10V7K capacitor (C1192) is connected between the +5VALW power source and ground.

[illegible]

Change C116,C141 to
SE076104K80 2010/04/06

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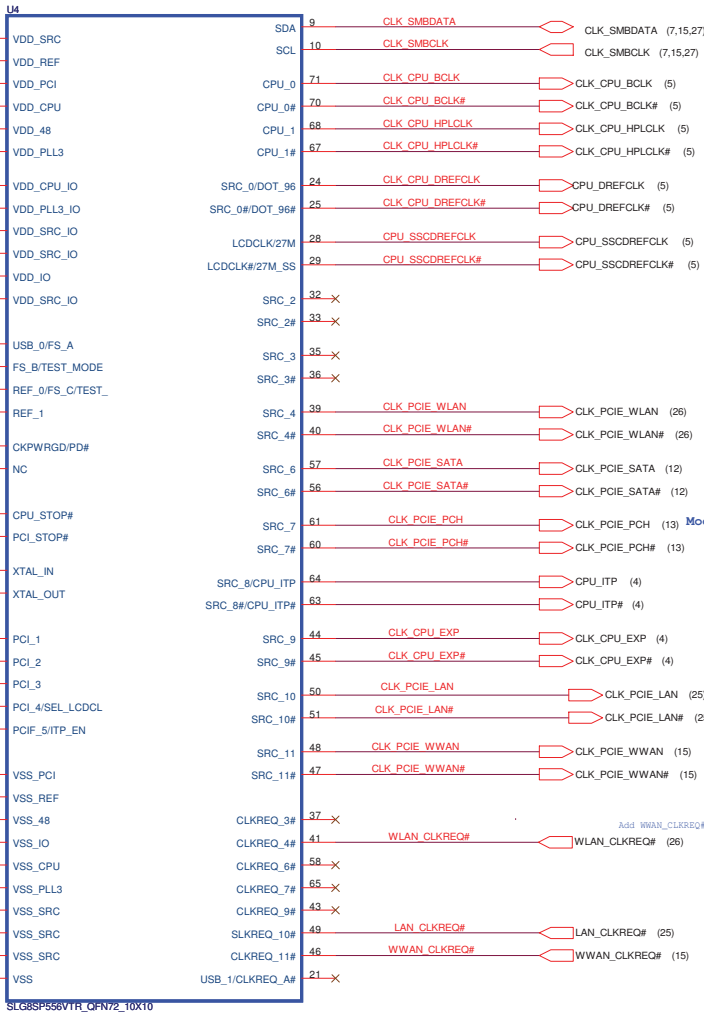
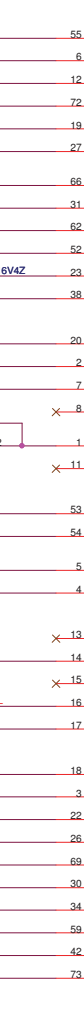
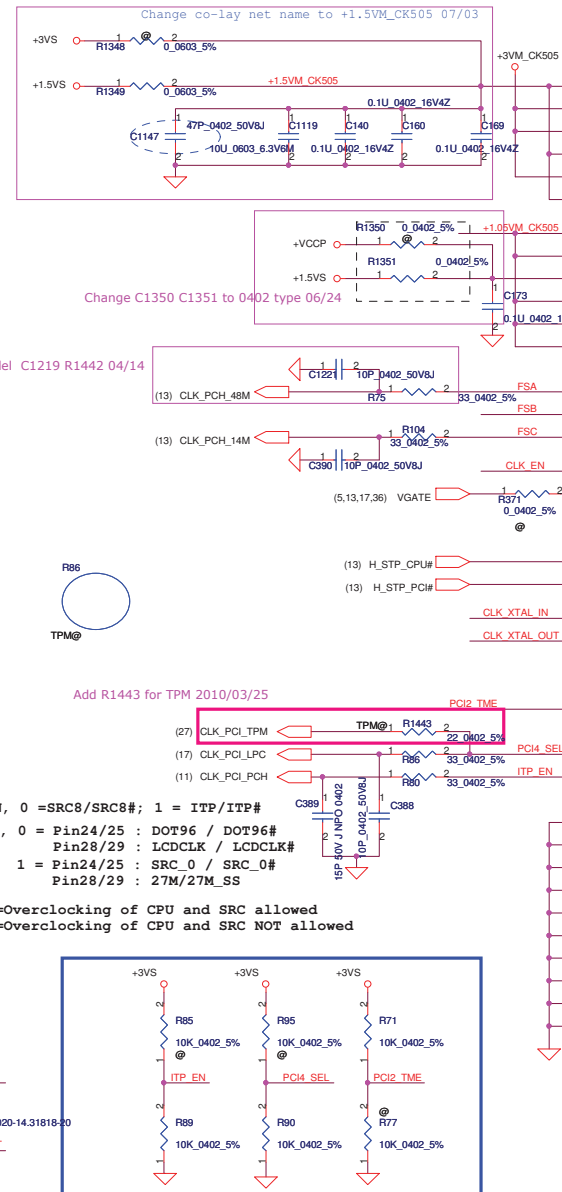
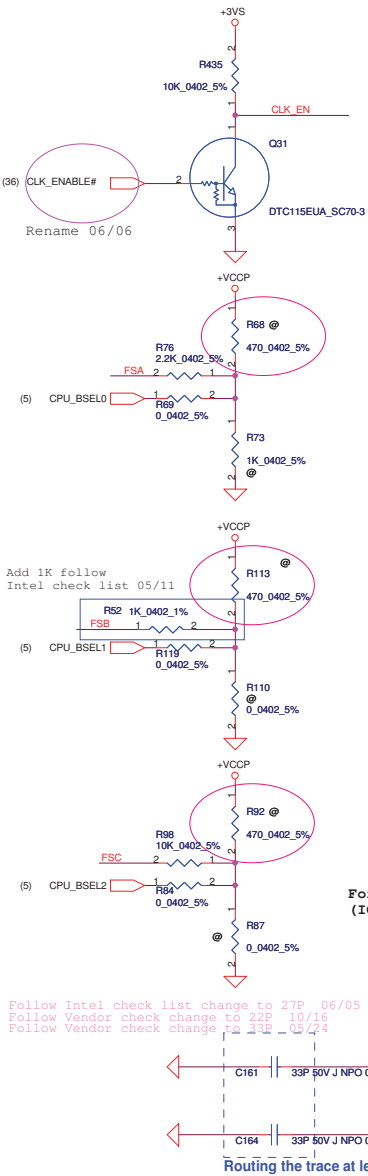
FSC CLKSEL2	FSB CLKSEL1	FSA CLKSEL0	CPU MHz	SRC MHz	PCI MHz	REF MHz	DOT_96 MHz	USB MHz
0	0	0	266	100	33.3	14.318	96.0	48.0
0	0	1	133	100	33.3	14.318	96.0	48.0
0	1	0	200	100	33.3	14.318	96.0	48.0
0	1	1	166	100	33.3	14.318	96.0	48.0
1	0	0	333	100	33.3	14.318	96.0	48.0
1	0	1	100	100	33.3	14.318	96.0	48.0
1	1	0	400	100	33.3	14.318	96.0	48.0
1	1	1	Reserved					

Add C1145 C1146 C1147 for EMI 06/12

IDT: SA00003H610

Realtek: SA00003H730

Change Q10 to SB00000DH00 2010/04/06



SRC PORT LIST

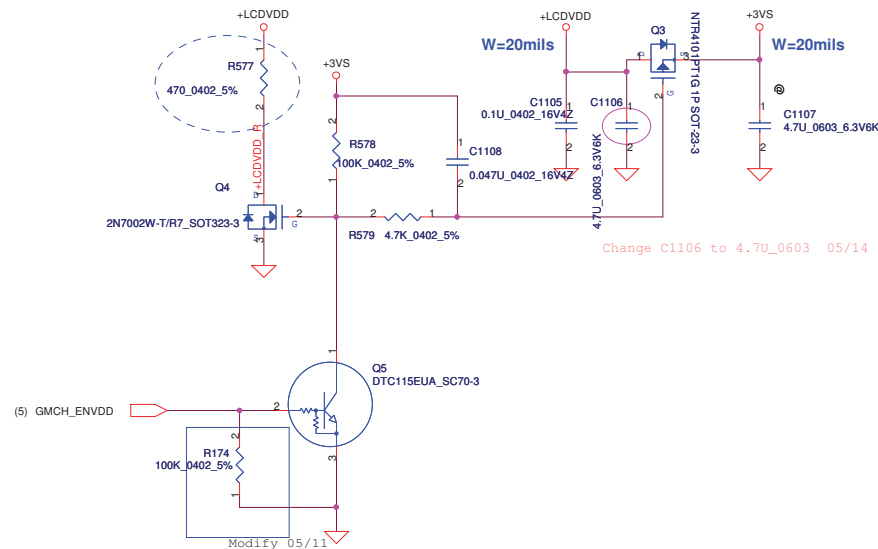
PORT	DEVICE
SRC1	CPU_SSCDREFCLK
SRC2	
SRC3	
SRC4	PCIE_WLAN
SRC6	PCIE_SATA
SRC7	PCIE_PCH
SRC8	CPU_ITP
SRC9	CLK_CPU_EXP
SRC10	PCIE_LAN
SRC11	PCIE_WWAN

REQ PORT LIST

PORT	DEVICE
REQ_3#	
REQ_4#	PCIE_WLAN
REQ_6#	
REQ_7#	
REQ_9#	
REQ_10#	PCIE_WWAN
REQ_11#	
REQ_A#	

LCD POWER CIRCUIT

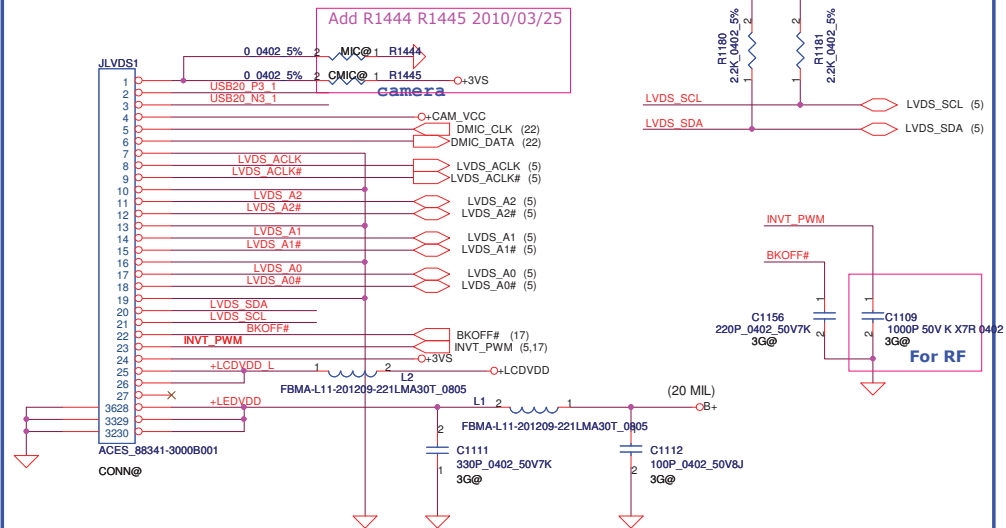
Change R577 to 0402 SIZE 06/16



Change C1106 to 4.7U_0603 05/14

CMOS & LCD/PANEL BD. Conn.

Modify JLVDS1 08/04



Add R1444 R1445 2010/03/25

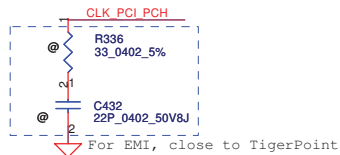
Add for RF 07/02

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Change L12, L14, L15 to SM01000C600 2010/04/06

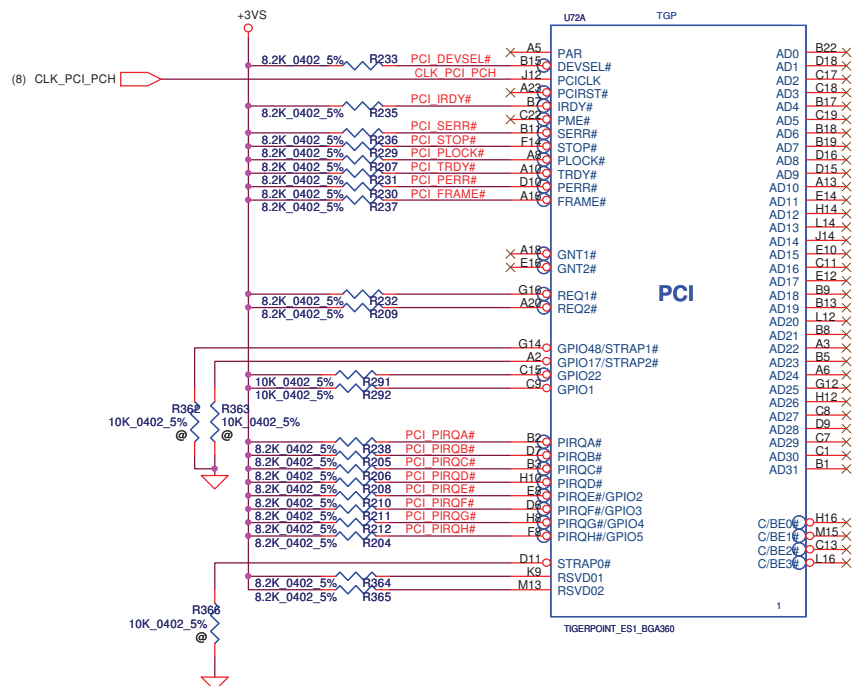


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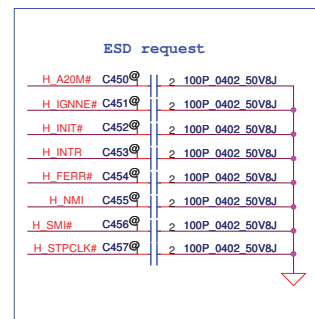
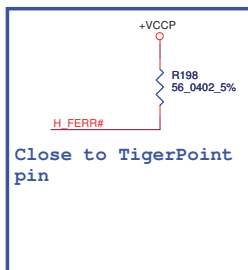
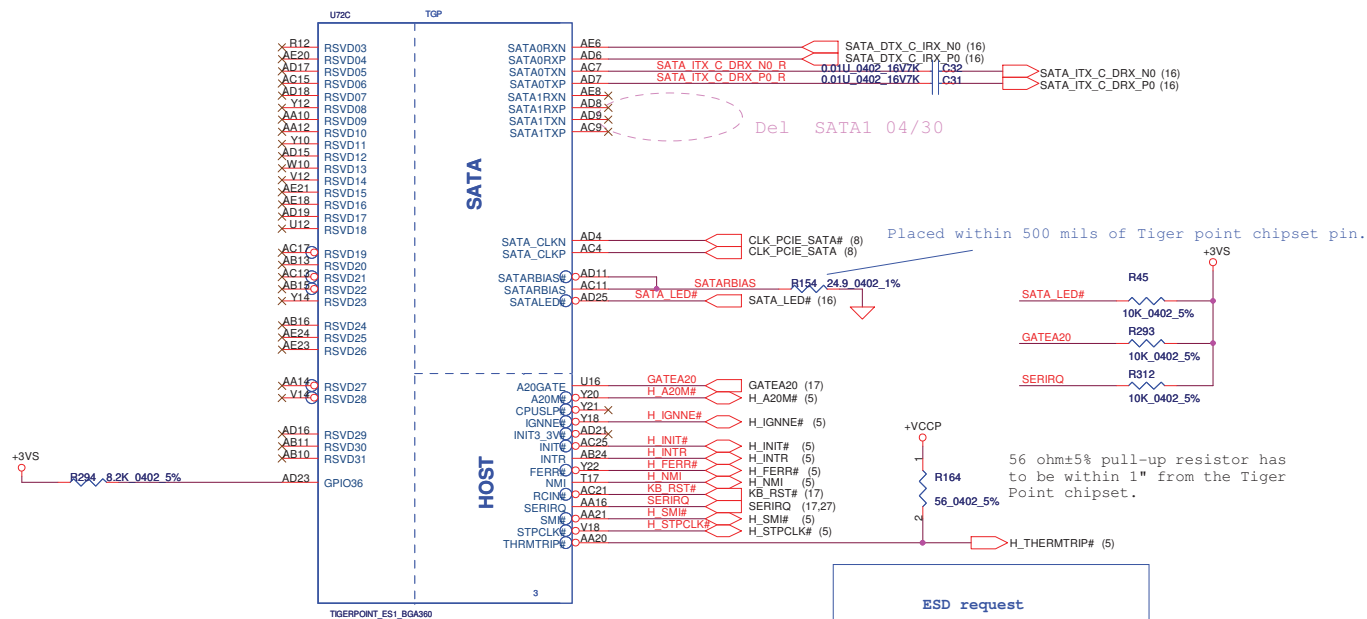
(27) G_SENSOR_INT PCI_PIRQ#

Add for G-sensor interrupt 2010/03/11



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

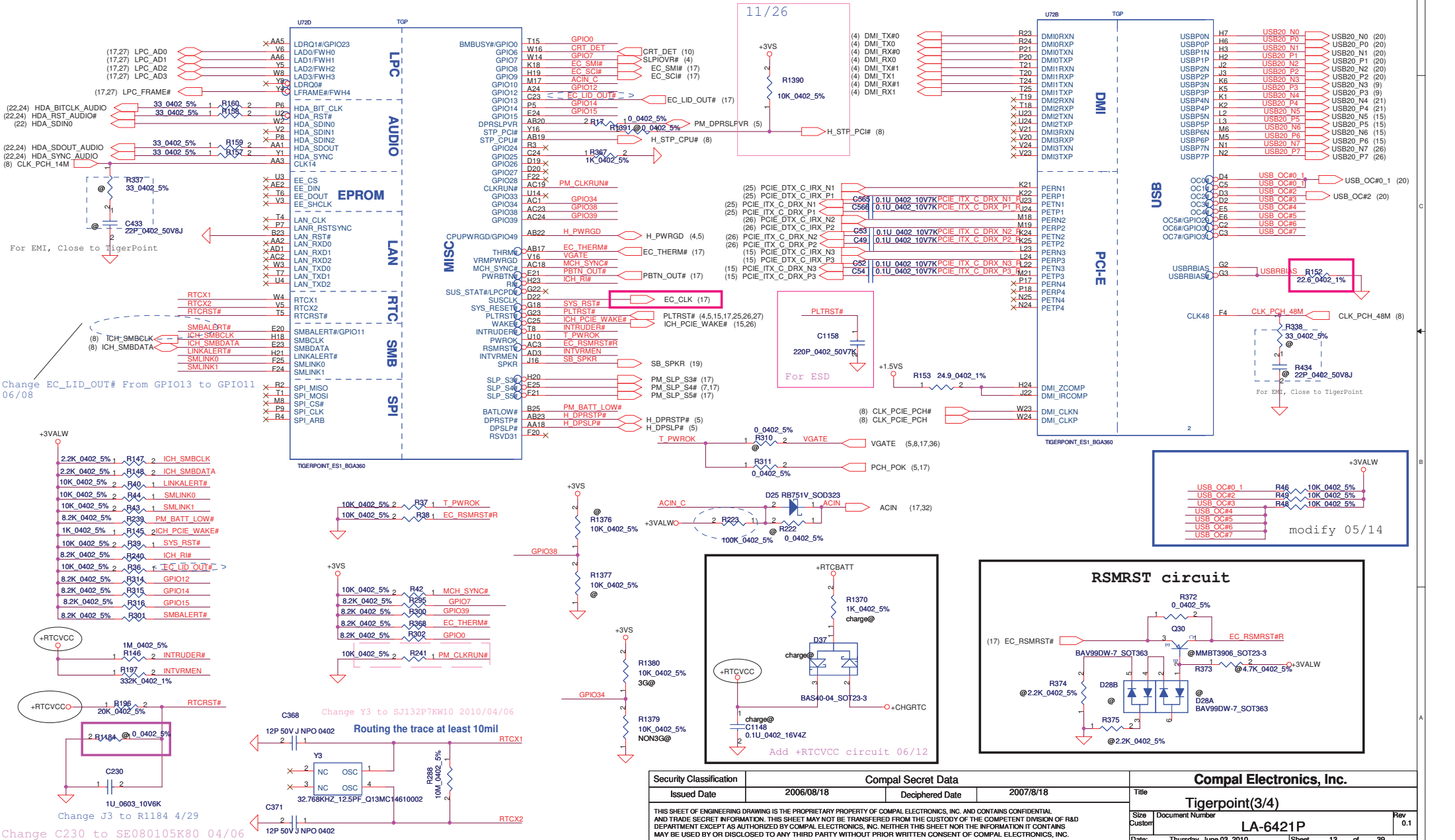
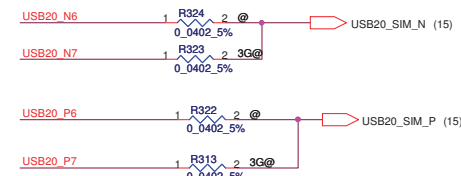
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PCIE Port List	
1	LAN
2	WLAN
3	WWAN
4	

USB Port List	
0	USB Left1
1	USB Left2
2	USB Right2
3	CMOS
4	CardReader
5	WWAN
6	BT
7	WIMAX



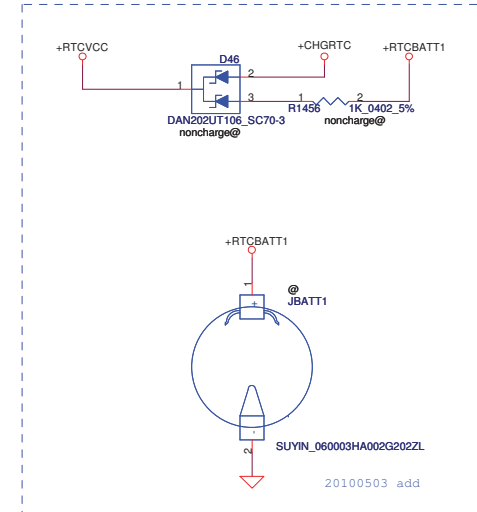
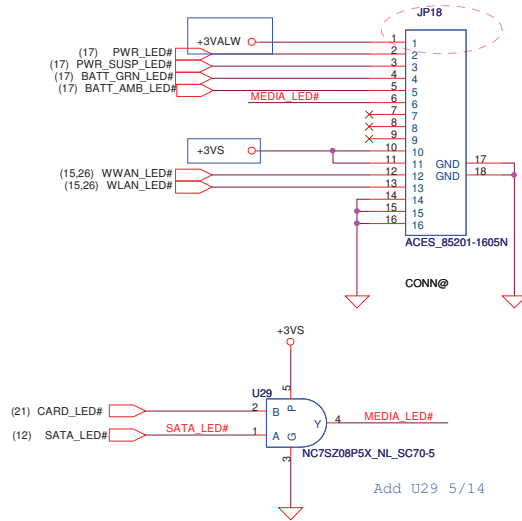
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ADD LED PCB CONN 06/12

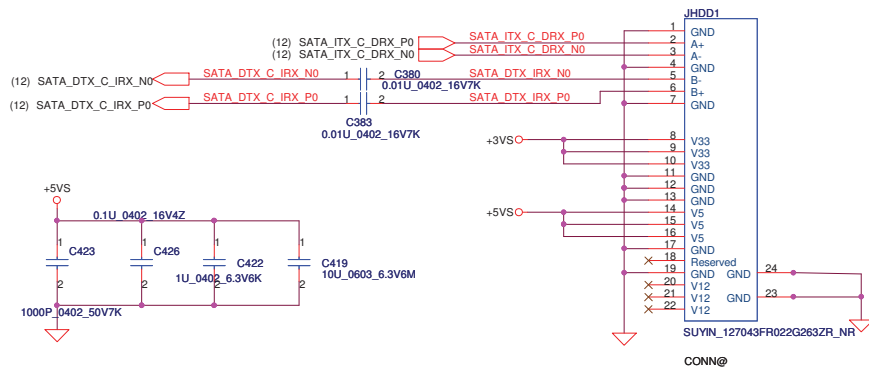
Change JP18 to NEW P/N 06/23

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

LED PCB CONN

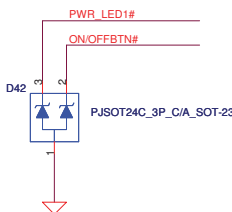


SATA HDD Conn.

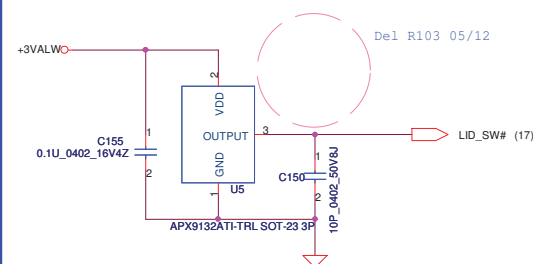
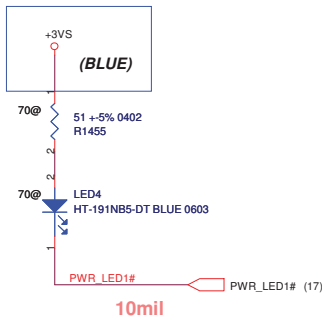


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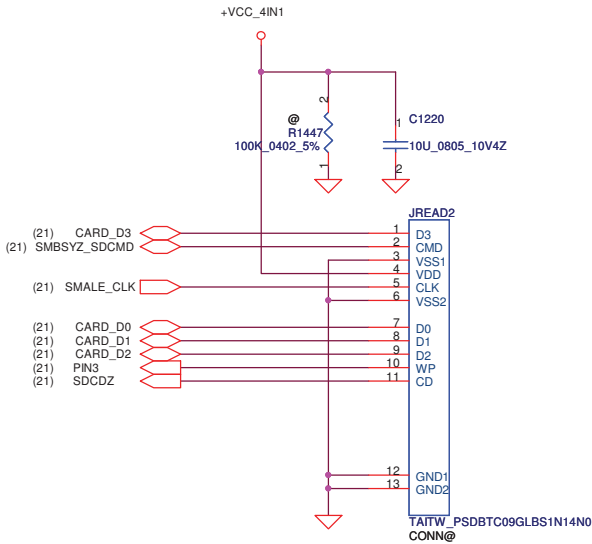
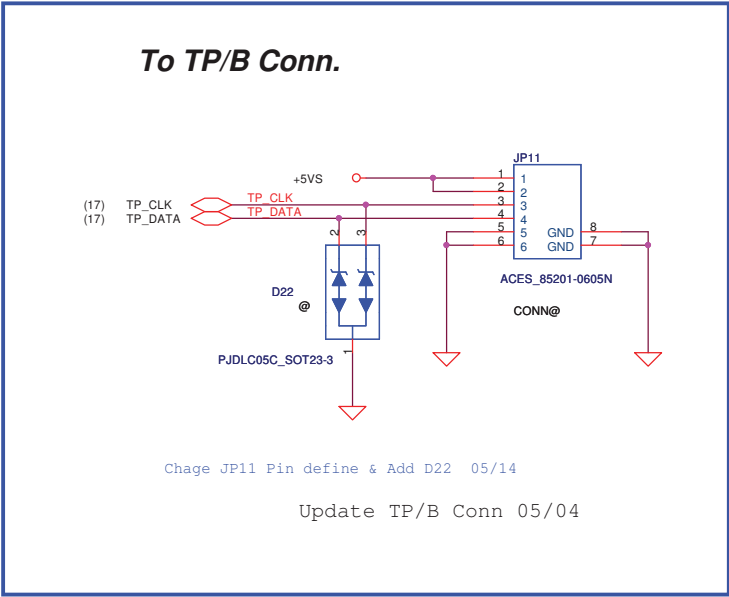
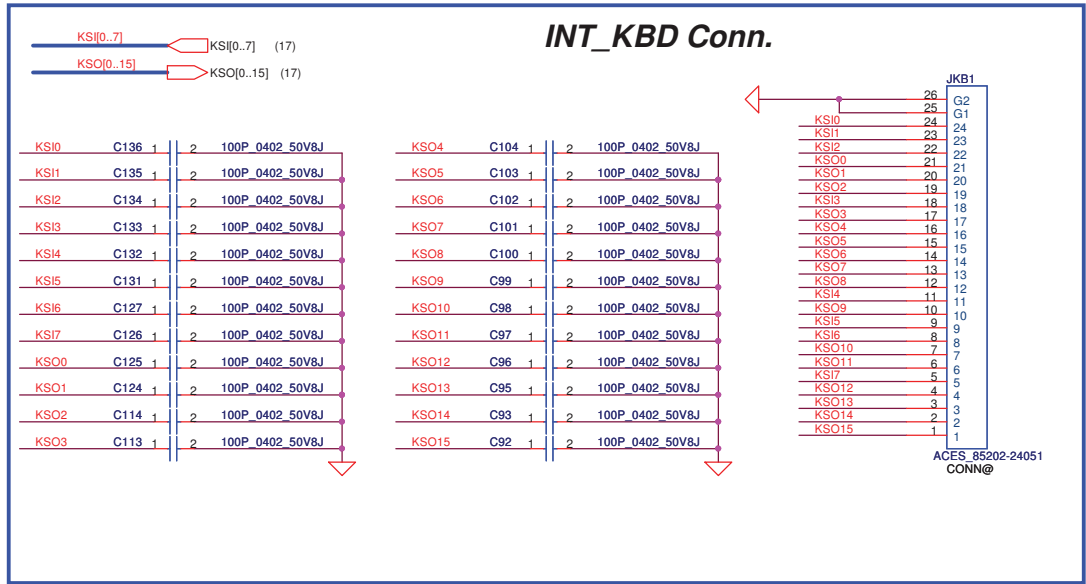
A diagram showing a blue wire connected to a terminal labeled **+3VS**. The wire is labeled **(BLUE)**.



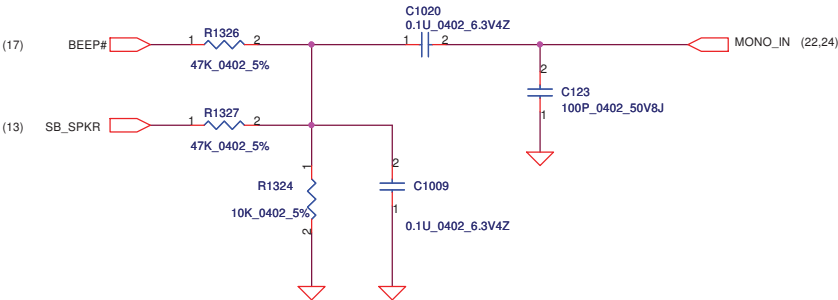
Add For PAV70 2010/04/09



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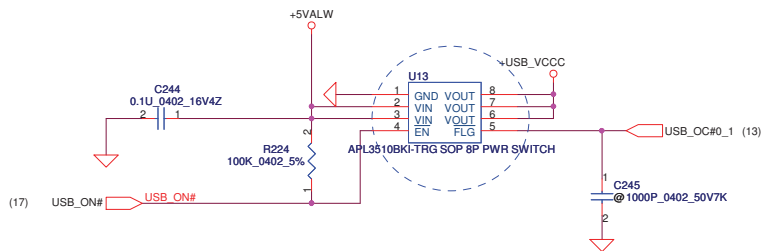


6/26 Add circuit



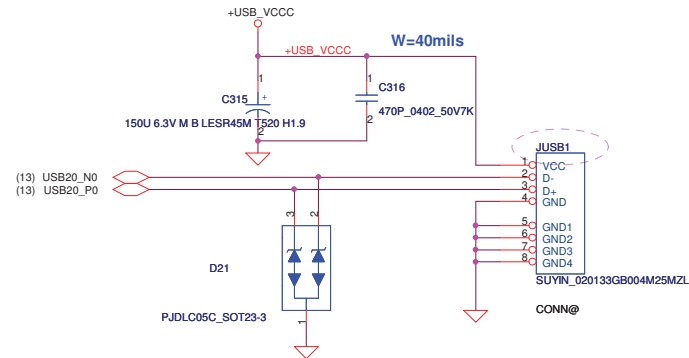
Modify MONO_IN schematic,move some parts to I/O Board , Add the MONO_IN_R on M/B 06/25

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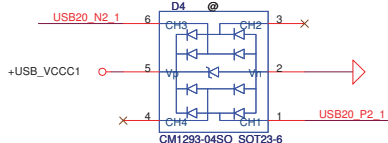
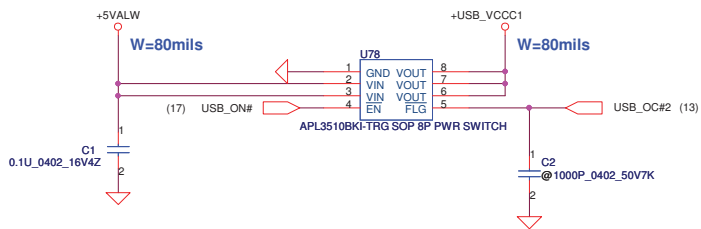
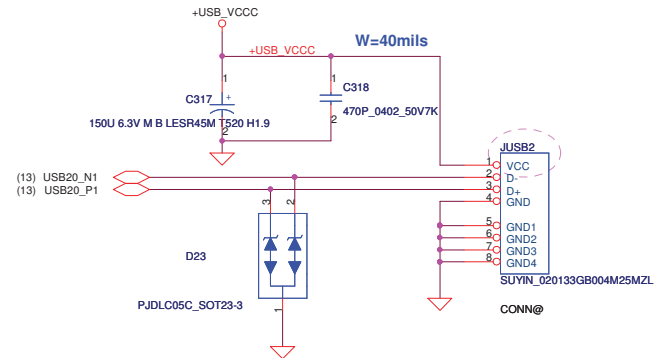


USB CONN.1

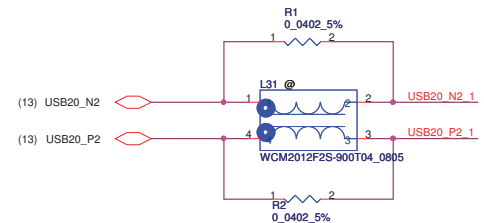
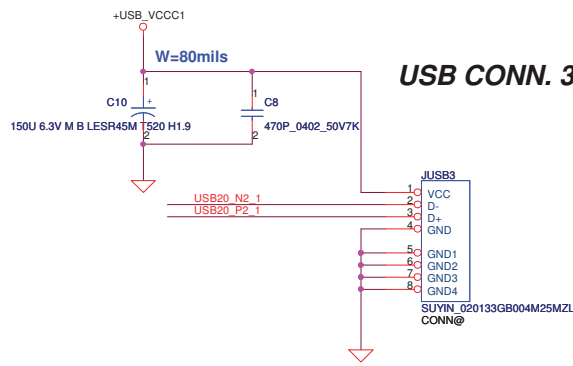
Change JUSB1 JUSB2 to NEW P/N SP010906181 06/23



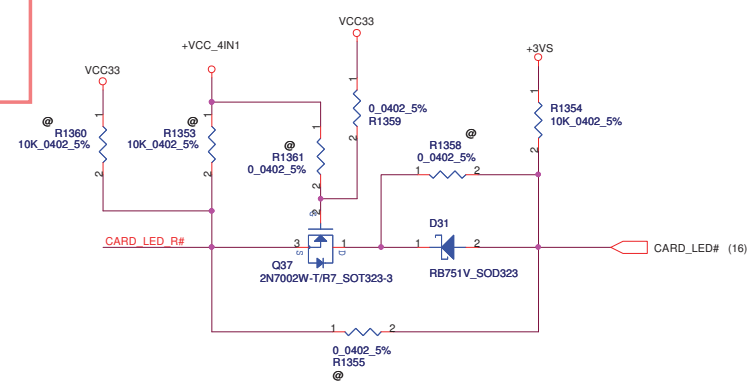
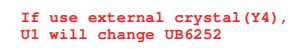
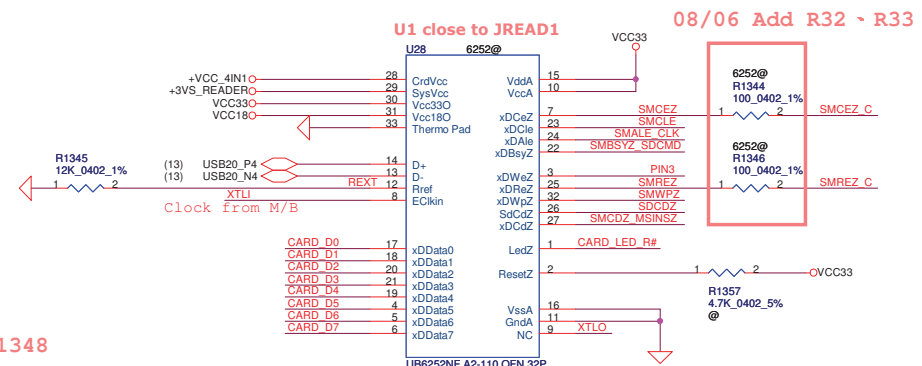
USB CONN.2



USB CONN. 3

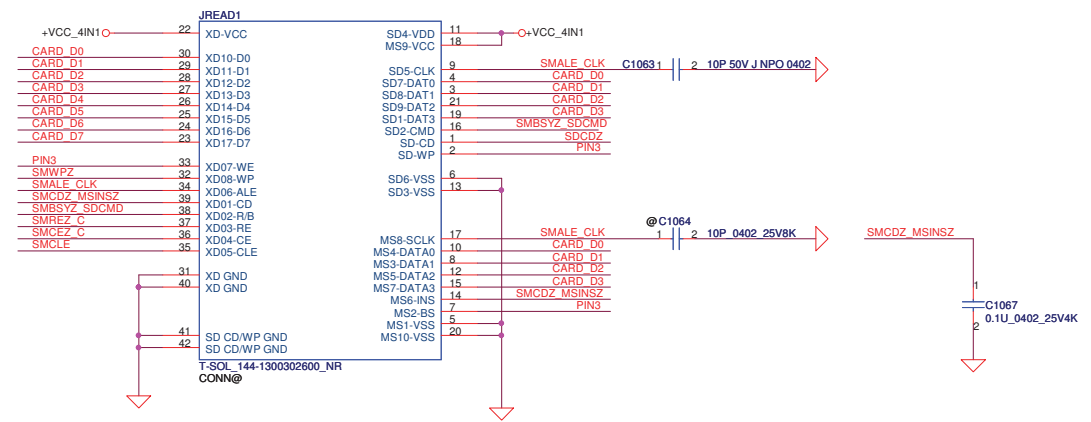
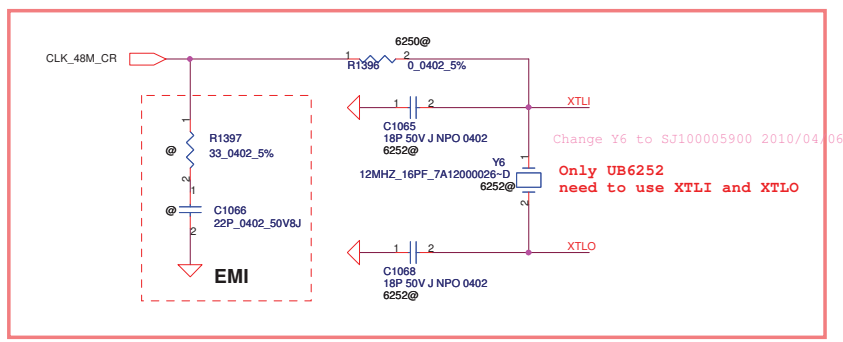


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								USB PORTS			
								Size B			
								Document Number			
								LA-6421P			
								Date: Thursday, June 03, 2010			
								Sheet 20 of 39			

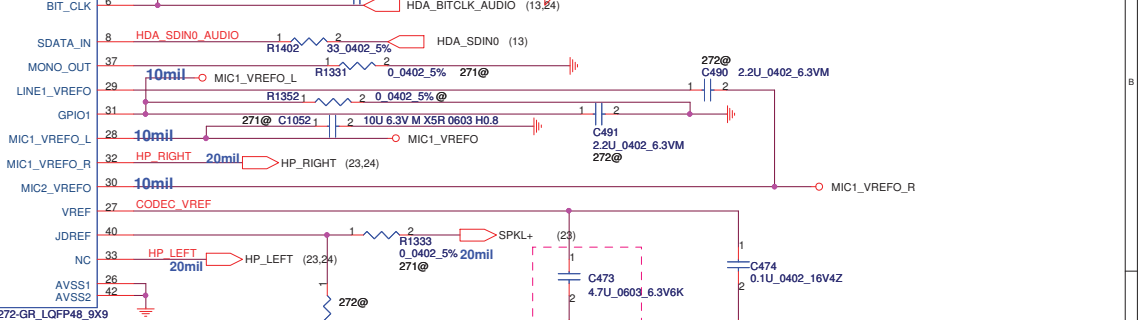
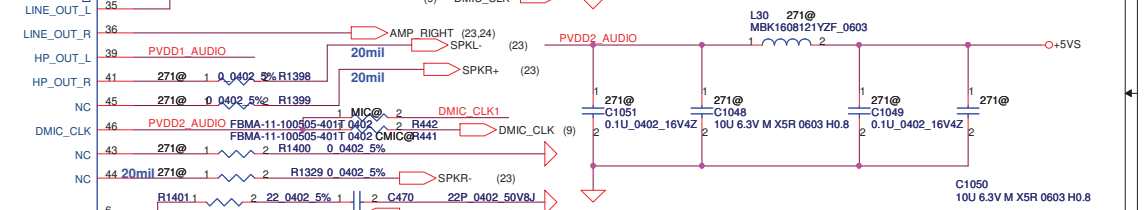
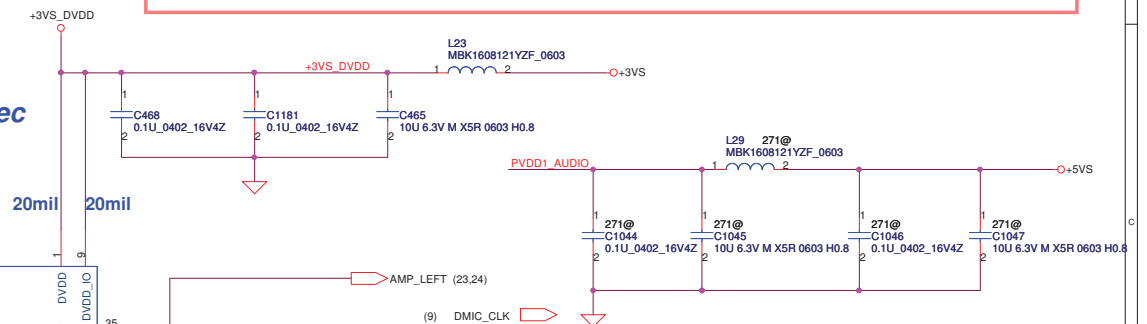
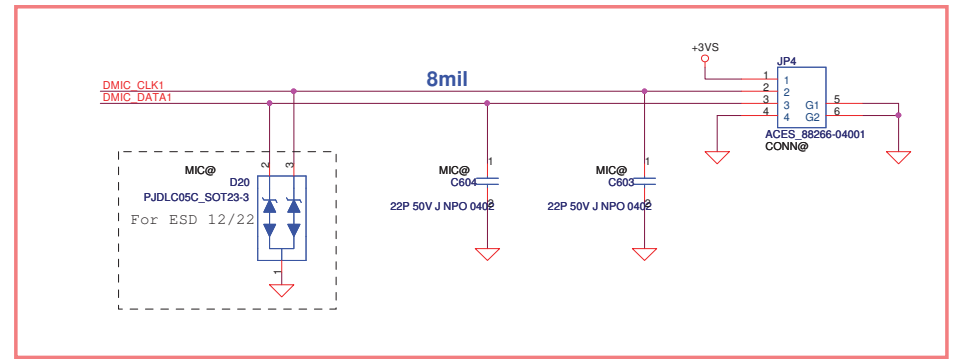


07/02 Update JREADER1

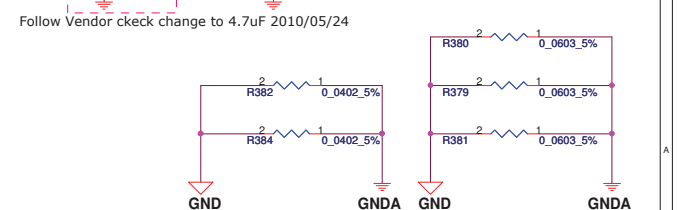
4/30 Add CLK_SD_48M

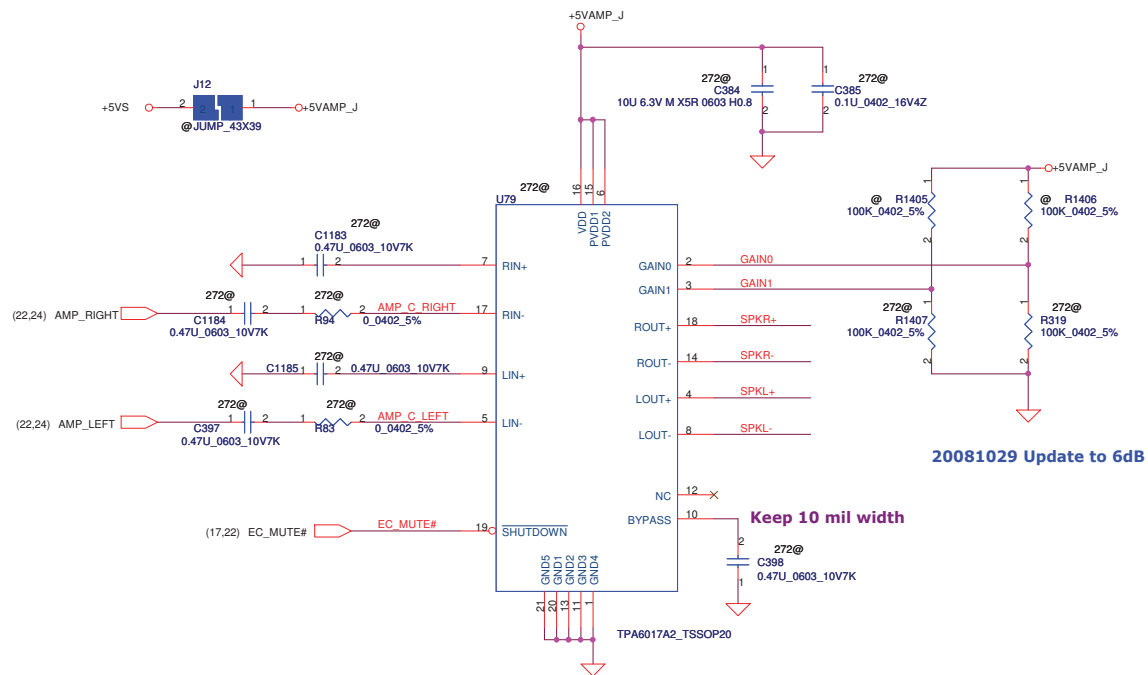


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Issued Date	2009/01/22	Deciphered Date	2009/11/20	Title	Card reader	
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				Custom	LA-6421P	0.1
				Date	Thursday, June 03, 2010	Sheet
3	1	2				

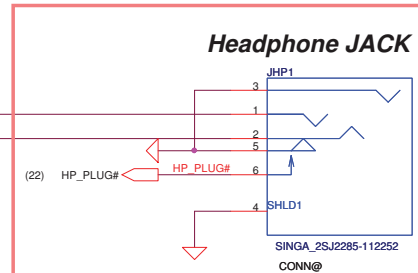
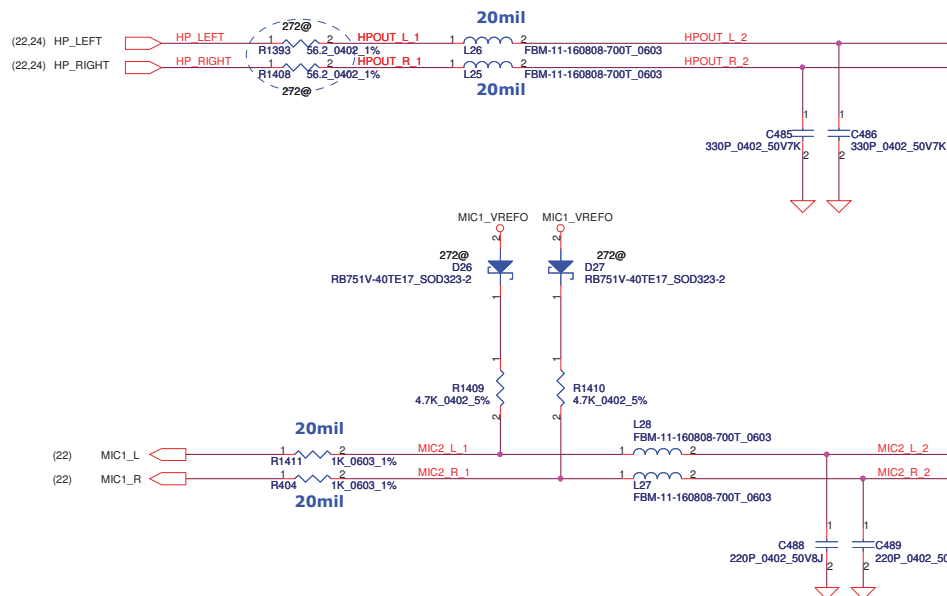
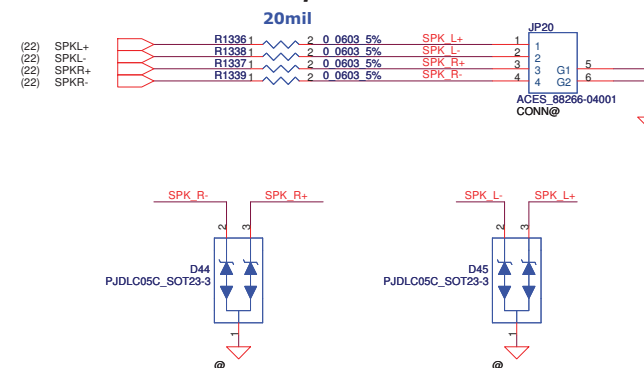


Change to SA00002CI20 ALC272-VA2-GR

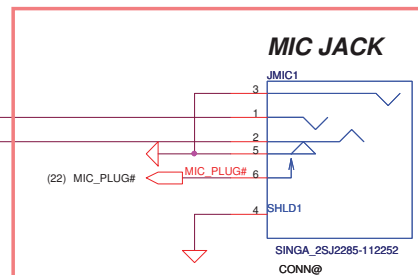




Int. Speaker Conn.



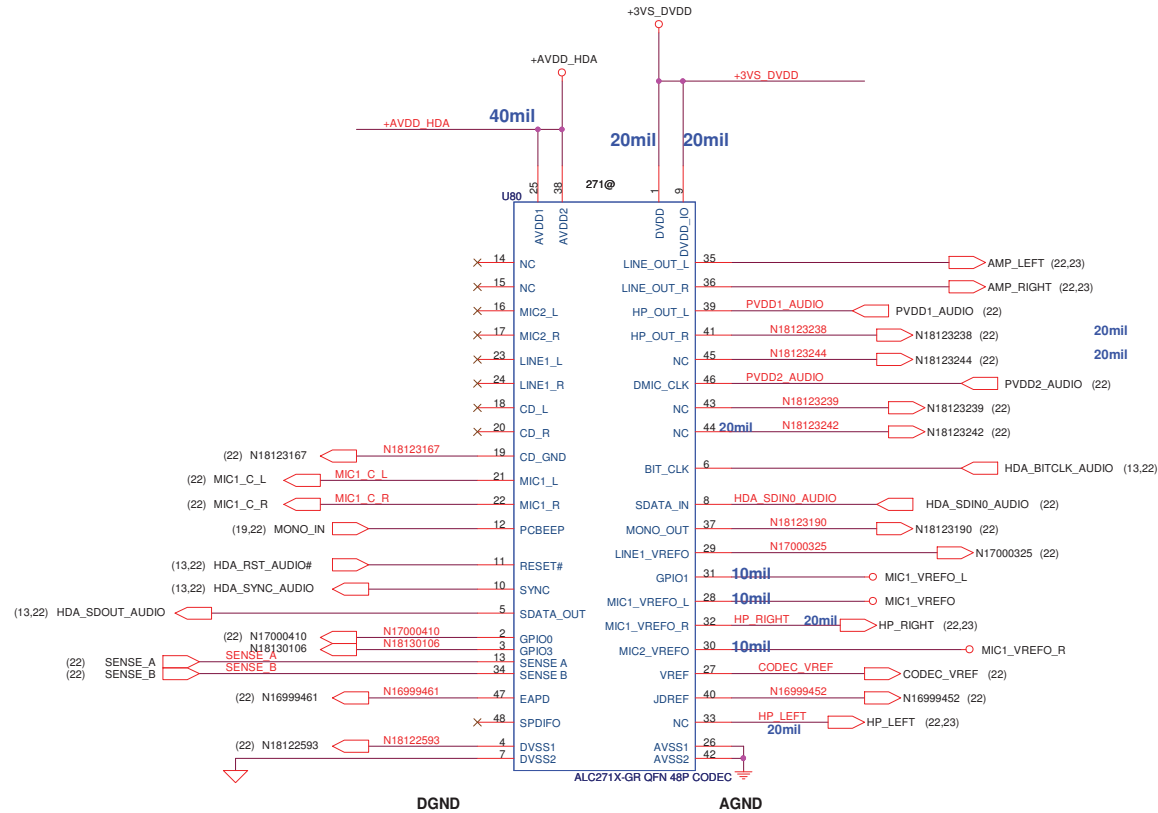
6/19 Update Headphone connector



6/19 Update MIC connector

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

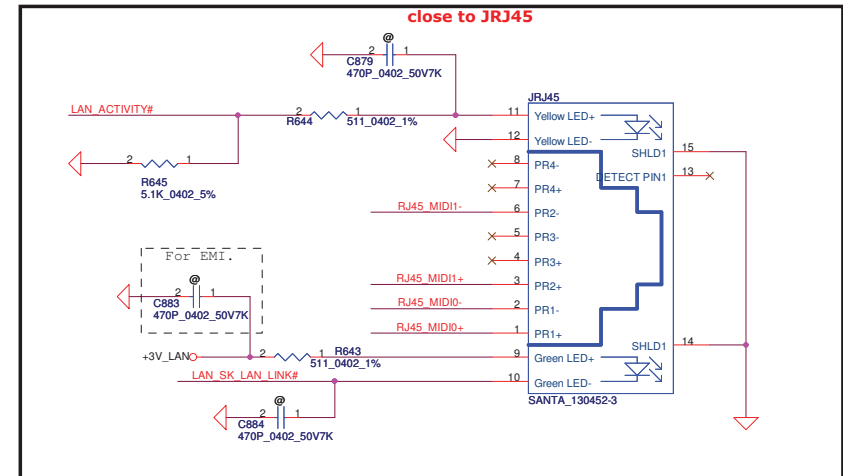
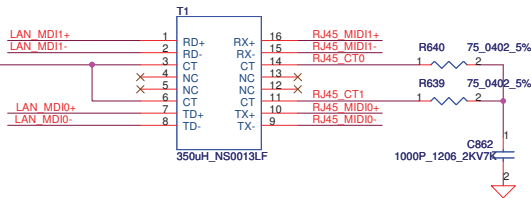
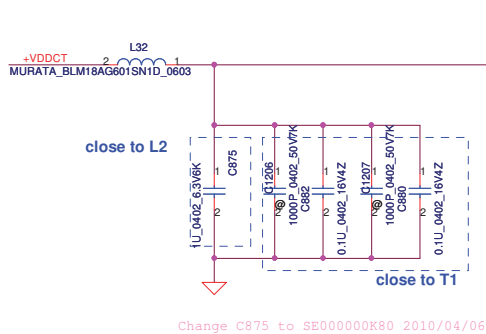
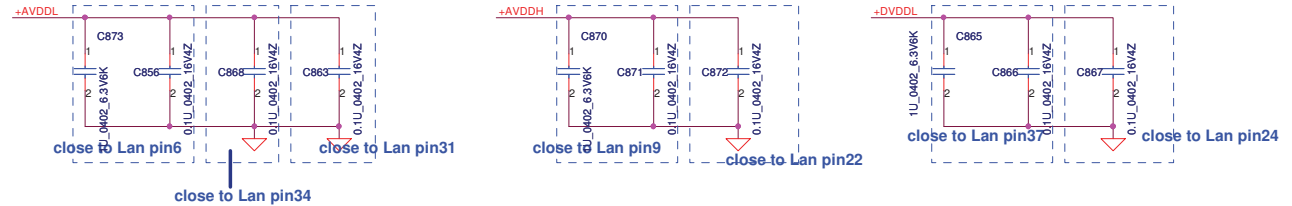
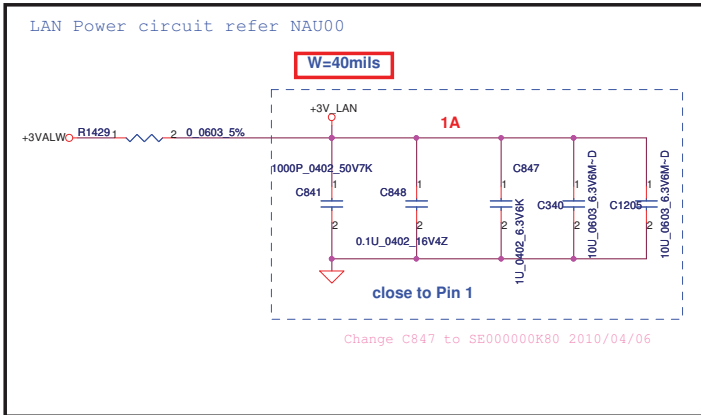
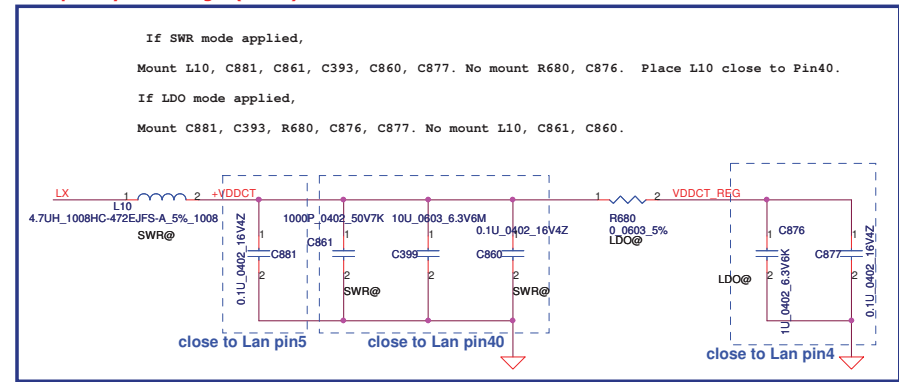
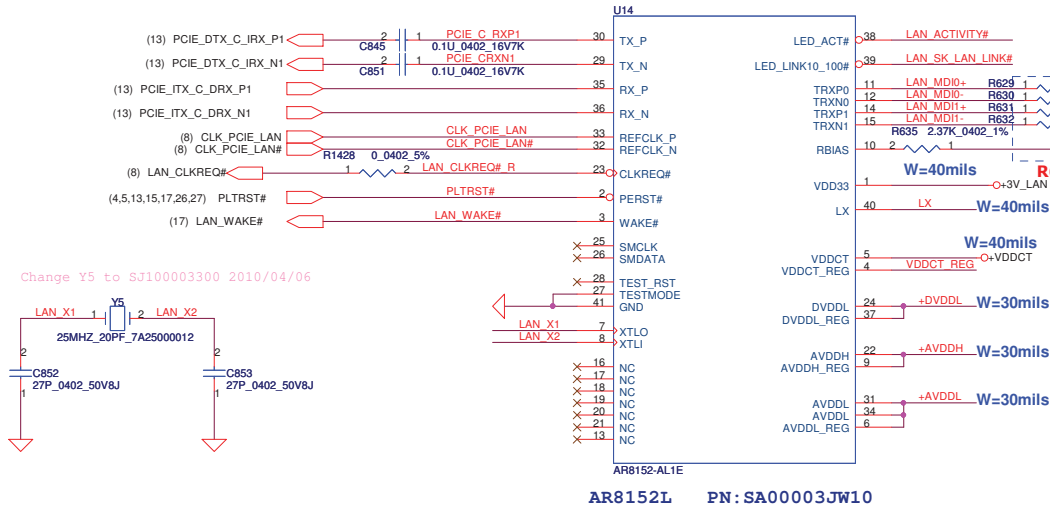
HD Audio Codec



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)

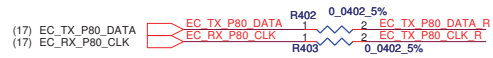
Compal Electronics, Inc.			
Title	<Title> HD Audio Codec ALC271		
Size	Document Number	Rev	
Custom	LA-6421P	LA-6222P	0.1
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Change LAN chip to AR8152-L for NAV70/80 DDR3 2010/01/22

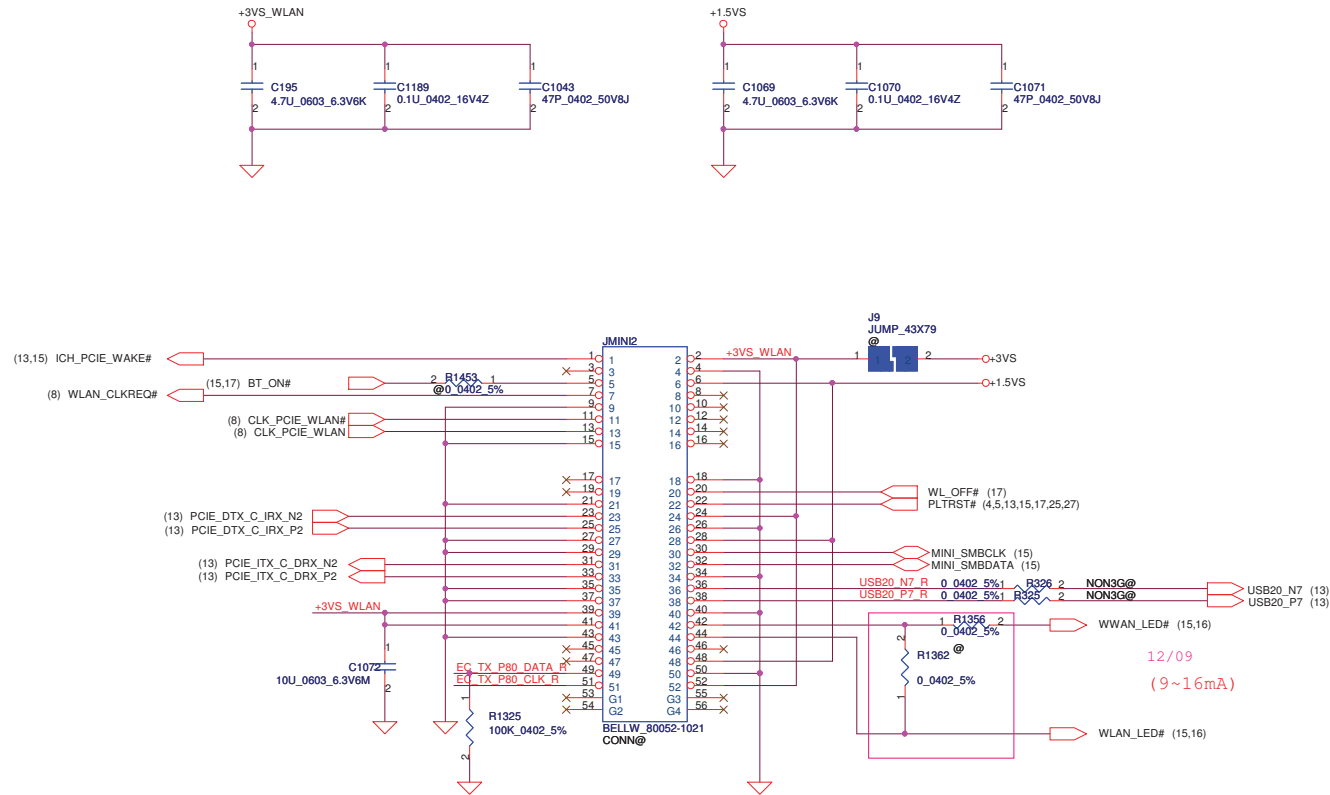


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Issued Date	2009/7/7	Deciphered Date	2010/7/7	Title	LAN AR8152
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Mini-Express Card for WWAN



Mini-Express Card for WLAN

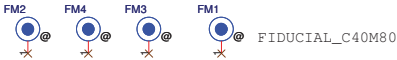
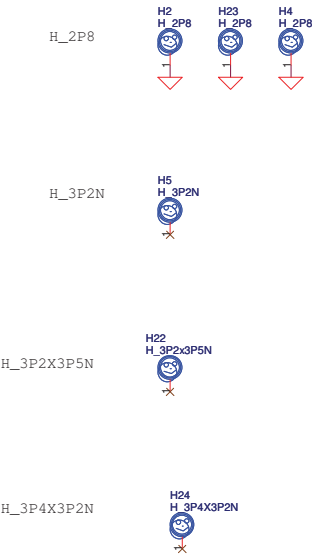
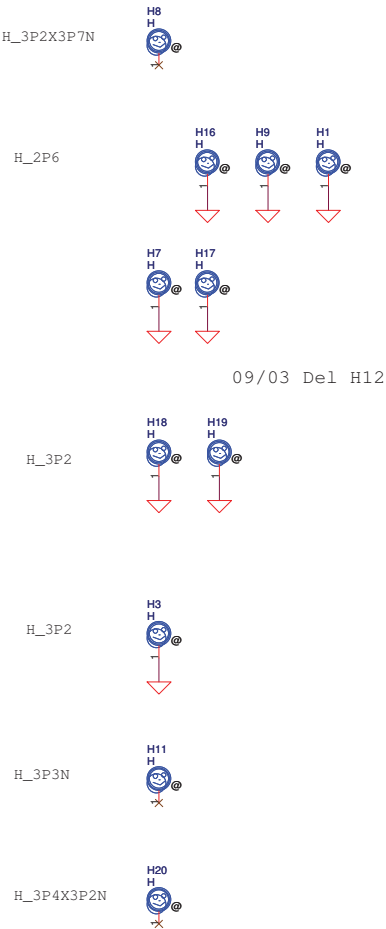


5/12 Update WLAN connector(the same as KAV60)
 6/1 Revised 37、39、41、42、43 to NC
 6/12 Update connector to DC040006S00
 6/26 Update JMINI1 footprint
 7/01 update pin 23,25,31,33



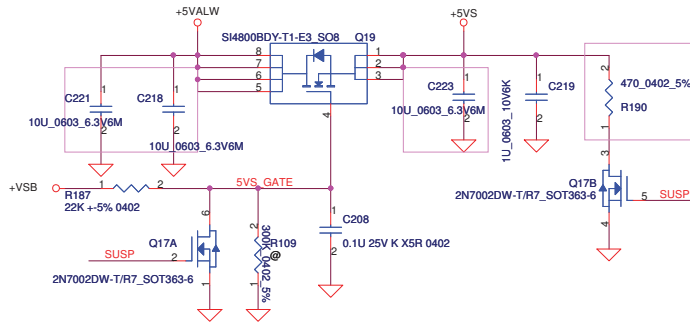
Security Classification		Compal Secret Data		Compal Electronics, Inc. TPM/G-Sensor/Light sensor	
Issued Date	2008/09/15	Deciphered Date	2009/12/31	Title	
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				Document Number	0.1
				LA-642IP	
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Modify Hole location by (ME Drawing 06/12) 0615

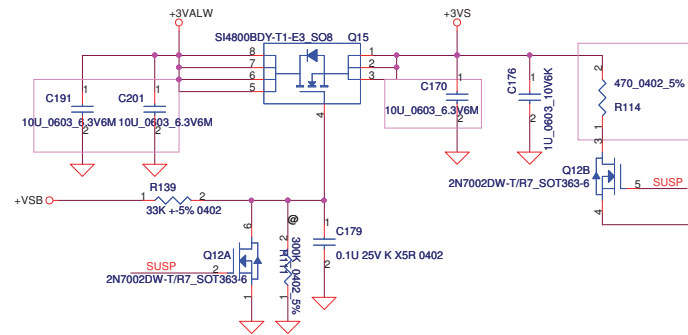


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				Size	Document Number	Rev
				B	LA-6421P	0.1
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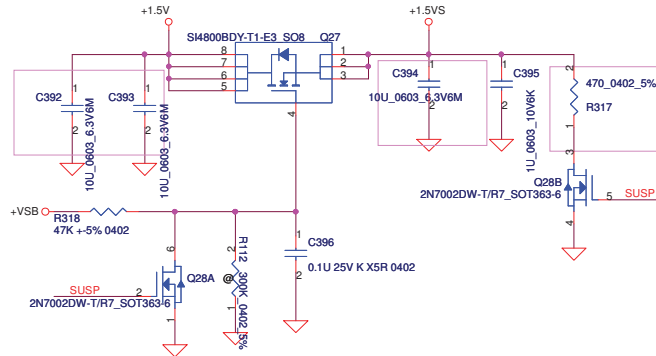
+5VALW TO +5VS



+3VALW TO +3VS

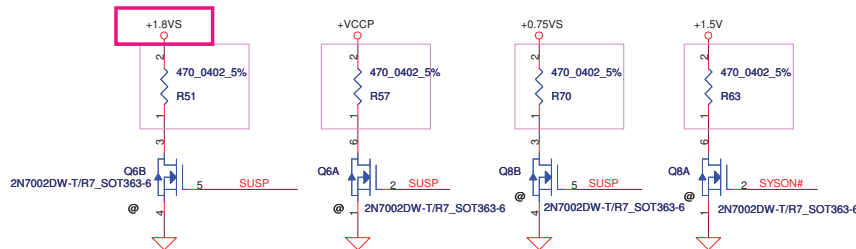
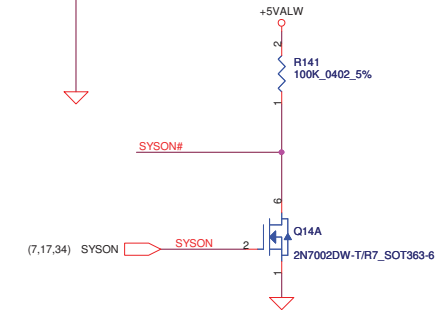
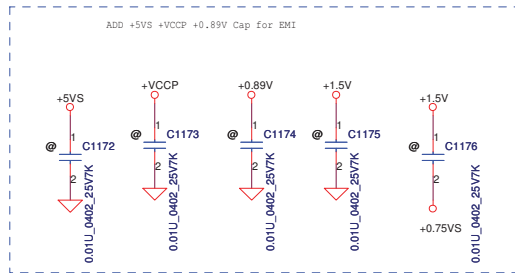


+1.5V to +1.5VS

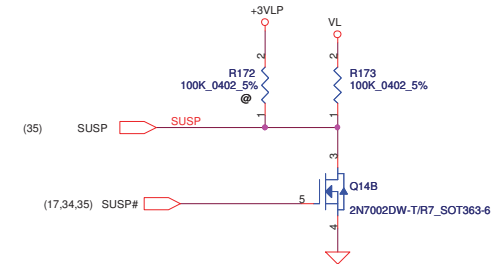


Change Q12,Q14,Q17,Q28 to SB00000DH00 2010/04/06

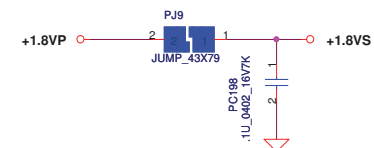
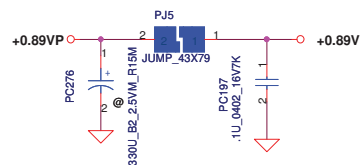
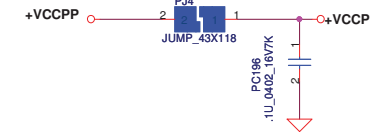
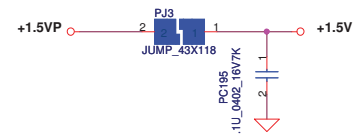
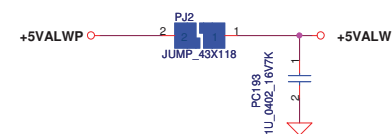
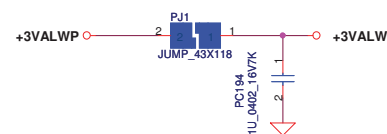
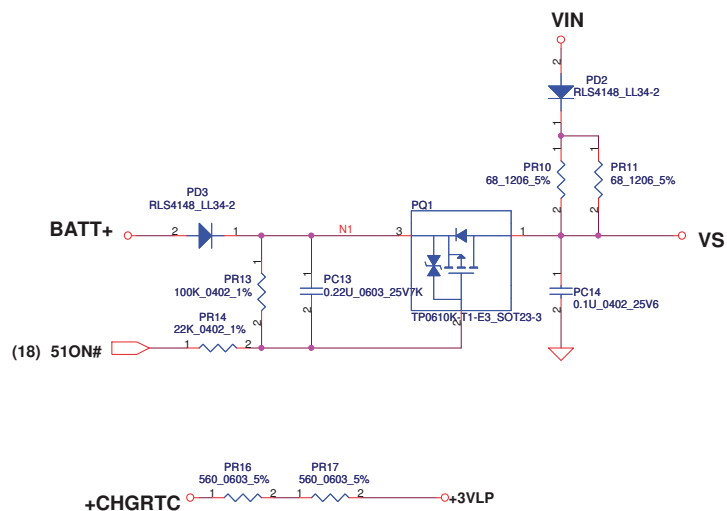
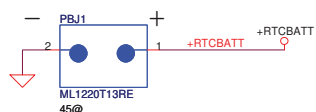
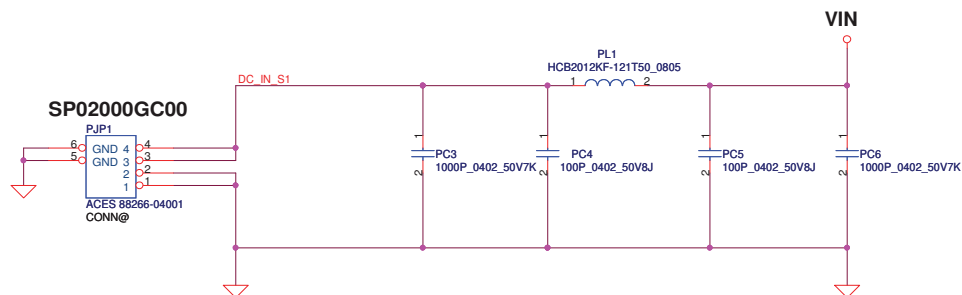
Change C176,C219,C395 to SE080105K80 2010/04/06



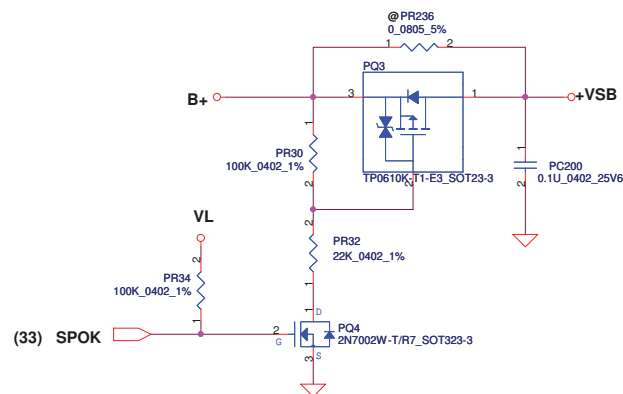
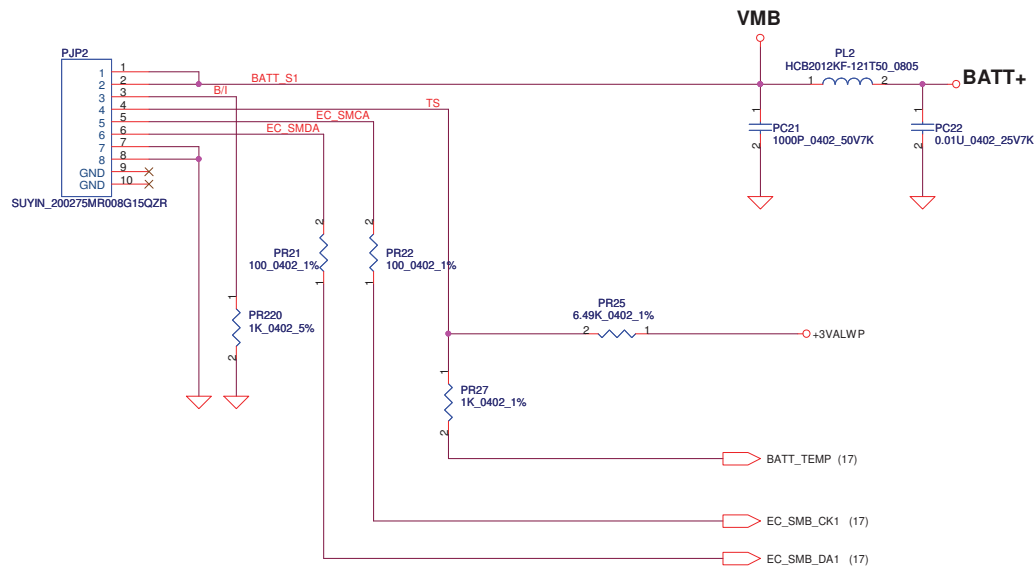
Change Q6,Q8 to SB00000DH00 2010/04/06



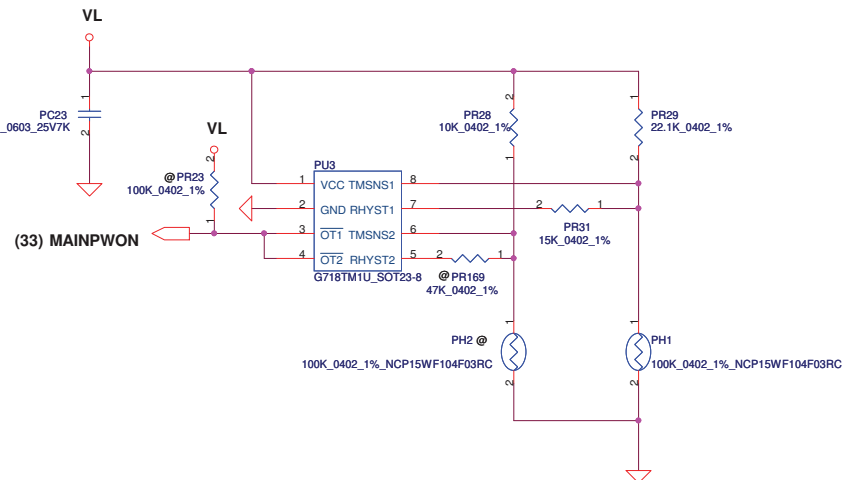
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2006/08/18				2007/8/18				Title			
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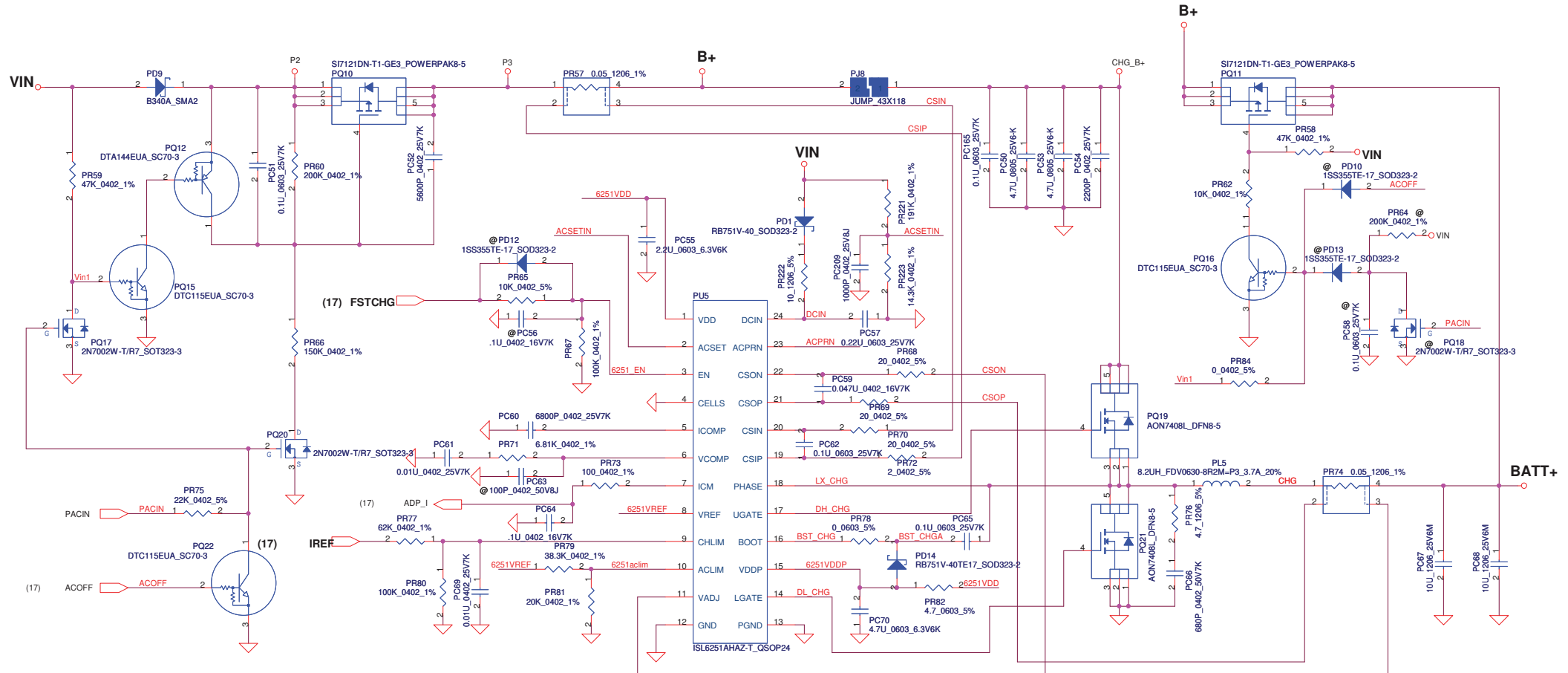
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Issued Date	2007/09/20	Deciphered Date	2008/09/20	Title	
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PH1 under CPU botten side :
 CPU thermal protection at 92 degree C
 Recovery at 72 degree C



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				Rev	0.1



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

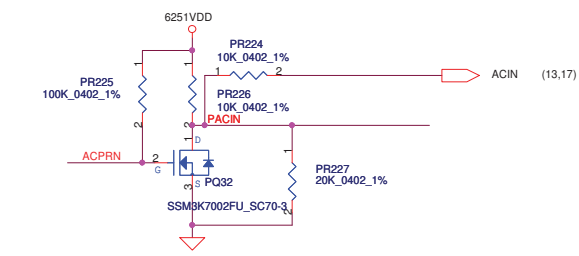
CP mode
 $V_{acim} = 2.39 \cdot (20K / (20K + 38.3K)) = 0.8199V$
 $I_{input} = (1/0.05) \cdot ((0.05 \cdot V_{acim}) / 2.39 + 0.05)$
 where $V_{acim} = 0.8199V$, $I_{input} = 1.343A$

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

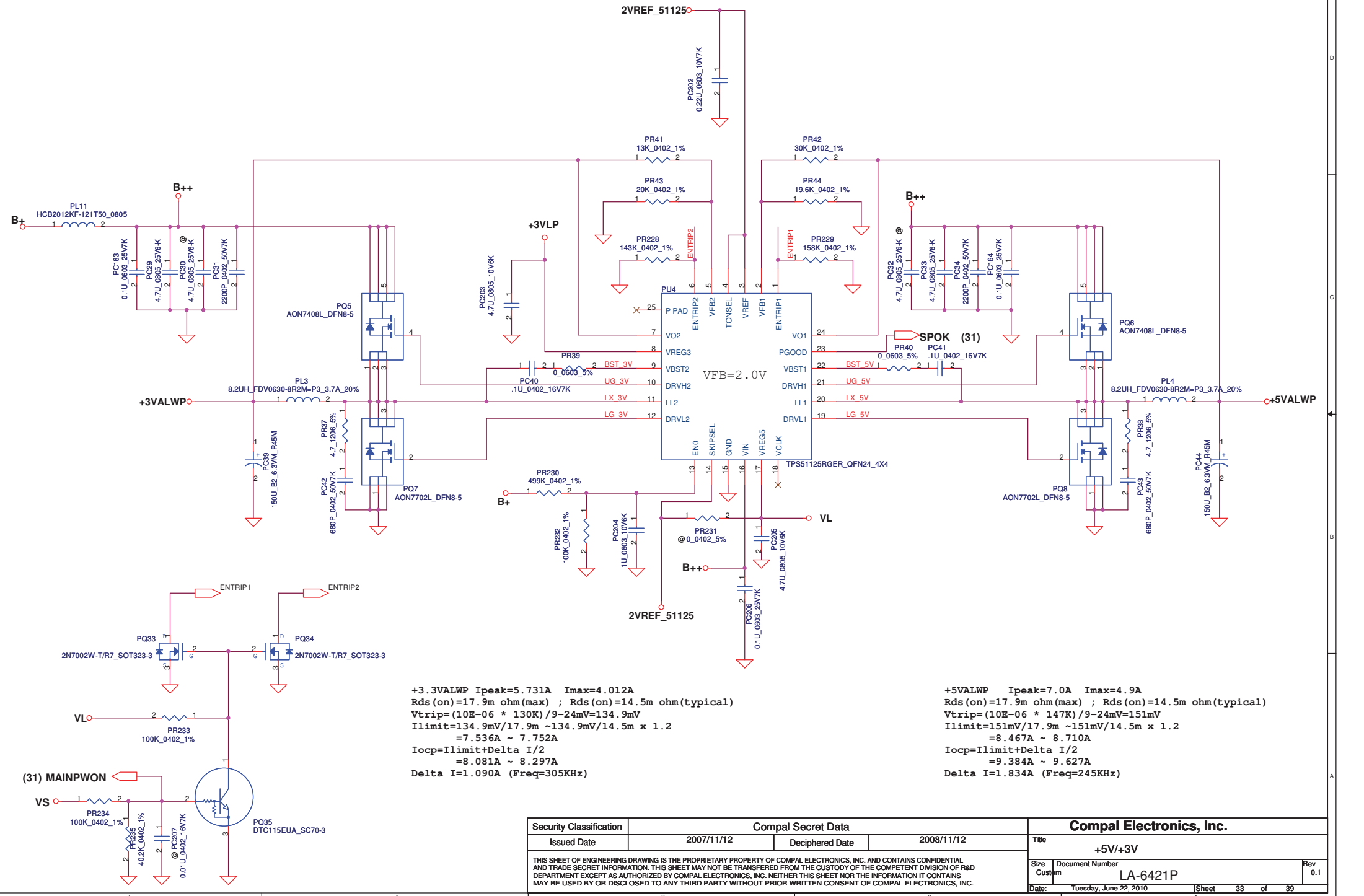
BATT Type	Charging Voltage (0x15)	CV mode
Normal 3S LI-ON Cells	12600mV	12.60V

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

(17) CALIBRATE#



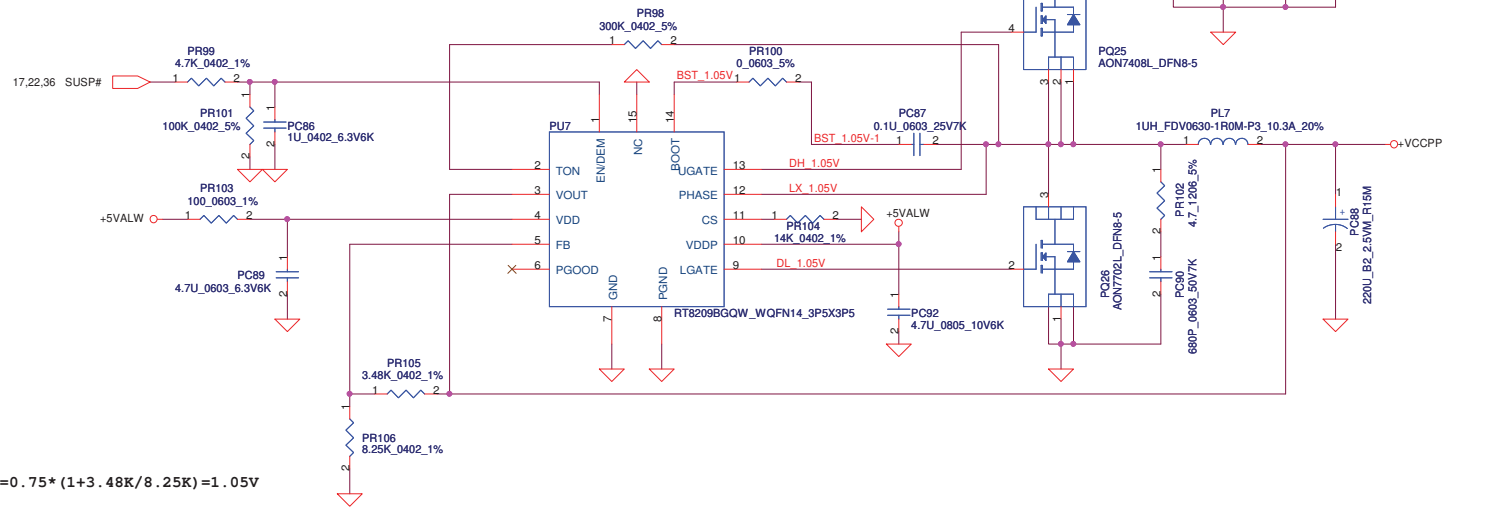
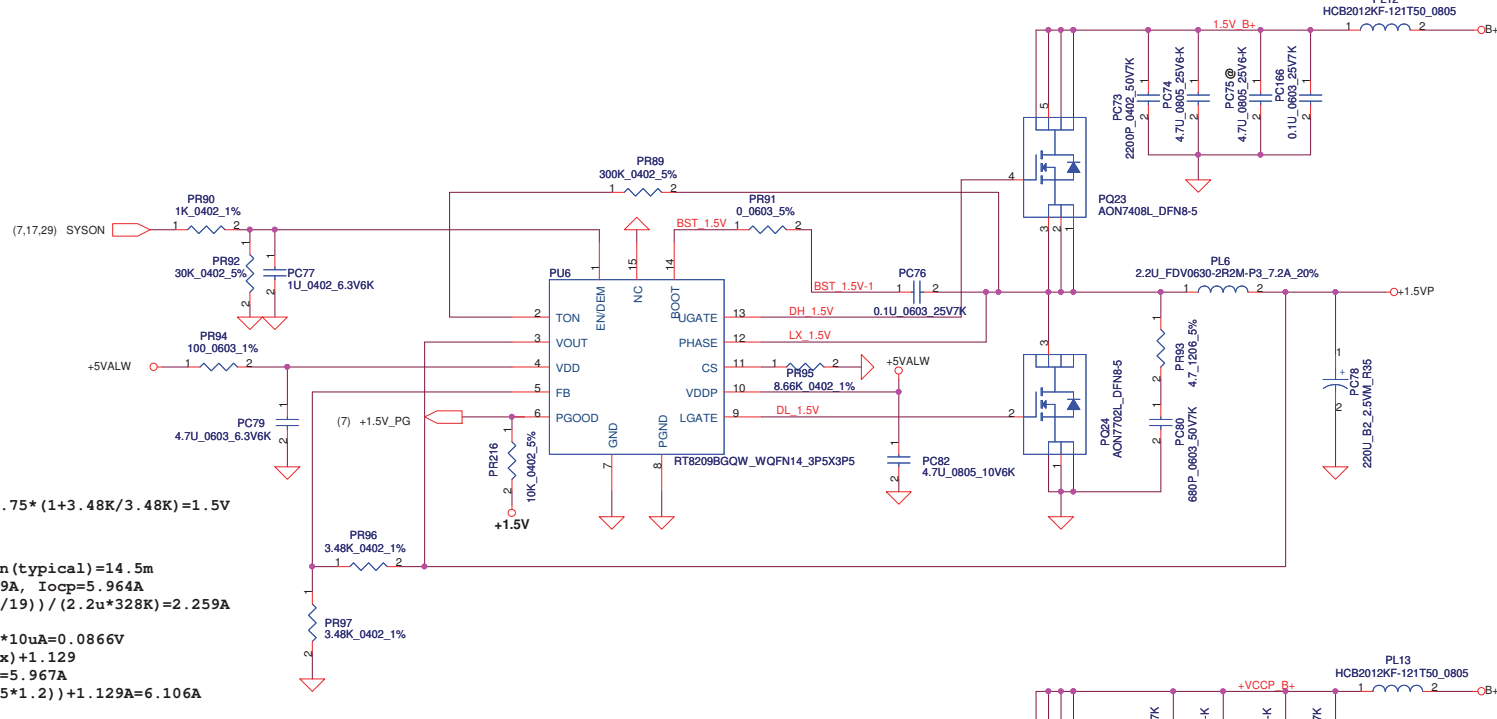
$V_{th, rise (typical)} = ((191K / 14.3K) + 1) \cdot 1.26$
 $= 18.89V$
 $V_{th, fall (typical)} = ((191K / 14.3K) + 1) \cdot 1.26 - 3.4\mu A \cdot 191K$
 $= 17.43V$



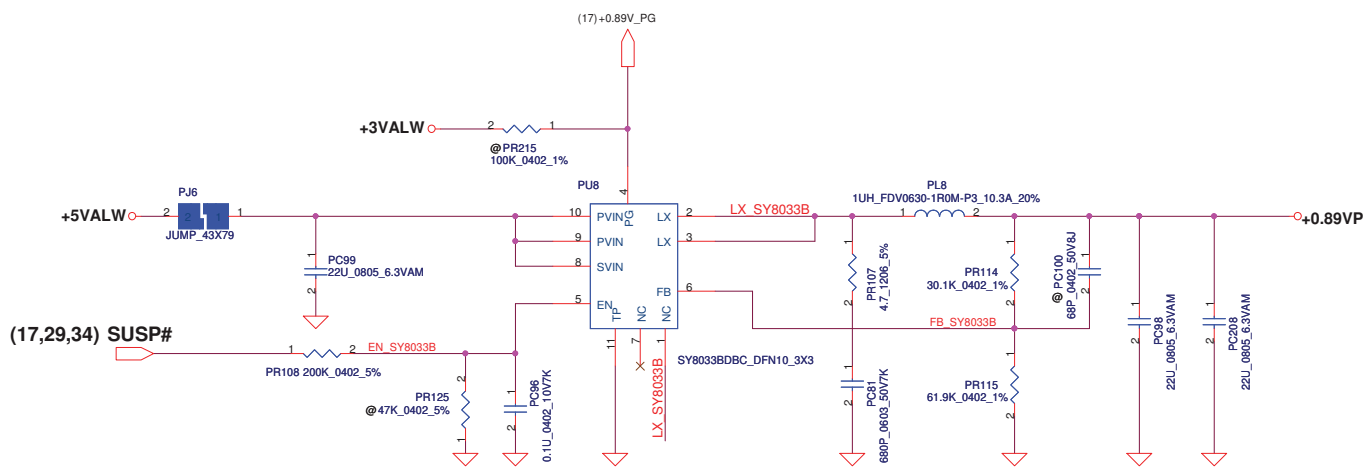
+3.3VALWP Ipeak=5.731A Imax=4.012A
Rds(on)=17.9m ohm(max) ; Rds(on)=14.5m ohm(typical)
Vtrip=(10E-06 * 130K)/9-24mV=134.9mV
Ilimit=134.9mV/17.9m ~134.9mV/14.5m x 1.2
=7.536A ~ 7.752A
Iocp=Ilimit+Delta I/2
=8.081A ~ 8.297A
Delta I=1.090A (Freq=305KHz)

+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)

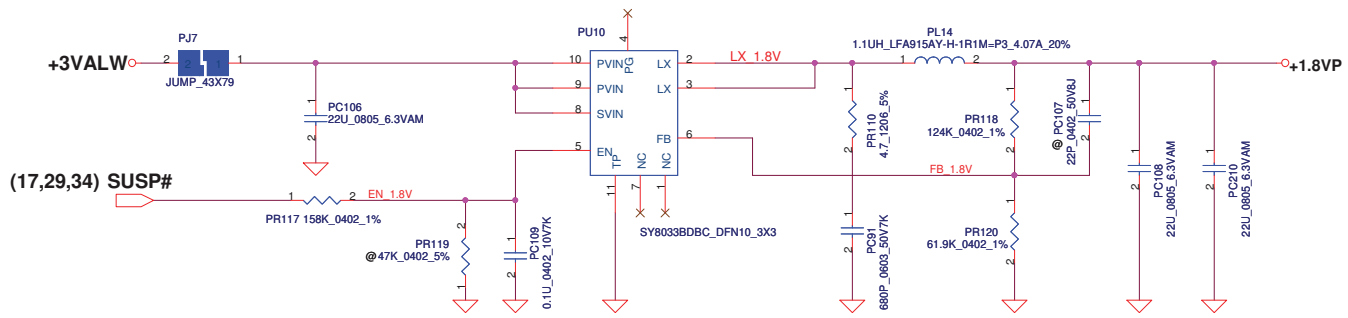
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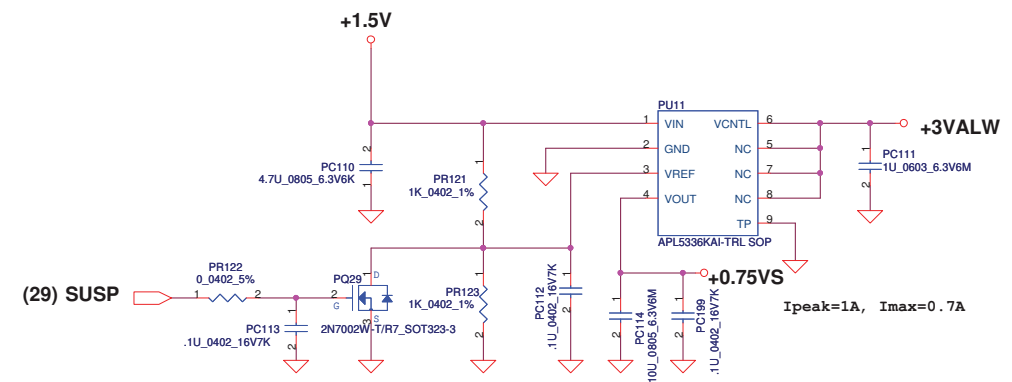
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$\langle V_o = 0.89V \rangle \quad V_{FB} = 0.6V$
 $V_o = V_{FB} * (1 + PR114 / PR115) = 0.6 * (1 + 30.1K / 61.9K) = 0.89V$
 $I_{peak} = 2.64A, \quad I_{max} = 1.848A$



$\langle V_o = 1.8V \rangle \quad V_{FB} = 0.6V$
 $V_o = V_{FB} * (1 + PR118 / PR120) = 0.6 * (1 + 124K / 61.9K) = 1.8V$
 $I_{peak} = 0.318A, \quad I_{max} = 0.223A$



$I_{peak} = 1A, \quad I_{max} = 0.7A$

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

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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 SH00000J100 to SH00000BS00 Change PL6,PL10 from SH00000FD10 to SH000000700 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 fromSA00003RU00(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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Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
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<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 TFM@ 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			
<Title>			
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