



Compal Confidential

Everest Schematics Document

Intel Merom Processor with Calistoga + DDRII + ICH7M

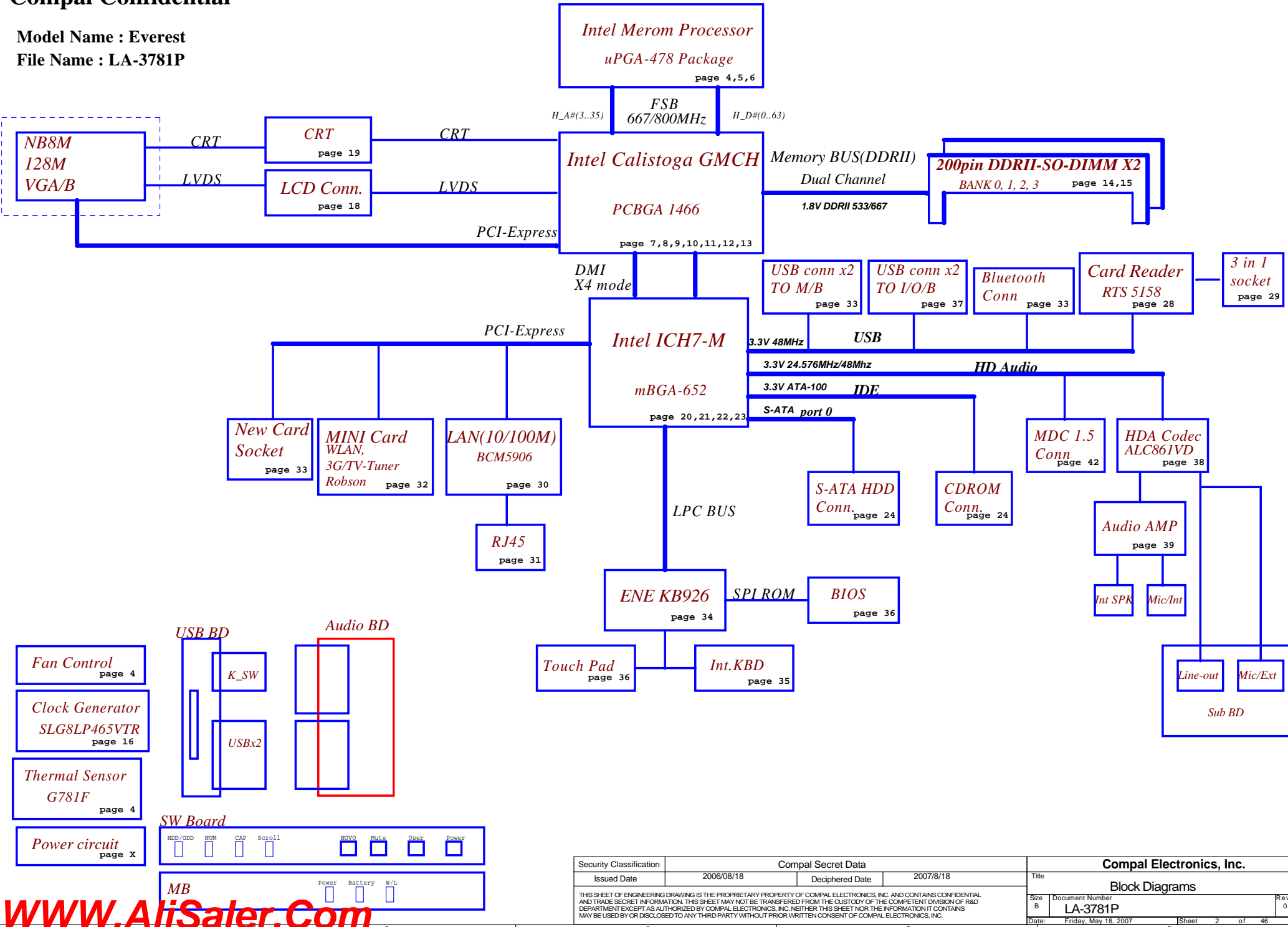
2007-05-15

REV: 1.0

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Model Name : Everest
File Name : LA-3781P



Voltage Rails

Power Plane	Description	S1	S3	S5
VIN	Adapter power supply (19V)	NA	NA	NA
B+	AC or battery power rail for power circuit.	NA	NA	NA
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF
+0.9VS	0.9V 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
+1.8V	1.8V power rail for DDR	ON	ON	OFF
+1.8VS	1.8V switched power rail	ON	OFF	OFF
+2.5VS	2.5V switched 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.

External PCI Devices

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

No PCI Device

EC SM Bus1 address

Device	Address
Smart Battery	0001 011X b
EEPROM(24C16/02)	1010 000X b

EC SM Bus2 address

Device	Address
GMT-781	1001 100X b
NVIDIA NB8X	

STATE \ SIGNAL	SLP_S1#	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON	HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S1 (Power On Suspend)	LOW	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)	LOW	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	LOW	ON	OFF	OFF	OFF

BOARD ID Table

ID	BRD ID	R54/42(Rb)	Vab
IHL00	0 R01 (EVT)	0	0V
IHLV2	1 R02 (DVT)	8.2K	0.25V
IHLV3	2 R03 (PVT)	18K	0.50V
IHLV3	3 R10A (MP)	33K	0.82V
IHLV3	4 R01 (EVT)	56K	1.19V
IHLV3	5 R02 (DVT)	100K	1.65V
IHLV3	6 R03 (PVT)	200K	2.20V
IHLV3	7 R10A (MP)	NC	3.30V

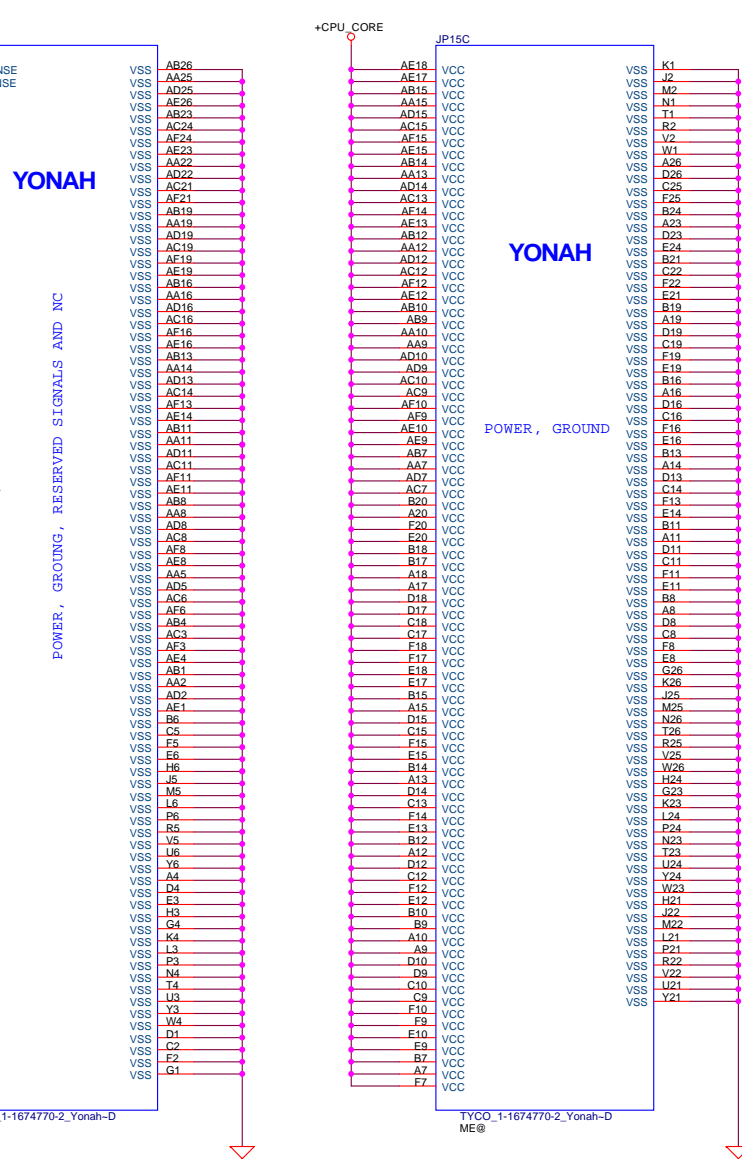
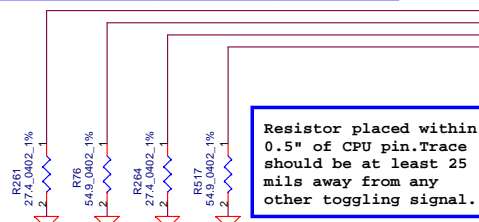
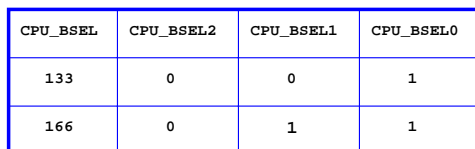
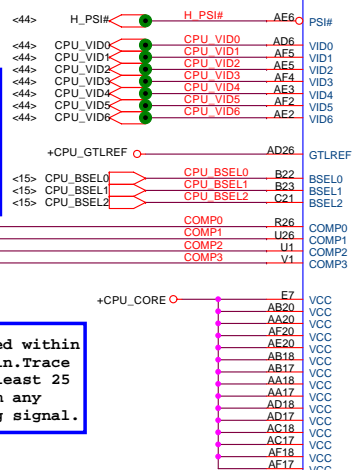
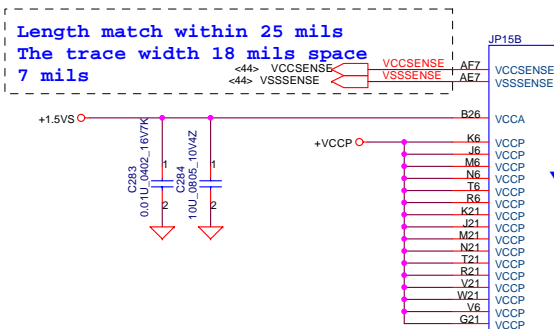
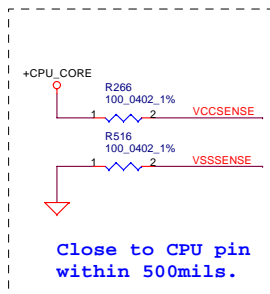
PANEL ID Table

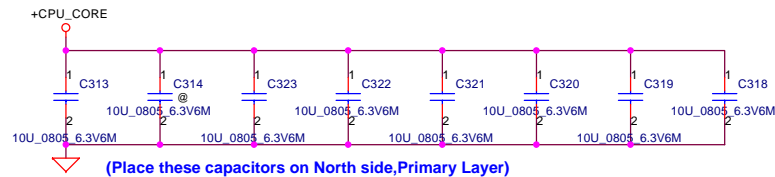
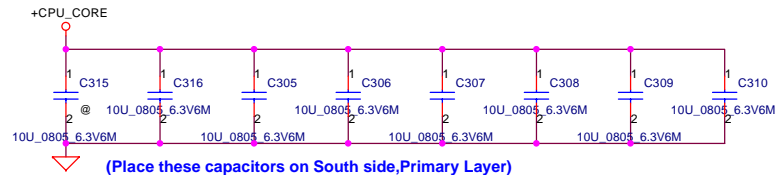
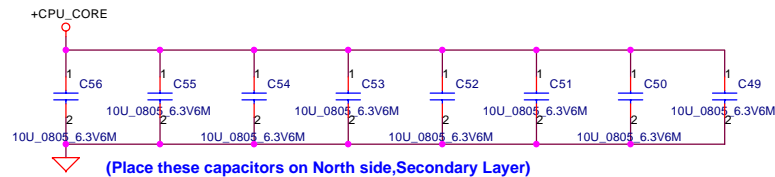
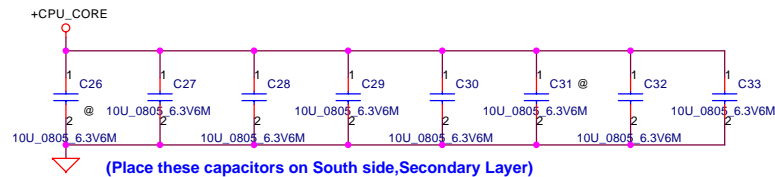
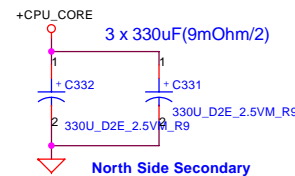
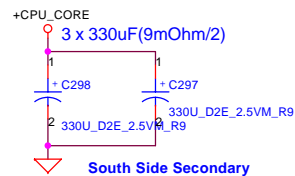
ID	UMA_DES	Vab
0	IHL00/IGT30 UMA	3.30V
1	IHLV3 UMA	2.20V
2		
3		
4		
5		
6	IHLV2 VGA	0.25V
7	IHL00/IGT30 VGA	0.25V

ICH7M SM Bus address

Device	Address
Clock Generator (SLG8LP465VTR)	1101 001Xb
DDR DIMM0	1010 000Xb
DDR DIMM1	1010 010Xb
Wireless	
NewCard	
LAN	

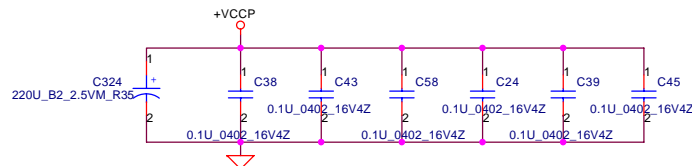
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9/25 10U checked. OK for use!

+CPU-CORE Decoupling	C,uF	ESR, mohm	ESL,nH
SPCAP, Polymer	6X330uF	9m ohm/6	1.8nH/6
MLCC 0805 X5R	32X22uF	3m ohm/32	0.6nH/32
	32X10uF	3m ohm/32	0.6nH/32

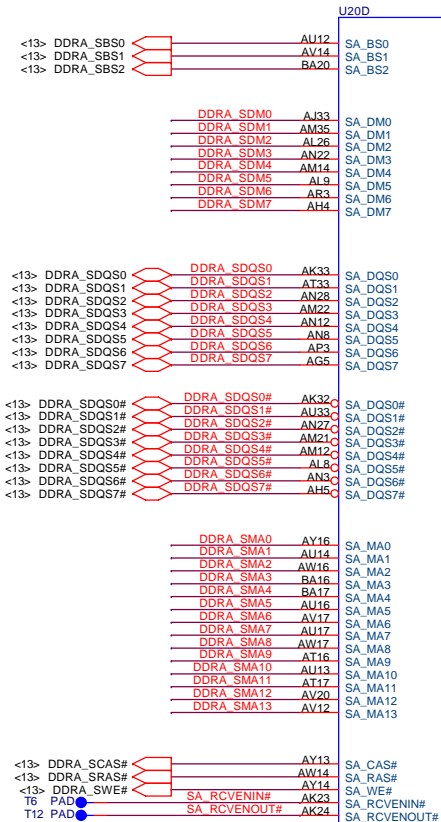


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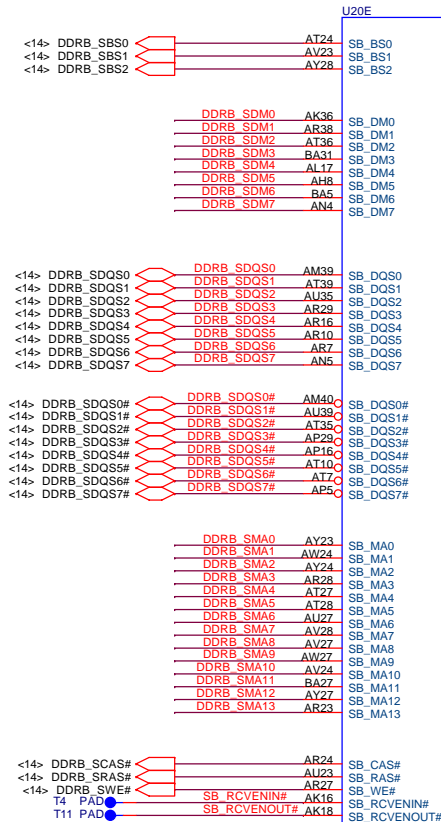
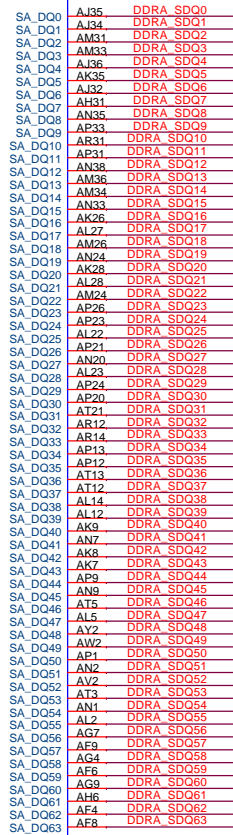


<13> DDRA_SDQ[0..63] <13> DDRA_SDM[0..7] <13> DDRA_SMA[0..13]

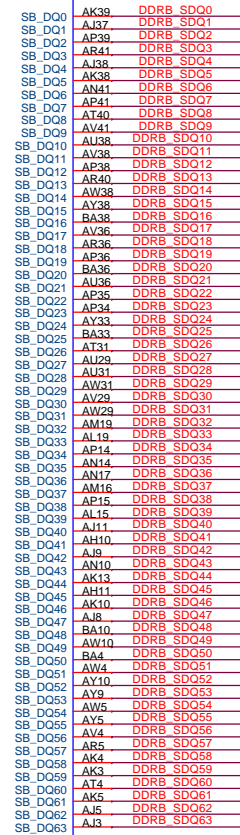
<14> DDRB_SDQ[0..63] <14> DDRB_SDM[0..7] <14> DDRB_SMA[0..13]



DDR SYS MEMORY A



DDR SYS MEMORY B





Compal Electronics, Inc.			
Title Crestline (4/7)-VGA/LVDS/TV			
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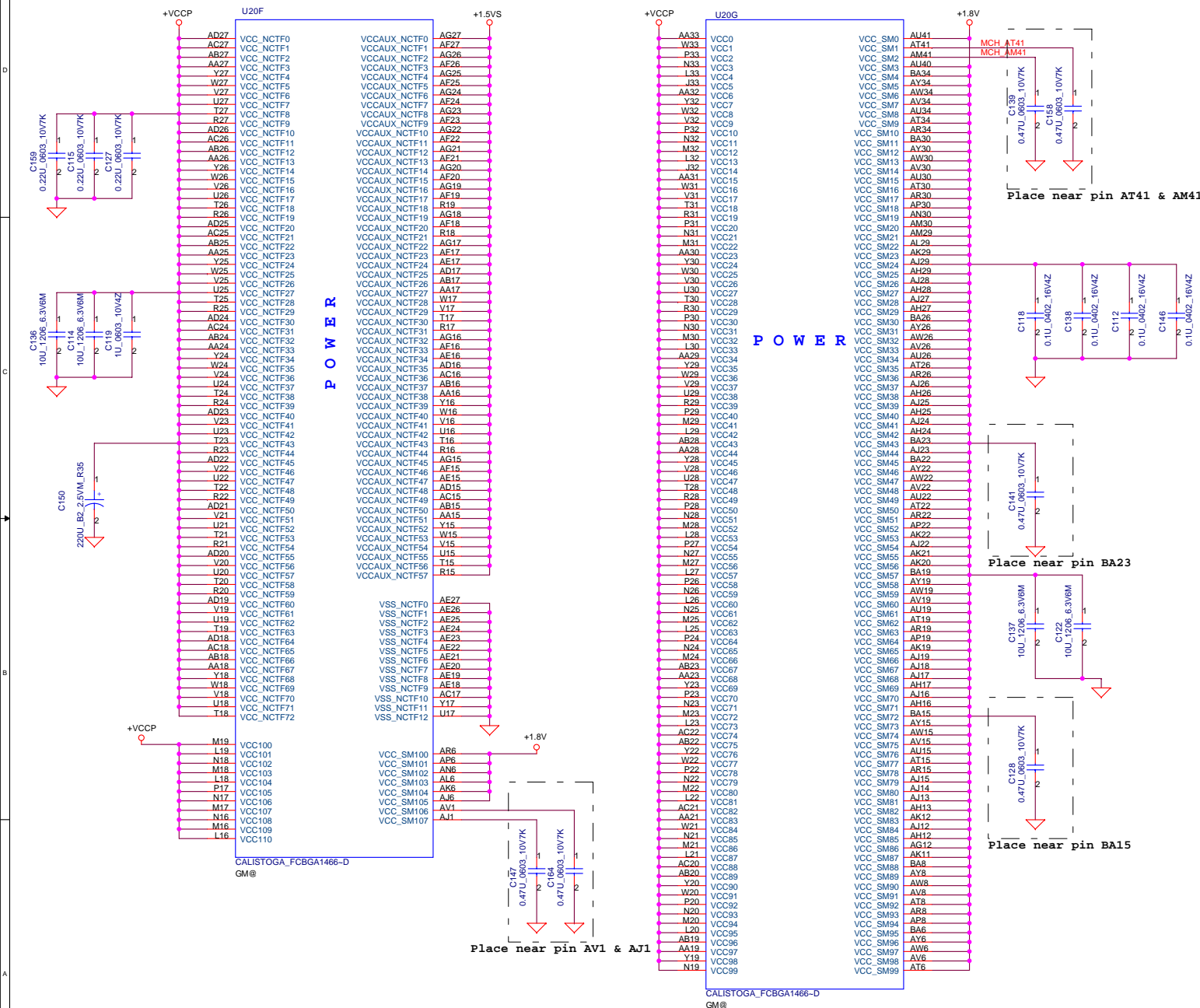
Strap Pin Table

CFG[3:17] have internal pull up

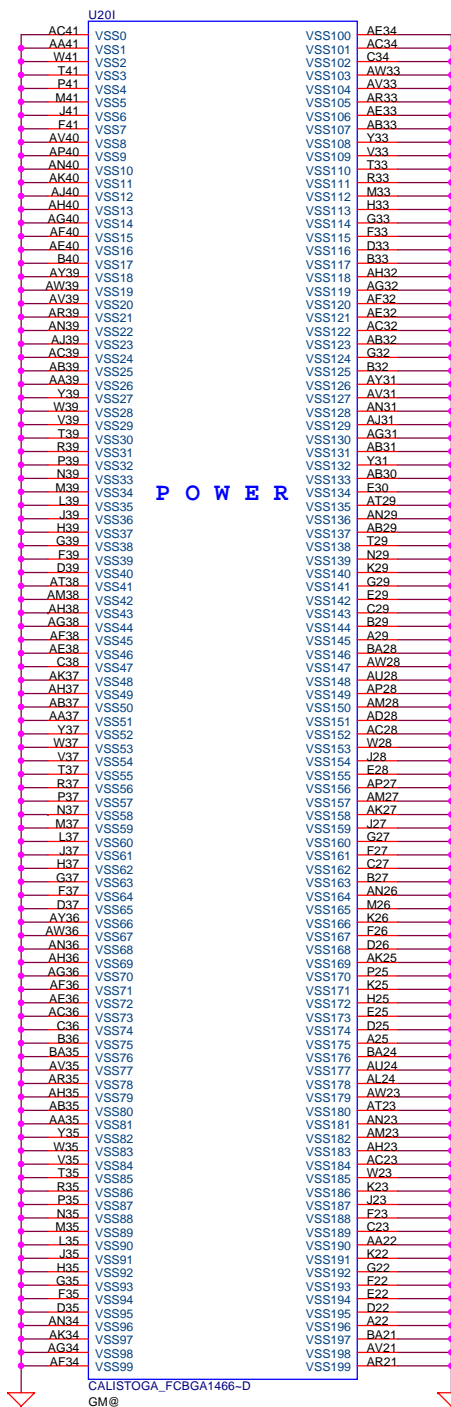
CFG[19:18] have internal pull down

CFG[2:0]	011 = 667MT/s FSB 001 = 533MT/s FSB
CFG5	0 = DMI x 2 1 = DMI x 4 *(Default)
CFG7	0 = Reserved 1 = Mobile Yonah CPU *(Default)
CFG9	0 = Lane Reversal Enable 1 = Normal Operation (Default) *
CFG6	0 = Reserved 1 = Calistoga *
CFG[13:12]	00 = Reserved 01 = XOR Mode Enabled 10 = All Z Mode Enabled 11 = Normal Operation *(Default)
CFG16	0 = Dynamic ODT Disabled 1 = Dynamic ODT Enabled *(Default)
CFG10 CFG18	10 = 1.05V *(Default) 01 = 1.5V
CFG19	0 = Normal Operation *(Default) 1 = DMI Lane Reversal Enable
SDVO_CTRLDATA	0 = No SDVO Device Present *(Default) 1 = SDVO Device Present
CFG20 (PCIE/SDVO select)	0 = Only PCIE or SDVO is operational. *(Default) 1 = PCIE/SDVO are operating simu.

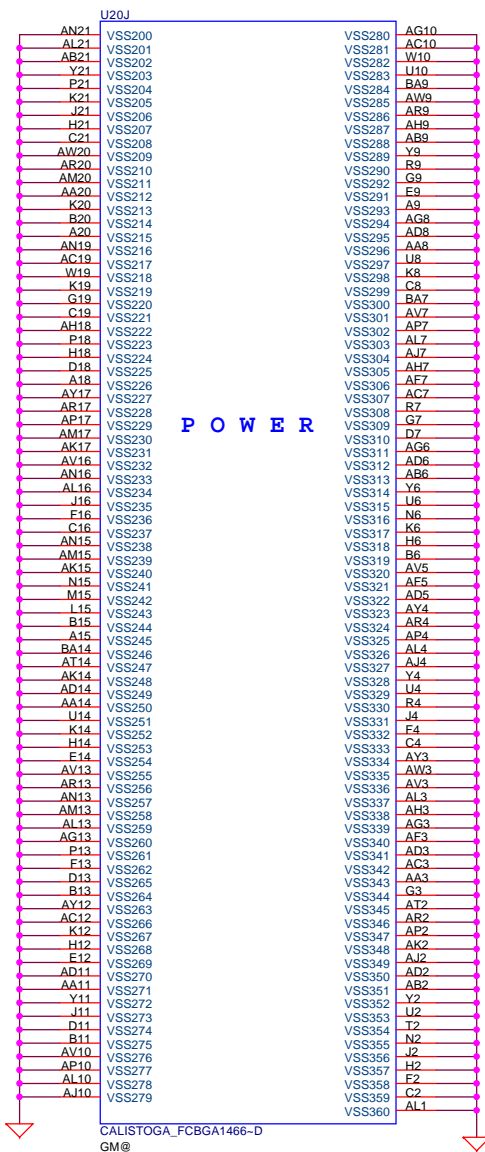
<7>	CFG5	R124	1	2	@ 2.2K 0402 5%
<7>	CFG7	R88	1	2	@ 2.2K 0402 5%
<7>	CFG9	R110	1	2	@ 2.2K 0402 5%
<7>	CFG11	R123	1	2	@ 2.2K 0402 5%
<7>	CFG12	R125	1	2	@ 2.2K 0402 5%
<7>	CFG13	R109	1	2	@ 2.2K 0402 5%
<7>	CFG16	R108	1	2	@ 2.2K 0402 5%
<7>	CFG18	R131	1	2	@ 1K 0402 5%
<7>	CFG19	R130	1	2	@ 1K 0402 5%
<7>	CFG20	R126	1	2	@ 1K 0402 5%



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POWER

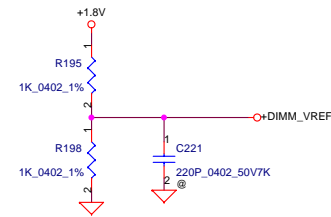
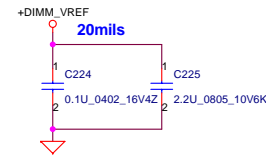
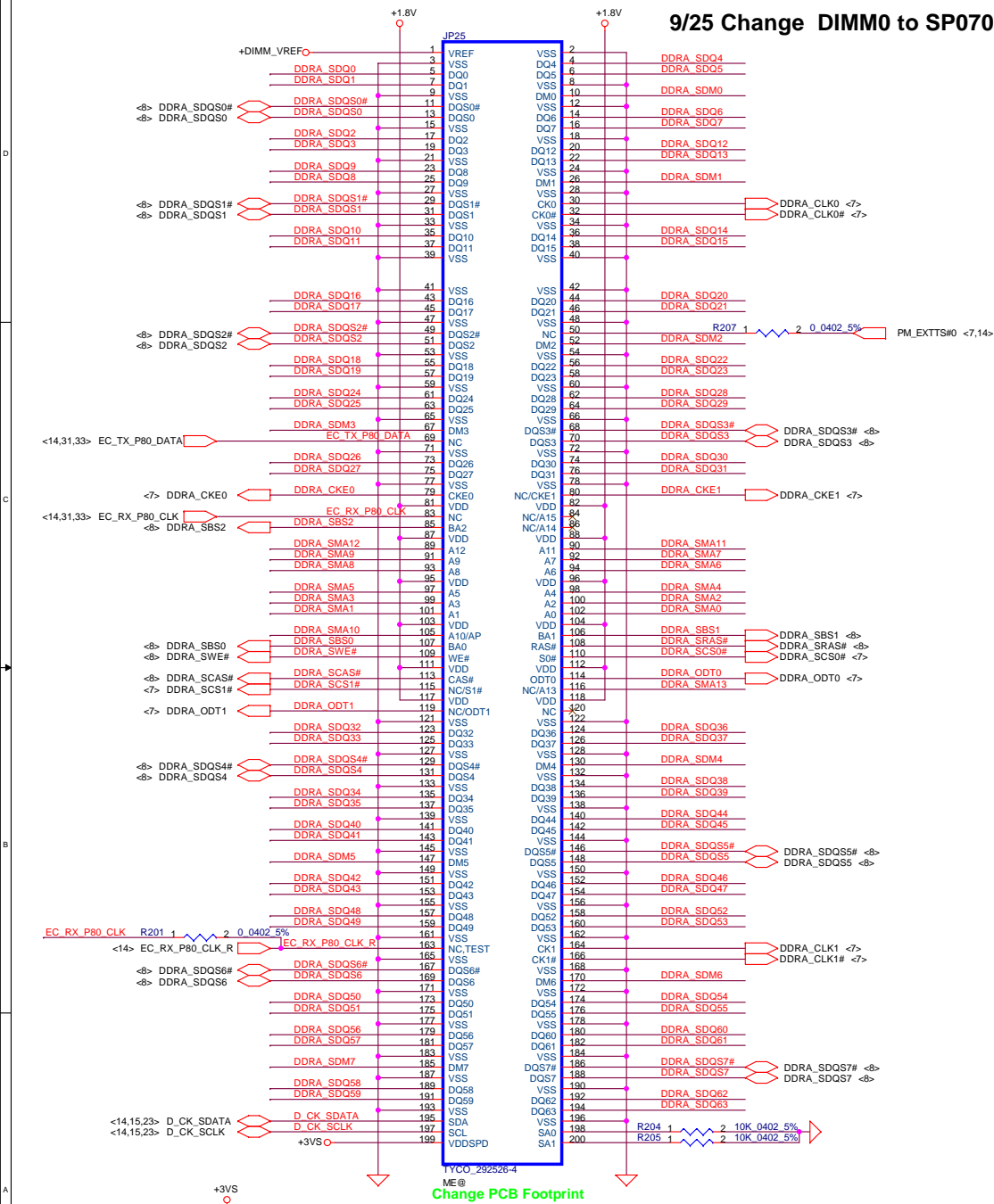


POWER

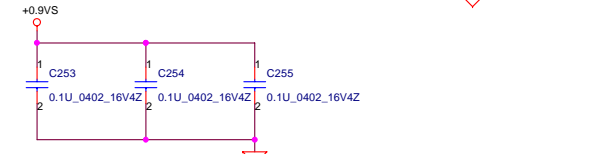
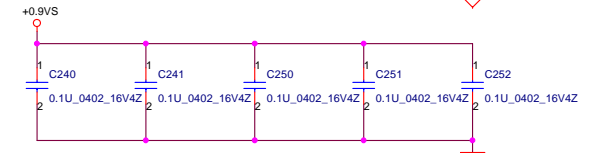
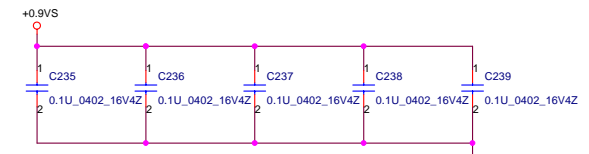
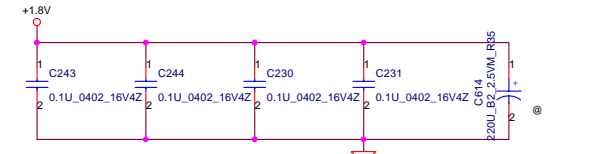
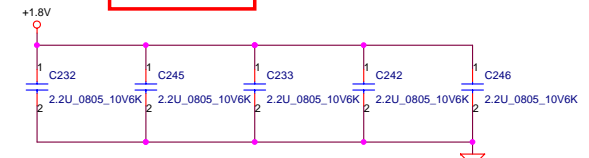
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9/25 Change DIMM0 to SP070004Z00 (HBL50)

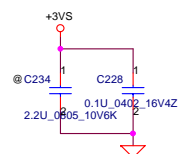


Layout Note:
Place near JP35



Layout Note:
Place these resistor
closely JP35,all
trace length Max=1.5

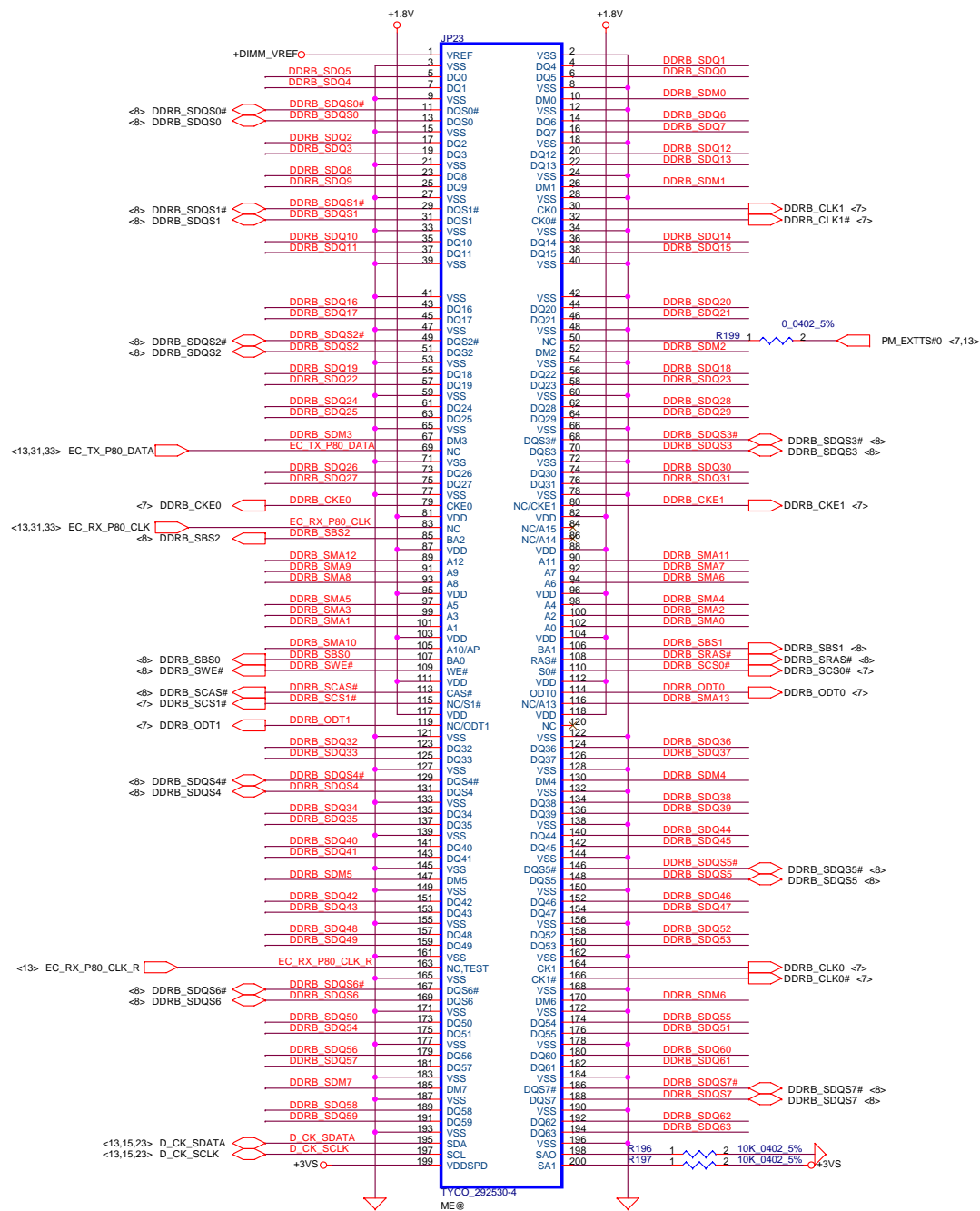
Layout Note:
Place one cap close to every 2 pullup resistors terminated to +0.9VS



DIMM0 STD H:5.2mm (BOT)

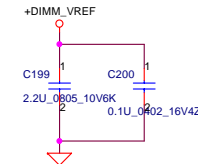
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9/25 Change DIMM1 to SP070006F00

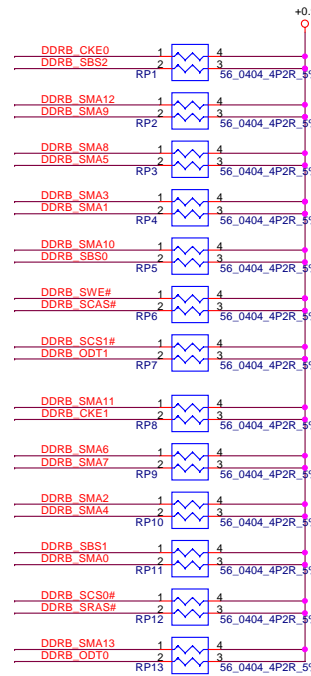
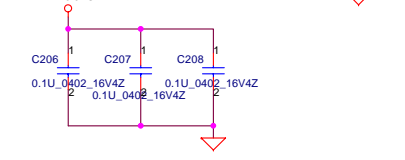
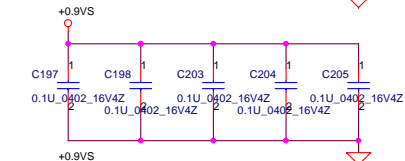
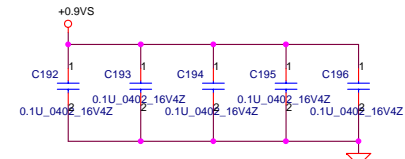
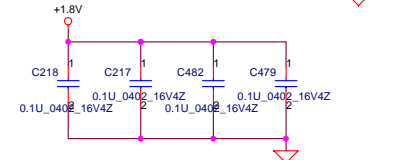
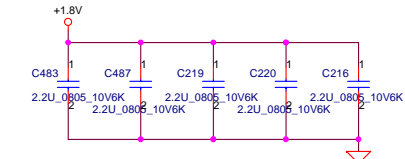


DIMM1 STD H:9.2mm (BOT)

DDR_B_SMA[0..13] → DDR_B SMA[0..13]
 DDR_B_SDQ[0..63] → DDR_B SDQ[0..63]
 DDR_B_SDM[0..7] → DDR_B SDM[0..7]



Layout Note:
Place near JP34



Layout Note:
Place these resistor
closely JP35, all
trace length Max=1.5"

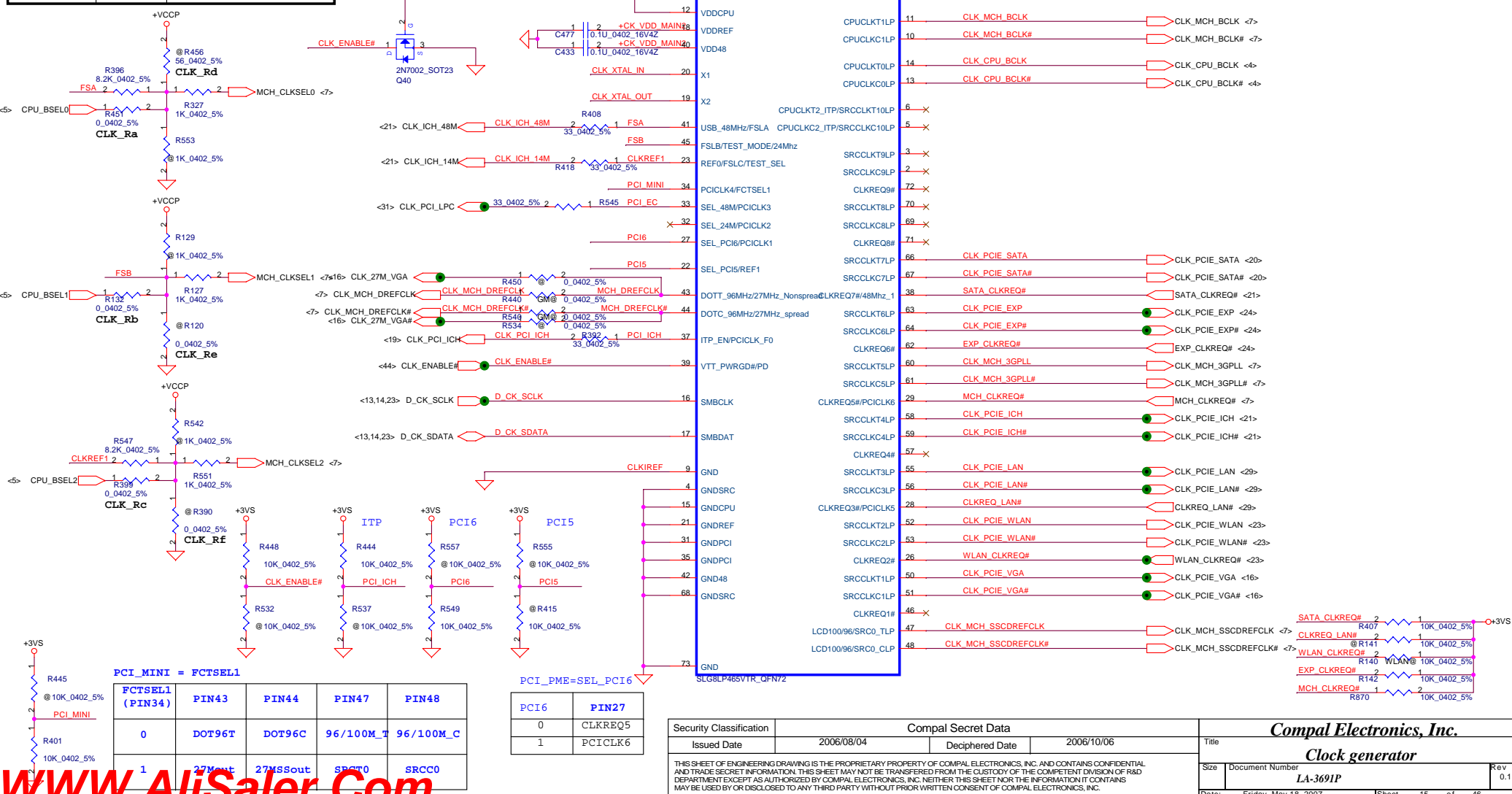
Layout Note:
Place one cap close to every 2 pullup
resistors terminated to +0.9VS

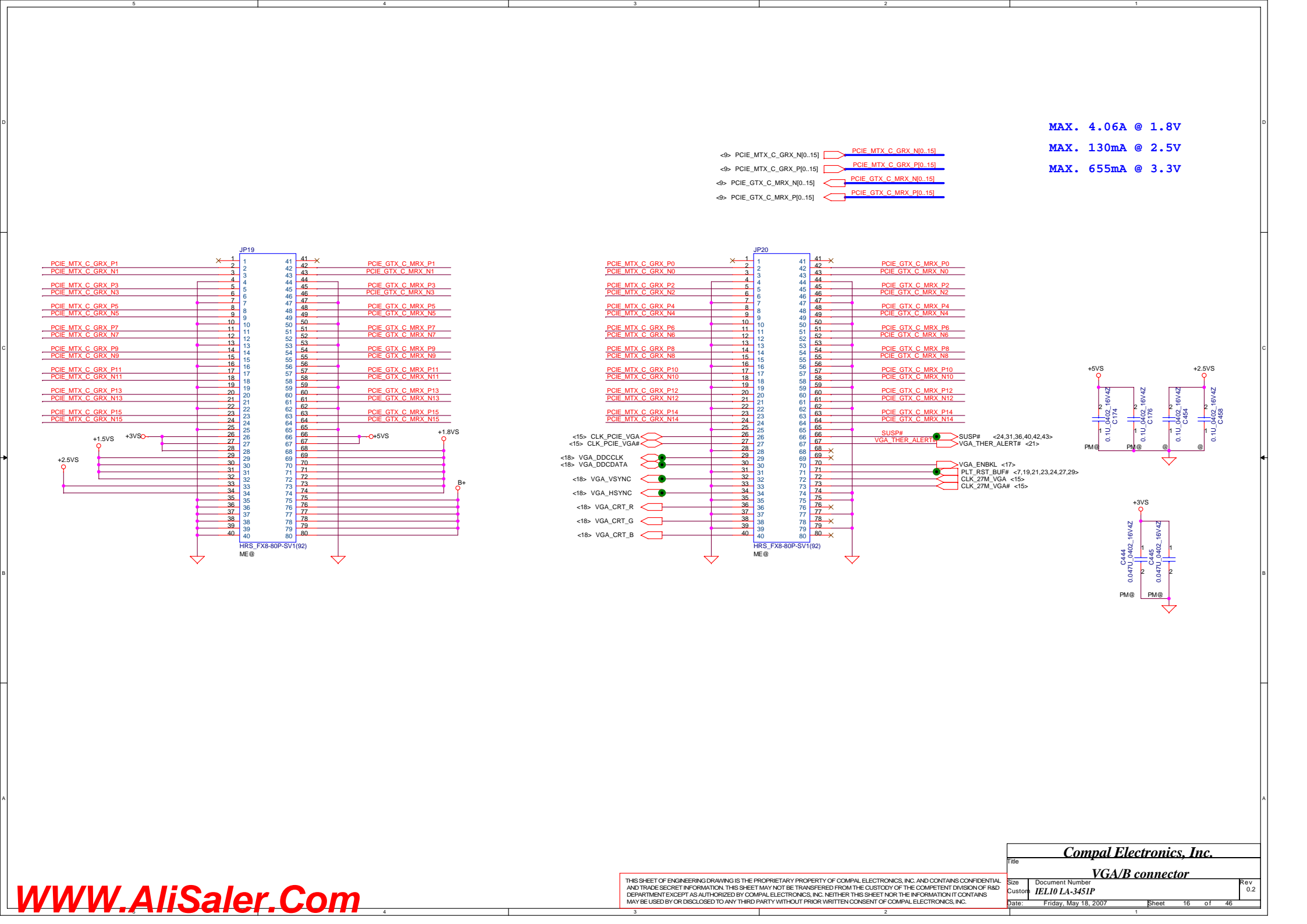
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Table : ICS954306

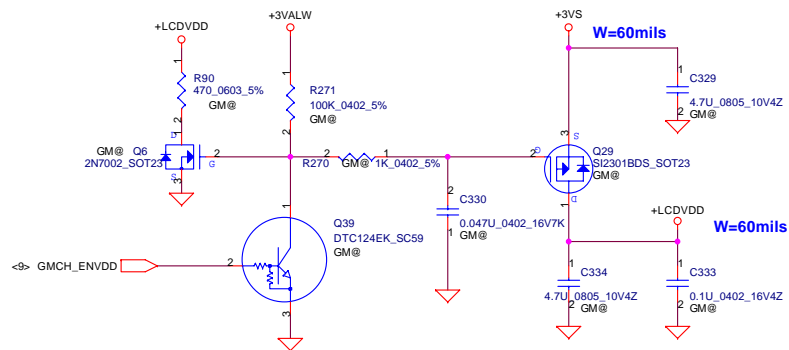
FSB Frequency Selet:

CPU Driven ★(Default)	Stuff	CLK_Ra	CLK_Rb	CLK_Rc
	No Stuff	CLK_Rd	CLK_Re	CLK_Rf ₂₄
533MHz	Stuff	CLK_Rd	CLK_Re	CLK_Rf
	No Stuff	CLK_Ra	CLK_Rb	CLK_Rc
667MHz	Stuff	CLK_Rd	CLK_Rf	
	No Stuff	CLK_Ra	CLK_Rb	CLK_Rc CLK_Re

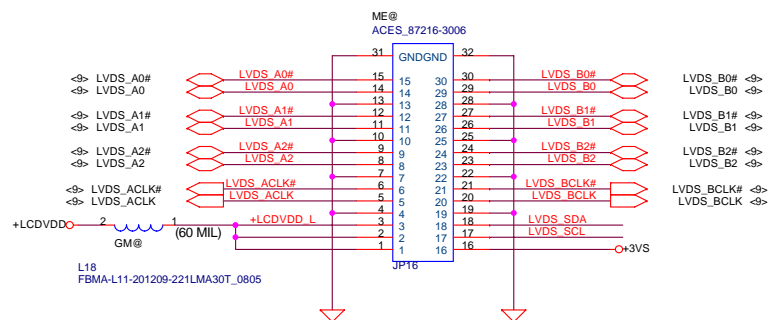




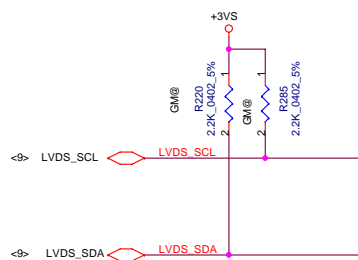
LCD POWER CIRCUIT



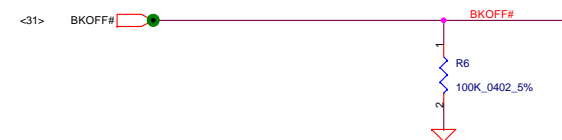
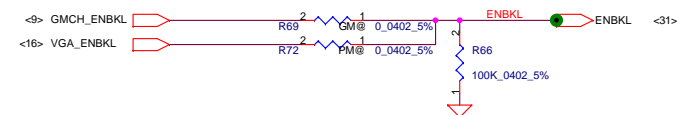
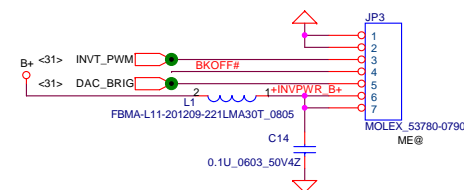
LCD/PANEL BD. Conn.



Follow HEL80's pin definition
Except pin 29



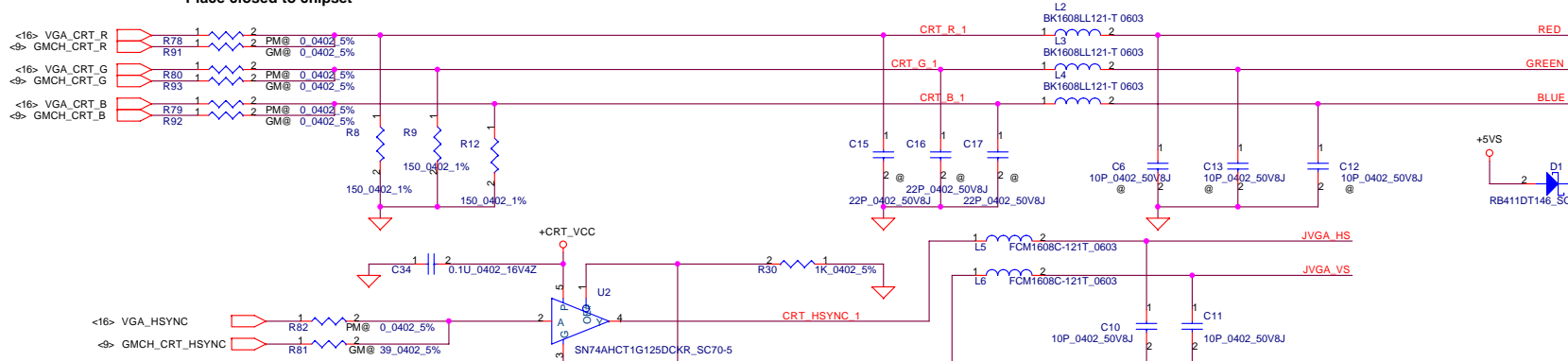
INVERTER Conn.



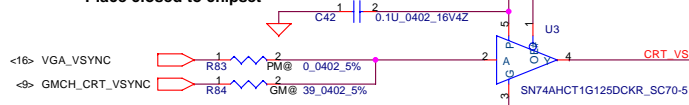
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				LVDS & DVI Connector	
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CRT Connector

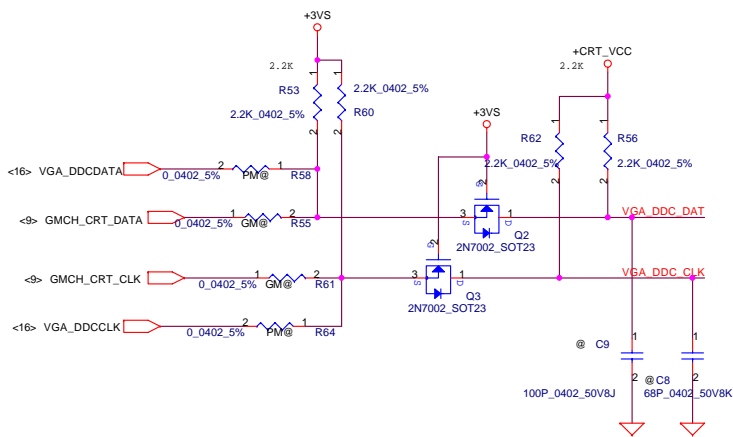
Place closed to chipset



Place closed to chipset

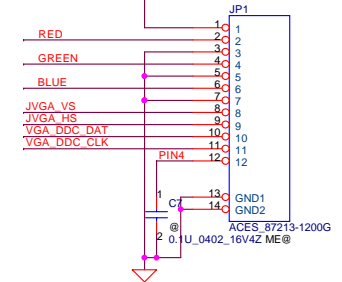


Update Footprint

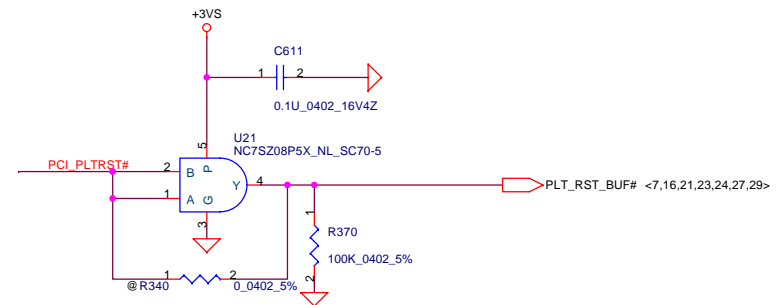
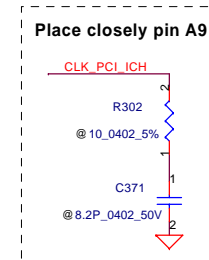
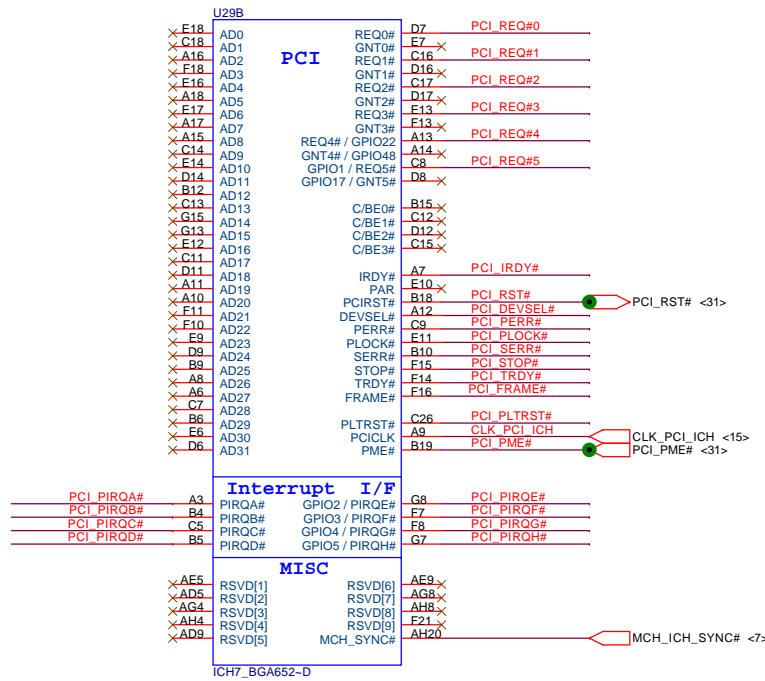
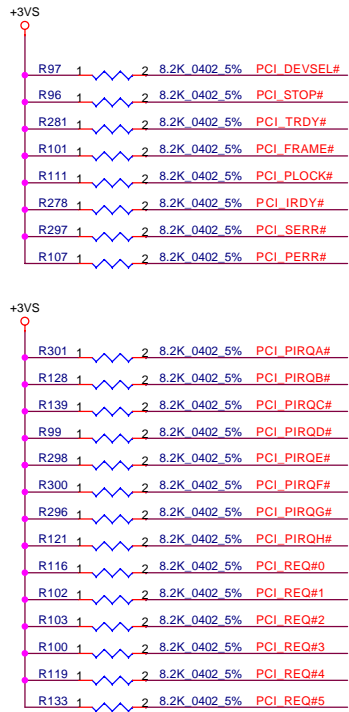


PIN ASSIGMENT

PIN	D-SUB	FUNCTION
1	9	+CRT_VCC
2	1	RED
3	6	GND
4	2	GREEN
5	7	GND
6	3	BLUE
7	8	GND
8	14	VSYNC
	10	GND
9	13	HSYNC
	11	SENSE
10	12	SM_DAT
11	15	SM_CLK
12		
	5	GND
	4	



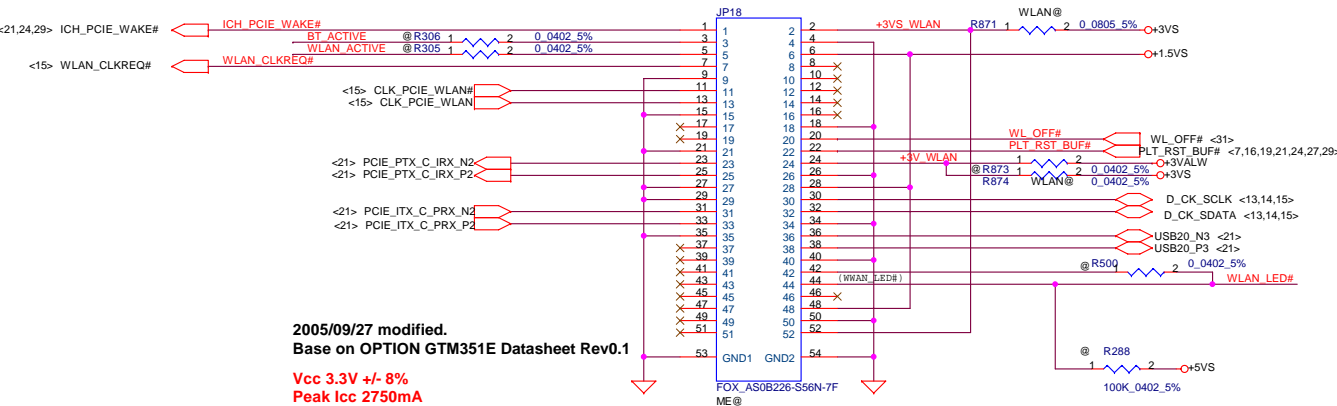
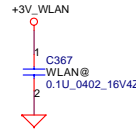
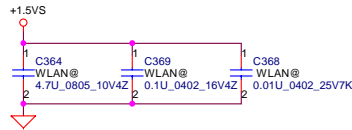
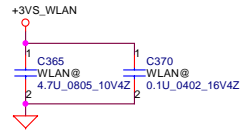
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Size		Document Number		Rev	
		LA-3691P		0.1	
Date:		Friday, May 18, 2007		Sheet 19 of 46	

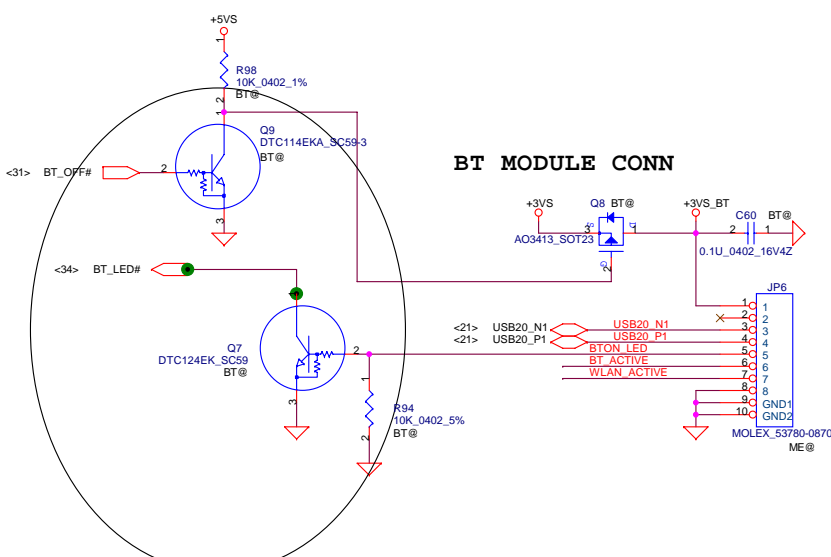
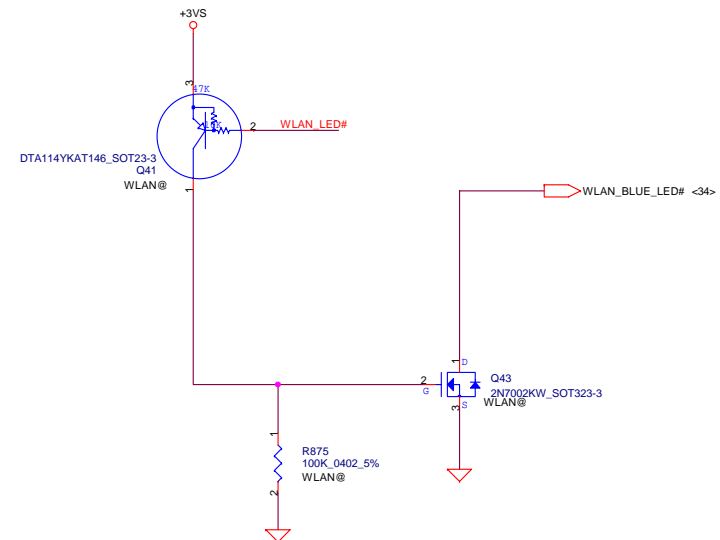
Mini-Express Card for 3G Or TV Tuner

Mini-Express Card for WLAN



2005/09/27 modified.
Base on OPTION GTM351E Datasheet Rev0.1

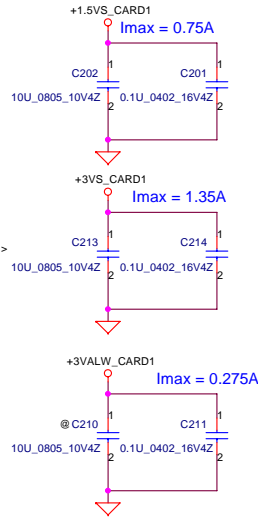
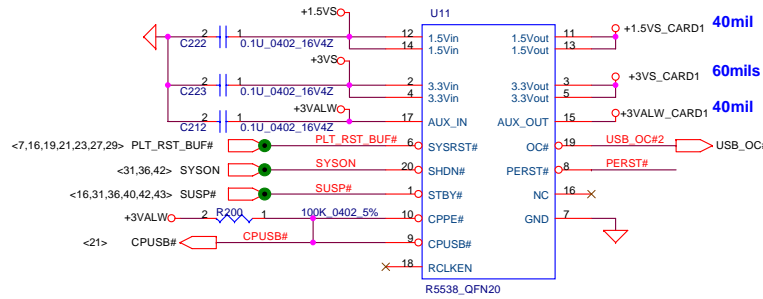
Vcc 3.3V +/- 8%
Peak Icc 2750mA
with max supply droop 50mA
Average Icc 1000mA



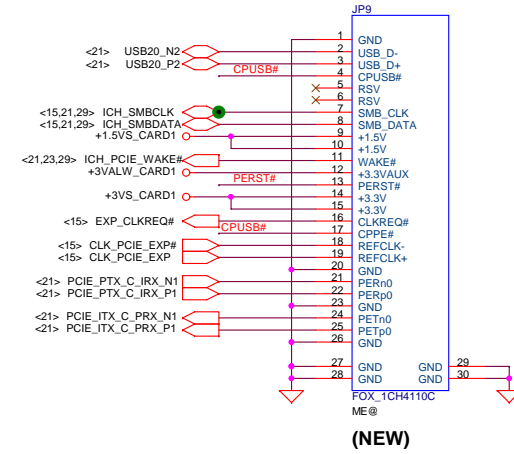
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Issued Date	2006/08/05	Deciphered Date	2007/08/05	Mini-Card/3G/FeliCa/FP	
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Date: Friday, May 18, 2007				Sheet 23	of 46

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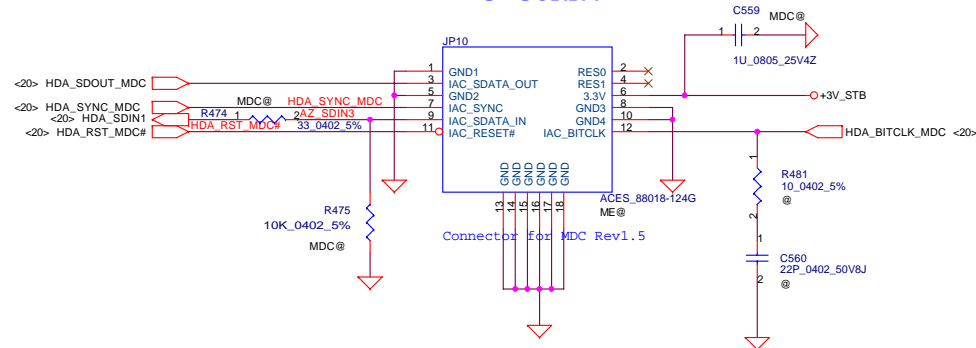
Express Card Power Switch



New Card Socket (Left/TOP)



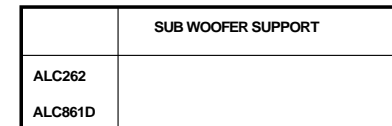
MDC CONN.



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28.7K for Module Design (VDDA = 4.702)

(output = 250 mA)

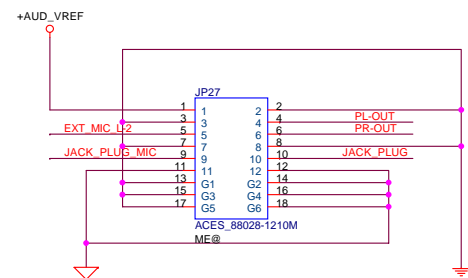
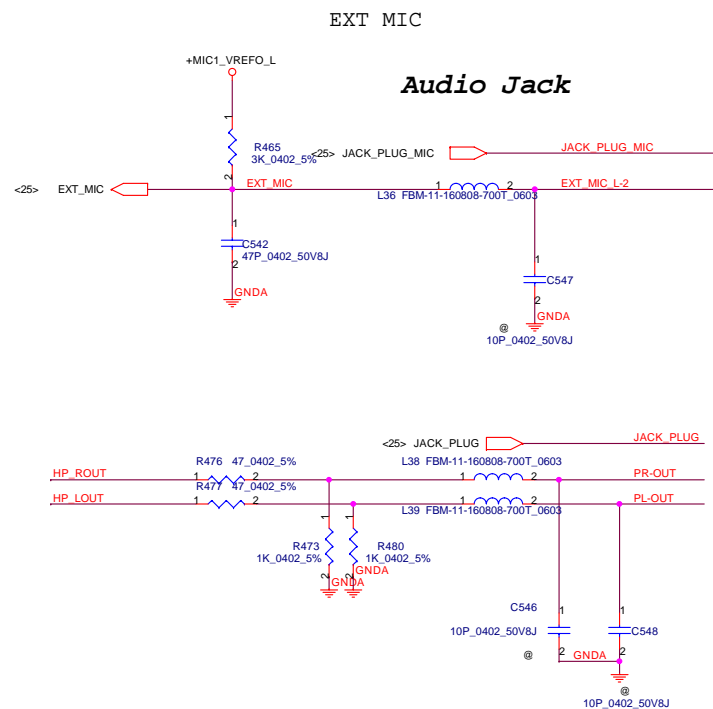
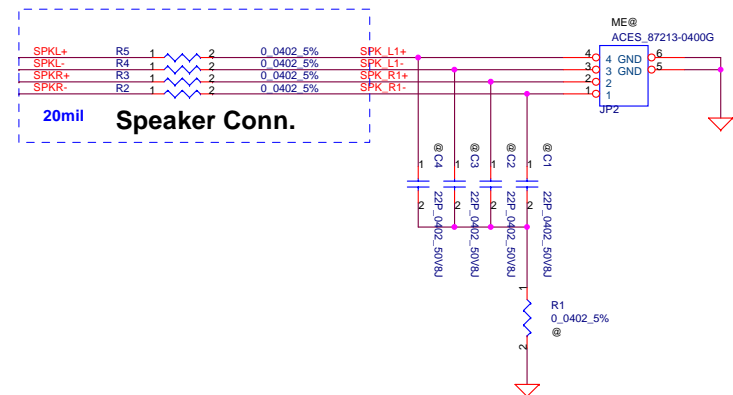


ALC861 VD Codec

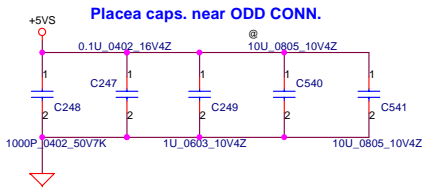
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Custom	IEL10 LA-3451P	0.2
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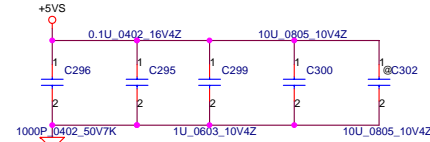
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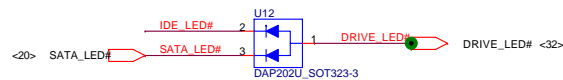
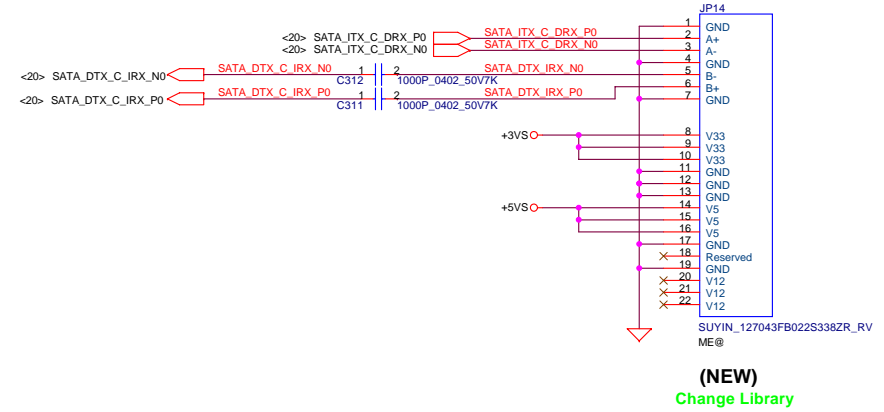
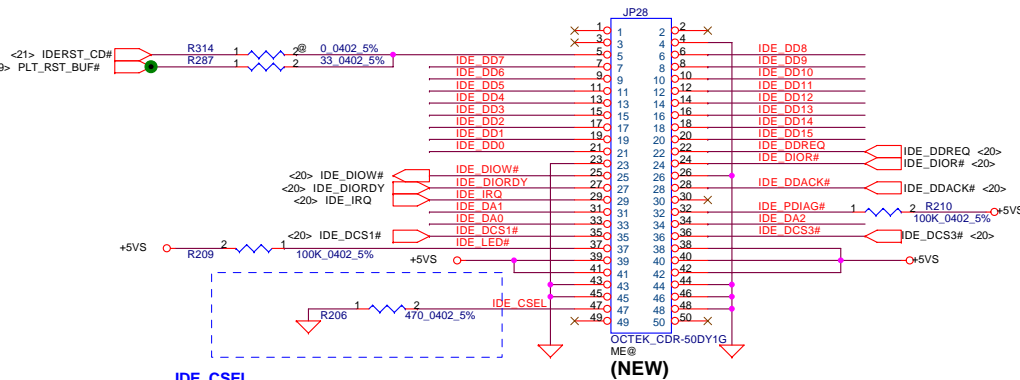
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Issued Date	2006/08/05	Deciphered Date	2007/08/05	Title	AMP/VR/Audio Jack/MIC	
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				Date:	Monday, May 21, 2007	Sheet 26 of 46



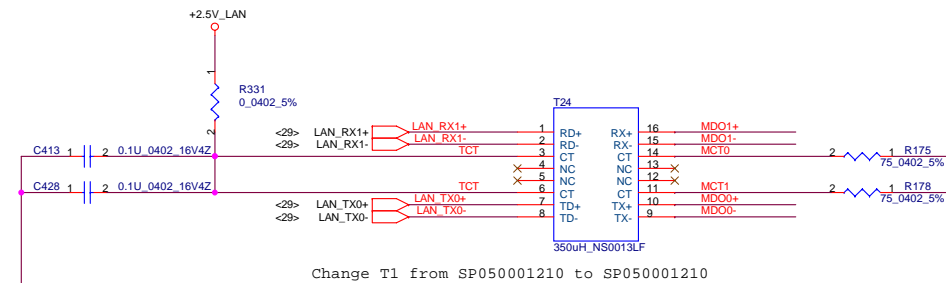
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SATA HDD Conn.

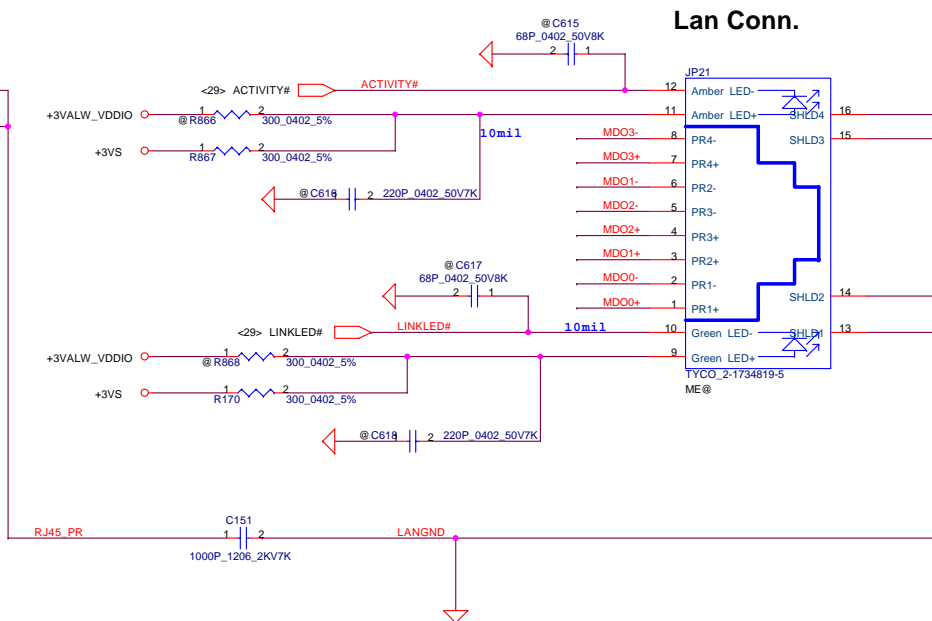
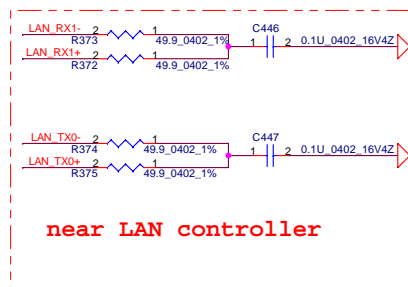


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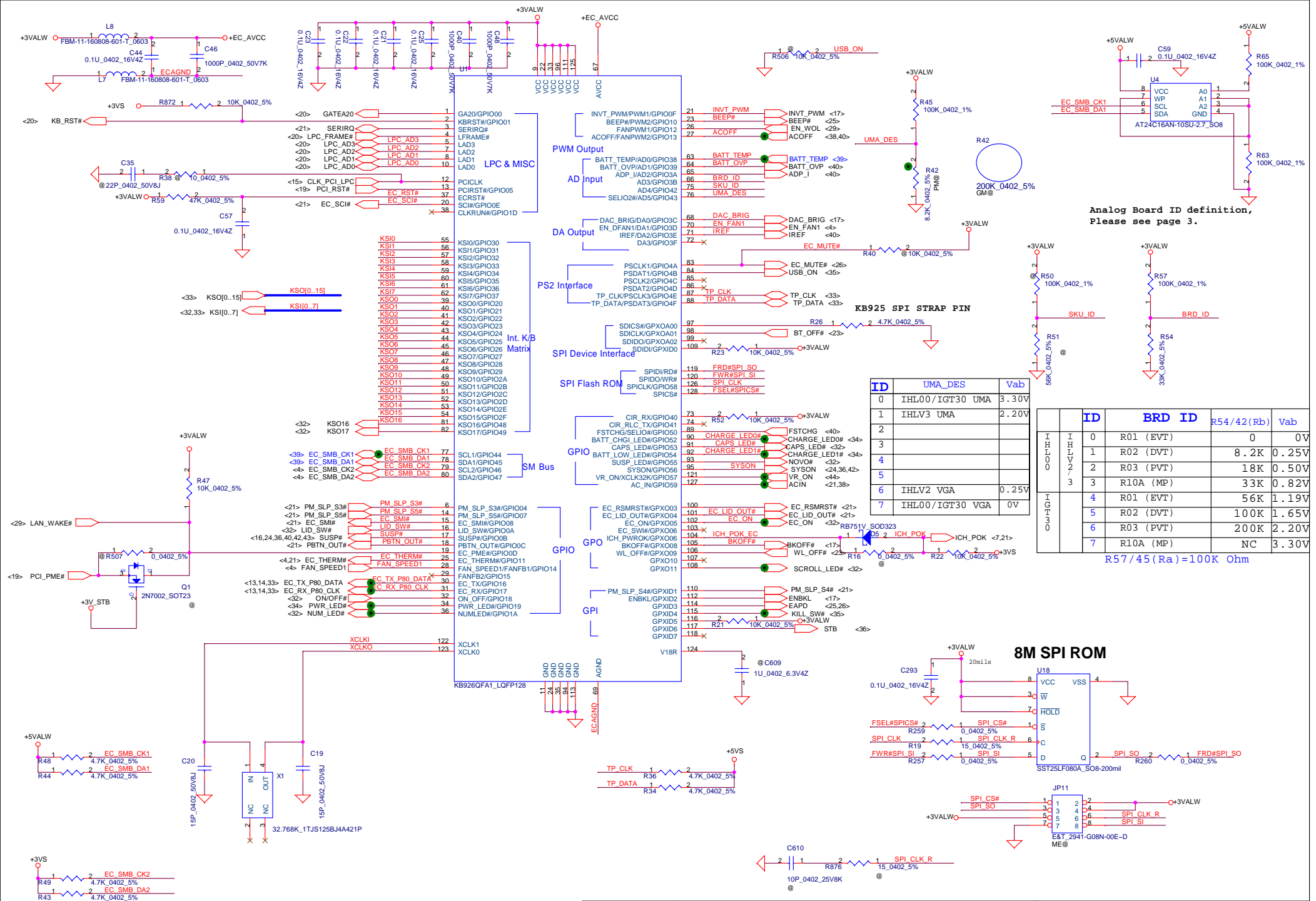


Change T1 from SP050001210 to SP050001210

Change C468,C470,C473,C474,C475,C476 from 0.01uF to 0.1uF



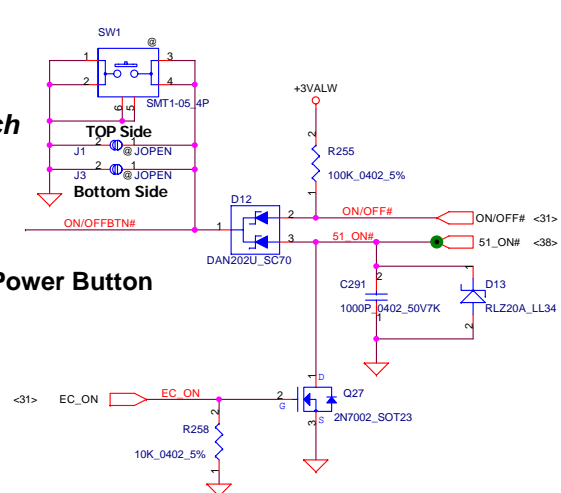
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Issued Date	2006/08/04	Deciphered Date	2006/10/06	LAN CONTROLLER	
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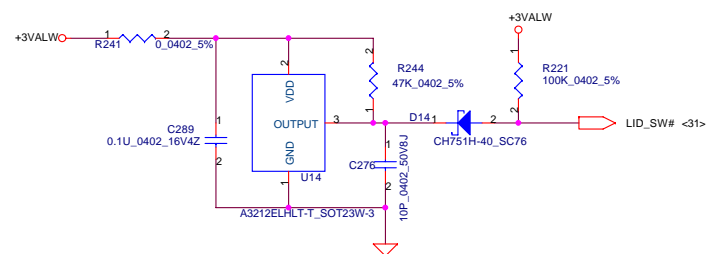
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Size	Document Number	Rev		Date	
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ON/OFF switch

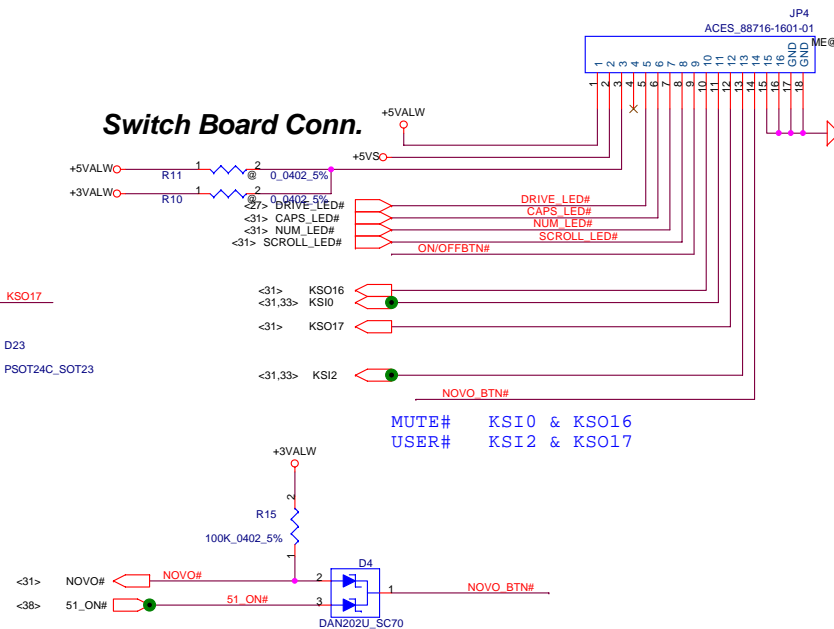
Power Button



LID Switch

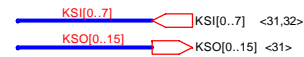


Switch Board Conn.

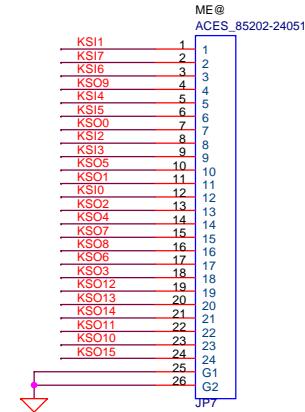
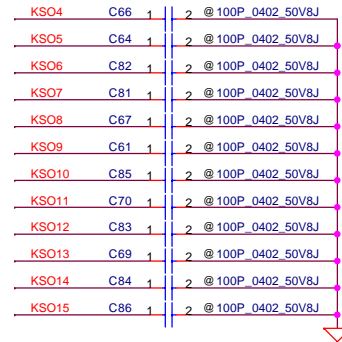


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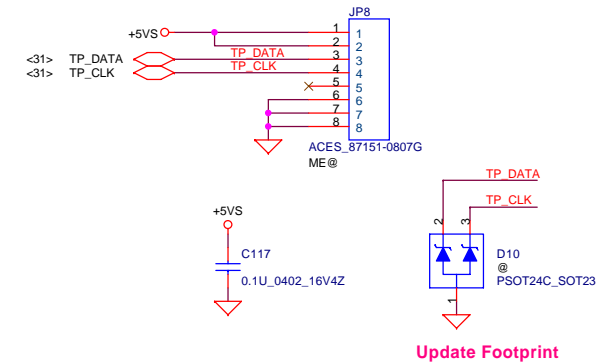
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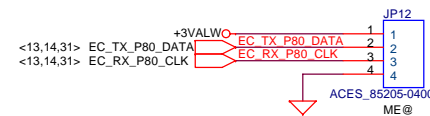
For IHL00



To TP/B Conn.

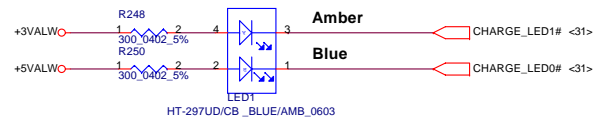
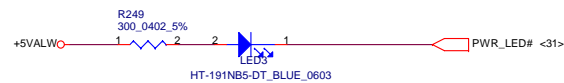


EC DEBUG PORT

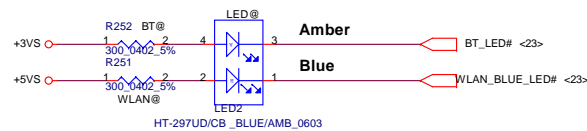


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LED



Blue&Amber

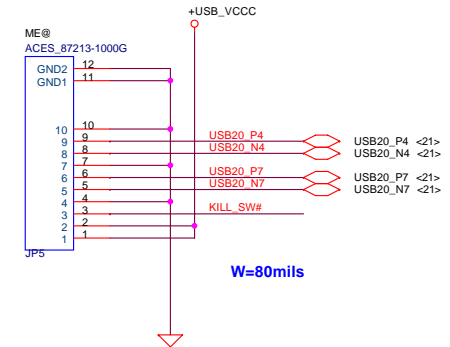
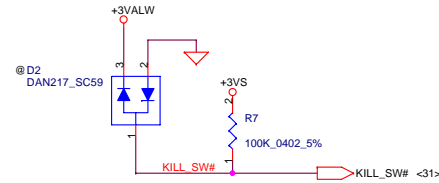


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				Size B	Document Number LA-3691P	Rev 0.1
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USB Conn.

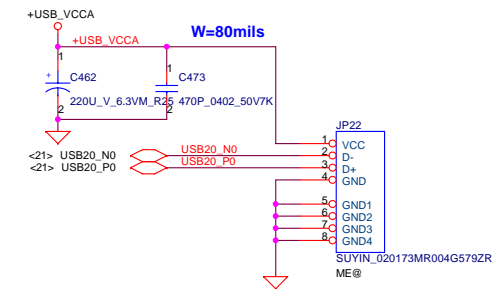
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Kill SWITCH



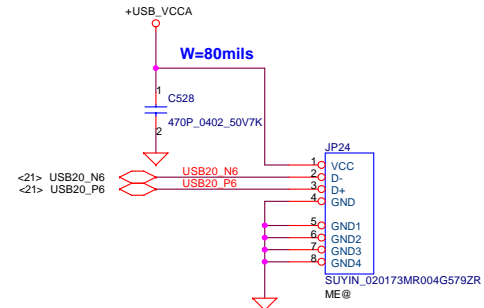
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USB CONN. 1

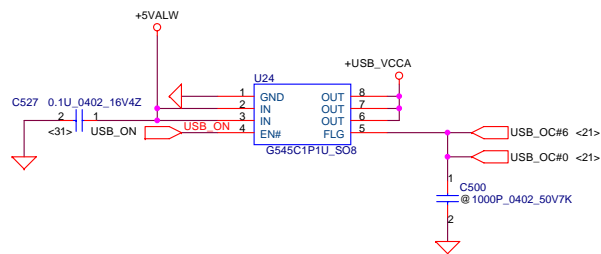
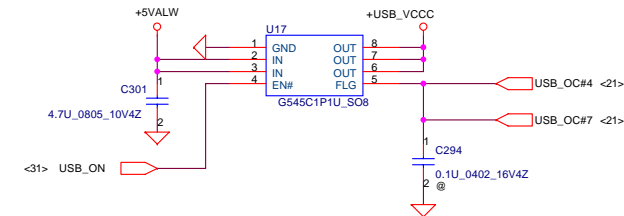
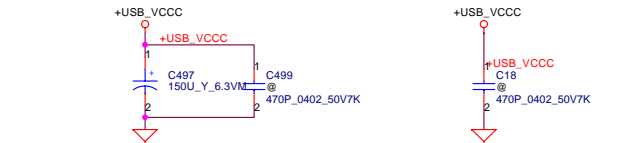


W=80mils

USB CONN. 2



W=80mils



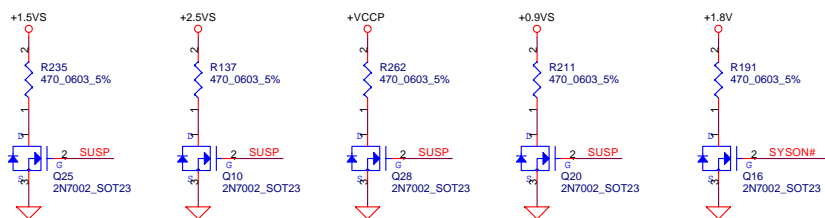
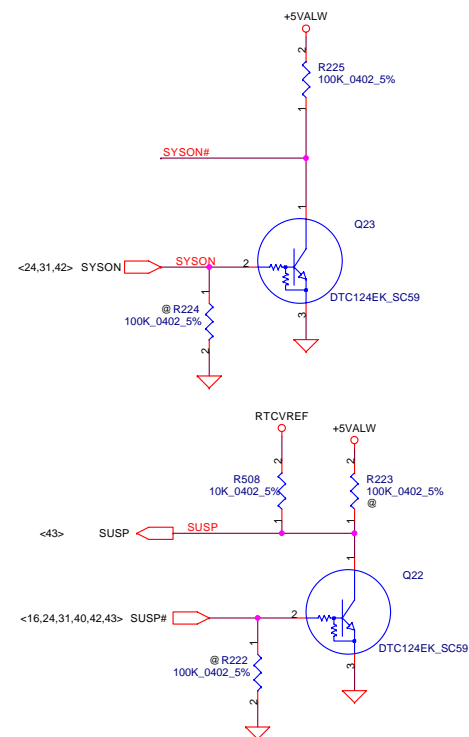
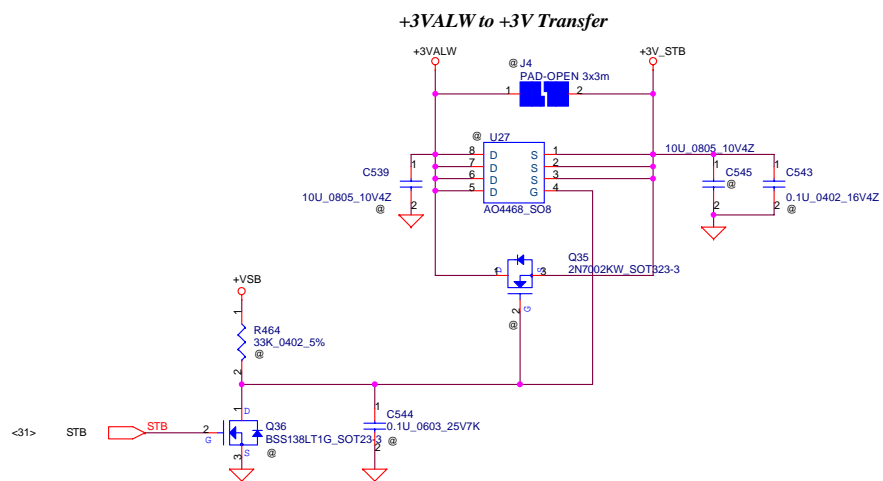
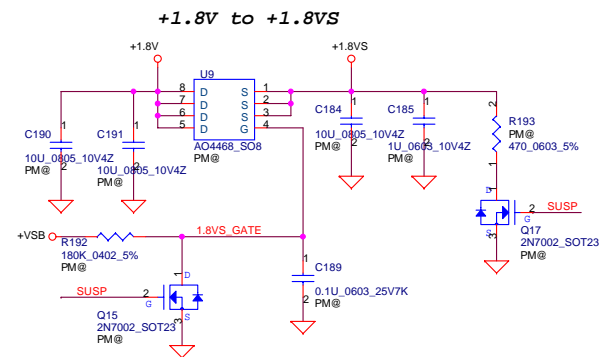
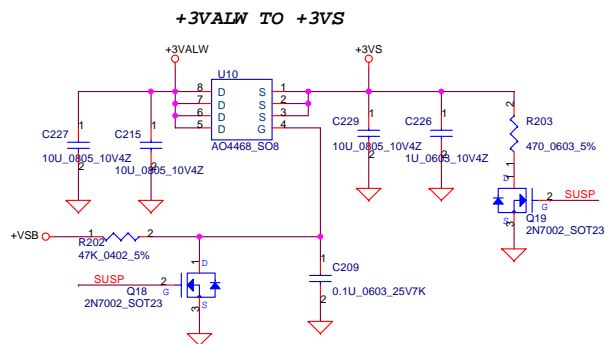
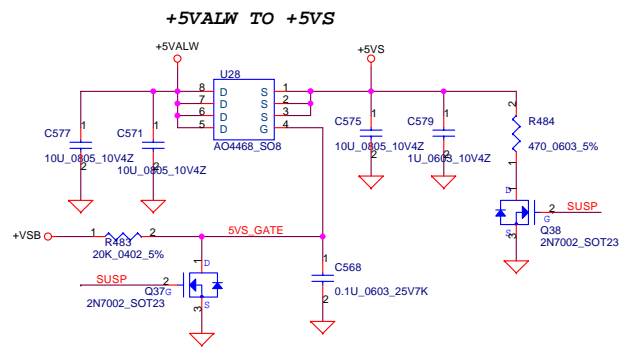
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Power OK, Reset and RTC Circuit, TP

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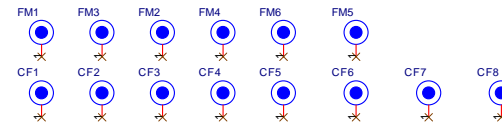
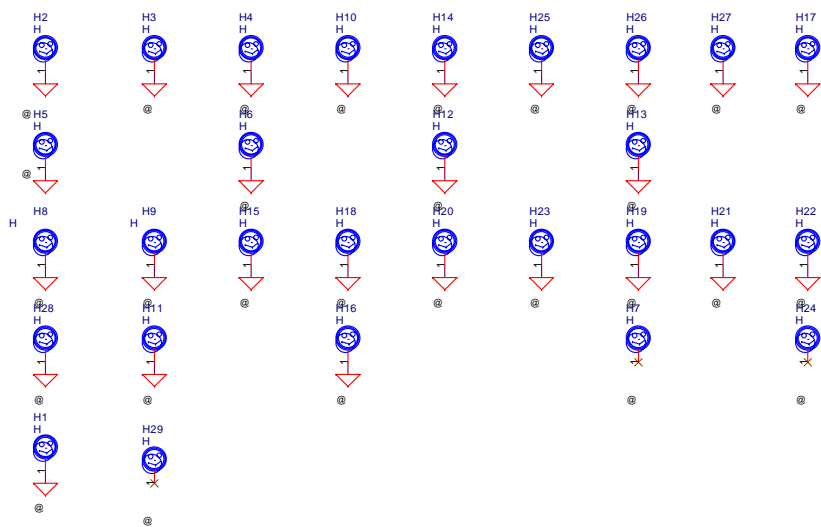
Date: Friday, May 18, 2007 Sheet 35 of 46



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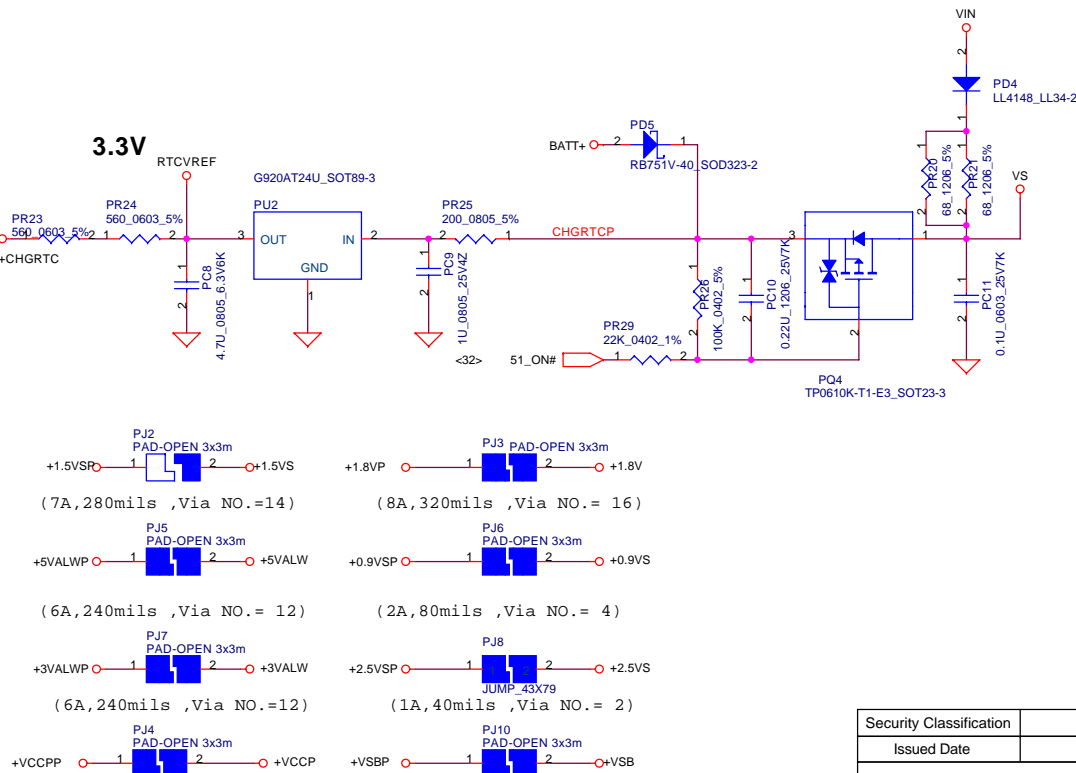
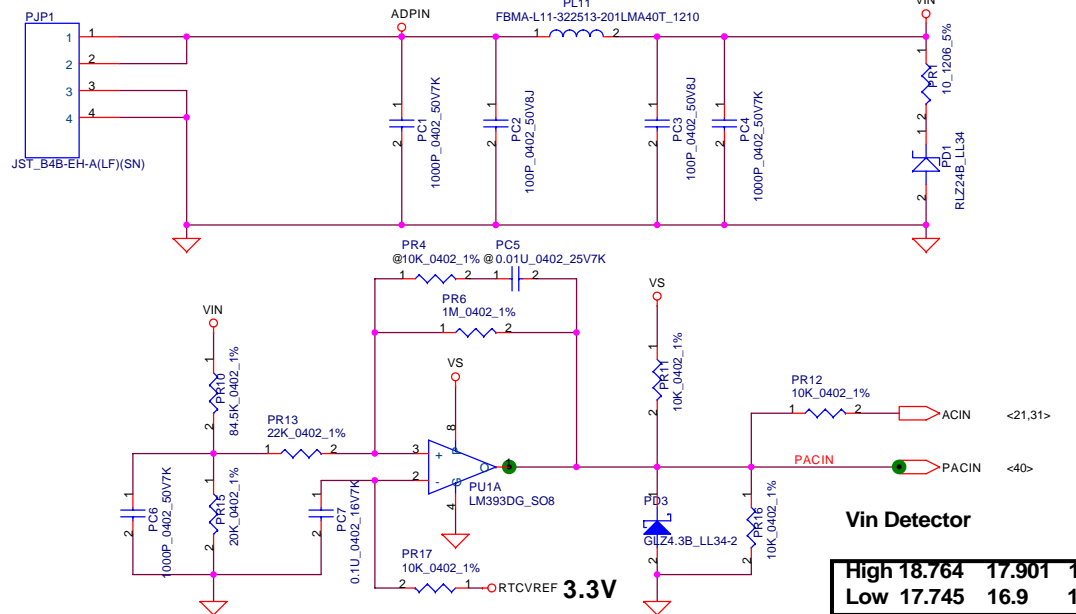
DC Interface

Rev 0.1



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DC030005Q00



ACIN

Precharge detector

Min. typ. Max.

H->L 14.589V 14.84V 15.243V

L->H 15.562V 15.97V 16.388V

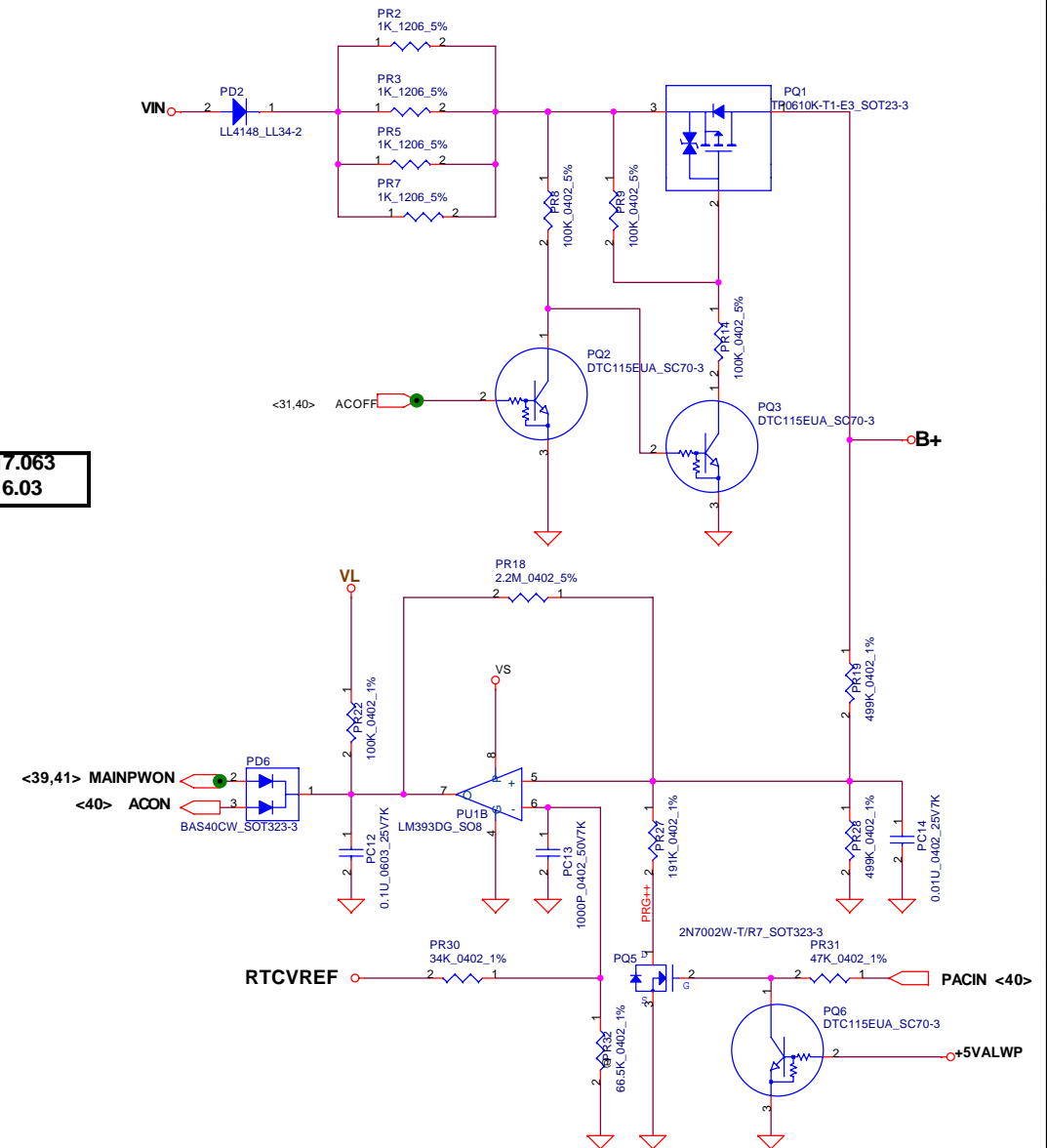
BATT ONLY

Precharge detector

Min. typ. Max.

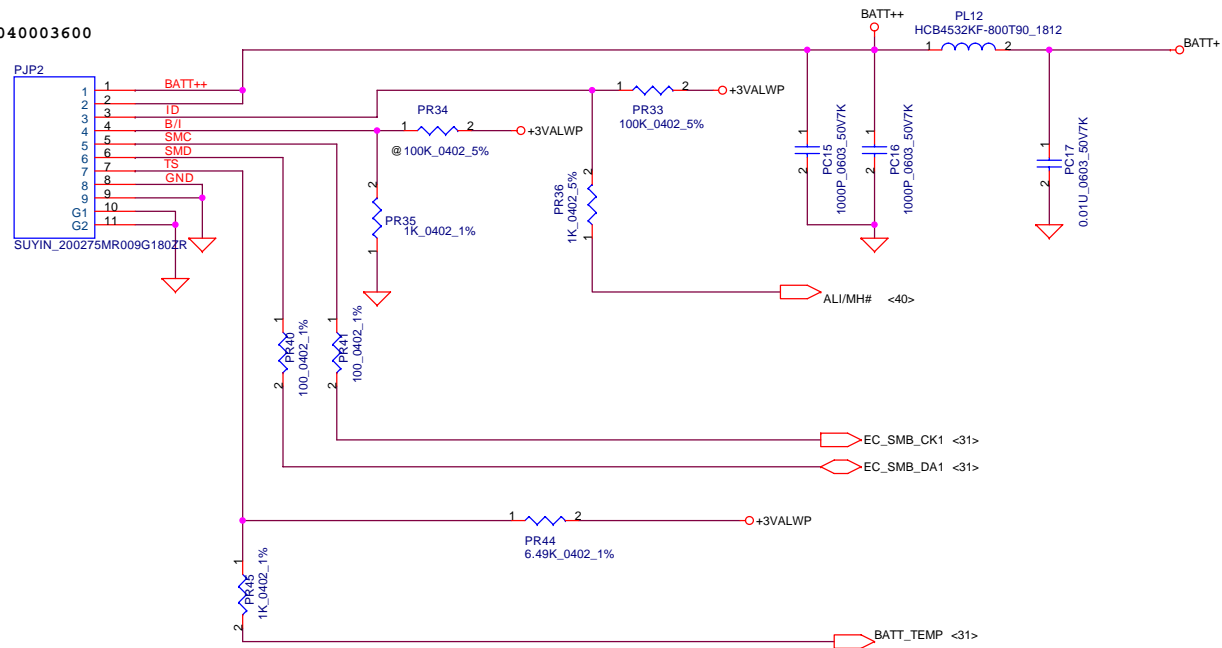
H->L 6.138V 6.214V 6.359V

L->H 7.196V 7.349V 7.505V

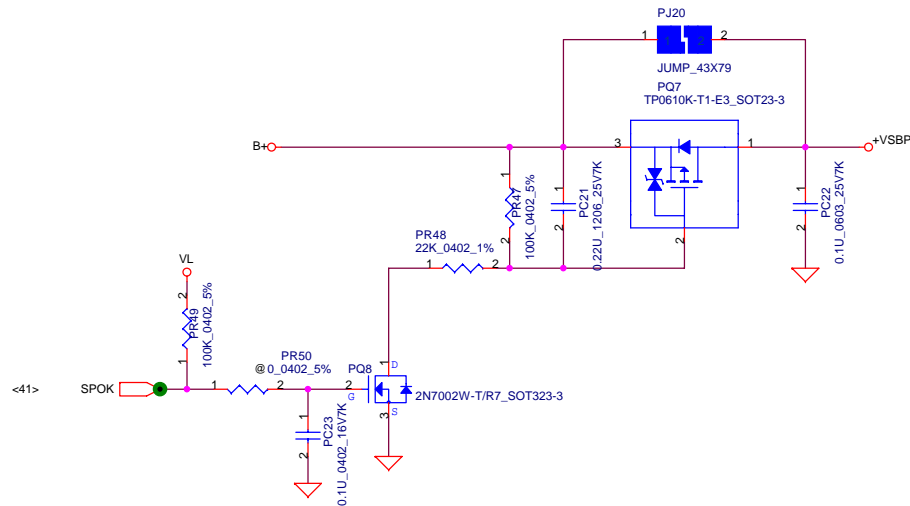
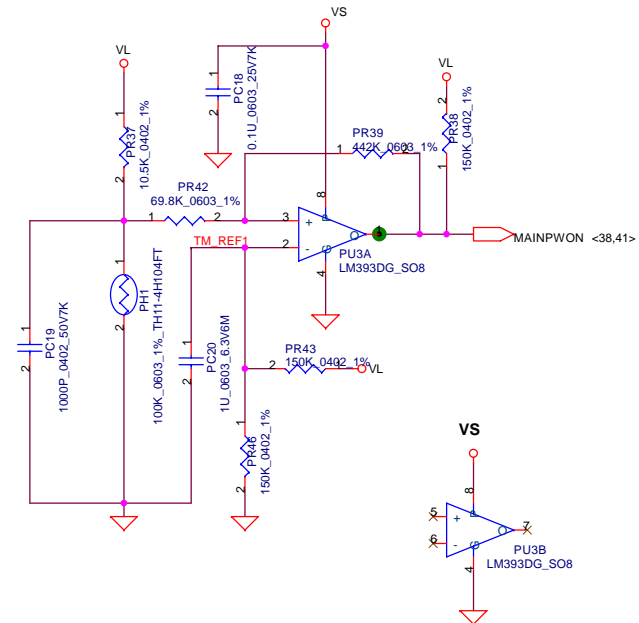


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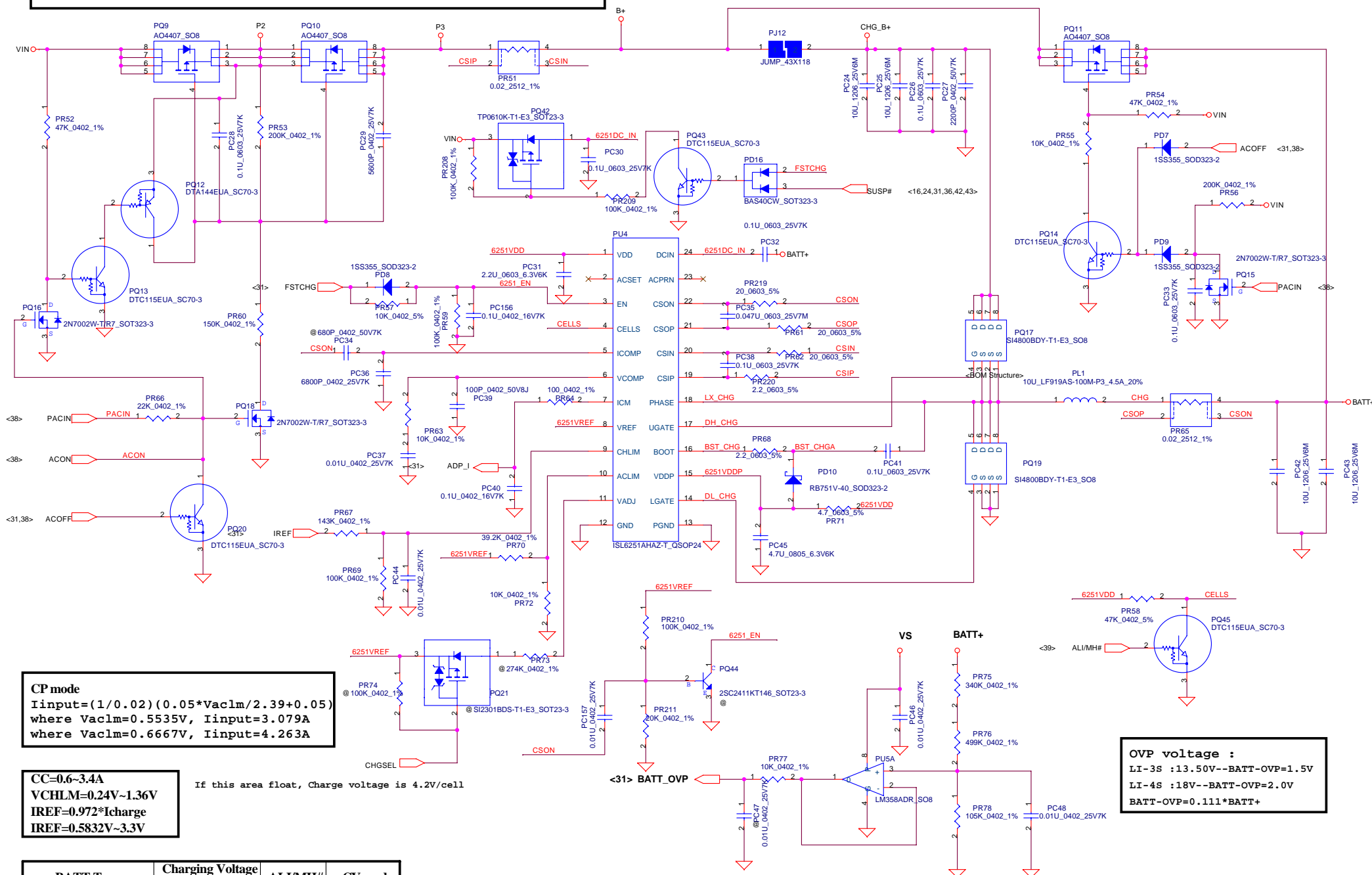
PH1 under CPU bottom side :
CPU thermal protection at 85 degree C
Recovery at 70 degree C



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65W, Iadapter=0~3.42A, Current sense=0.02ohm, PR69=39.2K, CP=3.079A
90W, Iadapter=0~4.74A, Current Sense=0.015ohm, PR69=28.7K, CP=4.263A

$$ADP_I = 19.9 * I_{\text{adapter}} * R_{\text{sense}}$$



CP mode
 $I_{\text{input}} = (1/0.02) (0.05 * V_{\text{aclm}} / 2.39 + 0.05)$
 where $V_{\text{aclm}} = 0.5535V$, $I_{\text{input}} = 3.079A$
 where $V_{\text{aclm}} = 0.6667V$, $I_{\text{input}} = 4.263A$

CC=0.6~3.4A
 $V_{\text{CHLM}} = 0.24V \sim 1.36V$
 $I_{\text{REF}} = 0.972 * I_{\text{charge}}$
 $I_{\text{REF}} = 0.5832V \sim 3.3V$

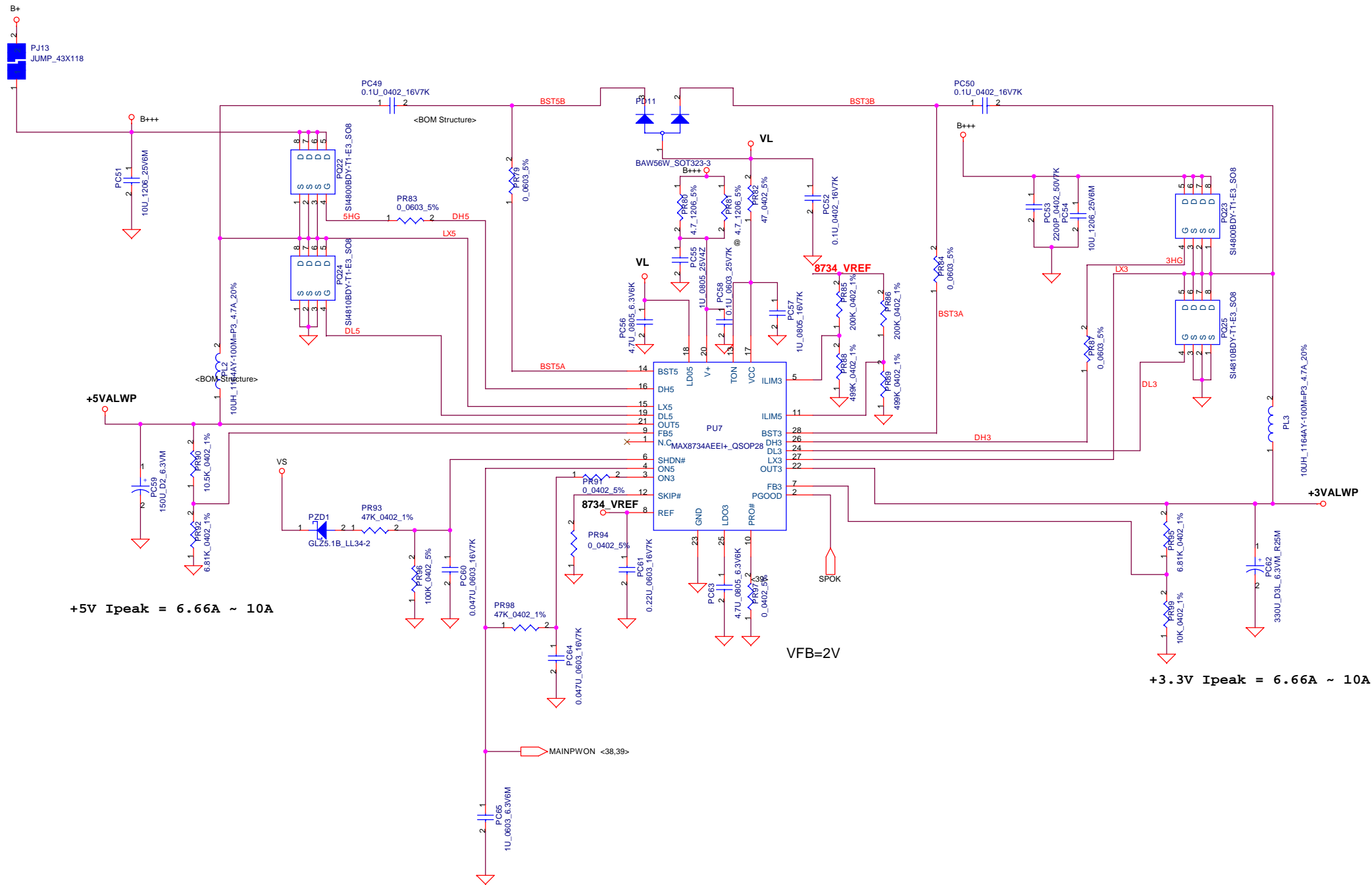
If this area float, Charge voltage is 4.2V/cell

OVP voltage :
 LI-3S : 13.50V--BATT-OVP=1.5V
 LI-4S : 18V--BATT-OVP=2.0V
 $BATT-OVP = 0.111 * BATT+$

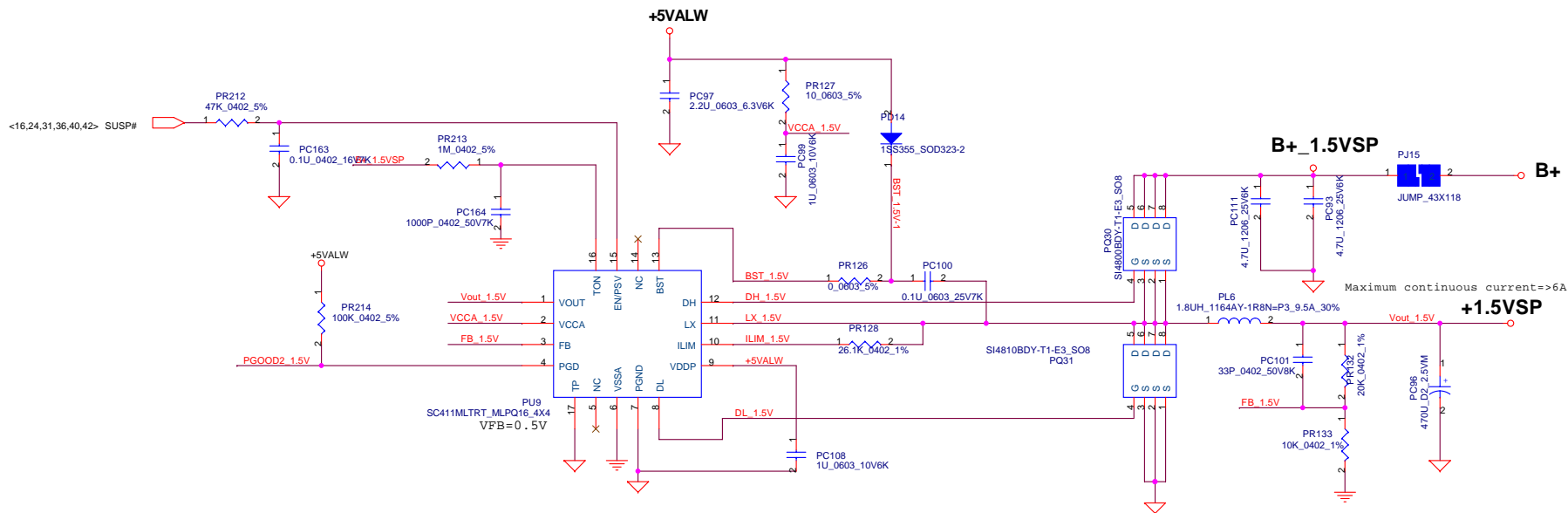
BATT Type	Charging Voltage (0x15)	ALI/MH#	CV mode
4800mAH 3S pack	16800mV	LOW	16.8V
2400mAH 4S pack	12600mV	HIGH	12.60V

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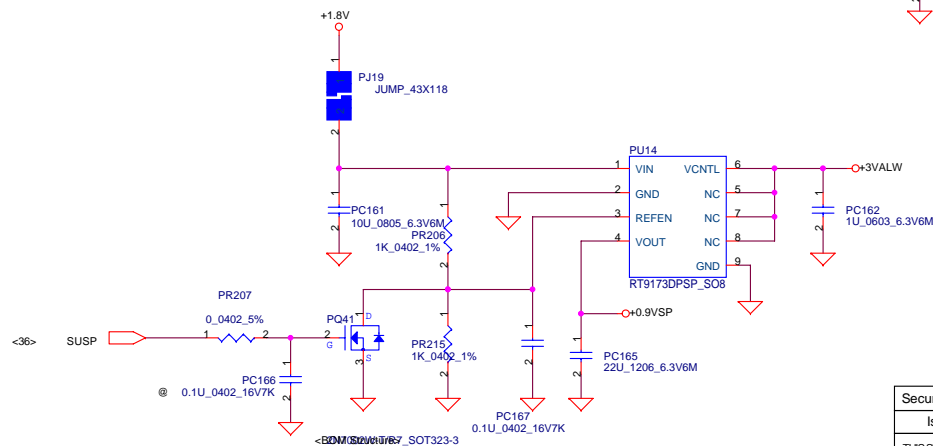
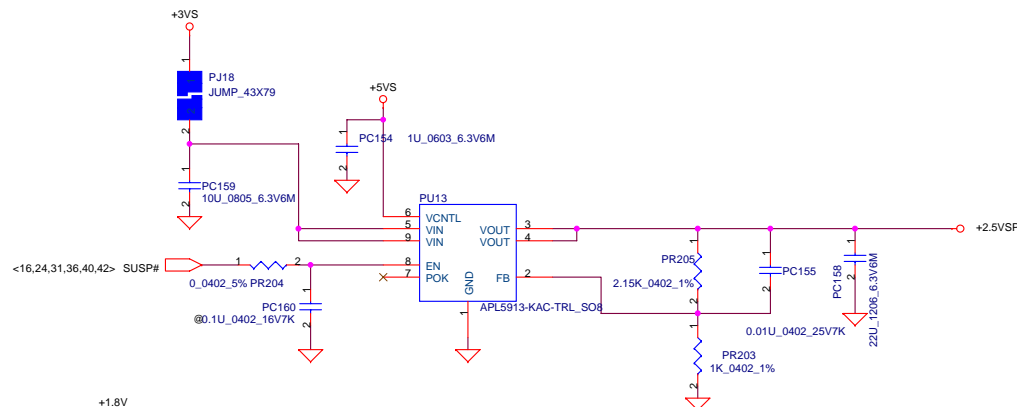


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Close to IC Side
Differential routing of feedback to VSSA2 and VOUT2 PIN

VFB=0.5V, Ipeak=14.02A, Imax=9.814A
The current rating of +1.05VSP include +VCC_GFX current.
 $V_o = V_{FB} * (1 + PR146 / PR147) = 1.05V$
 $T_{on} = (3.3E-12 * (PR142 + 37K) * (V_{out} / V_{bat})) + 50ns = 0.239\mu s$
 $SI4810BDY: R_{ds(on)} \Rightarrow Typ: 9m\Omega$
 $Max: 11.5 m\Omega$
 $I_{valleymin} = 9 * 10E-6 * (PR145 / R_{ds(ON)})_{max} * 1.5$
 $= 9 * 10E-6 * (26.1K / (0.0115 * 1.5)) = 13.617A$
 $I_{valleymax} = 11 * 10E-6 * (PR145 / R_{ds(ON)})_{min} * 1.2$
 $= 11 * 10E-6 * (26.1K / (0.009 * 1.3)) = 20.076A$
 $I_{ripple} = (v_{in} - v_{out}) * (T_{on} / L) = 4.292A, 1/2 I_{ripple} = 2.146A$
 $I_{ocp} = I_{valley} + I_{ripple} / 2$
OCP $\Rightarrow 15.763A \sim 22.222A$



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				1.5VSP/2.5VSP/0.9VSP	
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Version change list (P.I.R. List)

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Item	Fixed Issue	Rev.	PG#	Modify List
1	USB port 2 and 4 can't work	0.2	P.35	Change U17 P/N SA005280110 to SA00001H600
2	Change symbol	0.2	P.20.31	Change Y4 and X1 to SJ132P7K220
3	CRT wave	0.2	P.10	Change L41 to R878 and reserve C619
4	To meet INTEL SPEC	0.2		Change C148.C442.C171.C400.C606.C607 from 2200P to 22N
5	Delete reserve	0.2	P.17	Delete R71,74 Delete C171
6	FACTORY REQUEST	0.2	P.35	Delete JP5 PIN3
7	To meet CRT SPEC	0.2	P.18	Remove C7
8	Tune frequency	0.2	P.28	Change C511;515 from 27p to 18p
9	EMI Request	0.2		change C632 to 2.2nF Remove R441,R145,C6,12,13,change L2,3,4 to SM01000AL00
10	EMI Request	0.2	P.30	LAN RX TX change
11	EMI Request	0.2	P.32	ADD D22;23;24
12	EMI Request	0.2	P.4	Delete ITP_BPM0-5 and R515
13	FAN issue	0.2	P.4	Change R276 from 10k to 1k ohm C341 from 1000p to 100p
14	USB issue	1.0	P.21	Change USB port 2 to NEW card port 7 to USB Change R322 to 22 ohm
15	Remove LPC debug connect	1.0	P.33	Remove JP13,R265,R441,R145
16	ESD Request and reserve	1.0		ADD T48 AND R515 AND JP9 29,30 pin to GND
17	Power improve	1.0	P.6	RemoveC26,31,314,315
18		0.2		
19		0.2		
20		0.2		

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HW PIR		
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