

ZZZ1



PCB

# Compal Confidential

## KAWGO Schematics Document

AMD S1g1 / RS690MC / SB600

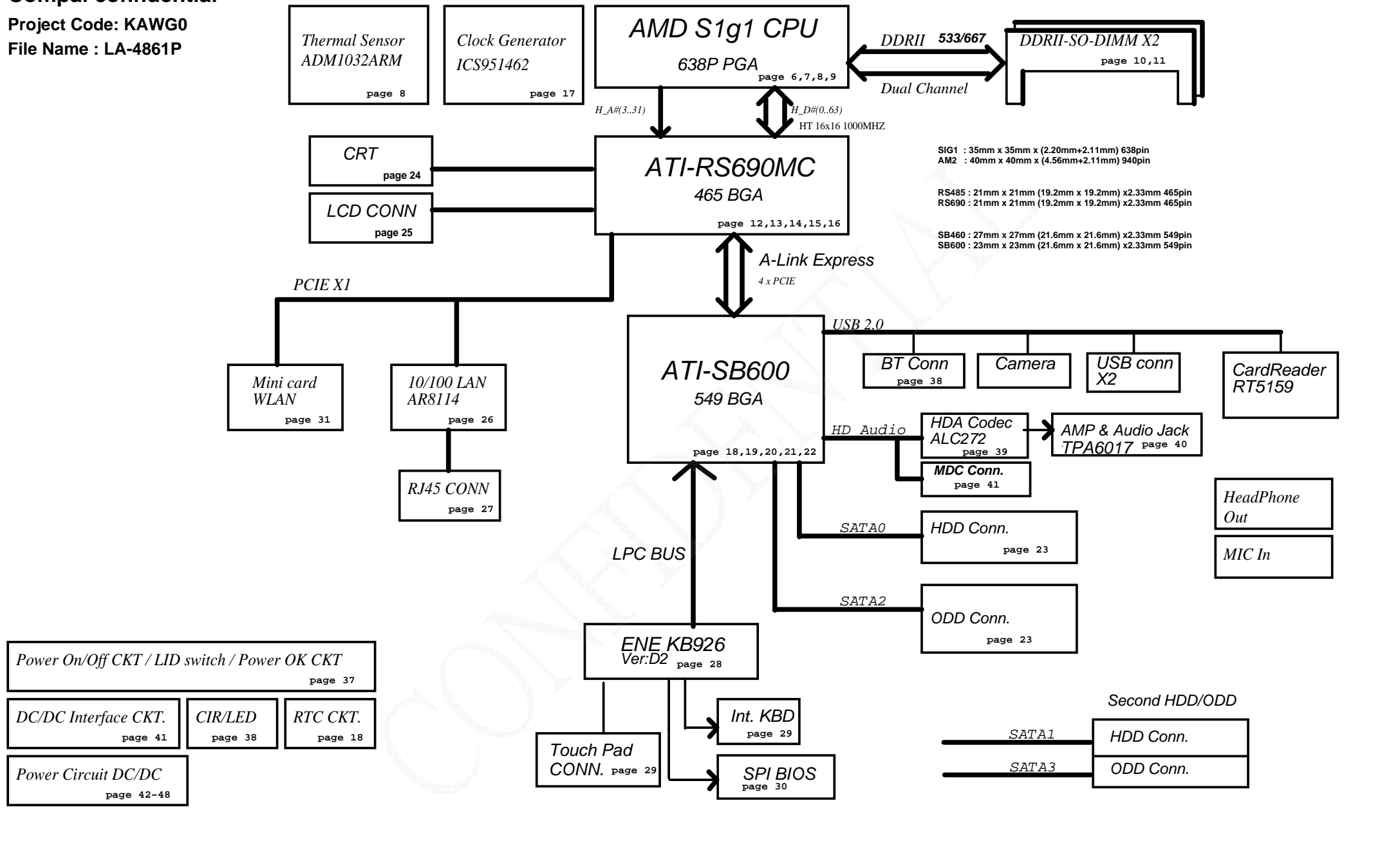
2009 / 04 / 09

Rev:1.0

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**Compal confidential**

Project Code: KAWG0  
File Name : LA-4861P



SIG1 : 35mm x 35mm x (2.20mm+2.11mm) 638pin  
AM2 : 40mm x 40mm x (4.56mm+2.11mm) 940pin  
RS485 : 21mm x 21mm (19.2mm x 19.2mm) x2.33mm 465pin  
RS690 : 21mm x 21mm (19.2mm x 19.2mm) x2.33mm 465pin  
SB460 : 27mm x 27mm (21.6mm x 21.6mm) x2.33mm 549pin  
SB600 : 23mm x 23mm (21.6mm x 21.6mm) x2.33mm 549pin

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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
+0.9V	0.9V switched power rail for DDR terminator	ON	ON	OFF
+1.2V_HT	1.2V switched power rail	ON	OFF	OFF
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+1.8VALW	1.8V always on power rail	ON	ON	ON*
+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#	Interrupts

### EC SM Bus1 address

Device	Address	Device	Address
Smart Battery	0001 011X b	ADM1032	1001 100X b

### EC SM Bus2 address

### SB600 SM Bus 1 address

Device	Address	Device	Address
Clock Generator (ICS951462)	1101 001Xb	New Card	
DDR DIMM0	1001 000Xb		
DDR DIMM2	1001 010Xb		
Wireless Lan			

### SB600 SM Bus 2 address

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 / SKU ID Table for AD channel

Vcc	3.3V +/- 5%			
Ra/Rc/Re	100K +/- 5%			
Board ID	Rb / Rd / Rf	VAD_BID min	VAD_BID typ	VAD_BID max
0	0	0 V	0 V	0 V
1	8.2K +/- 5%	0.216 V	0.250 V	0.289 V
2	18K +/- 5%	0.436 V	0.503 V	0.538 V
3	33K +/- 5%	0.712 V	0.819 V	0.875 V
4	56K +/- 5%	1.036 V	1.185 V	1.264 V
5	100K +/- 5%	1.453 V	1.650 V	1.759 V
6	200K +/- 5%	1.935 V	2.200 V	2.341 V
7	NC	2.500 V	3.300 V	3.300 V

### BOARD ID Table

Board ID	PCB Revision
0	0.1
1	0.2
2	0.3
3	1.0
4	
5	
6	
7	

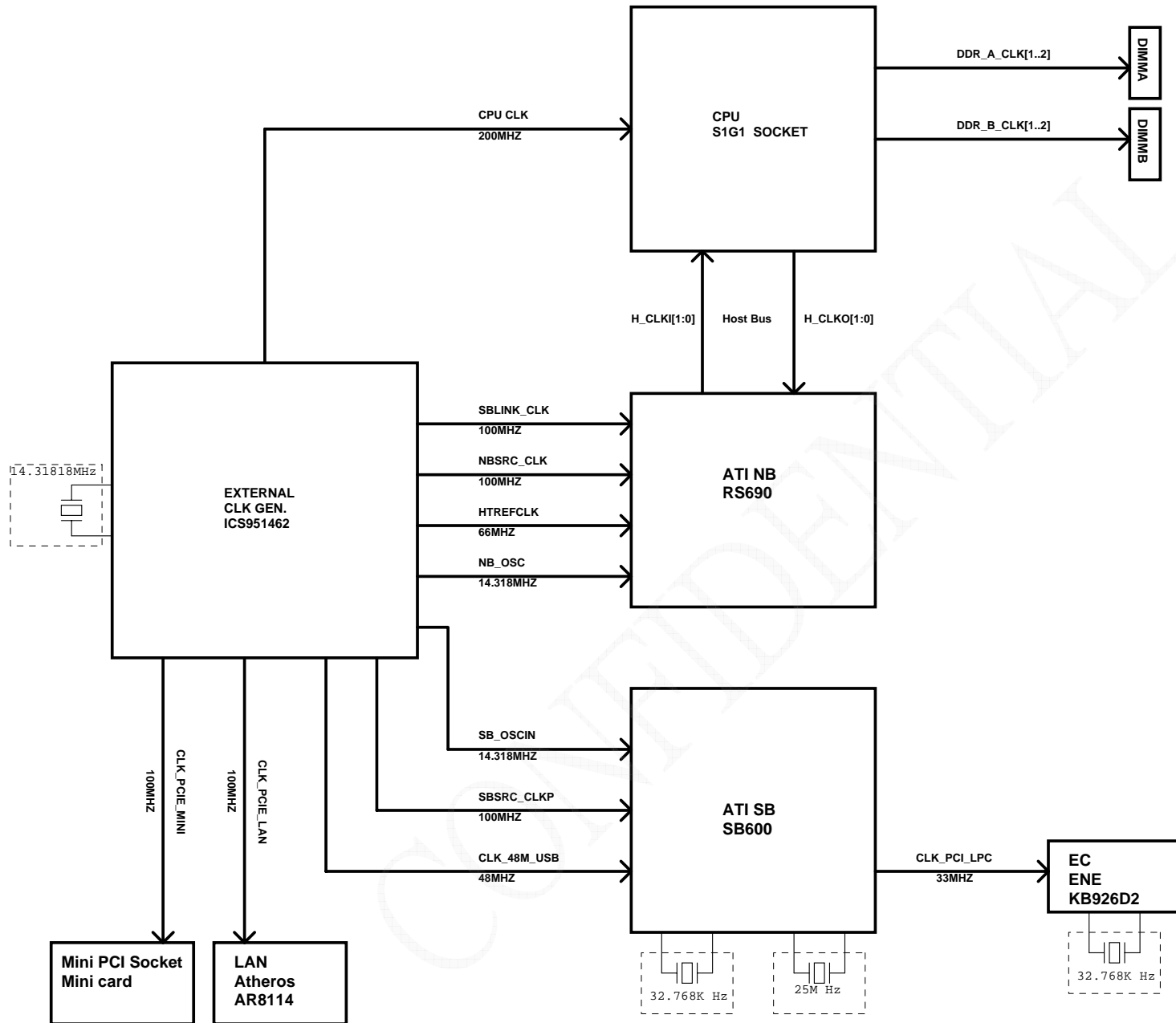
### BTO Option Table

BTO Item	BOM Structure
NC Function	NC@
10/100 Lan	8114@
GIGA Lan	8132@
17" ID	17@
15" ID	15@

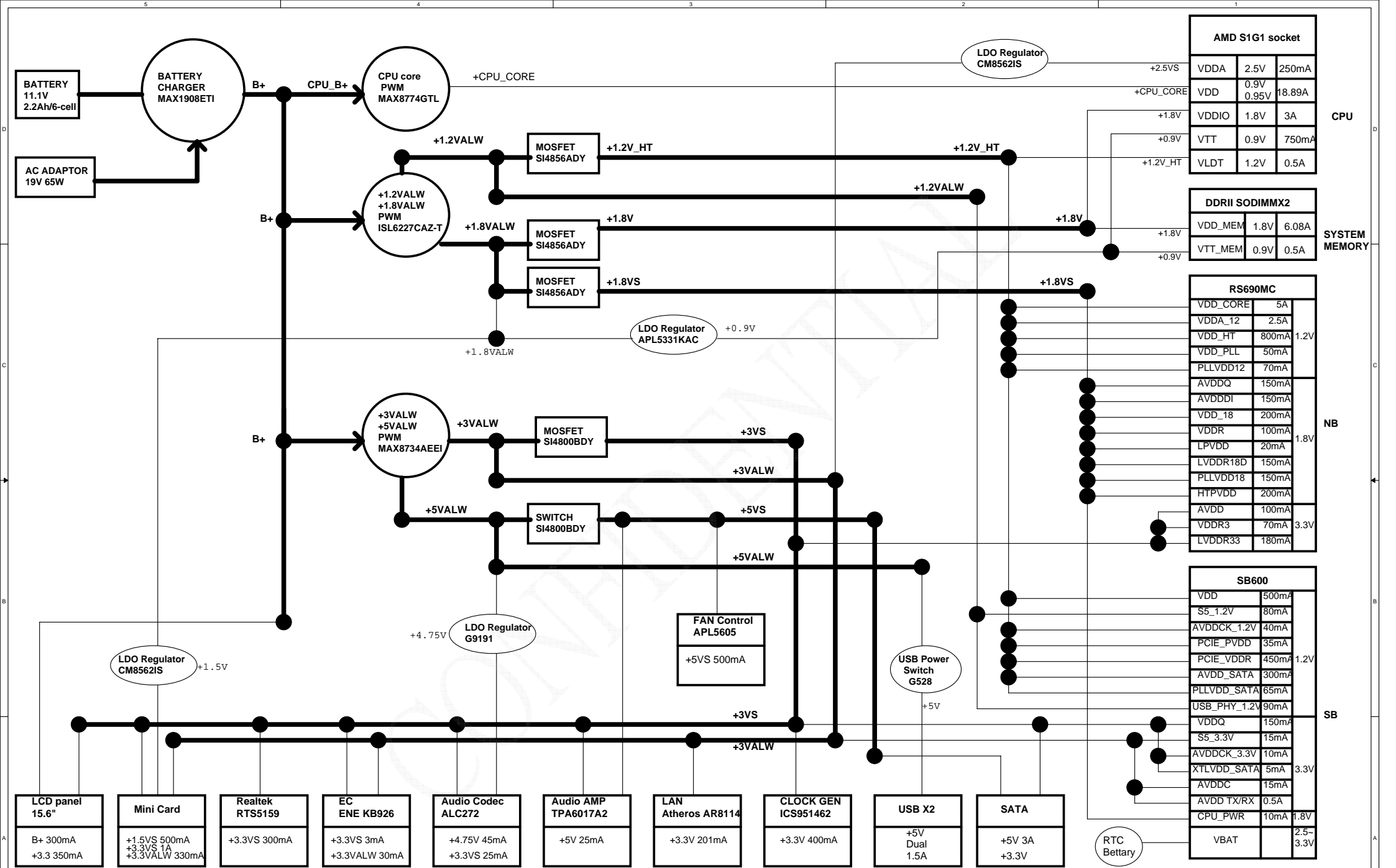
### SKU ID Table

SKU ID	SKU
0	
1	
2	
3	
4	
5	
6	
7	

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AMD S1G1 socket		
VDDA	2.5V	250mA
VDD	0.9V 0.95V	18.89A
VDDIO	1.8V	3A
VTT	0.9V	750mA
VLDT	1.2V	0.5A

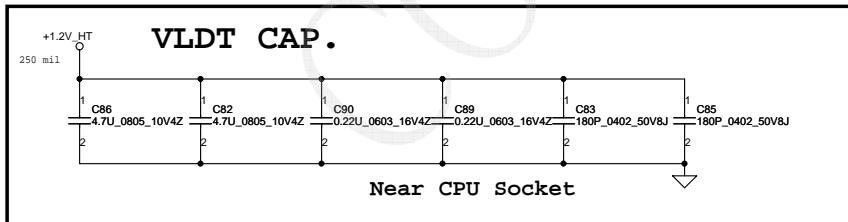
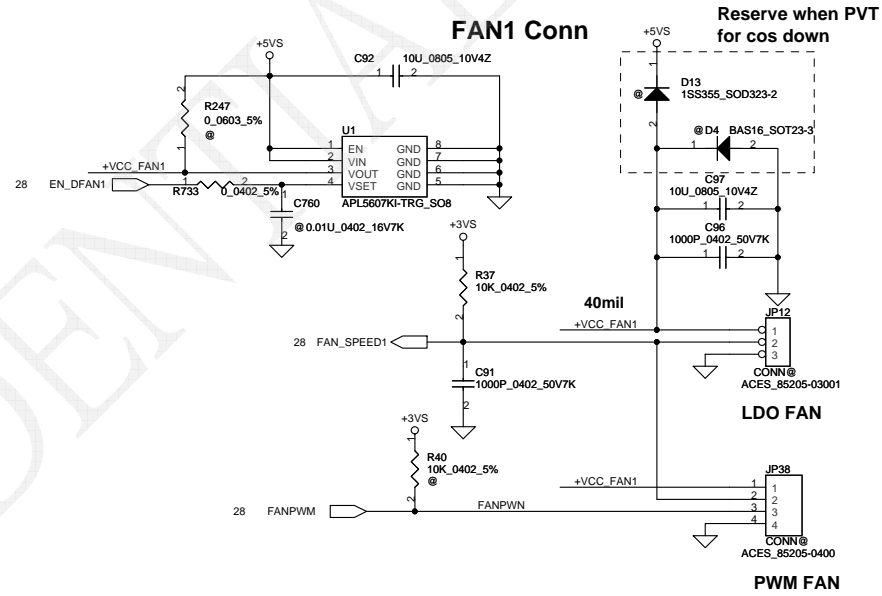
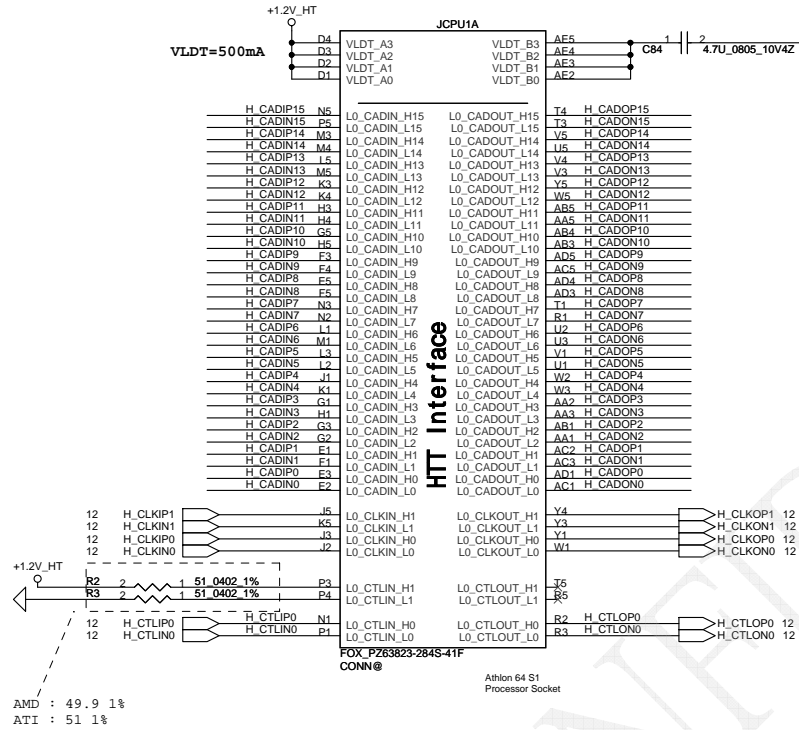
DDRII SODIMM2		
VDD_MEM	1.8V	6.08A
VTT_MEM	0.9V	0.5A

RS690MC		
VDD_CORE	5A	1.2V
VDDA_12	2.5A	
VDD_HT	800mA	
VDD_PLL	50mA	1.8V
PLLVDD12	70mA	
AVDDQ	150mA	
AVDDDI	150mA	3.3V
VDD_18	200mA	
VDDR	100mA	
LPVDD	20mA	1.8V
LVDDR18D	150mA	
PLLVDD18	150mA	
HTPVDD	200mA	3.3V
AVDD	100mA	
VDDR3	70mA	
LVDDR33	180mA	

SB600		
VDD	500mA	1.2V
S5_1.2V	80mA	
AVDDCK_1.2V	40mA	
PCIE_PVDD	35mA	1.2V
PCIE_VDDR	450mA	
AVDD_SATA	300mA	
PLLVDD_SATA	65mA	3.3V
USB_PHY_1.2V	90mA	
VDDQ	150mA	
S5_3.3V	15mA	3.3V
AVDDCK_3.3V	10mA	
XTLVDD_SATA	5mA	
AVDDC	15mA	1.8V
AVDD TX/RX	0.5A	
CPU_PWR	10mA	
VBAT		2.5-3.3V

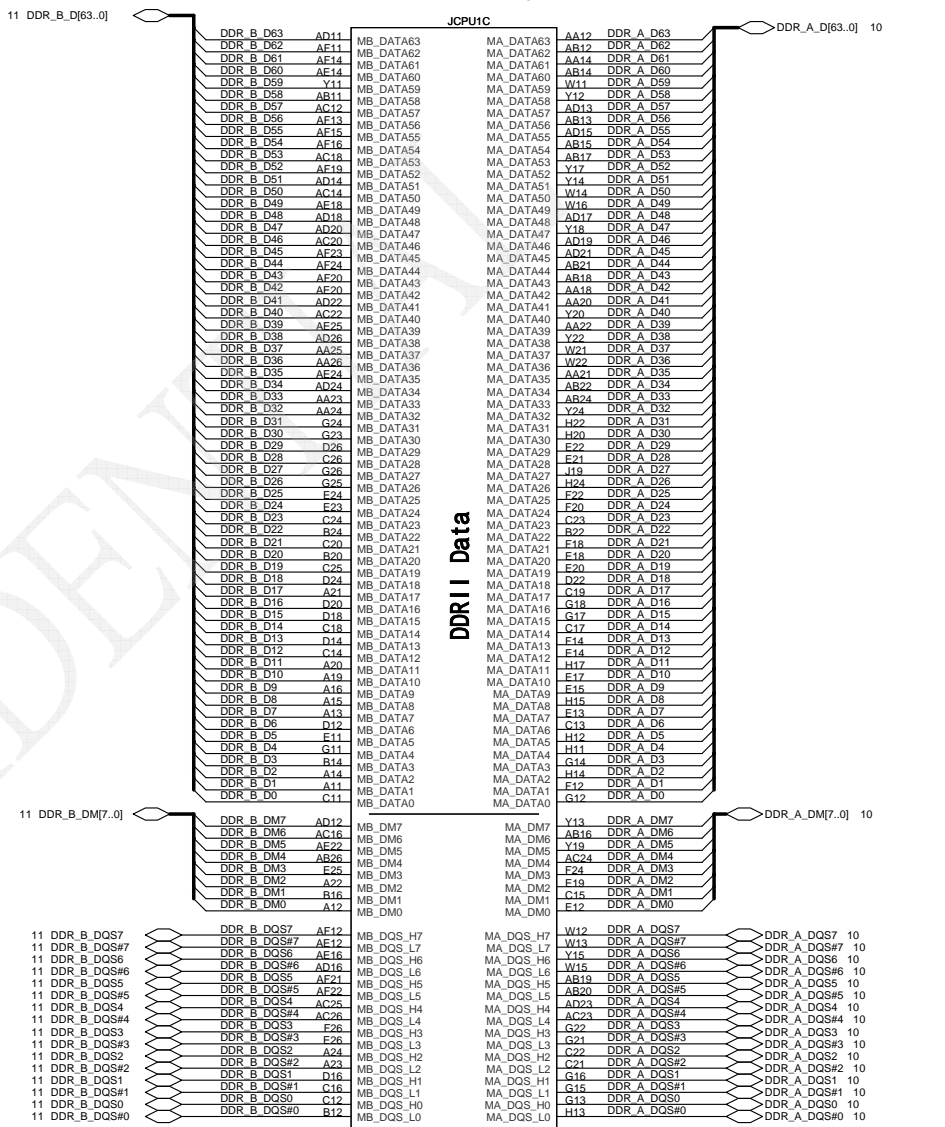
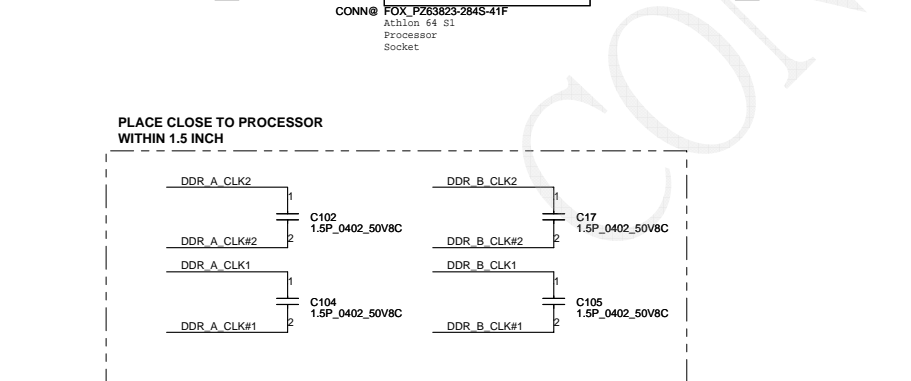
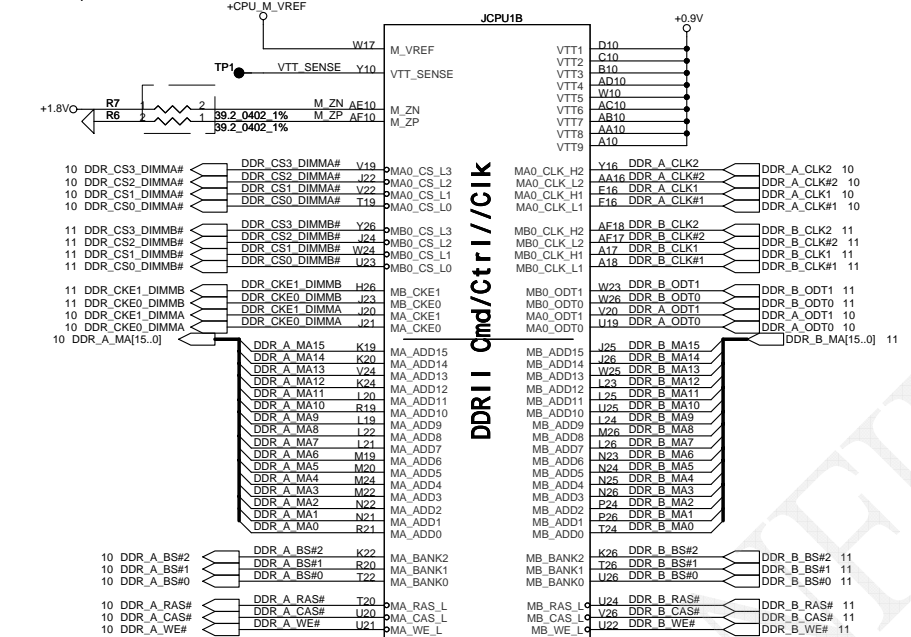
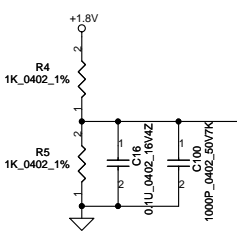
LCD panel 15.6"	Mini Card	Realtek RTS5159	EC ENE KB926	Audio Codec ALC272	Audio AMP TPA6017A2	LAN Atheros AR8114	CLOCK GEN ICS951462	USB X2	SATA
B+ 300mA +3.3 350mA	+1.5VS 500mA +3.3VS 1A +3.3VALW 330mA	+3.3VS 300mA	+3.3VS 3mA +3.3VALW 30mA	+4.75V 45mA +3.3VS 25mA	+5V 25mA	+3.3V 201mA	+3.3V 400mA	+5V Dual 1.5A	+5V 3A +3.3V

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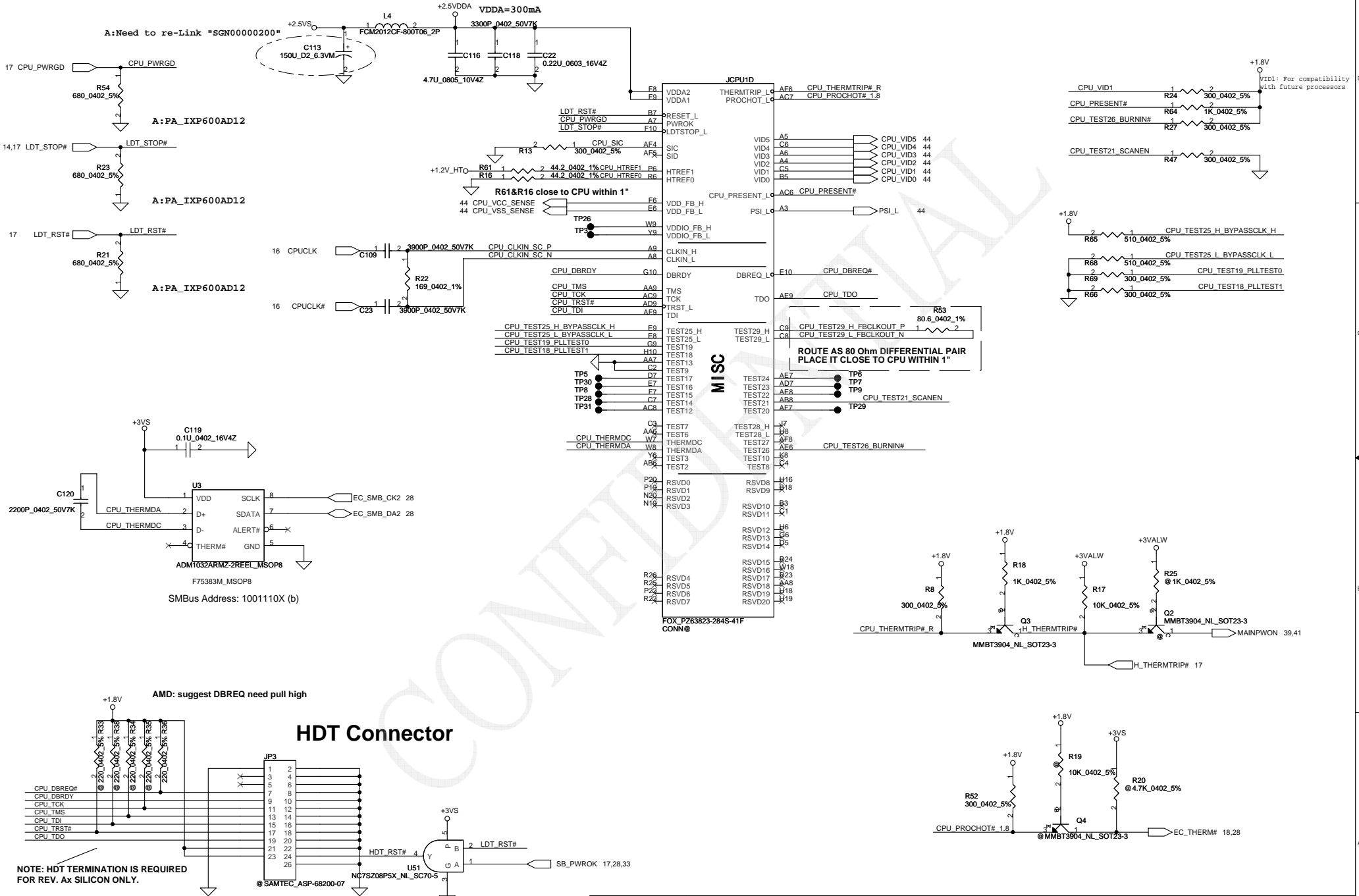
# Processor DDR2 Memory Interface



CONN@ FOX\_P263823-284S-41F  
Athlon 64 S1  
Processor  
Socket

CONN@ FOX\_P263823-284S-41F  
Athlon 64 S1  
Processor Socket

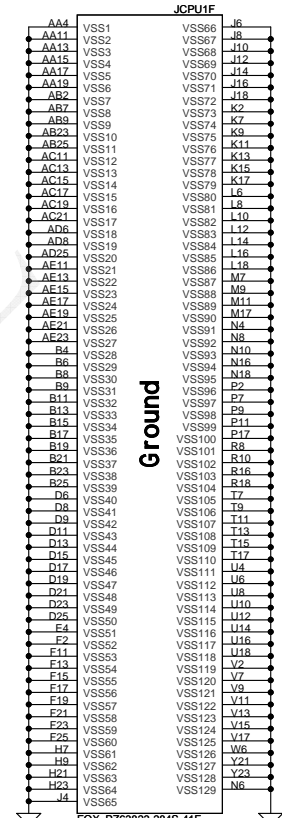
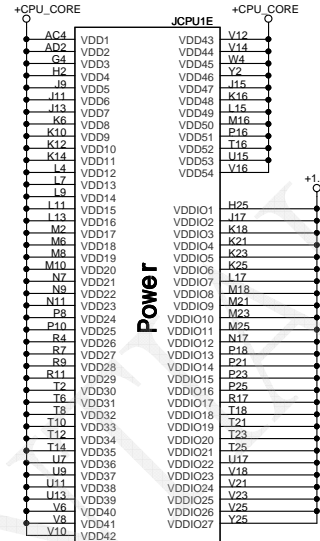
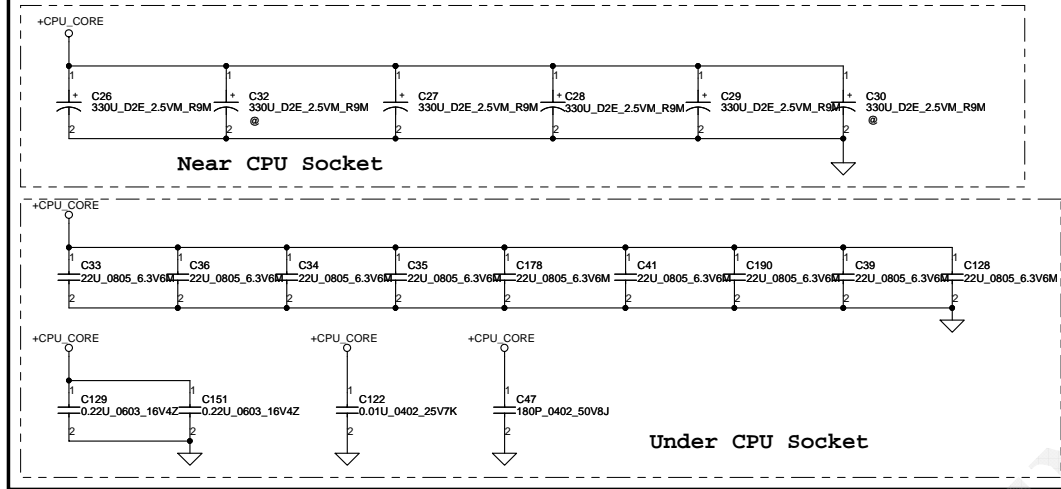
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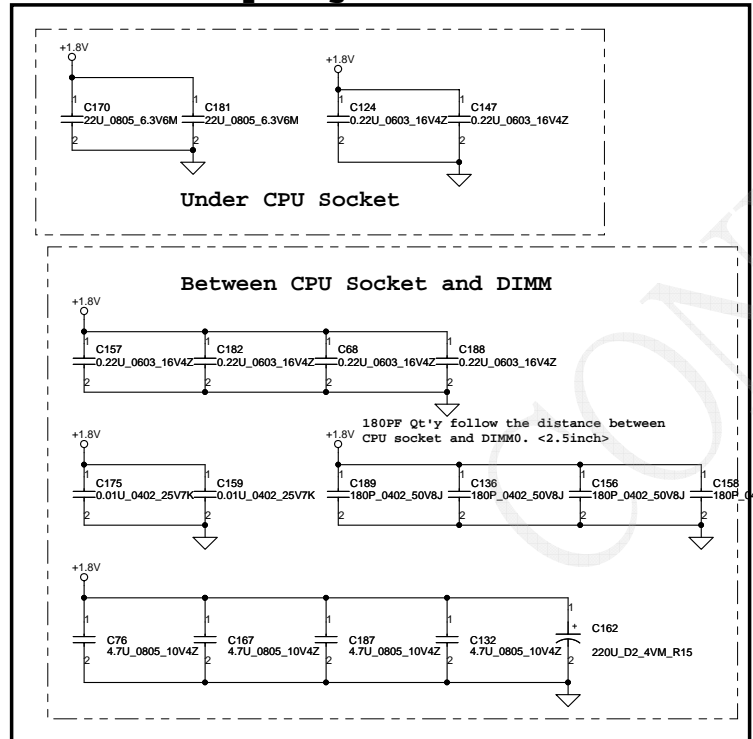
## VDD(+CPU\_CORE) decoupling.



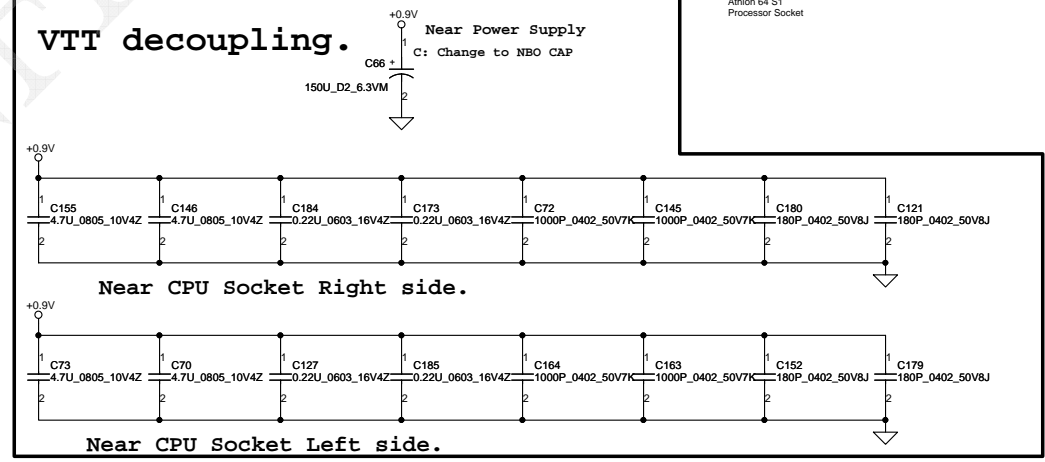
FOX\_P263823-284S-41F  
CONN@  
Athlon 64 S1  
Processor Socket

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CONN@  
Athlon 64 S1  
Processor Socket

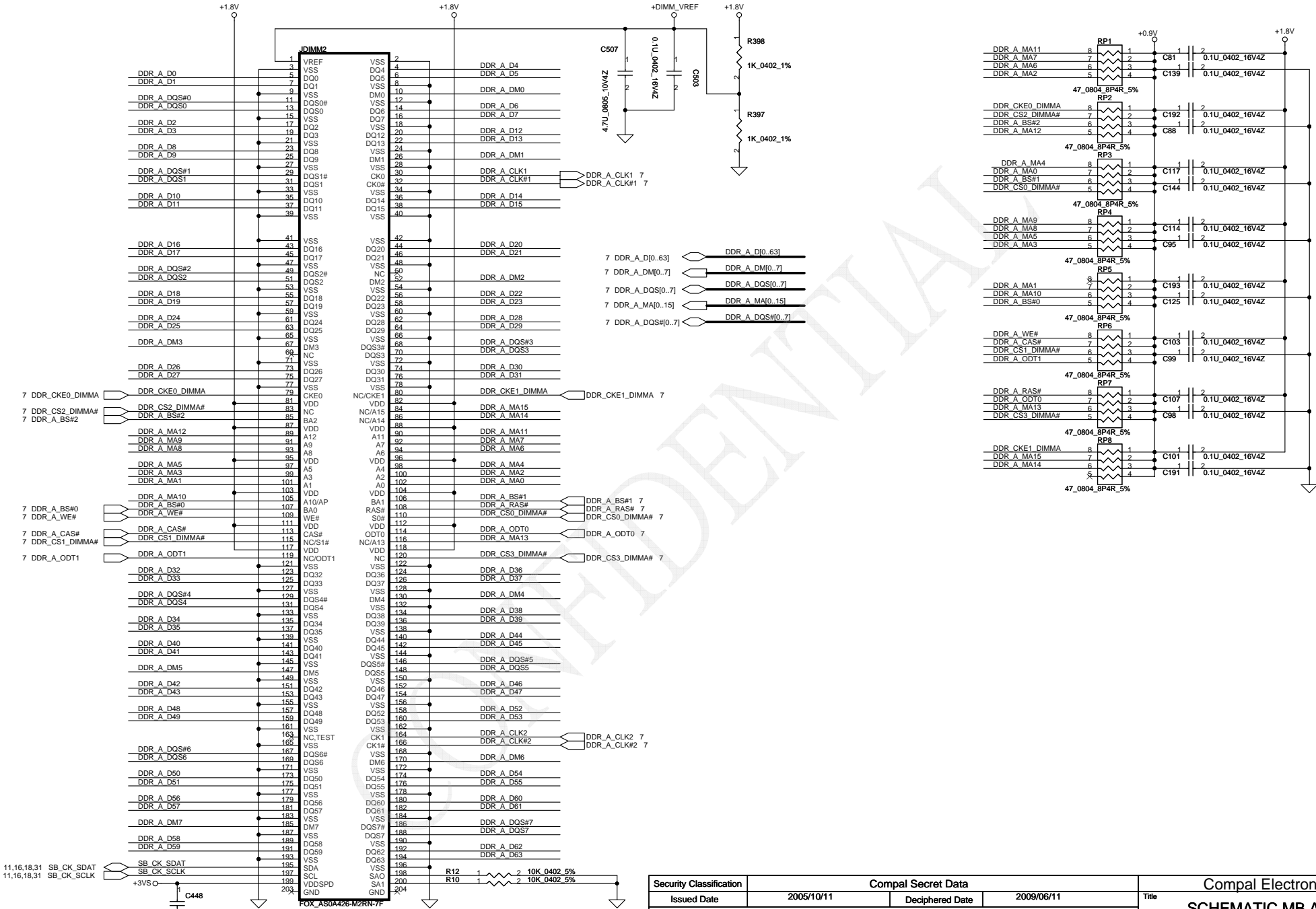
## VDDIO decoupling.



## VTT decoupling.

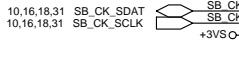
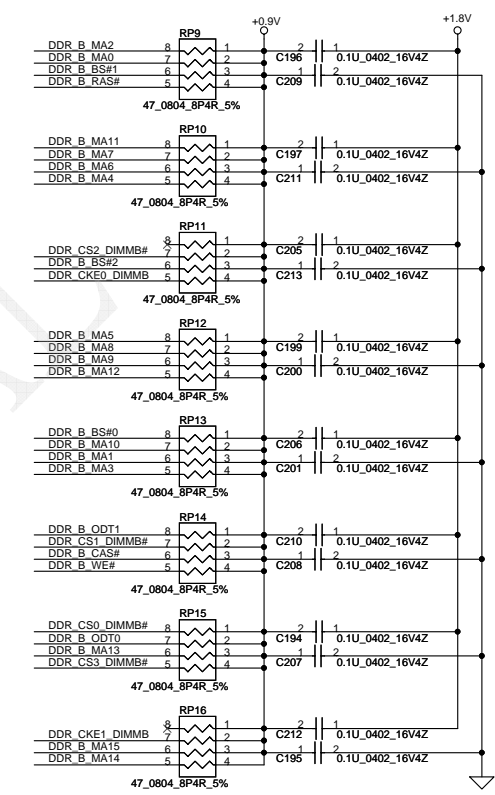
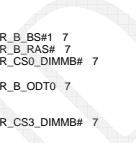
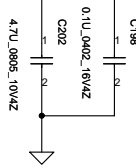
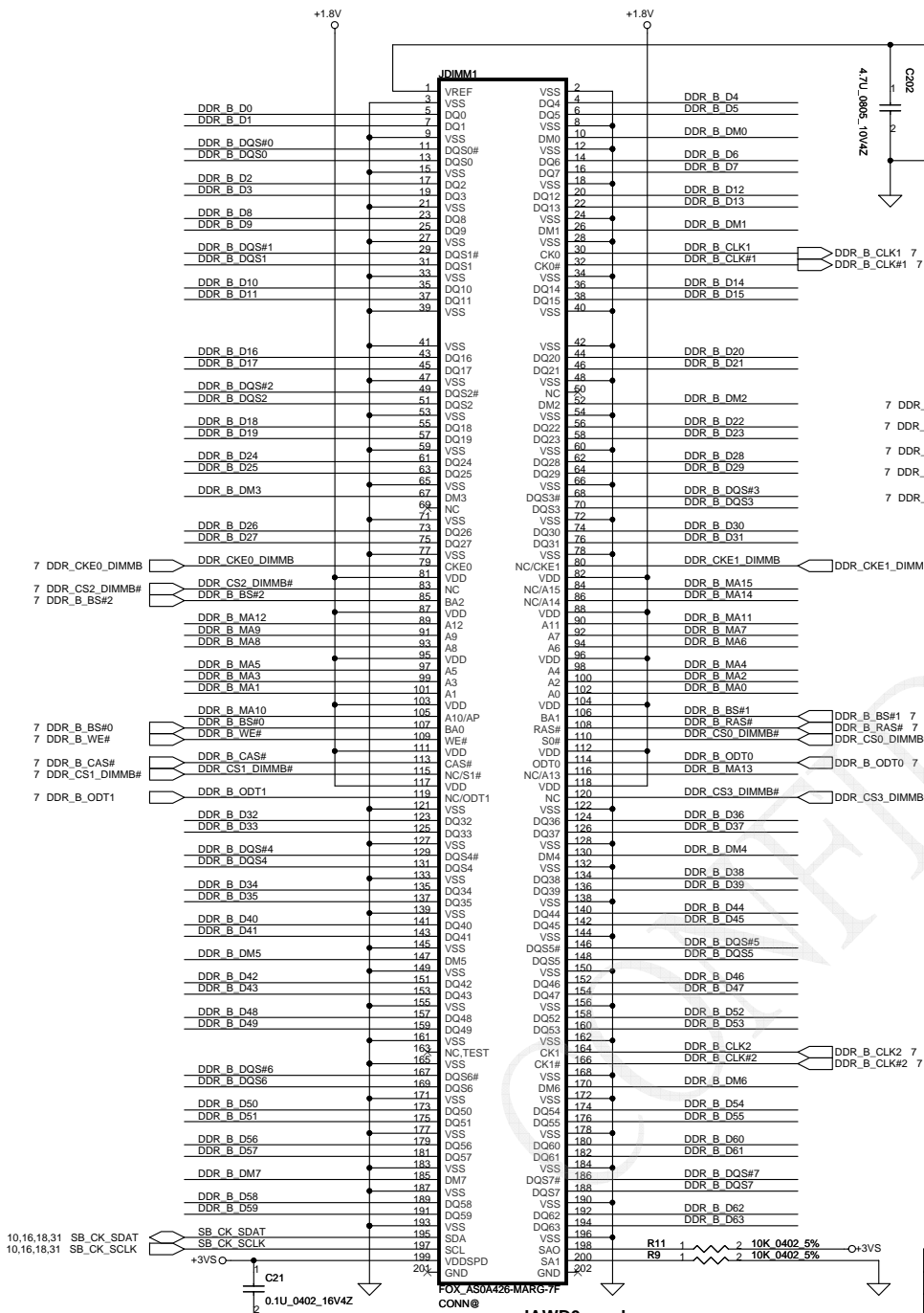


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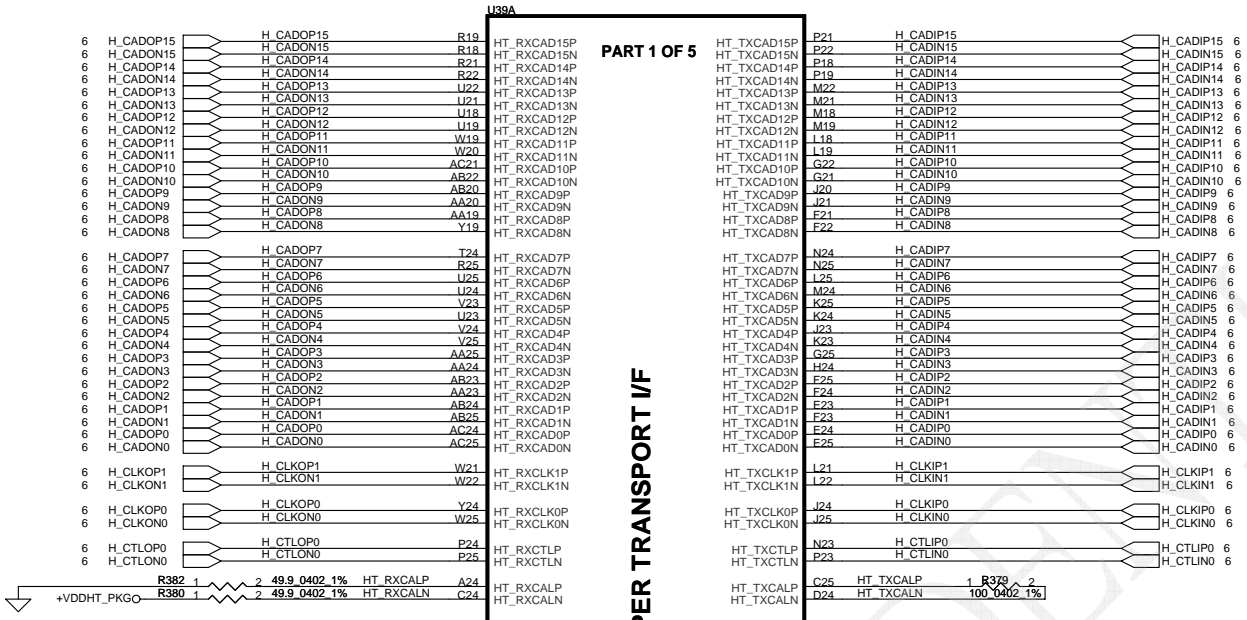
**JAWD0 used  
DIMM1 REV H:5.2mm (BOT)**

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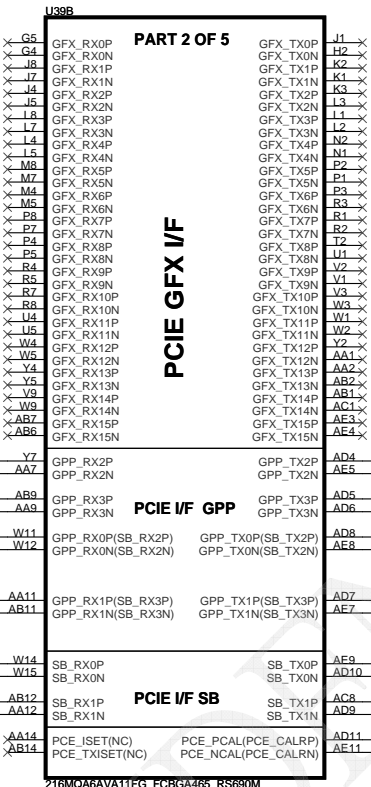
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RS690MC : SA000011480 / S IC 216LQA6AVA12FG RS690MC BGA 465P 0FA

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**WLAN**

**LAN**

**A-Link**

**WLAN**

**LAN**

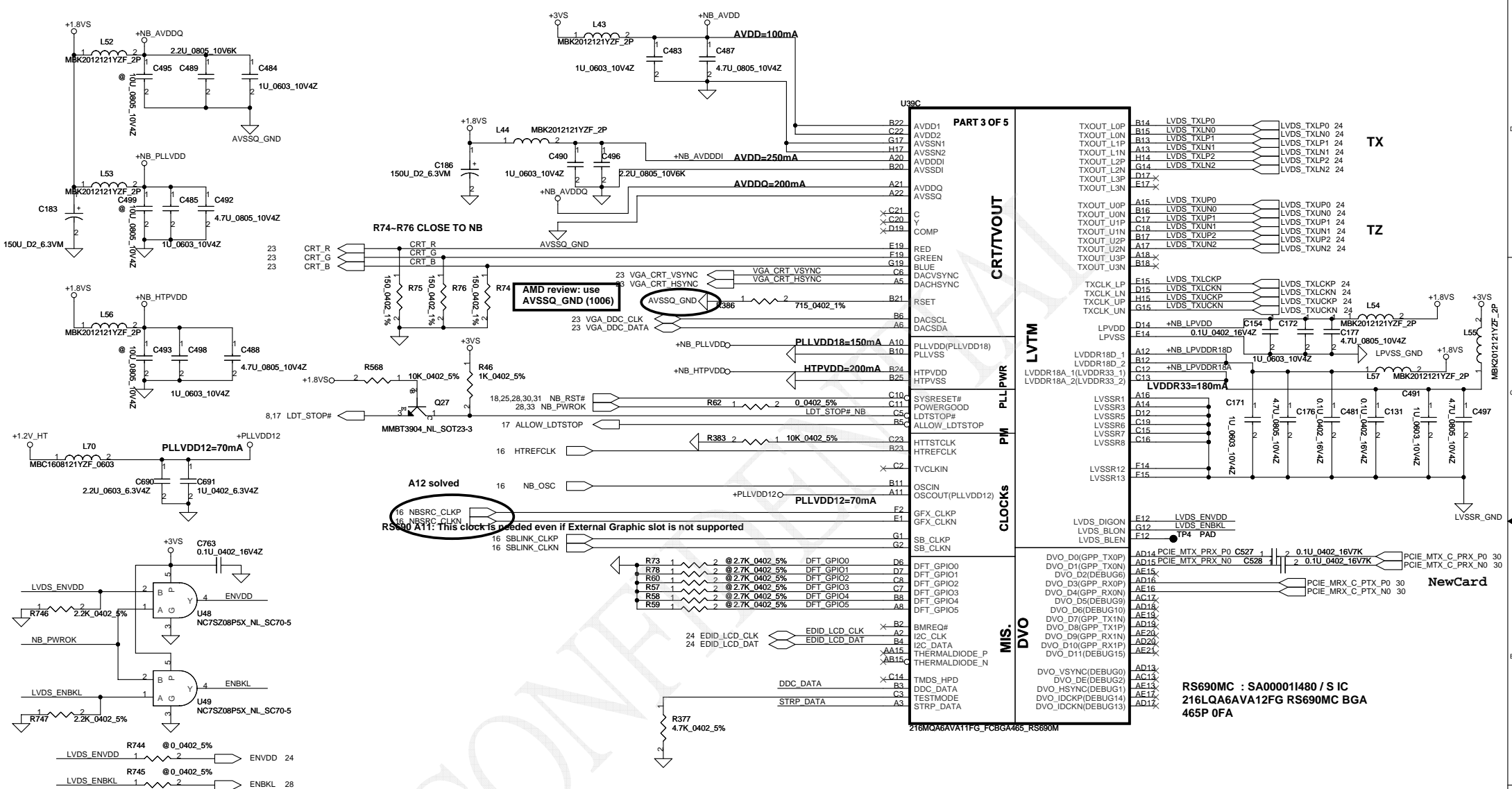
**A-Link**

AA14, AB14 NC  
for RS690

R375: 150 Ohm FOR RS485  
562 Ohm FOR RS690  
R376: 82.5 Ohm FOR RS485  
2K0hm FOR RS690

RS690MC : SA00001I480 / S IC 216LQA6AVA12FG RS690MC BGA 465P 0FA

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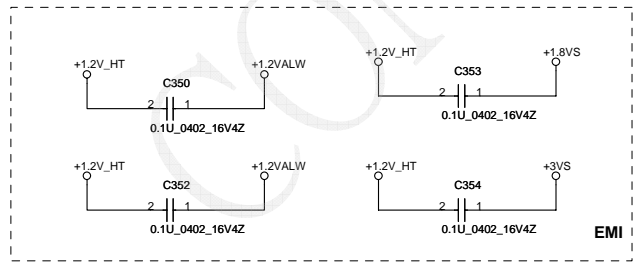
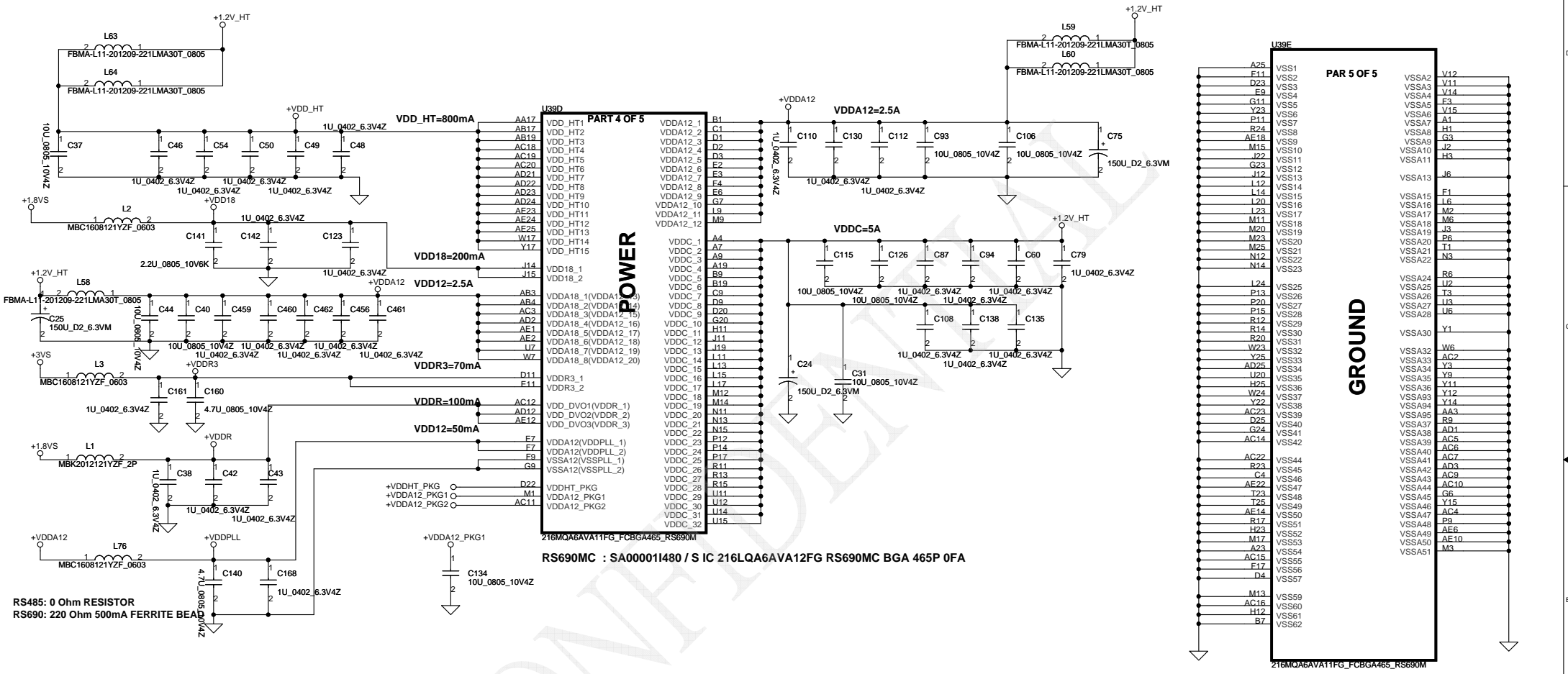


RS690		RS690 only	
<b>PULL HIGH</b> (internally pulled high)	DFT_GPIO0 Memory side port not available DEFAULT	DFT_GPIO1 Bypass the loading of EEPROM straps and use Hardware default values DEFAULT	DFT_GPIO[4:2] These pin straps are used to configure PCI-E GPP mode: 111: register defined (register default to Config E) 110: 4-0-0-0 Config A 101: 4-4 Config B 100: 4-2-2 Config C 011: 4-2-1-1 Config D 010: 4-1-1-1 Config E
<b>PULL LOW</b>	Memory side port available	I2C Master can load strap values from EEPROM if connected, or use default values if not connected	DFT_GPIO5 Enable debug bus via the memory IO pads, if available in the package use default values DEFAULT use the memory data bus to output the debug bus

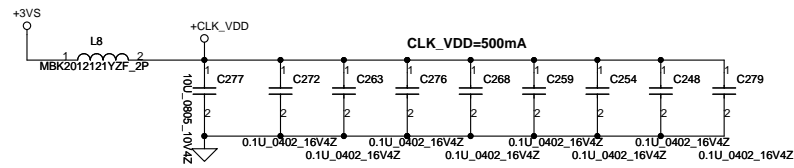
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RS690MC : SA000011480 / S IC  
216LQA6A1V2FG RS690MC BGA  
465P 0FA

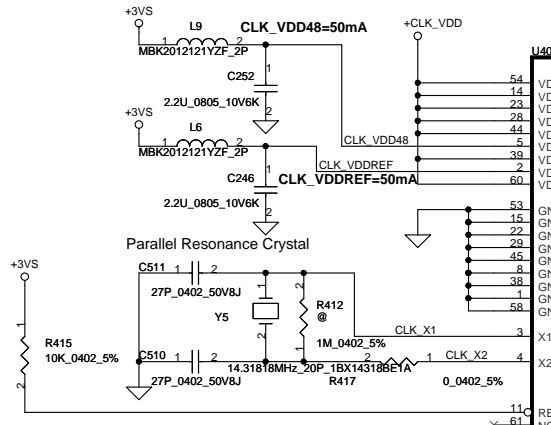
NewCard



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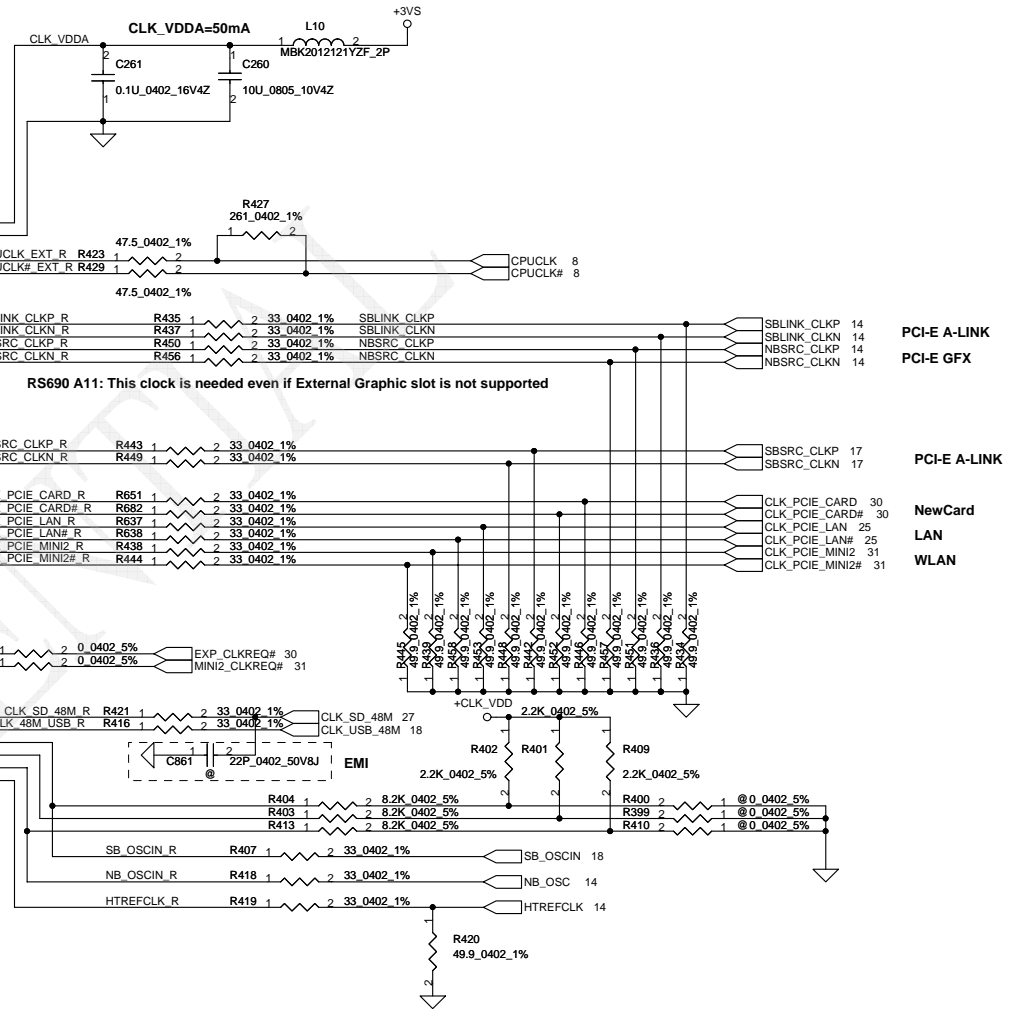


- 1- PLACE ALL SERIAL TERMINATION RESISTORS CLOSE TO U40
- 2- PUT DECOUPLING CAPS CLOSE TO U40 POWER PIN



$$I_{oh} = 5 * I_{ref} \text{ (2.32mA)}$$

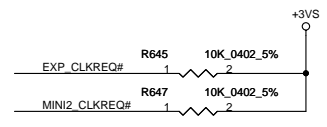
$$V_{oh} = 0.71V @ 60 \text{ ohm}$$



RS690 A11: This clock is needed even if External Graphic slot is not supported

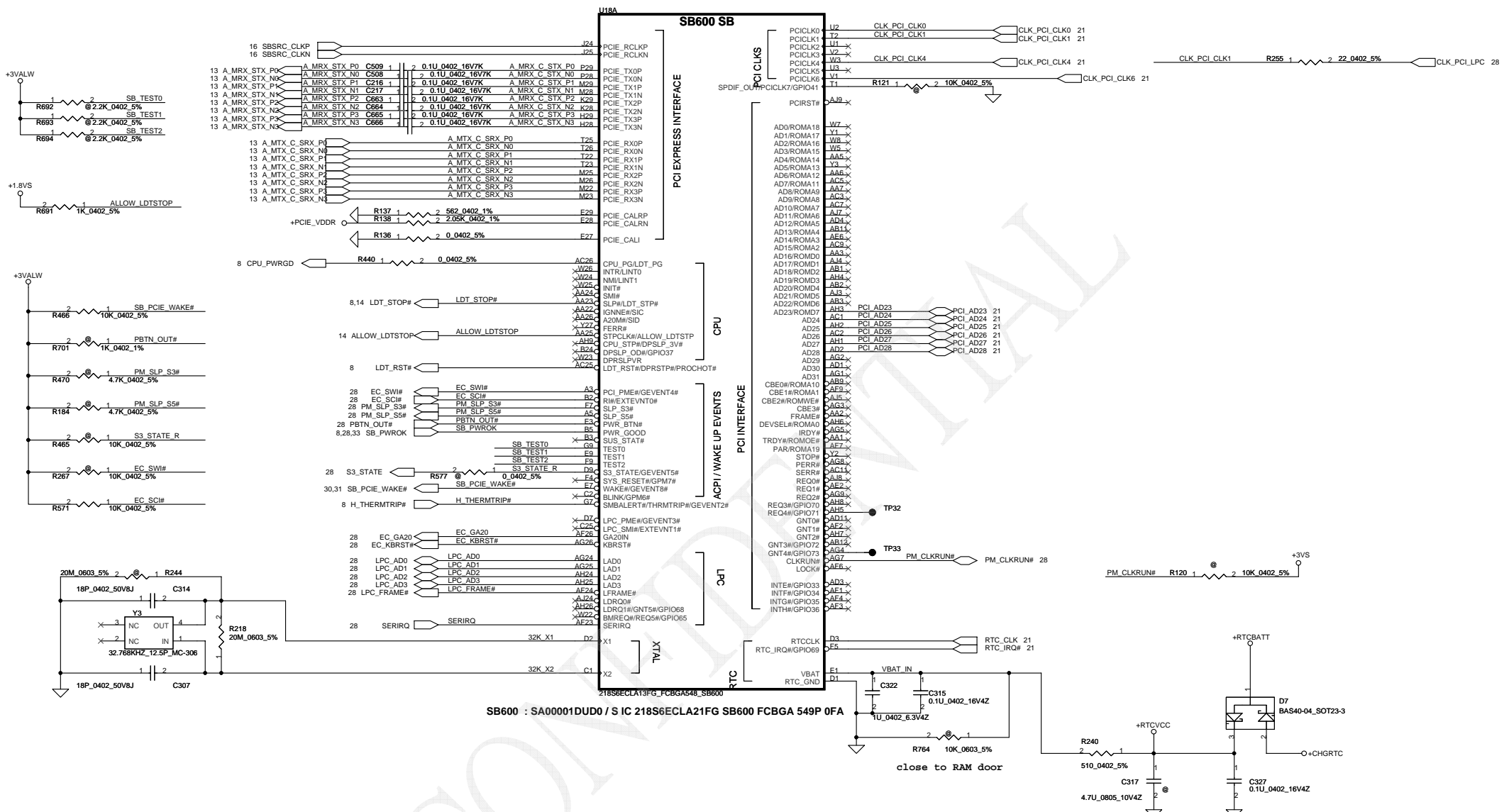
EXT CLK FREQUENCY SELECT TABLE(MHZ)

FS2	FS1	FS0	CPU	SRCLK [2:1]	HTT	PCI	USB	COMMENT
0	0	0	Hi-Z	100.00	Hi-Z	Hi-Z	48.00	Reserved
0	0	1	X	100.00	X/3	X/6	48.00	Reserved
0	1	0	180.00	100.00	60.00	30.00	48.00	Reserved
0	1	1	220.00	100.00	36.56	73.12	48.00	Reserved
1	0	0	100.00	100.00	66.66	33.33	48.00	Reserved
1	0	1	133.33	100.00	66.66	33.33	48.00	Reserved
1	1	1	200.00	100.00	66.66	33.33	48.00	Normal ATHLON64 operation



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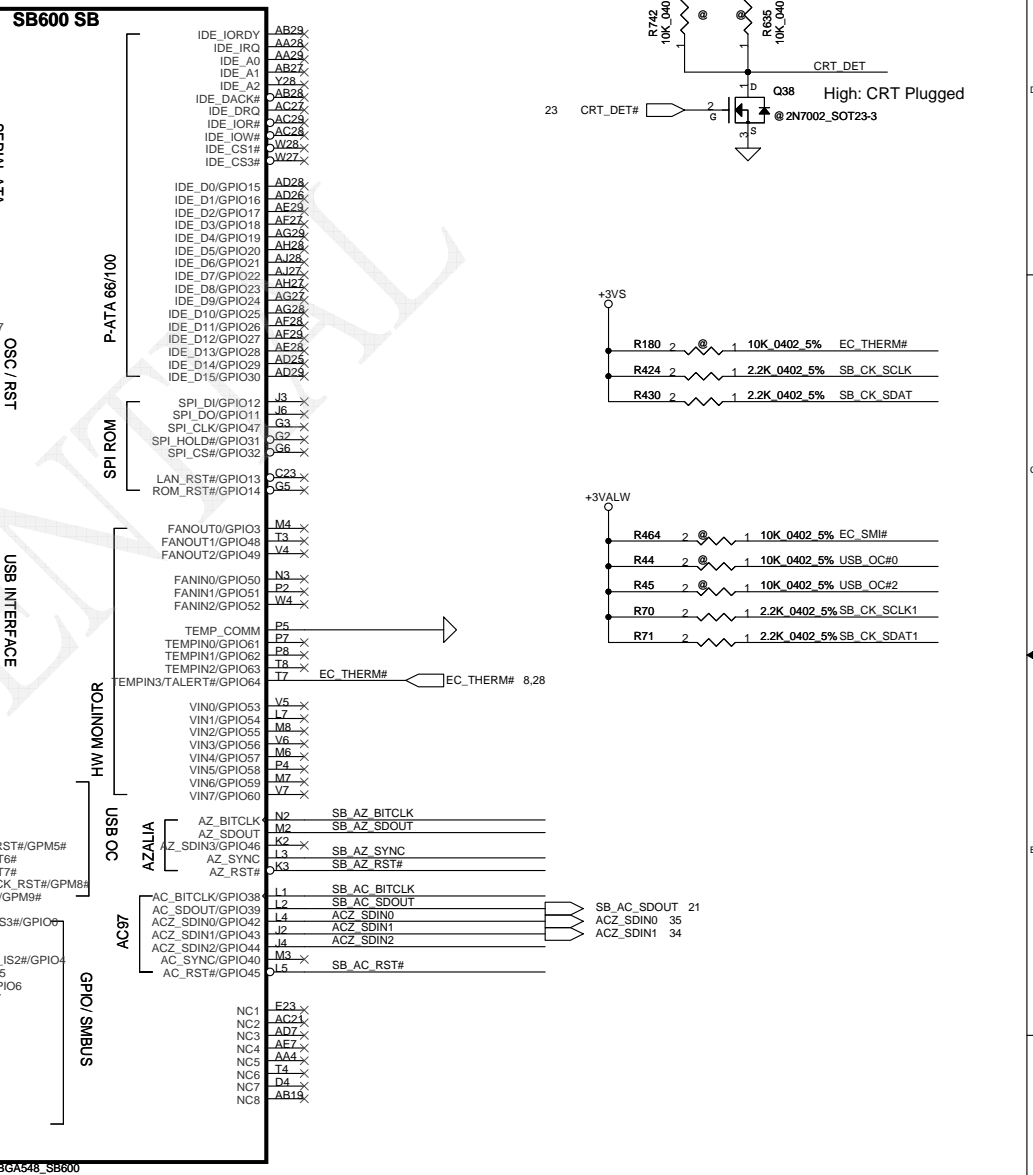
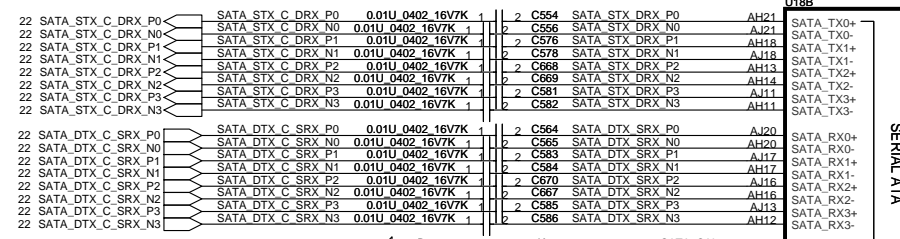
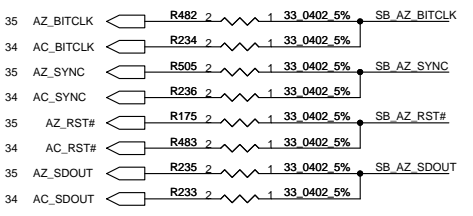
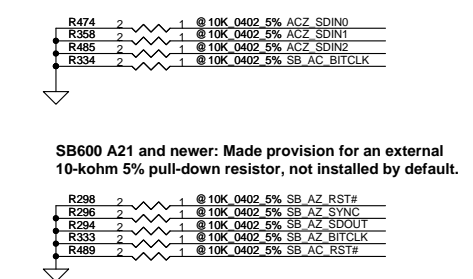
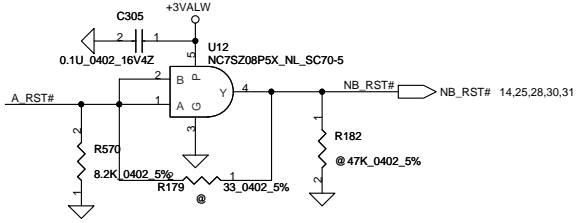
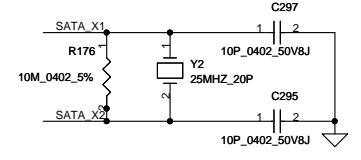


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**NOTE:**  
 R462 IS 1K 1% FOR  
 25MHz XTAL, 4.99K 1%  
 FOR 100MHz INTERNAL  
 CLOCK

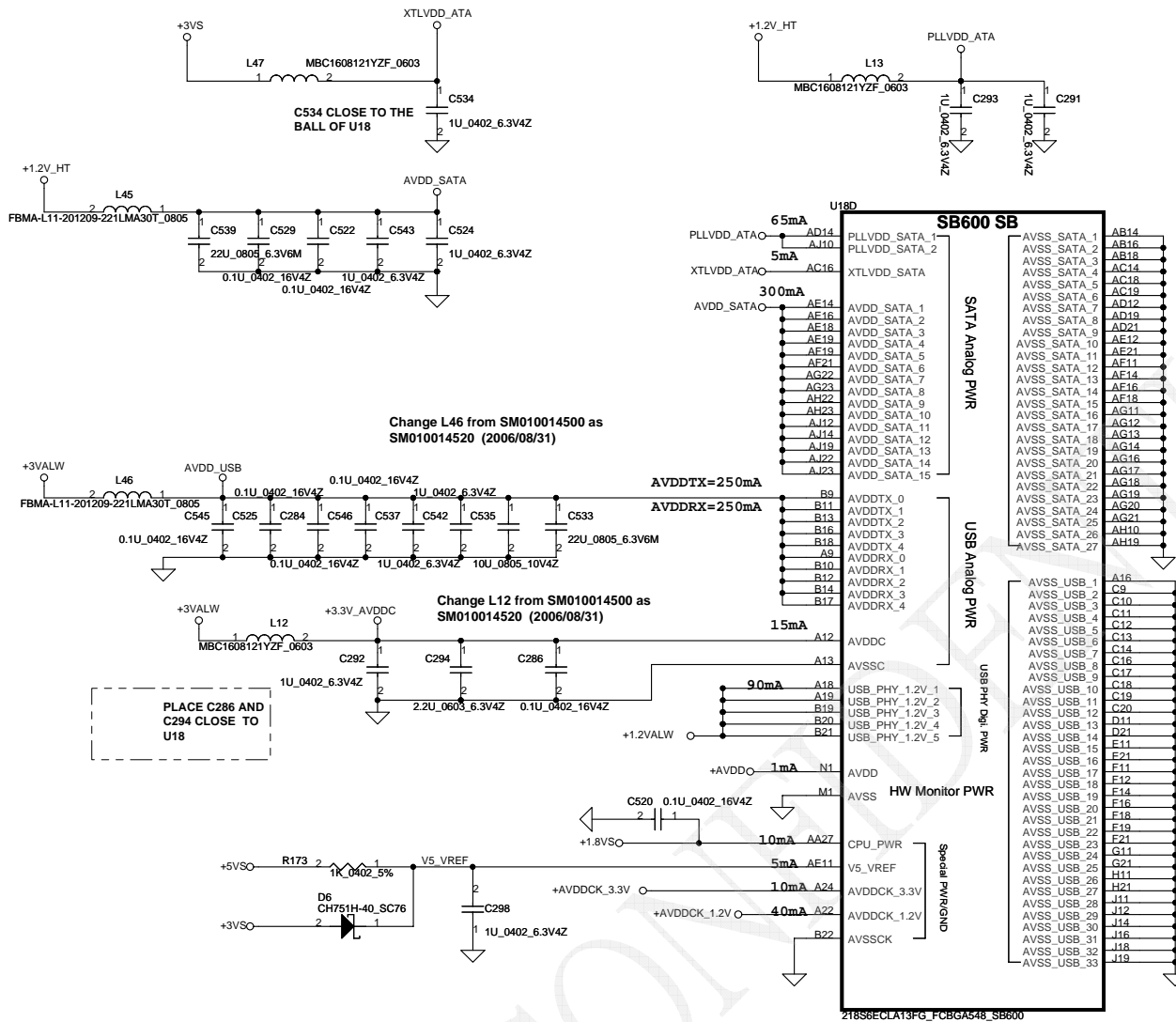
**PLACE SATA AC COUPLING  
 CAPS CLOSE TO CONN.**

**PORT0 : MAIN HDD  
 PORT1 : SECOND HDD  
 PORT2 : MAIN ODD  
 PORT3 : SECOND ODD**



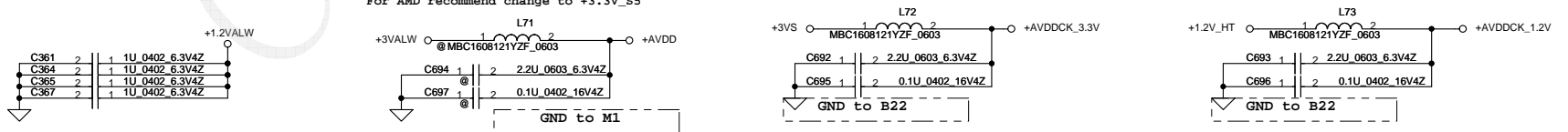
**SB600 : SA00001DUD0 / S IC 218S6ECLA21FG SB600 FCBGA 549P 0FA**

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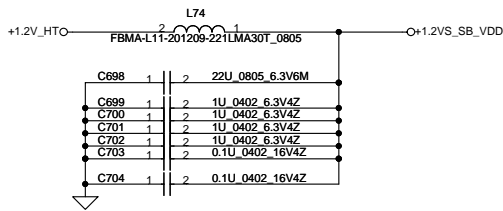
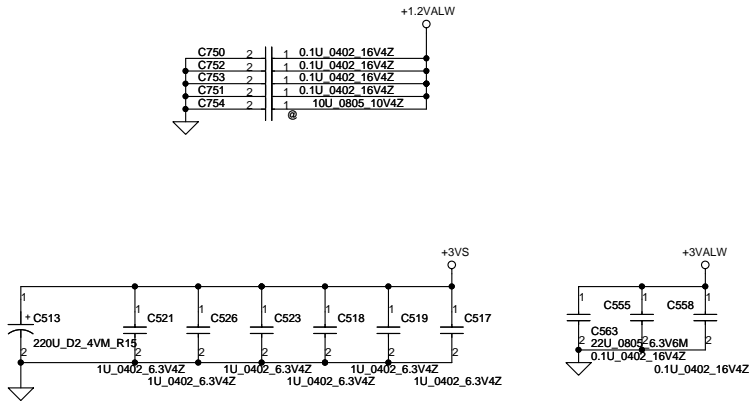


SB600 : SA00001DUD0 / S IC 218S6ECLA21FG SB600 FCBGA 549P 0FA

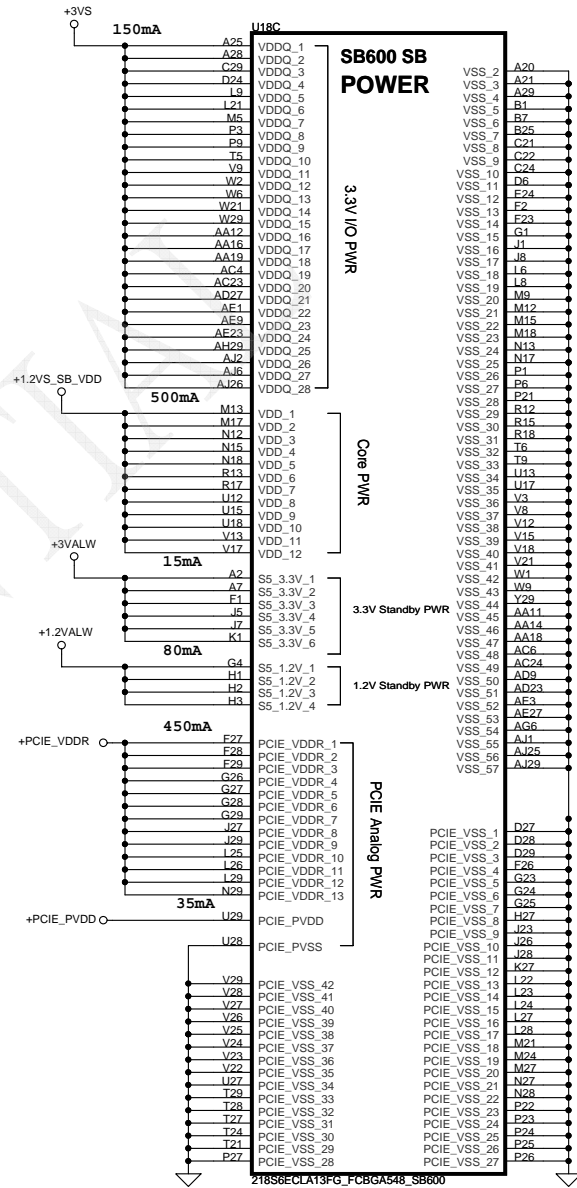
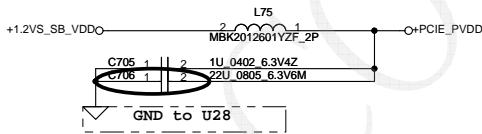
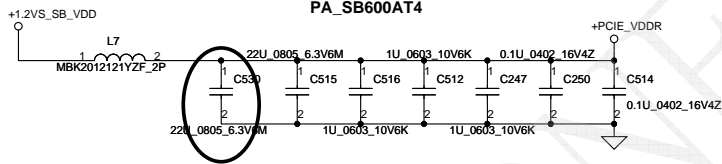
For AMD recommend change to +3.3V\_S5



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Delay PCIE\_VDDR / PCIE\_PVDD  
Add C530 to 22u  
PA\_SB600AT4

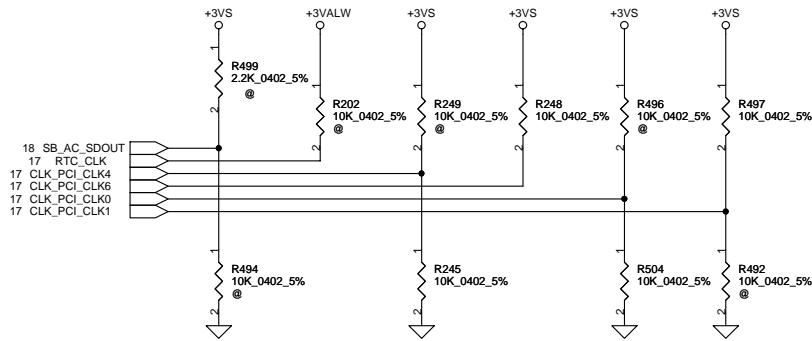


SB600 : SA00001DUD0 / S IC 218S6ECLA21FG SB600 FCBGA 549P 0FA

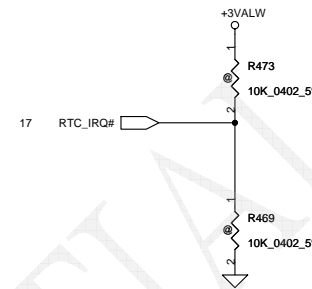
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# REQUIRED STRAPS

SB600 HAS 15K INTERNAL PD FOR AC\_SDOUT, 15K PU FOR RTC\_CLK, EXTERNAL PU/PD IS NOT REQUIRED; FOR SB460, EXTERNAL PU/PD ARE REQUIRED



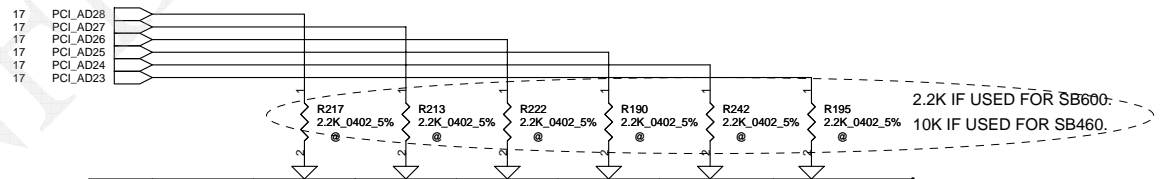
Internal RTC: Not connected. \*  
 External RTC: Connected to IRQ# pin on external RTC.  
 External RTC supports S5 wake capability (from S5 power rail or battery).



	AC_SDOUT	RTC_CLK	PCI_CLK4	PCI_CLK6	PCI_CLK0	PCI_CLK1
<b>PULL HIGH</b>	USE DEBUG STRAPS	INTERNAL RTC DEFAULT	USE INT. PLL48	CPU IF=K8 DEFAULT	ROM TYPE: H, H = PCI ROM H, L = SPI ROM L, H = LPC ROM L, L = FWH ROM	
<b>PULL LOW</b>	IGNORE DEBUG STRAPS DEFAULT	EXTERNAL RTC	USE EXT. 48MHZ DEFAULT	CPU IF=P4	DEFAULT	

# DEBUG STRAPS

SB600 HAS 15K INTERNAL PU FOR PCI\_AD[28:23]



	IDE_DACK#	PCI_AD28	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
<b>PULL HIGH</b>	USE LONG RESET DEFAULT	USE LONG RESET DEFAULT	USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	BOOTFAILTIMER DISABLED DEFAULT
<b>PULL LOW</b>	USE SHORT RESET	USE SHORT RESET	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	BOOTFAILTIMER ENABLED

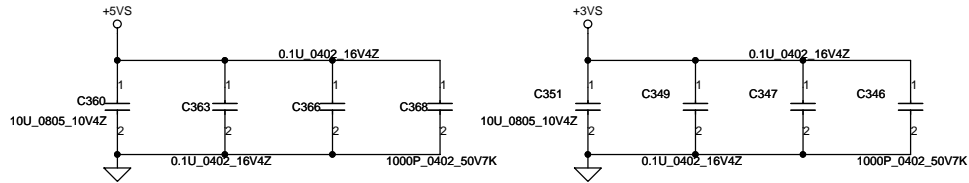
SB600 ONLY

NOTE: FOR SB460, PCI\_AD23 IS RESERVED

SB460 ONLY

SB600 ONLY

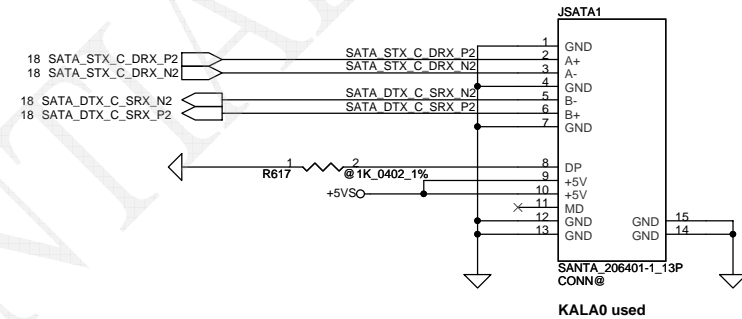
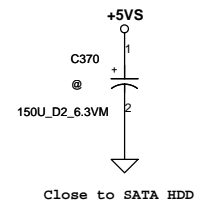
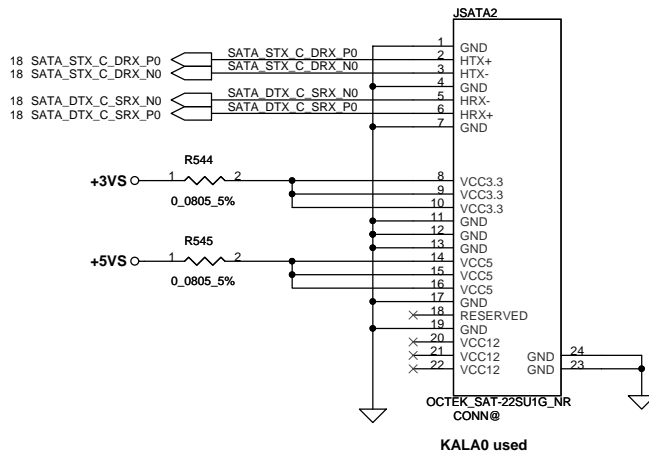
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**SATA HDD CONN**

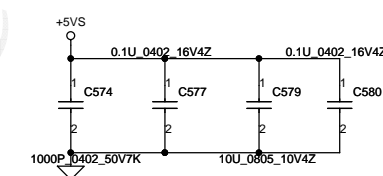
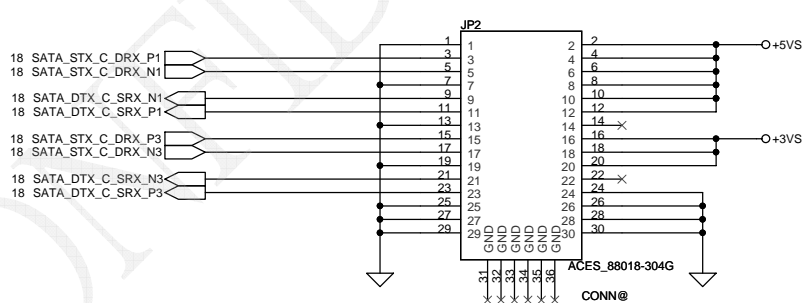
Placea caps. near ODD CONN.

**SATA ODD CONN**



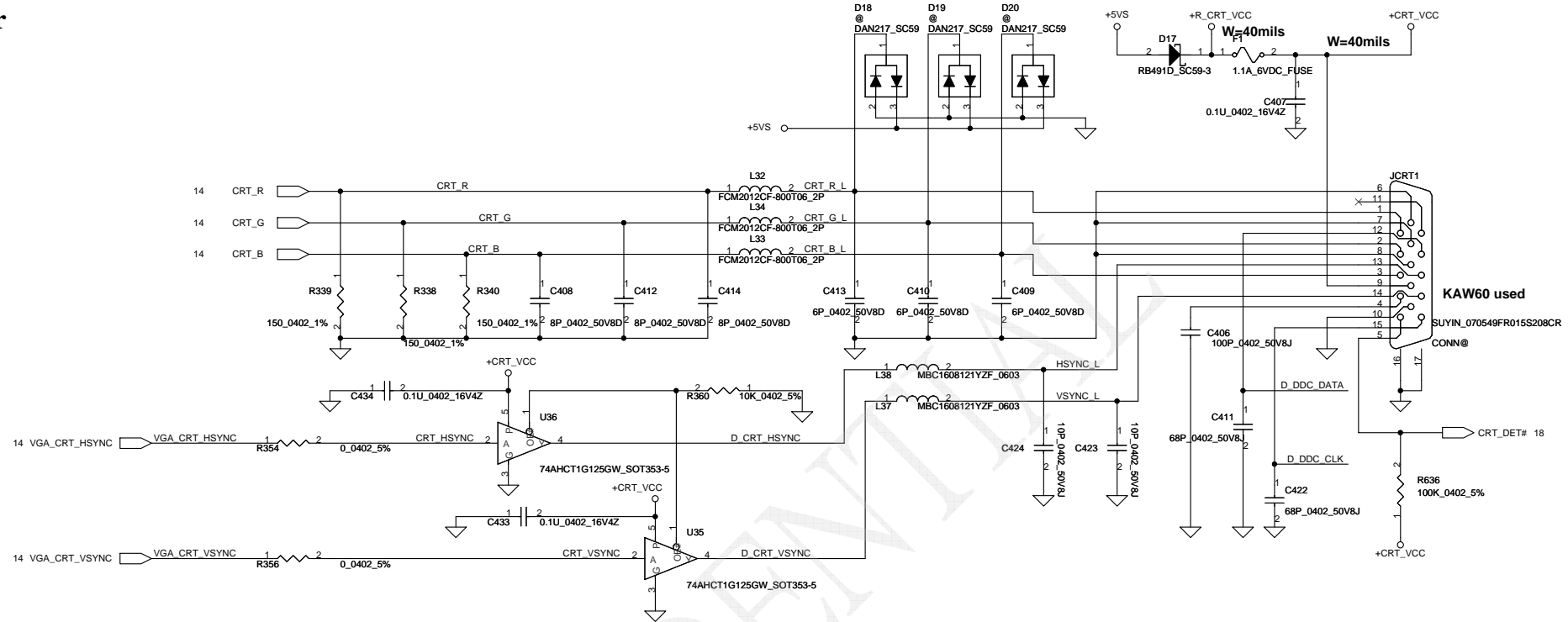
**Second HDD**

**Second ODD**

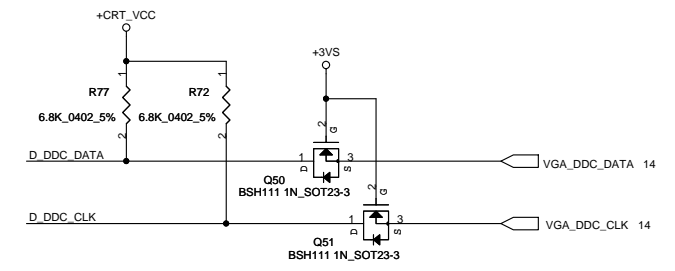


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# CRT Connector

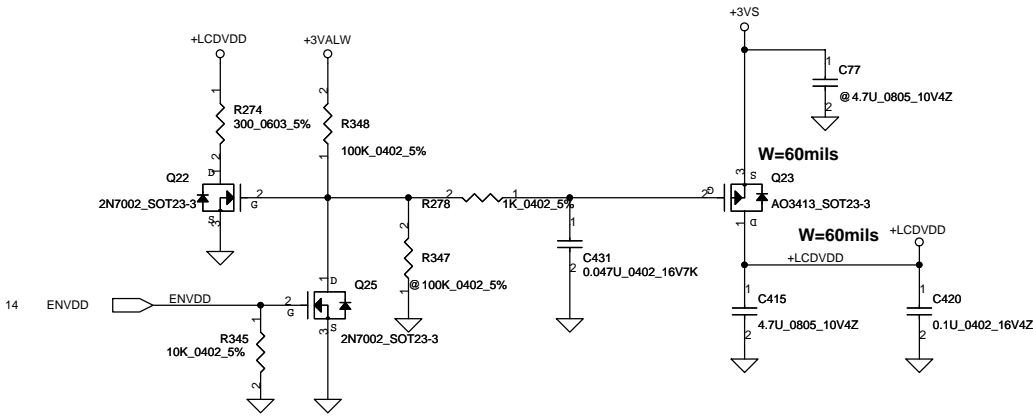


## Close to Conn side

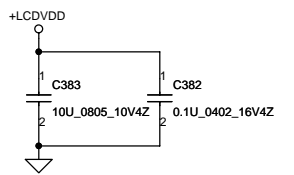
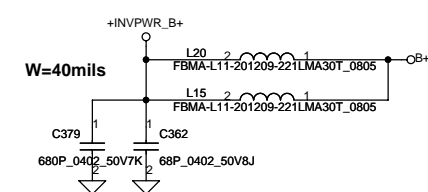
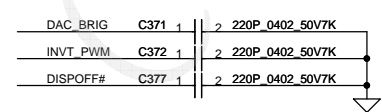
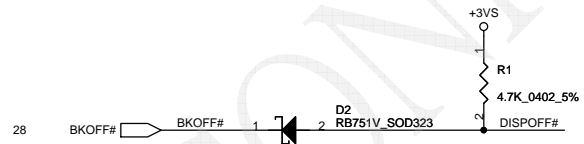
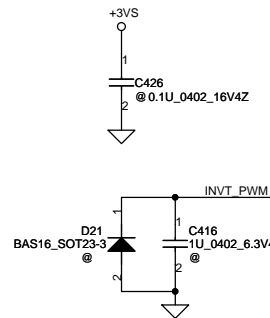
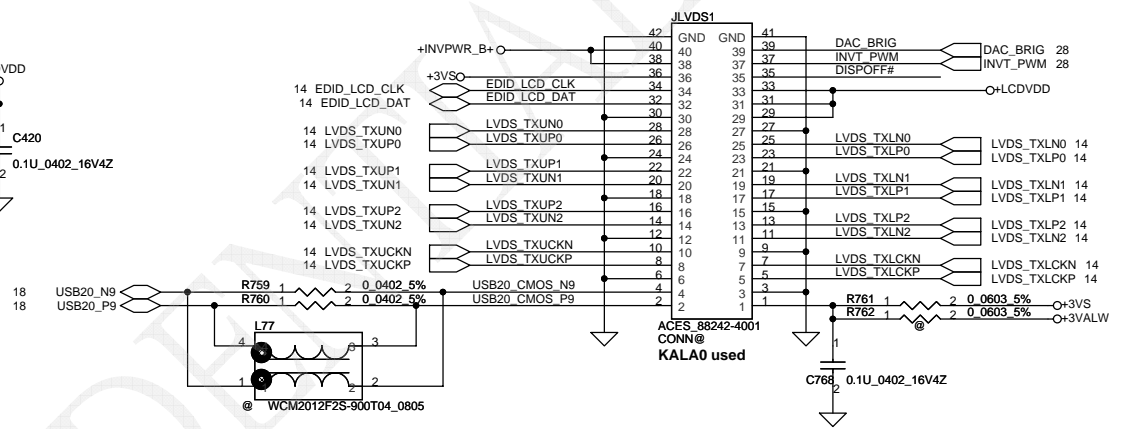


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# LCD POWER CIRCUIT

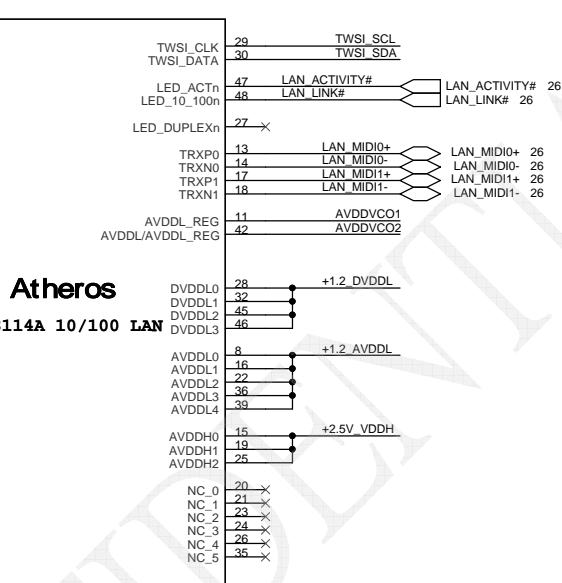
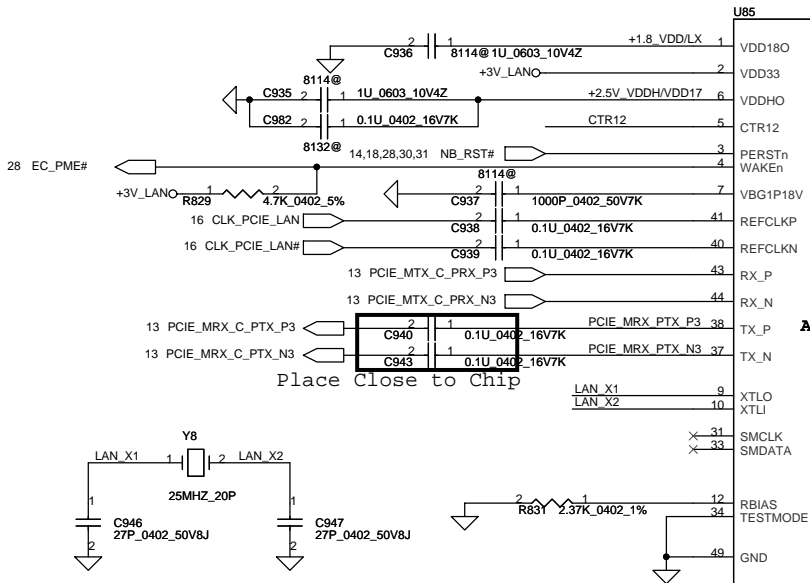
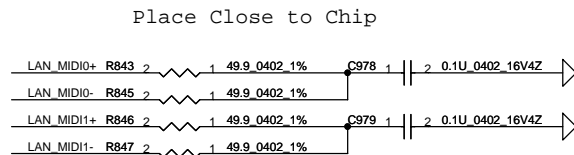
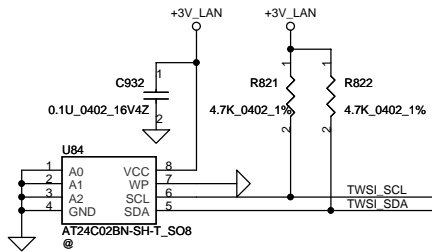
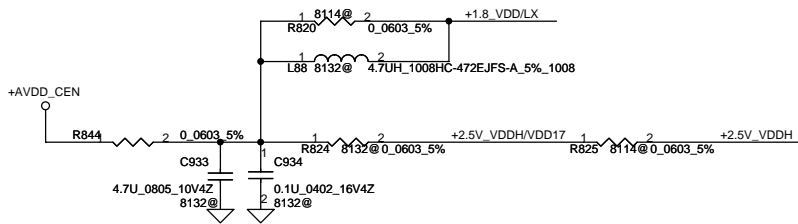


# LCD/PANEL CONN.

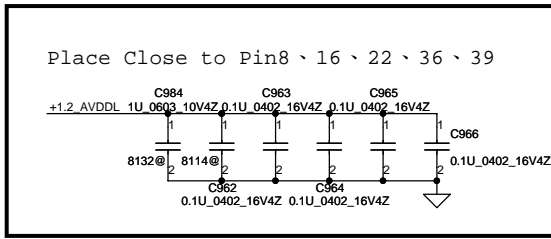
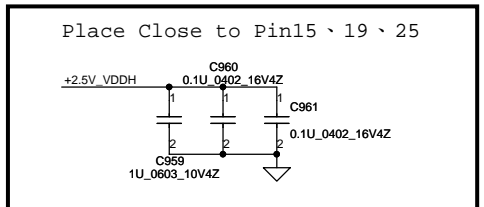
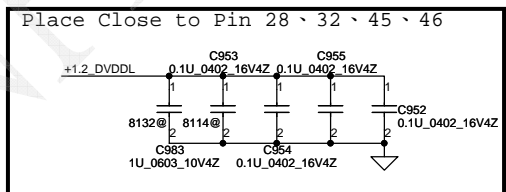
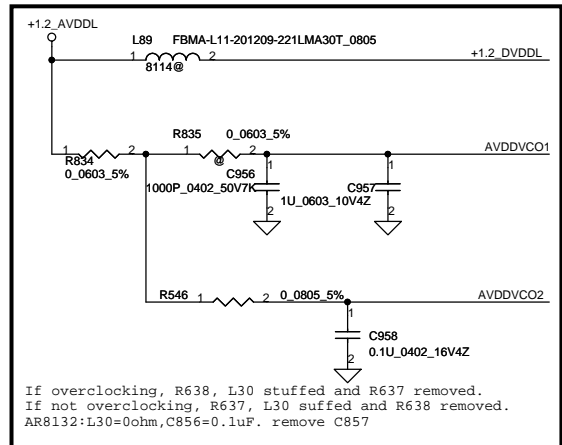
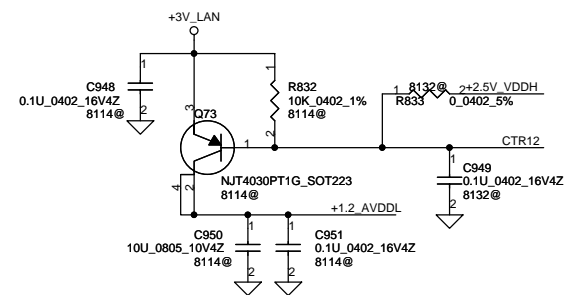
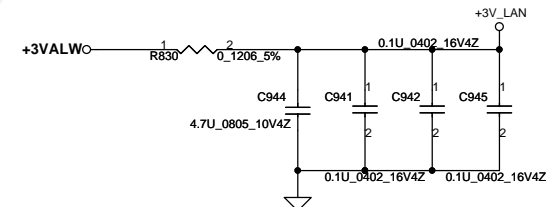


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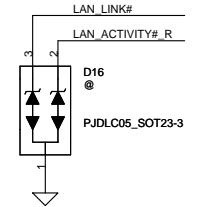
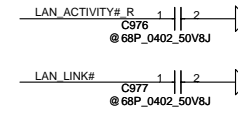
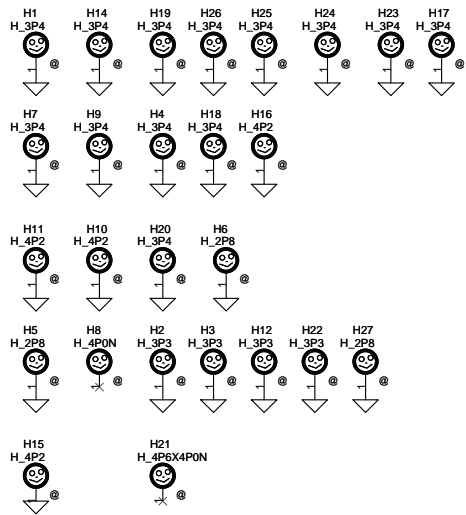
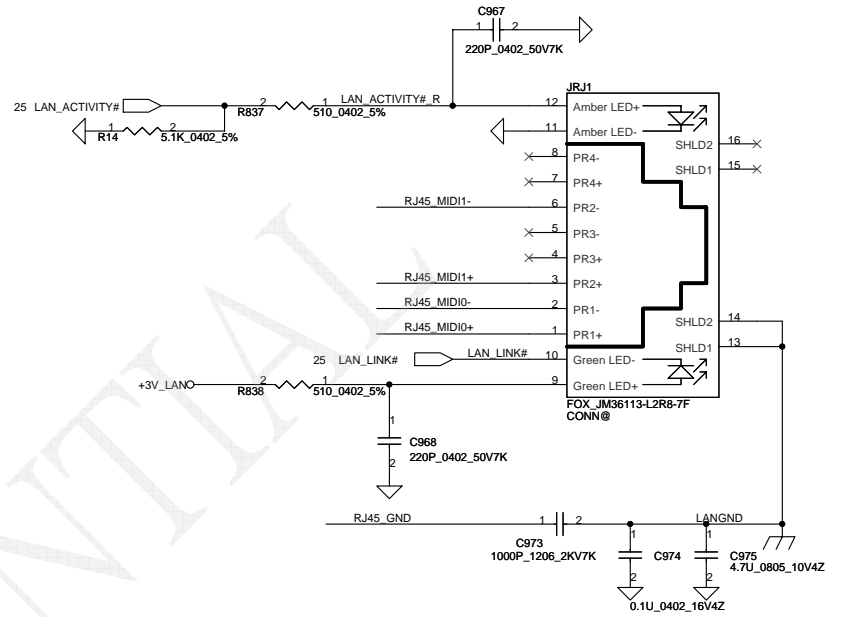
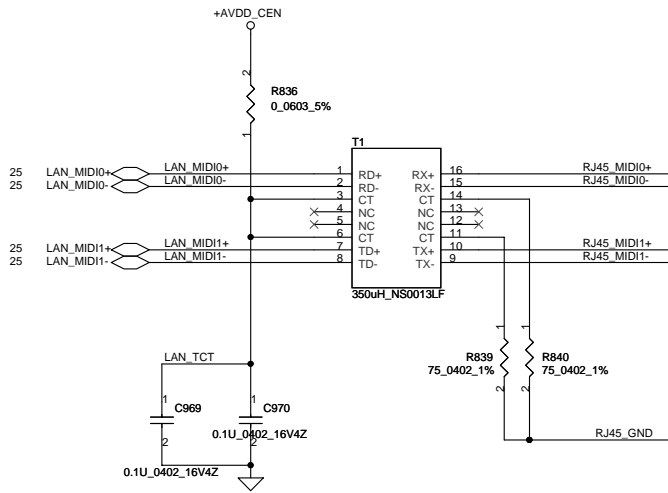




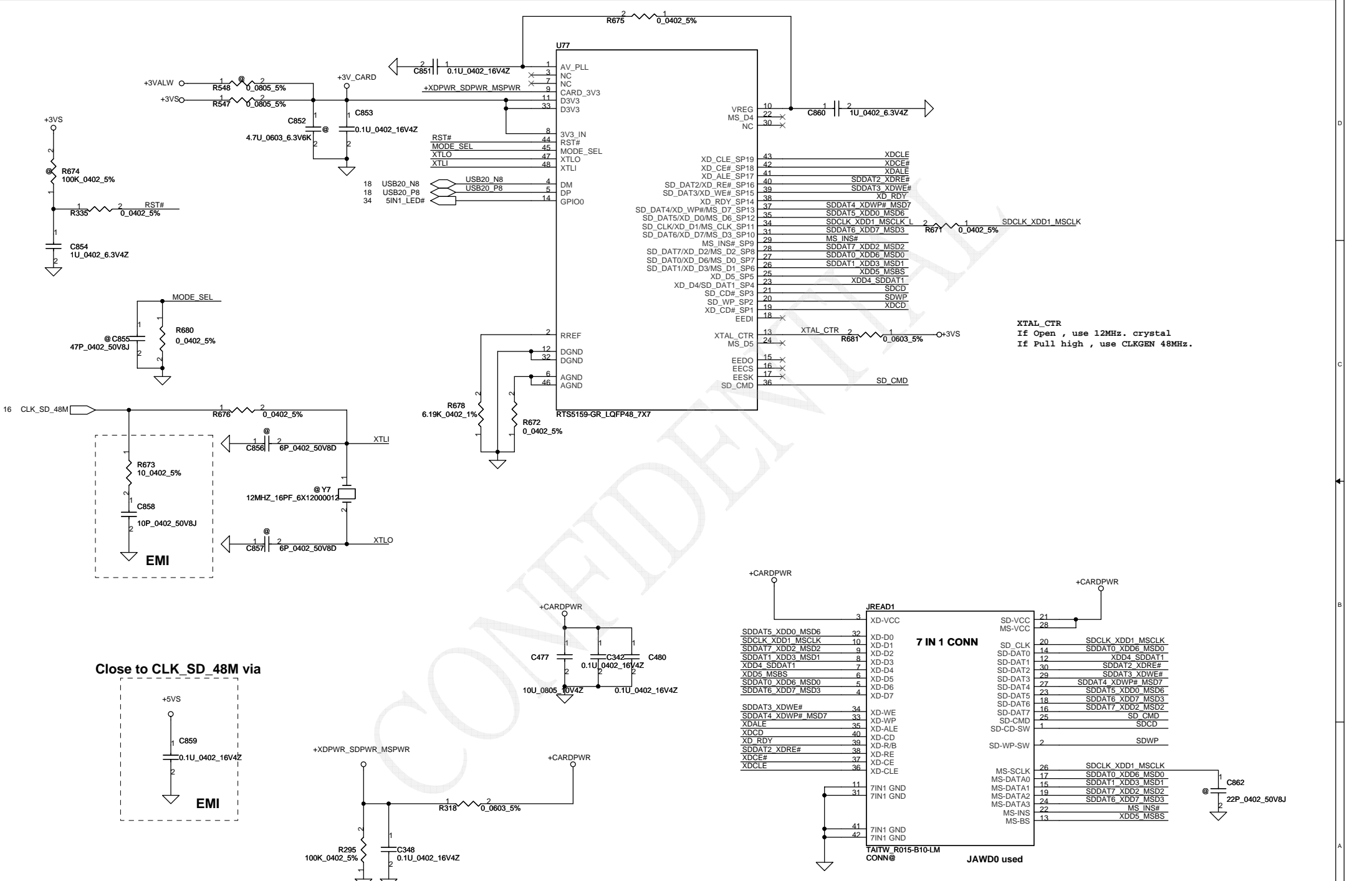
Layout Notice : Close to chip



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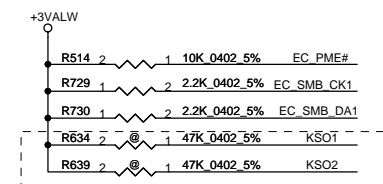
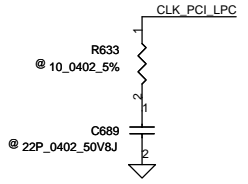
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Issued Date	2005/03/08	Deciphered Date	2009/06/11	Title	SCHMATIC,MB A4861
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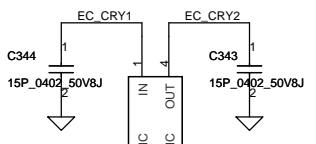
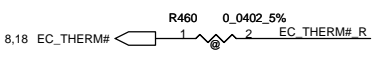
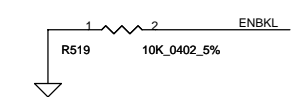
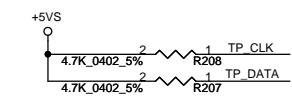
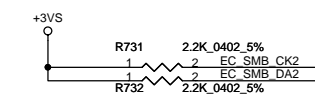
XTAL\_CTR  
 If Open , use 12MHz. crystal  
 If Pull high , use CLKNG 48MHz.

Close to CLK\_SD 48M via

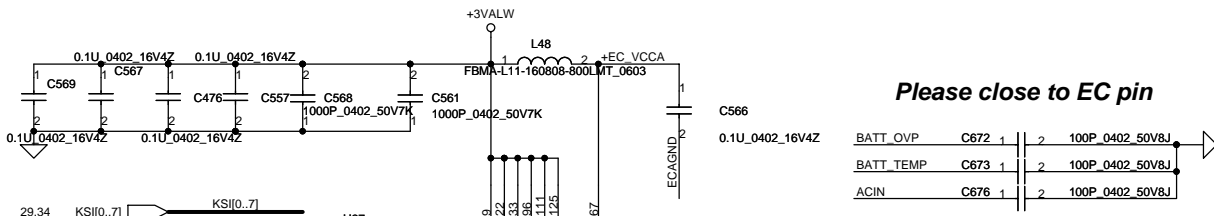
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**EC test-mode issue**



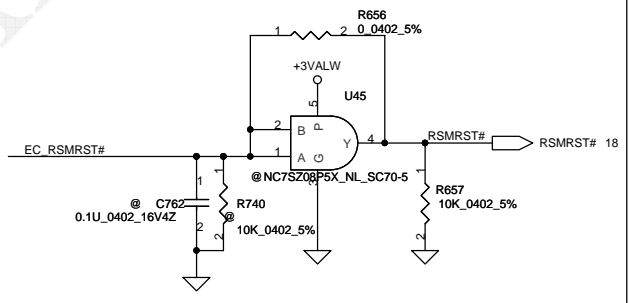
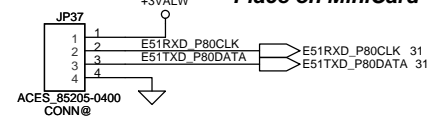
32.768KHZ\_12.5P\_MC-306



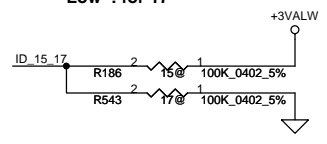
Please close to EC pin

For EC Tools

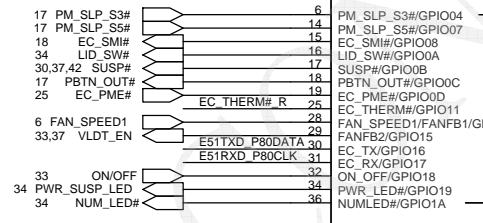
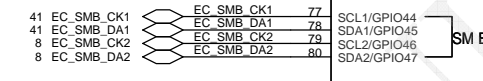
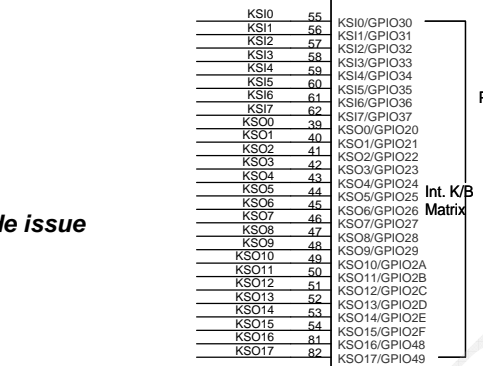
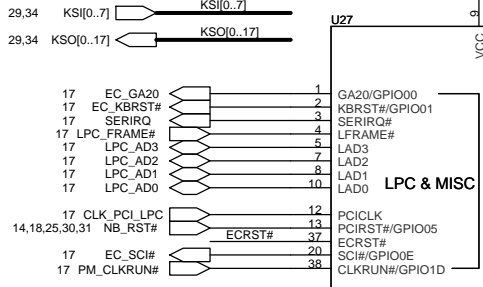
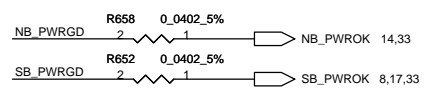
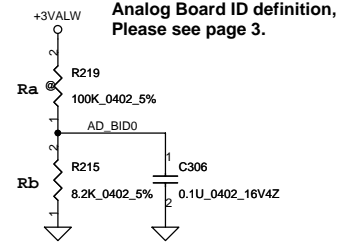
Place on MiniCard



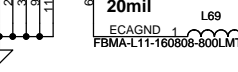
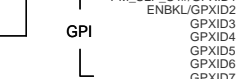
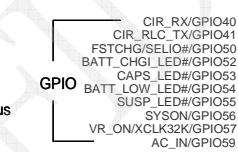
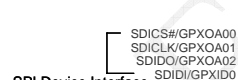
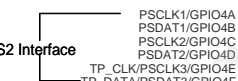
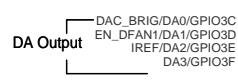
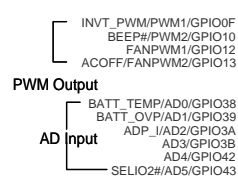
ID DETECT  
High : for 15"  
Low : for 17"



Analog Board ID definition,  
Please see page 3.

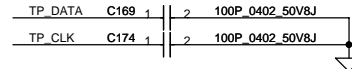
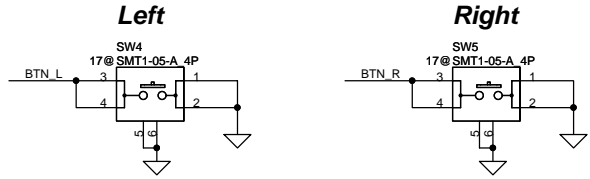


Chagne to D3 version

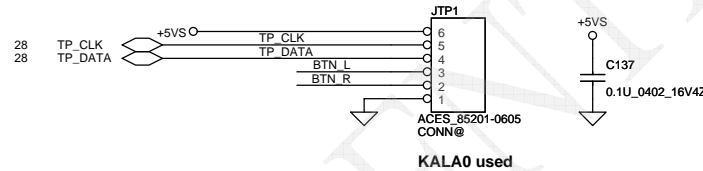


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For 17"

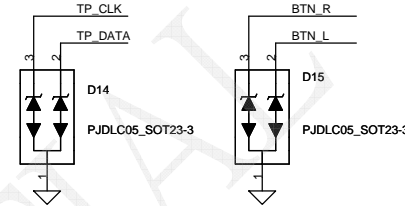
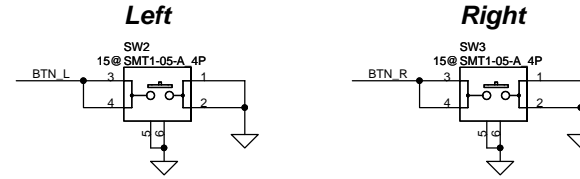


To TP/B Conn.



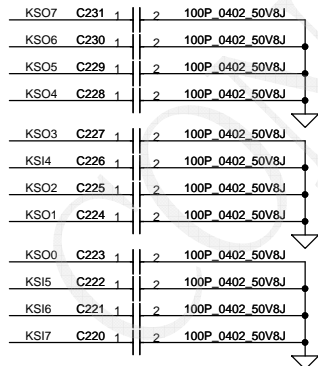
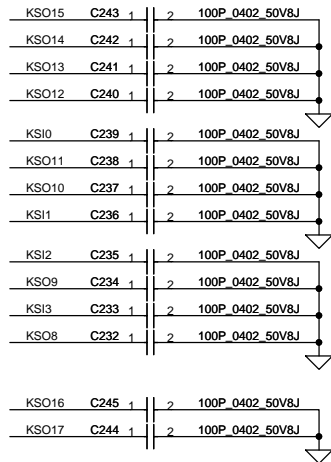
KALA0 used

For 15"

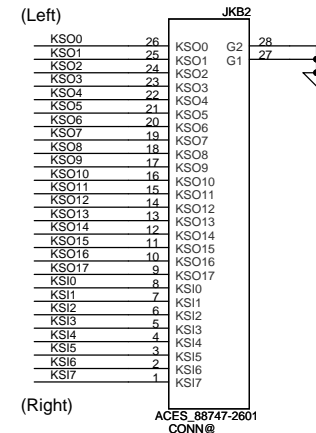
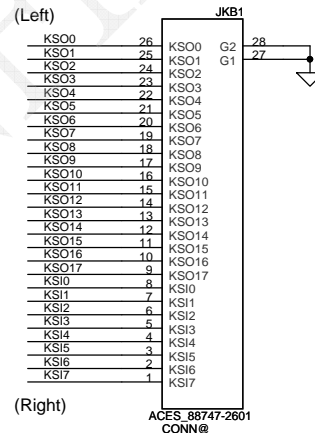


Change to SCA00000200

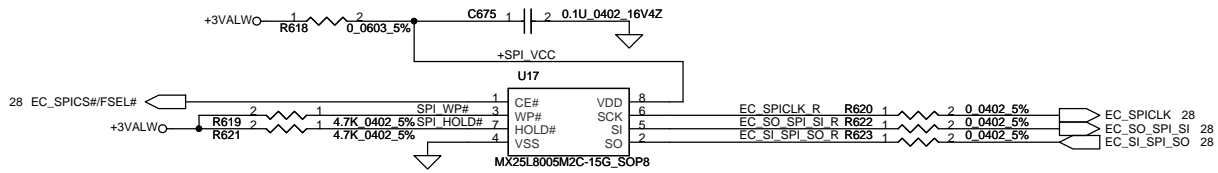
INT\_KBD Conn.



KB1 for 15"  
KB2 for 17"

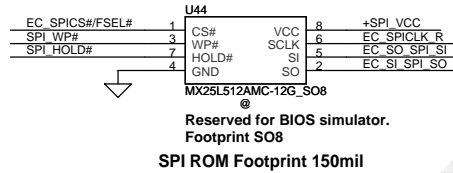
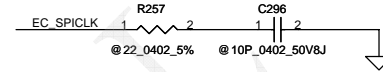


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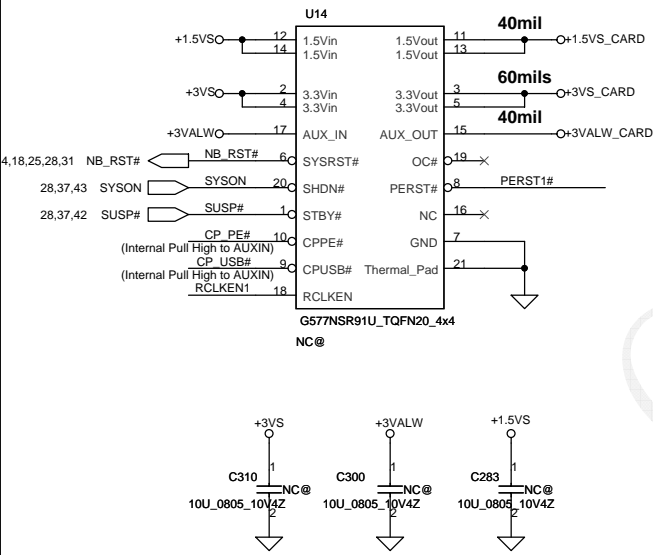


SA00000XT00 : S IC FL 8M MX25L8005M2C-15G SOP 8P  
 ENE suggestion SPI Frequency over 66MHz  
 SST: 50MHz  
 MXIC: 70MHz  
 ST: 40MHz

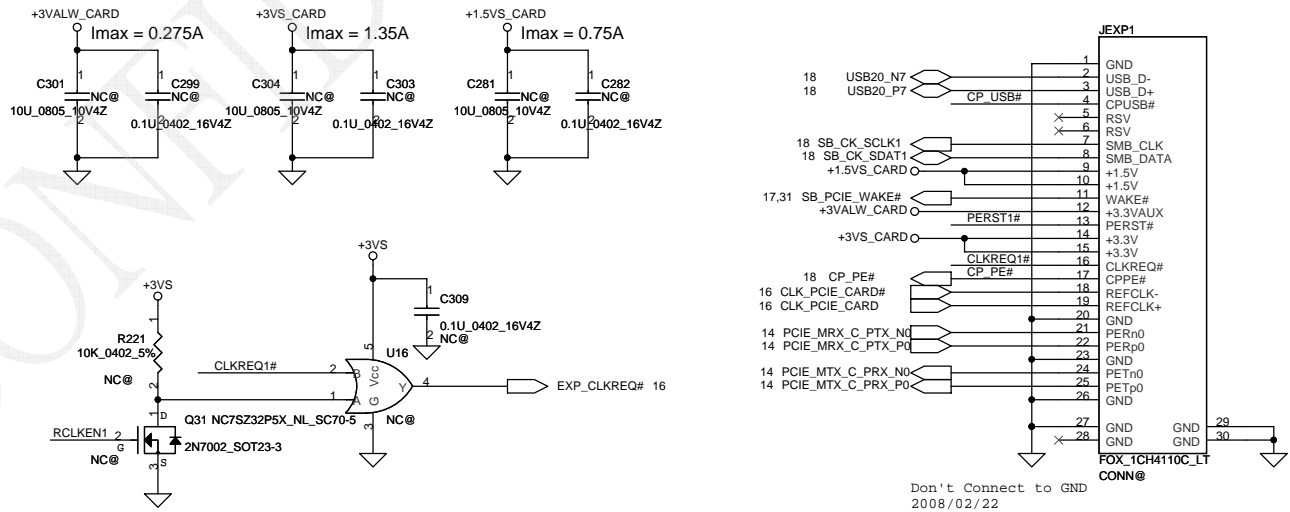
ONLY MXIC used in this project (66MHz)



### New Card Power Switch

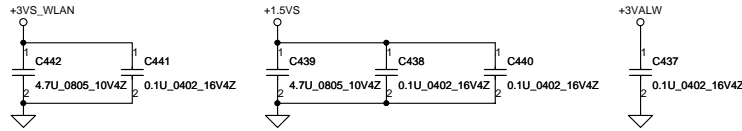


### New Card Socket (Left/TOP)

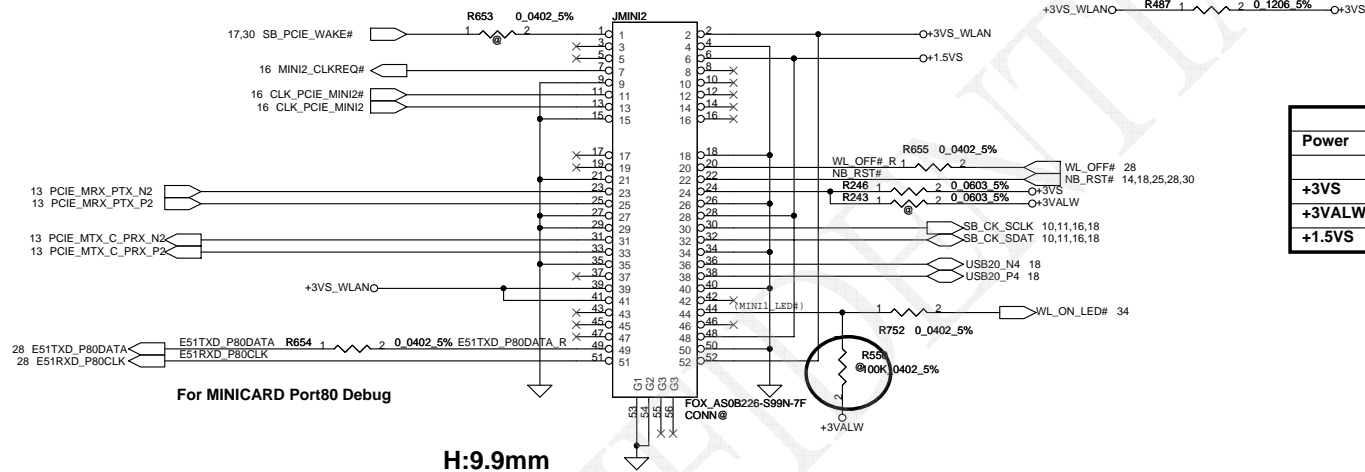


Don't Connect to GND  
 2008/02/22

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For Wireless LAN

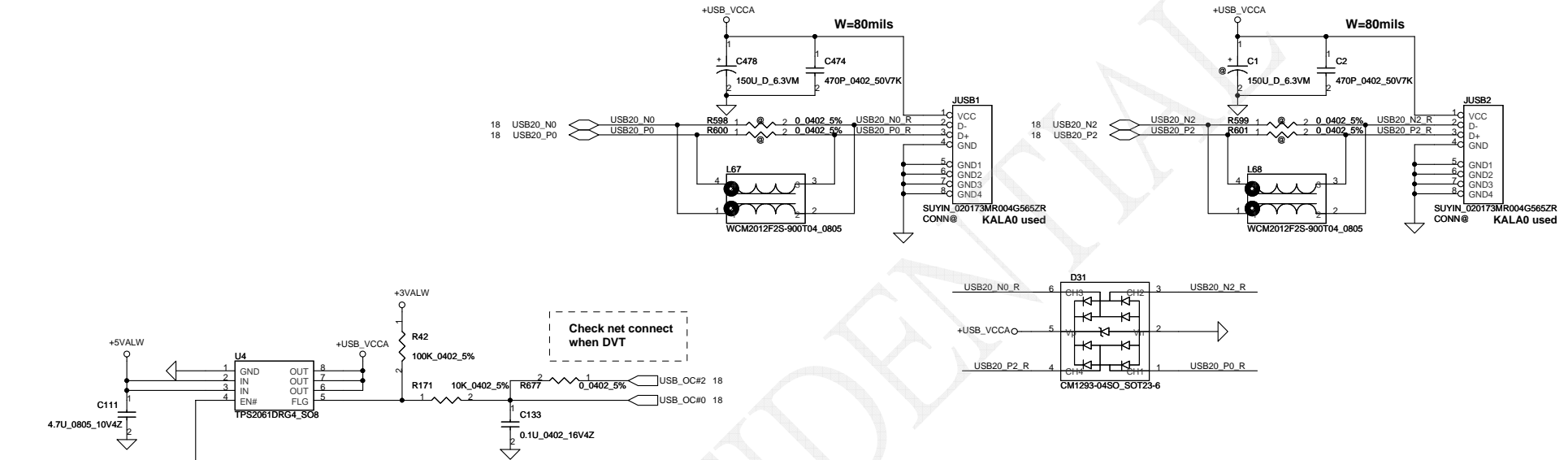


For MINICARD Port80 Debug

H:9.9mm

Mini Card Power Rating			
Power	Primary Power (mA)		Auxiliary Power (mA)
	Peak	Normal	Normal
+3VS	1000	750	
+3VALW	330	250	250 (wake enable)
+1.5VS	500	375	5 (Not wake enable)

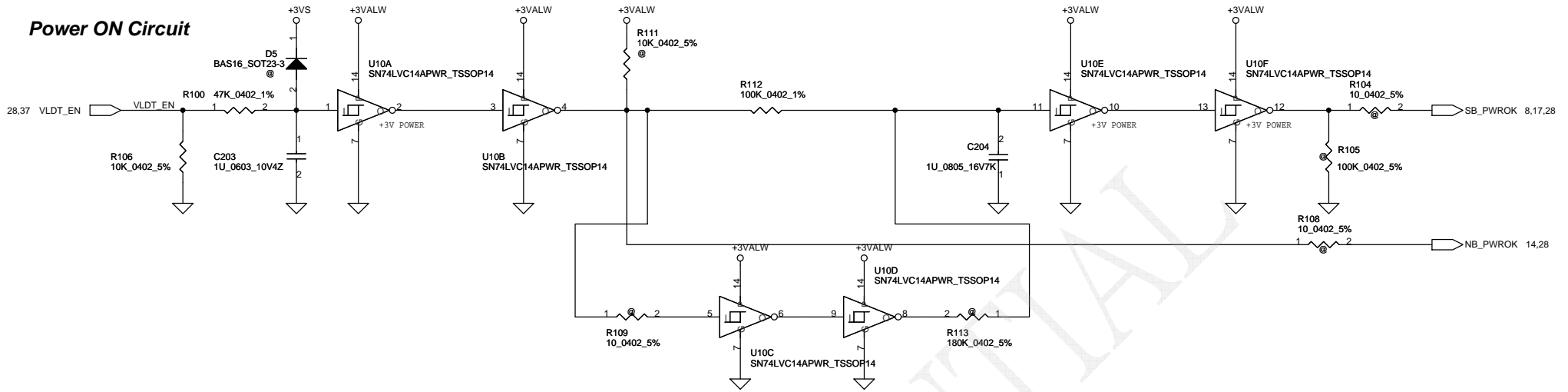
### USB CONN. 1 & 2



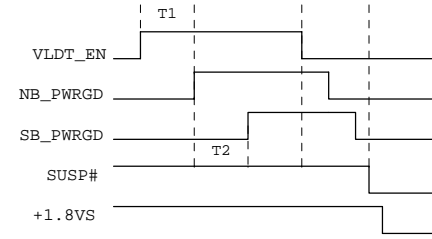
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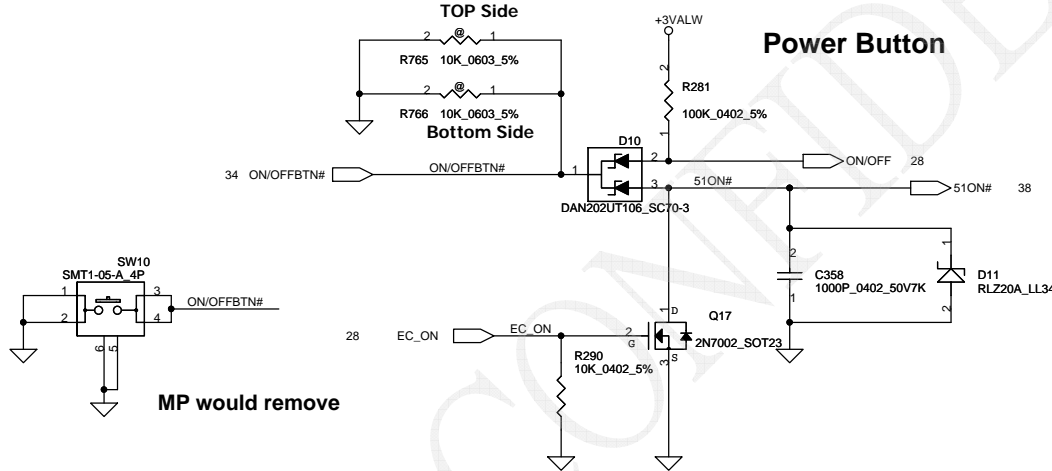
### Power ON Circuit



note:T1 minimum 15ms,T2 minimum 33ms/maximum 500ms,  
SUSP# goes to low after SB\_PWRGD goes to low for power down.

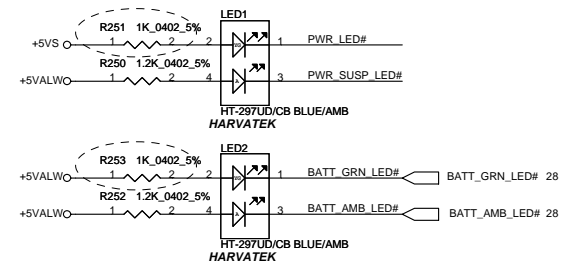
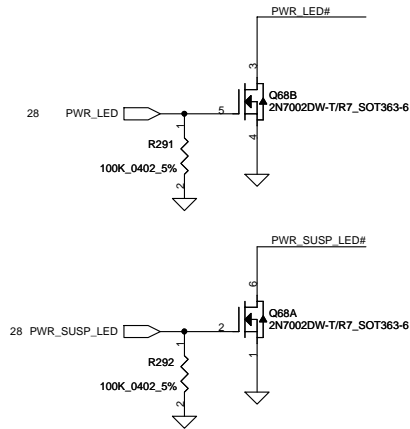


### Power Button

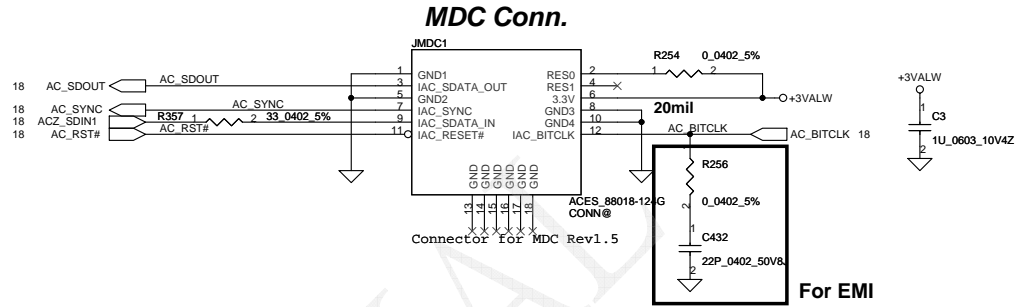


MP would remove

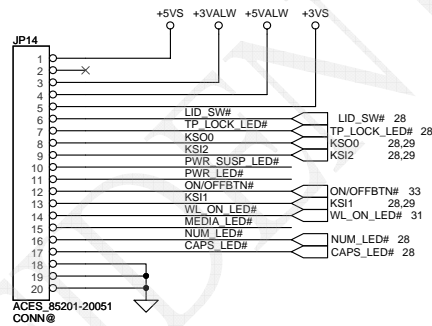
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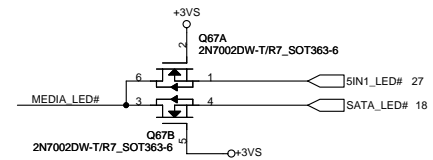
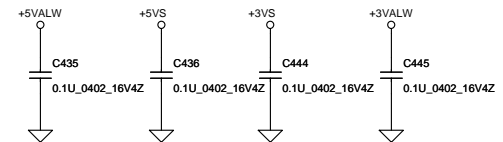
**BLUE/AMB LED**



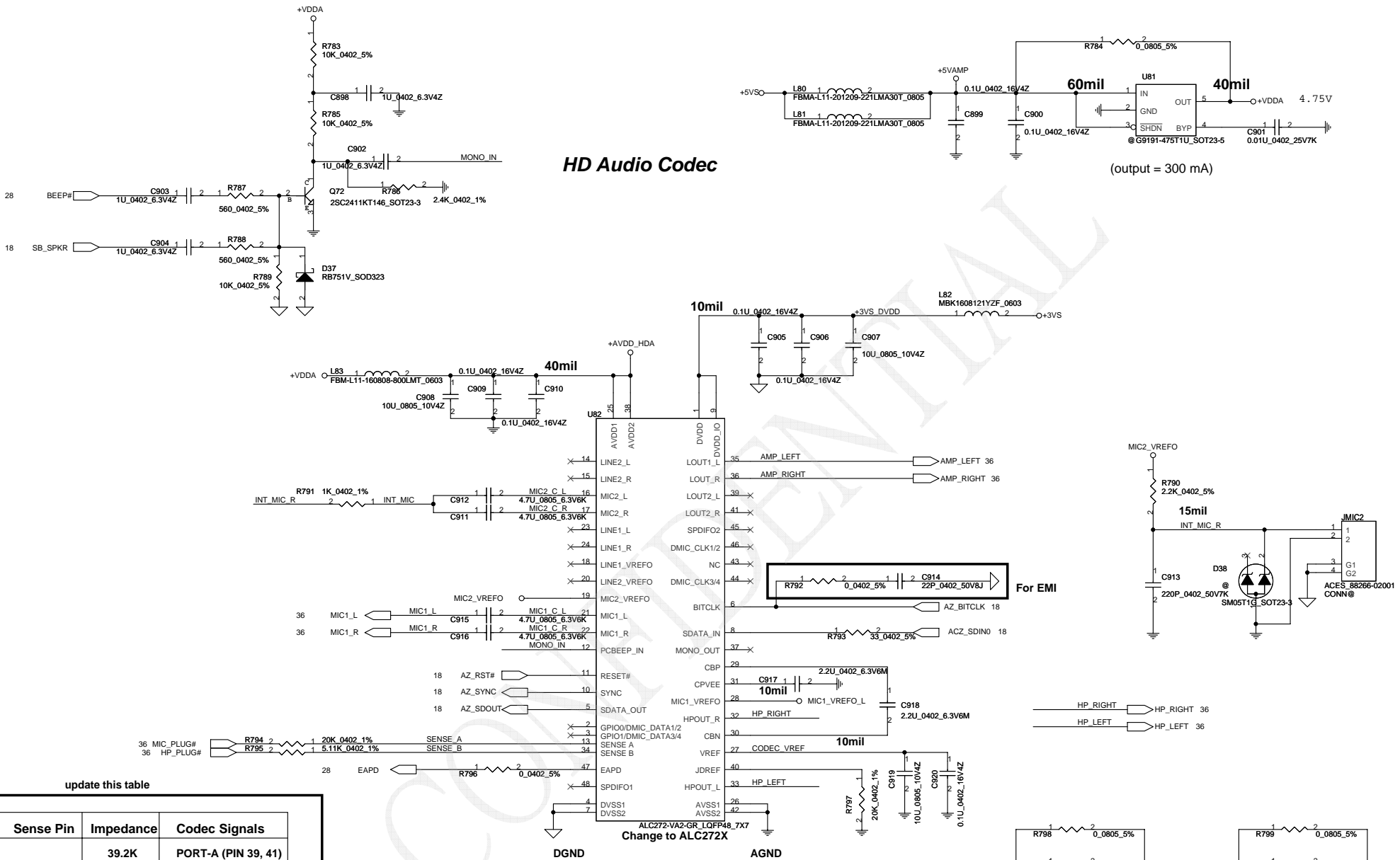
**To PWR LED/B**



	KSO0
KSI1	WL_BTN#
KSI2	TP_LOCK_BTN#
KSI3	
KSI4	
KSI5	
KSI6	

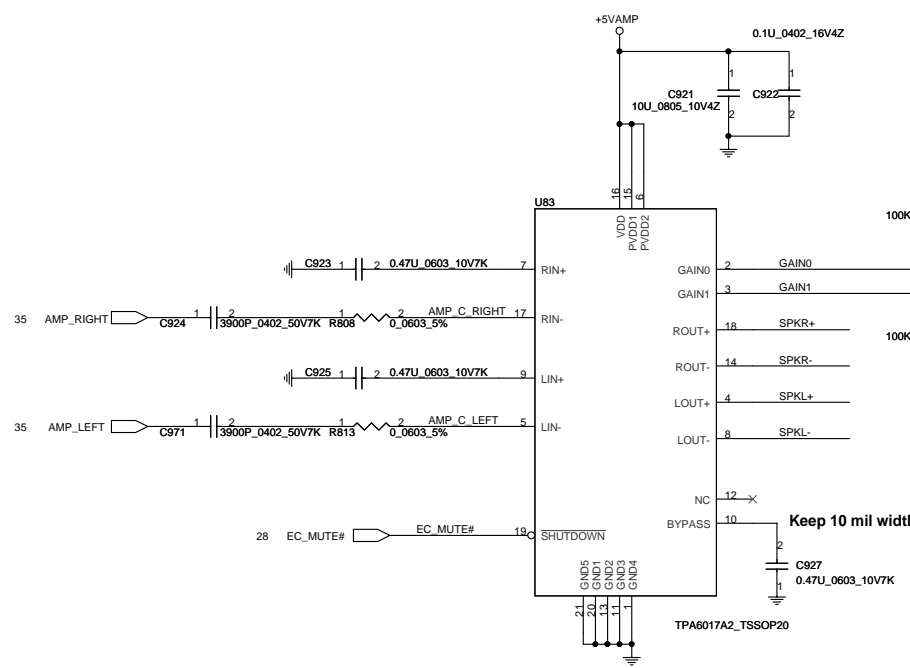


### HD Audio Codec

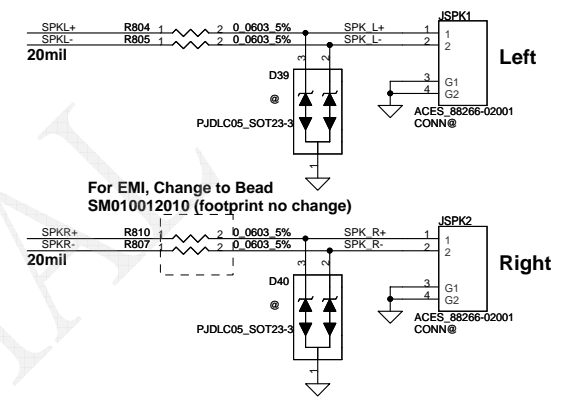


Sense Pin	Impedance	Codec Signals
SENSE A	39.2K	PORT-A (PIN 39, 41)
	20K	PORT-B (PIN 21, 22)
	10K	PORT-C (PIN 23, 24)
	5.1K	PORT-D (PIN 35, 36)
SENSE B	39.2K	PORT-E (PIN 14, 15)
	20K	PORT-F (PIN 16, 17)
	10K	PORT-G (PIN 43, 44)
	5.1K	PORT-H (PIN 45, 46)

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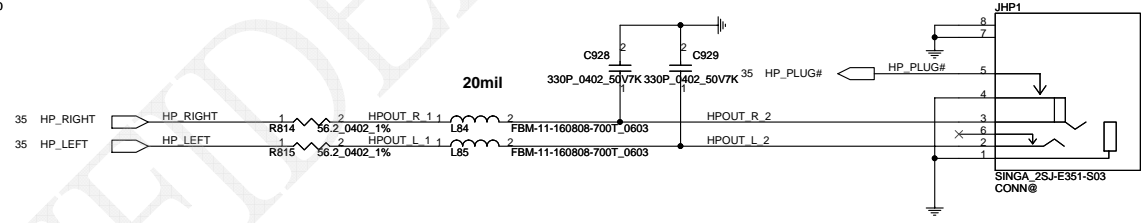


**Int. Speaker Conn.**

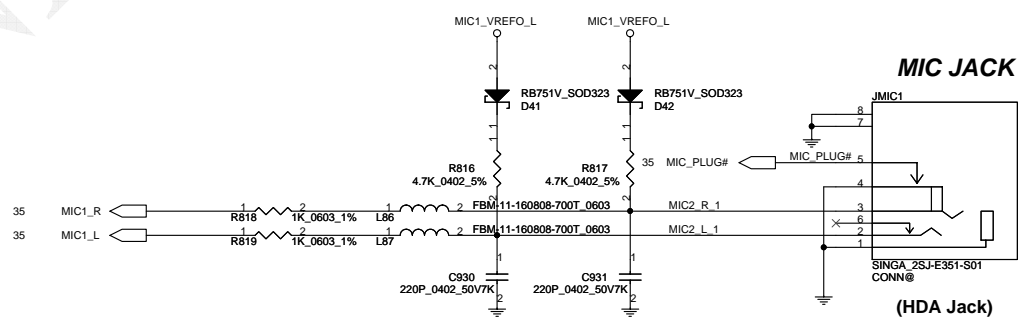


For EMI, Change to Bead SM010012010 (footprint no change)

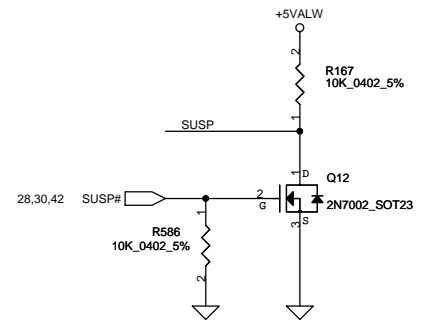
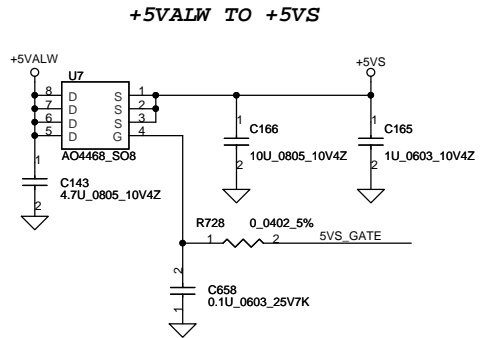
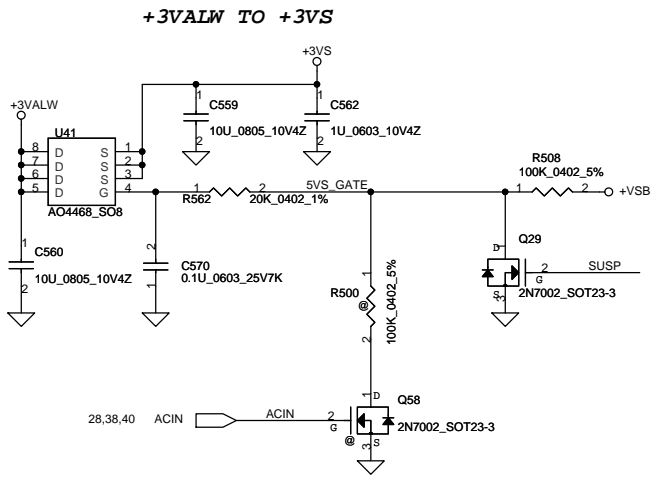
**LINE Out/Headphone Out**



**MIC JACK**

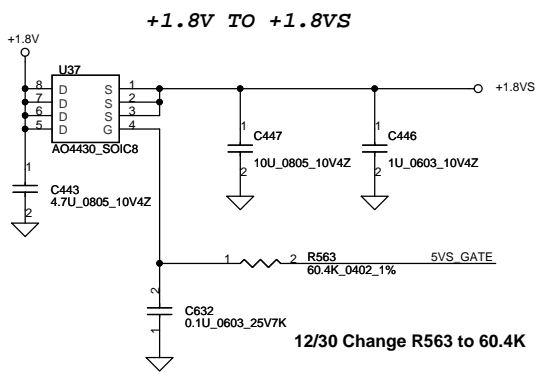


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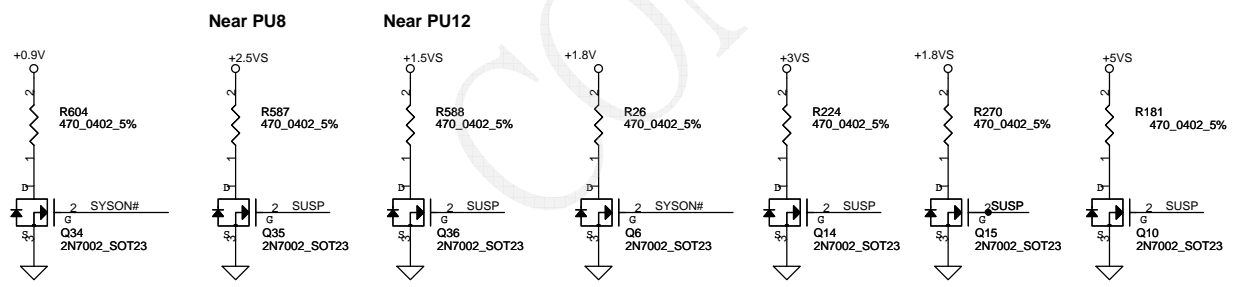
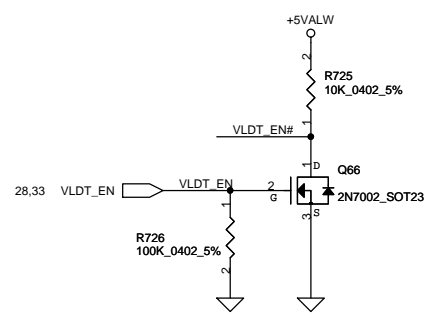
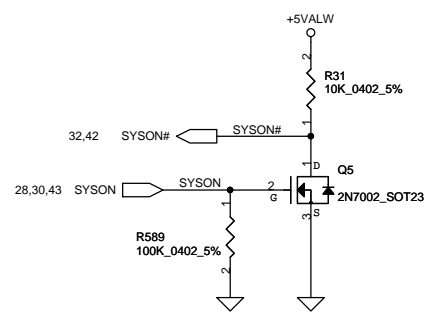
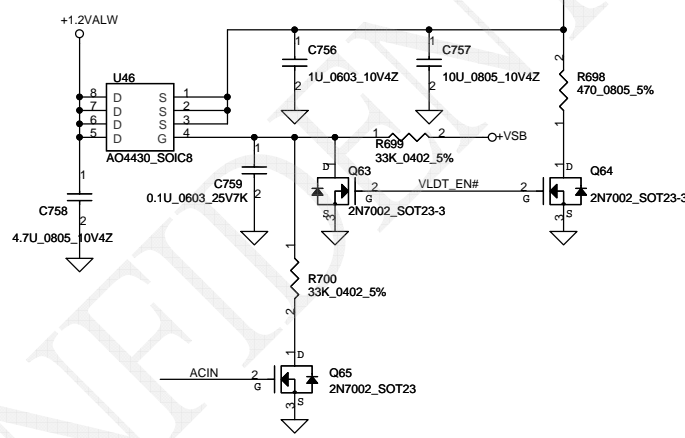


2006/2/22 Add C658 0.1uF

### +1.2VALW TO +1.2V\_HT

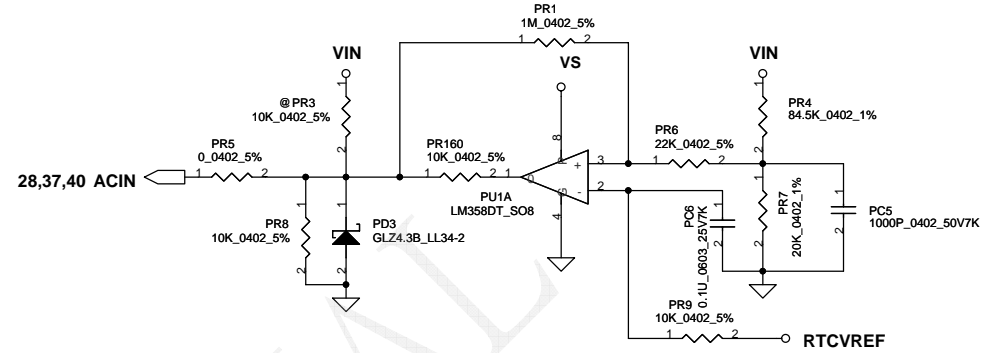
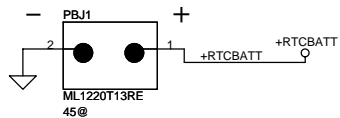
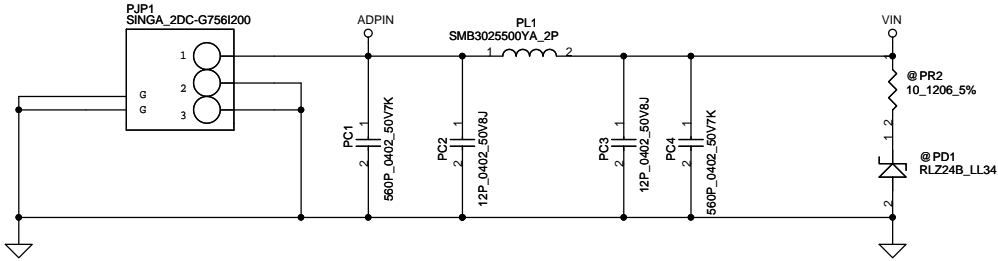


12/30 Change R563 to 60.4K

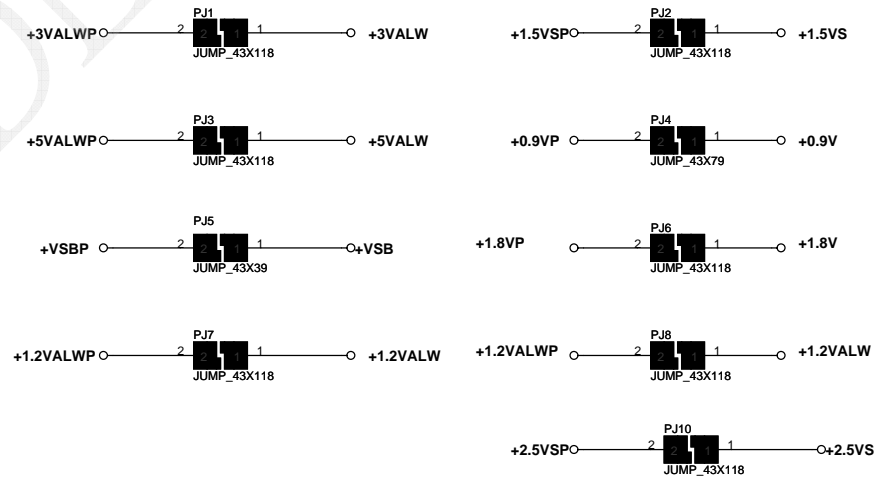
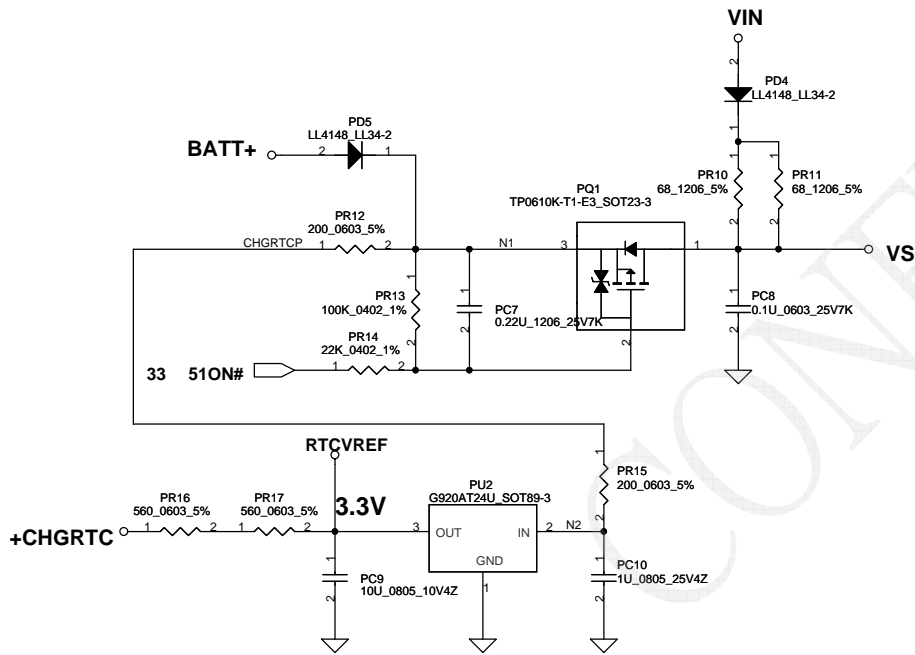


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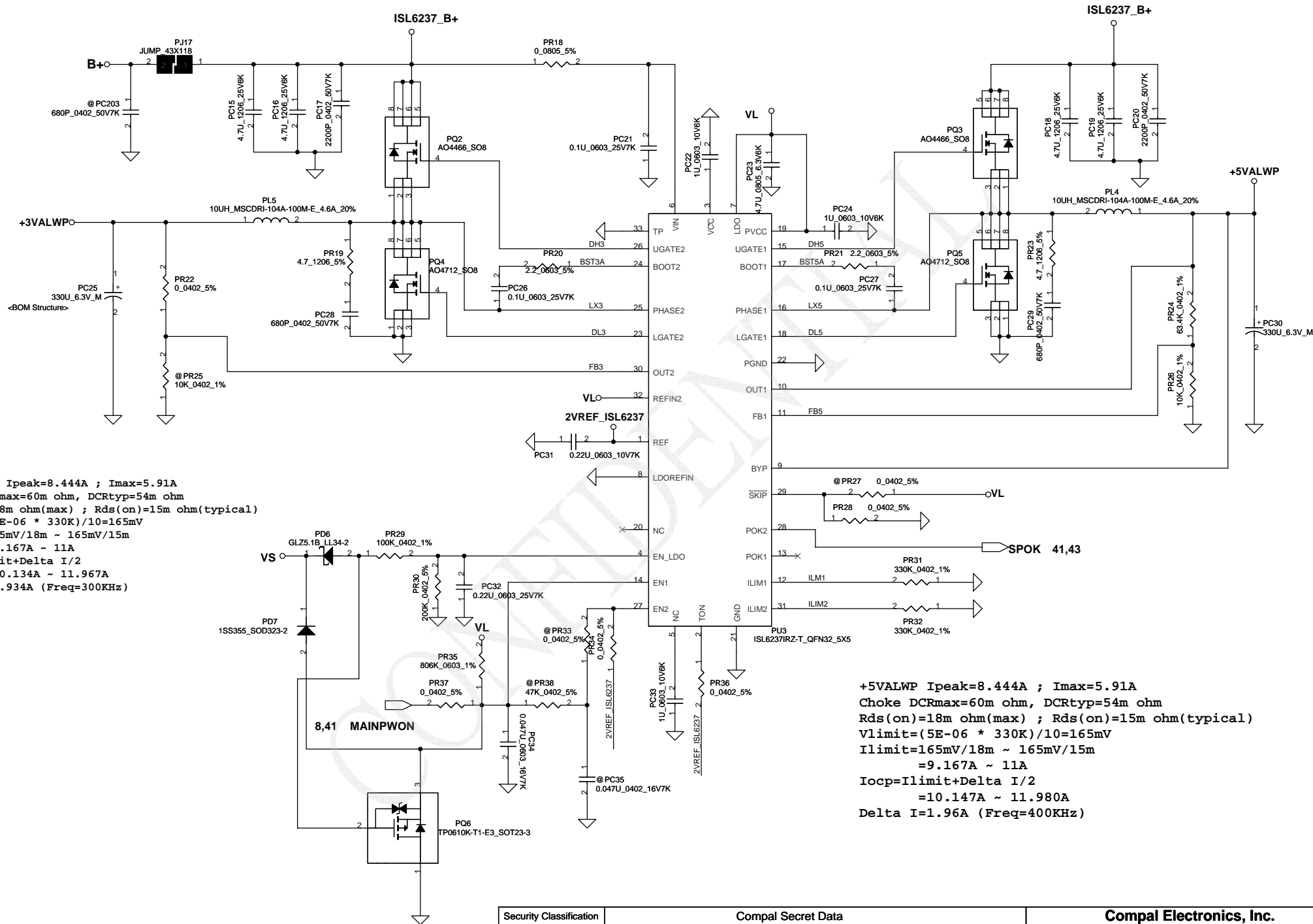
**DC231000500**



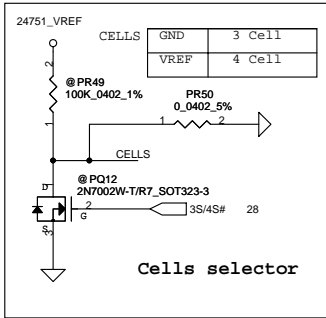
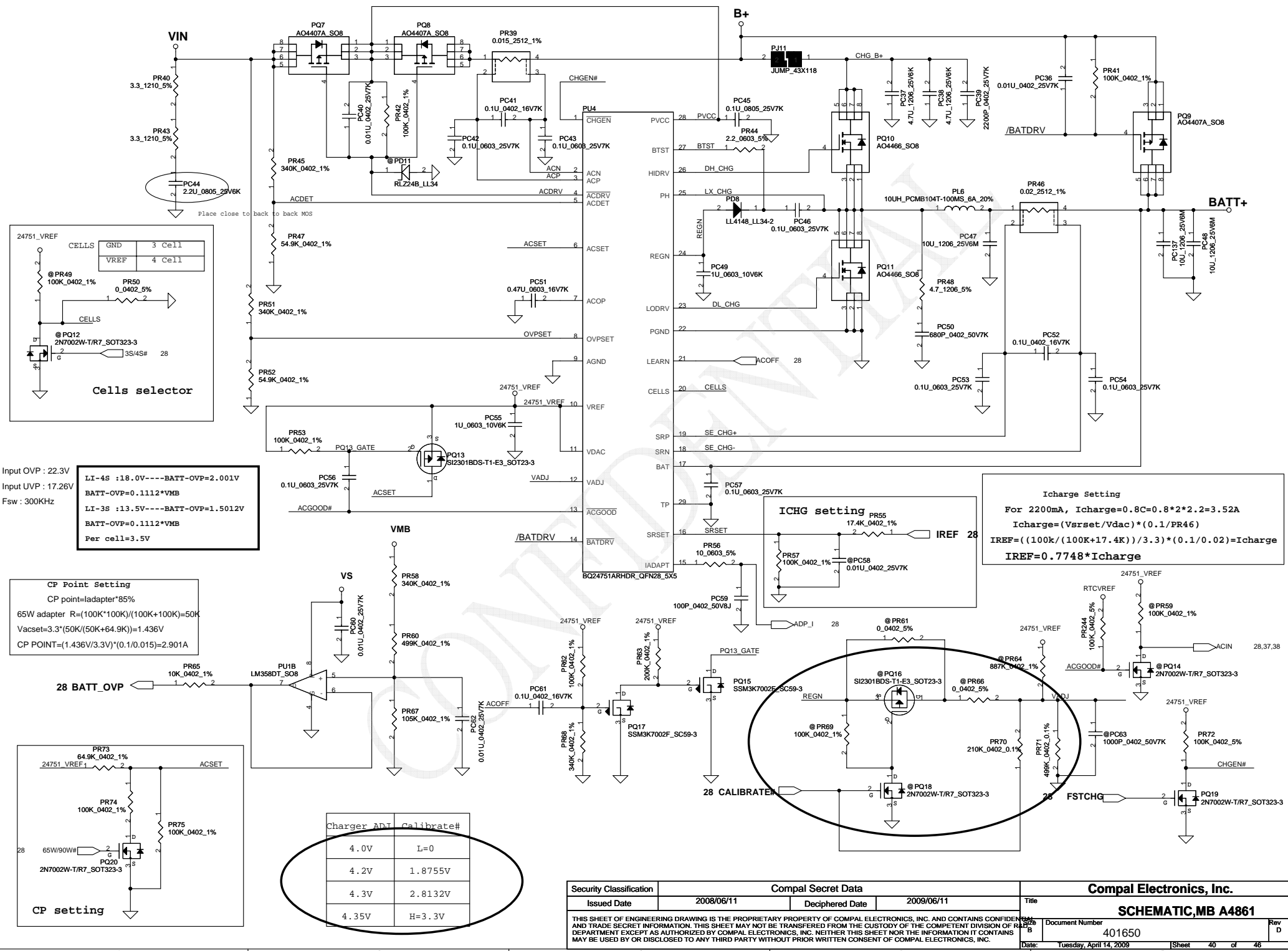
Vin Detector			
	Min.	Typ	Max.
H-->L	16.976V	17.525V	17.728V
L-->H	17.430V	17.901V	18.384V



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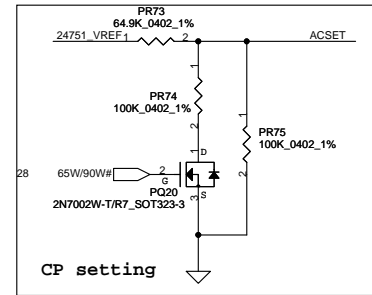
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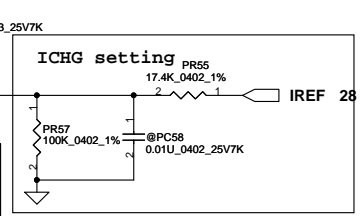
Input OVP : 22.3V  
 Input UVP : 17.26V  
 Fsw : 300KHz

LI-4S :18.0V----BATT-OVP=2.001V  
 BATT-OVP=0.1112\*VMB  
 LI-3S :13.5V----BATT-OVP=1.5012V  
 BATT-OVP=0.1112\*VMB  
 per cell=3.5V

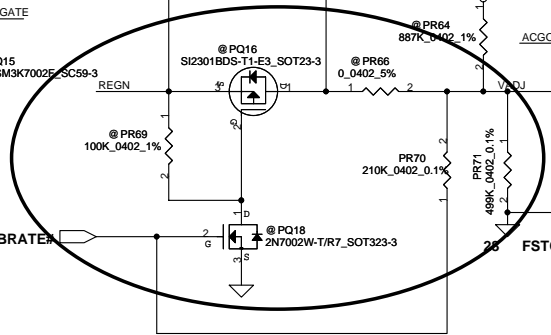
**CP Point Setting**  
 CP point=ladapter\*85%  
 65W adapter R=(100K\*100K)/(100K+100K)=50K  
 Vacset=3.3\*(50K/(50K+64.9K))=1.436V  
 CP POINT=(1.436V/3.3V)\*(0.1/0.015)=2.901A



Charger ADI	Calibrate#
4.0V	L=0
4.2V	1.8755V
4.3V	2.8132V
4.35V	H=3.3V

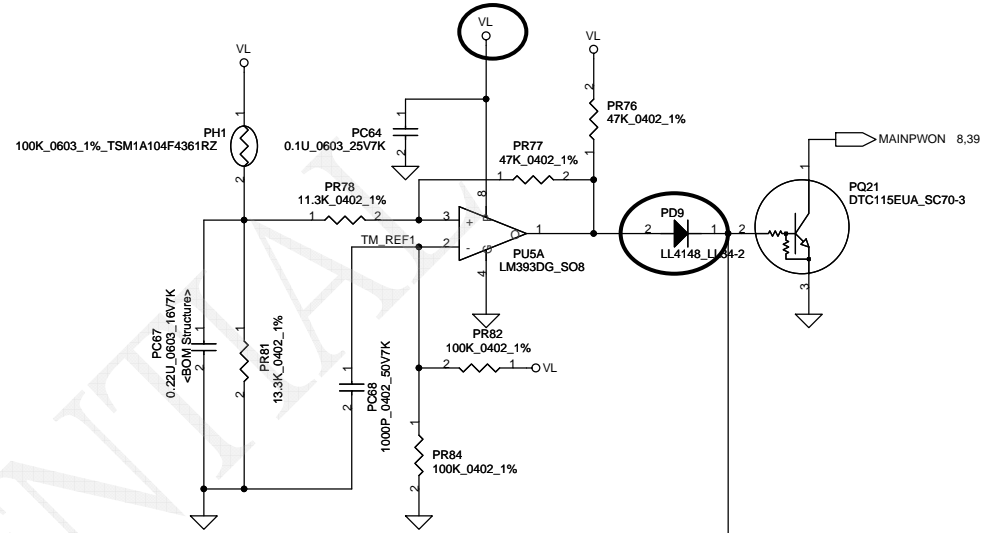


**Icharge Setting**  
 For 2200mA, Icharge=0.8C=0.8\*2\*2.2=3.52A  
 Icharge=(Vsrset/Vdac)\*(0.1/PR46)  
 IREF=((100k/(100K+17.4K))/3.3)\*(0.1/0.02)=Icharge  
 IREF=0.7748\*Icharge

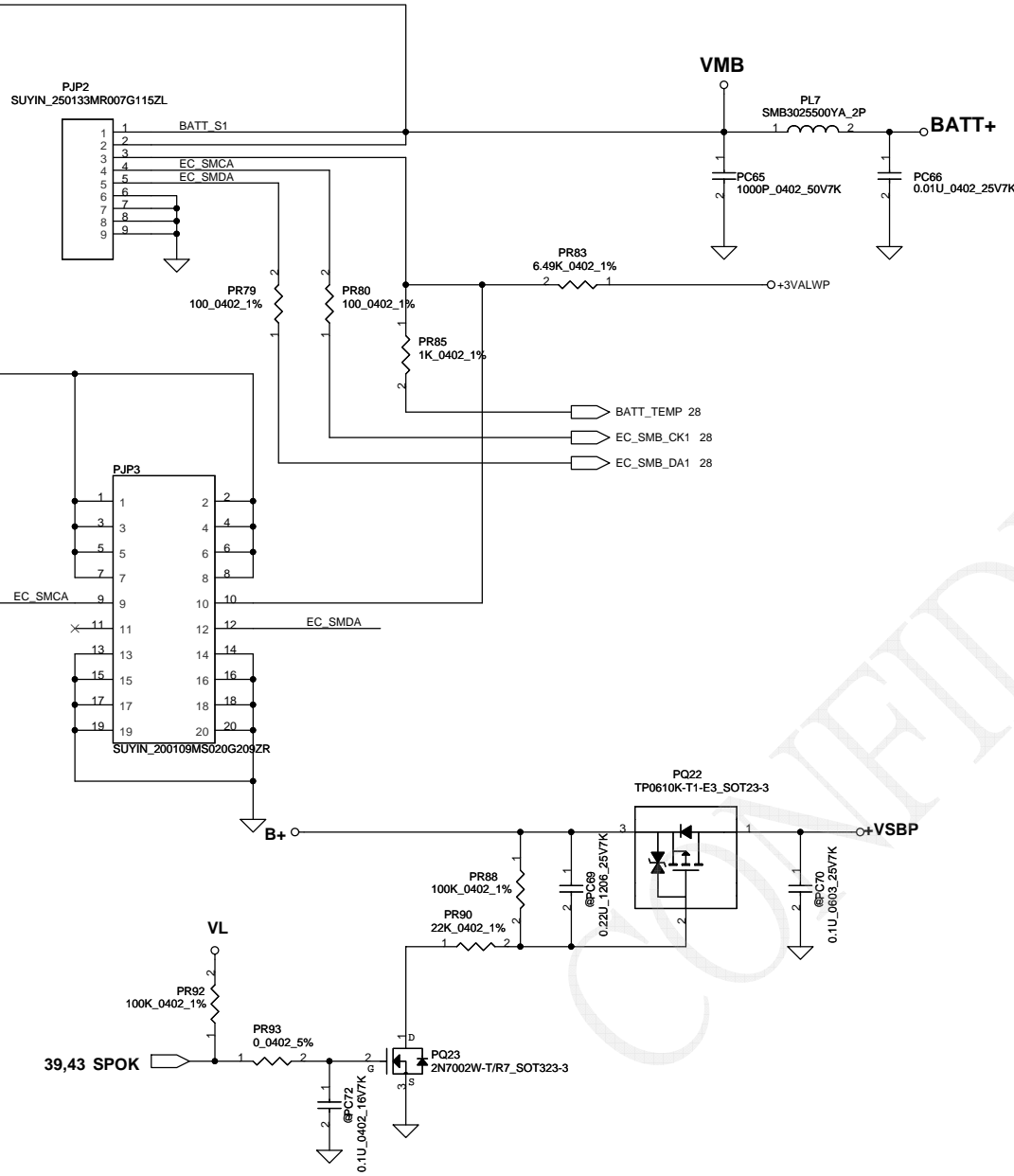
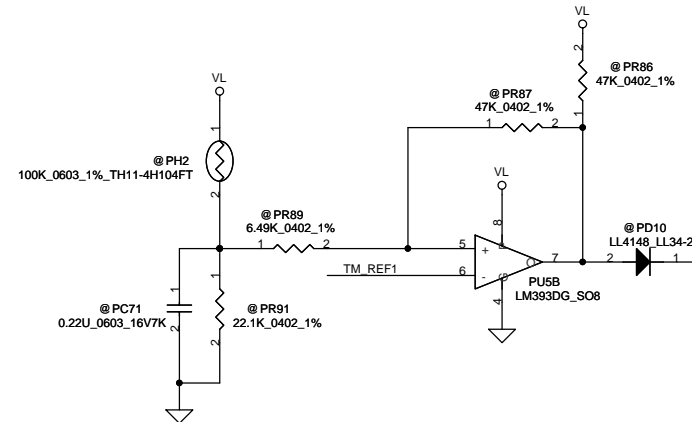




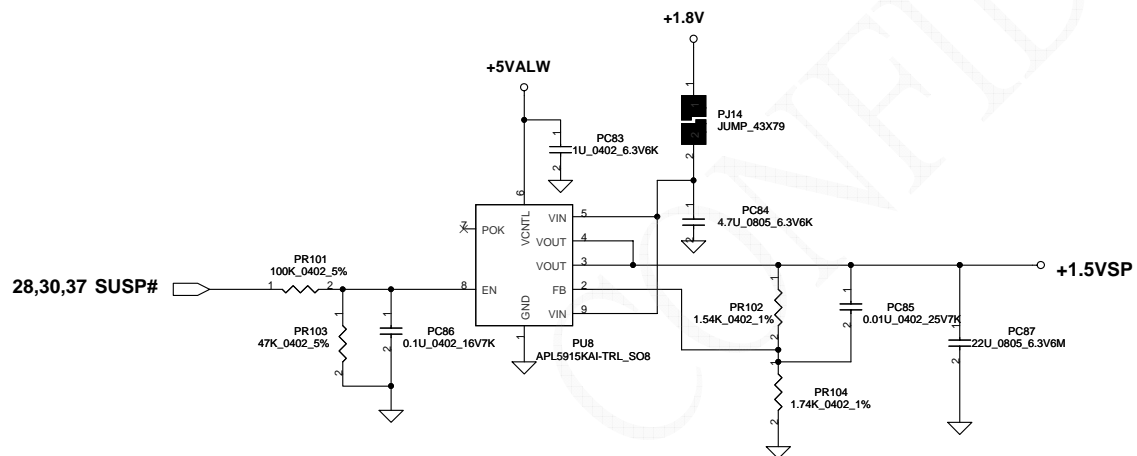
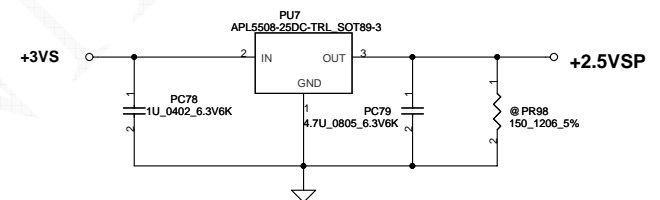
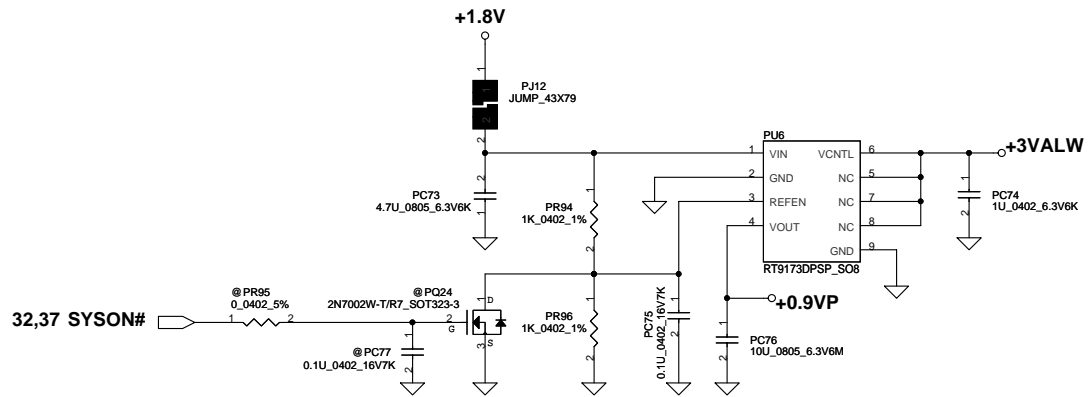
PH1 under CPU botten side :  
CPU thermal protection at 92 degree C



PH2 near main Battery CONN :  
BAT. thermal protection at 75 degree C



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**28,30,37 SYSON**

VFB=0.75V  
 $V_o = VFB * (1 + PR111 / PR112) = 0.75 * (1 + 14K / 10K) = 1.8V$   
 $R_{ton} = 267K \Rightarrow F_{sw} = 297KHz$

Cout ESR=15m ohm  
 $I_{peak} = 11.96A$ ,  $I_{max} = 8.372A$ ,  $I_{ocp} = 14.352A$   
 $\Delta I = ((19-1.8) * (1.8/19)) / (L * F_{sw})$   
 $((19-1.8) * (1.8/19)) / (1.8u * 297000) = 3.048A$   
 $\Rightarrow 1/2 \Delta I = 1.524A$

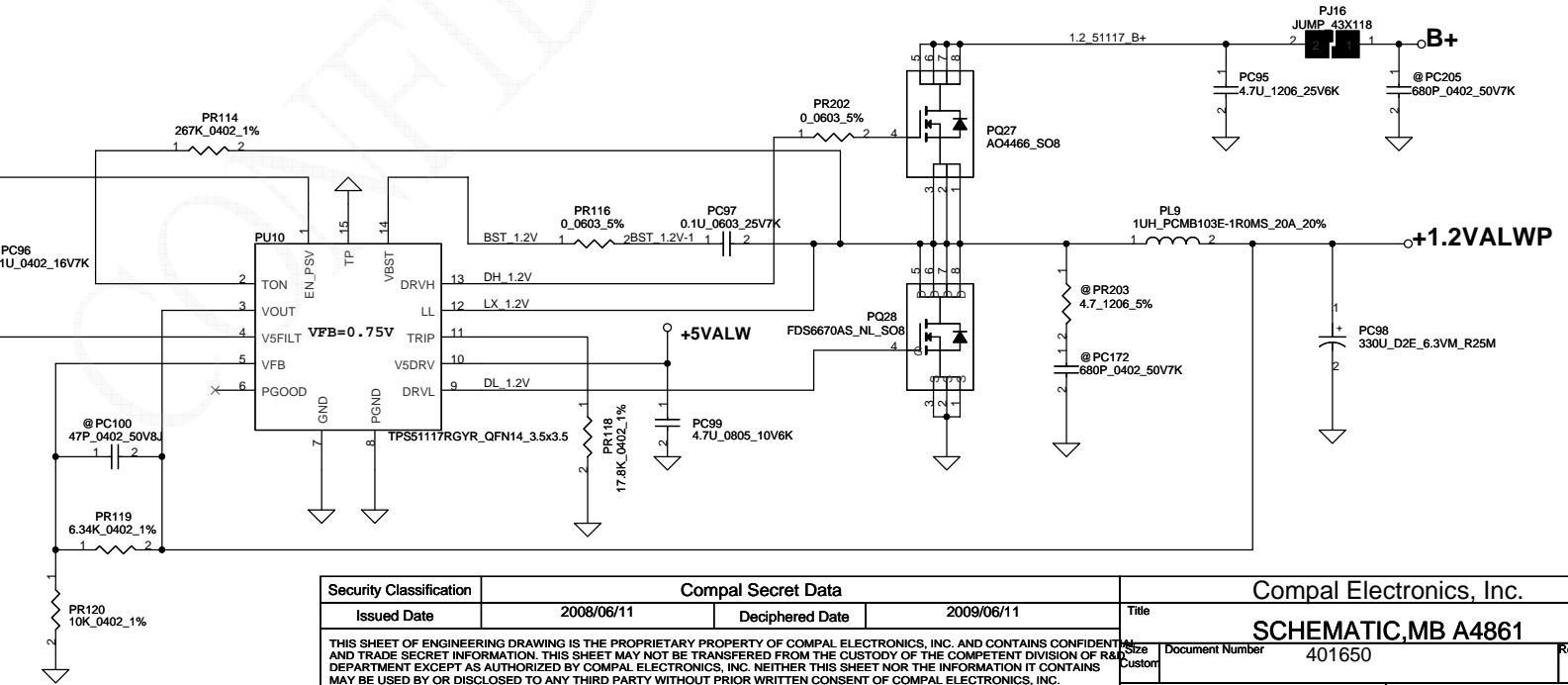
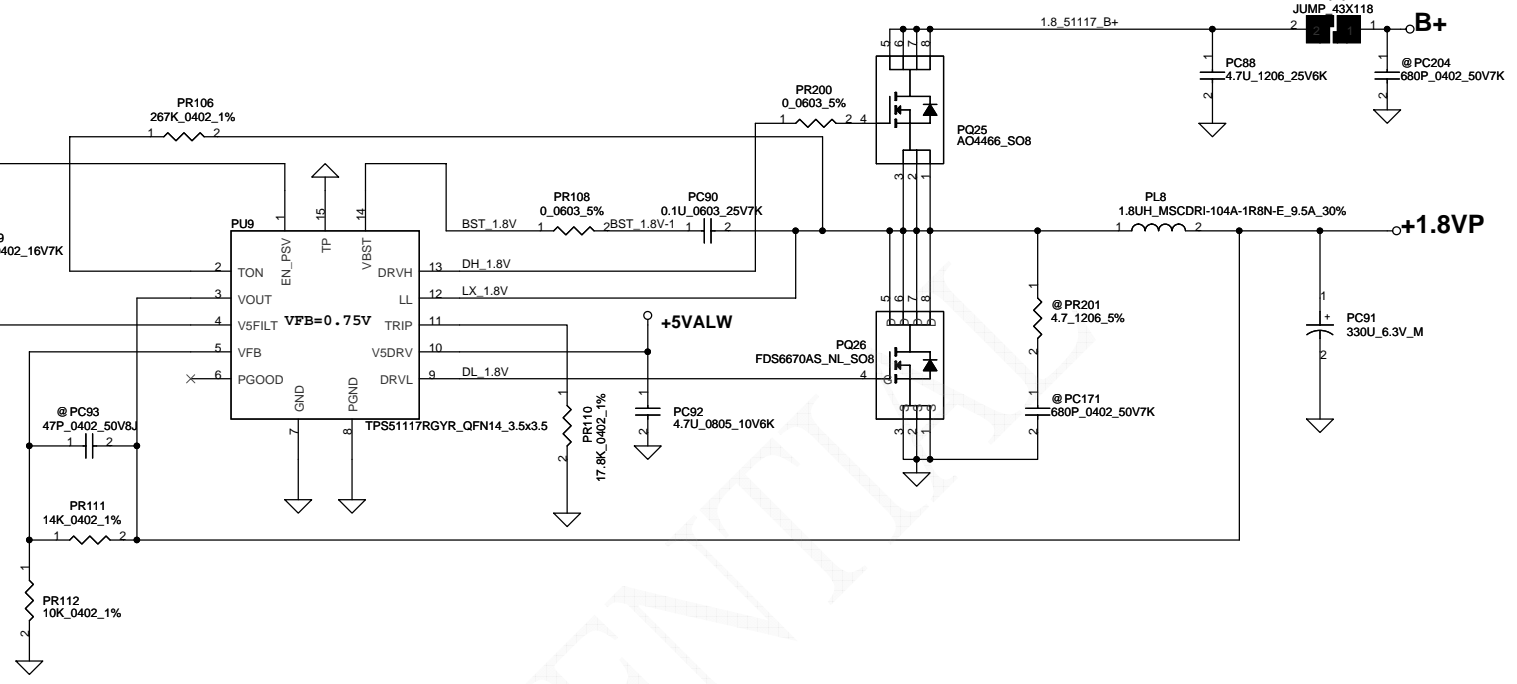
$R_{trip} = 17.8K$   
 $I_{ocp} = 13.04A \sim 21.41A$

**39,41 SPOK**

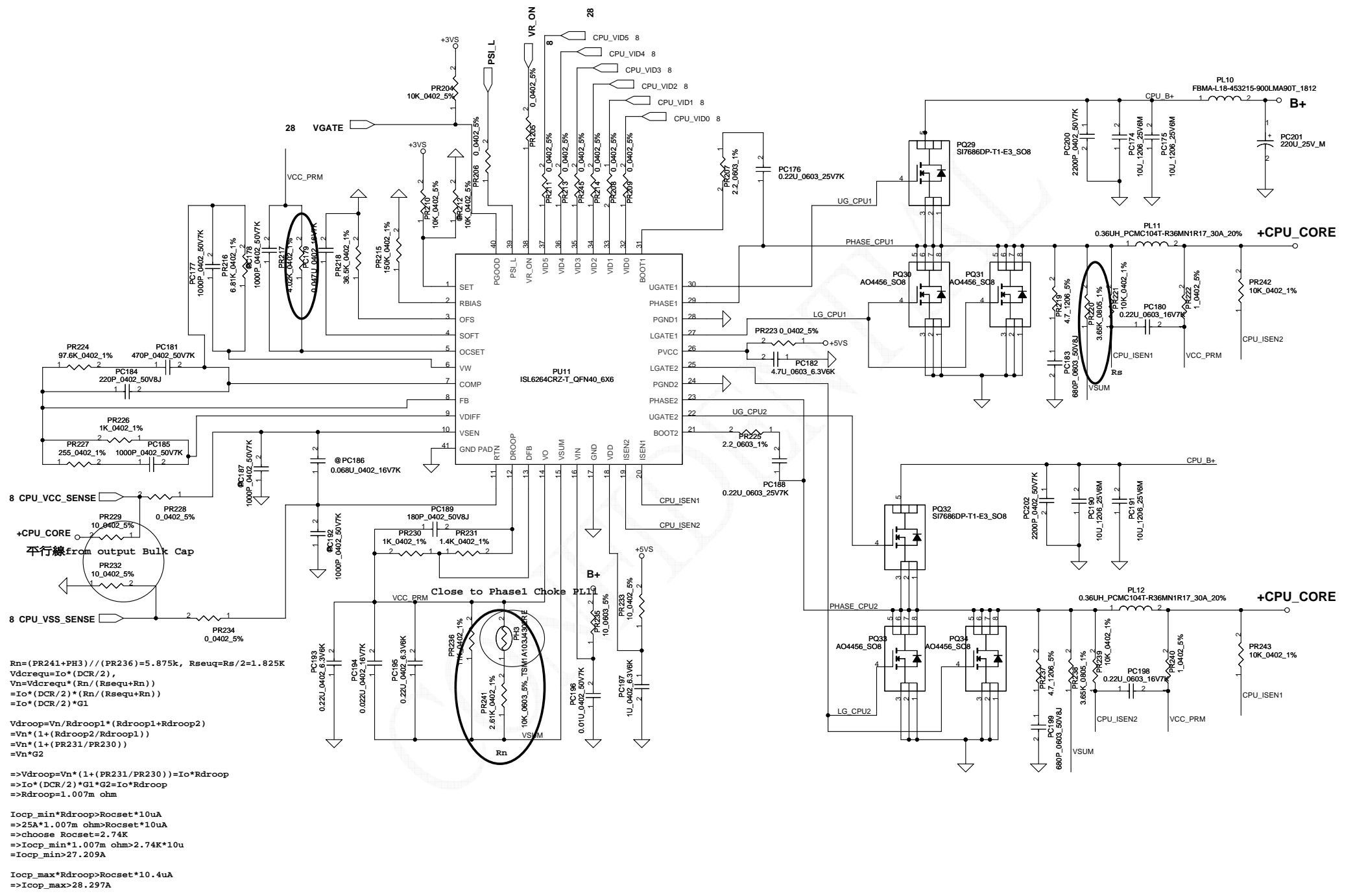
VFB=0.75V  
 $V_o = VFB * (1 + PR119 / PR120) = 0.75 * (1 + 6.04K / 10K) = 1.203V$   
 $R_{ton} = 267K \Rightarrow F_{sw} = 298KHz$

Cout ESR=15m ohm  
 $I_{peak} = 10.80A$ ,  $I_{max} = 7.56A$ ,  $I_{ocp} = 12.96A$   
 $\Delta I = ((19-1.2) * (1.2/19)) / (L * F_{sw})$   
 $((19-1.2) * (1.2/19)) / (1.8u * 298000) = 2.10A$   
 $\Rightarrow 1/2 \Delta I = 1.05A$

$R_{trip} = 17.8K$   
 $I_{ocp} = 12.75A \sim 20.83A$



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$R_n = (PR241 + PH3) / (PR236) = 5.875k$ ,  $R_{seuq} = R_s / 2 = 1.825k$   
 $V_{dcreq} = I_o * (DCR / 2)$   
 $V_n = V_{dcreq} * (R_n / (R_{seuq} + R_n))$   
 $= I_o * (DCR / 2) * (R_n / (R_{seuq} + R_n))$   
 $= I_o * (DCR / 2) * G1$   
 $V_{droop} = V_n / R_{droop1} * (R_{droop1} + R_{droop2})$   
 $= V_n * (1 + (R_{droop2} / R_{droop1}))$   
 $= V_n * (1 + (PR231 / PR230))$   
 $= V_n * G2$   
 $=> V_{droop} = V_n * (1 + (PR231 / PR230)) = I_o * R_{droop}$   
 $=> I_o * (DCR / 2) * G1 * G2 = I_o * R_{droop}$   
 $=> R_{droop} = 1.007m \text{ ohm}$   
 $I_{ocp\_min} * R_{droop} > R_{ocset} * 10\mu A$   
 $=> 25A * 1.007m \text{ ohm} > R_{ocset} * 10\mu A$   
 $=> \text{choose } R_{ocset} > 2.74k$   
 $=> I_{ocp\_min} * 1.007m \text{ ohm} > 2.74k * 10\mu A$   
 $=> I_{ocp\_min} > 27.209A$   
 $I_{ocp\_max} * R_{droop} > R_{ocset} * 10.4\mu A$   
 $=> I_{ocp\_max} > 28.297A$   
 $I_{ocp} = -27.209A - 28.297A$

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Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
1	Customer changed CPU to TF36/38.	TF36/38 is 31W CPU, must change MOS to 1H2L.	0.1	44	Add PQ31 and PQ34 SB000009F80( S TR AO4456 1N SO8)	08, 11/13	to DVT
2	Change CP OCP setting.	TF36/38 CPU OCP setting change.	0.1	44	Change PR198 to SD034402180(S RES 1/16W 4.02K 0402 1%)	08, 11/13	to DVT
3	S3 Mode issue.	Because APL5915 has 0.4V enable voltage, so add PR103 to pull down enable voltage when system in S3 mode	0.1	42	Add PR103 SD028470280( S RES 1/16W 47K 0402 5%)	08, 11/13	to DVT
4	AMD issue.	AMD request add 1.2V to 1.22V for chipset.	0.1	43	Change PR119 from SD034604180 to SD034634180.	08, 11/17	to DVT
5	EMI issue.	EMI request add charger snubber.	0.1	40	Add PR48 SD001470B80(S RES 1/4W 4.7 +-5% 1206) Add PC50 SE074681K80(S CER CAP 680P 50V K X7R 0402)	08, 11/17	to DVT
6	Cost issue.	Cost issue.	0.1	44	Change PC201 from SF000000G80(S ELE CAP 220U 25V M HA0 MVY) to SF22004M210(S ELE CAP 220U 25V M 8X10.2 CE-AX)	08, 11/17	to DVT
7	Support charge voltage.	Support charge voltage.	0.1	40	Delete PQ18 SB000006800(S TR 2N7002W T/R7 1N SOT-323)	08, 11/26	to DVT
8	Support charge voltage.	Support charge voltage.	0.1	40	Delete PQ16 SB923010020(S TR SI2301BDS-T1-E3 1P SOT23)	08, 11/26	to DVT
9	Support charge voltage.	Support charge voltage.	0.1	40	Delete PR66 SD028000080(S RES 1/16W 0 0402 5%)	08, 11/26	to DVT
10	Support charge voltage.	Support charge voltage.	0.1	40	Delete PR69 SD034100380(S RES 1/16W 100K 0402 1%)	08, 11/26	to DVT
11	Support charge voltage.	Support charge voltage.	0.1	40	Delete PC63 SE074102K80(S CER CAP 1000P 50V K X7R 0402)	08, 11/26	to DVT
12	Support charge voltage.	Support charge voltage.	0.1	40	Add PR70 SD034210380(S RES 1/16W 210K 0402 1%)	08, 11/26	to DVT
13	Support charge voltage.	Support charge voltage.	0.1	40	Add PR71 SD034499380(S RES 1/16W 499K 0402 1%)	08, 11/26	to DVT
14							
15							
16							
17							
18							

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

Item	Reason for change	Modify List	Rev.	PG#	Item	Reason for change	Modify List	Rev.	PG#
1	Material Change	Change U1 to APL5607	DVT	P06	26	Material Change	Change U82 to ALC272X-GR (SA00002CI20)	PVT	P35
2	Material Change	Change U85 to AR8132	DVT	P25	27	Material Change	Change U27 to KB926QFD3 (SA00001J580)	PVT	P28
3	8132 issue, OS black screen	Change L90 to R546 (0_0805)	DVT	P25	28	Material Change	Change U85 to AR8132M-AL1E (SA000034V00)	PVT	P25
4	Circuit issue	Add R677	DVT	P32	29	Material Change	Change U85 to AR8132-AL1E (SA000036Y00)	Pre-PVT	P25
5	RT5159 ID issue	Pop R680 to 0_0402_5%	DVT	P27	30	BOM change	Del D13,D4	Pre-PVT	P06
6	[EMI] Camera co-layout choke	Change R759,R760 to 0_0402 Reserve L77	DVT	P24	31	ESD Cost down	Del D16,D39,D40	Pre-PVT	
7	[Cost Down] audio LDO	Reserve U81 Pop784	DVT	P35	32	ESD Cost down	Change D15 to SCA00000200	Pre-PVT	
8	RT5159 unknow issue	Reserve R548, pop R547	DVT	P27	33	BOM change	Change R251,R253 to 1K	Pre-PVT	
9	[ESD]	Pop D39,D40	DVT	P36					
10	[ESD]	Pop D14,D15	DVT	P36					
11	[ESD]	Pop D16	DVT	P29					
12	[EMI]	Reserve C859 for EMI	DVT	P27					
13	Modify PWR Sequence	Reserve R104,R108 Pop R658,R652	DVT	P34 P28					
14	[EMI]	Reserve C861 for EMI	DVT	P16					
15	Material Change	Change JRJ1 type	DVT	P26					
16	Material Change	Change C924,C971 to 3900pF_0402	DVT	P36					
17	[EMI]	Reserve C350,C352,C353,C354	DVT	P15					
18	[EMI]	Pop R673 to 10ohm_0402 Pop C858 to 10pF_0402	PVT	P27					
19	[EMI]	Pop C859 to 0.1uF_0402	PVT	P27					
20	[EMI]	Pop C350,C352,C353,C354 to 0.1uF_0402	PVT	P15					
21	Material Change	Change R251,R253 to 1.1Kohm Change R250,R252 to 1.2Kohm	PVT	P34					
22	Material Change	Change Y2 footprint to correct	PVT	P18					
23	Material Change	Only cChange R810,R807 P/N to SM010012010	PVT	P36					
24	Circuit Change	Reserve PWN FAN function. Add R247,R40,JP38	PVT	P06					
25	Material Change	Change R814,R815 to 56.2ohm_0402	PVT	P36					

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