

Compal Confidential

JAQ10 M/B Schematics Document

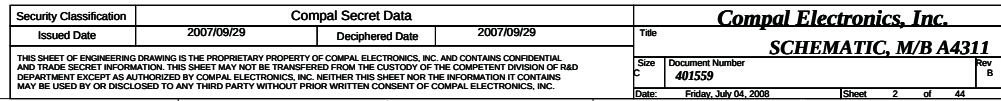
Intel Penryn Processor with Cantiga + DDRIII + ICH9M

2008-04-21

REV:1.0

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File Name : JAQ10



Voltage Rails

Power Plane	Description	S1	S3/M1	S5/M1
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	0.75VS power rail for DDR3 terminator	ON	OFF/ON	OFF/ON
+1.05VS	1.05V switched power rail	ON	OFF	OFF
+1.05VM	1.05VM switched power rail	ON	OFF/ON	OFF/ON
+1.5V	1.5V power rail for HDA	ON	ON	OFF/ON
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+1.8VS	1.8V switched power rail	ON	OFF	OFF
+3VALW	3.3V always on power rail	ON	ON	ON*
+3V_LAN	3.3V power rail for LAN	ON	OFF/ON	OFF/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
1394 TI	AD21	3	PIRQ-F
PCMCIA + Card Reader + Small Card	AD22	2	PIRQ-E

External PCI-e Devices

Device	PORT NO.	Interrupts
MINI CARD1 WLAN	P1	??
MINI CARD2 3G	P2	??
DOCKING PCI-E	P5	??
INTEL GIGA LAN	P6	??

EC SM Bus1 address

Device	Address	Device	Address
Smart Battery	0001 011X b	ADI ADM1032	1001 100X b
		GMT G781-1	1001 101X b

EC SM Bus2 address

ICH9M SM Bus address

Device	Address
Clock Generator (ICS9LPRS365)	1101 001Xb
DDR DIMM0	1001 000Xb
DDR DIMM2	1001 010Xb
HDMI Analog S/W	1100 000Xb

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

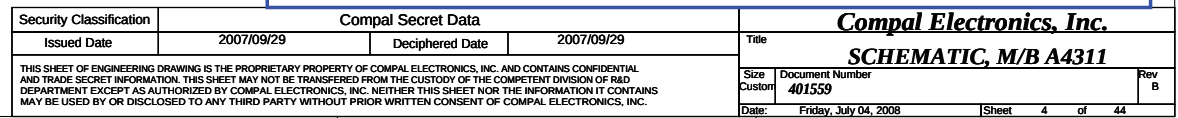
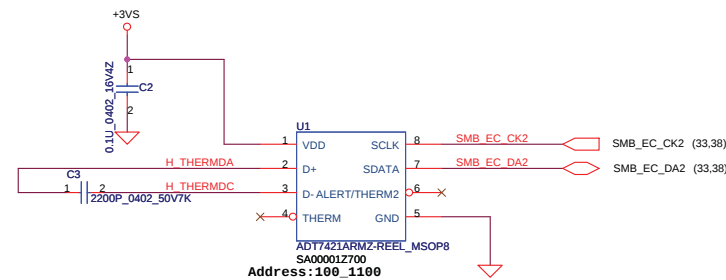
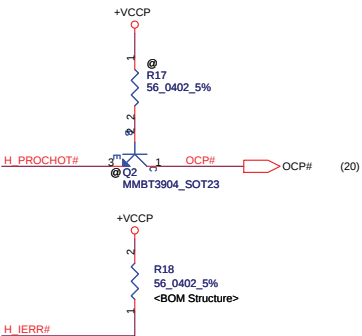
BOARD ID Table

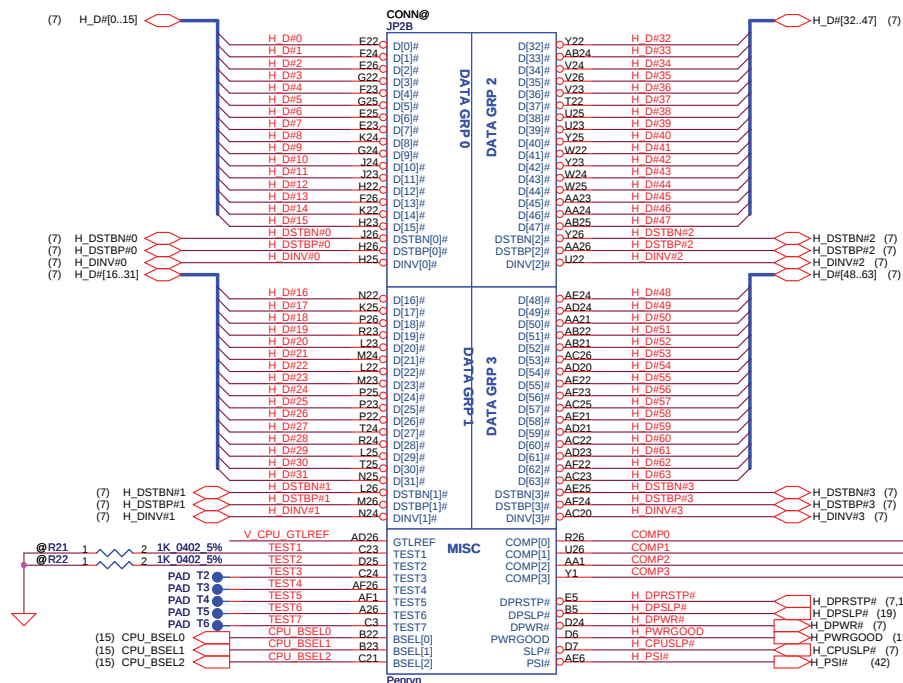
Board ID	PCB Revision
0	0.1
1	0.2
2	0.3
3	1.0
4	1A
5	
6	
7	

BTO Option Table

BTO Item	BOM Structure
Discrete	PM@
UMA	GM@
CIR	CIR@
8111C	8111C@
8102E	8102E@
ALC888VC	888VC@
ALC888VB	888VB@
ALC268	268@

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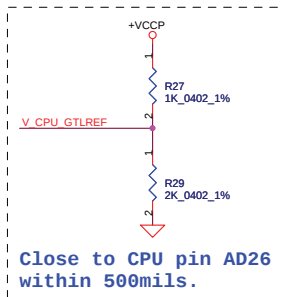




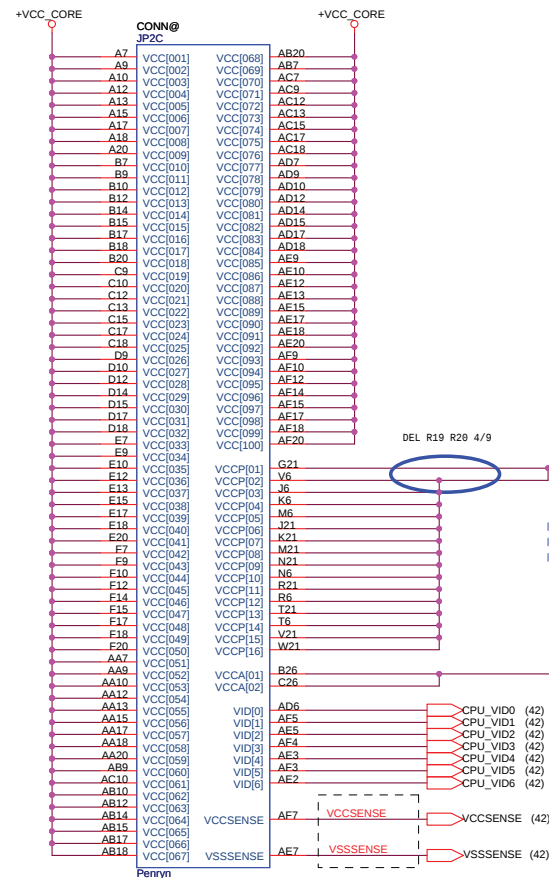
layout note: Route TEST3 & TEST5 traces on ground referenced layer to the TPs

CPU_BSEL	CPU_BSEL2	CPU_BSEL1	CPU_BSEL0
166	0	1	1
200	0	1	0
266	0	0	0

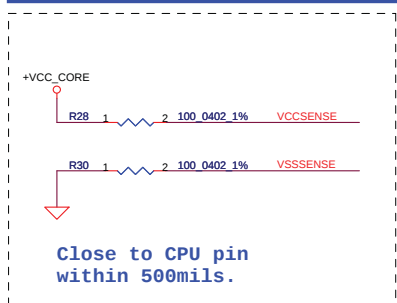
Resistor placed within 0.5" of CPU pin. Trace should be at least 25 mils away from any other toggling signal. COMP[0,2] trace width is 18 mils. COMP[1,3] trace width is 4 mils.



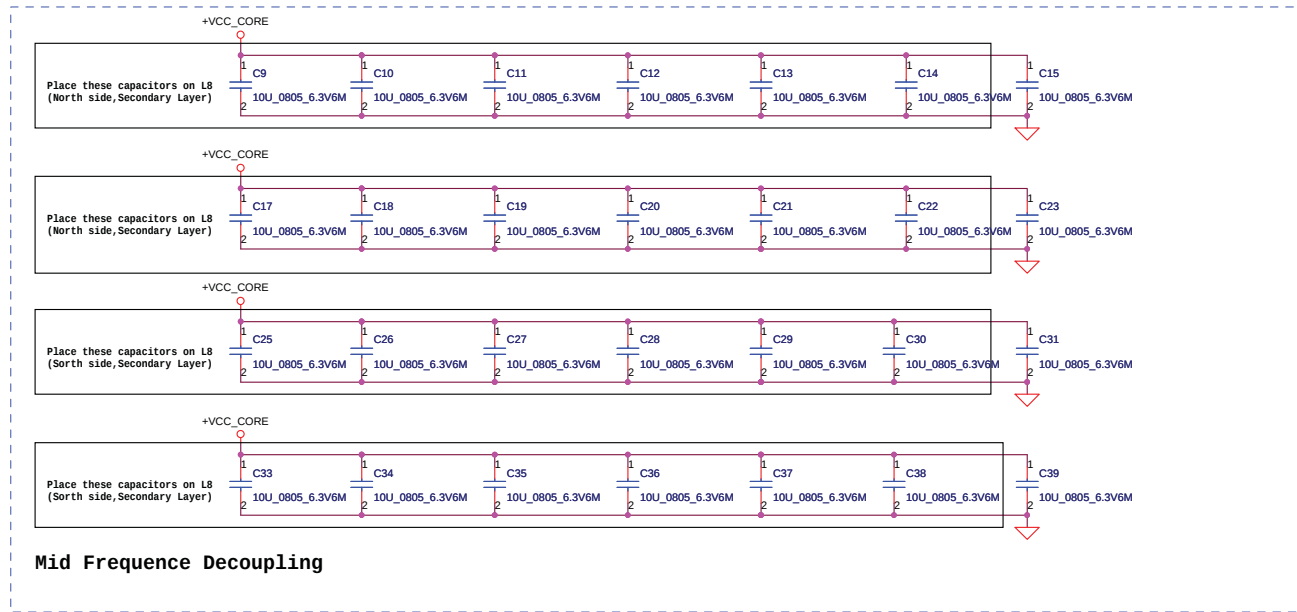
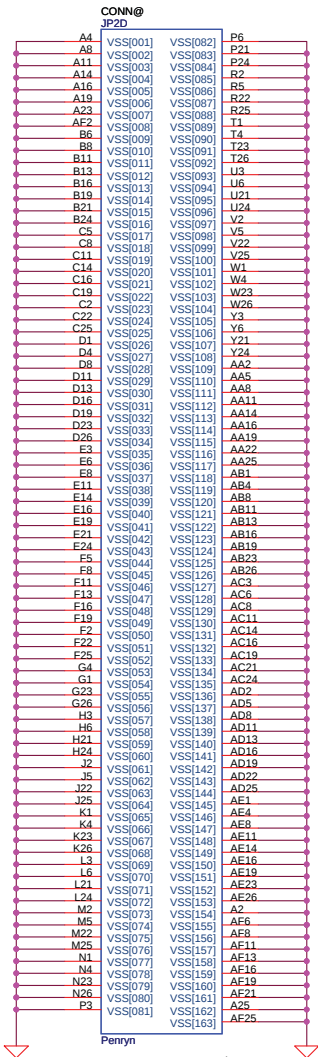
Close to CPU pin AD26 within 500mils.



Length match within 25 mils. The trace width/space/other is 20/7/25.

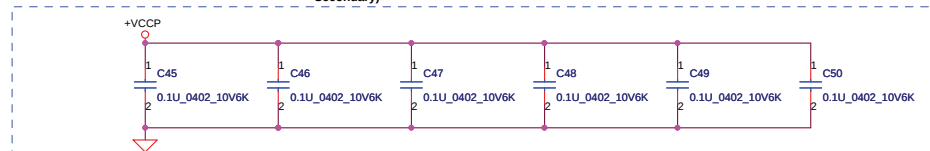
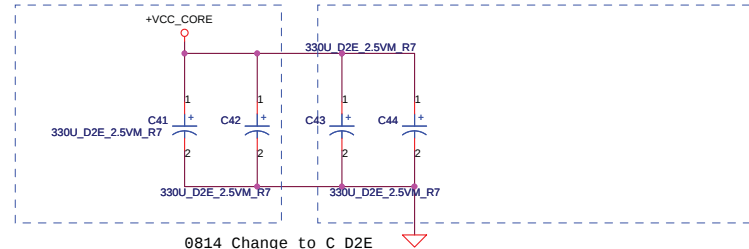


Close to CPU pin within 500mils.

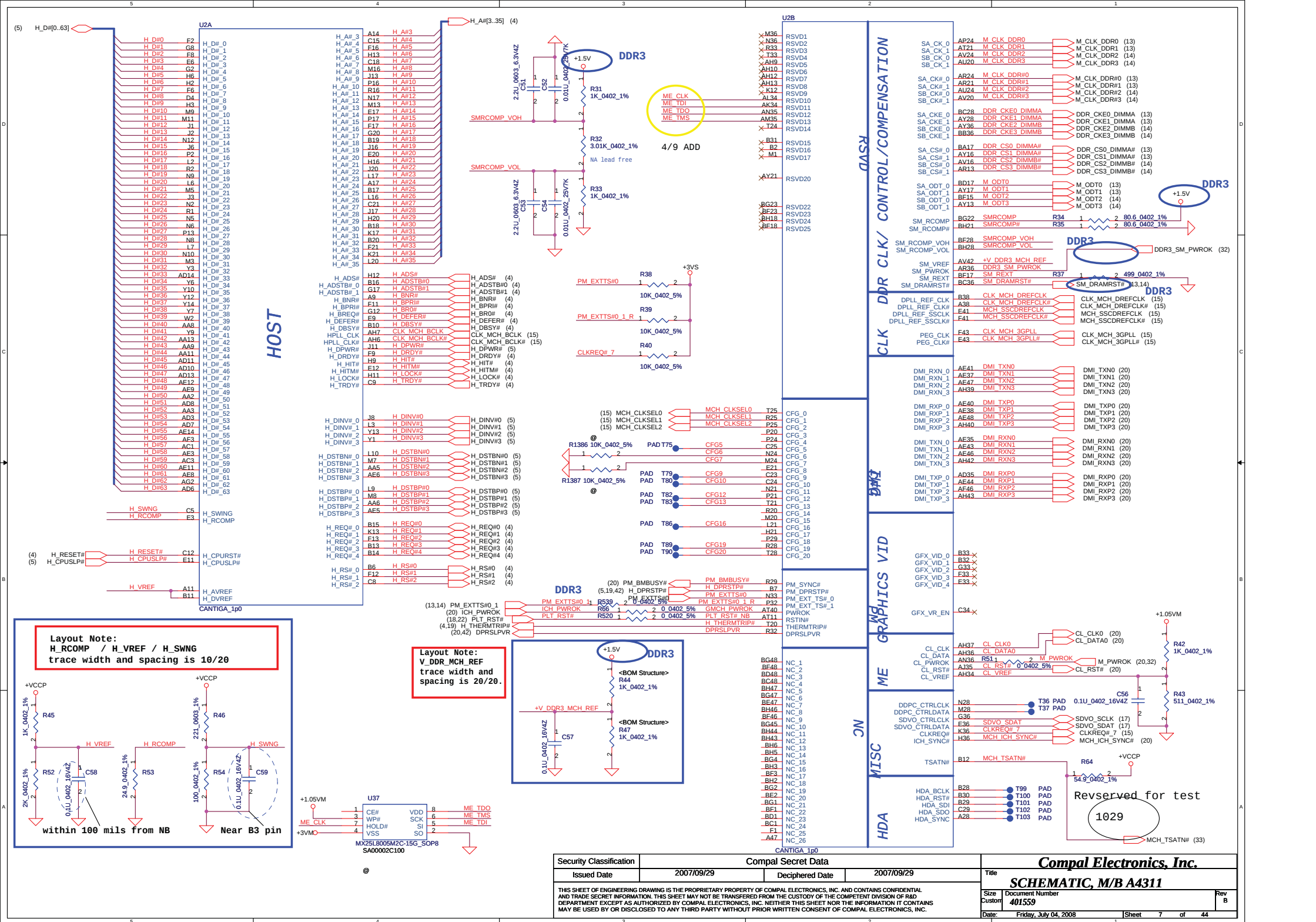


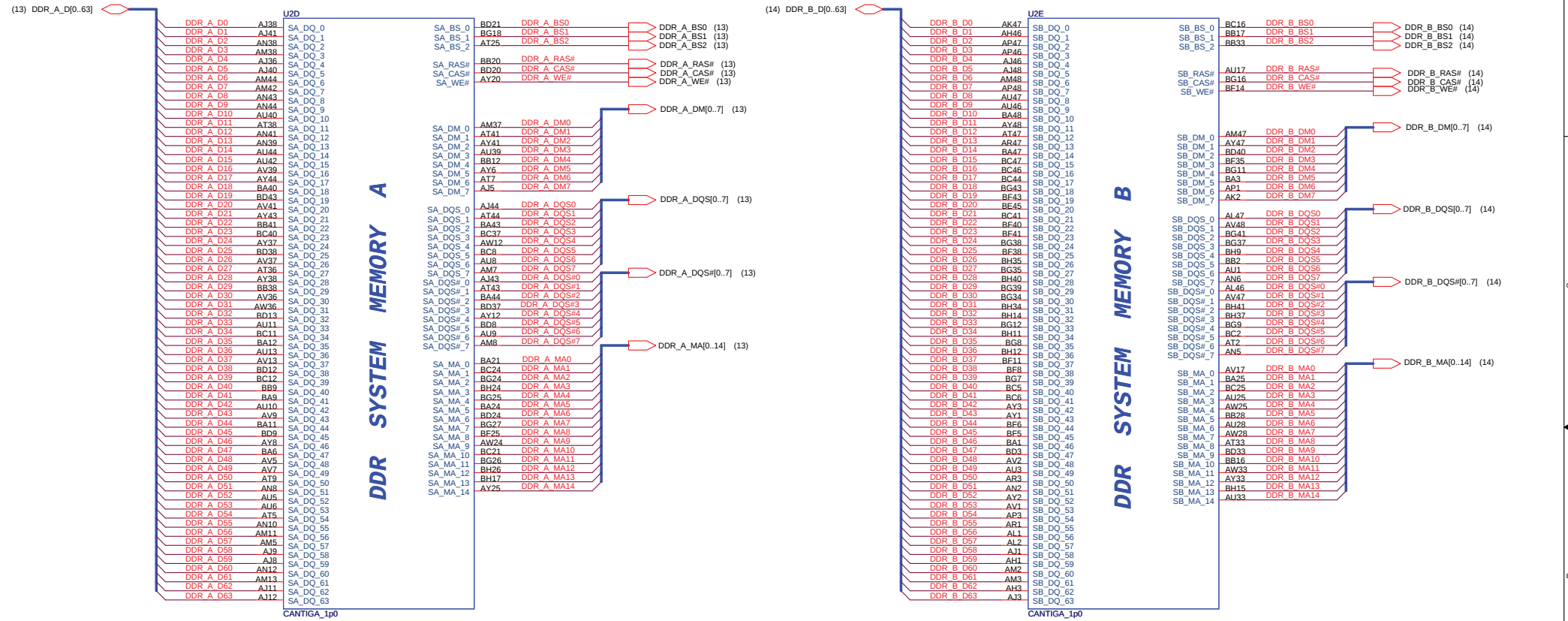
Near CPU CORE regulator

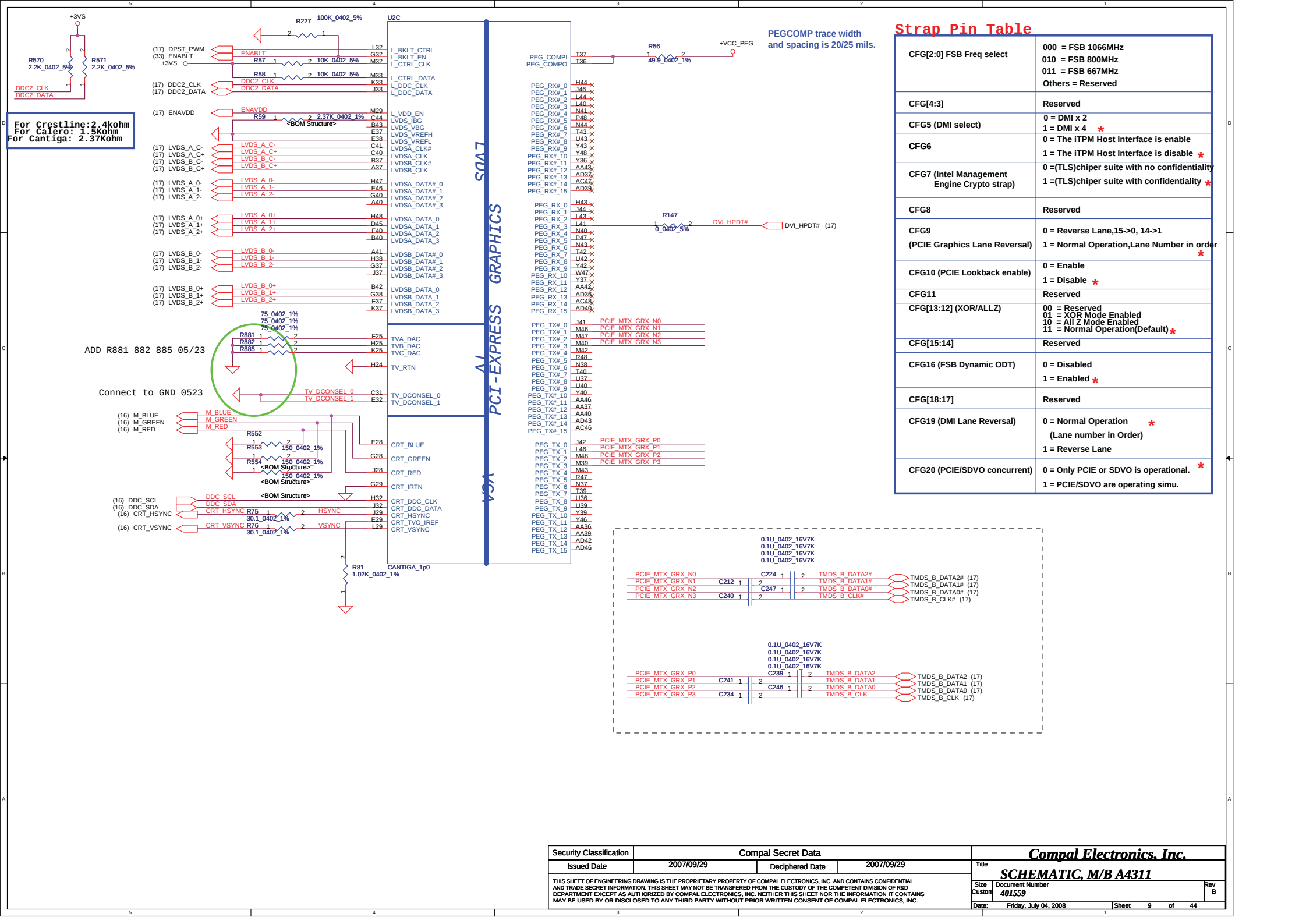
ESR <= 1.5m ohm
Capacitor > 1980uF

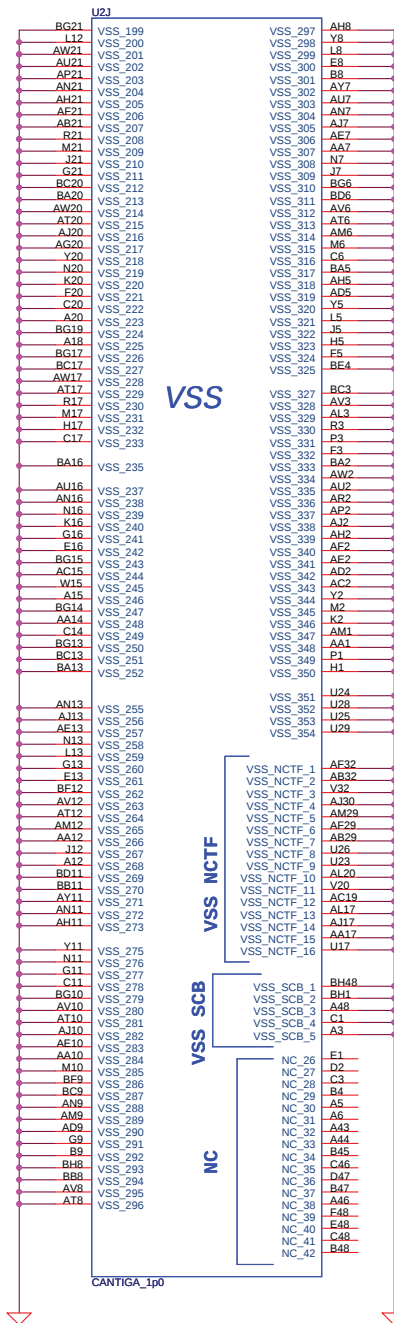
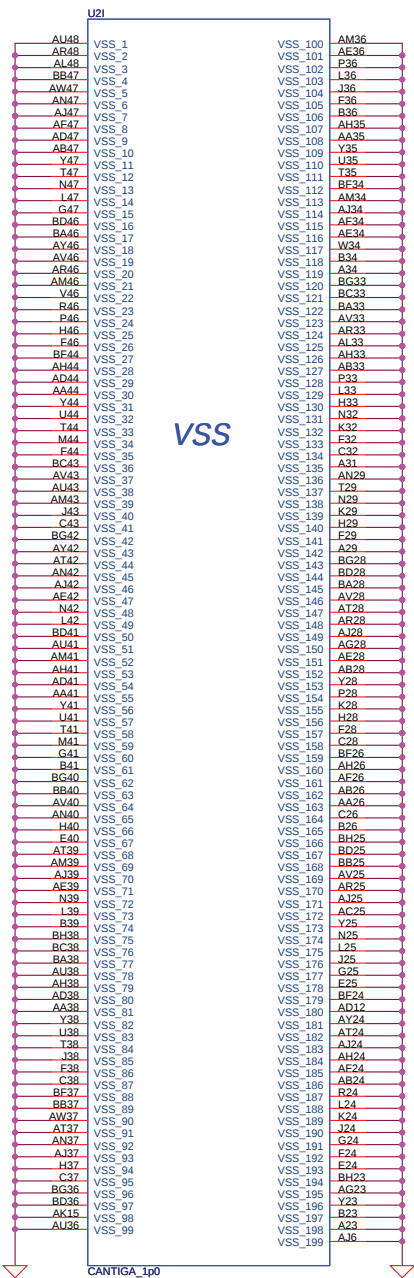


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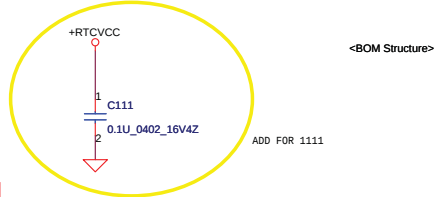




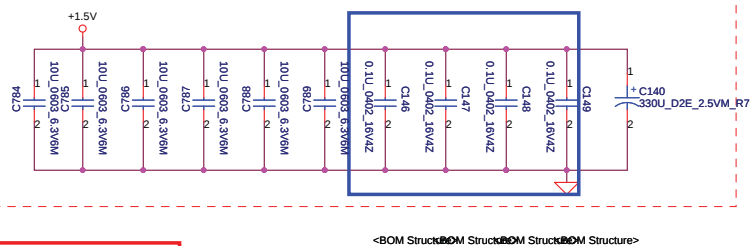




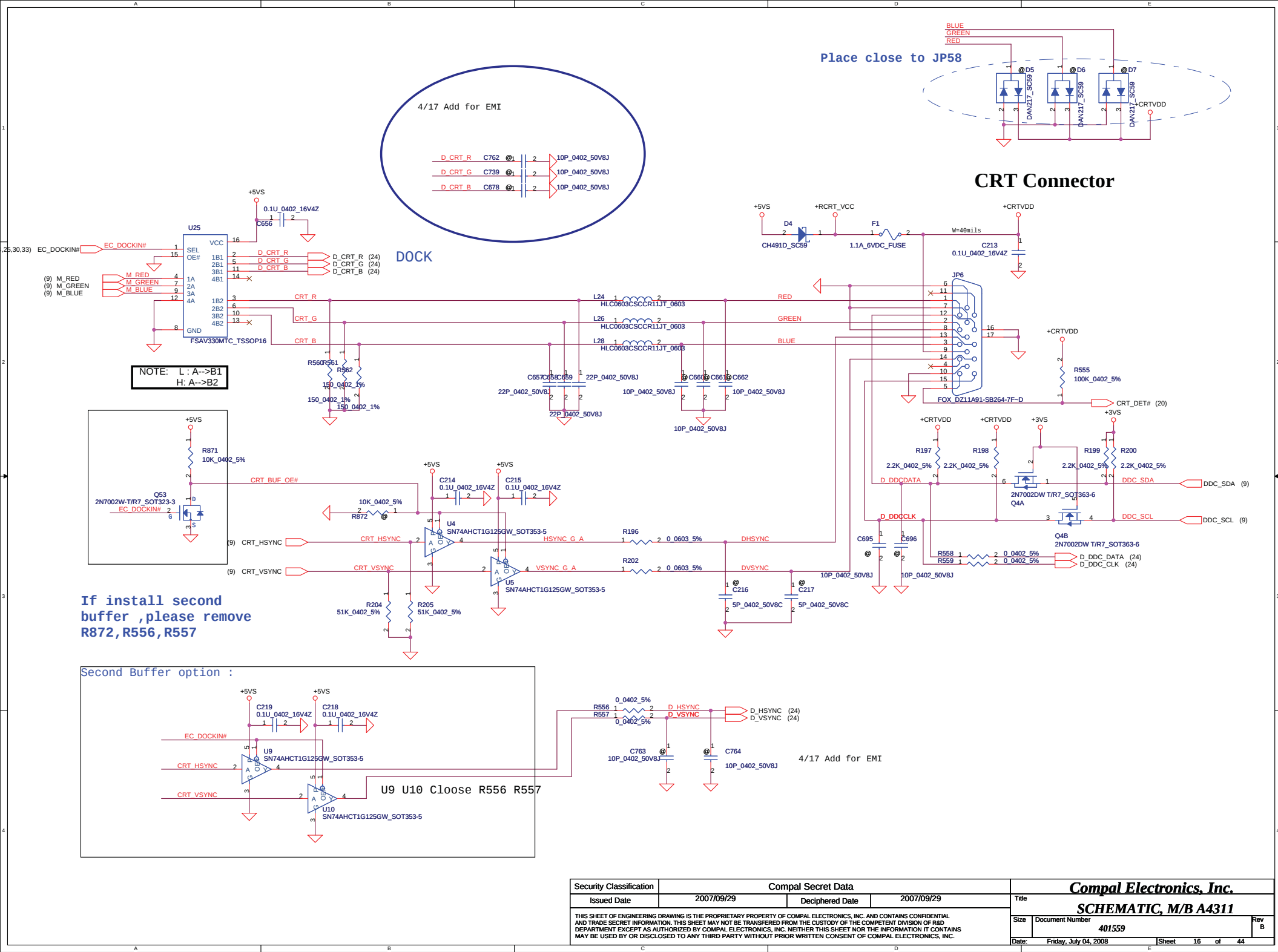
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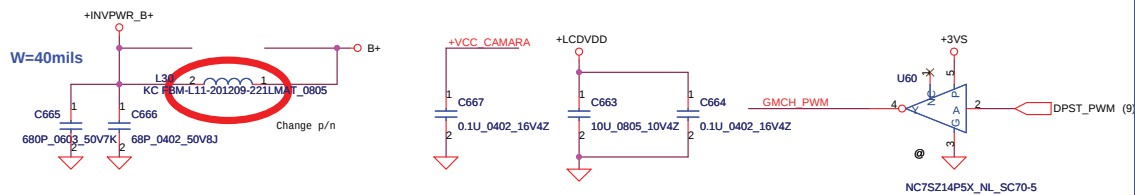


Layout Note: Place these 4 Caps near Command and Control signals of DIMMA - - - - -

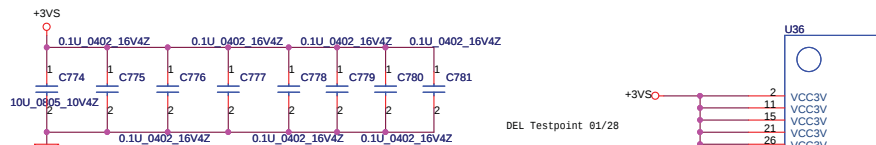
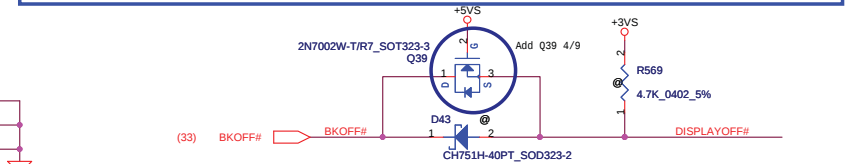
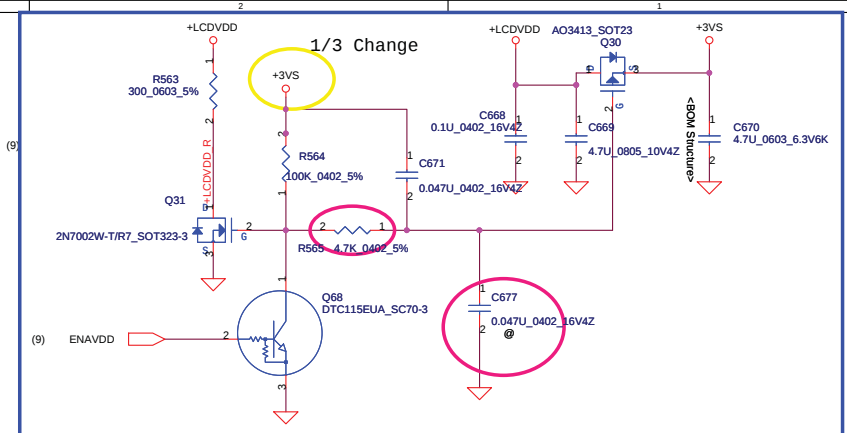
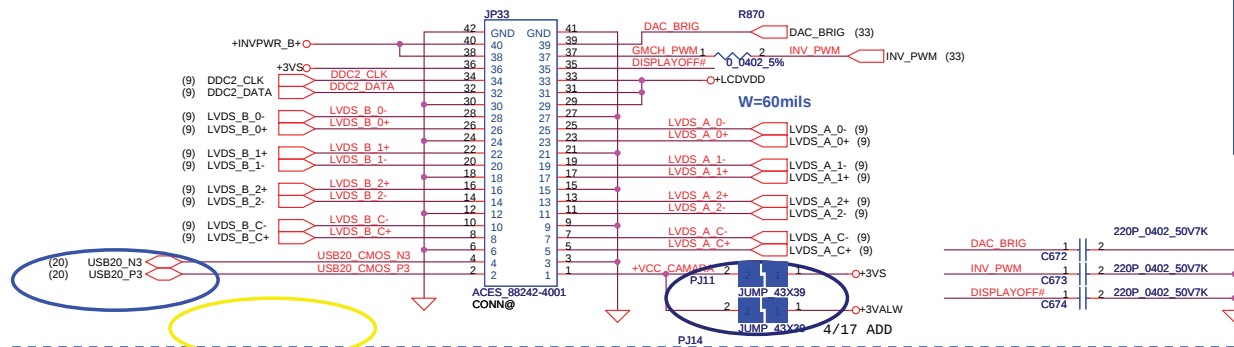


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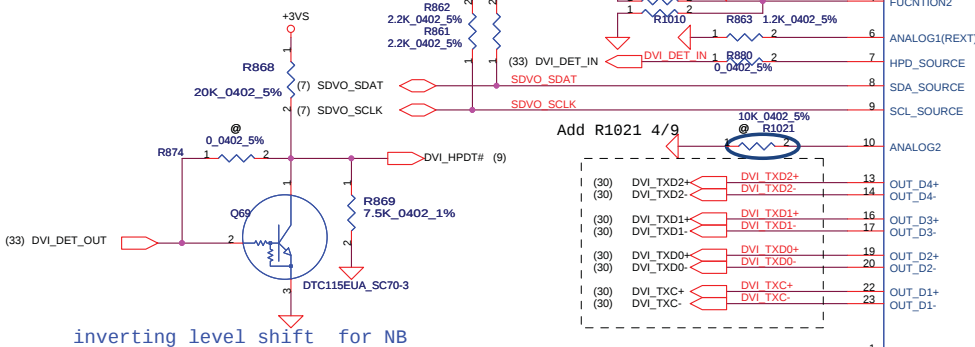




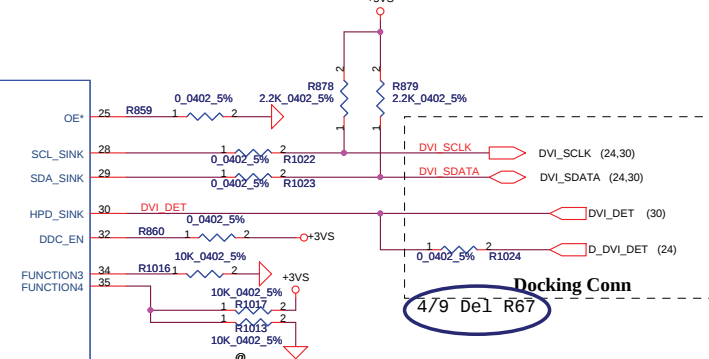
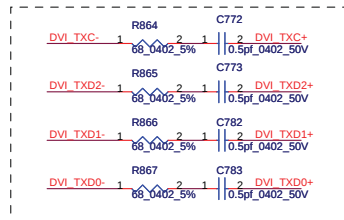
LVDS and USB CAM connector



Docking Conn



inverting level shift for NB

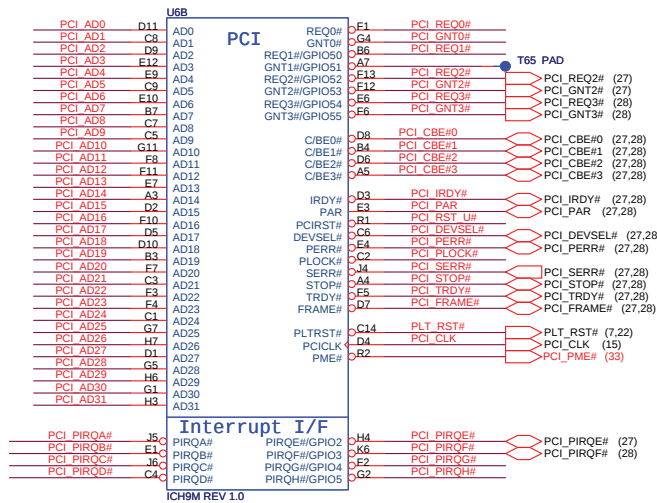
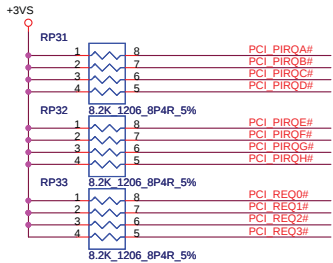
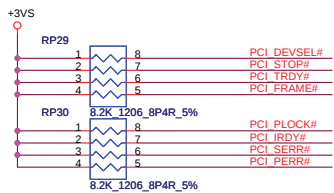


Docking Conn

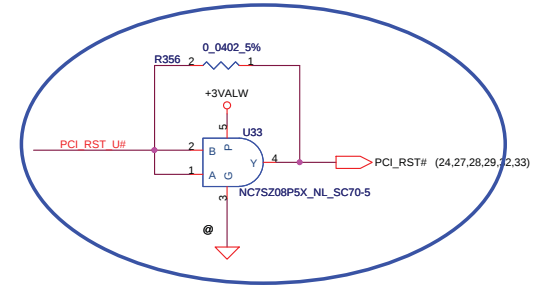
pin 4	0 = disable inverting output 1 = enable inverting output
pin 35	0 =Default value 1 = output driver current increased 10%

From GM

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(27,28) PCI_AD#[0..31] $\rightarrow$ PCI_AD#[0..31]
 (27,28) PCI_CBE#[0..3] $\rightarrow$ PCI_CBE#[0..3]



ADD Buffer for 4/9

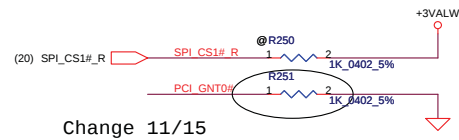
A16 swap override Strap

PCI_GNT3# Low= A16 swap override Enble
 High= Default *



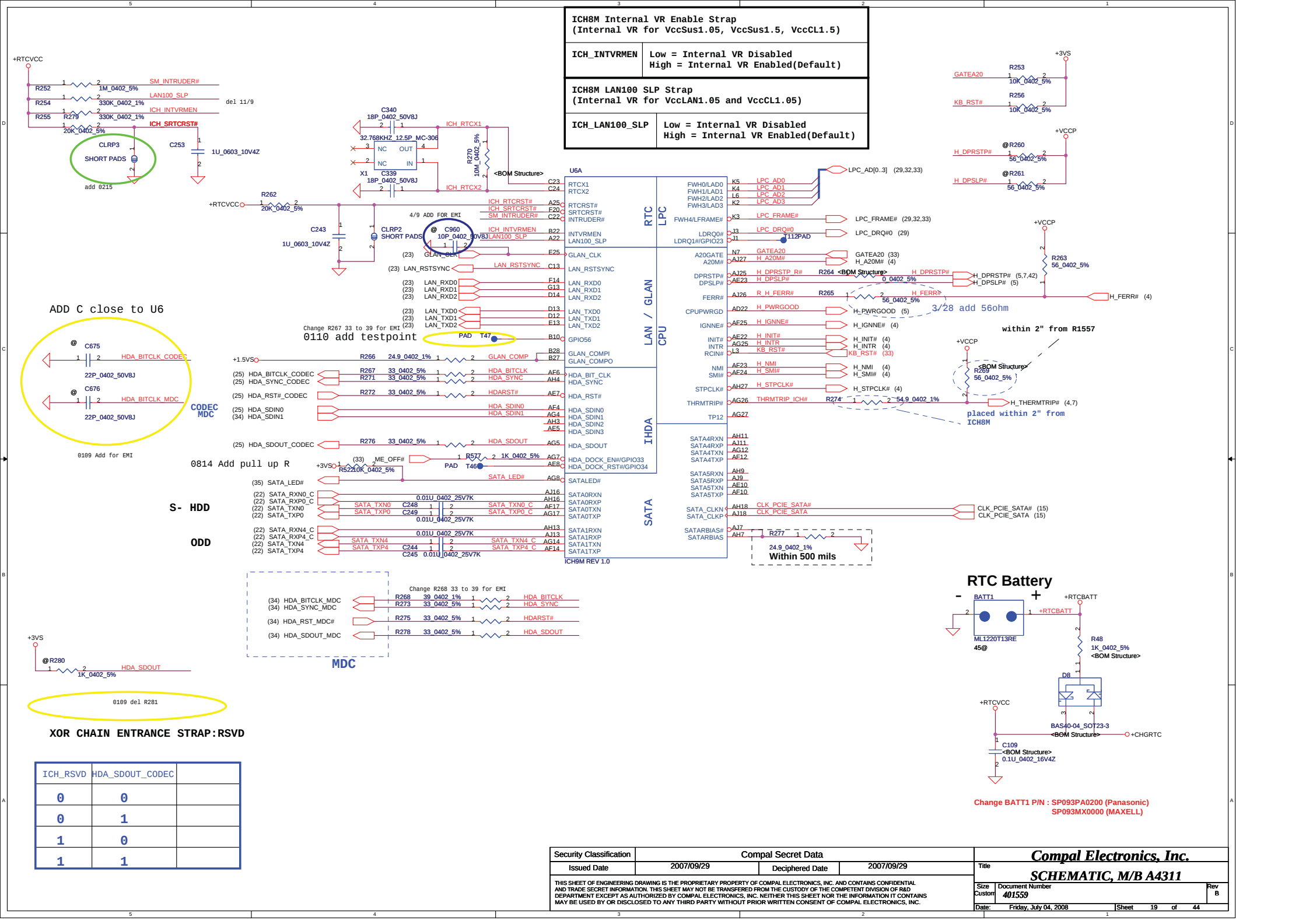
Boot BIOS Strap

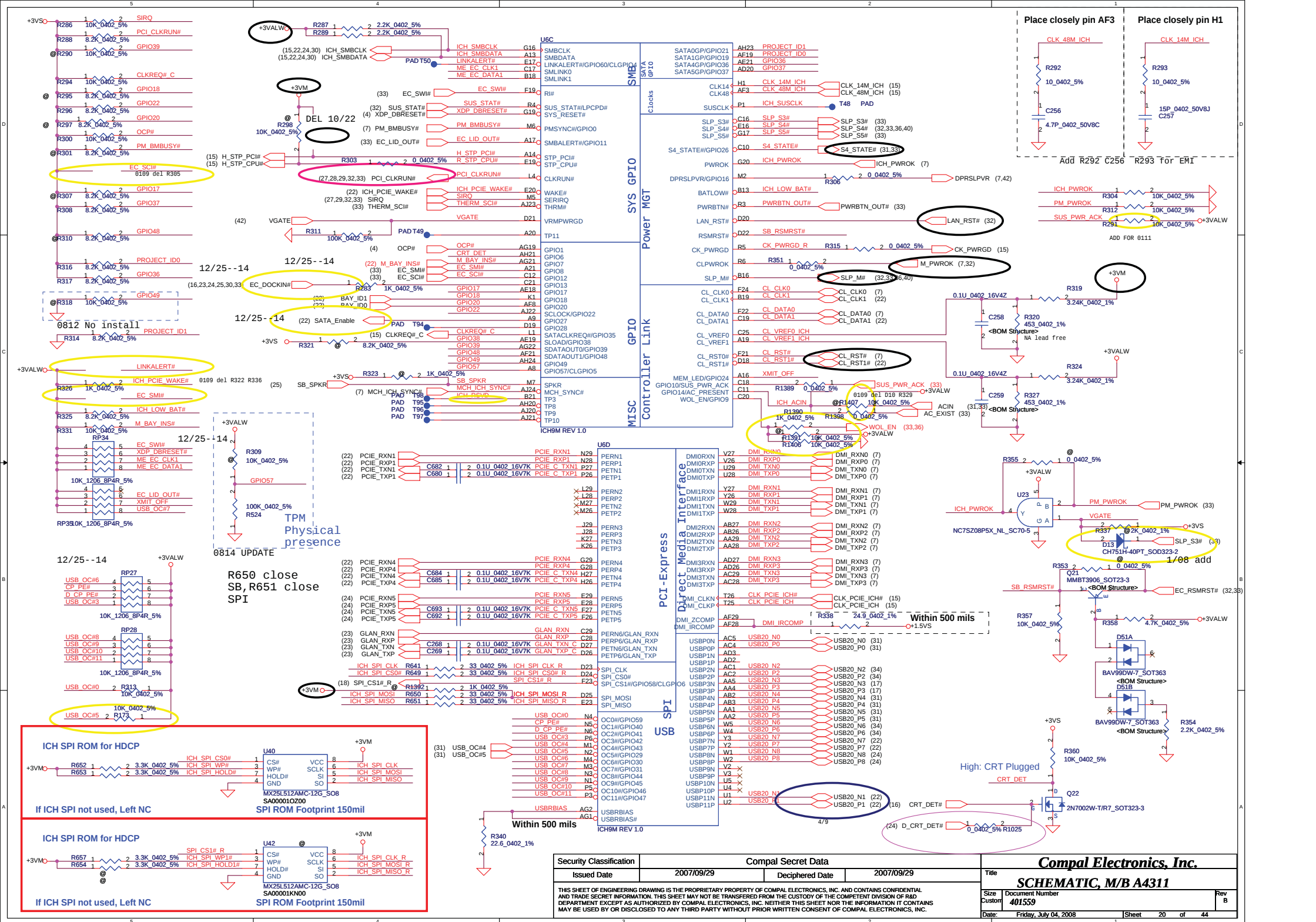
PCI_GNT0#	SPI_CS#1	Boot BIOS Location
0	1	SPI
1	0	PCI
1	1	LPC *

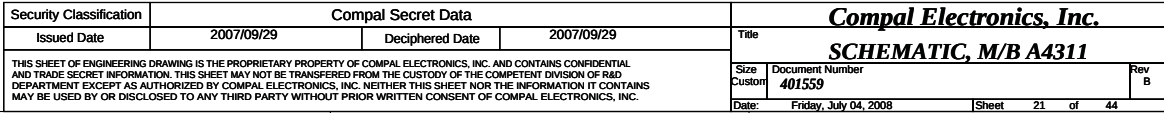


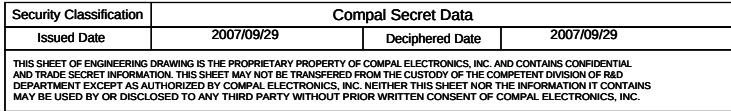
Change 11/15

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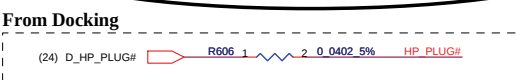
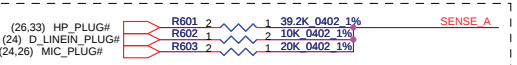
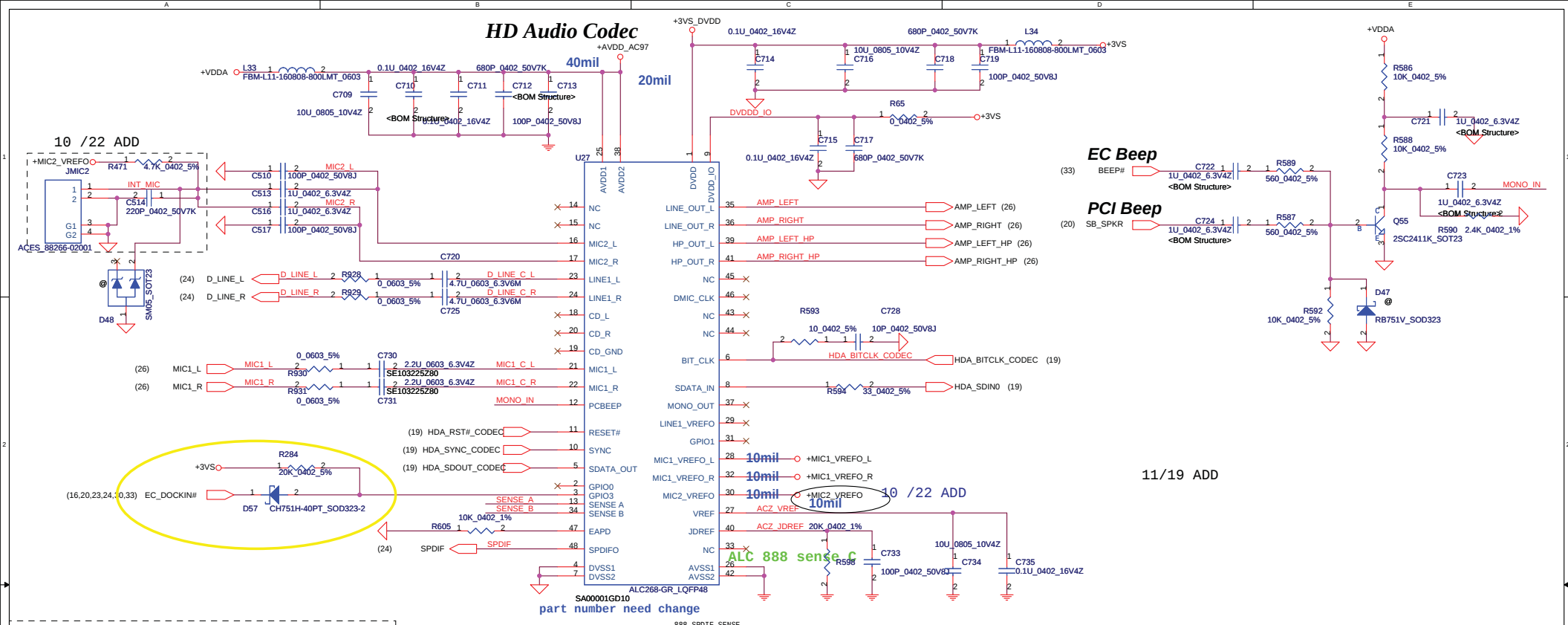






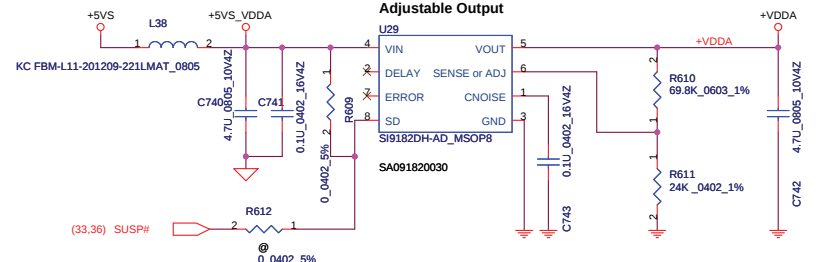


HD Audio Codec

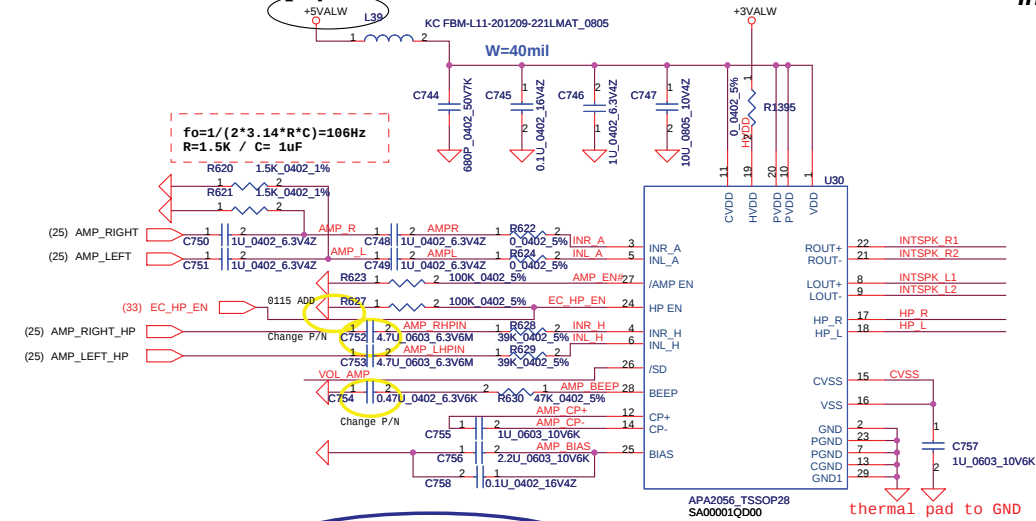


Sense Pin	Impedance	Codec Signals
SENSE A	39.2K	PORT-A (PIN 39, 41)
	20K	PORT-B (PIN 21, 22)
	10K	PORT-C (PIN 23, 24)
	5.1K	PORT-D (PIN 35, 36)
SENSE B	39.2K	PORT-E (PIN 14, 15)
	20K	PORT-F (PIN 16, 17)
	10K	PORT-G (PIN 43, 44)
	5.1K	PORT-H (PIN 45, 46)
SENSE C	39.2K	CD
	20K	1st S/PDIF Out
	10K	2nd S/PDIF Out
	5.1K	S/PDIF-IN

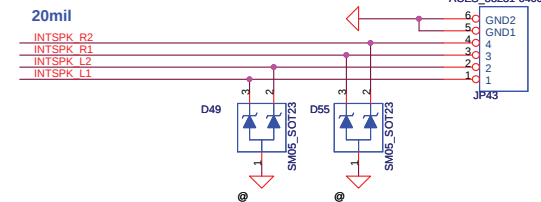
Regulator for CODEC



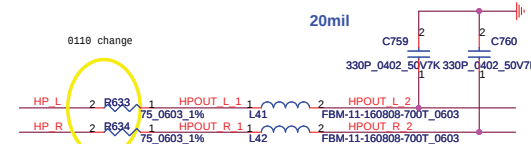
APA2056 SPK/HP Amplifier



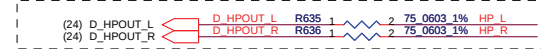
Int. Speaker Conn.



LINE Out/Headphone Out S/PDIF Out JACK



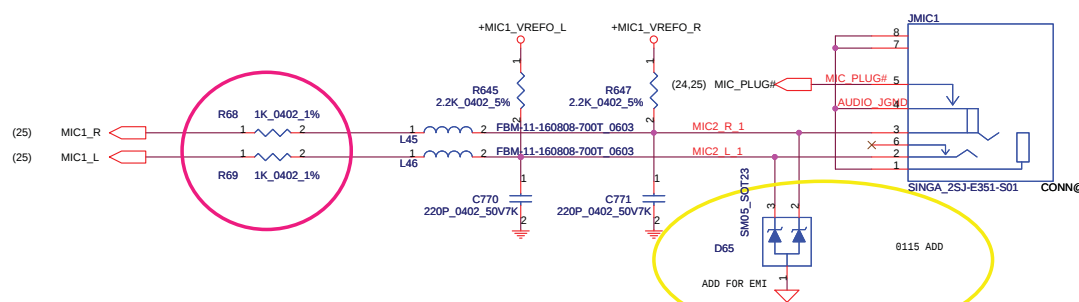
Docking Conn



Docking Conn



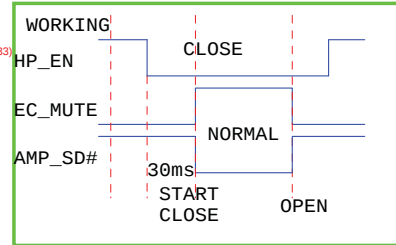
MIC JACK



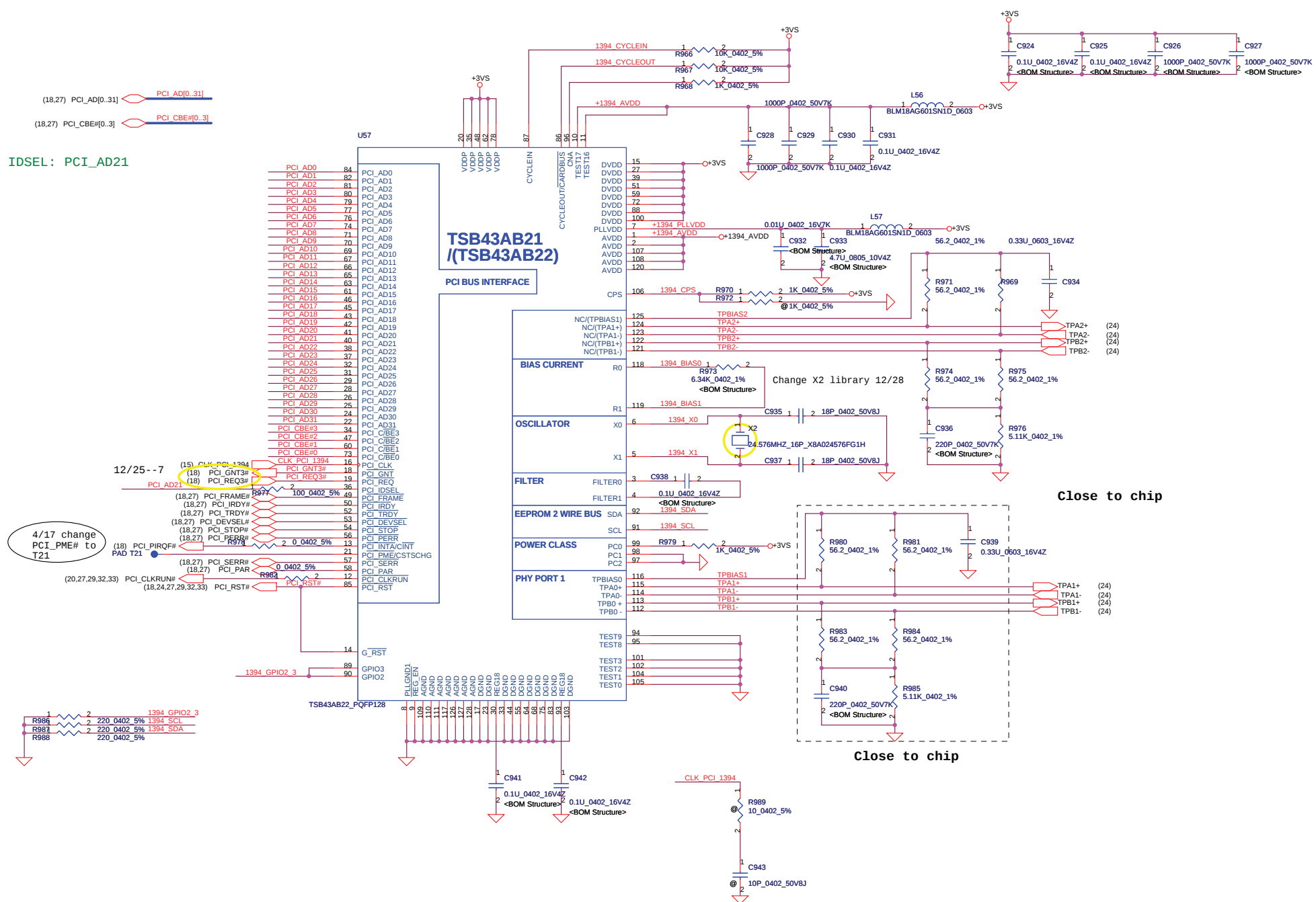
APA2057 gain setting table

gain	V	V(low)	V(high)
8		3.21	3.27
9		3.33	3.39
10		3.45	3.51

(dB) ← current setting(3.48V)



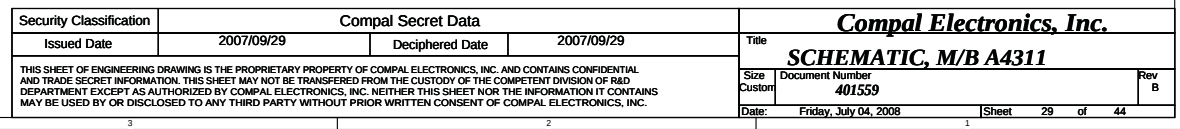
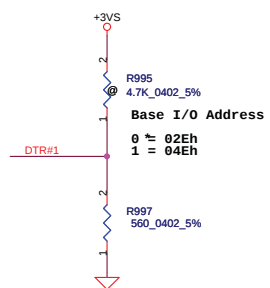
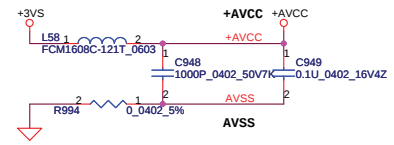
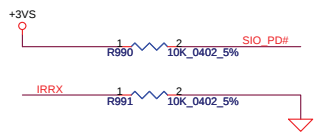
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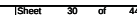


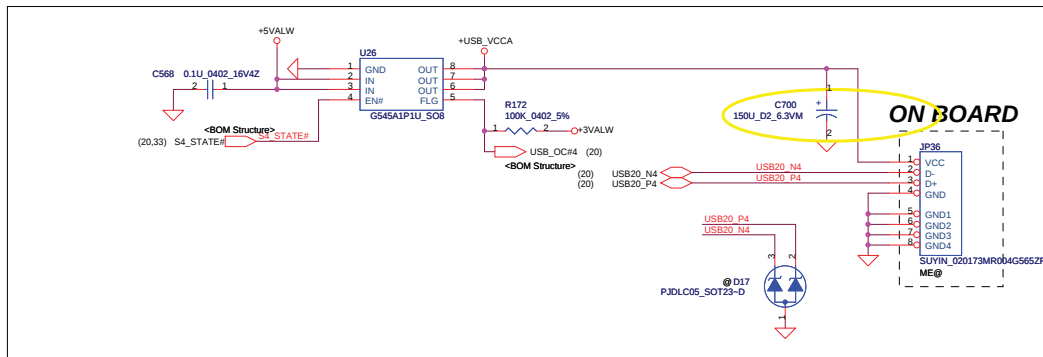
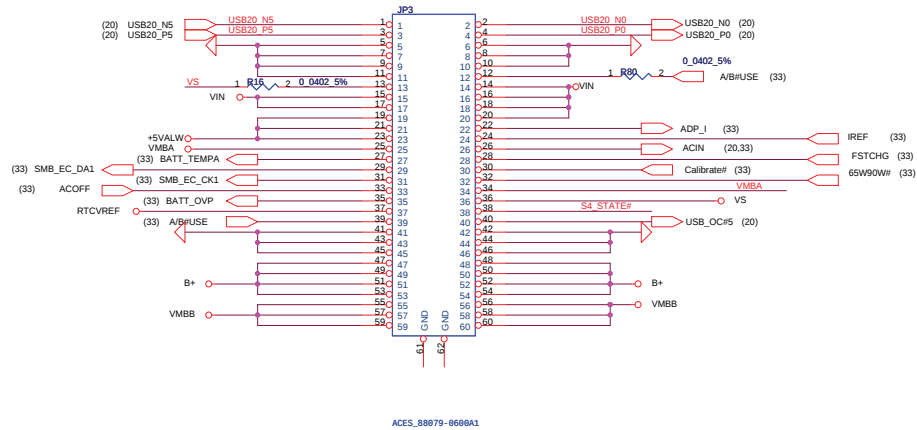
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```
Note for pin 2:  
If needs to support power on from IT8305  
CIR, please connect pin2 for "VSTBY".  
If don't need to support power on from  
IT8305 CIR, please connect pin2 for  
"V33".
```

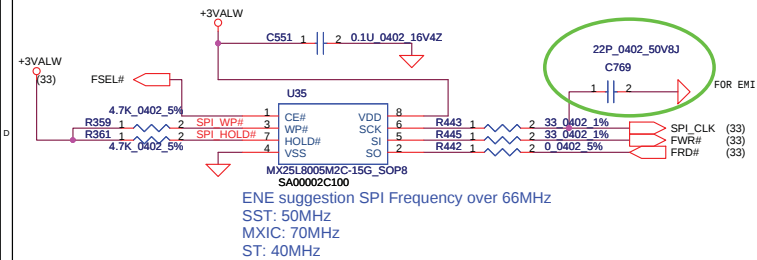
The diagram shows a 4-stage 1-bit shift register. It consists of four identical stages connected in series. Each stage is implemented using a 74VHC00 (NAND gate) and a 74VHC14 (inverter). The input of each stage is connected to the output of the previous stage. The output of the fourth stage is connected to the input of the first stage, forming a loop. The circuit is powered by a +3VS supply and a ground connection.







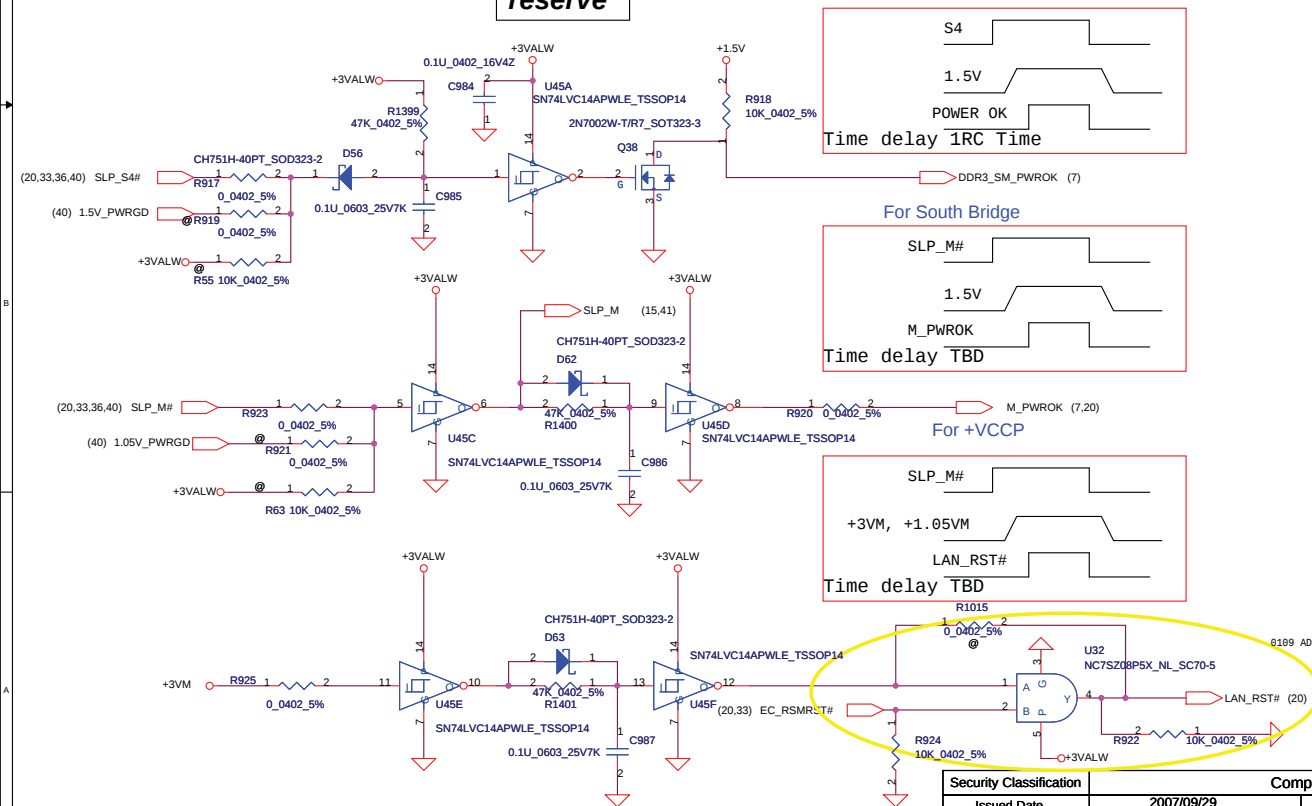
BIOS



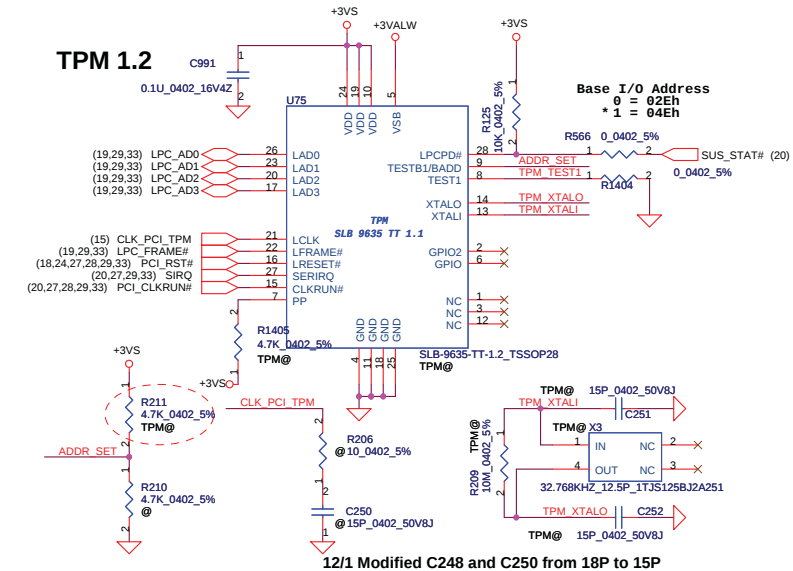
0115 DEL

Power ON Circuit

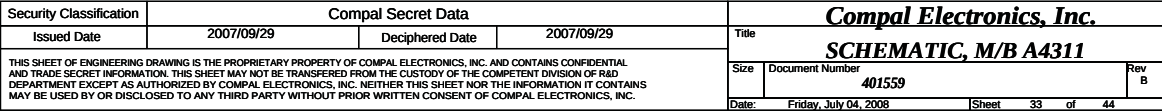
reserve



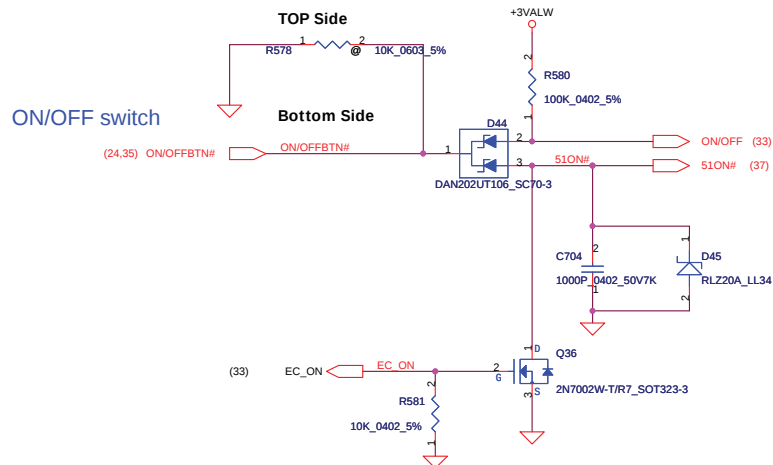
TPM 1.2



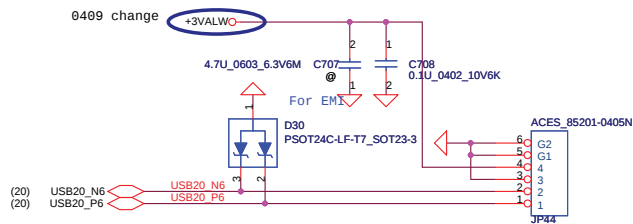
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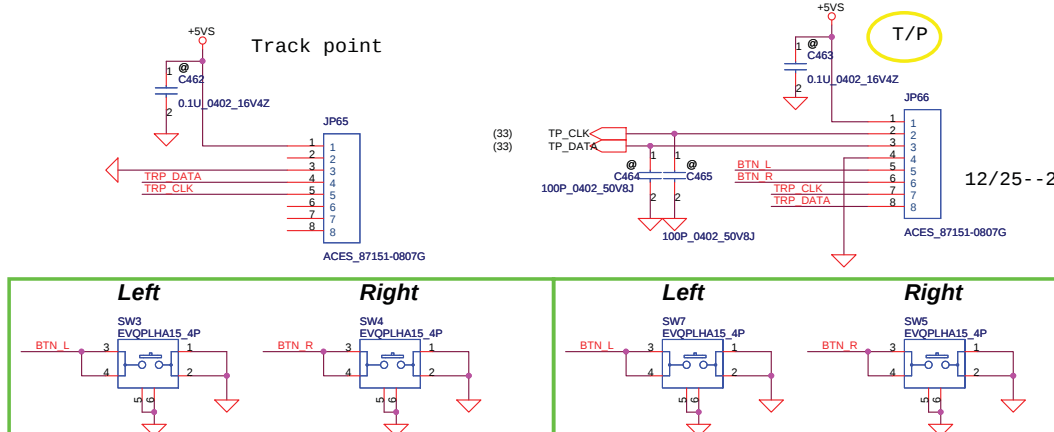
Power Button



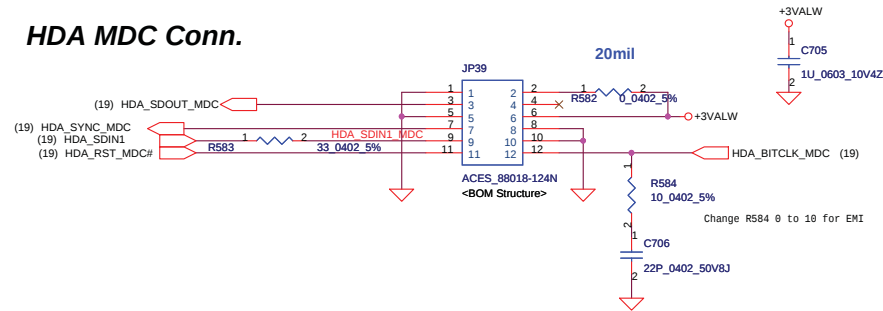
Finger Print Conn



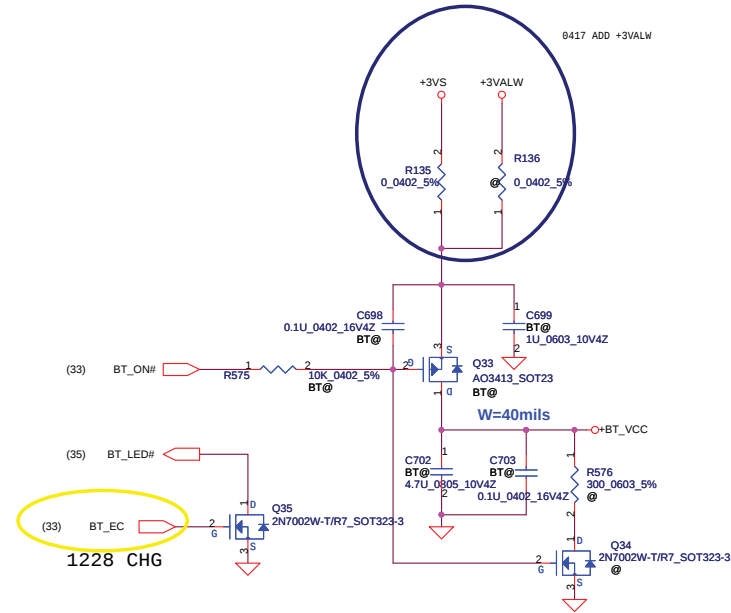
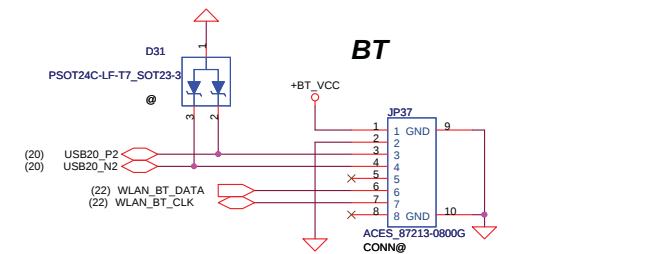
CHECK CONN



HDA MDC Conn.

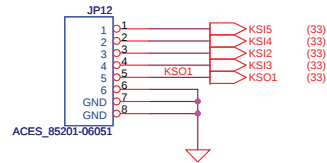


BT



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TO S/W B



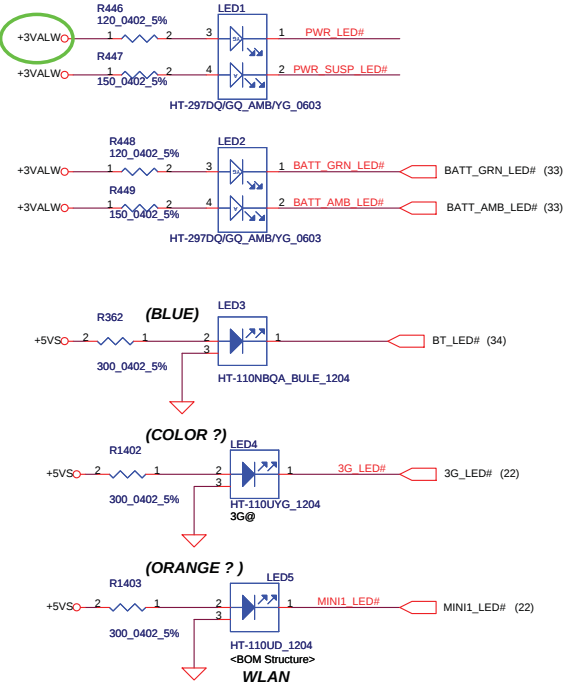
	KSO1	KSO2
KSI2	SYNC_BTN#	EMAIL_BTN#
KSI3	BRIEF_BTN#	PROGRAM_BTN#
KSI4	LOCK_BTN#	IE_BTN#
KSI5	E-KEY_BTN#	
KSI6		3G ON#
KSI7	WL ON#	BT ON#

0103 Change1

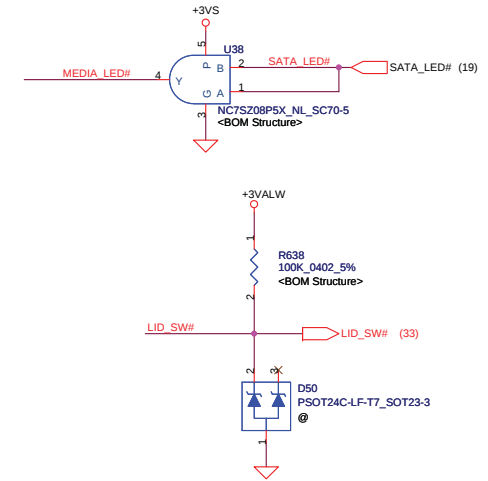
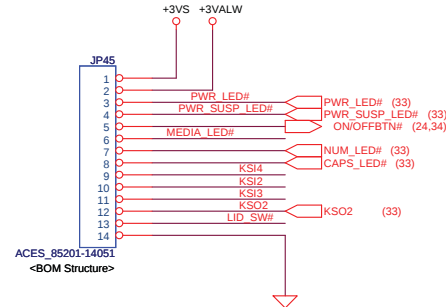
Change +3vs to +3valw

Compal Footprint

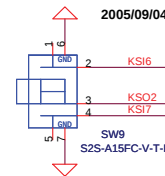
4 2
3 1



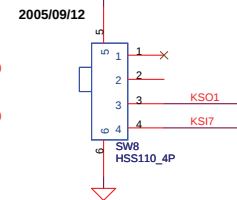
TO POWER BTN/B



BT_SW & 3G_SW



WL_SW

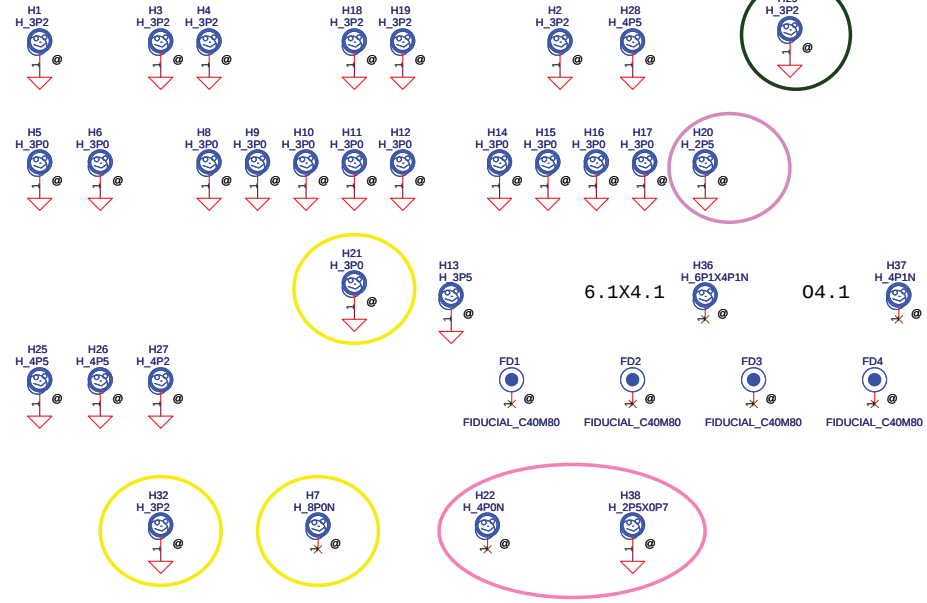


06 03.2

9 X 9 03

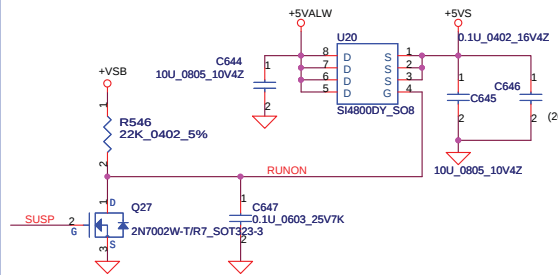
04.2

02.5

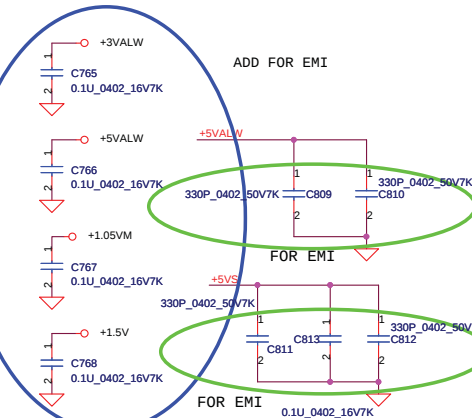
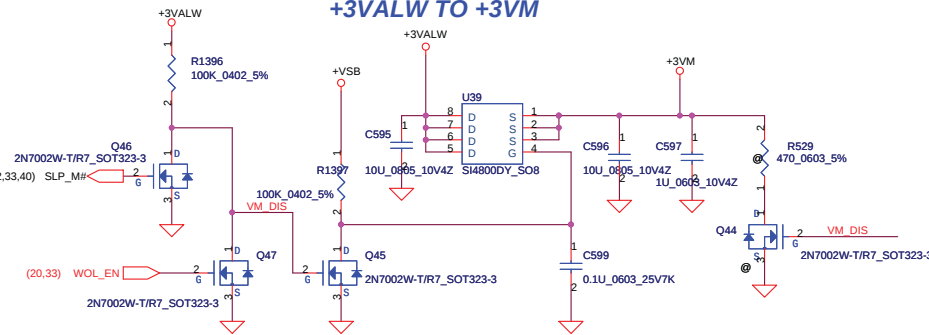


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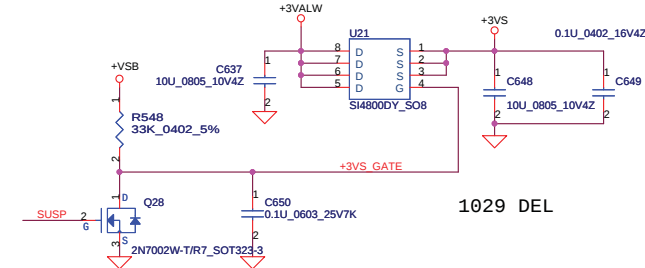
+5VALW to +5VS Transfer



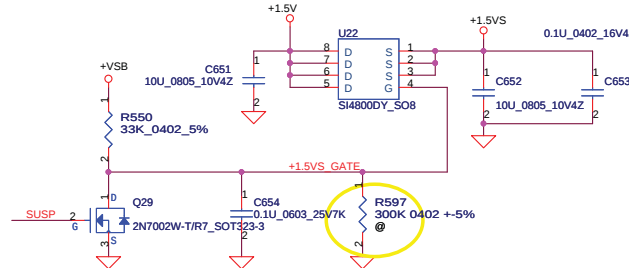
+3VALW TO +3VM



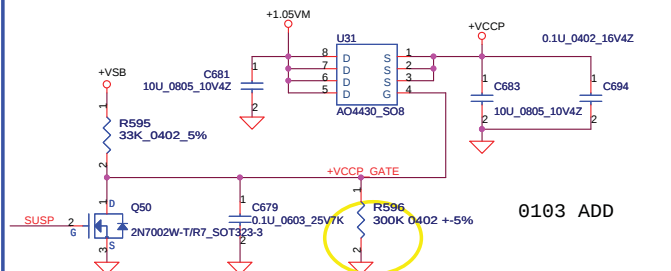
+3VALW to +3VS Transfer



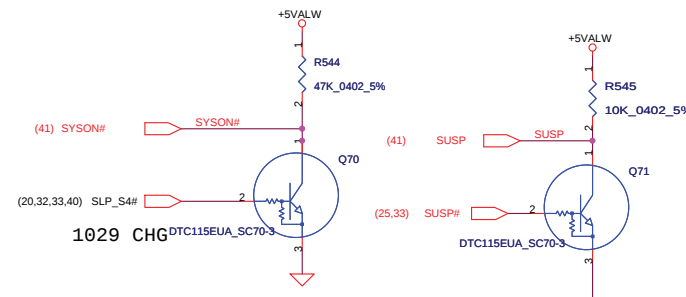
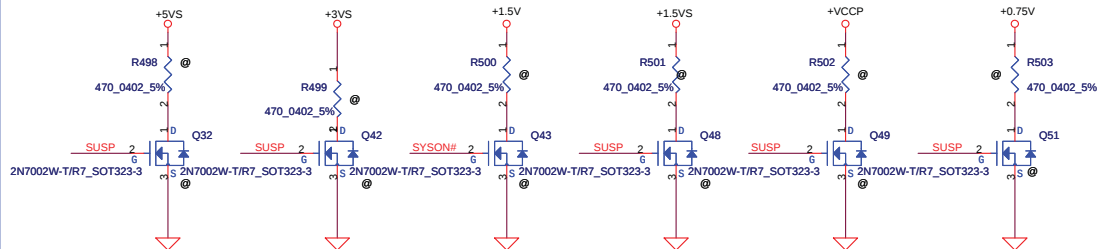
+1.5V to +1.5VS Transfer



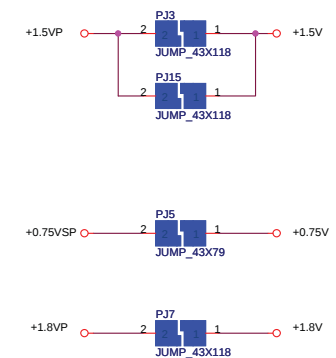
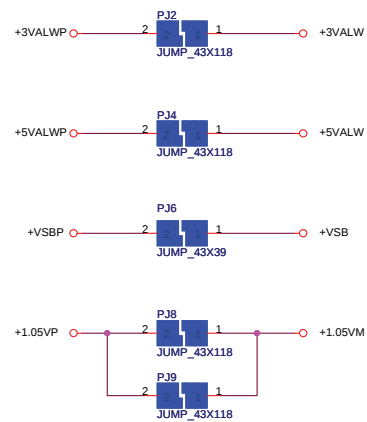
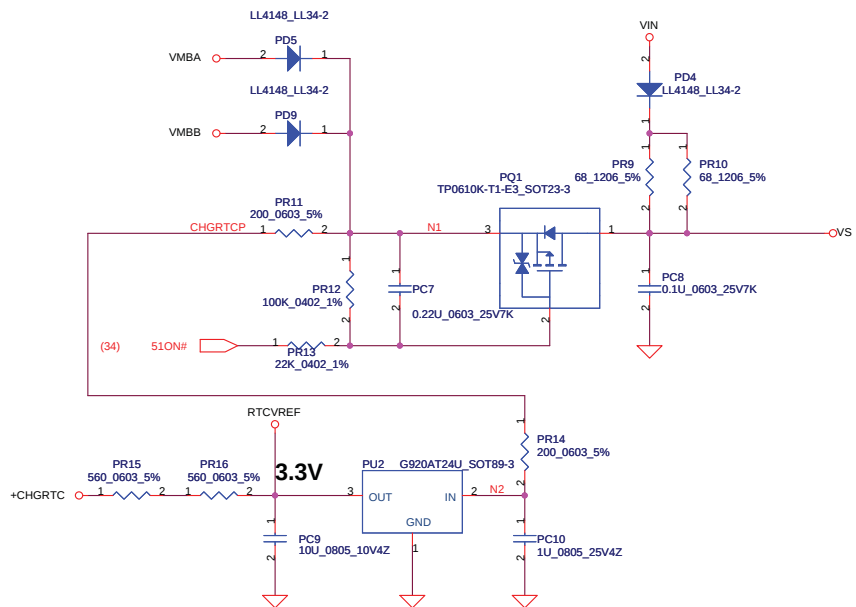
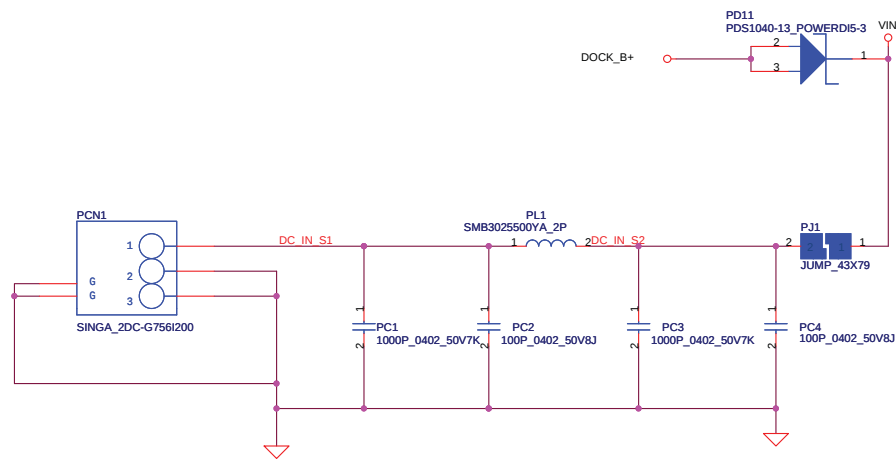
need power confirm +1.05VM to +VCCP Transfer



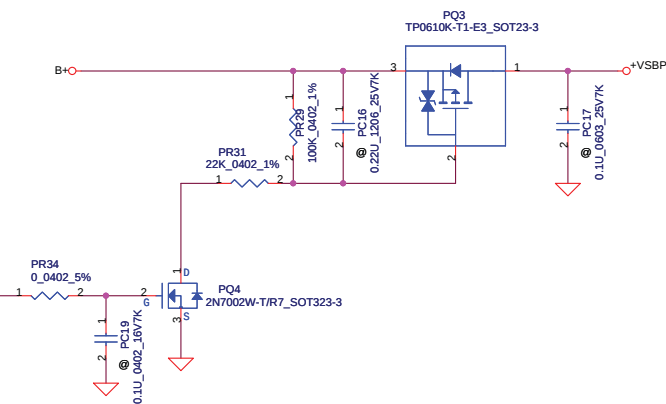
Discharge circuit



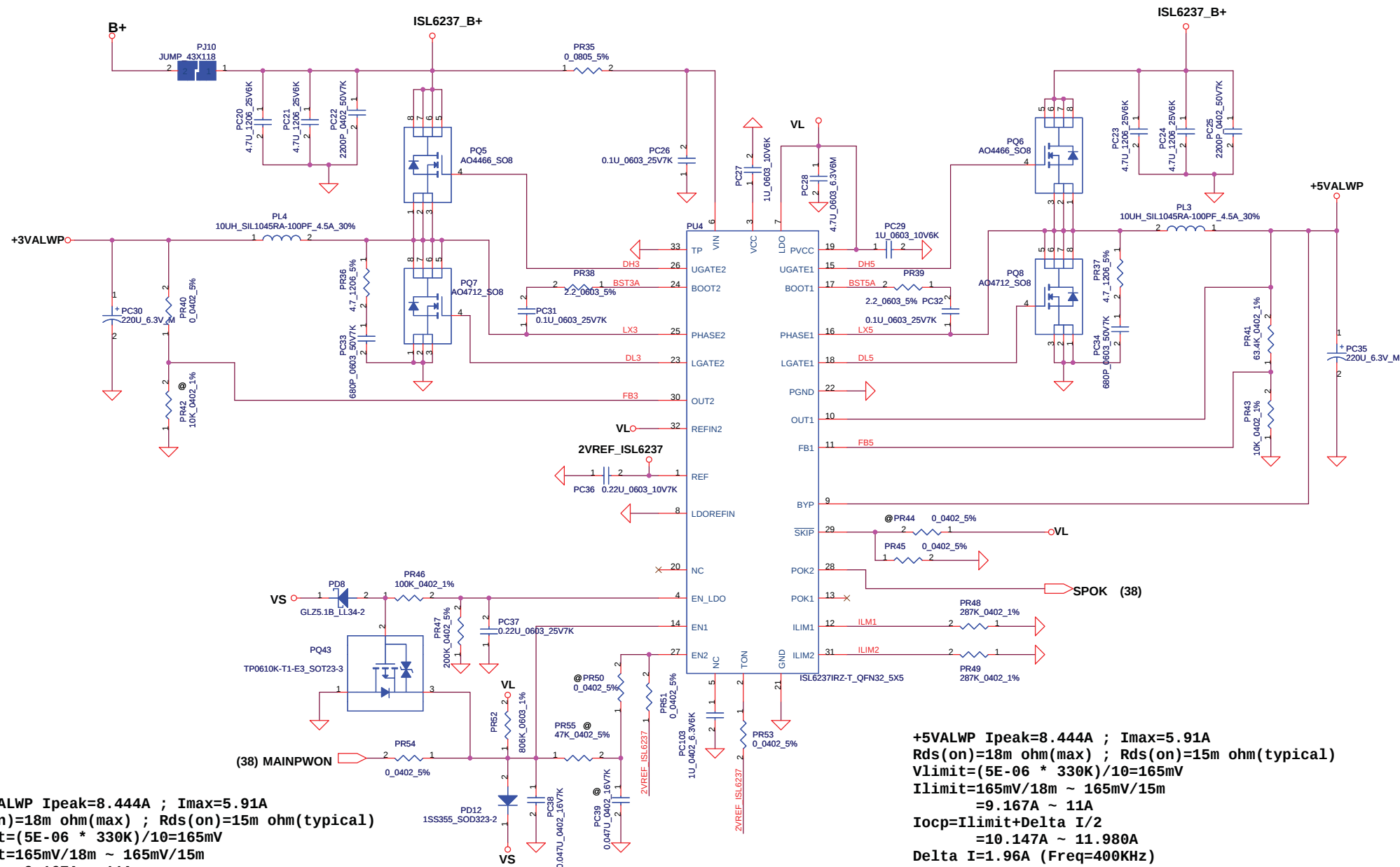
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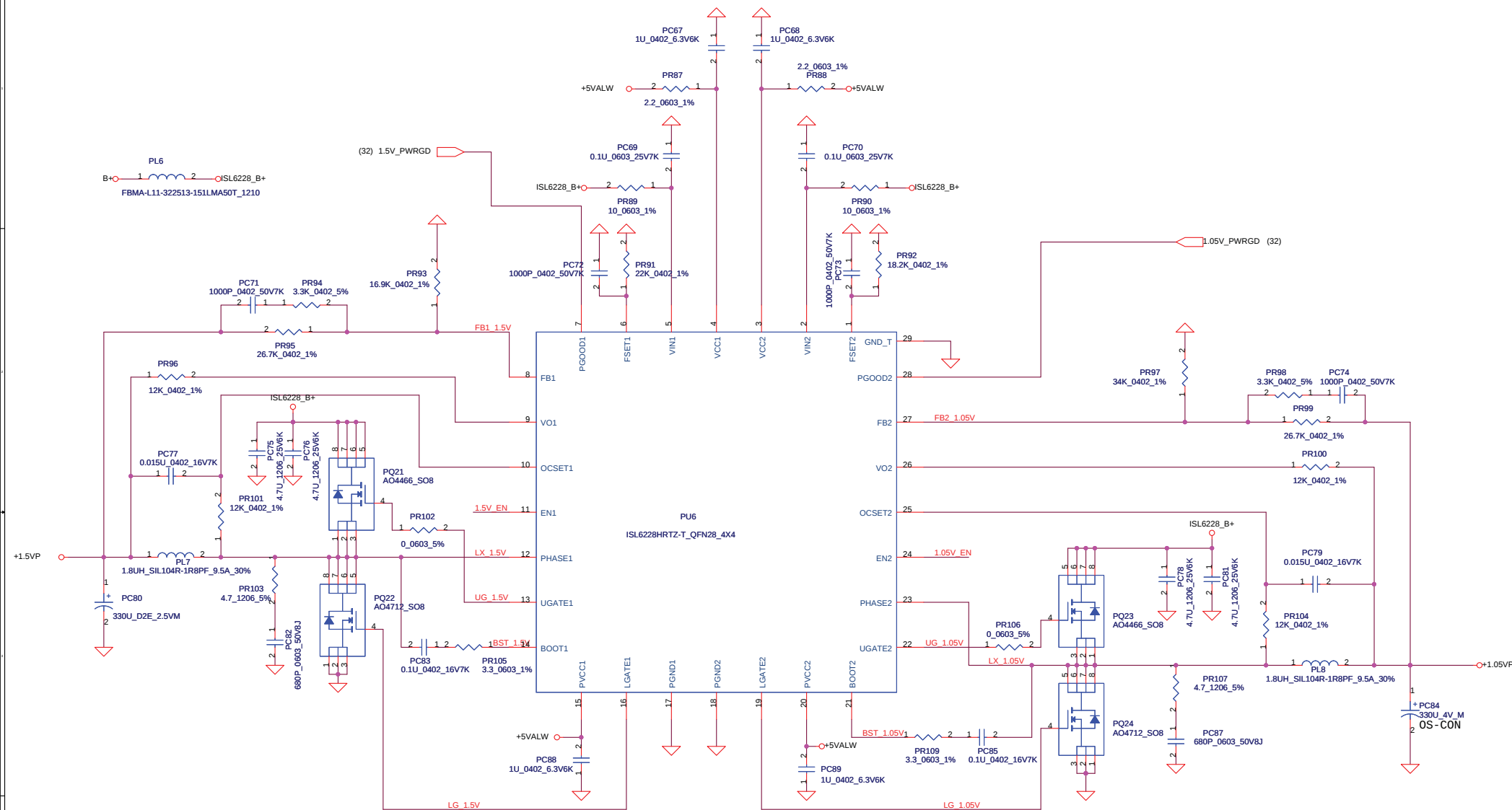
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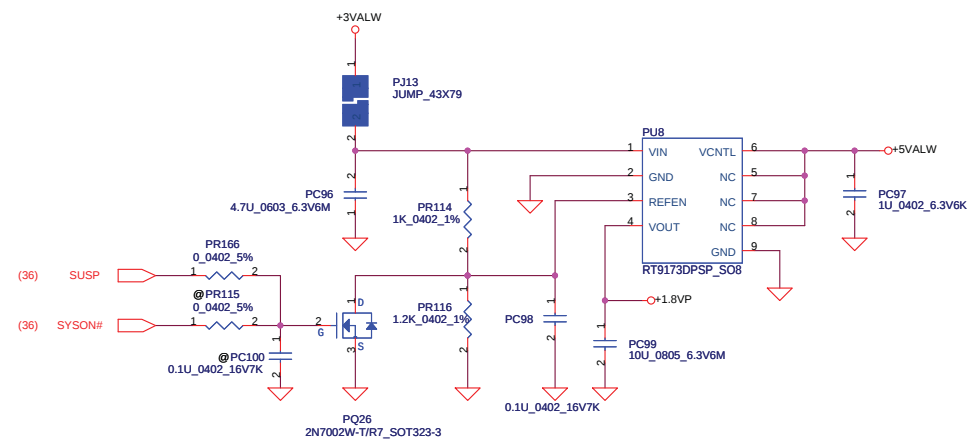
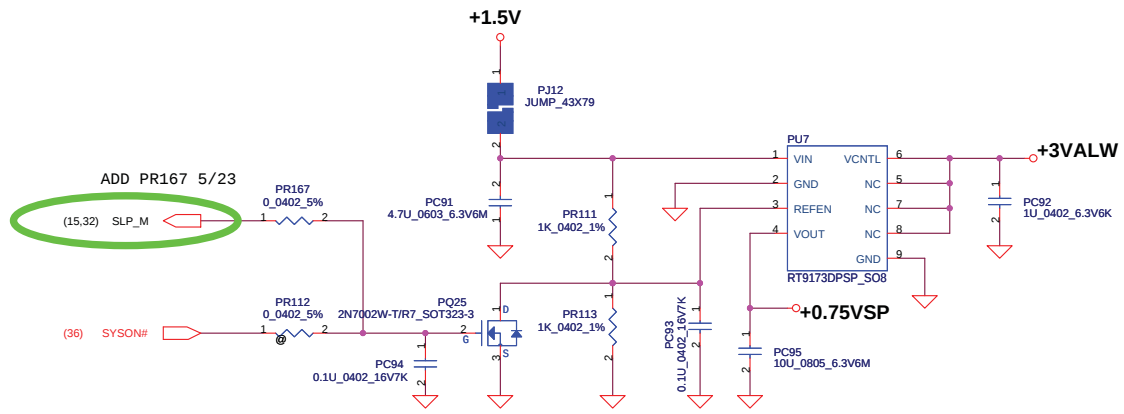
1.5VP Ipeak=9.45A ; Imax=6.615A
 DCR=10m ohm (max)
 $Rocset = (I_{ocp} * DCR) / 10E-06 = 12K \text{ ohm}$
 $I_{ocp} = 12A$
 $C_{sen} = L / (Rocset * DCR) = 0.015uF$

Freq=303KHz
 $Rfset = 1 / (1.5E-10 * Freq) = 22K$

1.05VP Ipeak=8.8A ; Imax=6.16A
 DCR=10m ohm (max)
 $Rocset = (I_{ocp} * DCR) / 10E-06 = 12K \text{ ohm}$
 $I_{ocp} = 12A$
 $C_{sen} = L / (Rocset * DCR) = 0.015uF$

Freq=366KHz
 $Rfset = 1 / (1.5E-10 * Freq) = 18.2K$

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Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
1		For 2nd source of ISL6237		39	Add PC103 SE000000K80(S CER CAP 1U 6.3V K X5R 0402) on Pin5 of PU4 to GND	2007 12/26	EVT
2		For EN function of PU4		39	Add PD12 SC100001K00(S DIO 1SS355 S0D323 T/R-5K)on pin 3 of PQ43 to VS	2007 12/26	EVT
3		Down size		39	Change PC38 from 0603 to 0402(SE076473K80)	2007 12/26	EVT
4		Down size		39	Change PC28 from 0805 to 0603(SE107475M80)	2007 12/26	EVT
5		Down size		37	Change PC7 from 1206 to 0603(SE0000005Z80)	2007 12/26	EVT
6		For more current		37	Change PD11 in SCS00002F00(S SCH DIO PDS1040-13 POWERDI5)	2007 12/26	EVT
7		For more current		37	Change PD1 in SCS00002F00(S SCH DIO PDS1040-13 POWERDI5)	2007 12/26	EVT
8		Down size		41	Change PC91 from 0805 to 0603(SE107475M80)	2007 12/26	EVT
9		Down size		41	Change PC96 from 0805 to 0603(SE107475M80)	2007 12/26	EVT
10		Down size		41	Change PC92 from 0603 to 0402(SE000000K80)	2007 12/26	EVT
11		Down size		41	Change PC97 from 0603 to 0402(SE000000K80)	2007 12/26	EVT
12		Down size		42	Change PC110 from 0603 to 0402(SE000000K80)	2007 12/26	EVT
13		Down size		42	Change PC112 from 0603 to 0402(SE074681K80)	2007 12/26	EVT
14		Down size		42	Change PC121 from 0603 to 0402(SE074681K80)	2007 12/26	EVT
15		Down size		42	Change PC128 from 0603 to 0402(SE0000003W00)	2007 12/26	EVT
16		Down size		38	Change PC14 from 0805 to 0603(SE026224K80)	2007 12/26	EVT
17		Down size		38	Change PC18 from 0805 to 0603(SE026224K80)	2007 12/26	EVT
18		Sourcer request		40	Change PC71、PC74 from NP0 to X7R (SE074102K80)	2008 01/14	EVT
19		DFX		37	Delete PD1	2008 01/14	EVT
20		OCP adjust		39	Change PL3、PL4 from 4.7uH to 10uH (SH0000002L80)	2008 01/14	EVT
21		OCP adjust		39	Change PR48、PR49 from 330K to 287K (SD0000005D80)	2008 01/14	EVT
22	HW request	Set 1.5V==>1.54V, 1.05V==>1.07V		40	Change PR95、PR99 from 25.5K to 26.7K (SD034267280)	2008 01/14	EVT
23	HW request	Set 5V==>5.138V		39	Change PR41 from 61.9K to 63.4K (SD03463K280)	2008 04/17	DVT

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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
24	Thermal request	Change protect point from 92 to 86 degree C		38	Change PR22 from 15.4K to 16.9K (SD034169280)	2008 04/17	DVT
25		3G EMI request			Delete PR36、PR37、PR103、PR107、PC33、PC34、PC82、PC87 "@" mark	2008 04/22	DVT
26					Change PR105、PR109、PR130、PR144 from 0 to 2.2		
27		3G EMI request		40	Change PR105、PR109 from 2.2 to 3.3	2008 05/21	PVT
28	EPA power	HW request		41	Add PR167, mark "@" PR112	2008 05/27	PVT
29		EMI request		37	Delete PJ4, add PL12 (SM010020720)	2008 05/27	PVT
30		3G EMI request		39	Change PR38、PR39 from 0 to 2.2	2008 05/29	PVT
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Size	Document Number	Rev
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