

# Compal Confidential

## HGW51 Schematics Document

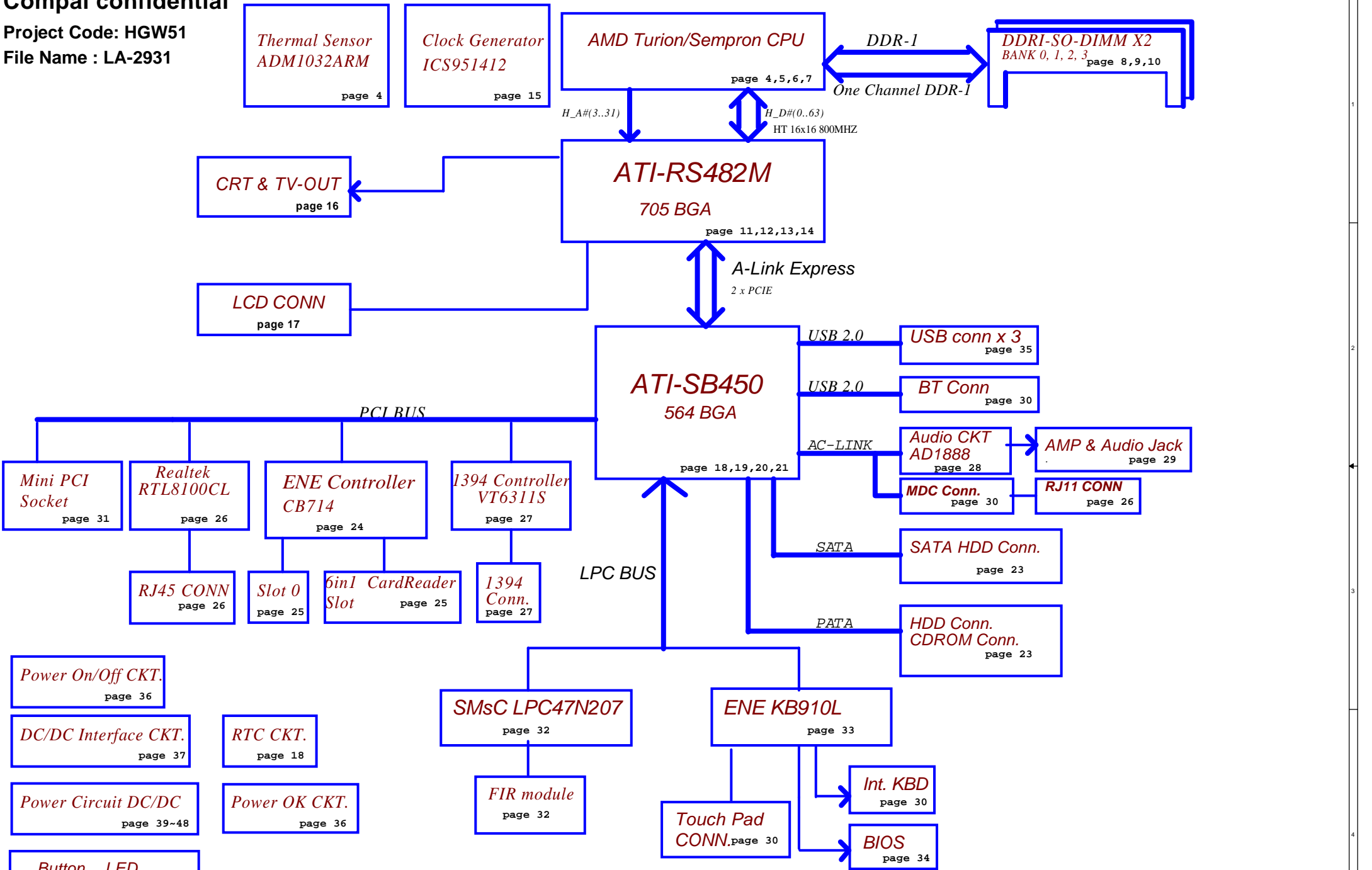
AMD/Sempron/ATI RS482M/SB450

2005 / 08 / 18 Rev:0.3 For C test

Security Classification	Compal Secret Data			Title	
Issued Date	2005/05/09	Deciphered Date	2006/03/08	Cover Sheet	
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				Custom	LA-2931
				Date:	Thursday, August 18, 2005
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**Compal confidential**

Project Code: HGW51  
File Name : LA-2931



Security Classification	Compal Secret Data		Title	
Issued Date	2005/05/09	Deciphered Date	2006/03/08	Block Diagrams
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### Voltage Rails

Power Plane	Description	S1	S3	S4/ 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
+1.05VS	1.05V switched power rail	ON	OFF	OFF
+DDRVTT	0.9V switched power rail for DDR terminator	ON	OFF	OFF
+1.5VALW	1.5V always on power rail	ON	ON	ON*
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+1.8VS	1.8V switched power rail	ON	OFF	OFF
+DDRVCC	1.8V power rail for DDR	ON	ON	OFF
+2.5VS	2.5V switched power rail	ON	OFF	OFF
+3VALW	3.3V always on power rail	ON	ON	ON*
+3V	3.3V power rail	ON	ON	OFF
+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
+5VMOD	5V switched power rail for Module Bay	ON	OFF	OFF
+12VALW	12V 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
CardBus	AD20	2	PIRQE/PIRQH
1394	AD16	0	PIRQE
SD	AD20	2	PIRQE/PIRQH
Mini-PCI	AD18	1	PIRQF
LAN	AD22	3	PIRQG

### EC SM Bus1 address

Device	Address	Device	Address
Smart Battery	0001 011X b	ADM1032	1001 110X b
EEPROM(24C16/02)	1010 000X b		
(24C04)	1011 000Xb		

### EC SM Bus2 address

### SB450 SM Bus address

Device	Address
Clock Generator (ICS 951412AGT)	1101 001Xb
DDR# DIMM0	1001 000Xb
DDR# DIMM2	1001 010Xb

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 for AD channel

Vcc	3.3V +/- 5%			
Ra / Rc	100K +/- 5%			
Board ID	Rb / Rd	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	
3	
4	
5	
6	
7	

### BTO Option Table

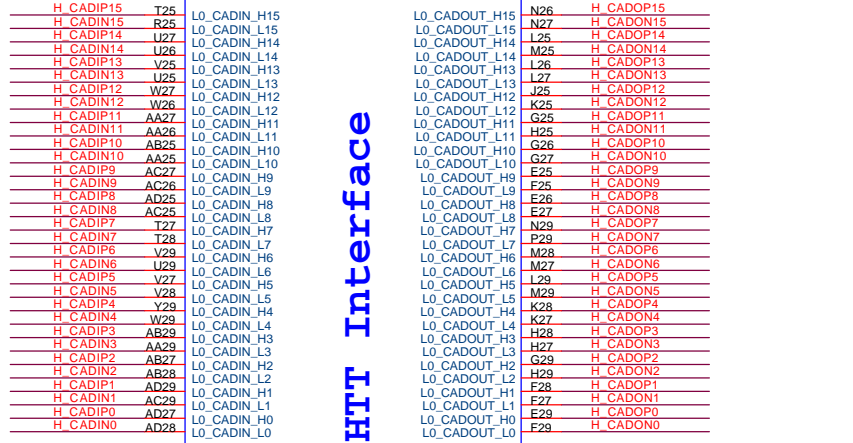
BTO Item	BOM Structure

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 <11> H\_CADIN[0..15] H\_CADIN0..15

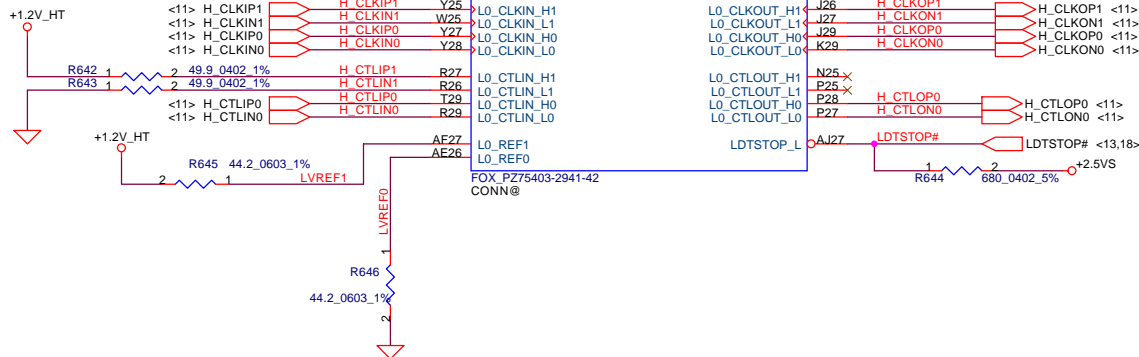
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U50A

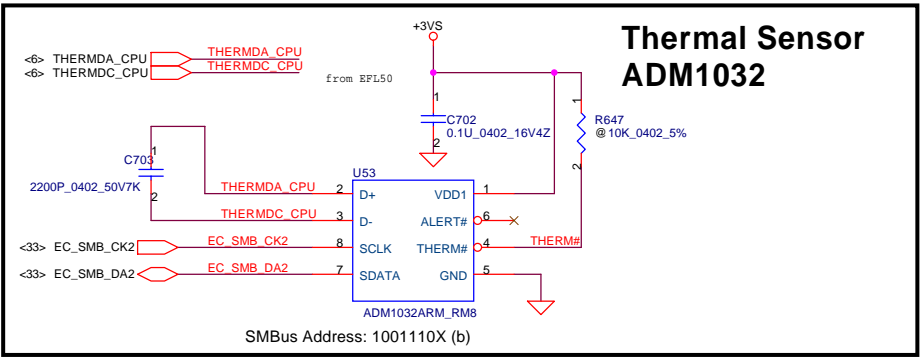
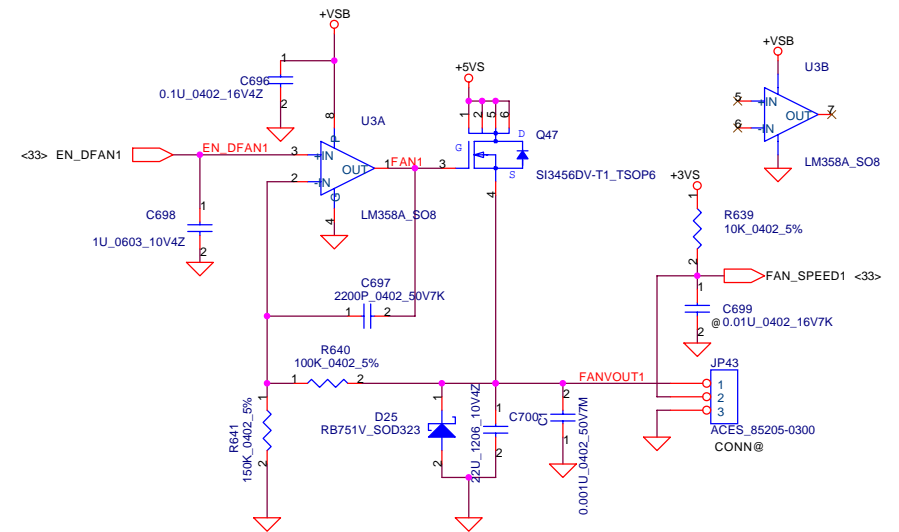
**Claw Hammer-DTR**



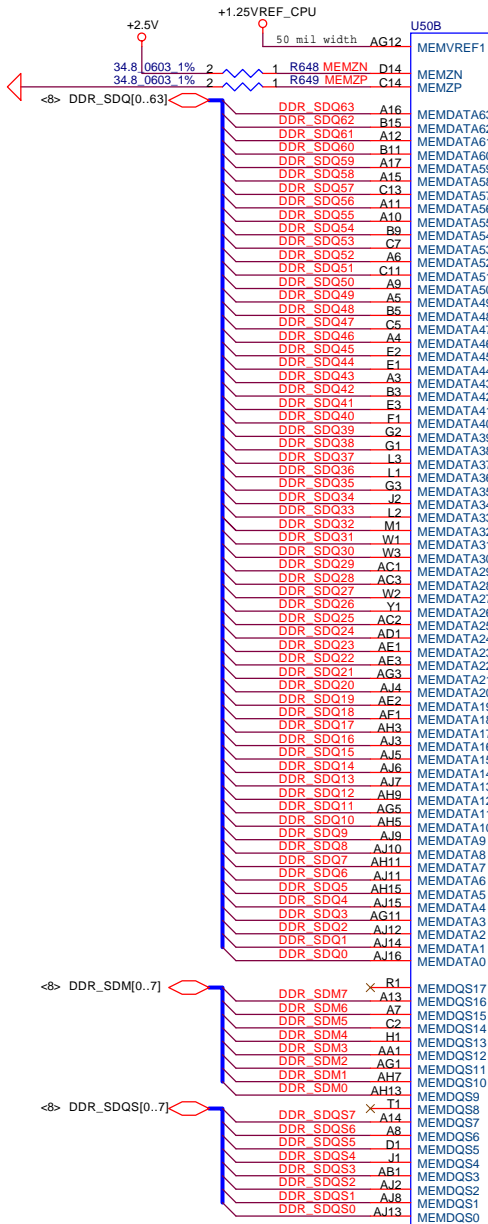
**HTT Interface**



**FAN Conn**



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Issued Date	2005/05/09	Deciphered Date	2006/03/11	Claw Hammer CPU (Host Bus)	
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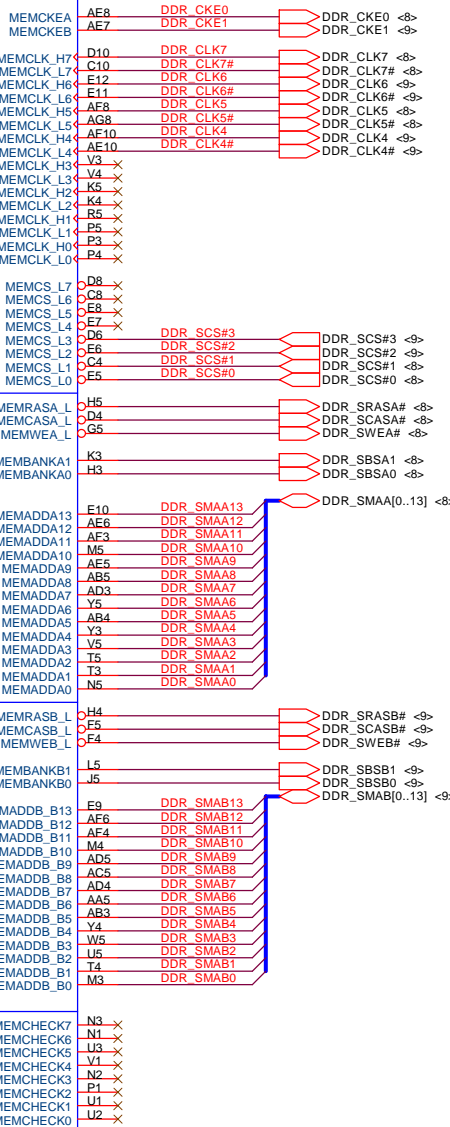


**Claw Hammer-DTR**

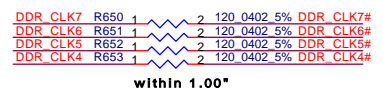
**DDR Memory**

**A CHANGE ADDRESS**

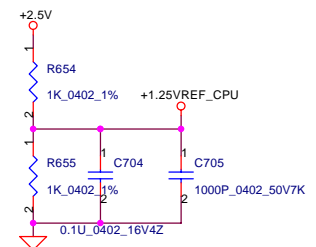
**B CHANGE ADDRESS**



DDR\_CLK5/5# & DDR\_CLK7/7#  
route to nearest DIMM  
DDR\_CLK4/4# & DDR\_CLK6/6#  
route to farthest DIMM

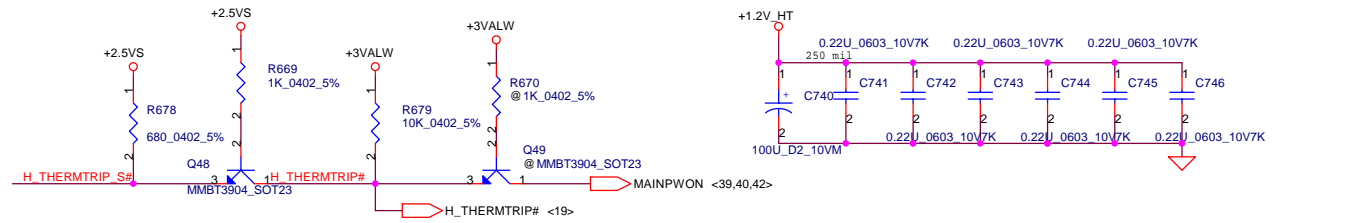
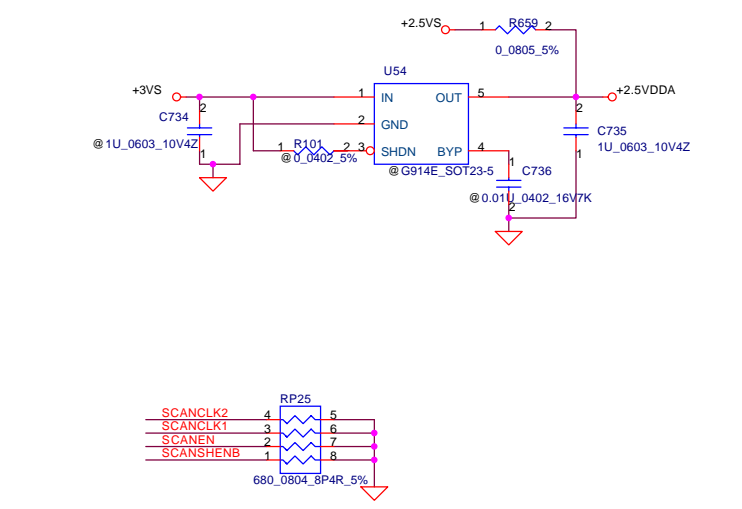
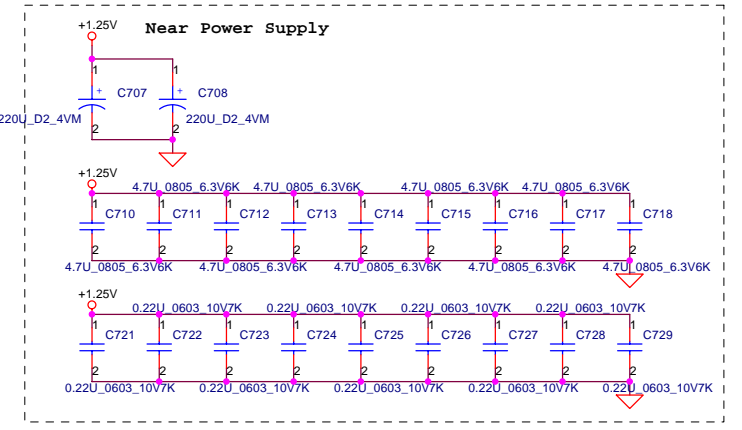
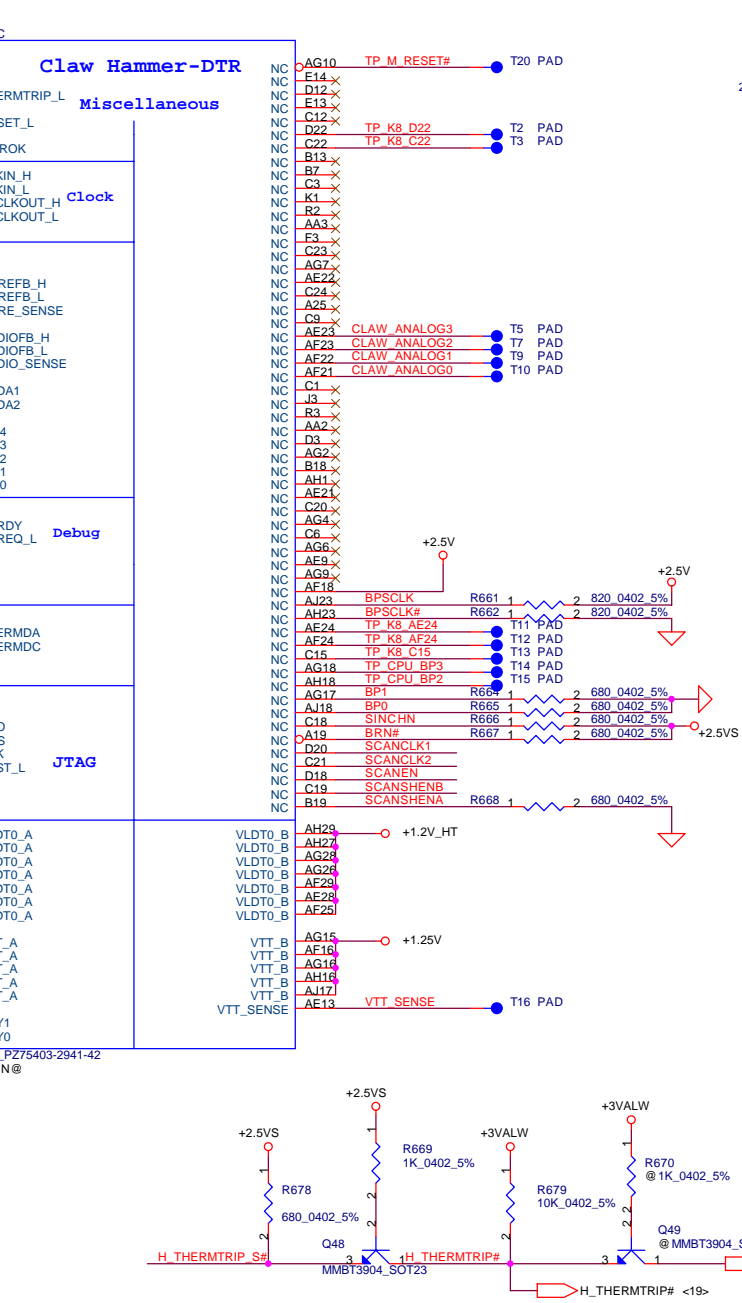
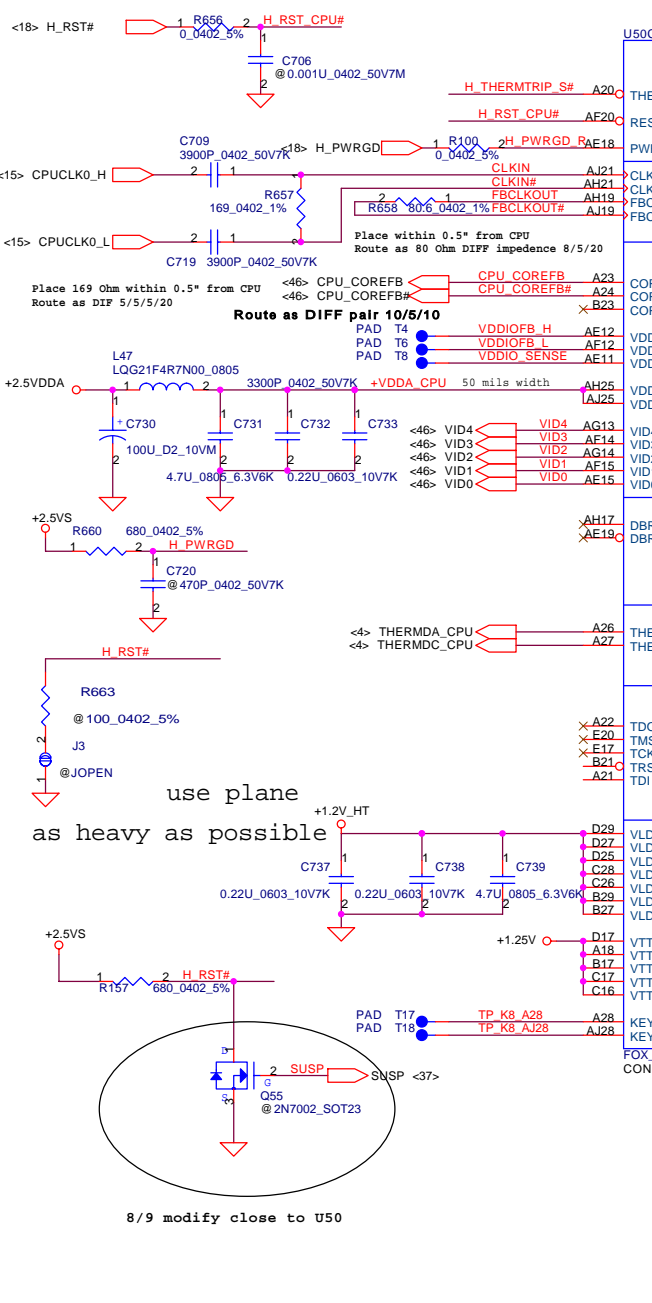


within 1.00"



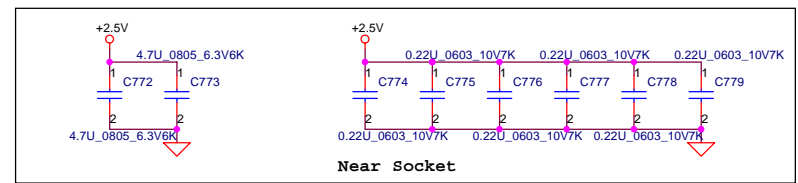
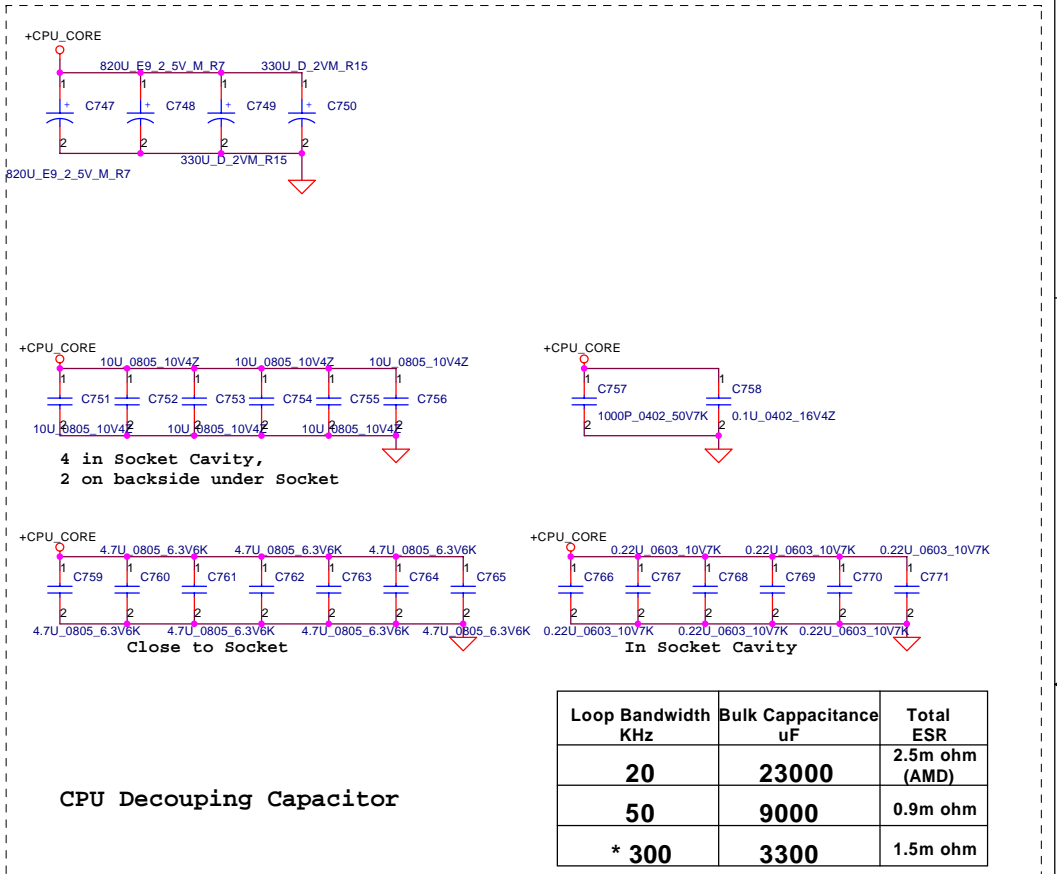
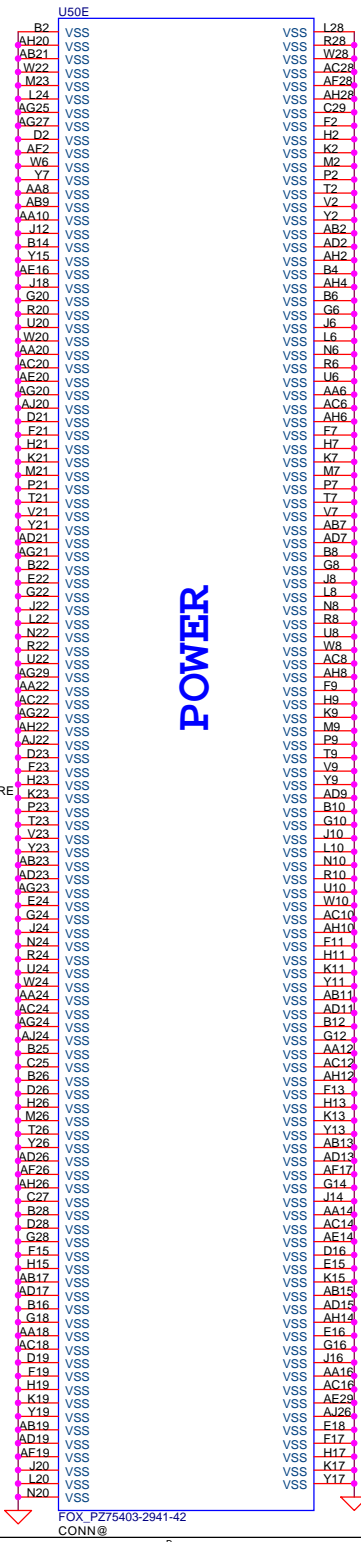
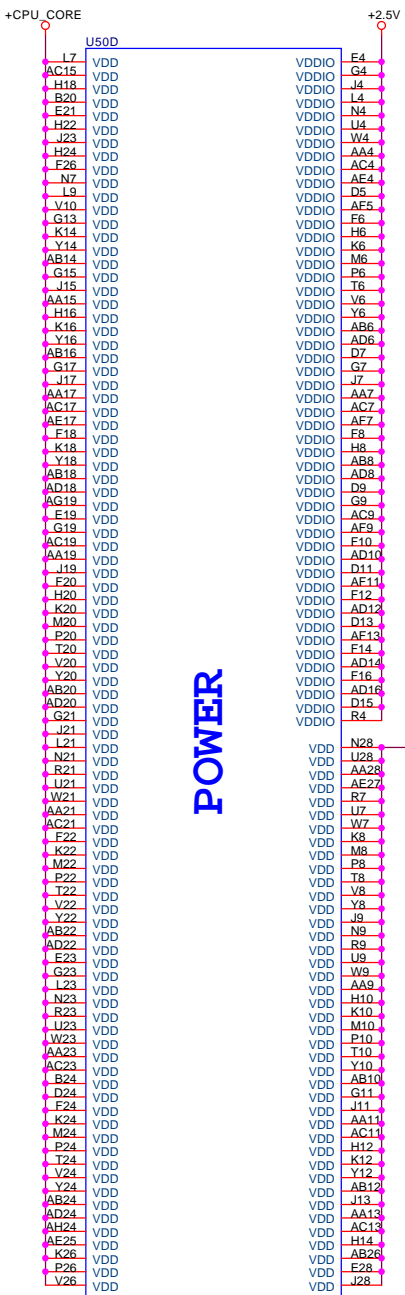
FOX\_PZ75403-2941-42  
CONN@

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Issued Date	2005/03/01	Deciphered Date	2006/03/11	Claw Hammer (Memory Bus)	
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8/9 modify close to U50

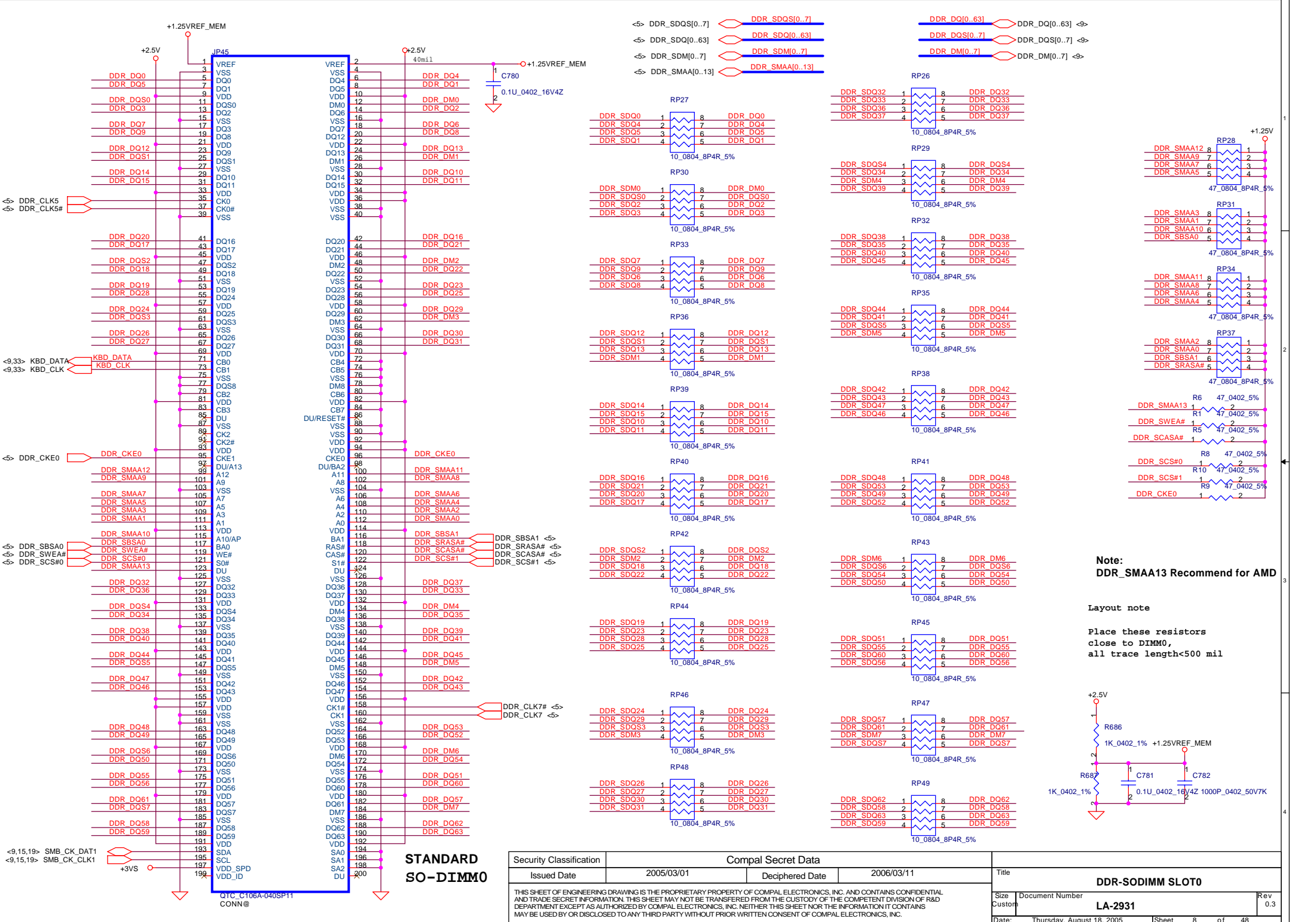
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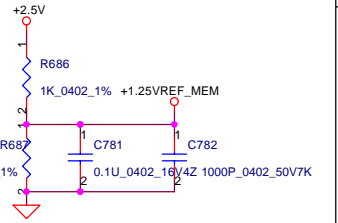
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Issued Date	2005/03/01	Deciphered Date	2006/03/11	Claw Harmer (Power & Ground)	
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**Note:**  
DDR\_SMAA13 Recommend for AMD

**Layout note**  
Place these resistors close to DIMM0, all trace length<500 mil

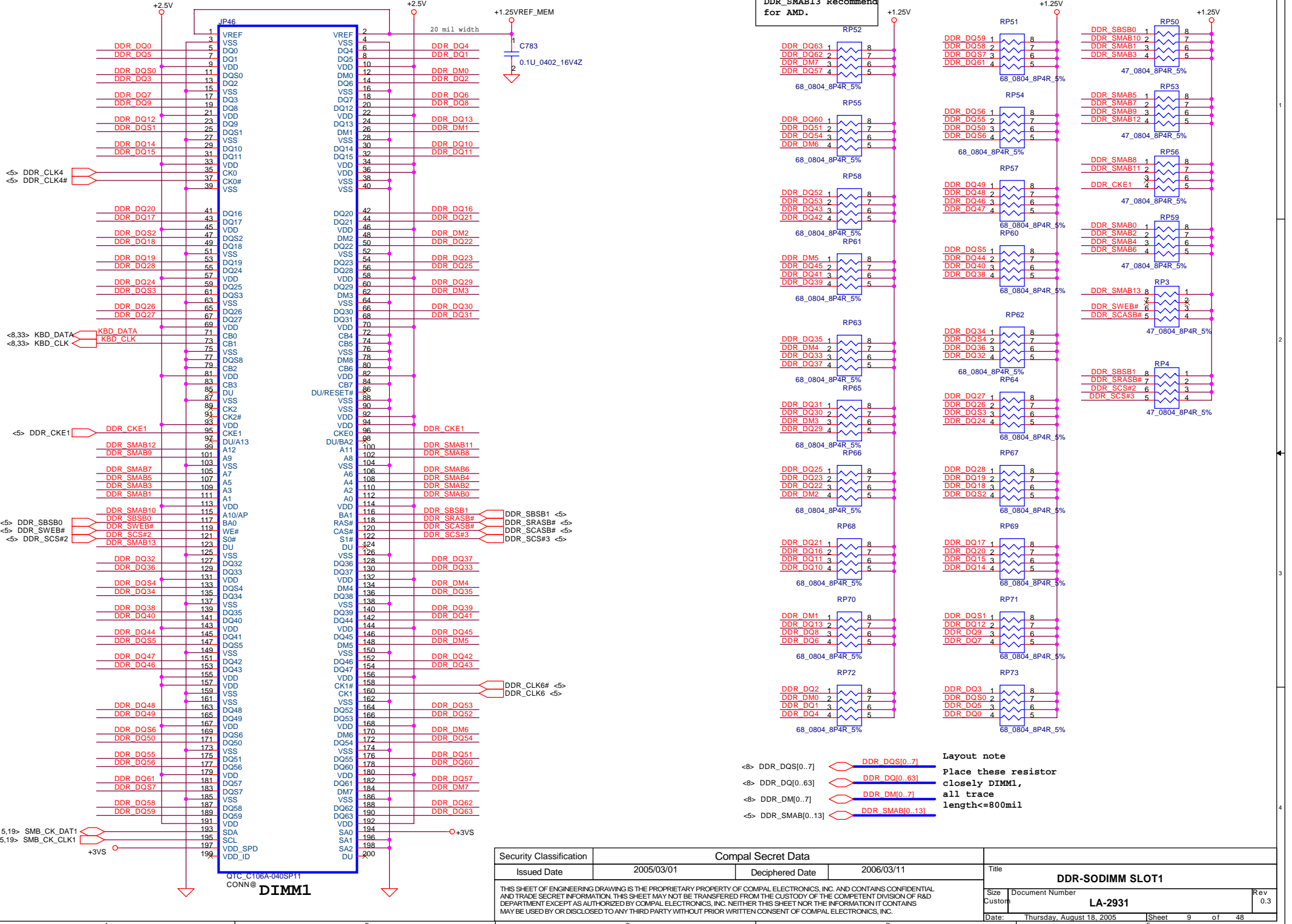


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Issued Date	2005/03/01	Deciphered Date	2006/03/11	DDR-SODIMM SLOTO	
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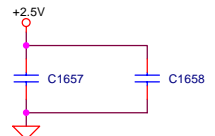
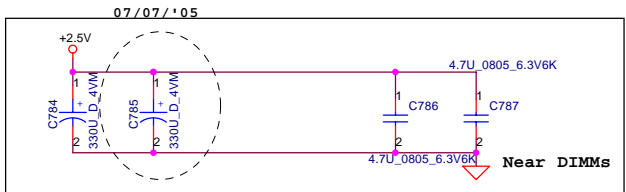
**STANDARD SO-DIMM0**

QTC\_C106A-040SP11  
CONN@





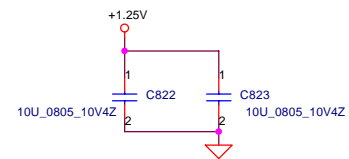
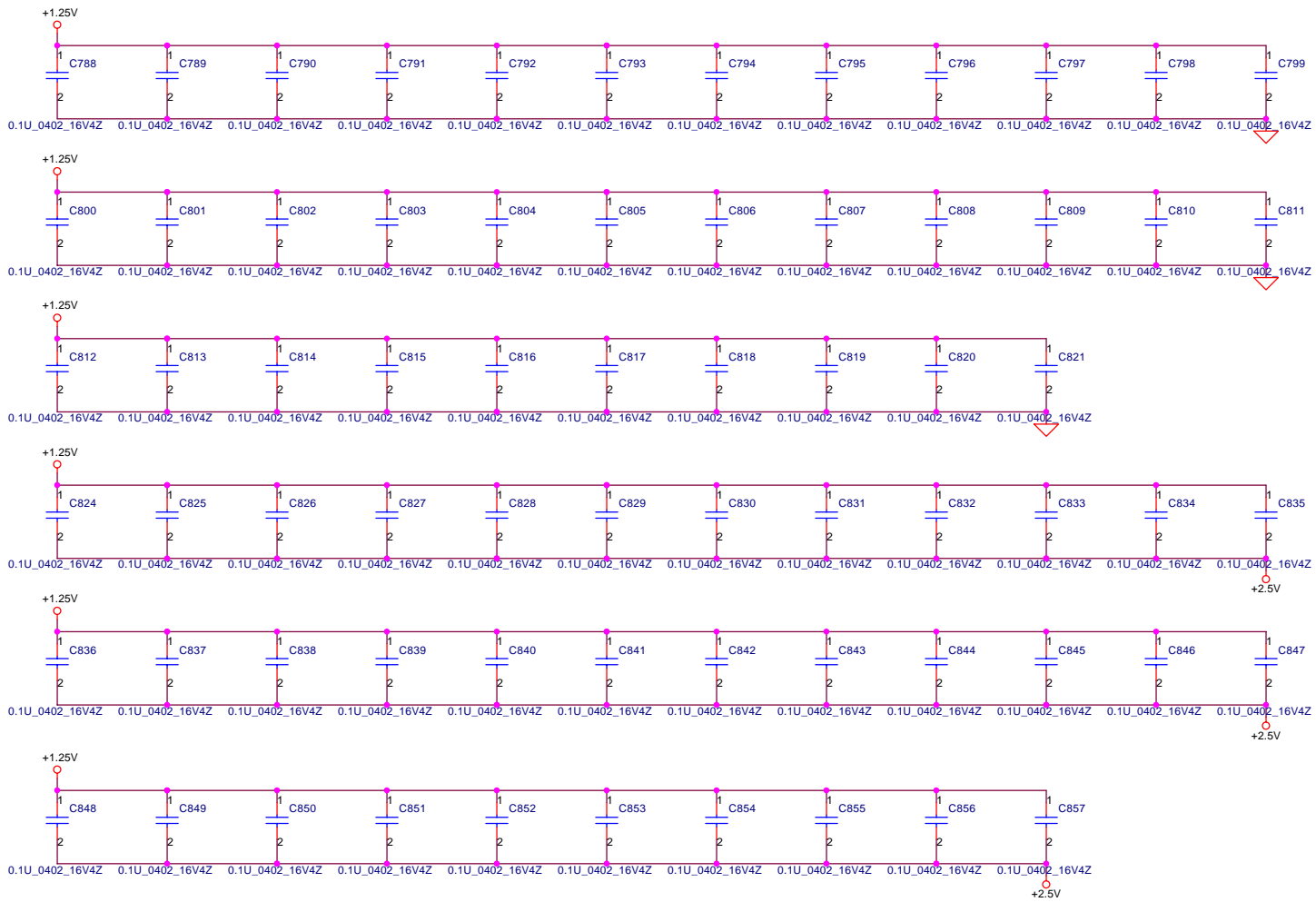
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Issued Date	2005/03/01	Deciphered Date	2006/03/11	DDR-SODIMM SLOT1	
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@ 100P\_0402\_25V8K @ 100P\_0402\_25V8K

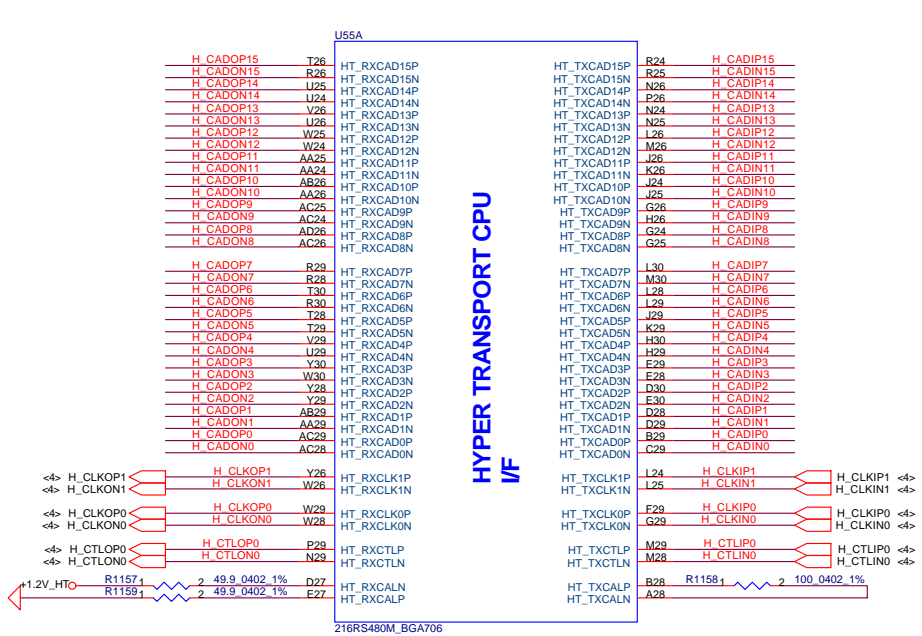
**Layout note :**  
Place one cap close to every 2 pull up resistors termination to +1.25V

**Please Close to DDR\_CLK4/5 via hole**

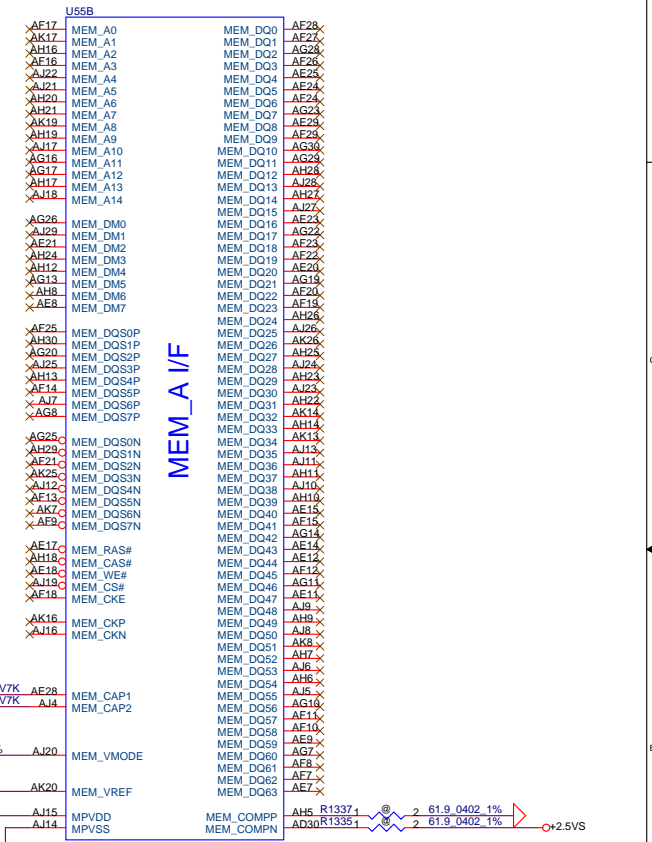


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Issued Date	2005/03/01	Deciphered Date	2006/03/11	DDR SODIMM Decoupling	
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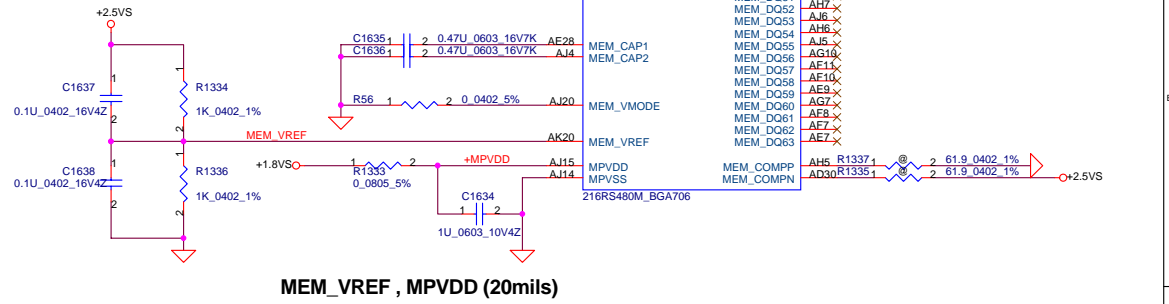
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 <-> H\_CADIN[0..15]    H\_CADIN[0..15]  
 <-> H\_CADOP[0..15]    H\_CADOP[0..15]  
 <-> H\_CADON[0..15]    H\_CADON[0..15]



HYPER TRANSPORT CPU I/F

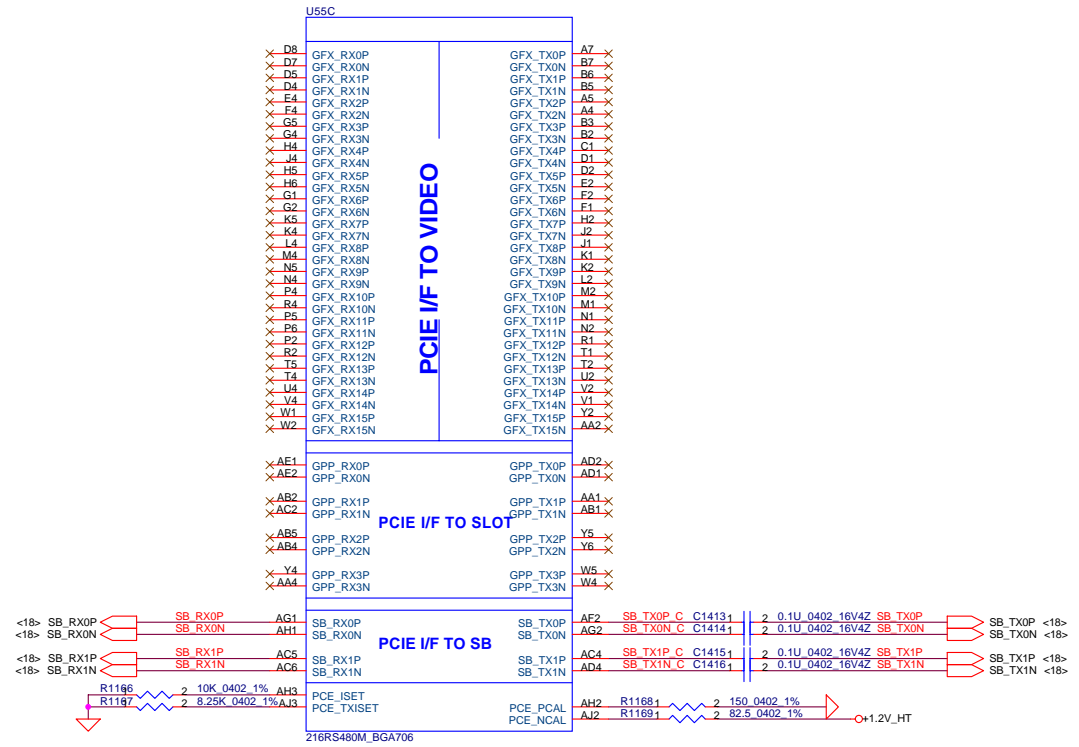


MEM\_A I/F



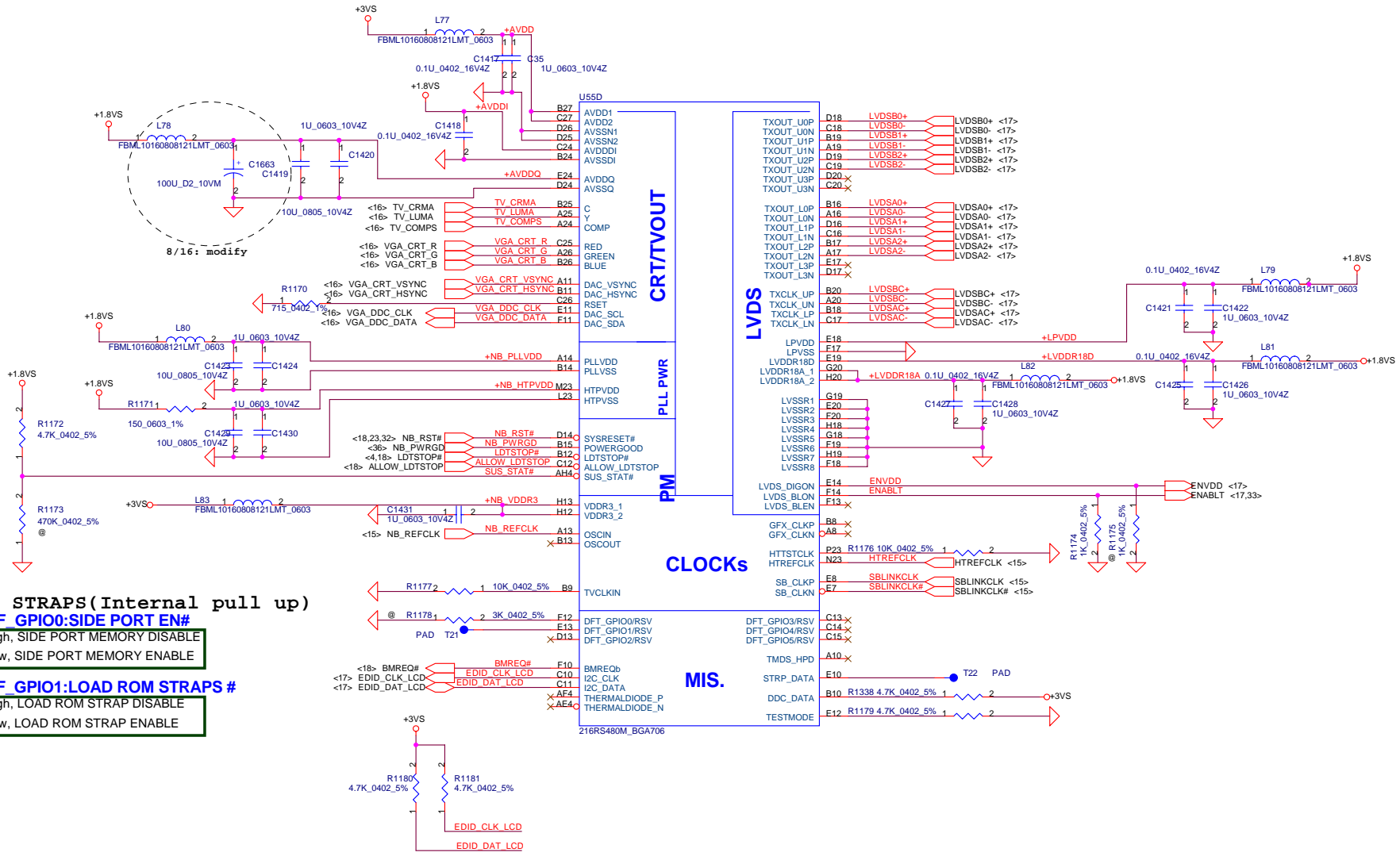
MEM\_VREF , MPVDD (20mils)

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Issued Date	2005/03/01	Deciphered Date	2005/04/06	RS480M-HT/VMEM	
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Issued Date	2005/03/01	Deciphered Date	2005/04/06	RS480M PCIE/DVI Controller	
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**AVDD , AVDDI , AVDDQ , +NB\_PLLVDD , +NB\_HTPVDD  
+NB\_VDDR3 , LPVDD , LVDDR18D , LVDDR18A (20mils)**

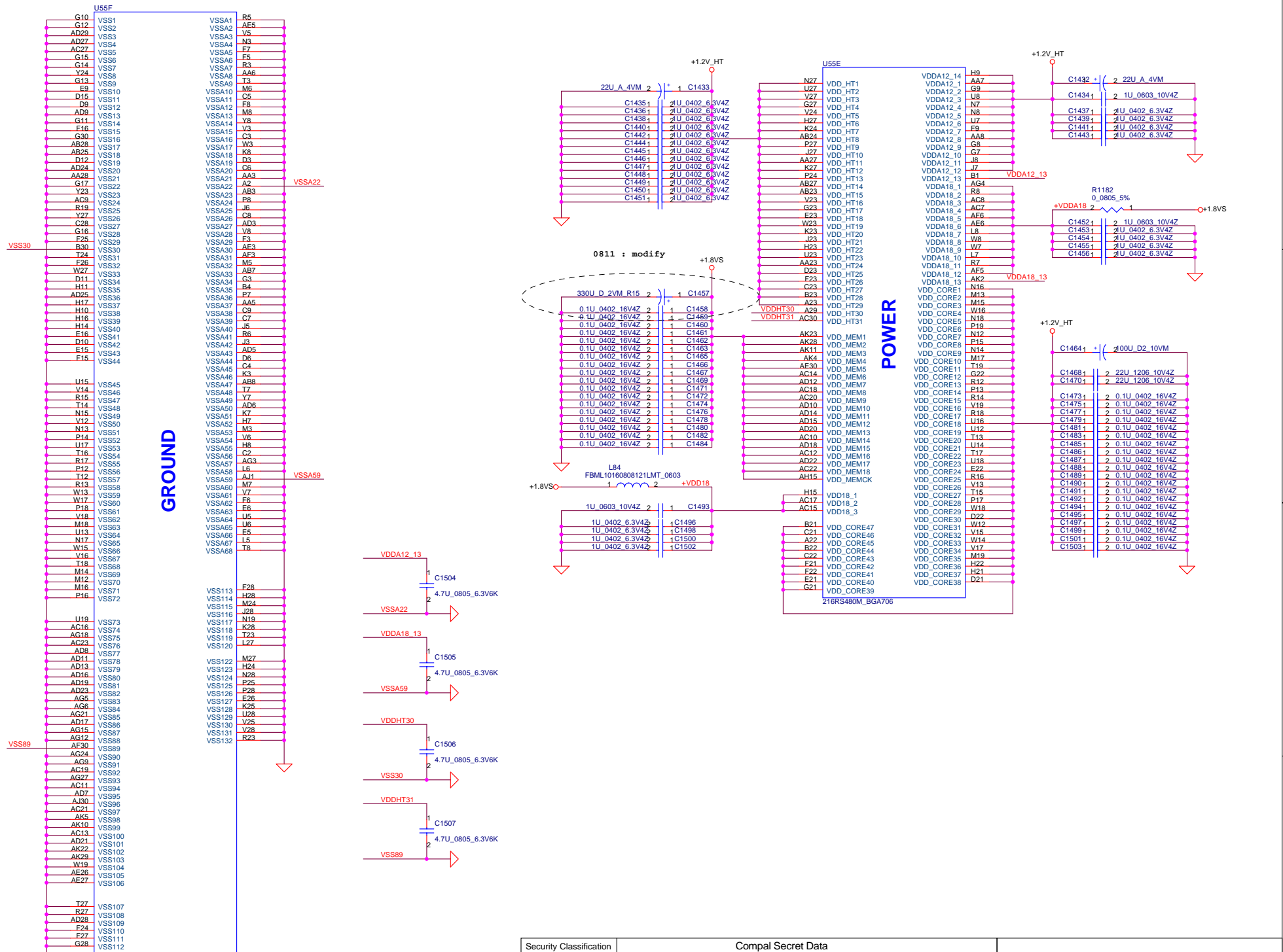


**NB STRAPS (Internal pull up)**  
**DEF GPIO0:SIDE PORT EN#**  
 High, SIDE PORT MEMORY DISABLE  
 Low, SIDE PORT MEMORY ENABLE

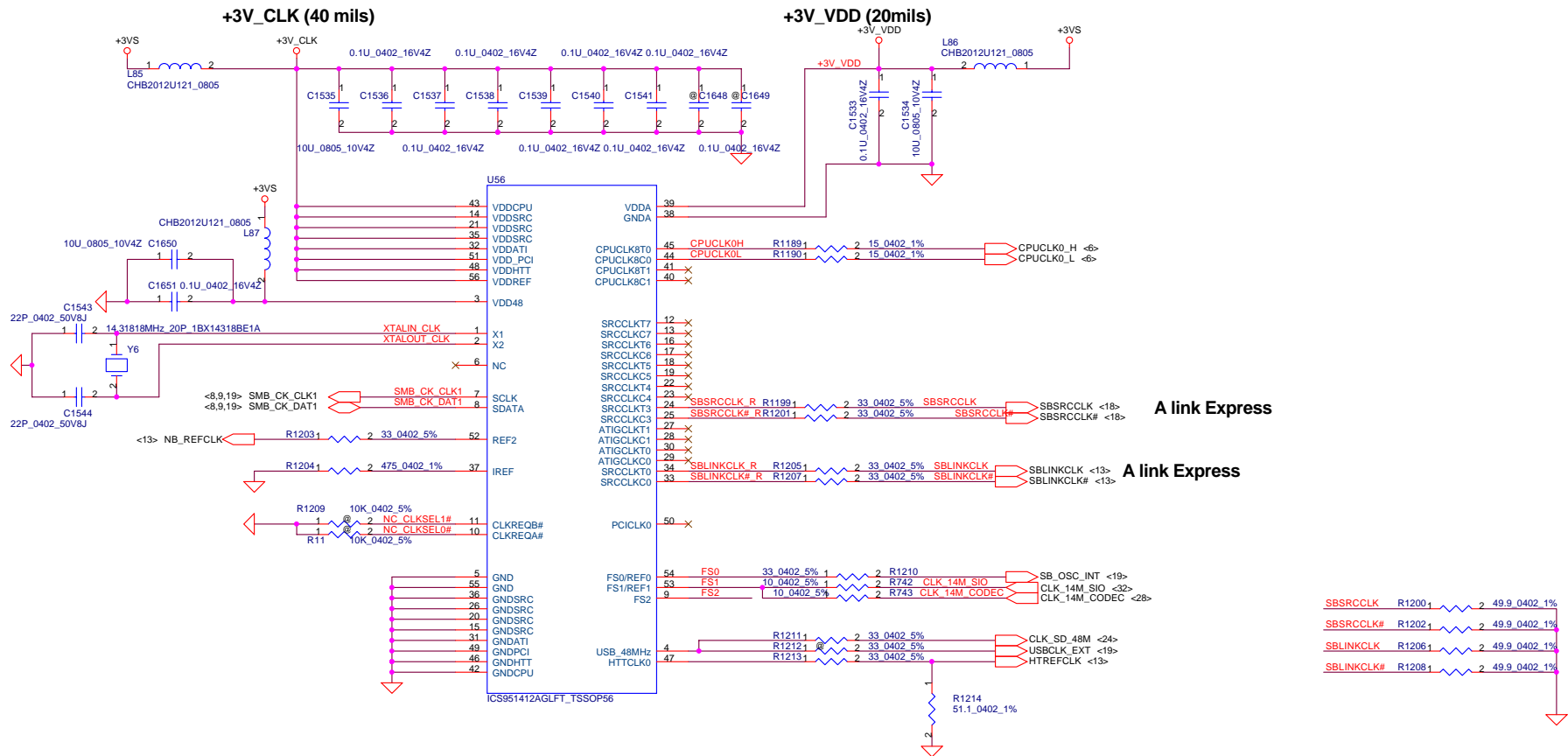
**DEF GPIO1:LOAD ROM STRAPS #**  
 High, LOAD ROM STRAP DISABLE  
 Low, LOAD ROM STRAP ENABLE

Security Classification	Compal Secret Data		
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Title			<b>RS480M VIDEO_IF/CLOCK GEN</b>
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Title		RS480M Power/GND		
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A link Express

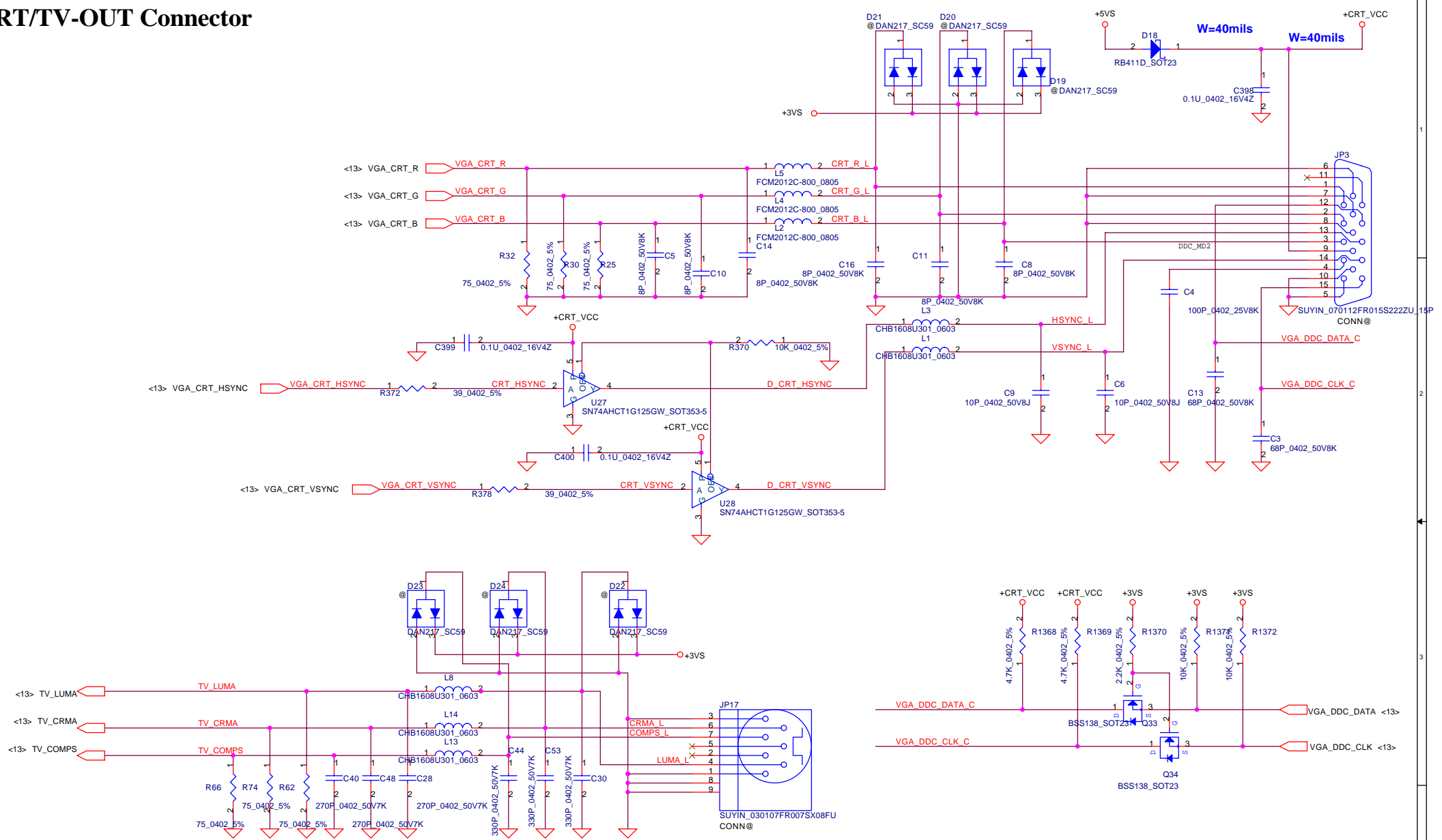
A link Express

EXT CLK FREQUENCY SELECT TABLE(MHZ)

FS2	FS1	FS0	CPU	SRCCLK [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 HAMMER operation

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Issued Date	2005/03/01	Deciphered Date	2005/04/06	Clock Generator		
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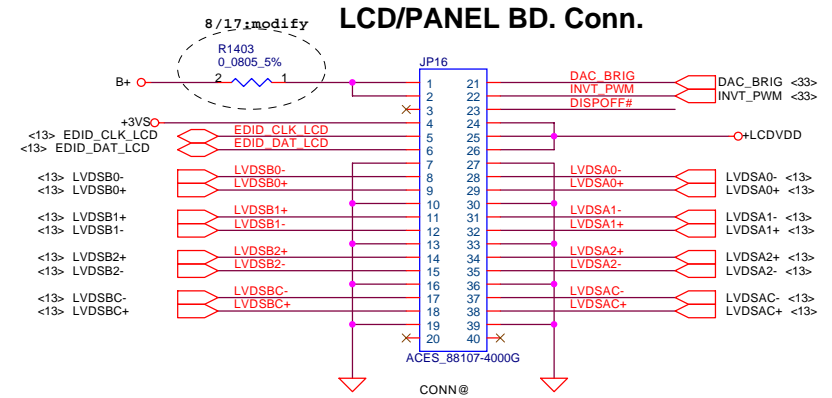
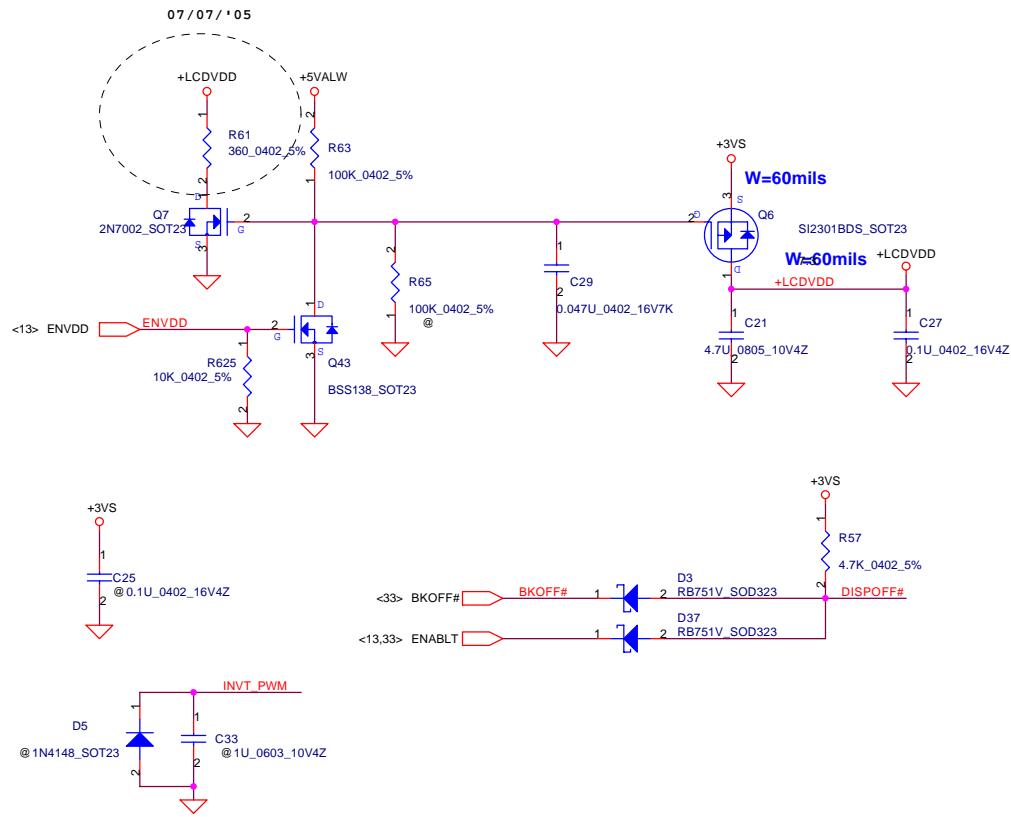
# CRT/TV-OUT Connector



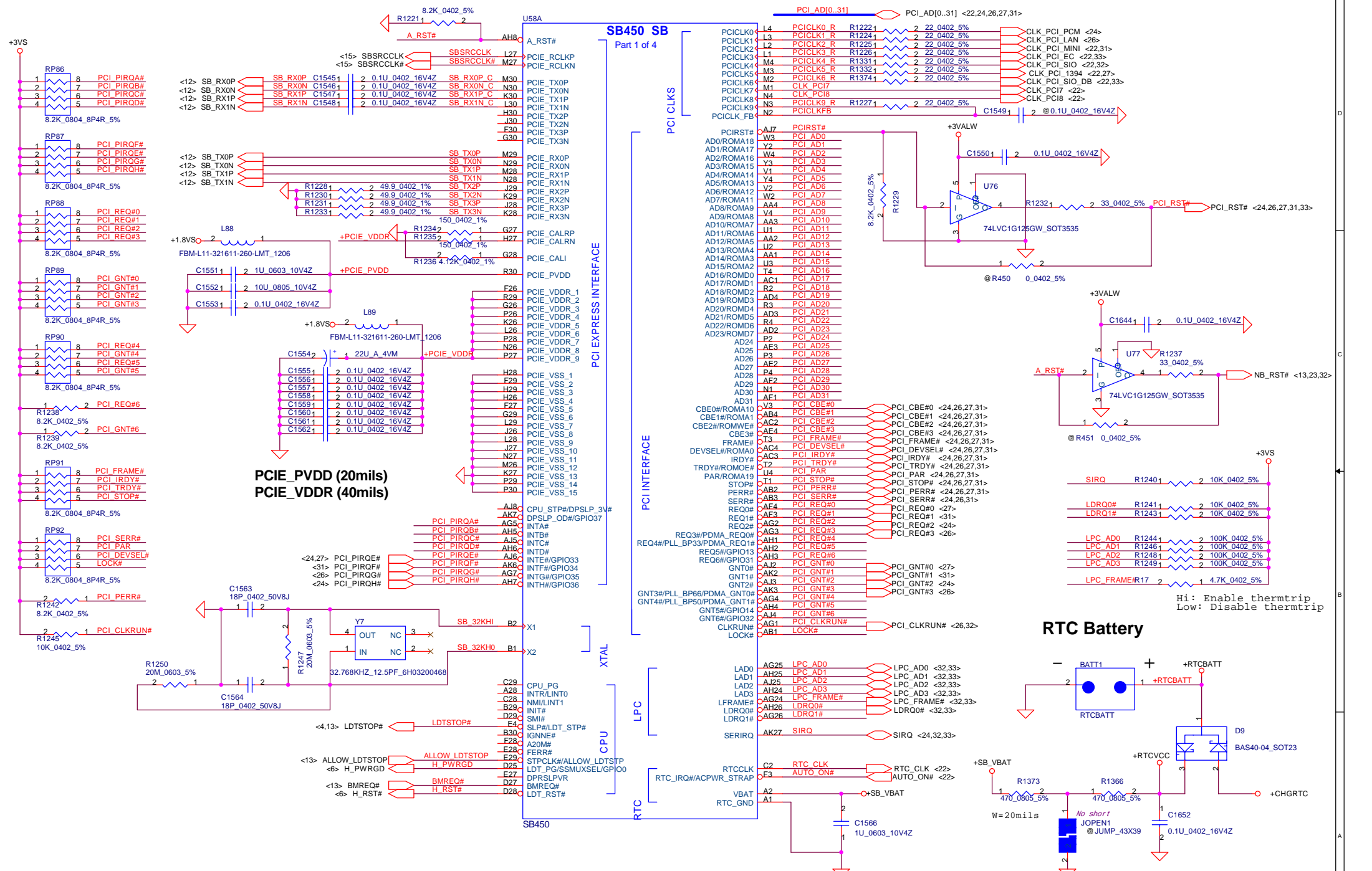
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# LCD POWER CIRCUIT



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Issued Date	2005/03/01	Deciphered Date	2005/04/06	LCD Conn	
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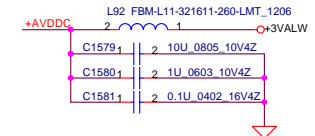
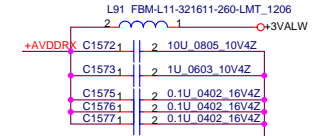
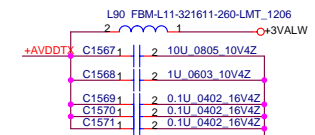
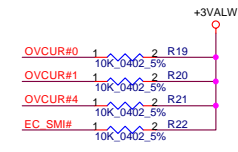
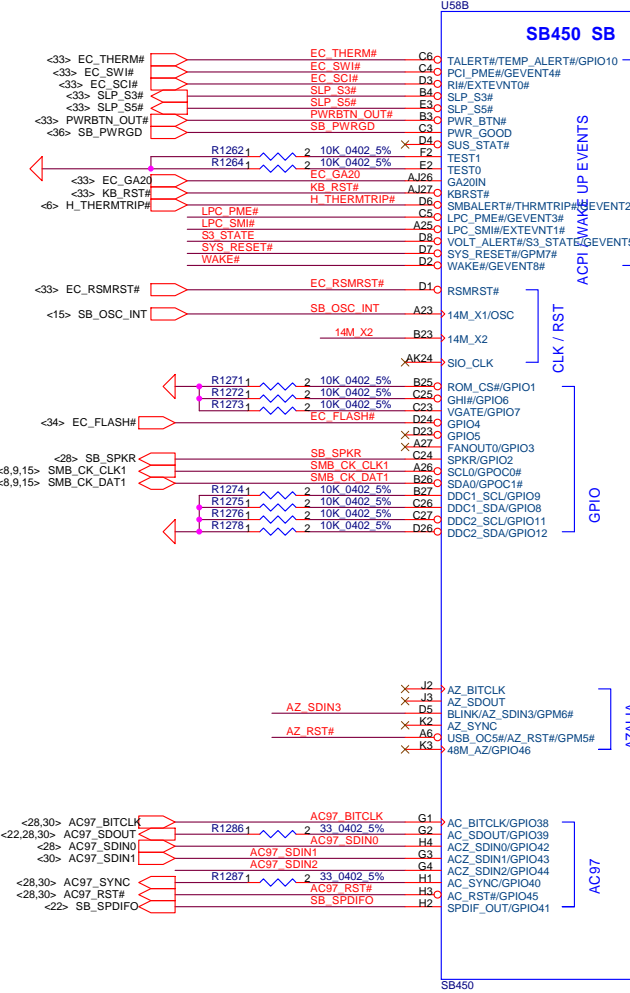
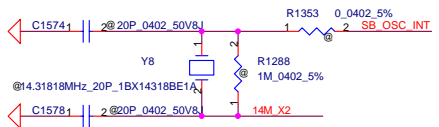
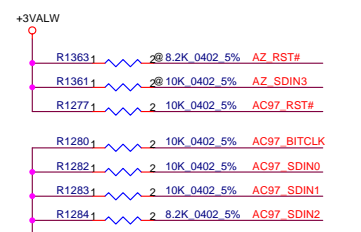
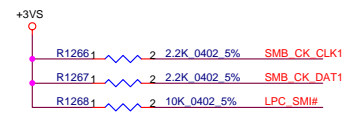
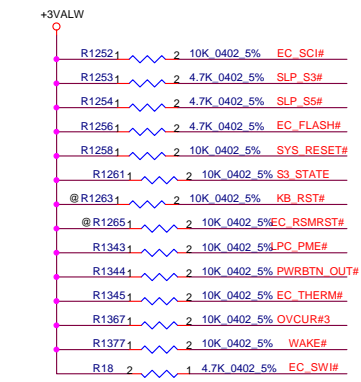


PCIE\_PVDD (20mils)  
PCIE\_VDDK (40mils)

### RTC Battery

Hi: Enable thermtrip  
Low: Disable thermtrip

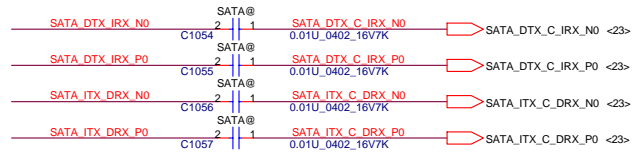
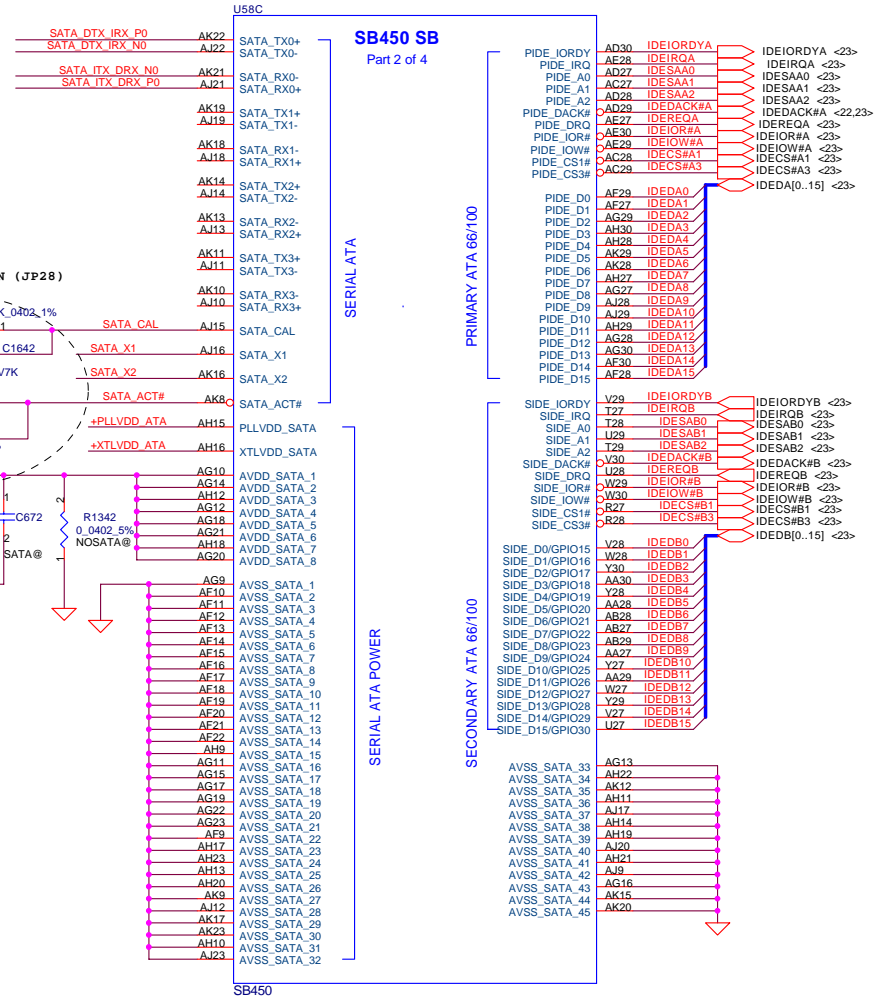
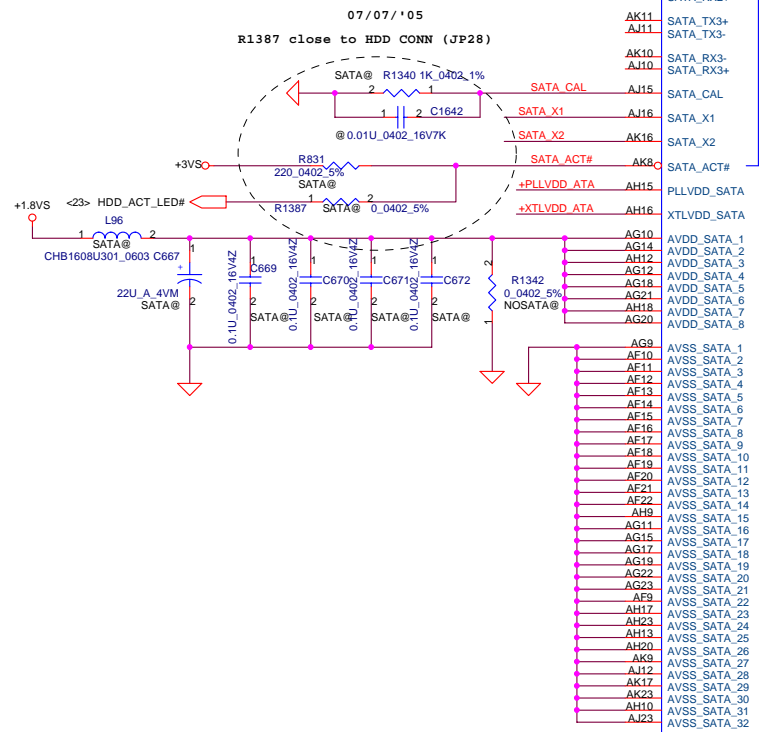
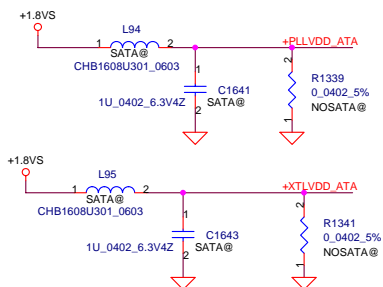
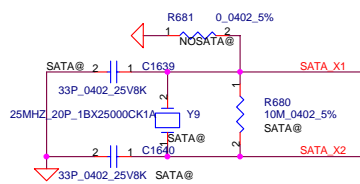
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AVDDC (20mils)  
AVDDTX , AVDDRDX (40mils)

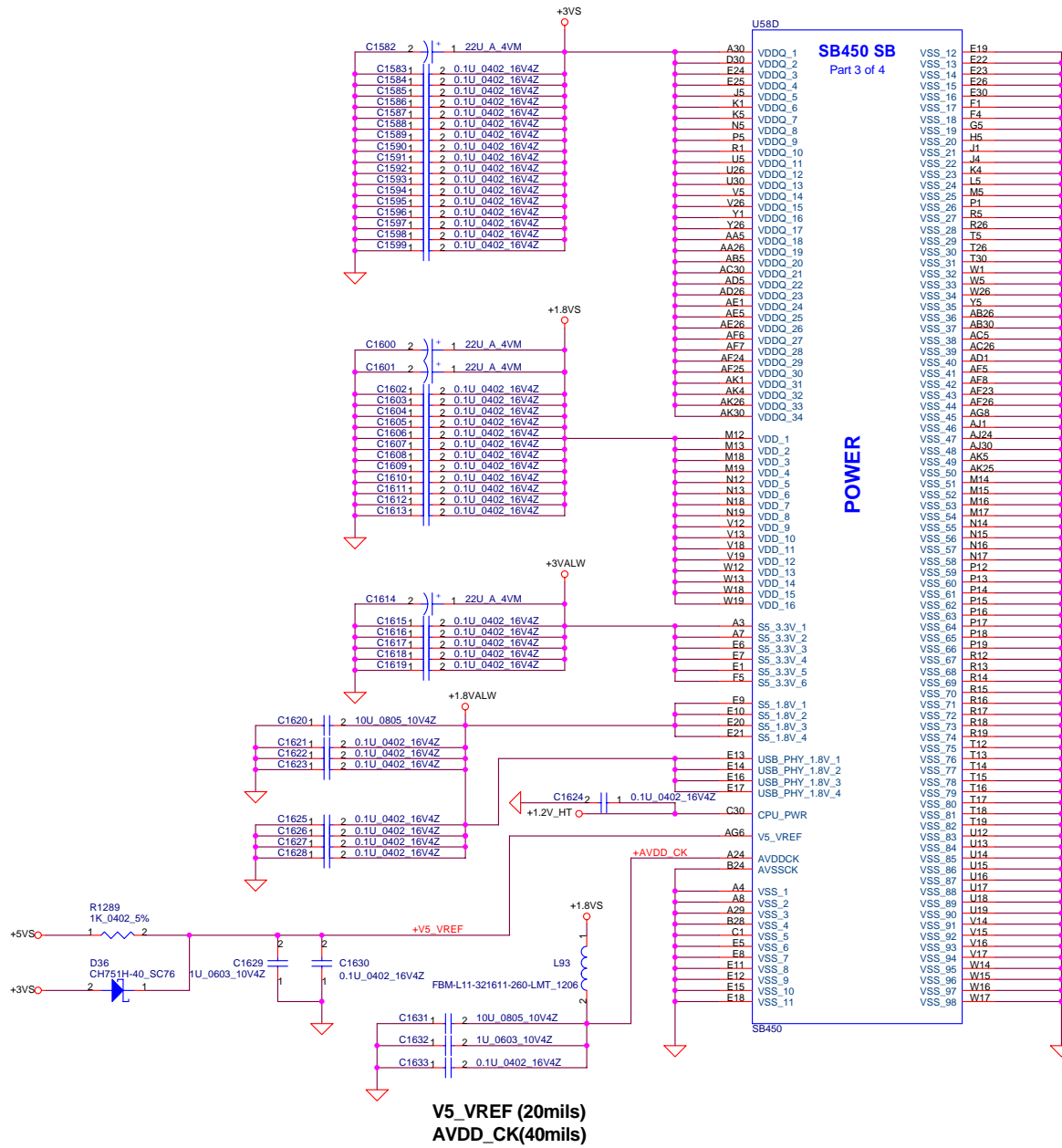
	GPIO12	GPIO11
HYNIX 128MB	0	1
SAMSUNG 128MB	1	1
*No VRAM	0	0
Reserved	1	0

Security Classification	Compal Secret Data			Title	SB400-USB/ACPI/AC97/GPIO		
Issued Date	2005/03/01	Deciphered Date	2005/04/06	Size	Document Number	Rev	
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Issued Date	2005/03/01	Deciphered Date	2005/04/06	Title			
				SB400-IDE/SATA			
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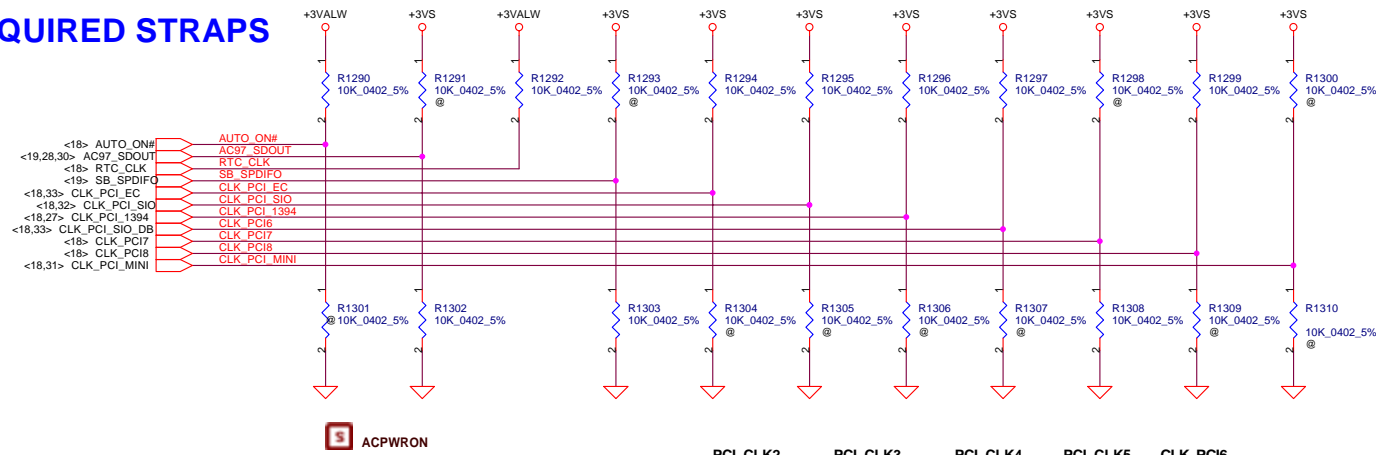
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V5\_VREF (20mils)  
AVDD\_CK(40mils)

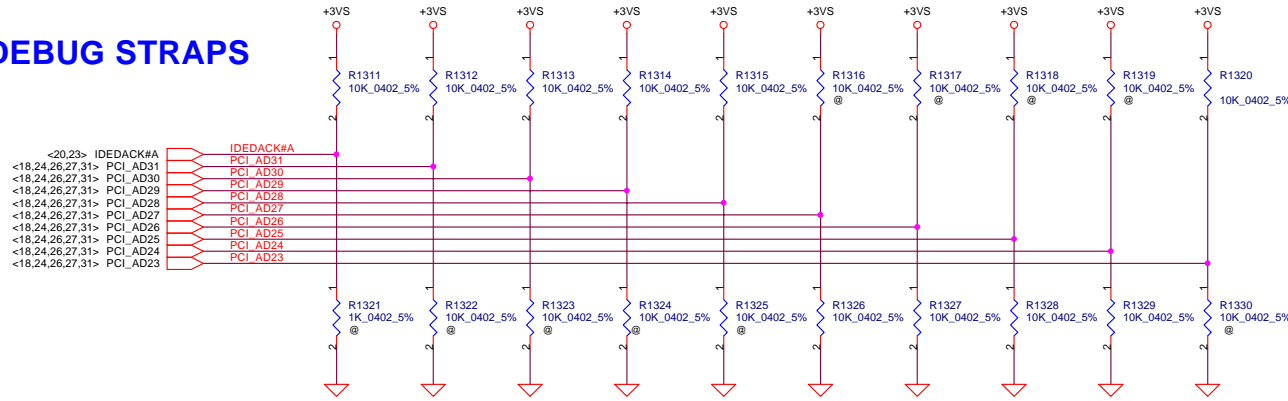
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# REQUIRED STRAPS



	AUTO_ON#	AC97_SDOOUT	RTC_CLK	SB_SPDIF0	CLK_PCI_MINI	CLK_PCI_EC	CLK_PCI_SIO	CLK_PCI_1394	CLK_PCI7	CLK_PCI8
<b>PULL HIGH</b>	MANUAL PWR ON DEFAULT	USE DEBUG STRAPS	INTERNAL RTC DEFAULT	SIO 24MHz	48MHz OSC MODE	USB PHY PWRDOWN DISABLE DEFAULT	INTERNAL 48MHz DEFAULT	PCIE_CM_SET LOW DEFAULT	CPU I/F = K8 DEFAULT	ROM TYPE H,H = PCI ROM H,L = PMC LPC ROM
<b>PULL LOW</b>	AUTO PWR ON	IGNORE DEBUG STRAPS DEFAULT	EXTERNAL RTC (NOT SUPPORTED W/ IT8712 )	SIO 48MHz DEFAULT	48MHz XTAL MODE	USB PHY PWRDOWN ENABLE	EXTERNAL 48MHz	PCIE_CM_SET High	CPU I/F = P4	L,H = NORMAL LPC ROM L,L = FWH ROM DEFAULT

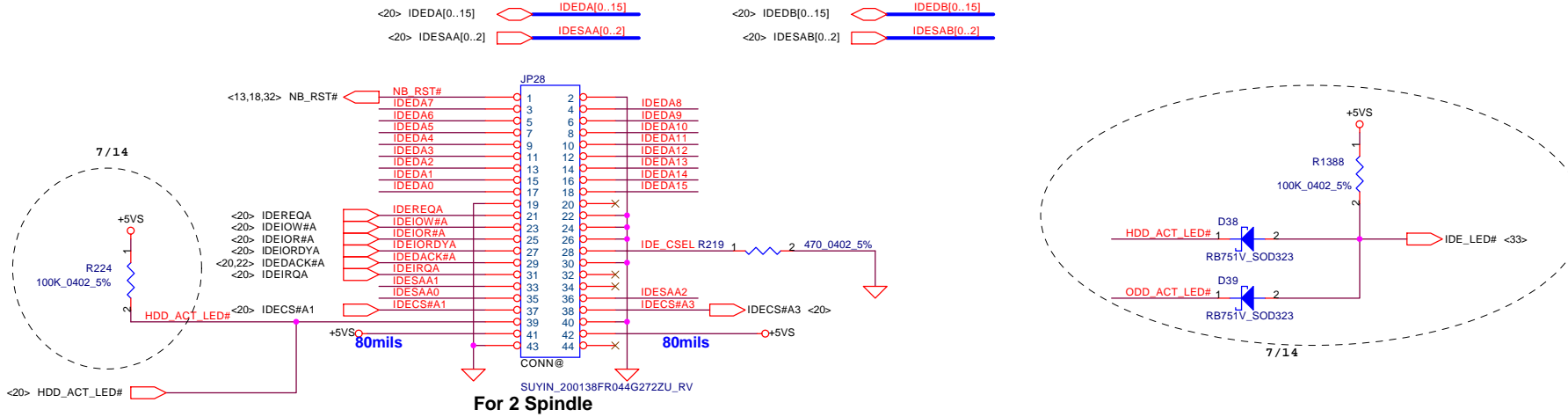
# DEBUG STRAPS



	PD_DACK#	PCI_AD31	PCI_AD30	PCI_AD29	PCI_AD28	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
<b>PULL HIGH</b>	USE LONG RESET DEFAULT	RESERVED	RESERVED	RESERVED	RESERVED	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	RESERVED
<b>PULL LOW</b>	USE SHORT RESET					USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	

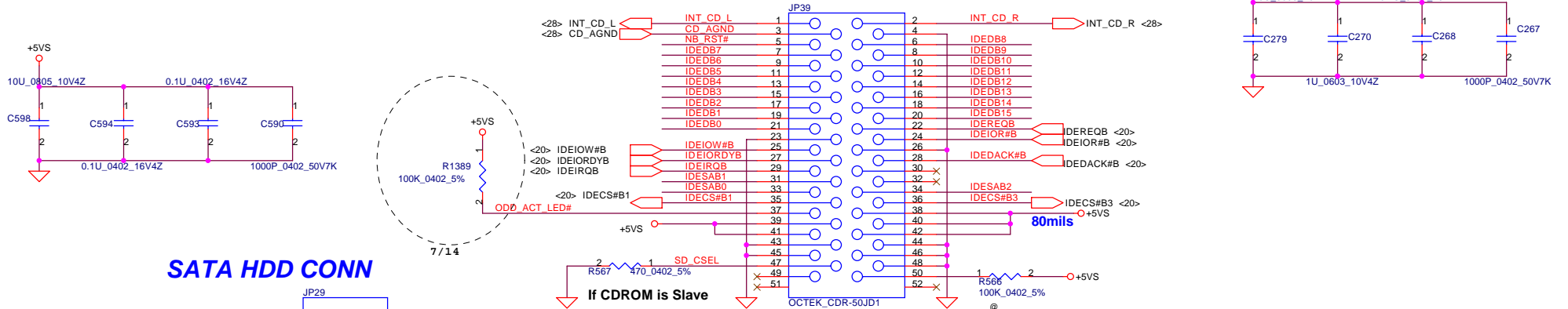
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Issued Date	2005/03/01	Deciphered Date	2005/04/06	Hardware Trap	
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# HDD CONN



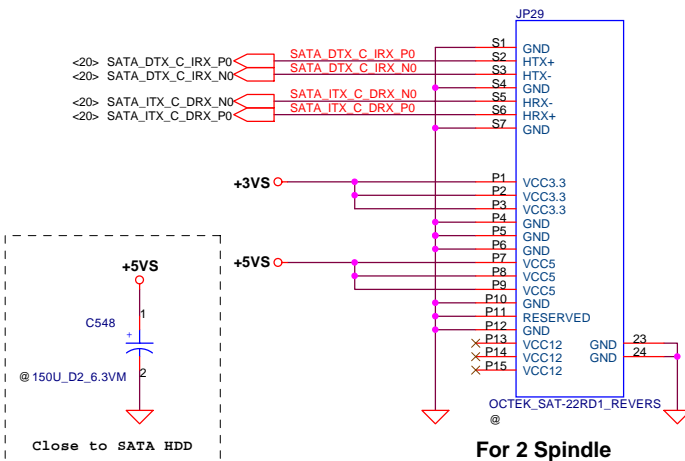
For 2 Spindle

# CDROM CONN



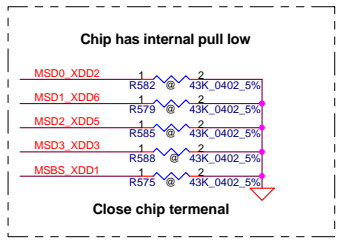
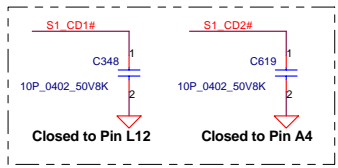
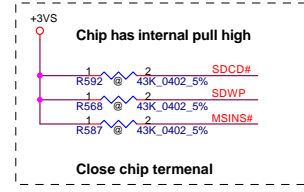
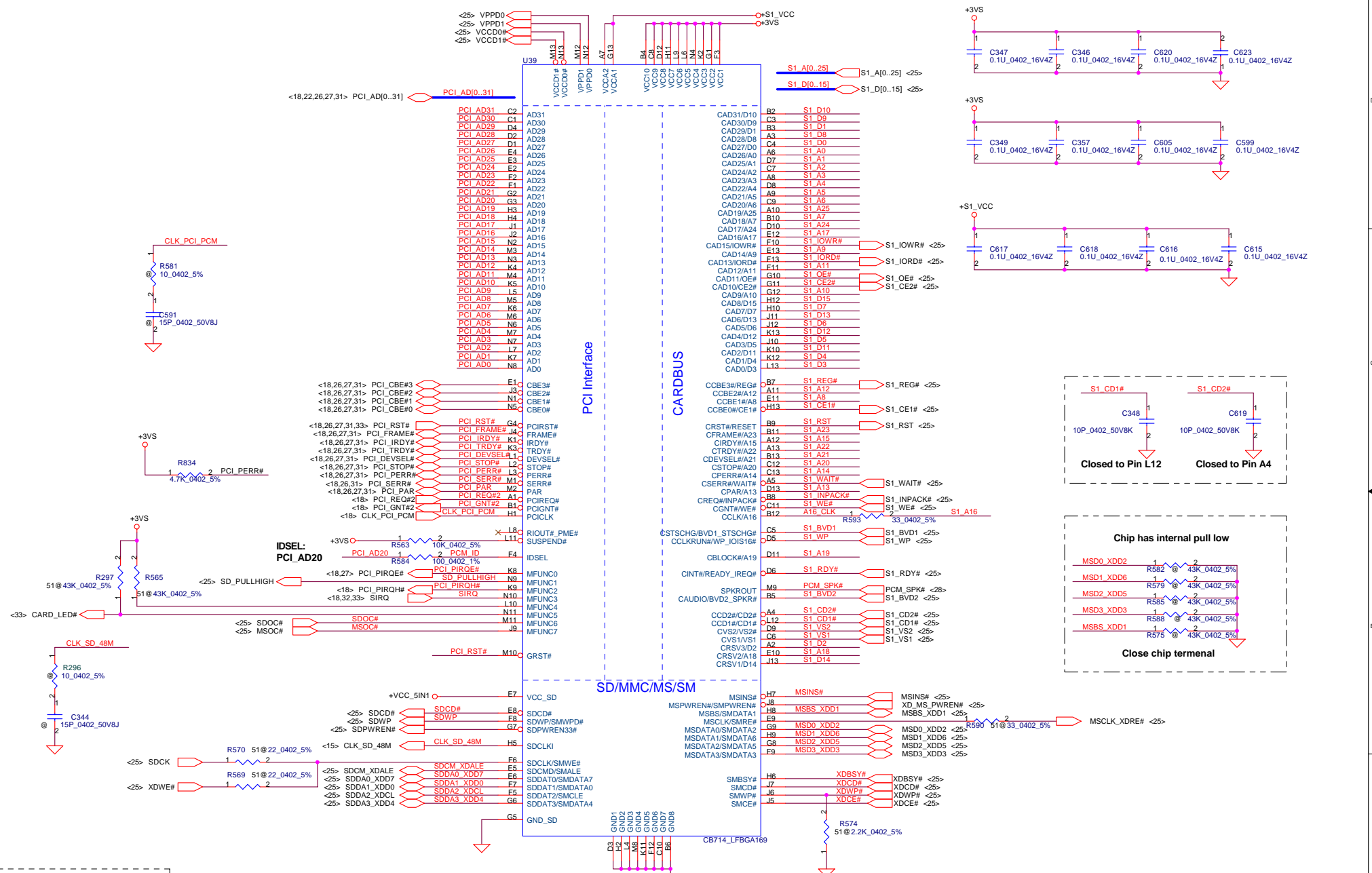
If CDROM is Slave  
then SD\_CSEL= Floating  
else SD\_CSEL= Low

# SATA HDD CONN



For 2 Spindle

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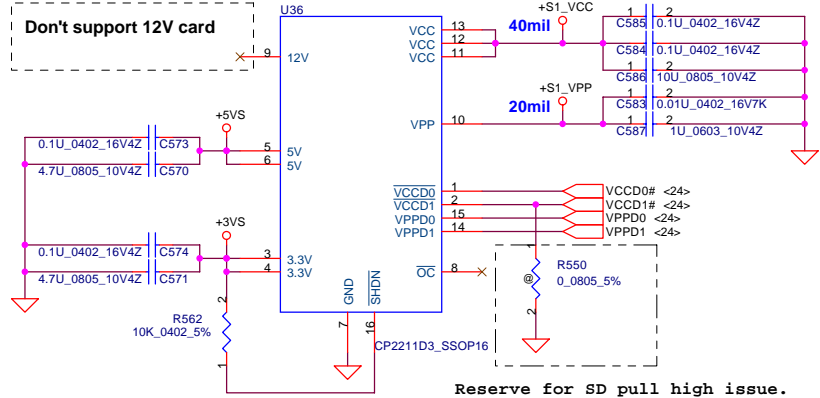


SDCD# & SDWP# & MSINS# have internal 30Kohm pull up resistor

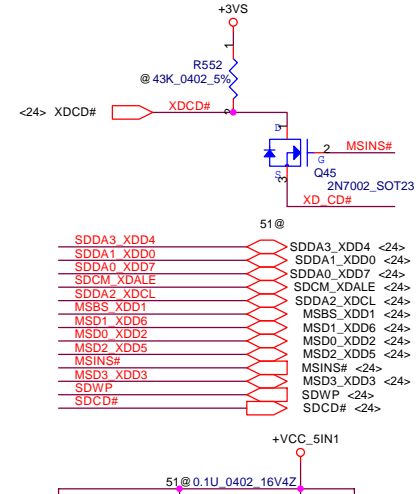
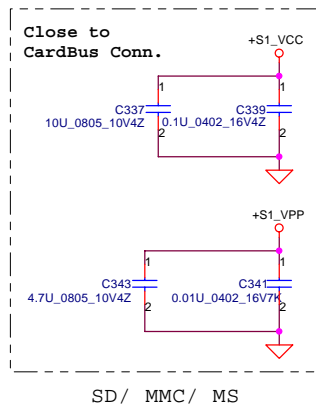
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Issued Date	2005/03/01	Deciphered Date	2005/04/06	PCMCIA ENE CB714	
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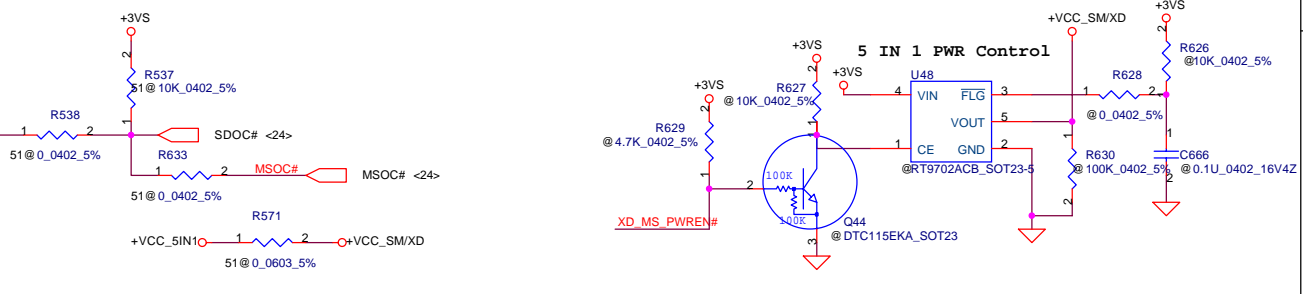
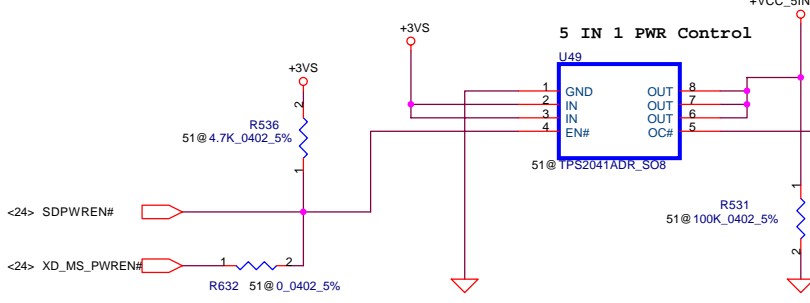
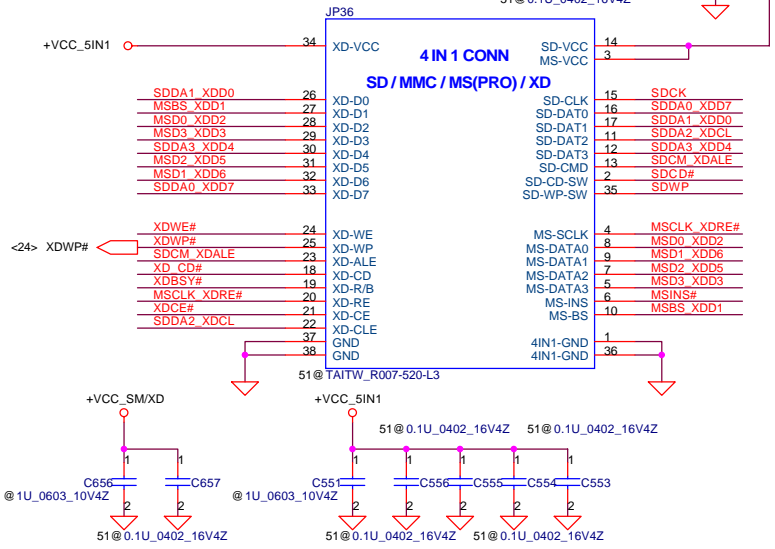
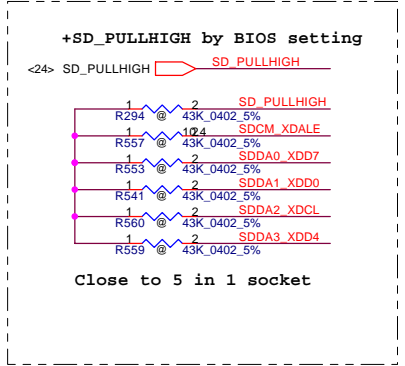
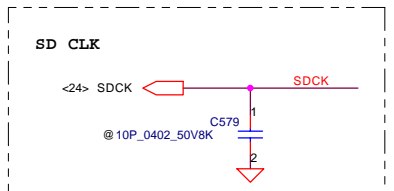
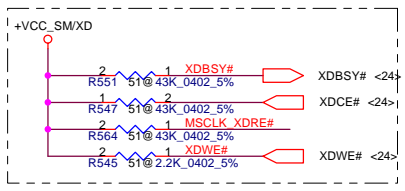
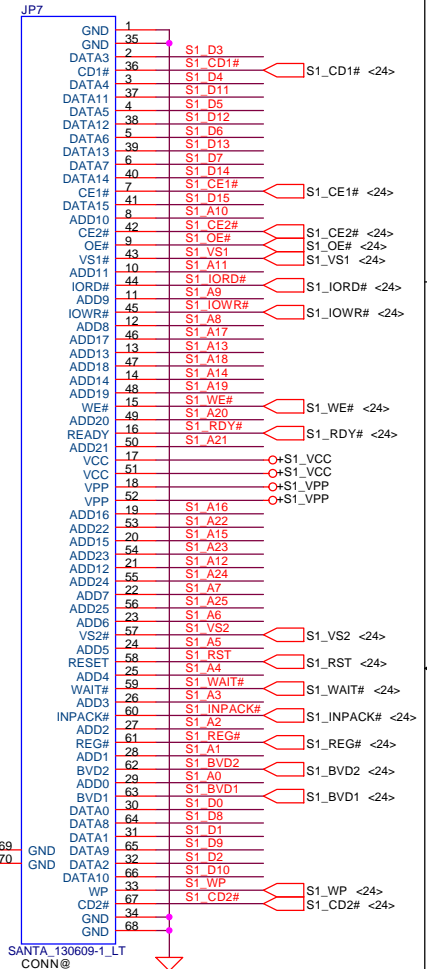
# PCMCIA Power Controller



Chip has internal pull high

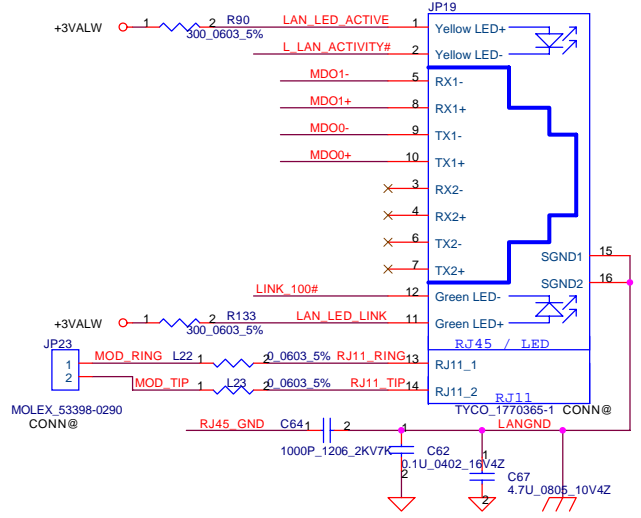
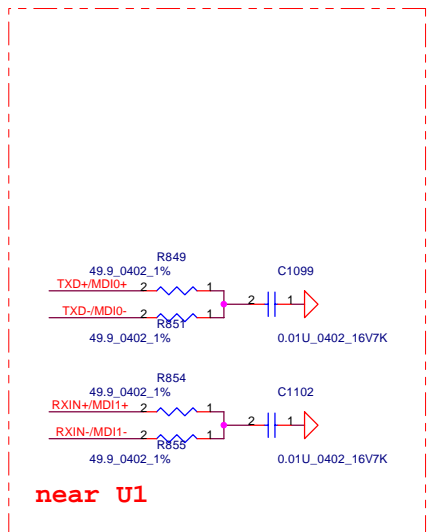
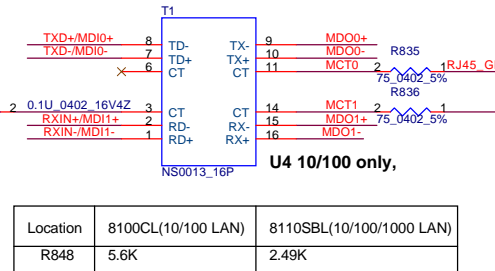
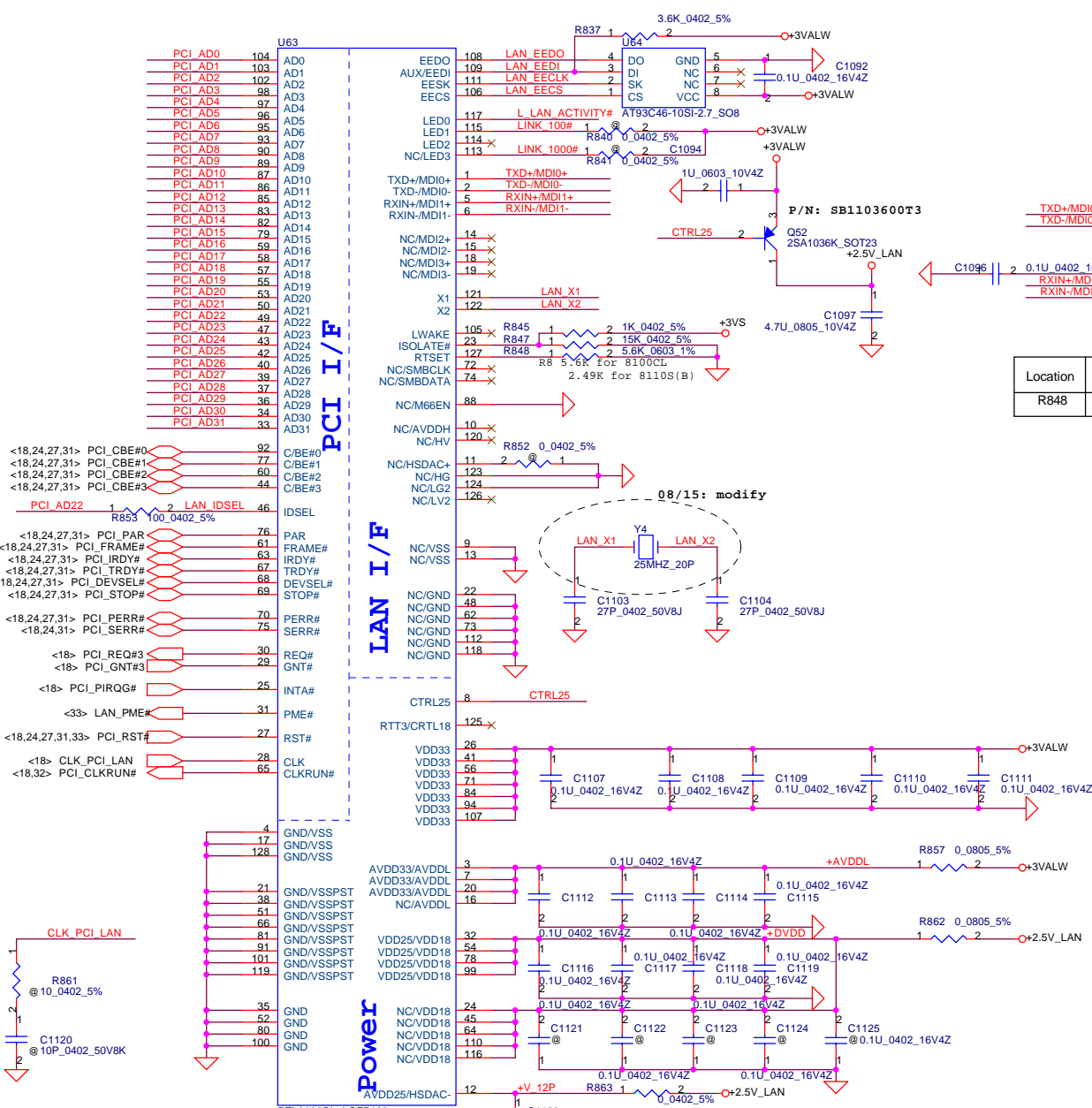


## CardBus Socket



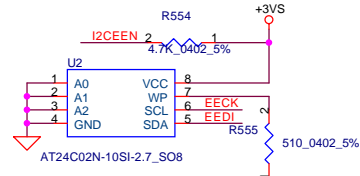
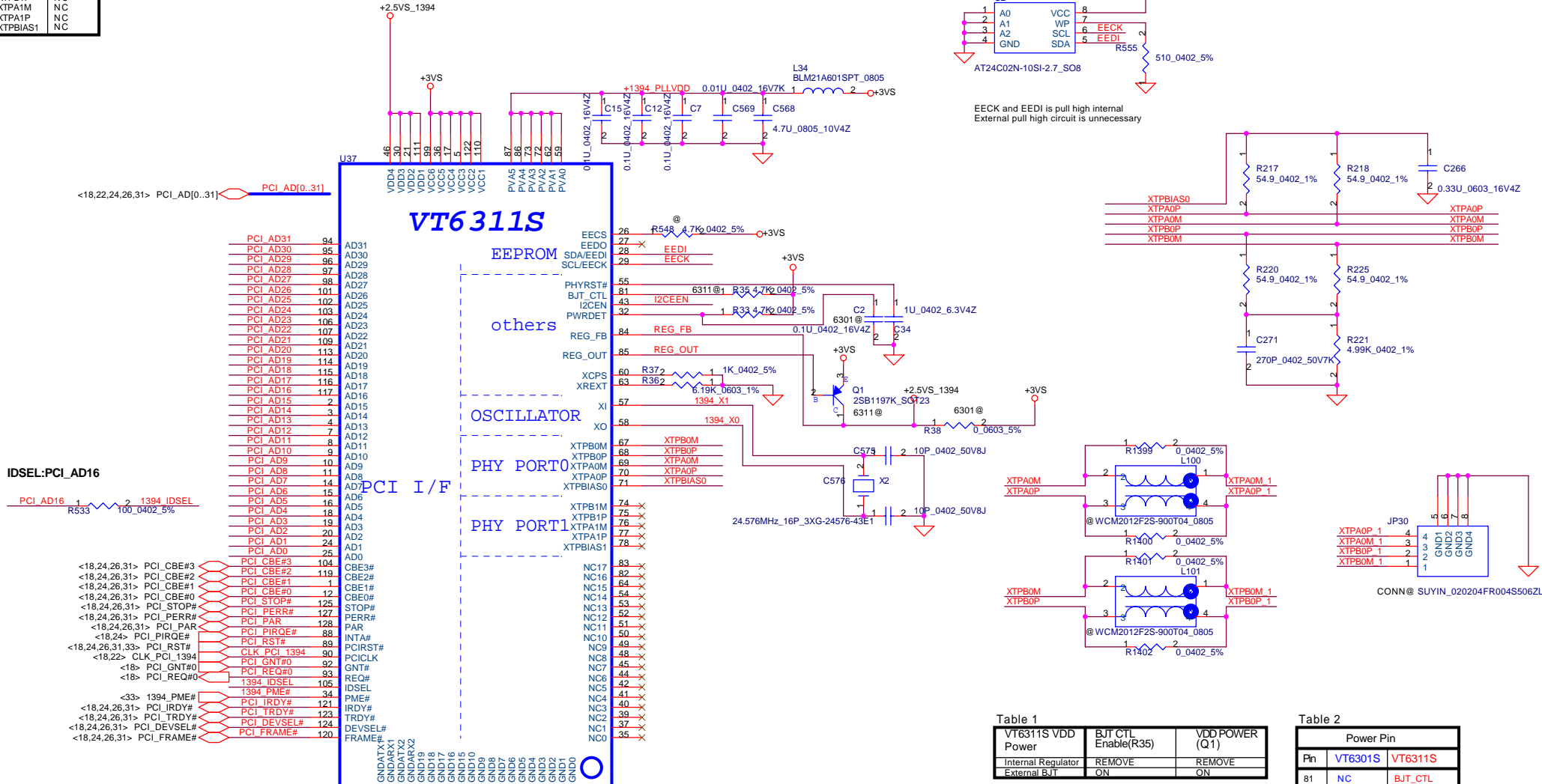
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<18,22,24,27,31> PCI\_AD[0..31]



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Analog Pin		
Pin	VT6308S	VT6311S
74	XTPB1M	NC
75	XTPB1P	NC
76	XTPA1M	NC
77	XTPA1P	NC
78	XTPBIA1	NC



EECK and EED1 is pull high internal  
External pull high circuit is unnecessary

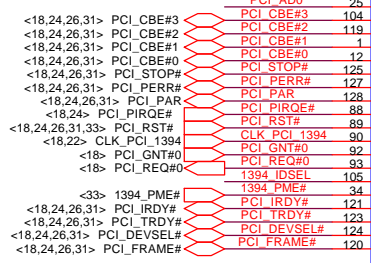
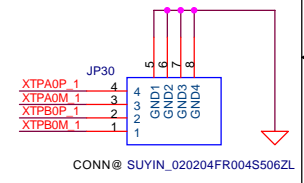
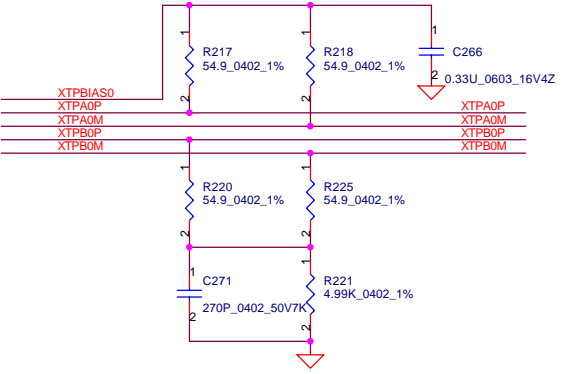


Table 1

VT6311S VDD Power	BJT CTL Enable(R35)	VDD POWER (Q1)
Internal Regulator	REMOVE	REMOVE
External BJT	ON	ON

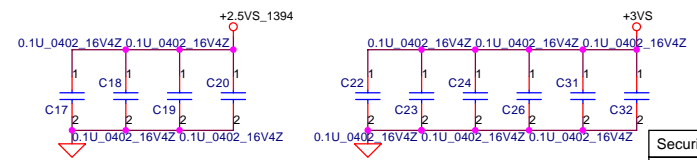
Table 2

Power Pin		
Pin	VT6301S	VT6311S
81	NC	BJT_CTL
84	NC	REG_FB
85	NC	REG_OUT
32	VCC(+3.3V)	PWRDET
36	PVD(+3.3V)	VCC(+3.3V)
46	PVD(+3.3V)	VDD(+2.5V)
21	VCC(+3.3V)	VDD(+2.5V)
111	VCC(+3.3V)	VDD(+2.5V)
30	VCC(+3.3V)	VDD(+2.5V)

PHY Differential Pin		
74	NC	NC
75	NC	NC
76	NC	NC
77	NC	NC
78	NC	NC

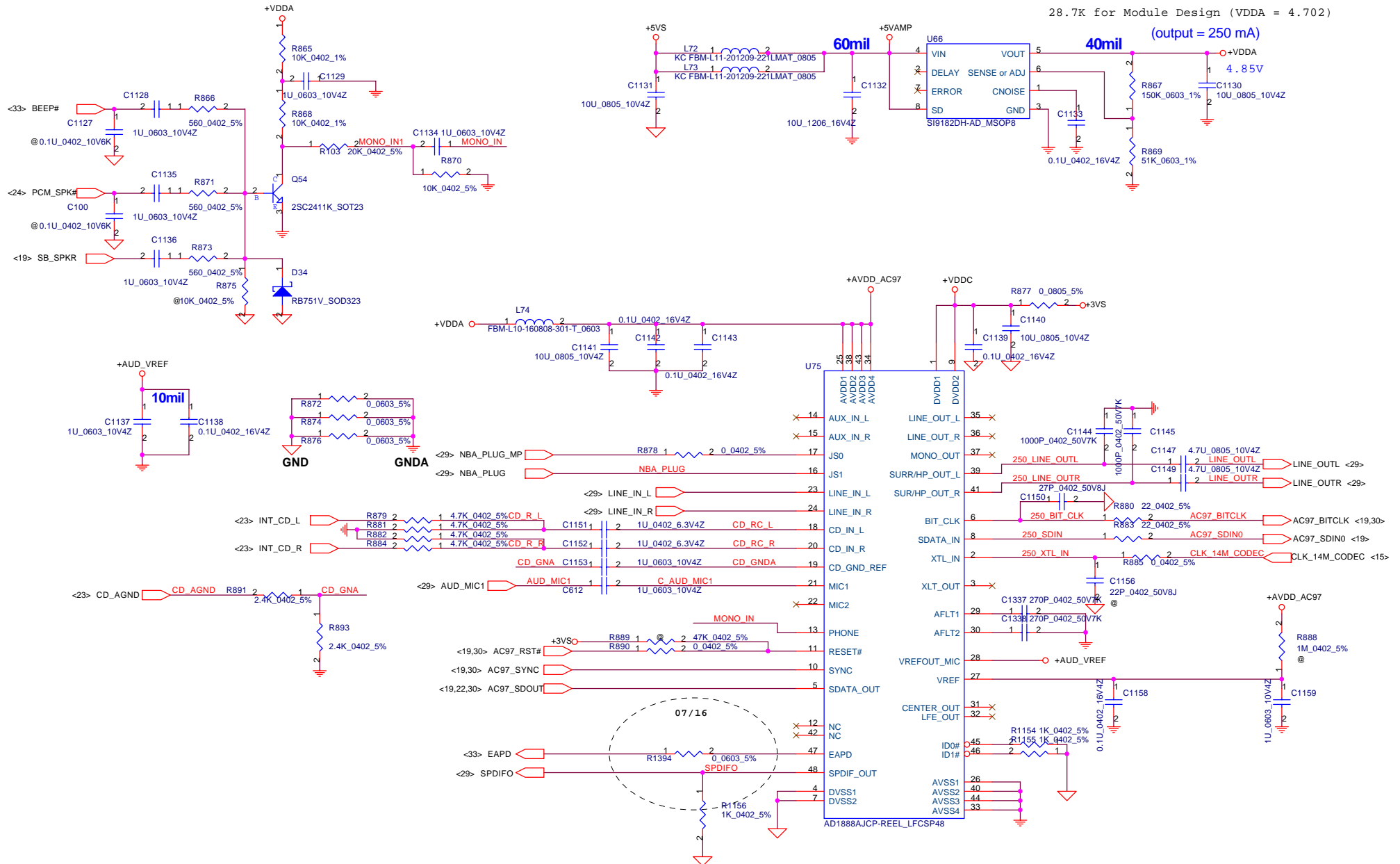
1394 CHIP	VCC/PWRDET Enable(R33)	VCC/PWRDET Enable(C2)	BJT CTL Enable(R35,Q1)	VCC/VDD POWER	XREXT (R36)
VT6301S	0 ohm	ON	REMOVE	R38 must mount. R39 doesn't mount.	6.34K 1%
VT6311S	4.7K ohm	REMOVE	ON	R38 don't mount. R39 must mount. See Table 2	6.20K 1%



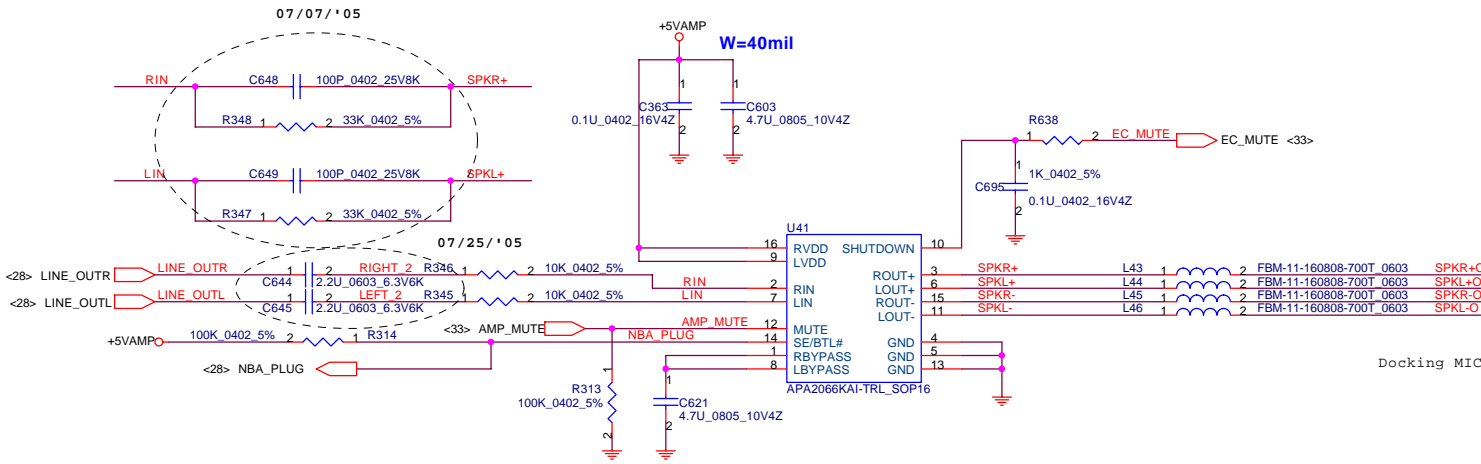
Security Classification		Compal Secret Data		Title	
Issued Date	2005/05/09	Deciphered Date	2006/03/11	VIA 1394 VT6311S	
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# AC97 Codec

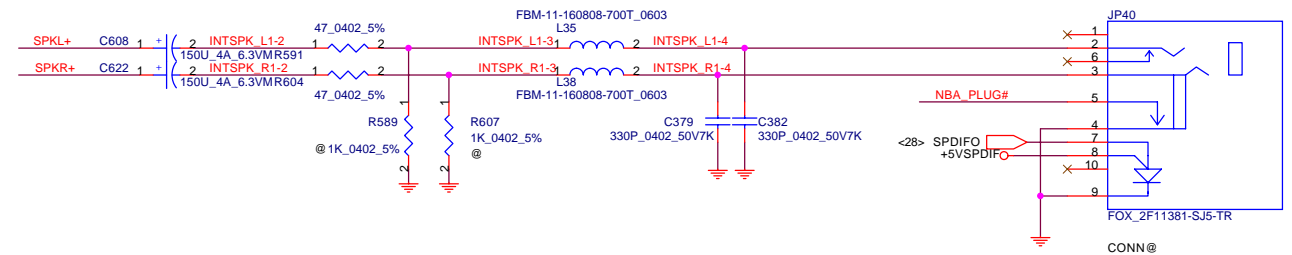
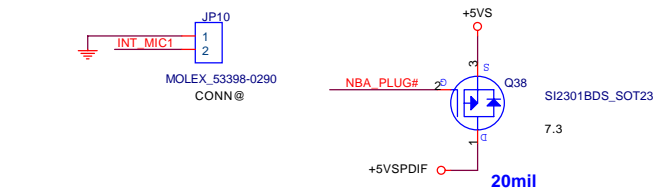
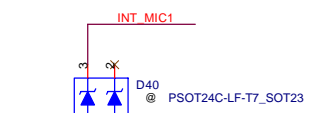
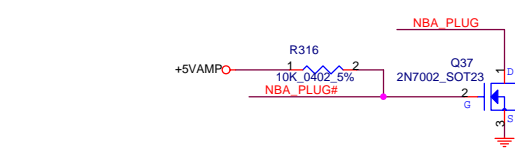
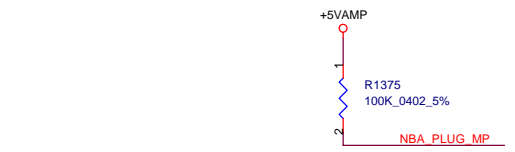
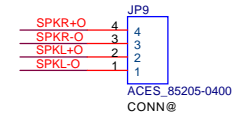
28.7K for Module Design (VDDA = 4.702)



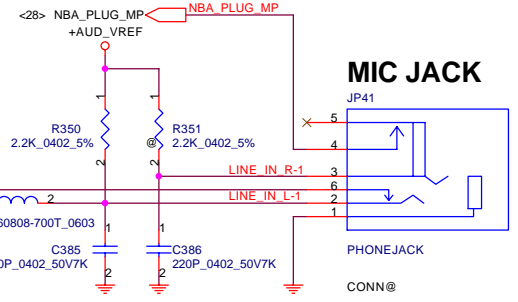
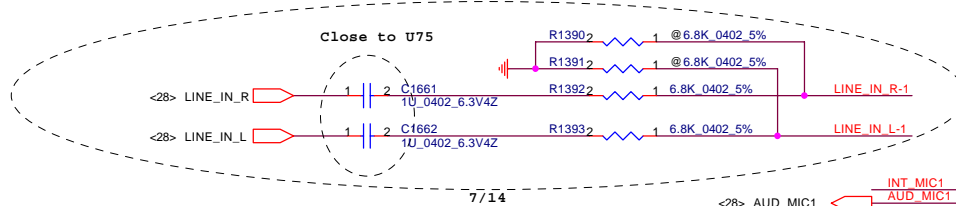
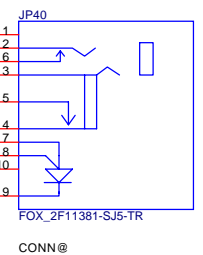
Security Classification		Compal Secret Data		Title	
Issued Date	2005/03/01	Deciphered Date	2005/04/06	AC97 Codec AD1888	
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Date:	Thursday, August 18, 2005	Sheet	28	of	48



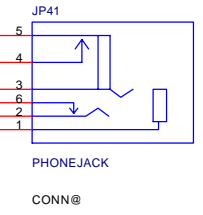
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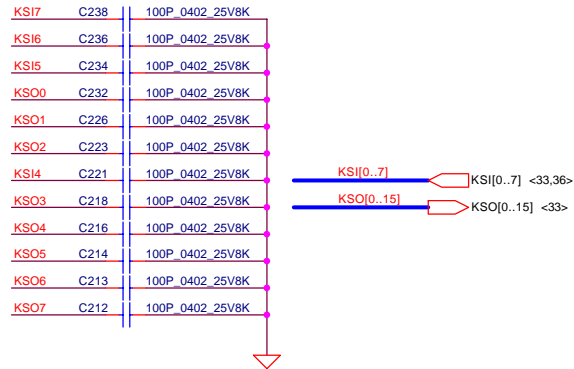
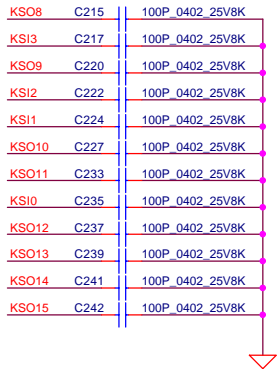
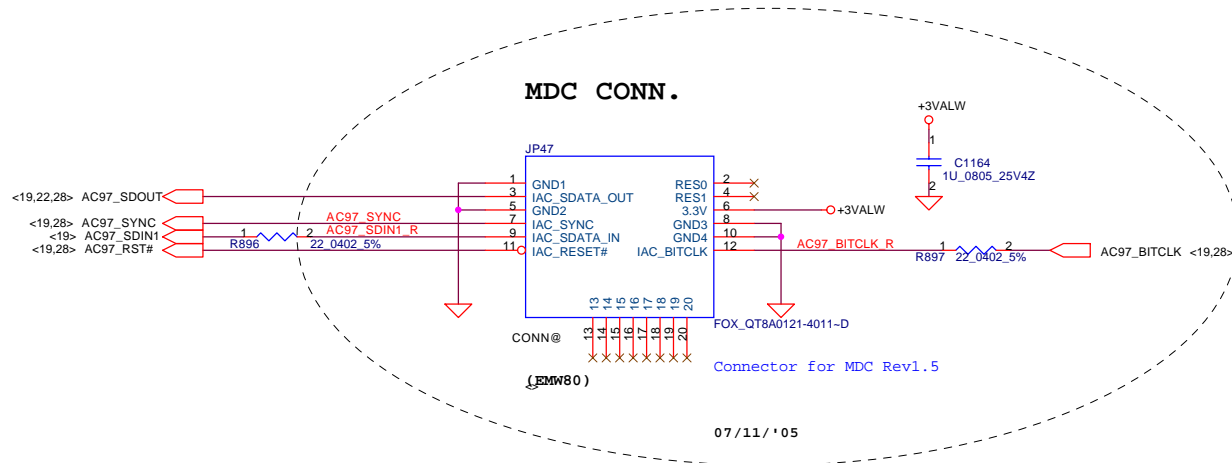
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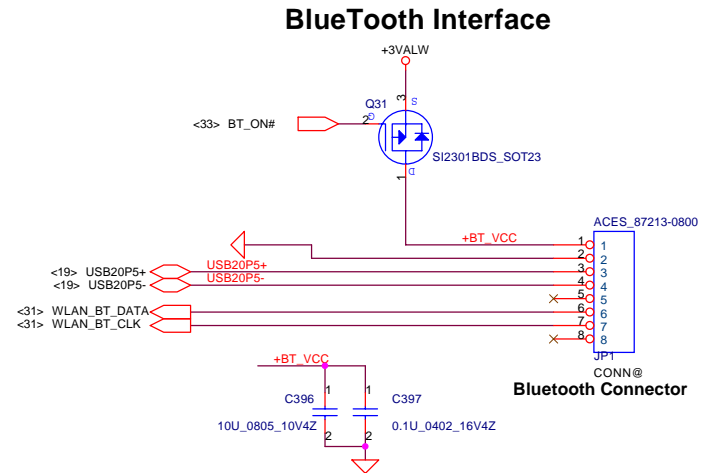
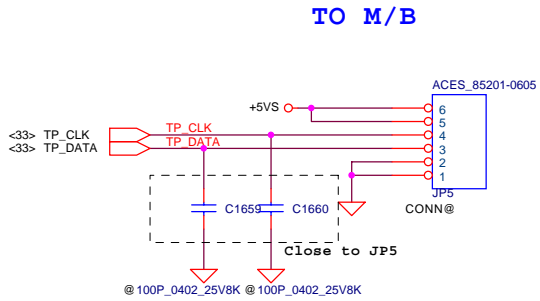
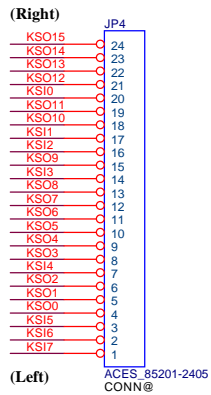
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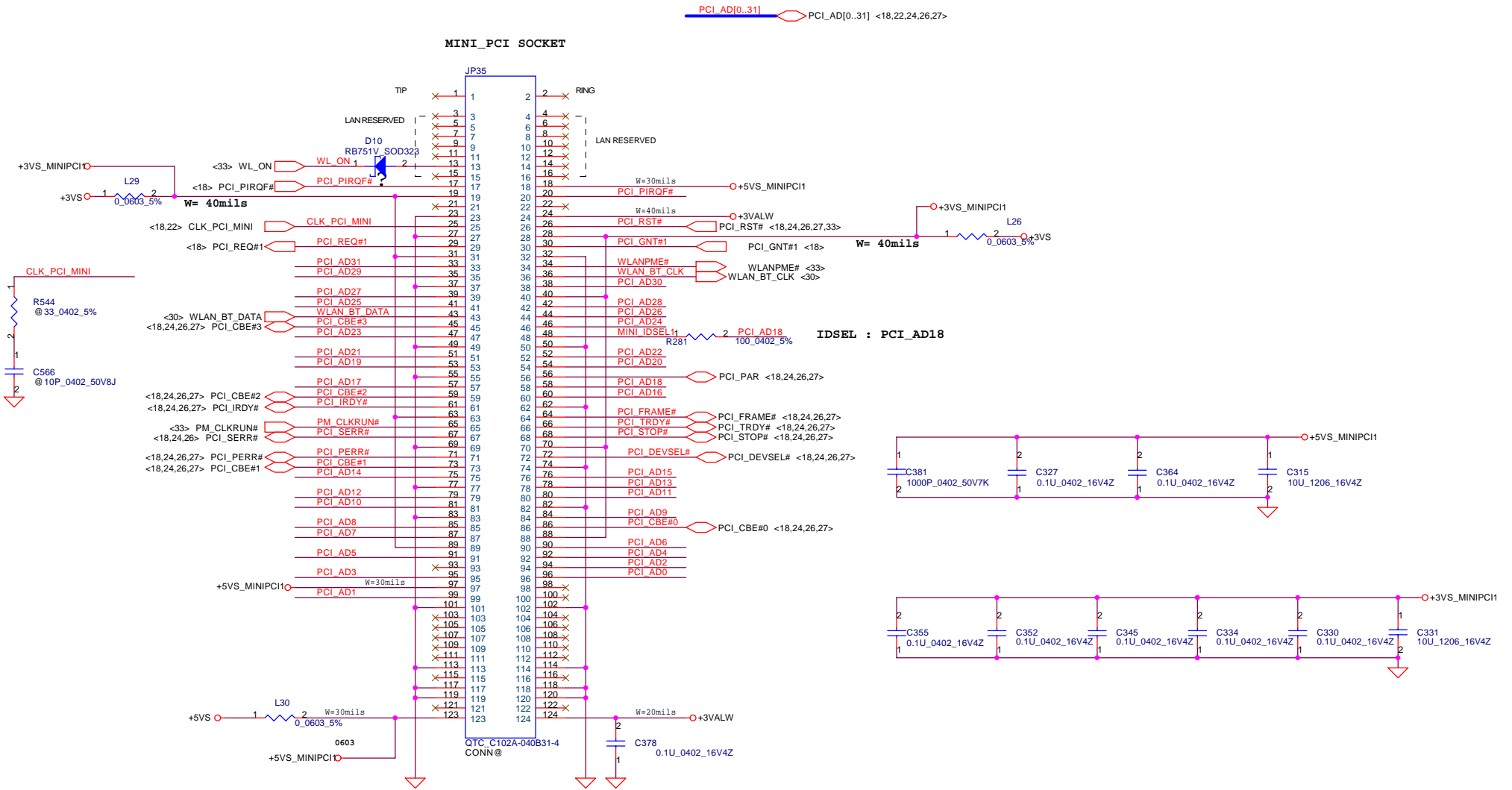
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Issued Date	2005/03/01	Deciphered Date	2005/04/06	AMP & Audio Jack	
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### INT\_KBD CONN.

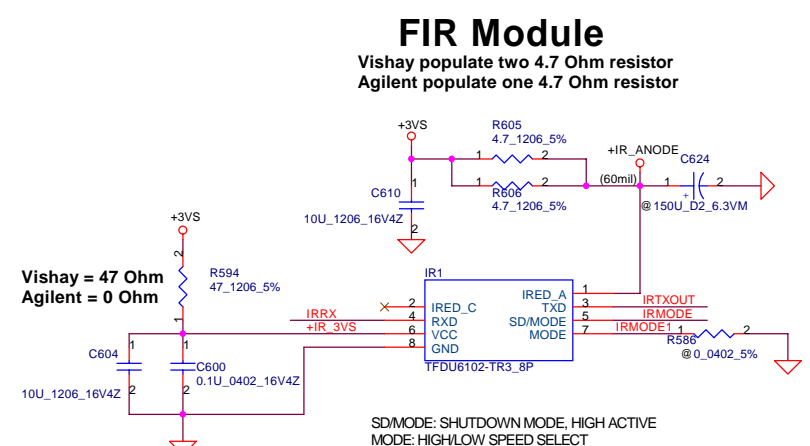
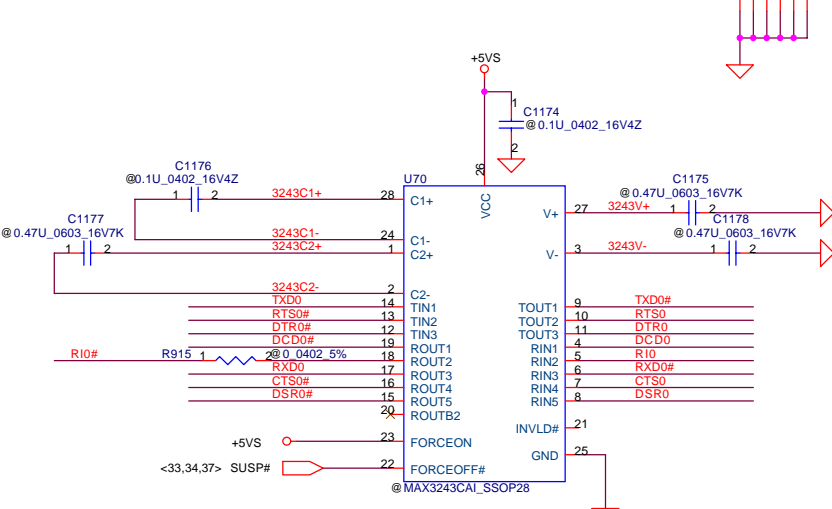
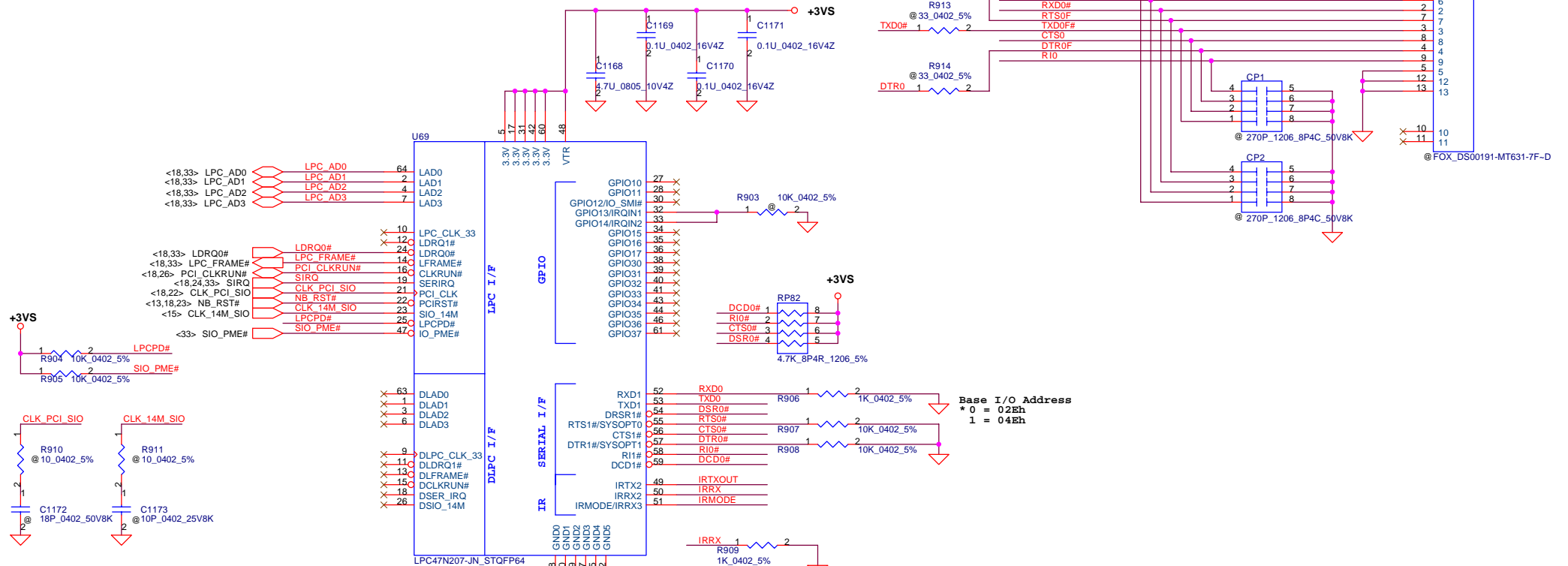


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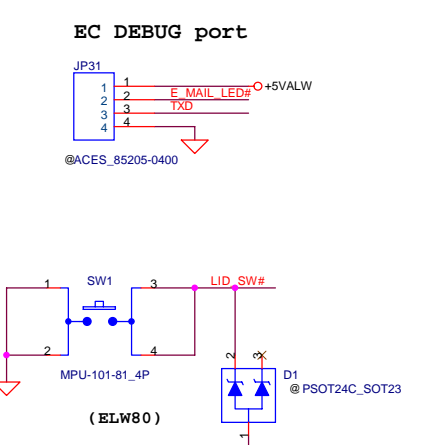
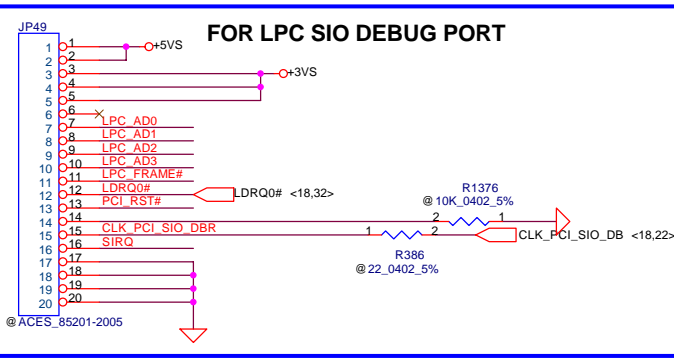
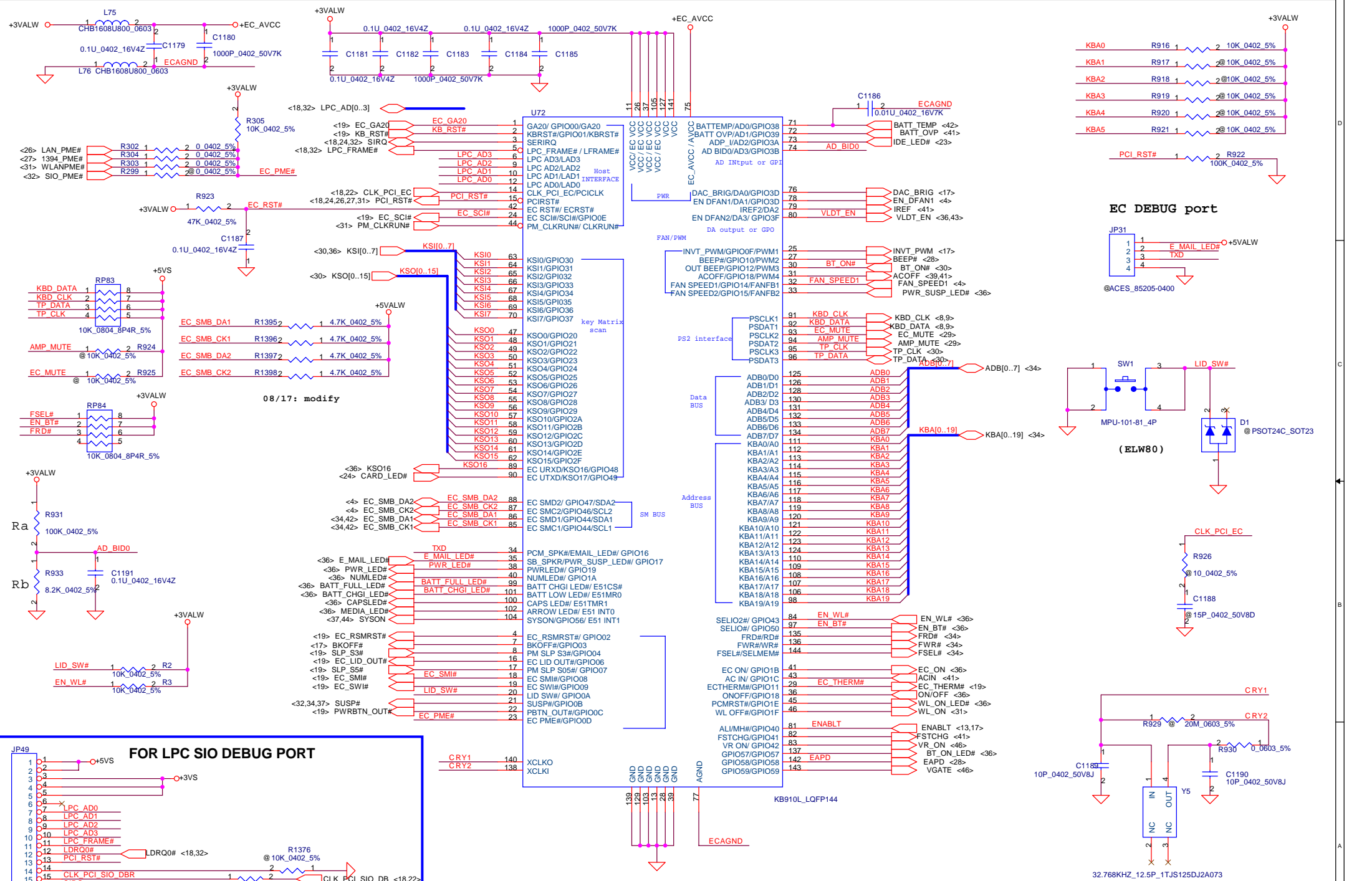
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# SUPER I/O SMsC FDC47N207



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Size Custom	Document Number	Rev		LA-2931	
Date:	Thursday, August 18, 2005	Sheet	32	of	48

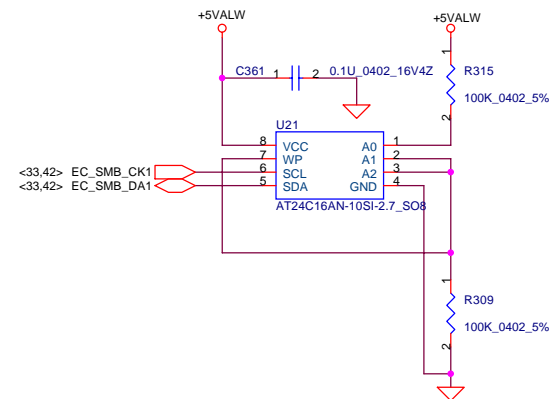
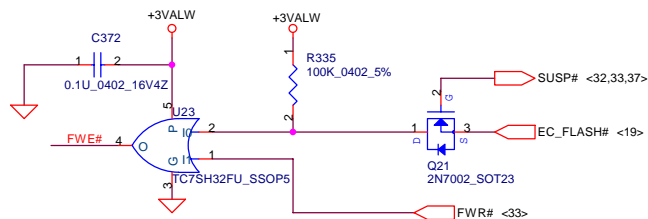
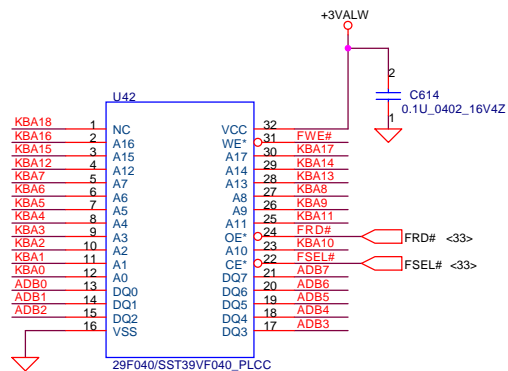




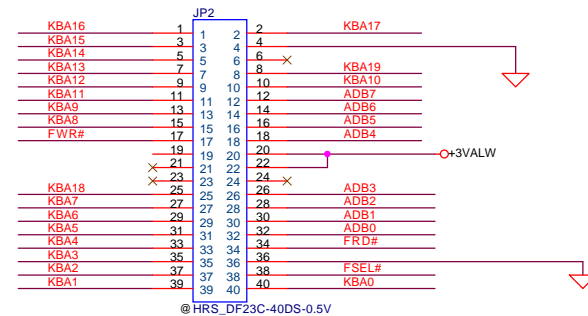
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KB910L/LIT SW		
Size	Document Number	Rev
Custom	LA-2931	0.3
Date:	Thursday, August 18, 2005	Sheet 33 of 48

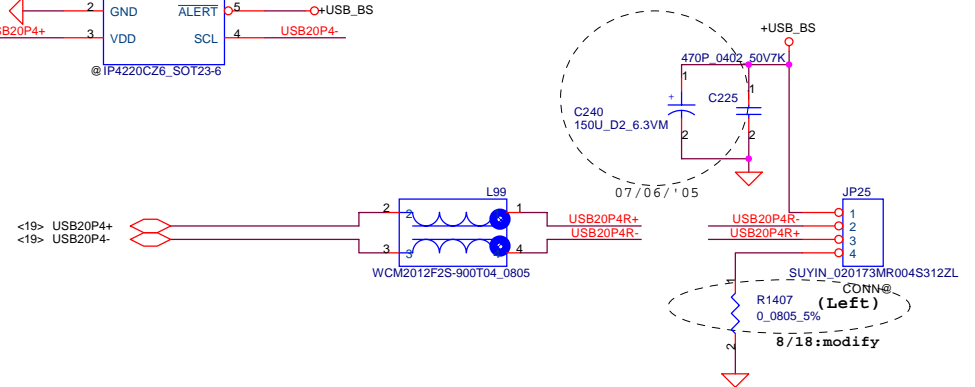
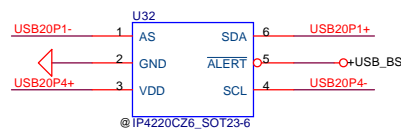
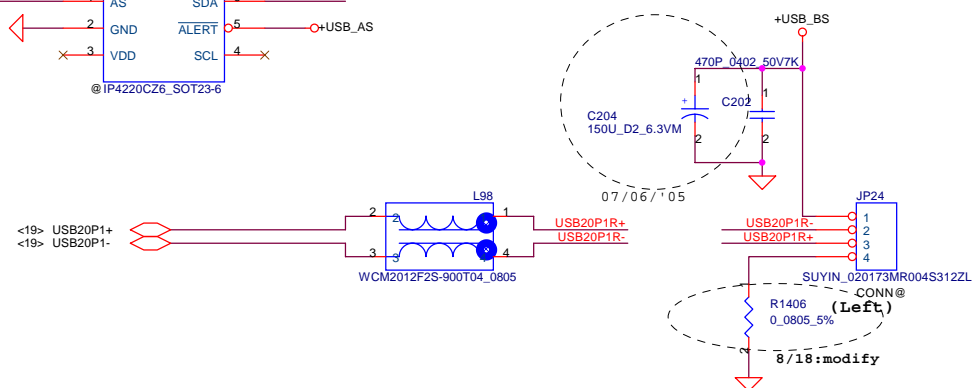
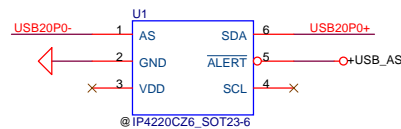
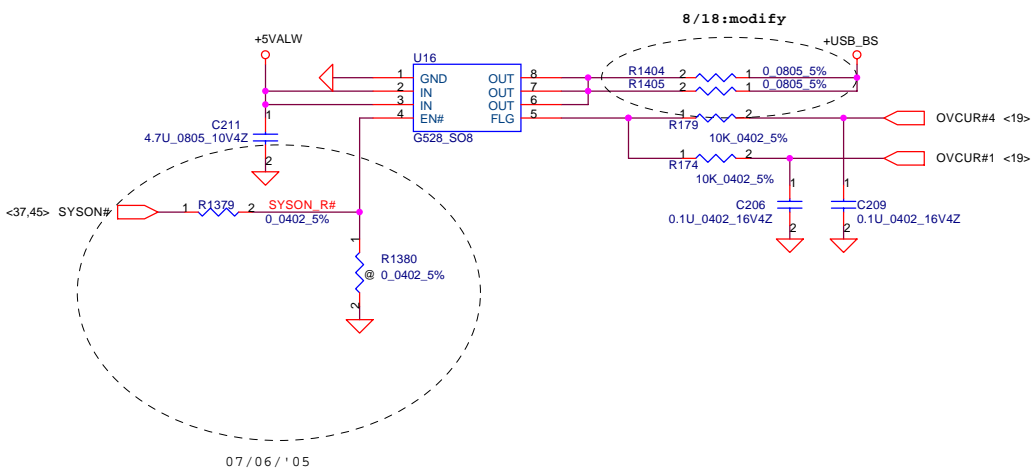
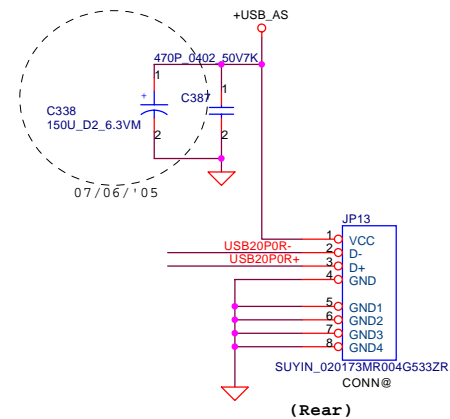
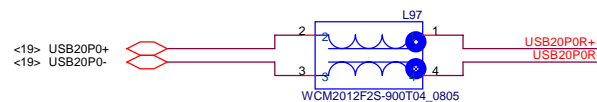
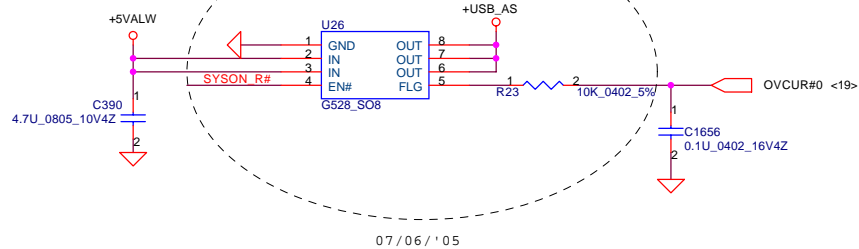
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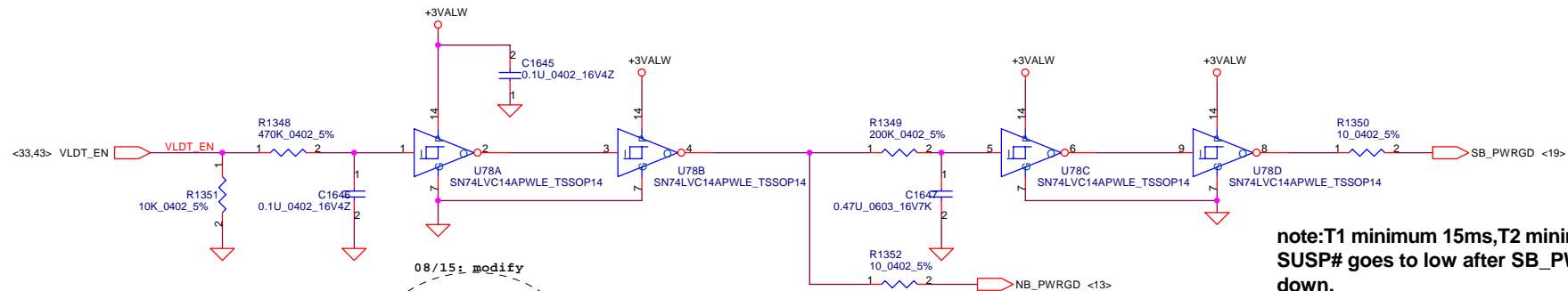
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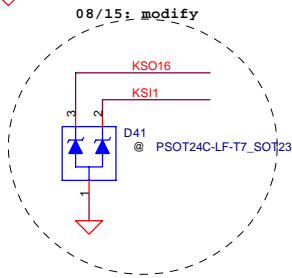
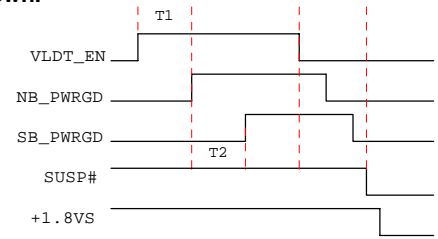
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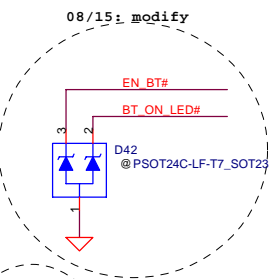


note:T1 minimum 15ms,T2 minimum 33ms/maximum 500ms, SUSP# goes to low after SB\_PWRGD goes to low for power down.



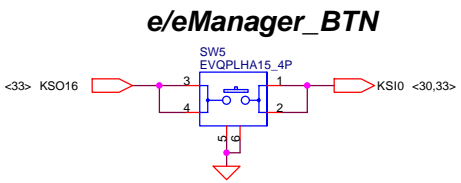
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Internet\_BTN

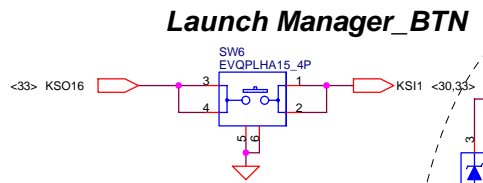


BlueTooth\_BTN

Wireless\_BTN



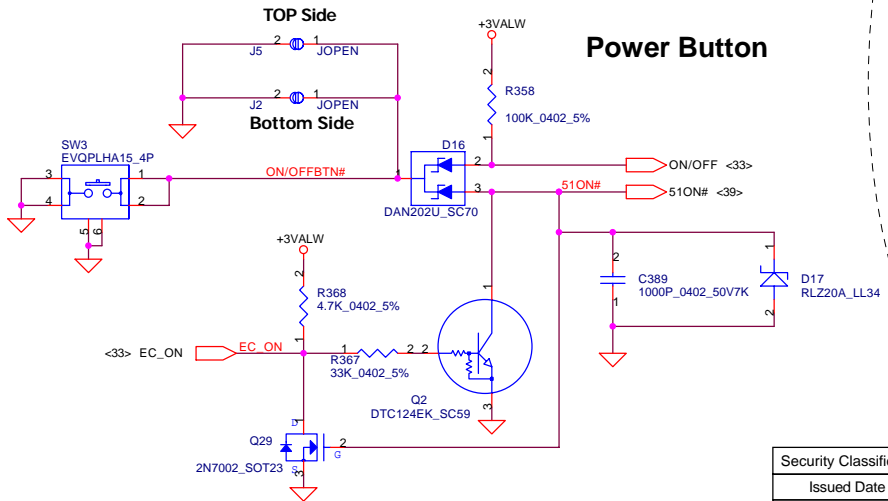
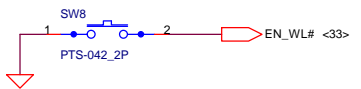
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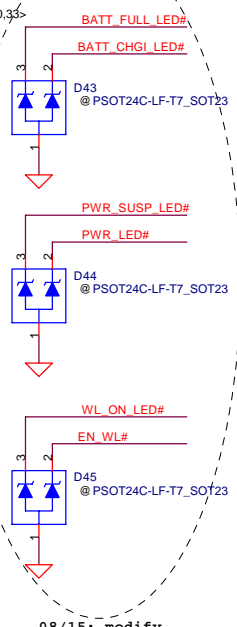
Launch Manager\_BTN



LED Indicator

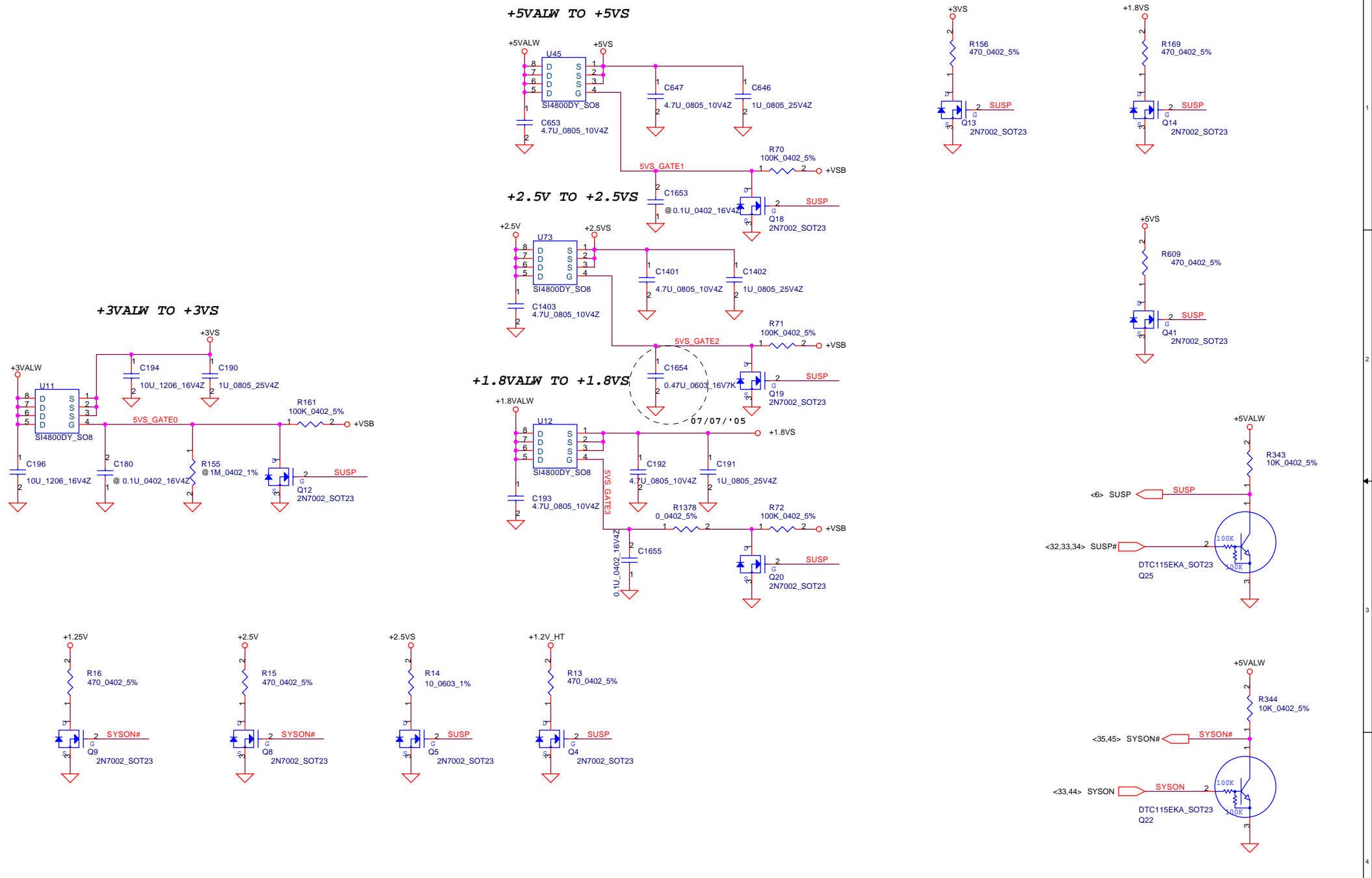


Power Button



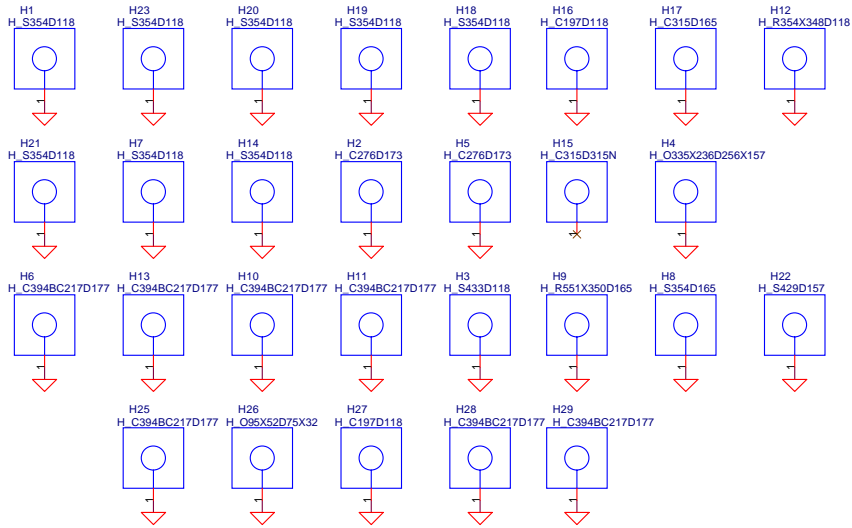
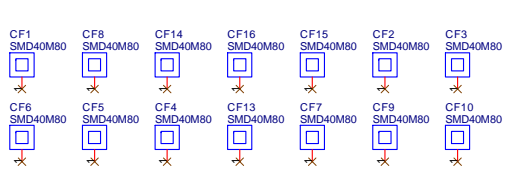
08/15: modify

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Size Custom	Document Number	Rev		0.3	
Date:	Thursday, August 18, 2005	Sheet	36	of	48



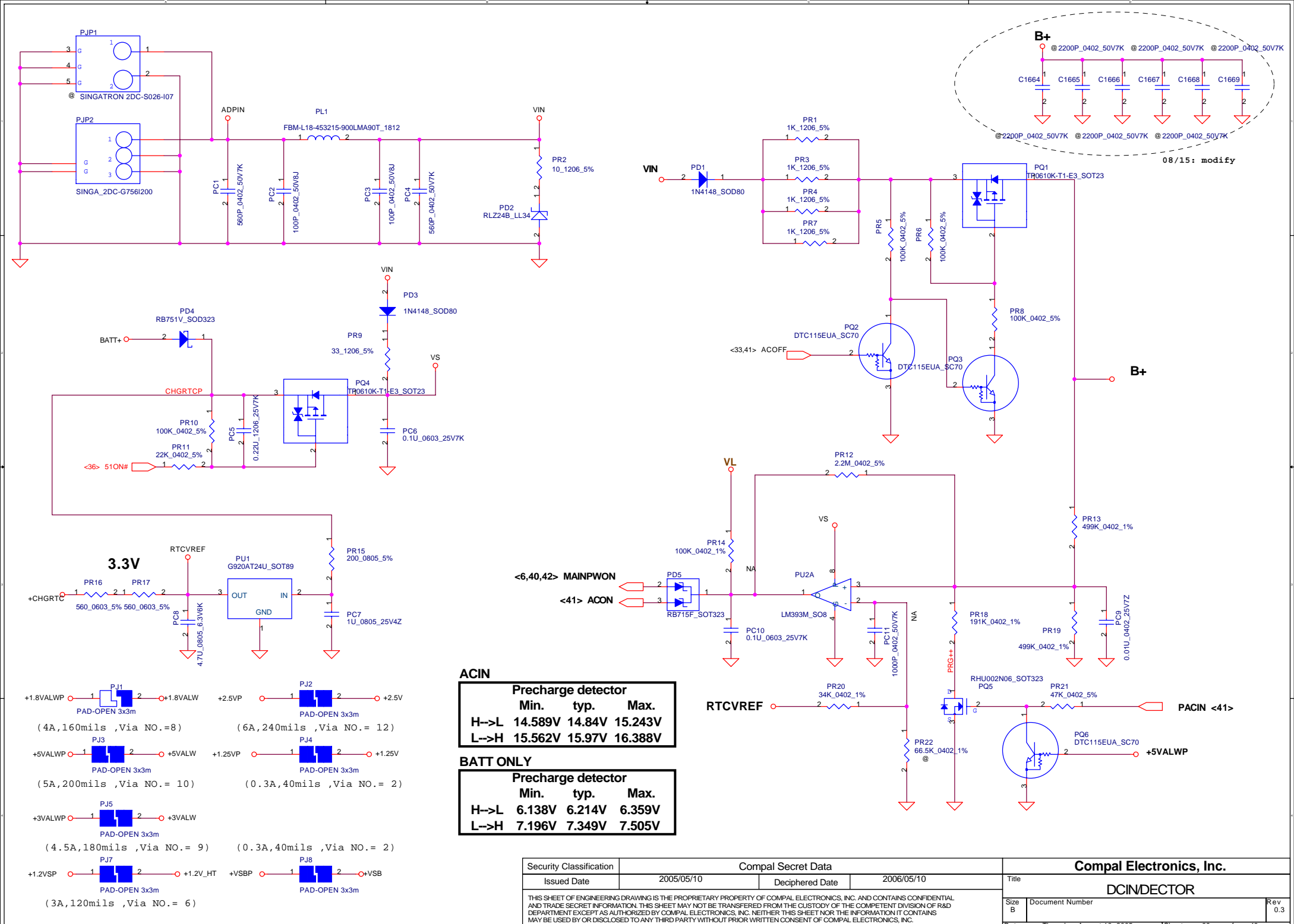
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Chip_Name	Label_Name
EXP_TXP0/SDVOB_RED	PCIE_MTX_C_GRX_P0
EXP_TXN0/SDVOB_RED#	PCIE_MTX_C_GRX_N0
EXP_TXP1/SDVOB_GREEN	PCIE_MTX_C_GRX_P1
EXP_TXN1/SDVOB_GREEN#	PCIE_MTX_C_GRX_N1
EXP_TXP2/SDVOB_BLUE	PCIE_MTX_C_GRX_P2
EXP_TXN2/SDVOB_BLUE#	PCIE_MTX_C_GRX_N2
EXP_TXP3/SDVOB_CLKP	PCIE_MTX_C_GRX_P3
EXP_TXN3/SDVOB_CLKN	PCIE_MTX_C_GRX_N3
EXP_RXP1/SDVO_INT	PCEI_GTX_C_MRX_P1
EXP_RXN1/SDVO_INT#	PCEI_GTX_C_MRX_N1

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				Custom	LA-2931
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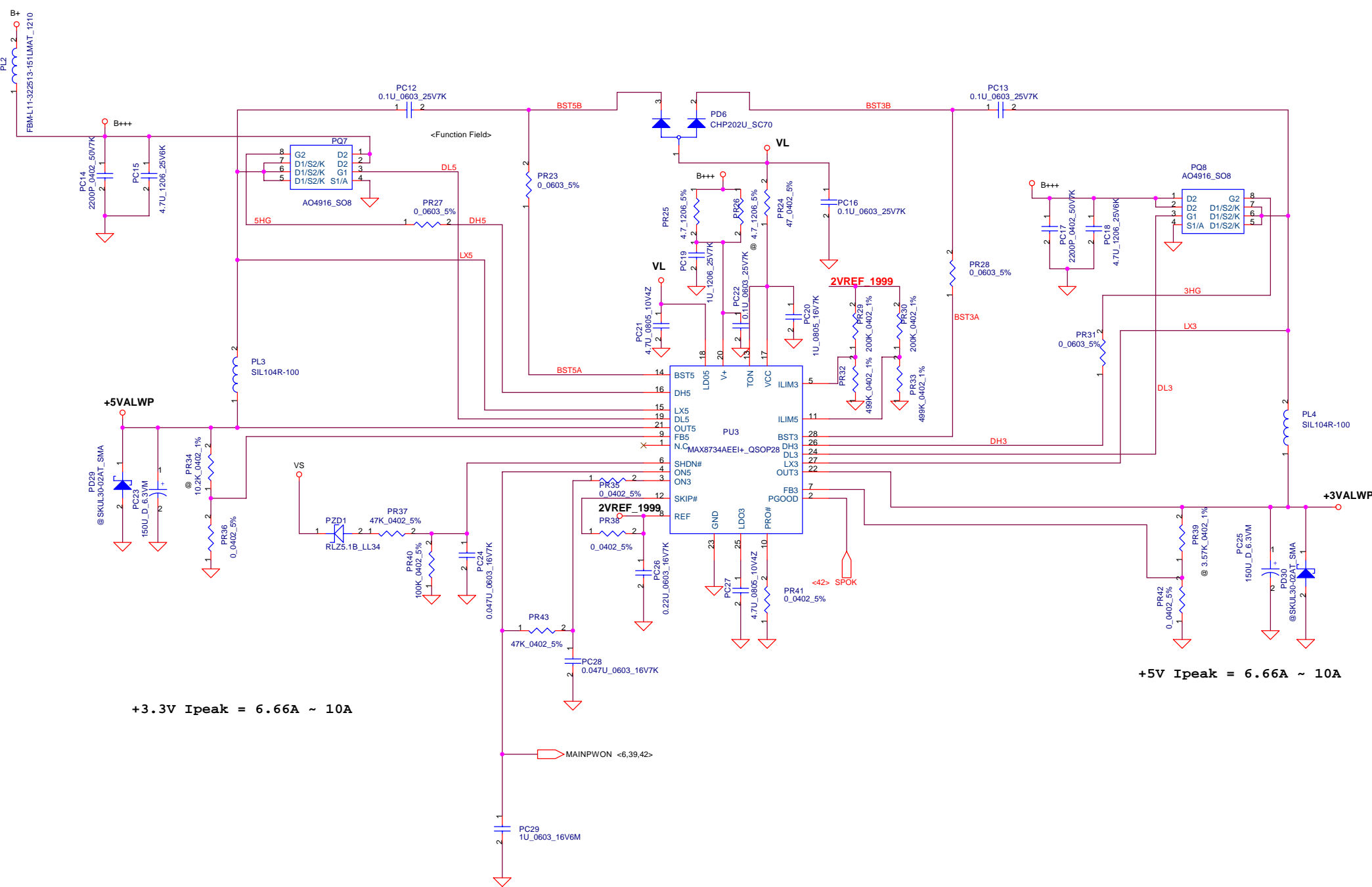


ACIN			
	Min.	typ.	Max.
H->L	14.589V	14.84V	15.243V
L->H	15.562V	15.97V	16.388V

BATT ONLY			
	Min.	typ.	Max.
H->L	6.138V	6.214V	6.359V
L->H	7.196V	7.349V	7.505V

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Size B	Document Number			Rev	0.3
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**+3.3V Ipeak = 6.66A ~ 10A**

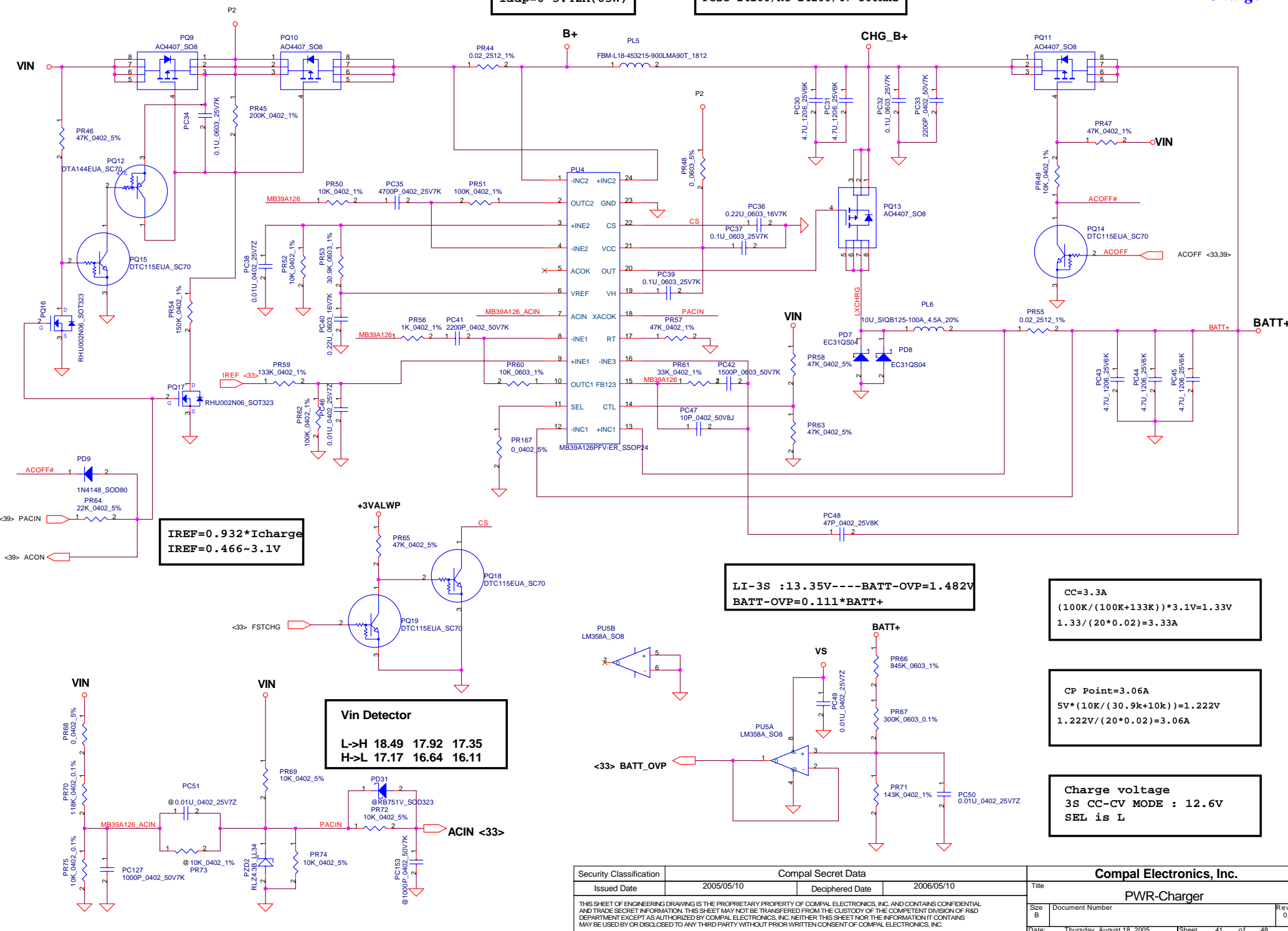
**+5V Ipeak = 6.66A ~ 10A**

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$I_{adp} = 0 \sim 3.42A (65W)$

$F_{osc} = 14100/Rt = 14100/47 = 300KHz$



$I_{REF} = 0.932 * I_{charge}$   
 $I_{REF} = 0.466 \sim 3.1V$

LI-3S : 13.35V --- BATT-OVP = 1.482V  
 $BATT-OVP = 0.111 * BATT+$

CC=3.3A  
 $(100k / (100k + 133k)) * 3.1V = 1.33V$   
 $1.33 / (20 * 0.02) = 3.33A$

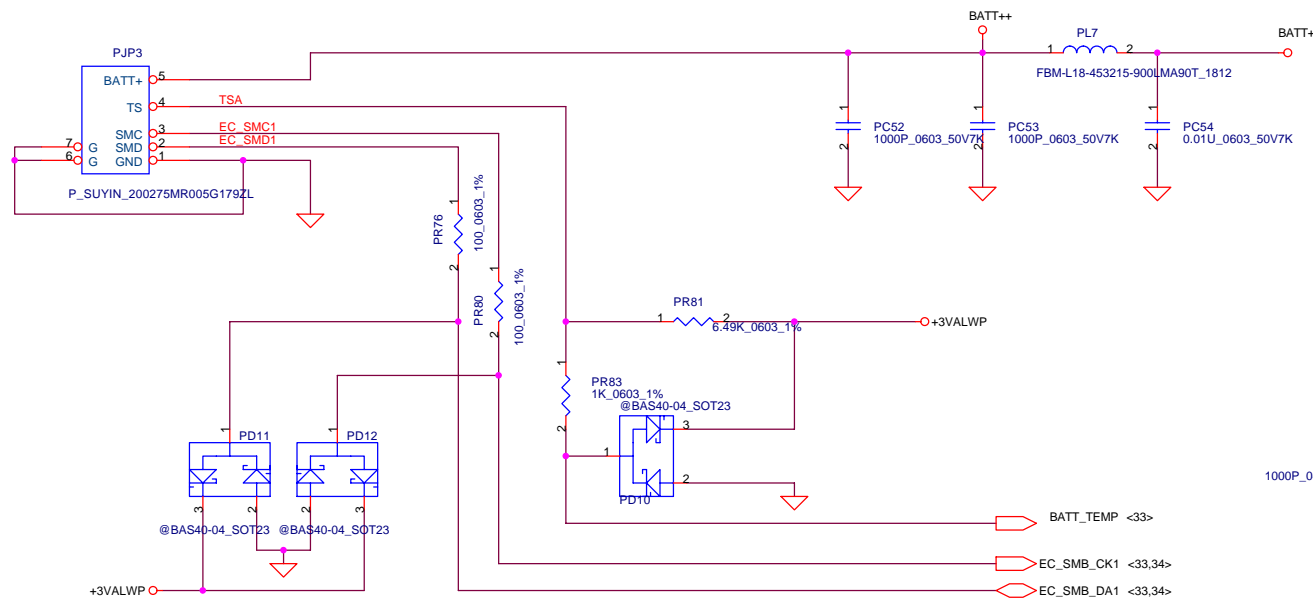
CP Point=3.06A  
 $5V * (10k / (30.9k + 10k)) = 1.222V$   
 $1.222V / (20 * 0.02) = 3.06A$

Charge voltage  
 3S CC-CV MODE : 12.6V  
 SEL is L

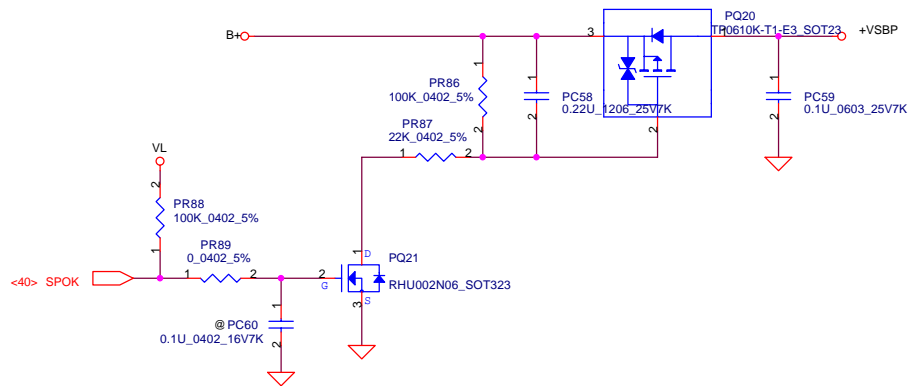
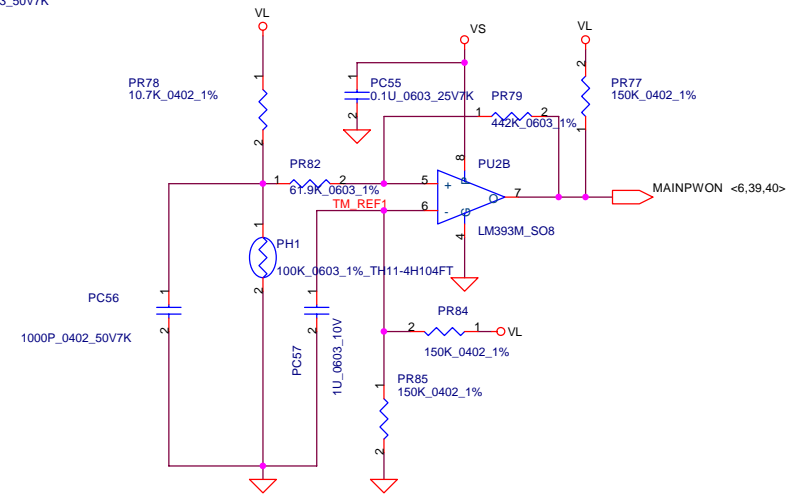
Vin Detector  
 L->H 18.49 17.92 17.35  
 H->L 17.17 16.64 16.11

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PWR-Charger		
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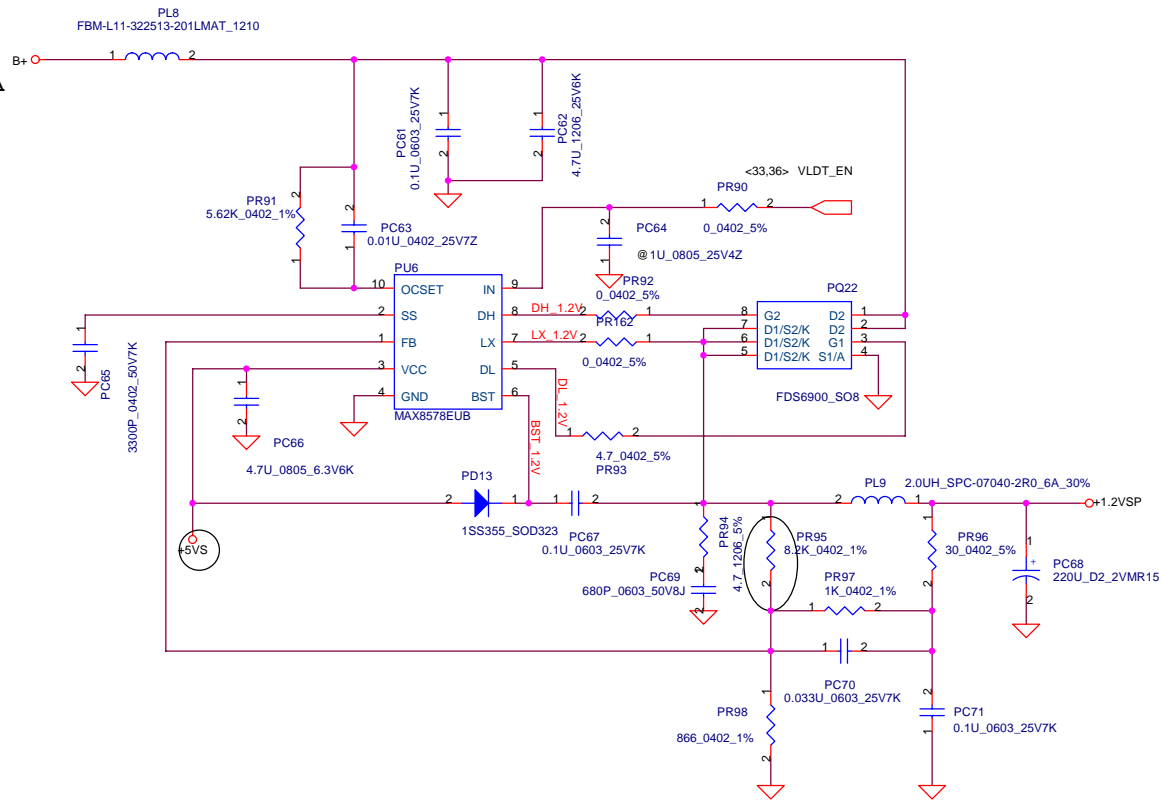


**PH1 under CPU bottom side :**  
 CPU thermal protection at 85 degree C  
 Recovery at 70 degree C



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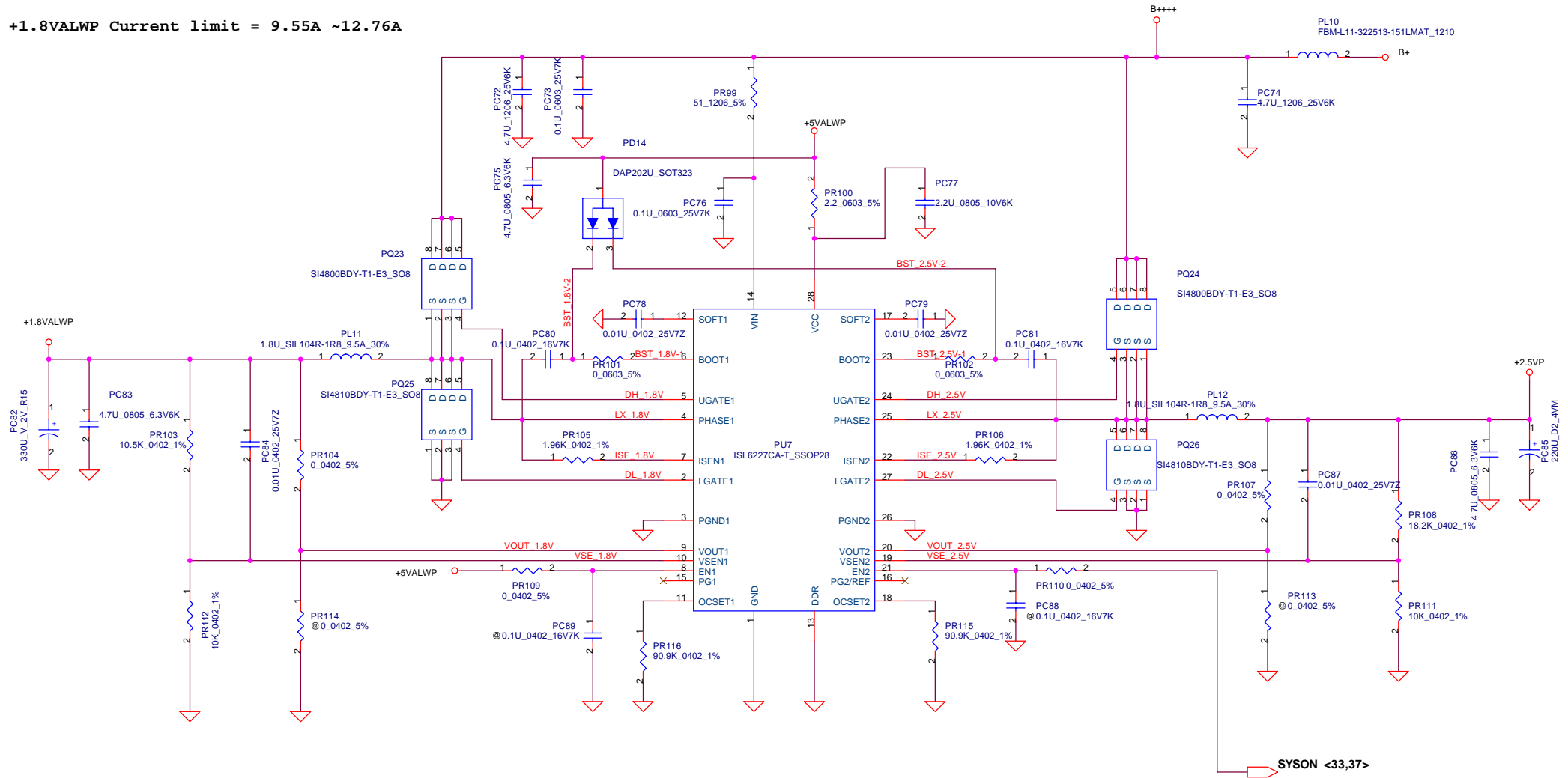
+1.2VSP Current limit = 8.29A ~9.6A



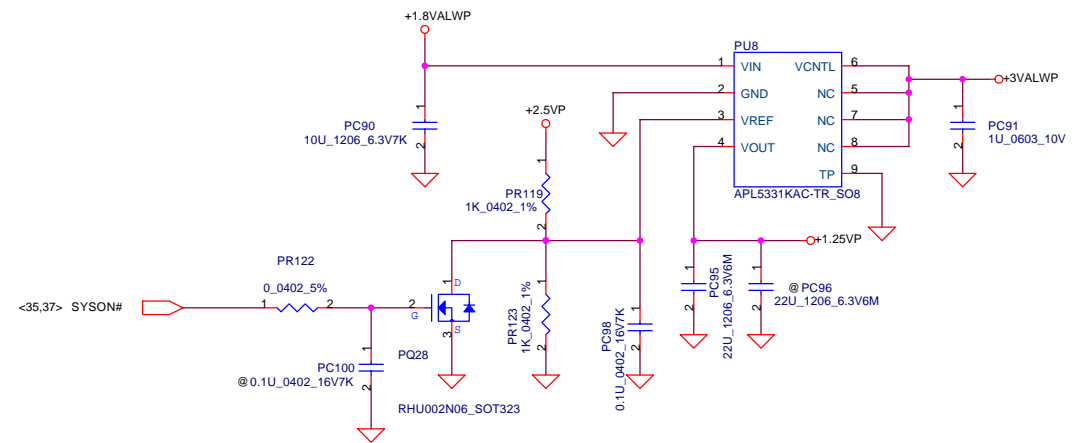
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+2.5VP O.C.P. =9A ~ 12.2A

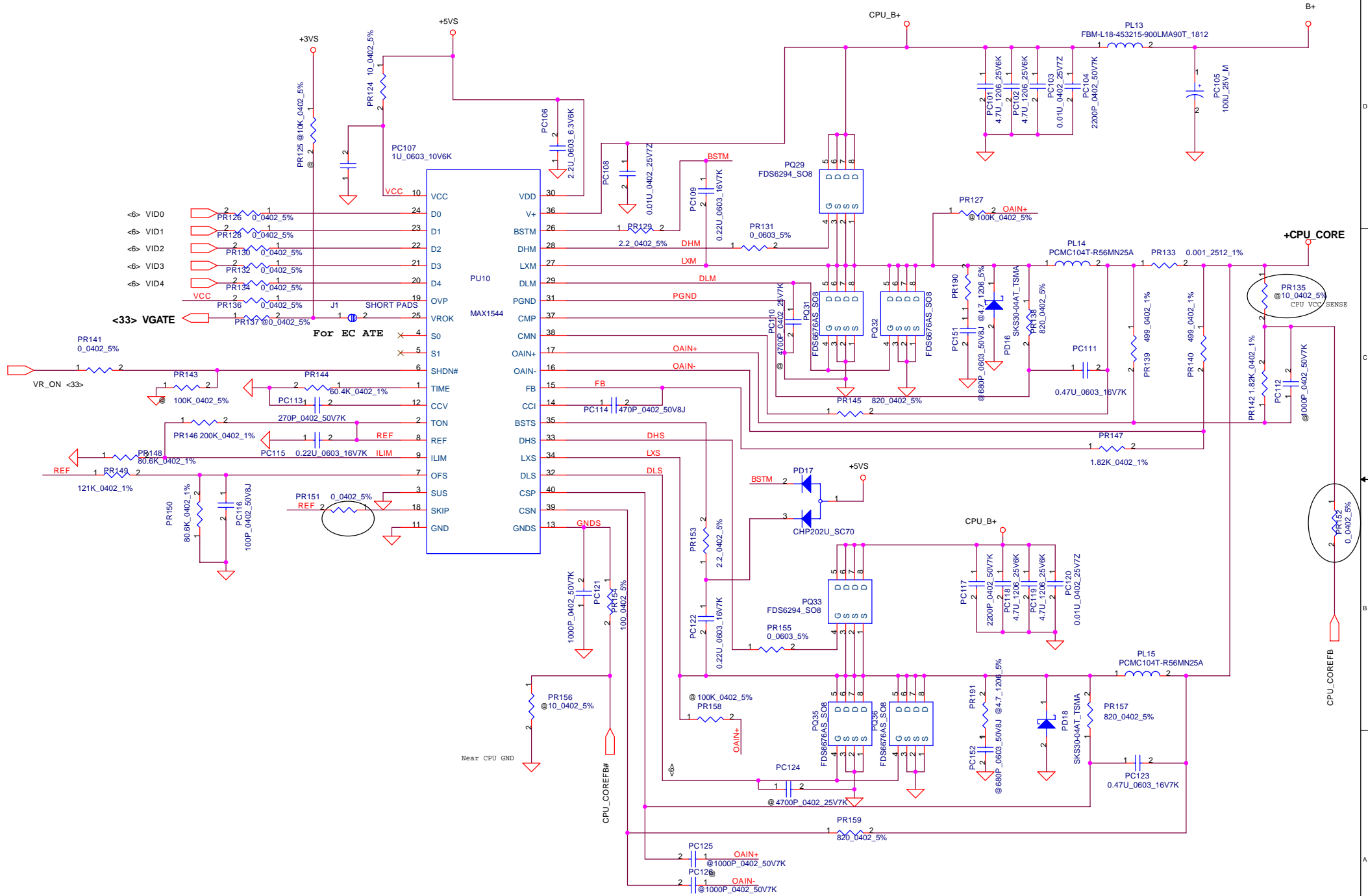
+1.8VALWP Current limit = 9.55A ~12.76A



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Size	Document Number			Rev	
Custom				0.3	
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Version change list (P.I.R. List)

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	VER	Phase
1		add ACIN detect RC filter		42	add PD31,PC153		DVT
2		revert or decrease CPU CORE ring with EMI solution : snubber		47	Reserve PR190//PR191: 4.7 1206 ,add PC151/PC152:680P		DVT
3		Modify 1.2VP voltage level		44	change PR95 from 6.81k to 8.2k		DVT
4		delete 1.2VP power good		44	delete PR164,PR163,PR165,PR166,PQ38,PQ39,PC128		DVT
5		delete Charger 3S/4S selector		42	delete PR160,PQ37		DVT
6							
7							
8							
9							
10							
11							
8							
9							

<b>Compal Electronics, Inc.</b>		
Title		
PIR (PWR)		
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Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	VER	Phase
1	1.Del +3V PWR		0.2	30,31			
2	1.Del Q3,C611,C609,C639,R341,Q24,R340		0.2	37			
3	1.Del JP6 2.PWR_SUSP_LED#/WL_ON_LED#/BT_ON_LED# conn to EC		0.2	36			
4	1.Del NET MSPWREN# 2.Del R561/R634 3.Change XDOC# to MSOC#		0.2	24/25			
5	1.change LAN LED PWR from +2.5V_LAN to +3VALW 2.DEL R856 3.Change Q52		0.2	26			
6	1.DEL MIC1 2.Change Q38		0.2	29			
7	1.Change U26 to G528 2.ADD C1656/R1379/R1380/L97/L98/L99/R1381~R1386		0.2	35			
8							
9							

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Issued Date	2005/03/08	Deciphered Date	2006/03/08	PIR (HW)	
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