

COMPAL CONFIDENTIAL

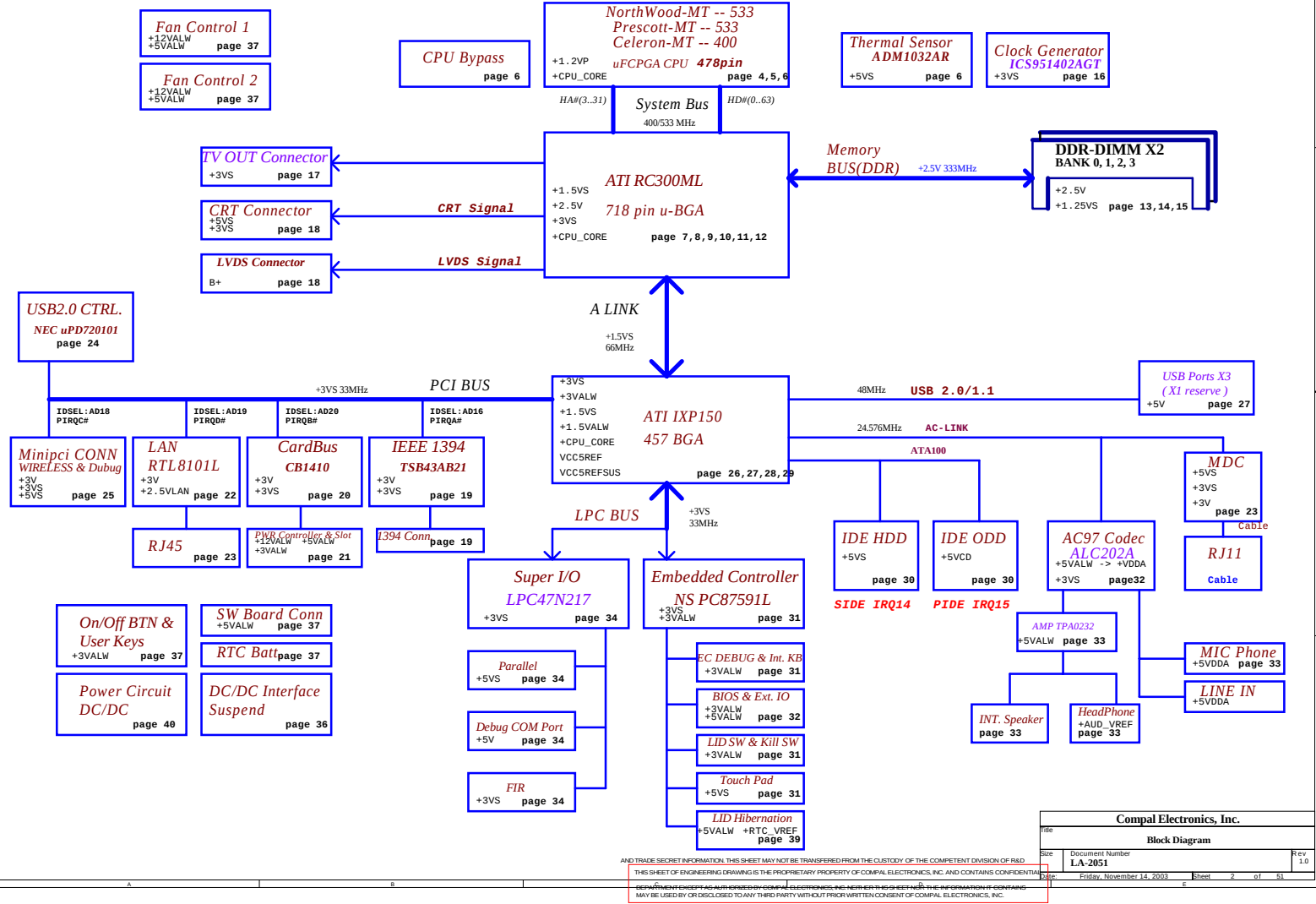
MODEL NAME : *Sapporo XA*
COMPAL P/N : **DFL10**
PCB NO : **LA-2051**
Revision : *1.0*

Sapporo XA Schematics Document
uFCBGA/uFCPGA NorthWood MT

2003 11 07 v1.0

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Block Diagram			
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Voltage Rails

Power Plane	Description	S0-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
+1.2V	The voltage for Processor VID select	ON	OFF	OFF
+1.25VS	1.25V switched power rail for DDR Vtt	ON	OFF	OFF
+1.5VS	1.5V I/O power rail for ATI-RS300M/RC300M NB AGP.	ON	OFF	OFF
+1.8VS	1.8V switched power rail for ATI-RS300M/RC300M NB.	ON	OFF	OFF
+2.5VALW	2.5V always on power rail	ON	ON	ON*
+2.5V	2.5V system 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 system power rail for SB,LAN,CardReader and HUB.	ON	ON	OFF
+3VS	3.3V switched power rail	ON	OFF	OFF
+5VALW	5V always on power rail	ON	ON	ON*
+5V	5V system power rail .	ON	ON	OFF
+5VS	5V switched power rail	ON	OFF	OFF
+12VALW	12V always on power rail	ON	ON	ON*
RTC/VCC	RTC power	ON	ON	ON

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

External PCI Devices

DEVICE	IDSEL #	REQ/GNT #	PIRQ
NB Internal VGA	N/A	N/A	A
AGP BUS	AGP_DEVSEL	N/A	A
SOUTHBRIDGE	AD31 (INT.)	N/A	N/A
USB	AD30 (INT.)	N/A	D
AC97	AD31 (INT.)	N/A	B
ATA 100	AD31 (INT.)	N/A	A
ETHERNET	AD24(INT.)	N/A	C
1394	AD16	0	A
LAN	AD19	1	D
CARD BUS	AD20	2	A
Wireless LAN(MINI PCI)	AD18	3	C

EXT USB AD23(EXT.) 4 A,C,D

EC SM Bus1 address

EC SM Bus2 address

Device	Address	Device	Address
Smart Battery	0001 011X b	ADM1032	1001 100X b
EEPROM(24C16)	1010 000X b		

I2C / SMBUS ADDRESSING

DEVICE	HEX	ADDRESS
DDR SO-DIMM 0	A0	1 0 1 0 0 0 0 X
DDR SO-DIMM 1	A2	1 0 1 0 0 0 1 X
CLOCK GENERATOR (EXT.)	D2	1 1 0 1 0 0 1 X

Power Managment table

Signal	+3VALW +5VALW +12VALW	+5V +3V +2.5V	+2.5VS +1.8VS +5VS +3VS +1.5VS +CPU_CORE +1.25VS
S0	ON	ON	ON
S1	ON	ON	ON
S3	ON	ON	OFF
S5 S4/AC	ON	OFF	OFF
S5 S4/AC don't exist	OFF	OFF	OFF

SKU ID Table for AD channel

Vcc	3.3V +/- 5%			
Ra	100K +/- 5%			
SKU ID	Rb	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

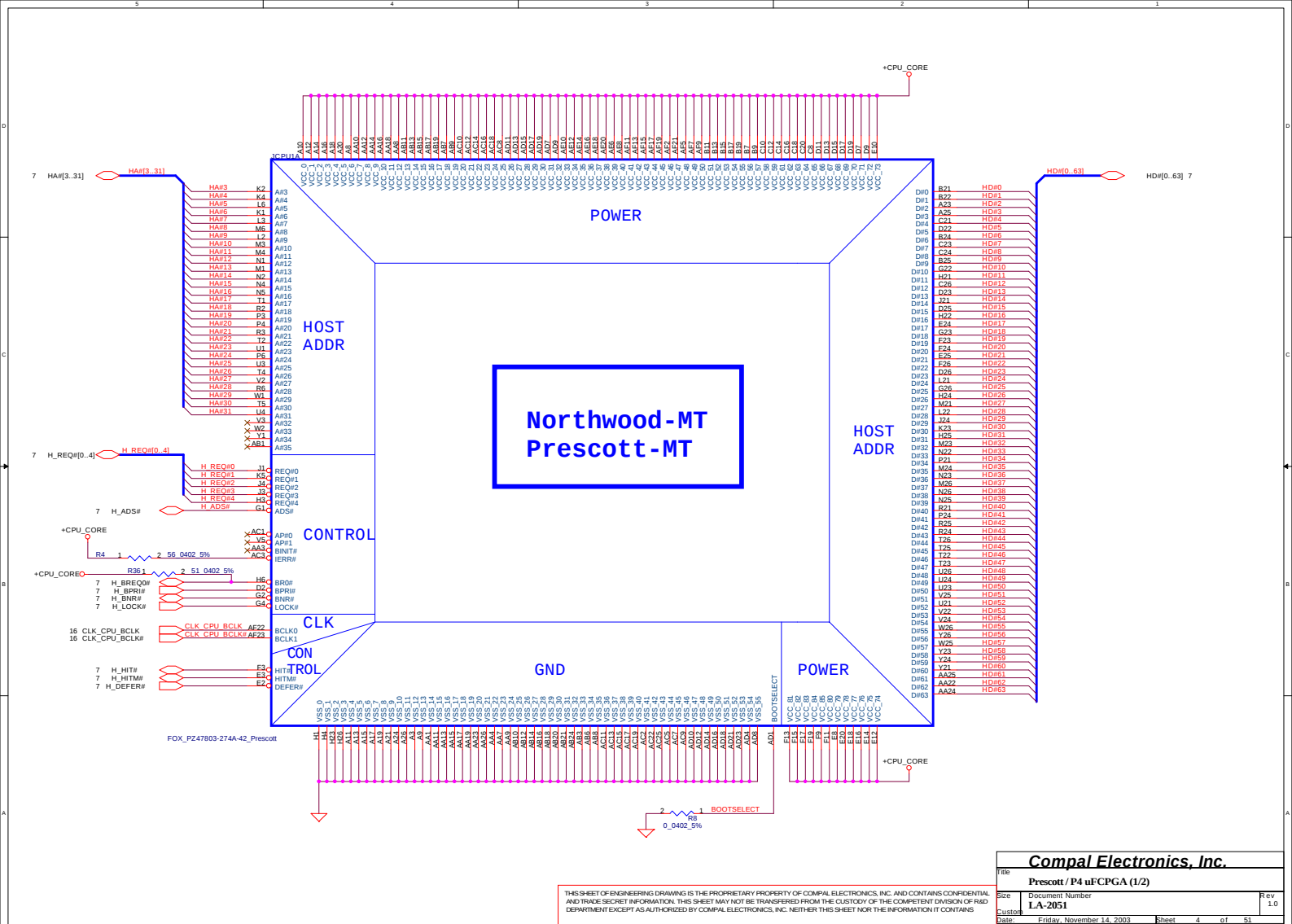
BOARD ID

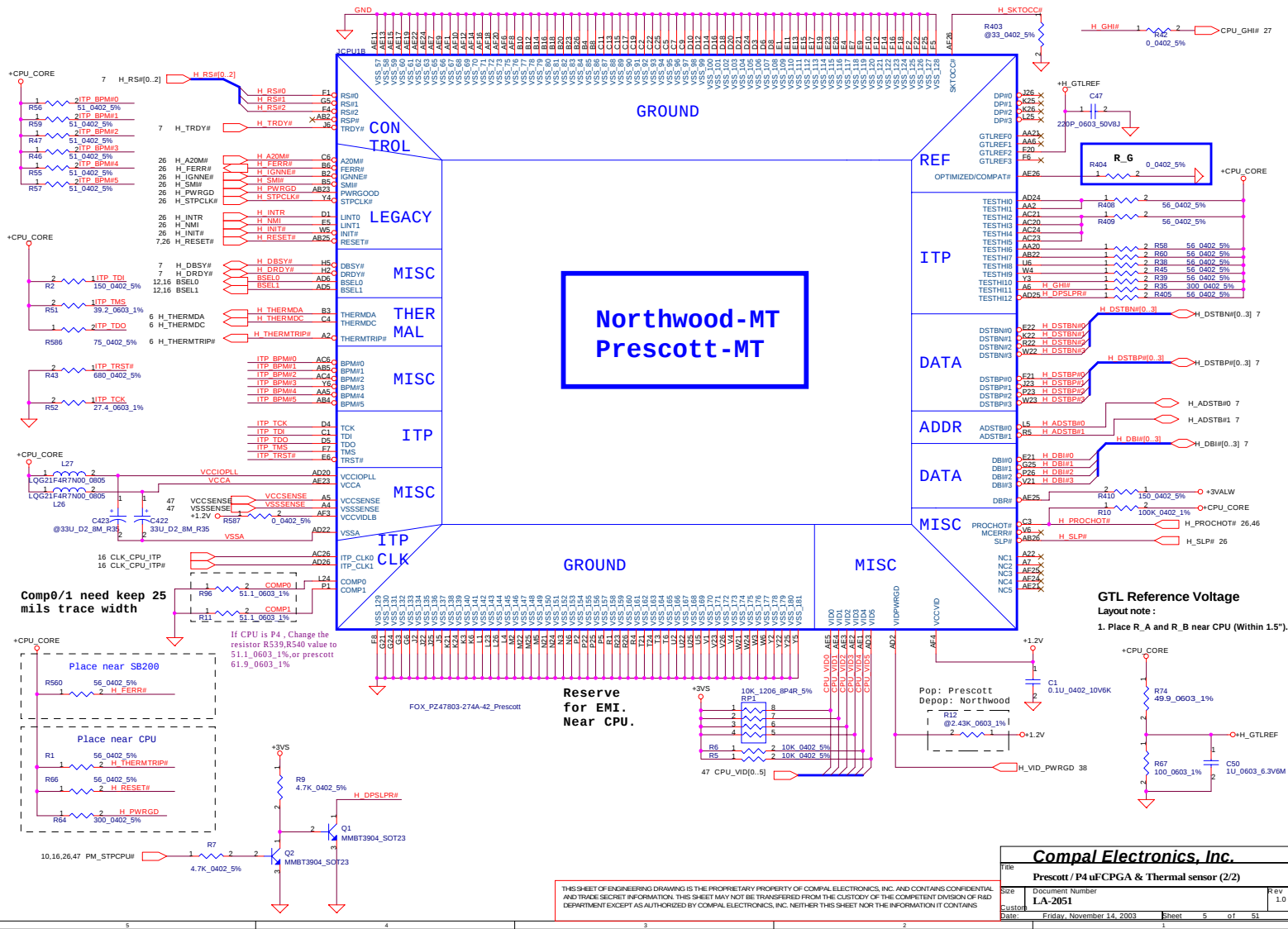
Version	BID1	BID0
0	0	0
1	0	1
2	1	0
3	1	1

SKU ID	CD PLAY FUNCTION	Short cut key
0		
1		
2		
3	YES	YES
4	YES	NO
5	NO	YES
6	NO	NO
7		

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Note & Revision			
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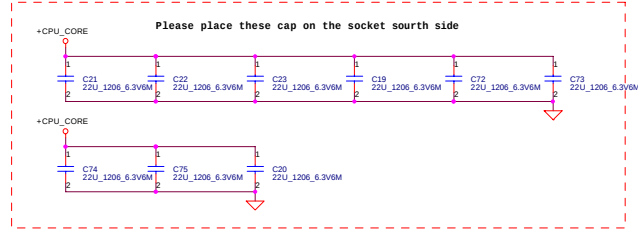
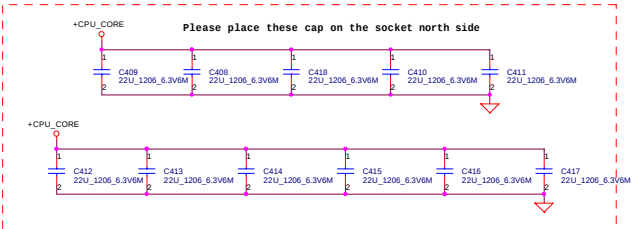
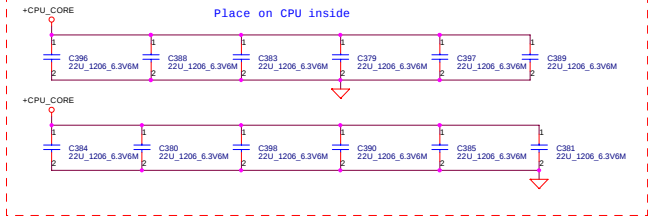


Compal Electronics, Inc.				
Prescott / P4 uFCPGA & Thermal sensor (2/2)				
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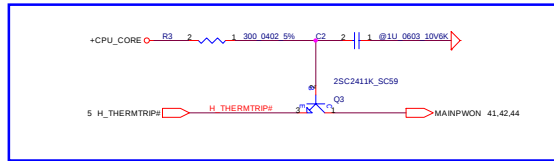
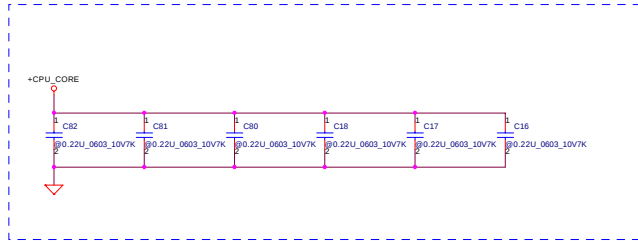
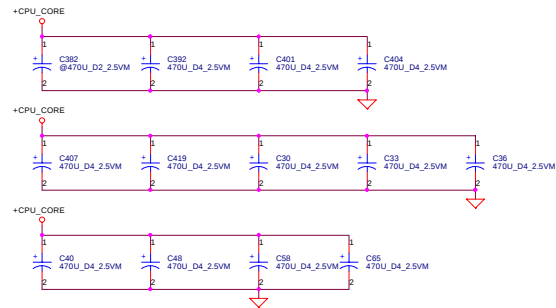
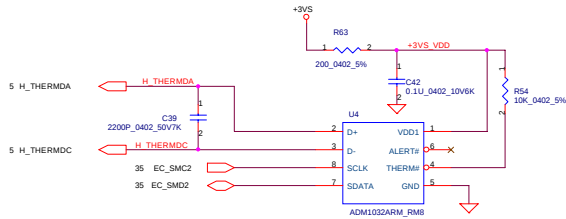
Layout note :
Place close to CPU. Use 2-3 vias per PAD.
Place 22uF caps x31 pcs, populated 14pcs.

Layout note :
Place close to CPU power and ground pin as possible (<1inch)

For Desktop's CPU:
470uFx15/12mOhm H=1.8 each
Total 0.923m ohm



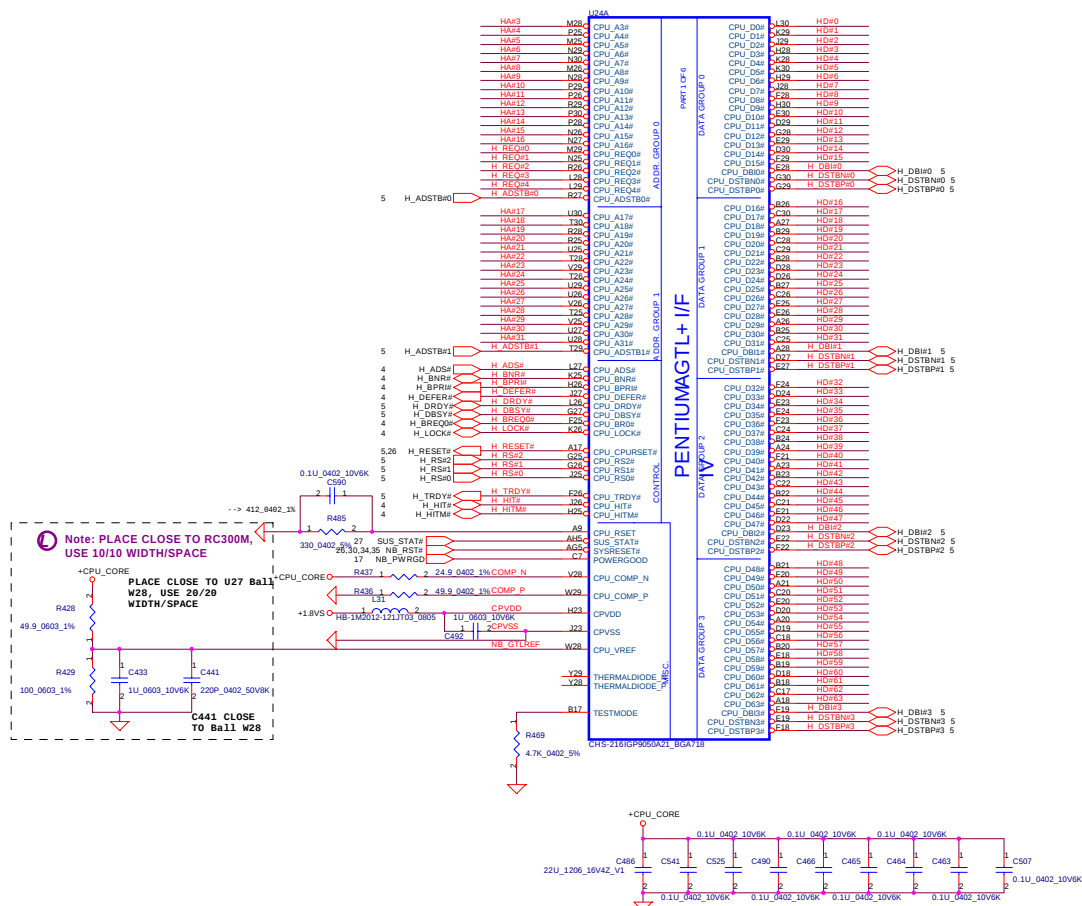
CPU Temperature Sensor



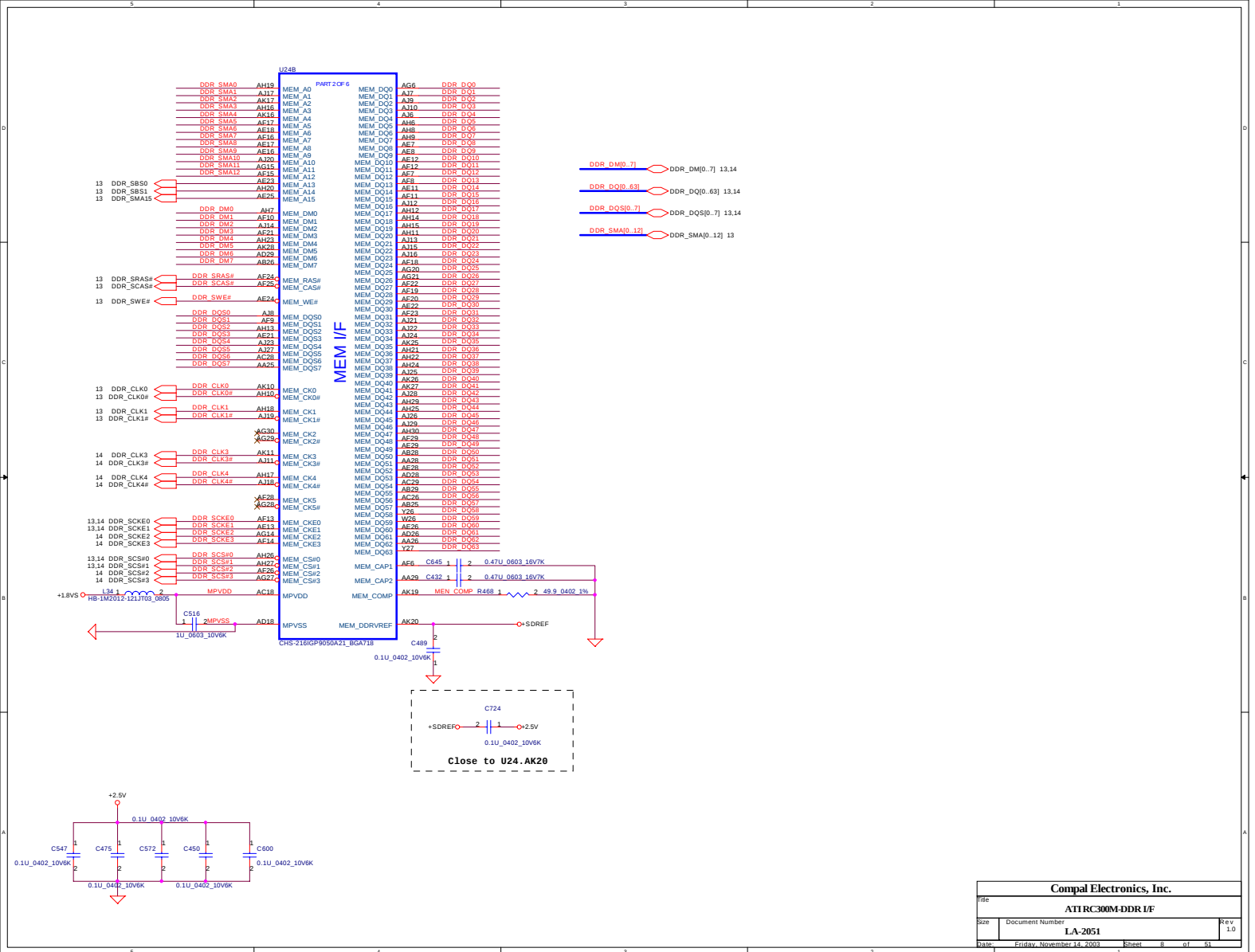
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CPU Decoupling CAP.			
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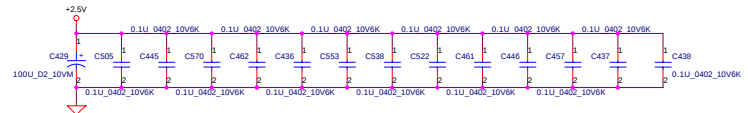
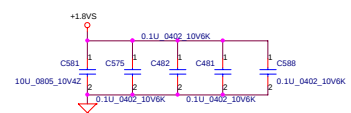
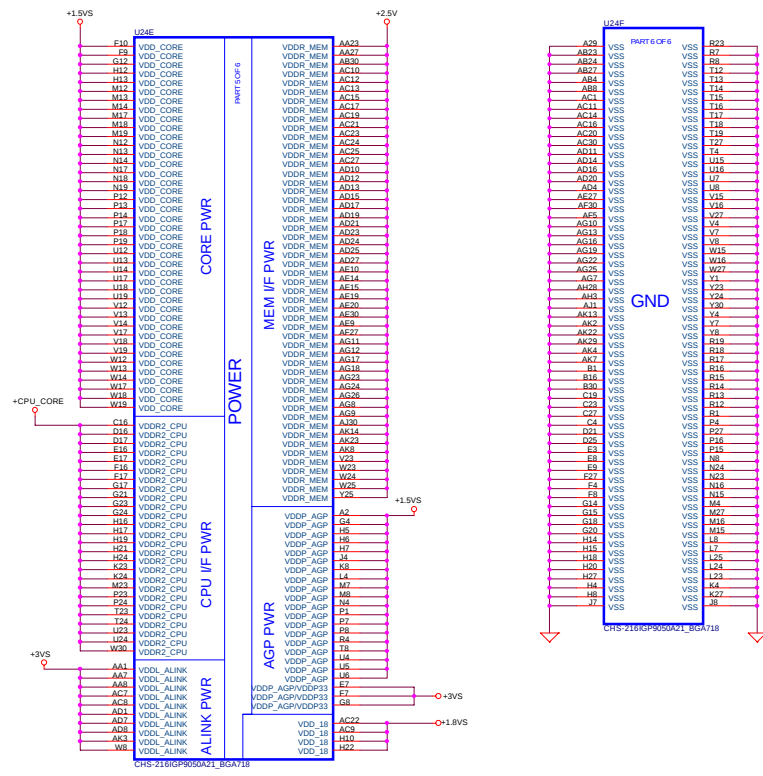
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HAH[3..31] HAH[3..31] 4
H_REQ[0..4] H_REQ[0..4] 4
HDI[0..63] HDI[0..63] 4



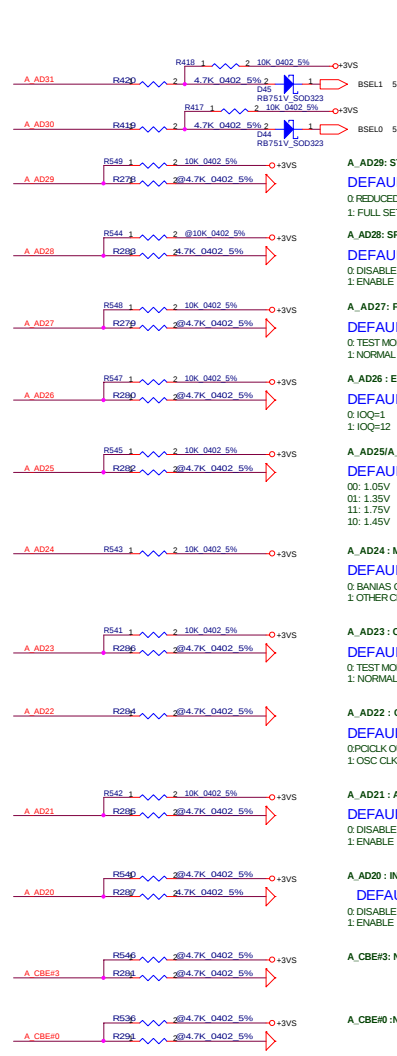
Compal Electronics, Inc.				
File: AT1RC300M-AGTL+				
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AT1RC300M-POWER				
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A_AD[31..30] : FSB CLK SPEED
DEFAULT: 01
00: 100 MHz
01: 133 MHz
10: 200MHz
11:166 MHz

A_AD29: STRAP CONFIGURATION
DEFAULT:1
0 REDUCEDE SET
1: FULL SET(internal Pull high)

A_AD28: SPREAD SPECTRUM ENABLE
DEFAULT:0
0 DISABLE
1: ENABLE

A_AD27: FrcShortReset#
DEFAULT: 1
0 TEST MODE
1: NORMAL MODE

A_AD26 : ENABLE IOQ
DEFAULT: 1
0 IOQ=1
1: IOQ=12

A_AD25/A_AD17 : CPU VOLTAGE[L0]
DEFAULT: 10
AD25=1 DESTOP CPU
AD25=0 MOBILE CPU
AD17 -- DON'T CARE
00: 1.05V
01: 1.35V
11: 1.75V
10: 1.45V

A_AD24 : MOBILE CPU SELECT
DEFAULT: 1
0 BANIAS CPU
1 OTHER CPU

A_AD23 : CLOCK BYPASS DISABLE
DEFAULT: 1
0 TEST MODE
1: NORMAL(internal Pull high)

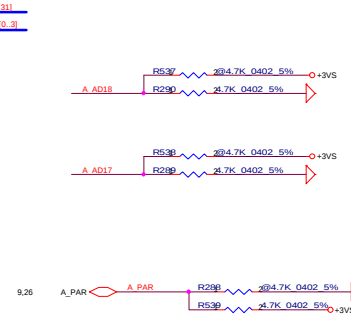
A_AD22 : OSC PAD OUTPUT PCICLK
DEFAULT : 1
0 PCCLK OUT
1: OSC CLK OUT

A_AD21 : AUTO_CAL ENABLE
DEFAULT : 1
0 DISABLE
1: ENABLE

A_AD20 : INTERNAL CLK GEN ENABLE
DEFAULT : 0
0 DISABLE
1: ENABLE

A_CBE#3: NOT USED

A_CBE#0 :NO USED



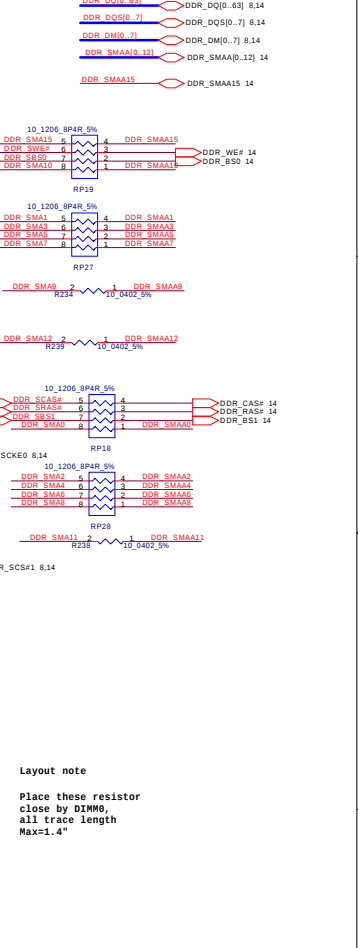
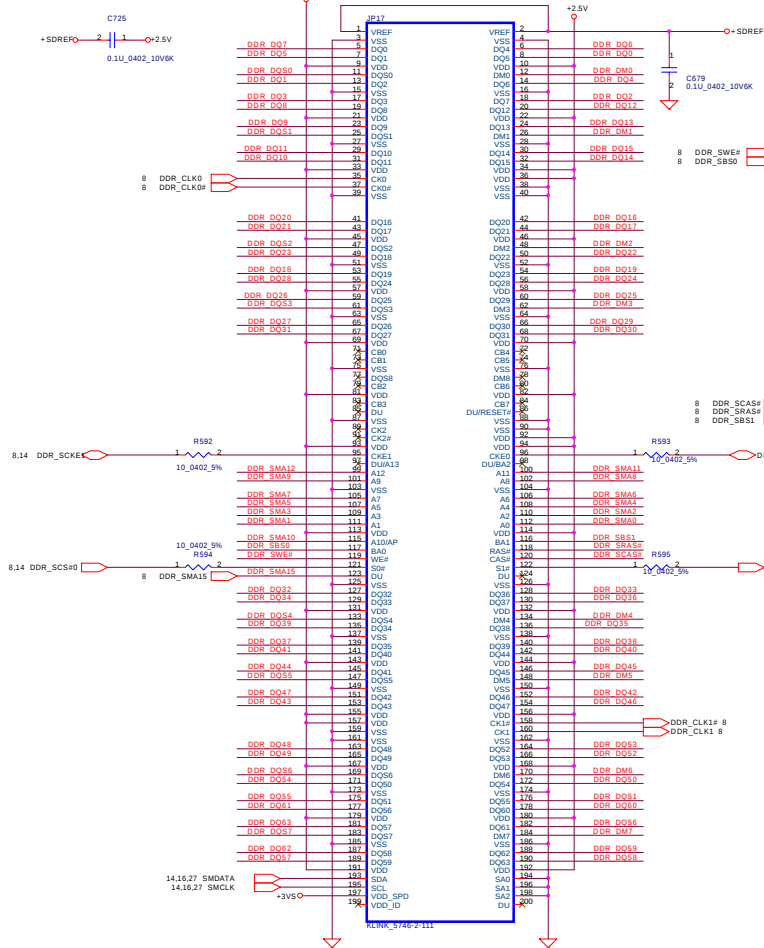
A_AD18 : ENABLE PHASE CALIBRATION
DEFAULT: 0
0 DISABLE
1:ENABLE

A_AD25/A_AD17 : CPU VOLTAGE[L0]
DEFAULT: 0
00: 1.05V
01: 1.35V
11: 1.75V
10: 1.45V

PAR: EXTENDED DEBUG MODE
DEFAULT: 1
0: DEBUG MODE
1: NORMAL

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Compal Electronics, Inc.				
Title		ATIRC300M-SYSTEM STRAP		
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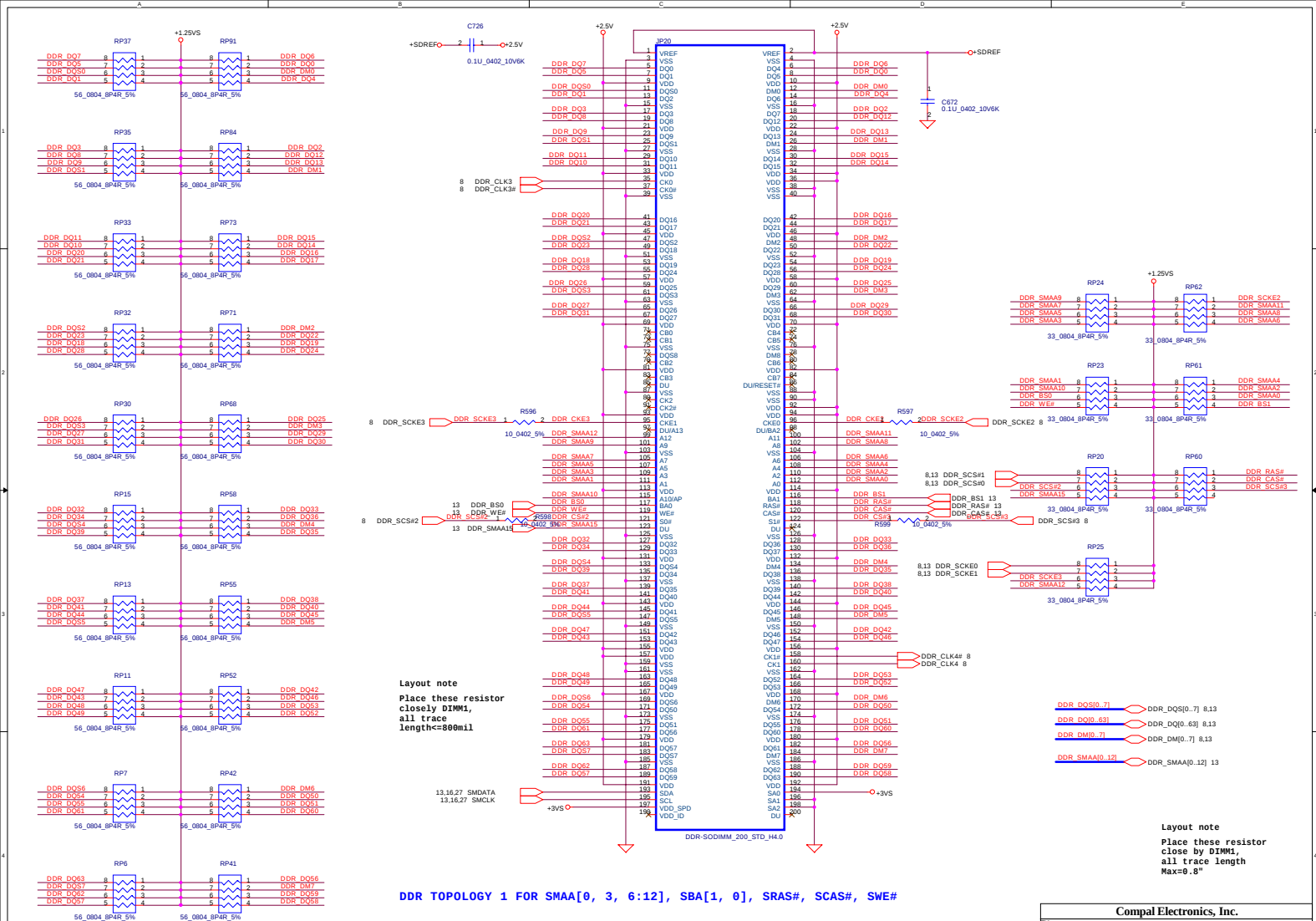
Layout note
Place these resistors
close to DIMM0,
all trace length<500 mil

DDR TOPOLOGY 1 FOR SMAA[0, 3, 6:12], SBA[1, 0], SRAS#, SCAS#, SWE#

Layout note
Place these resistor
close by DIMM0,
all trace length
Max=1.4"

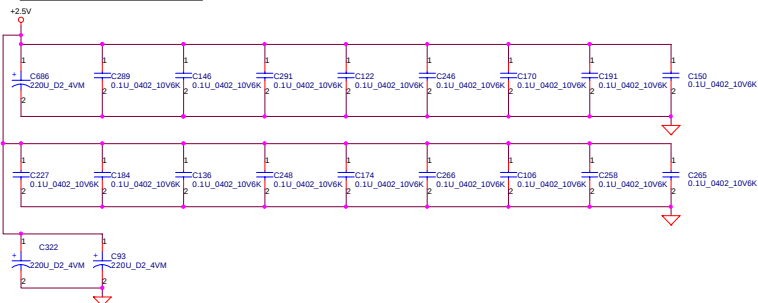
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DDR-SODIMM SLOT0			
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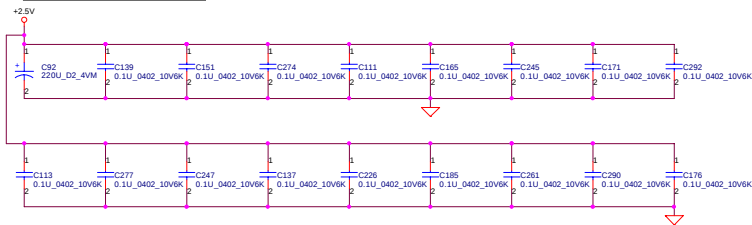


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Title			
DDR-SODIMM SLOT1			
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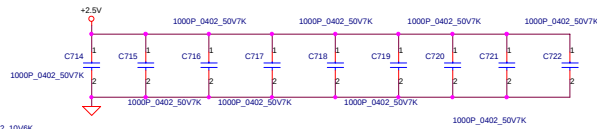
Layout note :
Distribute as close as possible
to DDR-SODIMM0.



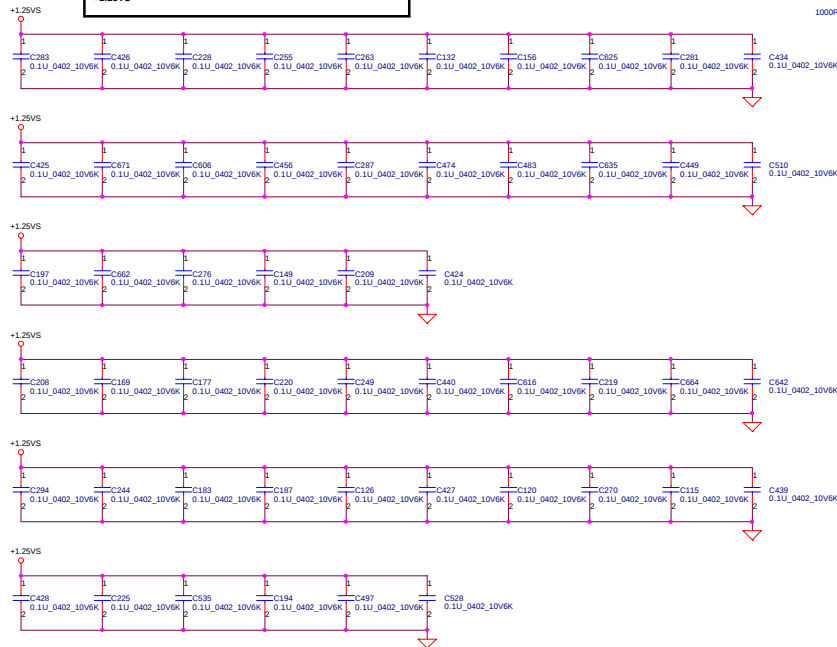
Layout note :
Distribute as close as possible
to DDR-SODIMM1.



Layout note :
for EMI solution

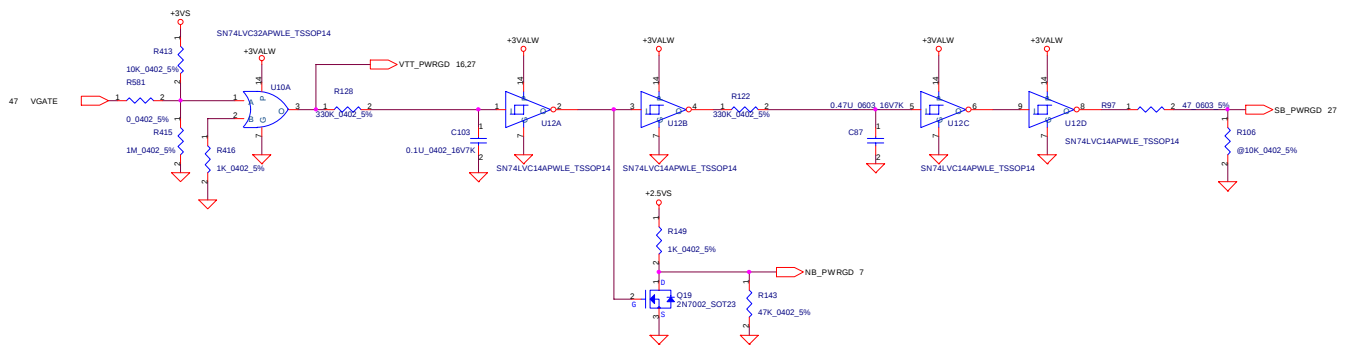


Layout note :
Place one cap close to every 2 pull up resistors termination to
+1.25VS

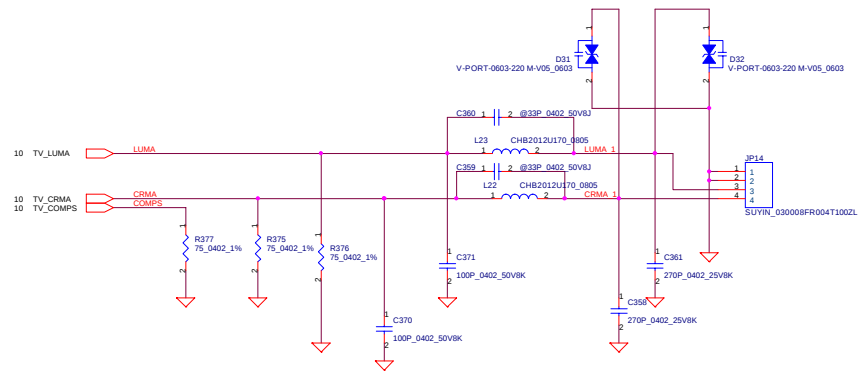


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DDR SODIMM Decoupling			
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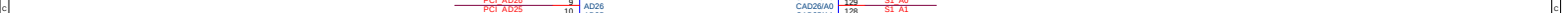


TV-OUT CONN.



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CH-7011& TV-CONN.			
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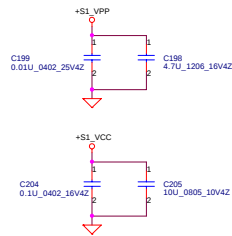
C309	0.1U_0402_16V4Z
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	CardBus Controller<TI PC11410>
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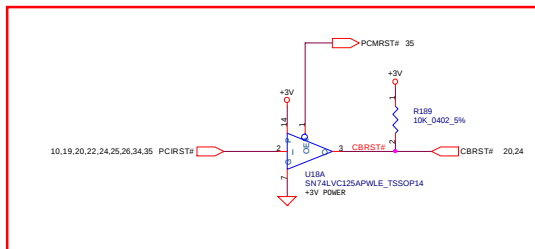
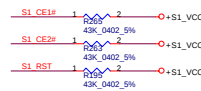
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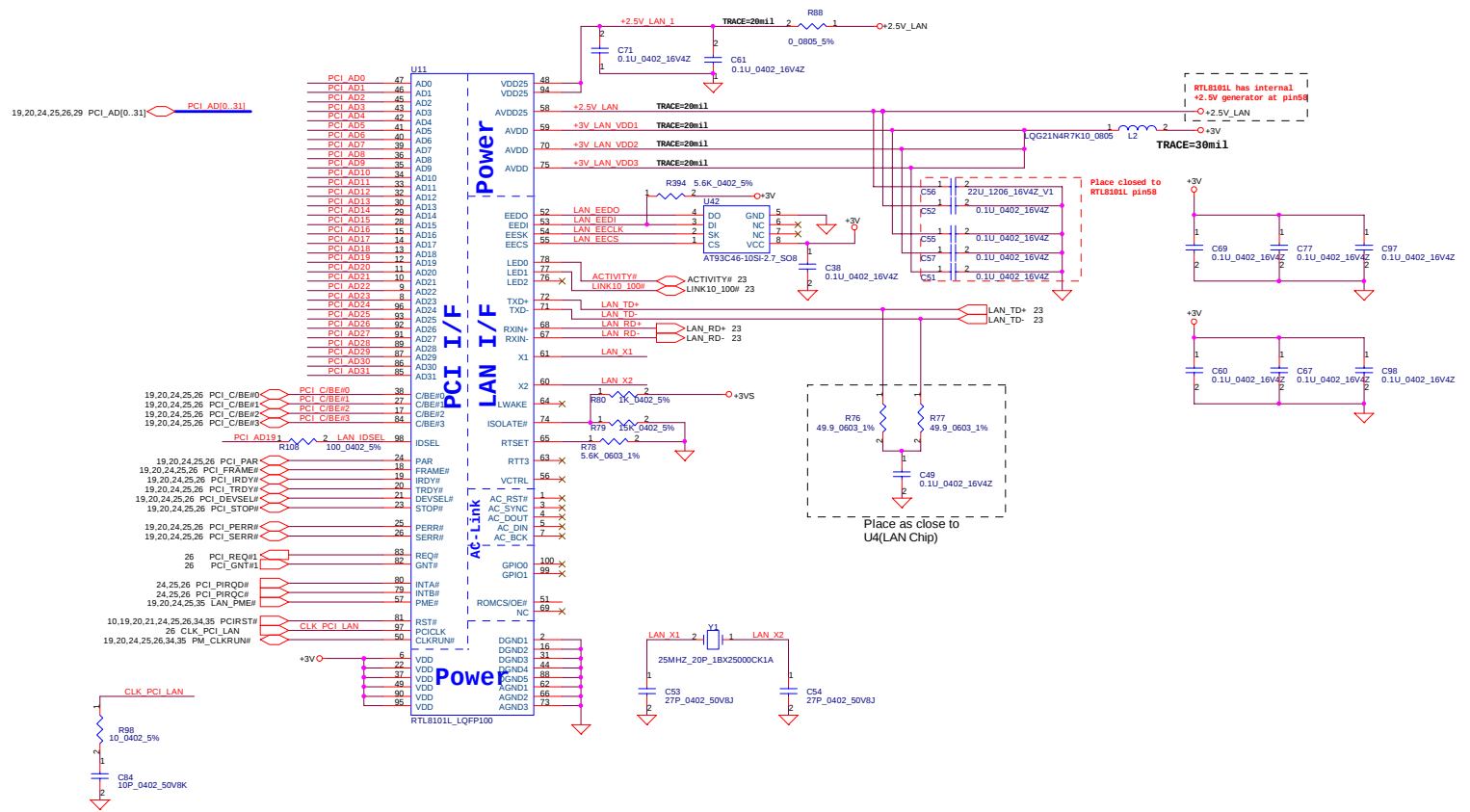


20 S1_A[0..25]  S1_A[0..25]

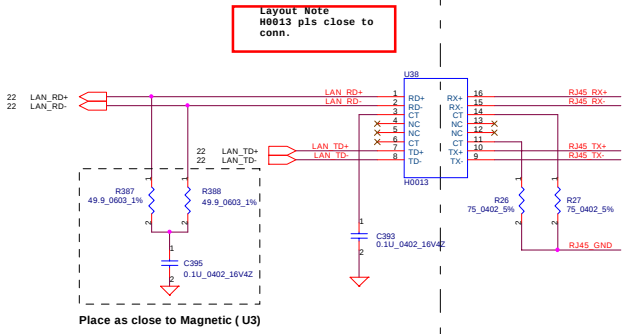
20 S1_D[0..15]  S1_D[0..15]

[illegible]

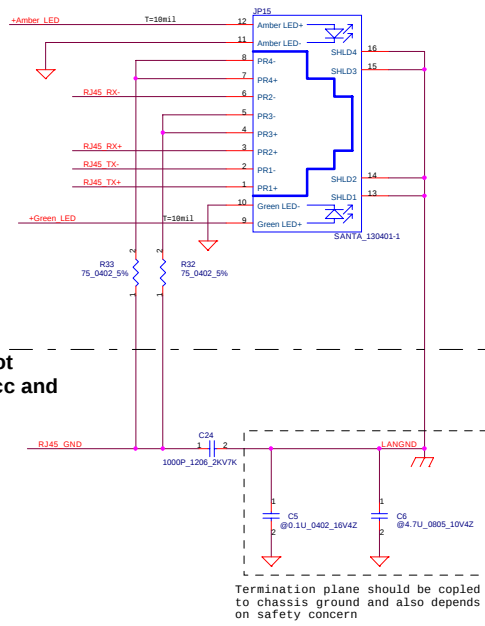
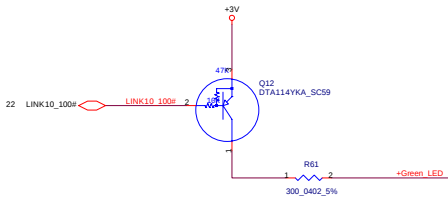
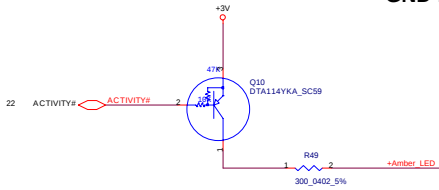
LAN AD19 REQ#1/GNT#1 PCI_PIRQD#



Keep Out 40mil



LAYOUT NOTICE: This area do not connect to power plan include Vcc and GND in any layer



Termination plane should be copied to chassis ground and also depends on safety concern

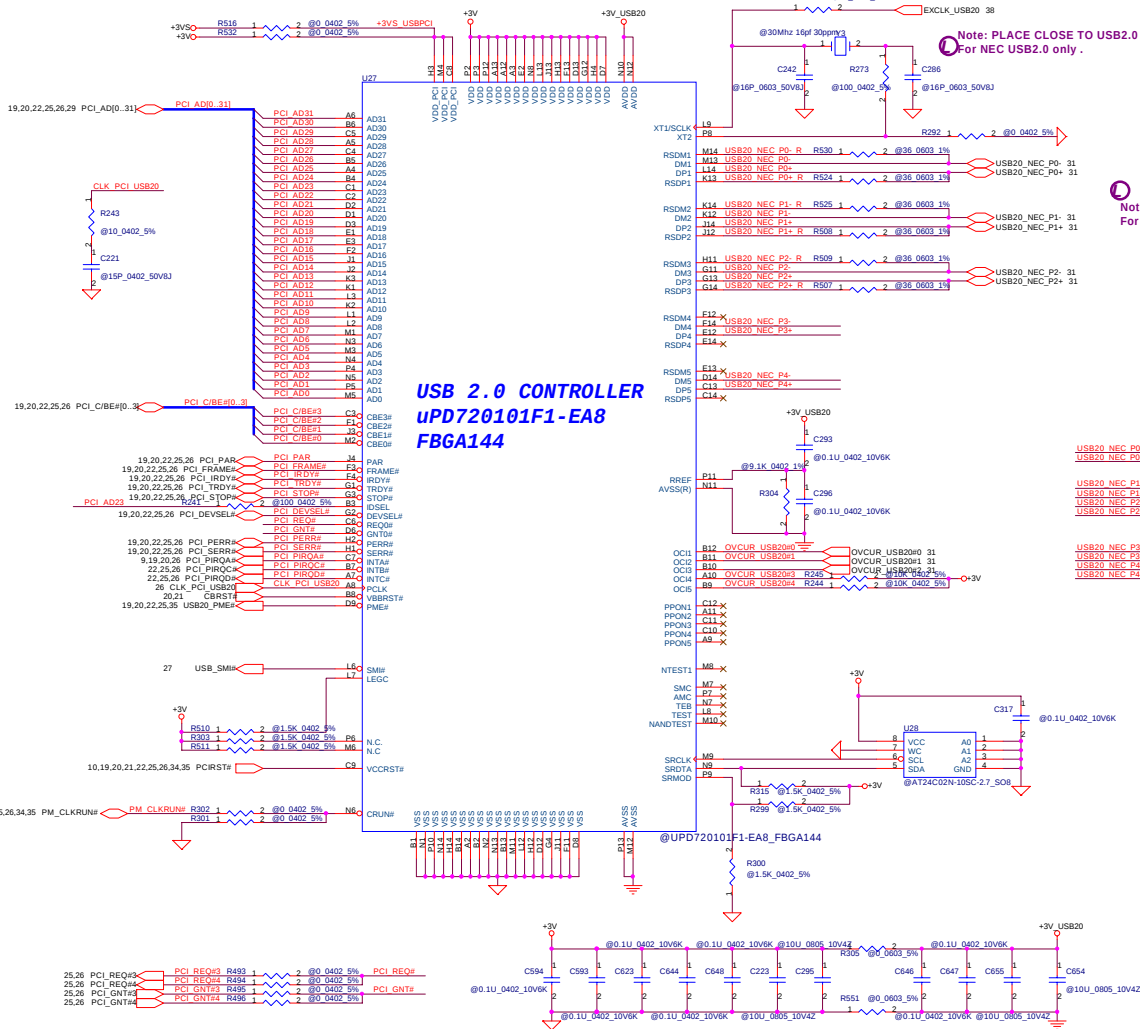
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RJ11/RJ45 Connector

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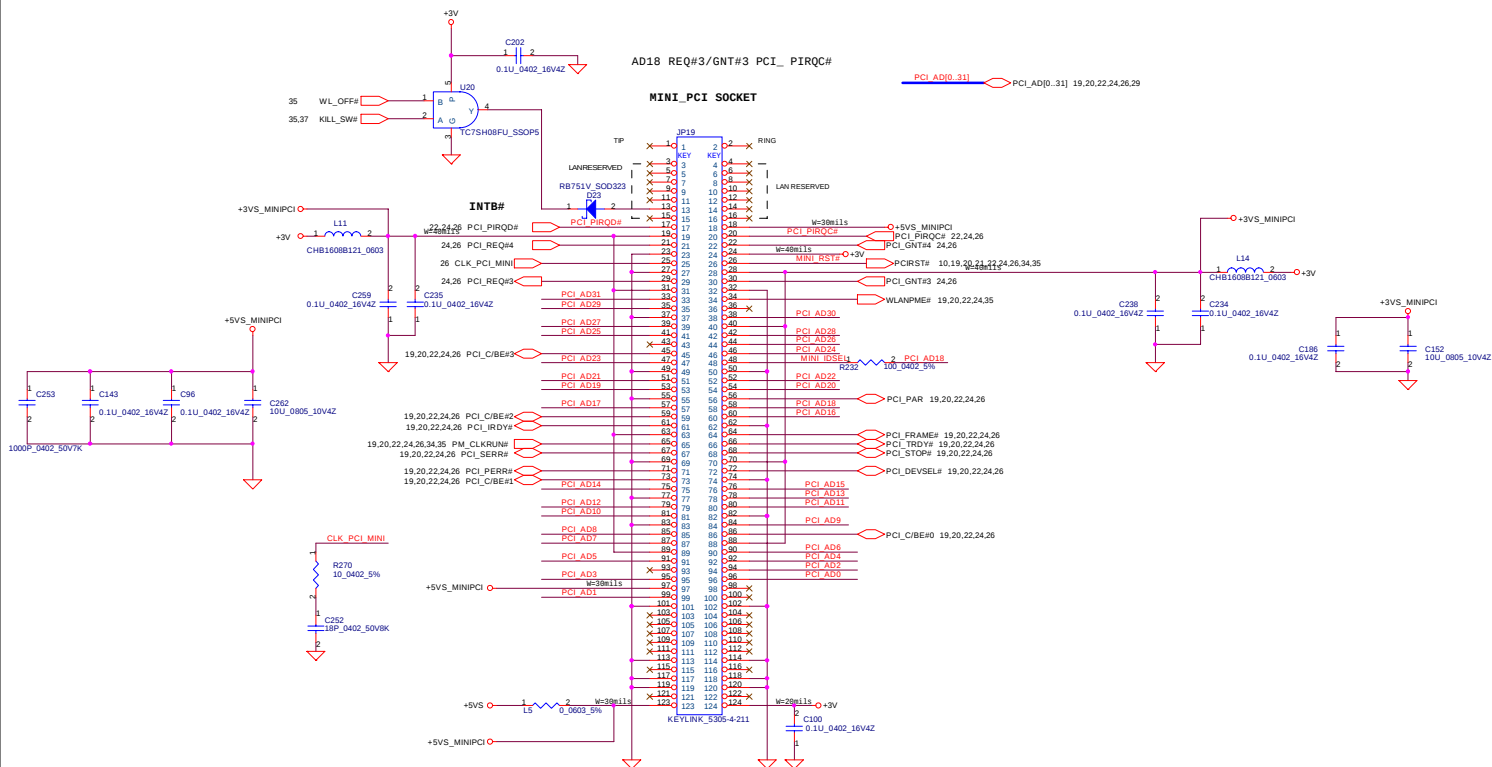
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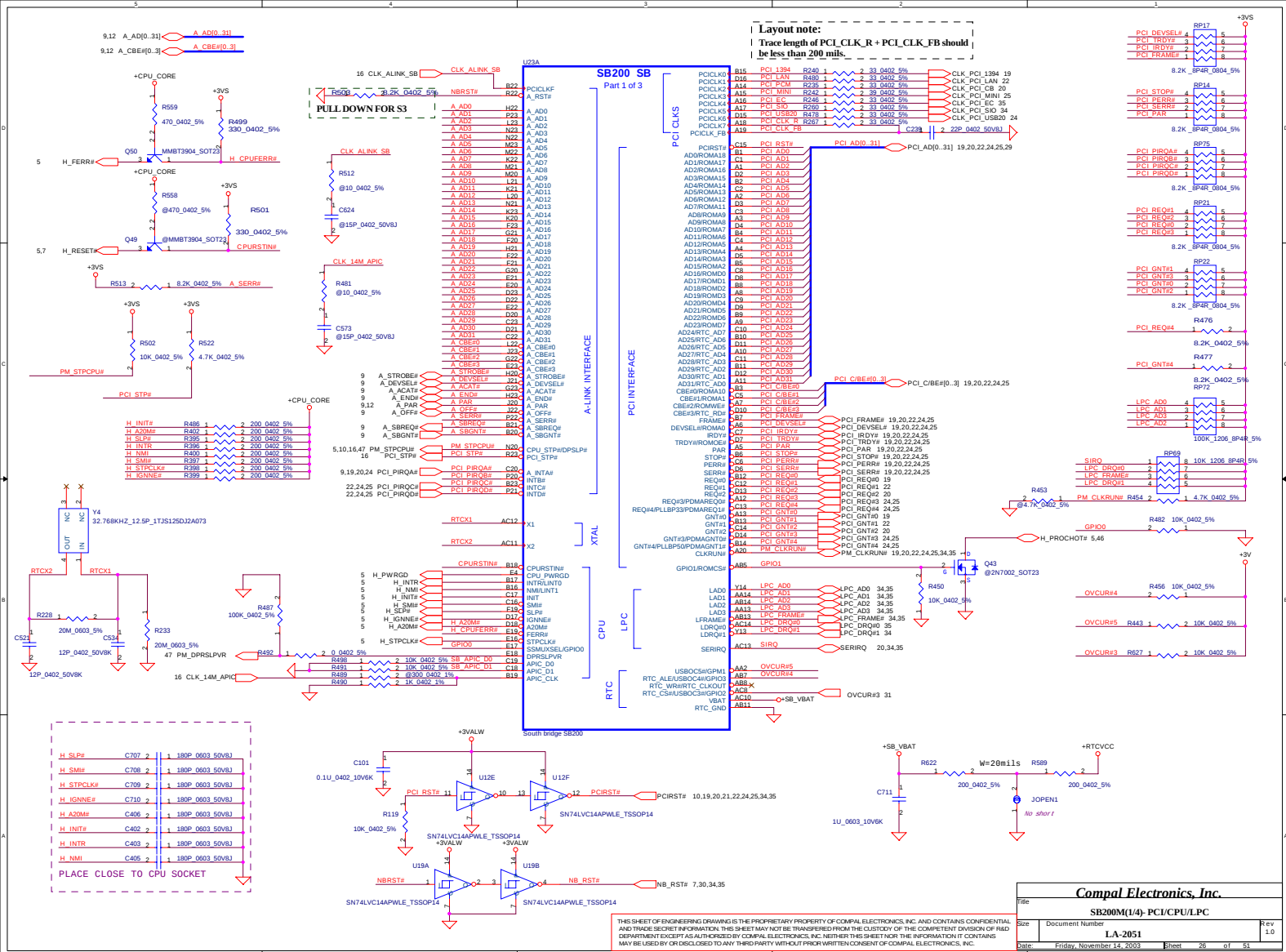
Compal Electronics, Inc.			
NEC uPD720101 - USB2.0 Controller			
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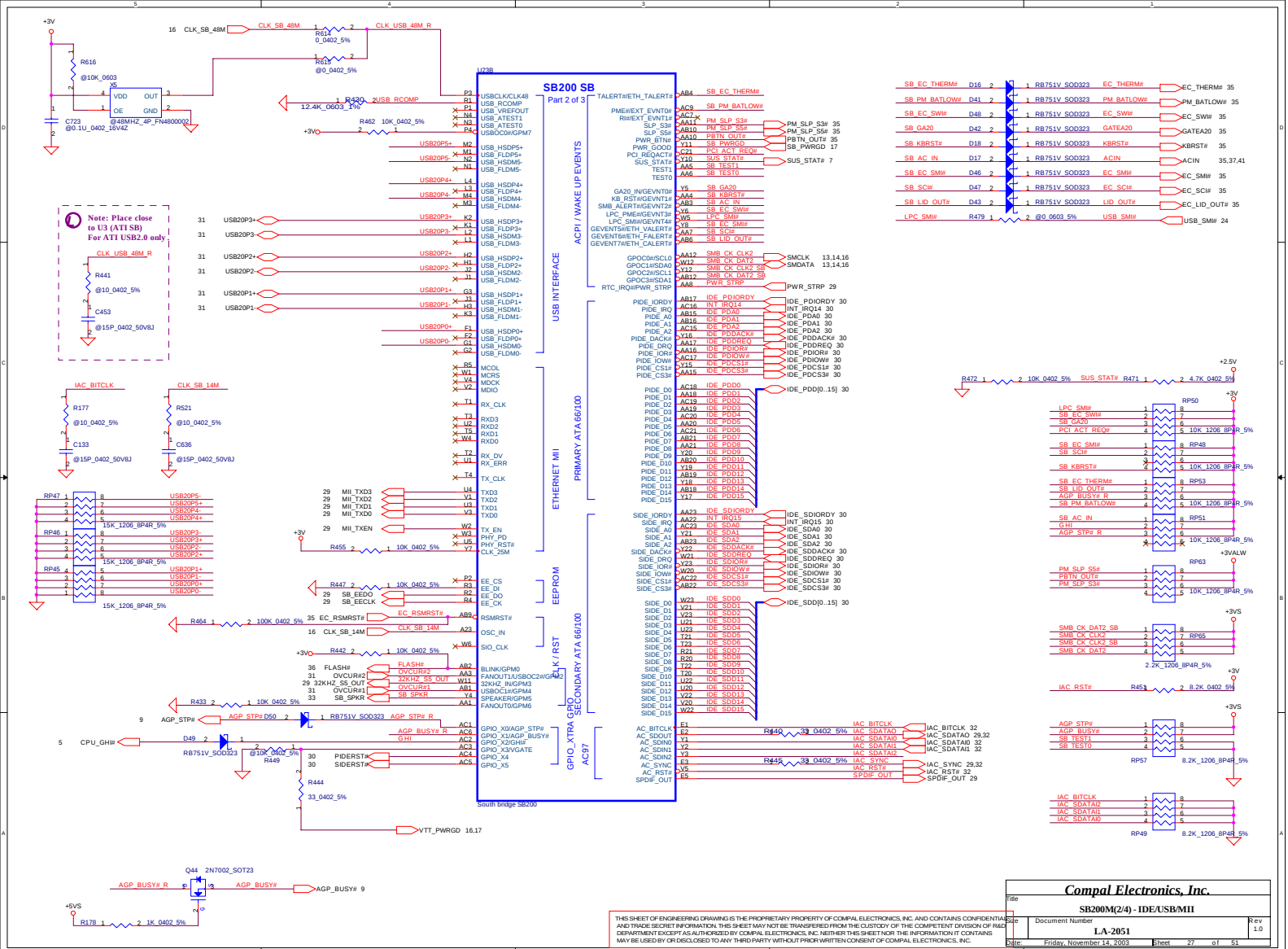
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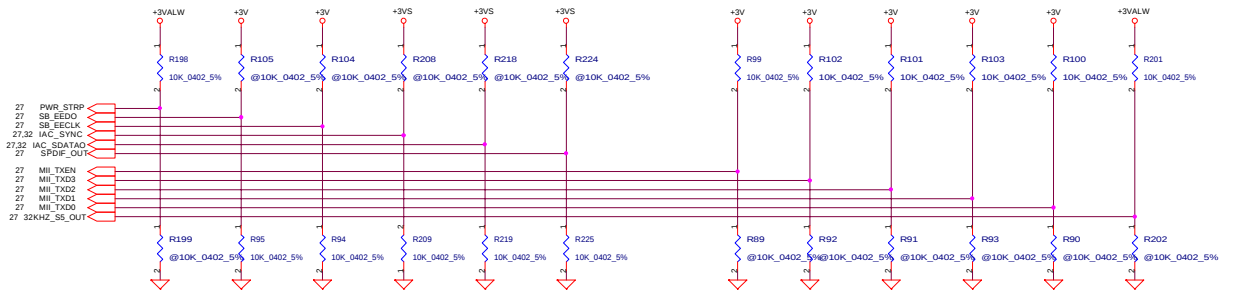


Compal Electronics, Ltd.			
Title			
Mini PCI Slot			
Size	Document Number		Rev
Customer	LA-2051		1.0
Date	Friday, November 14, 2003	Sheet	25 of 53

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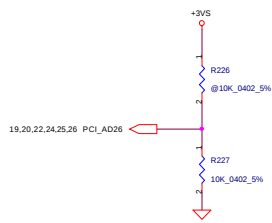






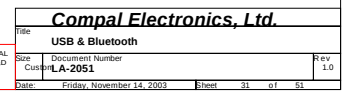
REQUIRED SYSTEM STRAPS

	PWR_STRP	IGN DEBUG EEDO	EECK	AC_SYNC	AC_SDOUT	SPOIF_OUT	SPEEDSTEP CPU_STP%	FREQLTCH TX_EN	ETHERNET TXD[3:0]	32KHZ_S5
STRAP HIGH	MANUAL PWR ON DEFAULT	USE DEBUG STRAPS	ROM ON PCI BUS	INIT ACTIVE HIGH	33MHz NB BUS	SIO 24MHz	ENABLE SPEED STEP	DISABLE CPU FREQ SETTING DEFAULT	PROCESSOR FREQ MULTIPLIER	32KHZ OUTPUT FROM SB200 (INT RTC)
STRAP LOW	AUTO PWR ON	IGNORE DEBUG STRAPS DEFAULT	ROM ON LPC BUS DEFAULT	INIT ACTIVE LOW (P#)	HI SPEED A-LINK DEFAULT	SIO 48MHz DEFAULT	DISABLE SPEED STEP DEFAULT	ENABLE CPU FREQSETTING		32KHZ INPUT TO SB200 (EXT RTC)

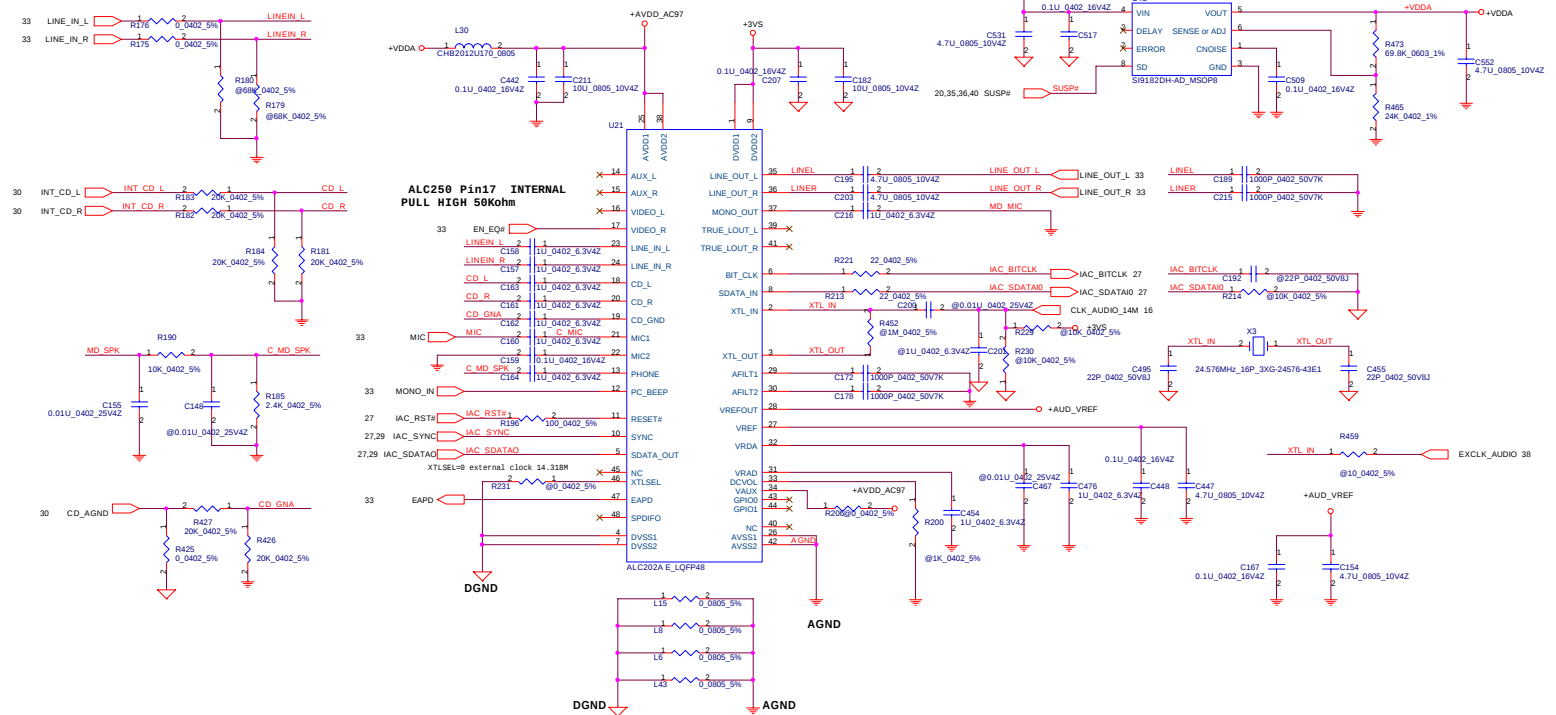


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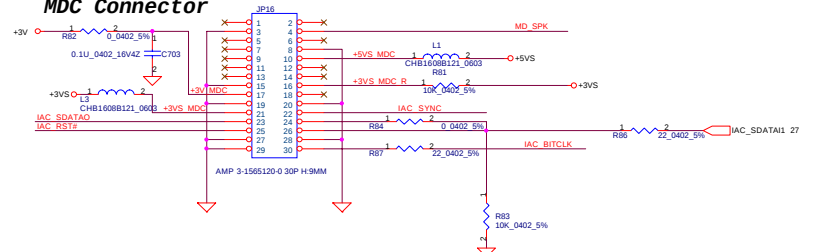
Compal Electronics, Inc.			
SB200M(4/4) - STRAPS			
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AC97 Codec



MDC Connector



Compal Electronics, Ltd.

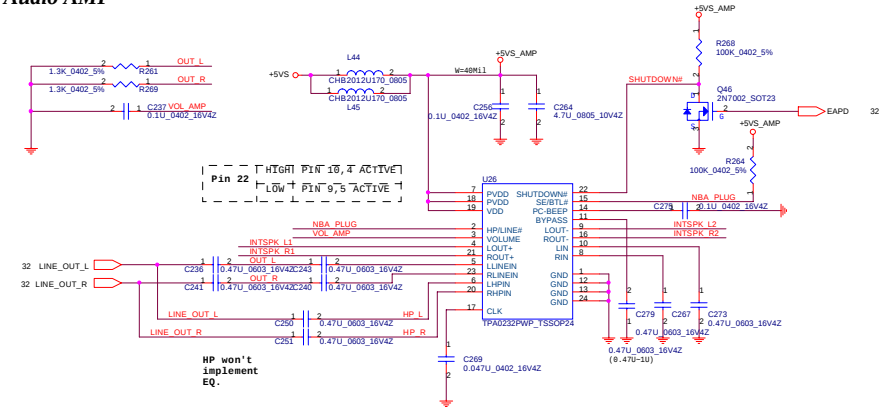
AC97 Codec ALC202

Document Number
LA-2051

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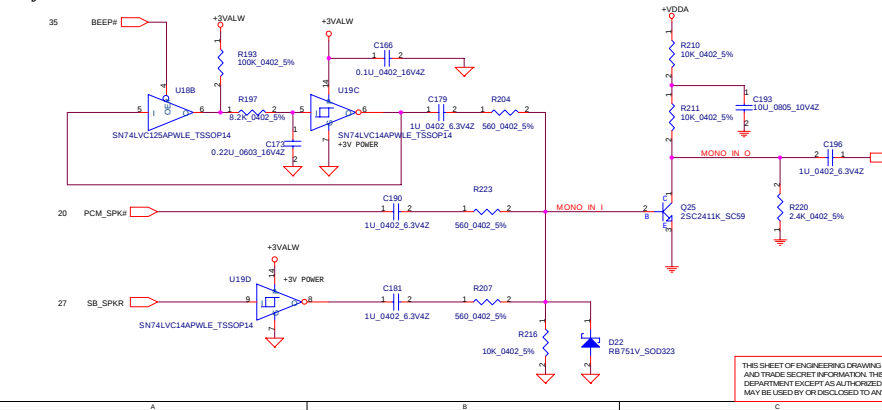
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Audio AMP

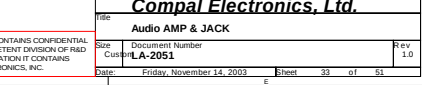
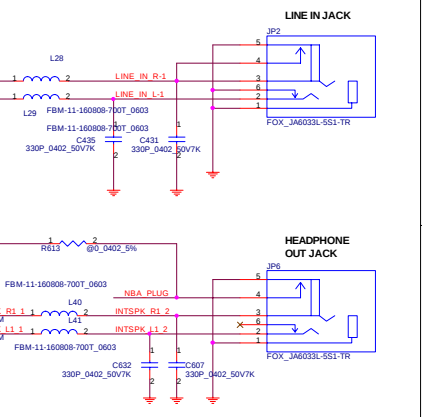
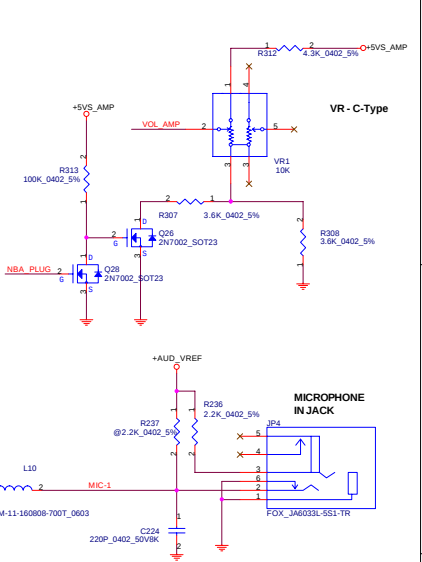


W/O EQ R385=R386= 1.3K Ohm
C537=C539= 0.47U
R = R385, R386
C = C537, C539
 $f_0 = 1 / (2 * 3.14 * R * C) = 260\text{Hz}$
R=1.3K / C=0.47U

System Sound

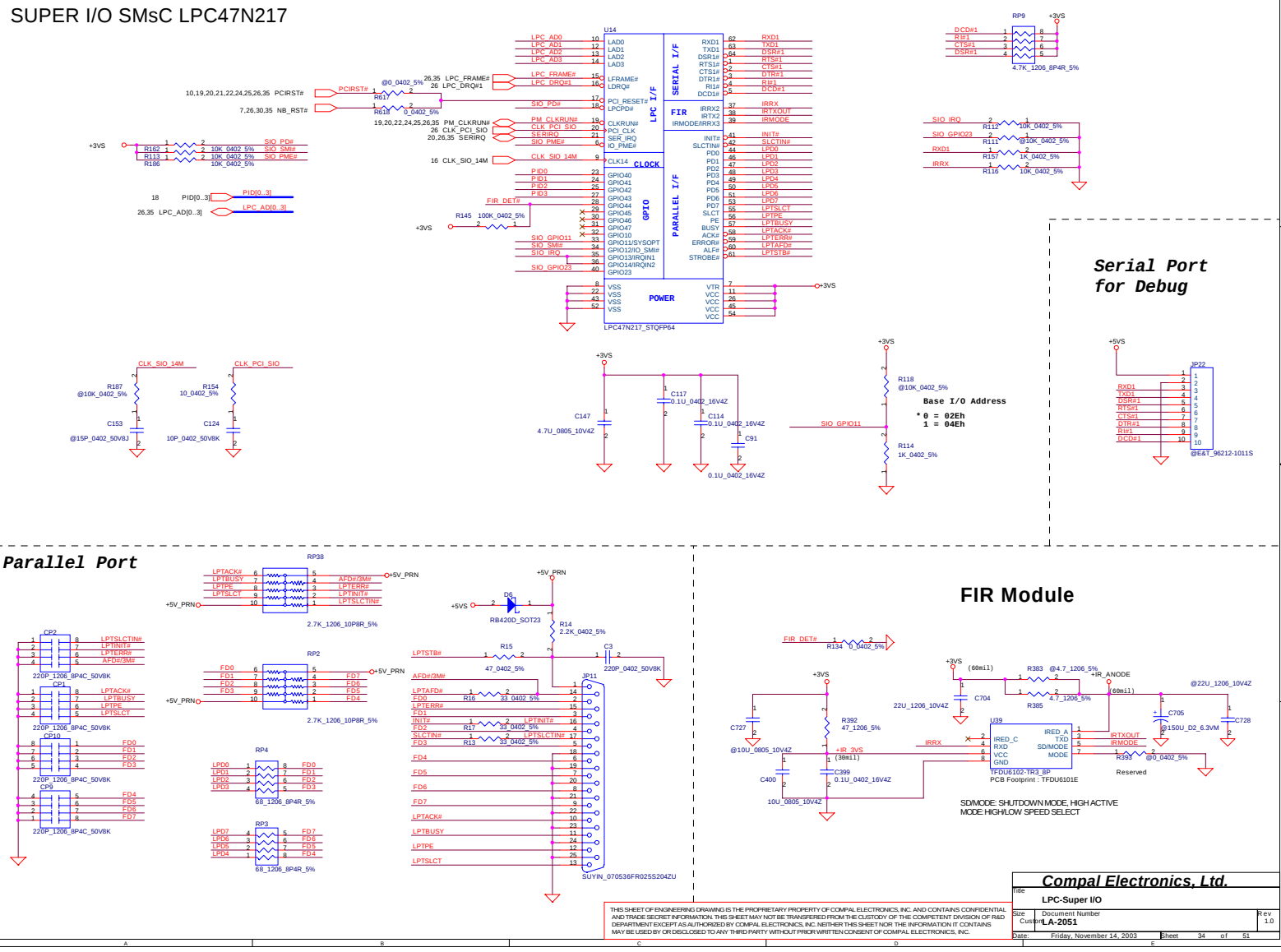


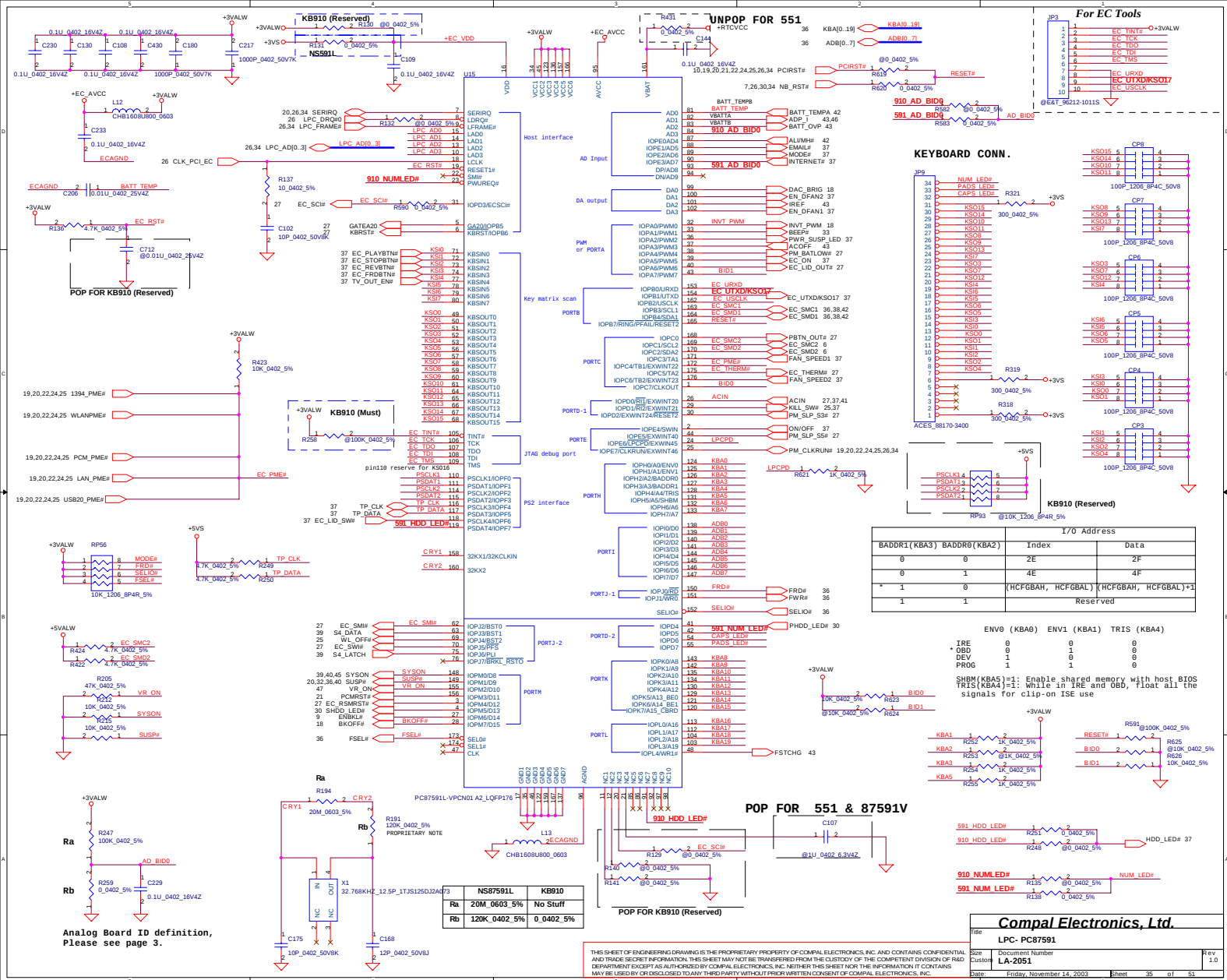
	W/O EQ	
R513	4.3K	
R307	3.6K	
R308	3.6K	
Bias (Gain)	SPK 056 V 12 dB HP 1.006V -2dB	

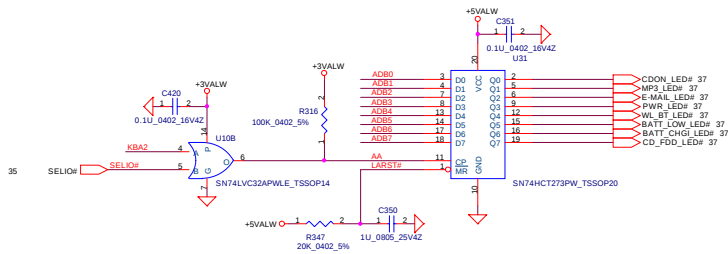


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Doc	Audio AMP & JACK		
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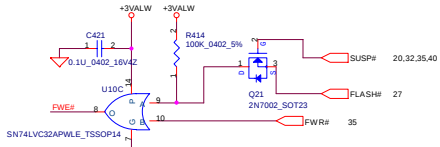
SUPER I/O SMSc LPC47N217



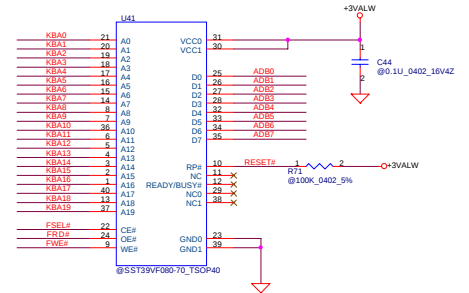
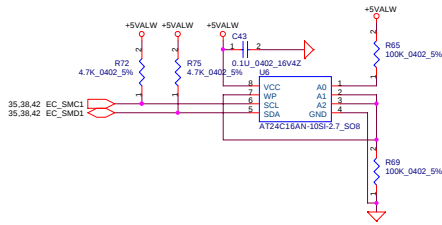
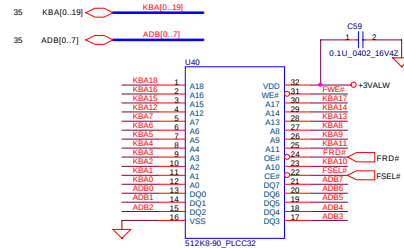




System BIOS



SMBus EEPROM



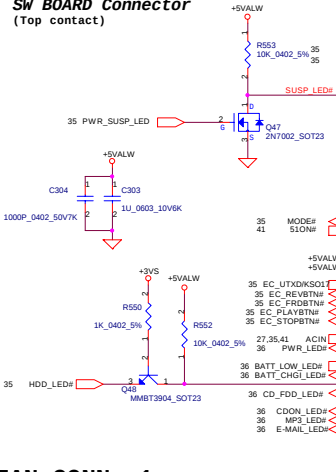
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BIOS & Ext.I/O

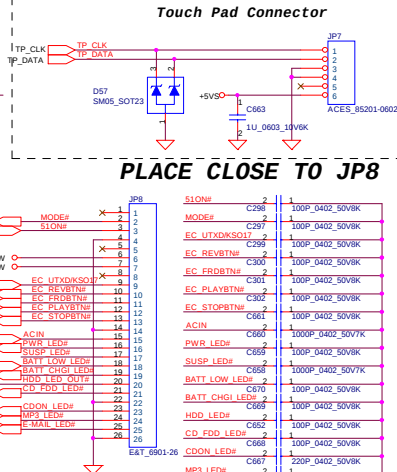
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SW BOARD Connector
(Top contact)

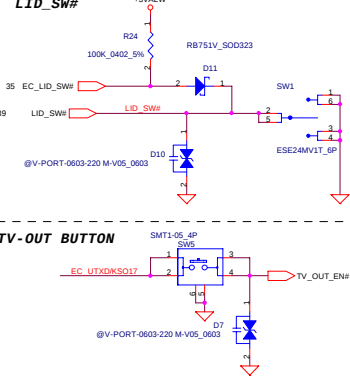


Touch Pad Connector

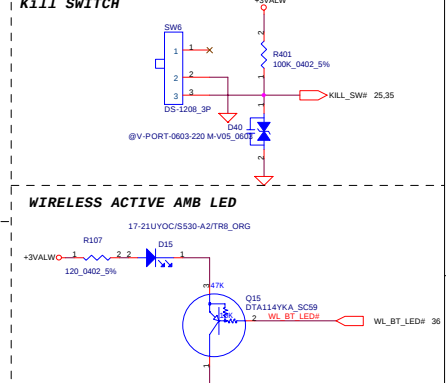


PLACE CLOSE TO JP8

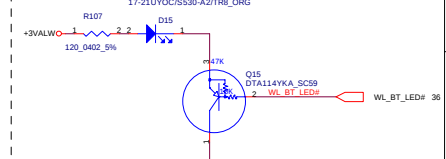
LID_SW#



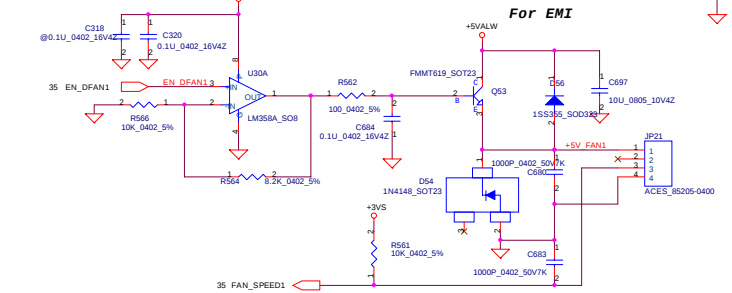
Kill SWITCH



WIRELESS ACTIVE AMB LED

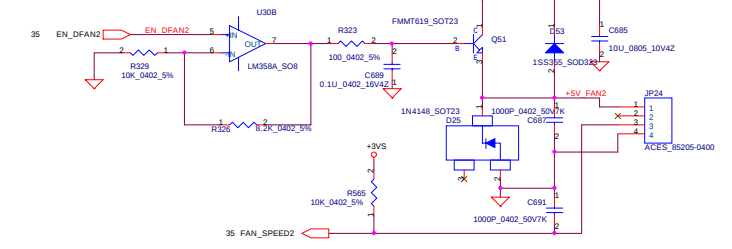


FAN CONN. 1

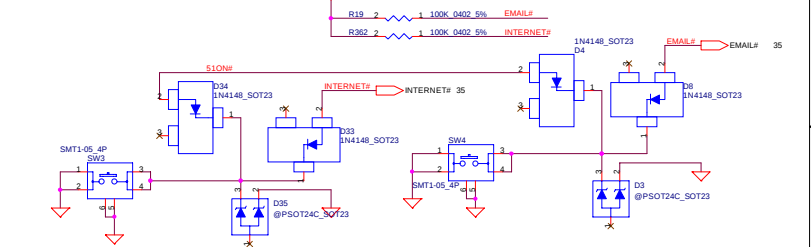


For EMI

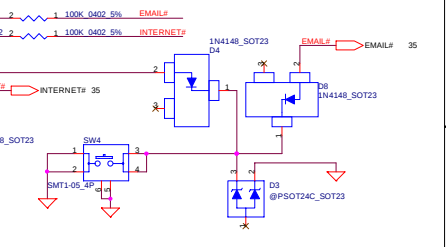
FAN CONN. 2



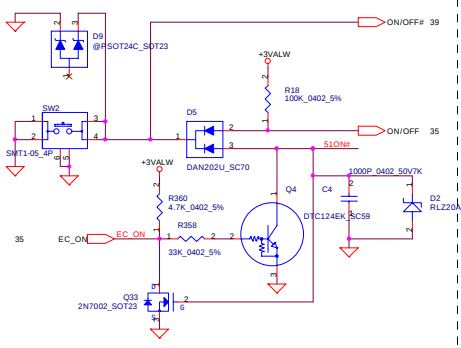
Internet Button



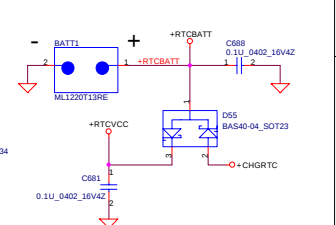
User Button & E-MAIL SW

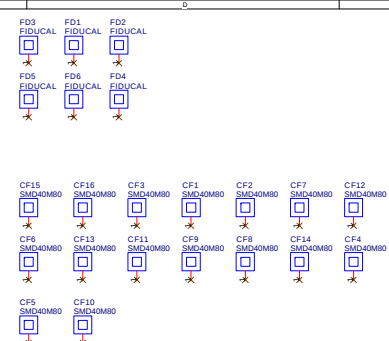


Power Button

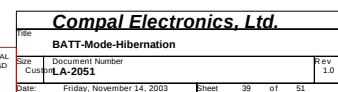


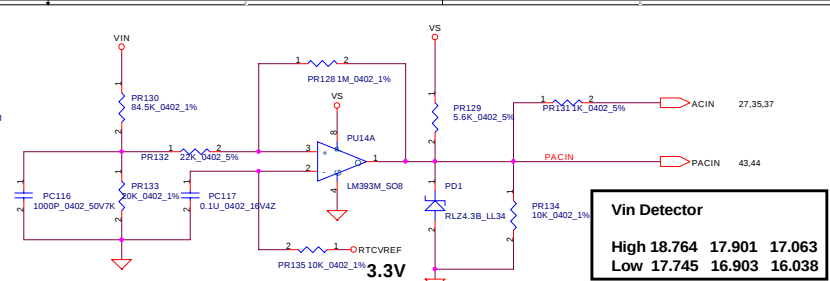
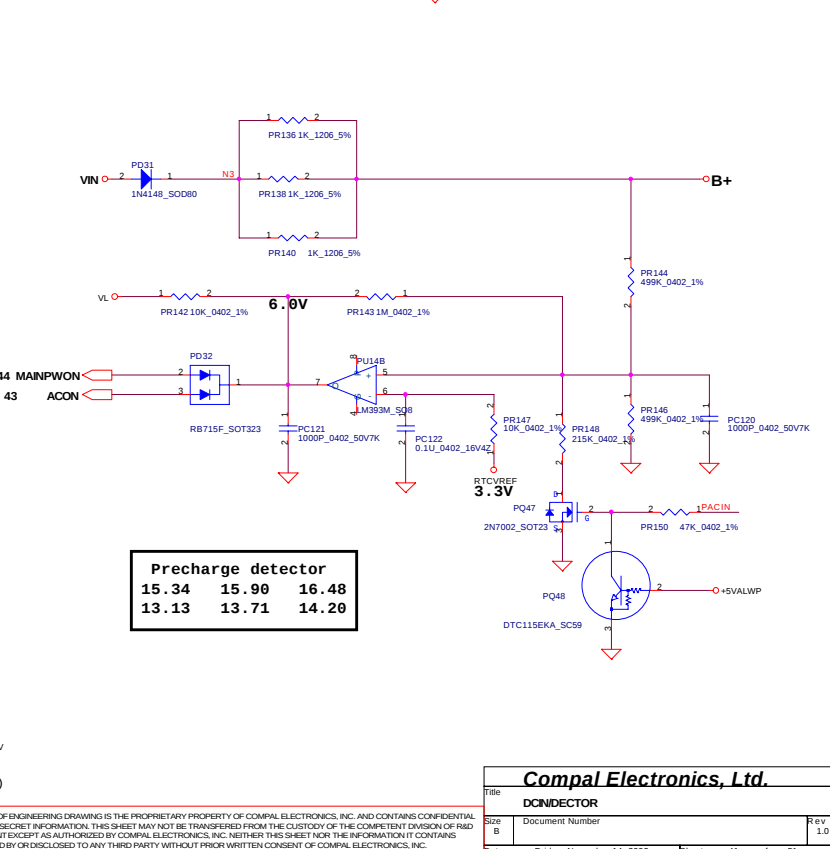
RTC BATT



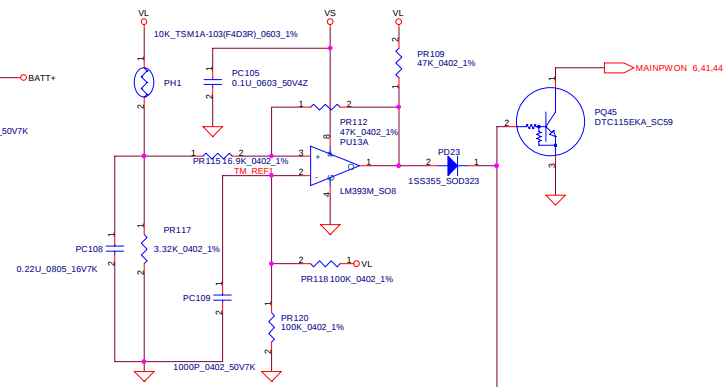


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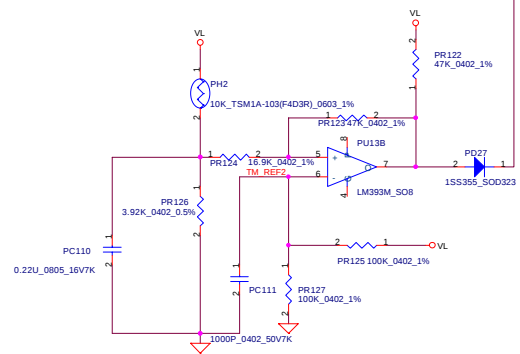


[illegible]

PH1 under CPU botten side :
CPU thermal protection at 84 degree C
Recovery at 44(45) degree C



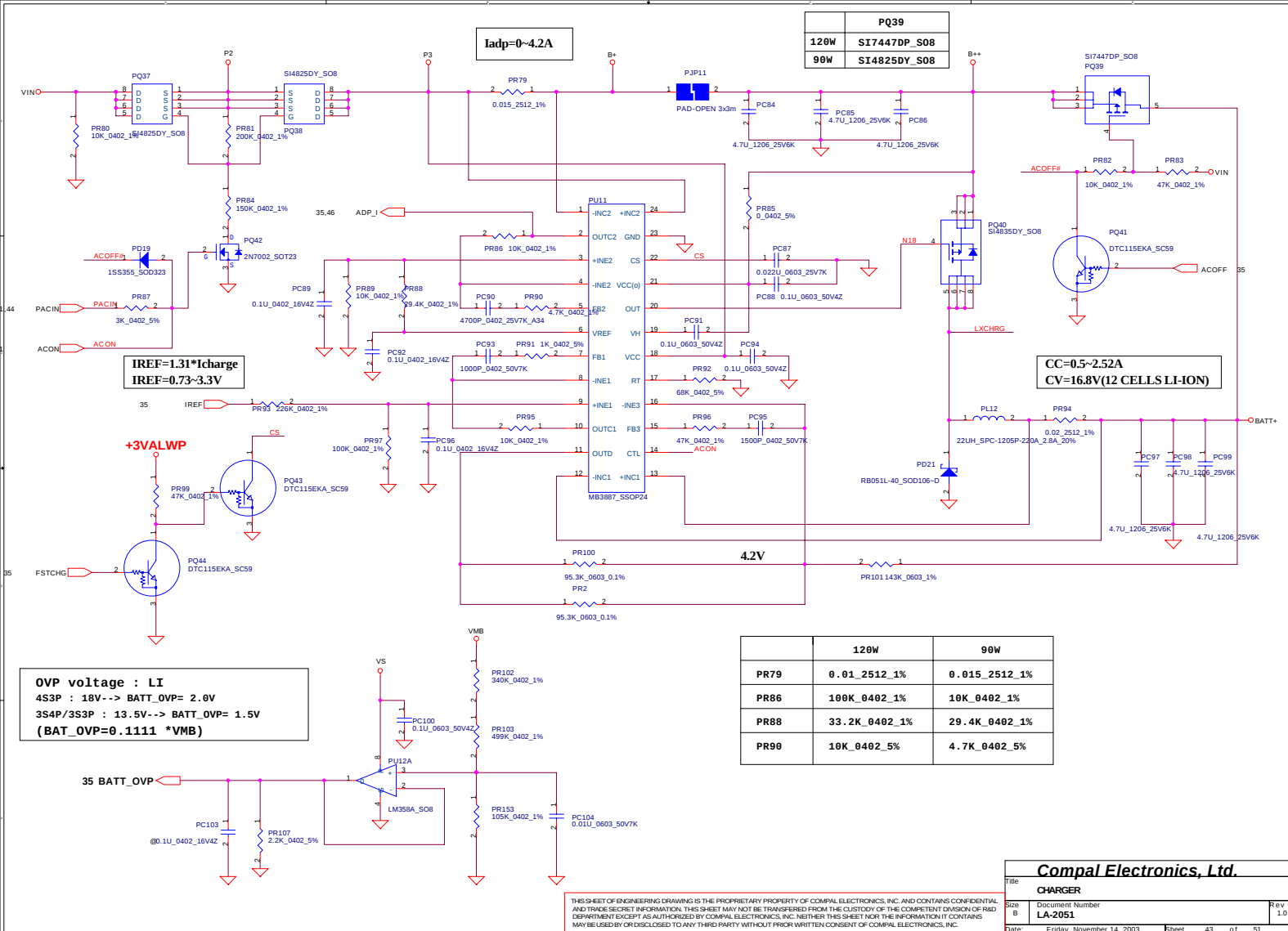
PH2 near main Battery CONN :
BAT. thermal protection at 78 degree C
Recovery at 39(40) degree C

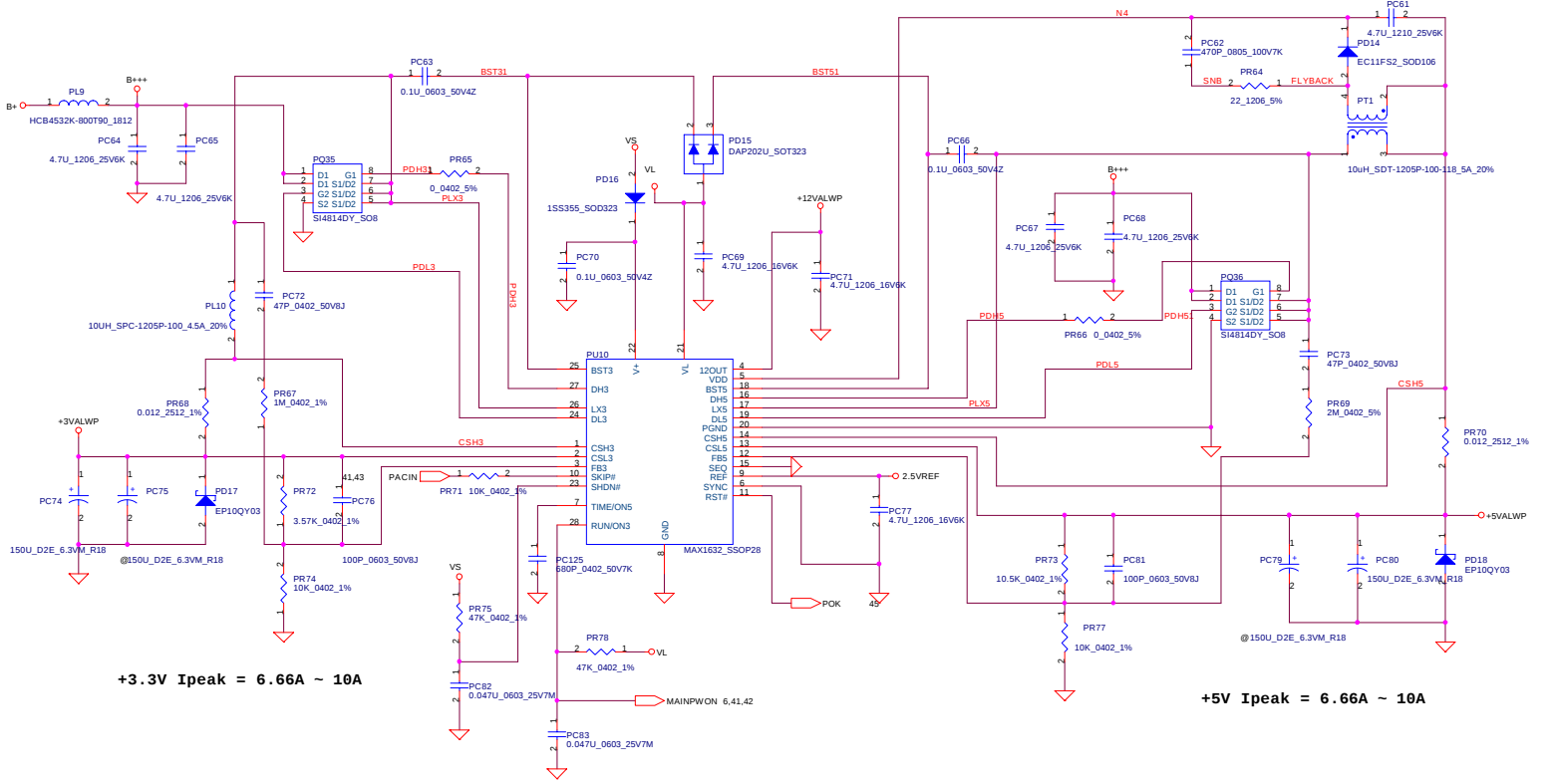


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Title		
BATTERY CONN / OTP		
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Date:	Friday, November 14, 2003	Sheet 42 of 51

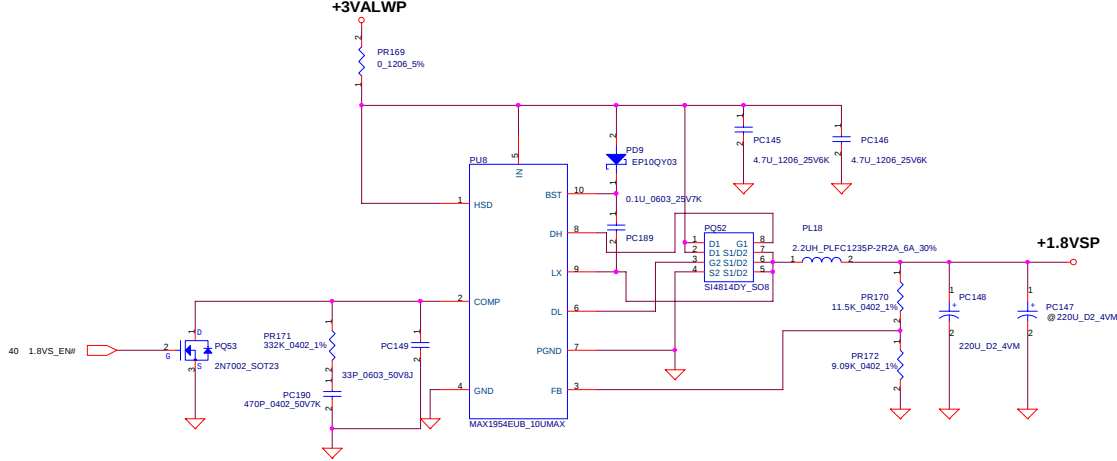
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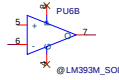
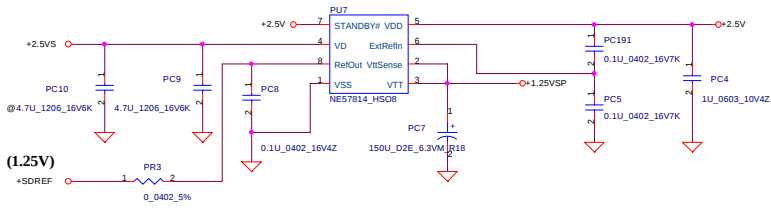
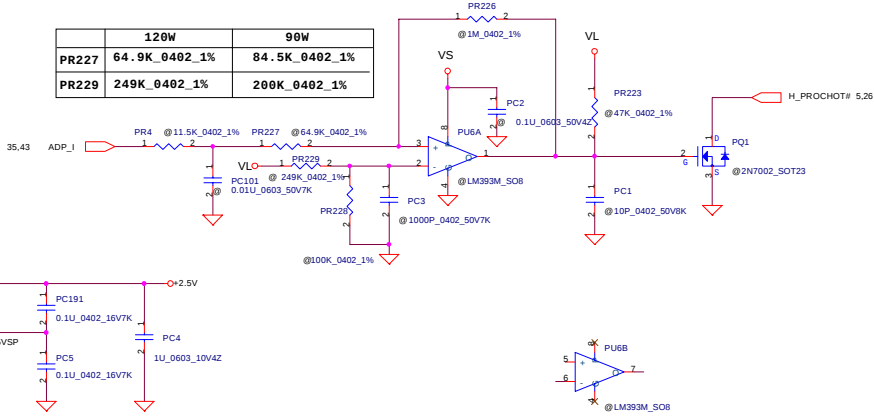


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Title			
5V/3V/12V			
Size B			
Document Number		Rev	
LA-2051		1.0	
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Friday, November 14, 2003		44 of 51	

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	120W	90W
PR227	64.9K_0402_1%	84.5K_0402_1%
PR229	249K_0402_1%	200K_0402_1%



Compal Electronics, Ltd.

Title

+1.25VSP/+1.8VSP

Size

Document Number

Cust

LA-2051

Date

Friday, November 14, 2003

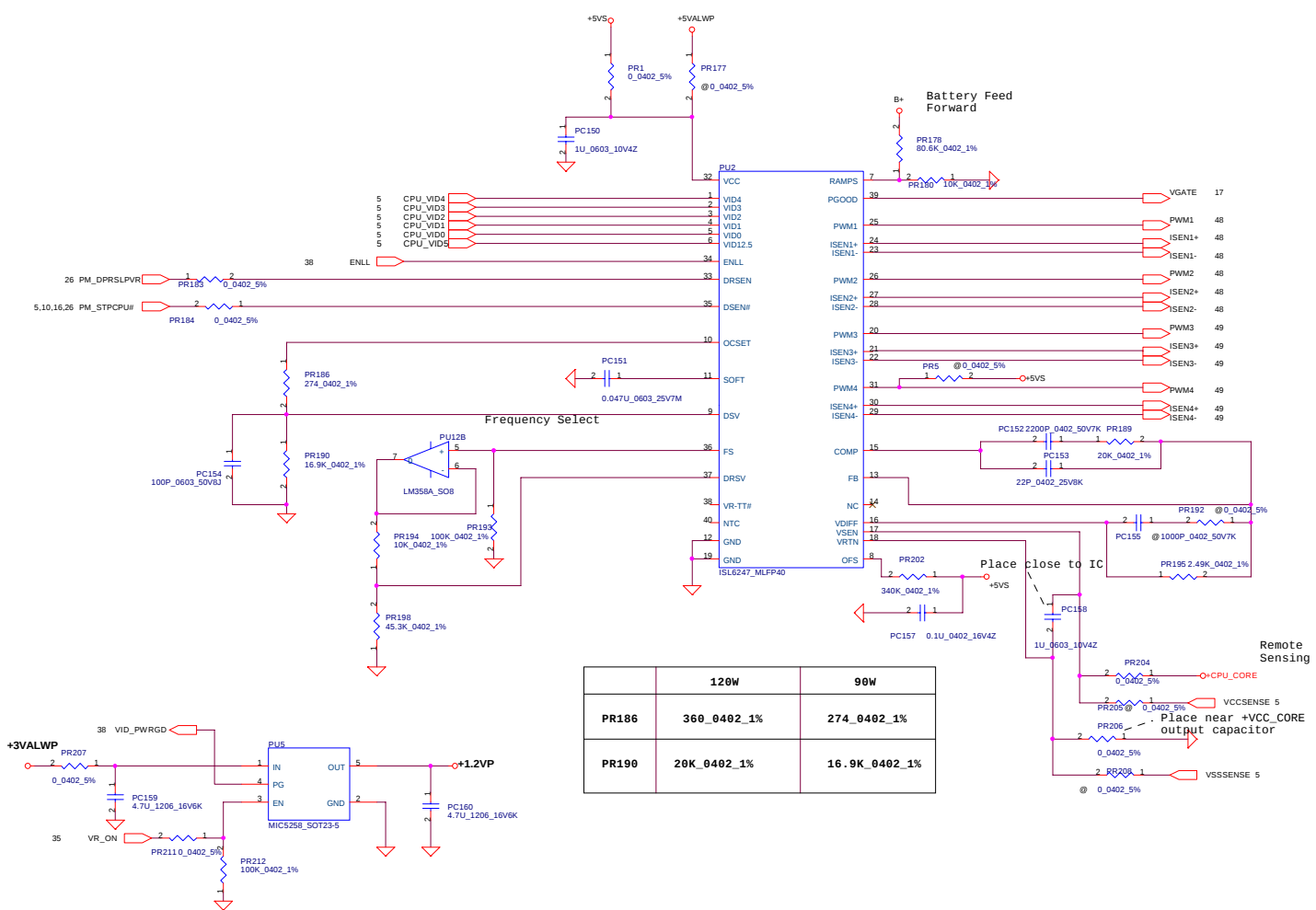
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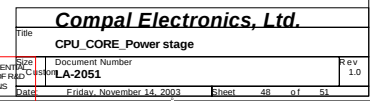
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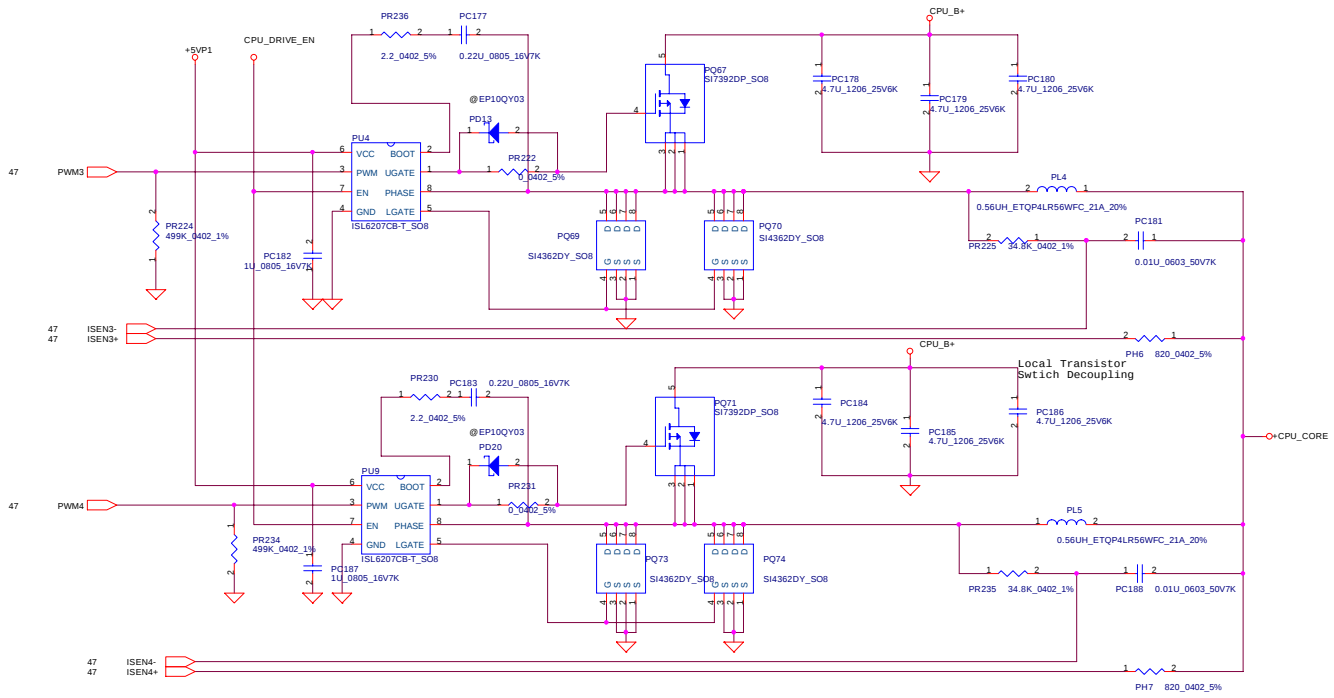
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	3 PHASE	4 PHASE
UNPOP	PU9, PC187, PR234, PR230, PC183, PQ71 PQ73, PQ74, PR231, PR235, PL5, PC188, PH7	PR5
POP	PR5	PU9, PC187, PR234, PR230, PC183, PQ71 PQ73, PQ74, PR231, PR235, PL5, PC188, PH7

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File: CPU_CORE_Power stage

Size: Document Number

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REV 0.1	Date	Page	Description	Location
09/12	P. 13, P. 14		Del DDR data damping	DEL RP40, RP43, RP44, RP54, RP59, RP64, RP67, RP70, RP74, RP82, RP5, RP8, RP10, RP12, RP16, RP26, RP29, RP31, RP34, RP36.
09/12	P. 13, P. 14		Add DDR address & control damping	ADD R592, R593, R594, R595, R596, R597, R598, R599
09/15	P. 27		LPC_SMI# Pull high to +3V	LPC_SMI# connect to RP50 Pin 1
09/16	P. 27		Del ATI USB feedback resistor	DEL R438, R439, R446, R448, R434, R435
09/16	P. 31		Change USB form NEC to ATI	DEL R34, R40, R373, R374, R371, R372, R575, R573, R345 ADD R30, R48, R363, R364, R365, R366, R574, R576, R344
09/20	P. 18		Change LVDS Conn to 40 pin	Change JP1
09/20	P. 16		Disconnect CPU_STP# & PCI_STP#	DEL R579, R580 ADD R577, R578
09/20	P. 24		Del external USB chip	DEL U27, R516, R241, R510, R303, R511, R302, R300, R315, R245, U28, R244, R304, R530, R524, R508, R509, R507, C242, C286, Y3, R273, R297, R298, RP83, RP66, C654, C655, C647, C646, R305, R551, R494, R496
09/22	P. 33		Add bead between +5VS & +5V_AMP	ADD L44, L45
09/22	P. 32		Reserve LAN AC97-link to MDC	Reserve ADD R604, R605, R606, R607, R608, R609, R610, R612
10/15	P. 27, 35		Fix PME function	Del R421 and change EC591 EC_SWI#(pin70) connect to SB200 EXT_EVENT1 to SB200 GEVENT3#, Del LPC_PME#
10/15	P. 10, 16		Change NB CLK Voltage	Change R161=68, R506=56
10/16	P. 27		Add USB 48M OSC	Add R614, R615, R616, C723, X5
10/16	P. 8, 13, 14		Add 0.1uF between +SDREF & +2.5V	Add C724, C725, C726
10/16	P. 28		Change R to L	Change R460, R475, R528 to L47, L48, L49
10/16	P. 26		Solve CMOS reset when AC-IN	Change R589 from 1k to 0 ohm
10/17	P. 35		Change PCIRST# to NB_RST# for ATI suggestion, change SIO and IDE & EC	Add R617, R618, R619, R620
10/17	P. 10		Modify Q45	Mirror Q45
10/17	P. 26		Modify R558	Reserve R558
10/17	P. 26		Modify R558	Reserve R558
10/17	P. 27, 31		Change USB port form 0~2 to 1~3, because Port 0 have some problem	
10/17	P. 28		Change R432 from 1k to 100 ohm for ATI suggestion	
10/20	P. 33		change R312 from 3k to 4.3k to follow DBL10 gain	
10/20	P. 33		Add L50, L51, L52, L53 for EMI request	
10/20	P. 37		Add D57 for ESD	
10/20	P. 25		change C252 form 10P to 18P for EMI	
10/23	P. 34		Del R116 to fix FIR signal level drop	
10/23	P. 31		Add C26, C27, C28, C29 for USB 2.0 EMI	
10/23	P. 26		Change R242 from 33ohm to 39ohm for EMI	
11/07	P. 26, 35		Change X1, Y4 footprint	
11/07	P. 35		Add R621, R623-R626 for board ID	
11/07	P. 39		C35 change to X7R	
11/07	P. 17		Delete R106 for SB_PWRGD timing	
11/07	P. 34		Add R116 for FIR disconnect Issue	
11/07	P. 15		C322, C686, C92, C93 change to 220uF/25mohm for RST issue	
11/07	P. 38		Delete J1, J2 for EMI	
11/13	P. 26		Add R627 for USB2.0 wakeup	
11/14	P. 9		Add R628 for ENVDD goes high issue	

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