

COMPAL CONFIDENTIAL

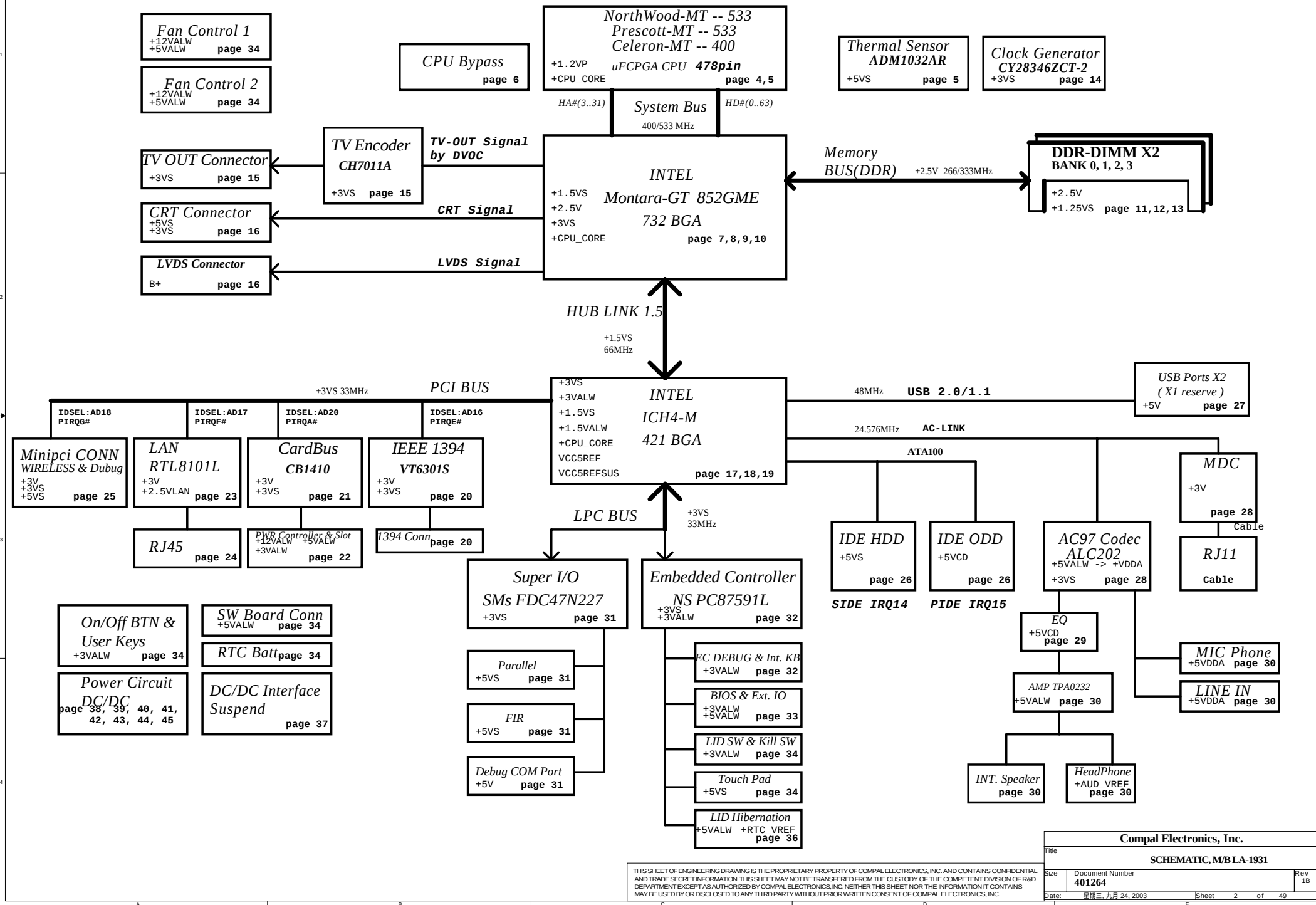
MODEL NAME : DBL10 -- Sapporo X
COMPAL P/N : DA8BL10L010
PCB NO : LA-1931
Revision : 1.0

DBL10 -- Sapporo X Schematics Document
uFCBGA/uFCPGA NorthWood MT
2003-09-19 v1.0

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Title		
Cover Sheet		
Size	Document Number	Rev
	401264	1B
Date:	~P期二, 十月 28, 2003	Sheet 1 of 49

Model : DBL10 -- Sapporo X



Voltage Rails

Power Plane	Description	S1	S3	S5
VIN	Adapter power supply (19V)	N/A	N/A	N/A
B+	AC or battery power rail for power circuit.	N/A	N/A	N/A
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF
+1.2V	1.2V switched power rail for CPU AGTL Bus	ON	ON	OFF
+1.25VS	1.25V switched power rail	ON	OFF	OFF
+1.5VALW	1.5V always on power rail	ON	ON	ON
+1.5V	1.5V power rail	ON	ON	OFF
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+2.5V	2.5V power rail	ON	ON	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
+5V	5V power rail	ON	ON	OFF
+5VS	5V switched power rail	ON	OFF	OFF
+12VALW	12V always on power rail	ON	ON	ON
+RTCBATT	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 (follow PCI IRQ routing plannig ver0.2.04)

Device	IDSEL#	REQ#/GNT#	Interrupts - (ICH4-M)
CardBus (ENE-CB1410)	AD20	2	PIRQA#
IEEE 1394 (VIA-VT6301S)	AD16	0	PIRQE#
LAN (Realtek-RTL8101L)	AD17	3	PIRQF#
Mini-PCI	AD18	1 INTA#/INTB#	PIRQG# / PIRQH#

EC SM Bus1 address

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

EC SM Bus2 address

Device	Address
ADM1032	1001 100X b

ICH4 SM Bus address

Device	Address
CLK GEN (ICS-950810)	1101 001X

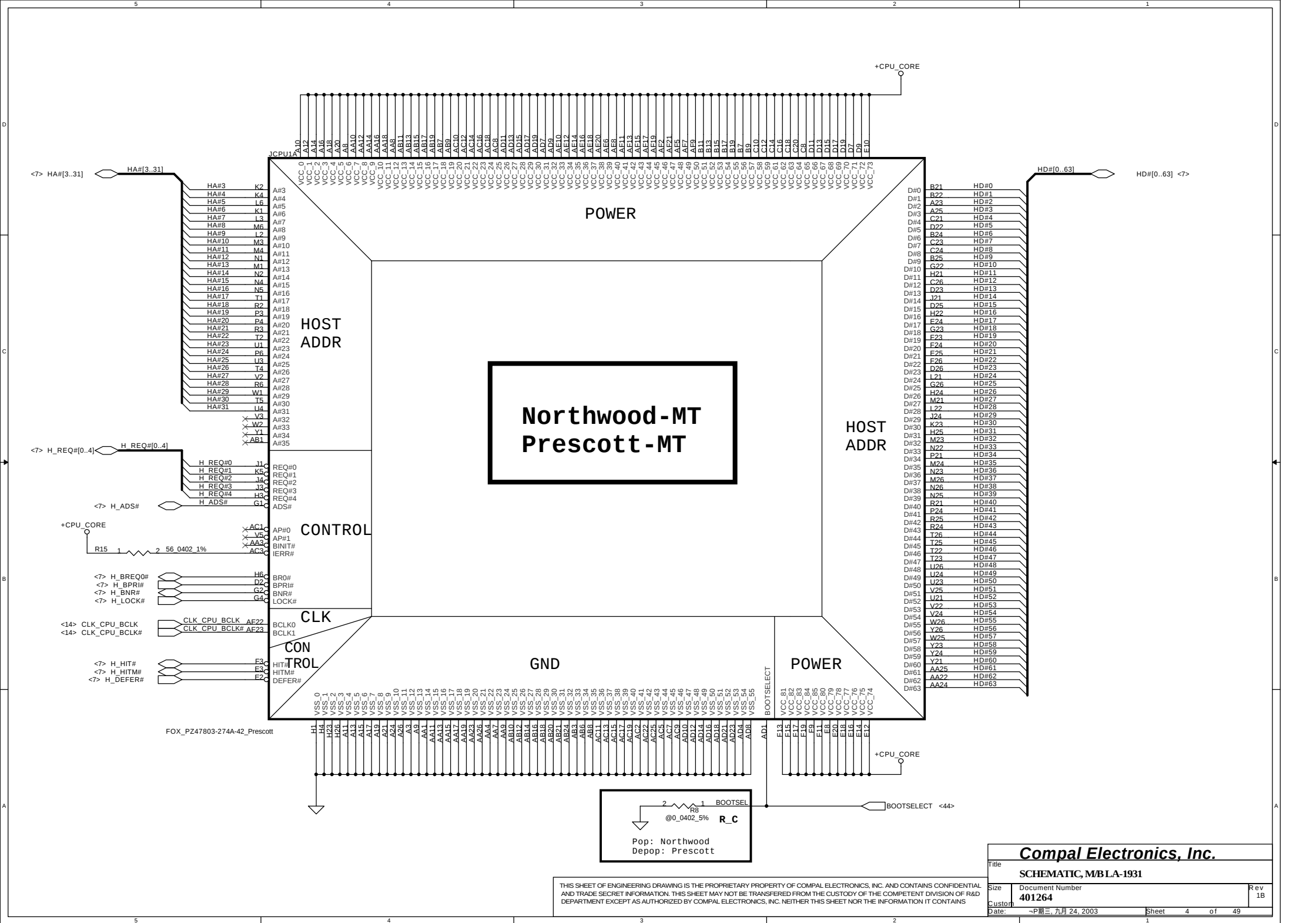
Power Managment table

Signal State	+1.5VALW +3VALW +5VALW +12VALW	+5V +3V +2.5V +1.2V	+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

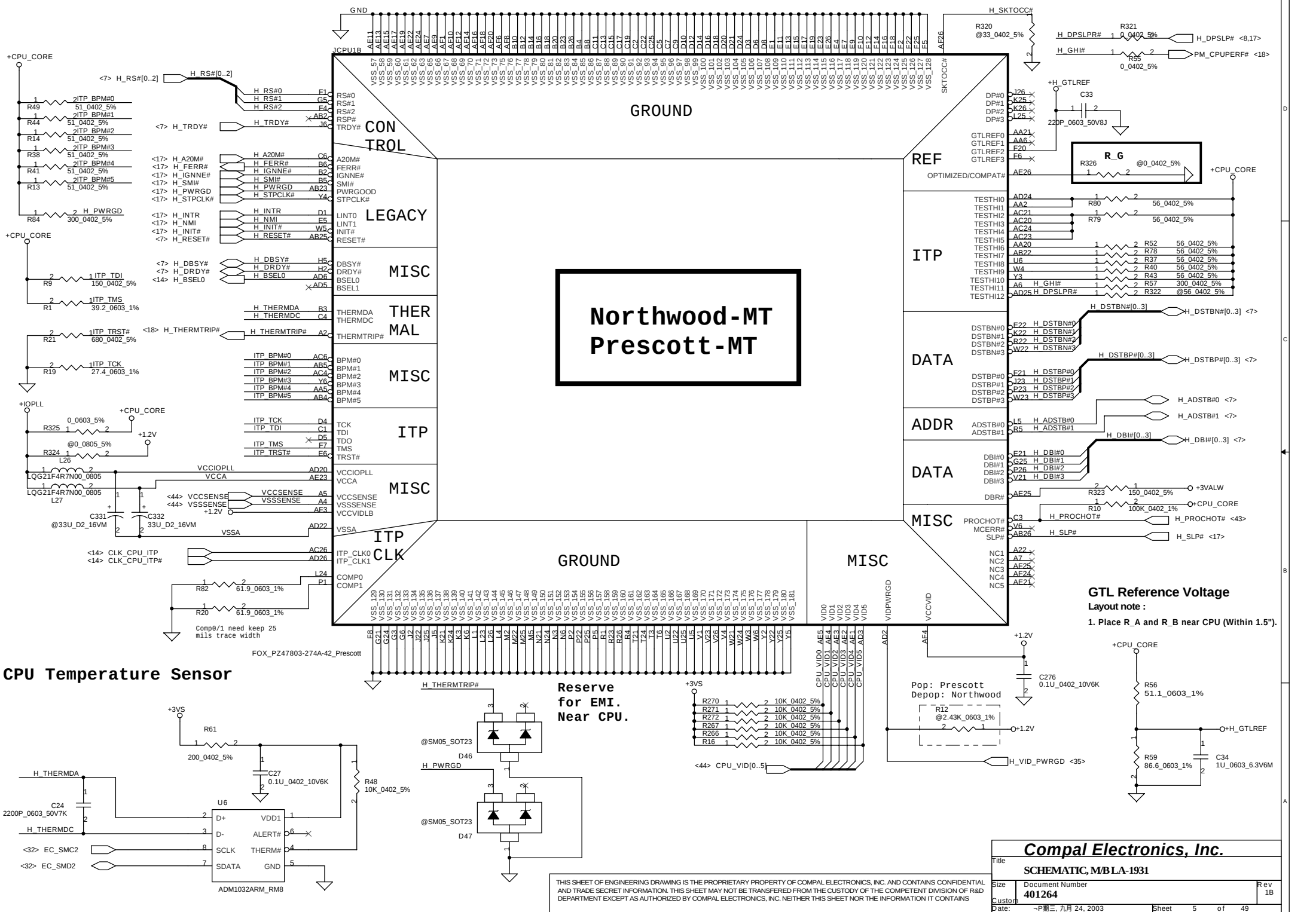
Board ID Table for AD channel

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

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



Northwood-MT Prescott-MT

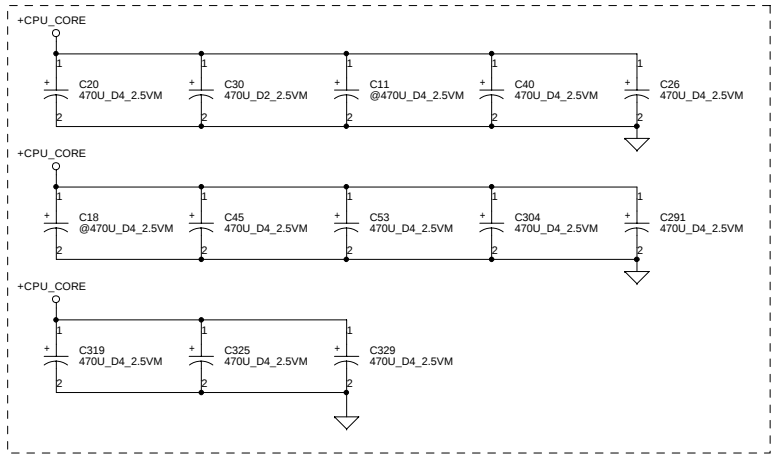
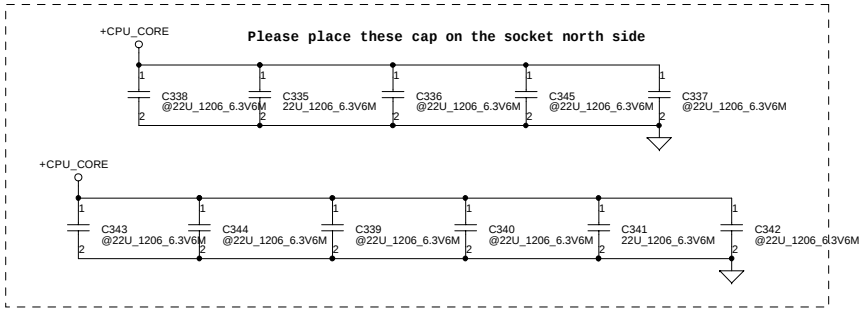
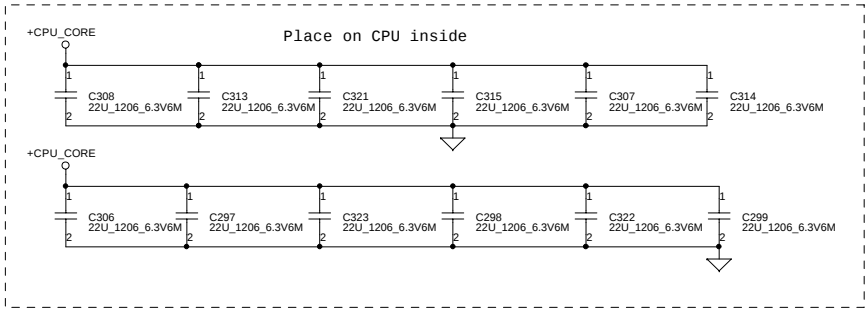


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Size			Document Number		
Custom			401264		
Date:			~P期三, 九月 24, 2003		
Sheet			5 of 49		
Rev			1B		

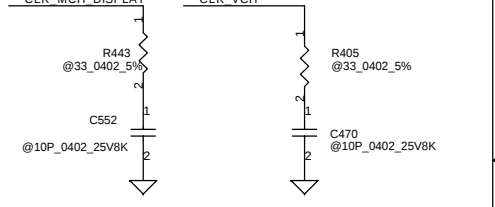
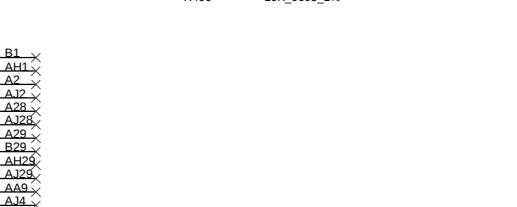
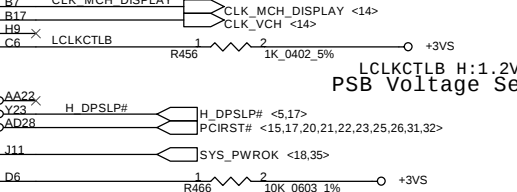
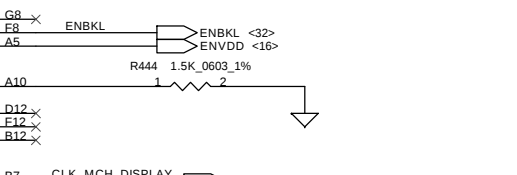
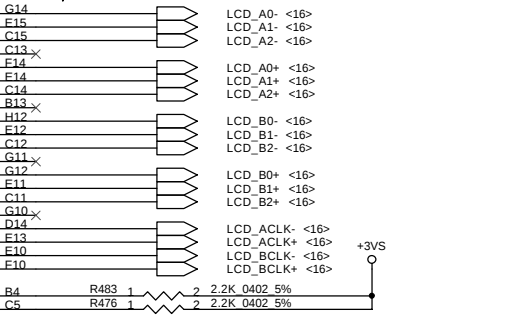
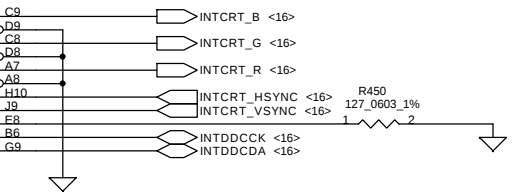
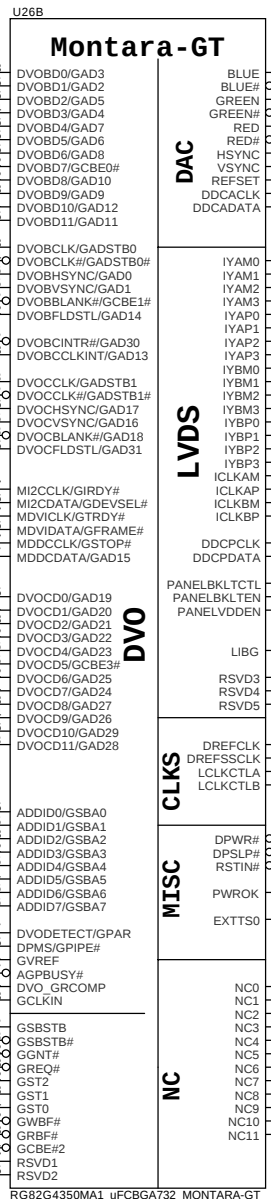
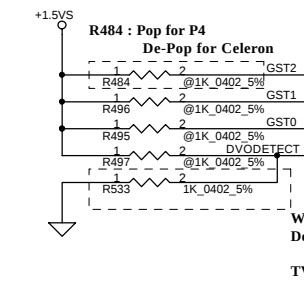
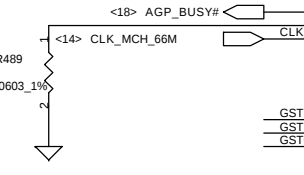
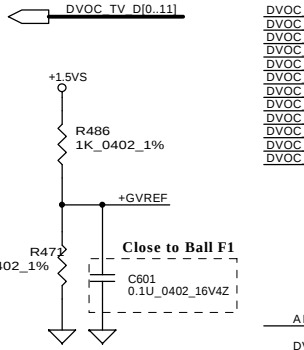
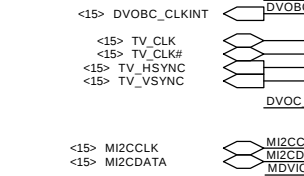
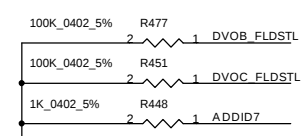
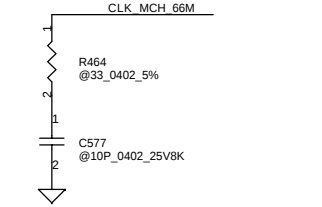
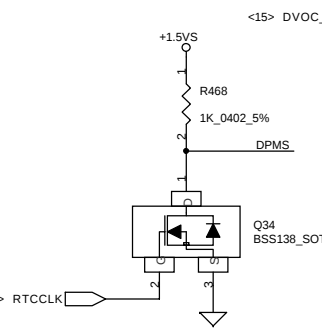
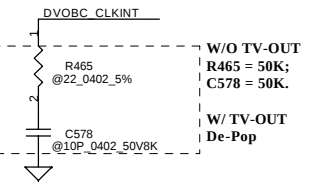
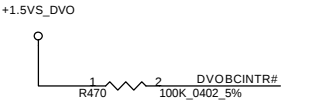
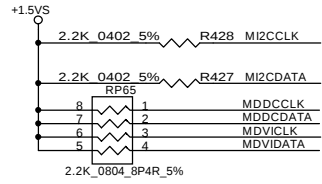
Layout note :
Place close to CPU. Use 2-3 vias per PAD.
Place 22uF caps x31 pcs, populated 14pcs.

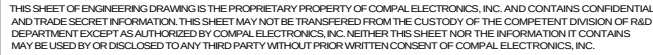
Layout note :
Place close to CPU power and ground pin as possible (<1inch)

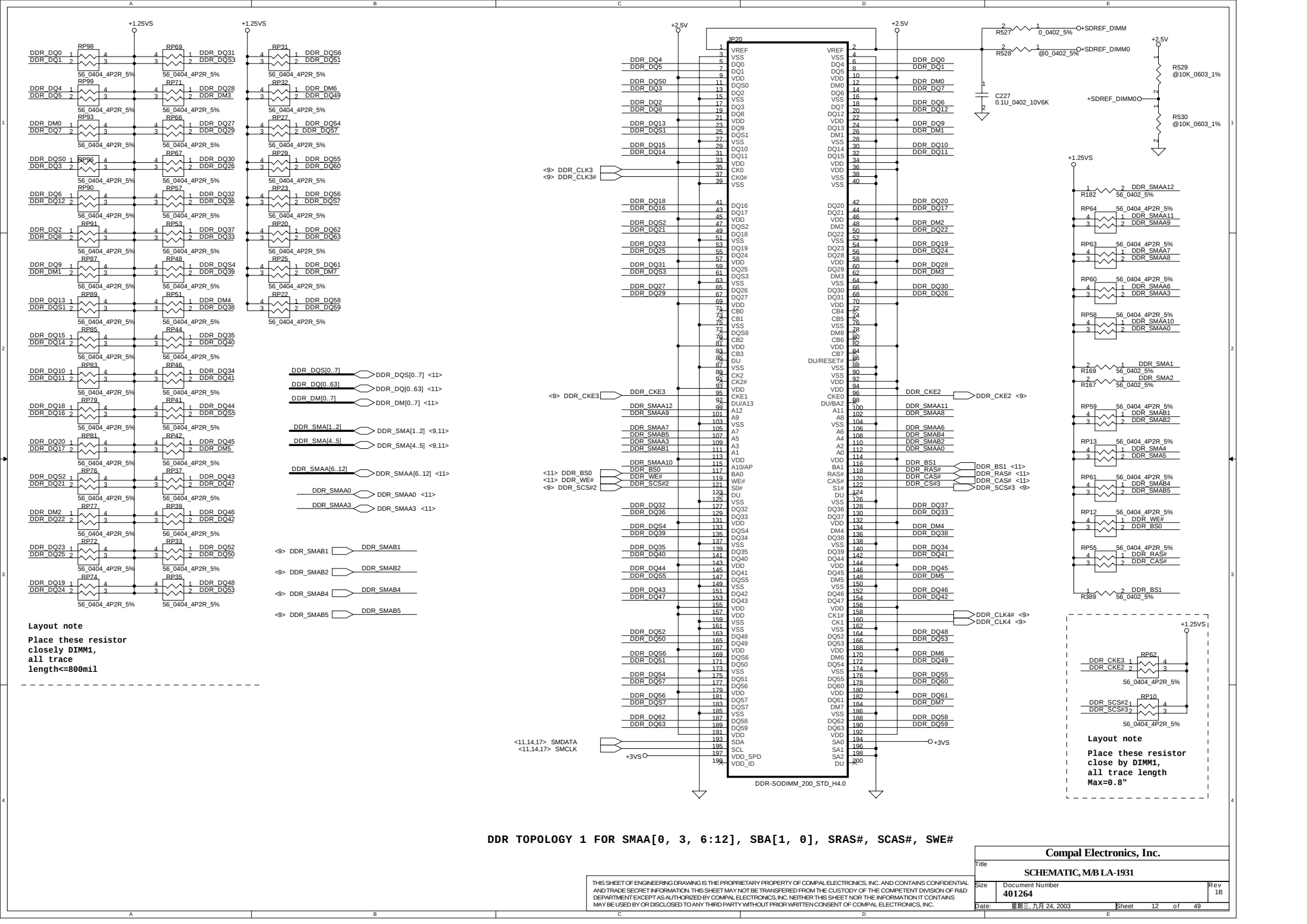
For Desktop's CPU:
470uFx15/12mOhm H=1.8 each
Total 0.923m ohm



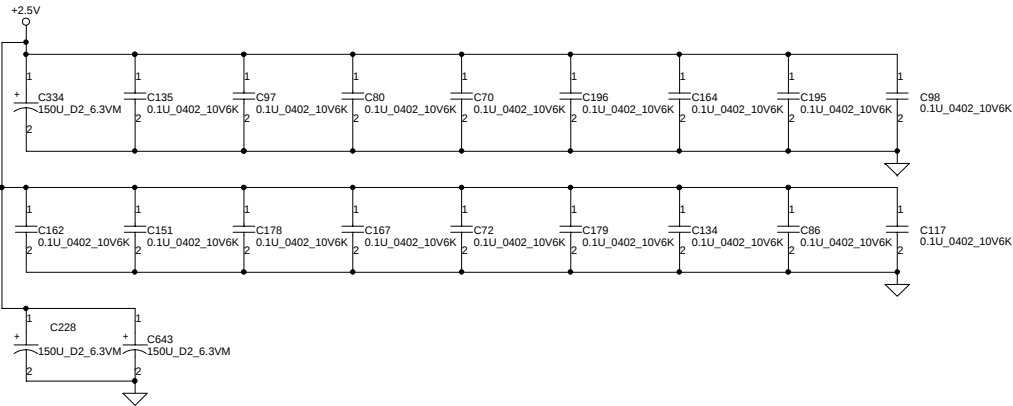
I2C BUS PULL UP



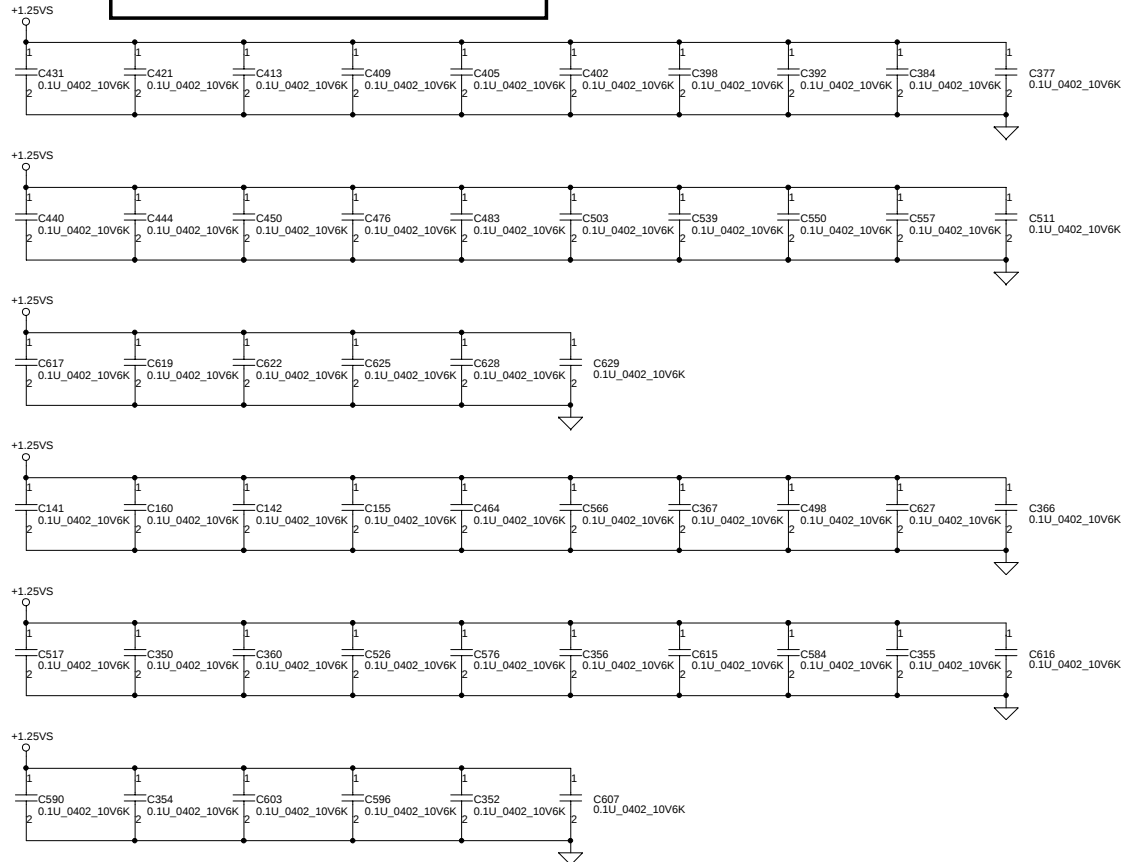




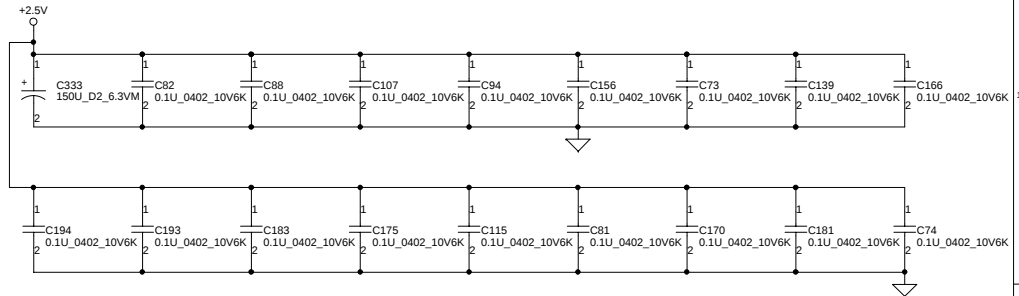
Layout note :
Distribute as close as possible
to DDR-SODIMM0.



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



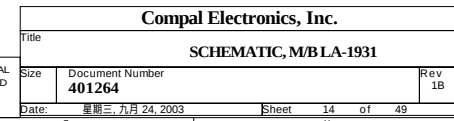
Layout note :
Distribute as close as possible
to DDR-SODIMM1.



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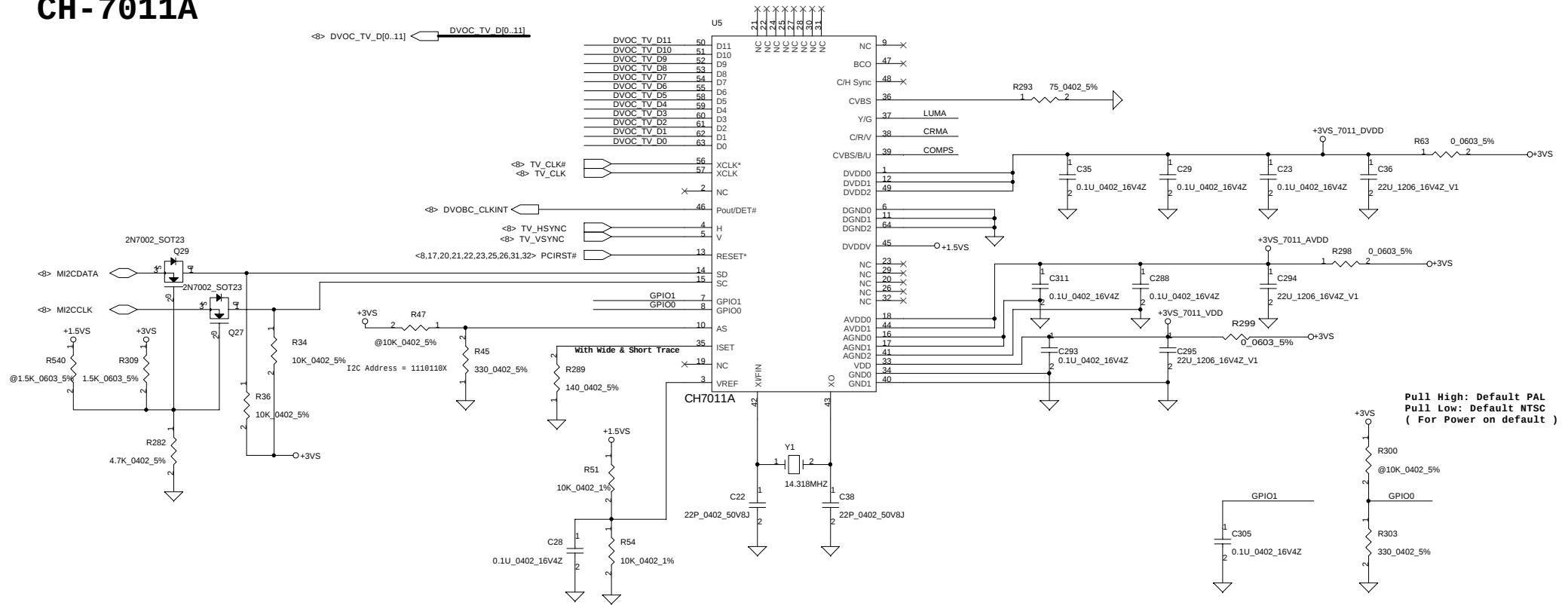
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Title			
SCHEMATIC, M/B LA-1931			
Size	Document Number	Rev	
	401264	1B	
Date:	星期三, 九月 24, 2003	Sheet	13 of 49

SEL[2:0]	CK-408 Speed
001	100 MHZ
011	133 MHZ

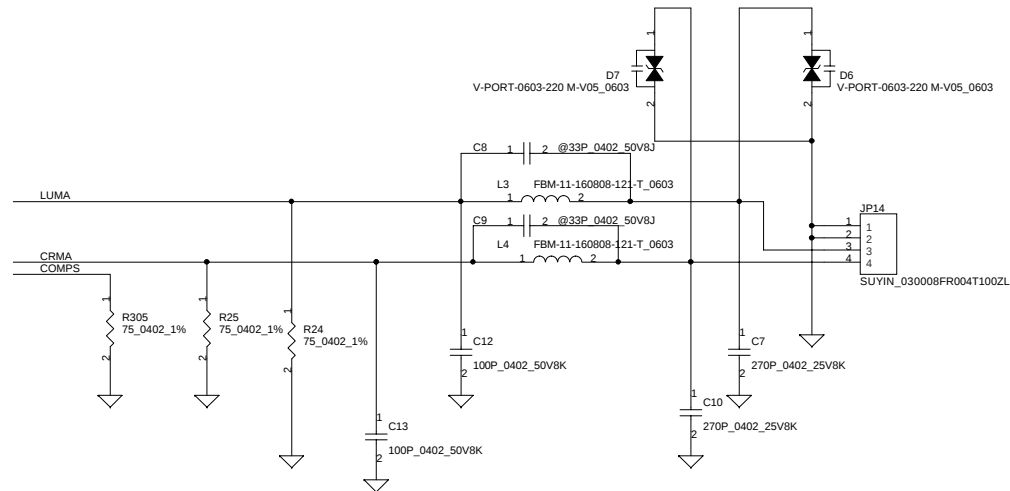


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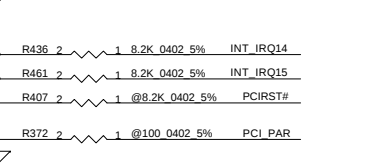
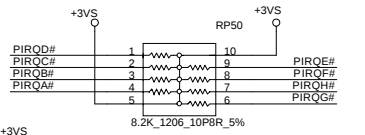
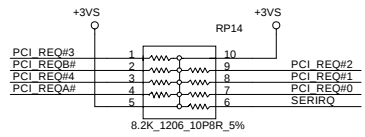
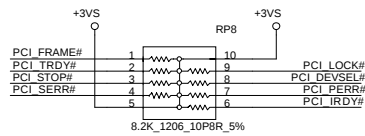


TV-OUT CONN.

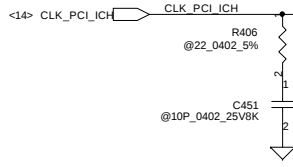


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Title			
SCHEMATIC, M/B LA-1931			
Size	Document Number	Rev	
Customer	401264	1B	
Date:	星期三, 九月 24, 2003	Sheet	15 of 49

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Note:
In ICH4, PCI_GNT[0..4] don't need external pullup



<20,21,23,25> PCI_AD[0..31]

<20,21,23,25> PCI_C/BE#0
<20,21,23,25> PCI_C/BE#1
<20,21,23,25> PCI_C/BE#2
<20,21,23,25> PCI_C/BE#3

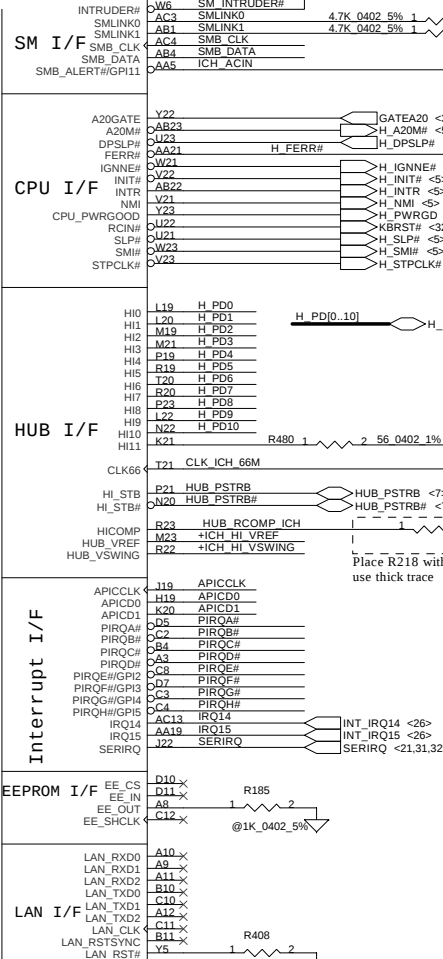
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<25> PCI_REQ#1
<21> PCI_REQ#2
<23> PCI_REQ#3

<20> PCI_GNT#0
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<21> PCI_GNT#2
<23> PCI_GNT#3

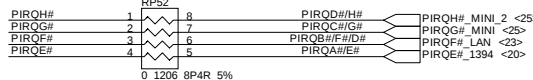
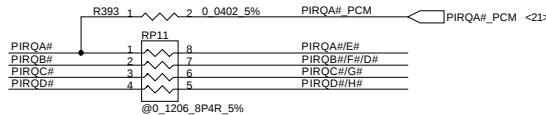
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<20,21,23,25> PCI_IRDY#
<20,21,23,25> PCI_PERR#
<20,21,23,25> PCI_LOCK#
<32> ICH_WAKE_UP#
<8,15,20,21,22,23,25,26,31,32> PCIRST#
<21,23,25> PCI_SERR#
<20,21,23,25> PCI_STOP#
<20,21,23,25> PCI_TRDY#

PCI_REQ#
PCI_REQ#
GNT#
PIDERST#
SIDERST#

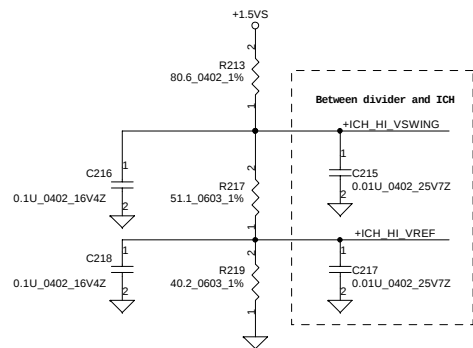
ICH4-M



ICH4-M



HUB I/F REF VOLTAGE



Place this schematic close to ICH

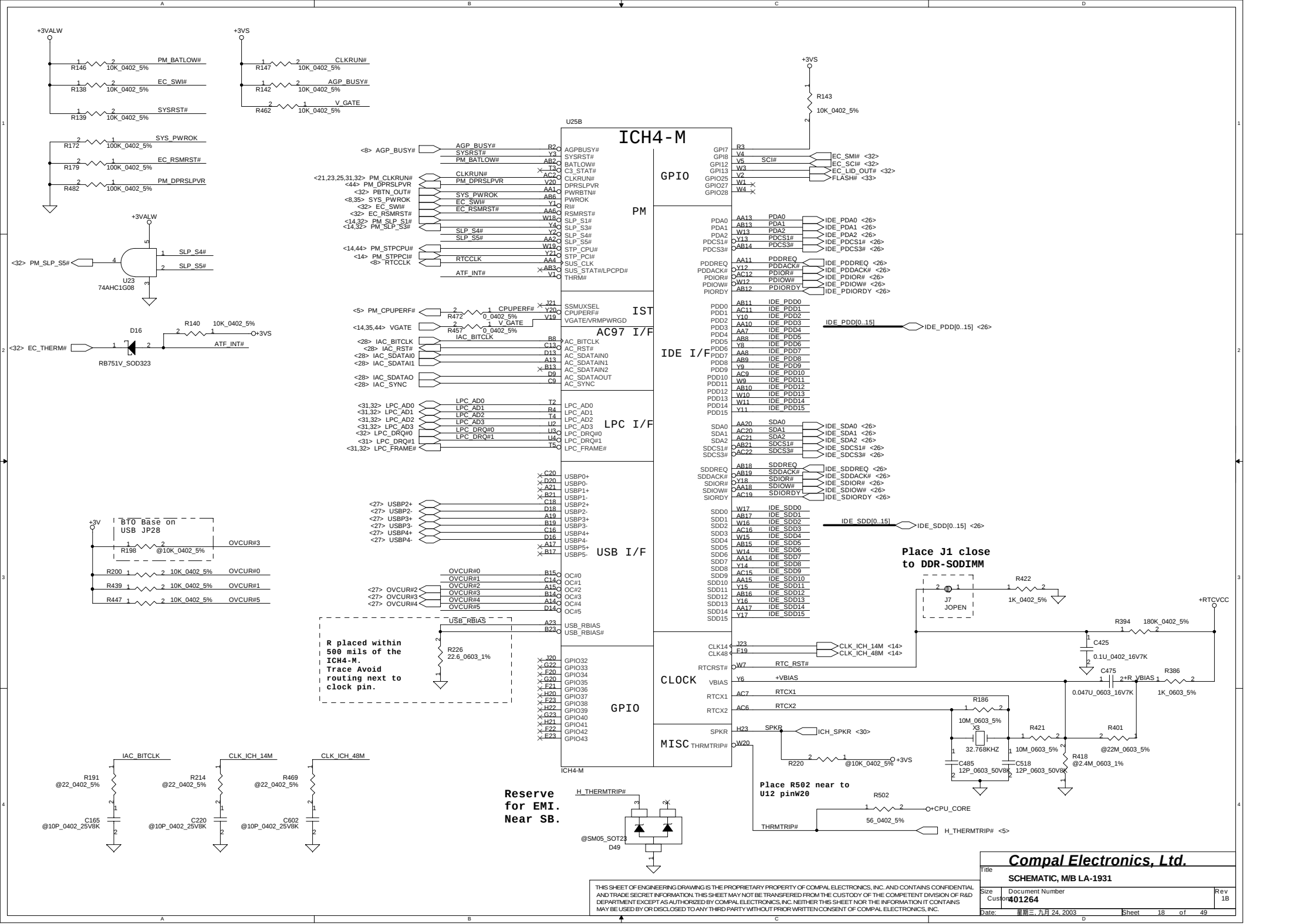
Topology 1: Pop : RP52 and R393 Depop : RP11	
1394	Trace: PIRQE#_1394 Use IRQE
CardBus	Trace: PIRQA# Use IRQA
LAN	Trace: PIRQF#_LAN Use IRQF
MINIPCI	Trace: PIRQG# Use IRQG

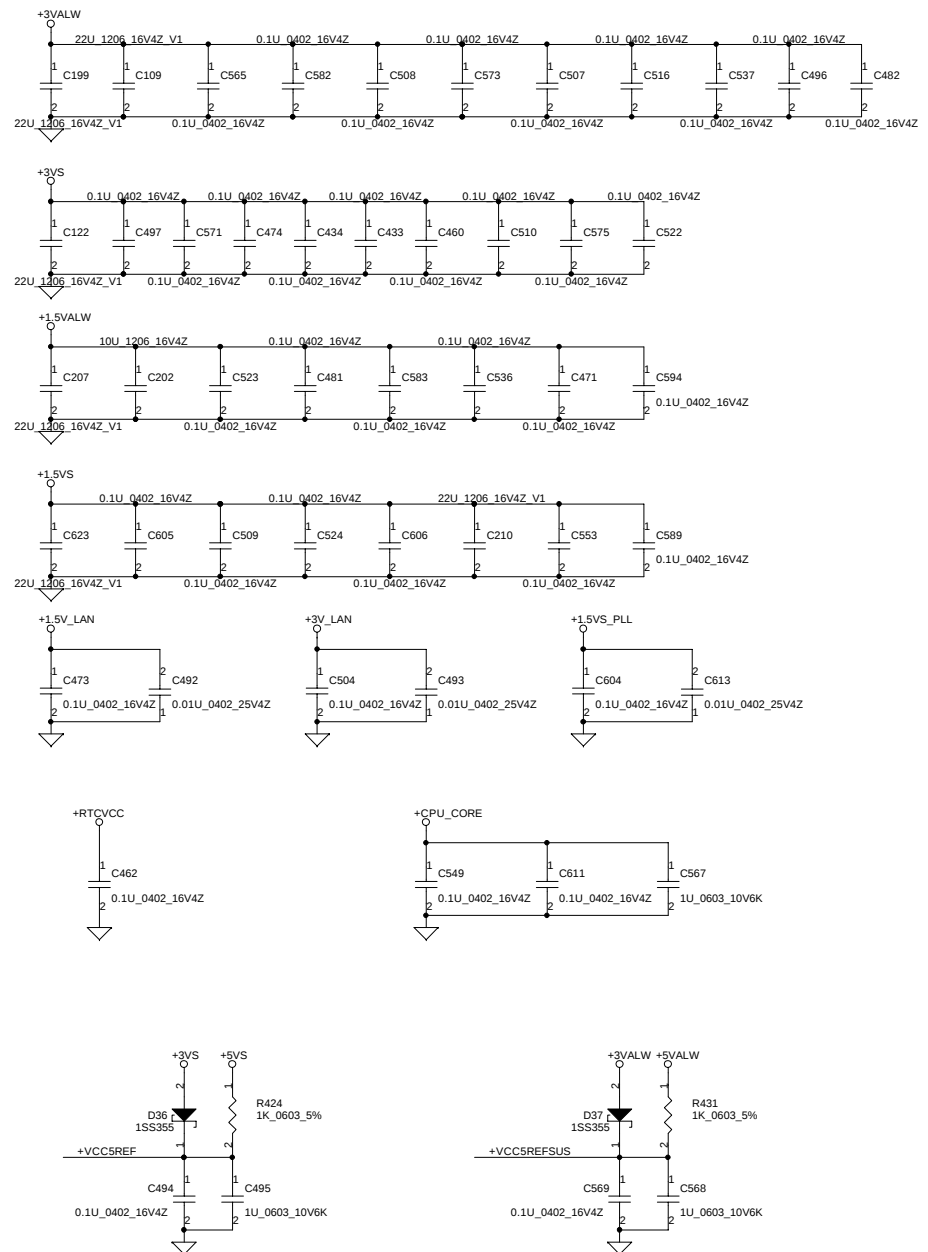
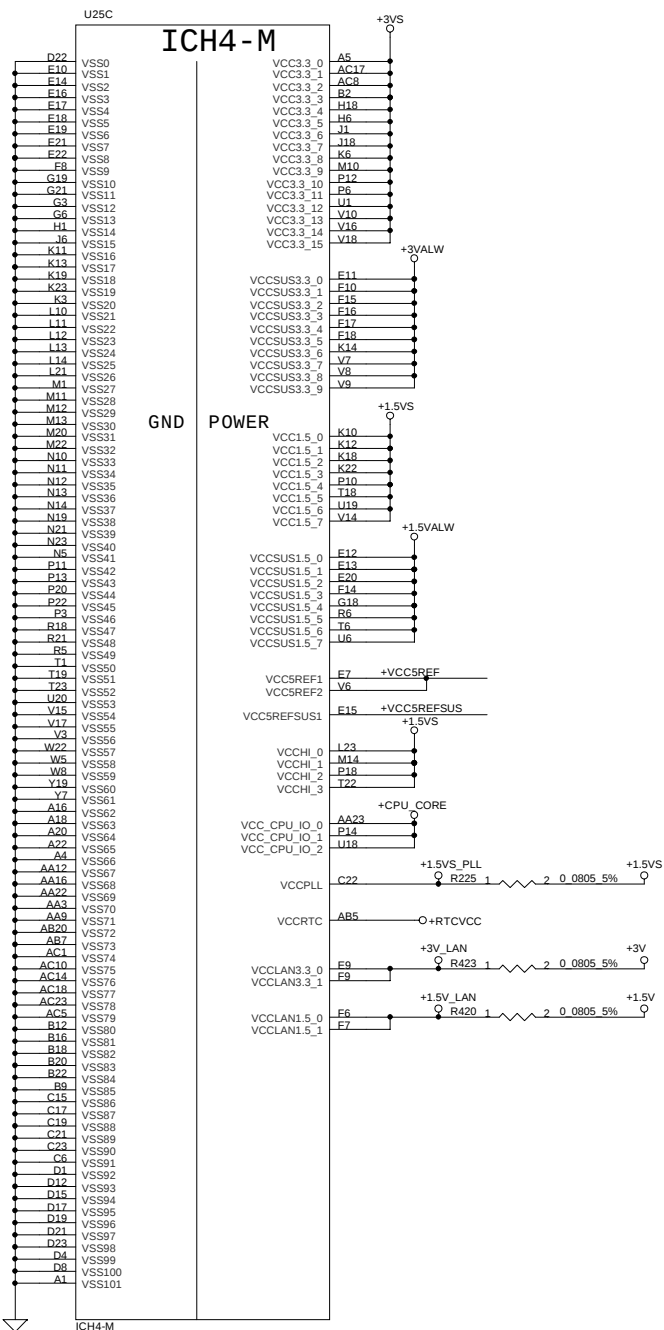
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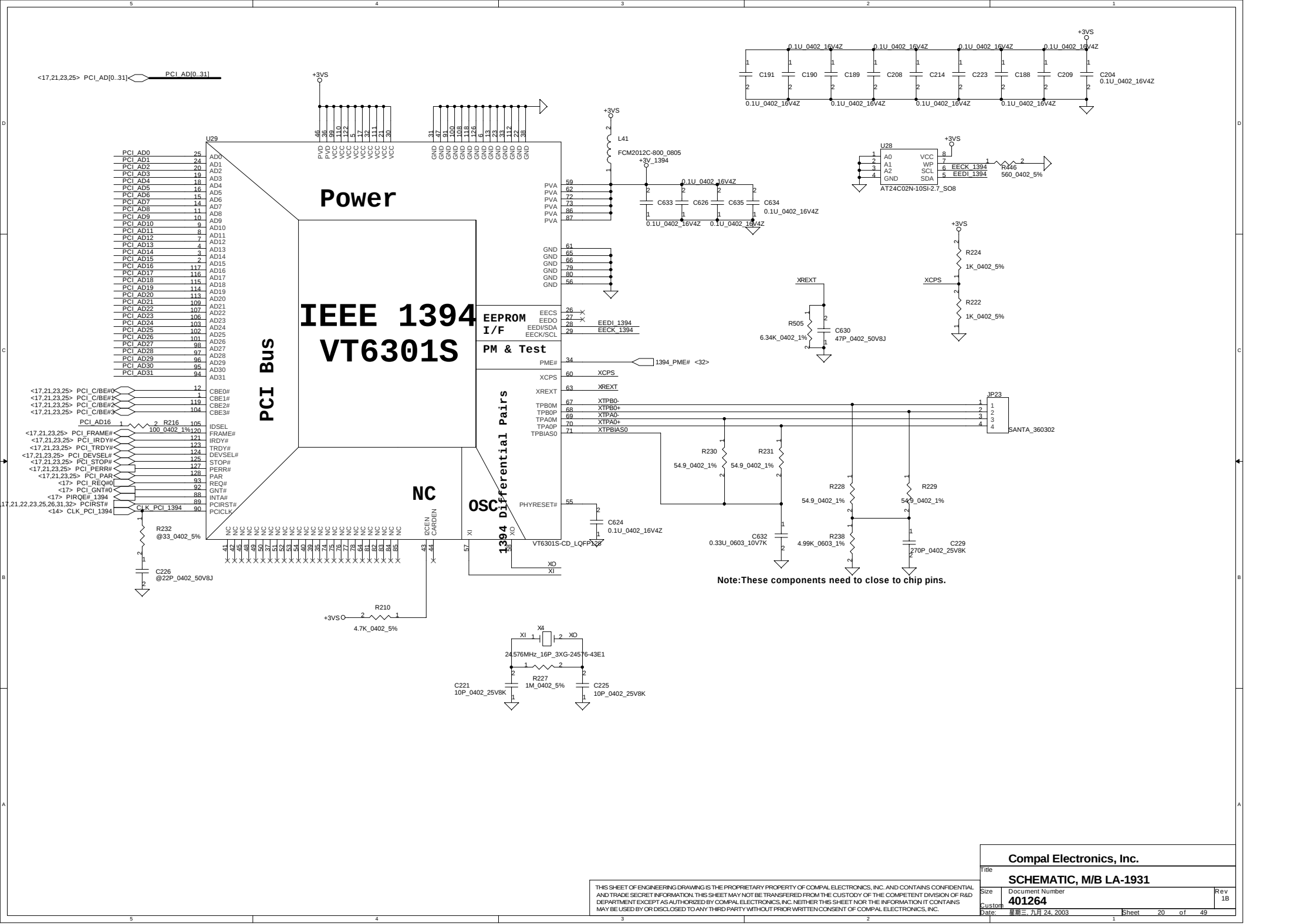
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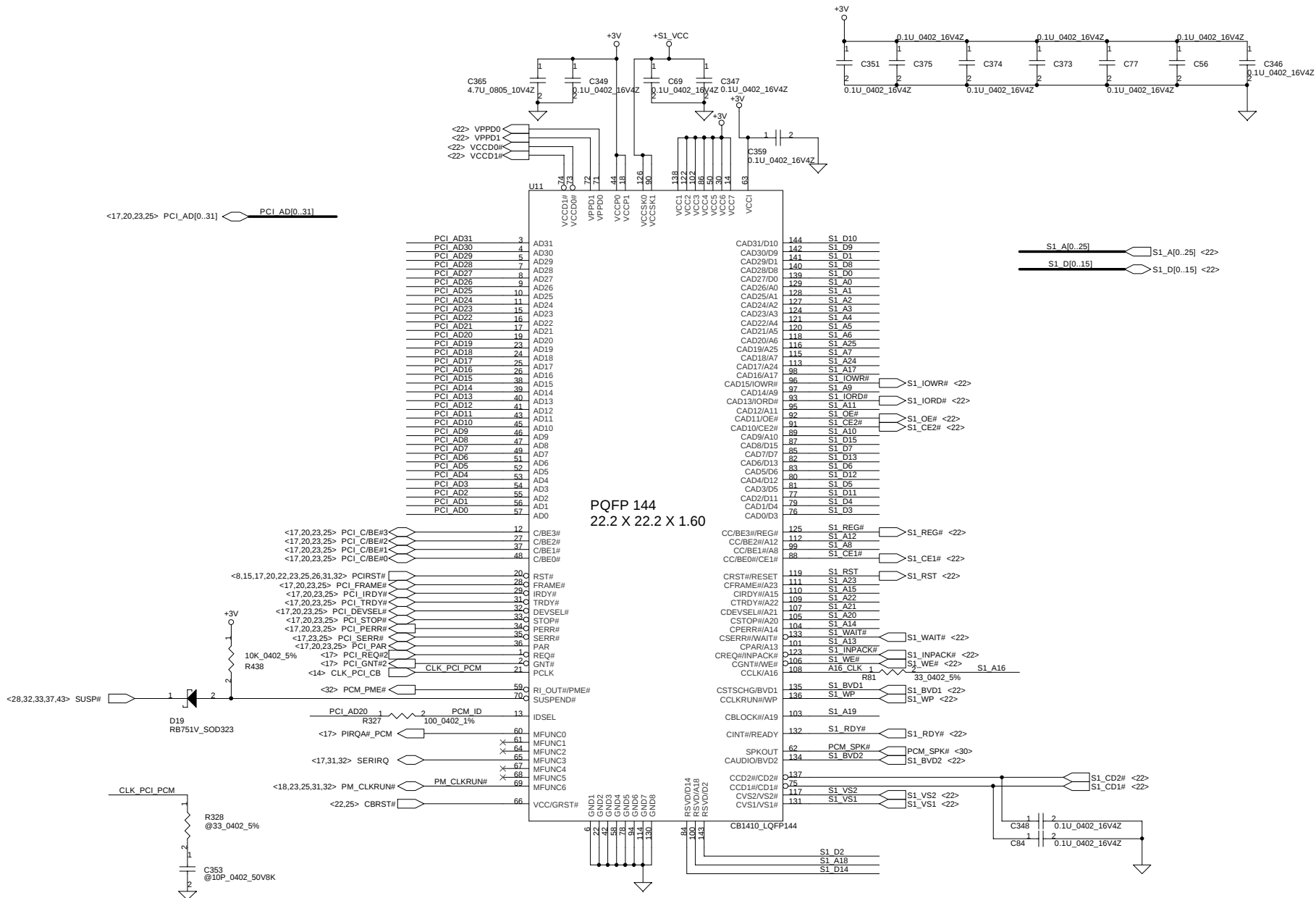
Title	Document Number	Rev
Size	401264	1B
Customer		
Date	星期三, 九月 24, 2003	Sheet 17 of 49

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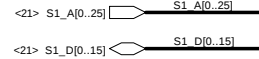
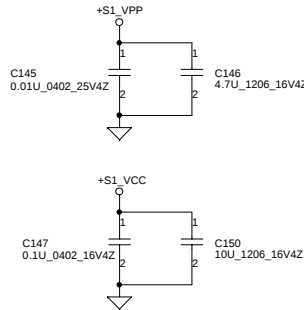
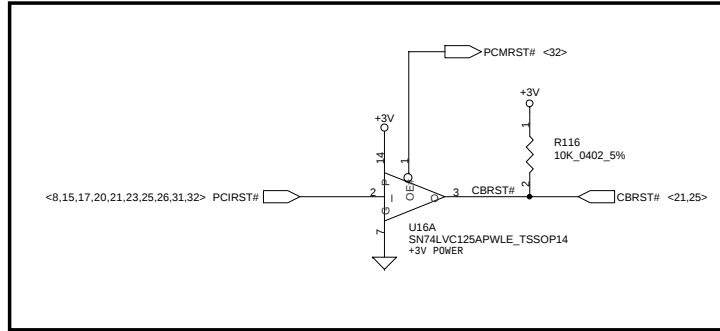
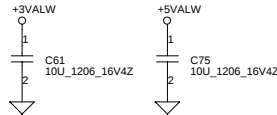
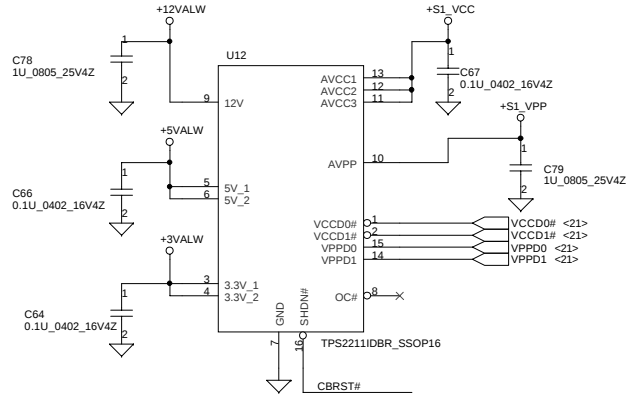




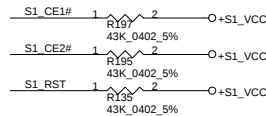
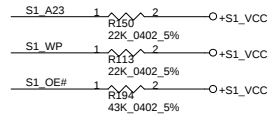
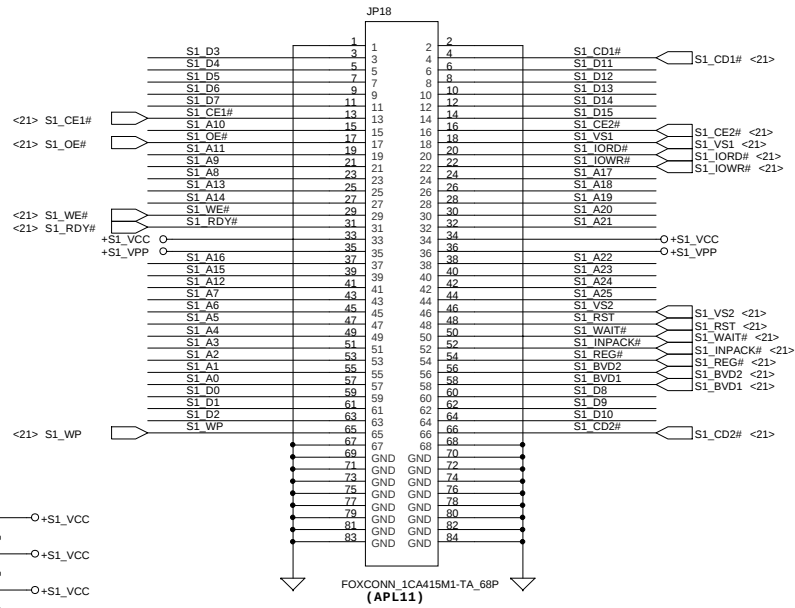
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Compal Electronics, Ltd.		
Title		
SCHEMATIC, M/B LA-1931		
Size	Document Number	Rev
Customer	401264	1B
Date	星期三, 九月 24, 2003	Sheet 21 of 49

PCMCIA Power Controller



CardBus Socket



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SCHEMATIC, MB LA-1931

Title	Document Number	Rev
Size	401264	1B
Cust#		
Date	星期三, 九月 24, 2003	Sheet 22 of 49

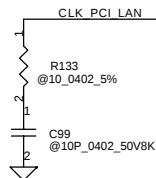
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<17,20,21,25> PCI_AD[0..31]

PCI AD0	47	AD0
PCI AD1	46	AD1
PCI AD2	45	AD2
PCI AD3	43	AD3
PCI AD4	42	AD4
PCI AD5	41	AD5
PCI AD6	40	AD6
PCI AD7	39	AD7
PCI AD8	36	AD8
PCI AD9	35	AD9
PCI AD10	34	AD10
PCI AD11	33	AD11
PCI AD12	32	AD12
PCI AD13	30	AD13
PCI AD14	29	AD14
PCI AD15	28	AD15
PCI AD16	15	AD16
PCI AD17	14	AD17
PCI AD18	13	AD18
PCI AD19	12	AD19
PCI AD20	11	AD20
PCI AD21	10	AD21
PCI AD22	9	AD22
PCI AD23	8	AD23
PCI AD24	36	AD24
PCI AD25	33	AD25
PCI AD26	92	AD26
PCI AD27	91	AD27
PCI AD28	89	AD28
PCI AD29	87	AD29
PCI AD30	86	AD30
PCI AD31	85	AD31

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<17,20,21,25> PCI_C/BE#1	PCI_C/BE#1	27	C/BE#1
<17,20,21,25> PCI_C/BE#2	PCI_C/BE#2	17	C/BE#2
<17,20,21,25> PCI_C/BE#3	PCI_C/BE#3	84	C/BE#3

PCI AD17	1	LAN IDSEL	98	IDSEL
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<17,20,21,25> PCI_FRAME#	19	IRDY#	20	TRDY#
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<17> PIRQF#_LAN	57	PME#	81	RST#
<8,15,17,20,21,22,25,26,31,32> PCIRST#	97	CLK_PCI_LAN	50	CLK_PCI_LAN
<14> CLK_PCI_LAN	50	PM_CLKRUN#	6	VDD
<18,21,25,31,32> PM_CLKRUN#	6	VDD	37	VDD
	49	VDD	90	VDD
	95	VDD	73	AGND3



Power

PCI I/F

LAN I/F

Power

Power

PCI I/F

LAN I/F

Power

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PCI I/F

LAN I/F

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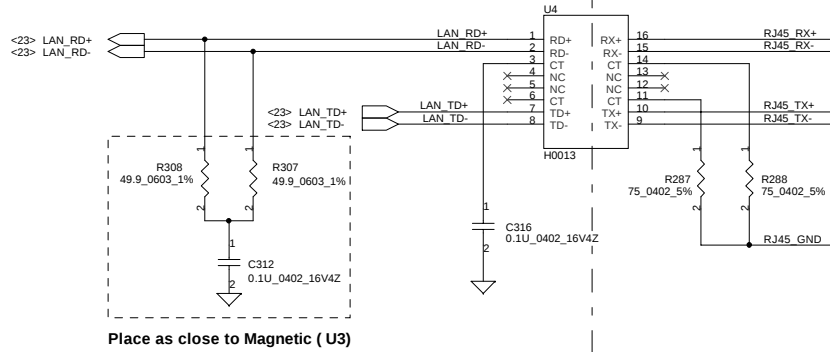
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Size	Document Number 401264
Date	~P期三, 九月 24, 2003
Sheet	23 of 49

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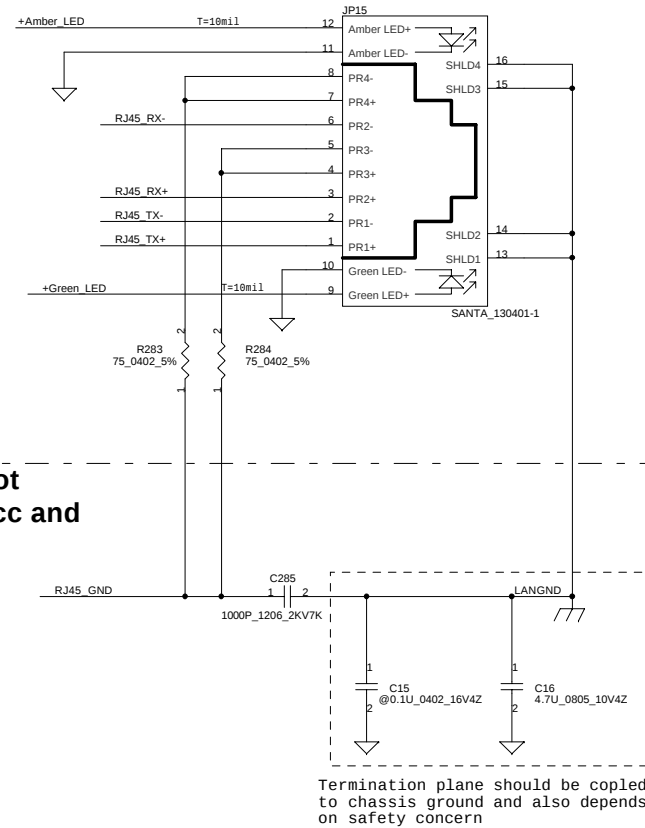
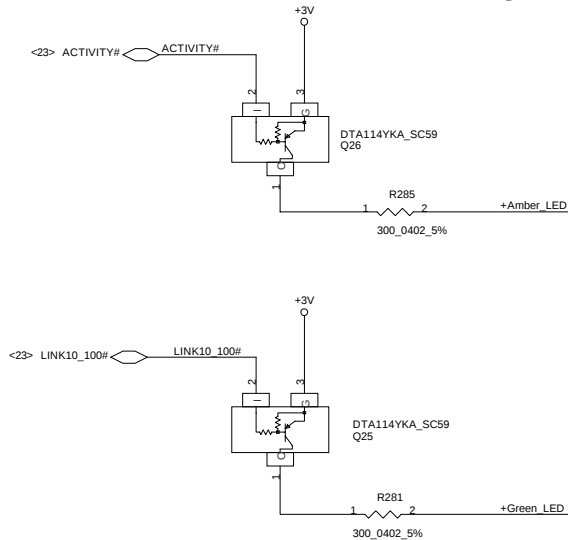
Rev
18

Keep Out 40mil

Layout Note
H0013 pls close to
conn.



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

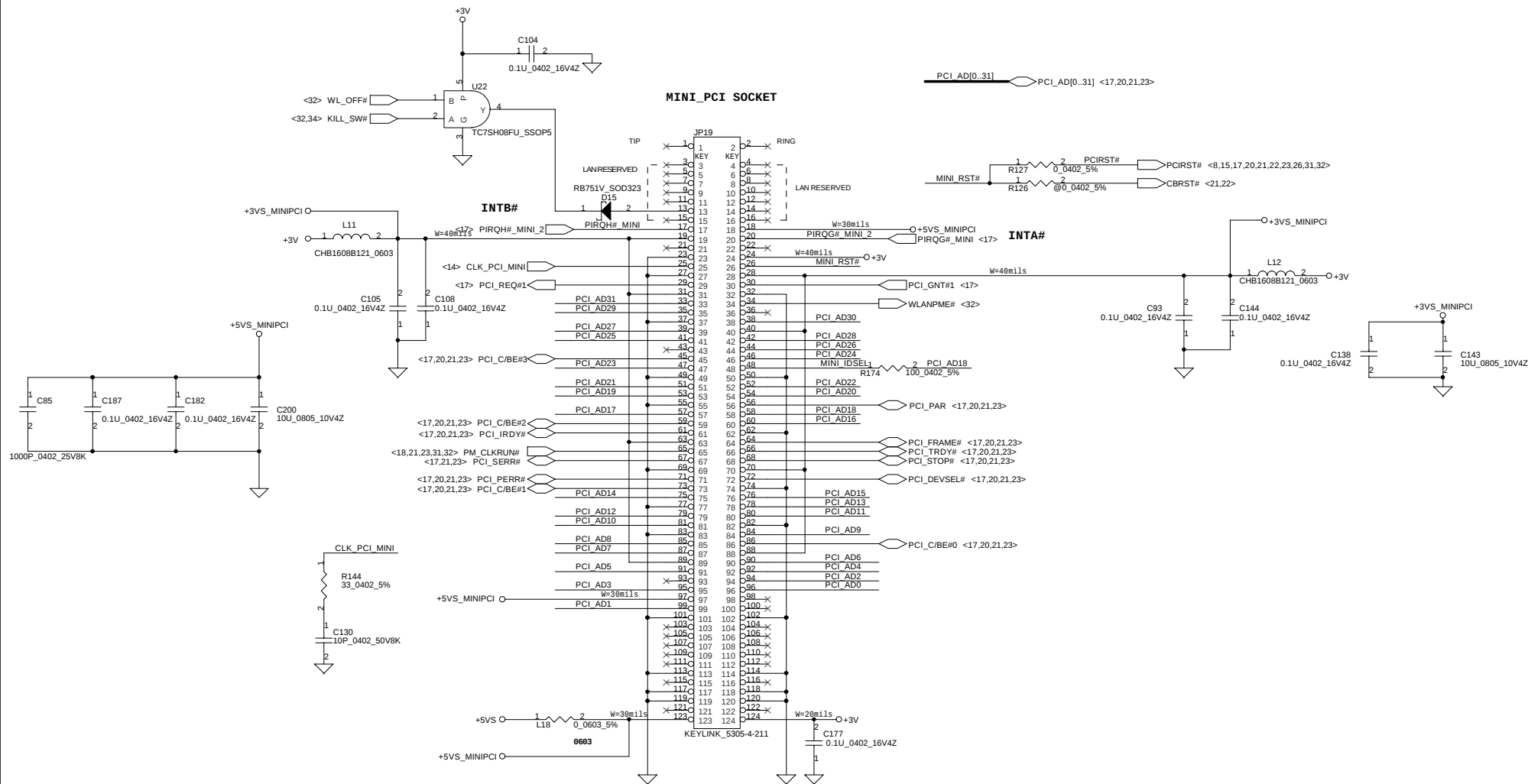


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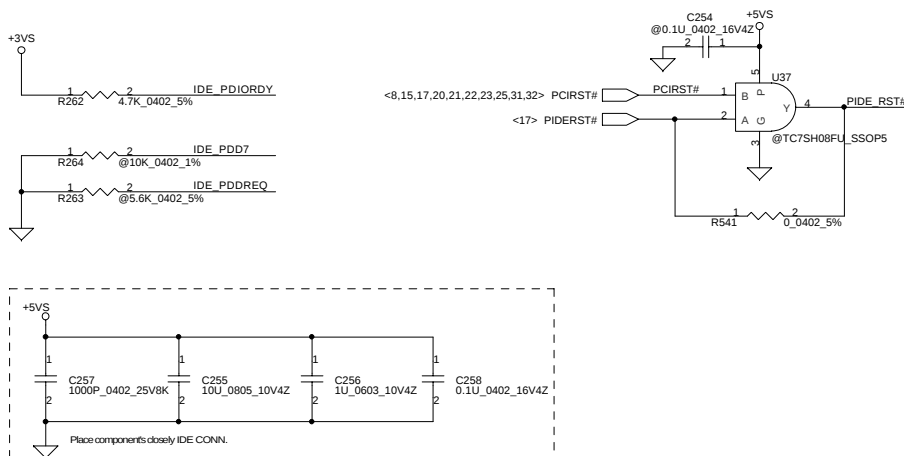
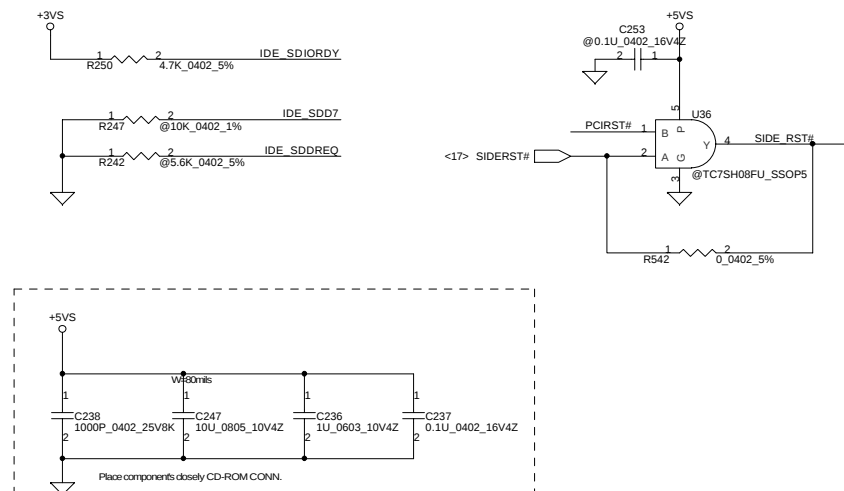
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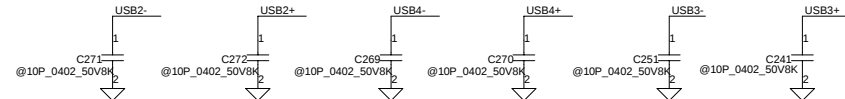
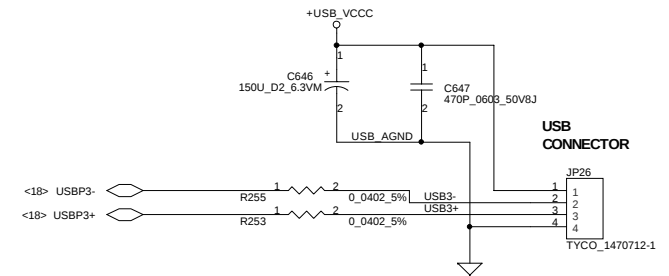
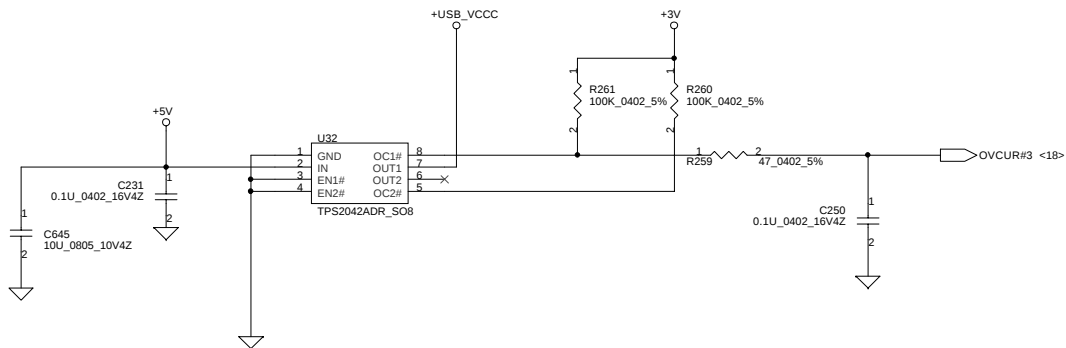
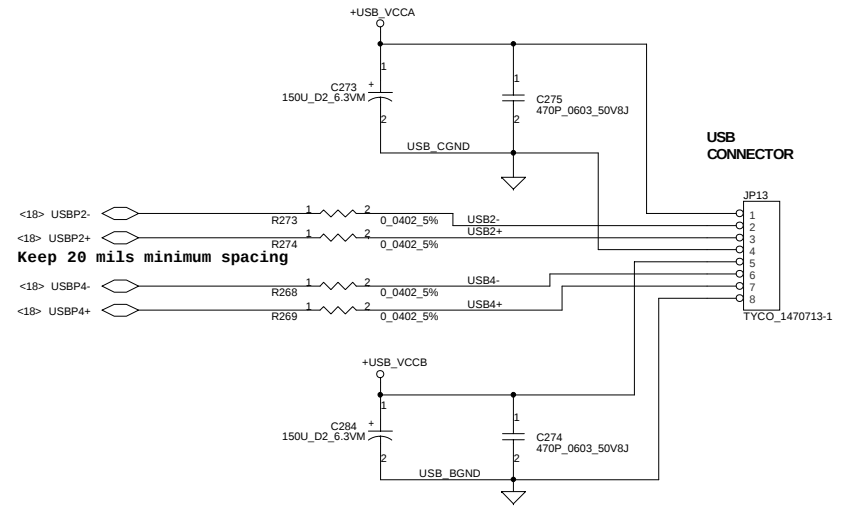
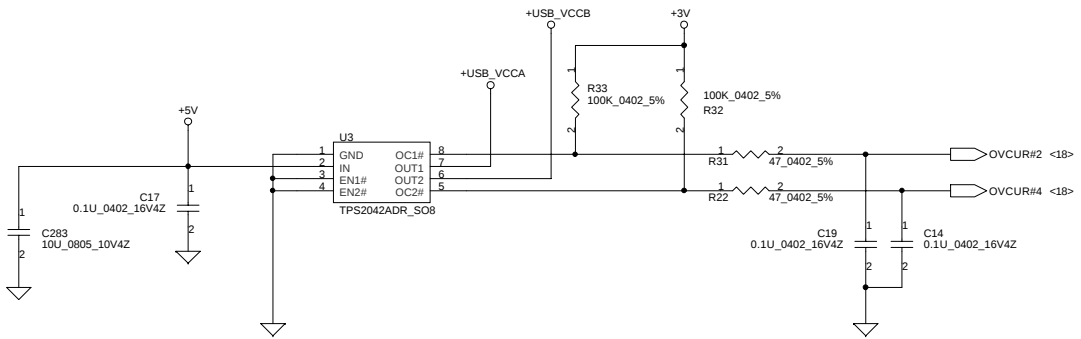


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Title			
SCHEMATIC, MB LA-1931			
Size	Document Number		Rev
Cust#	401264		1B
Date:	星期三, 九月 24, 2003		Sheet 25 of 49

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IDE Module CONN.

**CD-ROM Module CONN.**



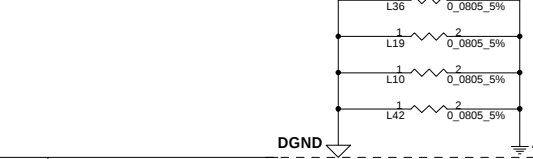
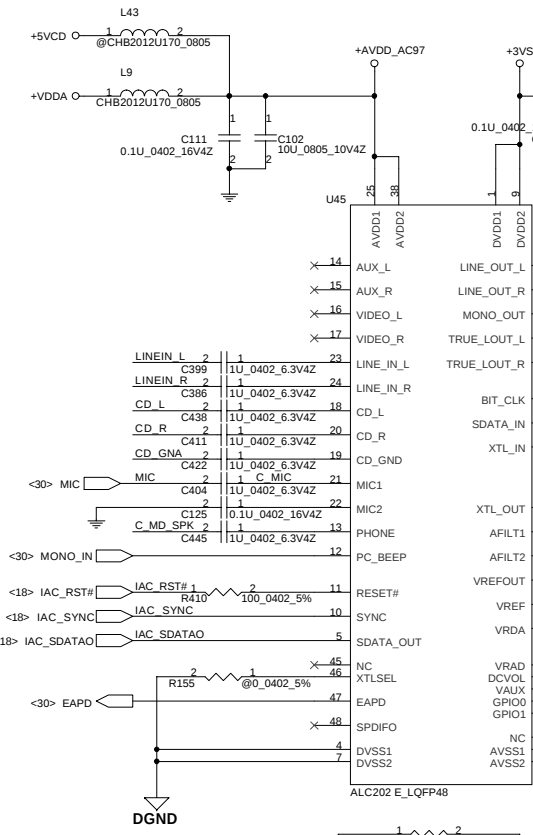
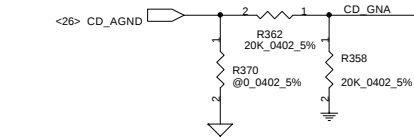
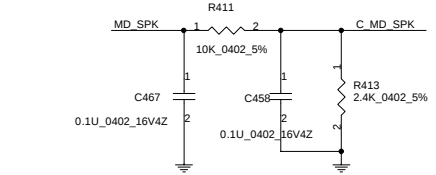
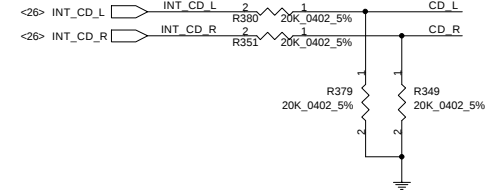
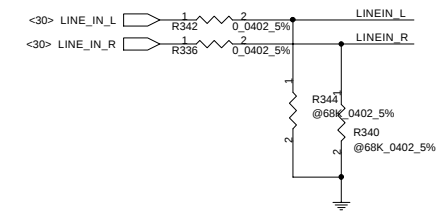
Compal Electronics, Ltd.

SCHEMATIC, M/B LA-1931

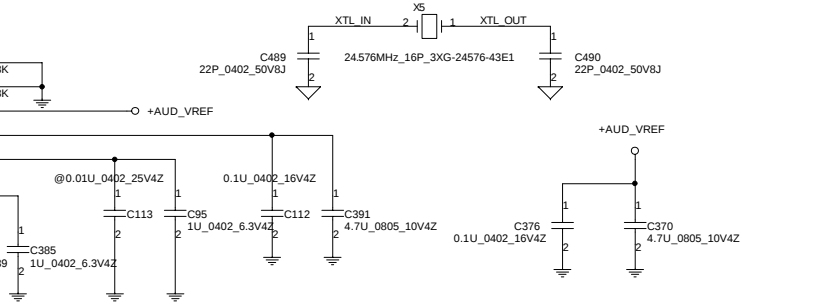
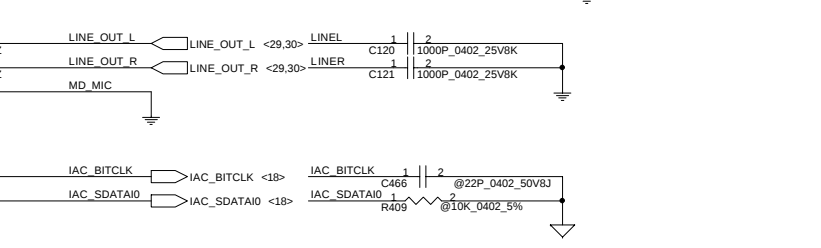
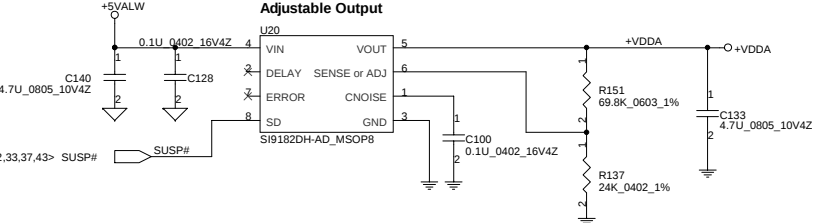
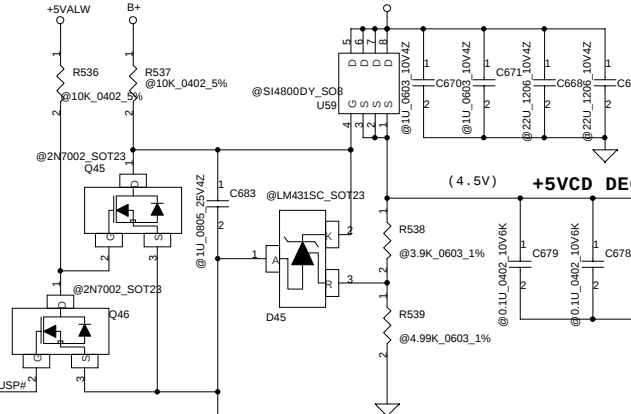
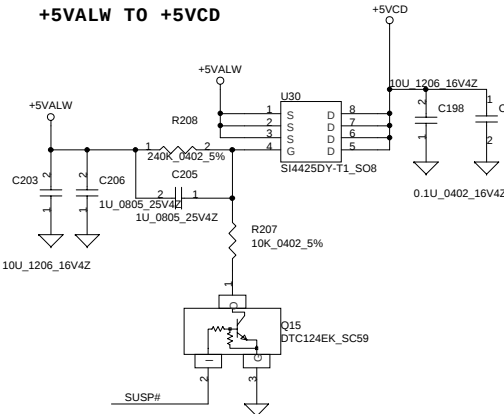
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Size	Document Number	Rev
Cust#	401264	1B
Date:	星期三, 九月 24, 2003	Sheet 27 of 49

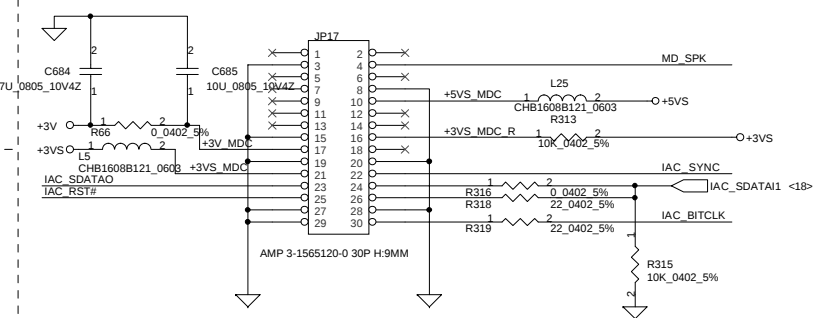
AC97 Codec



+5VALW TO +5VCD



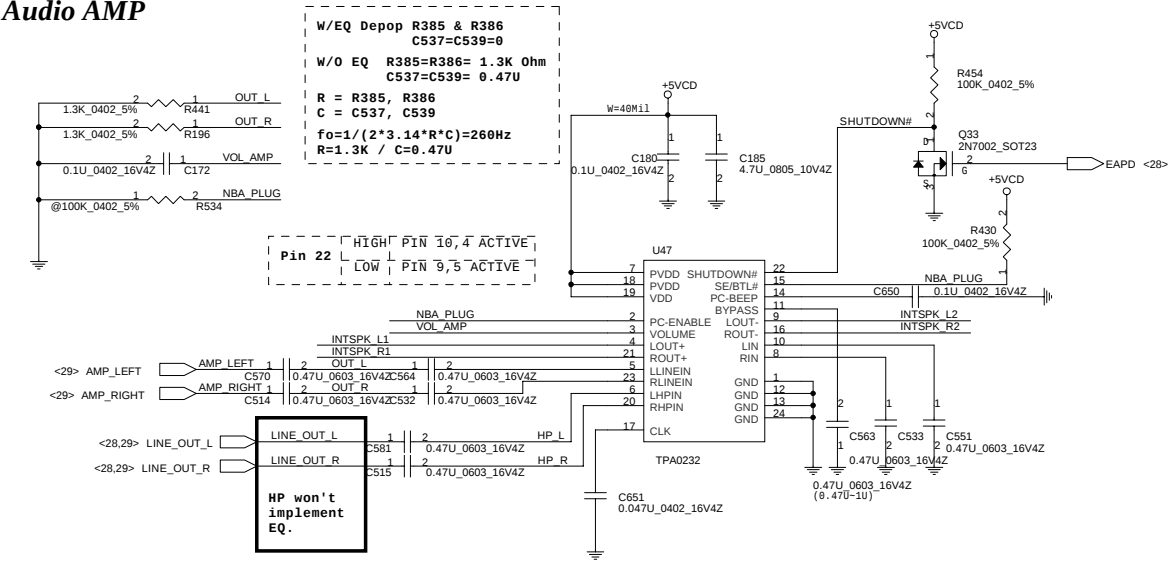
MDC Connector



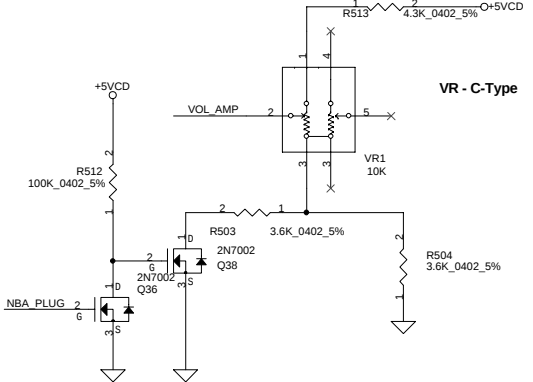
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Size	401264		
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Date	星期三, 九月 24, 2003	Sheet	28 of 49

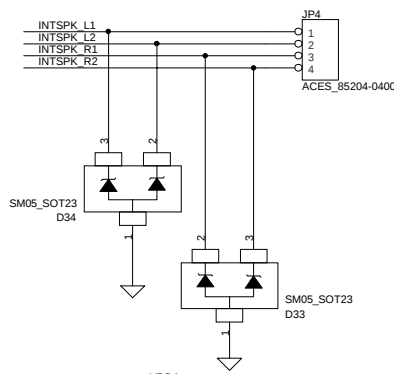
Audio AMP



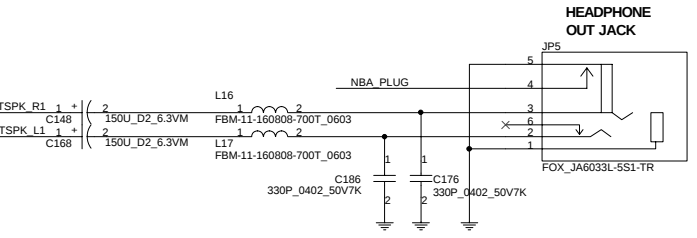
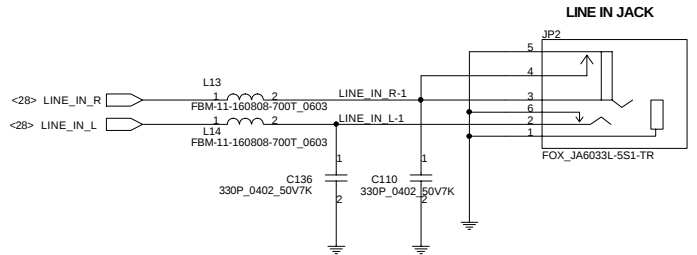
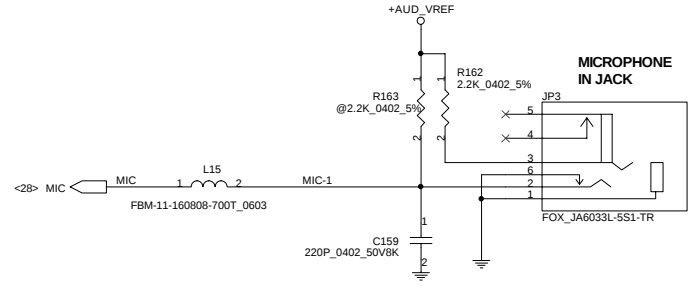
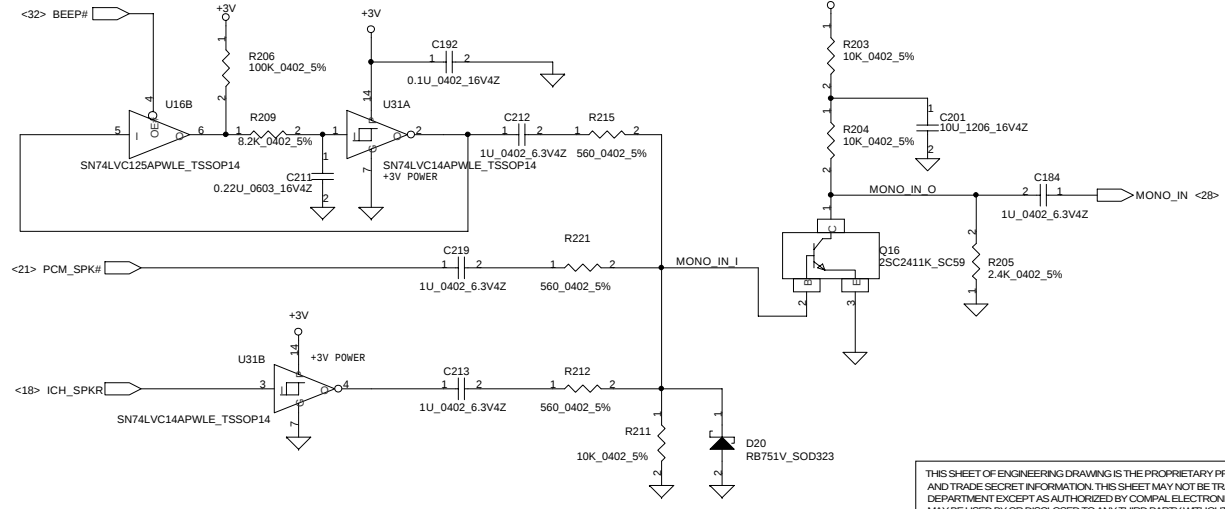
	W/ EQ	W/O EQ
R513	4.3K	4.3K
R504	3.6K	3.6K
R503	6.2K	3.6K
Bias (Gain)	SPK 0.687 V 10 dB HP 1.006 V -2 dB	SPK 0.560 V 12 dB HP 1.006 V -2 dB



Speaker Connector



System Sound



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Date

Document Number

401264

Rev

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Sheet

30

of

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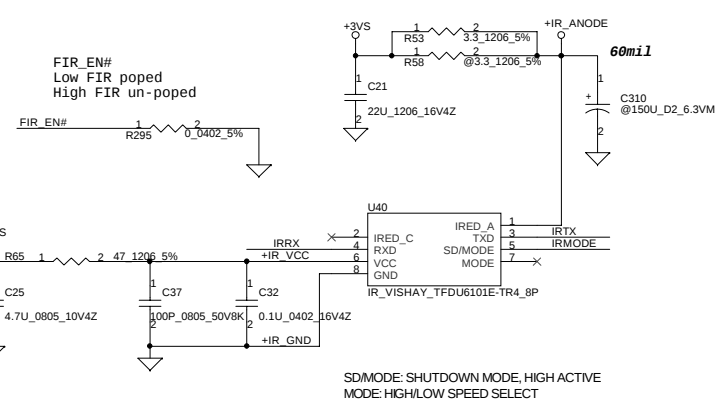
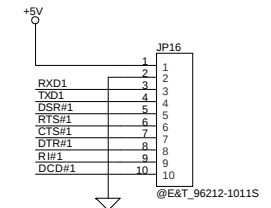
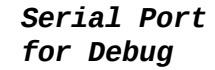
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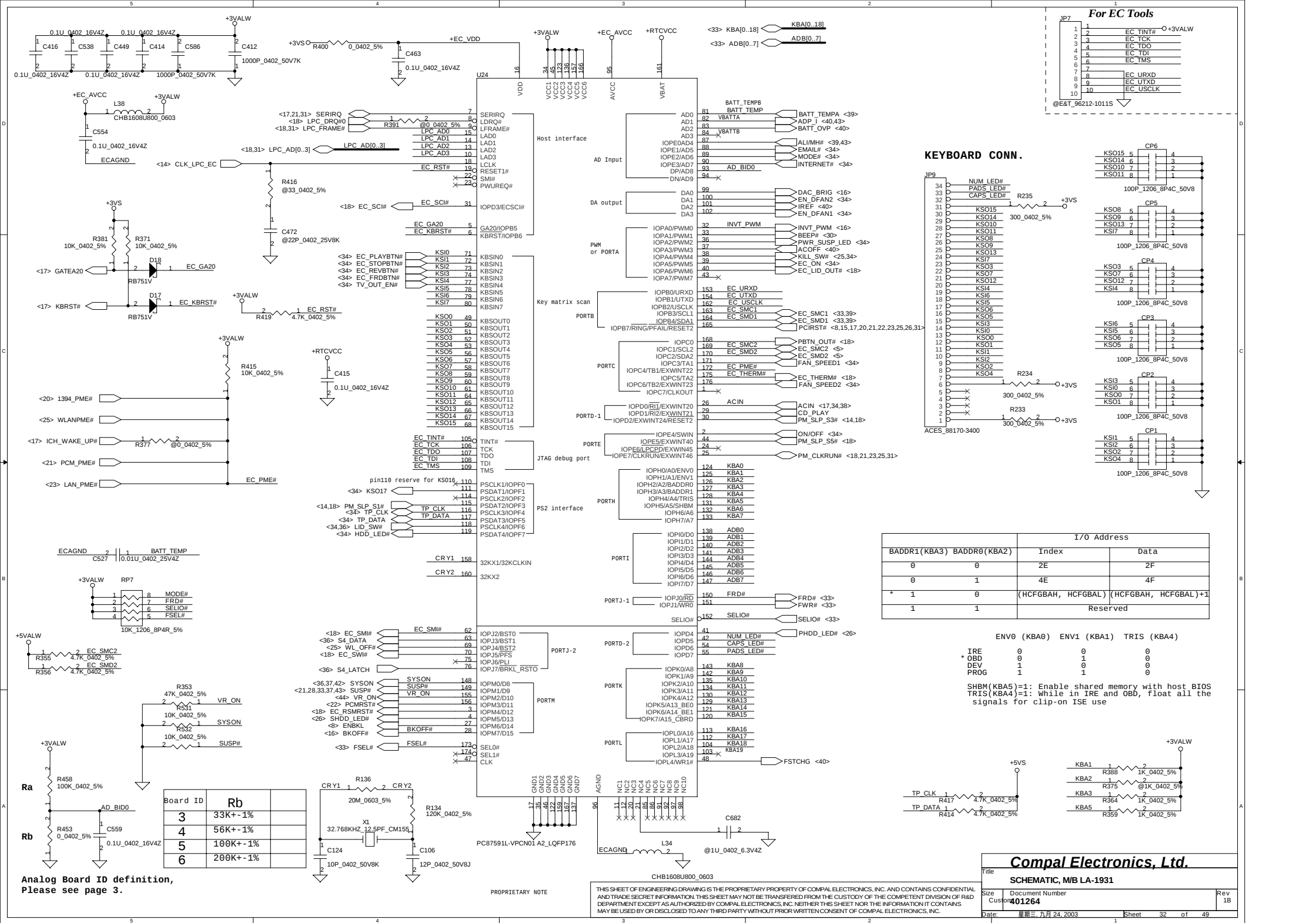
SD/MODE: SHUTDOWN MODE, HIGH ACTIVE
MODE: HIGH/LOW SPEED SELECT

Compal Electronics, Ltd.

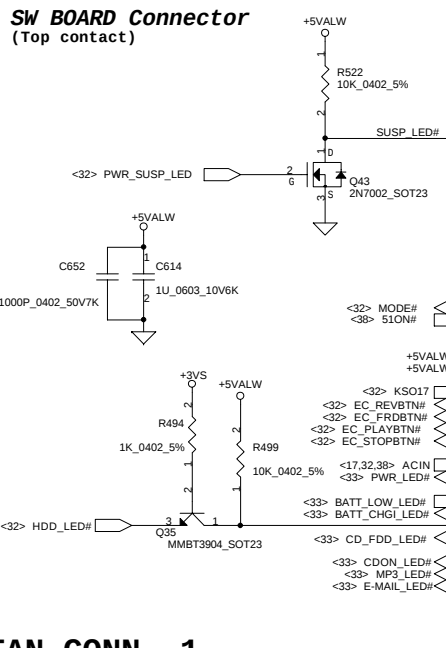
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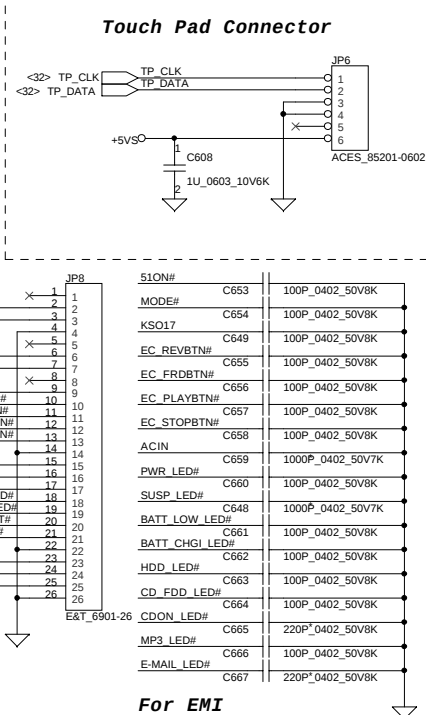
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	Date:	星期三, 九月 24, 2003	Sheet 31 of 49



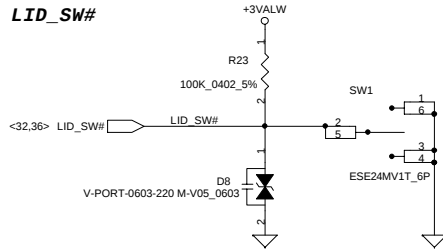
SW BOARD Connector (Top contact)



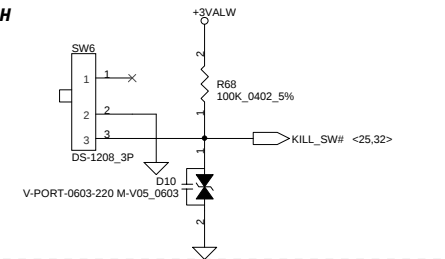
Touch Pad Connector



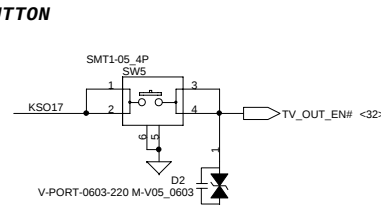
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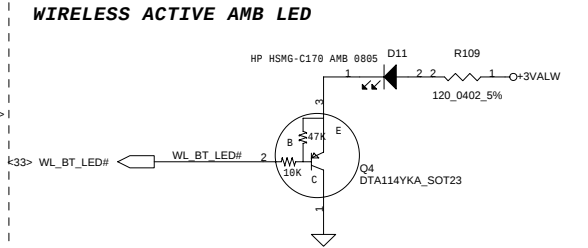
Kill SWITCH



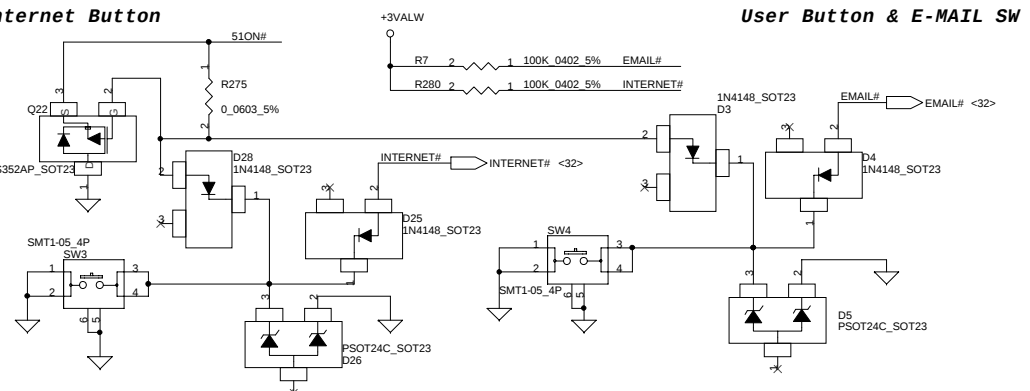
TV-OUT BUTTON



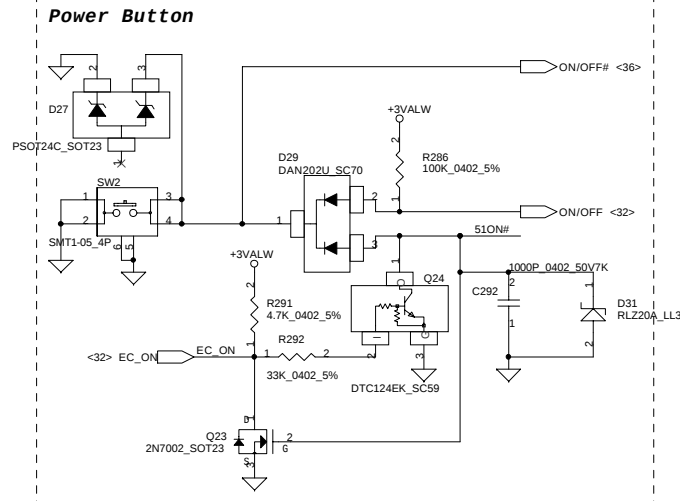
WIRELESS ACTIVE AMB LED



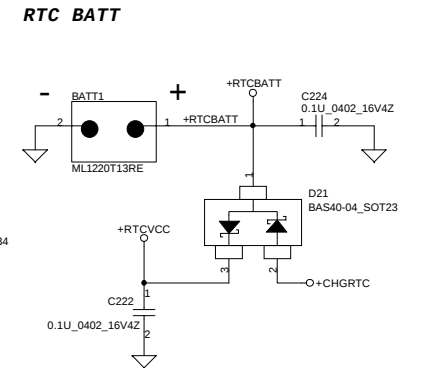
Internet Button



Power Button



RTC BATT



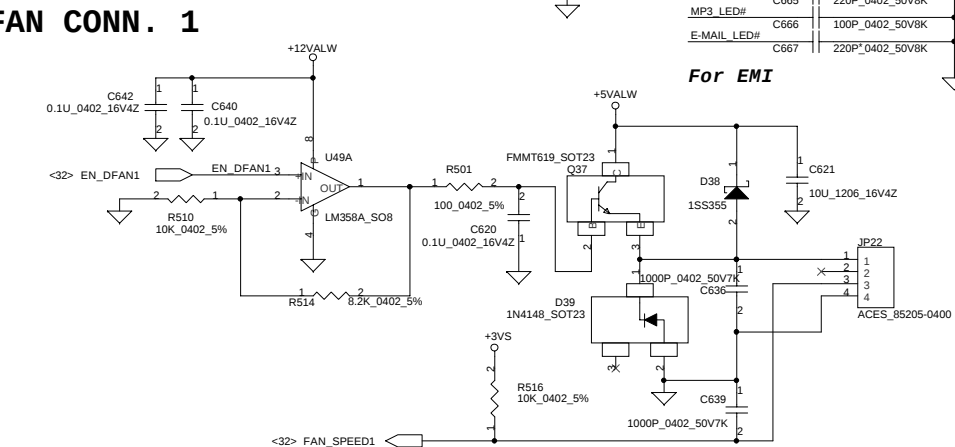
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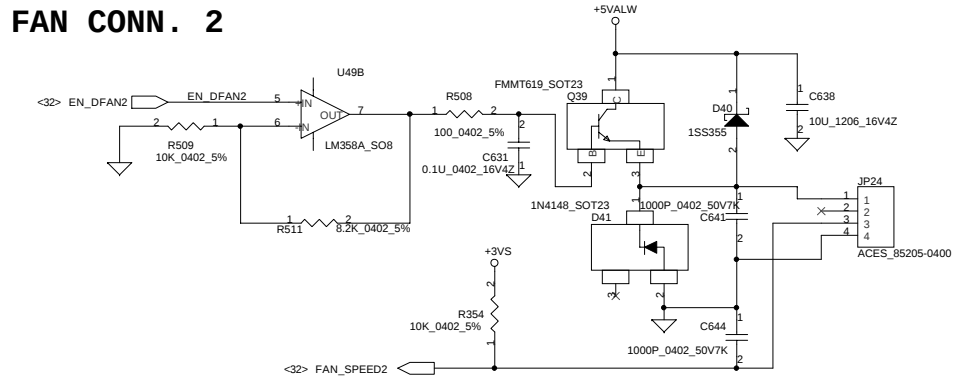
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Size	401264	1B
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Date	星期三, 九月 24, 2003	Sheet 34 of 49

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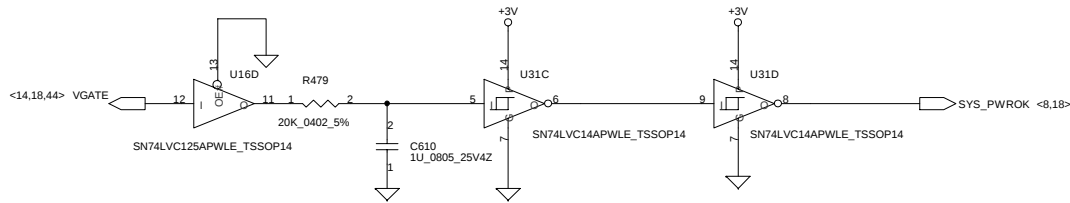
FAN CONN. 1



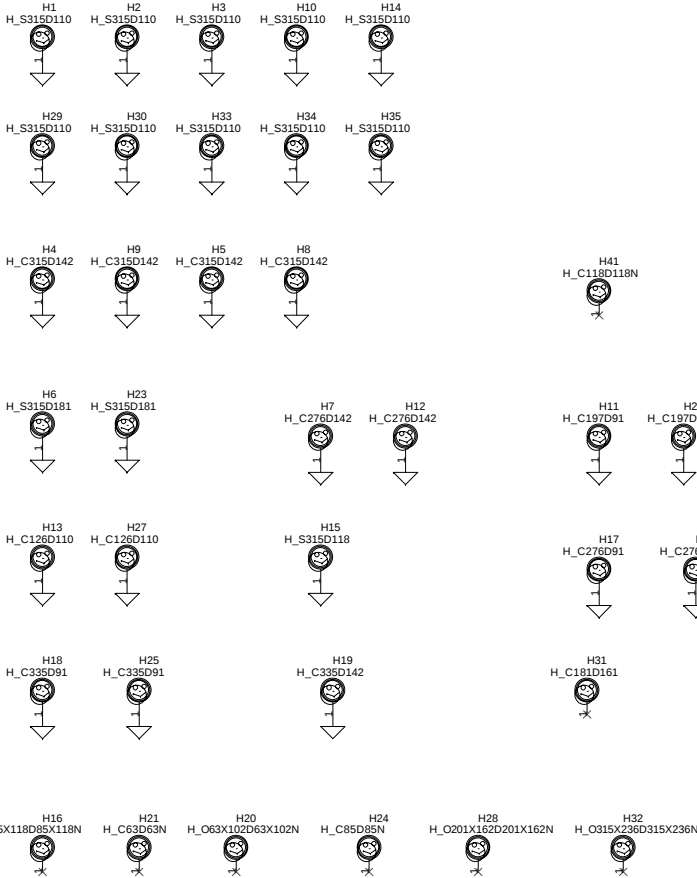
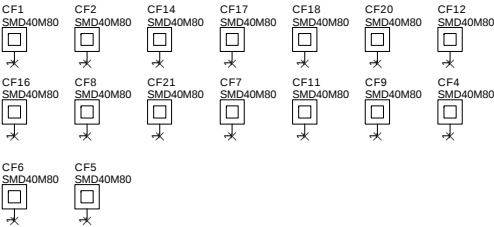
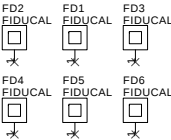
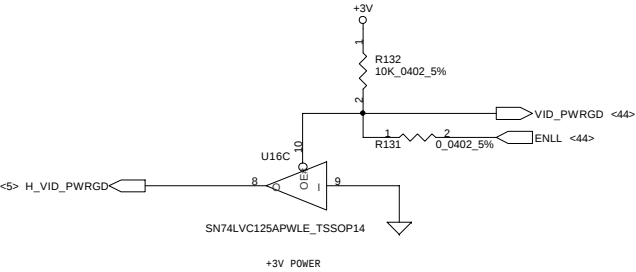
FAN CONN. 2



Power Good Circuit

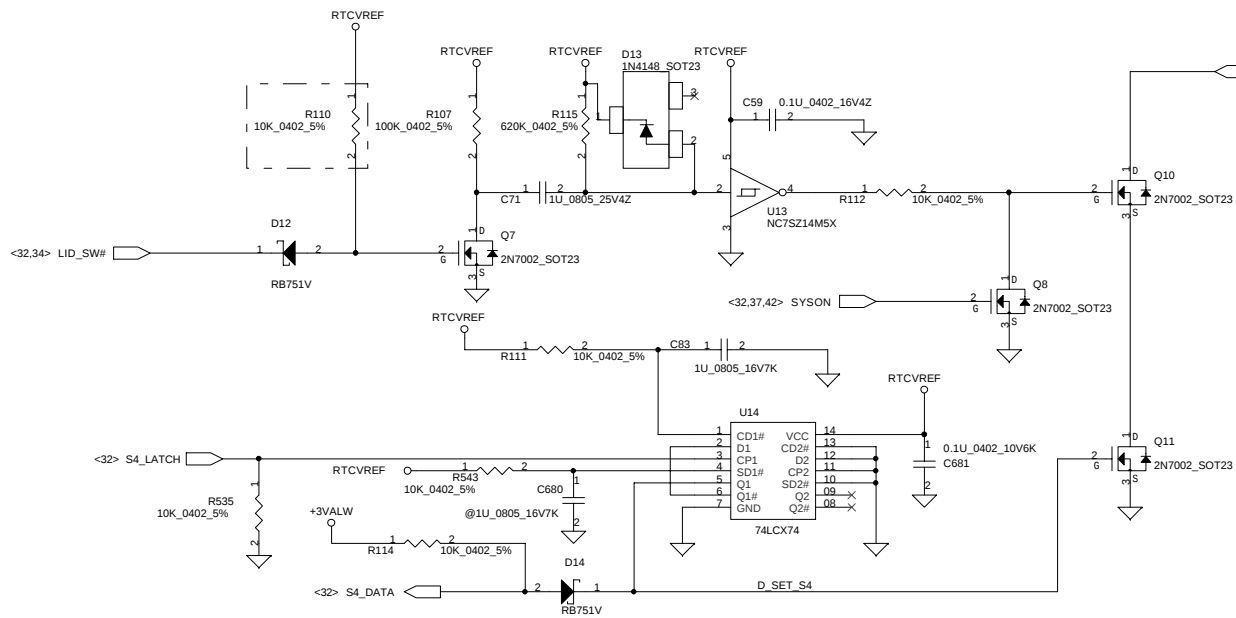


VID_PWRGD



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Size	Document Number	Rev	
Customer	401264	1B	
Date	星期三, 九月 24, 2003	Sheet	35 of 49

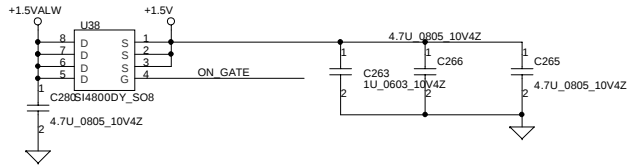
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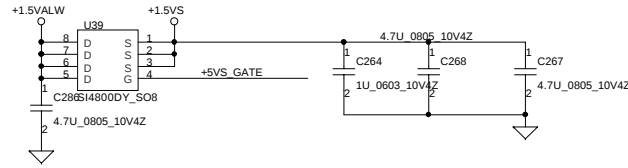
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SCHEMATIC, M/B LA-1931			
Title			
Size	Document Number	Rev	
Customer	401264	1B	
Date:	星期三, 九月 24, 2003	Sheet	36 of 49

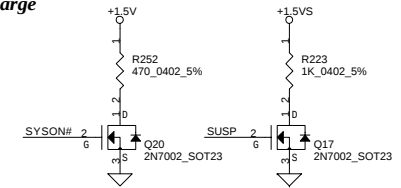
+1.5VALW To +1.5V Transfer



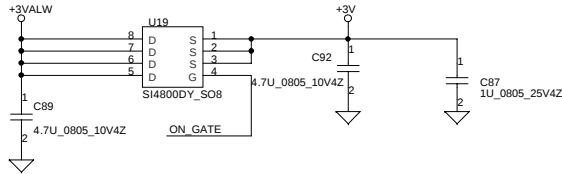
+1.5VALW To +1.5VS Transfer



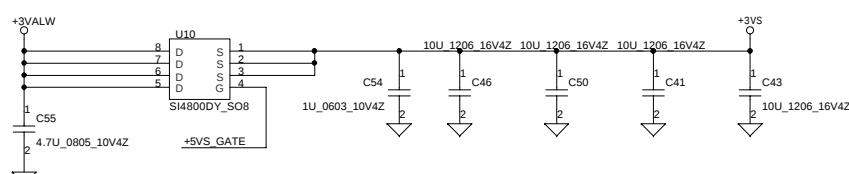
+1.5V & +1.5VS Discharge



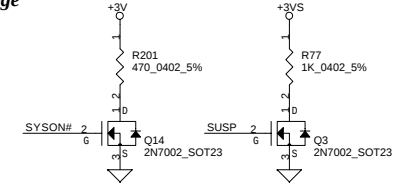
+3VALW To +3V Transfer



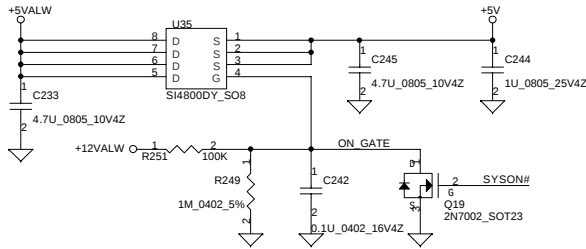
+3VALW To +3VS Transfer



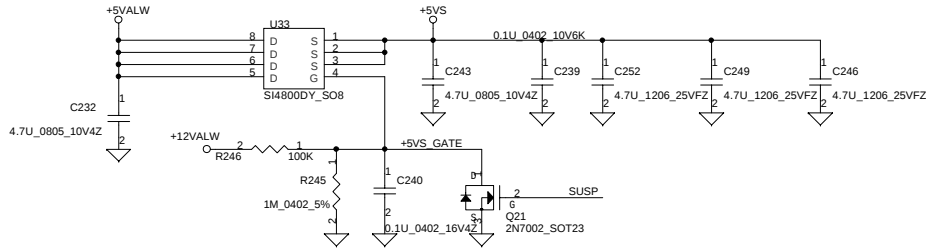
+3V & +3VS Discharge



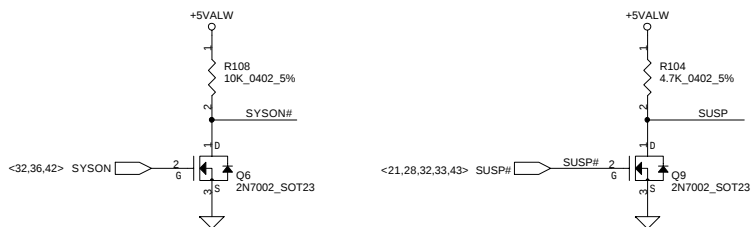
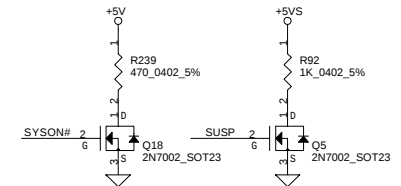
+5VALW To +5V Transfer



+5VALW To +5VS Transfer

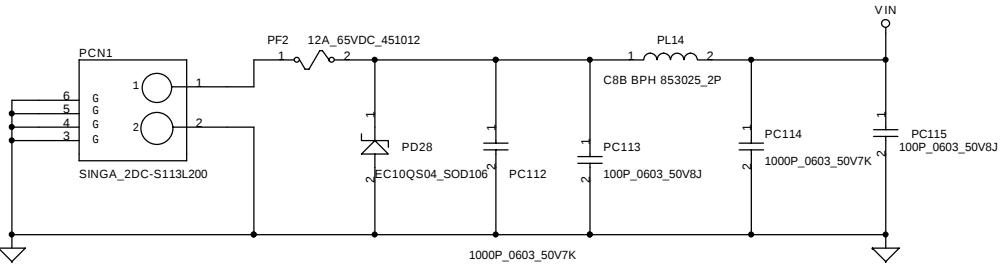


+5V & +5VS Discharge

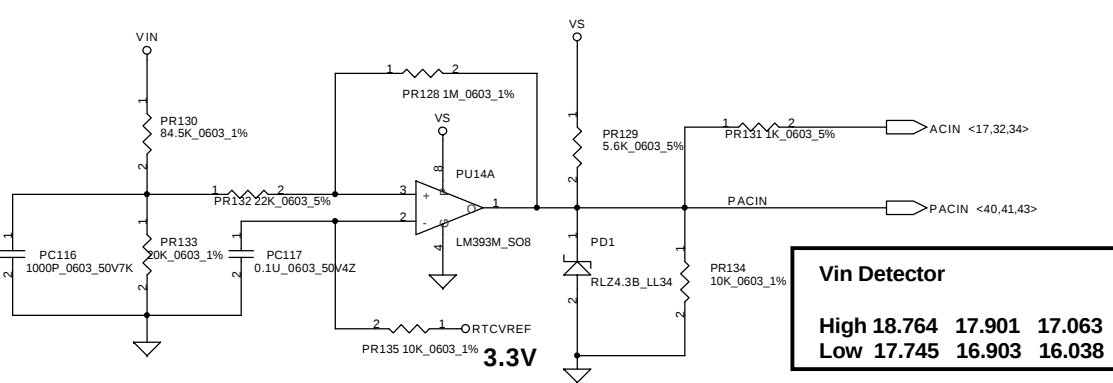


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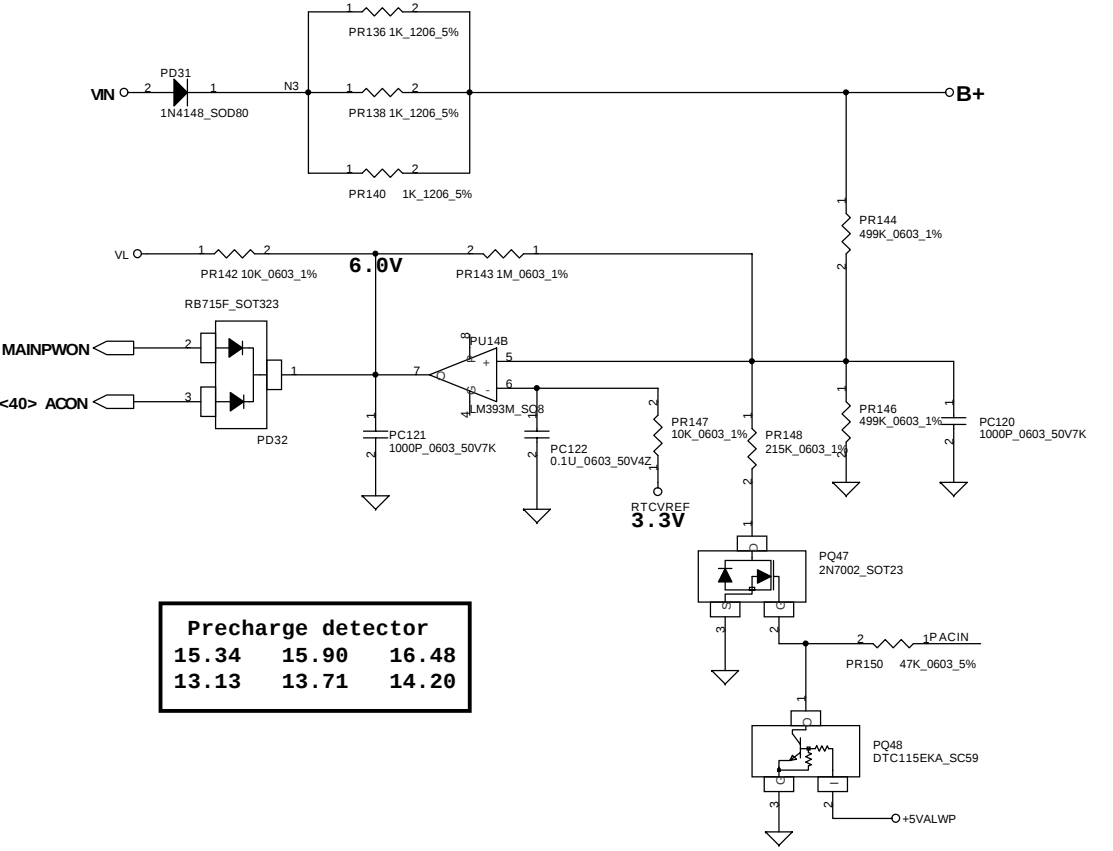
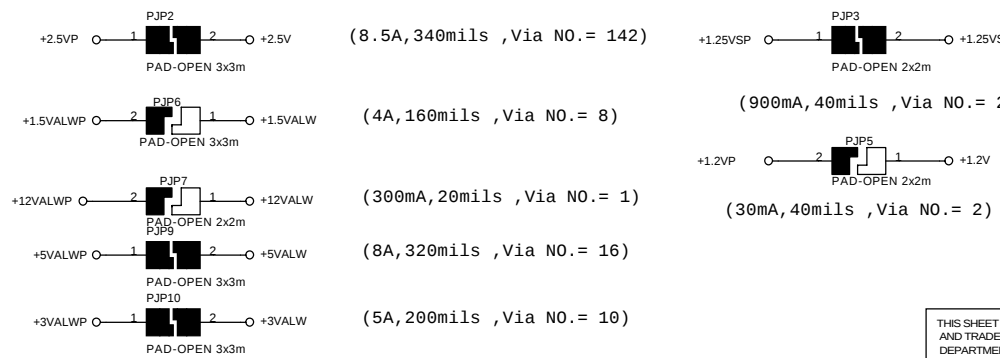
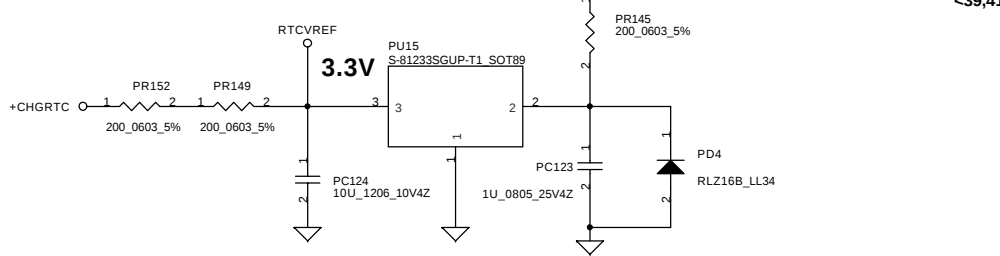
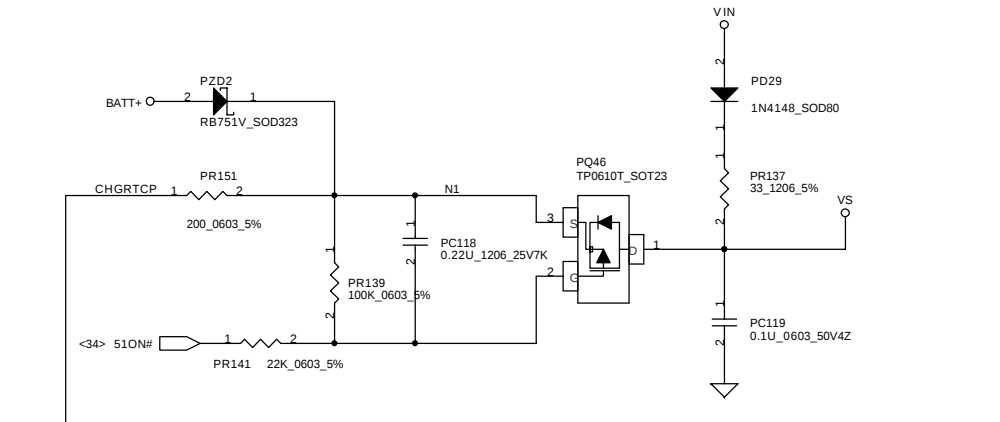
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SCHEMATIC, M/B LA-1931			
Title	Size	Document Number	Rev
	Custom	401264	1B
Date: 星期三, 九月 24, 2003	Sheet	37	of 49



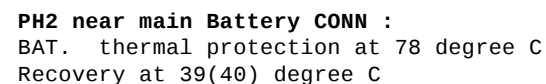
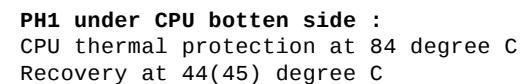
SINGA_2DC-S133L200	120W
SINGA_2DC-S726B201	90W

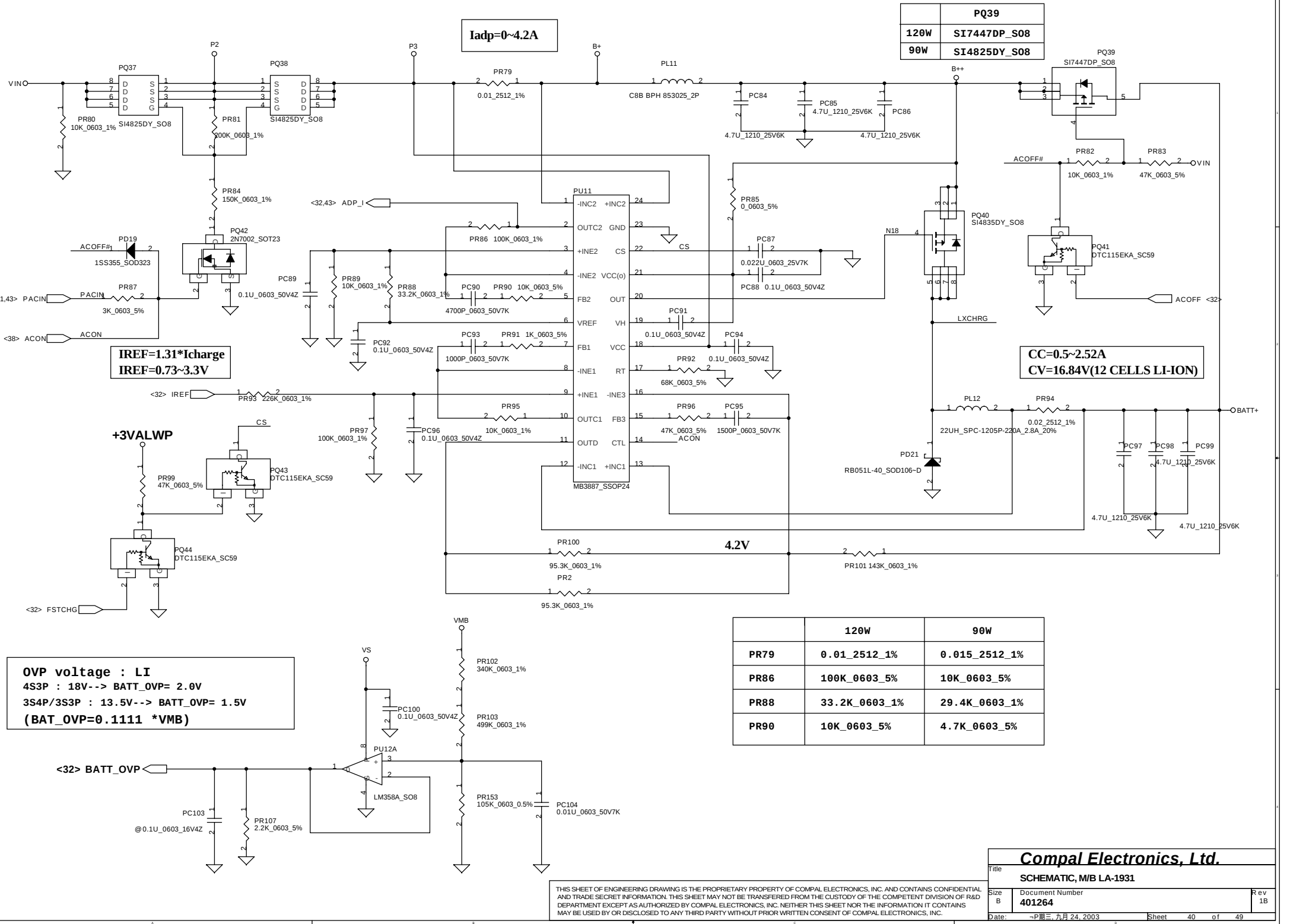


Vin Detector		
High	18.764	17.901
Low	17.745	16.903



Precharge detector		
15.34	15.90	16.48
13.13	13.71	14.20





	PQ39
120W	SI7447DP_S08
90W	SI4825DY_S08

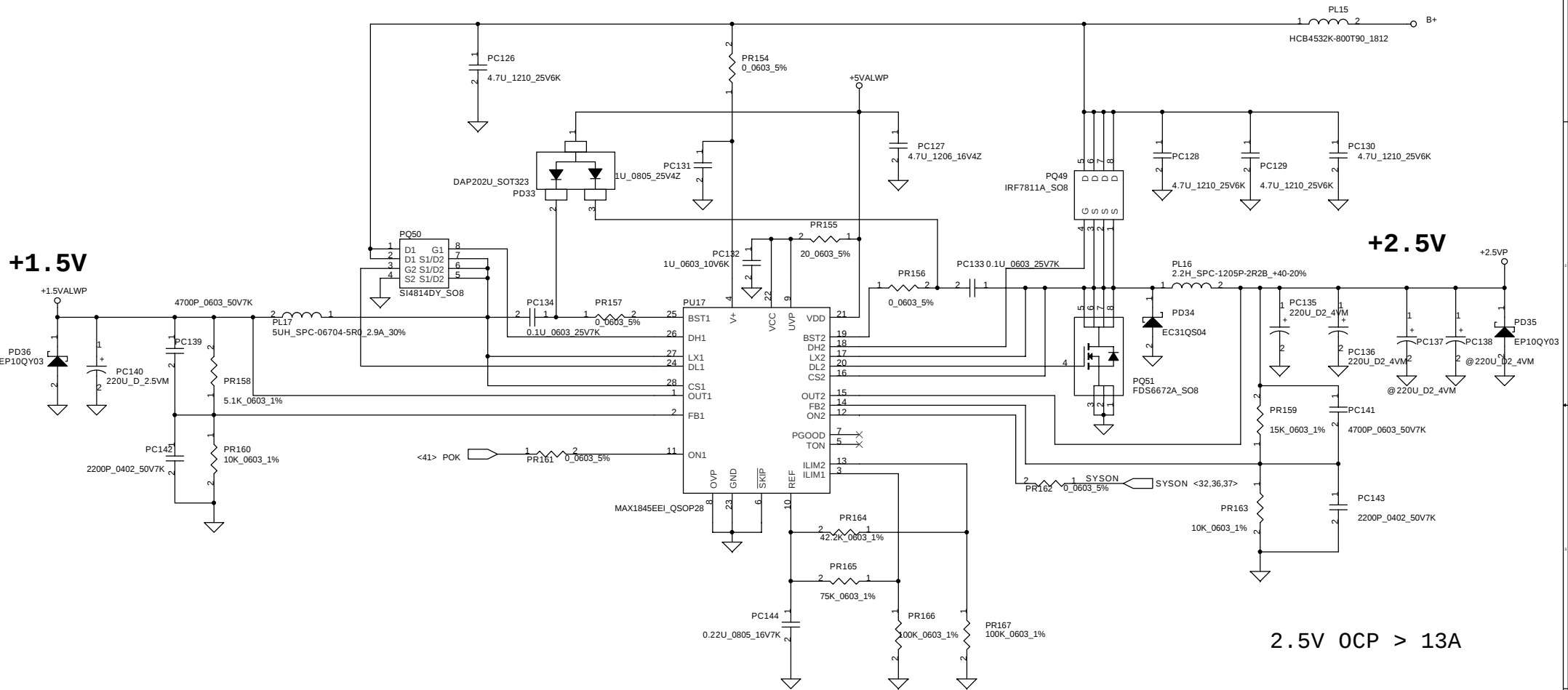
CC=0.5~2.52A
CV=16.84V(12 CELLS LI-ION)

	120W	90W
PR79	0.01_2512_1%	0.015_2512_1%
PR86	100K_0603_5%	10K_0603_5%
PR88	33.2K_0603_1%	29.4K_0603_1%
PR90	10K_0603_5%	4.7K_0603_5%

OVP voltage : LI
4S3P : 18V--> BATT_OVP= 2.0V
3S4P/3S3P : 13.5V--> BATT_OVP= 1.5V
(BATT_OVP=0.1111 *VMB)

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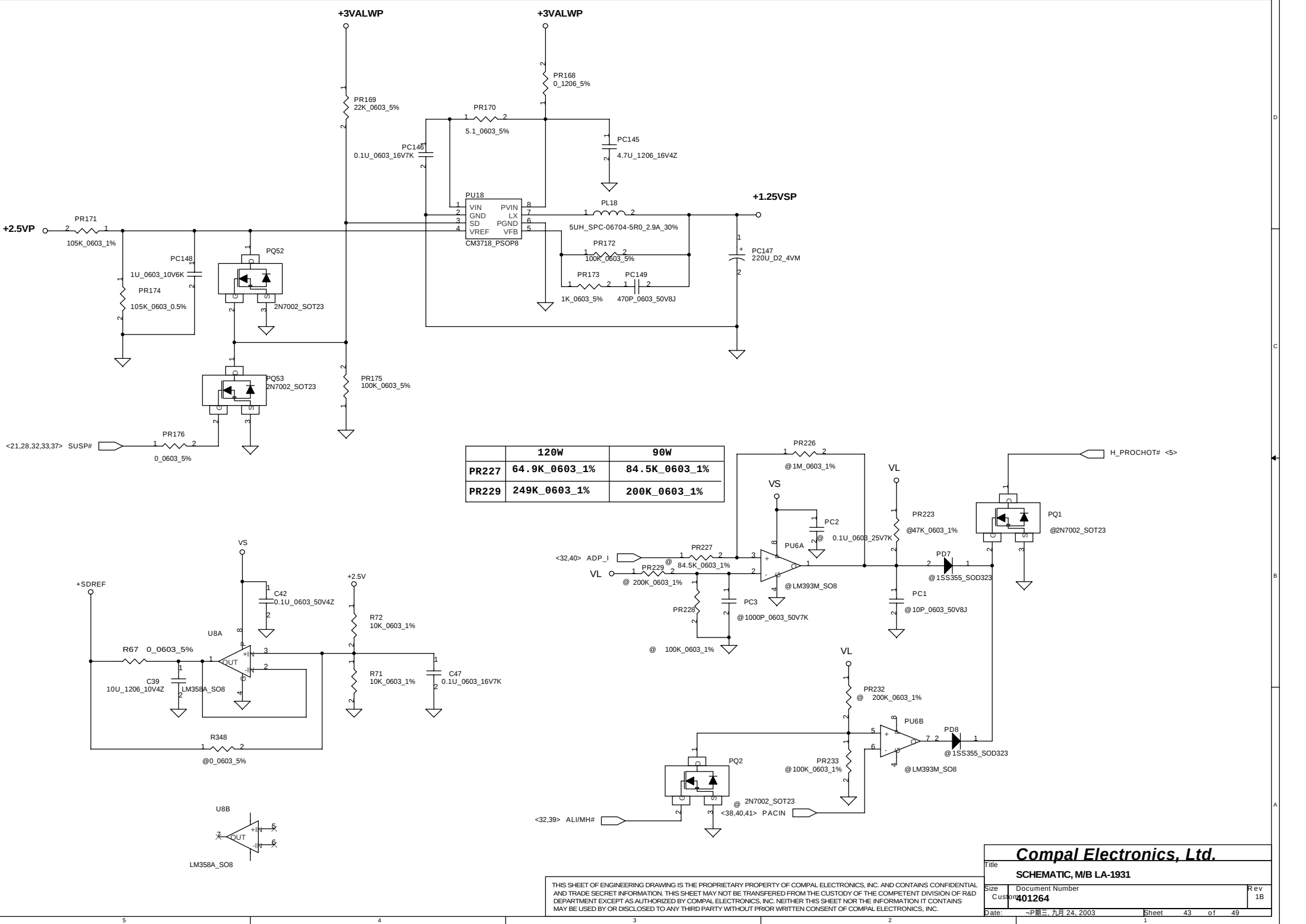
+2.5V/+1.5V



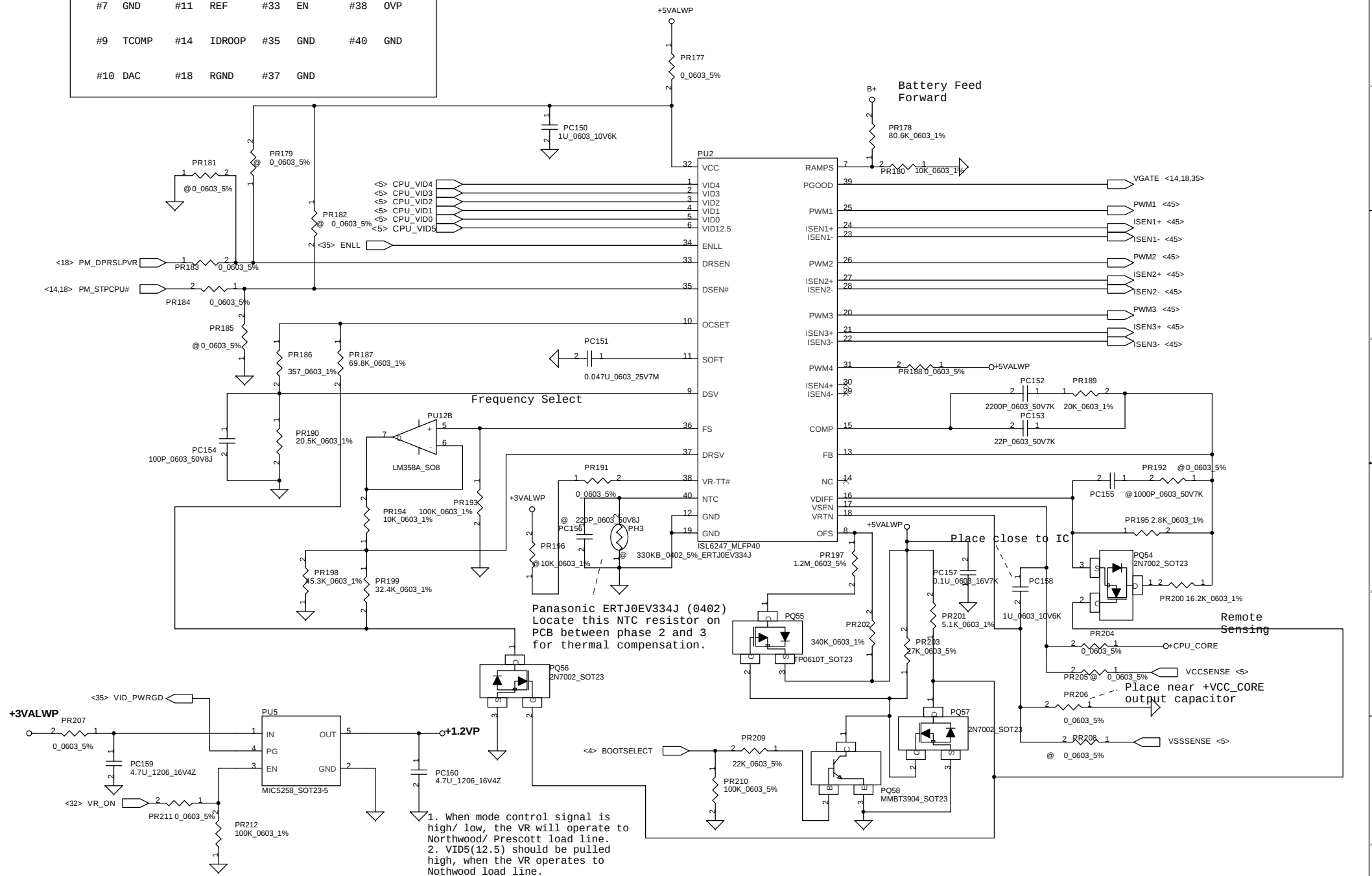
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Title		SCHEMATIC, M/B LA-1931	
Size	Custom	Document Number	Rev
401264			1B
Date:	~P 星期三, 九月 24, 2003	Sheet	42 of 49

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	120W	90W
PR227	64.9K_0603_1%	84.5K_0603_1%
PR229	249K_0603_1%	200K_0603_1%



BOOTSELECT=0 NORTHWOOD

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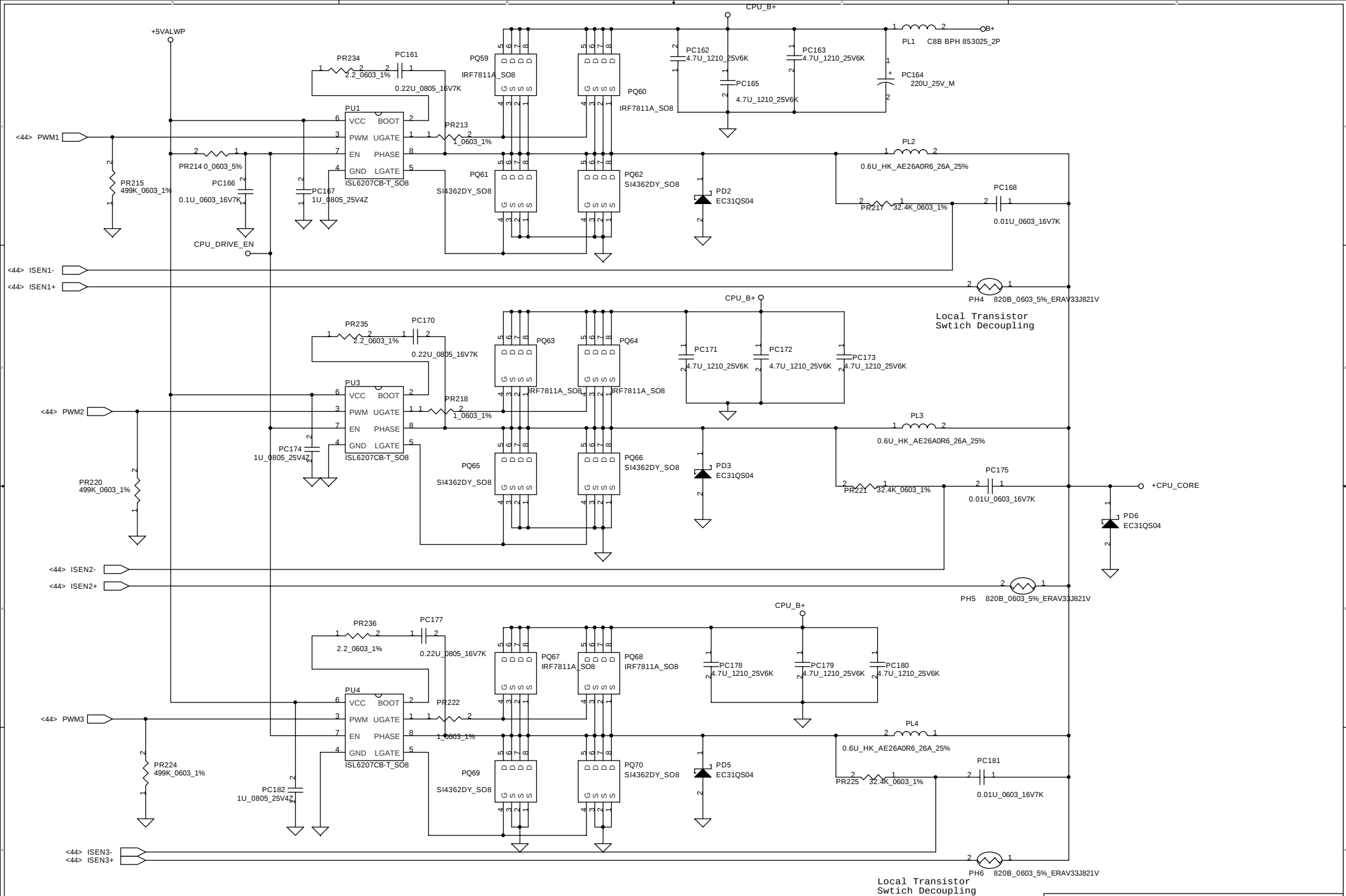
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Rev
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Date: 一P期三, 九月 24, 2003

Sheet 44 of 49



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Title			
SCHEMATIC, M/B LA-1931			
Size	Document Number	Rev	
Custom	401264	1B	
Date:	~P 星期三, 九月 24, 2003	Sheet	45 of 49

REV 0.1		
Date	Page	Description
04/10	21	Delete Power interface short line.
04/13	21, 22	Change Card Bus controller as one slote CB1410
	11, 12	Swap RAM data signals.
04/16	29	Add EQ circuit
	43	Add throutholing circuit.
	26, 31	Add FIR and Remove SW DJ cicuit
04/24	17	Add R569 and R570 for Layout Request. Move Signal IRQE#~H# from RP92 to RP91 and del RP92.
	14	CLK-GEN. pin 1(VDD_REF) and pin 46(VDD_CPU_0) change power plan as +3V_VDD. Suggestion from ICS
		C249 and C251 change power plane as +3VDD
04/25	45	PL4 swap pin1 and pin2.
	6	Change CPU Decoupling CAP. from 22U_1210_6.3V6M to 22U_1206_6.3V6M (H=1.6)
	32	1. EC GPIO signal HDD_LED# move from pin114 to pin119.
		2. Add signal PM_SLP_S1# on EC GPIO pin115.
	28	Q44 for +5VCD change part name as U55
04/28	8	Del R73, cause it duplicate pull high.
	27	Change C478 and C488 from 150U to 10U
	36	Change R480 from 560K to 620K Ohm
	4	Add R571 for BOOTSELECT
	5	Add R573 for OPTIMIZED/COMPAT#
	18	Add R572 for signal PM DPRSLPVR
04/29		Rename from Layout
04/30	33	R73 0402 -> 0603 and C52 0805 -> 0603
	16	C2, C5, C259, C3, C4, C6, C260, C261 and C262 Link CIS.
	5	Thermal Sensor : Del R62, R61 8.2K-->200Ohm and power +5VS -> +3VS, C27 value 0.1U -> 1U, Sensor power rout direction : +3VS -> R61 -> C27.1 -> U6.1
	17	Add Q40 and Q41, R517 and R518 for SMBus isolate solution.
05/01	8	Change CRT_HSYNC -> INTCRT_HSYNC and CRT_VSYNC -> INTCRT_VSYNC on MGCH terminal.
05/02	33	Remove dummy net on SUSP#.
	16	R28, C277, C278 and C279 modify P/N for CIS link
	17	C215 and C217 modify P/N for CIS link
	22	C145 modify P/N for CIS link
	20	Remove dummy net on XI
	14	R83 and R94 modify P/N for CIS link
05/03	32	CP4 pin2 add connected to GND
05/05	42	PR151 pin1 SYSON signal --> MAINPWON
	8	Swap U26.B6 (INTDDCDA) and U26.G9 (INTDDCCK) --> U26.B6 (INTDDCCK) and U26.G9 (INTDDCDA)
	9	+SDREF circuit move to page 44
	6	Modify Cap.s location same with Layout
	14	Change R129 net from PM_SLP_S3# to PM_SLP_S1#
	16	Add R519 and R520 for EC protect
05/06	20	EEDI_LAN --> EEDI_1394; EECK_LAN --> EECK_1394
	27	Remove R26. Delete USBEN# and U3.3, U3.4, U32.3 and U32.4 connect to GND.
		Delete R30, R279, R258 and R257.
		Change C273, C284 and C646 220U -->150U.
	42	PR151 pin1 SYSON signal --> POK; PU10 pin 11 output POK.
	5	R324 size 0603 -> 0805
	32	U24.175 ATF_INT# --> EC_THERM#
05/07	28	Add L42 between GND and AGND by EMI request.
	17	R408, remove @ for Intel comment.
	5	R56 60.4_0603_1% --> 51.1_0603_1%; R59 102_0603_1% -> 86.6_0603_1%
05/08	35	H19 GNDA -> GND; H31 GND -> GNDA
	37	C242 0.01U -> 0.1U.
	11	JP21 DDR-SO-DIMM link with CIS.
	29	De-pop EQ components, add @ symbol on components.

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Title		
SCHEMATIC, MB LA-1931		
Size	Document Number	Rev
Custom	401264	1B
Date:	星期三, 九月 24, 2003	Sheet 46 of 49

REV 0.2

Date	Page	Description
05/12	35	Change H31 GND --> AGND and H19 AGND --> GND
	37	R104 and R108 power plane changed, +3VALW --> +5VALW
05/29	40	Change PR100 47.5K-->95.3K
		PR100 47.5K-->95.3K;PQ37,PQ38,PQ39 SI4835DY-->SI4825DY
		PR79 0.015-->0.01; PR86 10K-->100K ;PR90 4.7K-->10K; PR88 29.4K-->33.2K
		Add PR2 95.3K
	38	Change PCN1 90W-->120W
	20	U29 Pin 37 pull up with 4.7K Ohm --> U29 Pin 43
		change X4 footprint same as X2
	16	Add Protect circuit for EC (Add D42, D43 ,D44 and R521)
	32	PWR_SUSP_LED# --> PWR_SUSP_LED
	34	Add reverse circuit for PWR_SUSP_LED (Add Q43 and R522).
	23	change Y2 footprint same as X2
	36	change J1 ~ J6 footprint from JUMP_2MM to 2MM
05/30	35	Add H41 and change H13 H27 size.
06/02	38	Change PL14 value
	39	Change PL13 value
	45	Change PL1 value
	40	Change PQ39 and PL11 value
	11	Add R523, R524, R525 and R526, Del R515
	12	Add R527, R528, R529 and R530
06/03	6	Delete C281, C287, C300, C309, C317, C324, C327 and C330.
06/05	34	Add C648 and C649 for EMI request
	32	Add R531 and R532 for EC floating issue
	8	Add R533 for DVO device detect

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Title		
SCHEMATIC, M/B LA-1931		
Size	Document Number	Rev
Cust	401264	1B
Date:	星期三, 九月 24, 2003	Sheet 47 of 49

REV 0.3

Date	Page	Description
06/12	25	Swap IRQG#_MINI2 and IRQH#_MINI
06/30	30	Change sound resource, cause Headphone without EQ.
07/01	40	Modify PQ38 direction
	28	Add regulator : Add Q44, Q45, Q46, D45 and R536 ~ R539.
		Change C95, C129, C385, C386, C399, C404, C441, C422, C438 and C445 size : 0603 -> 0402.
	29	Change R166, R357, R426, R435, R148, R173, R187, R347, R352, R432, R181 and R346 size : 0603 -> 0402.
	30	Change amplifier from TPA6011A4 to TPA0232.
		Add R534, C651 and C650
		Delete R202, R199, R434 and R442.
		Change C563 1U to 0.47U
		Change VR type from A-Curve to C-Curve.
		Change C184, C212, C213, C219 size 0603 -> 0402.
	14	R129 change net from PM_SLP_S1# to PM_SLP_S3#
		Q13 : 2SC2411K --> 2N7002
		R445 : 10K --> 0 Ohm
	10	Change C491 size : 1210 -> 1206; Change C465 and C468 size : 1210 --> D type
	35	Change SYS_PWROK control signal
	25	SWAP PIRQG#_MINI and PIRQH#_MINI_2
07/09	14	U21 and R128 add '@', and R129 remove '@' CLK_PWD#.
	26	U36, U37, C253 and C254 --> @; Add R541 and 542 --> 0 Ohm
	28	Change Q44 --> U59; Add decoupling CAPs., C668 ~ C679.
	35	Change H13 and H27 size
	30	Change ESD diode type near speaker connector. Change D35 and D33 type, Del D34 and D32.
07/10	36	Change S4 resume function power plane +RTC_VCC -> RTCVREF
		Add R543, C680 and C681
	32	Add C682, reserve for PC97551.
07/16	5	R270 R271 R272 R267 R266 R16 R220 1K_0402_5% --> 10K_0402_5%
	32, 8	Delete R412 R399 R369 R390 R485 R306
	16	R304, R314, R317, R310, C318 1_0603_5% -> 1_0402_5%
	18	R422 1_0603_5% -> 1_0402_5%
07/16	5	Add D46 and D47 for EMI solution
	17	Add D48 for EMI solution
	19	Add D49 for EMI solution
	10	C491 C_1210 -> C_1206
	30	MONO_IN GNDA --> GND
07/18	28	Delete L36, L19, L10 and L42
07/21	30	D33, D34 GND --> GNDA
07/22	35	H31 GNDA --> Non-PDH hole.
	29	EQ-1 and EQ-2 GNDA --> GNDA-EQ
		Add R544 for GNDA <-> GNDA-EQ
		Add L44 L45 for EMI request GND <-> GNDA-EQ
	28	Add L36, L19, L10 and L42 for EMI request GNDA <-> GND

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Title		SCHEMATIC, M/B LA-1931	
Size	Document Number		Rev
Cust	401264		1B
Date:	星期三, 九月 24, 2003	Sheet	48 of 49

REV 1.0

Date	Page	Description
08/04	28	Reserve C683, C684 and C685 for Audio noise issue R370 --> @ C467 and C458 change as 0.1U for Audio noise issue
08/18	44	PC151 0.033U -->0.047U; PC152 1000P --> 2200P; Add PC153 22P
09/19	44	PR195 2.26K --> 2.8K
09/22	45	PR217 PR221 PR225 48.4K -->32.4K

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Title		
SCHEMATIC, M/B LA-1931		
Size	Document Number	Rev
Custom	401264	1B
Date:	星期三, 九月 24, 2003	Sheet 49 of 49