

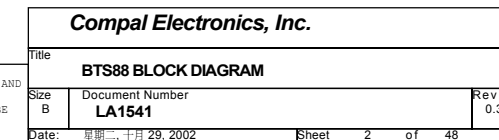
BTS88 LA-1541 REV0.3 Schematics Document

**Intel Pentium 4 Processor in the 478-pin Package
with 845PE / ICH4 / NVIDIA SQ17 chipset**

2002-10-26-A For B2-Test

Compal Electronics, Ltd.			
Title			
BTS88 Cover Sheet			
Size B	Document Number LA1541		Rev 0.3
Date:	星期二, 十月 29, 2002	Sheet 1 of 48	

REV:0.3



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Voltage Rails

Power Plane	Description	S1	S3	S5
VIN	Adapter power supply (19V)	N/A	N/A	N/A
B+	AC or battery power rail for power circuit.	N/A	N/A	N/A
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF
+1.2VP	1.2V switched power rail for CPU AGTL Bus	ON	OFF	OFF
+1.25VS	1.25V switched power rail	ON	OFF	OFF
+1.5VS	AGP 4X	ON	OFF	OFF
+1.5VALW	1.5V always on power rail	ON	ON	ON*
+2.5V	2.5V power rail	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*
+5V	5V power rail	ON	ON	OFF
+5VS	5V switched power rail	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
VGA			PIRQA
CardBus	AD20	2	PIRQA/PIRQB
LAN	AD17	3	PIRQB
Mini-PCI	AD18	1/4	PIRQC/PIRQD
1394	AD16	0	PIRQA

EC SM Bus1 address

Device	Address	Device	Address
Smart Battery	0001 011X b	MAX1617MEE	1001 110X b
EEPROM(24C16/02)	1010 000X b	OZ168	0011 0100 b
(24C04)	1011 000Xb	Smart Battery	0001 011X b
		Docking	0011 011X b
		DOT Board	XXXX XXXXb

ICH4 SM Bus address

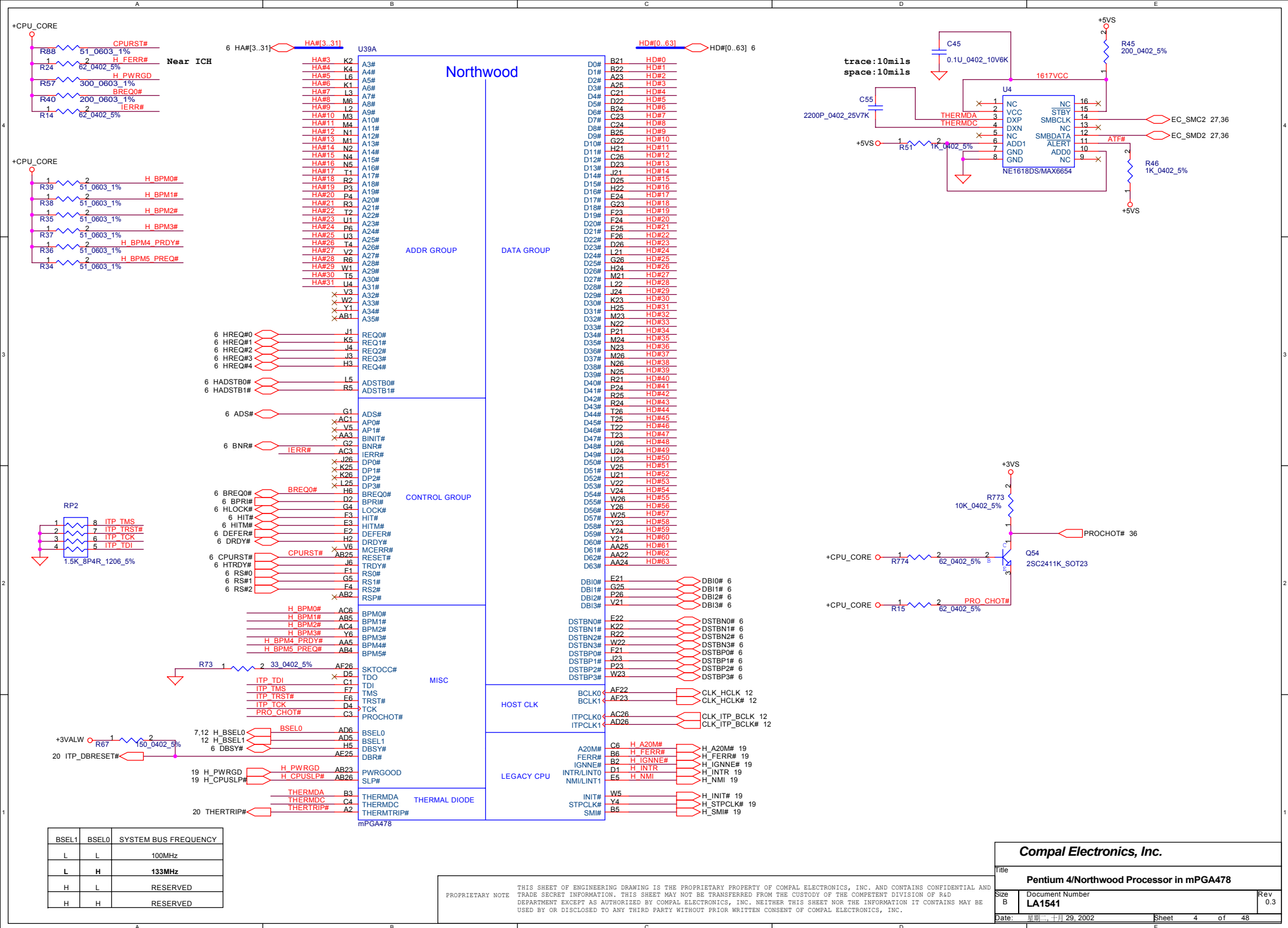
Device	Address
Clock Generator (ICS950810)	1101 001Xb
DDR DIMM0	1001 000Xb
DDR DIMM1	1001 001Xb

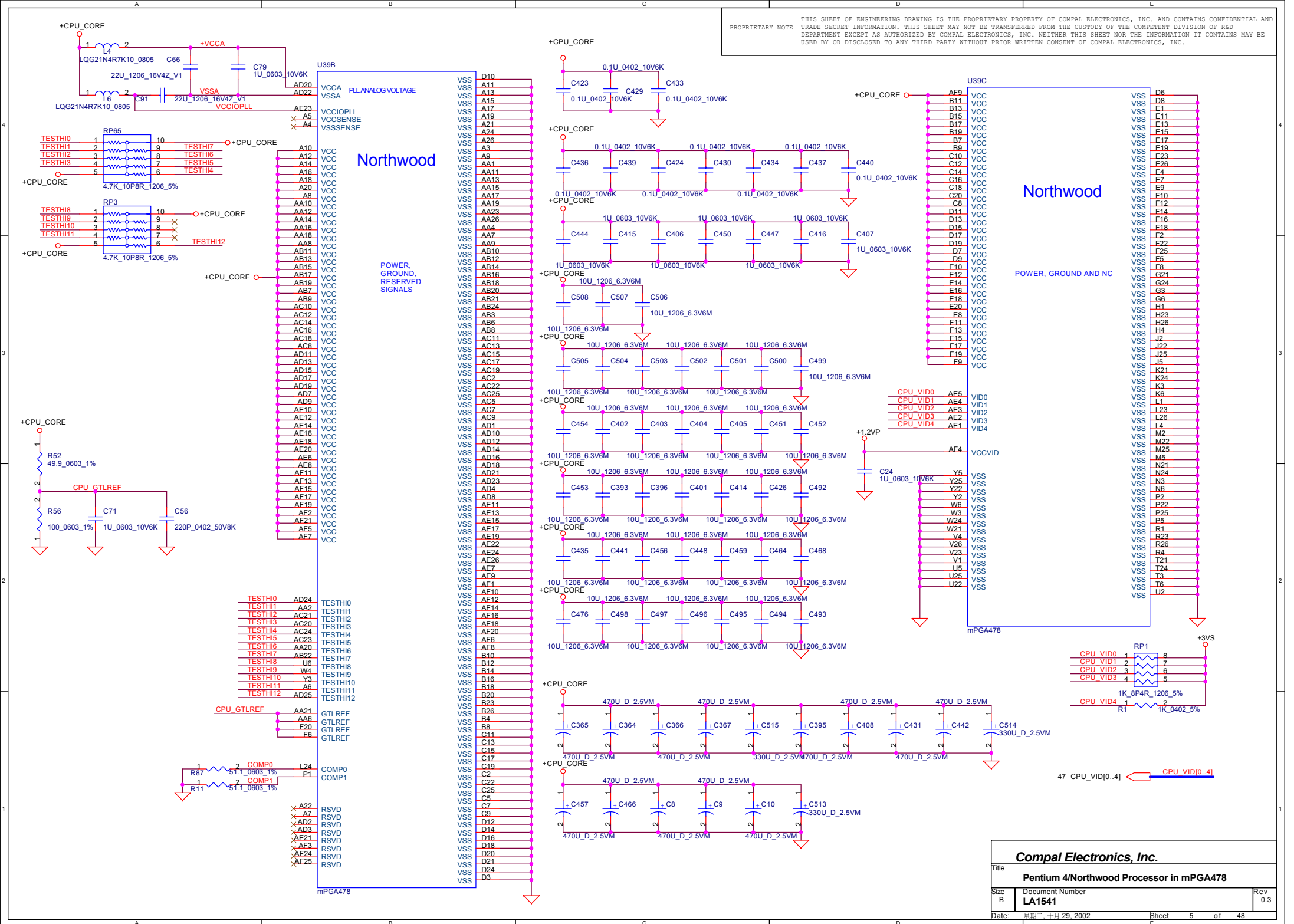
STATE	SIGNAL	SLP_S1#	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON		HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S1 (Power On Suspend)		LOW	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)		LOW	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)		LOW	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)		LOW	LOW	LOW	LOW	ON	OFF	OFF	OFF

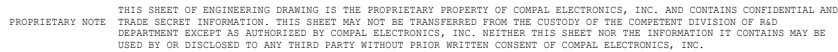
Board ID Table for AD channel

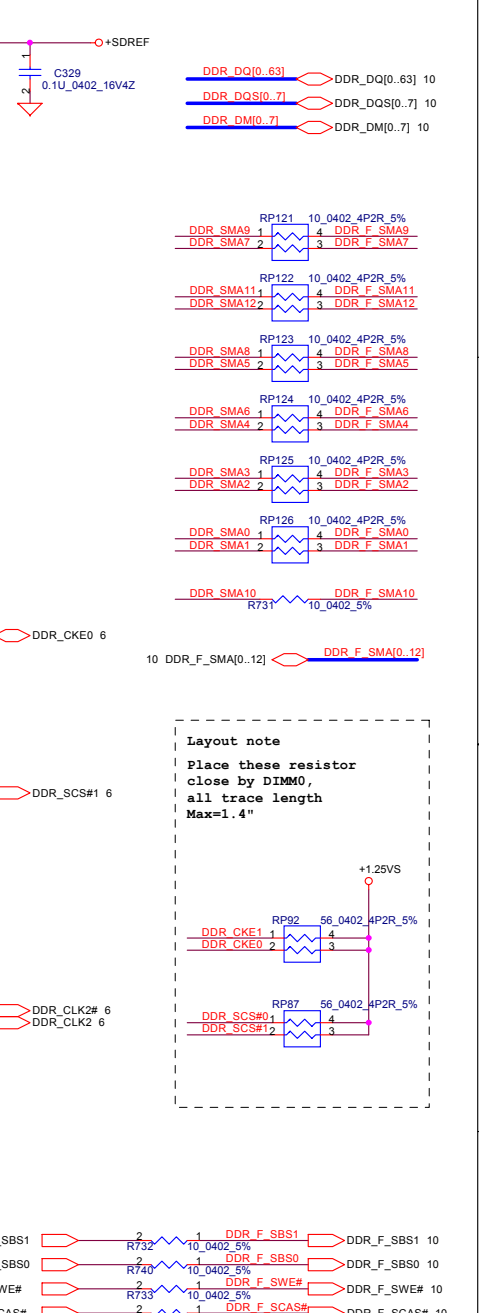
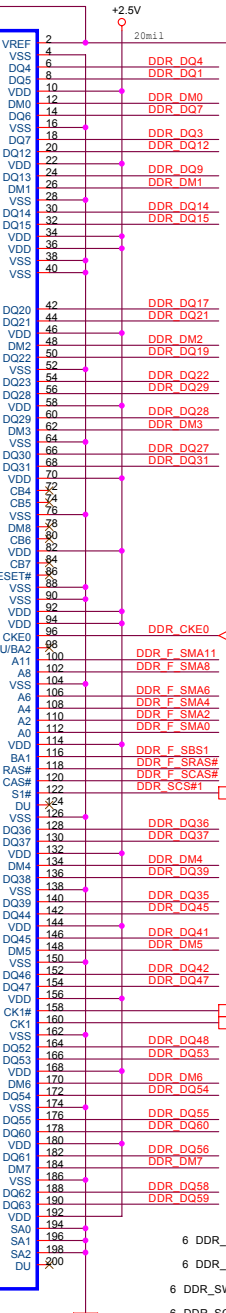
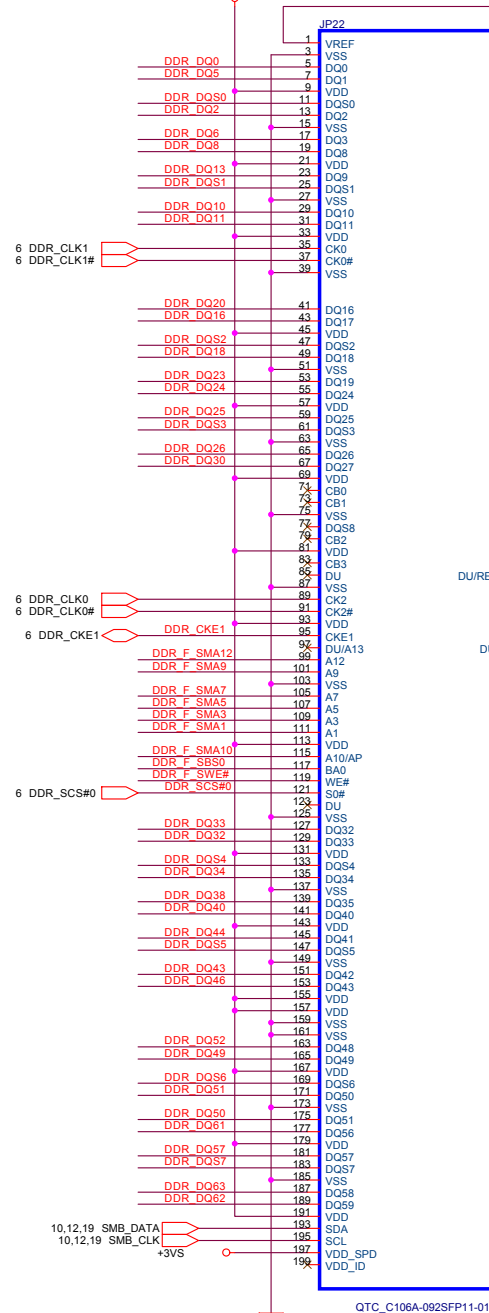
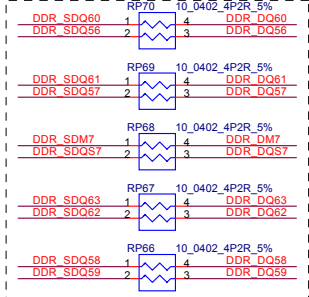
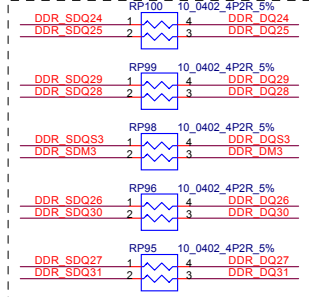
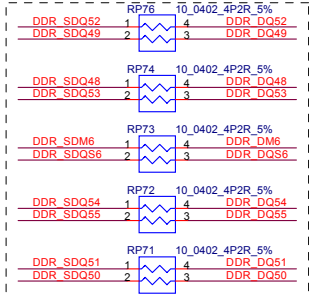
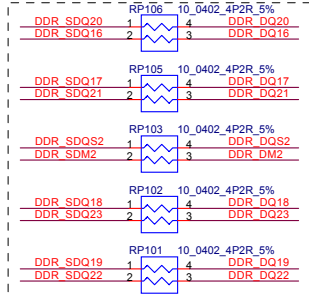
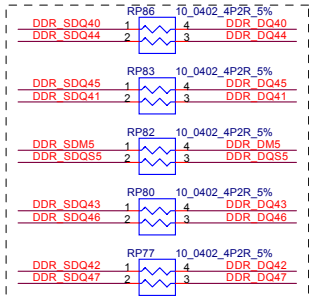
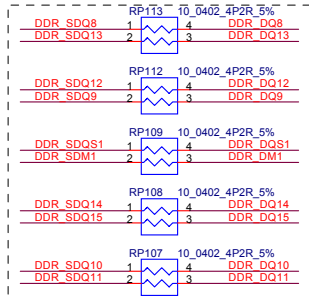
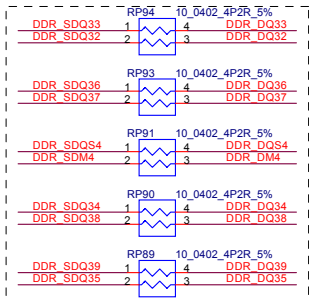
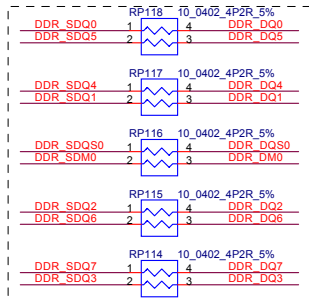
Vcc	3.3V +/- 5%			
Ra	100K +/- 5%			
Board ID	Rb	VAD_BID min	VAD_BID typ	VAD_BID max
0	0	0 V	0 V	0 V
1	8.2K +/- 5%	0.216 V	0.250 V	0.289 V
2	18K +/- 5%	0.436 V	0.503 V	0.538 V
3	33K +/- 5%	0.712 V	0.819 V	0.875 V
4	56K +/- 5%	1.036 V	1.185 V	1.264 V
5	100K +/- 5%	1.453 V	1.650 V	1.759 V
6	200K +/- 5%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

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







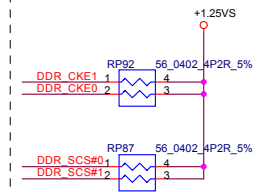


6 DDR_SDQ[0..63] < DDR_SDQ[0..63]
6 DDR_SDQS[0..7] < DDR_SDQS[0..7]
6 DDR_SMA[0..12] < DDR_SMA[0..12]
6 DDR_SDM[0..7] < DDR_SDM[0..7]

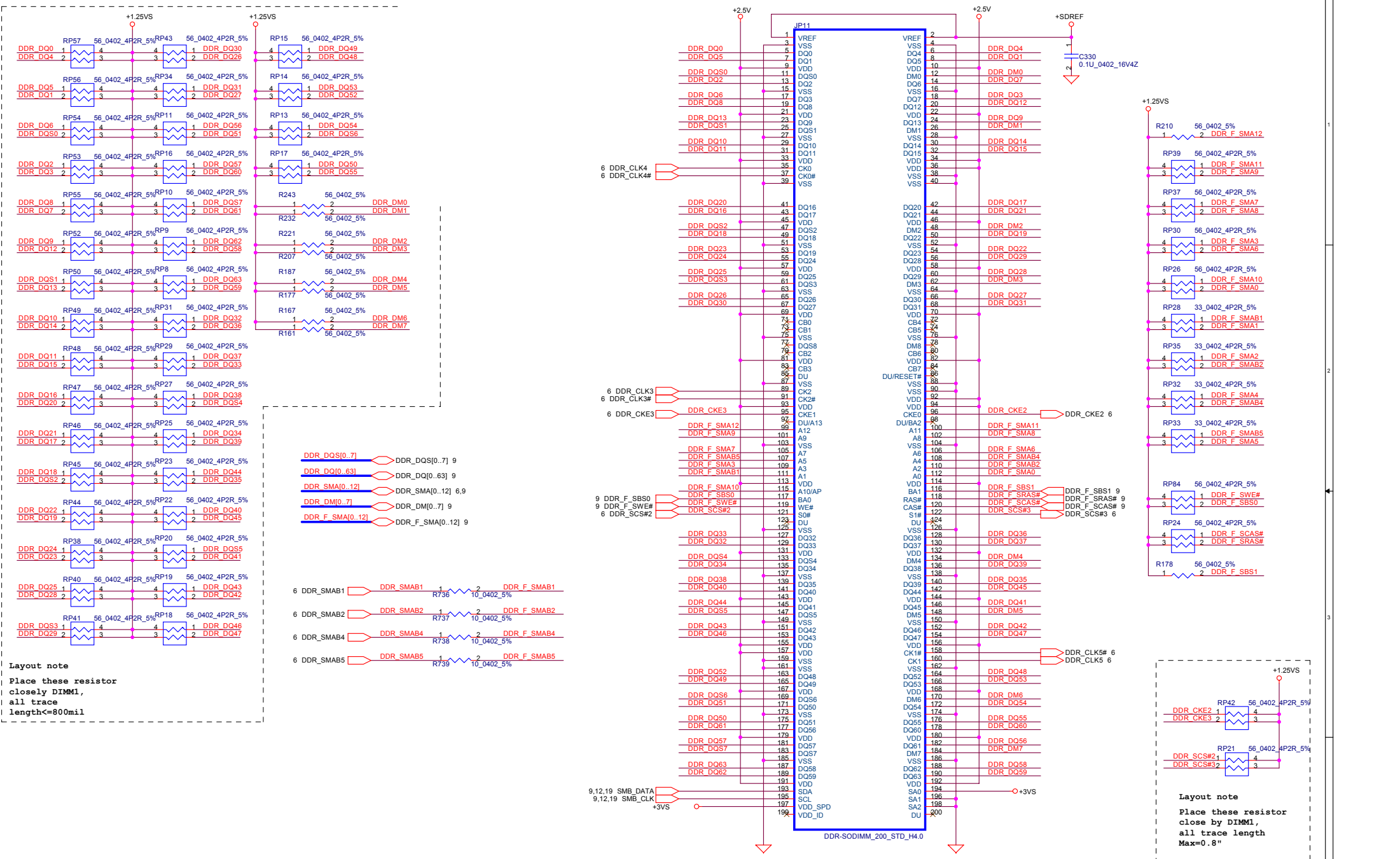
Layout note
Place these resistors
close to DIMM0,
all trace length<500 mil

Bottom-1
DIMM0

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

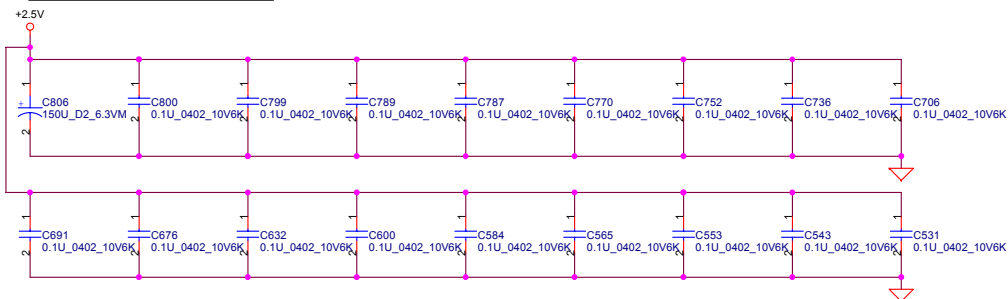


6 DDR_SBS1 < R732 10_0402 5% < DDR_F_SBS1 10
6 DDR_SBS0 < R740 10_0402 5% < DDR_F_SBS0 10
6 DDR_SWE# < R733 10_0402 5% < DDR_F_SWE# 10
6 DDR_SCAS# < R734 10_0402 5% < DDR_F_SCAS# 10
6 DDR_SRAS# < R735 10_0402 5% < DDR_F_SRAS# 10

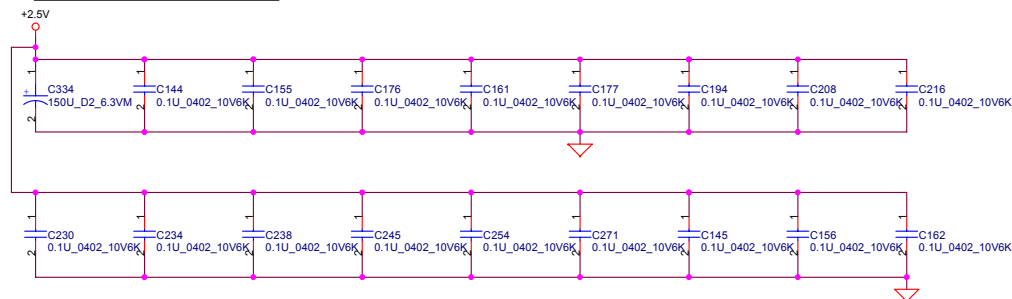


Bottom-2
DIMM1

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



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



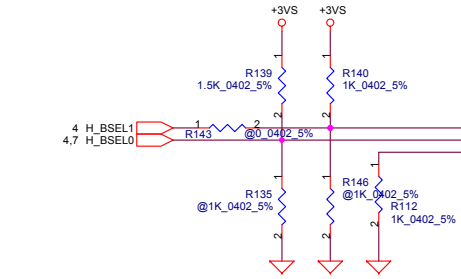
Layout note :
Place one cap close to every 2 pull up resistors termination to
+1.25VS



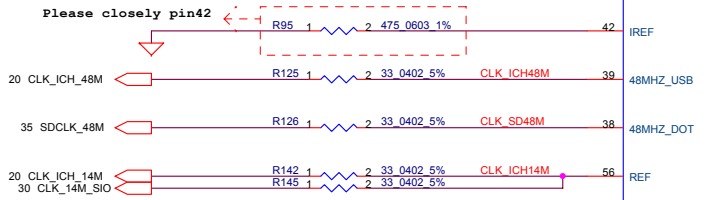
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Compal Electronics, Inc.		
Title		
DDR SODIMM Decoupling		
Size B	Document Number LA1541	Rev 0.3
Date: 星期二, 十月 29, 2002	Sheet 11	of 48

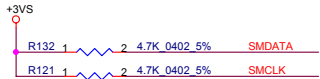
SEL2	SEL1	SEL0	Function
0	0	1	100Mhz Host CLK
0	1	0	200Mhz Host CLK
0	1	1	133Mhz Host CLK



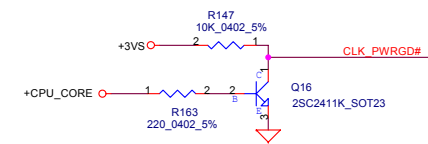
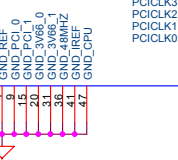
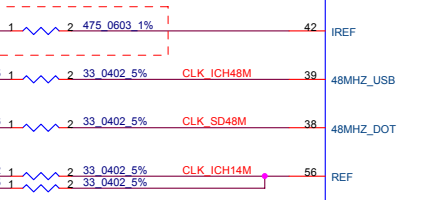
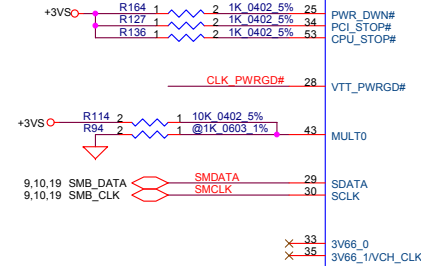
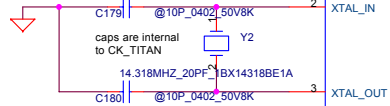
MULT0	Reference R, Iref= VDD/(3*Rr)	Output Current
0	Rr = 221 1%, Iref = 5.00mA	Ioh = 4 * Iref
1	Rr = 475 1%, Iref = 2.32mA	Ioh = 6 * Iref



Note:
CPU_CLK[2:0] needs to be running in C3, C4.



Place Crystal within 500 mils of CK_Titan



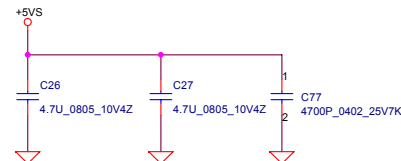
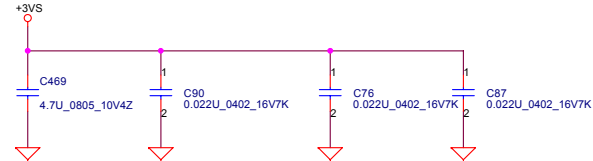
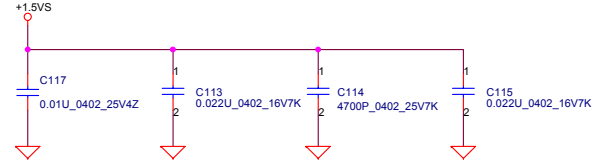
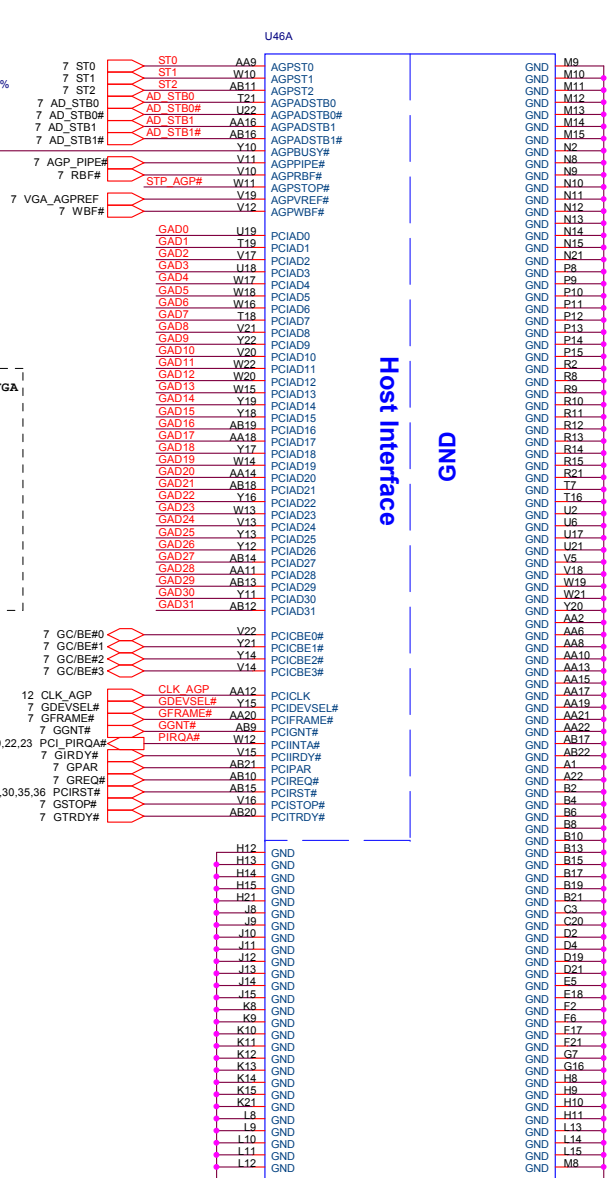
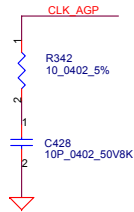
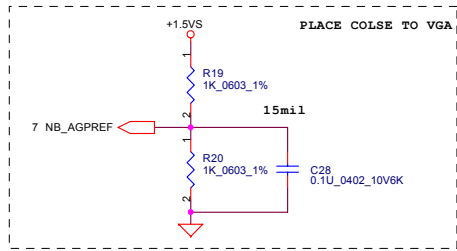
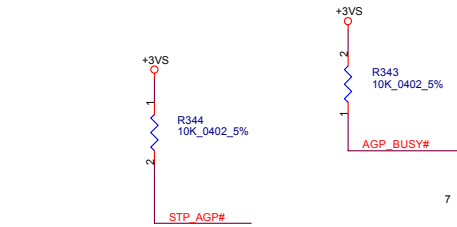
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Compal Electronics, Inc.

Clock Generator

Size	Document Number	Rev
B	LA1541	0.3
Date:	星期二, 十月 29, 2002	Sheet 12 of 48

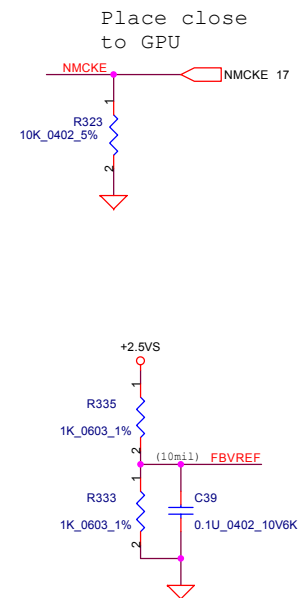
7 GAD[0..31]  GAD[0..31]

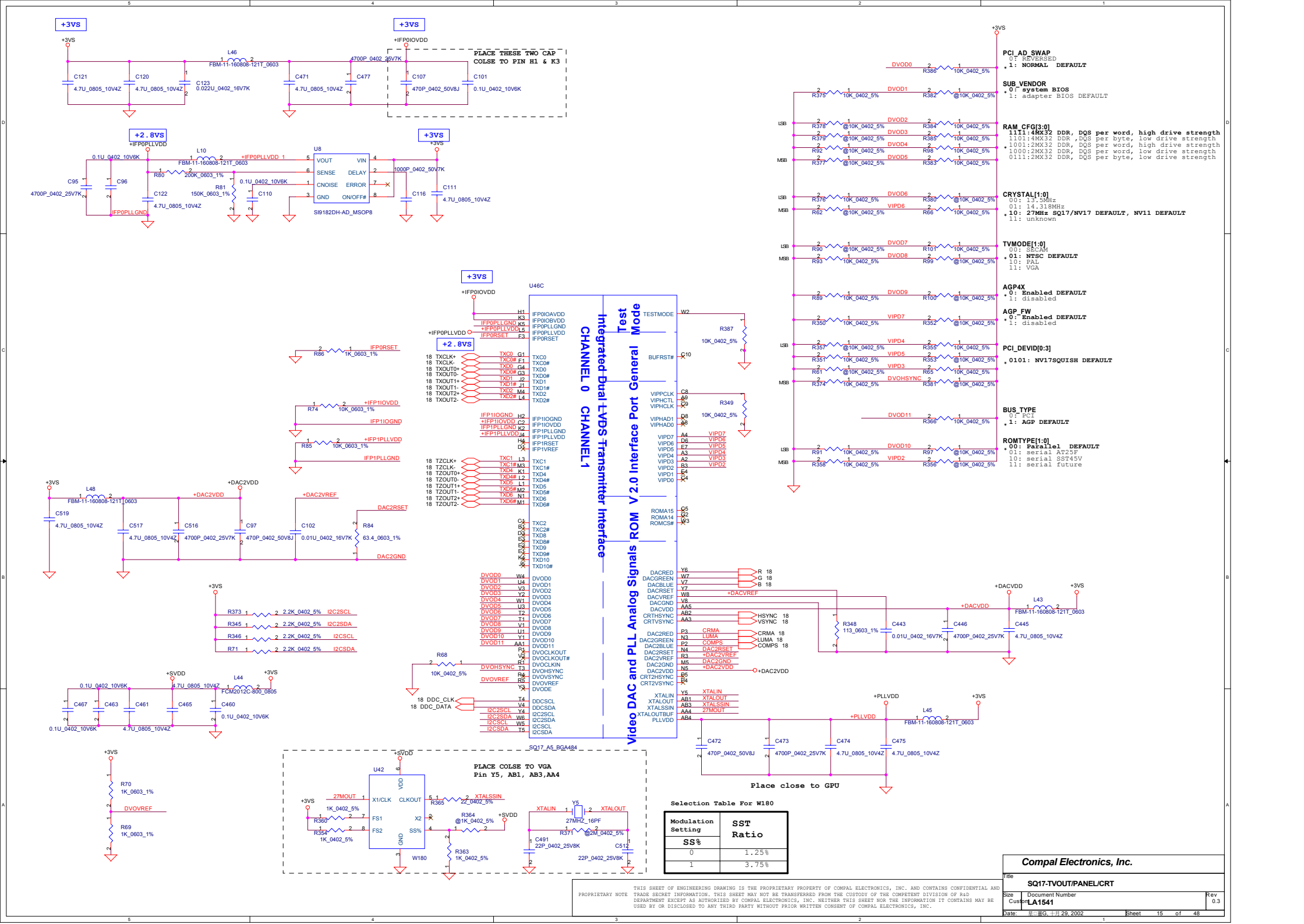


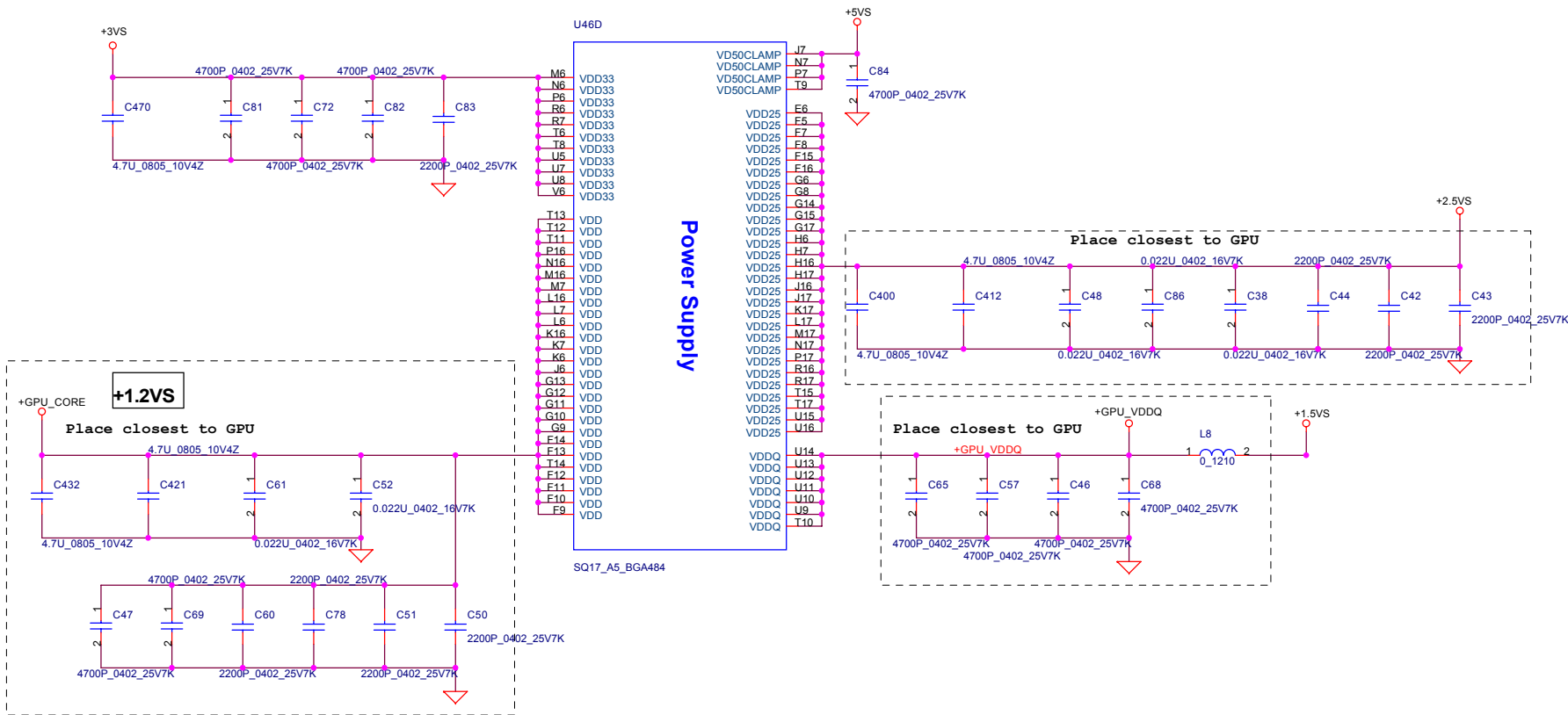
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Title			SQ17-AGP I/F
Size	Document Number	Rev	
Customer	LA1541	0.3	
Date:	星期二, 十月 29, 2002	Sheet	13 of 48







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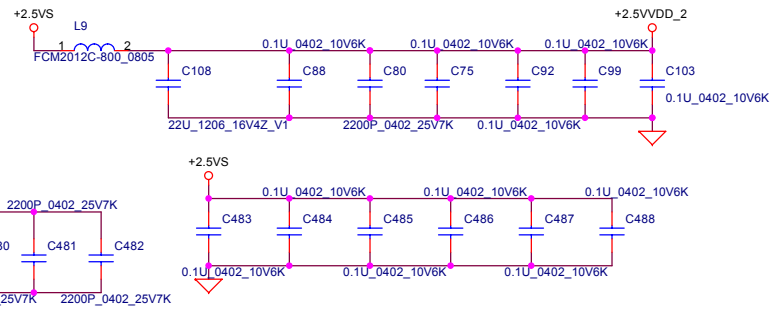
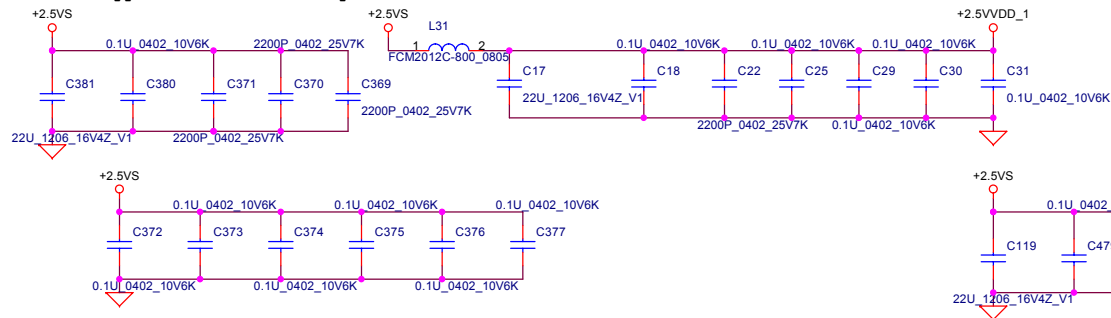
Title
SQ17-GPUPOWER

Size
Document Number
Custom LA1541 Rev
0.3

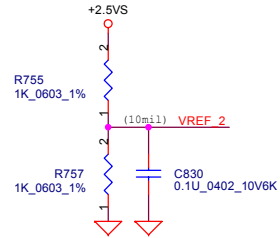
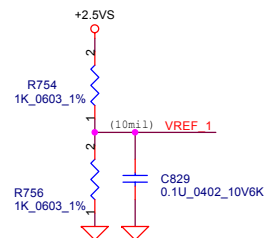
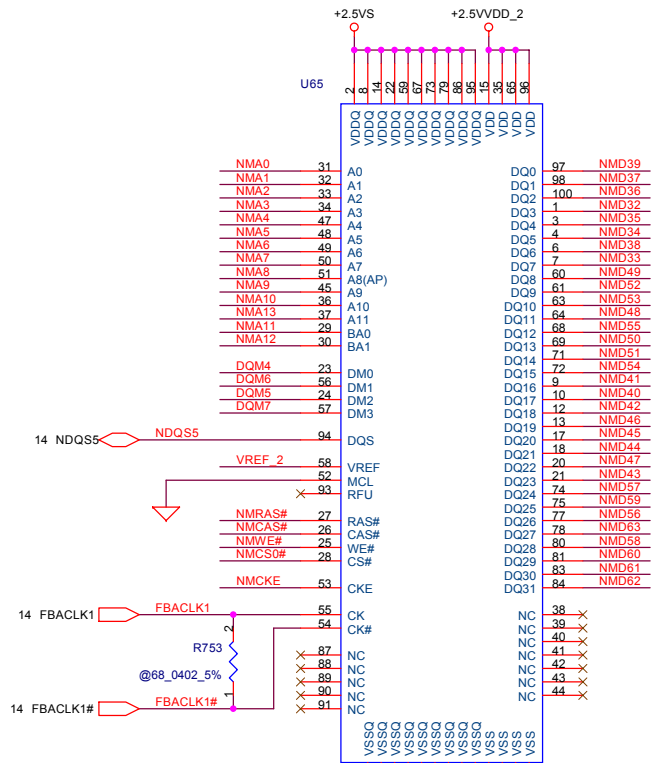
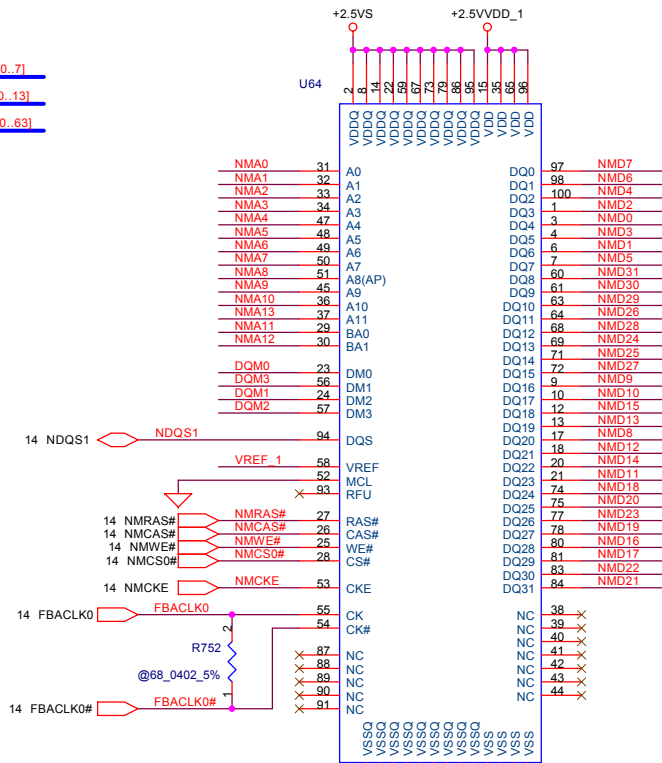
Date: 星期二, 十月 29, 2002 Sheet 16 of 48

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As close as possible to related pin



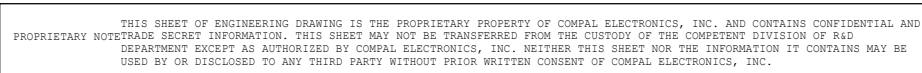
14 DQM[0..7] DQM[0..7]
14 NMA[0..13] NMA[0..13]
14 NMD[0..63] NMD[0..63]



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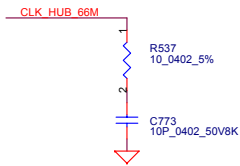
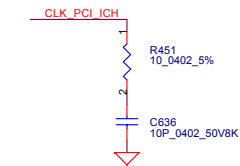
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Title			
NVIDIA SQ17 A CHANNEL DDR			
Size	Document Number		Rev
	LA1541		
Date: 星期二, 十月 29, 2002		Sheet 17 of 48	0.3

LVDS Connector

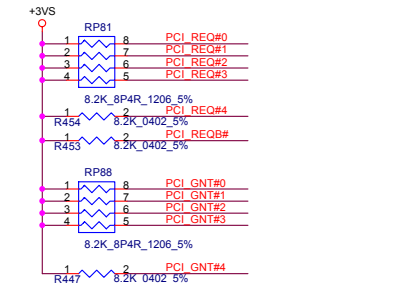
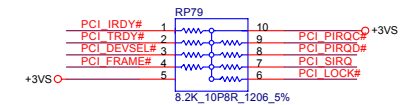
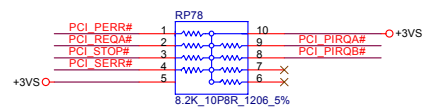


CRT&TV-OUT Connector

Page:	星期二, 十月 29, 2002	Sheet	18	of	48
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PCI Pullups



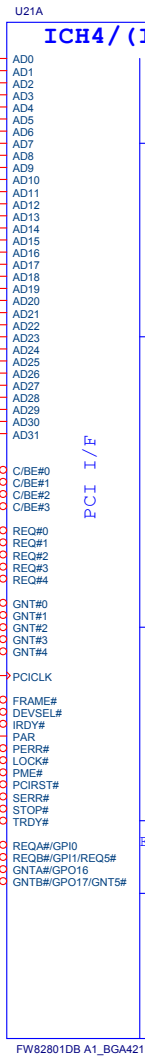
22,23,25,26 PCI_AD[0..31] PCI_AD[0..31]

22,23,25,26 PCI_C/BE#0 PCI_C/BE#0
22,23,25,26 PCI_C/BE#1 PCI_C/BE#1
22,23,25,26 PCI_C/BE#2 PCI_C/BE#2
22,23,25,26 PCI_C/BE#3 PCI_C/BE#3
22 PCI_REQ#0 PCI_REQ#0
26 PCI_REQ#1 PCI_REQ#1
23 PCI_REQ#2 PCI_REQ#2
25 PCI_REQ#3 PCI_REQ#3
22 PCI_GNT#0 PCI_GNT#0
26 PCI_GNT#1 PCI_GNT#1
23 PCI_GNT#2 PCI_GNT#2
25 PCI_GNT#3 PCI_GNT#3

12 CLK_PCI_ICH CLK_PCI_ICH
22,23,25,26 PCI_FRAME# PCI_FRAME#
22,23,25,26 PCI_DEVSEL# PCI_DEVSEL#
22,23,25,26 PCI_IRDY# PCI_IRDY#
22,23,25,26 PCI_PERR# PCI_PERR#
23 PCI_LOCK# PCI_LOCK#
7,13,22,23,24,25,26,28,30,35,36 PCI_RST# PCI_RST#
22,23,25,26 PCI_SERR# PCI_SERR#
22,23,25,26 PCI_STOP# PCI_STOP#
22,23,25,26 PCI_TRDY# PCI_TRDY#

28 PIDERST# PIDERST#
28 SIDERST# SIDERST#

1 R487 2 @8.2K_0402_5%



SM I/F
INTRUDER#
SMB_CLK
SMB_DATA
SMB_ALERT#

CPU I/F
A20GATE
A20M#
FERR#
IGNNE#
INTR#
NMI#
CPU_PWRGOOD#
RCIN#
SLP#
SMI#
STPCLK#

HUB I/F
HI0
HI1
HI2
HI3
HI4
HI5
HI6
HI7
HI8
HI9
HI10
HI11

Interrupt I/F
APICCLK
APICD0
APICD1
PIRQA#
PIRQB#
PIROC#
PIROD#
PIRQE#/GPI0
PIROF#/GPI3
PIROG#/GPI4
PIROH#/GPI5
IRQ14
IRQ15
SERIRQ

EEPROM I/F
EE_CS
EE_IN
A8
EE_OUT
C12#

LAN I/F
LAN_RXD0
LAN_RXD1
LAN_RXD2
LAN_TXD0
LAN_TXD1
LAN_TXD2
LAN_CLK
LAN_RSTSYNC
LAN_RST#

INTRUDER#
AC3 SMLINK0
AB1 SMLINK1
AC4 SMB_CLK
AB4 SMB_DATA
AA5 ACIN

Y22
U23
AA21
W22
V21
Y23
U22
U21
W23
V23

HUB PD[0..10] HUB_PD[0..10] 6

CLK_HUB_66M CLK_ICH_66M 12

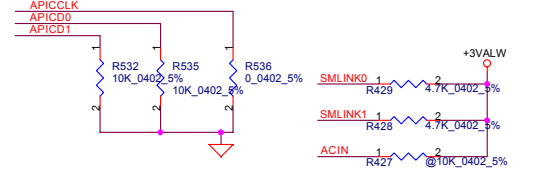
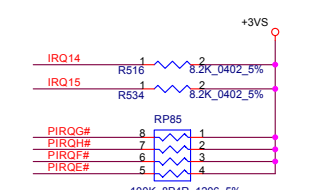
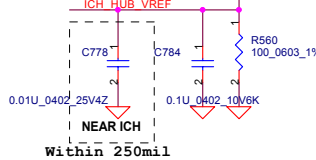
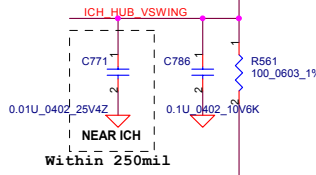
HUB_PSTRB# 6 HUB_PSTRB# 6

HUB_VSWING ICH_HUB_VREF ICH_HUB_VSWING

APICCLK
APICD0
APICD1
PIRQA#
PIRQB#
PIROC#
PIROD#
PIRQE#/GPI0
PIROF#/GPI3
PIROG#/GPI4
PIROH#/GPI5
IRQ14
IRQ15
SERIRQ

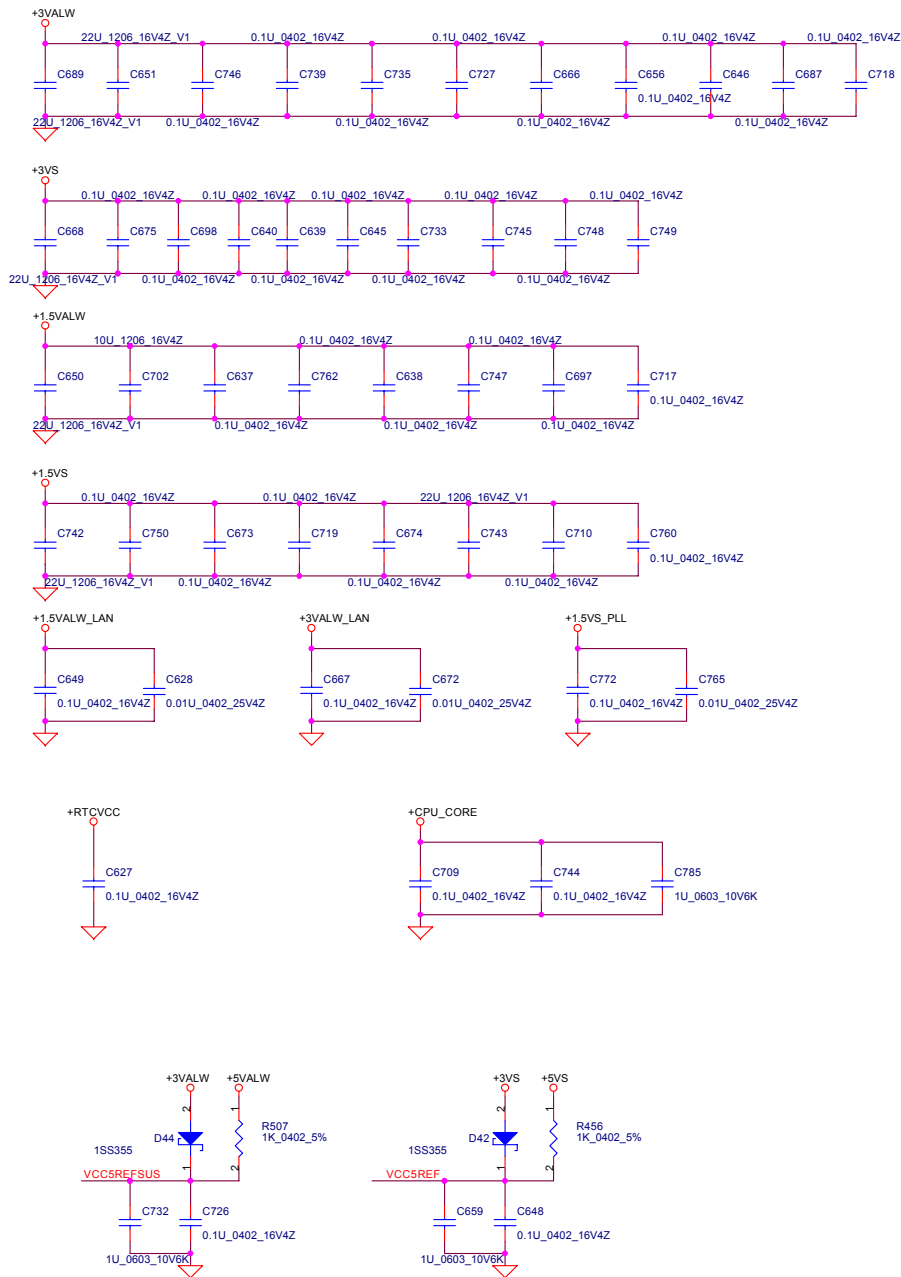
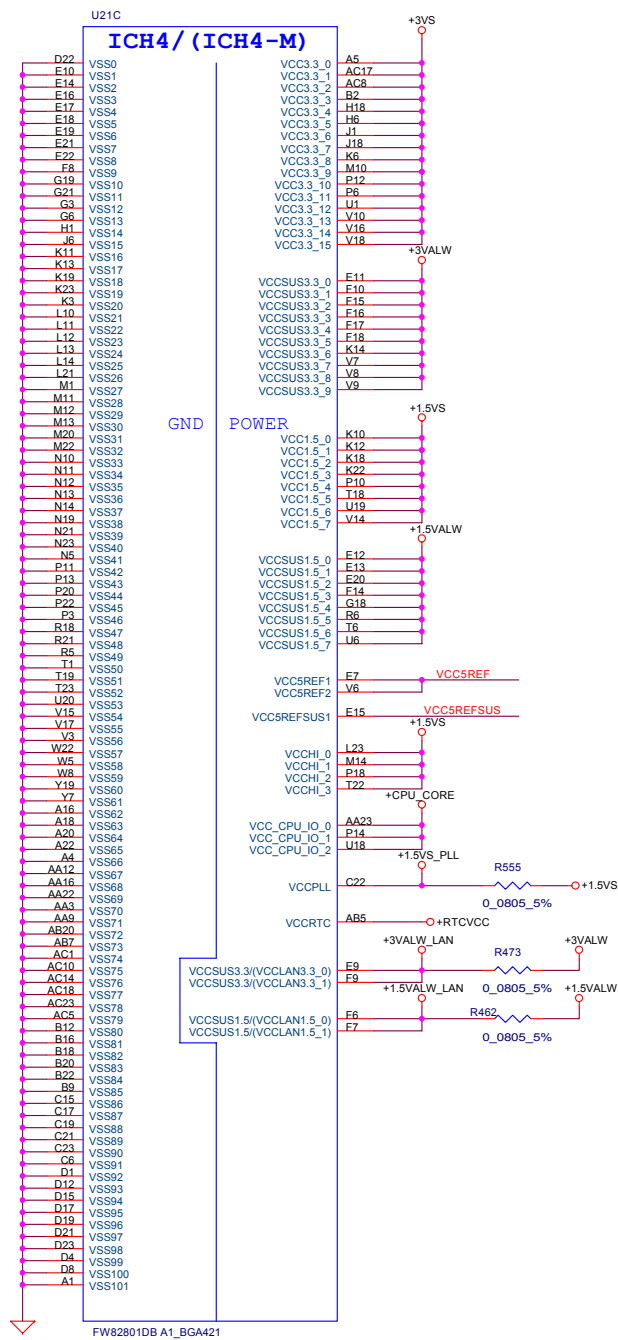
EE_CS
EE_IN
A8
EE_OUT
C12#

LAN_RXD0
LAN_RXD1
LAN_RXD2
LAN_TXD0
LAN_TXD1
LAN_TXD2
LAN_CLK
LAN_RSTSYNC
LAN_RST#

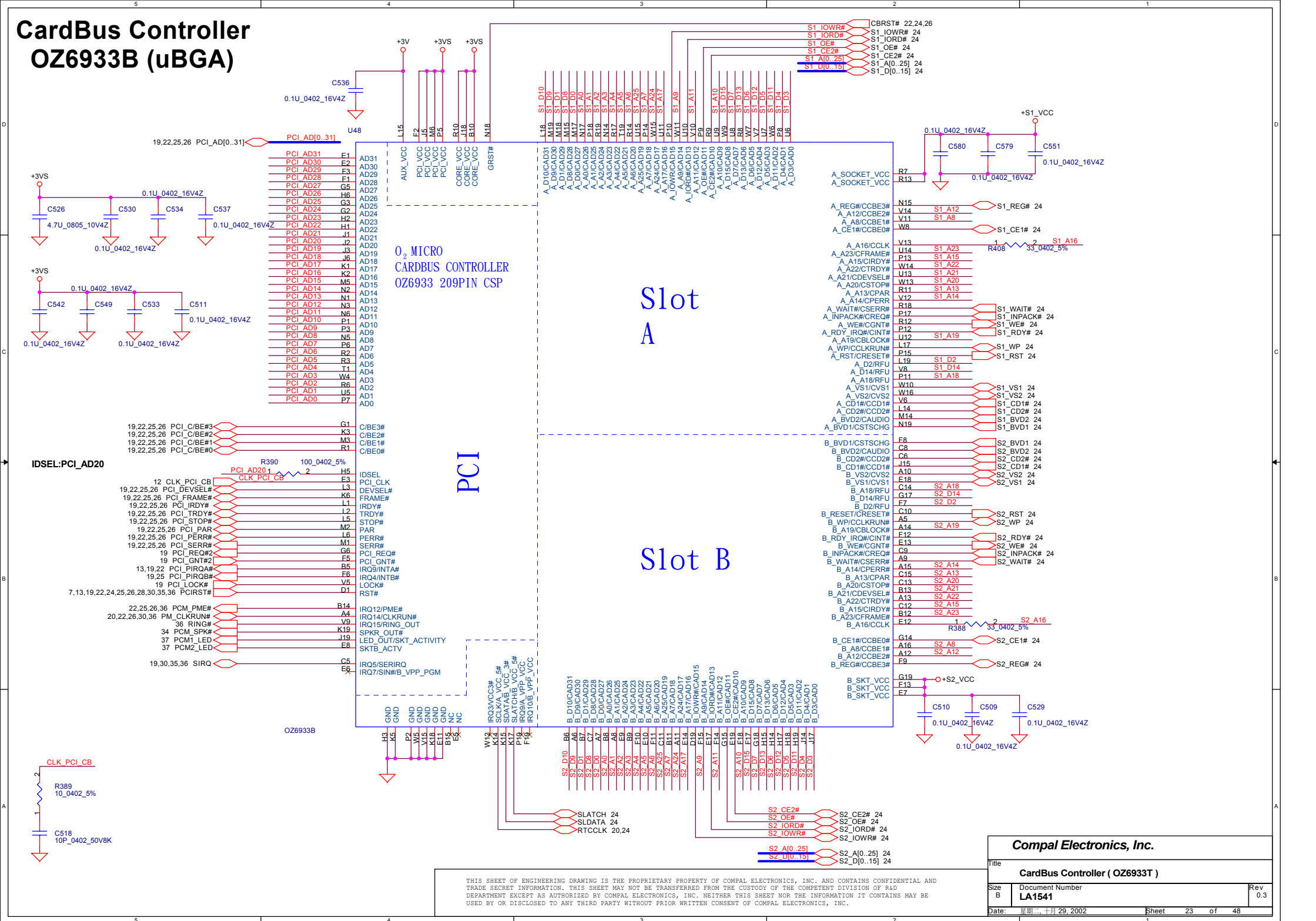


Compal Electronics, Inc.			
Title			
ICH4 - CPU/ICH/HUB			
Size	Document Number	Rev	
	LA1541	0.3	
Date:	日期: 二月 29, 2002	Sheet	19 of 48

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CardBus Controller OZ6933B (uBGA)



Compal Electronics, Inc.

Title	CardBus Controller (OZ6933T)
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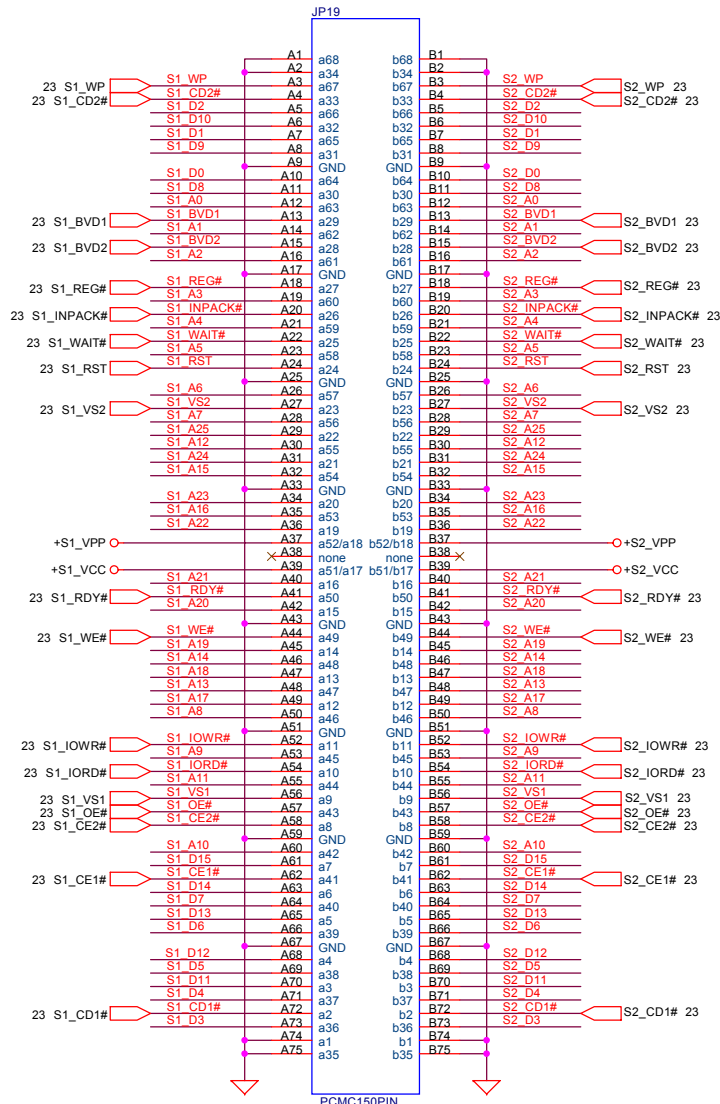
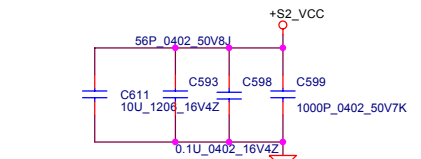
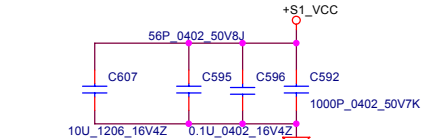
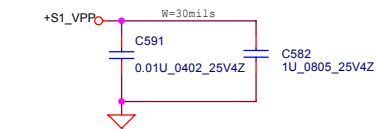
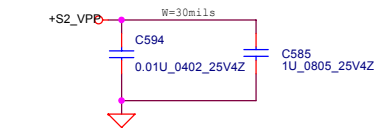
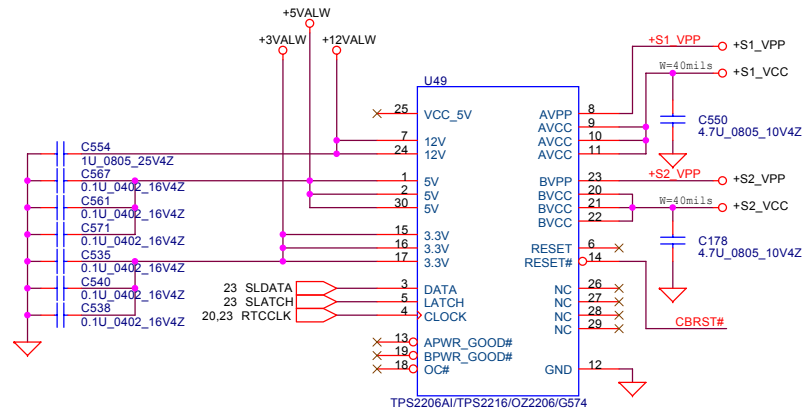
Size B	Document Number LA1541	Rev 0.3
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Date: 星期二, 十月 29, 2002 Sheet 23 of 48

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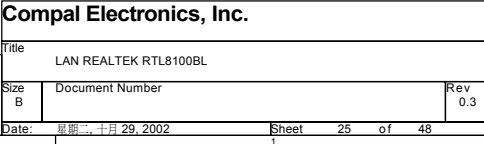
PCMCIA POWER CTRL.

CARDBUS
SOCKET

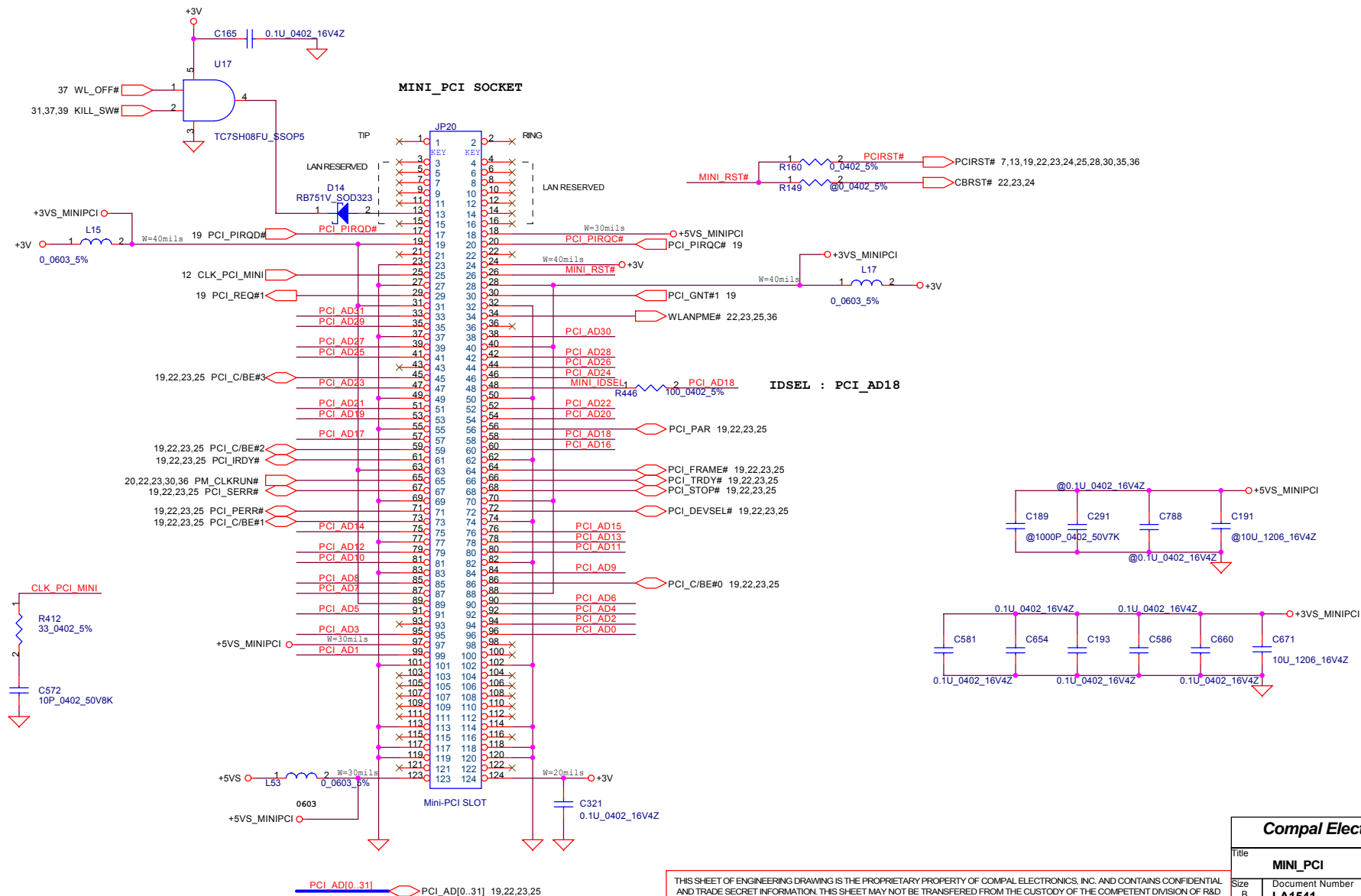


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Compal Electronics, Inc.			
Title			
Foxconn PCMCIA SOCKET			
Size	Document Number	Rev	
B	LA1541	0.3	
Date:	星期二, 十月 29, 2002	Sheet	24 of 48

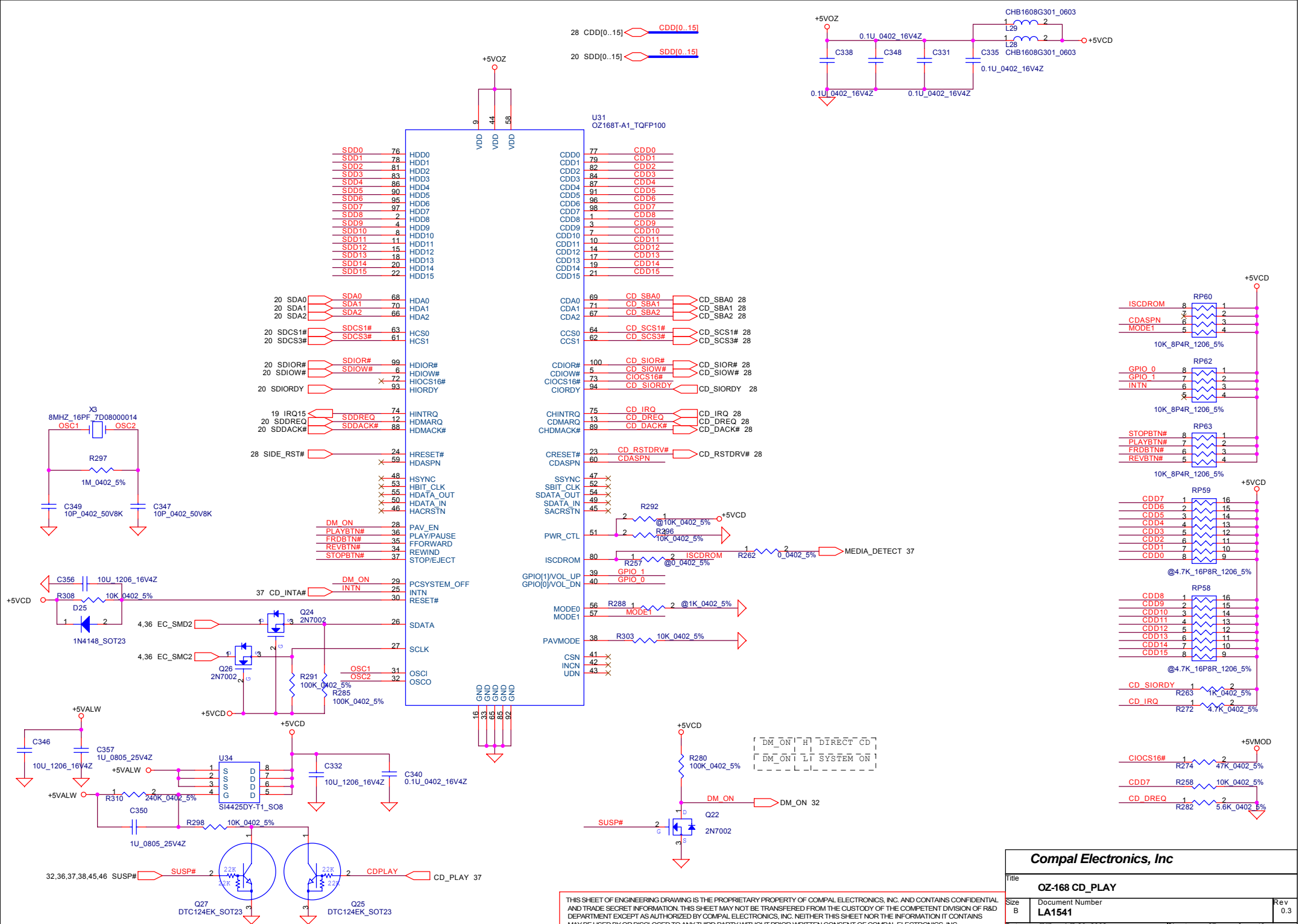


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Compal Electronics, Inc			
Title			
MINI_PCI			
Size	Document Number	Rev	
B	LA1541	0.3	
Date:	星期三, 十月 29, 2002	Sheet	26 of 48

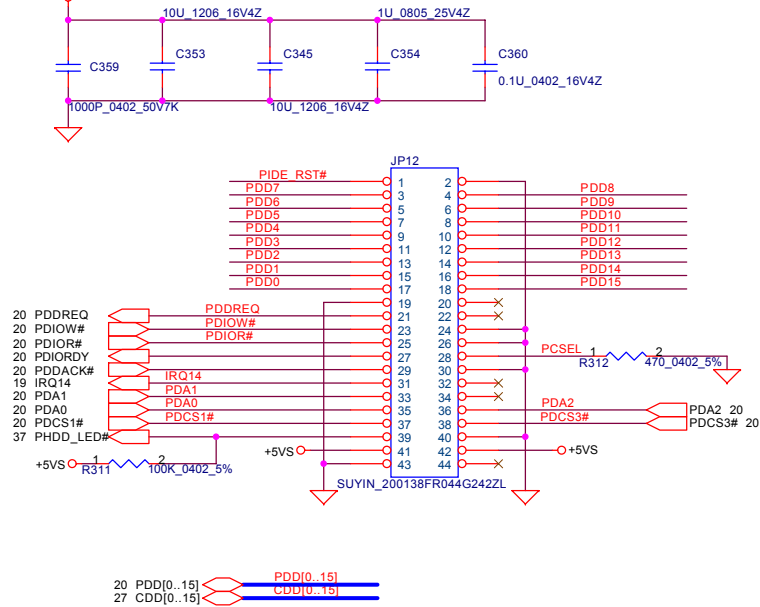


IDE,CD-ROM Module CONN.

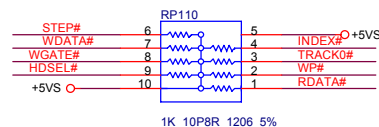
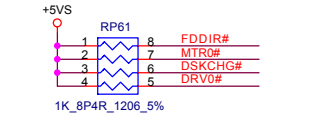
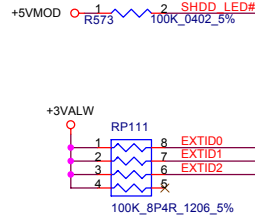
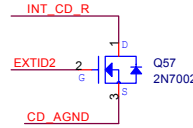
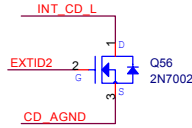
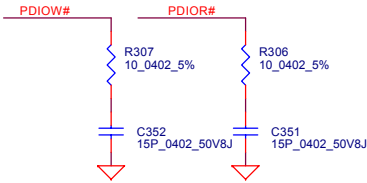
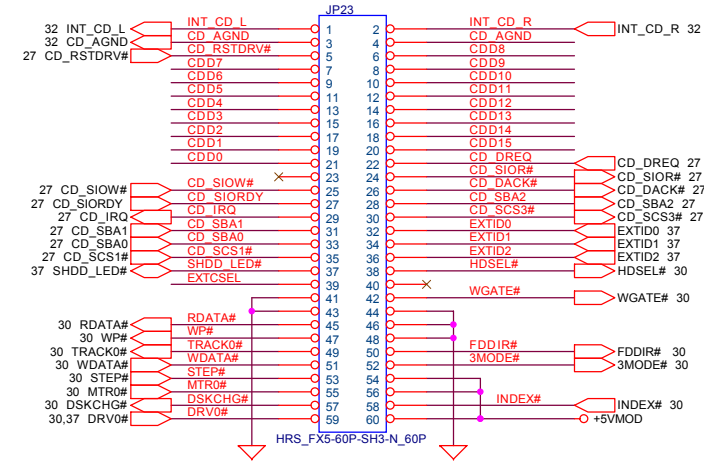
Placea caps. near HDD

CONN.

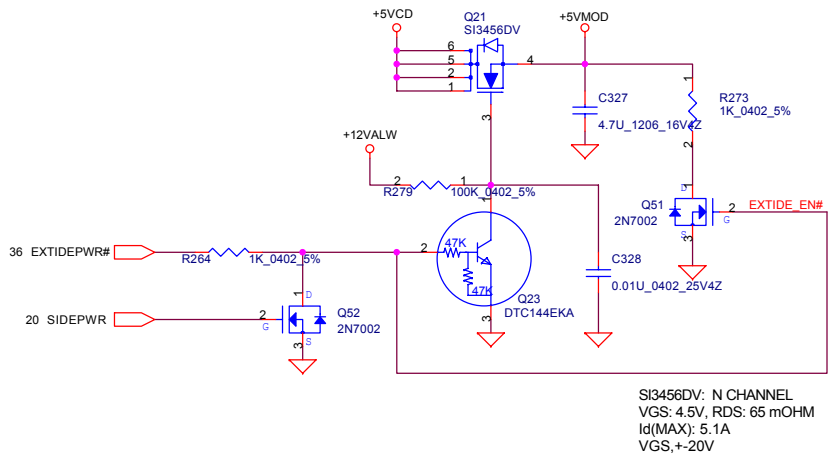
Layout Note: +5VSHDD trace width 60 mil



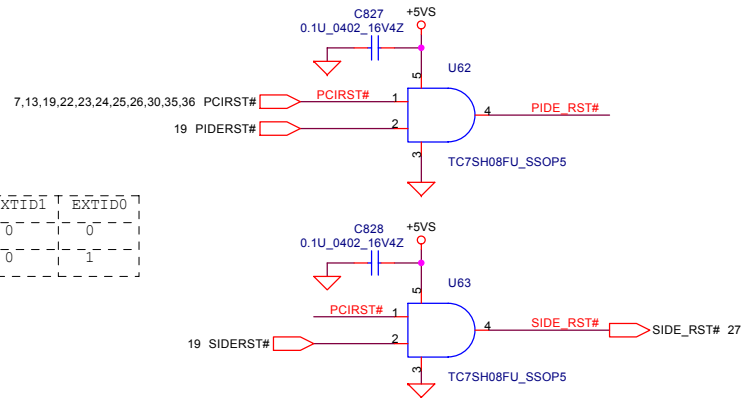
CD-ROM / FDD CONNECTOR



DEVICE	EXTID2	EXTID1	EXTID0
FDD	0	0	0
CD-ROM	0	0	1



SI3456DV: N CHANNEL
VGS: 4.5V, RDS: 65 mOHM
Id(MAX): 5.1A
VGS, +20V

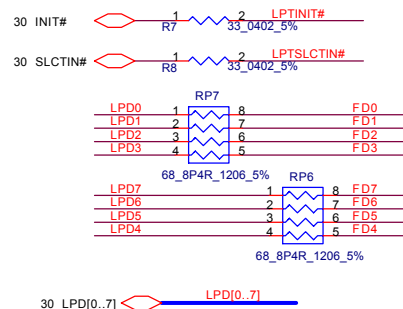
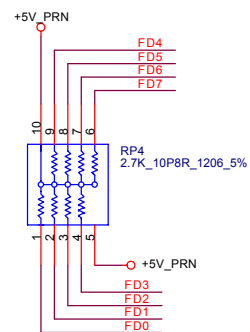
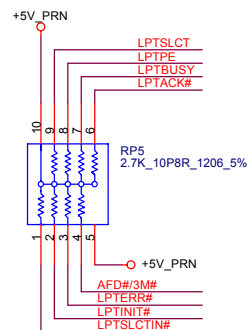
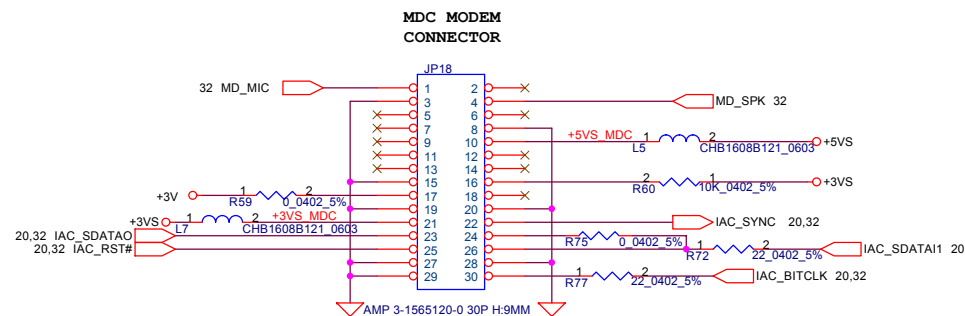


Compal Electronics, Inc.

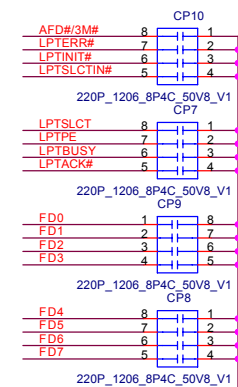
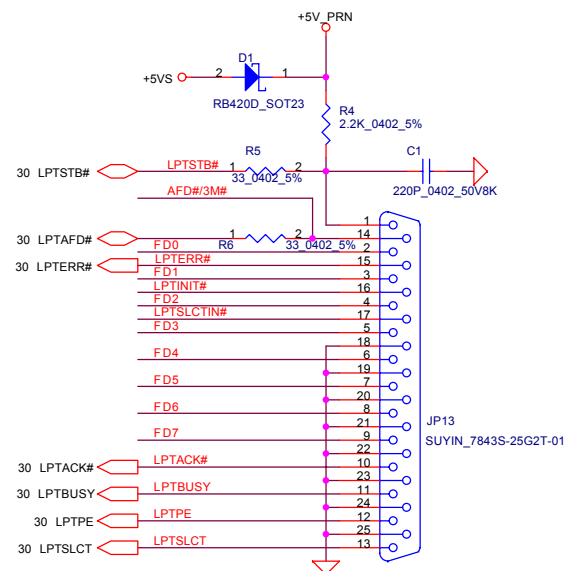
IDE/ FDD MODULE CONN.

Size	Document Number	Rev
B	LA1541	0.3
Date:	星期三, 十月 29, 2002	Sheet 28 of 48

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PARALLEL PORT

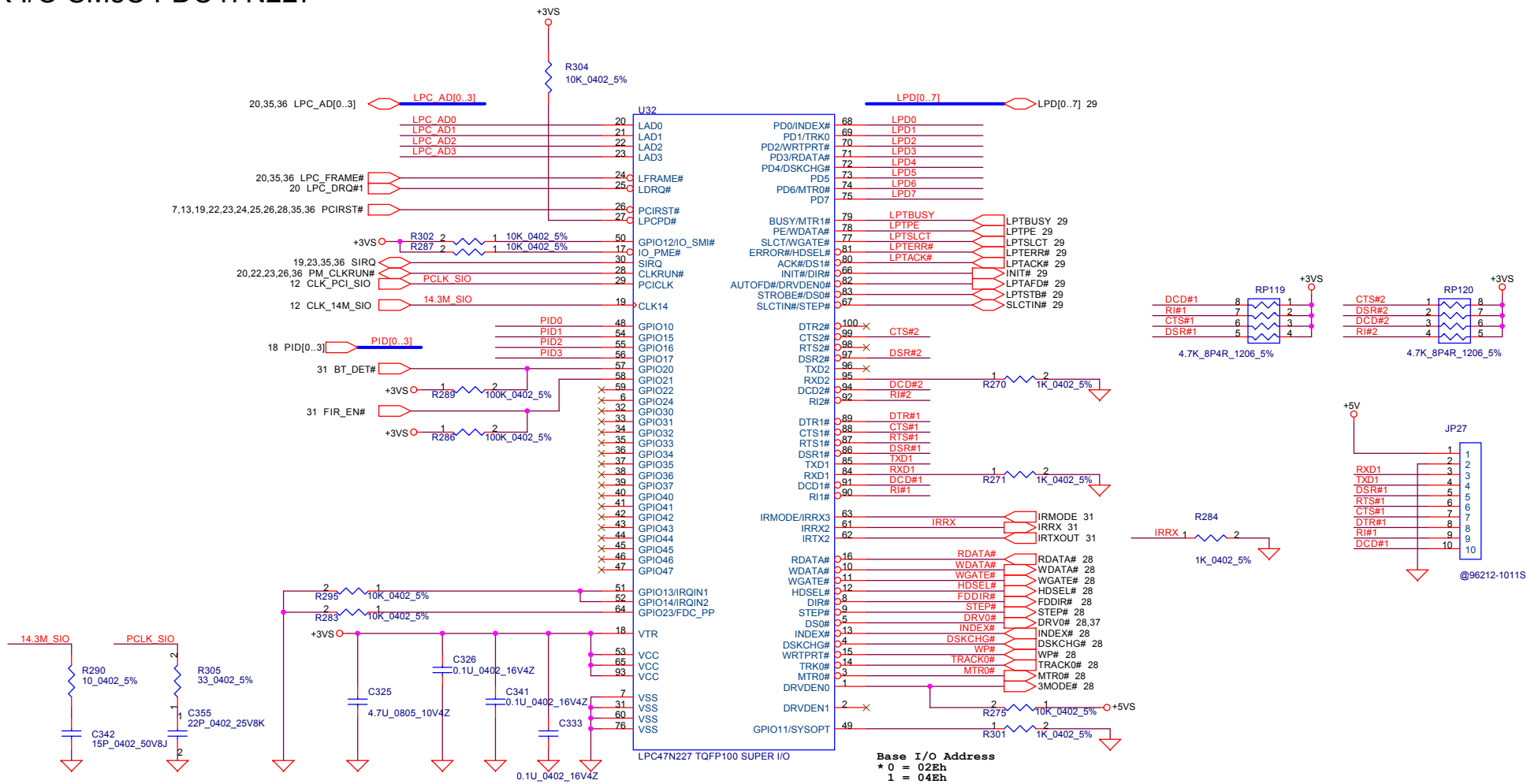


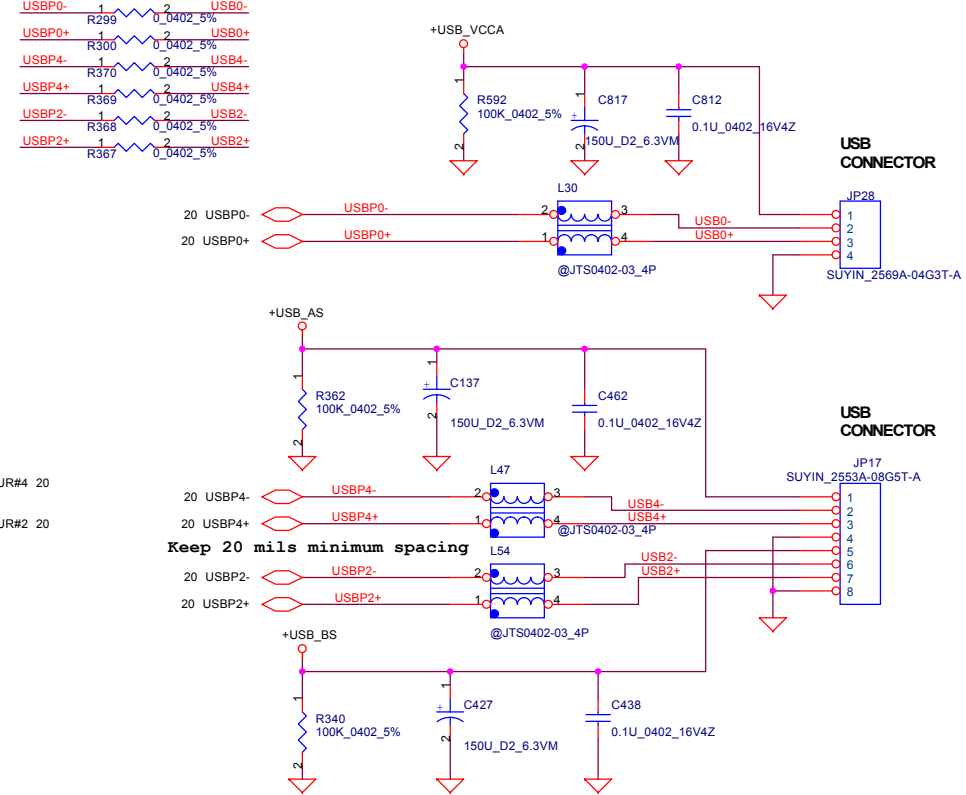
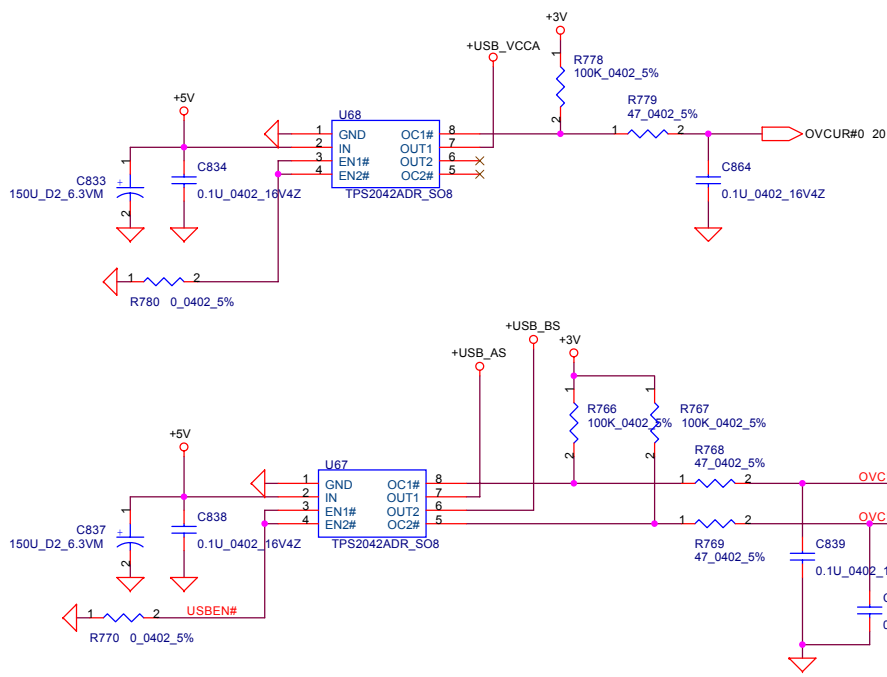
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Compal Electronics, Inc.

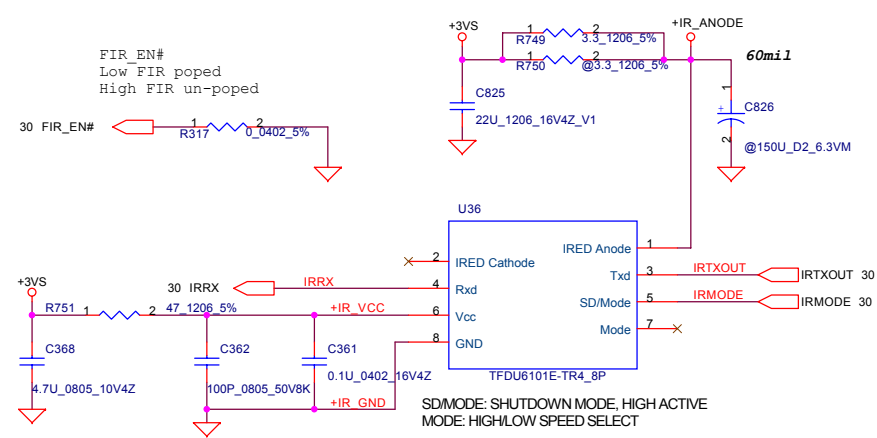
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Size	Document Number	Rev	
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Date:	星期三, 十月 29, 2002	Sheet	29 of 48

SUPER I/O SMC FDC47N227

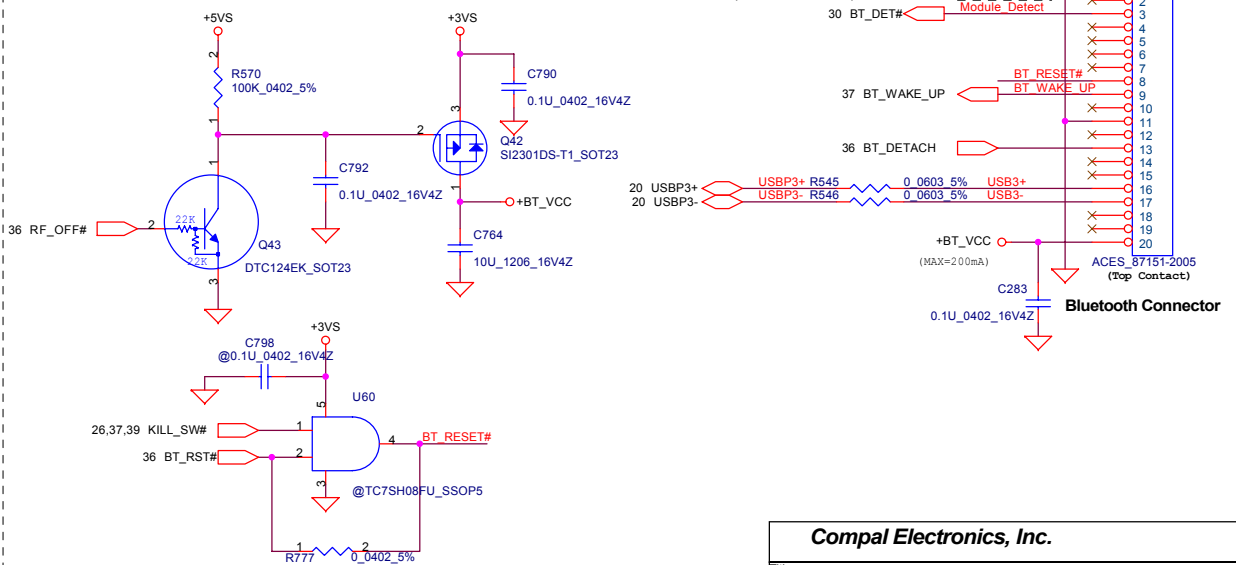




FIR Module



BlueTooth Interface

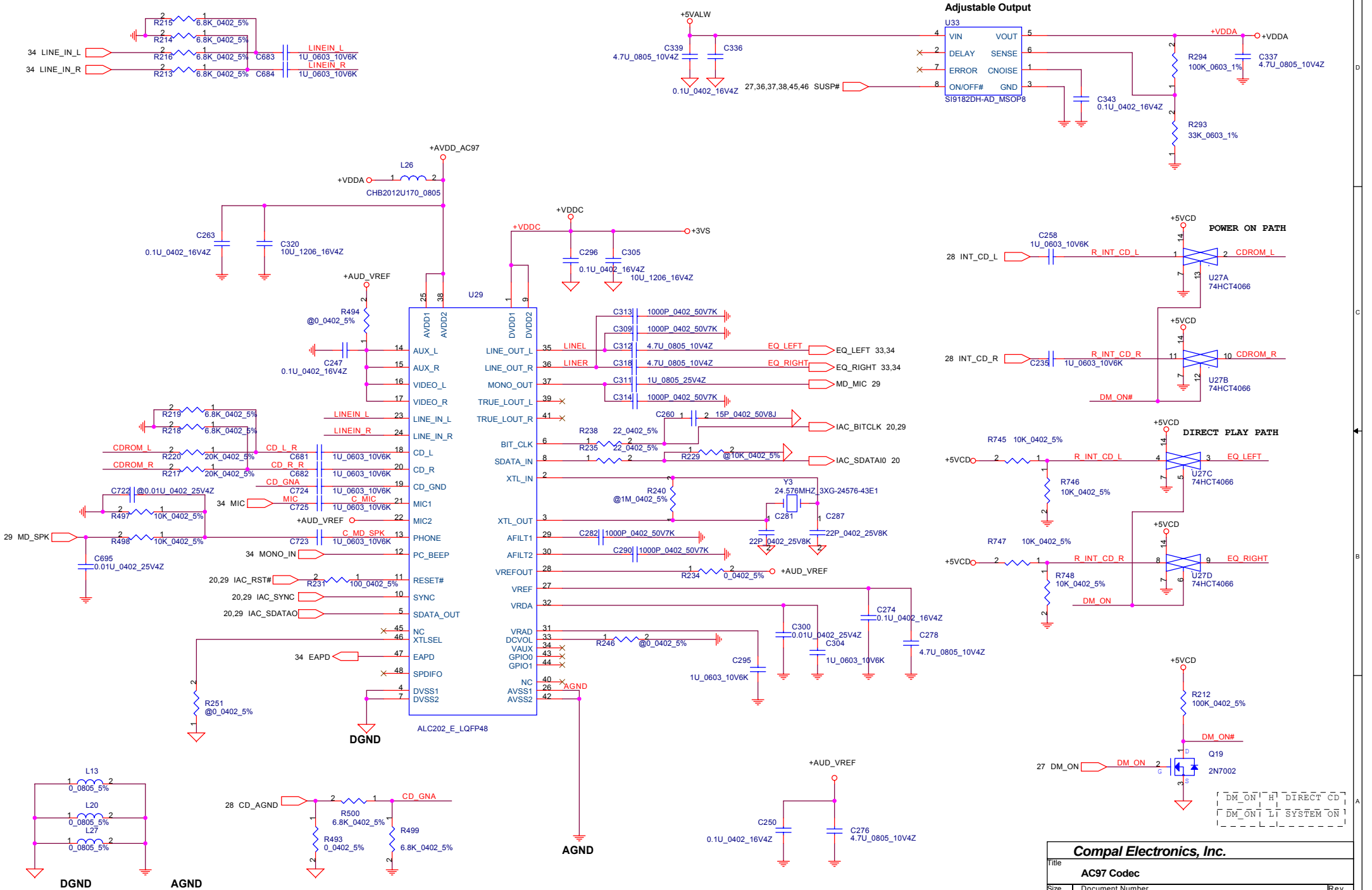


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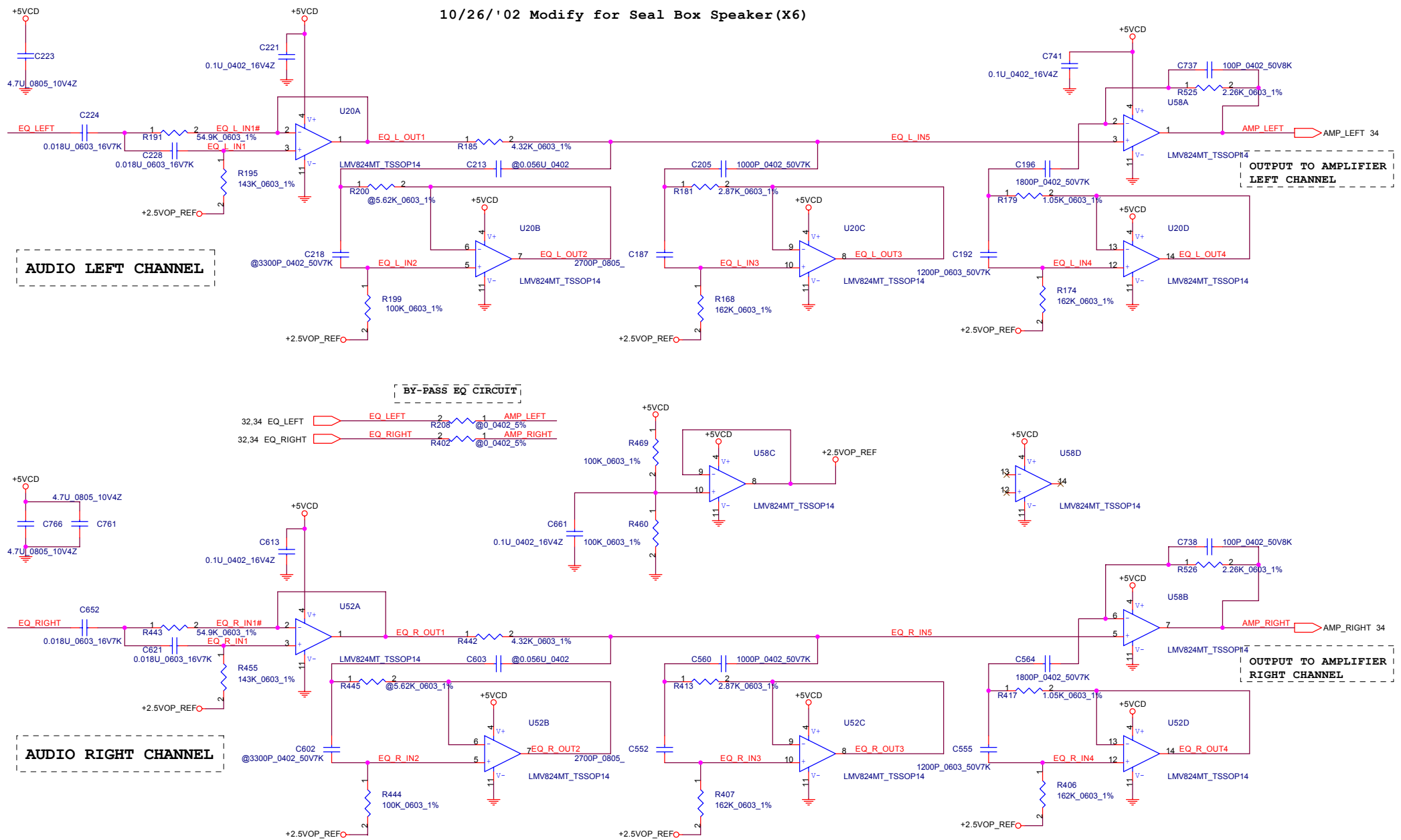
Compal Electronics, Inc.			
Title			
USB/Bluetooth/FIR			
Size	Document Number	Rev	
B	LA1541	0.3	
Date:	日期: 十月 29, 2002	Sheet	31 of 48

AC97 Codec

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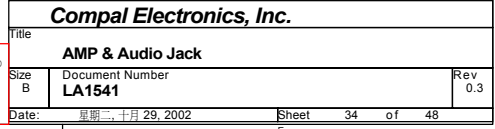
10/26/'02 Modify for Seal Box Speaker(X6)



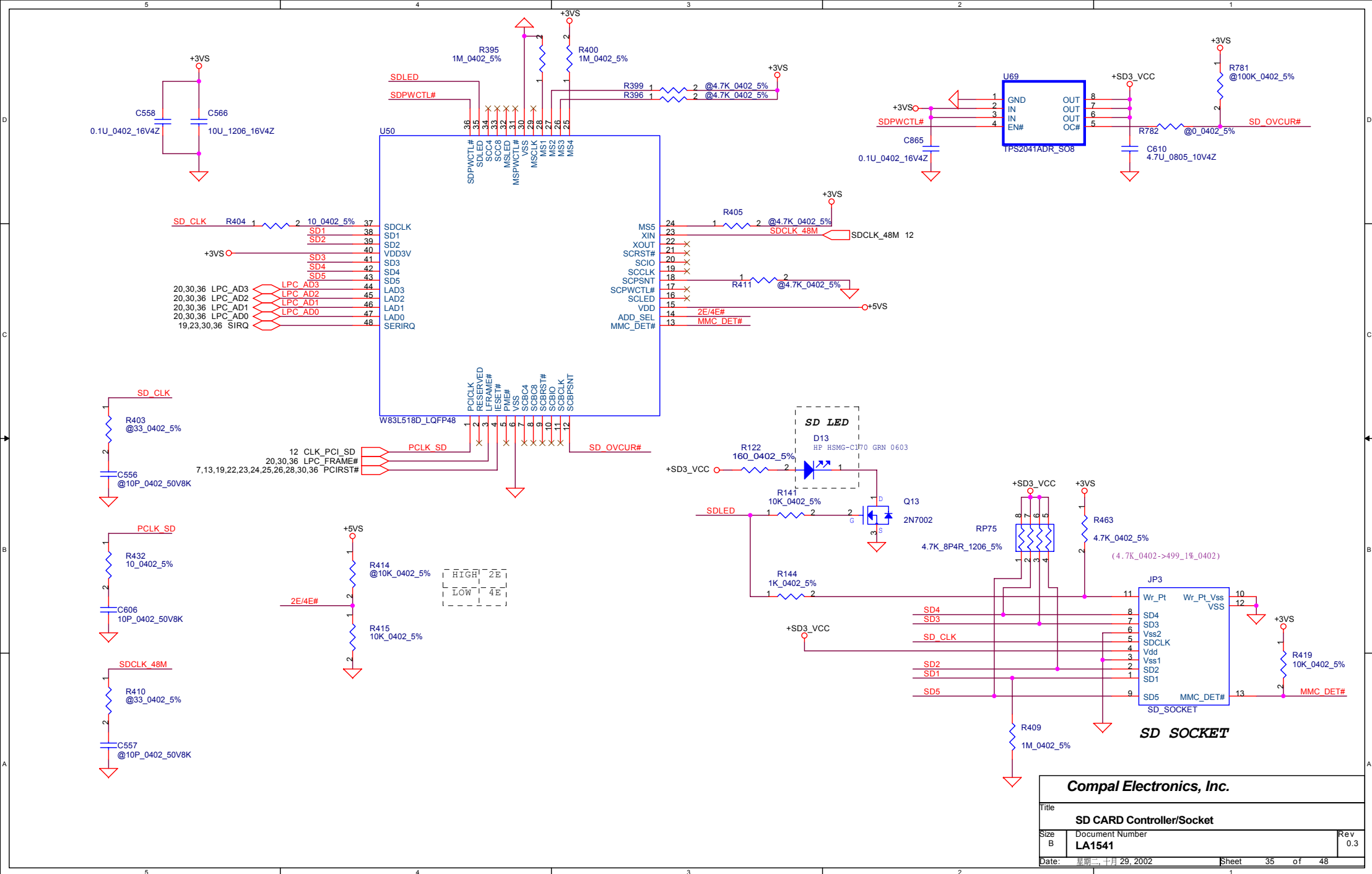
Compal Electronics, Inc.

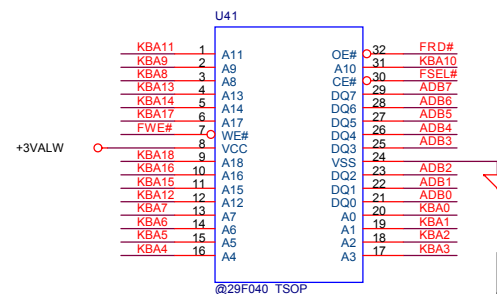
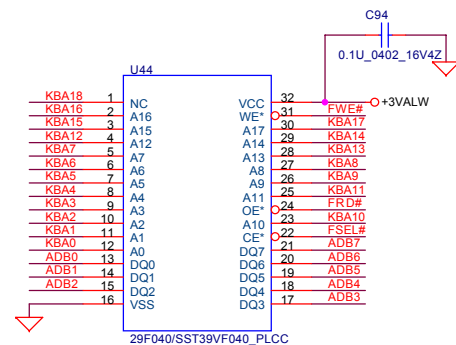
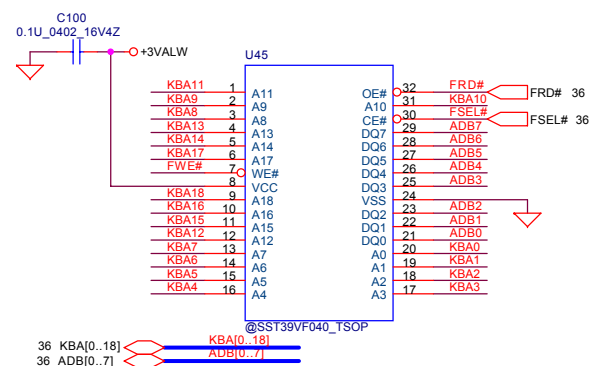
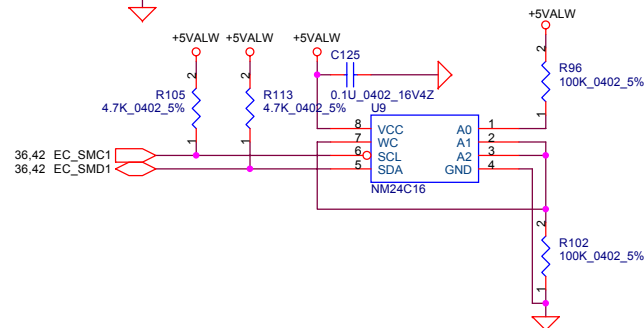
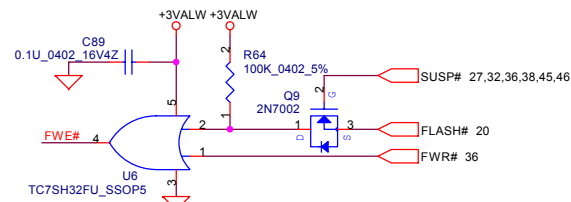
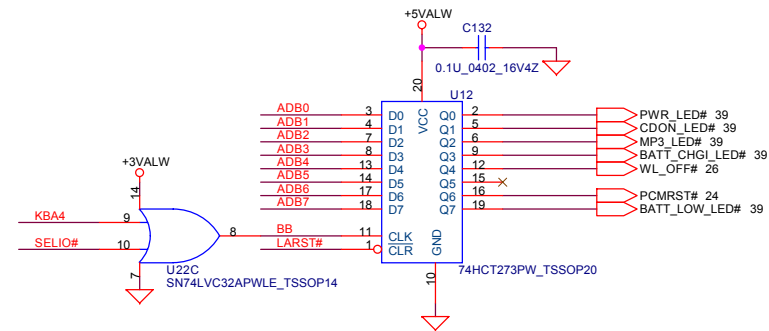
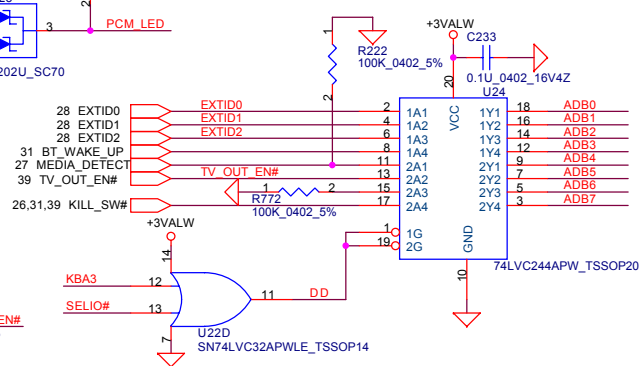
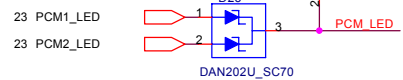
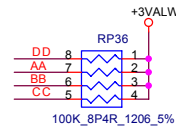
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Size B	Document Number	Rev	
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Date:	星期二, 十月 29, 2002	Sheet	33 of 48

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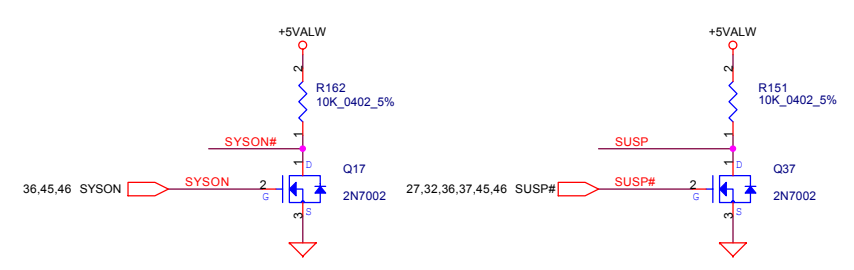
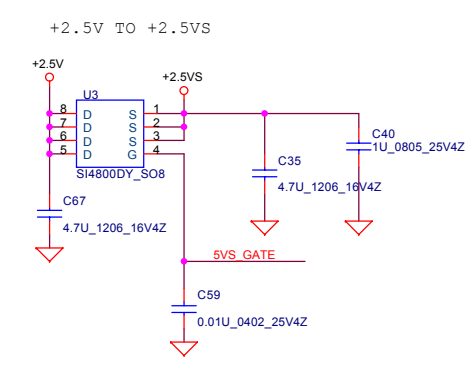
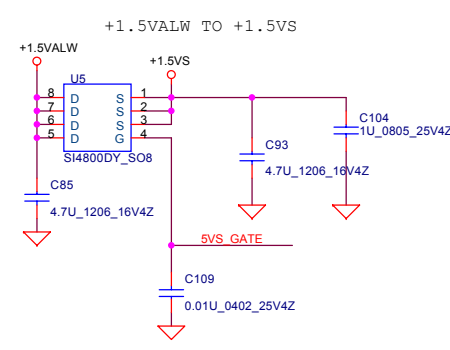
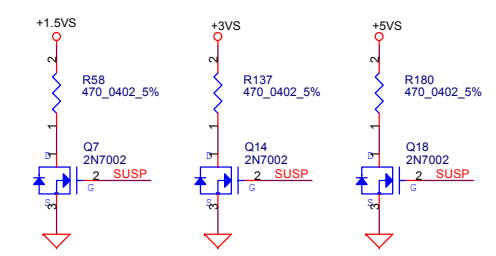
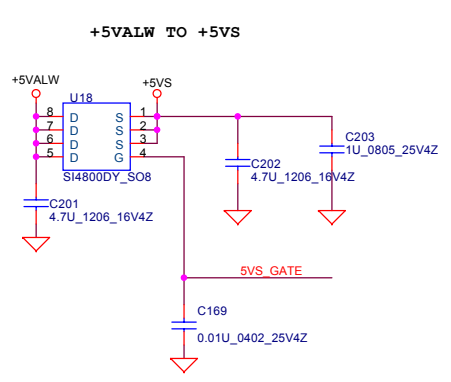
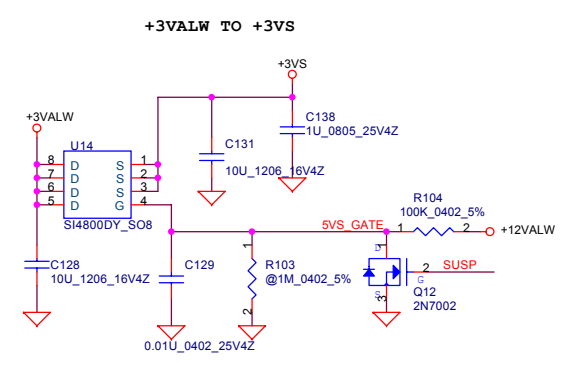
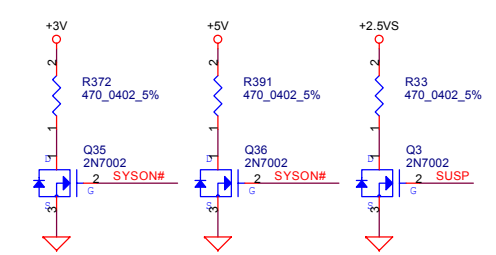
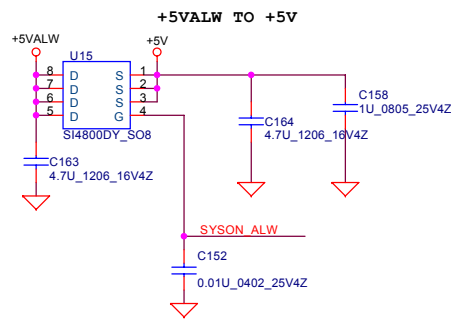
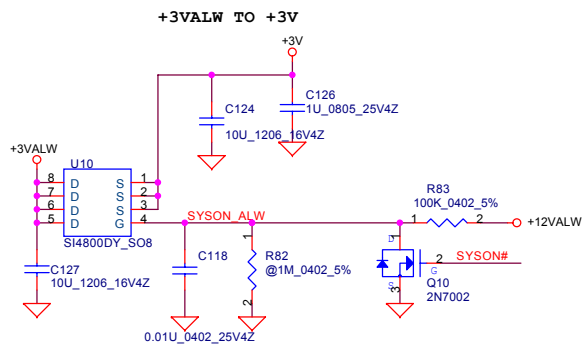


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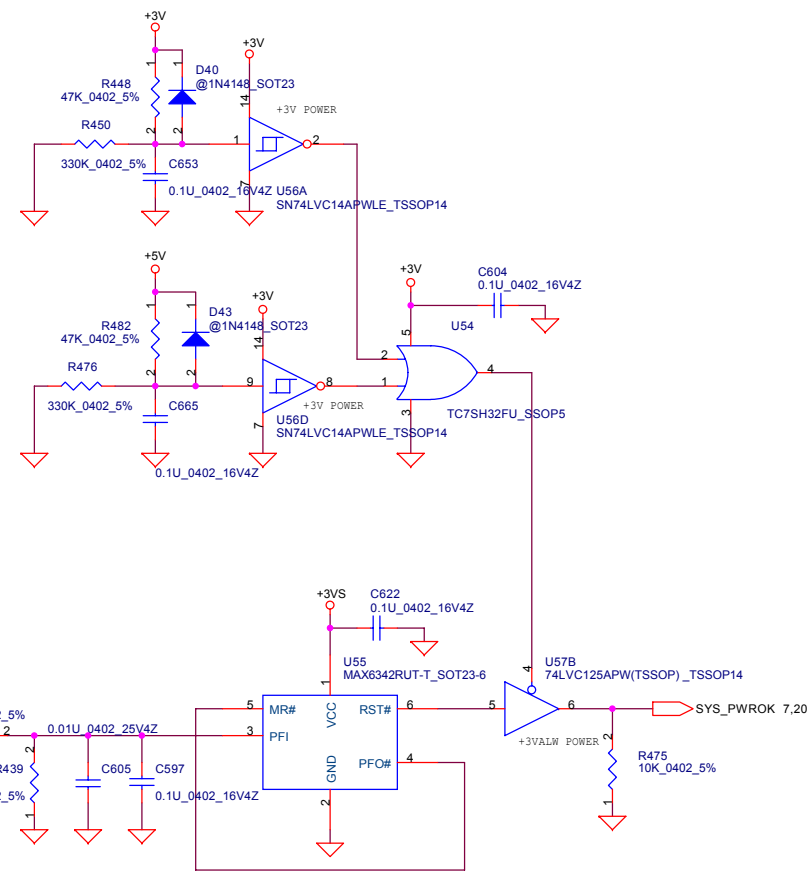
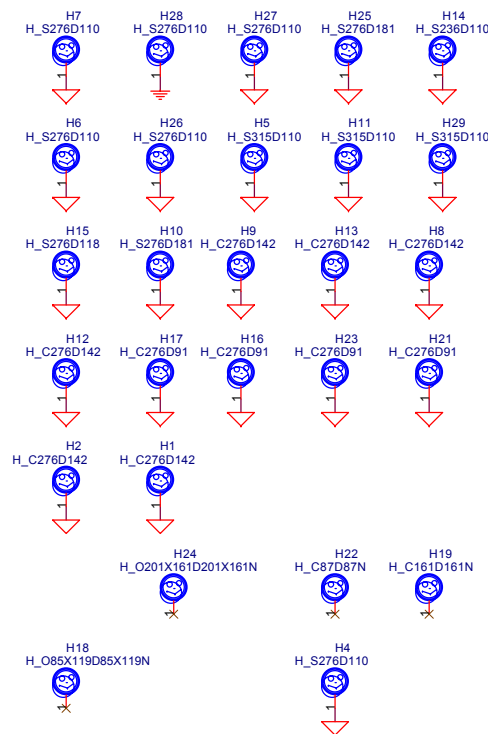


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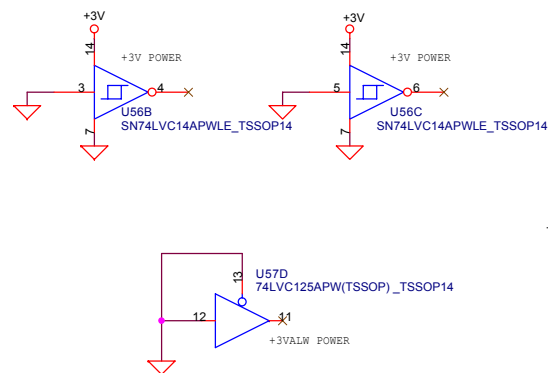
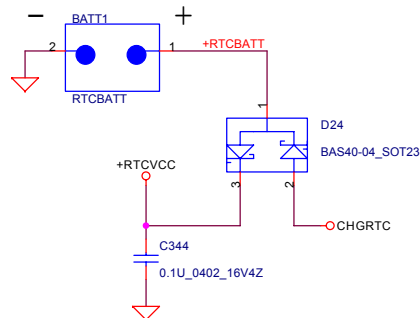


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POWER CONTROL CKT			
Size B	Document Number LA1541	Rev 0.3	
Date: 星期二, 十月 29, 2002	Sheet 38	of 48	E



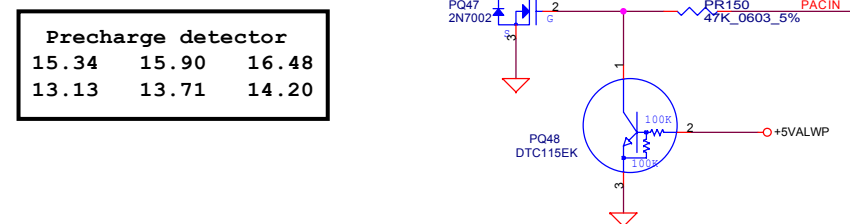
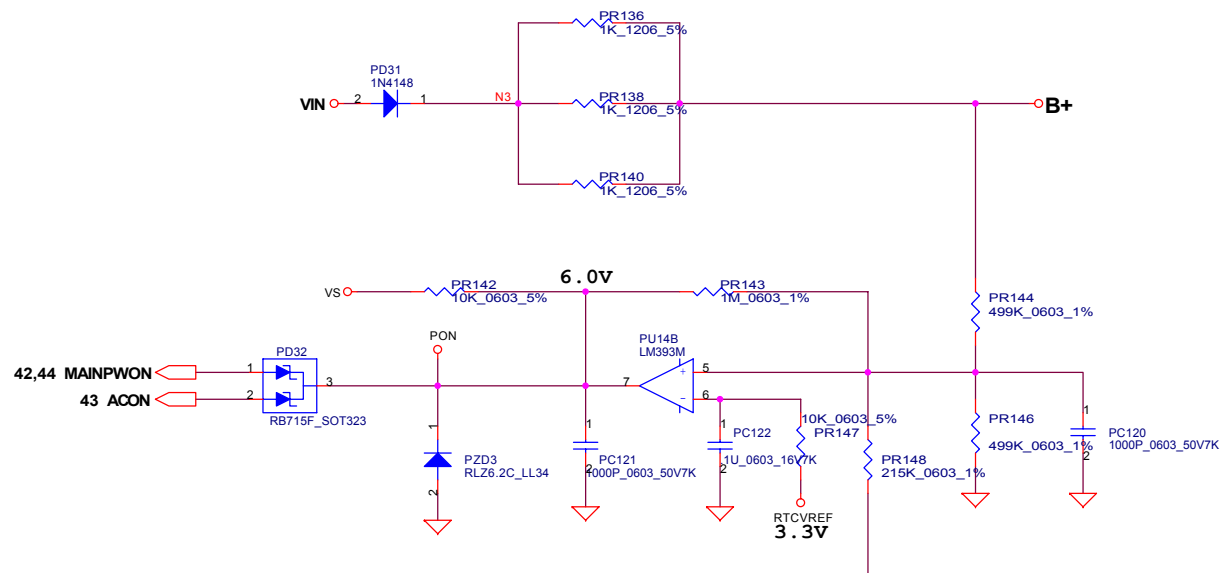
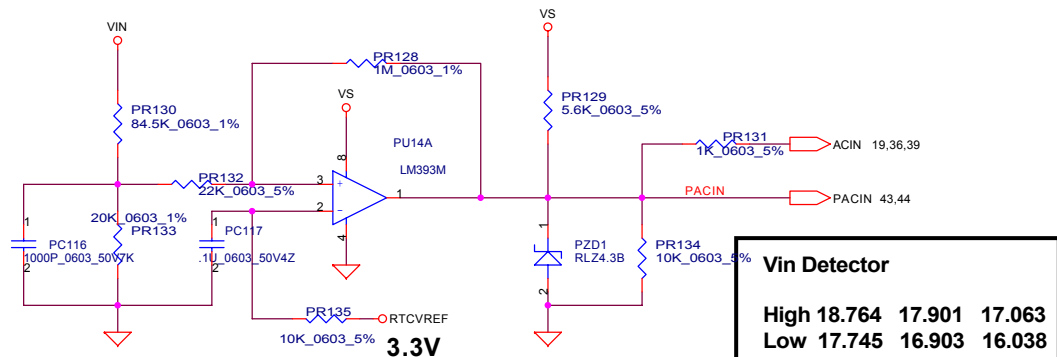
RTC BATT



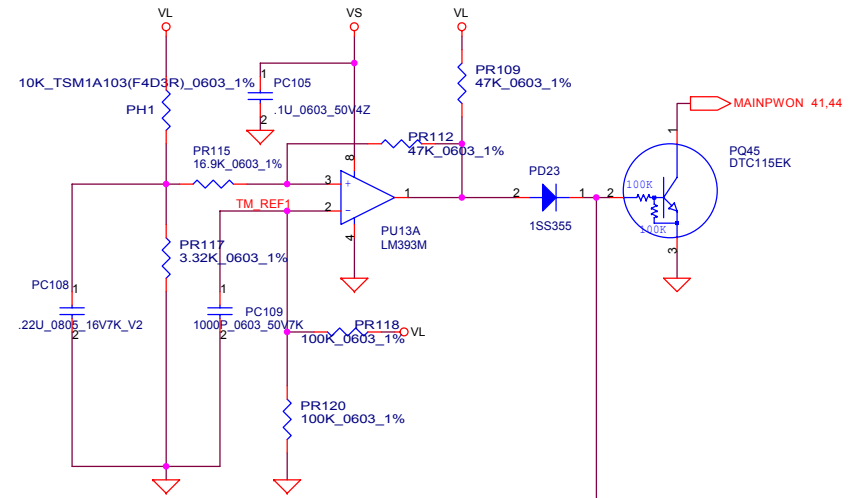
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Title			RESET
Size	Document Number	Rev	
B	LA1541	0.3	
Date:	星期二, 十月 29, 2002	Sheet	40 of 48

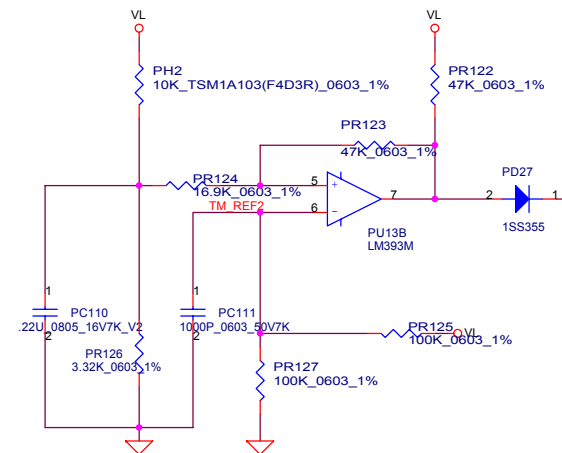
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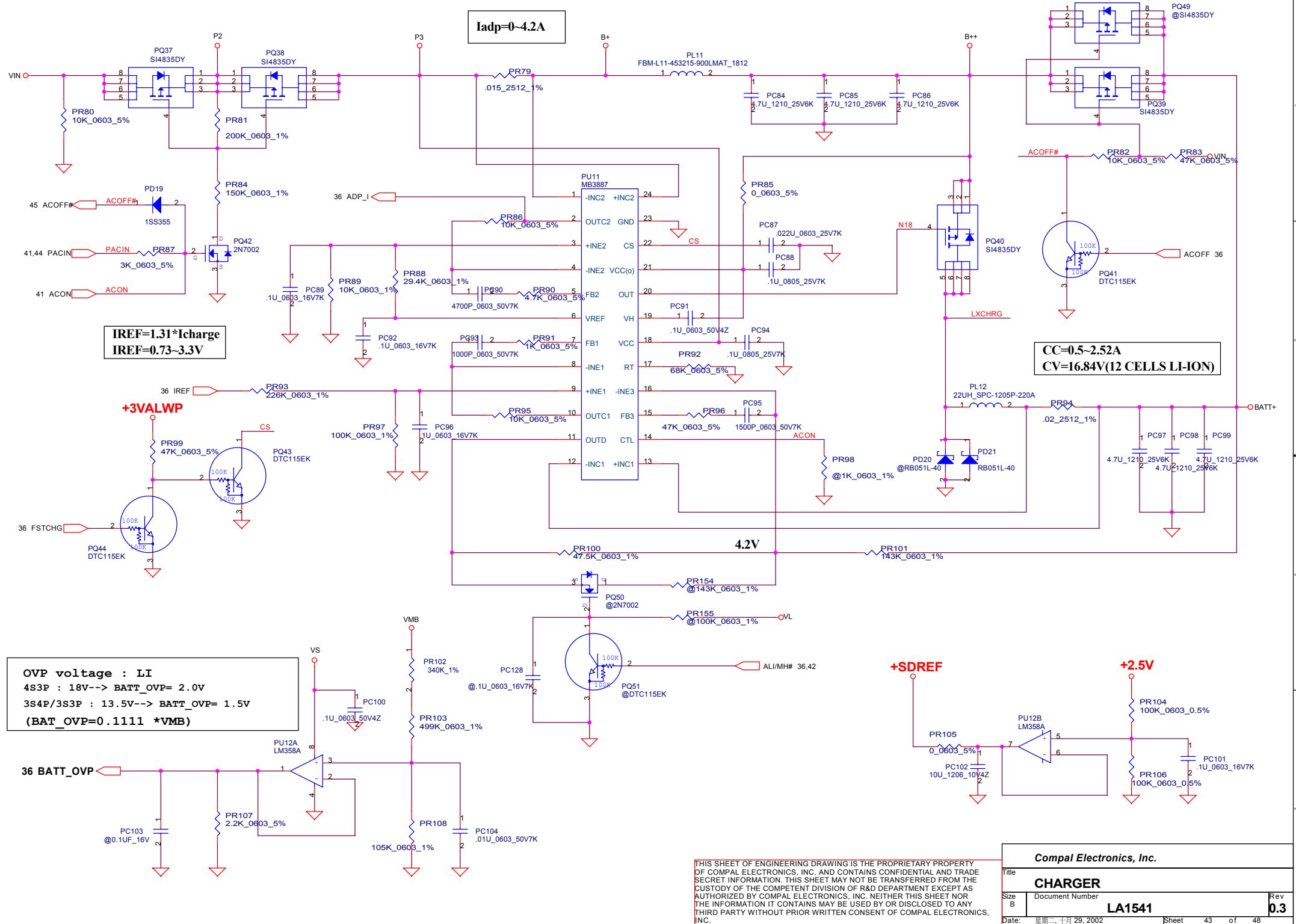
CPU thermal protection at 84 degree C
Recovery at 44(45) degree C

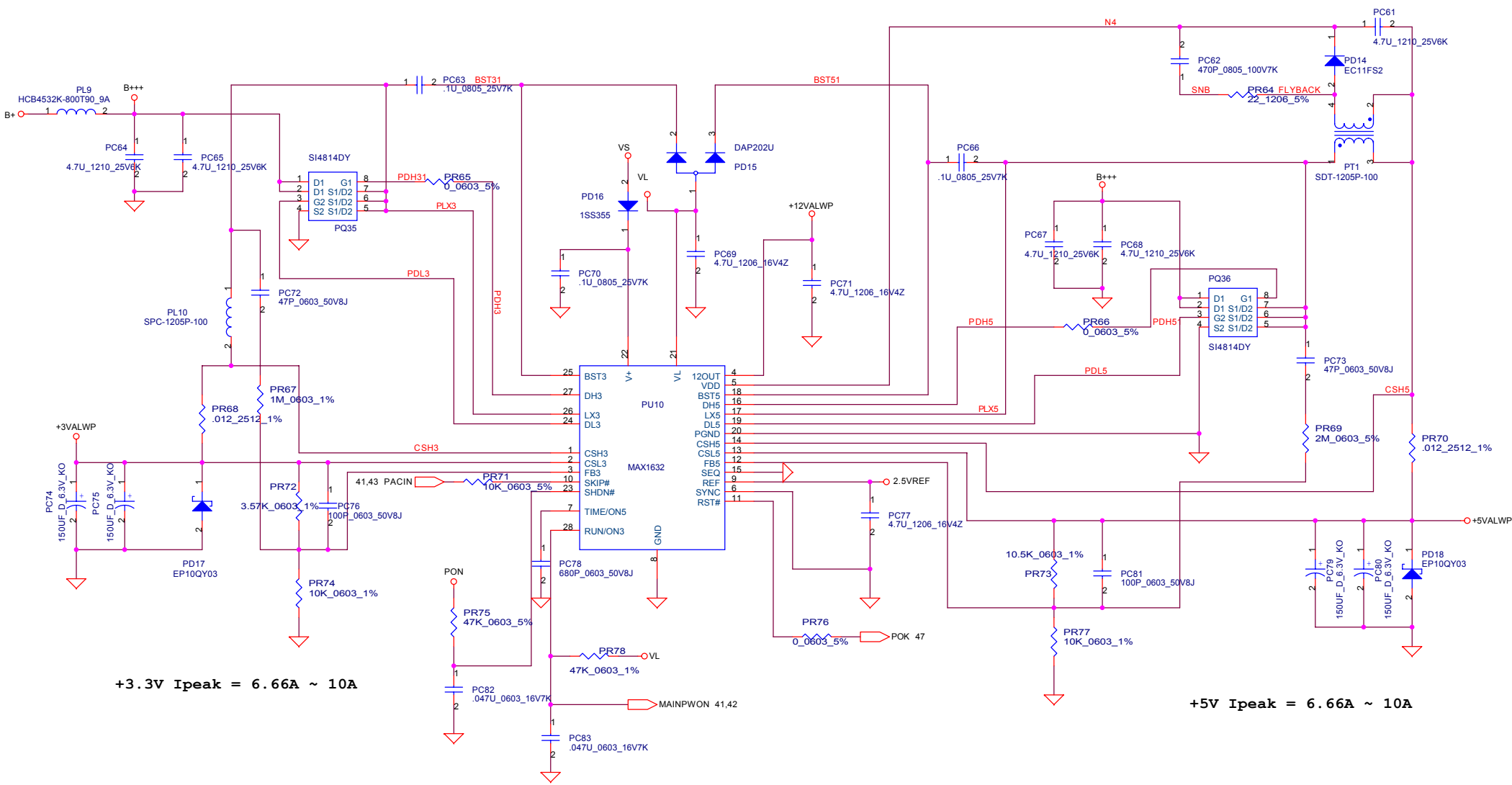


BAT. thermal protection at 84 degree C
Recovery at 44(45) degree C



Title			
BATTERY CONN / OTP			
Size B	Document Number		Rev
	LA1541		0.3
Date:	星期三, 十月 29, 2002	Sheet	42 of 48



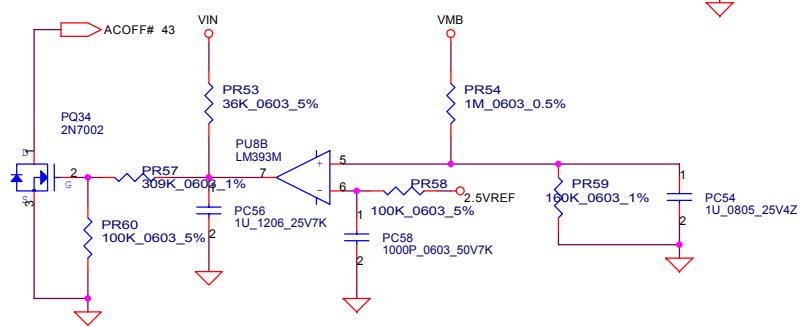
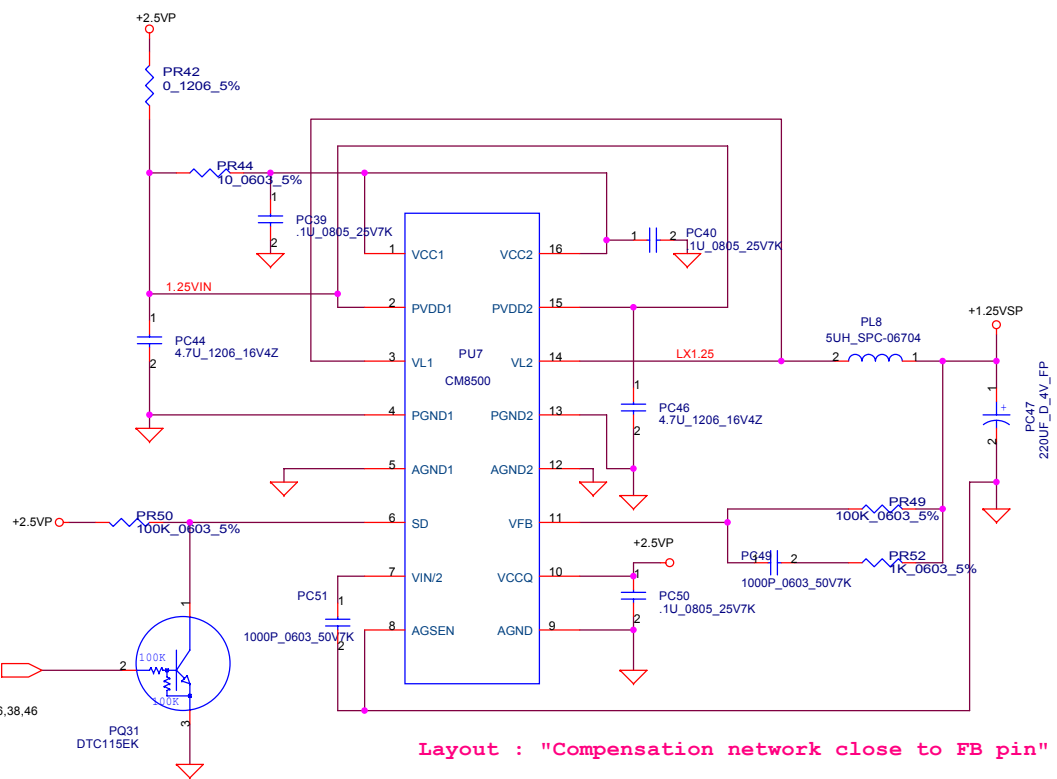
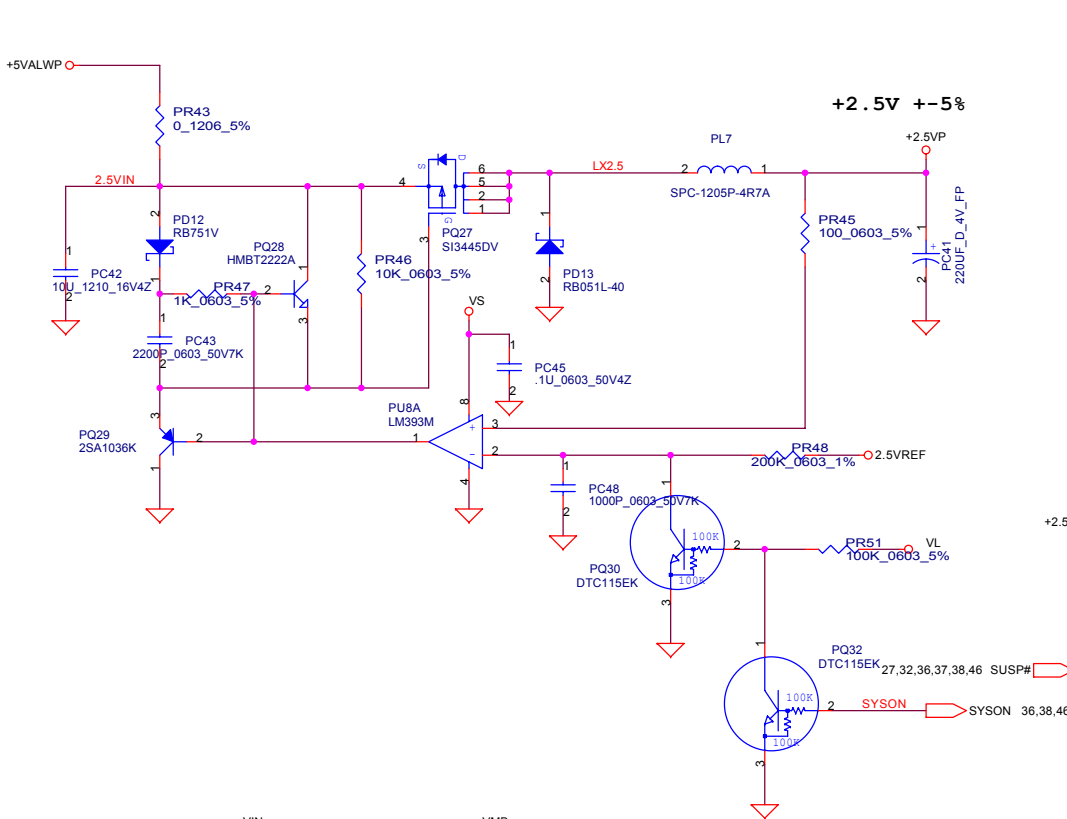


+3.3V Ipeak = 6.66A ~ 10A

+5V Ipeak = 6.66A ~ 10A

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Title			
5V/3.3V/12V			
Size B			
Document Number			
LA1541			
Rev			
0.3			
Date: 星期二, 十月 29, 2002			
Sheet 44 of 48			



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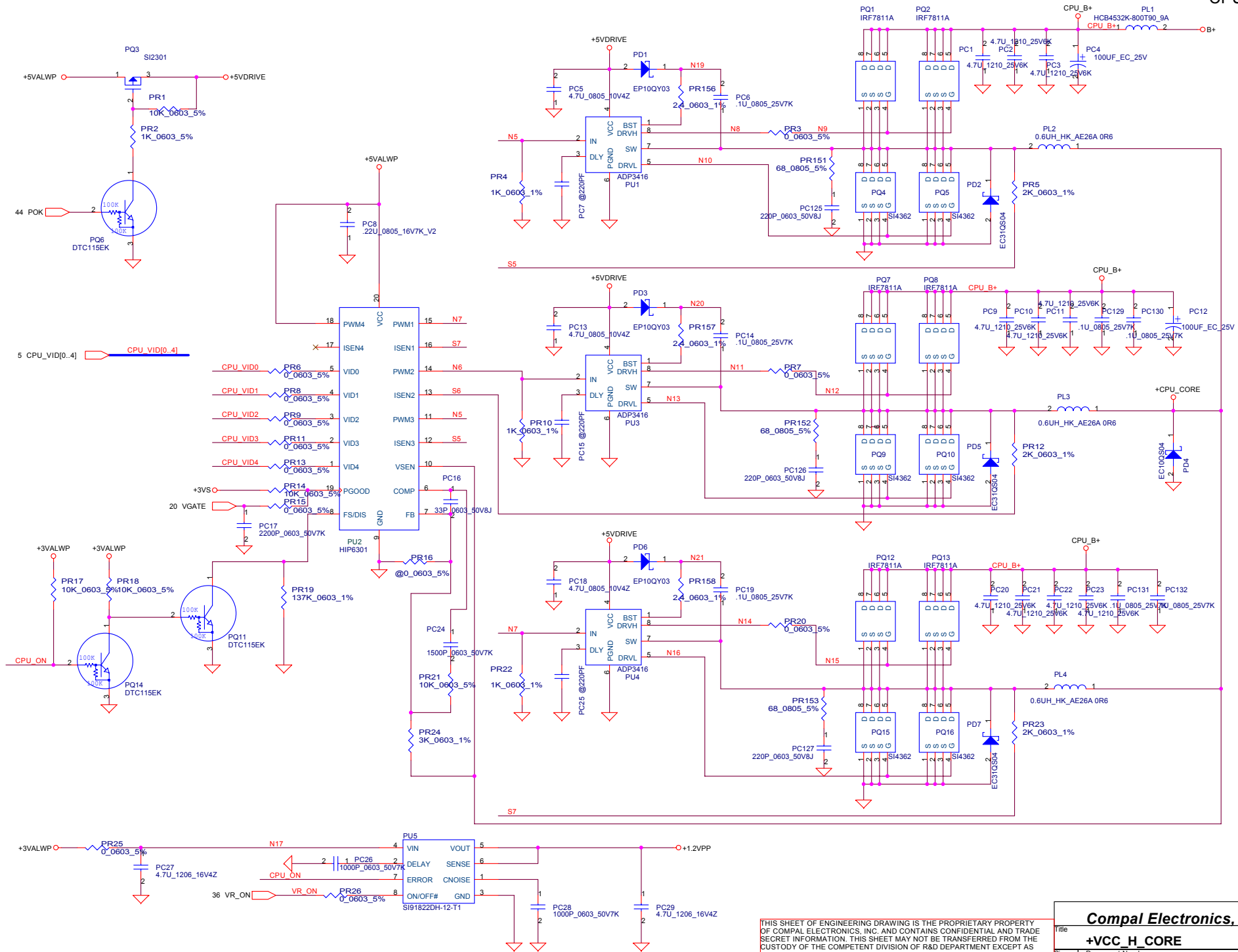
Compal Electronics, Inc.			
Title DDR / 2.5V / 1.25V			
Size B	Document Number LA1541		Rev 0.3
Date: 星期二, 十月 29, 2002	Sheet	45 of 48	

POWER_SEL	+GPU_CORE	
L	1.2V	Unmount PR159/PR160/PQ52/PQ53 PR39=97.6K_0603_1%
H	1.35V	Mount PR159/PR160/PQ52/PQ53 PR39=124K_0603_1%

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Compal Electronics, Inc.		
Title VGA_CORE / 1.5V		
Size B	Document Number LA1541	Rev 0.3
Date: 星期二, 十月 29, 2002	Sheet 46 of 48	

CPU-CORE



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+VCC_H_CORE

LA1541

Rev	
0.3	

Date: 星期二, 十月 29, 2002

Sheet 47 of 48

BTS88 PIR LIST

HW PIR LIST

10/29 Modified R577 to 4.3K_0402_5%
R575 to 3.3K_0402_5%
R574 to 6.2K_0402_5% for +10dB audio gain

10/29 Modified ESD diode symbol

PWR PIR LIST

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Title			
BTS88 PIR LIST			
Size	Document Number		Rev
Custom	LA1541		0.3
Date:	星期二, 十月 29, 2002	Sheet	48 of 48