

Compal Confidential

DCL513A Schematics Document

Banias ICP uFCBGA/uFCPGA Package with Montara-GM Core Logic

2004-05-05

REV: 1.0

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Title			
Cover Sheet			
Size	Document Number		Rev
	DCL55 LA-2201		1.0
Date:	星期一, 八月 16, 2004		Sheet 1 of 43

Mobile Intel Celeron Processor
uFCBGA/uFCPGA CPU
478 pin **page 4,5**

Thermal Sensor
ADM1032

page 4

Clock Generator
ICS950810CG

page 13

Fan Control page 31

LVDS & CRT Connector page 19

TV-Out Conn.
page 18

TV Encoder
CH7011 page 18

HA#(3..31) System Bus HD#(0..63)
400MHz

Montara 855GME

uFCBGA-732 pin

page 6,7,8,9

Memory
BUS(DDR)
2.5V 200/266/333MHz

DDR-SO-DIMM X2
BANK 0, 1, 2, 3
page 10,11,12

HUB-Link

PCI BUS 3.3V 33MHz

*MINI
PCI I/F*

page 24

@ 1394
Controller
VIA VT6301S
page 23

LAN
RTL 8101L
page 22

CardBus
ENE CB1410
page 20

ICH4-M

BGA-421

page 14,15,16

Diagram showing the connection of a USB connector. The pins are labeled: USB port 0, 2, 4 (USBx3) and USB conn. The voltage is 3.3V 48MHz. The page number is 26.

MBC Conn.
page 25

LED INDICATE

page 26

*Power On/Off
Reset & RTC*

page 31

DC/DC Interface
Suspend

page 34

Power Circuit	
DC/DC	
page	
36	37
38	39
40	41
42	43

```
graph TD; A[SIO LPC47N217  
page 27] --- B[PARALLEL  
page 28]; A --- C[FIR  
page 31]; B --- C;
```

LPC BUS
3.3V 33MHz

ENE KB910
LPC to X-BUS
& KBC
page 29

Winbond
W83L518D
page 2

SD/MS Slot
page 25

EC I/O Buffer
page 30

Touch Pad
page 28

BIOS page 30

Int.KBD page 28

page 26

AC-LINK

HDD

page 1

CDROM

page 1

AC97
Codec
ALC202
page 3

AMP & Phone Jack

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Block Diagram

Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期一, 八月 16, 2004	Sheet 2 of 43

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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
+VCCP	1.05V rail for Processor I/O	ON	OFF	OFF
+1.2VS	1.2VS switched power rail for GMCH	ON	OFF	OFF
+1.25VS	1.25V switched power rail	ON	OFF	OFF
+1.5VALW	1.5V power rail	ON	ON	ON
+1.5V	1.5V power rail	ON	ON	OFF
+1.5VS	1.5V power rail for GMCH	ON	OFF	OFF
+1.8VS	1.8V switched power rail	ON	OFF	OFF
+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.

Board ID Table for AD channel

Vcc	3.3V +/- 5%			
R368	100K +/- 5%			
Board ID	R361	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

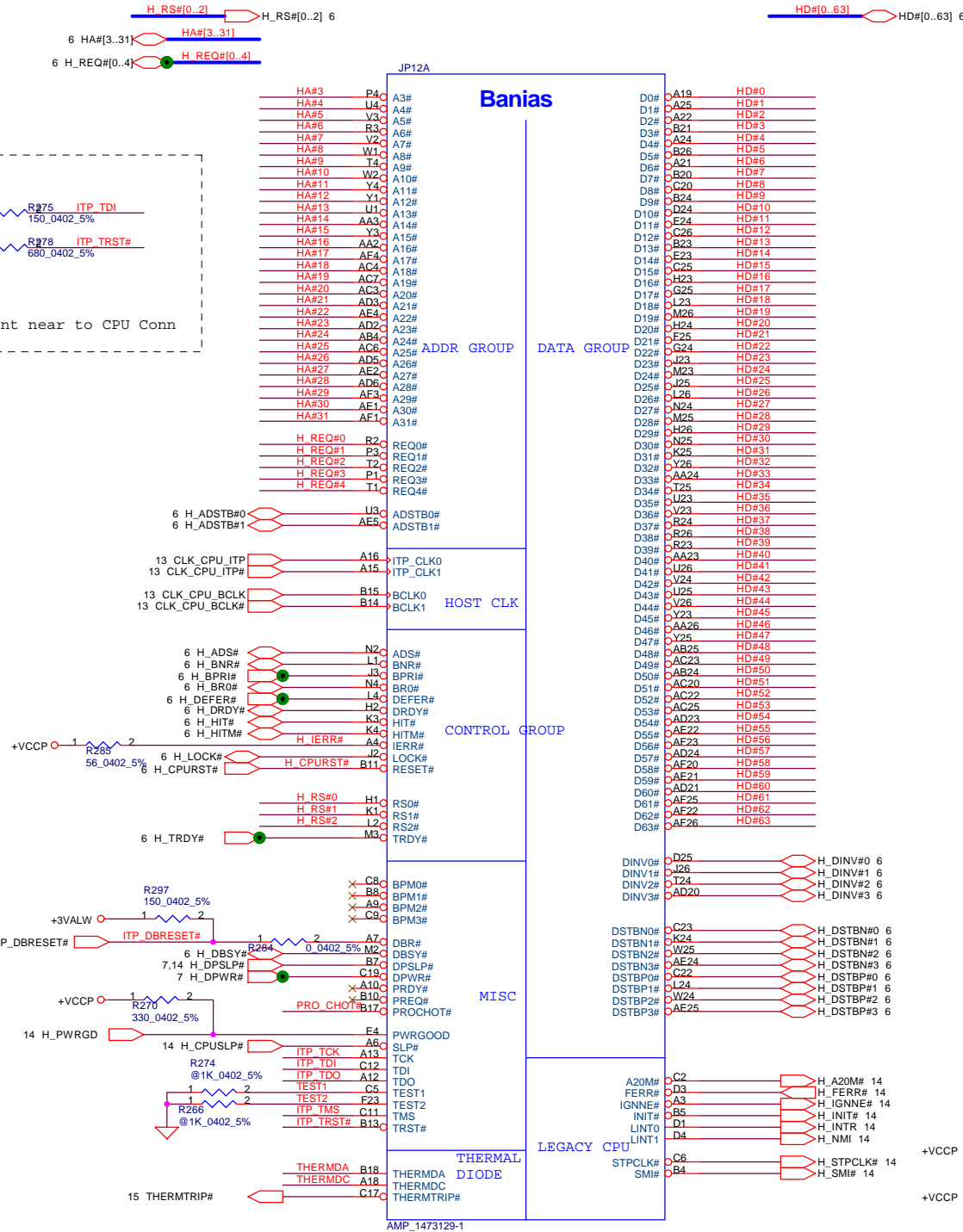
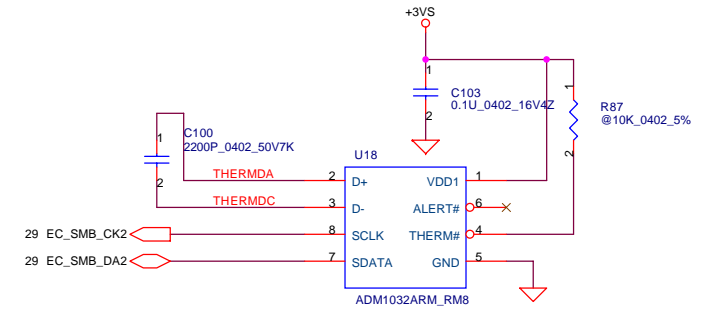
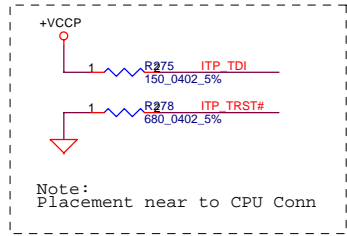
Board ID	PCB Revision
0	
1	0.1
2	0.2
3	1.0
4	
5	
6	
7	

External PCI Devices

Device	IDSEL#	REQ#/GNT#	Interrupts
CardBus	AD20	2	PIRQA
LAN	AD17	3	PIRQF
Mini-PCI	AD18/AD20	1/4	PIRQG/PIRQH
1394	AD16	0	PIRQE

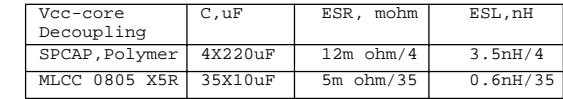
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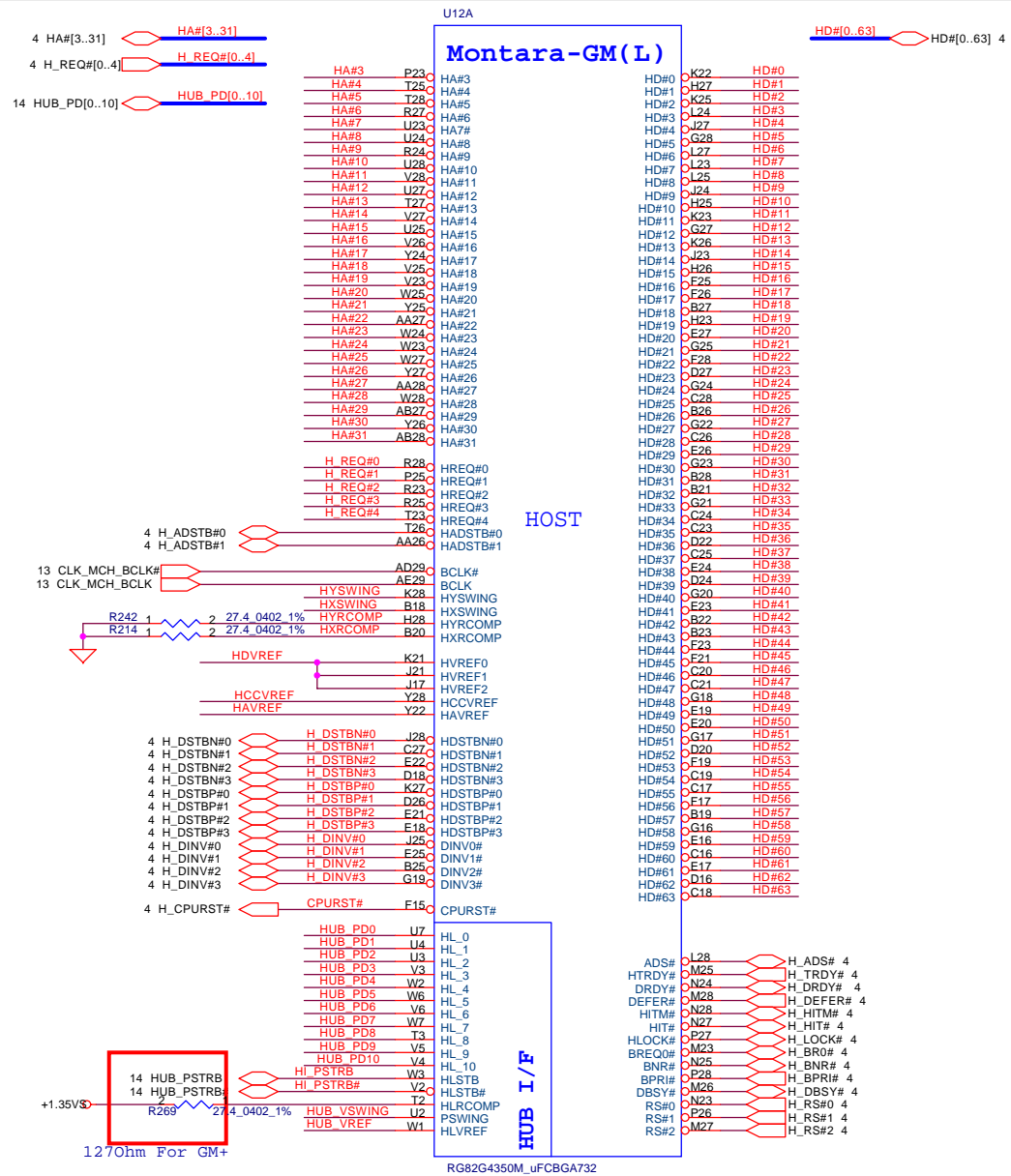
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B	DCL55 LA-2201		1.0
Date:	星期四, 五月 06, 2004		Sheet 3 of 43



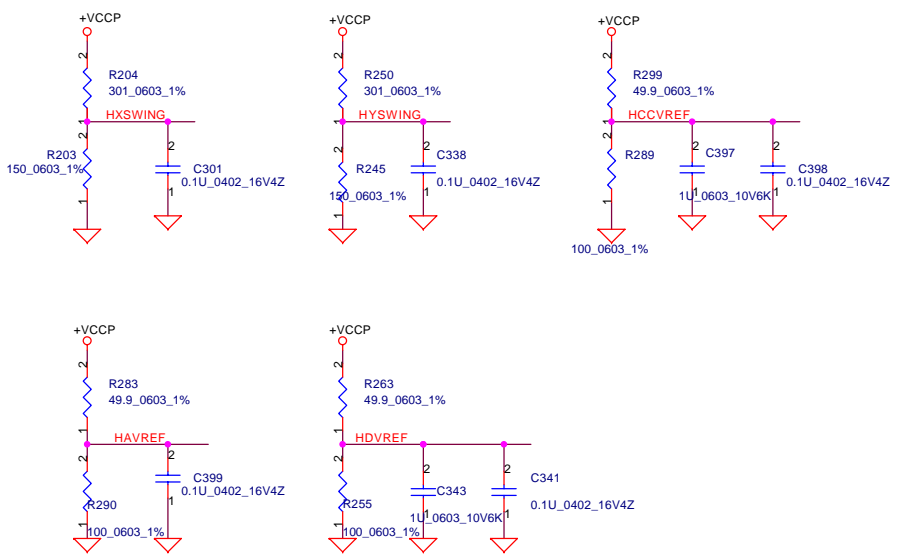
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Banias Processor in mFCPGA479 with ITP			
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Date:	星期四, 五月 06, 2004	Sheet	4 of 43

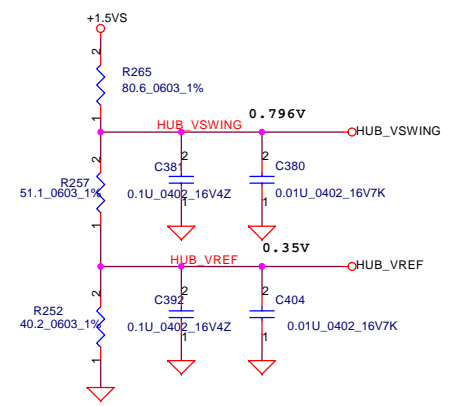




HOST REF VOLTAGE



HUB I/F REF VOLTAGE



18 DVOC_D[0..11] ← DVOC_D[0..11]

no TV OUT mount R253

DVOCB_CLKINT

R253
100K_0402_5%

18 DVOCB_CLKINT

18 DVOC_CLK
18 DVOC_CLK#
18 DVOC_HSYNC
18 DVOC_VSYNC

18 MI2CCLK
18 MI2CDATA

no TV out mount R466 , Del R251,R235

+1.5VS

R466
1K_0402_5%

DVODETECT

R251
@1K_0603_1%

+1.5VS

10K_0603_1%

15 RTCCCLK

15 AGP_BUSY#

13 CLK_MCH_66M

Montara-GM(L)

DAC

DVO

LVDs

CLKs

MISC

NC

R3
R5
R6
R4
P6
P5
N5
P2
N2
N3
M1
M5

P3
P4
T6
T5
C13
M2

G2
M3

J3
J2
K6
L2
L5
L3
H5

K7
N6
N7
M6
P7
T7

K5
K1
K3
K2
J6
J5
H2
H1
H4
H6
G3

E5
F5
E3
E2
G5
F4
G6
F6

L7
D5
F1
F7
D1
Y3

AA5
F2
F3
B2
B3
C2
C3
C4
D2
D3
D7
L4

RG82G4350M_uFCBGA732

C9
D9
C8
D8
A7
A8
H10
J9
E8
B6
G9

G14
E15
C15
C13
E14
C14
B13
H12
E12
C12
G11
G12
E11
C11
D14
E13
E10
F10

B4
C5

G8
F8
A5

D12
F12
B12
A10

B7
B17
H9
C6

AA22
Y23
AD28

J11
D6
AJ1

B1
AH1
A2
AJ2
A28
AJ28
B29
AH29
AJ29
AA9
AJ4

NC0
NC1
NC2
NC3
NC4
NC5
NC6
NC7
NC8
NC9
NC10
NC11

1270hm For GM+

R247
127_0603_1%

LCD DC2 R217 2 2.2K_0402_5%
LCD DD2 R216 2 2.2K_0402_5%

+3VS

R222
@510_0402_5%

+3VS

+1.5VS

GST0 R227 @1K_0402_5%
GST1 R226 @1K_0402_5%

CLK_MCH_48M

R223
@33_0402_5%

C302
@22P_0402_50V8J

CLK_SSC_66M

R211
@33_0402_5%

C284
@22P_0402_50V8J

CLK_MCH_66M

R291
@33_0402_5%

C405
@22P_0402_50V8J

I2C BUS PULL UP

RP50

MDVICLK
MDDCCLK
MDVIDATA
MDDCDATA

2.2K_0804_8P4R_5%

MI2CCLK
MI2CDATA

R249
R264
2.2K_0402_5%

DVO REF VOLTAGE

+1.5VS

R236
1K_0603_1%

GVREF

R235
C325
0.1U_0402_16V4Z

1K_0603_1%

Starp pin list

LCLKCTLB: High for P4
N.C. for Banias(default low)
DVODETECT: Low to enable DVO
High to disable DVO

GST0	GST1	PSB/Sys Mem/ GFX Core
0	0	400/266/200 (default)
0	1	400/200/200
1	0	400/200/133

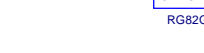
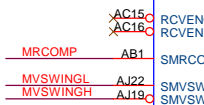
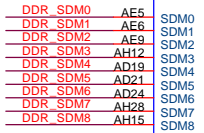
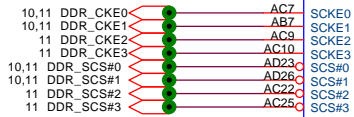
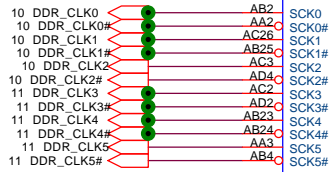
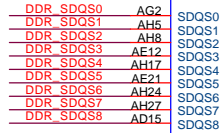
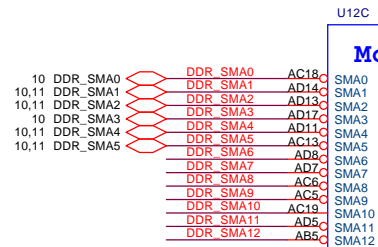
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Sheet 7 of 43

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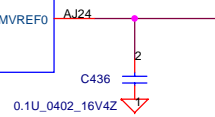
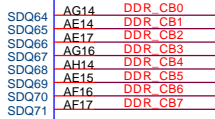
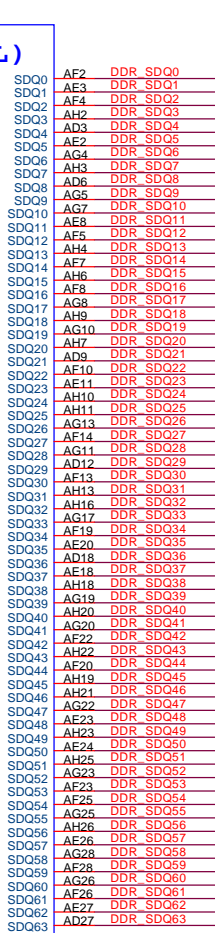


U12C

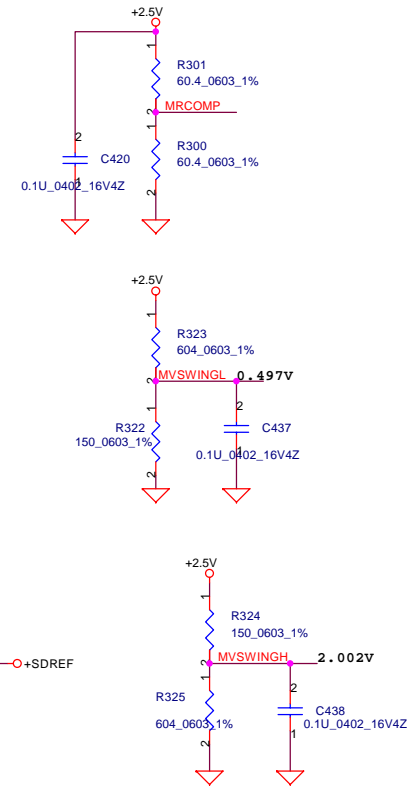
Montara-GM(L)

MEMORY

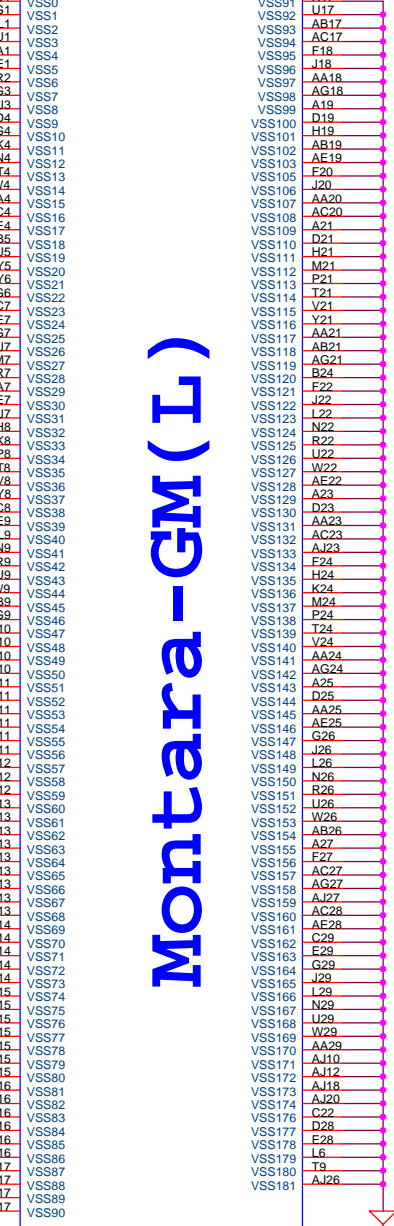
RG82G4350M_uFCBGA732



DDR REF & SWING VOLTAGE



U12D



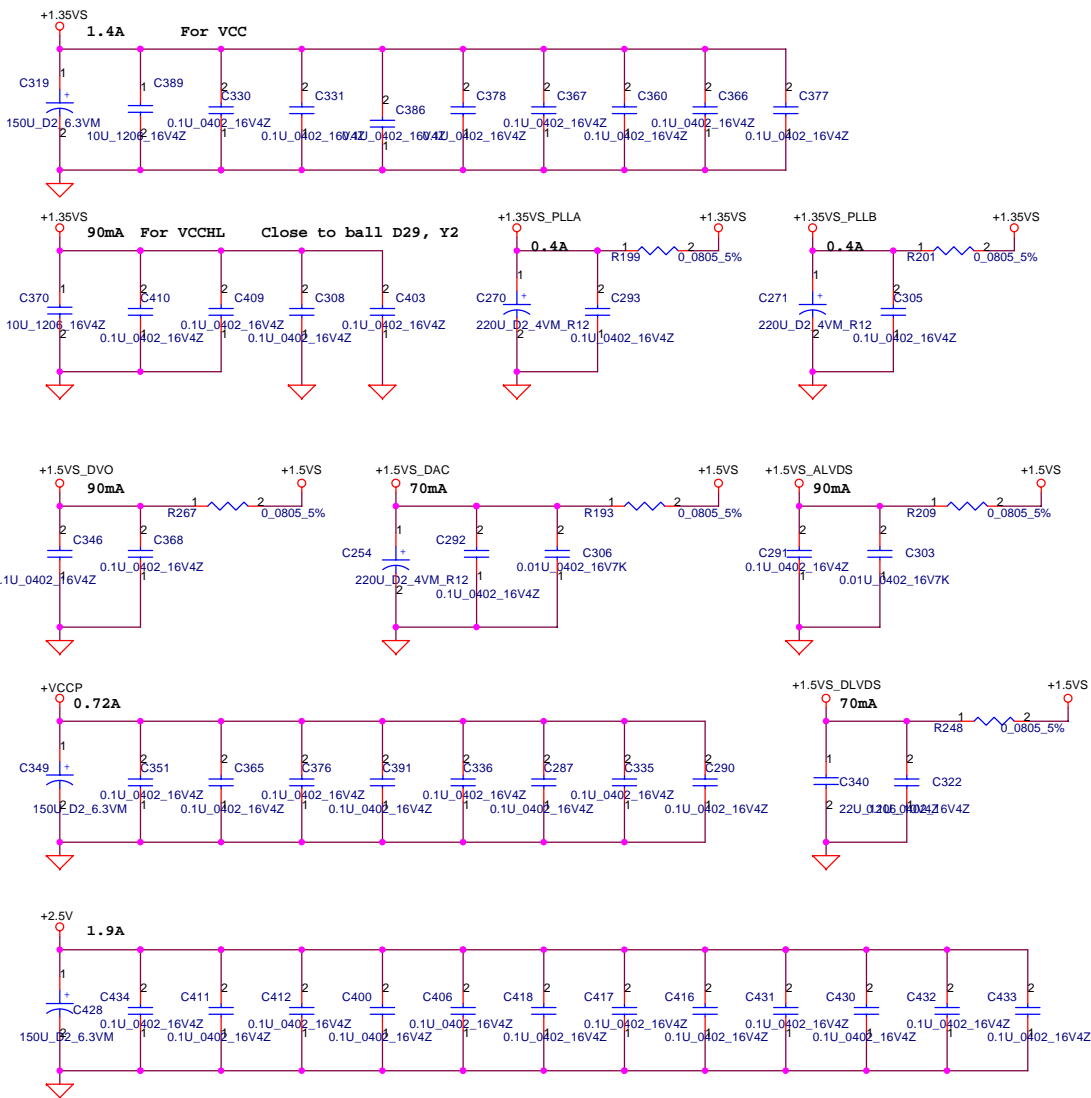
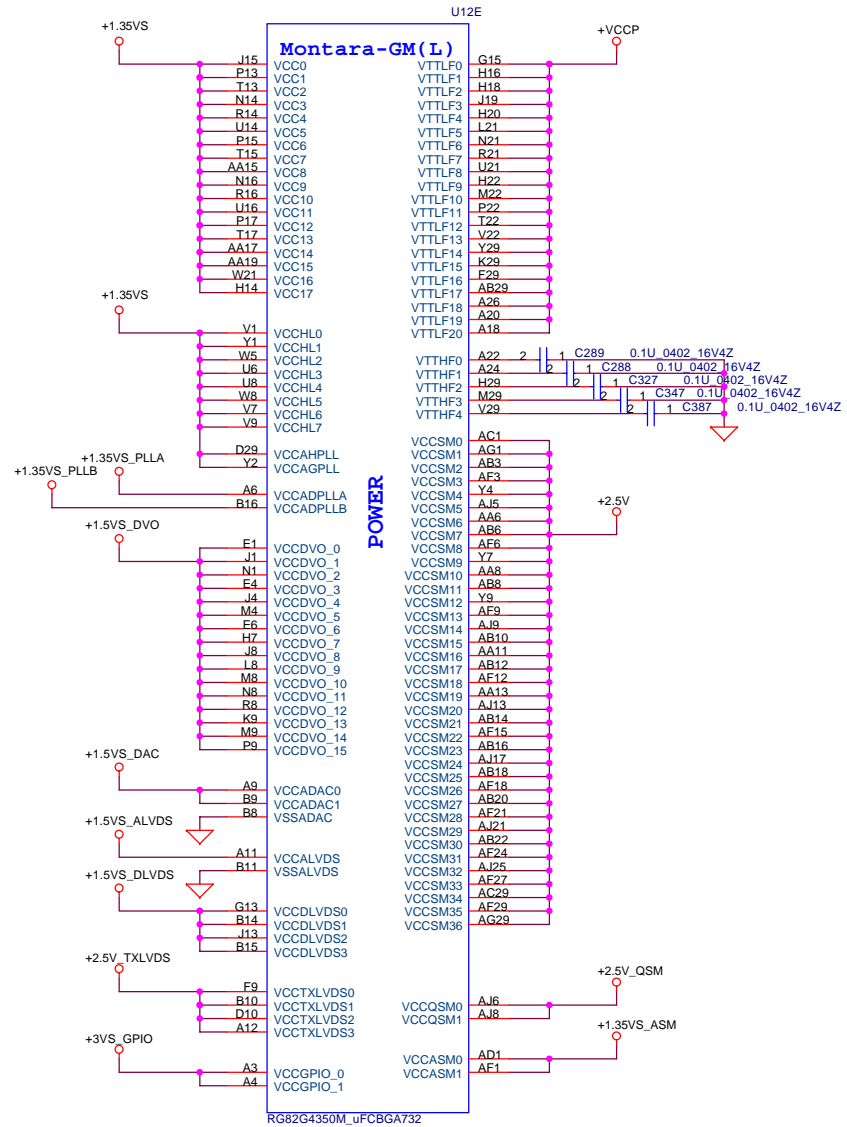
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Date			
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Sheet			
8 of 43			
Rev			
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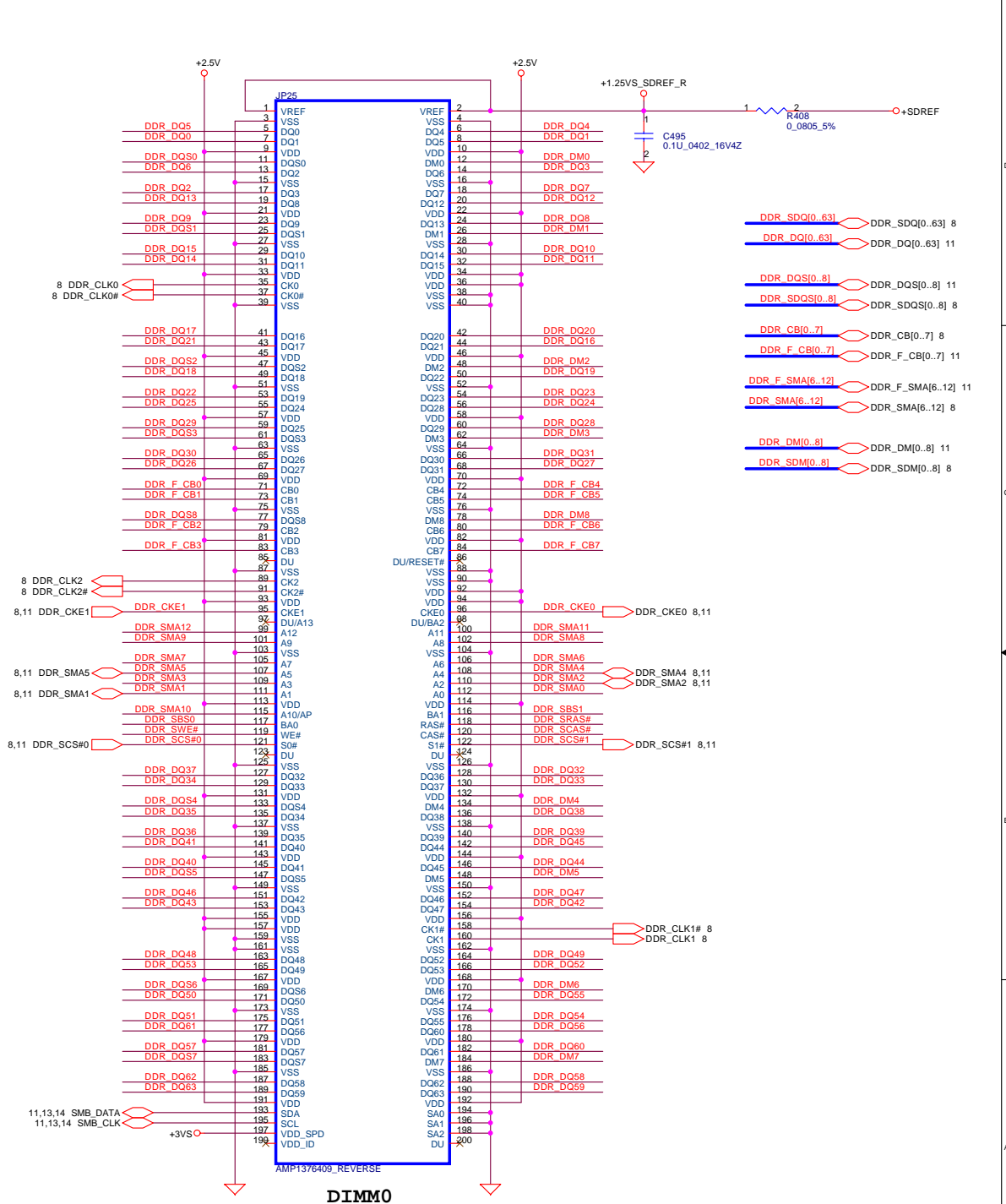
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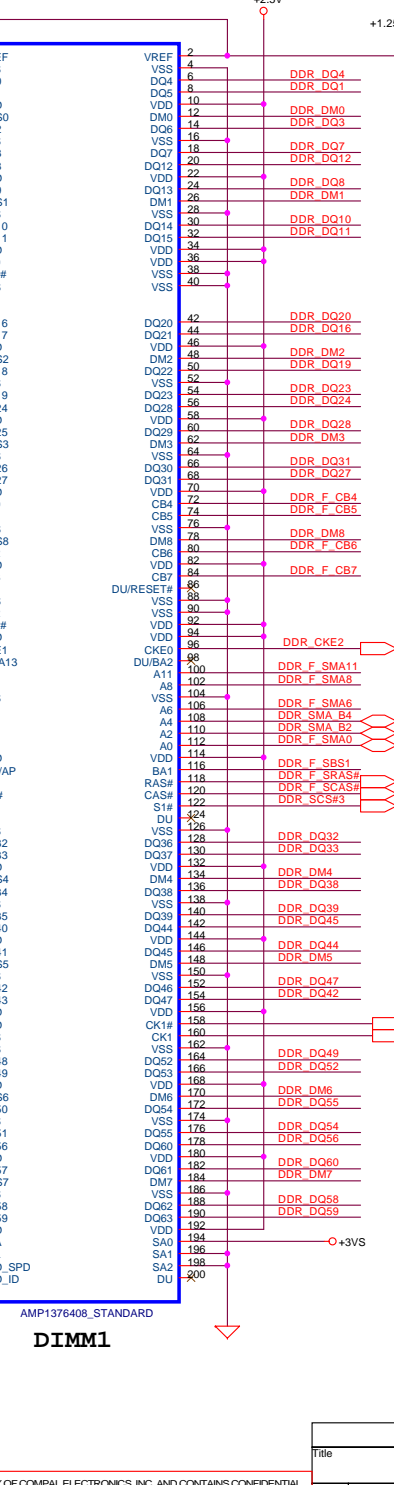
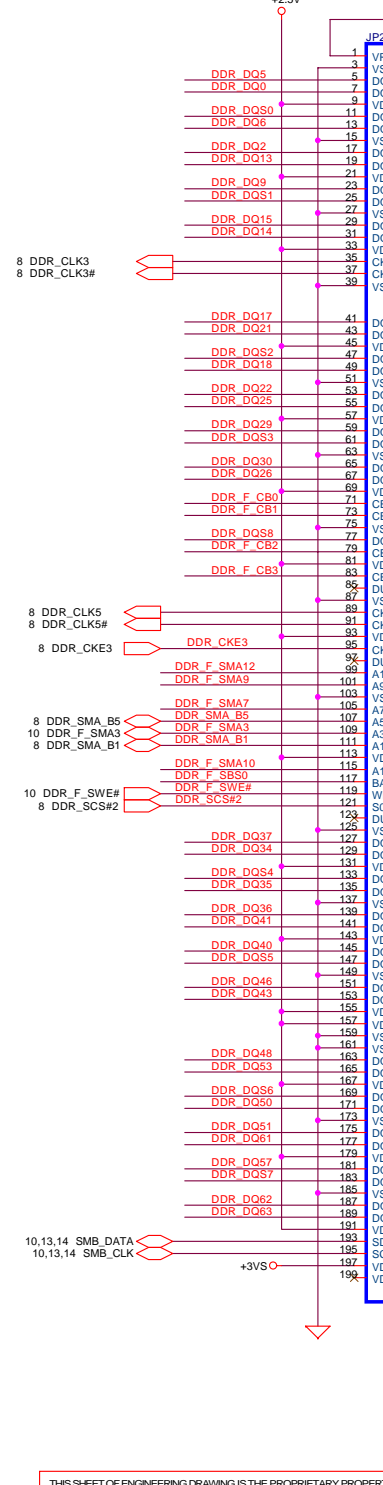
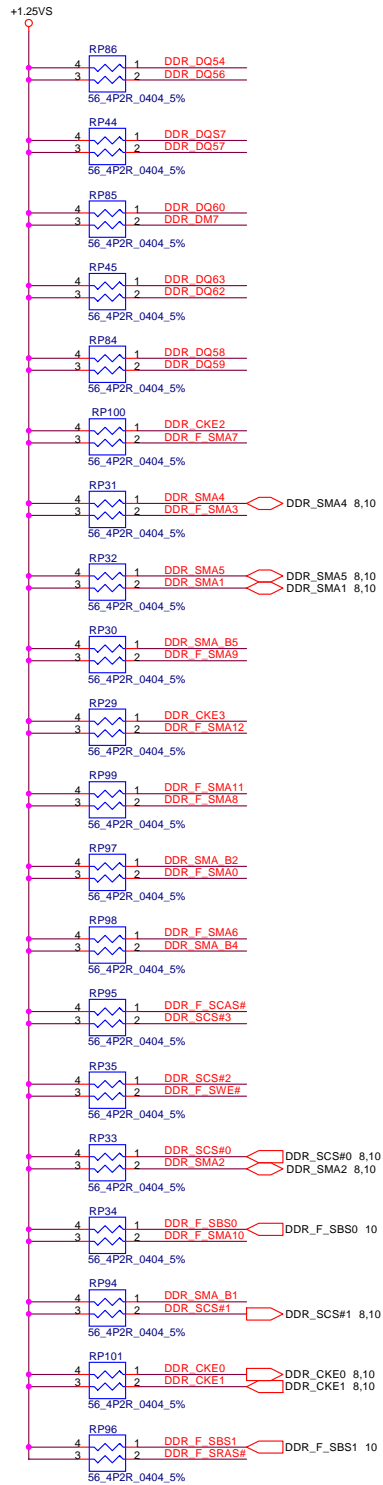
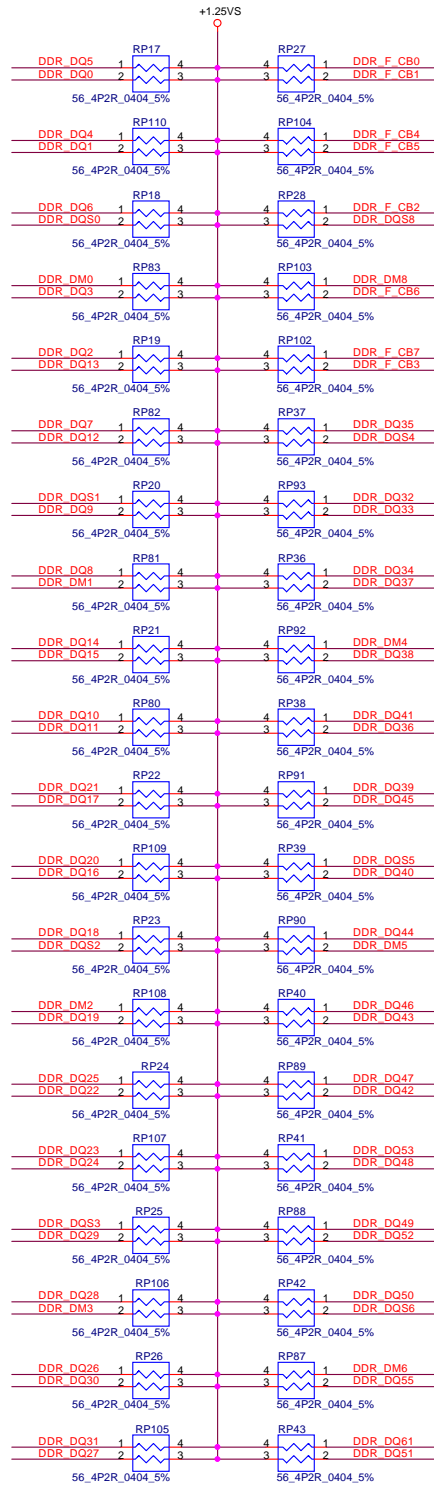


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Size	Document Number DCL55 LA-2201		Rev 1.0
Date:	星期四, 五月 06, 2004	Sheet	9 of 43



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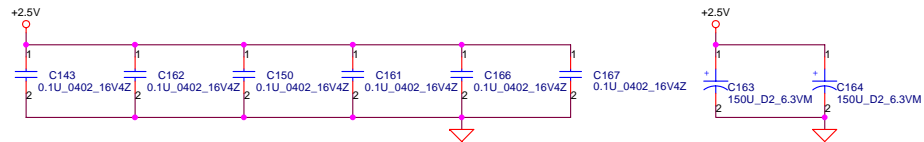
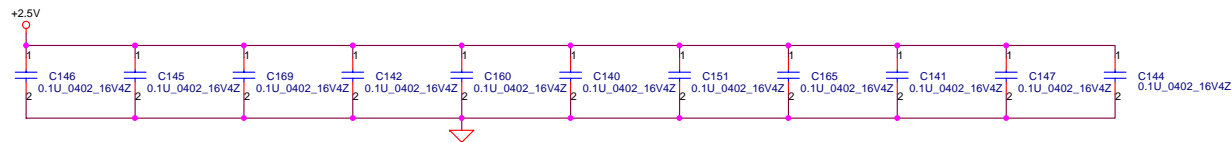


- DDR_F_SMA[6..12] 10
- DDR_DQ[0..63] 10
- DDR_DQS[0..8] 10
- DDR_F_CB[0..7] 10
- DDR_DM[0..8] 10

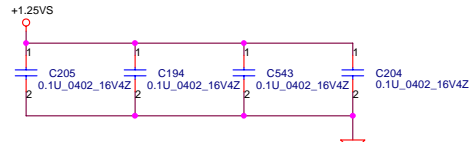
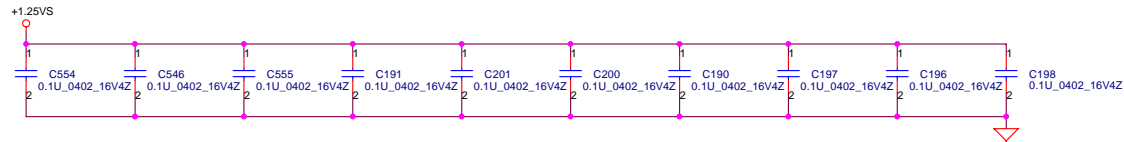
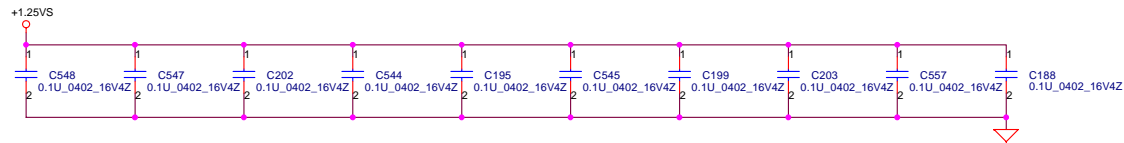
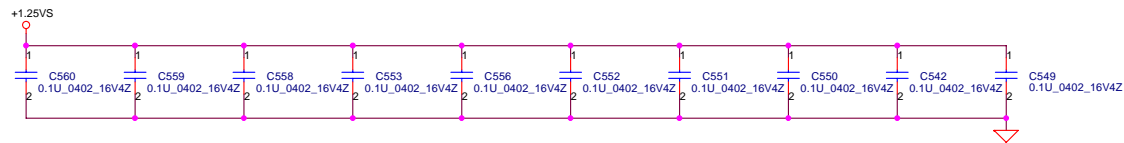
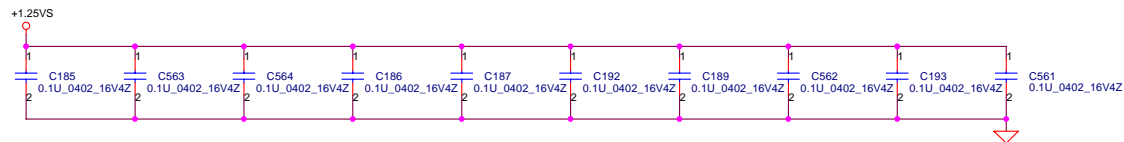
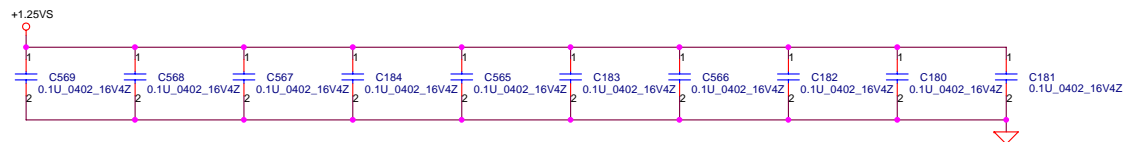
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DDR-SODIMM SLOT1			
Title	Document Number	Rev	
	DCL55 LA-2201	1.0	
Date:	星期四, 五月 06, 2004	Sheet	11 of 43

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



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



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Title			
DDR SODIMM Decoupling			
Size	Document Number		Rev
	DCL55 LA-2201		1.0
Date:	星期四, 五月 06, 2004		Sheet 12 of 43

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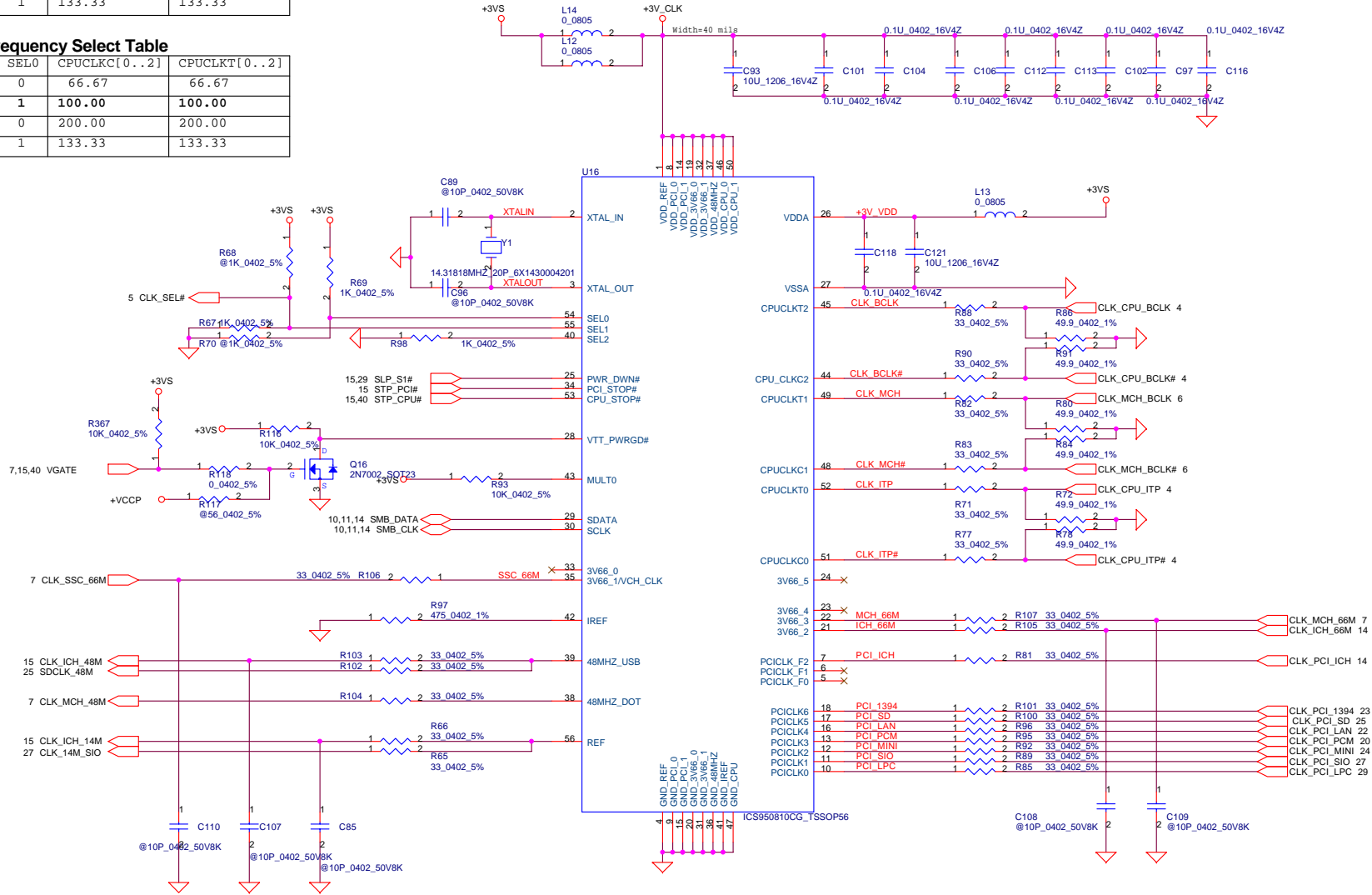
ICS950810 Frequency Select Table

SEL2	SEL1	SEL0	CPUCLKC[0..2]	CPUCLKT[0..2]
0	0	0	166.67	166.67
0	0	1	100.00	100.00
0	1	0	200.00	200.00
0	1	1	133.33	133.33

CY28346-2 Frequency Select Table

SEL2	SEL1	SEL0	CPUCLKC[0..2]	CPUCLKT[0..2]
0	0	0	66.67	66.67
0	0	1	100.00	100.00
0	1	0	200.00	200.00
0	1	1	133.33	133.33

Clock Generator



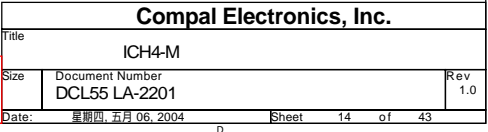
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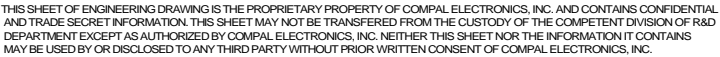
Compal Electronics, Inc.

Clock Generator

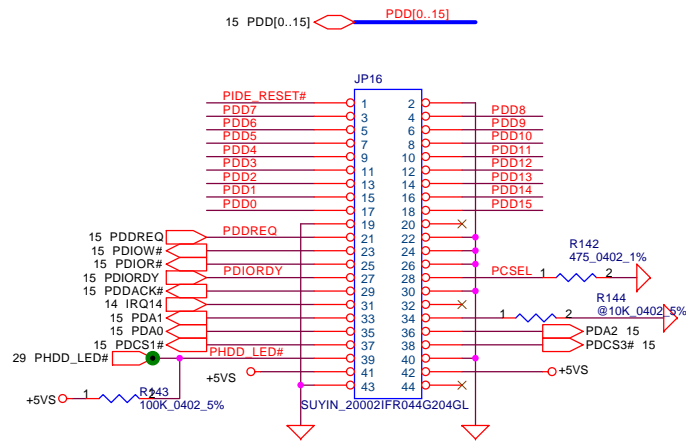
Size	Document Number	Rev
B	DCL55 LA-2201	1.0

Date: 星期四, 五月 06, 2004 Sheet 13 of 43

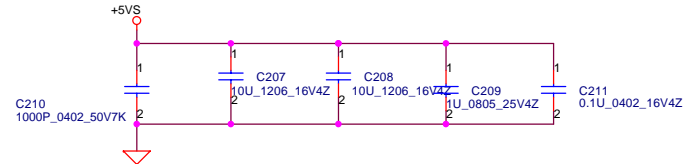




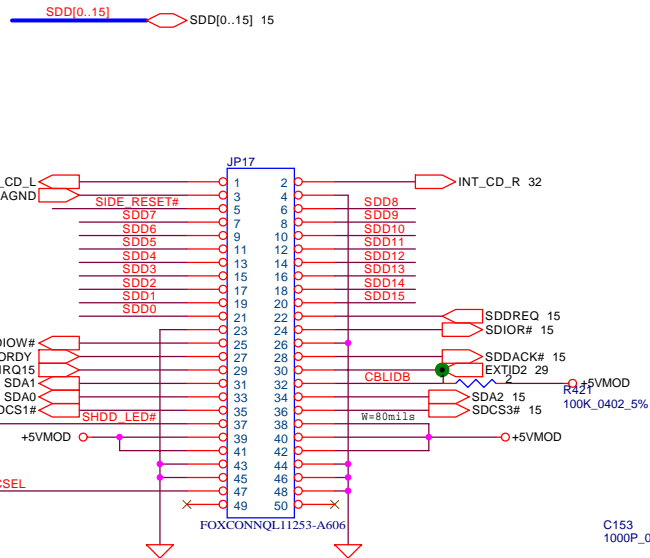
HDD Connector



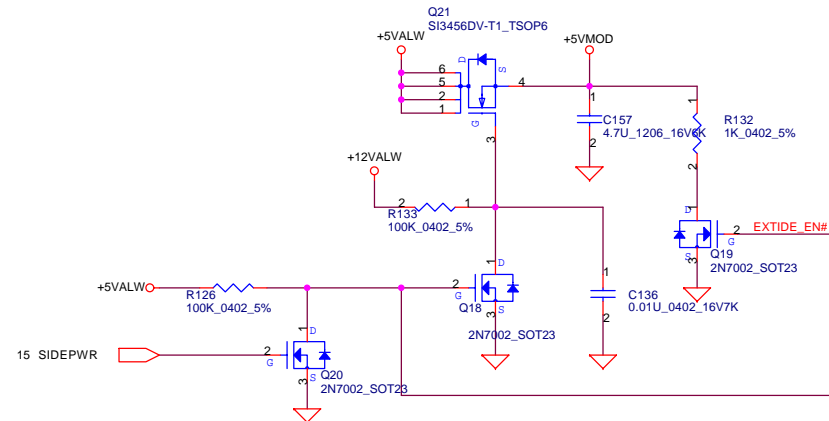
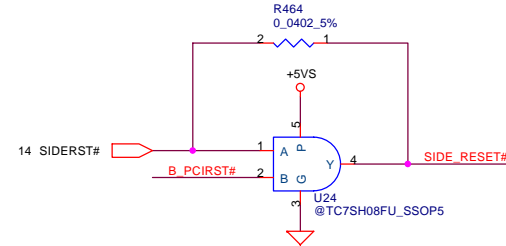
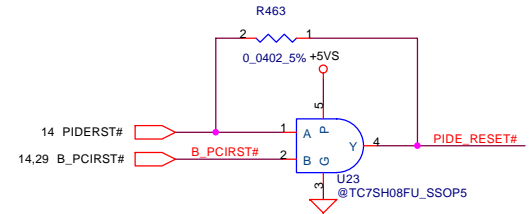
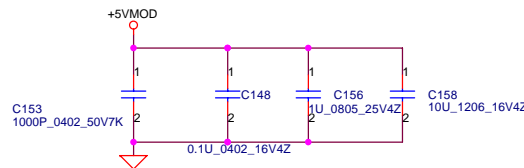
Placea caps. near HDD
CONN.



CD-ROM Connector



Placea caps. near CDROM
CONN.



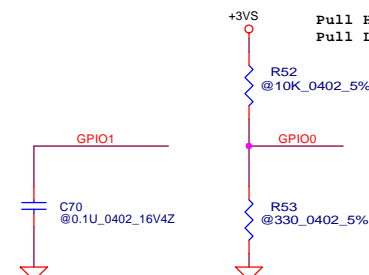
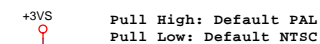
SI3456DV: N CHANNEL
VGS: 4.5V, RDS: 65 mOHM
Id(MAX): 5.1A
VGS,+20V

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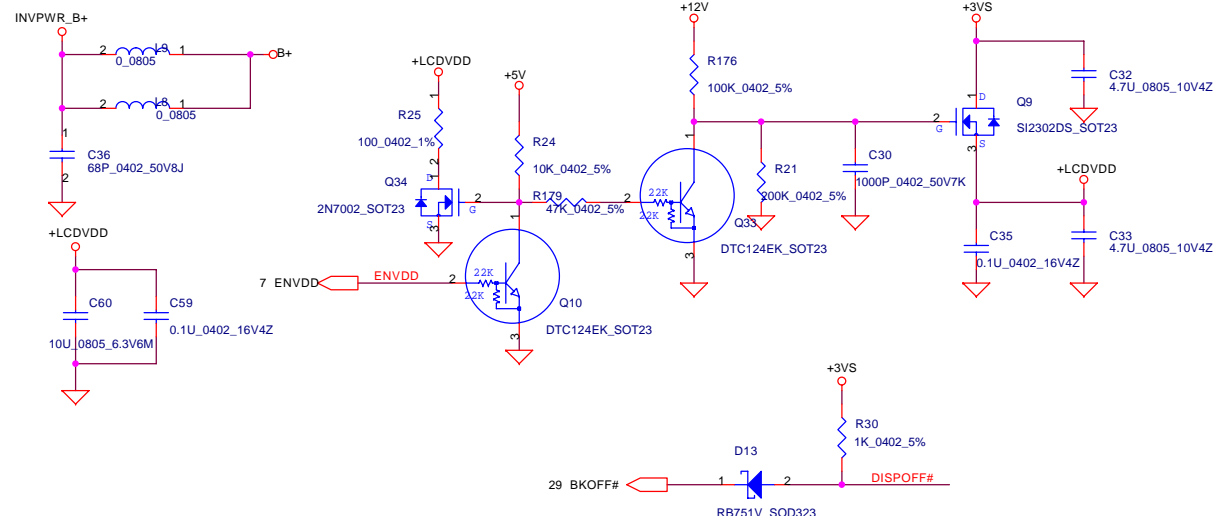
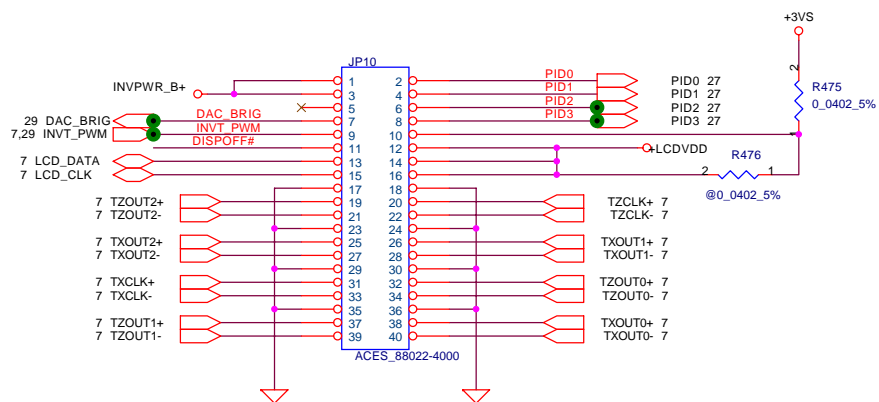
Compal Electronics, Inc.

Title		
IDE/CD-ROM Module		
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 17 of 43

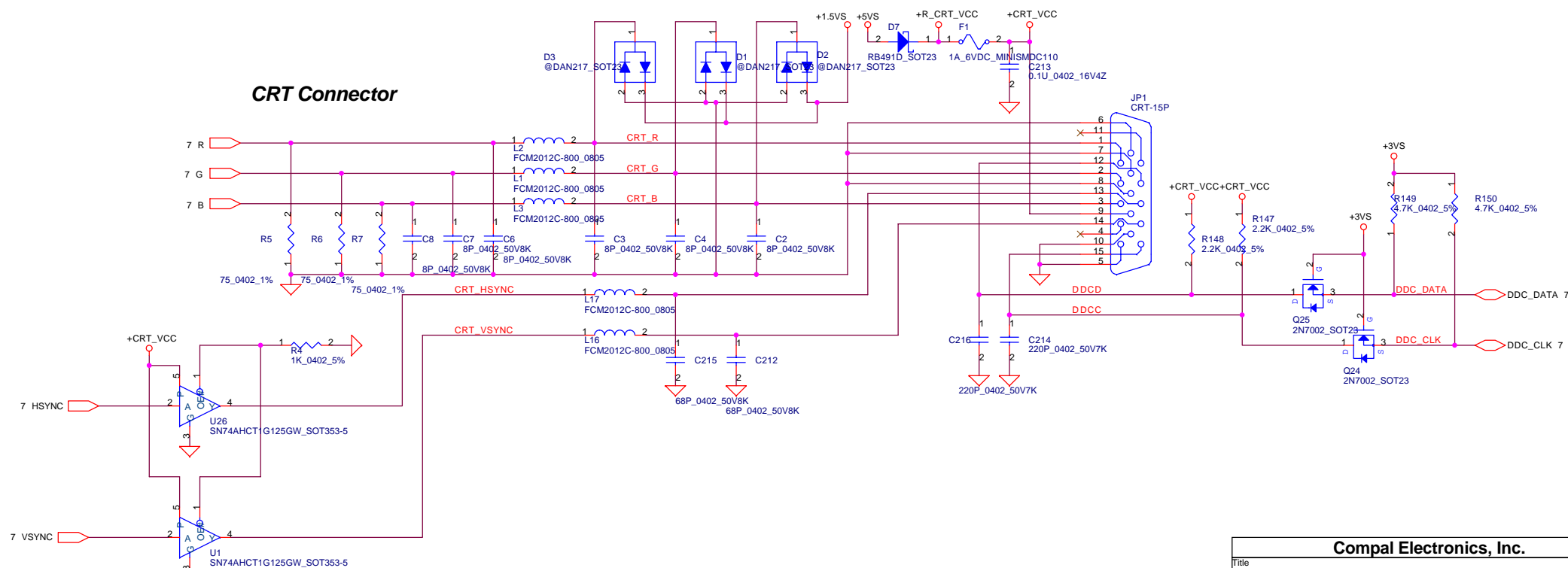
TV Encoder



LVDS Connector



CRT Connector



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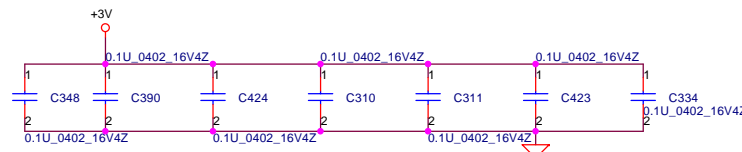
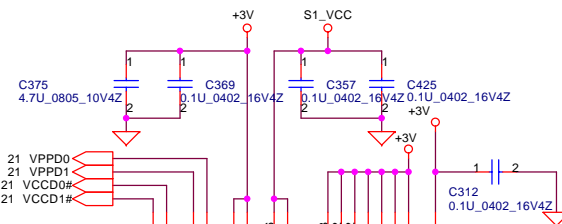
14,22,23,24 PCI_AD[0..31]

PCI_AD31 3
PCI_AD30 4
PCI_AD29 5
PCI_AD28 7
PCI_AD27 8
PCI_AD26 9
PCI_AD25 10
PCI_AD24 11
PCI_AD23 15
PCI_AD22 16
PCI_AD21 17
PCI_AD20 19
PCI_AD19 23
PCI_AD18 24
PCI_AD17 25
PCI_AD16 26
PCI_AD15 38
PCI_AD14 39
PCI_AD13 40
PCI_AD12 43
PCI_AD11 45
PCI_AD10 46
PCI_AD9 47
PCI_AD8 49
PCI_AD7 51
PCI_AD6 52
PCI_AD5 53
PCI_AD4 54
PCI_AD3 55
PCI_AD2 56
PCI_AD1 57
AD0

PQFP 144
22.2 X 22.2 X 1.60

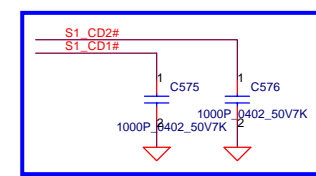
14,22,23,24 PCI_C/BE#3 12
14,22,23,24 PCI_C/BE#2 27
14,22,23,24 PCI_C/BE#1 37
14,22,23,24 PCI_C/BE#0 48
7,14,18,21,22,23,24,25,27 PCIRST# 20
14,22,23,24 PCI_FRAME# 28
14,22,23,24 PCI_IRDY# 29
14,22,23,24 PCI_TRDY# 32
14,22,23,24 PCI_DEVSEL# 33
14,22,23,24 PCI_STOP# 34
14,22,23,24 PCI_PERR# 35
14,22,24 PCI_SERR# 36
14,22,23,24 PCI_PAR# 38
14 PCI_REQ#2 1
14 PCI_GNT#2 2
13 CLK_PCI_PCM 21
29,30,34,39,42 SUSP# 1
22,23,24,29 PCM_PME# 58
PCI_AD20 1
14 PCI_PIRQA# 1
29 PCM_RI# 64
14,25,27,29 SIRQ 65
15,22,24,27,29 PM_CLKRUN# 67
21 CBRST# 66

CLK_PCI_PCM
R259 10_0402_5%
C361 18P_0402_50V8K



S1_A[0..25]
S1_D[0..15]

CAD31/D10 144
CAD30/D9 142
CAD29/D1 141
CAD28/D8 140
CAD27/D0 139
CAD26/A0 129
CAD25/A1 128
CAD24/A2 127
CAD23/A3 124
CAD22/A4 121
CAD21/A5 120
CAD20/A6 118
CAD19/A25 116
CAD18/A7 115
CAD17/A24 113
CAD16/A17 98
CAD15/IOWR# 96
CAD14/A9 97
CAD13/IORD# 93
CAD12/A11 95
CAD11/OE# 92
CAD10/CE2# 91
CAD9/A10 89
CAD8/D15 87
CAD7/D7 85
CAD6/D13 82
CAD5/D6 80
CAD4/D12 81
CAD3/D5 77
CAD2/D11 79
CAD1/D4 76
S1_D10
S1_D9
S1_D1
S1_D8
S1_D0
S1_A0
S1_A1
S1_A2
S1_A3
S1_A4
S1_A5
S1_A6
S1_A25
S1_A7
S1_A24
S1_A17
S1_IOWR#
S1_A9
S1_IORD#
S1_OE#
S1_OE#
S1_CE2#
S1_A10
S1_D15
S1_D7
S1_D13
S1_D6
S1_D12
S1_D5
S1_D11
S1_D4
S1_D3
S1_REG#
S1_A12
S1_A8
S1_CE1#
S1_CE1#
S1_RST
S1_A23
S1_A15
S1_A22
S1_A21
S1_A20
S1_A14
S1_WAIT#
S1_A13
S1_INPACK#
S1_INPACK#
S1_WE#
S1_WE#
S1_A16
S1_BVD1
S1_WP
S1_WP
S1_A19
S1_RDY#
PCM_SPK#
S1_BVD2
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S1_VS2
S1_VS1
S1_D2
S1_A18
S1_D14



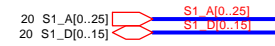
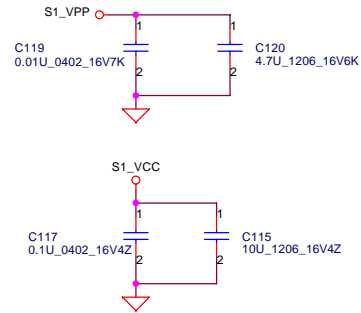
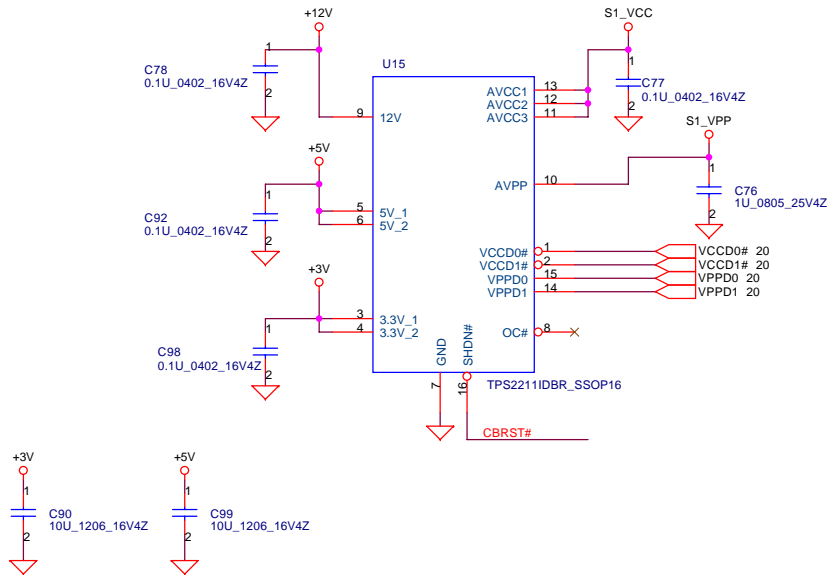
Reserve for CB1410 B0 Version

Compal Electronics, Inc.			
Title			
PCMCIA controller ENE CB1410			
Size			
Document Number			
DCL55 LA-2201			
Date			
Rev			
1.0			
Sheet			
20 of 43			

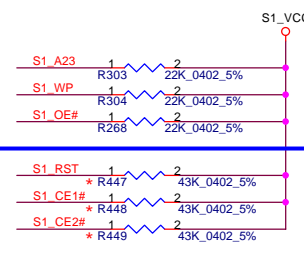
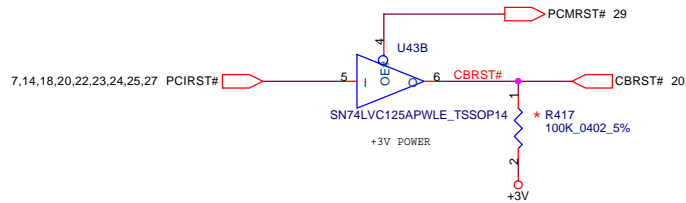
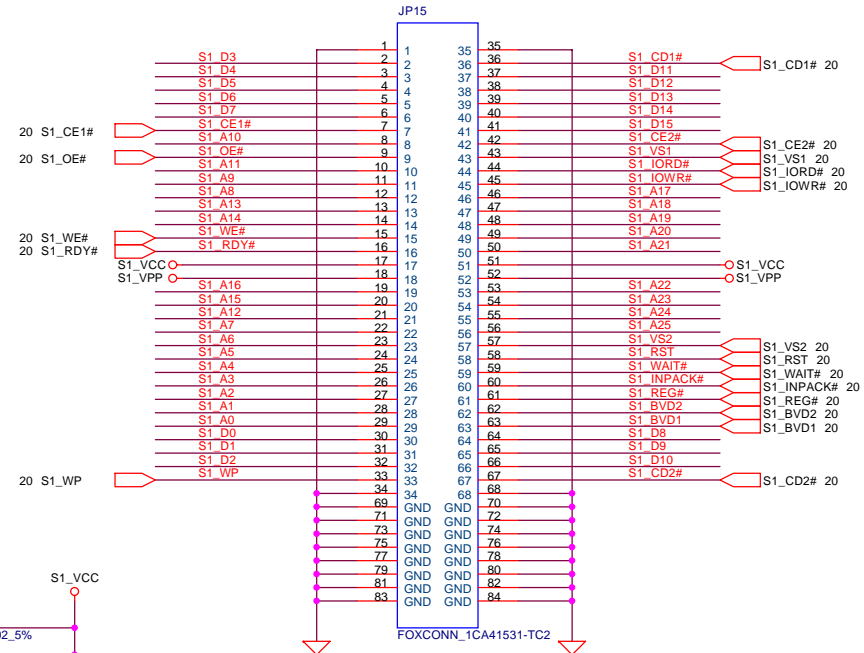
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PCMCIA Power Controller

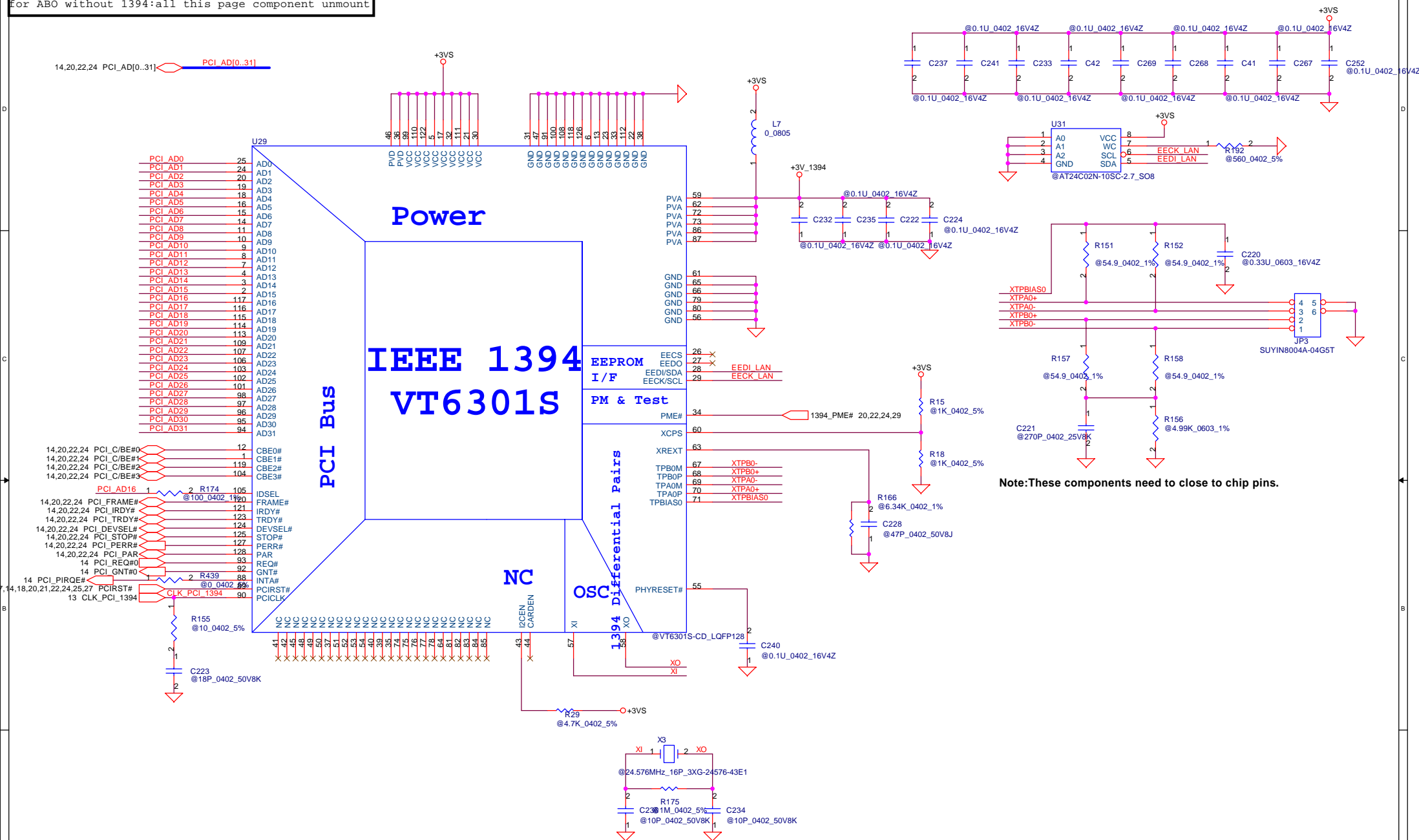


CardBus Socket



Reserve for CB1410 B0 Version


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for ABO without 1394:all this page component unmount
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Compal Electronics, Inc.

Title	IEEE-1394 VT6301S
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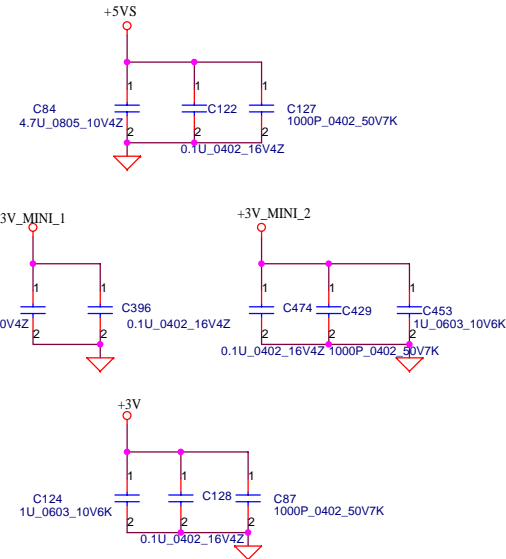
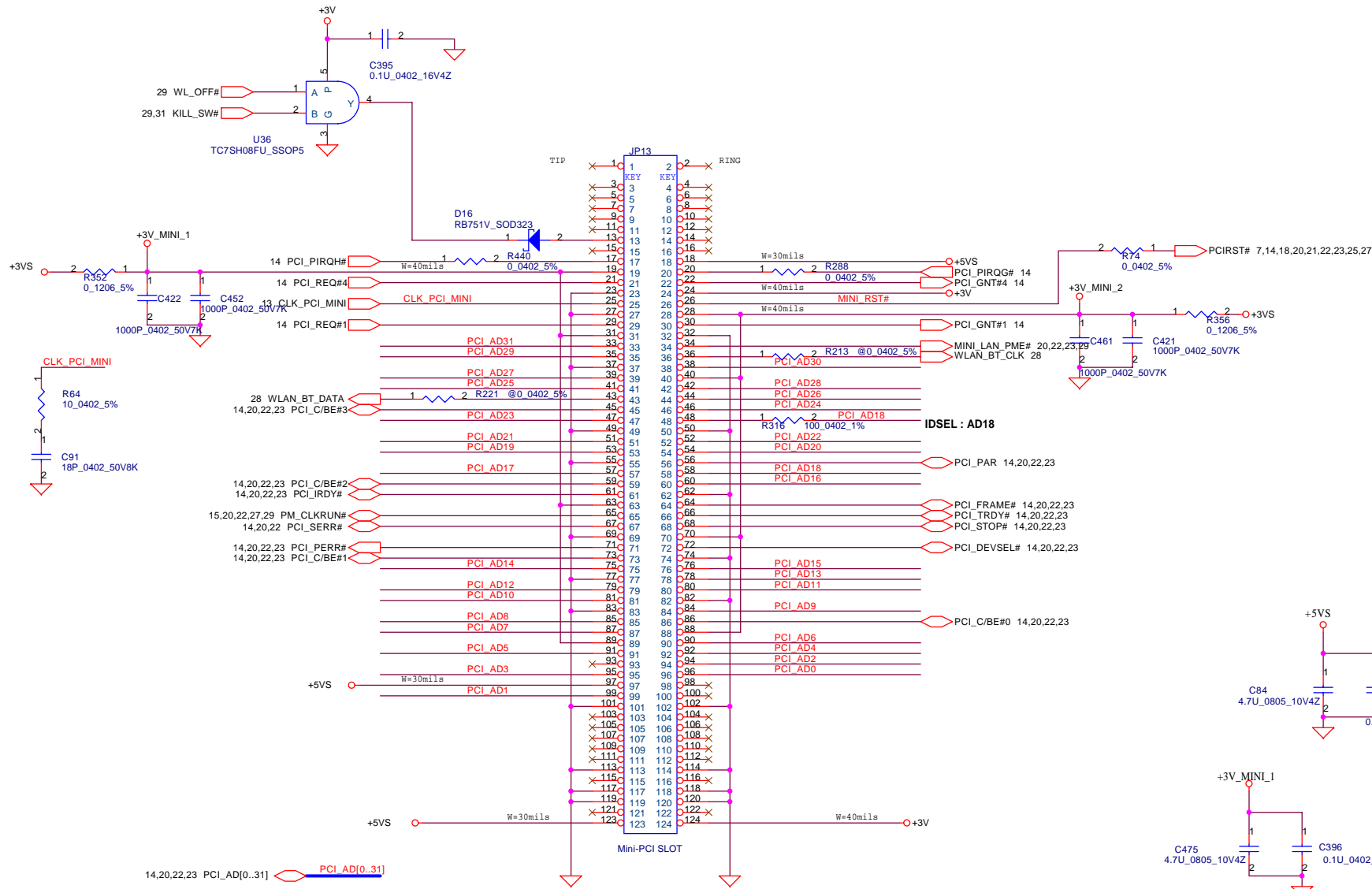
Size	Document Number
	DCL55 LA-2201

Rev	1.0
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Date: 星期四, 五月 06, 2004

Sheet 23 of 43

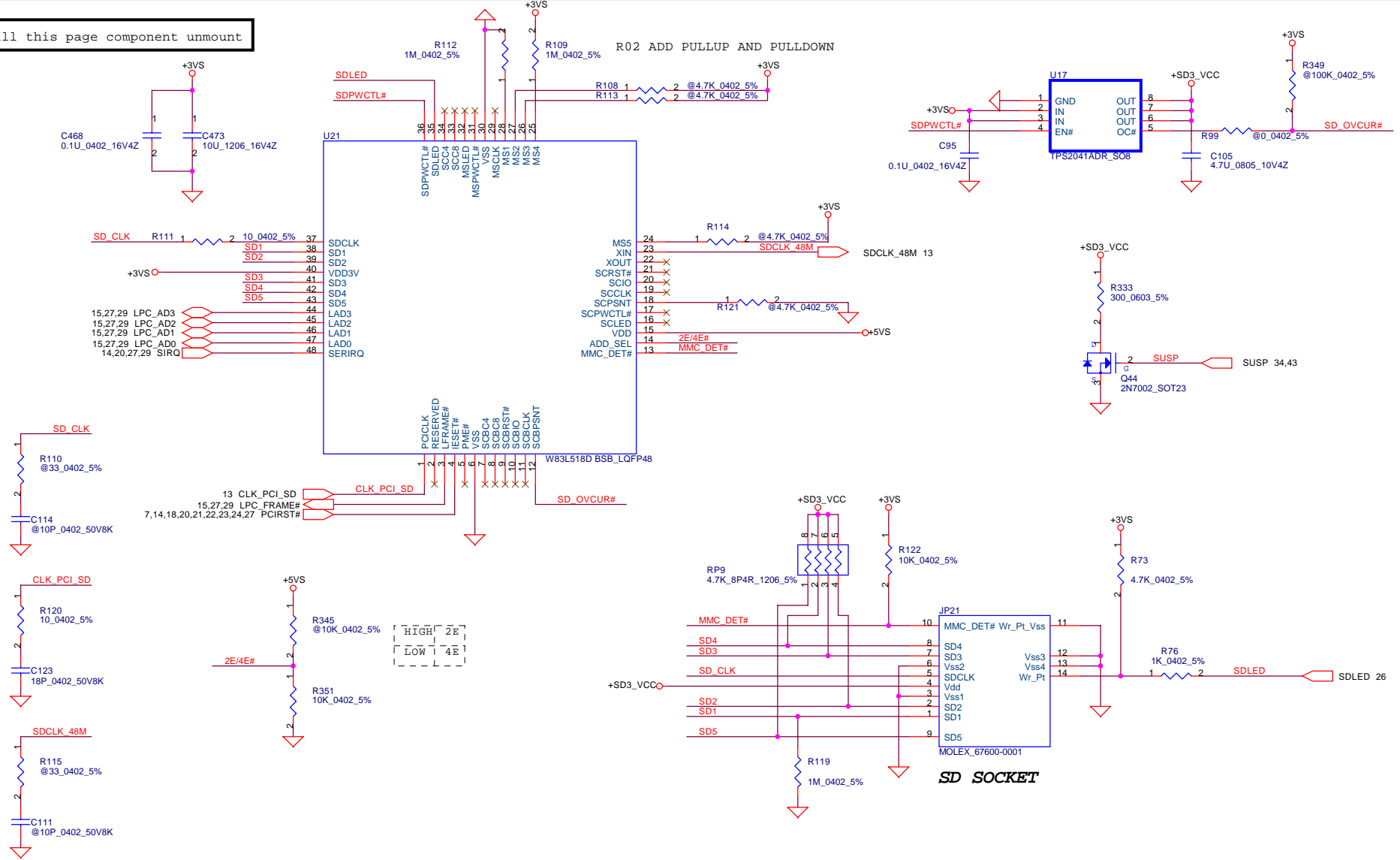
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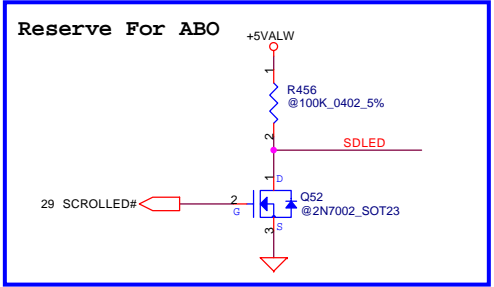
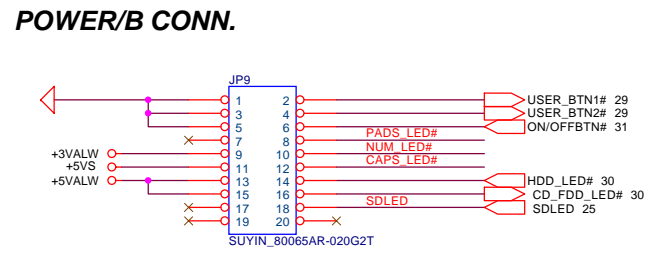
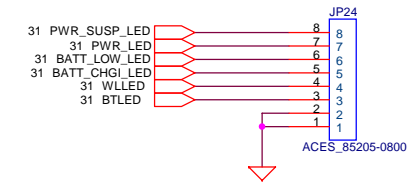
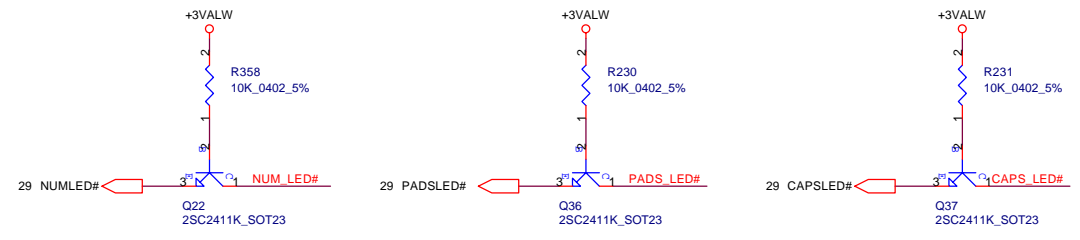
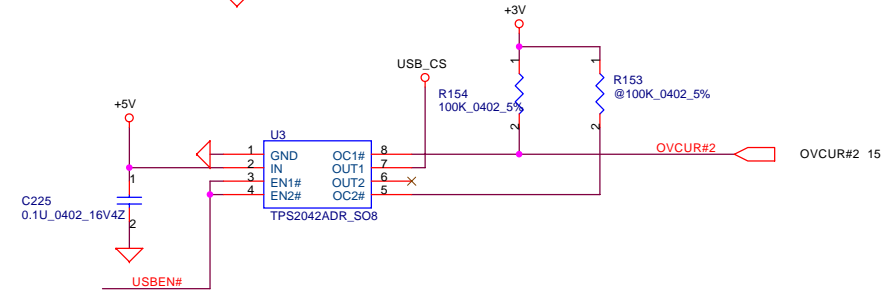
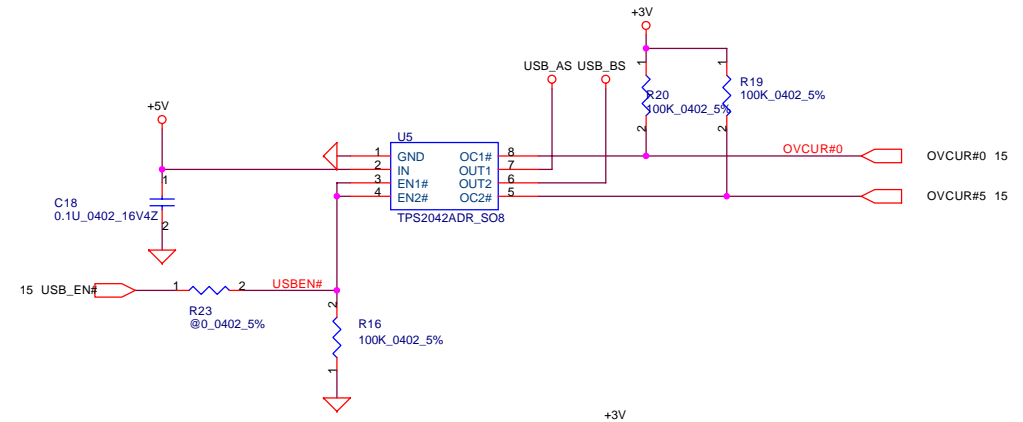
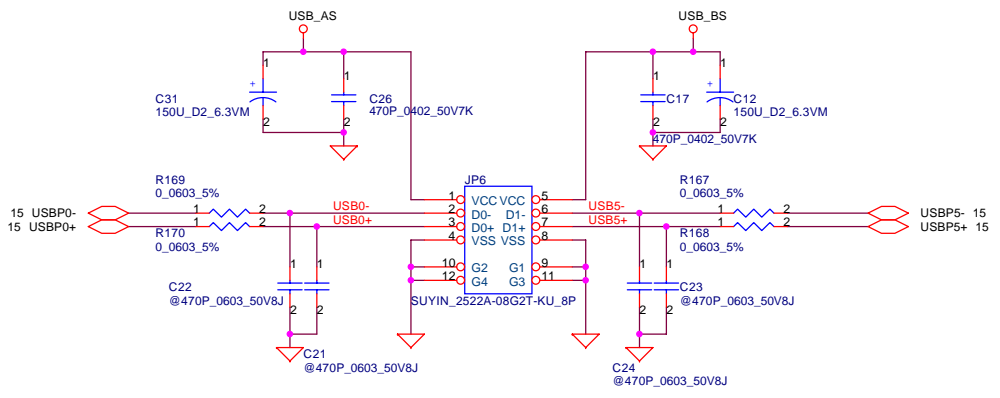
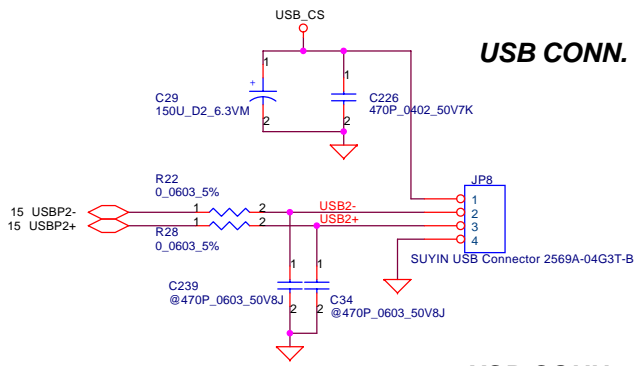


Compal Electronics, Inc.			
Title		Mini PCI Slot	
Size	Document Number	Rev	
B	DCL55 LA-2201	1.0	
Date:	星期四, 五月 06, 2004	Sheet	24 of 43

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FOR ABO: all this page component unmount

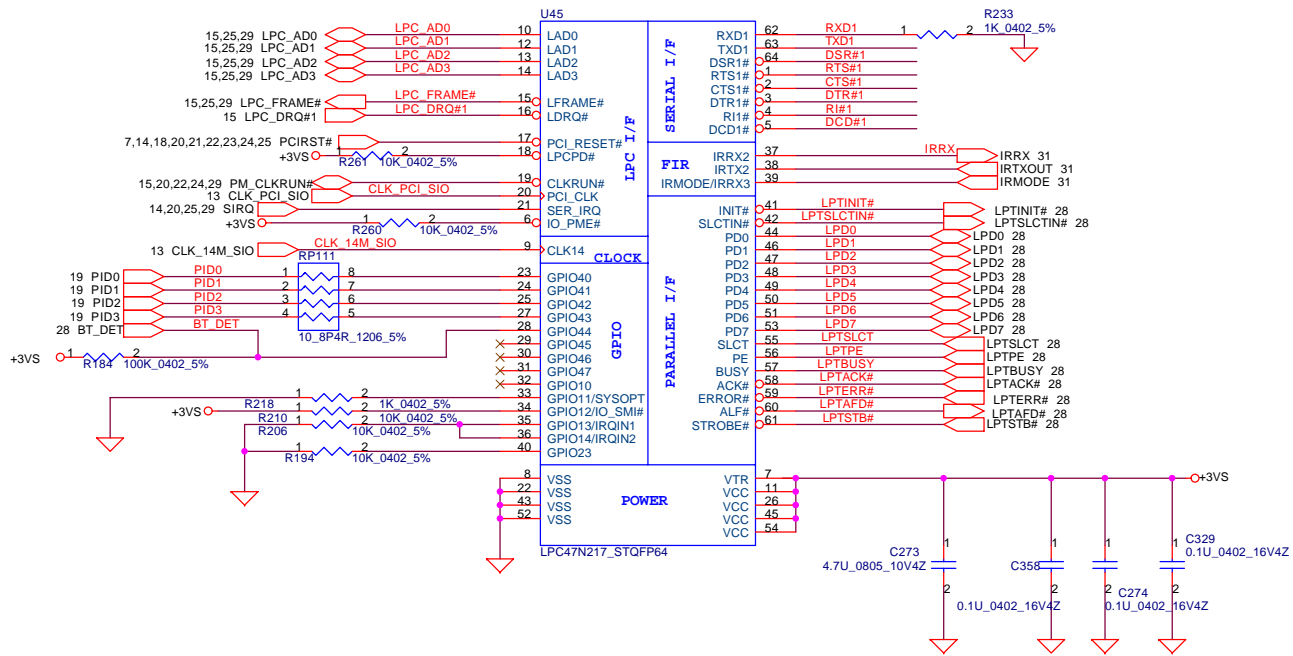




Compal Electronics, Inc.			
Title			
USB & LED			
Size	Document Number		Rev
B	DCL55 LA-2201		1.0
Date:	星期四, 五月 06, 2004		Sheet 26 of 43

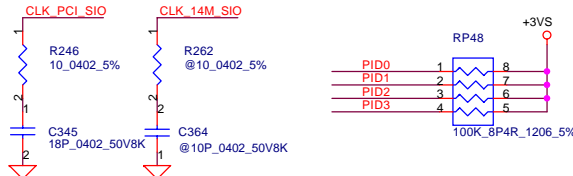
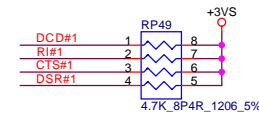
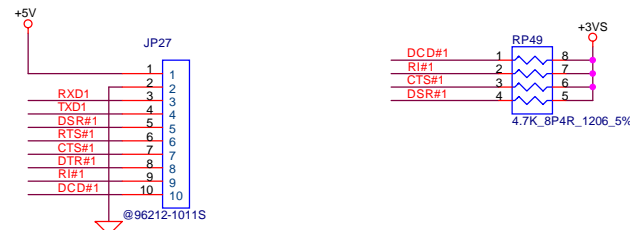
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SUPER I/O SMsC FDC47N227



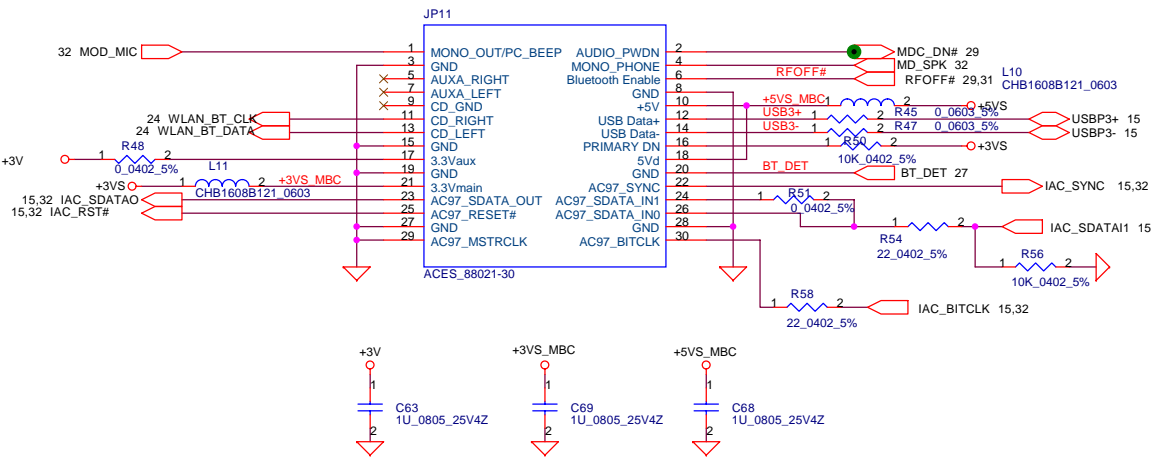
Base I/O Address
* 0 = 02Eh
1 = 04Eh

IRRX 1 R196 2
@1K_0402_5%

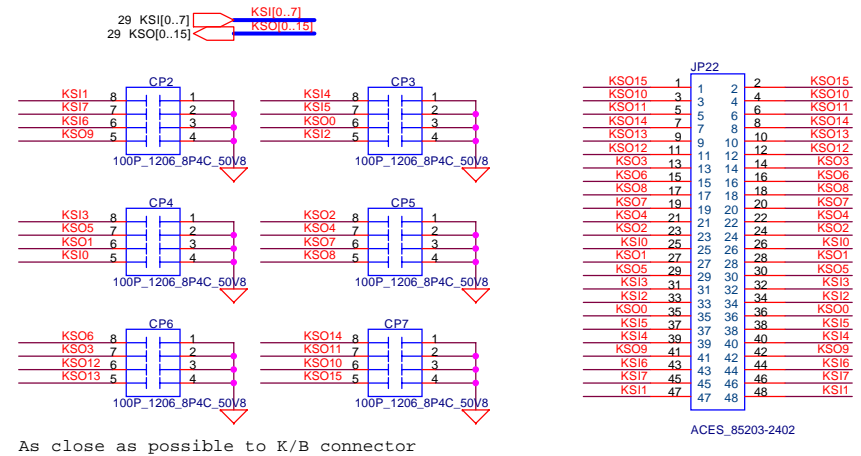


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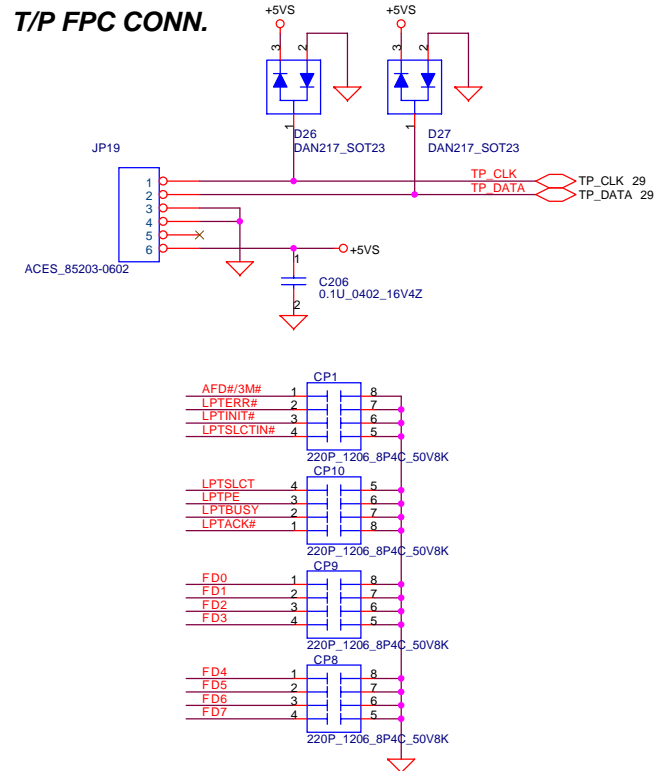
MBC CONN.

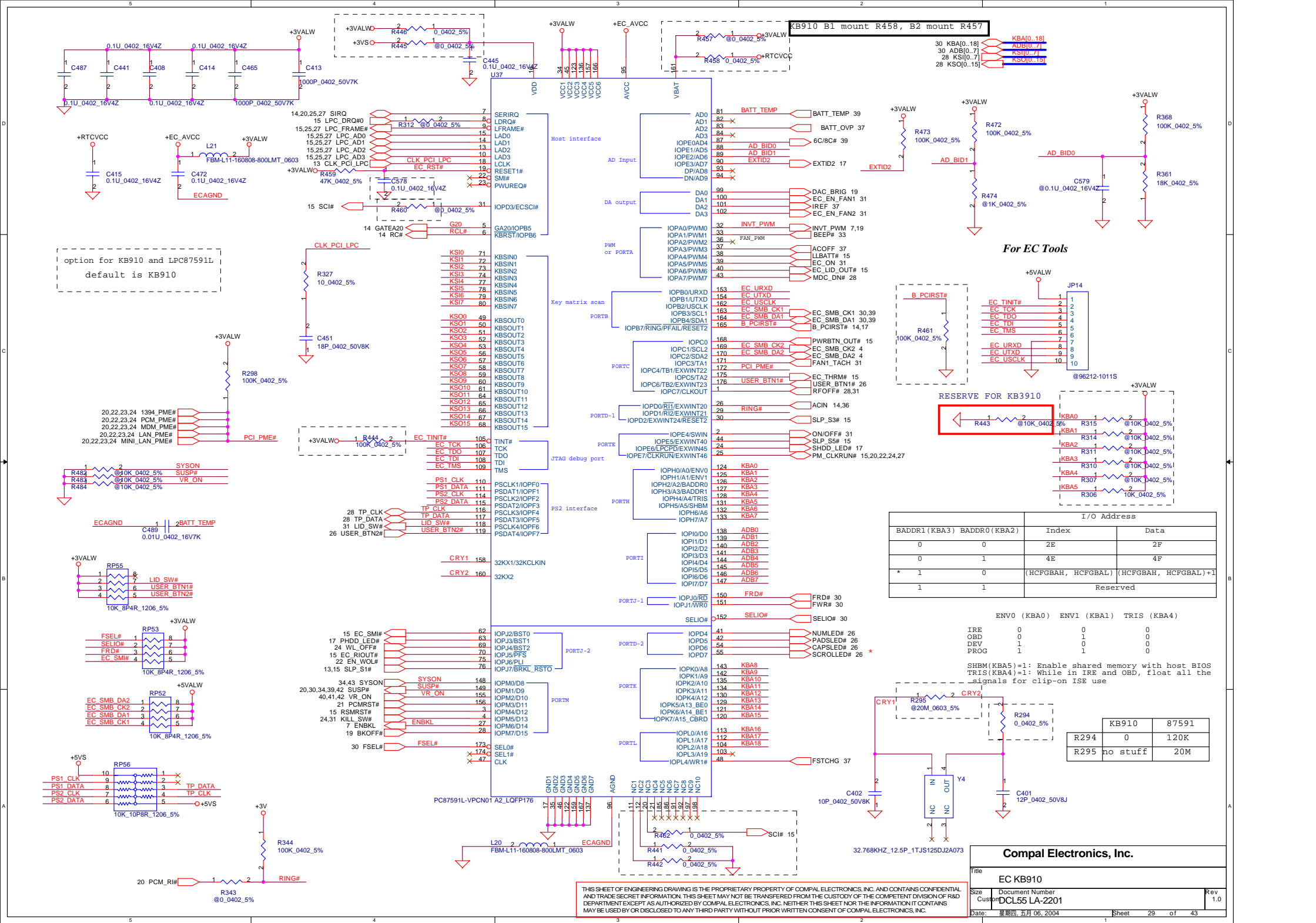


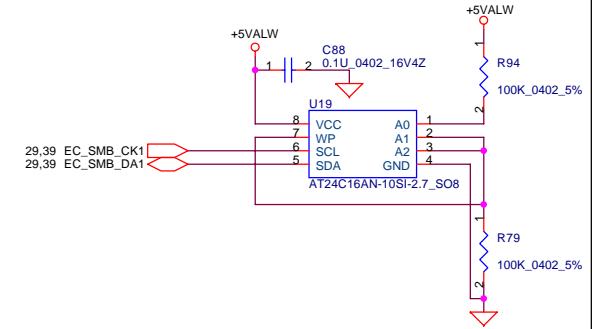
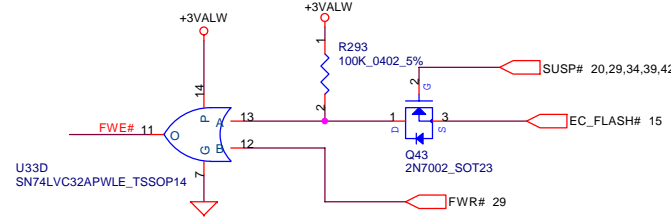
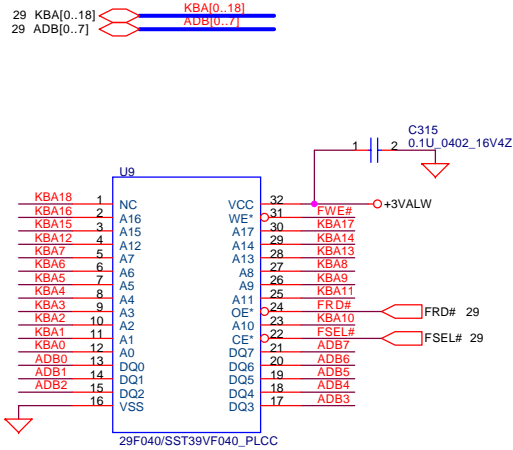
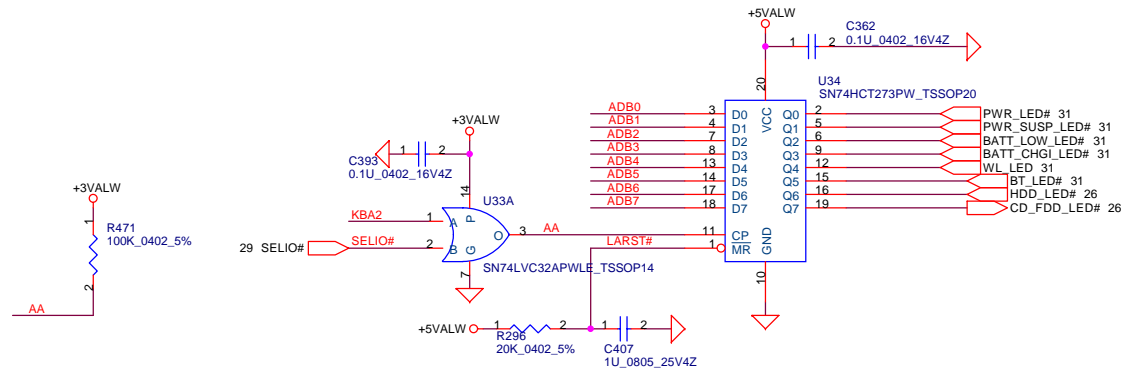
INT_KBD CONN.



T/P FPC CONN.





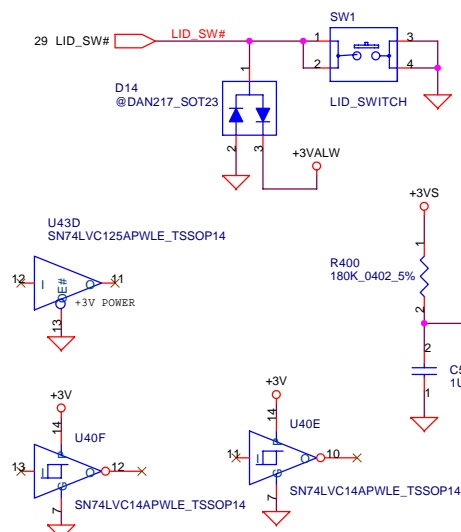


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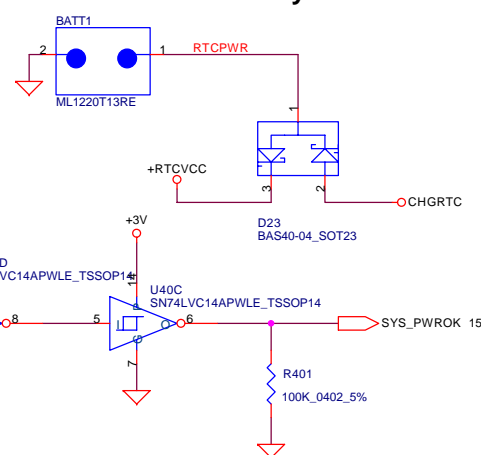
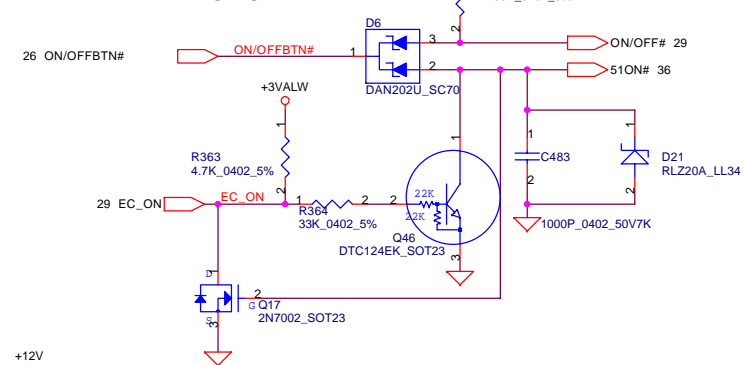
Title		BIOS & EXT. I/O PORT	
Size	Document Number	Rev	
B	DCL55 LA-2201	1.0	
Date:	星期四, 五月 06, 2004	Sheet	30 of 43

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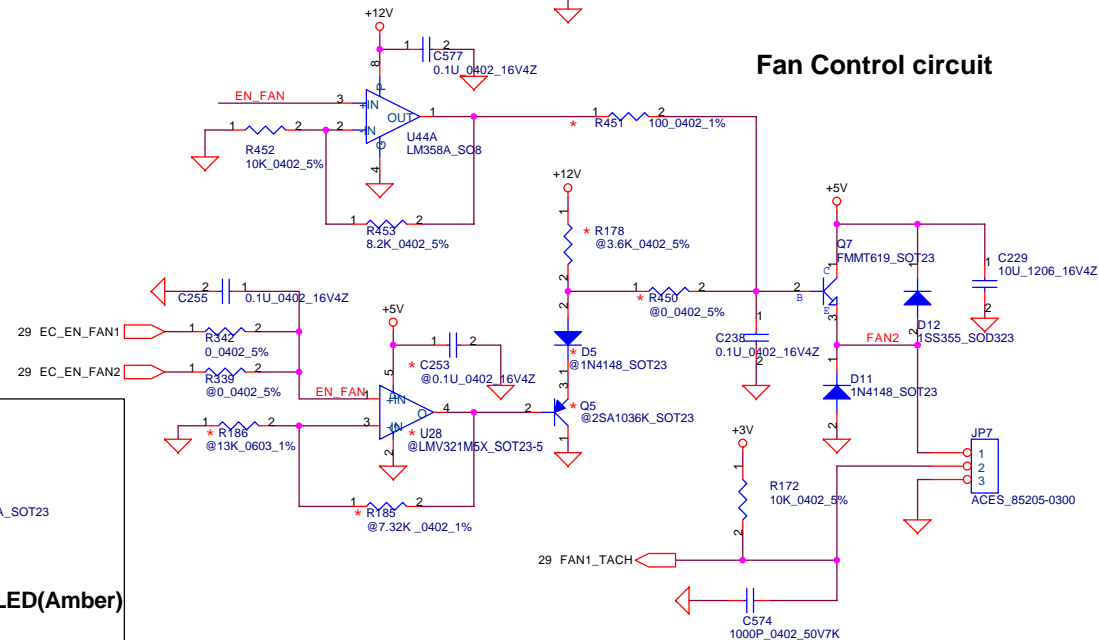
Power ON Circuit



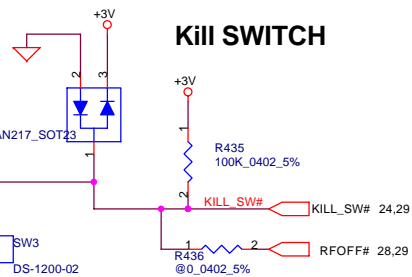
RTC Battery

**Power BTN**

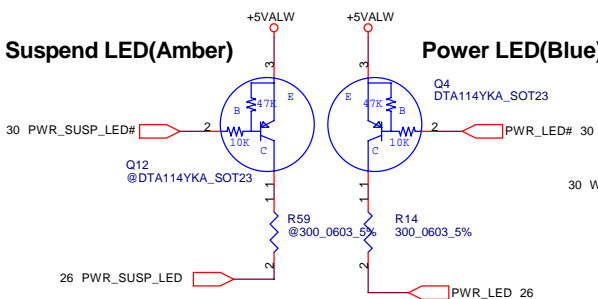
Fan Control circuit



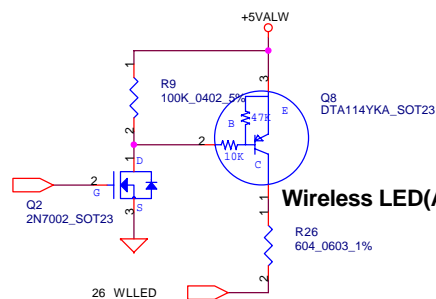
Kill SWITCH



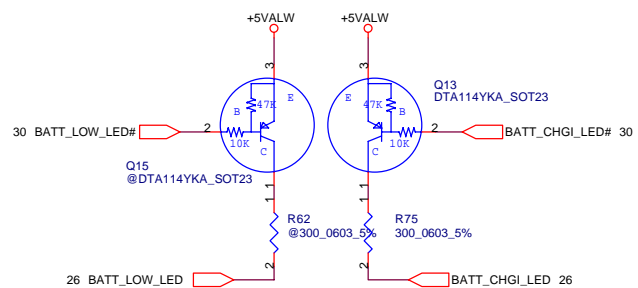
Suspend LED(Amber)

**Power LED(Blue)**

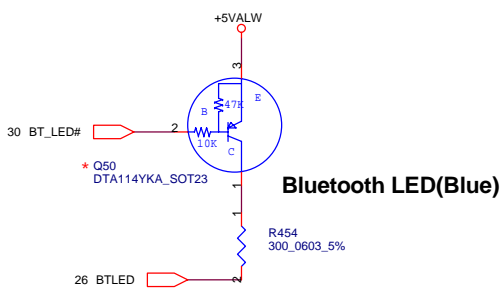
Wireless LED(Amber)



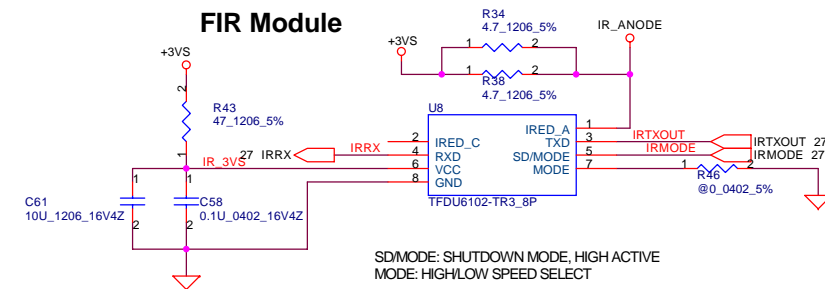
BATT Low LED(Amber)



BATT Charge LED(Blue)



FIR Module



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

Compal Electronics, Inc.

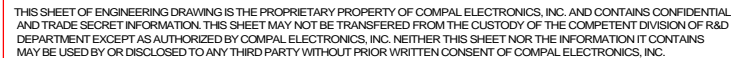
Title	Power OK/Reset/BTC battery/Lid Switch/Int KB
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Size	Document Number	Rev
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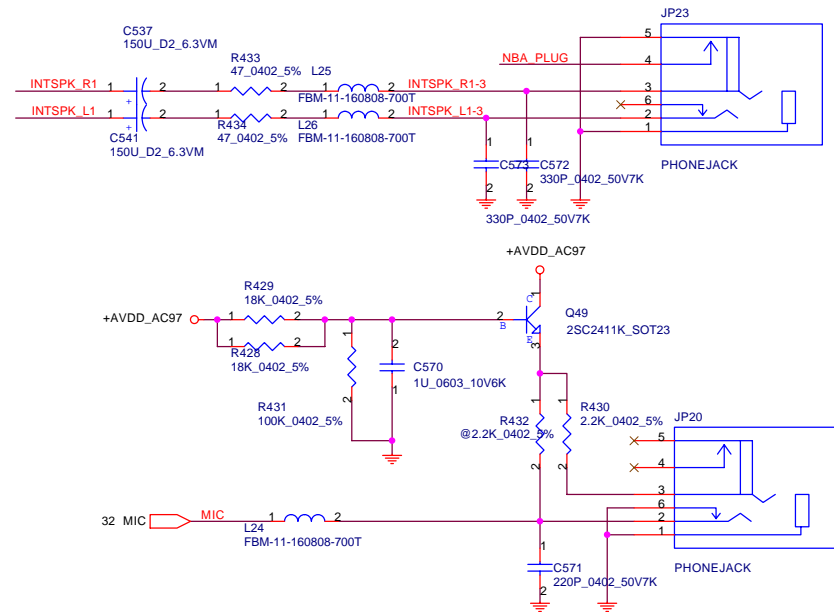
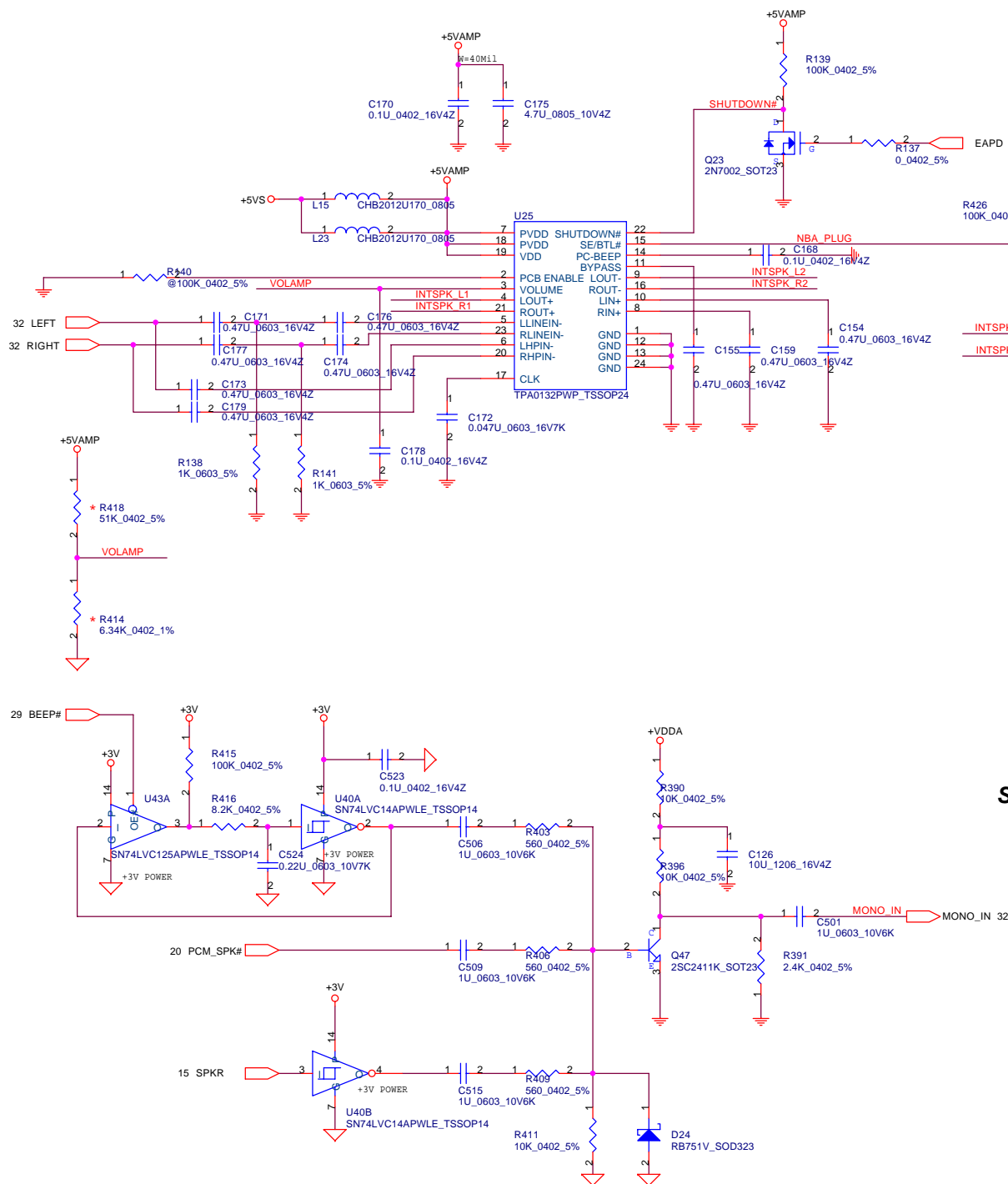
	DCL55 LA-2201	1.0
Date:	星期四 五月 06, 2004	Sheet 31 of 42

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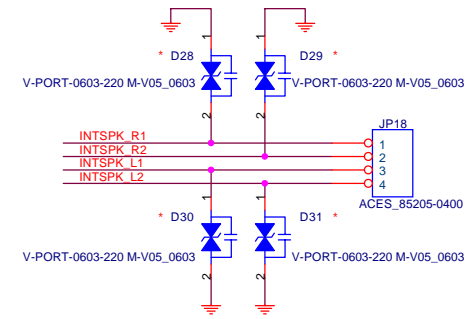
WWW.AliSaler.Com



Date: 星期四, 五月 06, 2004 Sheet 32 of 43

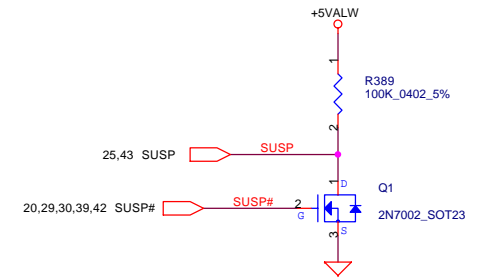
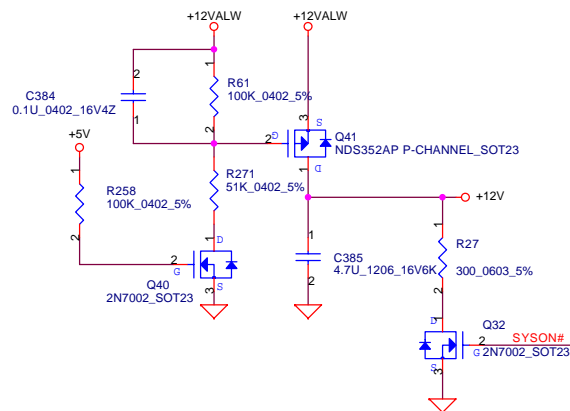
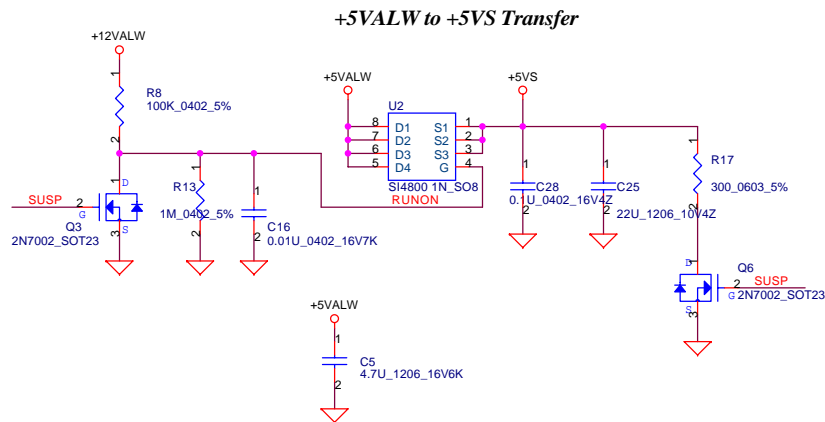
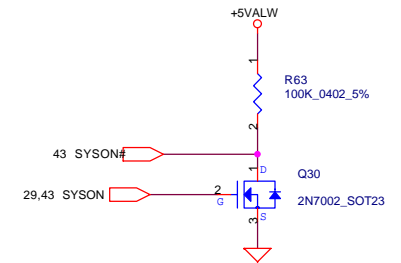
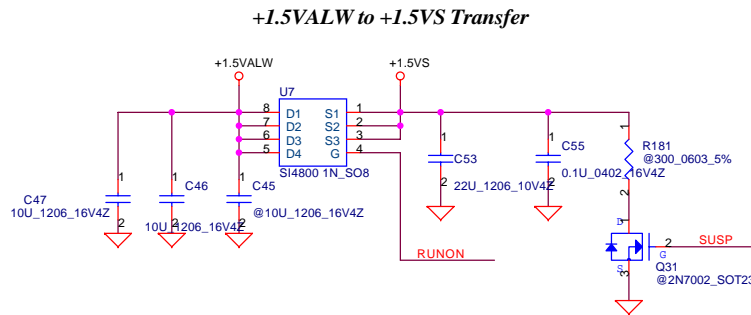
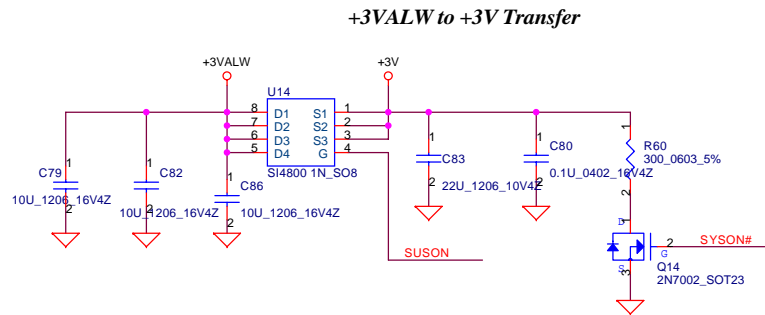
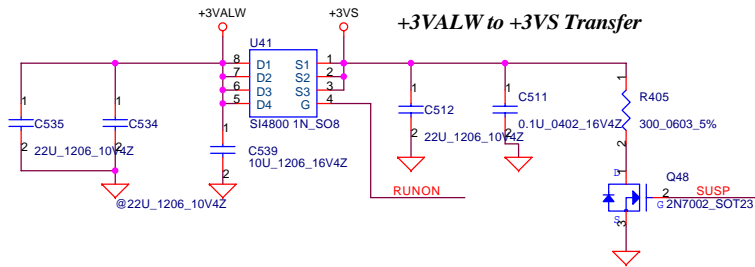
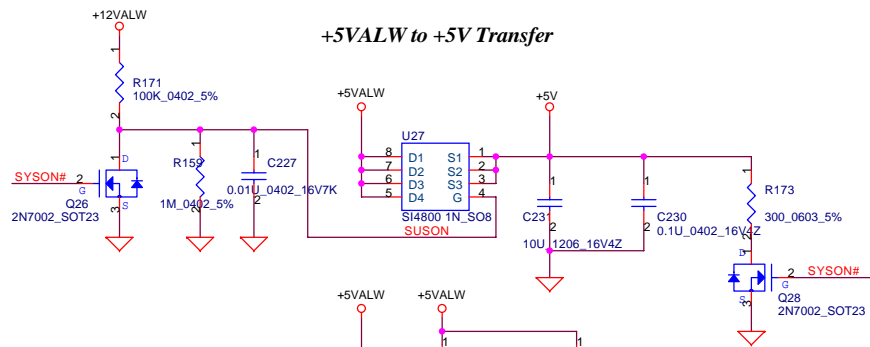


SPEAKER CONN.



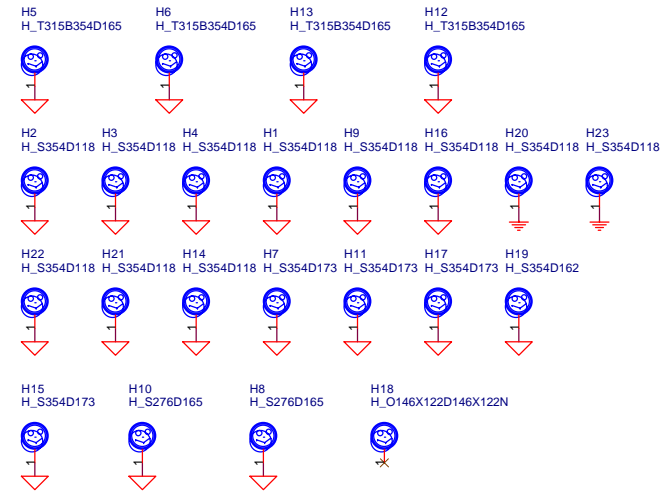
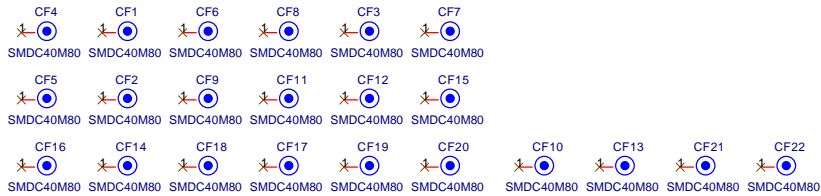
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Compal Electronics, Inc.			
Title			
AMP & Audio Jack			
Size	Document Number	Rev	
	DCL55 LA-2201	1.0	
Date:	星期四, 五月 06, 2004	Sheet	33 of 43



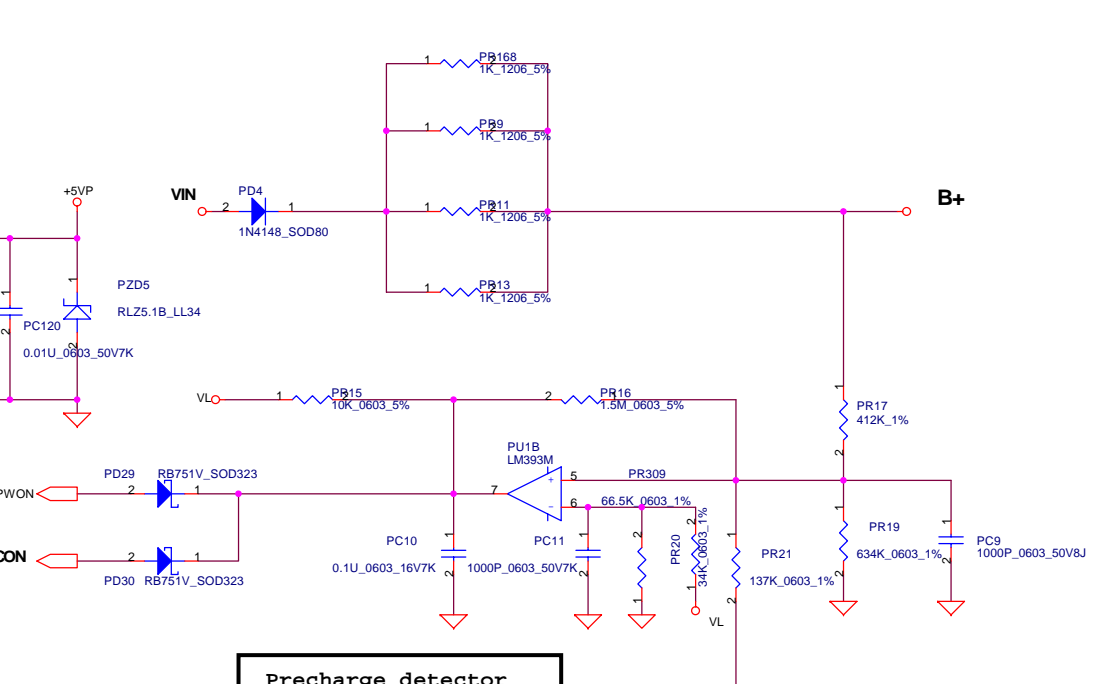
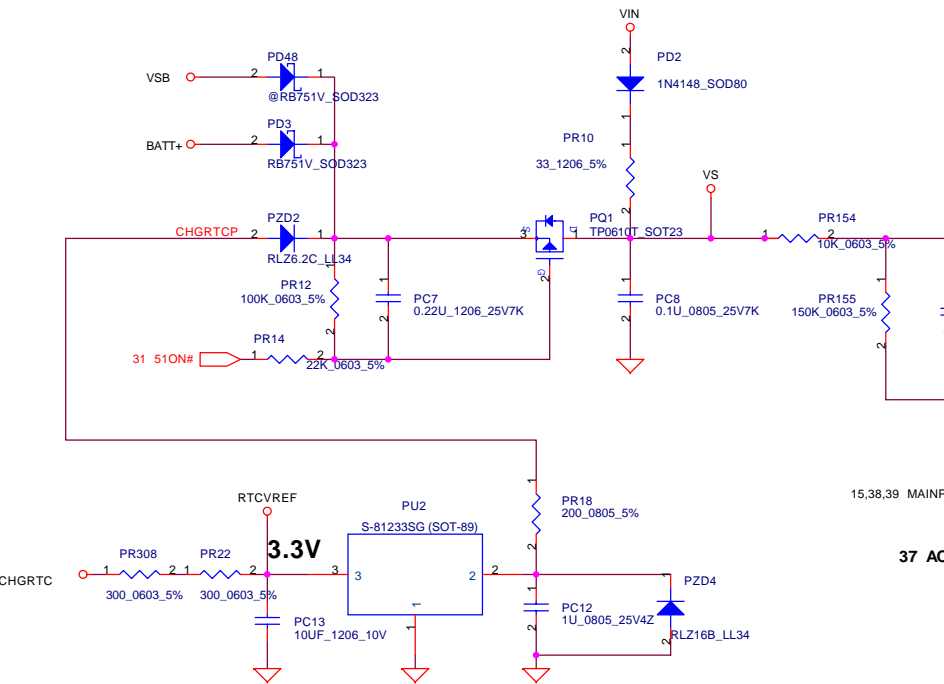
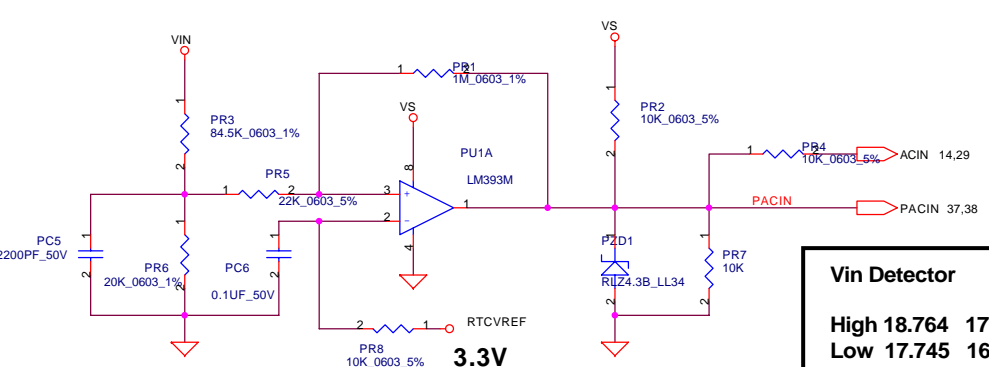
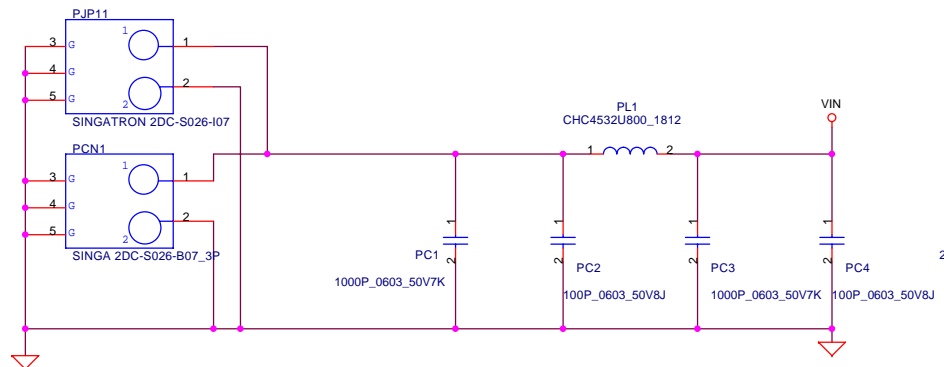
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Compal Electronics, Inc.			
Title DC/DC Circuit Interface			
Size	Document Number	Rev	
	DCL55 LA-2201	1.0	
Date:	星期四, 五月 06, 2004	Sheet	34 of 43



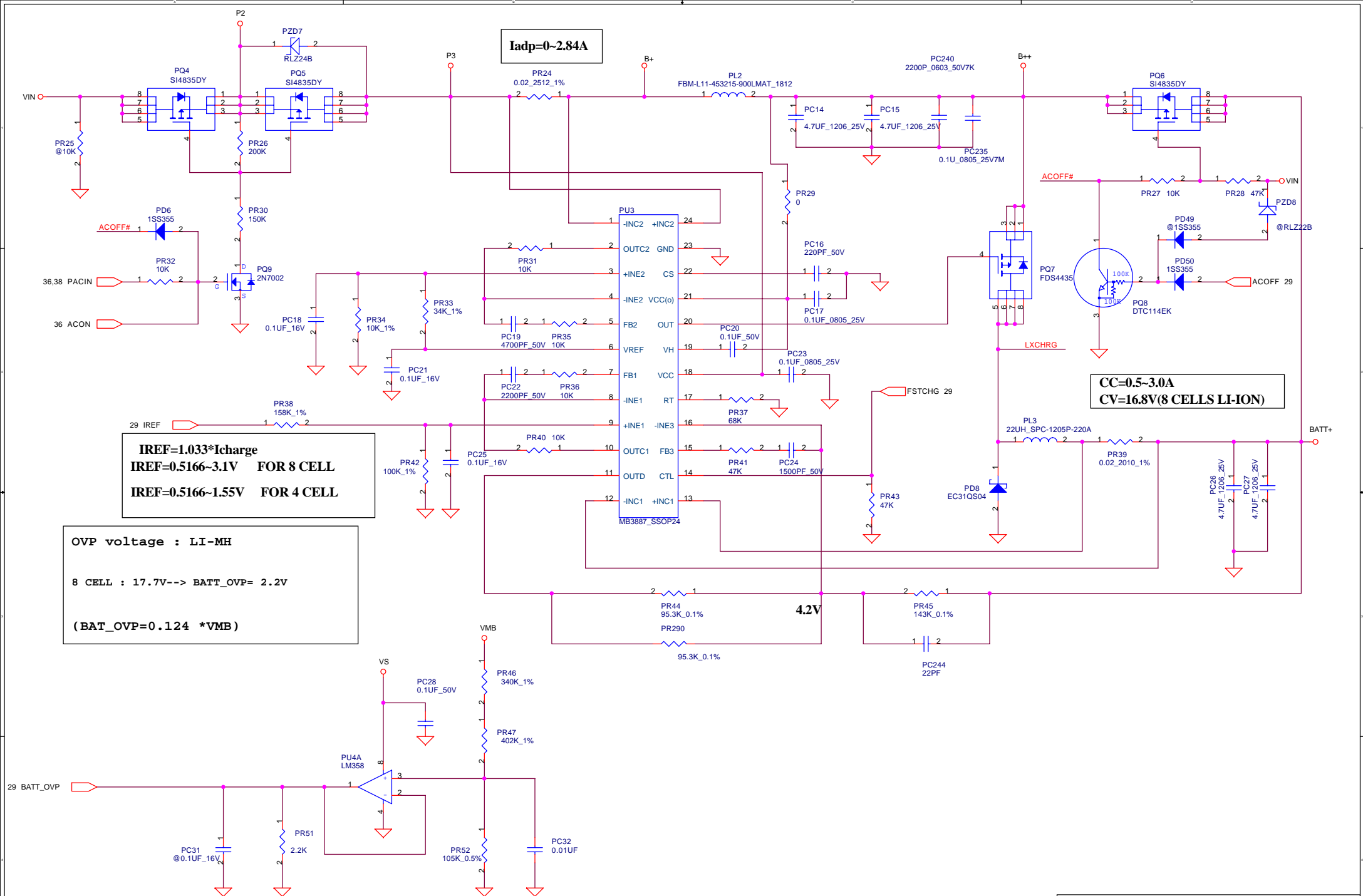
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Compal Electronics, Inc.			
Title		Skew Hole	
Size	Document Number		Rev
	DCL51 LA-1881		1.0
Date:	星期四, 五月 06, 2004	Sheet	35 of 45



Precharge detector		
AC ADAPTOR		
	16.69	16.05 15.42
	15.6	15.02 14.35

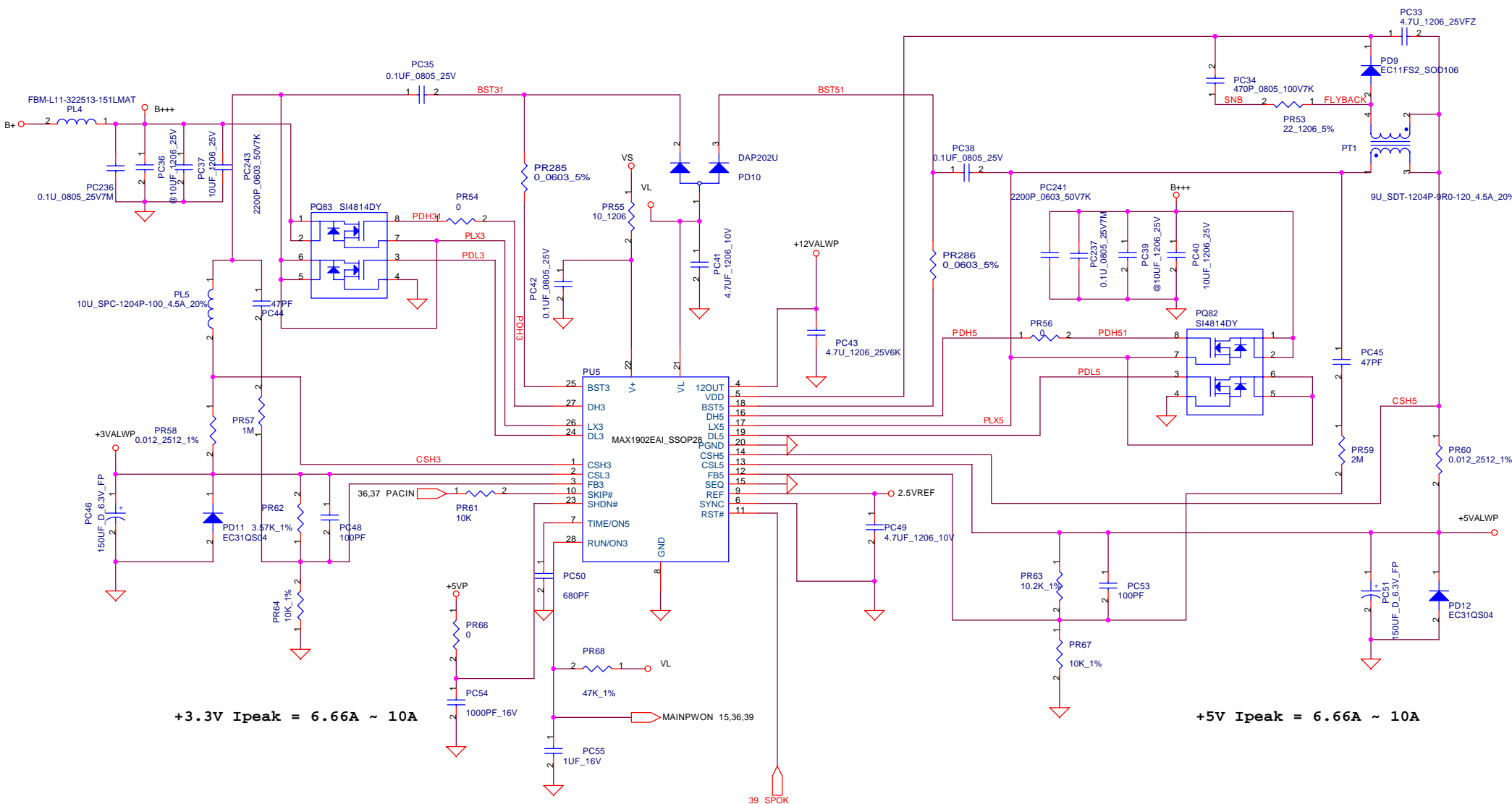
Precharge detector		
AC ADAPTOR		
	6.33	6.12 5.92
	5.227	5.09 4.85



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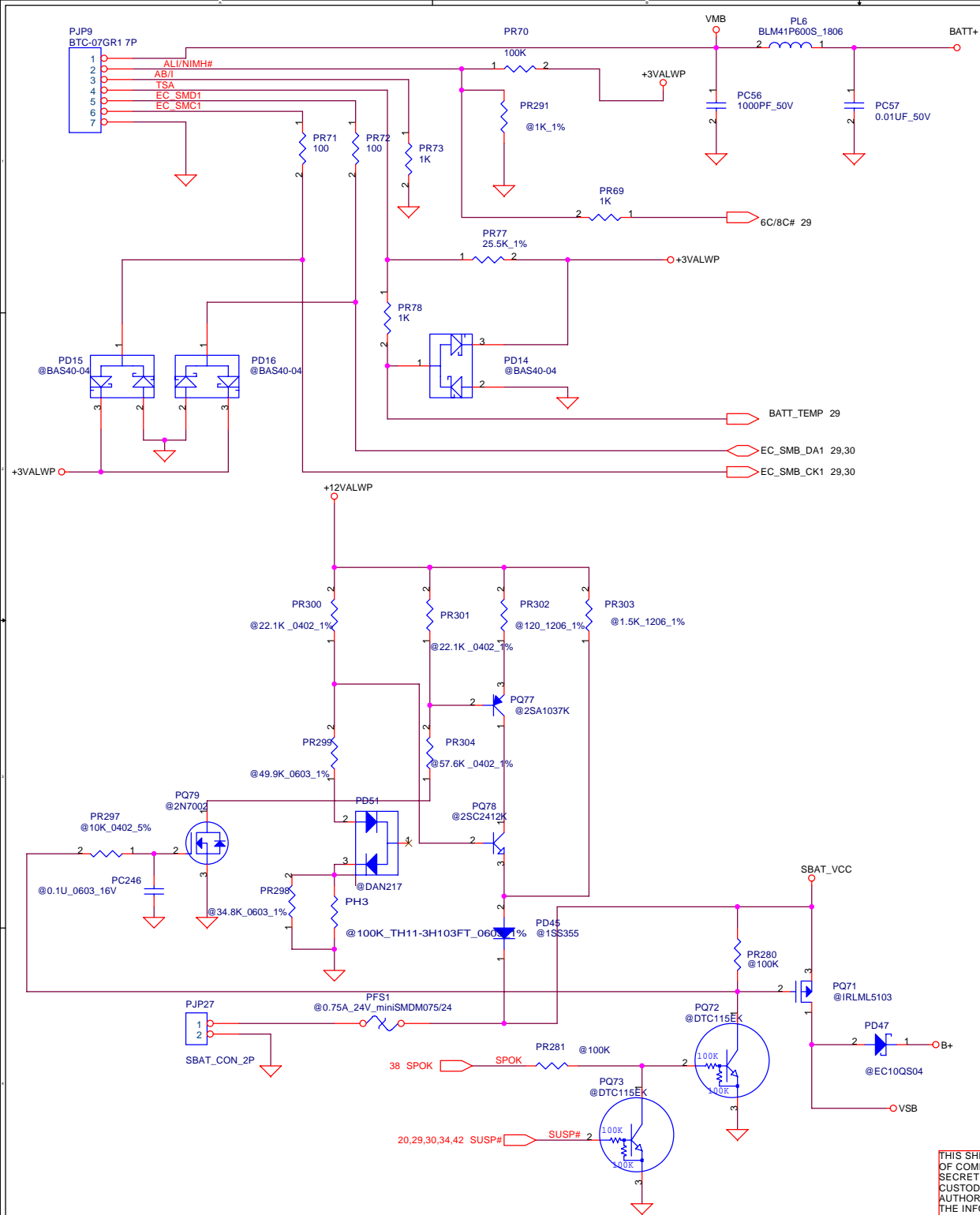
Compal Electronics, Inc.

Title		CHARGER	
Size	B	Document Number	DCL55 LA-2201
Date:	星期四, 五月 06, 2004	Sheet	37 of 45
Rev	1.0		

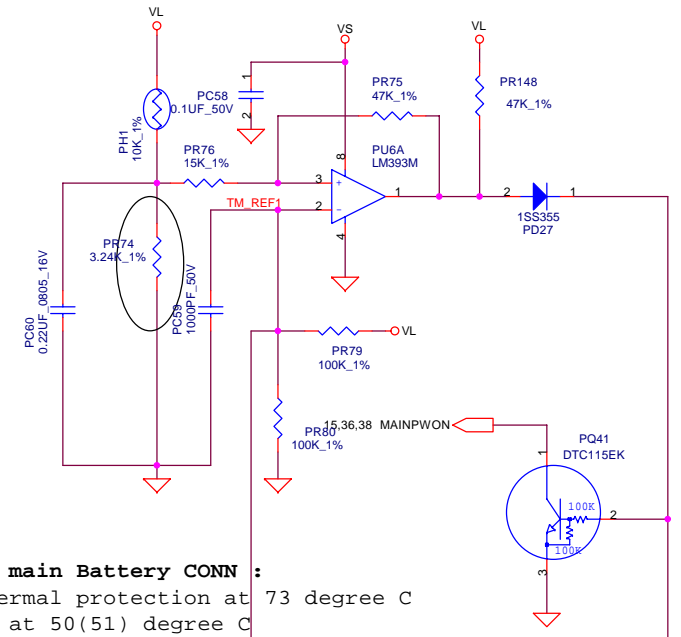


+3.3V Ipeak = 6.66A ~ 10A

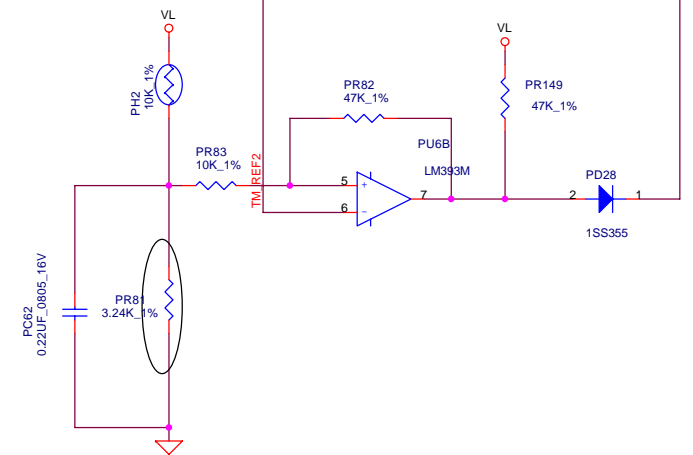
+5V Ipeak = 6.66A ~ 10A



PH1 under CPU botten side :
CPU thermal protection at 82 degree C
Recovery at 48 degree C



PH2 near main Battery CONN :
BAT. thermal protection at 73 degree C
Recovery at 50(51) degree C

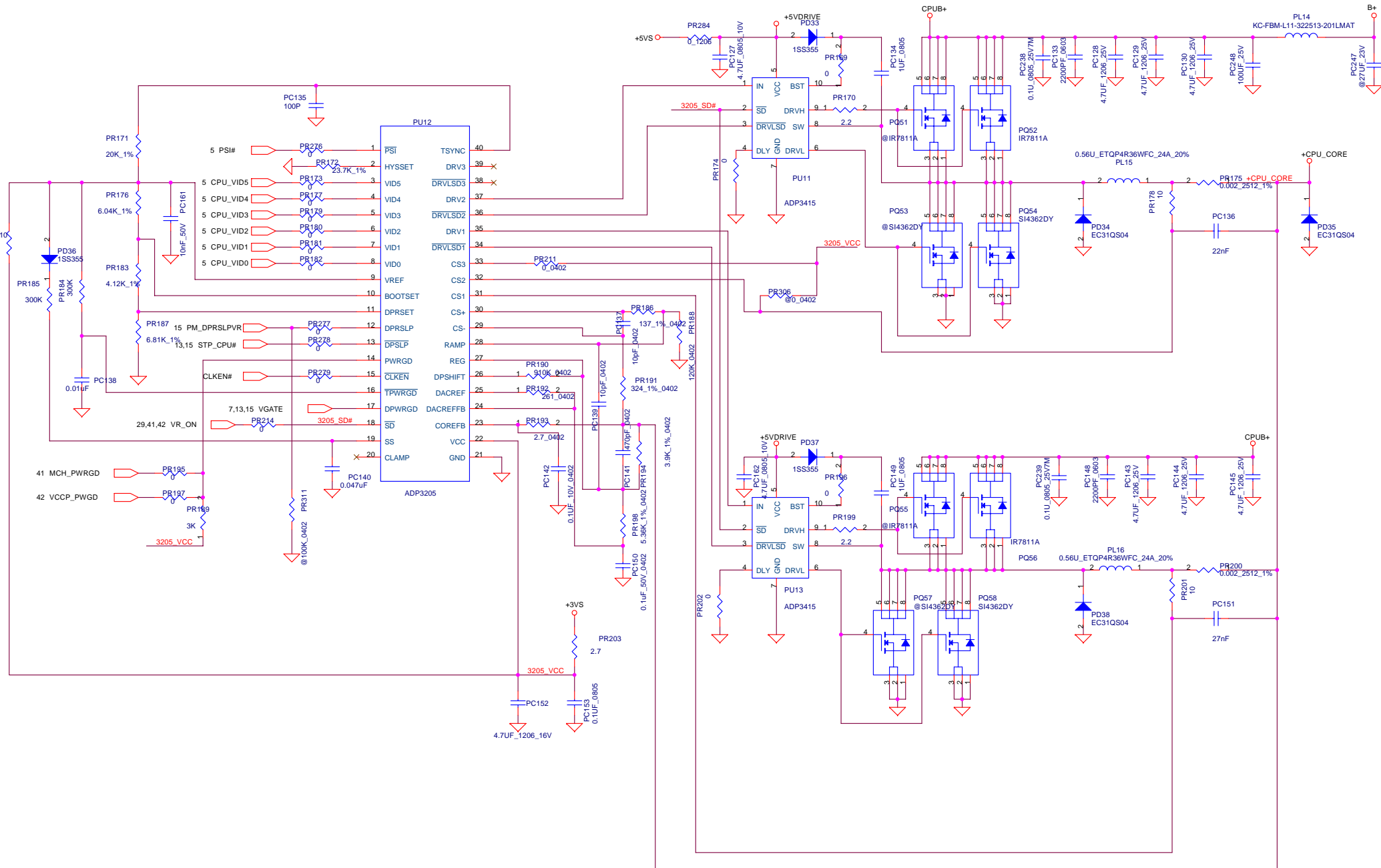


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Title			BATTERY CONN / OTP/1.2V
Size	Document Number	Rev	
B	DCL55 LA-2201	1.0	
Date: 星期四, 五月 06, 2004		Sheet	39 of 45

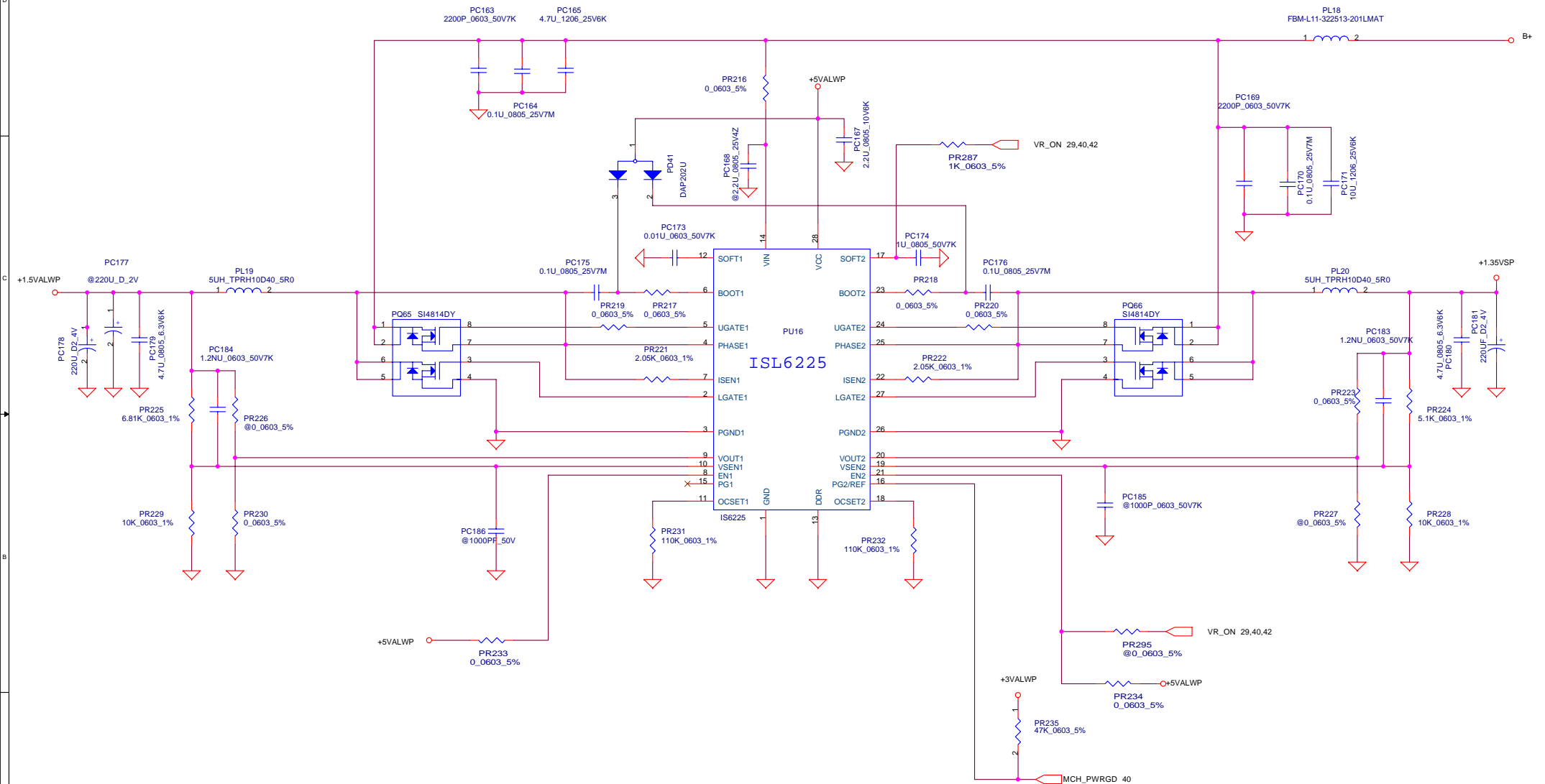
CPU-CORE



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Title		+VCC_H CORE	
Size	Document Number	Rev	
B	DCL55 LA-2201	1.0	
Date:	日期: 五月 06, 2004	Sheet	40 of 45

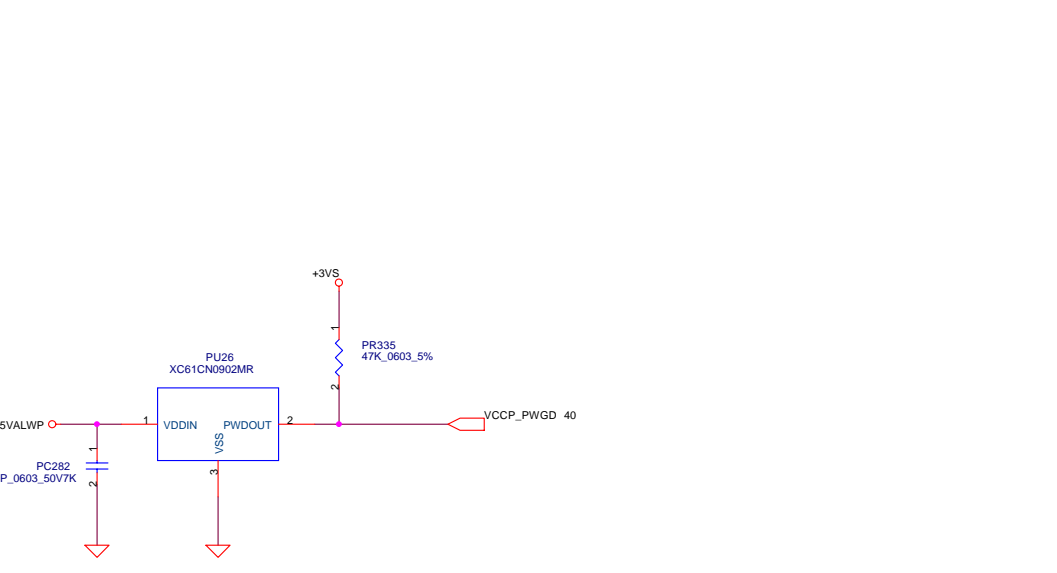
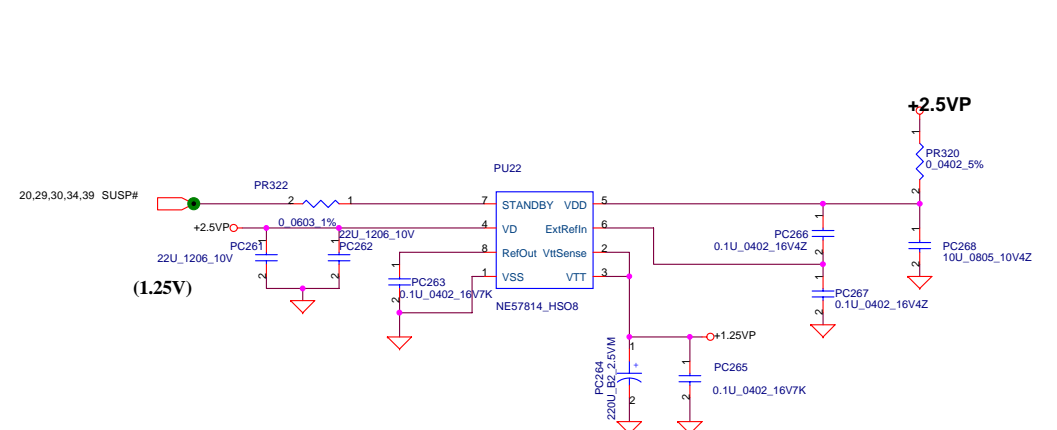
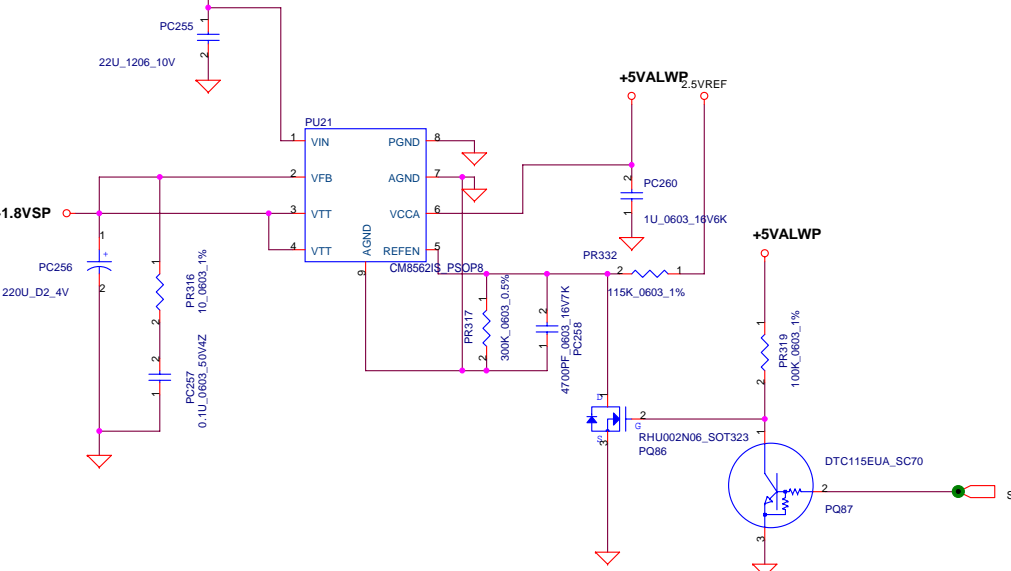
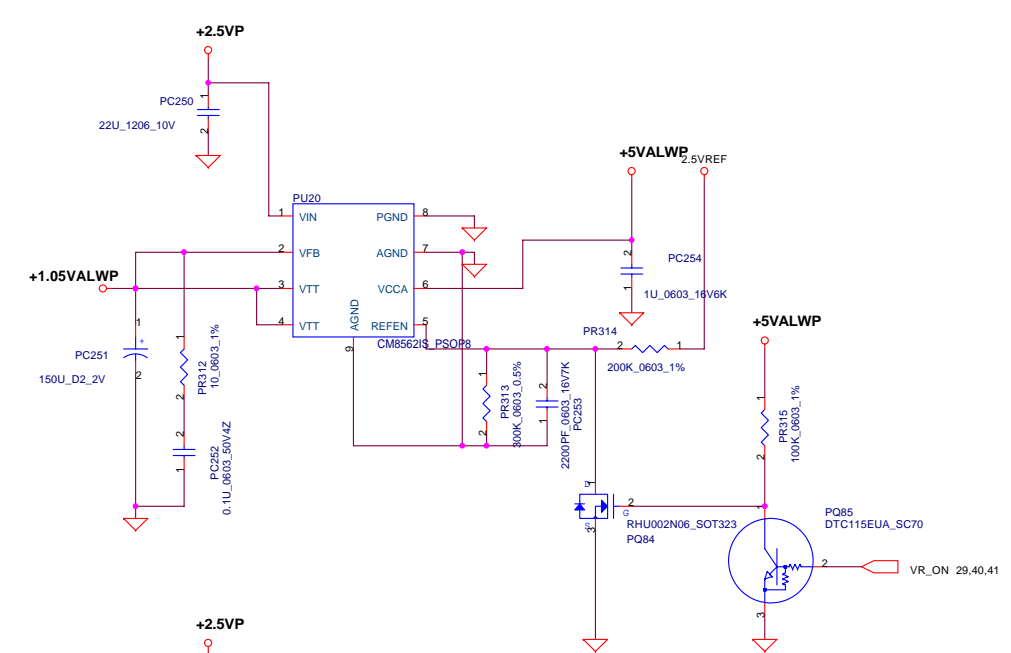
+1.5VALWPV/+1.2VSP



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Title			
1.5V & 1.2V			
Size	Document Number		Rev
B	DCL55 LA-2201		1.0
Date:	星期四, 五月 06, 2004	Sheet	41 of 45

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Title			
2.5V & 1.25V			
Size	Document Number	Rev	
B	DCL55 LA-2201	1.0	
Date:	星期四, 五月 06, 2004	Sheet	42 of 45

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Version change list (P.I.R. List)

Page 1 of 1
for PWR

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	VER	Phase
1		Set c4 mode controlled by bios based difference CPU		40	DELETE PR311:100K ; ADD PR277:0		DVT
2		Modify 1.05VP voltage level		42	1. change PR314 to 200k		DVT
3		modify 1.05VP,1.8VP soft start time		42	add PC253, PC258 to be 0.1U		DVT
4		add +SDREF signal circuit		43	add PR339:0; PQ89: 2N7002; PC283,PC284 :0.1U 16V;PR336,PR337:100K;PC285:10U 1206		PVT
5		Add one set power good:VCCP_PWGD		42,41	ADD LDO PU26 :XC61CN;PR335:47K;PC282:1000P 50V,PCHANGE R235 FROM 10K TO 47K		PVT
6		modify 1.05VP,1.8VP soft start time		42	CHANGE PC253 from 0.1u to 2200PF, PC258 from 0.1U to 4700PF		PVT
7		CHANGE PU5 from MAX1631 to MAX1902 (BECAUSE MAX1631 shortage)		38	CHANGE PT1 from 10u_1205P to 9u_sdt-1204p-9r0-120;delete PU19;CHANGE pl5 FROM 10U_SPC-1205P-100 to 10u_1204p-100_4.5A;change PC39 from 180PF to 470PF;DELETE PZD6;change PU5 from max1631 to max1902		MP
8		FOR CL53A ; To change 1.2VSP to 1.35 VSP		37,41	CHANGE PR224 from 3.48K to 5.1K, delete PD49,DELETE PZD8		
9							

Compal Electronics, Inc.

Title

PIR (PWR)

Size

Document Number

DCL55

Rev

1.0

Date: 星期日, 五月 06, 2004

Sheet 44 of 45

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	VER	Phase
1		reserve +SDREF signal circuit		8	reserve R477,R479		PVT
2		reserve +SDREF signal circuit		10	reserve R480,R481		PVT
3		EMI performance		8	change C420_net from MRCOMP to +2.5V		PVT
4		reserve syson,susp#,vr_on pull low resister		29	reserve R482,R483,R484		PVT
5		cost down			change L18,L19,L14,L13,L12,L8,L9,L7 to 0 ohm del C534,C45		PVT
6		board version update		29	change R361 from 8.2k to 18k		PVT
7		for customer request			del TV_out , 1394 funtion		PVT
8		solove leakage			del D15		preMP
9		board version update		29	change R361 from 8.2k to 33k		preMP