

Compal Confidential

DCL513A Schematics Document

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

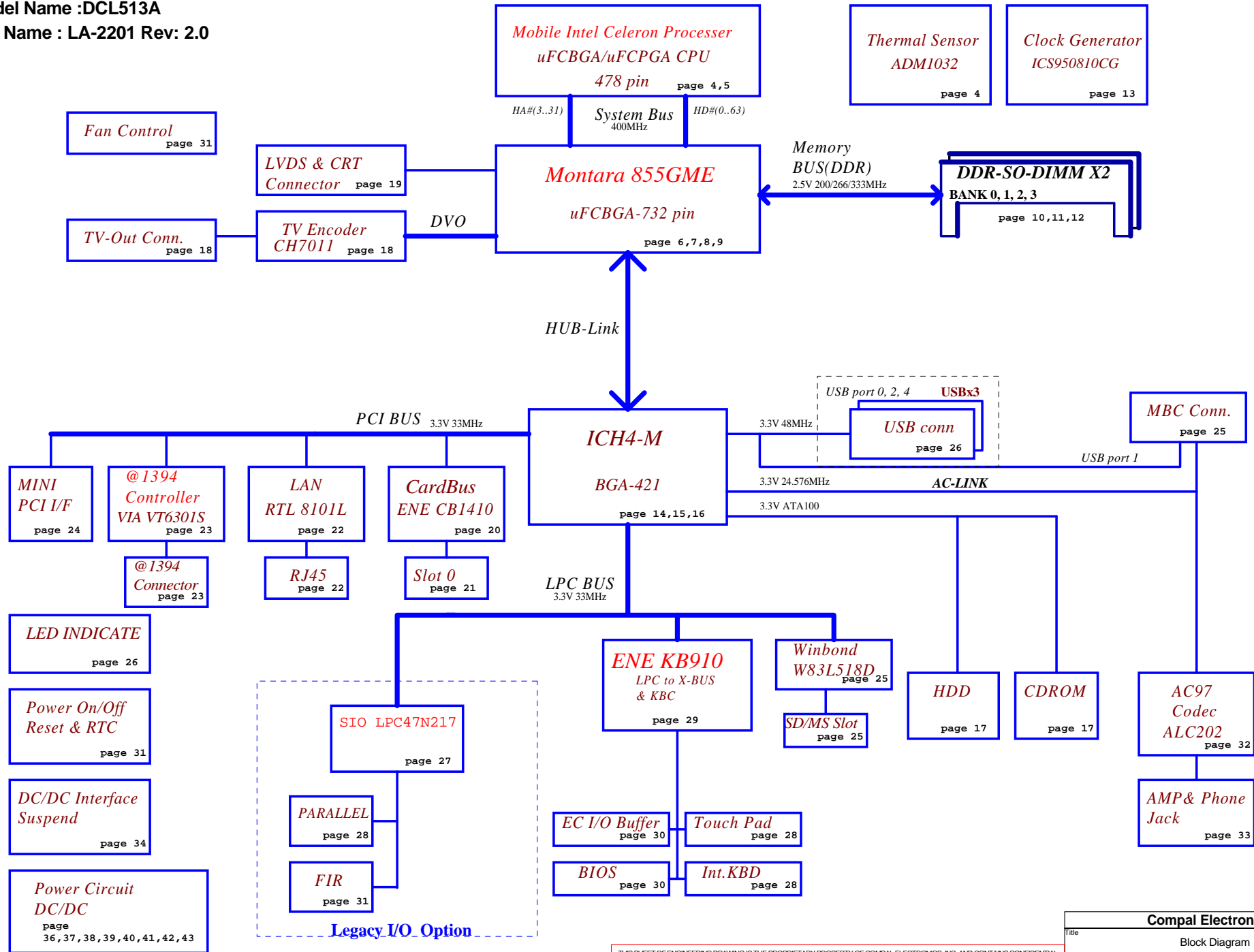
2004-05-05

REV: 1.0

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

Model Name :DCL513A
File Name : LA-2201 Rev: 2.0



Compal Electronics, Inc.		
Title Block Diagram		
Size	Document Number DCL55 LA-2201	Rev 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

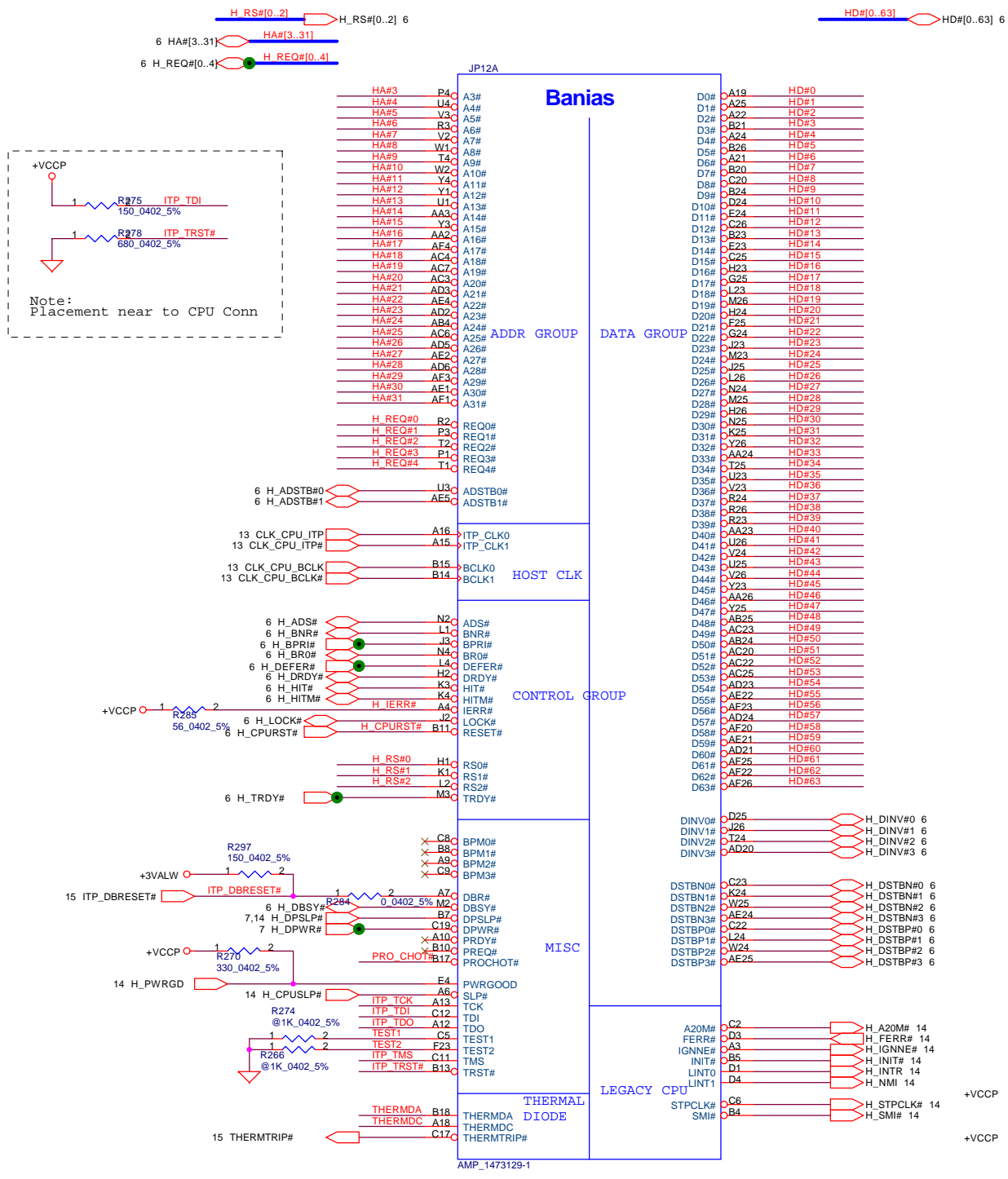
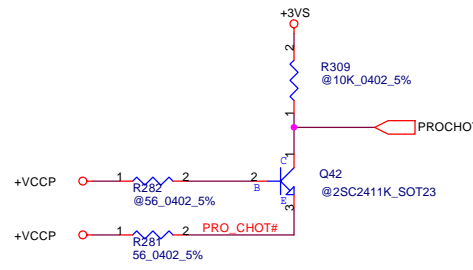
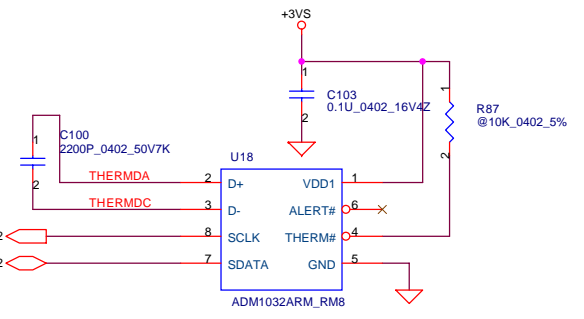
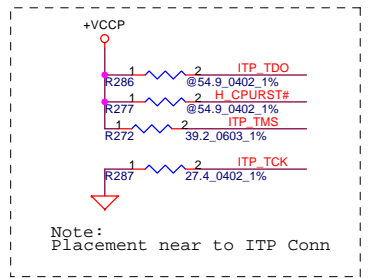
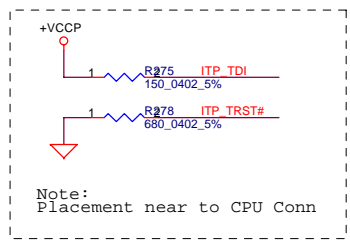
Board ID	PCB Revision
0	
1	0.1
2	0.2
3	1.0
4	
5	
6	
7	

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

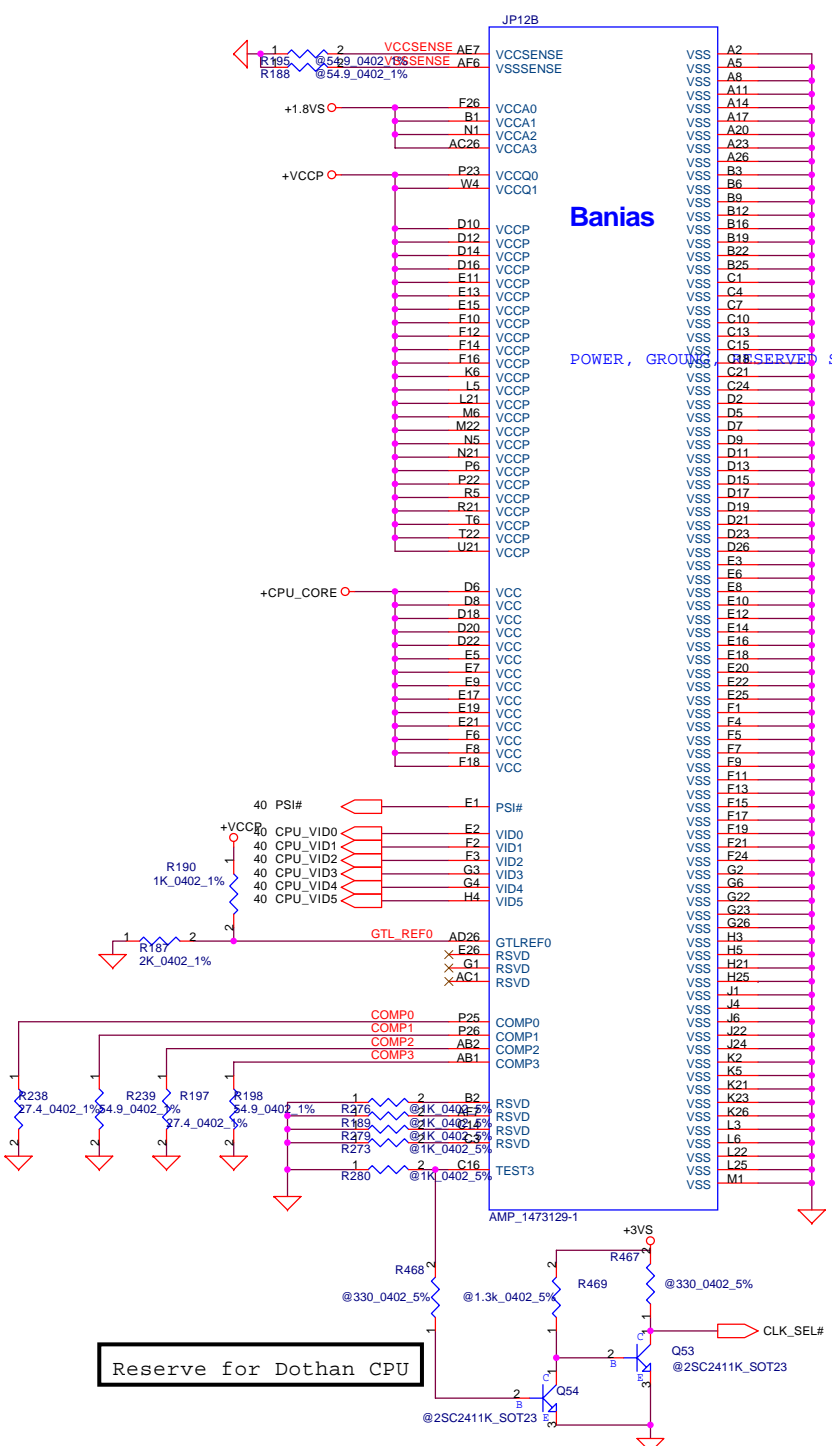
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Title	Notes & PIR	
Size	Document Number	Rev
B	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 3 of 43



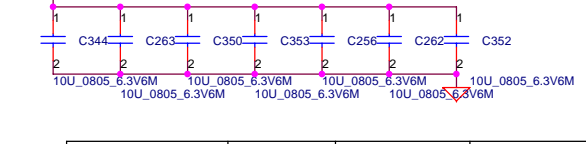
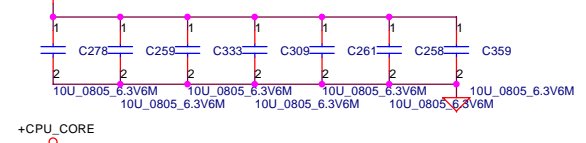
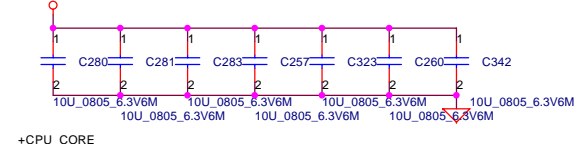
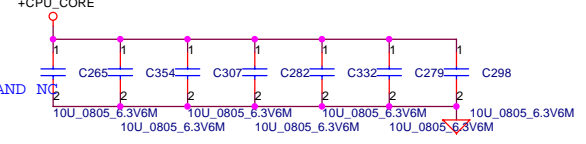
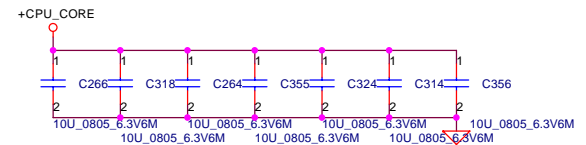
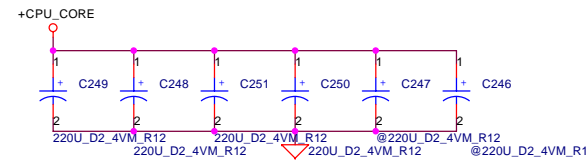
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Title Banias Processor in mFCPGA479 with ITP		
Size A3	Document Number DCL55 LA-2201	Rev 1.0
Date: 星期四, 五月 06, 2004	Sheet 4	of 43

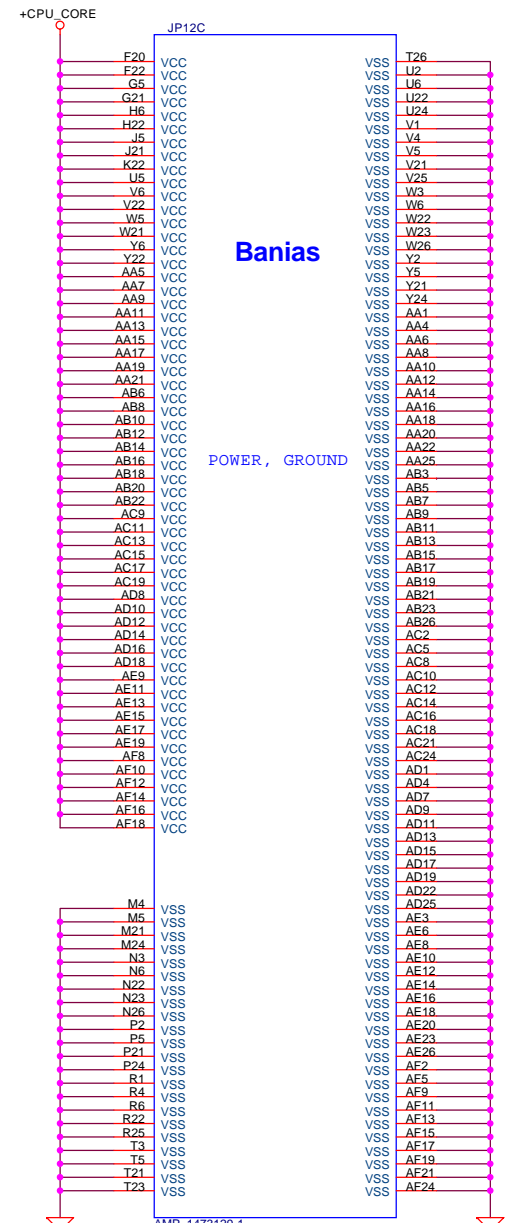
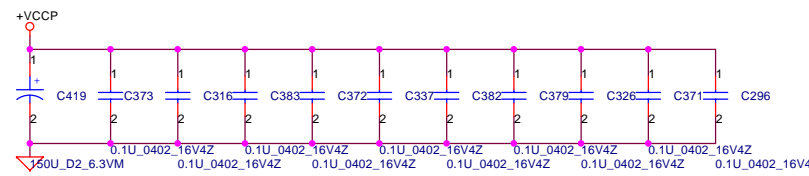
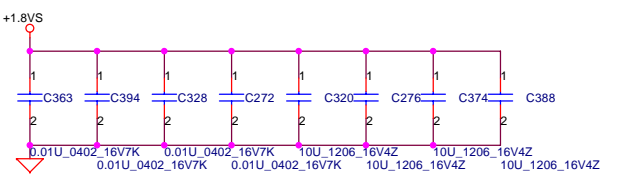


Banias

POWER, GROUND, RESERVED SIGNALS AND NC



Vcc-core Decoupling	C, uF	ESR, mohm	ESL, nH
SPCAP, Polymer	4X220uF	12m ohm/4	3.5nH/4
MLCC 0805 X5R	35X10uF	5m ohm/35	0.6nH/35



Banias

POWER, GROUND

Reserve for Dothan CPU

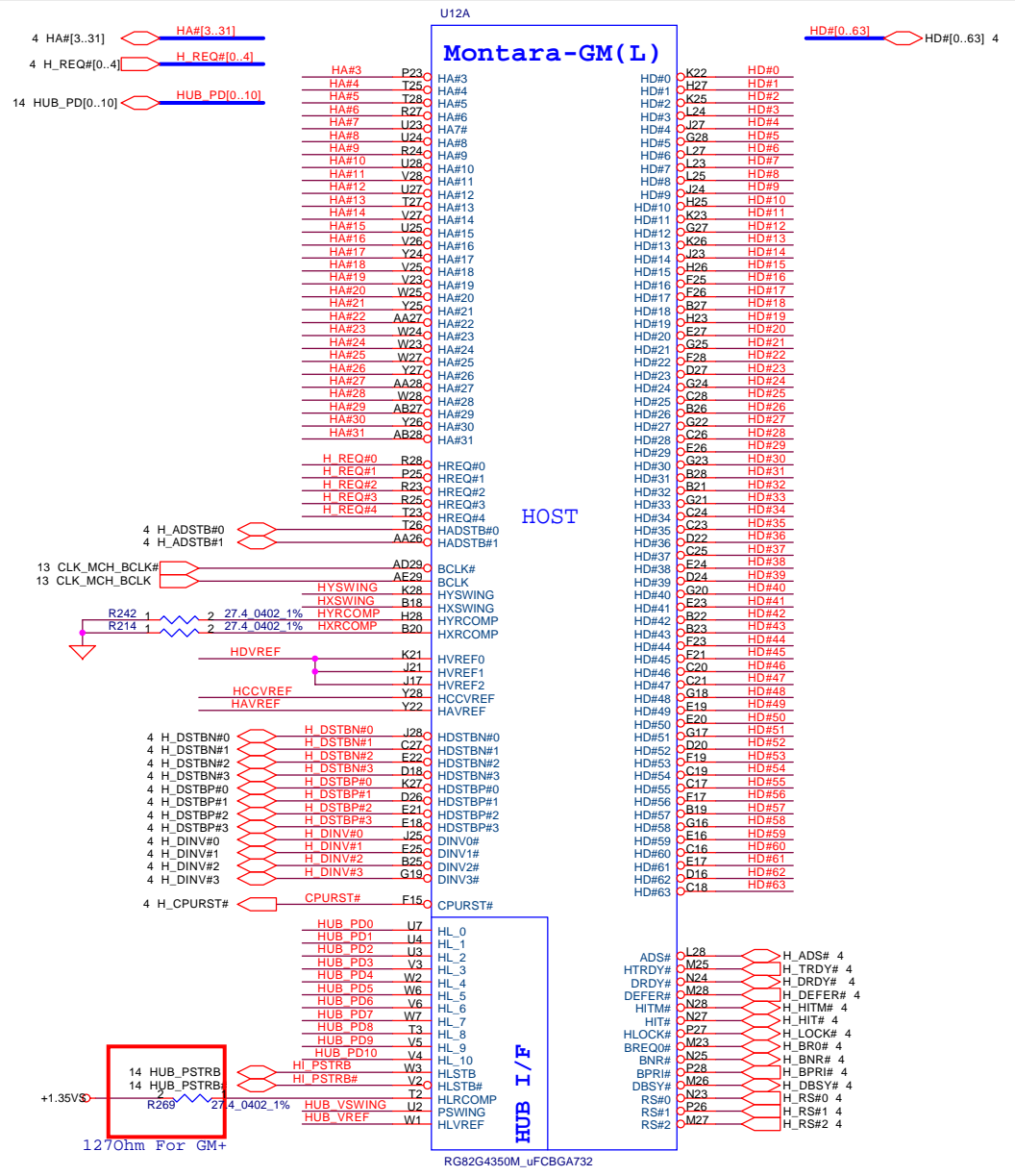
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Compal Electronics, Inc.

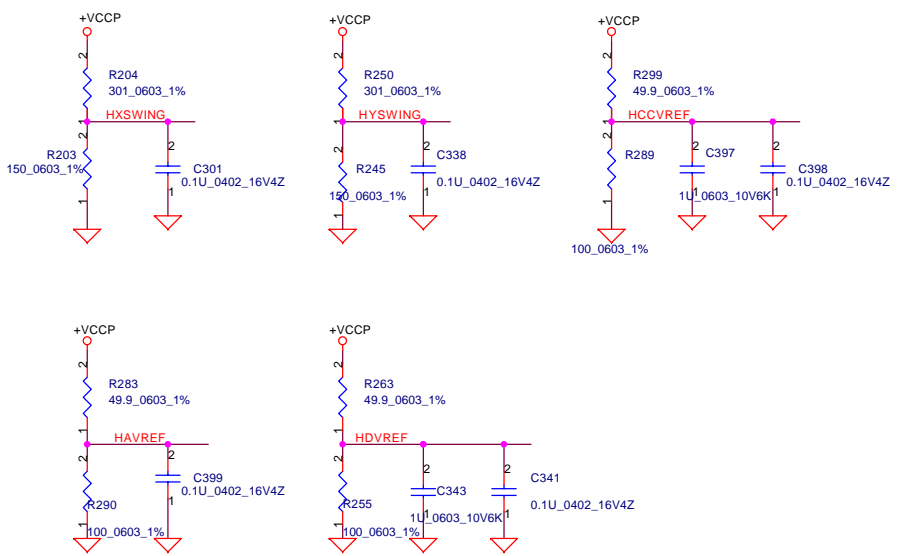
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Size A3 Document Number: DCL55 LA-2201 Rev 1.0

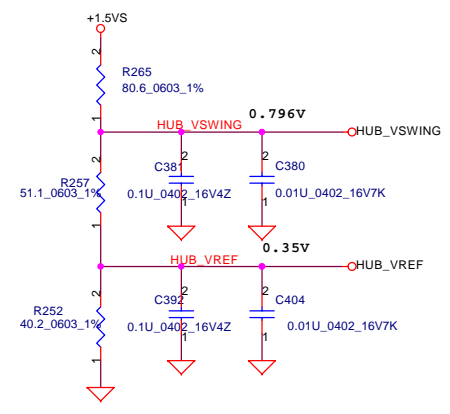
Date: 星期四, 五月 06, 2004 Sheet 5 of 43



HOST REF VOLTAGE

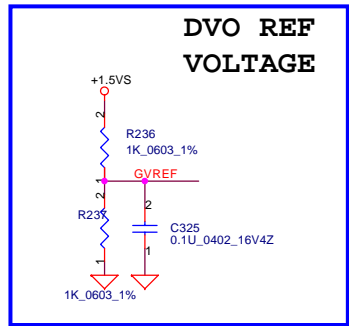
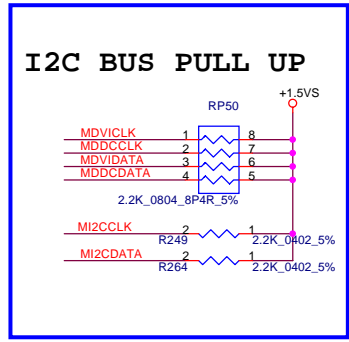
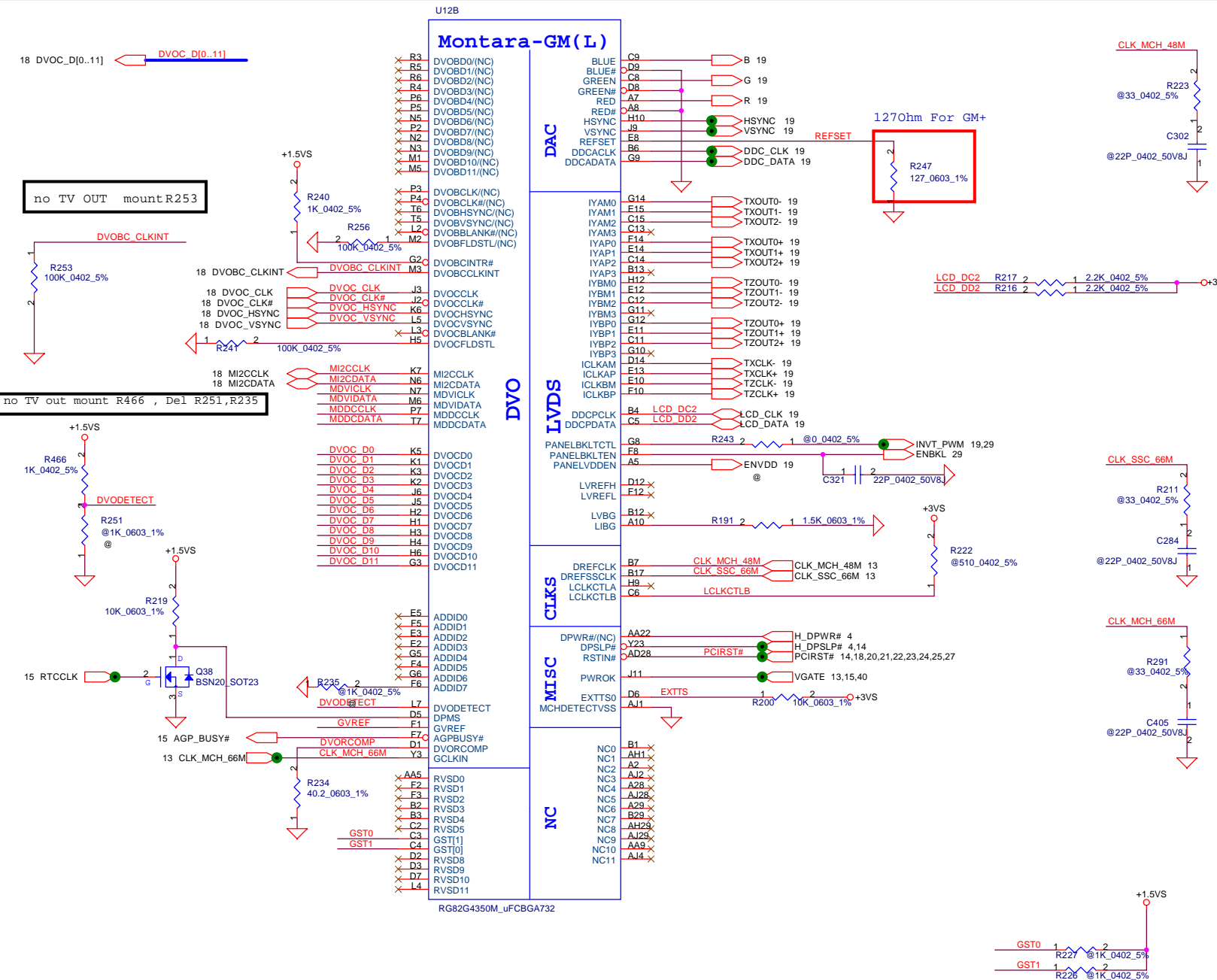


HUB I/F REF VOLTAGE



Compal Electronics, Inc.		
Title	MONTARA-GM-HOST(1/4)	
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 6 of 43

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Starp pin list

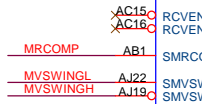
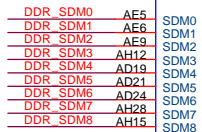
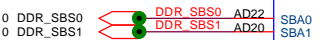
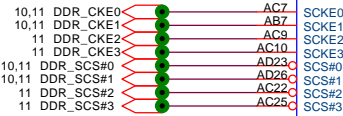
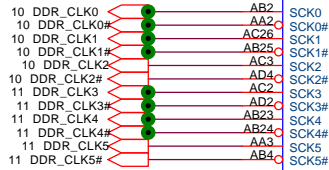
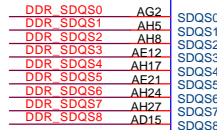
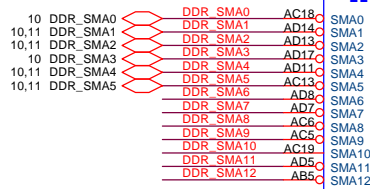
LCLKCTLB: High for P4
 N.C. for Banias(default low)
 DVODETECT: Low to enable DVO
 High to disable DVO

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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U12C

Montara-GM(L)



MEMORY

SWE#

SRAS#

SCAS#

SCK0

SCK0#

SCK1

SCK1#

SCK2

SCK2#

SCK3

SCK3#

SCK4

SCK4#

SCK5

SCK5#

SCKE0

SCKE1

SCKE2

SCKE3

SCS#0

SCS#1

SCS#2

SCS#3

SBA0

SBA1

SDM0

SDM1

SDM2

SDM3

SDM4

SDM5

SDM6

SDM7

SDM8

RCVENOUT#

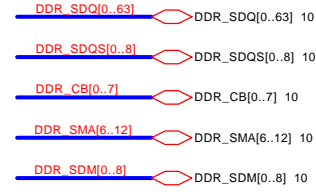
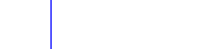
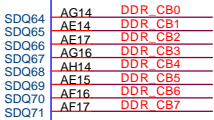
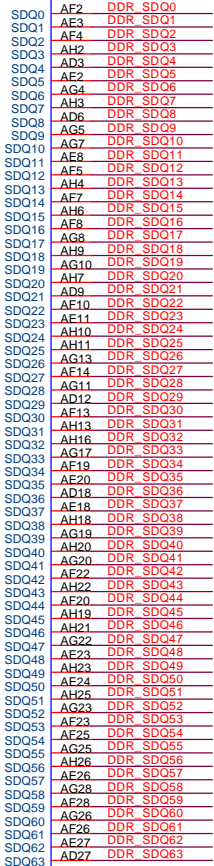
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MRCOMP

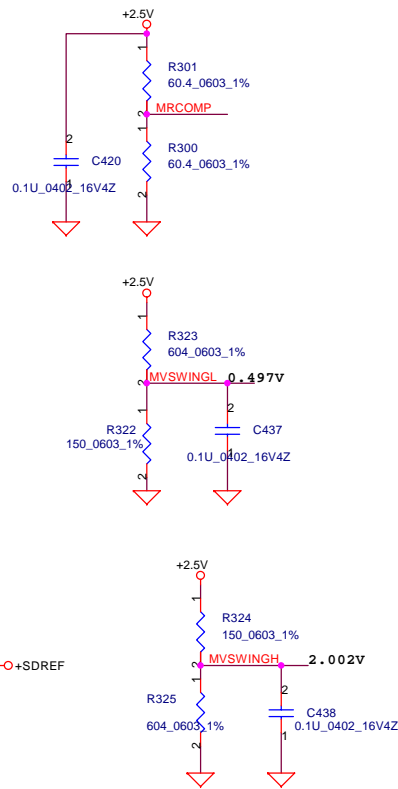
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MVSWINGH

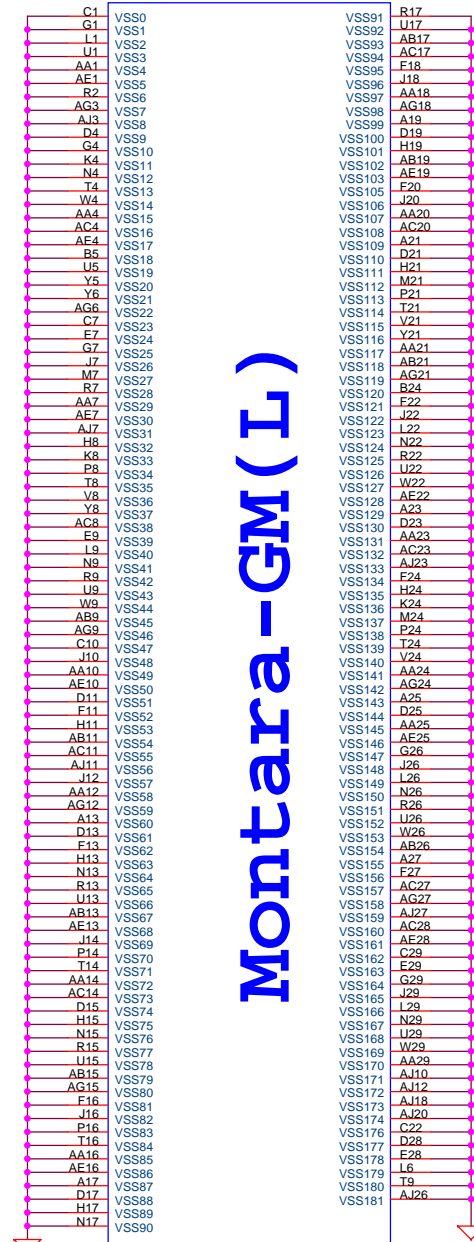
RG82G4350M_uFCBGA732



DDR REF & SWING VOLTAGE



U12D

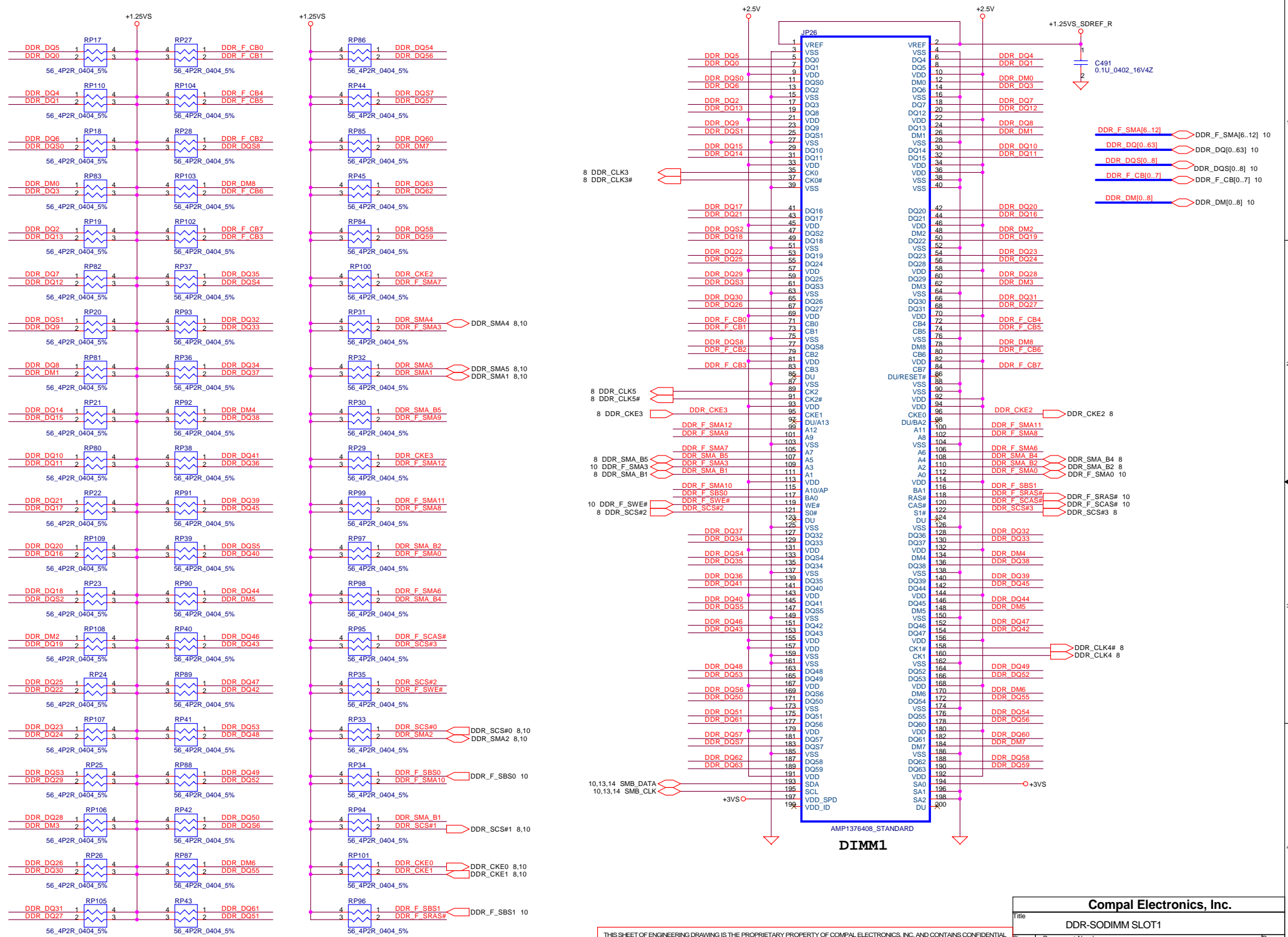


Montara-GM(L)

RG82G4350M_uFCBGA732

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Title	MONTARA-GM-DDR(3/4)	
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 8 of 43

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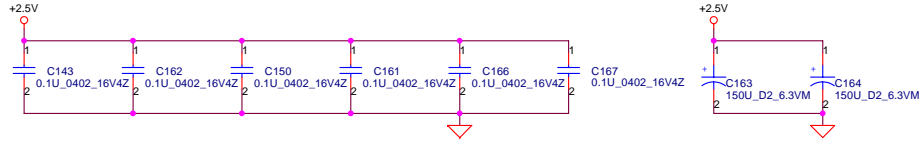
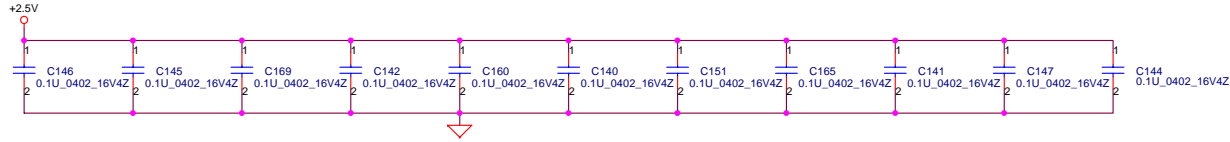
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- DDR DQ[0..63] ○ DDR_DQ[0..63] 10
- DDR DQS[0..8] ○ DDR_DQS[0..8] 10
- DDR F CB[0..7] ○ DDR_F_CB[0..7] 10
- DDR DM[0..8] ○ DDR_DM[0..8] 10

Compal Electronics, Inc.		
DDR-SODIMM SLOT1		
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 11 of 43

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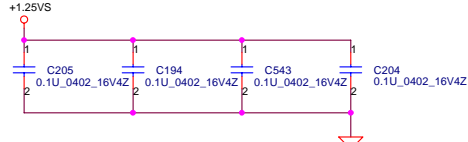
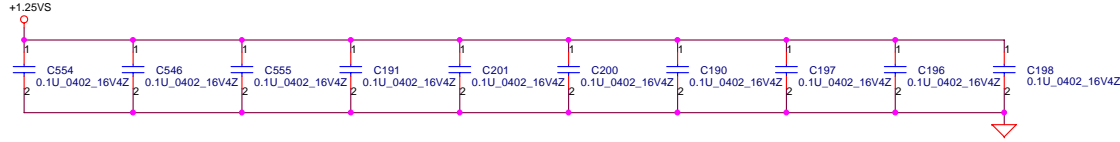
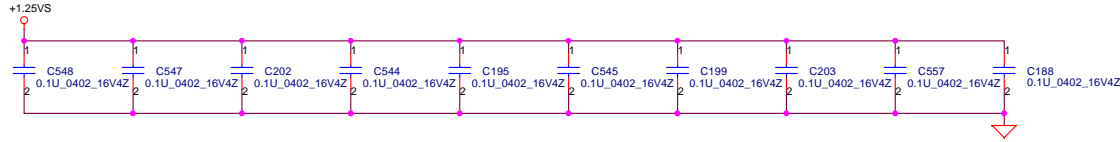
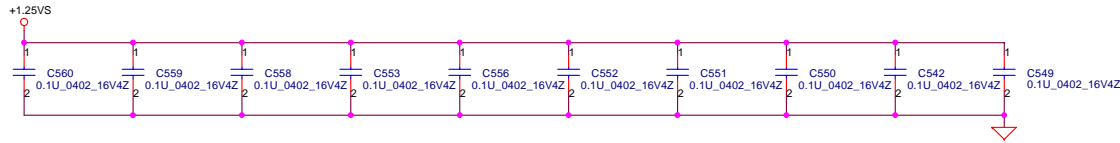
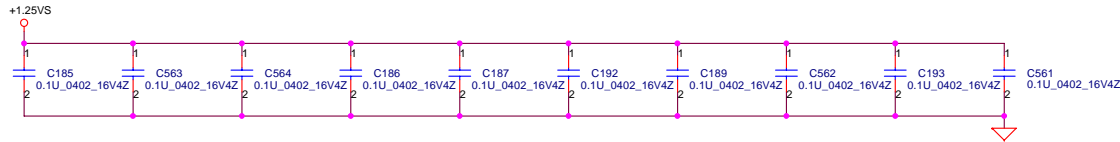
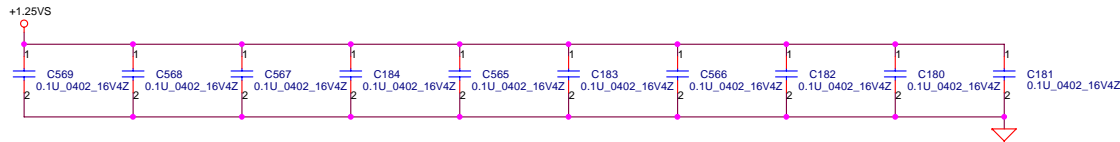
Layout note :

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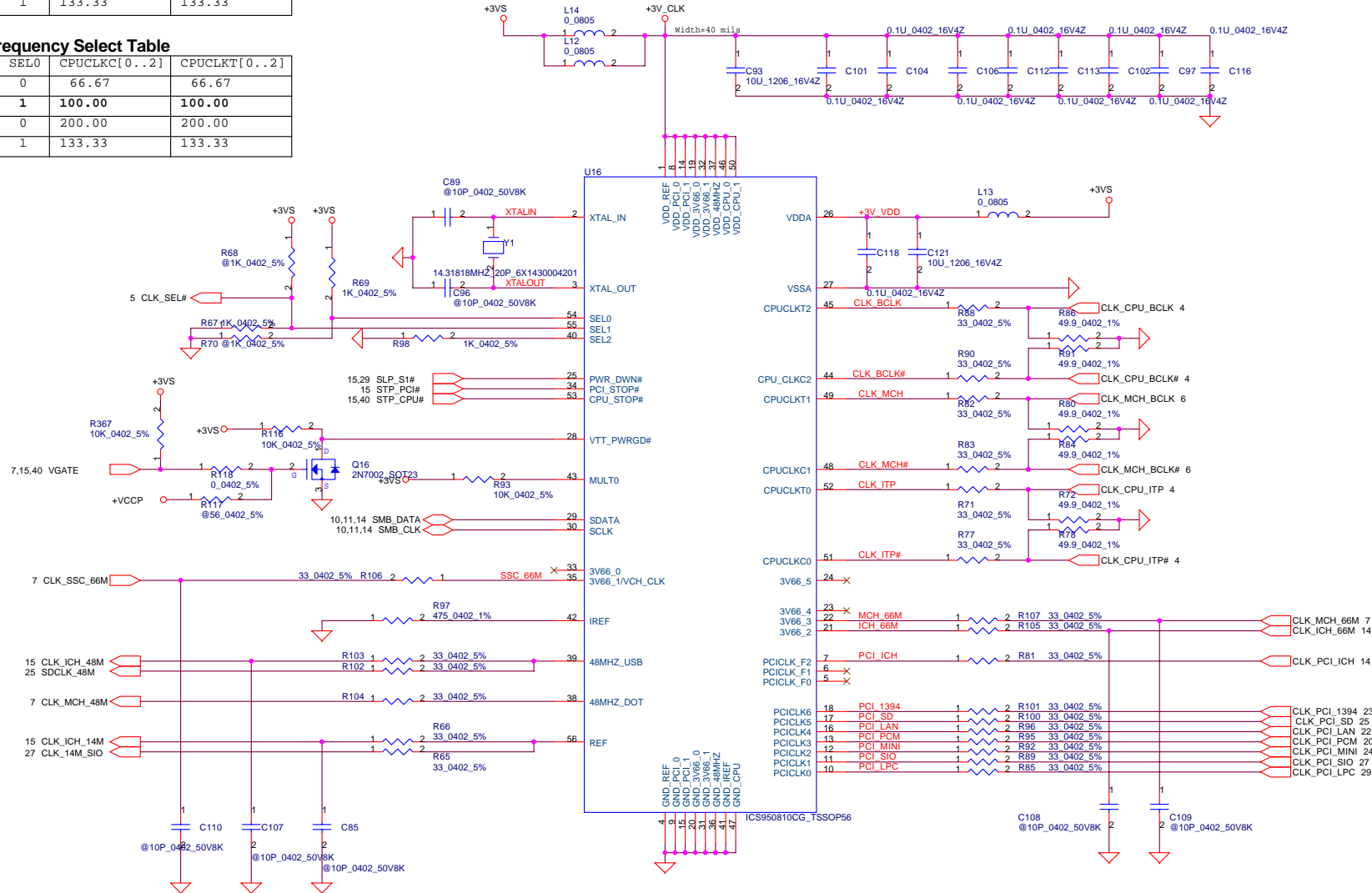
Compal Electronics, Inc.		
Title DDR SODIMM Decoupling		
Size	Document Number DCL55 LA-2201	Rev 1.0
Date:	星期四, 五月 06, 2004	Sheet 12 of 43

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

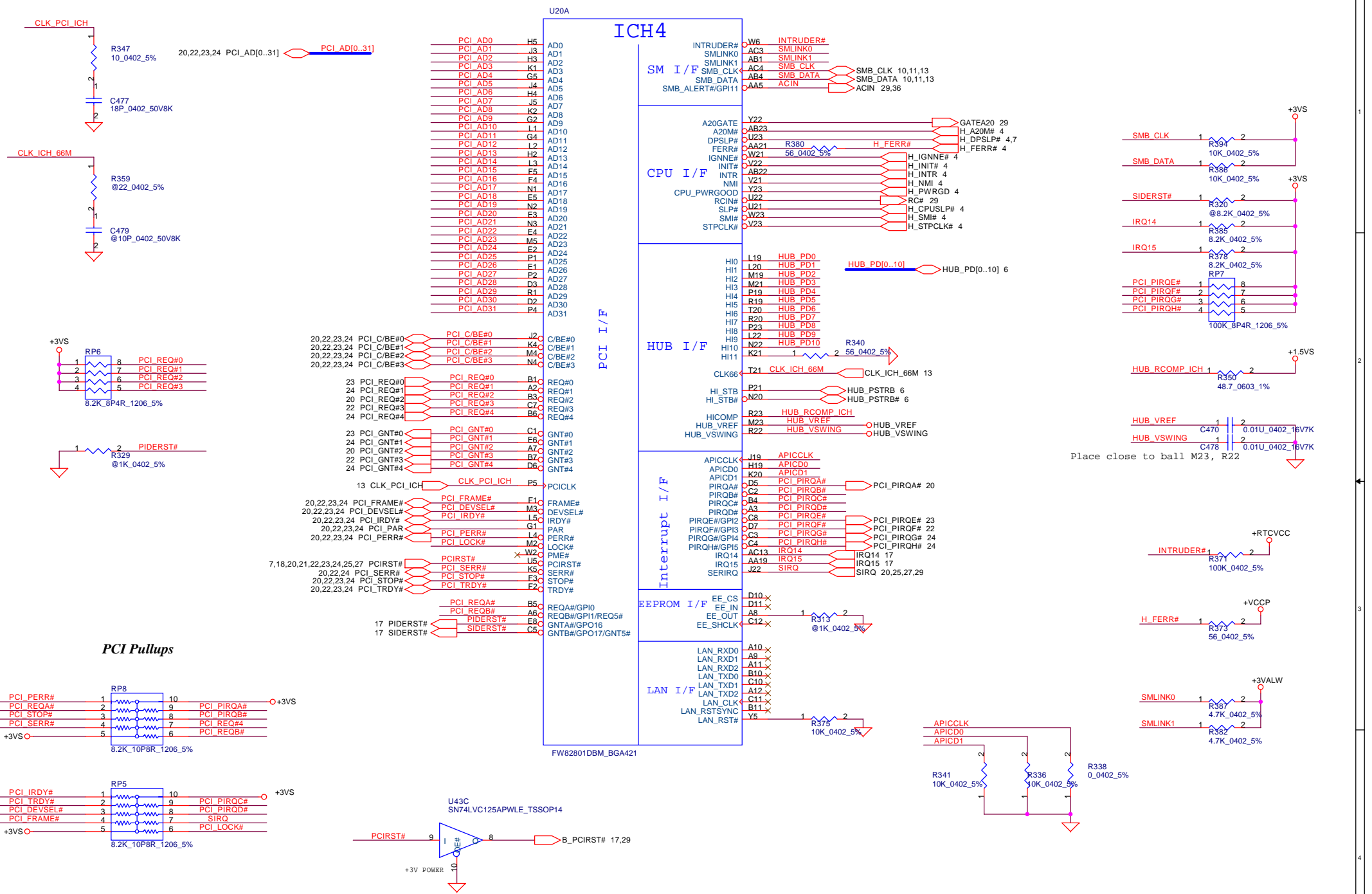
CY28346-2 Frequency Select Table

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



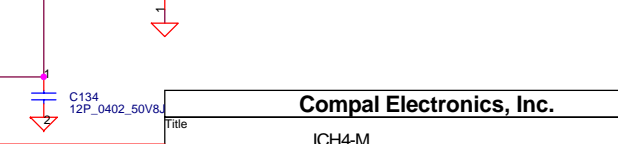
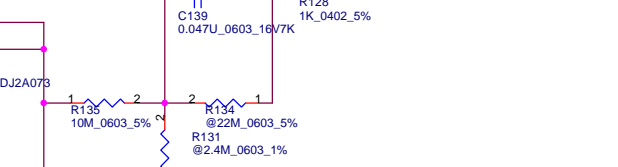
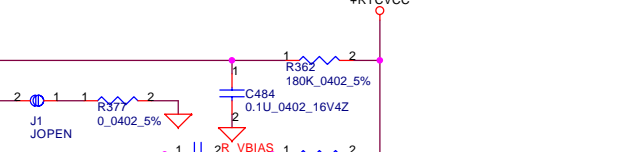
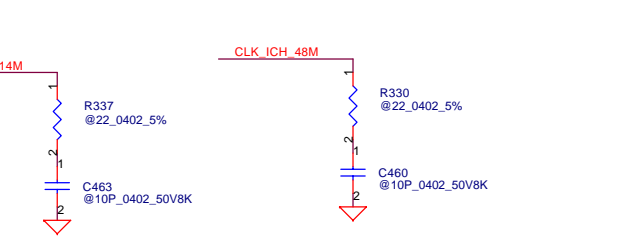
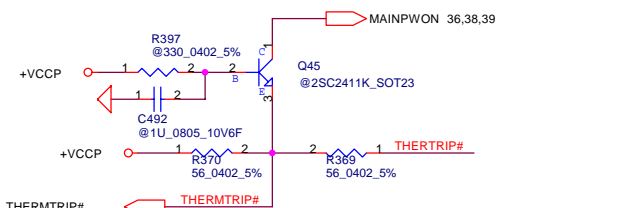
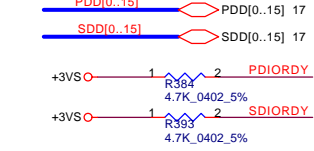
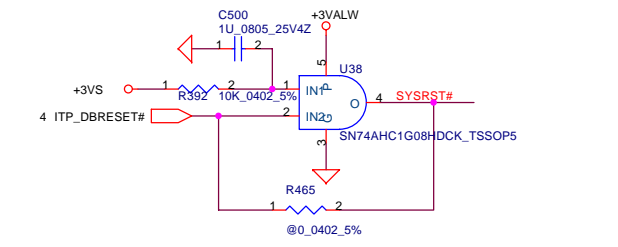
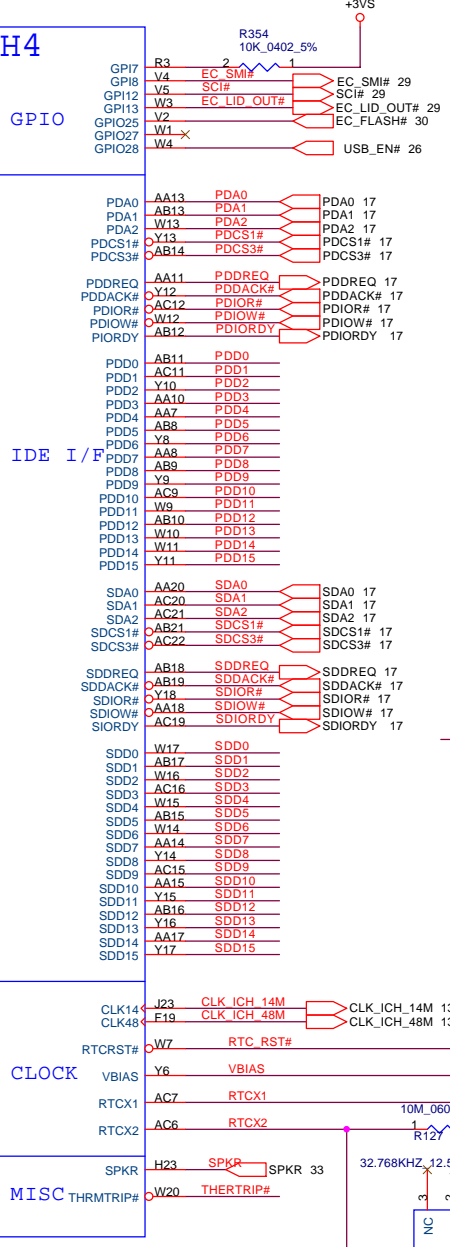
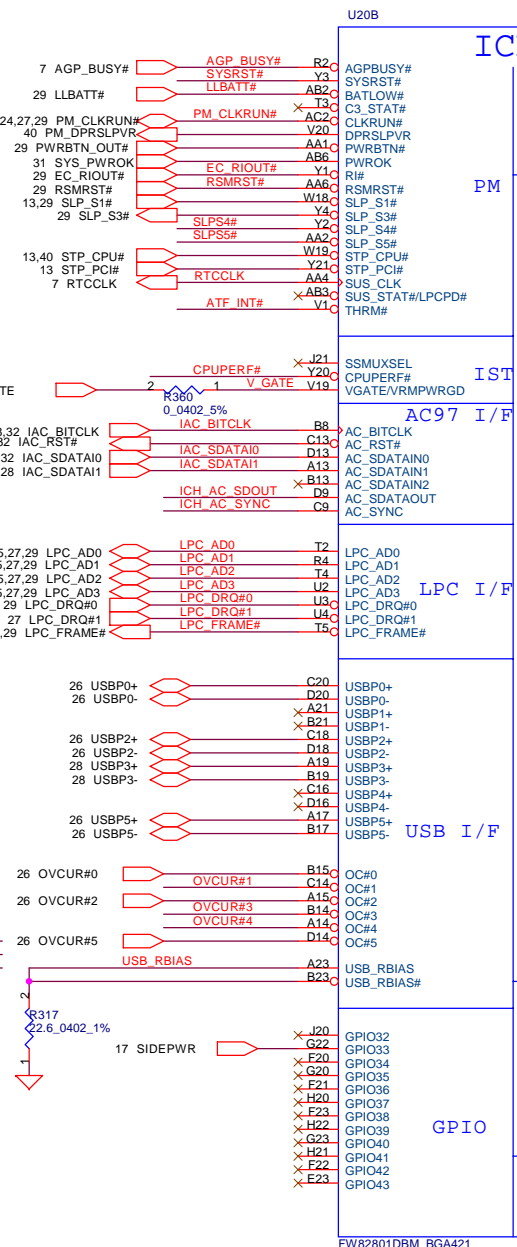
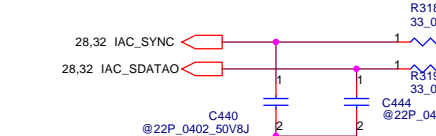
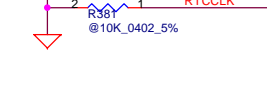
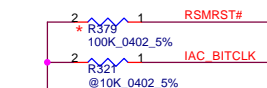
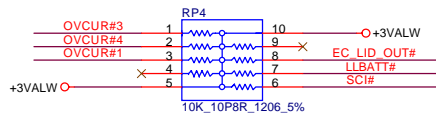
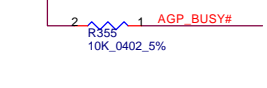
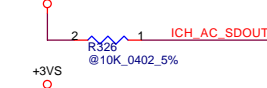
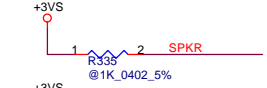
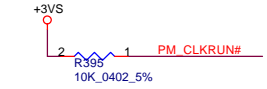
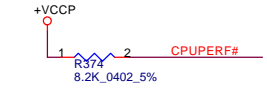
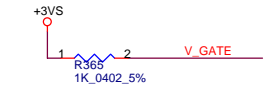
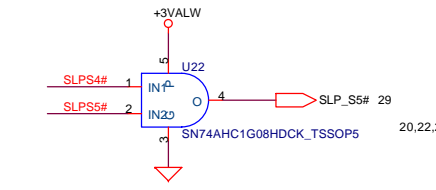
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Compal Electronics, Inc.		
Title Clock Generator		
Size B	Document Number DCL55 LA-2201	Rev 1.0
Date: 星期四, 五月 06, 2004	Sheet 13	of 43



Compal Electronics, Inc.		
Title	ICH4-M	
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 14 of 43

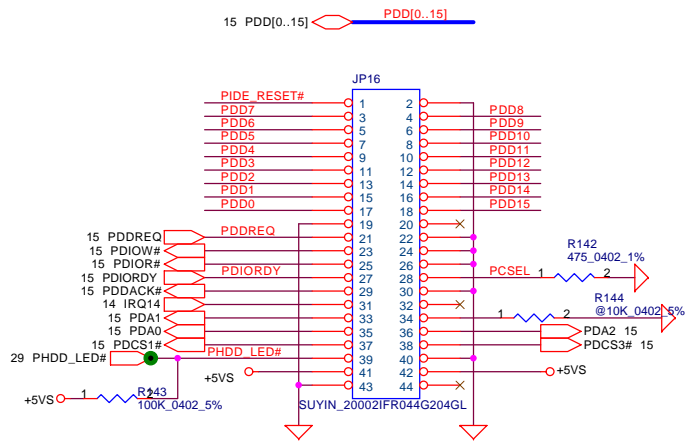
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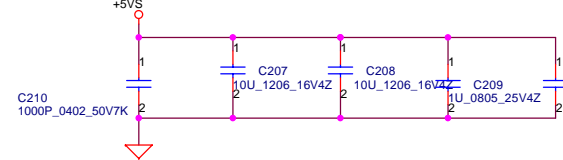
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Compal Electronics, Inc.		
Title ICH4-M		
Size	Document Number DCL55 LA-2201	Rev 1.0
Date:	星期四, 五月 06, 2004	Sheet 15 of 43

HDD Connector

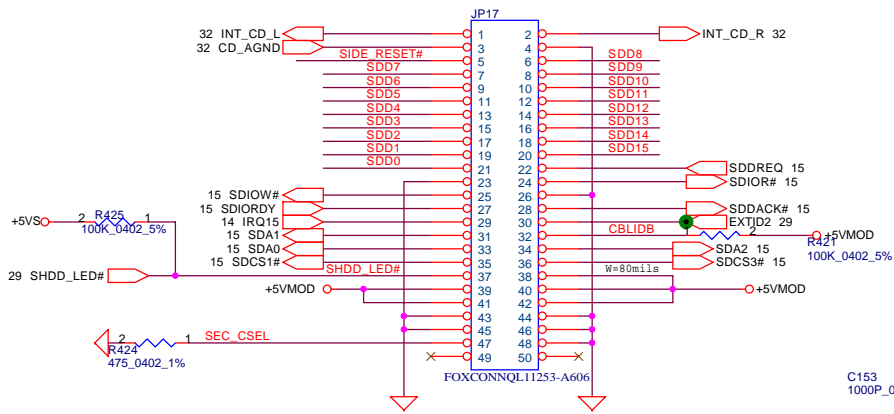


Placea caps. near HDD CONN.

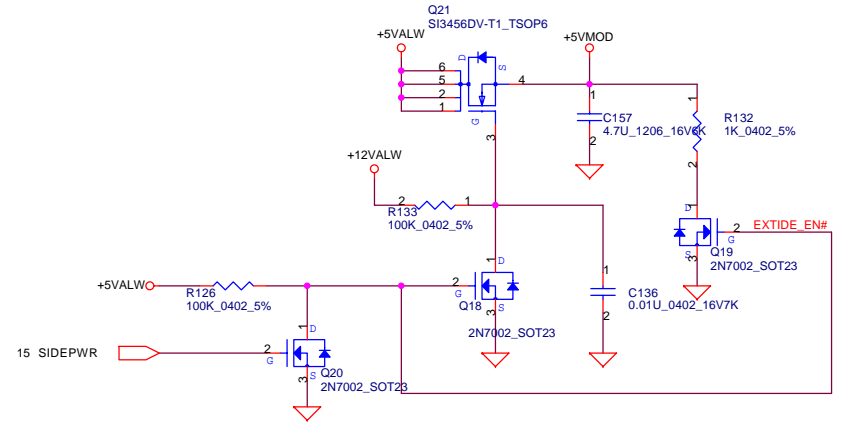
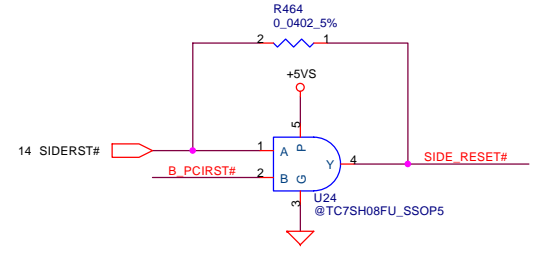
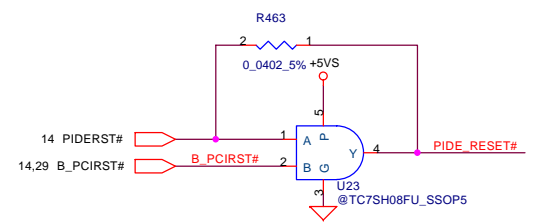
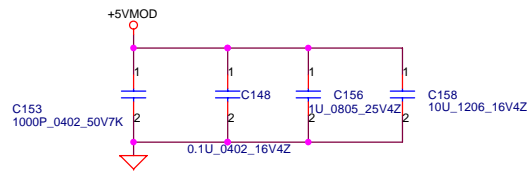


CD-ROM Connector

SDD[0..15] ↔ SDD[0..15] 15



Placea caps. near CDROM CONN.



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

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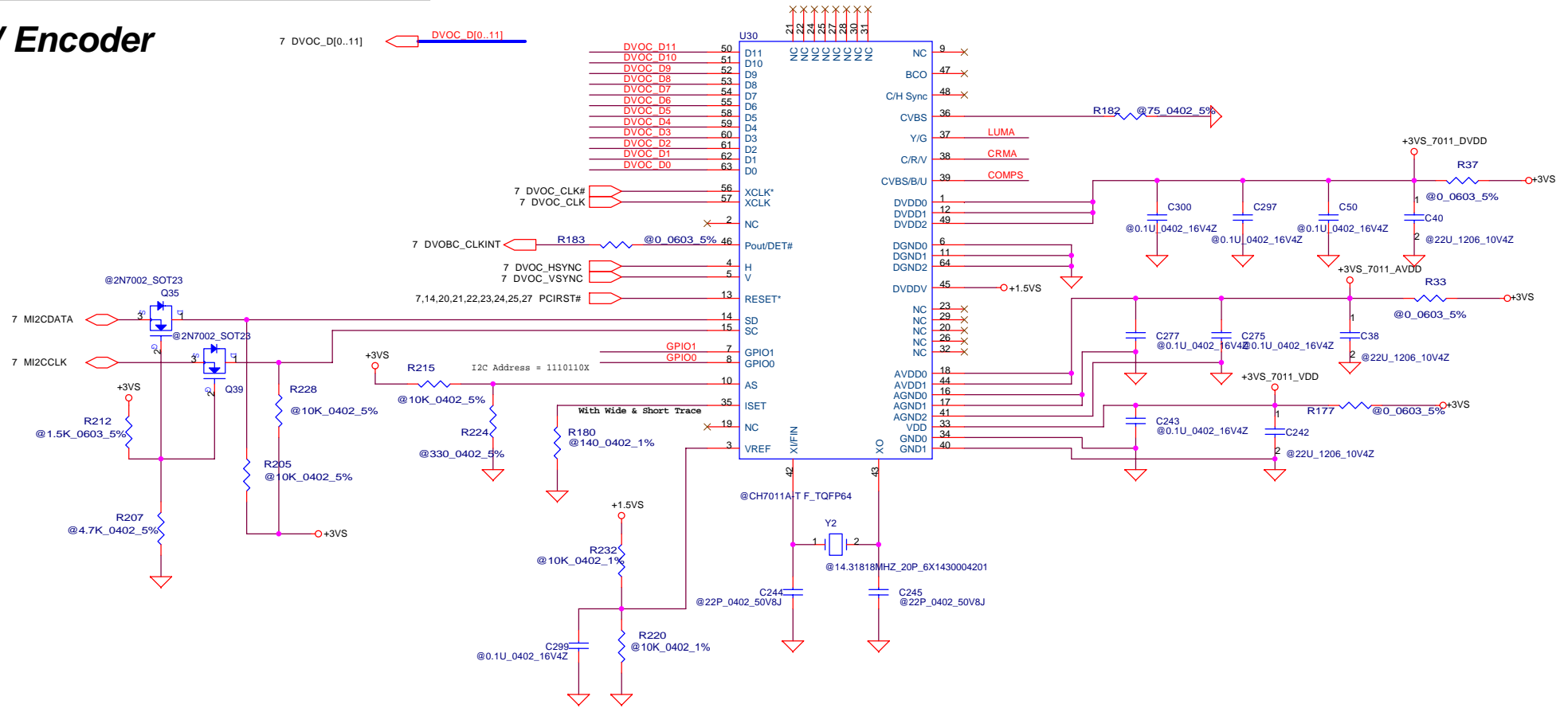
Compal Electronics, Inc.		
Title	IDE/CD-ROM Module	
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 17 of 43

For ABO without TV_out:all this page component unmount

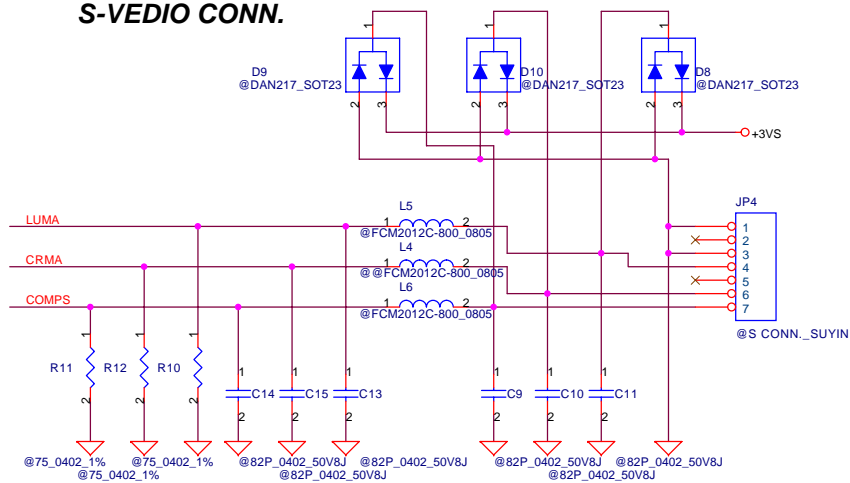
TV Encoder

7 DVOC_D[0..11]

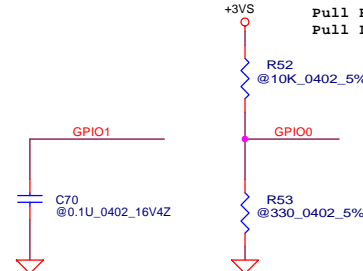
DVOC_D[0..11]



S-VIDEO CONN.



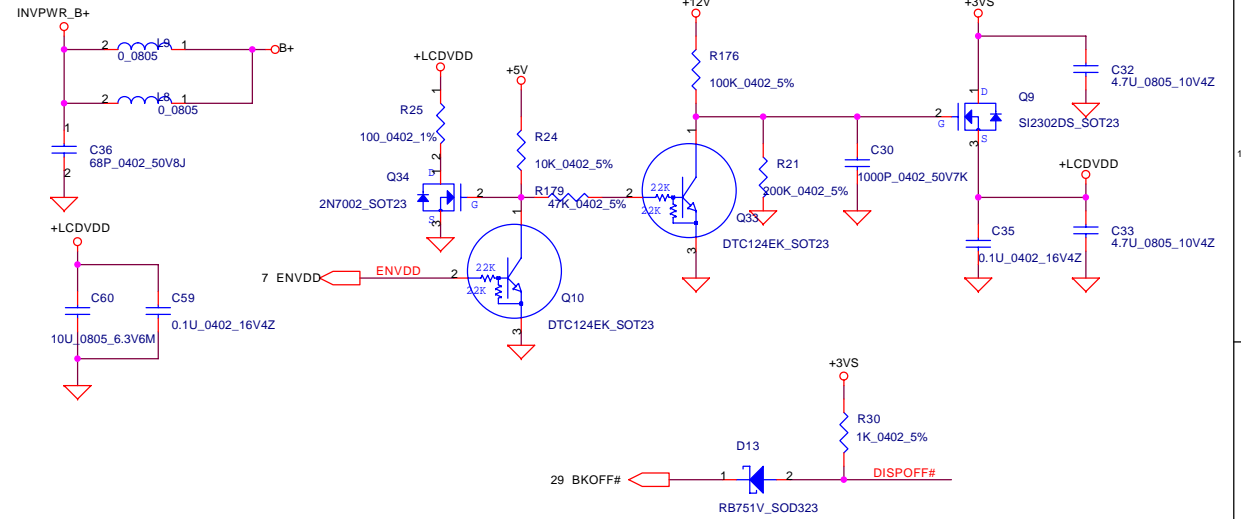
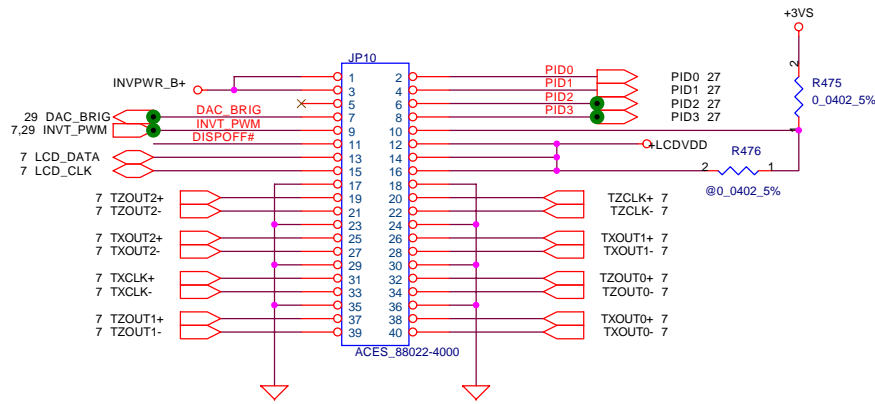
Pull High: Default PAL
Pull Low: Default NTSC



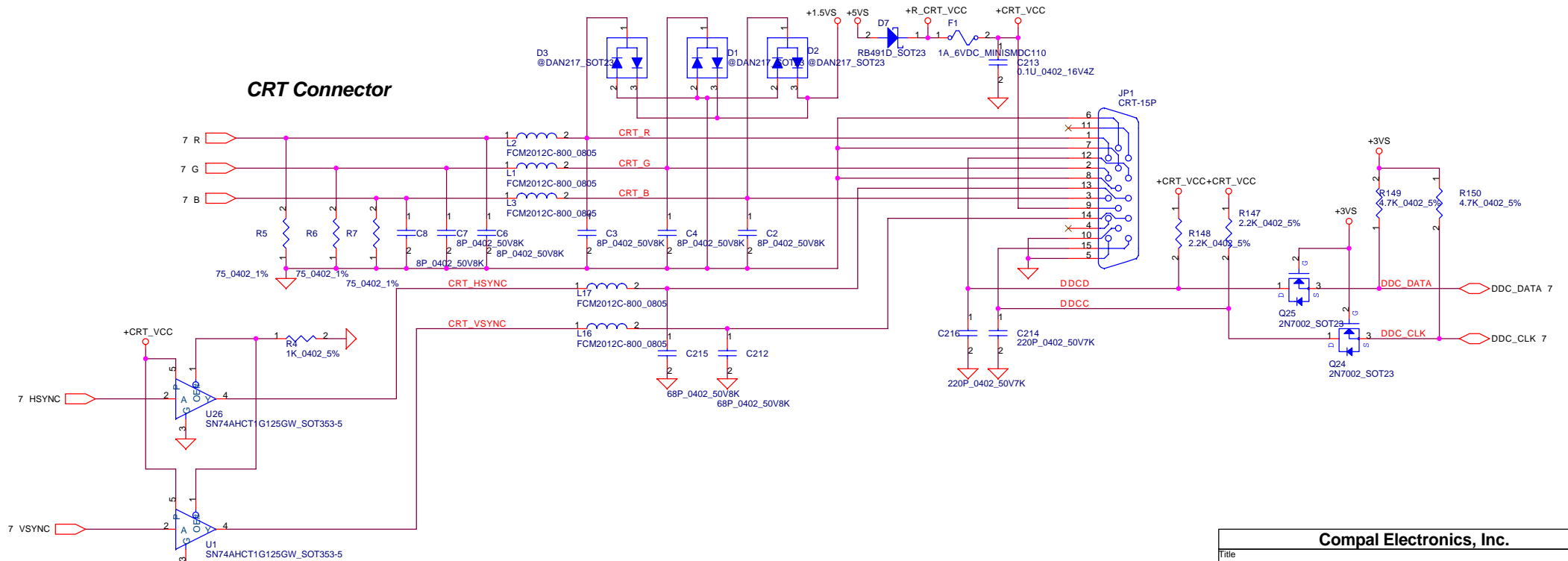
Compal Electronics, Inc.		
Title	TV Encoder	
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 18 of 43

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LVDS Connector

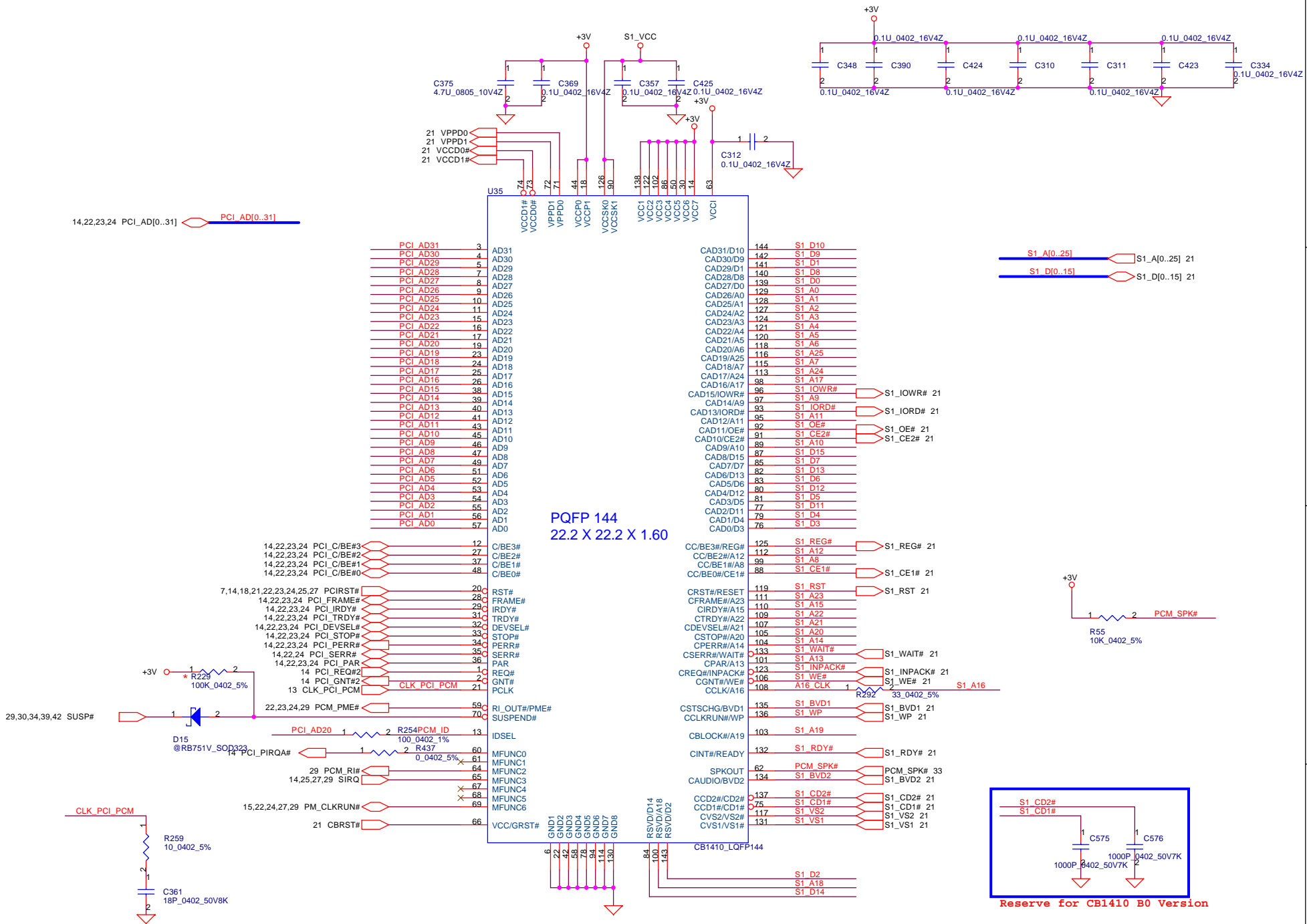


CRT Connector

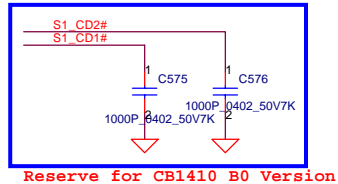


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Compal Electronics, Inc.		
Title: LVDS & CRT		
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 19 of 43



PQFP 144
22.2 X 22.2 X 1.60

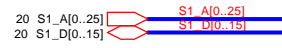
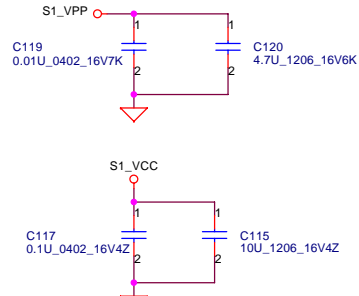
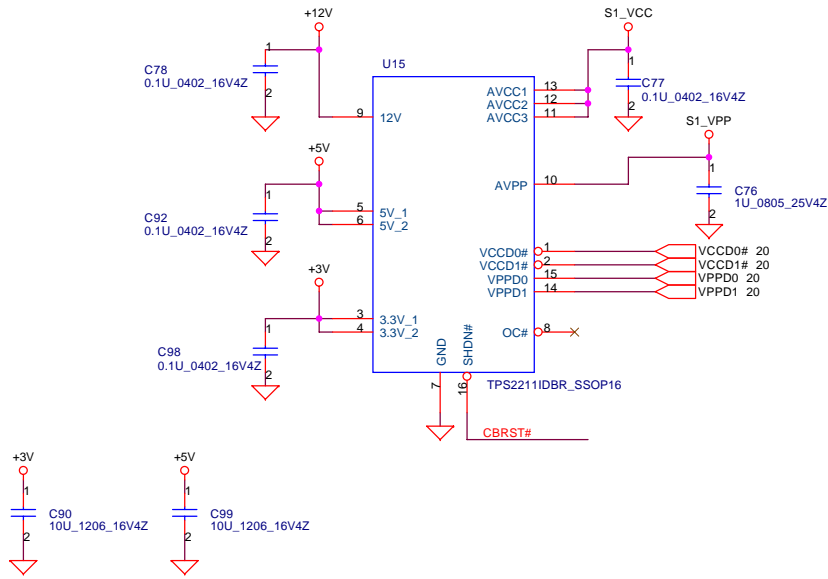


Reserve for CB1410 B0 Version

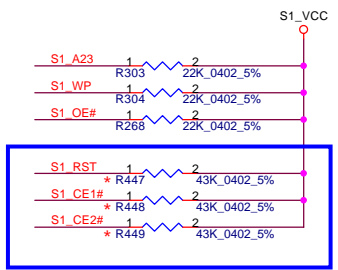
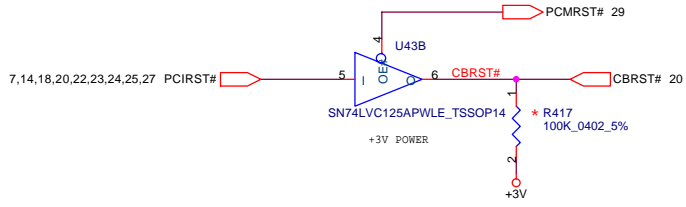
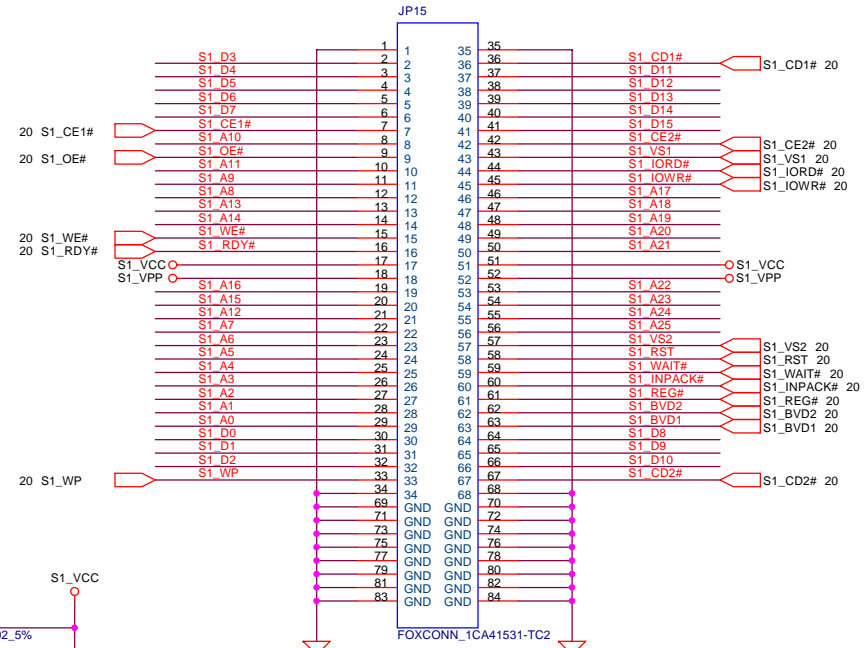
Compal Electronics, Inc.			
Title PCMCIA controller ENE CB1410			
Size	Document Number DCL55 LA-2201	Rev 1.0	
Date:	星期四, 五月 06, 2004	Sheet	20 of 43

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PCMCIA Power Controller



CardBus Socket

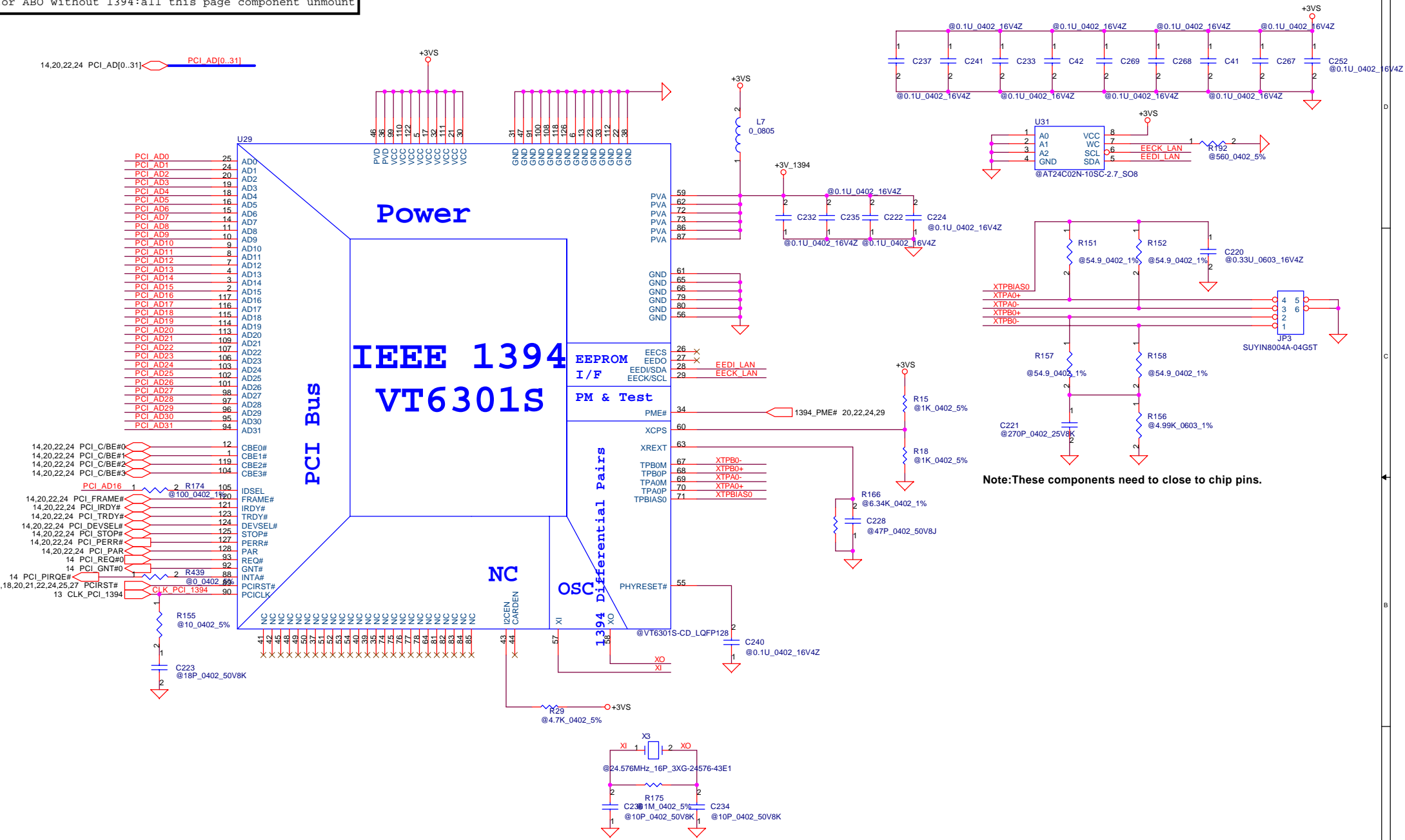


Reserve for CB1410 B0 Version

Compal Electronics, Inc.		
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Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 21 of 43

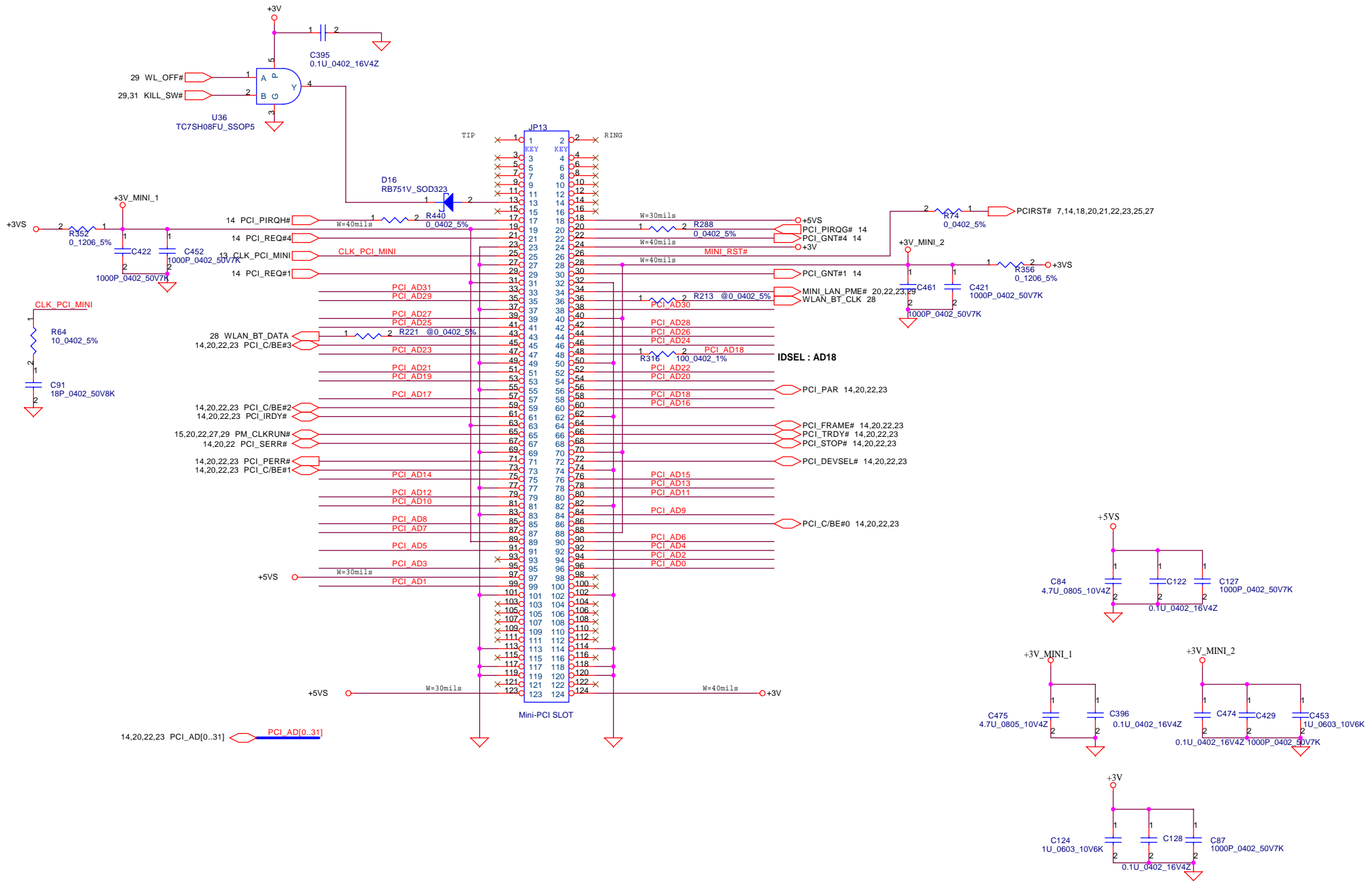
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For ABO without 1394:all this page component unmount



Compal Electronics, Inc.		
Title	IEEE-1394 VT6301S	
Size	Document Number	Rev
B	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 23 of 43

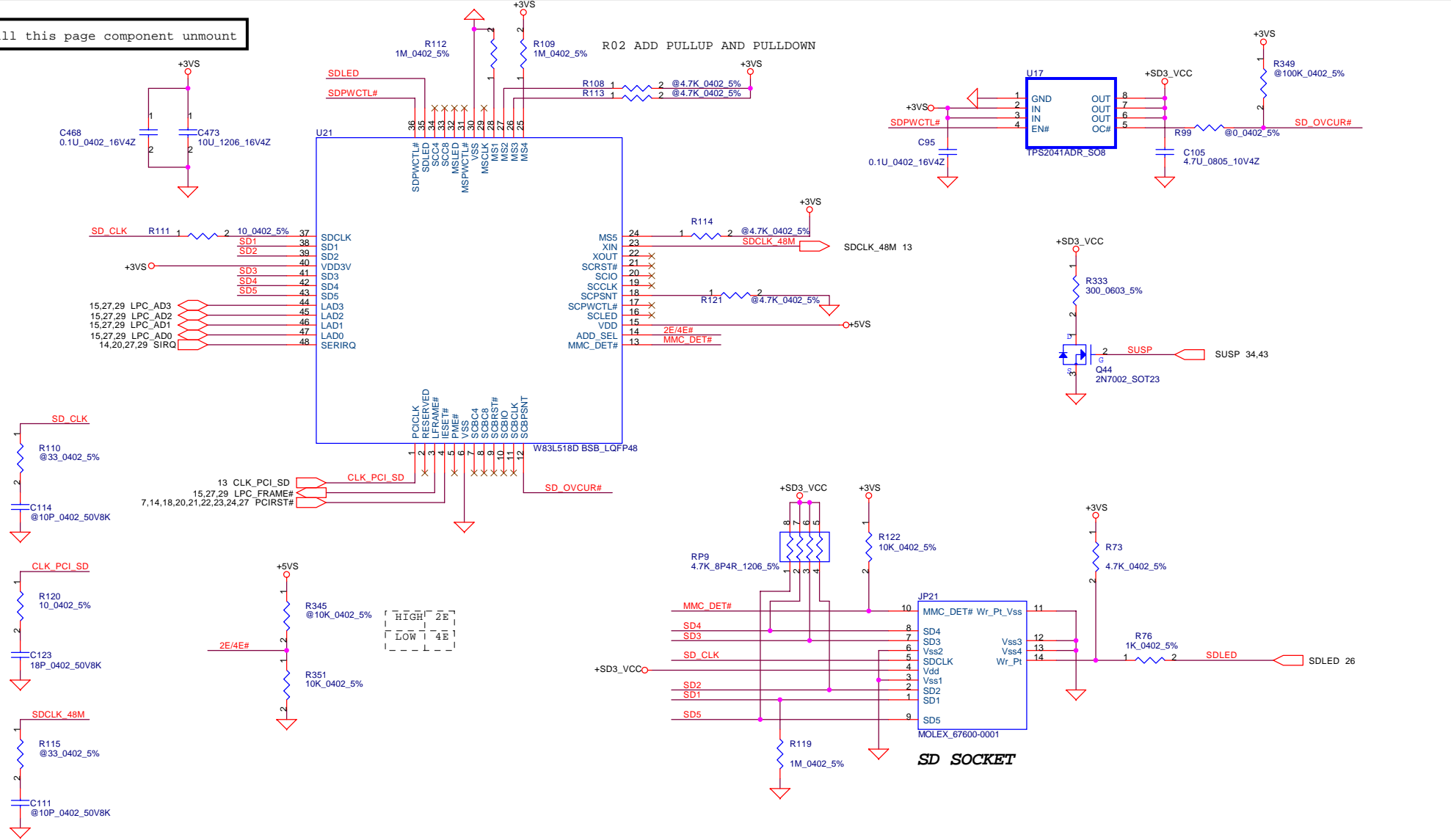
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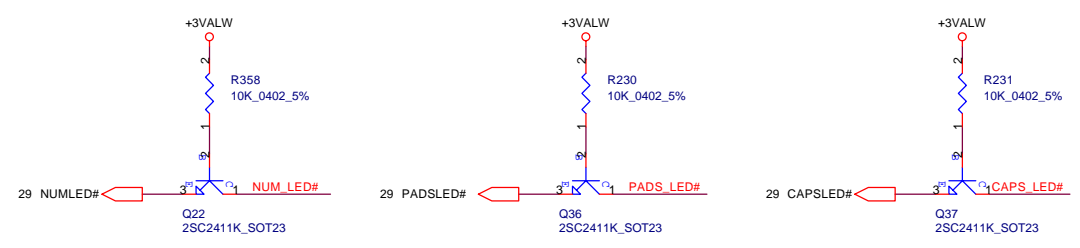
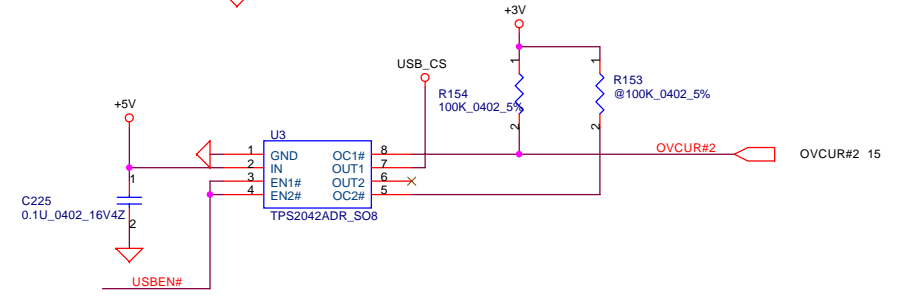
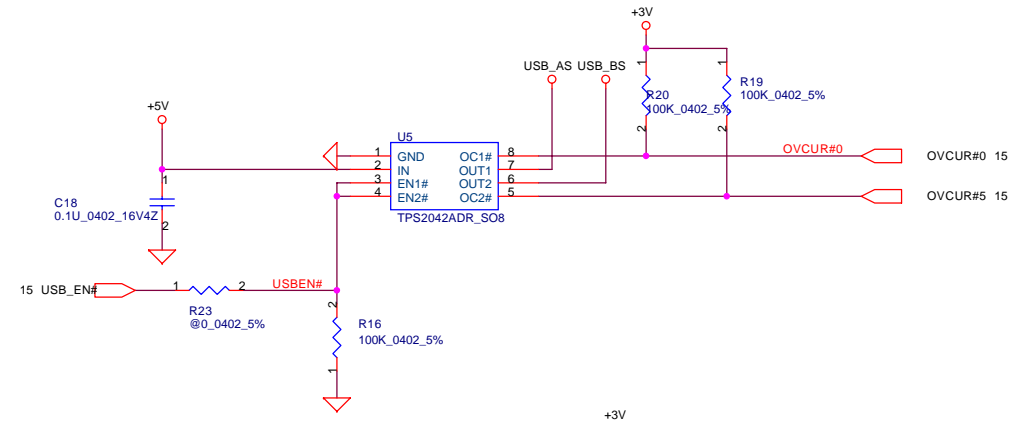
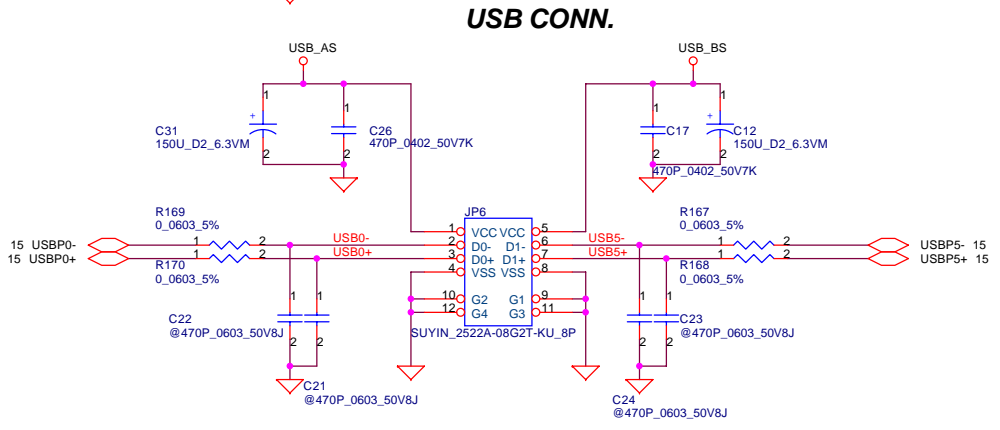
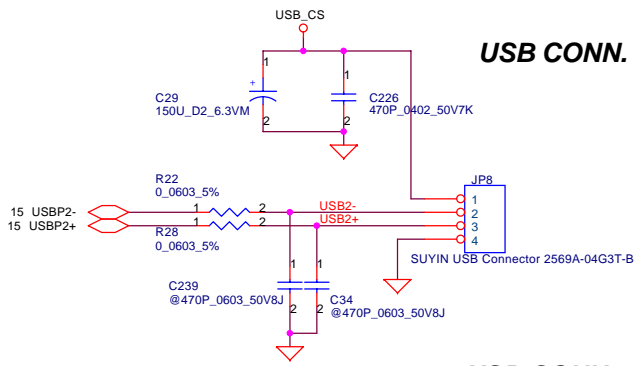
Compal Electronics, Inc.		
Title	Mini PCI Slot	
Size	Document Number	Rev
B	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 24 of 43

FOR ABO: all this page component unmount

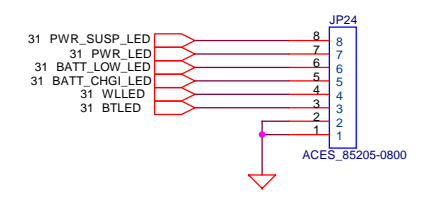


Compal Electronics, Inc.		
Title	SD CARD Controller/Socket	
Size	Document Number	Rev
B	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 25 of 43

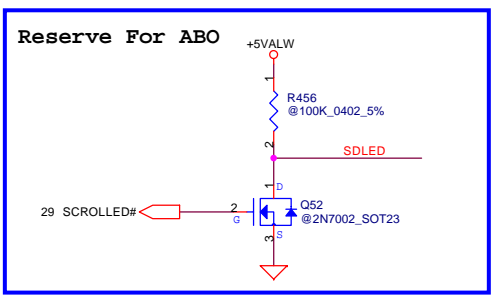
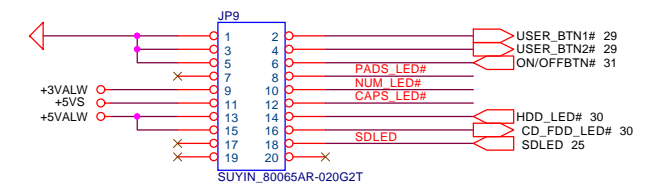
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LED/B CONN.



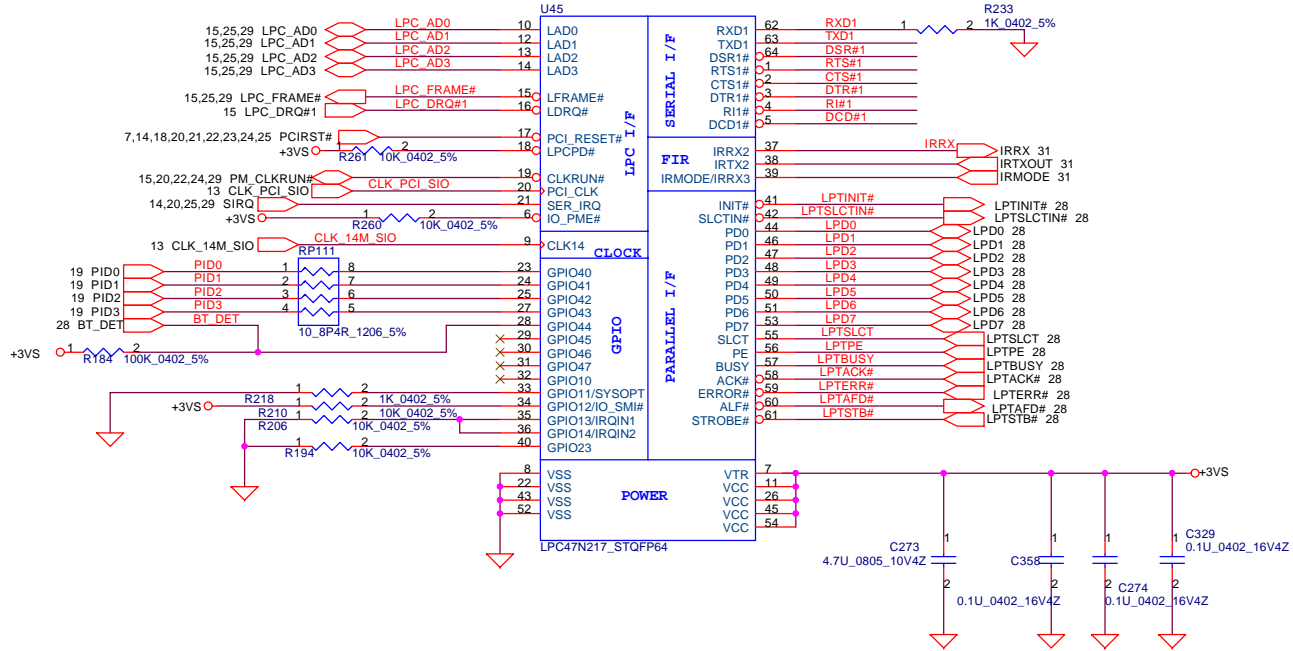
POWER/B CONN.



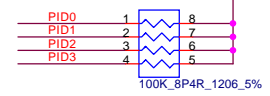
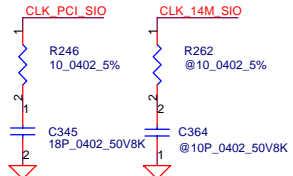
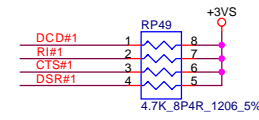
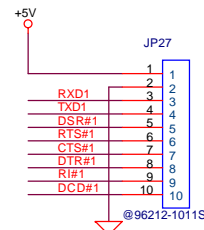
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Compal Electronics, Inc.		
Title	USB & LED	
Size	Document Number	Rev
B	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 26 of 43

SUPER I/O SMC FDC47N227

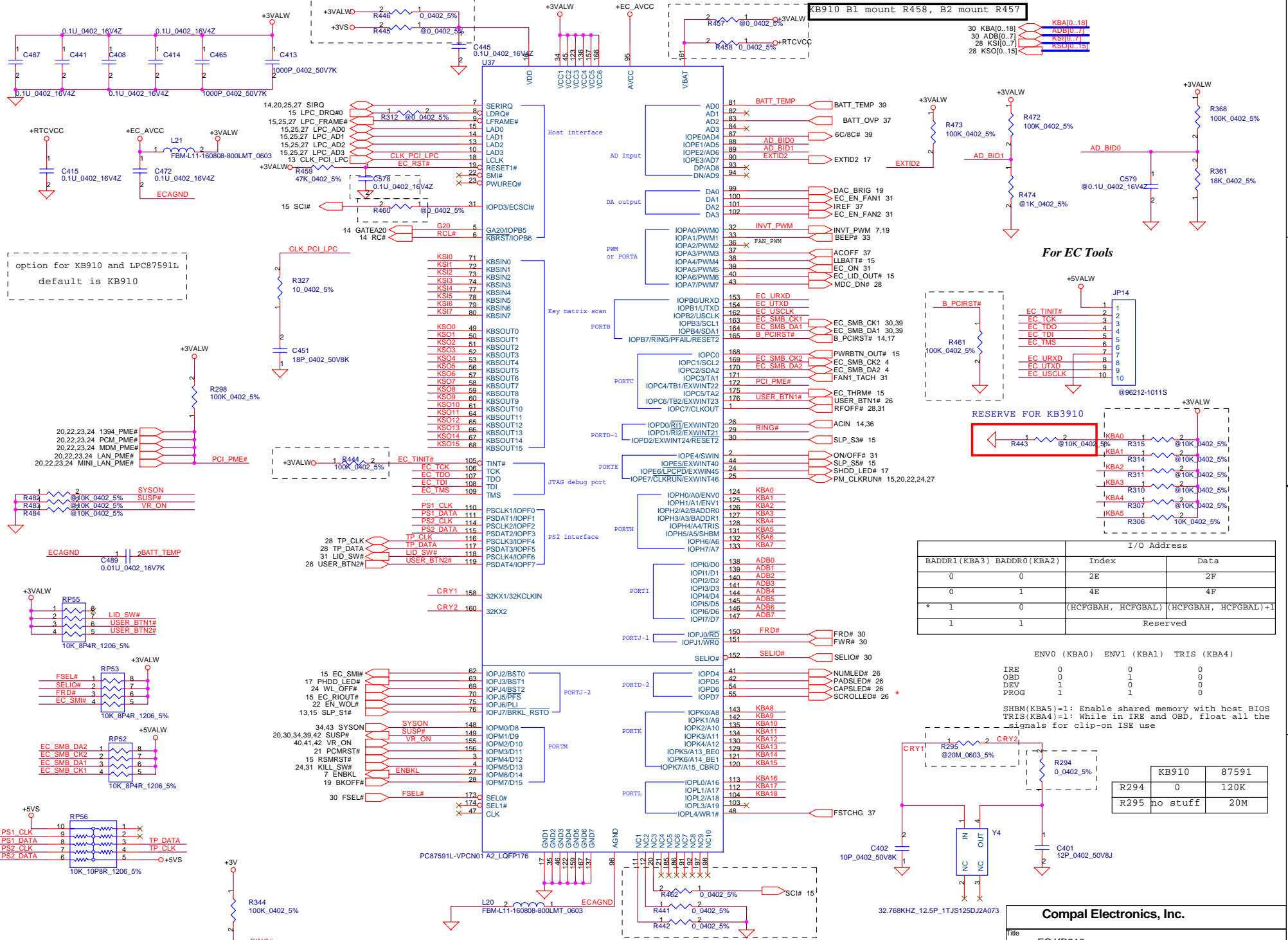


Base I/O Address
 * 0 = 02Eh
 1 = 04Eh



Compal Electronics, Inc.		
Title SUPER I/O		
Size B	Document Number DCL55 LA-2201	Rev 1.0
Date: 星期四, 五月 06, 2004	Sheet 27	of 43

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option for KB910 and LPC87591L
default is KB910

For EC Tools

RESERVE FOR KB3910

I/O Address			
BADDR1 (KBA3)	BADDR0 (KBA2)	Index	Data
0	0	2E	2F
0	1	4E	4F
* 1	0	(HCFGBAH, HCFGBAL)	(HCFGBAH, HCFGBAL)+1
1	1	Reserved	

ENV0 (KBA0)	ENV1 (KBA1)	TRIS (KBA4)
IRE 0	0	0
OBD 0	1	0
DEV 1	0	0
PROG 1	0	1

SHBM(KBA5)=1: Enable shared memory with host BIOS
TRIS(KBA4)=1: While in IRE and OBD, float all the signals for clip-on ISE use

	KB910	87591
R294	0	120K
R295	no stuff	20M

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Compal Electronics, Inc.

Title: EC KB910

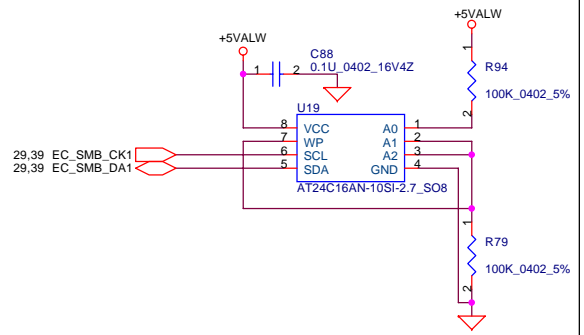
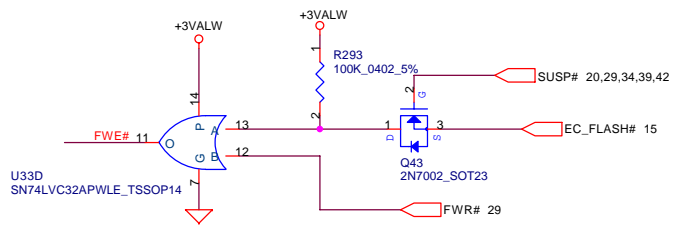
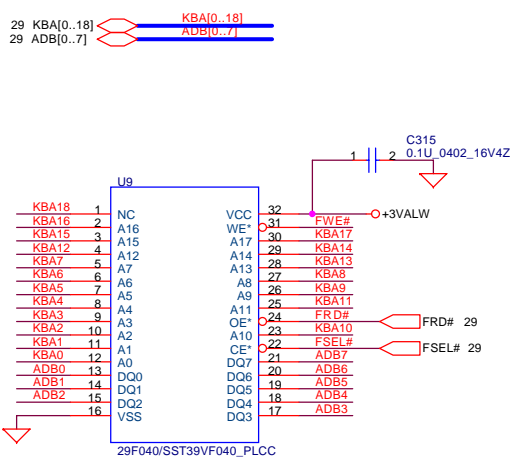
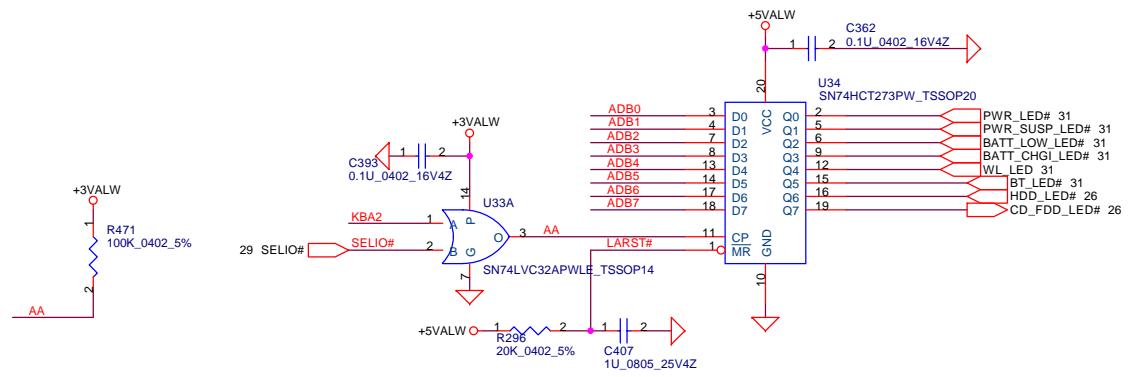
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Customer: 星洲, 五月 06, 2004

Date: 星洲, 五月 06, 2004

Sheet: 29 of 43

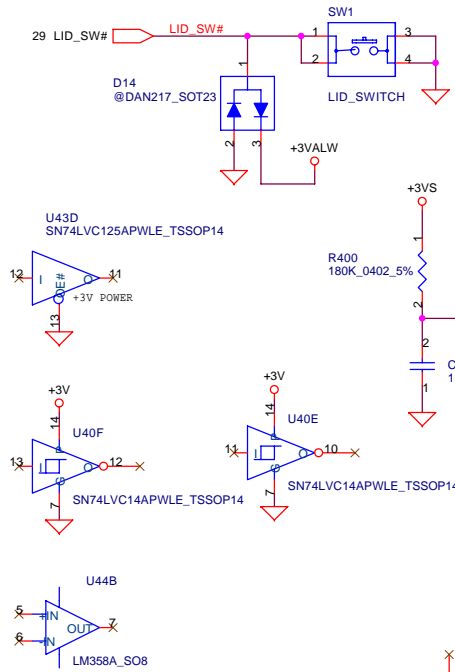
Rev: 1.0



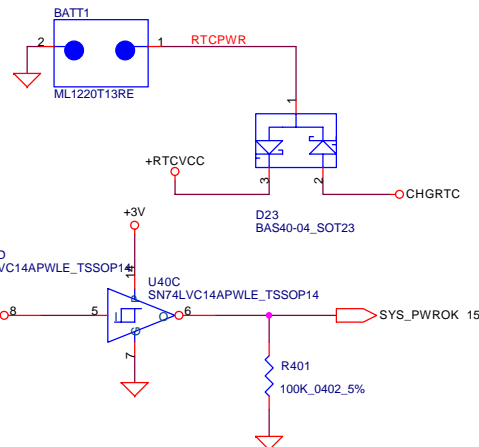
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Compal Electronics, Inc.			
Title: BIOS & EXT. I/O PORT			
Size: B	Document Number: DCL55 LA-2201	Rev: 1.0	
Date: 星期四, 五月 06, 2004	Sheet: 30	of	43

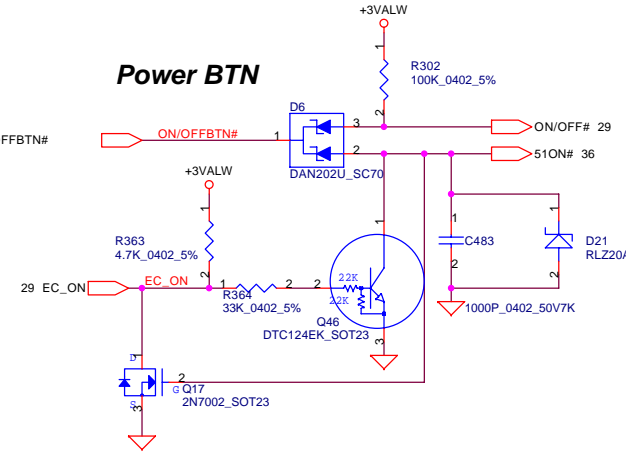
Power ON Circuit



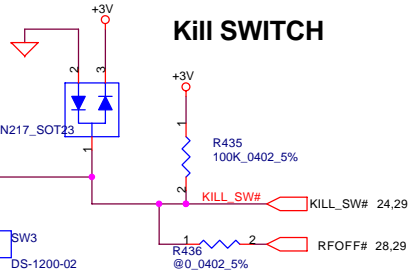
RTC Battery



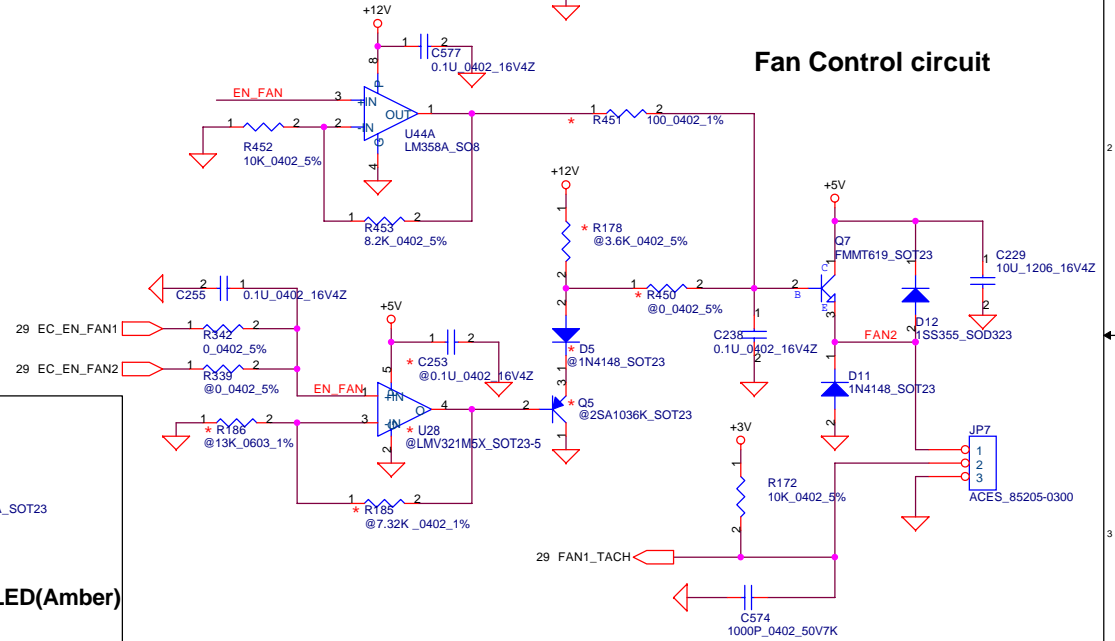
Power BTN



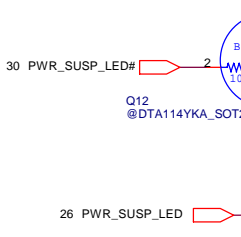
Kill SWITCH



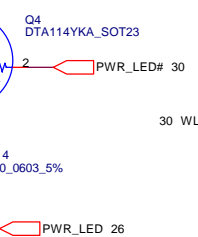
Fan Control circuit



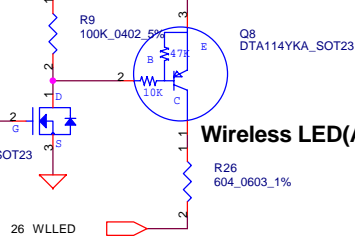
Suspend LED(Amber)



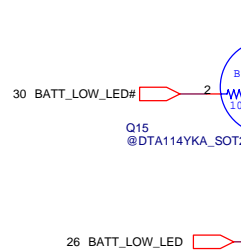
Power LED(Blue)



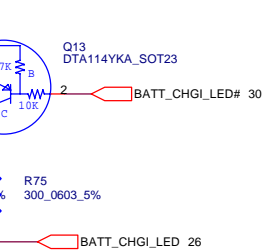
Wireless LED(Amber)



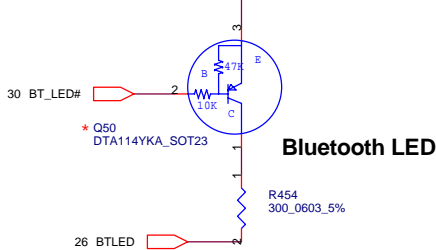
BATT Low LED(Amber)



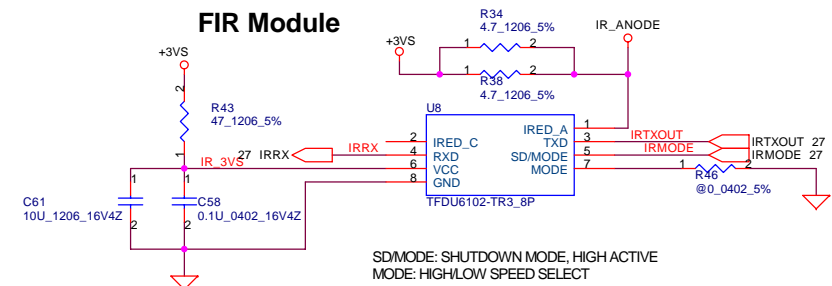
BATT Charge LED(Blue)



Bluetooth LED(Blue)



FIR Module

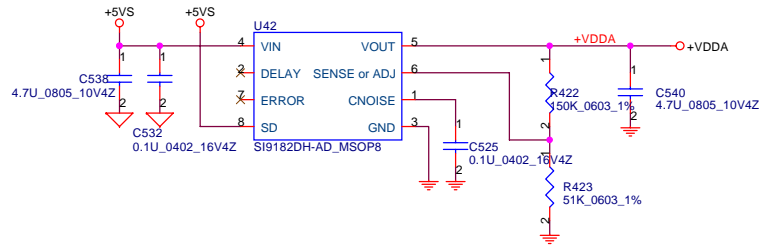


SD/MODE: SHUTDOWN MODE, HIGH ACTIVE
MODE: HIGH/LOW SPEED SELECT

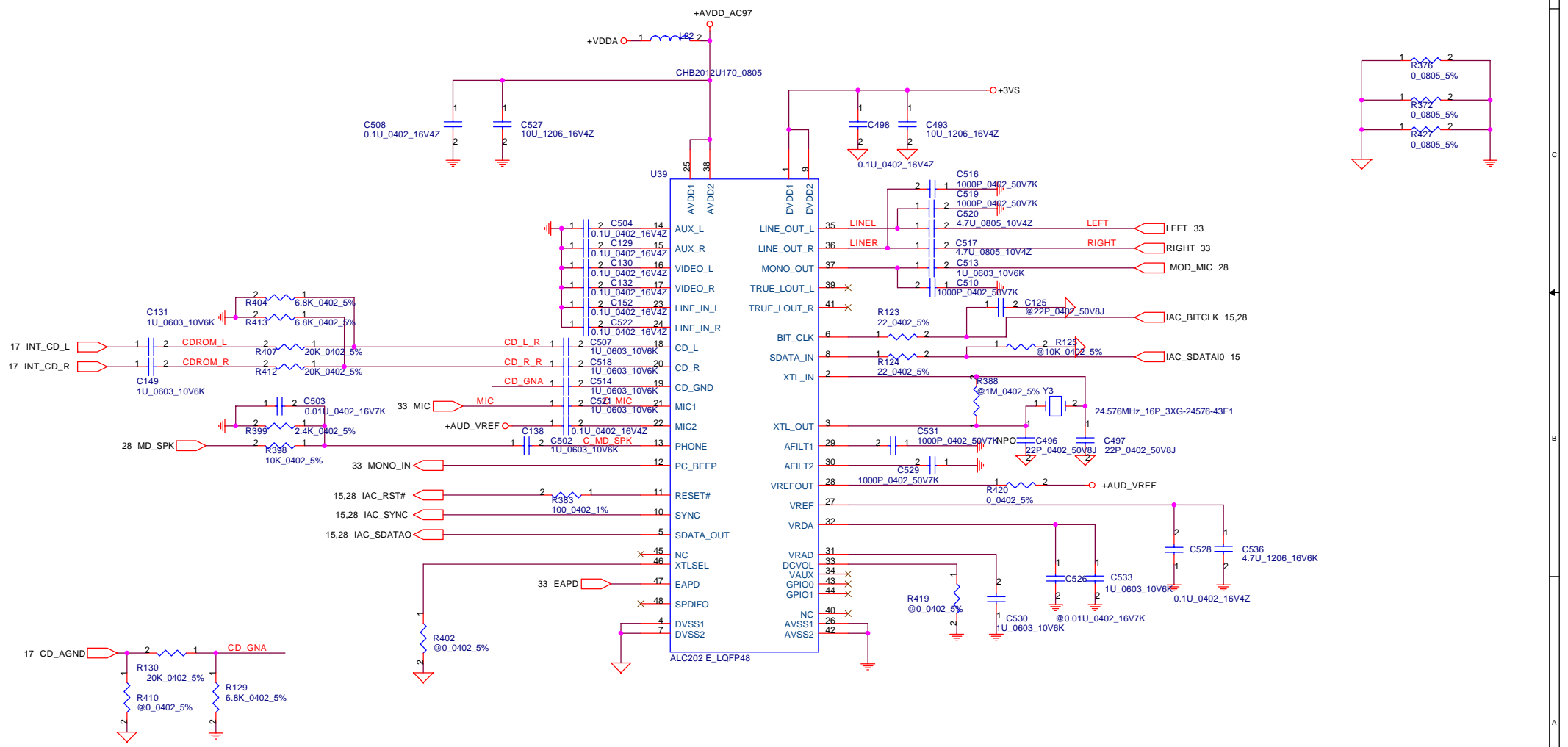
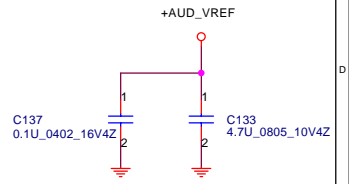
Compal Electronics, Inc.		
Title	Power OK/Reset/RTC battery/Lid Switch/Int. KB	
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 31 of 43

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AC97 Codec

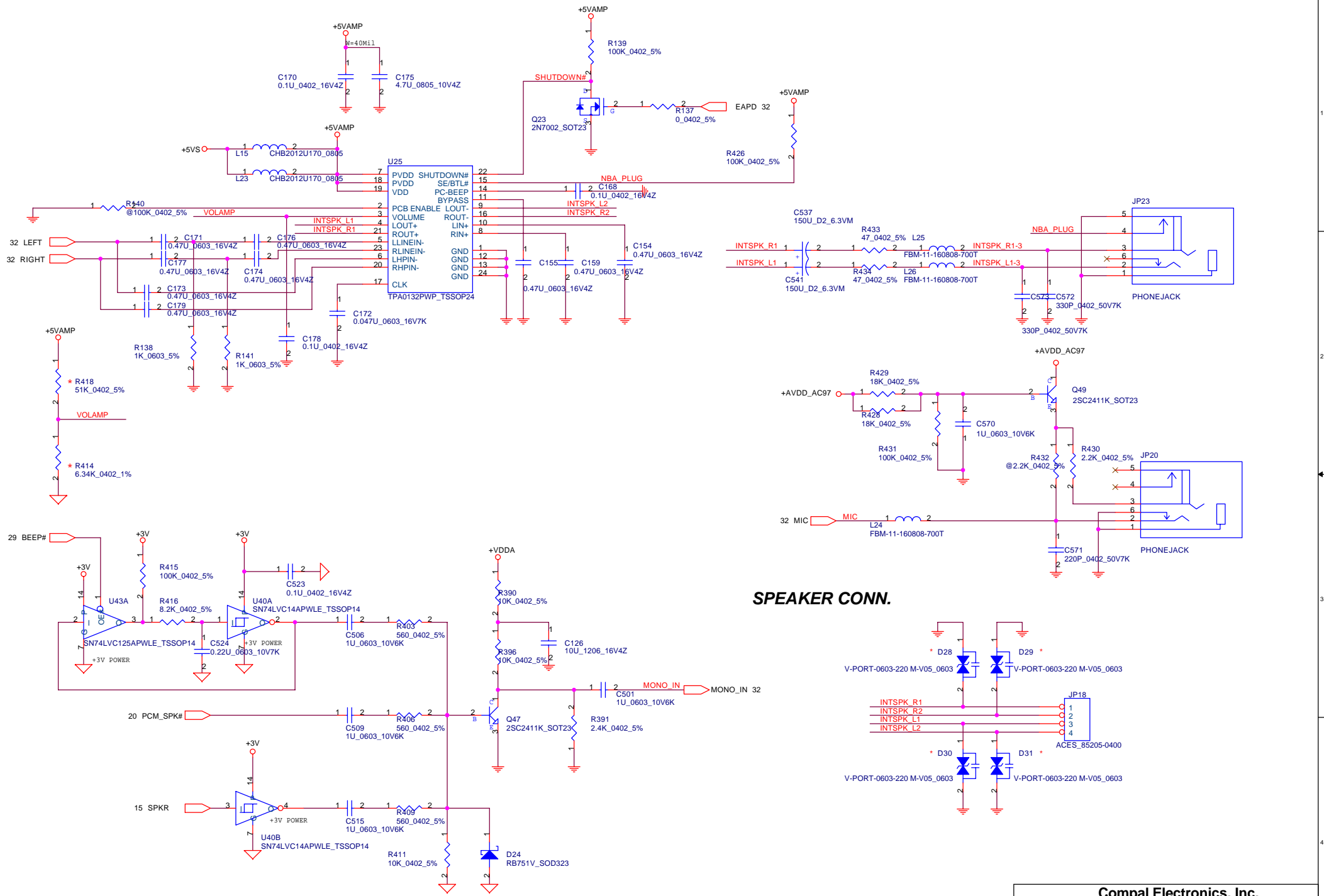


R402	MODE
Stuff	14.318MHz External
No-Stuff	24.576MHz Crystal or External Colck

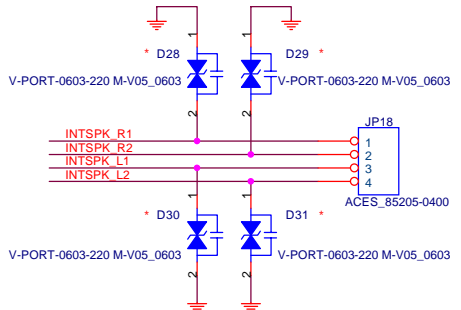


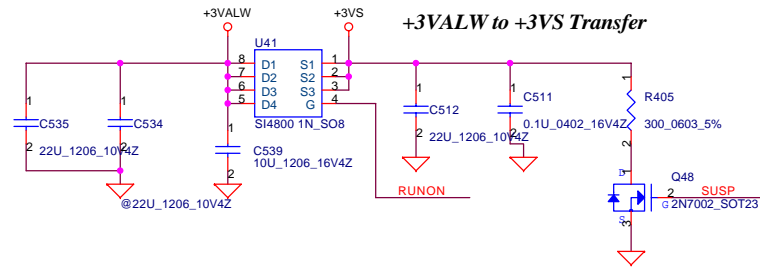
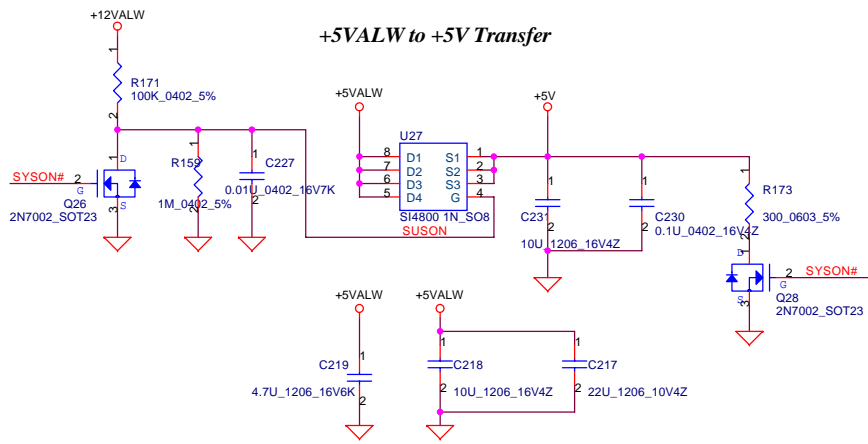
Compal Electronics, Inc.		
Title	AC97 Codec	
Size	Document Number	Rev
B	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 32 of 43

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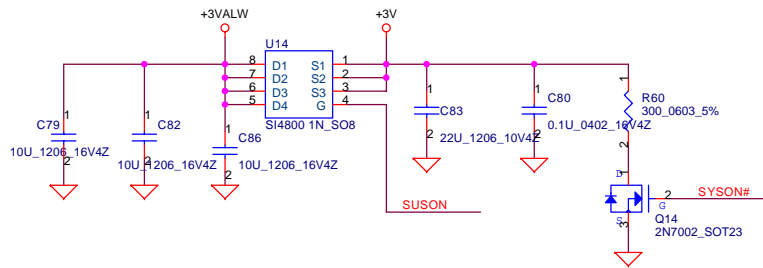


SPEAKER CONN.

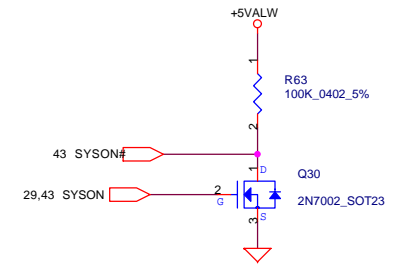
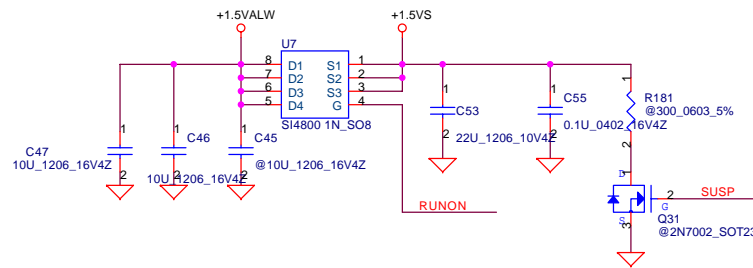




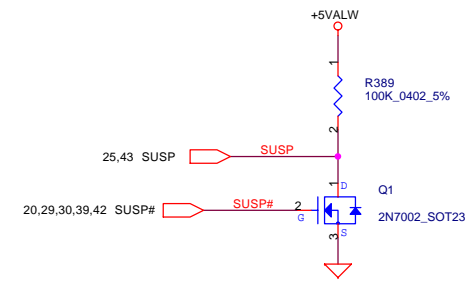
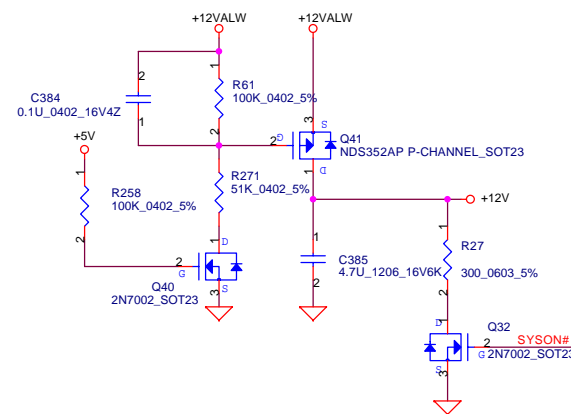
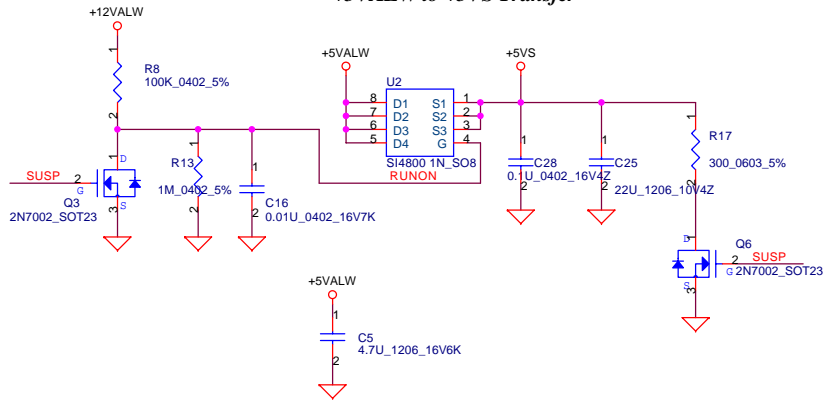
+3VALW to +3V Transfer



+1.5VALW to +1.5VS Transfer

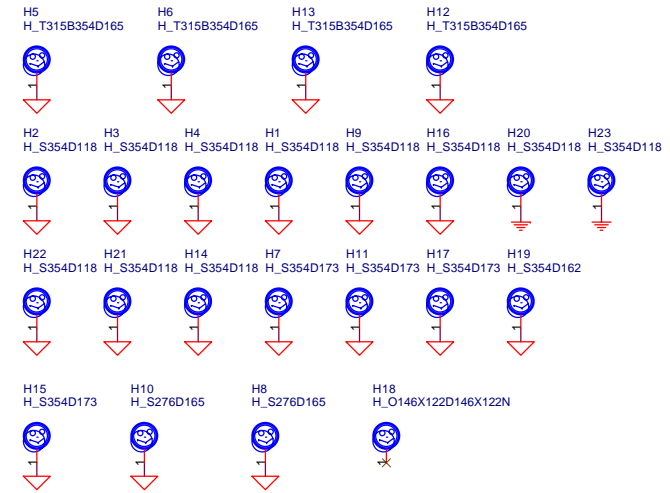
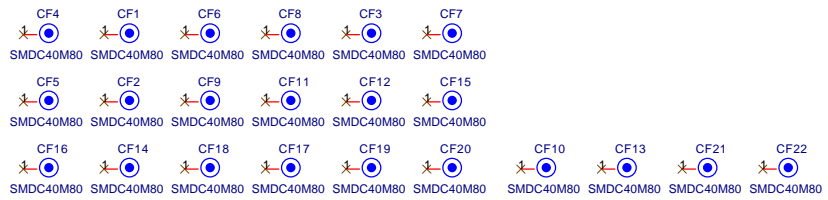


+5VALW to +5VS Transfer



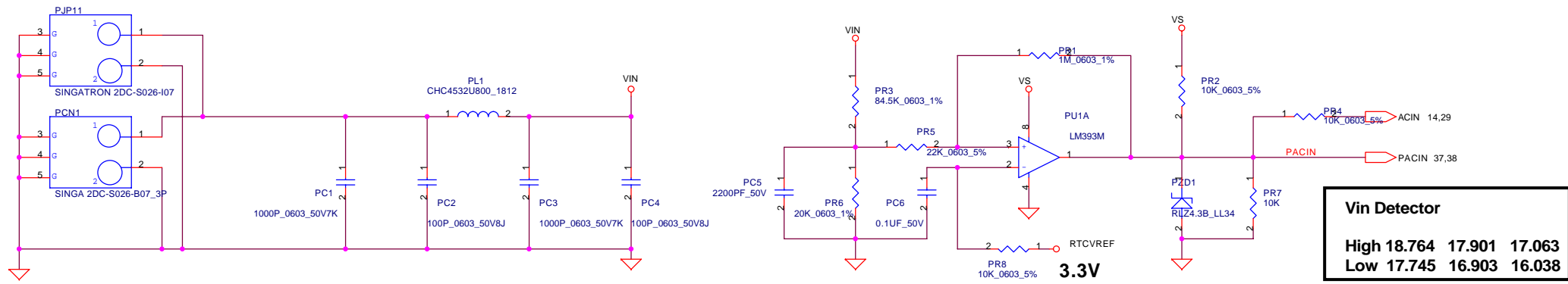
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Compal Electronics, Inc.		
Title DC/DC Circuit Interface		
Size	Document Number DCL55 LA-2201	Rev 1.0
Date	星期四, 五月 06, 2004	Sheet 34 of 43

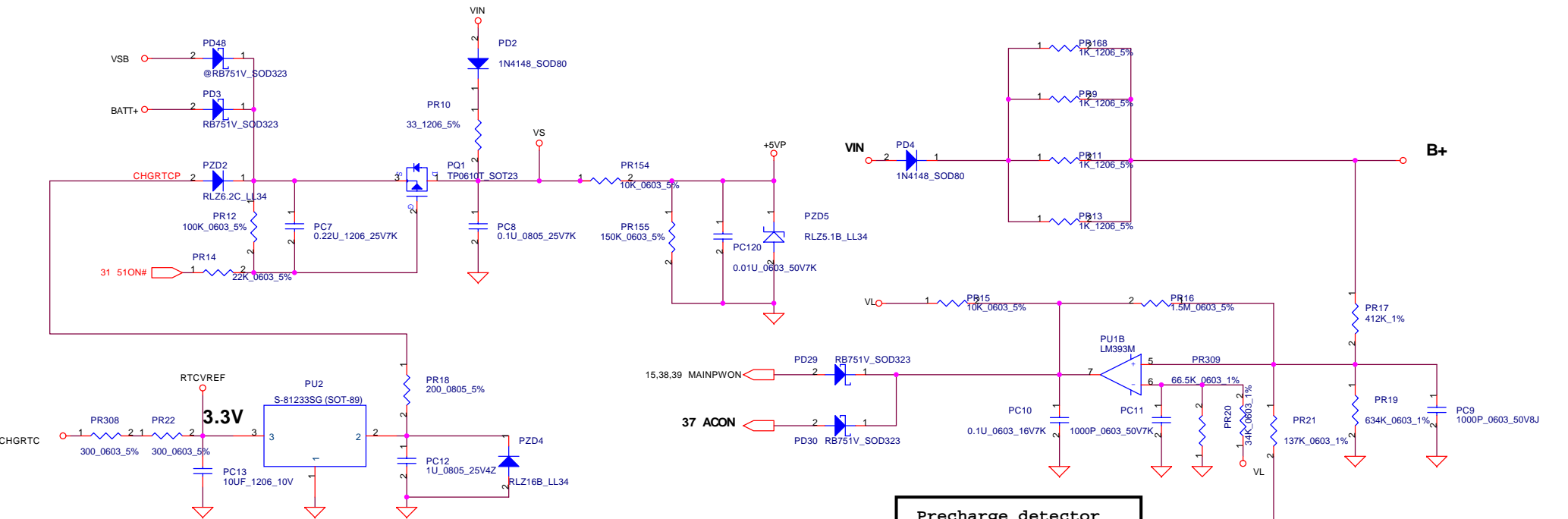


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Compal Electronics, Inc.		
Title Skew Hole		
Size	Document Number DCL51 LA-1881	Rev 1.0
Date	星期四, 五月 06, 2004	Sheet 35 of 45

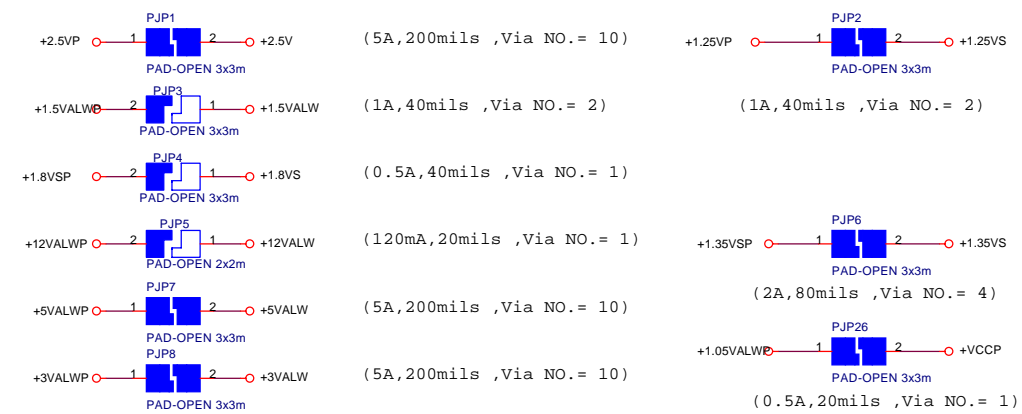


Vin Detector		
High	18.764	17.901
Low	17.745	16.903
	17.063	16.038

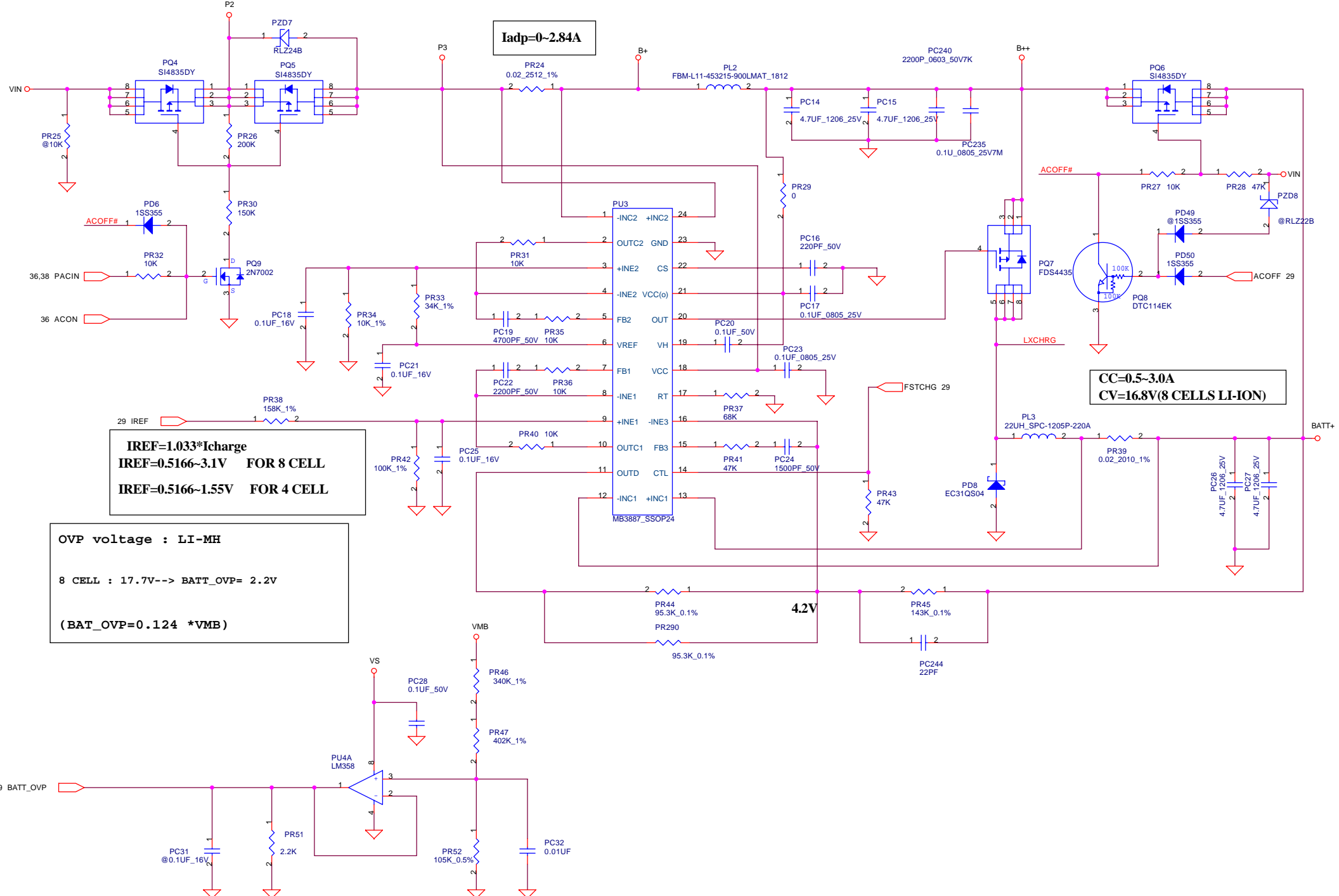


Precharge detector AC ADAPTOR		
	16.69	16.05
	15.6	15.02
	14.35	14.35

Precharge detector AC ADAPTOR		
	6.33	6.12
	5.227	5.09
	4.85	4.85



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I_{adp}=0-2.84A

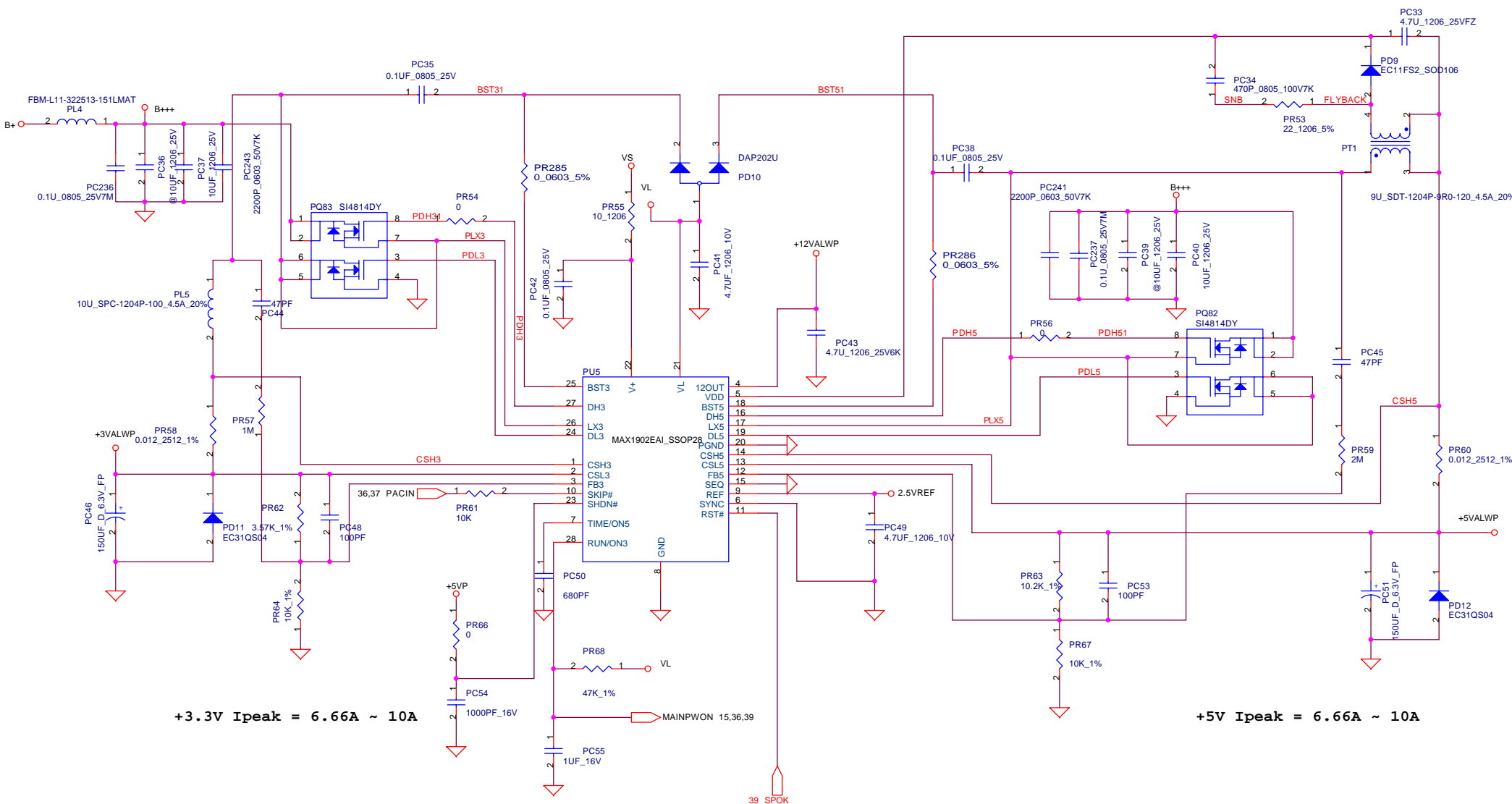
**CC=0.5-3.0A
CV=16.85V(8 CELLS LI-ION)**

**I_{REF}=1.033*I_{charge}
I_{REF}=0.5166-3.1V FOR 8 CELL
I_{REF}=0.5166-1.55V FOR 4 CELL**

OVP voltage : LI-MH
8 CELL : 17.7V--> BATT_OVP= 2.2V
(BATT_OVP=0.124 *V_{MB})

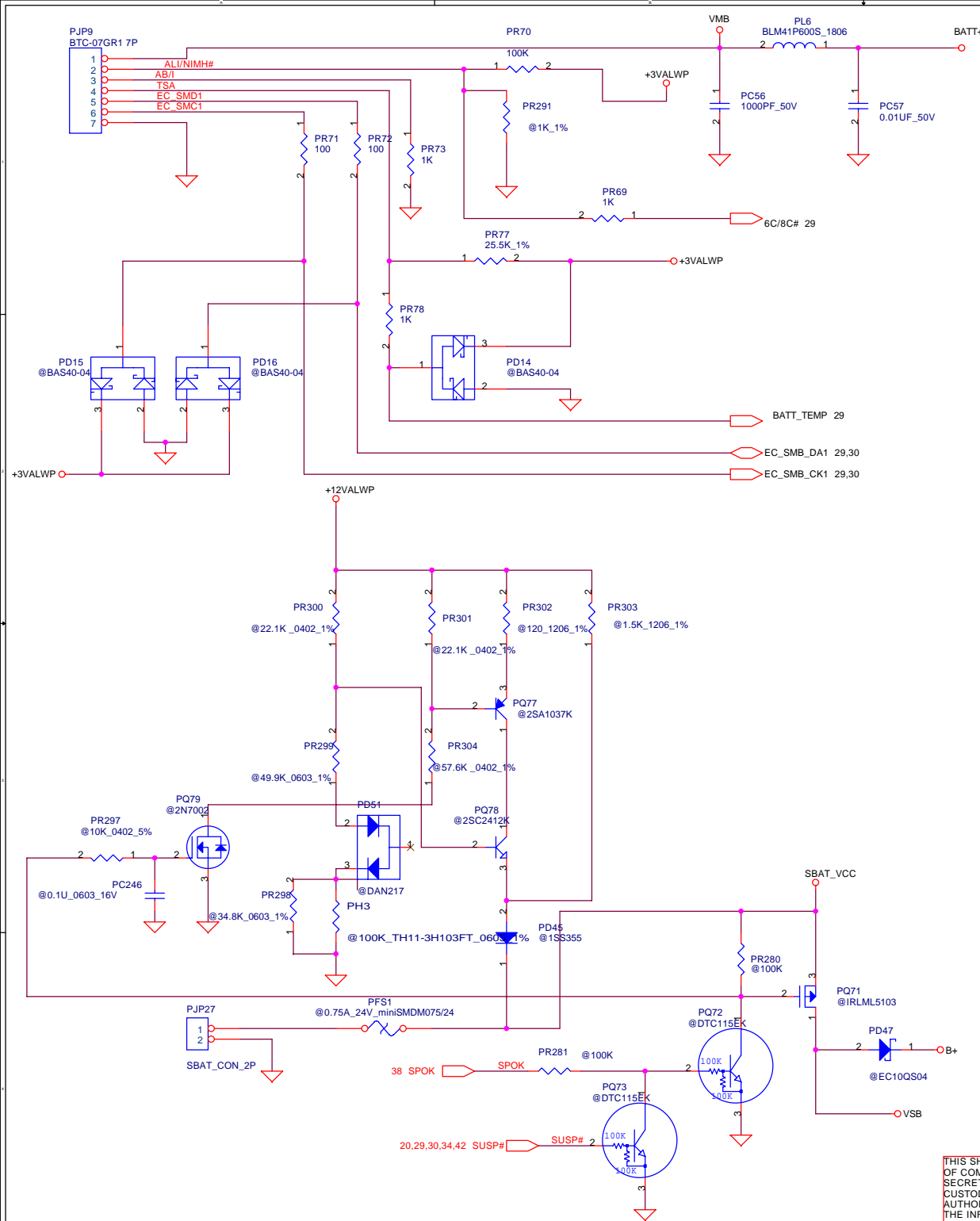
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Compal Electronics, Inc.		
Title		
CHARGER		
Size	Document Number	Rev
B	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 37 of 45

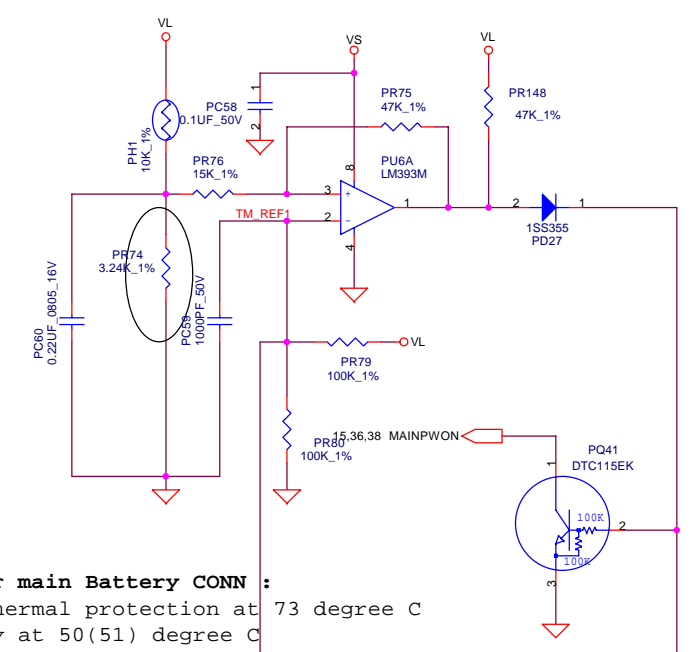


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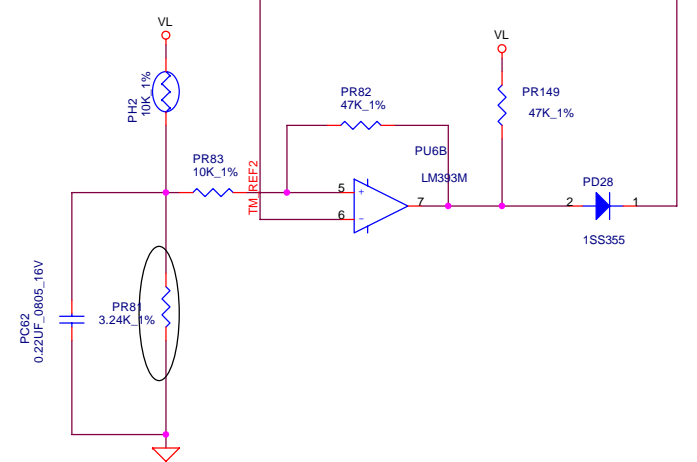
Compal Electronics, Inc.		
Title		
5V/3.3V/12V		
Size	Document Number	Rev
B	DCL55 LA-2201	1.0
Date: 星期四, 五月 06, 2004	Sheet	38 of 45



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

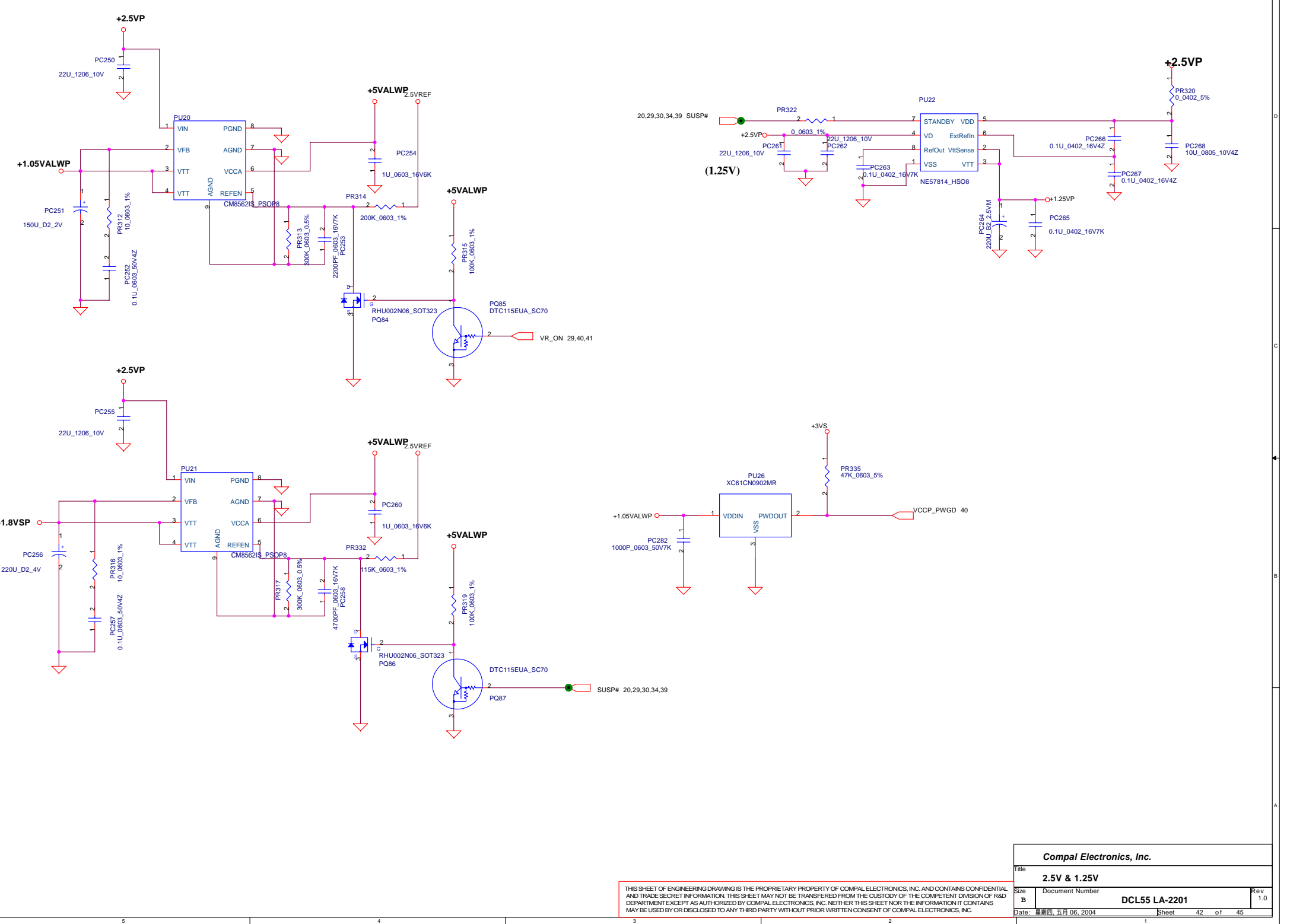


PH2 near main Battery CONN :
 BAT. thermal protection at 73 degree C
 Recovery at 50(51) degree C



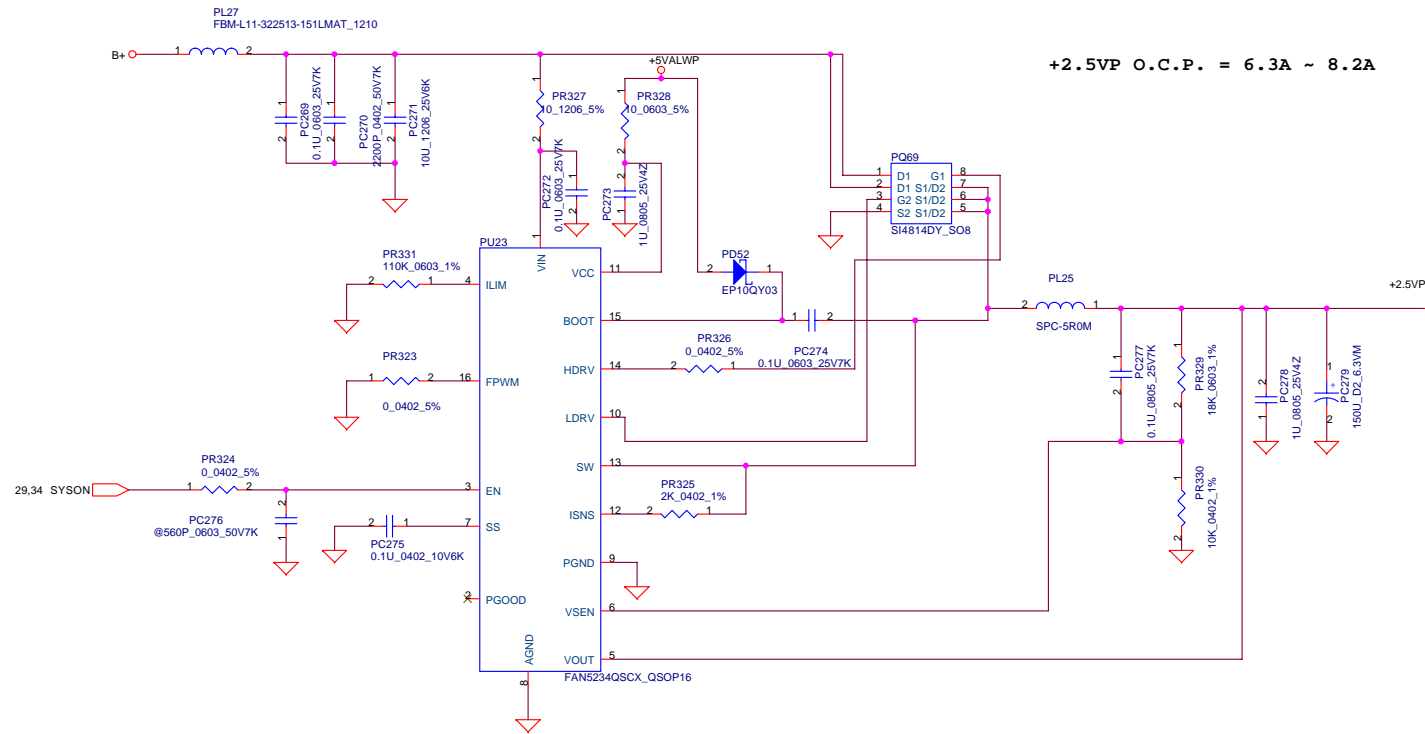
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Compal Electronics, Inc.		
Title BATTERY CONN / OTP/1.2V		
Size B	Document Number DCL55 LA-2201	Rev 1.0
Date: 星期四, 五月 06, 2004	Sheet 39	of 45

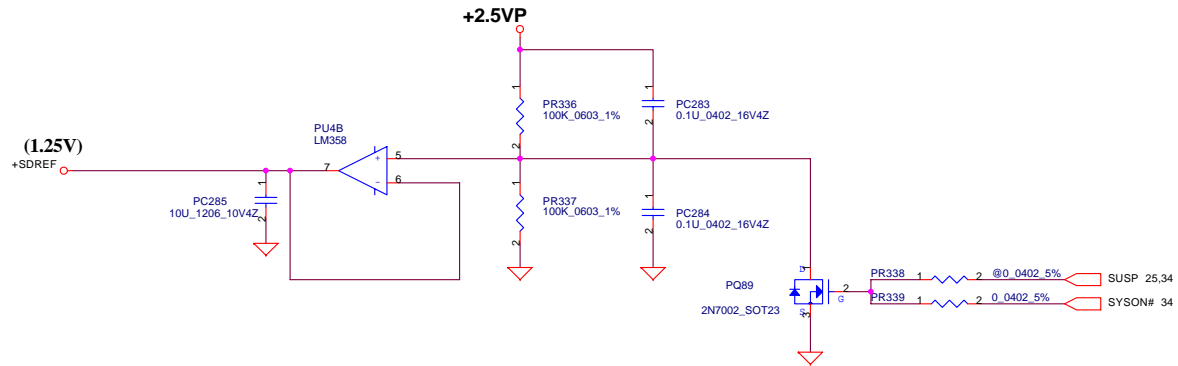


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Compal Electronics, Inc.			
Title			
2.5V & 1.25V			
Size	Document Number		Rev
B	DCL55 LA-2201		1.0
Date:	星期四, 五月 06, 2004	Sheet	42 of 45



+2.5VP O.C.P. = 6.3A ~ 8.2A



Compal Electronics, Inc.			
Title			
2.5V & 1.25V			
Size	Document Number		Rev
B	DCL55 LA-2201		1.0
Date:	星期四, 五月 06, 2004	Sheet	43 of 45

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

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 p15 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	Rev
	DCL55	1.0
Date:	星期五, 五月 06, 2004	Sheet 44 of 45

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

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

Compal Electronics, Inc.			
Title			
PIR (PWR)			
Size	Document Number		Rev
	DCL55		1.0
Date:	星期四, 五月 06, 2004		Sheet 45 of 45