

Compal Confidential

DCL513A Schematics Document

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

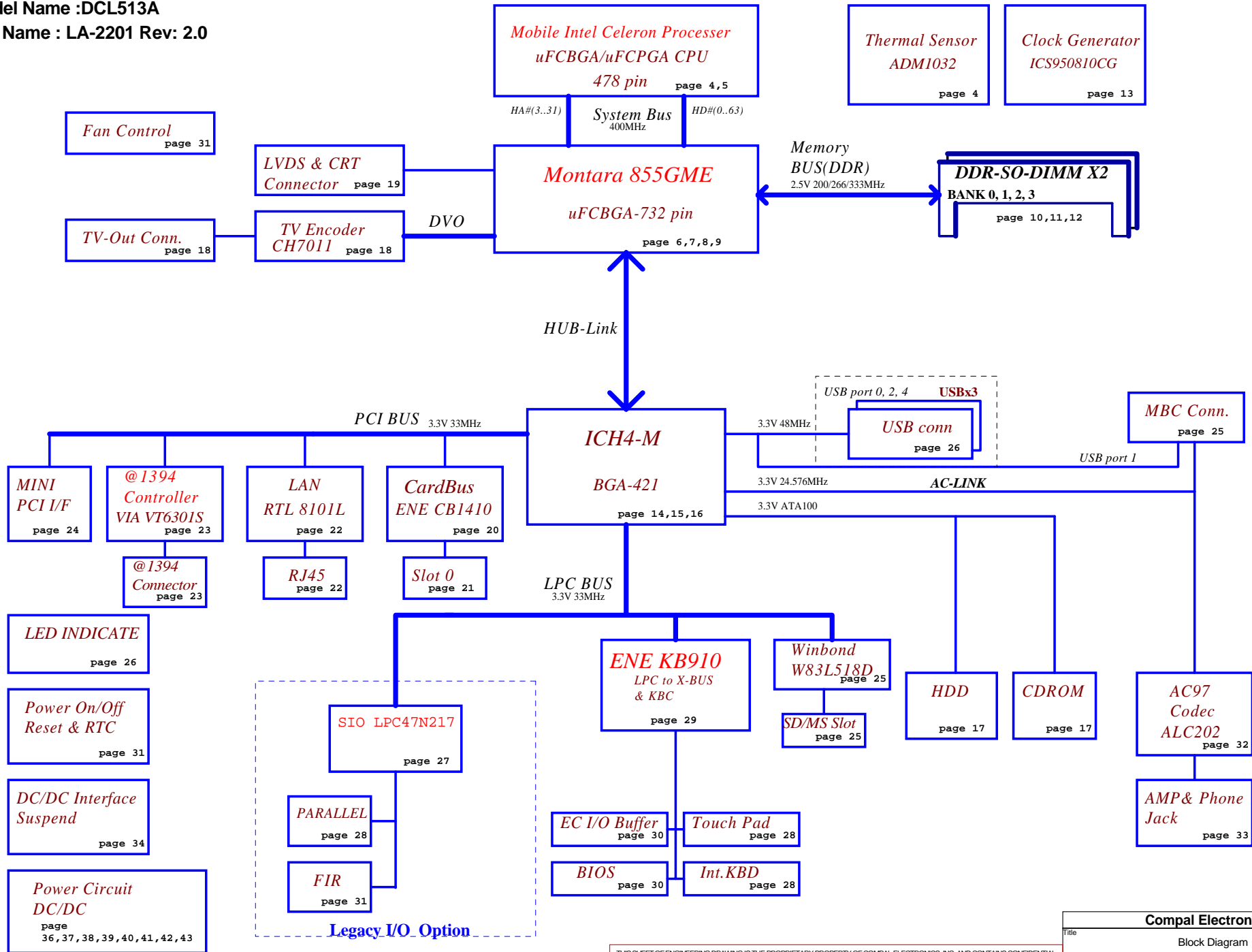
2004-05-05

REV: 1.0

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Title		Cover Sheet	
Size	Document Number	Rev	
	DCL55 LA-2201	1.0	
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Model Name :DCL513A
File Name : LA-2201 Rev: 2.0



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Title Block Diagram		
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Voltage Rails

Power Plane	Description	S0-S1	S3	S5
VIN	Adapter power supply (19V)	N/A	N/A	N/A
B+	AC or battery power rail for power circuit.	N/A	N/A	N/A
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF
+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

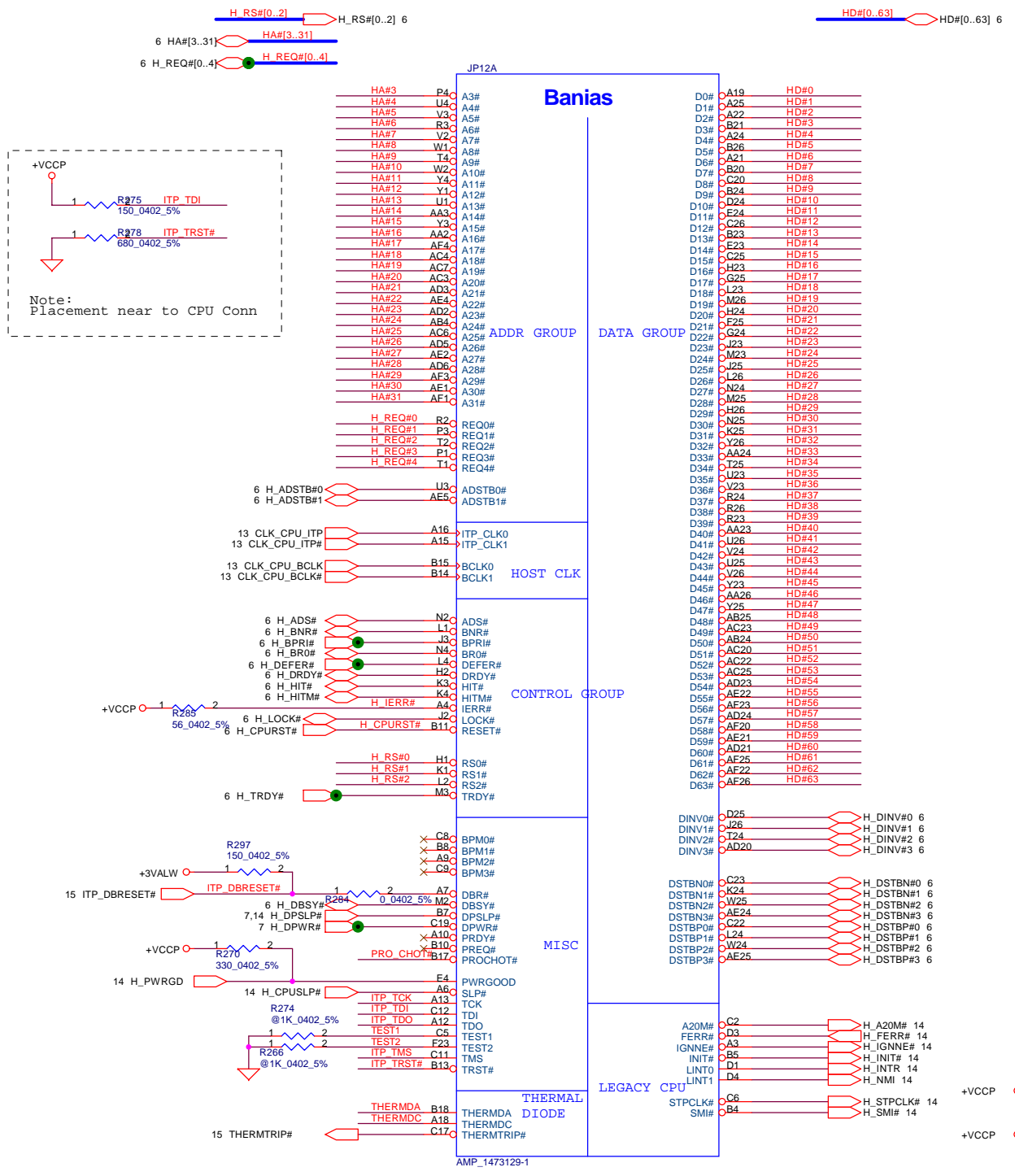
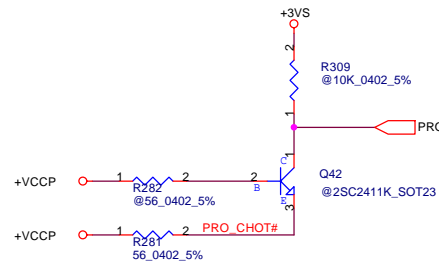
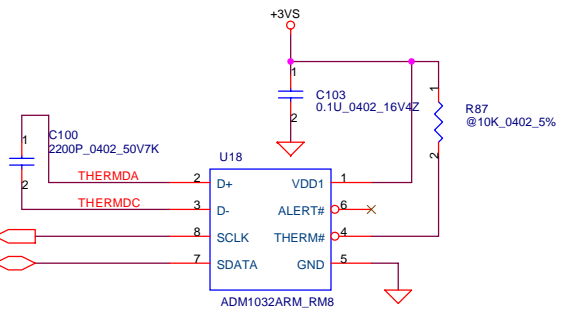
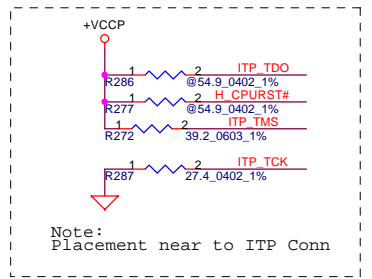
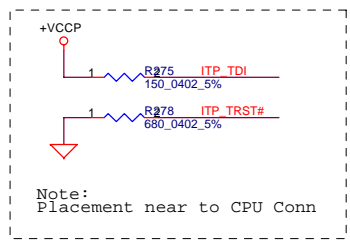
Board ID	PCB Revision
0	
1	0.1
2	0.2
3	1.0
4	
5	
6	
7	

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

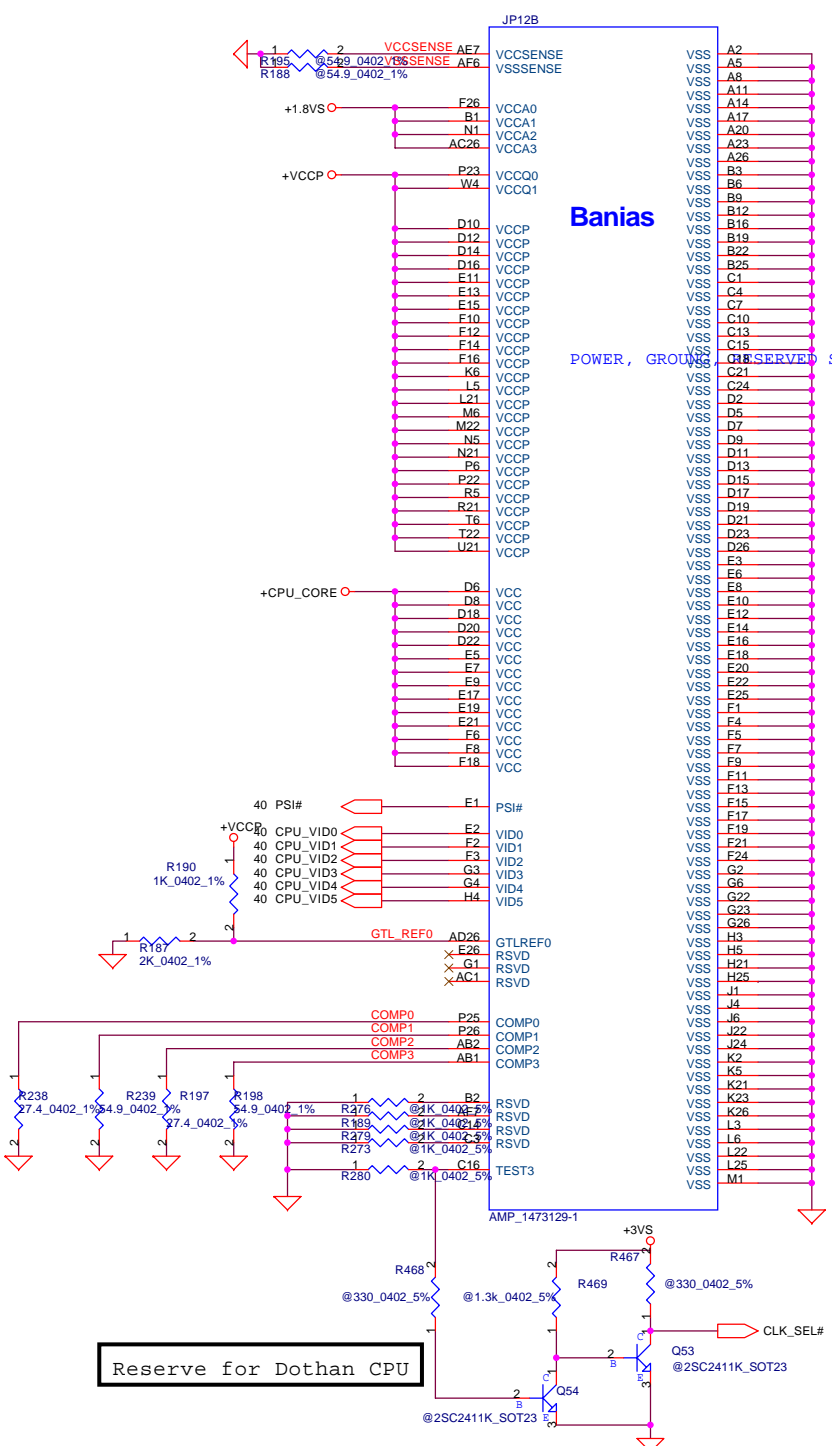
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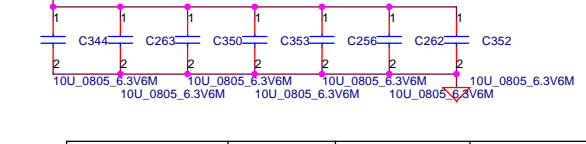
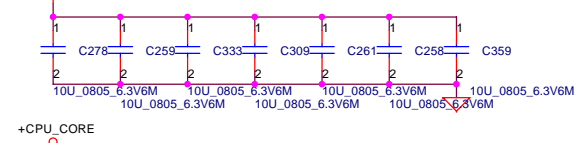
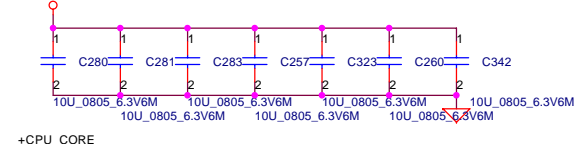
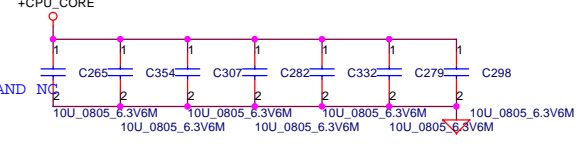
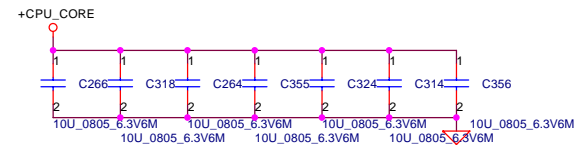
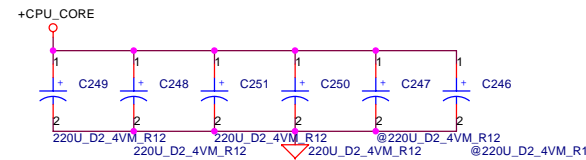
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Title Banias Processor in mFCPGA479 with ITP		
Size A3	Document Number DCL55 LA-2201	Rev 1.0
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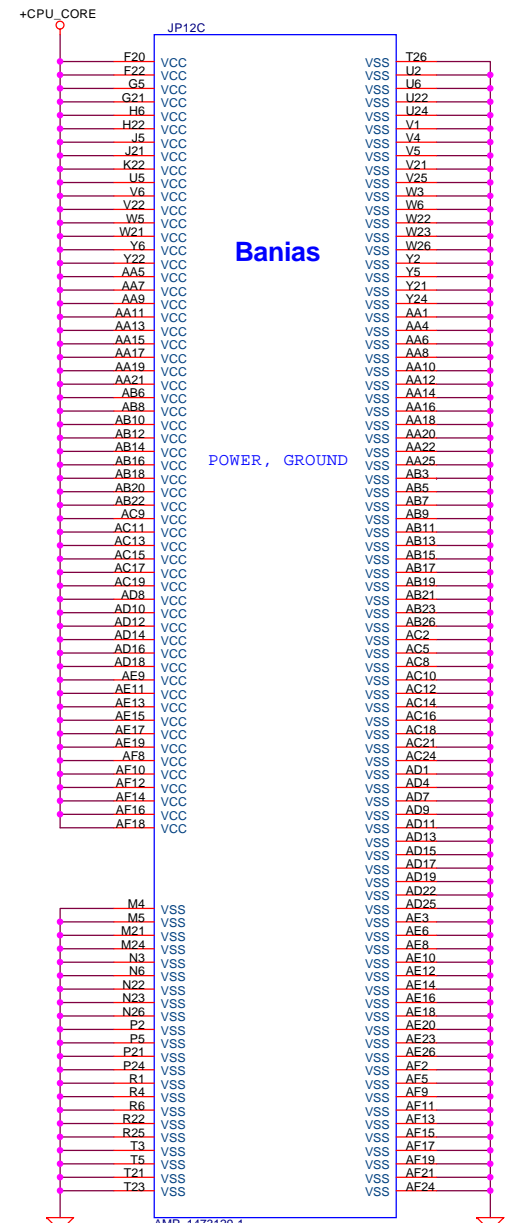
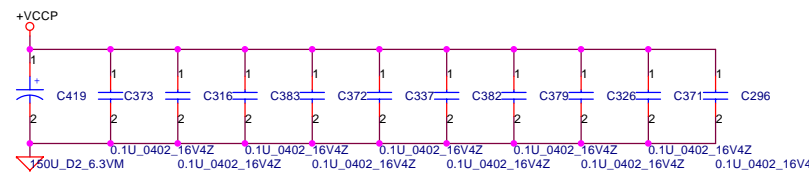
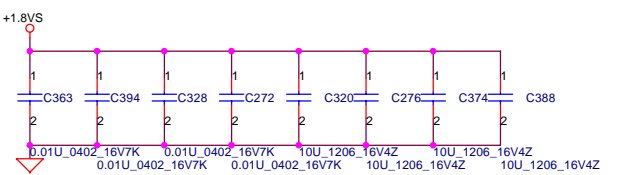


Banias

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

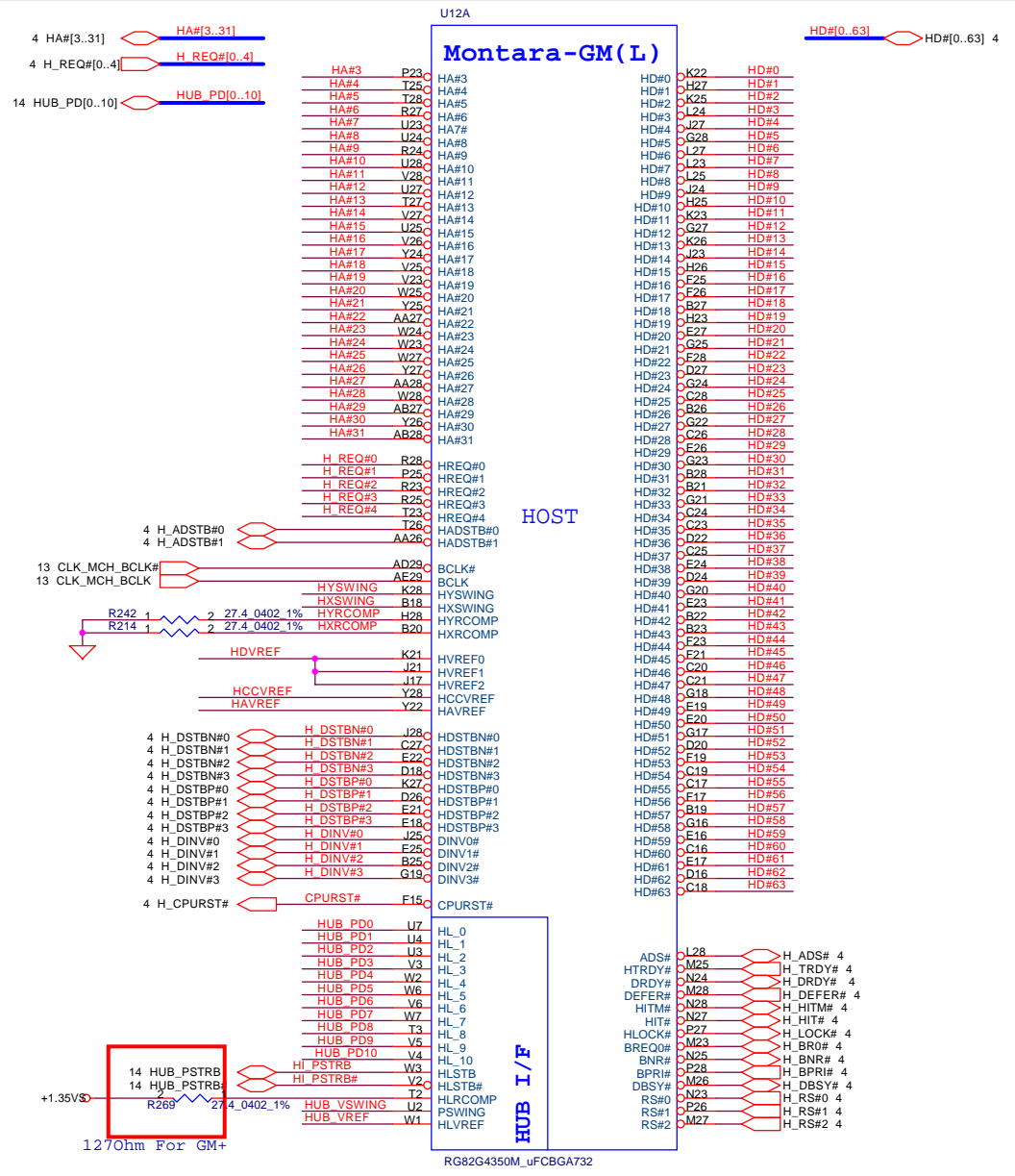
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Compal Electronics, Inc.

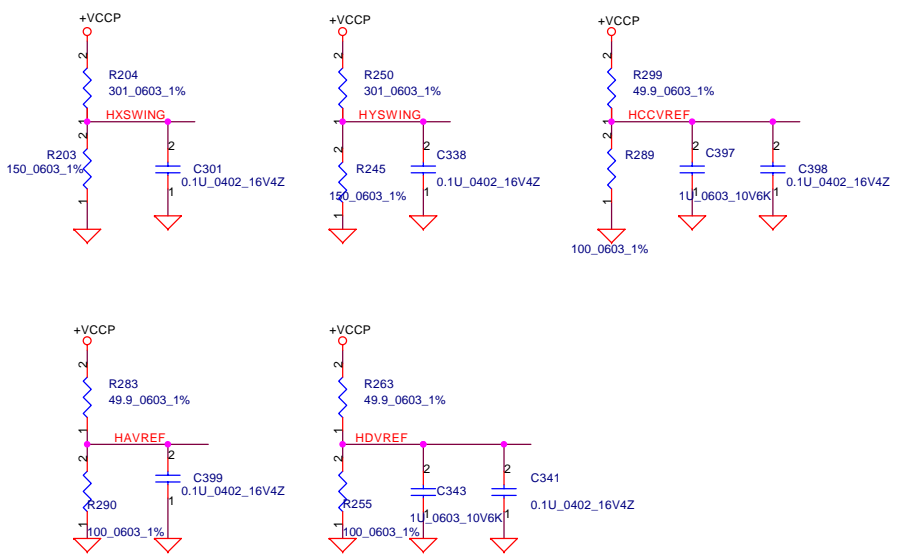
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Size A3 Document Number: DCL55 LA-2201 Rev 1.0

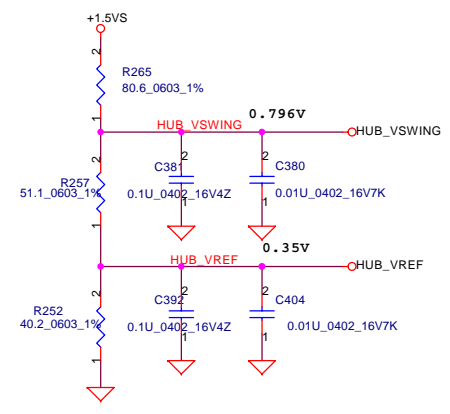
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HOST REF VOLTAGE

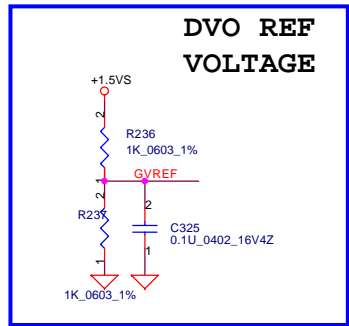
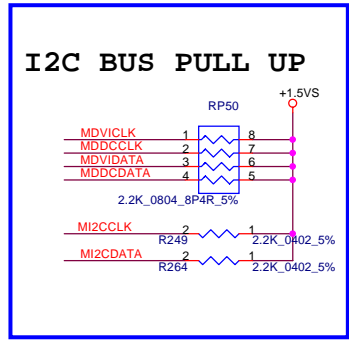
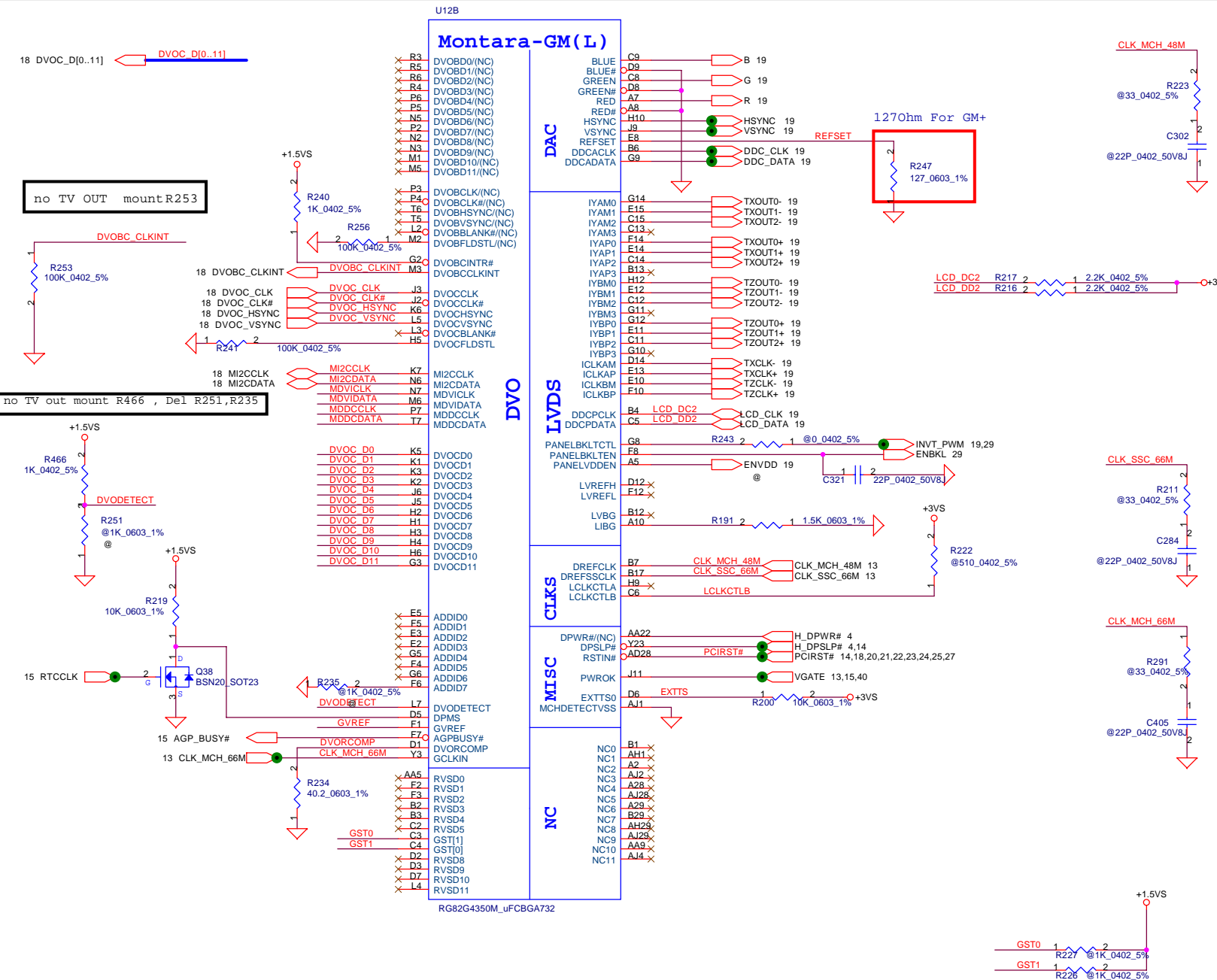


HUB I/F REF VOLTAGE



Compal Electronics, Inc.		
Title	MONTARA-GM-HOST(1/4)	
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Starp pin list

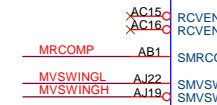
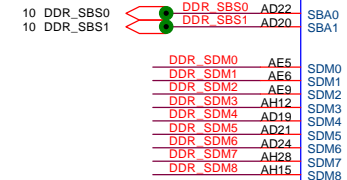
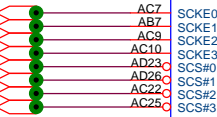
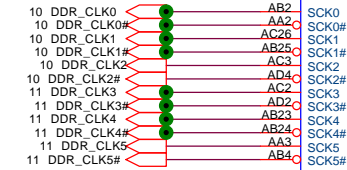
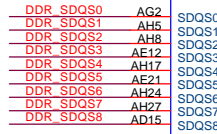
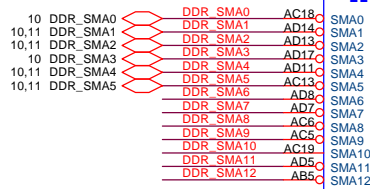
LCLKCTLB: High for P4
 N.C. for Banias(default low)
 DVODETECT: Low to enable DVO
 High to disable DVO

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

RG82G4350M_uFCBGA732

RG82G4350M_uFCBGA732

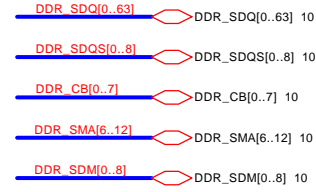
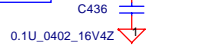
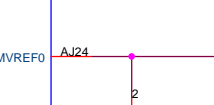
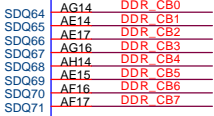
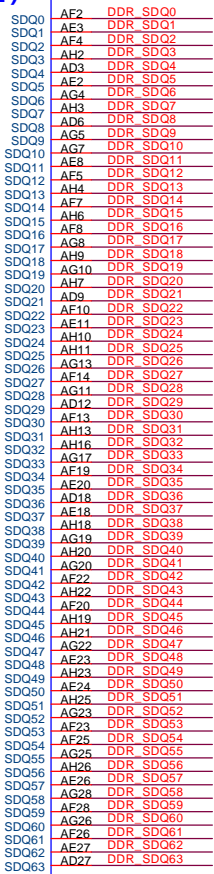
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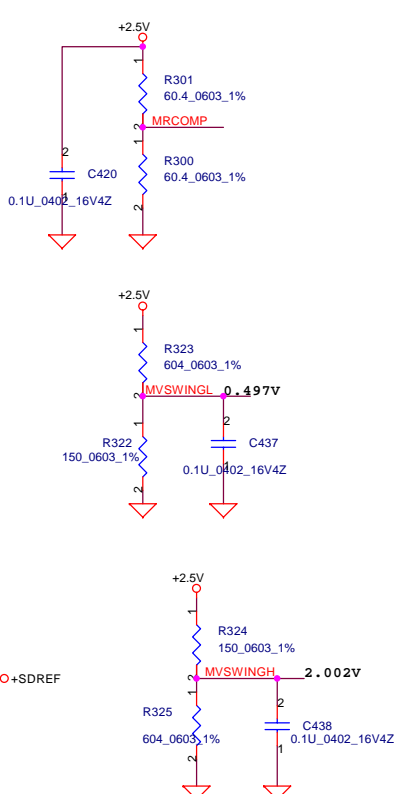
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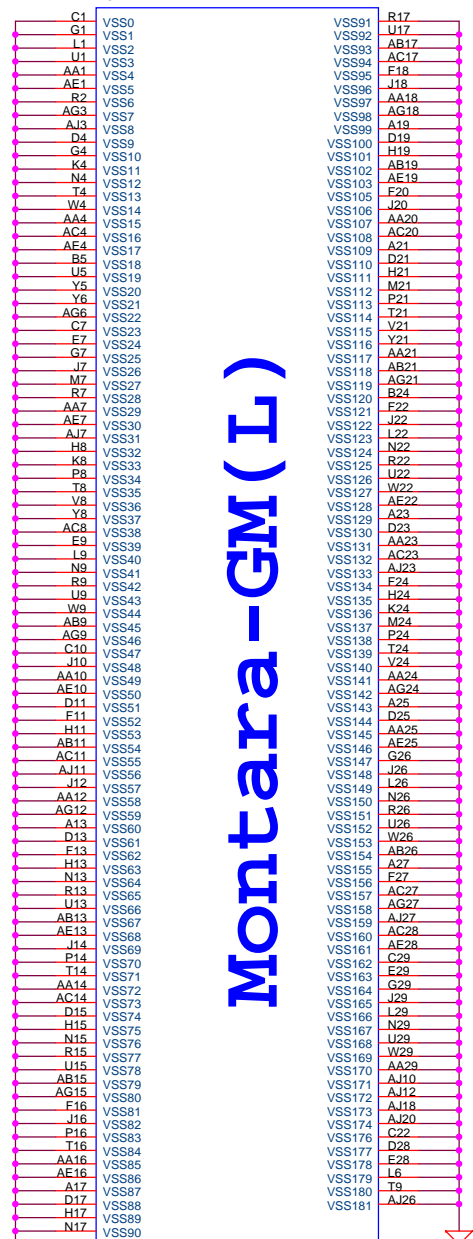
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DDR REF & SWING VOLTAGE



U12D

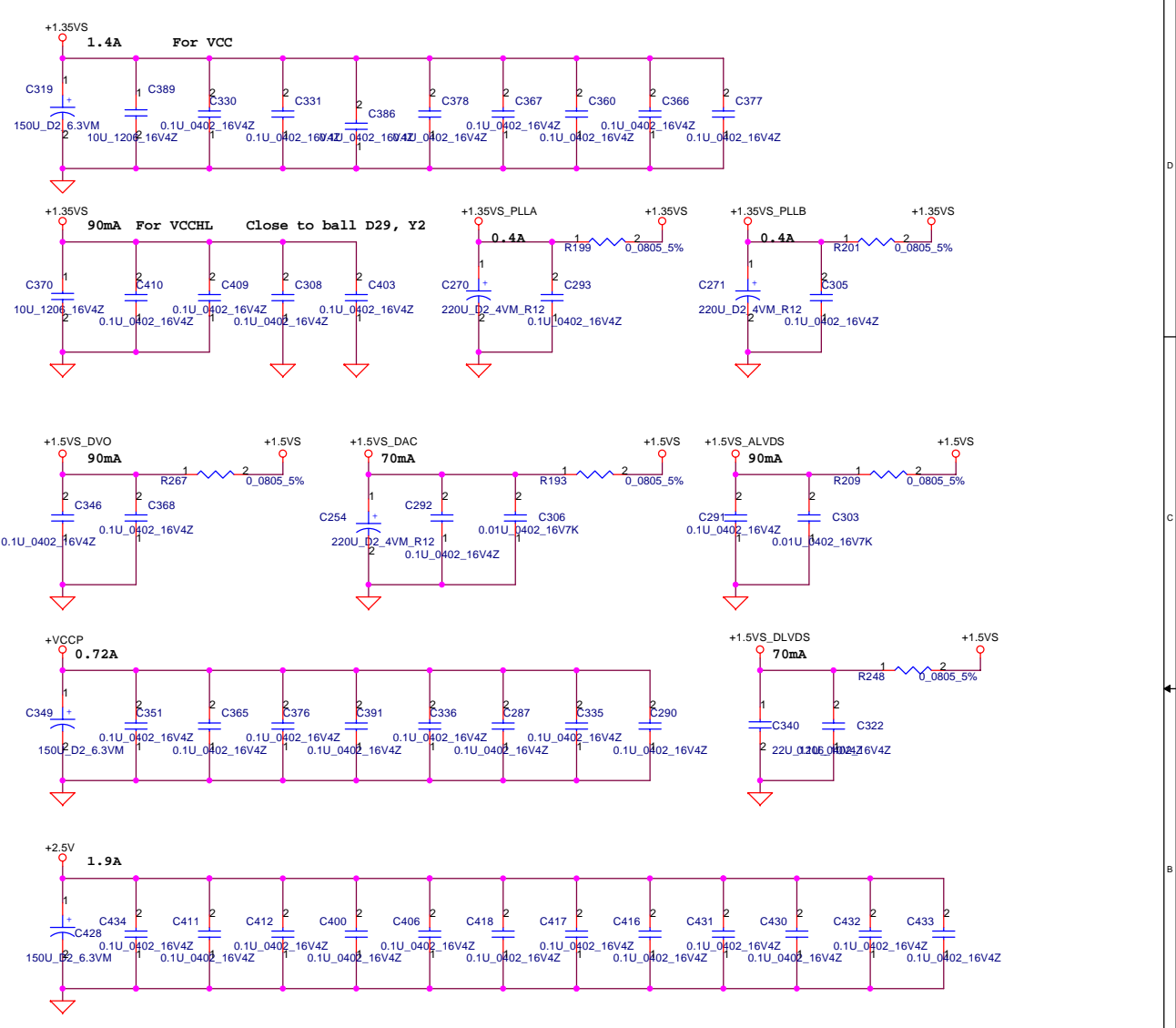
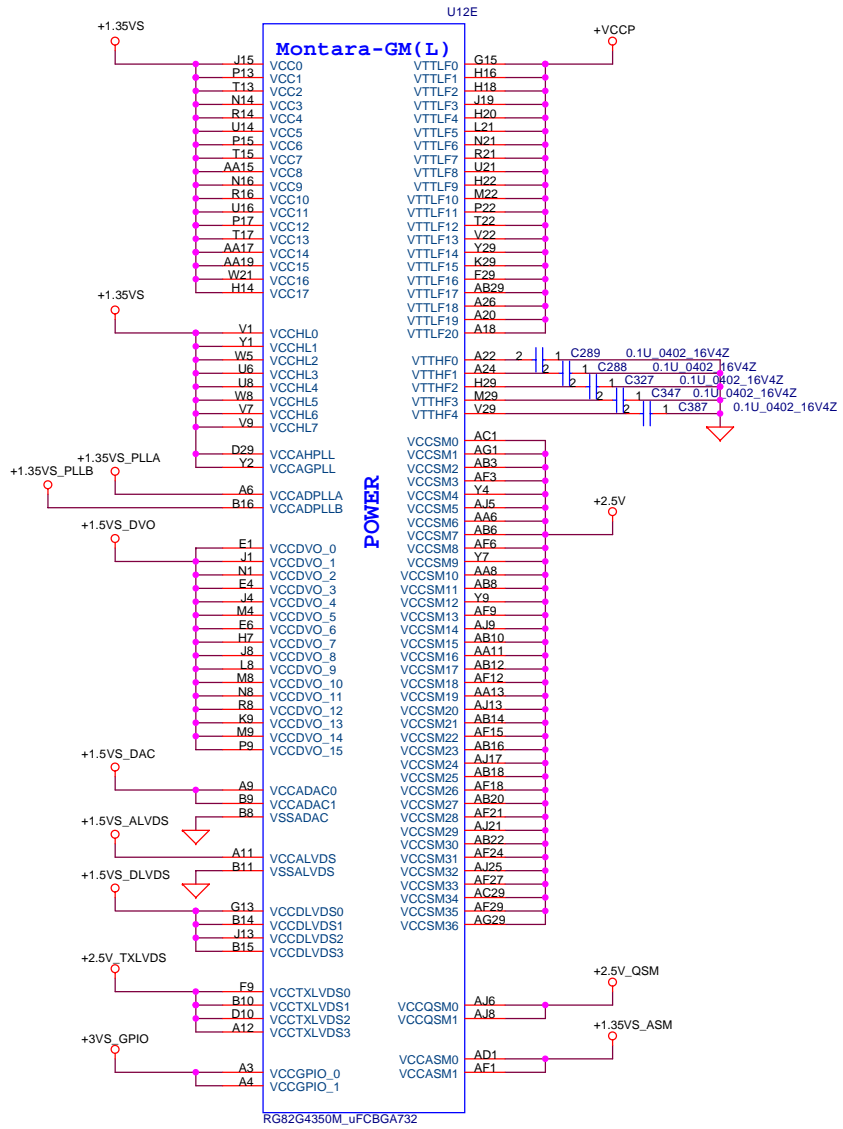


RG82G4350M_uFCBGA732

Montara-GM(L)

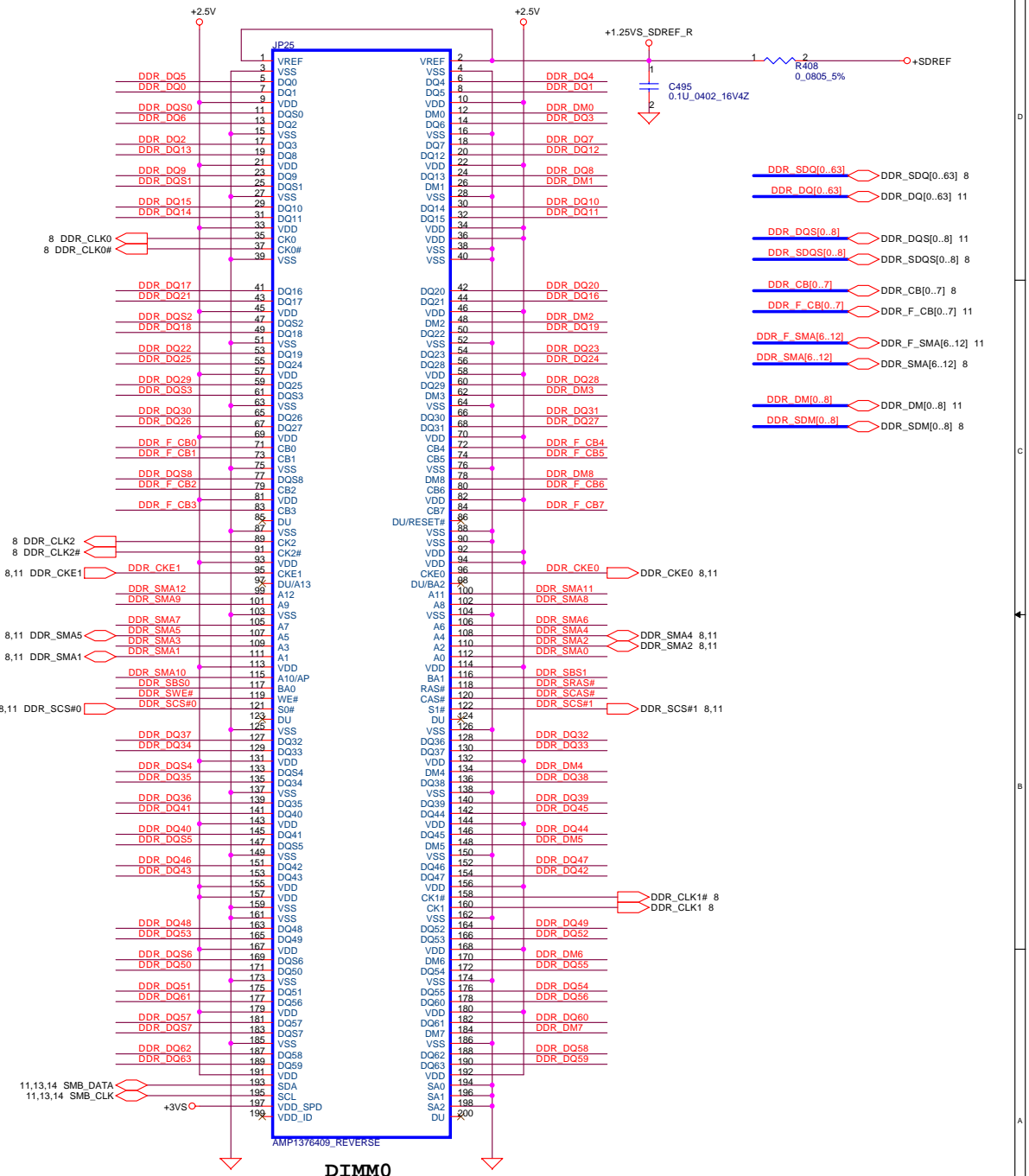
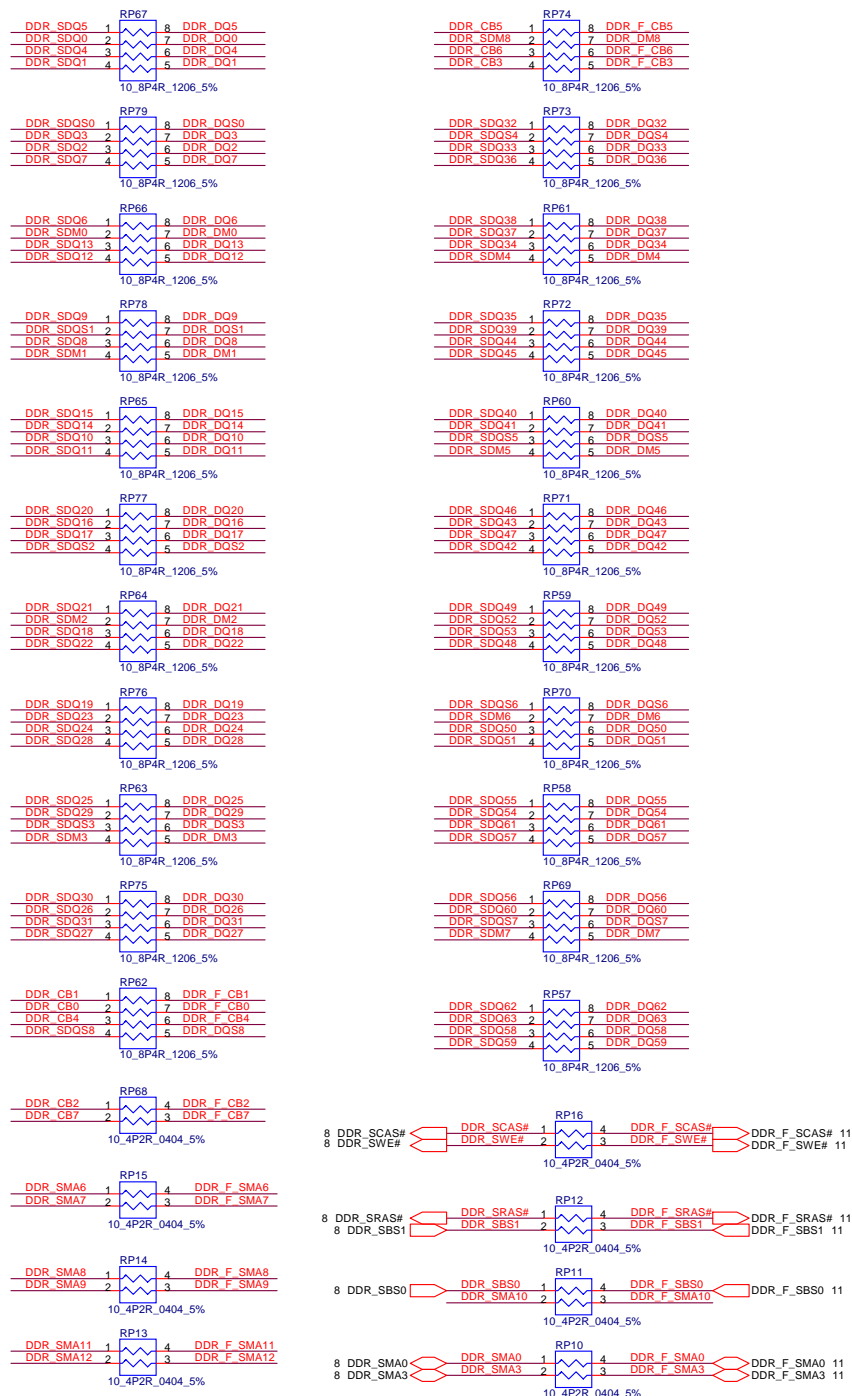
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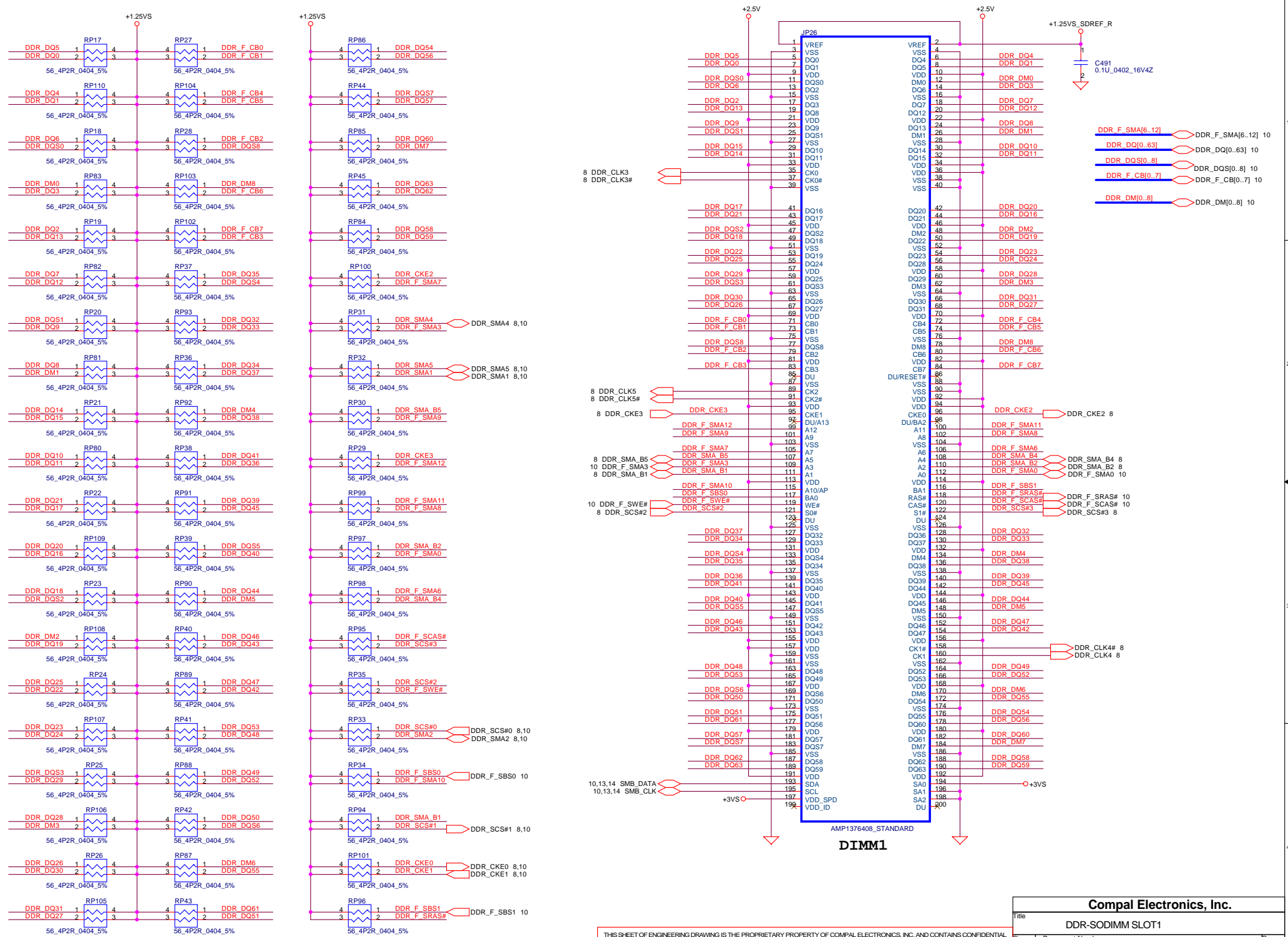
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Title DDR-SODIMM SLOT0			
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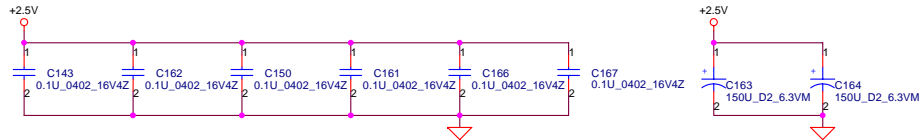
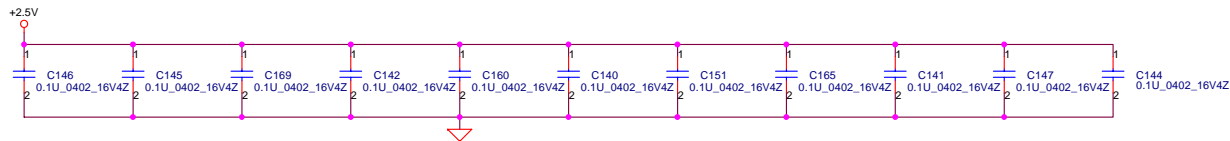
- DDR F SMA[6..12] ○ DDR_F_SMA[6..12] 10
- DDR DQ[0..63] ○ DDR_DQ[0..63] 10
- DDR DQS[0..8] ○ DDR_DQS[0..8] 10
- DDR F CB[0..7] ○ DDR_F_CB[0..7] 10
- DDR DM[0..8] ○ DDR_DM[0..8] 10

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Compal Electronics, Inc.		
DDR-SODIMM SLOT1		
Size	Document Number	Rev
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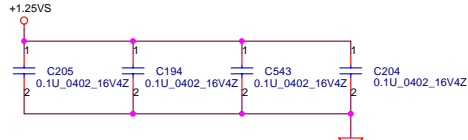
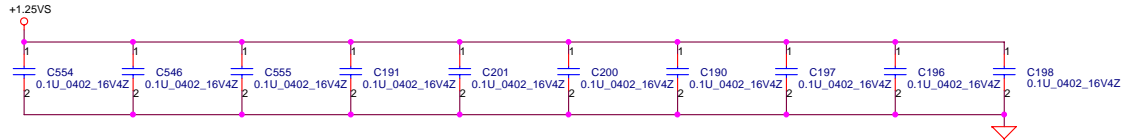
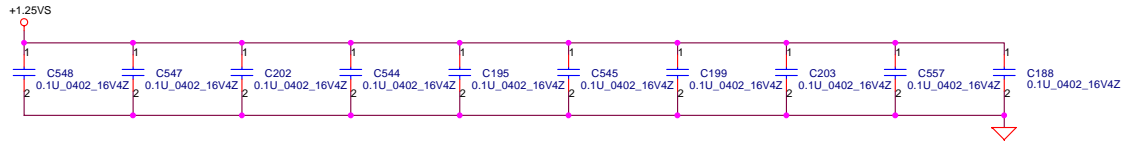
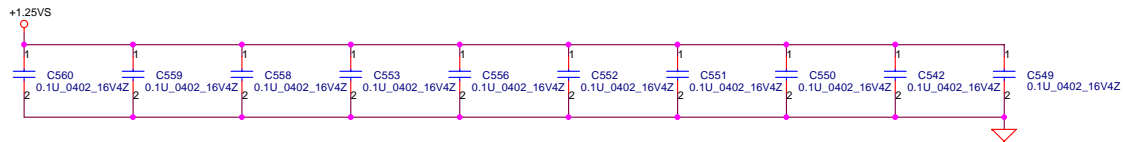
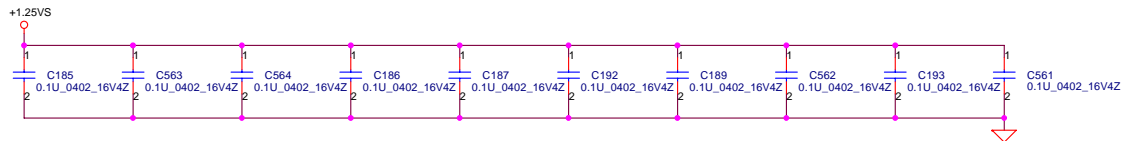
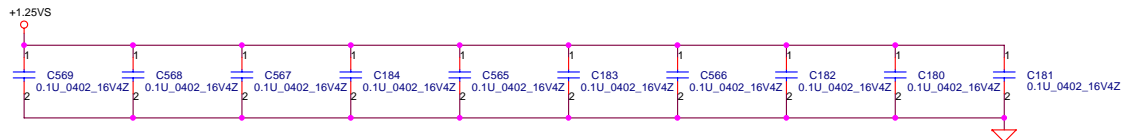
Layout note :

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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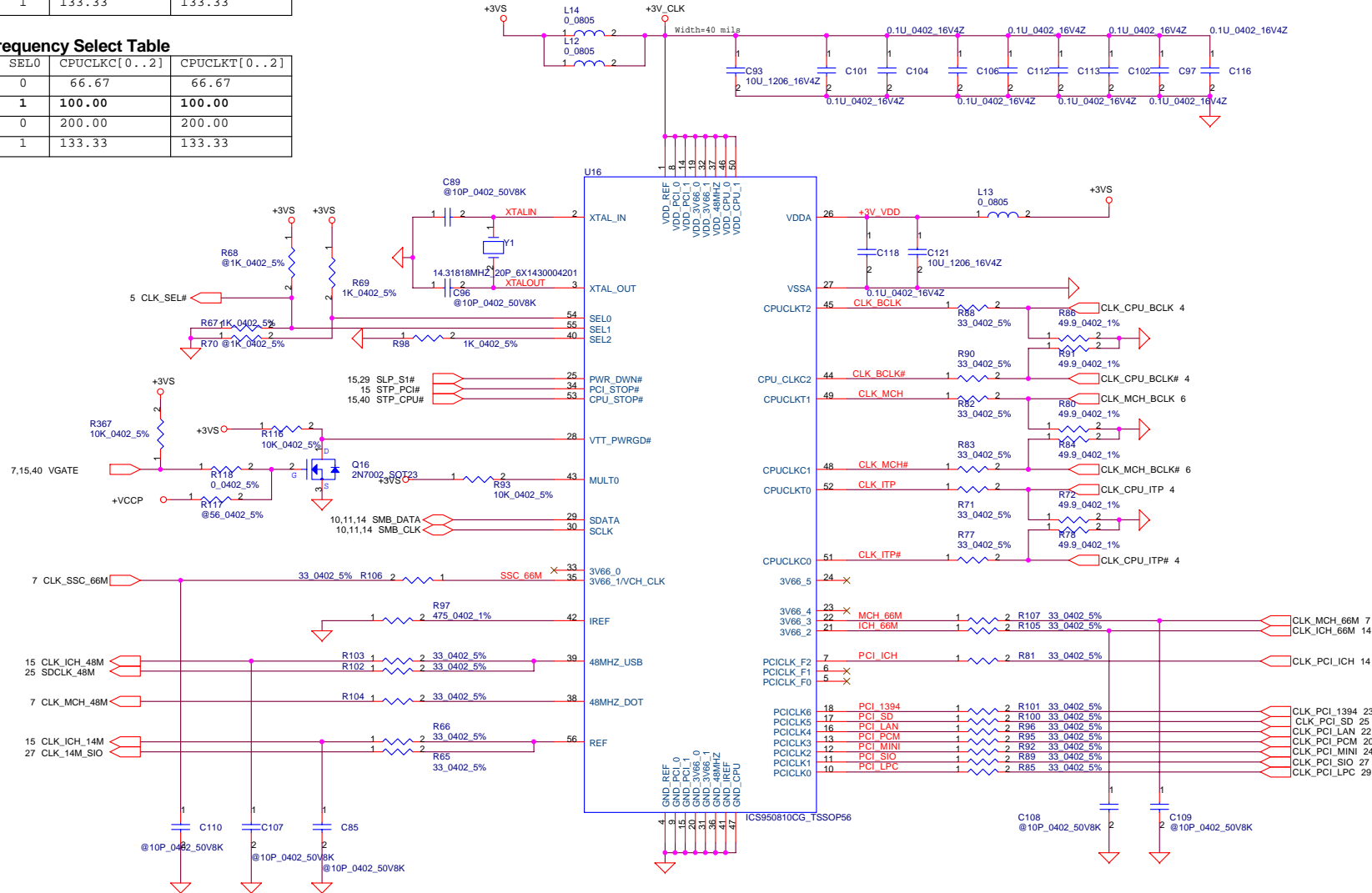
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Title DDR SODIMM Decoupling		
Size	Document Number DCL55 LA-2201	Rev 1.0
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ICS950810 Frequency Select Table

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

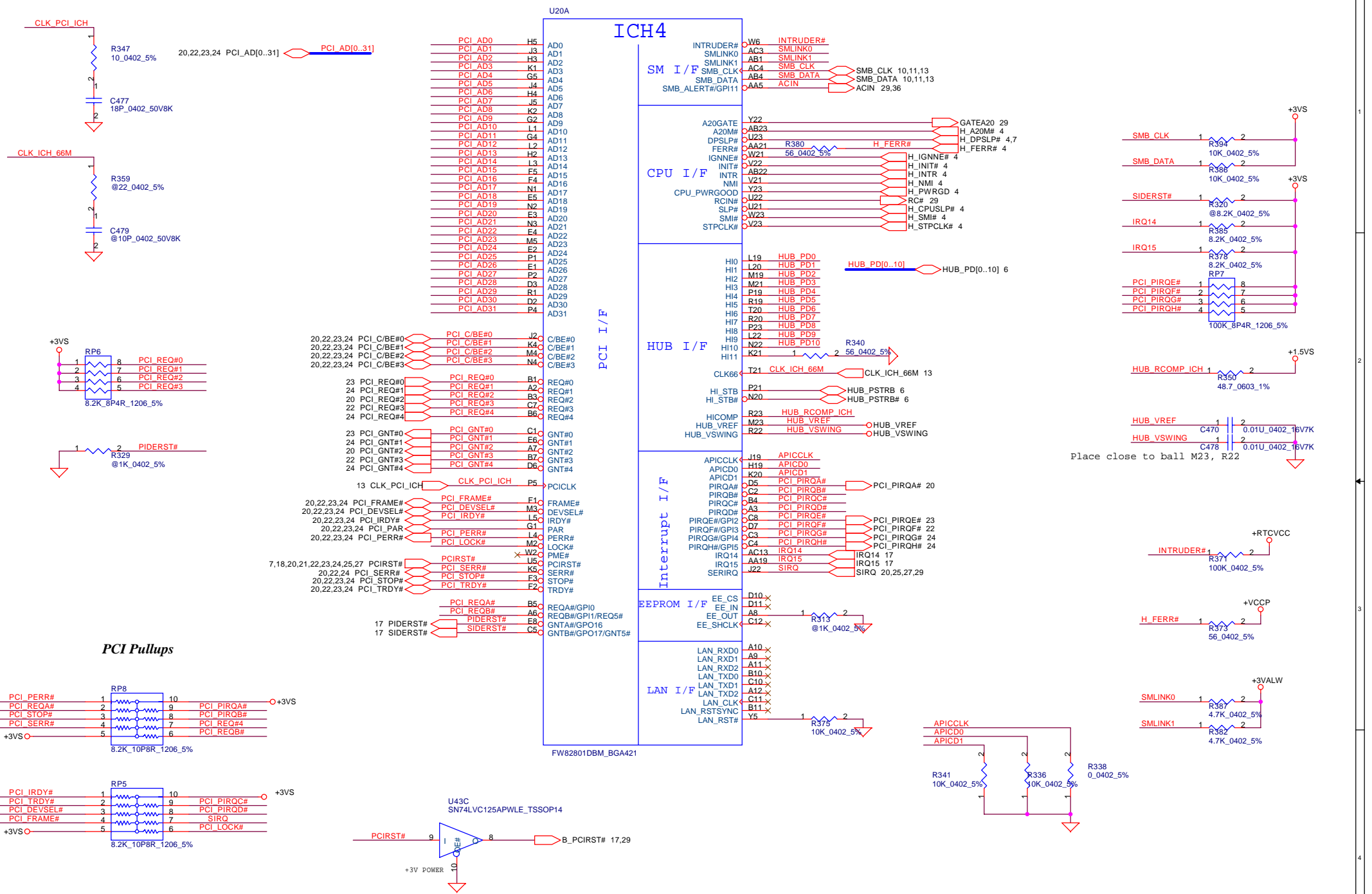
CY28346-2 Frequency Select Table

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

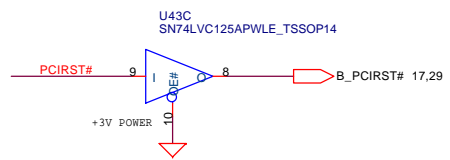
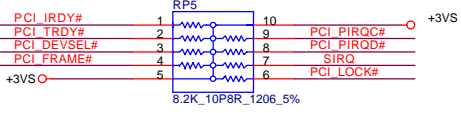
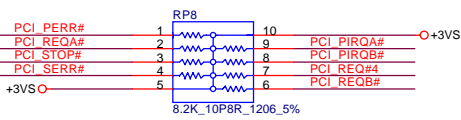


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Compal Electronics, Inc.		
Title Clock Generator		
Size B	Document Number DCL55 LA-2201	Rev 1.0
Date: 日期四, 五月 06, 2004	Sheet 13	of 43

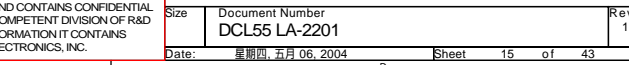
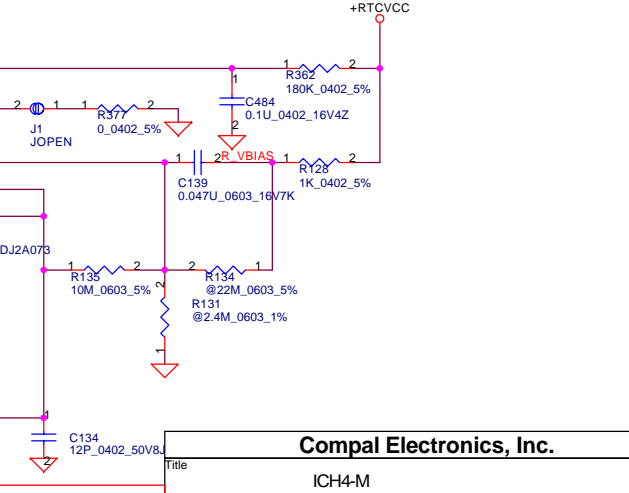
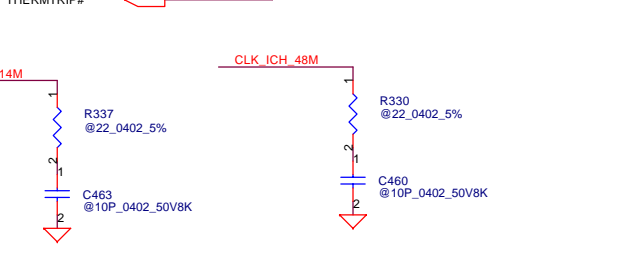
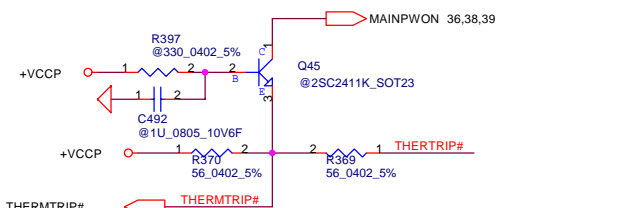
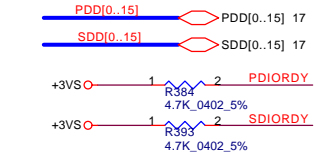
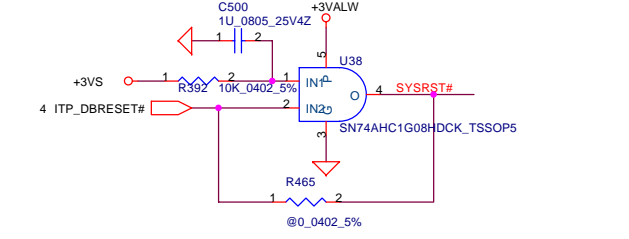
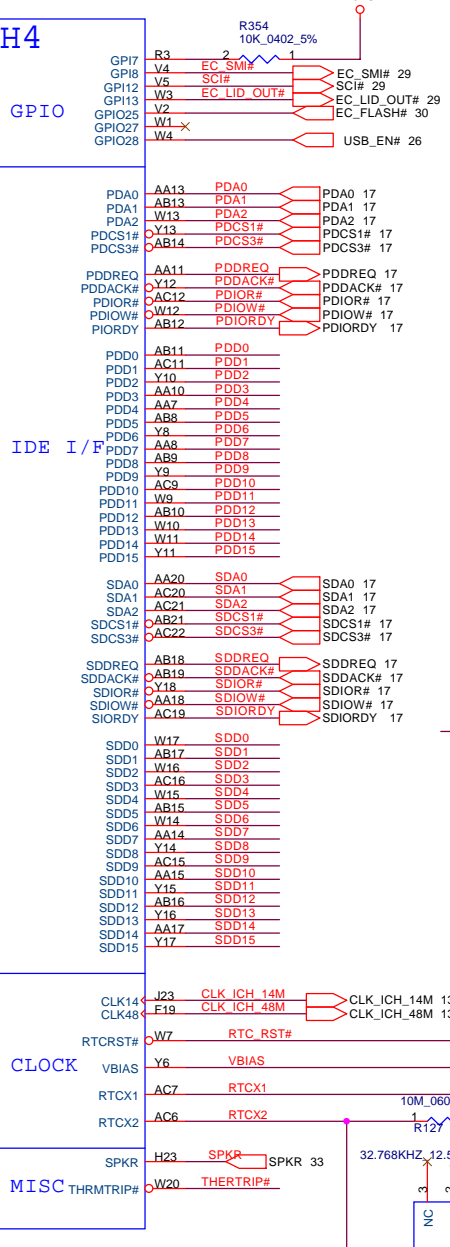
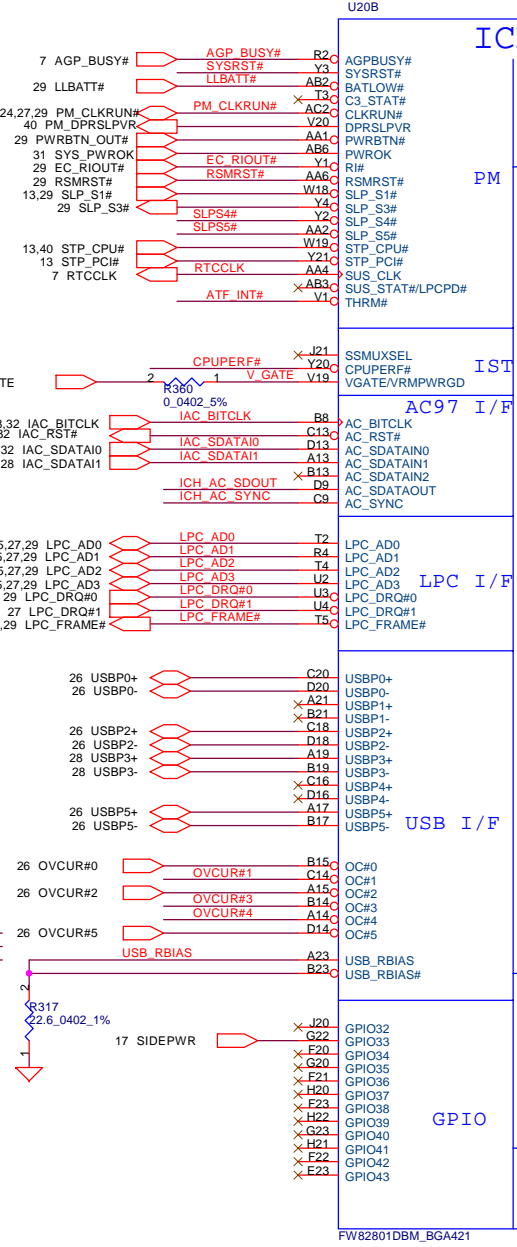
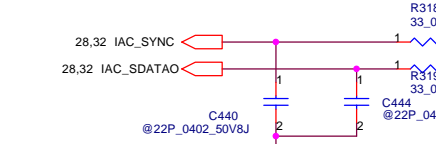
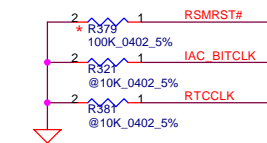
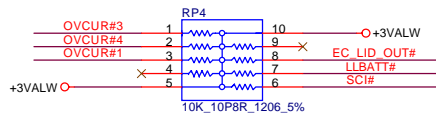
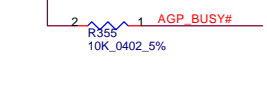
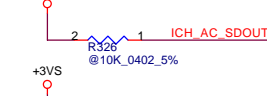
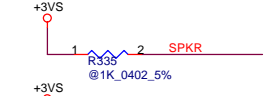
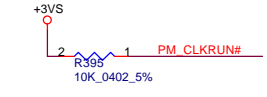
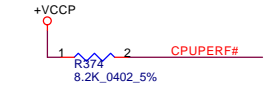
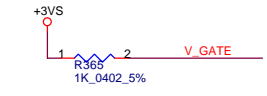
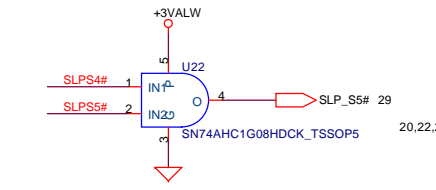


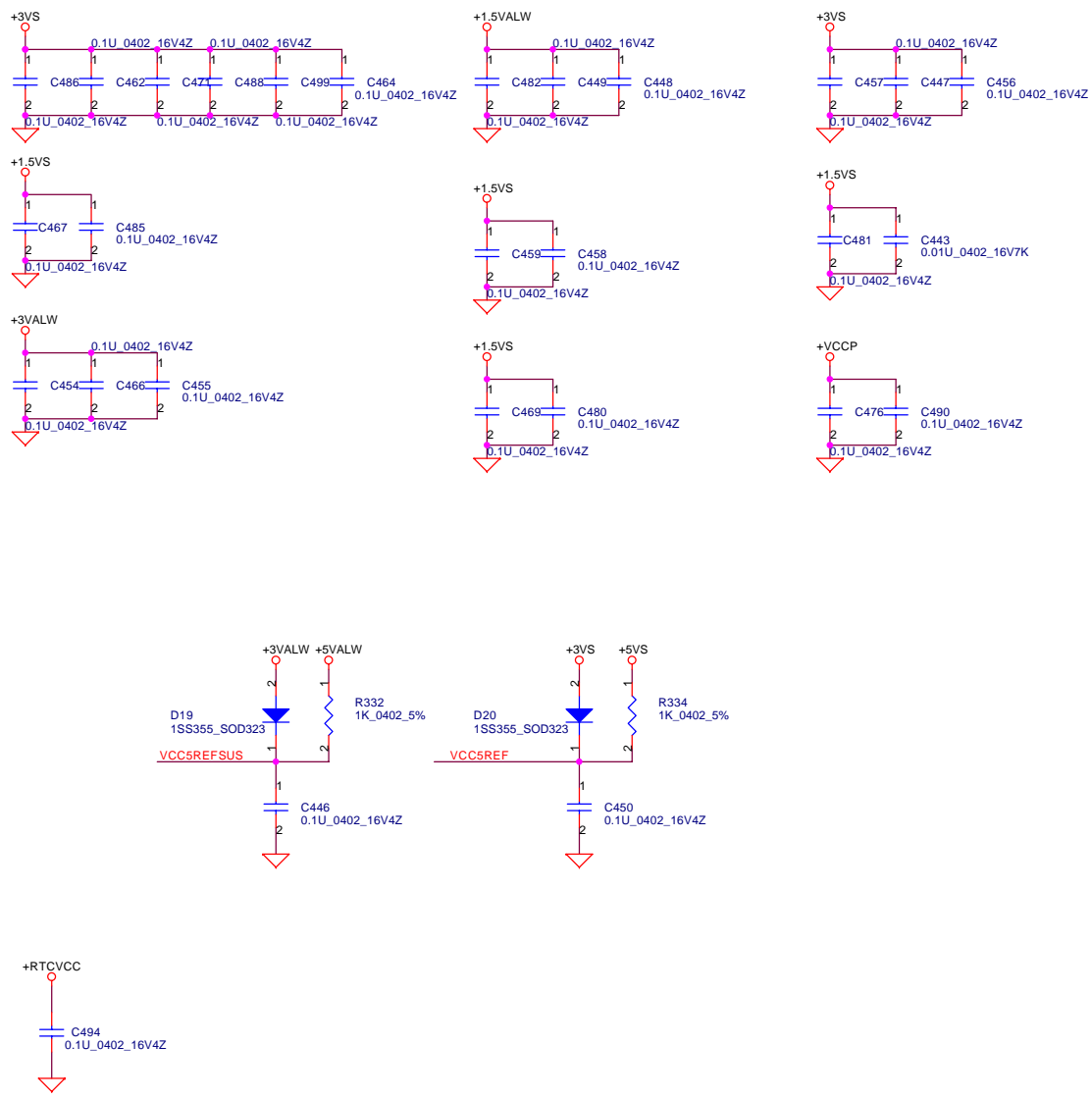
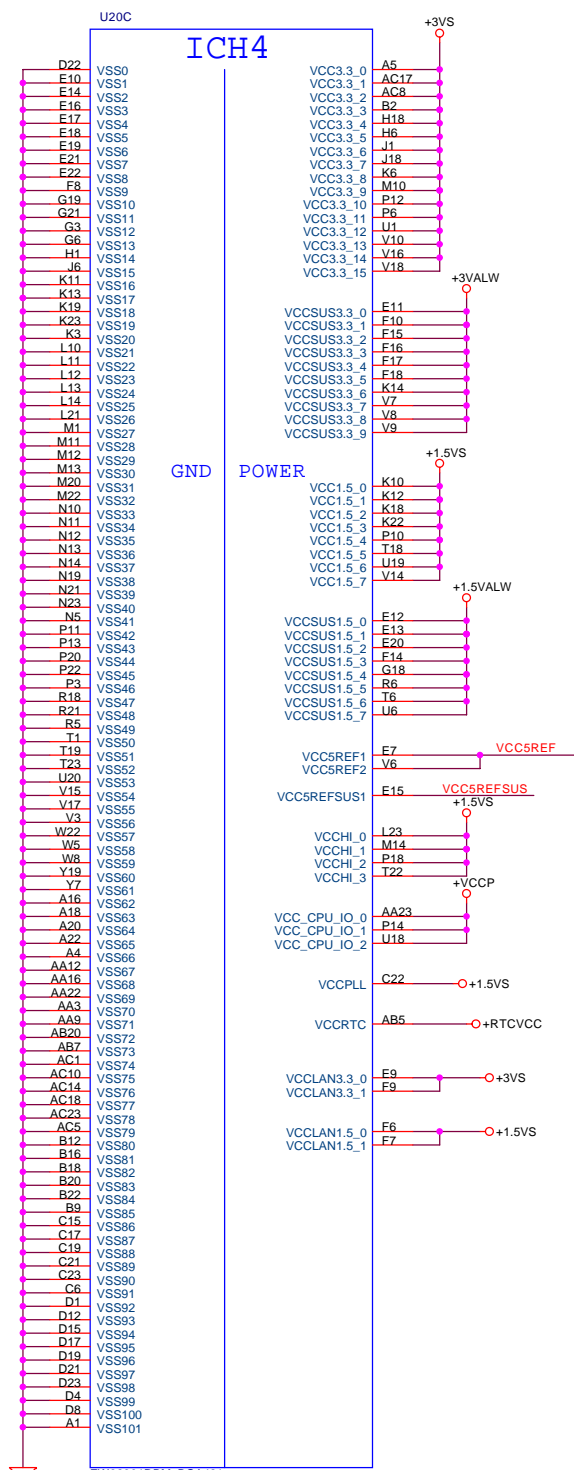
PCI Pullups



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

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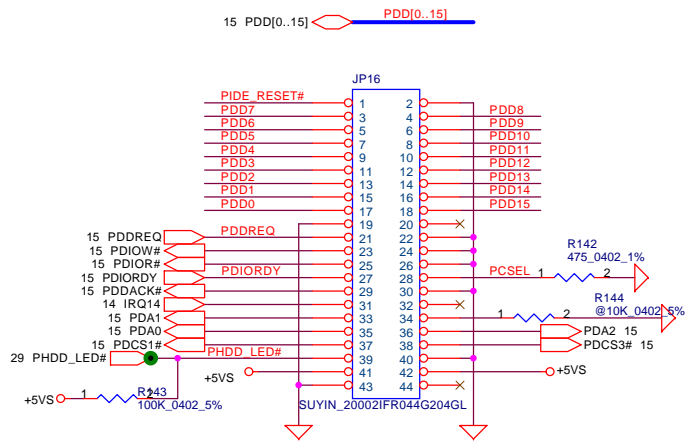




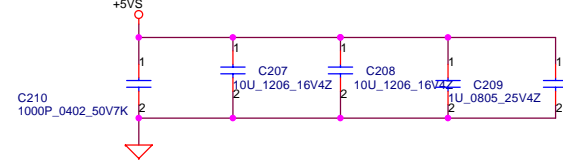
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Compal Electronics, Inc.		
Title ICH4-M		
Size	Document Number DCL55 LA-2201	Rev 1.0
Date:	星期四, 五月 06, 2004	Sheet 16 of 43

HDD Connector

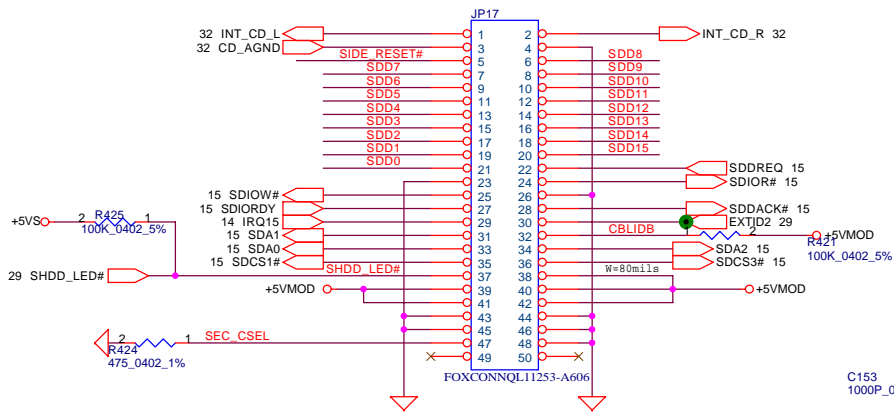


Placea caps. near HDD CONN.

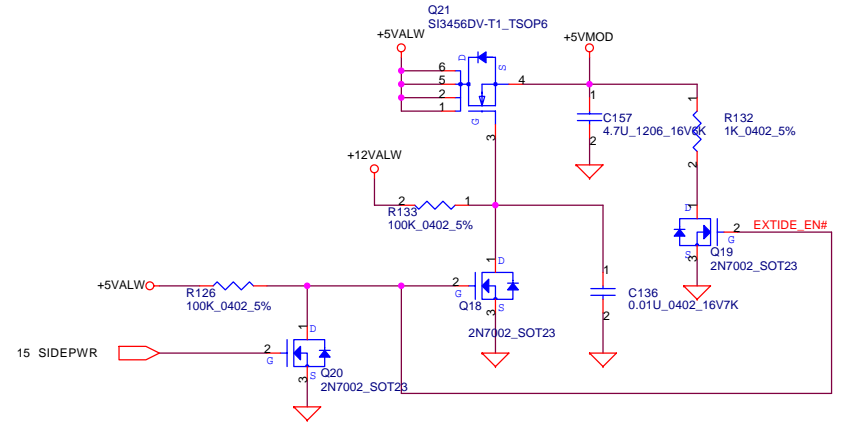
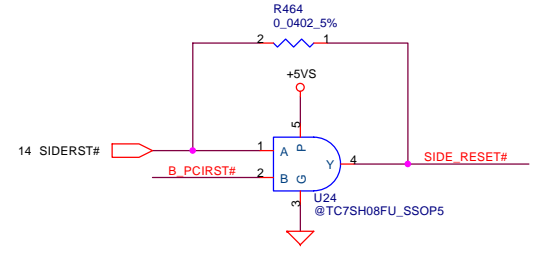
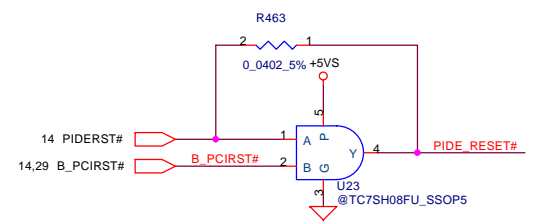
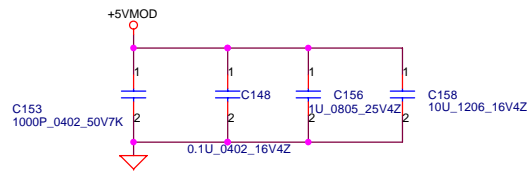


CD-ROM Connector

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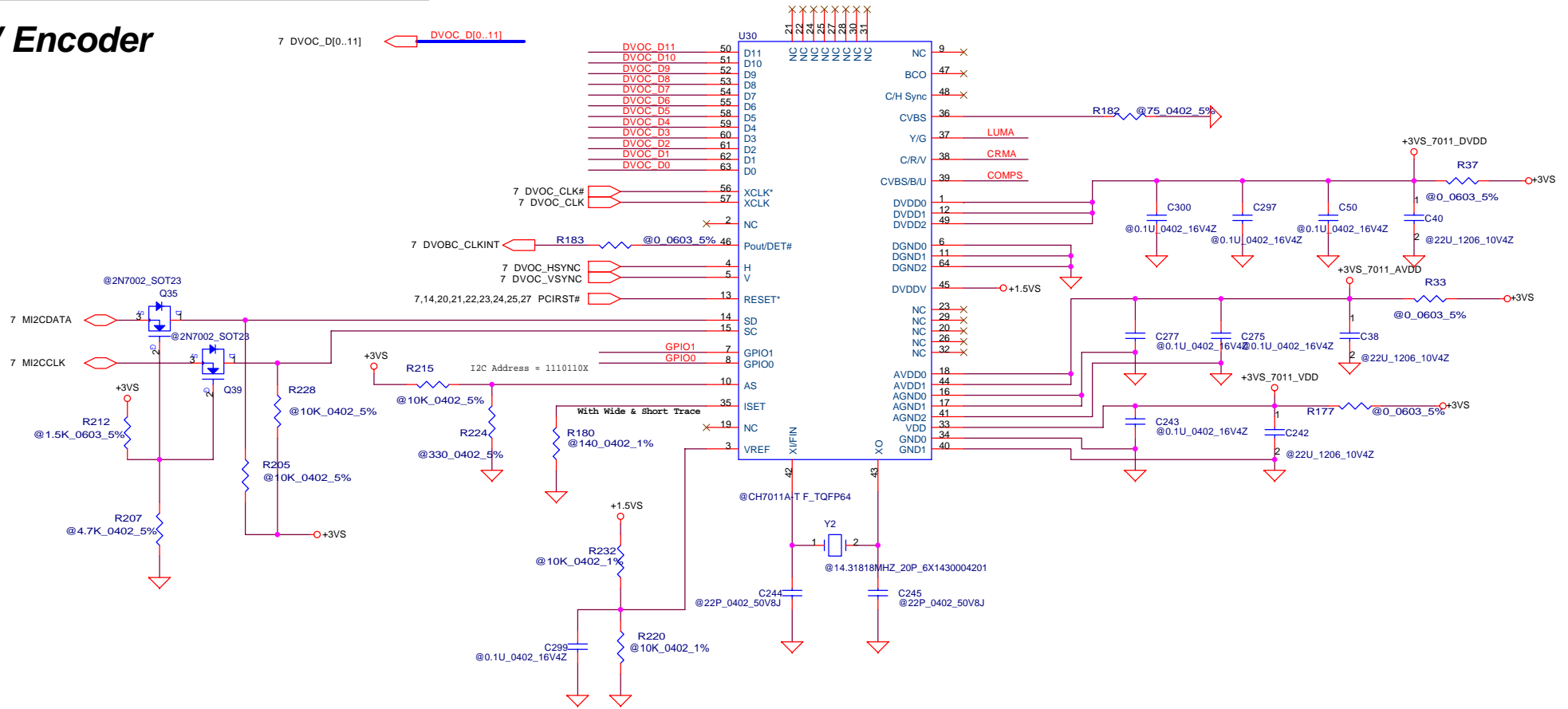
Compal Electronics, Inc.		
Title	IDE/CD-ROM Module	
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 17 of 43

For ABO without TV_out:all this page component unmount

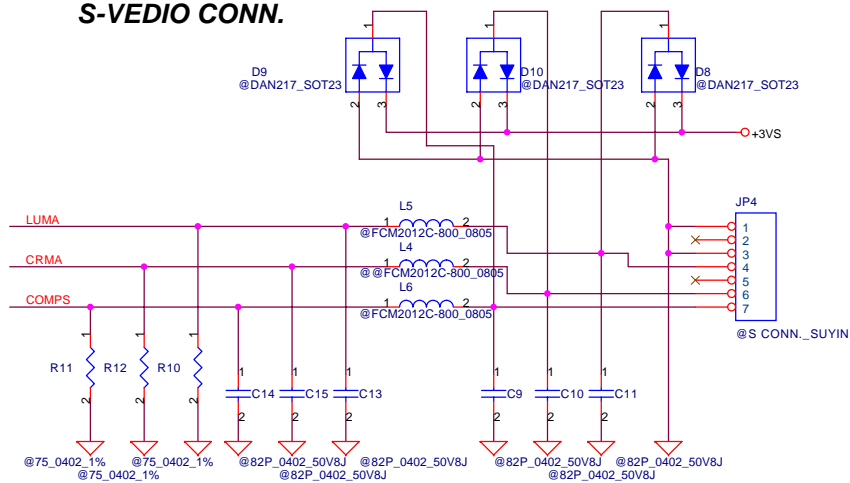
TV Encoder

7 DVOC_D[0..11]

DVOC_D[0..11]



S-VIDEO CONN.

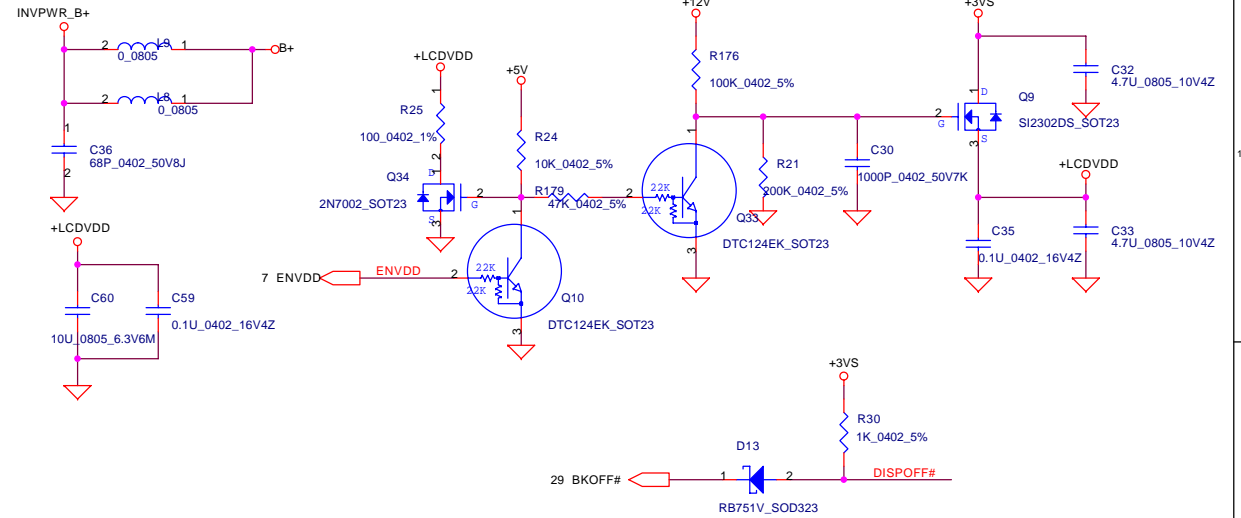
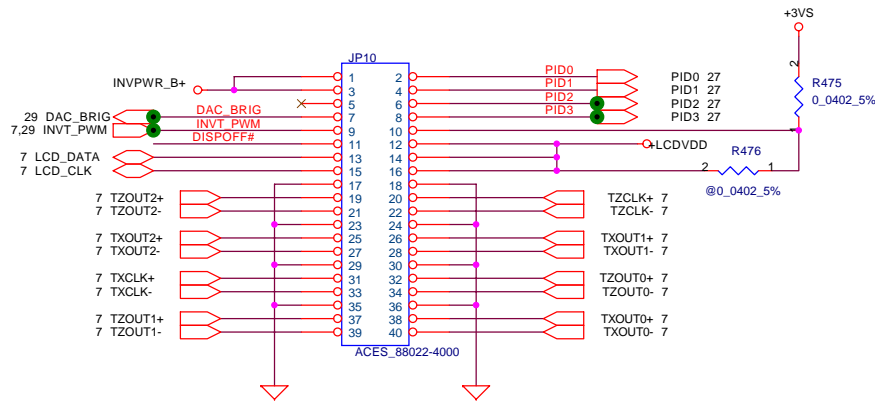


Pull High: Default PAL
Pull Low: Default NTSC

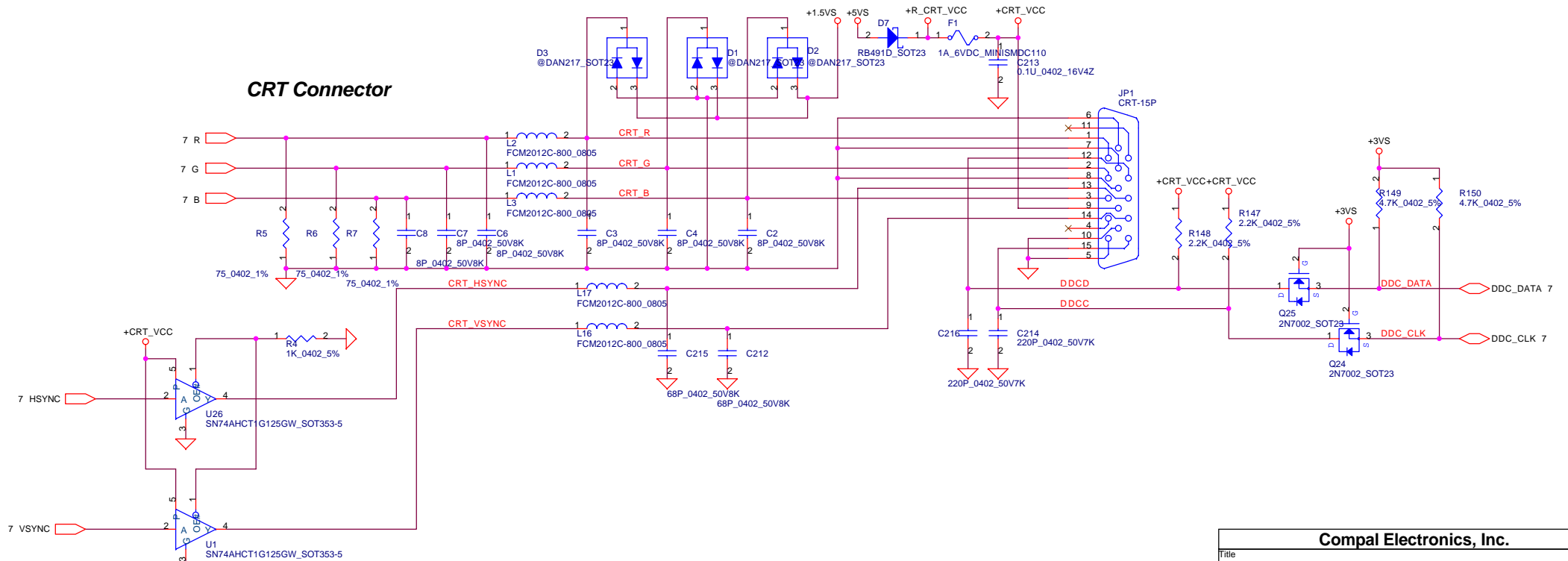
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Title			TV Encoder		
Size	Document Number				Rev
	DCL55 LA-2201				1.0
Date:	星期四, 五月 06, 2004	Sheet	18	of	43

LVDS Connector

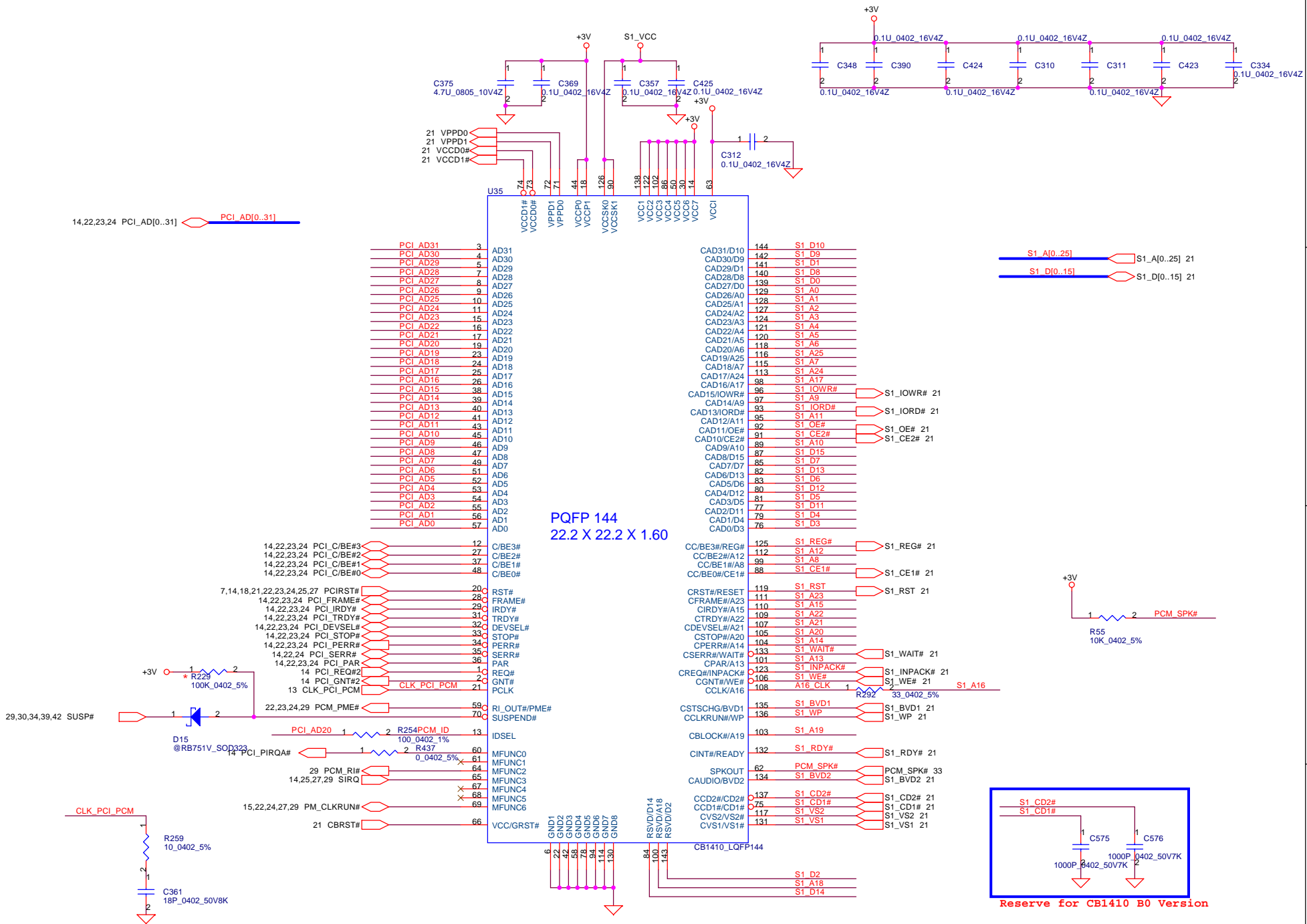


CRT Connector

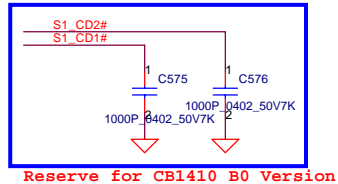


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Compal Electronics, Inc.		
Title	LVDS & CRT	
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 19 of 43



PQFP 144
22.2 X 22.2 X 1.60

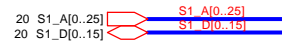
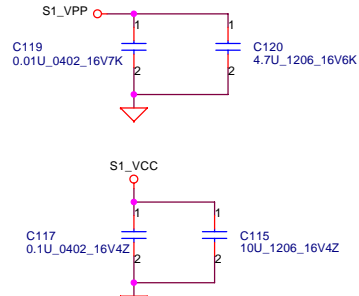
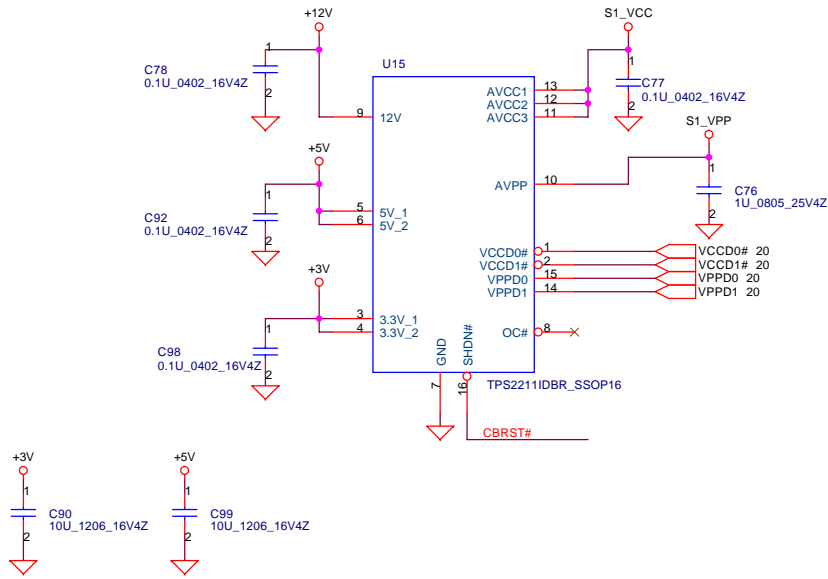


Reserve for CB1410 B0 Version

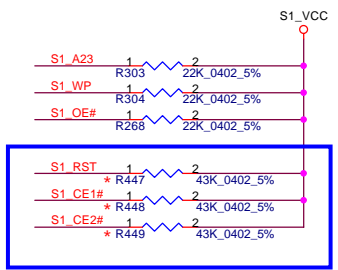
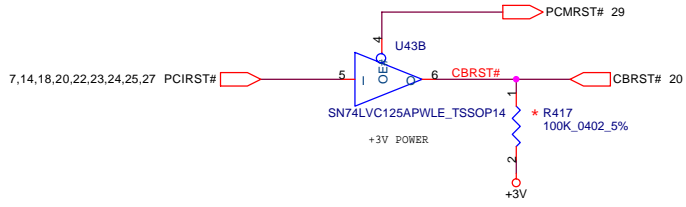
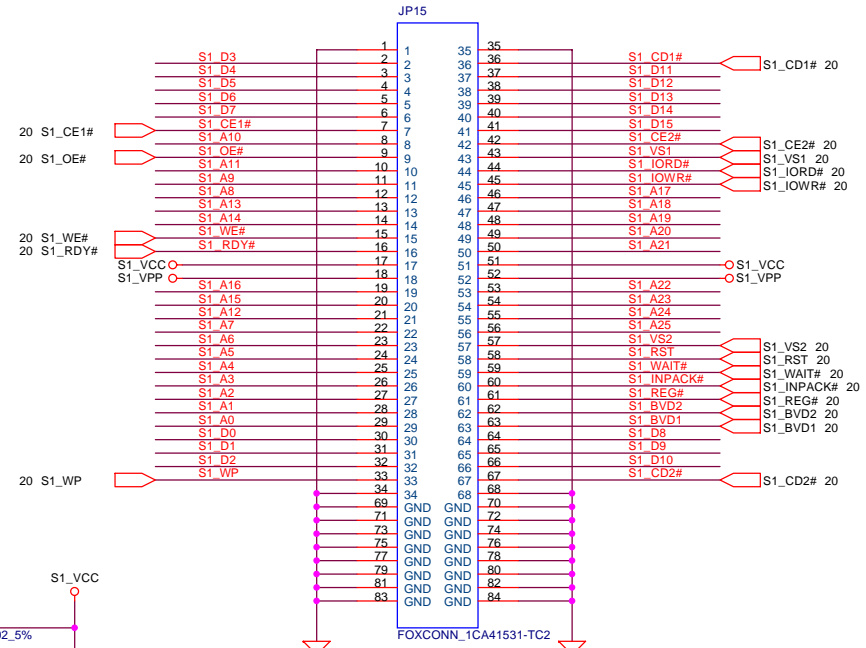
Compal Electronics, Inc.		
Title PCMCIA controller ENE CB1410		
Size	Document Number DCL55 LA-2201	Rev 1.0
Date:	星期四, 五月 06, 2004	Sheet 20 of 43

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PCMCIA Power Controller



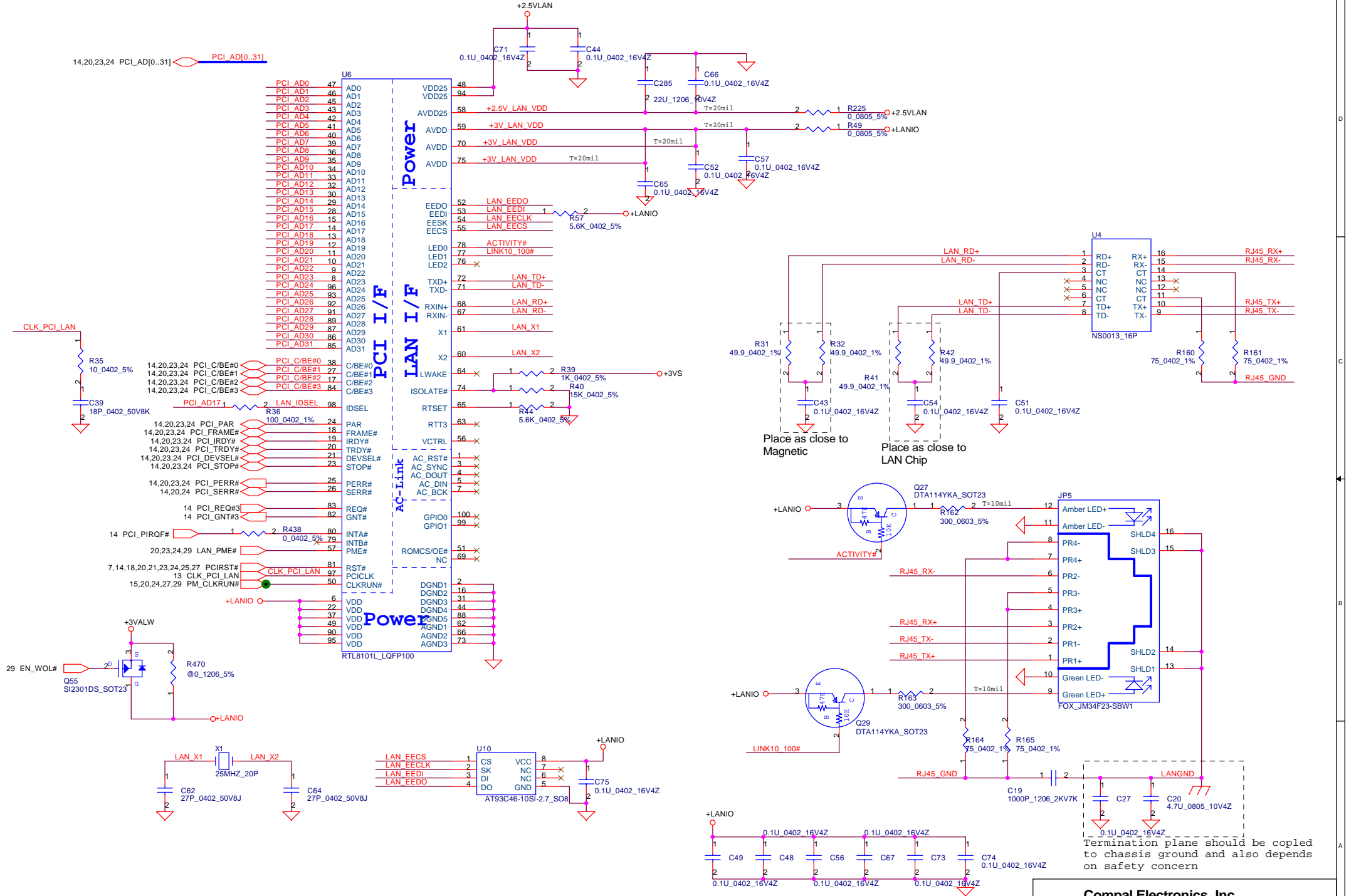
CardBus Socket



Reserve for CB1410 B0 Version

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

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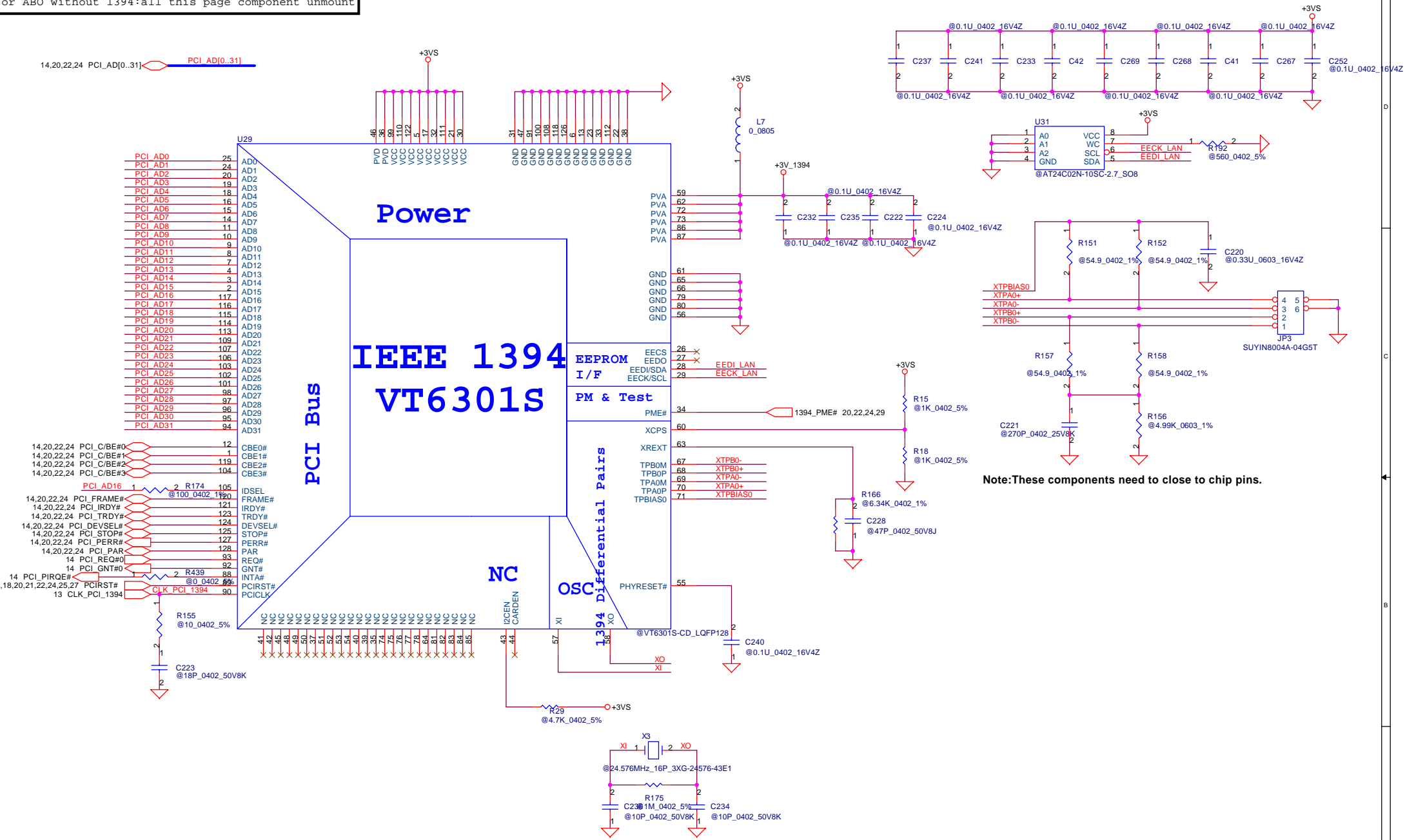
Compal Electronics, Inc.

Title LAN RTL8101L		
Size B	Document Number DCLE55 LA-2201	Rev 1.0
Date: 星期日, 五月 06, 2004	Sheet 22 of 43	

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

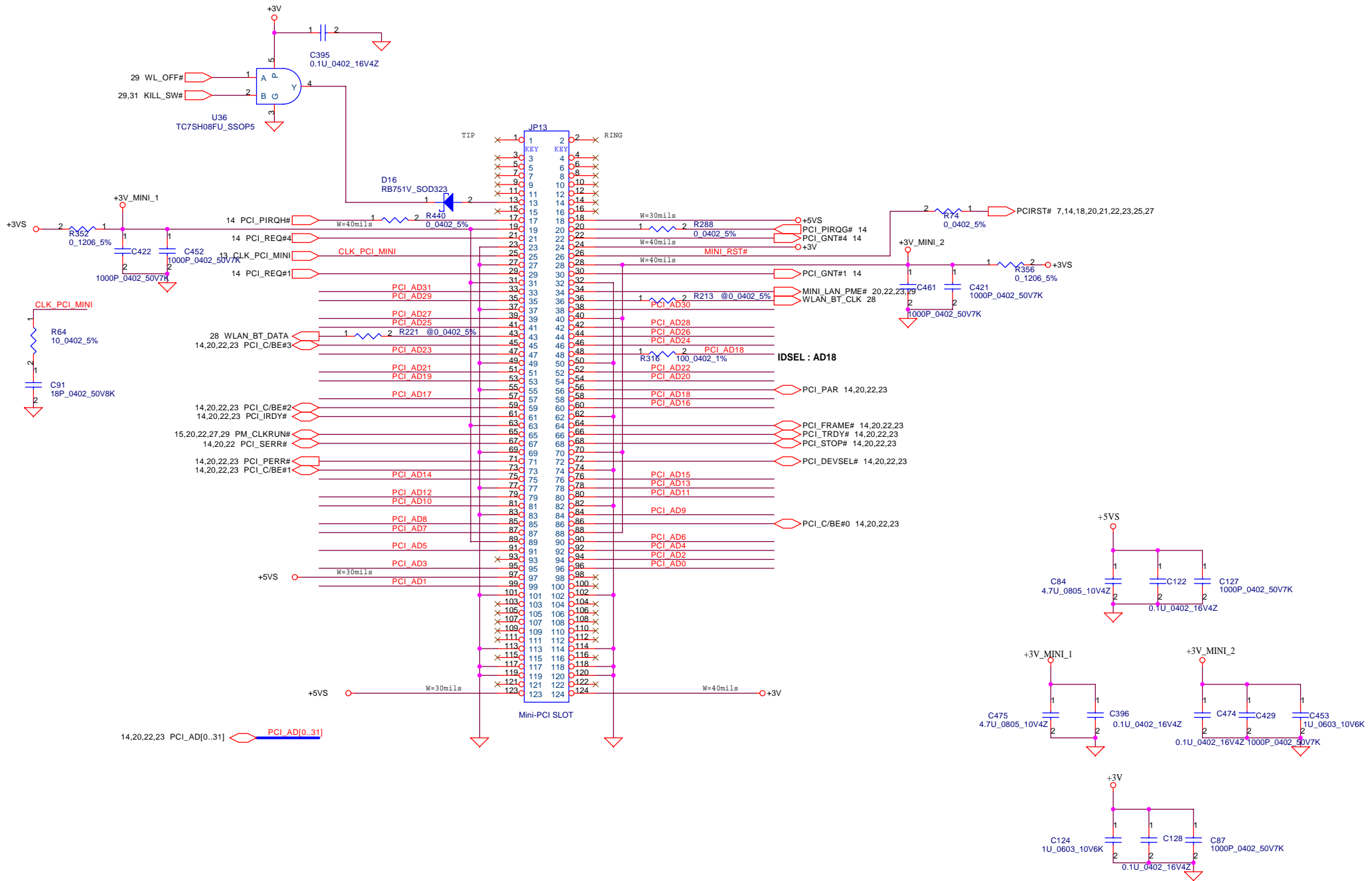
For ABO without 1394:all this page component unmount



Note: These components need to close to chip pins.

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

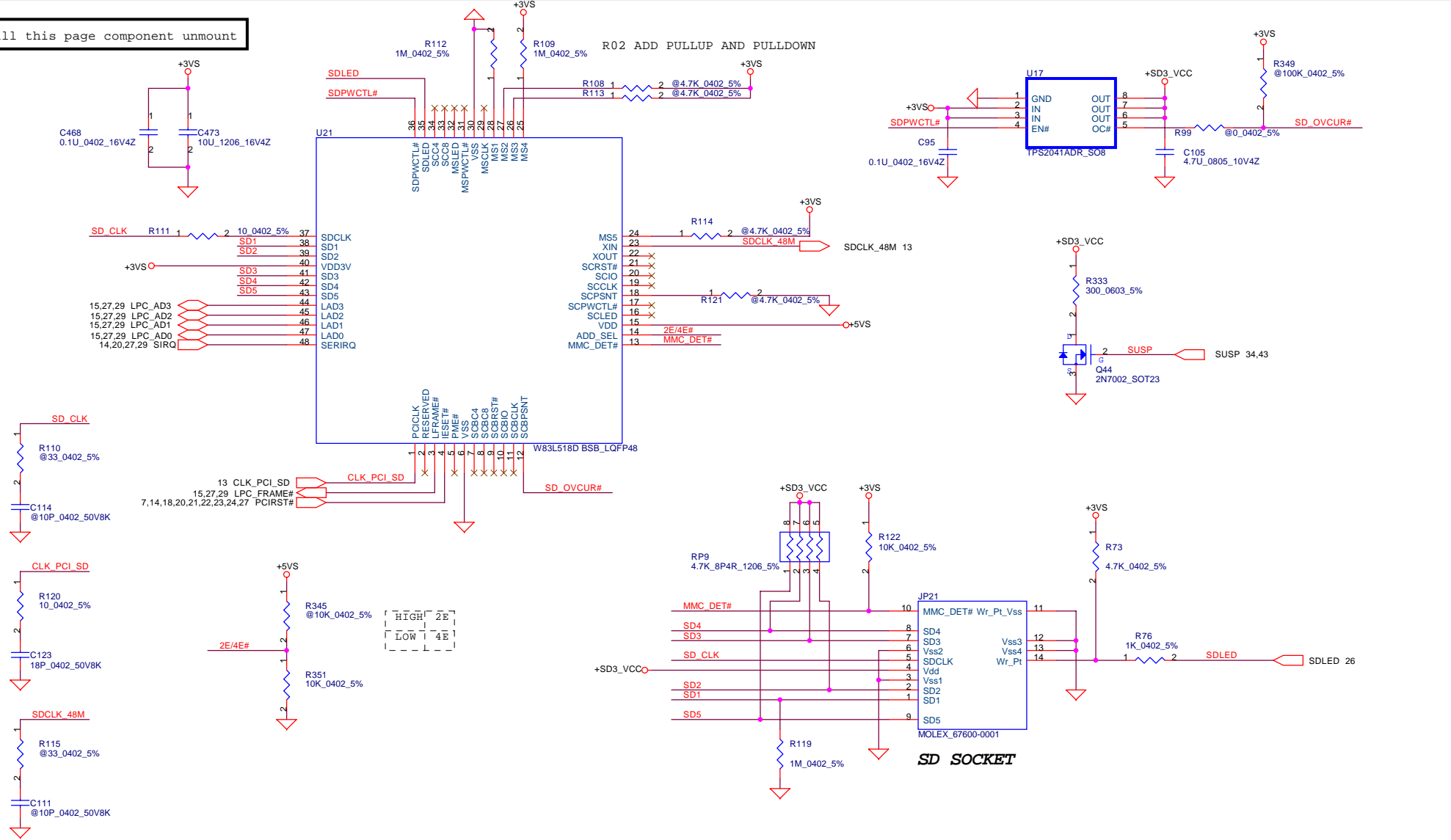
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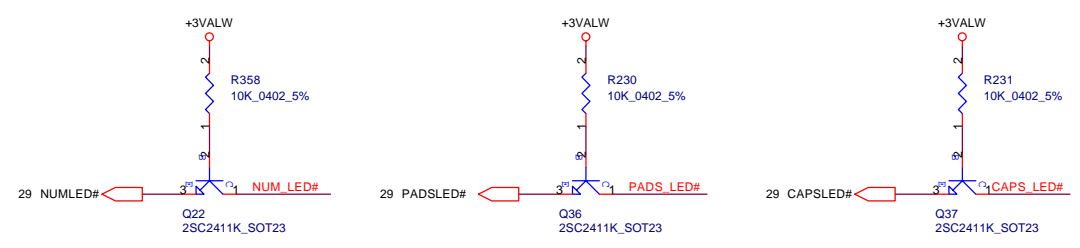
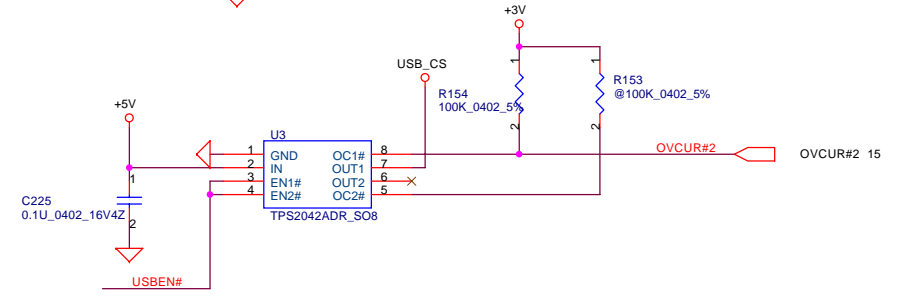
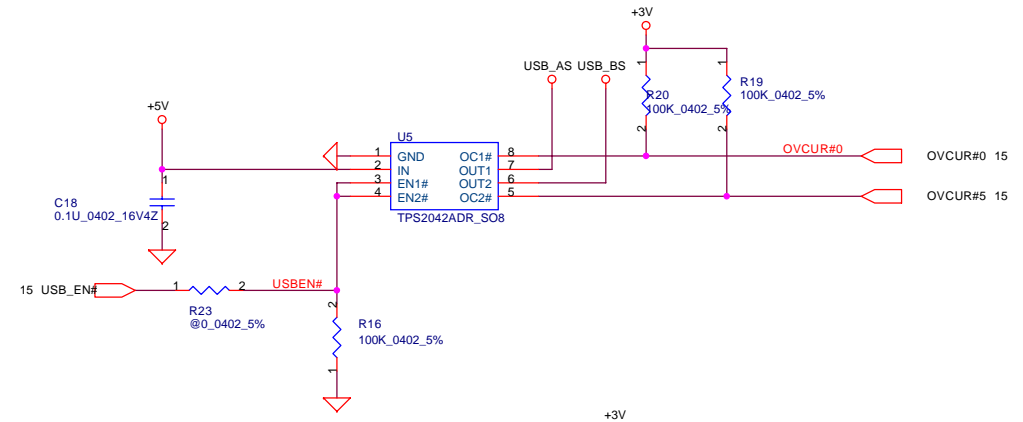
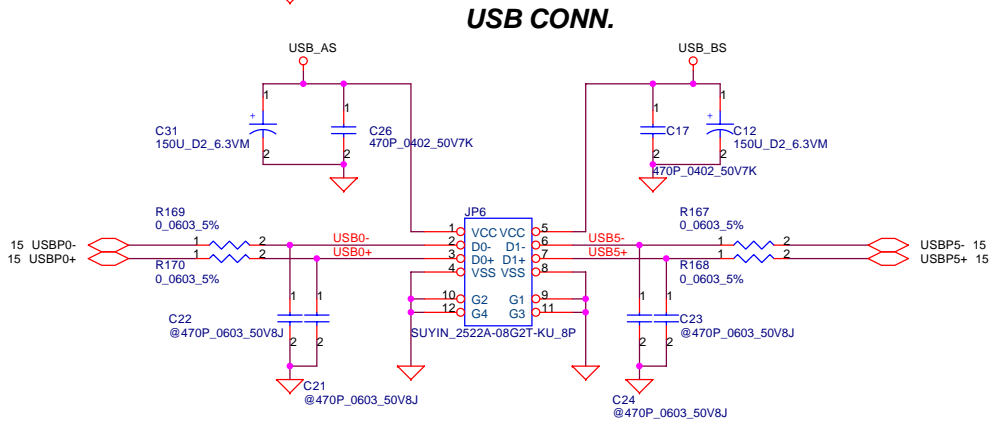
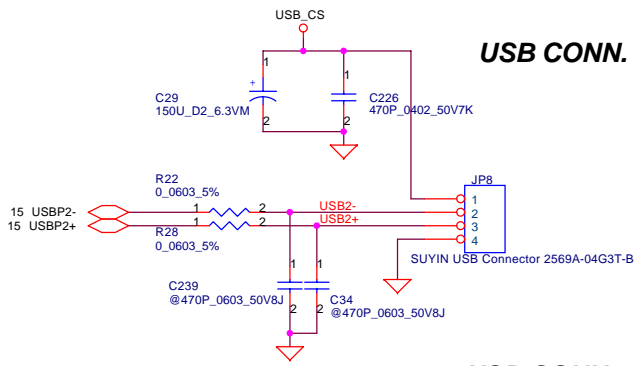
Compal Electronics, Inc. Title: Mini PCI Slot		
Size B	Document Number DCL55 LA-2201	Rev 1.0
Date:	星期四, 五月 06, 2004	Sheet 24 of 43

FOR ABO: all this page component unmount

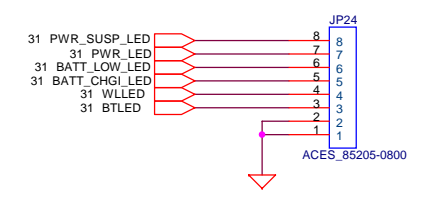


Compal Electronics, Inc.		
Title SD CARD Controller/Socket		
Size B	Document Number DCL55 LA-2201	Rev 1.0
Date: 星期四, 五月 06, 2004	Sheet 25	of 43

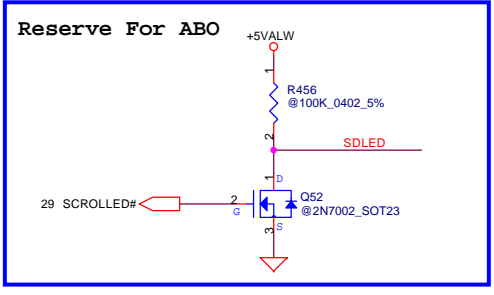
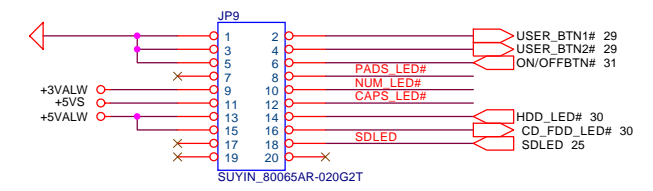
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LED/B CONN.



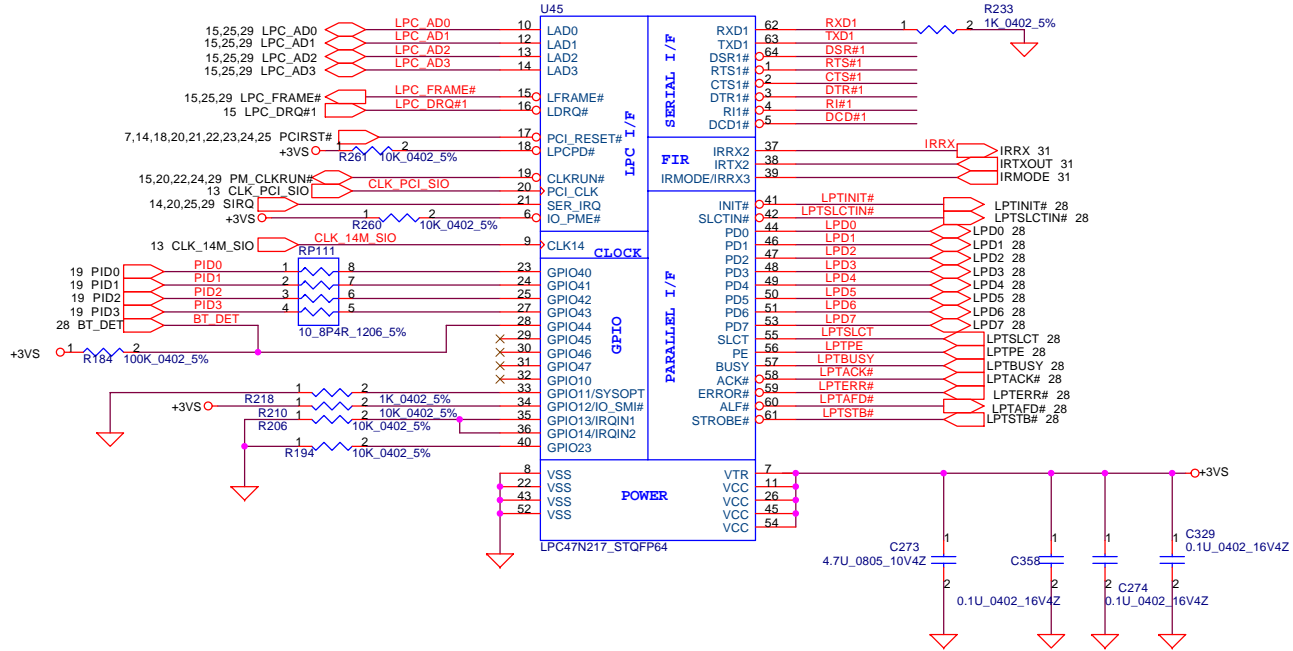
POWER/B CONN.



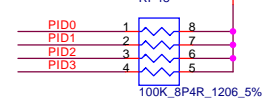
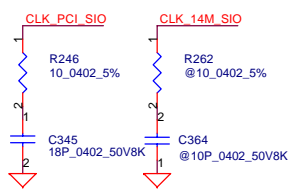
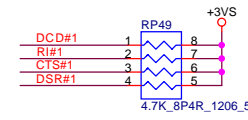
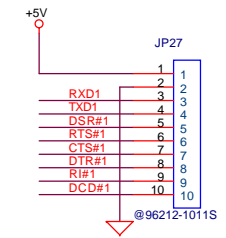
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Compal Electronics, Inc.		
Title USB & LED		
Size B	Document Number DCL55 LA-2201	Rev 1.0
Date: 星期四, 五月 06, 2004	Sheet 26	of 43

SUPER I/O SMC FDC47N227



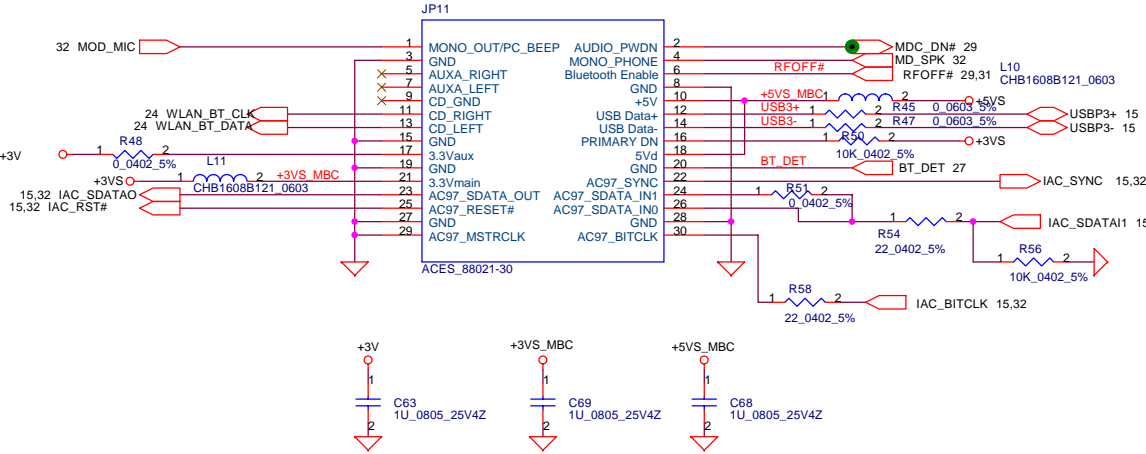
Base I/O Address
 * 0 = 02Eh
 1 = 04Eh



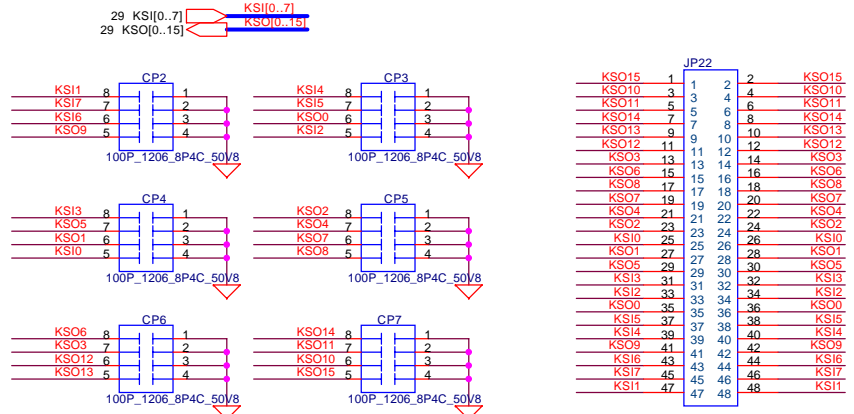
Compal Electronics, Inc.		
Title SUPER I/O		
Size B	Document Number DCL55 LA-2201	Rev 1.0
Date 星期四, 五月 06, 2004	Sheet 27 of 43	

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MBC CONN.

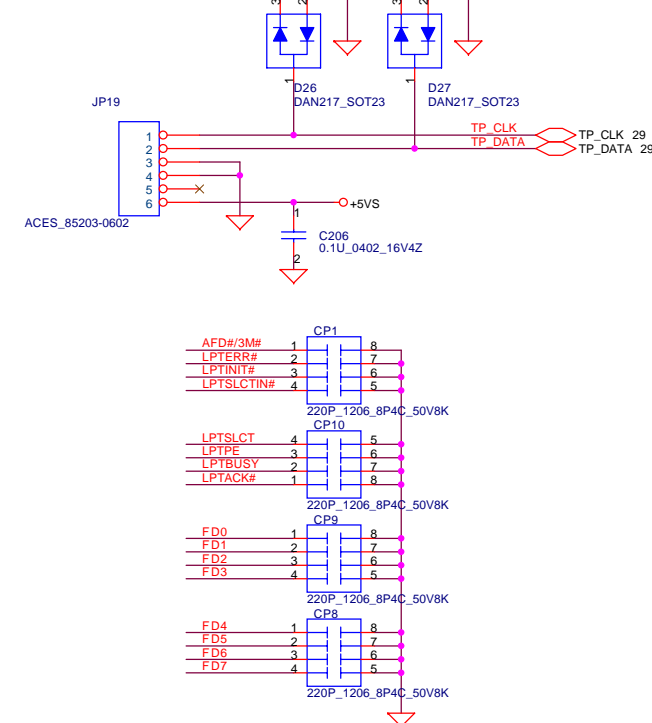


INT_KBD CONN.

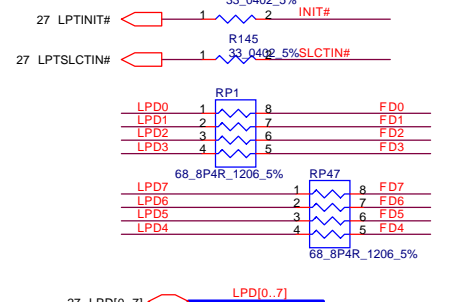
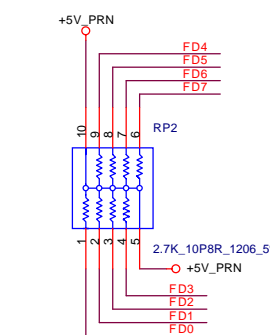
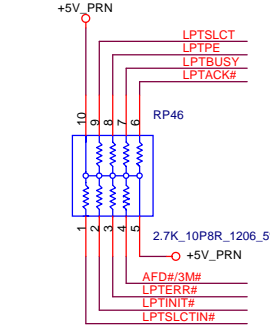
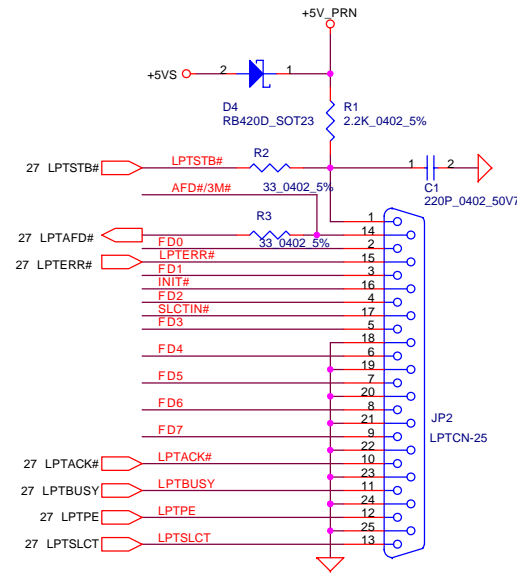


As close as possible to K/B connector

T/P FPC CONN.



PARALLEL PORT



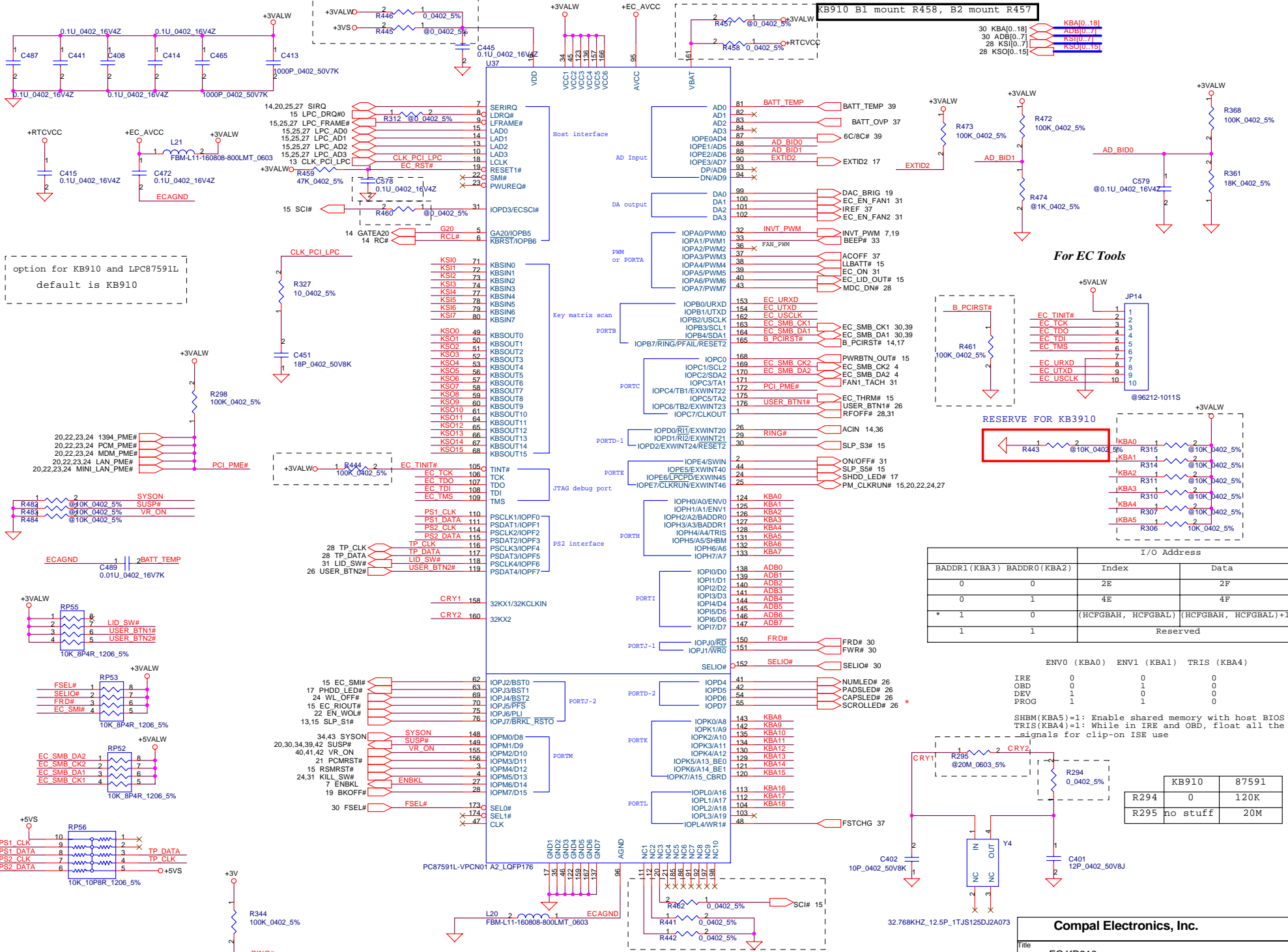
Compal Electronics, Inc.

Title PARALLEL/MDC PORT

Size Document Number DCL55 LA-2201 Rev 1.0

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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
OBDD 0	1	0
DEV 1	0	0
PROG 1	9	1

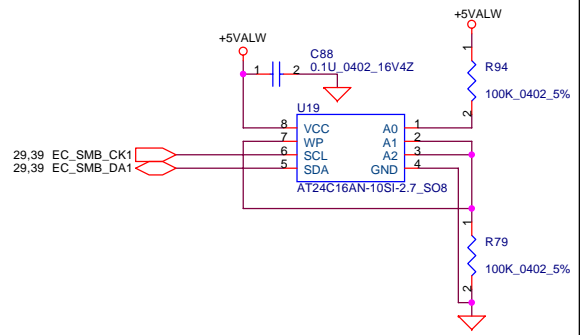
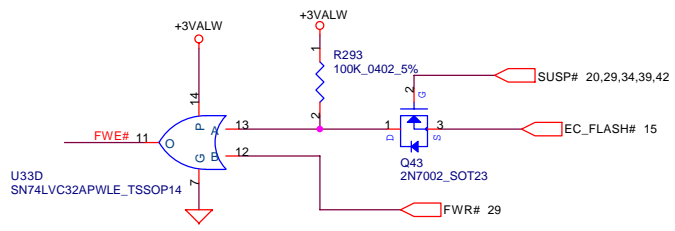
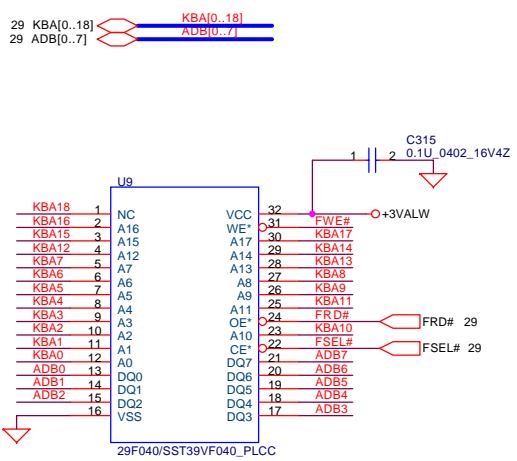
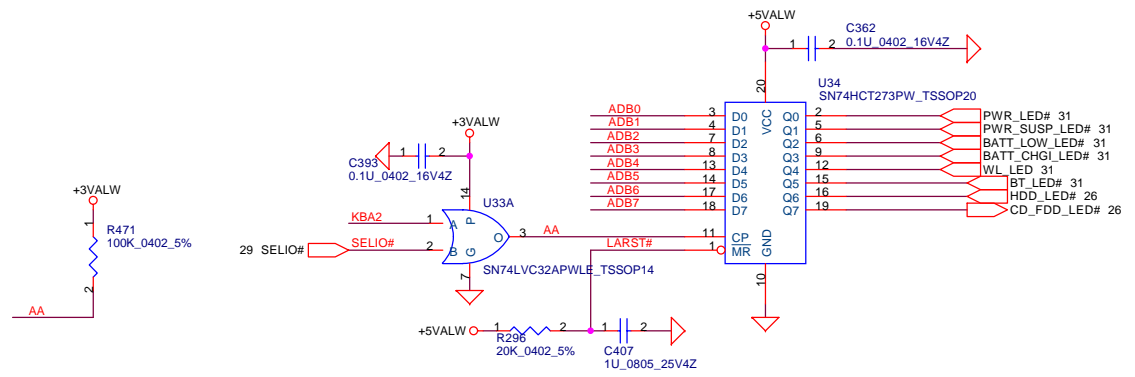
SHBM(KBA5)=1: Enable shared memory with host BIOS
TRIS(KBA4)=1: While in IRE and OBD, float all the signals for clip-on ISE use

	KB910	87591
R294	0	120K
R295	no stuff	20M

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Compal Electronics, Inc.

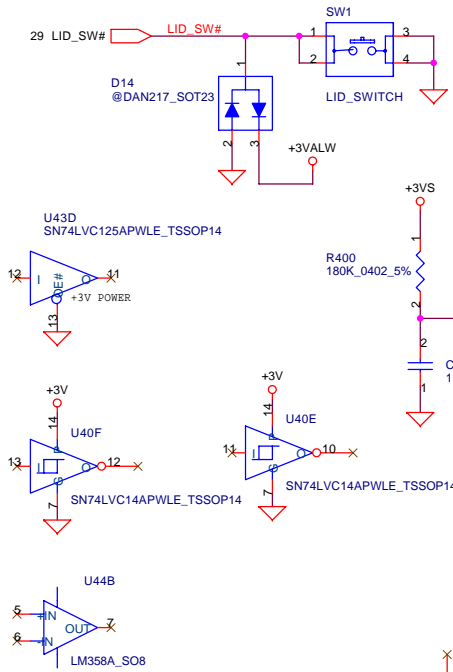
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Size	Document Number	DCL55 LA-2201	
Customer	Date	Rev	1.0
日期	星期	Sheet	29 of 43



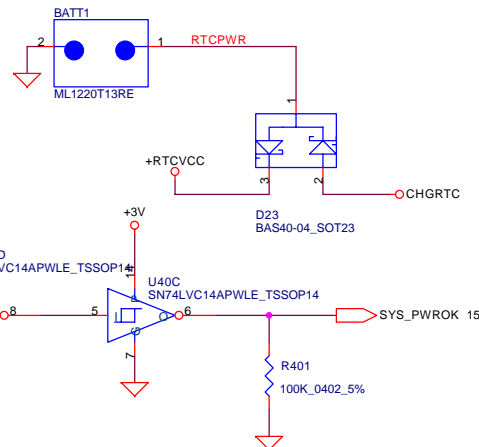
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Compal Electronics, Inc.			
Title: BIOS & EXT. I/O PORT			
Size: B	Document Number: DCL55 LA-2201	Rev: 1.0	
Date: 星期四, 五月 06, 2004	Sheet: 30	of	43

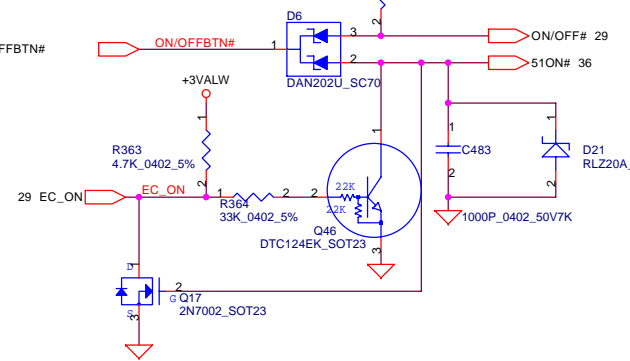
Power ON Circuit



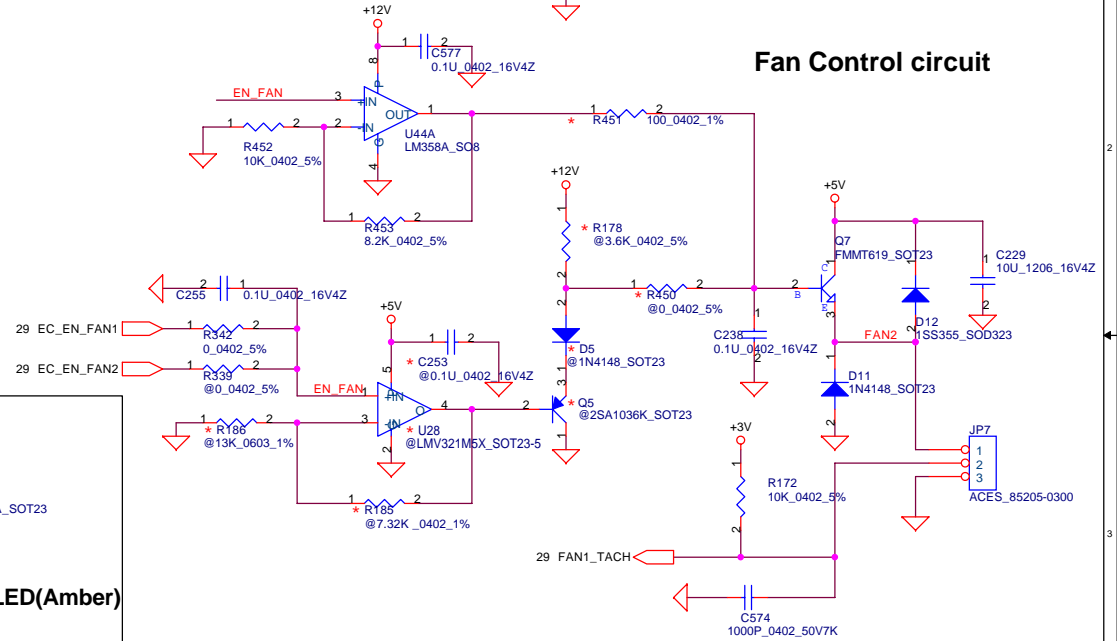
RTC Battery



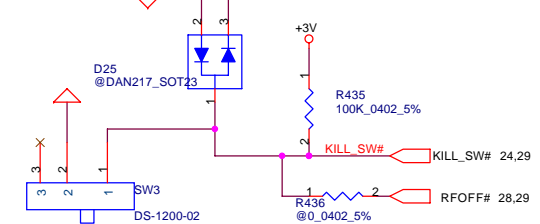
Power BTN



Fan Control circuit

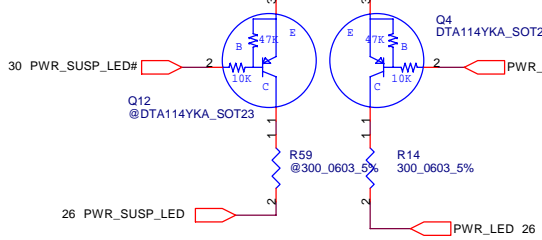


Kill SWITCH

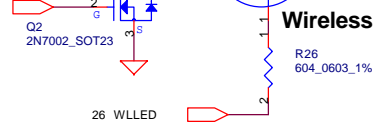


Suspend LED(Amber)

Power LED(Blue)

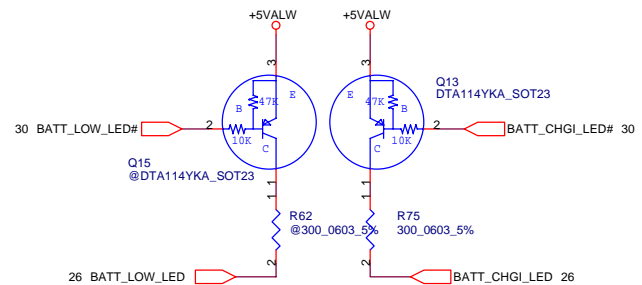


Wireless LED(Amber)



BATT Low LED(Amber)

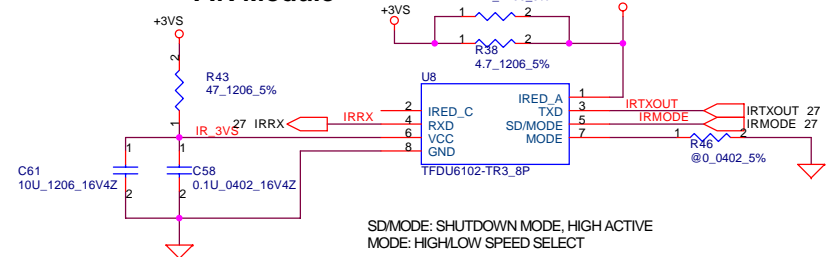
BATT Charge LED(Blue)



Bluetooth LED(Blue)



FIR Module

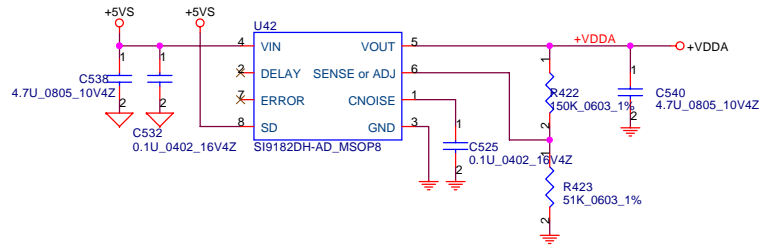


Compal Electronics, Inc.

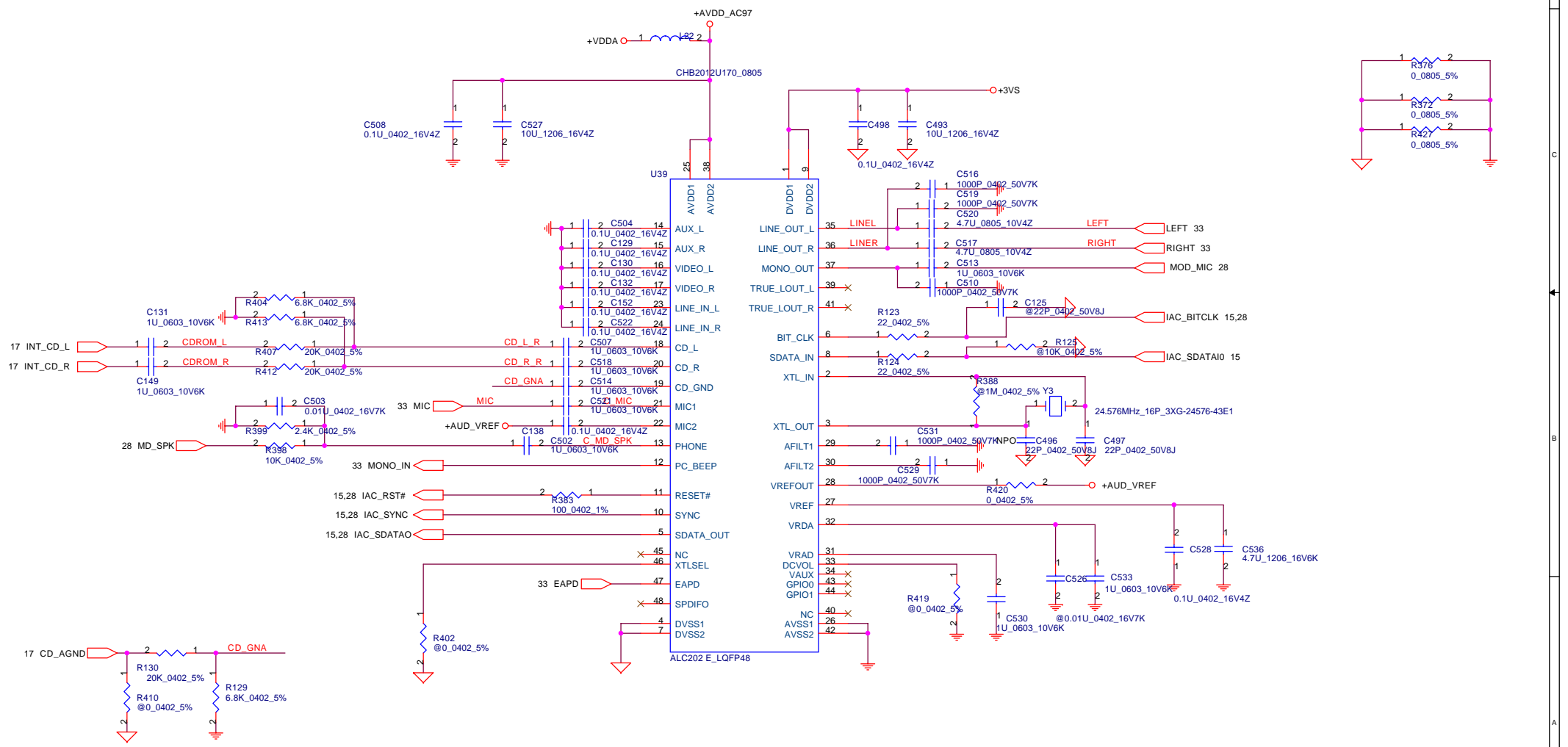
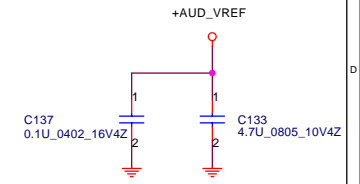
Title	Power OK/Reset/RTC battery/Lid Switch/Int. KB	
Size	Document Number	Rev
	DCL55 LA-2201	1.0
Date:	星期四, 五月 06, 2004	Sheet 31 of 43

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AC97 Codec

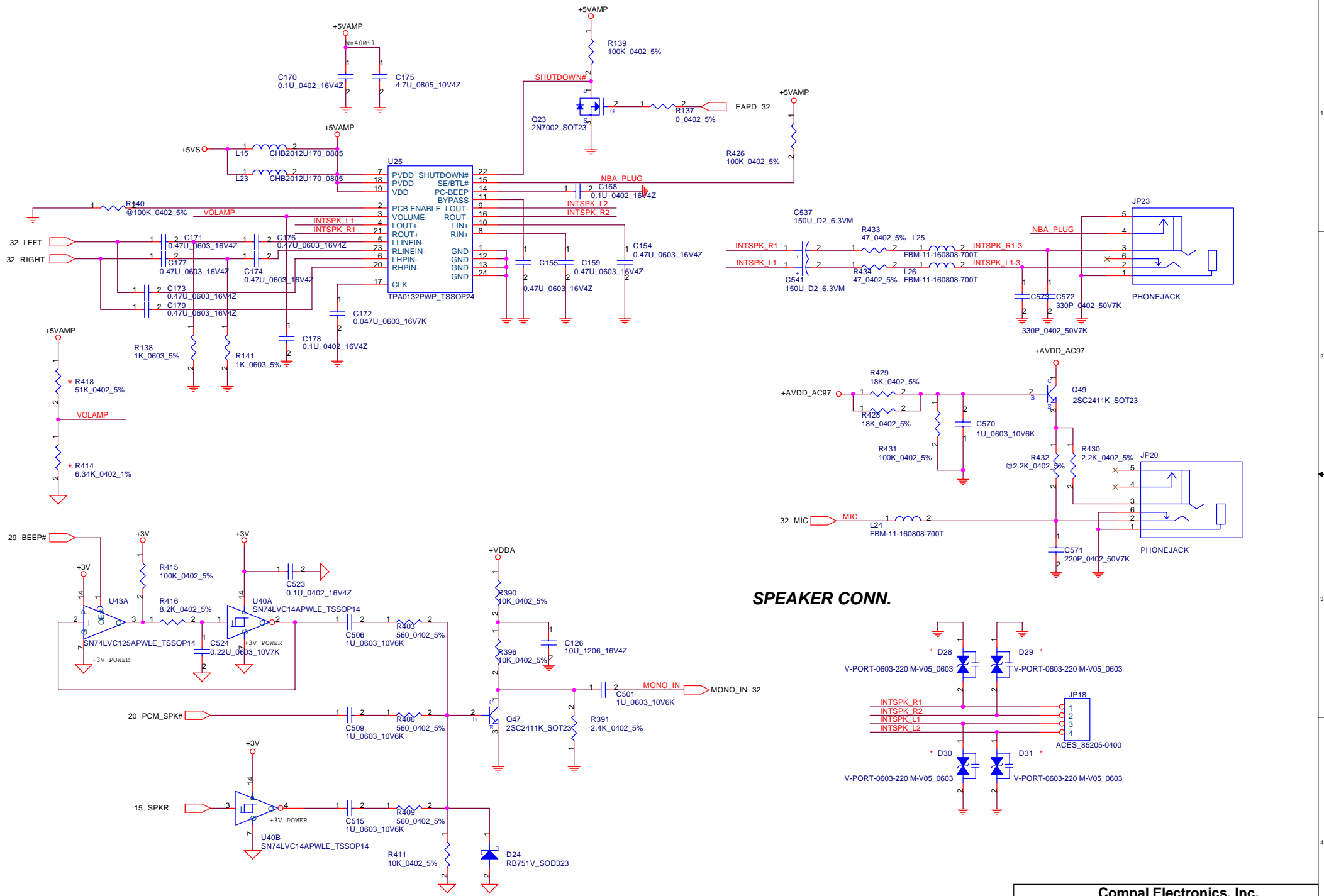


R402	MODE
Stuff	14.318MHz External
No-Stuff	24.576MHz Crystal or External Colck

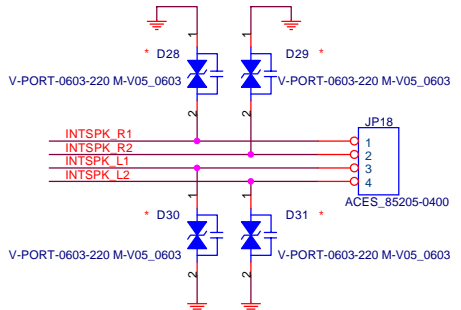


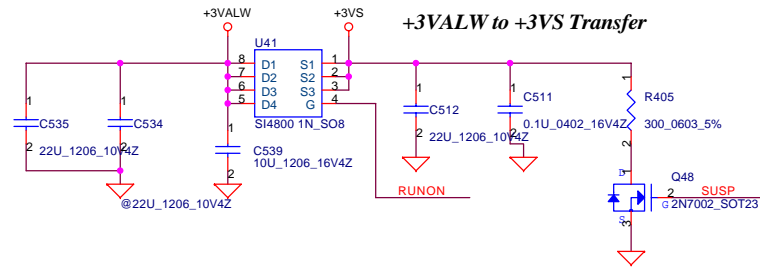
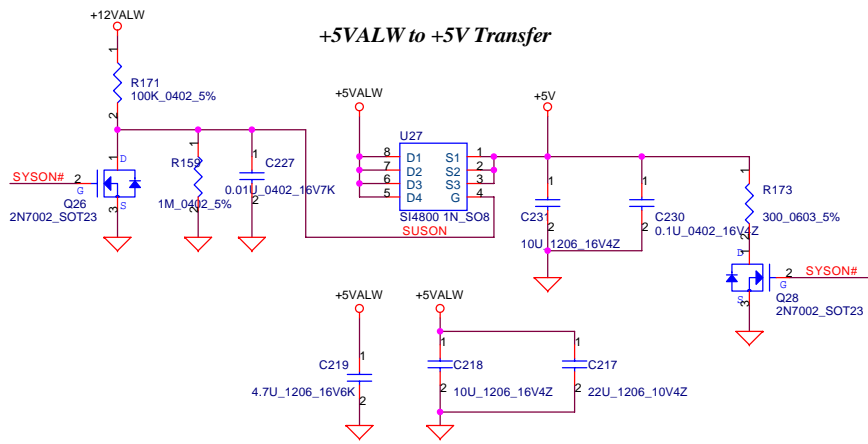
Compal Electronics, Inc.		
Title	AC97 Codec	
Size	Document Number	Rev
B	DCL55 LA-2201	1.0
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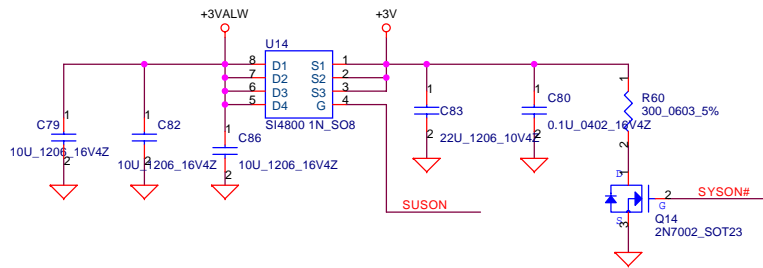


SPEAKER CONN.

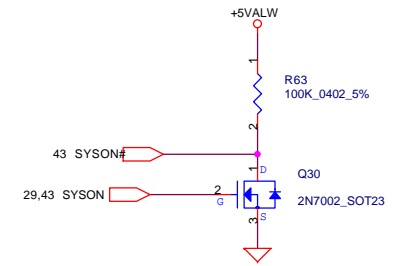
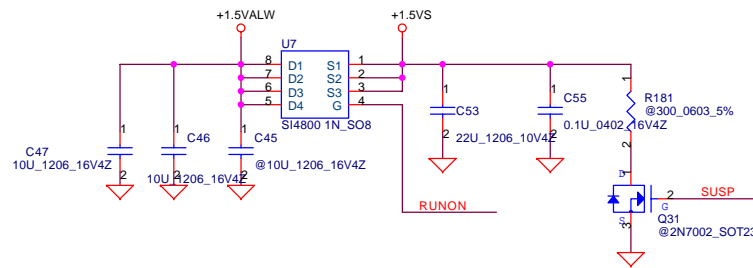




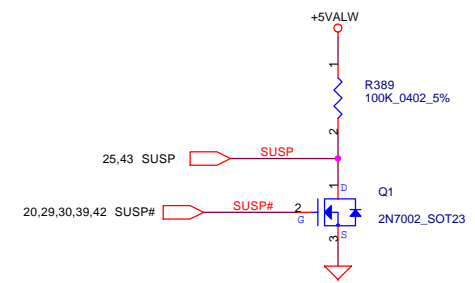
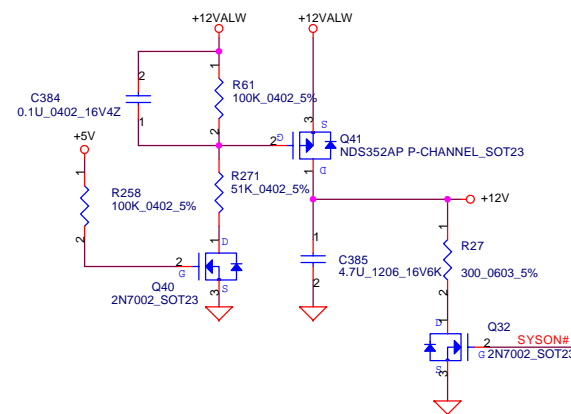
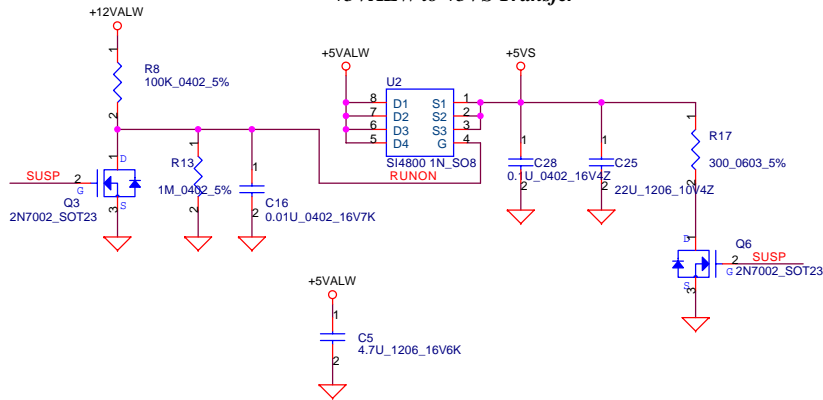
+3VALW to +3V Transfer



+1.5VALW to +1.5VS Transfer

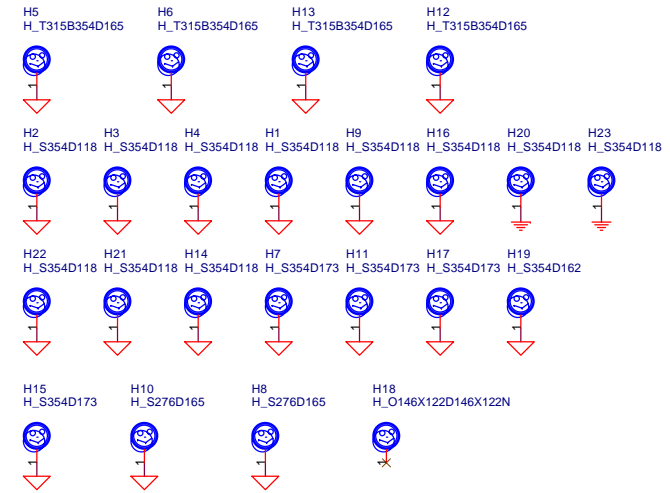
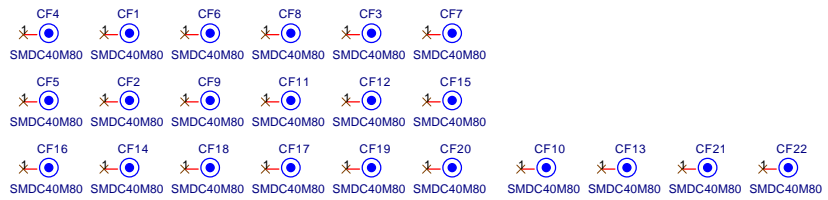


+5VALW to +5VS Transfer



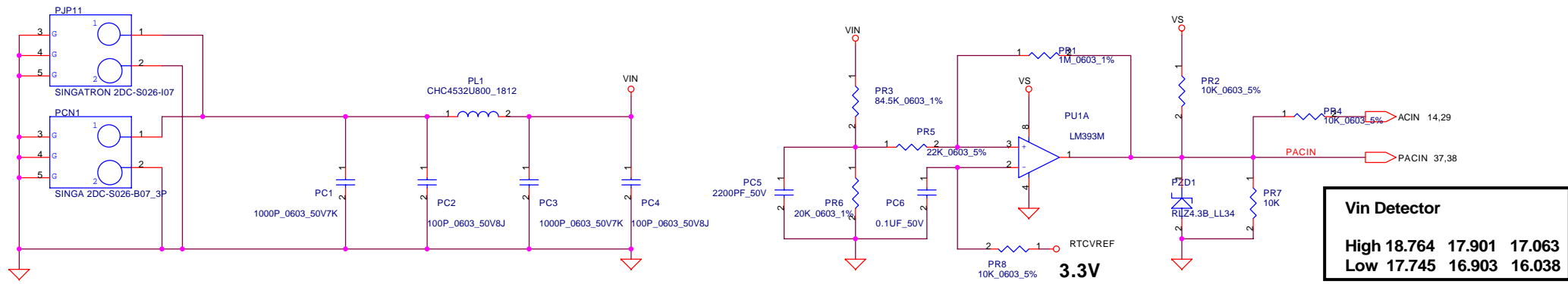
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Compal Electronics, Inc.		
Title DC/DC Circuit Interface		
Size	Document Number DCL55 LA-2201	Rev 1.0
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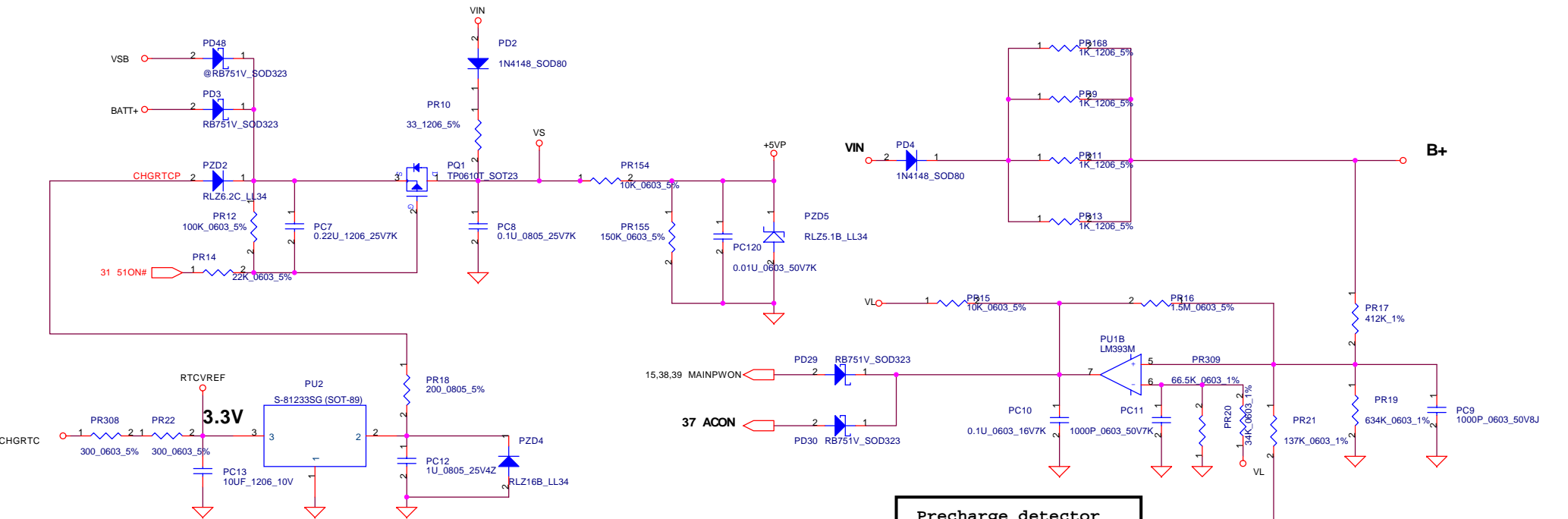


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Compal Electronics, Inc.		
Title Skew Hole		
Size	Document Number DCL51 LA-1881	Rev 1.0
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Vin Detector		
High	18.764	17.901
Low	17.745	16.903
	17.063	16.038

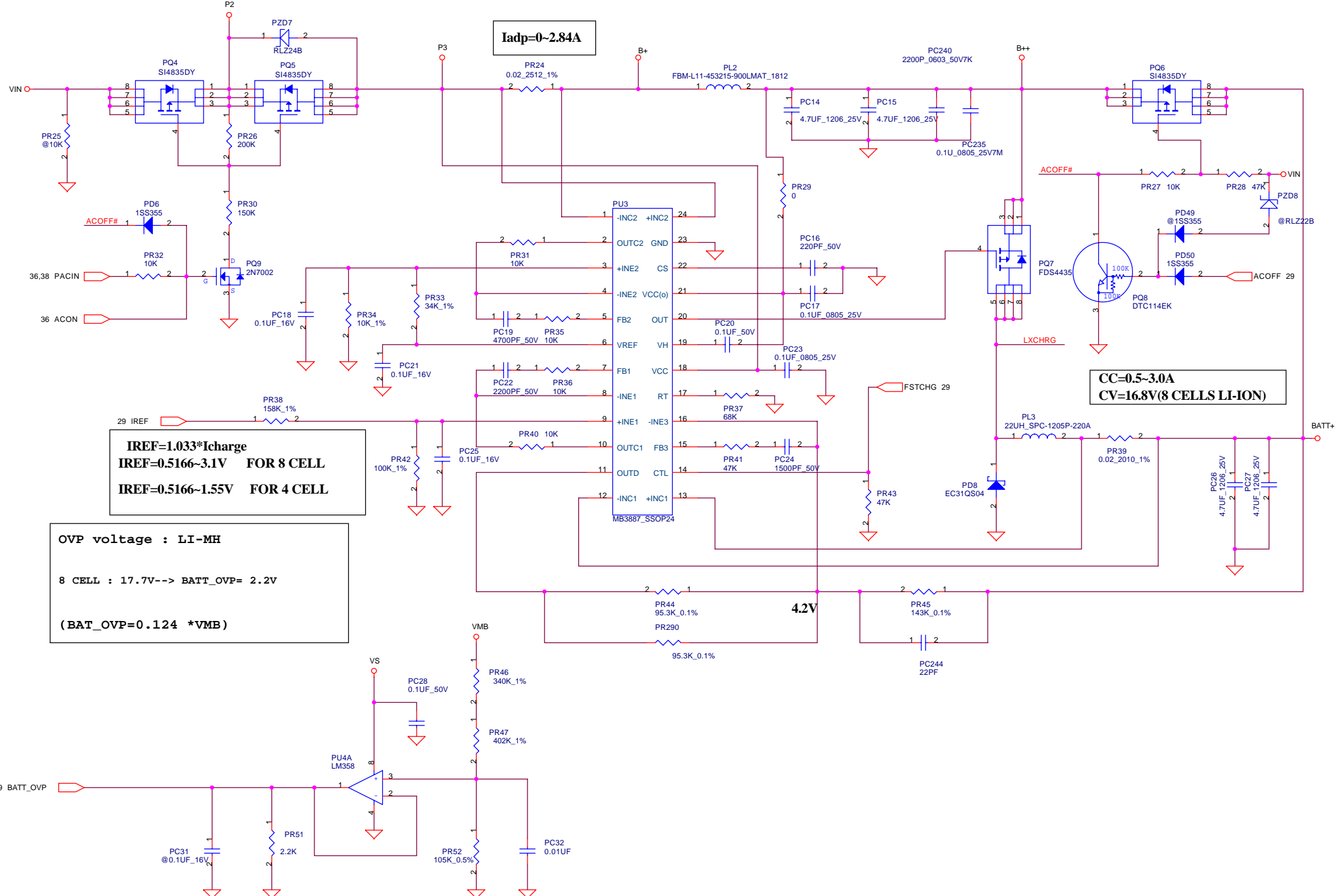


Precharge detector AC ADAPTOR		
	16.69	16.05
	15.6	15.02
	14.35	14.35

Precharge detector AC ADAPTOR		
	6.33	6.12
	5.227	5.09
	4.85	4.85

- +2.5VP 1 PJP1 2 +2.5V (5A,200mils ,Via NO.= 10)
- +1.5VALWP 2 PJP3 1 +1.5VALW (1A,40mils ,Via NO.= 2)
- +1.8VSP 2 PJP4 1 +1.8VS (0.5A,40mils ,Via NO.= 1)
- +12VALWP 2 PJP5 1 +12VALW (120mA,20mils ,Via NO.= 1)
- +5VALWP 1 PJP7 2 +5VALW (5A,200mils ,Via NO.= 10)
- +3VALWP 1 PJP8 2 +3VALW (5A,200mils ,Via NO.= 10)
- +1.25VP 1 PJP2 2 +1.25VS (1A,40mils ,Via NO.= 2)
- +1.35VSP 1 PJP6 2 +1.35VS (2A,80mils ,Via NO.= 4)
- +1.05VALWP 1 PJP26 2 +VCCP (0.5A,20mils ,Via NO.= 1)

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I_{adp}=0-2.84A

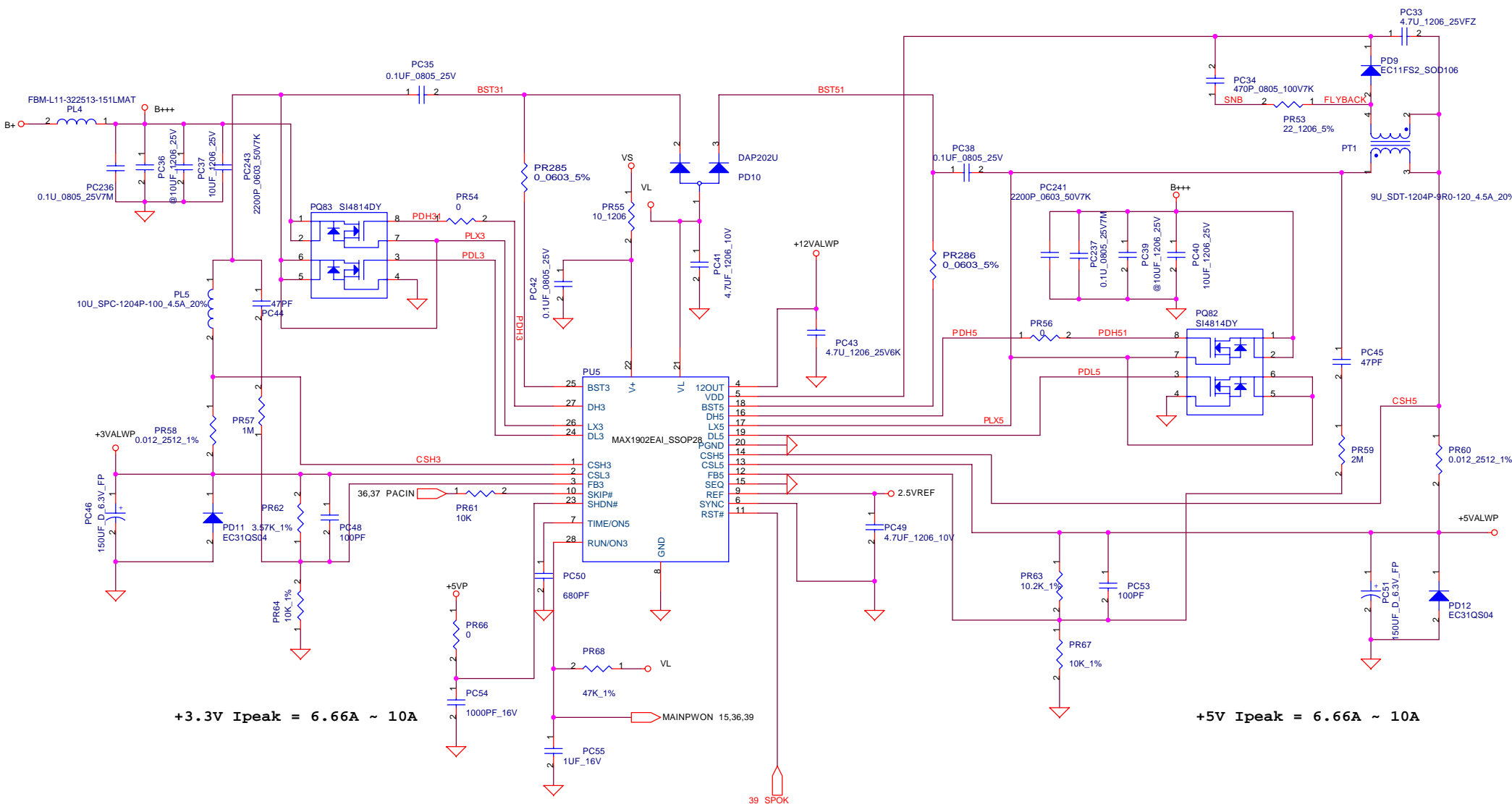
**CC=0.5-3.0A
CV=16.85V(8 CELLS LI-ION)**

**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

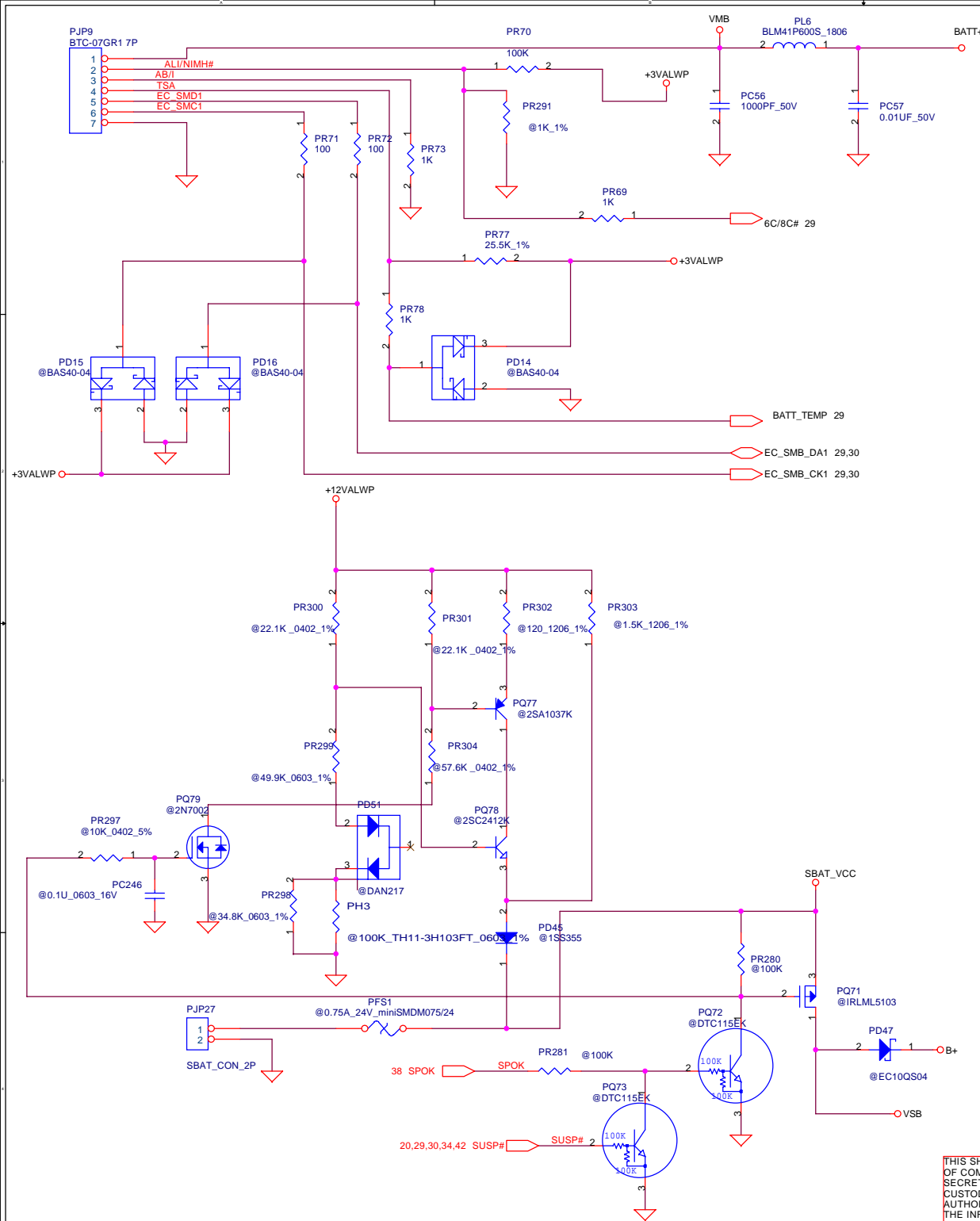


+3.3V I_{peak} = 6.66A ~ 10A

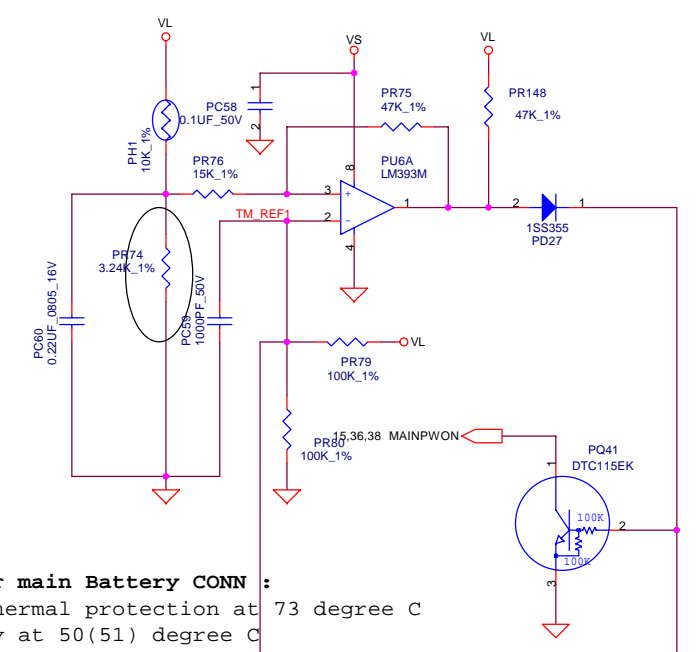
+5V I_{peak} = 6.66A ~ 10A

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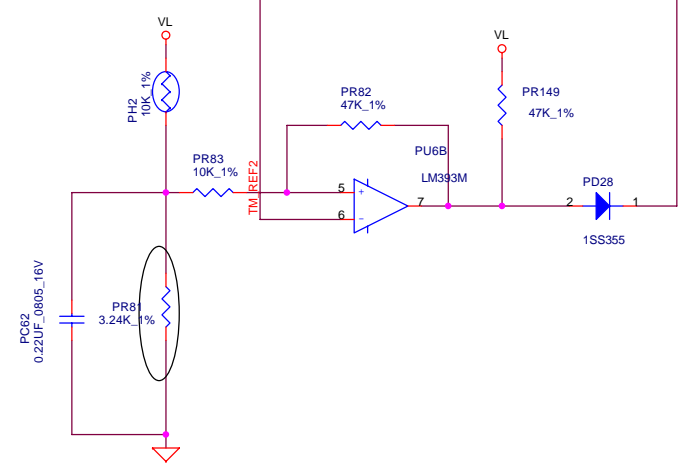
Compal Electronics, Inc.		
Title		
5V/3.3V/12V		
Size	Document Number	Rev
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PH1 under CPU bottom side :
 CPU thermal protection at 82 degree C
 Recovery at 48 degree C



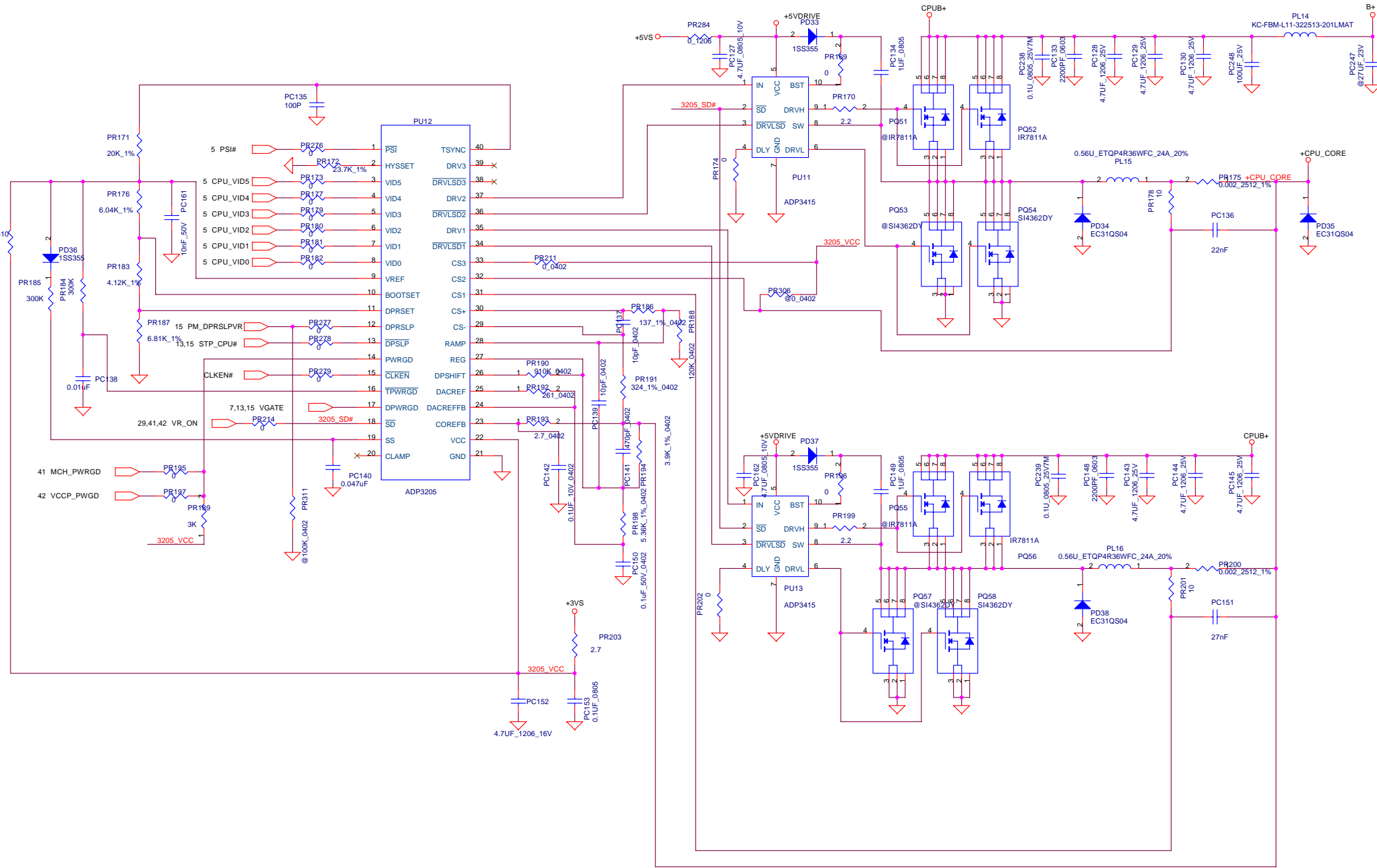
PH2 near main Battery CONN :
 BAT. thermal protection at 73 degree C
 Recovery at 50(51) degree C



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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

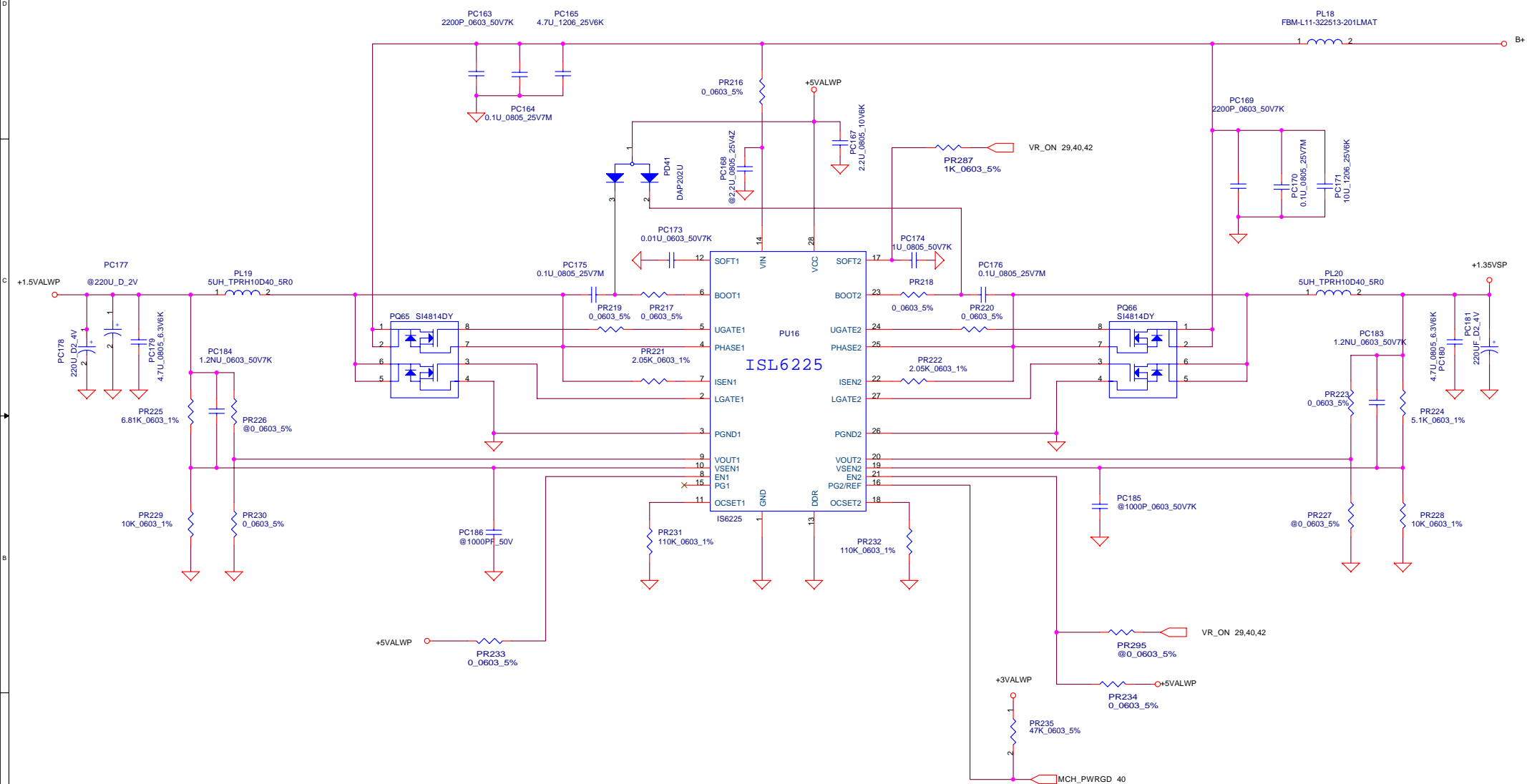
CPU-CORE



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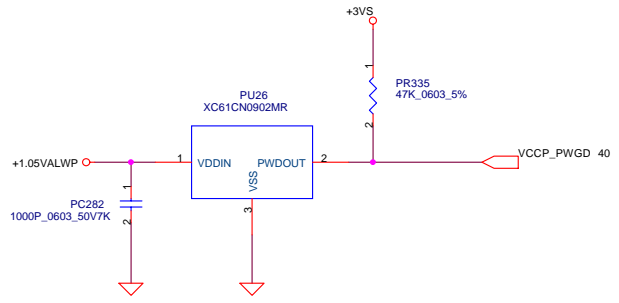
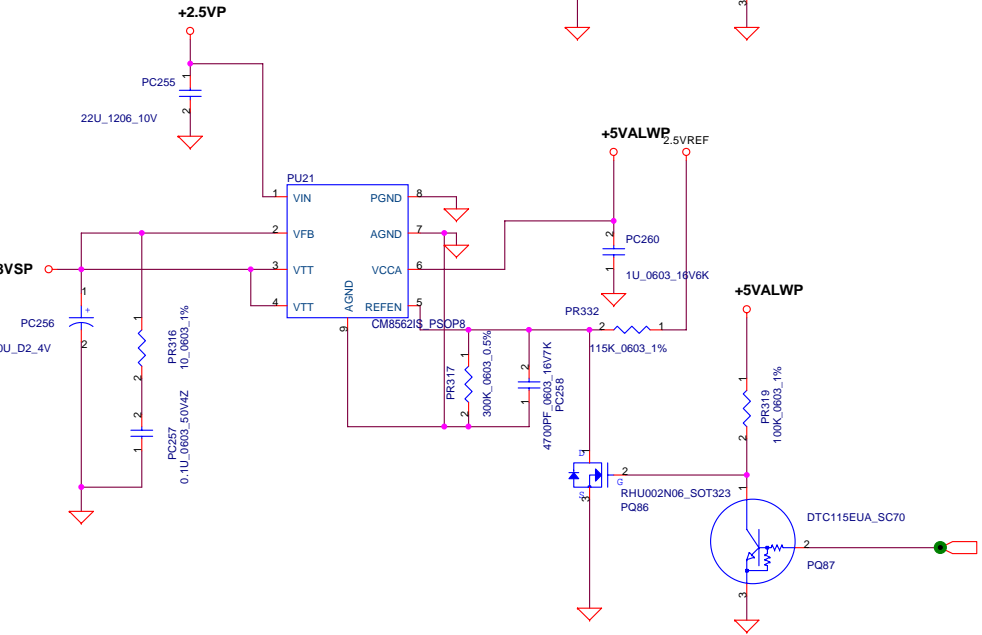
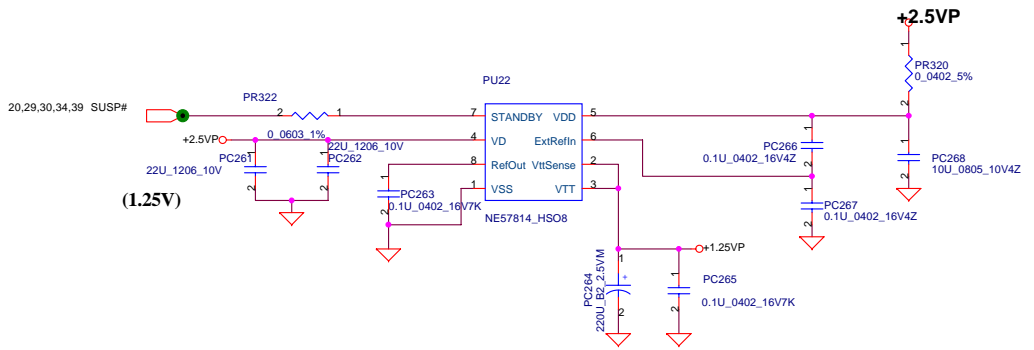
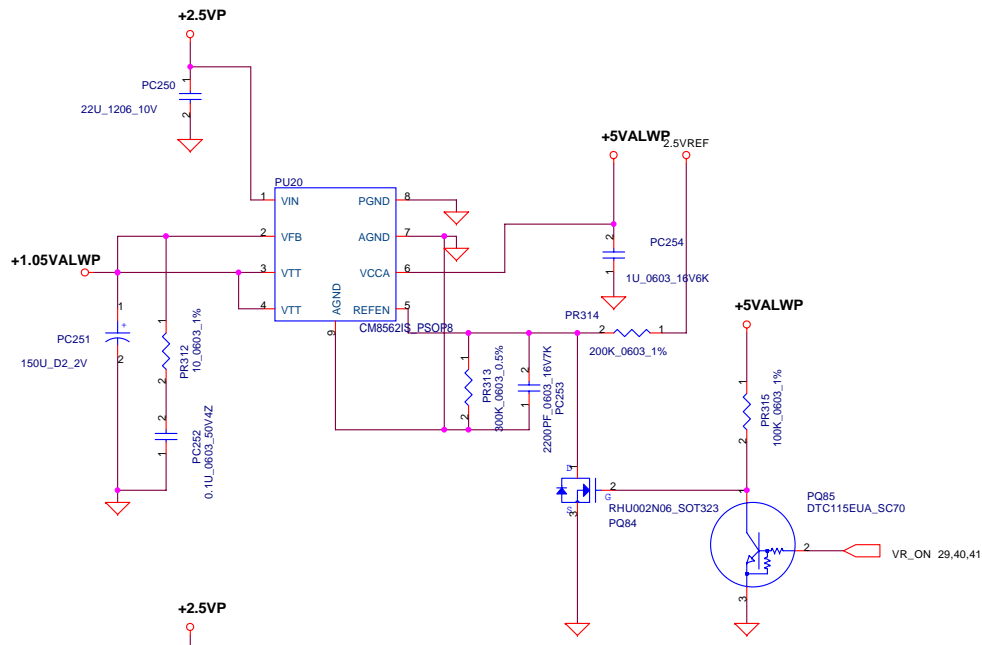
Compal Electronics, Inc.		
+VCC_H CORE		
Size B	Document Number DCL55 LA-2201	Rev 1.0
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+1.5VALWPV/+1.2VSP



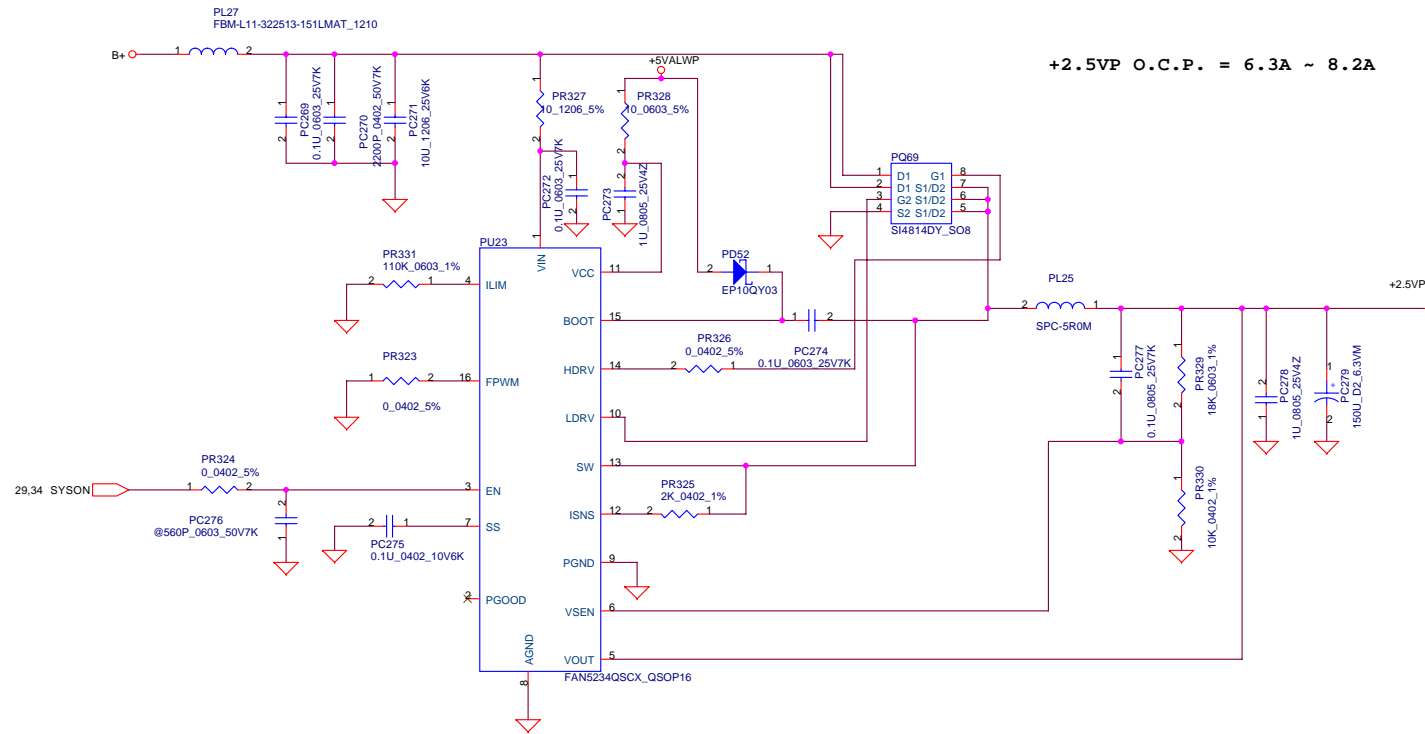
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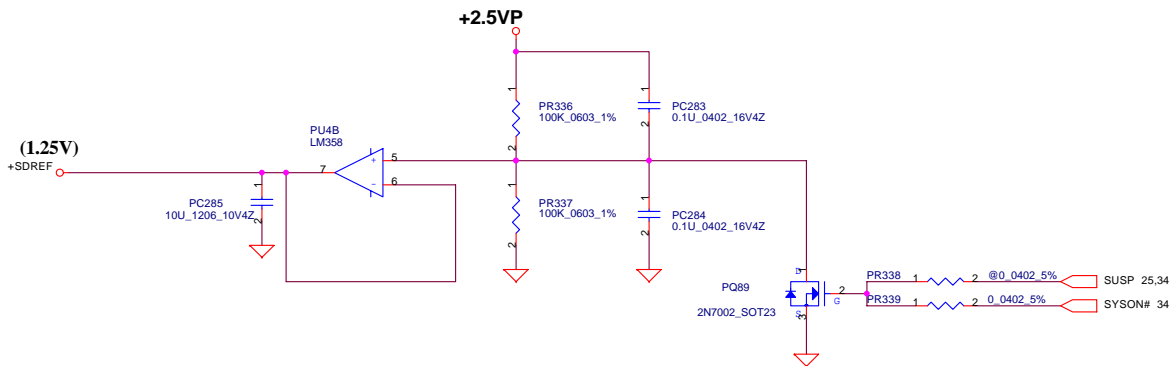


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+2.5VP O.C.P. = 6.3A ~ 8.2A



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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							

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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

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