

Compal Confidential

DCL56 Schematics Document

Banias uFCBGA/uFCPGA Package with Odem Core Logic

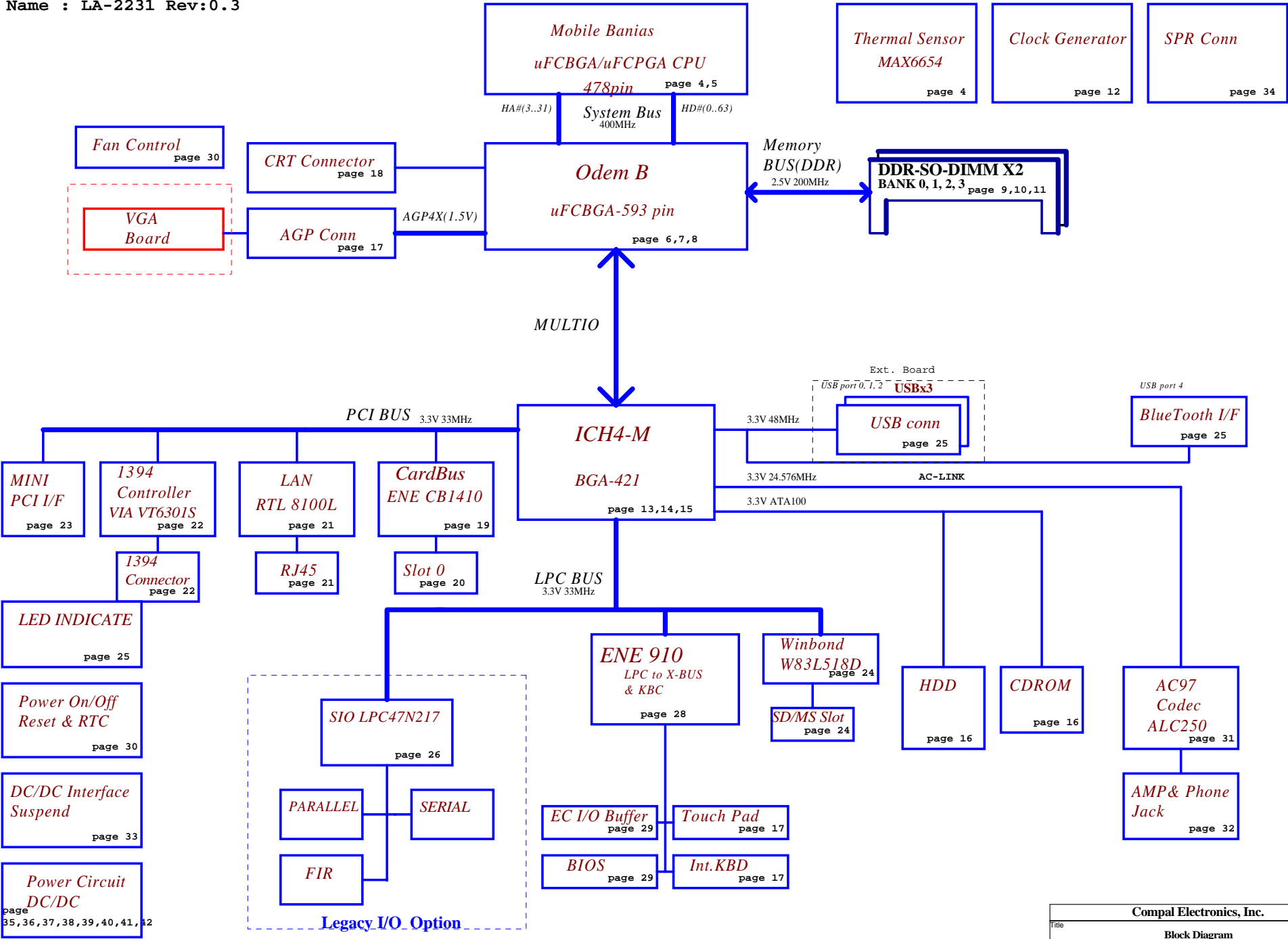
2004-02-03 for C-test

REV: 0.3

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Compal Electronics, Inc.		
Title		
Cover Sheet		
Size	Document Number	Rev
	DCL56 LA2231	0.3
Date:	Thursday, February 05, 2004	Sheet 1 of 45

Model Name :DCL56
File Name : LA-2231 Rev:0.3



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 MCH	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	AGP 4X	ON	OFF	OFF
+1.8VALW	1.8V power rail	ON	ON	ON*
+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

BID2	BID1	BID0	PCB Revision
0	0	0	0.1
0	0	1	0.2
0	1	0	0.3
0	1	1	0.4
1	0	0	
1	0	1	
1	1	0	
1	1	1	

External PCI Devices

Device	IDSEL#	REQ#/GNT#	Interrupts
VGA			PIRQA
CardBus	AD19	2	PIRQC
LAN	AD17	3	PIRQD
Mini-PCI	AD18,AD22	1/4	PIRQC/PIRQD
1394	AD16	0	PIRQB

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Compal Electronics, Ltd.

Title

Notes & PIR

Size B

Document Number

DCL56 LA2231

Rev

0.3

Date:

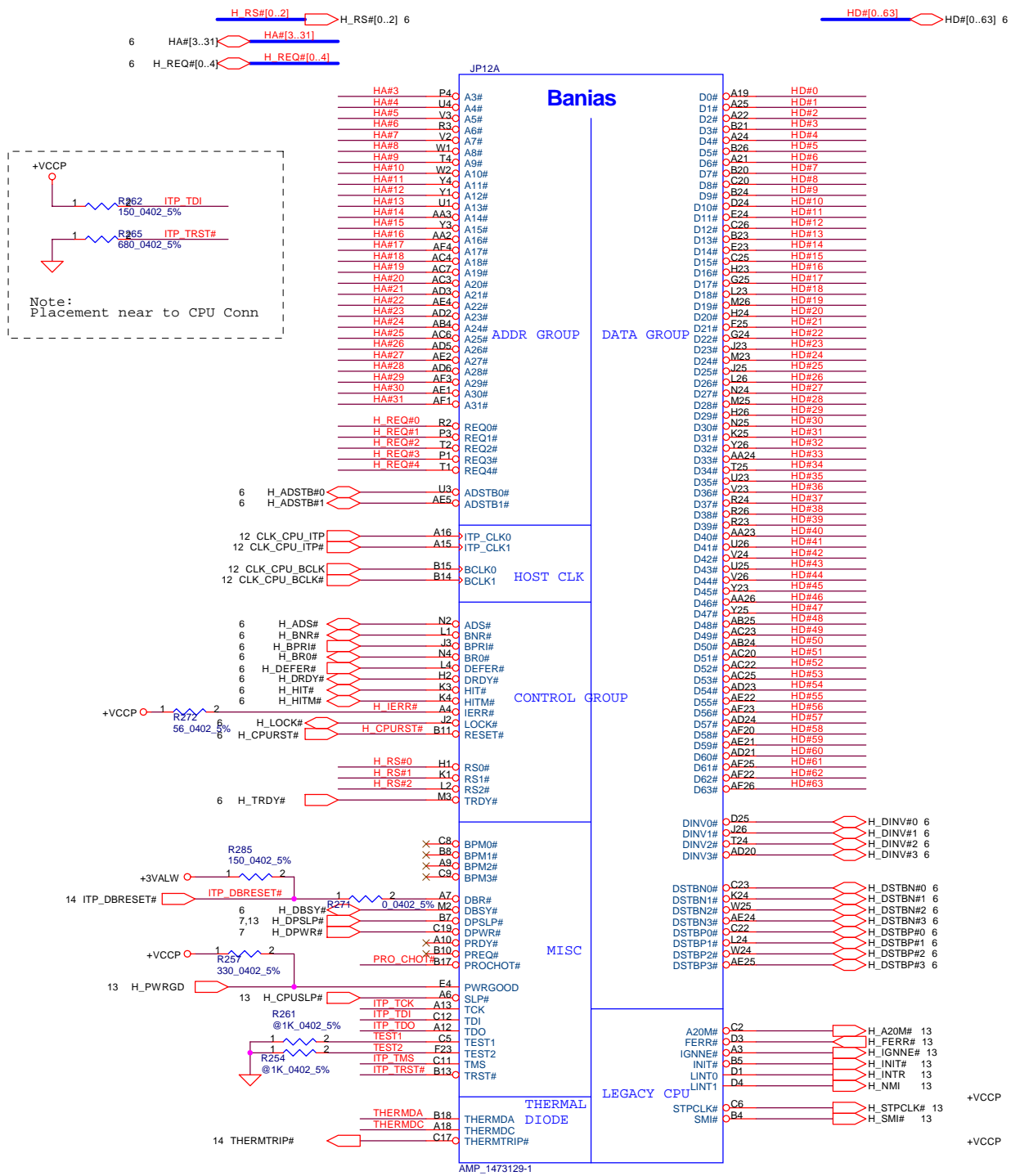
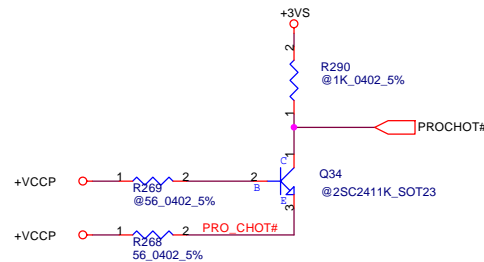
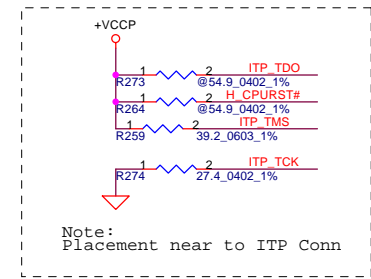
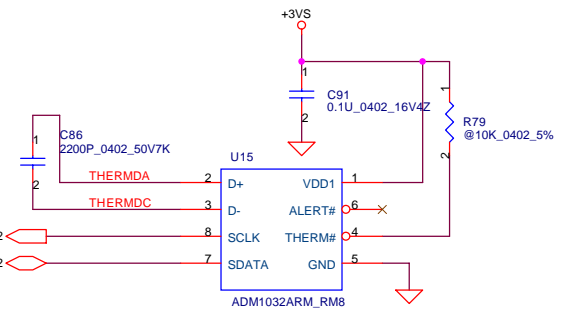
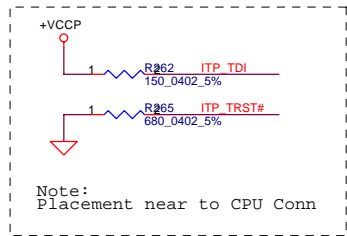
Thursday, February 05, 2004

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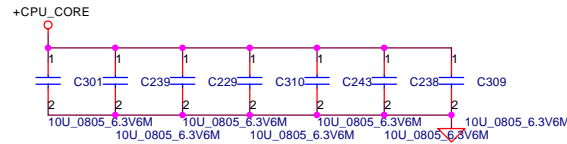
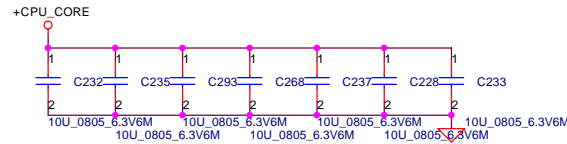
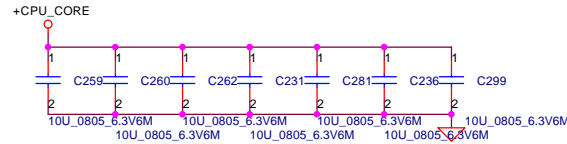
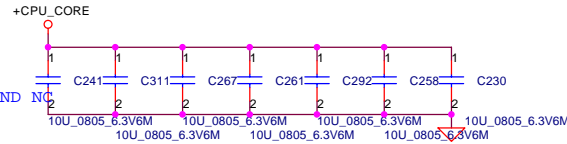
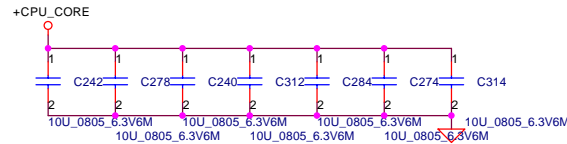
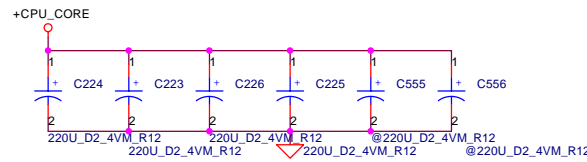
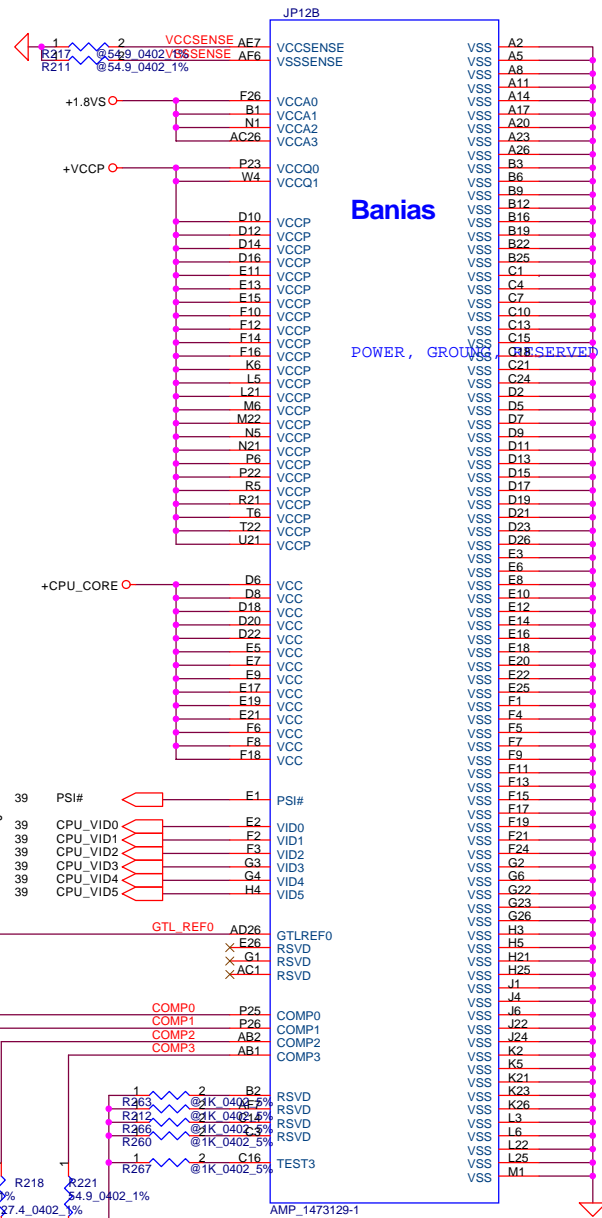
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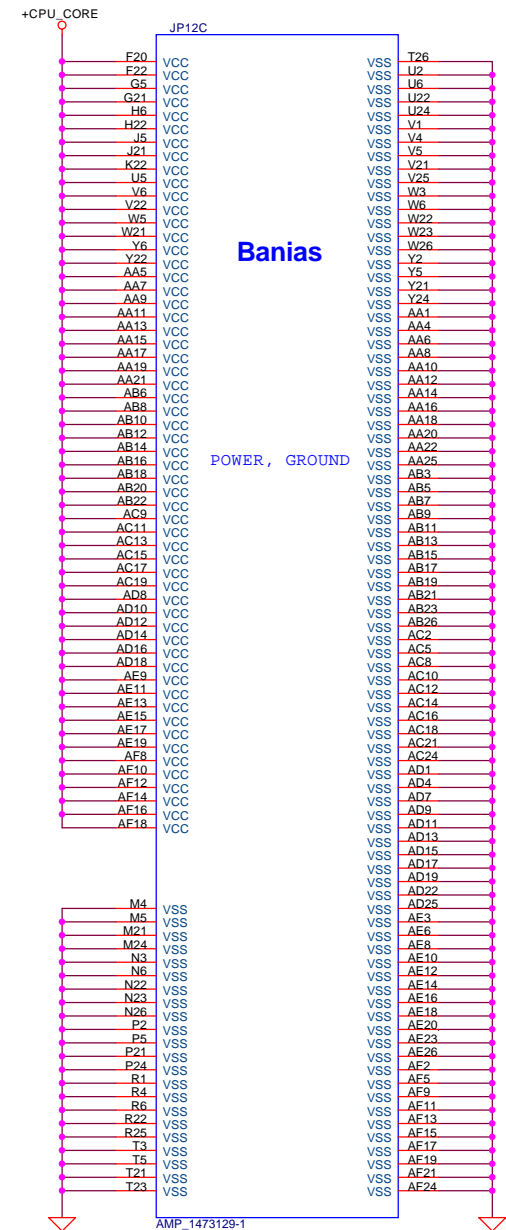
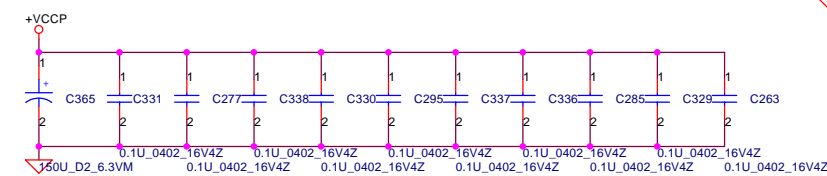
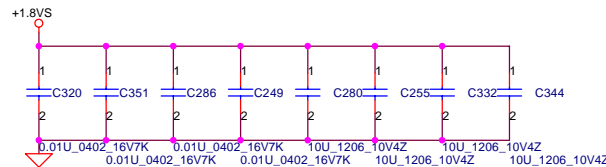
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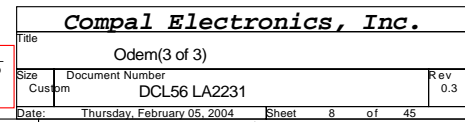
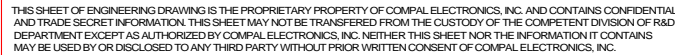


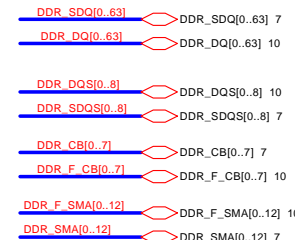
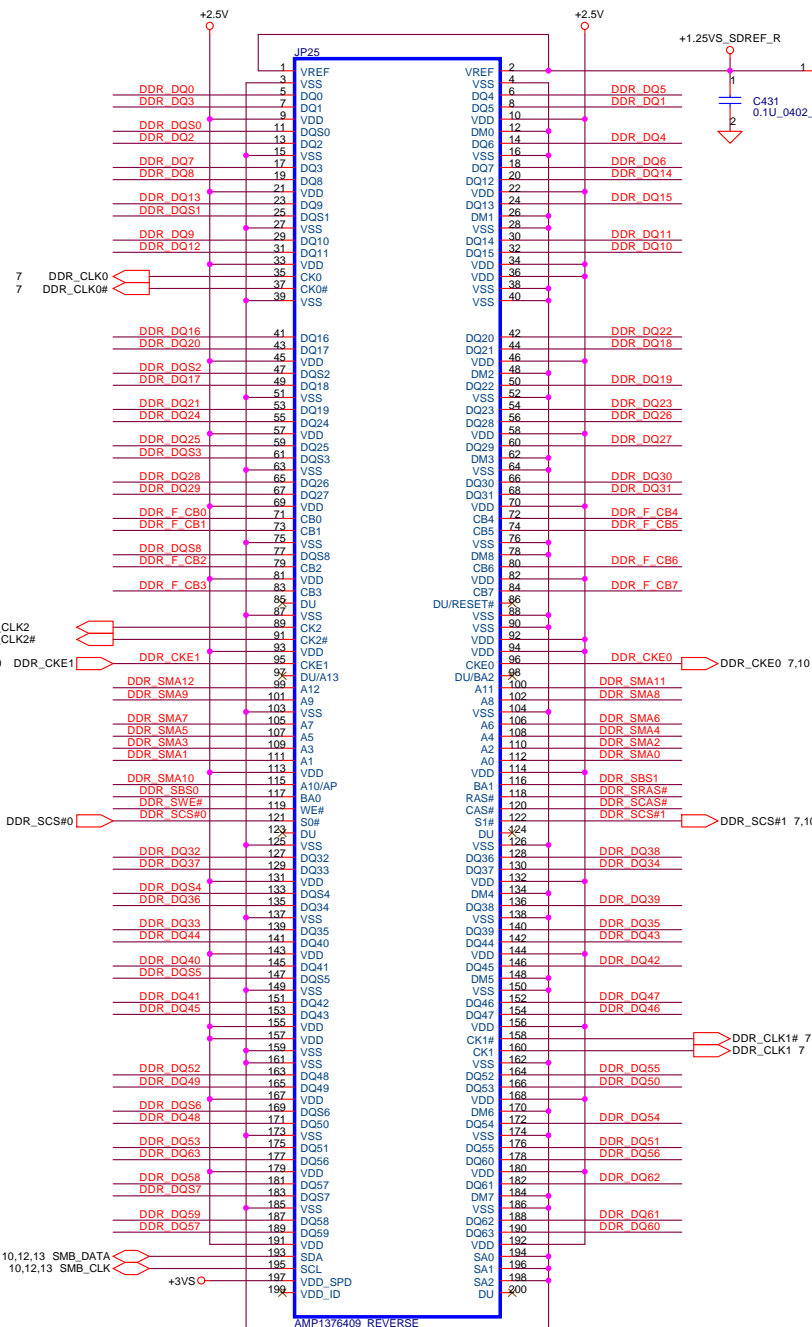
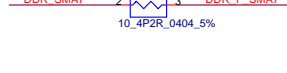
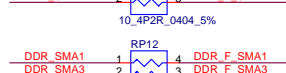
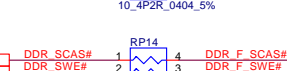
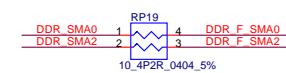
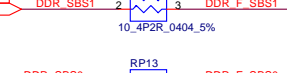
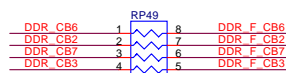
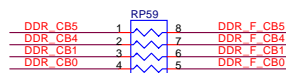
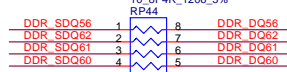
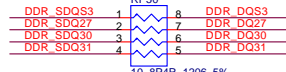
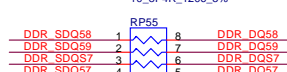
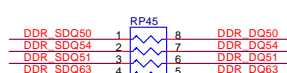
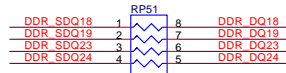
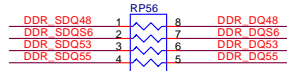
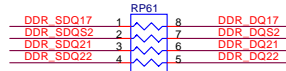
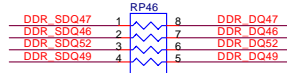
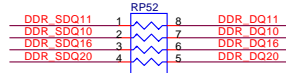
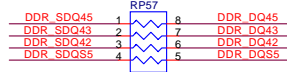
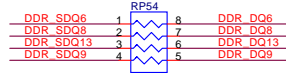
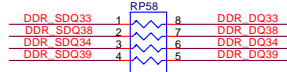
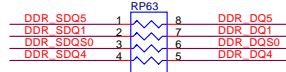
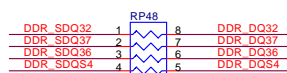
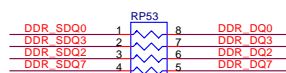
Vcc-core Decoupling	C, uF	ESR, mohm	ESL, nH
SPCAP, Polymer	4X220uF	12m ohm/4	3.5nH/4
MLCC 0805 X5R	35X10uF	5m ohm/35	0.6nH/35



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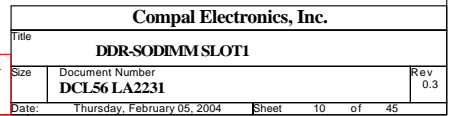
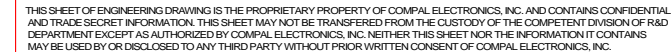
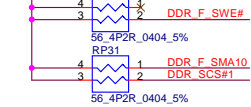
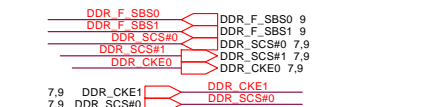
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Title Banias Processor in mFCPGA479		
Size A3	Document Number DCL56 LA2231	Rev 0.3
Date Thursday, February 05, 2004	Sheet 5	of 45



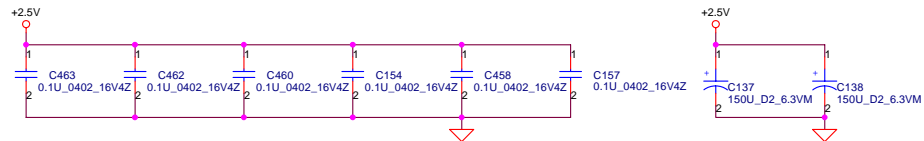
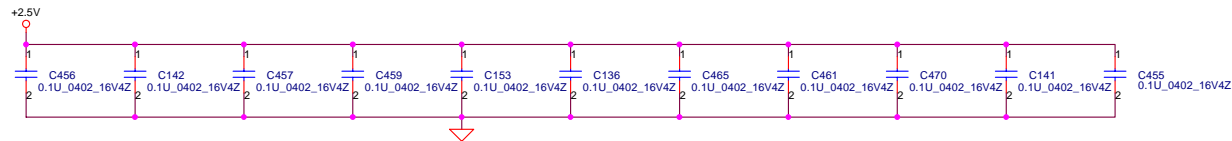


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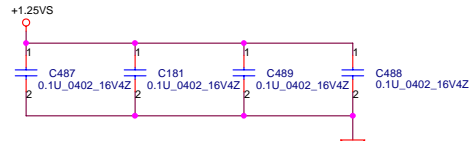
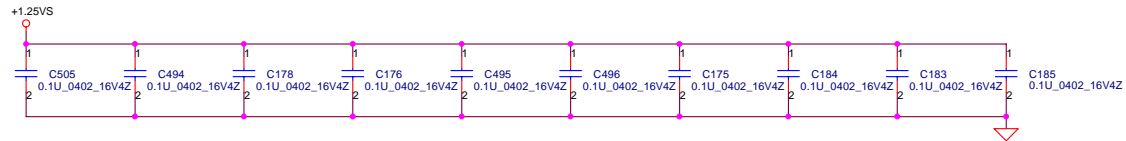
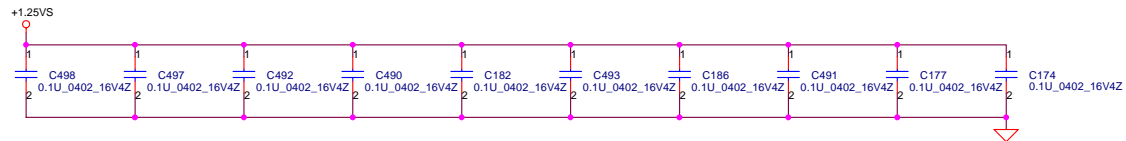
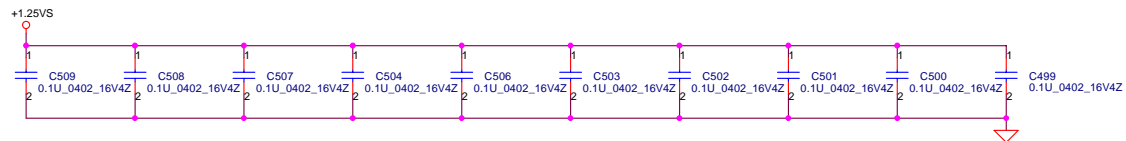
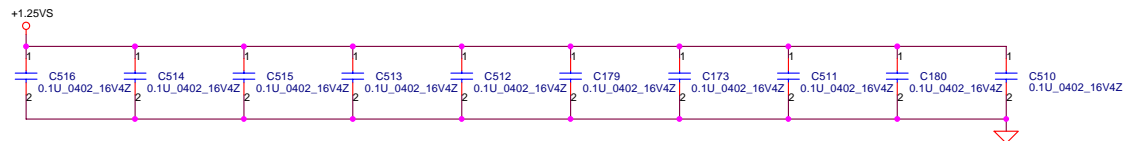
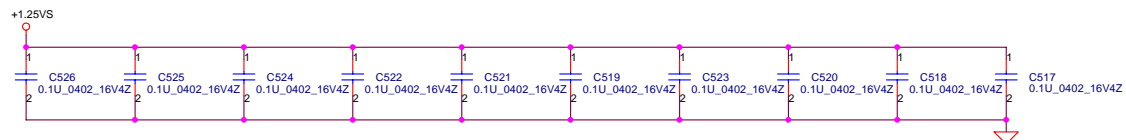
Compal Electronics, Inc.			
Title			
DDR-SODIMM SLOT0			
Size	Document Number	Rev	
	DC156 LA2231	0.3	
Date:	Thursday, February 05, 2004	Sheet	9 of 45



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



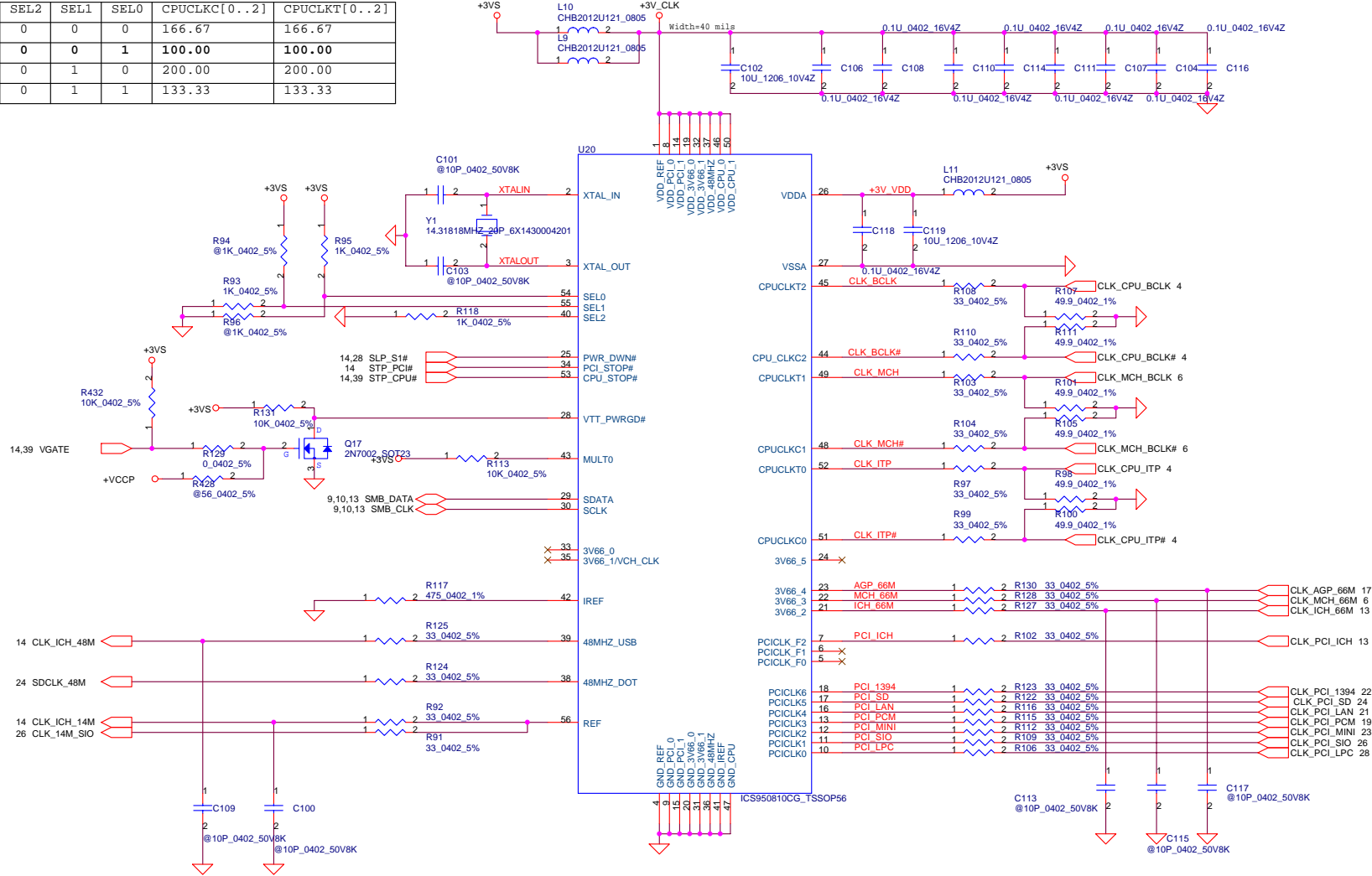
Layout note :
Place one cap close to every 2 pull up resistors termination to
+1.25V



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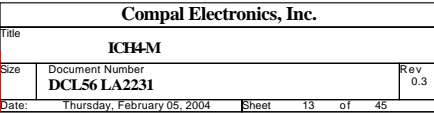
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Title			
DDR SODIMM Decoupling			
Size	Document Number		Rev
	DCL56 LA2231		0.3
Date:	Thursday, February 05, 2004	Sheet	11 of 45

SEL2	SEL1	SEL0	CPUCLK[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

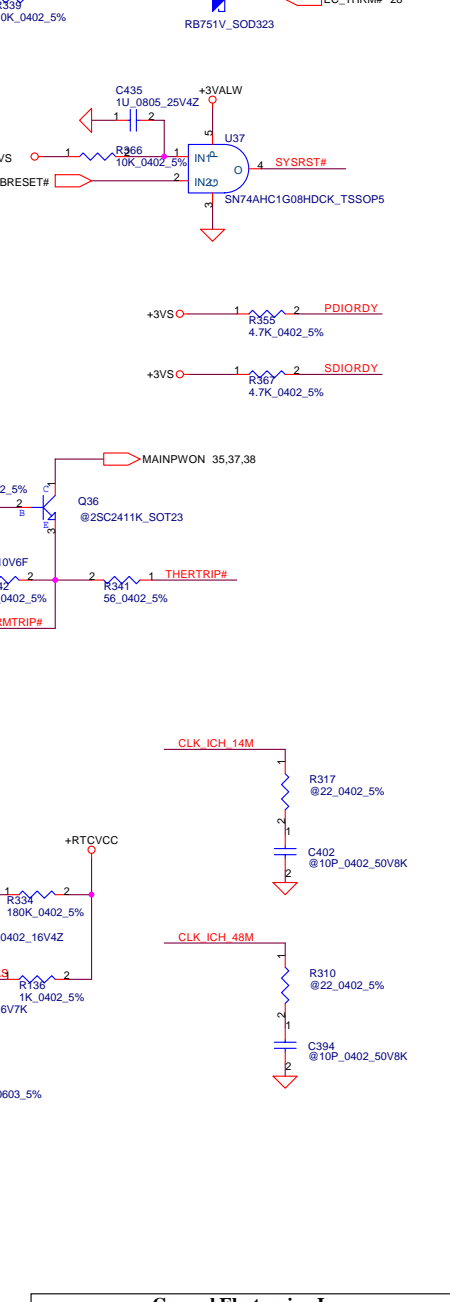
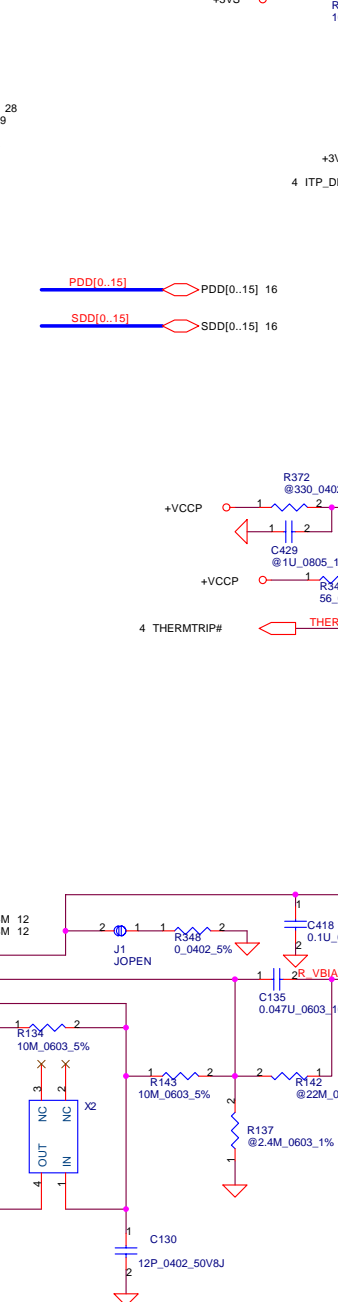
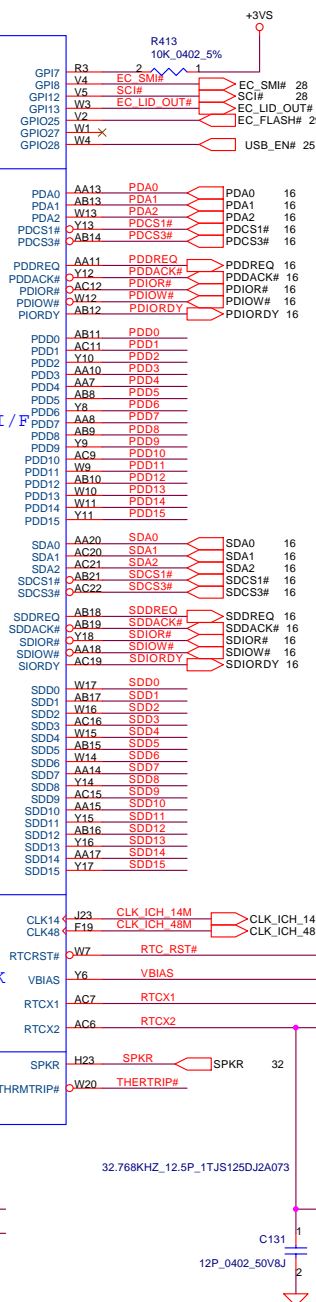
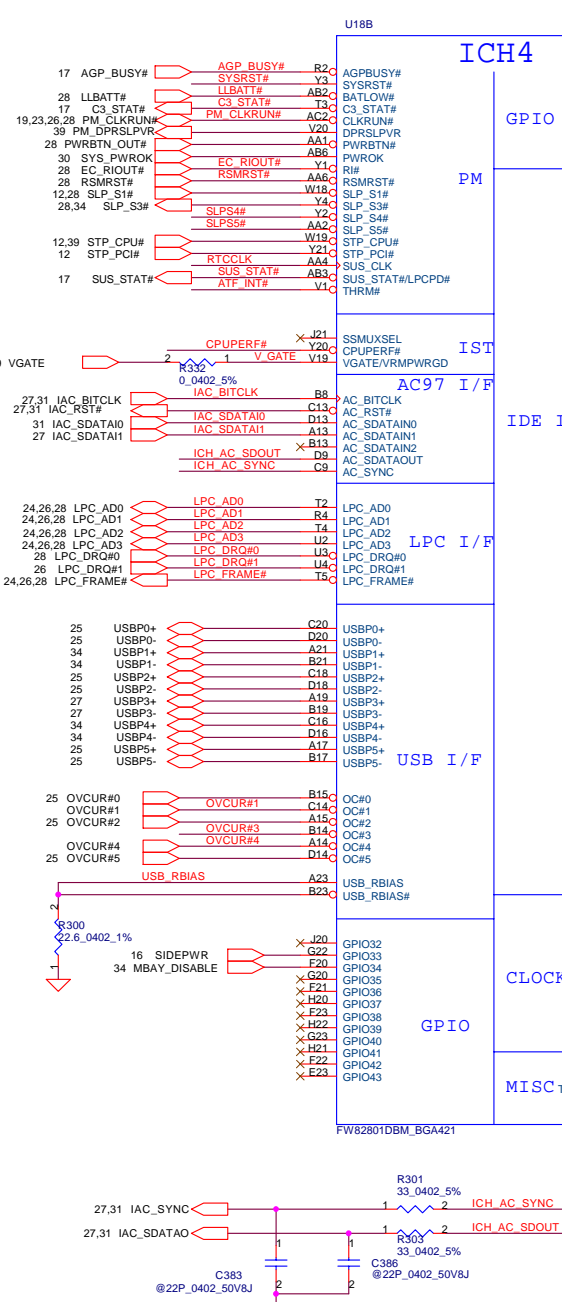
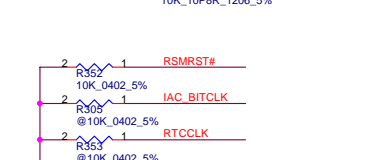
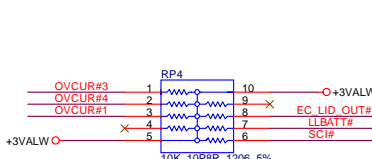
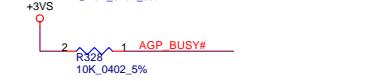
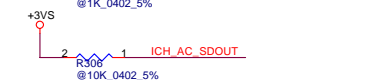
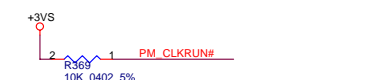
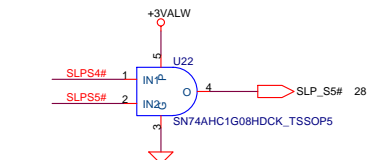


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Compal Electronics, Inc.			
Clock Generator			
Size B	Document Number DCL56 LA2231	Rev 0.3	
Date: Thursday, February 05, 2004	Sheet 12	of 45	

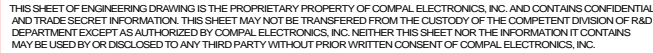


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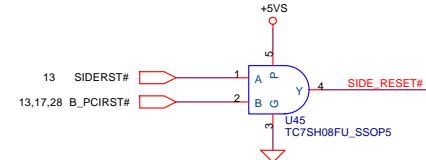
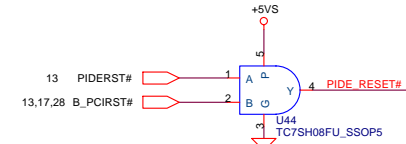
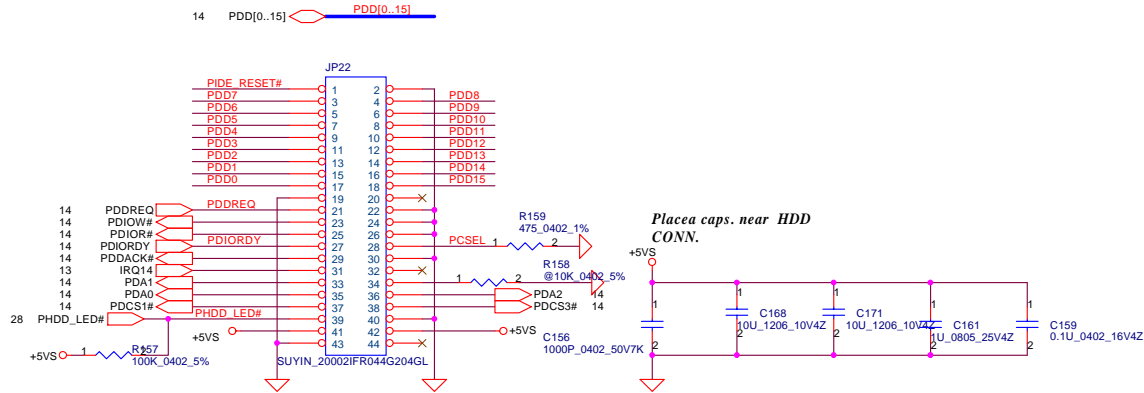


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Compal Electronics, Inc.			
Title			
ICH4-M			
Size	Document Number	Rev	
	DCL56 LA2231	0.3	
Date:	Thursday, February 05, 2004	Sheet	14 of 45

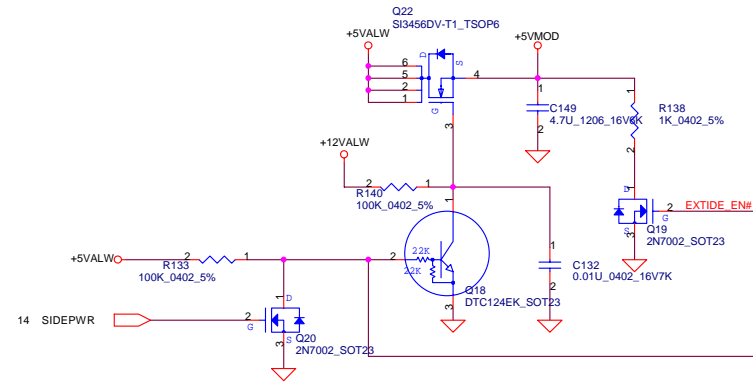
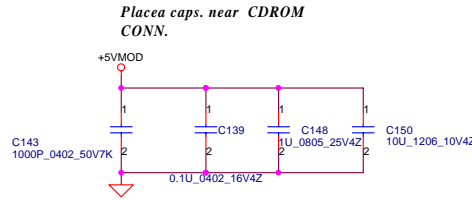
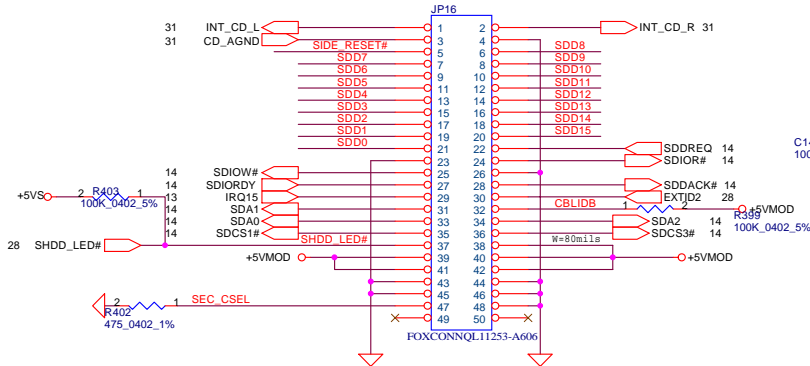


HDD Connector



CD-ROM Connector

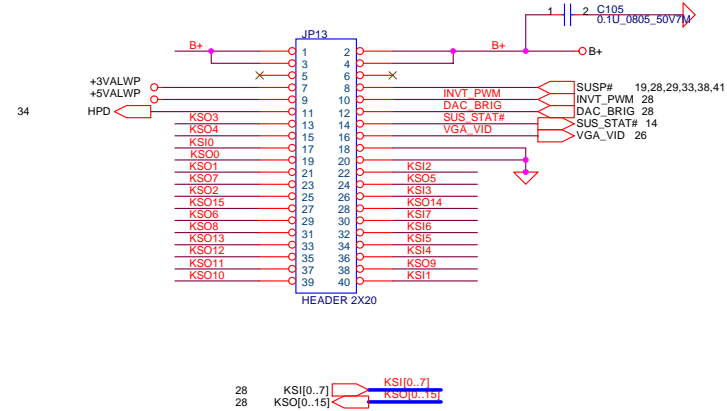
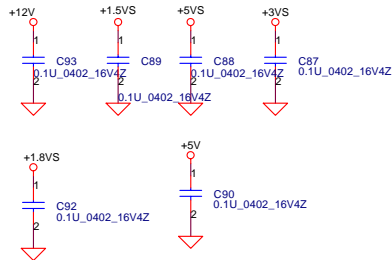
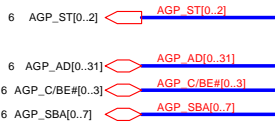
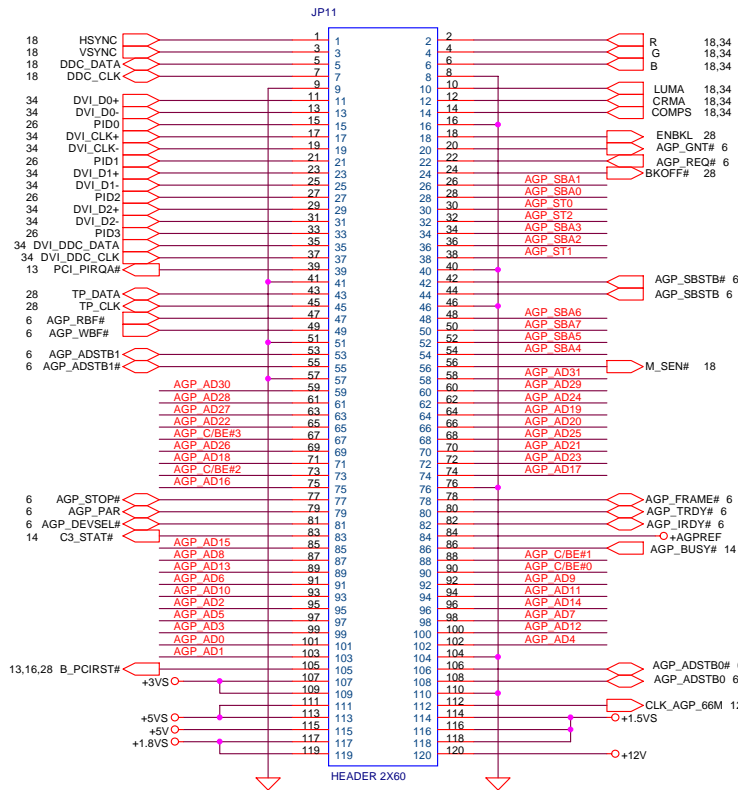
SDD[0..15] SDD[0..15] 14



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

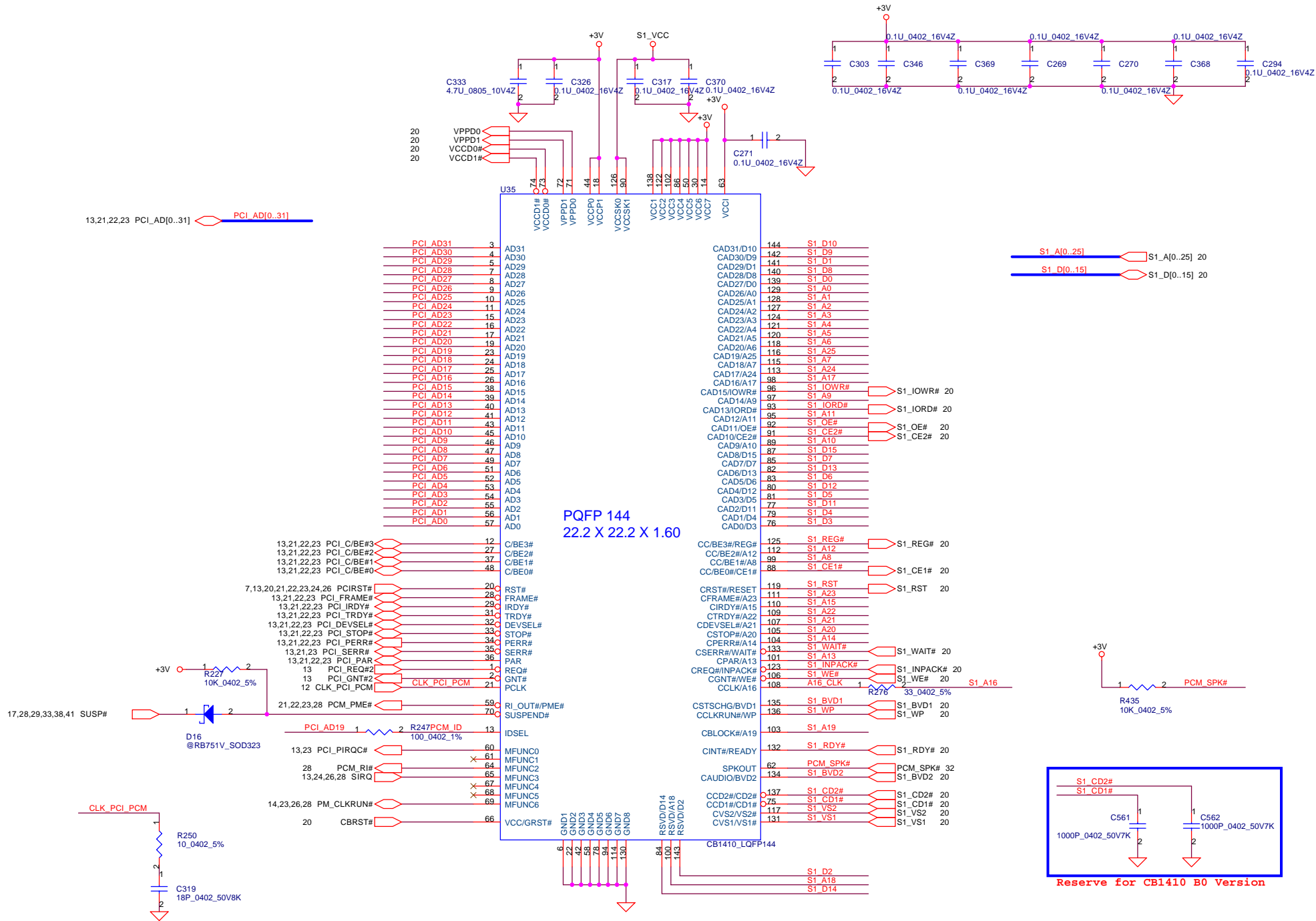
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Compal Electronics, Inc.			
Title			
IDE/CD-ROM Module			
Size	Document Number	Rev	
	DCL56 LA2231	0.3	
Date:	Thursday, February 05, 2004	Sheet	16 of 45



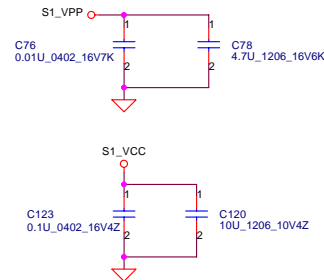
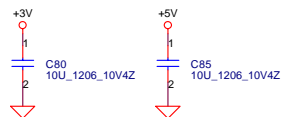
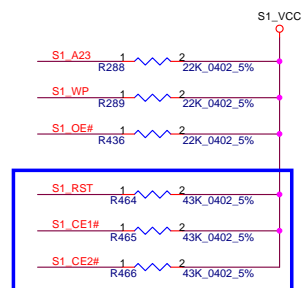
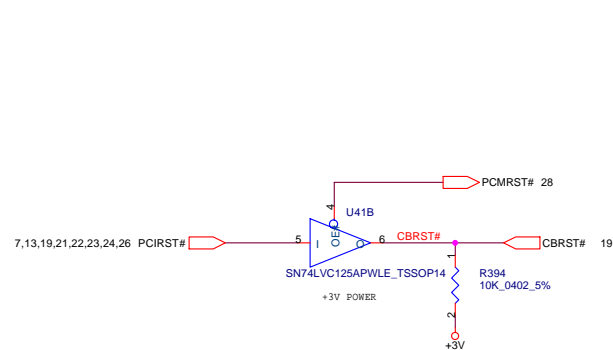
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Compal Electronics, Inc.			
AGPCConn.			
Size	Document Number	Rev	
	DCL56 LA2231	0.3	
Date:	Thursday, February 05, 2004	Sheet	17 of 45



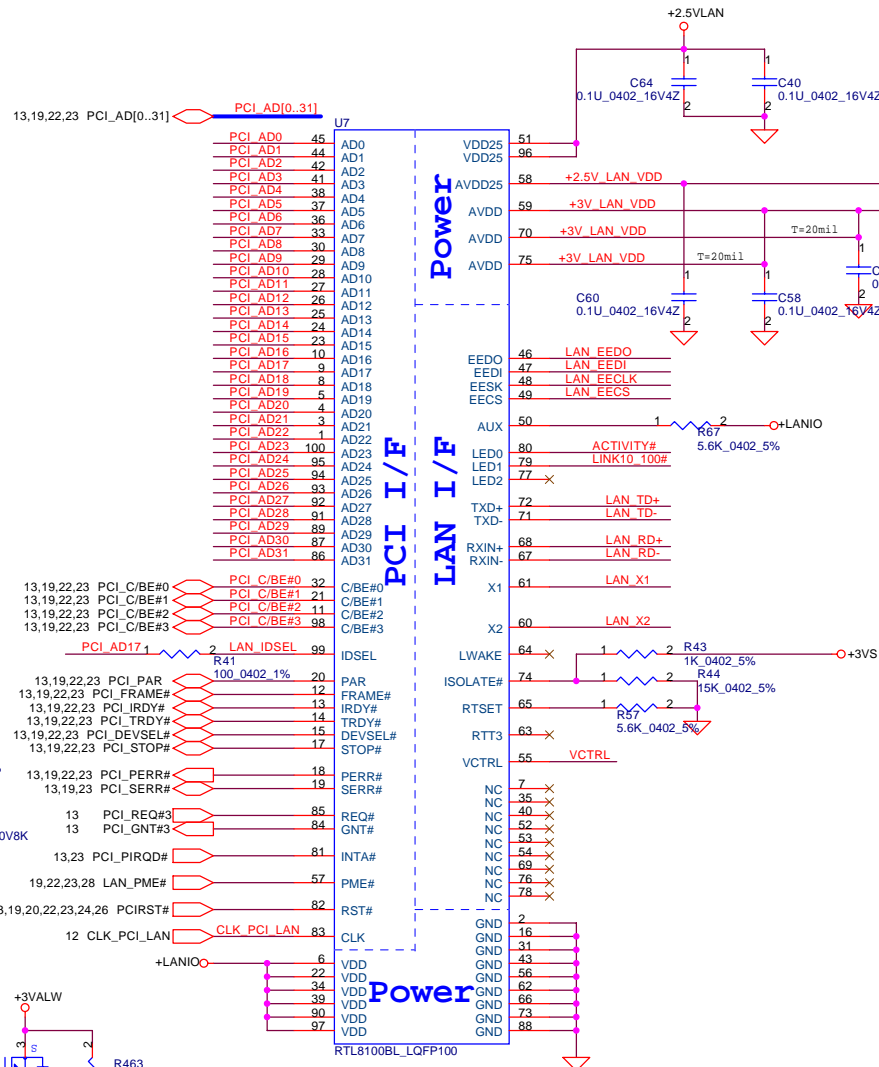
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The schematic diagram shows the TPS2211IDBR_SOP16 regulator circuit. The circuit includes a TPS2211IDBR_SOP16 IC, a U14 12V regulator, and various capacitors (C71, C70, C84, C69, C82). The input is +12V, and the output is 12V. The circuit is powered by +12V, +5V, and +3V. The output is 12V. The circuit is powered by +12V, +5V, and +3V. The output is 12V.

[illegible]

Compal Electronics, Inc.			
Title			
CardBus Socket			
Size	Document Number		Rev
	DCL56 LA2231		0.3
Date:	Thursday, February 05, 2004	Sheet	20 of 45

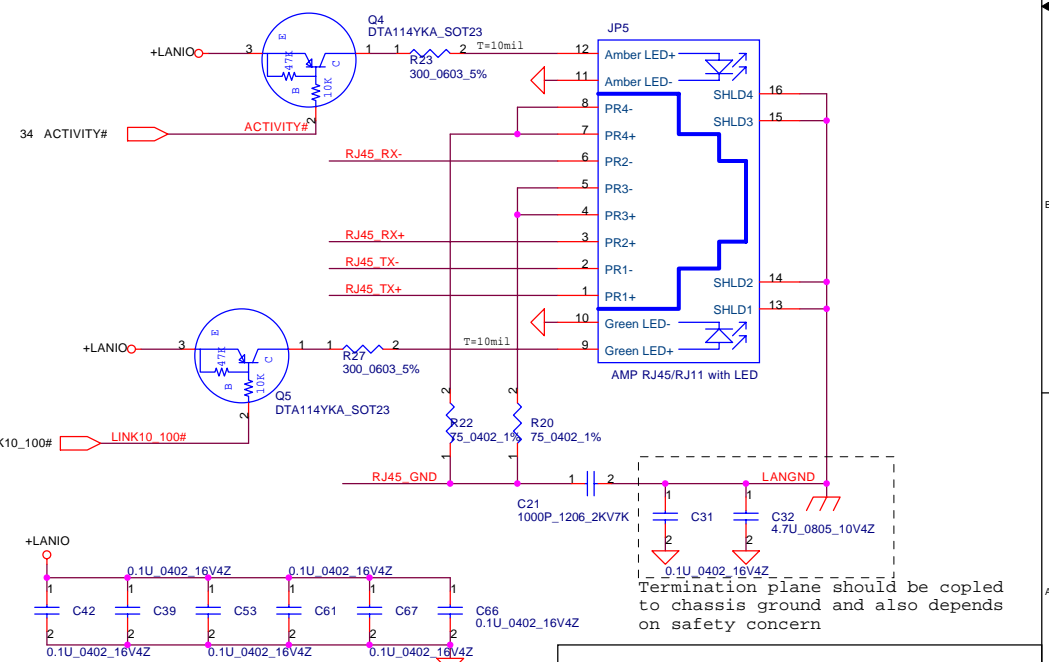
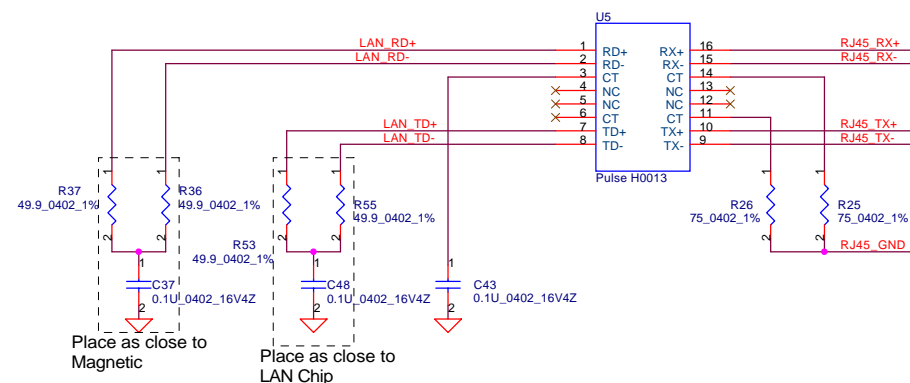
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For Wake on Lan from S4

Note : I_{max} for VDD25 = 40mA
2.5V should be ready before
+3V is ready

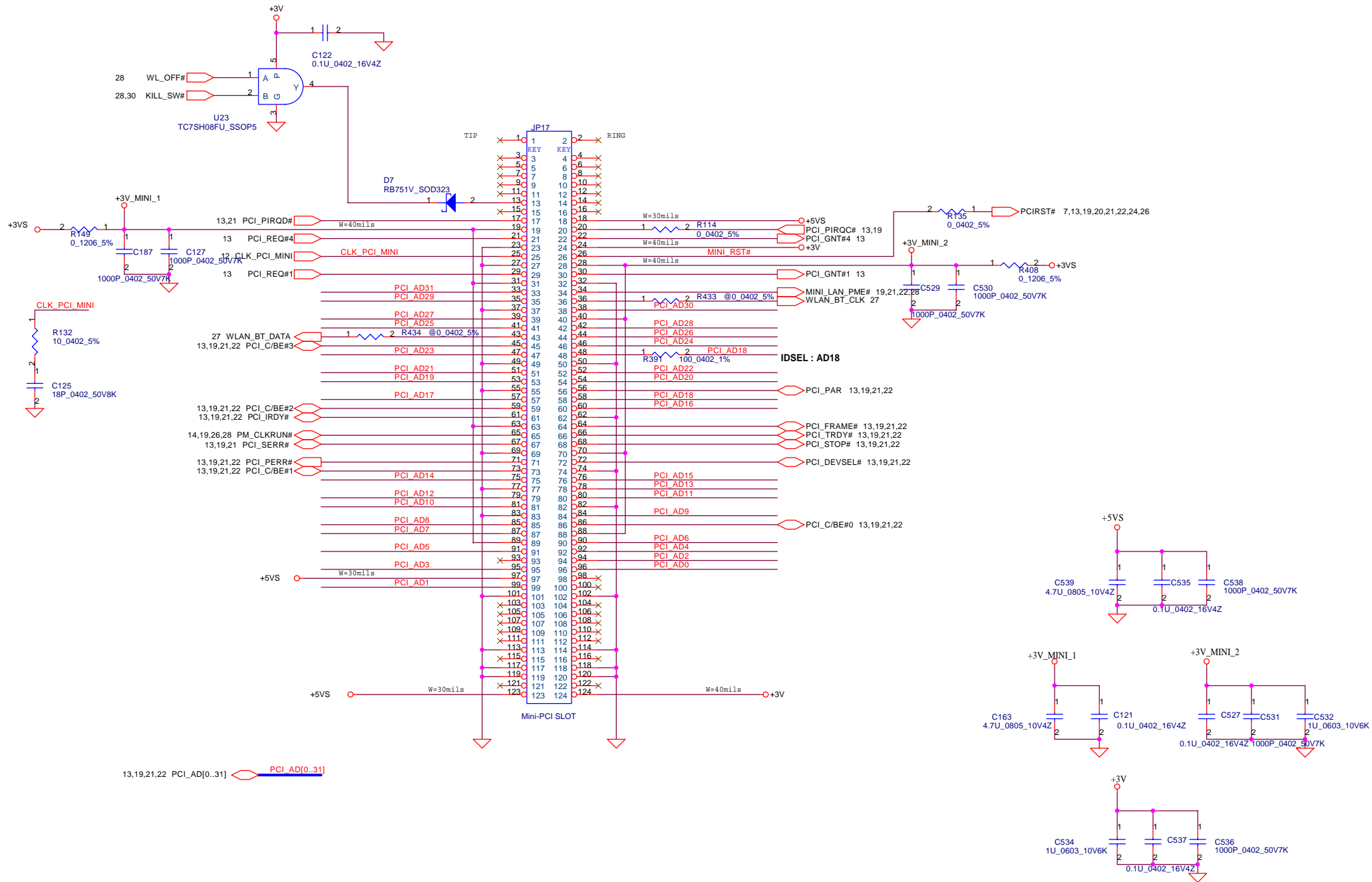
2.5VLAN power generated by VCTRL.



Compal Electronics, Inc.

Title		
LAN RTL8100BL		
Size	Document Number	Rev
B	DCL56 LA2231	0.3
Date:	Thursday, February 05, 2004	Sheet 21 of 45

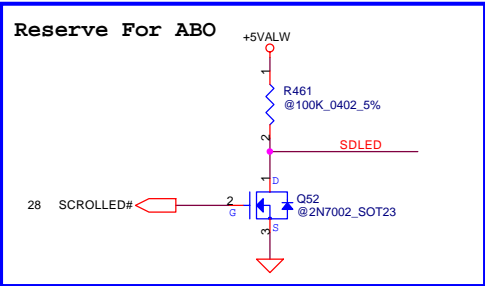
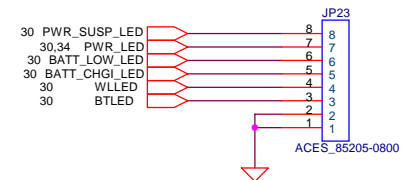
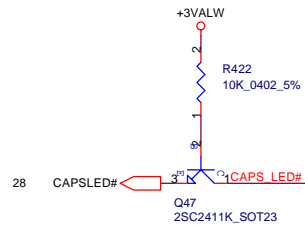
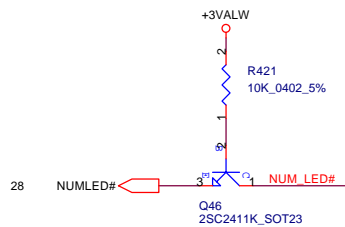
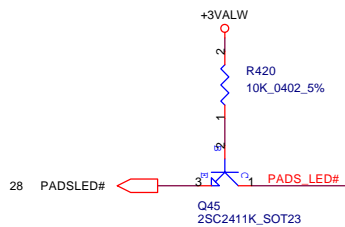
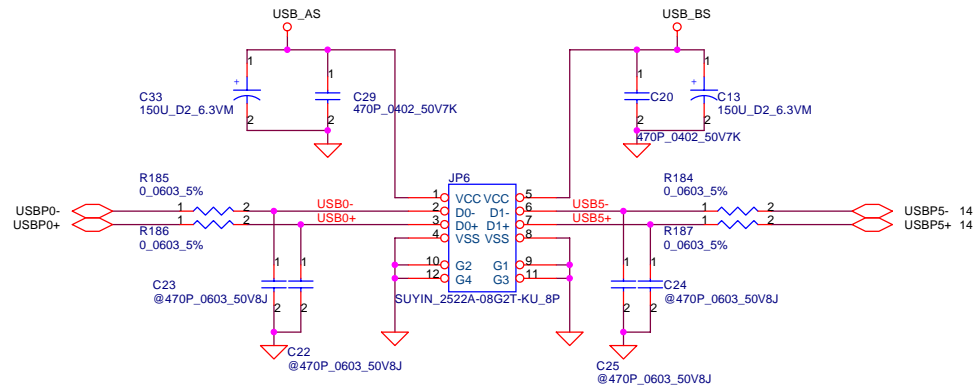
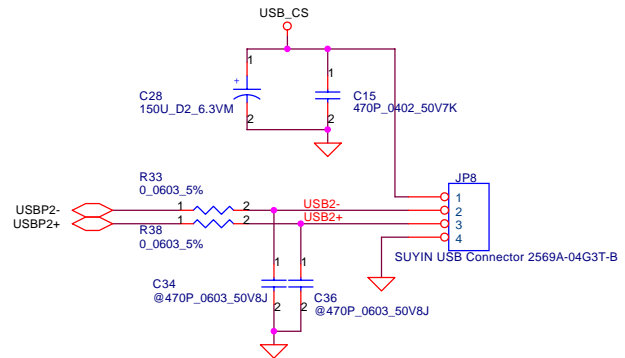
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Size	Custom	Document Number	DCL56 LA2231
Date:	Thursday, February 05, 2004	Sheet	23 of 45
Rev		0.3	

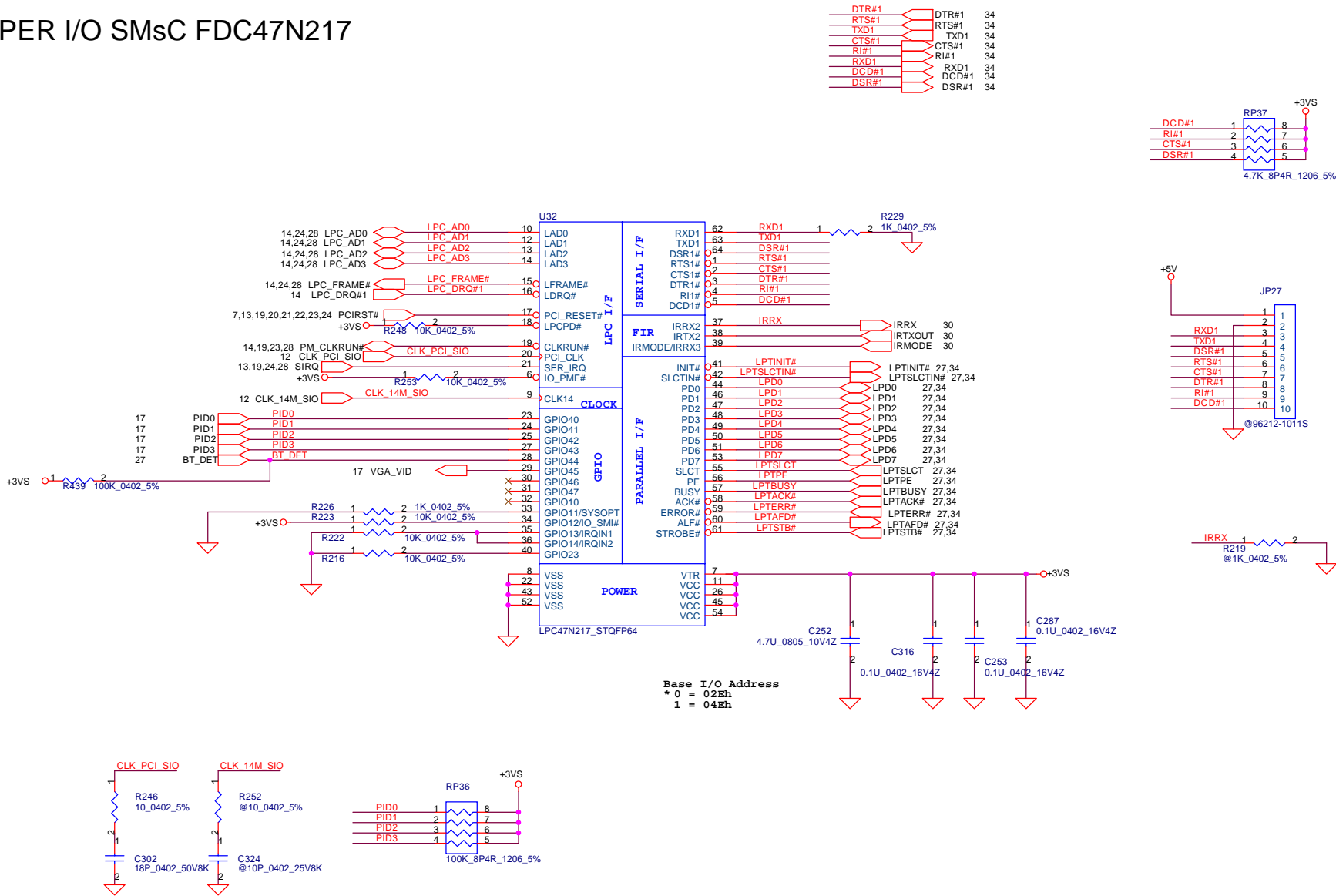
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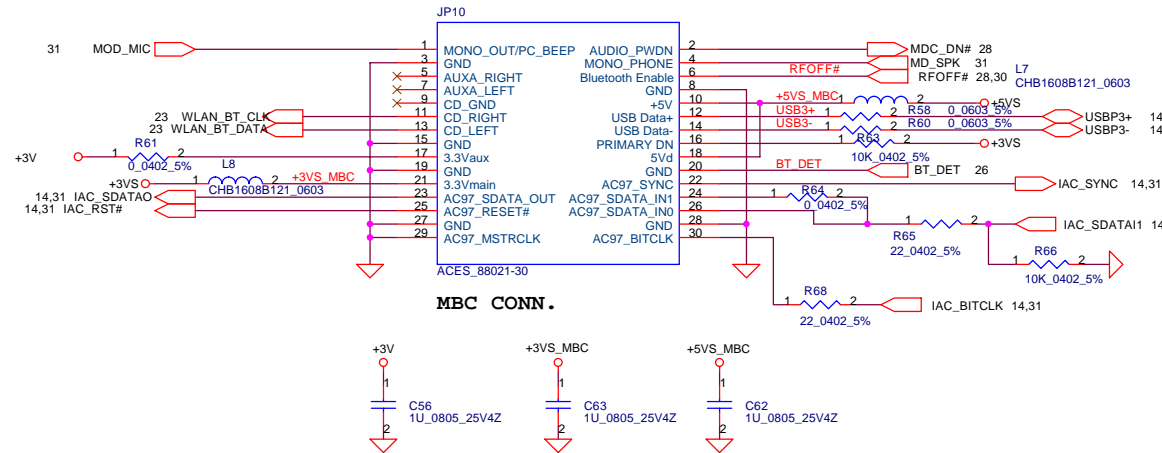


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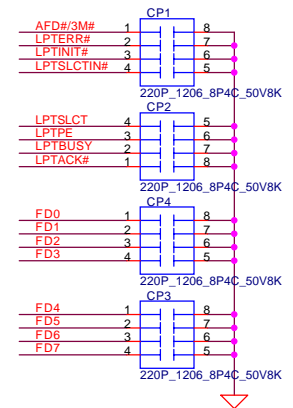
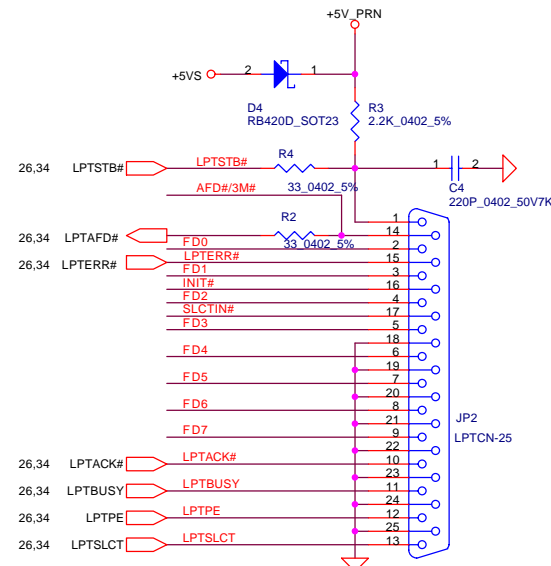
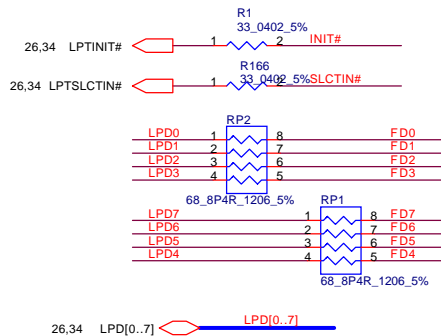
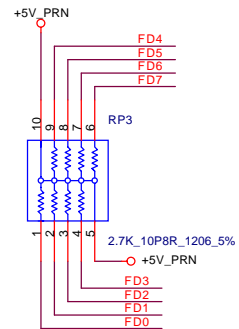
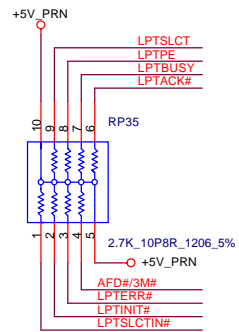
Compal Electronics, Inc.			
Title	USB		
Size	Document Number	Rev	
Custom	DCL56 LA2231	0.3	
Date:	Thursday, February 05, 2004	Sheet	25 of 45

SUPER I/O SMsC FDC47N217





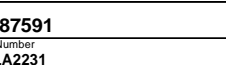
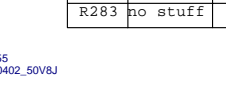
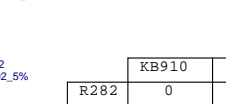
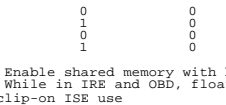
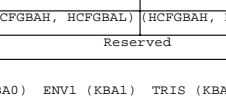
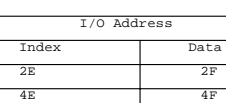
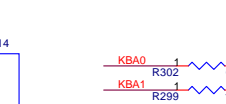
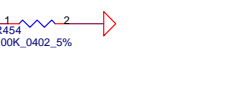
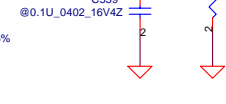
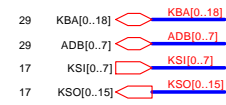
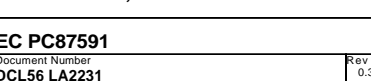
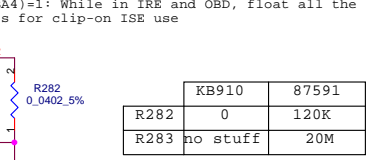
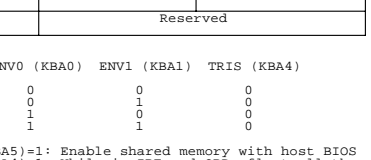
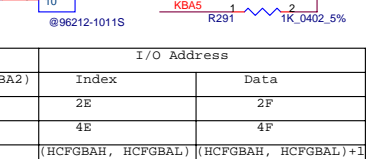
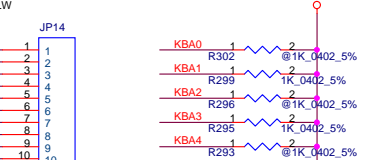
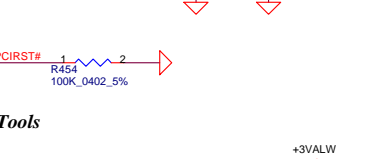
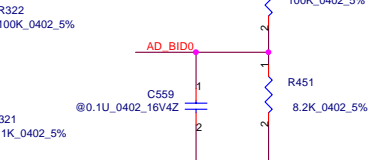
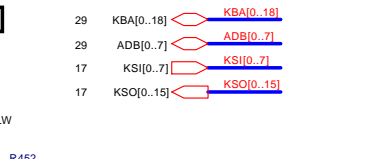
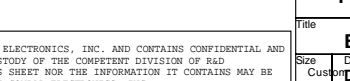
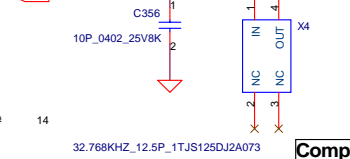
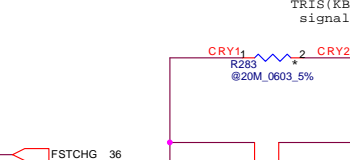
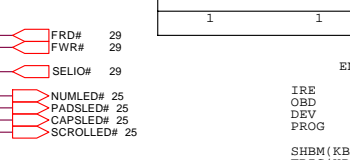
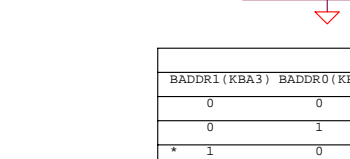
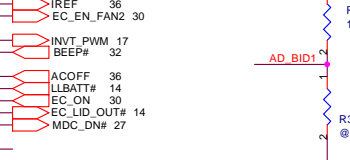
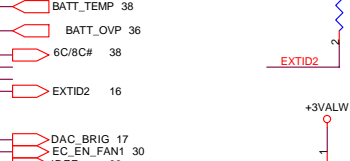
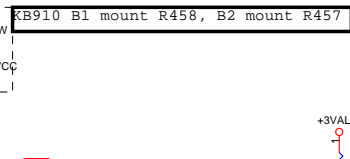
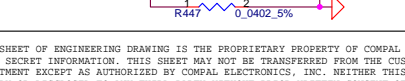
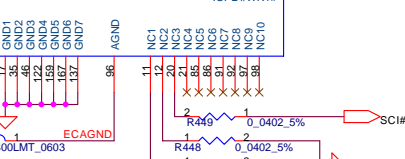
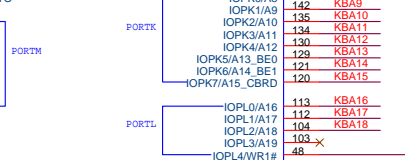
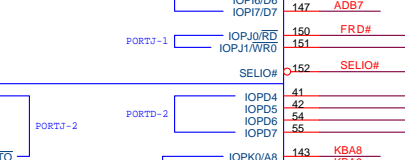
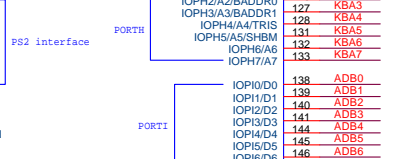
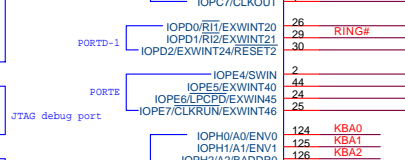
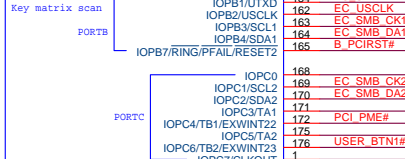
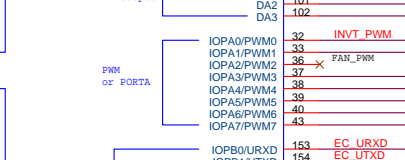
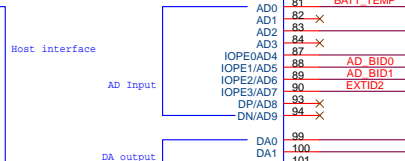
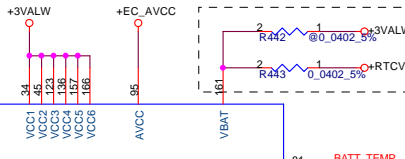
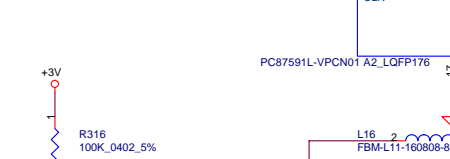
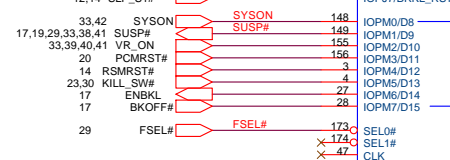
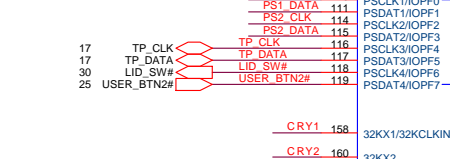
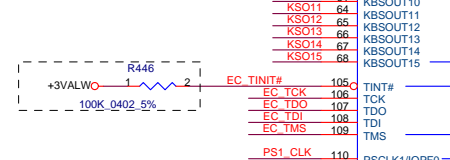
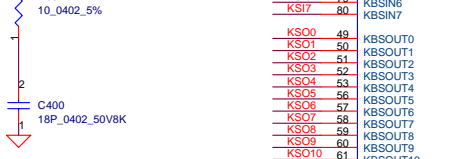
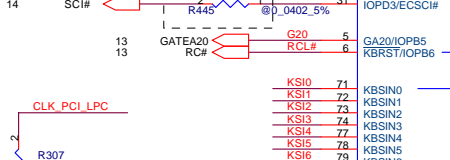
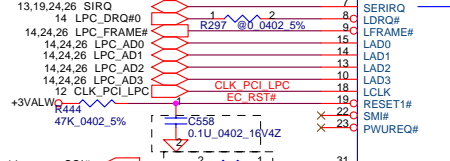
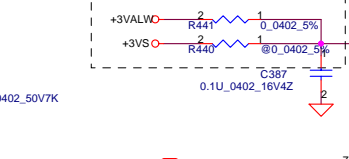
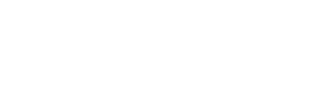
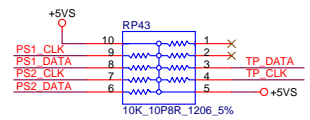
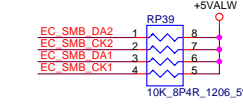
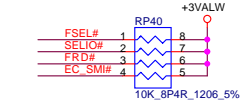
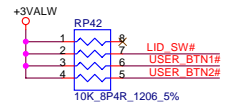
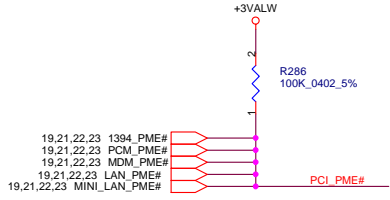
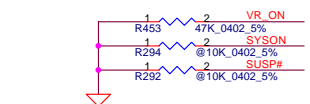
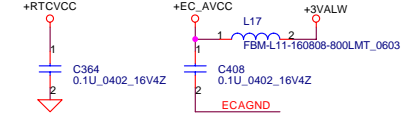
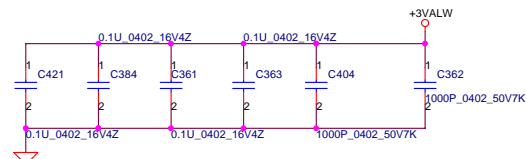
PARALLEL PORT



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Title			
PARALLEL/MDC PORT			
Size	Document Number	Rev	
	DCL56 LA2231	0.3	
Date:	Thursday, February 05, 2004	Sheet	27 of 45

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For EC Tools

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	0	0
DEV	1	0	0
PROG	1	1	0

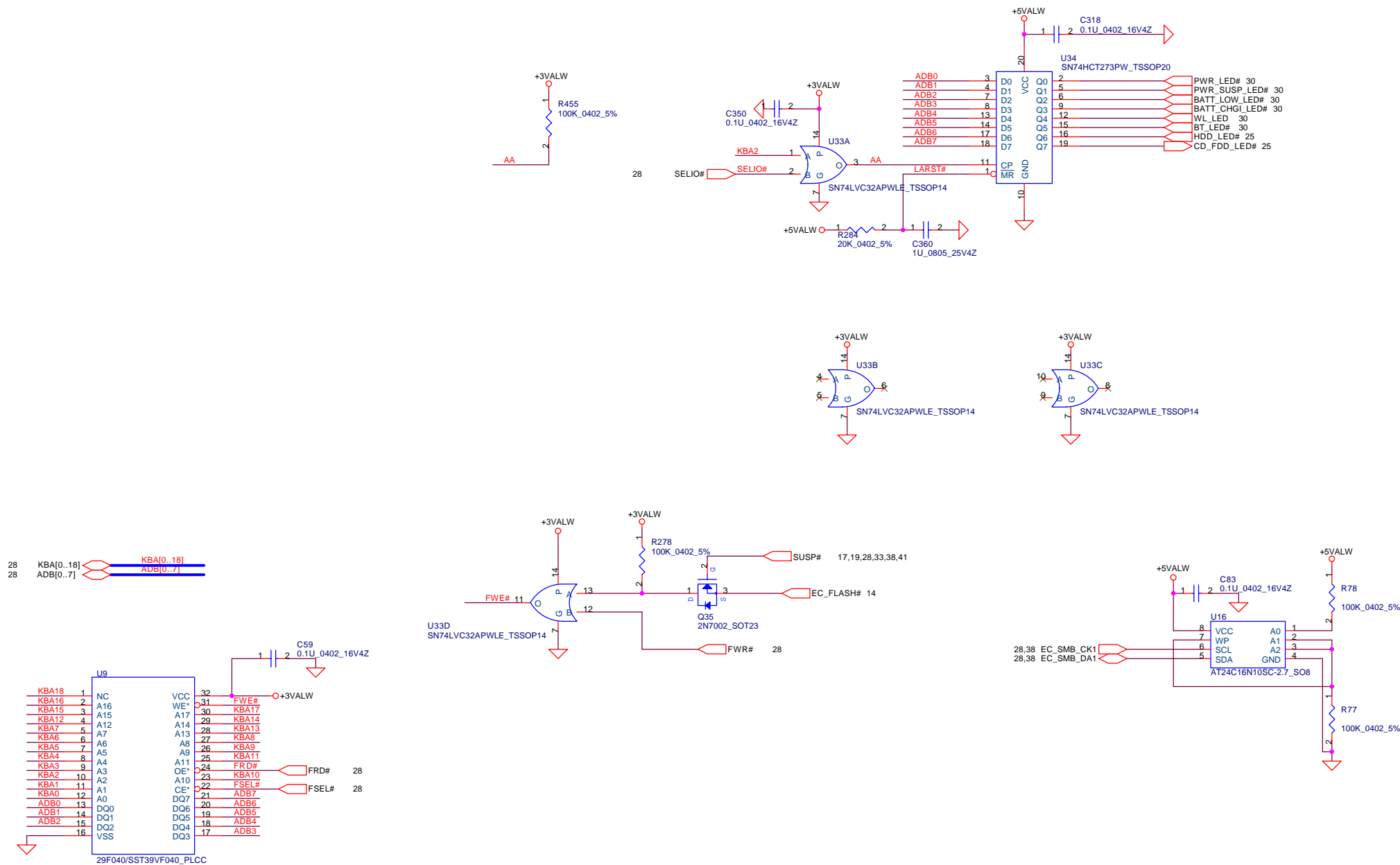
SHBM(KBA5)=1: Enable shared memory with host BIOS
TRIS(KBA4)=1: While in IRE and OBD, float all the signals for clip-on ISE use

R282	0	120K
R283	no stuff	20M

Compal Electronics, Inc.

EC PC87591			
Size	Document Number	Rev	
Custom	DCL56 LA2231	0.3	
Date:	Thursday, February 05, 2004	Sheet	28 of 45

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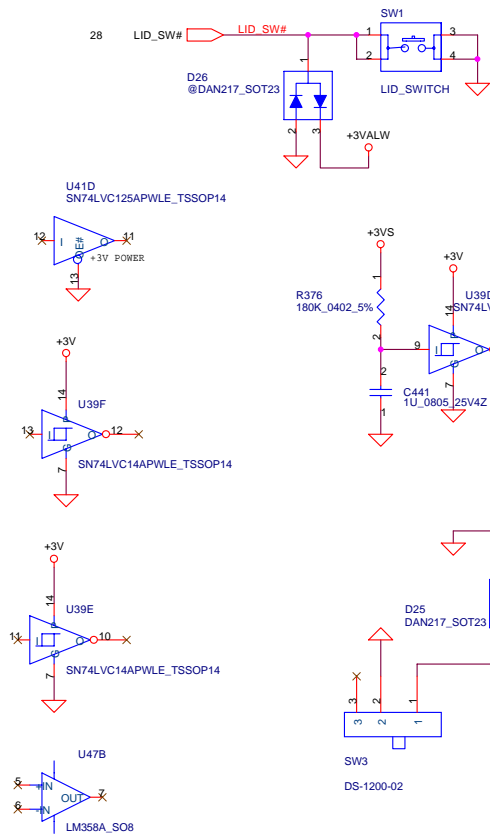


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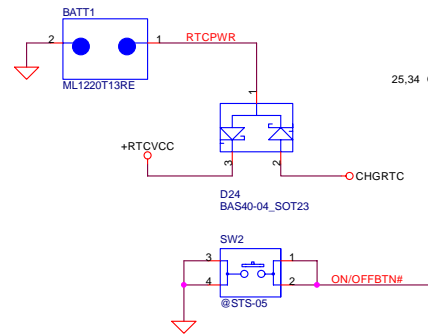
Title			BIOS & EXT. I/O PORT
Size	Document Number	Rev	
B	DCL56 LA2231	0.3	
Date:	Thursday, February 05, 2004	Sheet	29 of 45

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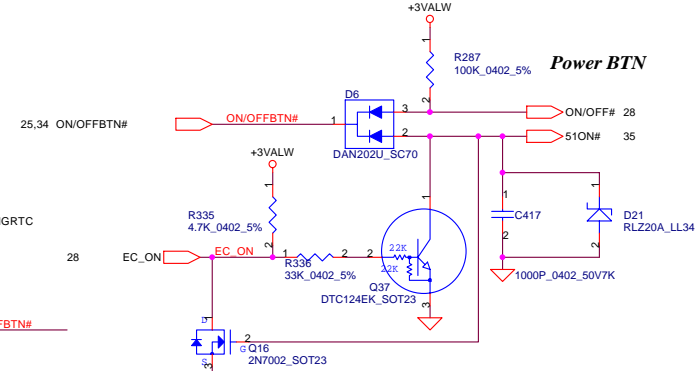
Power ON Circuit



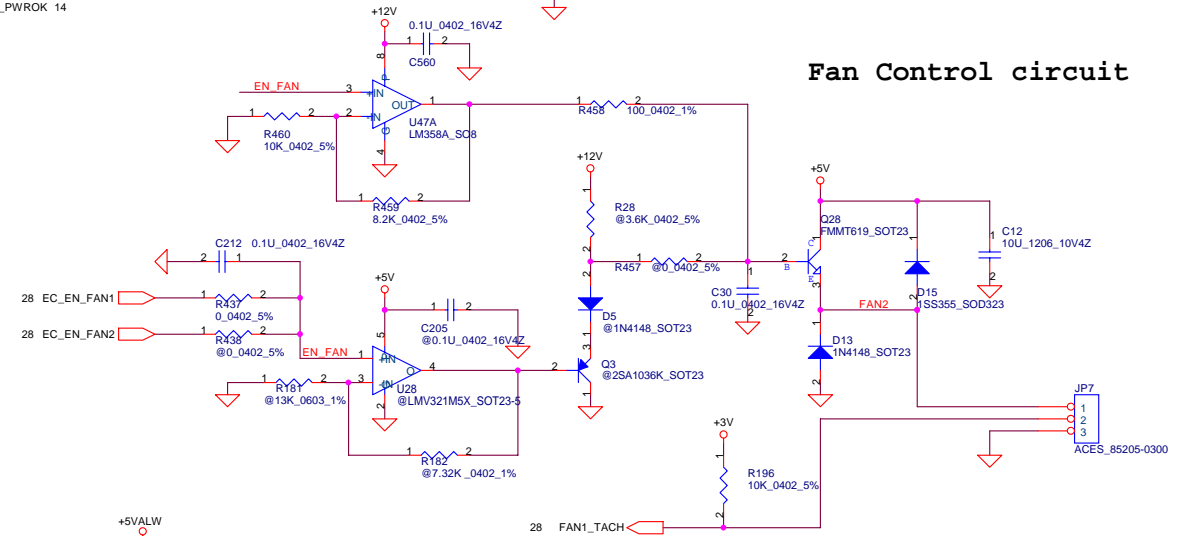
RTC Battery



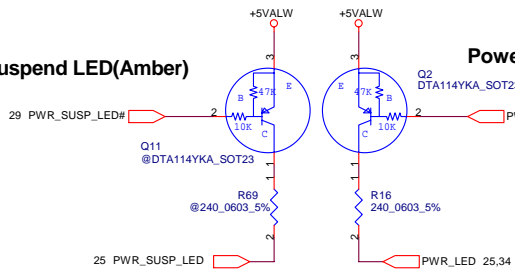
Power BTN



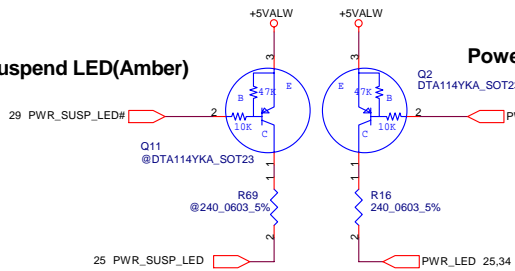
Fan Control circuit



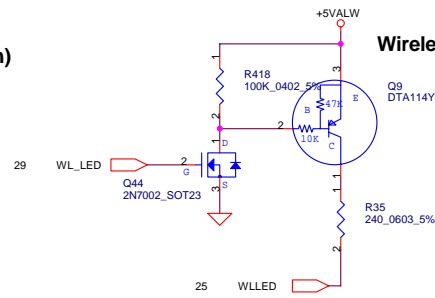
Suspend LED(Amber)



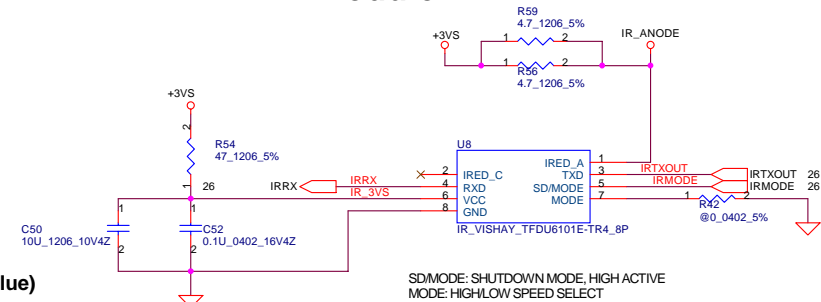
Power LED(Green)



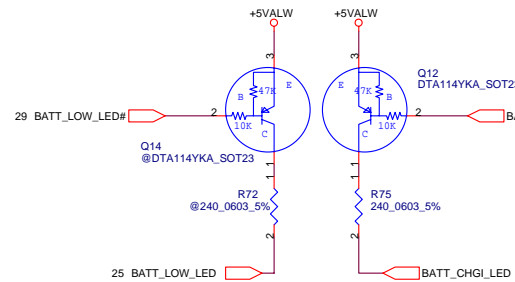
Wireless LED(Amber)



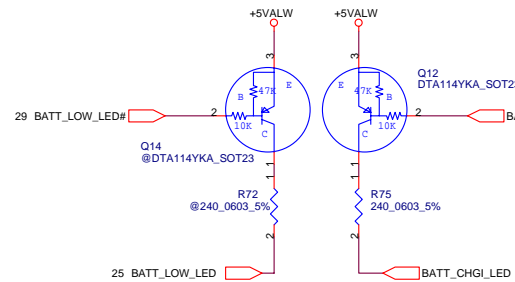
FIR Module



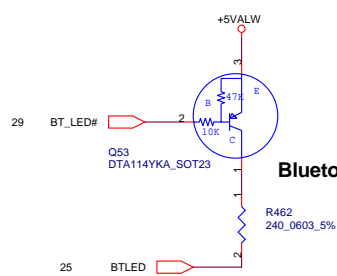
BATT Low LED(Amber)



BATT Charge LED(Green)



Bluetooth LED(Blue)

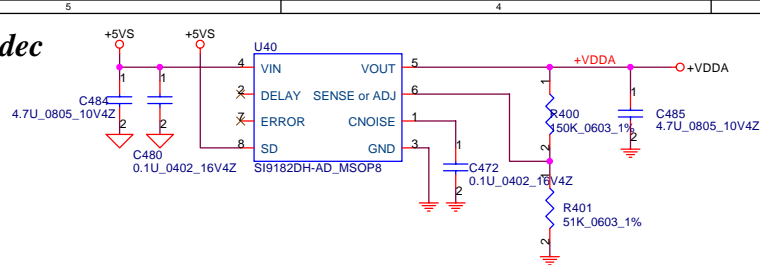


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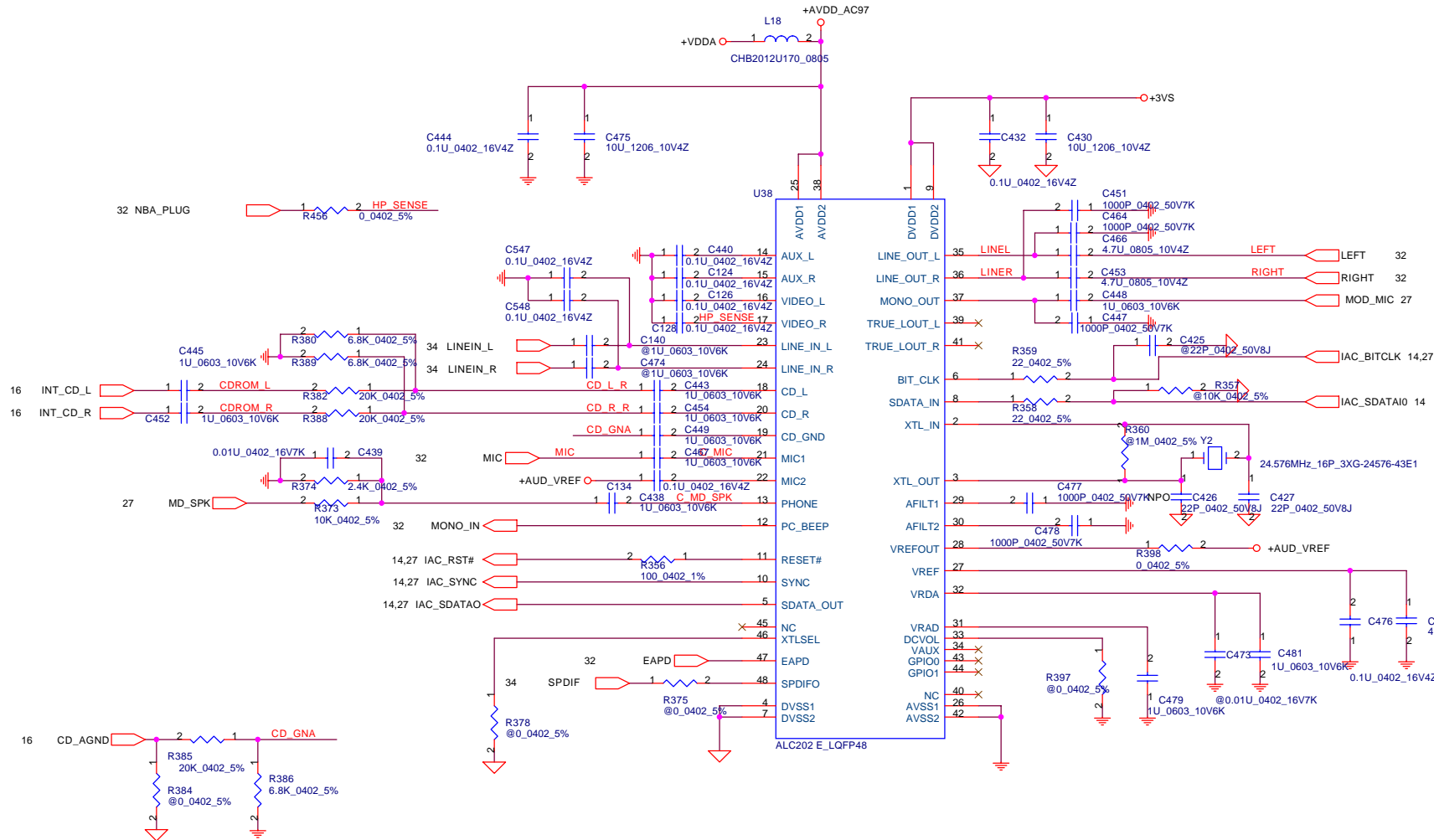
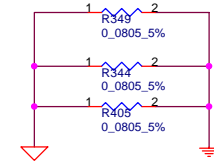
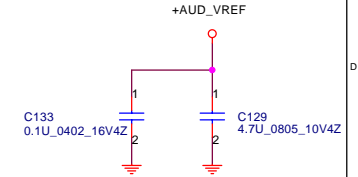
Title			
Power OK/Reset/RTC battery/Lid Switch/Int. KB			
Size	Document Number	Rev	
	DCL56 LA2231	0.3	
Date:	Thursday, February 05, 2004	Sheet	30 of 45

AC97 Codec



R740	MODE
Stuff	14.318MHz External
No-Stuff	24.576MHz Crystal or External Colclk

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Compal Electronics, Inc.

Title	Author	Year	Journal	Volume	Page
...

AC97 Codec

Size

Document Number

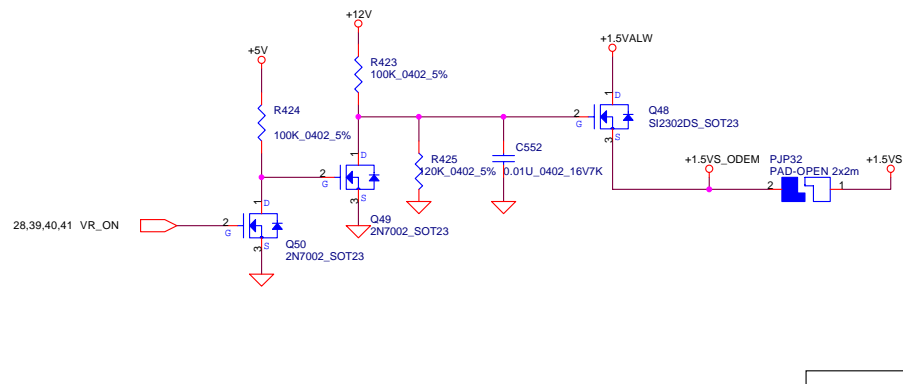
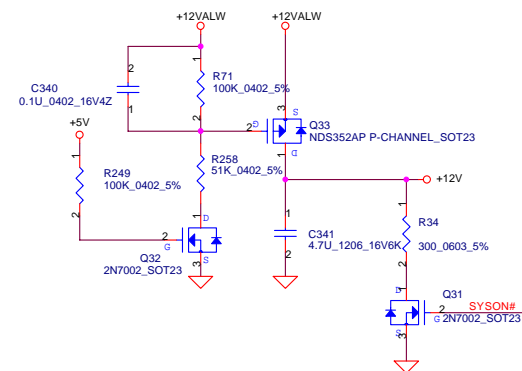
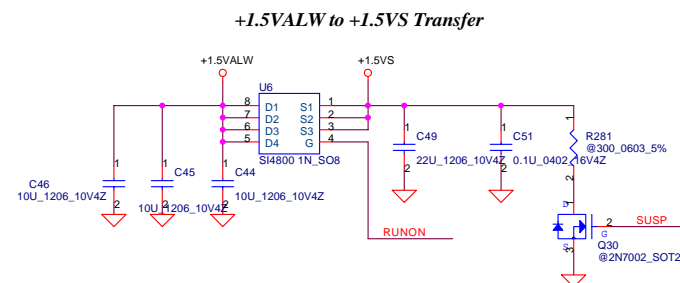
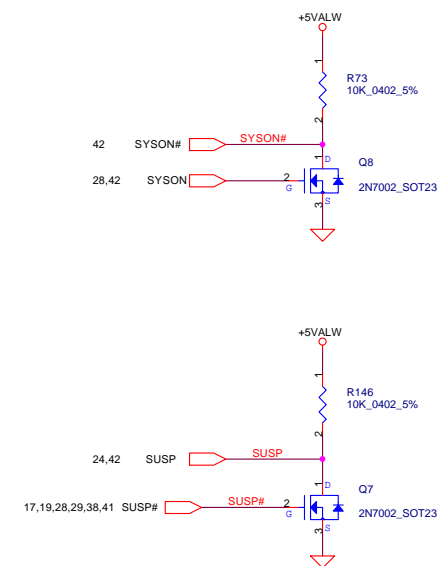
DCL56 LA2231

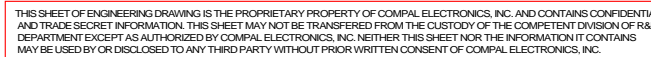
Rev	
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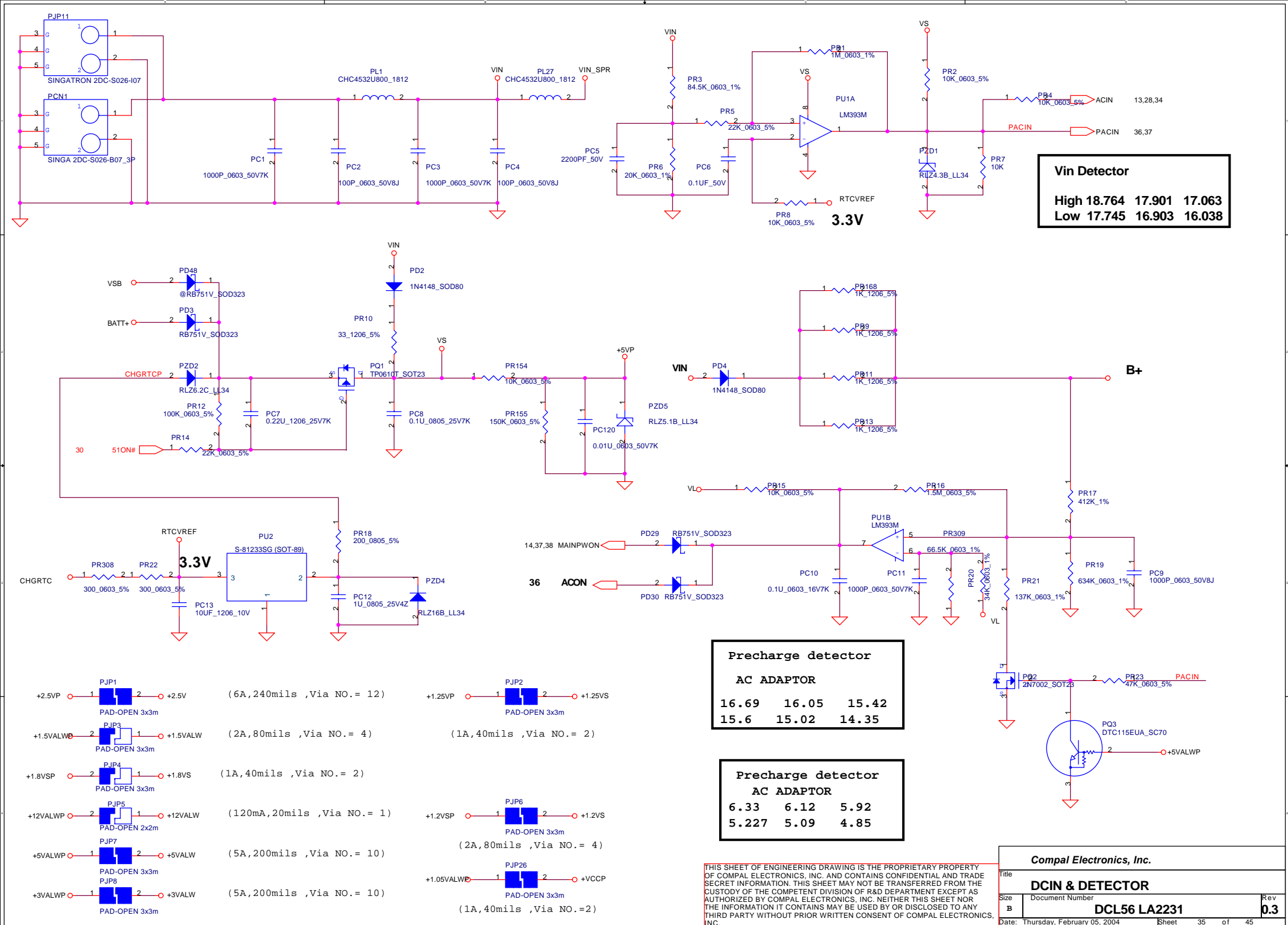
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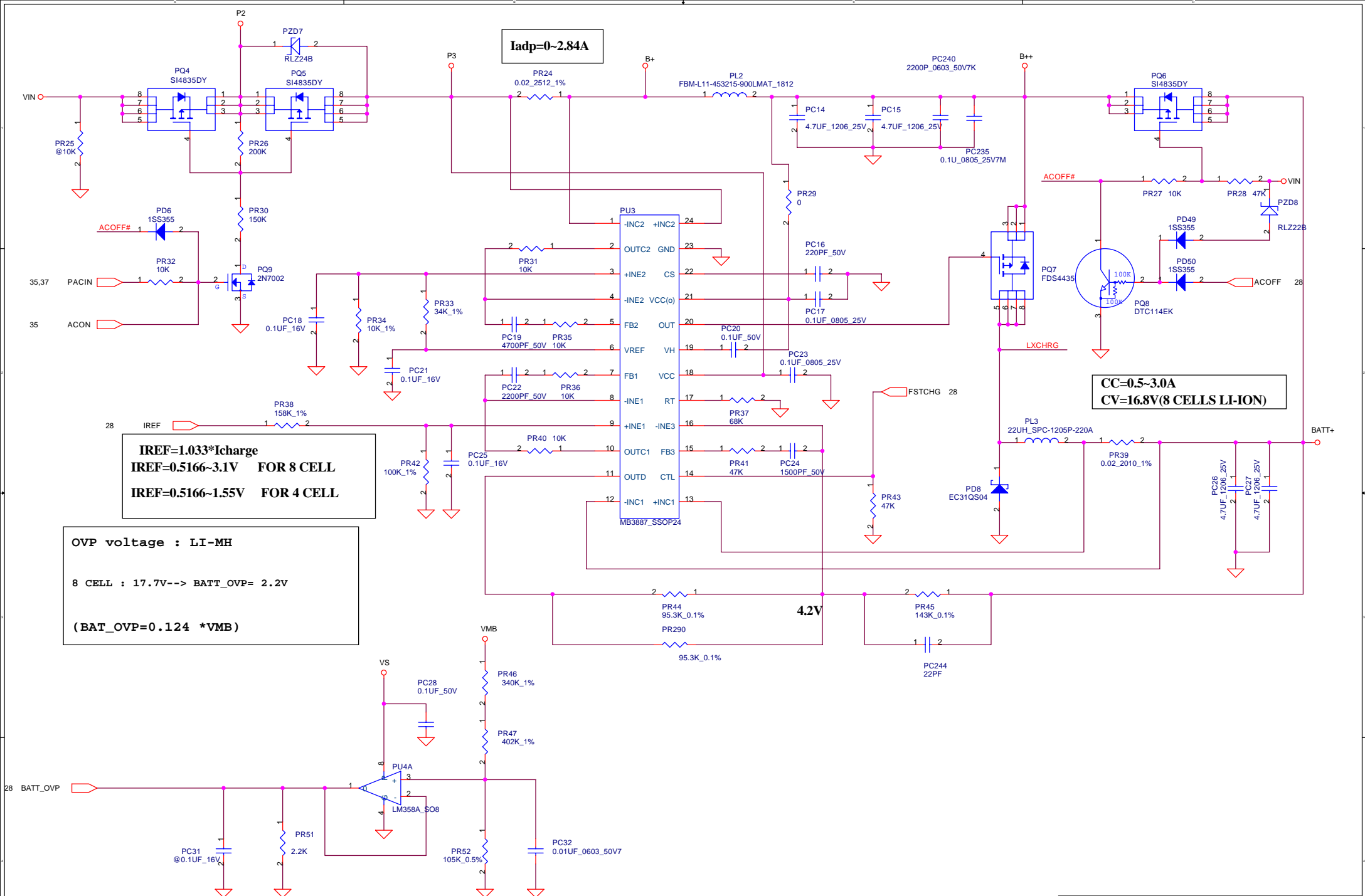
Date: Thursday, February 05, 2004

Sheet 31 of 45





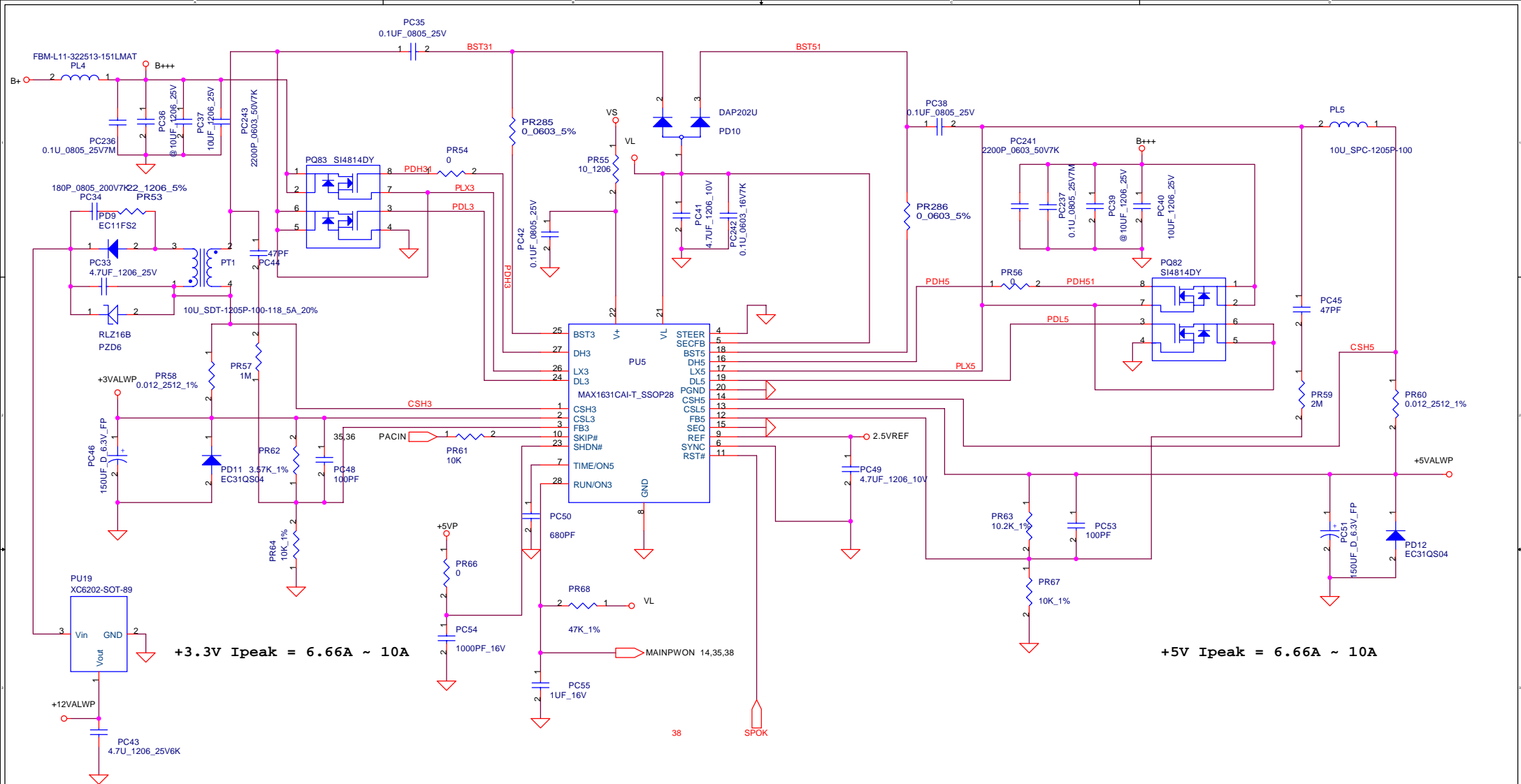




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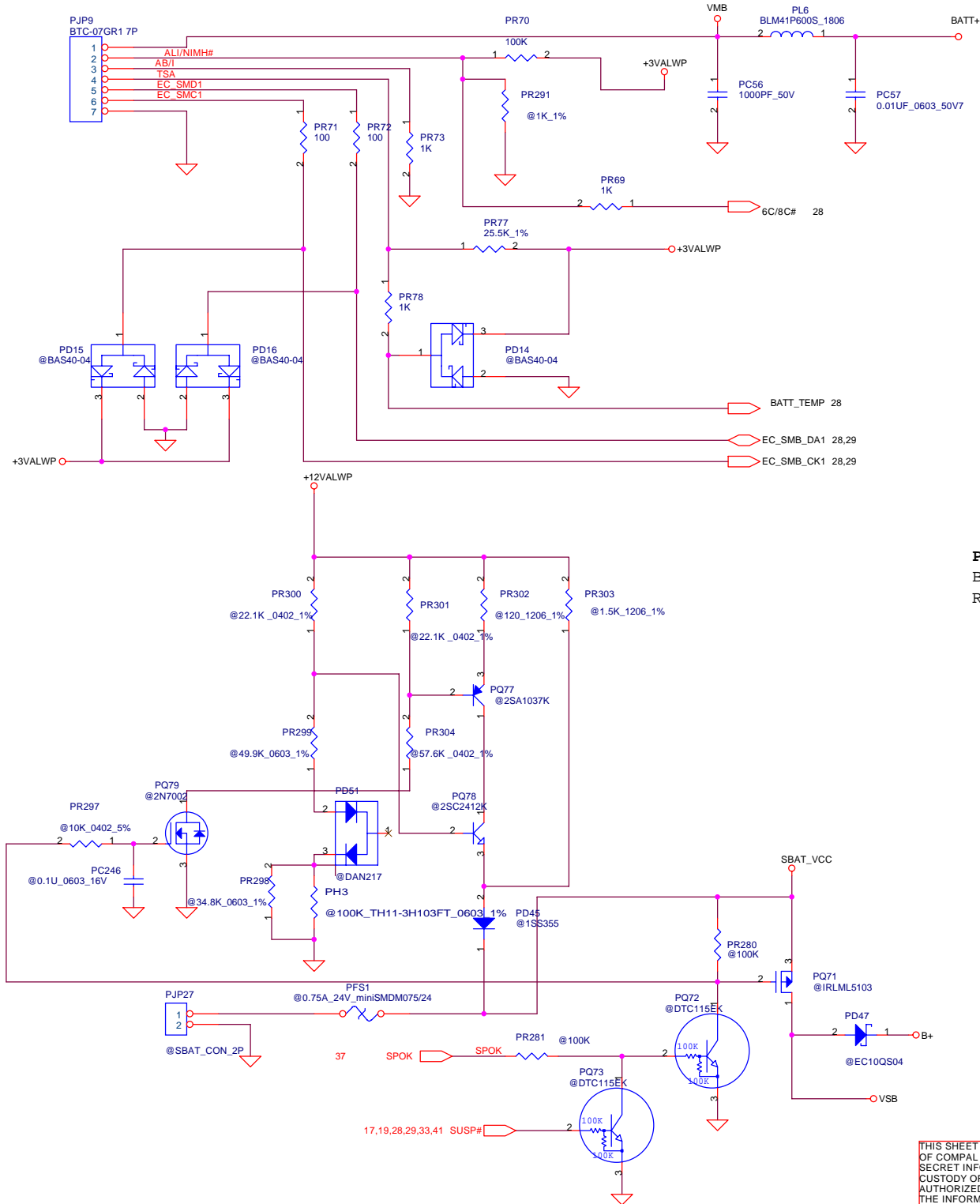
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Size	Document Number		Rev
B	DCL56 LA2231		0.3
Date:	Thursday, February 05, 2004		Sheet 36 of 45



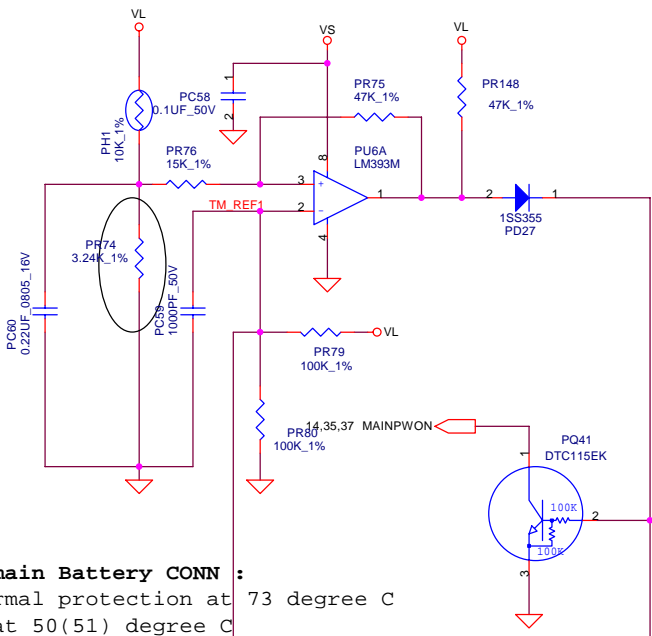
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Compal Electronics, Inc.

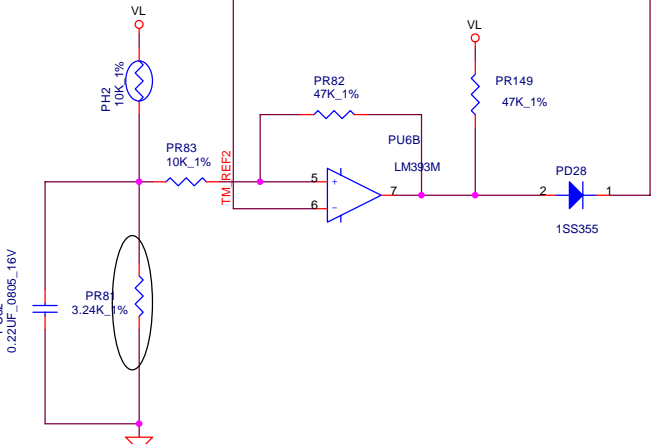
Title	5V/3.3V/12V		
Size	Document Number		
B	DCL56 LA2231		
Date:	Thursday, February 05, 2004	Sheet	37 of 45
Rev	0.3		



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



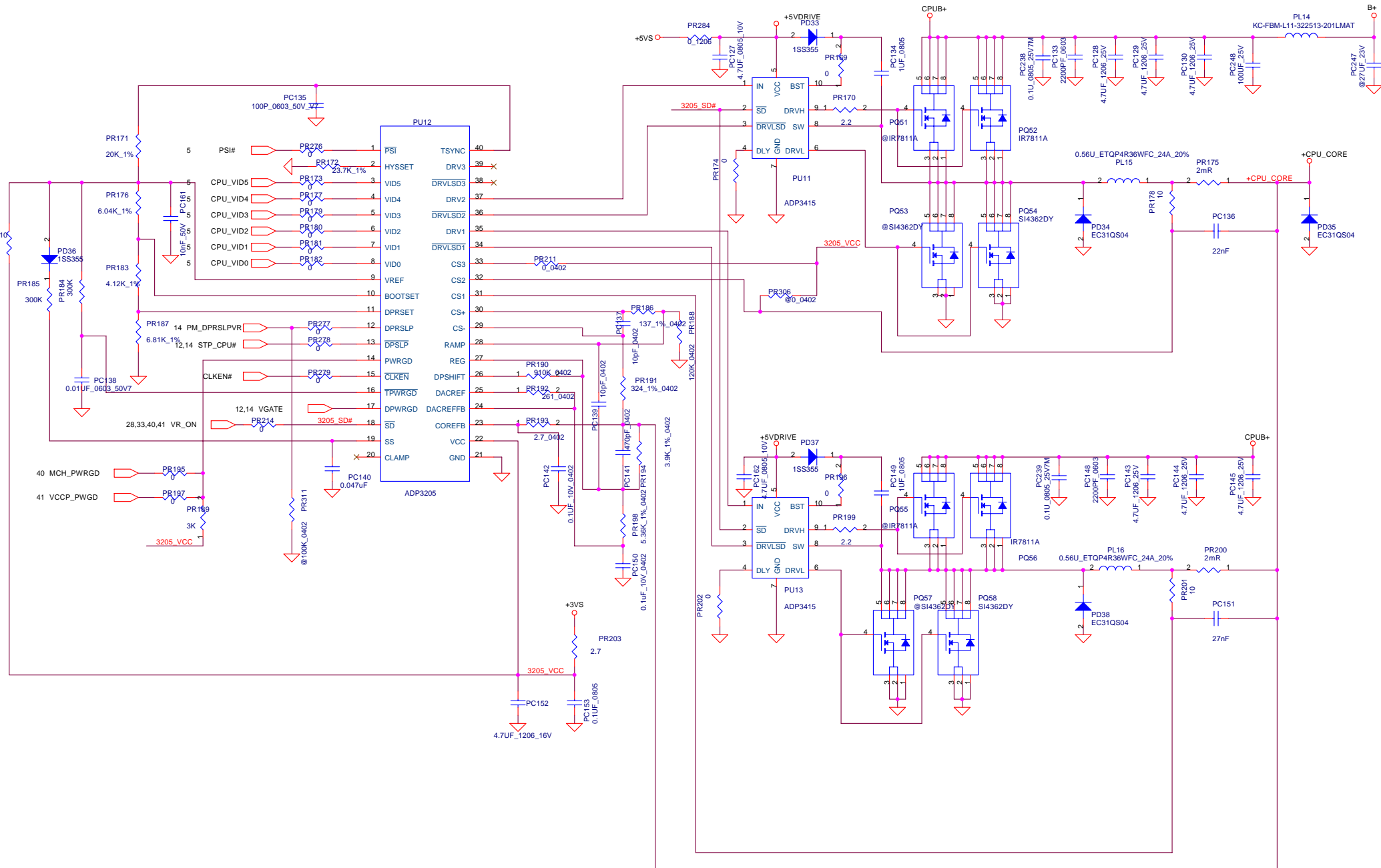
PH2 near main Battery CONN :
 BAT. thermal protection at 73 degree C
 Recovery at 50(51) degree C



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Compal Electronics, Inc.			
Title	BATTERY CONN / OTP/1.2V		
Size	Document Number		
B	DCL56 LA2231		
Date:	Thursday, February 05, 2004	Sheet	38 of 45
Rev	0.3		

CPU-CORE



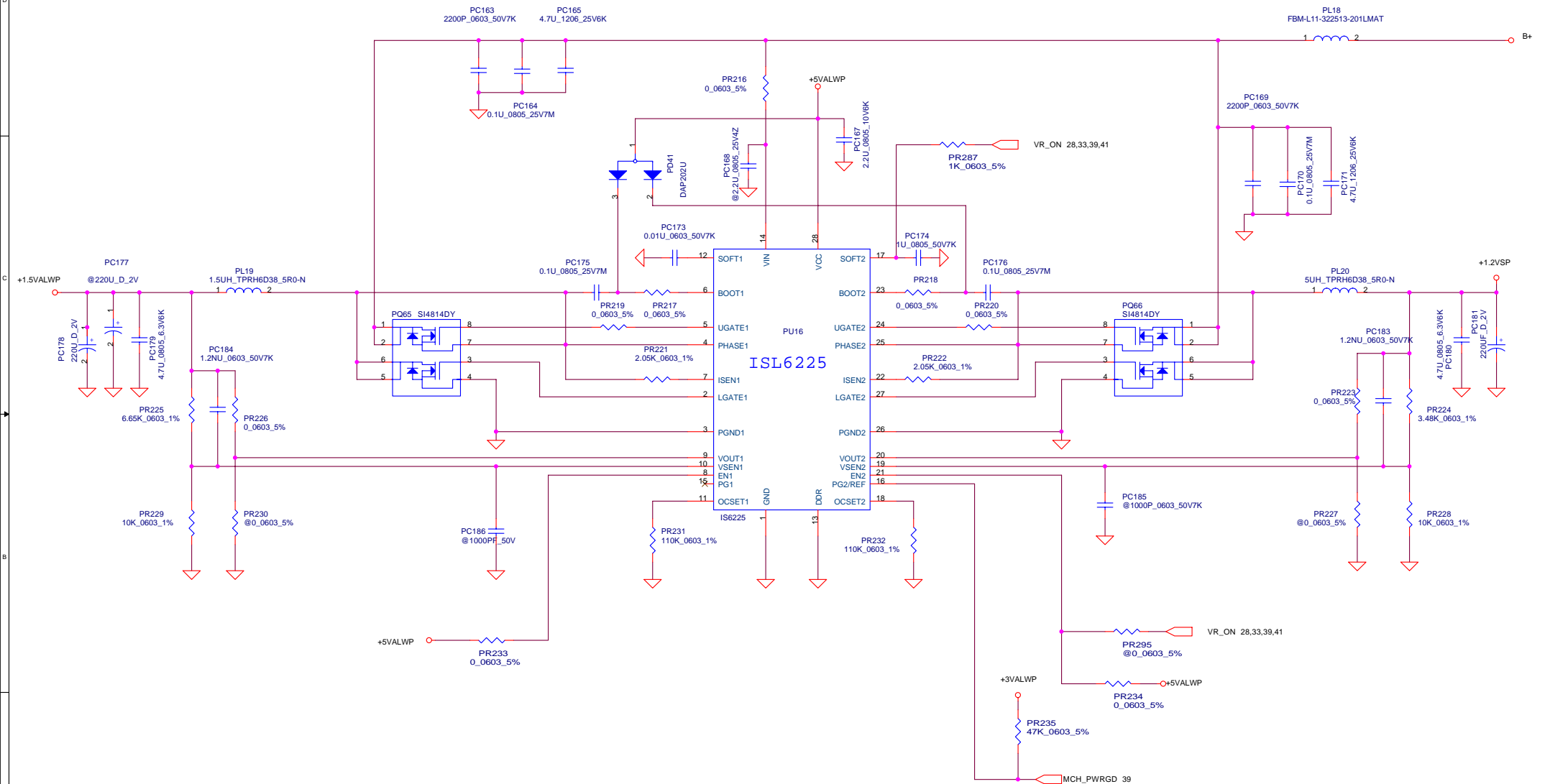
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Compal Electronics, Inc.

+VCC_H CORE

Size	Document Number	Rev
B	DCL56 LA2231	0.3
Date:	Thursday, February 05, 2004	Sheet 39 of 45

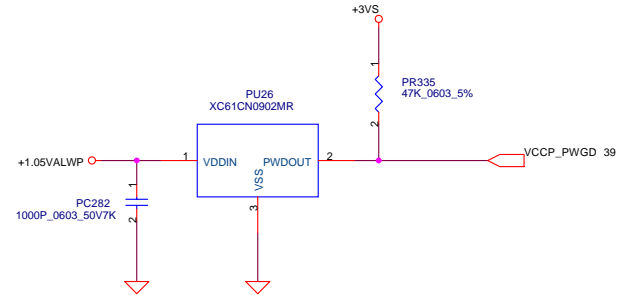
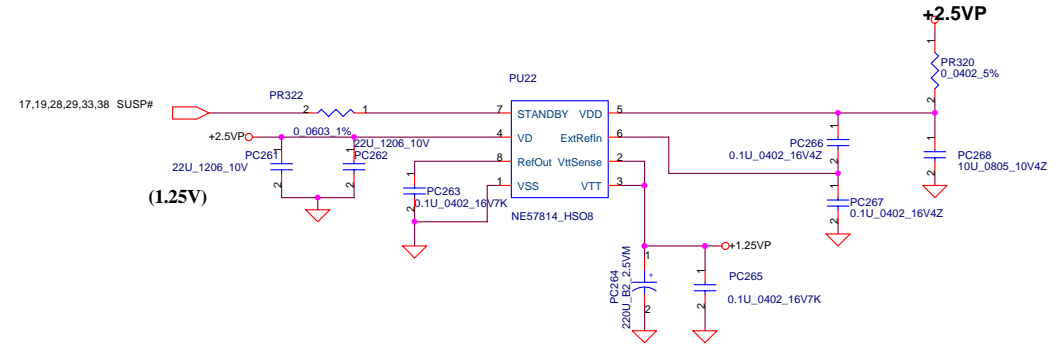
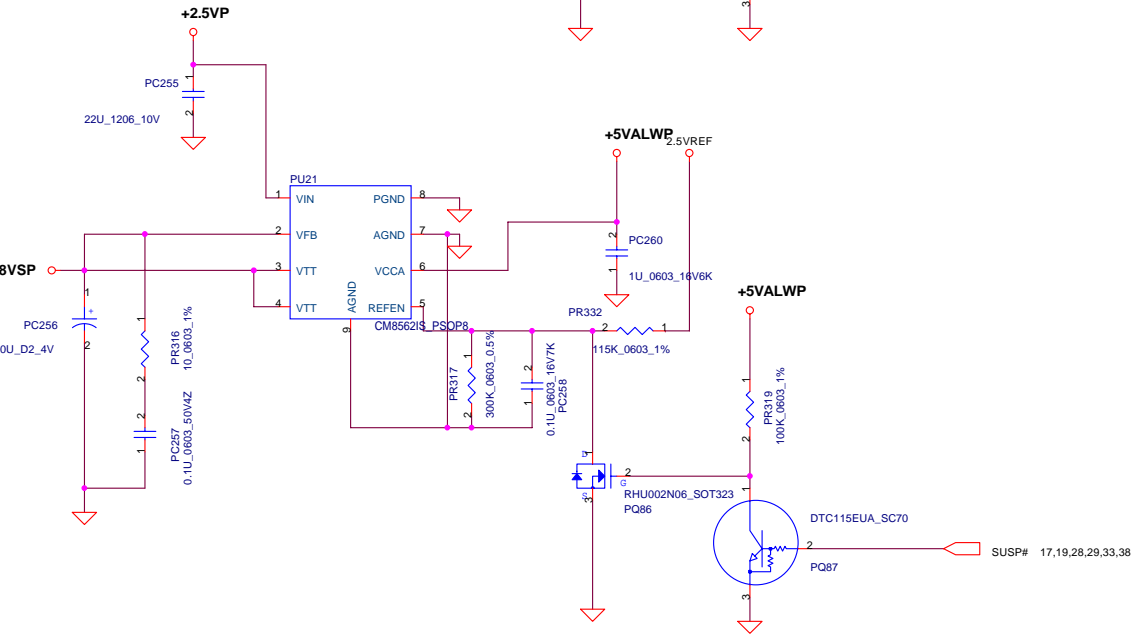
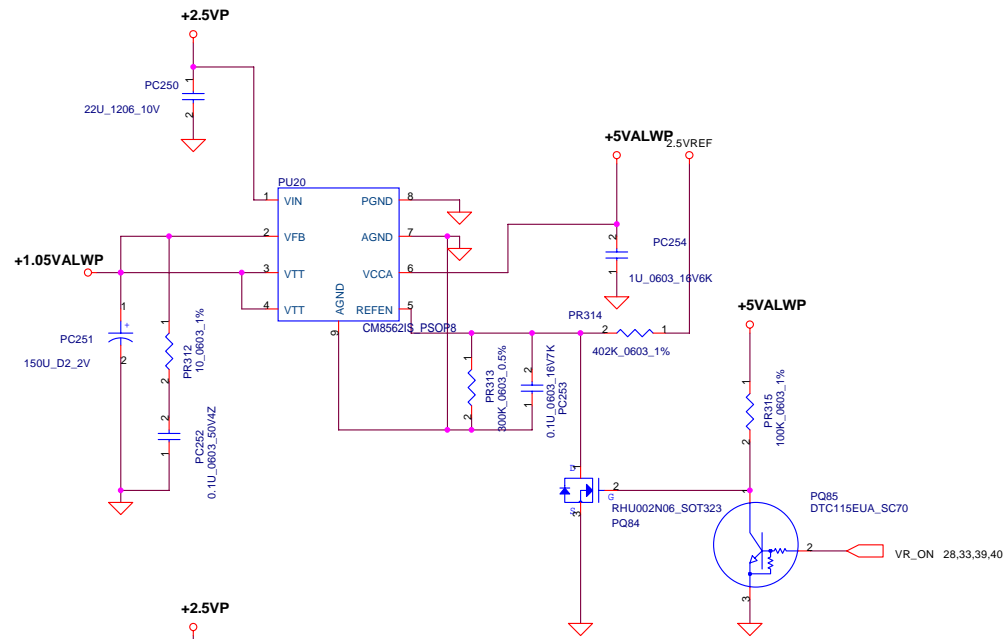
+1.5VALWPV/+1.2VSP



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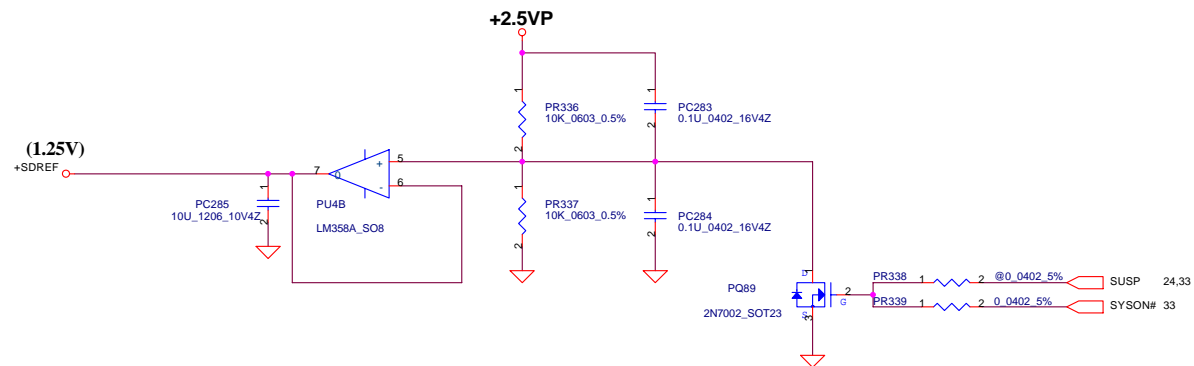
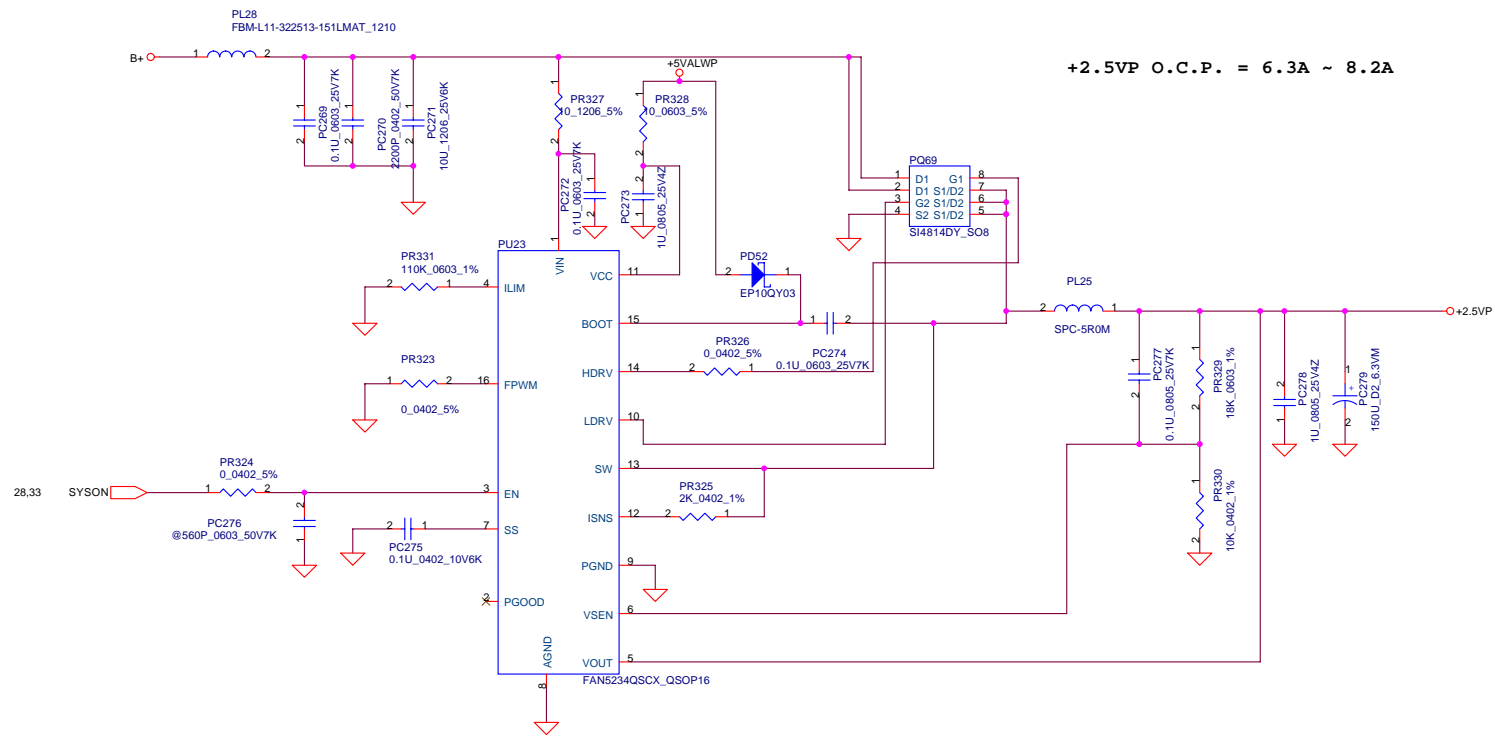
Title 1.5V & 1.2V			
Size B	Document Number DCL56 LA2231	Rev 0.3	
Date: Thursday, February 05, 2004		Sheet 40 of 45	

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Compal Electronics, Inc.			
Title	1.8V & 1.05V		
Size	Document Number	DCL56 LA2231	
B			Rev 0.3
Date:	Thursday, February 05, 2004	Sheet	41 of 45



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Compale Electronics, Inc.			
Title	2.5V & 1.25V		
Size	Document Number	DCL56 LA2231	
B			Rev 0.3
Date: Thursday, February 05, 2004	Sheet 42 of 45		

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

Page 1 of 1
for HW

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	VER	Phase
1.	IDE reset signal level error	Change signal level from 3V to 5V		P16	Delete D8,D9,R144,R147 Add U44,U45		DVT
2.	LED light not enough	Change VCC from +3VALW to +5VALW		P25	Add Q45,Q46,Q47 Add R420,R421,R422		DVT
3.	Change flash ROM size	Change from 4Mb to 8Mb		P29	Delete U9 Add U42		DVT
4.	Change flash ROM size	Change from 8Mb to 4Mb		P29	Delete U42, C549, R419, JP28 Add U9, C59		PVT
5.	Change USB Power	Change USB Power from +5VALW to +5V		P25	Change U2.2, U4.2 form +5VALW to +5V		PVT
6.	Noise when system boot	Change PCM_SPK# sequence		P19	Add R435 on PCM_SPK# and pull up to +3V		PVT
7.	Some CF card can't read	Pull up S1_OE#		P20	Add R436 on S1_OE# to pull up to S1_VCC		PVT
8.	Change FAN Connector	Change FAN Connector		P30	Change FAN Connector JP7 from 4-Pin to 3-Pin		PVT
9.	Add Bluetooth Detect Pin	Add Bluetooth Detect Pin		P30	Add Bluetooth Detect Pin form Super I/O GPIO20 to JP10 Pin20		PVT

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Compal Electronics, Inc.		
Title		
Note & Revision		
Size	Document Number	Rev
	DCL56 LA2231	0.3
Date:	Thursday, February 05, 2004	Sheet 43 of 45

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

Page 1 of 1
for PWR

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	VER	Phase
1		change cpu core from two phase to one phase		39	1.delete PC127,PU11,PD33,PR169,PR170, PC134,PR174,PQ51,PQ52,PQ53, PQ54,PC128,PC129,PC130,PC238, PC133,PD34,PR175,PC136,PR178 2.add PR306:0, PQ76:SI4362, PL28:0.6U 3.Change PR200 from 2m(CYNTEC) to 1m (DALE) PC51 from 22nF to 33nF PR190 from 620K to 910K PR188 from 240k to 390k PC143,PC144,PC145 from 4.7U from 10U		DVT
2		For new version FAN5236 & ISL6225, modify enable function		40,41,42	1. delete PR287, PR234, PR288, PR254, PR289, PR274 2. add PR295: 0, PR296: 0, PR297 3. change PC143,PC144,PC 145 from 4.7U to 10u		DVT
3		modify for 3.3v to reduce power loss		37	Change PC34 from 470PF to 180PF		DVT
4		modify 5V reference		37	change PR63 from 10k to 10.2k		DVT
5		modify charging current		35	Change PR22 from 200 to 300 Add PR308 from 300		DVT
6		modify bridge battery charging current		38	1. Add PR300:22.1K, PR301: 22.1K, PR302:442, PR303:6.8K, PQ77:2SA1037K, PQ78: 2SC2412K, PH3:100K ,PD51:DAN217, PQ79: 2N7002,PR299:49.9K, PR304 :57.6K, PC246: 0.1U, PR297:10K 2. Delete PD46		DVT
7		modify and to reduce 5VALWPS,3VALWPS output recover edge voltage		37	1.Change PD12 from EP10QY03 to EC10QS04 PD11 from EP10QY03 to EC10QS04 PU13(ADP3415 driver) VCC from +5VALWP to +5VS PU12(ADP3205 controller) VCC from +3VALWP to+3VS 2.Delete PQ10,PQ11:SI4800DY, PQ12,PQ13:SI4810DY, PC46,PC56 Add PQ82,PQ83:SI4814DY		DVT
8		modify precharge circuit		35	1.Change PR17 from 150k to 412k PR19 from 2.4M to 634K PR20 from 10K to 34K PR21 from 75K to 137K 2 Add PR309 :66.5K		DVT
9		modify battery OVP:8 cell:2.2V 6 cell 1.8V		36	1 change PR47 from 174k to 402k		

Compal Electronics, Inc.

Title		PIR	
Size	Document Number	DCL56 LA2231	
Date:	Thursday, February 05, 2004	Sheet	44 of 45
		Rev	0.3

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

Page 2 of 2
for PWR

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	VER	Phase
1		change cpu core from two phase to one phase		39	1.ADD PC127,PU11,PD33,PR169,PR170, PC134,PR174,PQ51,PQ52,PQ53, PQ54,PC128,PC129,PC130,PC238, PC133,PD34,PR175,PC136,PR178 2.DELETE PR306:0, PQ76:SI4362, PL28:0.6U 3.Change PR175,PR200 from 1m (DALE) TO 2m(CYNTEC), PC151,PC136 from 33nF to 22nF, PR188 from 240k to 120k , ADD PC128,PC129,PC130 : 4.7U 4.Change PR186 from 56 TO 137(Frequency from 300k to 250KHZ), 5. ChangePR188 from 240k to 120k(Vcore from 1.46 to 1.466v,vid code=1.468v when Io=0A), PR187 change from 3.4k to 3.48k(Vboot=1.2v,and Vc4from0.741 to 0.752v)		PVT
2		Change new version FAN5236d &ISL6225b to ISL6225CA&FAN5236, modify enable function		40,41,42	1. ADD PR287, PR234, PR288, PR254, PR289, PR274 2. DELETE PR295: 0, PR296: 0, PR297 3.ADD PR287,PR288,PR289 4.Change PC174,PC198,PC222 FROM 0.01U TO 4.7U 16V		PVT
3		modify FAN5236 RC feed back compasation		40,41,42	PC183,PC184,PC207,PC208:FROM 0.01UF TO 1.2NF		PVT
4		change cpu core cap to 6*4.7uF 1210 not 3*10uF due to 10uF cap height >2mm		39	PC128,PC129,PC130,PC143,PC144,PC145FROM 10UF TO 4.7UNF		PVT
5		modify bridge battery charging current:		38	change PR302 be120 1206,PR303 be1.5k 1206		PVT
6		modify PU17,PU18 max current,OCP		40,41	change PR221,PR222,PR241,PR242 fom 1.27k(0603) to 1.05k(1206)		PVT
7		modify charger CP point :from from 61.5W to 54W		36	change PR332 fom 21K(0603) to 26.1K(0603)		PVT
8		modify and confirm PU12 Vref build time		39	INCREASE PR310 10KB between PU12Vref(PIN9) to PU12 VCC		
9		FOR bridge battery safety, add PTC as protection		38	add PFS1 0.75A/24V		

Compal Electronics, Inc.

Title			
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	DCL56 LA2231		0.3
Date:	Thursday, February 05, 2004		Sheet 45 of 45