Compal Confidential

DAT20 Schematics Document

Banias uFCPGA Package with 855PM(Odem) + ICH4-M

2003-09-25

REV: 0.3

Compal Electronics, Inc.		
Title: Cover Sheet		
Size: Custom	Document Number: DAT20 LA-1971	Rev: 0.3
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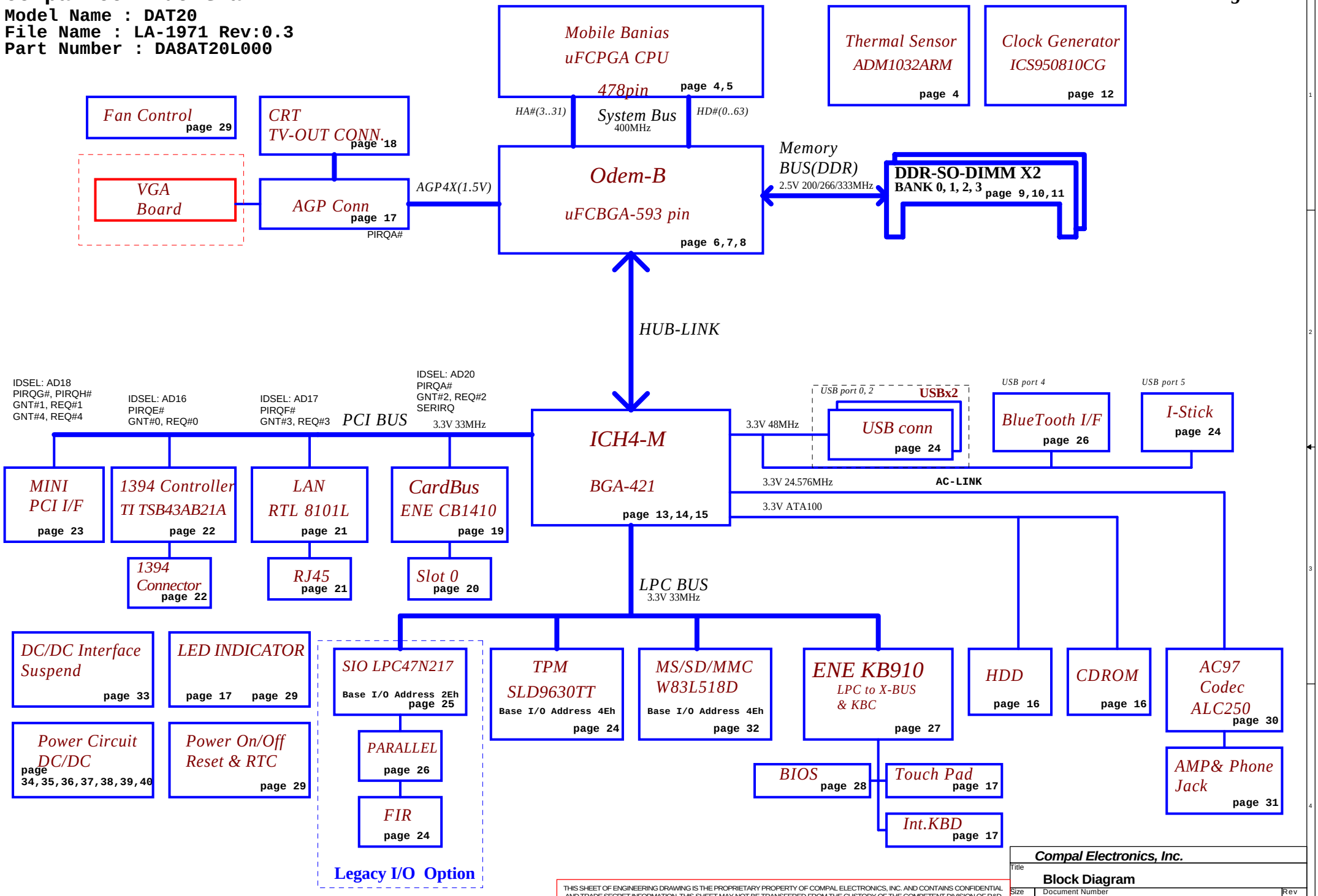
Compal confidential

Model Name : DAT20
File Name : LA-1971 Rev:0.3
Part Number : DA8AT20L000

Block Diagram



Compal Electronics, Inc.		
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 MCH	ON	OFF	OFF
+1.25VS	1.25V switched power rail	ON	OFF	OFF
+1.5VALW	1.5V power rail	ON	ON	ON
+1.5VS	AGP 4X	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.

External PCI Devices

Device	IDSEL#	REQ#/GNT#	Interrupts
VGA			PIRQA
CardBus	AD20	2	PIRQA
LAN	AD17	3	PIRQF
Mini-PCI	AD18,AD22	1/4	PIRQG/PIRQH
1394	AD16	0	PIRQE

EC SM Bus1 address

Device	Address
Smart Battery	0001 011X b
EEPROM(24C16/02)	1010 000X b
(24C04)	1011 000Xb

EC SM Bus2 address

Device	Address
ADM1032	1001 110X b

ICH4-M SM Bus address

Device	Address
Clock Generator (ICS950810CG)	1101 001Xb
DDR DIMM0	1010 000Xb
DDR DIMM1	1010 001Xb

Board ID Table for AD channel

Vcc	3.3V +/- 5%
Ra	100K +/- 5%

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

Board ID	PCB Revision
0	0.1
* 1	0.2
2	0.3
3	0.4
4	
5	
6	
7	

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Title: Notes
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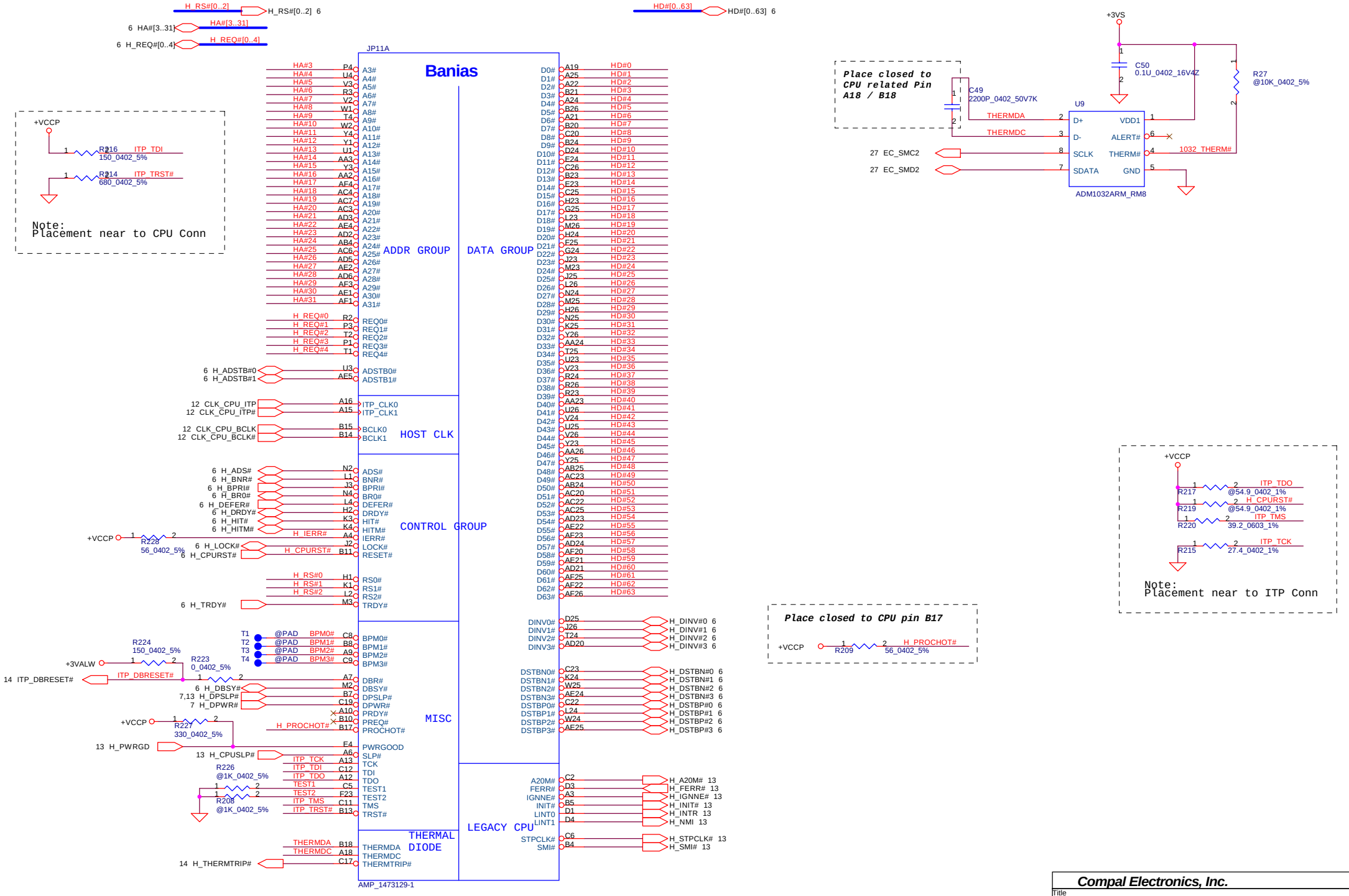

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Title: **Banias Processor in mFCPGA479 (1/2)**

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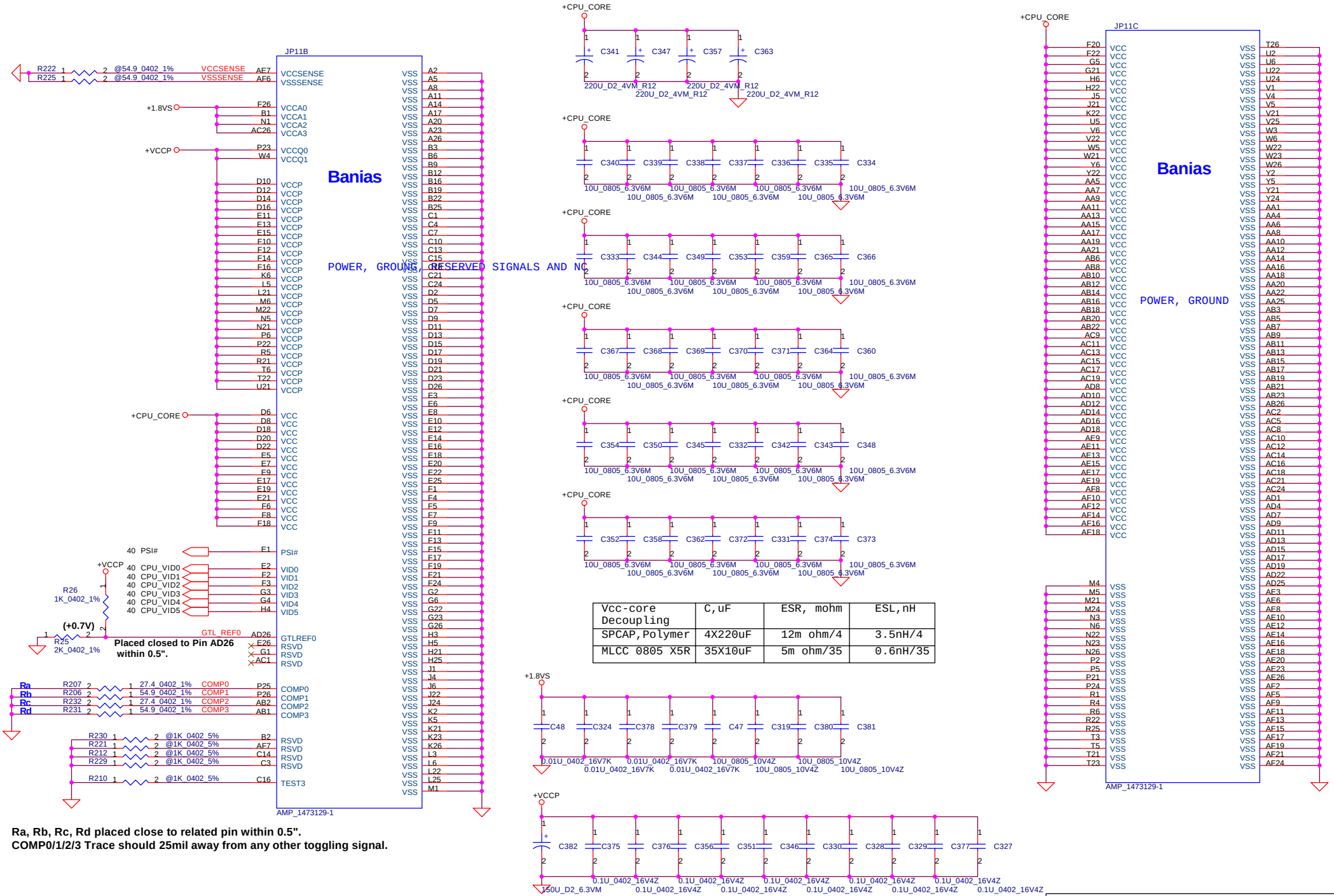

Vcc-core Decoupling	C,uF	ESR, mohm	ESL,nH
SPCAP,Polymer	4X220uF	12m ohm/4	3.5nH/4
MLCC 0805 X5R	35X10uF	5m ohm/35	0.6nH/35

Compal Electronics, Inc.

Title: Banias Processor in mFCPGA479 (2/2)

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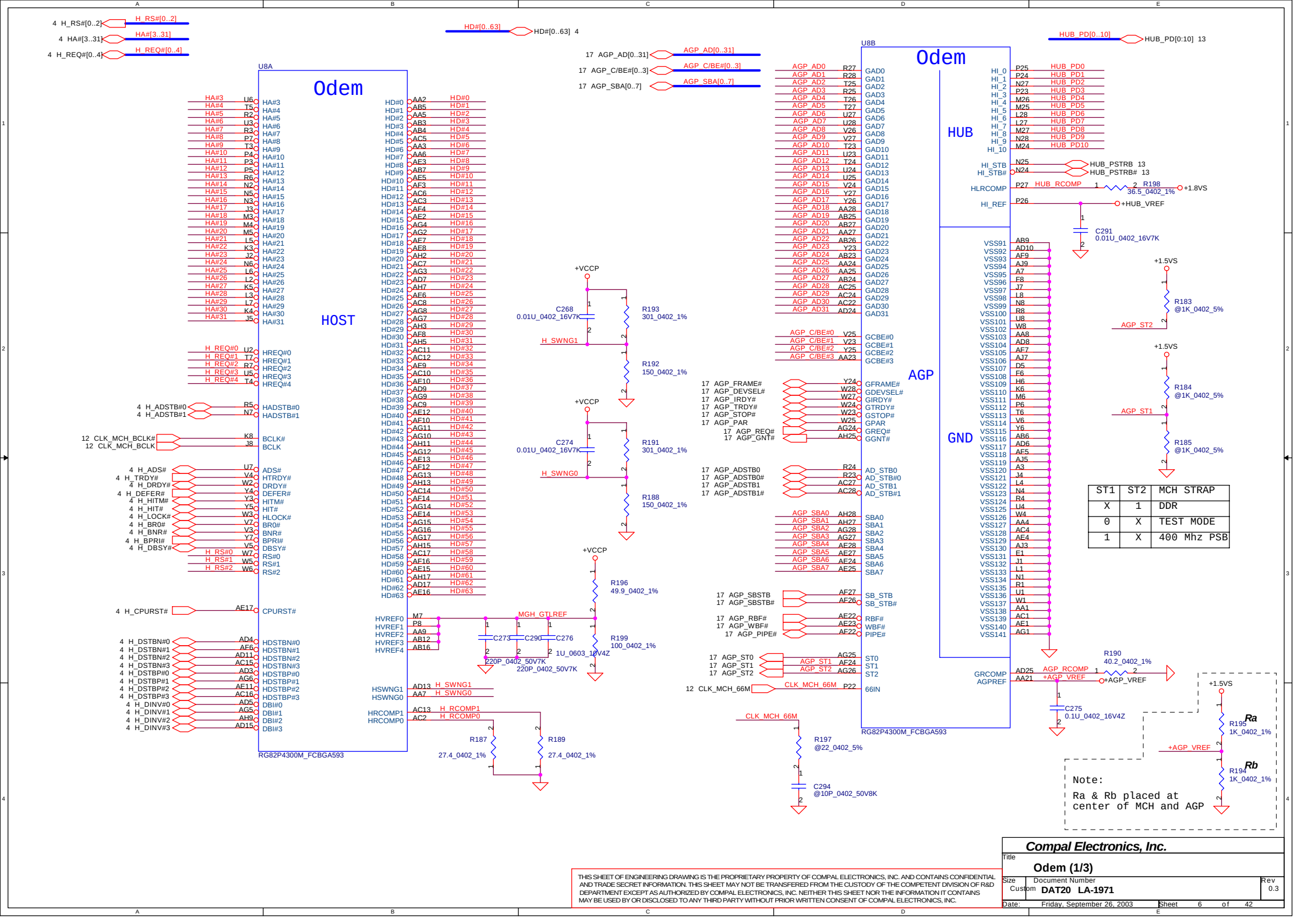

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Title: **Odem (1/3)**

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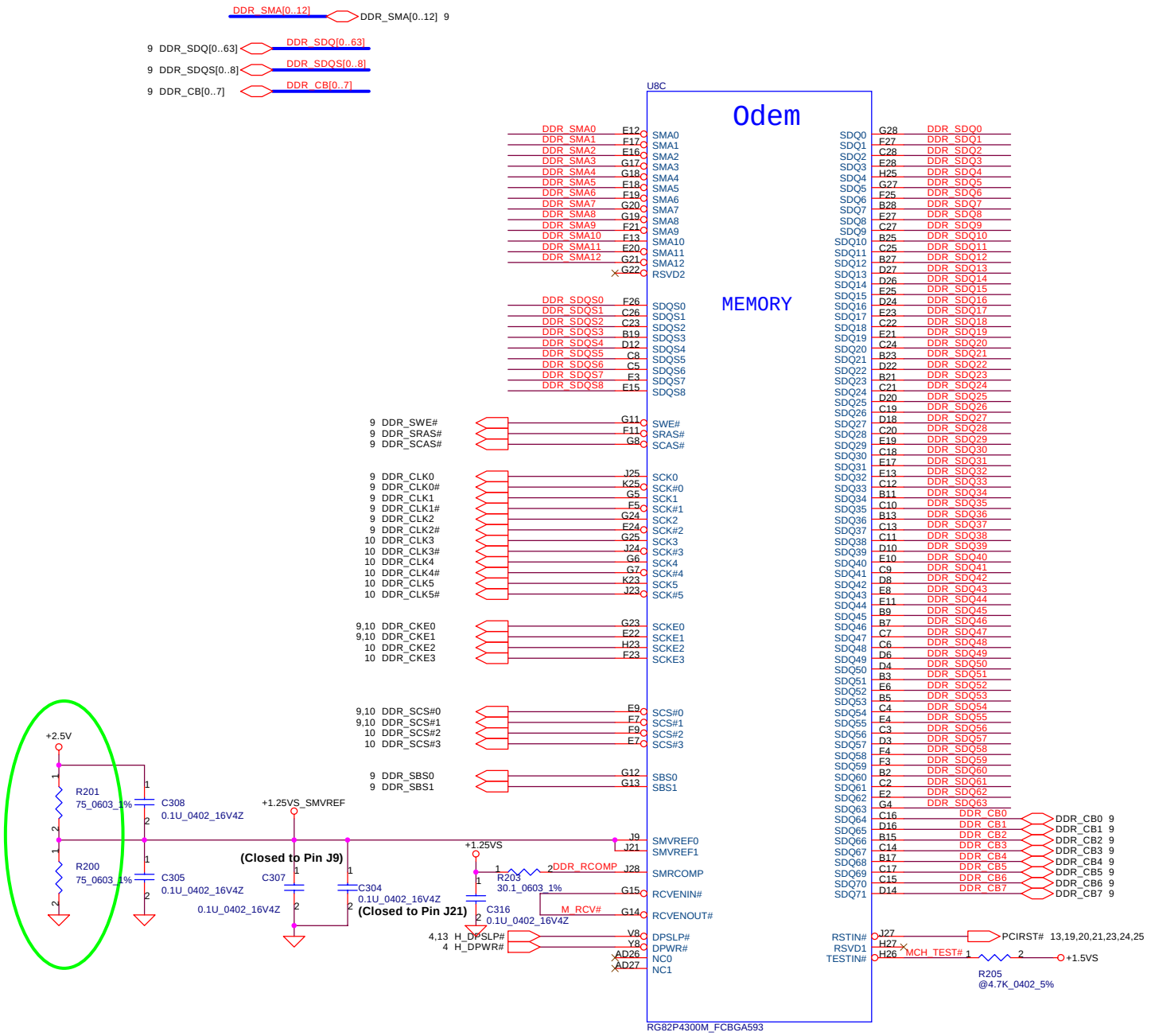

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Title: **Odem (2/3)**

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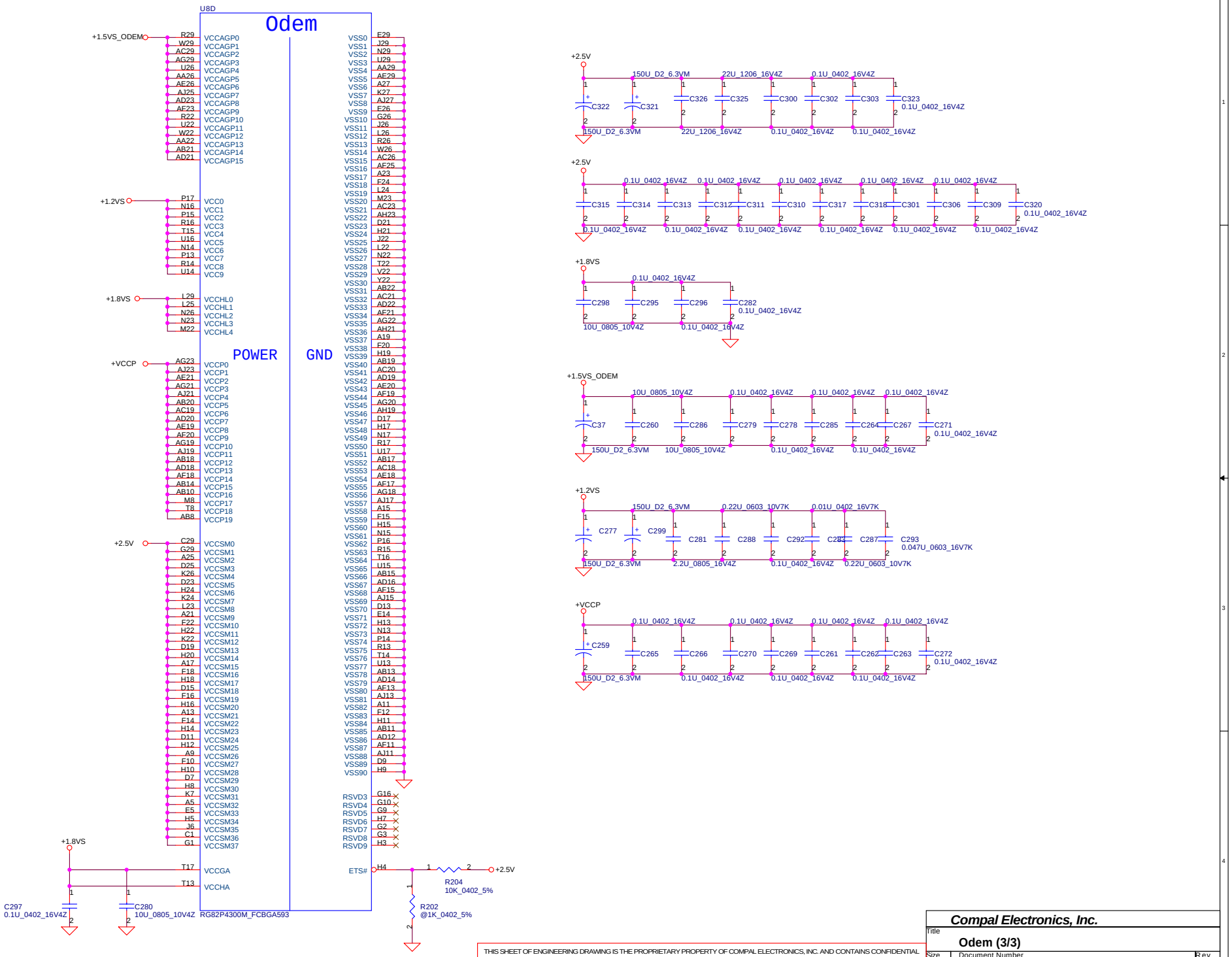

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Title: **Odem (3/3)**

Size	Document Number	Rev
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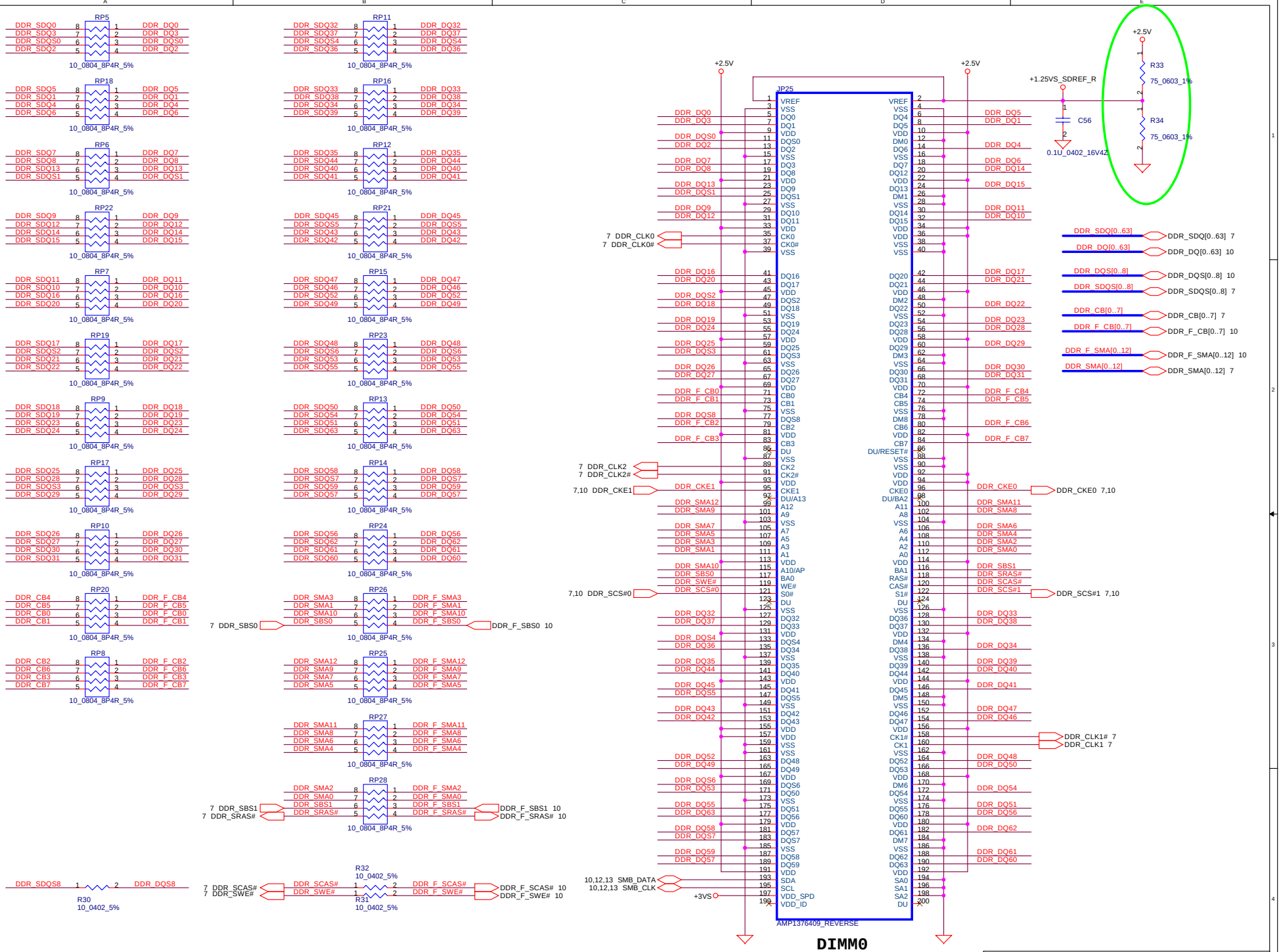

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Title: DDR-SODIMM SLOT0

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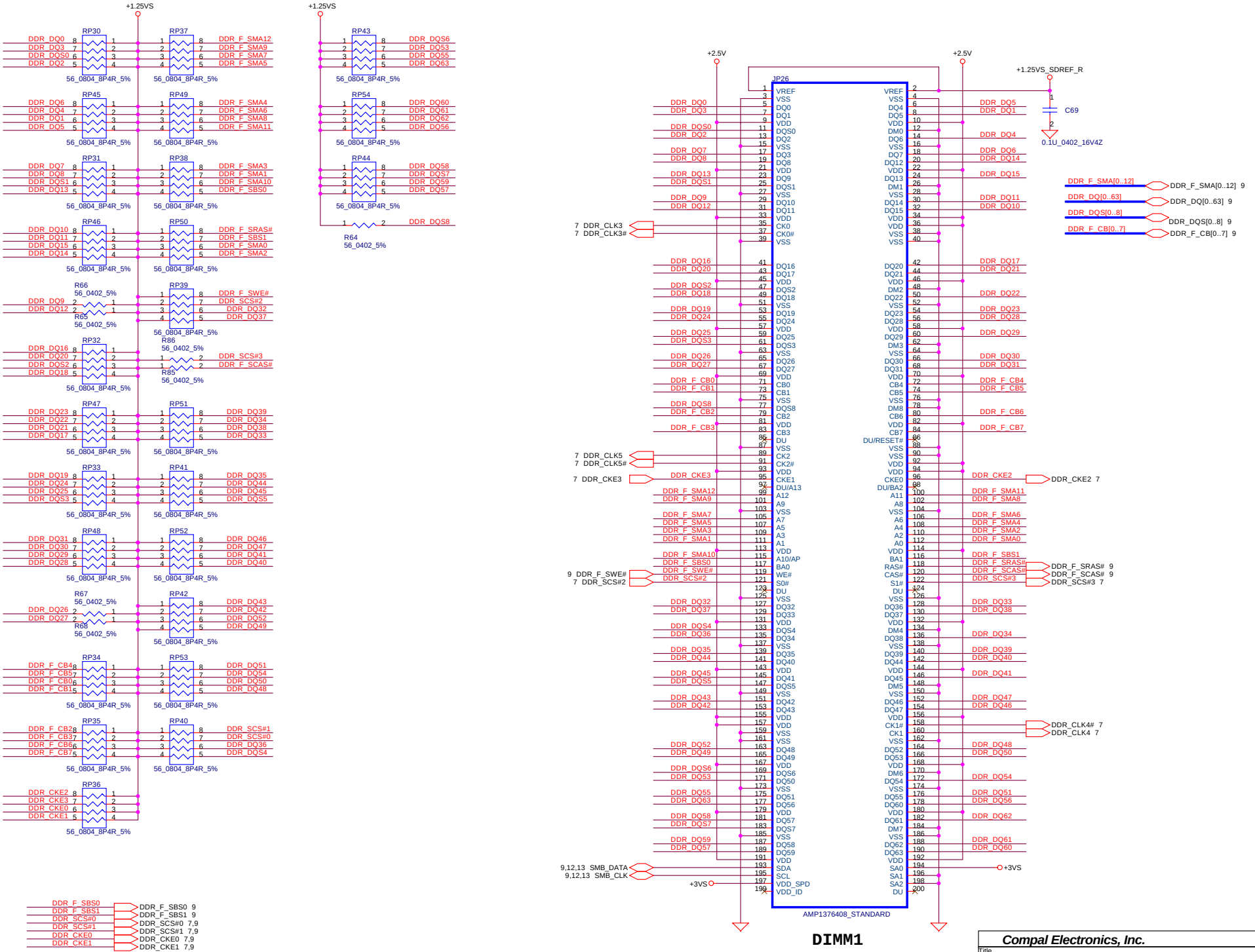

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Title: DDR-SODIMM SLOT1

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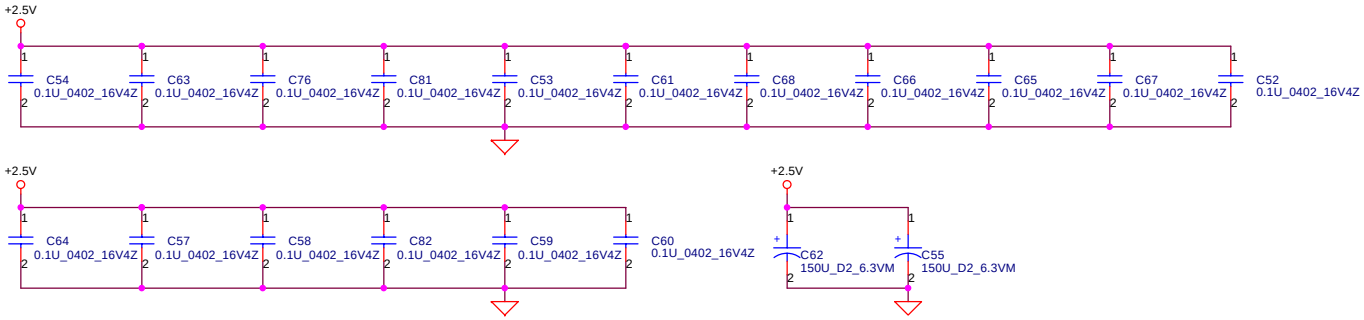
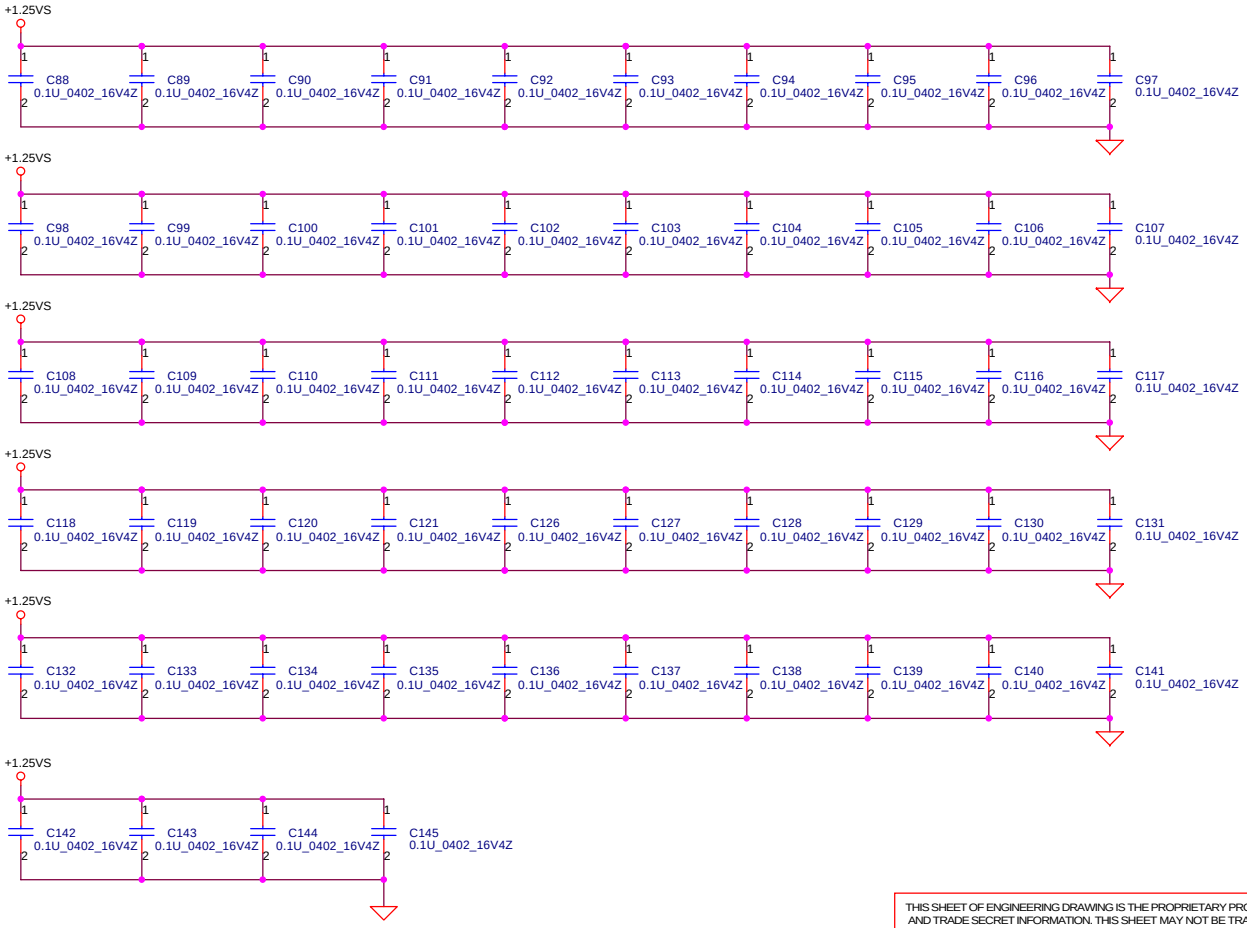
Layout note :

Distribute as close as possible to DDR-SODIMM.



Layout note :

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



Compal Electronics, Inc.		
Title: DDR SODIMM Decoupling		
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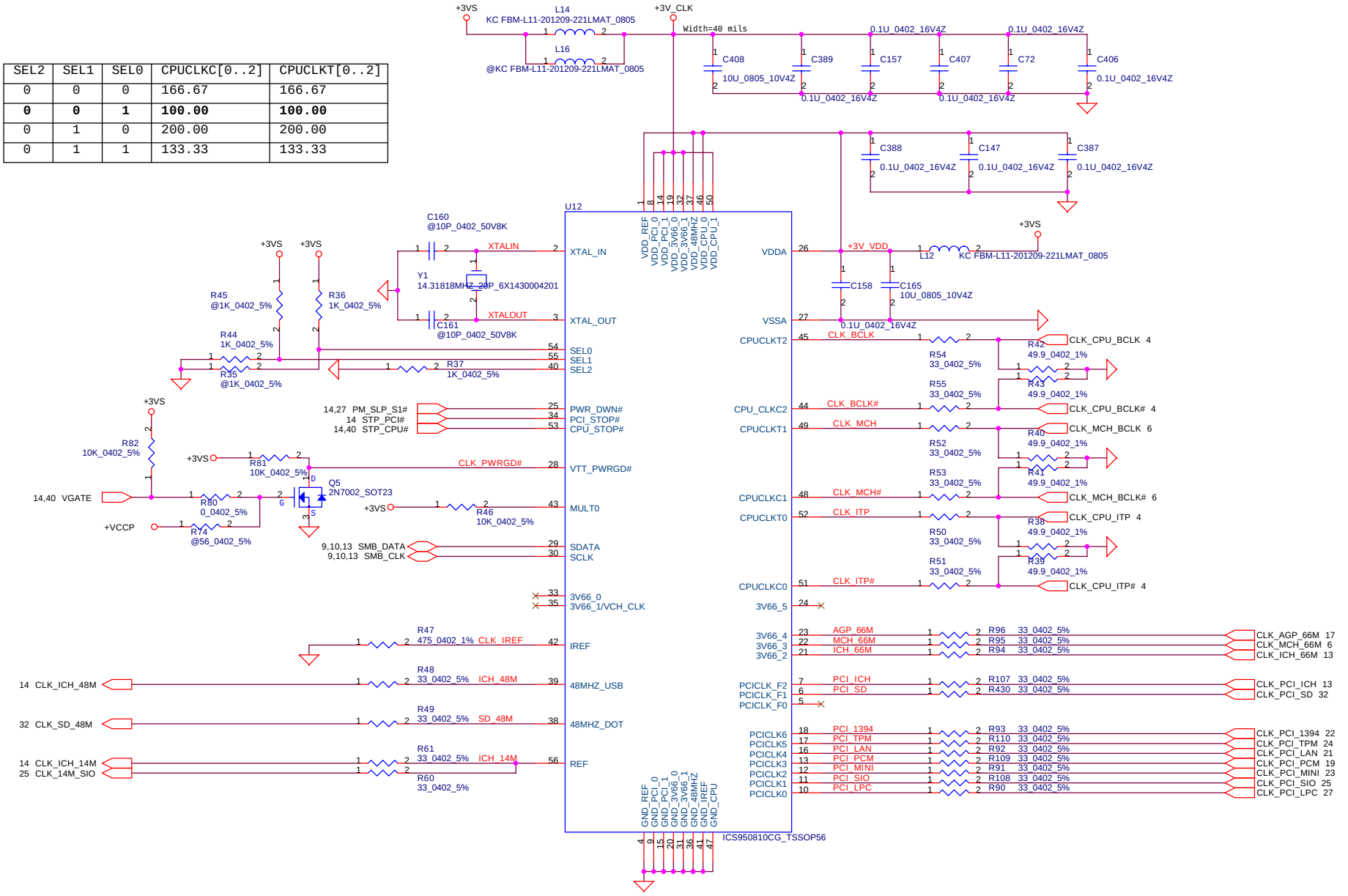
Clock Generator

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

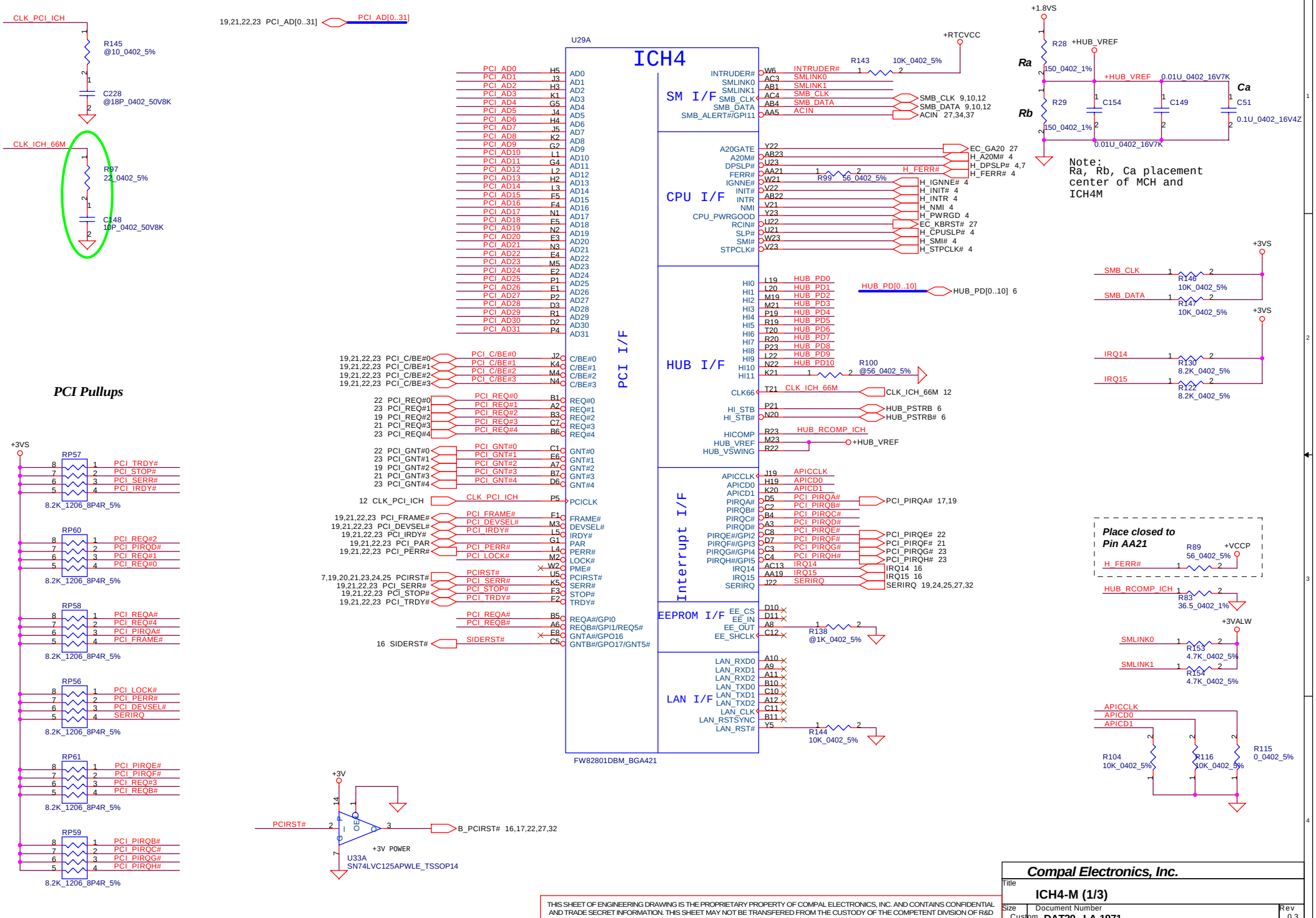


Compal Electronics, Inc.

Title: **Clock Generator**

Size: Custom | Document Number: **DAT20 LA-1971** | Rev: 0.3

Date: Friday, September 26, 2003 | Sheet 12 of 42



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Title: **ICH4-M (1/3)**

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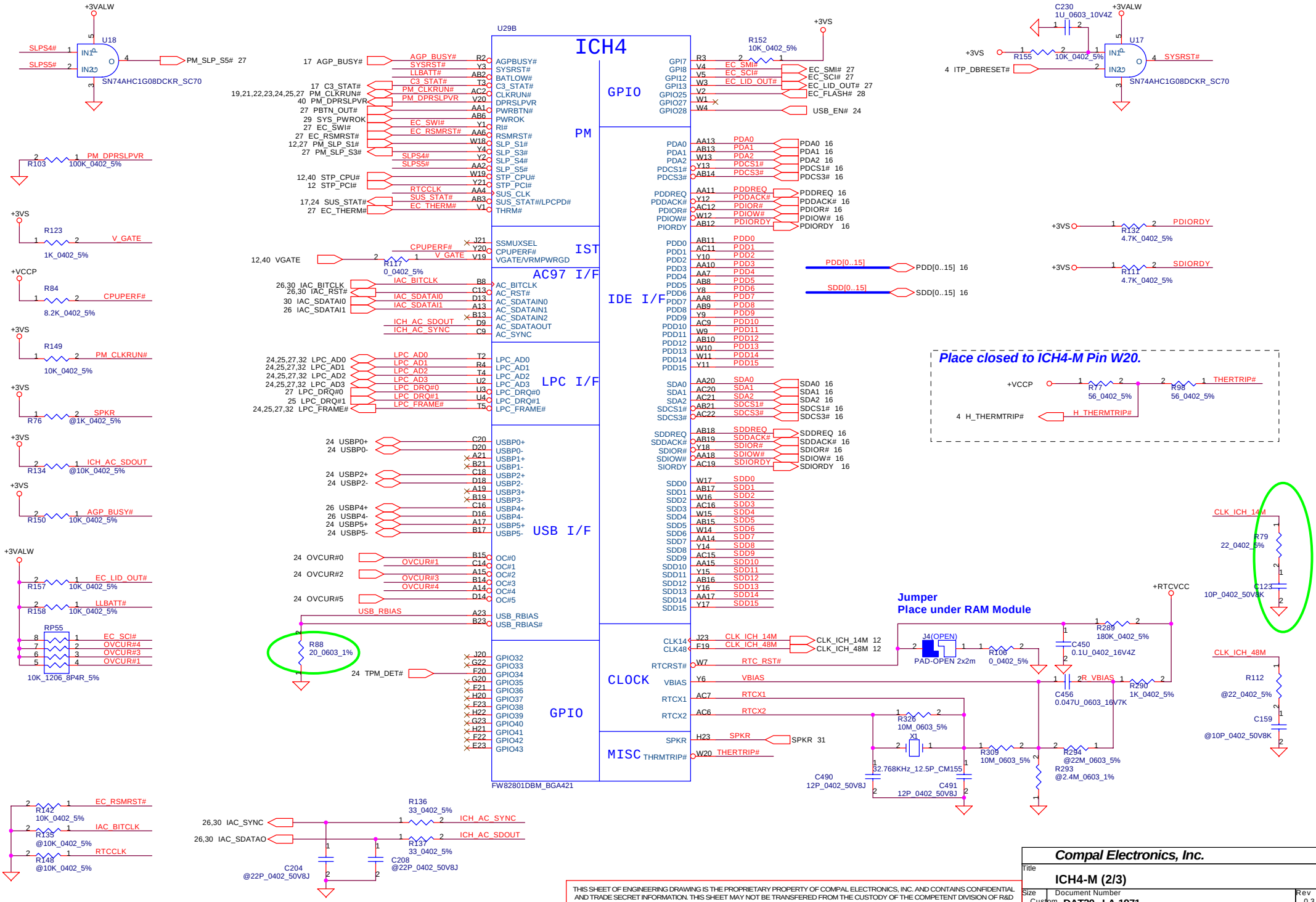

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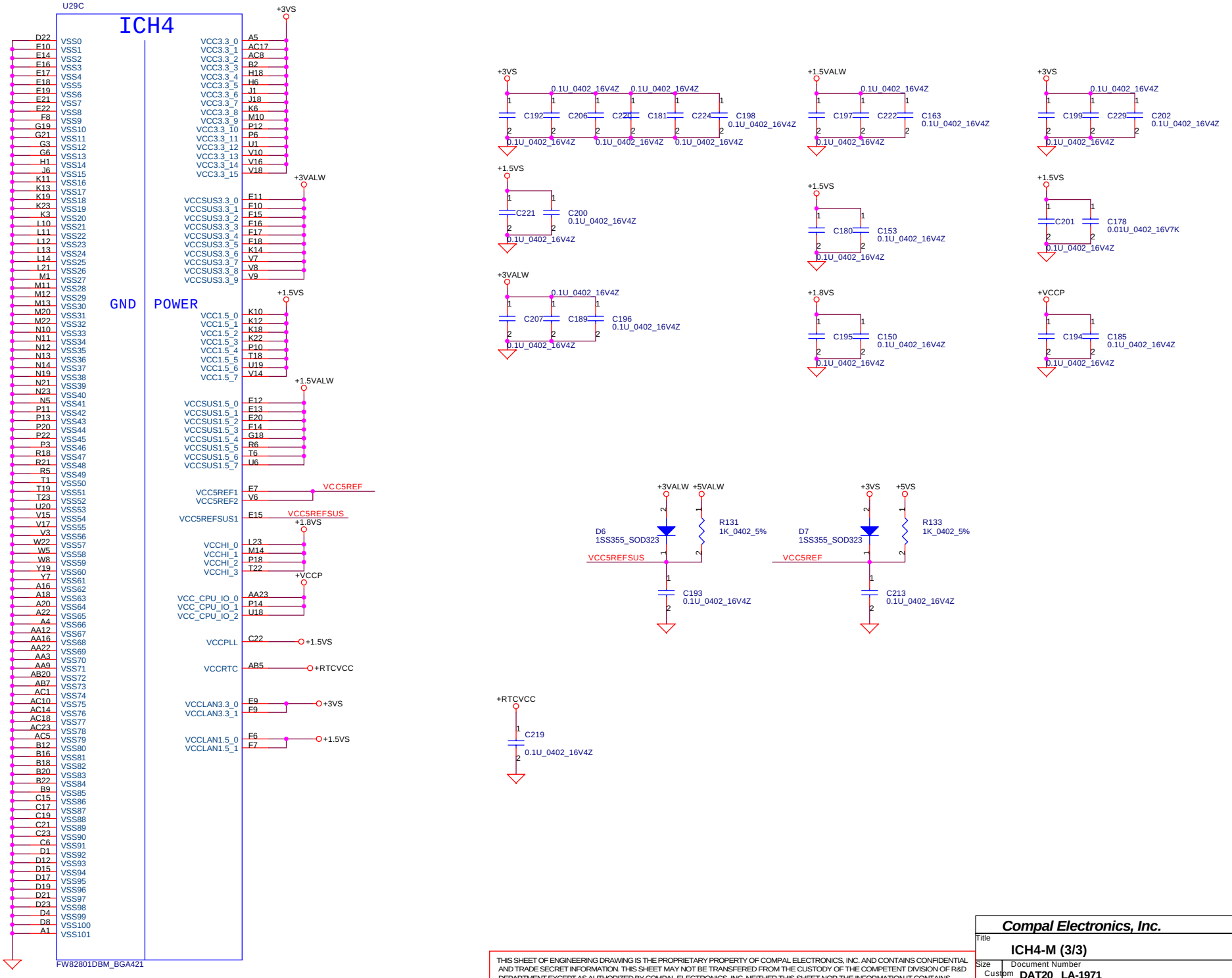

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Title: **ICH4-M (3/3)**

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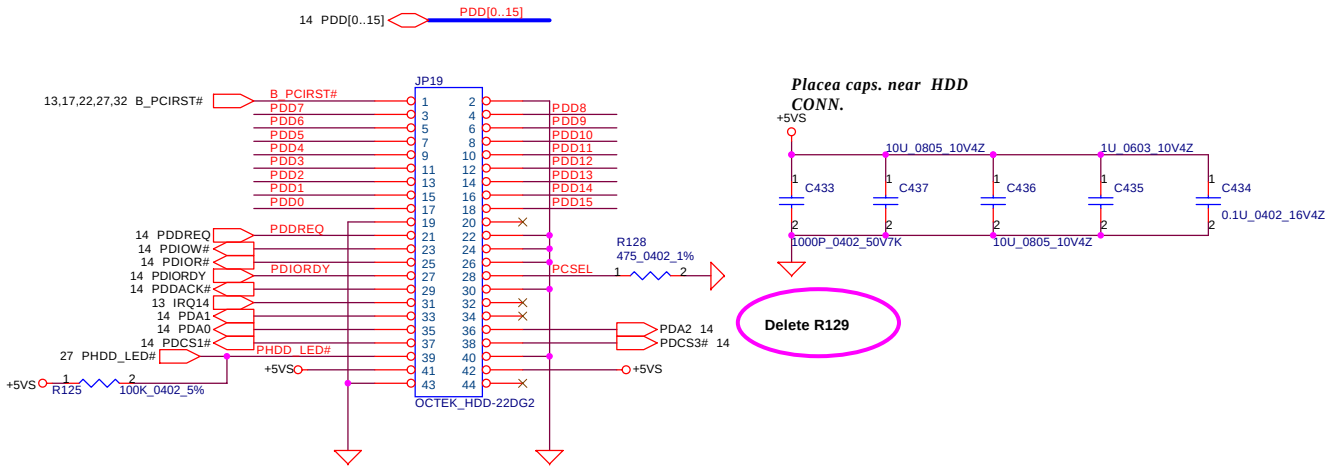
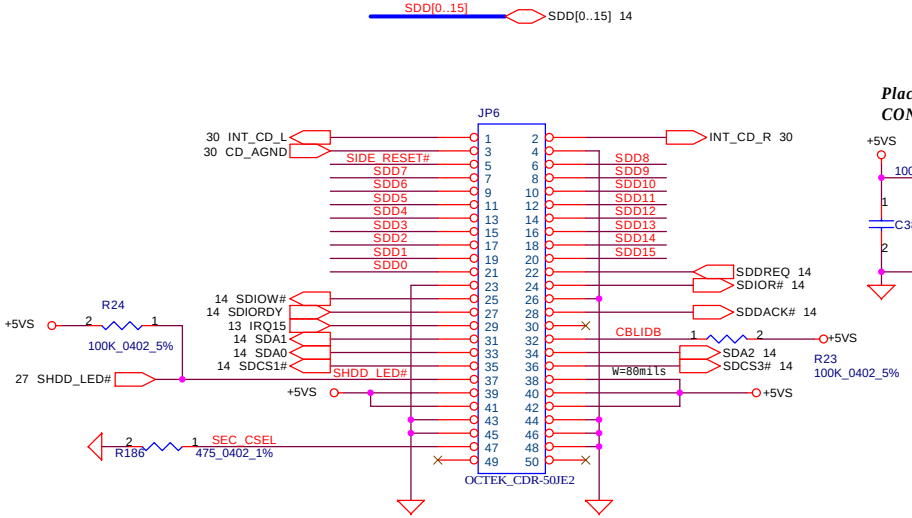
HDD Connector



Placea caps. near HDD CONN.

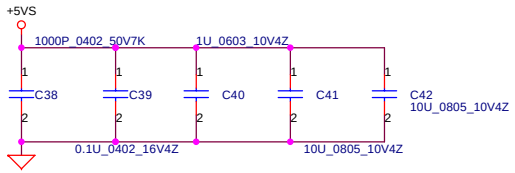
Delete R129

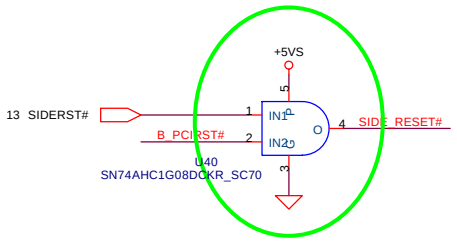
CD-ROM Connector



Change PCB Footprint.

Place caps. near CDROM CONN.





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Title: IDE/CD-ROM Module		
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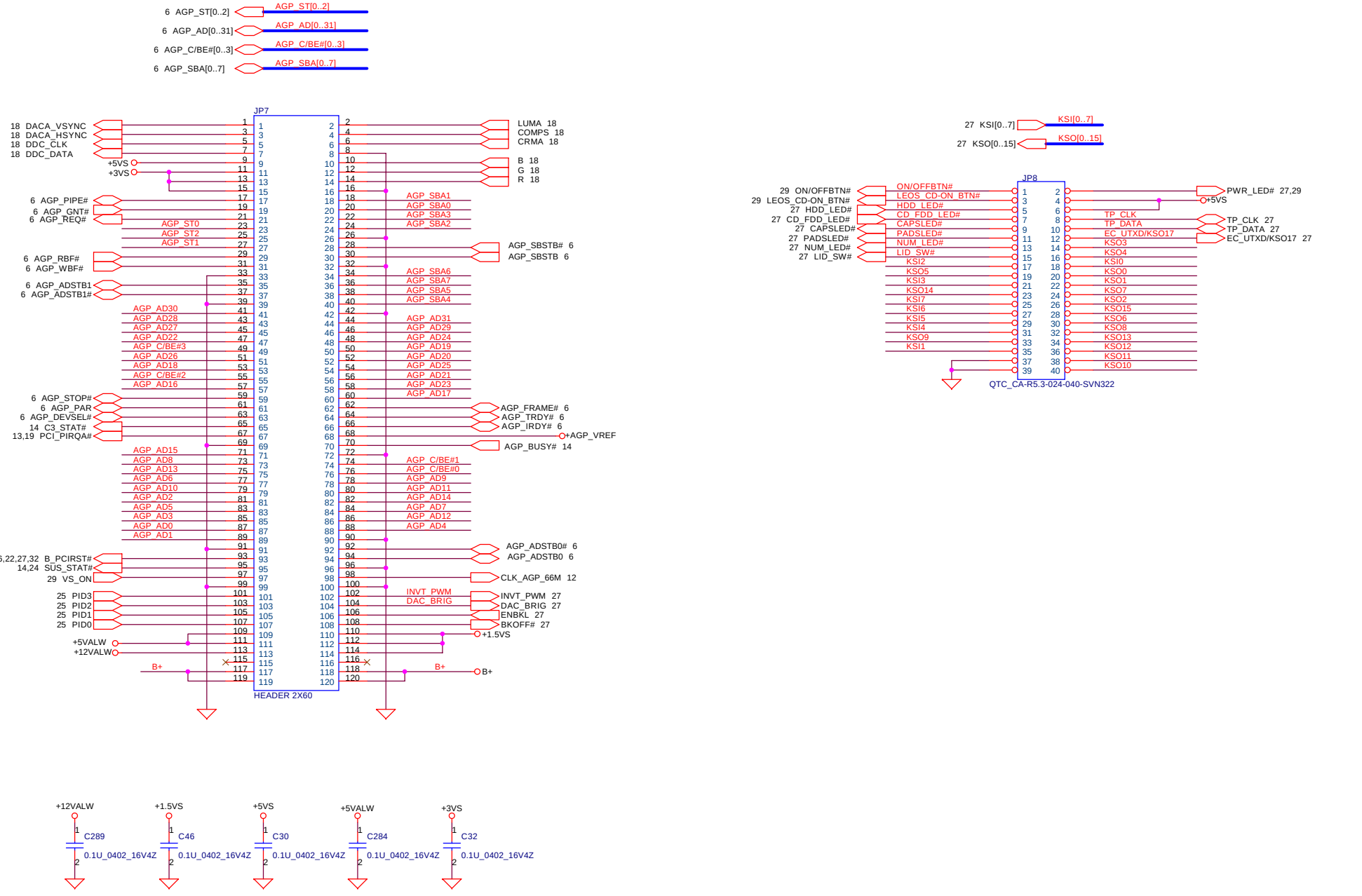

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Title: **AGP Connector**

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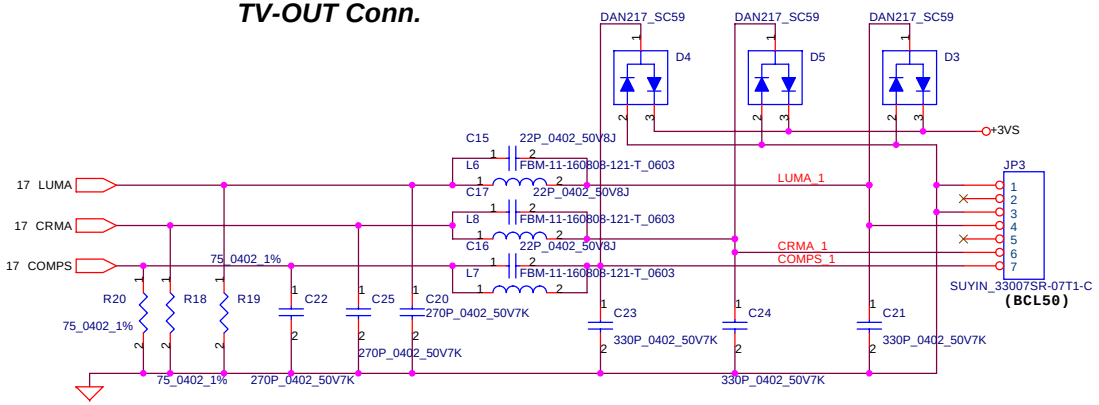
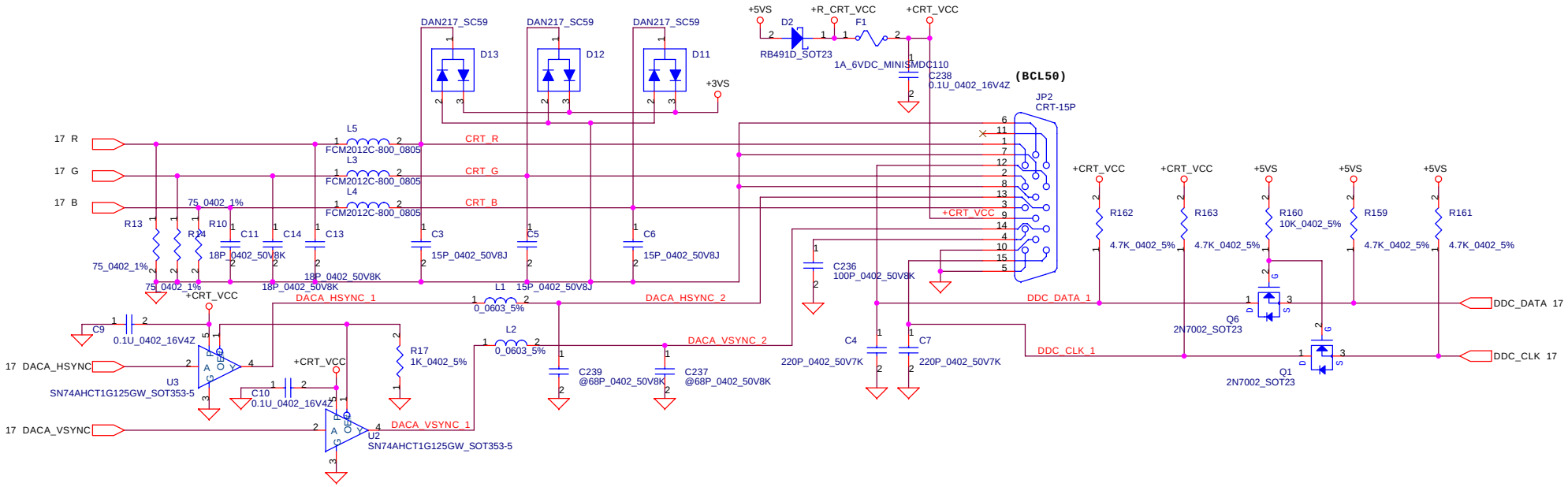
CRT, TV-OUT CONNECTOR

TV-OUT Conn.



CRT Conn.



Compal Electronics, Inc.		
Title: CRT,TV-OUT CONNECTOR		
Size: Custom	Document Number: DAT20 LA-1971	Rev: 0.3
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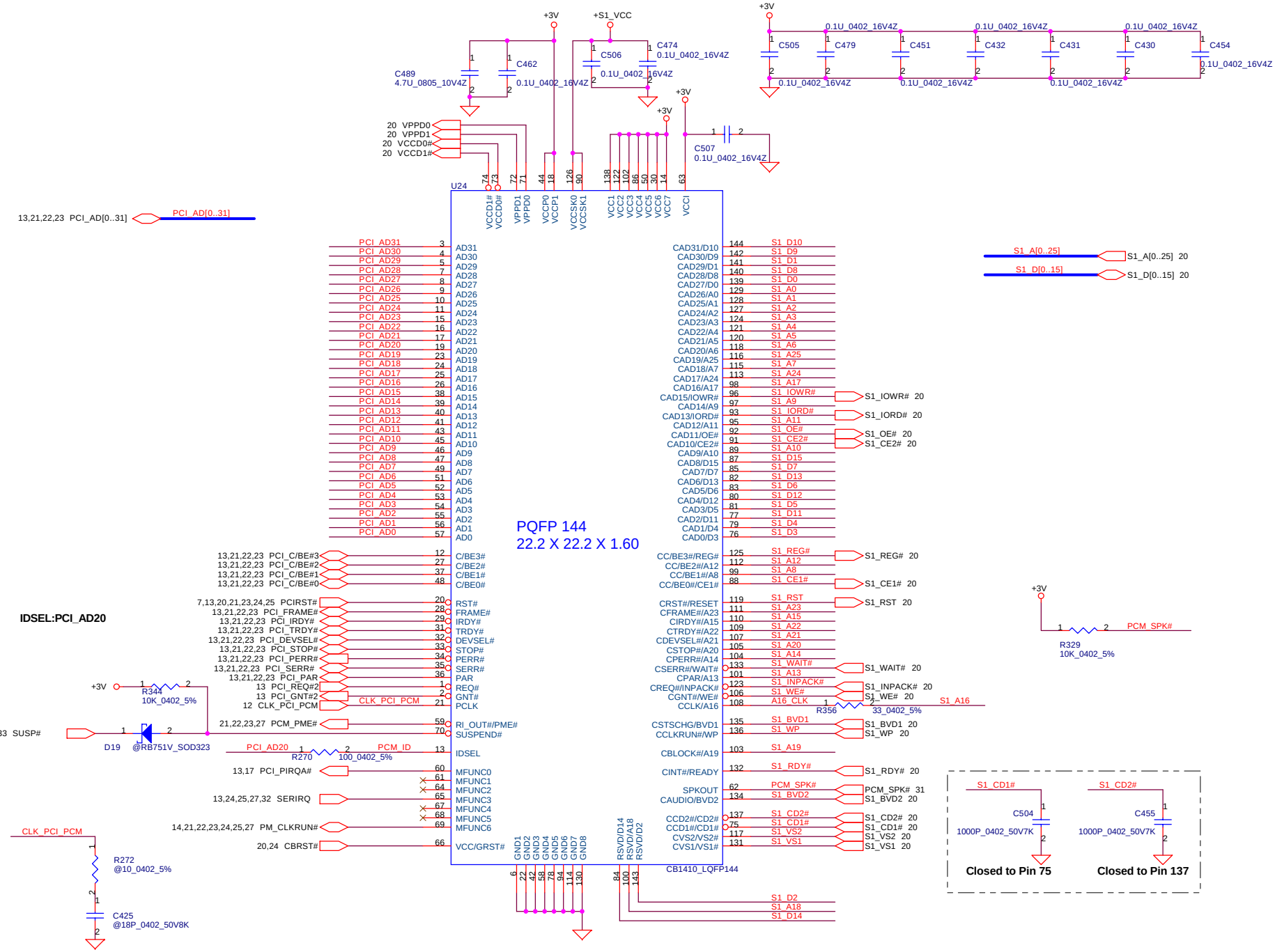

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Title: **PCMCIA controller ENE CB1410**

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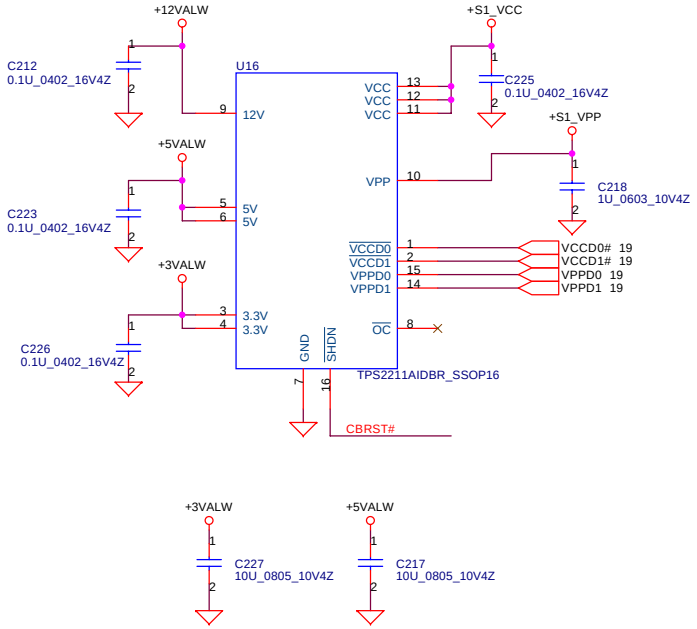
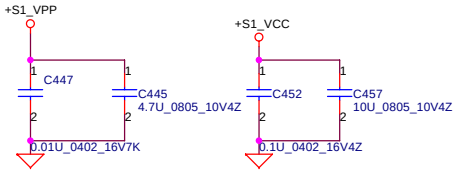
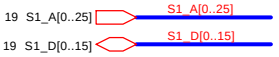
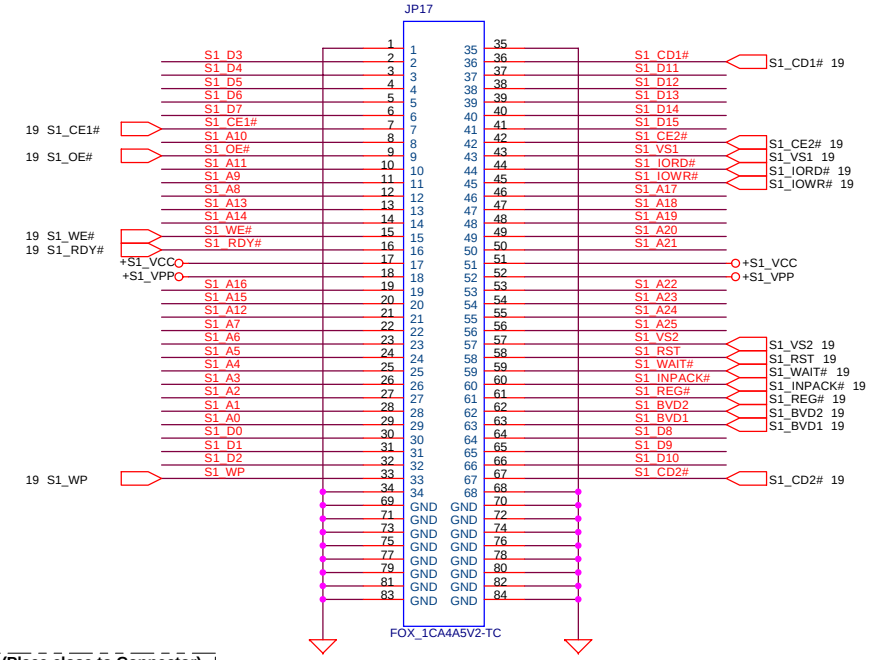
PCMCIA Power Controller



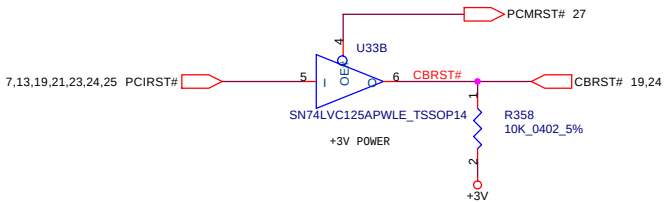


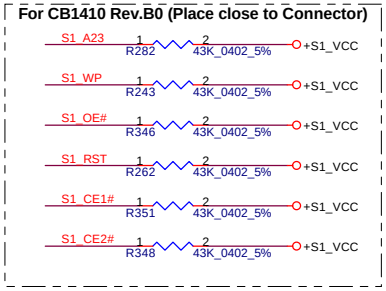


CardBus Socket



SP01F002800





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Title: **CardBus Socket**

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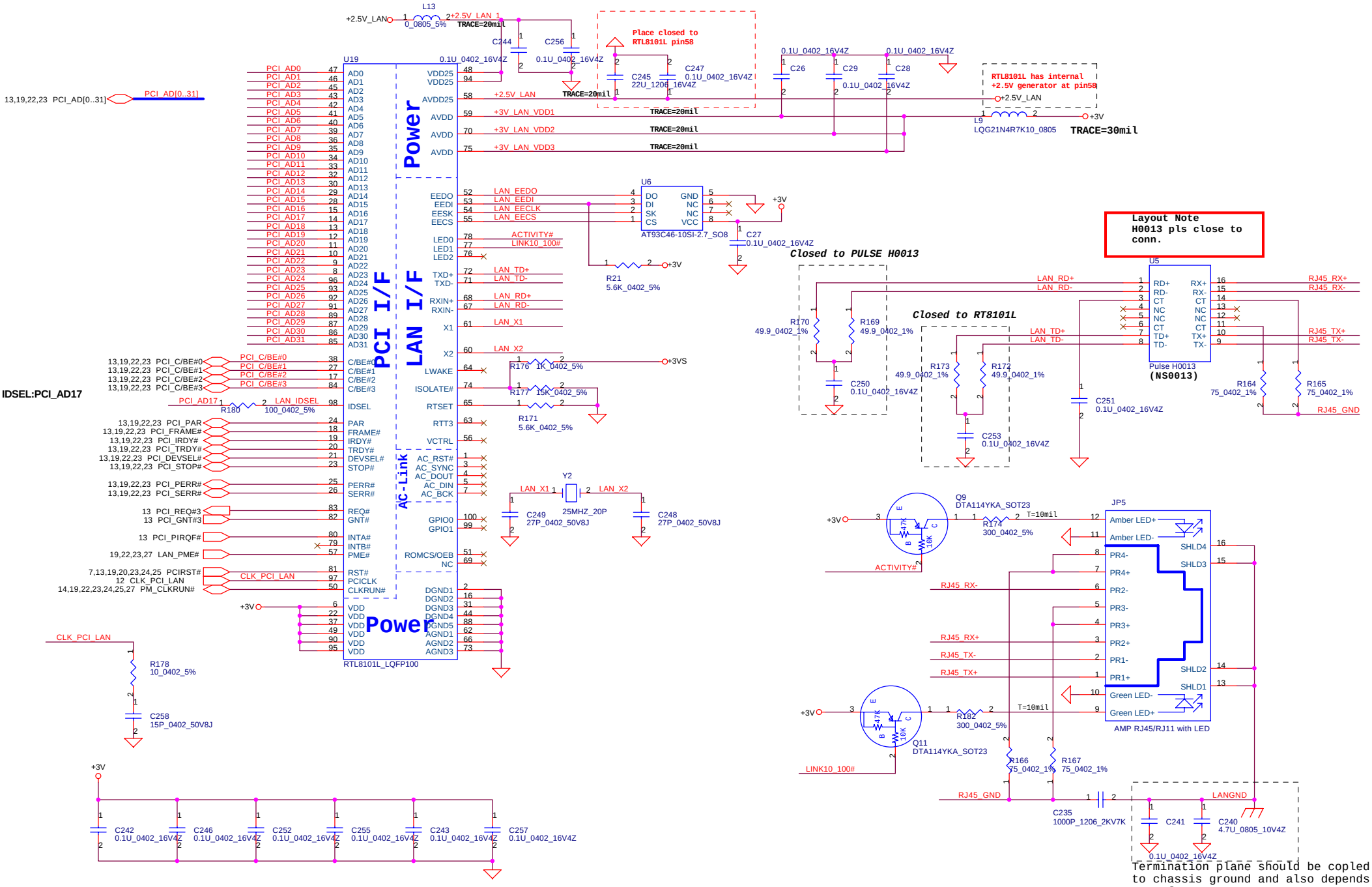

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Title	LAN REALTEK RTL8101L	
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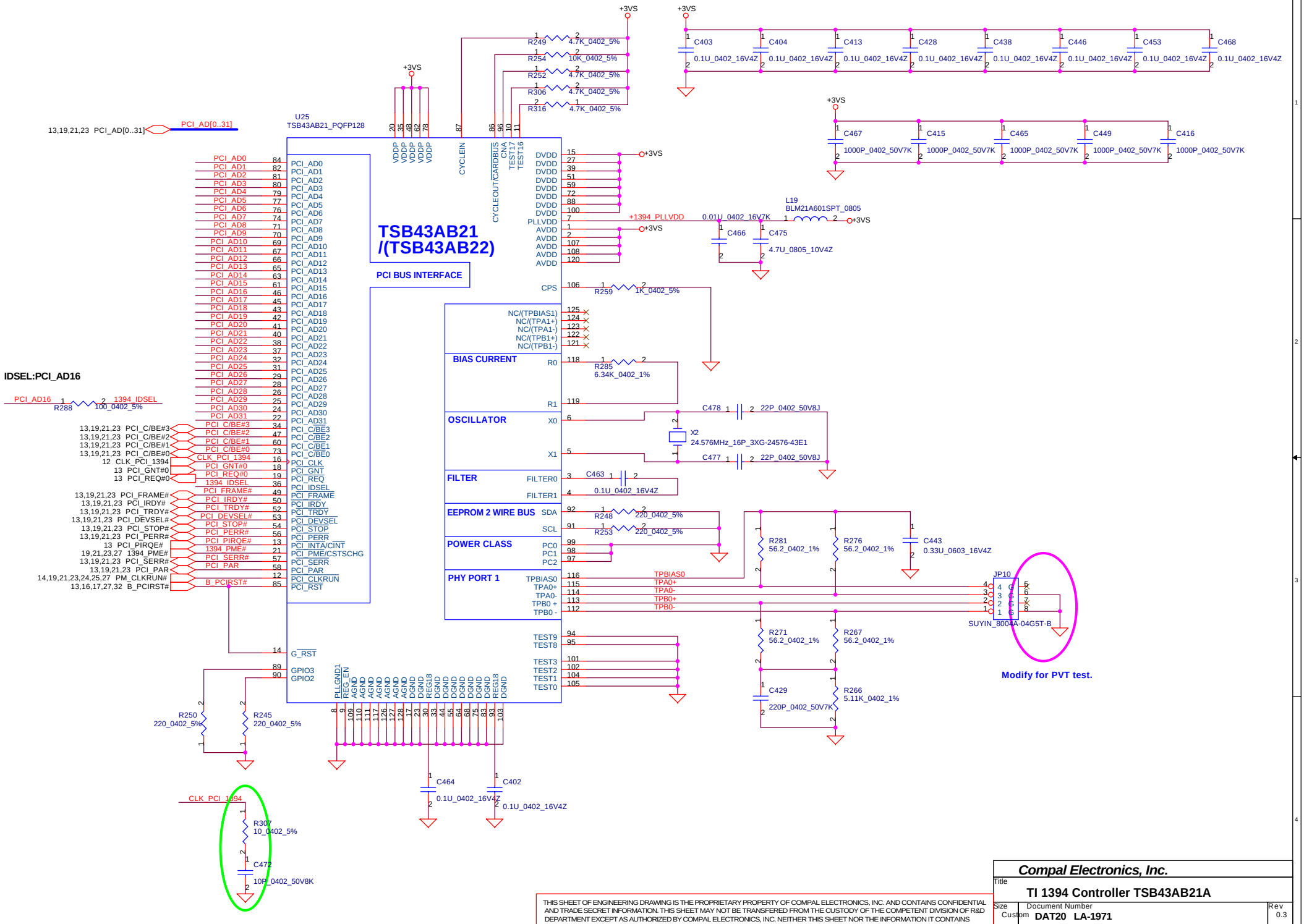
U25
TSB43AB21_PQFP128
TSB43AB21
/(TSB43AB22)
PCI BUS INTERFACE
BIAS CURRENT
OSCILLATOR
FILTER
EEPROM 2 WIRE BUS
POWER CLASS
PHY PORT 1
IDSEL:PCI_AD16
Modify for PVT test.
Compal Electronics, Inc.
TI 1394 Controller TSB43AB21A
DAT20 LA-1971
Friday, September 26, 2003
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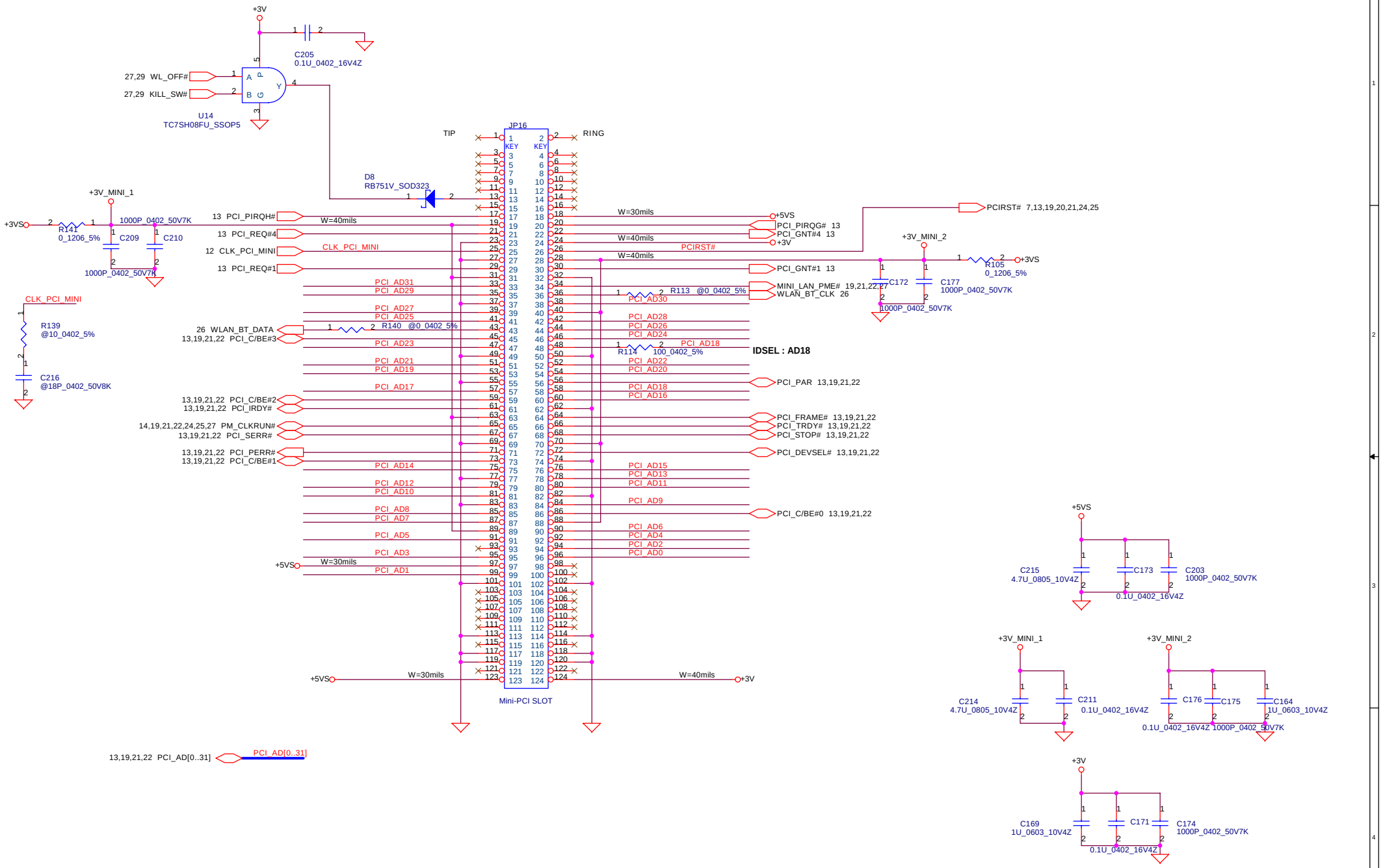

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Title: **Mini PCI Slot**

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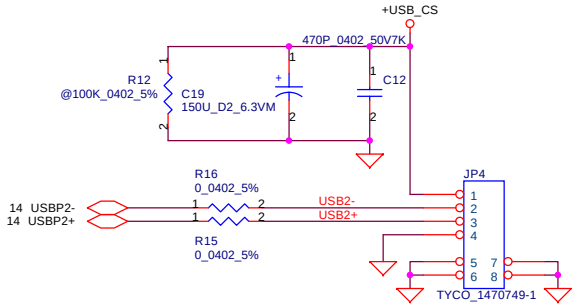
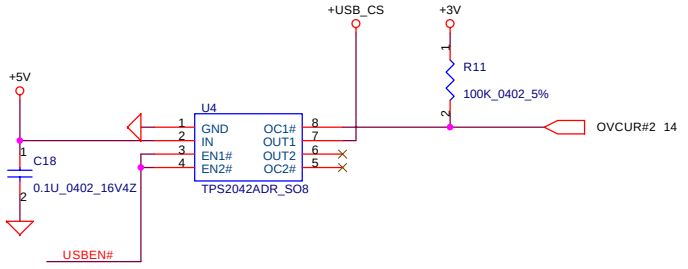
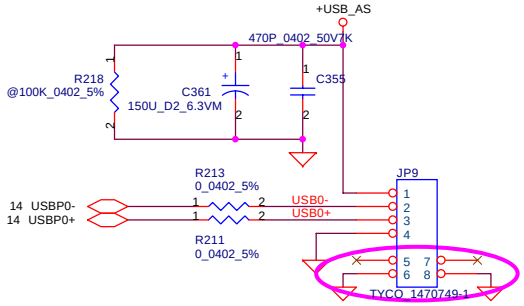
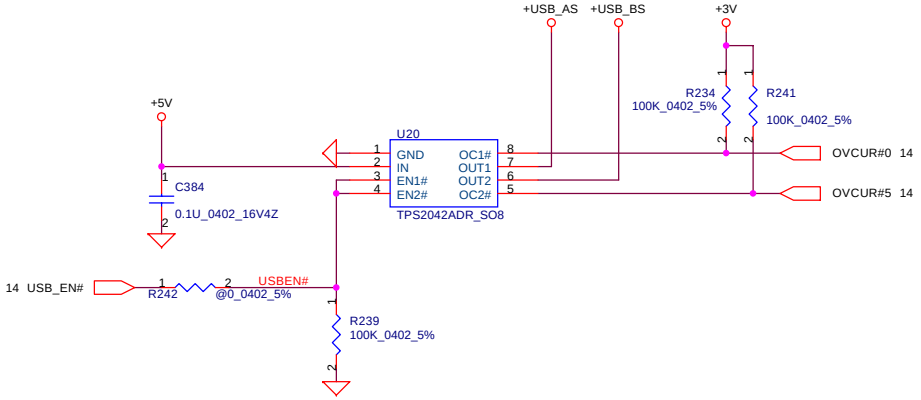
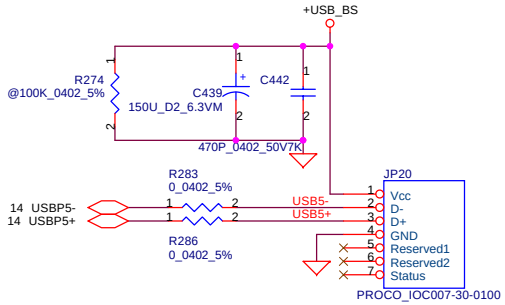
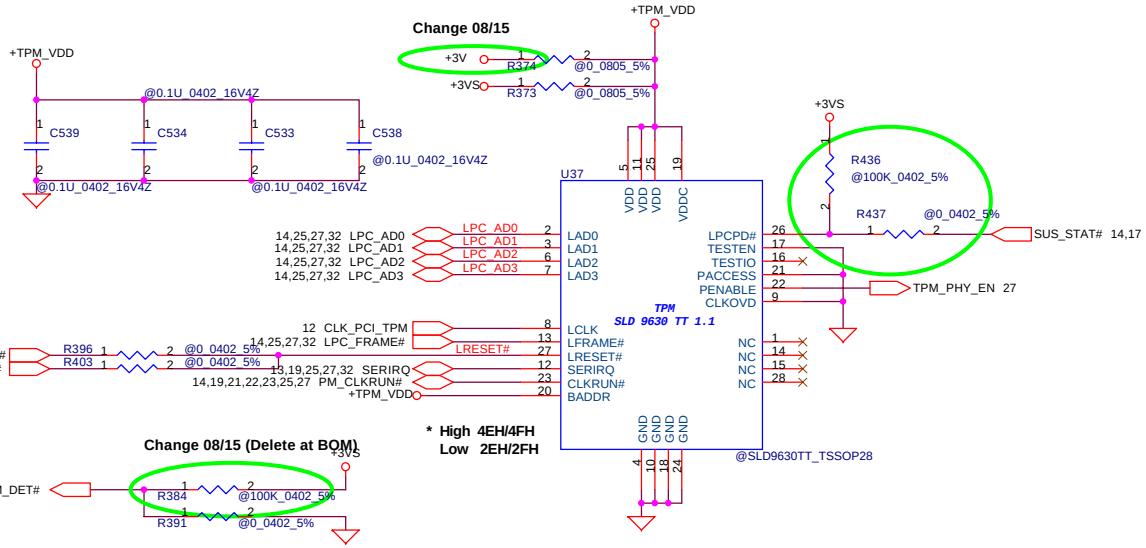




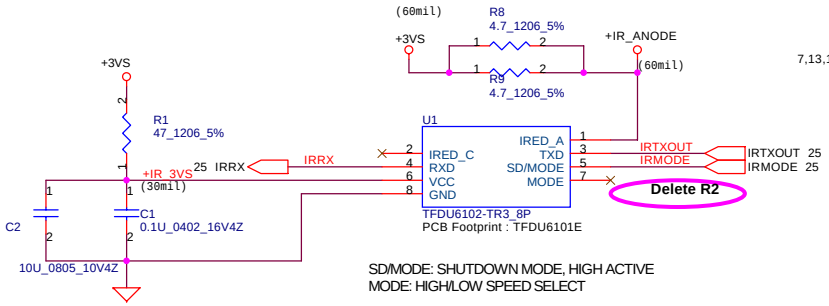








FIR Module



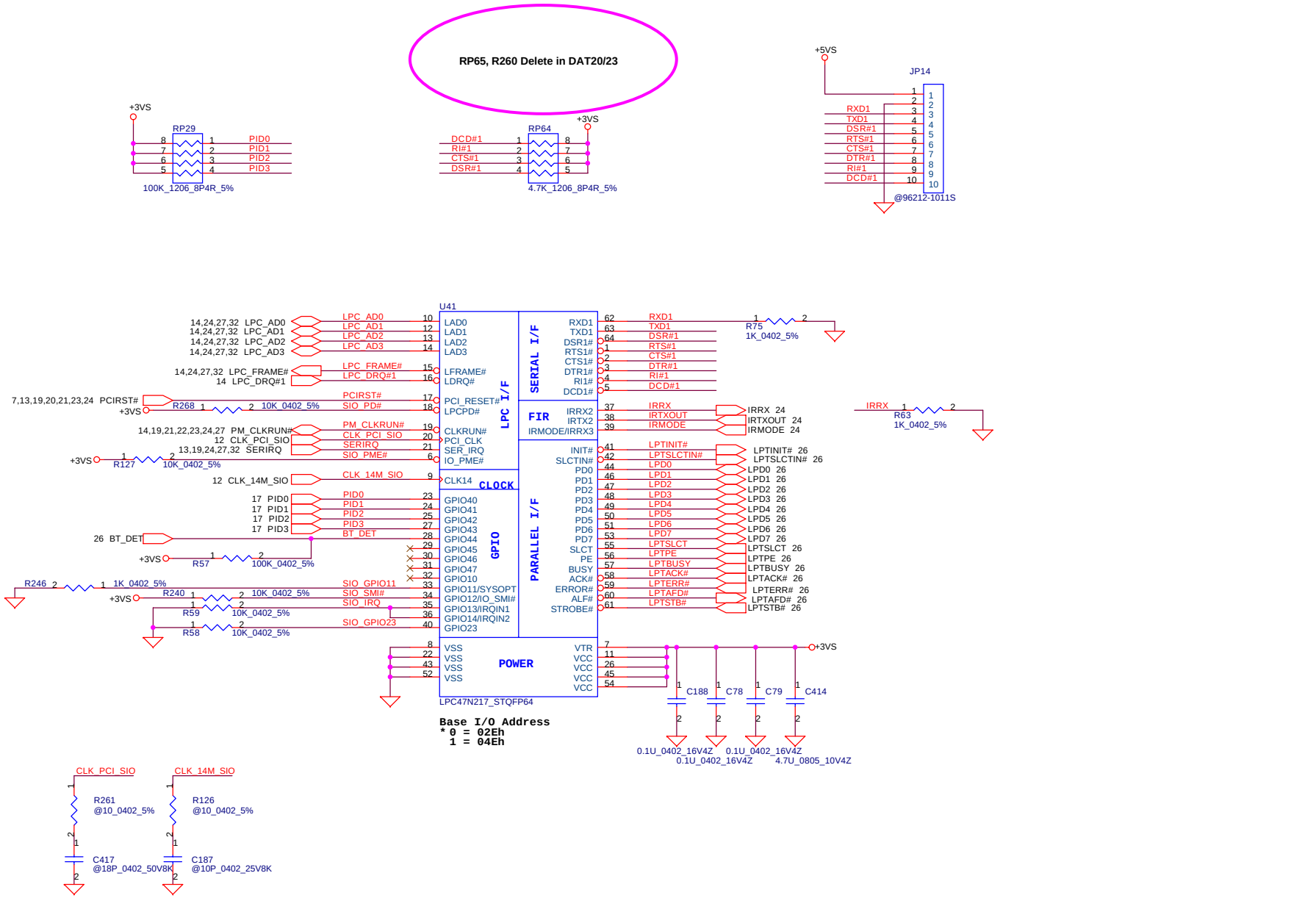
Compal Electronics, Inc.

Title: **USB / FIR / TPM**

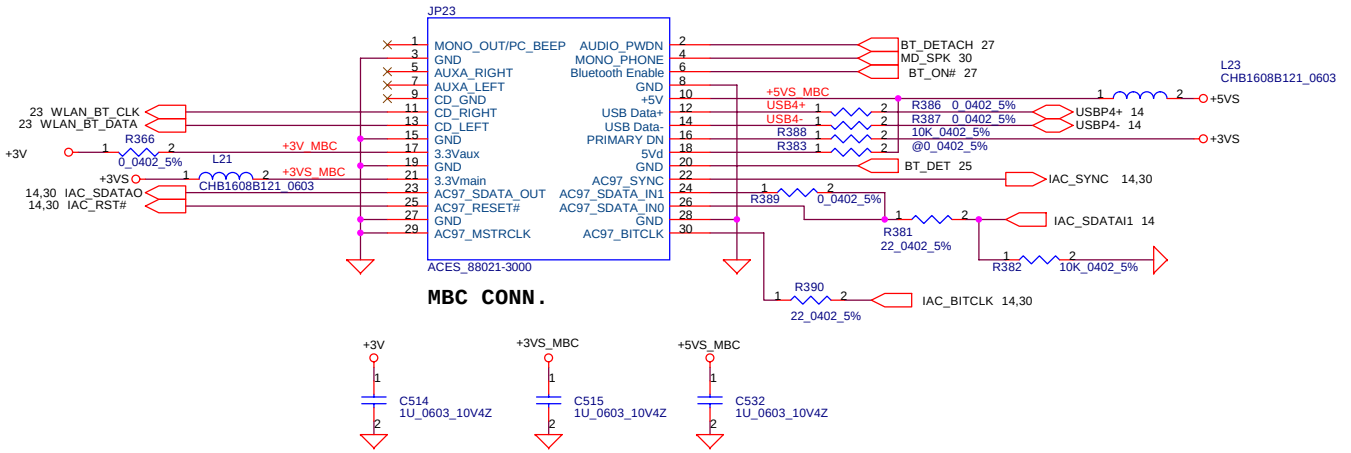
Size: Custom | Document Number: **DAT20 LA-1971** | Rev: 0.3

Date: Friday, September 26, 2003 | Sheet 24 of 42

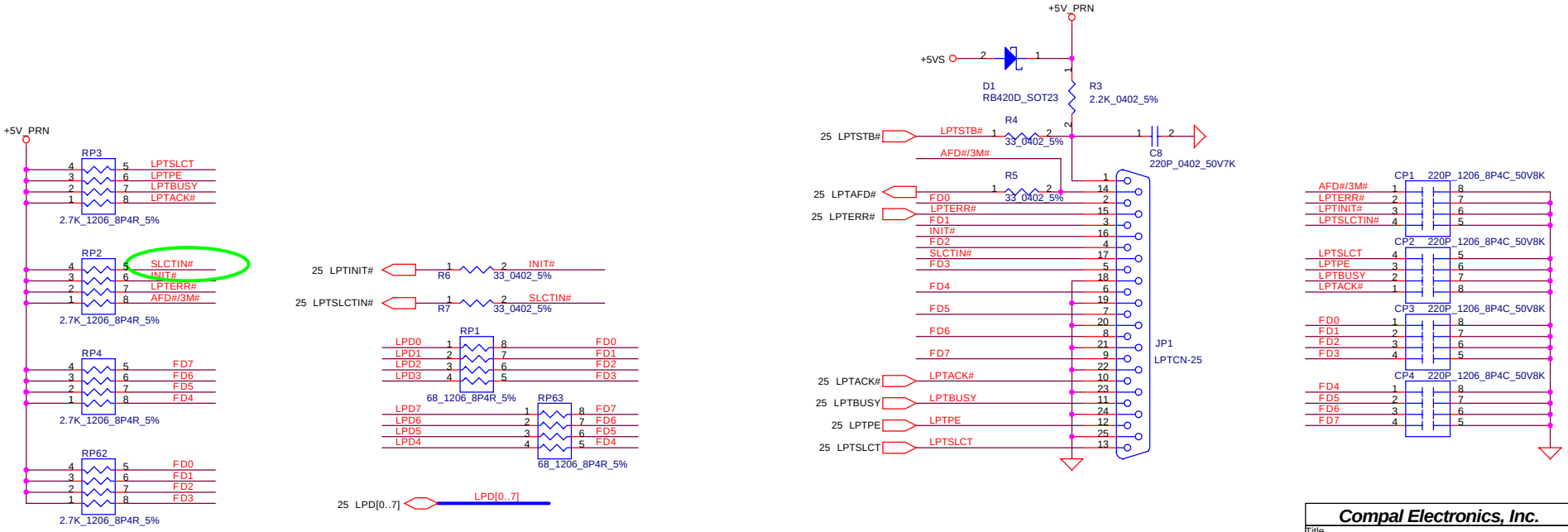
SUPER I/O SMsC LPC47N217



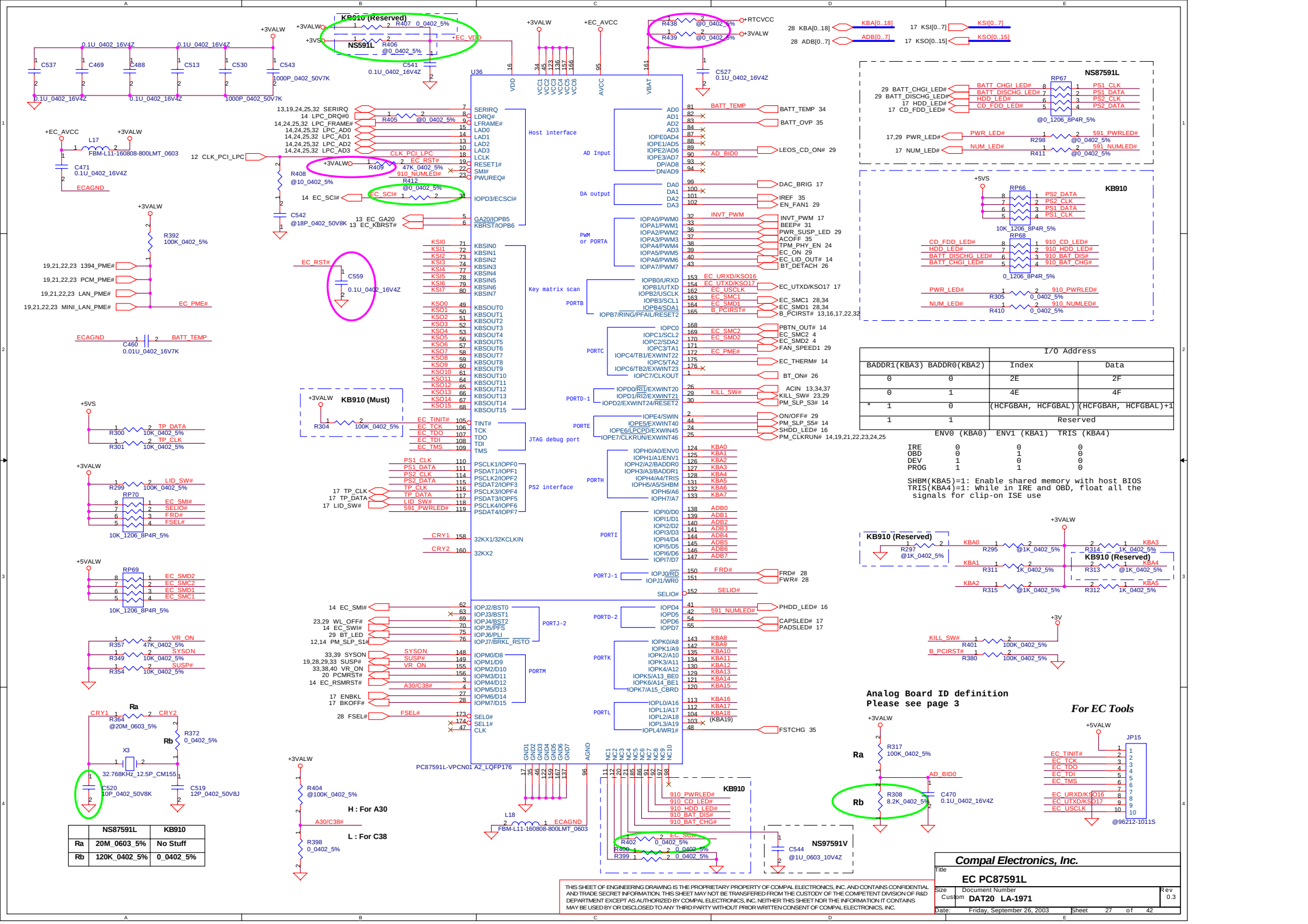
Compal Electronics, Inc.		
Title: SUPER I/O LPC47N217		
Size: Custom	Document Number: DAT20 LA-1971	Rev: 0.3
Date: Friday, September 26, 2003	Sheet 25 of 42	



PARALLEL PORT



Compal Electronics, Inc.		
Title: PARALLEL / MDC PORT		
Size: Custom	Document Number: DAT20 LA-1971	Rev: 0.3
Date: Friday, September 26, 2003	Sheet 26 of 42	

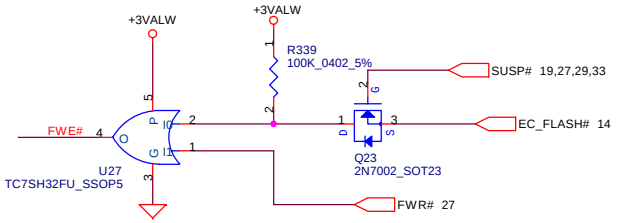


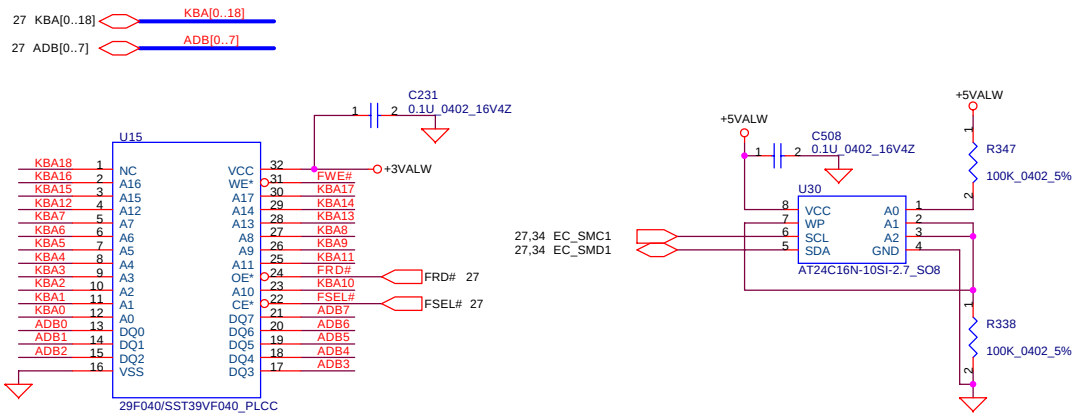
	NS87591L	KB910
Ra	20M_0603_5%	No Stuff
Rb	120K_0402_5%	0_0402_5%

CF2 SMDC40M80
CF4 SMDC40M80
CF1 SMDC40M80
CF3 SMDC40M80
CF8 SMDC40M80
CF15 SMDC40M80
CF5 SMDC40M80
CF6 SMDC40M80
CF9 SMDC40M80
CF12 SMDC40M80
CF11 SMDC40M80
CF14 SMDC40M80
CF13 SMDC40M80
CF16 SMDC40M80

FD1 FIDUCAL
FD2 FIDUCAL
FD3 FIDUCAL
FD4 FIDUCAL
FD5 FIDUCAL
FD6 FIDUCAL

H4 H_S315D138
H3 H_S315D138
H9 H_S315D138
H22 H_S315D138
H19 H_S315D138
H17 H_S315D138
H21 H_S315D138
H15 H_S315D138
H14 H_C315D138
H1 H_S315D165
H2 H_S315D165
H8 H_S315D165
H10 H_S315D165
H6 H_C354D165
H7 H_C354D165
H11 H_C354D165
H12 H_C354D165
H18 H_C276D142
H16 H_C256D165
H20 H_R386X189D307X110
H13 H_S315D138
H5 H_S394D165
H24 H_O292X55D272X35
H23 H_O174X55D154X35





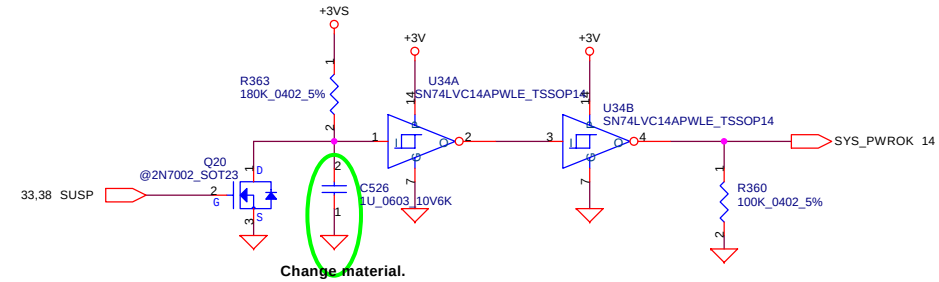
Compal Electronics, Inc.

Title: **BIOS & EXT. I/O PORT**

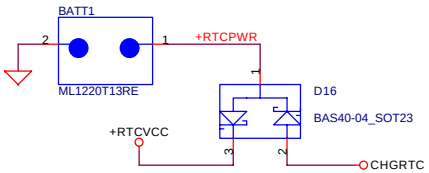
Size: Custom | Document Number: **DAT20 LA-1971** | Rev: 0.3

Date: Friday, September 26, 2003 | Sheet 28 of 42

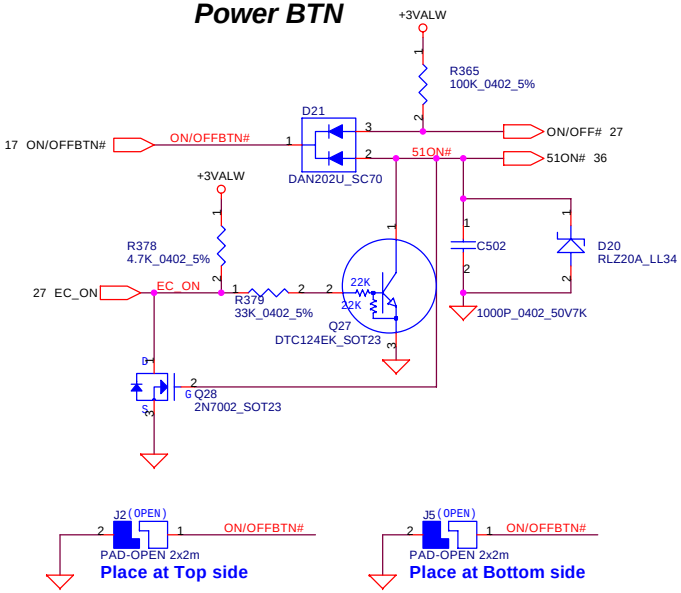
Power ON Circuit

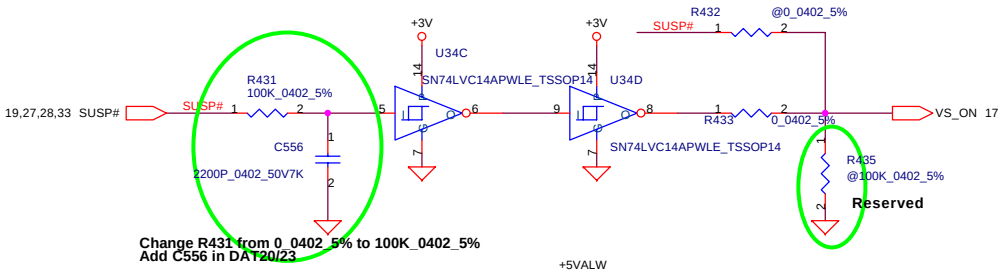


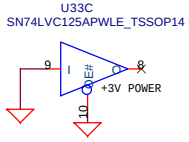
RTC Battery



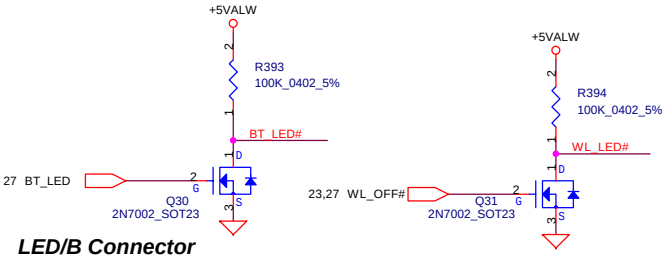
Power BTN



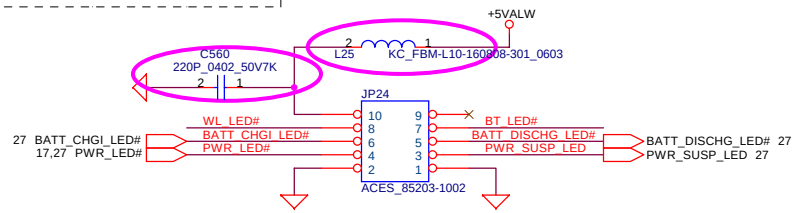


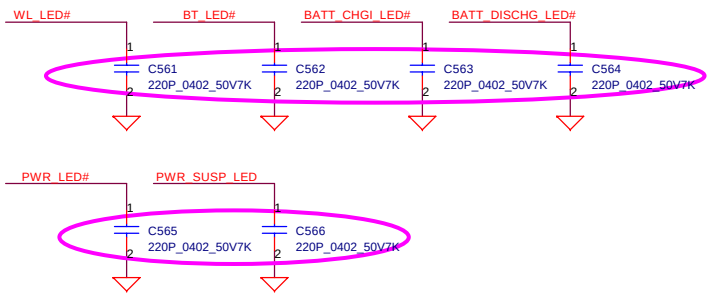


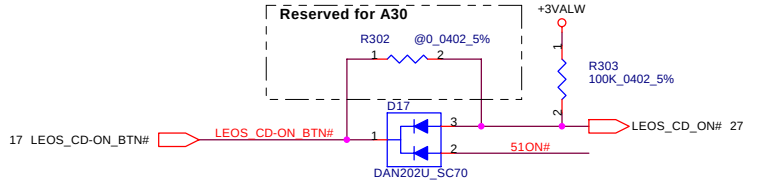
LED INDICATOR	C38	30
PWR	Blue	Green
PWR_SUSP	AMB	AMB
BATT_CHGI	Blue	Green
BATT_DISCHG	AMB	AMB
WL_LED	Blue	Green
BT_LED	AMB	AMB
SD_LED	None	Green



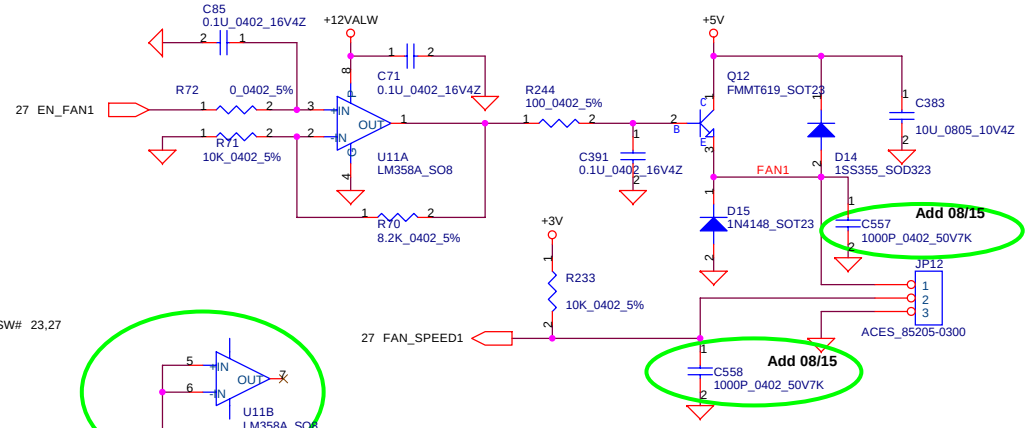
LED/B Connector



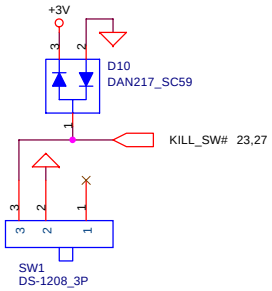




Fan Control circuit



KILL_Switch



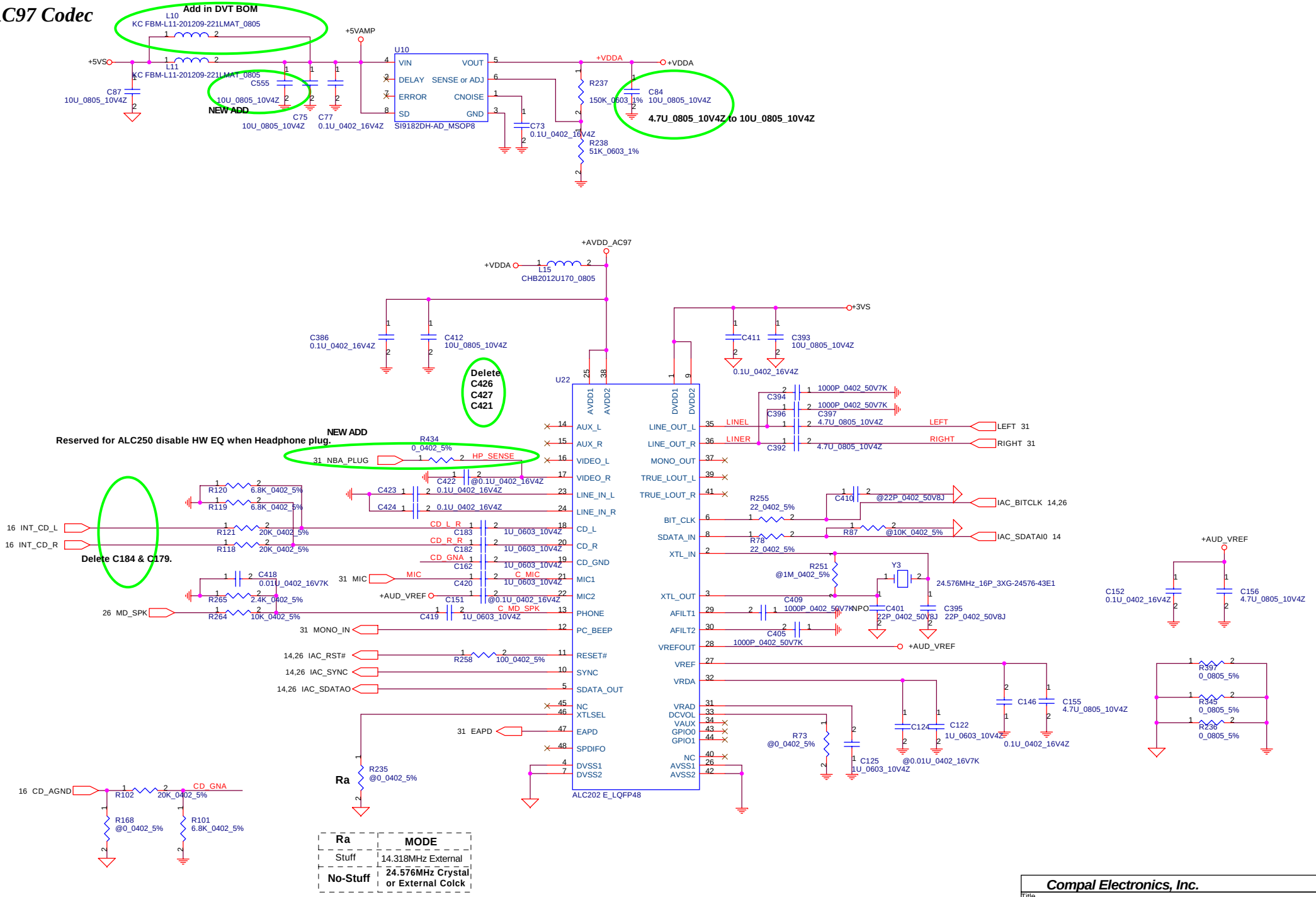
Compal Electronics, Inc.

Title: Power OK/Reset/RTC battery

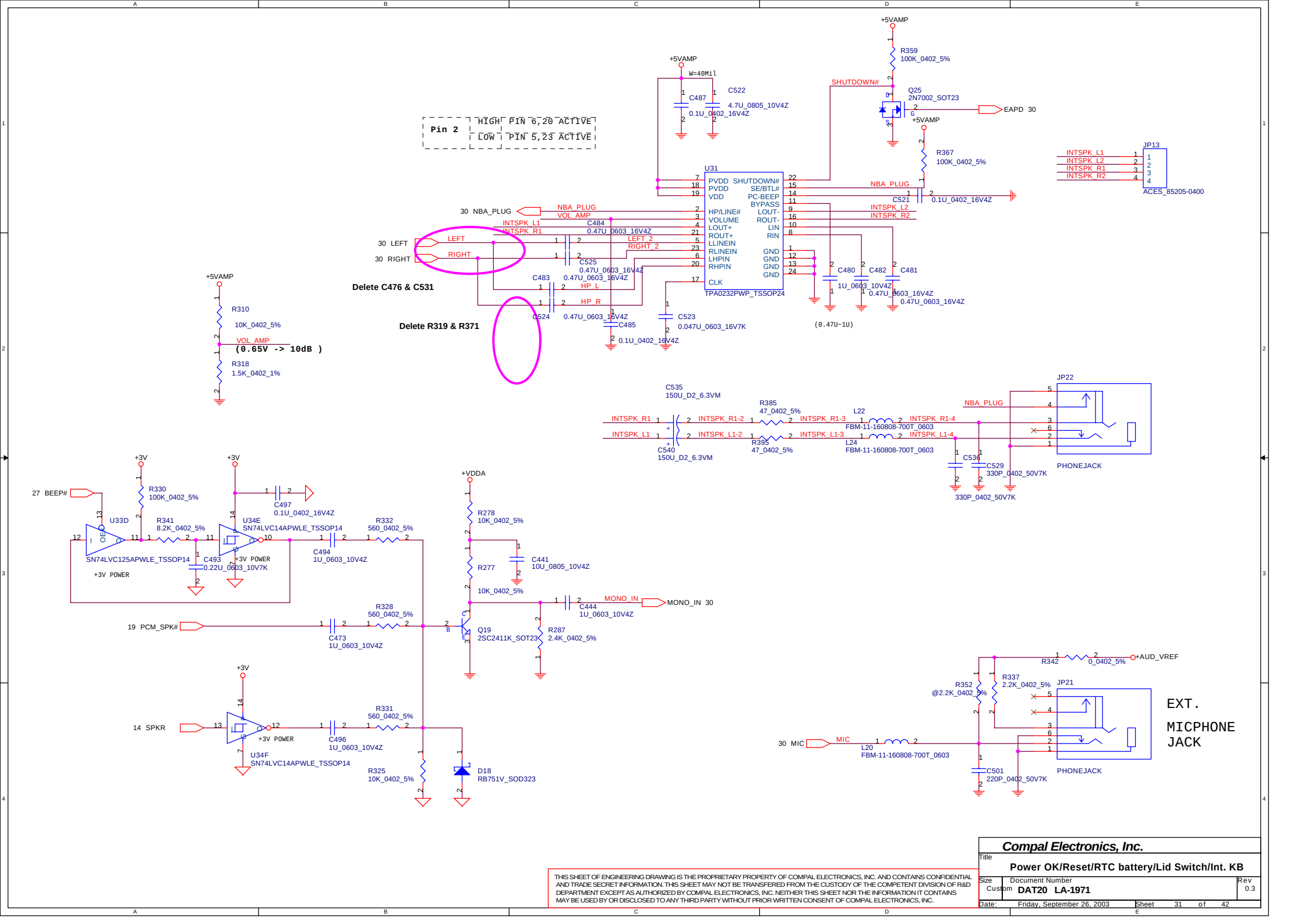
Size: Custom | Document Number: DAT20 LA-1971 | Rev: 0.3

Date: Friday, September 26, 2003 | Sheet 29 of 42

AC97 Codec



Compal Electronics, Inc.			
Title: AC97 Codec Realtek ALC202			
Size: Custom	Document Number: DAT20 LA-1971		Rev: 0.3
Date: Friday, September 26, 2003	Sheet 30 of 42		

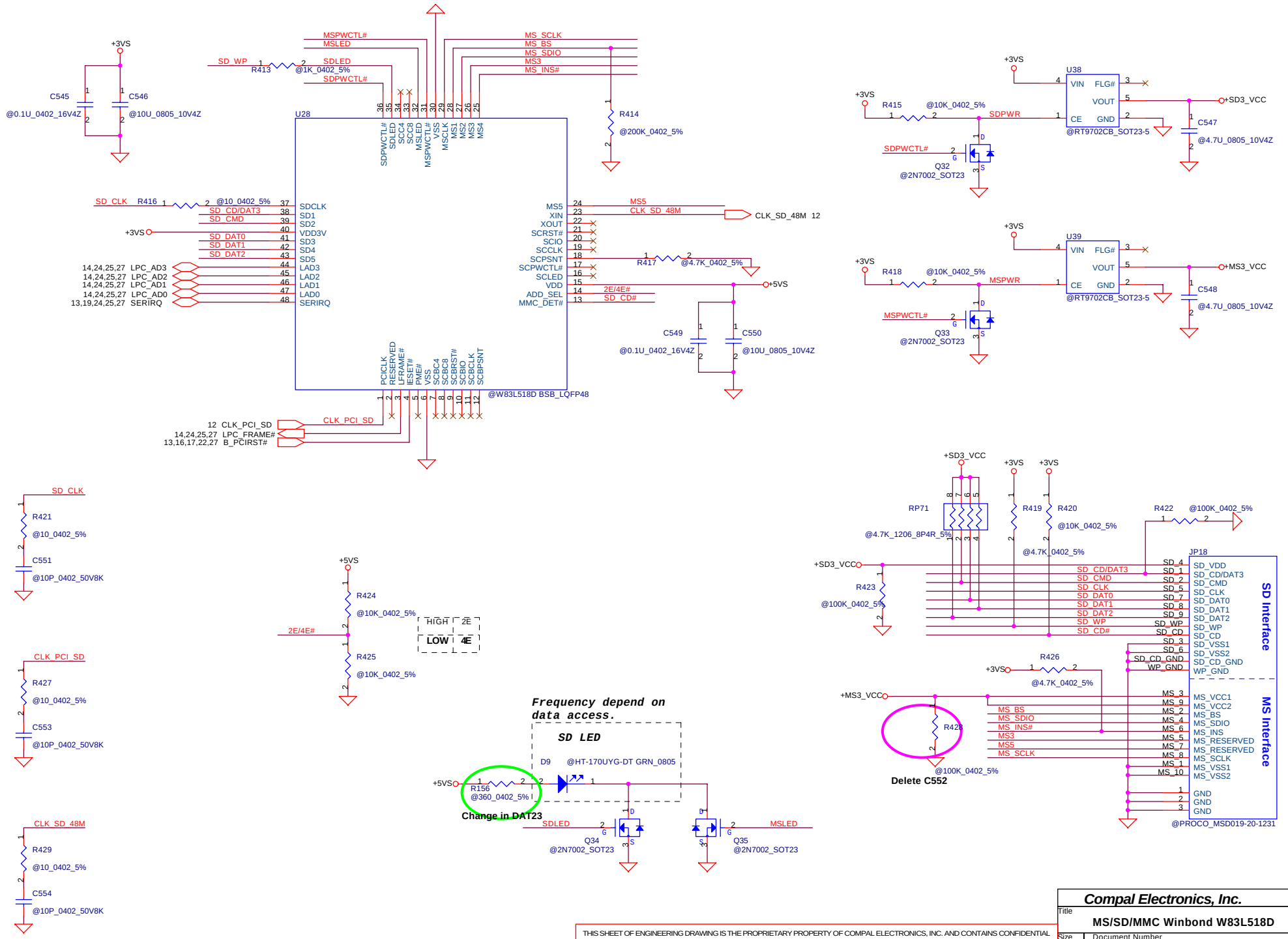


Compal Electronics, Inc.

Title: **Power OK/Reset/RTC battery/Lid Switch/Int. KB**

Size: Custom | Document Number: **DAT20 LA-1971** | Rev: 0.3

Date: Friday, September 26, 2003 | Sheet 31 of 42



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Compal Electronics, Inc.

Title	MS/SD/MMC Winbond W83L518D	
Size: Custom	Document Number: DAT20 LA-1971	Rev: 0.3
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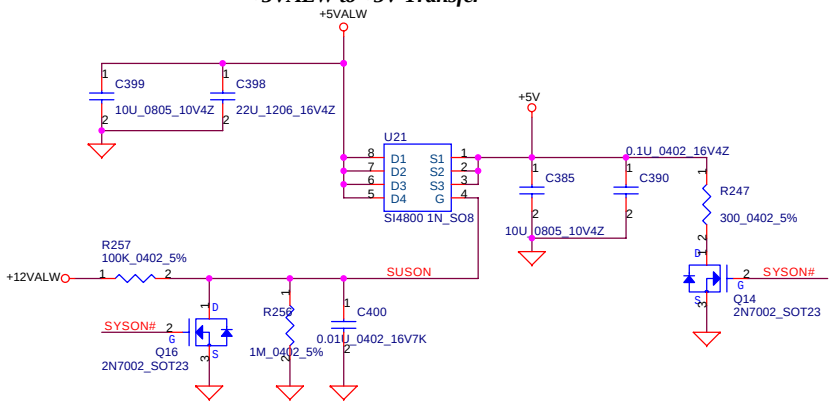
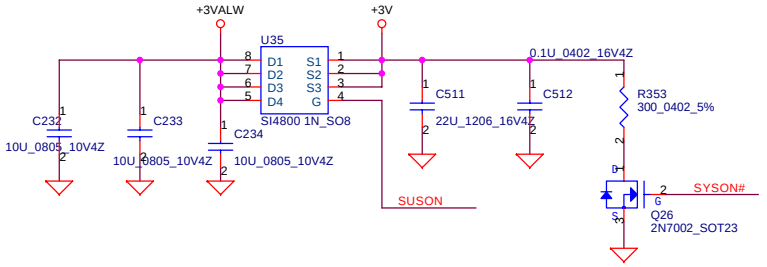
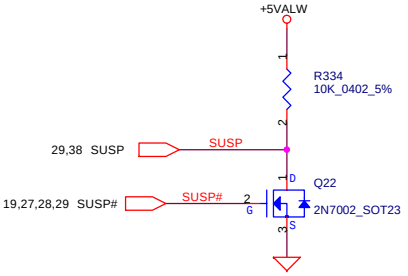
+5VALW to +5V Transfer

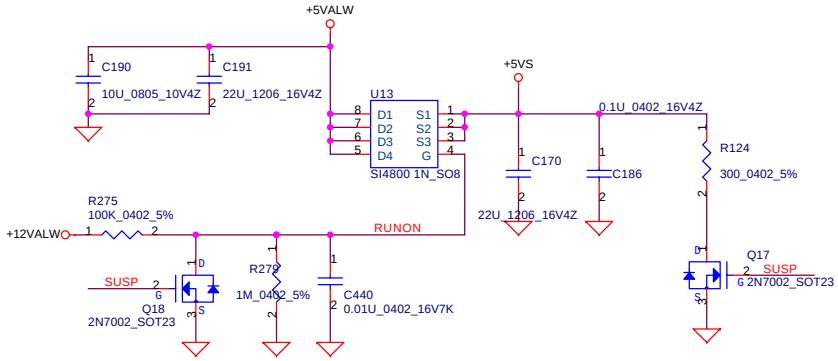


+3VALW to +3V Transfer

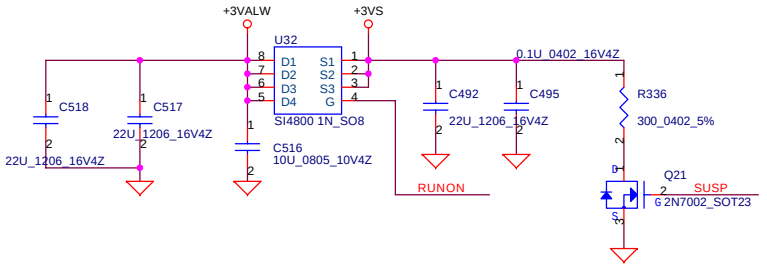


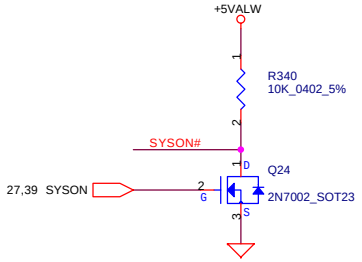


+5VALW to +5VS Transfer

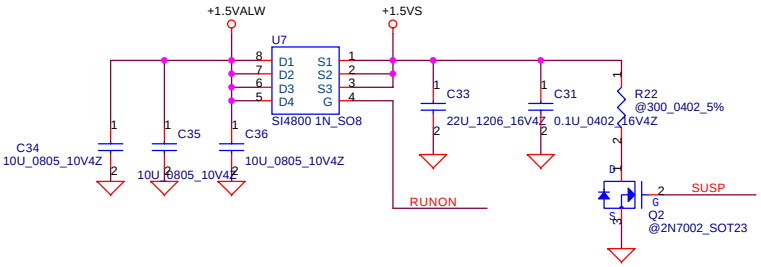


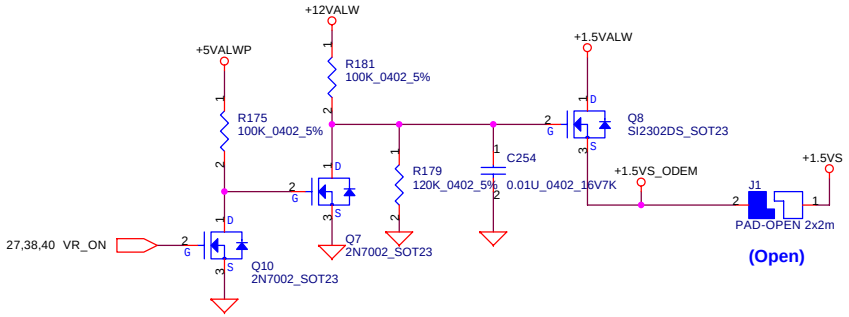
+3VALW to +3VS Transfer





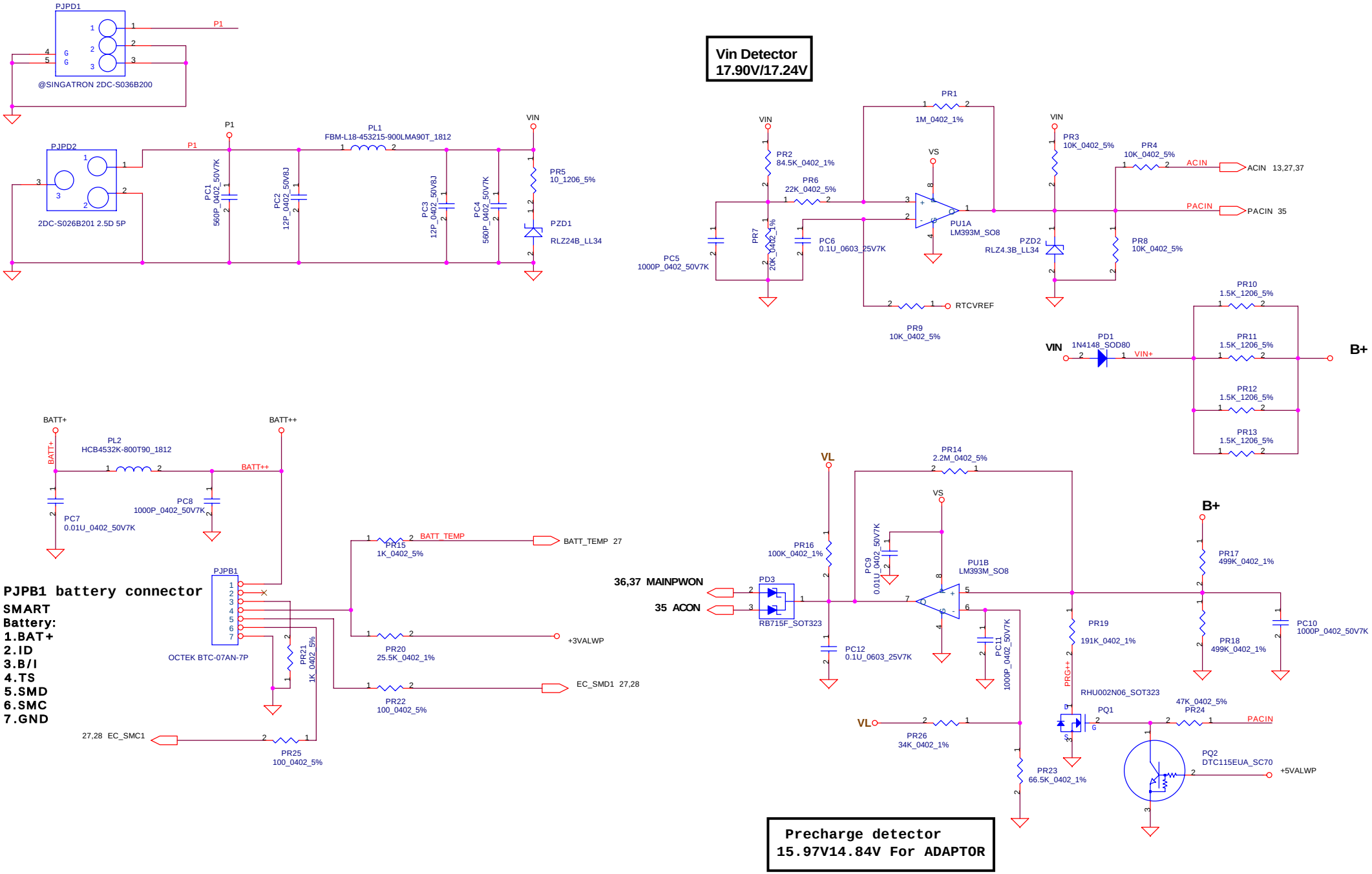
+1.5VALW to +1.5VS Transfer





Compal Electronics, Inc.

Title	DC/DC Circuit Interface	
Size: Custom	Document Number: DAT20 LA-1971	Rev: 0.3
Date: Friday, September 26, 2003	Sheet 33 of 42	



Compal Electronics, Inc.
Title: DCIN & DETECTOR & Precharge
Size: Custom
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Rev: 0.3
Date: Friday, September 26, 2003
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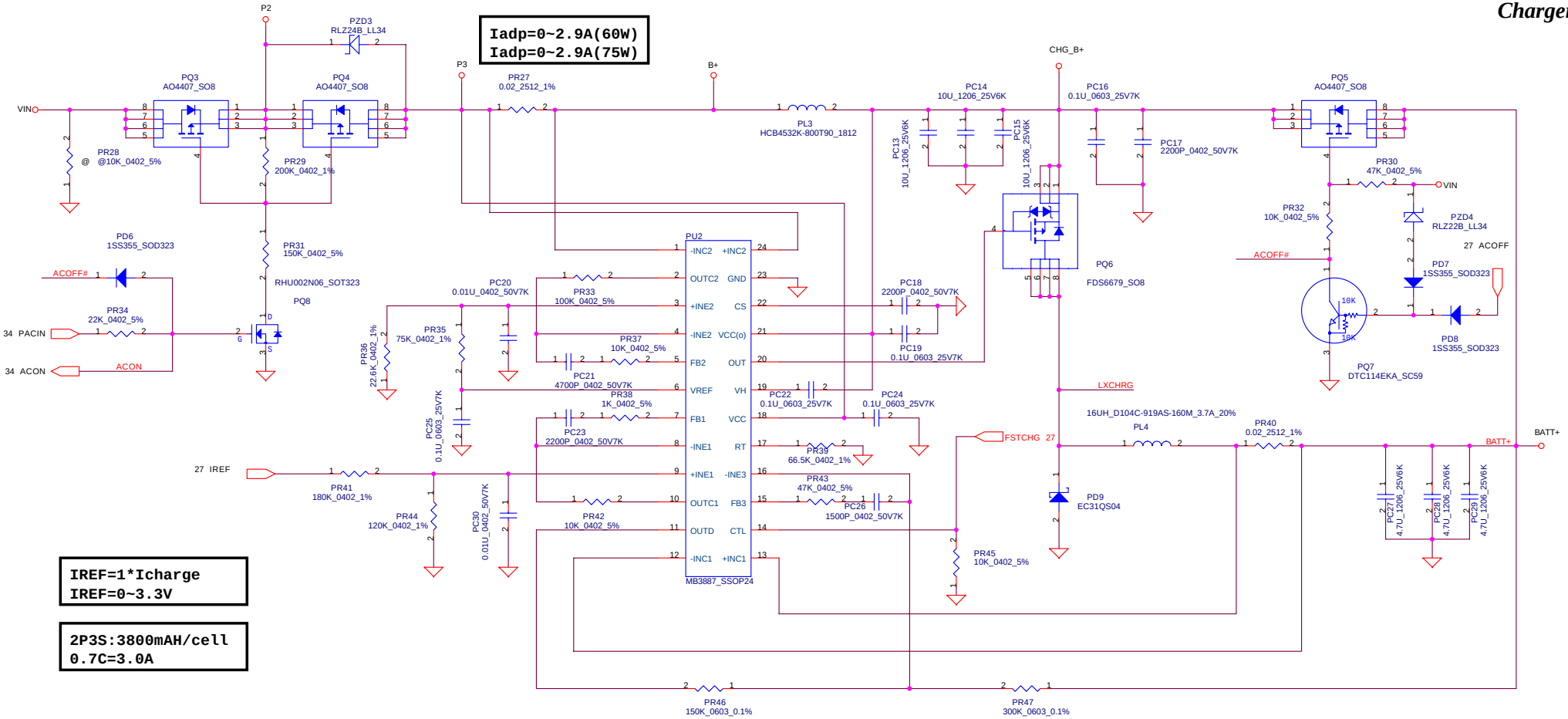
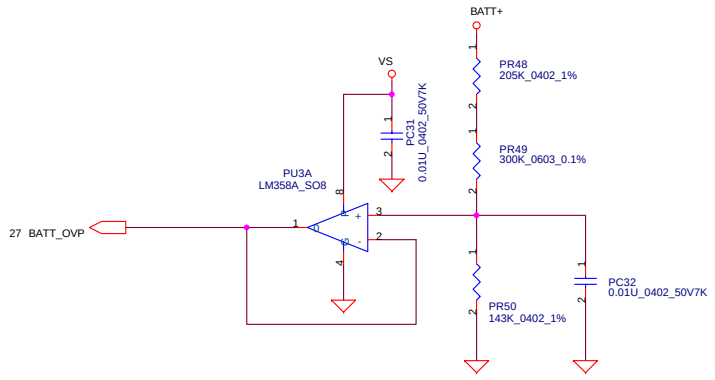
Charger

Iadp=0~2.9A(60W)
Iadp=0~2.9A(75W)



IREF=1*Icharge
IREF=0~3.3V

2P3S:3800mAH/cell
0.7C=3.0A



Charge voltage
3S CC-CV MODE : 12.6V

OVP voltage :
LI-3S :12.9V----BATT-OVP=2.84V
BATT-OVP=0.2206*BATT+

Compal Electronics, Inc.

Title: Charger

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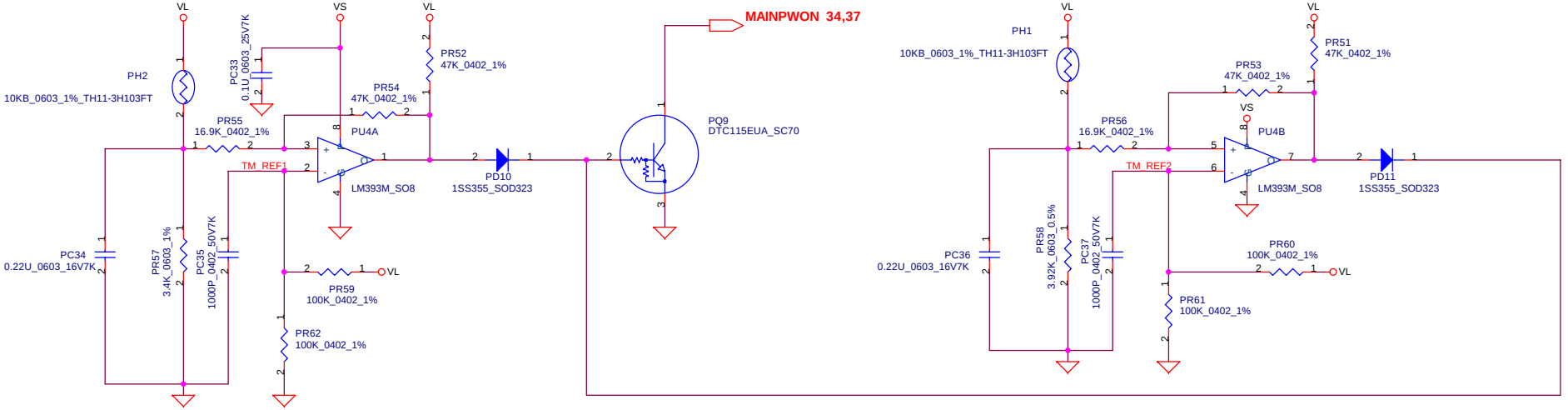
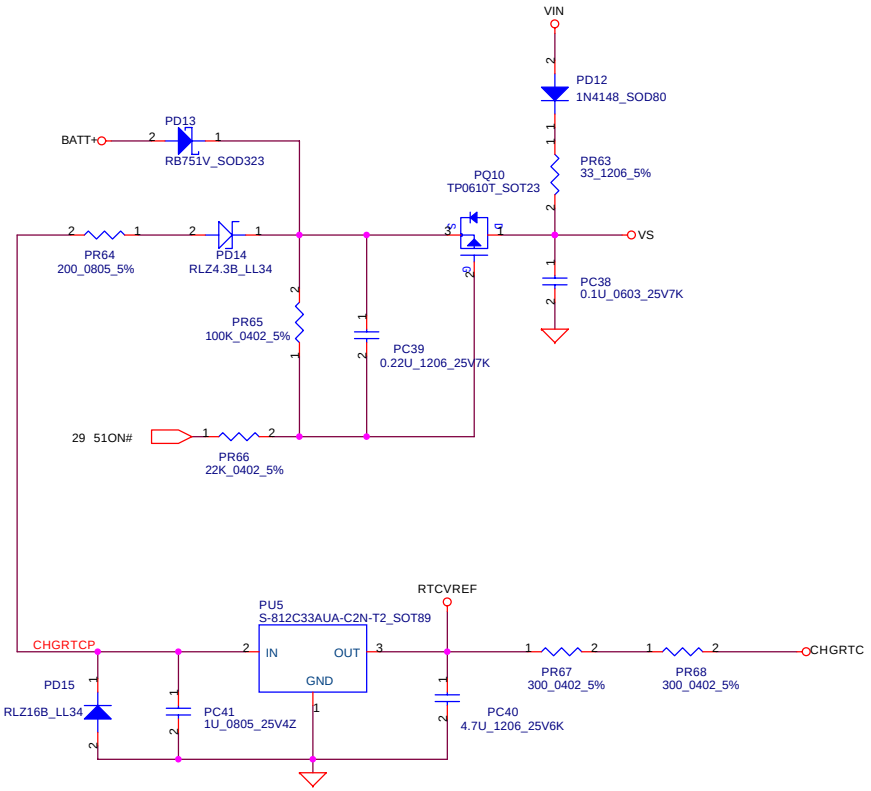
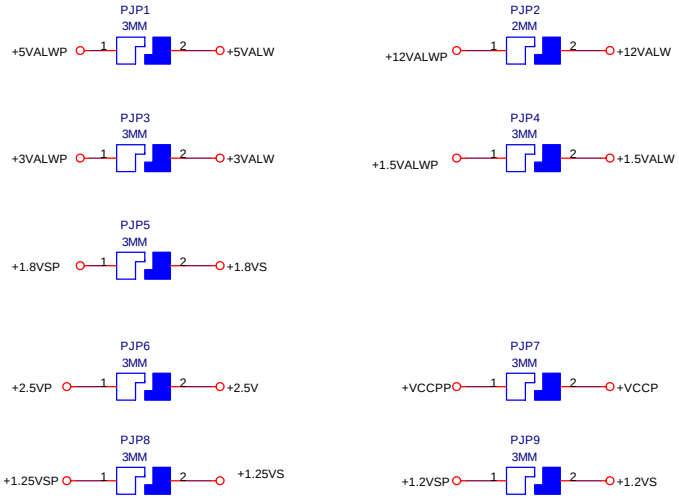
PH1 under CPU botten side :
CPU thermal protection at 85 degree C
Recovery at 44(45) degree C

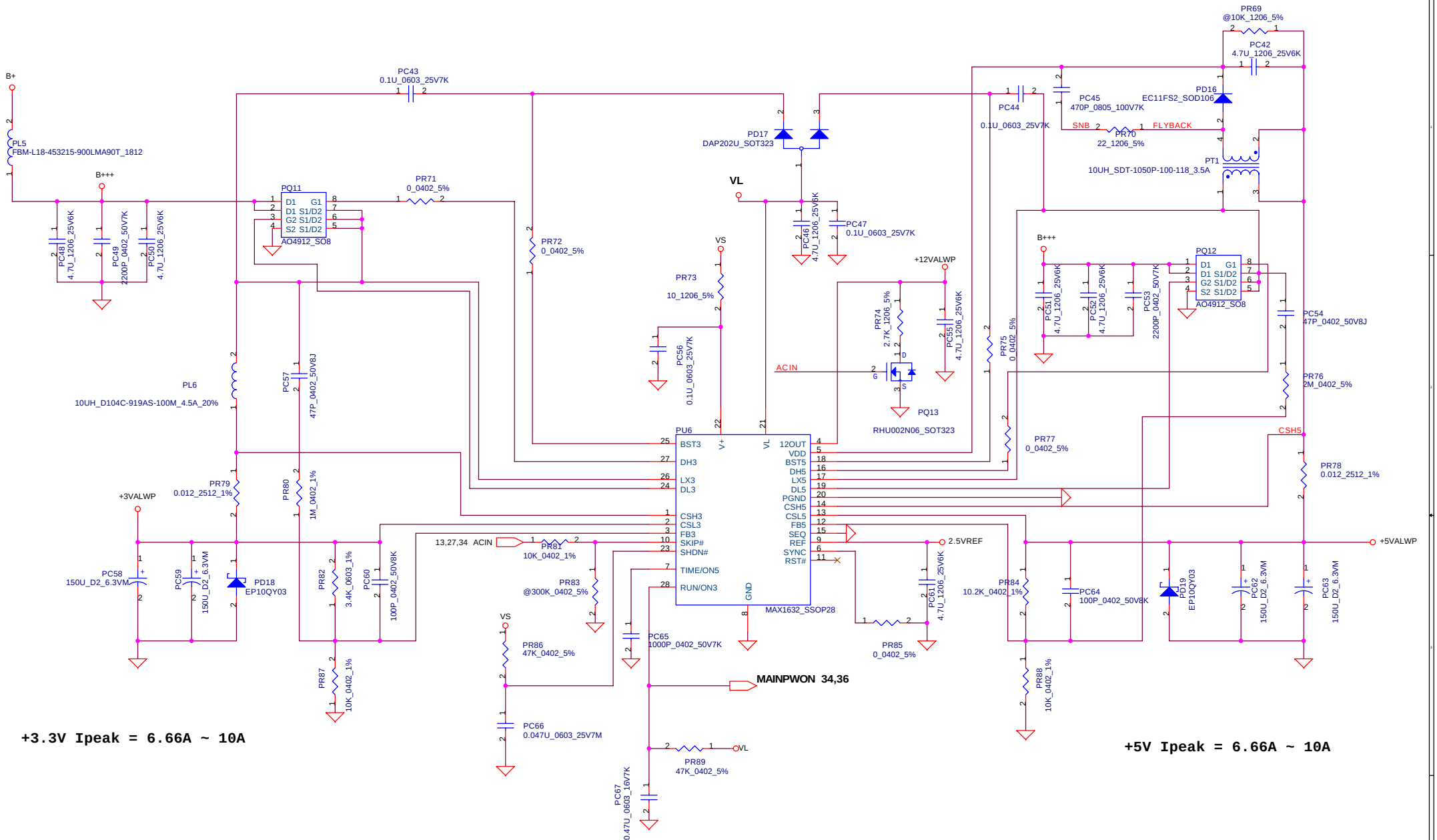
PH2 near main Battery CONN :
BAT. thermal protection at 78 degree C
Recovery at 39(40) degree C





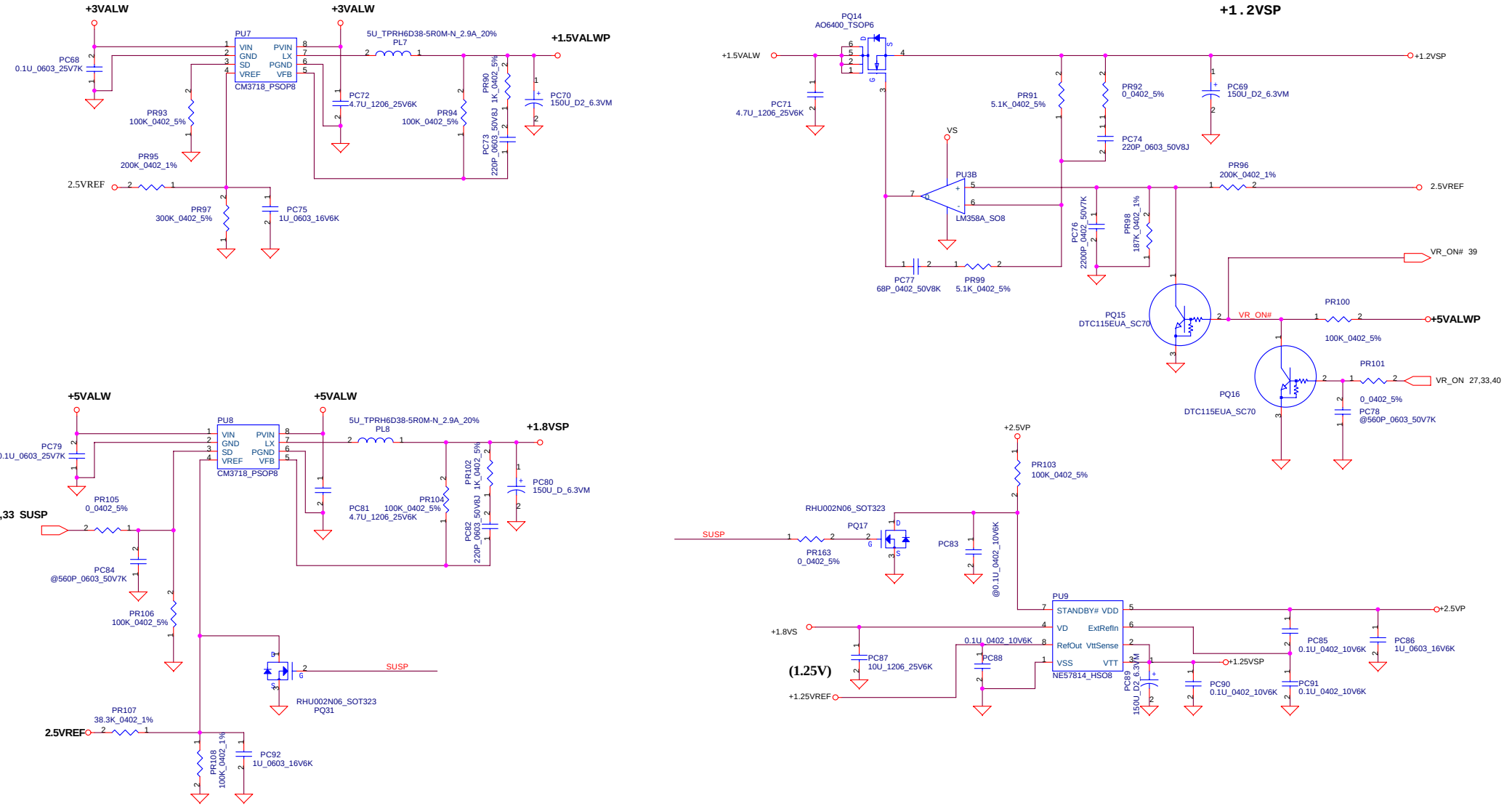


Compal Electronics, Inc.		
Title: RTC Battery & OTP		
Size: B	Document Number: DAT20 LA-1971	Rev: 0.3
Date: Friday, September 26, 2003	Sheet 36 of 42	



Compal Electronics, Inc.

Title	+5VALWP / +3VALWP / +12VALWP	
Size: Custom	Document Number: DAT20 LA-1971	Rev: 0.3
Date: Friday, September 26, 2003	Sheet 37 of 42	

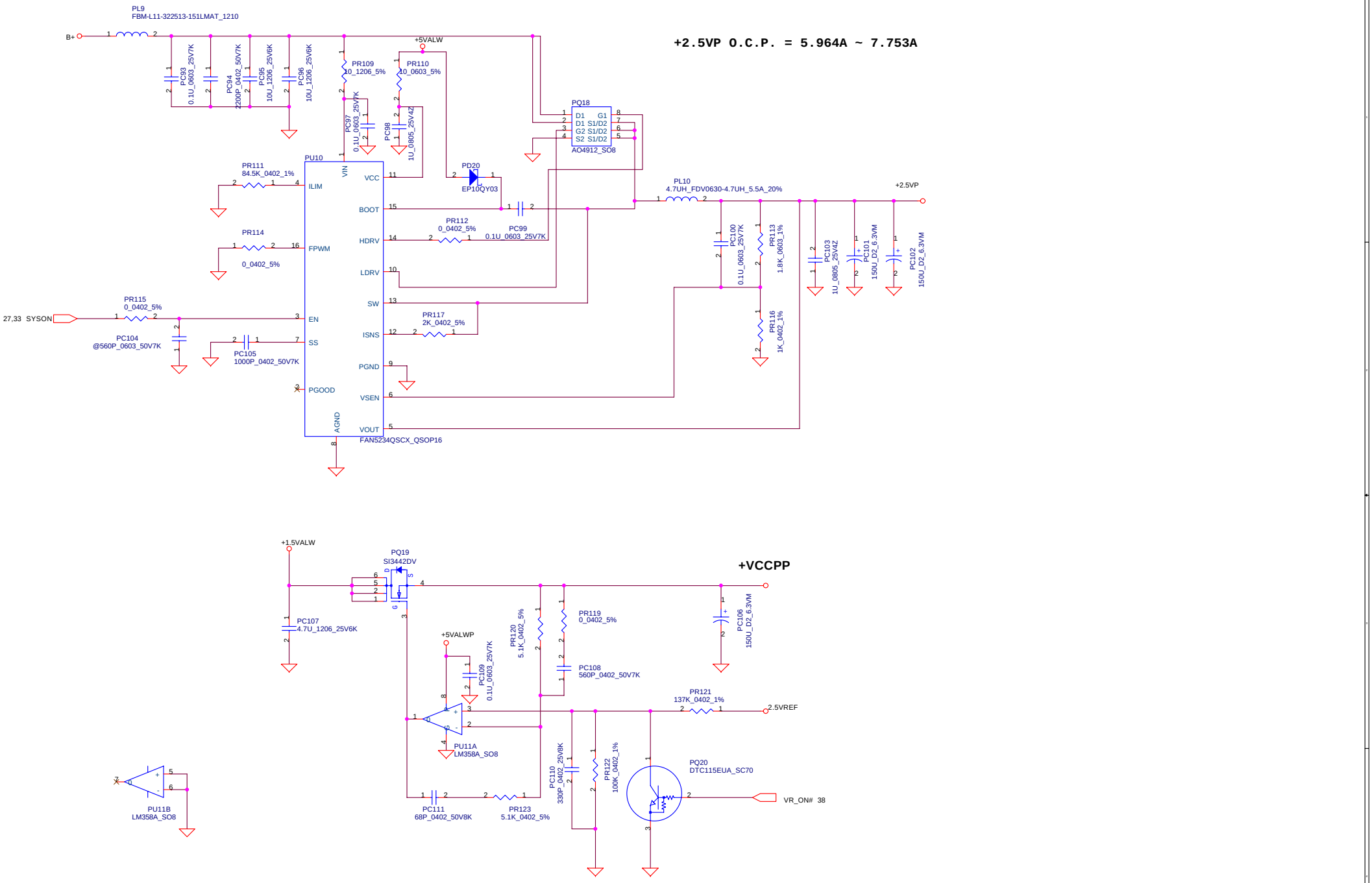


Compal Electronics, Inc.

Title: **+1.8VSP & +1.25VSP &1.5VALWP & +1.2VSP**

Size	Document Number	Rev
Custom	DAT20 LA-1971	0.3

Date: Friday, September 26, 2003 Sheet 38 of 42



Compal Electronics, Inc.

Title: **DDR +2.5VP & VCCPP**

Size: Custom | Document Number: **DAT20 LA-1971** | Rev: 0.3

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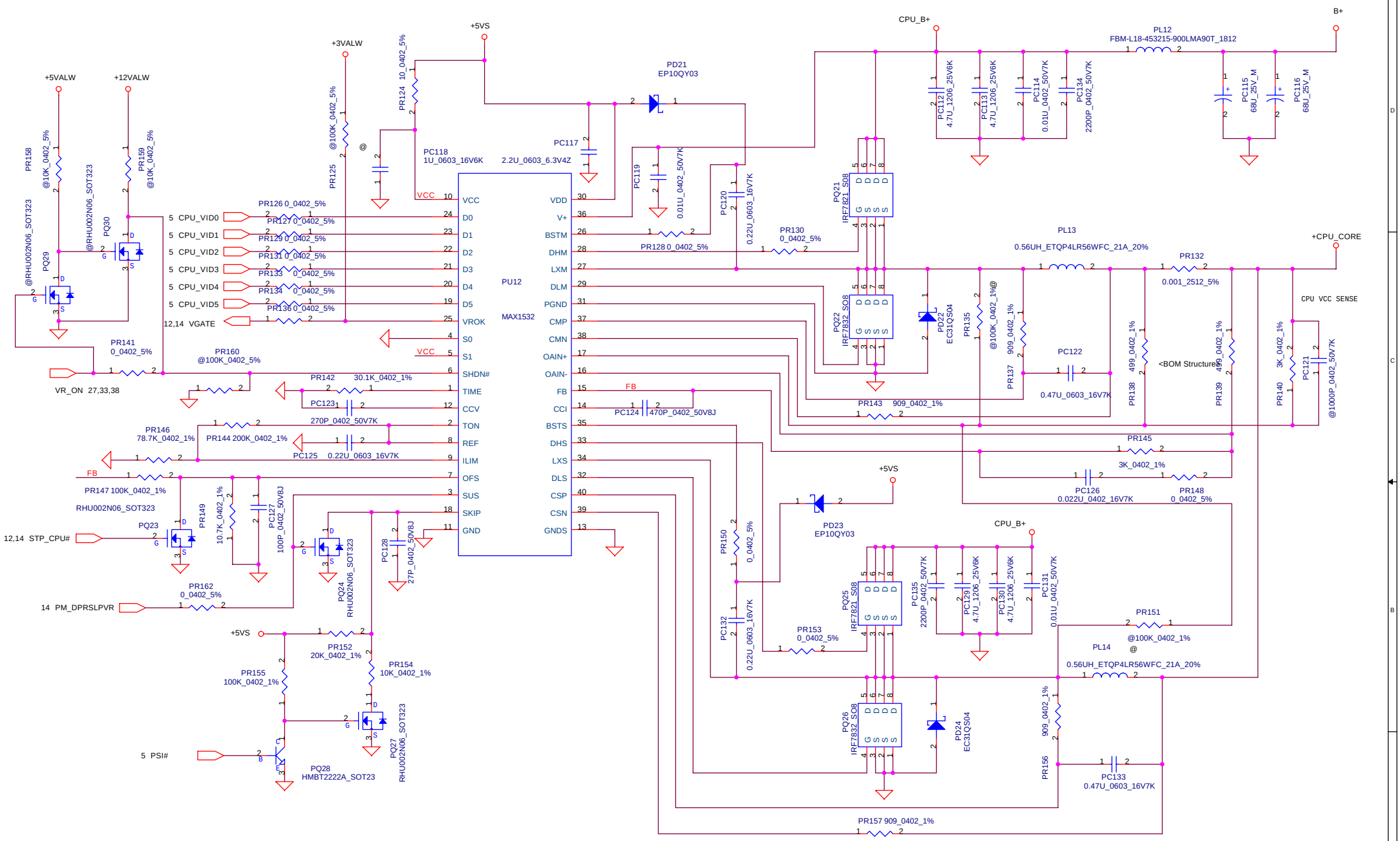

Compal Electronics, Inc.

Title	+CPU_CORE	
Size: Custom	Document Number: DAT20 LA-1971	Rev: 0.3
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DAT20 PIR LIST

HW PIR LIST

EVT -> DVT

[Page 7 & 9] Change Material R33, R34, R200, R201 (75_0603_1%)

[Page 14] Change Material R38 (20_0603_1%)

[Page 16] Change Material U40

[Page 24] Modify R374 connected from +3VALW to +3V & delete R384 (Remove TPM detect function)

[Page 25] Delete RP65 & R260 which reserved for LPC47N227

[Page 26] Change SLCTIN# connection.

[Page 27] Change R308 from 0_0402_5% to 8.2K_0402_5% for DVT test AD_BID0

[Page 29] Change material for C526 from 1U_0603_10V4Z to 1U_0603_10V6K
Add C556 2200P_0402_50V7K
Add C557, C558 1000P_0402_50V7K

[Page 30] Add L10
Change C84 from 4.7U_0805_10V4Z to 10U_0805_10V4Z
Add C555 10U_0805_10V4Z
Delete C184, C179 1U_0603_10V4Z

[Page 32] R156 from 390_0402_5% to 360_0402_5%

[Page 27] R409 from 10K_0402_5% to 47K_0402_5% & add C559 0.1U_0402_16V4Z

DVT -> PVT

[Page 12] Delete C70, C80, C166, C167, C168

[Page 24] Delete R2 (Reserved for FIR)

[Page 31] Delete C476, C531, R319, R371 AudiooHigh pass filter.

Compal Electronics, Inc.
Title: DAT20 PIR LIST
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Date: Friday, September 26, 2003 | Sheet 41 of 42

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

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	B.Ver#	Phase
1	M/B cannot power on.	RC delay time is not enough of Max1632 on3 pin.	0.2	34	1.Change PC67 from 0.047U_0805_10V6K to 0.47U _16V K X7R 0603.	0.2	DVT
2	Layout symbol error.	Layout symbol error.	0.2	37	1.Change PR26 PCB footprint from R_0603 to R_0402.	0.2	DVT
3	Layout symbol error.	Layout symbol error.	0.2	40	1.Change PD22 from EP10QY03 to EP31QS04.	0.2	DVT
4	System cannot re-start and Windows fail when into C4.	The CPU cannot into skip mode,happen the OVP when C4.	0.2	40	Swap the PR154 and PR155.	0.2	DVT
5	Rating not enough.	Rating not enough.	0.2	34	1.Change PC66 from 0.047U_00603_16V7K to 0.047U_00603_25V7M.	0.2	DVT
6.	Rating is not enough.	Surge power rating concerned.	0.2	39	1.Change PR109 from 10_0603 to 10_1206.	0.2	DVT
7.	Change size.	Change size.	0.2		1.Change PR149,PR44,PR48,PR82,PR36,PR107,PR39,PR121, PR140,PR145 and PR146 from 0603 to 0402.	0.2	DVT
8.	Change size.	Change size.	0.2		1.Change PC114,PC131,PC49,PC21,PC53,PC128,PC126,PC124,PC31, PC7 and PC9 from 0603 to 0402.	0.2	DVT
9.	Change size.	Change size.	0.2		1.Change PC56,PC24,0C38,PC100,PC16 and PC19 from 0805 to 0603.	0.2	DVT
10.	Choke rating is not enough.	Charge current power rating concerned.	0.2	35	1.Change PL4 from 22UH to 16UH.	0.2	DVT
11.	Appication of CM3718 has overshoot issue during system on.	Charge control signal SHDN# to reference.	0.2	38	1.Add PQ31.	0.2	DVT
12.	EMI issue of charger.	EMI issue of charger.	0.3	35	1.Change PQ6 from AO4407 to FDS6679. Add the PR164 on GATE pin of PQ6.	0.3	PVT
13.	EMI issue of CPU_CORE.	EMI issue of CPU_CORE.	0.3	40	1.Change PQ21 and PQ25 from IRF7821 to IRF7811A. Add the 2200P on PC134 and PC135.	0.3	PVT
14.							