

BTQ00 Rev0.1 Schematics Document

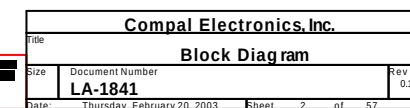
Intel Prescott uFCPGA-478 / P4 Northwood

with Springdale / ICH5 / nVIDIA NV18/34/31M chipset

2003/02/20

Compal Electronics, Inc.			
Title			
Cover Sheet			
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File Name : BTQ00



Voltage Rails

Power Plane	Description	S1	S3	S5
VIN	Adapter powersupply(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
+CPU_VID	1.2V switched power rail for CPU AGTL Bus	ON	OFF	OFF
+VTT_GMCH	+1.225V (Prescott) / +1.45V (Northwood)	ON	OFF	OFF
+VGA_CORE	1.2V switched power rail for VGA chip	ON	OFF	OFF
+1.25VS	1.25V switched power rail	ON	OFF	OFF
+1.5VS	AGP 4X/8X	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/PIRQB
LAN	AD17	3	PIRQB
Mini-PCI	AD18	1/4	PIRQC/PIRQD
1394	AD16	0	PIRQA
SD	AD22		

EC SM Bus1 address

Device	Address	Device	Address
Smart Battery	0001 011X b	ADM1032	1001 110X b
EEPROM(24C1602)	1010 000X b	OZ168	0011 0100 b
(24C84)	1011 000Xb		

EC SM Bus2 address

ICH4 SM Bus address

Device	Address
Clock Generator (ICS 952623)	1101 001Xb
DDR DIMM0	1001 000Xb
DDR DIMM1	1001 001Xb

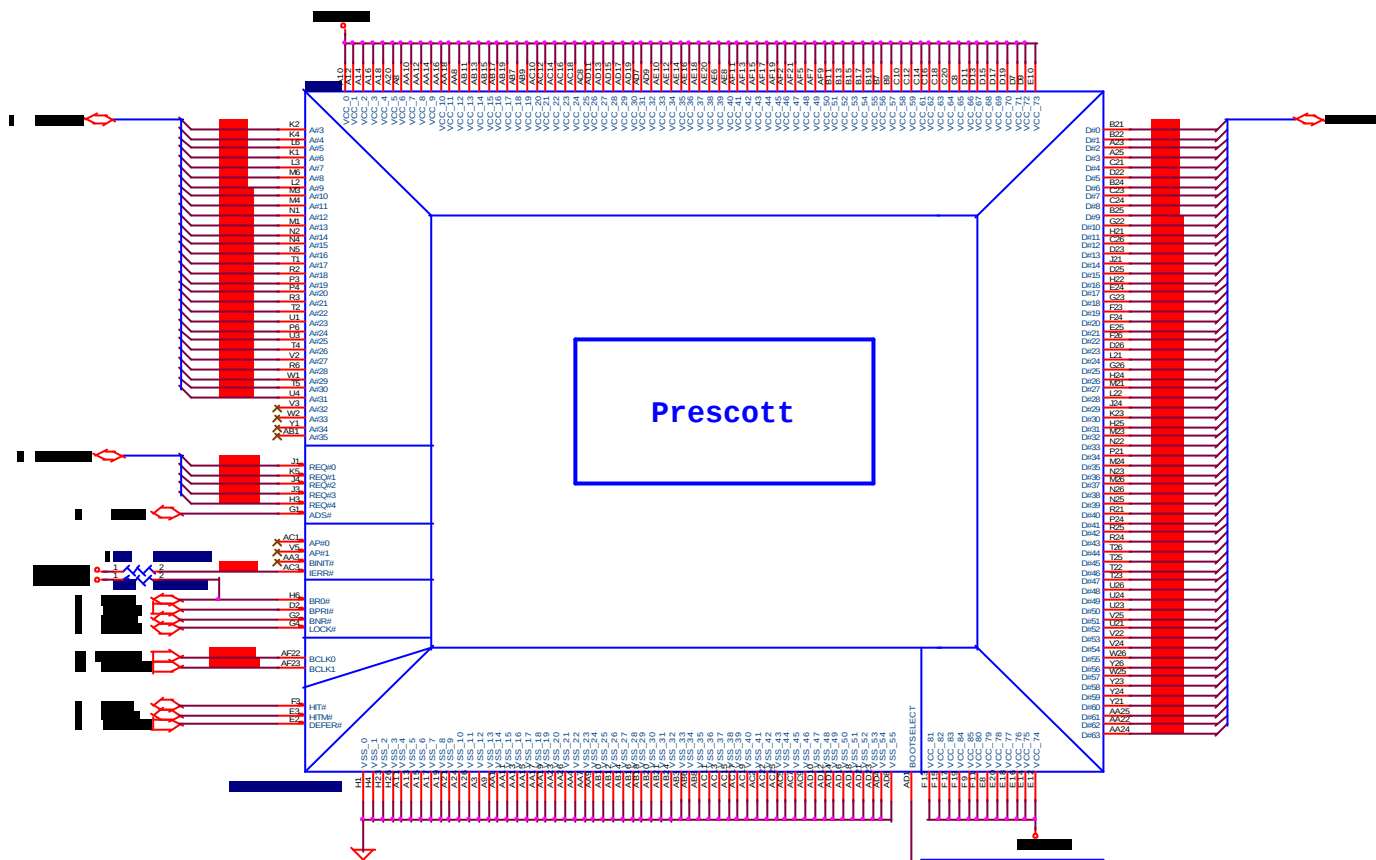
STATE \ SIGNAL	SLP_S1#	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON	HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S1 (Power On Suspend)	LOW	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)	LOW	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	LOW	ON	OFF	OFF	OFF

Board ID Table for AD channel

Vcc	3.3V +/- 5%			
Ra	100K +/- 5%			
Board ID	Rb	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

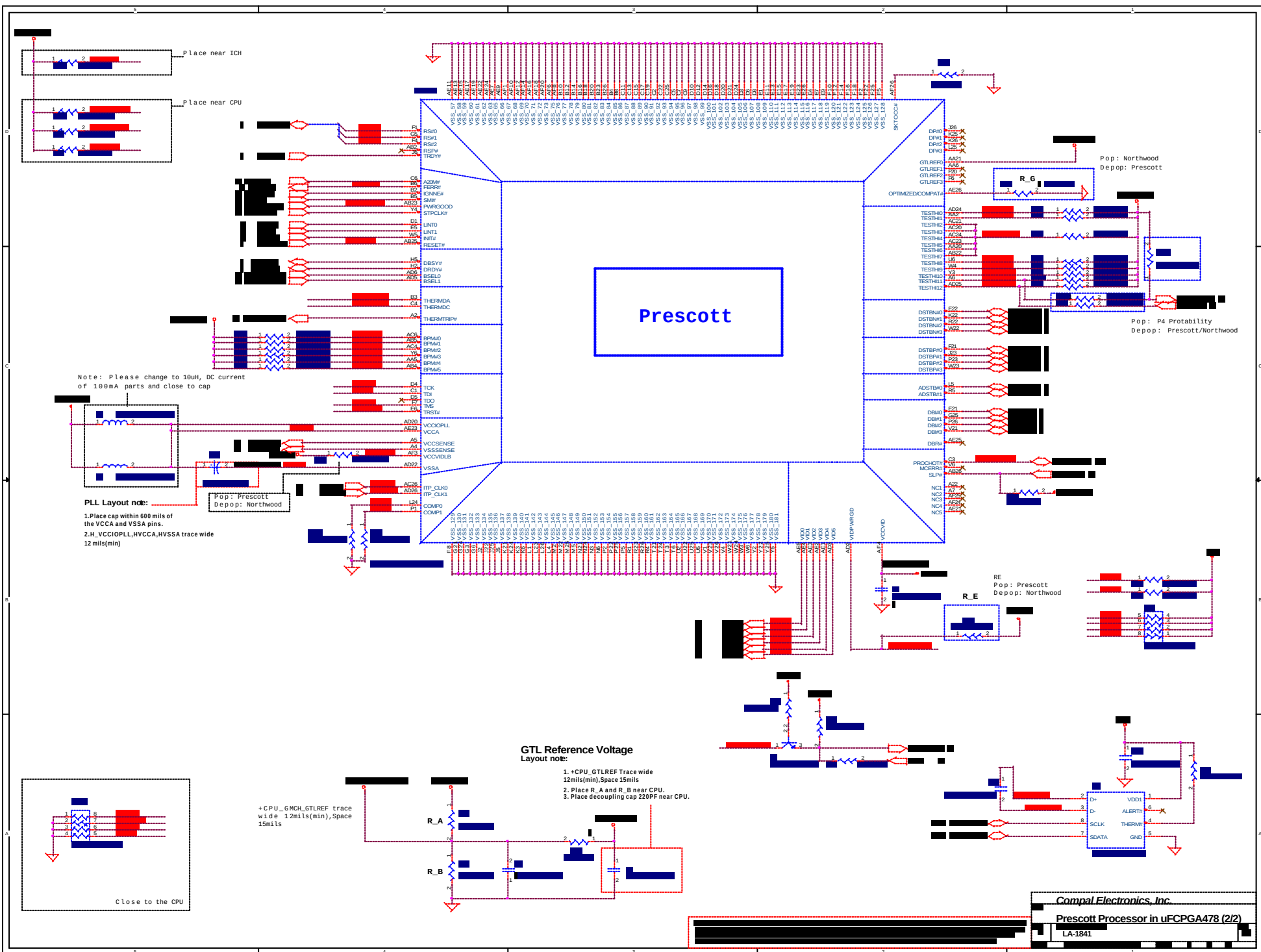
Board ID	PCB Revision
0	0.1
1	
2	
3	
4	
5	
6	
7	

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Notes		
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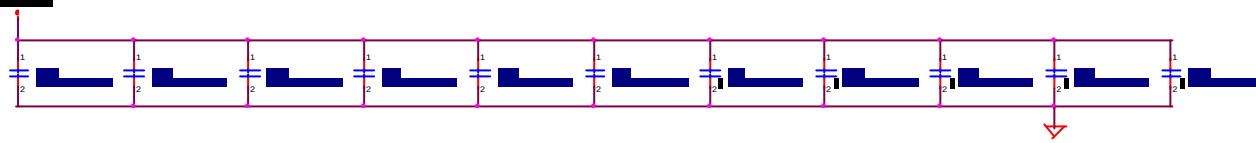


Reference Intel document
Desktop P4 Spec.: 1998 P4 0.13u 512KB L2 EMTS Rev.2.0
Desktop Prescott Spec.: 1919 Prescott EMTS Rev.0.5

Pin number	Northwood Pin name	Comment	Prescott Pin name	Comment	Northwood	Prescott
B6	FERR#	Pull-up 62ohm to +VCC_CORE	FERR#/PBE#	Pull-up 62ohm to +VCC_CORE	Pop	Pop
AA20	ITPCLKOUTB	Pull-up 56ohm to +VCC_CORE	TESTHI6	Pull-up 62ohm to +VCC_CORE	Pop	Pop
AB22	ITPCLKOUT1	Pull-up 56ohm to +VCC_CORE	TESTHI7	Pull-up 62ohm to +VCC_CORE	Pop	Pop
AD2	NC	float	VIDPWRGD	Pull-up 8.2kohm to +VCCVID	Depop	Pop
AD3	NC	float	VID5	Pull-up 1kohm to +3VRUN & connect to PWRIC	Depop	Pop
AF3	NC	float	VCCVIDLB	Connect to +VCCVID	Depop	Pop
AD20	VCCA	Connect to CPU Filter	VCCIOPLL	Connect to CPU Filter		
AF23	VCCIOPLL	Connect to CPU Filter	VCCA	Connect to CPU Filter		
AD1	VSS	Connect to GND	BOOTSELECT	CPU determine	Pop	Depop
AE20	VSS	Connect to GND	OPTIMIZED/ COMPAT#	float	Pop	Depop

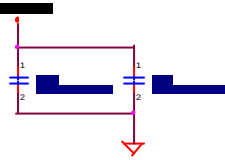
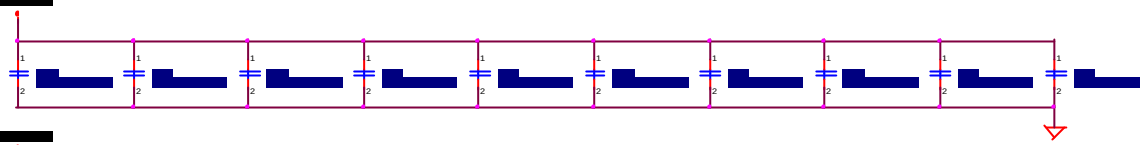


Place 11 North of Socket(Stuff 8)

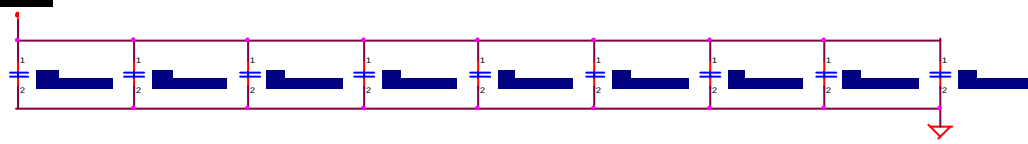


22uF depop reference
Springdale Customer Schematic R1.2 page82

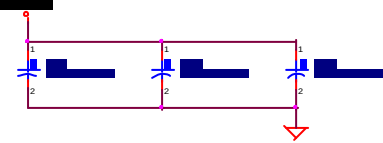
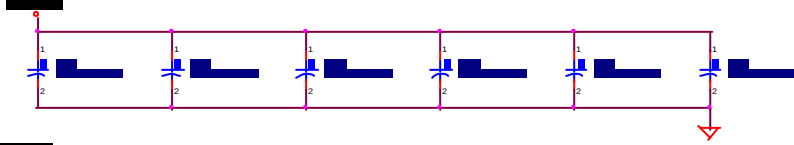
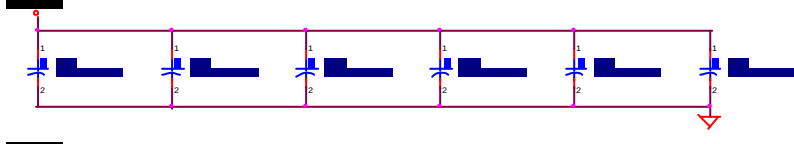
Place 12 Inside Socket(Stuff all)



Place 9 South of Socket(Unstuff all)



470uF _ERS10m ohm* 15, ESR=0.5m ohm



Decoupling Reference Document:
Springdale Chipset Platform Design guide Rev1.11
(12474)page239

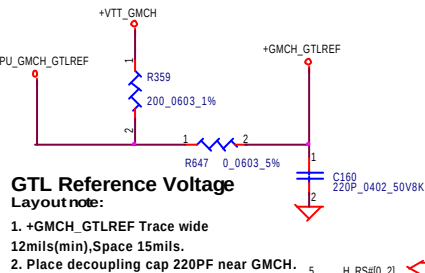
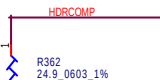
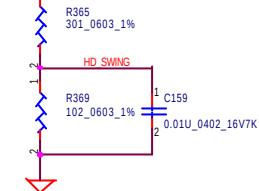
Decoupling Reference Requirement:
560uF Polymer, ESR:5m ohm(each) * 10
22uF X5R * 32

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CPU Decoupling

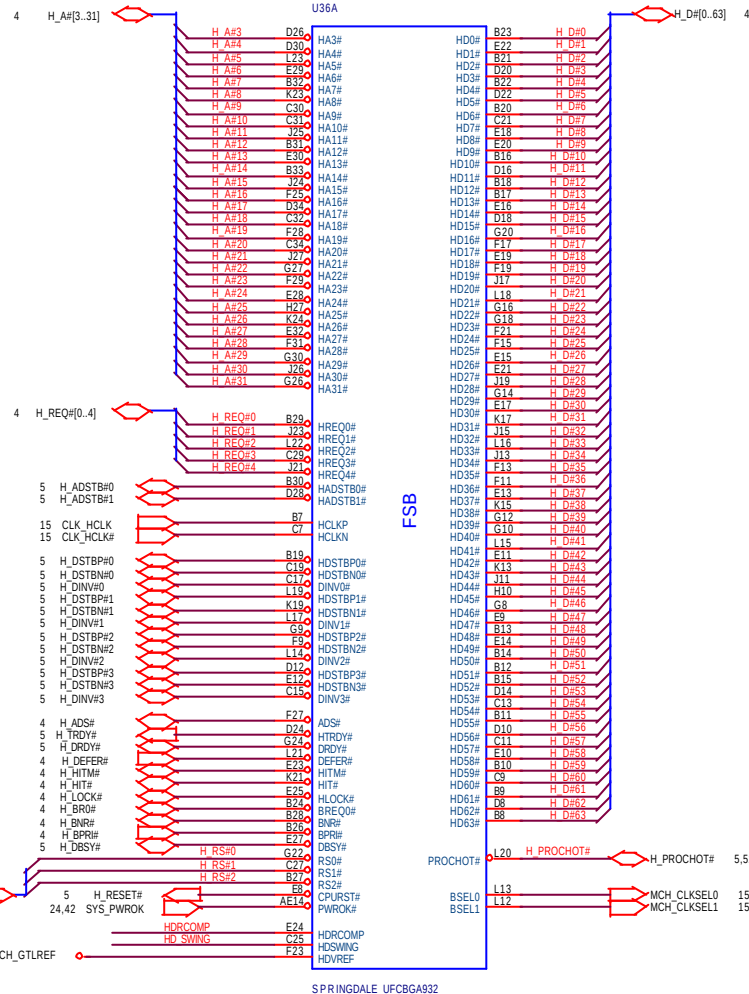
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Trace width 10mils, Space 7mils



GTL Reference Voltage Layoutnote:

1. +GMCH_GTLREF Trace wide 12mils(min), Space 15mils.
2. Place decoupling cap 220PF near GMCH.

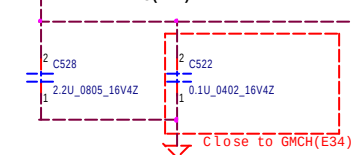


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12.14 DDRA_SMA[0..12]

DDRA_SMA[0..12]

U36B

12.14 DDRA_SWE#
12.14 DDRA_SCAS#
12.14 DDRA_SRAS#12.14 DDRA_SBS0
12.14 DDRA_SBS112.14 DDRA_SCSE0
12.14 DDRA_SCSE112.14 DDRA_CKE0
12.14 DDRA_CKE112 DDRA_CLK1
12 DDRA_CLK1#
12 DDRA_CLK2
12 DDRA_CLK2#+SM_VREF_A
+SM_VREF_A trace width of 12mils and space 12mils(min)

Close to GMCH(E34)

Trace width of 12mils and space 10mils(min)

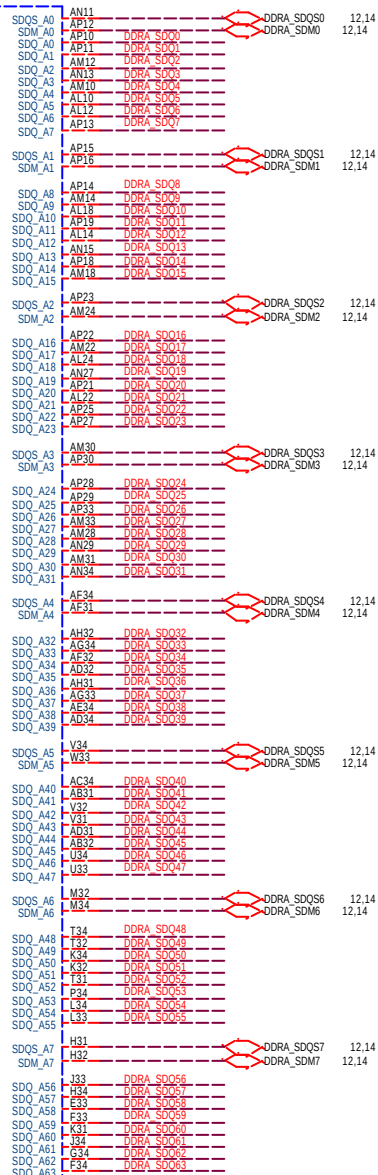
Change to 42.2 1%

Place resistors within 1.0 inch of GMCH (AK9)

Change to 42.2 1%

DDR Channel A

SPRINGDALE_UFCBGAS32

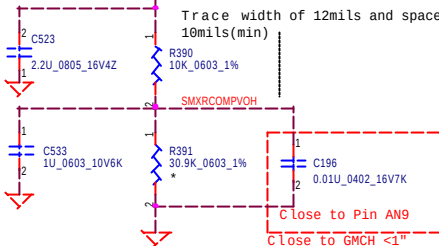


DDRA_SDQ[0..63]

DDRA_SDQ[0..63]

12.14

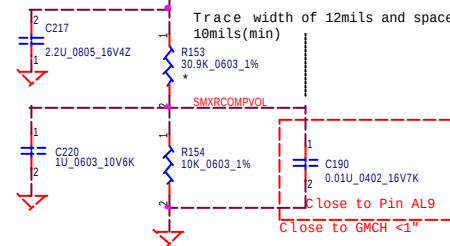
+2.5V



* Change to 31.12K

Follow Intel design guide R1.11(12474) page124,125

+2.5V



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Springdale-DDR Interface-A(2/5)

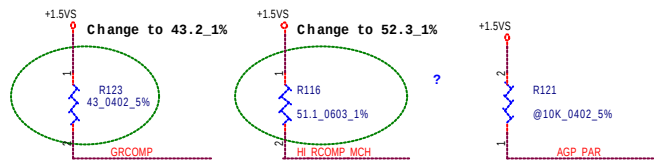
Document Number

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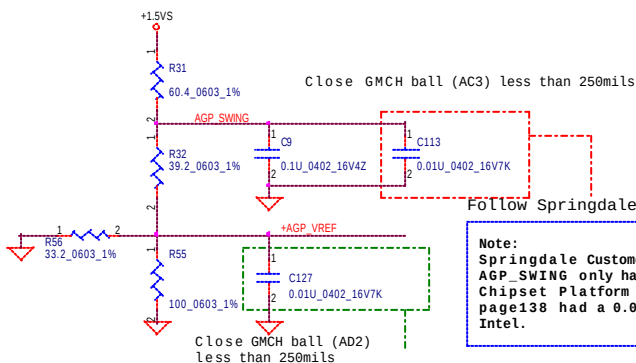
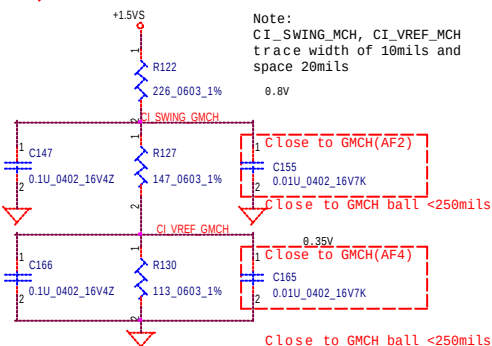
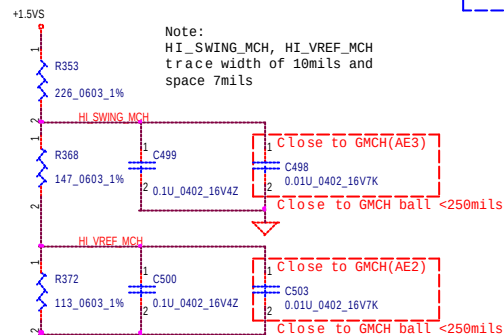
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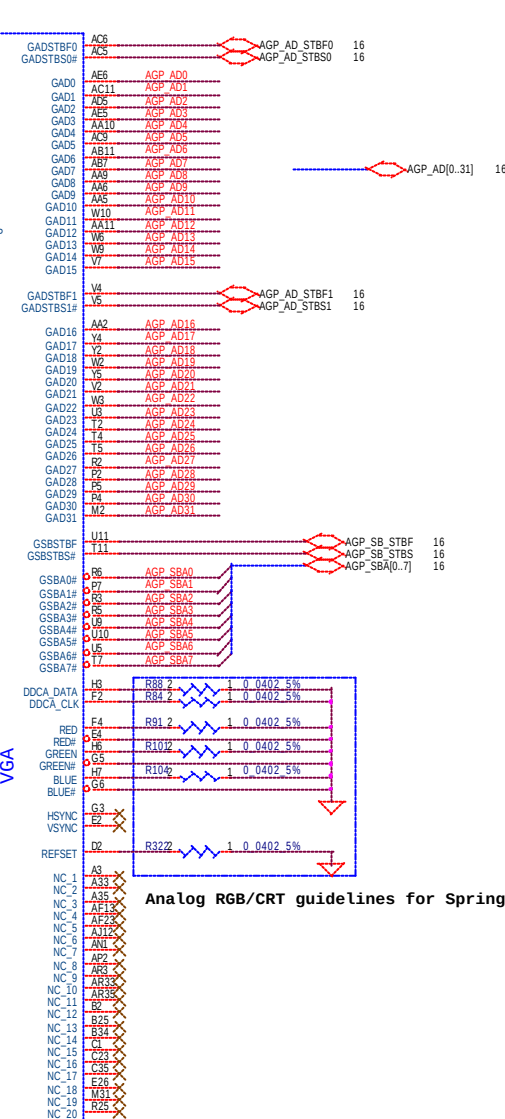
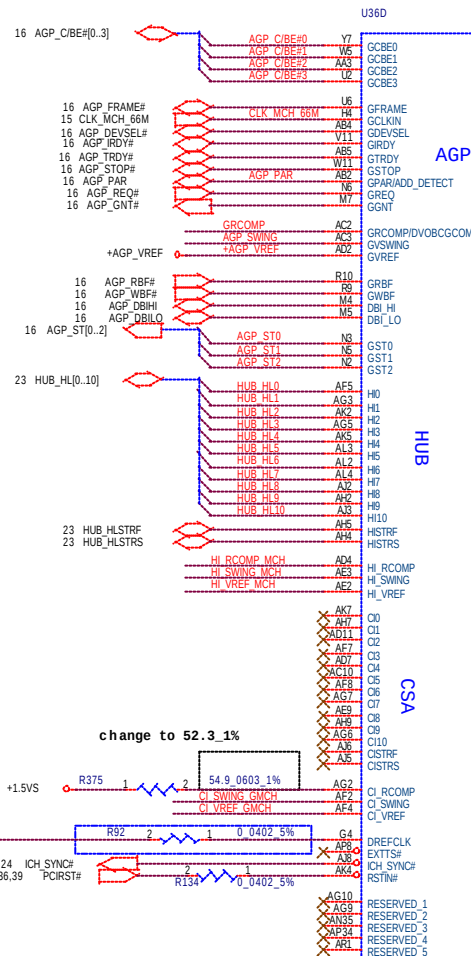
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1: External AGP
0: Internal Graphics



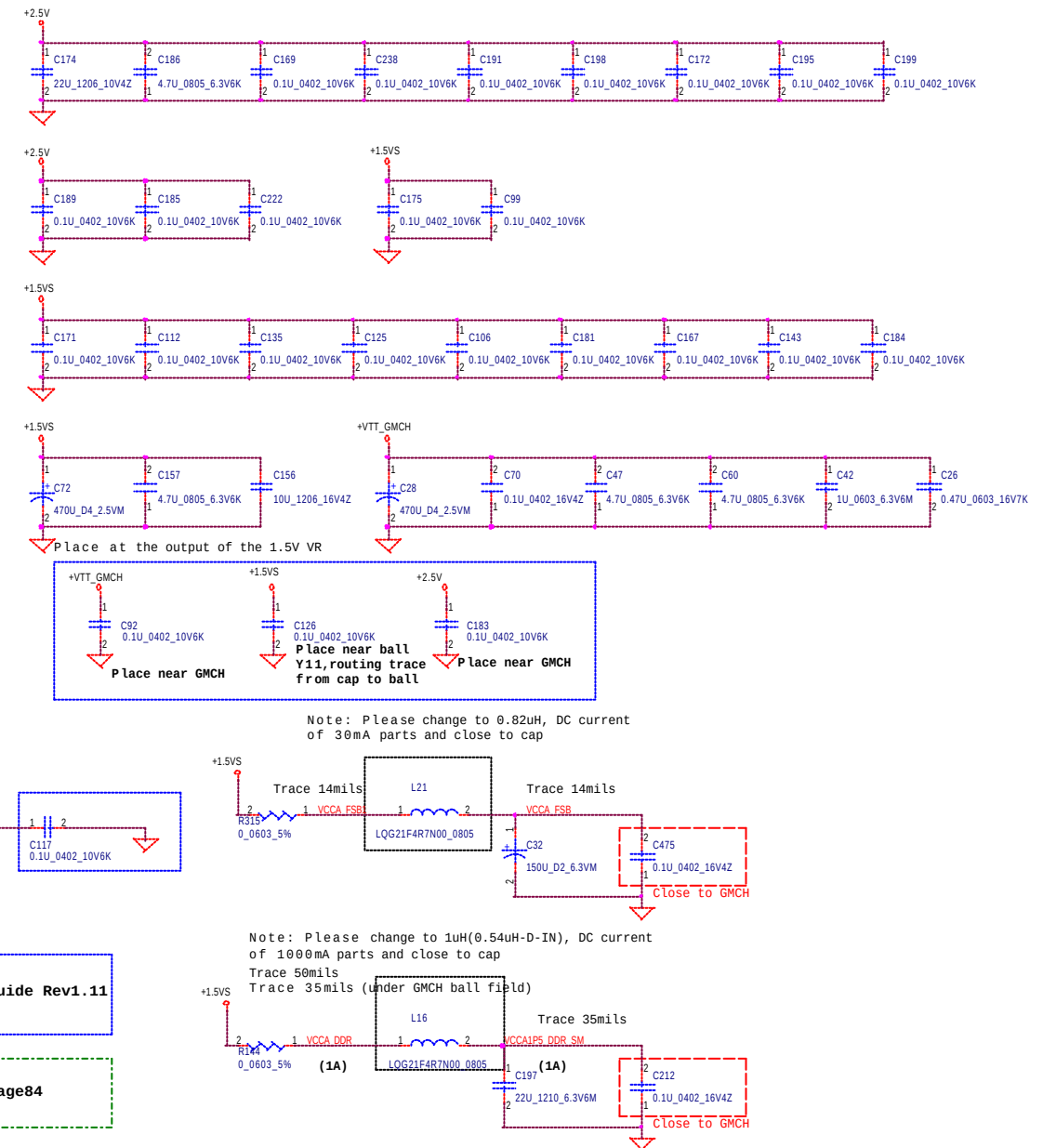
Note:
Springdale Customer Schematic R1.2 page18
AGP_SWING only had 0.1u cap ; But Springdale
Chipset Platform Design guide Rev1.11(12474)
page138 had a 0.01uf cap. need confirm with
Intel.

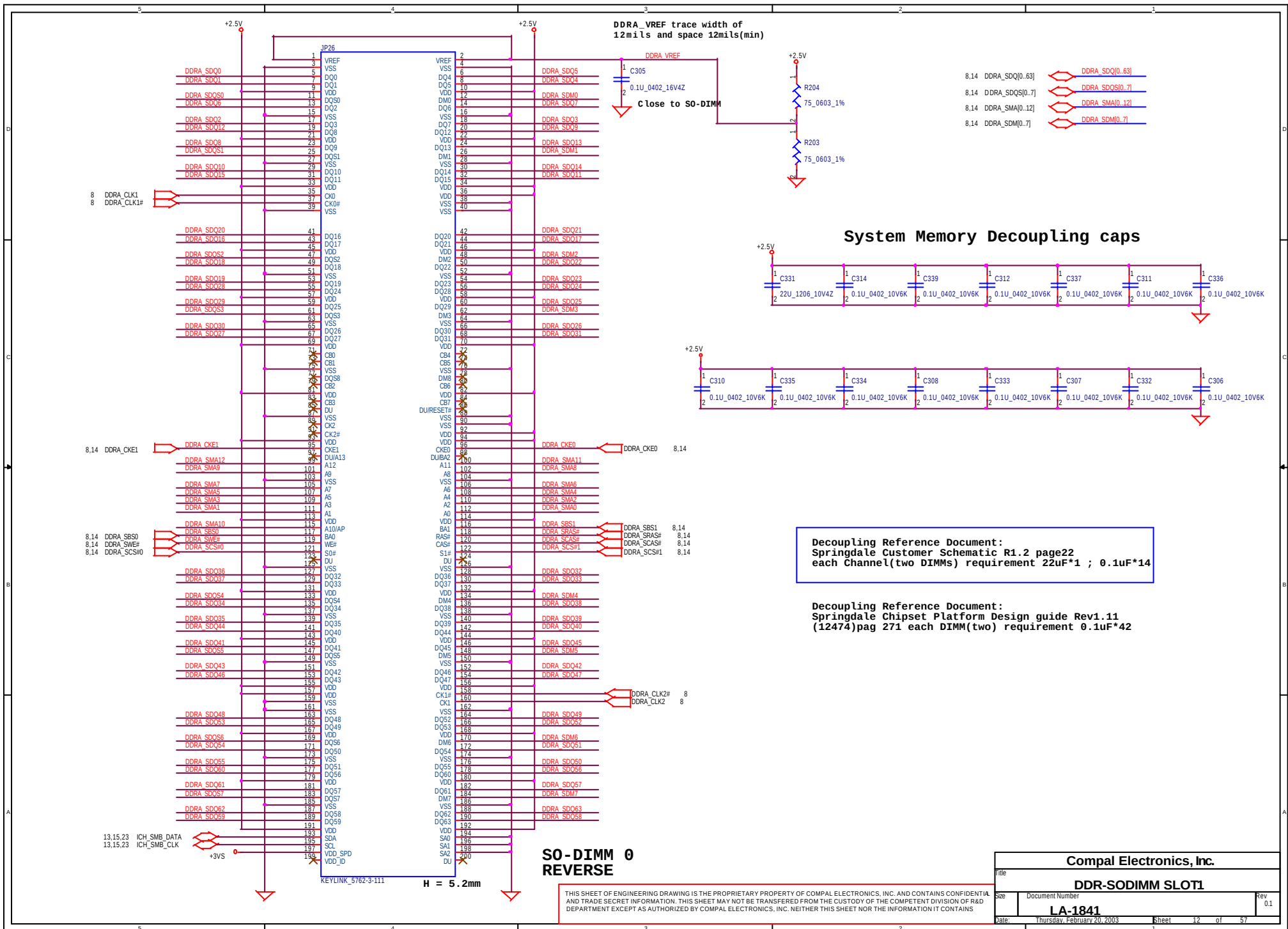


Analog RGB/CRT guidelines for Springdale-P

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Title		
Springdale-AGP/HUB/VGA/CSA (4/5)		
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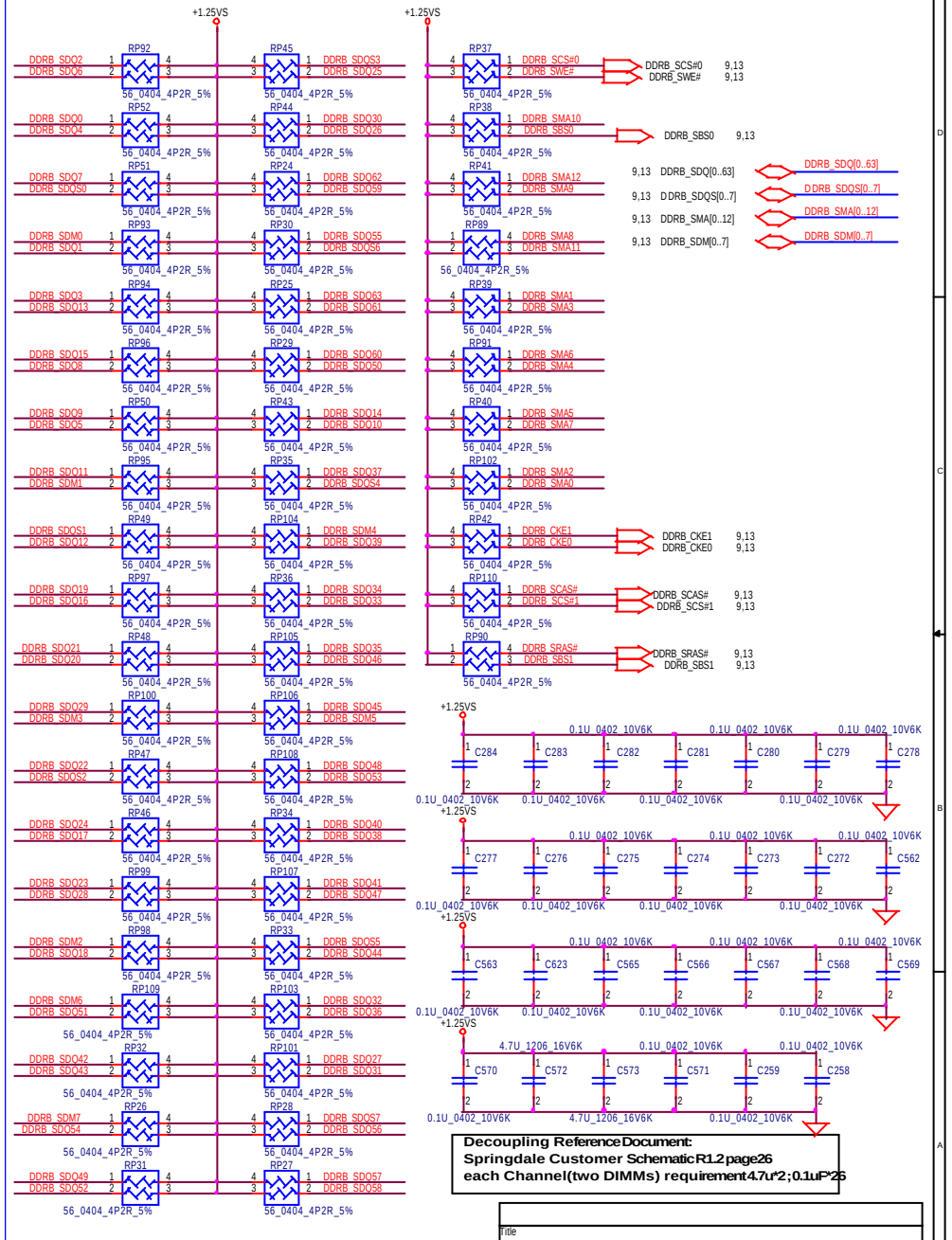




Channel A(DIMM0) Termination resistors & Decoupling caps



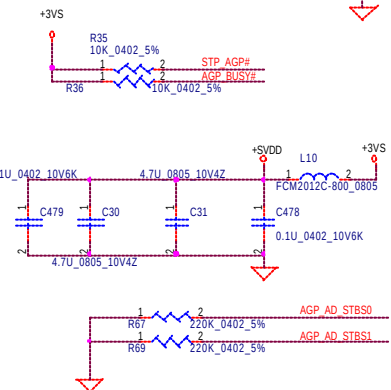
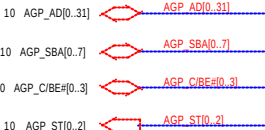
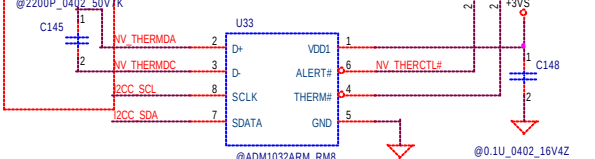
Channel B (DIMM1) Termination resistors & Decoupling caps



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DDR Termination Resistors			
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Place close to pin H2 & H3

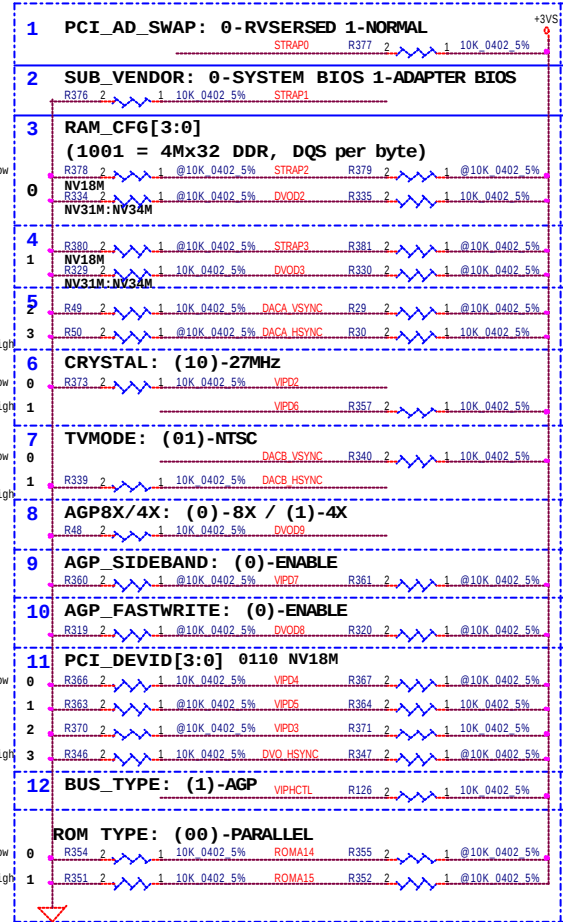
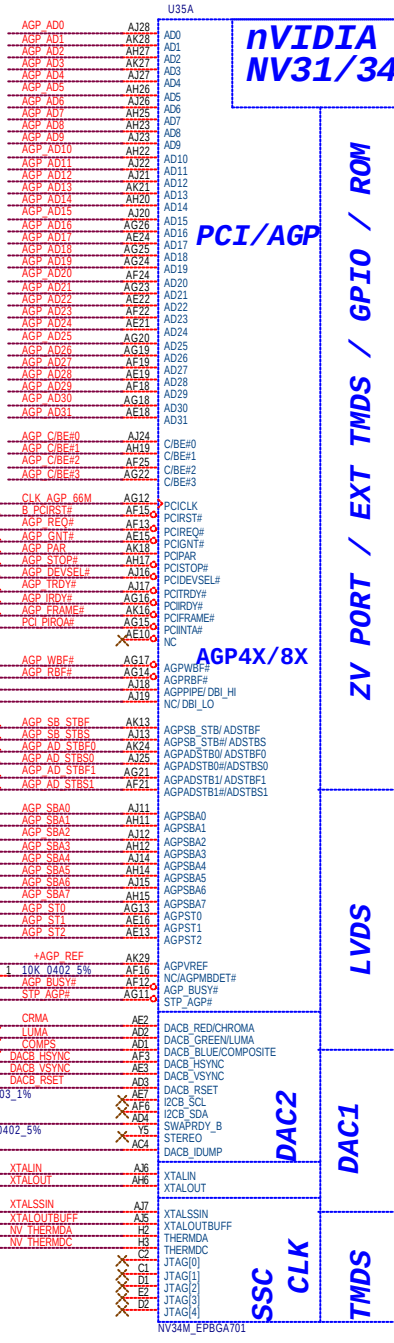
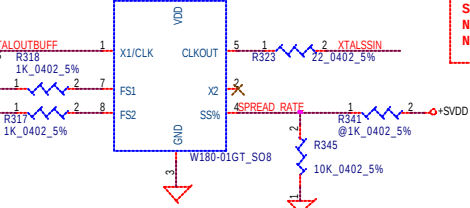


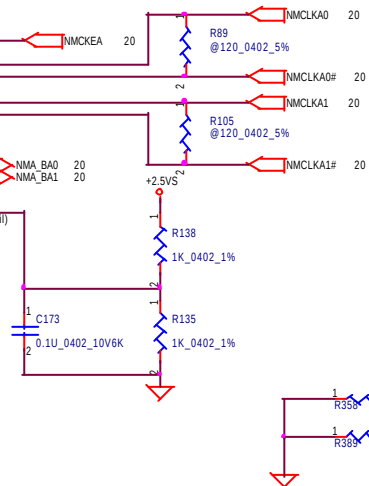
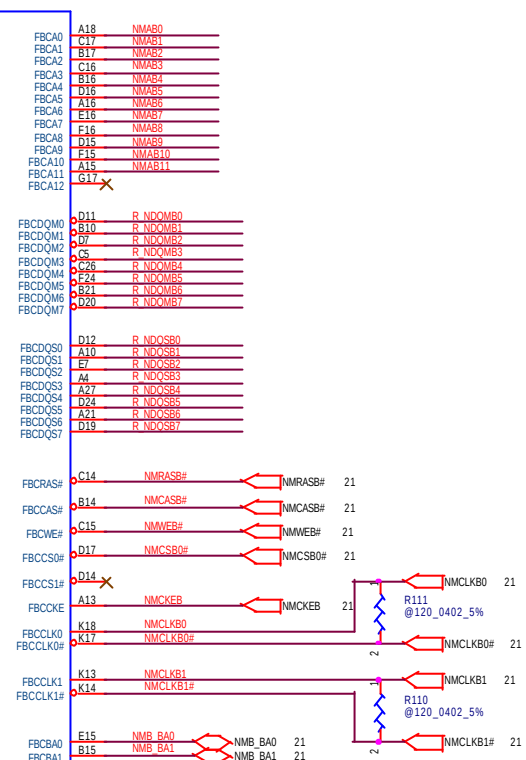
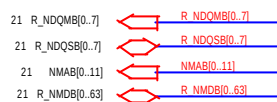
Selection Table For W180

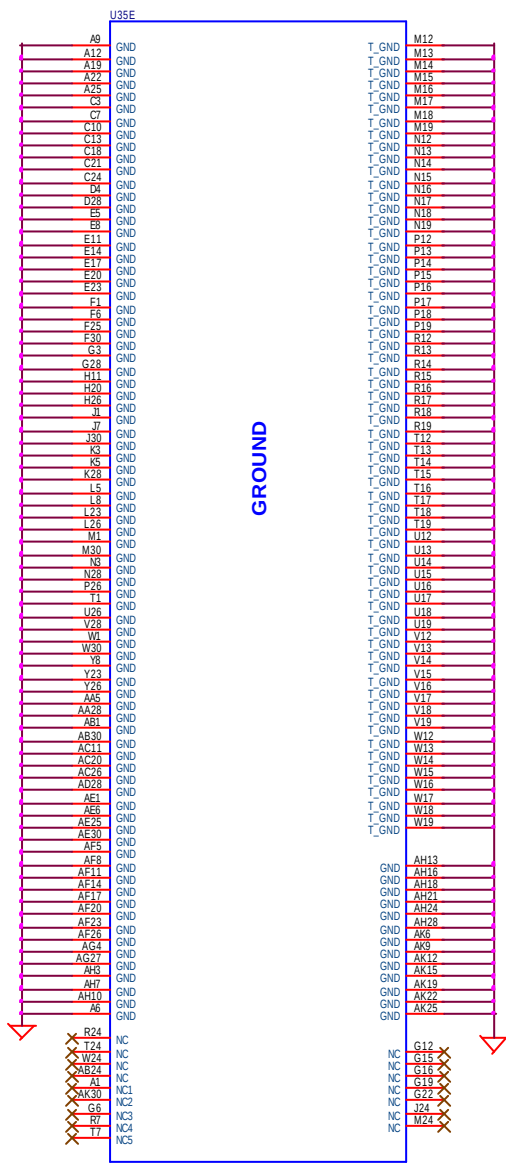
Modulation Setting	SST Ratio
0	1.25%
1	3.75%

Close VGA ball (AK29) less than 250mils

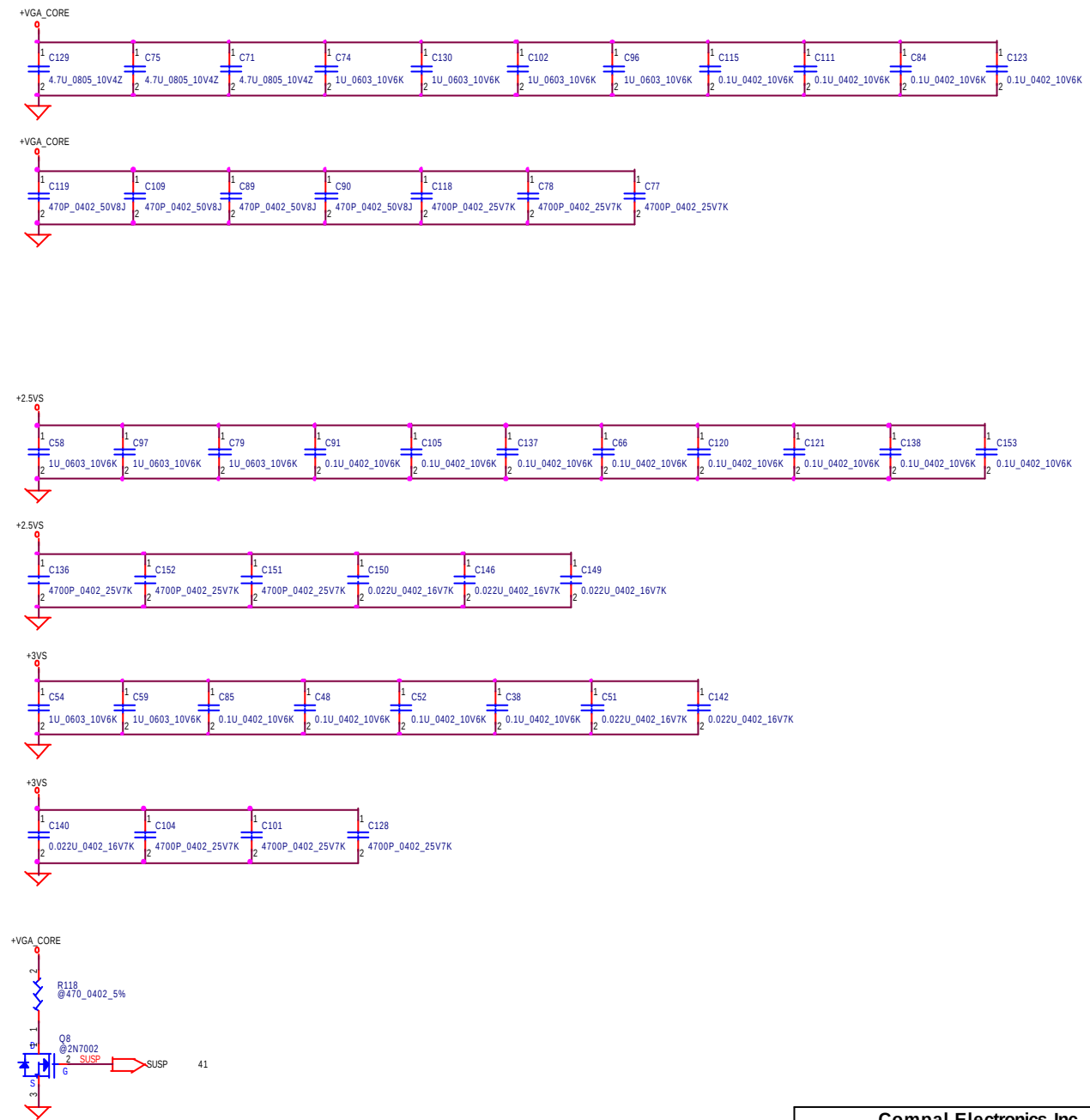
PLACE COLSE TO VGA Pin AJ5, AJ7,







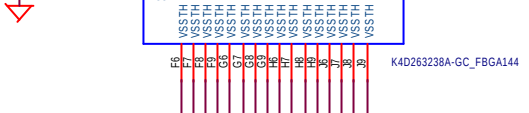
NV34M_EPBGA701



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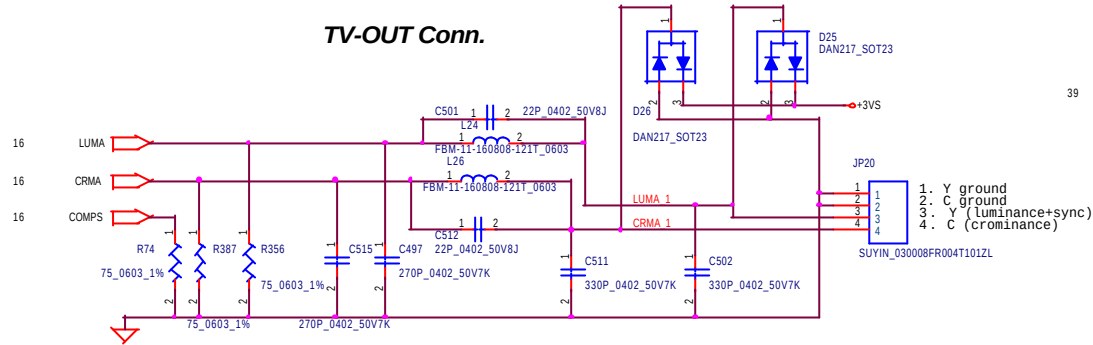
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Title			
nVIDIA NV31M (DECOUPLING CAP)			
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AS close as possible to related pin

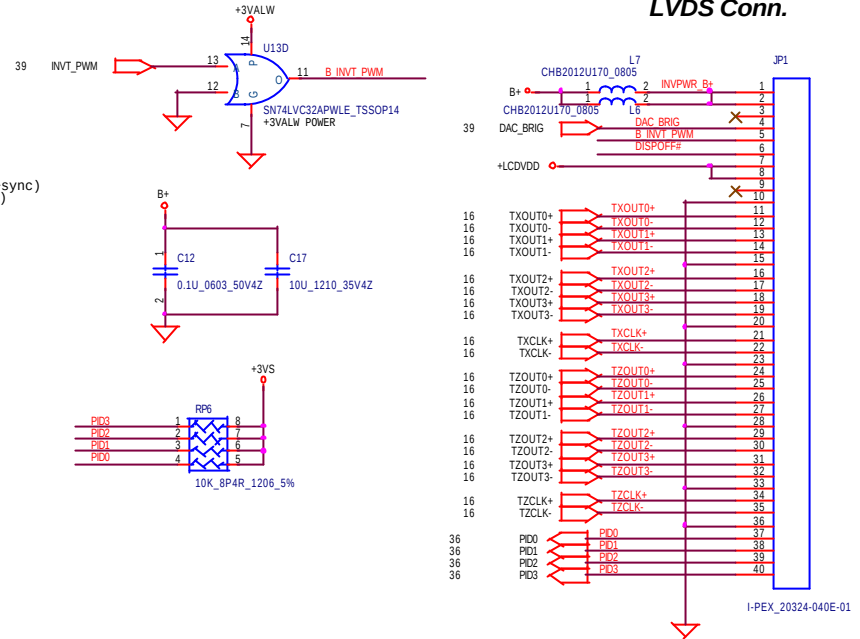


CRT, TV-OUT & LVDS CONNECTOR

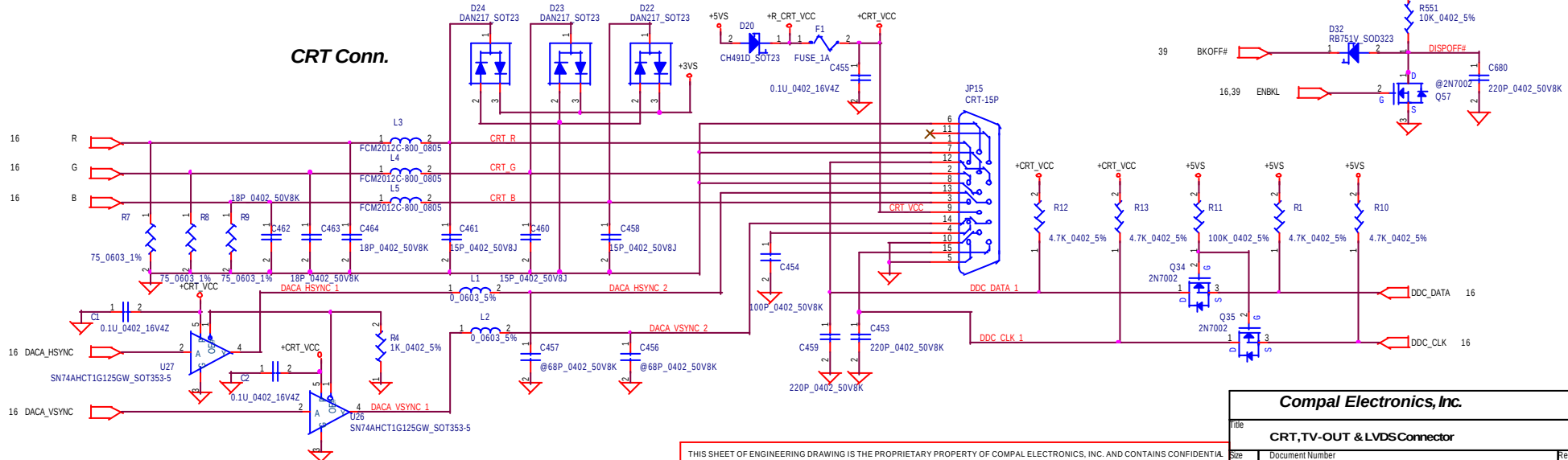
TV-OUT Conn.



LVDS Conn.

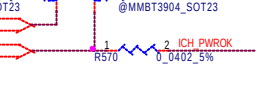
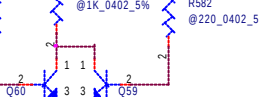
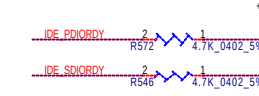
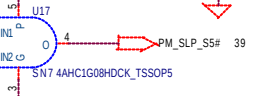
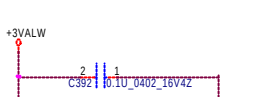
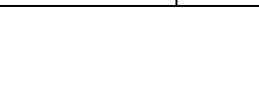
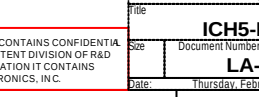
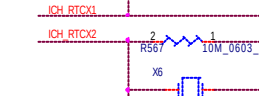
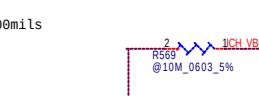
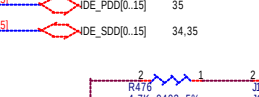
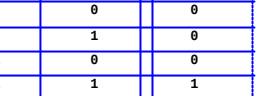
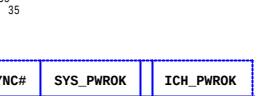
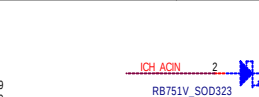
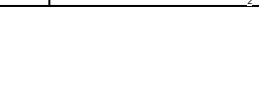
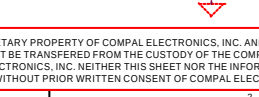
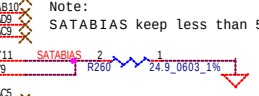
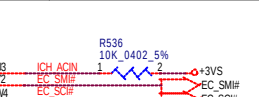
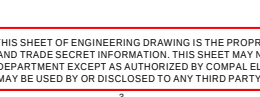
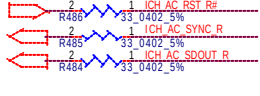
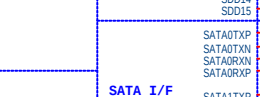
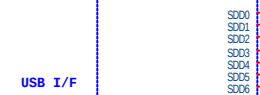
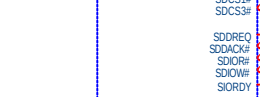
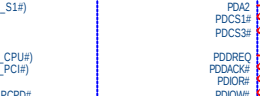
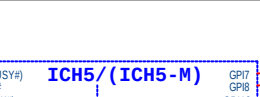
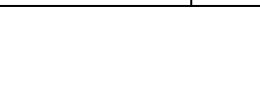
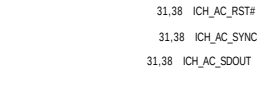
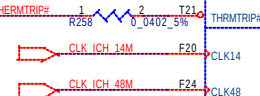
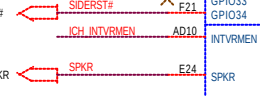
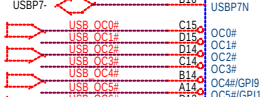
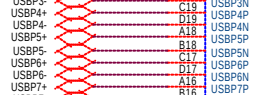
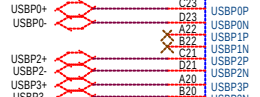
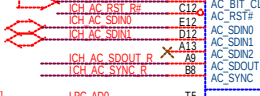
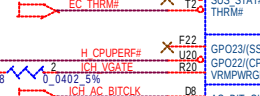
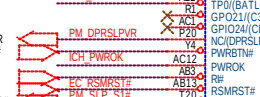
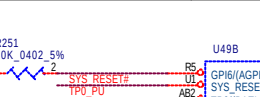
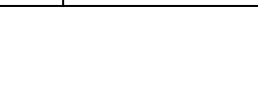
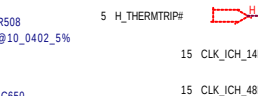
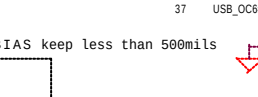
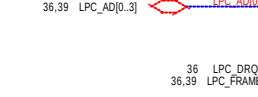
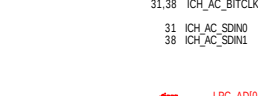
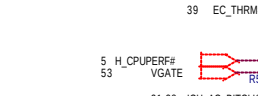
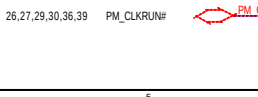
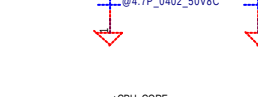
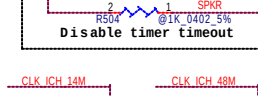
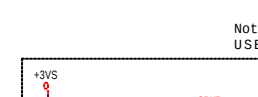
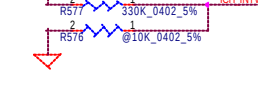
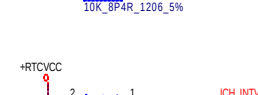
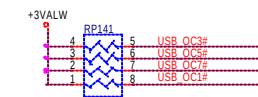
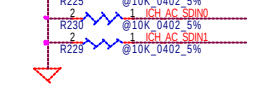
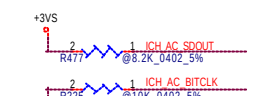
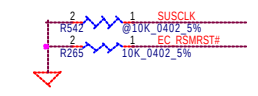
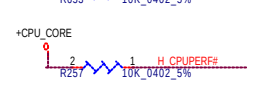
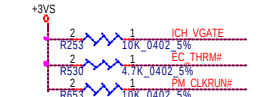
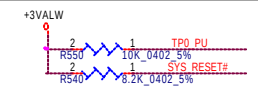


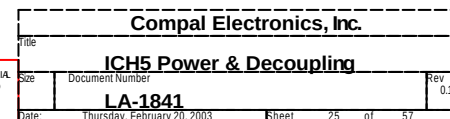
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Title			
CRT,TV-OUT & LVDS Connector			
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LAN Realtek RT8101L

23.27,29,30 PCI_AD[0..31] PCI_AD[0..31]

PCI_A00	47	A00
PCI_A01	46	A01
PCI_A02	45	A02
PCI_A03	44	A03
PCI_A04	43	A04
PCI_A05	42	A05
PCI_A06	41	A06
PCI_A07	40	A07
PCI_A08	39	A08
PCI_A09	38	A09
PCI_A10	37	A10
PCI_A11	36	A11
PCI_A12	35	A12
PCI_A13	34	A13
PCI_A14	33	A14
PCI_A15	32	A15
PCI_A16	31	A16
PCI_A17	30	A17
PCI_A18	29	A18
PCI_A19	28	A19
PCI_A20	27	A20
PCI_A21	26	A21
PCI_A22	25	A22
PCI_A23	24	A23
PCI_A24	23	A24
PCI_A25	22	A25
PCI_A26	21	A26
PCI_A27	20	A27
PCI_A28	19	A28
PCI_A29	18	A29
PCI_A30	17	A30
PCI_A31	16	A31

IDSEL-PCI_AD17

23.27,29,30	PCI_CBE#0	PCI_CBE#0	38	CBE#0
23.27,29,30	PCI_CBE#1	PCI_CBE#1	37	CBE#1
23.27,29,30	PCI_CBE#2	PCI_CBE#2	36	CBE#2
23.27,29,30	PCI_CBE#3	PCI_CBE#3	35	CBE#3
23.27,29,30	PCI_PAR	PCI_PAR	24	PAR
23.27,29,30	PCI_FRAME#	PCI_FRAME#	18	FRAME#
23.27,29,30	PCI_IRDY#	PCI_IRDY#	19	IRDY#
23.27,29,30	PCI_TRDY#	PCI_TRDY#	20	TRDY#
23.27,29,30	PCI_DEVSEL#	PCI_DEVSEL#	21	DEVSEL#
23.27,29,30	PCI_STOP#	PCI_STOP#	23	STOP#
23.27,29,30	PCI_PERR#	PCI_PERR#	25	PERR#
23.27,29,30	PCI_SERR#	PCI_SERR#	26	SERR#
23	PCI_REQ#3	PCI_REQ#3	83	REQ#
23	PCI_GNT#3	PCI_GNT#3	82	GNT#
23.27	PCI_PIRQB#	PCI_PIRQB#	80	PIRQB#
27,29,30,39	LAN_PME#	LAN_PME#	57	PME#
10,23,27,29,30,36,39	PCIRST#	PCIRST#	81	RST#
15	CLK_PCI_LAN	CLK_PCI_LAN	97	CLKRUN#
24,27,29,30,36,39	PM_CLKRUN#	PM_CLKRUN#	50	CLKRUN#

Power
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AC-Link

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0.1U_0402_16V4Z
C122
C121
C120

0.1U_0402_16V4Z
C119
C118
C117

0.1U_0402_16V4Z
C116
C115
C114

0.1U_0402_16V4Z
C113
C112
C111

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C110
C109
C108

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C107
C106
C105

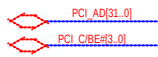
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C103
C102

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C101
C100
C99

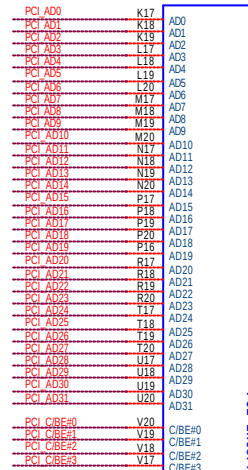
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C98
C97
C96

0.1U_0402_16V4Z
C95
C94
C93

23,26,29,30 PCI_AD[31..0]
23,26,29,30 PCI_CBE#[3..0]



USA



SD Interface

SmartMedia Interface

PCI Interface

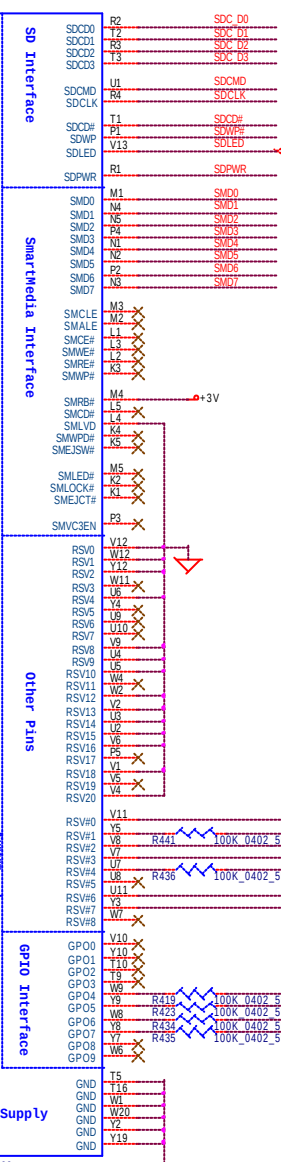
Other Pins

Power Supply

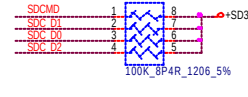
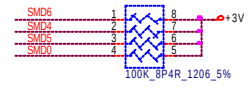
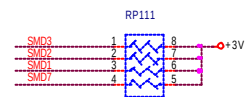
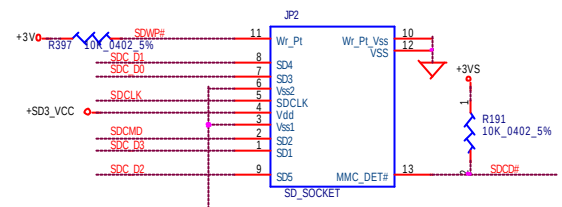
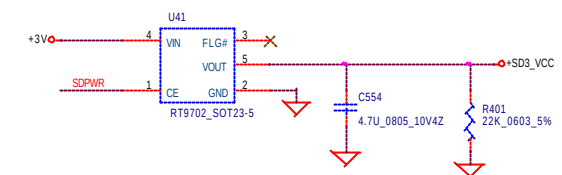
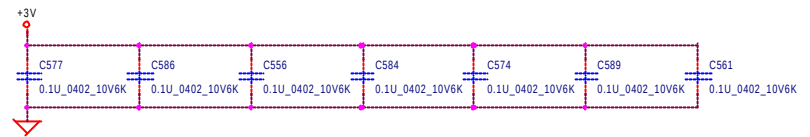
GPIO Interface

Power Supply

TC6385XB_PBG328



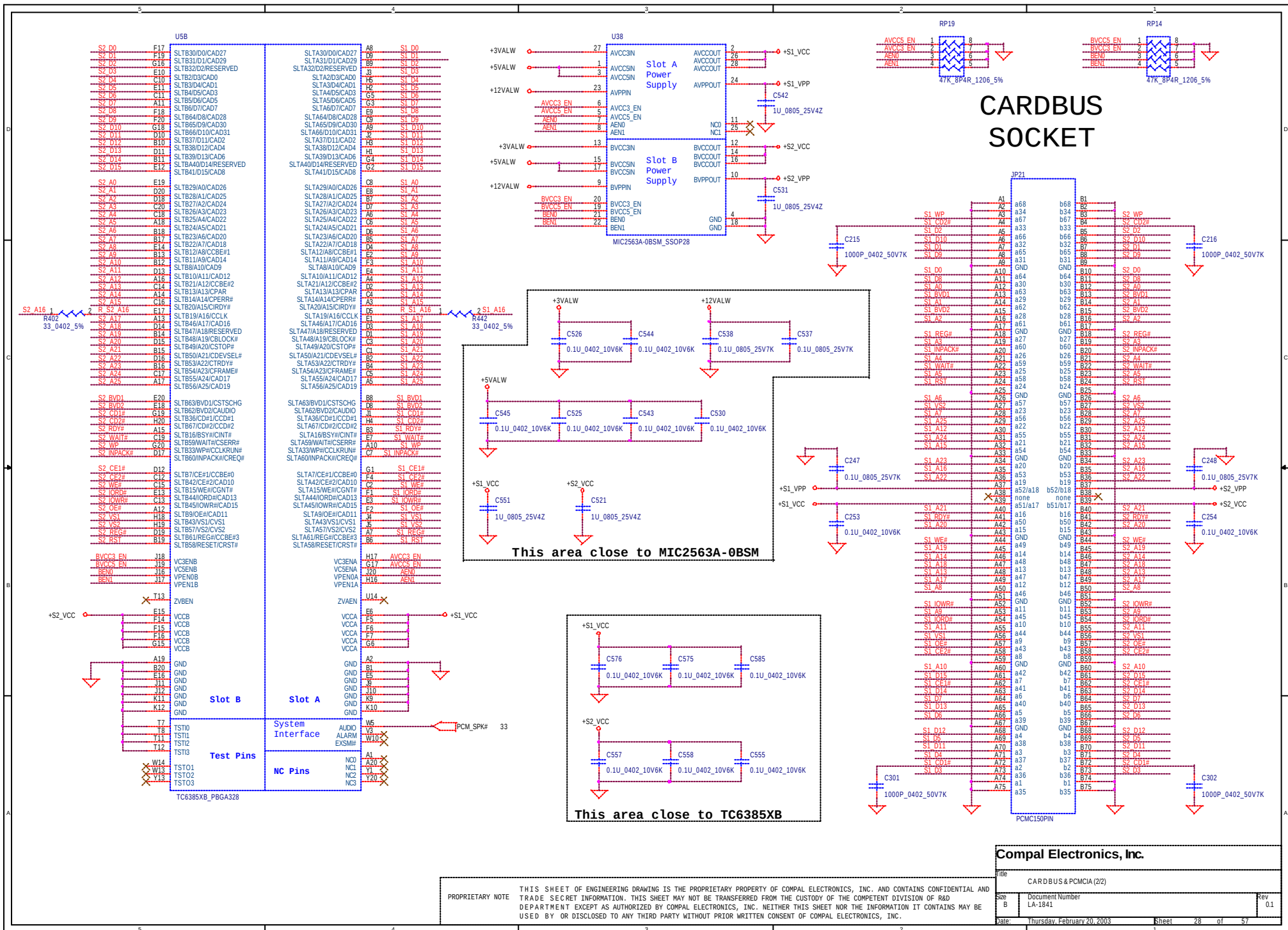
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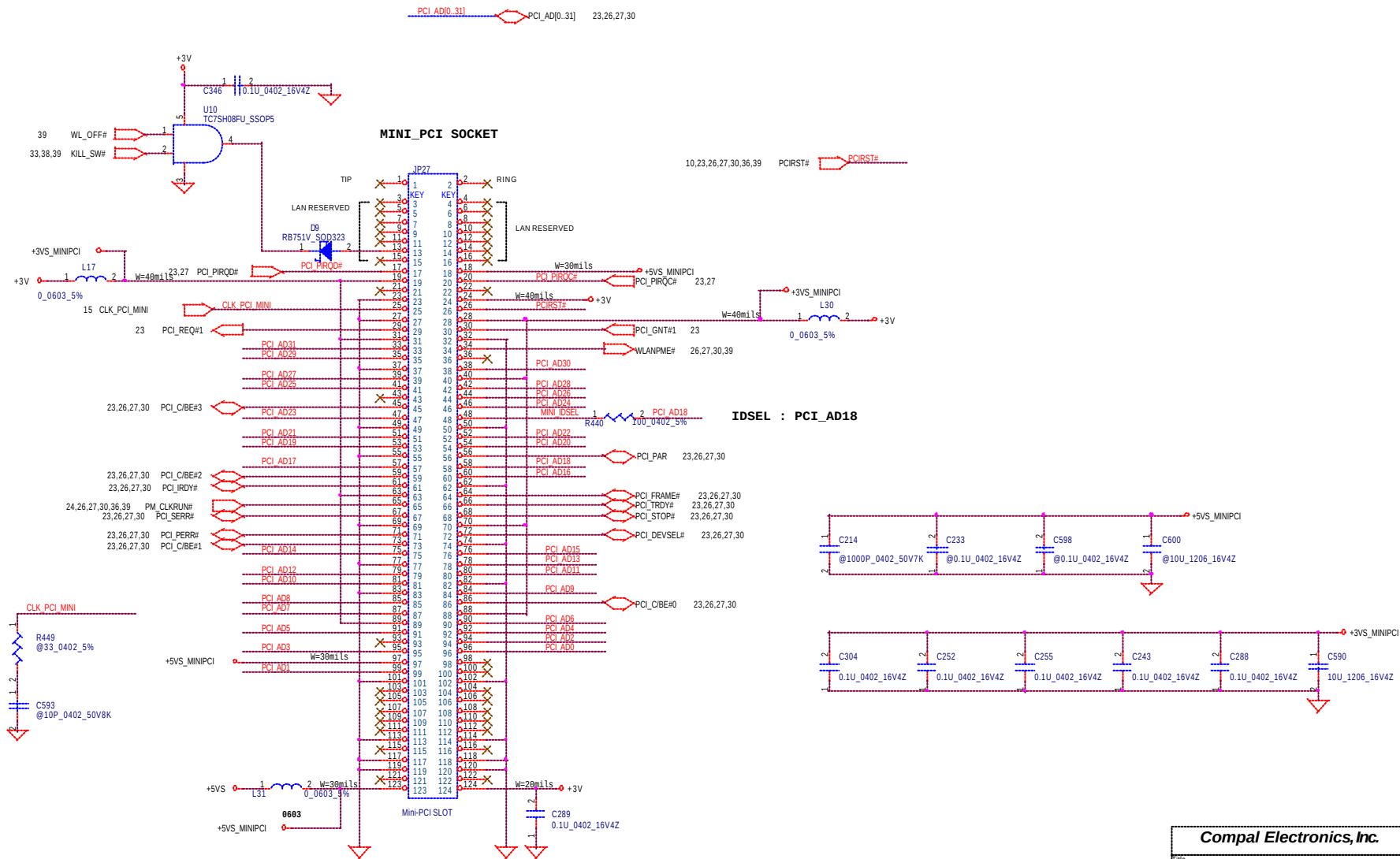


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Title			CARDBUS & SD CONN (1/2)
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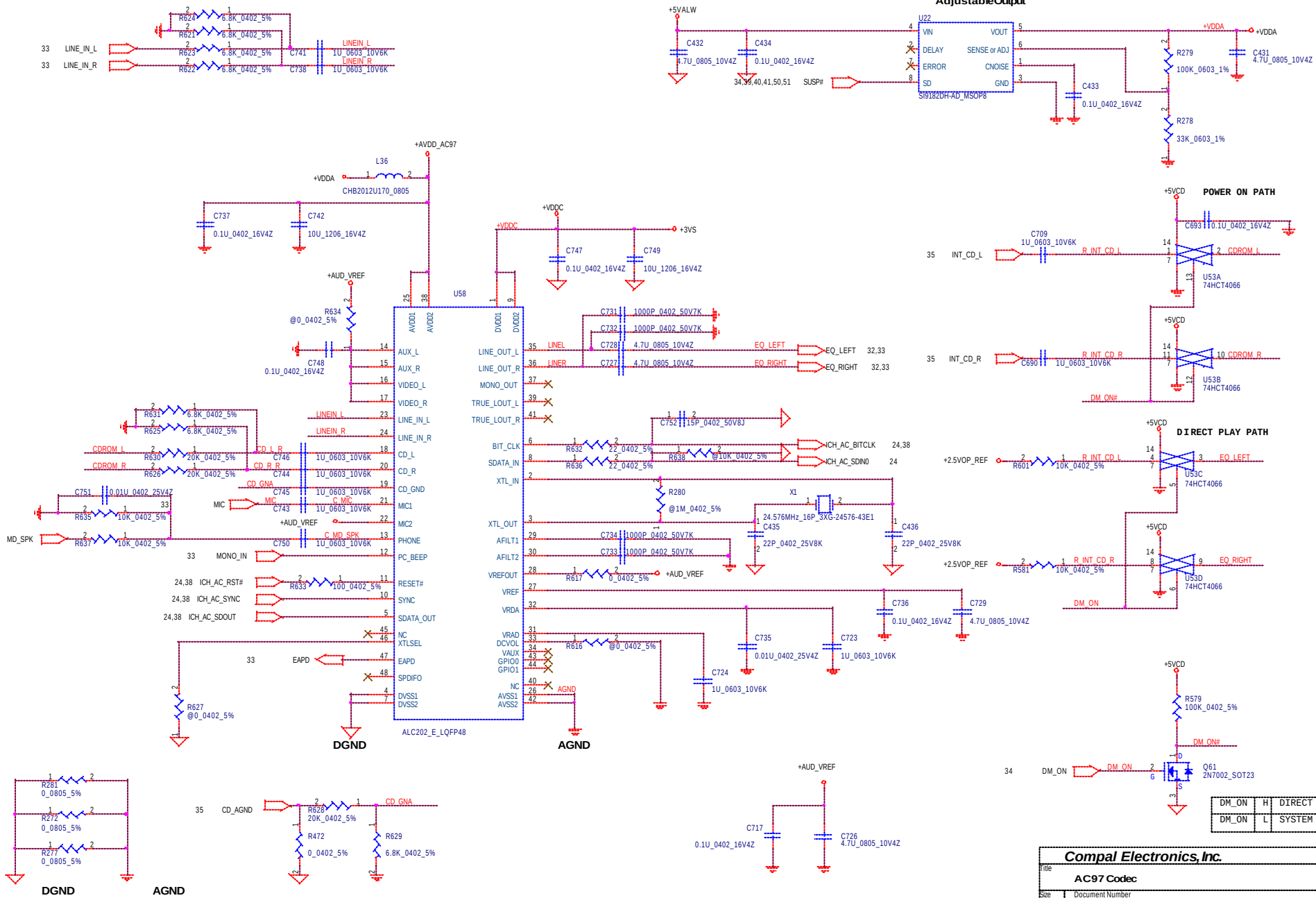


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Compal Electronics, Inc.			
Title			
MINI_PCI			
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AC97 Codec

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DM_ON	H	DIRECT CD
DM_ON	L	SYSTEM ON

Compal Electronics, Inc.

Title	AC97 Codec
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Size	Document Number
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Rev

Rev

Date: Thursday, February 20, 2003 Sheet 31 of 57

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BTQ00 EQ Circuit

AUDIO LEFT CHANNEL

OUTPUT TO AMPLIFIER LEFT CHANNEL

BY-PASS EQ CIRCUIT

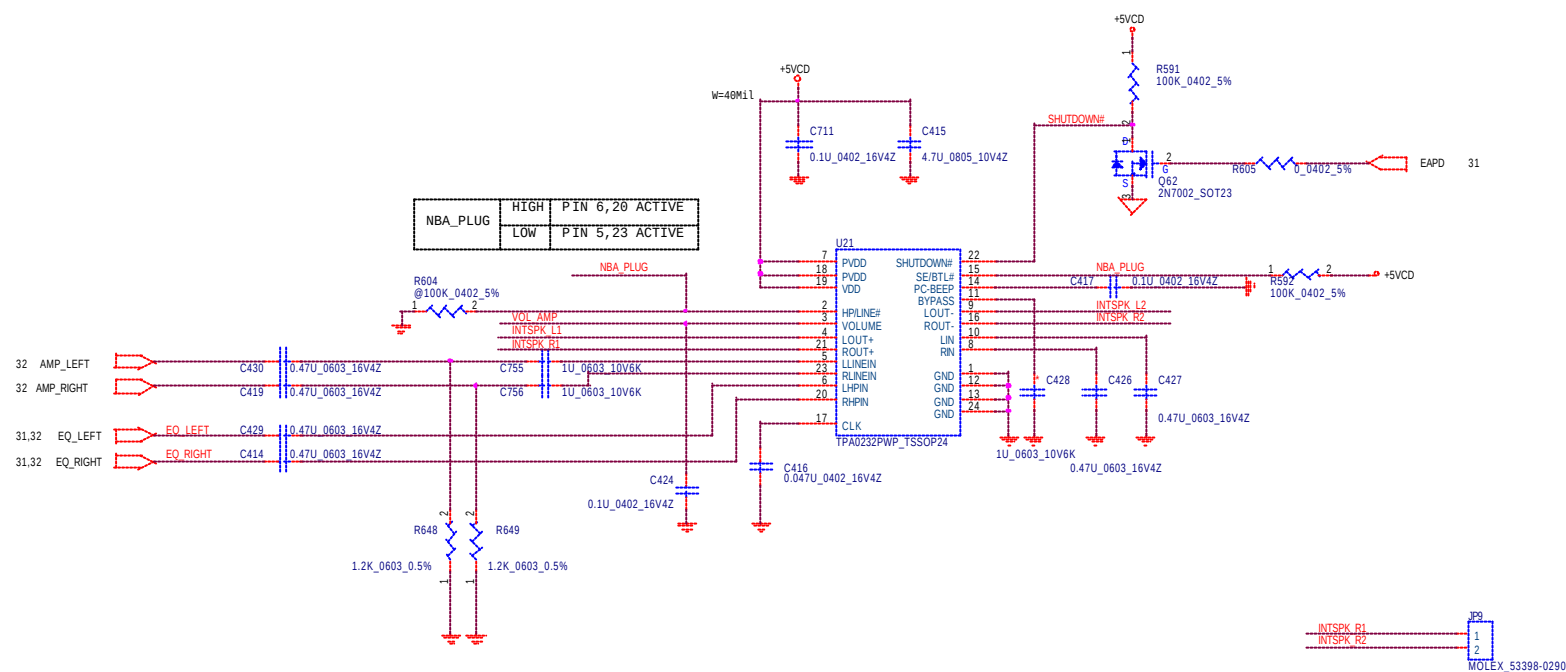
AUDIO RIGHT CHANNEL

OUTPUT TO AMPLIFIER RIGHT CHANNEL

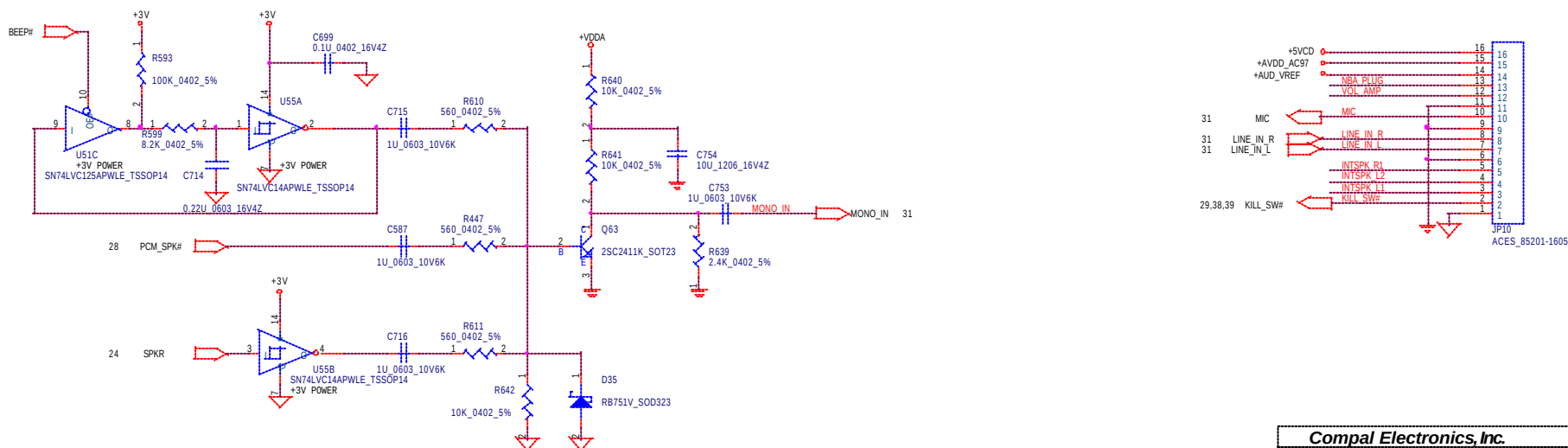
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HAREWAREEQ		
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Audio AMP



AUDIO Board Conn.



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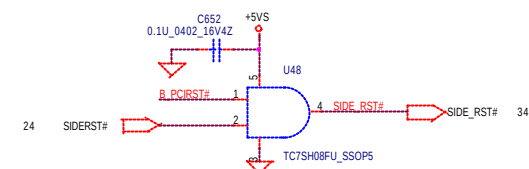
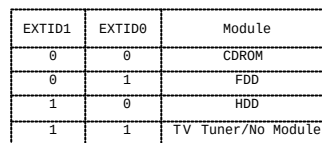
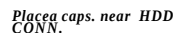
Title **AMP & Audio Jack**

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Rev	0.1
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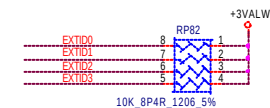
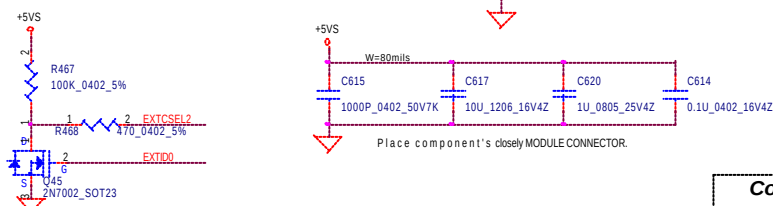
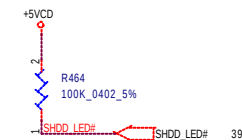
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IDE,CD-ROM Module CONN.

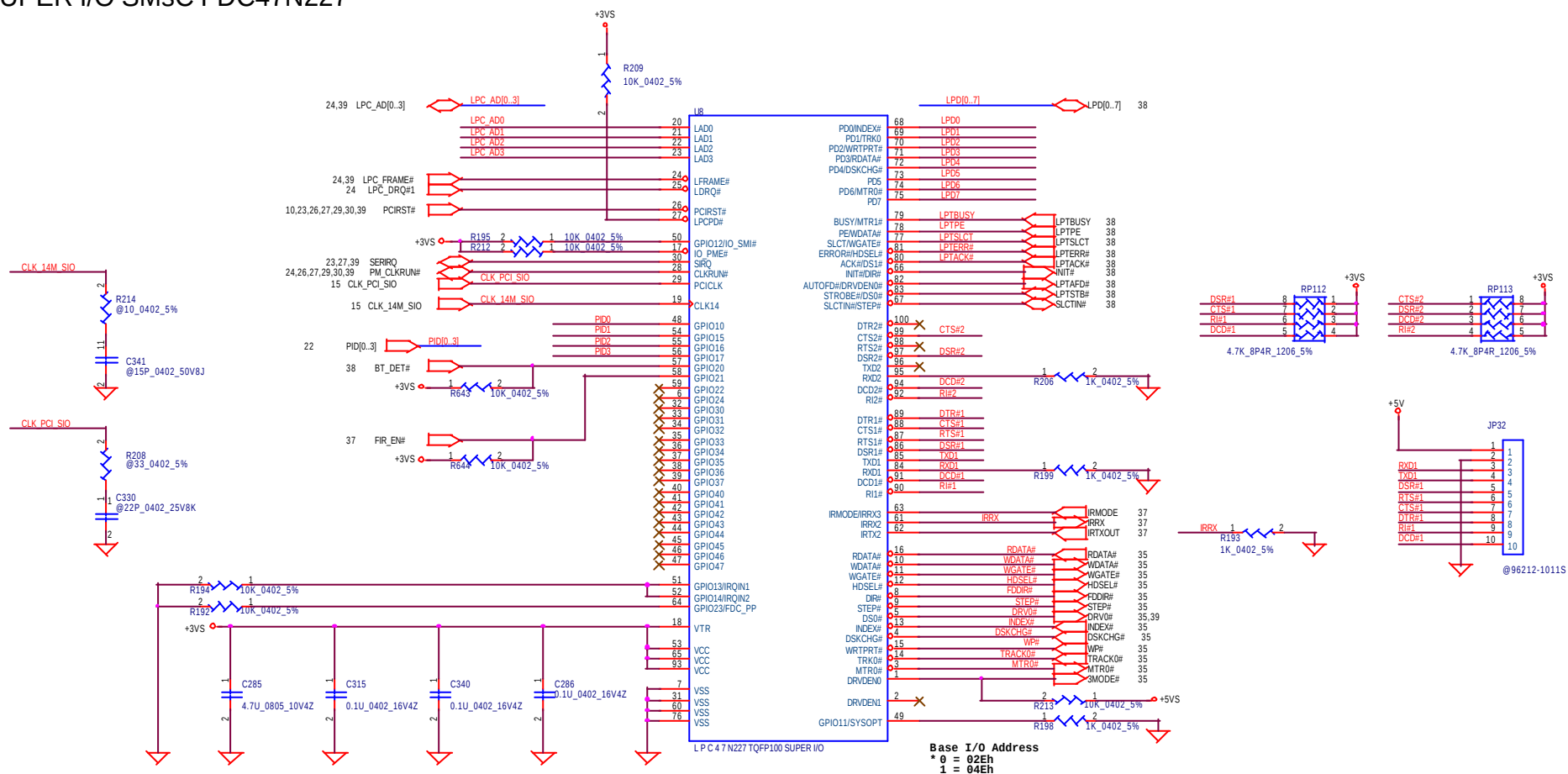


EXTID3	EXTID2	Module
0	0	CDROM
0	1	FDD
1	0	HDD
1	1	TV Tuner/No Module

2nd Module Conn. (Slave)

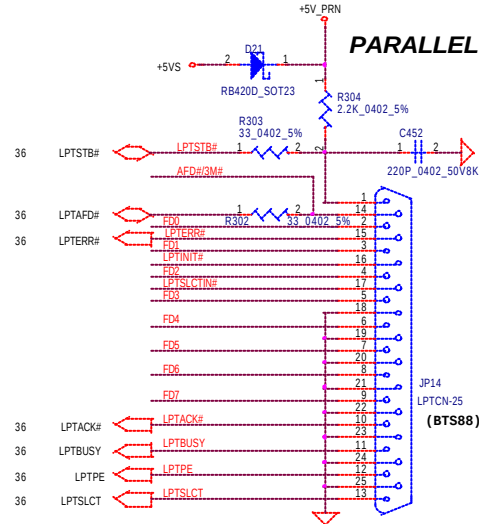
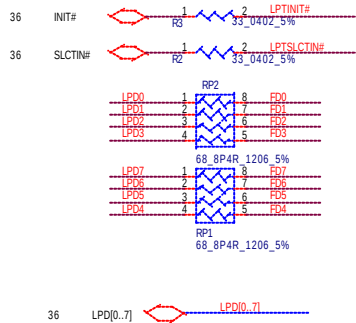
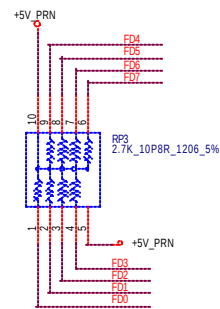
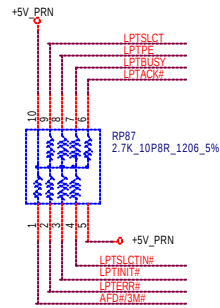
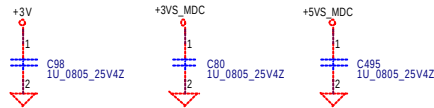
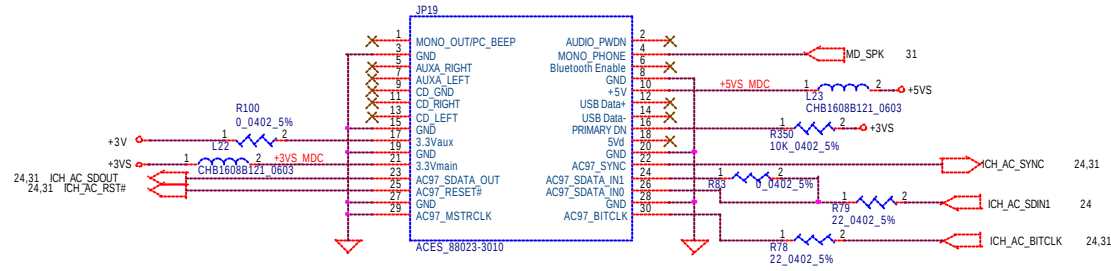


SUPER I/O SMsC FDC47N227

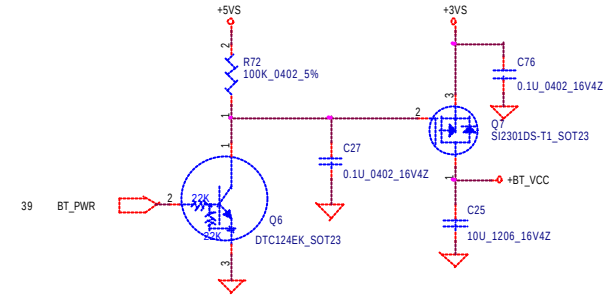


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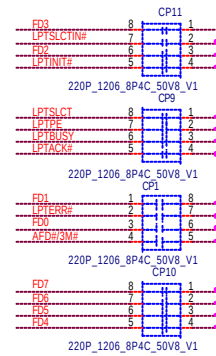
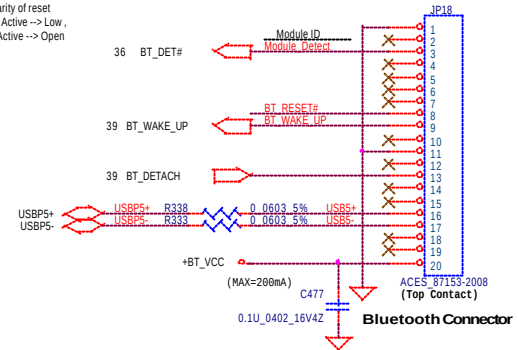
MDC CONN.



BlueTooth Interface



Module ID
Indication for polarity of reset
Reset input High Active --> Low,
Reset input Low Active --> Open



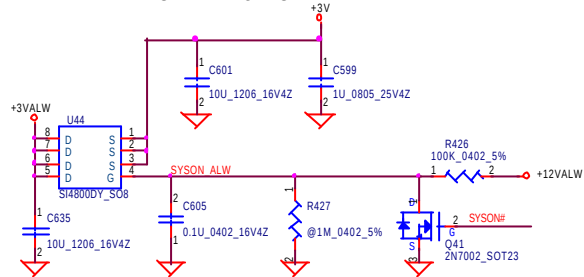
Compal Electronics, Inc.

Title			PARALLEL MDC PORT
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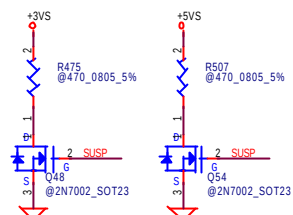
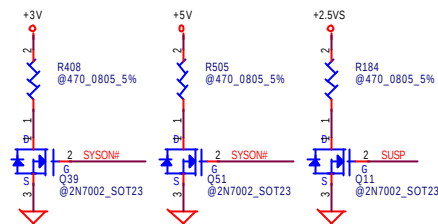
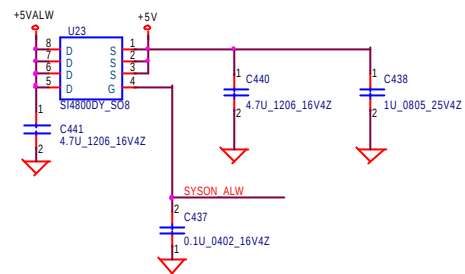
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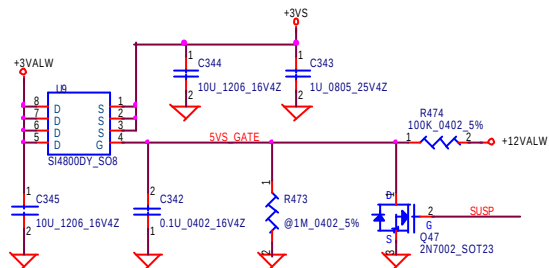
+3VALW TO +3V



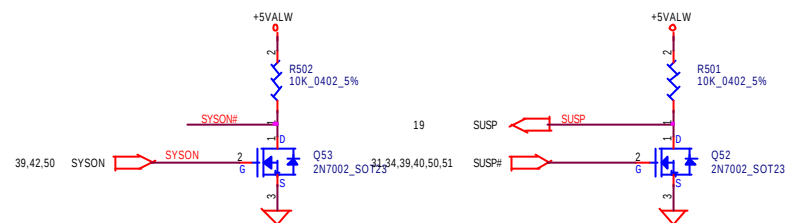
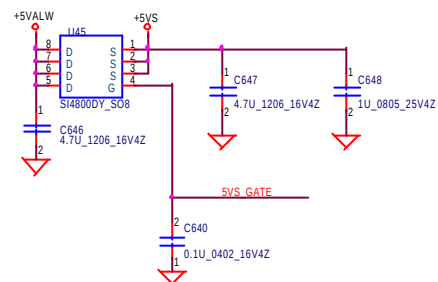
+5VALW TO +5V



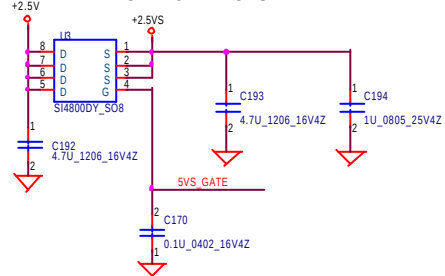
+3VALW TO +3VS



+5VALW TO +5VS



+2.5V TO +2.5VS



Compal Electronics, Inc.

POWER CONTROL CKT

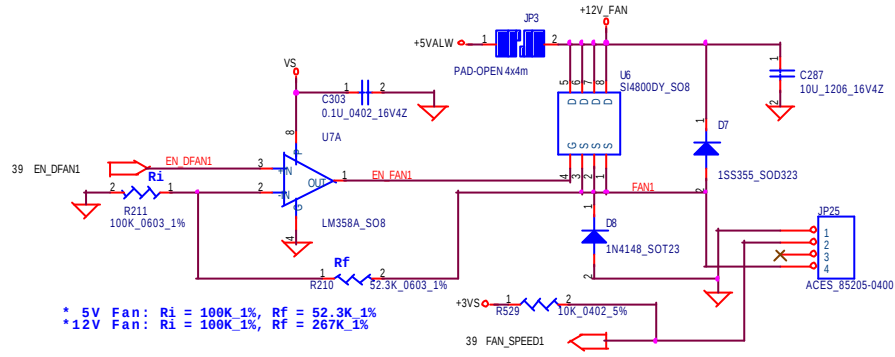
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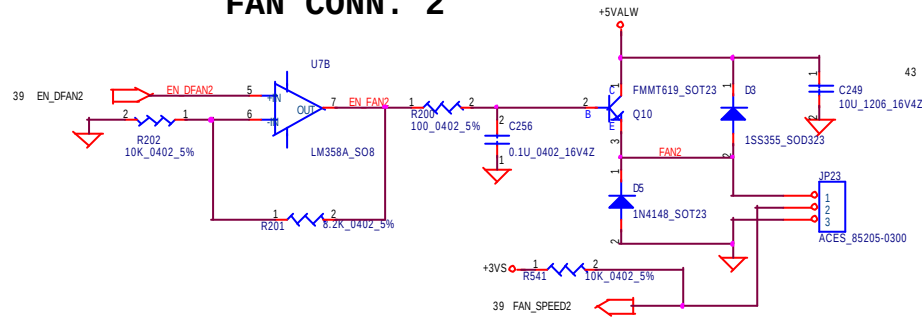
Power ON Circuit

RTC Battery

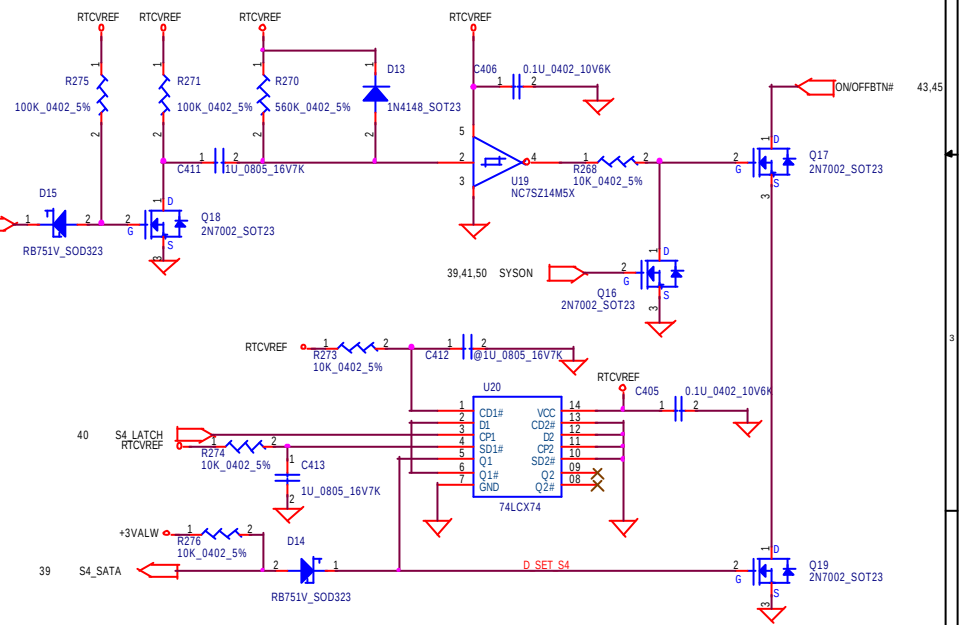
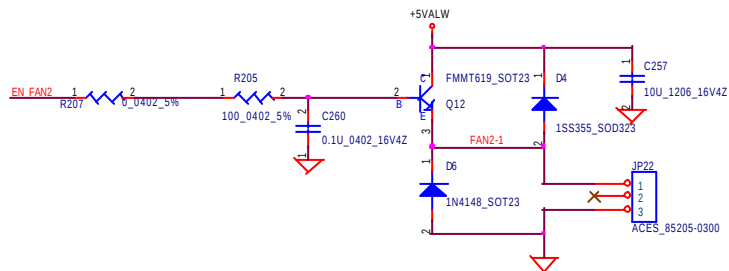
FAN CONN. 1



FAN CONN. 2

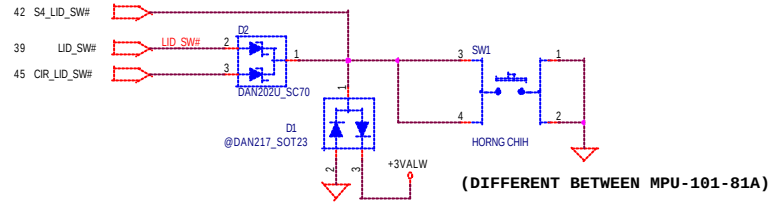


FAN CONN. 3

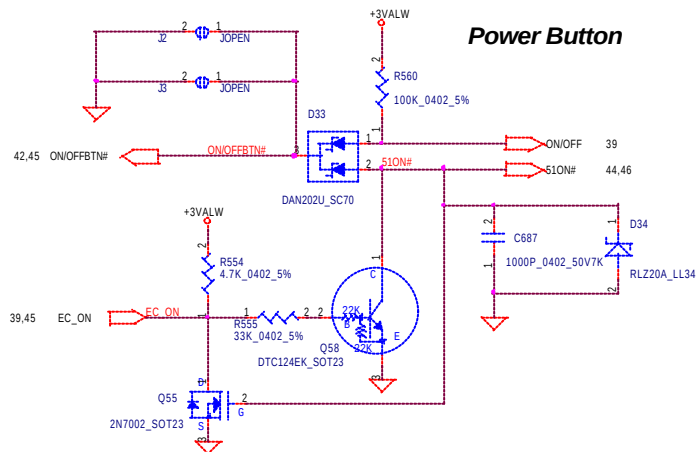


Compal Electronics, Inc.			
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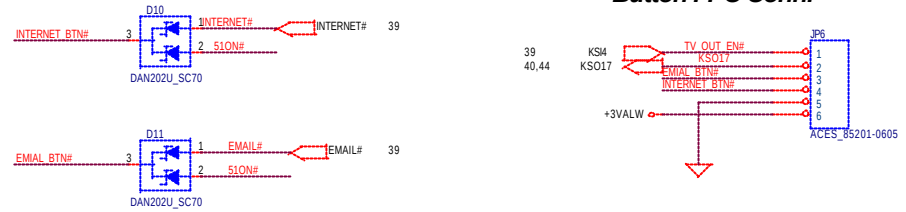
LID Switch



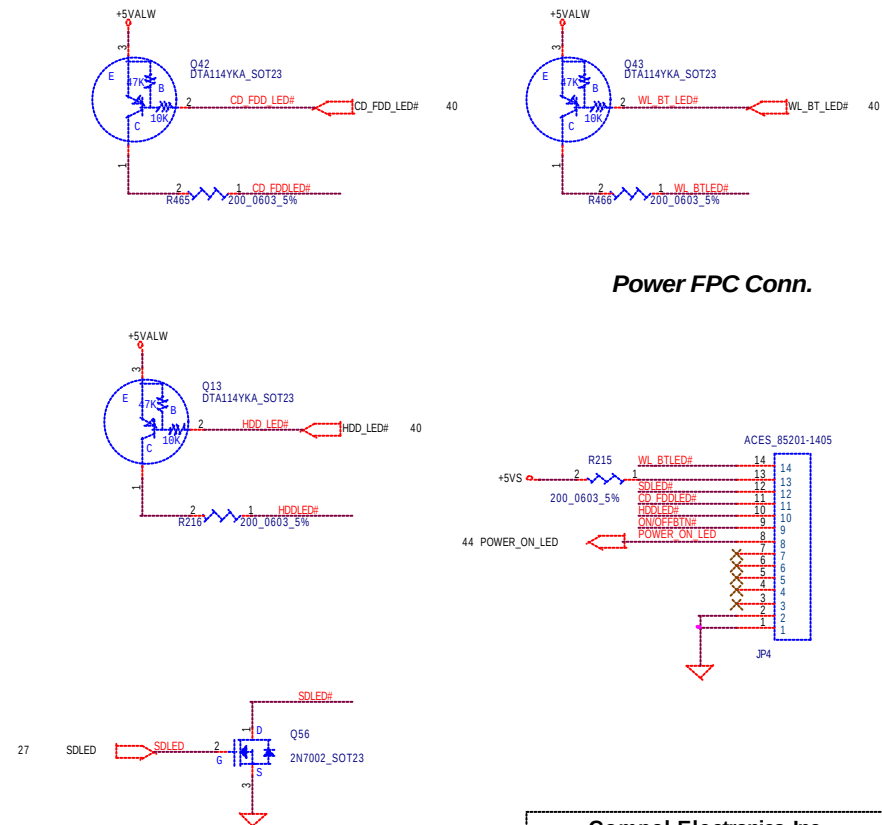
Power Button



Button FPC Conn.

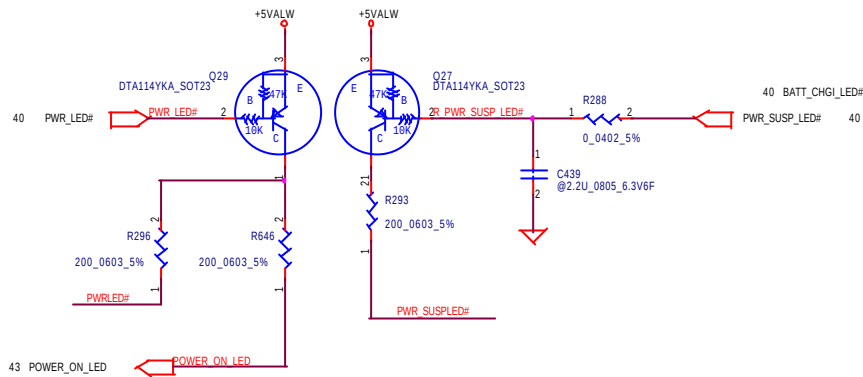


Power FPC Conn.

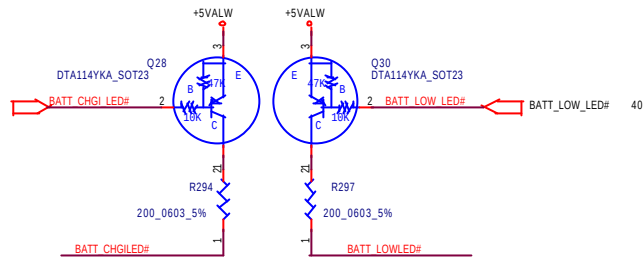


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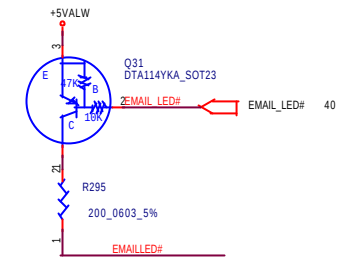
Compal Electronics, Inc.			
Switches & Connectors			
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POWER/SUSP LED

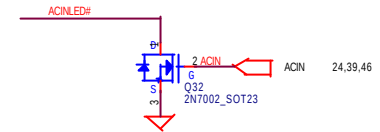
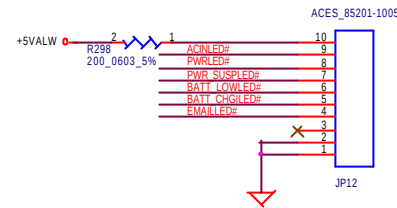


BATTERY CHGI/LOW LED

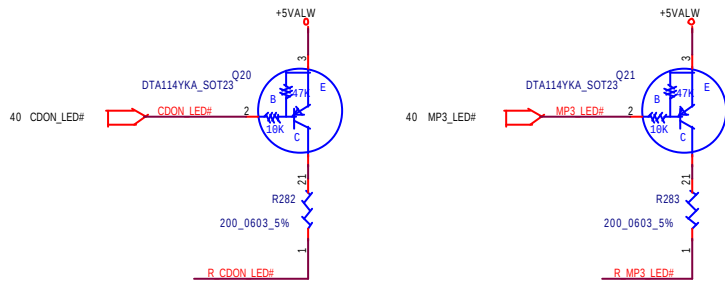


EMAIL LED

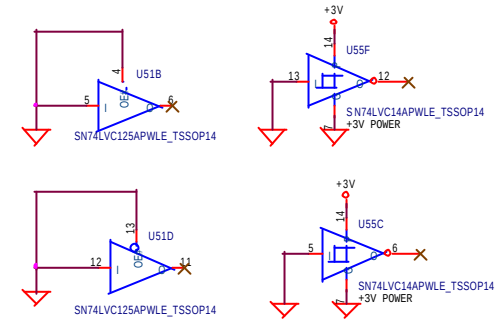
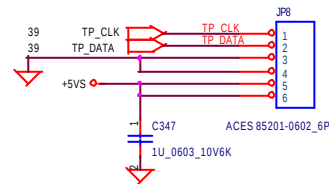
LED FPC Conn.



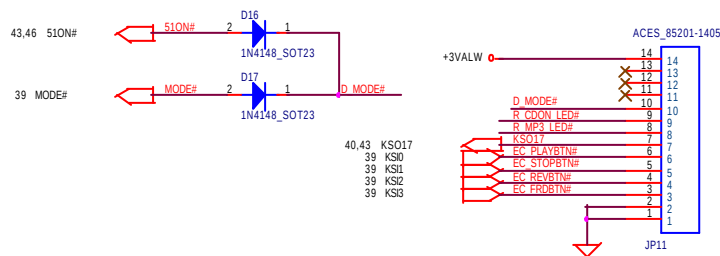
ACIN LED



Touch Pad Connector

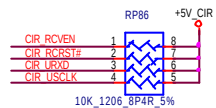
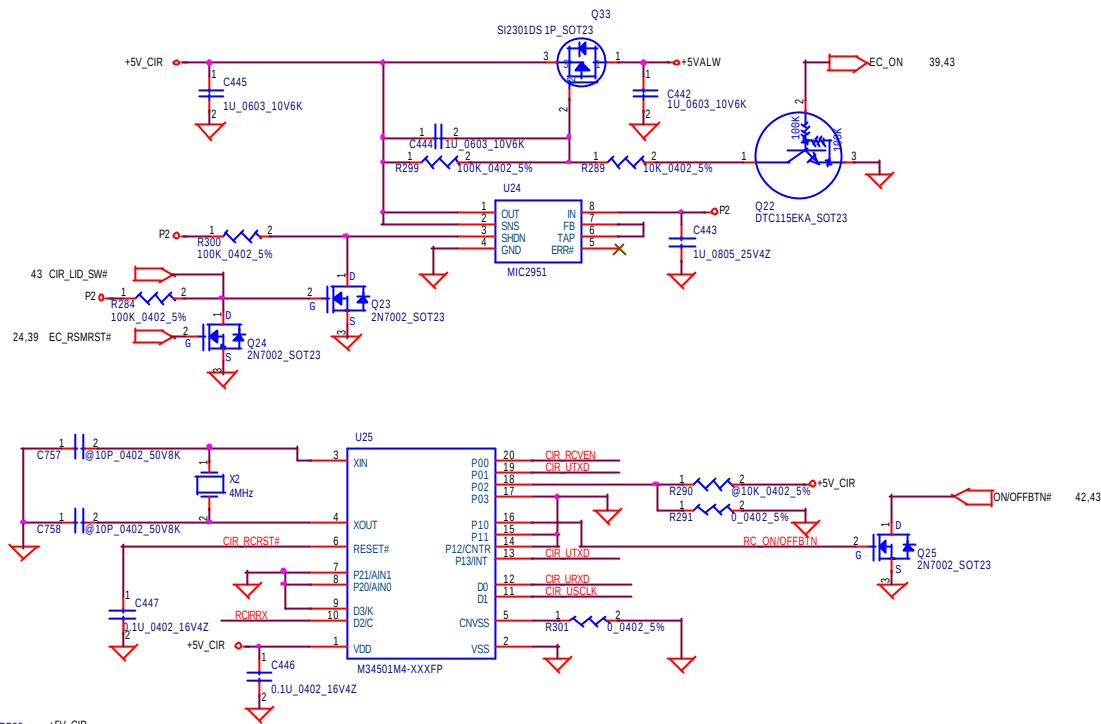


CDPLAY Board Conn.

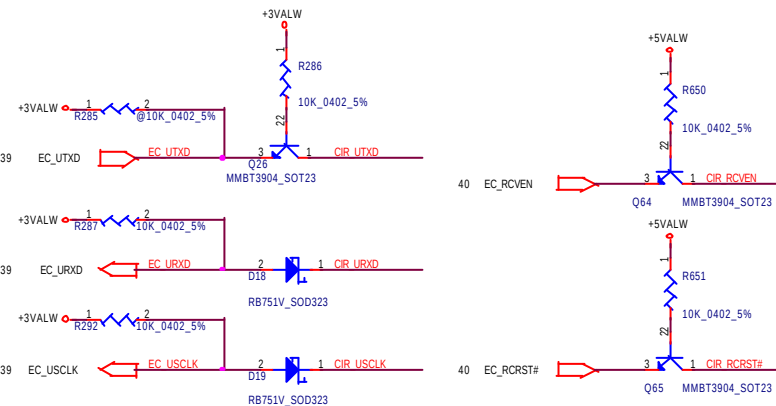
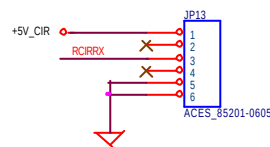


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Compal Electronics, Inc.			
Title			
Switches & Connectors			
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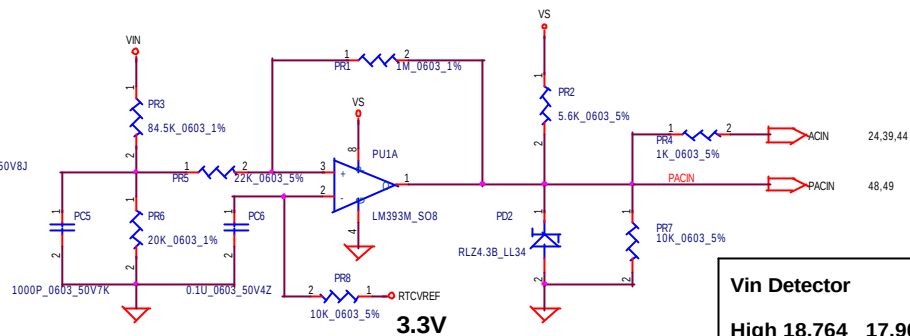
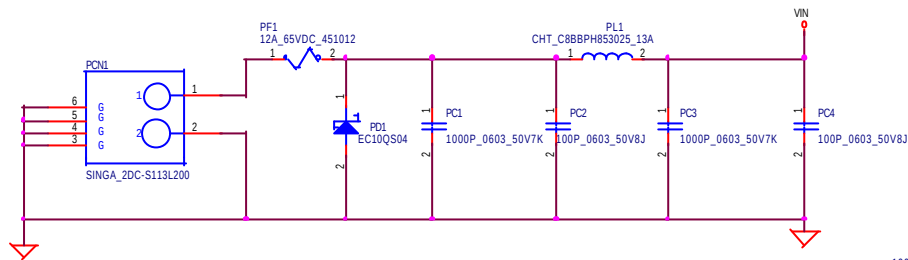


CIR Reciever Board Conn.

**Compal Electronics, Inc.**

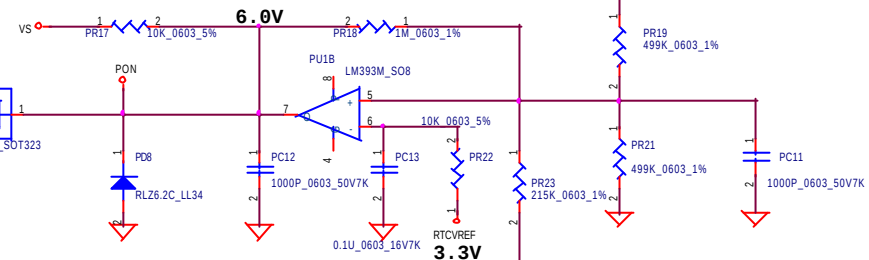
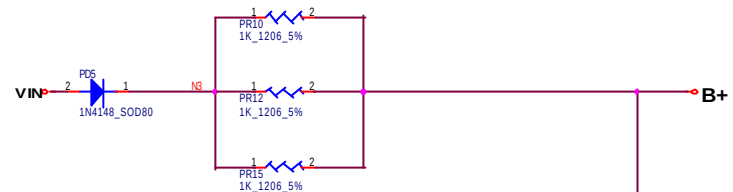
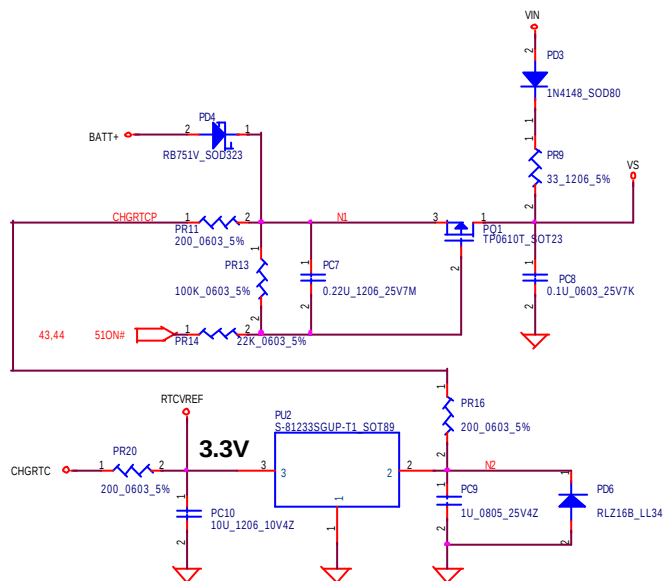
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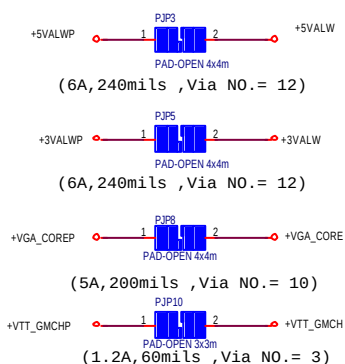
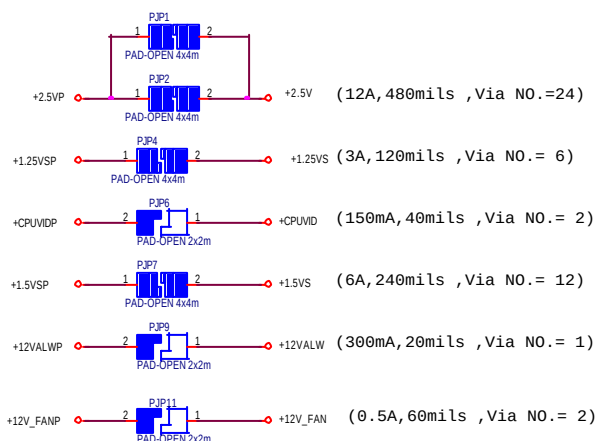
Vin Detector

High 18.764 17.901 17.063
Low 17.745 16.903 16.038



Precharge detector

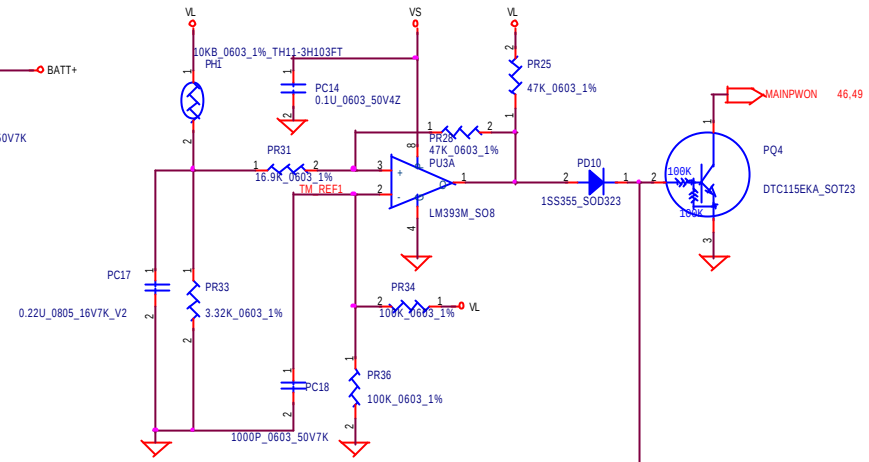
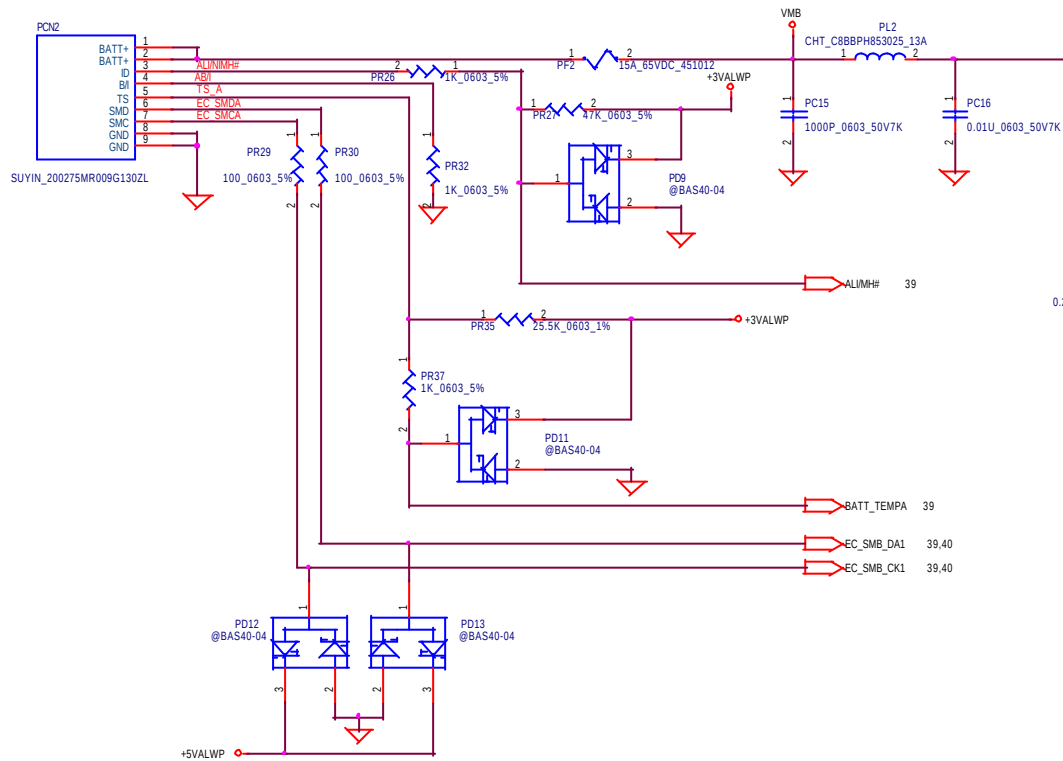
15.34 15.90 16.48
13.13 13.71 14.20



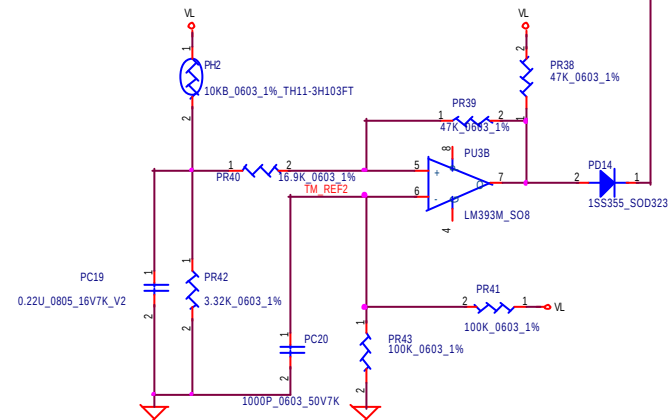
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Compal Electronics, Inc.			
DCIN&DETECTOR			
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PH1 under CPU botten side :
CPU thermal protection at 84 degree C
Recovery at 45 degree C

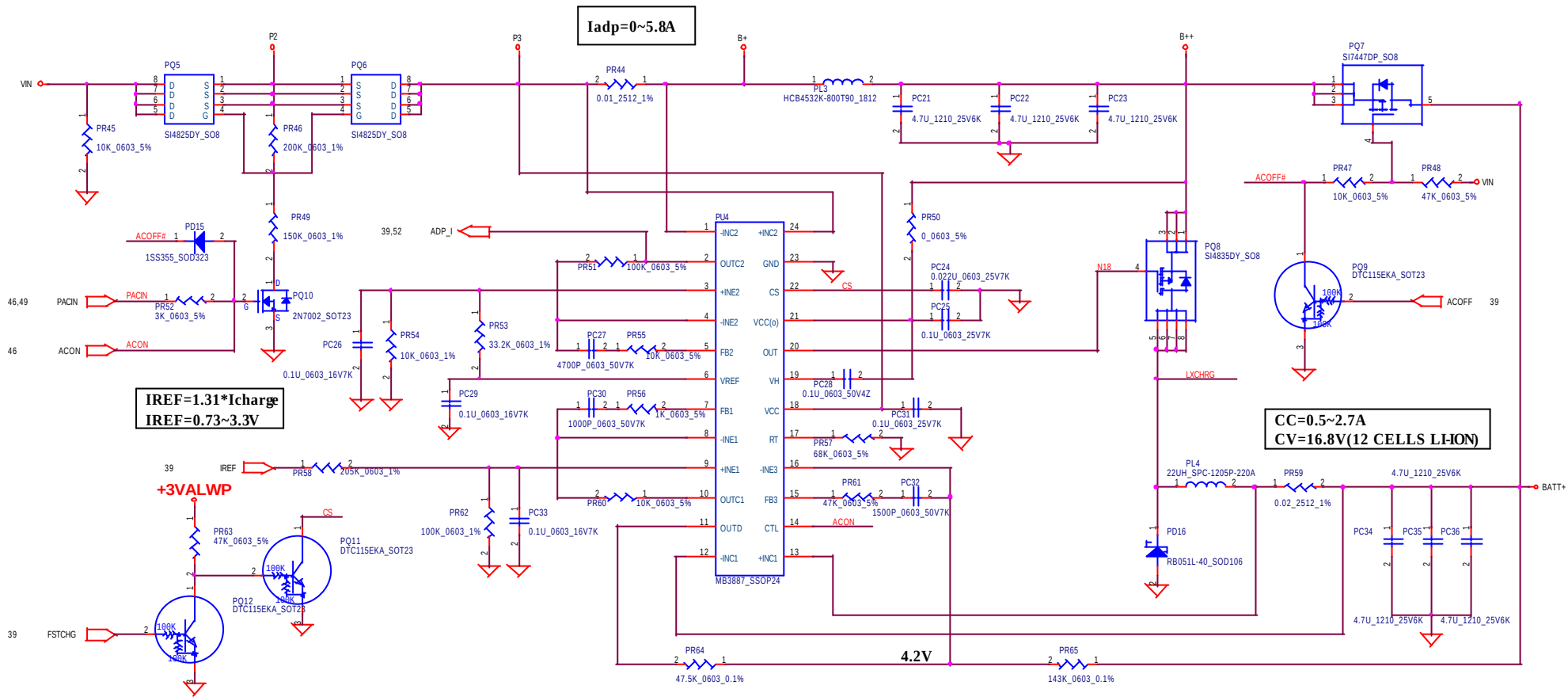


PH2 near main Battery CONN :
BAT. thermal protection at 84 degree C
Recovery at 45 degree C

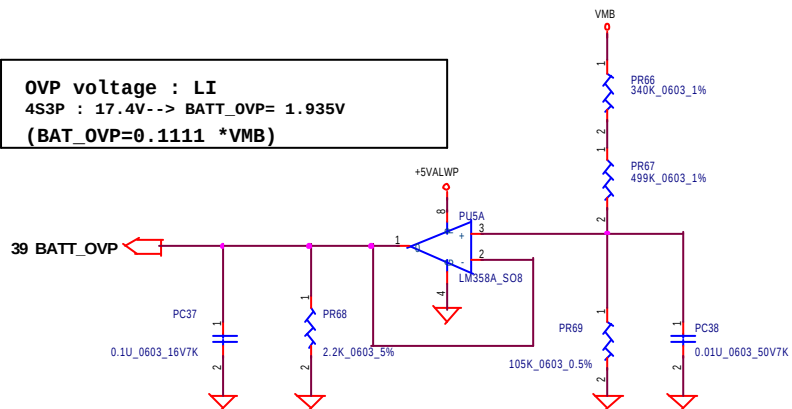


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Compal Electronics, Inc.			
Title			
BATTERY CONN/OTP			
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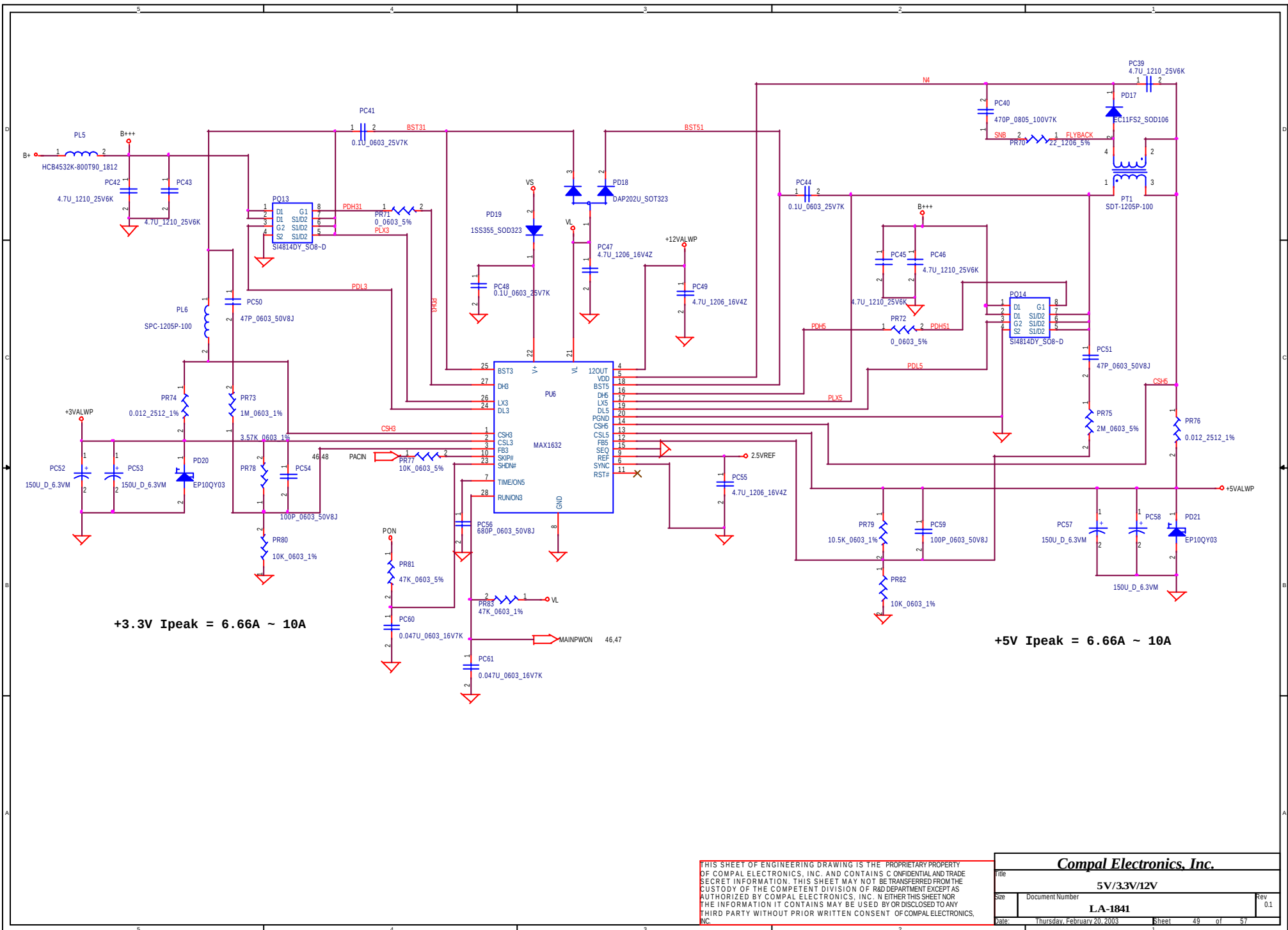
OVP voltage : LI
4S3P : 17.4V--> BATT_OVP= 1.935V
(BATT_OVP=0.1111 *VMB)



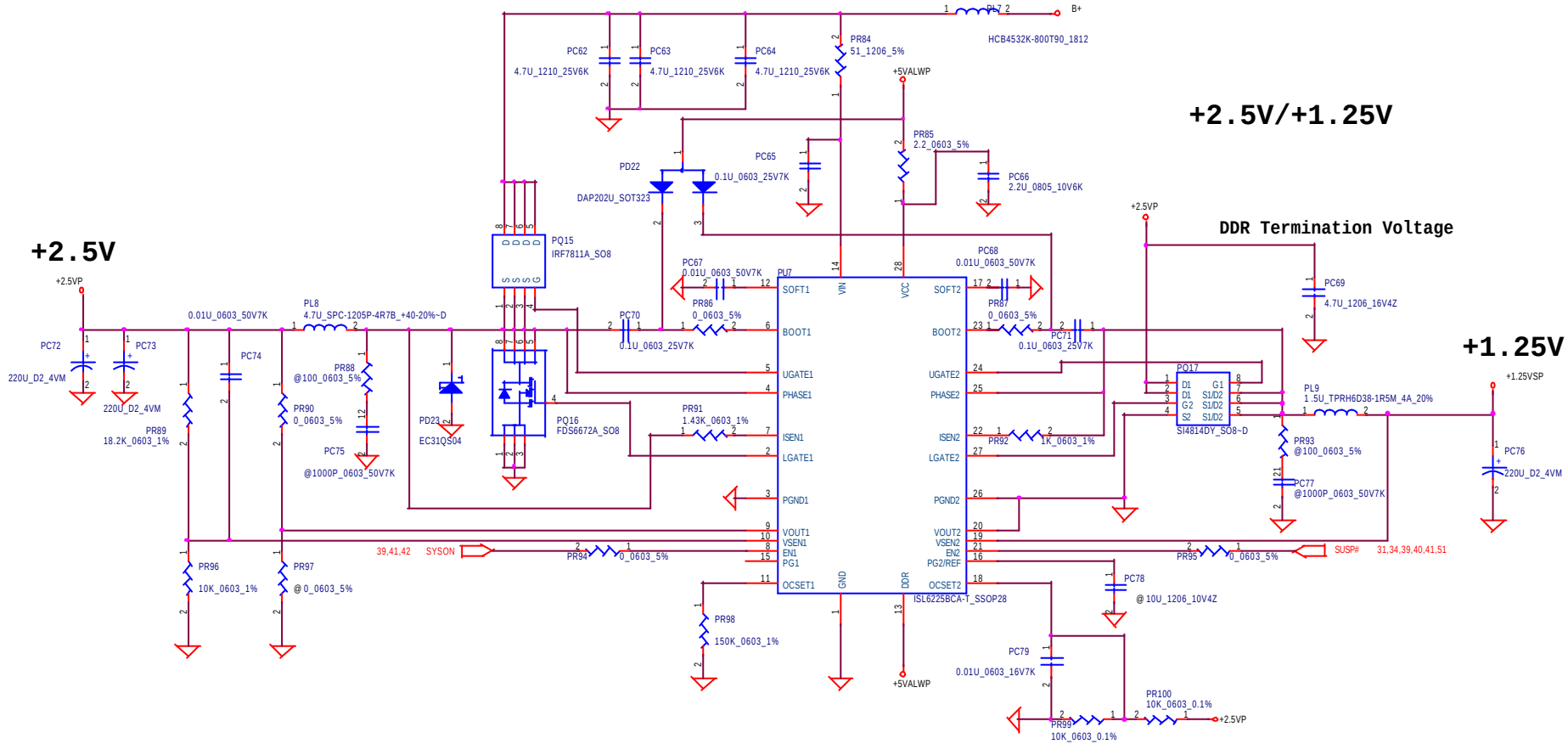
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CHARGER		
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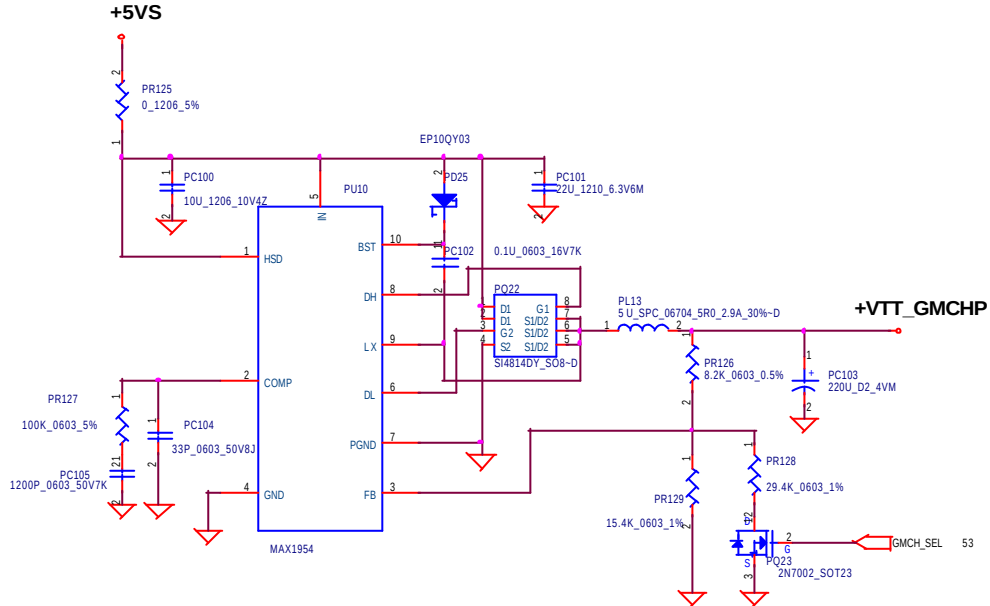
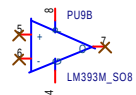
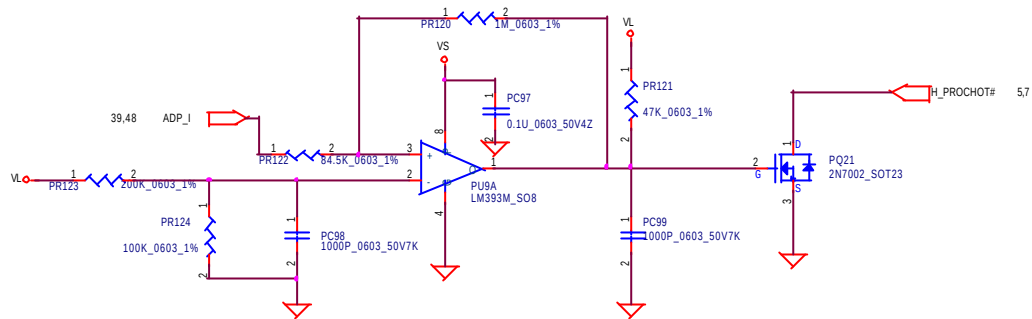
Compal Electronics, Inc.		
Title		
5V/3.3V/12V		
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Compal Electronics, Inc.			
Title		DDR/2.5V/1.25V	
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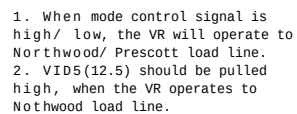


GMCH_SEL=1	VOUT=1.225V FOR PRESCOTT
GMCH_SEL=0	VOUT=1.45V FOR NORTHWOOD

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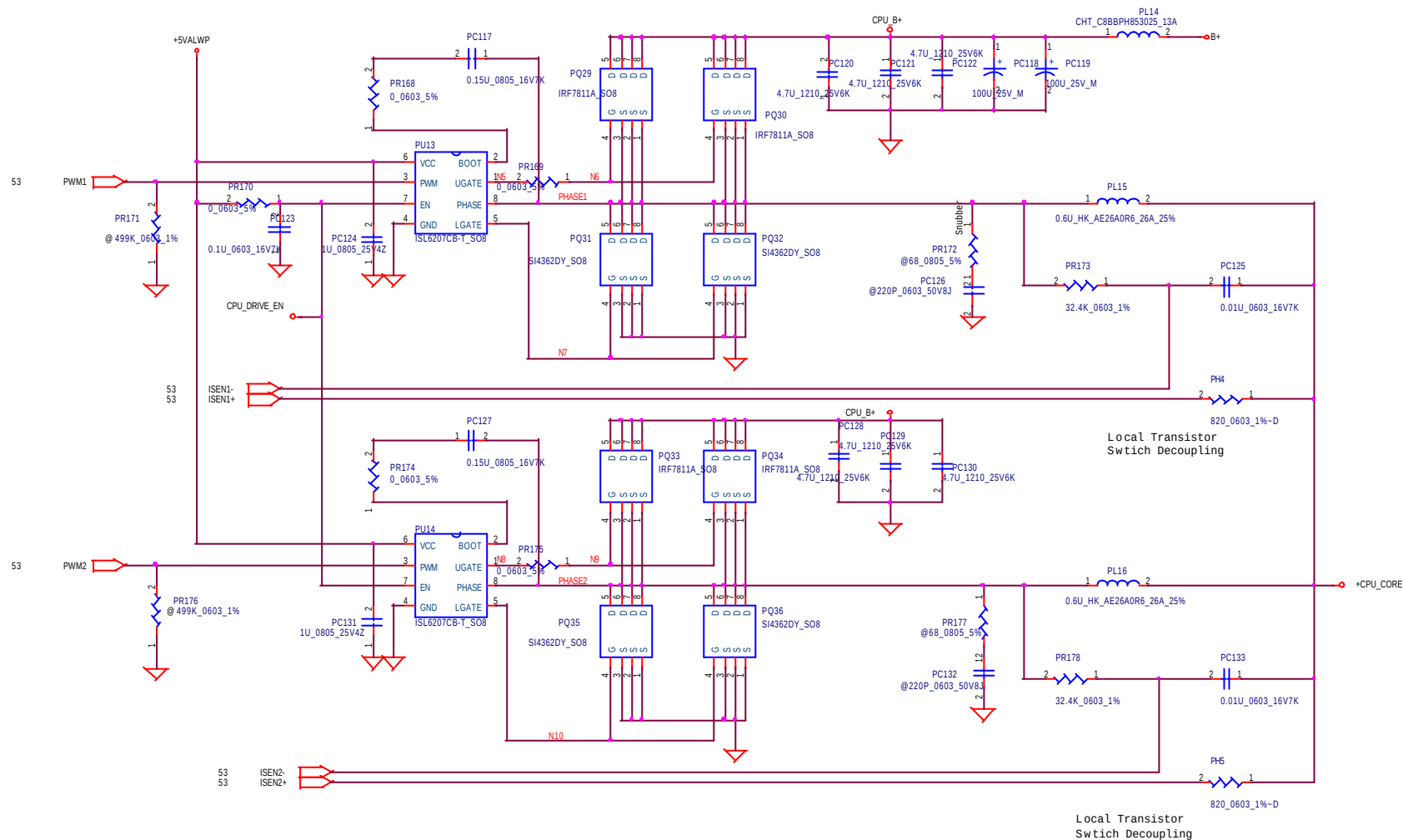
Compal Electronics, Inc.		
Title VTT_GMCH/CLOCK/THROTLING		
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#7	GND	#11	REF	#33	EN	#38	OVP
#9	TCOMP	#14	IDR00P	#35	GND	#40	GND
#10	DAC	#18	RGND	#37	GND		



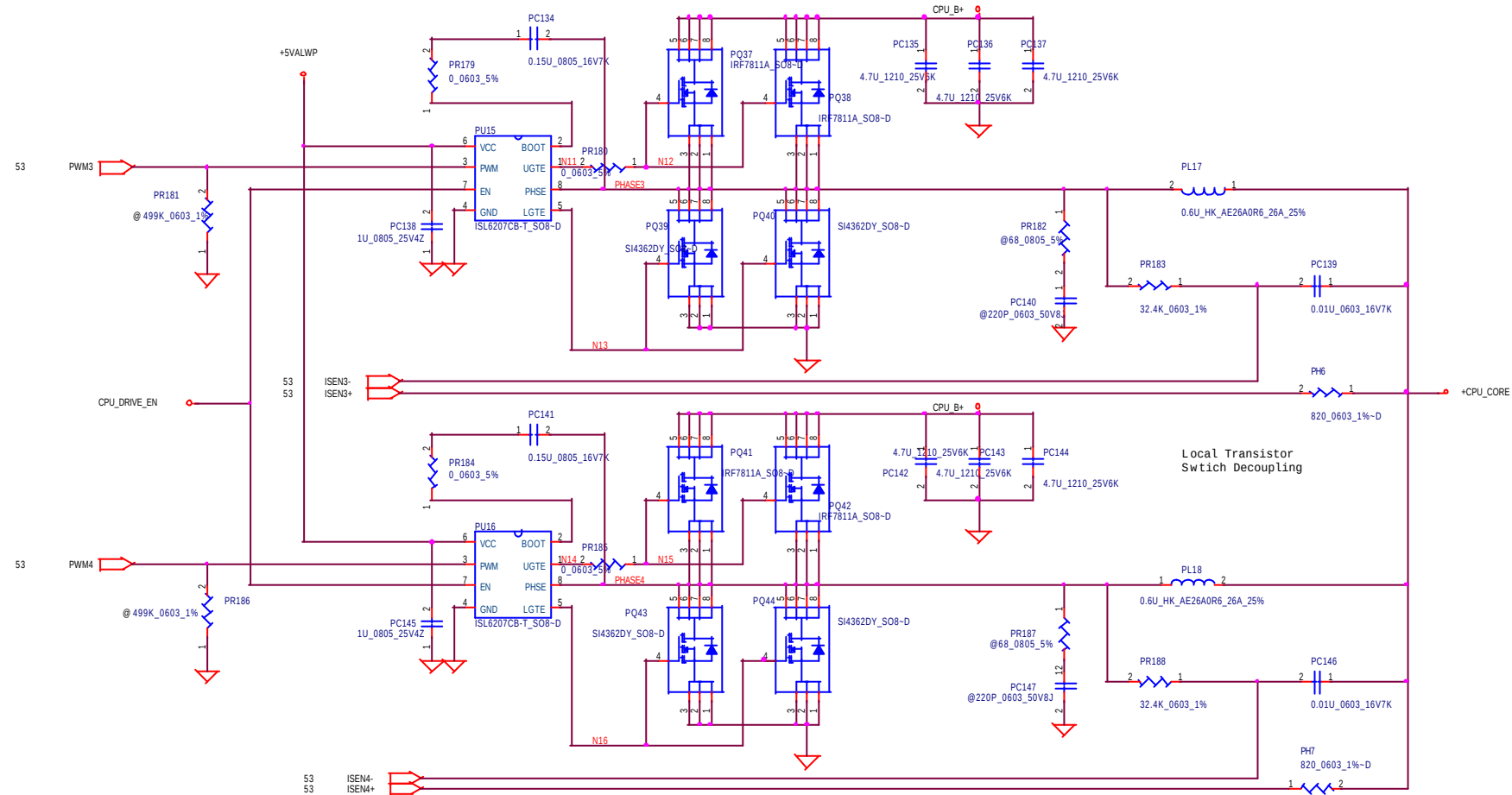
BOOTSELECT=0 NORTHWOOD

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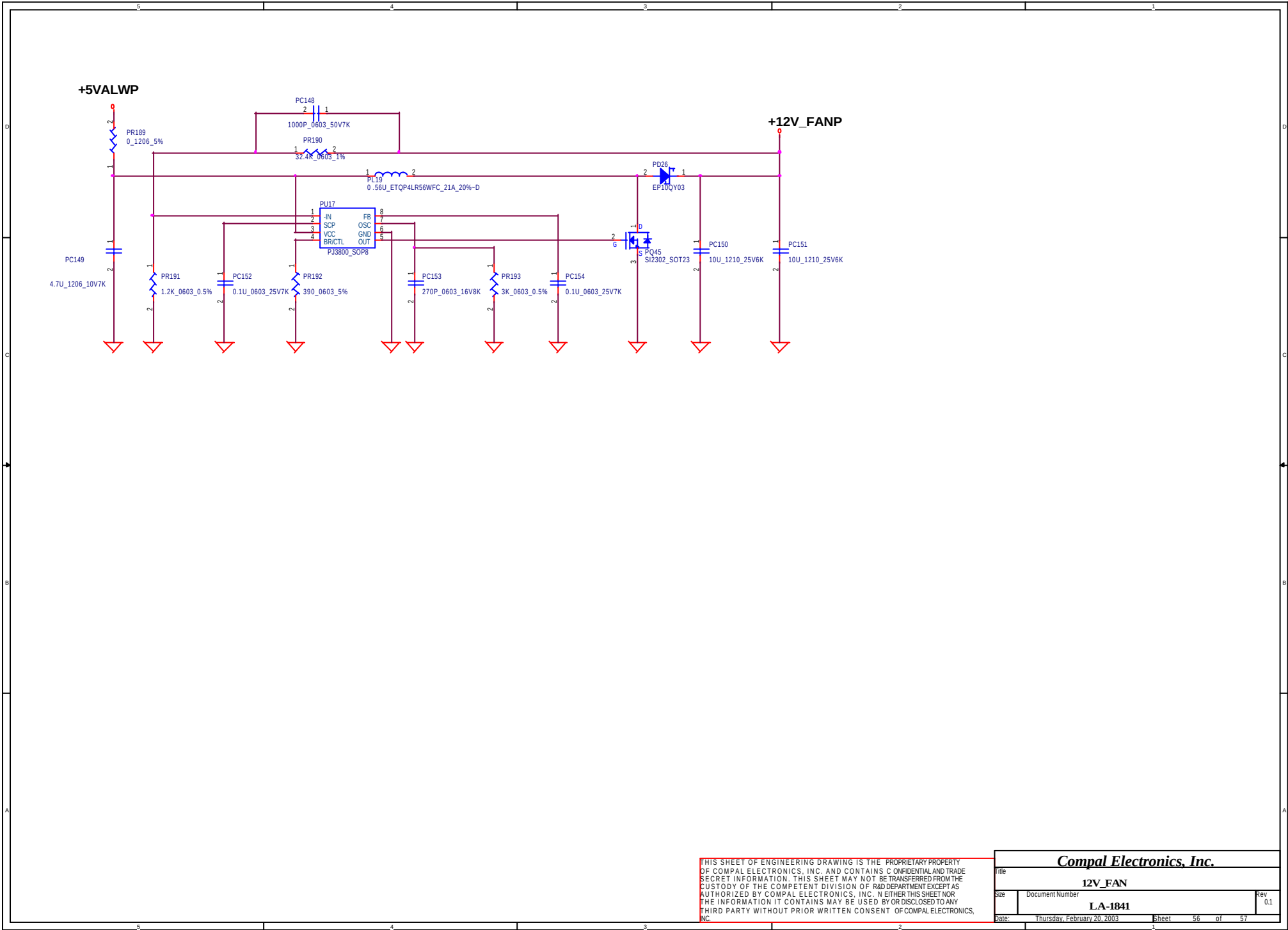
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Compal Electronics, Inc.			
CPU_CORE Powerstage 1			
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CPU_CORE Powerstage2			
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Compal Electronics, Inc.			
Title		12V_FAN	
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BTQ00 PIR LIST

***** Rev0.1 PIR List *****

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Compal Electronics, Inc.		
Title		
BTQ00 PIR LIST		
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