

Sakhir 10, 10C, 10G

LA-2491 Schematics Document

**Intel Dothan / Alviso GM(PM) / DDR-1 / ICH6-M / Fix Bay
(nVIDIA NV43M / NV44M / ATi M22 / M24)**

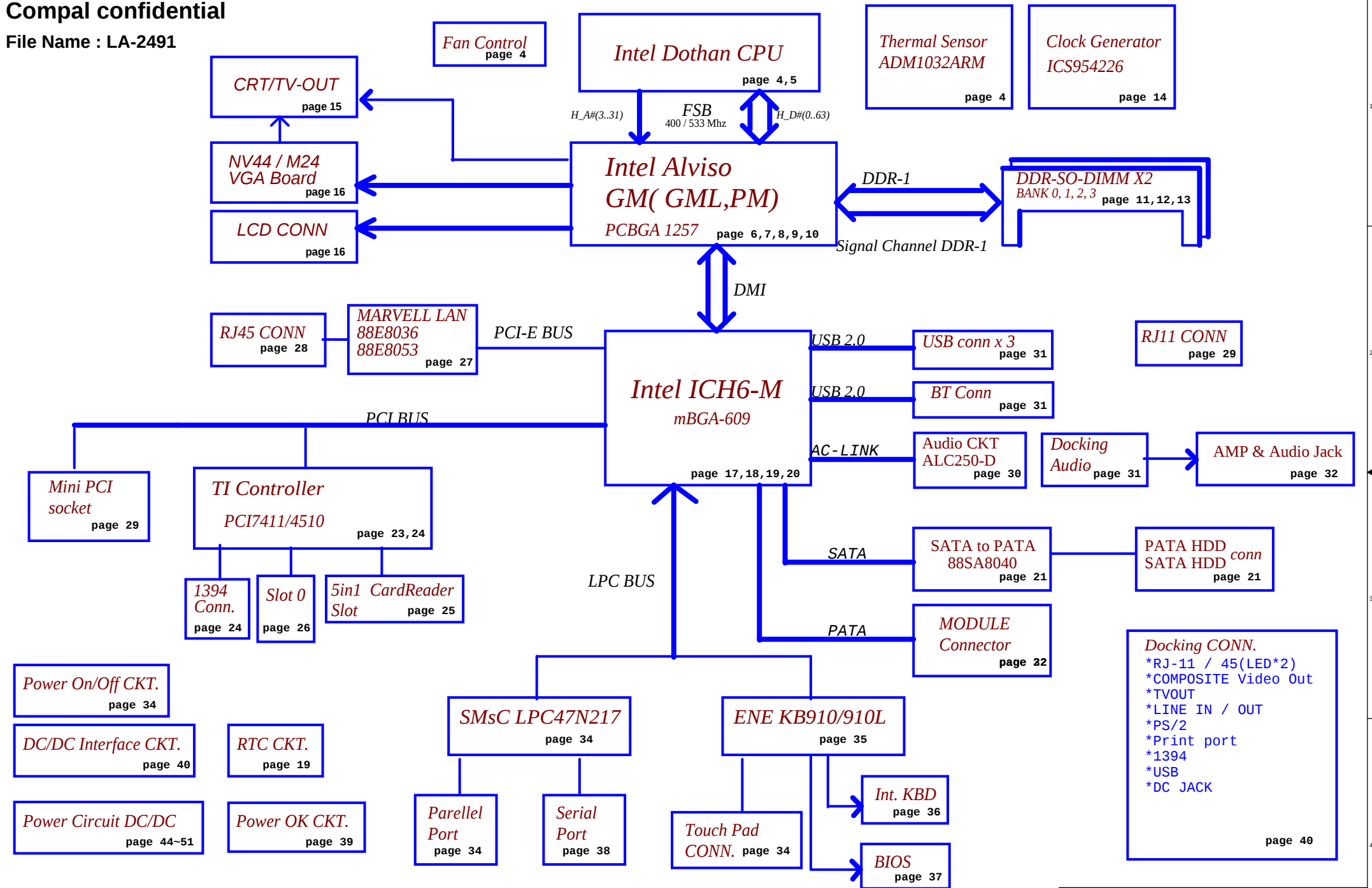
**2004 / 11 / 28
Rev:1.0**

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Compal confidential

File Name : LA-2491



Voltage Rails

Power Plane	Description	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
+1.05VS	1.05V switched power rail	ON	OFF	OFF
+DDRVTT	1.25V switched power rail for DDR terminator	ON	OFF	OFF
+1.5VALW	1.5V always on power rail	ON	ON	ON*
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+1.8VS	1.8V switched power rail	ON	OFF	OFF
+DDRVCC	2.5V power rail for DDR	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*
+5VS	5V switched power rail	ON	OFF	OFF
+5VCD	5V switched power rail for Direct CD	ON	OFF	OFF
+5VMOD	5V switched power rail for Module Bay	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
CardBus	AD20	2	PIRQA/PIRQB
1394	AD20	2	PIRQA/PIRQB
SD	AD20	2	PIRQA/PIRQB
Mini-PCI	AD18	1	PIRQG/PIRQH

EC SM Bus1 address

Device	Address	Device	Address
Smart Battery	0001 011X b	ADM1032	1001 110X b
EEPROM(24C16/02)	1010 000X b	2'nd Battery	1001 011X b
(24C04)	1011 000Xb	Docking	1010 000X b

ICH6M SM Bus address

Device	Address
Clock Generator (ICS 952623)	1101 001Xb
DDR DIMM0	1001 000Xb
DDR DIMM2	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 / SKU ID Table for AD channel

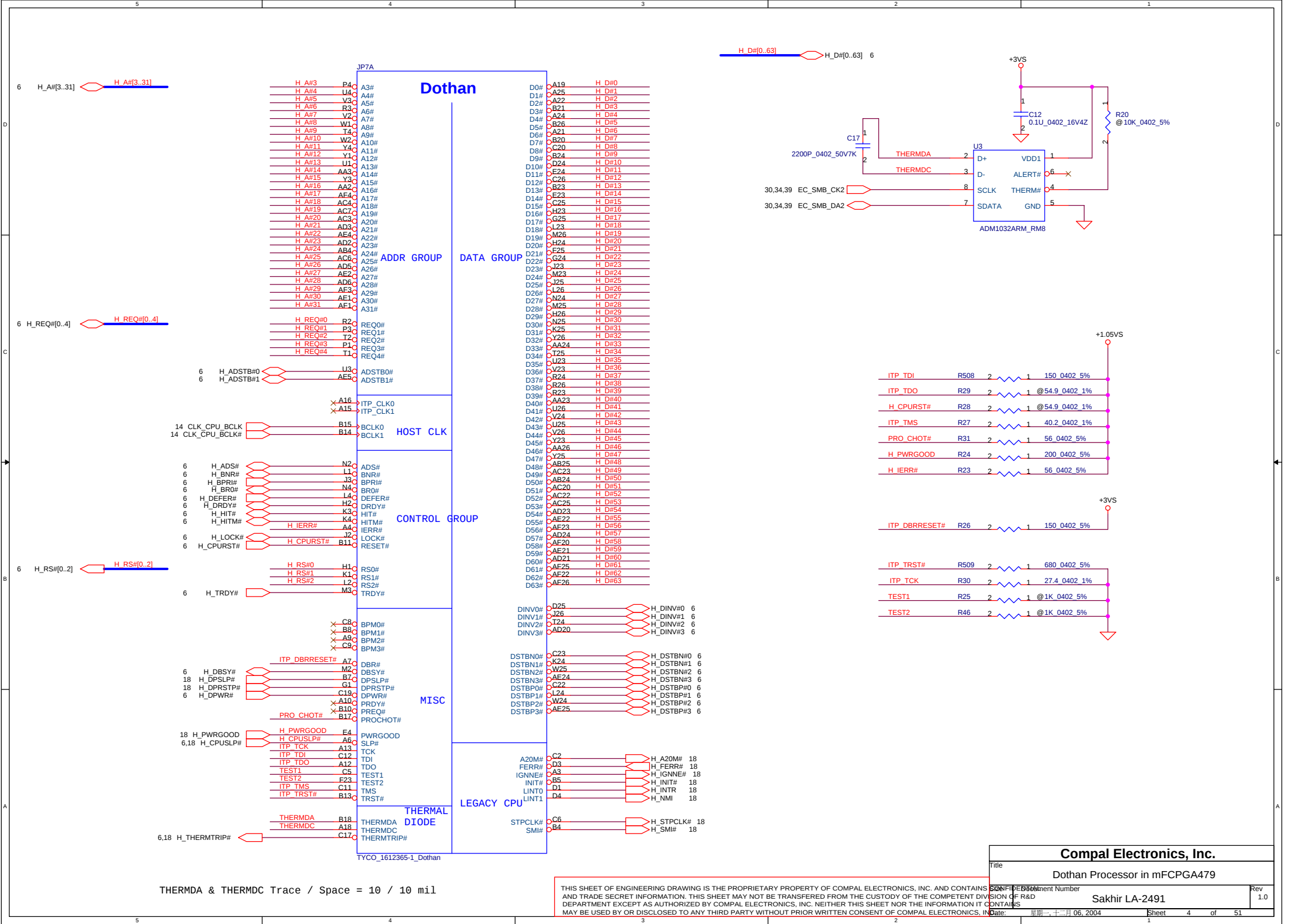
Vcc	3.3V +/- 5%			
Ra/Rc/Re	100K +/- 5%			
Board ID	Rb / Rd / Rf	VAD_BID min	VAD_BID typ	VAD_BID max
0	0	0 V	0 V	0 V
1	8.2K +/- 5%	0.216 V	0.250 V	0.289 V
2	18K +/- 5%	0.436 V	0.503 V	0.538 V
3	33K +/- 5%	0.712 V	0.819 V	0.875 V
4	56K +/- 5%	1.036 V	1.185 V	1.264 V
5	100K +/- 5%	1.453 V	1.650 V	1.759 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 Table

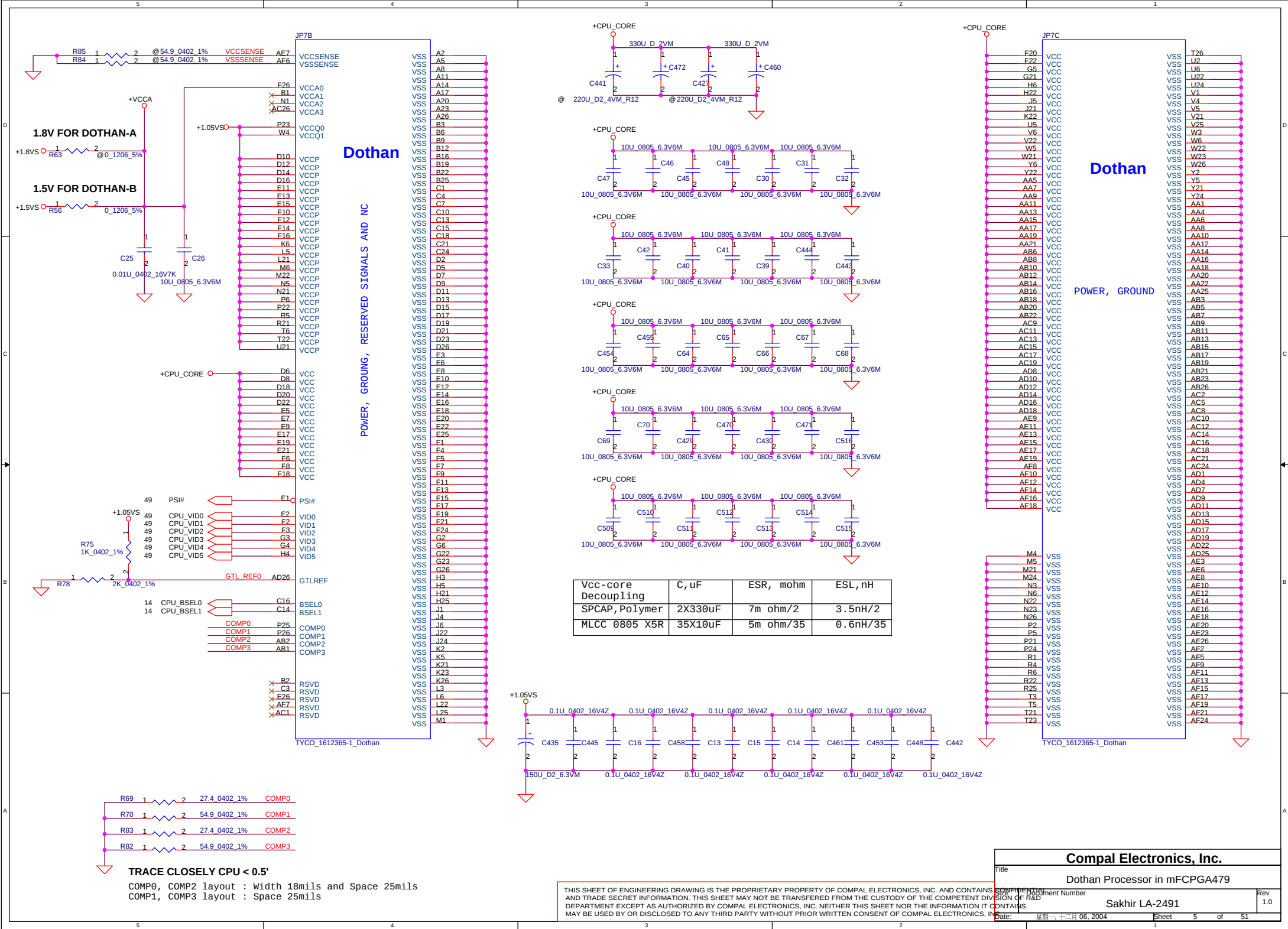
Board ID	PCB Revision
0	0.1
1	0.2
2	0.3
3	1.0
4	
5	
6	
7	

SKU ID Table

	SKU_ID_CHECK_1	7	6	5
SKU_ID_CHECK_0		1-Button	3-Buttons	7-Buttons
0	10	1		0
1	10C	3	12	2
2	10G	5		4
3	10GC	7	13	6
4	10J	11		10
5				
6				



THERMDA & THERMDC Trace / Space = 10 / 10 mil



Vcc-core Decoupling	C, uF	ESR, mohm	ESL, nH
SPCAP, Polymer	2X330uF	7m ohm/2	3.5nH/2
MLCC 0805 X5R	35X10uF	5m ohm/35	0.6nH/35

TRACE CLOSELY CPU < 0.5'
COMP0, COMP2 layout : Width 18mils and Space 25mils
COMP1, COMP3 layout : Space 25mils

11 DDRA_SDQ[0..63] DDRA_SDQ[0..63]
11 DDRA_SDM[0..7] DDRA_SDM[0..7]
11 DDRA_SDQS[0..7] DDRA_SDQS[0..7]
11 DDRA_SMA[0..13] DDRA_SMA[0..13]

12 DDRB_SMA[0..13] DDRB_SMA[0..13]

11 DDRA_SBS0 AK15 SA_BS0#
11 DDRA_SBS1 AK16 SA_BS1#
 AK17 SA_BS2#

DDRA_SDM0 AJ37 SA_DM0
DDRA_SDM1 AP35 SA_DM1
DDRA_SDM2 AL29 SA_DM2
DDRA_SDM3 AP24 SA_DM3
DDRA_SDM4 AP9 SA_DM4
DDRA_SDM5 AP4 SA_DM5
DDRA_SDM6 AJ2 SA_DM6
DDRA_SDM7 AD3 SA_DM7

DDRA_SDQS0 AK36 SA_DQS0
DDRA_SDQS1 AP33 SA_DQS1
DDRA_SDQS2 AN29 SA_DQS2
DDRA_SDQS3 AP23 SA_DQS3
DDRA_SDQS4 AM8 SA_DQS4
DDRA_SDQS5 AM4 SA_DQS5
DDRA_SDQS6 AJ1 SA_DQS6
DDRA_SDQS7 AE5 SA_DQS7

 AK35 SA_DQS0#
 AP34 SA_DQS1#
 AN30 SA_DQS2#
 AN23 SA_DQS3#
 AN8 SA_DQS4#
 AM5 SA_DQS5#
 AH1 SA_DQS6#
 AE4 SA_DQS7#

DDRA_SMA0 AL17 SA_MA0
DDRA_SMA1 AP17 SA_MA1
DDRA_SMA2 AP18 SA_MA2
DDRA_SMA3 AM17 SA_MA3
DDRA_SMA4 AN18 SA_MA4
DDRA_SMA5 AM18 SA_MA5
DDRA_SMA6 AL19 SA_MA6
DDRA_SMA7 AP20 SA_MA7
DDRA_SMA8 AM19 SA_MA8
DDRA_SMA9 AL20 SA_MA9
DDRA_SMA10 AM15 SA_MA10
DDRA_SMA11 AN20 SA_MA11
DDRA_SMA12 AM20 SA_MA12
DDRA_SMA13 AM15 SA_MA13

DDR MEMORY SYSTEM A

U5C
SADQ0 AG35 DDRA_SDQ0
SADQ1 AH35 DDRA_SDQ1
SADQ2 AL37 DDRA_SDQ2
SADQ3 AH36 DDRA_SDQ3
SADQ4 AJ35 DDRA_SDQ4
SADQ5 AK37 DDRA_SDQ5
SADQ6 AL34 DDRA_SDQ6
SADQ7 AM36 DDRA_SDQ7
SADQ8 AN35 DDRA_SDQ8
SADQ9 AP32 DDRA_SDQ9
SADQ10 AM31 DDRA_SDQ10
SADQ11 AM34 DDRA_SDQ11
SADQ12 AM35 DDRA_SDQ12
SADQ13 AL32 DDRA_SDQ13
SADQ14 AM32 DDRA_SDQ14
SADQ15 AN31 DDRA_SDQ15
SADQ16 AP31 DDRA_SDQ16
SADQ17 AN28 DDRA_SDQ17
SADQ18 AP28 DDRA_SDQ18
SADQ19 AL30 DDRA_SDQ19
SADQ20 AM30 DDRA_SDQ20
SADQ21 AM28 DDRA_SDQ21
SADQ22 AL28 DDRA_SDQ22
SADQ23 AP27 DDRA_SDQ23
SADQ24 AM27 DDRA_SDQ24
SADQ25 AM23 DDRA_SDQ25
SADQ26 AM22 DDRA_SDQ26
SADQ27 AL23 DDRA_SDQ27
SADQ28 AM24 DDRA_SDQ28
SADQ29 AN22 DDRA_SDQ29
SADQ30 AP22 DDRA_SDQ30
SADQ31 AM9 DDRA_SDQ31
SADQ32 AL9 DDRA_SDQ32
SADQ33 AL6 DDRA_SDQ33
SADQ34 AP7 DDRA_SDQ34
SADQ35 AP11 DDRA_SDQ35
SADQ36 AP10 DDRA_SDQ36
SADQ37 AL7 DDRA_SDQ37
SADQ38 AM7 DDRA_SDQ38
SADQ39 AN5 DDRA_SDQ39
SADQ40 AN6 DDRA_SDQ40
SADQ41 AN3 DDRA_SDQ41
SADQ42 AP3 DDRA_SDQ42
SADQ43 AP6 DDRA_SDQ43
SADQ44 AM6 DDRA_SDQ44
SADQ45 AL4 DDRA_SDQ45
SADQ46 AM3 DDRA_SDQ46
SADQ47 AK2 DDRA_SDQ47
SADQ48 AK3 DDRA_SDQ48
SADQ49 AG2 DDRA_SDQ49
SADQ50 AG1 DDRA_SDQ50
SADQ51 AL3 DDRA_SDQ51
SADQ52 AM2 DDRA_SDQ52
SADQ53 AH3 DDRA_SDQ53
SADQ54 AG3 DDRA_SDQ54
SADQ55 AE3 DDRA_SDQ55
SADQ56 AE3 DDRA_SDQ56
SADQ57 AD6 DDRA_SDQ57
SADQ58 AC4 DDRA_SDQ58
SADQ59 AF2 DDRA_SDQ59
SADQ60 AE1 DDRA_SDQ60
SADQ61 AD4 DDRA_SDQ61
SADQ62 AD5 DDRA_SDQ62
SADQ63

ALVISO_BGA1257

U5D
12 DDRB_SBS0 AJ15 SB_BS0#
12 DDRB_SBS1 AG17 SB_BS1#
 AG21 SB_BS2#

SB_DM0 AF32 SB_DM0
SB_DM1 AK34 SB_DM1
SB_DM2 AK27 SB_DM2
SB_DM3 AK24 SB_DM3
SB_DM4 AJ10 SB_DM4
SB_DM5 AK5 SB_DM5
SB_DM6 AE7 SB_DM6
SB_DM7 AB7 SB_DM7

SB_DQS0 AF34 SB_DQS0
SB_DQS1 AK32 SB_DQS1
SB_DQS2 AJ28 SB_DQS2
SB_DQS3 AK23 SB_DQS3
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SB_DQS5 AH6 SB_DQS5
SB_DQS6 AF8 SB_DQS6
SB_DQS7 AB4 SB_DQS7

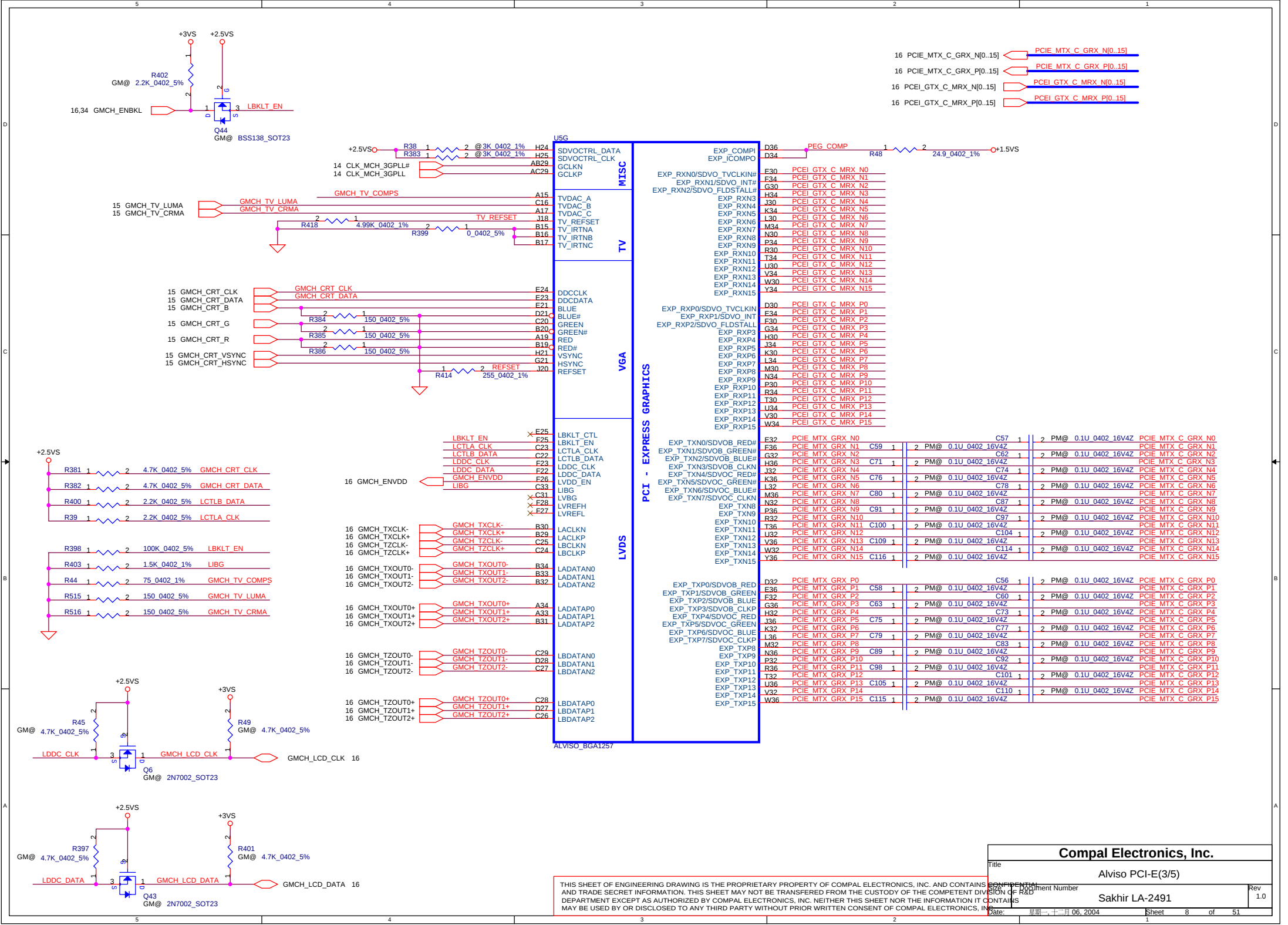
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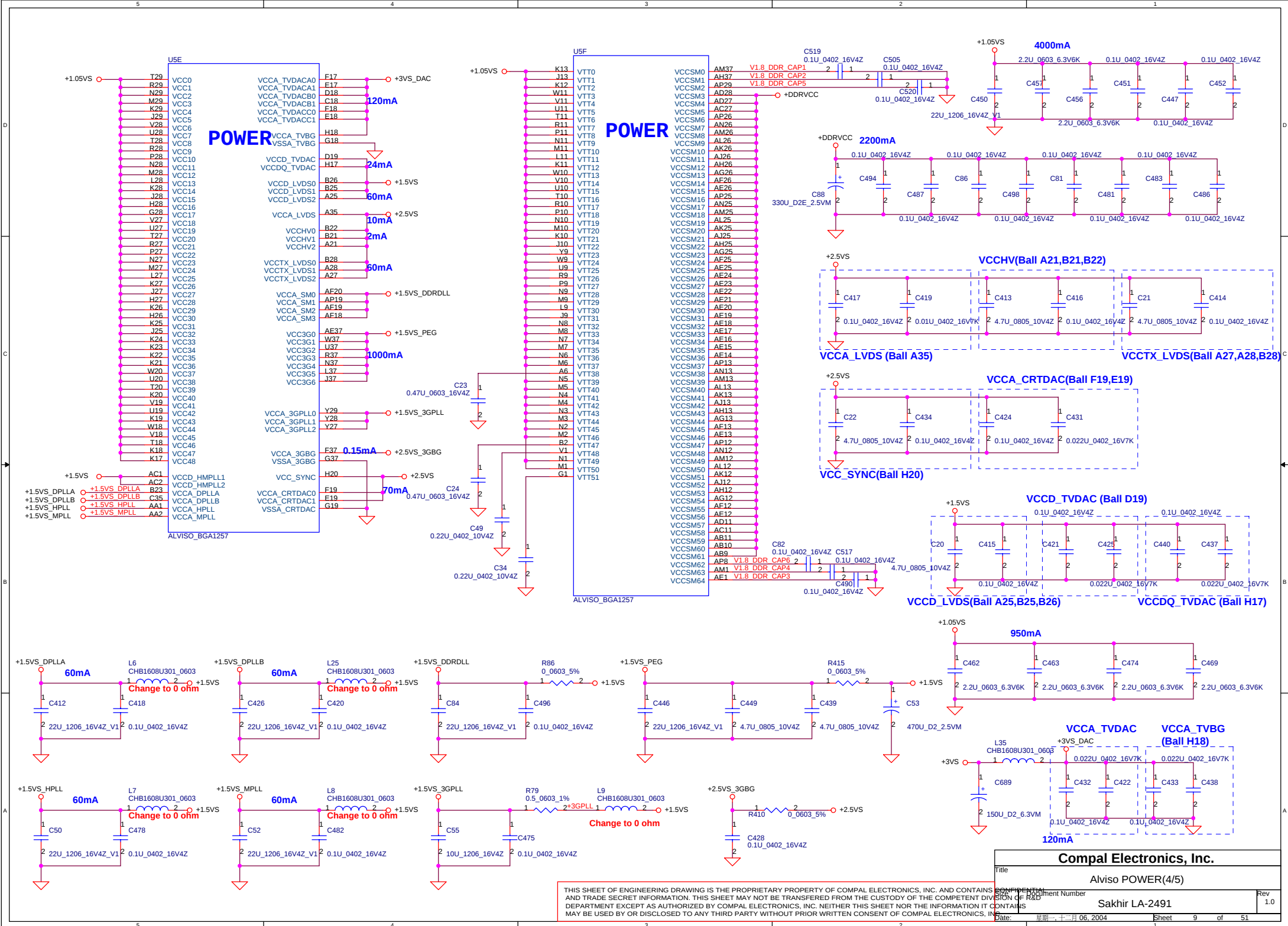
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DDR_B_SMA4 AK18 SB_MA4
DDR_B_SMA5 AJ19 SB_MA5
DDR_B_SMA6 AK19 SB_MA6
DDR_B_SMA7 AH19 SB_MA7
DDR_B_SMA8 AJ20 SB_MA8
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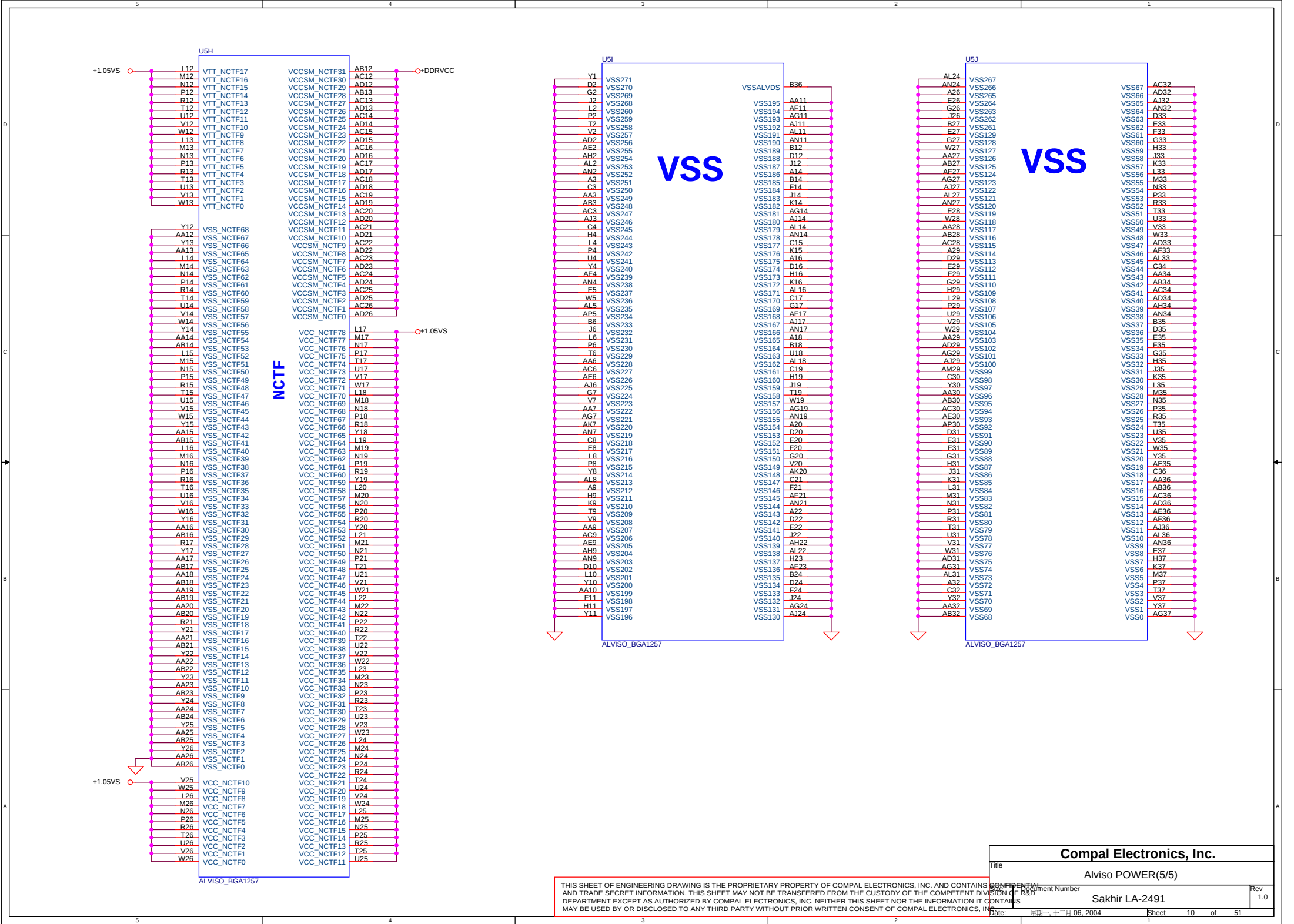
DDR SYSTEM MEMORY B

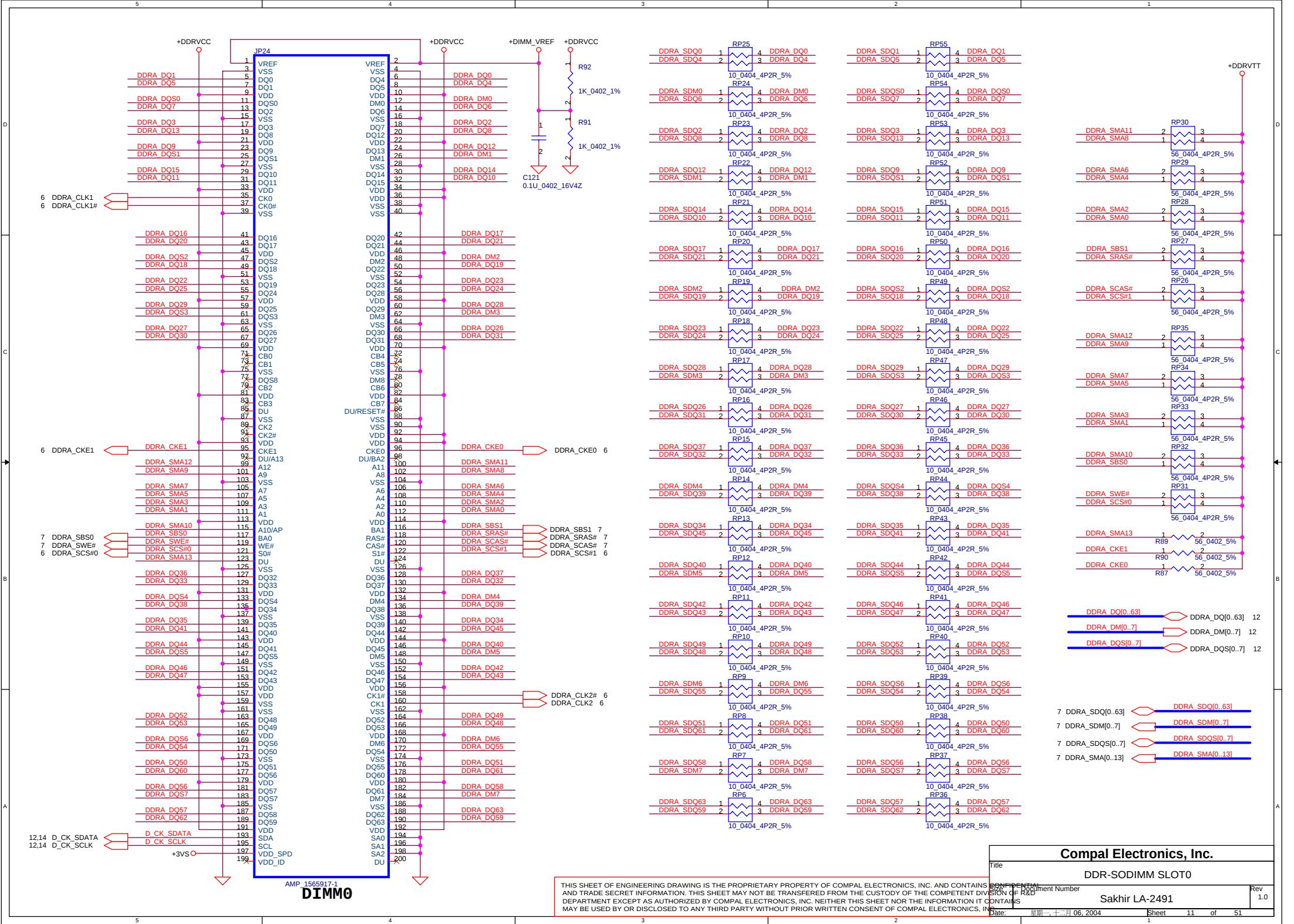
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SBDQ1 AE32
SBDQ2 AG36
SBDQ3 AE34
SBDQ4 AE33
SBDQ5 AF31
SBDQ6 AE30
SBDQ7 AH33
SBDQ8 AH32
SBDQ9 AK31
SBDQ10 AG30
SBDQ11 AG34
SBDQ12 AG33
SBDQ13 AH31
SBDQ14 AJ31
SBDQ15 AK30
SBDQ16 AJ30
SBDQ17 AH29
SBDQ18 AH28
SBDQ19 AK29
SBDQ20 AH27
SBDQ21 AG28
SBDQ22 AE24
SBDQ23 AG23
SBDQ24 AJ22
SBDQ25 AK22
SBDQ26 AH24
SBDQ27 AH23
SBDQ28 AG22
SBDQ29 AJ21
SBDQ30 AG19
SBDQ31 AG9
SBDQ32 AG8
SBDQ33 AH9
SBDQ34 AH10
SBDQ35 AJ9
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SBDQ38 A34
SBDQ39 AH5
SBDQ40 AK8
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SBDQ42 AJ5
SBDQ43 AK4
SBDQ44 AG5
SBDQ45 AG4
SBDQ46 AD8
SBDQ47 AD9
SBDQ48 AH4
SBDQ49 AG6
SBDQ50 AE8
SBDQ51 AD7
SBDQ52 AC5
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SBDQ56 AC8
SBDQ57 AC7
SBDQ58 AA4
SBDQ59 AA5

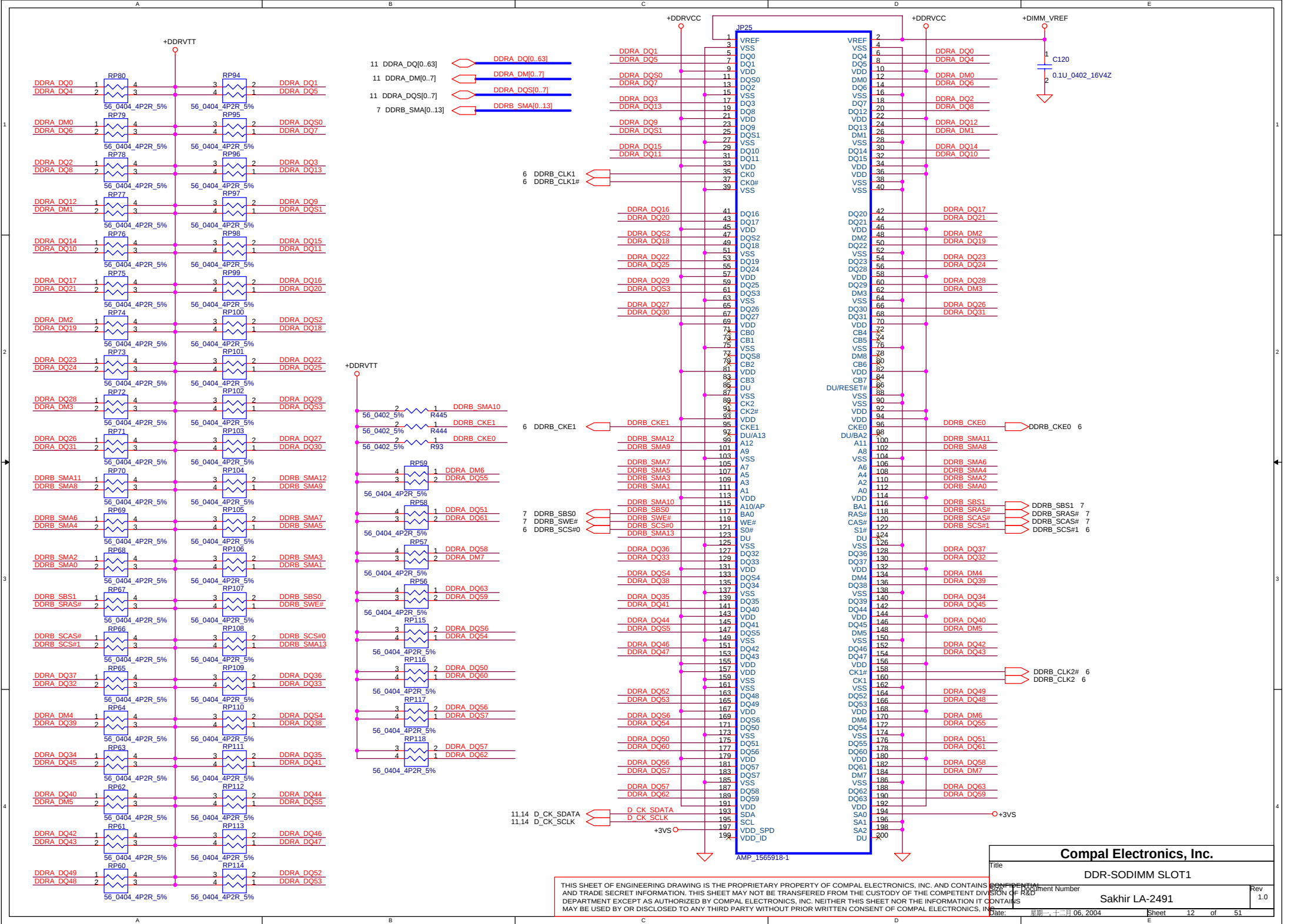
ALVISO_BGA1257



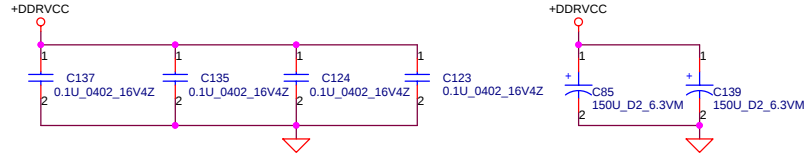
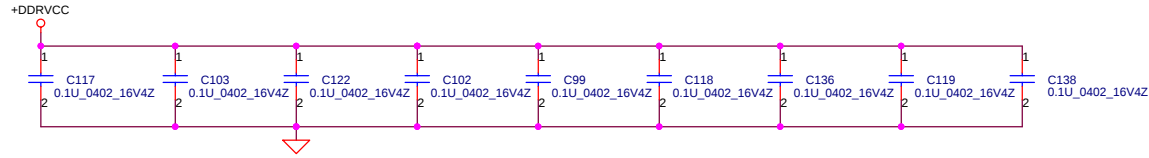




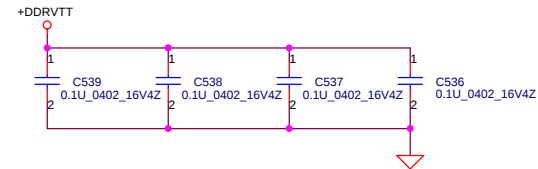
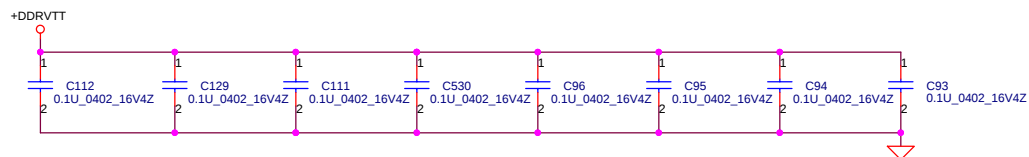
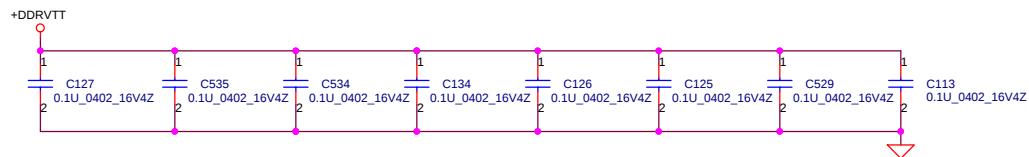
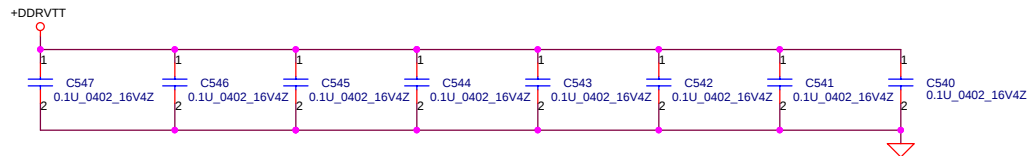
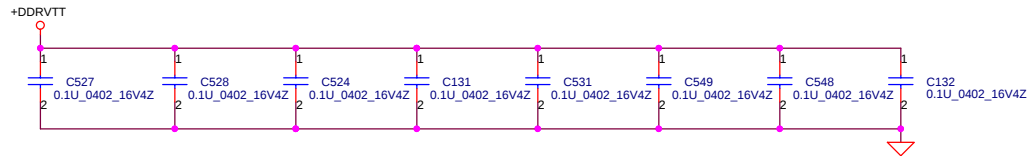
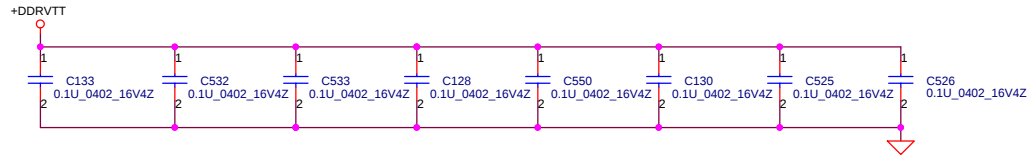




Layout note :
Distribute as close as possible
to DDR-SODIMM.

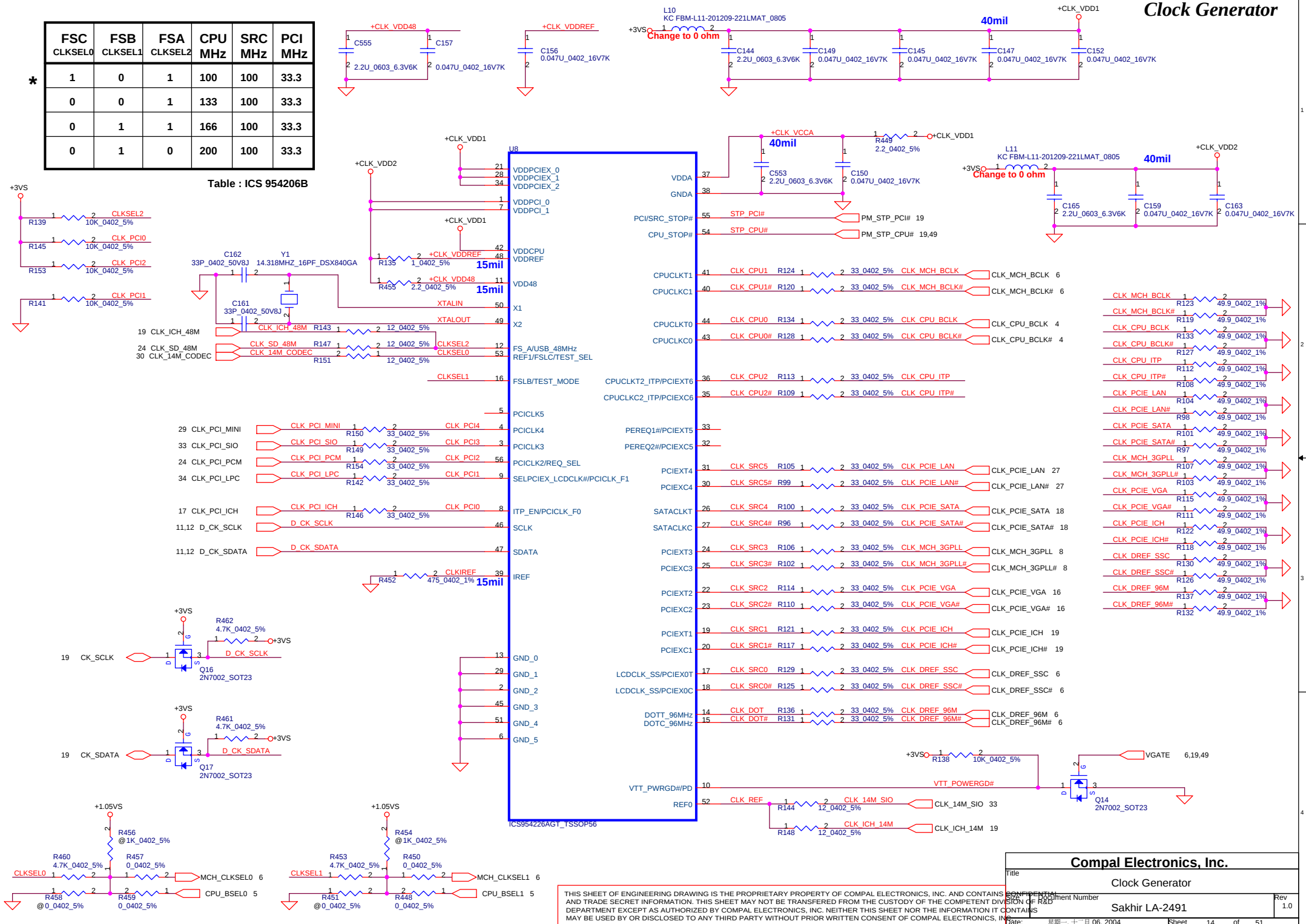


Layout note :
Place one cap close to every 2 pull up resistors termination to
+1.25V



FSC	FSB	FSA	CPU	SRC	PCI
CLKSEL0	CLKSEL1	CLKSEL2	MHz	MHz	MHz
1	0	1	100	100	33.3
0	0	1	133	100	33.3
0	1	1	166	100	33.3
0	1	0	200	100	33.3

Table : ICS 954206B

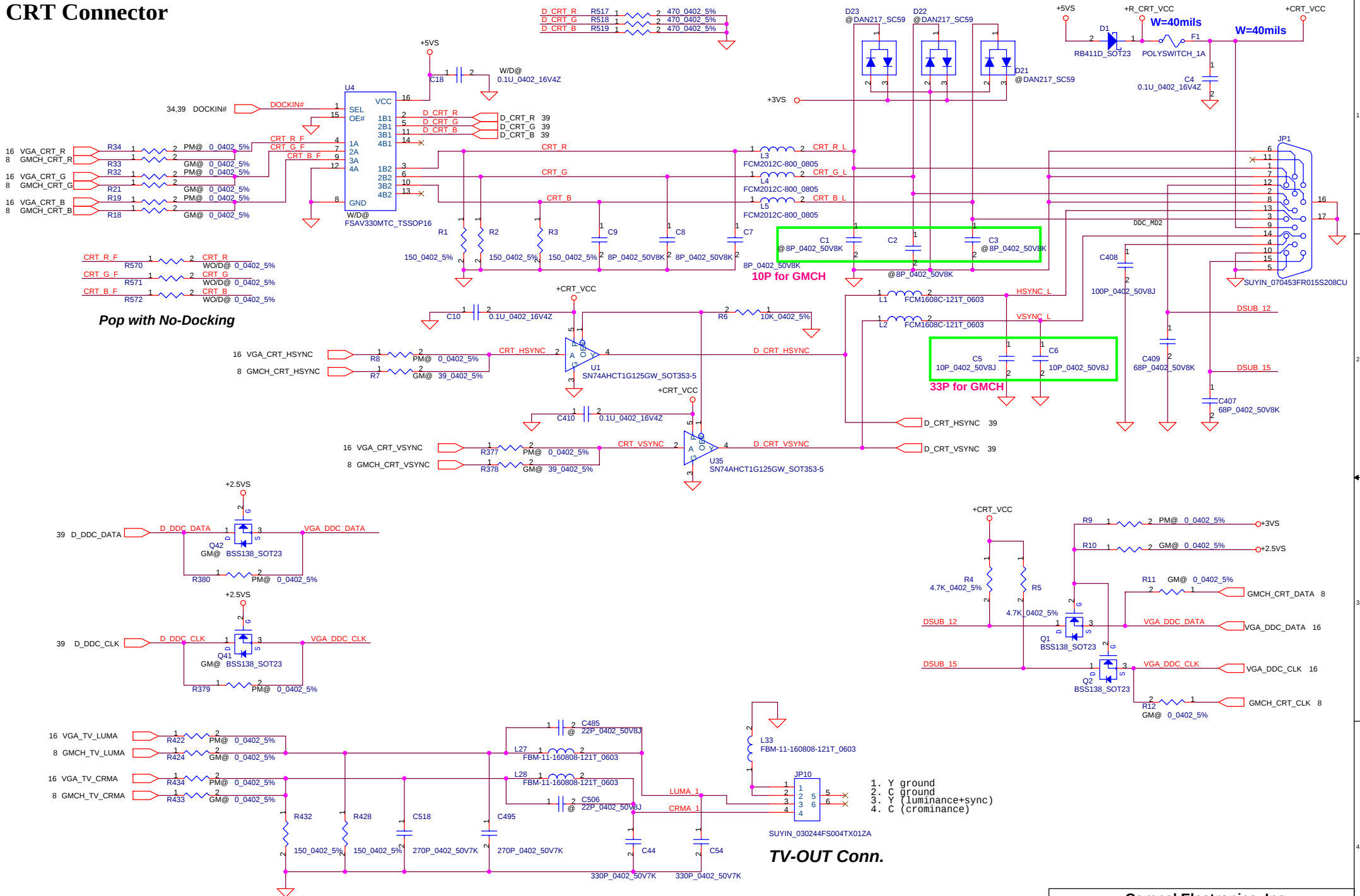


Clock Generator

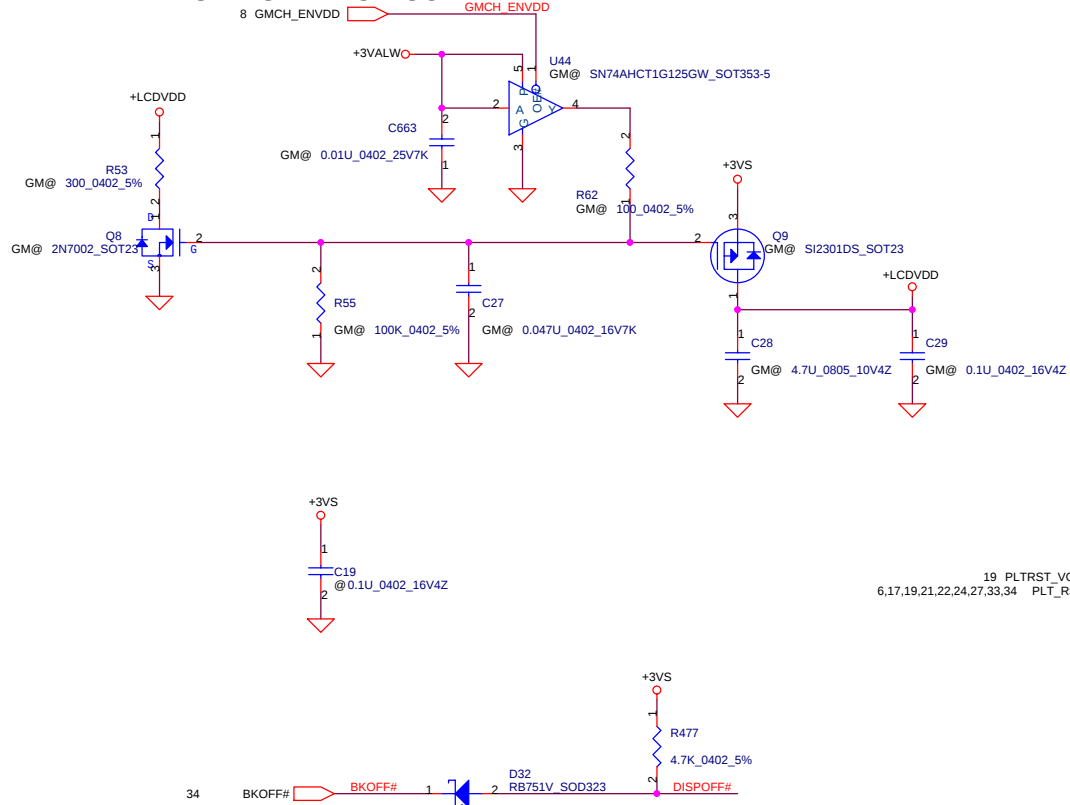
Compal Electronics, Inc.	
Title	Clock Generator
Document Number	Sakhir LA-2491
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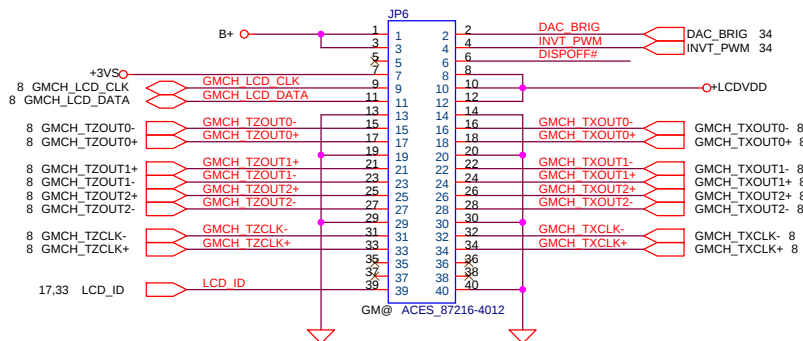
CRT Connector



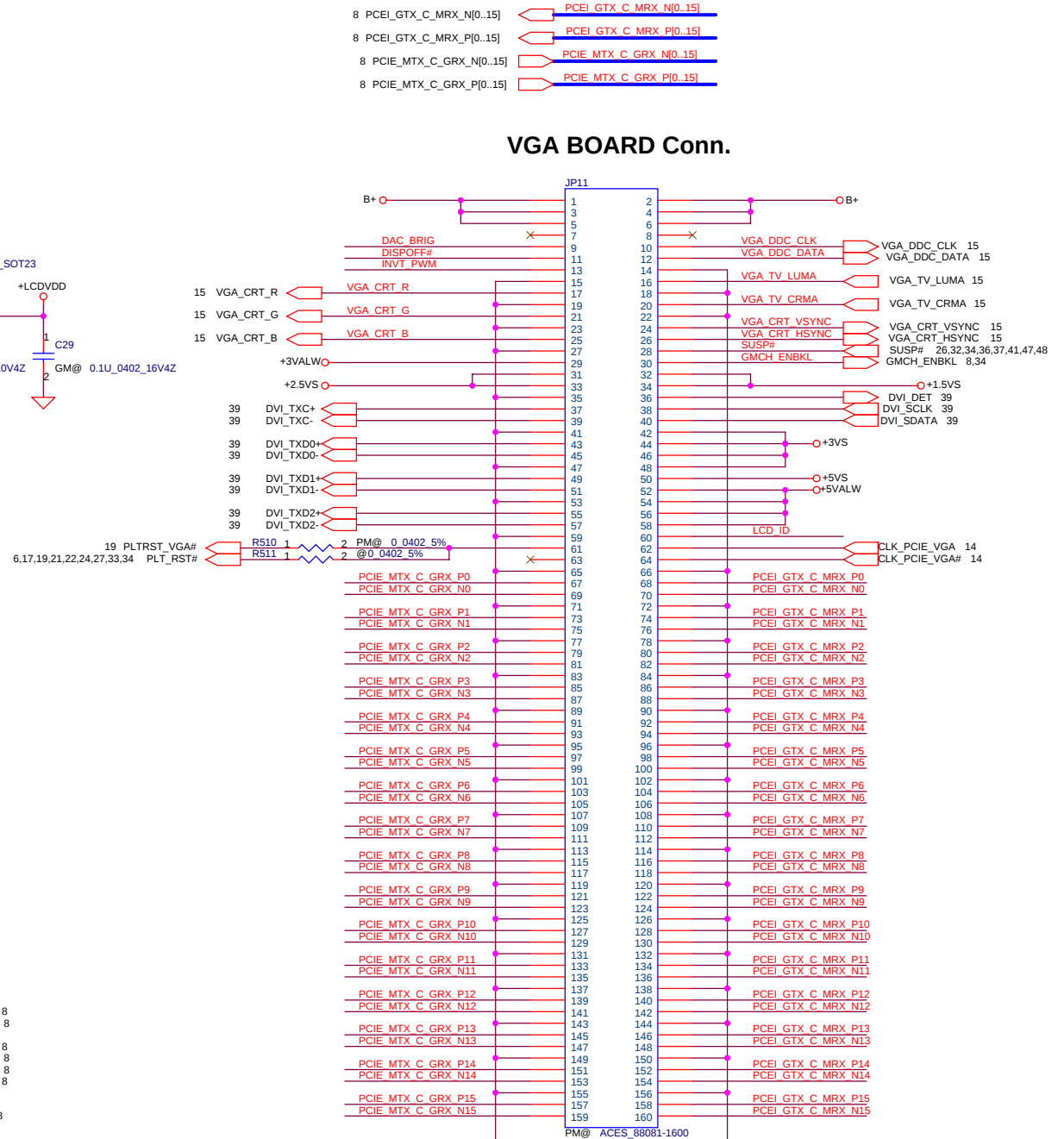
LCD POWER CIRCUIT



LCD/PANEL BD. Conn.

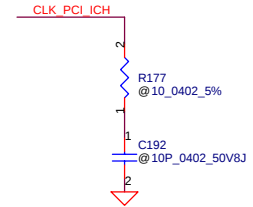
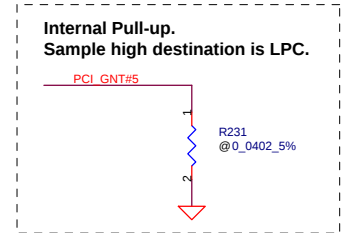
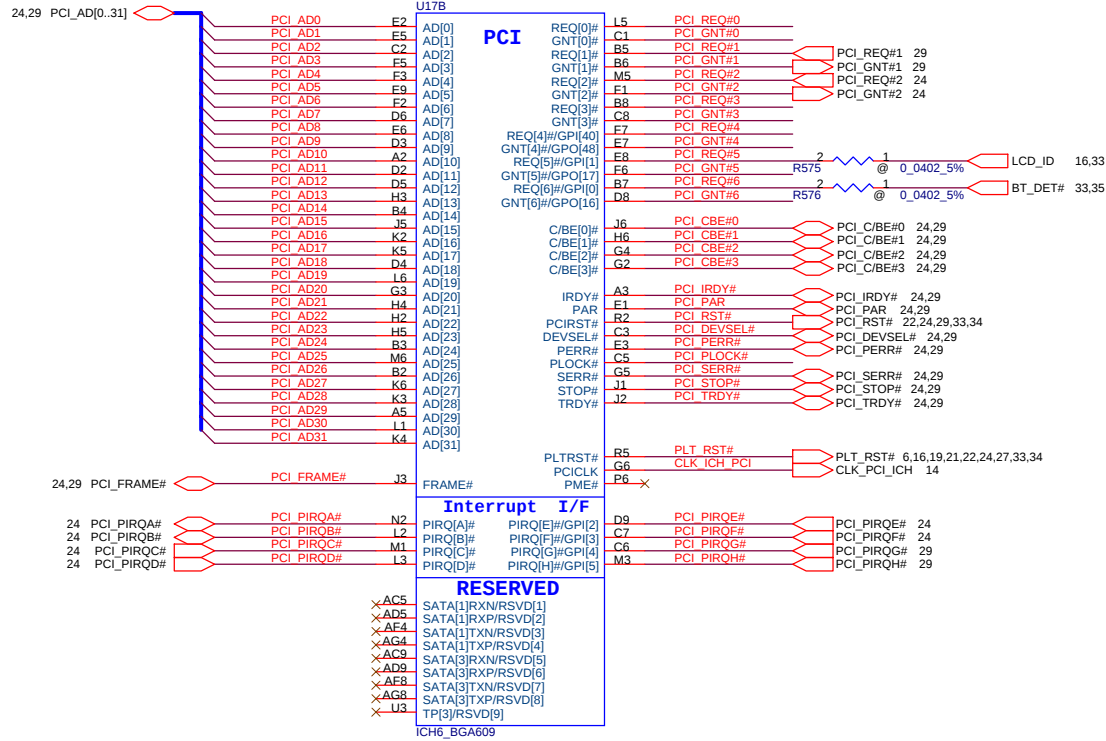
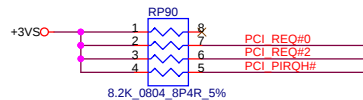
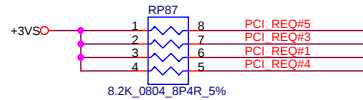
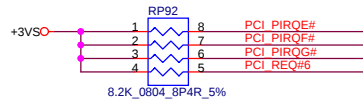
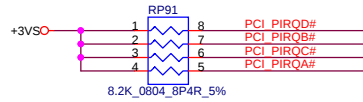
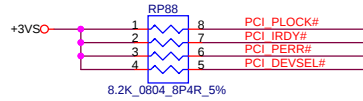
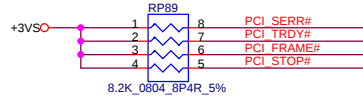


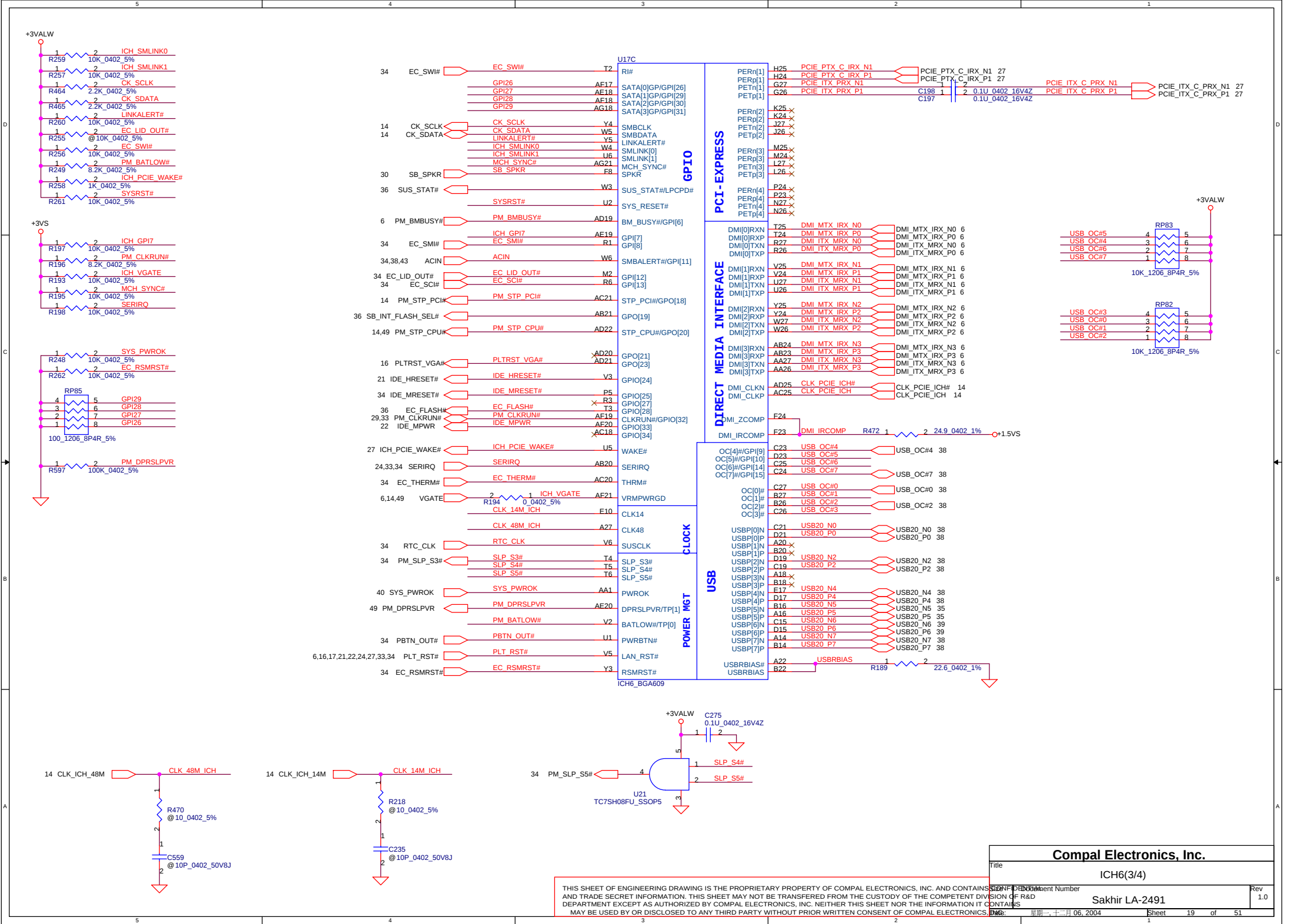
VGA BOARD Conn.

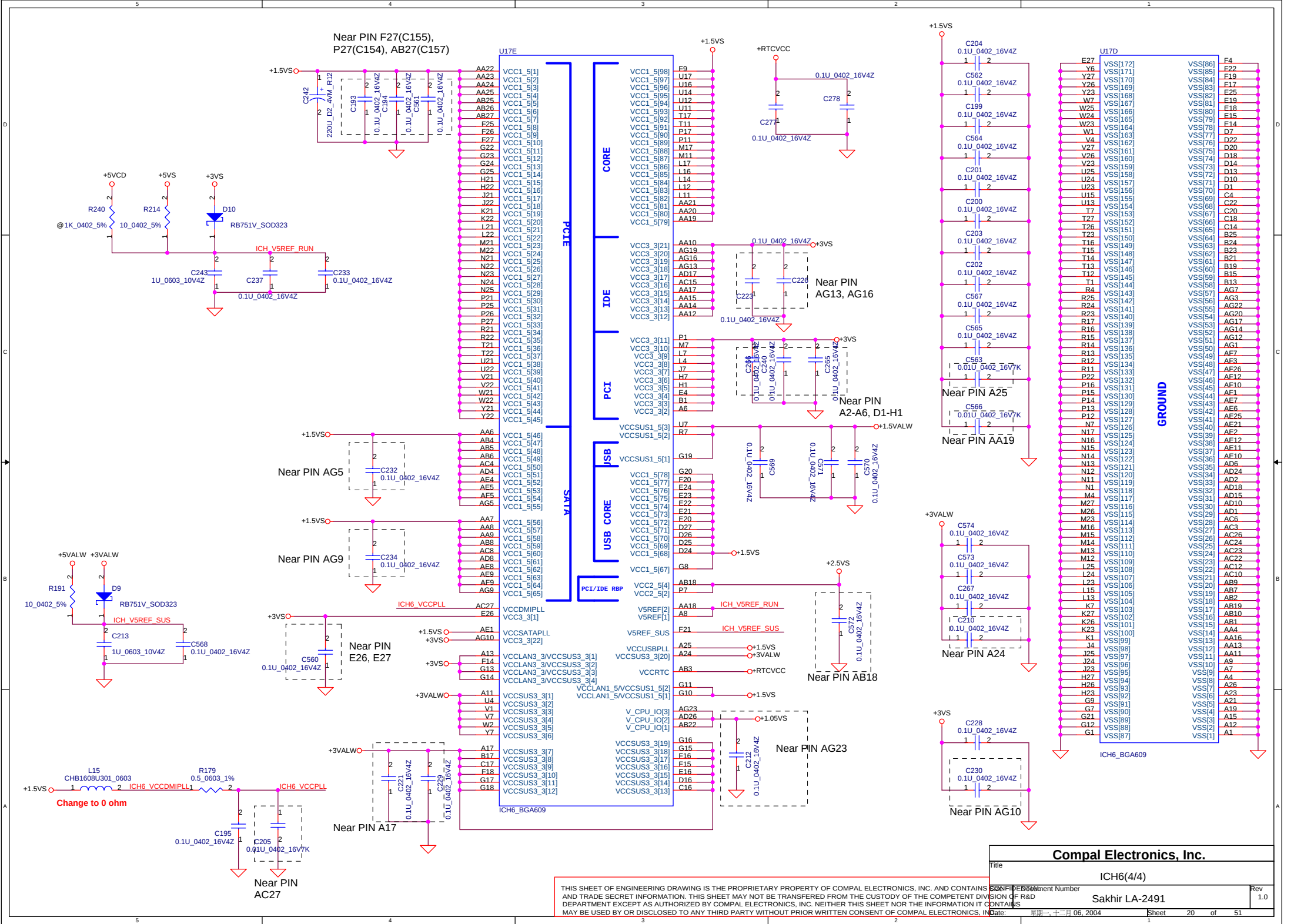


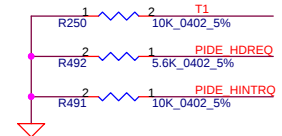
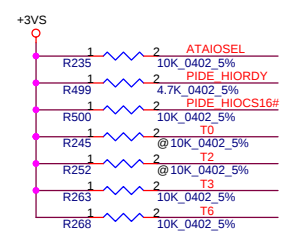
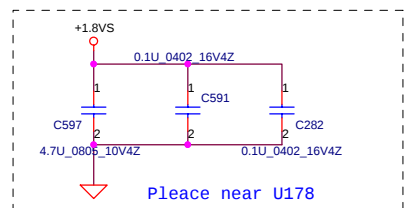
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VGA / LCD CONN.	
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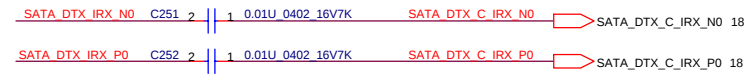
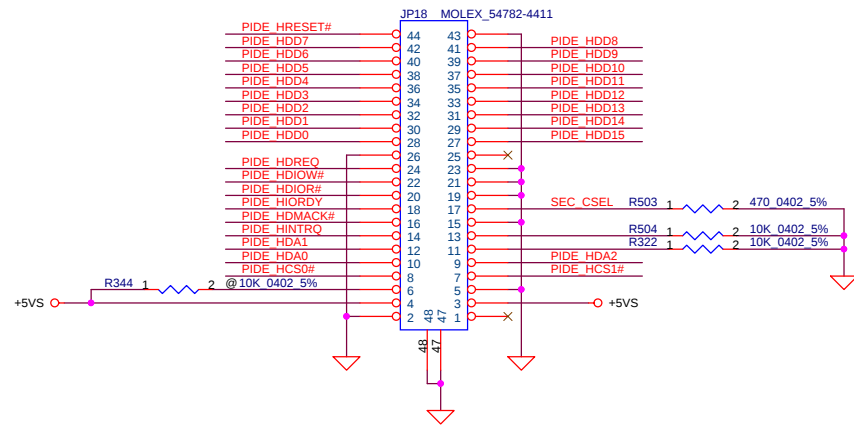
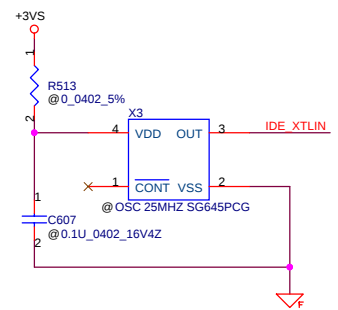
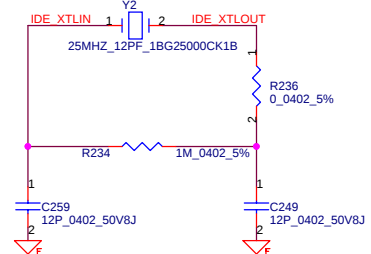
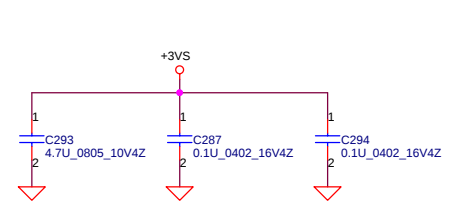
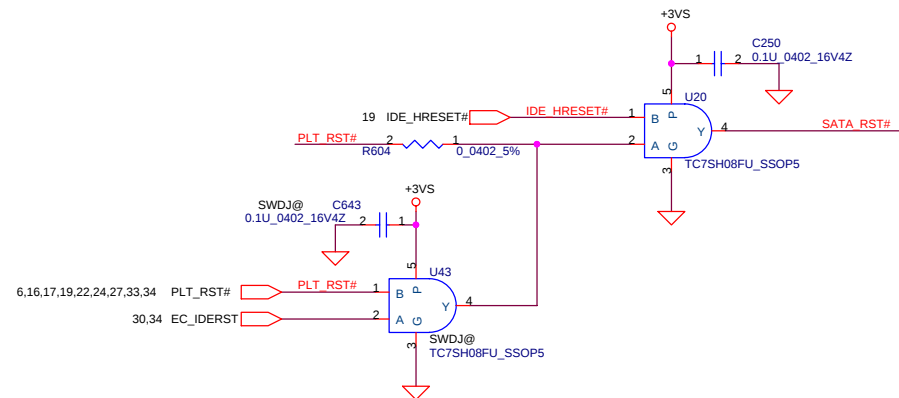
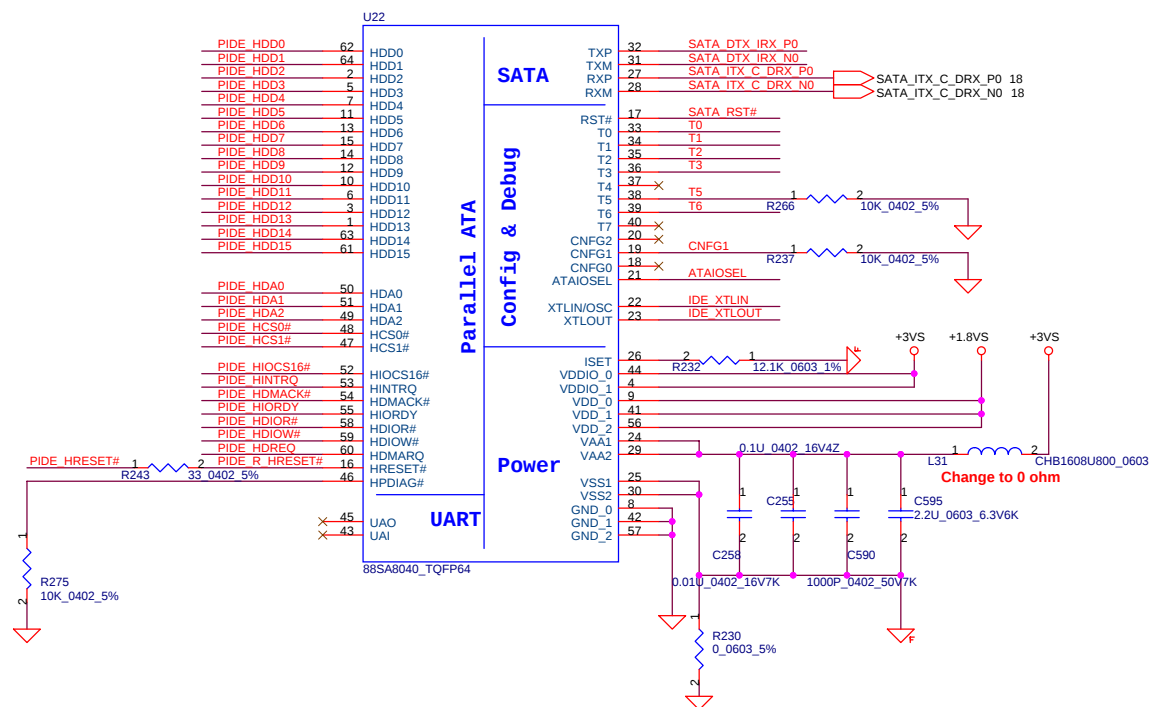






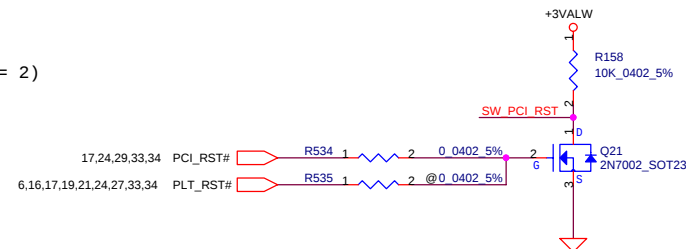
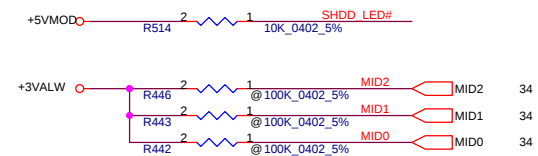
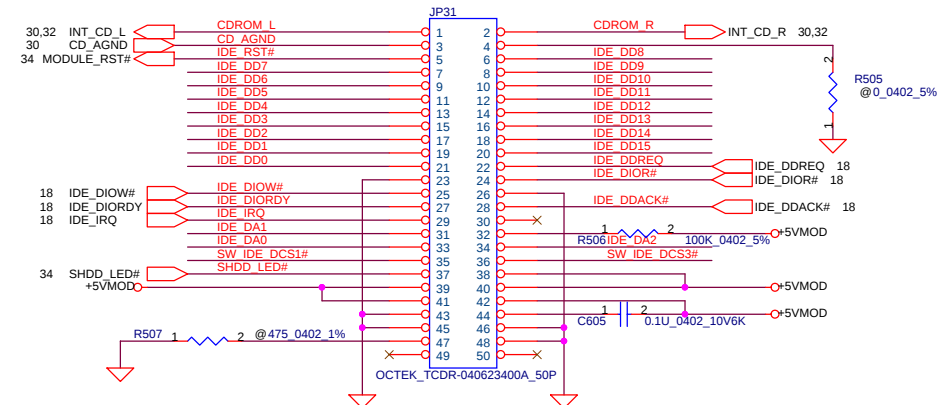
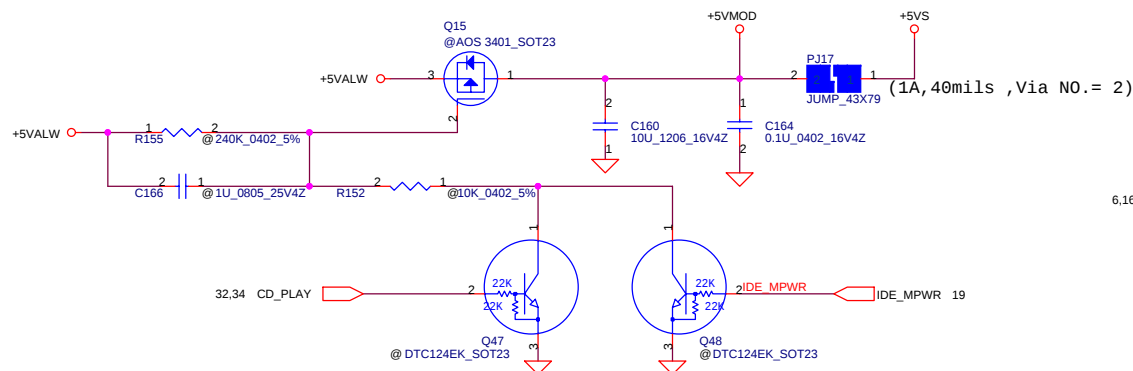
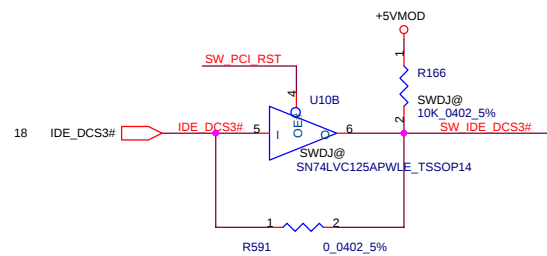
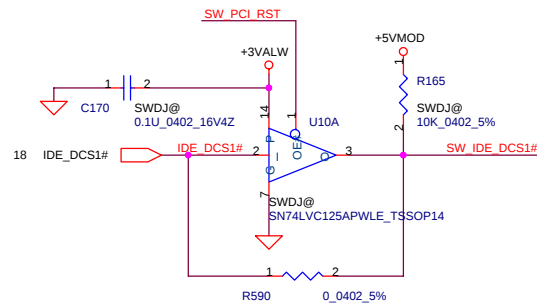
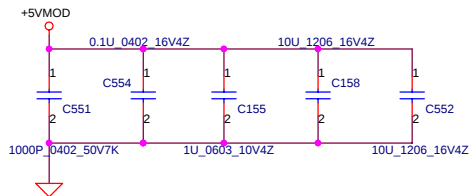


CNF62 INT PD	CNF61	CNF60 INT PD	NOTE
0	0	0	Device Mode 100MB/s
0	0	1	Device Mode 133MB/s
0	1	0	Device Mode 150MB/s
1	0	0	Host Mode 100MB/s
1	0	1	Host Mode 133MB/s
1	1	0	Host Mode 150MB/s
0	1	1	Reserved
1	1	1	Reserved



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		Document Number Sakhir LA-2491	Rev 1.0
Date: 星期一, 十二月 06, 2004		Sheet 21 of 51	

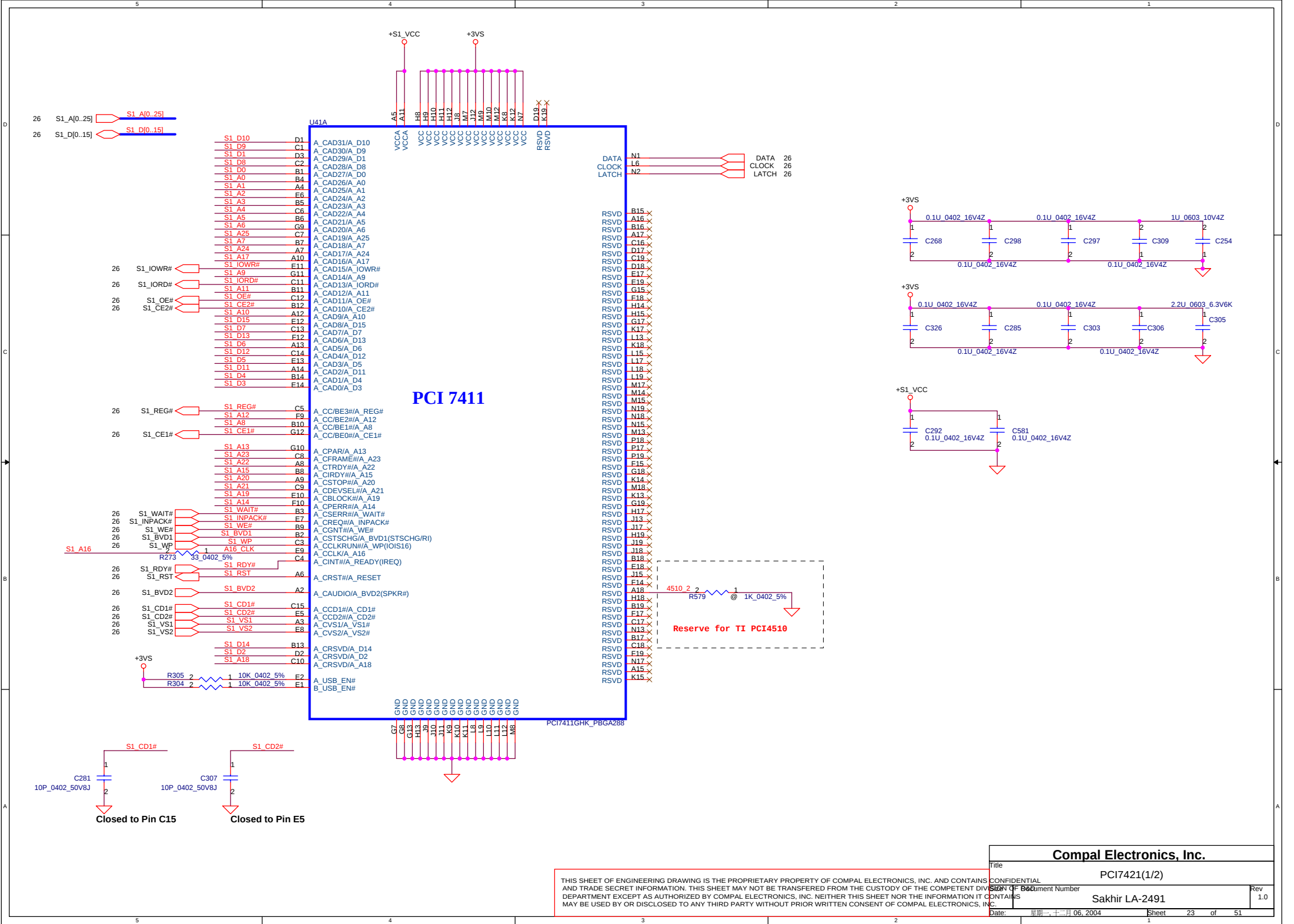
Placea caps. near ODD CONN.

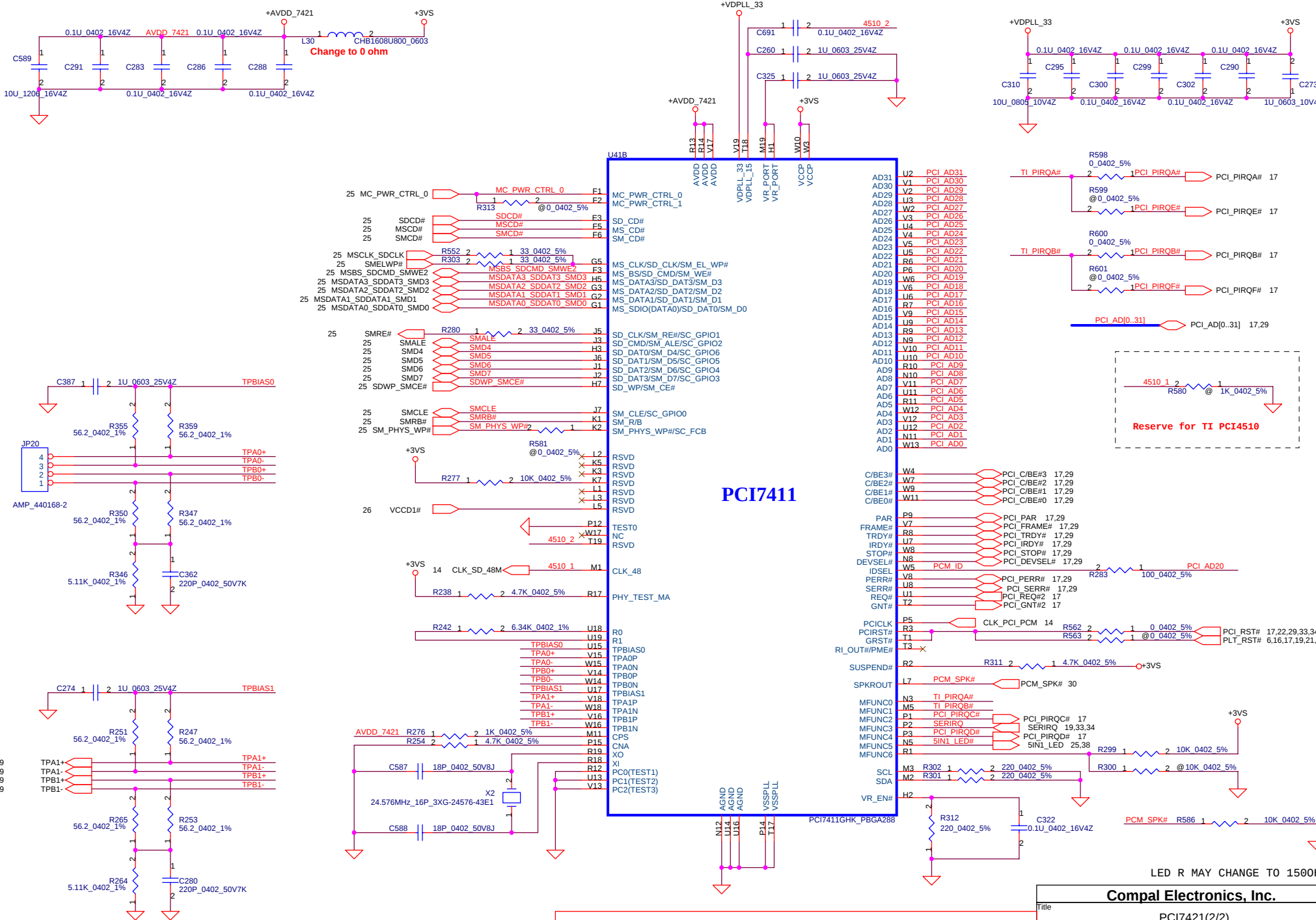


Module Conn.

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Title HDD & CDROM Connector			
Drawing Number Sakhir LA-2491			Rev 1.0
Date: 星期一, 十二月 06, 2004 Sheet 22 of 51			



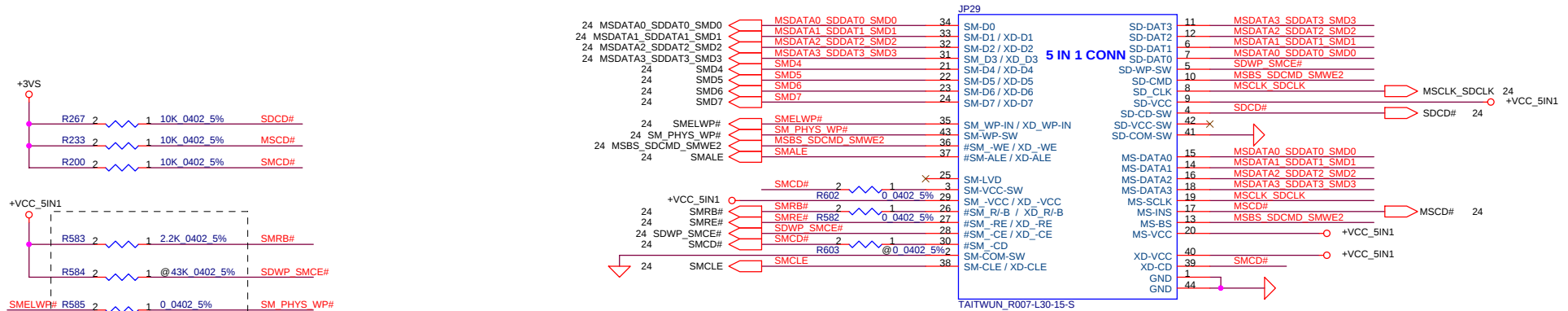


LED R MAY CHANGE TO 1500HM

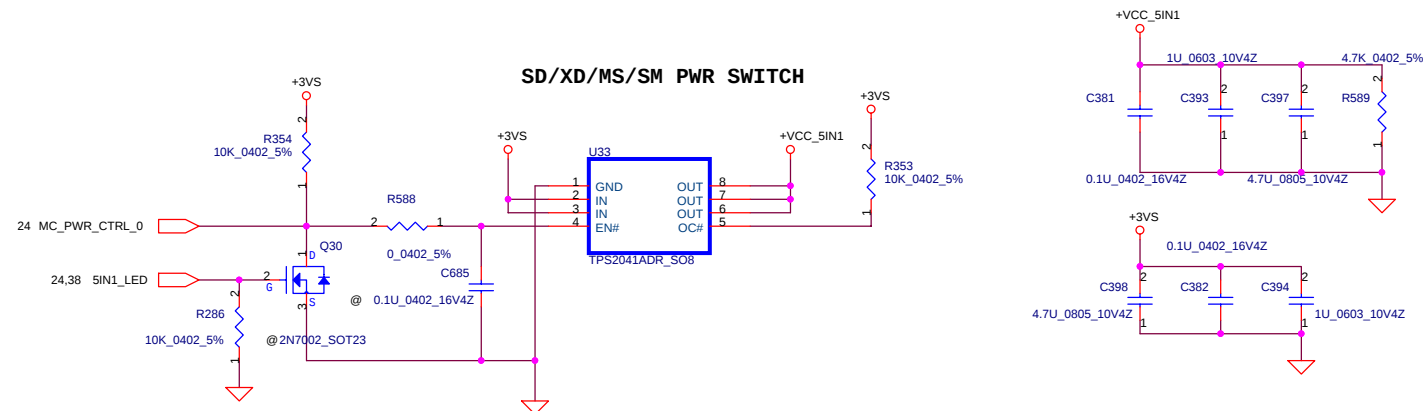
Compal Electronics, Inc.	
Title PCI7421(2/2)	
Size of Document Number	Rev 1.0
Sakhr LA-2491	
Date: 星期二, 十二月 06, 2004	Sheet 24 of 51

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5 in 1 CardReader Conn.



TI Workaround need check

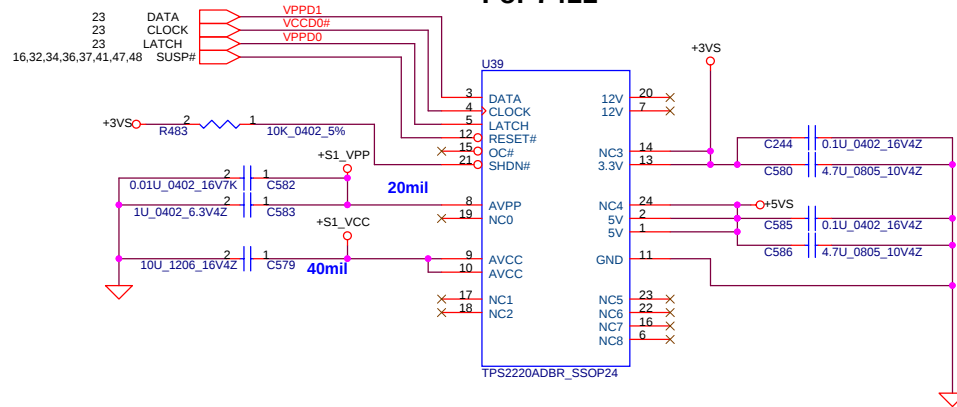


Compal Electronics, Inc.

Title	5 IN 1 Stocket	Rev	1.0
Size of Document Number	Sakhir LA-2491	Date	星期一, 十二月 06, 2004
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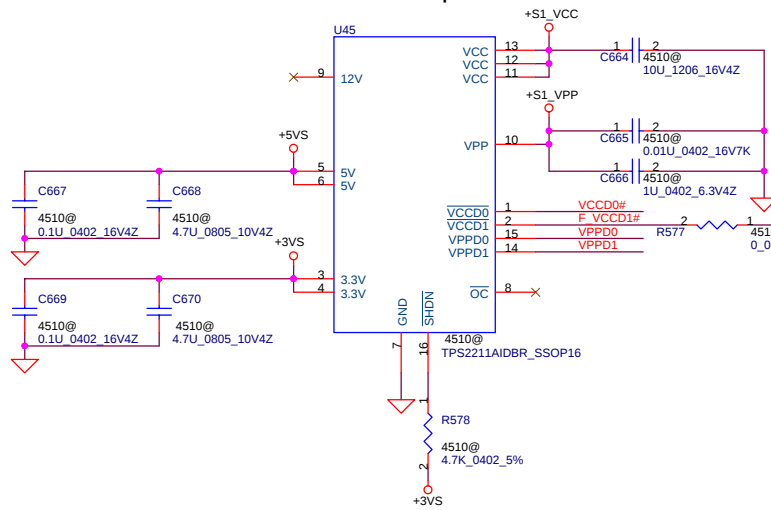
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For 7411

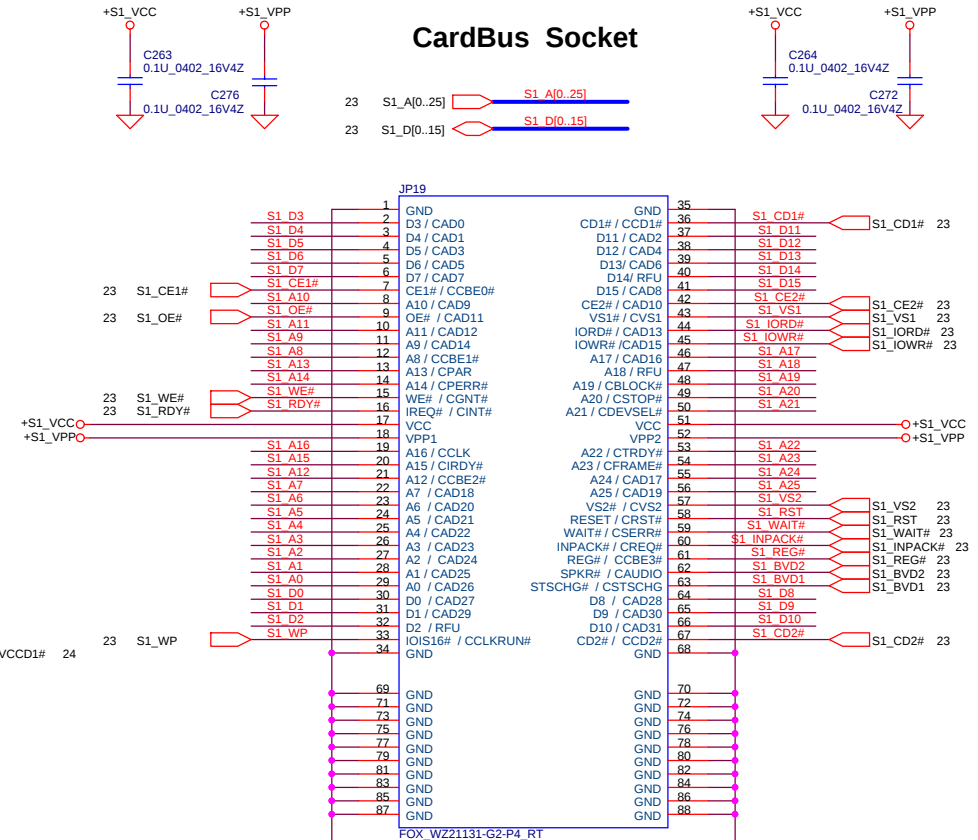


For 4510

use U4 footprint



CardBus Socket



Compal Electronics, Inc.

CardBUS Socket

Sakhir LA-2491

Rev	
1.0	

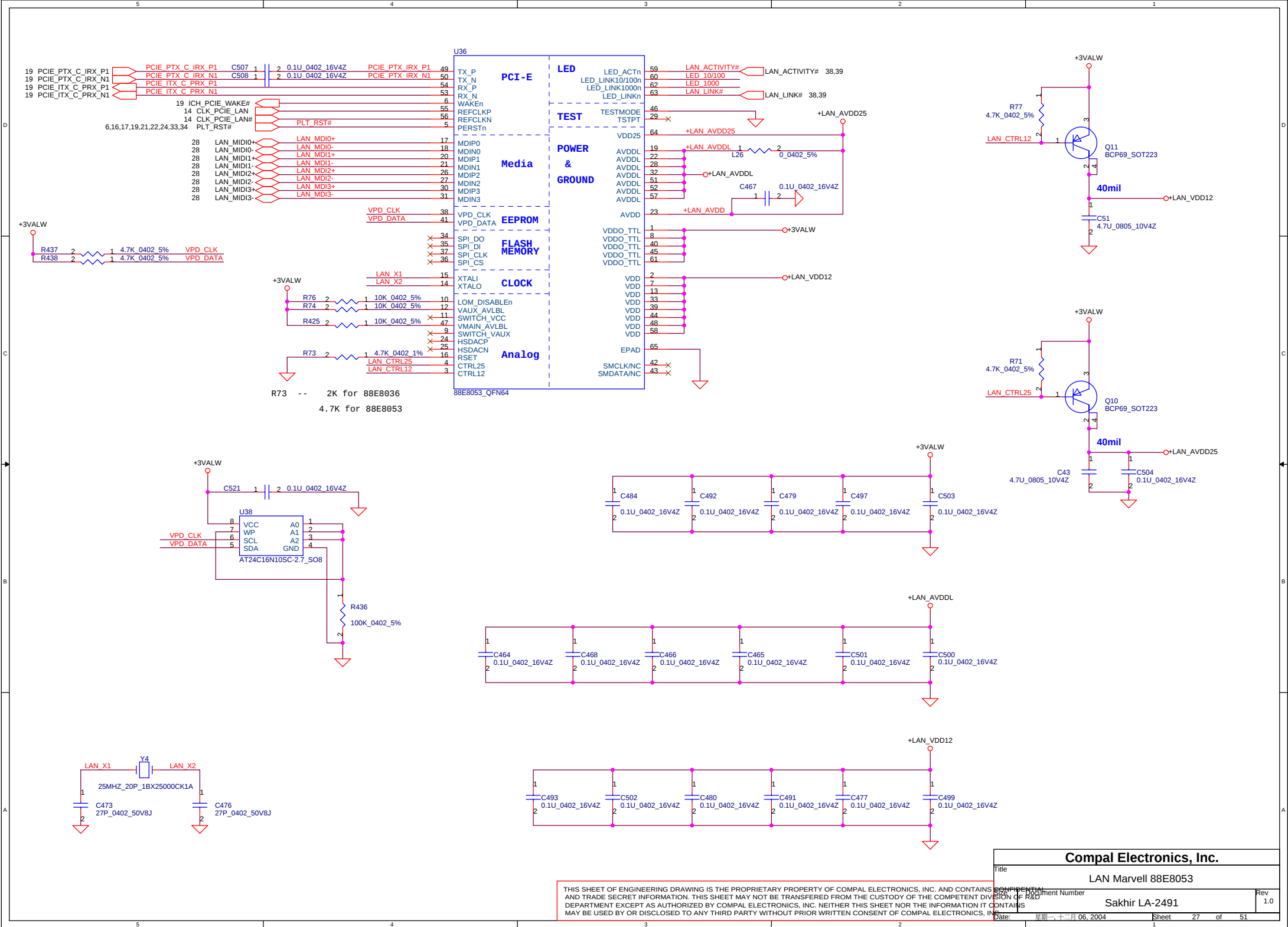
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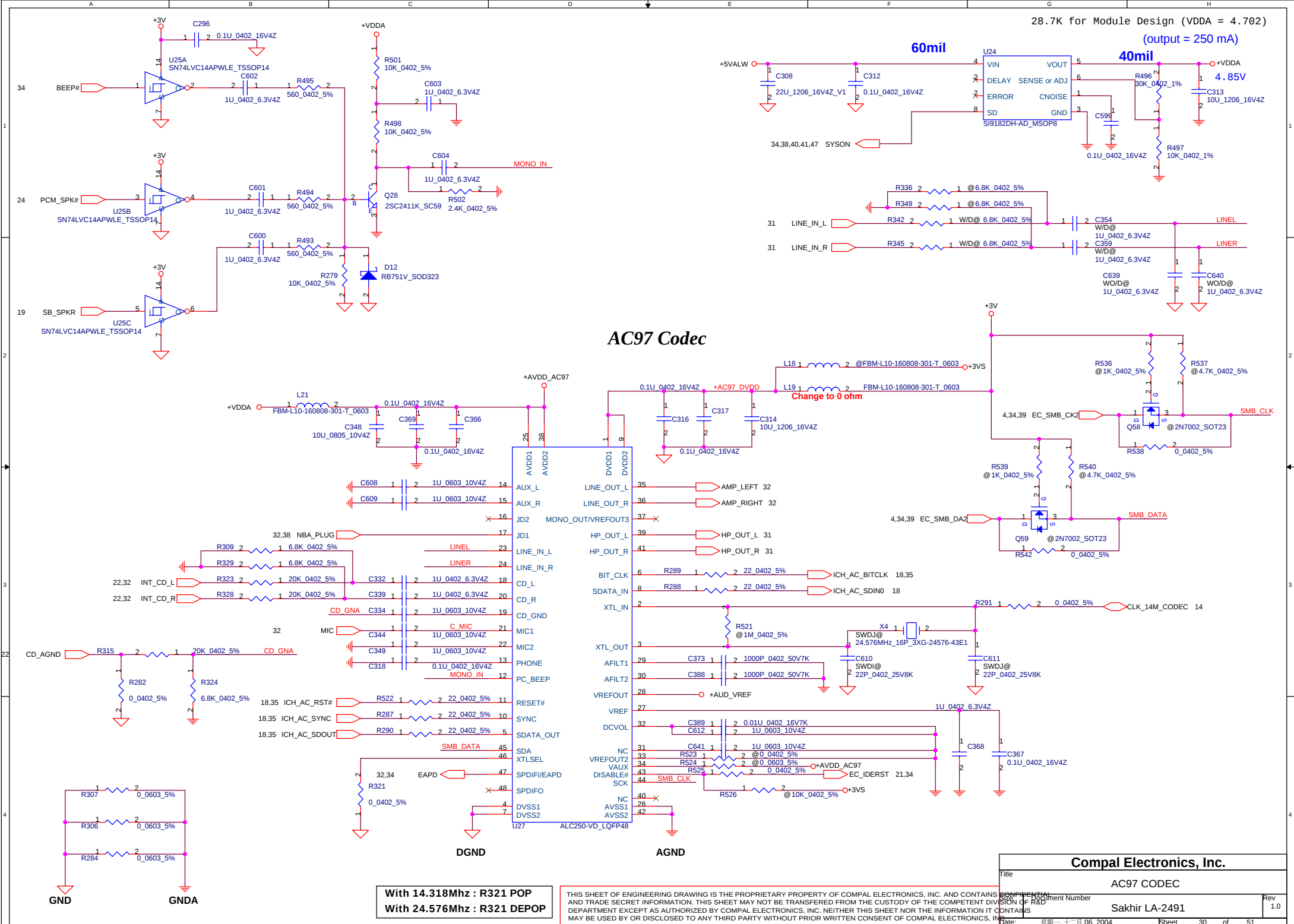
NS CONFIDENTIAL
DIVISION OF B&C Document Number

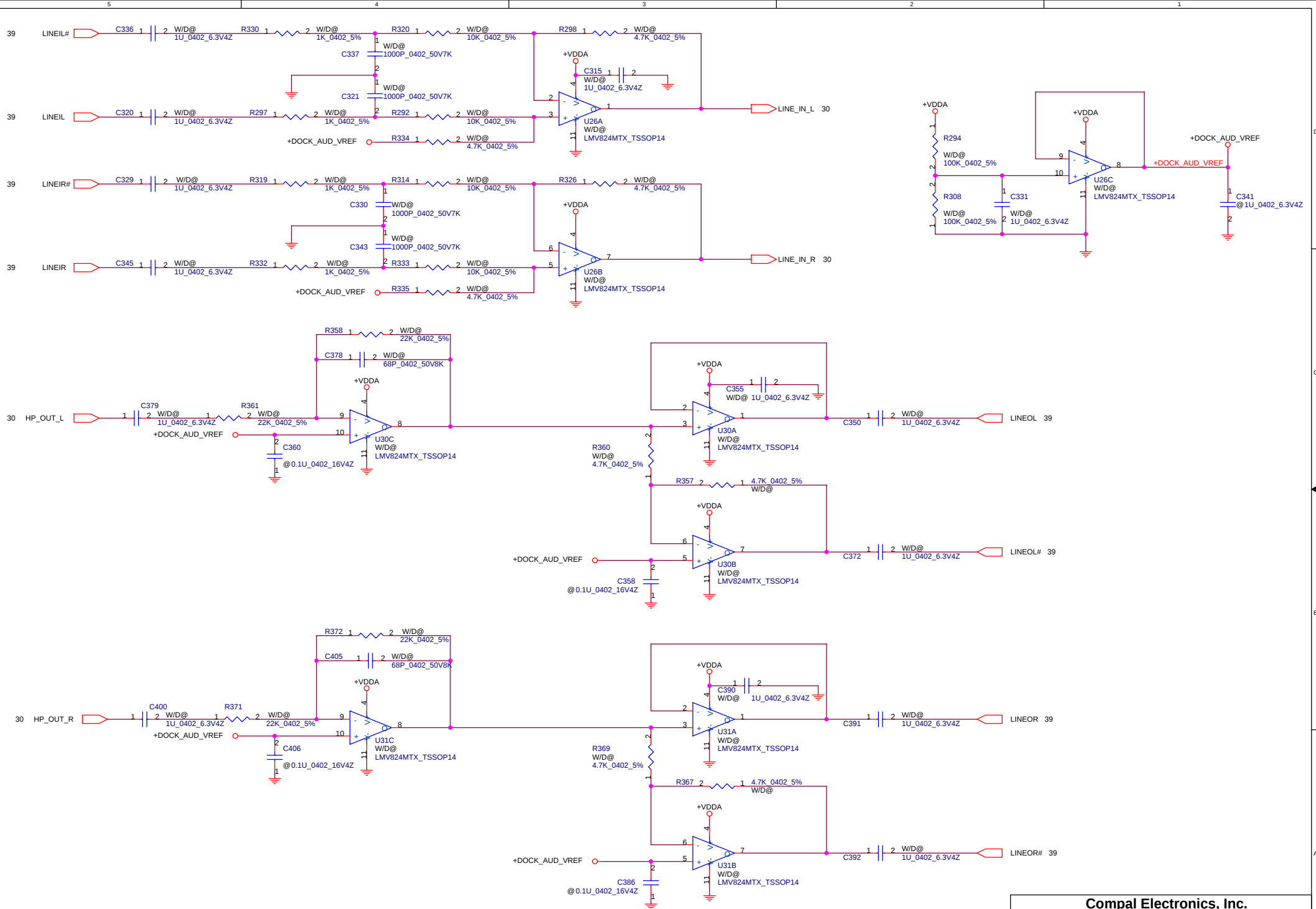
Date: 星期一, 十二月 06, 2004

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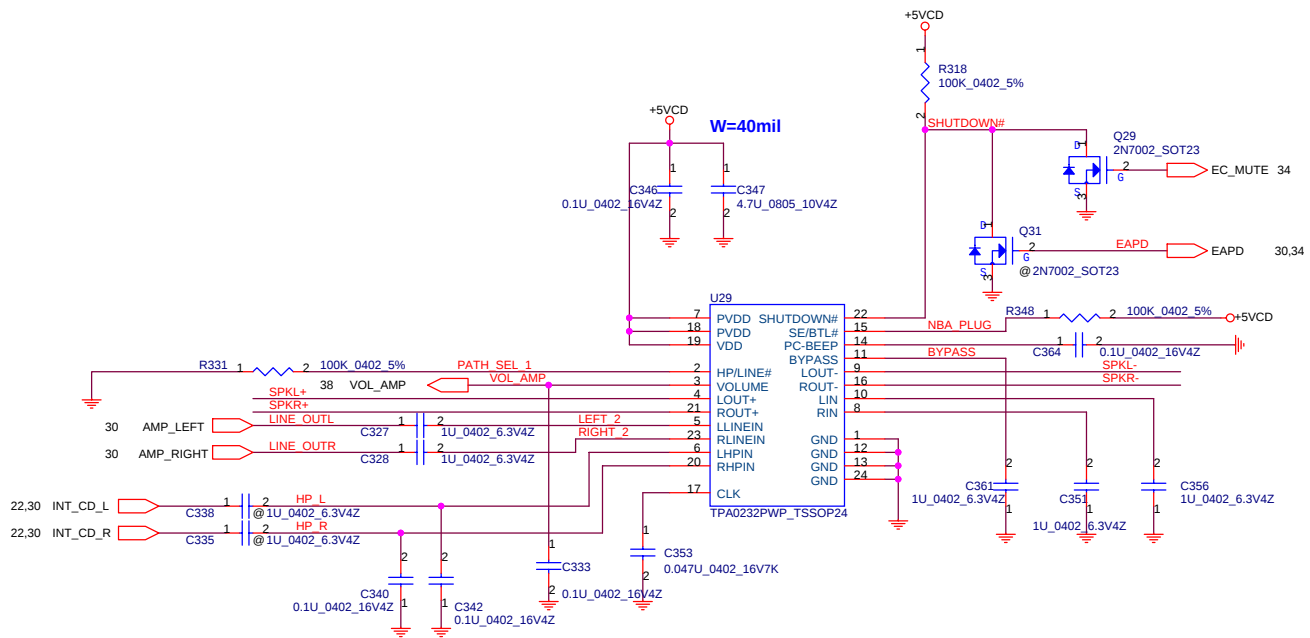




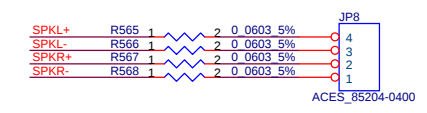


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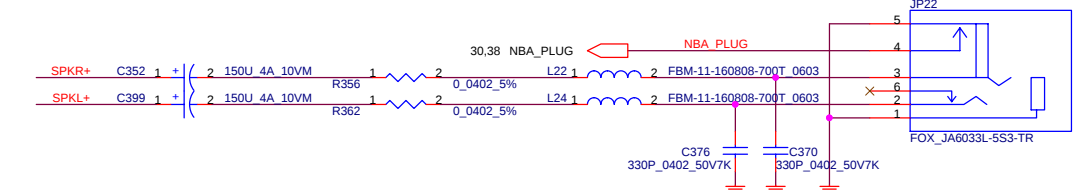
Compal Electronics, Inc.			
Title		Docking Audio	
Size	Document Number	Sakhir LA-2491	
Date		星期一, 十二月 06, 2004	Rev 1.0
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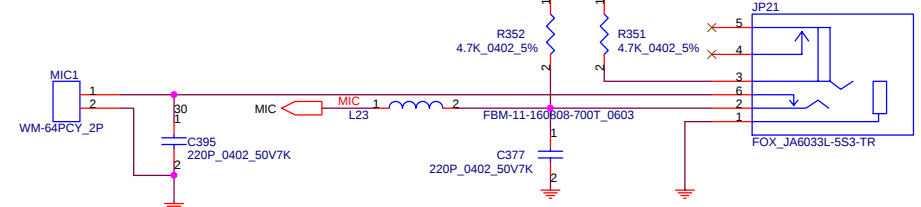
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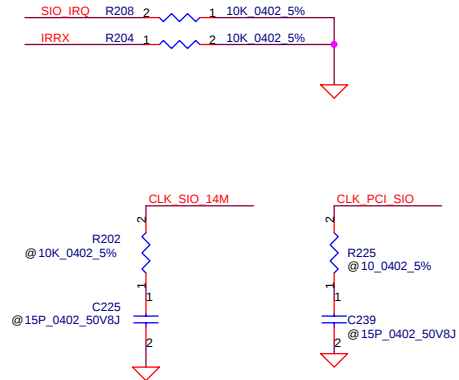
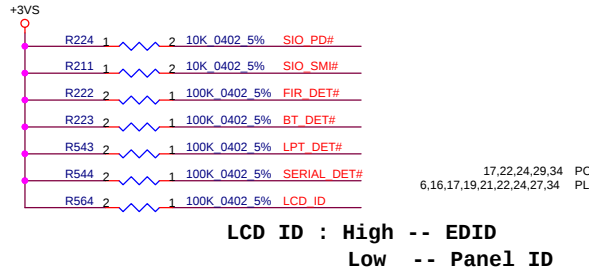
HeadPhone JACK



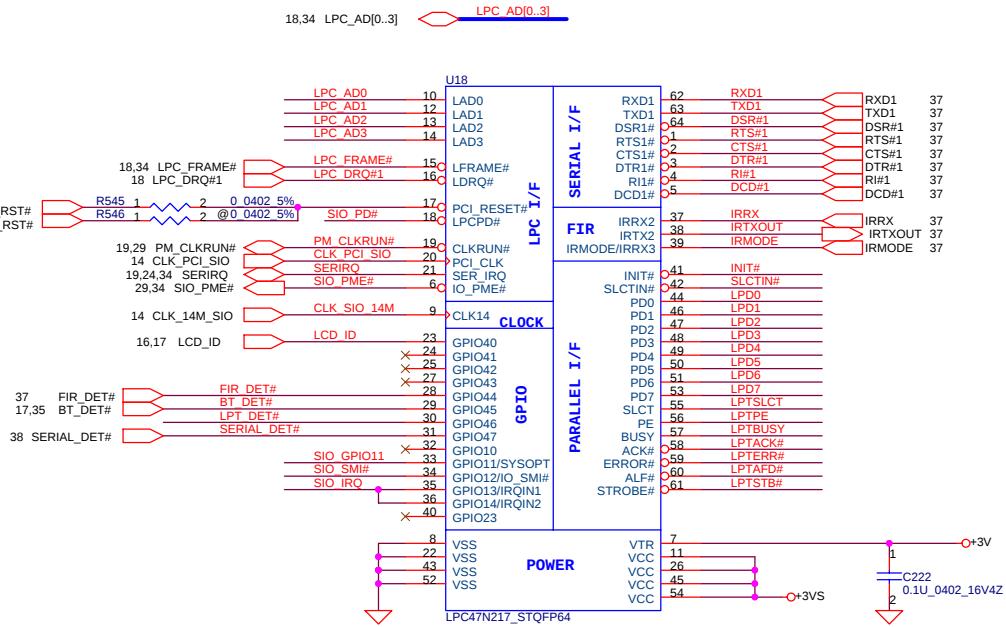
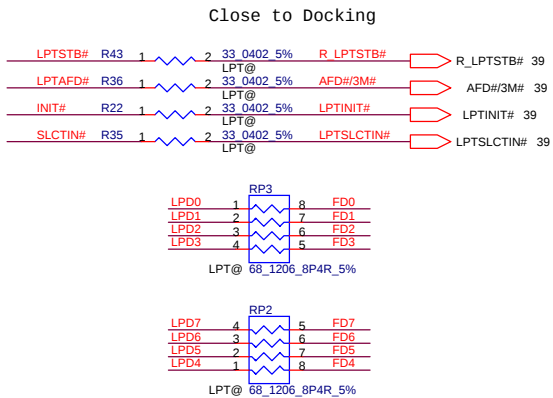
MIC JACK



SUPER I/O SMsC LPC47N217

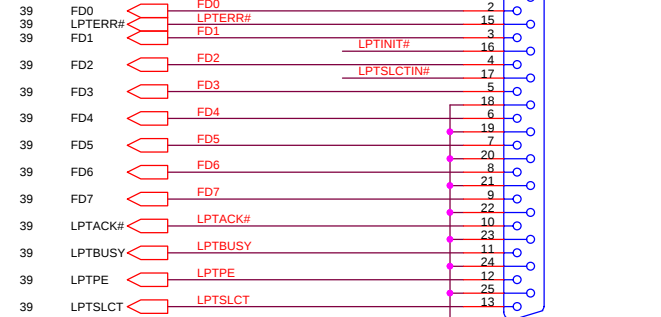
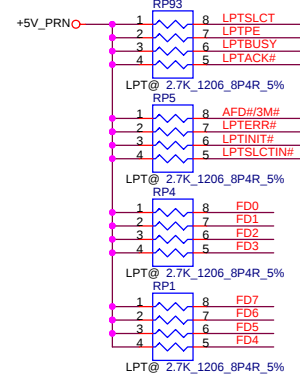
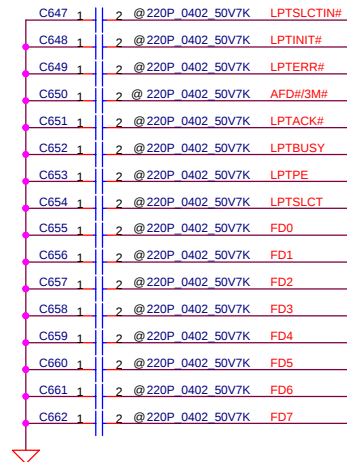
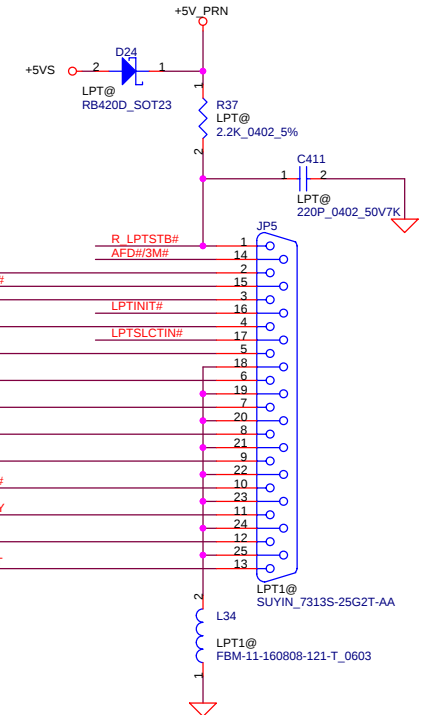
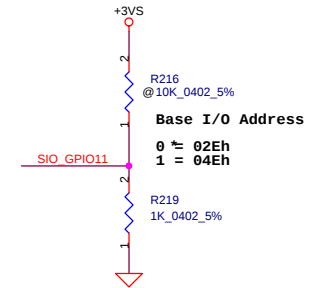
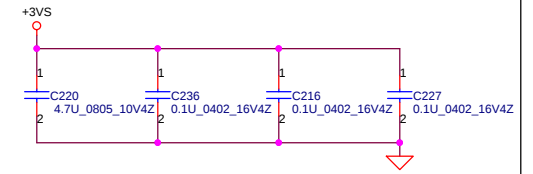
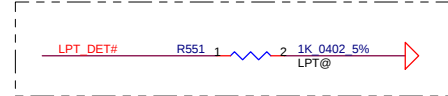


No Docking and Parallel Port ----->Del



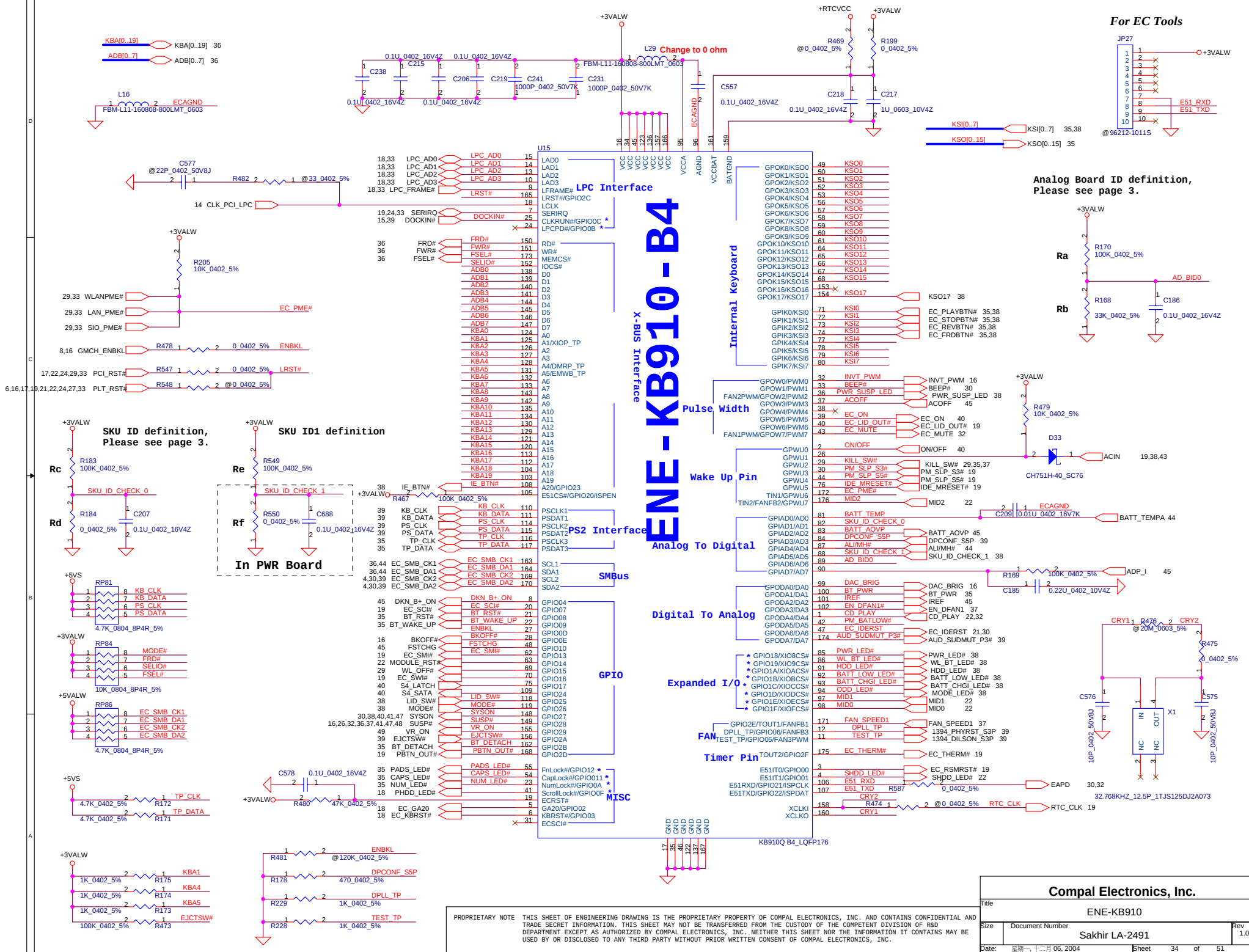
Parallel Port

LPT Module L: R POP LPT Enable
 H: R De-POP LPT Disable



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Title				LPC-Super I/O 217			
NS CONFIDENTIAL				Rev			
DIVISION OF R&D				1.0			
CONTAINS				Sakhir LA-2491			
ING							
Date: 星期一, 十二月 06, 2004		Sheet 33		of 51			



For EC Tools

Analog Board ID definition, Please see page 3.

SKU ID definition, Please see page 3.

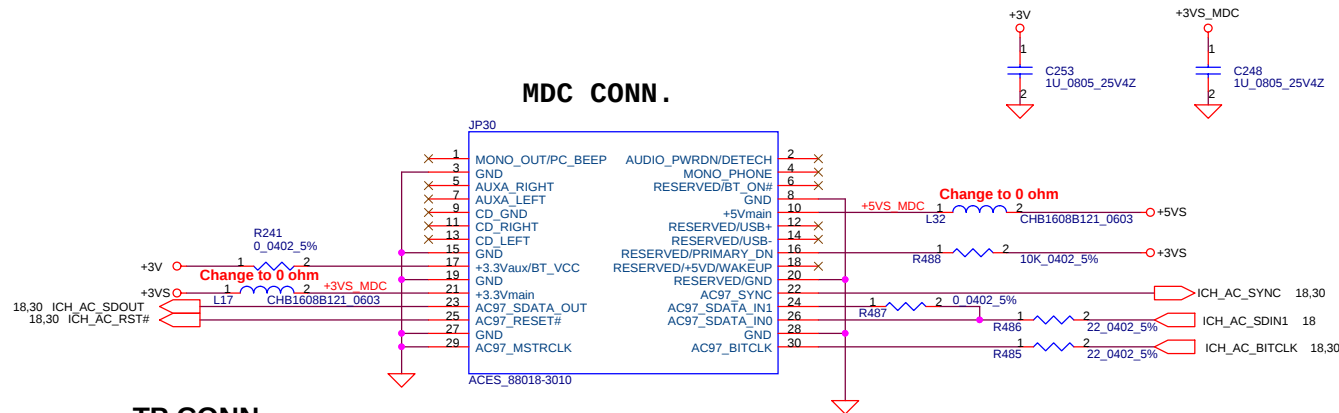
SKU ID1 definition

In PWR Board

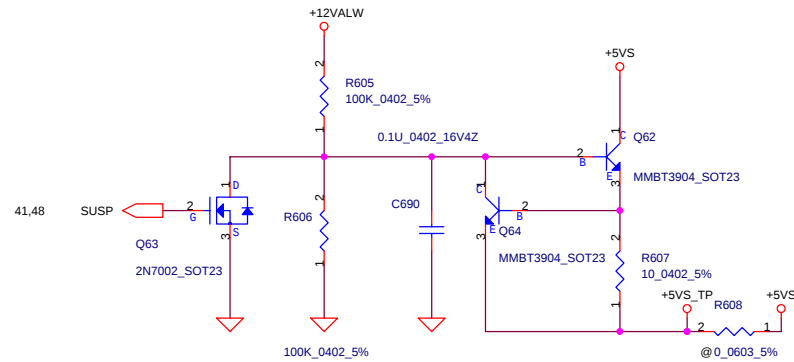
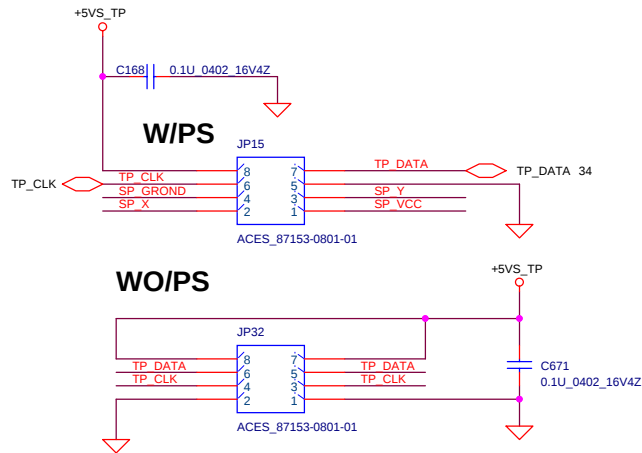
Compal Electronics, Inc.				
ENE-KB910				
Title	Document Number	Sakhr LA-2491		Rev 1.0
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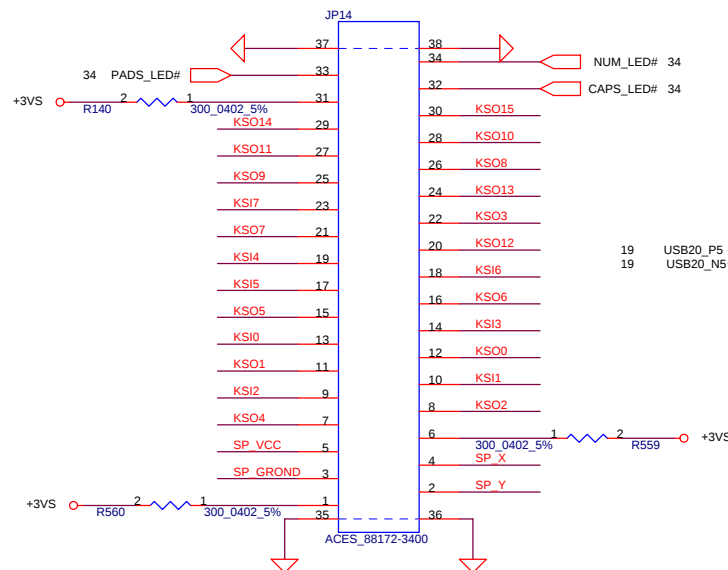
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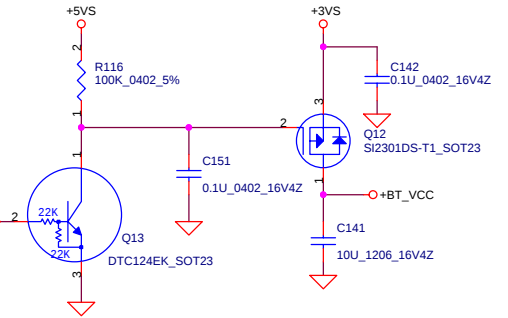
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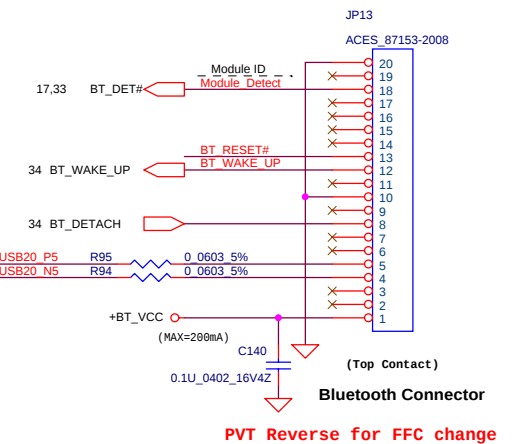
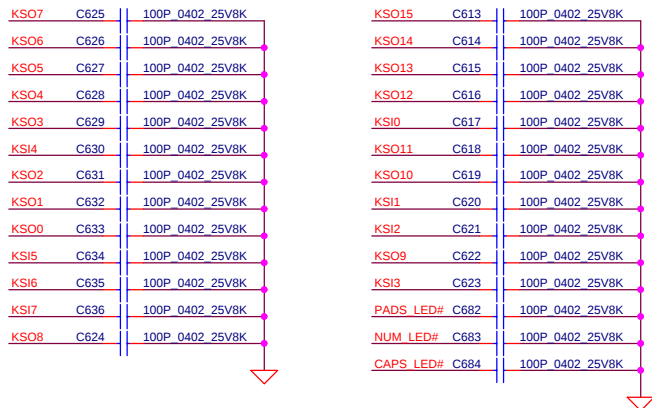
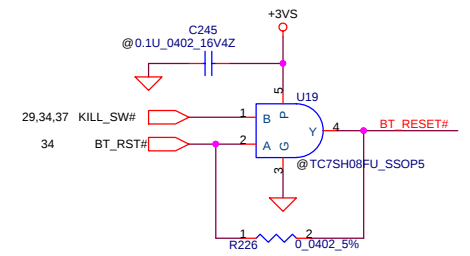
INT_KBD CONN.

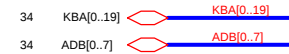
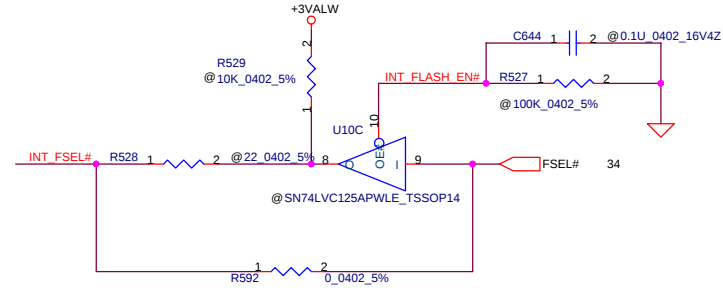
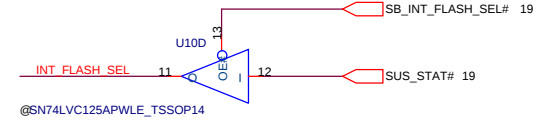
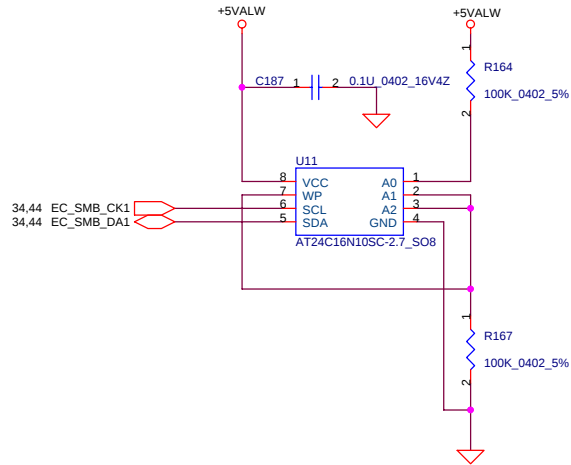
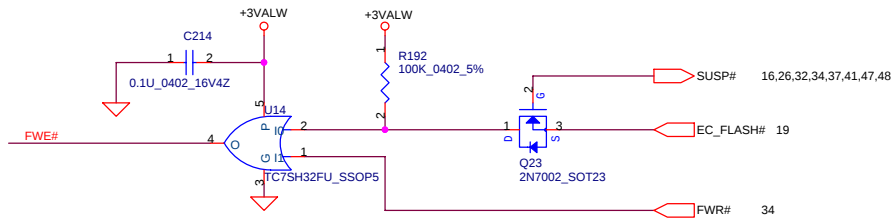


BlueTooth Interface

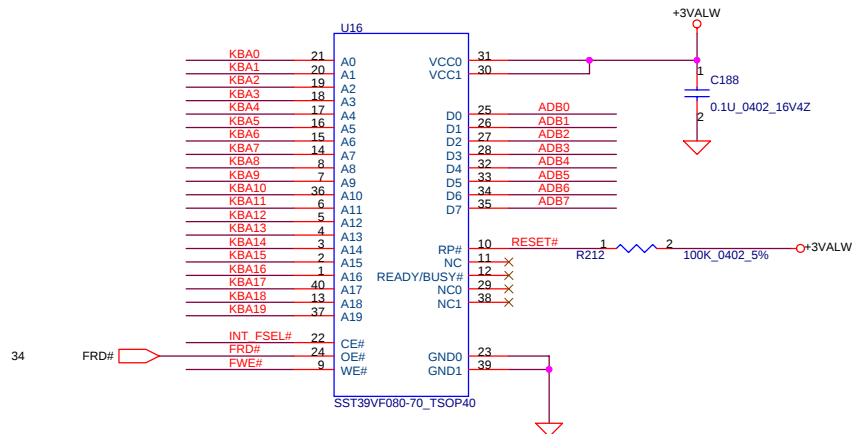


Module ID
Indication for polarity of reset
Reset input High Active --> Low ,
Reset input Low Active --> Open

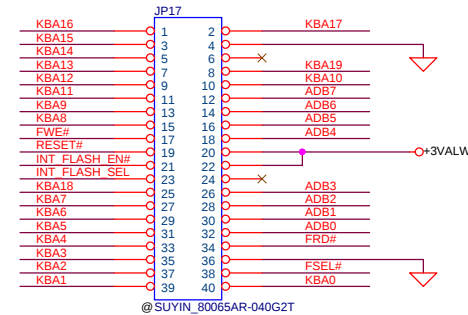




1MB Flash ROM



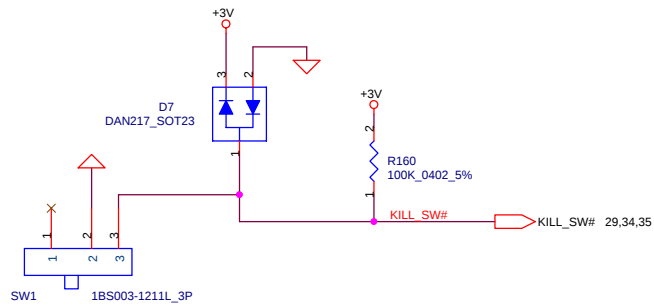
1MB ROM Socket



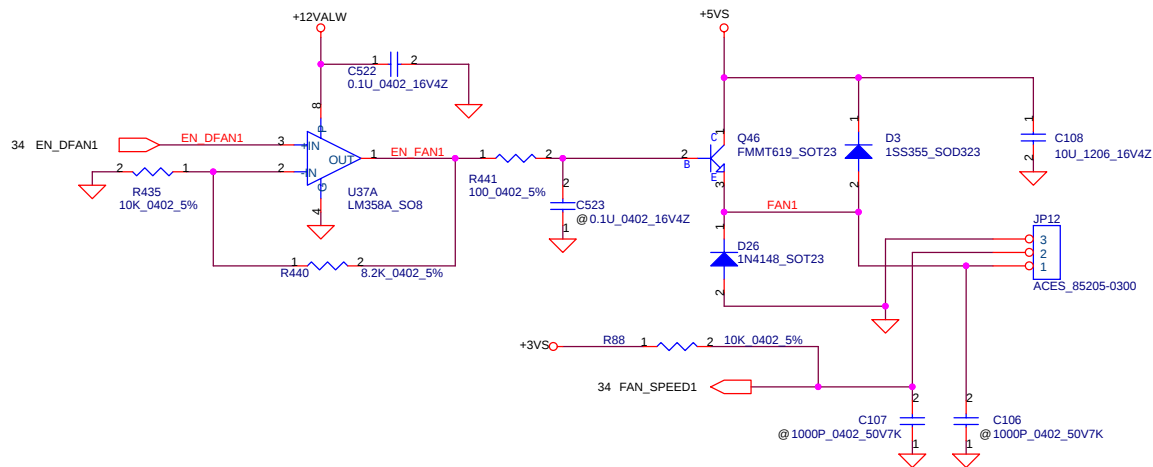
Compal Electronics, Inc.			
Title		BIOS & EXT. I/O PORT	
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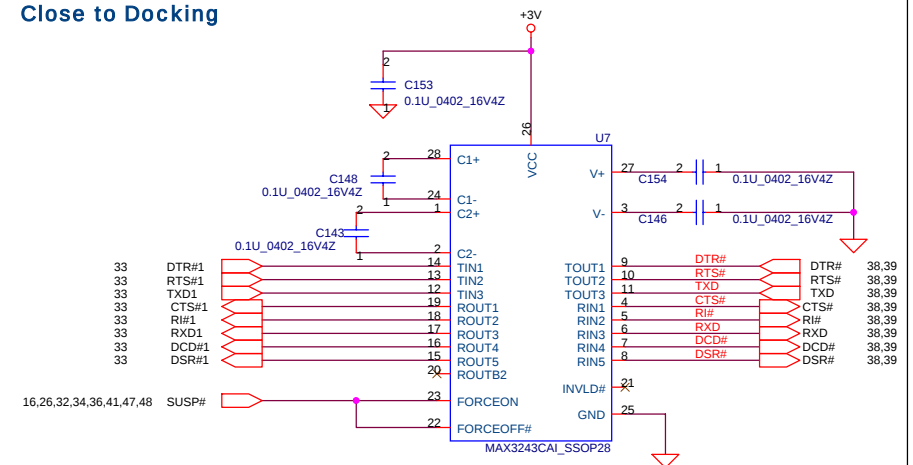
Kill SWITCH



FAN Conn



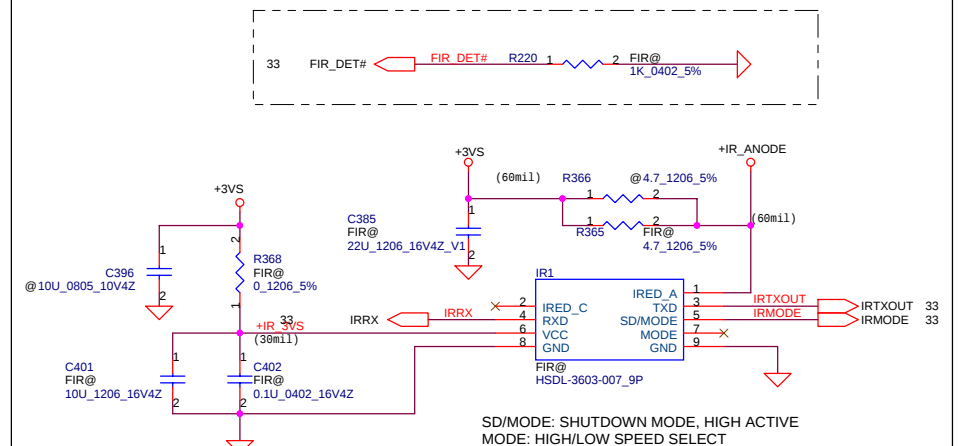
Close to Docking



No Docking and Serial Port ----->Del

FIR Module

L: R POP; FIR Enable
H: R De-POP/FIR Disable



Compal Electronics, Inc.

FAN1 / FIR / Kill

Sakhir LA-2491

Rev	1.0
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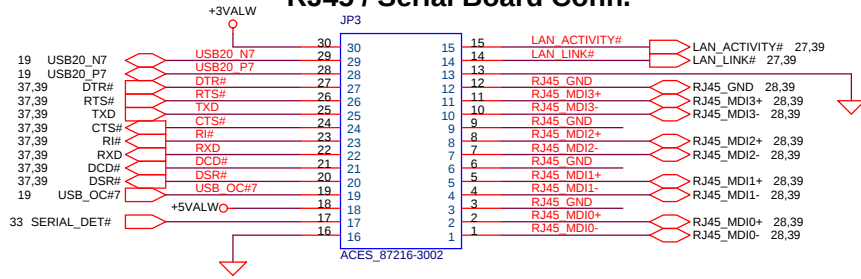
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DIVISION OF R&D
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S, IN Date: 星期一, 十二月 06, 2004

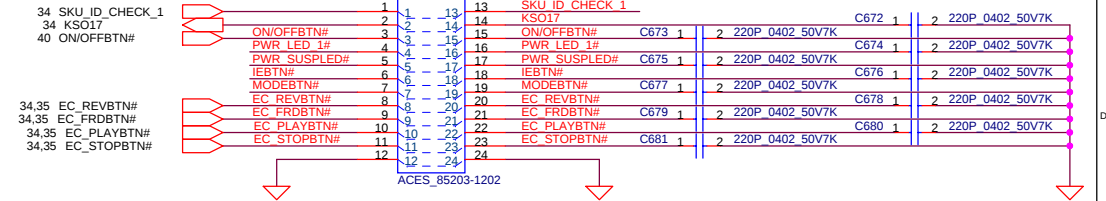
Sale: 星期一, 十二月 06, 2004

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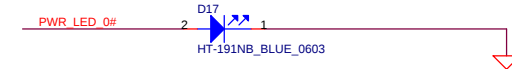
RJ45 / Serial Board Conn.



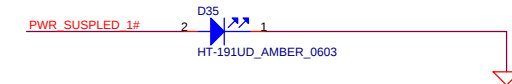
Power / LED Board Conn.



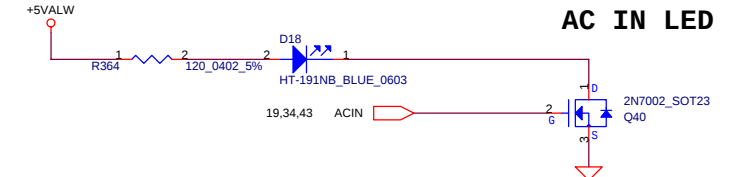
POWER/ON LED



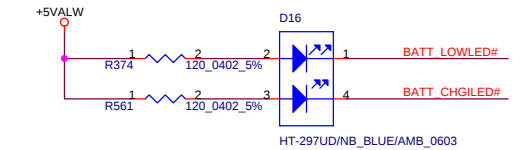
POWER/SUSP LED



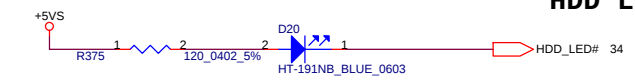
AC IN LED



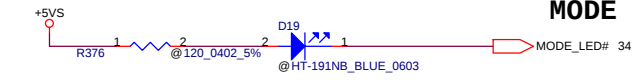
BATTERY CHG



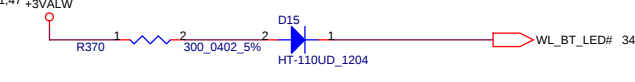
HDD LED



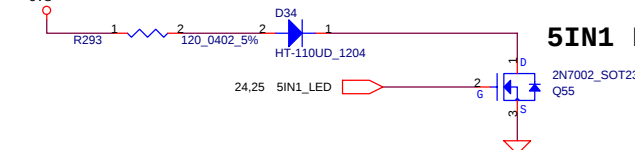
MODE LED



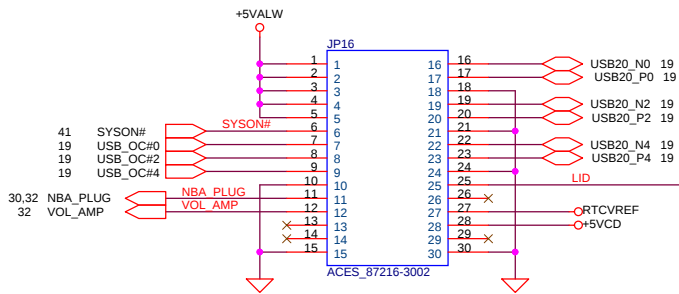
WL LED



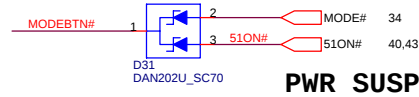
5IN1 LED



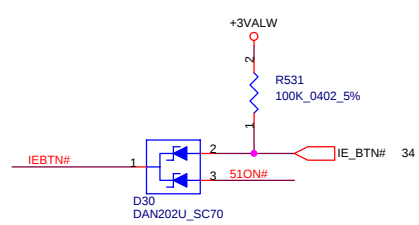
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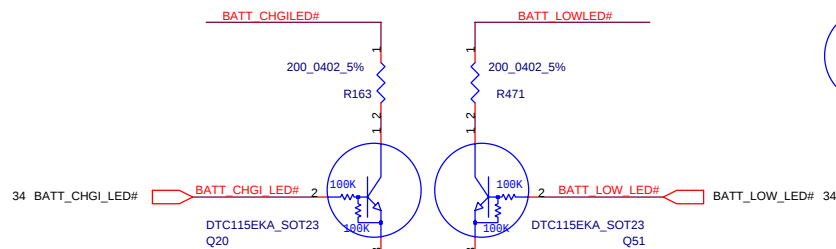
PWR SUSP LED



PWR SUSP LED



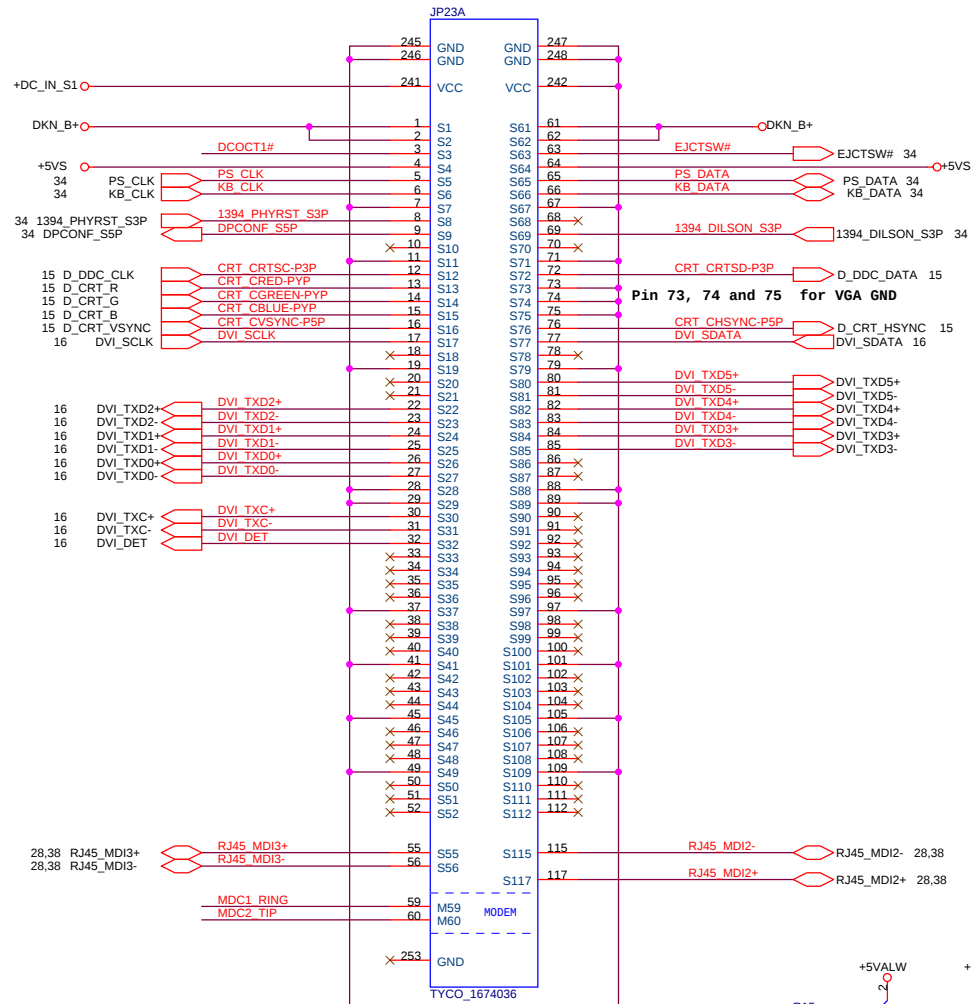
BATTERY CHG/Low LED



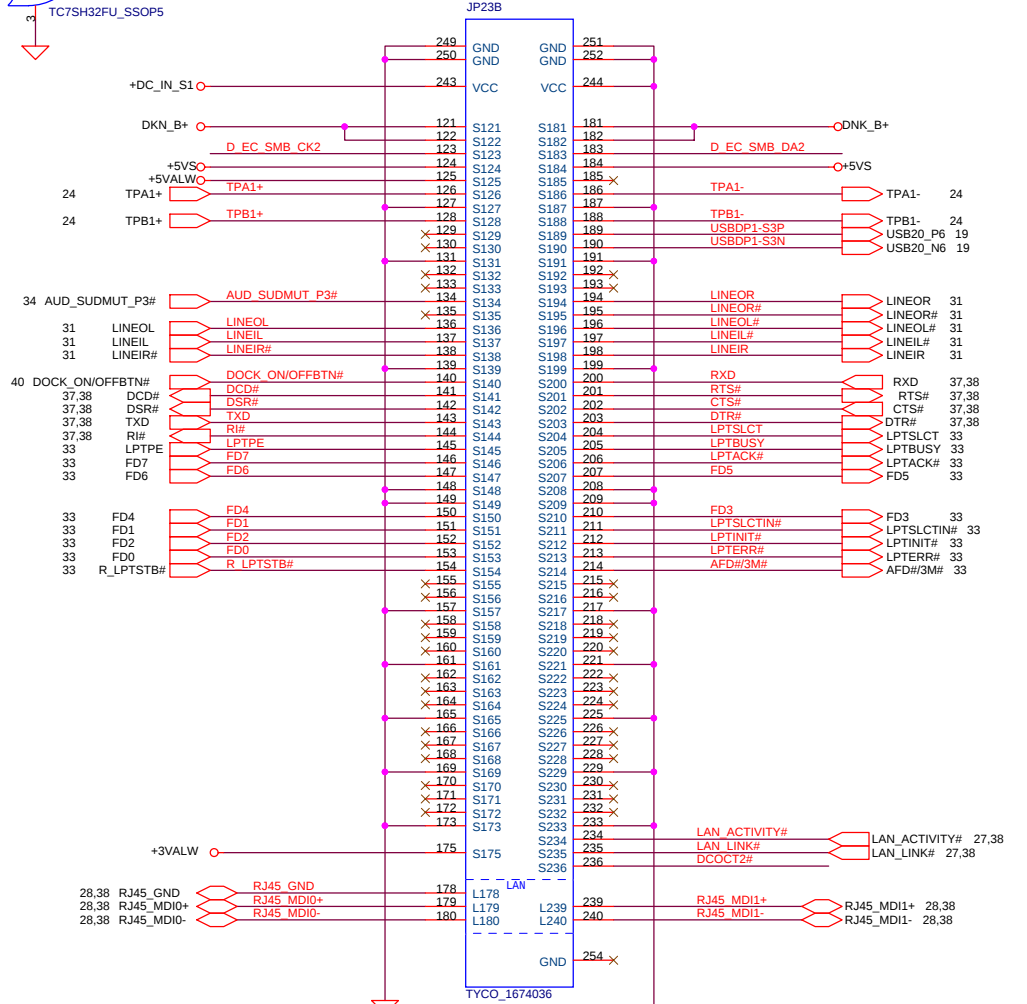
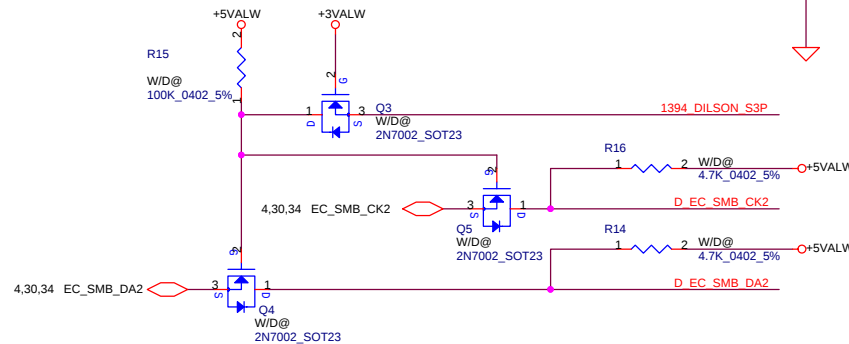
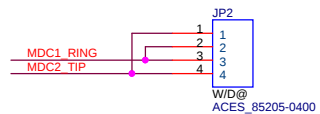
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Date	2004.12.06
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Docking Conn.

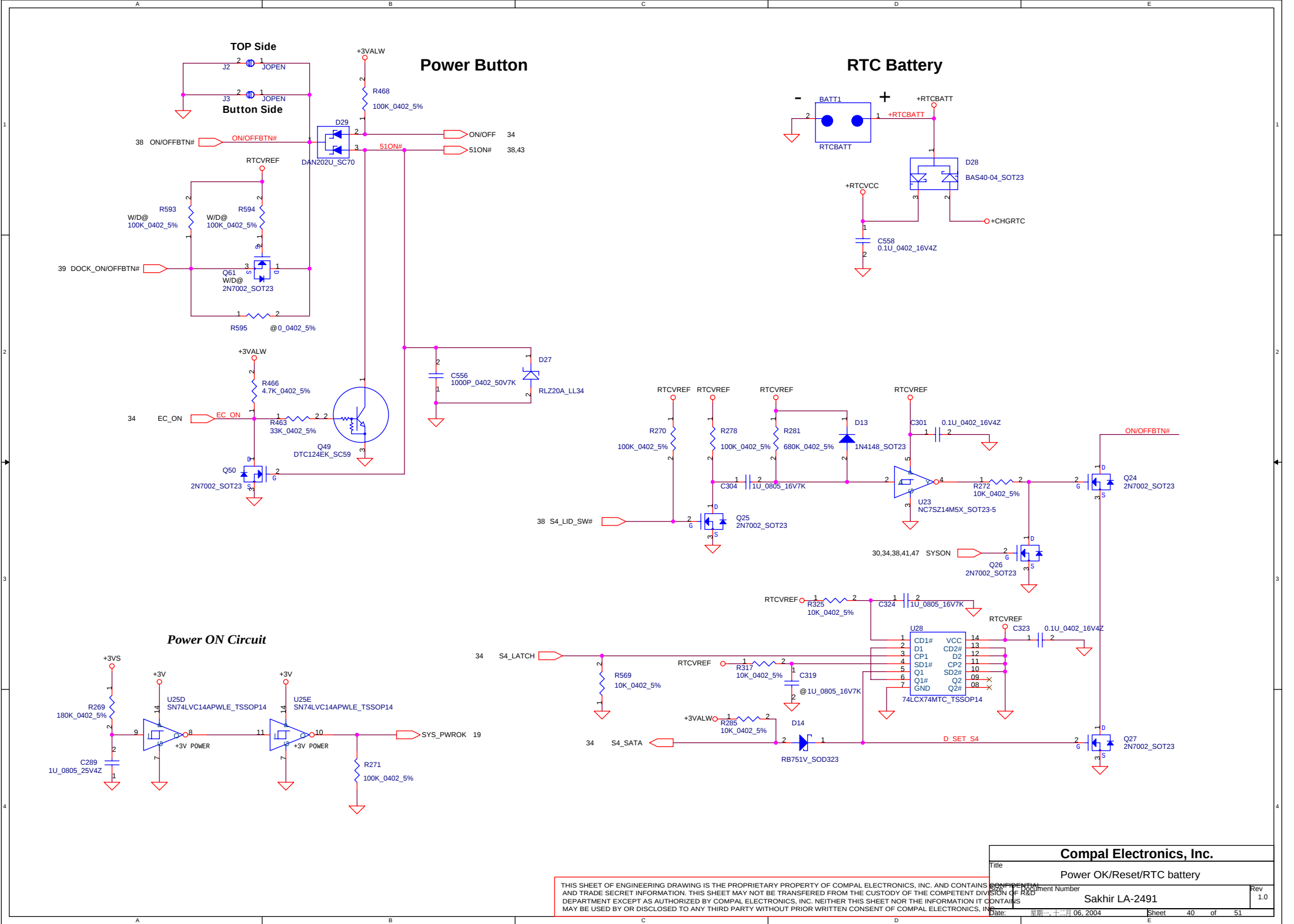


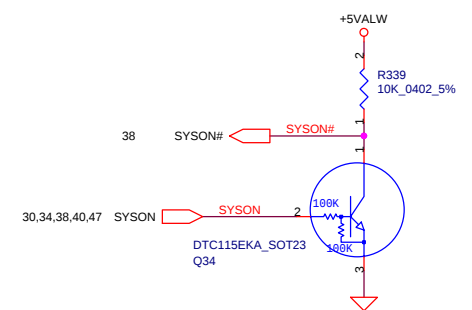
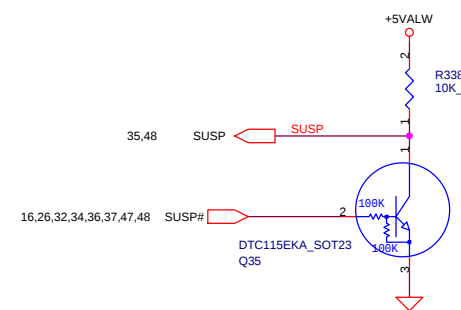
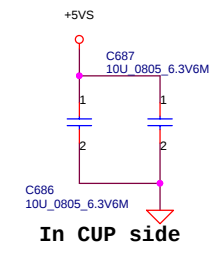
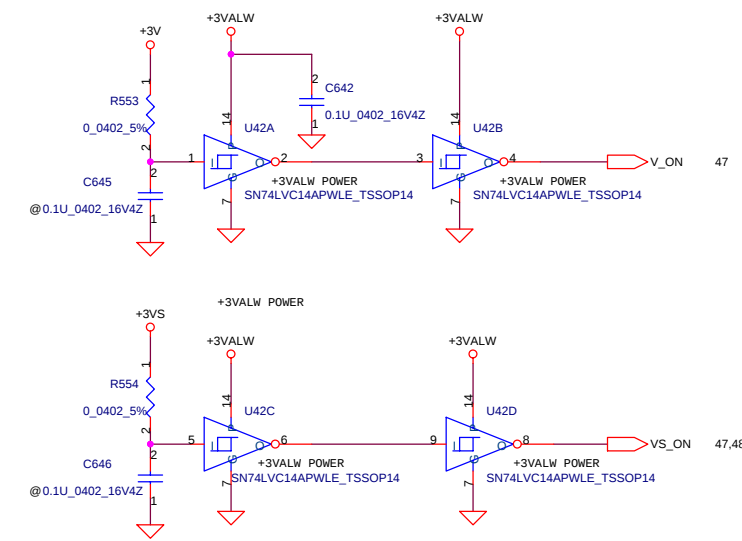
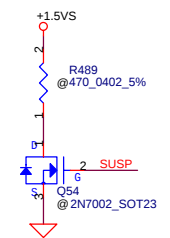
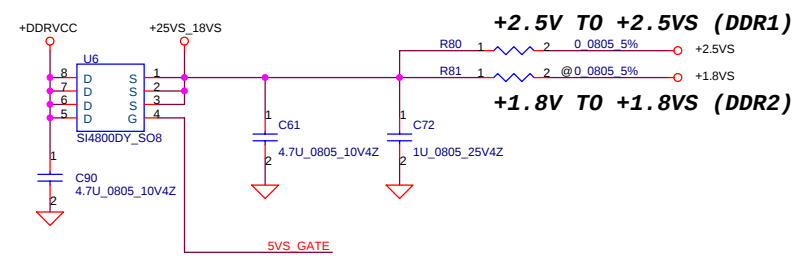
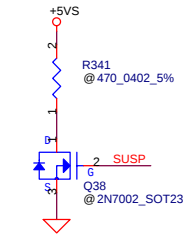
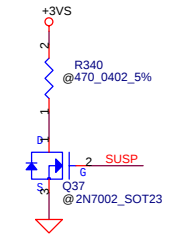
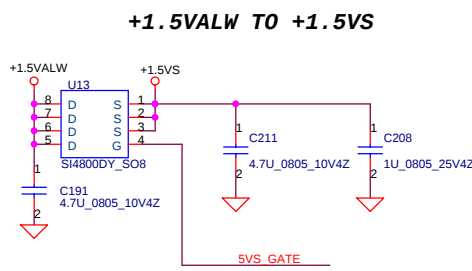
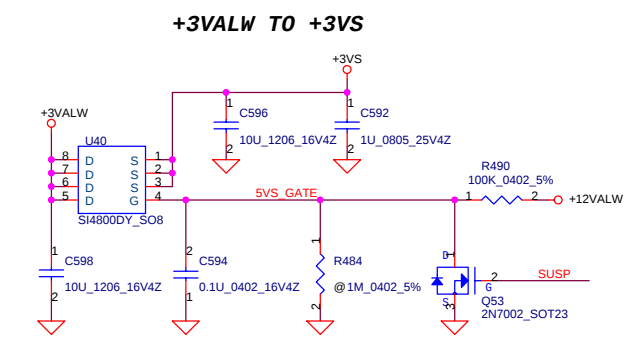
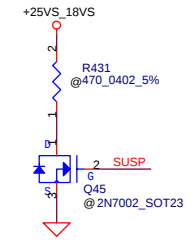
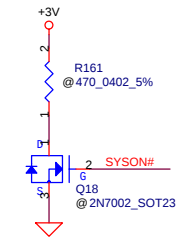
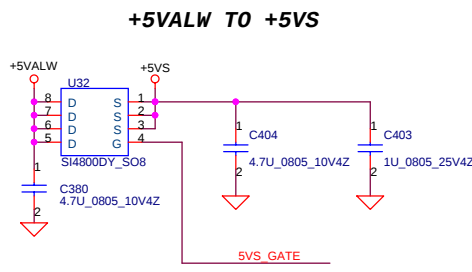
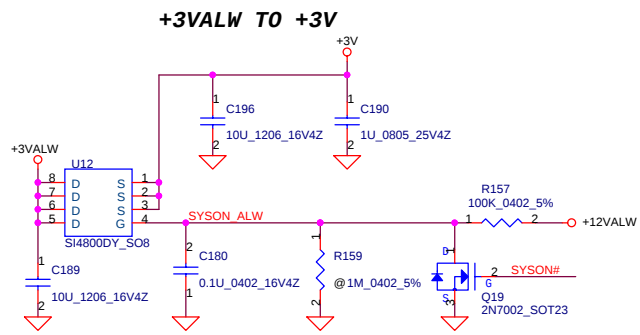
MDC to Docking Conn.



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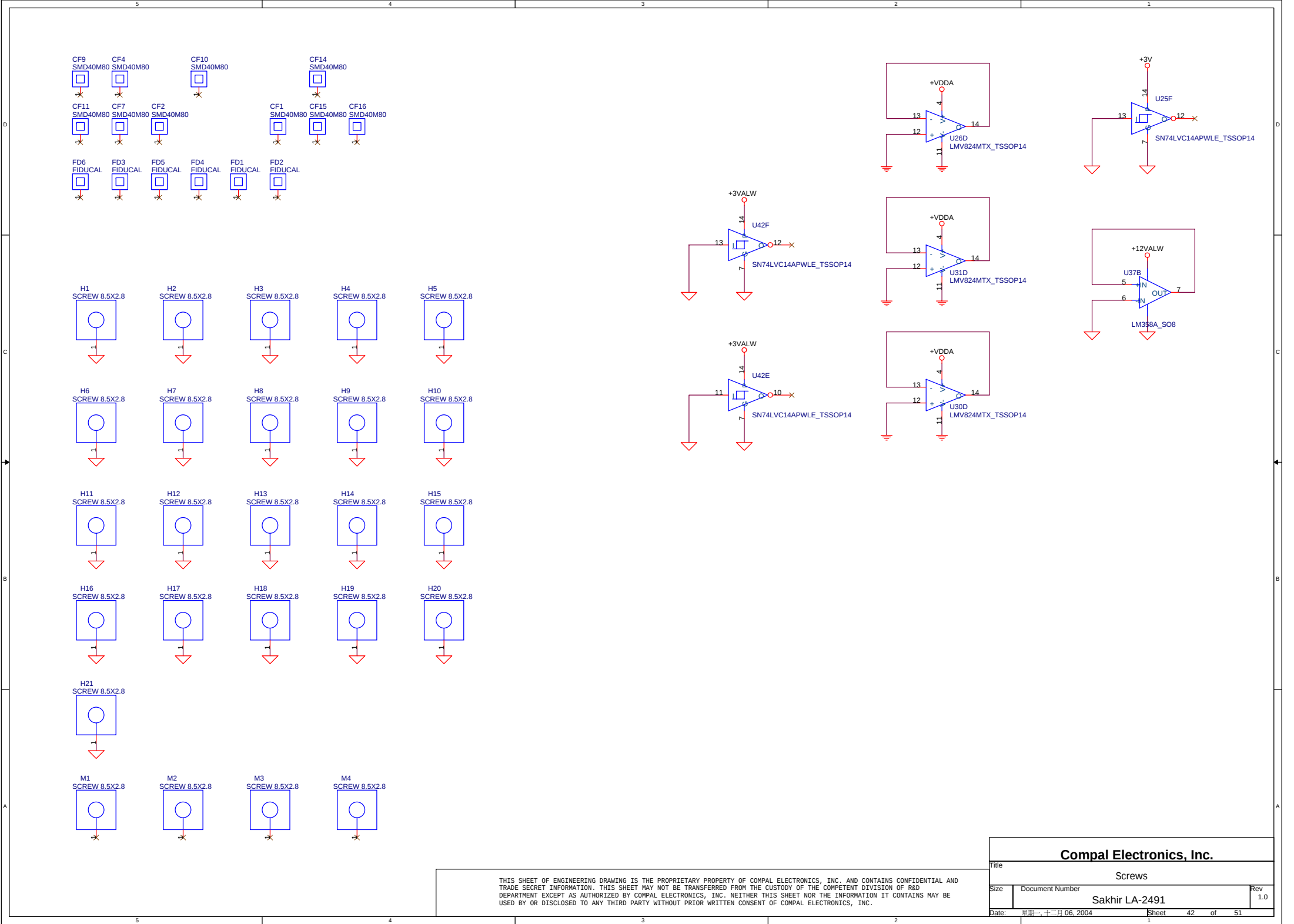
Compal Electronics, Inc.	
Title	Docking
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Author	Sakhir LA-2491
Date	星期二, 十二月 06, 2004
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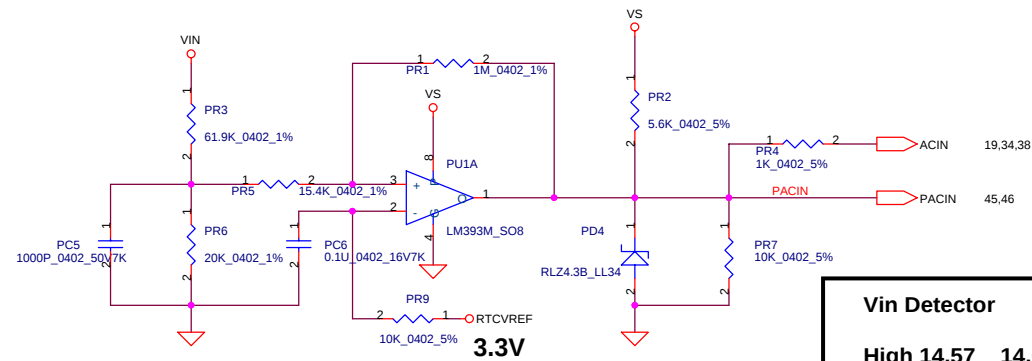
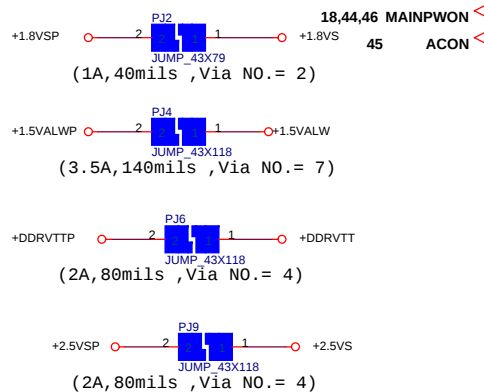
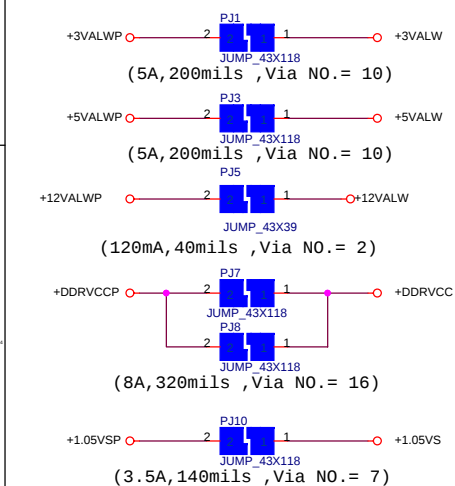
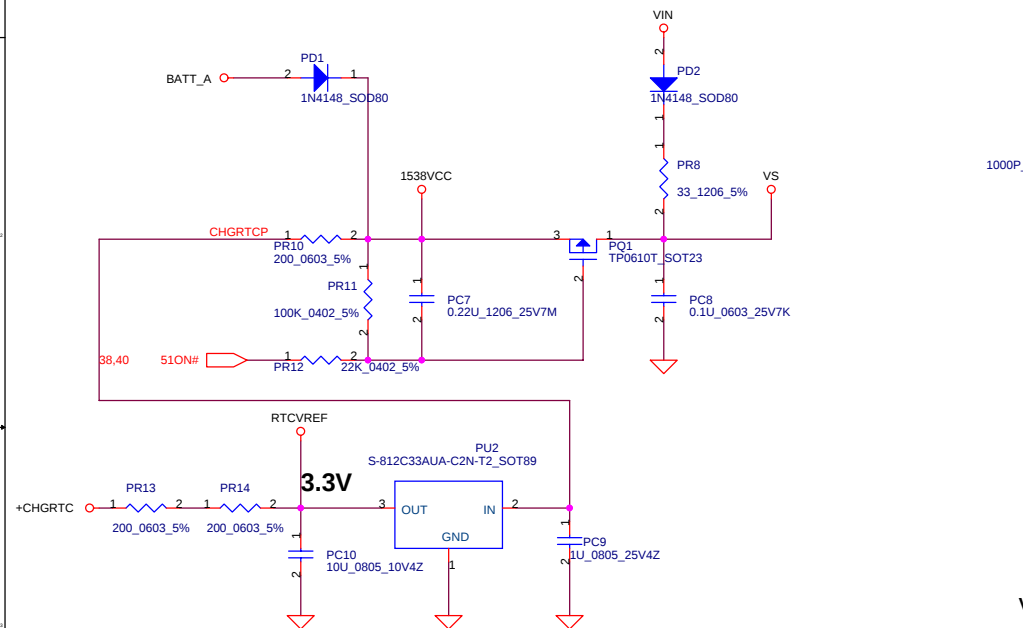
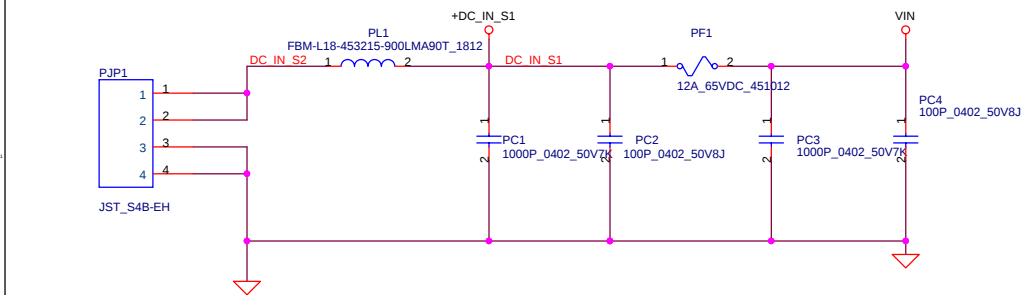
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Compal Electronics, Inc.			
POWER CONTROL CKT			
Size B	Document Number	Rev 1.0	
Sakhir LA-2491			
Date:	星期二, 十二月 06, 2004	Sheet	41 of 51

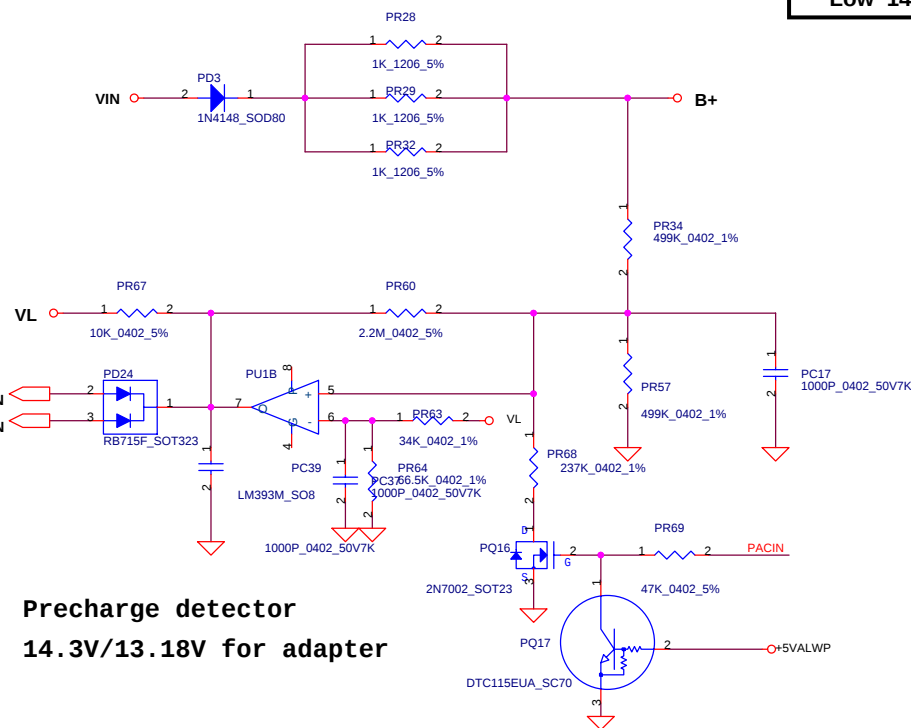


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Title				
Screws				
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Vin Detector			
High	14.57	14.01	13.46
Low	14.06	13.51	12.98

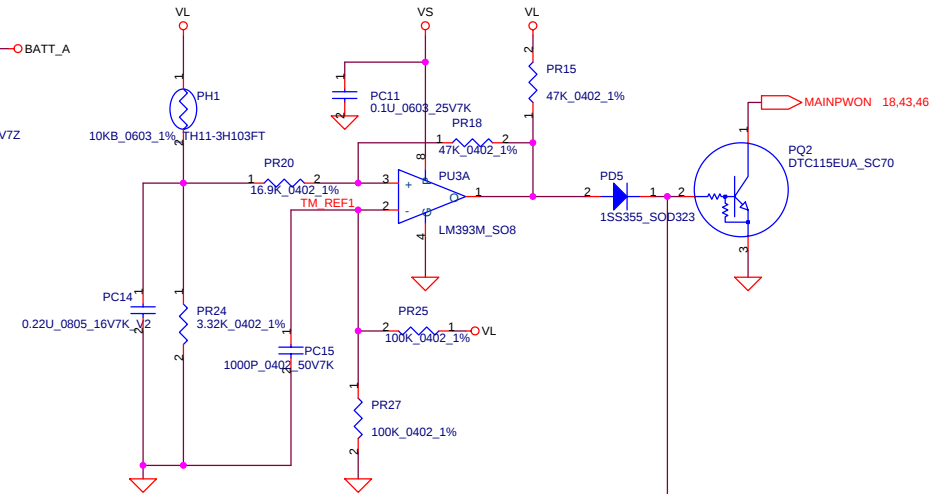
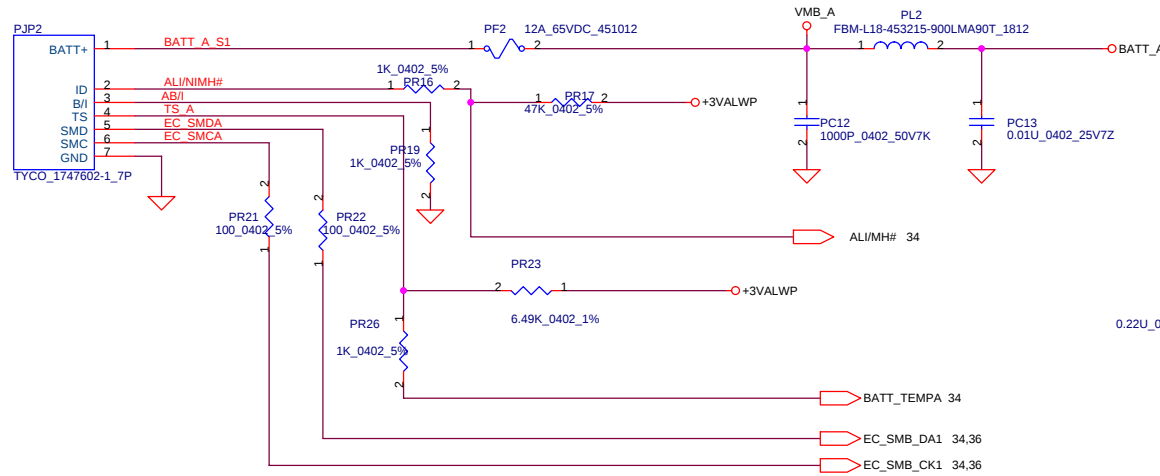


Precharge detector
14.3V/13.18V for adapter

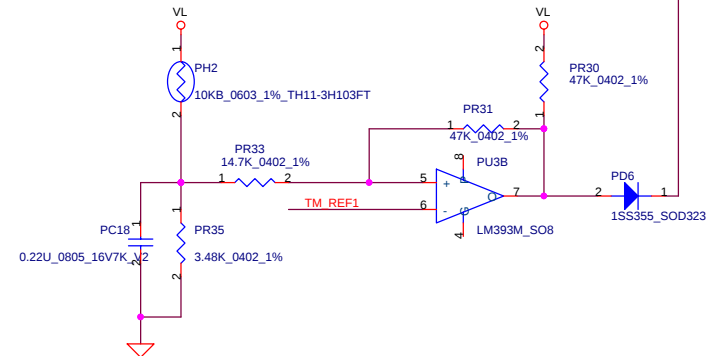
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Title DCIN & DETECTOR			
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PH1 under CPU botten side :
CPU thermal protection at 84 degree C
Recovery at 45 degree C

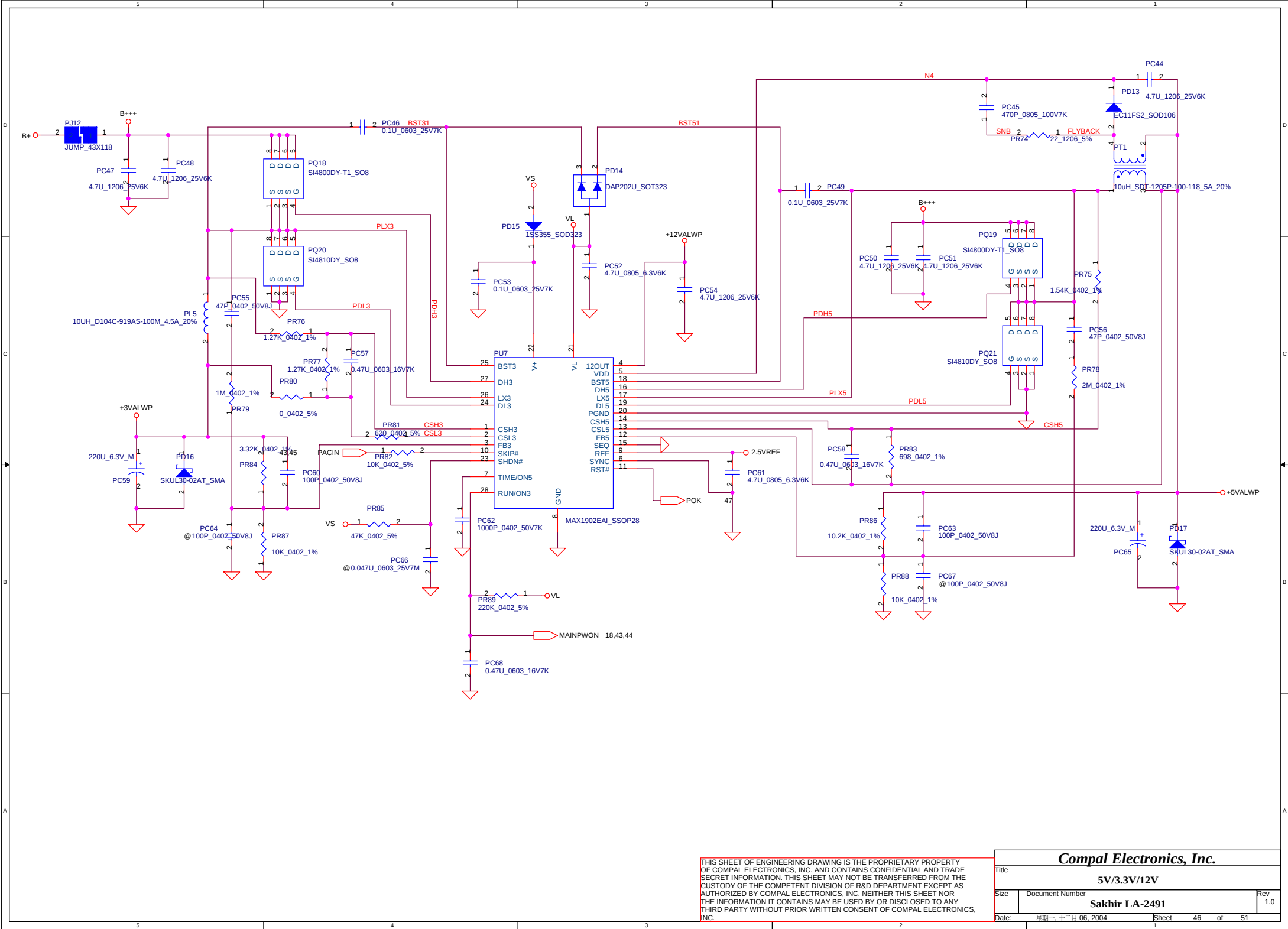


PH2 near main Battery CONN :
BAT. thermal protection at 79 degree C
Recovery at 45 degree C



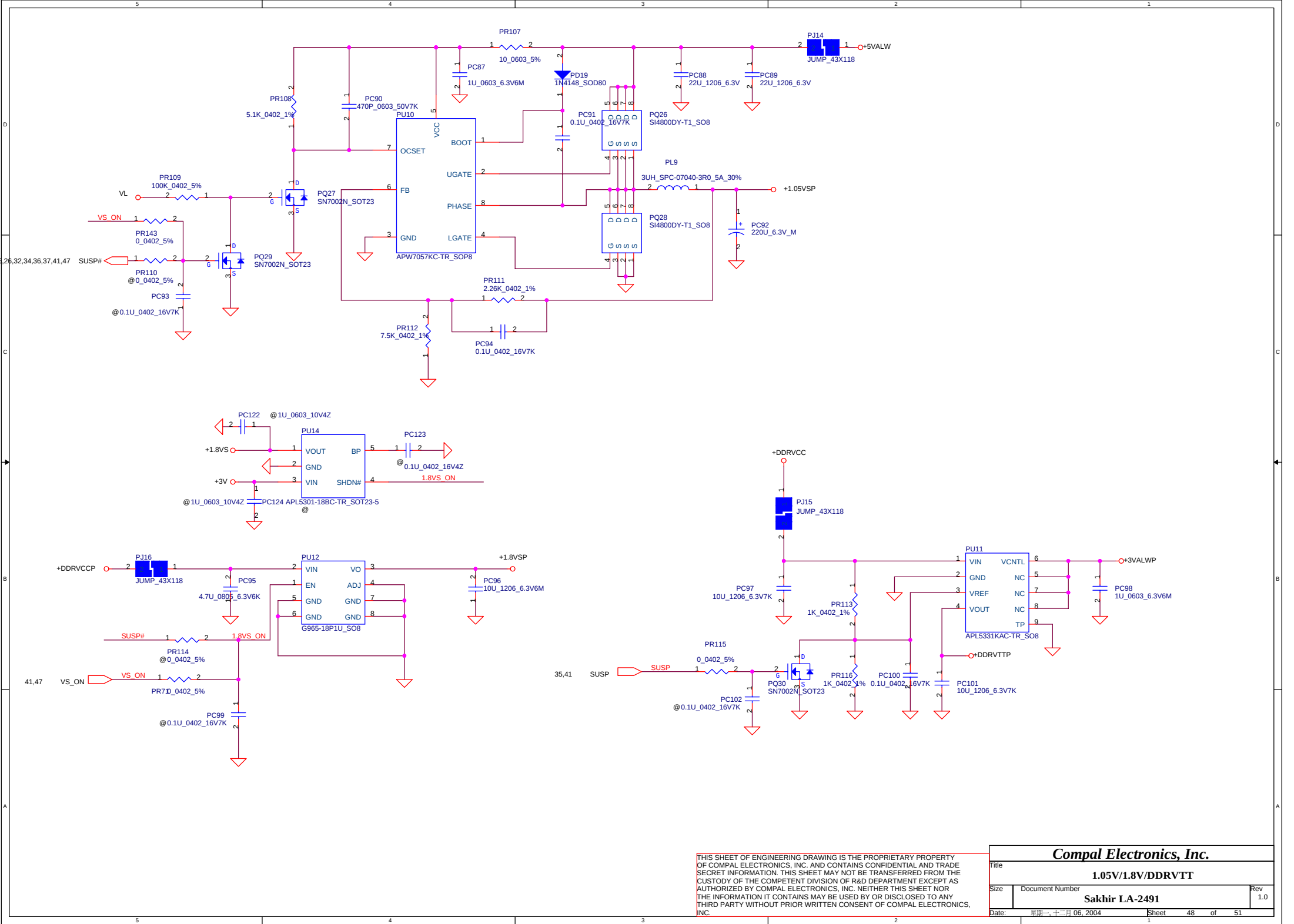
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Title			
BATTERY CONN / OTP			
Size	Document Number		Rev
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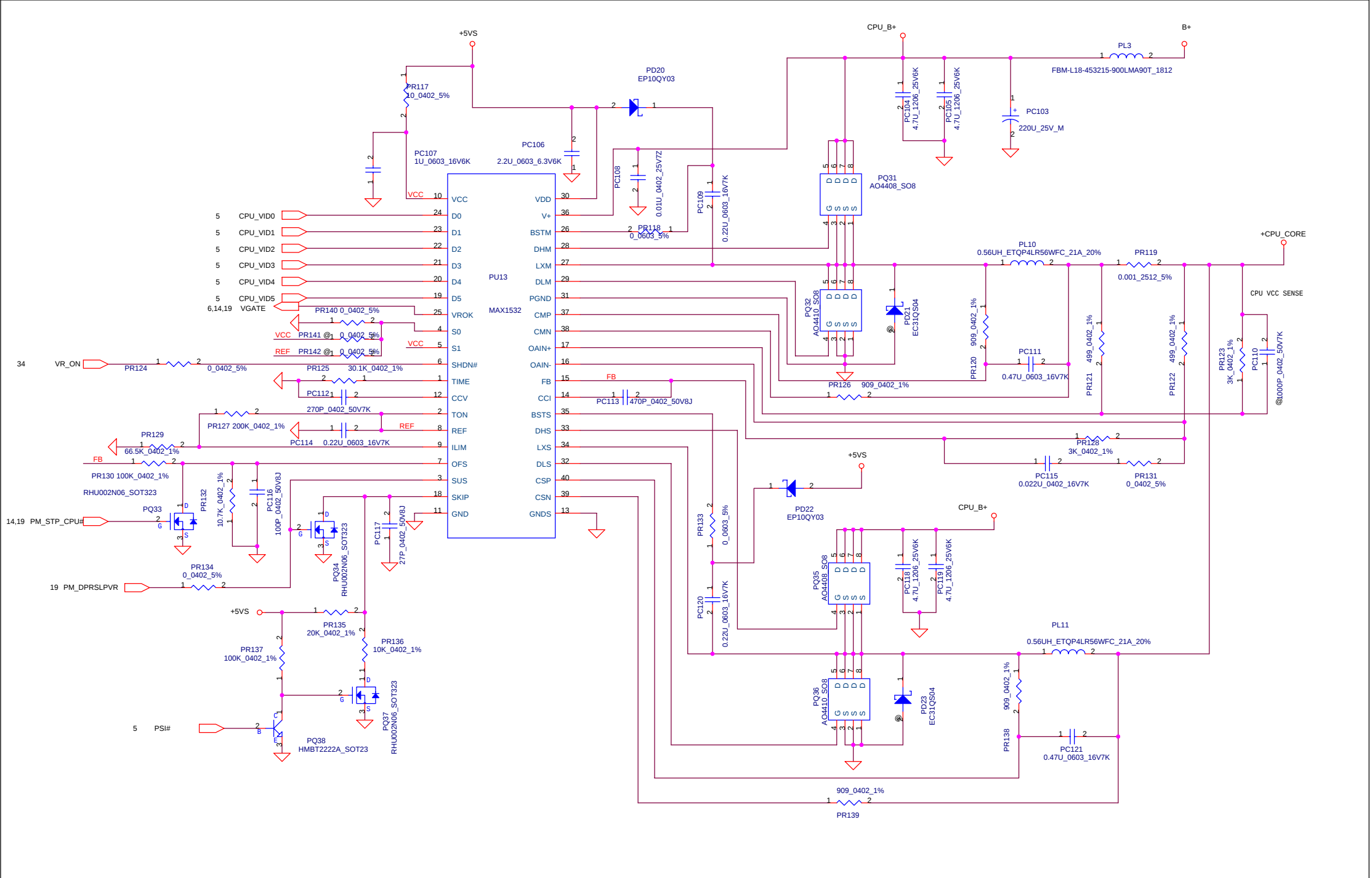
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Title		
5V/3.3V/12V		
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Title		
1.05V/1.8V/DDRVTT		
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CPU_CORE			
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Intel Recommend

Intel Recommend

Power Team testing OK

Intel Recommend

RGB without Docking
EMI
EMI

LCDVDD Soft-Start

Intel Recommend
Intel Recommend
Intel Recommend

Intel Recommend

SWDJ testing

TI Recommend

TI Recommend

Marvwl Recommend

Design Change

Design Change

EMI

Design Change

Design Change
EMI
Design Change

SWDJ testing

Design Change

Design Change

6.27 RTCVREF EMI

Design Change

Design Change

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Title			
PIR			
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Title			
Changed-List History-1			
Size	Document Number		Rev
	LA-2251		1.0
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