

# Compal Confidential

## JAL90 M/B Schematics Document

Intel Penryn Processor with Cantiga + DDRII + ICH9M

2008-07-04

REV:1.0

|   |            |                    |            |                          |                    |
|---|------------|--------------------|------------|--------------------------|--------------------|
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|   |            |                    |            | Document Number          | 401551             |
| Date: Monday, July 21, 2008   |            |                    |            | Sheet                    | 1 of 50            |

**Model Name : JAL90**  
**File Name : LA-4201P**



|   |            |                    |            |                          |                       |
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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 |
| +0.9VS      | 0.9V switched power rail for DDR terminator | ON  | OFF | OFF |
| +1.05VS     | 1.05V switched power rail                   | ON  | OFF | OFF |
| +1.25VS     | 1.25V switched power rail                   | ON  | OFF | OFF |
| +1.5V       | 1.5V power rail for HDA                     | ON  | ON  | OFF |
| +1.5VS      | 1.5V switched power rail                    | ON  | OFF | OFF |
| +1.8V       | 1.8V power rail for DDR                     | ON  | ON  | OFF |
| +1.8VS      | 1.8V switched power rail                    | ON  | OFF | 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 for SB                      | ON  | ON  | X   |
| +3V_LAN     | 3.3V power rail for LAN                     | ON  | ON  | X   |
| +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 |
| +VSB        | VSB 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 |
|--------|--------|-----------|------------|
|--------|--------|-----------|------------|

EC SM Bus1 address

| Device           | Address     | Device      | Address     |
|------------------|-------------|-------------|-------------|
| Smart Battery    | 0001 011X b | ADI ADT7421 | 1001 100X b |
| EEPROM(24C16/02) | 1010 000X b |             |             |
| GMT G781-1       | 1001 101X b |             |             |

EC SM Bus2 address

ICH9M SM Bus address

| Device                                       | Address    |
|--|------------|
| Clock Generator<br>(ICS9LPRS367, SLG8SP556V) | 1101 001Xb |
| DDR DIMM0                                    | 1001 000Xb |
| DDR DIMM2                                    | 1001 010Xb |

| 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         | 0.155 V     |
| 1        | 8.2K +/- 5%  | 0.168 V     | 0.250 V     | 0.362 V     |
| 2        | 18K +/- 5%   | 0.375 V     | 0.503 V     | 0.621 V     |
| 3        | 33K +/- 5%   | 0.634 V     | 0.819 V     | 0.945 V     |
| 4        | 56K +/- 5%   | 0.958 V     | 1.185 V     | 1.359 V     |
| 5        | 100K +/- 5%  | 1.372 V     | 1.650 V     | 1.838 V     |
| 6        | 200K +/- 5%  | 1.851 V     | 2.200 V     | 2.420 V     |
| 7        | NC           | 2.433 V     | 3.300 V     | 3.300 V     |

BOARD ID Table

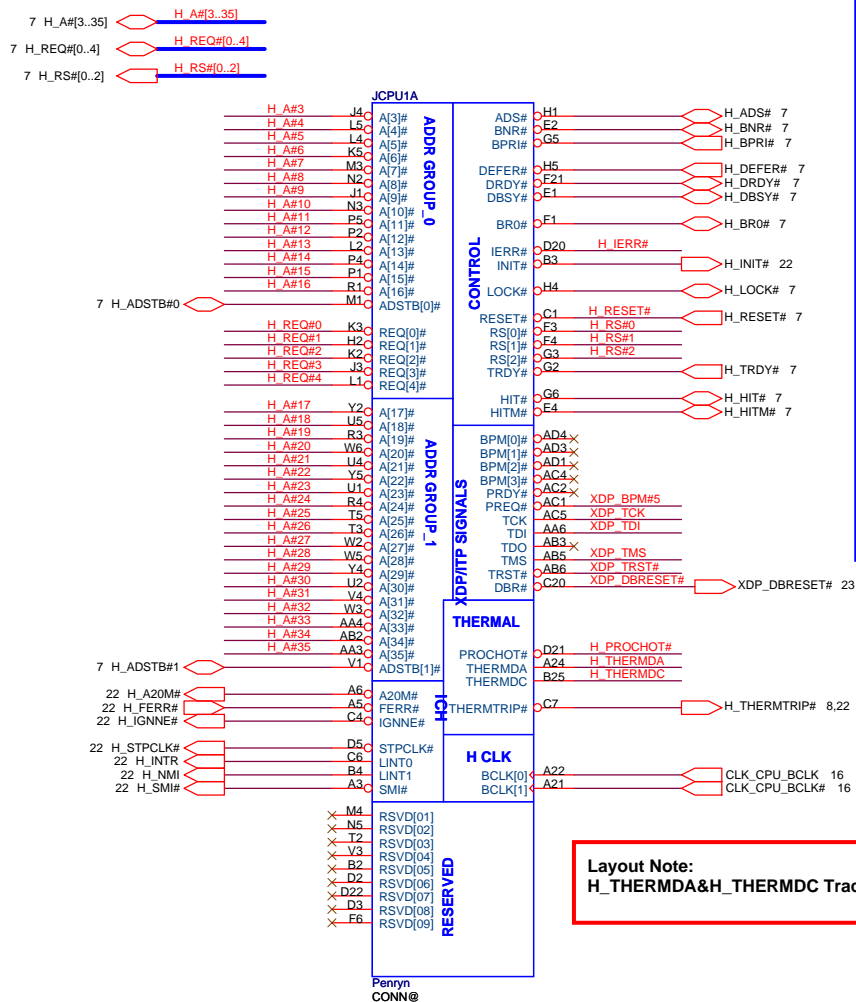
| Board ID | PCB Revision |
|----------|--------------|
| 0        | 0.1          |
| 1        | 0.2          |
| 2        | 0.3          |
| 3        | 1.0          |
| 4        | 1A           |
| 5        |              |
| 6        |              |
| 7        |              |

BTO Option Table

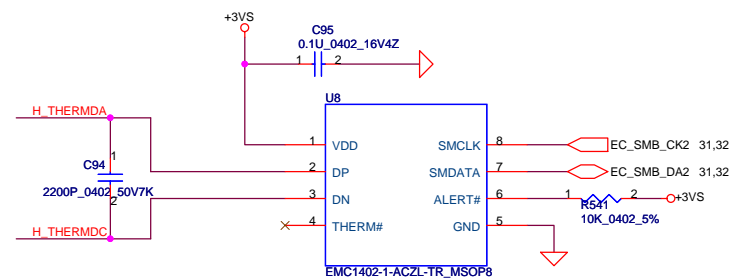
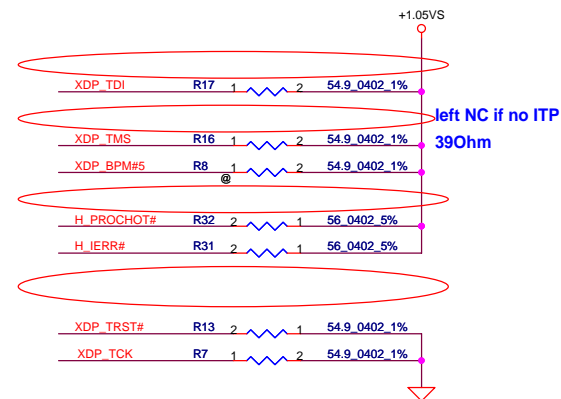
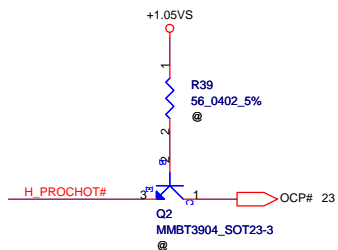
| BTO Item    | BOM Structure |
|-------------|---------------|
| JAL90       | JAL90@        |
| JAW50/KAW00 | JAW50@        |
| UMA         | GM@           |
| JAL90-UMA   | JAL90GM@      |
| JAW50/KAW00 | GLPM@         |
| Discrete    |               |
| Discrete    | PM@           |
| ALC888VC    | 888VC@        |
| ALC888VB    | 888VB@        |
| 8111C       | 8111C@        |
| 8102E       | 8102E@        |
| ALC268      | 268@          |
| JAL90/JAW50 | ABO@          |
| KAW00       | EM@           |
| JAL90/JAW50 |               |
| KAW00       | JAL9050@      |
| JAL90-DIS   | JAL90PM@      |
| JAW50-DIS   | JAW50PM@      |
| JAW50-UMA   | JAW50GL@      |

BOM Configuration Table

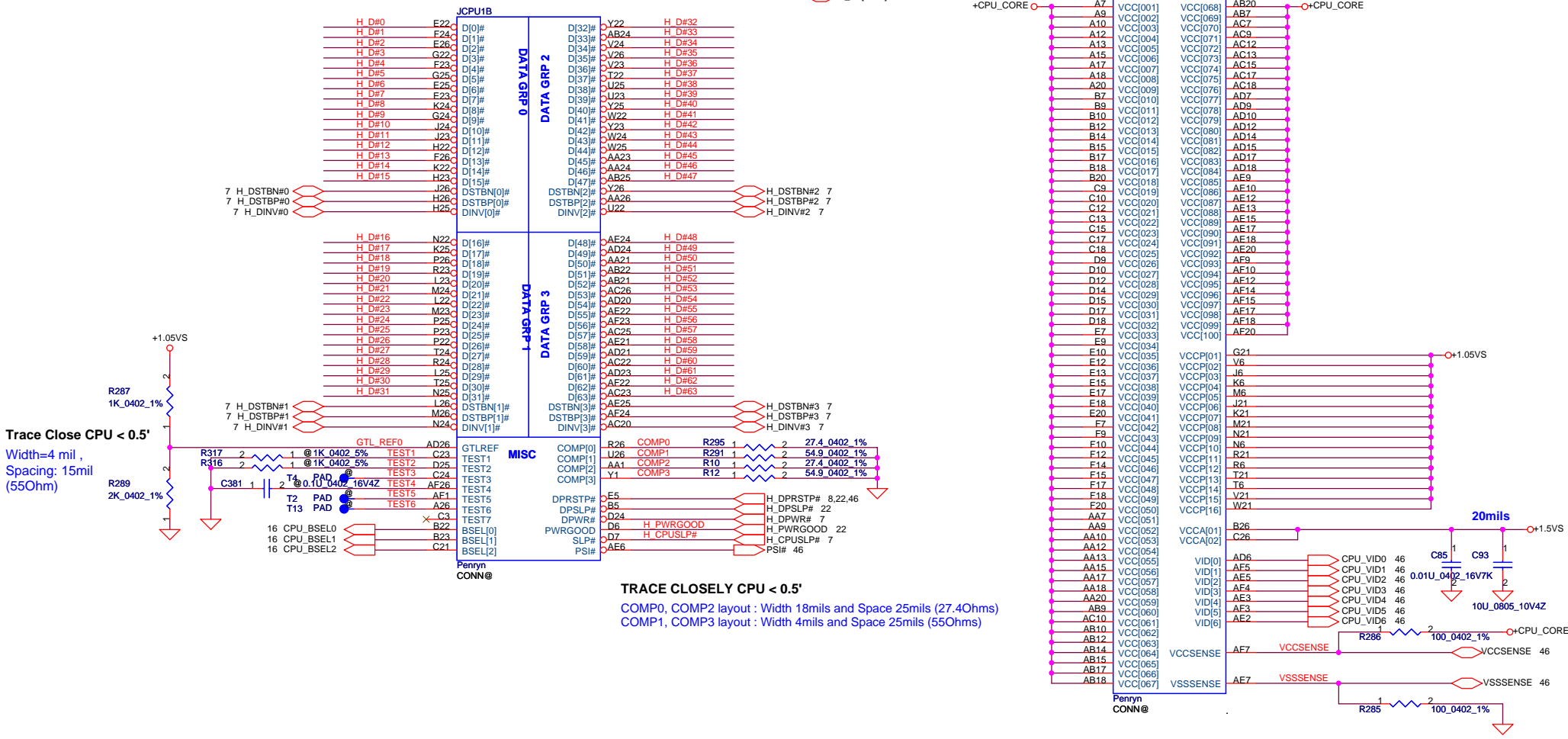
| Project   | BOM Configuration   |
|-----------|---|
| JAL90-UMA | 431551BOL01:JAL90GM@/JAL9050@/JAL90@/GM@/888VC@/8111C@/ABO@       |
| JAL90-DIS | 431551BOL02:PM@/JAL90PM@/JAL9050@/JAL90@/GLPM@/888VC@/8111C@/ABO@ |
| JAW50-UMA | 431551BOL11:JAW50@/JAW50GL@/JAL9050@/GM@/GLPM@/8111C@/268@/ABO@   |
| JAW50-DIS | 431551BOL12:PM@/JAW50@/JAW50PM@/JAL9050@/GLPM@/8111C@/268@/ABO@   |
| KAW00     | 431551BOL31:JAW50@/JAW50GL@/JAL9050@/GM@/GLPM@/8111C@/268@/EM@    |



| BSEL2 | BSEL1 | BSEL0 | BCLK |
|-------|-------|-------|------|
| 0     | 0     | 0     | 266  |
| 0     | 1     | 0     | 200  |
| 0     | 1     | 1     | 166  |



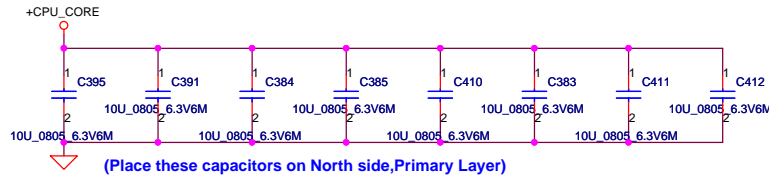
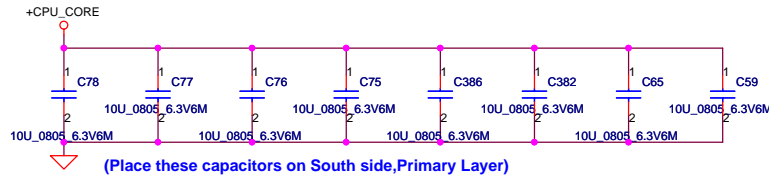
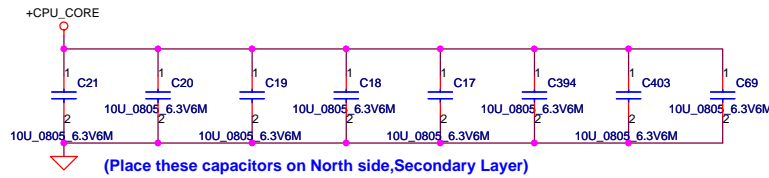
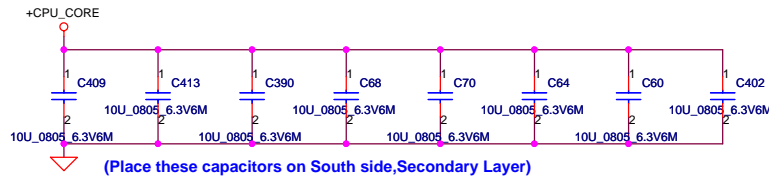
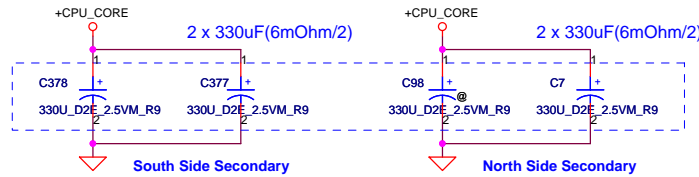
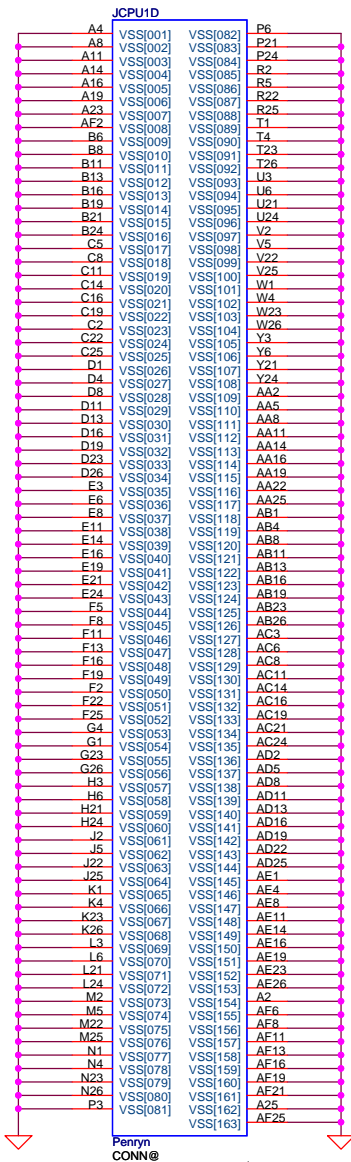
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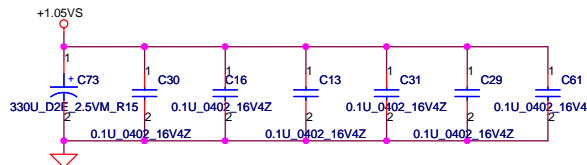
Trace Close CPU < 0.5'  
Width=4 mil,  
Spacing: 15mil  
(55Ohm)

TRACE CLOSELY CPU < 0.5'  
COMP0, COMP2 layout : Width 18mils and Space 25mils (27.4Ohms)  
COMP1, COMP3 layout : Width 4mils and Space 25mils (55Ohms)

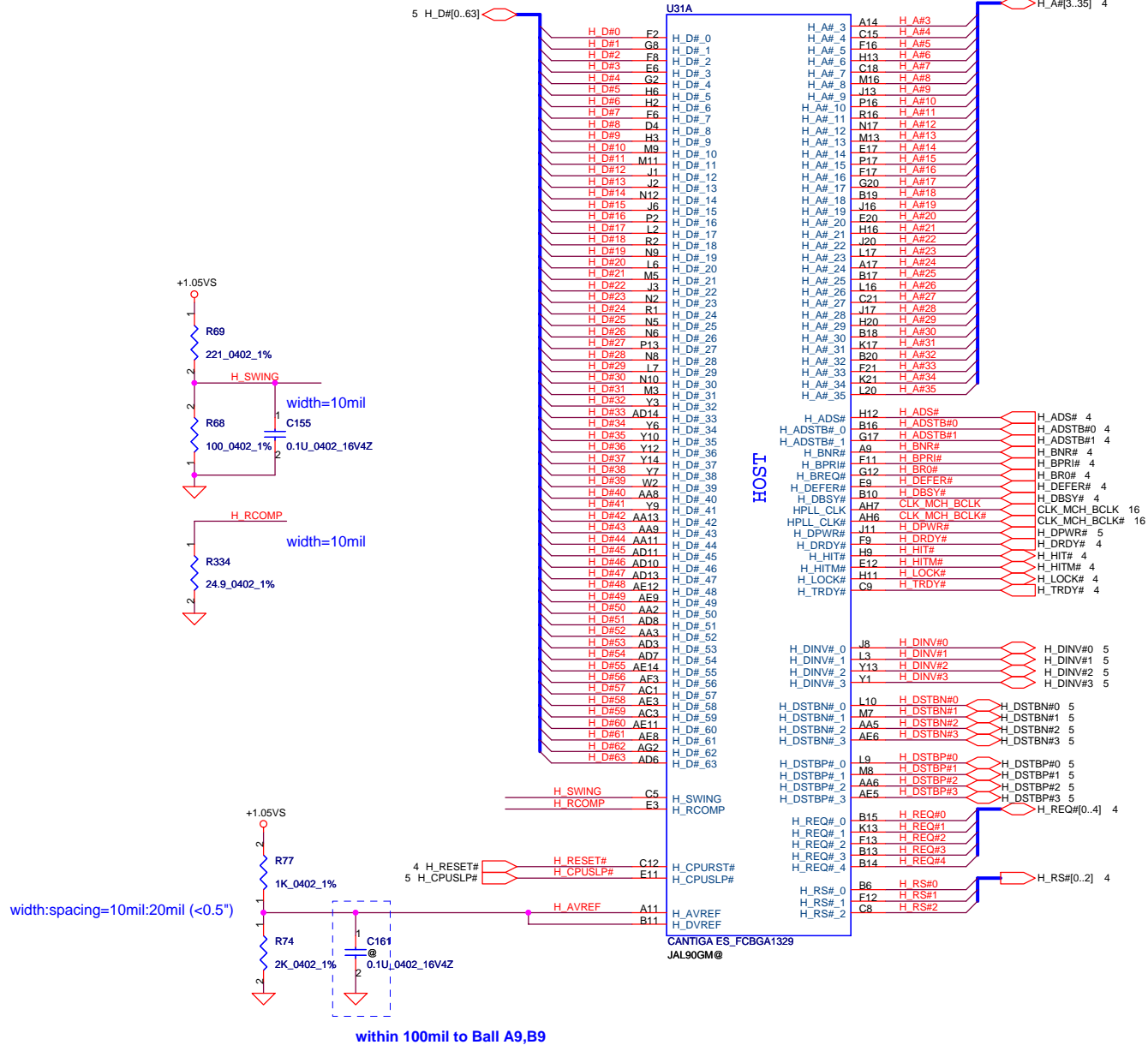
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|   |            |                    |            | Sheet                    | 5 of 50               |



| +CPU-CORE<br>Decoupling | C,uF    | ESR, mohm | ESL,nH   |
|-------------------------|---------|-----------|----------|
| SPCAP, Polymer          | 4X330uF | 6m ohm/4  | 1.8nH/6  |
| MLCC 0805 X5R           | 32X22uF | 3m ohm/32 | 0.6nH/32 |
|                         | 32X10uF | 3m ohm/32 | 0.6nH/32 |

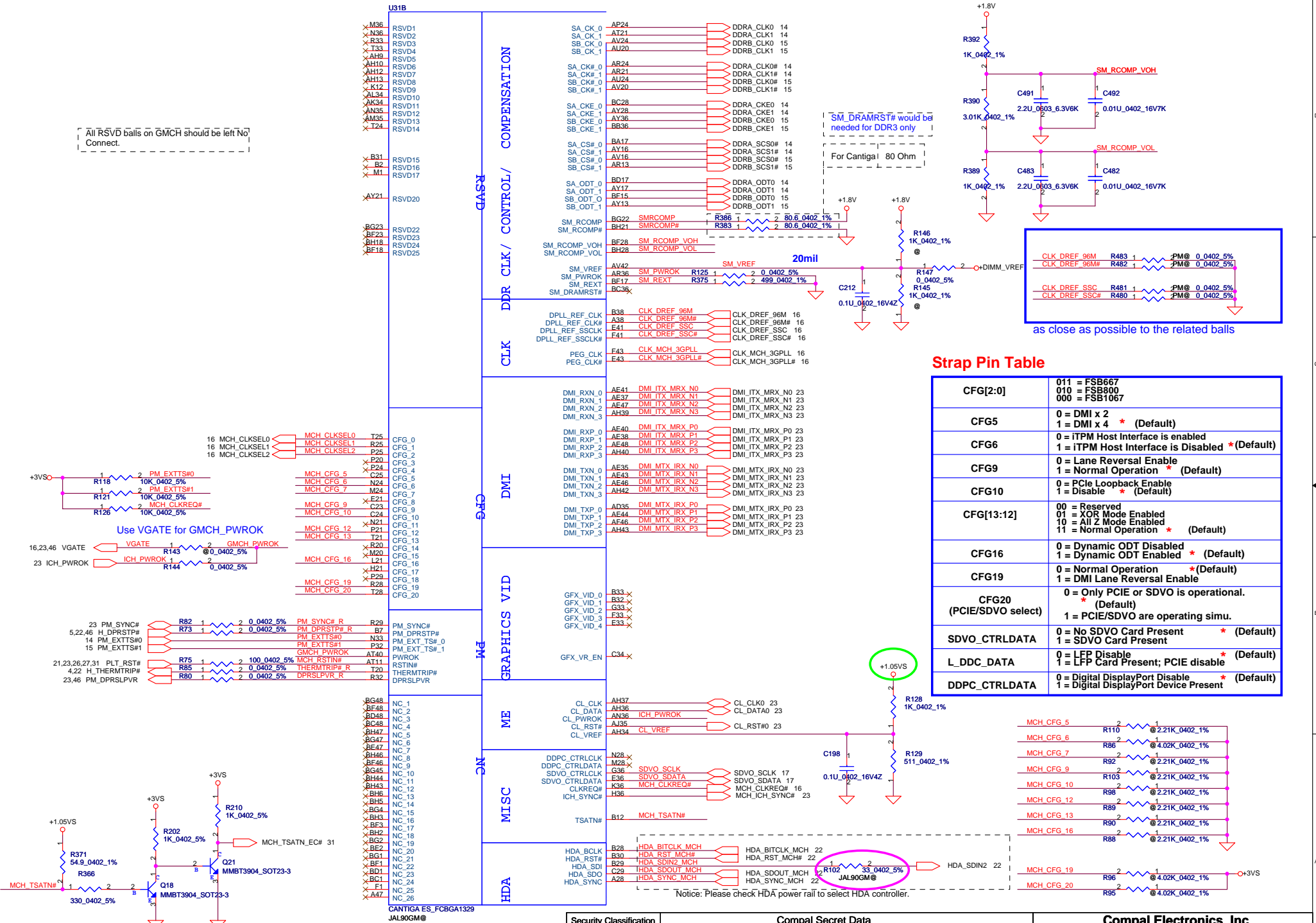


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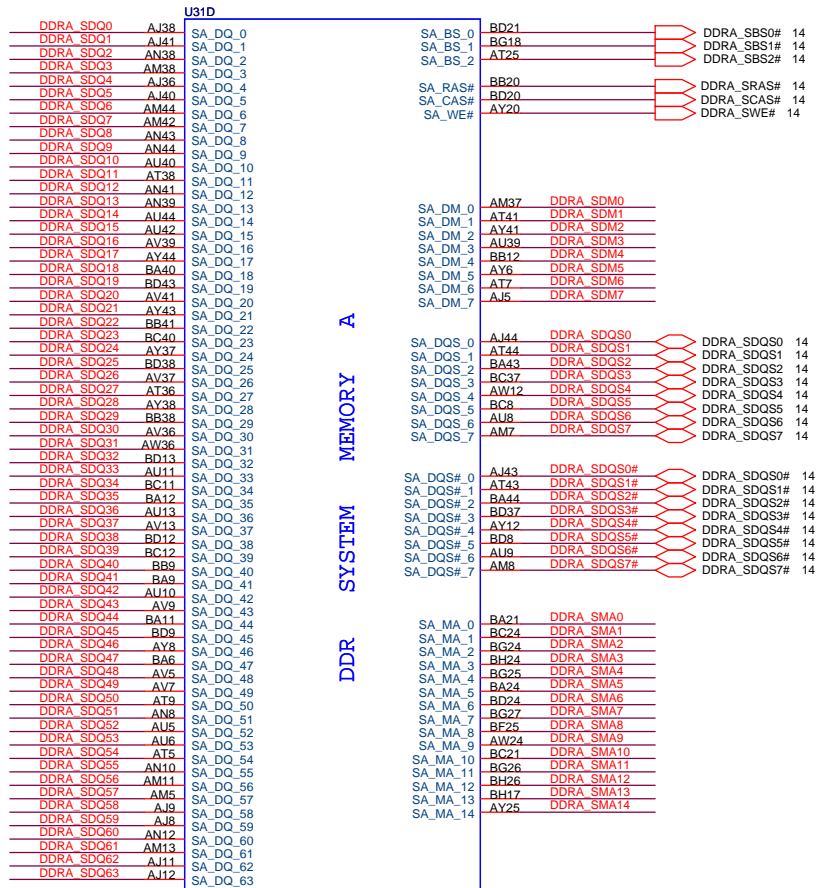
All RSVD balls on GMCH should be left No Connect.



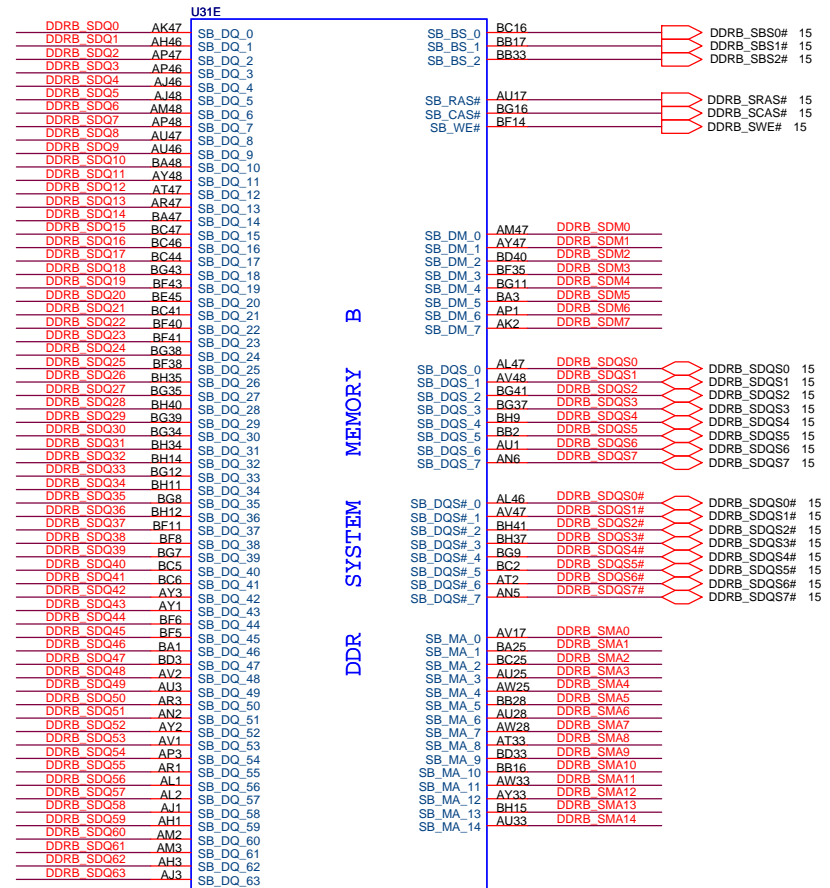
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14 DDRA\_SDQ[0..63] DDRA\_SDQ[0..63]  
14 DDRA\_SDM[0..7] DDRA\_SDM[0..7]  
14 DDRA\_SMA[0..14] DDRA\_SMA[0..14]

15 DDRB\_SDQ[0..63] DDRB\_SDQ[0..63]  
15 DDRB\_SDM[0..7] DDRB\_SDM[0..7]  
15 DDRB\_SMA[0..14] DDRB\_SMA[0..14]

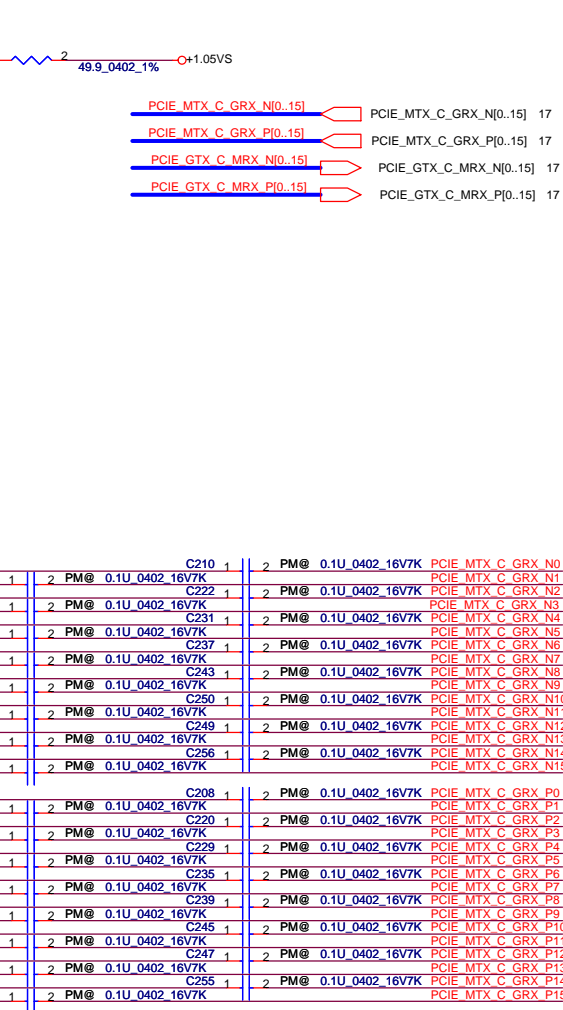
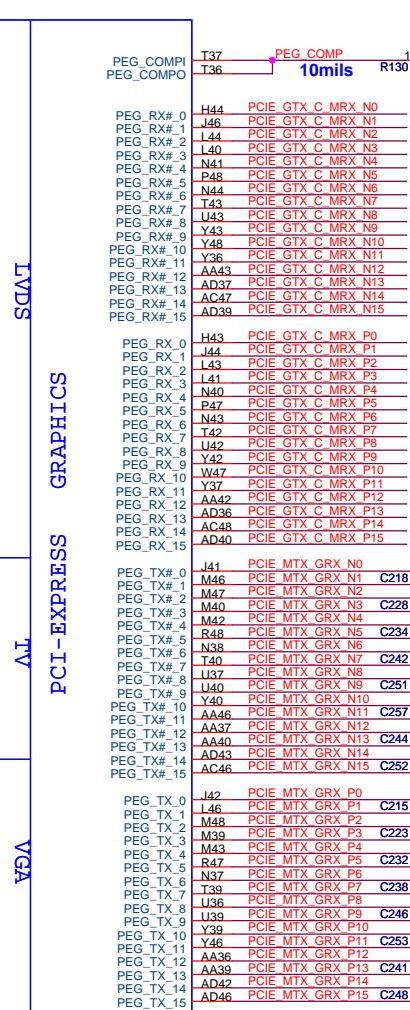
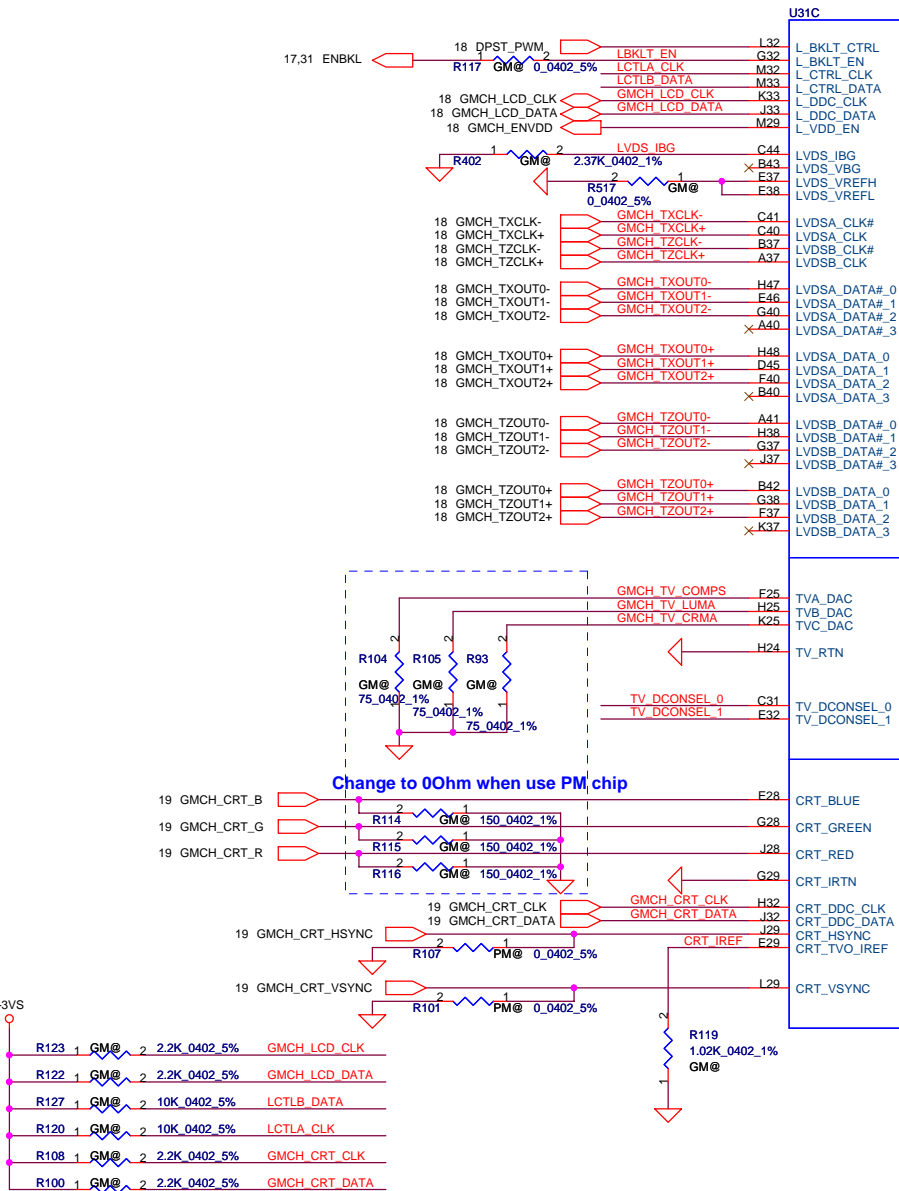


CANTIGA ES\_FCBGA1329  
JAL90GM@

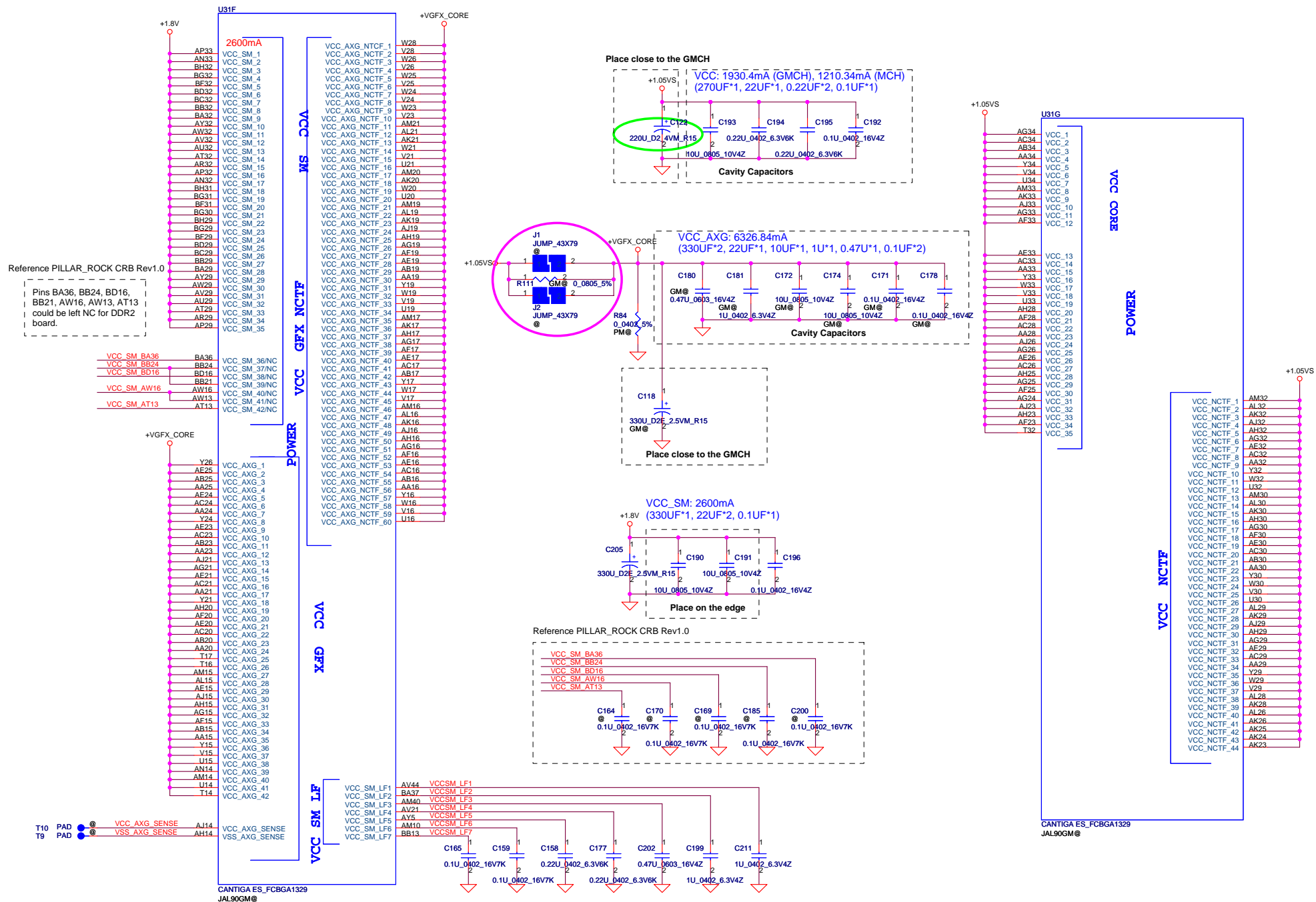


CANTIGA ES\_FCBGA1329  
JAL90GM@

|   |                       |                    |            |                          |                    |
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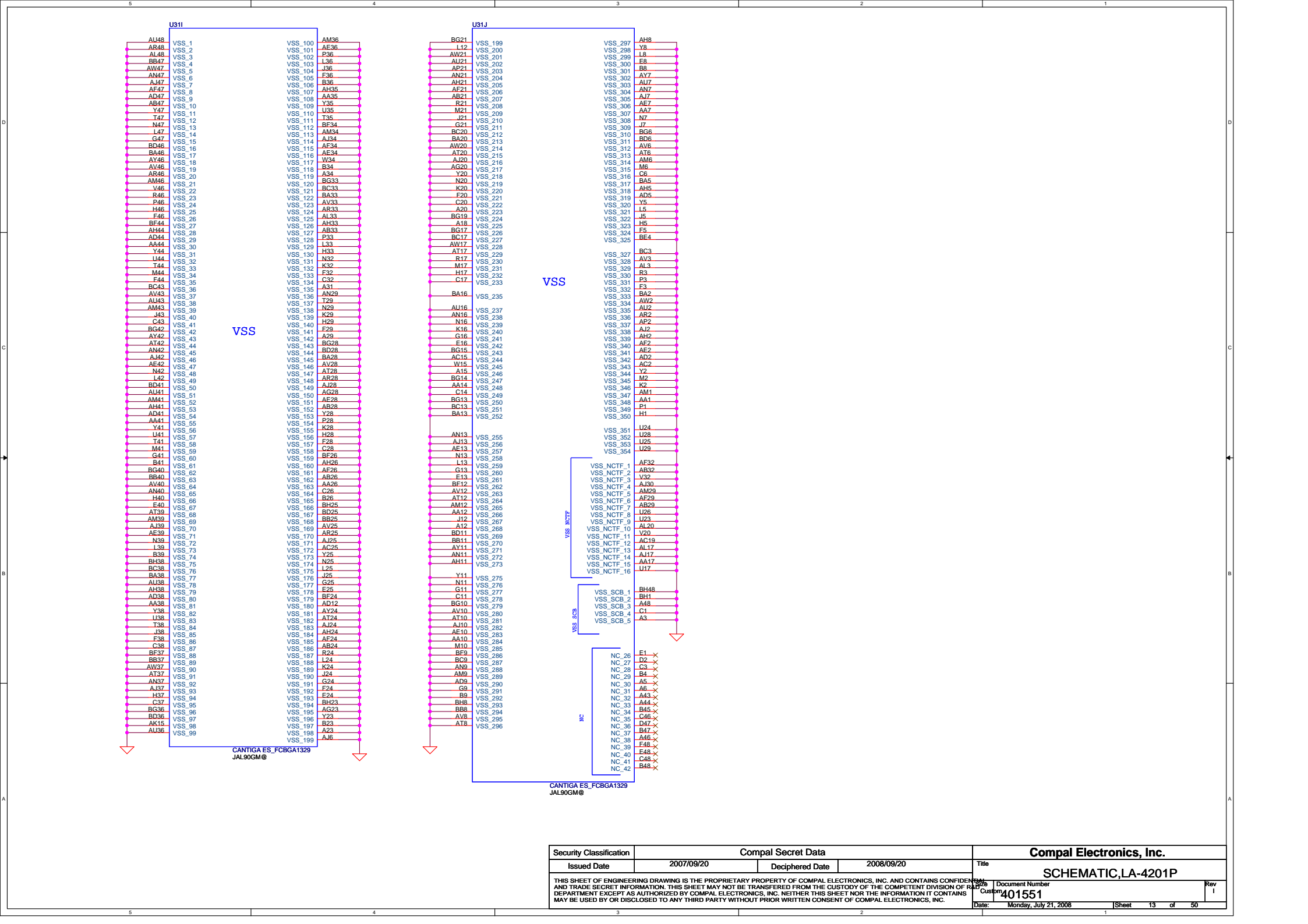


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|   |  |                    |  |                 |  |                          |  |          |  |                       |  |                |  |



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# DIMM1 REV H:9.2mm (BOT)

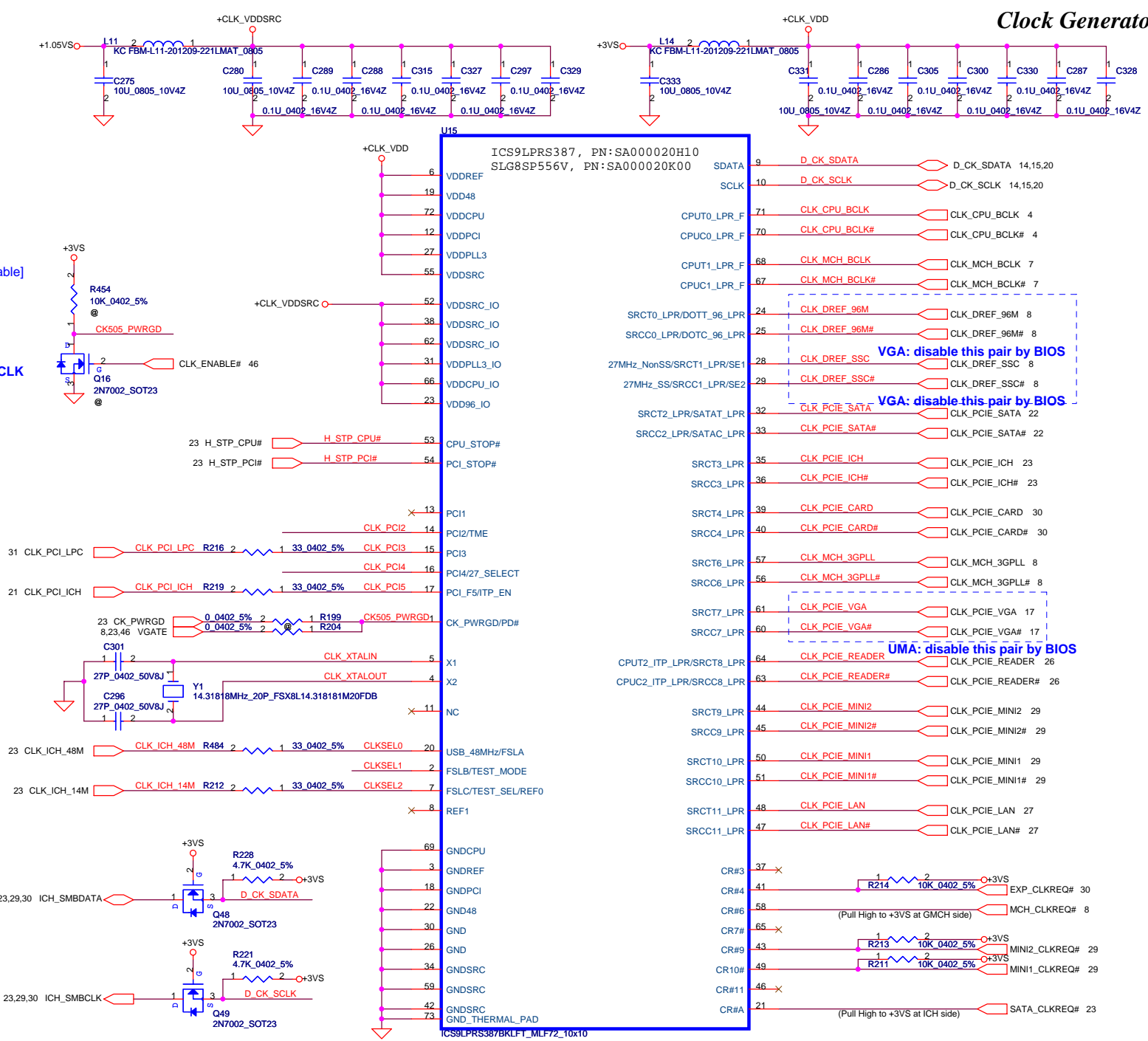
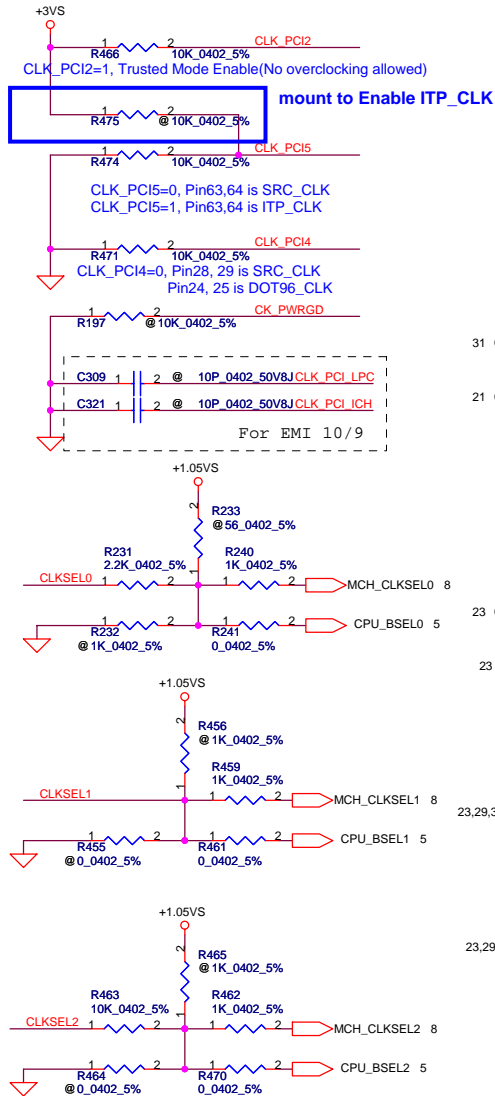
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|   |            |                    |            | Date:                    | Monday, July 21, 2008 |
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| FSLC    | FSLB    | FSLA    | CPU MHz | SRC MHz | PCI MHz |
|---------|---------|---------|---------|---------|---------|
| CLKSEL2 | CLKSEL1 | CLKSEL0 |         |         |         |
| 0       | 0       | 0       | 266     | 100     | 33.3    |
| 0       | 1       | 0       | 200     | 100     | 33.3    |
| 0       | 1       | 1       | 166     | 100     | 33.3    |

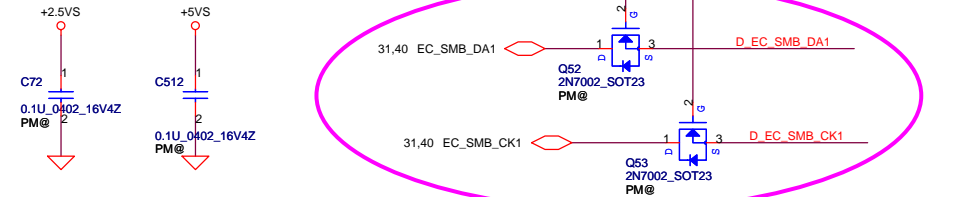
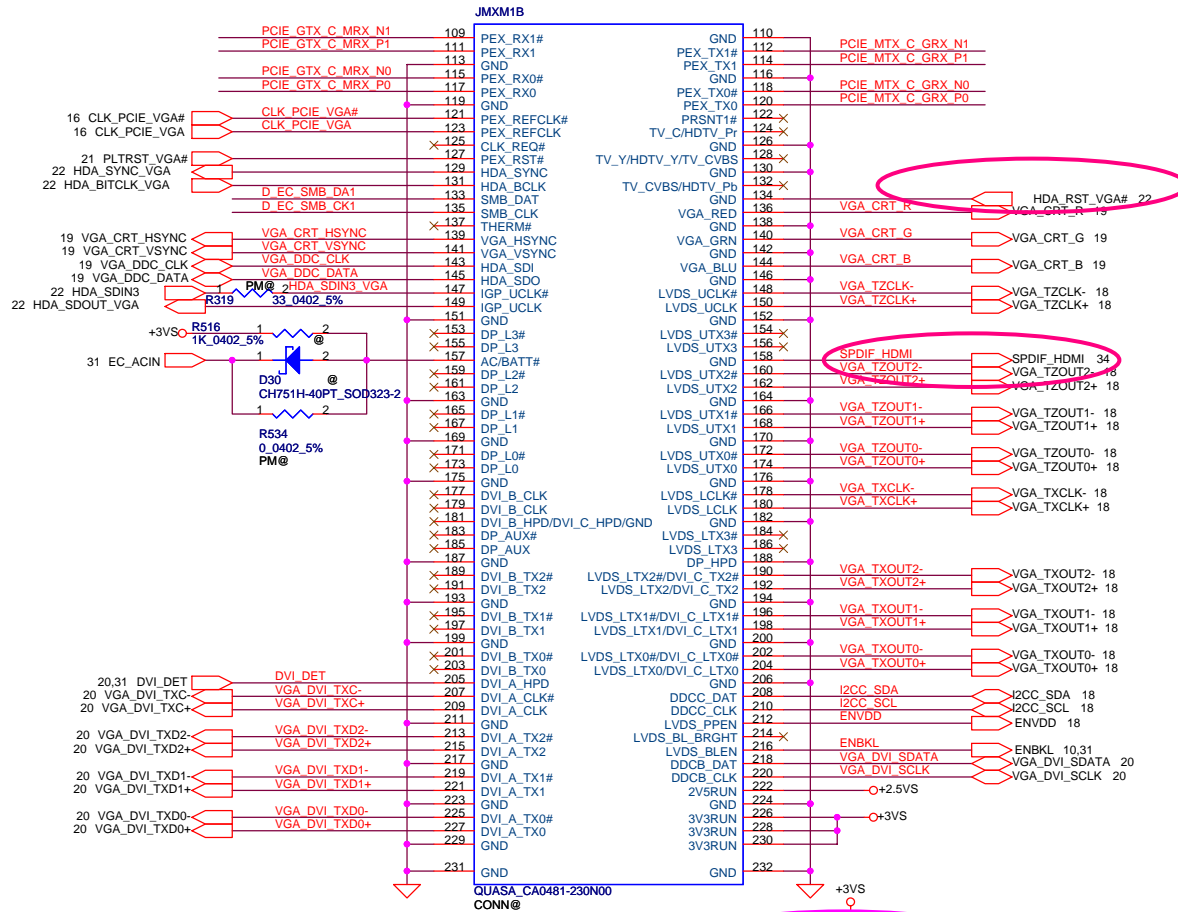
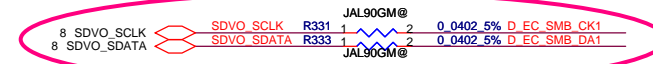
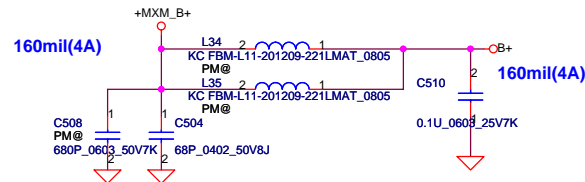
Table : ICS9LPRS387

| CLK_REQ#           | Control | Free-Run |
|--------------------|---------|----------|
| CR#_10(WLAN)       | PCIEX10 | PCIEX0   |
| CR#_6(MCH)         | PCIEX6  | PCIEX1   |
| CR#_4(NEW CARD)    | PCIEX4  |          |
| CR#_9(MINI CARDII) | PCIEX9  |          |

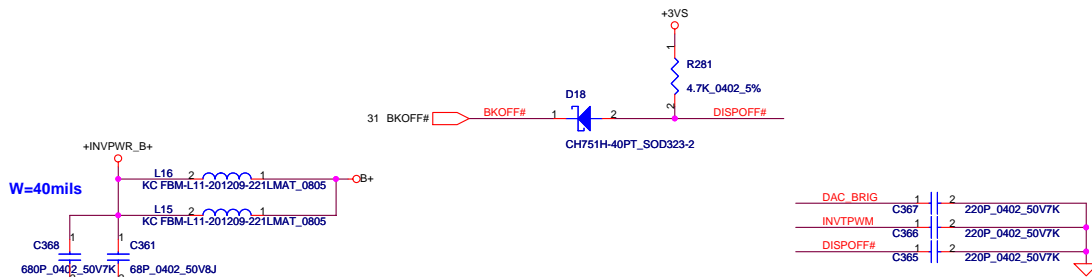
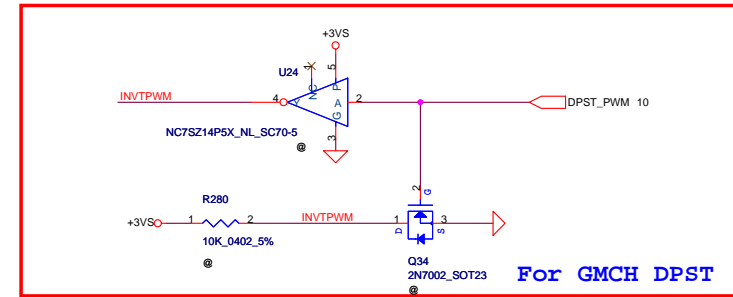
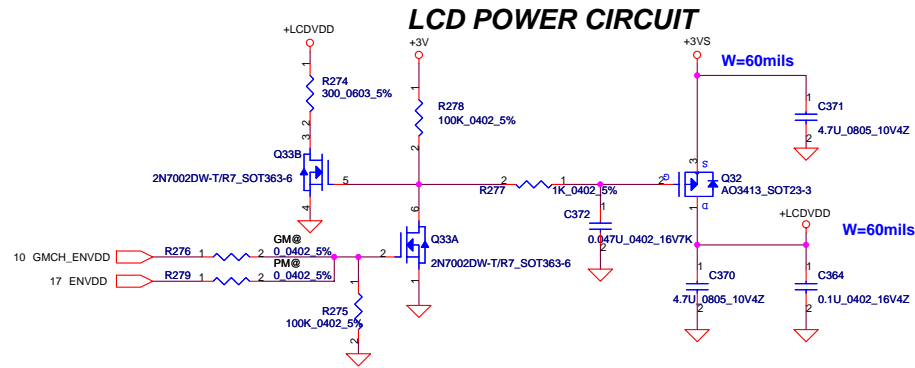
SRC7(VGA\_CLK): Discrete VGA[Enable] UMA[Disable]



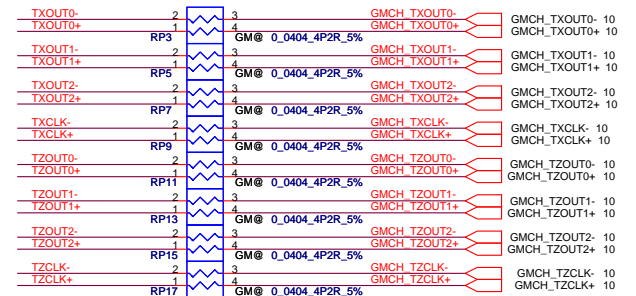
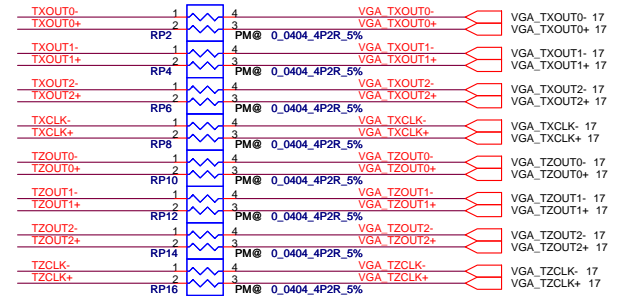
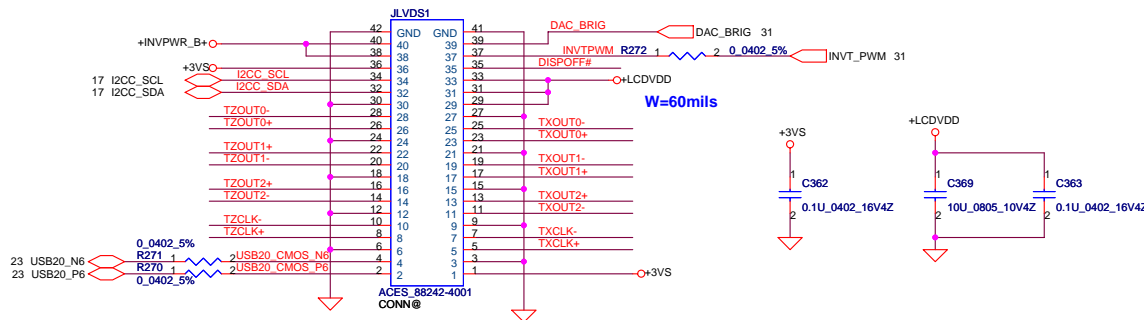
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| Security Classification   |            | Compal Secret Data |            | Compal Electronics, Inc.    |                |
| Issued Date   | 2007/09/20 | Deciphered Date    | 2008/09/20 | Title                       |                |
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|   |            |                    |            | 401551                      |                |
|   |            |                    |            | Date: Monday, July 21, 2008 | Sheet 16 of 50 |



|   |            |                    |            |                               |                           |
|---|------------|--------------------|------------|-------------------------------|---------------------------|
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|   |            |                    |            | Date<br>Monday, July 21, 2008 | Rev<br>1                  |
|   |            |                    |            | Sheet<br>17                   | of<br>50                  |

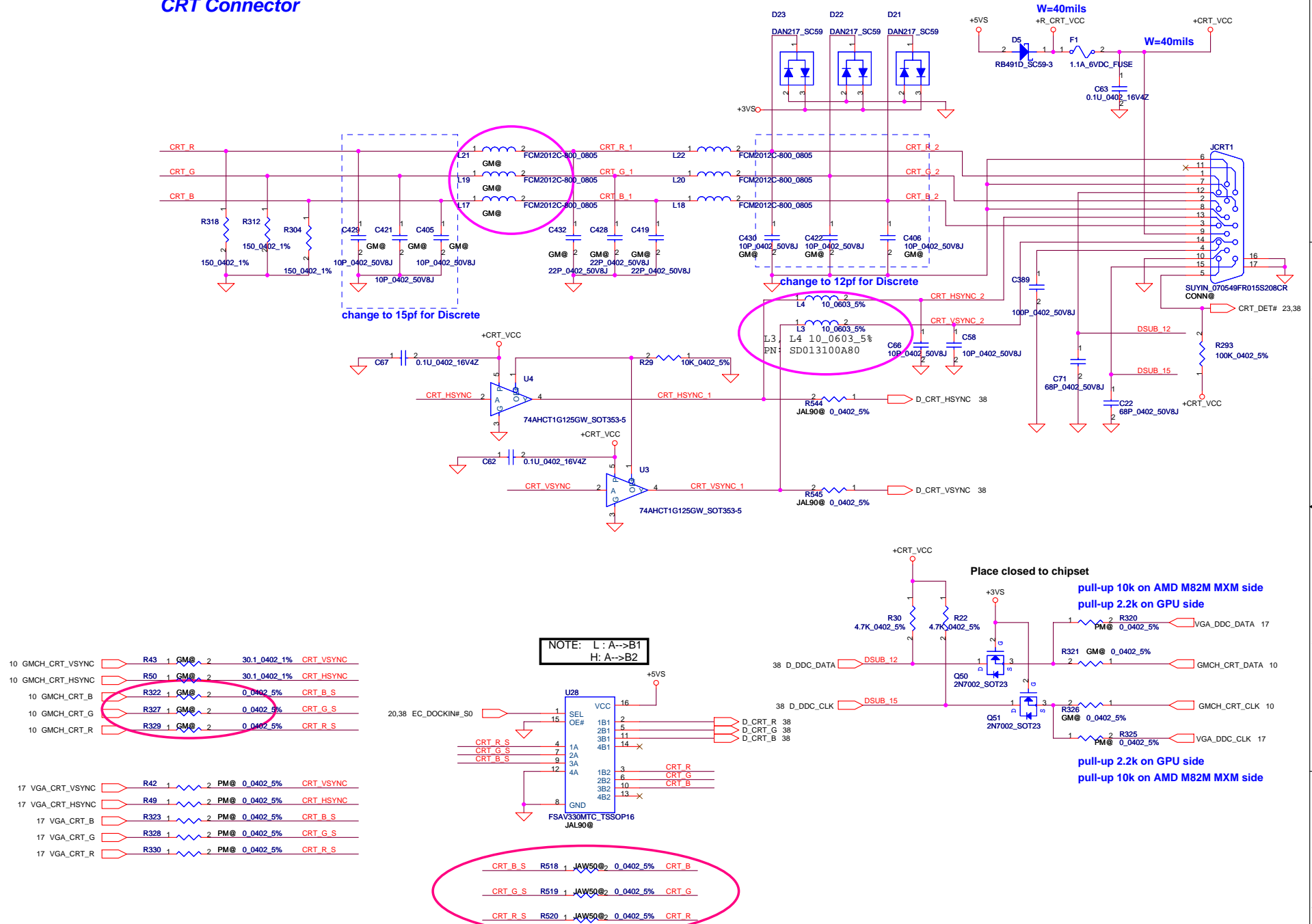


LCD/PANEL BD. Conn.



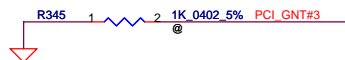
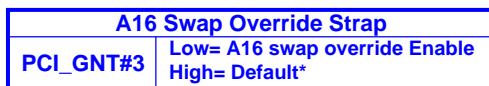
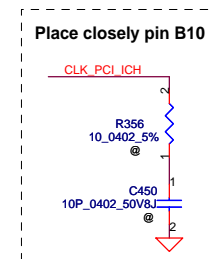
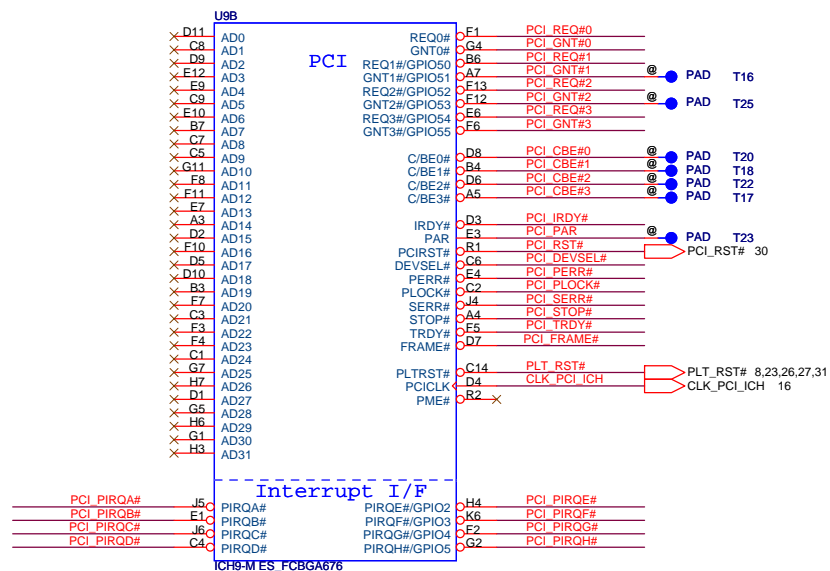
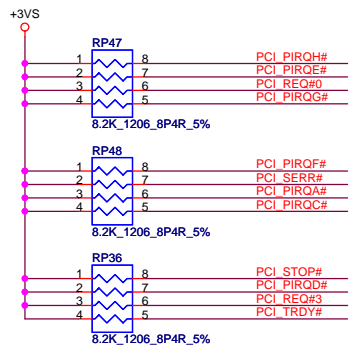
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| Issued Date   | 2007/09/20 | Deciphered Date    | 2008/09/20 | Title                       |                |
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|   |            |                    |            | Document Number             | Rev            |
|   |            |                    |            | 401551                      | I              |
|   |            |                    |            | Date: Monday, July 21, 2008 | Sheet 18 of 50 |

# CRT Connector

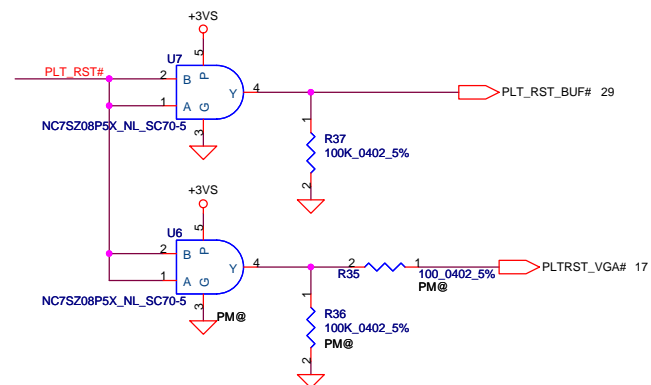
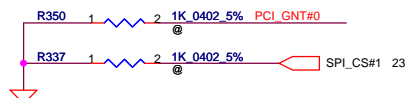


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| Boot BIOS Strap |          |                    |
|-----------------|----------|--------------------|
| PCI_GNT#0       | SPI_CS#1 | Boot BIOS Loaction |
| 0               | 1        | SPI                |
| 1               | 0        | PCI                |
| 1               | 1        | LPC*               |

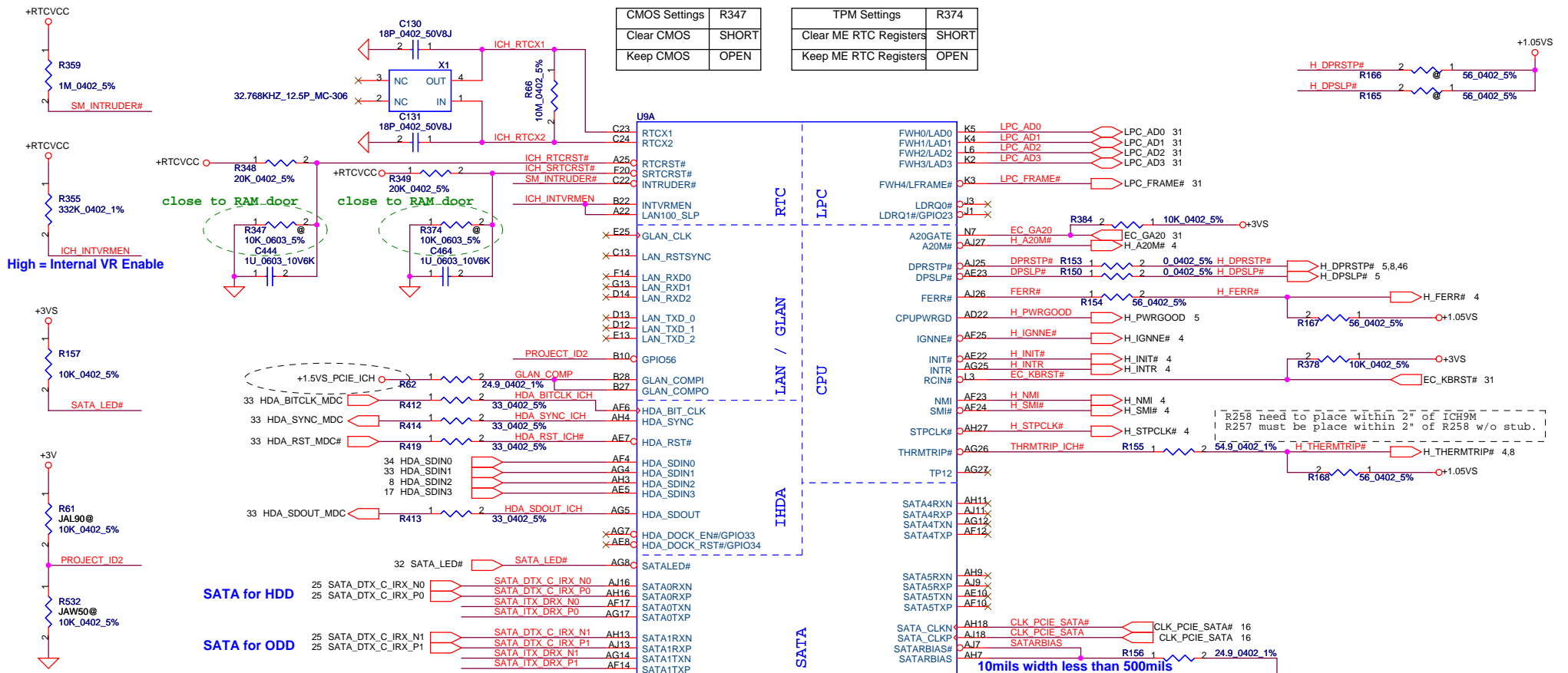


**For VGA/B**

|   |                    |                 |            |                          |                       |                |
|---|--------------------|-----------------|------------|--------------------------|-----------------------|----------------|
| Security Classification   | Compal Secret Data |                 |            | Compal Electronics, Inc. |                       |                |
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| CMOS Settings |  | R347  |
|---------------|--|-------|
| Clear CMOS    |  | SHORT |
| Keep CMOS     |  | OPEN  |

| TPM Settings           |  | R374  |
|------------------------|--|-------|
| Clear ME RTC Registers |  | SHORT |
| Keep ME RTC Registers  |  | OPEN  |



SATA for HDD

SATA for ODD

HDA for AUDIO

HDA for GMCH

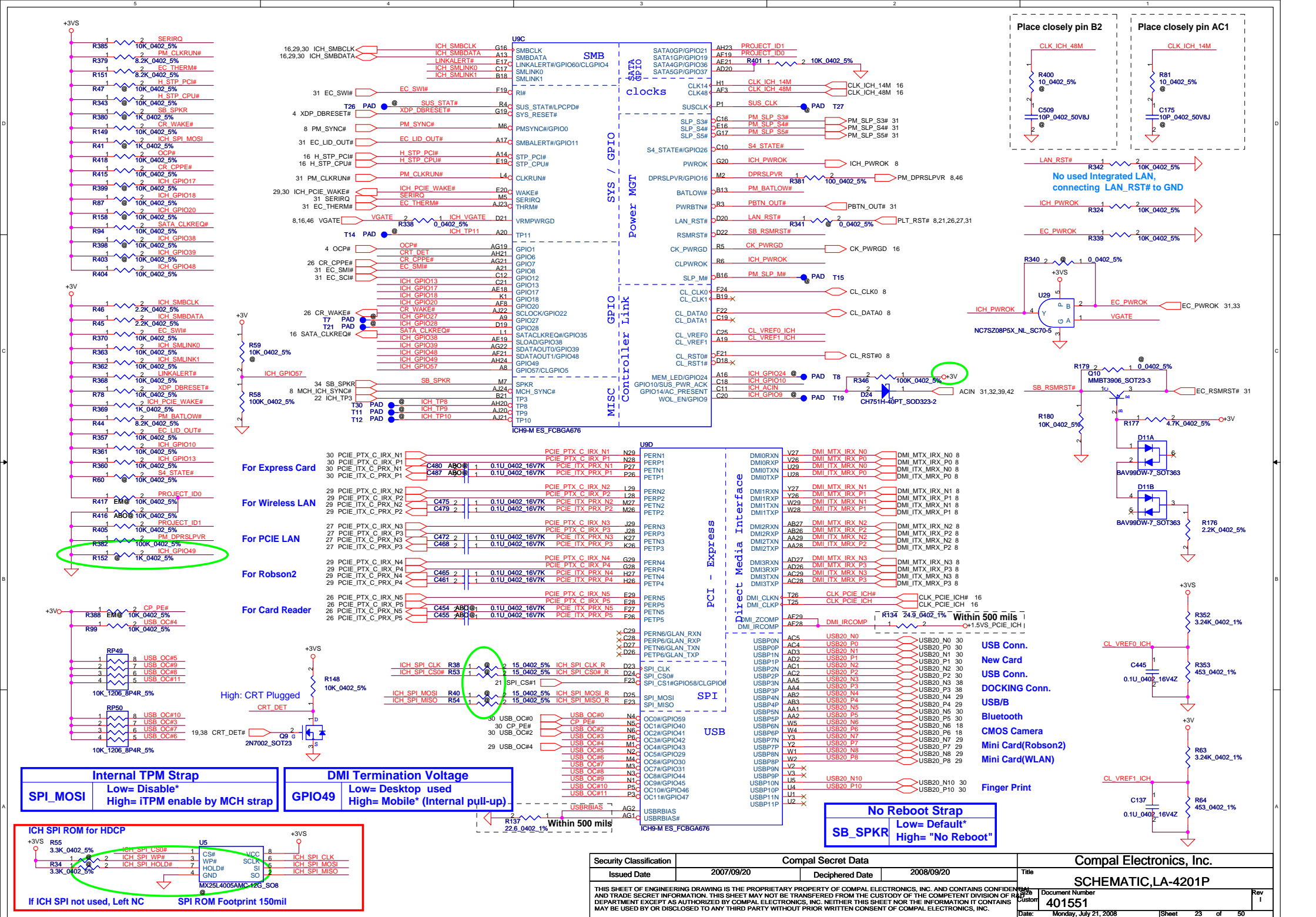
HDA for VGA

#### XOR Chain Entrance Strap

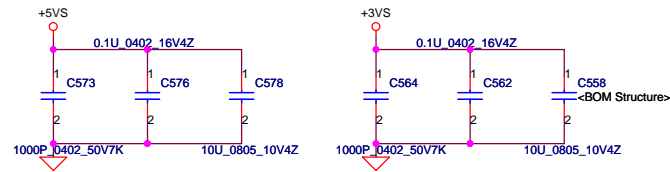
| ICH_TP3 | HDA_SDOUT | Description                |
|---------|-----------|----------------------------|
| 0       | 0         | RSVD                       |
| 0       | 1         | Enter XOR Chain            |
| 1       | 0         | Normal Operation           |
| 1       | 1         | Set PCIe port config bit 1 |

**Flash Descriptor Security Override Strap**  
GPIO33 Low= Descriptor Security override  
High= Default\* (Internal pull-up)

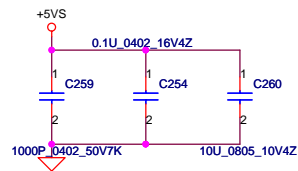
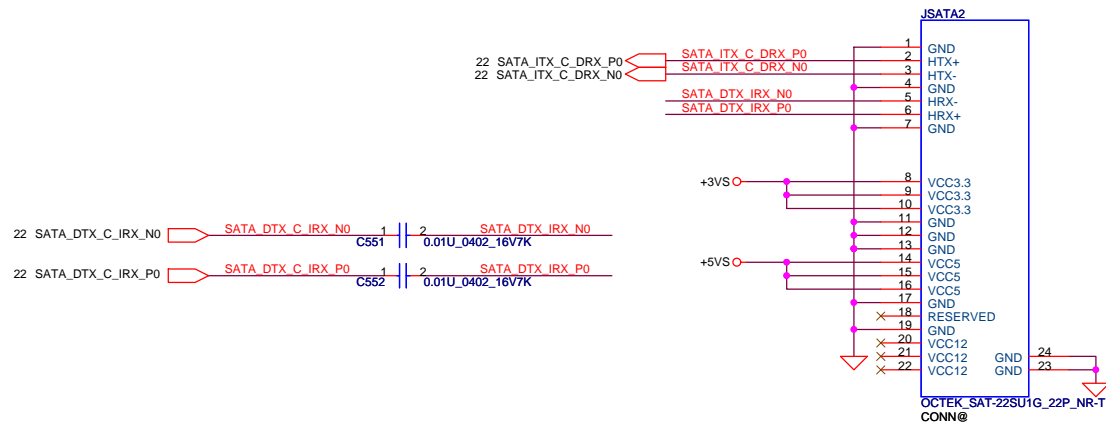
| Security Classification   |            | Compal Secret Data |            | Compal Electronics, Inc. |                       |
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|   |            |                    |            | Sheet                    | 22 of 50              |



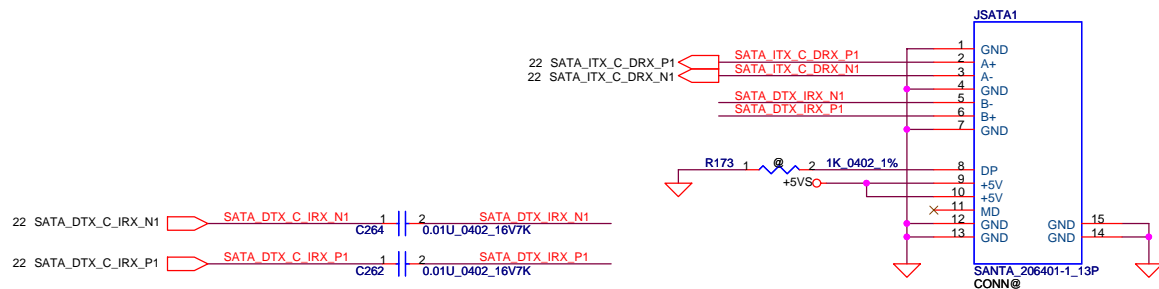




## SATA HDD Conn.



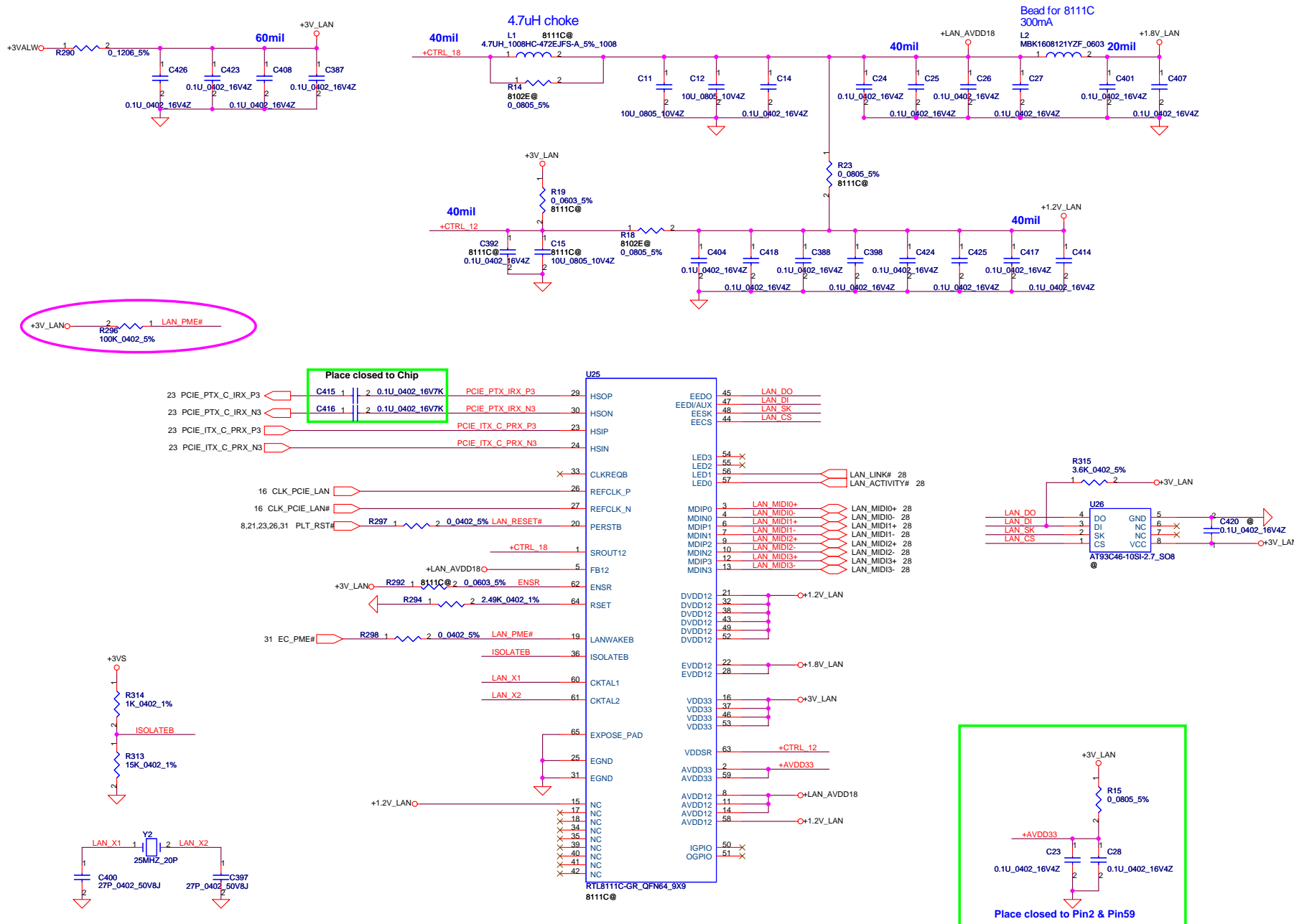
## SATA ODD Conn.



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|   |            |                    |            | Sheet                    | 25 of 50              |

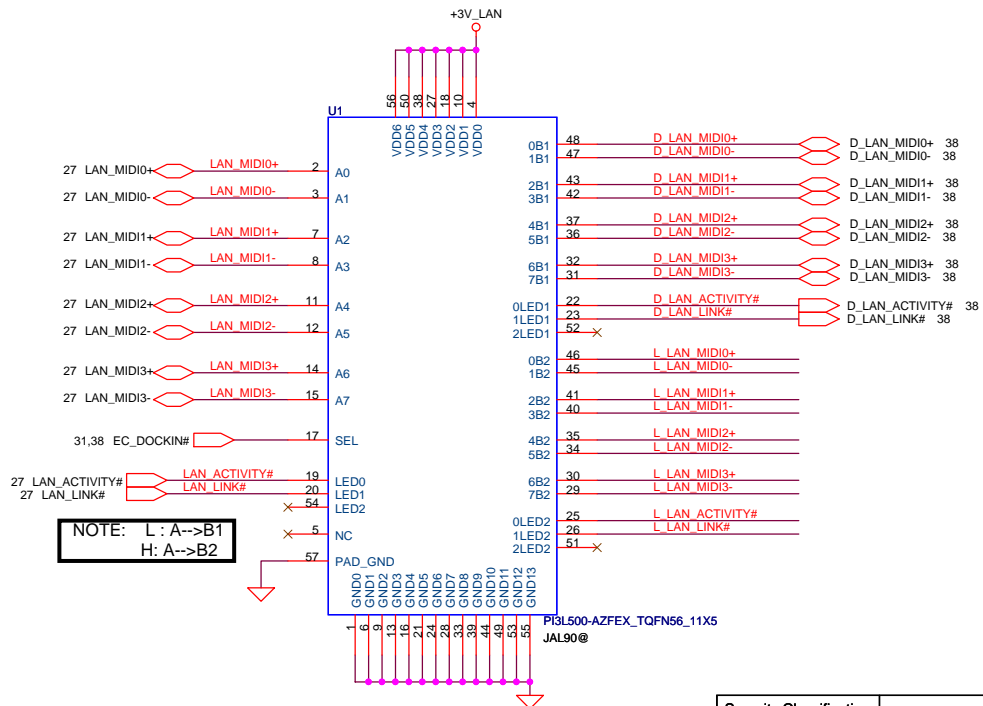
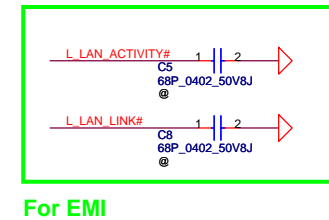
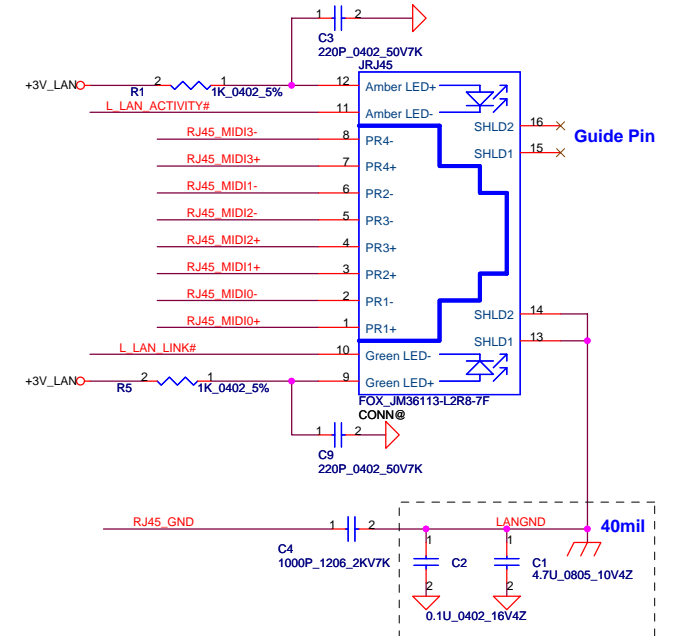
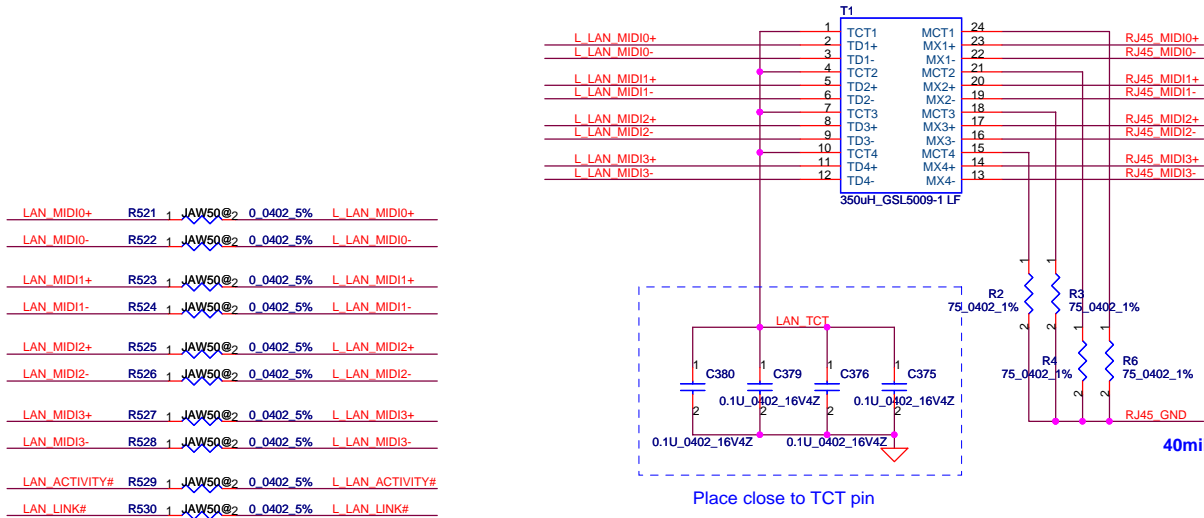


# LAN RTL8111C/8102E



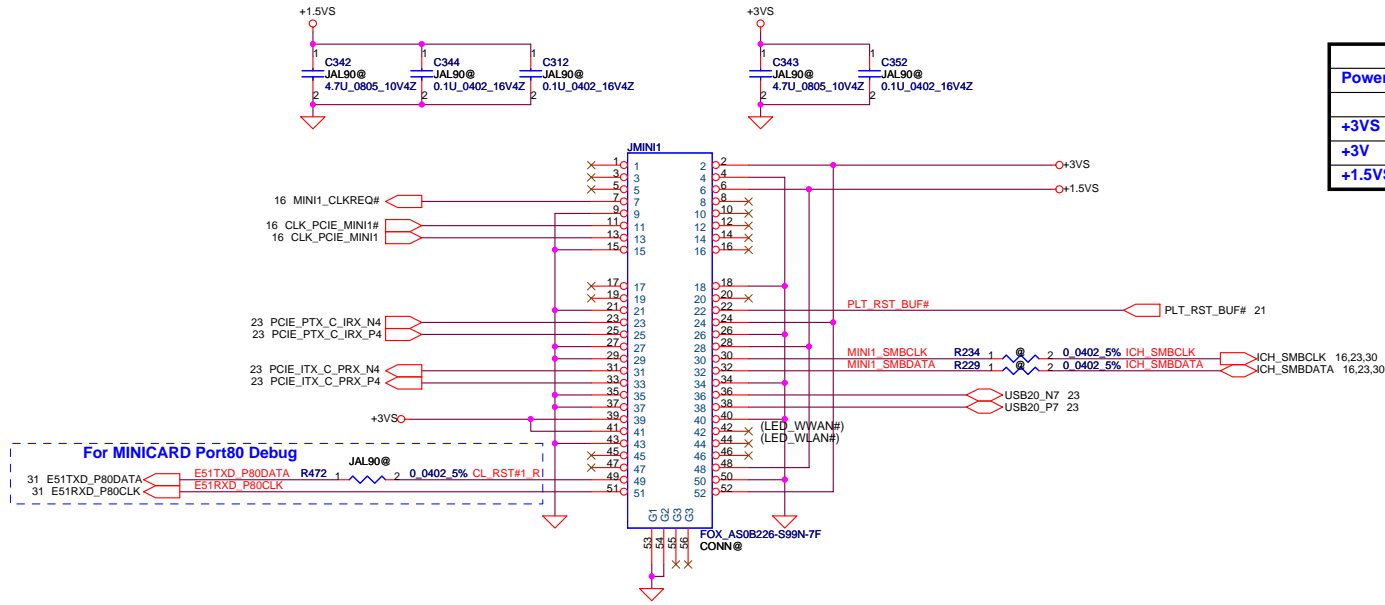
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|   |  |                    |  |                 |  |                          |  | Document Number    |          | Rev I |
|   |  |                    |  |                 |  |                          |  | 401551             |          |       |
| Date: Monday, July 21, 2008   |  |                    |  |                 |  |                          |  | Sheet              | 27 of 50 |       |

## LAN RTL8111C/8102E



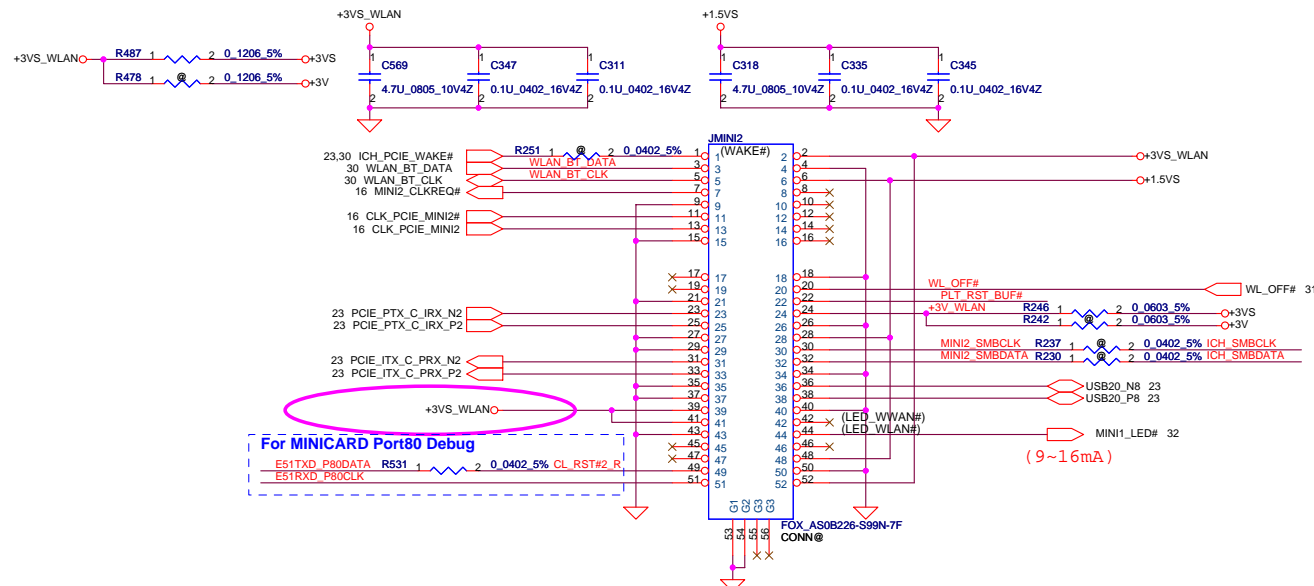
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|   |                    |                 |            | B                        | 401551                | 1              |
|   |                    |                 |            | Date:                    | Monday, July 21, 2008 | Sheet 28 of 50 |

## For Robson2

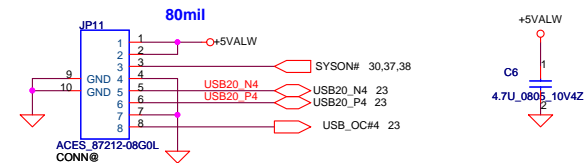


| Power  | Mini Card Power Rating |                      |                     |
|--------|------------------------|----------------------|---------------------|
|        | Primary Power (mA)     | Auxiliary Power (mA) |                     |
|        | Peak                   | Normal               | Normal              |
| +3VS   | 1000                   | 750                  |                     |
| +3V    | 330                    | 250                  | 250 (wake enable)   |
| +1.5VS | 500                    | 375                  | 5 (Not wake enable) |

## For Wireless LAN

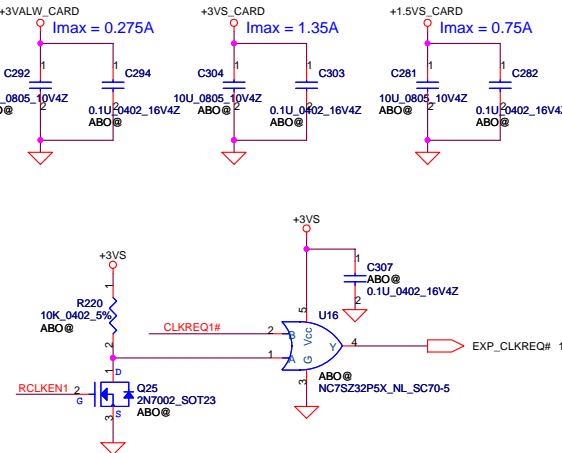
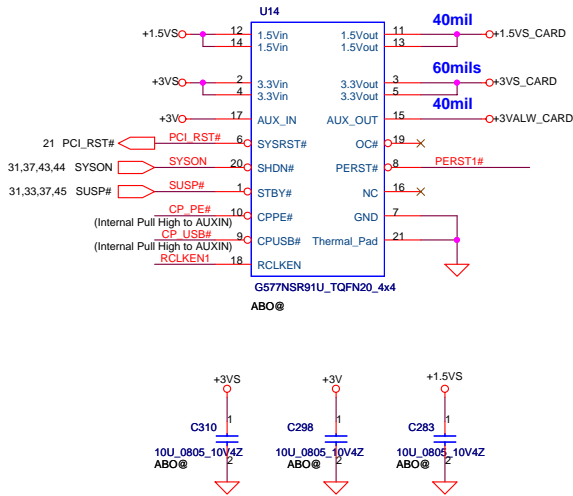


## To USB/B Connector

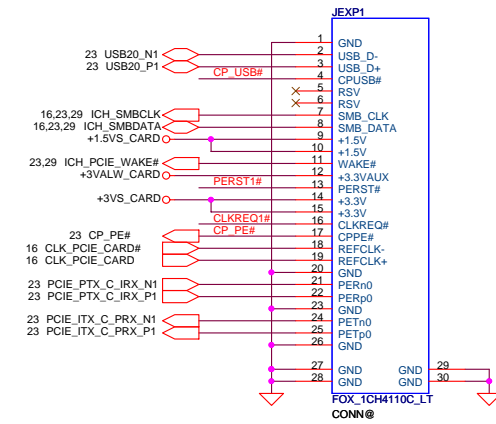


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|   |                    |                 |            | 1                        | 401551                | 1              |
|   |                    |                 |            | Date:                    | Monday, July 21, 2008 | Sheet 29 of 50 |

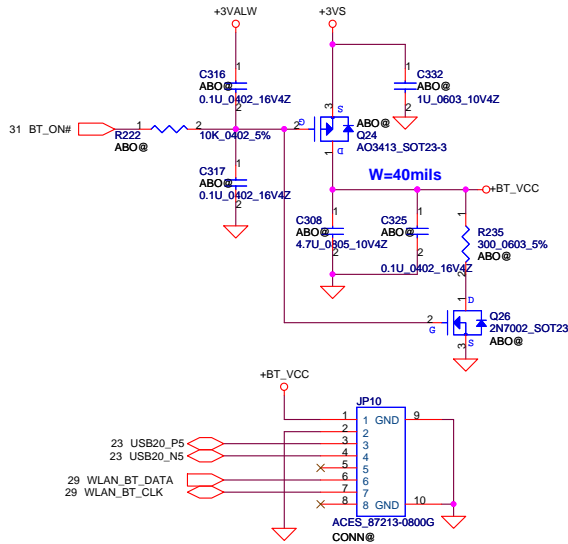
## New Card Power Switch



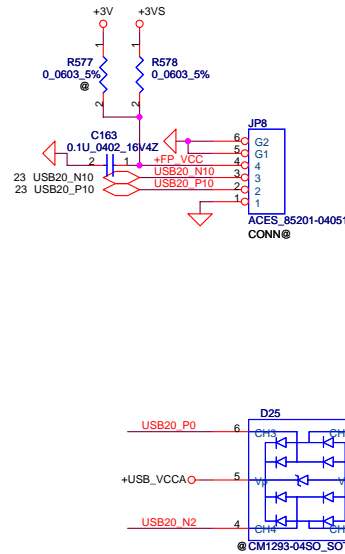
## New Card Socket (Left/TOP)



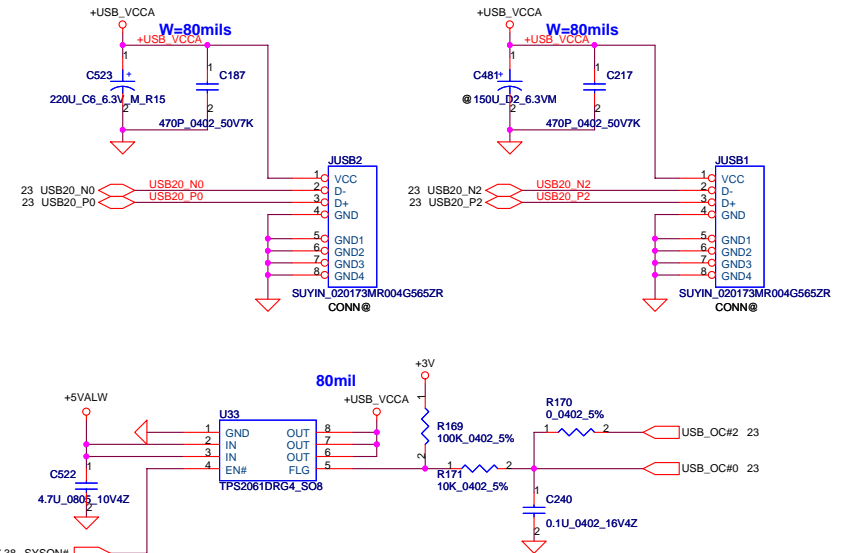
## Bluetooth Conn.



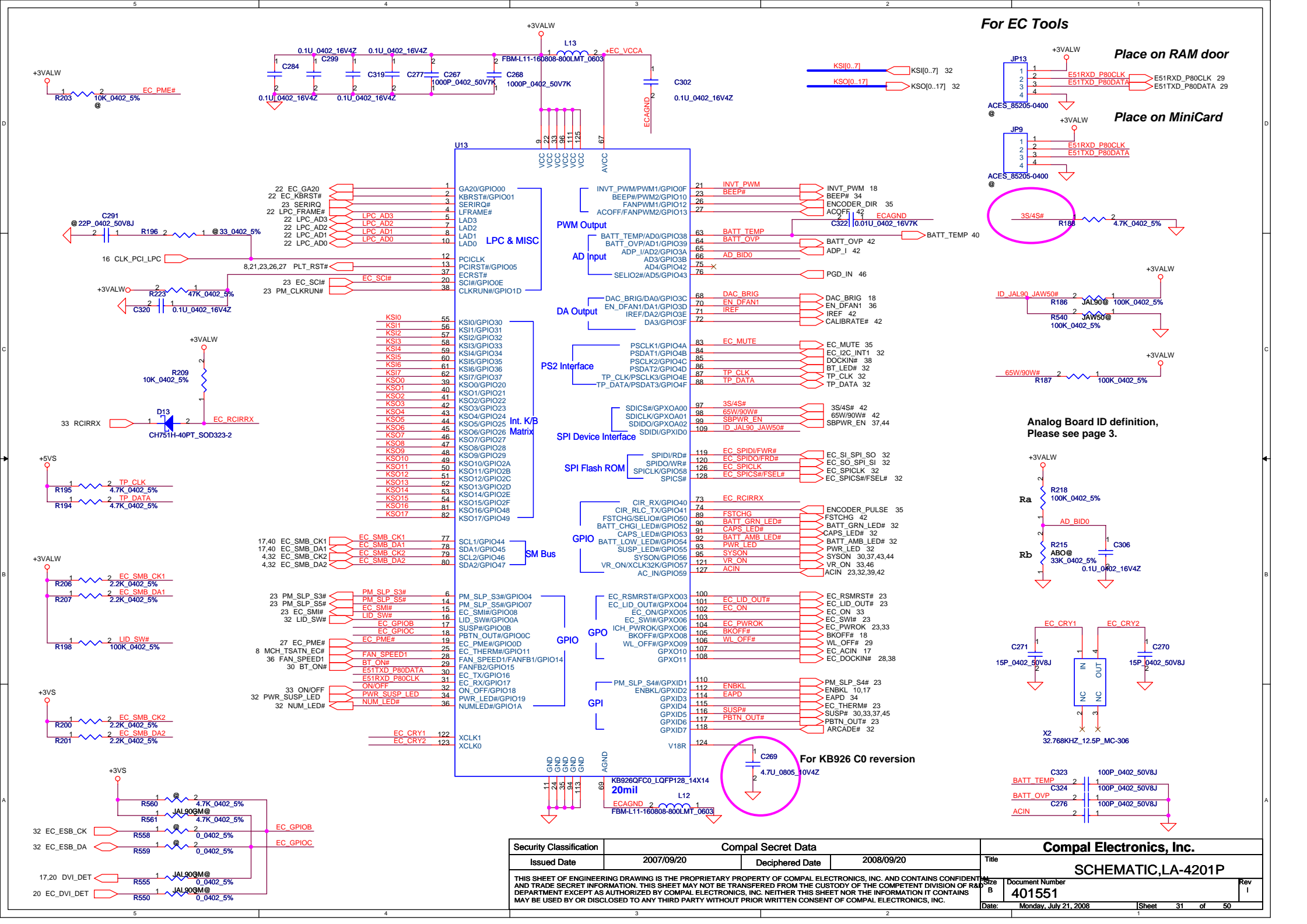
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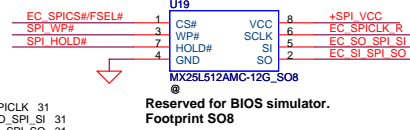


## USB CONN. (Stack-up Type)

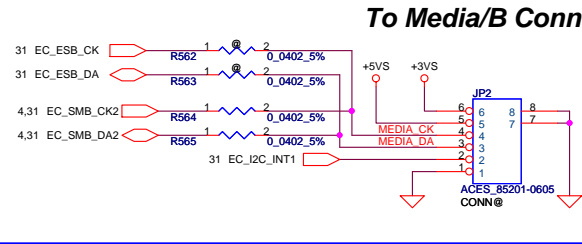
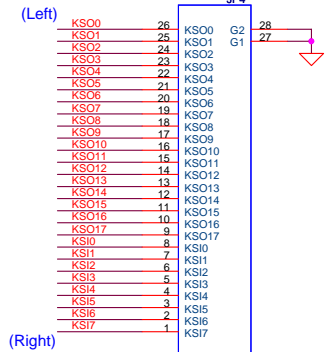


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|   |            |                    |            | Rev                      | I                     |
|   |            |                    |            | Document Number          | 401551                |
|   |            |                    |            | Date                     | Monday, July 21, 2008 |
|   |            |                    |            | Sheet                    | 30 of 50              |

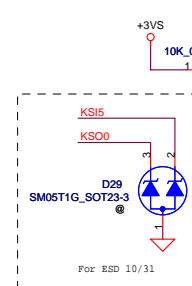
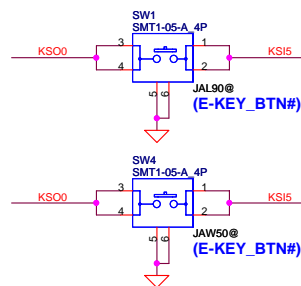




**INT\_KBD Conn.**

[illegible]

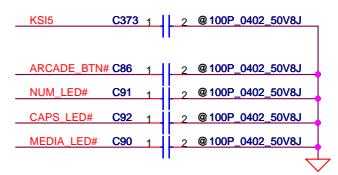
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|------|------------|
|      | KS00       |
| KS11 | WL_BTN#    |
| KS12 | BT_BTN#    |
| KS13 | EMAIL_BTN# |
| KS14 | IE_BTN#    |
| KS15 | E-KEY_BTN# |



The schematic diagram illustrates the electrical connections for the ACES\_85201-0605 module. It includes the following components and connections:

- Module:** ACES\_85201-0605, CONN@
- Power:** +5V supply connected to pins 6 and 8.
- TP Signals:**
  - TP\_CLK (pin 8) connected to pin 8 of the module.
  - TP\_DATA (pin 7) connected to pin 7 of the module.
- Buttons:**
  - LEFT\_BTN# (pin 4) connected to pin 4 of the module.
  - RIGHT\_BTN# (pin 2) connected to pin 2 of the module.
- Capacitors:**
  - C148 (100P\_0402\_50V8J) connected to TP\_CLK.
  - C145 (100P\_0402\_50V8J) connected to TP\_DATA.
  - C147 (0.1U\_0402\_16V4Z) connected to the +5V supply.
- Switches:**
  - SW2 (SMT1-05-A 4P) connected to LEFT\_BTN#.
  - SW3 (SMT1-05-A 4P) connected to RIGHT\_BTN#.
- Diodes:** D7 (PSOT24C\_SOT23) connected to TP\_CLK and TP\_DATA.

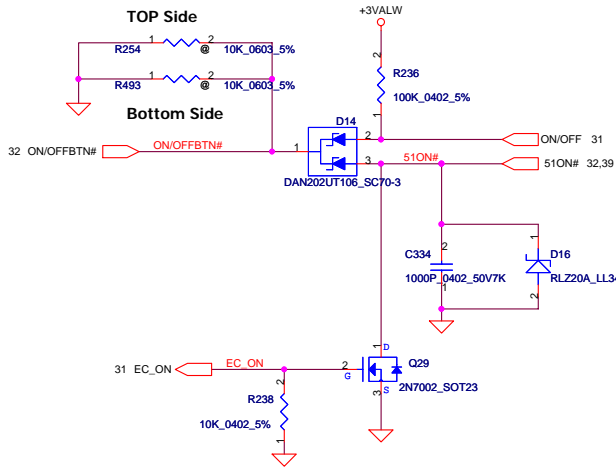
**FOR EMI**



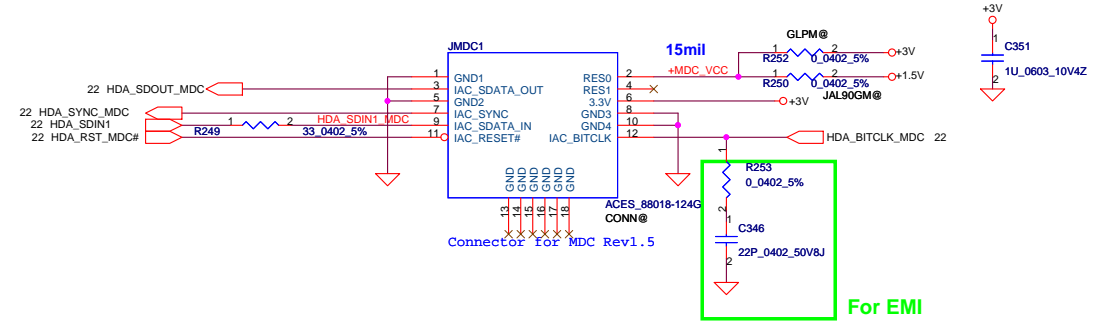
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|--|--------------------|-----------------|------------|--------------------------|-----------------------|----------------|
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|  |                    |                 |            | B                        | 401551                | I              |
|  |                    |                 |            | Date:                    | Monday, July 21, 2008 | Sheet 32 of 50 |

## Power Button

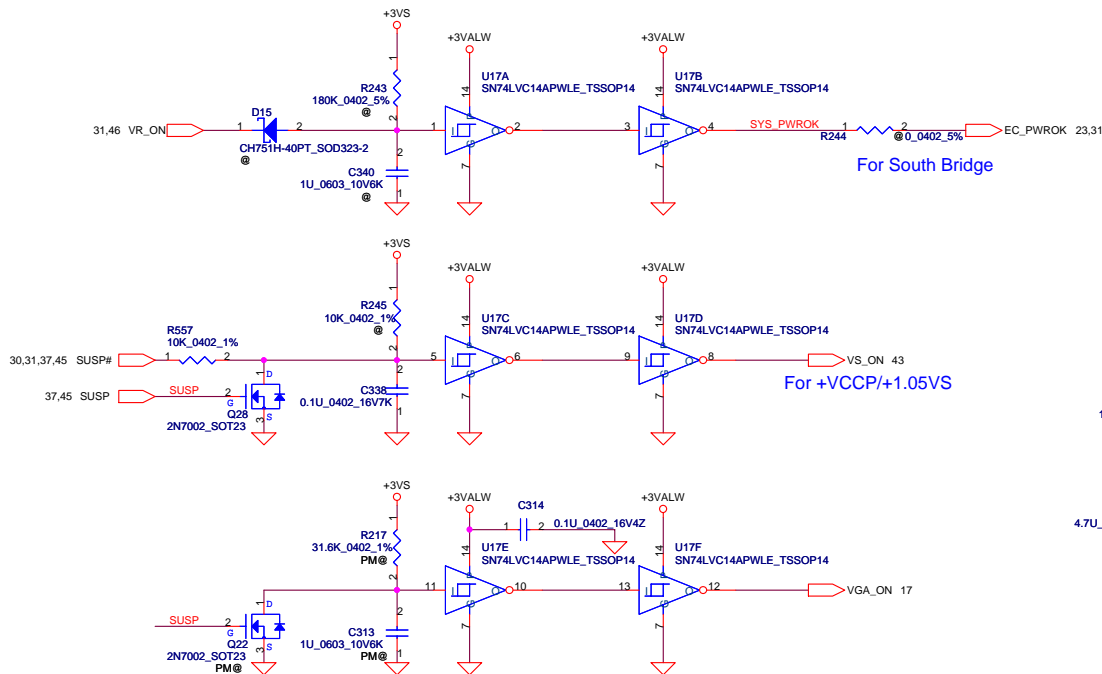
ON/OFF switch



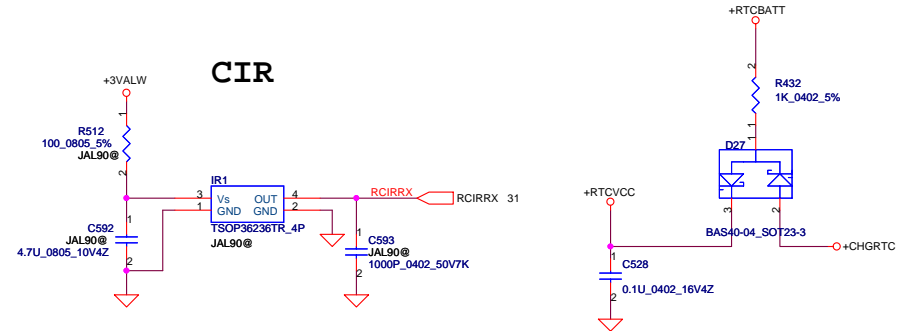
## HDA MDC Conn.



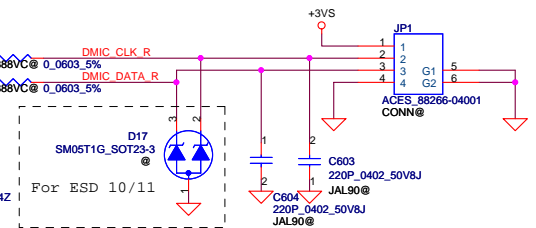
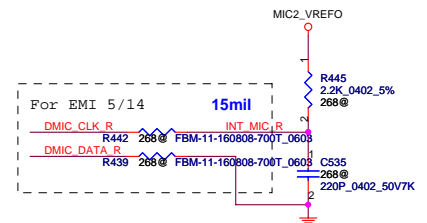
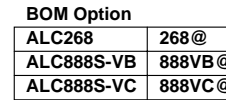
## Power ON Circuit



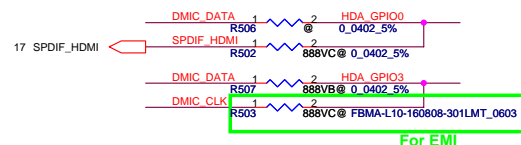
## CIR



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|   |  |  |  | Document Number    |  |  |  | Sheet 33 of 50              |  |  |  |
|   |  |  |  | 401551             |  |  |  |                             |  |  |  |



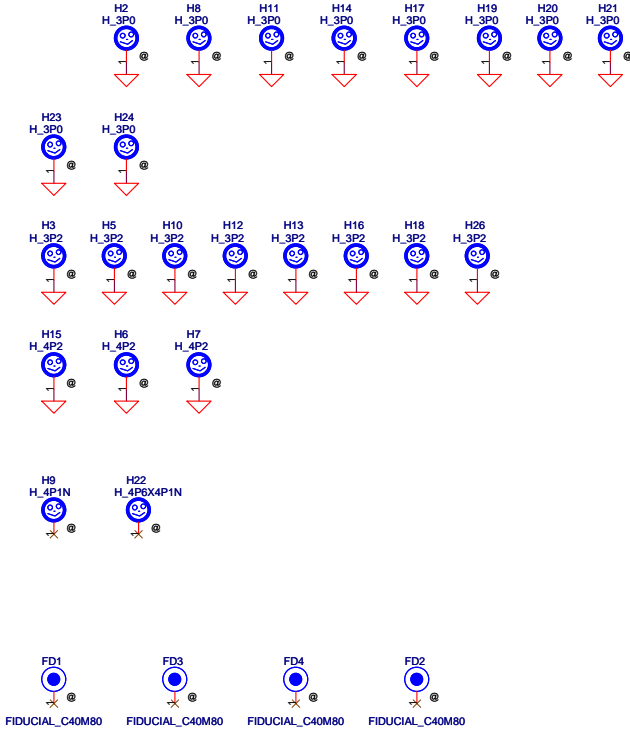
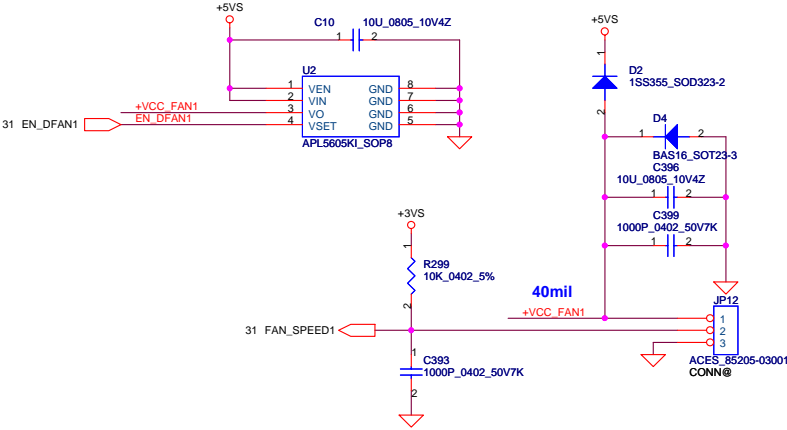
| Sense Pin | Impedance | Codec Signals       |
|-----------|-----------|---------------------|
| SENSE A   | 39.2K     | PORT-A (PIN 39, 41) |
|           | 20K       | PORT-B (PIN 21, 22) |
|           | 10K       | PORT-C (PIN 23, 24) |
|           | 5.1K      | PORT-D (PIN 35, 36) |
| SENSE B   | 39.2K     | PORT-E (PIN 14, 15) |
|           | 20K       | PORT-F (PIN 16, 17) |
|           | 10K       | PORT-G (PIN 43, 44) |
|           | 5.1K      | PORT-H (PIN 45, 46) |



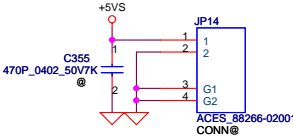
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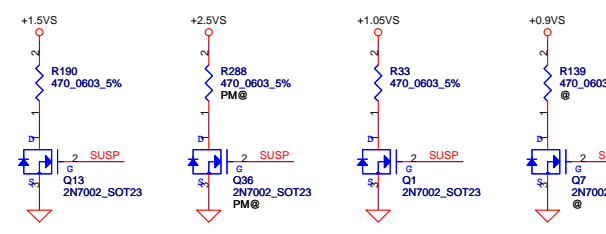
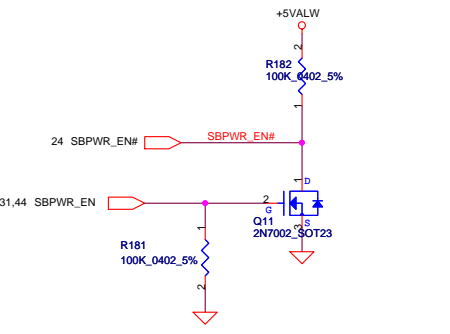
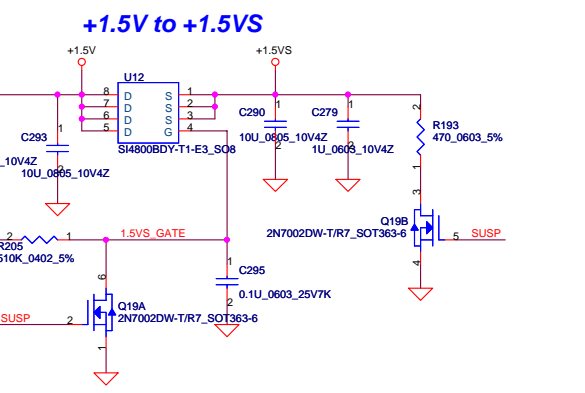
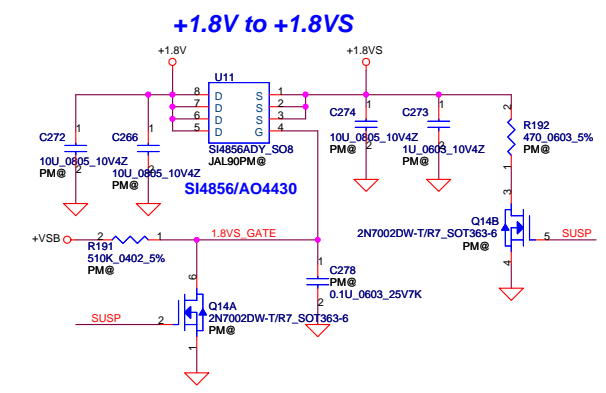
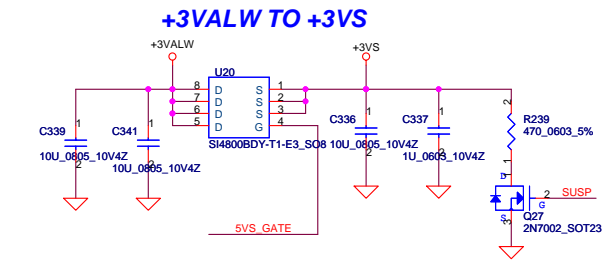
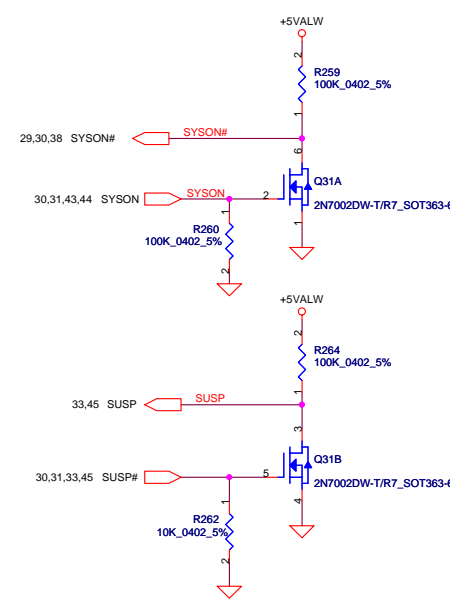
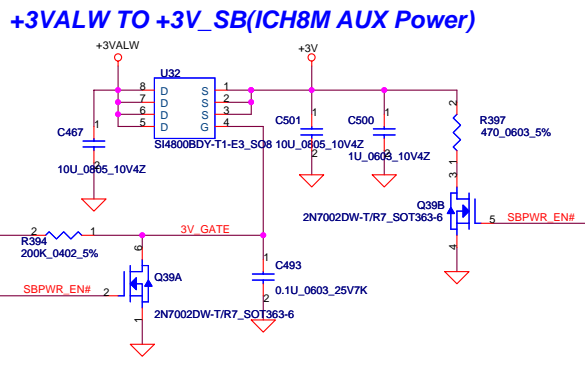
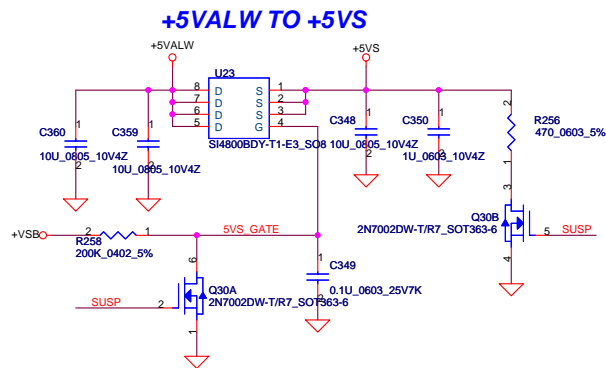
FAN1 Conn



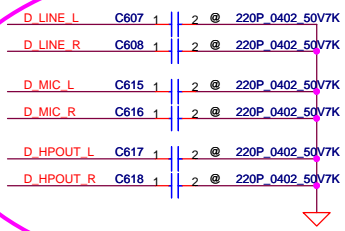
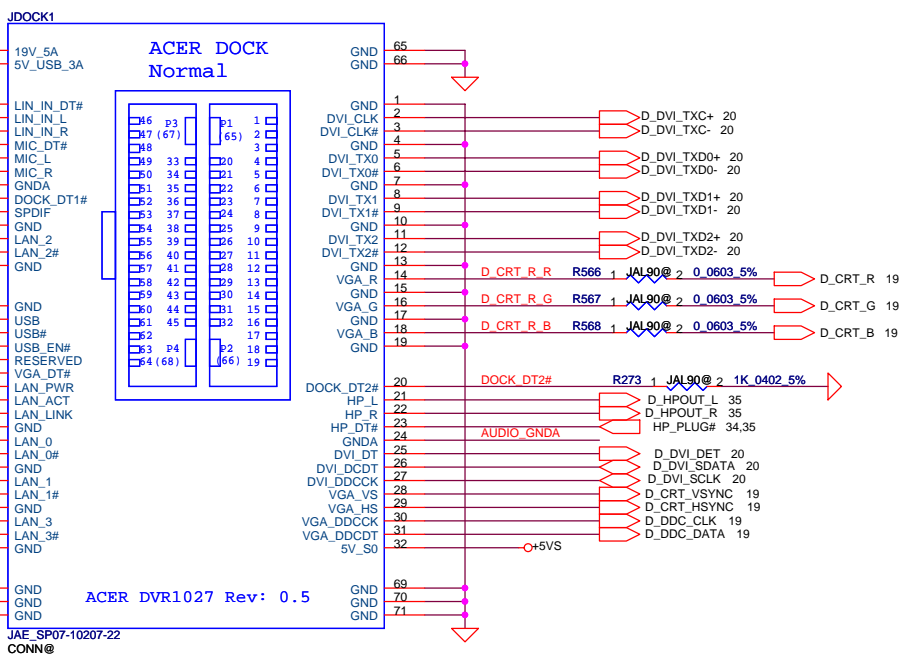
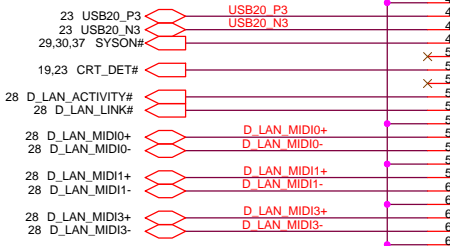
COVER LIGHTConn



|                         |  |                       |  |                          |  |
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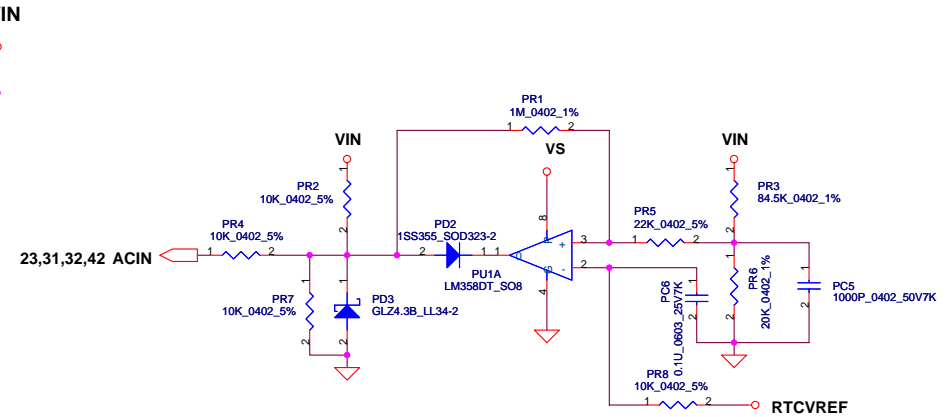
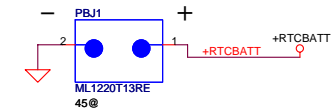
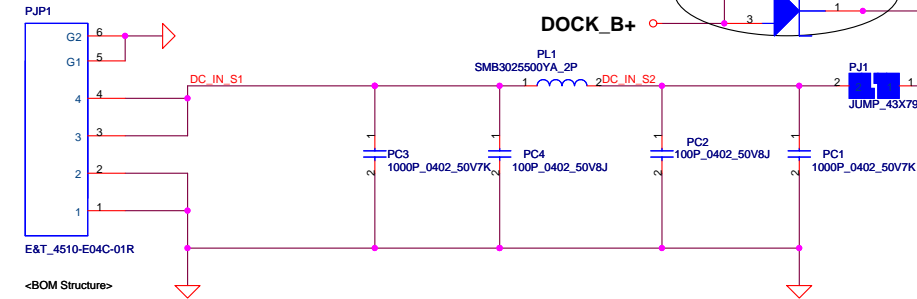


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| Date:   |  |  |  | Monday, July 21, 2008 |  |  |  | Sheet 37 of 50           |  |  |  |

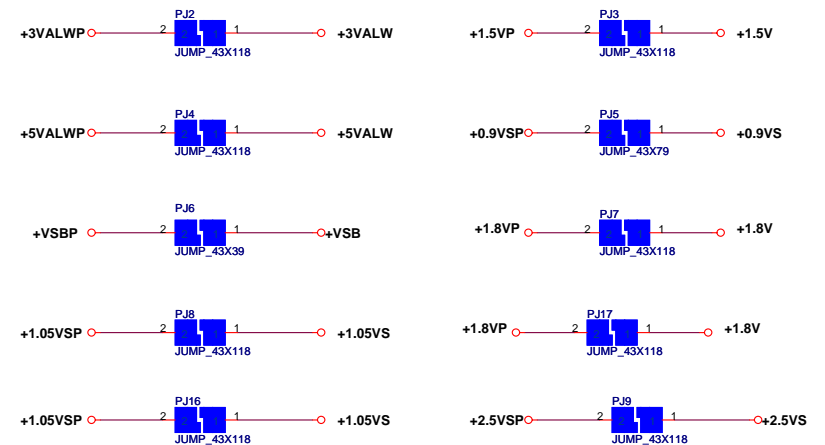
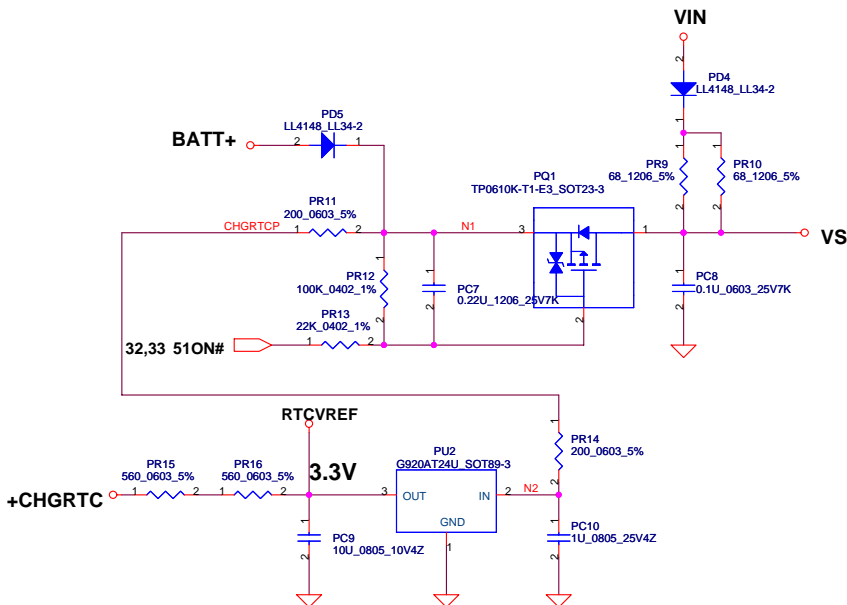


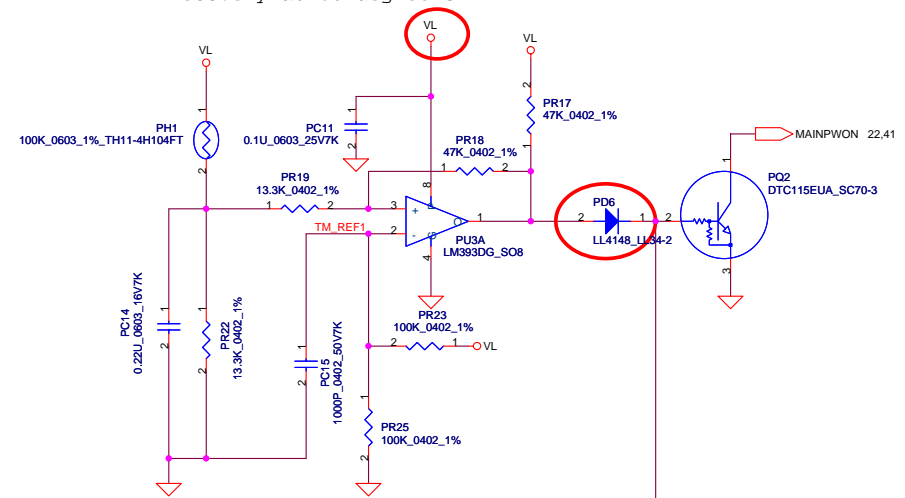
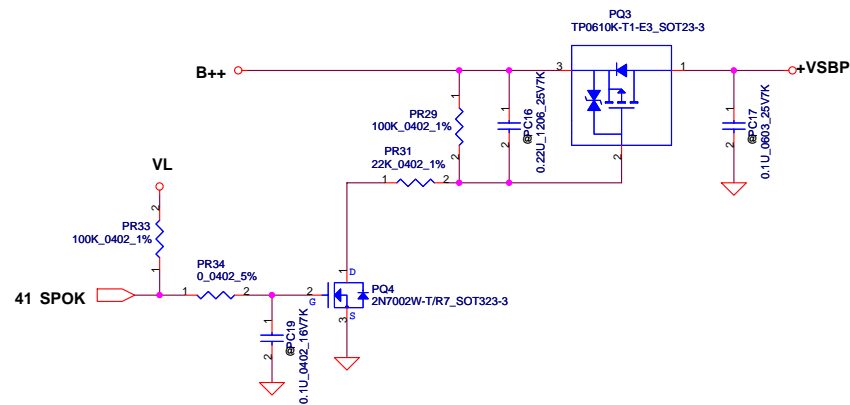
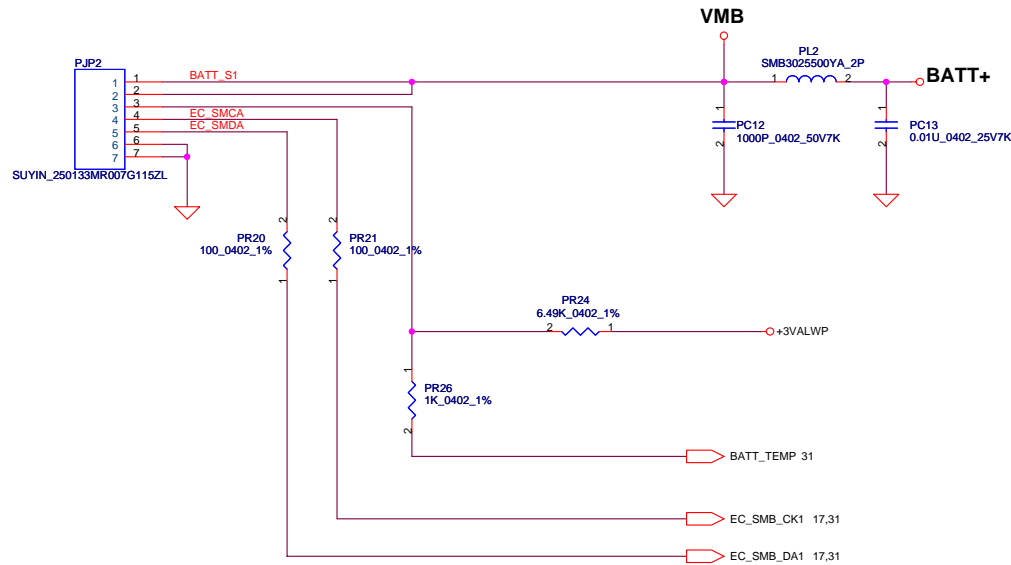
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|   |  |                    |  |                 |  | Date:                    |  | Monday, July 21, 2008 |  | Sheet 38 of 50     |  |

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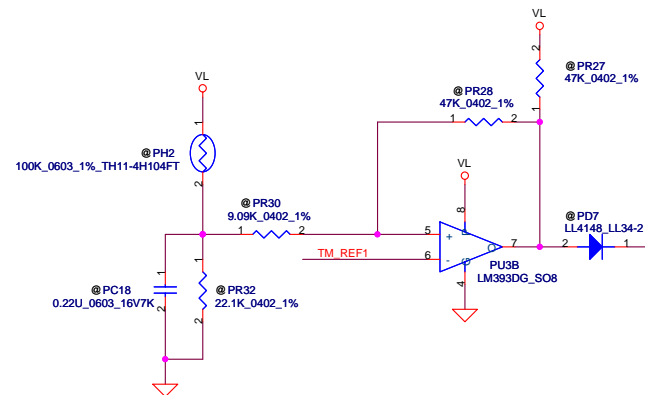


| Vin Dectector |         |         |         |
|---------------|---------|---------|---------|
|               | Min.    | Typ     | Max.    |
| H-->L         | 16.976V | 17.525V | 17.728V |
| L-->H         | 17.430V | 17.901V | 18.384V |

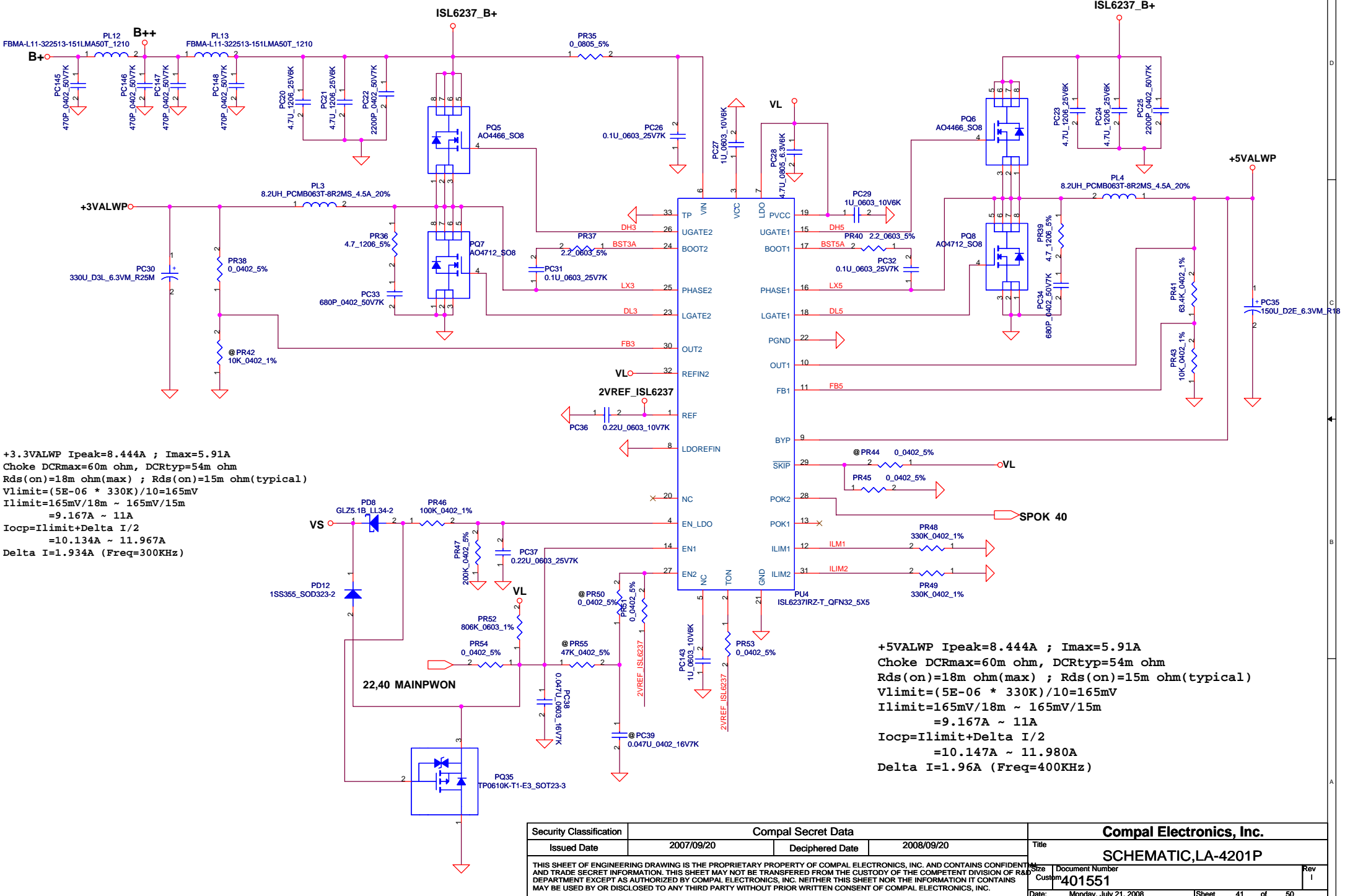




**PH2 near main Battery CONN :**  
BAT. thermal protection at 79 degree C  
Recovery at 47 degree C



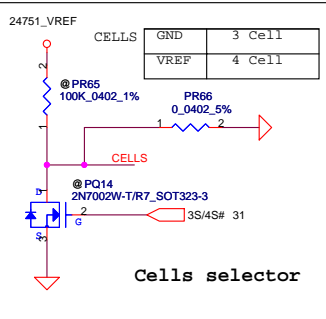
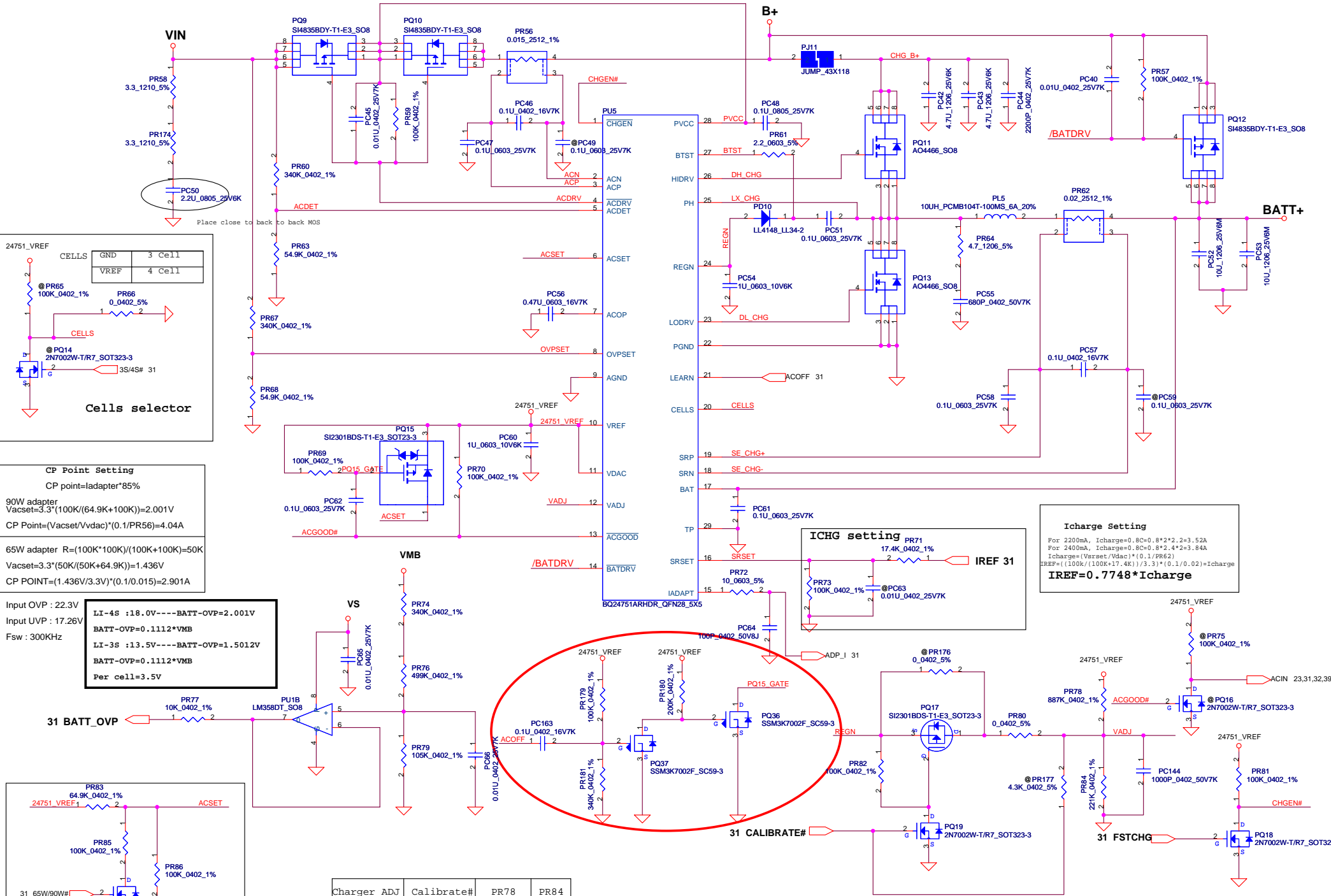
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+3.3VALWP Ipeak=8.444A ; Imax=5.91A  
Choke DCRmax=60m ohm, DCRtyp=54m ohm  
Rds(on)=18m ohm(max) ; Rds(on)=15m ohm(typical)  
Vlimit=(5E-06 \* 330K)/10=165mV  
Ilimit=165mV/18m ~ 165mV/15m  
=9.167A ~ 11A  
Iocp=Ilimit+Delta I/2  
=10.134A ~ 11.967A  
Delta I=1.934A (Freq=300KHz)

+5VALWP Ipeak=8.444A ; Imax=5.91A  
Choke DCRmax=60m ohm, DCRtyp=54m ohm  
Rds(on)=18m ohm(max) ; Rds(on)=15m ohm(typical)  
Vlimit=(5E-06 \* 330K)/10=165mV  
Ilimit=165mV/18m ~ 165mV/15m  
=9.167A ~ 11A  
Iocp=Ilimit+Delta I/2  
=10.147A ~ 11.980A  
Delta I=1.96A (Freq=400KHz)

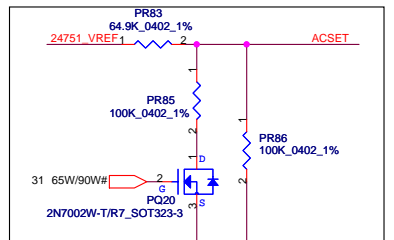
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|   |            |                    |            | Sheet                    | 41 of 50              |



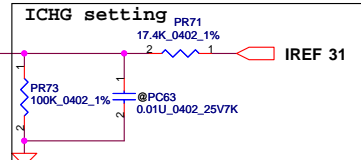
**CP Point Setting**  
 CP point=ladapter\*85%  
 90W adapter  
 $V_{acset}=3.3 \cdot (100K/(64.9K+100K))=2.001V$   
 $CP\ Point=(V_{acset}/V_{vdac}) \cdot (0.1/PR56)=4.04A$   
 65W adapter  $R=(100K \cdot 100K)/(100K+100K)=50K$   
 $V_{acset}=3.3 \cdot (50K/(50K+64.9K))=1.436V$   
 $CP\ POINT=(1.436V/3.3V) \cdot (0.1/0.015)=2.901A$

Input OVP : 22.3V  
 Input UVP : 17.26V  
 Fsw : 300KHz

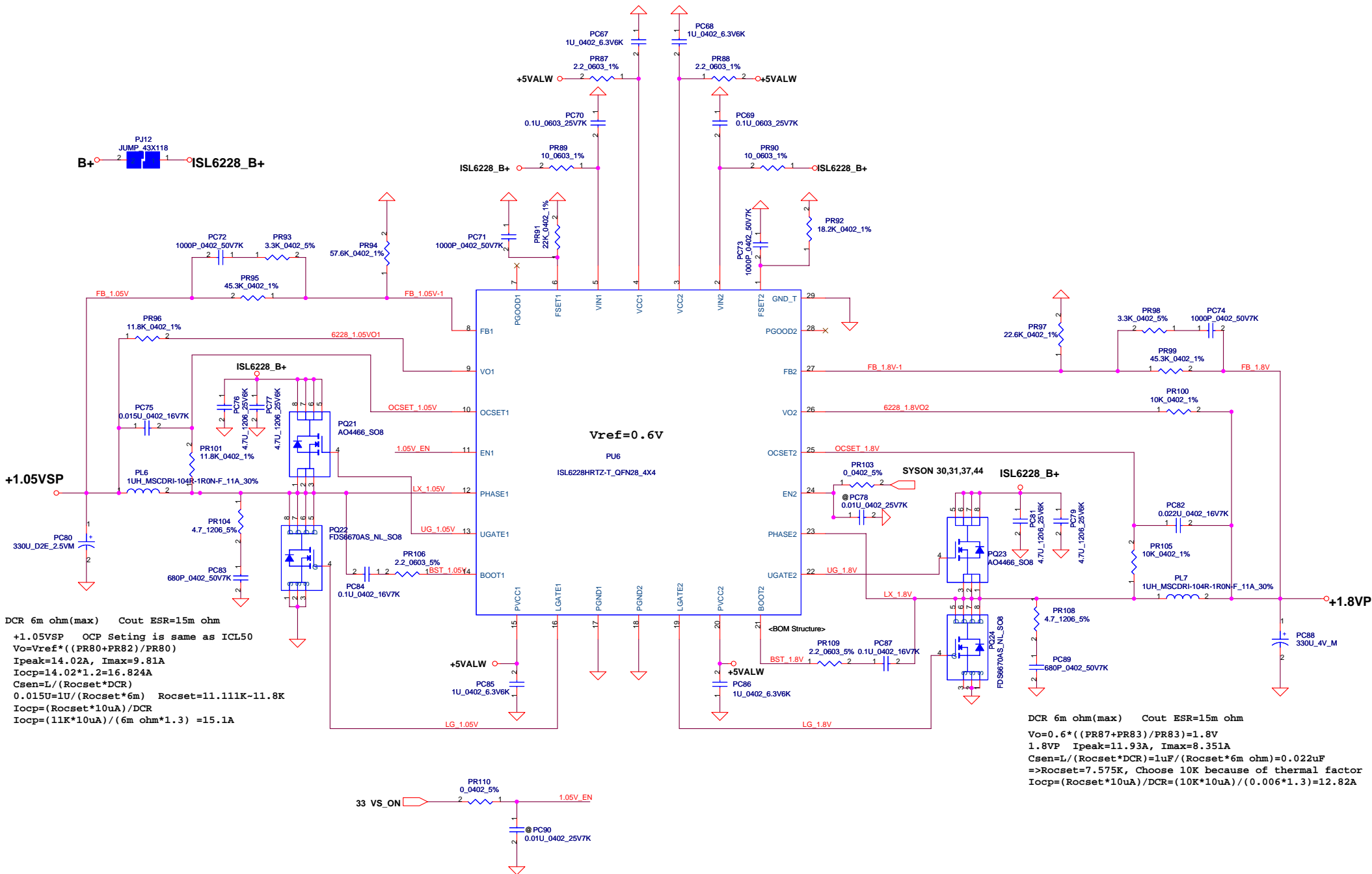
LI-4S : 18.0V----BATT-OVP=2.001V  
 BATT-OVP=0.1112\*VMB  
 LI-3S : 13.5V----BATT-OVP=1.5012V  
 BATT-OVP=0.1112\*VMB  
 Per cell=3.5V

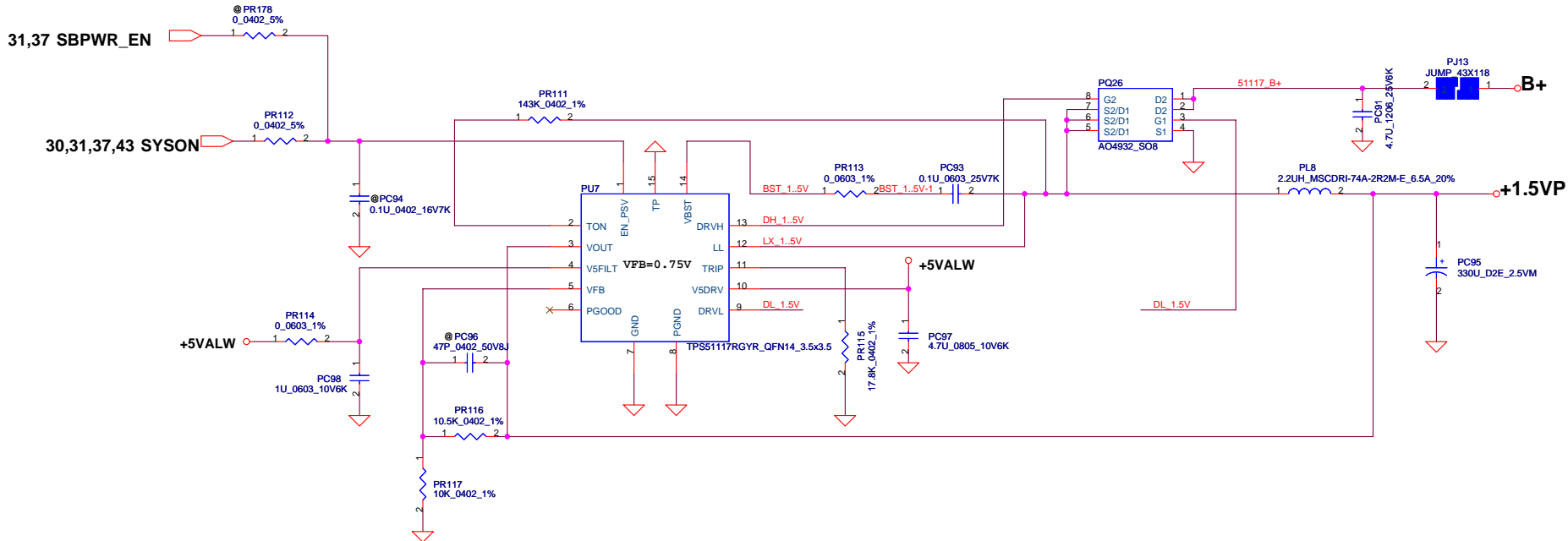


| Charger ADJ | Calibrate# | PR78 | PR84 |
|-------------|------------|------|------|
| 4.0V        | L          | @    | @    |
| 4.1V        | L          | 887K | 221K |
|             | H          | @    | @    |



**Icharge Setting**  
 For 2200mA,  $I_{charge}=0.8C=0.8 \cdot 2.2=3.52A$   
 For 2400mA,  $I_{charge}=0.8C=0.8 \cdot 2.4=3.84A$   
 $I_{charge}=(V_{acset}/V_{vdac}) \cdot (0.1/PR62)$   
 $IREF=((100K/(100K+17.4K))/3.3) \cdot (0.1/0.02)=I_{charge}$   
 **$IREF=0.7748 \cdot I_{charge}$**

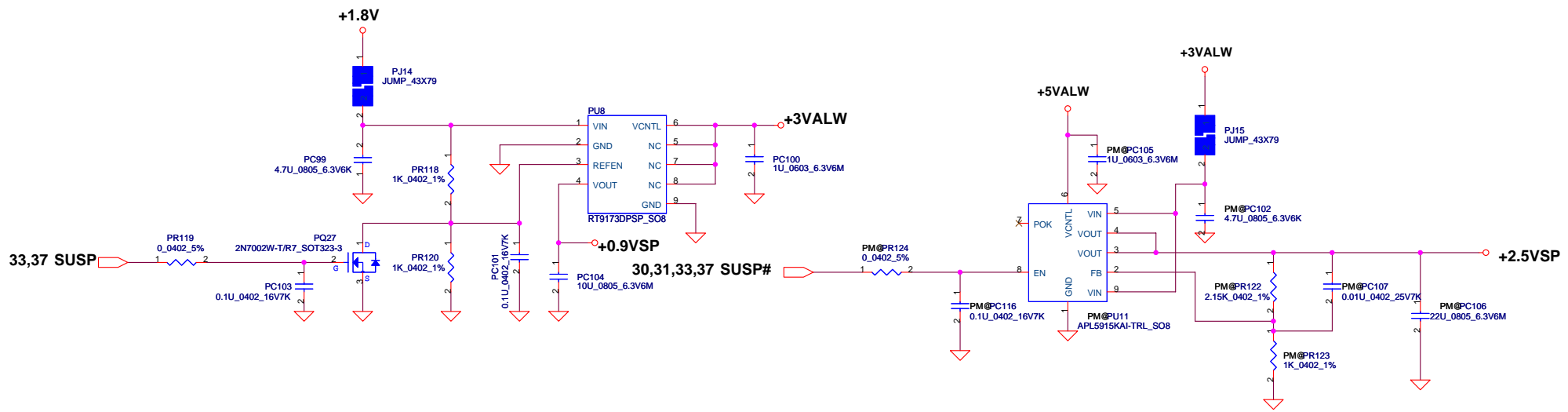




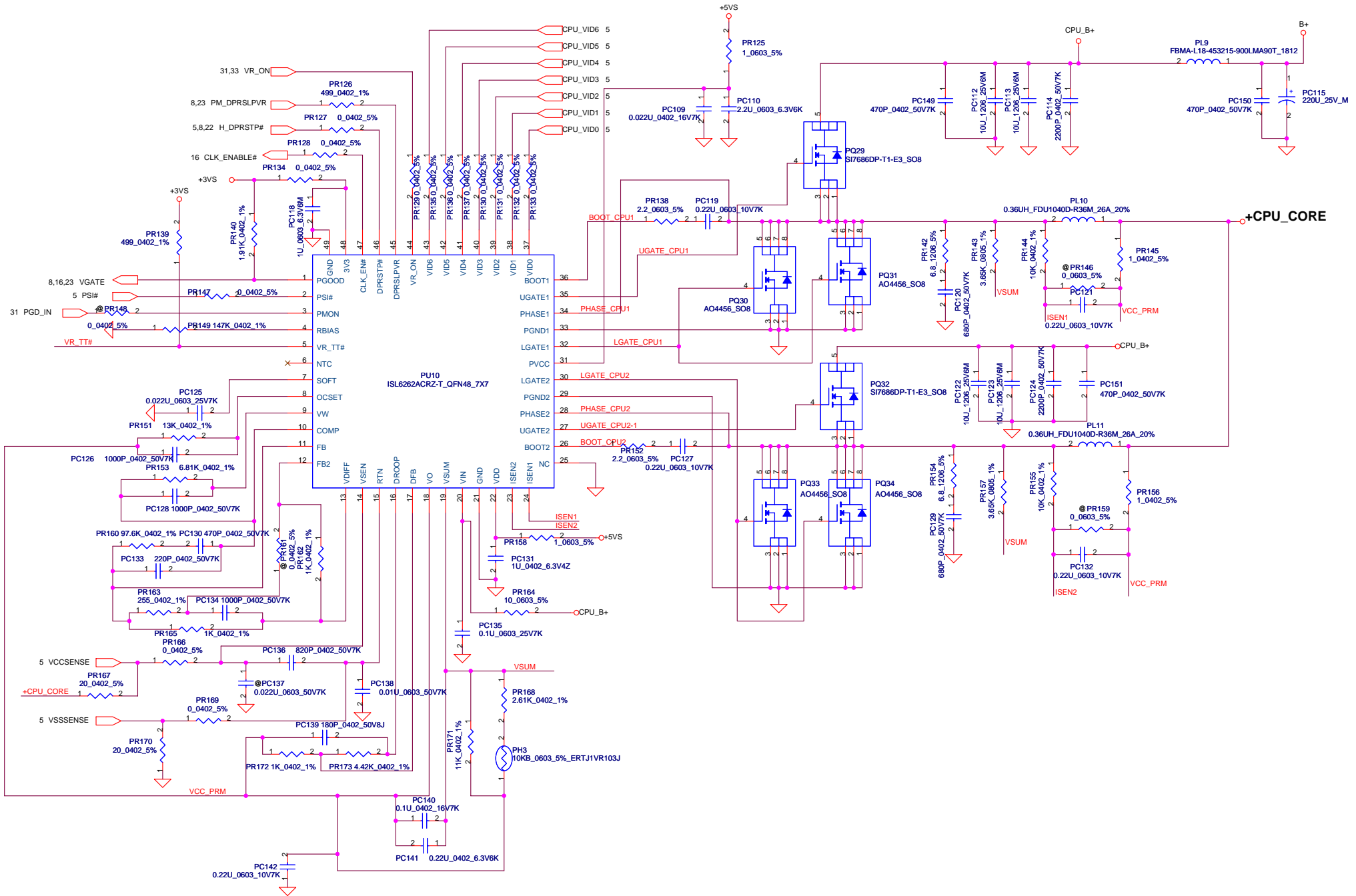
$V_{FB}=0.75V$   
 $V_o=V_{FB} \cdot (1+PR87/PR88)=0.75 \cdot (1+10K/10K)=1.5V$   
 $Ton=19 \cdot e^{-12 \cdot 143000 \cdot ((2/3) \cdot V_o+100mV)/19}+50ns$   
 $=2.645e-7 \text{ us}$   
 $=>V_o/V_{in}=D=Ton/Ts \Rightarrow Ts=3.35us$   
 $Fsw=298KHz$

$Cout \text{ ESR}=15m \text{ ohm}$   
 $I_{peak}=4.71A, I_{max}=3.297A, I_{ocp}=5.652A$   
 $\Delta I=((19-1.5) \cdot (1.5/19))/(L \cdot Fsw)=2.107A$   
 $=>1/2 \Delta I=1.053A$   
 $V_{trip}=R_{trip} \cdot I_{ocp}=17.8K \cdot 10uA=0.178V$   
 $I_{ocpmin}=V_{trip}/R_{dsonmax} \cdot 1.2+1.053A$   
 $=0.178/(0.027 \cdot 1.2)+1.053=5.493A+1.053A=6.546A$   
 $I_{ocpmax}=(0.178/(0.021 \cdot 1.1))+1.053A=7.705A+1.053A$   
 $=8.758A$   
 $I_{ocp}=6.546A-8.758A$

|   |                       |                 |                          |                    |
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| Date: Monday, July 21, 2008   |                    |                 |            |                          | Sheet 45 of 50     |



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

Page 1 of 2  
for PWR

| Item | Fixed Issue                                | Reason for change  | Rev. | PG#          | Modify List  | Date     | Phase |
|------|--|--|------|--------------|--|----------|-------|
| 1    | ISL6237 can't shutdown while battery only. | ISL6237 can't shutdown while battery only.                                     | 0.1  | 41           | Add PQ35 SB906100210 TP0610K.  | 20071031 | EVT   |
| 2    | Delete PD1                                 | Because we can cost down and B+ has another one.                               | 0.2  | 39           | Delete PD1 SCSB540C080 (S SCH DIO B540C-13-F SMC)  | 20071115 | DVT   |
| 3    | 3/5V exit on battery mode shutdown.        | To prevent 3/5V exit on battery mode shutdown.                                 | 0.3  | 41           | Add SC100001K00 (S DIO 1SS355 SOD323 T/R-5K  | 20071211 | DVT   |
| 4    | PD11 has over temp. issue.                 | Because PD11 has over temperature issue in JAQ60, we change it to a 10A diode. | 0.3  | 39           | Change PD11 from SCSB540C080 to SCS00002F00 .  | 20071211 | DVT   |
| 5    | Add snubber in 3/5V by EMI request.        | Add snubber in 3/5V by EMI request.  | 0.3  | 41           | Add PR36 and PR39 to SD001470B80   | 20071211 | DVT   |
| 6    | Down size.                                 | Down size. by sourcer request.   | 0.3  | 46           | Change PC136 from SE025821K80 to SE000003W00   | 20071211 | DVT   |
| 7    | Down size.                                 | Down size. by sourcer request.   | 0.3  | 46           | Change PC120 and PC129 from SE024681J80 to SE074681K80   | 20071211 | DVT   |
| 8    | Down size.                                 | Down size. by sourcer request.   | 0.3  | 43           | Change PC72 and PC74 from SE068102J80 to SE074102K80   | 20071211 | DVT   |
| 9    | 2nd source trial run TI controller.        | 2nd source trial run TI controller.  | 0.3  | 41           | Add PC143 SE080105K80  | 20071211 | DVT   |
| 10   | Add snubber in 3/5V by EMI request.        | Add snubber in 3/5V by EMI request.  | 0.3  | 41           | Add PC33 and PC34 SE074681K80  | 20071211 | DVT   |
| 11   | To meet Jeta SPEC.                         | To meet Jeta SPEC.   | 0.3  | 42           | Add PC144 SE074102K80  | 20071211 | DVT   |
| 12   | Increase +5VALWP                           | HW requirement.  | 0.4  | 41           | Change PR41 from SD034619280(S RES 1/16W 61.9K 0402 1%) to SD03463K280(S RES 1/16W 63.4K 0402 1%)  | 20080123 | PVT   |
| 13   | Increase +5VALWP                           | HW requirement.  | 0.4  | 43           | change PR94 from SD034604280(S RES 1/16W 60.4K 0402 1%) to SD034576280(S RES 1/16W 57.6K 0402 1%)  | 20080123 | PVT   |
| 14   | Increase +5VALWP                           | HW requirement.  | 0.4  | 44           | Change PRI16 from SD034100280(S RES 1/16W 10K 0402 1%) to SD034105280(S RES 1/16W 10.5K 0402 1%)   | 20080123 | PVT   |
| 15   | Add EMI solution.                          | For EMI requirement.   | 0.4  | 41,42, 43,46 | Change PR37, PR40, PR61, PRI06, PRI09, PRI38, PRI52 from SD013000080(S RES 1/10W 0 +-5% 0603) to SD013220B80 (S RES 1/10W 2.2 +-5% 0603) | 20080123 | PVT   |
| 16   | Add EMI solution.                          | For EMI requirement.   | 0.4  | 43           | Add PR64, PRI04 and PRI08 SD001470B80(S RES 1/4W 4.7 +-5% 1206)  | 20080123 | PVT   |
| 17   | Add EMI solution.                          | For EMI requirement.   | 0.4  | 43           | Add PC55, PC83 and PC89 SE074681K80(S CER CAP 680P 50V K X7R 0402)   | 20080123 | PVT   |
| 18   | Add EMI solution.                          | For EMI requirement.   | 0.4  | 41           | Add PC145, PC146, PC147, PC148 SE074471K80 (S CER CAP 470P 50V K X7R 0402)   | 20080123 | PVT   |
| 19   | Add EMI solution.                          | For EMI requirement.   | 0.4  | 41           | Add PLI2, PLI3 SM0100I6410 (S SUPPRE KC FBMA-L11-322513-151LMA50T)   | 20080123 | PVT   |
| 20   | AO4916 will be EOL.                        | AO4916 will be EOL.  | 0.5  | 44           | Change PQ26 from SB000002W80 S TR AO4916 2N S08 to SB0000BG00 S TR AO4932_S08  | 20080201 | PVT   |
| 21   | Thermal shutdown issue.                    | Change OTP setting from 92C to 96C.  | 0.6  | 40           | Change PR19 and PR22 to SD034133280(S RES 13.3K 0402 1%)   | 20080214 | PVT   |
| 22   | EMI request.                               | EMI request.   | 0.6  | 46           | Add PC149,PC150,PC151 SE074471K80(S CER CAP 470P X7R 0402)   | 20080214 | PVT   |
| 23   |  |  |      |              |  |          |       |

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A --> B Change List

12/13-----  
Page 12, Mount R83, C179, C188  
Change R91 BOM structure to @  
Page 19, Mount D21, D22, D23  
Page 20, Change U40, U41 BOM structure to @  
12/12-----  
Page 19, Change C430, C422, C406 with BOM structure GM@  
Page 20, Add R548, R549 2.2K\_0402 with BOM structure @  
Change R542, R543 BOM structure to PM@  
Change Q3, Q5, Q46, Q47 to BSH111  
Page 28, Change T1 to SP050003T10  
Page 34, Change C603, C604 location and BOM structure to JAL90@  
Page 35, Change R449 to 43K\_0402\_1%  
Page 27, Add R550 with BOM structure @  
Page 49, Add option component for C430, C422, C402, C429, C421, C405  
Del C419, C428, C432, C513, C214 (Option Component)  
12/10-----  
Page 19, Add R544, R545 0\_0402 with BOM structure JAL90@  
Page 20, Add U40, U41 SN74CBTD3306CPWR\_TSSOP8 with BOM structure JAL90@  
Page 35, Change R486, R477, R485, R476 to 56.2\_0603 1%  
Page 38, Add R546, R547 10\_0402\_5% with BOM structure @  
Update MCH and ICH part number.  
U31 --> SA00001ZO30 (PM)  
SA00001P930 (GM)  
U9 --> SA00002AN10 (ICH9)  
12/07-----  
Page 12, Add C606, 220U\_D2\_4VM\_R15 with BOM Structure GM@  
Change C435 to 220uF\_D2 with BOM Structure @  
Page 17, Update JMXM1 PCBfoot to QUASA\_CA0481-230N00\_230P-T  
Page 20, Add R542, R543 4.7K\_0402 with BOM Structure JAL90@  
Update Power Schematics  
12/06-----  
Page 4, Add R541 10K\_0402 with BOM Structure @  
Page 17, Add R534 0\_0402 with BOM Structure PM@  
Change D30, R516 BOM Structure to @  
Page 31, Add R540 100K\_0402 with BOM structure JAW50@  
Change R186 BOM Structure JAL90@  
Page 38, Add R533 10K\_0402 with BOM Structure JAL90@  
Add C605 0.1U\_0402 with BOM Strcture @  
Change Q35 to 2N7002DW-T/R7\_SOT363-6  
12/05-----  
Page 16, Update U15 to ICS9LPRS387BKLFT (SA000020H10)  
Page 31, Delete R534  
Page 34, Delete R533  
Page 38, Update JDOCK1 CIS Symbol to JAE\_SP07-10207-19\_68P-T  
12/04-----  
Page 16, 17, 19 Delete Q23, Q37, Q38 2N7002DW-T/R7\_SOT363-6  
Add Q48, Q49, Q50, Q51, Q52, Q53 2N7002\_SOT23  
Page 22, Add 10K\_0402 with BOM Structure JAW50@  
Change R61 BOM Structure to JAL90@  
Page 31, Change R215 to 8.2K\_0402  
Page 34, Add C603, C604 220P\_0402\_50V8J with BOM structure @  
11/30-----  
Page 18, C368 change to 680P\_0402\_50V7K  
Page 20, D20 Change to CH751H-40PT\_SOD323-2  
Delete Q4  
Add Q46, Q47 2N7002\_SOT23 with BOM Structure JAL90@  
Page 26, Delete R532, Q46  
Add R538, R539 0\_0402 with BOM Structure @  
Change D31 with BOM Structure @  
Change U34 PN to SA00001W910  
Page 31 Change EC\_SMB\_CK2/DA2 Pull High to +3VS  
Page 32, Add SW4 with BOM Structure JAW50@  
Change SW1 BOM Structure to JAL90@  
Change JP2 Pin3/Pin4 to EC\_SMB\_CK2/DA2

11/28-----  
Page 12, Add R536, R537 0\_0402 with BOM Structure PM@  
Page 30, Change U14 to G577NSR91U  
Page 34, Change R438, R439, R441, R442 to 0\_0603 (BOM Error)  
Page 35, Change R473, R467 to 2.2K\_0402\_5%  
Change R9, R11, R26, R28 to 0\_0603 (BOM Error)  
11/27-----  
Page 19, Change D5 to RB491D\_SC59-3 accordig to Module design  
Page 25, Update JSATA2(HDD) PCB footprint to OCTEK\_SAT-22SU1G\_22P\_NR-T  
Page 33, C313 change to 1U\_0402\_6.3V6K  
Page 37, Mount R189, Q17 for +1.8V discharge circuit.  
11/22-----  
Page 26, Add R535 22\_0402  
Page 31, Add R534 0\_0402 for +RTCVCC  
11/19-----  
Rev A  
Page 8, R482, R480 Pull down (CLK\_DREF\_96M#/CLK\_DREF\_SSC#)  
Page 12, L32, L10, C505, C513, C263, C214 BOM Structure change to GM@  
Add C513, C214 0\_0402 (PM@) for Option Component (Page 49)  
Page 23, Unmount R341  
Mount R342  
Page 28, Update R521, R522, R523, R524, R525, R526, R527, R528, R529, R530 function field.  
Page 29, SWAP function of JMINI1 and JMINI2 (JMINI1 for Robson2, JMINI2 for WLAN)  
Delete C355 0.1U\_0402  
Add R531 0\_0402  
Page 34, Add R533 0\_0402 for ALC888VB DMIC\_CLK  
11/14-----  
Rev B  
Page 7, 8, 9, 10, 11, 12, 13 change U31 BOM Structure from GM@ to JAL90GM@  
Page 8, R102 BOM Structure change from GM@ to JAL90GM@  
Page 10, C210, C218, C222, C228, C208, C215, C220, C223 add BOM Structure PM@  
Page 49, Add C210, C218, C222, C228, C208, C215, C220, C223 option component BOM Structure JAL90GM@  
Add U31 Cantiga-GL, LED1 with BOM Structure JAW50@  
Page 12, R396, C498 BOM Structure change from GM@ to JAL90GM@  
R395 BOM Structure change from PM@ to GLPM@.  
Page 17, R331, R333 BOM Structure change from GM@ to JAL90GM@  
Page 19, R322, R327, R329 BOM Structure change from GM@ to JAL90GM@  
U28 add BOM Structure JAL90@  
Add R518, R519, R520 0\_0402\_5% for JAW50 CRT signal  
Page 20, R51, R52, Q4, R344, R336, C439, C440, R332, U30, R67, R72, Q3, Q5, D6, F2, C443,  
R351, R354, R358, R364, R365, R367, R372, R373, D19, C427, C431, U27,  
D20, R305, R306, 307, R308, R309, R310 add BOM Structure JAL90@  
Page 22, R408, R409, R410, R411 change BOM Structure from GM@ to JAL90GM@  
Page 23, R38, R53, R40, R54, R55, R34, U5 change BOM Structure from GM@ to JAL90GM@  
Page 24, R160, R162 BOM Structure change from PM@ to GLPM@  
R159, R161 BOM Structure change from GM@ to GLPM@  
Page 28, Add R521, R522, R523, R524, R525, R526, R527, R528, R529, R530 0\_0402\_5% for JAW50  
U1 add BOM Structure JAL90@  
Page 29, C343, C352, C342, C344, C312, C355 add BOM Structure JAL90@  
Page 32, Q15, LED1 add BOM Structure JAL90@  
Page 33, R512, C592, IR1, C593 add BOM Structure JAL90@  
R252 change BOM Structure from PM@ to GLPM@  
R250 change BOM Structure from GM@ to JAL90GM@  
Page 34, C583, C582, R445, C535, R442, R439 change BOM Structure from @ to 268@  
R490, R506 change BOM Structure from 268@ to @  
R441, R438 add BOM Structure 888VC@  
Page 35, R485, R476, R457, R460, R440, R444, R434, U39, R263, R255, R257, R261, C356, C353,  
C354, U21, R265, C358, U22, C357, Q43 add BOM Structure JAL90@  
Page 37, C272, C266, U11, C274, C273, R192, Q14, C278, R191 add BOM Structure PM@  
Page 38, R282, R284, Q35, R273 add BOM Structure JAL90@  
Rev A  
Page 37, Change R262 from 100K\_0402 to 10K\_0402 for Power Require(for 2.5V LDO).

|   |                       |                    |            |                          |                    |
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B --> C Change List

0220-----  
Page 6, Change C98 BOM structure to @

0218-----  
Page 20, Add R569 with BOM structure @  
Page 23, R34, R38, R40, R53, R54, R55 change BOM structure to @  
Page 31, Change R215 to 18K  
Update Power Schematics

0213-----  
Page 11, Delete R113  
Add J1 JUMP\_43X79 with BOM structure @  
Page 31, R558, R559 0 ohm with BOM structure @  
R560, R561 4.7K with BOM structure @  
Page 32, R562, R563 0 ohm with BOM Structure @  
R564, R565 0 ohm  
Page 38, Delete C619  
Add R566, R567, R568 0\_0603 with BOM Structure JAL90@

0204-----  
Page 12, Change L31 to MBK1608301YZF\_0603 with BOM structure GM@  
Change R163 to 0\_0805\_5%  
Page 23, Change BOM Structure of U5 to @  
Page 27, Change BOM Structure of R555 and R550 to @  
Page 33, Change R217 to 31.6K\_0402\_1%  
Change C313 to 1U\_0603\_10V6K  
Page 34, Change R503 to FBMA-L10-160808-301LMT\_0603

01/31-----  
Page 23, Delete U10

01/29-----  
Page 23, Change R152 BOM Structure to @

01/24-----  
Page 4, Change U8 to SA00001Z700 (EMC1402)  
Page 33, Change C338 to SE076104K80  
Page 35, Mount C584

01/23-----  
Page 38 Delete F3, R558~560, C609~614

01/22-----  
Page 11, Delete R79  
Change J1 Symbol to JUMP\_43X79  
Page 33, Add R557 10K (Check)  
Change R245 BOM Structure with @  
Page 38, Add C609~614, R558~560 (Check)  
C607,608, 615~619 (Check)

01/17-----  
Page 11, Add R79 0\_0805  
Update Power Schematics

01/16-----  
Page 11, Delete R79 0\_0805  
Add J1 JUMP\_43X79  
Page 16, Change C296, R301 to 27P\_0402  
Page 19, Change L17, L19, L21 BOM structure to GM@  
Page 23, Mount U29, R339  
Add U10 with BOM structure @ (Co-lay with U5)  
Change R340 Bom structure to @  
Change U5 to MX25L4005AMC-12G\_SO8 (SA00002A900)

Page 27, Change U26, C420 BOM structure to @  
Change R550 to 0\_0402  
Add R555 0\_0402  
Page 32, Change R269 to 240\_0402\_5%, R267 to 453\_0402\_1%  
Change R268 pin1 connect to +5VALW  
Page 33, Change R217 to 18K\_0402\_1% with BOM structure PM@  
Page 35, Add R551,R552, R553, R554 75\_0603\_1% with BOM structure JAL90@  
Add D32 PJDLC05\_SOT23-3  
Page 38, Add F3 3A\_15VDC\_SMD2920P300TF/15  
Page 49, Add R551,R552, R553, R554 1K\_0603\_1% with BOM structure 268@  
Add L17, L19, L21 0\_0805 with BOM structure PM@  
Update U38 (ALC268-VB1-GR ) PN:SA00001GD10 for JAW50

C --> C2 Change List

0319-----  
Page 20, Add R574 0 ohm with BOM Structure JAL90@  
Page 32, Add R570 0 ohm with BOM Structure JAL9050 @  
Add R571 0 ohm with BOM Structure KAL20@  
Add Q37 AO3413 with BOM Structure KAL20@  
Add R575, R576 10K with BOM Structure KAL20@  
Add Q54 2N7002DW with BOM Structure KAL20@  
Update Power Schematics  
Update U31 PN to SA00002JT50(GM)/SA00002JJ50(PM)

C2 --> PreMP Change List

0704-----  
Page 20, Change R51, R52, R67, R72, R542, R543, R574 BOM structure to JAL90PM@  
Page 37, Change U11 BOM structure to JAL90PM@  
Page 50, Add U11 SI4800BDY-T1-E3\_SO8 withe BOM structure JAW50PM@  
Change U31 BOM Structure to JAW50GL@

0624-----  
Page 37, Change U12, U20, U23, U32 to SI4800BDY

0610-----  
Page 23, Change R388 BOM structure to EM@

0528-----  
Add ABO@ for Bluetooth/NewCard/CardReader option  
R222, C316, C317, C332, Q24, C308, C325, R235, Q26  
U14, U16, Q25, C310, C298, C283, C307, C292, C294, C304, C303, C281, C282, R220, C487, C480  
C524, C525, C526, C527, C529, C530, C532, C533, C534, C543, C544, C545, C546, C544, C545  
C547, C548, C549, D26, R427, R428, R429, R430, R435, R436, R443, R452, R453, R535, U34  
Page 23, Change R417 BOM structure to EM@  
Change R416 BOM Sturcture to ABO@  
Page 31, Change R215 BOM structure to ABO@  
Page 32, Change R570 BOM structure to JAL90@  
Page 50, Add R215 with BOM structure EM@

0523-----  
Page 4, Mount R541  
Page 32, Change R266, R268 Bom Structure to JAL90@  
Page 50, Add R266 2.49K\_0402\_1% with BOM Structure JAW50@  
Add R268 1.69K\_0402\_1% with BOM Structure JAW50@  
Change JAW50 U31 PN to SA00002Q830

0514----- (For JAW50 Analog MIC, EMI Requirement)  
Page 34 change R439, R442 to FBMA-L11-160808-700LMT(SM010004010) with BOM structure 268@  
0513----- (For Acer Lab P193WAX DVI Detect)  
Page 20, Change R51, R52, R67 and R72 BOM structure to PM@  
Page 50, Add R51, R52, R67 and R72 4.7K\_0402 with BOM Structure JAL90GM@

0429----- (For PC Beep sound, volume down)  
Page 34, Change R496 to 1.3K

0422-----  
Update U9 PN to SA00002JH70  
Update U31 PN to SA00002JJA0/SA00002JTB0

0410-----  
Page 30, Add R577 0\_0603 with BOM structure @  
Add R578 0\_0603

0407-----  
Page 20, change R574 BOM structure to PM@  
Page 31, change R550, R555, R561 BOM structure to JAL90GM@  
Change R215 to 33K  
Page 32, change R266,R268 to 4.99K 1%  
change R267 to 2.49K 1%  
change R269 to 1.69K 1%  
Page 50, change JAL90 PCB P/N to DAZ04700100

|   |            |                    |            |                          |                           |
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## PCB

ZZZ



PCB JAL90 LA-4201P LS-4201P/4202P/4204P/4205P/4207P/4208P

LA4201MB Rev0: DA600007400  
LA4201MB Rev1: DA600007410  
LA4201MB with Small Board Rev1: DAZ04700100

## IC

U31



CANTIGA ES\_FCBGA1329  
CANTIGA PM: SA00002JJA0

U31



CANTIGA ES\_FCBGA1329  
CANTIGA GL: SA00002Q830

U25



RTL8102E-GR\_OFN64P\_9X9  
RTL8102E-GR: SA00001YY00

U38



ALC888S-VB\_LQFP48\_7x7  
ALC888S-VB: SA000026V10

U38



ALC268-GR\_LQFP48\_9X9  
ALC268-VB1-GR: SA00001GD10

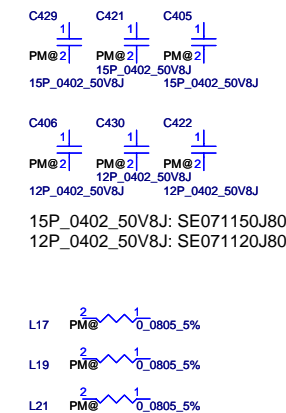
## JAW50 Discrete

U11



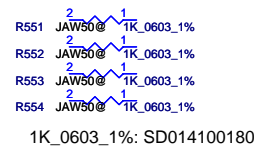
SI4800BDY-T1-E3\_SO8  
SI4800BDY-T1-E3\_SO8: SB548000310

## CRT



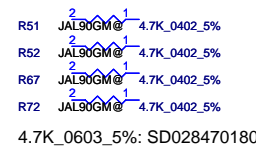
0.0805\_5%: SD002000080

## AUDIO



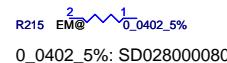
1K\_0603\_1%: SD014100180

## HDMI/DVI DDC Pull-High



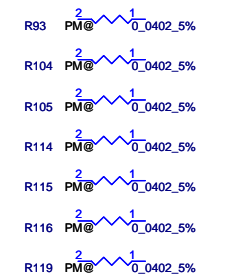
4.7K\_0603\_5%: SD028470180

## KAW00



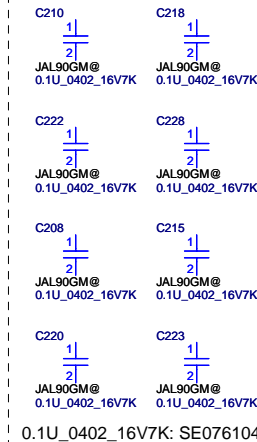
0.0402\_5%: SD028000080

## MCH



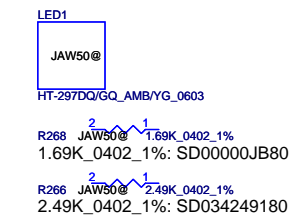
0.0402\_5%: SD028000080

## GM45-HDMI



0.1U\_0402\_16V7K: SE076104K80

## JAW50 LED



1.69K\_0402\_1%: SD00000JB80

2.49K\_0402\_1%: SD034249180

|   |            |                    |            |                          |                       |
|---|------------|--------------------|------------|--------------------------|-----------------------|
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