

MODEL NAME : VAW01  
PROJECT CODE : ANRVAW0100  
PCB NO : LA-9101P (Mars Pro)

DA60000UT00 LA-9101P M/B  
DA40001FO00 LS-9101P POWER BUTTON/B  
DA40001FP00 LS-9102P USB/B  
DA40001FQ00 LS-9103P TP BUTTON/B



ZZZ R1@  
PCB VAW01 LA-9101P LS-9101P/9102P/9103P  
DAZ0U500100



ZZZ GCER3@  
PCB VAW01 LA-9101P LS-9101P/9102P/9103P GOLD A31 !  
DAZ0U500101



ZZZ TRIR3@  
PCB VAW00 LA-9101P LS-9101P/9102P/9103P TRIPOD A31 !  
DAZ0U500102



ZZZ HANNR3@  
PCB VAW00 LA-9101P LS-9101P/9102P/9103P HANNSTARB A31 !  
DAZ0U500103



ZZZ ZDTR3@  
PCB VAW00 LA-9101P LS-9101P/9102P/9103P ZDT A31 !  
DAZ0U500104

# Dell / Compal Confidential

## Schematic Document

### Intel Chief River

### Ivy Bridge (BGA) + Panther Point

### OAK 15" UMA/DIS AMD Mars Pro

2012-08-22

Rev: 0.4

46@ : for 46 level

@ : Nopop Component

CONN@ : Connector Component

KB9012@ : ENE KB9012 Implemented

UMA@ : Only for UMA

EMC@ : EMI/ESD parts

GCLK@ : Green CLK implemented

GCLKUMA@ : Green CLK for UMA

GCLKDIS@ : Green CLK for DIS

XTAL@ : X'tal implemented

XTALDIS@ : X'tal with DIS implemented

R1@ : R1 P/N

R3@ : R3 P/N

i3R1@ : CPU i3-3217 1.8G

i3VOSR1@ : CPU i3-2365 1.4G

i5R1@ : CPU i5-3317 1.7G

i7R1@ : CPU i7-3517 1.9G

CEL1@ : CPU Celeron 887 1.5G

PENR1@ : CPU Pentium 997 1.6G

DIS@ : Only for Discrete

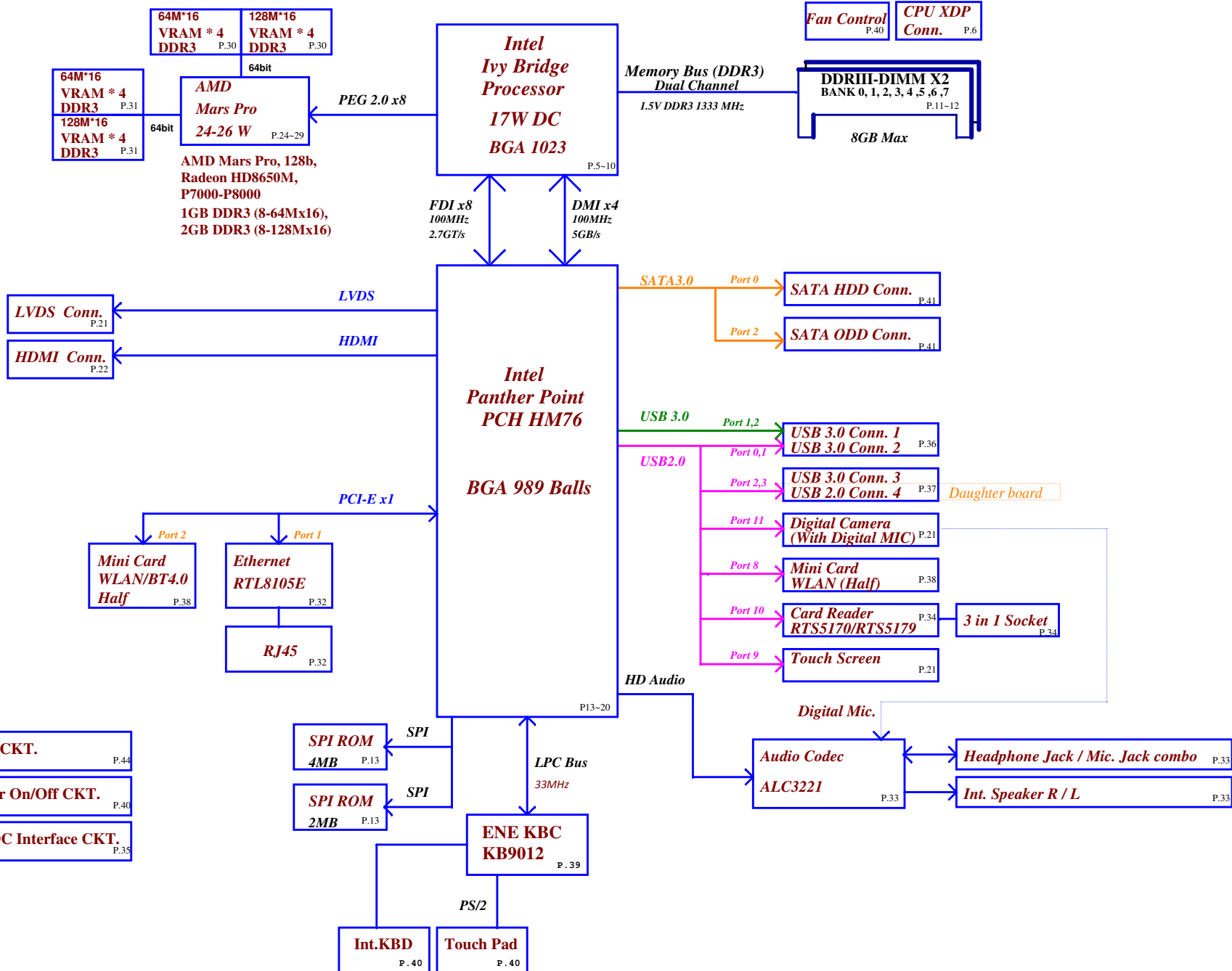
TH@/THR1@ : Thames-XT

MS@/MSR1@ : Mars Pro

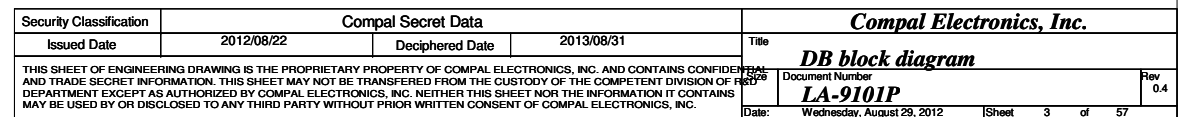
X76@ :

SPI-ROM & VRAM Group

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            |                          |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|------------|--------------------------|----------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data |                 |            | Compal Electronics, Inc. |                            |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22         | Deciphered Date | 2013/08/31 | Title                    | Cover Page                 |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Date                     | Wednesday, August 28, 2012 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Sheet                    | 1 of 57                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Rev                      | 0.4                        |



**Project Code : VAW01**  
**File Name : LA-9101P**



Board ID Table for AD channel

|          |             |             |             |             |           |
|----------|-------------|-------------|-------------|-------------|-----------|
| Vcc      | 3.3V +/- 5% |             |             |             |           |
| Ra       | 100K +/- 5% |             |             |             |           |
| Board ID | Rb          | VAD_BID min | VAD_BID typ | VAD_BID max | EC AD3    |
| 0        | 0           | 0 V         | 0 V         | 0.155 V     | 0x00-0x0C |
| 1        | 8.2K +/- 5% | 0.168 V     | 0.250 V     | 0.362 V     | 0x0D-0x1C |
| 2        | 18K +/- 5%  | 0.375 V     | 0.503 V     | 0.621 V     | 0x1D-0x30 |
| 3        | 33K +/- 5%  | 0.634 V     | 0.819 V     | 0.945 V     | 0x31-0x49 |
| 4        | 56K +/- 5%  | 0.958 V     | 1.185 V     | 1.359 V     | 0x4A-0x69 |
| 5        | 100K +/- 5% | 1.372 V     | 1.650 V     | 1.838 V     | 0x6A-0x8E |
| 6        | 200K +/- 5% | 1.851 V     | 2.200 V     | 2.420 V     | 0x8F-0xBB |
| 7        | NC          | 2.433 V     | 3.300 V     | 3.300 V     | 0xBC-0xFF |

BOARD ID Table

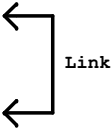
|      |              |
|------|--------------|
| ID   | PCB Revision |
| 0    | 0.1          |
| 1    | 0.1          |
| 2    | 0.2          |
| 3    | 0.2          |
| 4    | 0.3          |
| 5    | 0.4          |
| 6    | 1.0          |
| 7    | 1.0          |
| UMA  | THM          |
| MARS |              |

Project ID Table

|    |                  |
|----|------------------|
| ID | Project Revision |
| 0  |                  |
| 1  |                  |
| 2  |                  |
| 3  |                  |
| 4  |                  |
| 5  | UMA              |
| 6  | DIS THAMES       |
| 7  | DIS MARS PRO     |

SMBUS Control Table

|                             | SOURCE | MINI1 | MINI2 | BATT | SODIMM | Express Card | Thermal Sensor | FFS | VGA Thermal Sensor | VGA | XDP | Charger |
|-----------------------------|--------|-------|-------|------|--------|--------------|----------------|-----|--------------------|-----|-----|---------|
| EC_SMB_CK1<br>EC_SMB_DA1    | KB9012 |       |       | V    |        |              |                |     |                    |     |     | V       |
| EC_SMB_CK2<br>EC_SMB_DA2    | KB9012 |       |       |      |        |              |                |     | V                  | V   |     |         |
| PCH_SML0CLK<br>PCH_SML0DATA | PCH    |       |       |      |        |              |                |     |                    |     |     |         |
| PCH_SML1CLK<br>PCH_SML1DATA | PCH    |       |       |      |        |              |                |     |                    |     |     |         |
| MEM_SMBCLK<br>MEM_SMBDATA   | PCH    | V     | V     |      | V      | V            |                | V   |                    |     | V   |         |



|     |           |                  |
|-----|-----------|------------------|
| PCH | USB PORT# | DESTINATION      |
|     | 0         | USB conn.2       |
|     | 1         | USB conn.1       |
|     | 2         | USB conn.3       |
|     | 3         | USB conn.4 (DB)  |
|     | 4         | NC               |
|     | 5         | NC               |
|     | 6         | NC               |
|     | 7         | NC               |
|     | 8         | MINI CARD (WLAN) |
|     | 9         | Touch Screen     |
|     | 10        | Card Reader      |
|     | 11        | Camera           |
|     | 12        | NC               |
|     | 13        | NC               |

|     |              |                |             |             |
|-----|--------------|----------------|-------------|-------------|
| CLK | DIFFERENTIAL | DESTINATION    | FLEX CLOCKS | DESTINATION |
|     | CLKOUT_PCIE0 | 10/100 LAN     | CLKOUTFLEX0 | None        |
|     | CLKOUT_PCIE1 | MINI CARD WLAN | CLKOUTFLEX1 | None        |
|     | CLKOUT_PCIE2 | None           | CLKOUTFLEX2 | None        |
|     | CLKOUT_PCIE3 | None           | CLKOUTFLEX3 | None        |
|     | CLKOUT_PCIE4 | None           |             |             |
|     | CLKOUT_PCIE5 | None           |             |             |
|     | CLKOUT_PCIE6 | None           |             |             |
|     | CLKOUT_PCIE7 | None           |             |             |
|     | CLKOUT_PEG_B | None           |             |             |

|        |              |
|--------|--------------|
| CLKOUT | DESTINATION  |
| PCI0   | PCH_LOOPBACK |
| PCI1   | EC LPC       |
| PCI2   | None         |
| PCI3   | None         |
| PCI4   | None         |

|       |             |
|-------|-------------|
| SATA  | DESTINATION |
| SATA0 | HDD         |
| SATA1 | None        |
| SATA2 | ODD         |
| SATA3 | None        |
| SATA4 | None        |
| SATA5 | None        |

|             |                  |
|-------------|------------------|
| PCI EXPRESS | DESTINATION      |
| Lane 1      | 10/100 LAN       |
| Lane 2      | MINI CARD (WLAN) |
| Lane 3      | None             |
| Lane 4      | None             |
| Lane 5      | None             |
| Lane 6      | None             |
| Lane 7      | None             |
| Lane 8      | None             |

Symbol Note :

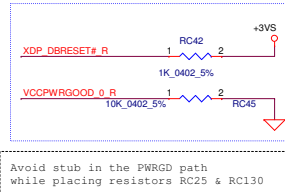
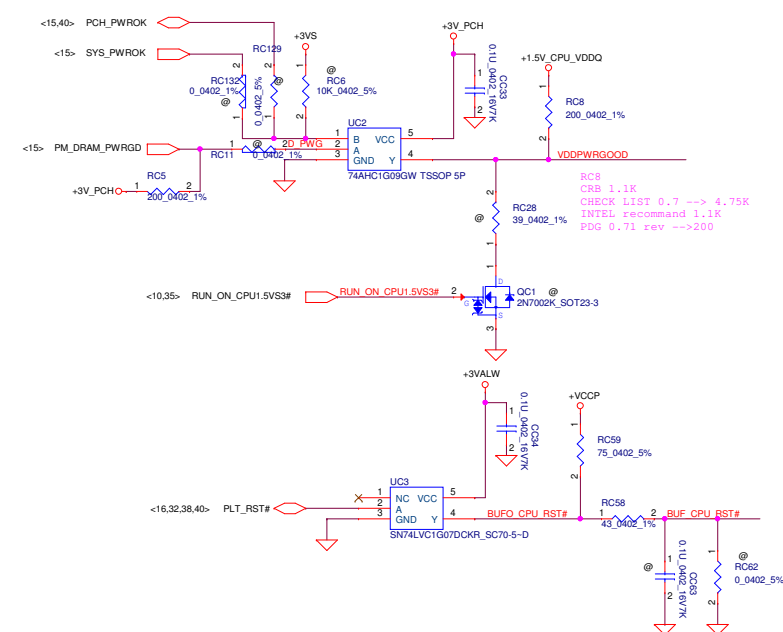


: means Digital Ground

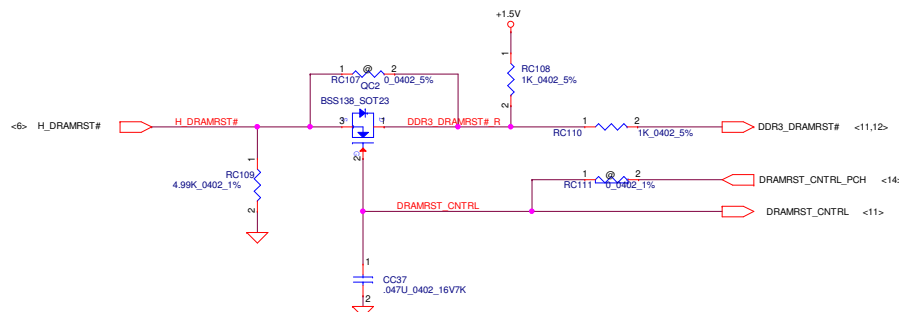
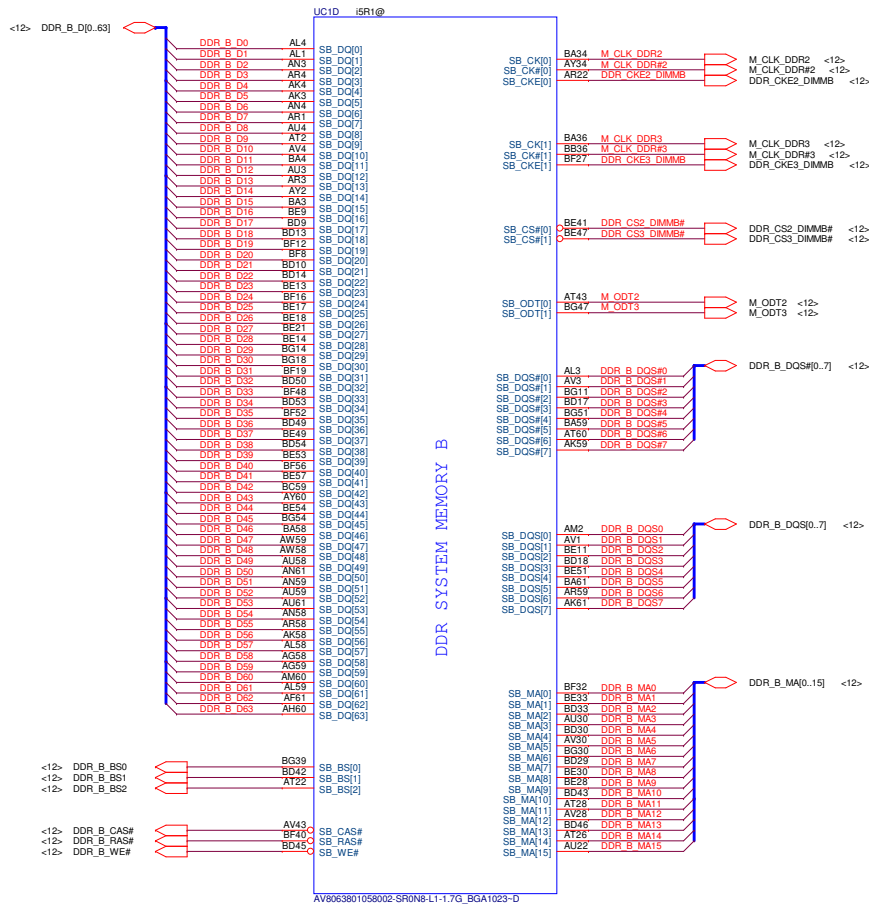
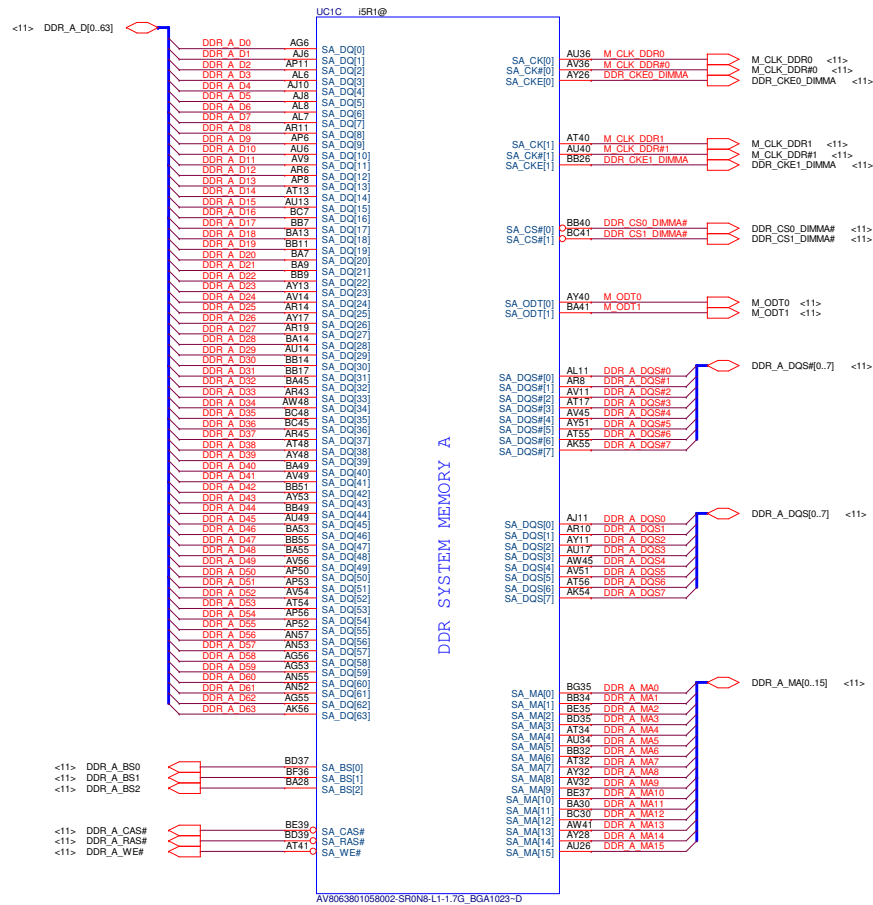


: means Analog Ground





|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                                                            |                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|------------------------------------------------------------|---------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc.                                   |                           |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | Title                                                      | PROCESSOR(2/6) PM,XDP,CLK |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | LA-9101P<br>Date: Wednesday, August 29, 2012 Sheet 6 of 57 |                           |



CFG2

RC116  
1K\_0402\_1%

CFG2

CFG2

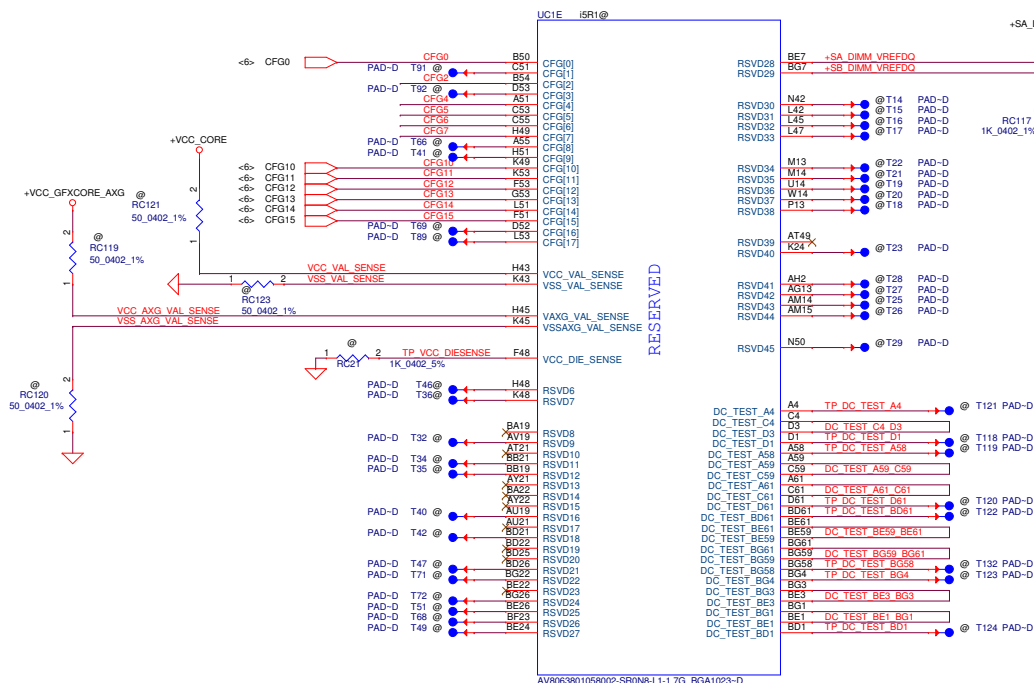
1:(Default) Normal Operation; Lane #  
definition matches socket pin map definition

\*0:Lane Reversed

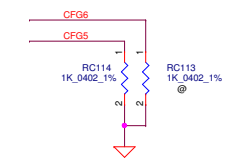
CFG4

RC112  
1K\_0402\_1%

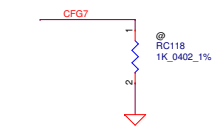
CFG4



| Display Port Presence Strap |                                                                                                                                                                                 |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CFG4                        | <p>★ 1 : Disabled; No Physical Display Port attached to Embedded Display Port</p> <p>0 : Enabled; An external Display Port device is connected to the Embedded Display Port</p> |



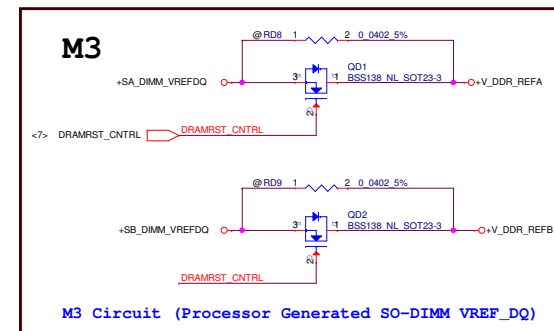
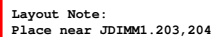
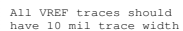
| PCIE Port Bifurcation Straps |                                                                                                                                                                                                                                                       |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CFG[6:5]                     | 11: (Default) x16 - Device 1 functions 1 and 2 disabled<br>*10: x8, x8 - Device 1 function 1 enabled ; function 2 disabled<br>01: Reserved - (Device 1 function 1 disabled ; function 2 enabled)<br>00: x8,x4,x4 - Device 1 functions 1 and 2 enabled |



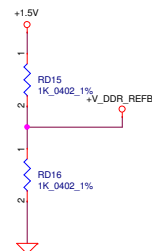
| PEG DEFER TRAINING |                                                                                                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------|
| CFG7               | <p>*1: (Default) PEG Train immediately following xxRESETB de assertion</p> <p>0: PEG Wait for BIOS for training</p> |



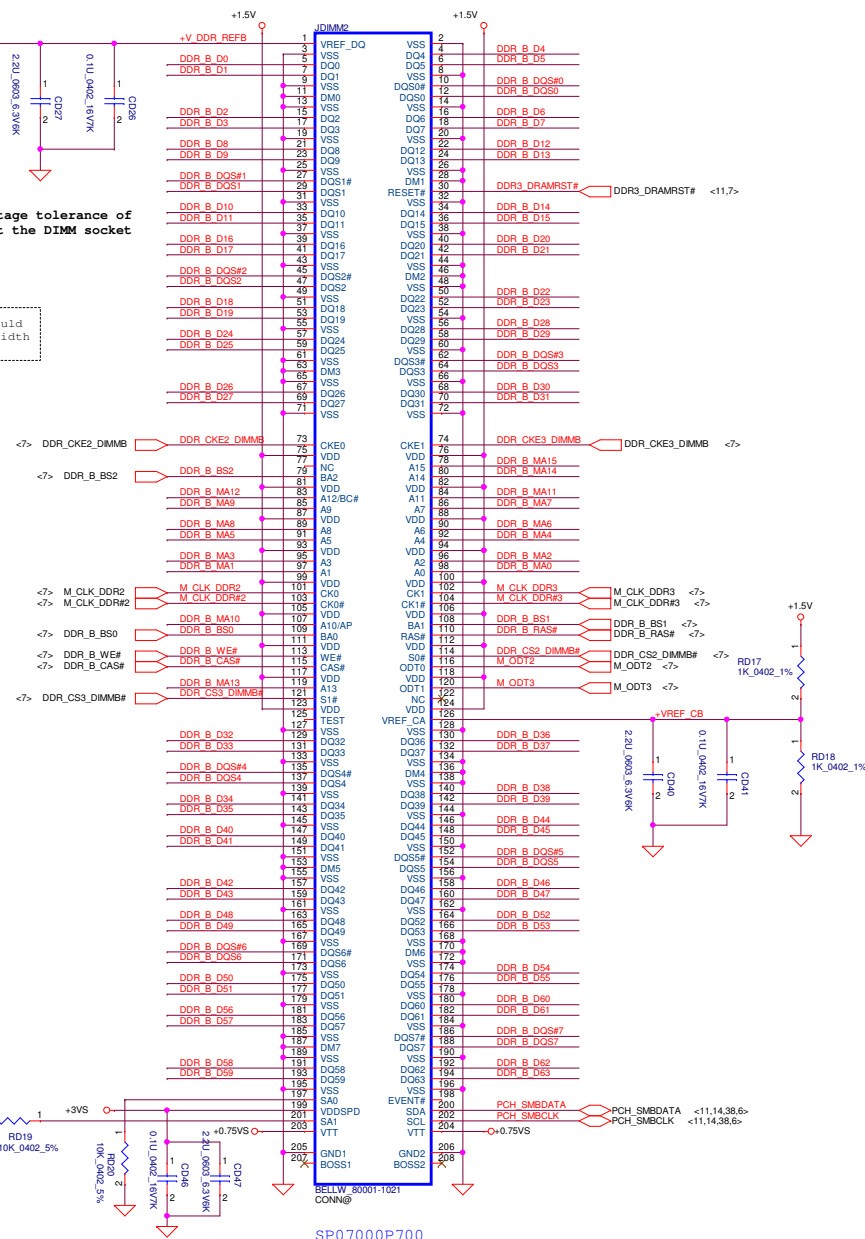
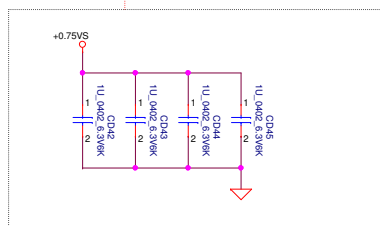
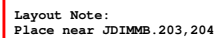




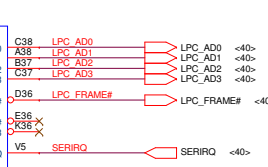
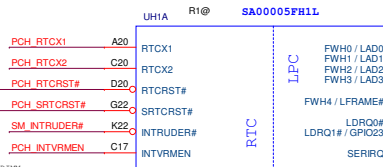
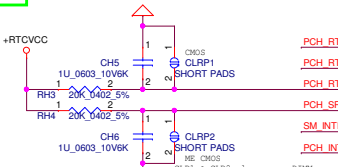
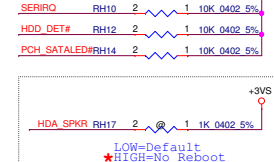
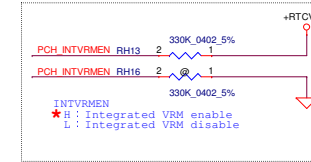
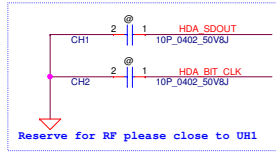
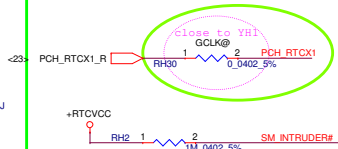
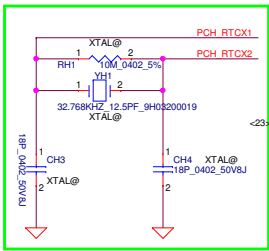
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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|----------------------------|--------------|----------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                    |            | Compal Secret Data |            | Compal Electronics, Inc.   |              |          |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                    |            | LA-9101P                   | 0.4          |          |
| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                    |            | Wednesday, August 23, 2012 | Sheet        | 11 of 57 |



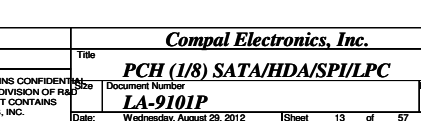
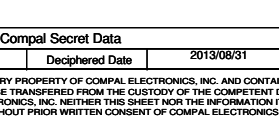
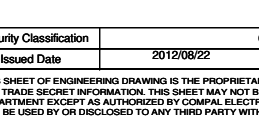
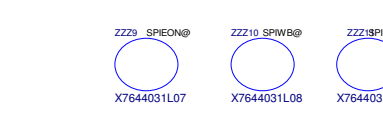
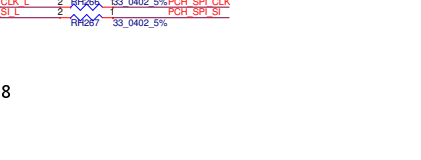
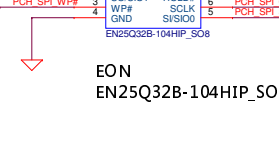
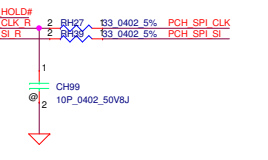
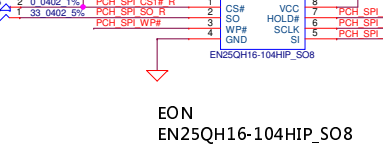
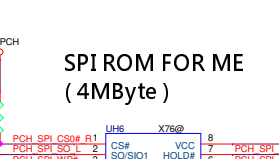
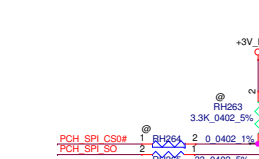
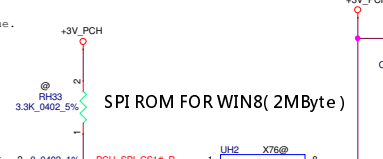
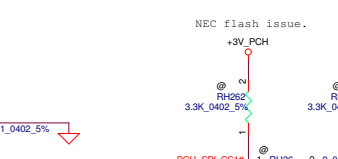
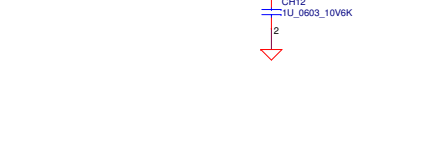
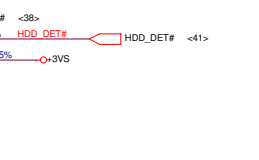
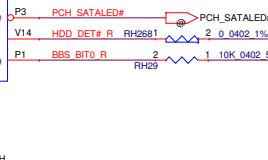
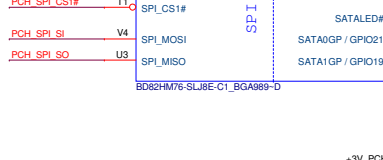
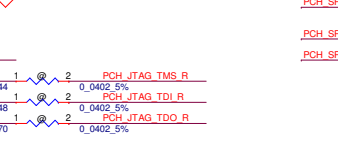
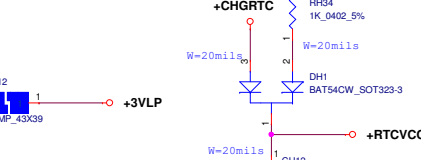
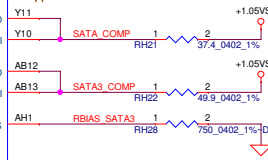
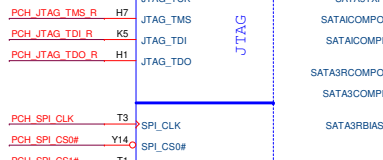
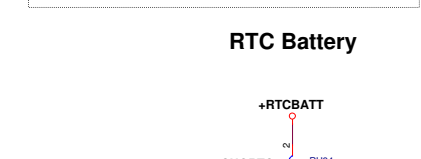
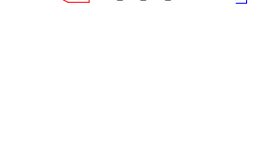
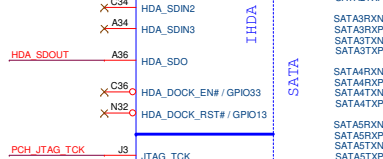
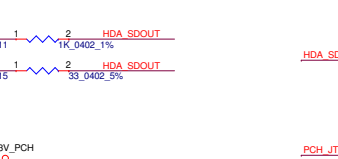
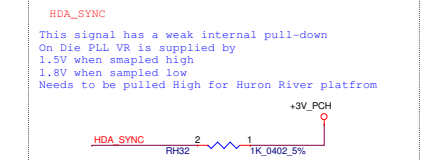
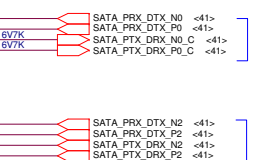
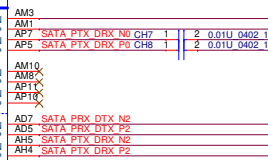
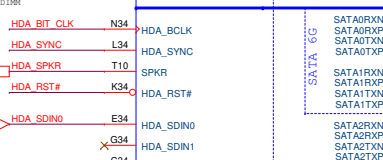
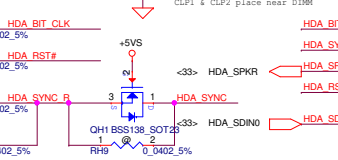
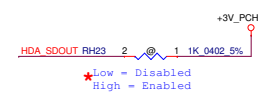
All VREF traces should have 10 mil trace width



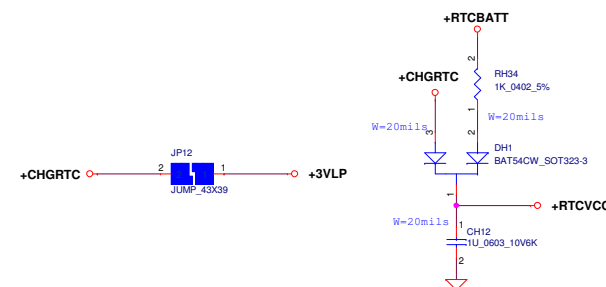
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                            |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|----------------------------|-----------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc.   |                 |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | Title                      | DDRIII DIMMB    |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | LA-9101P                   |                 |
| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                    |            | Wednesday, August 29, 2012 | Sheet 12 of 57  |



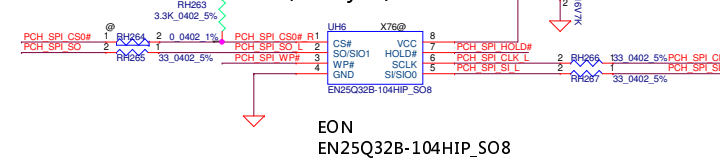
**HDA\_SDO**  
ME debug mode, this signal has a weak internal PD  
L=>security measures defined in the Flash  
Descriptor will be in effect (default)  
H=>Flash Descriptor Security will be overridden



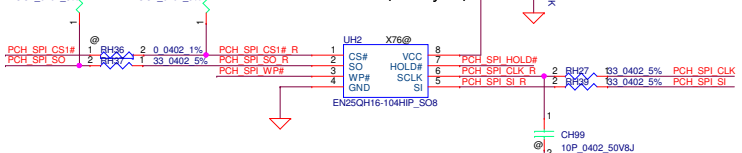
## RTC Battery



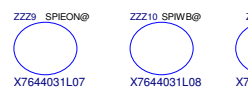
## SPI ROM FOR ME (4MByte)



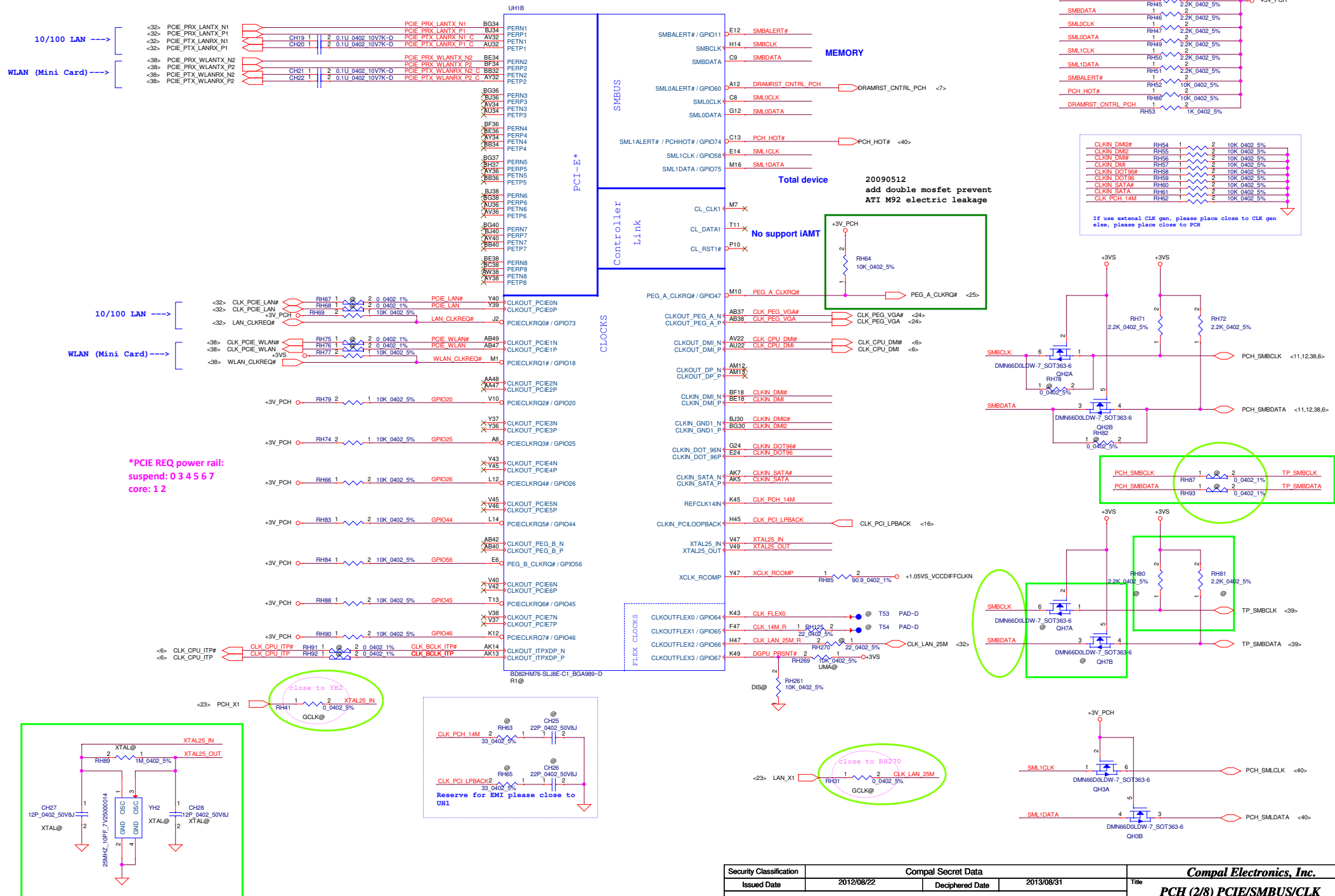
## SPI ROM FOR WIN8 (2MByte)

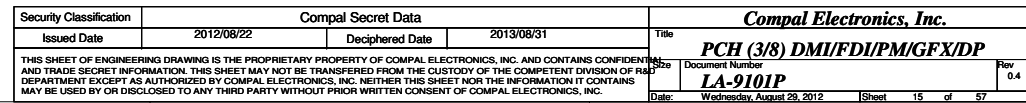


## EON EN25QH16-104HIP\_S08

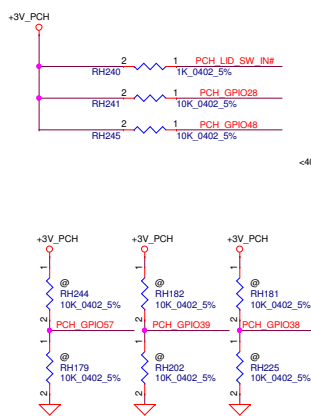


| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Title                      |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|----------------------------|----------------------------|
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | PCH (I/8) SATA/HDA/SPI/LPC |                            |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date                       | Wednesday, August 28, 2012 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                      | 13 of 57                   |



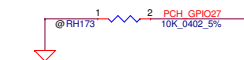
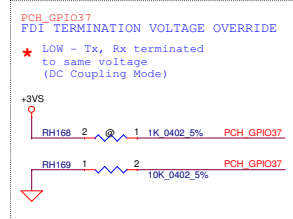
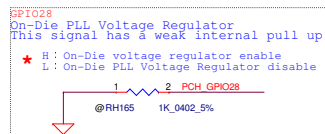




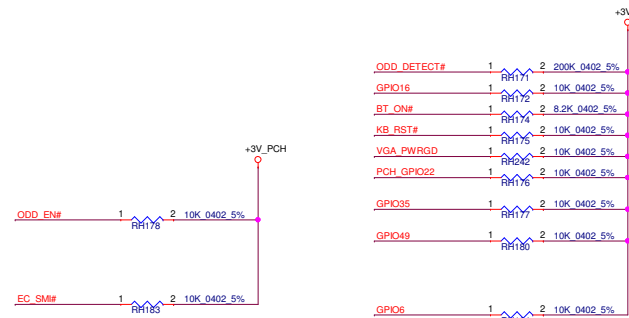
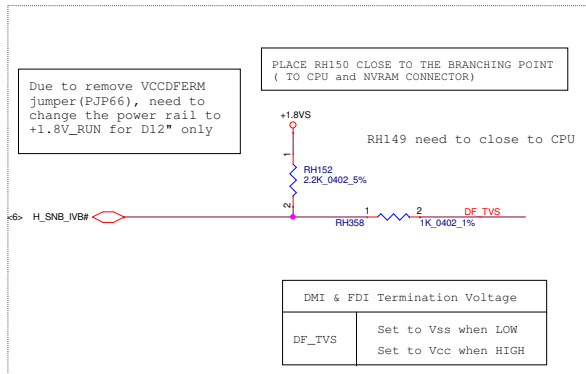
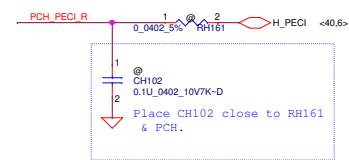
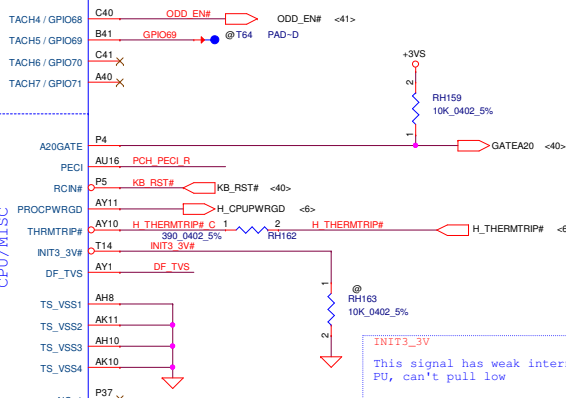
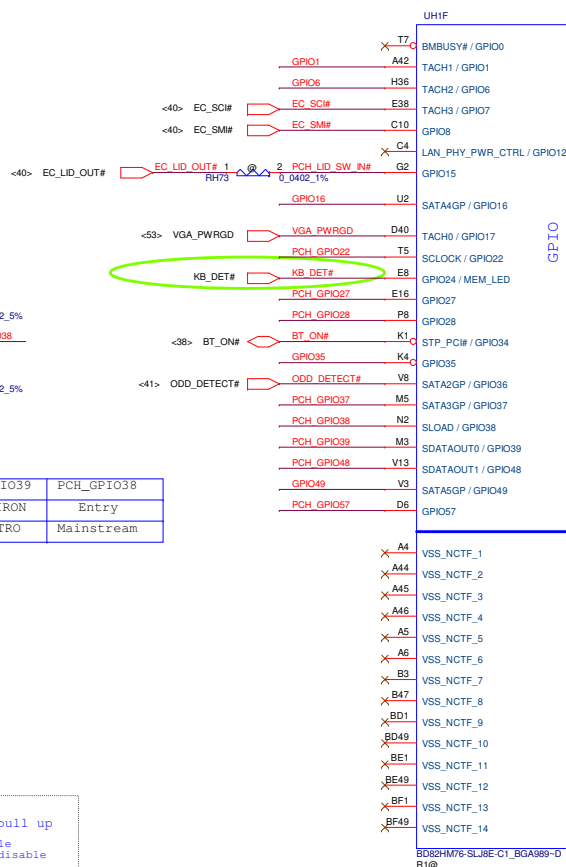


#### System ID

|      | PCH_GPIO57 | PCH_GPIO39 | PCH_GPIO38 |
|------|------------|------------|------------|
| LOW  | VAW00 15'' | INSPIRON   | Entry      |
| HIGH | VAW10 17'' | VOSTRO     | Mainstream |

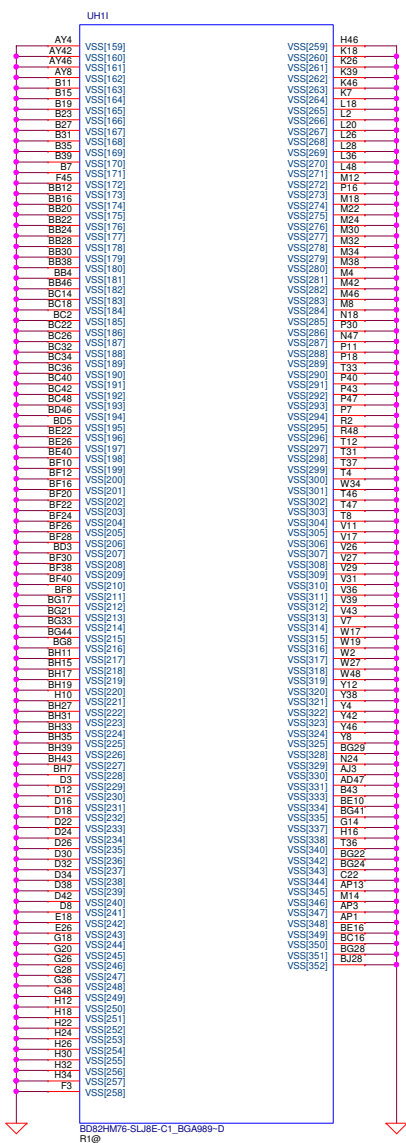
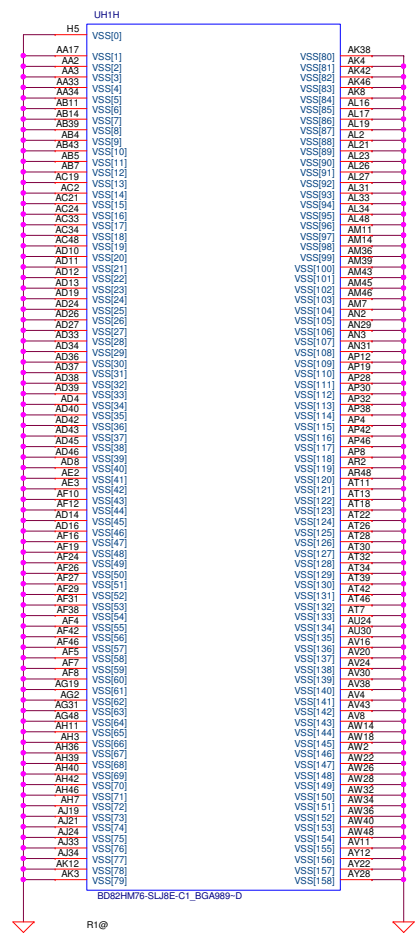


PCH\_GPIO28 needs to be connected to XDP\_FN8  
PCH\_GPIO35 needs to be connected to XDP\_FN9  
PCH\_GPIO15 needs to be connected to XDP\_FN16  
Please refer to Huron River Debug Board DG 0.5

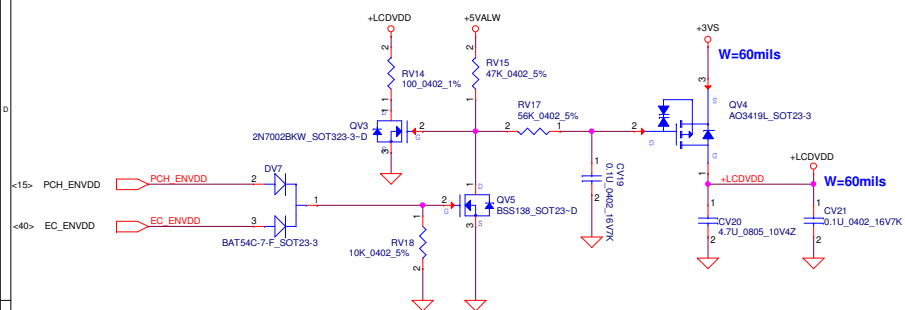




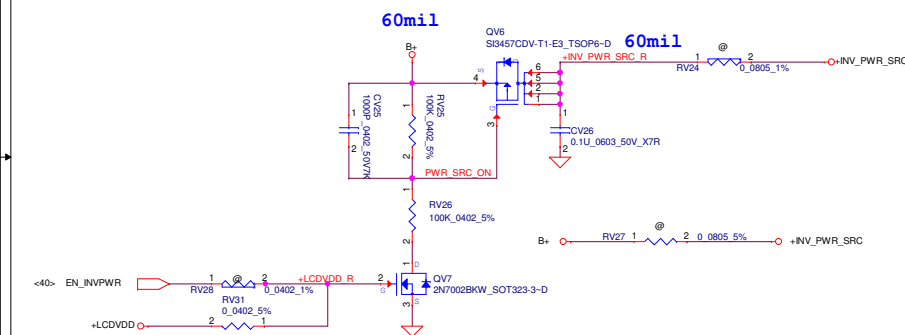




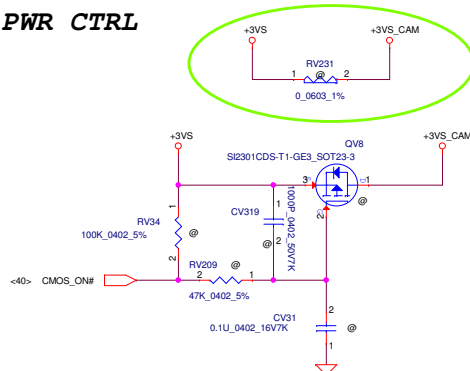
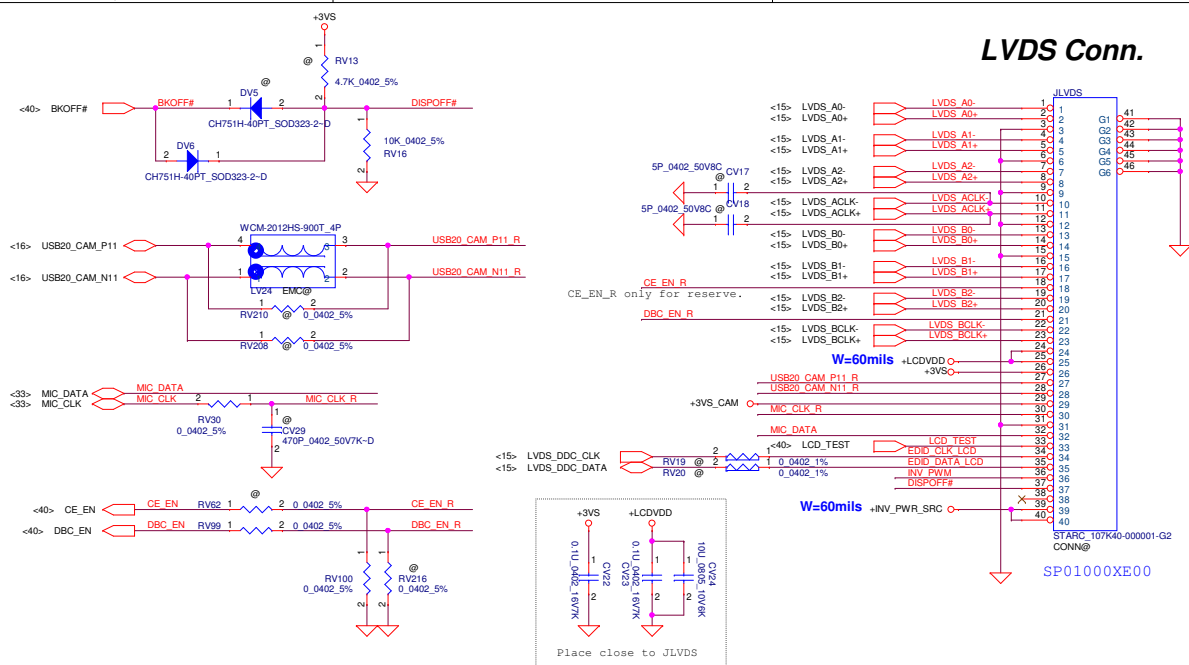
*LCD PWR CTRL*



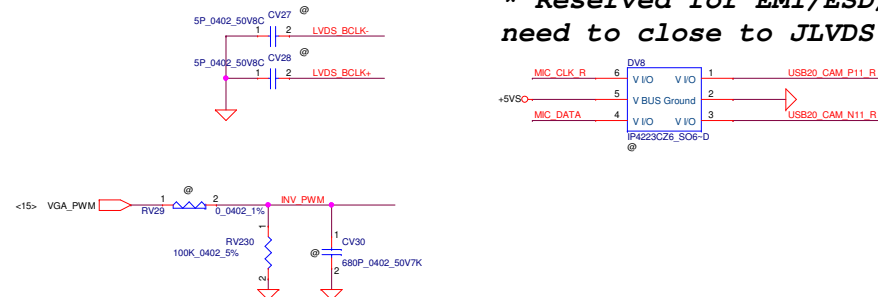
*LCD backlight PWR CTRL*



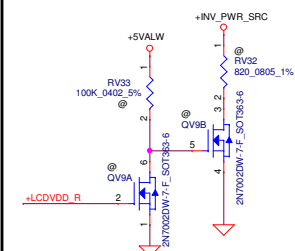
## Webcam PWR CTRL

**LVDS Conn.**

\* Reserved for EMI/ESD/RF  
need to close to JLVDS

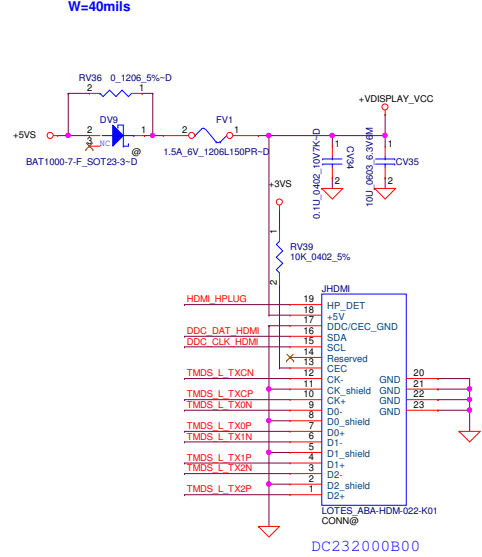
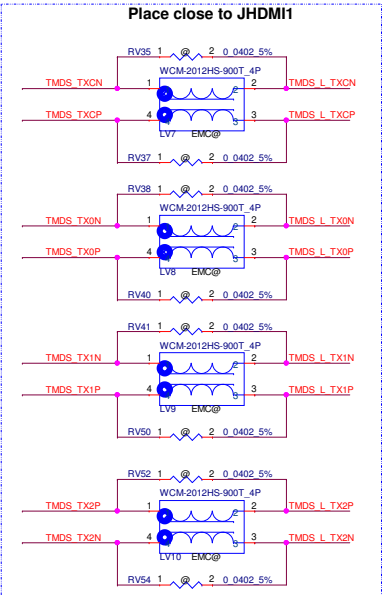
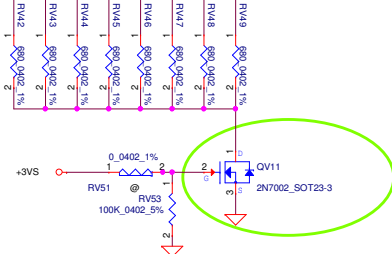


\* Reserved for LCD  
sequence tuning



|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                          |                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------|---------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc. |                           |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | Title                    | LVDS/webcam               |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | LA-9101P                 |                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date                     | Wednesday August 29, 2012 |

|      |              |      |   |   |      |      |         |           |
|------|--------------|------|---|---|------|------|---------|-----------|
| <15> | HDMI_A3N_VGA | CV32 | 2 | 1 | 0.1U | 0402 | 10V7K-D | TMDS TXCN |
| <15> | HDMI_A3P_VGA | CV33 | 2 | 1 | 0.1U | 0402 | 10V7K-D | TMDS TXCP |
| <15> | HDMI_A0N_VGA | CV36 | 2 | 1 | 0.1U | 0402 | 10V7K-D | TMDS TX0N |
| <15> | HDMI_A0P_VGA | CV37 | 2 | 1 | 0.1U | 0402 | 10V7K-D | TMDS TX0P |
| <15> | HDMI_A1N_VGA | CV38 | 2 | 1 | 0.1U | 0402 | 10V7K-D | TMDS TX1N |
| <15> | HDMI_A1P_VGA | CV39 | 2 | 1 | 0.1U | 0402 | 10V7K-D | TMDS TX1P |
| <15> | HDMI_A2N_VGA | CV40 | 2 | 1 | 0.1U | 0402 | 10V7K-D | TMDS TX2N |
| <15> | HDMI_A2P_VGA | CV41 | 2 | 1 | 0.1U | 0402 | 10V7K-D | TMDS TX2P |

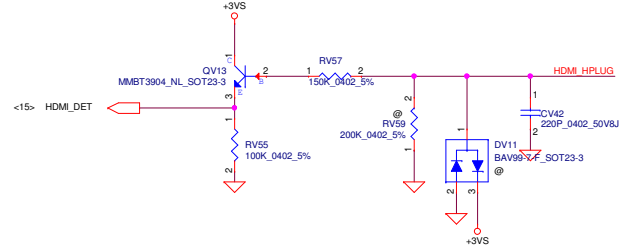
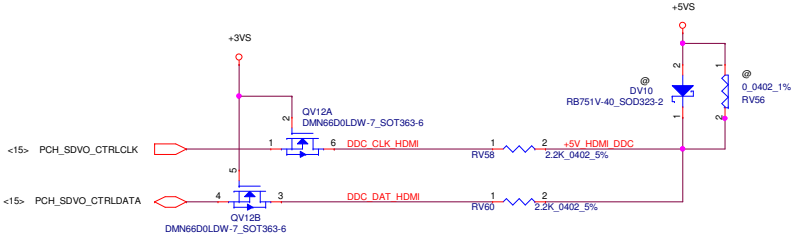


|           |        |   |   |                 |
|-----------|--------|---|---|-----------------|
| TMDS TXCN | @CV358 | 1 | 2 | 100P_0402_50V8J |
| TMDS TXCP | @CV360 | 1 | 2 | 100P_0402_50V8J |
| TMDS TX0N | @CV362 | 1 | 2 | 100P_0402_50V8J |
| TMDS TX0P | @CV363 | 1 | 2 | 100P_0402_50V8J |
| TMDS TX1N | @CV359 | 1 | 2 | 100P_0402_50V8J |
| TMDS TX1P | @CV357 | 1 | 2 | 100P_0402_50V8J |
| TMDS TX2N | @CV361 | 1 | 2 | 100P_0402_50V8J |
| TMDS TX2P | @CV364 | 1 | 2 | 100P_0402_50V8J |

20111024 EMI ADD

|             |       |   |   |                   |
|-------------|-------|---|---|-------------------|
| TMDS L_TXCN | CV349 | 1 | 2 | 3.3P_0402_50V8C-D |
| TMDS L_TXCP | CV350 | 1 | 2 | 3.3P_0402_50V8C-D |
| TMDS L_TX0N | CV351 | 1 | 2 | 3.3P_0402_50V8C-D |
| TMDS L_TX0P | CV352 | 1 | 2 | 3.3P_0402_50V8C-D |
| TMDS L_TX1N | CV353 | 1 | 2 | 3.3P_0402_50V8C-D |
| TMDS L_TX1P | CV354 | 1 | 2 | 3.3P_0402_50V8C-D |
| TMDS L_TX2N | CV355 | 1 | 2 | 3.3P_0402_50V8C-D |
| TMDS L_TX2P | CV356 | 1 | 2 | 3.3P_0402_50V8C-D |

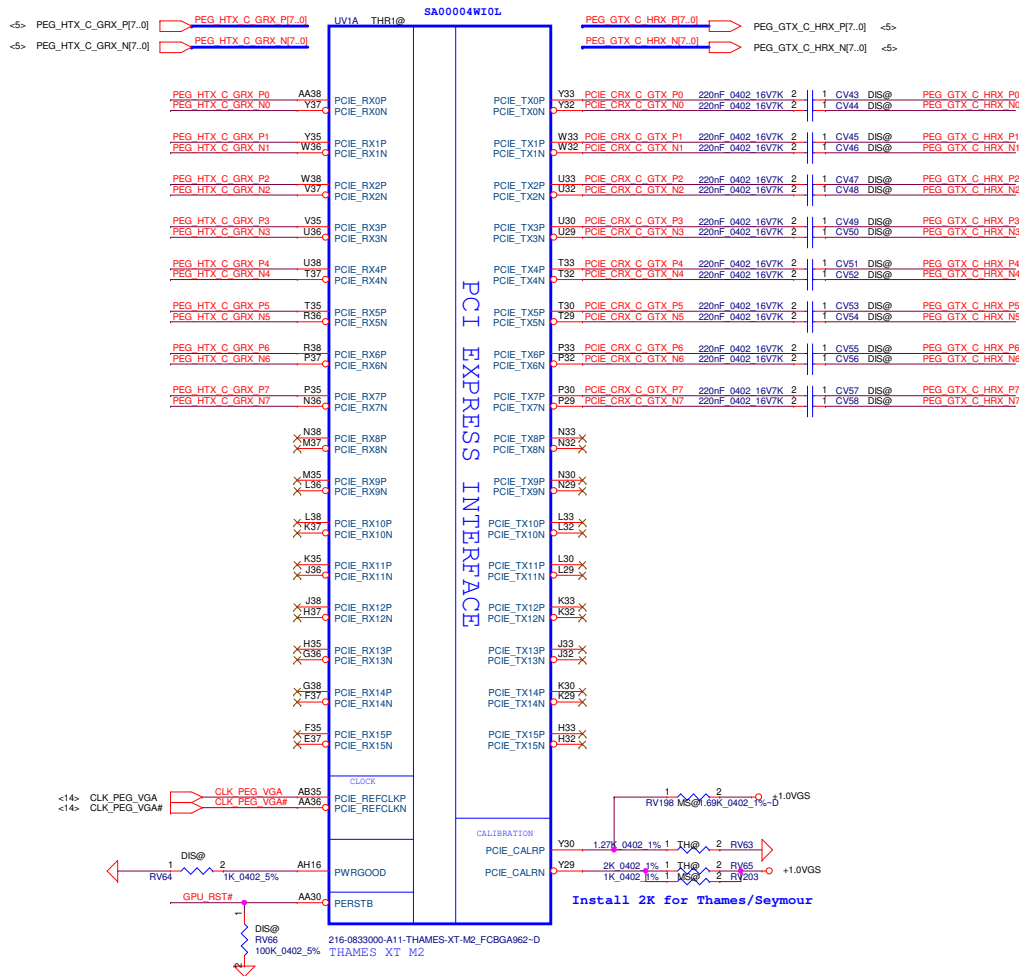
20110805 EMI ADD



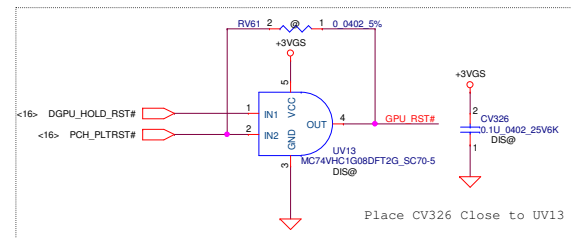
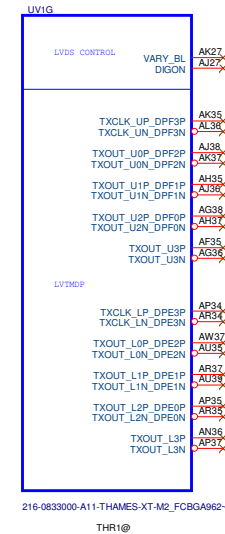
|             |                         |
|-------------|-------------------------|
| 46@         | ROYALTY HDMI W/LOGO     |
| Part Number | Description             |
| 8000000023M | HDMI W/Logo:8000000023M |



# GFX PCIE LANE REVERSAL



## LVDS Interface



SA00004W11L

216-0833000-A11-THAMES-XT-M2\_FCBGA962-D



SA00005X10L

MARS-PRO\_FCBGA962-D



SA00005X10L

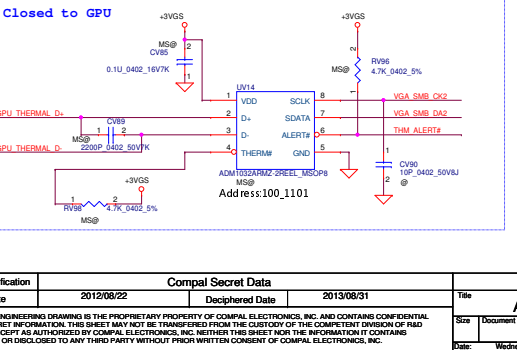
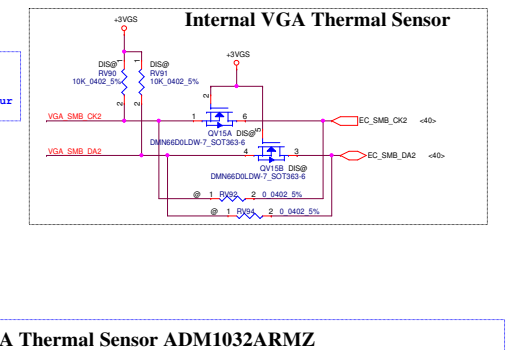
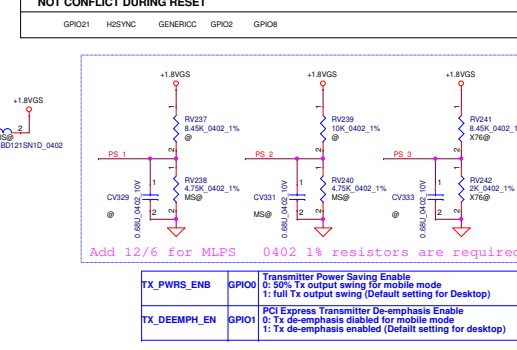
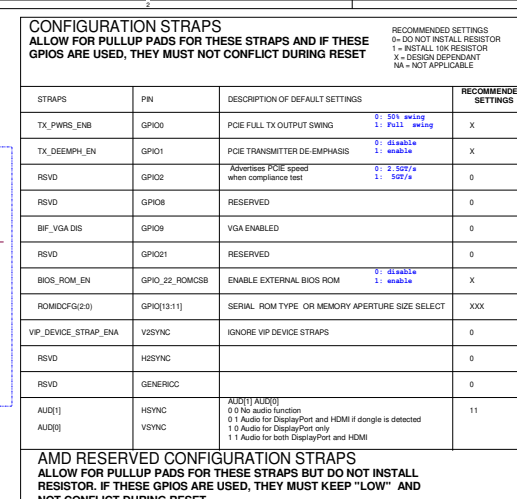
MARS-PRO\_FCBGA962-D



Chelsea Pro

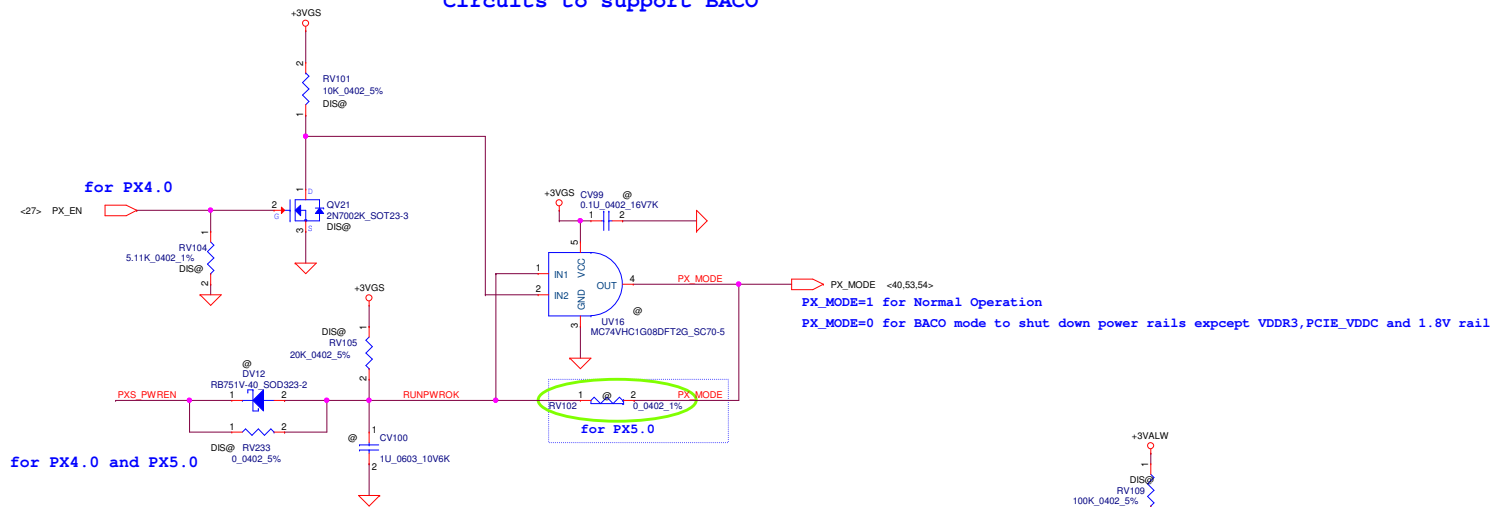
Chelsea Pro

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                           |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|---------------------------|----------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Title                     |                            |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | ATI ThamesXT M2 PCIE/LVDS |                            |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date                      | Wednesday, August 28, 2012 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                     | 24 of 57                   |



55mA@1.0V, in BACO mode

## Circuits to support BACO



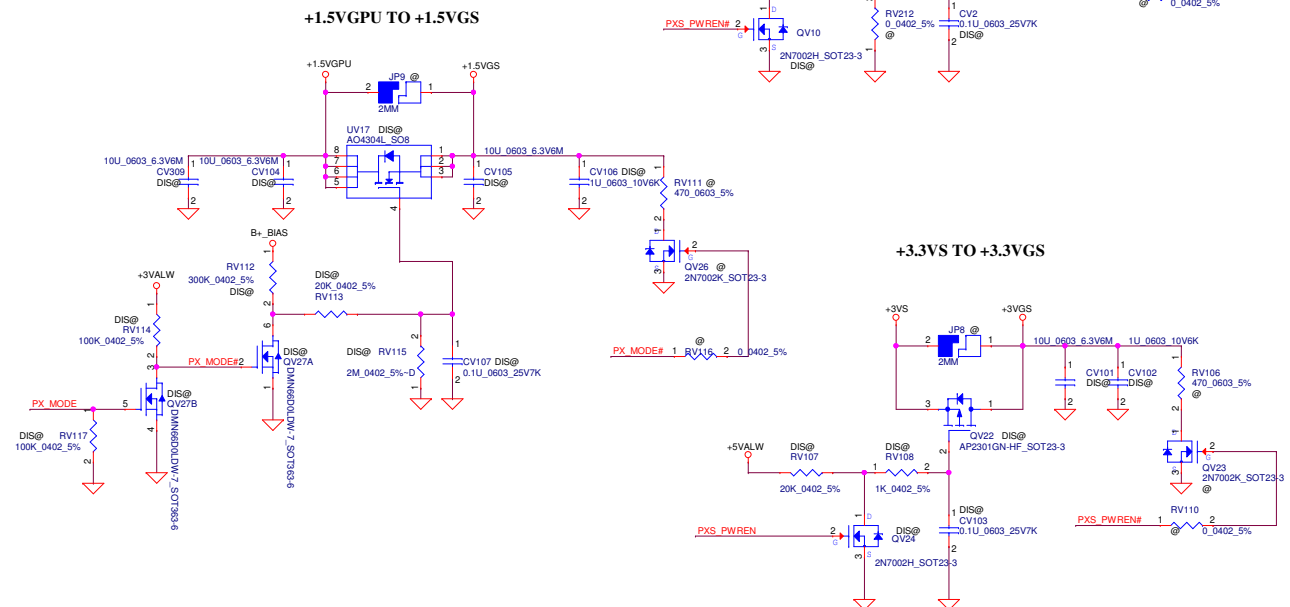
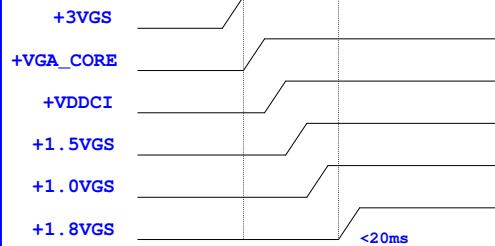
## Note:

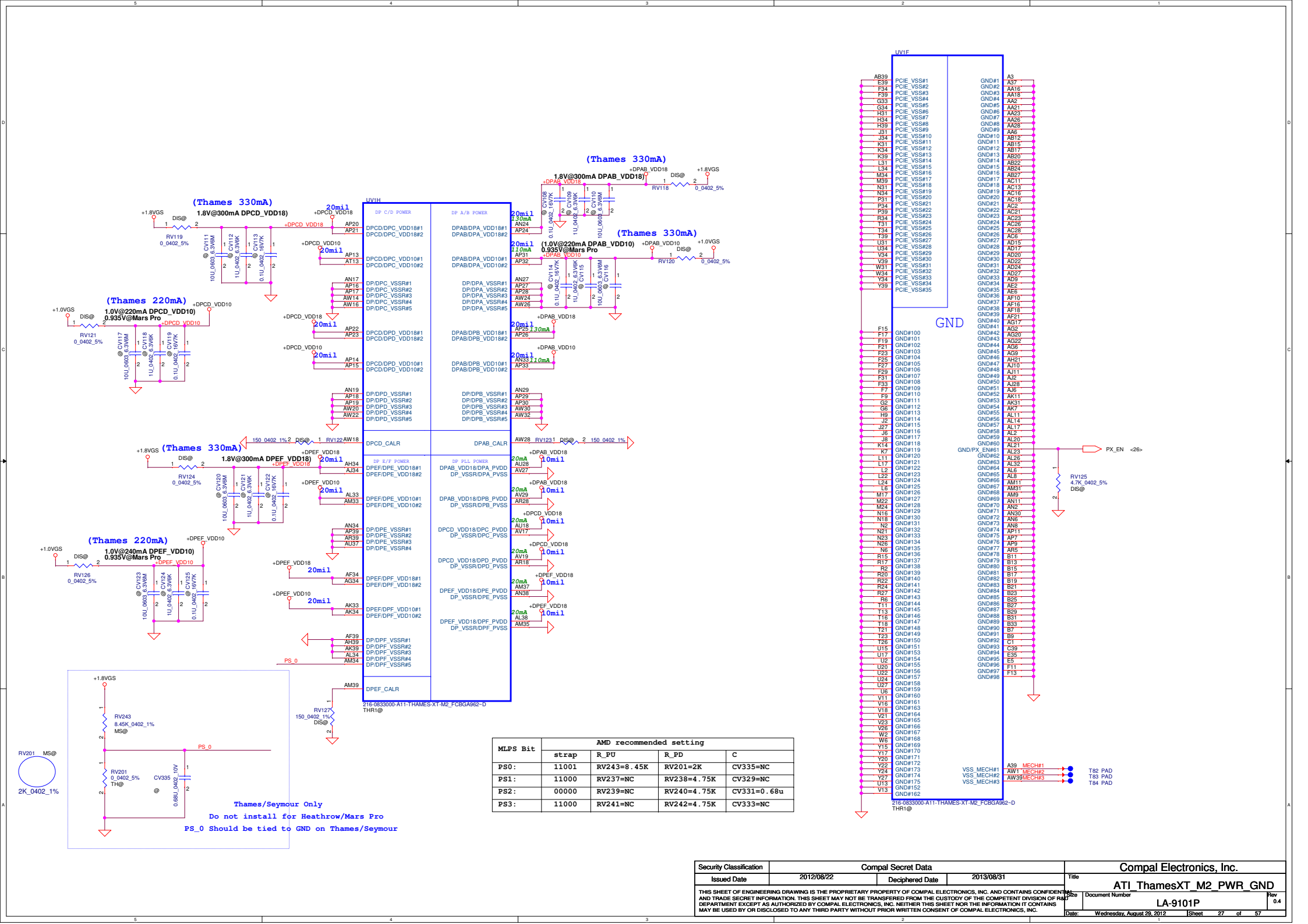
PX4.0 +VGA\_CORE, VDDCI, +1.5VGS ON

PX4.0 +3VGS, +1.0VGS, +1.8VGS OFF

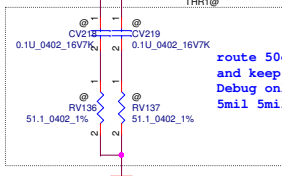
PX5.0 +3VGS, +VGA\_CORE, VDDCI, +1.5VGS, +1.0VGS, +1.8VGS OFF

## Power Sequence of Thames and Mars Pro



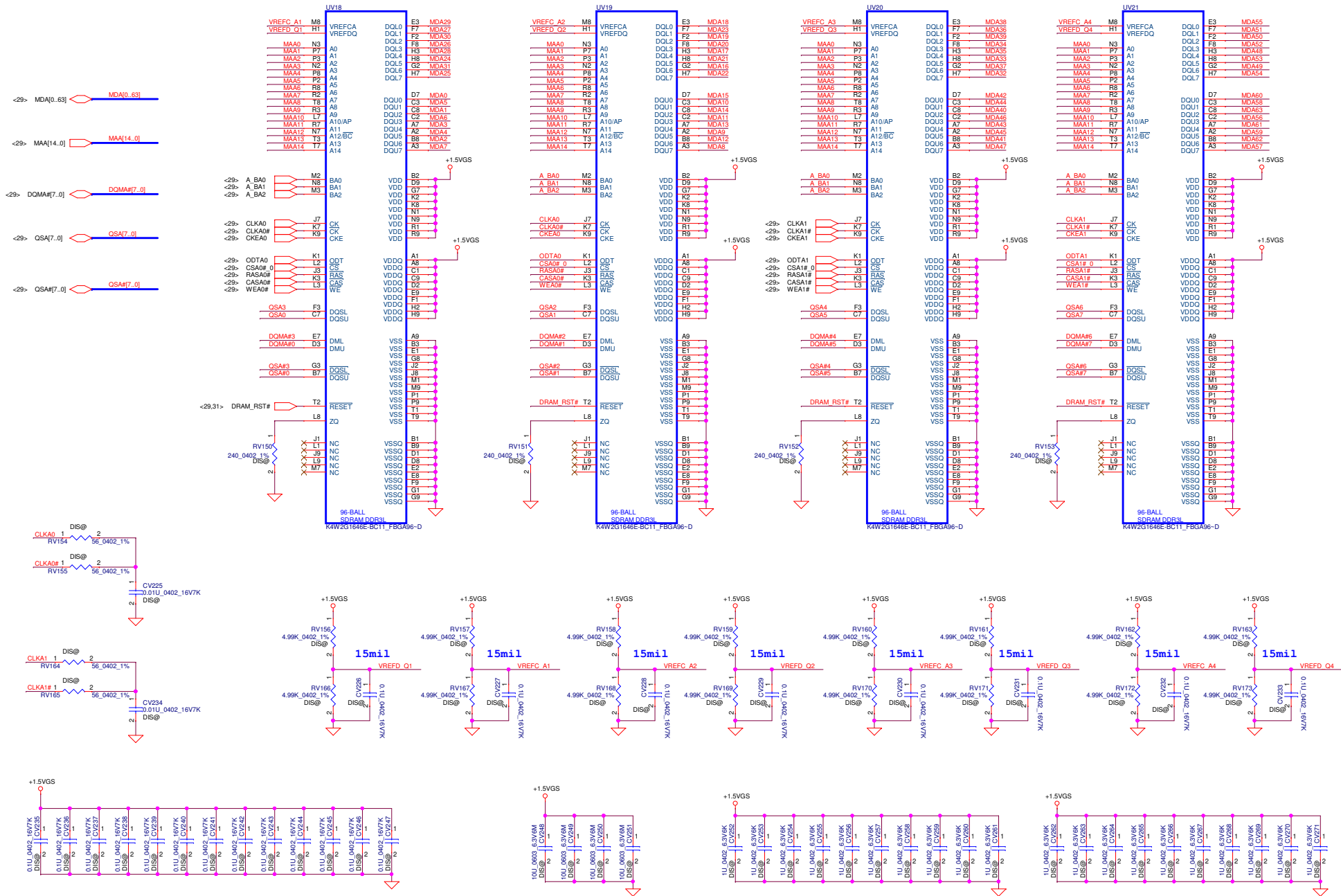




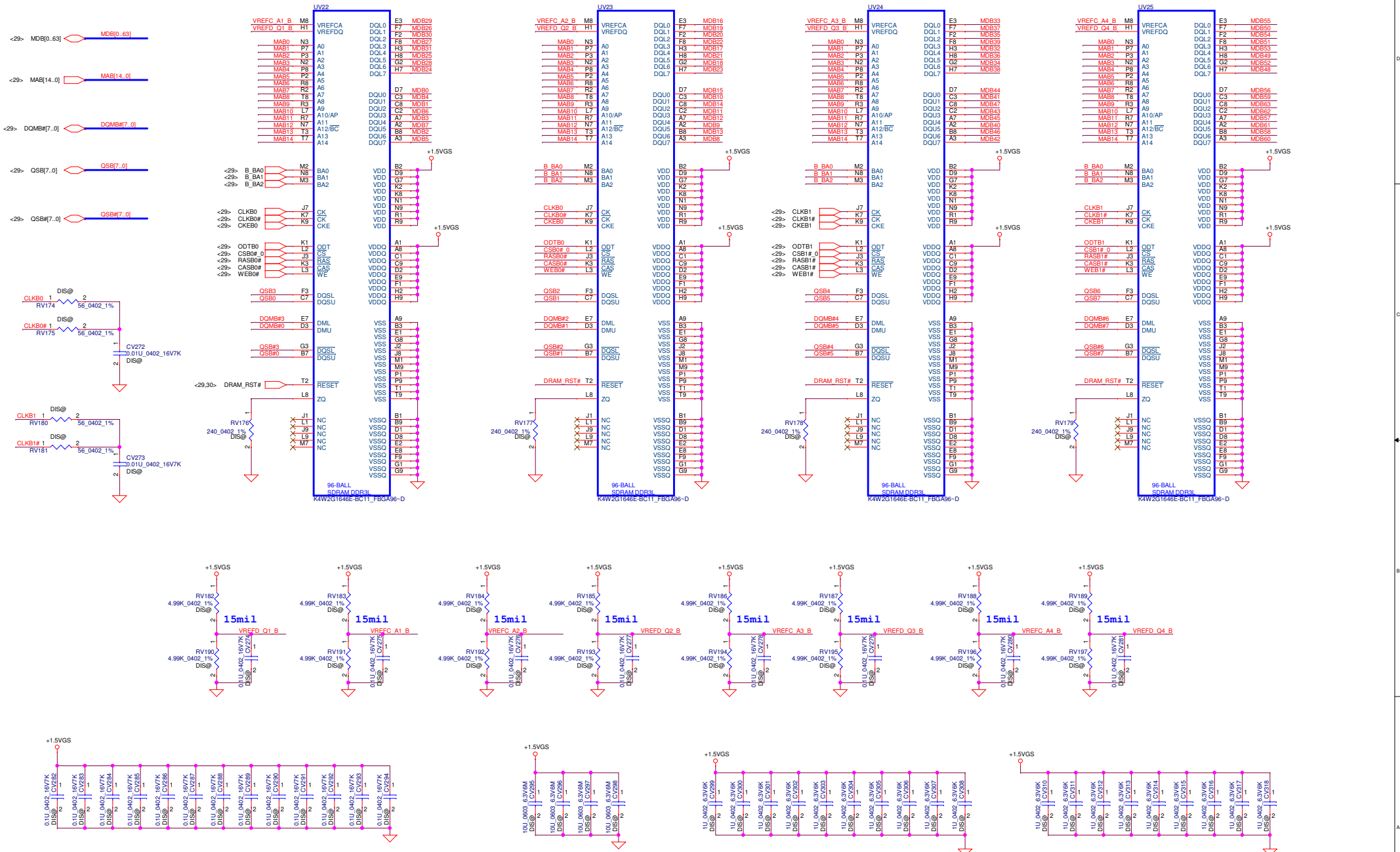


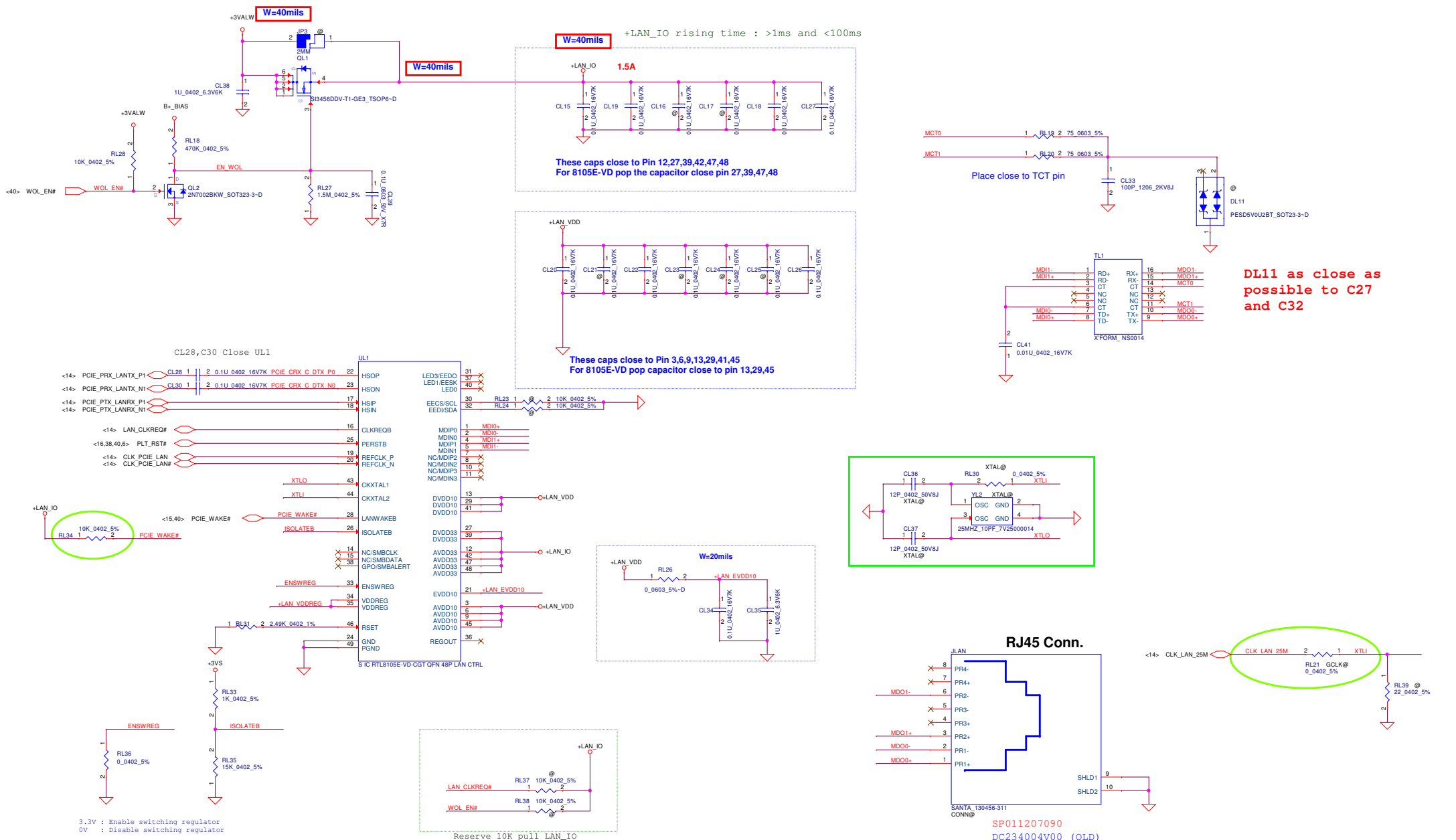
|                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                            |                 |                          |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------|-----------------|--------------------------|------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | Compal Secret Data         |                 | Compal Electronics, Inc. |                        |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                |  | 2012/08/22                 | Deciphered Date | 2013/08/31               | Title                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                            |                 |                          | AT1 ThamesXT_M2 MEM IF |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                            |                 | LA-9101P                 | 0.4                    |
| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Wednesday, August 29, 2012 |                 | Sheet                    | 29 of 57               |

# CHANNEL A: 256MB/512MB DDR3

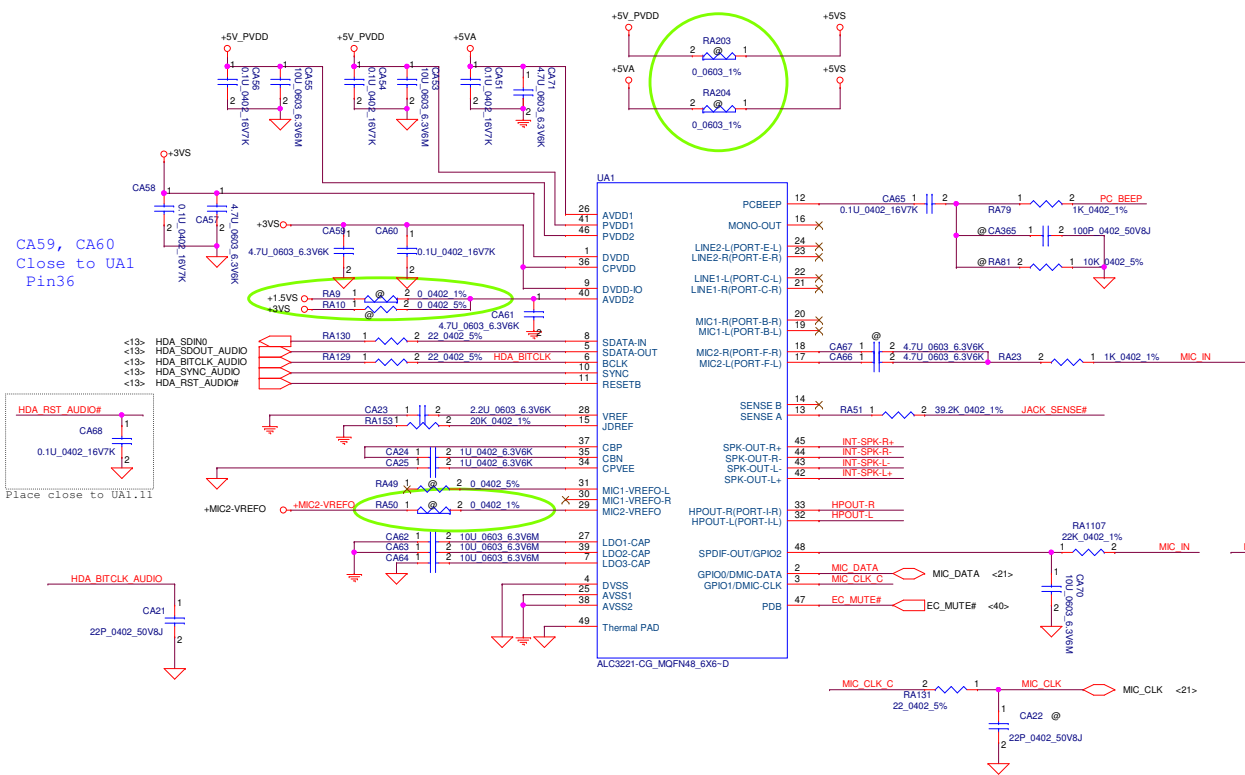


# CHANNEL B: 256MB/512MB DDR3

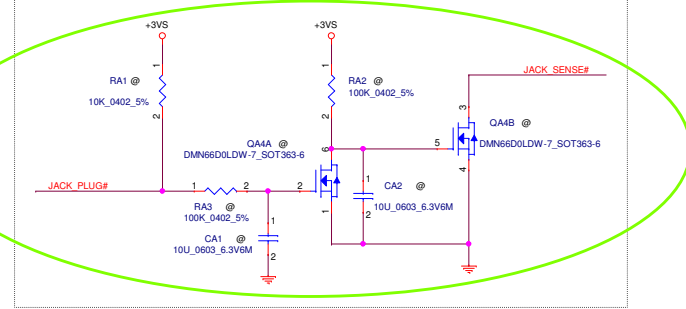




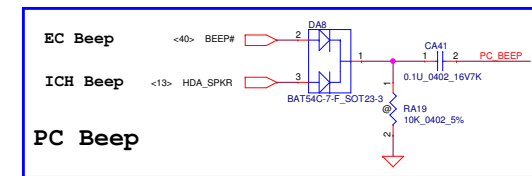
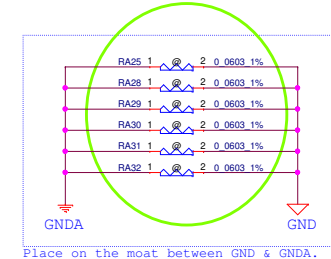
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc. |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------|----------------------------|
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | Title                    | LAN RTL8105E               |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date                     | Wednesday, August 23, 2012 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 32 of 57                   |



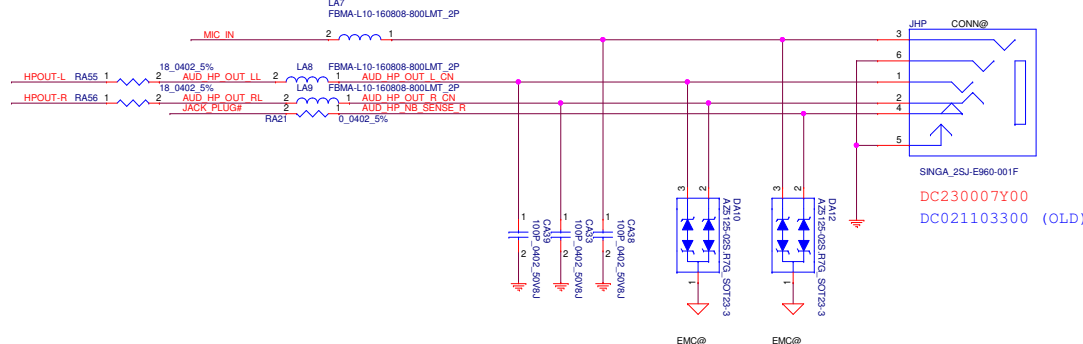
JACK\_PLUG Delay cricutis



Reserve for cancel Delay cricutis

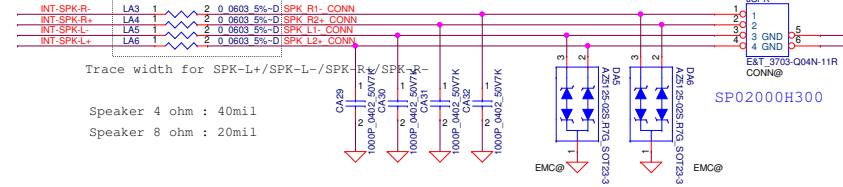


iPhone type Combo Jack

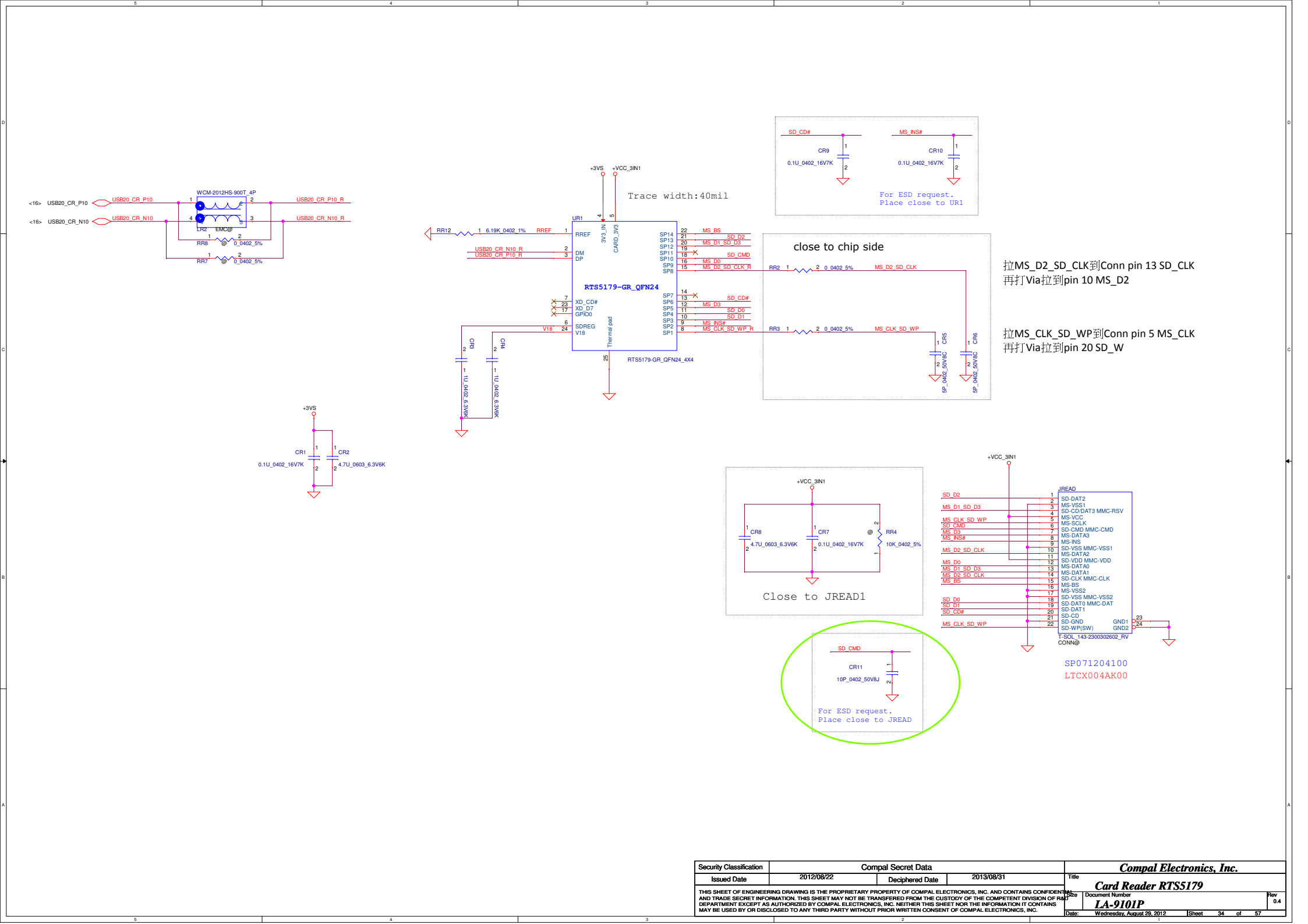


Close to UA1  
Pin11,13,14,16

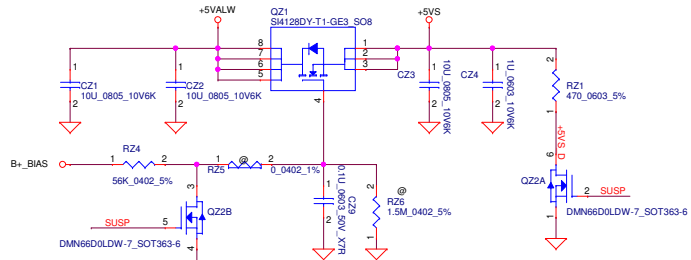
close to Codec



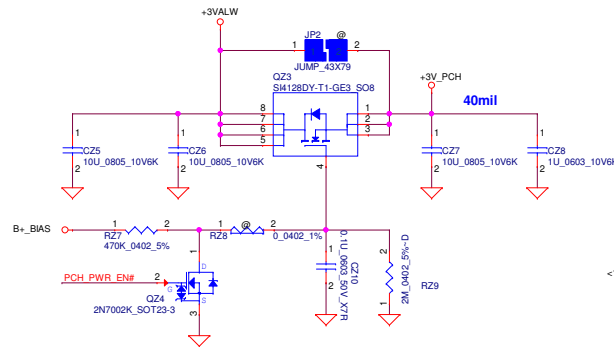
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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|----------------------------------|----------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Title                            |                |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | Compal Electronics, Inc.         |                |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | LA-9101P                         | 04             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date: Wednesday, August 28, 2012 | Sheet 33 of 57 |



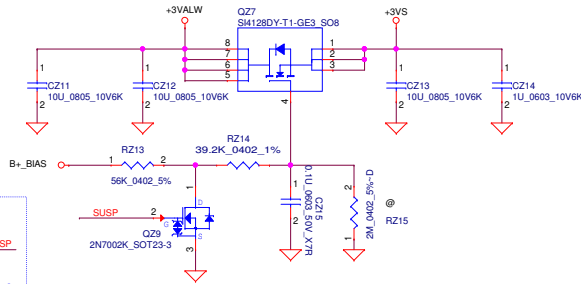
### +5VALW to +5VS



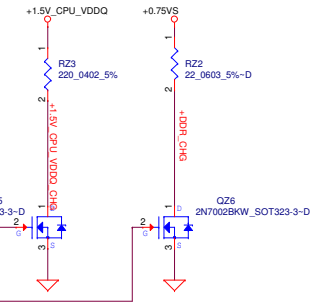
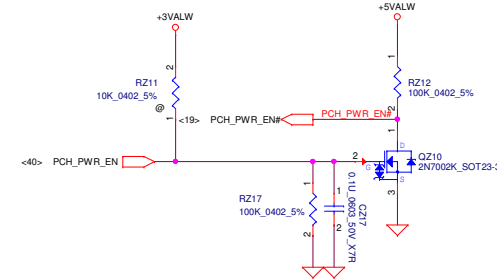
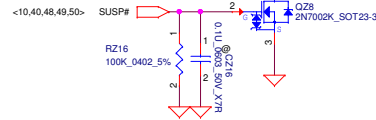
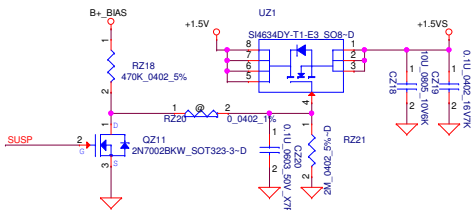
### +3VALW to +3V\_PCH



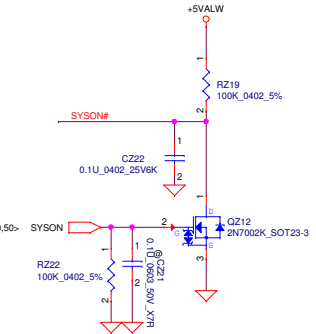
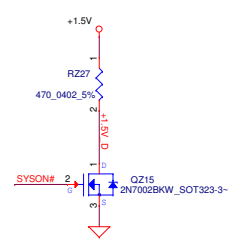
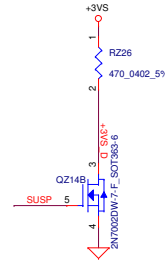
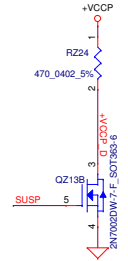
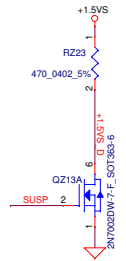
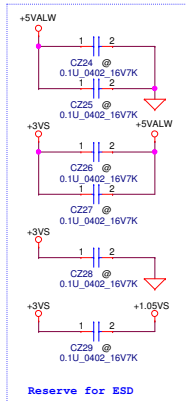
### +3VALW to +3VS

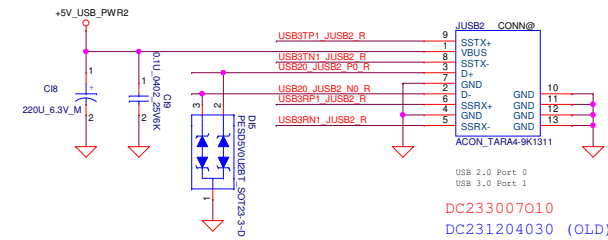
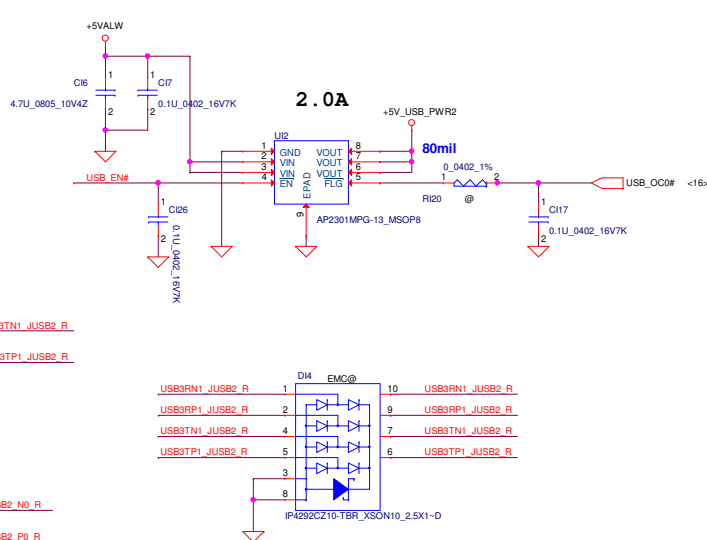
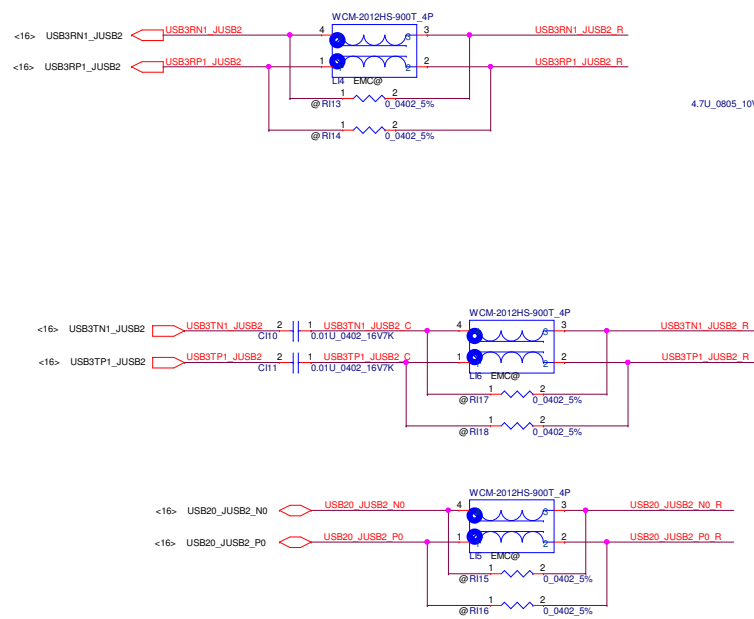
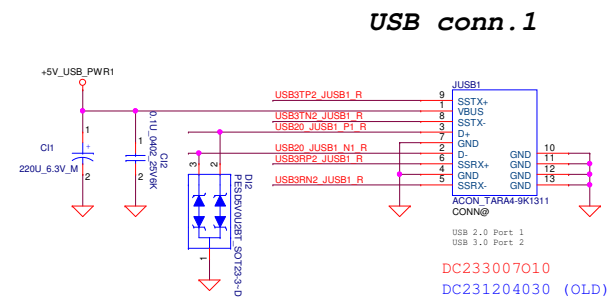
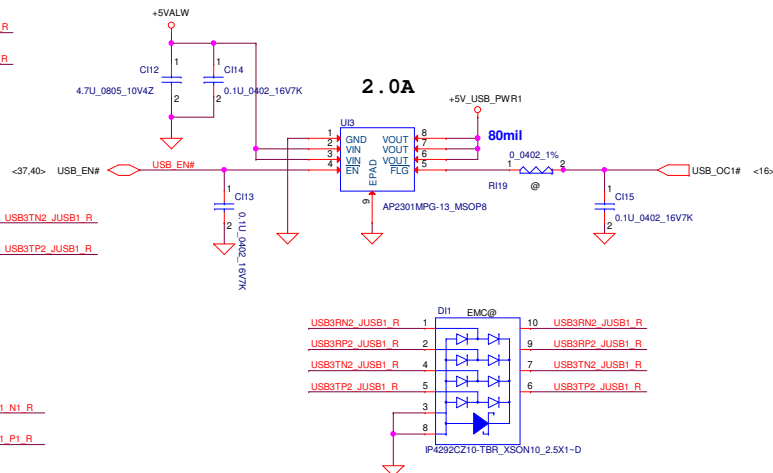
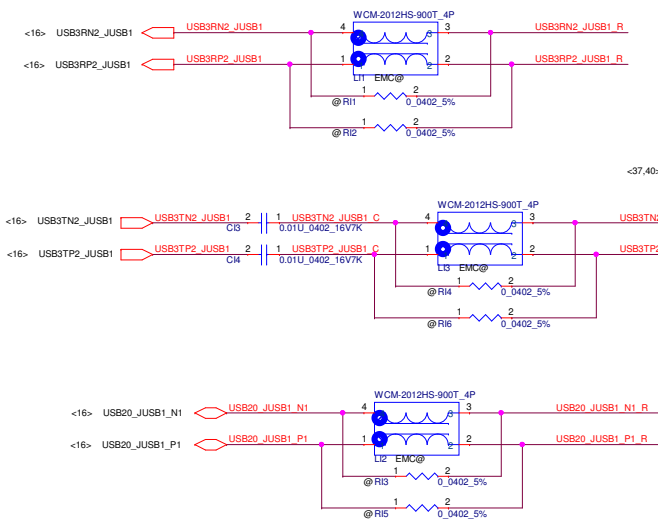


### +1.5V To +1.5VS

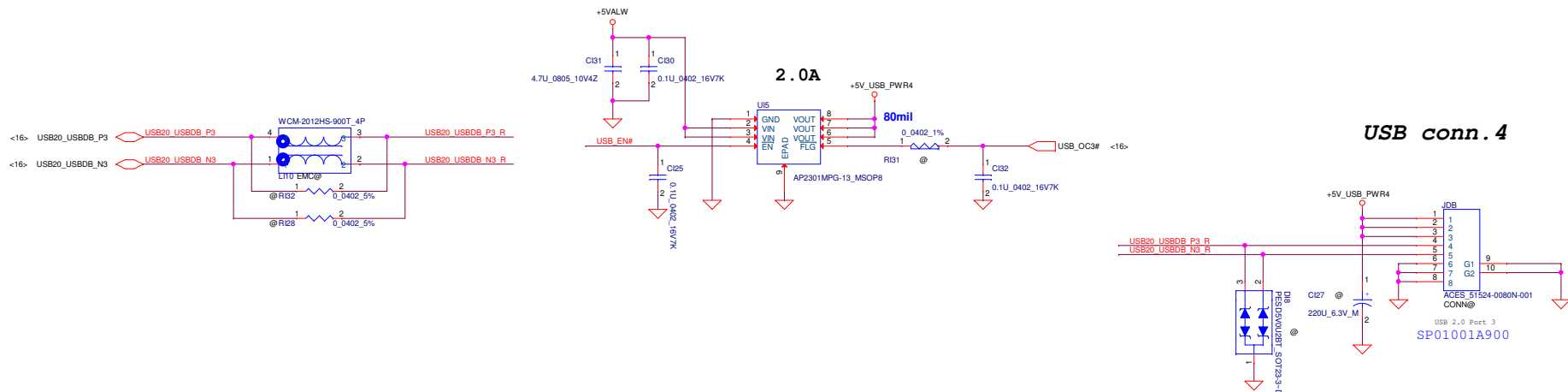
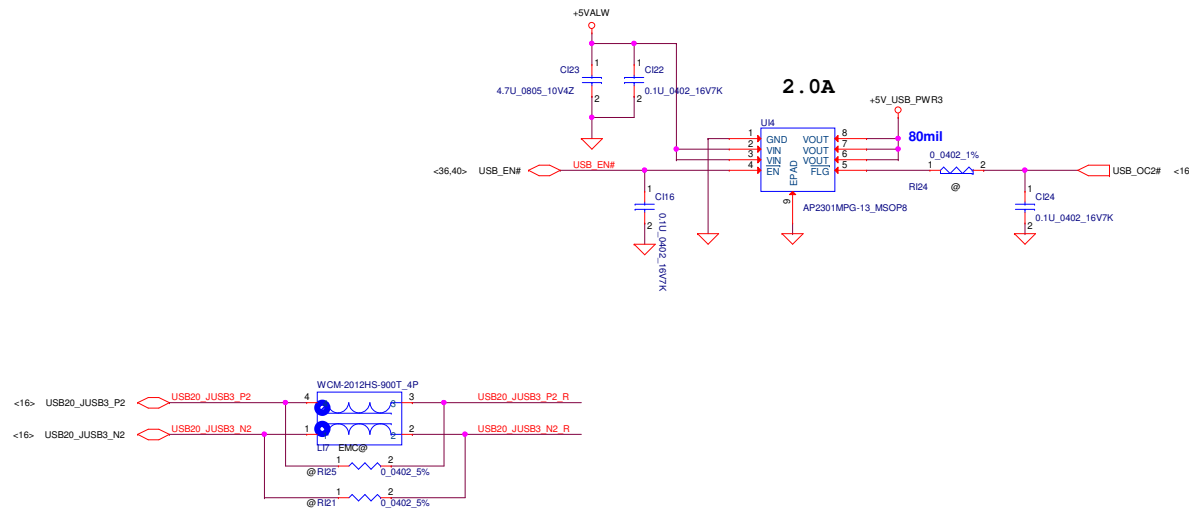


Reserve for ESD  
CZ23 2 1  
0.1U\_0402\_16V7K  
Please close to Q29

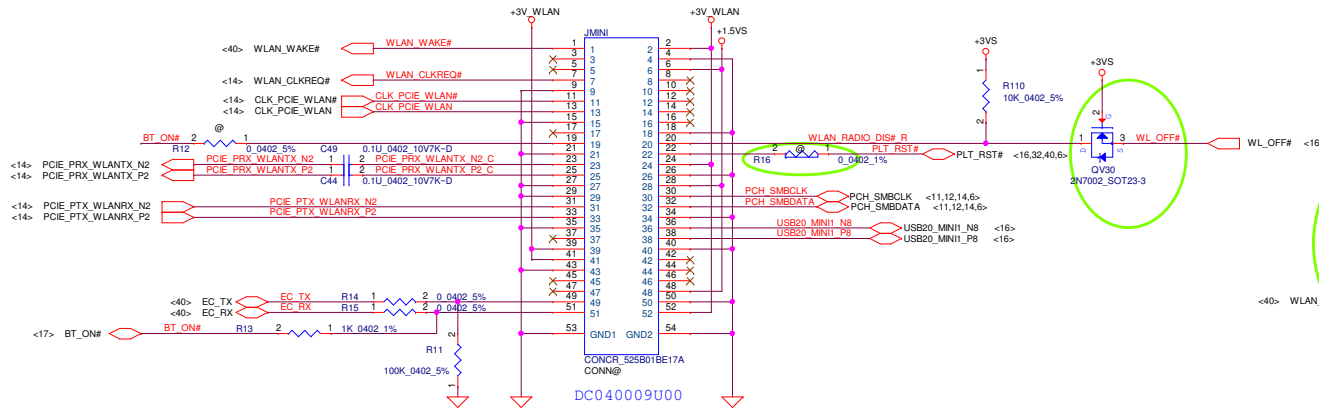




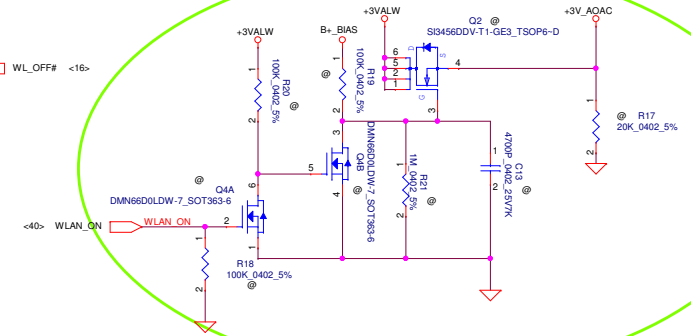
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                                  |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|----------------------------------|----------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Title                            |                |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | USB3.0                           |                |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | LA-9101P                         |                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date: Wednesday, August 28, 2012 | Sheet 36 of 57 |



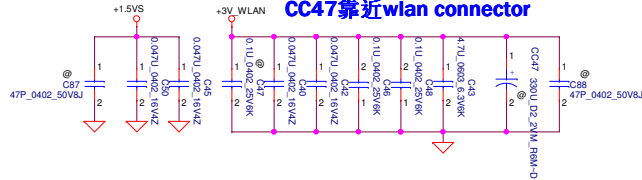
# Mini WLAN/WIMAX H=6.7



## Power Control for Mini card



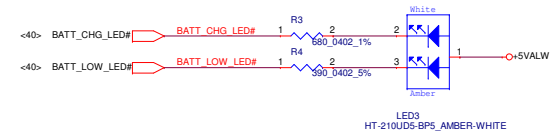
## CC47靠近wlan connector



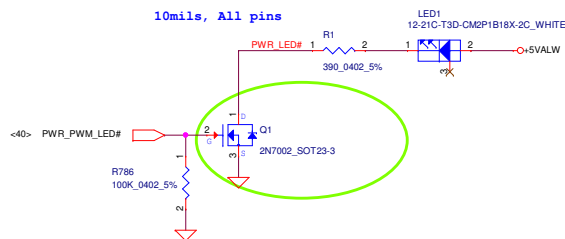
## HDD LED



## Battery LED

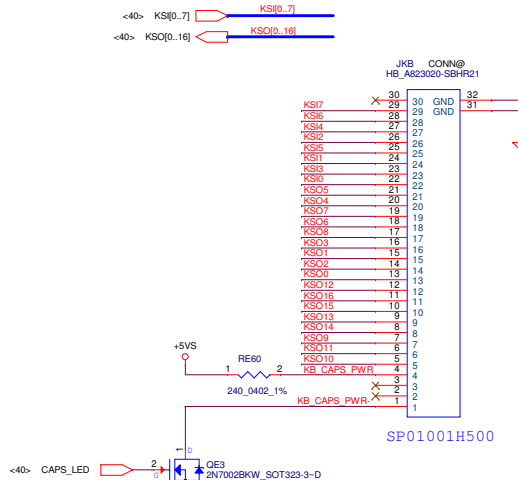
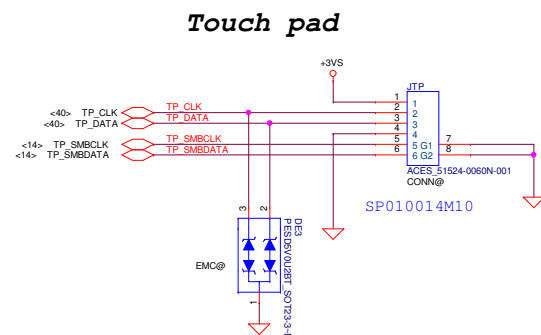
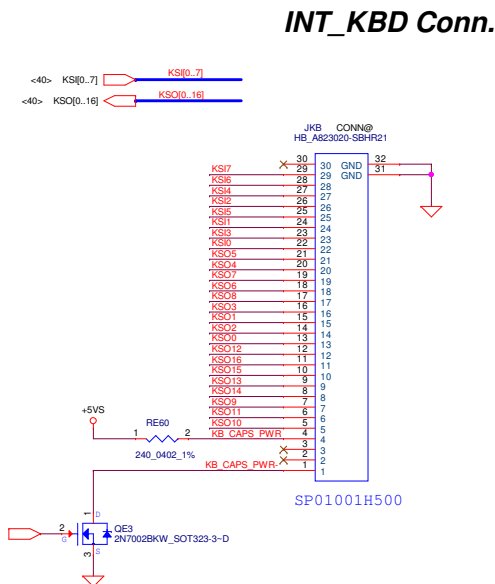
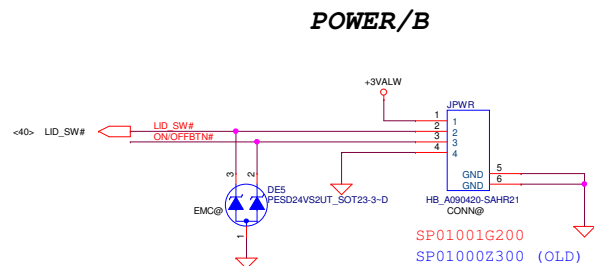
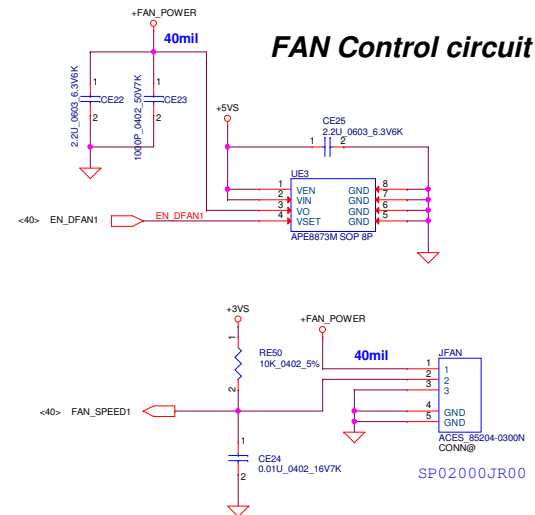
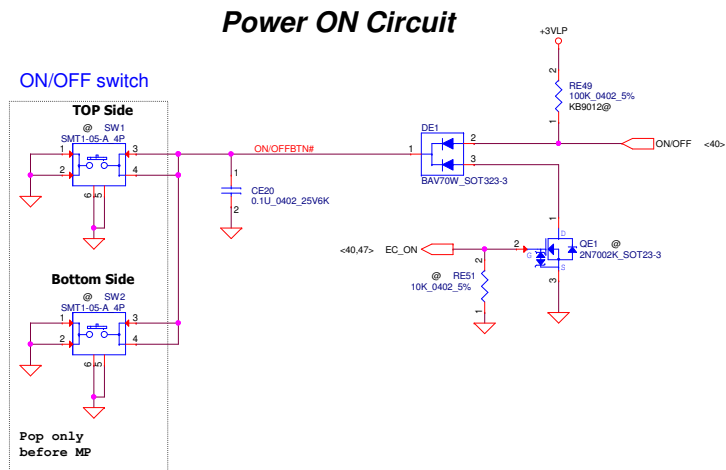


## Power LED

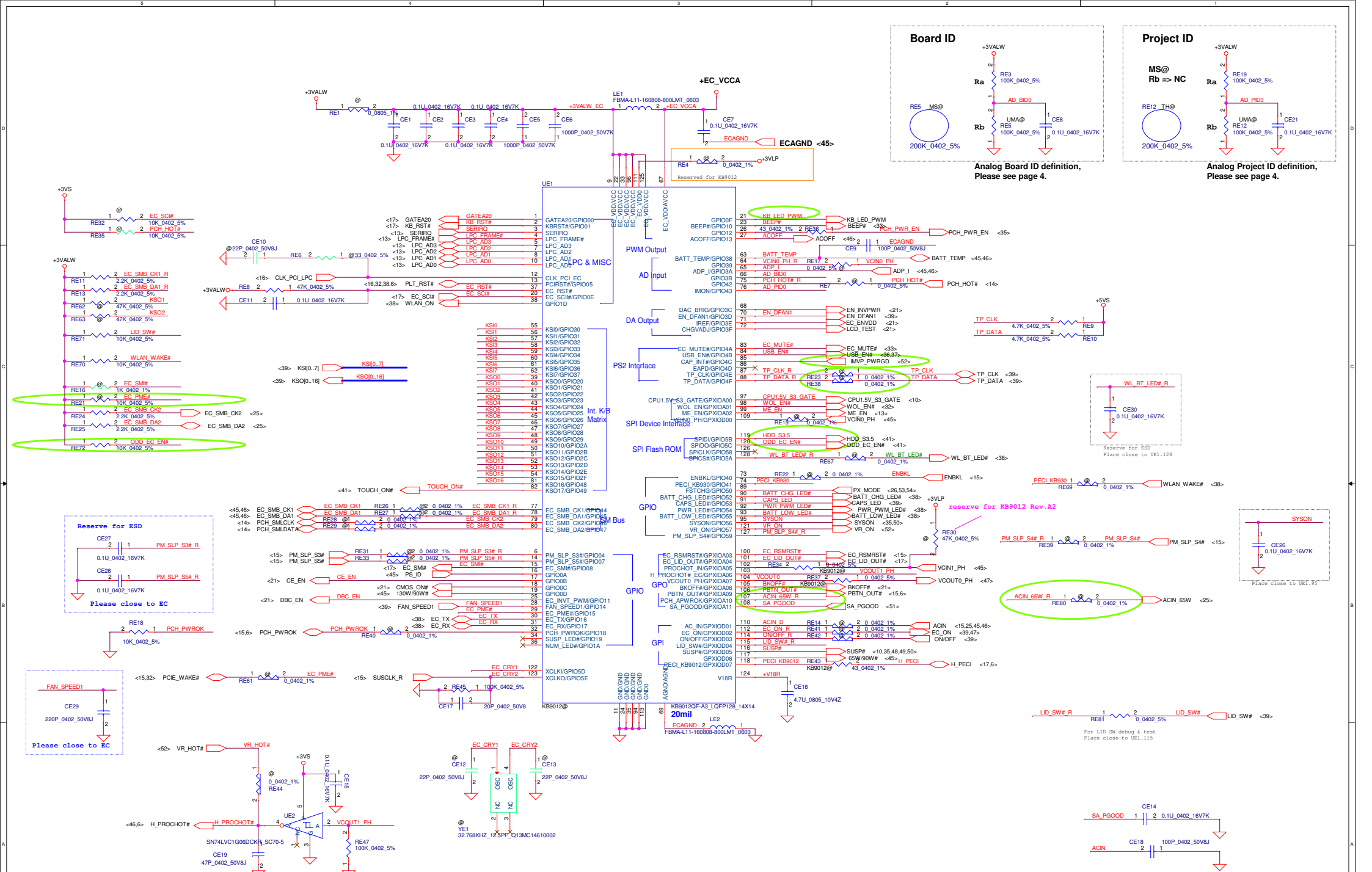


## Wireless LED



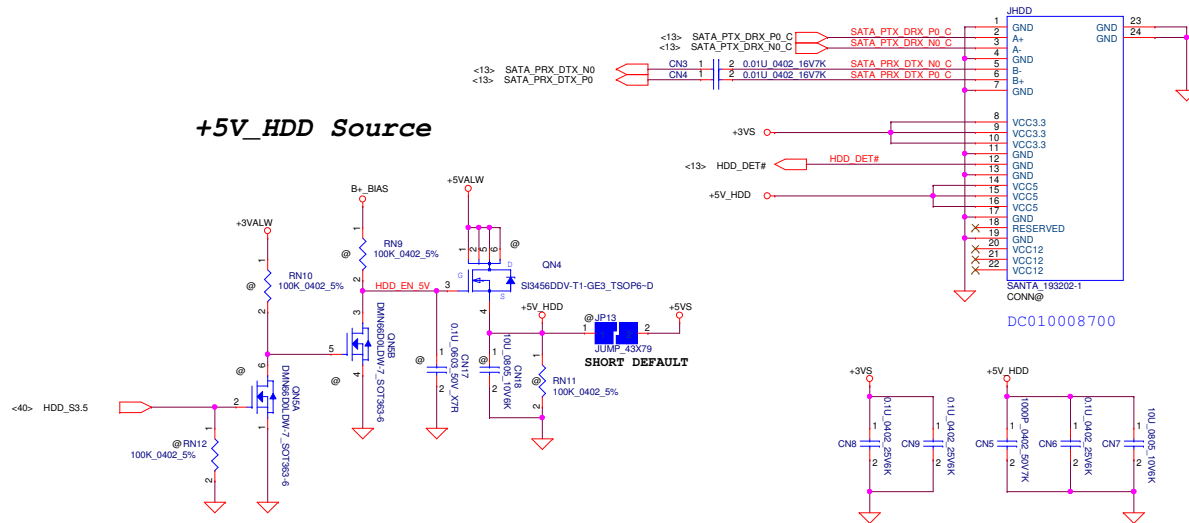


|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                                  |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|----------------------------------|----------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Title                            |                |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | FAN/TP/KB/PWR SW                 |                |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date: Wednesday, August 28, 2012 | Sheet 39 of 57 |

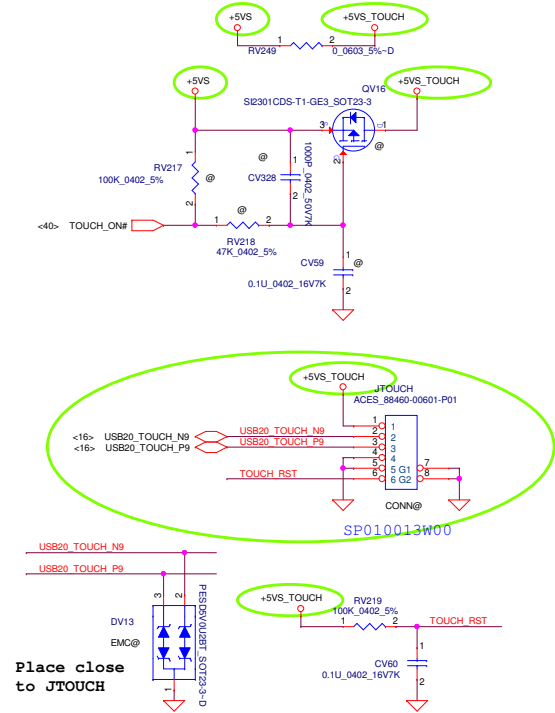


## SATA HDD Conn.

### +5V\_HDD Source

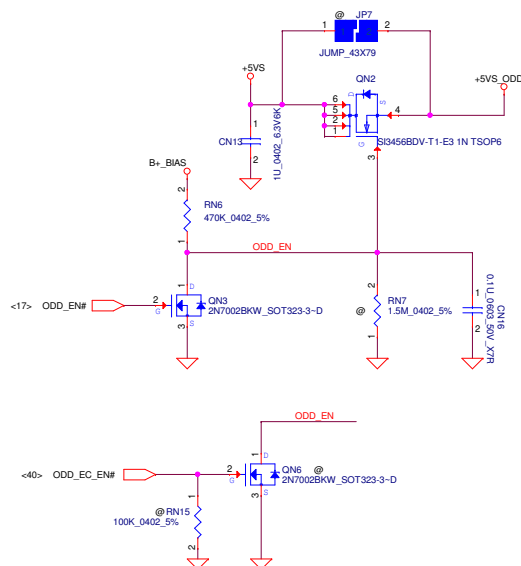


## \* Touch Screen Panel

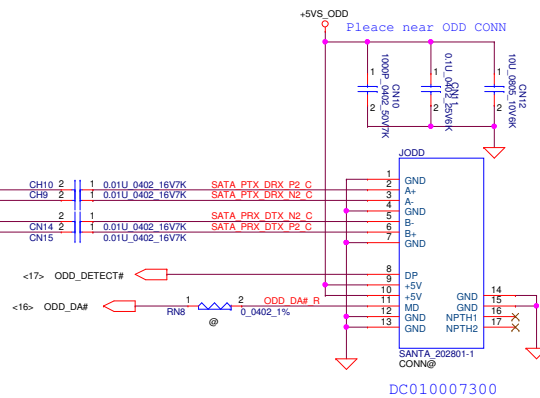


Place close  
to JTOUCH

### ODD Power Control

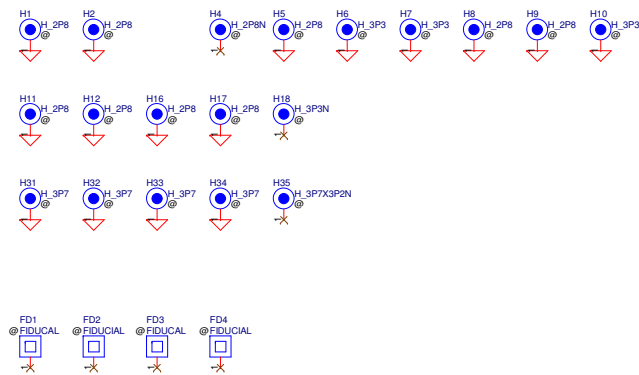


### SATA ODD Conn.



| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Title           |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|-----------------|----------------------------|
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | Document Number | HDD / ODD                  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date            | Wednesday, August 28, 2012 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet           | 41 of 57                   |

Screw Hole



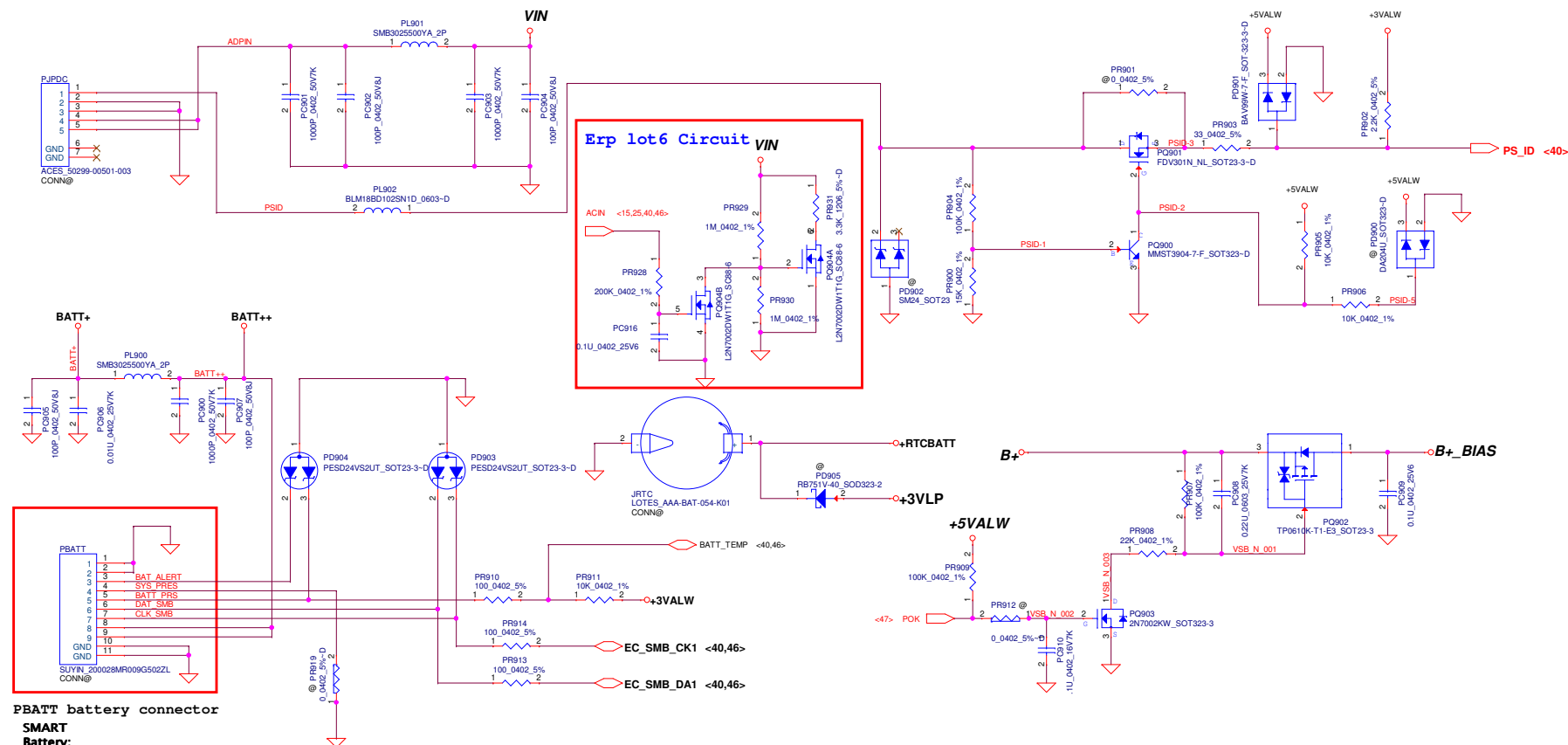
## Version Change List (P. I. R. List)

## Page 1

| Item | Page#                  | Title                 | Date       | Request Owner | Issue Description                                             | Solution Description                                                                                                                                                                                                                                                     | Rev. |
|------|------------------------|-----------------------|------------|---------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 1    | 34                     | Card Reader           | 2012/04/27 | HW            | The Card reader USB signal is incorrect.                      | SWAP UR1 USB signal P/N                                                                                                                                                                                                                                                  | 0.2  |
| 2    | 40                     | Keyboard              | 2012/05/03 | SED           | Keyboard pin define change.                                   | Follow new SPEC.SWAP JKB pin define.                                                                                                                                                                                                                                     | 0.2  |
| 3    | 16, 21, 34, 36, 37, 38 | USB                   | 2012/05/04 | Function team | Change USB port assignment for function team request          | USB port change detail please reference Page.16 description.                                                                                                                                                                                                             | 0.2  |
| 4    | 26                     | VGA                   | 2012/05/05 | HW            | Delete reserve BACO circuit                                   | Delete UV15, QV16, QV17, QV18, QV19, QV20, RV99, RV100, RV249, CV96, CV98                                                                                                                                                                                                | 0.2  |
| 5    | 42                     | DC/DC                 | 2012/05/07 | HW            | Design change                                                 | UN-POP R211, POP R217                                                                                                                                                                                                                                                    | 0.2  |
| 6    | 33                     | Audio codec           | 2012/05/09 | ESD           | ESD team ask solution                                         | Add RA29, RA30, RA31, RA32 and place on the moat between GND & GNDA                                                                                                                                                                                                      | 0.2  |
| 7    | 6, 17                  | PCH                   | 2012/05/09 | ESD           | ESD team ask reserve solution                                 | Add CC151, CH102 for reserve                                                                                                                                                                                                                                             | 0.2  |
| 8    | 32                     | LAN                   | 2012/05/10 | HW            | Remove China Go-rural for DELL request                        | Remove DL7, DL8, DL9                                                                                                                                                                                                                                                     | 0.2  |
| 9    | 16, 38                 | USB                   | 2012/05/10 | HW            | Remove JUSB3 USB3.0                                           | Delete LI8, LI9, DI6 and change JUSB3 to USB2.0 type                                                                                                                                                                                                                     | 0.2  |
| 10   | 32                     | Crystal               | 2012/05/15 | HW            | Crystal vendor suggestion                                     | Change CL36, CL37 from 33p/0402 to 12p/0402                                                                                                                                                                                                                              | 0.2  |
| 11   | 21, 39                 | LVDS                  | 2012/05/17 | SED           | Add FHD Panel CE_ENABLE, DBC_ENABLE function from SED request | Add CE_EN, DBC_EN control pin to EC                                                                                                                                                                                                                                      | 0.2  |
| 12   | 21                     | LVDS                  | 2012/05/22 | SED           | Follow SED team request disable CE_EN function                | Change RV62 to DE-POP and RV100 to POP for disable CE_EN function                                                                                                                                                                                                        | 0.2  |
| 13   | 33                     | Audio codec           | 2012/05/23 | CODEC         | Follow CODEC vendor suggestion                                | Add AUDIO JACK PLUG delay circuit, Spearate NET JACK_PLUG to<br>-> JACK_SENSE# & "> JACK_PLUG#                                                                                                                                                                           | 0.2  |
| 14   | 16, 21                 | Touch Screen          | 2012/05/29 | HW            | Add touch screen function                                     | Add RV217, RV218, RV219, RV249, CV59, CV60, CV328, DV13, QV16, JTOUCH                                                                                                                                                                                                    | 0.2  |
| 15   | 39                     | Board ID              | 2012/05/30 | HW            | Board ID change for PT                                        | Change RE5 from 8.2k_0402(SD028820180) to 33k_0402(SD028330280)                                                                                                                                                                                                          | 0.2  |
| 16   | 21, 39                 | Touch Screen          | 2012/05/30 | HW            | Add touch screen function power control                       | Add NET "TOUCH_ON#" from JTOUCH to UE1.82(KB9012) for TOUCH SCREEN PANEL power control                                                                                                                                                                                   | 0.2  |
| 17   | 33                     | Audio codec           | 2012/05/30 | HW            | Follow RealTek suggestion remove, delete reserve MUTE circuit | Delete D1, QA1, QA2, QA3, RA24, RA26, RA60, RA62, RA68, RA109, CA72, CA73                                                                                                                                                                                                | 0.2  |
| 18   | 15, 16, 39, 41         | ESD                   | 2012/05/30 | ESD           | ESD ask CAP for reserve                                       | Reserve 0.1u/0402 CH104, CZ23, CH105, CE27, CE28                                                                                                                                                                                                                         | 0.2  |
| 19   | 14                     | Green CLK             | 2012/05/30 | HW            | For Green CLK test                                            | Change RH31, RH41, RV232 0ohm form "GCLK#" to "g"<br>for break the clock signal to device                                                                                                                                                                                | 0.2  |
| 20   | 10, 26, 41             | DC/DC                 | 2012/05/31 | HW            | Change "+1.5V_CPU_VDDQ", "+1.5VS", "+1.5VGS" derating         | Change RC150 330K/0402 to 2M/0402, RC151 100K/0402 to 470K/0402, RZ18 100K/0402 to 470K/0402, RV115 0/0402 to 2M/0402                                                                                                                                                    | 0.2  |
| 21   | 41                     | DC/DC                 | 2012/05/31 | HW            | For power sequence trunning                                   | Change RZ15 to DE-POP                                                                                                                                                                                                                                                    | 0.2  |
| 22   | 06, 15, 16, 39, 41     | ESD                   | 2012/05/31 | ESD           | Follow ESD team request                                       | Change 0.1u/0402 from "g" to POP                                                                                                                                                                                                                                         | 0.2  |
| 23   | 32                     | Green CLK             | 2012/06/15 | HW            | Change for Green CLK bom control                              | Change RL21, RL30 from "g" to "GCLK#"                                                                                                                                                                                                                                    | 0.2  |
| 24   | 41                     | DC/DC                 | 2012/06/15 | HW            | For WLAN card power sequence issue                            | Change RZ4, RZ13 from 470K/0402 56K/0402                                                                                                                                                                                                                                 | 0.2  |
| 25   | 35, 41                 | Schematic page modify | 2012/06/18 | HW            | Schematic page modify for easily maintain.                    | Swap Page. 35 & Page 41.                                                                                                                                                                                                                                                 | 0.2  |
| 26   | 41                     | ODD                   | 2012/06/18 | HW            | Change component location for easily maintain.                | Move RH42, RH43 from Page.13 to Page.41.                                                                                                                                                                                                                                 | 0.2  |
| 27   | 39                     | FAN                   | 2012/06/29 | HW            | Fan speed noise issue                                         | Reserve 220p/0402 CE24                                                                                                                                                                                                                                                   | 0.3  |
| 28   | 6                      | CPU                   | 2012/06/29 | ESD           | System boot-up shot down issue.                               | Change CC151 from POP to "g"                                                                                                                                                                                                                                             | 0.3  |
| 29   | 21, 35, 39, 40, 41     | Circuit adjust        | 2012/07/01 | HW            | Circuit & page adjust for OAK 15" & OAK 17"                   | 1. Swap P.35 & P.41 and move touch screen circuit from P.21 to P.41.<br>2. Swap P.39 & P.40 page no                                                                                                                                                                      | 0.3  |
| 30   | 40                     | LID SW                | 2012/07/01 | HW            | LID SW need a trace for debug and switch.                     | Add RE81 for LID SW.                                                                                                                                                                                                                                                     | 0.3  |
| 31   | 25                     | GPU                   | 2012/07/01 | HW            | Follow AMD request, MarsPro will used MPLs.                   | Change RV75, RV76, RV81 from "DIS#" to "TH#"                                                                                                                                                                                                                             | 0.3  |
| 32   | 29                     | GPU                   | 2012/07/01 | HW            | Follow AMD request, MEM_CALRP2 is not need for Mars ASIC now. | Change RV205 from "MS#" to "g"                                                                                                                                                                                                                                           | 0.3  |
| 33   | 38                     | MINI card             | 2012/07/03 | HW            | Power Control for Mini card didn't need                       | Change R17 to "g"                                                                                                                                                                                                                                                        | 0.3  |
| 34   | 6                      | XDP                   | 2012/07/06 | HW            | S3 return hang issue                                          | Change RC89 from "g" to POP                                                                                                                                                                                                                                              | 0.3  |
| 35   | 23                     | GREEN CLK             | 2012/07/09 | HW            | Follow Green CLK FAE suggestion                               | 1. Change UG1.2(+3VLP) & UG1.8(+3VALN) connect to +LAN_IO<br>2. Add R787 connect from +RTCBATT to C5.2 & UG1.10<br>3. Change C14 from 0.1u to 5p/0402<br>4. Change C8 connect from +3V_ALW to +LAN_IO<br>5. Add R788 0ohm/0402 from +RTCVCC to UG1 for GCLK & DH1 select | 0.3  |
| 36   | 35                     | MOAT                  | 2012/07/09 | ESD           | For ESD request reserve CAP.                                  | Reserve those CAP for ESD MOAT.                                                                                                                                                                                                                                          | 0.3  |
| 37   | 18                     | LVDS                  | 2012/07/10 | HW            | Change RES and reserve CAP for LVDS issue                     | Change RH185 from 0ohm-short to 0ohm/0805, and reserve CH106 1U/0402                                                                                                                                                                                                     | 0.3  |
| 38   | 41                     | Connector             | 2012/07/10 | ME            | For ME request                                                | Change JBTB1 footprint from SP02000G800 (OLD) to SP02000MJ00                                                                                                                                                                                                             | 0.3  |
| 39   | 13                     | PCH                   | 2012/07/11 | ESD           | Follow ESD team request                                       | Add RH44, RH48, RH70 & NET PCH_JTAG_TMS_R, PCH_JTAG_TDI_R, PCH_JTAG_IDO_R for break signal trace                                                                                                                                                                         | 0.3  |
| 40   | 40                     | PCH                   | 2012/07/11 | ESD           | Follow ESD team request                                       | 1. Change NET NAME "N59110727" to "WL_BT_LED#_R"<br>2. Reserve 0.1u/0402 on "WL_BT_LED#_R" for ESD                                                                                                                                                                       | 0.3  |
| 41   | 21                     | LVDS                  | 2012/07/11 | HW            | Reserve for CE function for LVDS connector                    | Change CE_EN_R from dummy to JLVDS.18                                                                                                                                                                                                                                    | 0.3  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                          |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------|----------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc. |                            |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2012/08/22 | Deciphered Date    | 2013/08/31 | Title                    | HW-PIR                     |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date                     | Wednesday, August 28, 2012 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 43 of 57                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Rev                      | 0.4                        |

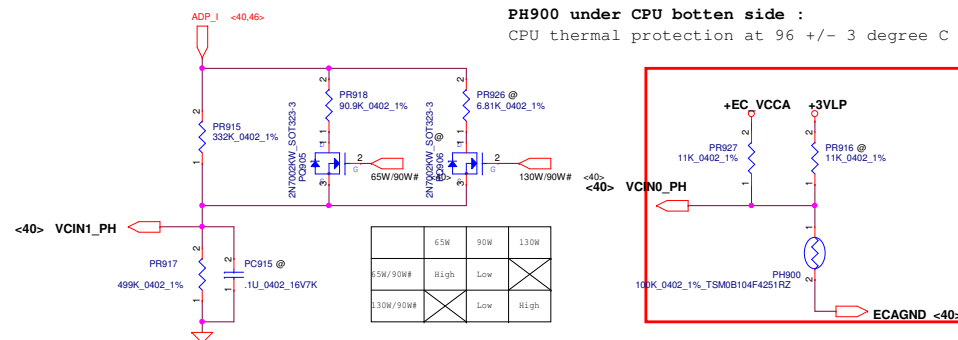
|                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                           |                    |            |                                        |            |
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| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Wednesday August 29, 2012 |                    | Sheet      | 44                                     | of 57      |



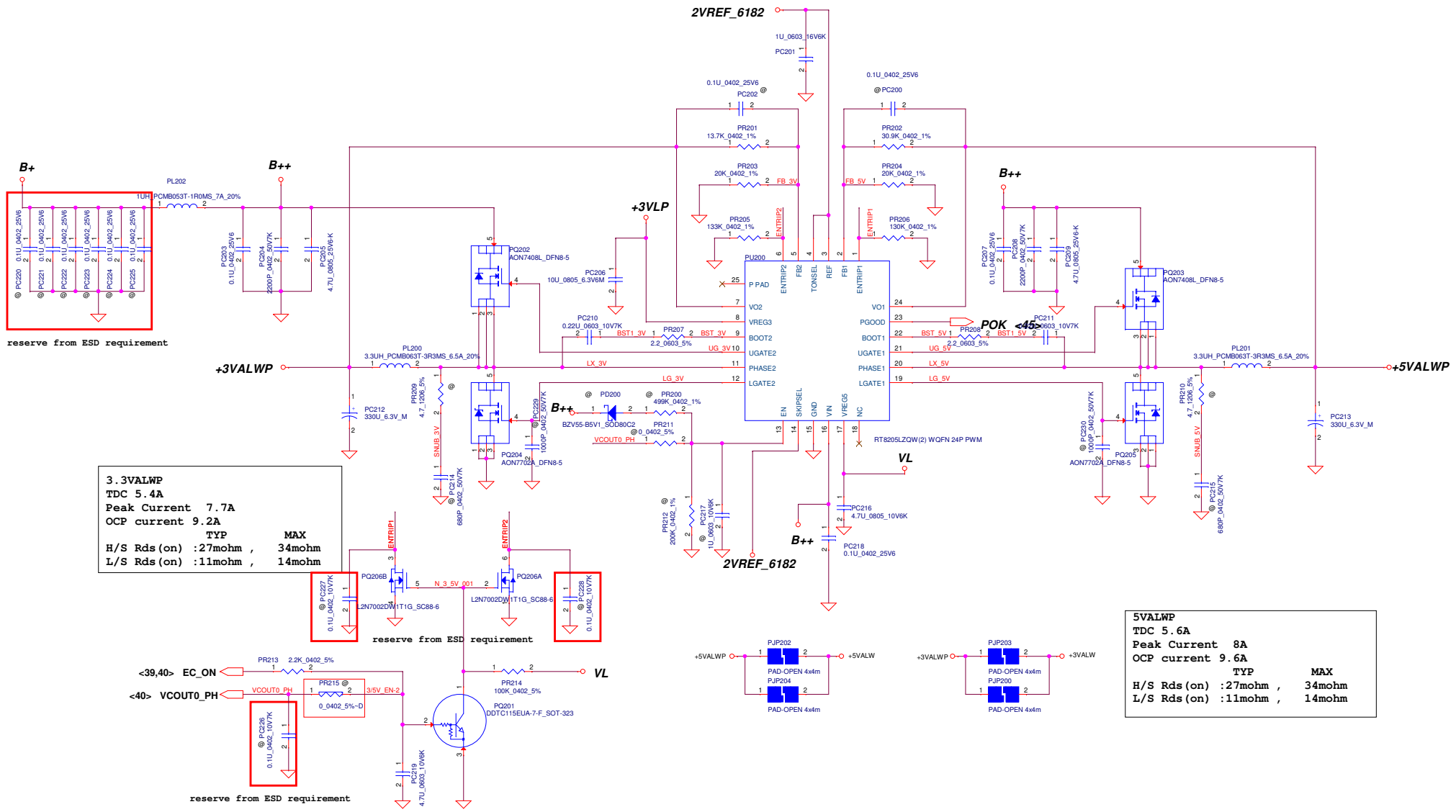
PBATT battery connector

SMART  
Battery:  
01.BATT+  
02.BATT-  
03.CLK\_SMB  
04.DAT\_SMB  
05.BATT\_PRES  
06.SYS\_PRES  
07.BATT\_ALERT  
08.GND1  
09.GND2

PH900 under CPU bottom side :  
CPU thermal protection at 96 +/- 3 degree C

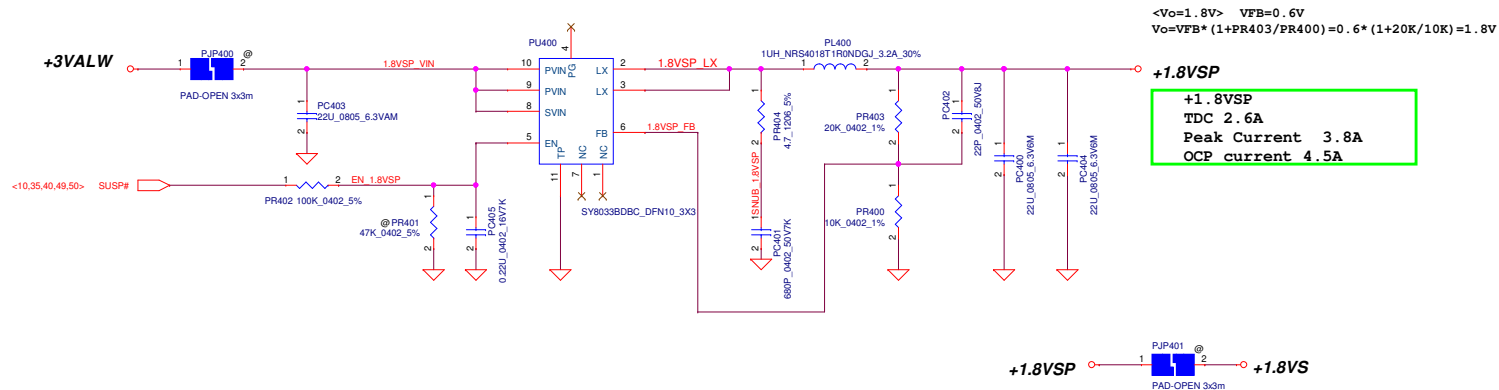




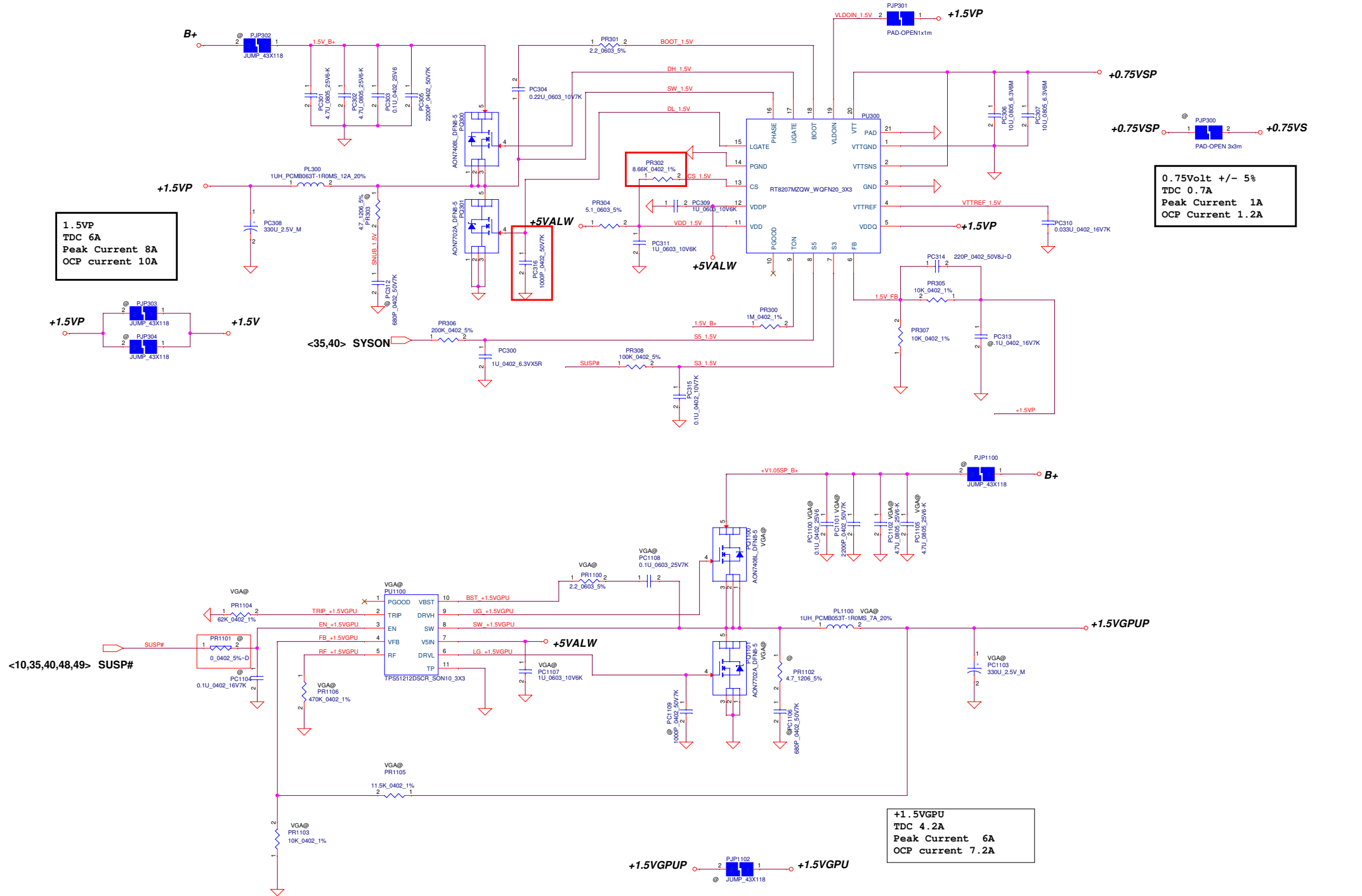


3.3VALWP  
TDC 5.4A  
Peak Current 7.7A  
OCP current 9.2A  
TYP  
H/S Rds (on) : 27mohm , 34mohm  
L/S Rds (on) : 11mohm , 14mohm  
MAX

5VALWP  
TDC 5.6A  
Peak Current 8A  
OCP current 9.6A  
TYP  
H/S Rds (on) : 27mohm , 34mohm  
L/S Rds (on) : 11mohm , 14mohm  
MAX

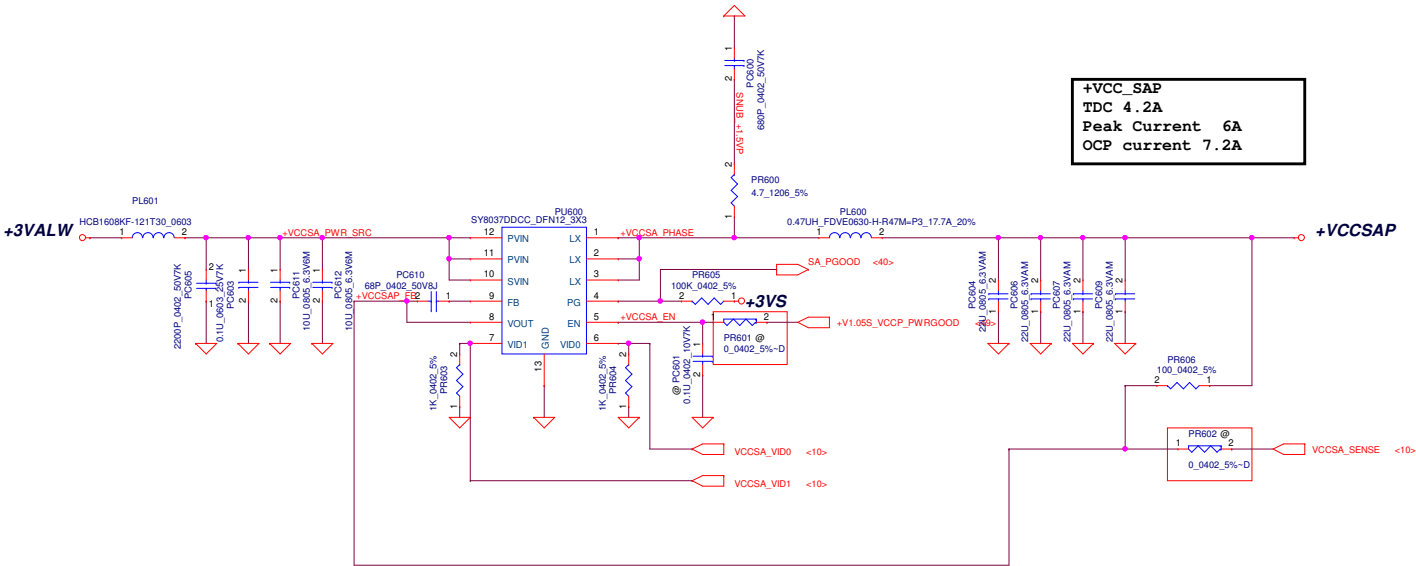




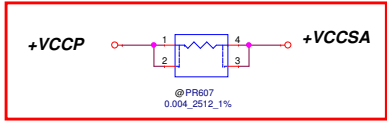
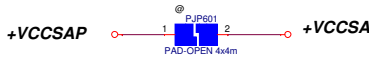


| VID [0] | VID[1] | VCCSA Vout |
|---------|--------|------------|
| 0       | 0      | 0.9V       |
| 0       | 1      | 0.85V      |
| 1       | 0      | 0.775V     |
| 1       | 1      | 0.75V      |

output voltage adjustable network

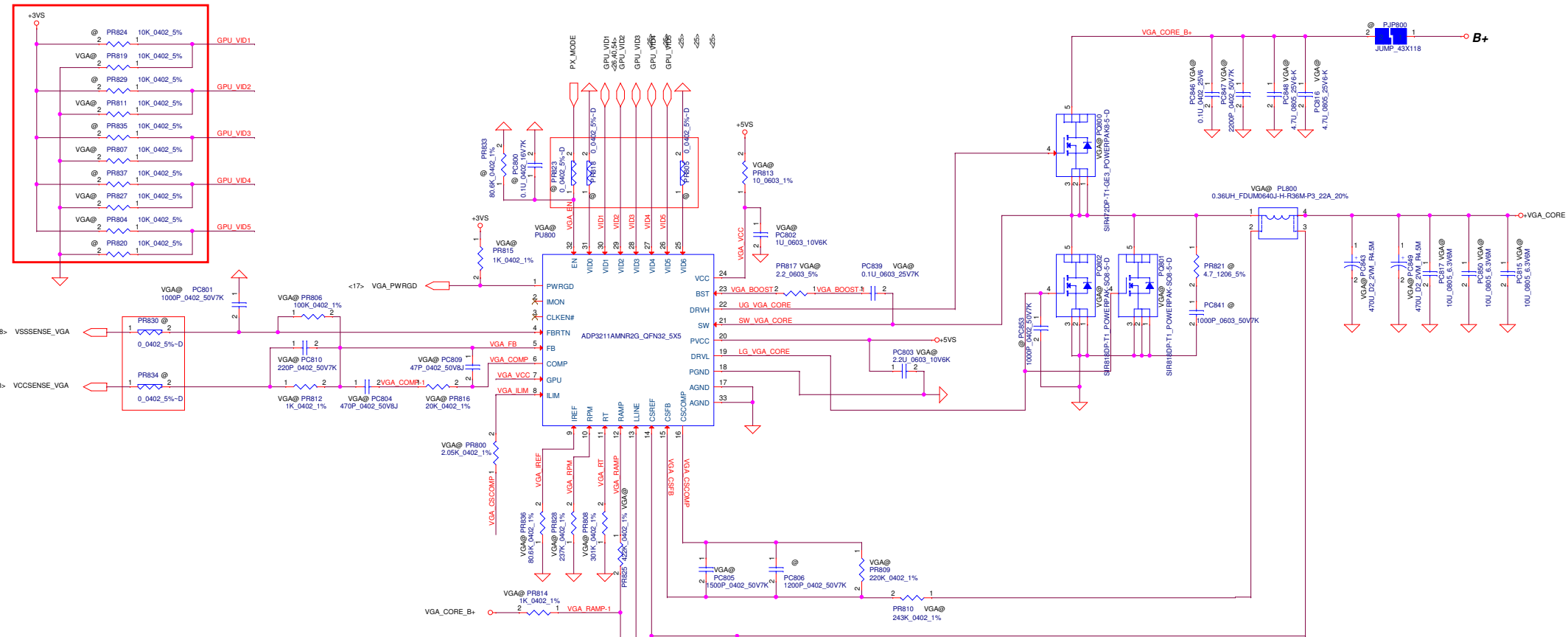


The 1k PD on the VCCSA VIDs are empty.  
These should be stuffed to ensure that  
VCCSA VID is 00 prior to VCCIO stability.



reserve for Pentium and Celeron only





Mars Pro

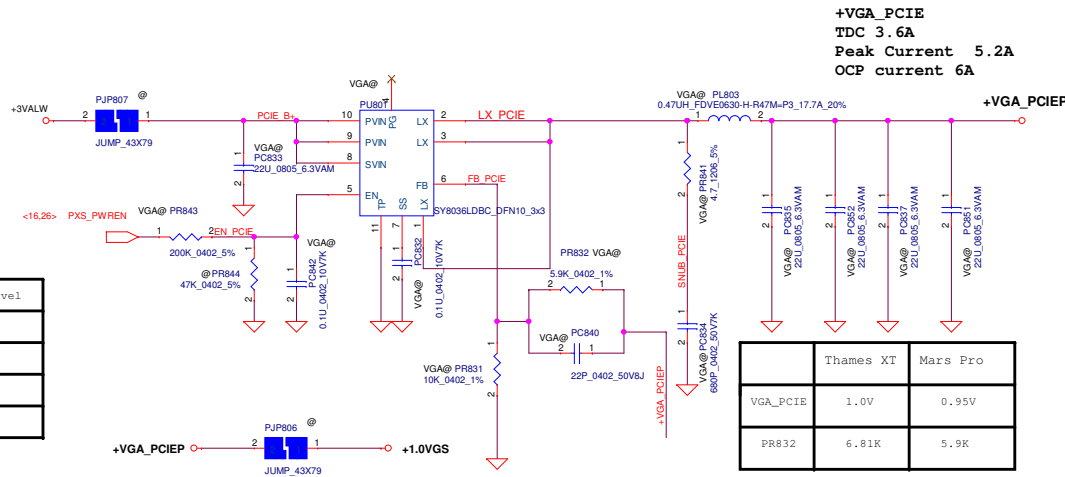
| GPU_VID5<br>(GPIO_10) | GPU_VID4<br>(GPIO_14) | GPU_VID3<br>(GPIO_15) | GPU_VID2<br>(GPIO_16) | GPU_VID1<br>(GPIO_20) | Core Voltage Level |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------|
| 0                     | 1                     | 1                     | 1                     | 1                     | 1.125V             |
| 1                     | 0                     | 0                     | 0                     | 0                     | 1.1V               |
| 1                     | 0                     | 0                     | 0                     | 1                     | 1.075V             |
| 1                     | 0                     | 0                     | 1                     | 0                     | 1.05V              |
| 1                     | 0                     | 0                     | 1                     | 1                     | 1.025V             |
| 1                     | 0                     | 1                     | 0                     | 0                     | 1V                 |
| 1                     | 0                     | 1                     | 0                     | 1                     | 0.975V             |
| 1                     | 0                     | 1                     | 1                     | 0                     | 0.95V              |
| 1                     | 0                     | 1                     | 1                     | 1                     | 0.925V             |
| 1                     | 1                     | 0                     | 0                     | 0                     | 0.9V               |
| 1                     | 1                     | 0                     | 0                     | 1                     | 0.875V             |
| 1                     | 1                     | 0                     | 1                     | 0                     | 0.85V              |
| 1                     | 1                     | 0                     | 1                     | 1                     | 0.825V             |
| 1                     | 1                     | 1                     | 0                     | 0                     | 0.8V               |

+VGA\_CORE  
TDC 22A  
Peak Current 30A  
OCP current 36A  
FSW=350kHz  
DCR 1.1mohm +/-5%  
Loadline = 1.5mohm

Thames XT

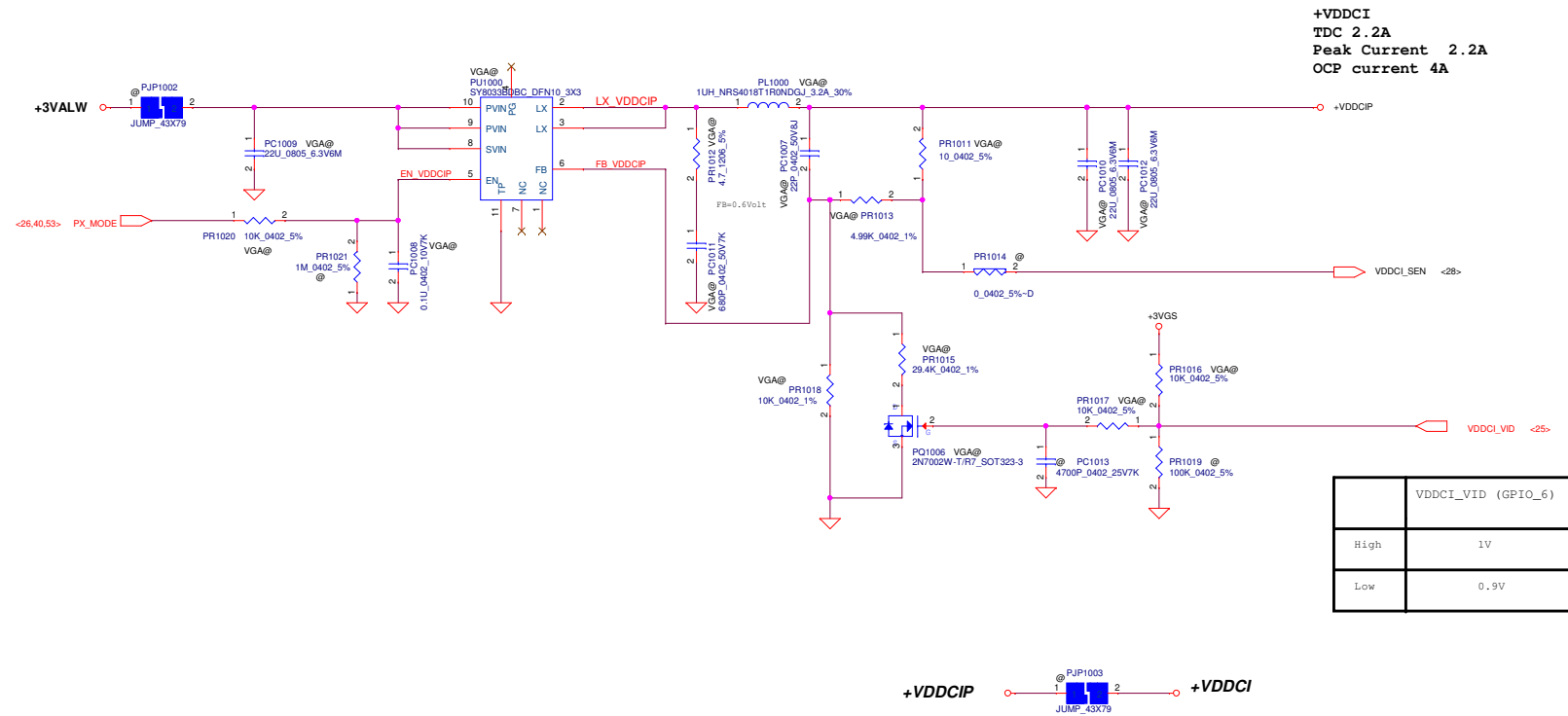
| GPU_VID5<br>(GPIO_10) | GPU_VID4<br>(GPIO_14) | GPU_VID3<br>(GPIO_15) | GPU_VID2<br>(GPIO_16) | GPU_VID1<br>(GPIO_20) | Core Voltage Level |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------|
| 1                     | 0                     | 0                     | 1                     | 0                     | 1.05V              |
| 1                     | 0                     | 1                     | 0                     | 0                     | 1V                 |
| 1                     | 0                     | 1                     | 1                     | 0                     | 0.95V              |
| 1                     | 1                     | 0                     | 0                     | 0                     | 0.9V               |

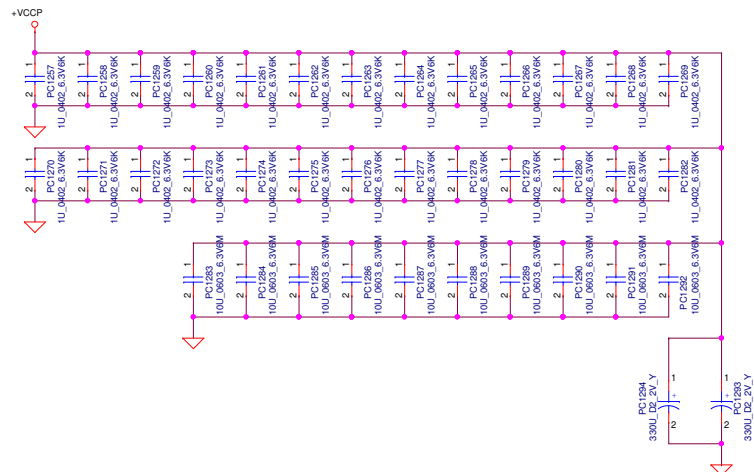
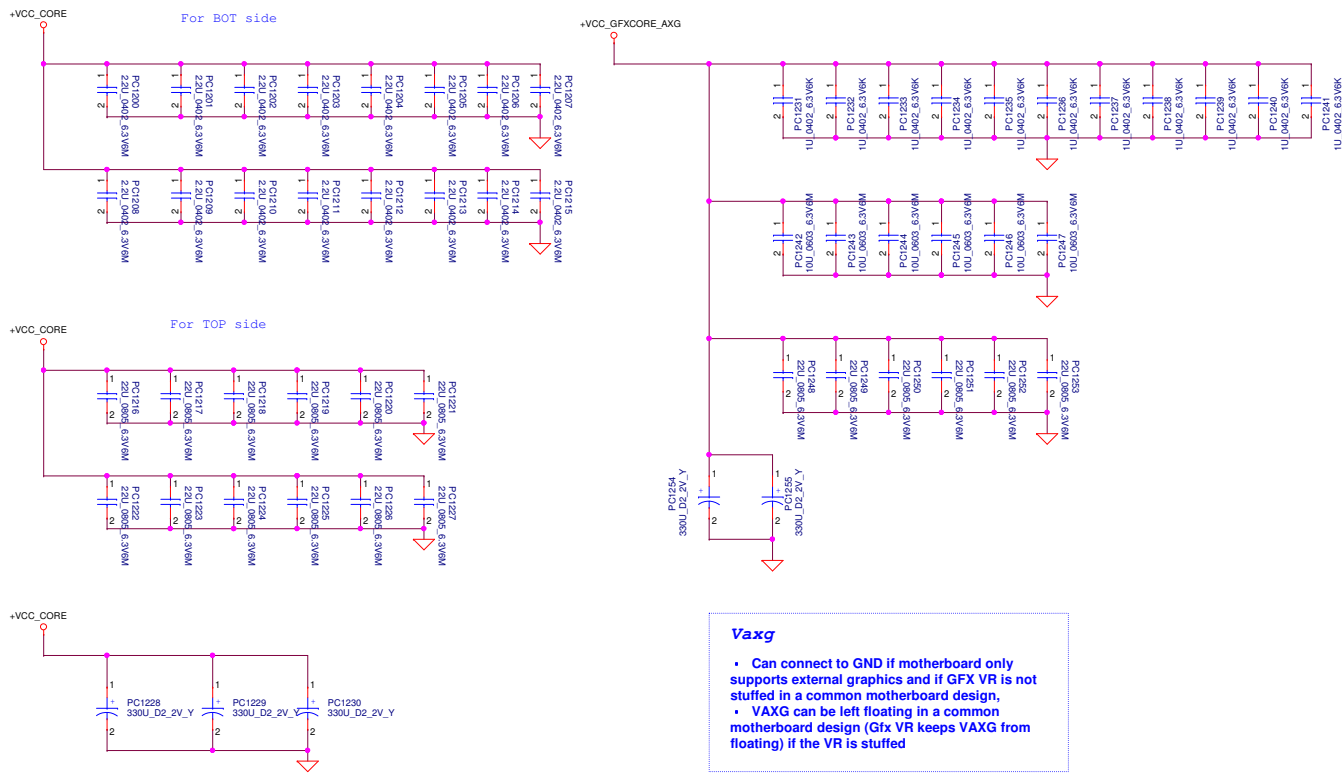
+VGA\_CORE  
TDC 20A  
Peak Current 30A  
OCP current 36A  
FSW=350kHz  
DCR 1.1mohm +/-5%



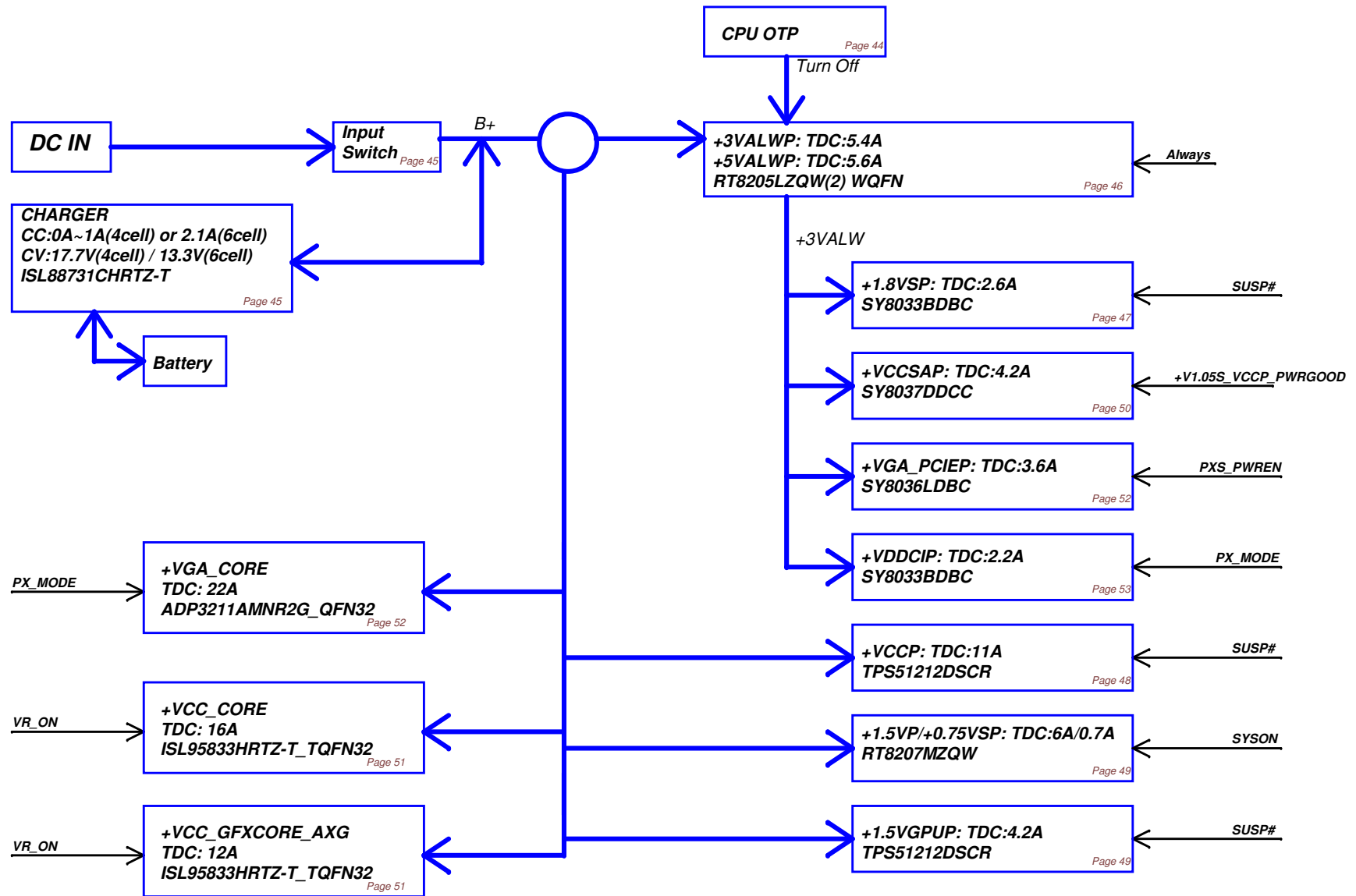
+VGA\_PCIE  
TDC 3.6A  
Peak Current 5.2A  
OCP current 6A

|          | Thames XT | Mars Pro |
|----------|-----------|----------|
| VGA_PCIE | 1.0V      | 0.95V    |
| PR832    | 6.81K     | 5.9K     |





# Power block



## Page 1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            |                          |                            |       |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|------------|--------------------------|----------------------------|-------|----------|
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | LA-9101P                 |                            |       |          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Date:                    | Wednesday, August 29, 2012 | Sheet | 57 of 57 |