

Compal Confidential

P7YE5/S5 Schematics Document

AMD Sabine

APU Llano / Hudson M2 / Vancouver Whistler_Seymour

DIS only / UMA only / PX Muxless with BACO

2011-02-18

LA-6991P REV: 0.2



PCB

Part Number = DA80000NI00



X76

Part Number = X76264BOL81

SEYSAM1G@



X76

Part Number = X76264BOL82

SEYHYN1G@



X76

Part Number = X76264BOL55

WHISAM1G@



X76

Part Number = X76264BOL60

WHIHYN1G@



X76

Part Number = X76264BOL61

SAM2G@



X76

Part Number = X76264BOL62

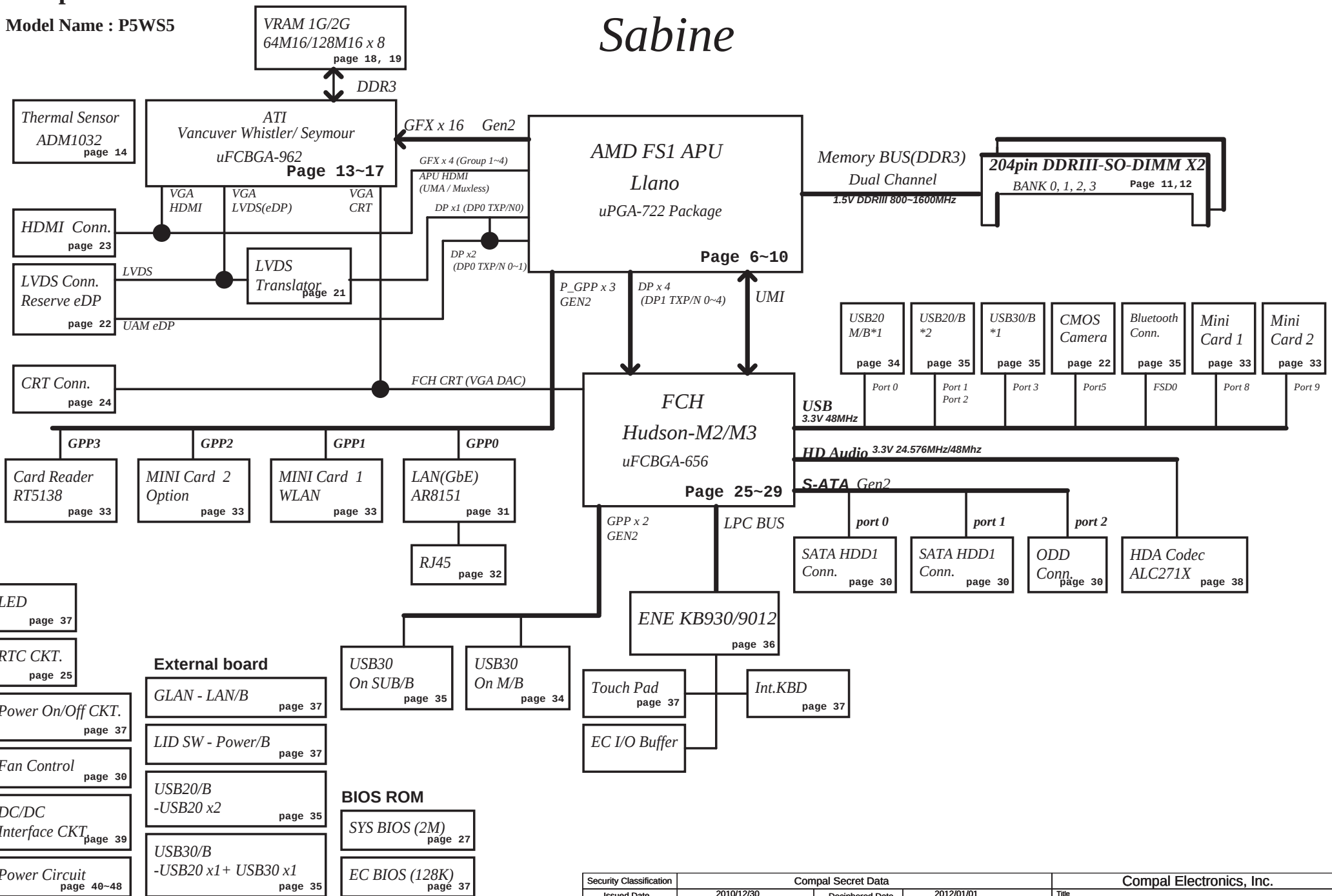
HYN2G@

Security Classification		Compal Secret Data		Compal Electronics, Inc.	
Issued Date	2010/12/30	Deciphered Date	2012/01/01	Title	SCHEMATIC MB A6991
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				4019BN	A
Date: Thursday, February 24, 2011				Sheet	1 of 50

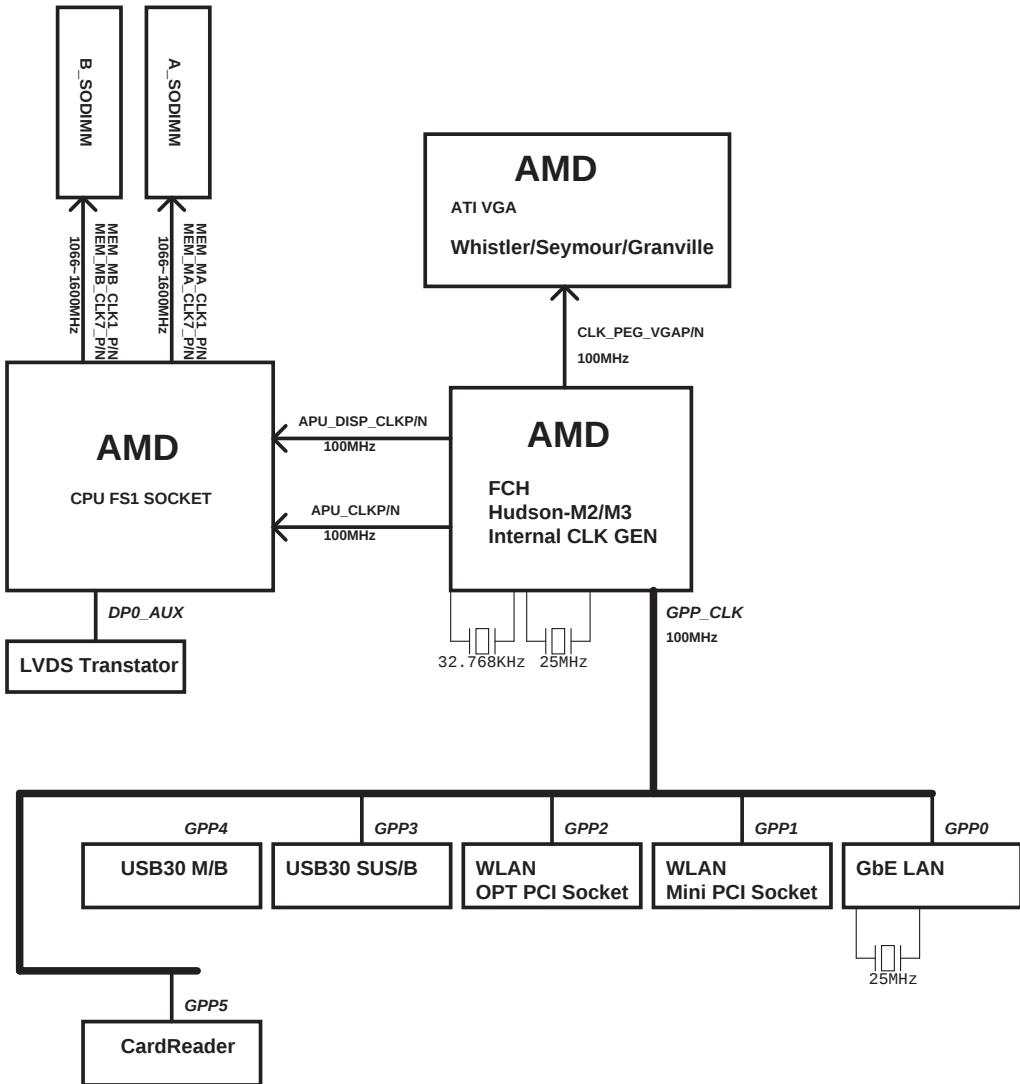
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Model Name : P5WS5

Sabine



CLOCK DISTRIBUTION

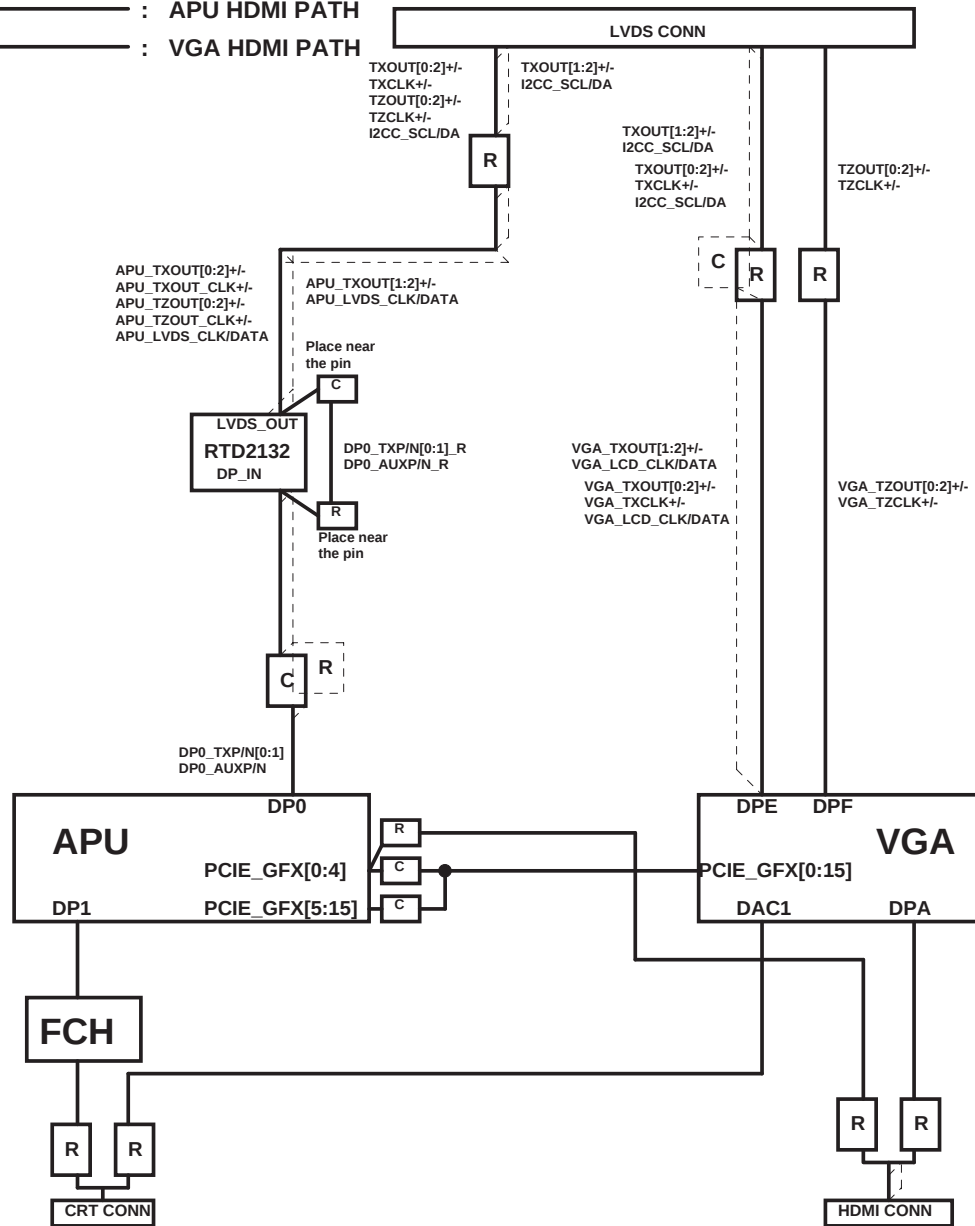


DISPLAY DISTRIBUTION

- ```

_____ : LVDS PATH
_____, --- : eDP PATH
_____ : APU HDMI PATH
_____ : VGA HDMI PATH

```



|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            |                    |                             |               |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Custom             | 4019BN                      |               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Date:              | Thursday, February 24, 2011 | Sheet 3 of 50 |

Voltage Rails

| Power Plane  | Description                                  | S1  | S3  | S5  |
|--------------|----------------------------------------------|-----|-----|-----|
| VIN          | Adapter power supply (19V)                   | N/A | N/A | N/A |
| B+           | AC or battery power rail for power circuit.  | N/A | N/A | N/A |
| +CPU_CORE    | Core voltage for CPU                         | ON  | OFF | OFF |
| +CPU_CORE_1  | Core voltage for CPU (0.7-1.2V)              | ON  | OFF | OFF |
| +CPU_CORE_NB | Voltage for On-die VGA of APU                | ON  | OFF | OFF |
| +VGA_CORE    | 0.95-1.2V switched power rail                | ON  | OFF | OFF |
| +0.75VS      | 0.75V switched power rail for DDR terminator | ON  | ON  | OFF |
| +1.0VSG      | 1.0V switched power rail for VGA             | ON  | OFF | OFF |
| +1.1ALW      | 1.1V switched power rail for FCH             | ON  | ON  | ON* |
| +1.1VS       | 1.1V switched power rail for FCH             | ON  | OFF | OFF |
| +1.2VS       | 1.2V switched power rail for APU             | ON  | OFF | OFF |
| +1.5V        | 1.5V power rail for CPU VDDIO and DDR        | ON  | ON  | OFF |
| +1.5VS       | 1.5V switched power rail                     | ON  | OFF | OFF |
| +1.8VSG      | 1.8V switched power rail                     | ON  | OFF | OFF |
| +2.5VS       | 2.5V for CPU_VDDA                            | ON  | OFF | OFF |
| +3VALW       | 3.3V always on power rail                    | ON  | ON  | ON* |
| +3V_LAN      | 3.3V power rail for LAN                      | ON  | ON  | ON  |
| +3VS         | 3.3V switched power rail                     | ON  | OFF | OFF |
| +5VALW       | 5V always on power rail                      | ON  | ON  | ON* |
| +5VS         | 5V switched power rail                       | ON  | OFF | OFF |
| +VSB         | VSB always on power rail                     | ON  | ON  | ON* |
| +RTCVCC      | RTC power                                    | ON  | ON  | ON  |

Note : ON\* means that this power plane is ON only with AC power available, otherwise it is OFF.

External PCI Devices

| Device | IDSEL# | REQ#/GNT# | Interrupts |
|--------|--------|-----------|------------|
|        |        |           |            |
|        |        |           |            |
|        |        |           |            |
|        |        |           |            |
|        |        |           |            |
|        |        |           |            |

EC SM Bus1 address

EC SM Bus2 address

| Device        | Address     | HEX | Device                | Address     | HEX |
|---------------|-------------|-----|-----------------------|-------------|-----|
| Smart Battery | 0001 011X b | 16H | SB-TSI                | 1001 100X b | 98H |
|               |             |     | GMT G781-1 (GPU)      | 1001 101X b | 9AH |
|               |             |     | CAT24C64WJ (RTD2136S) | 1010 100X b | A8H |
|               |             |     | VGA-TSI               | 1000 001X b | 82H |
|               |             |     |                       |             |     |

FCH SM Bus 0 address

FCH SM Bus 1 address

| Device    | Address    | HEX | Device | Address | HEX |
|-----------|------------|-----|--------|---------|-----|
| DDR DIMM1 | 1001 000Xb | 90  |        |         |     |
| DDR DIMM2 | 1001 010Xb | 94  |        |         |     |
|           |            |     |        |         |     |
|           |            |     |        |         |     |
|           |            |     |        |         |     |

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

Board ID / SKU ID Table for AD channel

| Vcc      | 3.3V +/- 5%  |             |             |             |
|----------|--------------|-------------|-------------|-------------|
| Ra/Rc/Re | 100K +/- 5%  |             |             |             |
| Board ID | Rb / Rd / Rf | VAD_BID min | VAD_BID typ | VAD_BID max |
| 0        | 0            | 0 V         | 0 V         | 0 V         |
| 1        | 8.2K +/- 5%  | 0.216 V     | 0.250 V     | 0.289 V     |
| 2        | 18K +/- 5%   | 0.436 V     | 0.503 V     | 0.538 V     |
| 3        | 33K +/- 5%   | 0.712 V     | 0.819 V     | 0.875 V     |
| 4        | 56K +/- 5%   | 1.036 V     | 1.185 V     | 1.264 V     |
| 5        | 100K +/- 5%  | 1.453 V     | 1.650 V     | 1.759 V     |
| 6        | 200K +/- 5%  | 1.935 V     | 2.200 V     | 2.341 V     |
| 7        | NC           | 2.500 V     | 3.300 V     | 3.300 V     |

BTO Option Table

| BOM Structure | BTO Item                                    |
|---------------|---------------------------------------------|
| UMA@          | Display from UMA (PX4.0 or UMA only)        |
| VGA@          | Have VGA chip (Discrete only or PX4.0)      |
| DISO@         | Display from VGA (Discrete only)            |
| SEYM@         | Use Seymour (Discrete only and PX4.0)       |
| WHI@          | Use Whistler (Discrete only and PX4.0)      |
| GRAN@         | Use Granville (Discrete only and PX4.0)     |
| VAN@          | Use Vancouver VGA (Discrete only and PX4.0) |
| RT@           | Use translator RTD2136S                     |
| ANX@          | Use translator ANX3110                      |
| M2@           | Use Hudson-M2                               |
| M3@           | Use Hudson-M3                               |
| 930@          | Use KB930                                   |
| 9012@         | Use KB9012                                  |
| 128@          | Use VRAM channel A                          |
| PX@           | PX4.0                                       |
| BACO@         | Use BACO                                    |
| NOBACO@       | No use BACO                                 |
| APULVDS@      | UMA LVDS path                               |
| APUEDP@       | UMA eDP path                                |
| VGALVDS@      | VGA LVDS path                               |
| VGAEDP@       | VGA eDP path                                |
| EDP@          | eDP path                                    |
| JE@           | ACER                                        |
| SJV@          | PB and GW                                   |
| NOGRAN@       | No Use Granville                            |
|               |                                             |
|               |                                             |
|               |                                             |
|               |                                             |
|               |                                             |

PROJECT ID Table

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

BOARD ID Table

| Board ID | PCB Revision |
|----------|--------------|
| 0        |              |
| 1        | 0.1(EVT)     |
| 2        | 0.2(DVT)     |
| 3        |              |
| 4        |              |
| 5        |              |
| 6        |              |
| 7        |              |

BOM Config

EVT

UMA only:

UMA@, RT@, ANX@, M3@, 930@, APULVDS@, JE@

DISO only:

VGA@, DISO@, VGALVDS@, SEYM@ or WHI@, VAN@, 128@(With WHI@), NOGRAN@, NOBACO@, M3@, 930@, JE@

PX

UMA@, VGA@, PX@, SEYM@ or WHI@, VAN@, 128@(With WHI@), NOGRAN@, RT@, ANX@, APULVDS@, BACO@, M3@, 930@, JE@

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Date:                    | Thursday, February 24, 2011 | Sheet 4 of 50 |

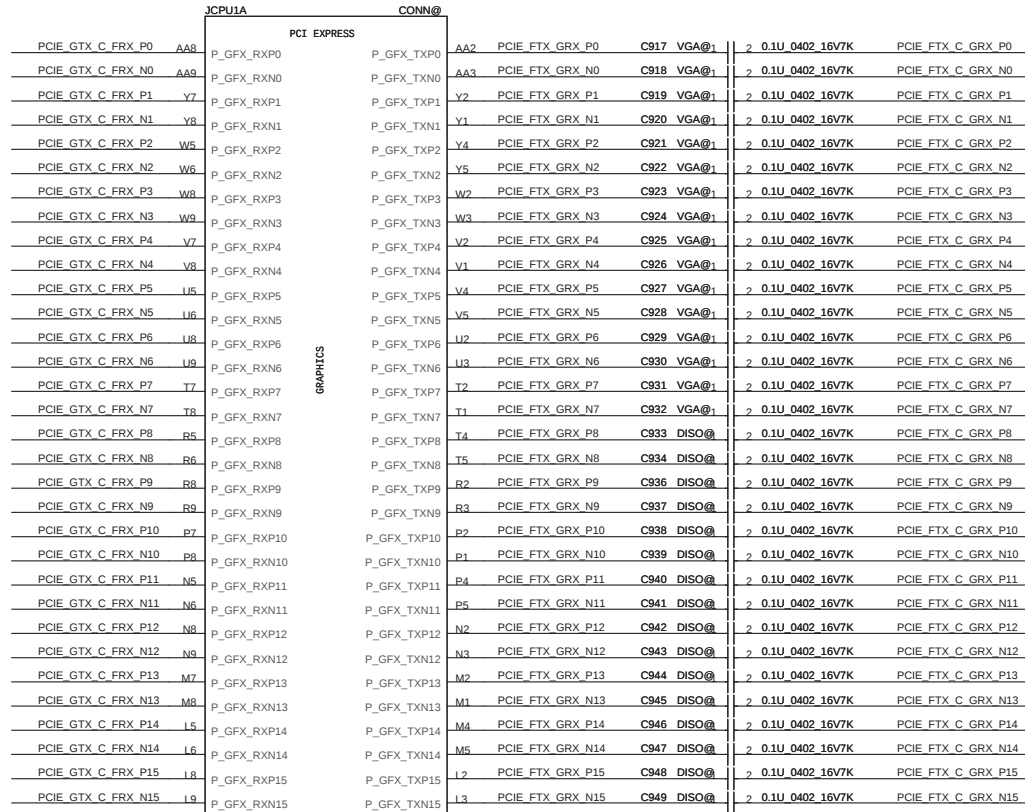


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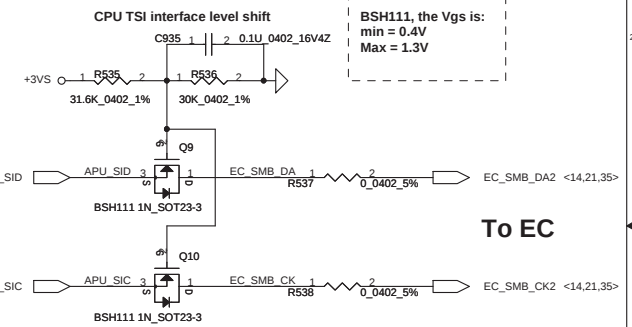
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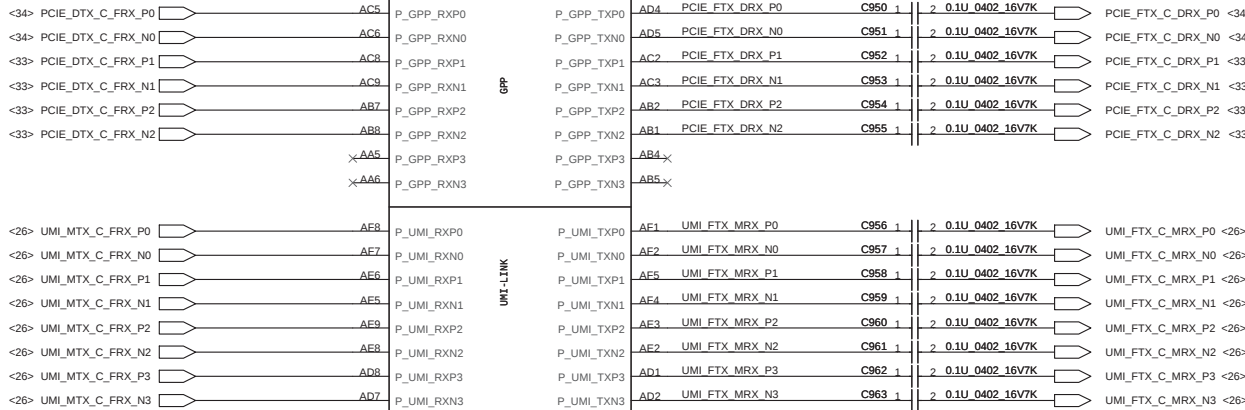


To VGA

2  
1  
0  
To HDMI  
CLK

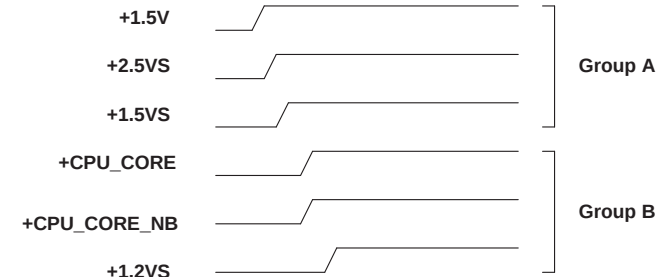


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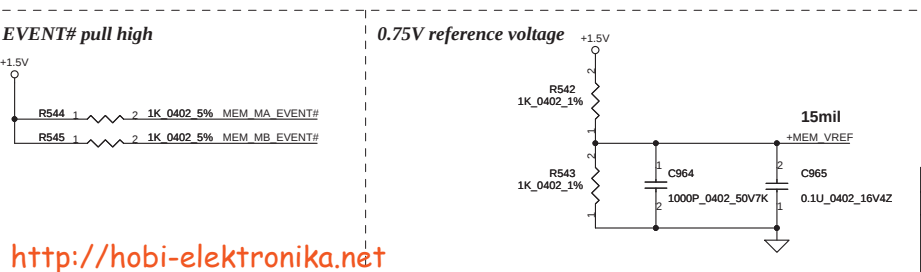


AMD\_TOPEDO\_FS-1

## Power Sequence of APU



| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data |                 |            | Compal Electronics, Inc. |                             |               |
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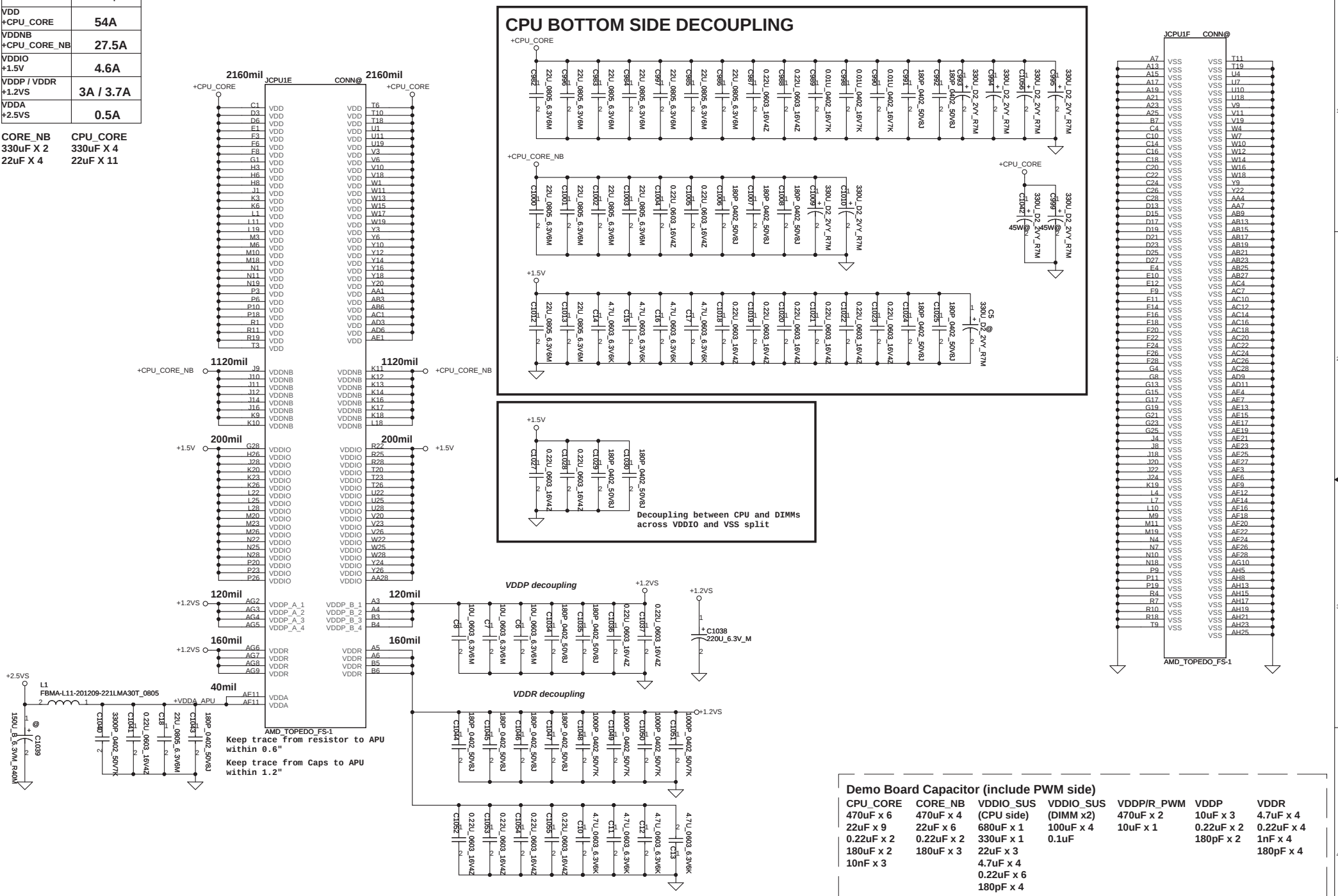


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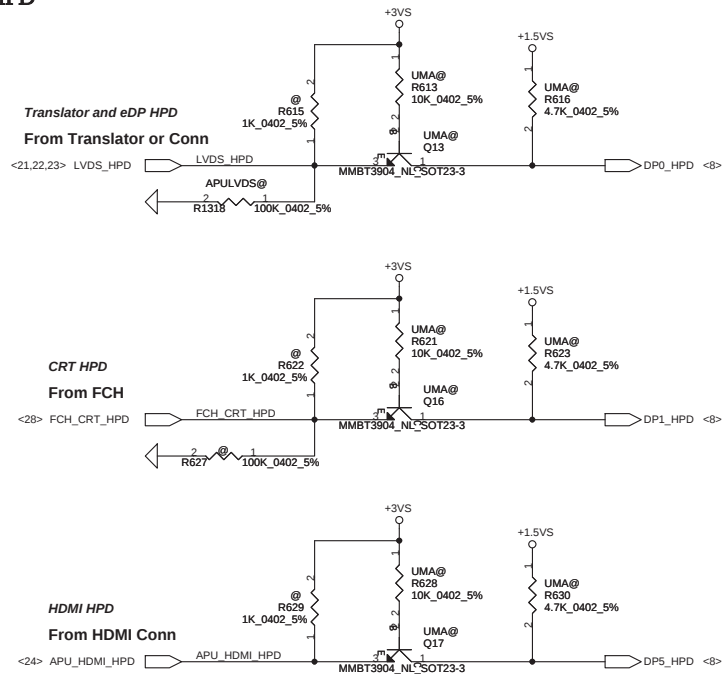


| Power Name            | Consumption |
|-----------------------|-------------|
| VDD<br>+CPU_CORE      | 54A         |
| VDDNB<br>+CPU_CORE_NB | 27.5A       |
| VDDIO                 | 4.6A        |
| VDDP / VDDR<br>+1.2VS | 3A / 3.7A   |
| VDDA<br>+2.5VS        | 0.5A        |

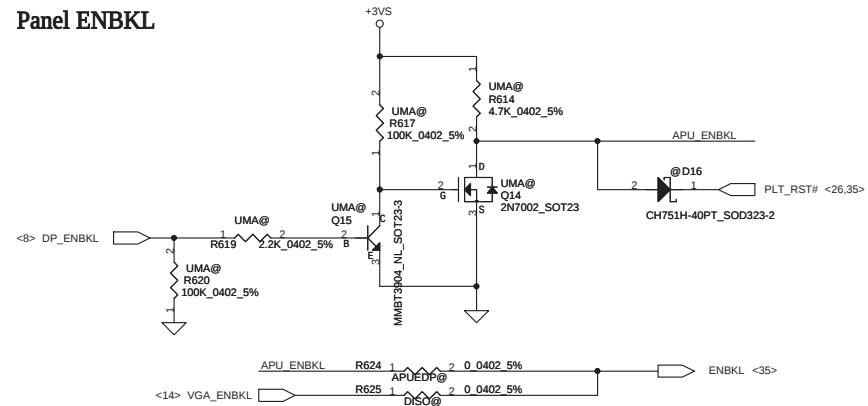
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|----------------------------------|------------------------------------|
| CORE_NB<br>330uF X 2<br>22uF X 4 | CPU_CORE<br>330uF X 4<br>22uF X 11 |
|----------------------------------|------------------------------------|



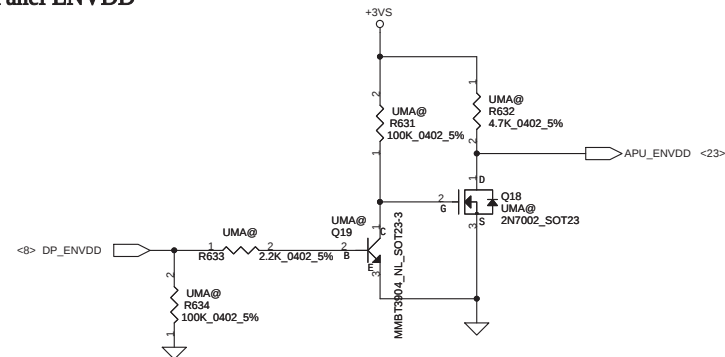
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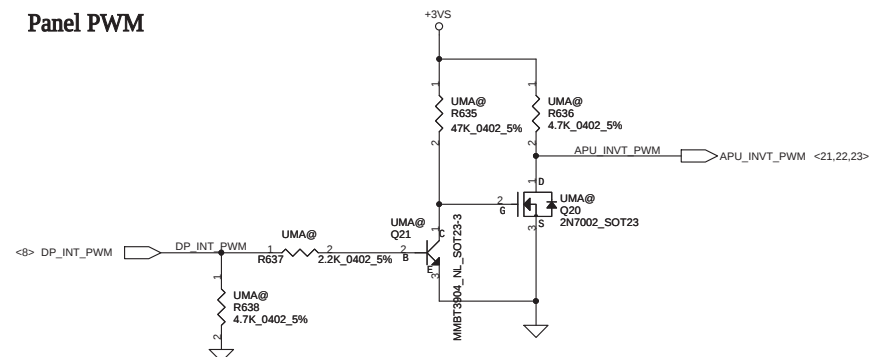
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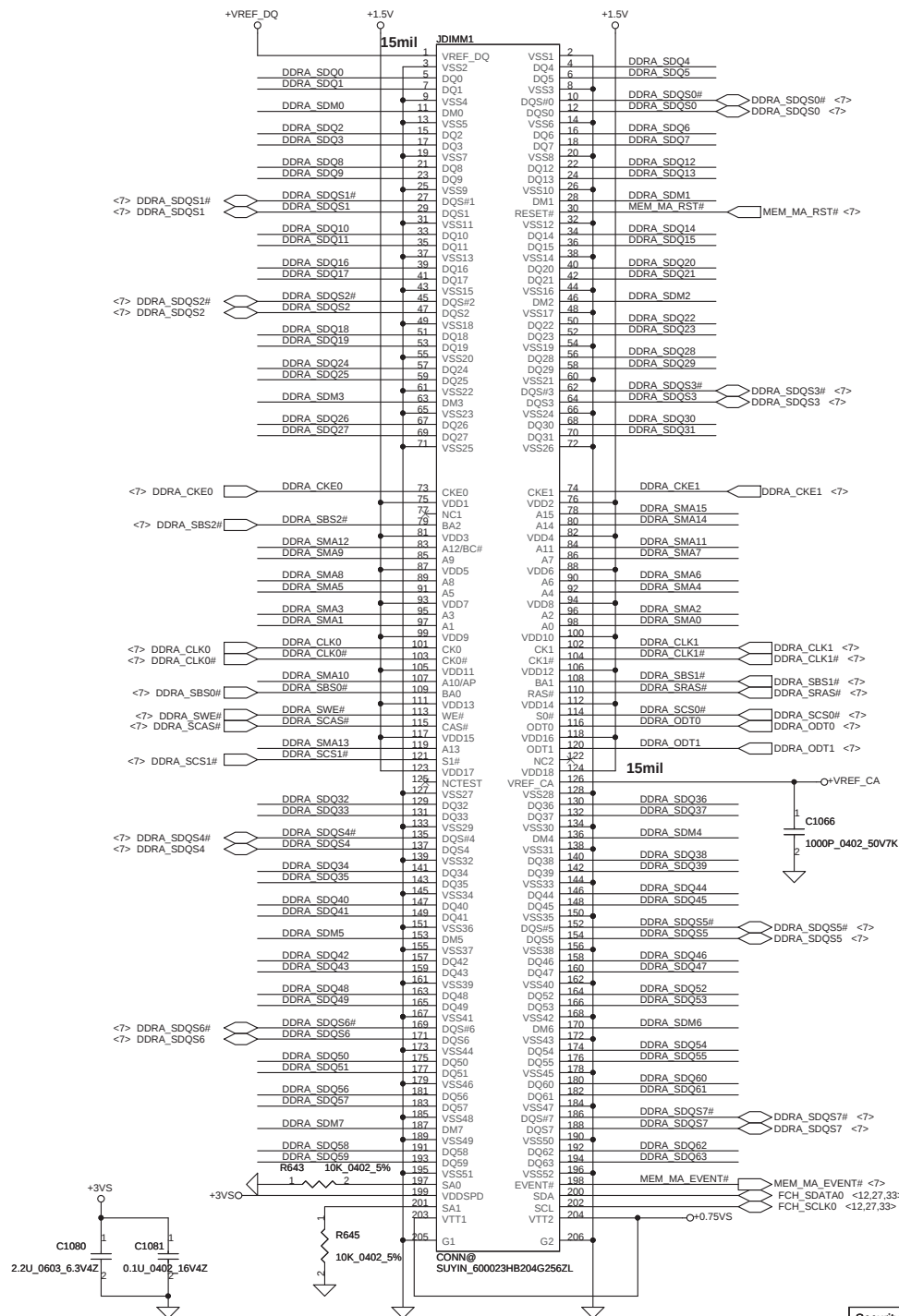
## Panel ENVDD



## Panel PWM



|                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             |                    |            |                 |                    |
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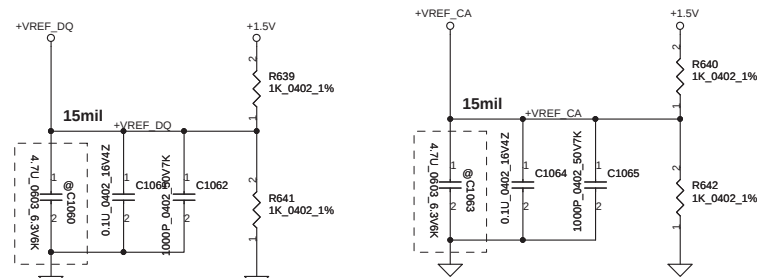
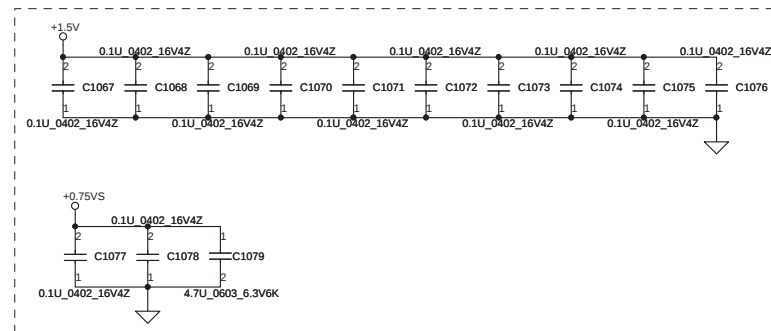


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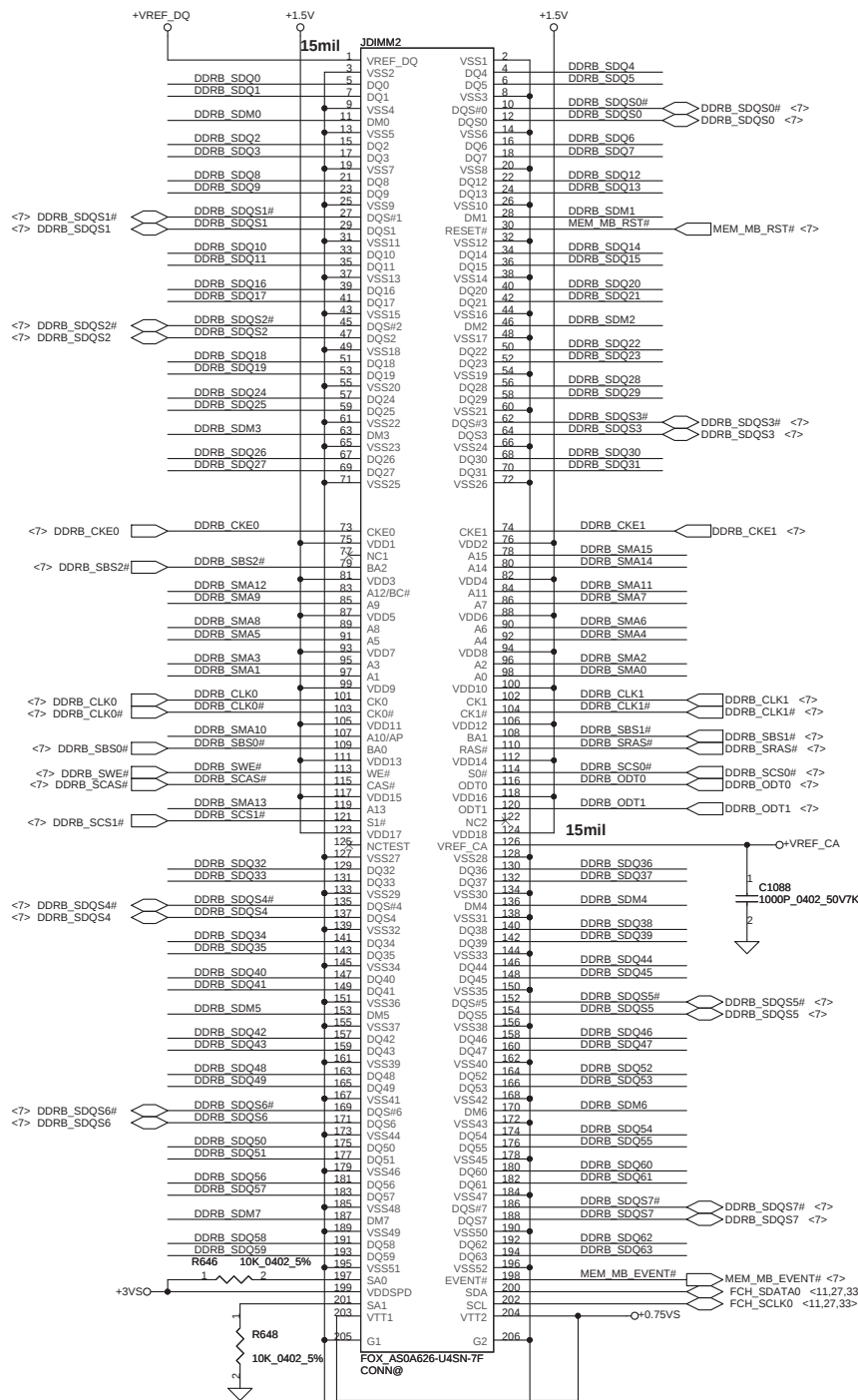
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Place near DIMM1



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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 11 of 50                    |



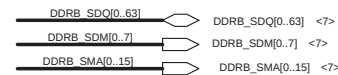
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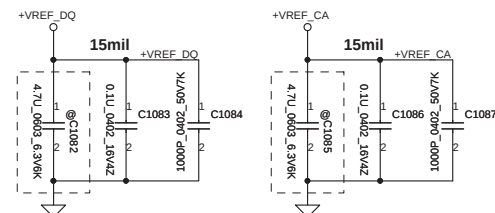
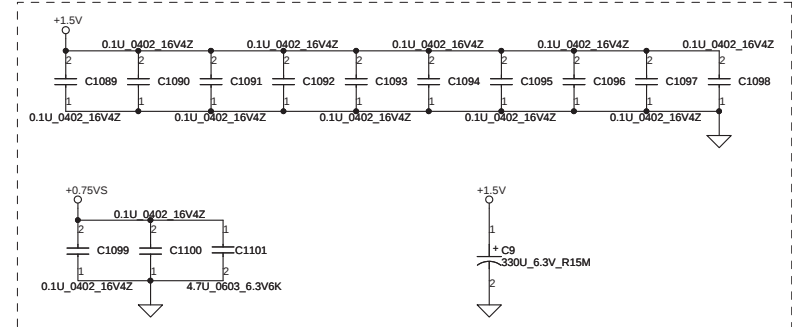
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Place near DIMM2



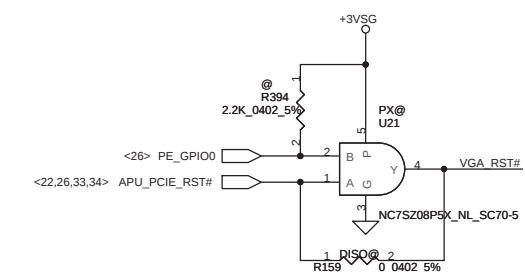
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date: Thursday, February 24, 2011 | Sheet 12 of 50 |

The diagram illustrates the PCI Express interface connections. On the left, the U8A processor is connected to the PCI Express controller. The connections include:

- PCIe\_FTX\_C**: Signals for FTX\_C, GRX\_P, and GRX\_N, connected to the U8A and the PCI Express controller.
- PCIe\_GTX\_C**: Signals for GTX\_C, FRX\_P, and FRX\_N, connected to the U8A and the PCI Express controller.
- Control Signals**: CLK\_PEG\_VGA, CLK\_PEG\_VGA#, PWRGOOD, and PERSTB.
- Calibration Signals**: CALRP and CALRN.

The U8A is connected to the PCI Express controller via a series of multiplexers and buffers. The connections are as follows:

- PCIe\_FTX\_C**: FTX\_C, GRX\_P, and GRX\_N are connected to the U8A and the PCI Express controller.
- PCIe\_GTX\_C**: GTX\_C, FRX\_P, and FRX\_N are connected to the U8A and the PCI Express controller.
- Control Signals**: CLK\_PEG\_VGA, CLK\_PEG\_VGA#, PWRGOOD, and PERSTB.
- Calibration Signals**: CALRP and CALRN.

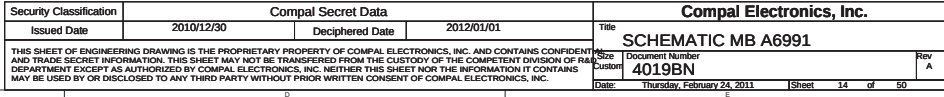
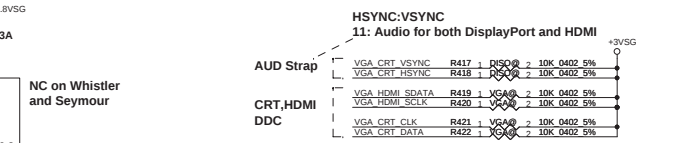
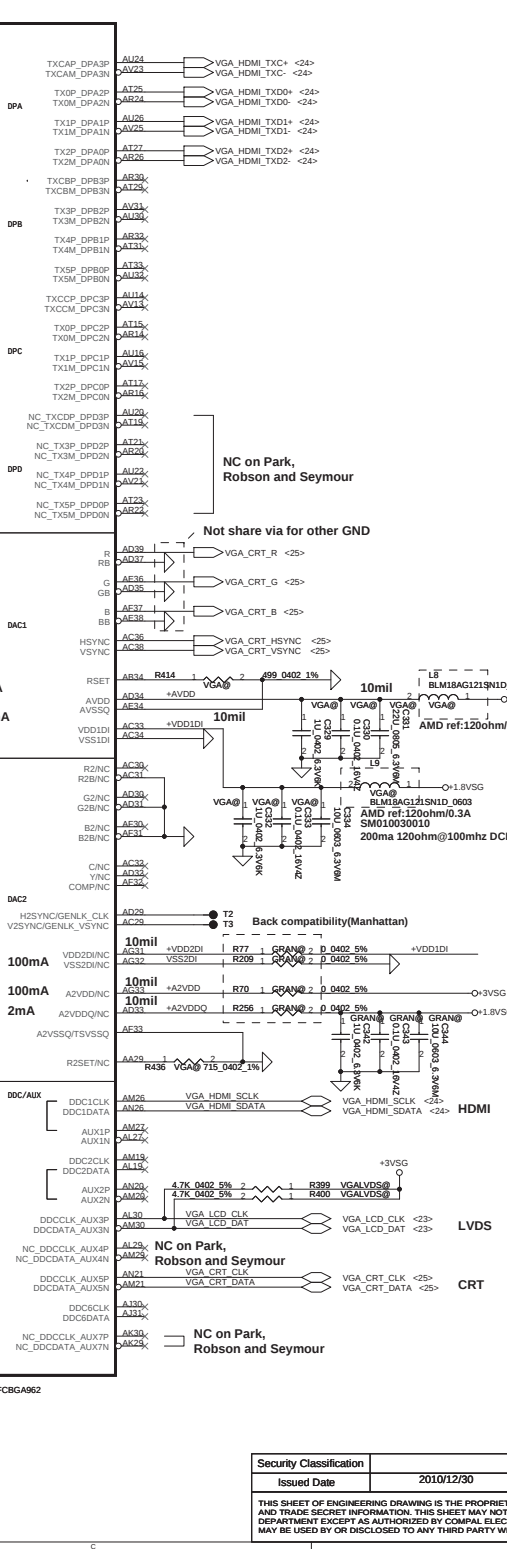


216-0810005 A11  
WHISTLER PRO M2 A11:  
SA00004C720(S IC 216-0810005 A11 WHISTLER PRO FCBGA 962P ABO !)

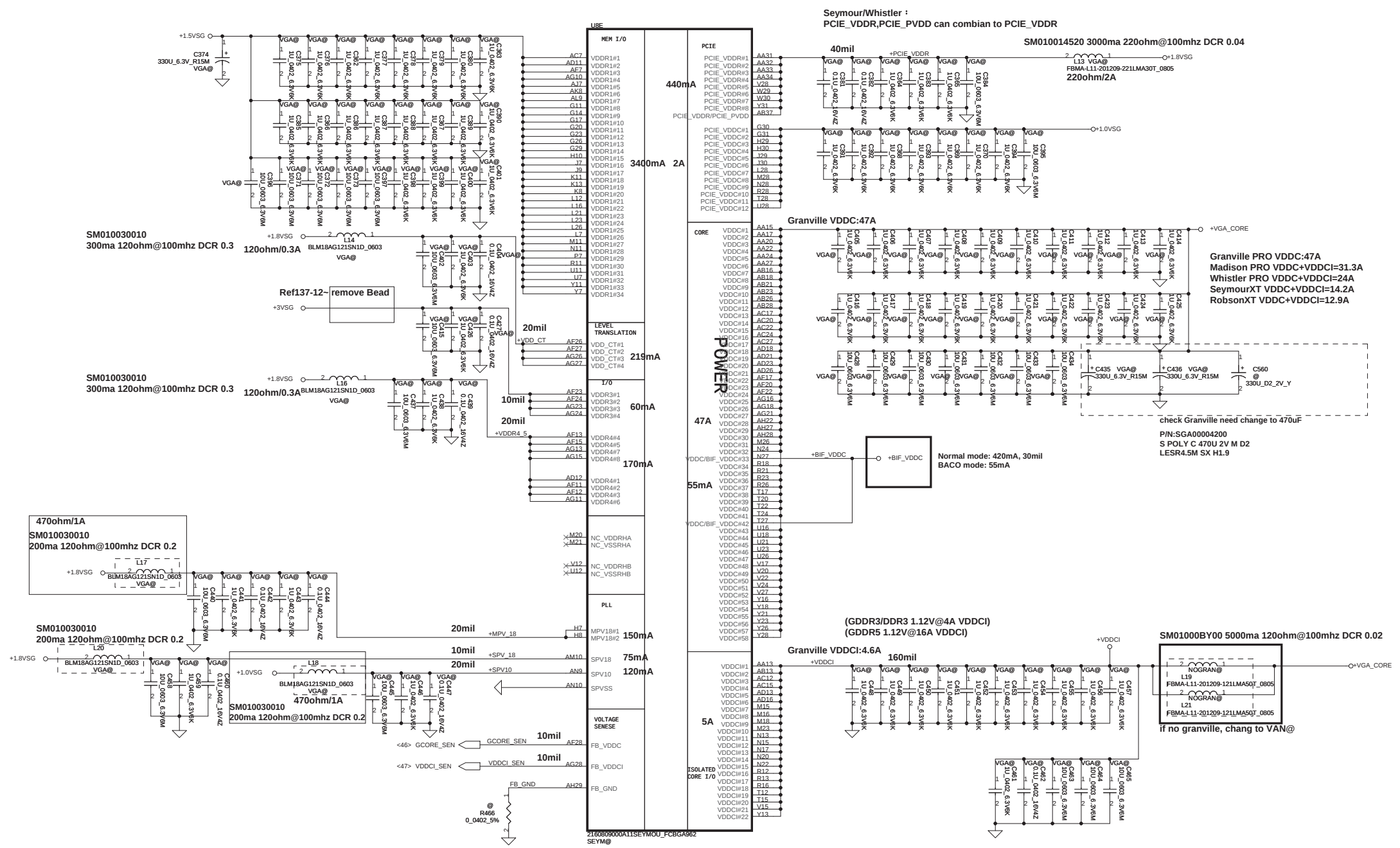
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 13 of 50                    |

## Global Swap Lock on Multiple GPUs

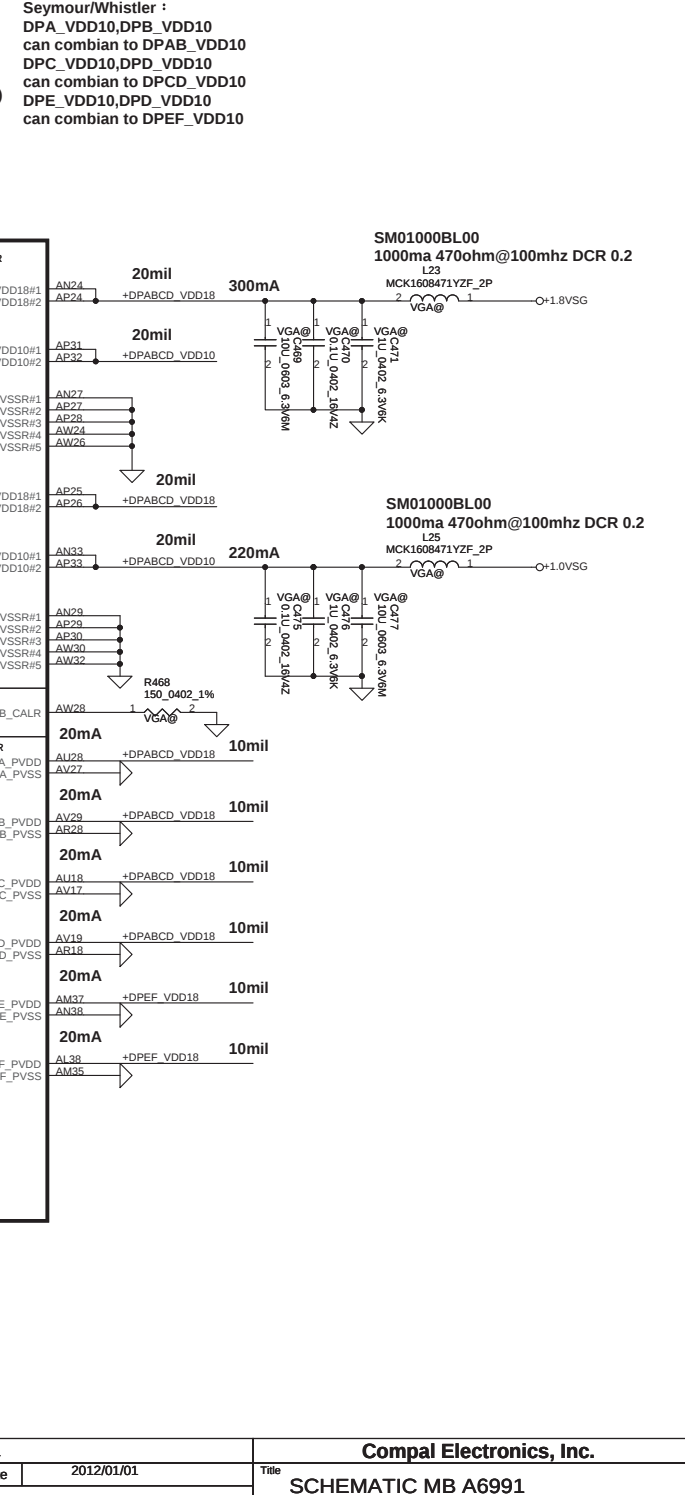
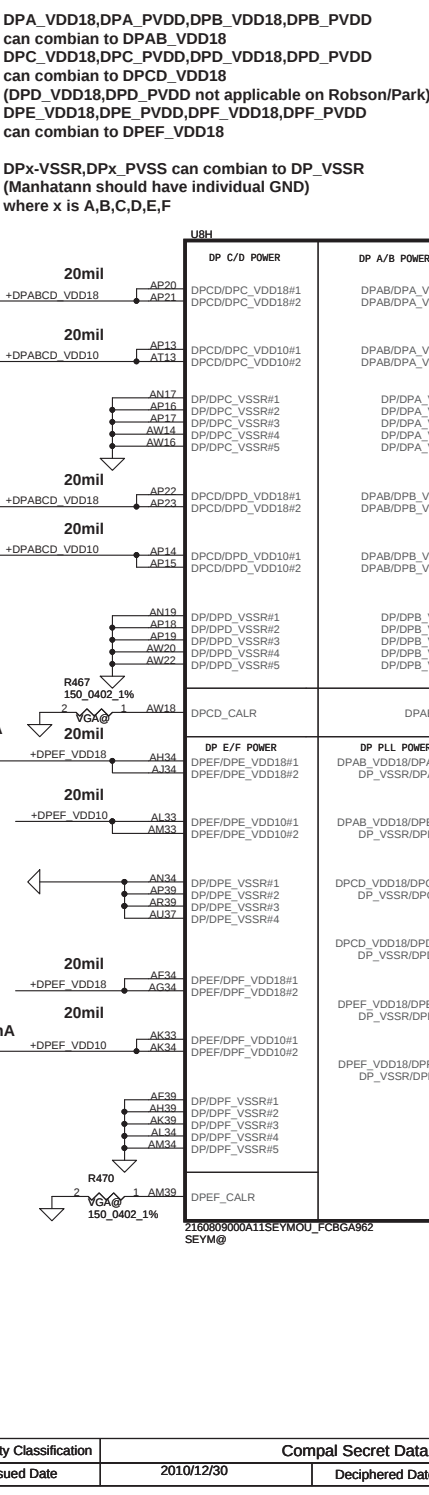
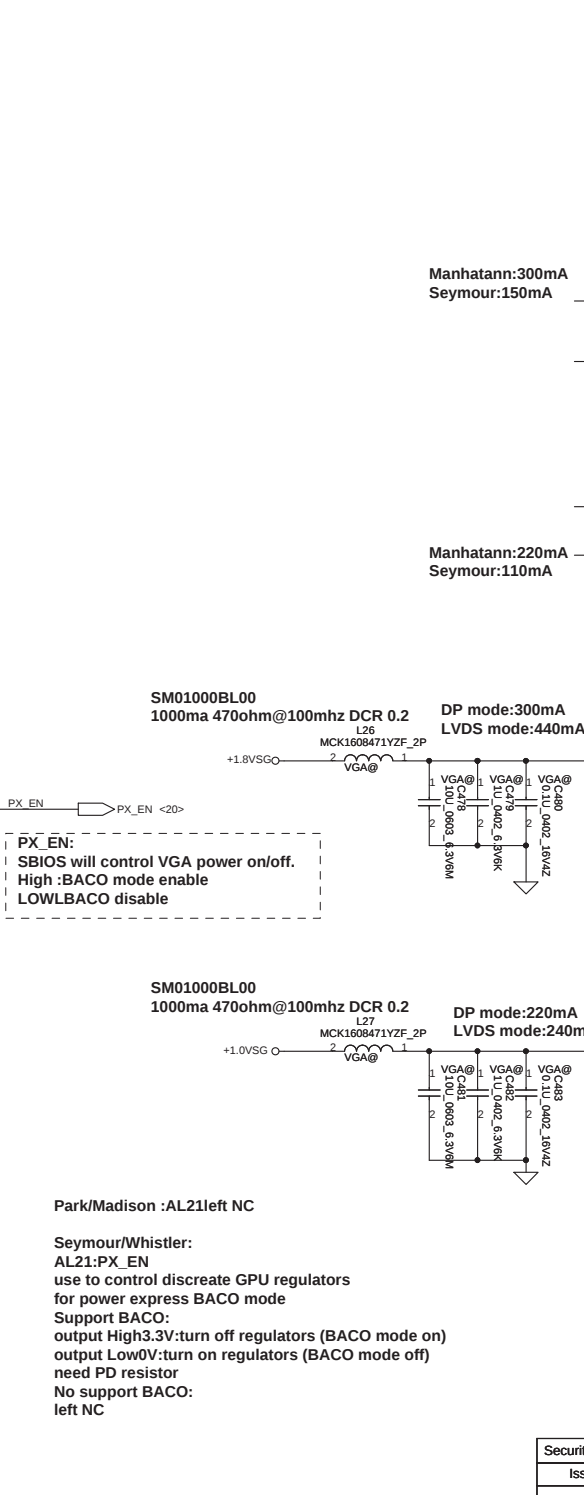
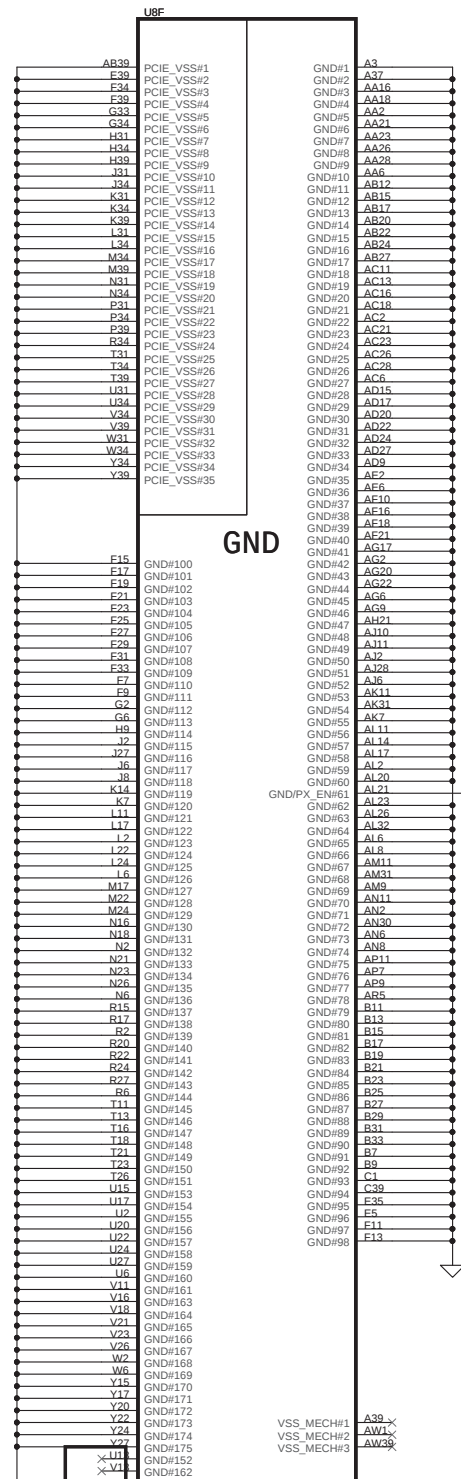
| WHISTLER-PRO |        |                 |        |              |                 |         |
|--------------|--------|-----------------|--------|--------------|-----------------|---------|
| ID3-0        | Vendor | Size            | Freq   | PIN          | Description     | Quality |
| 0000         | SAM    | E-die 64*16     | 800MHz | SA000035720  | K4W1G1646E-HC12 | V       |
| 0001         | SAM    | C-die 128*16    | 800MHz | SA000035WQ60 | K4W1G1646E-HC12 | V       |
| 0010         | SAM    | G-die 64*16     | 933MHz | SA00004QCS10 | K4W1G1646E-BC11 |         |
| 0011         | SAM    | C-die 128*16    | 933MHz | SA000047G20  | K4W2G1646C-HC11 |         |
| 0100         |        |                 |        |              |                 |         |
| 0101         |        |                 |        |              |                 |         |
| 0110         |        |                 |        |              |                 |         |
| 0111         |        |                 |        |              |                 |         |
| 1000         | HYN    | Orion-die 64*16 | 800MHz | SA000032420  | H5TQ1G63BFR-12C |         |
| 1001         | HYN    | Vega-die 128*16 | 800MHz | SA000033V50  | H5TQ26G3BFR-12C | V       |
| 1010         | HYN    | Vega-die 64*16  | 800MHz | SA000041S40  | H5TQ1G63DFR-12C |         |
| 1011         | HYN    | Vega-die 64*16  | 800MHz | SA000033V40  | H5TQ1G63DFR-12C |         |
| 1100         | HYN    | Vega-die 128*16 | 900MHz | SA000032Y20  | H5TQ26G3BFR-11C |         |
| 1110         |        |                 |        |              |                 |         |
| 1111         |        |                 |        |              |                 |         |





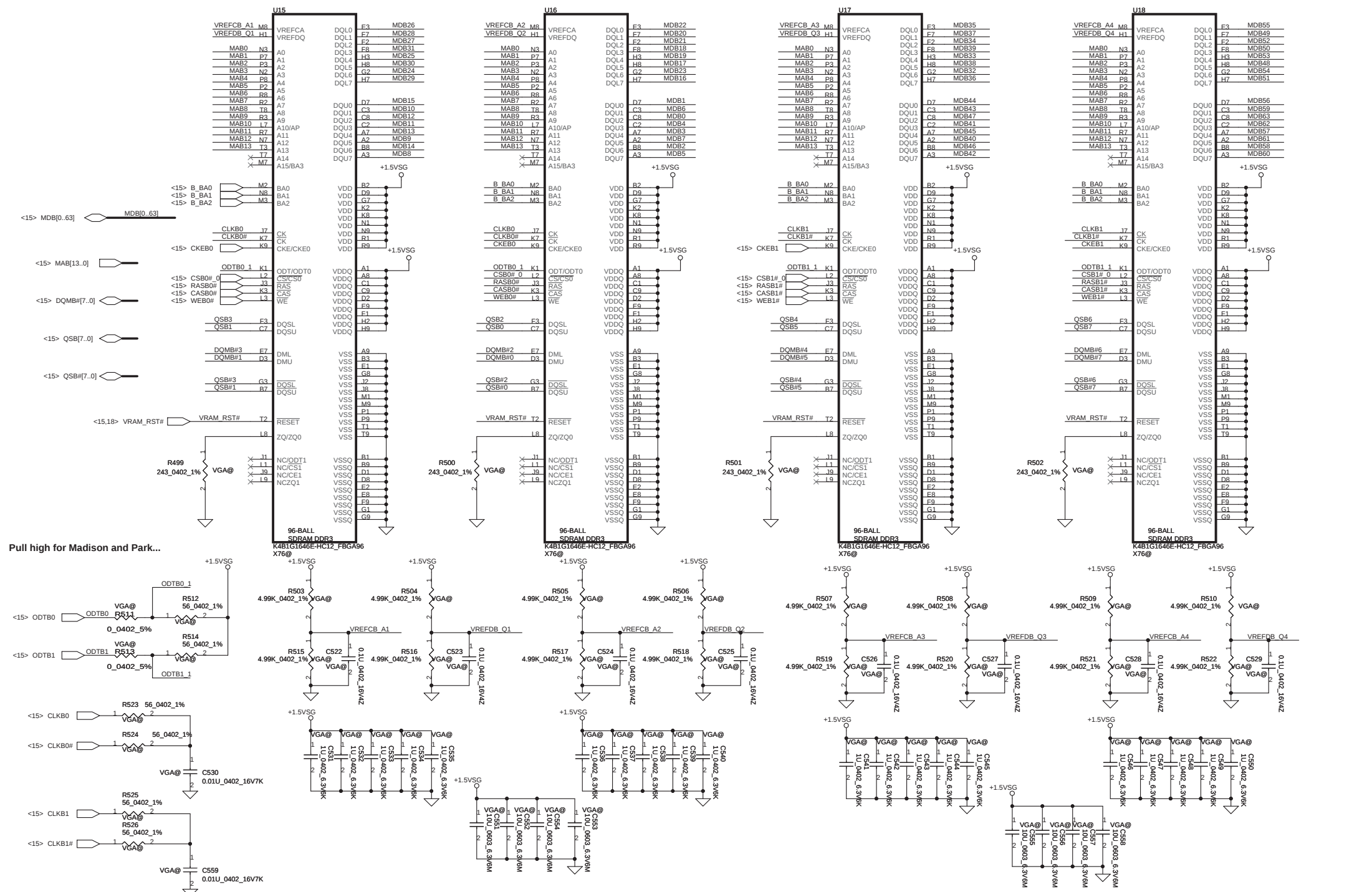


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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date: Thursday, February 24, 2011 | Sheet 16 of 50 |



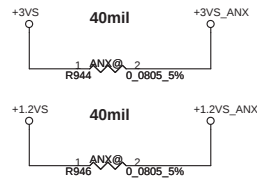
| Security Classification                                                                                                                                                                                                                                                                                     |            | Compal Secret Data |            | Title              |                             |
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|                                                                                                                                                                                                                                                                                                             |            |                    |            | Sheet              | 17 of 50                    |



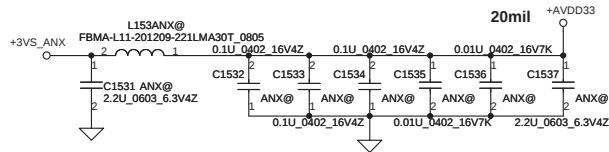
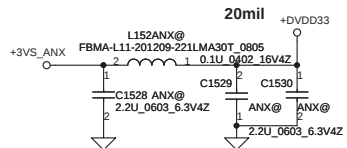
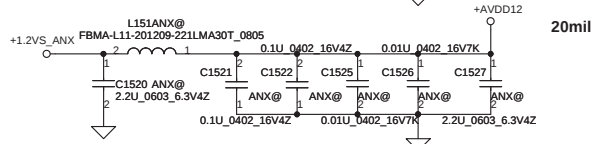
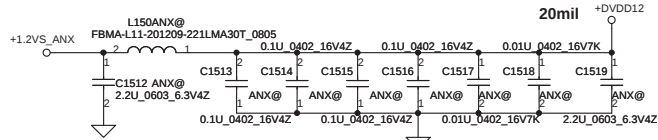








PD 100K at Page10



<21> DP0\_AUXN\_ANX  
<21> DP0\_AUXP\_ANX  
<10,21,23> LVDS\_HPD  
<21> DP0\_TXN0\_ANX  
<21> DP0\_TXP0\_ANX  
<21> DP0\_TXN1\_ANX  
<21> DP0\_TXP1\_ANX

<13,26,33,34> APU\_PCIE\_RST#  
<23> ANX\_ENVDD

+3VS\_ANX@ R30 1 ANX@ 2 10K 0402\_5% 12

+3VS\_ANX@ R1312 1 ANX@ 2 1M 0402\_5% 12

C1509 1 ANX@ 2 0.1U 0402\_16V4Z

T46 PAD 51

T45 PAD 52

R31 1 ANX@ 2 10K 0402\_5% 16

T43 PAD 17

T44 PAD 18

R1315 ANX@ 2 12K 0402\_1% 16

C1510 1 ANX@ 2 100P 0402\_50V8J

R\_BIAS 64

T37 PAD 55

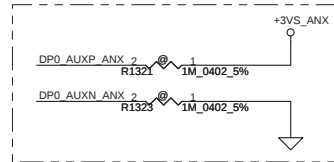
T38 PAD 57

T39 PAD 56

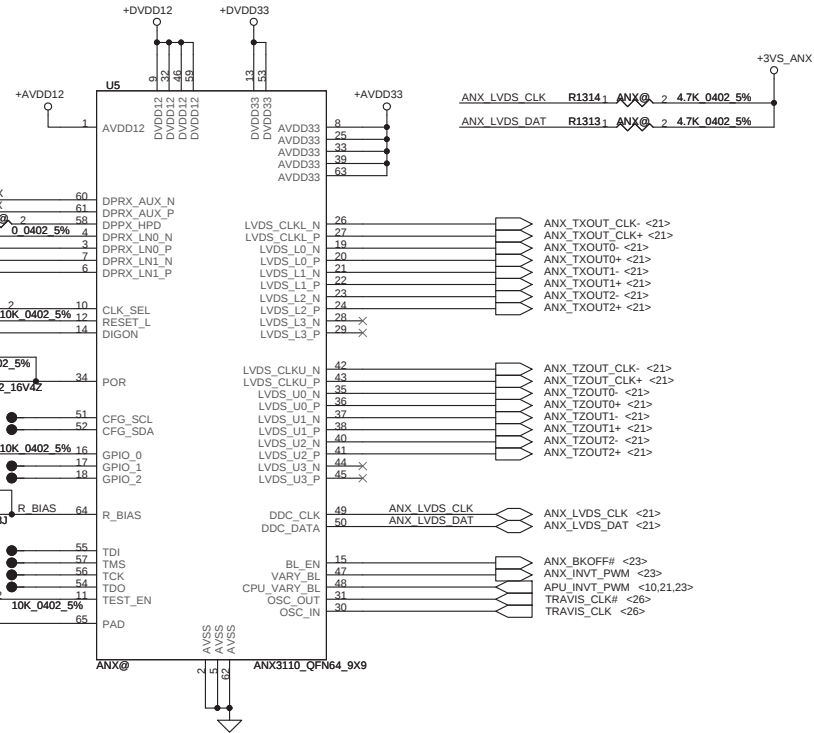
T40 PAD 54

R32 1 ANX@ 2 10K 0402\_5% 11

ANX@ 65

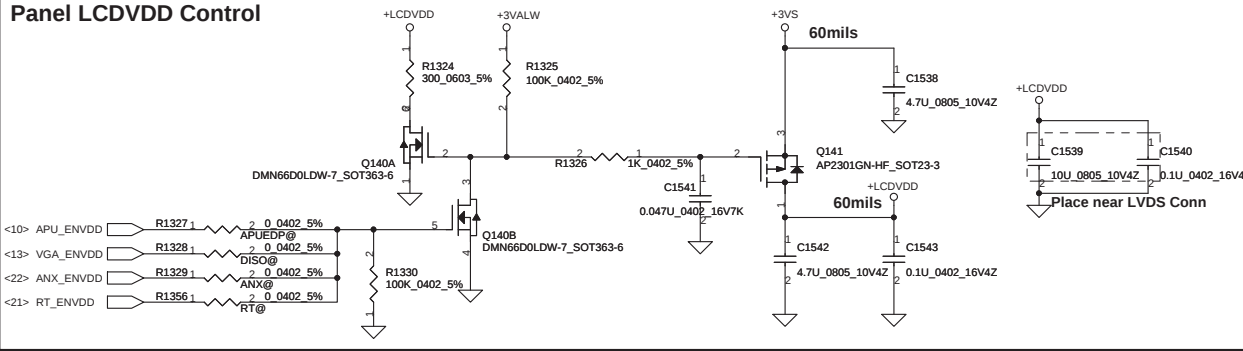


Place via on each trace bus and let resistor very close the via.

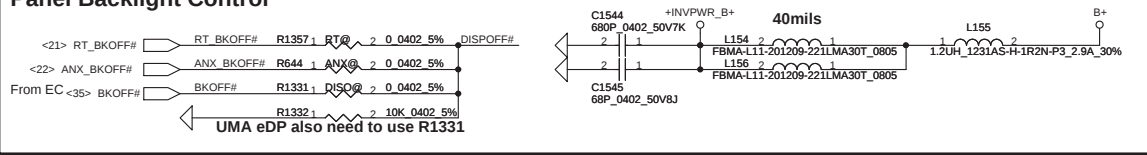


|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                          |                             |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 22 of 50                    |

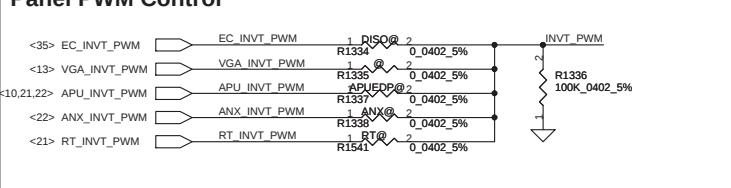
## Panel LCDVDD Control



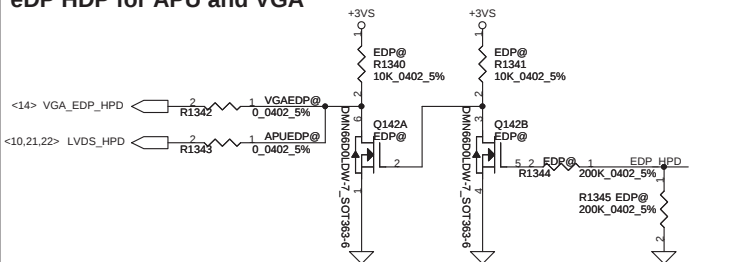
## Panel Backlight Control



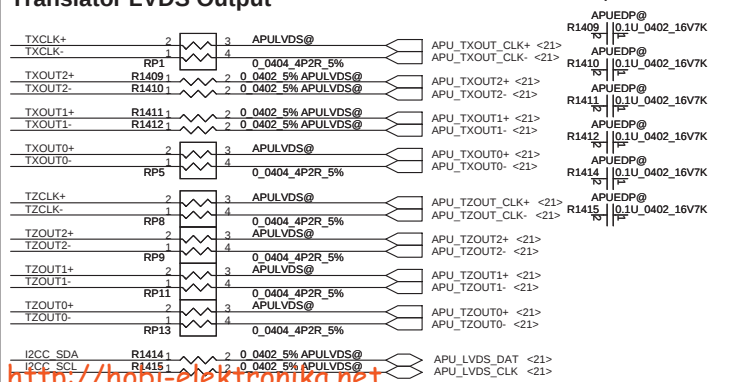
## Panel PWM Control



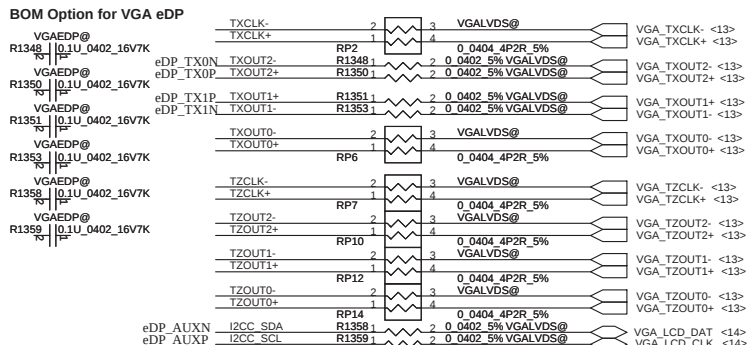
## eDP HDP for APU and VGA



## Translator LVDS Output

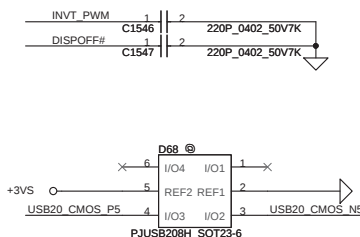
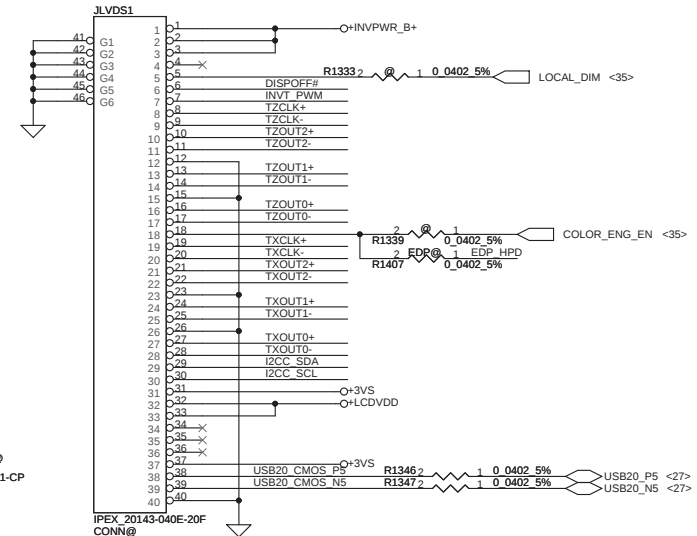


## VGA LVDS Output (Reserve eDP)

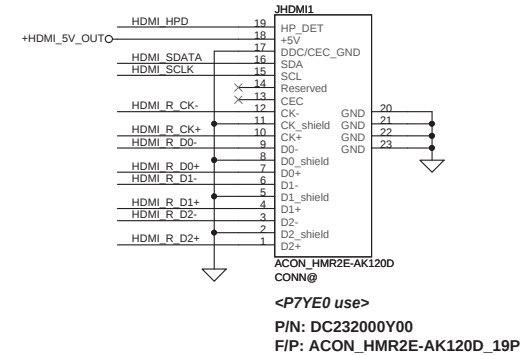
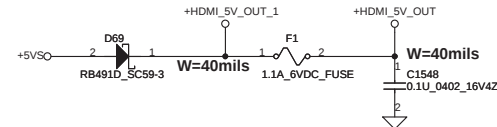
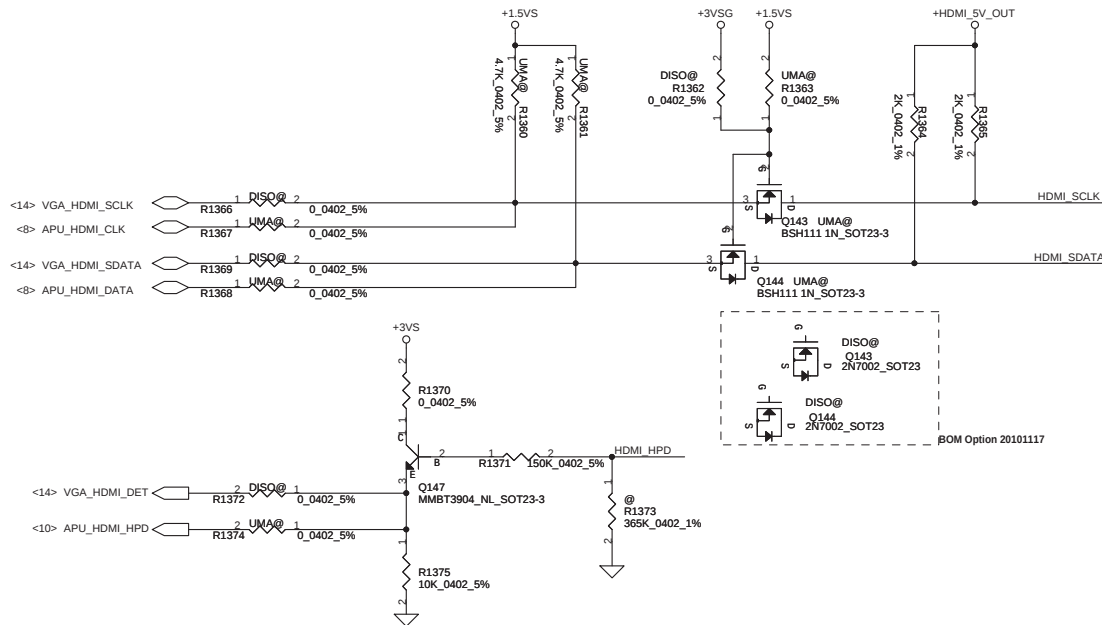


| UMA/DIS LVDS/eDP Mapping table   |                          |                             |                      |                      |
|----------------------------------|--------------------------|-----------------------------|----------------------|----------------------|
| UMA                              |                          | DIS                         |                      | Panel                |
| LVDS                             | eDP                      | LVDS                        | eDP                  | Conn.                |
| APU_TXOUT0+<br>APU_TXOUT0-       |                          | VGA_TXOUT0+<br>VGA_TXOUT0-  |                      | TXOUT0+<br>TXOUT0-   |
| APU_TXOUT1+<br>APU_TXOUT1-       | DP0_TXP1_R<br>DP0_TXN1_R | VGA_TXOUT1+<br>VGA_TXOUT1-  | eDP_TX1P<br>eDP_TX1N | TXOUT1+<br>TXOUT1-   |
| APU_TXOUT2+<br>APU_TXOUT2-       | DP0_TXP0_R<br>DP0_TXN0_R | VGA_TXOUT2+<br>VGA_TXOUT2-  | eDP_TX0P<br>eDP_TX0N | TXOUT2+<br>TXOUT2-   |
| APU_TXOUT_CLK+<br>APU_TXOUT_CLK- |                          | VGA_TXCLK+<br>VGA_TXCLK-    |                      | TXCLK+<br>TXCLK-     |
| APU_TZOUT0+<br>APU_TZOUT0-       |                          | VGA_TZOUT0+<br>VGA_TZOUT0-  |                      | TZOUT0+<br>TZOUT0-   |
| APU_TZOUT1+<br>APU_TZOUT1-       |                          | VGA_TZOUT1+<br>VGA_TZOUT1-  |                      | TZOUT1+<br>TZOUT1-   |
| APU_TZOUT2+<br>APU_TZOUT2-       |                          | VGA_TZOUT2+<br>VGA_TZOUT2-  |                      | TZOUT2+<br>TZOUT2-   |
| APU_TZOUT_CLK+<br>APU_TZOUT_CLK- |                          | VGA_TZCLK+<br>VGA_TZCLK-    |                      | TZCLK+<br>TZCLK-     |
| APU_LVDS_CLK<br>APU_LVDS_DAT     | DP0_AUXP_R<br>DP0_AUXN_R | VGA_LCD_CLK<br>VGA_LCD_DATA | eDP_AUXP<br>eDP_AUXN | I2CC_SCL<br>I2CC_SDA |

**LCD/LED PANEL Conn.** P/N: SP010016810  
F/P: IPEX\_20143-040E-20F\_40P



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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 23 of 50                    |



Place near C917-C924 and use common via

From VGA

From APU

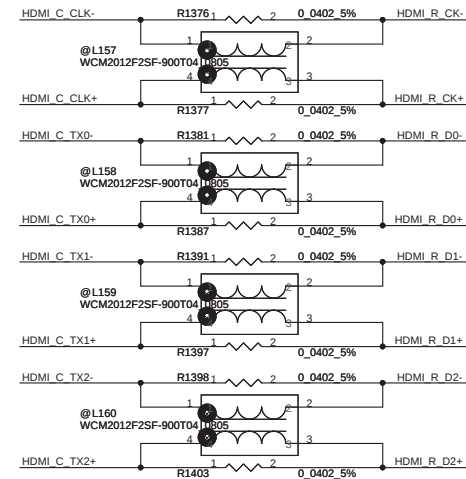
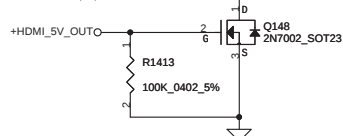
Near the connector

|               |         |                   |               |         |                    |
|---------------|---------|-------------------|---------------|---------|--------------------|
| HDMI C TX2- R | C1549 2 | 1 0.1U 0402 16V7K | HDMI C TX2- R | R1399 1 | 2 DISO@499 0402 1% |
| HDMI C TX2+ R | C1550 2 | 1 0.1U 0402 16V7K | HDMI C TX2+ R | R1400 1 | 2 DISO@499 0402 1% |
| HDMI C TX1- R | C1551 2 | 1 0.1U 0402 16V7K | HDMI C TX1- R | R1401 1 | 2 DISO@499 0402 1% |
| HDMI C TX1+ R | C1552 2 | 1 0.1U 0402 16V7K | HDMI C TX1+ R | R1402 1 | 2 DISO@499 0402 1% |
| HDMI C TX0- R | C1553 2 | 1 0.1U 0402 16V7K | HDMI C TX0- R | R1403 1 | 2 DISO@499 0402 1% |
| HDMI C TX0+ R | C1554 2 | 1 0.1U 0402 16V7K | HDMI C TX0+ R | R1404 1 | 2 DISO@499 0402 1% |
| HDMI C CLK- R | C1555 2 | 1 0.1U 0402 16V7K | HDMI C CLK- R | R1405 1 | 2 DISO@499 0402 1% |
| HDMI C CLK+ R | C1556 2 | 1 0.1U 0402 16V7K | HDMI C CLK+ R | R1406 1 | 2 DISO@499 0402 1% |

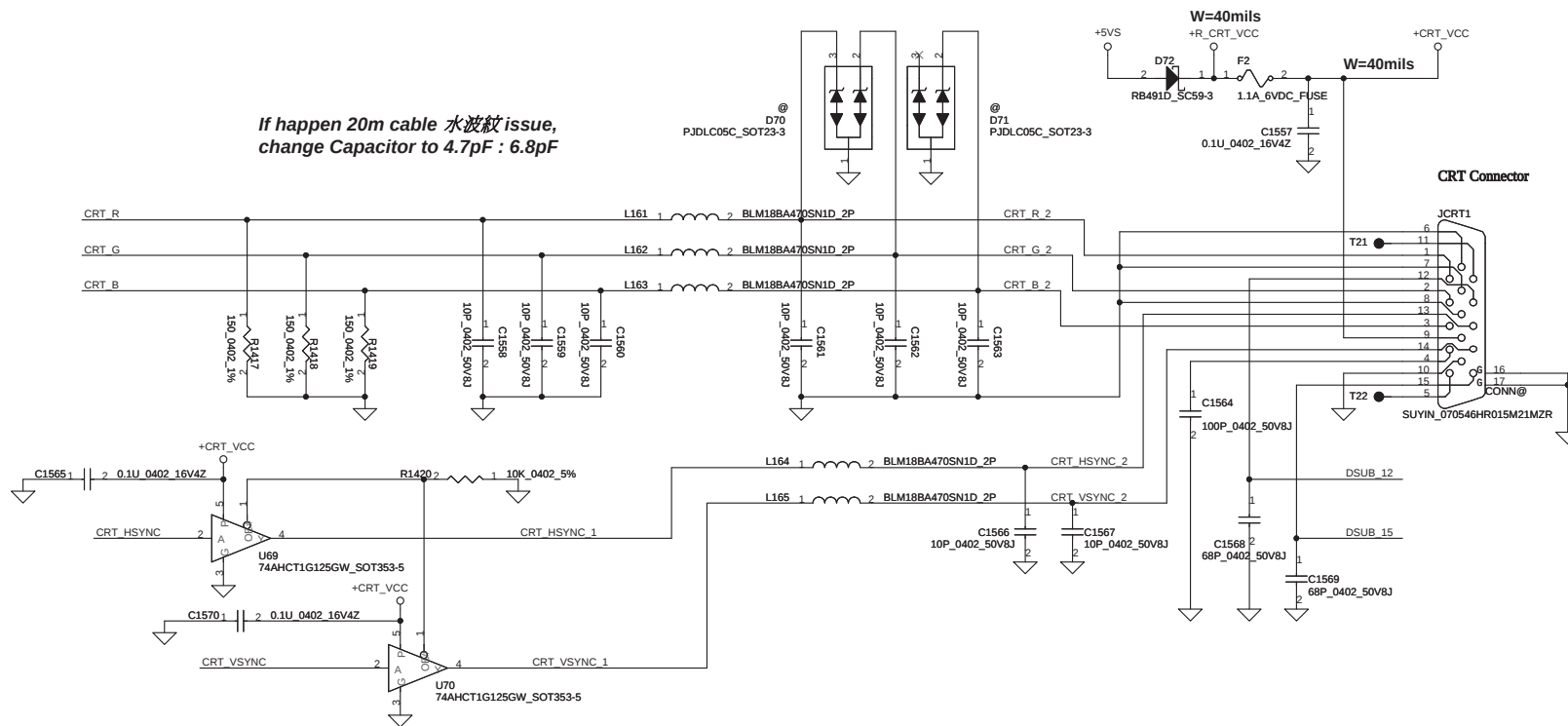
UMA use 604 ohm  
VGA use 499 ohm

For UMA HDMI  
termination BOM option

|         |                   |
|---------|-------------------|
| R1399 2 | UMA@1 604 0402 1% |
| R1400 2 | UMA@1 604 0402 1% |
| R1401 2 | UMA@1 604 0402 1% |
| R1402 2 | UMA@1 604 0402 1% |
| R1403 2 | UMA@1 604 0402 1% |
| R1404 2 | UMA@1 604 0402 1% |
| R1405 2 | UMA@1 604 0402 1% |
| R1406 2 | UMA@1 604 0402 1% |
| R1407 2 | UMA@1 604 0402 1% |
| R1408 2 | UMA@1 604 0402 1% |



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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date:                    | Thursday, February 24, 2011 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 24 of 50                    |



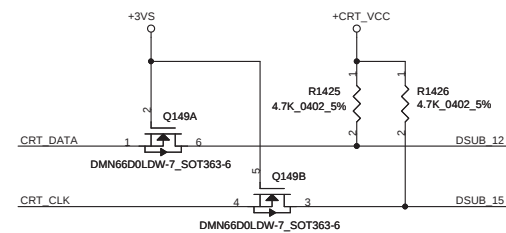
#### Use common via

|                      |                 |       |      |   |           |           |
|----------------------|-----------------|-------|------|---|-----------|-----------|
| <28> FCH_CRT_R       | FCH_CRT_R       | R1421 | UMA@ | 1 | 0.0402 5% | CRT_R     |
| <28> FCH_CRT_G       | FCH_CRT_G       | R1422 | UMA@ | 1 | 0.0402 5% | CRT_G     |
| <28> FCH_CRT_B       | FCH_CRT_B       | R1423 | UMA@ | 1 | 0.0402 5% | CRT_B     |
| <28> FCH_CRT_HSYNC   | FCH_CRT_HSYNC   | R1424 | UMA@ | 1 | 0.0402 5% | CRT_HSYNC |
| <28> FCH_CRT_VSYNC   | FCH_CRT_VSYNC   | R1427 | UMA@ | 1 | 0.0402 5% | CRT_VSYNC |
| <28> FCH_CRT_DDC_SDA | FCH_CRT_DDC_SDA | R1428 | UMA@ | 1 | 0.0402 5% | CRT_DATA  |
| <28> FCH_CRT_DDC_SCL | FCH_CRT_DDC_SCL | R1429 | UMA@ | 1 | 0.0402 5% | CRT_CLK   |

#### From VGA

|                    |               |       |       |   |           |           |
|--------------------|---------------|-------|-------|---|-----------|-----------|
| <14> VGA_CRT_R     | VGA_CRT_R     | R1430 | DISO@ | 1 | 0.0402 5% | CRT_R     |
| <14> VGA_CRT_G     | VGA_CRT_G     | R1431 | DISO@ | 1 | 0.0402 5% | CRT_G     |
| <14> VGA_CRT_B     | VGA_CRT_B     | R1432 | DISO@ | 1 | 0.0402 5% | CRT_B     |
| <14> VGA_CRT_HSYNC | VGA_CRT_HSYNC | R1433 | DISO@ | 1 | 0.0402 5% | CRT_HSYNC |
| <14> VGA_CRT_VSYNC | VGA_CRT_VSYNC | R1434 | DISO@ | 1 | 0.0402 5% | CRT_VSYNC |
| <14> VGA_CRT_DATA  | VGA_CRT_DATA  | R1435 | DISO@ | 1 | 0.0402 5% | CRT_DATA  |
| <14> VGA_CRT_CLK   | VGA_CRT_CLK   | R1436 | DISO@ | 1 | 0.0402 5% | CRT_CLK   |

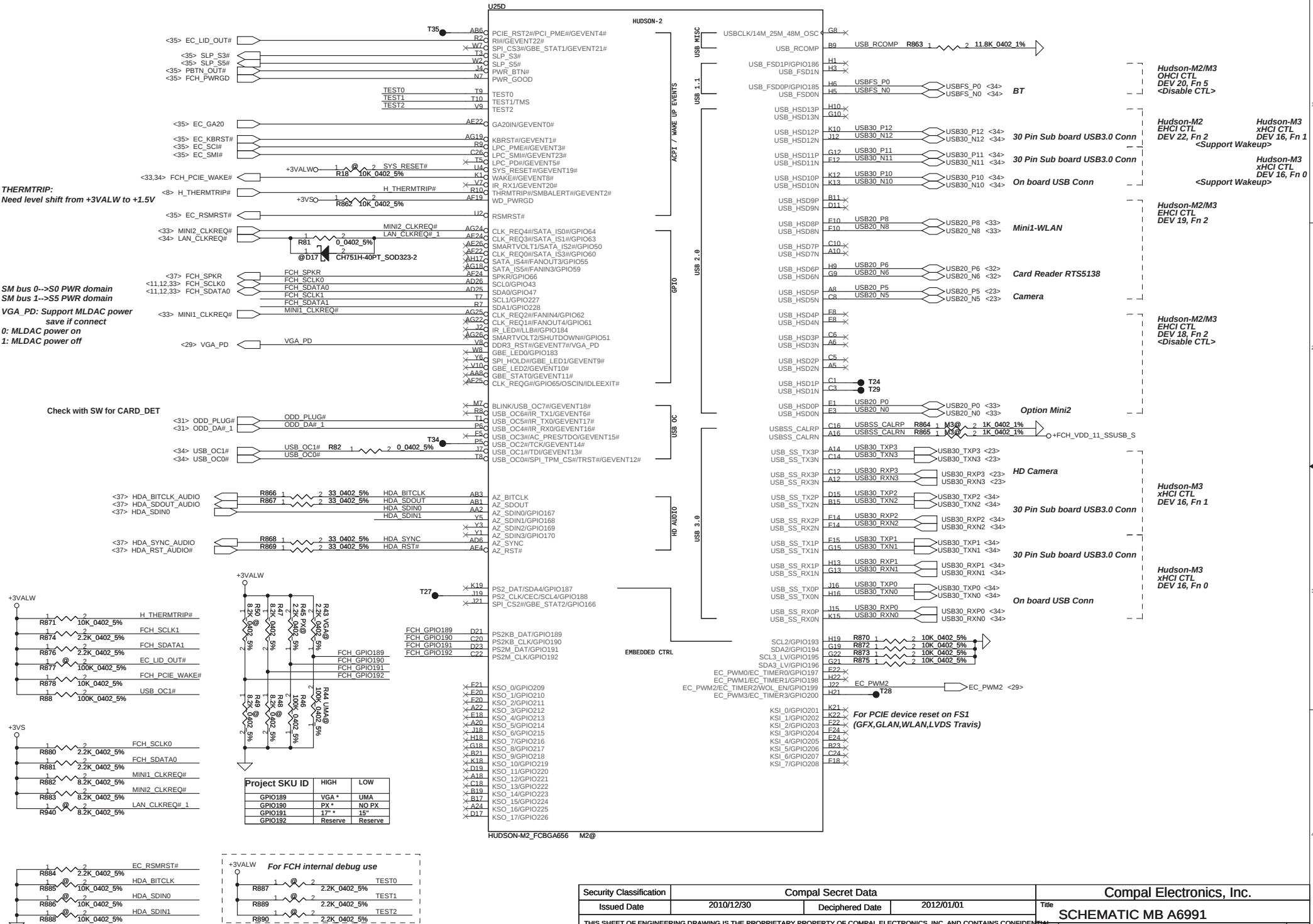
#### Close to Conn side



| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc. |                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------|-----------------------------|
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2010/12/30 | Deciphered Date    | 2012/01/01 | Title                    | SCHEMATIC MB A6991          |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date:                    | Thursday, February 24, 2011 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 25 of 50                    |



# PCIE\_RST2 : Reset PCIE device on Hudson2

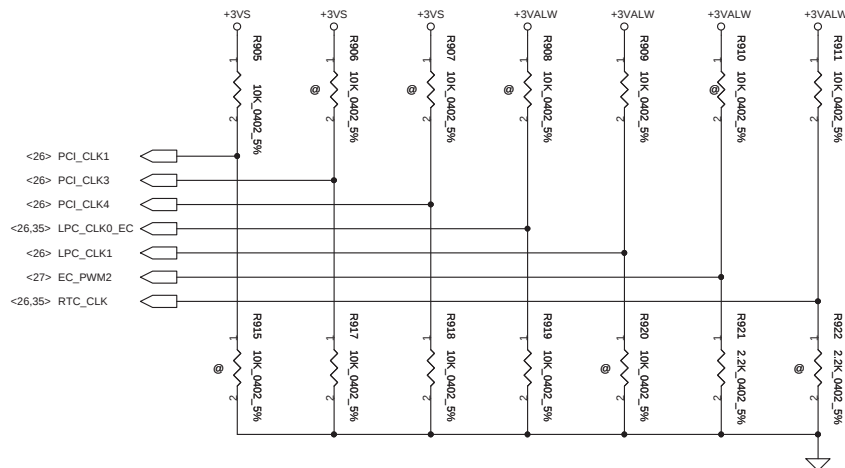




|                                   |                                  |          |
|-----------------------------------|----------------------------------|----------|
| Size<br>Custom                    | Document Number<br><b>4019BN</b> | Rev<br>A |
| Date: Thursday, February 24, 2011 | Sheet 28 of 50                   |          |

## STRAP PINS

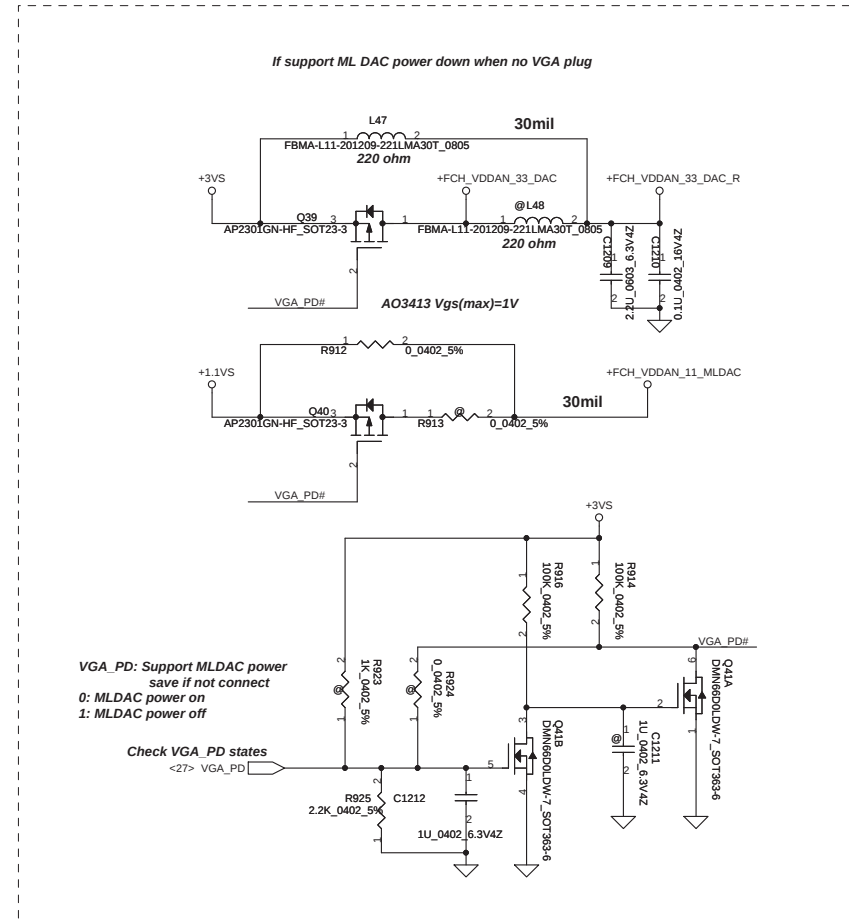
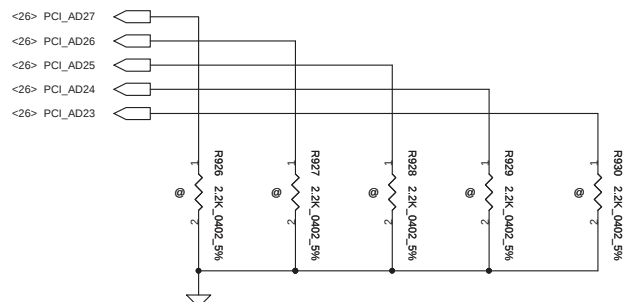
|              |                               |                                     |                                    |                           |                              |                    |                                        |
|--------------|-------------------------------|-------------------------------------|------------------------------------|---------------------------|------------------------------|--------------------|----------------------------------------|
| PULL<br>HIGH | PCI_CLK1                      | PCI_CLK3                            | PCI_CLK4                           | LPC_CLK0                  | LPC_CLK1                     | EC_PWM2            | RTC_CLK                                |
|              | ALLOW<br>PCIE GEN2<br>DEFAULT | USE<br>DEBUG<br>STRAPS              | NON_FUSION<br>CLOCK MODE           | EC<br>ENABLED             | CLKGEN<br>ENABLED<br>DEFAULT | LPC ROM            | S5 PLUS<br>MODE<br>DISABLED<br>DEFAULT |
| PULL<br>LOW  | FORCE<br>PCIE GEN1            | IGNORE<br>DEBUG<br>STRAP<br>DEFAULT | FUSION<br>CLOCK<br>MODE<br>DEFAULT | EC<br>DISABLED<br>DEFAULT | CLKGEN<br>DISABLE            | SPI ROM<br>DEFAULT | S5 PLUS<br>MODE<br>ENABLED             |



## DEBUG STRAPS

FCH HAS 15K INTERNAL PU FOR PCI\_AD[27:23]

|          |           |                        |                                |                       |                                    |                                 |
|----------|-----------|------------------------|--------------------------------|-----------------------|------------------------------------|---------------------------------|
| PCI_AD26 |           | PCI_AD27               |                                | PCI_AD25              | PCI_AD24                           | PCI_AD23                        |
|          | PULL HIGH | USE PCI PLL<br>DEFAULT | DISABLE ILA AUTORUN<br>DEFAULT | USE FC PLL<br>DEFAULT | USE DEFAULT PCIE STRAPS<br>DEFAULT | DISABLE PCI MEM BOOT<br>DEFAULT |
|          | PULL LOW  | BYPASS PCI PLL         | ENABLE ILA AUTORUN             | BYPASS FC PLL         | USE EEPROM PCIE STRAPS             | ENABLE PCI MEM BOOT             |

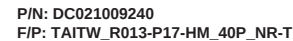




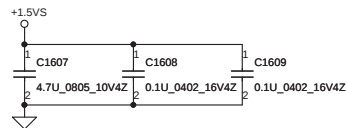
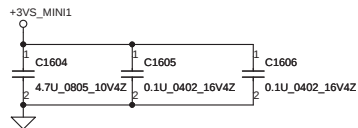
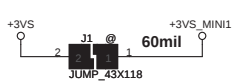




## Share Pin

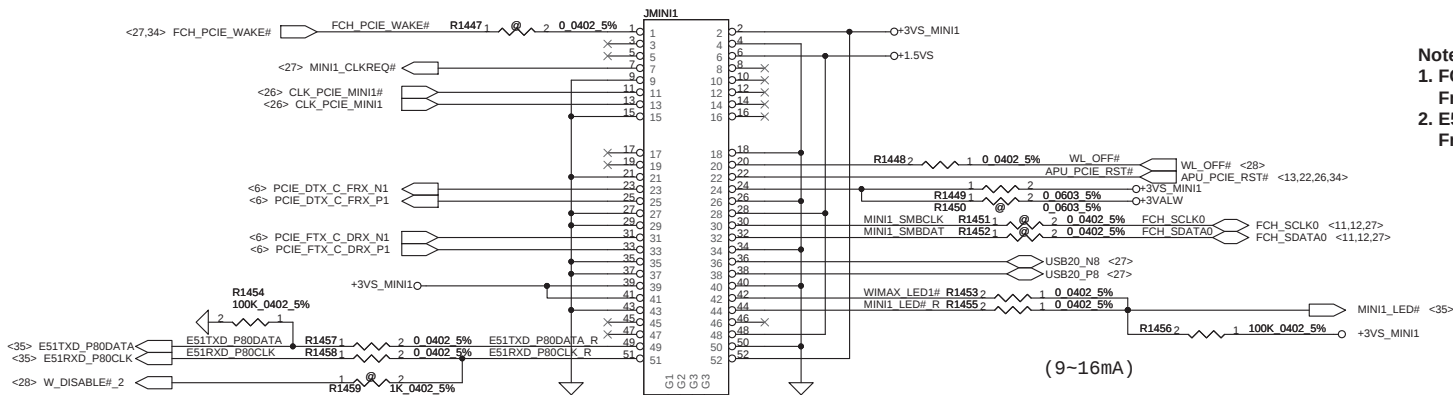


# Mini-Express Card for WLAN



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

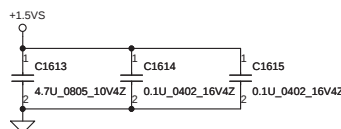
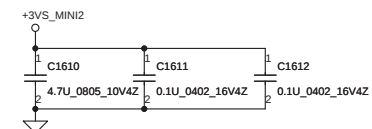
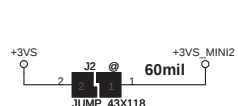
P/N: SP01000P700  
F/P: ACES\_88914-5204\_52P



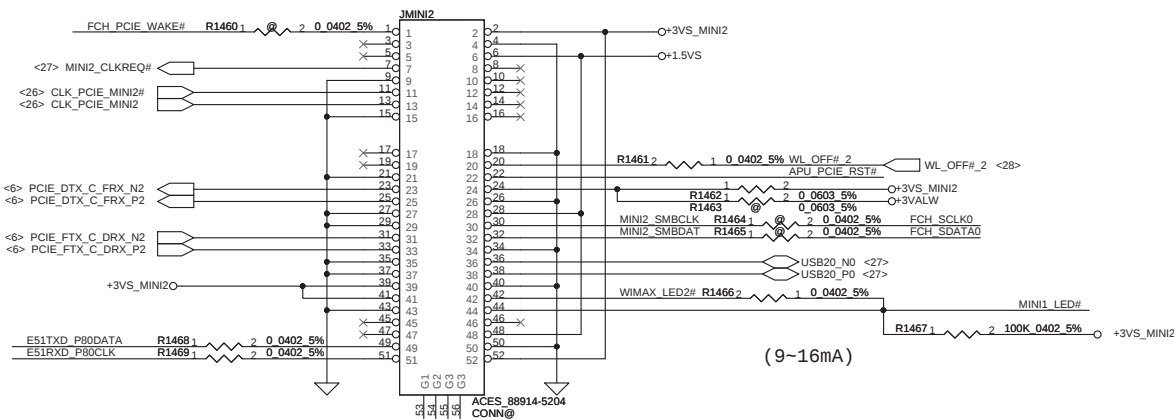
(9~16mA)

Height : 8mm

<P7WE0 use>



P/N: SP01000P700  
F/P: ACES\_88914-5204\_52P



(9~16mA)

Height : 8mm

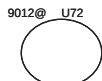
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Note:

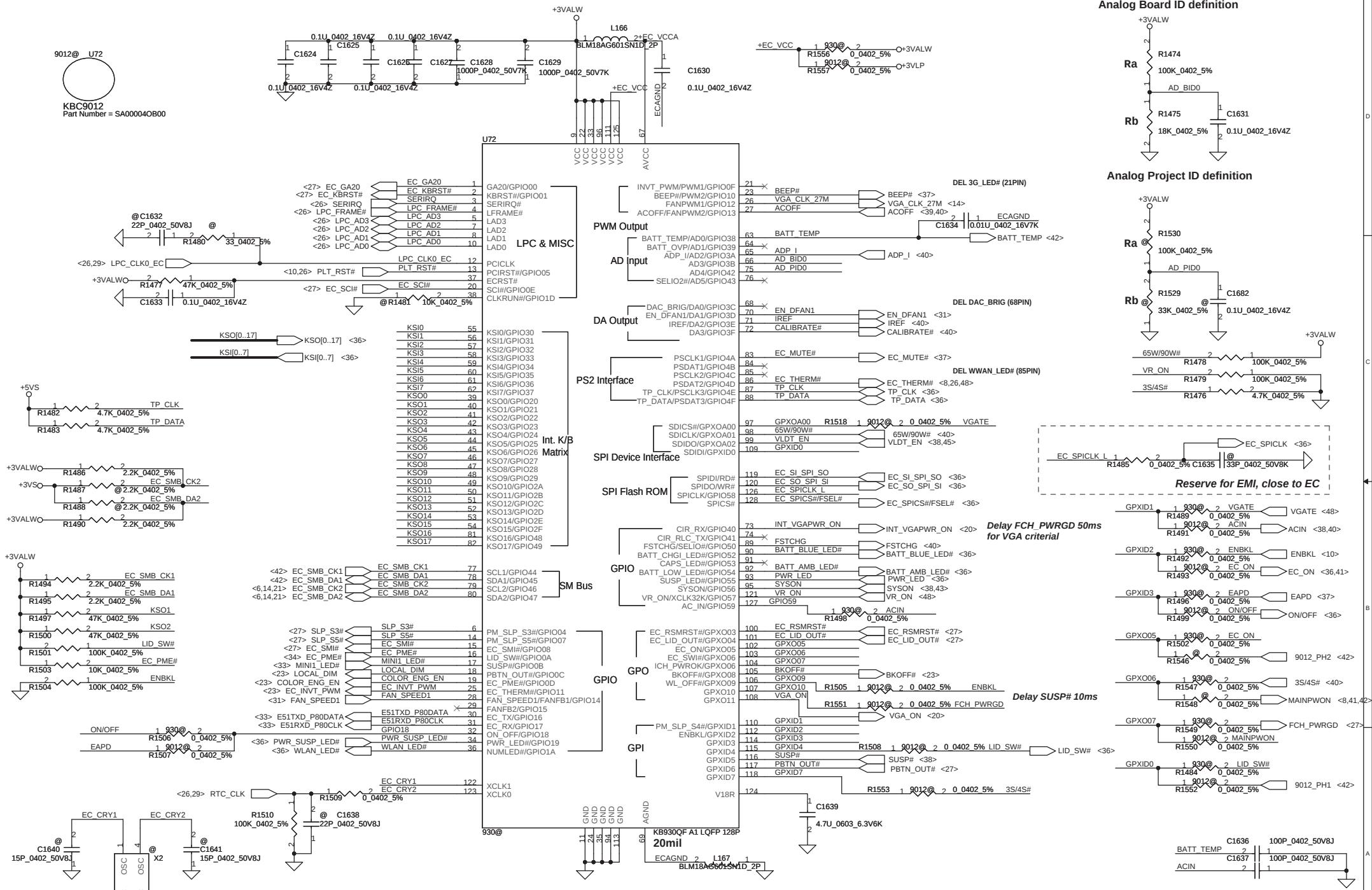
1. FCH\_SCLK0 and FCH\_SDAT0 route as daisy chain.  
From FCH->JMINI2->DDR SOCKET->JMINI1
2. E51RXD\_P80CLK and E51TXD\_P80DATA route as daisy chain.  
From EC->JMINI2->JMINI1

| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc. |                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------|-----------------------------|
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2010/12/30 | Deciphered Date    | 2012/01/01 | Title                    | SCHEMATIC MB A6991          |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date                     | Thursday, February 24, 2011 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 33 of 50                    |





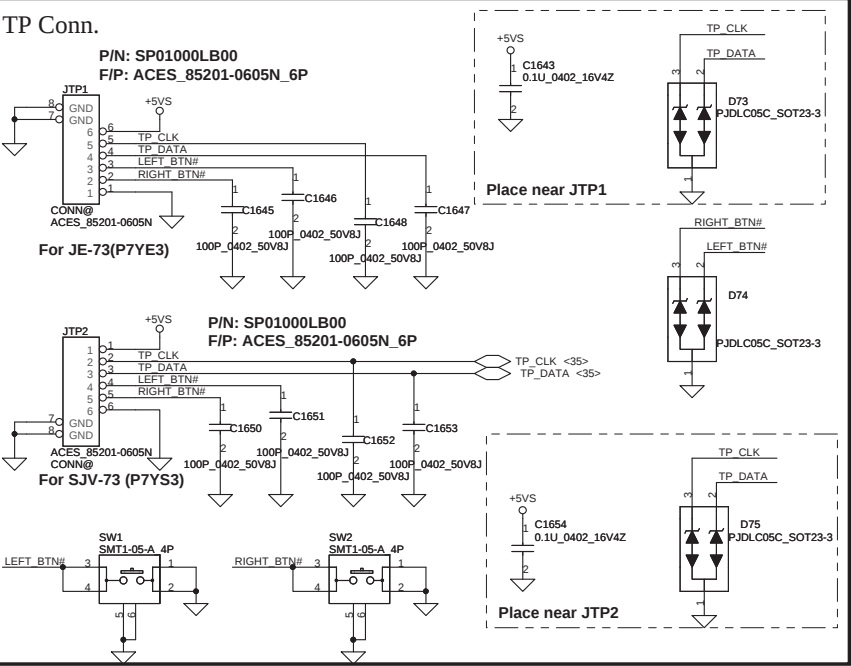
KBC9012  
Part Number = SA00004OB00



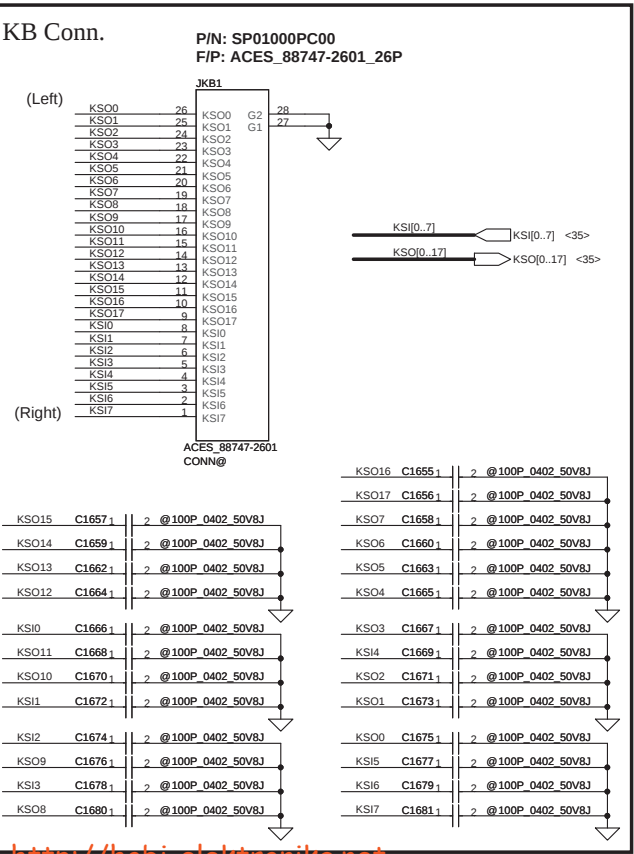
<http://hobi-elektronika.net>

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                             |            |                          |          |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------|------------|--------------------------|----------|--|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data          |            | Compal Electronics, Inc. |          |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                             |            | 4019BN                   |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                             |            | Rev A                    |          |  |
| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            | Thursday, February 24, 2011 |            | Sheet                    | 35 of 50 |  |

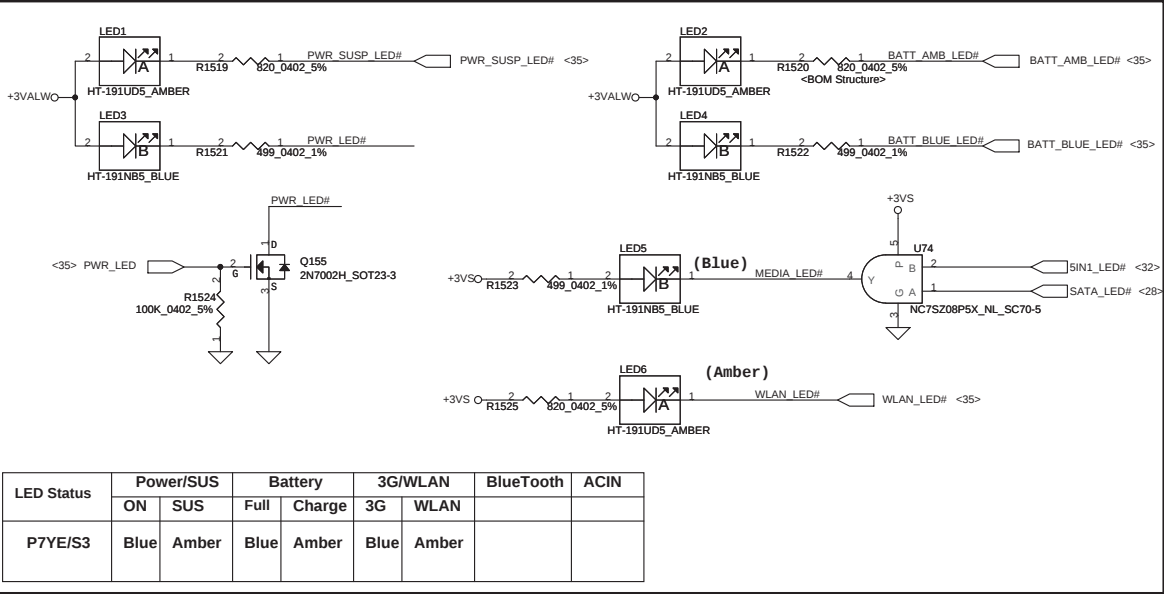
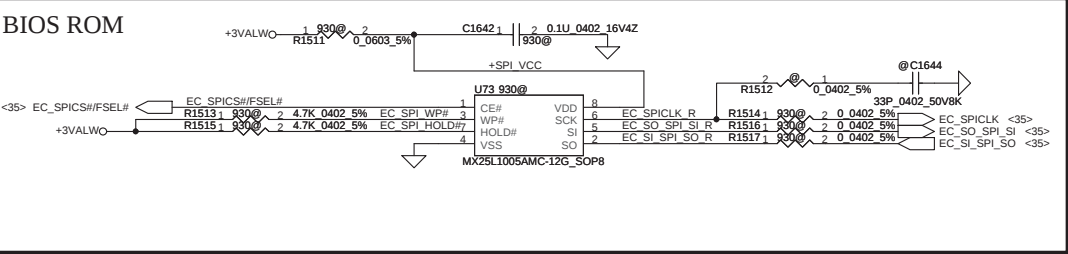
TP Conn.



KB Conn.

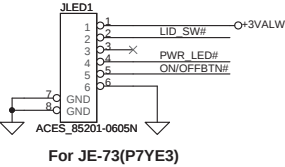


BIOS ROM



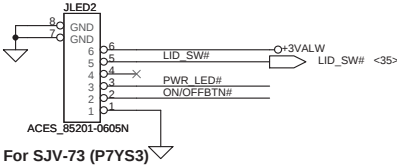
LS-6913P

P/N: SP01000LB00  
F/P: ACES\_85201-0605N\_6P

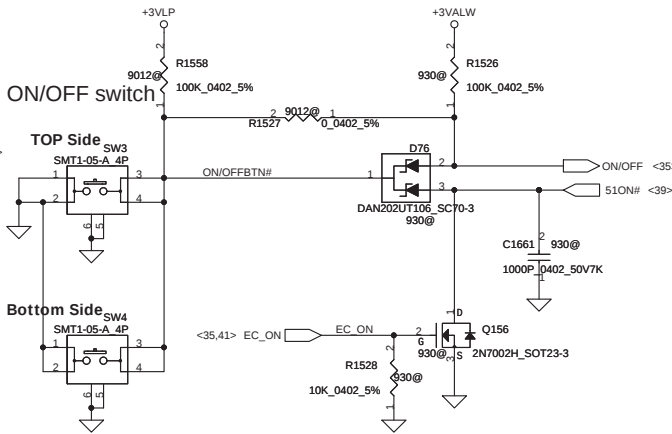


LS-6913P

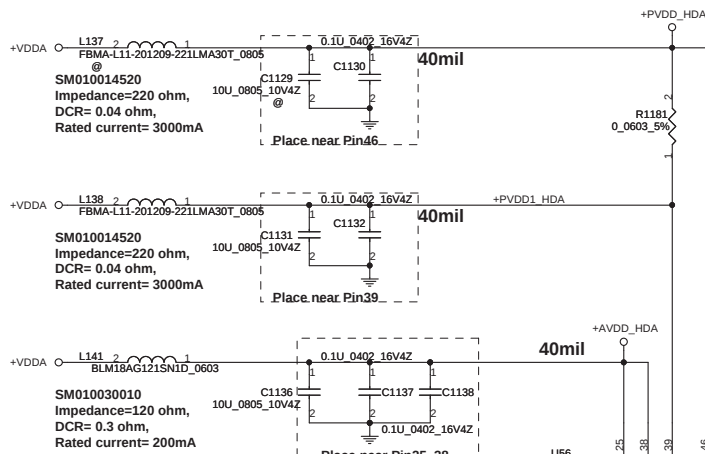
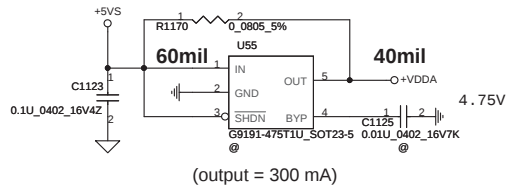
P/N: SP01000LB00  
F/P: ACES\_85201-0605N\_6P



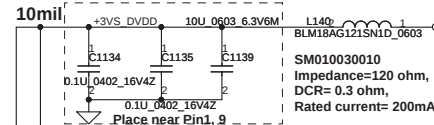
Power Button



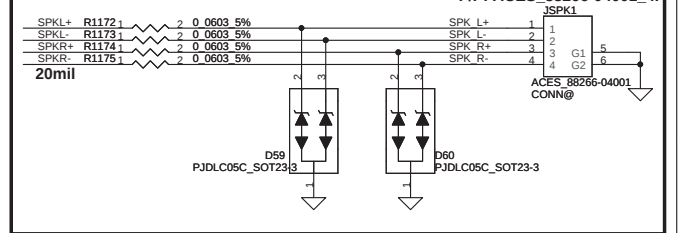
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            |                          |                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|------------|--------------------------|-----------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data |                 |            | Compal Electronics, Inc. |                             |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Date:                    | Thursday, February 24, 2011 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Sheet                    | 36 of 50                    |



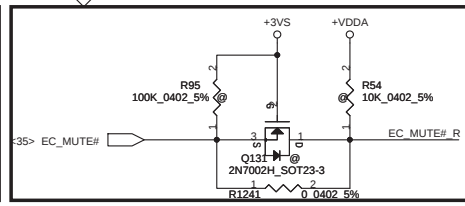
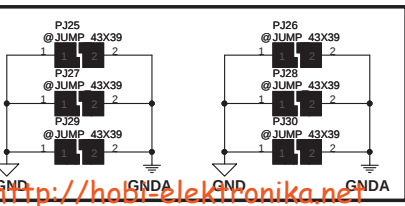
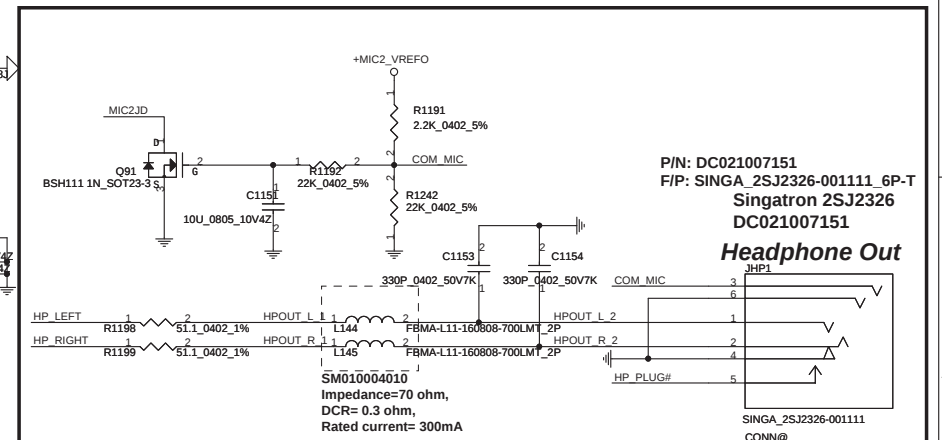
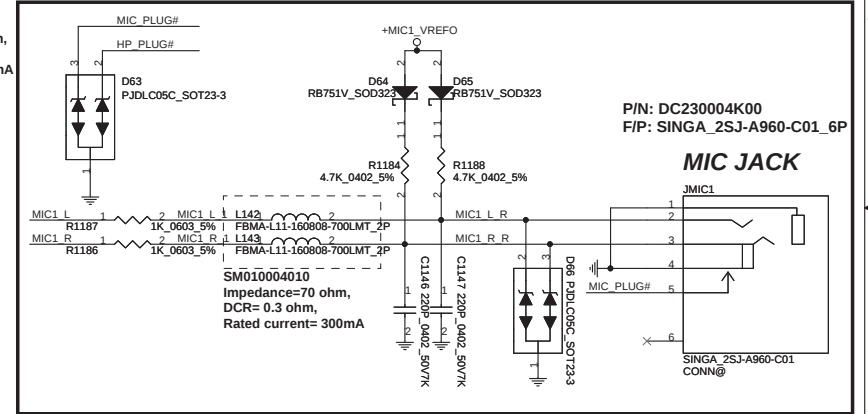
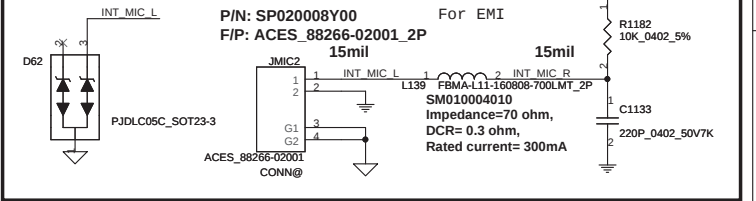
## HD Audio Codec



## Int. Speaker Conn.

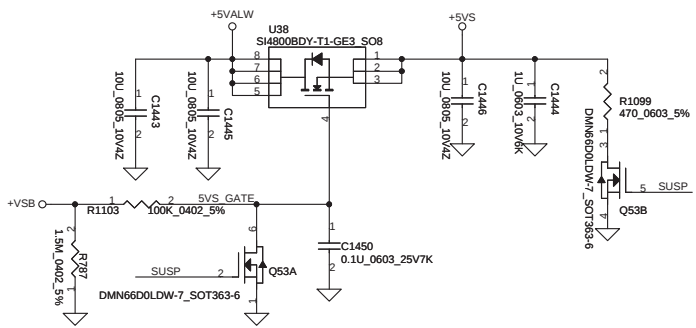


## Int. MIC Conn.

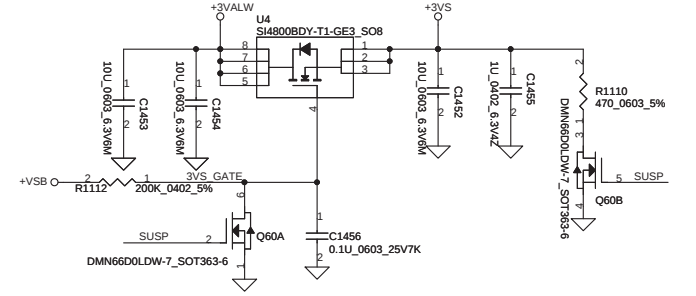


| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data                |            | Title                    |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------|------------|--------------------------|--|
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2010/12/30 | Deciphered Date                   | 2010/08/04 | Compal Electronics, Inc. |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            | Date: Thursday, February 24, 2011 |            | Sheet 37 of 50           |  |

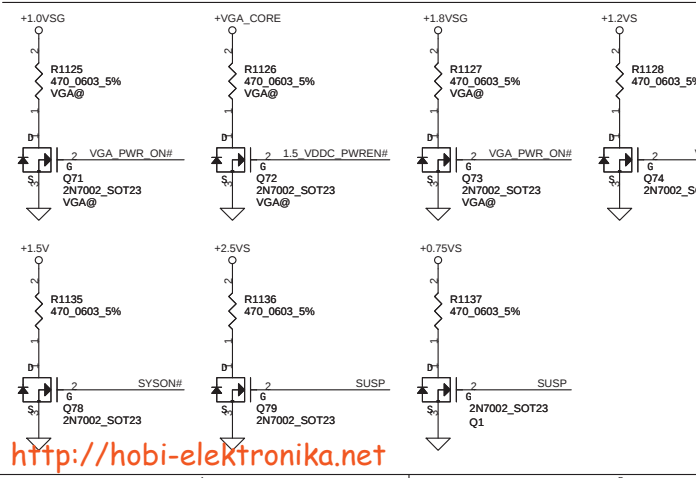
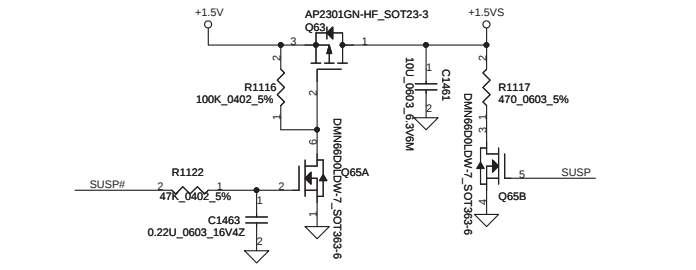
**+5VALW TO +5VS**



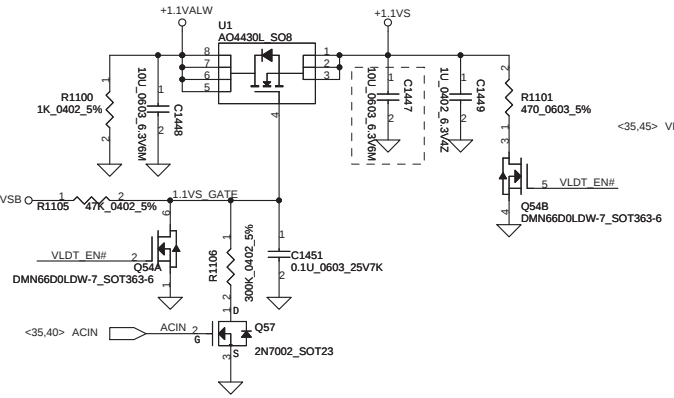
**+3VALW TO +3VS**



**+1.5V TO +1.5VS**

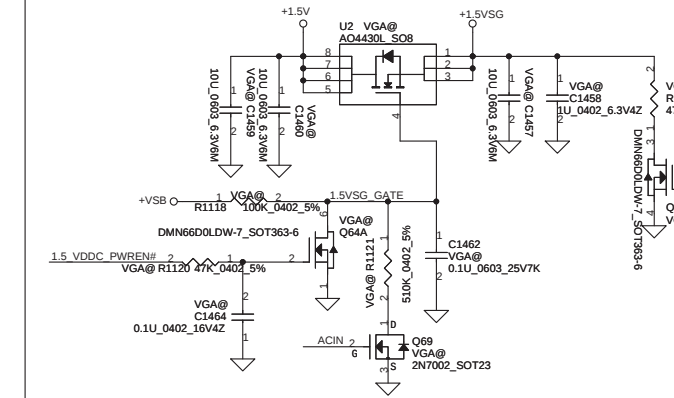


**+1.1VALW TO +1.1VS**

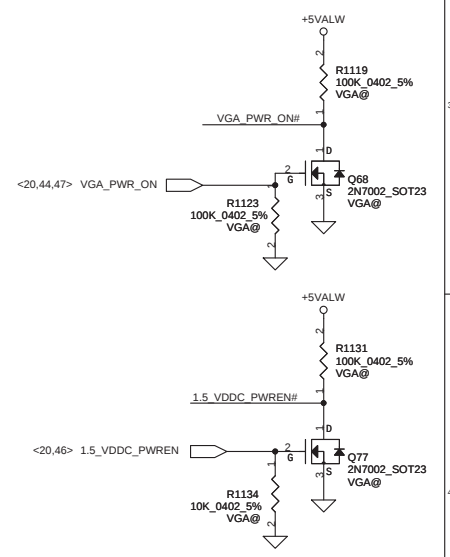
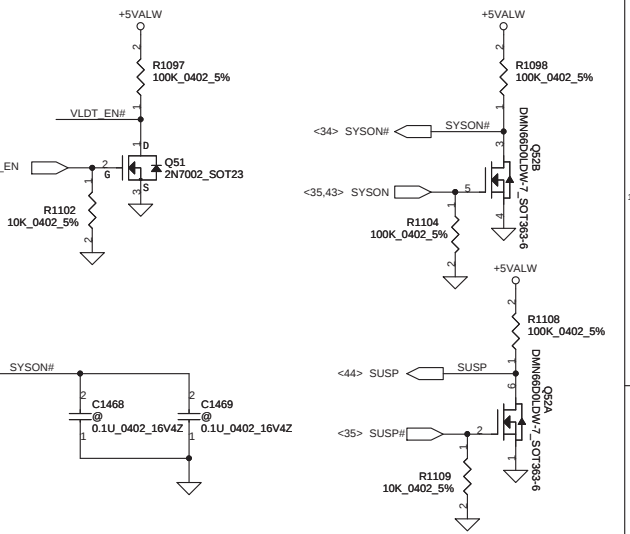
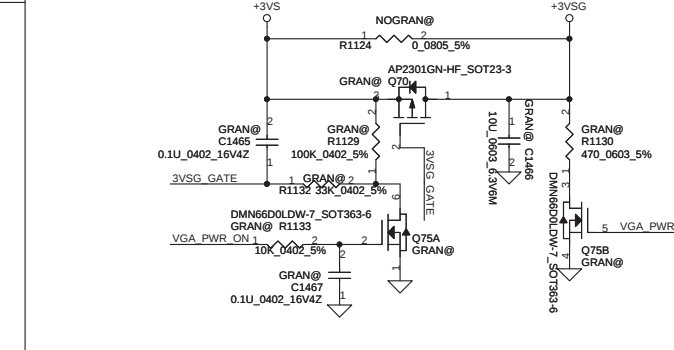


**VGA Power**

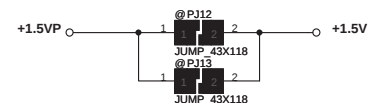
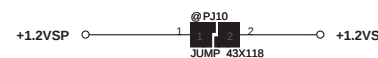
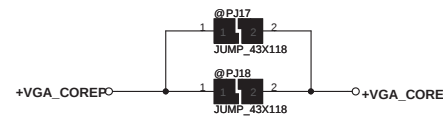
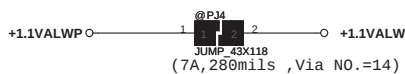
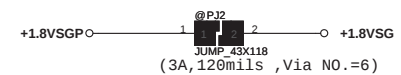
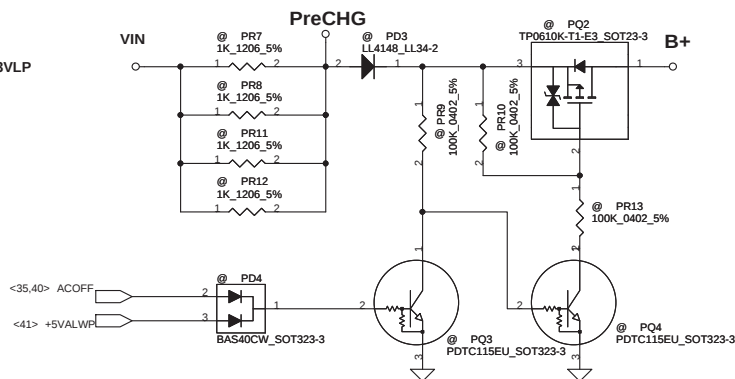
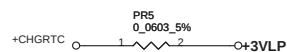
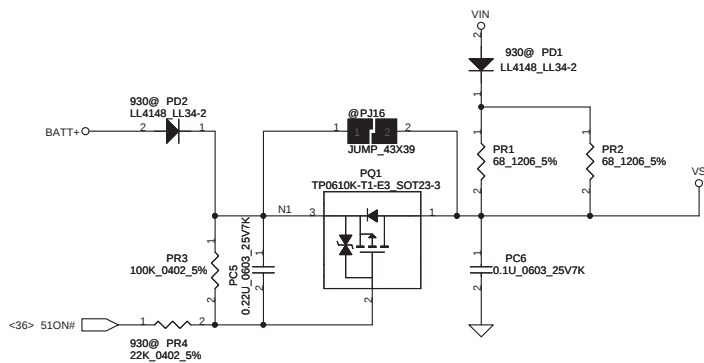
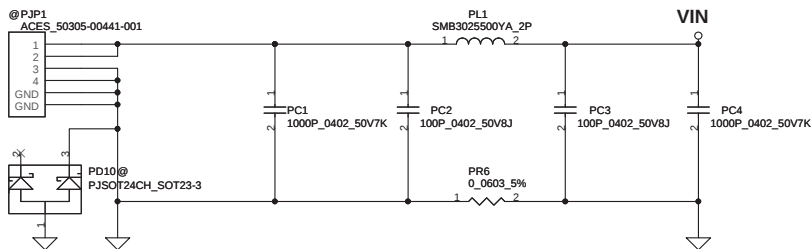
**+1.5V to +1.5VSG**



**+3VS to +3VSG**



|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                             |  |                 |  |                          |  |                    |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------|--|-----------------|--|--------------------------|--|--------------------|--|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | Compal Secret Data          |  |                 |  | Compal Electronics, Inc. |  |                    |  |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | 2010/12/30                  |  | Deciphered Date |  | 2012/01/01               |  | Title              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                             |  |                 |  |                          |  | SCHEMATIC MB A6991 |  |
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| Rev B                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | Document Number             |  |                 |  |                          |  | Rev A              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | 4019BN                      |  |                 |  |                          |  |                    |  |
| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | Thursday, February 24, 2011 |  |                 |  | Sheet 38 of 50           |  |                    |  |



When use Granville, short PJ24

$$CP = 85\% \cdot I_{ada} ; CP = 4.07A$$

**CP mode**  
 $I_{in} = (1/0.02) * (0.05 * V_{ac1m} / 2.39 + 0.05)$   
 where  $V_{ac1m} = 1.502V$ ,  $I_{in} = 4.07A$

| BATT Type             | Charging Voltage (0x15) | CV mode |
|-----------------------|-------------------------|---------|
| Normal 3S LI-ON Cells | 12600mV                 | 12.60V  |

**CC=0.6~4.48A**  
 $I_{REF} = 0.7224 * I_{charge}$   
 $I_{REF} = 0.43V \sim 3.24V$

$K_i$   
 $V_{chlim} = I_{ref} * (PR39 / (PR36 + PR39))$   
 $= I_{ref} * (100K / (80.6K + 100K))$   
 $= I_{ref} * 0.5537$   
 $I_{chanrg} = (165mV / PR369) * (V_{chlim} / 3.3V)$   
 $= (165m / 20m) * (1/3.3V) * I_{ref} * 0.5537$   
 $= 1.3842 * I_{ref}$   
 $I_{ref} = 0.7224 * I_{chanrg} \Rightarrow K_i = 0.7224$

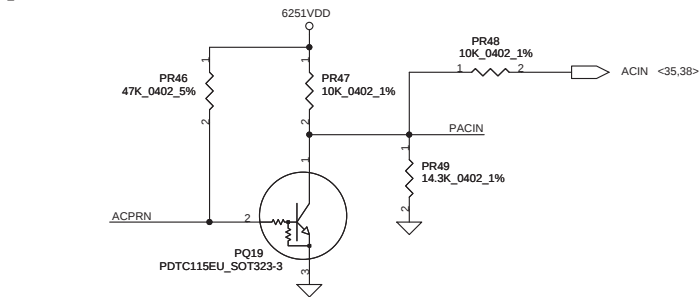
CP mode  
 $I_{input} = (1/0.02)(0.05 \cdot V_{ac1m}/2.39 + 0.05)$   
 where  $V_{ac1m} = 1.502V$ ,  $I_{input} = 4.07A$

|                       |                            |         |                                     |
|-----------------------|----------------------------|---------|-------------------------------------|
| BATT Type             | Charging Voltage<br>(0x15) | CV mode | CC=0.6~4.48A<br>IREF=0.7224*Icharge |
| Normal 3S LI-ON Cells | 12600mV                    | 12.60V  | IREF=0.43V~3.24V                    |

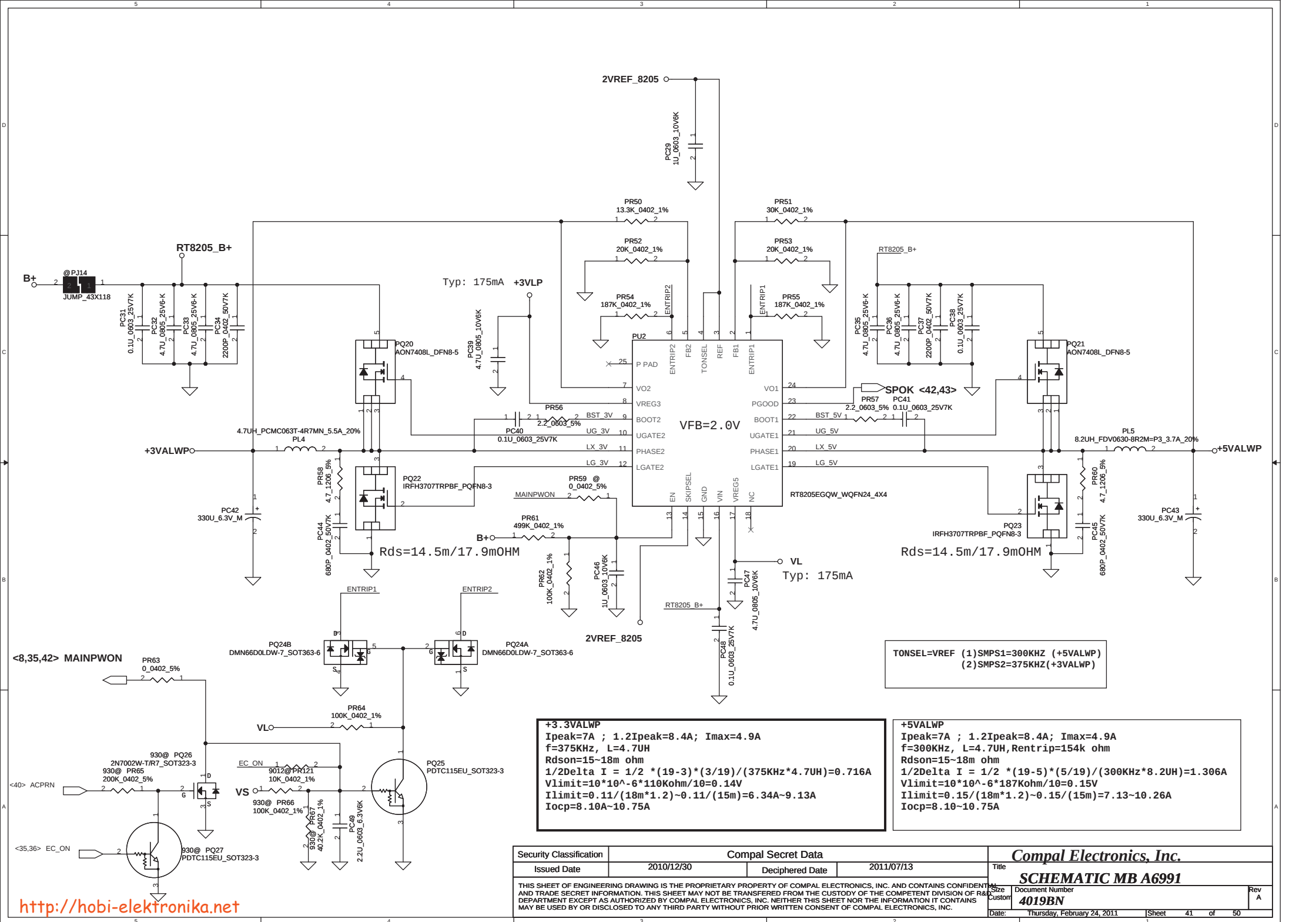
```
Ki
Vchlim=Iref*(PR39/(PR36+PR39))
=Iref*(100K/(80.6K+100K))
=Iref*0.5537
Ichanrg= (165mV/PR369)*(Vchlim/3.3V)
=(165m/20m)*(1/3.3V)*Iref*0.5537
=1.3842*Iref
=Iref*0.7224*Ichanrg =>Ki=0.7224
```

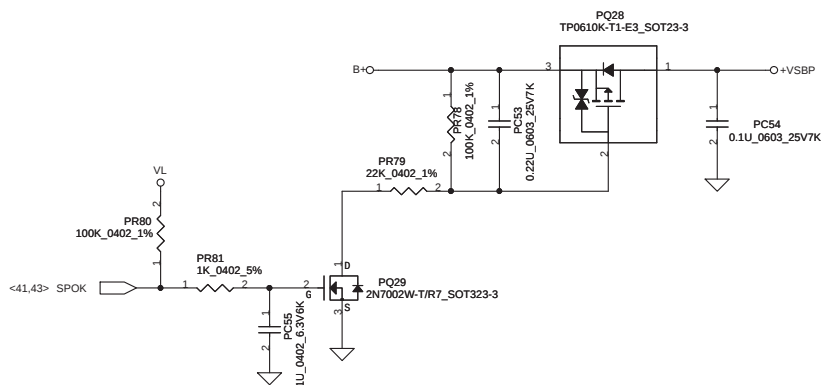
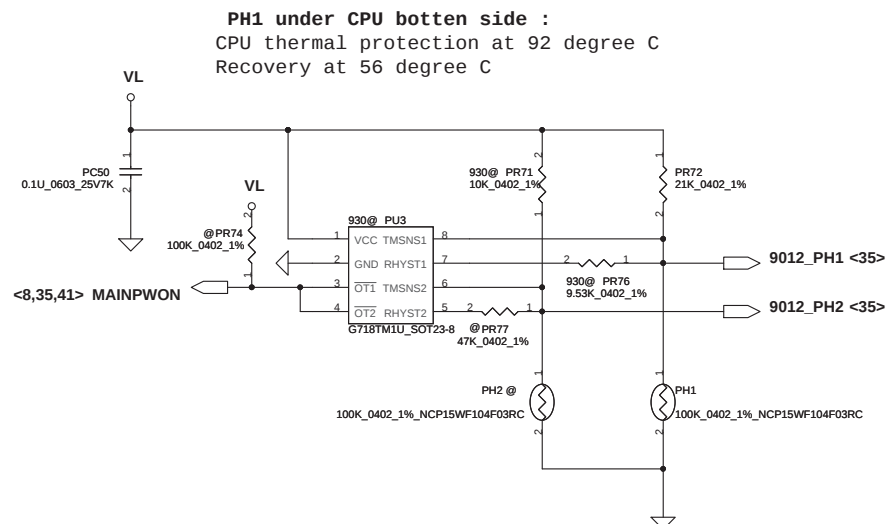
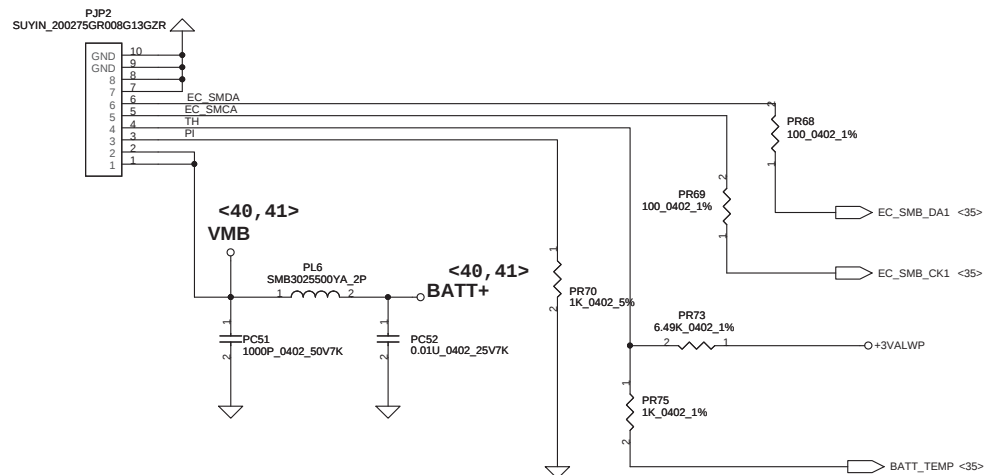
```
Kv
Rinternal ic=514K Rec=3K R1=PR44=15.4K R2=PR45=31.6K
R=514K//31.6K//(15.4k+3k)=11.372K
r=514K//514K//31.6K=28.14K
Vcell=0.175*Vadj+3.99V
4.2V=0.175*Vadj+3.99V ==>Vadj=1.2V
Vadj=Vref*(R/(R+514K))+CALIBRATE*(r/(r+514K))
1.483=CALIBRATE*0.6046 ==>CALIBRATE=1.899
1.899=-2*(Vcell+0.175)*Kv=(4.2-(4.2+A*0.175))*Kv
A=Vref*(R/(R+514K))=0.052
Kv=9.451
```

<http://hobi-elektronika.net>

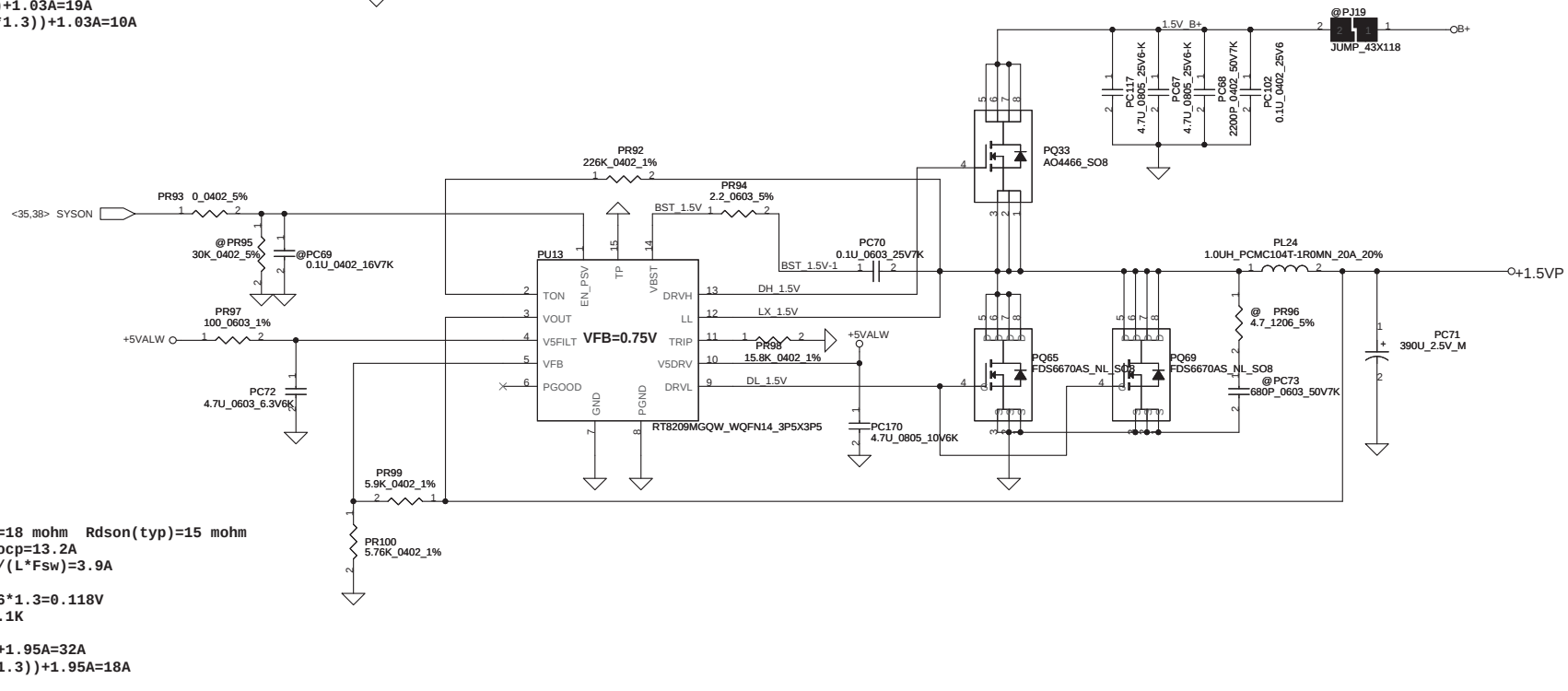
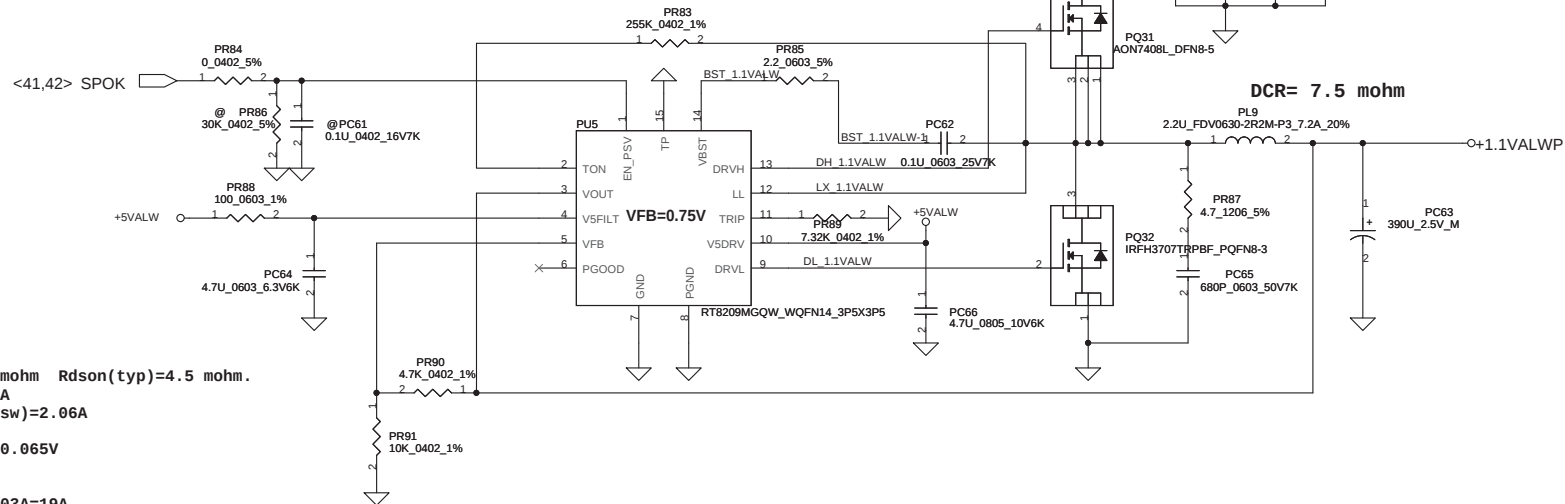


|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                                                              |                             |
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| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | <b>Compal Electronics, Inc.</b><br><b>SCHEMATIC MB A6991</b> |                             |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2010/12/30 | Deciphered Date    | 2011/07/13 | Title                                                        |                             |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date:                                                        | Thursday, February 24, 2011 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                                                        | 40 of 50                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Rev                                                          | A                           |

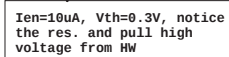
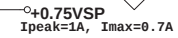




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| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data |                 |            | Compal Electronics, Inc. |                             |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Sheet                    | 42 of 50                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Rev                      | A                           |



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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                             |                    | 4019BN           |                          |          |  |
| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | Thursday, February 24, 2011 |                    | Sheet            |                          | 43 of 50 |  |



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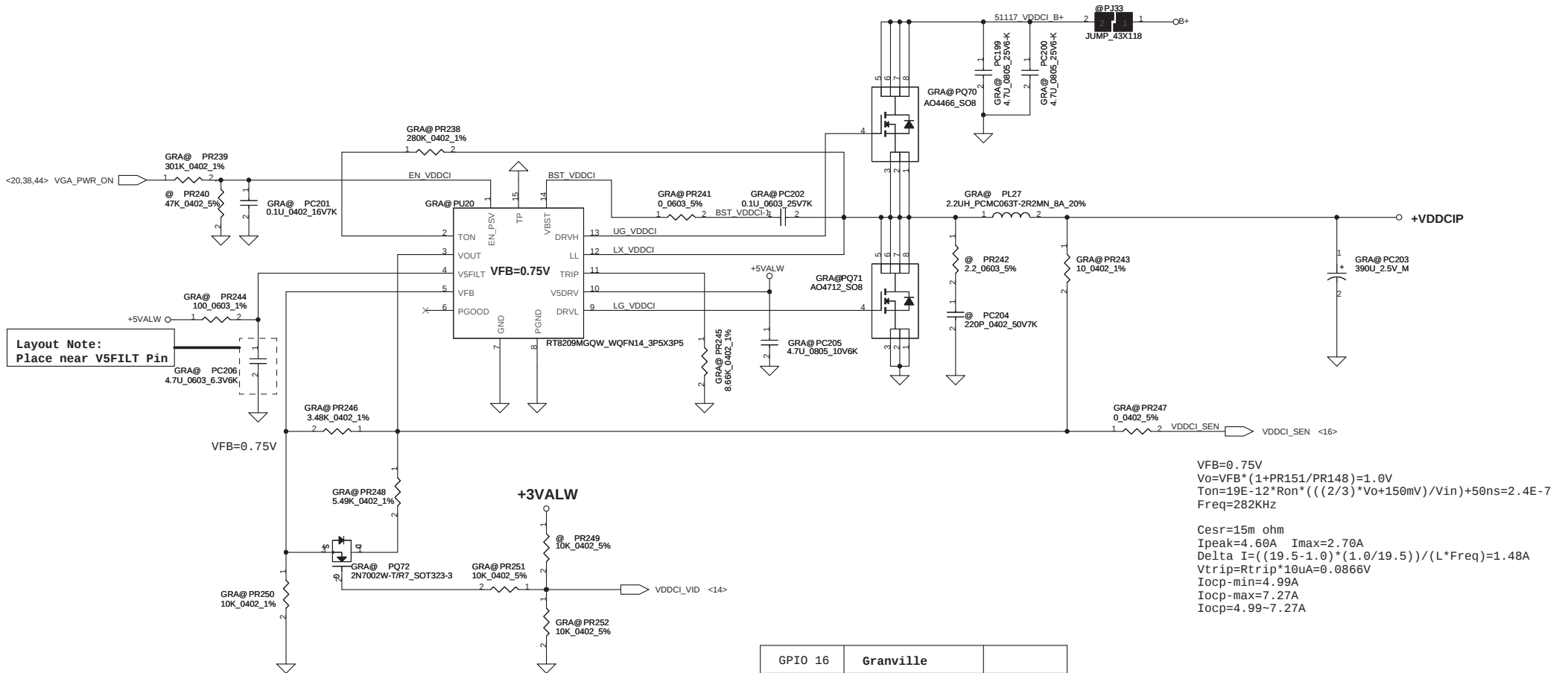
Title **SCHEMATIC MB A6991**

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| Size | Document Number |
| C    | 4019BN          |

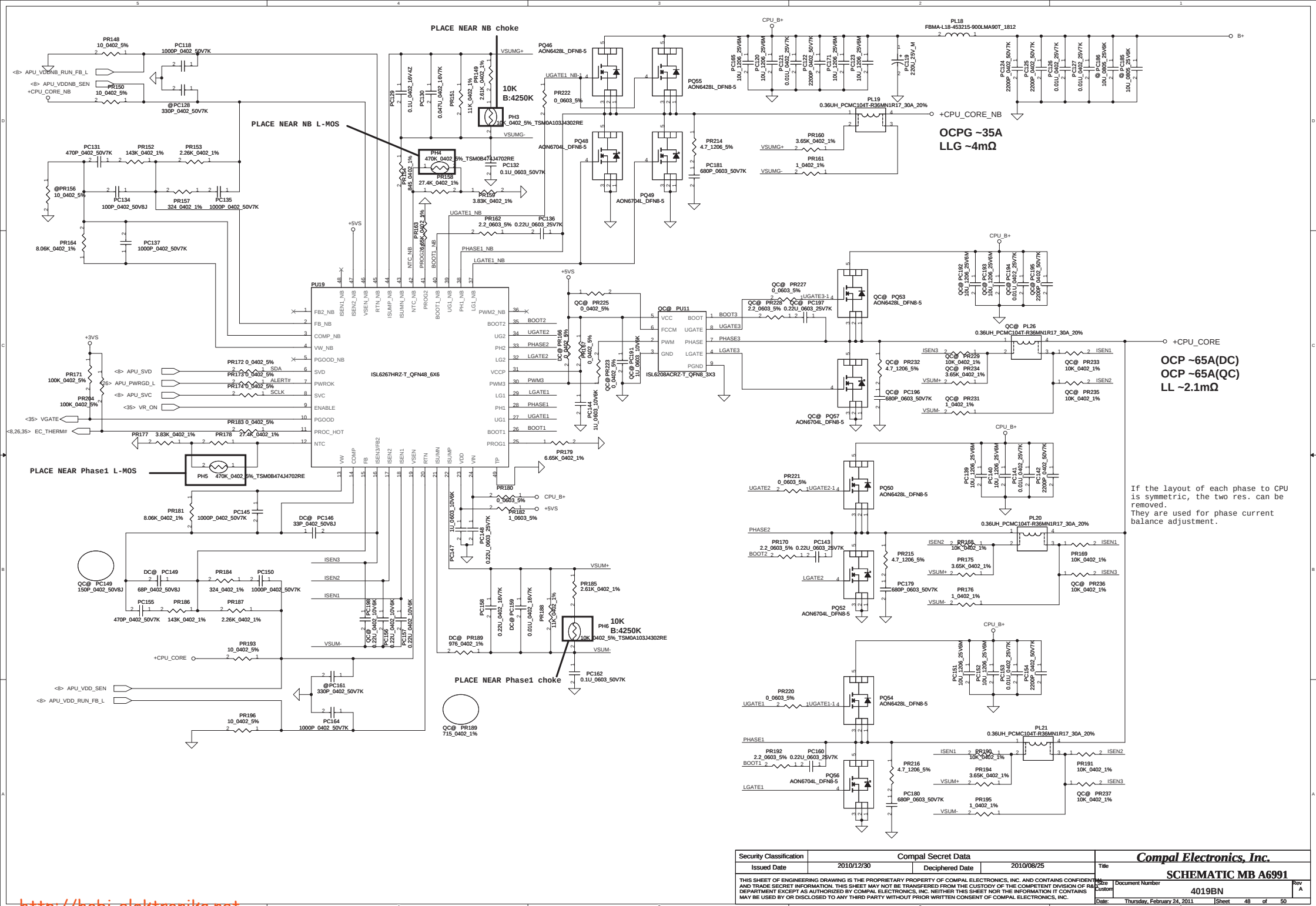
|       |                             |       |    |    |    |
|-------|-----------------------------|-------|----|----|----|
| Date: | Thursday, February 24, 2011 | Sheet | 44 | of | 50 |
|-------|-----------------------------|-------|----|----|----|







|           |                     |         |
|-----------|---------------------|---------|
| GPIO 16   | Granville           |         |
| VDDCI_VID | VDDCI Voltage Level | Comment |
| 0         | 1.00 V              | Default |
| 1         | 0.90 V              |         |



| Item | Fixed Issue | Reason for change | Rev. | PG# | Modify List                       | Date          | Phase |
|------|-------------|-------------------|------|-----|-----------------------------------|---------------|-------|
| 1    |             | Prevent ESD       |      |     | Change SB000006800 to SB000009Q80 | 2011<br>02/09 | DVT   |
| 2    |             |                   |      |     |                                   |               |       |
| 3    |             |                   |      |     |                                   |               |       |
| 4    |             |                   |      |     |                                   |               |       |
| 5    |             |                   |      |     |                                   |               |       |
| 6    |             |                   |      |     |                                   |               |       |
| 7    |             |                   |      |     |                                   |               |       |
| 8    |             |                   |      |     |                                   |               |       |
| 9    |             |                   |      |     |                                   |               |       |
| 10   |             |                   |      |     |                                   |               |       |
| 11   |             |                   |      |     |                                   |               |       |
| 12   |             |                   |      |     |                                   |               |       |
| 13   |             |                   |      |     |                                   |               |       |
| 14   |             |                   |      |     |                                   |               |       |
| 15   |             |                   |      |     |                                   |               |       |
| 16   |             |                   |      |     |                                   |               |       |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |                 |                    |
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| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data |                 | Title           |                    |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2010/12/30         | Deciphered Date | 2010/10/12      | SCHEMATIC MB A6991 |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 | 4019BN          | A                  |
| Date: Thursday, February 24, 2011                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                 | Sheet           | 49 of 50           |

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

- 0.1 -> 0.2
1. R1244 change to BACO@; Q136, Q139, R1262, R1259, R1260, R1261 change to @.
  2. Change TEST35 to PU (pop R558; unpopR559).
  3. EC\_PME# PU (Pop R1503).
  4. Change U56 pin 42,43 to DGND.
  5. Change U6, R1537, R1538, R1539, R1540 to @.
  6. ALLOW\_STOP, APU\_SVC, APU\_SVD PU to +1.5V (add R604, R607, R618).
  7. Reserve +1.2VS to replace U6 SW power (add R948 pad).
  8. Unpop R25, add Q145.
  9. Add component for KBC930 and KBC9012 colay:  
R1518 (9012@), R1546 (@), R1547 (930@), R1548 (@), R1549 (930@), R1550 (9012@),  
R1551 (@), R1552 (9012@), R1553 (9012@), R1556 (930@), R1557 (9012@),  
R1558 (9012@).
  10. Add Net for KBC930 and KBC9012 colay:  
9012\_PH2, GPXO06, GPXO07, GPXO10, 9012\_PH1, GPXID7, +EC\_VCC.
  11. Reserve R1554, R1555 for FFC USB/B.
  12. Delete RTS5209 PCIE port (del C1376, C1377, C158, C248); delete CLK req (del R55);  
delete Card det (del R144).
  13. For RTS5138, add USB port 6 and one 48MHz clock from FCH.
  14. Add R88 for USB/B oc pin.
  15. Change D33 to @.
  16. Change R1529, R1530, C1682 to @.
  17. For DVT board ID, change R1475 to 18K.
  18. Change R1526 to 930@.
  19. Change C1486 to PX@.
  20. Reserve R360, R403, C1 and C26 for EMI.
  21. Del R1554, R1555 for FFC USB/B.
  22. Change mini2 USB port from port 9 to port 0 (del R1542, R1543).
  23. Change R1289, R1290 to RT@.
  24. Add C1468, C1469 on SYSON# for ESD reserve.
  25. Change R417, R148 to DISO@.
  26. Add TP on JCRT1.5, JCRT1.11, USB port2.
  27. Add all EMI solution on TP Conn(include JE and SJV).
  28. Change U25 from A12 to A13 (unpop Q145, pop R25).
  29. Change U73, R1513, R1515, R1514, R1516, R1517, R1511, C1642 to 930@.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            |                          |                             |                |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Date:                    | Thursday, February 24, 2011 | Sheet 50 of 50 |