

# Compal Confidential

## Z5WAE Schematics Document

### AMD "Beema" Platform

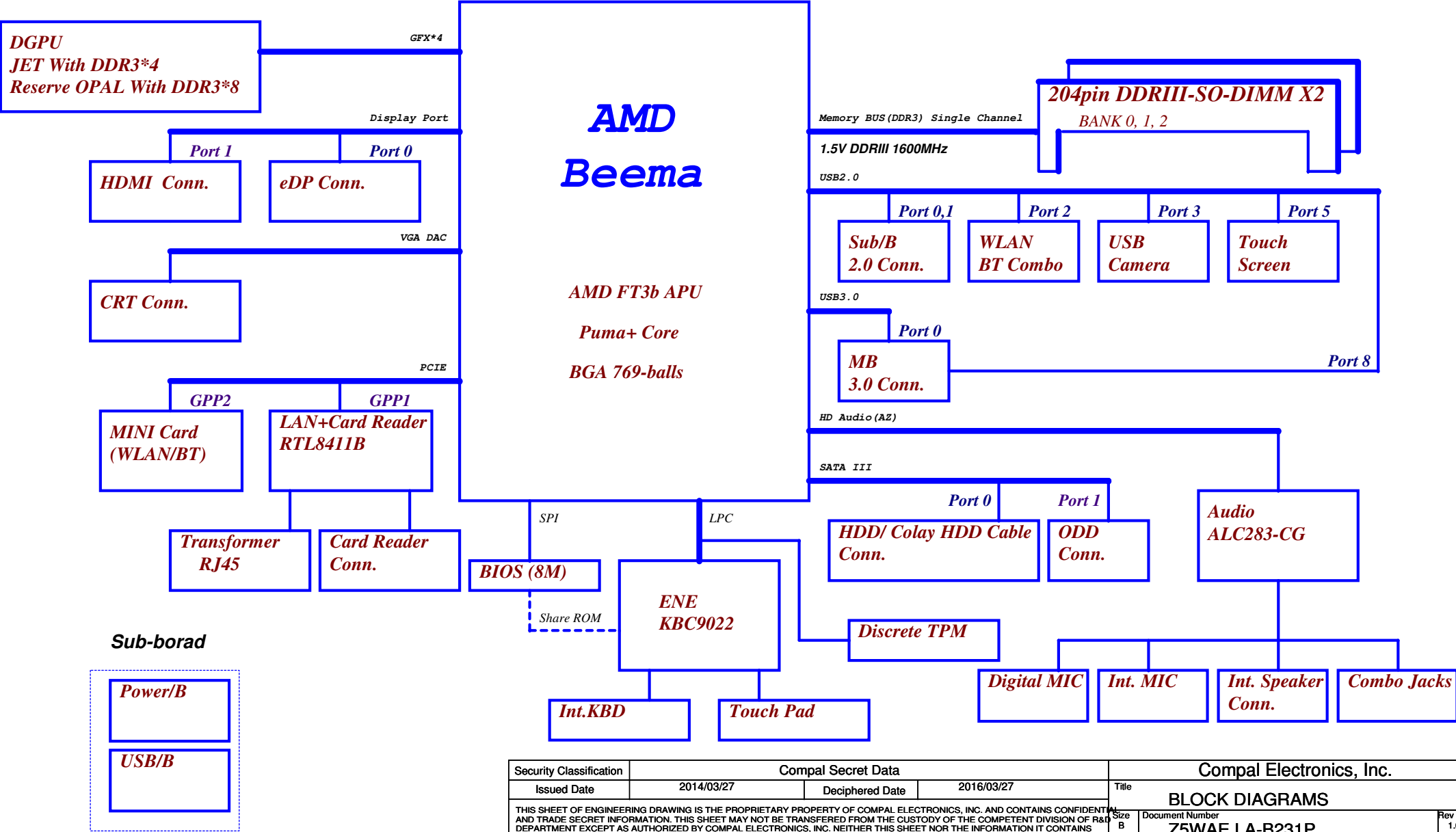
### AMD 25W APU With Puma+ Core and 25W DGPU with Jet

LA-B231P REV: 1.0  
2014-03-27

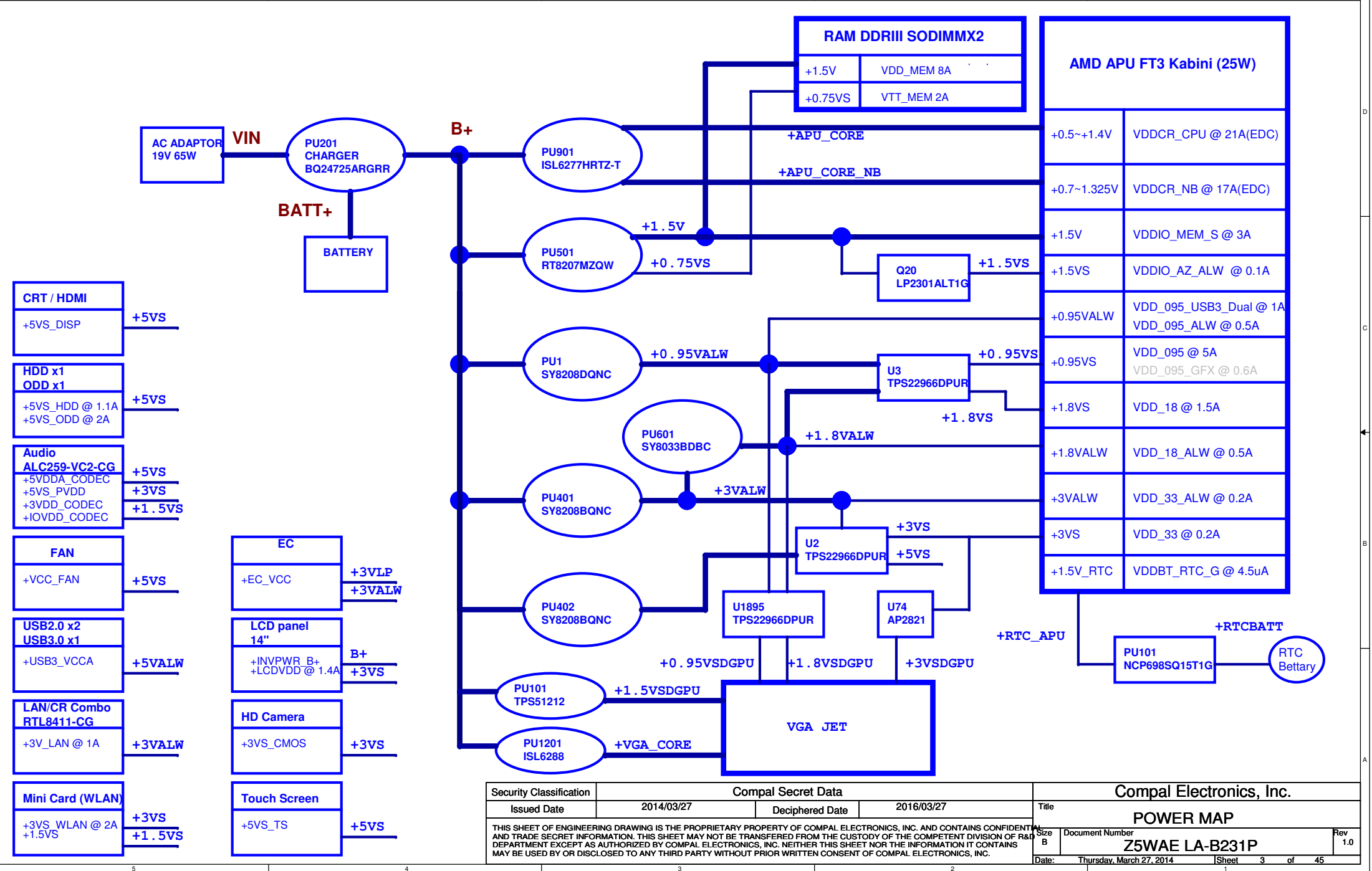
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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|------------|--------------------------|--------------------------|---------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                         | Compal Secret Data |                 |            | Compal Electronics, Inc. |                          |               |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                 |            | Date                     | Thursday, March 27, 2014 | Sheet 1 of 45 |

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Model Name : Z5WAE

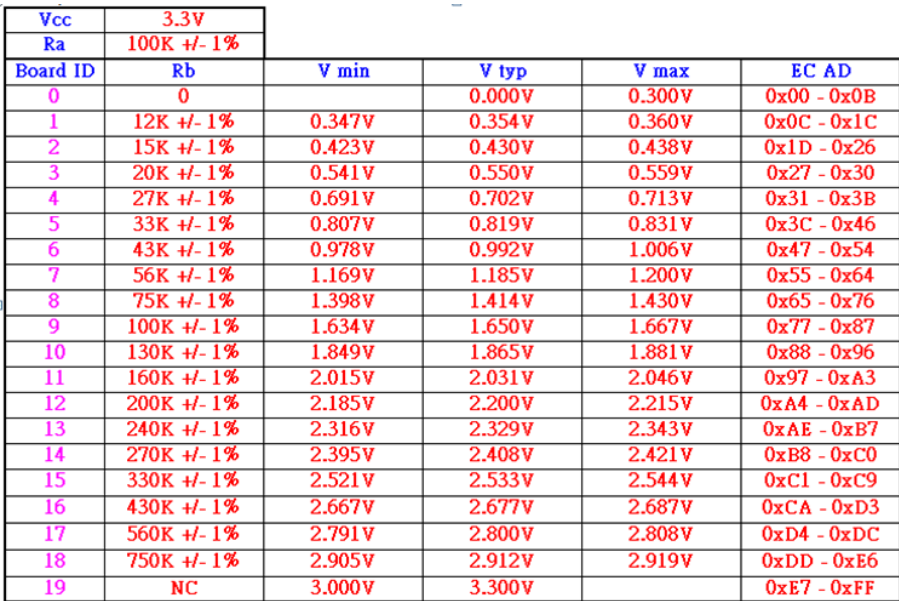


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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                          |  |                          |  | Size B         |  | Document Number |  | Rev 1.0 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                          |  |                          |  |                |  | Z5WAE LA-B231P  |  |         |  |
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| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                    |  | Thursday, March 27, 2014 |  | Sheet 2 of 45            |  |                |  |                 |  |         |  |



| Power Plane  | Description                                  | S0 | S3  | S5  |
|--------------|----------------------------------------------|----|-----|-----|
| VIN          | Adapter power supply (19V)                   | ON | ON  | ON  |
| B+           | AC or battery power rail for power circuit.  | ON | ON  | ON  |
| +APU_CORE    | Core voltage for APU                         | ON | OFF | OFF |
| +APU_CORE_NB | Voltage for On-die VGA of APU                | ON | OFF | OFF |
| +0.95VALW    | 0.95V always on power rail                   | ON | ON  | ON  |
| +0.95VS      | 0.95V switched power rail                    | ON | OFF | OFF |
| +1.8VALW     | 1.8V always on power rail                    | ON | ON  | ON  |
| +1.8VS       | 1.8V switched power rail                     | ON | OFF | OFF |
| +1.5V        | 1.5V power rail for APU and DDR              | ON | ON  | OFF |
| +1.5VS       | 1.5V switched power rail                     | ON | OFF | OFF |
| +0.75VS      | 0.75V switched power rail for DDR terminator | ON | OFF | OFF |
| +3VALW       | 3.3V always on power rail                    | 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 |
| +RTC_APU     | RTC power                                    | ON | OFF | OFF |
| +3VSDGPU     | VGA power                                    | ON | OFF | OFF |
| +1.8VSDGPU   | VGA power                                    | ON | OFF | OFF |
| +1.5VSDGPU   | VGA power                                    | ON | OFF | OFF |
| +0.95VSDGPU  | VGA power                                    | ON | OFF | OFF |
| +VGA_CORE    | VGA power                                    | ON | OFF | OFF |
|              |                                              |    |     |     |
|              |                                              |    |     |     |

| EC SMBus Port1 (+3VALW) |             |     | EC SMBus Port2 (+3VS) |             |     |
|-------------------------|-------------|-----|-----------------------|-------------|-----|
| Device                  | Address     | HEX | Device                | Address     | HEX |
| Smart Battery           | 0001 011X b | 16H | SB-TSI (APU)          | 1001 100X b | 98H |
|                         |             |     | VGA Temp.             |             | 41H |
|                         |             |     |                       |             |     |
|                         |             |     |                       |             |     |



| BOM Structure | BTO Item                            |
|---------------|-------------------------------------|
| @             | Unpop                               |
| CONN@         | Connector part control by ME        |
| EMI@          | EMI pop component                   |
| @EMI@         | EMI unpop component                 |
| ESD@          | ESD pop component                   |
| @ESD@         | ESD unpop component                 |
| AL@           | Auto Load EC ROM                    |
| RS@           | R-short                             |
| JP@           | Jump                                |
| TP@           | Test point                          |
| SP@           | Short pad for clear CMOS            |
| 1DMIC@        | Use 1 DMIC                          |
| 2DMIC@        | Use 2 DMIC                          |
| 45@           | HDMI royalty                        |
| 9012@         | Use KBC9012                         |
| 9022@         | Use KBC9022                         |
| A6@           | Use A6 APU                          |
| E1@           | Use E1 APU                          |
| BL@           | Keyboard backlight                  |
| TPM@          | Use discrete TPM module             |
| TPUSB@        | Use USB to I2C IC for T/P           |
| TPSM@         | Use APU SMBus for T/P               |
| VGA@          | Have discrete graphic               |
| MARS@         | Use Opal                            |
| JET@          | Use Jet                             |
| 128@          | Dual channel VRAM,pop with MARS@    |
| X76@          | VRAM type select,control by X76XX@  |
| X76XX@        | VRAM type select, control level X76 |

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

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

**G-A** +RTC  
EC\_ON

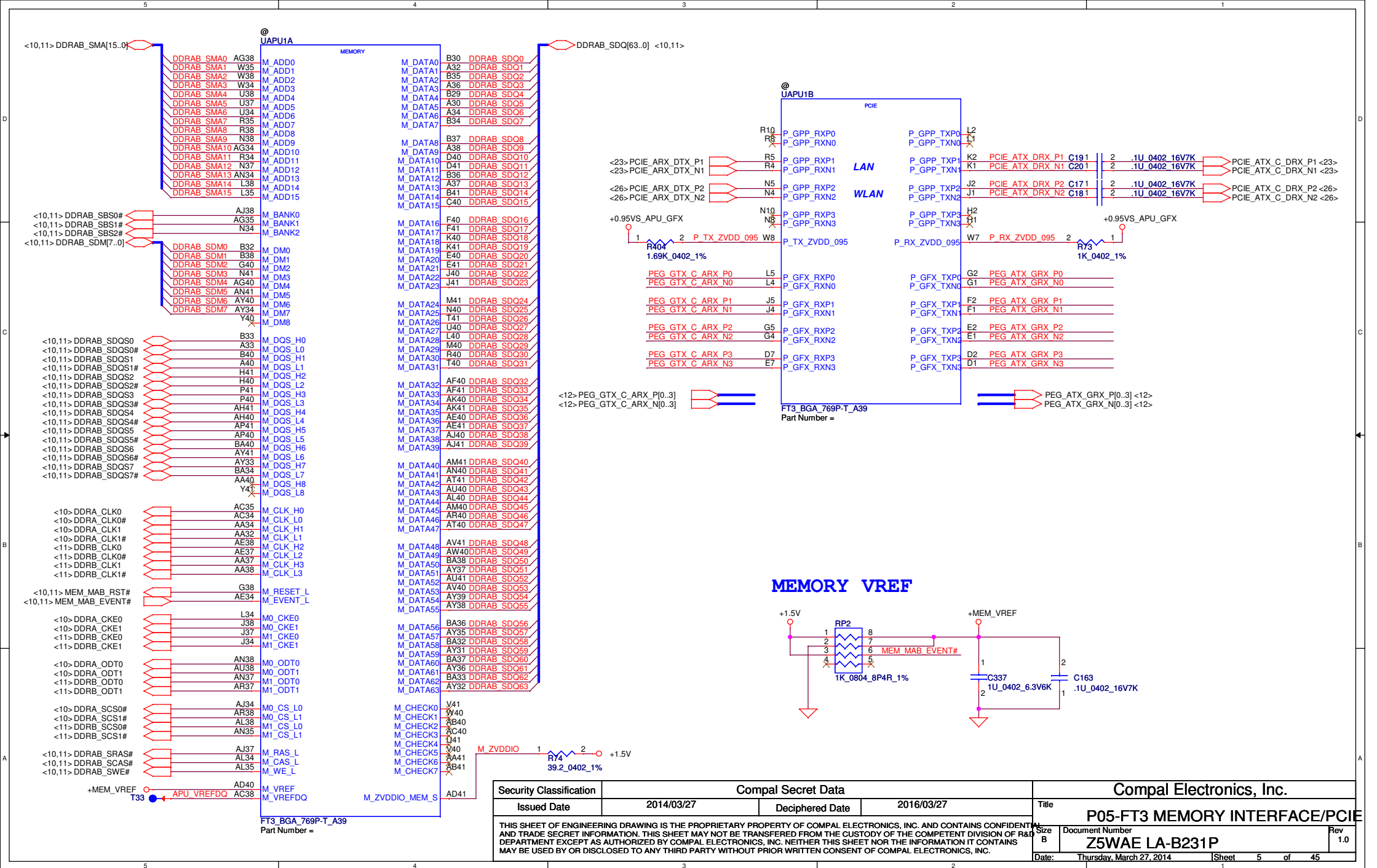
**G-B** +3VALW/+5VALW  
+1.8VALW  
+0.95VALW  
SYSON

**G-C** +1.5V  
SUSP#

**G-D** +3VS  
+1.8VS  
+1.5VS  
+0.95VS  
VR\_ON

**G-E** +APU\_CORE  
+APU\_CORE\_NB

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            |                          |                          |               |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Date:                    | Thursday, March 27, 2014 | Sheet 4 of 45 |



HDMI

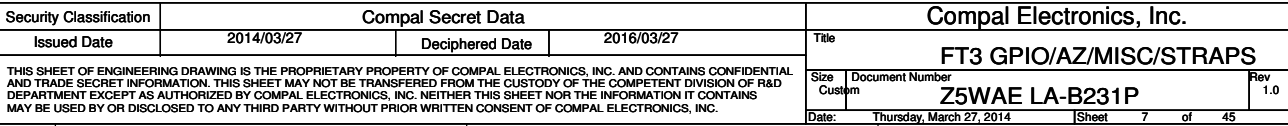
eDP

CRT

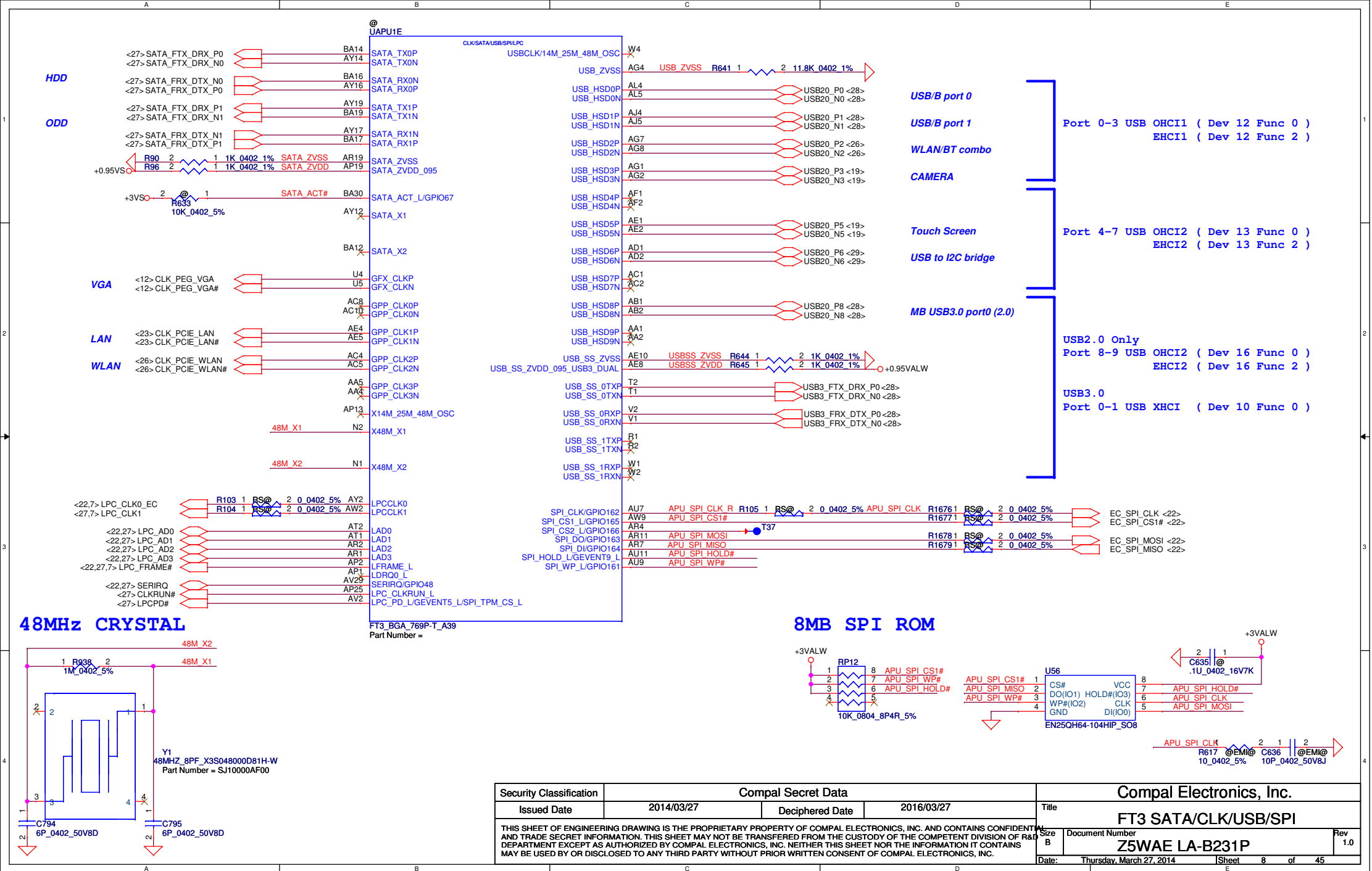
HDT+

PU +1.8VS

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                 |  |                          |  |                   |  |                          |  |               |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                 |  |                          |  | Size              |  | Document Number          |  | Rev           |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date: Thursday, March 27, 2014 | Sheet 8 of 45   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Rev 1.0                        |                 |



The circuit diagram shows a 1.5V DC source connected to a 100µF capacitor (C101) in parallel with a 5V regulator (U1). The regulator's output is connected to three 2.2V LEDs (C25, C26, C27) in parallel. The ground reference is marked with a red arrow and the letter 'E'.

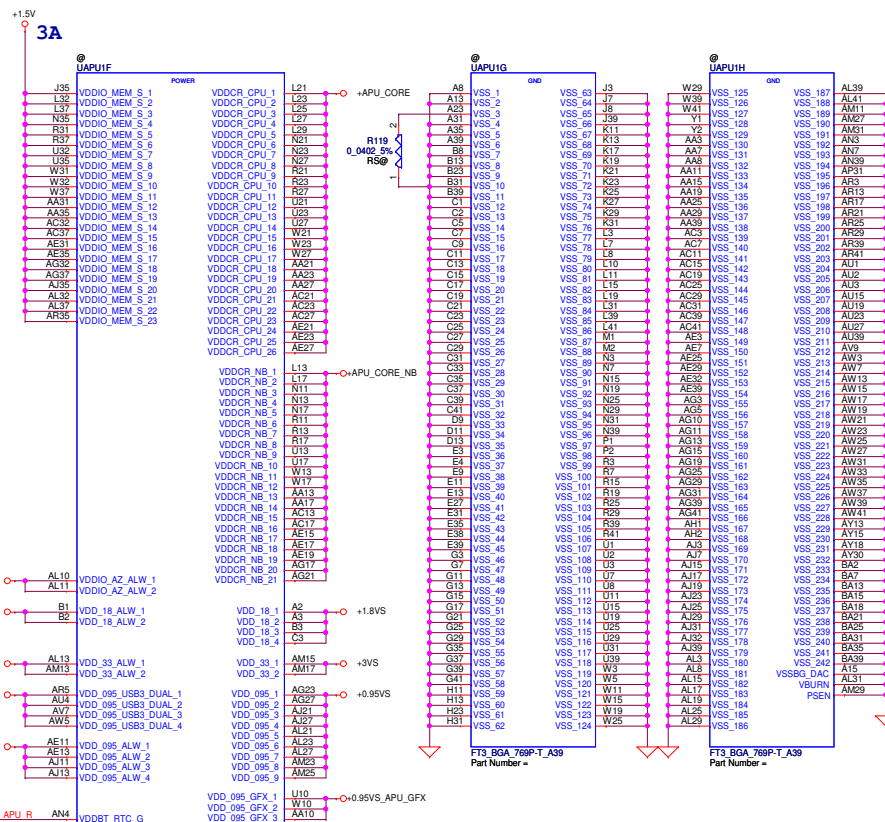
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VDD\_18\_ALW

RTC OF APU

RTC APU\_R

C  
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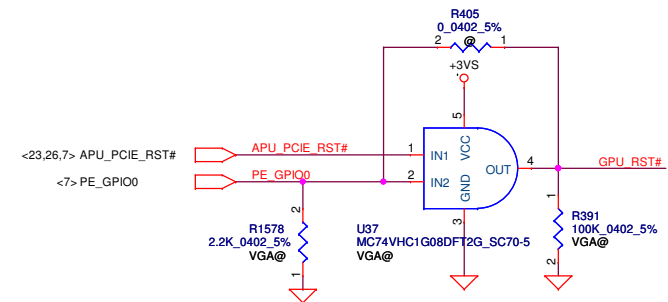
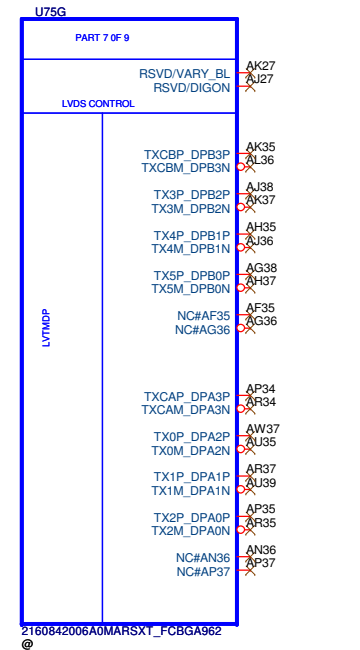
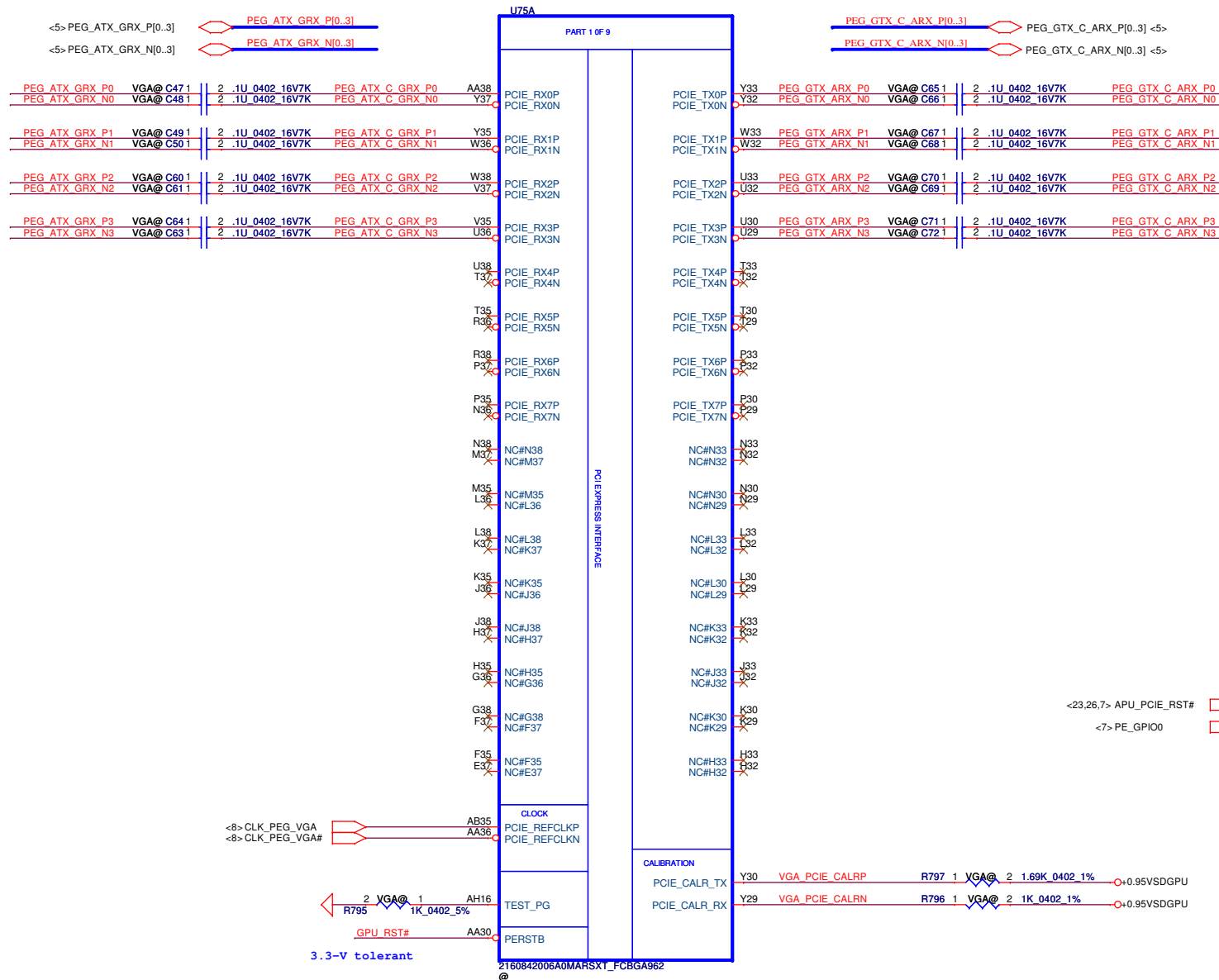


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|---------------------------------|----------------|---------|-------|
| <b>Compal Electronics, Inc.</b> |                |         |       |
| FT3 PWR/GND                     |                |         |       |
| Part Number                     | Z5WAE LA-B231P | Rev 1.0 |       |
| Day, March 27, 2014             | Sheet          | 9       | of 45 |

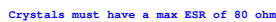




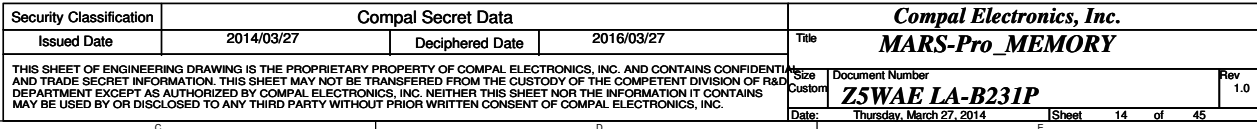
## ***GFX PCIE LANE REVERSAL***



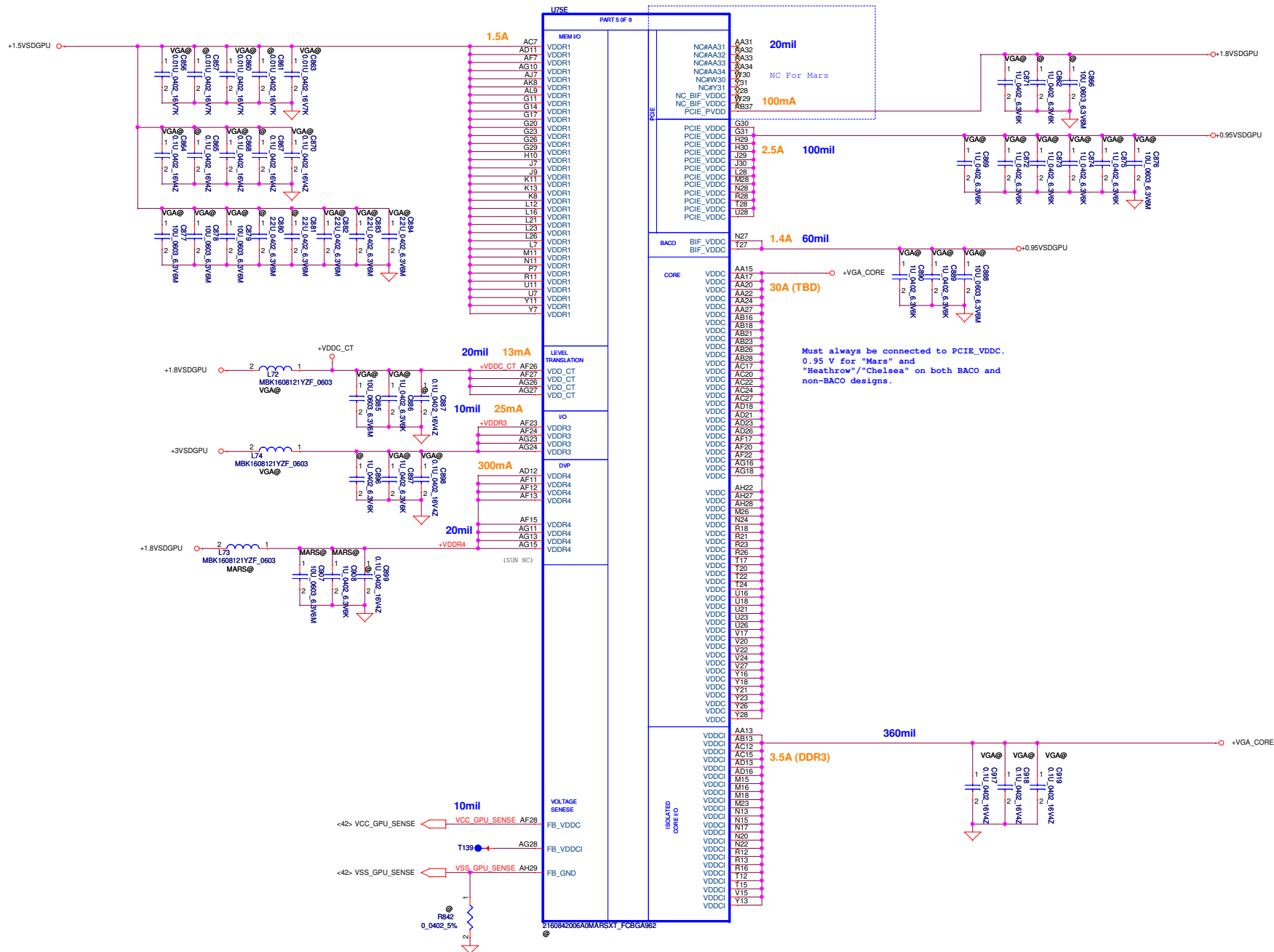
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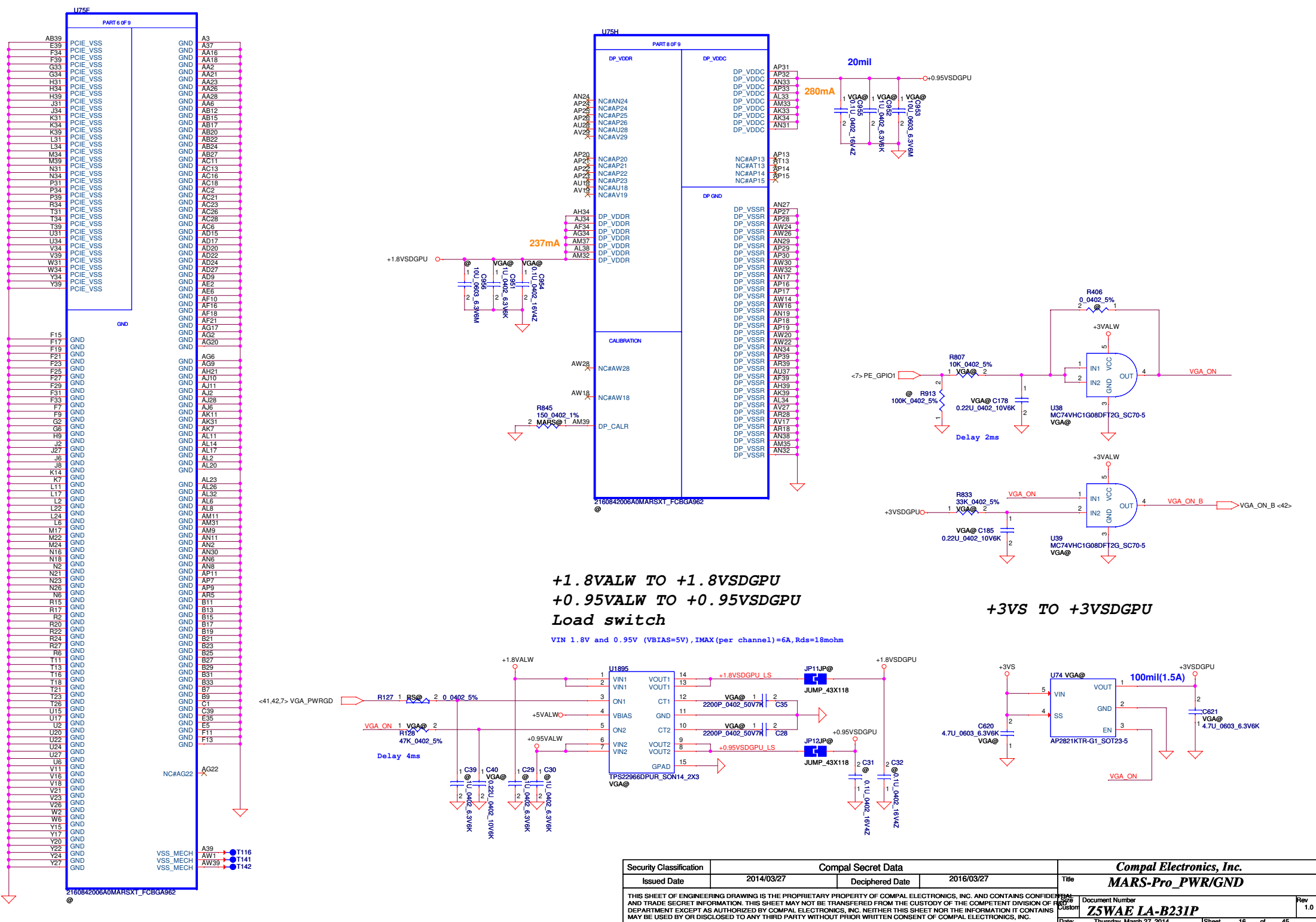


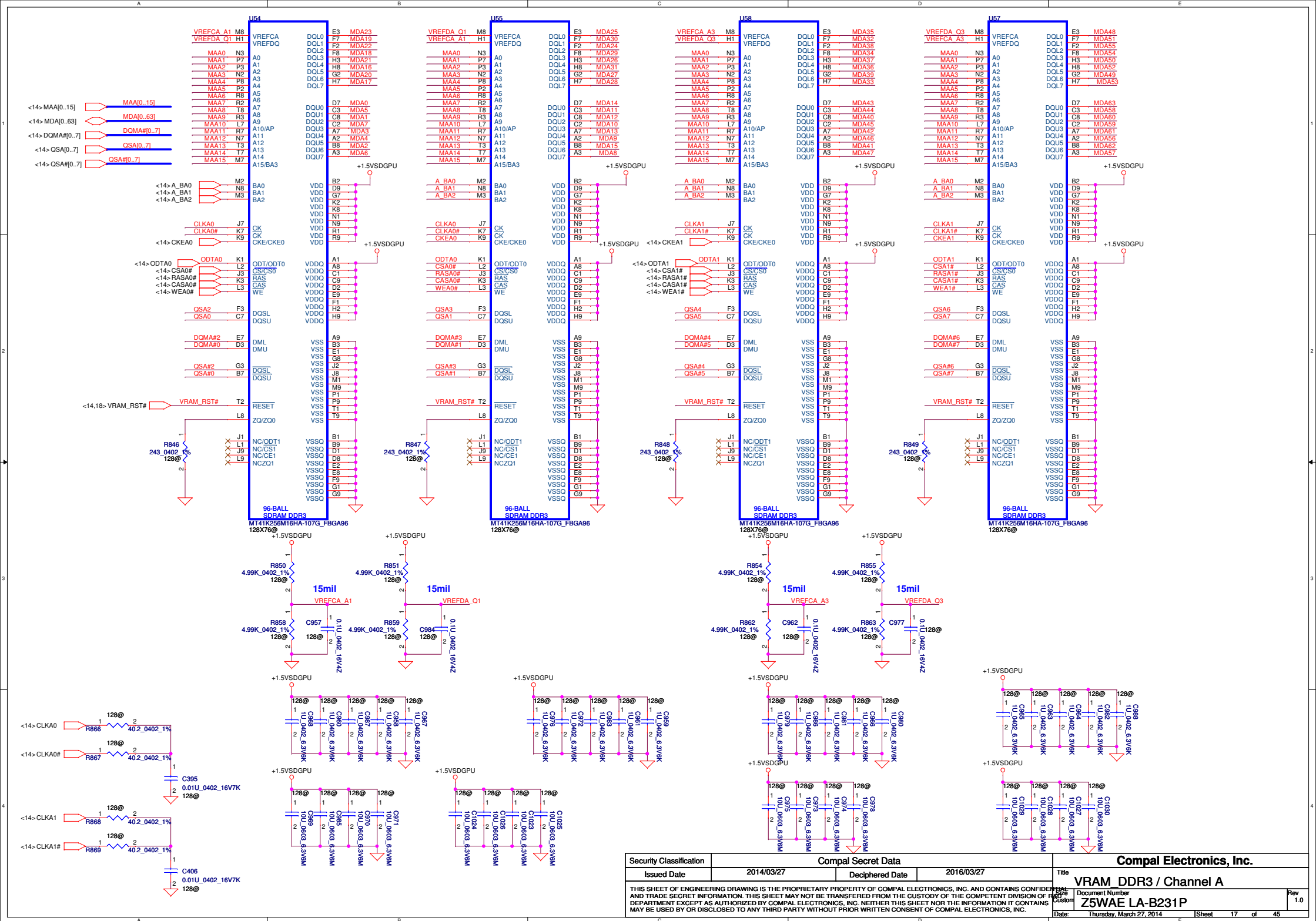


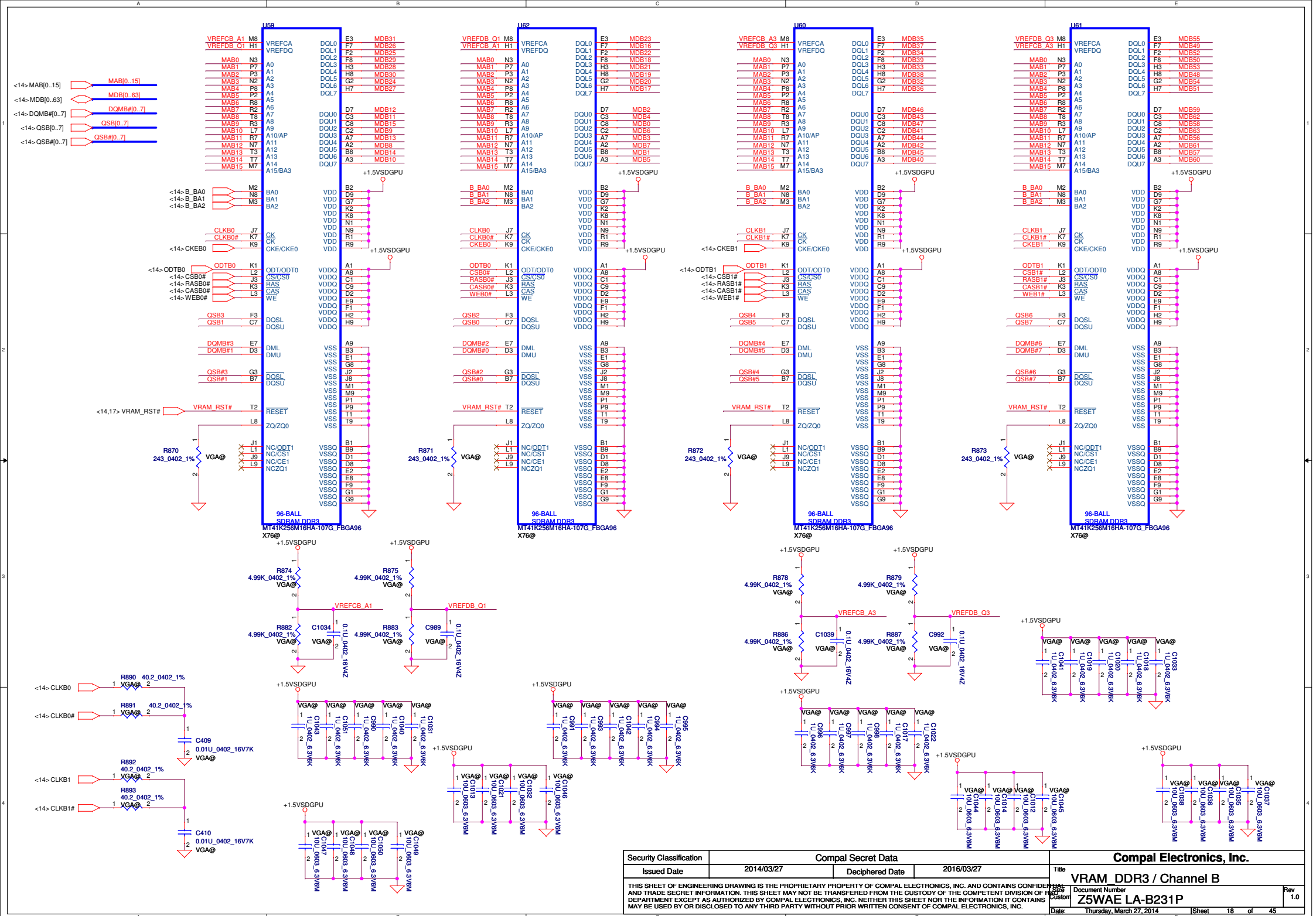


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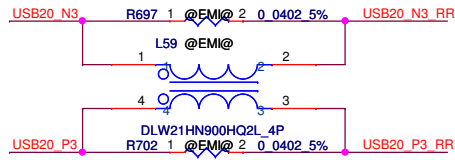
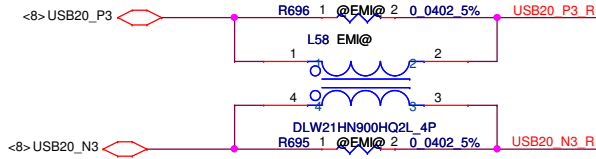
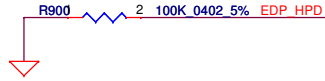
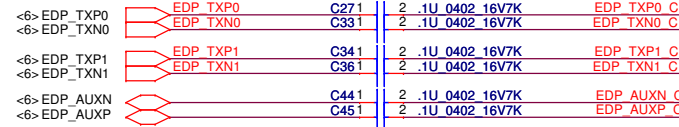
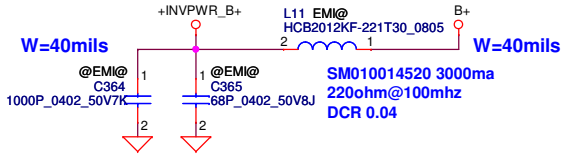
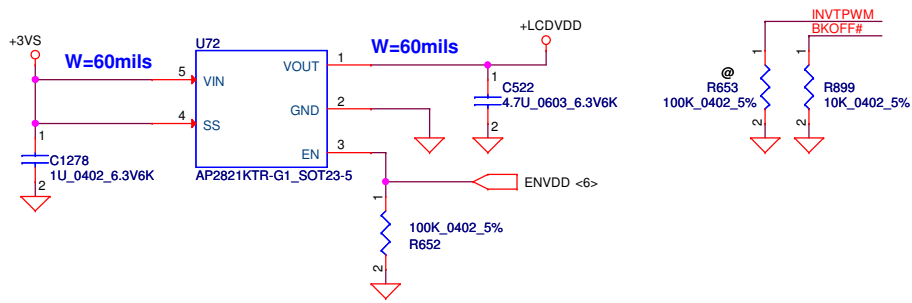




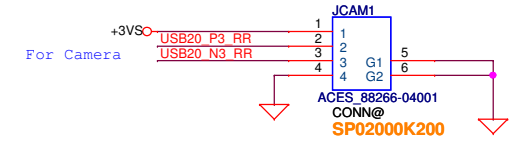
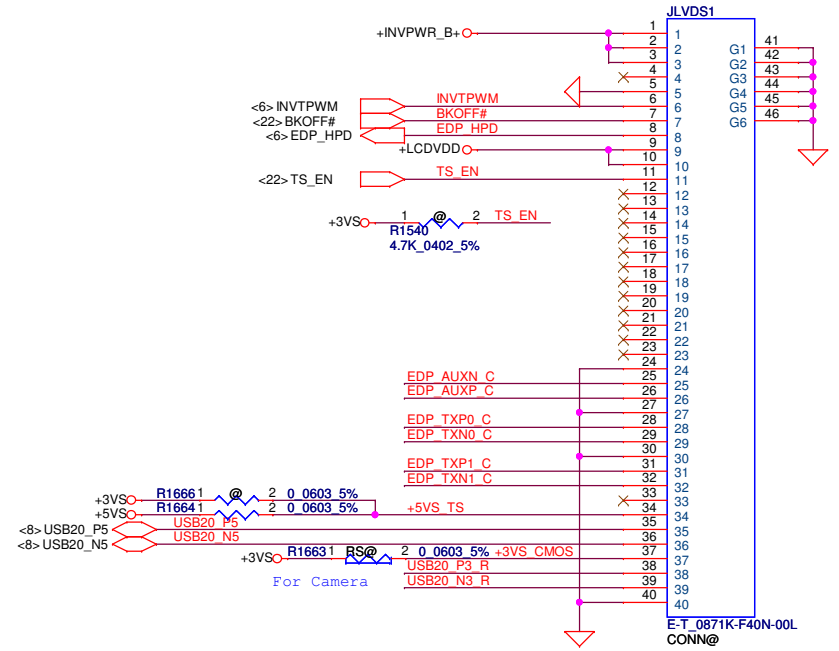




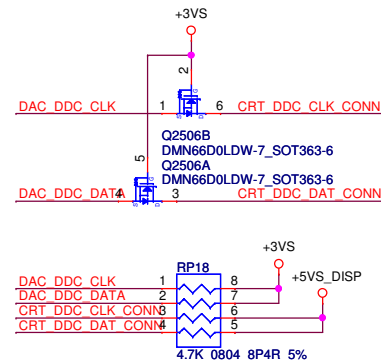
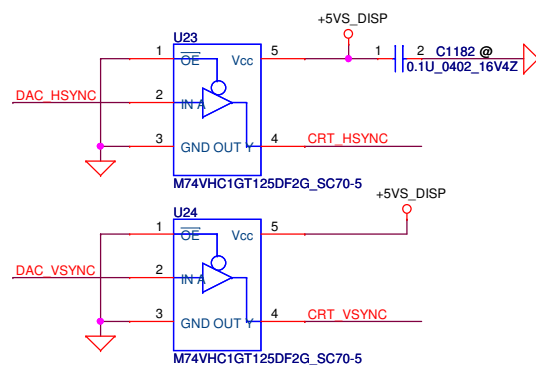
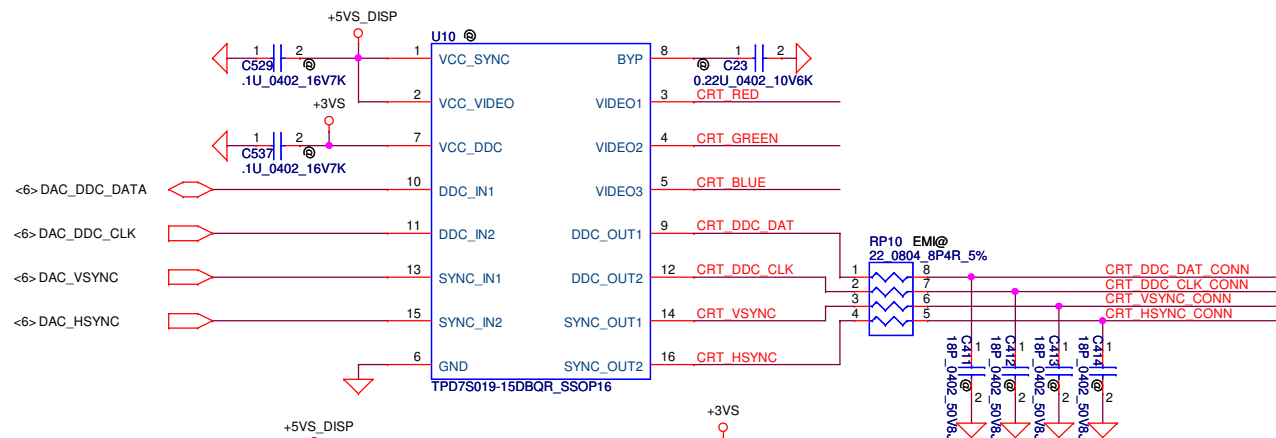
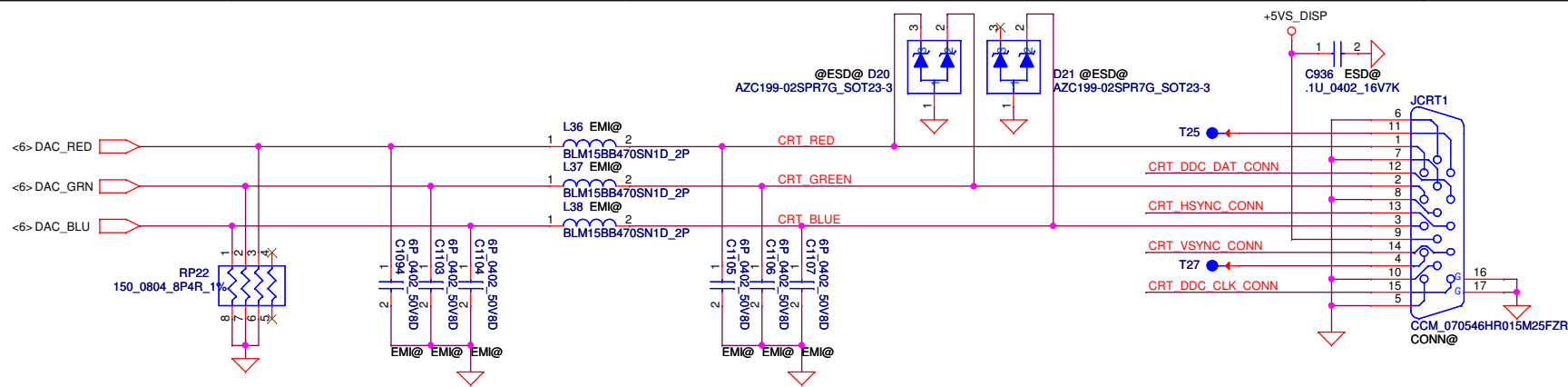
# LCD POWER CIRCUIT



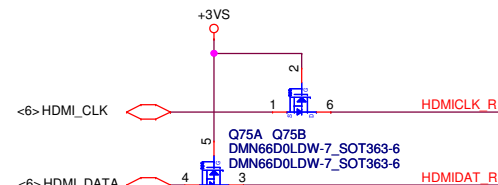
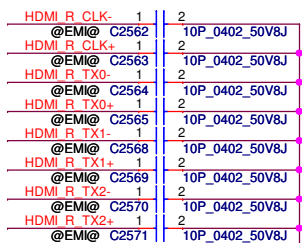
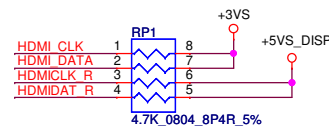
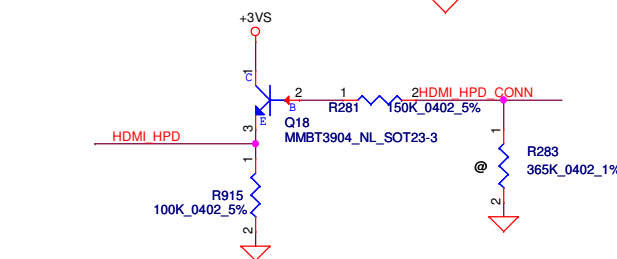
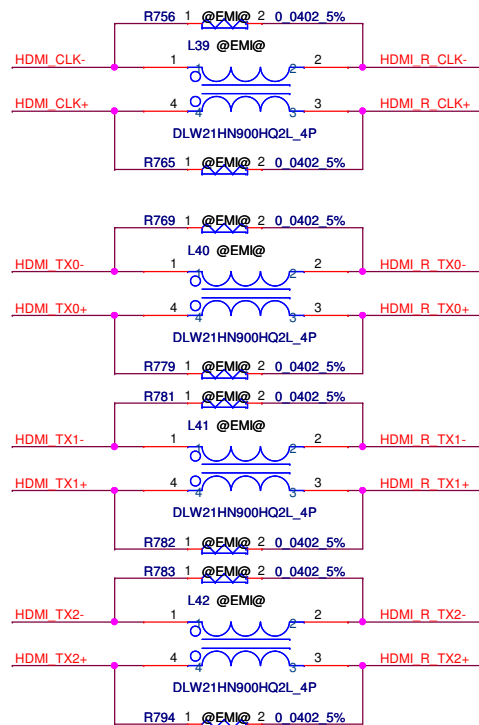
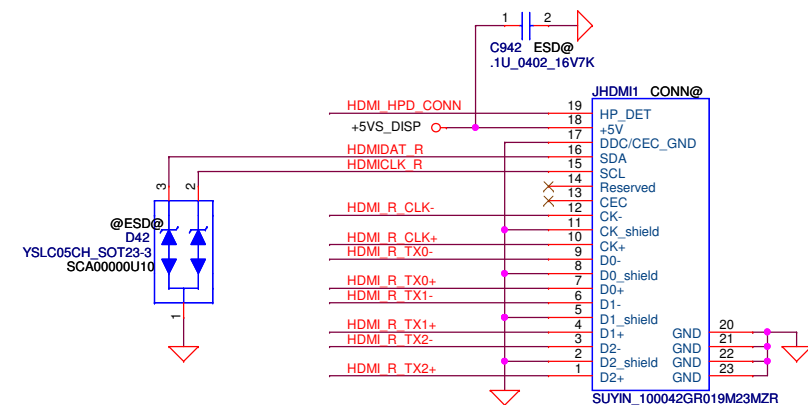
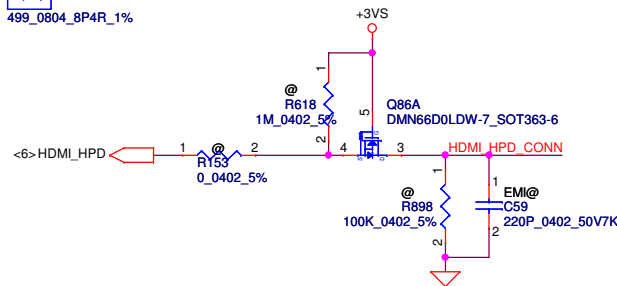
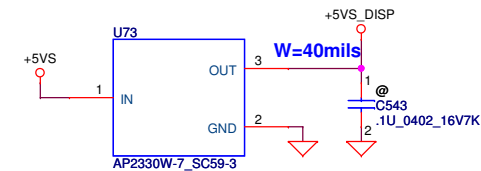
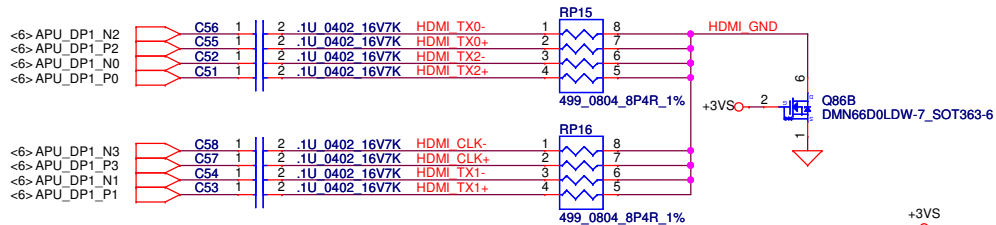
# eDP PANEL Conn.



|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                 |  |                          |  |                          |  |                |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------|--|-----------------|--|--------------------------|--|--------------------------|--|----------------|--|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | Compal Secret Data |  |                 |  | Compal Electronics, Inc. |  |                          |  |                |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                 |  | Size                     |  | Document Number          |  | Rev            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                 |  | B                        |  | Z5WAE LA-B231P           |  | 1.0            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                 |  | Date:                    |  | Thursday, March 27, 2014 |  | Sheet 19 of 45 |  |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                          |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------|----------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc. |          |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Z5WAE LA-B231P           | 1.0      |
| Date: Thursday, March 27, 2014                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                    |            | Sheet                    | 20 of 45 |

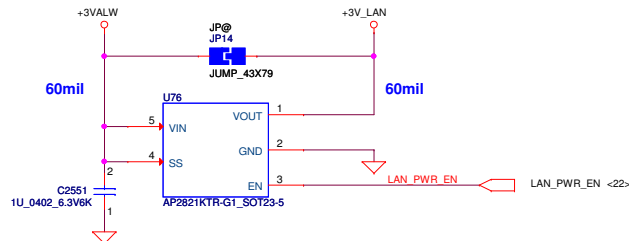


EMI request 1pF.

| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc. |  |
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| Size B                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            | Document Number    |            | Rev 1.0                  |  |
| Date: Thursday, March 27, 2014                                                                                                                                                                                                                                                                                                                                                                                                                                |            | Sheet 21 of 45     |            | Z5WAE LA-B231P           |  |



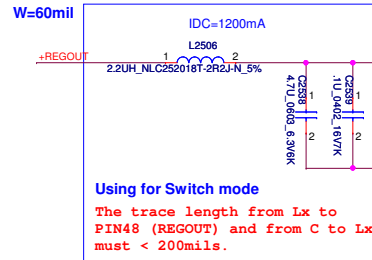




#### From EC

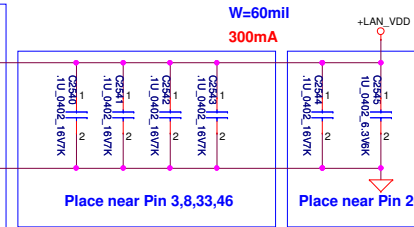
High active.  
EN threshold voltage min:1.2V typ:1.6V max:2.0V  
Current limit threshold 1.5~2.8A

+3V\_LAN Rising time must >0.5ms and <100ms



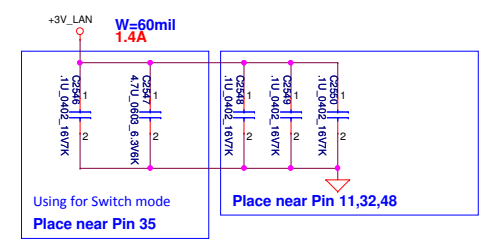
#### Using for Switch mode

The trace length from Lx to PIN48 (REGOUT) and from C to Lx must < 200mils.



Place near Pin 3,8,33,46

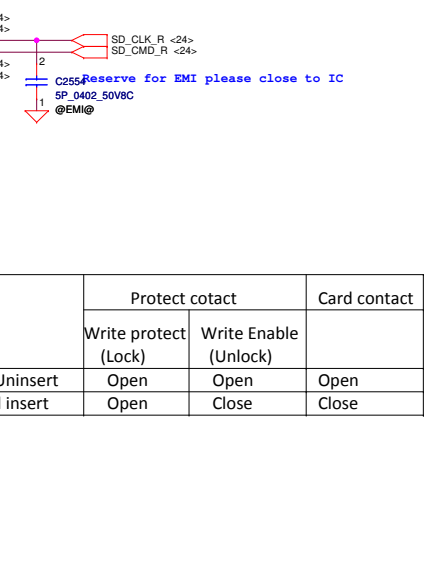
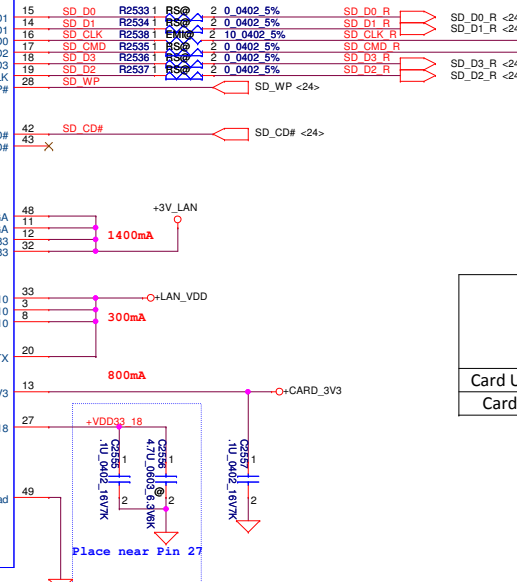
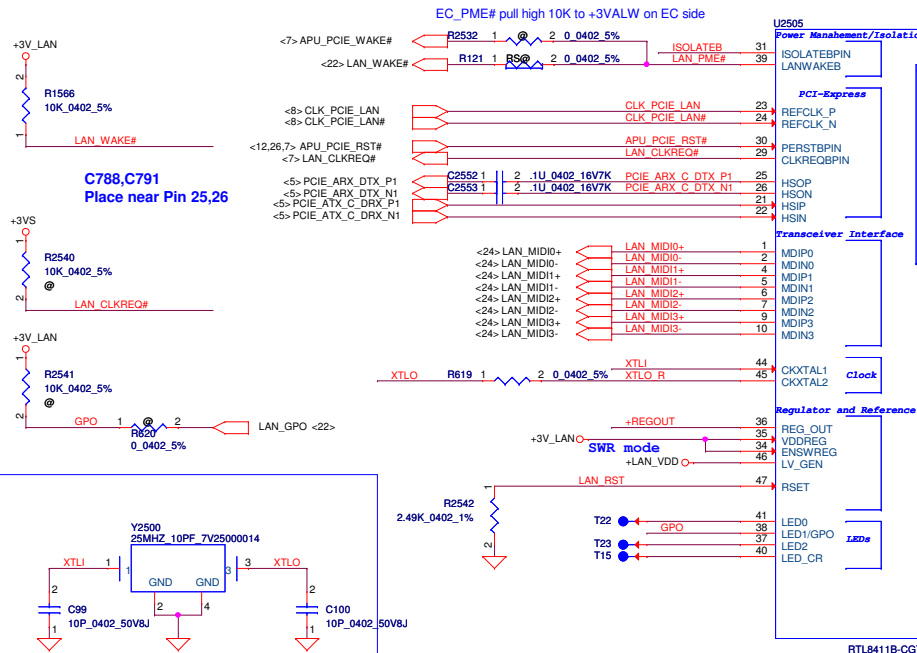
Place near Pin 20



Using for Switch mode

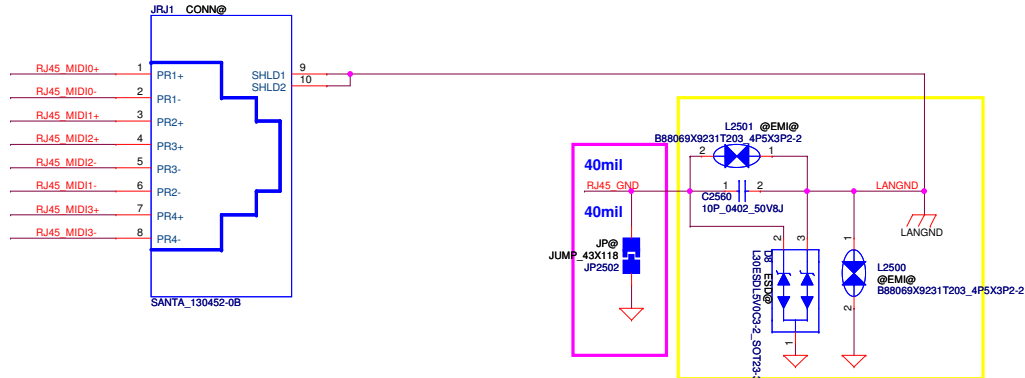
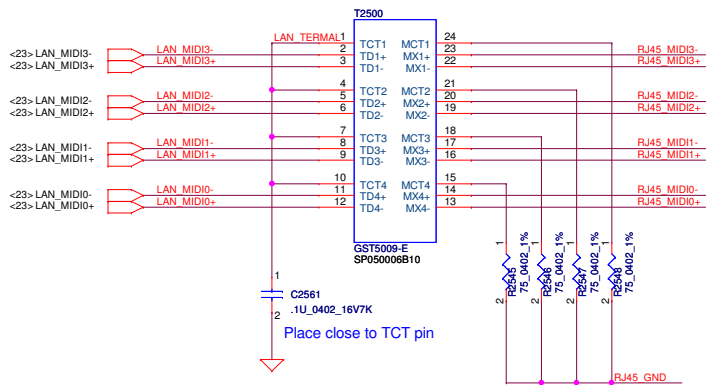
Place near Pin 35

Place near Pin 11,32,48

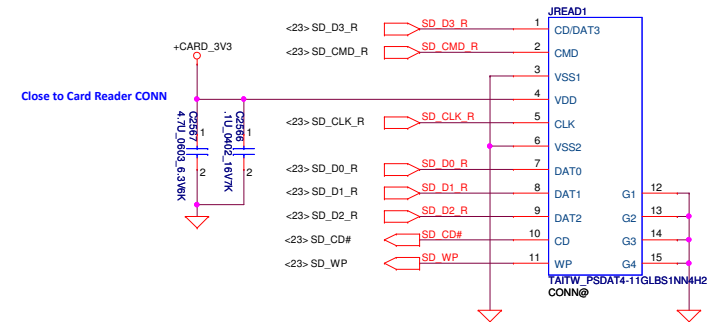


|               | Protect cotact       |                       | Card contact |
|---------------|----------------------|-----------------------|--------------|
|               | Write protect (Lock) | Write Enable (Unlock) |              |
| Card Uninsert | Open                 | Open                  | Open         |
| Card insert   | Open                 | Close                 | Close        |

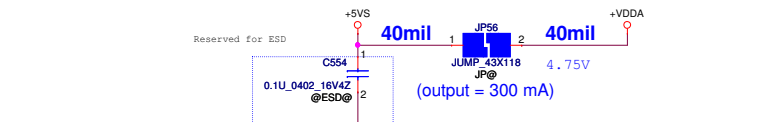
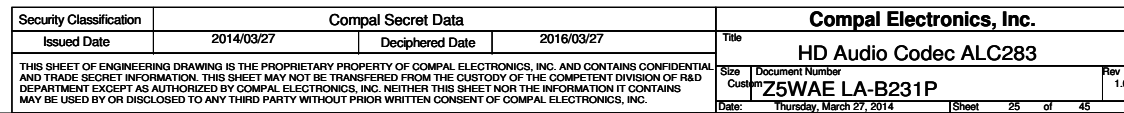
LAN Connector



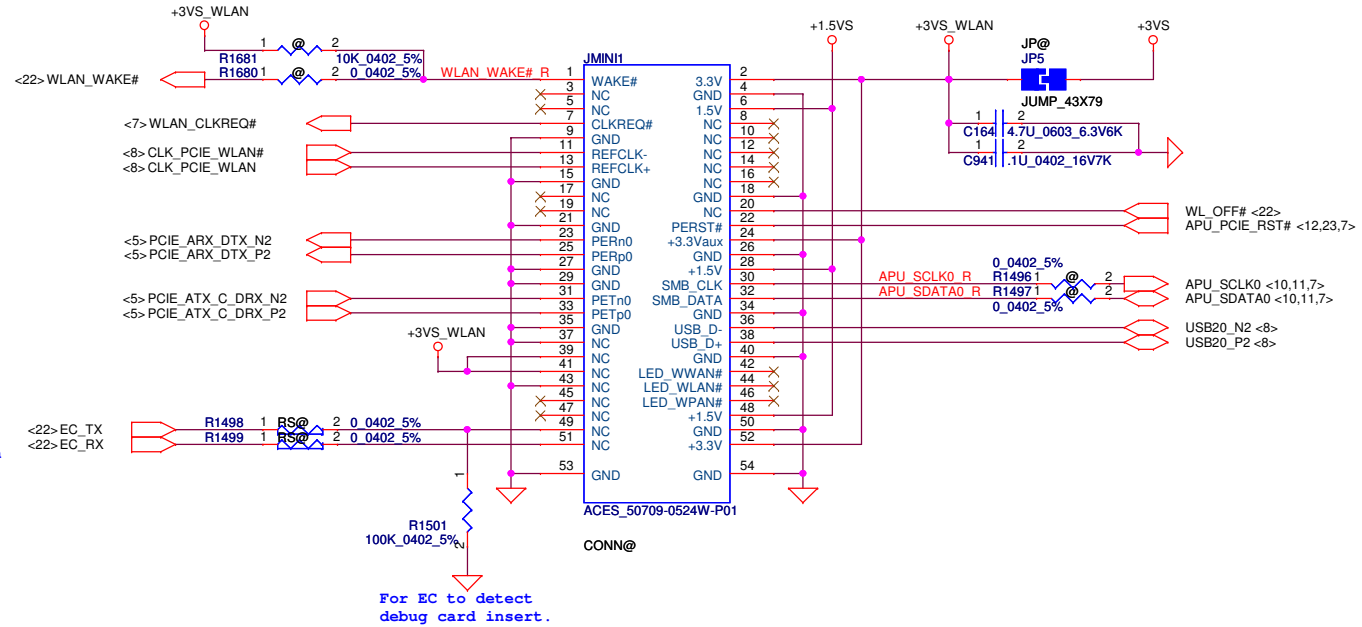
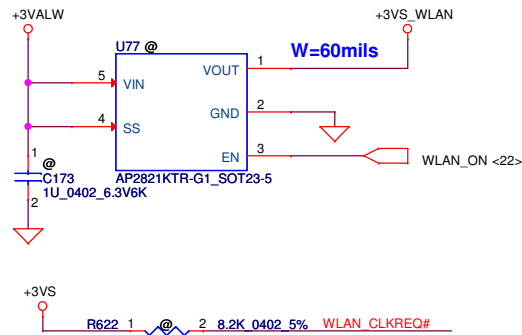
Card Reader Connector



## SM01000EJ00.3000ma 220ohm@100mhz DCR 0.04

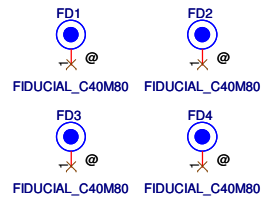
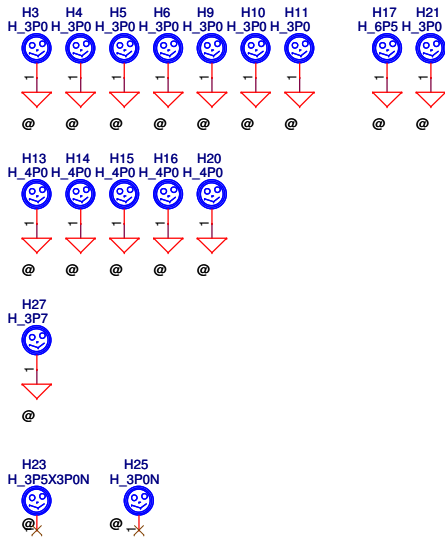
[illegible]

# Mini-Express Card(WLAN/WiMAX) H=4mm

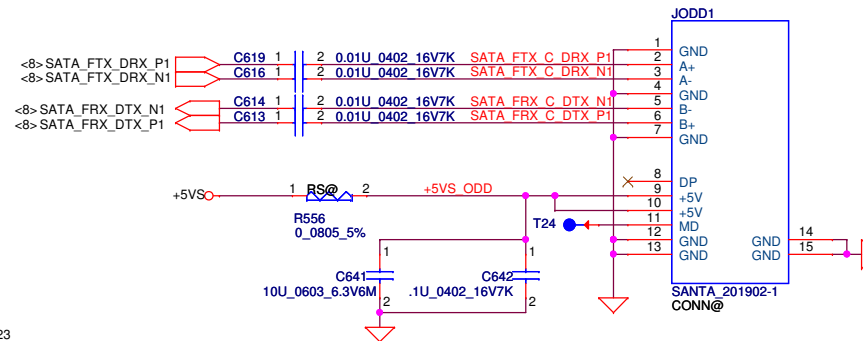


Use RX for BT off function

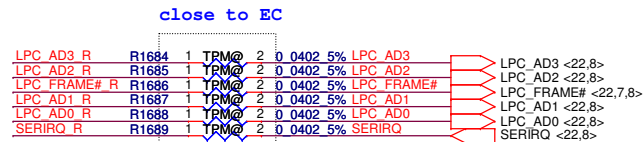
For EC to detect debug card insert.



|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                                |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------------|-----------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc.       |                 |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date: Thursday, March 27, 2014 | Sheet 26 of 45  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Rev 1.0                        |                 |

**SATA ODD Conn.**

## TPM



U2600 TPM@

| Module Pin | Module Label    | Board Pin | Board Label |
|------------|-----------------|-----------|-------------|
| 1          | GPIO0/XOR_OUT   | 5         | V3B         |
| 2          | GPIO1           | 10        | VDD         |
| 3          | GPIO2/GPX       | 19        | VDD         |
| 4          | GPIO3/BADD      | 24        | VDD         |
| 5          | GPIO4/CLKRUN#   | 8         | TEST        |
| 6          | LAD0/MISO       | 3         | NC          |
| 7          | LAD1/MOSI       | 12        | NC          |
| 8          | LAD2/SPI_IRQ#   | 13        | NC          |
| 9          | LAD3            | 14        | NC          |
| 10         | LPCPD#          | 4         | GND         |
| 11         | LCLK/SCLK       | 11        | GND         |
| 12         | LRFAME#/SCS#    | 18        | GND         |
| 13         | LRSET#/SPI_RST# | 25        | GND         |
| 14         | SERIRQ          |           |             |
| 15         | PP              |           |             |

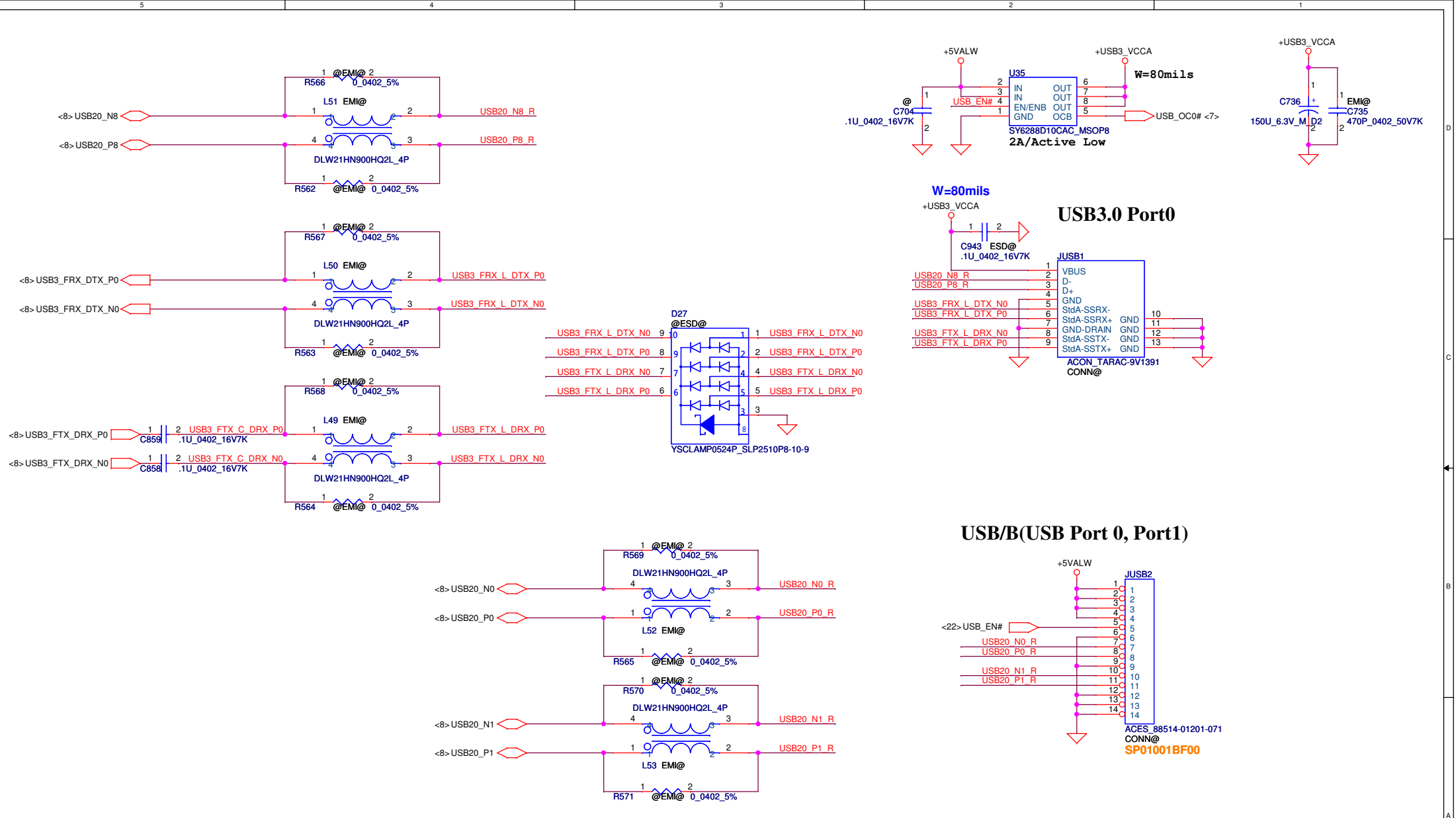
NPCT650AA0WX\_TSSOP28

SA000071000

[illegible]

CLKRUN# PH request by TPM chip DG 1/22

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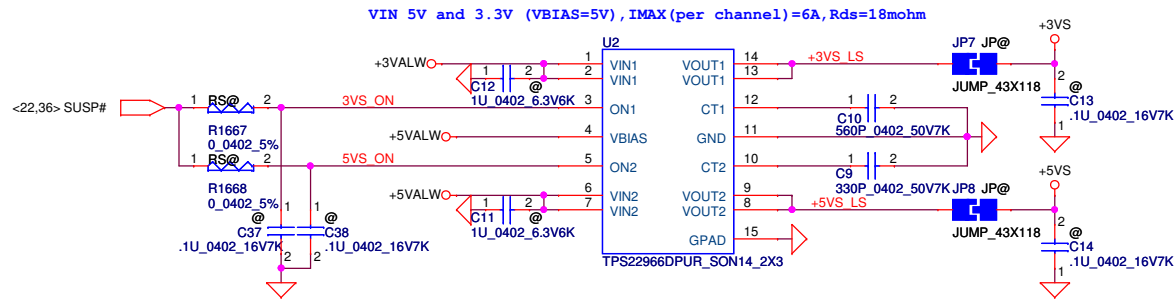


|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                          |                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------|--------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc. |                          |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Date:                    | Thursday, March 27, 2014 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 28 of 45                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Rev                      | 1.0                      |

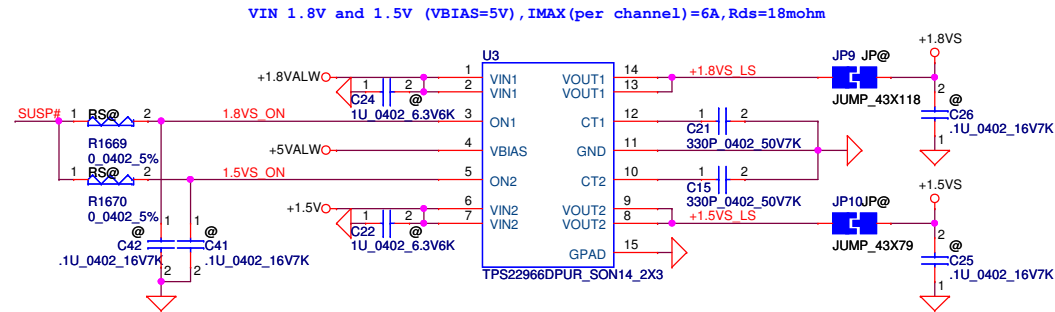




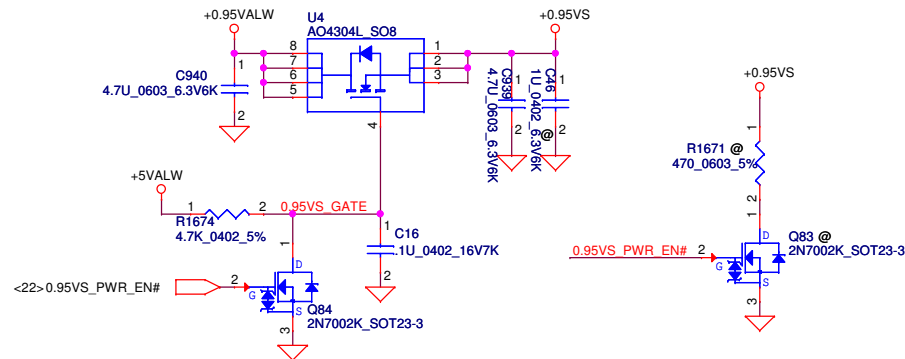
**+5VALW TO +5VS**  
**+3VALW TO +3VS**  
**Load switch**



**+1.8VALW TO +1.8VS**  
**+1.5V TO +1.5VS**  
**Load switch**



**+0.95VALW to +0.95VS**



|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            |                          |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|------------|--------------------------|----------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data |                 |            | Compal Electronics, Inc. |          |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2014/03/27         | Deciphered Date | 2016/03/27 | Title                    |          |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Z5WAE LA-B231P           | 1.0      |
| Date: Thursday, March 27, 2014                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                 |            | Sheet                    | 30 of 45 |

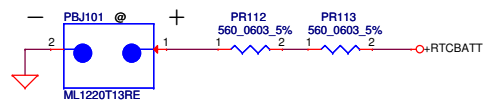
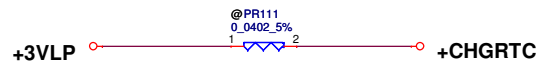
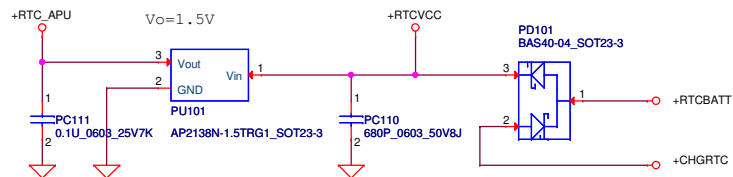
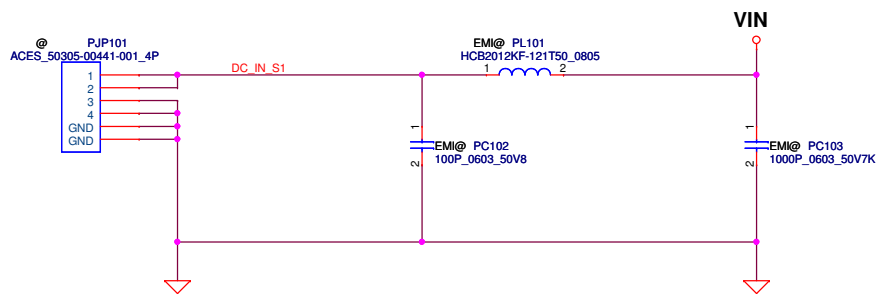
0.2

- 1. Add R693 for UMA/DIS select
- 2. Change R756,R765,R769,R779,R781,R782,R783 and R794 to Rshort for EMI request
- 3. Change BID to 1 for DVT
- 4. Change LAN\_WAKE# PU to +3V\_LAN
- 5. Add L76,L77,C2142 and C2140 for ESD request
- 6. Change R238 and R237 to 59ohm
- 7. Add L52,L53,R565,R569,R570 and R571 for EMI request.
- 8. Add R140,R141,R142,R143,R144 and R145 for reserve USB TP
- 9. Pop Q89, unpop R1690
- 10. Change D10 to SCA00001B00
- 11. Change L11 to SM01000EJ00
- 12. Add U39,R833,C185,R1578 for VGA power sequence issue
- 13. Remove APU\_ALERT#\_R
- 14. Add C668 and C836 for vendor request

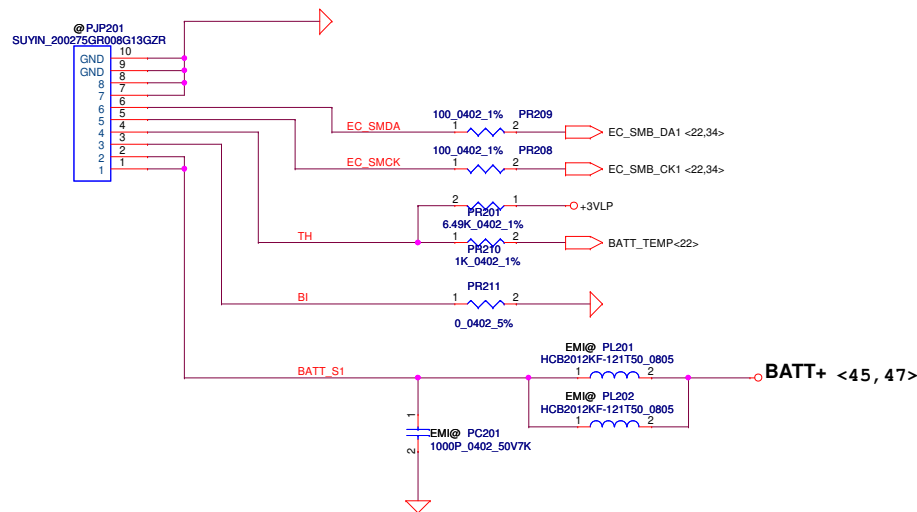
0.3

- 1. Change JTP1
- 2. Add U78 for TP +3V power plane
- 3. Change C849, C849 to 10p
- 4. Change C736 to 150u D2 type.
- 5. Change R699, R700 to 330ohm; R698, R701 to 560ohm
- 6. Change U69 +3VALW to +3VS
- 7. Add C366, C367, C368, C369 for EMI request
- 8. Add on board TPM
- 9. Add R619

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            |                          |                          |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|------------|--------------------------|--------------------------|----------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data |                 |            | Compal Electronics, Inc. |                          |                |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Size                     | Document Number          | Rev            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | C                        | Z5WAE LA-B231P           | 1.0            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Date:                    | Thursday, March 27, 2014 | Sheet 31 of 45 |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                 |            |                          |                          |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|------------|--------------------------|--------------------------|----------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Compal Secret Data |                 |            | Compal Electronics, Inc. |                          |                |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                 |            | Date:                    | Thursday, March 27, 2014 | Sheet 32 of 45 |



---Battery\_pin define---

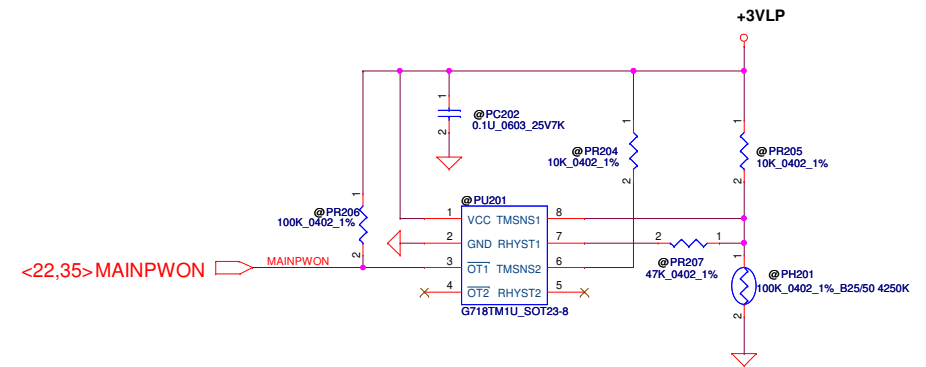
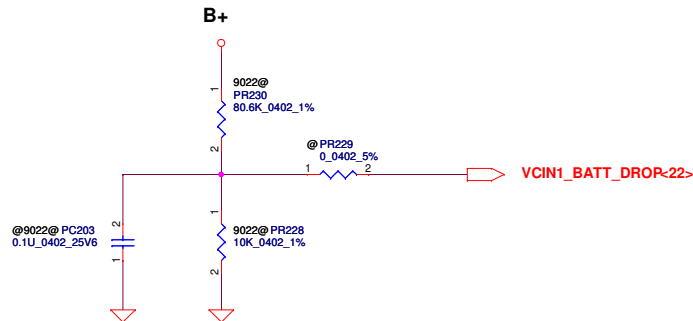
PIN1 GND  
PIN2 GND  
PIN3 SMD  
PIN4 SMC  
PIN5 TS  
PIN6 B/I  
PIN7 Batt+  
PIN8 Batt+

---Battery Con\_pin define---

PIN8 GND  
PIN7 GND  
PIN6 SMD  
PIN5 SMC  
PIN4 TS  
PIN3 B/I  
PIN2 Batt+  
PIN1 Batt+

**2013/10/02**  
**Add for ENE9022 Battery Voltage drop detection.**  
**Connect to ENE9022 pin64 AD1.**

**Battery is 3-cell design.**  
**B+=9V**



|       | For KB9012<br>OTP | For KB9022<br>OTP |
|-------|-------------------|-------------------|
| 92°C  |                   | 1.0V              |
| 56°C  |                   | 2.0V              |
| PR216 |                   | 16.9K ohm         |

**2014/01/02 update**

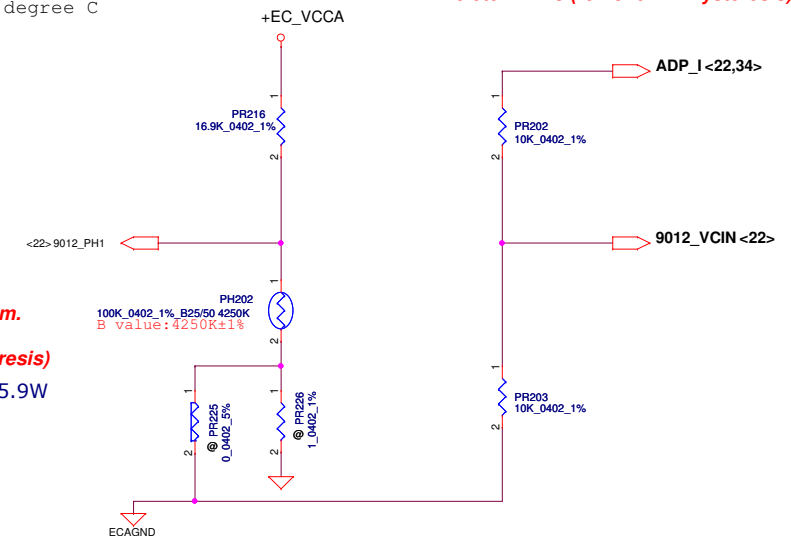
| For KB9022<br>sense 20mΩ | Active     | Recovery     |
|--------------------------|------------|--------------|
|                          |            |              |
| 65W                      | 70W, 0.73V | 55.9W, 0.59V |
|                          |            |              |

**2013/10/22 Modify**  
**PH201, PH202 change to common part.**

**2013/12/16 Modify**  
**Delete PR223.(remove HW hysteresis)**

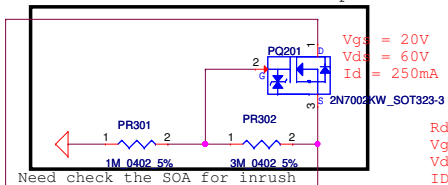
PH201 under CPU bottom side :  
CPU thermal protection at 92 degree C ( shutdown )  
Recovery at 56 degree C

**2013/10/25 Modify**  
**PR227(9012@) change to 26.1K ohm.**  
**2014/02/07 Modify**  
**Delete @PR227.(remove HW hysteresis)**  
For 65W adapter==>action 70W , Recovery 55.9W



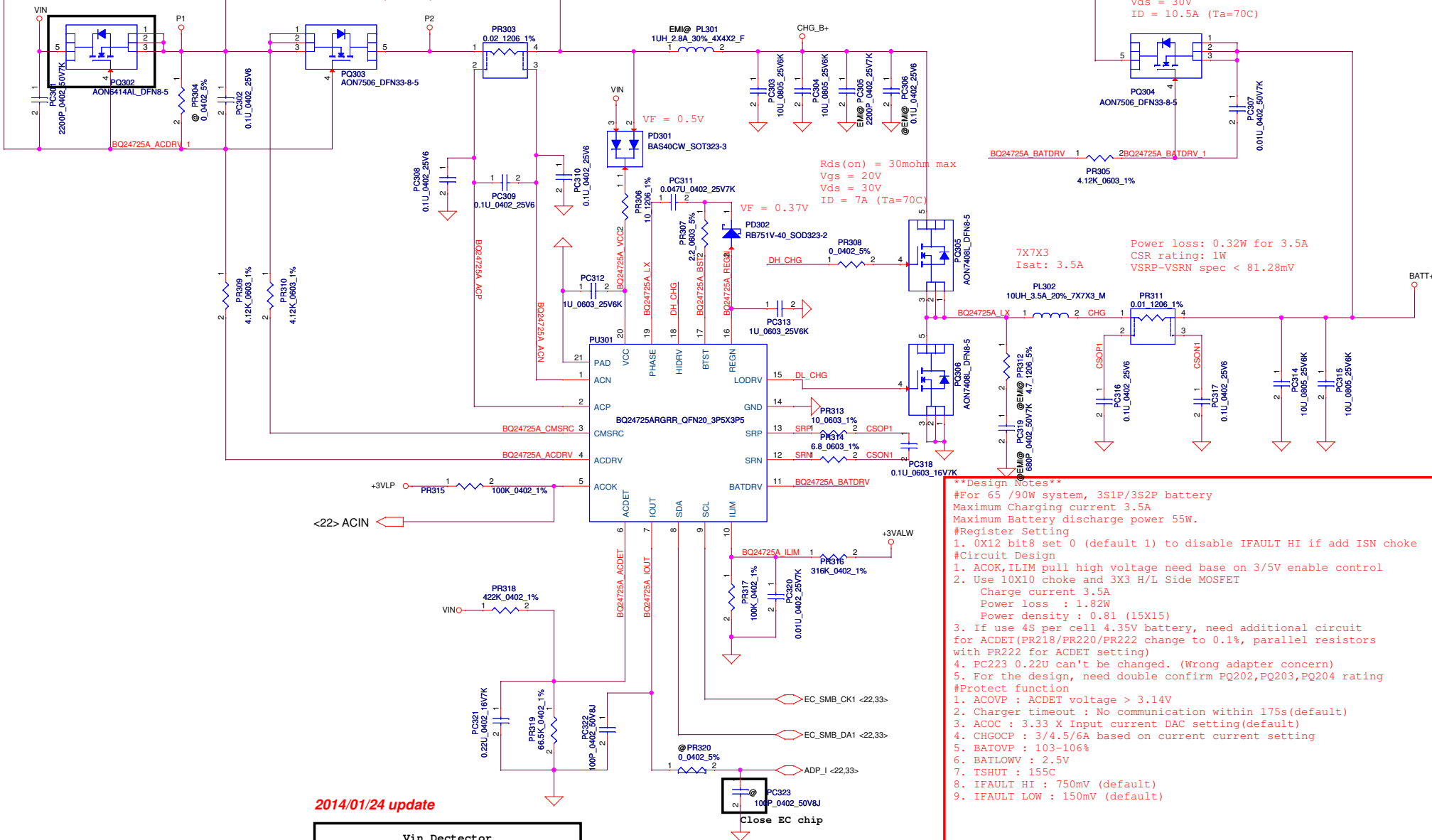
| Compal Secret Data                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                 |            | Compal Electronics, Inc. |                          |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------|------------|--------------------------|--------------------------|----------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Issued Date | Deciphered Date | 2016/03/27 | Title                    | Document Number          | Rev            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2014/03/27  |                 |            | BATTERY CONN / OTP       |                          | 1.0            |
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# Protection for reverse input



2013/10/14  
PR303 10m ohm chang -->20m ohm  
SD00000S120

Rds(on) = 15.8mohm max  
Vgs = 20V  
Vds = 30V  
ID = 10.5A (Ta=70C)



**\*\*Design Notes\*\***

#For 65 /90W system, 3S1P/3S2P battery  
Maximum Charging current 3.5A  
Maximum Battery discharge power 55W.

#Register Setting

- 0X12 bit8 set 0 (default 1) to disable IFAULT HI if add ISN choke

#Circuit Design

- ACOK, ILIM pull high voltage need base on 3/5V enable control
- Use 10X10 choke and 3X3 H/L Side MOSFET  
Charge current 3.5A  
Power loss : 1.82W  
Power density : 0.81 (15X15)
- If use 4S per cell 4.35V battery, need additional circuit for ACDET (PR218/PR220/PR222 change to 0.1%, parallel resistors with PR222 for ACDET setting)
- PC223 0.22u can't be changed. (Wrong adapter concern)
- For the design, need double confirm PQ202, PQ203, PQ204 rating

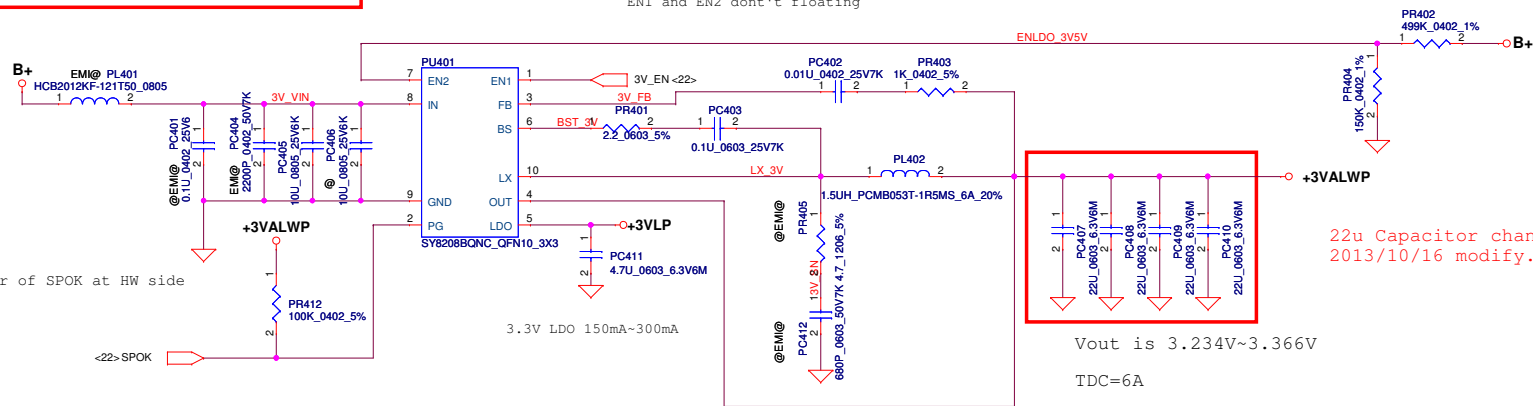
#Protect function

- ACOVF : ACDET voltage > 3.14V
- Charger timeout : No communication within 175s(default)
- ACOC : 3.33 X Input current DAC setting(default)
- CHGOCF : 3/4.5/6A based on current current setting
- BATOVF : 103-106%
- BATLOWV : 2.5V
- TSHUT : 155C
- IFAULT HI : 750mV (default)
- IFAULT LOW : 150mV (default)

# Module model information

SY8208B\_V2.mdd  
SY8208C\_V2.mdd

EN1 and EN2 don't floating



22u Capacitor change to 0603 size.  
2013/10/16 modify.

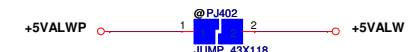
Vout is 3.234V~3.366V

TDC=6A



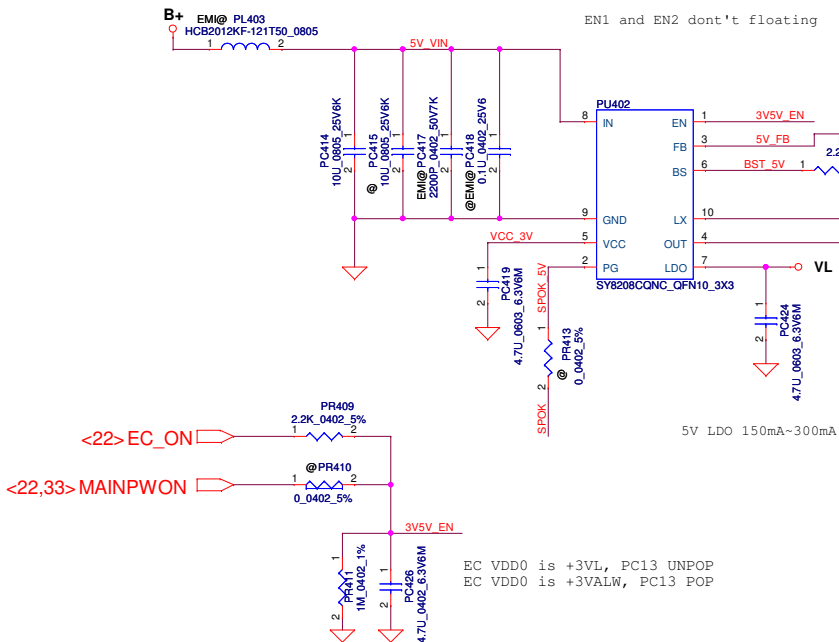
Vout is 4.998V~5.202V

TDC=6A



22u Capacitor change to 0603 size.  
2013/10/16 modify.  
reserve PC427, PC428 for IC Application.  
2013/11/29 modify.

Add non-pop PR413 for Test.  
2013/11/04 modify.



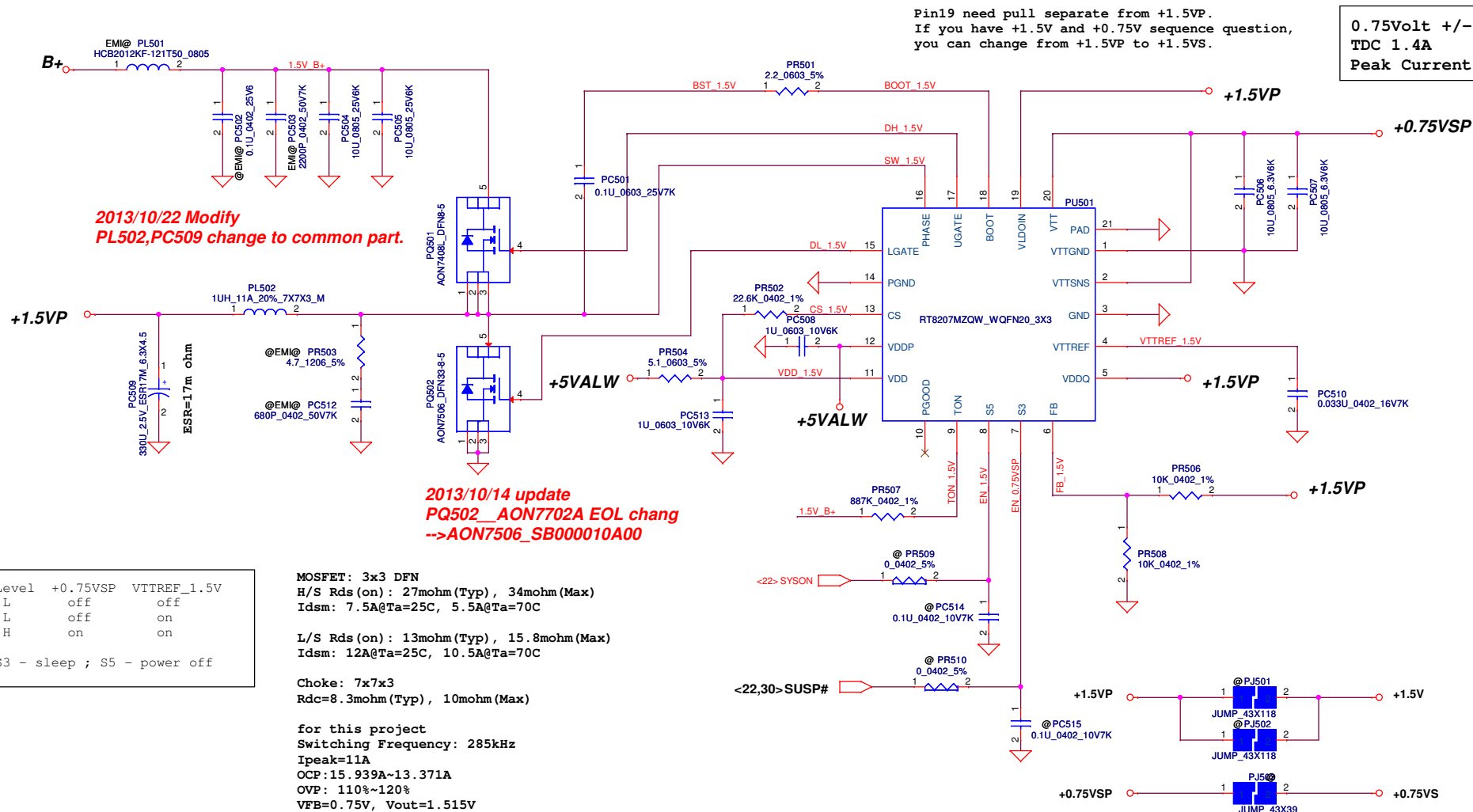
EC VDD0 is +3VL, PC13 UNPOP  
EC VDD0 is +3VALW, PC13 POP

| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                            |            | Compal Secret Data |            | Compal Electronics, Inc. |                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------|--------------------------|
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2014/03/27 | Deciphered Date    | 2016/03/27 | Title                    | +3VALW/+5VALW            |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                    |            | Date                     | Thursday, March 27, 2014 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                    |            | Sheet                    | 35 of 45                 |



# Module model information

RT8207M\_V1.mdd For Single layer  
RT8207M\_V2.mdd For Dual layer



|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                 |  |                                 |  |        |  |                          |  |                |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------|--|-----------------|--|---------------------------------|--|--------|--|--------------------------|--|----------------|--|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | Compal Secret Data |  |                 |  | <b>Compal Electronics, Inc.</b> |  |        |  |                          |  |                |  |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | 2014/03/27         |  | Deciphered Date |  | 2016/03/27                      |  | Title  |  | <b>+1.5VP/+0.75VSP</b>   |  |                |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                 |  |                                 |  | Custom |  | Document Number          |  | 1.0            |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |  |                 |  |                                 |  | Date:  |  | Thursday, March 27, 2014 |  | Sheet 36 of 45 |  |

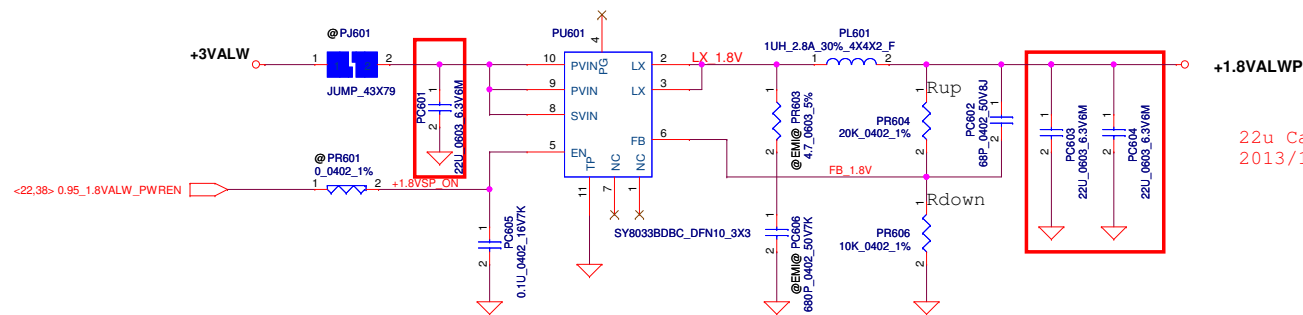
# Module model information

SY8033\_V1.mdd

22u Capacitor change to 0603 size.  
2013/10/16 modify.

**2013/10/22 Modify**  
**PL601 change to common part.**

FB=0.6V  
Note:Iload(max)=3.5A



22u Capacitor change to 0603 size.  
2013/10/16 modify.

**Note:**  
When design Vin=5V, please stuff snubber  
to prevent Vin damage

$$V_{out} = 0.6V * (1 + R_{up}/R_{down})$$

Delete PR605, because same net name have two PD resistor in circuit.  
2013/11/29 modify.



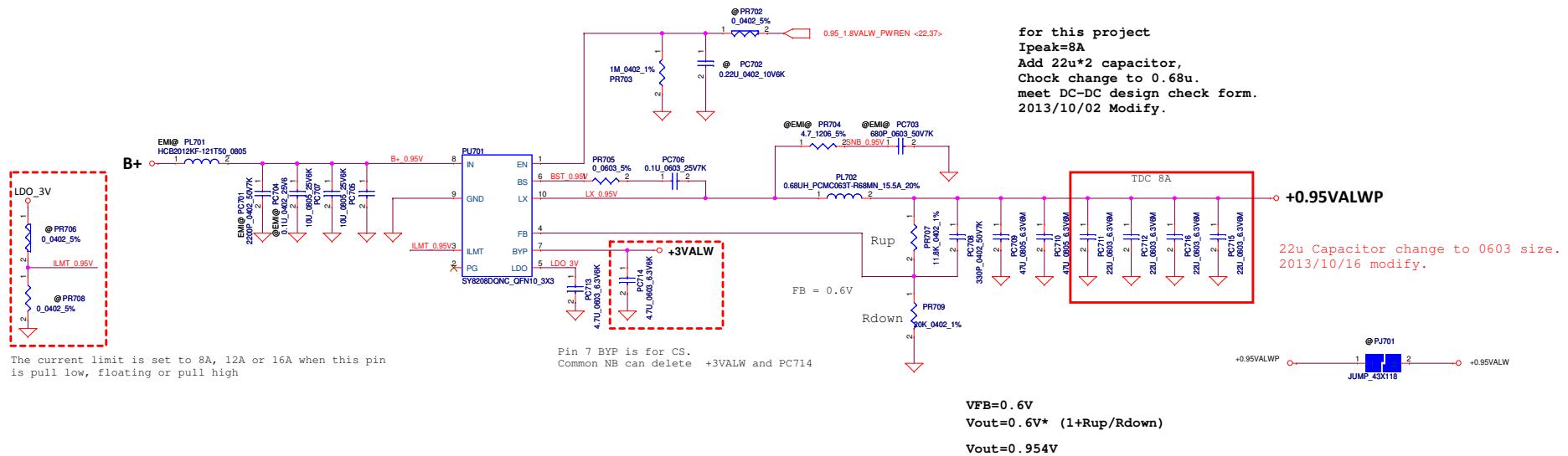
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |                          |                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|--------------------------|--------------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data |                 | Compal Electronics, Inc. |                                |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2014/03/27         | Deciphered Date | 2016/03/27               | Title                          |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |                          | Date: Thursday, March 27, 2014 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |                          | Sheet 37 of 45                 |

Module model information

SY8208D\_V1.mdd

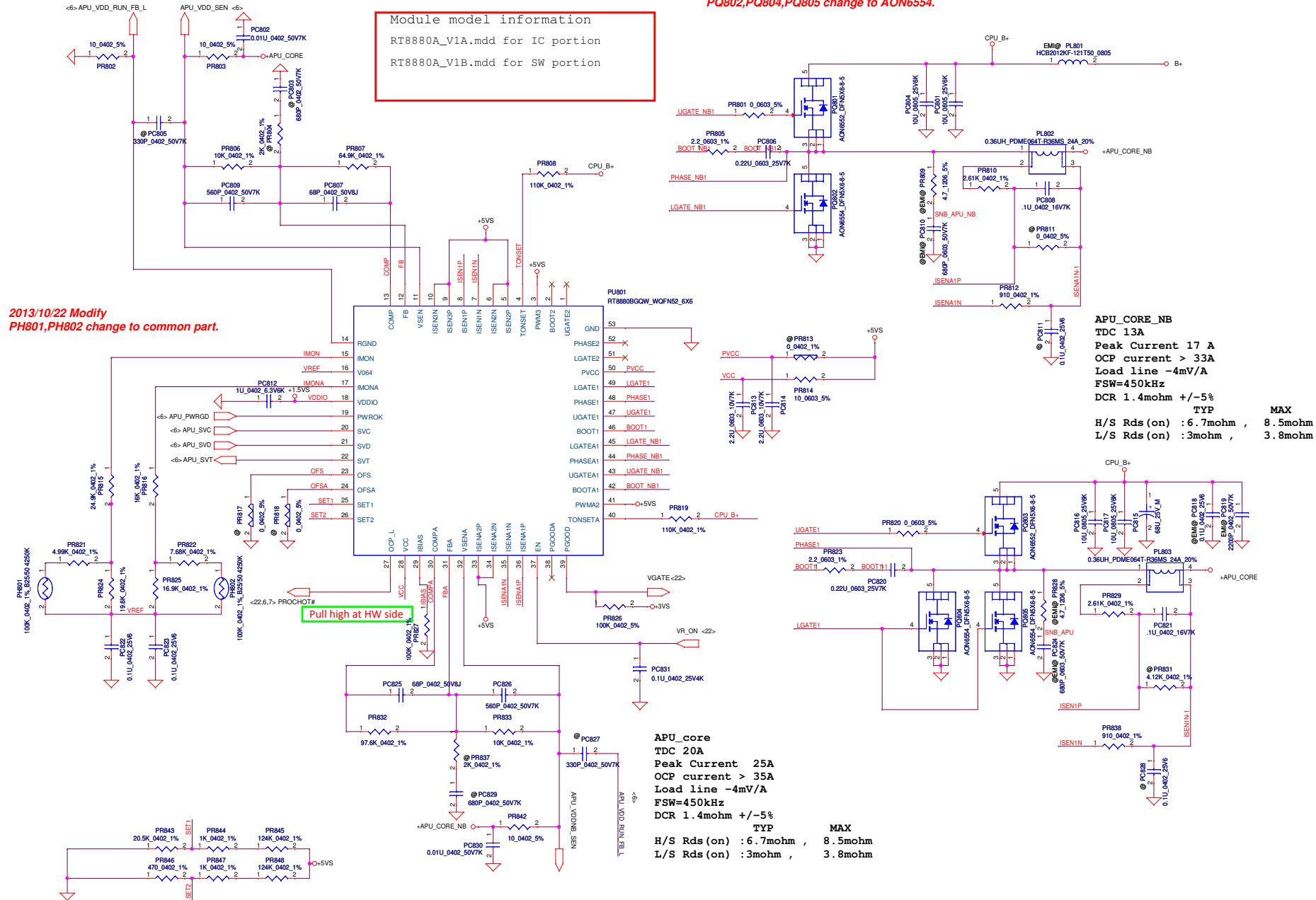
EN pin don't floating  
If have pull down resistor at HW side, pls delete PR2

for this project  
Ipeak=8A  
Add 22u\*2 capacitor,  
Chock change to 0.68u.  
meet DC-DC design check form.  
2013/10/02 Modify.



|                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                    |                 |                                 |            |                   |                 |  |  |  |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------|-----------------|---------------------------------|------------|-------------------|-----------------|--|--|--|---------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Compal Secret Data |                 | <i>Compal Electronics, Inc.</i> |            |                   |                 |  |  |  |         |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | 2014/03/27         | Deciphered Date |                                 | 2016/03/27 | Title             |                 |  |  |  |         |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                    |                 |                                 |            | <b>+0.95VALWP</b> |                 |  |  |  |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                    |                 |                                 |            | Size              | Document Number |  |  |  | Rev 1.0 |
| Date: Thursday, March 27, 2014                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                    |                 |                                 |            | Sheet 38 of 45    |                 |  |  |  |         |

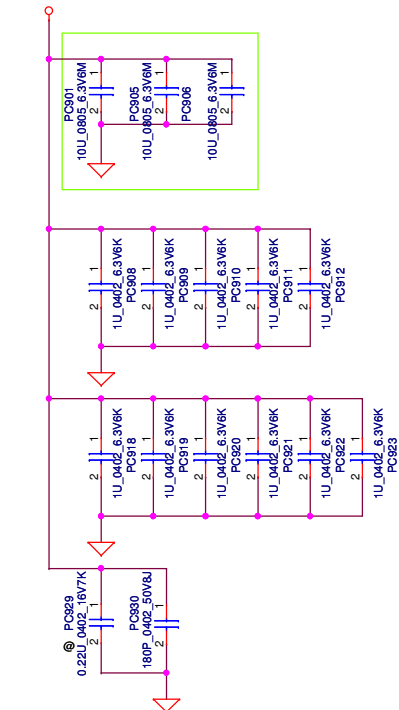
2013/10/16 Modify  
 PQ801,PQ803 change to AON6552.  
 PQ802,PQ804,PQ805 change to AON6554.



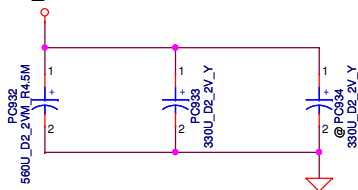
Delete PR834.PR835.PR836.PR839.PR840.PR841,  
 follow vender FAE suggest.  
 2013/11/29 modify.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |                 |                          |                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------|--------------------------|----------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data       |                 | Compal Electronics, Inc. |                      |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2014/03/27               | Deciphered Date | 2016/03/27               | Title                |
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| Size                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Document Number          | Rev             | 1.0                      |                      |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Thursday, March 27, 2014 | Sheet           | 39                       | of 45                |

# +APU\_CORE



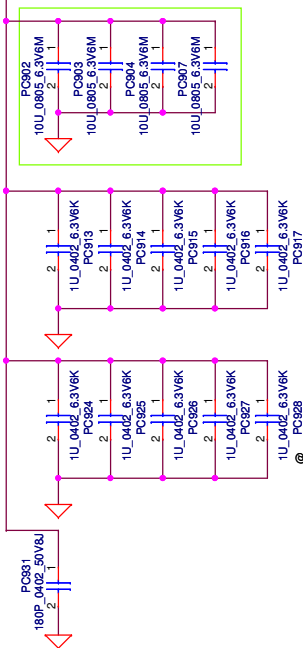
# +APU\_CORE



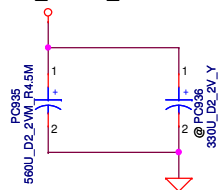
# +APU\_CORE (36.4)

# +APU\_CORE\_NB (36.5)

# +APU\_CORE\_NB



# +APU\_CORE\_NB



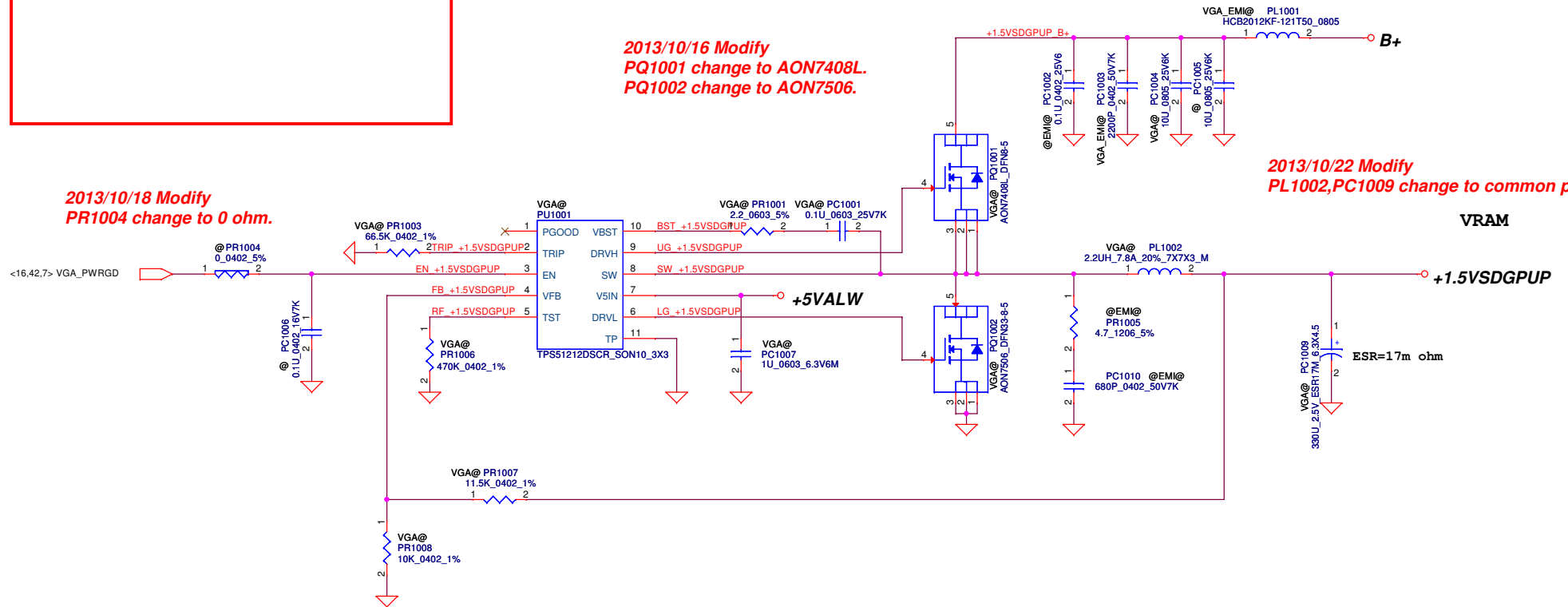
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            |                          |                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|------------|--------------------------|-----------------------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | Compal Secret Data |            | Compal Electronics, Inc. |                             |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2014/03/27 | Deciphered Date    | 2016/03/27 | Title                    | APU CORE/APU_CORE capacitor |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Sheet                    | 40 of 45                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                    |            | Rev                      | 1.0                         |

```
Module model information
TPS51212_V1.mdd for Single layer
TPS51212_V2.mdd for Dual layer
```

```
Module model information
TPS51212_V1.mdd for Single layer
TPS51212_V2.mdd for Dual layer
```

**2013/10/16 Modify**  
**PQ1001 change to AON7408L.**  
**PQ1002 change to AON7506.**

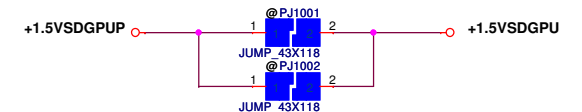
**2013/10/22 Modify**  
**PL1002,PC1009 change to common part.**



Choke: 7x7x3  
Rdc=15.5mohm +/-15%

| Vout   | PR1007 | PR1008 | PR1003 |
|--------|--------|--------|--------|
| +1.2V  | 7.15K  | 10k    | 105K   |
| +1.05V | 4.99k  | 10k    | 93.1k  |
| +1.5V  | 11.5K  | 10k    | 105K   |

Switching Frequency: 290kHz  
Ipeak=4.7A  
OCP: 6.884A~5.751A  
OVP: 120%~130%  
VFB=0.704V, Vout=1.514V  
PR1003=66.5K Ohm

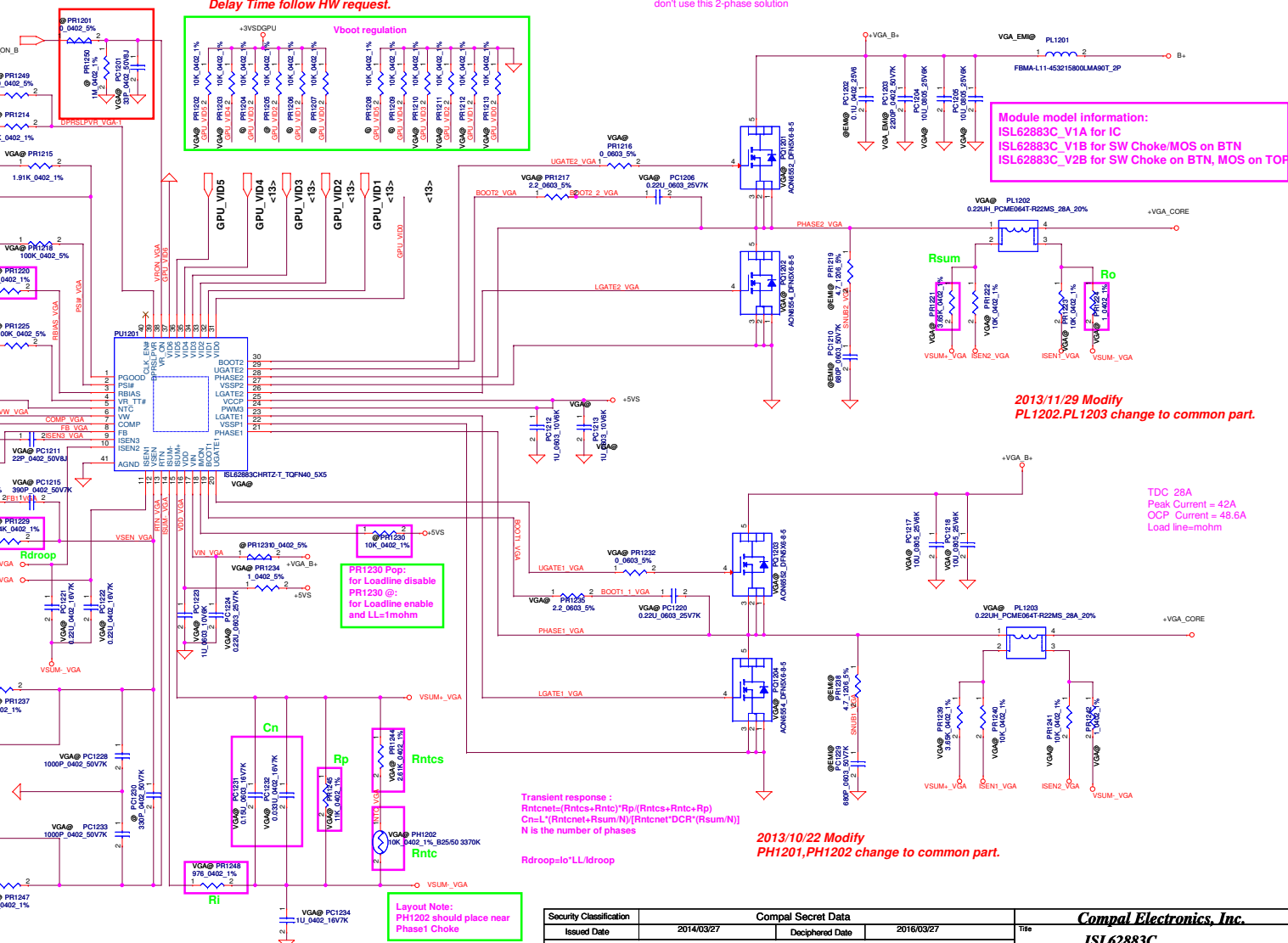


|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |  |                                 |                   |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|--|---------------------------------|-------------------|---------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data |                 |  | <b>Compal Electronics, Inc.</b> |                   |         |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2014/03/27         | Deciphered Date |  | Title                           | <b>1.5VSDGPUP</b> |         |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |  |                                 |                   |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |  | Date: Thursday, March 27, 2014  | Sheet 41 of 45    |         |

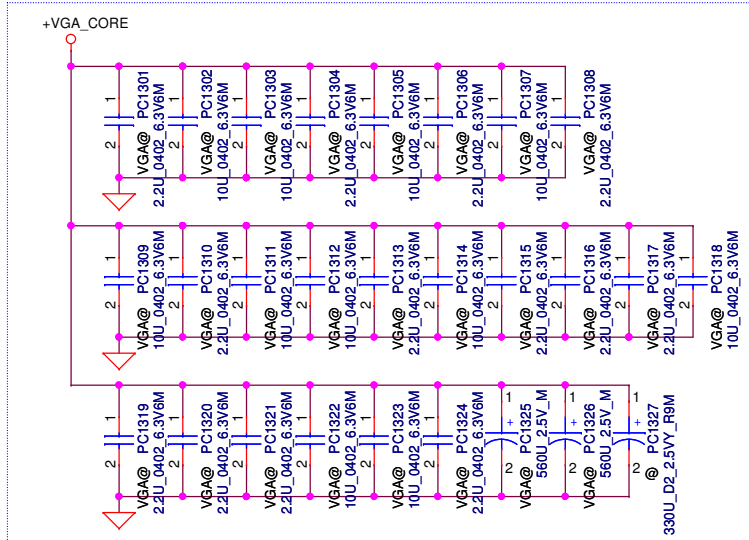
2013/10/25 Modify  
PR1229 change to 1.24K ohm.  
PR1248 change to 976 ohm.

[illegible]

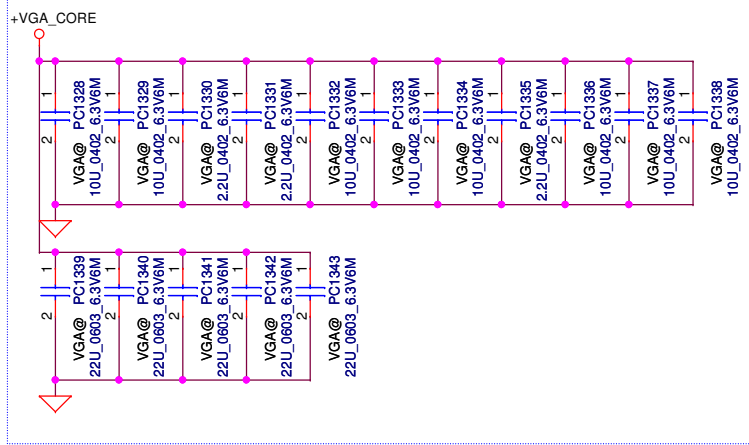
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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------|--|------------|--------------------------|--------------------------|----|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | Compal Secret Data |  | Title      |                          | Compal Electronics, Inc. |    |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | Deciphered Date    |  | 2016/03/27 |                          | ISL62883C                |    |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                    |  | Date       | Thursday, March 27, 2014 | Sheet                    | 42 |







AMD MARS  
GPU\_CORE  
560uF\*2+330uF\*1  
10uF\*8+2.2uF\*16



AMD MARS  
meet ripple  
22uF\*5+10uF\*11

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |                 |            |                              |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------|------------|------------------------------|------------|
| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       | Compal Secret Data       |                 |            | Compal Electronics, Inc.     |            |
| Issued Date                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2014/03/27               | Deciphered Date | 2016/03/27 | Title<br><b>VGA_CORE CAP</b> |            |
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| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Thursday, March 27, 2014 |                 |            | Sheet<br>43                  | of 45      |

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

Page 1 of 2  
for PWR

| Item | Fixed Issue    | Reason for change                      | Rev. | PG# | Modify List                                                                                                          | Date       | Phase |
|------|----------------|----------------------------------------|------|-----|----------------------------------------------------------------------------------------------------------------------|------------|-------|
| 1    | Design Change. | Design Change of Diode Application.    | 0.2  | 32  | Change PD101 to SCSS4004010(S SCH DIO BAS40-04 SOT23).                                                               | 2013/11/29 | DVT   |
| 2    | Design Change. | Design Change of IC Application.       | 0.2  | 35  | Add non-pop component PC427,PC428.                                                                                   | 2013/11/29 | DVT   |
| 3    | Design Change. | reduce part count.                     | 0.2  | 37  | Delete PR605 PD resister.                                                                                            | 2013/11/29 | DVT   |
| 4    | Design Change. | reduce part count.                     | 0.2  | 39  | Delete @PR834.@PR835.@PR836.@PR839.@PR840.@PR841.                                                                    | 2013/11/29 | DVT   |
| 5    | Design Change. | Design Change of VGA Type Application. | 0.2  | 42  | PR1205 change to non-pop.<br>PR1211 change to pop.                                                                   | 2013/11/29 | DVT   |
| 6    | Design Change. | Design Change of common part.          | 0.2  | 34  | Change PL301 to SH00000YG00<br>(S COIL 1UH +-30% 2.8A 4X4X2 FERRITE).                                                | 2013/11/29 | DVT   |
| 7    | Design Change. | Design Change of common part.          | 0.2  | 42  | Change PL1202.PL1203 to SH000011H00<br>(S COIL .22UH +-20% 24A 7X7X4 MOLDING).                                       | 2013/11/29 | DVT   |
| 8    | Design Change. | Design Change of Delay Time.           | 0.2  | 42  | Change PR1201 to SD028000080(S RES 1/16W 0 +-5% 0402).<br>Change PC1201 to non-pop.                                  | 2013/11/29 | DVT   |
| 9    | Design Change. | Design Change of EC Type Application.  | 0.2  | 35  | Add PD401 SCS00000Z00(S SCH DIO RB751V-40 SOD-323).                                                                  | 2013/11/29 | DVT   |
| 10   | Design Change. | Design Change of Circuit Application.  | 0.2  | 42  | Add PR1250 SD034100480(S RES 1/16W 1M +-1% 0402).                                                                    | 2013/11/29 | DVT   |
| 11   | Design Change. | Design Change of Delay Time.           | 0.2  | 42  | Change PR1201 to SD028000080(S RES 1/16W 0 +-5% 0402).<br>Change PC1201 to SE071330J80(S CER CAP 33P 50V J NPO 0402) | 2013/12/16 | DVT   |
| 12   | Design Change. | Design Change of Circuit Application.  | 0.2  | 33  | Delete PR223.(remove HW hysteresis)                                                                                  | 2013/12/16 | DVT   |
| 13   | Design Change. | Design Change of Circuit Application.  | 0.2  | 42  | Change PR1250 to non-pop.                                                                                            | 2013/12/16 | DVT   |
| 14   | Design Change. | Design Change of Circuit Application.  | 0.2  | 34  | Change PQ303,PQ304 to SB000010A00(S TR AON7506 1N DFN).                                                              | 2013/12/19 | DVT   |
| 15   | Design Change. | Design Change of Circuit Application.  | 0.2  | 33  | Add PL202 SM01000C000<br>(S SUPPRE_ TAI-TECH HCB2012KF-121T50 0805)                                                  | 2013/12/19 | DVT   |

| Security Classification                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | Compal Secret Data |                 | Compal Electronics, Inc. |                 |                          |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                    |                 |                          | Sheet           | 44 of 45                 |

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

| Item | Fixed Issue    | Reason for change                     | Rev. | PG#              | Modify List                                                                       | Date       | Phase |
|------|----------------|---------------------------------------|------|------------------|-----------------------------------------------------------------------------------|------------|-------|
| 16   | Design Change. | Design Change of Circuit Application. | 0.2  | 33               | Change PR211 to SD028000080(S RES 1/16W 0 +-5% 0402).                             | 2013/12/25 | DVT   |
| 17   | Design Change. | Design Change of Circuit Application. | 0.2  | 35               | Change PC426 to pop.                                                              | 2013/12/25 | DVT   |
| 18   | Design Change. | Design Change of Circuit Application. | 0.2  | 33               | Change PR216 to SD034162280(S RES 1/16W 16.2K +1% 0402).                          | 2013/12/25 | DVT   |
| 19   | Design Change. | Design Change of Circuit Application. | 0.2  | 33               | Change PR216 to SD034169280(S RES 1/16W 16.9K +-1% 0402).                         | 2014/01/02 | DVT   |
| 20   | Design Change. | Design Change of Circuit Application. | 0.2  | 33               | Change PR202 to SD034100280(S RES 1/16W 10K +-1% 0402).                           | 2014/01/02 | DVT   |
| 21   | Design Change. | Design Change of Circuit Application. | 0.3  | 37.38.<br>39.41. | Change PR813,PR601,PR706,PR702,PR1004<br>to SD028000080(S RES 1/16W 0 +-5% 0402). | 2014/02/07 | PVT   |
| 22   | Design Change. | Design Change of Circuit Application. | 0.3  | 35               | Remove PD401.<br>Add @PR410 SD028000080(S RES 1/16W 0 +-5% 0402).                 | 2014/02/07 | PVT   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            |                          |                          |                |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                 |            | Date:                    | Thursday, March 27, 2014 | Sheet 45 of 45 |

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