

AMD FT3 Based Gizmo 2 Development Board Schematic

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NOTES:

- 1) This Mini-ITX form factor reference schematic is for AMD FT3 Processor based systems. It can be used as a starting point for any design that uses this processor.
- 2) Unless otherwise specified, resistors have 5% tolerance.
- 3) Unless otherwise specified, capacitors have 20% tolerance.

IMPORTANT NOTICE:

- 1) This document may not reflect the most recent changes in board development and debug. Any developer intending to use this documentation as a reference should contact Gizmosphere via www.gizmosphere.org for updates, design recommendations and PCB layout guidelines. Gizmosphere also recommends a design review before considering production.
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DESIGN CONSIDERATIONS

DESIGN NOTE:
Example text for informational design notes.

DESIGN NOTE:
Example text for cautionary design notes.

DESIGN NOTE:
Example text for critical design notes.

LAYOUT NOTE:
Example text for critical layout guidelines.

| | | | |
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REVISION HISTORY:

| REV | DATE | NOTES |
|-----|--------------|--|
| A | Mar 06, 2013 | Initial Release |
| B | May 14, 2013 | DVT Release |
| C | Aug 07, 2013 | PVT Release |
| D | Nov 26, 2014 | <p>Page 8: Change APU_HSYNC to be pulled up to +3.3V.</p> <p>Page 9: a. Change R56 not to be populated. b. Change GBE_SMBALERT connected from GPIO68 to USB_OC2_L/TCK/GEVENT14_L for fixing two power domain of leakage problem.</p> <p>Page 17: Change R330 not to be populated for fixing two power domain of leakage problem.</p> <p>Page 22: a. Change C352 not to be populated. b. Add R364, and change C318 to 4700pF.</p> <p>Page 23: a. Add an AND gate U133 with VDDIO_SUS_PWRGD and SLP_S3# inputs and the output to enable +5V, +3.3V, +1.8V and +0.95V. b. Remove R345, R335, R344 and R334. c. Add snubber circuit C353/R358 and C355/R363. d. Add 0 OHM resistor R359 and R362 to boot pin.</p> <p>Page 24: a. Add 33 OHM series resistors on APU_SVD, APU_SVC and APU_SVT. b. Change R278 connection from APU_VDDIO_SUS to +1.8V for fixing two power domain of leakage problem.</p> <p>Page 25: a. Remove R343 and R339. b. Add snubber circuit C354 and R361. d. Add 0 OHM resistor R360 to boot pin.</p> |

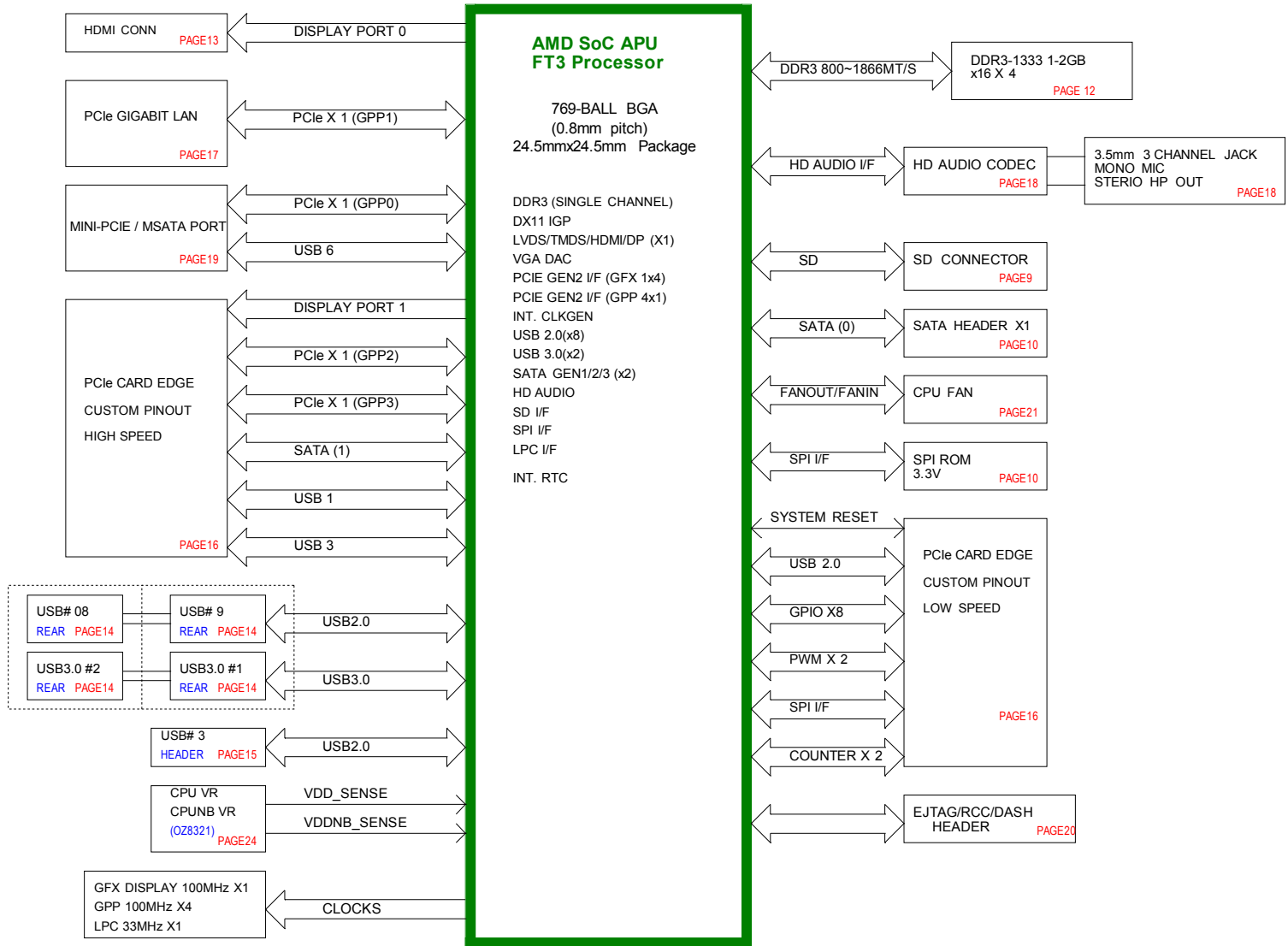
REFERENCE COLLATERAL:

| PID | REV | TITLE |
|-------|------|--|
| 51492 | 0.90 | AMD Electrical Data Sheet (EDS) for AMD Family 16h Models 00h-0Fh Processors (NDA) |
| 51489 | 1.06 | AMD FT3 Processor Functional Datasheet |
| 51387 | 1.03 | AMD FT3 Processor Motherboard Design Guide |
| 51389 | 1.05 | AMD FT3 Processor Motherboard Schematic Checklist |
| 51388 | 1.02 | AMD FT3 Processor Motherboard Layout Checklist |
| 51814 | 1.01 | AMD Thermal Design Guide for FT3 Processors |
| 40821 | 1.62 | AMD SB Temperature Sensor Interface (SB-TSI) Specification |
| 48022 | 1.04 | AMD Serial VID Interface 2.0 (SVI2) Specification |
| 50818 | 1.00 | AMD FT3 Infrastructure Roadmap |

The documents below were referenced in the creation of these schematics and were the published revisions at that time. They are listed here for reference only.

For the latest information, always visit www.gizmosphere.org.

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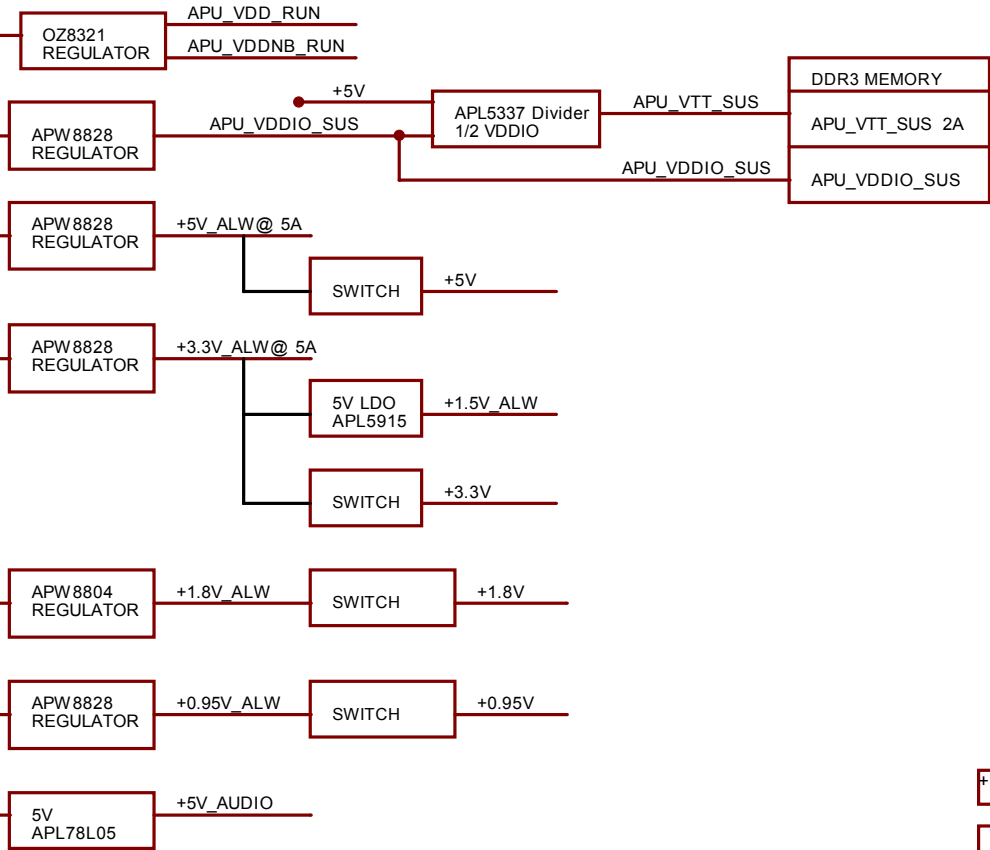
- POWER SW
 - RESET SW
 - POWER LED
 - HDD LED
 PAGE21

ON-BOARD
 POWER
 SUPPLIES
 PAGE22-25

Block Diagram

| | | | |
|--|------------------------------------|----------------|--------------|
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POWER SUPPLY
12V ~ 24V
48W



FT3 SoC APU

| | |
|---------------|------------------------------|
| APU_VDD_RUN | VDDCR_CPU 0.3-1.400V 15A |
| APU_VDDNB_RUN | VDDCR_NB 0.7-1.325V @ 13A |
| APU_VDDIO_SUS | VDDIO_MEM_S @ 3A |
| +0.95V | VDD_0.95 @ 5A |
| +0.95V | VDD_095_GFX @ 0.6A |
| +0.95V_ALW | VDD_095_USB3_DUAL @ 1.0A |
| +0.95V_ALW | VDD_095_ALW @ 0.5A |
| +1.8V | VDD_18 @ 1.5A |
| +1.8V_ALW | VDD_18_ALW @ 0.5A |
| +3.3V | VDD_33 @ 0.2A |
| +3.35V_ALW | VDD_33_ALW @ 0.2A |
| +1.5V_ALW | VDDIO_AZ_ALW @ 100mA |
| +1.5V_ALW | VDDBT_RTC_G(1.5V) |

+1.5V_ALW
LR44 1.5V

| | | |
|--------------|------------|-------|
| MINI PCIE X1 | | |
| +3.35V_ALW | +3.35V_ALW | 0.33A |
| +3.3V | +3.3V | 1A |
| +1.5V_ALW | +1.5V | 0.5A |

| | | |
|------------|------------|-------|
| RCC(DASH) | | |
| +3.35V_ALW | +3.35V_ALW | 0.02A |

| | | |
|-----------|---------|----|
| USB2.0 X6 | | |
| +5V_ALW | +5V_ALW | 3A |

| | | |
|------------|------------|-------|
| SPI ROM | | |
| +3.35V_ALW | +3.35V_ALW | 0.03A |

| | | |
|--------------|--------------|-------|
| AZALIA CODEC | | |
| +3.3V | +3.3V CORE | 0.01A |
| +5V_AUDIO | 5V ANALOG | 0.01A |
| +1.5V_ALW | +1.5V DVDDIO | 0.01A |

| | | |
|---------|-------|------|
| SD CARD | | |
| +3.3V | +3.3V | 0.1A |

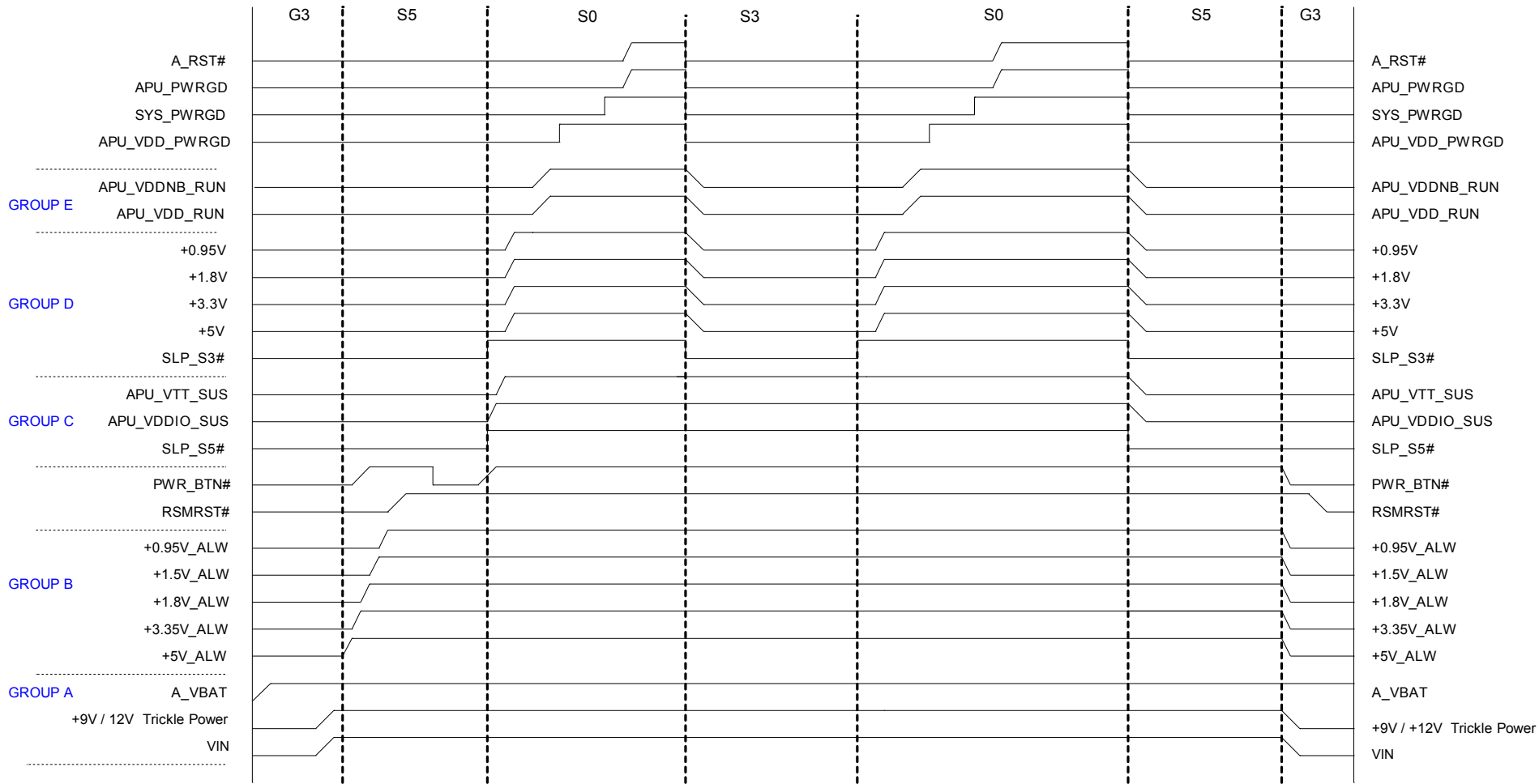
| | | |
|-----------|---------|------|
| USB3.0 X2 | | |
| +5V_ALW | +5V_ALW | 1.8A |

| | | |
|------|-----|-------|
| SATA | | |
| +5V | +5V | 0.75A |

| | | |
|------------|----------|--------|
| ETHERNET | | |
| +3.35V_ALW | +3.3Vaux | 0.107A |

| | | |
|-------------|------------|--------|
| TEMP SENSOR | | |
| +3.35V_ALW | +3.35V_ALW | 0.001A |

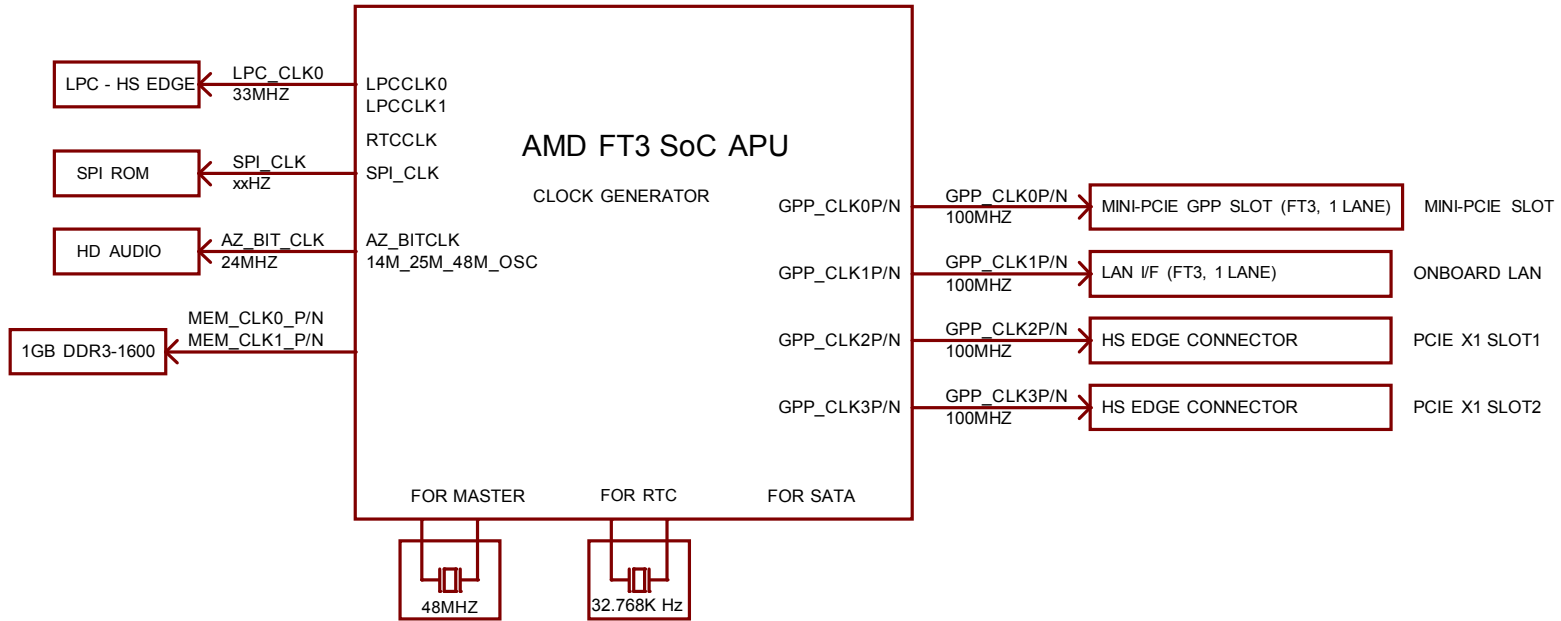
DESIGN NOTE:
See the Electrical Data Sheet (ESD) for AMD Family 16h Models 00h-0Fh Processors (PID: 51492) for details of power sequencing.



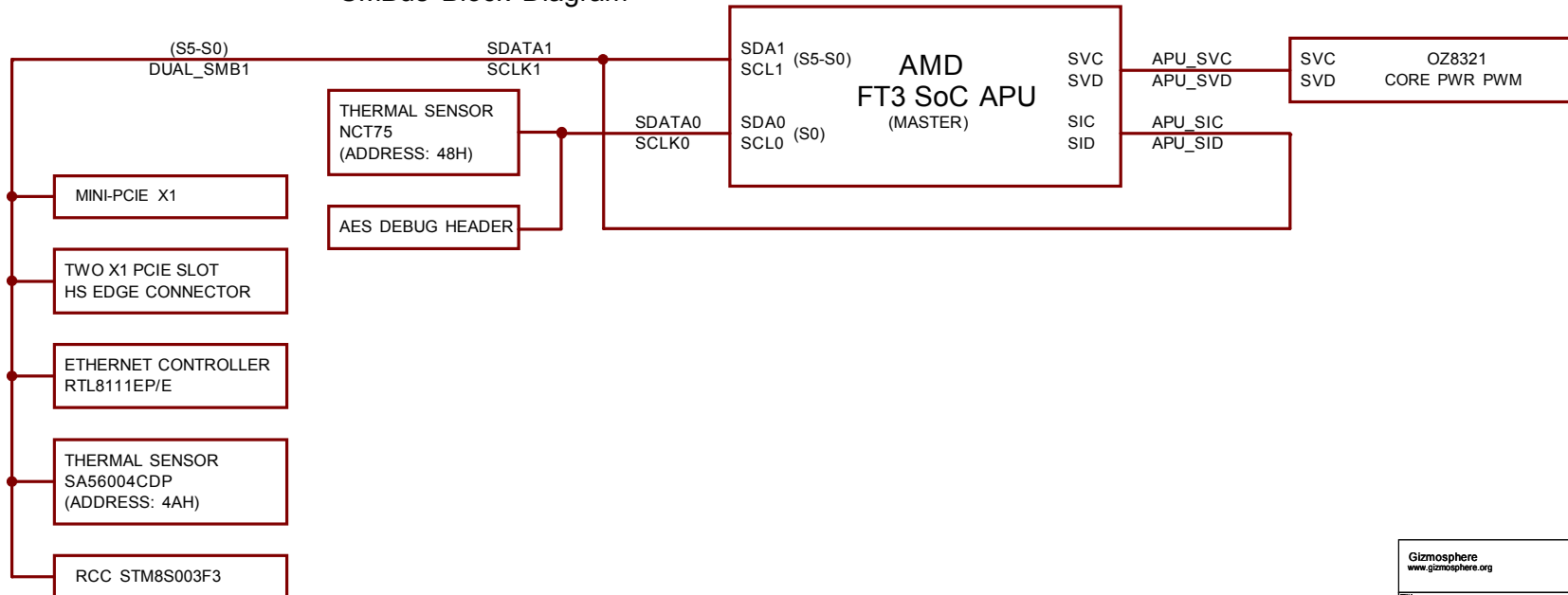
Power Sequence Diagram

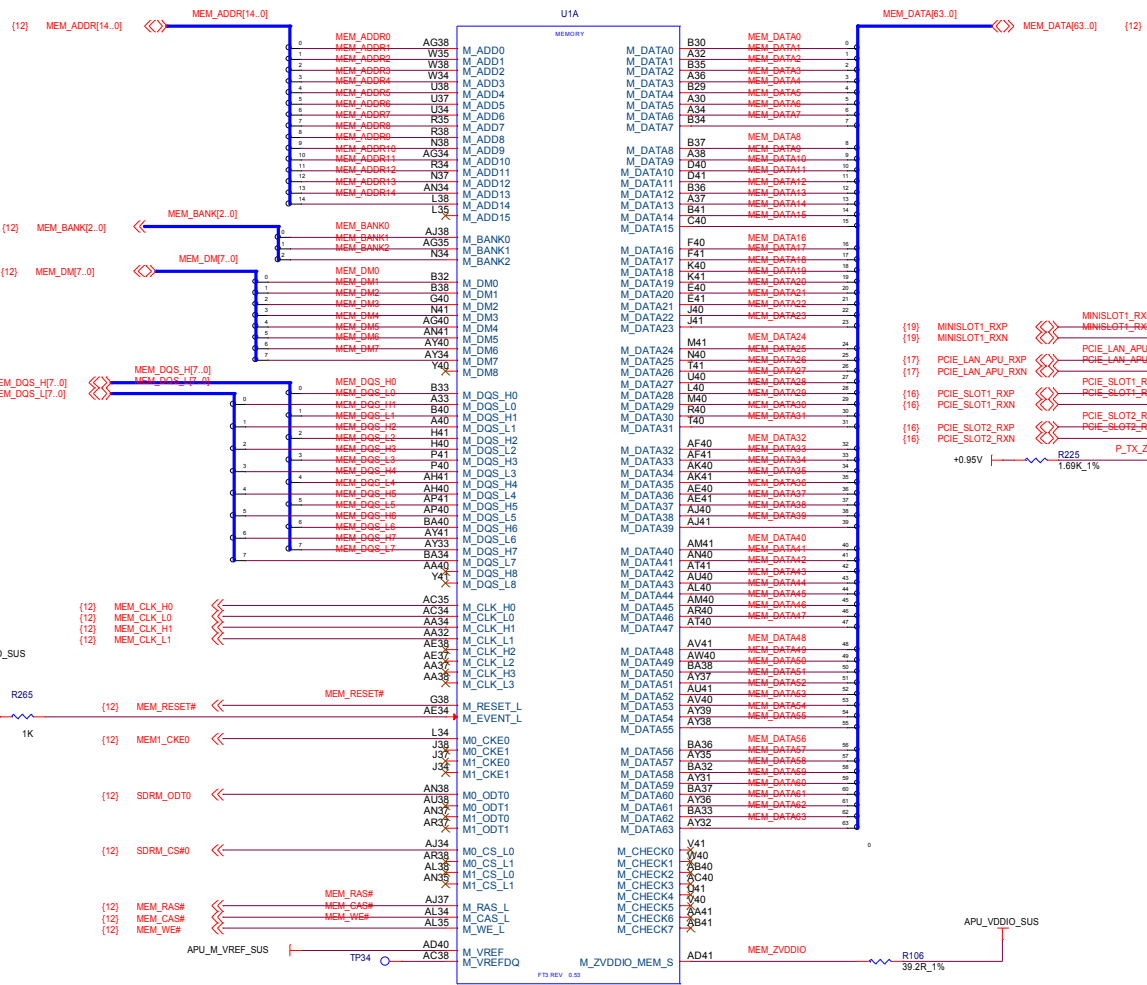
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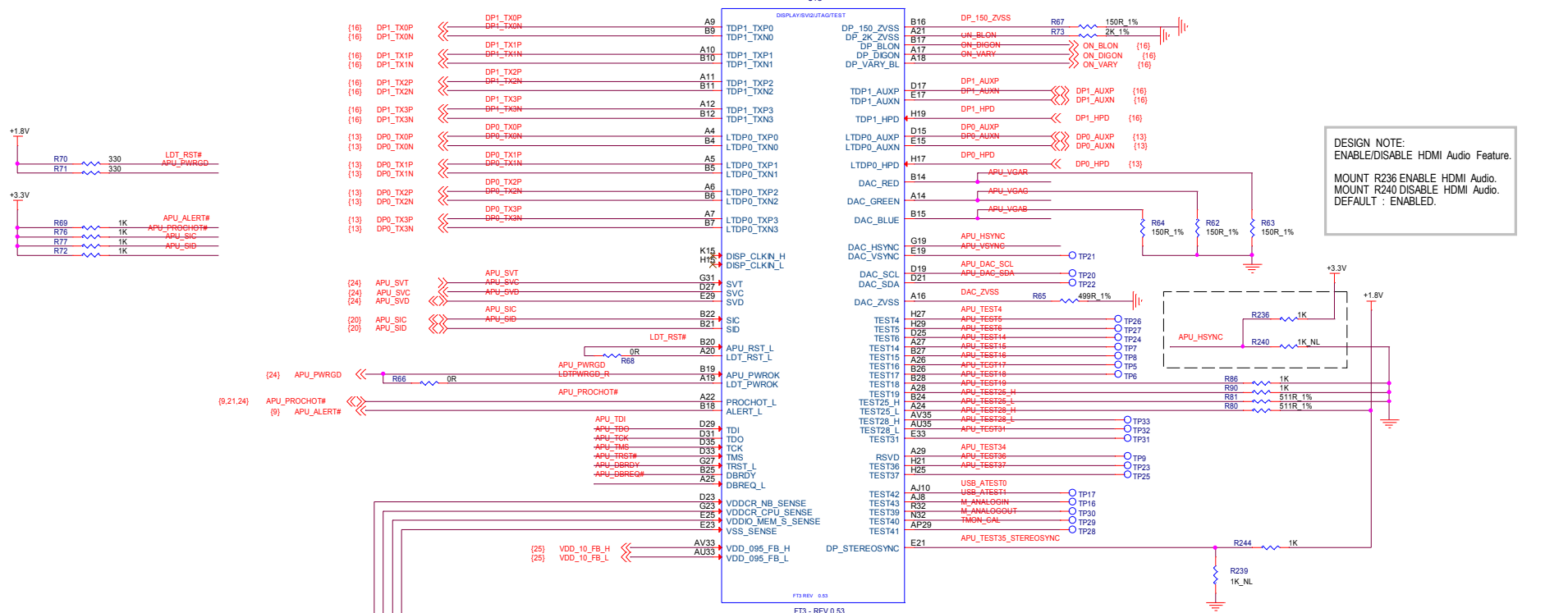
INTERNAL CLOCK



SMBus Block Diagram

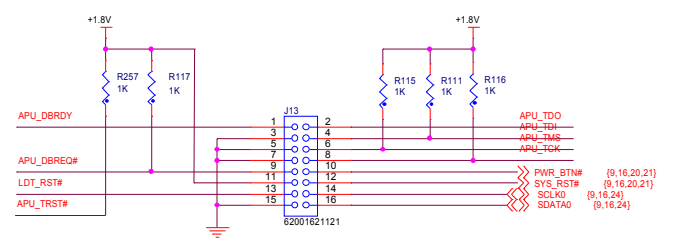


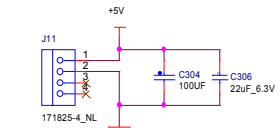
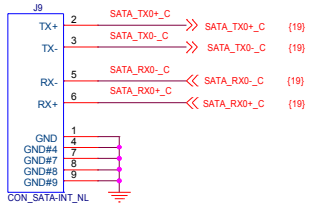
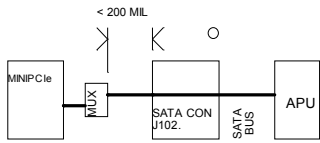




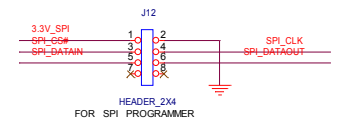
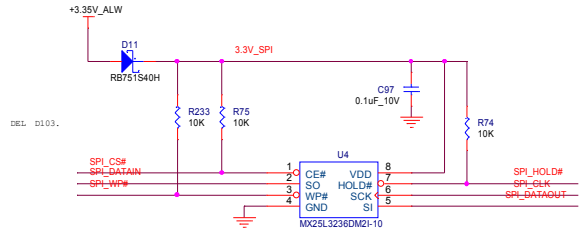
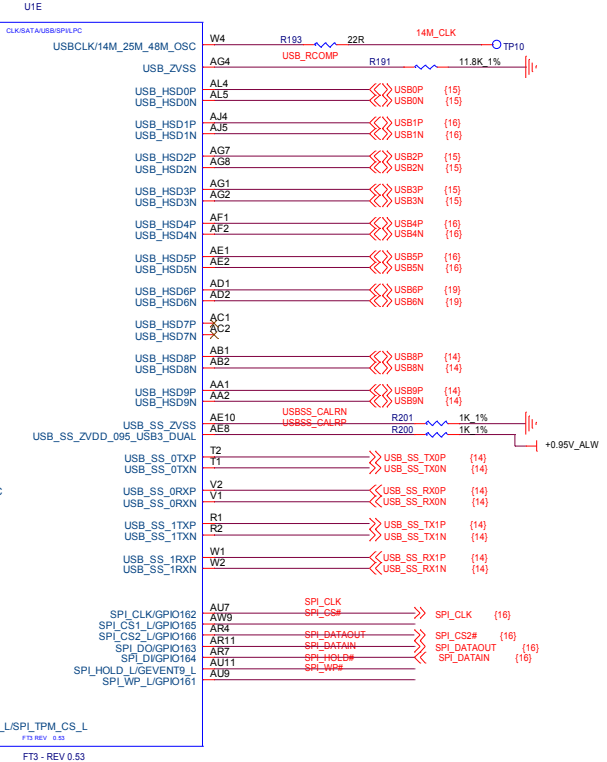
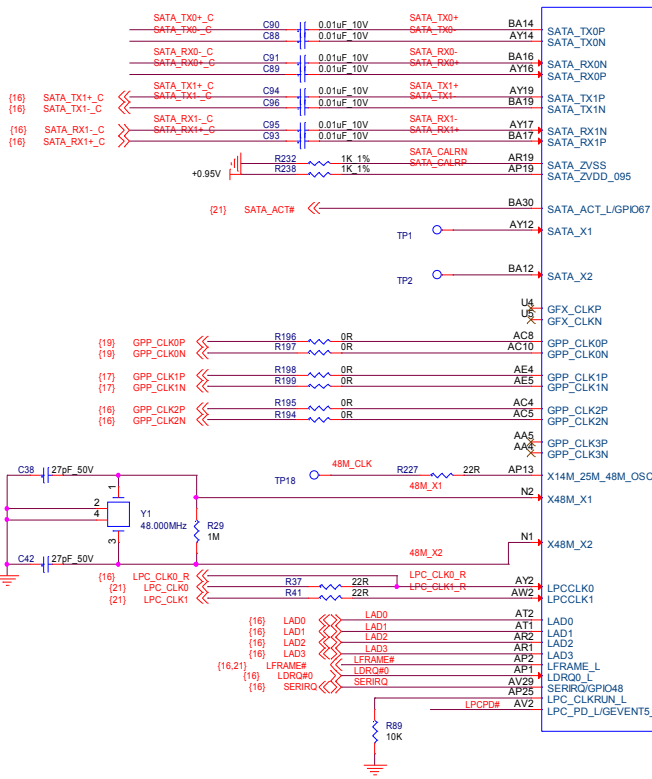
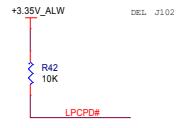
DESIGN NOTE:
 ENABLE/DISABLE HDMI Audio Feature.
 MOUNT R236 ENABLE HDMI Audio.
 MOUNT R240 DISABLE HDMI Audio.
 DEFAULT : ENABLED.

LAYOUT NOTE:
 Routed as differential pair.



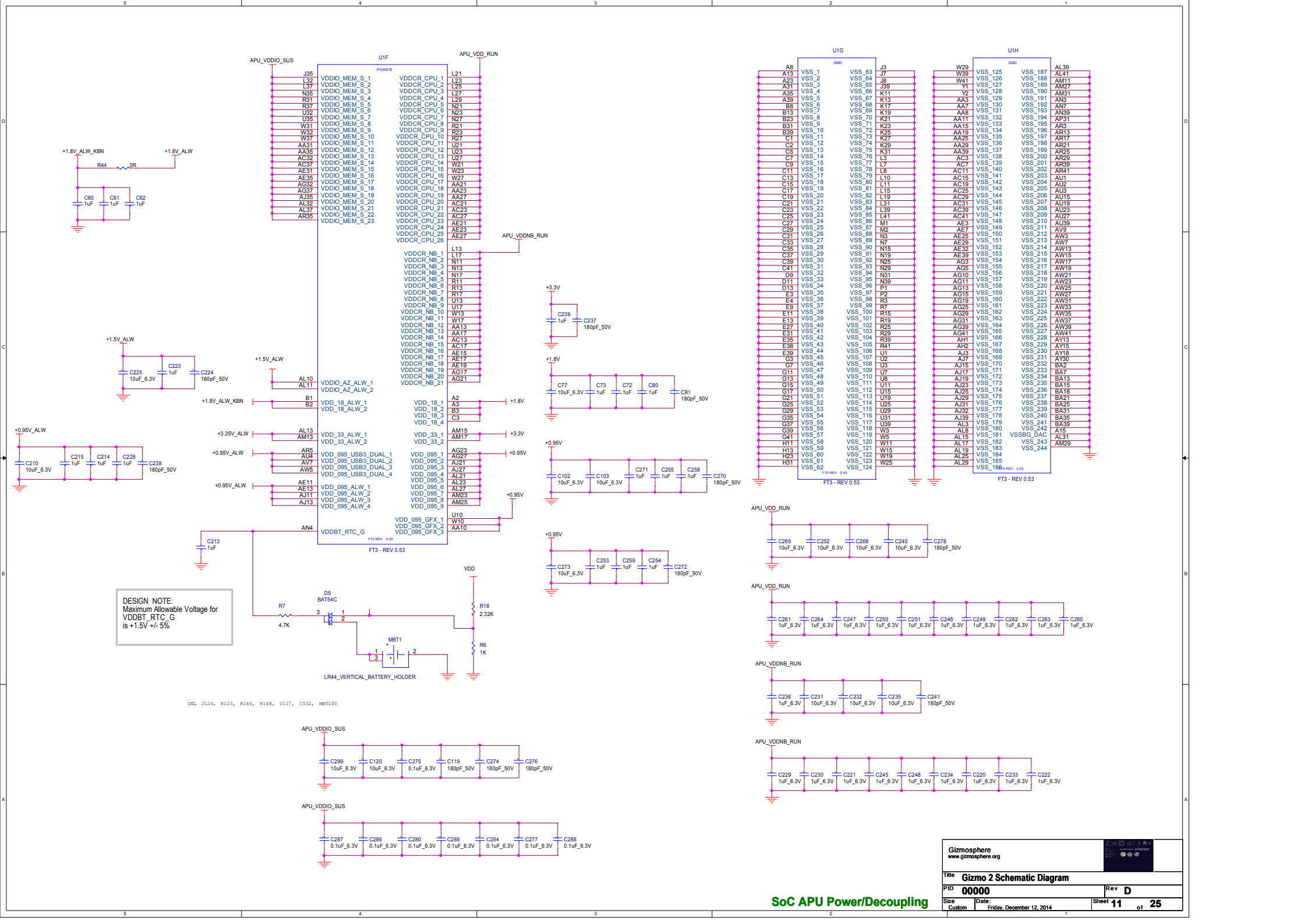


SATA POWER



SoC APU SATA/USB/SPI/CLK

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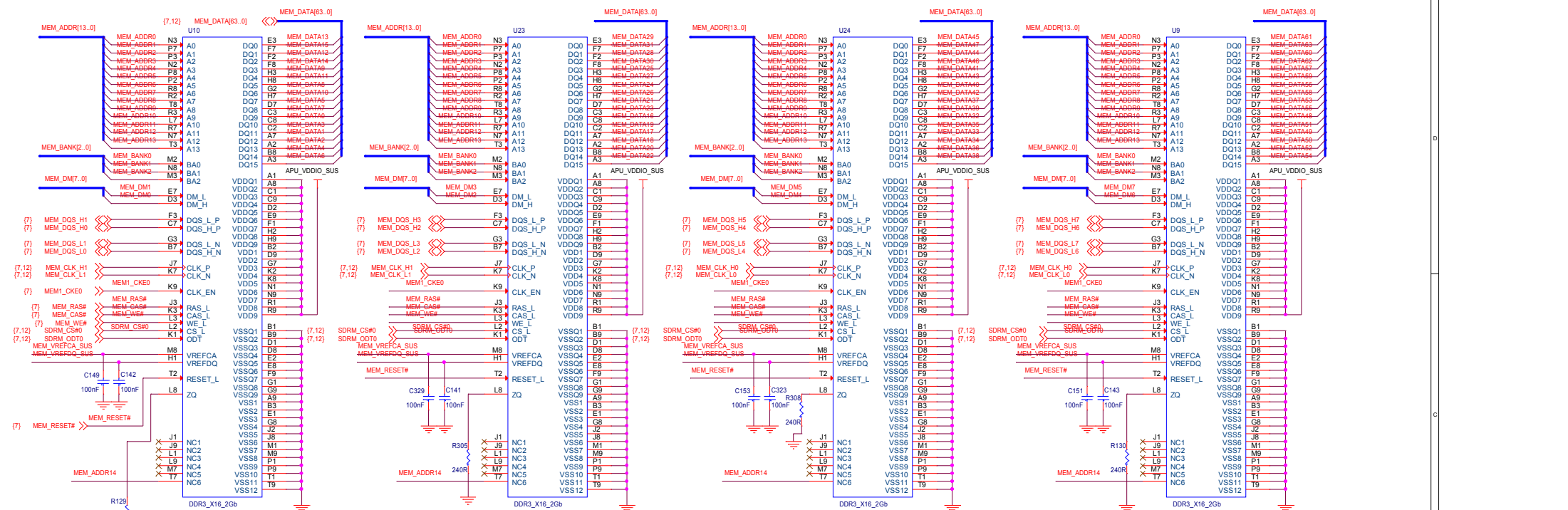


DESIGN NOTE:
Maximum Allowable Voltage for
VDDBT_RTC_G
is +1.5V +/- 5%

DEL J124, R123, R146, R148, U137, C532, MBF100

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SoC APU Power/Decoupling



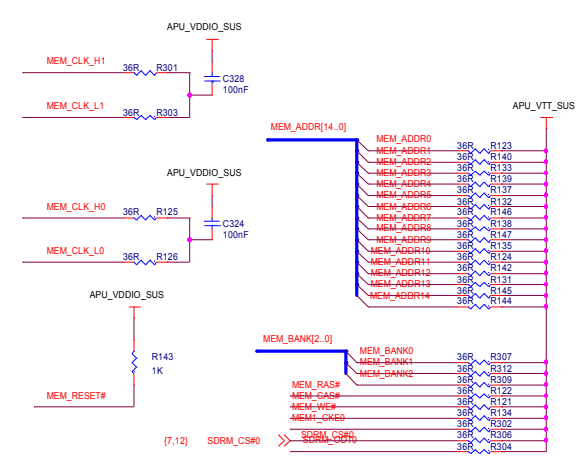
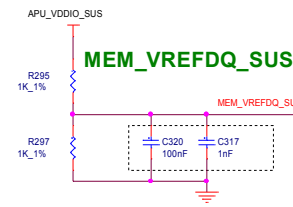
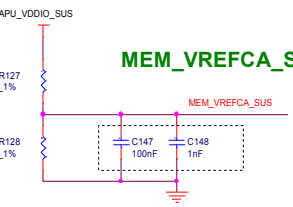
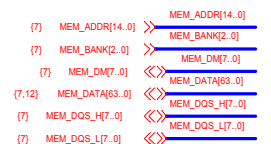
End device decoupling caps

Between device decoupling caps

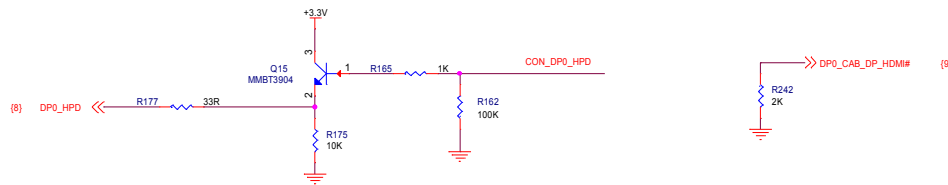
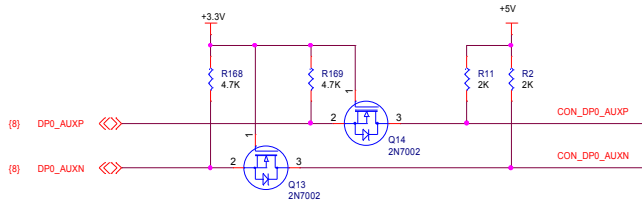
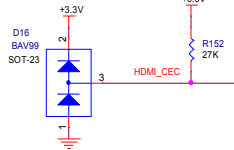
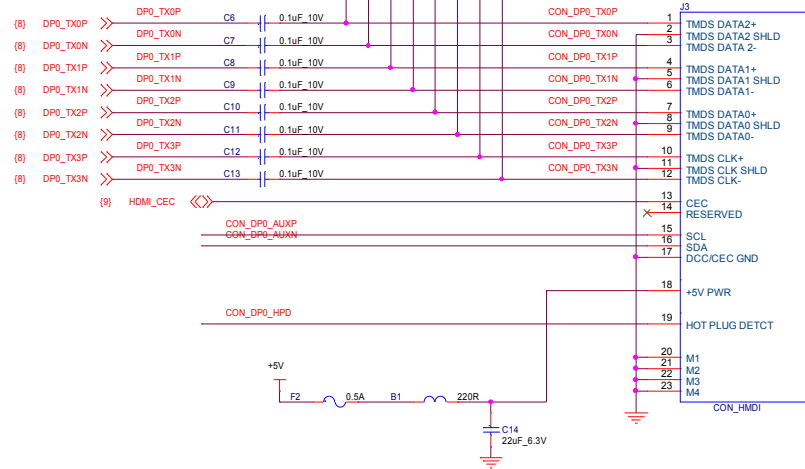
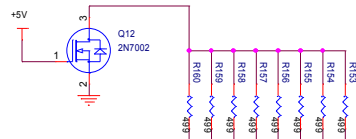
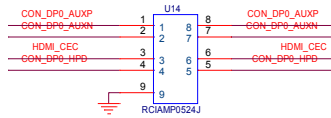
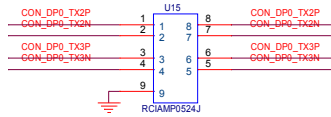
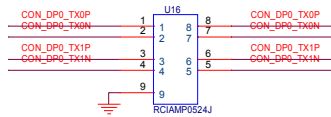
Between device decoupling caps

Between device decoupling caps

End device decoupling caps

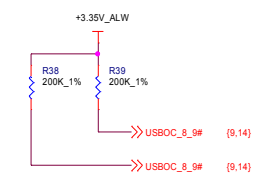
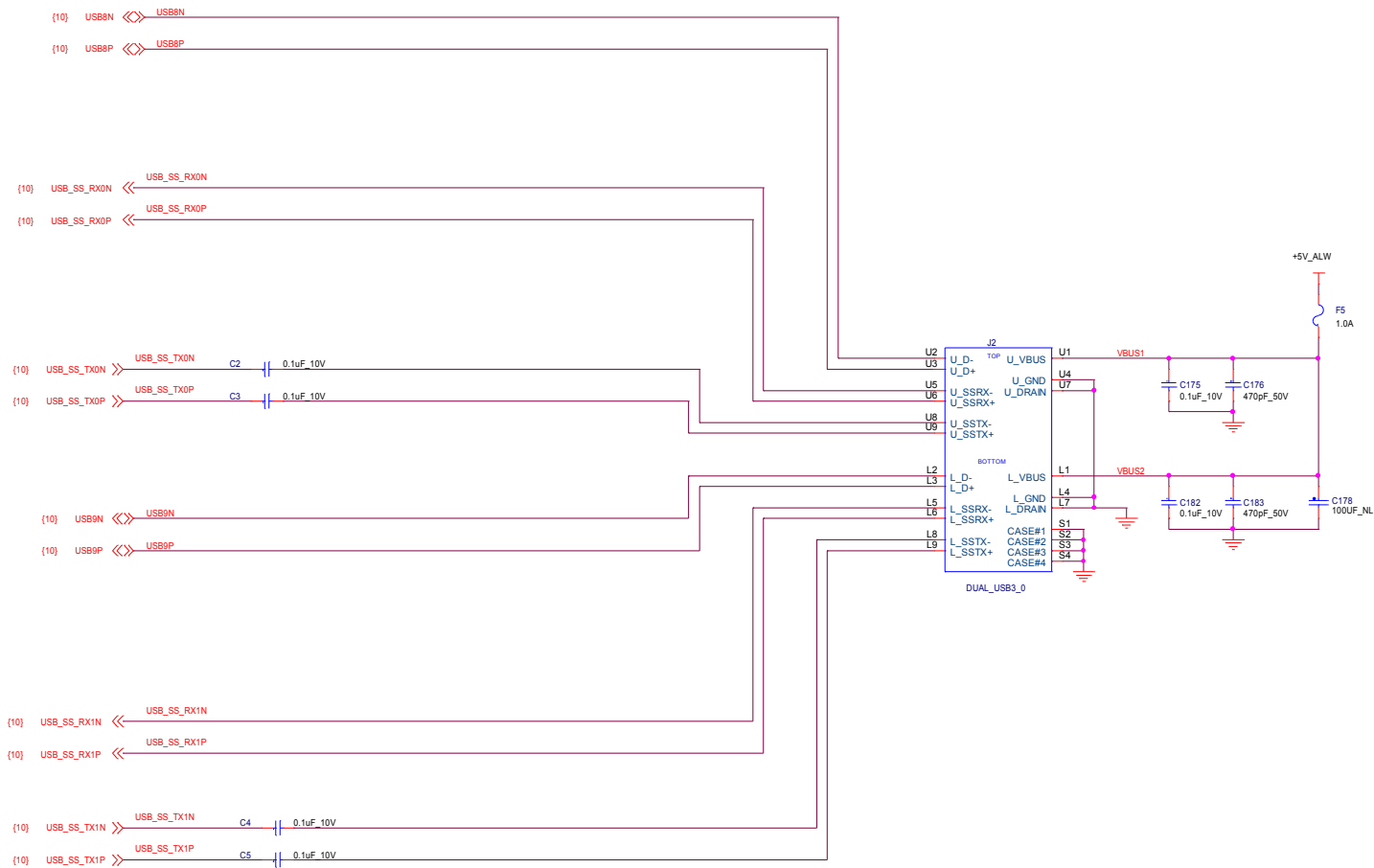


DDR3 SDRAM



HDMI Connector

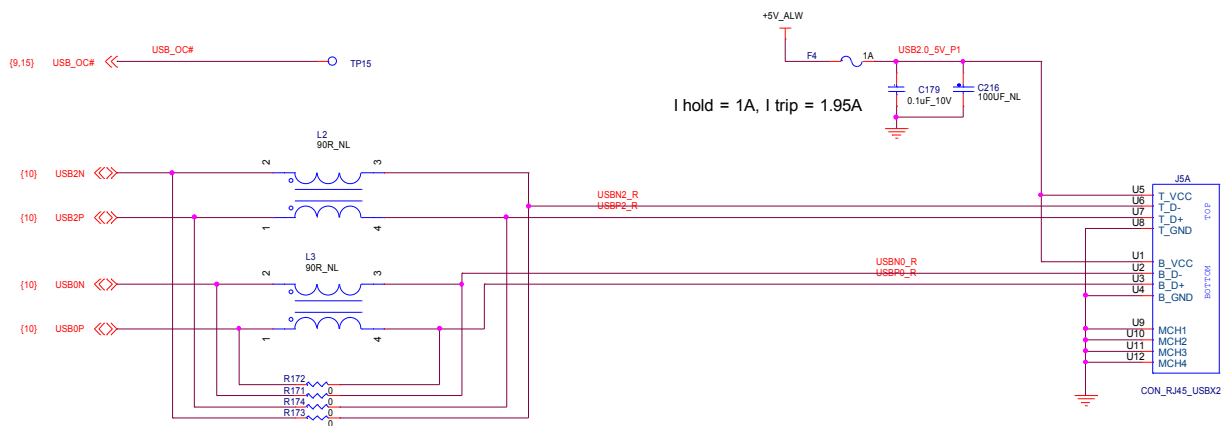
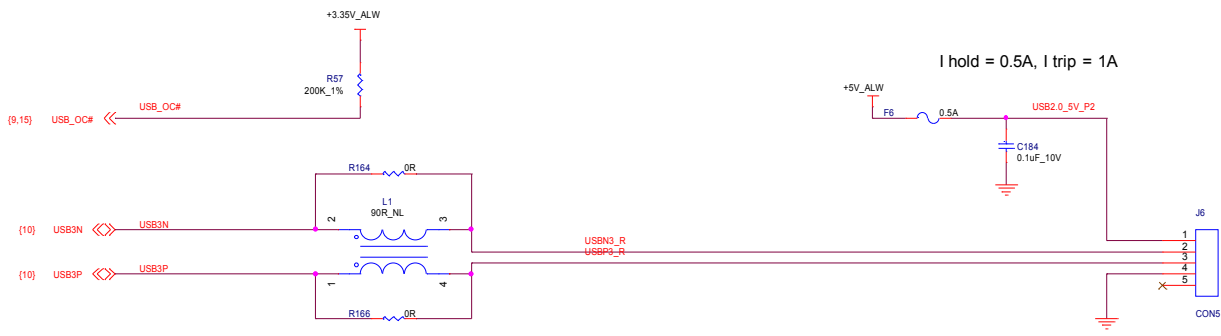
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I hold = 1A, I trip = 1.95A

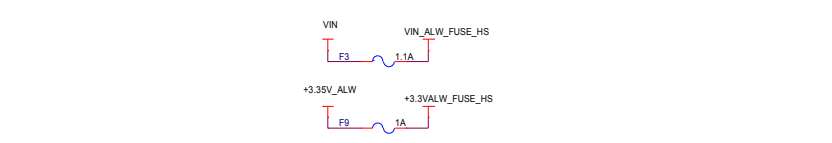
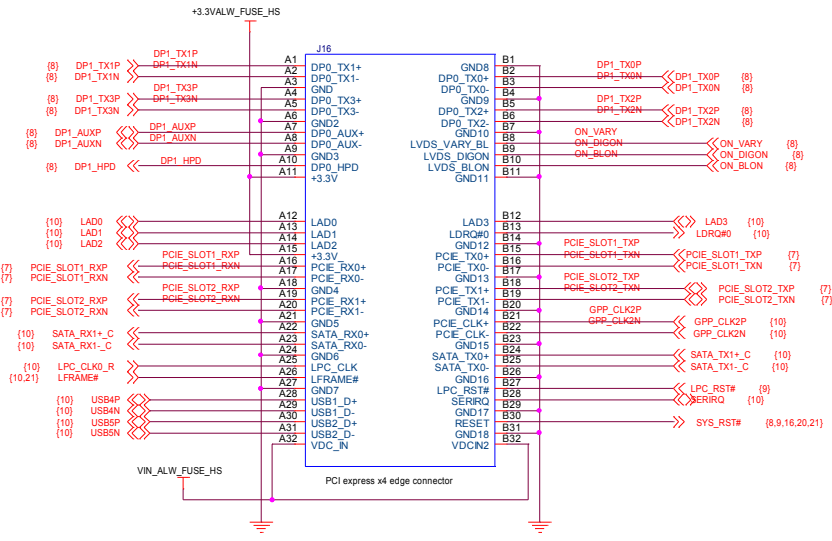
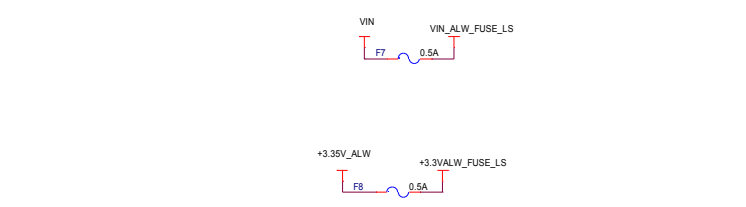
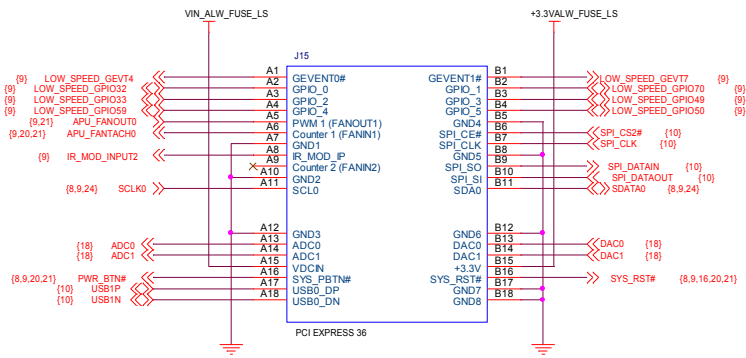
USB 3.0 Port x2

| | | | |
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USB 2.0 HEADER & USB-TYPE A (x4 Port)

| | | | |
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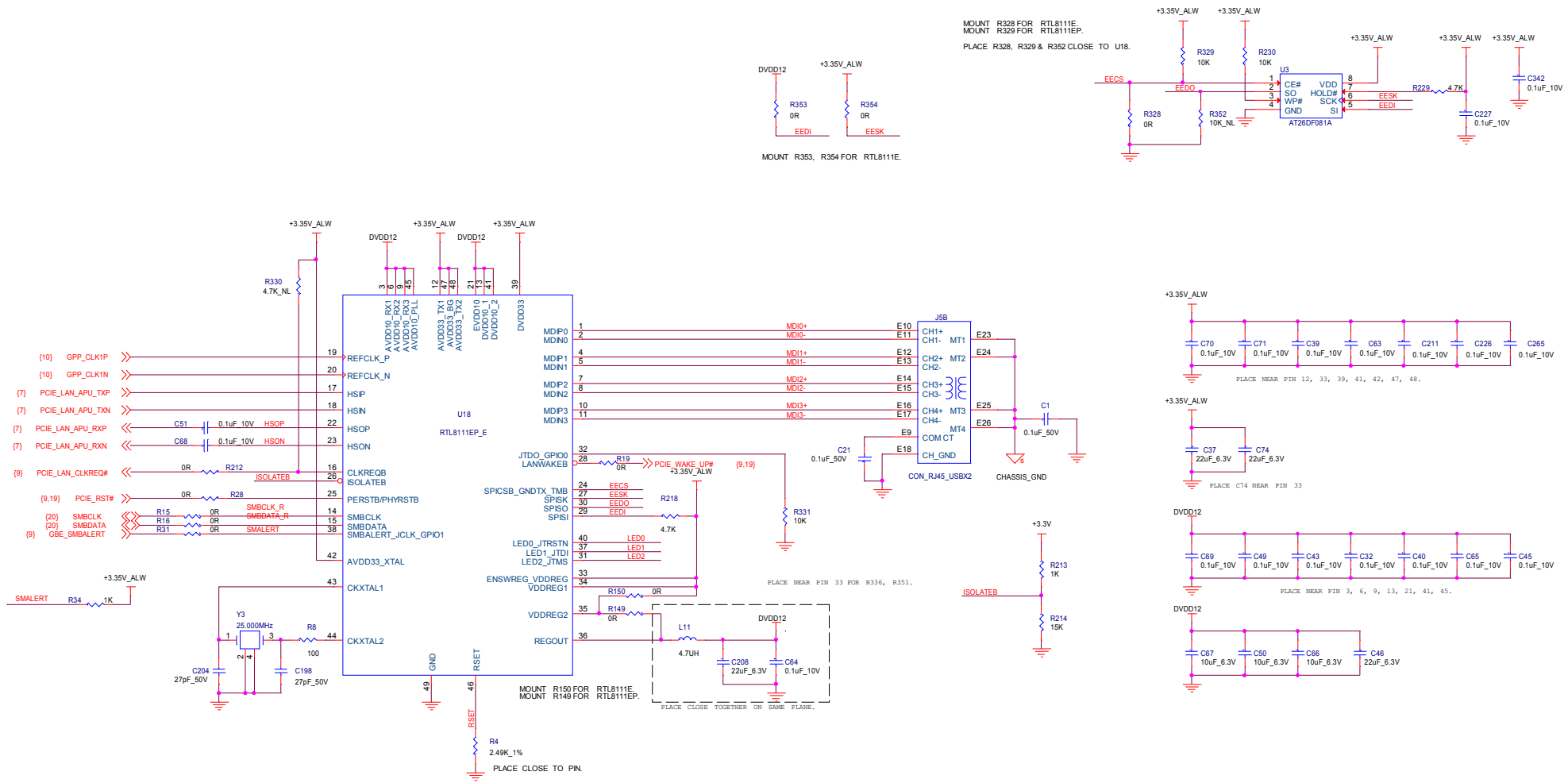


DESIGN NOTE:
PCIe lanes can be independent and connected to two different devices; or ganged and connected to a single device.

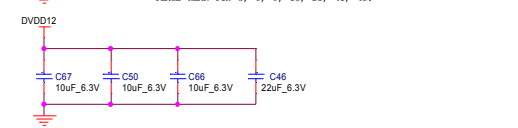
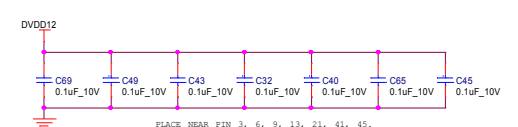
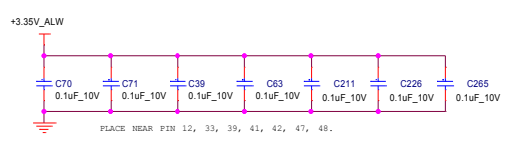
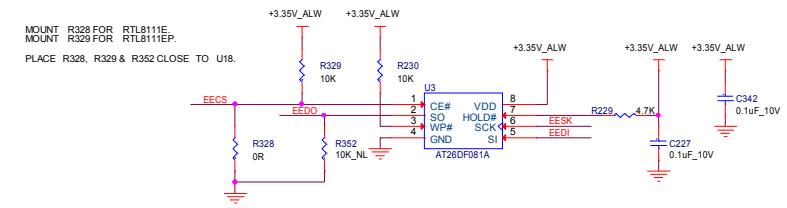
DESIGN NOTE:
This SATA port supports port multiplier devices allowing for multiple SATA drives connected to this single port.

LOW SPEED EDGE CONNECTOR

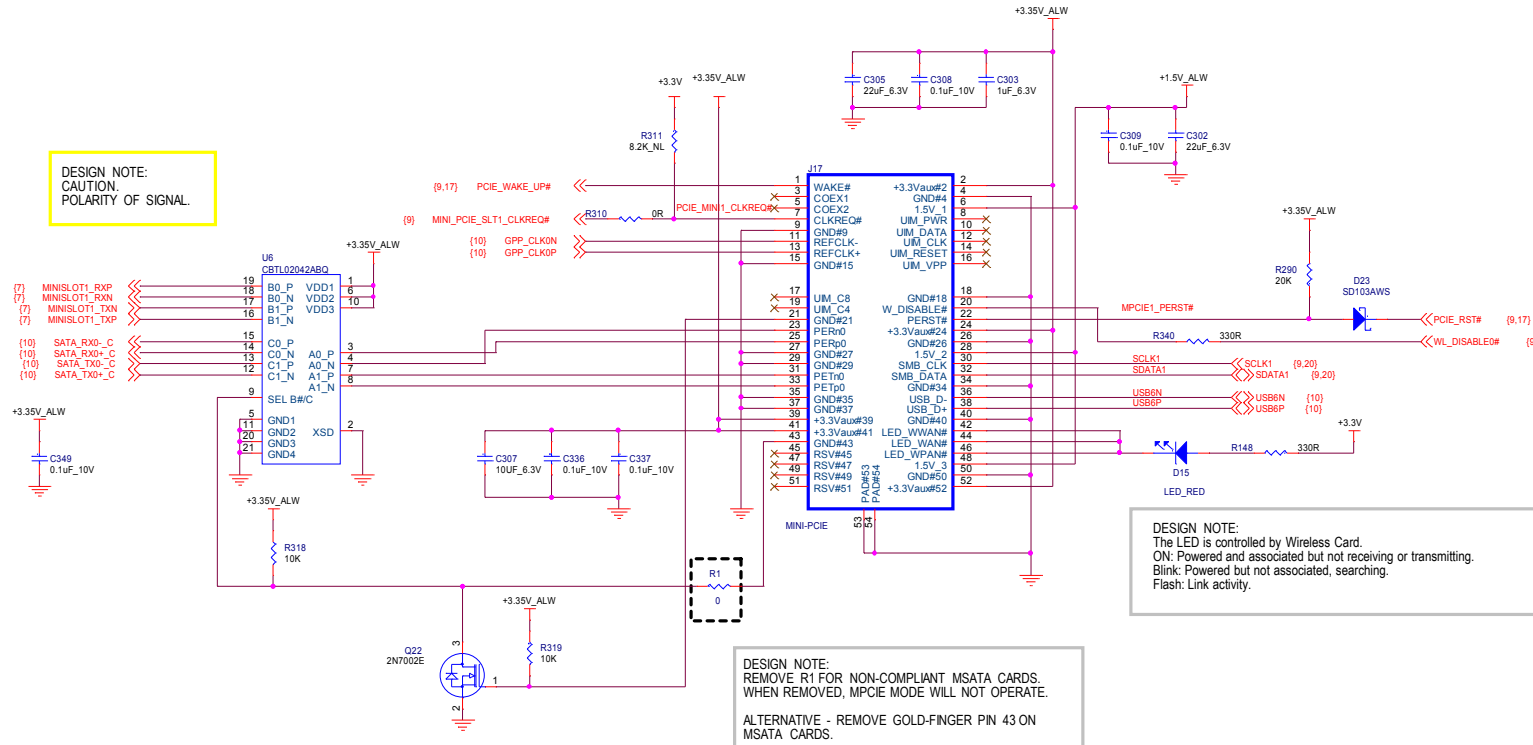
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SET OFFSET REG 0x18 : 0x0482
 USE RTNICPG V2.44 OR HIGHER.

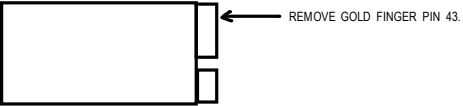
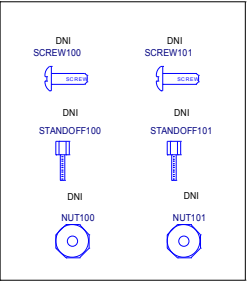


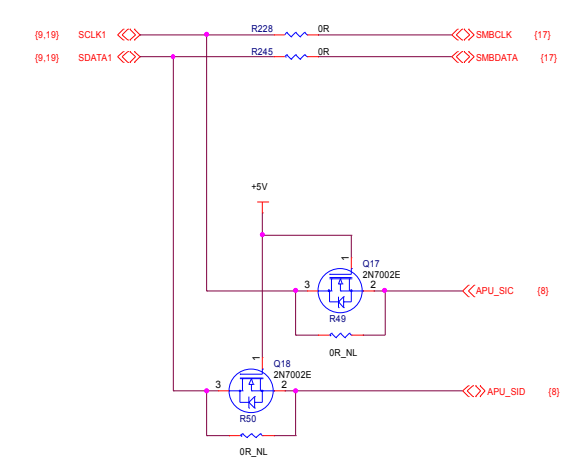
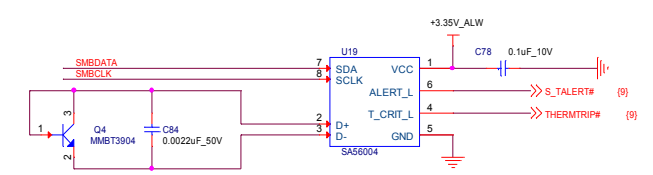
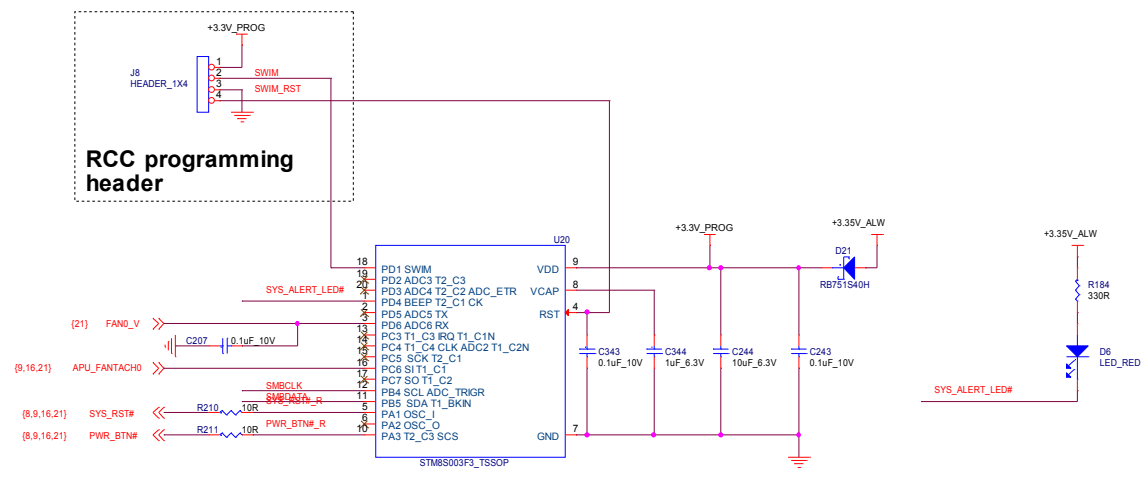
DESIGN NOTE:
CAUTION.
POLARITY OF SIGNAL.



DESIGN NOTE:
The LED is controlled by Wireless Card.
ON: Powered and associated but not receiving or transmitting.
Blink: Powered but not associated, searching.
Flash: Link activity.

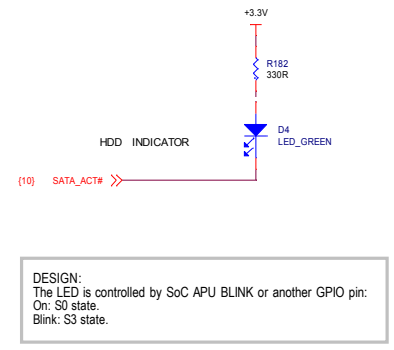
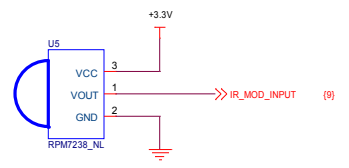
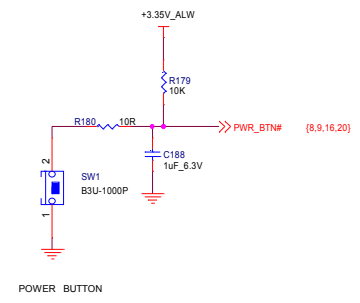
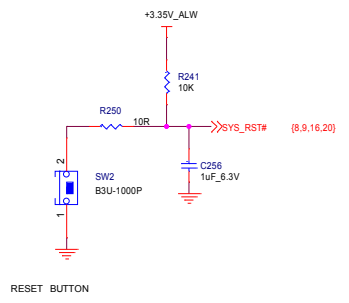
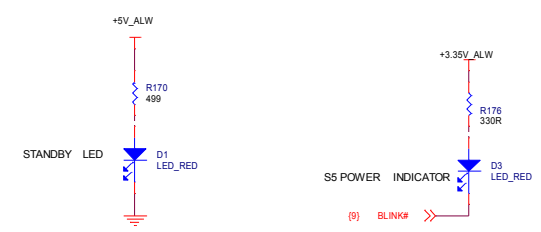
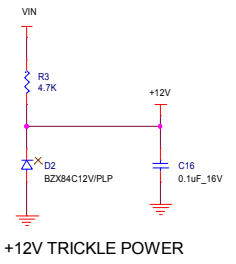
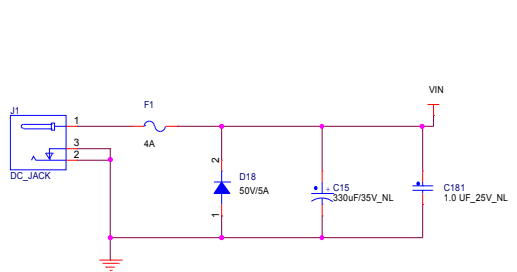
DESIGN NOTE:
REMOVE R1 FOR NON-COMPLIANT MSATA CARDS.
WHEN REMOVED, MPCIE MODE WILL NOT OPERATE.
ALTERNATIVE - REMOVE GOLD-FINGER PIN 43 ON MSATA CARDS.



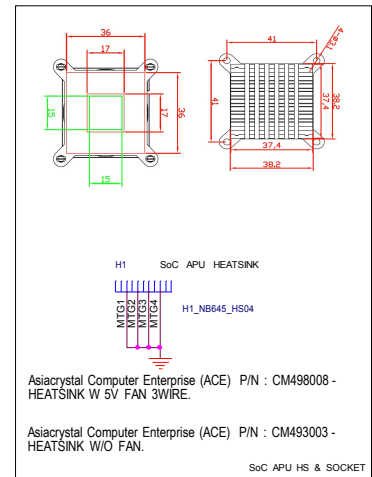
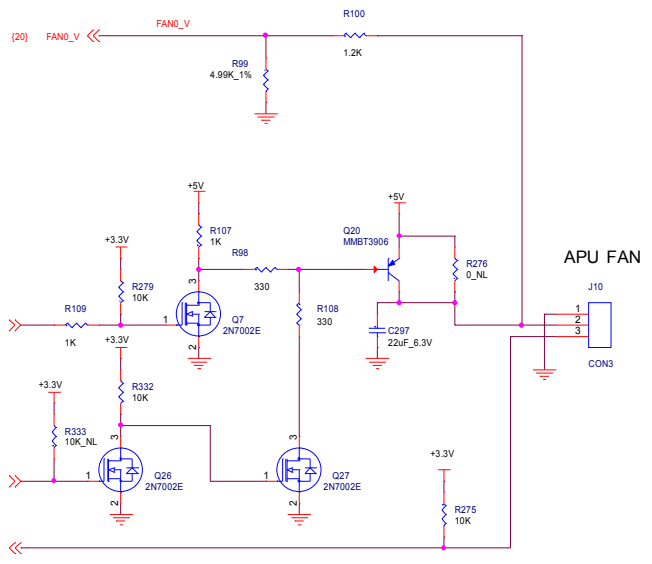


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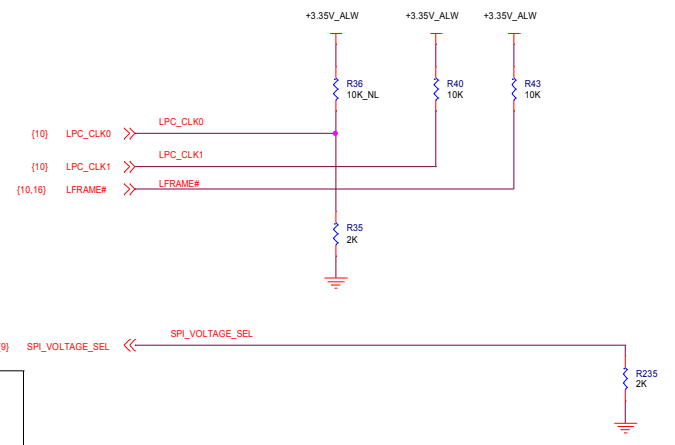
DASH/RCC



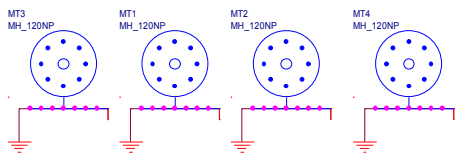
DESIGN:
The LED is controlled by SoC APU BLINK or another GPIO pin:
On: S0 state.
Blink: S3 state.

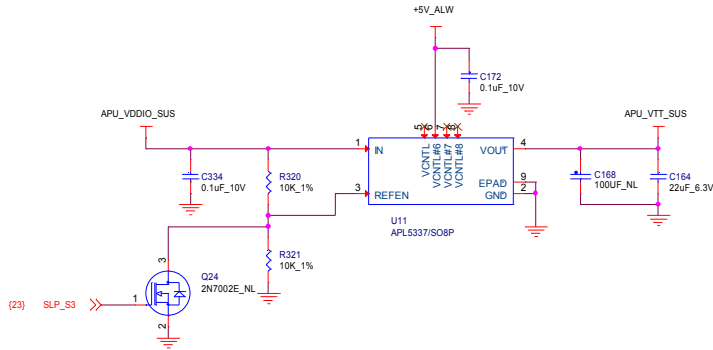
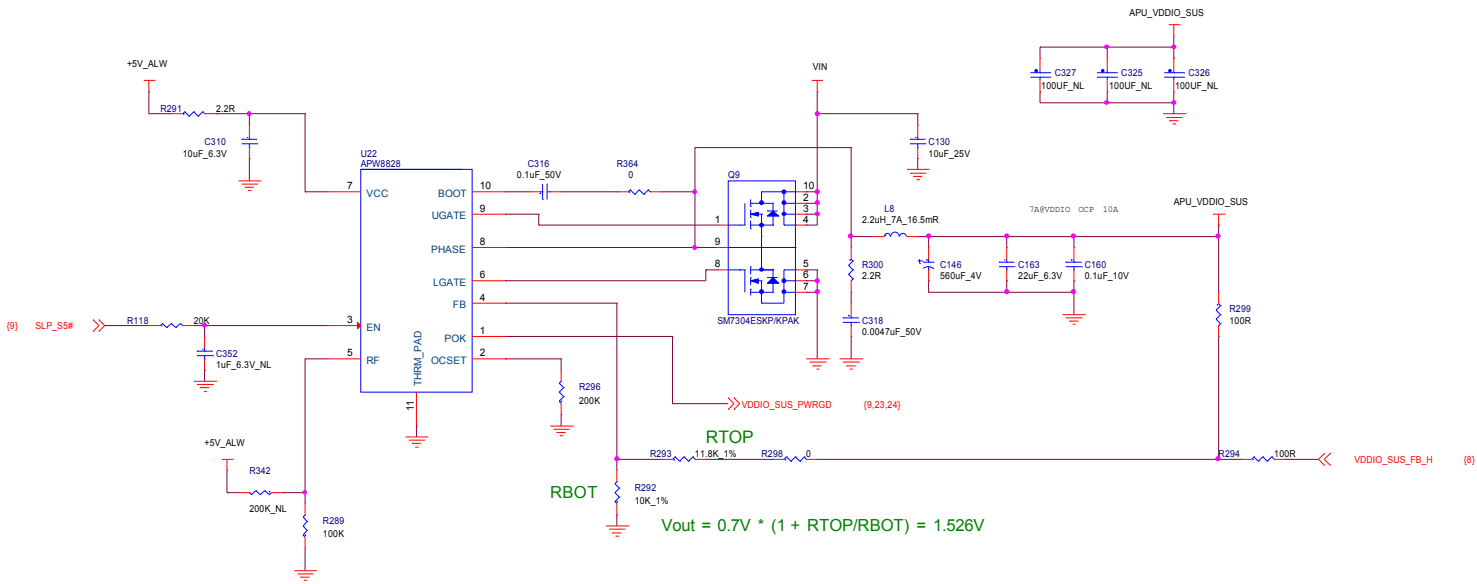


Asiacrystal Computer Enterprise (ACE) P/N : CM498008 - HEATSINK W 5V FAN 3WIRE.
Asiacrystal Computer Enterprise (ACE) P/N : CM493003 - HEATSINK W/O FAN.



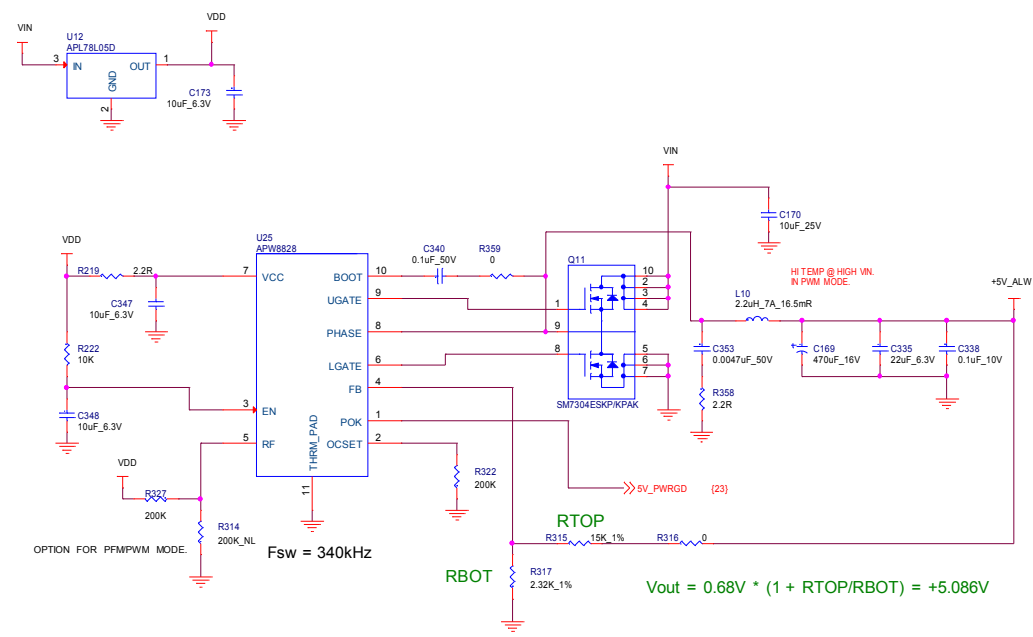
| | LPC_CLK0 | LPC_CLK1 | LFRAME# | SPI_VOLTAGE_SEL |
|-----------|------------------------------------|--------------------------|-------------------|------------------------|
| PULL HIGH | BOOT FAIL TIMER ENABLED | CLKGEN ENABLED (DEFAULT) | SPI ROM (DEFAULT) | 1.8V SPI ROM |
| PULL LOW | BOOT FAIL TIMER DISABLED (DEFAULT) | CLKGEN DISABLED | LPC ROM | 3.3V SPI ROM (DEFAULT) |



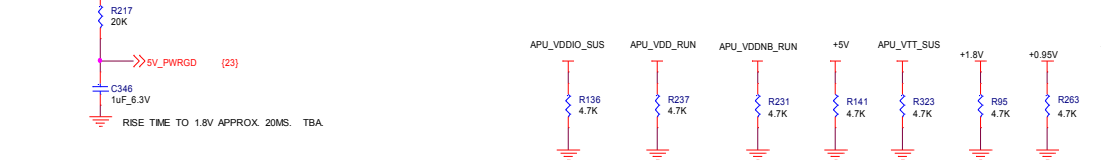
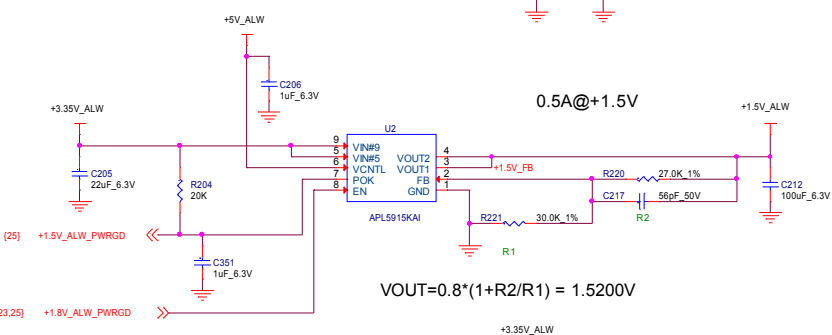
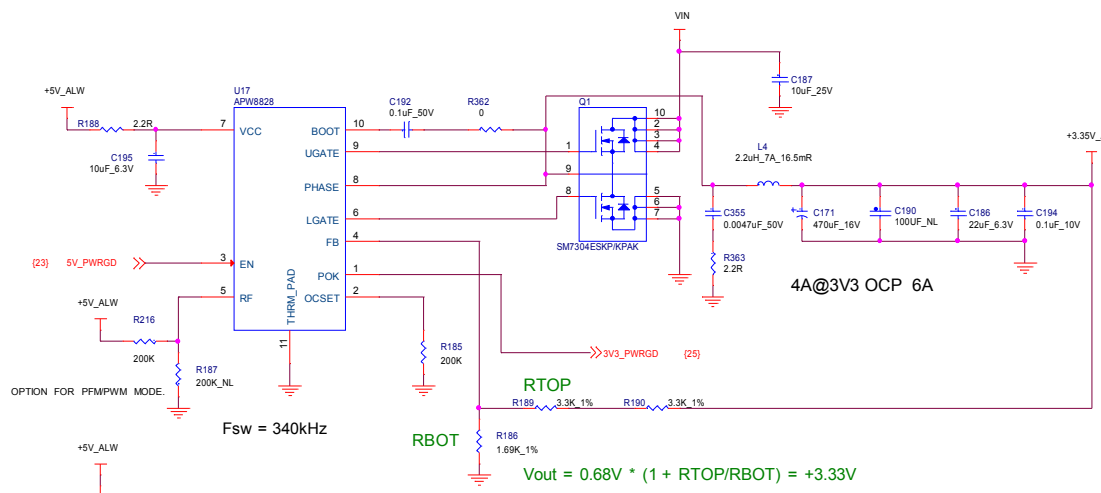
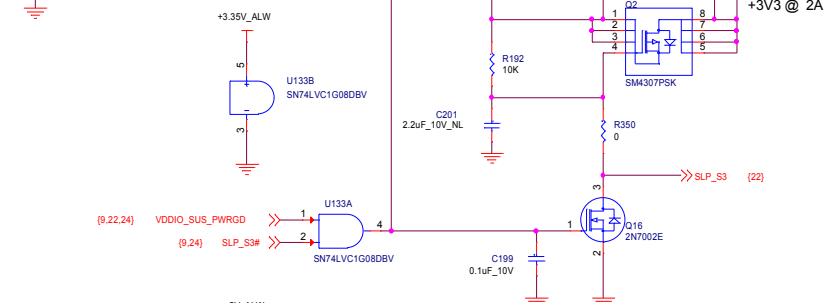
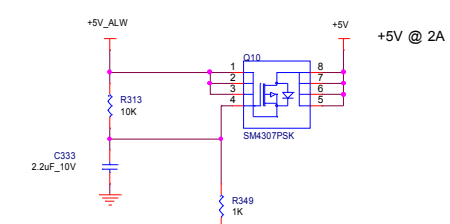
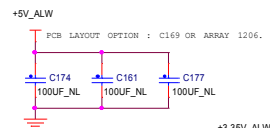


Dual Power/VDDIO_SUS

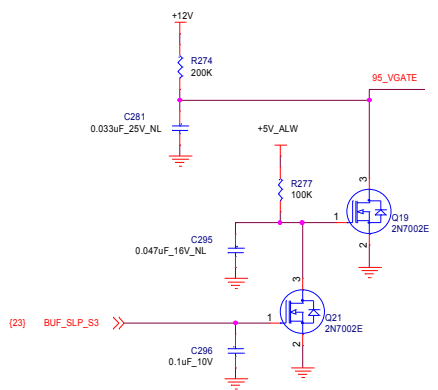
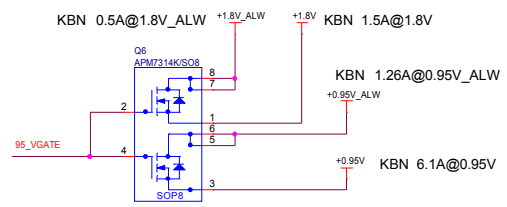
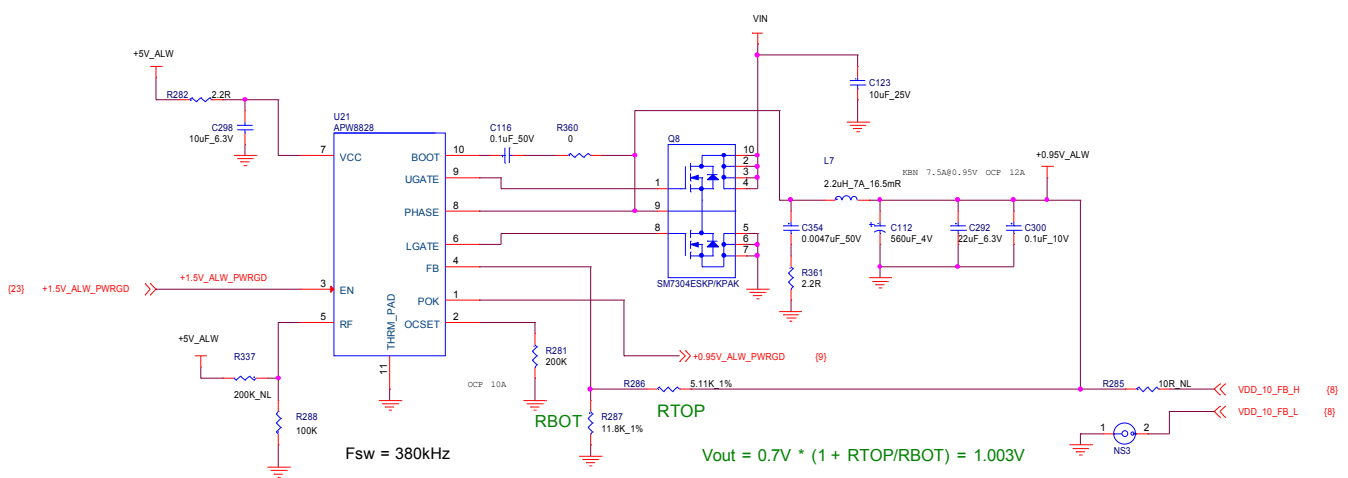
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5A@5DUAL OCP 8A

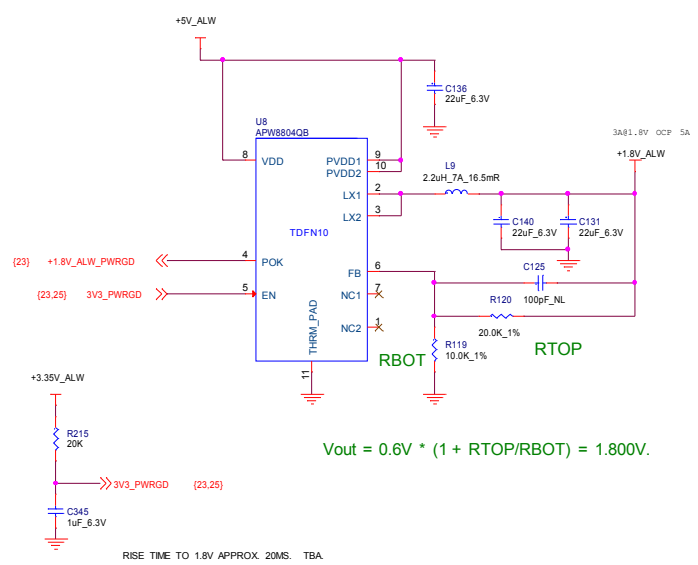


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ACPI Control Table

| | S0 | S3 | S5 |
|---------|----|----|----|
| SLP_S3# | 1 | 0 | 0 |
| SLP_S5# | 1 | 1 | 0 |



+0.95V_ALW/1.8V_ALW Power

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