

2016/09/02

CPU: AMD AM4

System

Chipset: PROM1

Main

Memory: Dual Channel/DDR4

Onboard Device:

Super I/O:IT8613E

LAN : RTL8111H/RTL8106E/8118AS

HD Codec:ALC887 3 jacks

Power solution:

CPU Voltage Regulators:3phase by ISL62773A

VDDNB voltage Regulators:2phase by ISL62773A

APU_VDDR/P_RUN voltage Regulators:LDO

DDR voltage Regulators:1Phase

Expansion Slots:

PCI EXPRESS 16X SLOT*1

PCI EXPRESS 1X SLOT*2

REAR I/O:

PS/2 KBMS*1

VGA Port*1 DVI Port*1 HDMI Port*1(option)

2 layer USB3.0

2 layer USB3.0 + RJ45 Ports*1

Front I/O:

Audio Jackets 3jets*1

USB3.0 Header*1

SATA3 Connectors*4

USB2.0 Header*2

CPU FAN*1

System1 FAN*1

Serial header*1

Front Audio Header*1

Front Panel Header*1

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| 41 | BOM |

| Features | Family 15h Models 60h-6Fh in AM4 Infrastructure | Family 17h Models 00h-0Fh in AM4 Infrastructure | Family 17h Models 10h-1Fh in AM4 Infrastructure |
|---------------------|--|--|--|
| APU Graphics | OPN Specific | Not Supported | OPN Specific |
| DDR4 | Supported | Supported | Supported |
| DDR3 | Not Supported | Not Supported | Not Supported |
| DDR3L | Not Supported | Not Supported | Not Supported |
| DDR3U | Not Supported | Not Supported | Not Supported |
| SODIMMs | Supported | Supported | Supported |
| Unbuffered DIMMs | Supported | Supported | Supported |
| ECC | OPN Specific | OPN Specific | OPN Specific |
| PCIe® Graphics | Up to 1 x8 Gen3 | Up to 1 x16 Gen3 or 2 x8 Gen3 | Up to 1 x8 Gen3 |
| PCIe® GPP | Up to 6 x1 Gen3 | Up to 8 x1 Gen3 ³ | Up to 8 x1 Gen3 ³ |
| Azalia | Supported | Supported | Supported |
| SATA 3.0 | Up to 2 Gen3 | Up to 2 Gen3 ³ | Up to 2 Gen3 ³ |
| SATA Express | Not Supported | Supported ³ | Supported ³ |
| SPI | Supported | Supported | Supported |
| eSPI | Supported | Supported | Supported |
| LPC | Supported | Supported | Supported |
| USB 2.0 | Supported | Supported | Supported |
| Features | Family 15h Models 60h-6Fh in AM4 Infrastructure | Family 17h Models 00h-0Fh in AM4 Infrastructure | Family 17h Models 10h-1Fh in AM4 Infrastructure |
| USB 3.1 | Up to 4 Gen1 ports | Up to 4 Gen1 ports | Up to 3 Gen2 ports and 1 Gen1 port |
| DDI | Supported | Not Supported | Supported |
| SVI2 ¹ | Supported | Supported | Supported |
| SB-TSI ² | Supported | Supported | Supported |

HW Engineer:

Date:

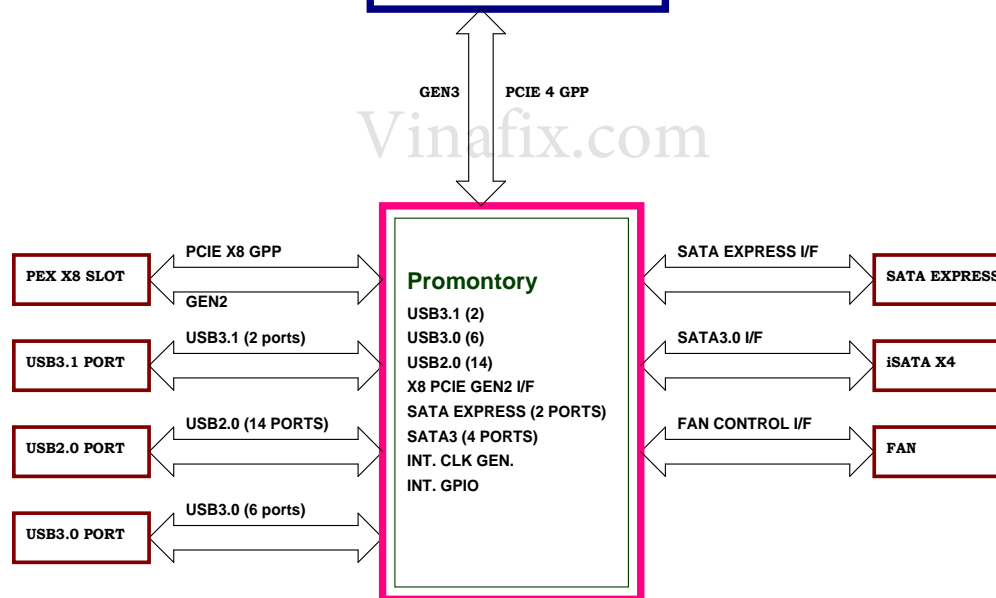
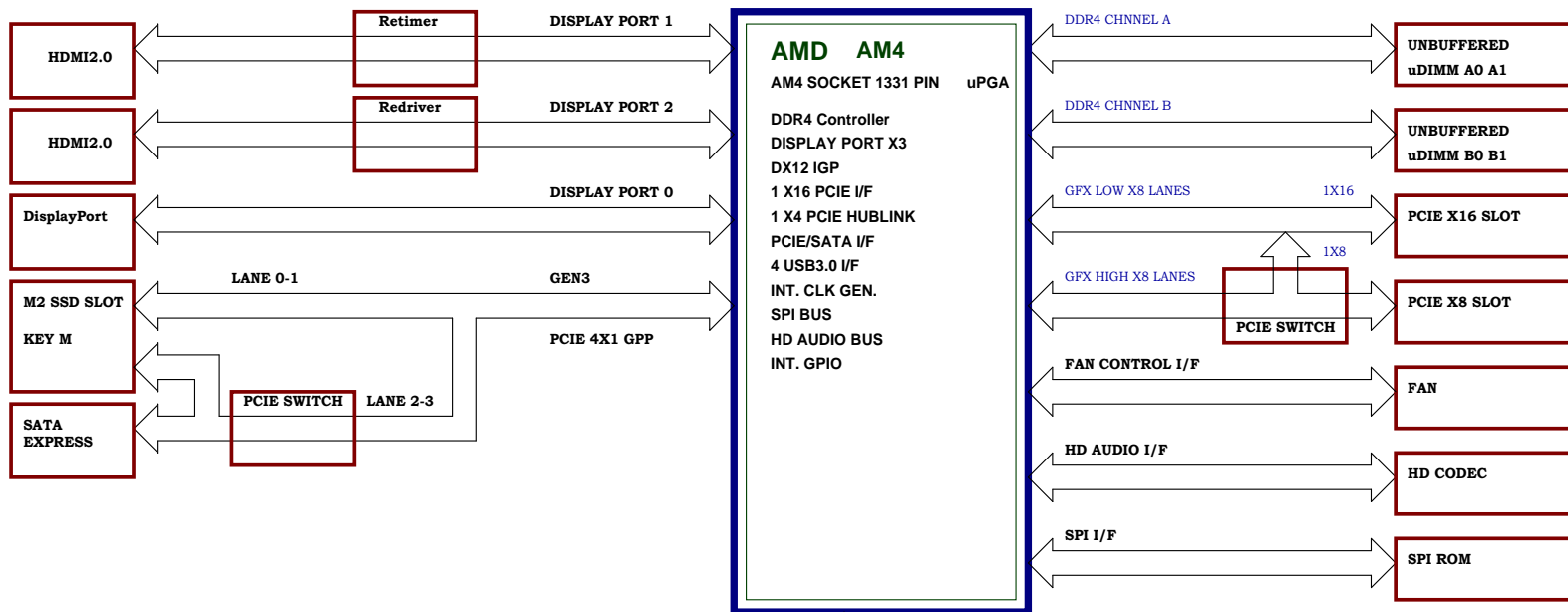
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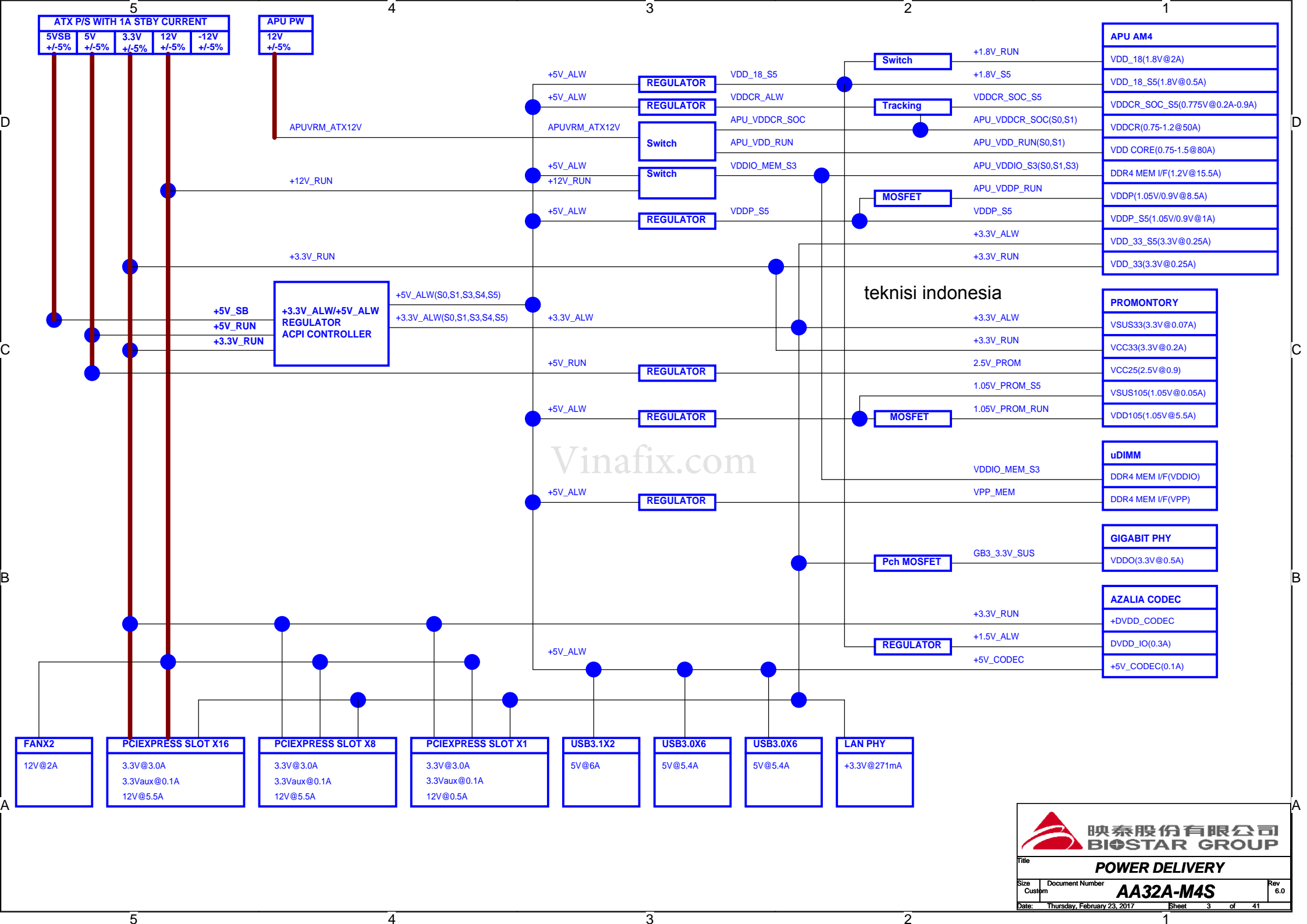
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| COVER | | | |
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| ATX P/S WITH 1A STBY CURRENT | | | | |
|------------------------------|-------|-------|-------|-------|
| 5VSB | 5V | 3.3V | 12V | -12V |
| +/-5% | +/-5% | +/-5% | +/-5% | +/-5% |

| APU PW | |
|--------|-------|
| 12V | +/-5% |

| APU AM4 | |
|--------------------------------|--|
| VDD_18(1.8V@2A) | |
| VDD_18_S5(1.8V@0.5A) | |
| VDDCR_SOC_S5(0.775V@0.2A-0.9A) | |
| VDDCR(0.75-1.2@50A) | |
| VDD CORE(0.75-1.5@80A) | |
| DDR4 MEM I/F(1.2V@15.5A) | |
| VDDP(1.05V/0.9V@8.5A) | |
| VDDP_S5(1.05V/0.9V@1A) | |
| VDD_33_S5(3.3V@0.25A) | |
| VDD_33(3.3V@0.25A) | |

| PROMONTORY | |
|----------------------|--|
| VSUS33(3.3V@0.07A) | |
| VCC33(3.3V@0.2A) | |
| VCC25(2.5V@0.9) | |
| VSUS105(1.05V@0.05A) | |
| VDD105(1.05V@5.5A) | |

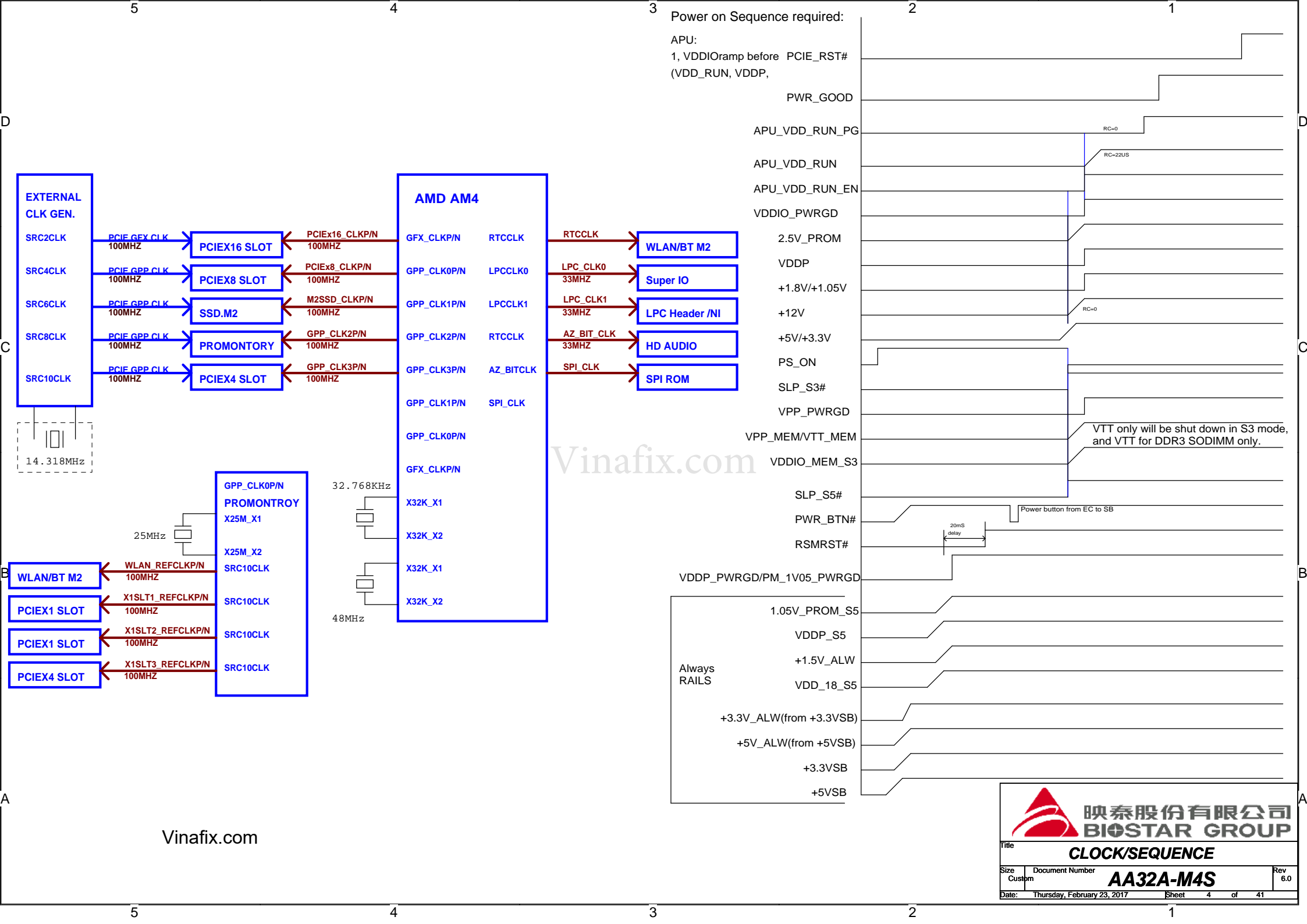
| uDIMM | |
|---------------------|--|
| DDR4 MEM I/F(VDDIO) | |
| DDR4 MEM I/F(VPP) | |

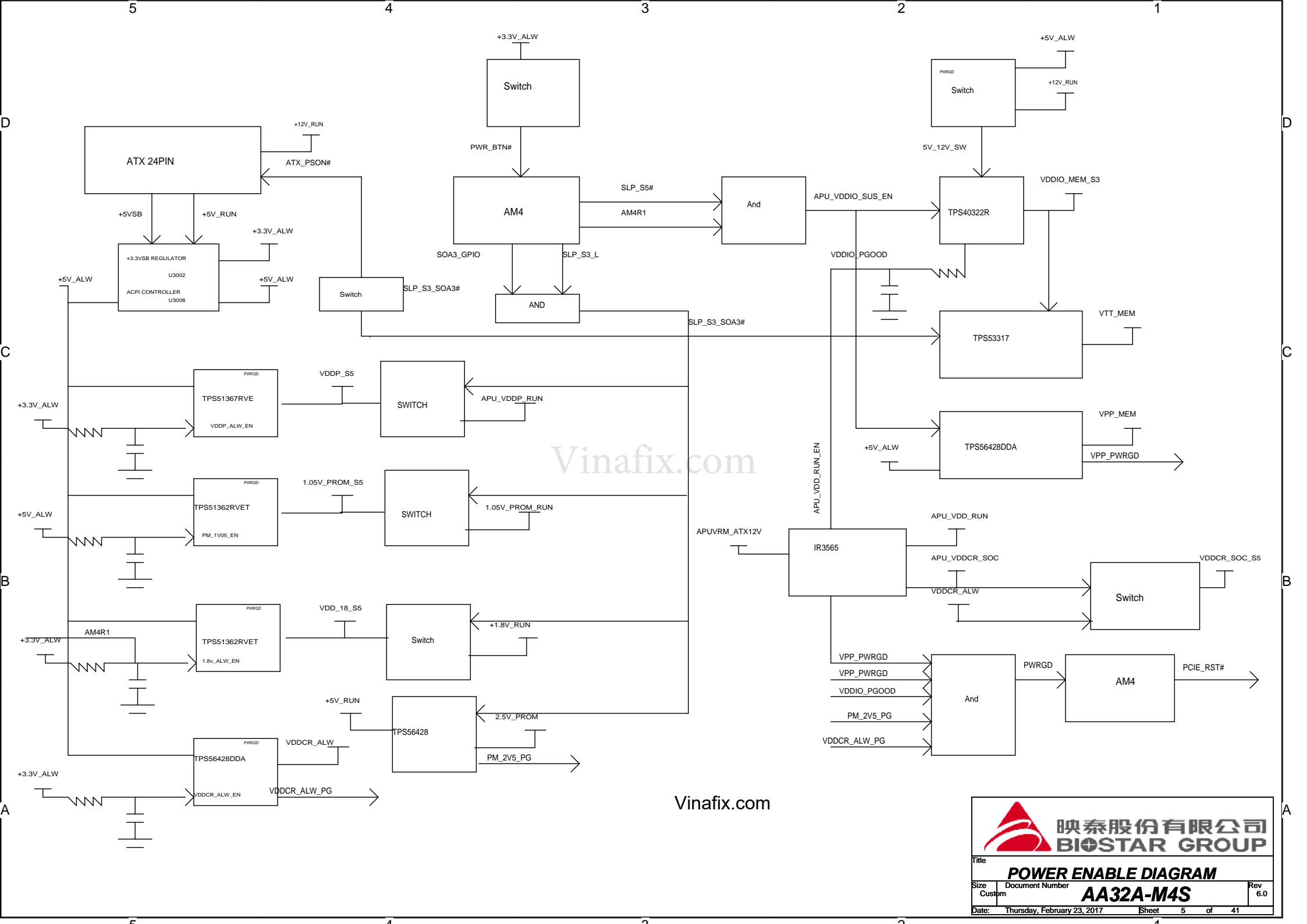
| GIGABIT PHY | |
|-----------------|--|
| VDDO(3.3V@0.5A) | |

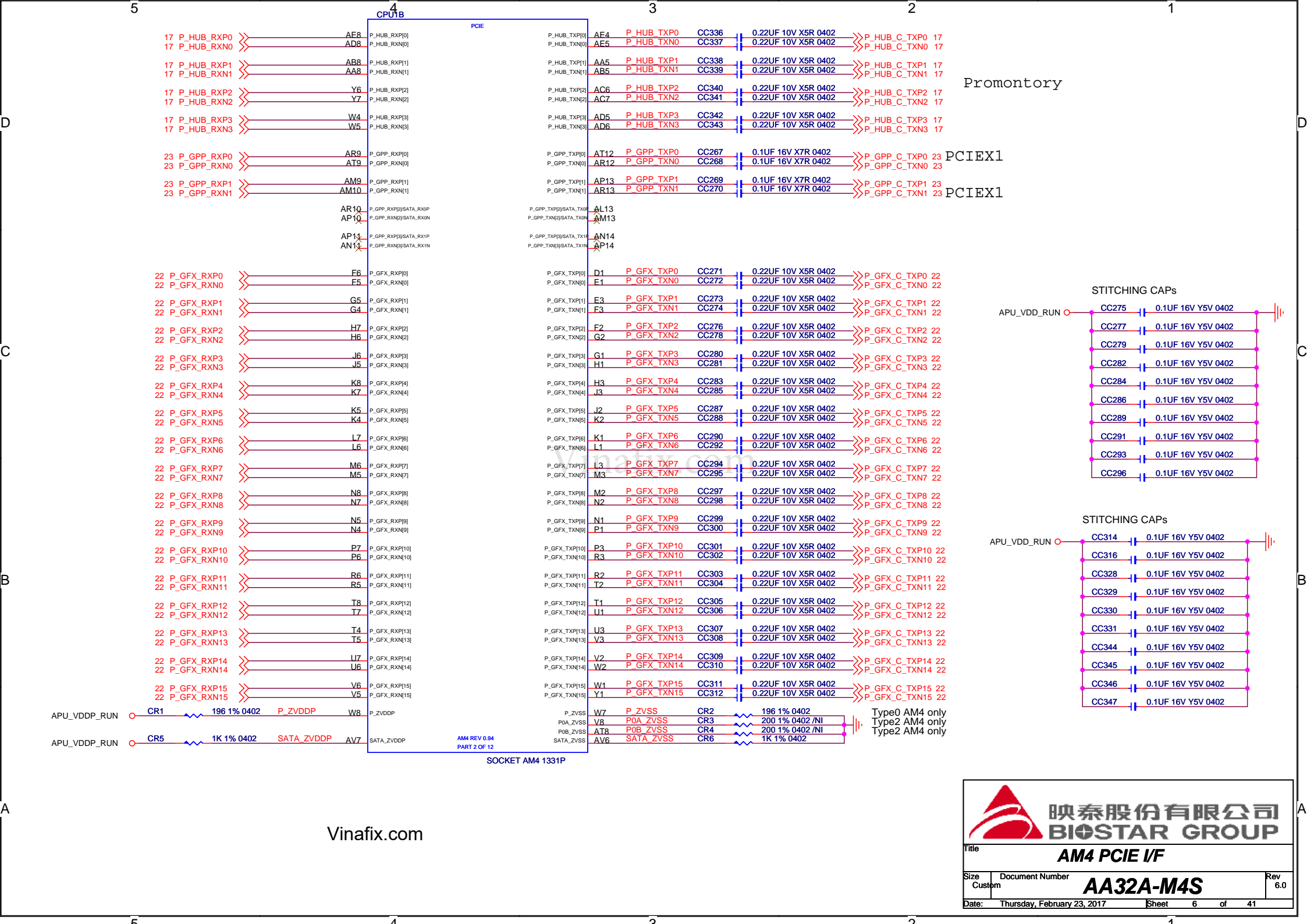
| AZALIA CODEC | |
|-----------------|--|
| +DVDD_CODEC | |
| DVDD_IO(0.3A) | |
| +5V_CODEC(0.1A) | |



| | | | | |
|--------|-----------------------------|-----------|----------------|-------|
| Title | | | POWER DELIVERY | |
| Size | Document Number | AA32A-M4S | | Rev |
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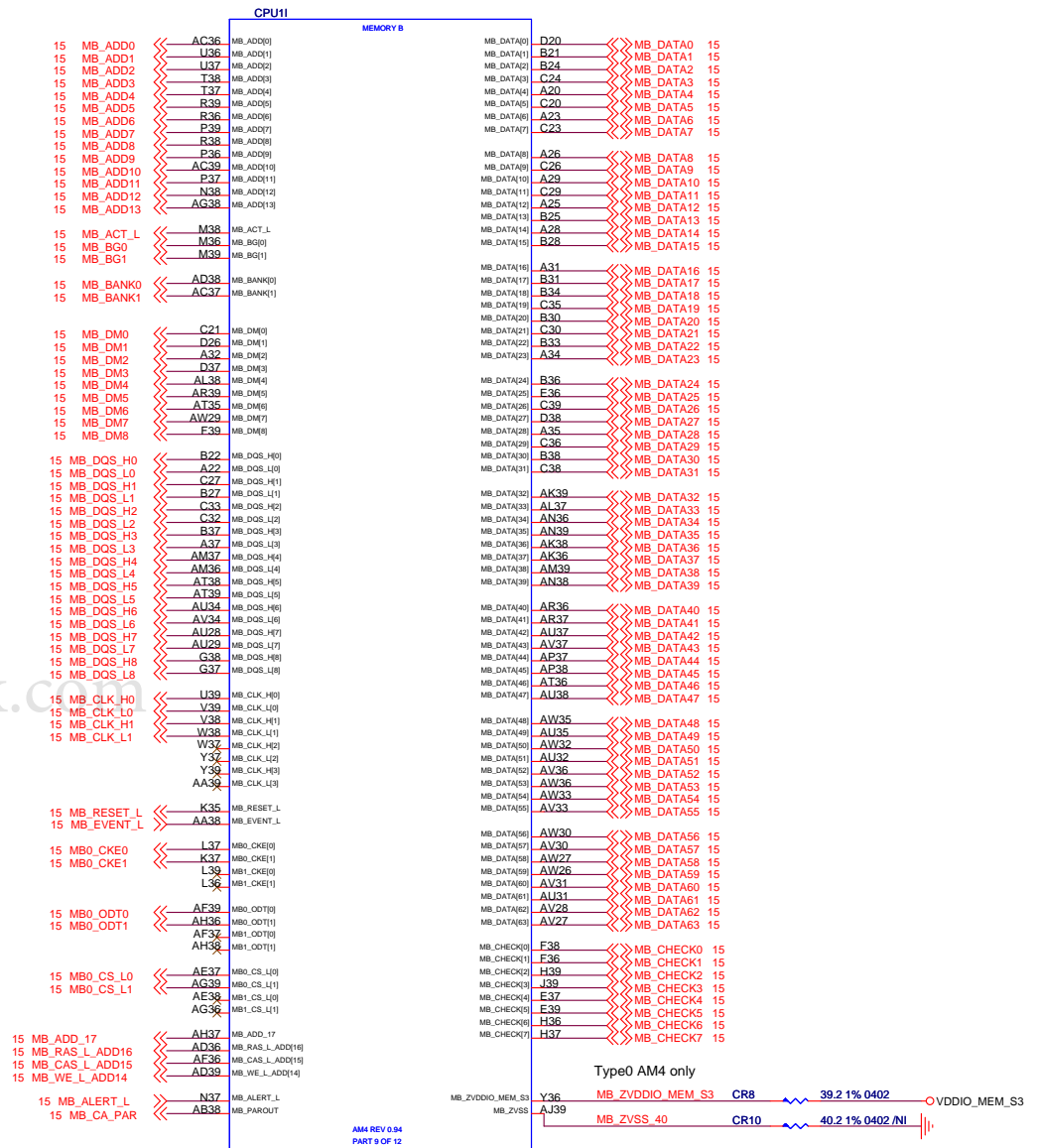
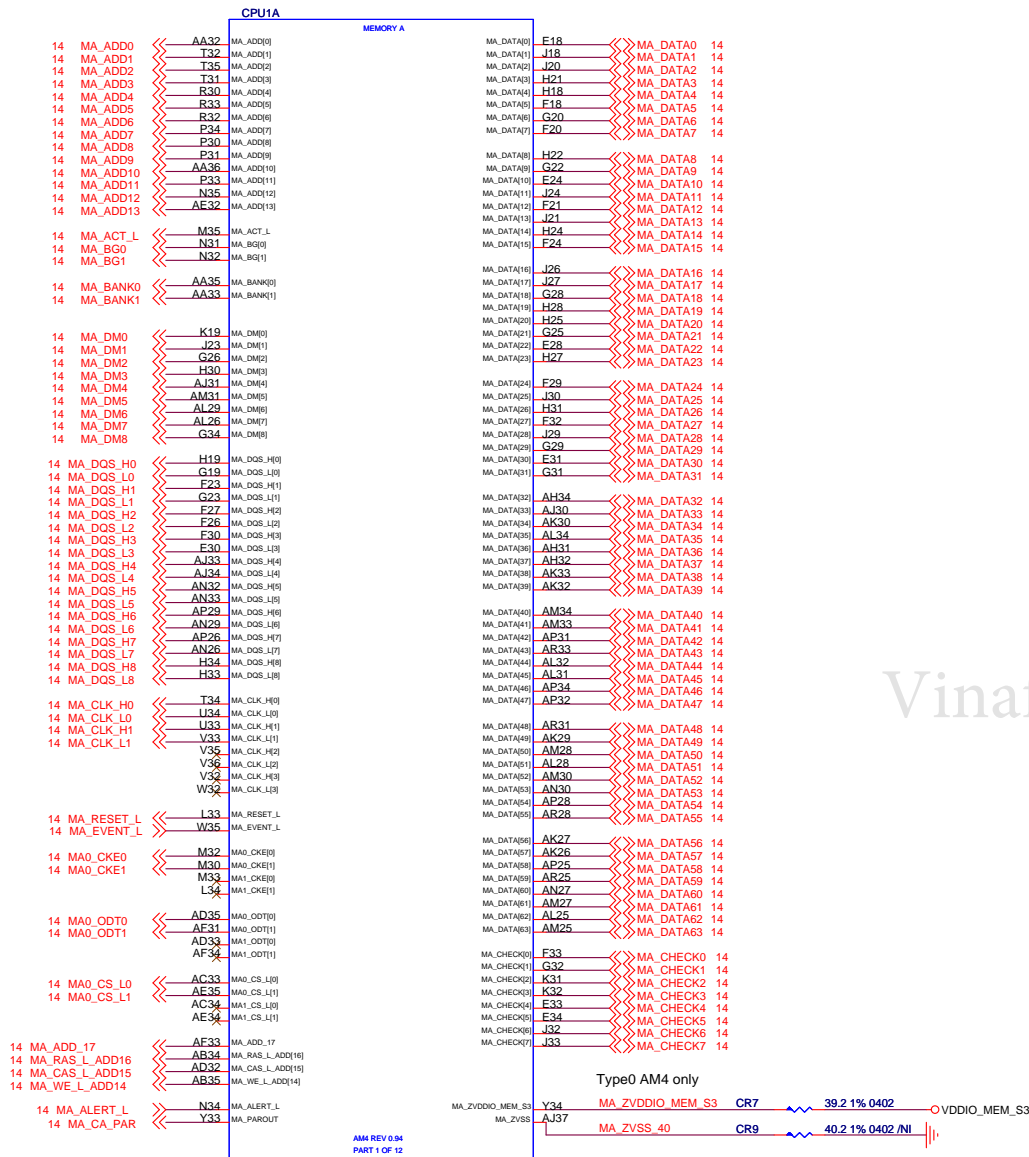


D

C

B

A



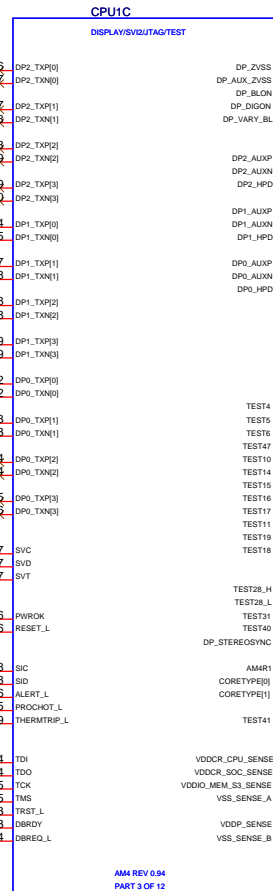
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| Title | | | |
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| AM4 MEM DDR4 | | | |
| Size | Document Number | Rev | |
| Cuspm | AA32A-M4S | 6.0 | |
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HDMI

VGA



SOCKET AM4 1331P

| BOOT VOLTAGE | SVC | SVD |
|--------------|-----|-----|
| 1.1V | 0 | 0 |
| 1.0V | 0 | 1 |
| 0.9V | 1 | 0 |
| 0.8V | 1 | 1 |

FOR DEBUG, PLACE THESE CAPS CLOSE TO APU

PU FOR INTERNAL
PD FOR CUSTOMER

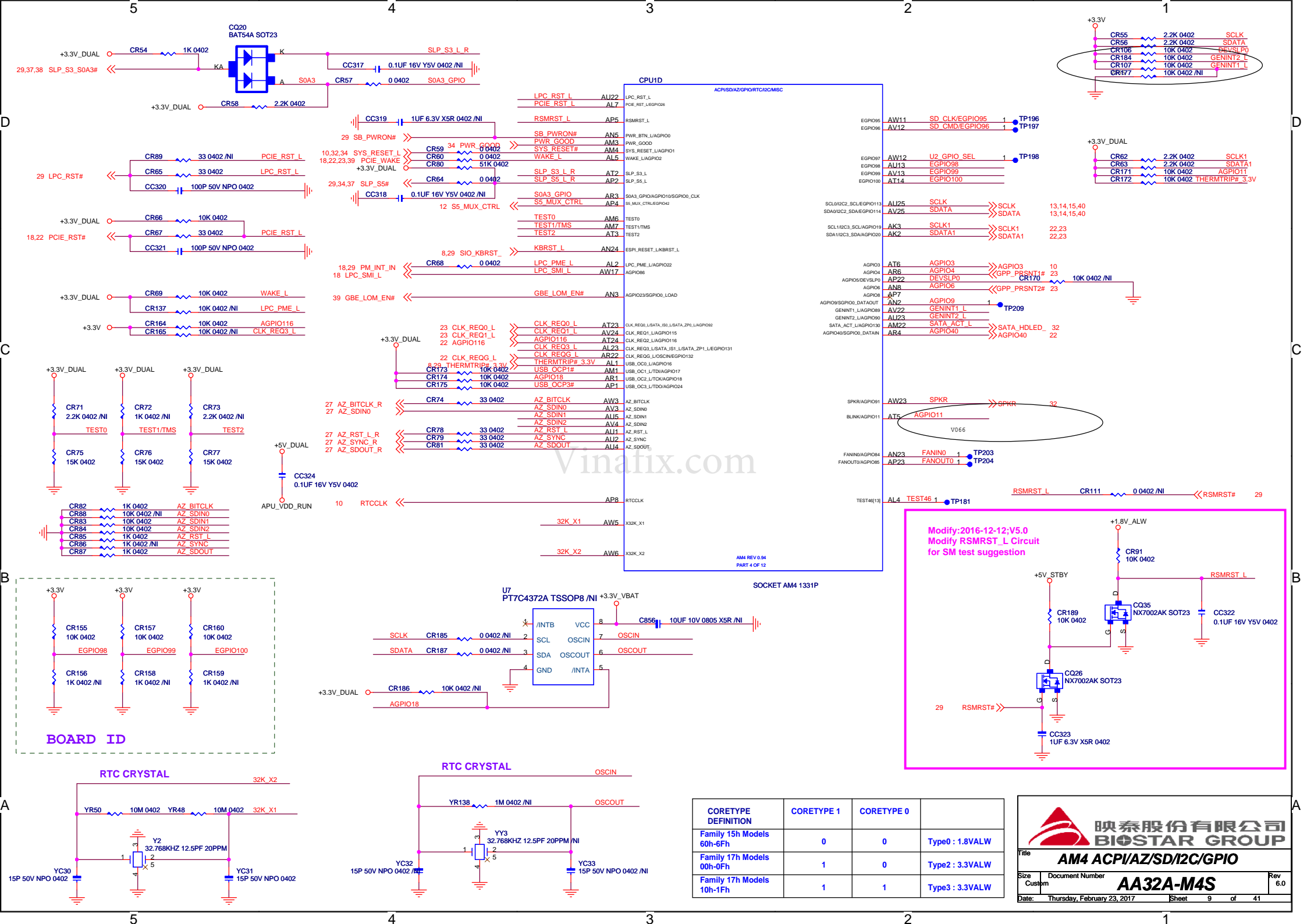
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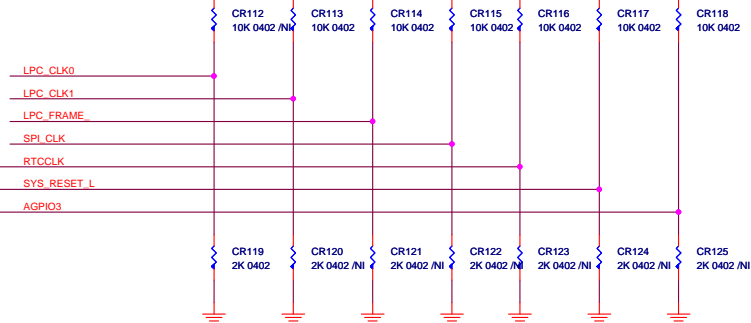
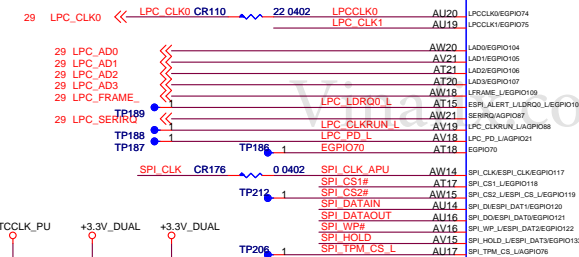
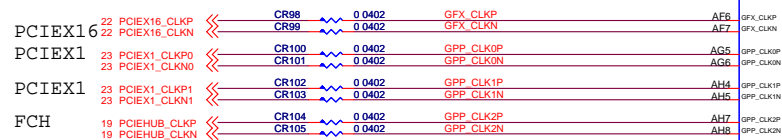
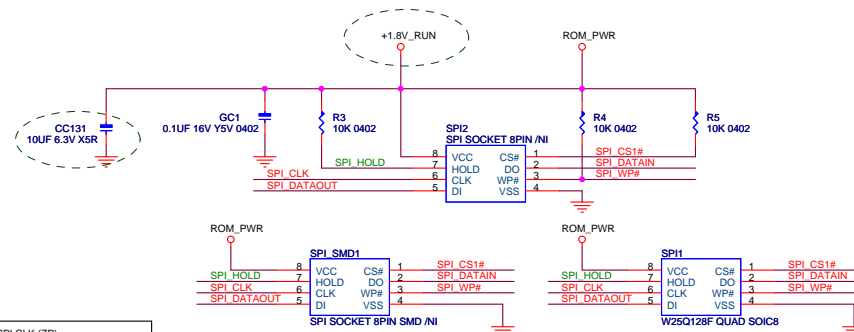
| CORETYPE DEFINITION | CORETYPE 1 | CORETYPE 0 | |
|------------------------------|------------|------------|--------------|
| Family 15h Models 60h-6Fh | 0 | 0 | Type0 : 1.8V |
| Family 17h Models 00h-0Fh | 1 | 0 | Type2 : 3.3V |
| Family 17h Models 10h-1Fh | 1 | 1 | Type3 : 3.3V |

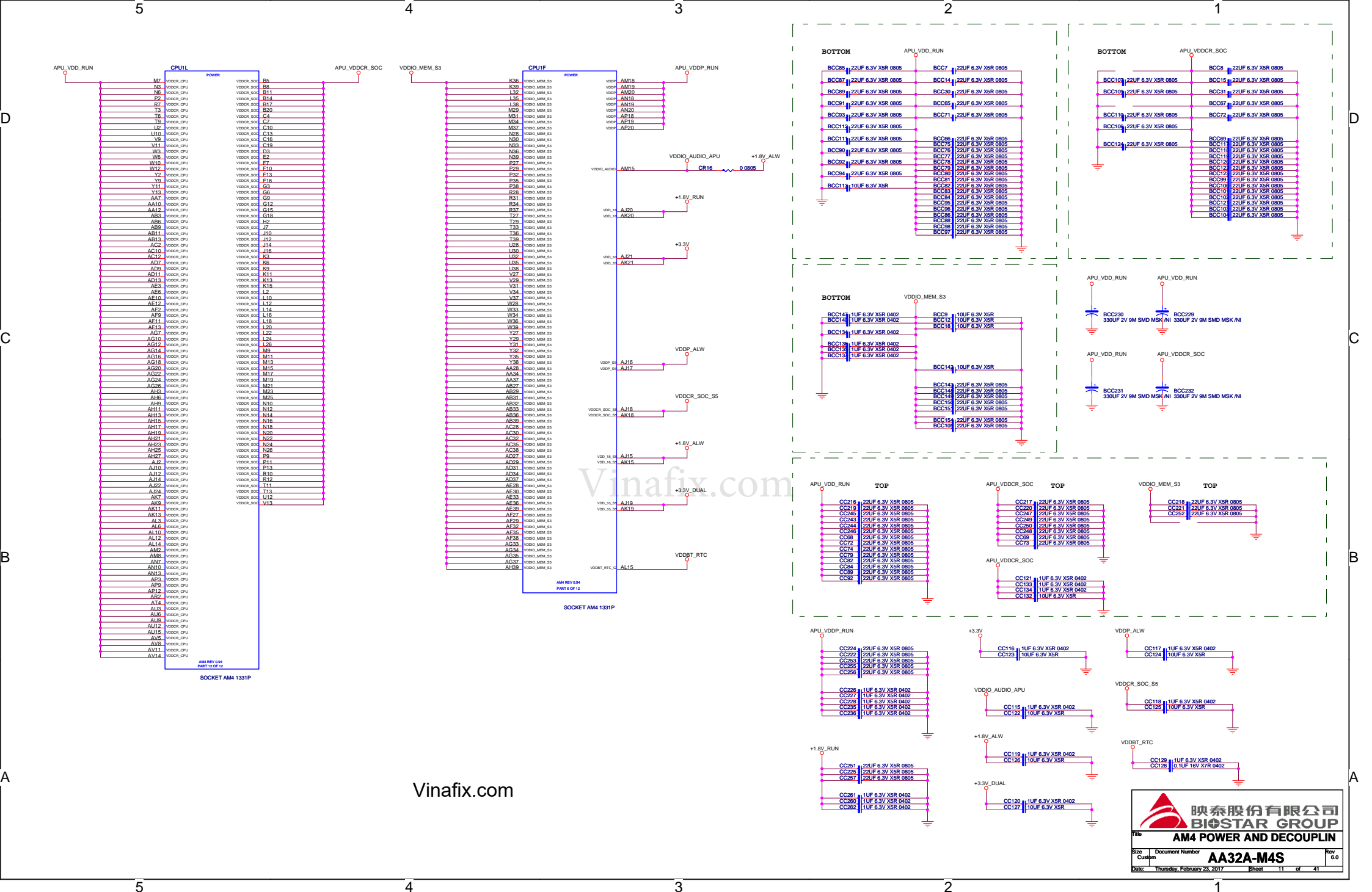
Title **AM4 DISPLAY/MISC**

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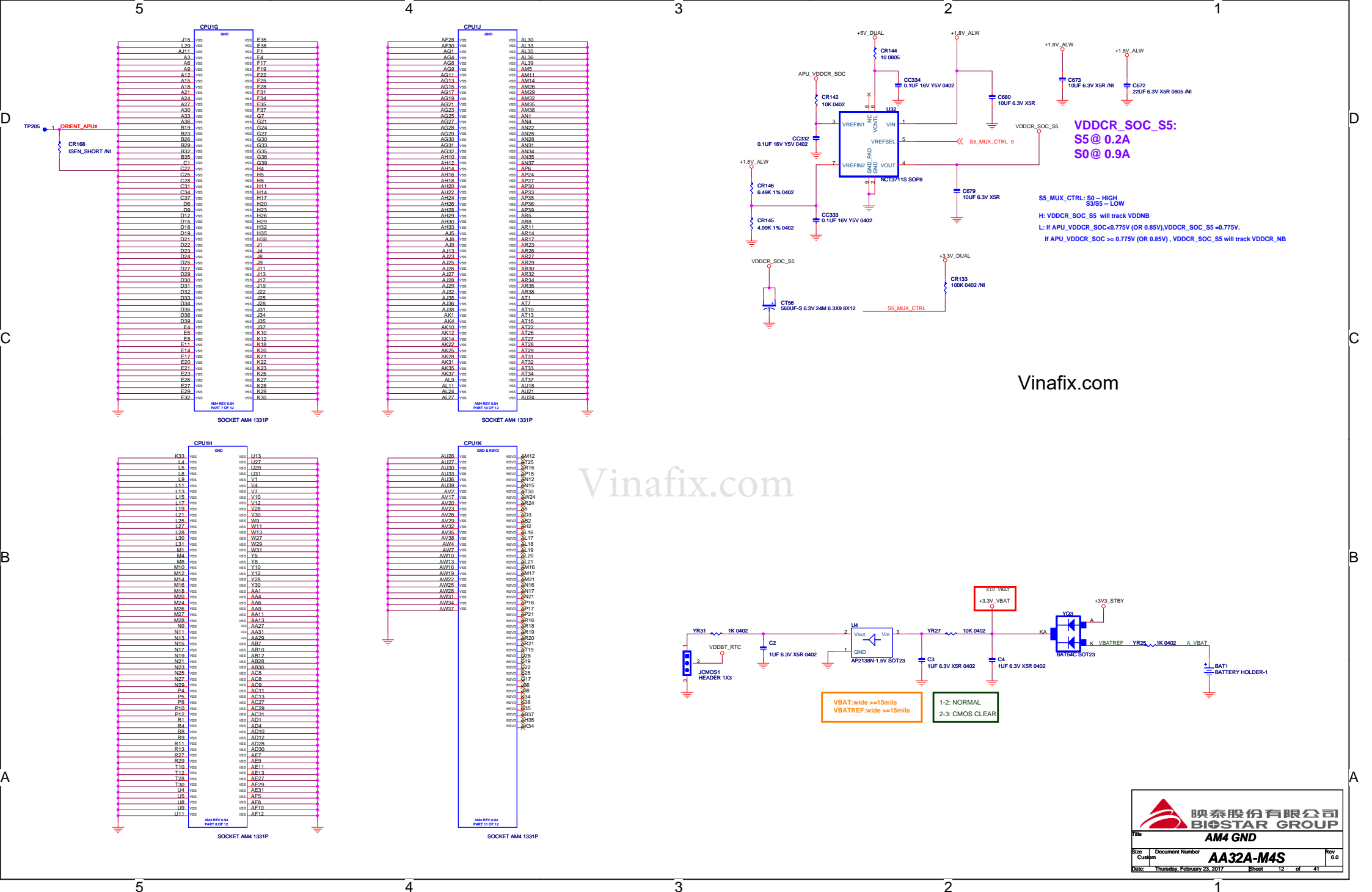
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AM4 POWER AND DECOUPLING

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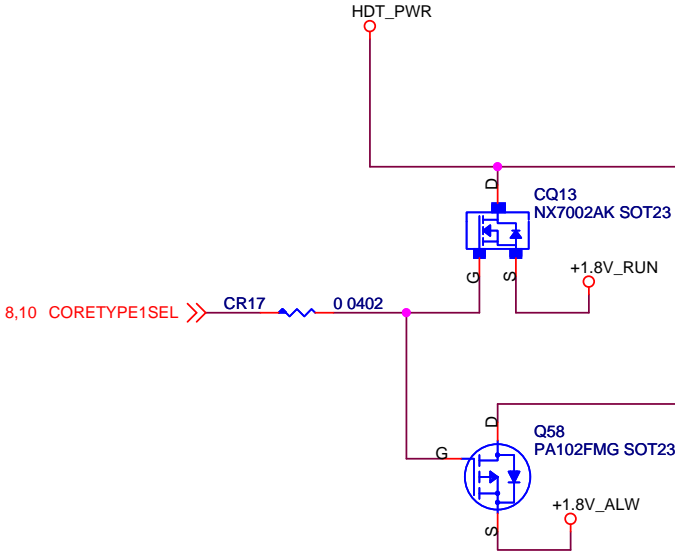
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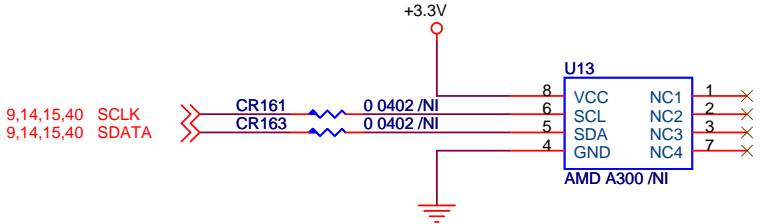
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| AM4 GND | | |
| File | Document Number | Rev |
| Size | Custom | AA32A-M4S |
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| CORETYPE DEFINITION | CORETYPE 1 | CORETYPE 0 | |
|------------------------------|------------|------------|-----------------|
| Family 15h Models 60h-6Fh | 0 | 0 | Type0 : 1.8V |
| Family 17h Models 00h-0Fh | 1 | 0 | Type2 : 1.8VALW |
| Family 17h Models 10h-1Fh | 1 | 1 | Type3 : 1.8VALW |



AMD family of activator IC, code-named Knoll



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Title

AM4 DEBUG

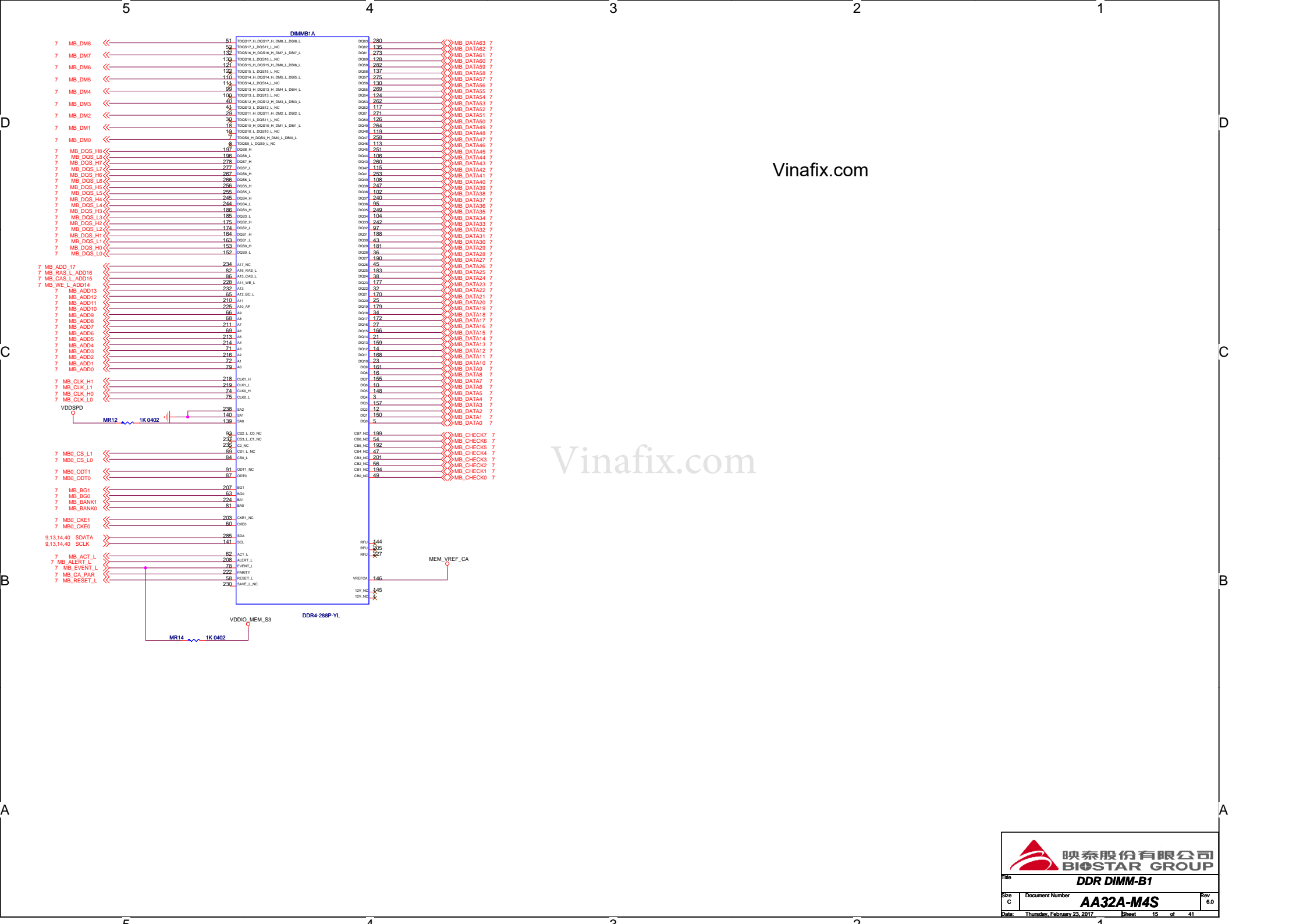
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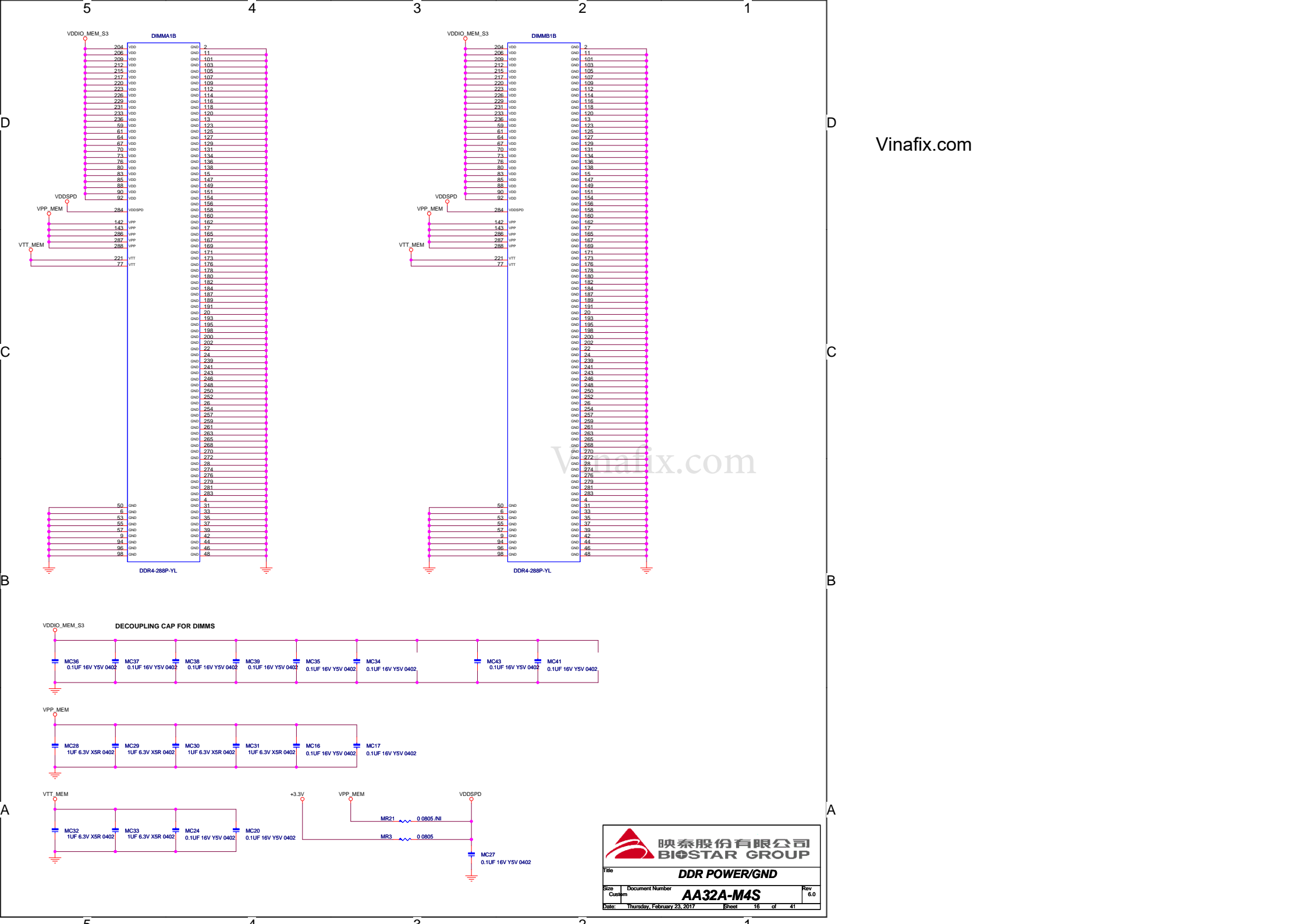
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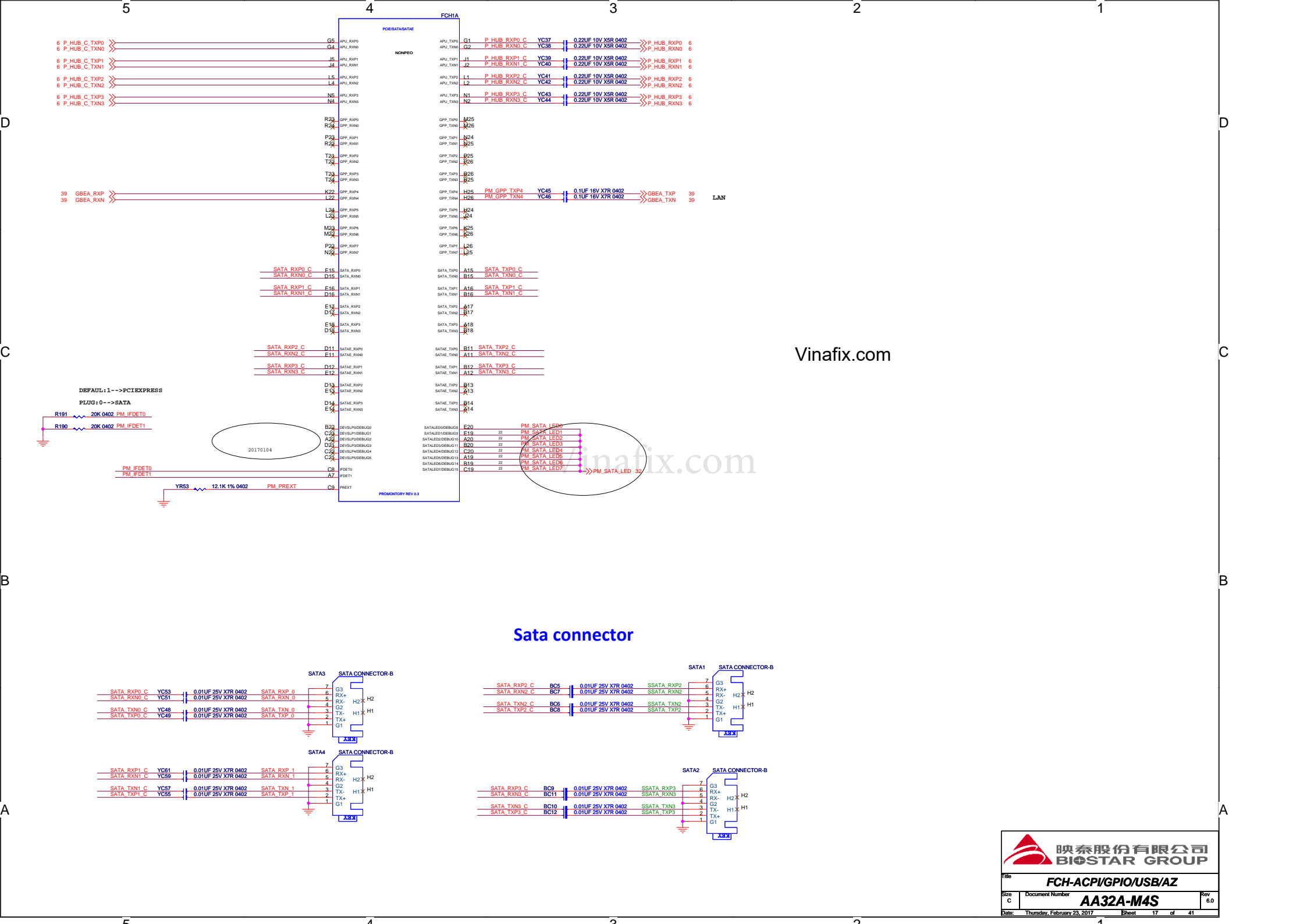
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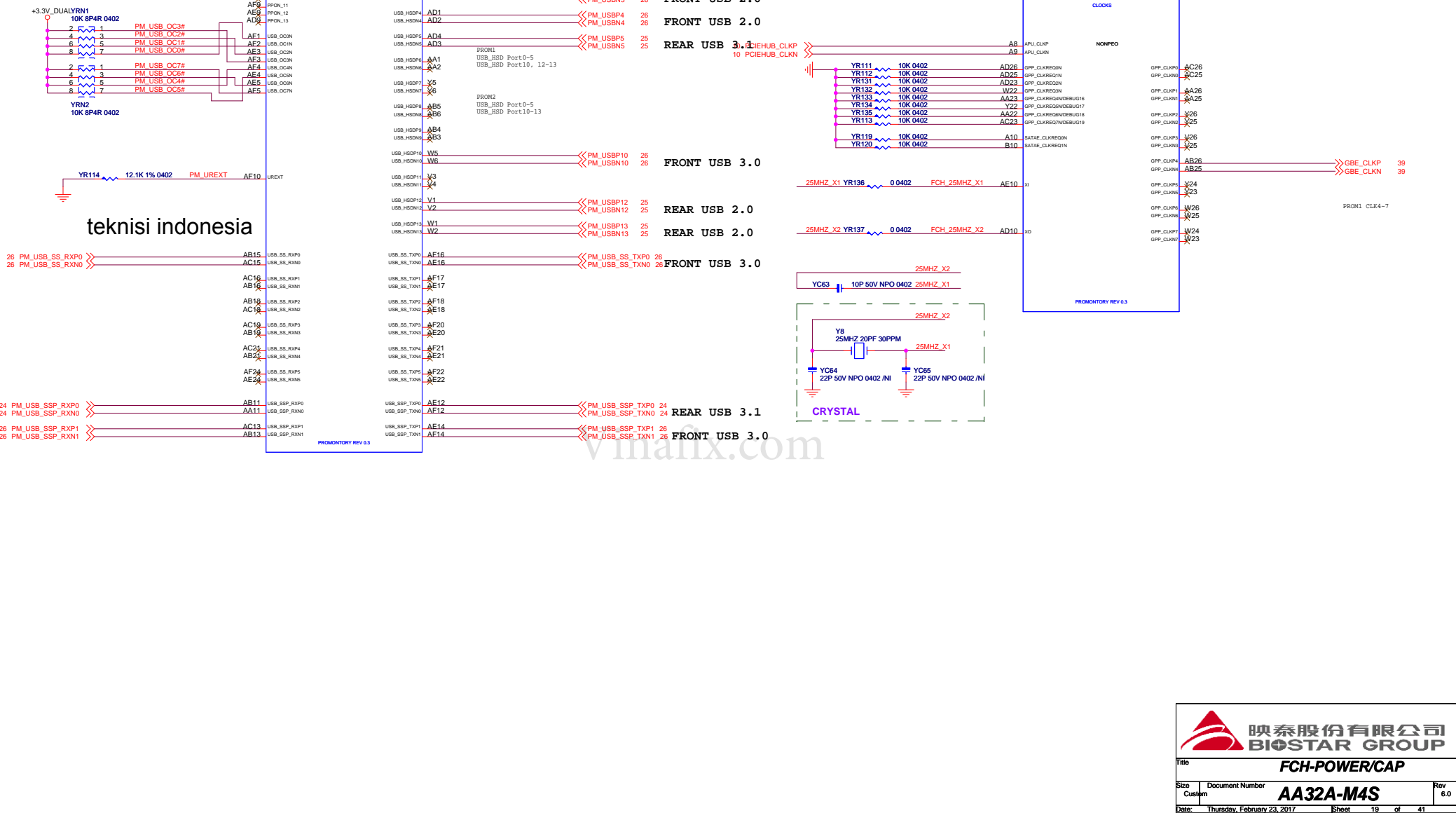
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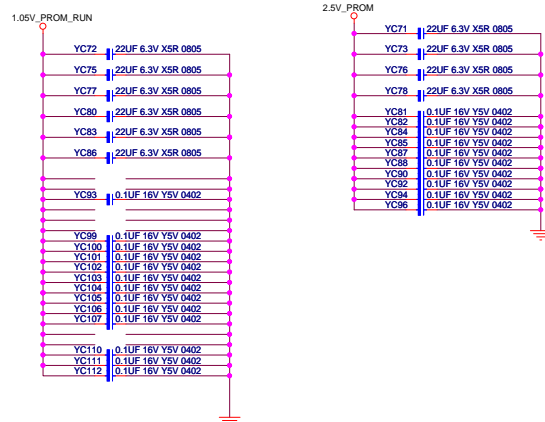
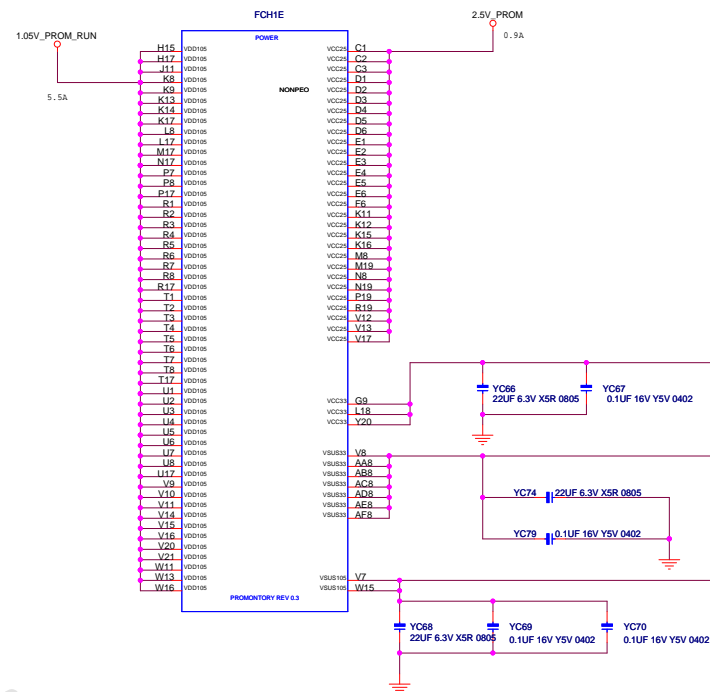
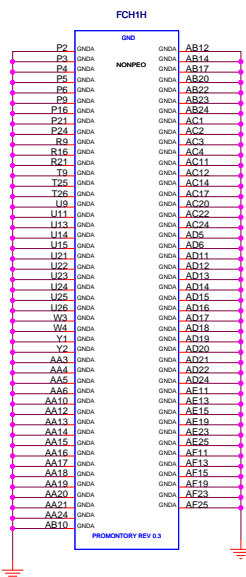
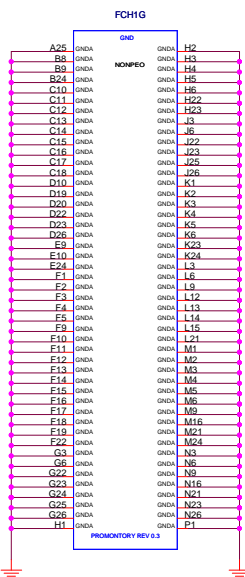
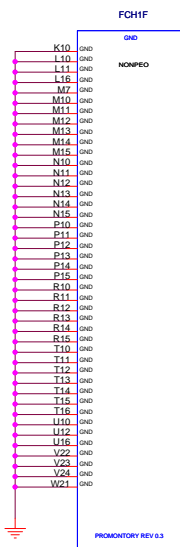


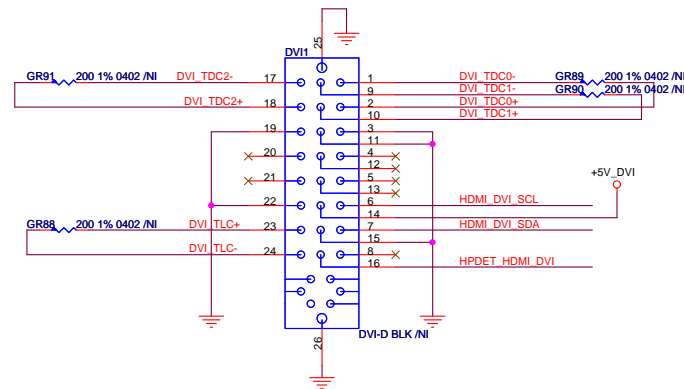
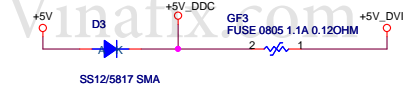
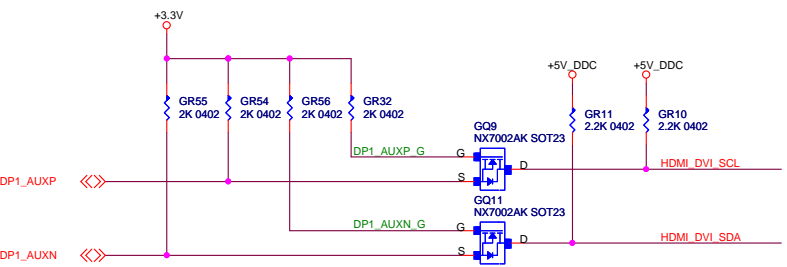


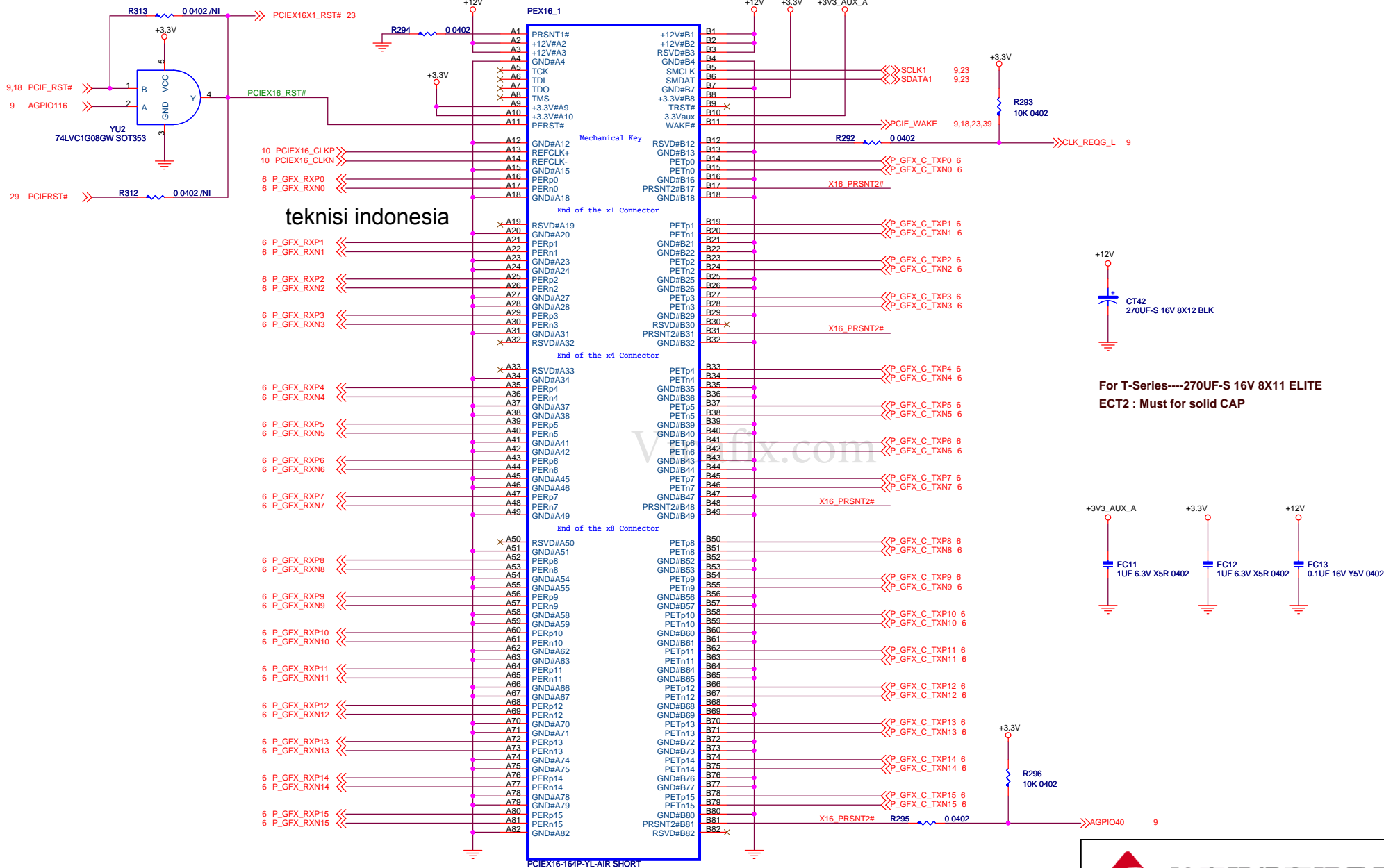


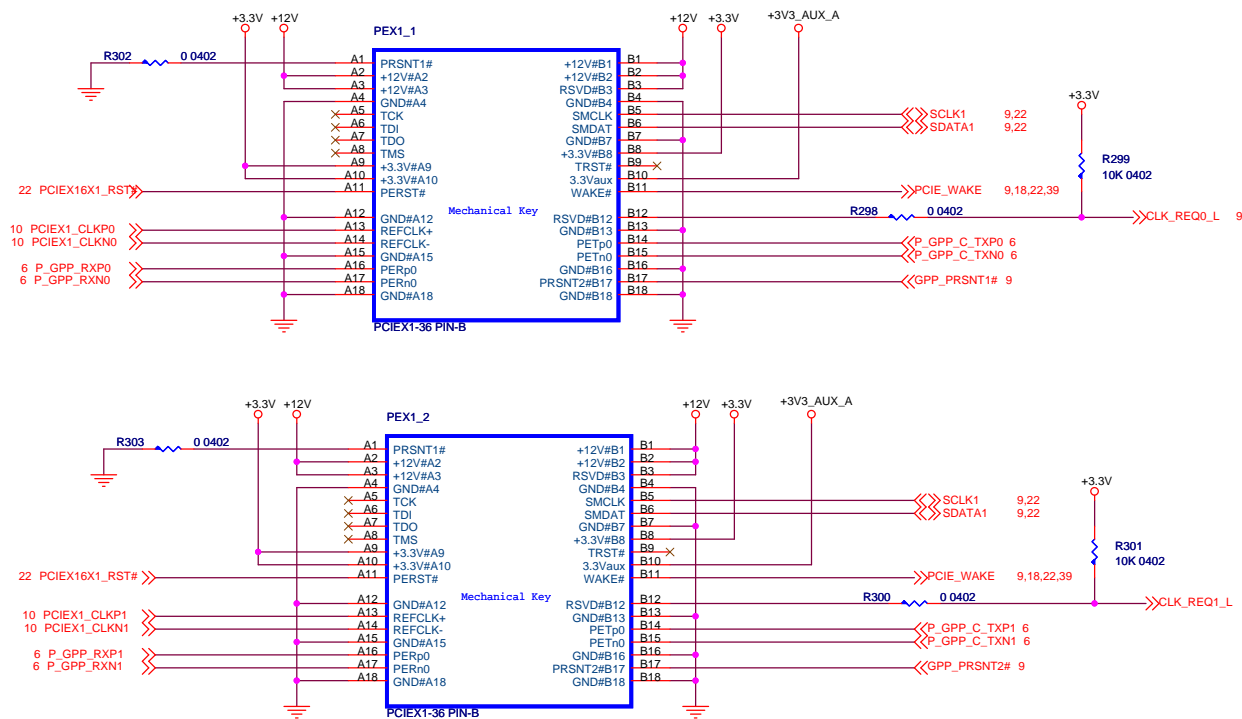






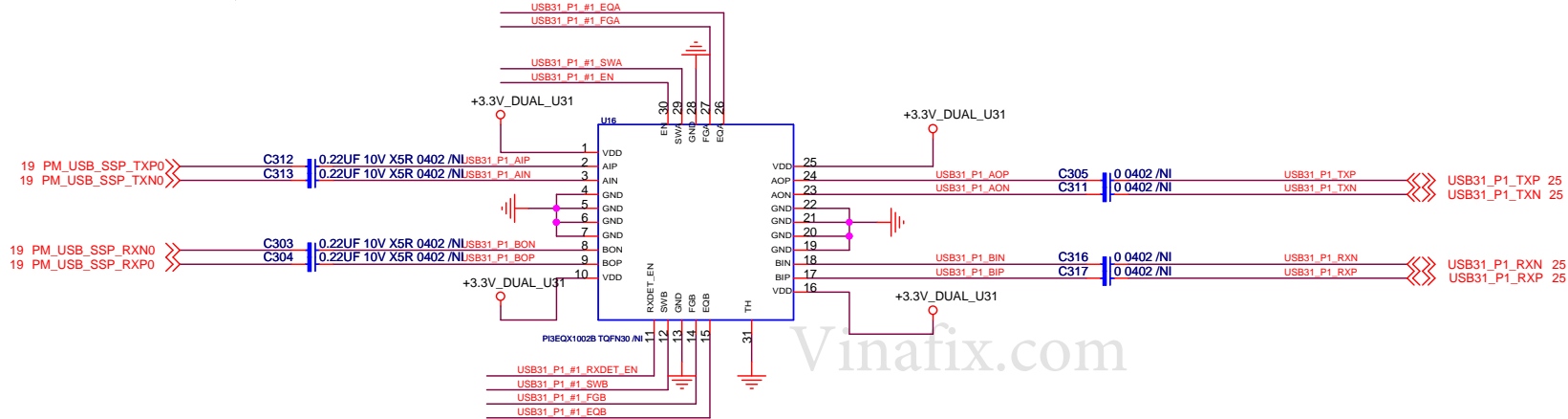
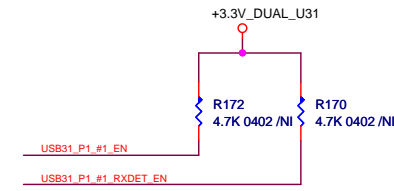
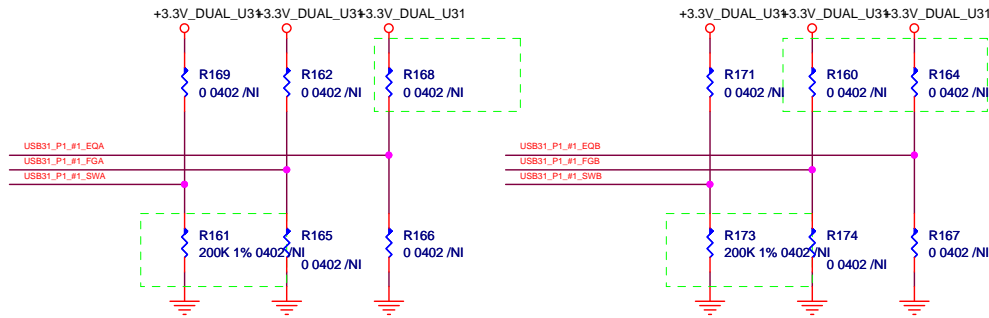
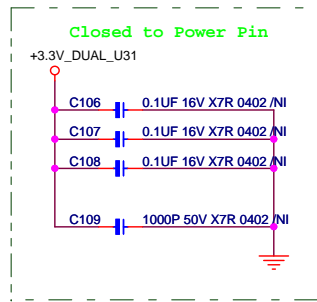




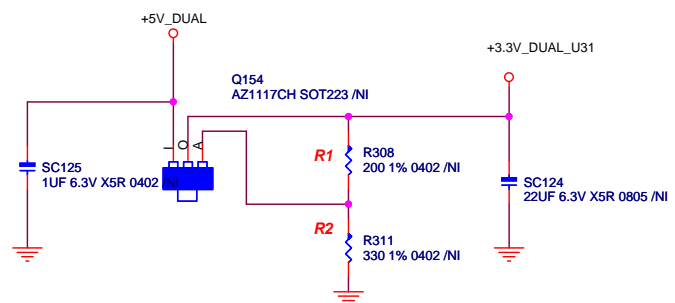
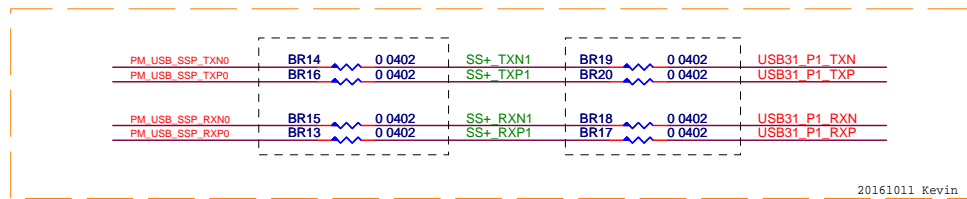


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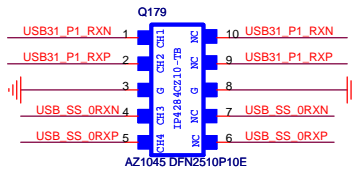
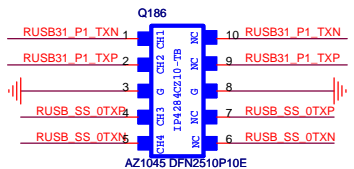
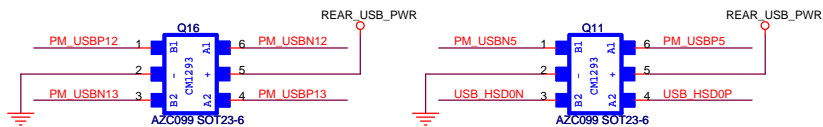
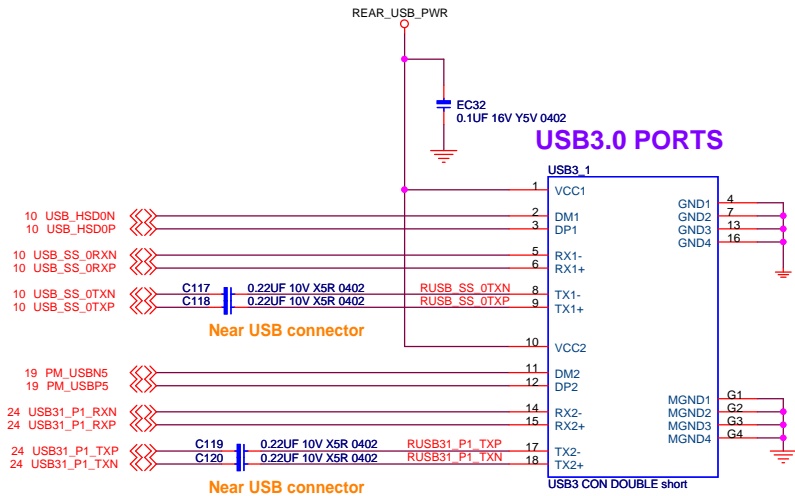
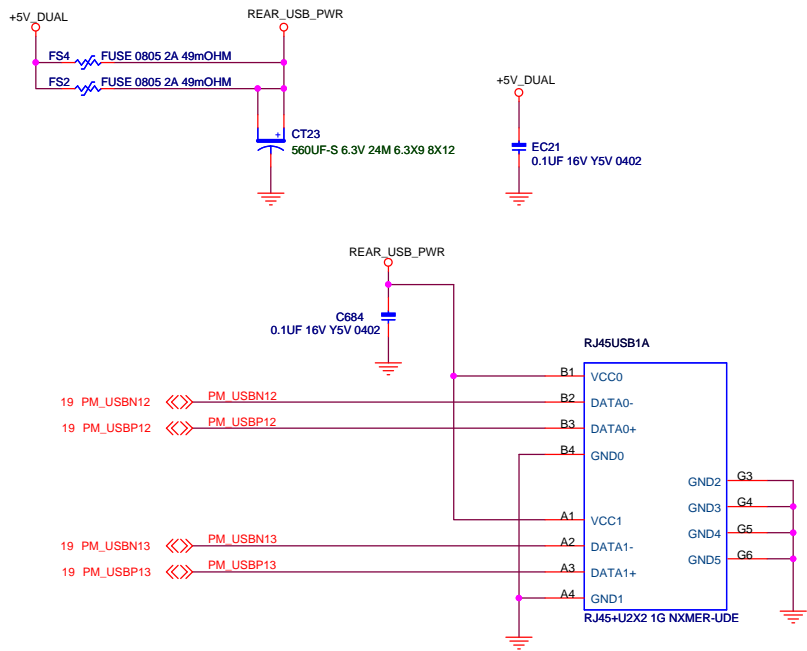
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Co-lay Re-driver for USB3.1



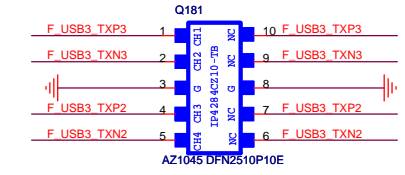
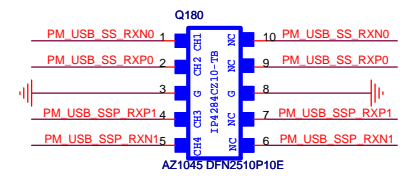
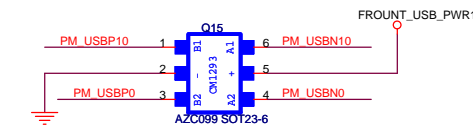
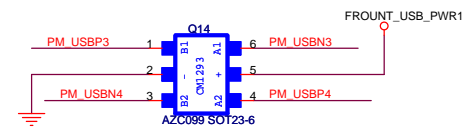
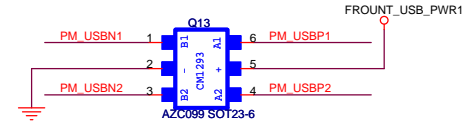
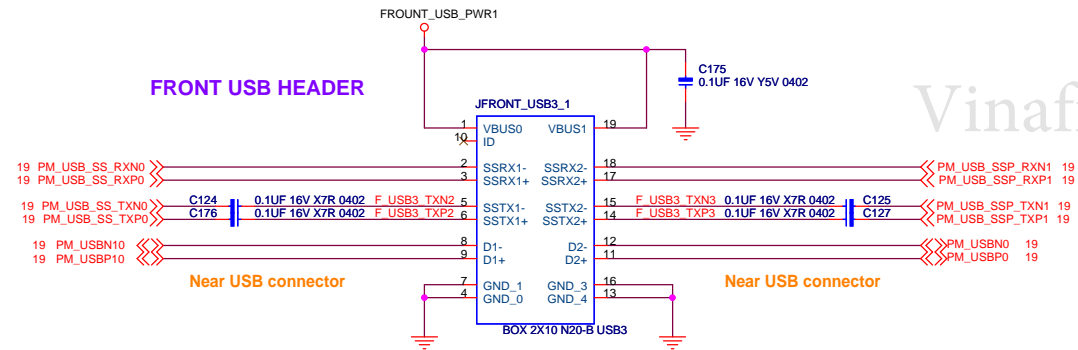
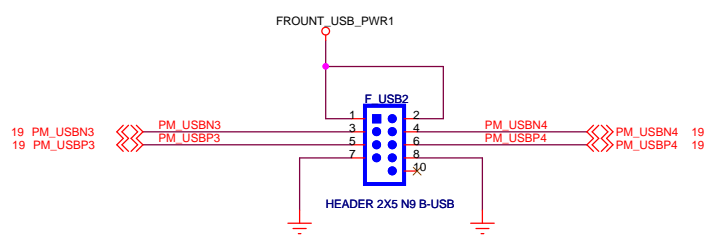
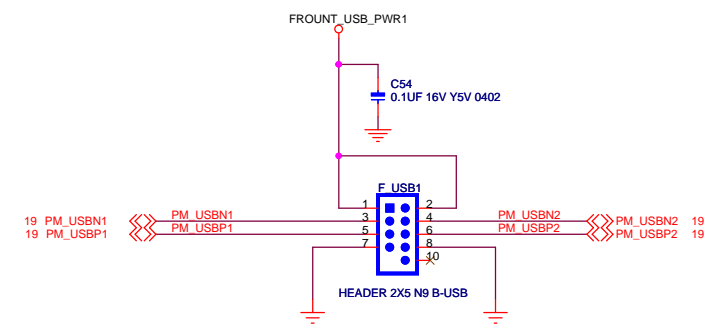
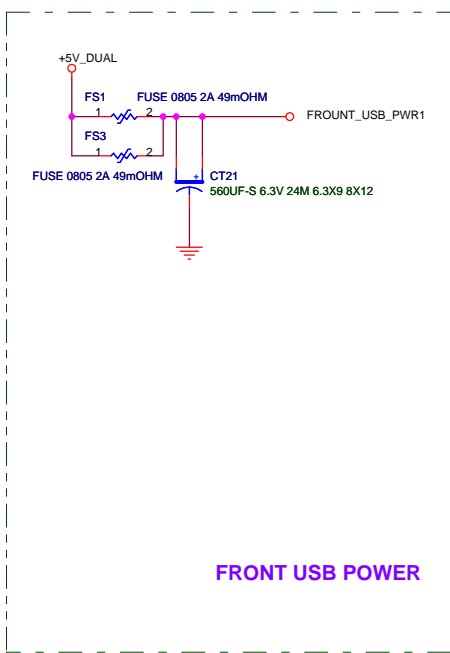
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| Title | | | DVI-I/HDMI CONNECTOR |
| Size | Document Number | Rev | |
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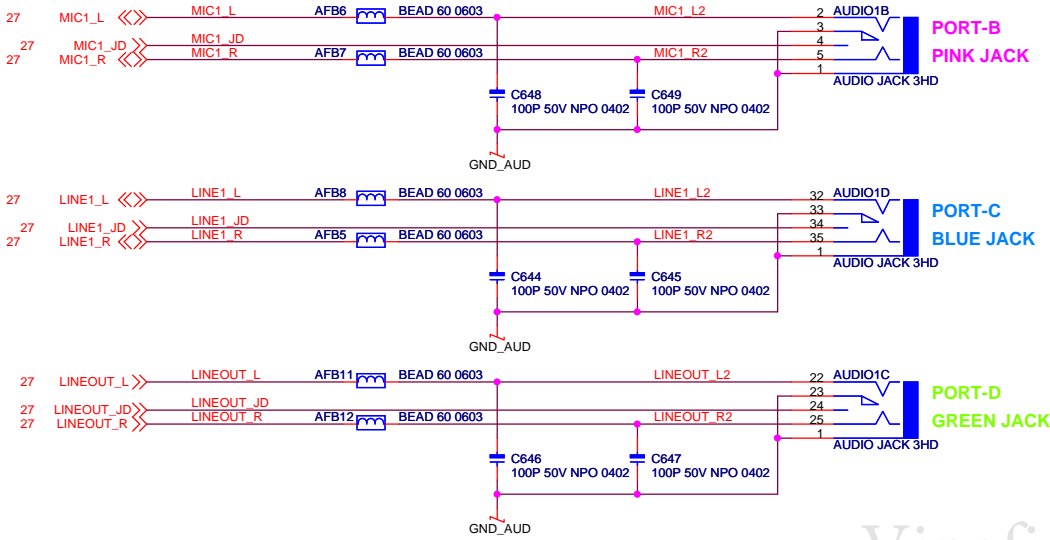
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| USB CONN | | | |
| Size | Document Number | Rev | |
| Custom | AA32A-M4S | 6.0 | |
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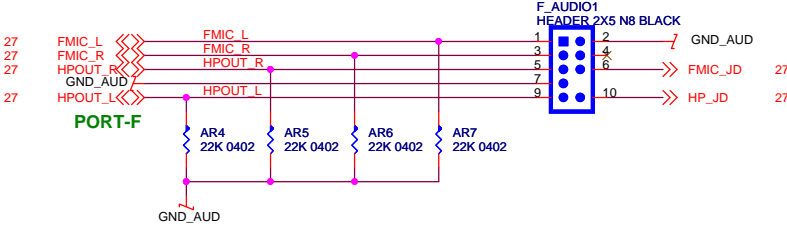


USB ESD

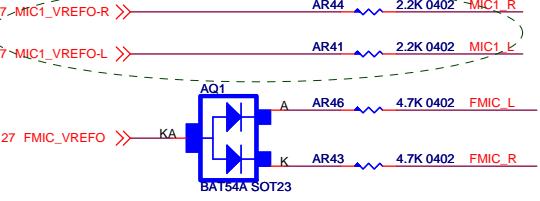
REAR AUDIO JACKS



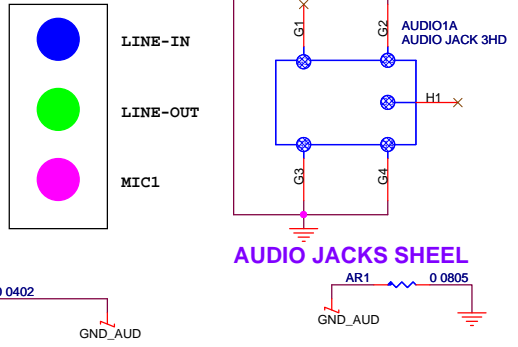
FRONT AUDIO HEADER



MIC VREF



SPDIF CONNECTOR



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NON AON
AYHAKJLUBSPHTR
GOLINOJGABGOAADMAT
WLOHBOJGABGOAADMAT
HPOHNPATJG



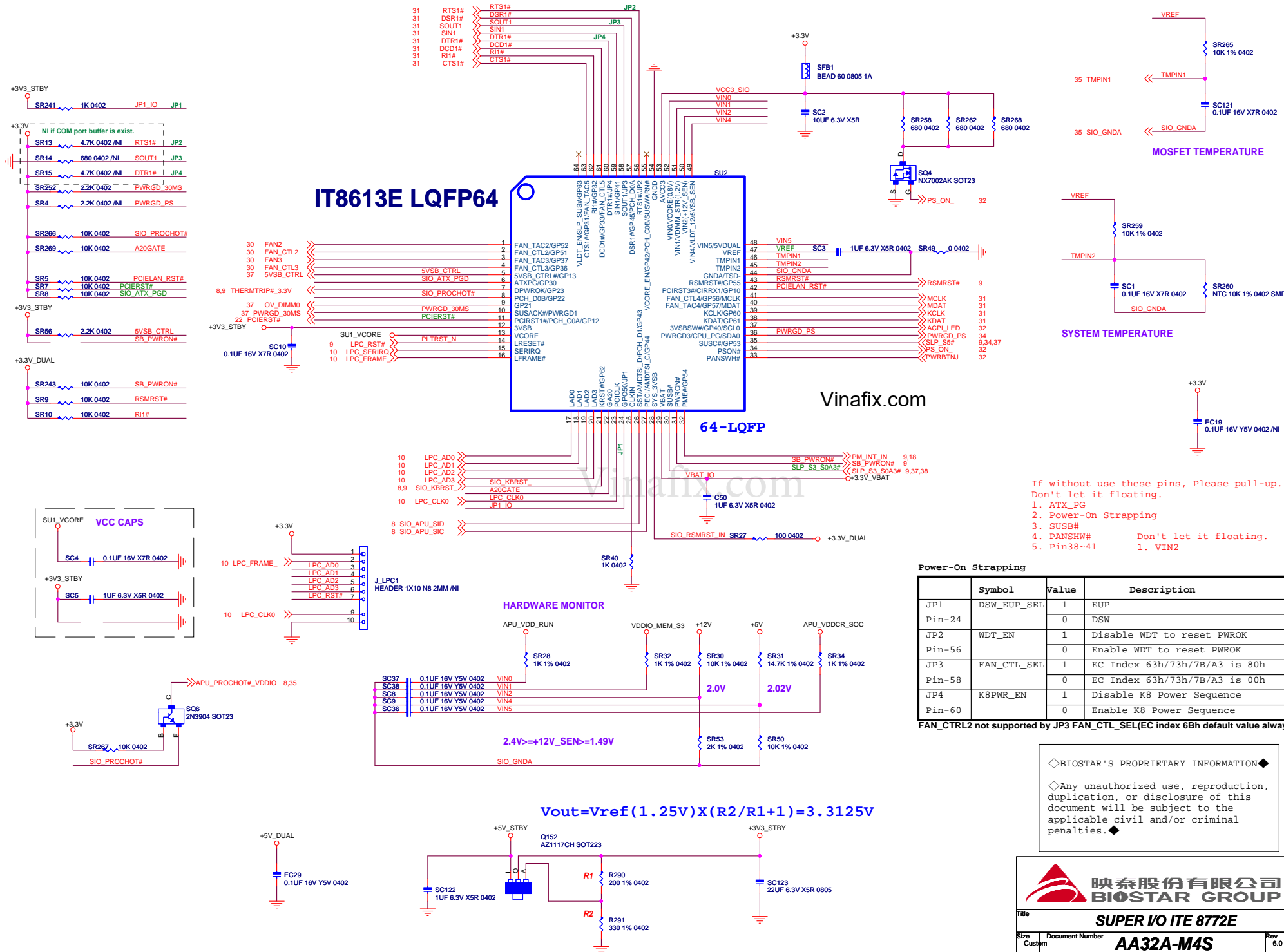
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| Size Custom | Document Number AA32A-M4S | Rev 6.0 |
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IT8613E LQFP64

64-LQFP

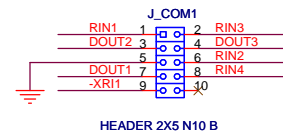
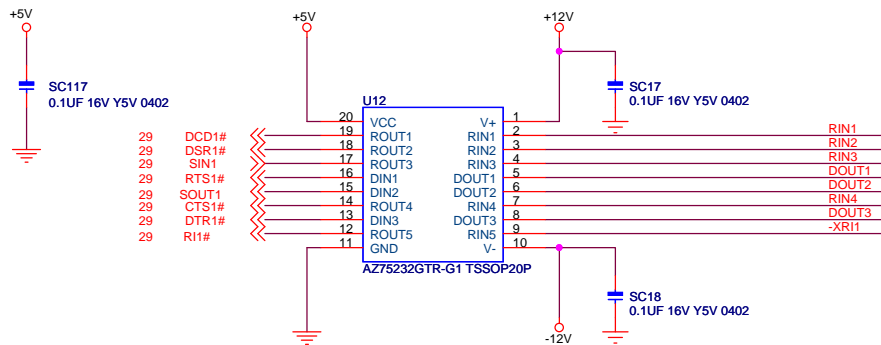
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If without use these pins, Please pull-up.
Don't let it floating.
1. ATX_PG
2. Power-On Strapping
3. SUSB#
4. PANSHW#
5. Pin38-41

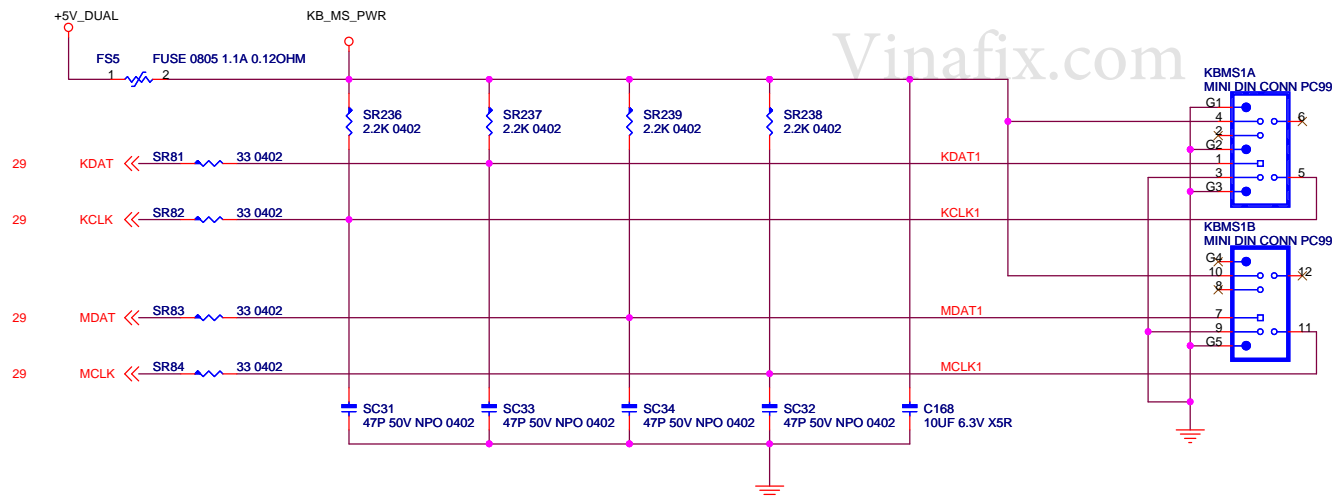
Don't let it floating.
1. VIN2

$$V_{out} = V_{ref} (1.25V) \times (R2/R1 + 1) = 3.3125V$$

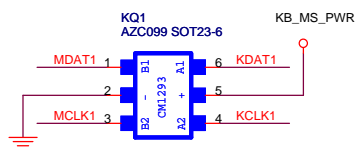


COM PORT

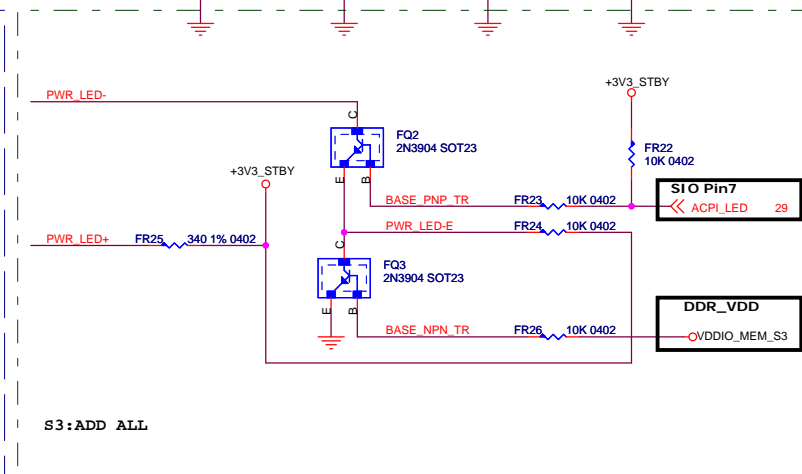
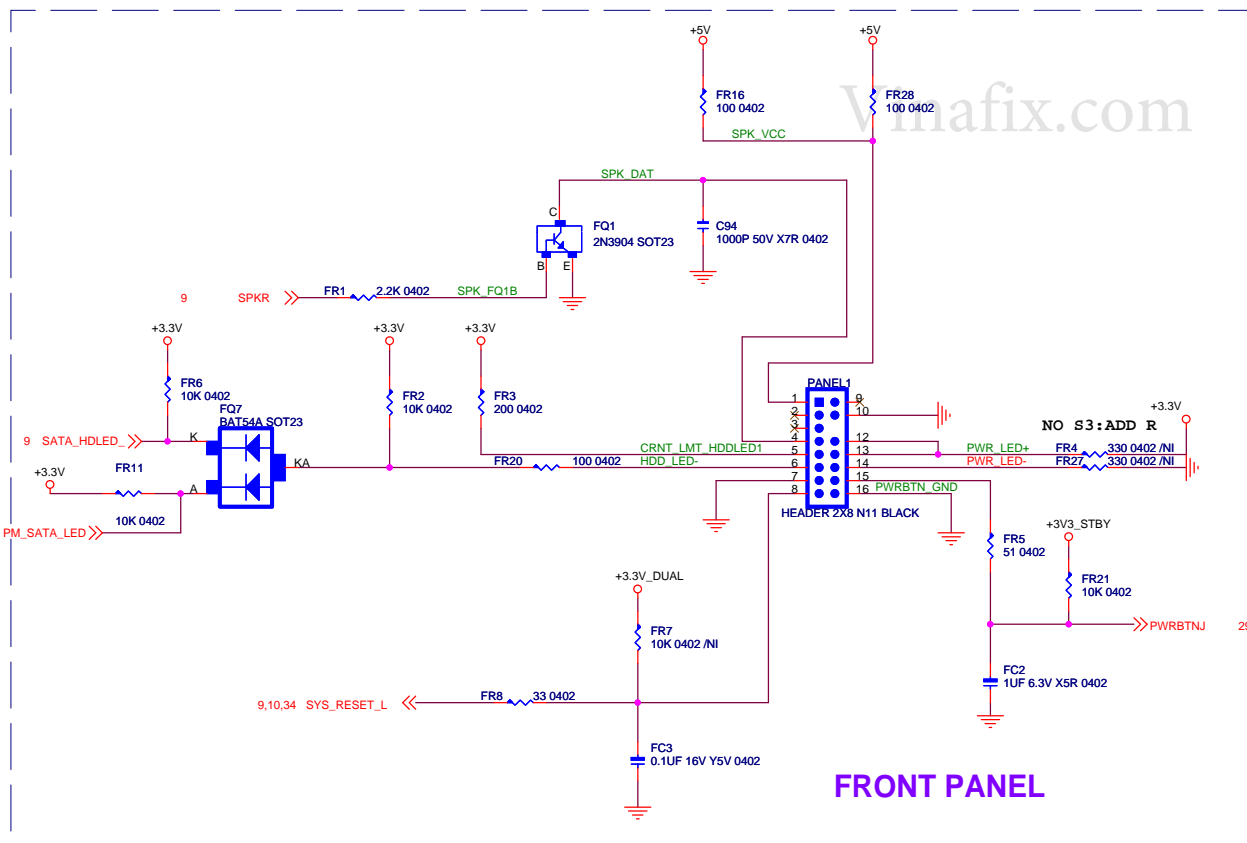
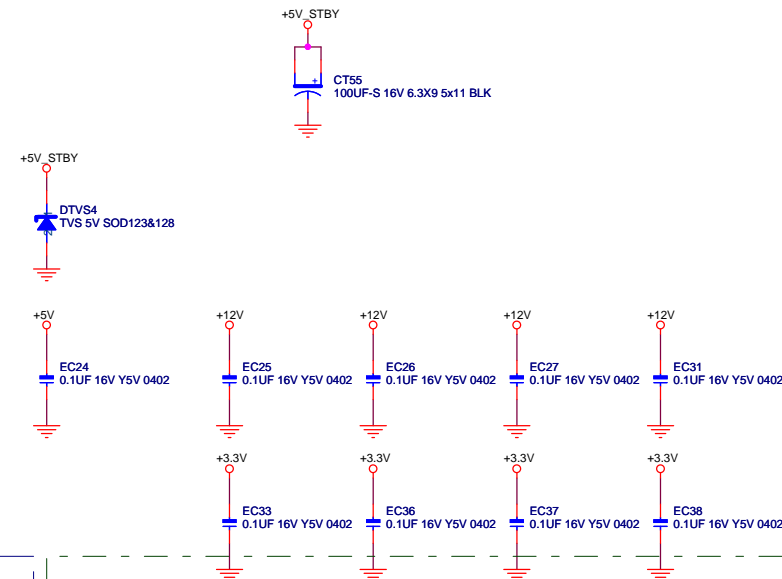
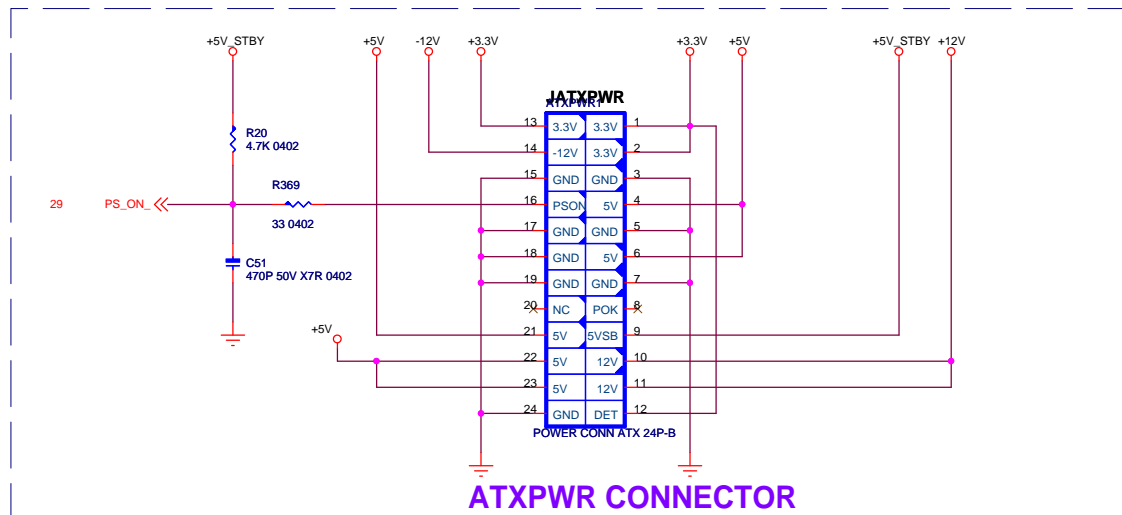
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KEYBOARD & MOUSE




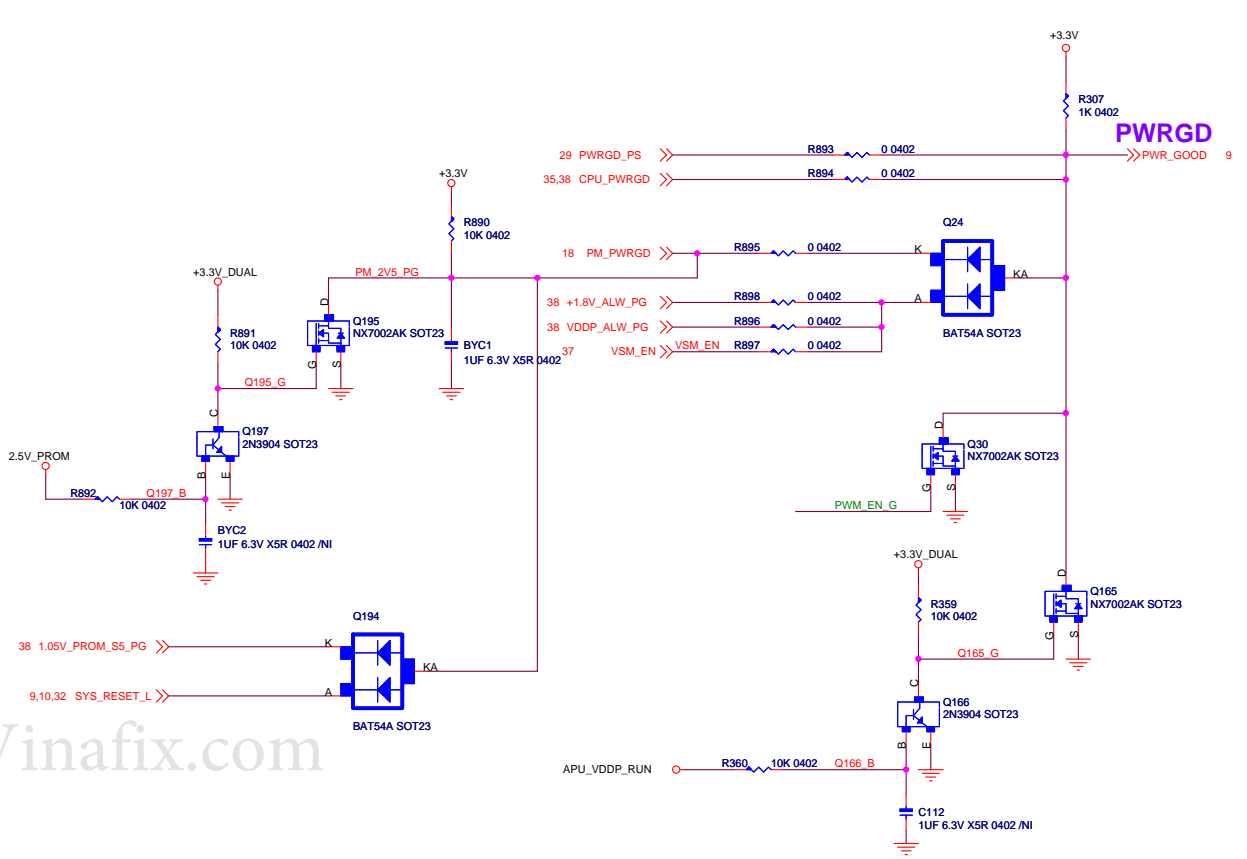
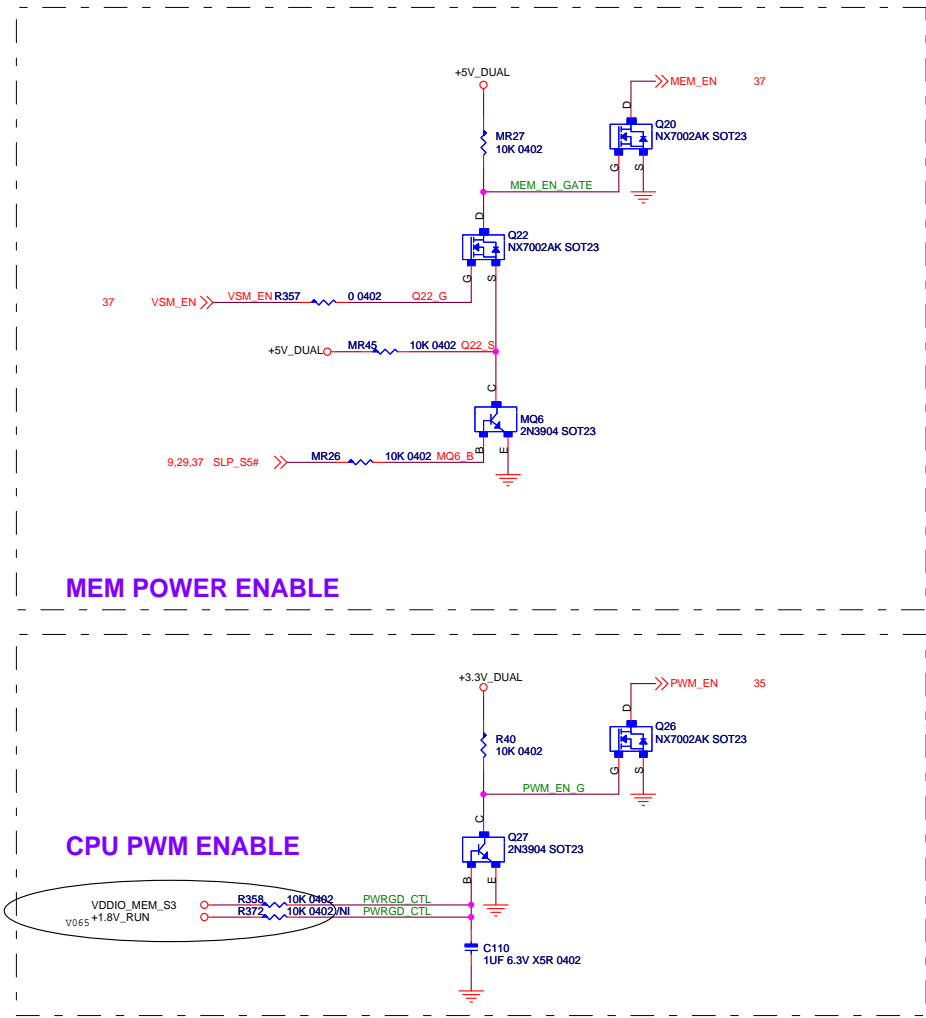
| | | | |
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|  映泰股份有限公司 BIOSSTAR GROUP | | | |
| Title | | | |
| COM Header/PS2 | | | |
| Size | Document Number | Rev | |
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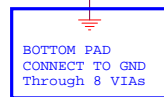


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| | | |
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| Title OVER VOLTAGE | | |
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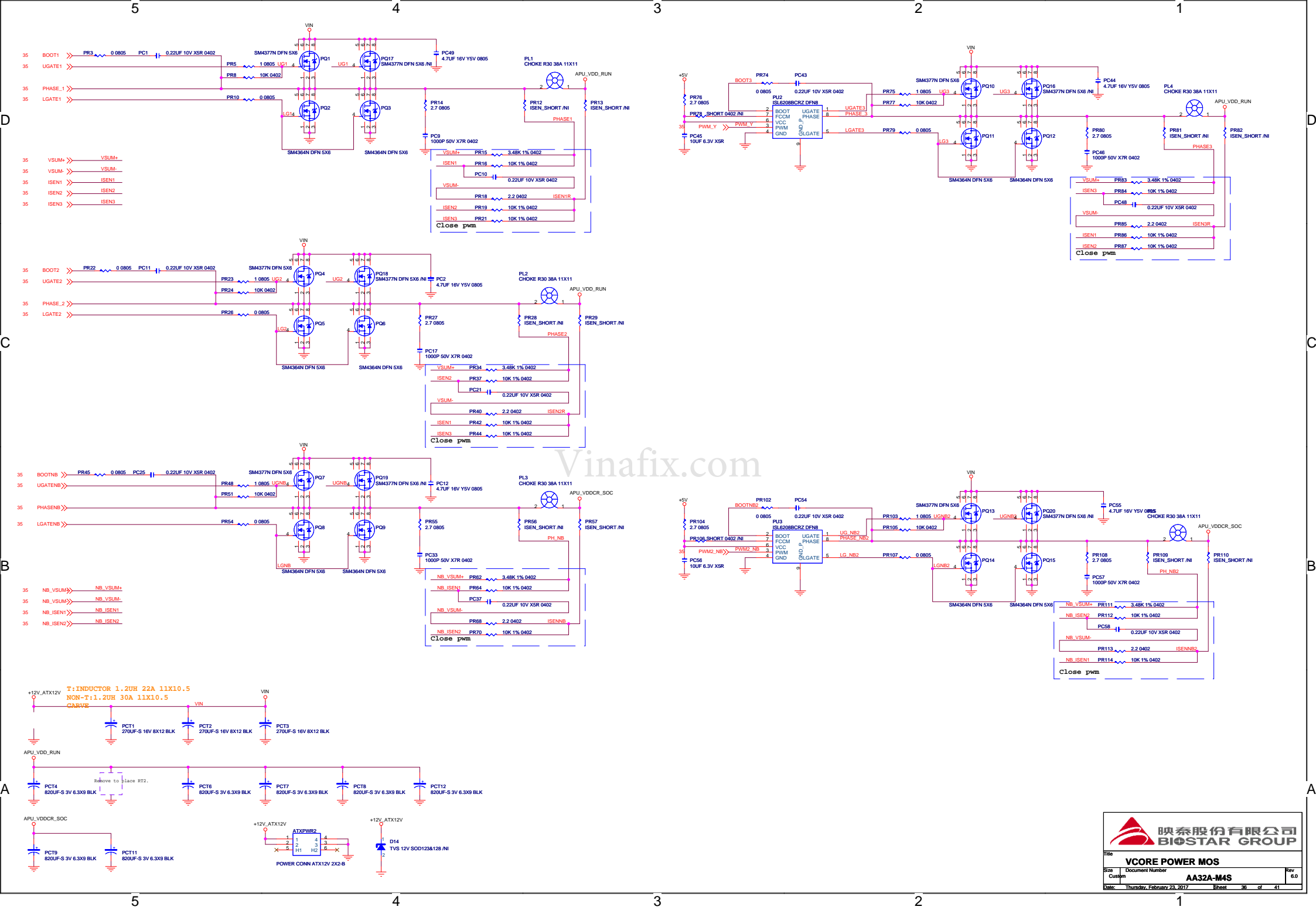


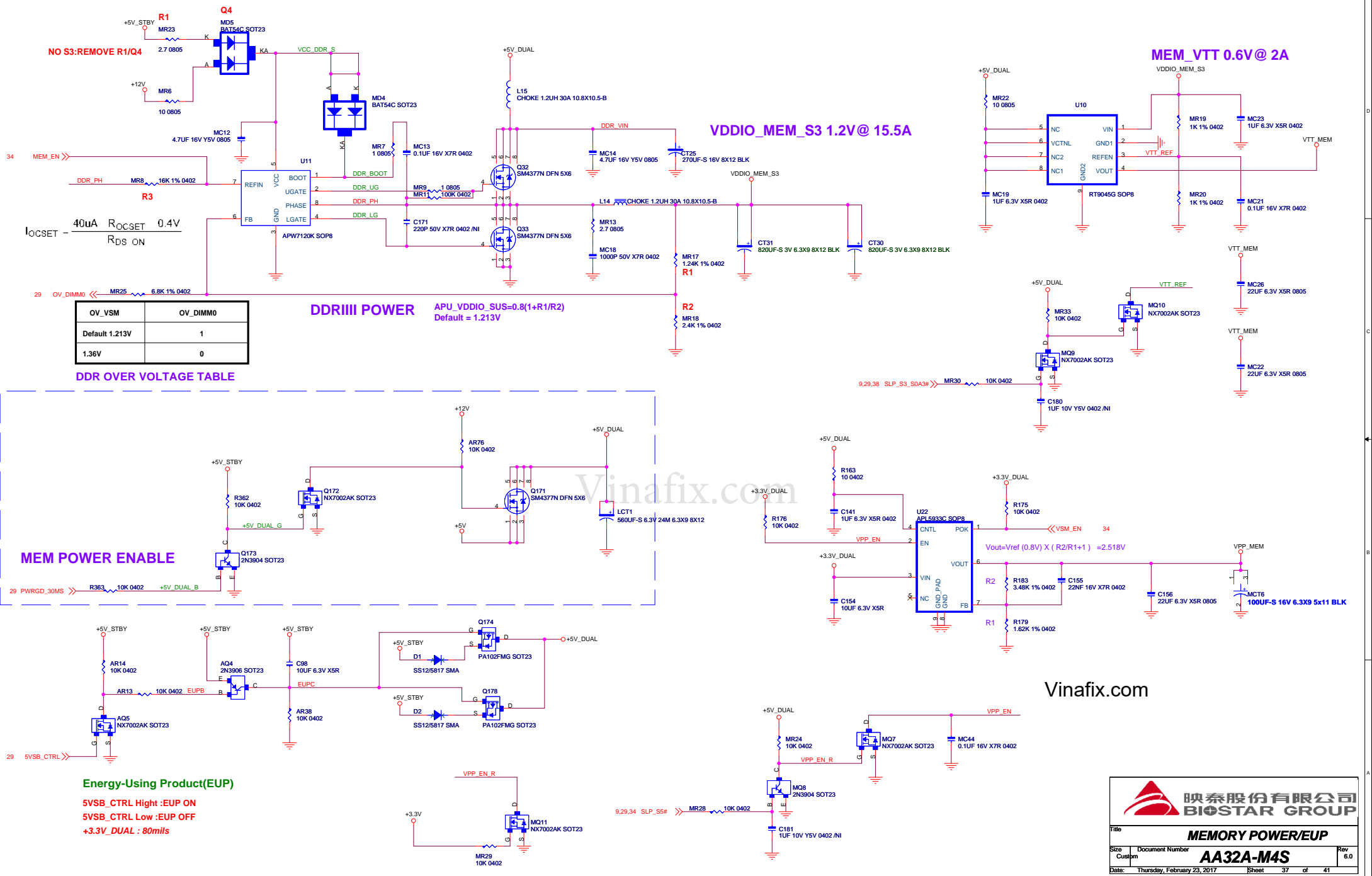


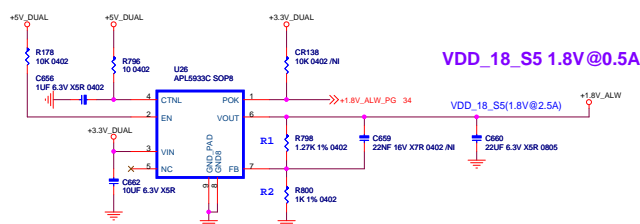
```
CPU LL : 1.3 m ohm
CPU TDC : 150A
CPU OCP : 170A

CPUNB LL : 4 m ohm
CPUNB TDC : 65A
CPUNB OCP : 98A
```

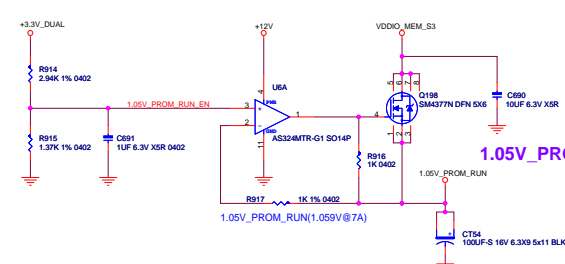




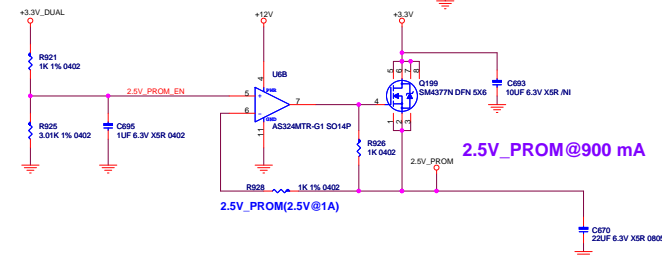




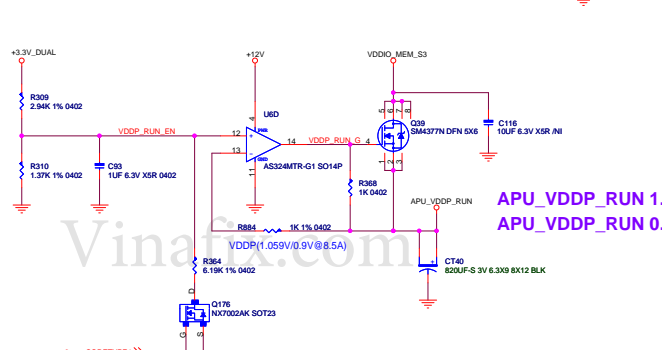
$$V_{out} = V_{ref}(0.8V) \times (R1/R2 + 1) = 1.816V @ 0.5A$$



$$1.05V_PROM_RUN @ 5.5A$$

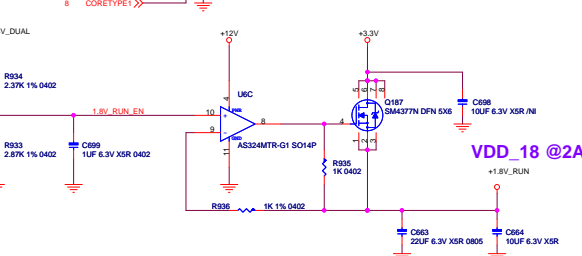


$$2.5V_PROM @ 900\text{ mA}$$



$$APU_VDDP_RUN\ 1.059V @ 8.5A$$

$$APU_VDDP_RUN\ 0.920V @ 8.5A$$

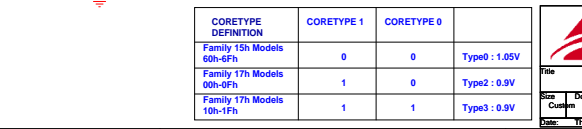


$$VDDP_ALW\ 1.062V @ 1A$$

$$VDDP_ALW\ 0.920V @ 1A$$



$$VDD_18 @ 2A$$




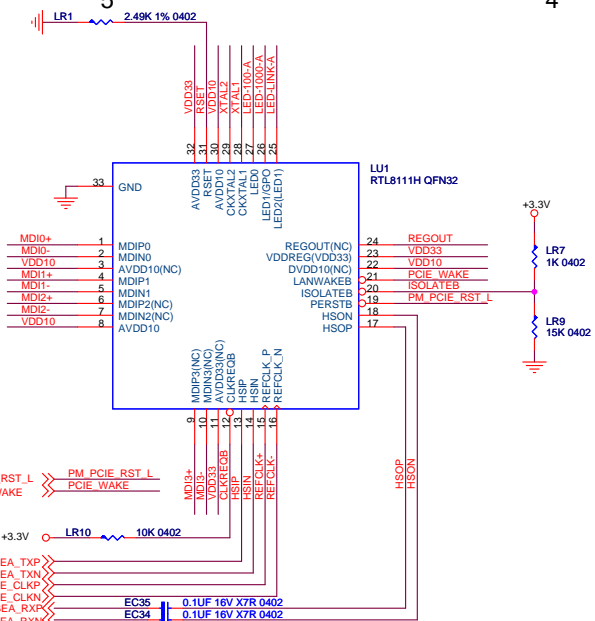
$$V_{out} = V_{ref}(0.8V) \times (R1/R2 + 1) = 3.332V @ 2A$$

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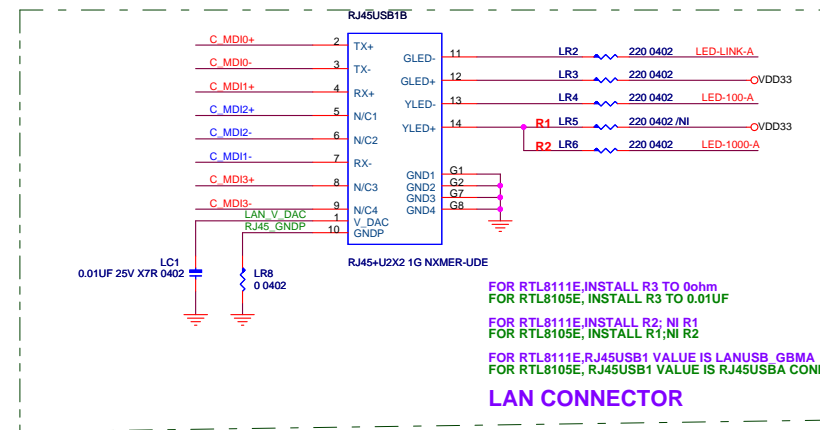
Power sequency

| CORETYPE DEFINITION | CORETYPE 1 | CORETYPE 0 | |
|---------------------------|------------|------------|---------------|
| Family 15h Models 60h-6Fh | 0 | 0 | Type0 : 1.05V |
| Family 17h Models 00h-0Fh | 1 | 0 | Type2 : 0.9V |
| Family 17h Models 10h-1Fh | 1 | 1 | Type3 : 0.9V |

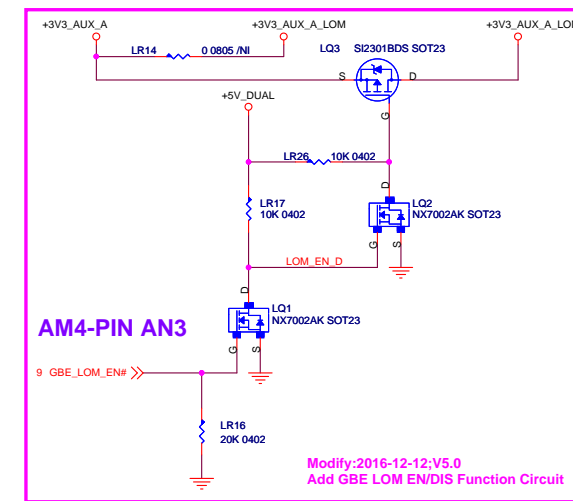
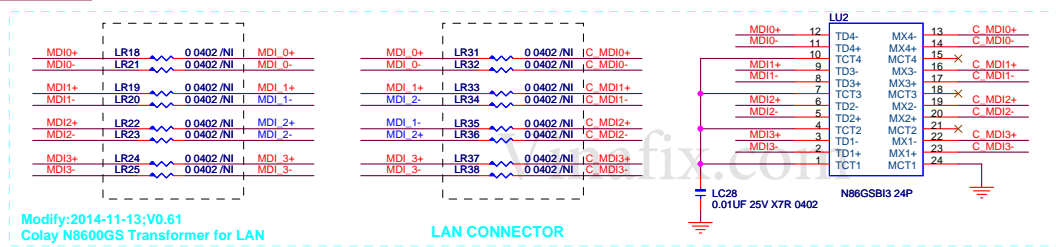
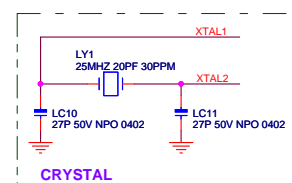
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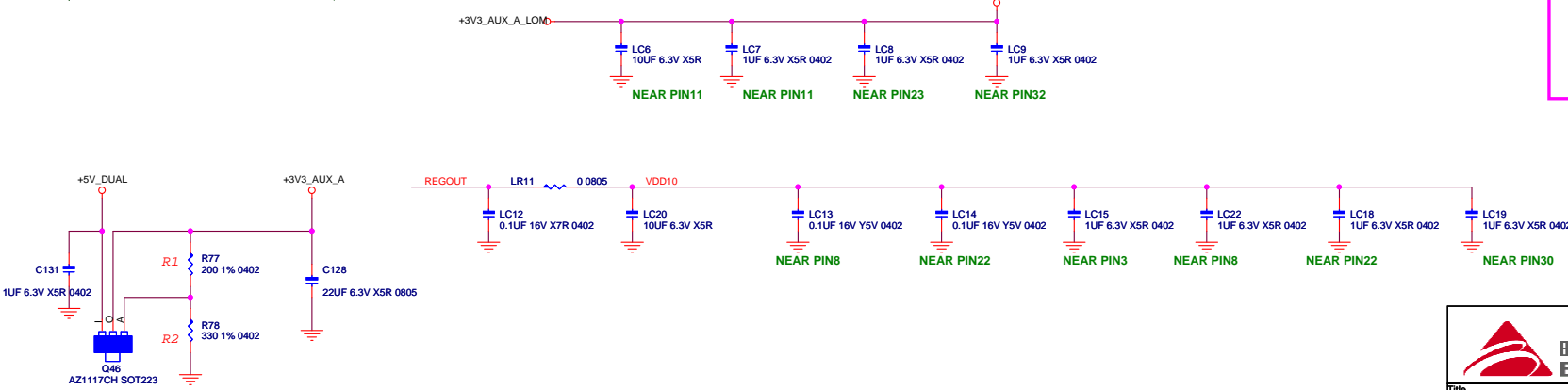
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FOR RTL8111E, INSTALL R3 TO 0ohm
FOR RTL8105E, INSTALL R3 TO 0.01UF
FOR RTL8111E, INSTALL R2; NI R1
FOR RTL8105E, INSTALL R1; NI R2
FOR RTL8111E, RJ45USB1 VALUE IS LANUSB_GBMA
FOR RTL8105E, RJ45USB1 VALUE IS RJ45USBA_CONN



Modify:2016-12-12;V5.0
Add GBE LOM EN/DIS Function Circuit



$$V_{out} = V_{ref} (1.25V) \times (1 + R2/R1) = 3.3125V$$

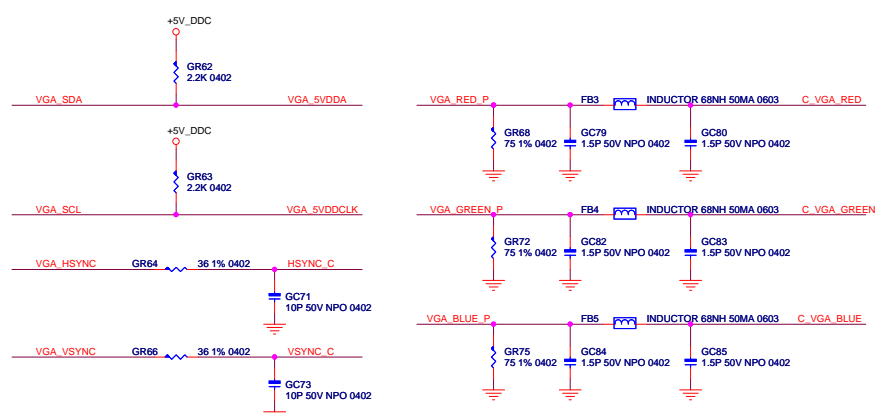
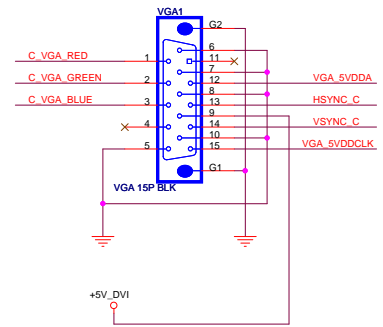
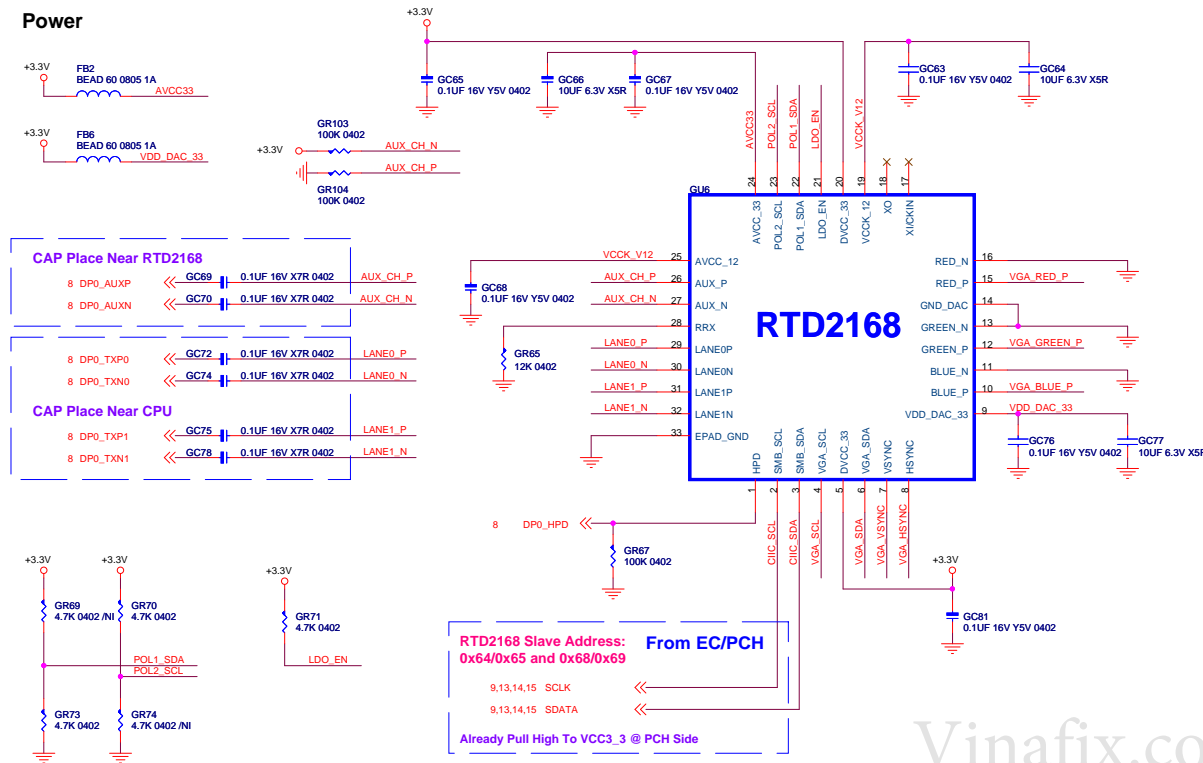
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BIOSTAR GROUP

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Power



Mode Configure Table(Power On Latch)

| | | POL1_SDA(PIN22) | |
|-----------------|---|-----------------|-------------|
| | | 0 | 1 |
| POL2_SCL(PIN23) | 0 | X | EP MODE |
| | 1 | ROM ONLY MODE | EEPROM MODE |

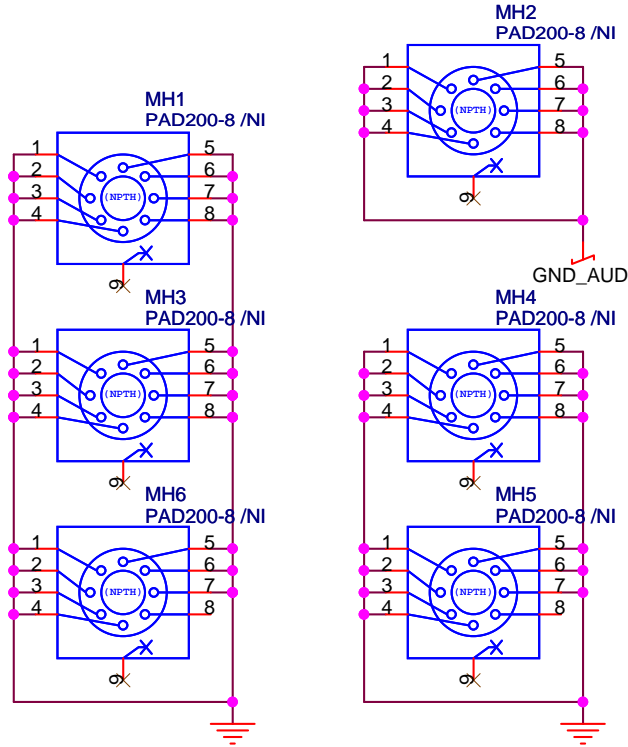
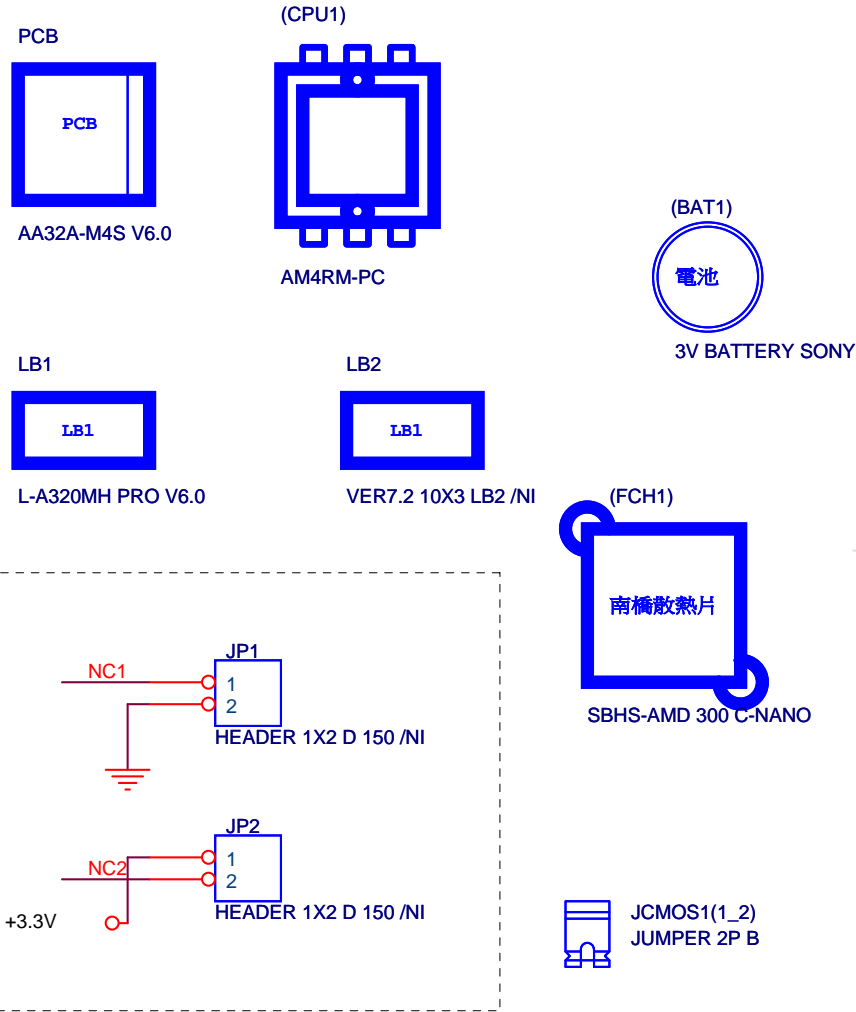
Embedded LDO

| LDO_EN(PIN21) | |
|------------------------------|-----------------------------|
| 0 | 1 |
| VCCCK_V12 from External 1.2V | VCCCK_V12 from Embedded LDO |

| Table 12 Power consumption by using embedded LDO and embedded clock source | | | | | | |
|--|------------|-----|-----|-----|------|--|
| Active Resolution / Standby | DP Config. | Min | Typ | Max | Unit | |
| 1280x800x60(74.25-MHz) | 1-Lane | - | 400 | 450 | mW | |
| 1600x900x60(103-MHz) | 1-Lane | - | 420 | 480 | mW | |
| 1920x1080x60(148-MHz) | 2-Lane | - | 480 | 595 | mW | |
| Stand-by mode | - | - | 7.5 | 8 | mW | |

| Title | | | |
|--------------------|-----------------------------|-------|----------|
| RTD2168 EDP to VGA | | | |
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