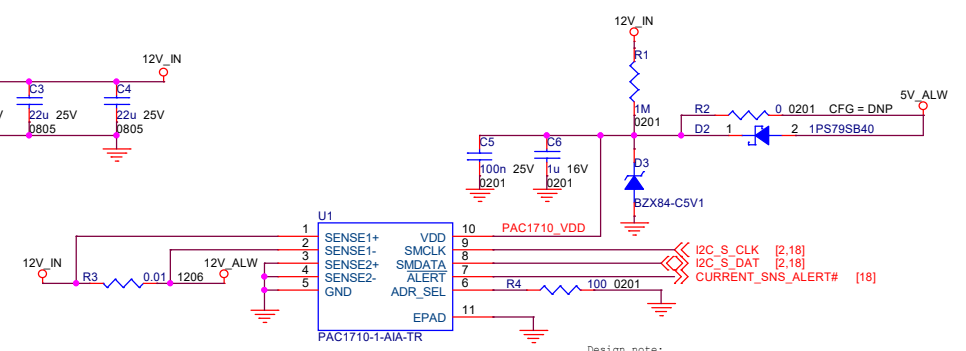
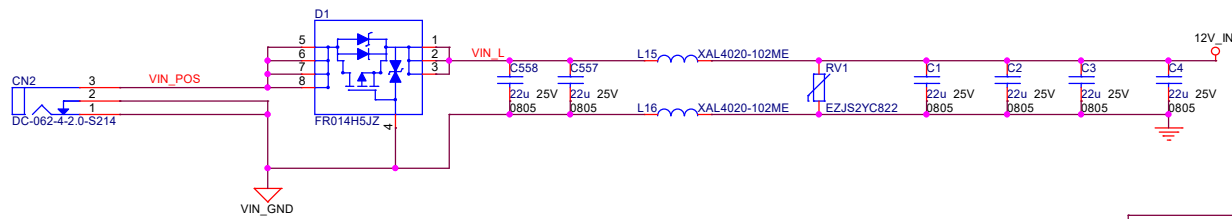
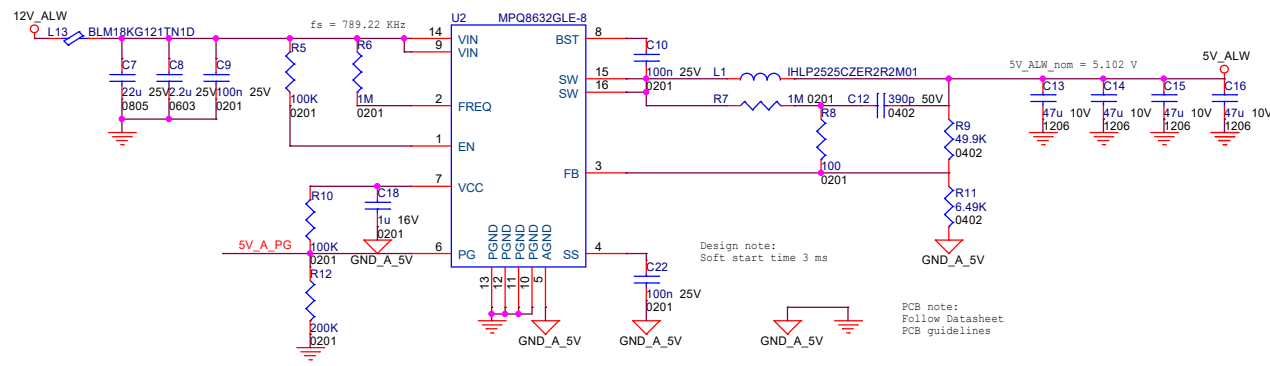


SD02 - Udoo x86 with Intel® Apollo Lake

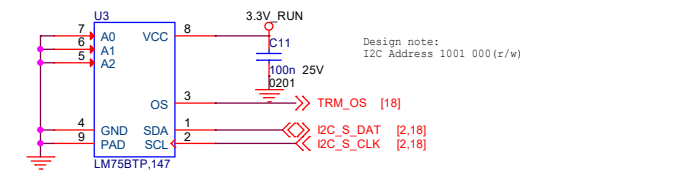


Design note:
I2C address options
R4 placed -> Address 1001 101 (r/w)
R4 not placed -> Address 0011 000 (r/w)

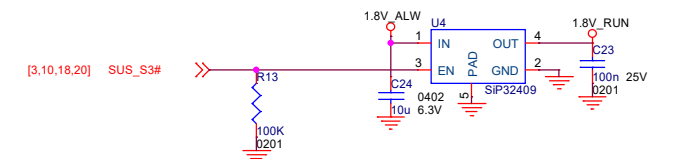


Design note:
Soft start time 3 ms

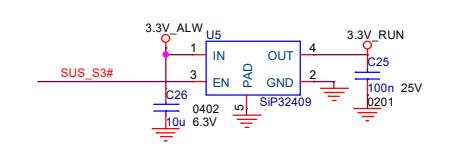
PCB note:
Follow Datasheet
PCB guidelines



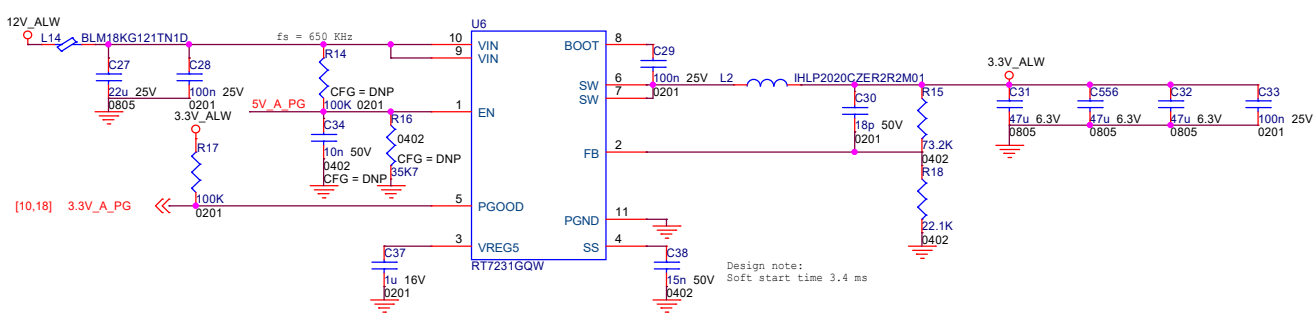
Design note:
I2C Address 1001 000 (r/w)



[3,10,18,20] SUS_S3#

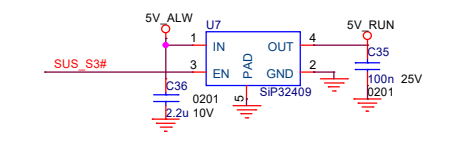


[3,10,18,20] SUS_S3#



Design note:
Soft start time 3.4 ms

[10,18] 3.3V_A_PG

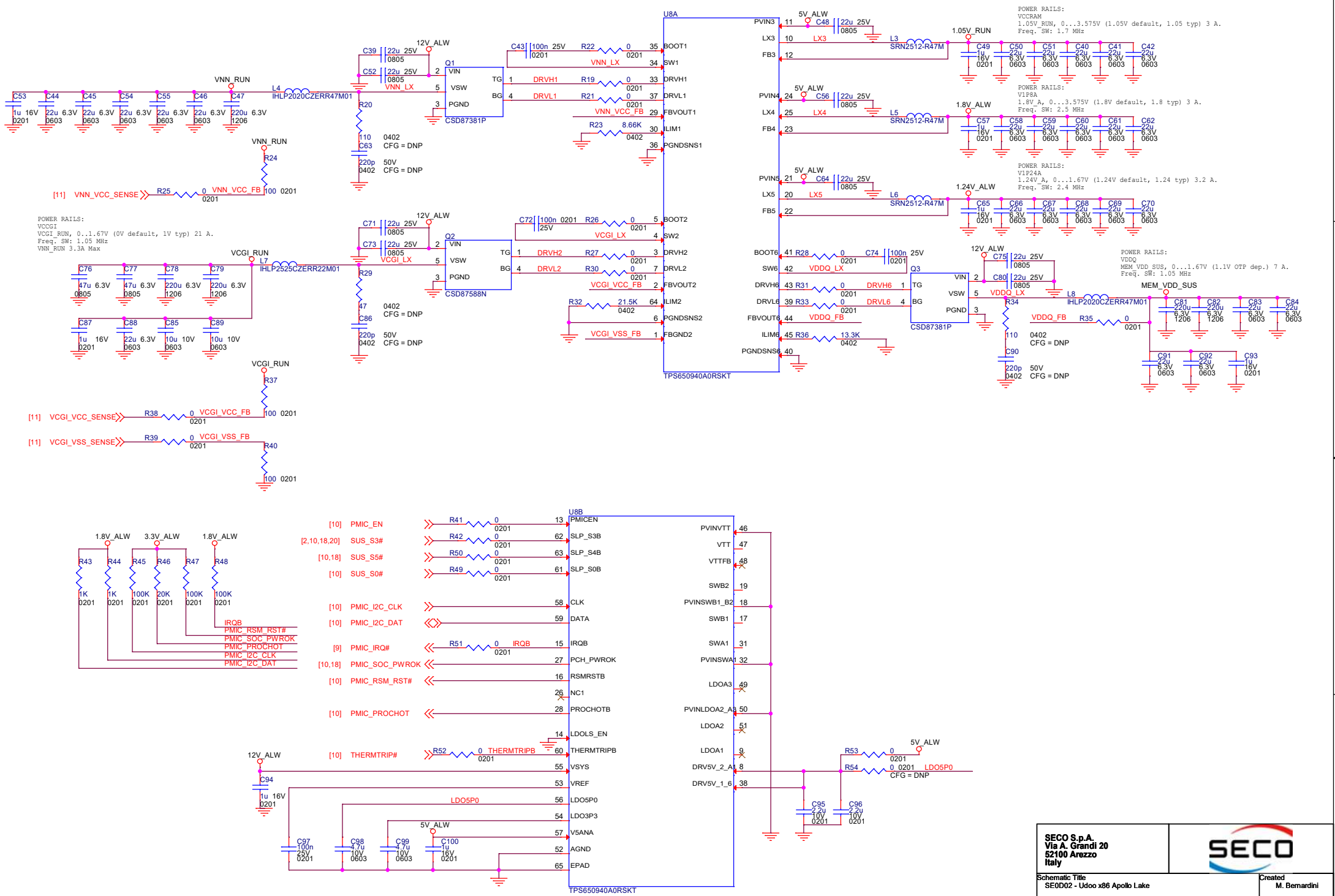


[3,10,18,20] SUS_S3#

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| | | |
|--|----------------------|--------------------------|
| Schematic Title SE0D02 - Udoo x86 Apollo Lake | | Created M. Bernardini |
| Size A3 | Page Name POWER 1 | Rev A0 |
| Date: Wednesday, October 16, 2019 | | Sheet 2 of 26 |



POWER RAILS:
 VCCGI
 VCGI_RUN, 0...1.67V (0V default, 1V typ) 21 A.
 Freq. SW: 1.05 MHz
 VNN_RUN 3.3A Max

POWER RAILS:
 VCCGRM
 1.05V_RUN, 0...3.575V (1.05V default, 1.05 typ) 3 A.
 Freq. SW: 1.7 MHz

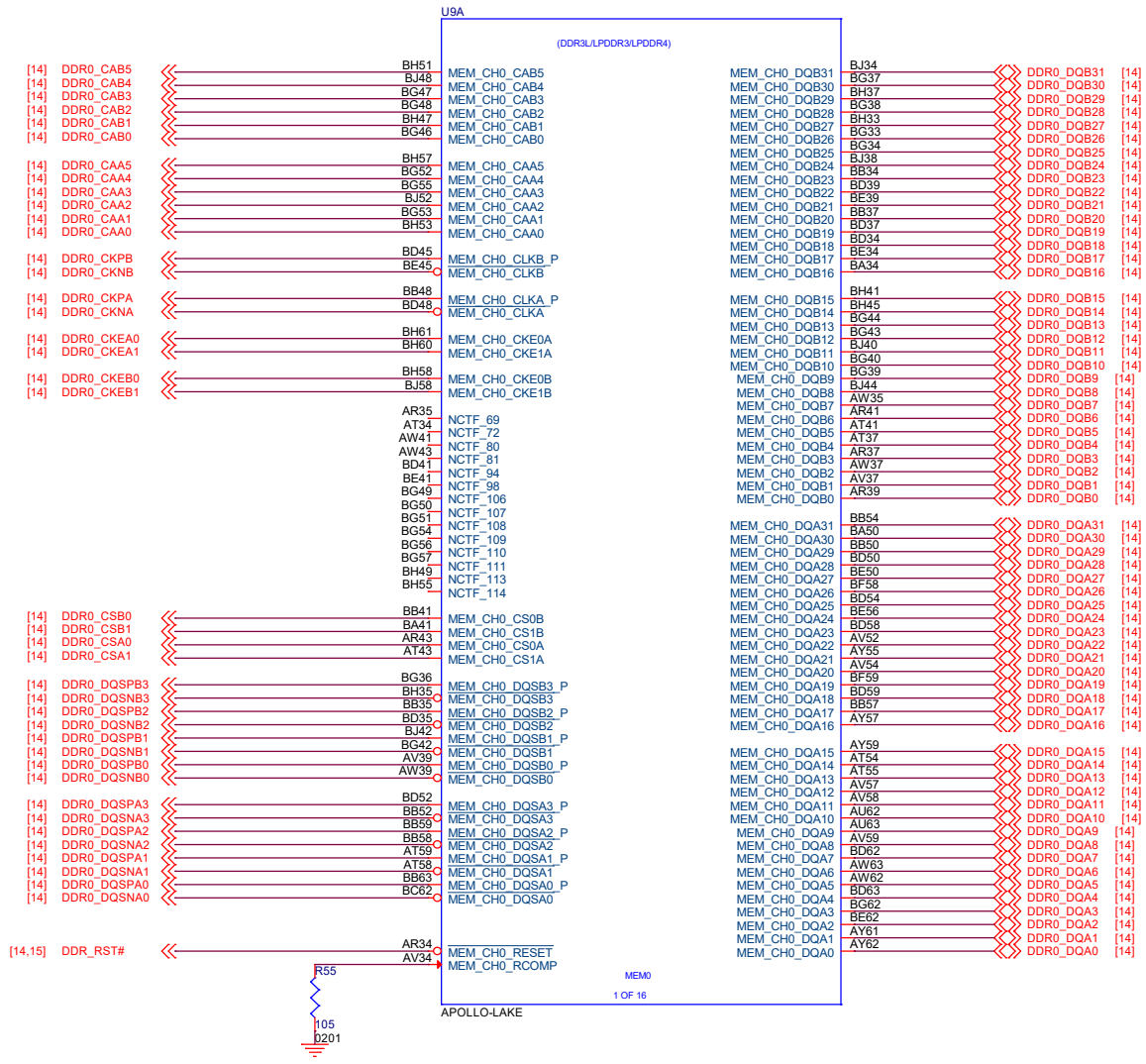
POWER RAILS:
 VIP8A
 1.8V_ALW, 0...3.575V (1.8V default, 1.8 typ) 3 A.
 Freq. SW: 2.5 MHz

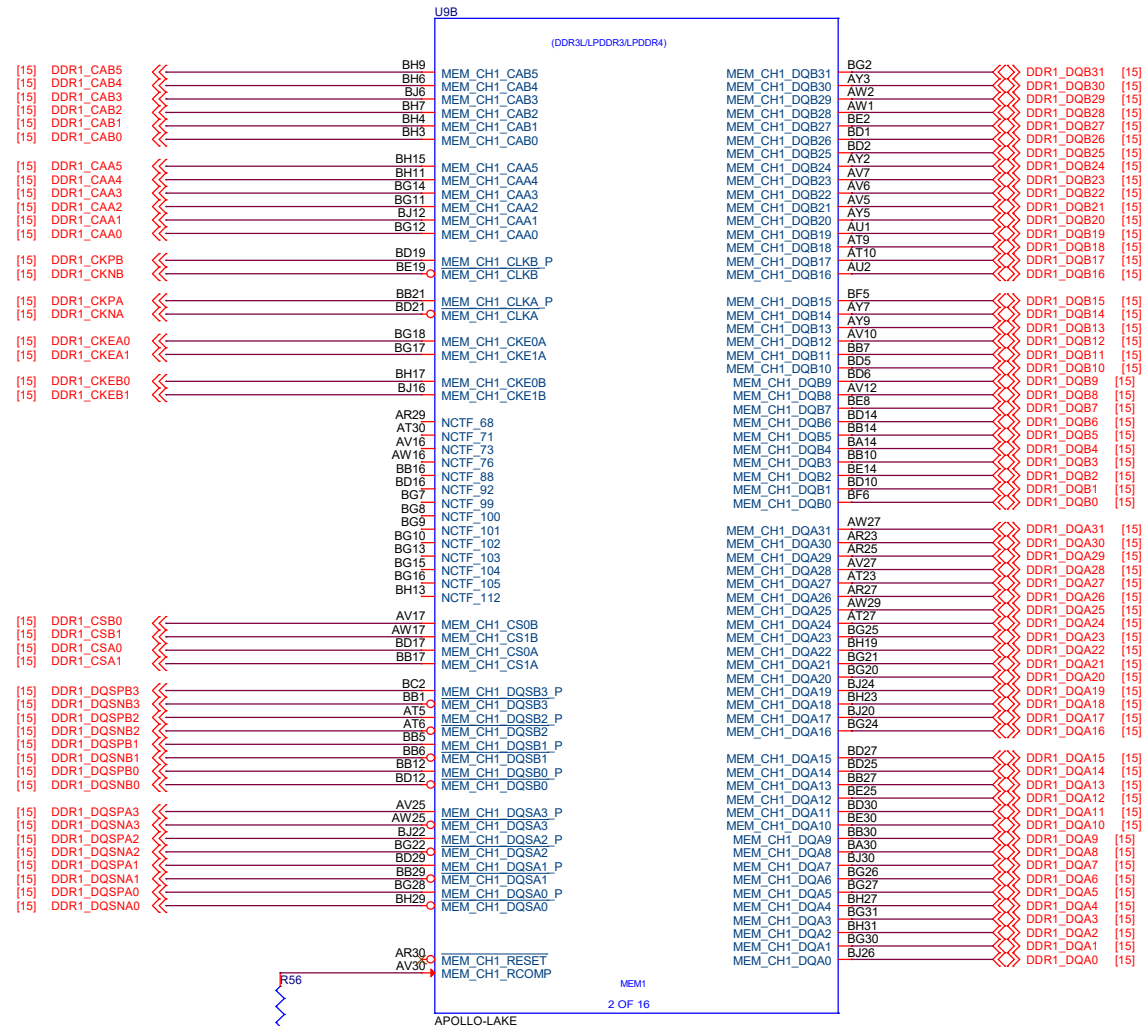
POWER RAILS:
 VIP24A
 1.24V_ALW, 0...1.67V (1.24V default, 1.24 typ) 3.2 A.
 Freq. SW: 2.4 MHz

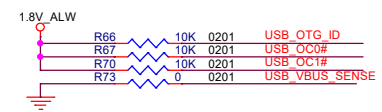
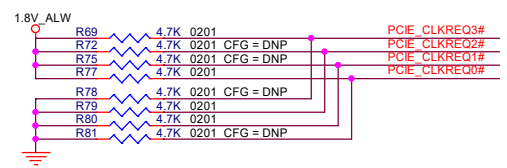
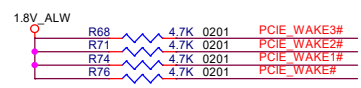
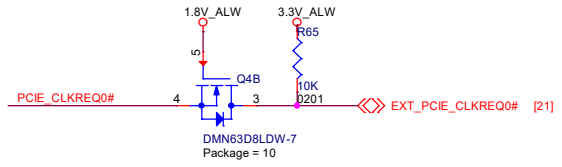
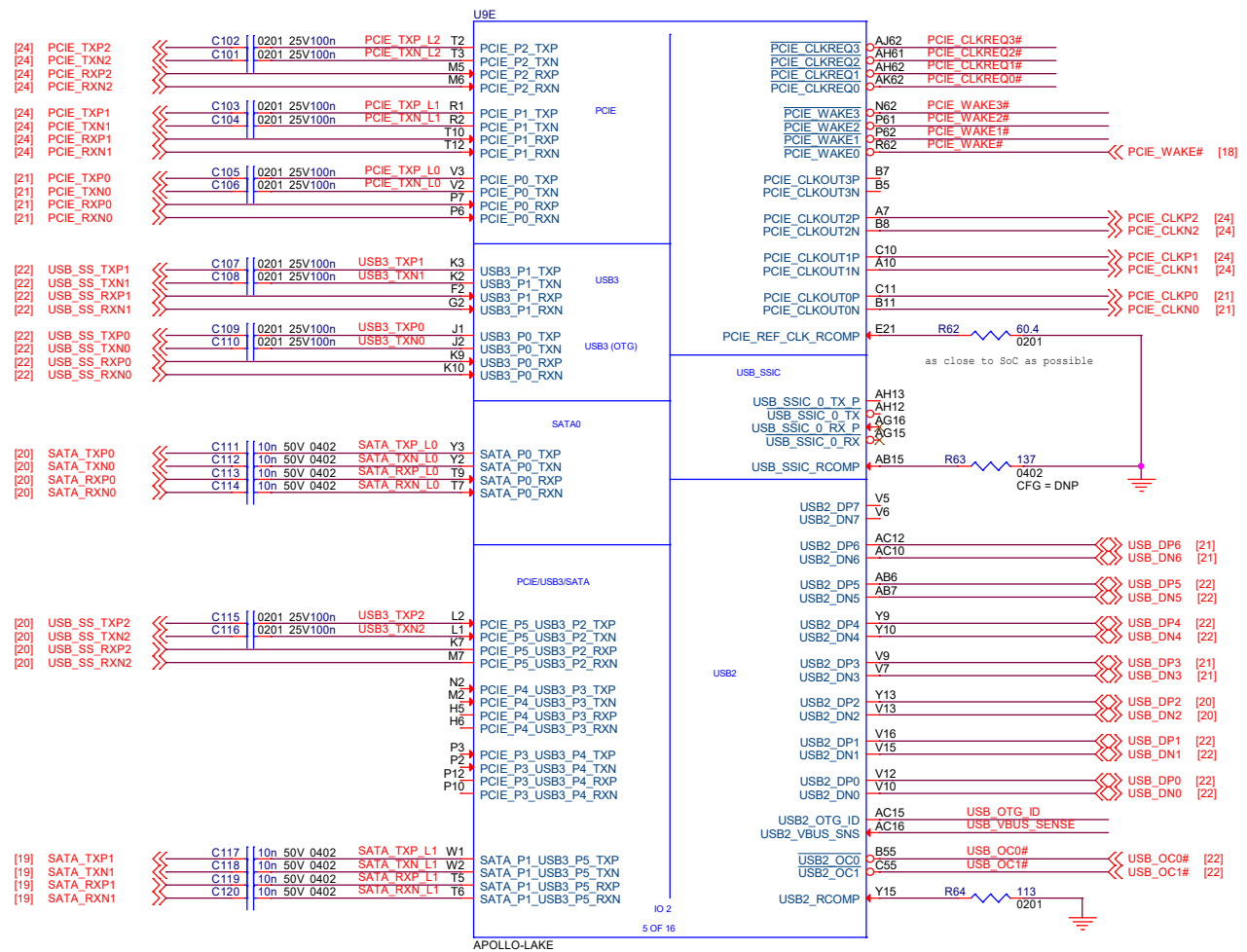
POWER RAILS:
 VDDQ
 MEM_VDD_SUS, 0...1.67V (1.1V OTP dep.) 7 A.
 Freq. SW: 1.05 MHz

- [10] PMIC_EN >> R41
- [2,10,18,20] SUS_S3# >> R42
- [10,18] SUS_S5# >> R50
- [10] SUS_S0# >> R49
- [10] PMIC_I2C_CLK >>
- [10] PMIC_I2C_DAT <<
- [9] PMIC_IRQ# << R51
- [10,18] PMIC_SOC_PWROK <<
- [10] PMIC_RSM_RST# <<
- [10] PMIC_PROCHOT <<
- [10] THERMTRIP# >> R52

| | | | |
|---|----------------------|--------------------------|----------|
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| Schematic Title SE0D02 - Udooc x86 Apollo Lake | | Created M. Bernardini | |
| Size A3 | Page Name POWER 2 | Rev A0 | |
| Date: Wednesday, October 16, 2019 | | Sheet 3 | of 26 |

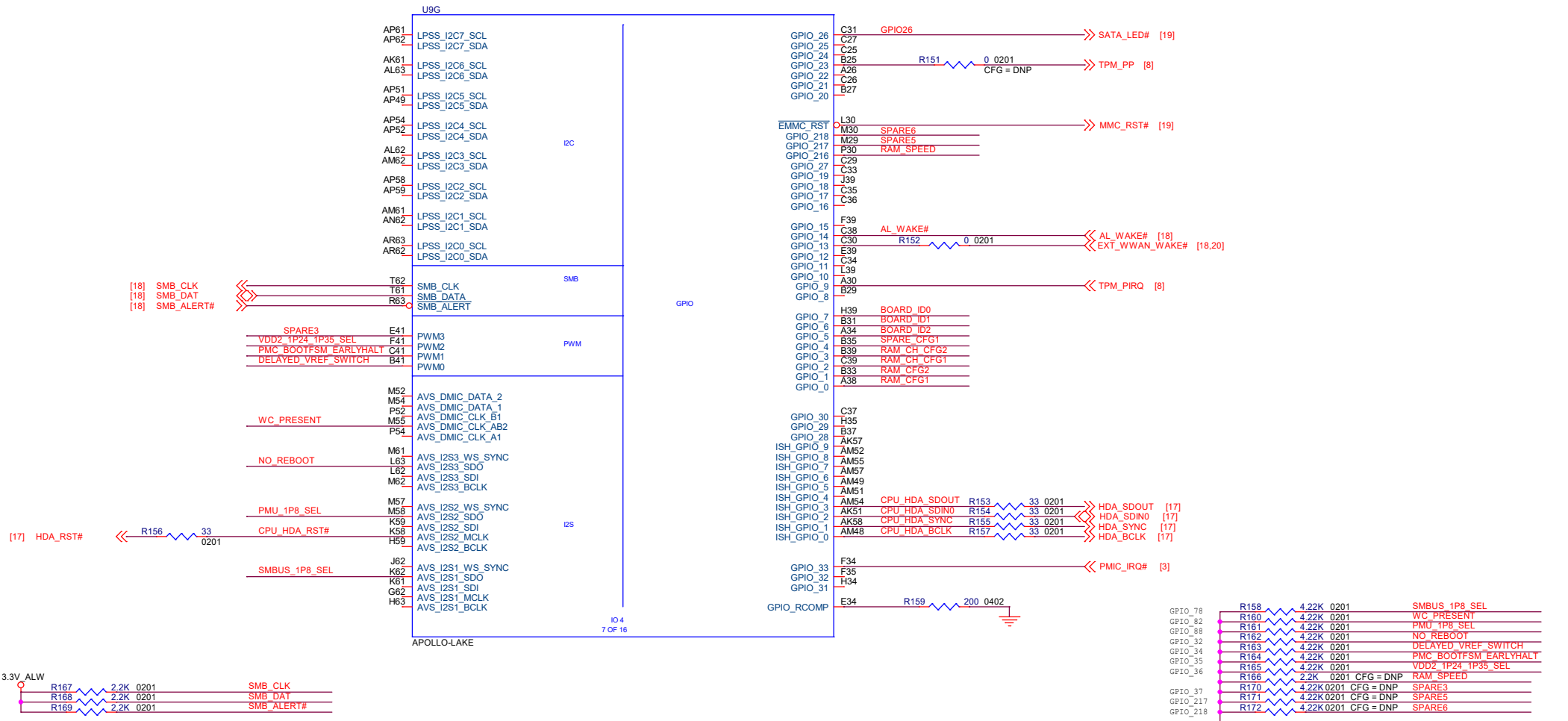






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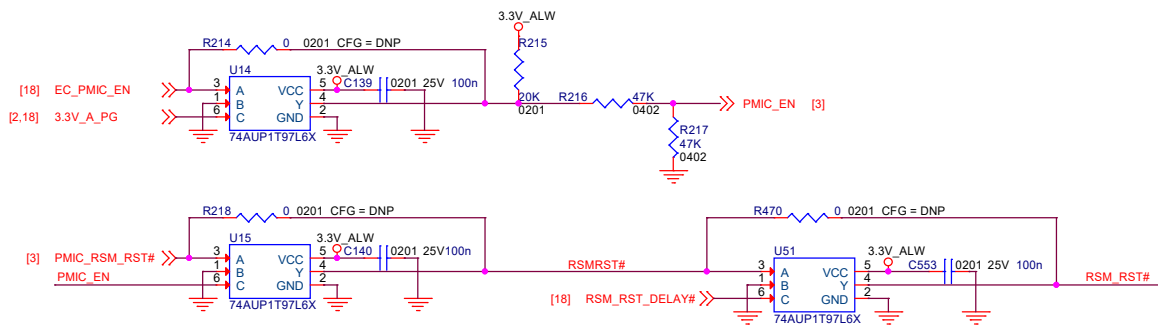
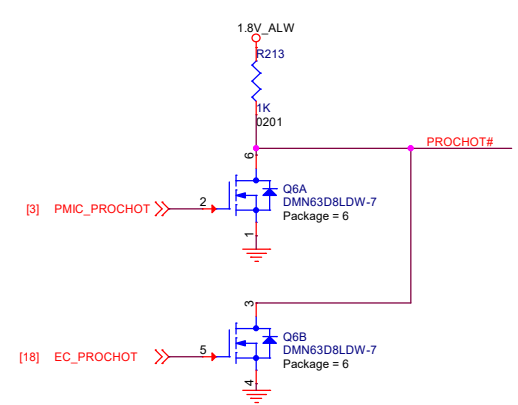
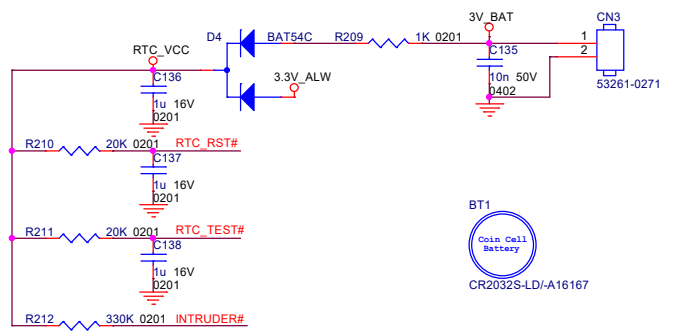
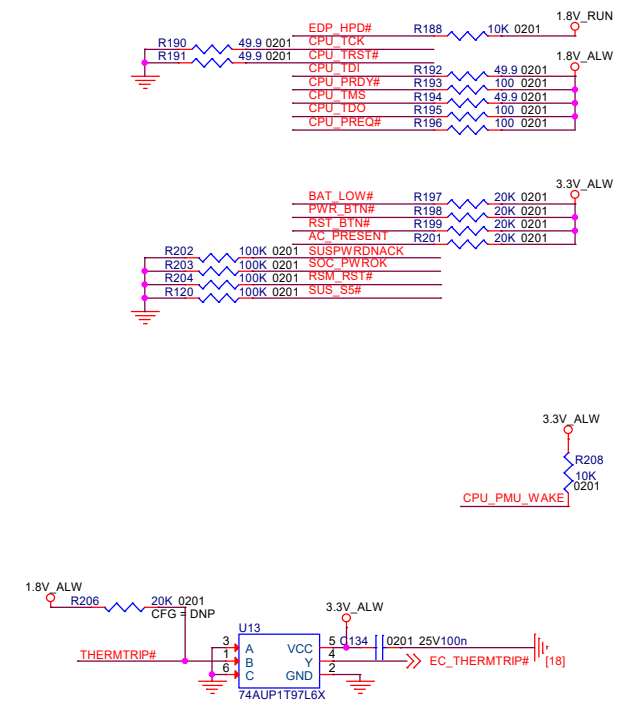
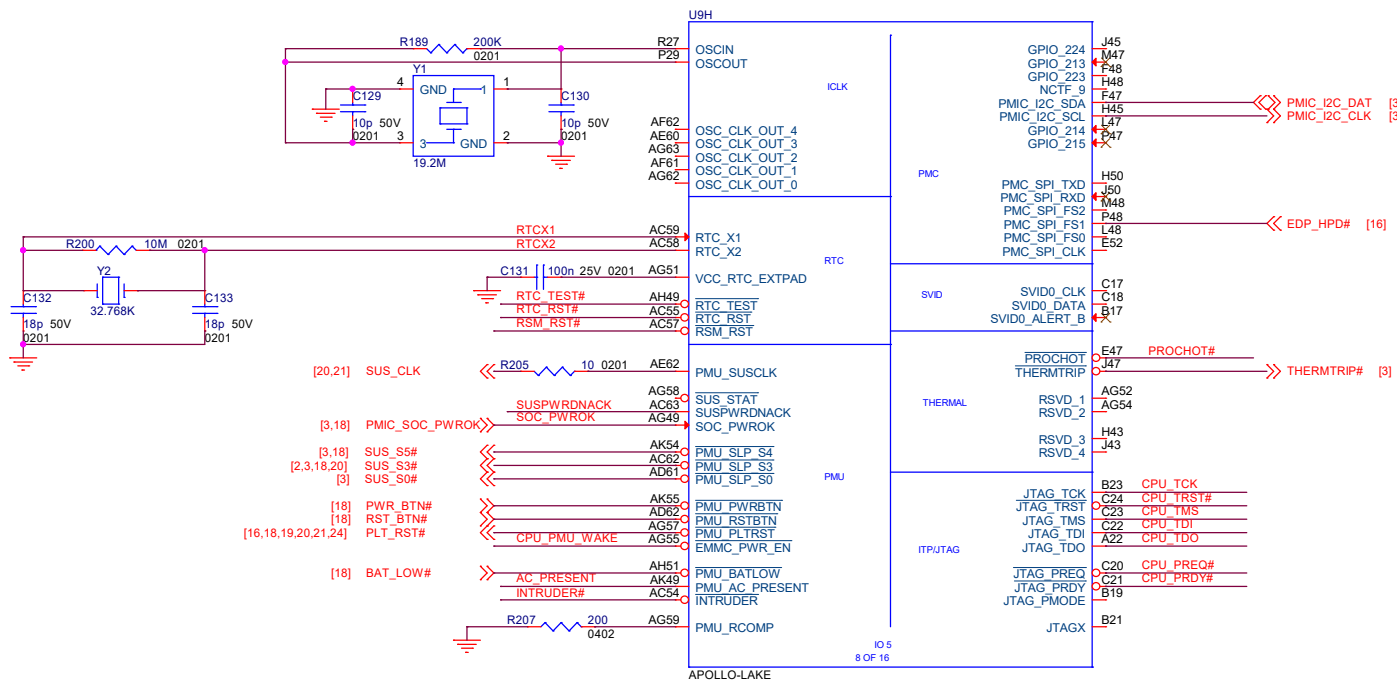
| | | | | |
|---------|------|-------|------|-----------------------|
| GPIO_78 | R158 | 4.22K | 0201 | SMBUS_1P8_SEL |
| GPIO_82 | R180 | 4.22K | 0201 | WC_PRESENT |
| GPIO_88 | R162 | 4.22K | 0201 | PMU_1P8_SEL |
| GPIO_32 | R163 | 4.22K | 0201 | NO_REBOOT |
| GPIO_34 | R164 | 4.22K | 0201 | DELAYED_VREF_SWITCH |
| GPIO_35 | R164 | 4.22K | 0201 | PMC_BOOTFSM_EARLYHALT |
| GPIO_36 | R165 | 4.22K | 0201 | VDD2_TP24_TP35_SEL |
| | R166 | 2.2K | 0201 | CFG = DNP |
| | R170 | 4.22K | 0201 | CFG = DNP |
| | R171 | 4.22K | 0201 | CFG = DNP |
| | R172 | 4.22K | 0201 | CFG = DNP |

| | | | | | |
|----------|------|------|------|-----------|-------------|
| 1.8V_ALW | R173 | 2.2K | 0201 | CFG = DNP | SPARE_CFG1 |
| | R174 | 2.2K | 0201 | CFG = DNP | BOARD_ID0 |
| | R175 | 2.2K | 0201 | CFG = DNP | BOARD_ID1 |
| | R176 | 2.2K | 0201 | CFG = DNP | BOARD_ID2 |
| | R177 | 2.2K | 0201 | CFG = DNP | BOARD_ID3 |
| | R178 | 2.2K | 0201 | CFG = DNP | RAM_CH_CFG1 |
| | R182 | 2.2K | 0201 | CFG = A0 | RAM_CFG2 |
| | R184 | 2.2K | 0201 | CFG = DNP | RAM_CFG1 |
| | R185 | 10K | 0201 | CFG = DNP | AL_WAKE# |

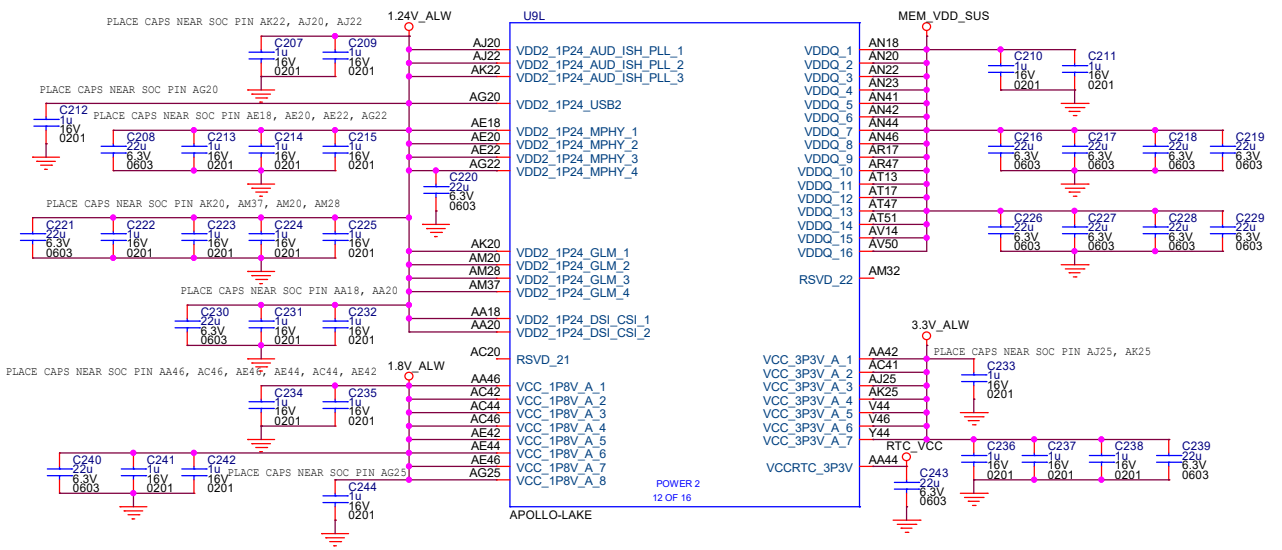
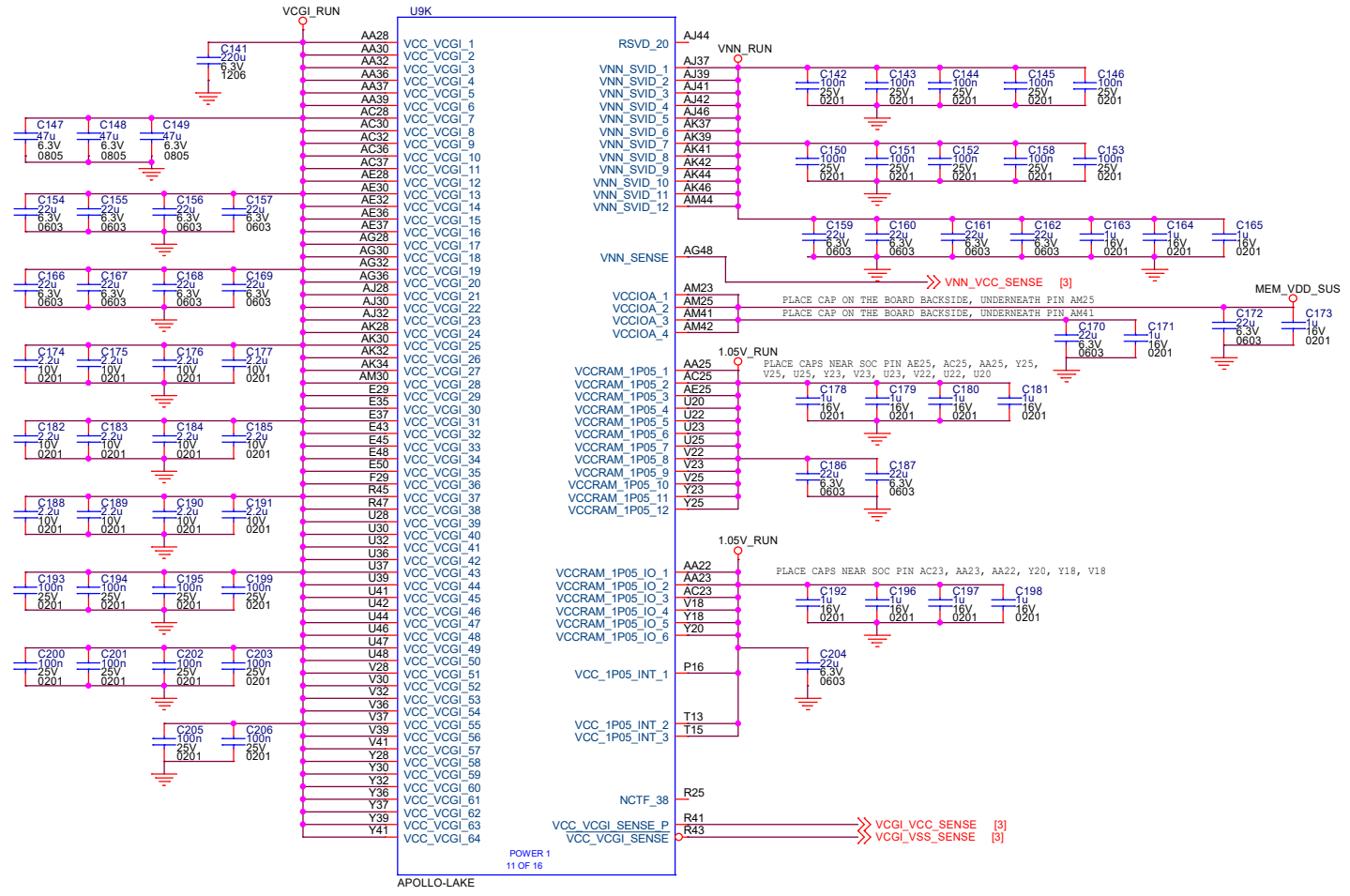
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Created
M. Bernardini

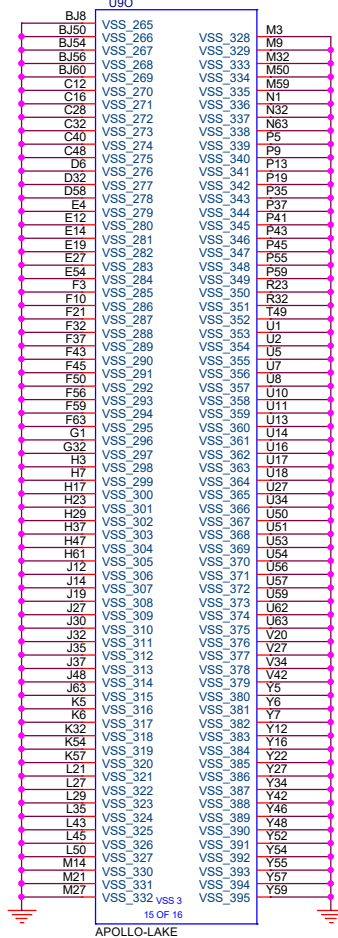
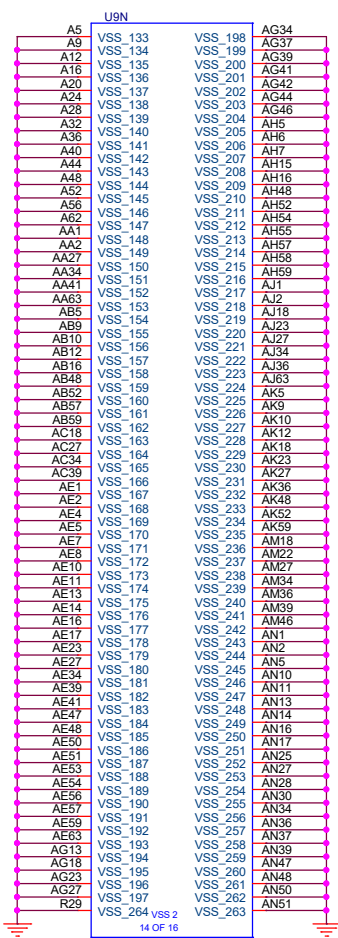
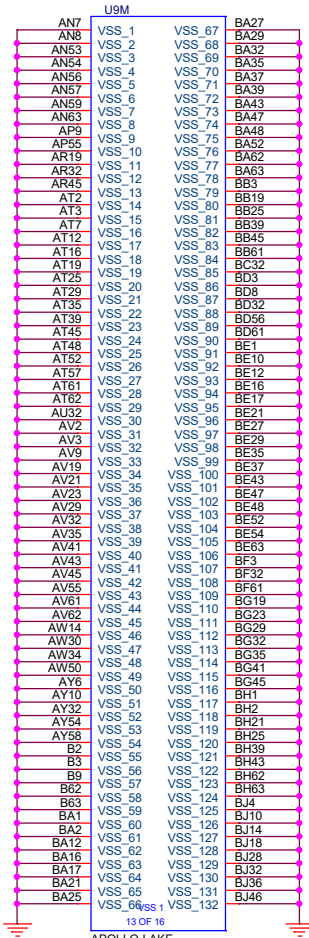
| | | |
|--|--------------------------------------|------------------|
| Schematic Title SE0002 - Udox x86 Apollo Lake | | Rev A0 |
| Size A3 | Page Name APOLLO LAKE SMB I2C HDA | Sheet 9 of 26 |
| Date: Wednesday, October 16, 2019 | | |



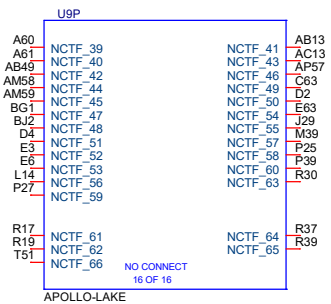
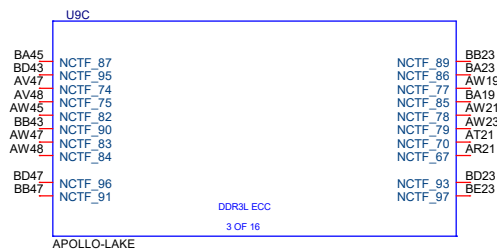
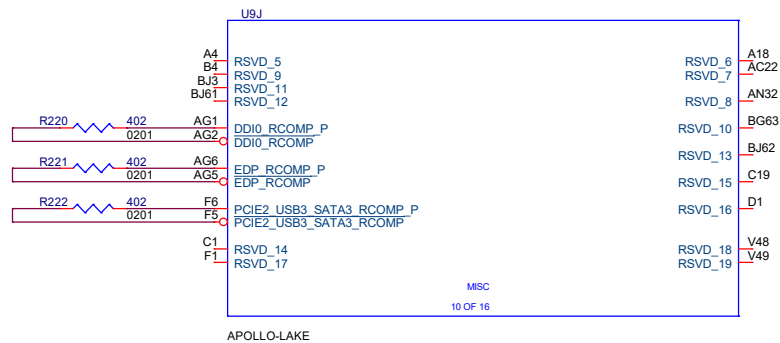
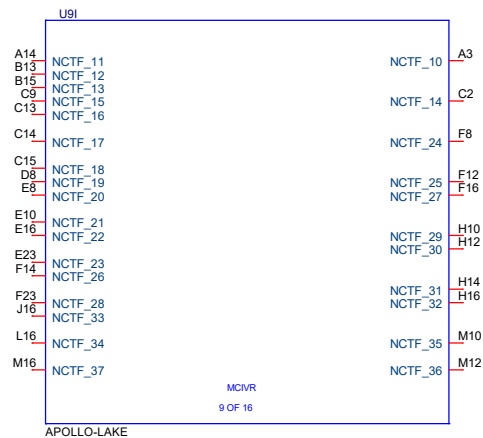
| | | | |
|---|---------------------------------------|--|--------------------------|
| SECO S.p.A. Via A. Grandi 20 52100 Arezzo Italy | | | |
| Schematic Title SE0D02 - Udoo x86 Apollo Lake | | | Created M. Bernardini |
| Size A3 | Page Name APOLLO LAKE CLK PWR MGMT | | Rev A0 |
| Date: Wednesday, October 16, 2019 | | | Sheet 10 of 26 |

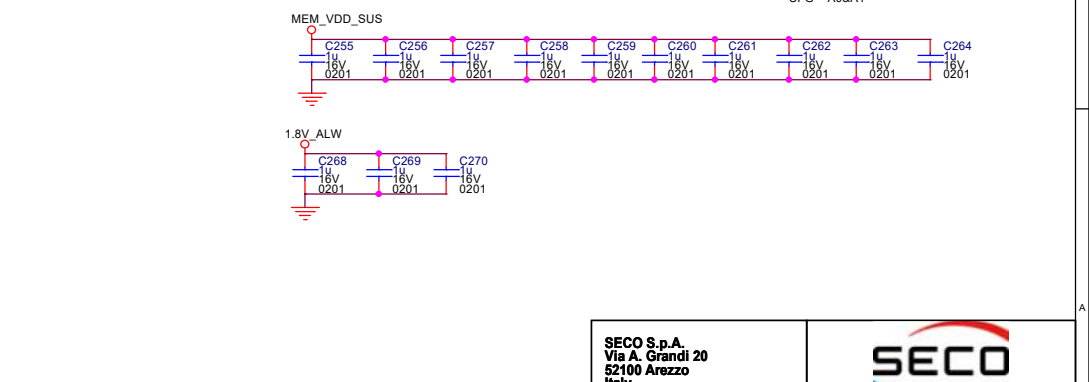
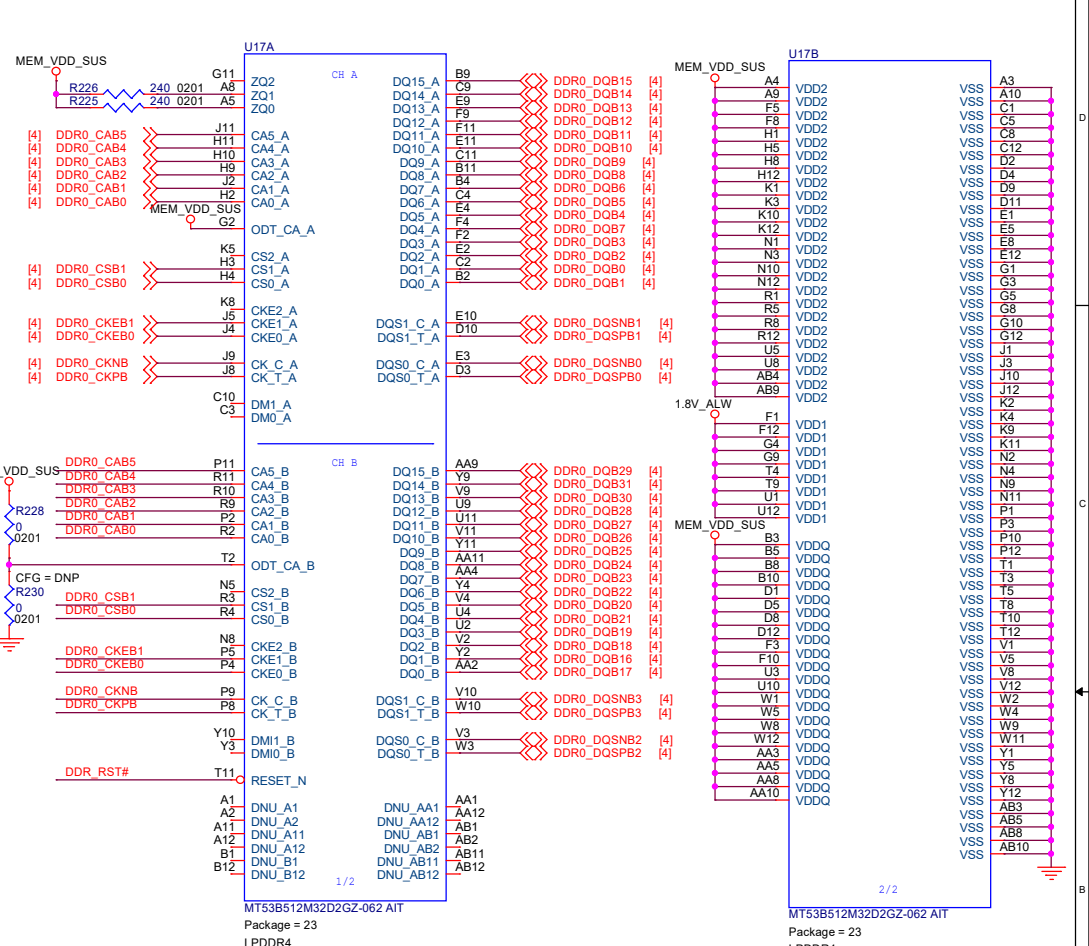
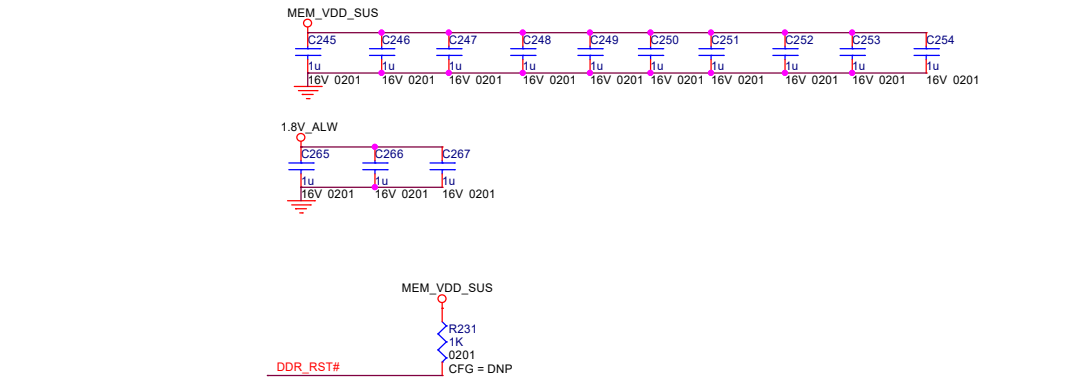
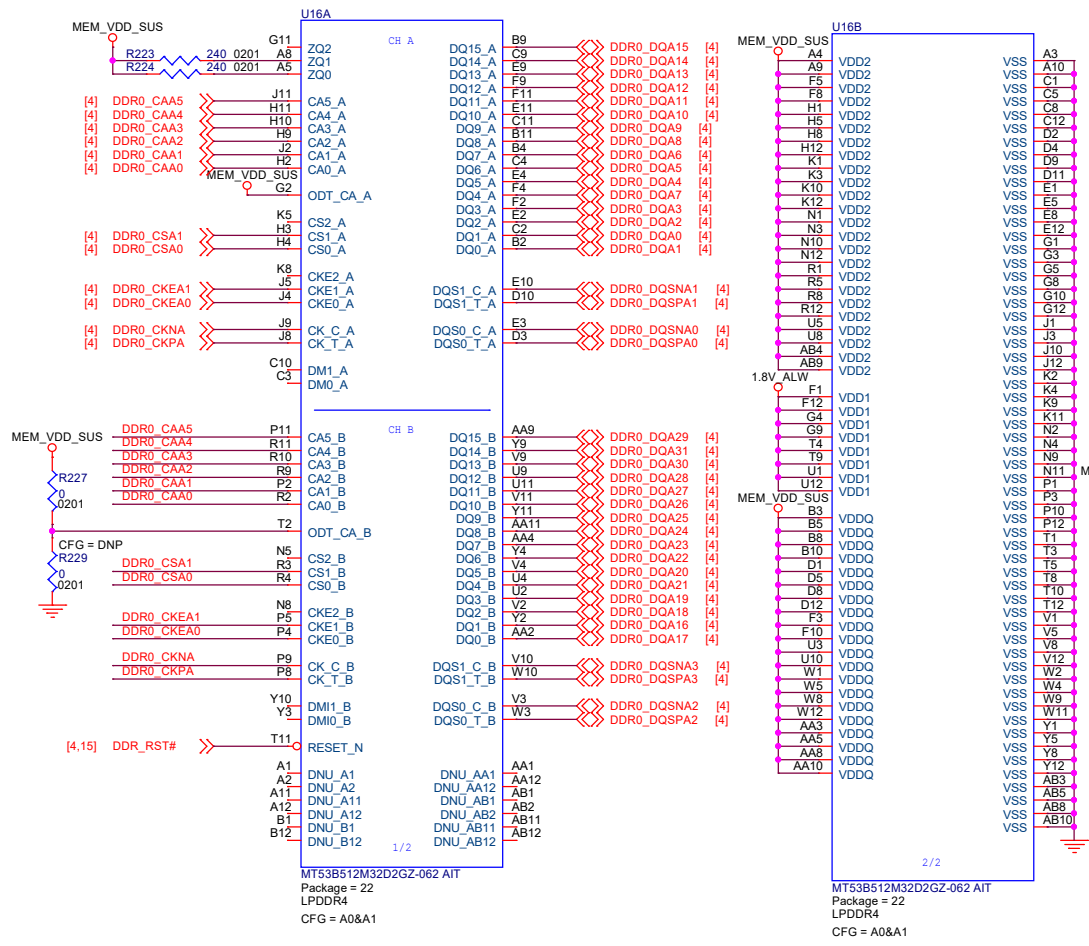


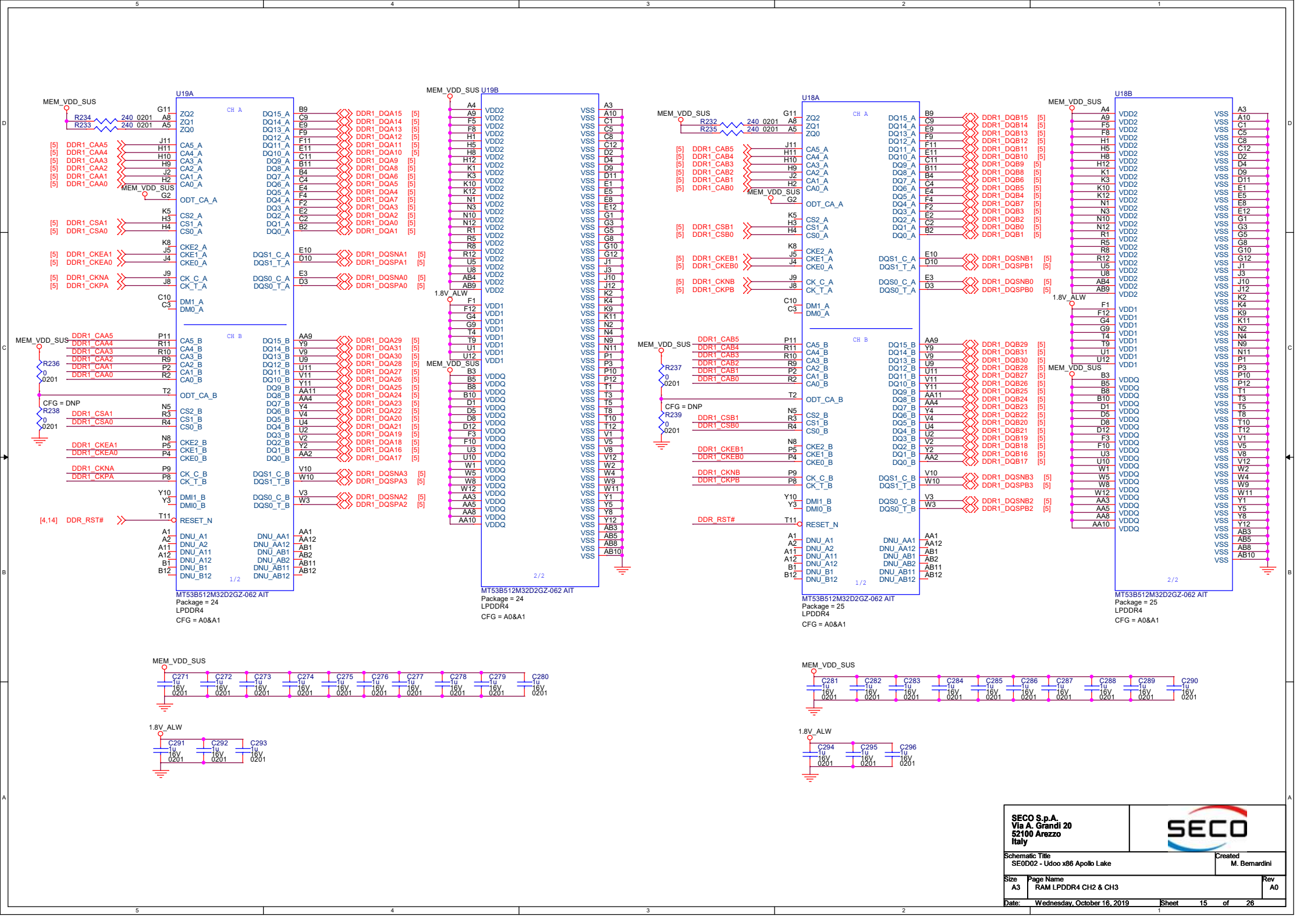
| | | | |
|--|--------------------------------------|--------------------------------|-----------|
| | | Created | |
| | | M. Bernardini | |
| Schematic Title SE00D2 - Udo0 x86 Apollo Lake | | Page Name APOLLO LAKE POWER | |
| Size A3 | Date: Wednesday, October 16, 2019 | Sheet 11 | Rev A0 |

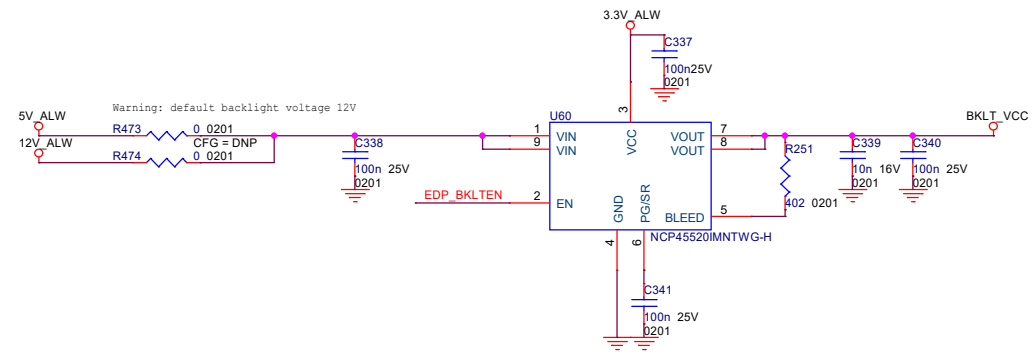
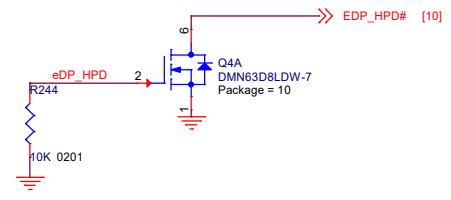
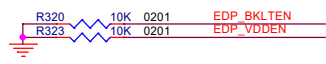
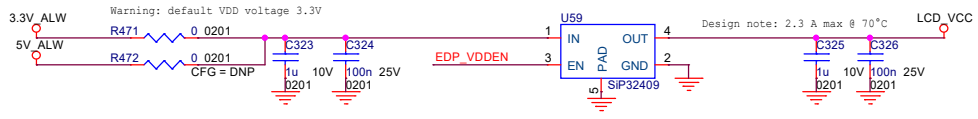
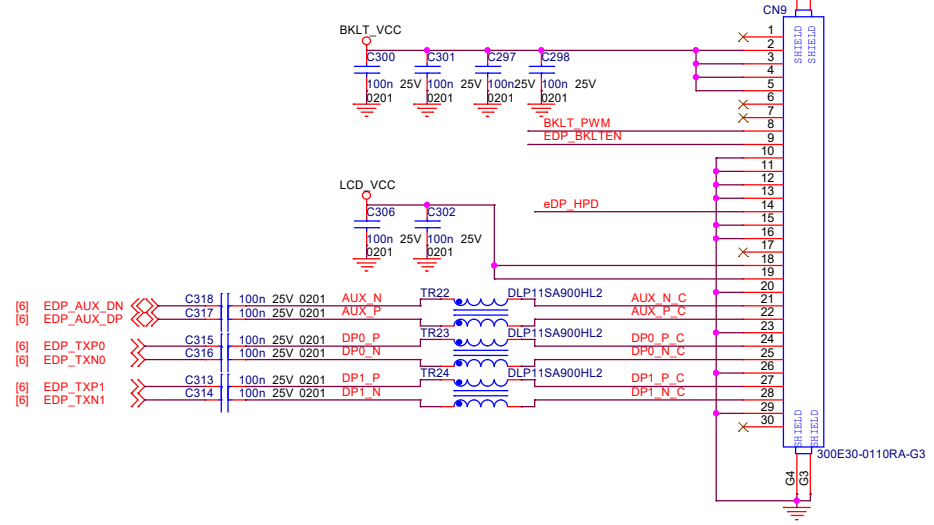
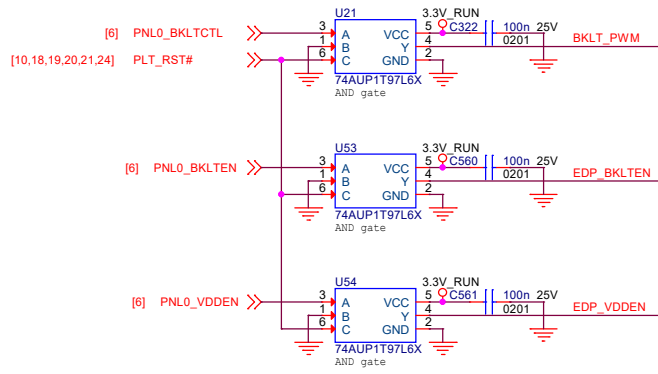


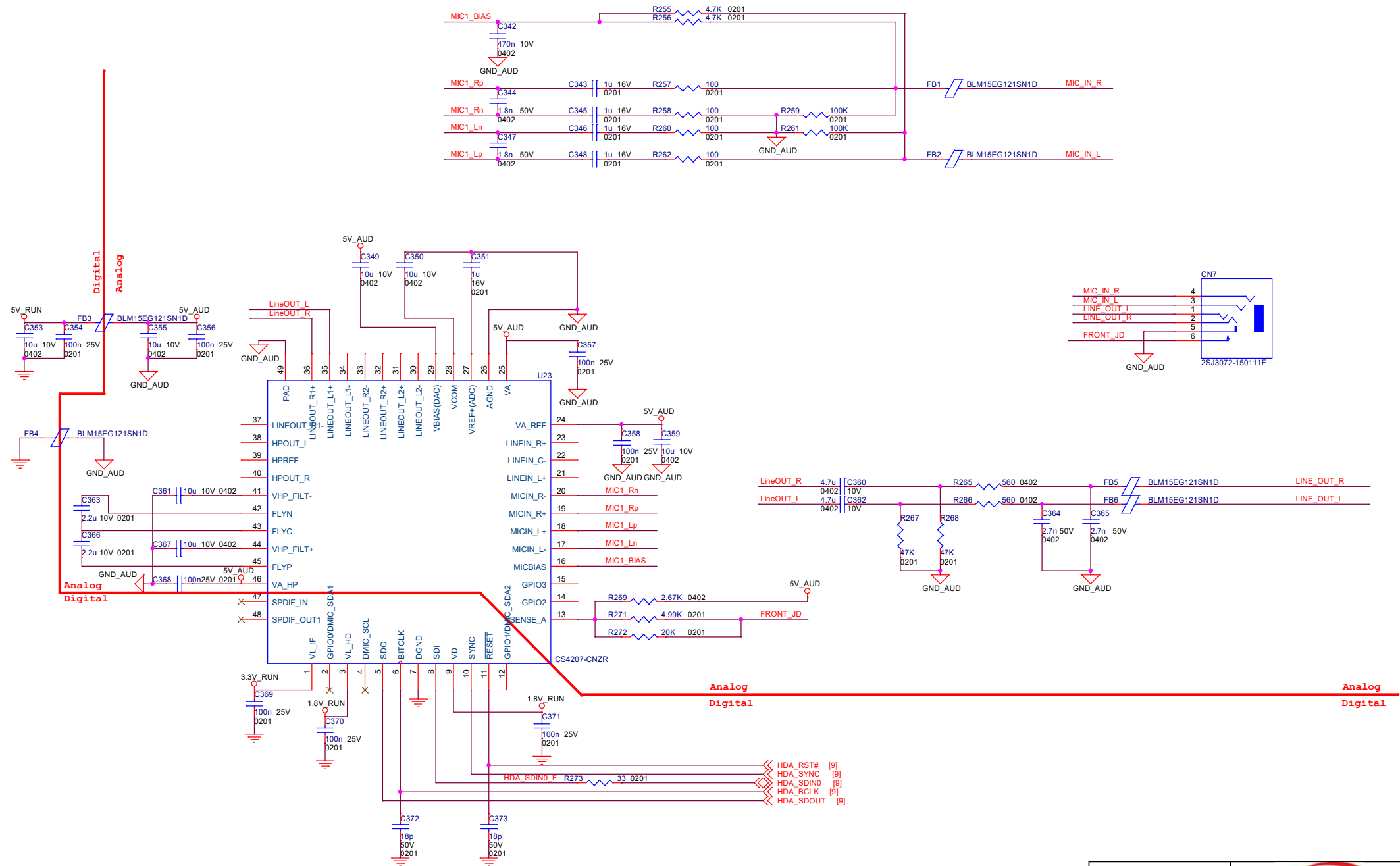
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| Schematic Title SE0D02 - Udoo x86 Apollo Lake | | |
| Size A3 Page Name APOLLO LKE GND | | Created M. Bernardini |
| Date: Wednesday, October 16, 2019 | | Sheet 12 of 26 |




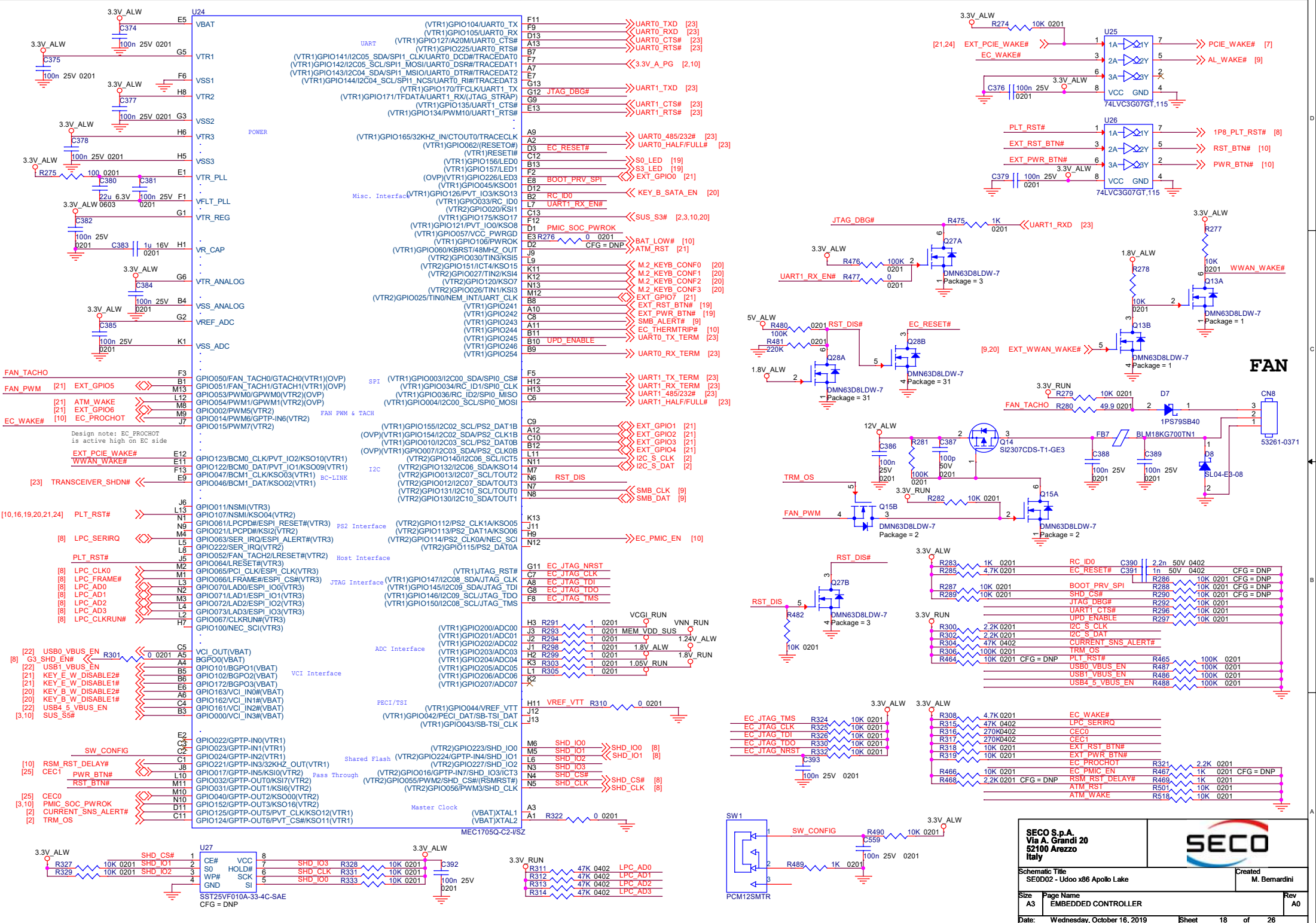








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| Schematic Title SE0D02 - Udoo x86 Apollo Lake | | Created M. Bernardini | |
| Size A3 | Page Name HDA | Rev A0 | |
| Date: Wednesday, October 16, 2019 | | Sheet 17 of 26 | |



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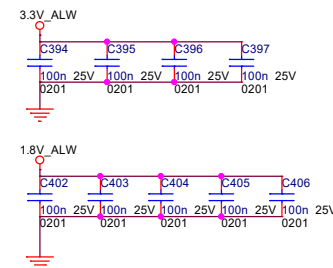
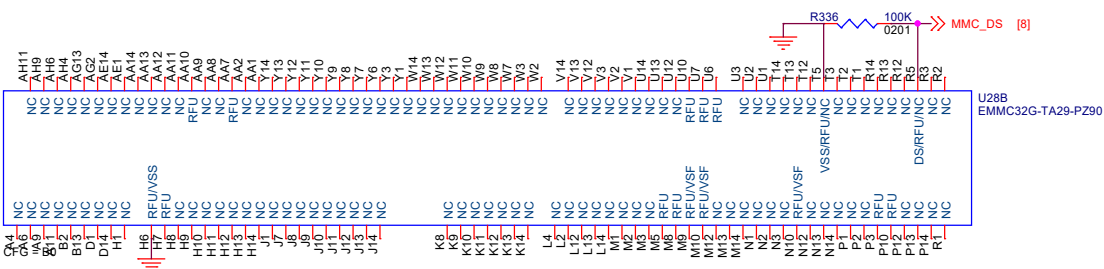
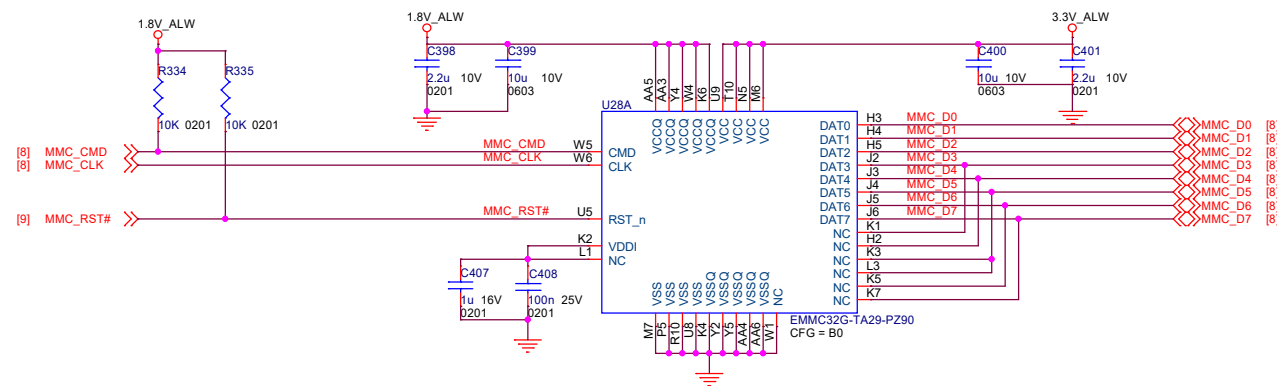
SECO

Schematic Title: SE0D02 - Udoox x86 Apollo Lake
Created: M. Bernardini

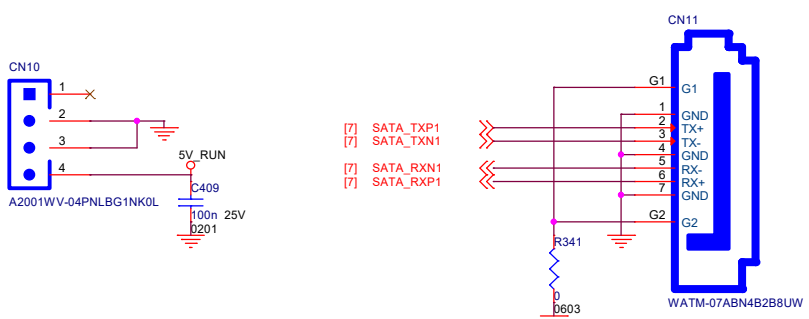
Size: A3
Page Name: EMBEDDED CONTROLLER
Rev: A0

Date: Wednesday, October 16, 2019
Sheet: 18 of 26

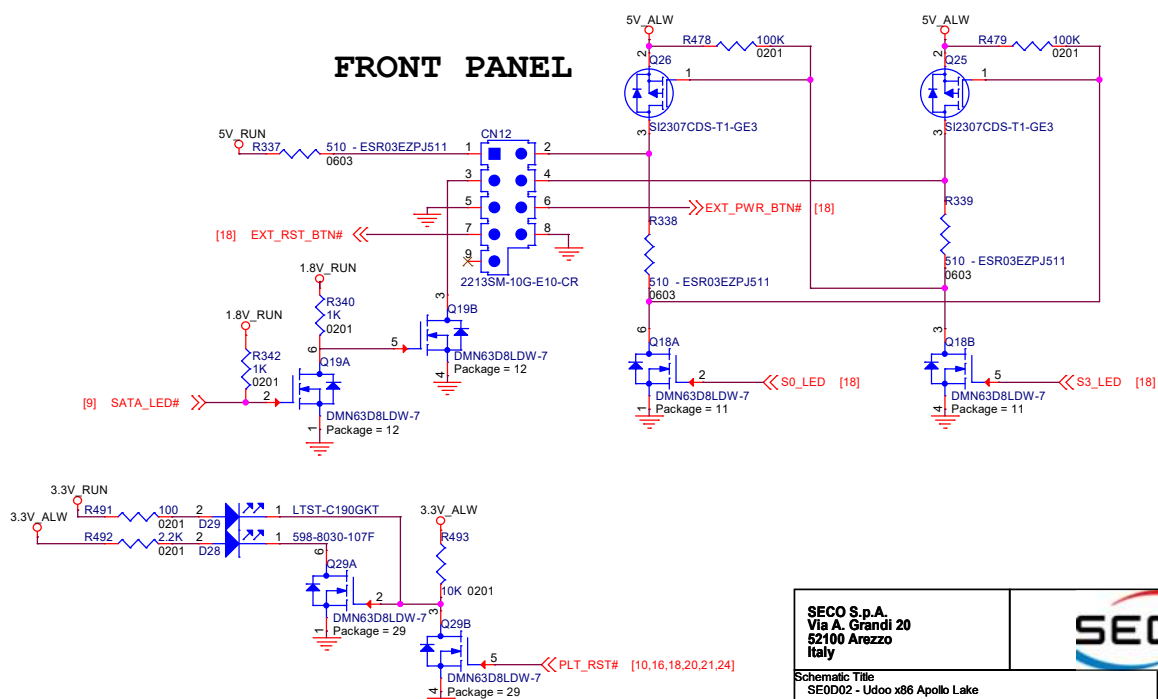
eMMC



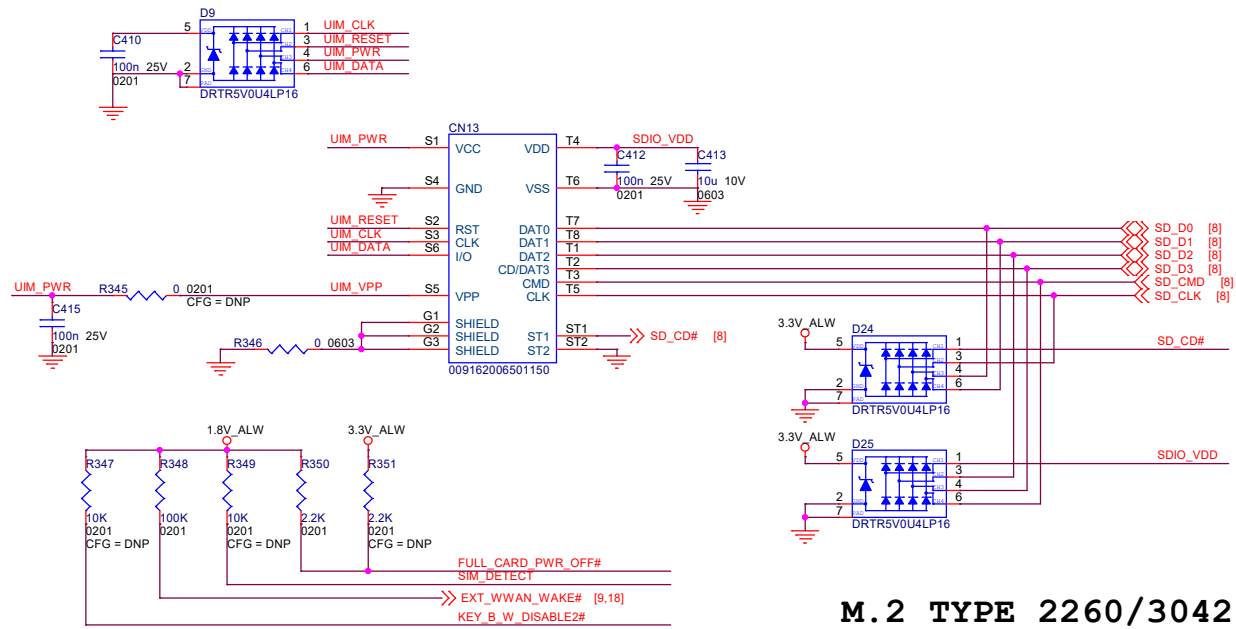
SATA



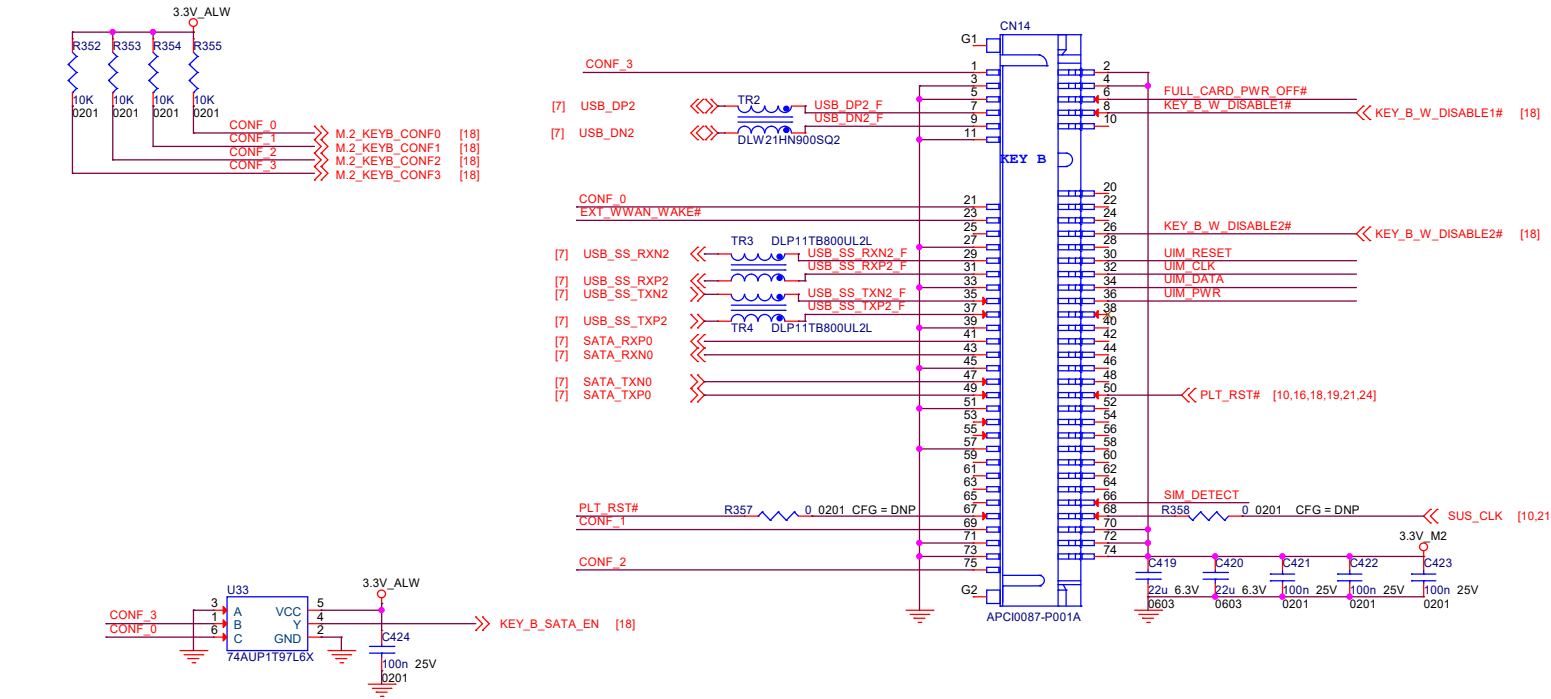
FRONT PANEL



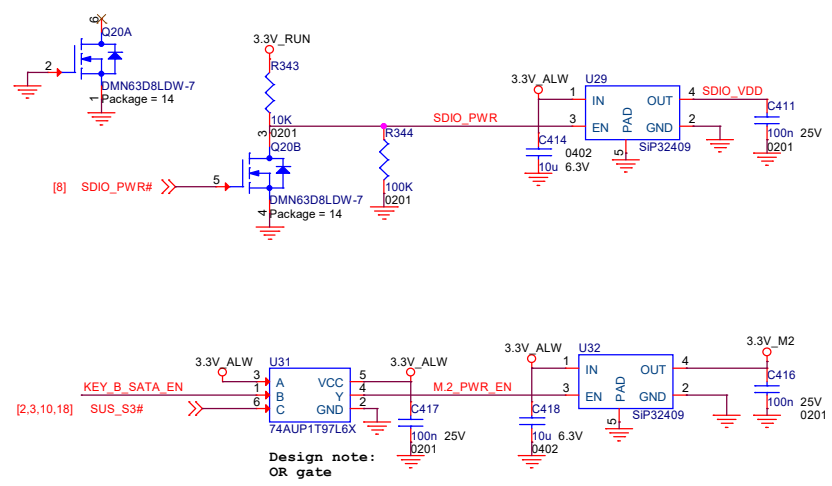
| | | |
|---|--|--------------------------|
| SECO S.p.A. Via A. Grandi 20 52100 Arezzo Italy | | |
| Schematic Title SE0D02 - Udoo x86 Apollo Lake | | |
| Size A3 | Page Name eMMC / SATA / Front panel | Created M. Bernardini |
| Date: Wednesday, October 16, 2019 | | Sheet 19 of 26 |



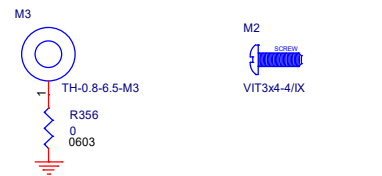
M.2 TYPE 2260/3042 SOCKET 2 KEY B



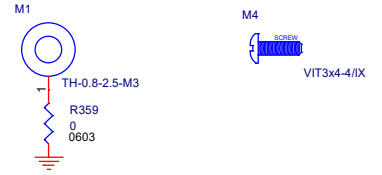
Design note:
 KEY_B_SATA_EN =
 CONF_0# and CONF_3
 WWAN - USB3 card powered in S5-S3-S0
 SATA card powered in S0 only



PCB NOTE:
 M.2 module Key B 2260



PCB NOTE:
 M.2 module Key B 3042 share the same hole with M.2 key E 2230



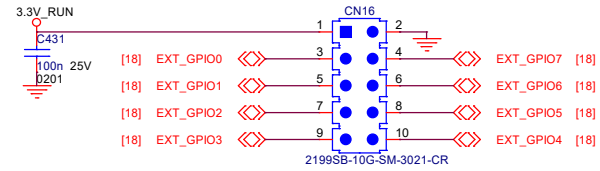
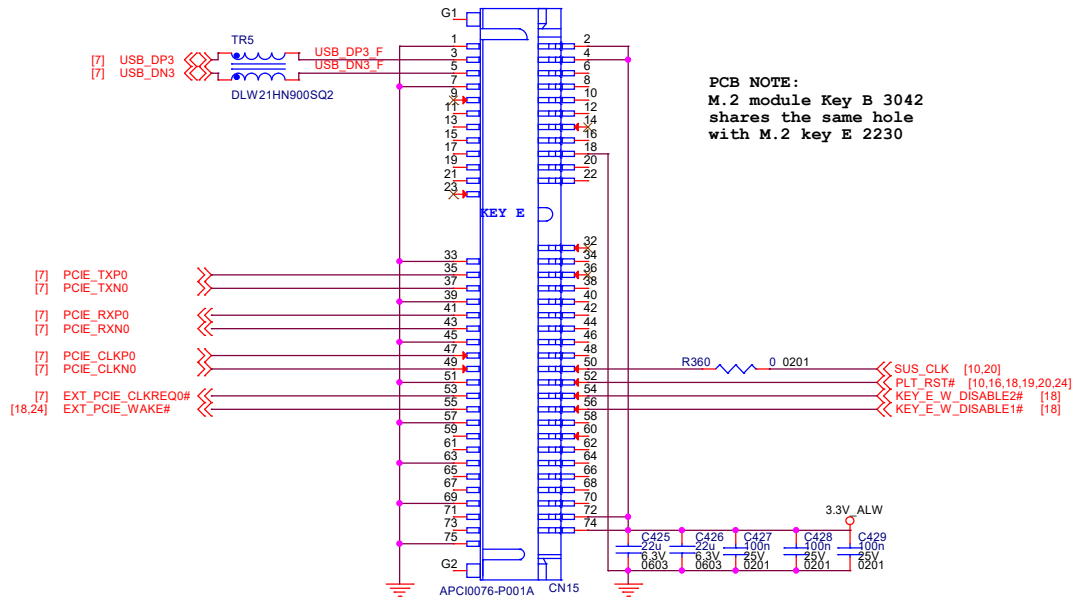
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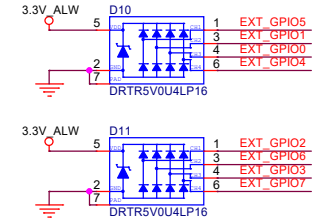
| | | |
|--|---------------------------------------|--------------------------|
| Schematic Title SE0D02 - Udoo x86 Apollo Lake | | Created M. Bernardini |
| Size A3 | Page Name uSD miniSIM M.2 SSD/WWAN | Rev A0 |
| Date: Wednesday, October 16, 2019 | Sheet 20 | of 26 |

M.2 TYPE 2230 SOCKET 1 KEY E

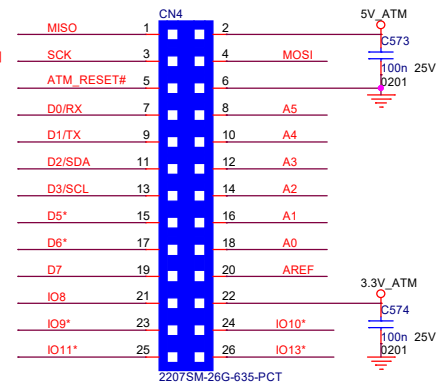
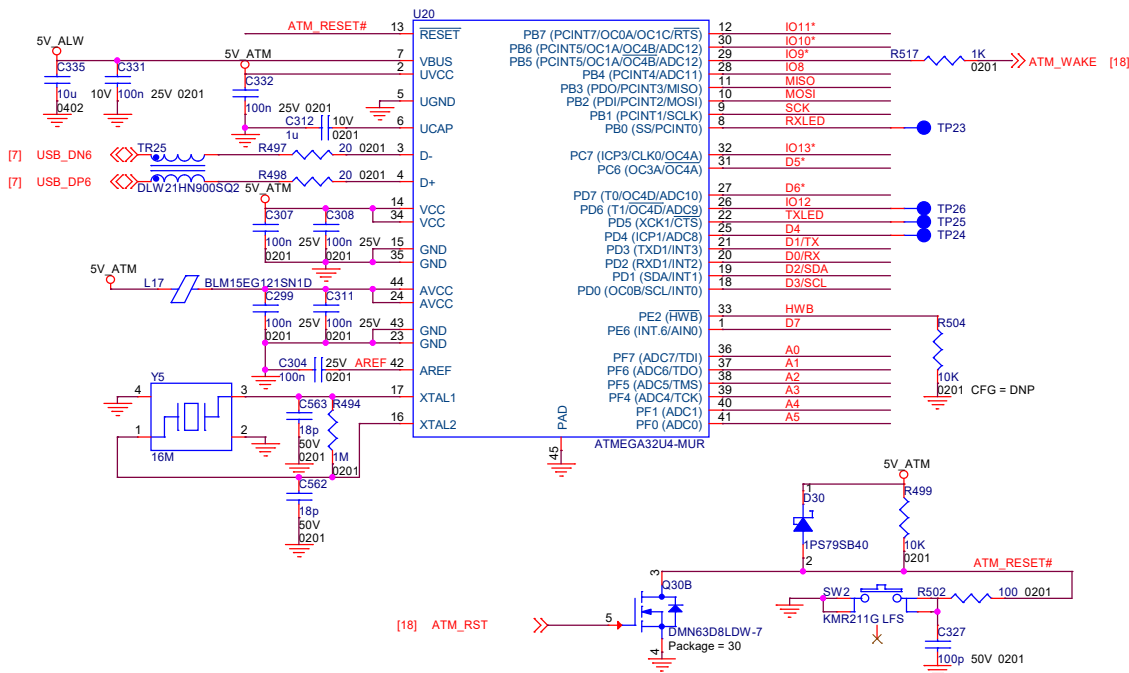
GPIO header



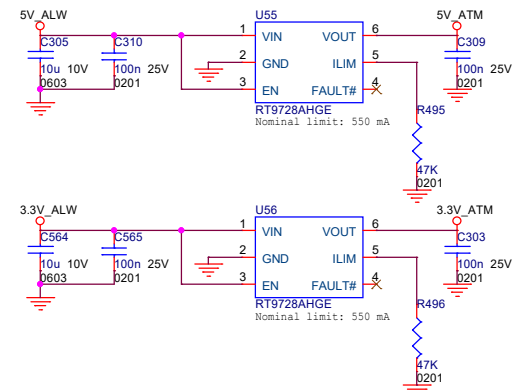
PCB Note:
Make room for ribbon cable matching part 10.54mm



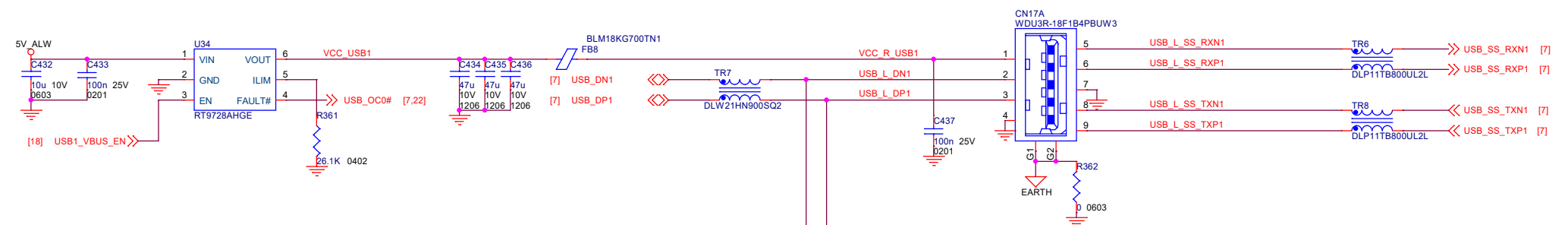
Arduino Leonardo



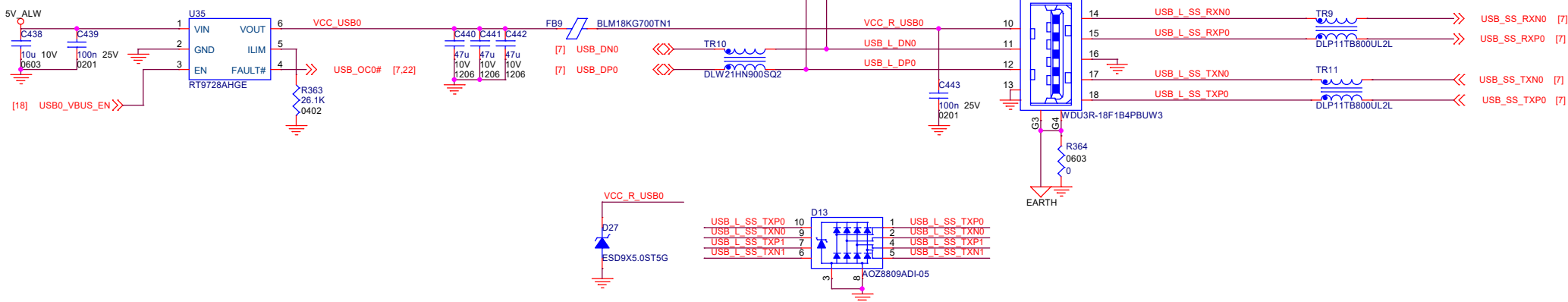
PCB note:
Place pin 1,2 close to M7
and pin 25,26 close to CN16
Place pin numbers on silkscreen



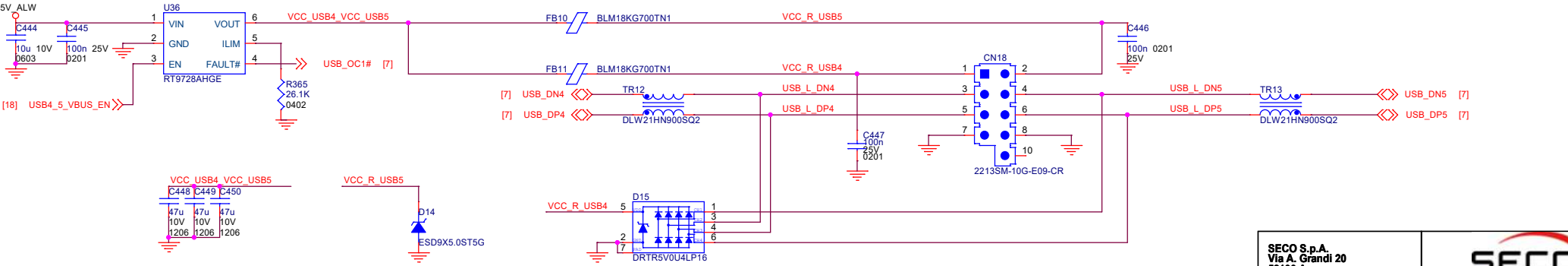
| | | |
|---|--|--------------------------|
| SECO S.p.A. Via A. Grandi 20 52100 Arezzo Italy | | |
| Schematic Title SE0D02 - Udoe x86 Apollo Lake | | Created M. Bernardini |
| Size A3 | Page Name M.2 / GPIO / Arduino Leonardo | Rev A0 |
| Date: Wednesday, October 16, 2019 | | Sheet 21 of 26 |



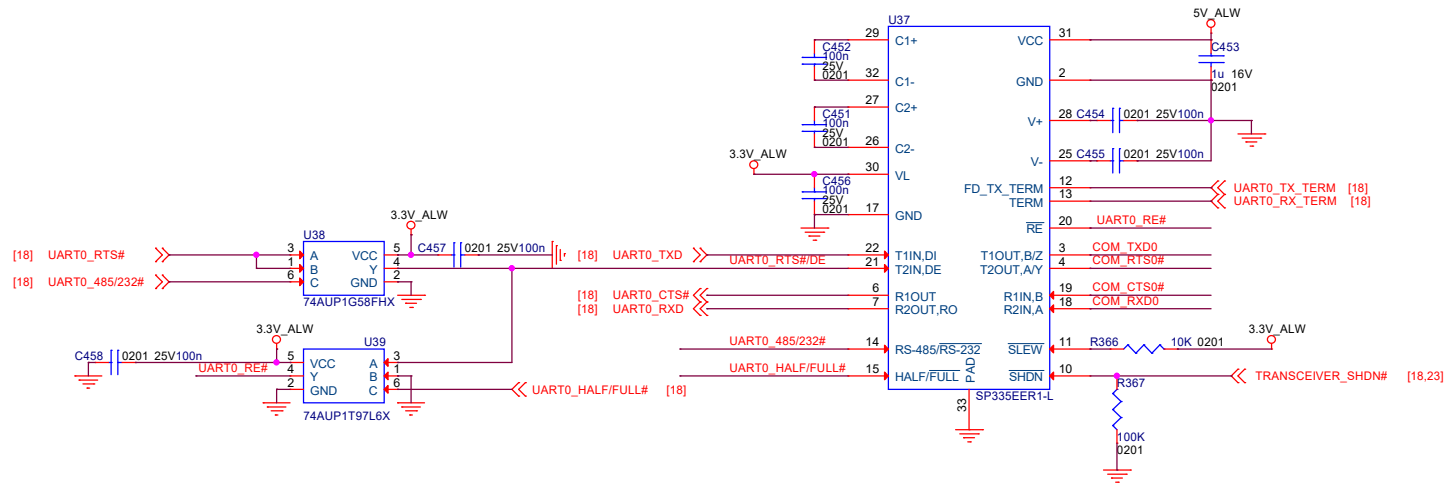
USB 3.0



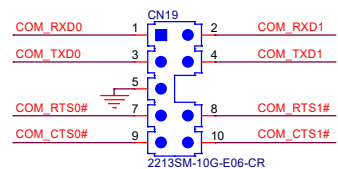
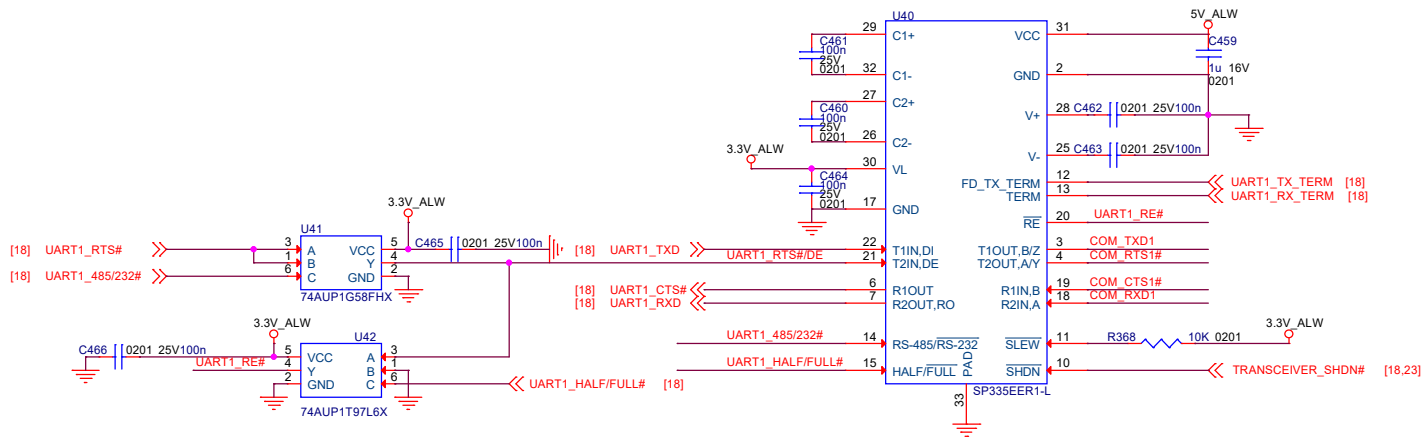
USB 2.0 Internal header



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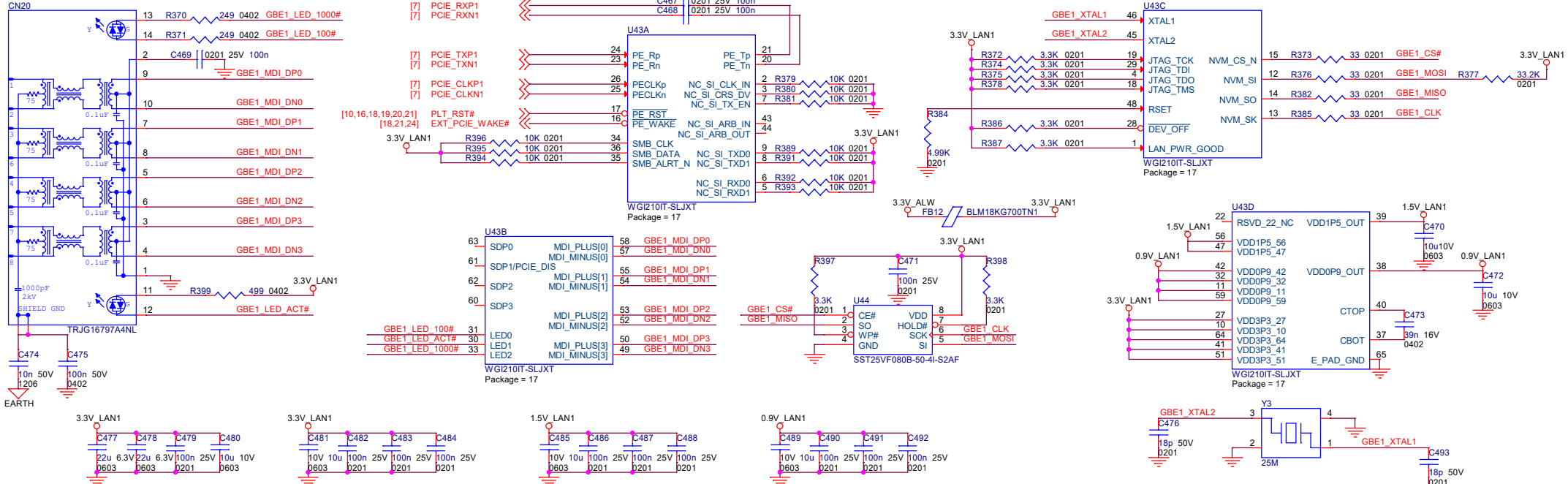
RS232 - RS485 TRANSCEIVERS



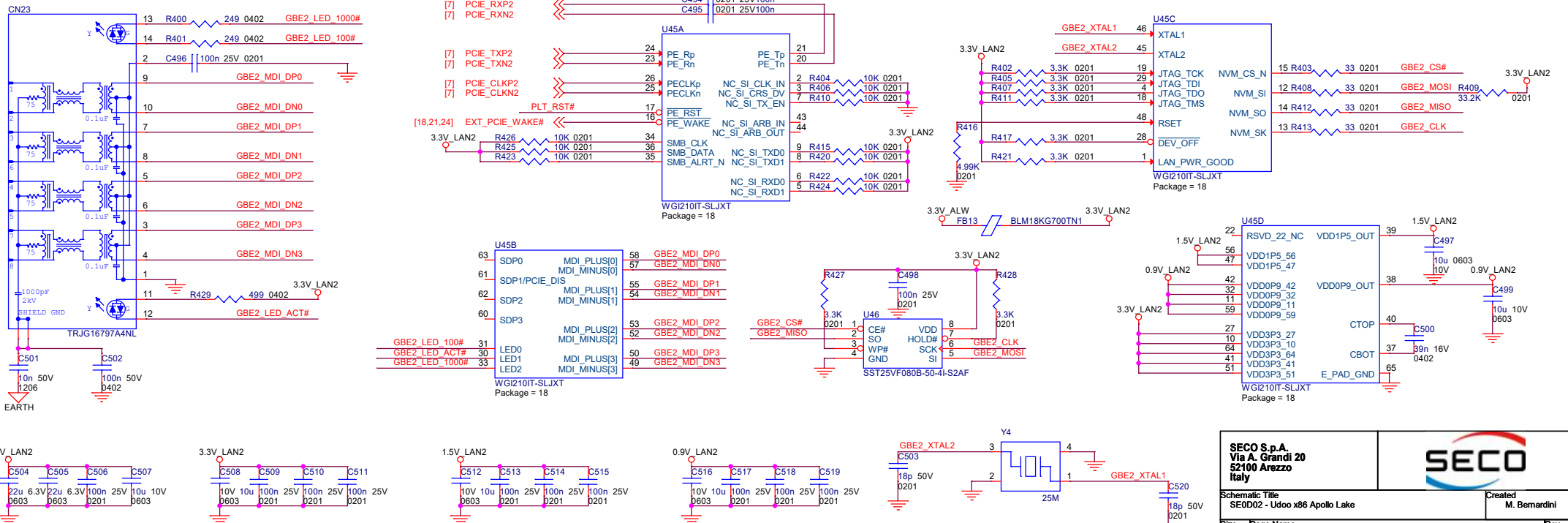
COM PORT Internal header

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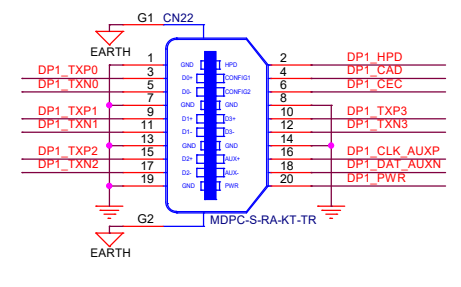
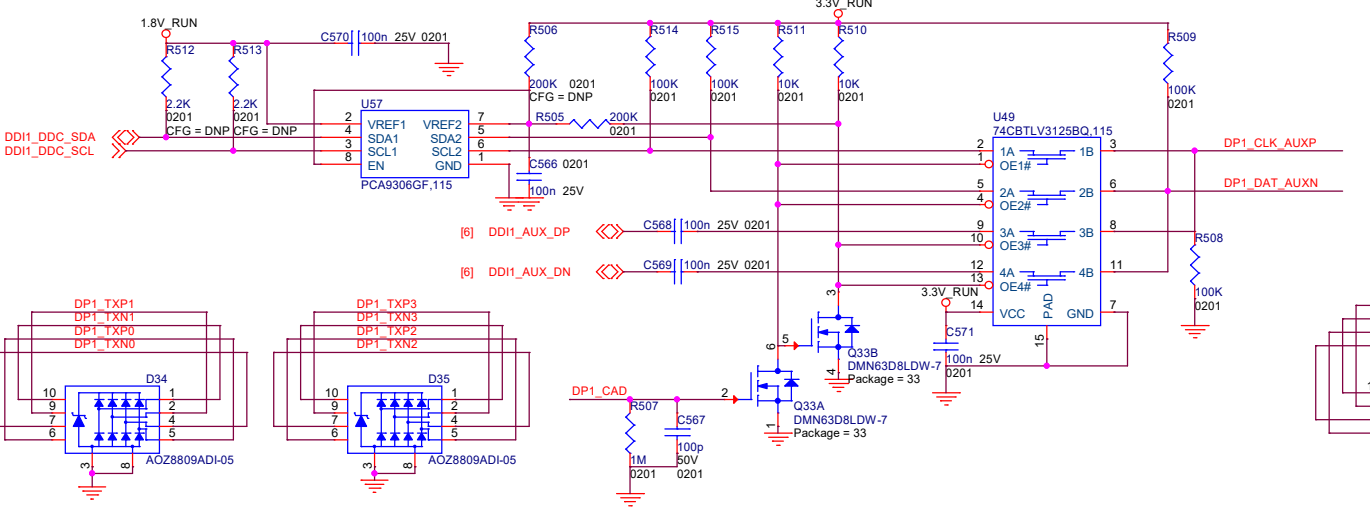
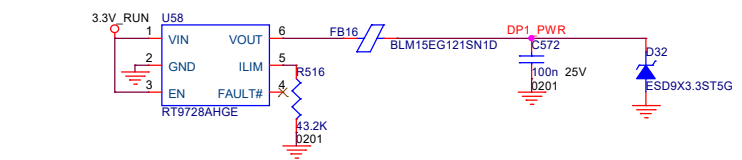
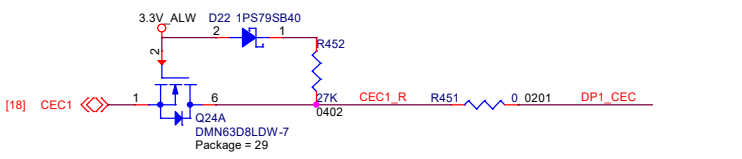
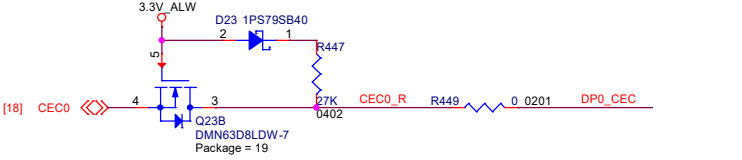
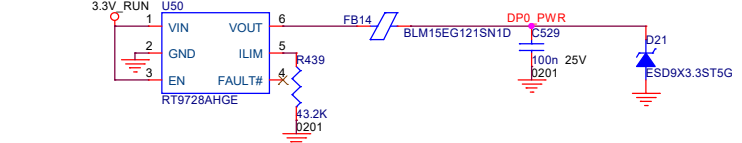
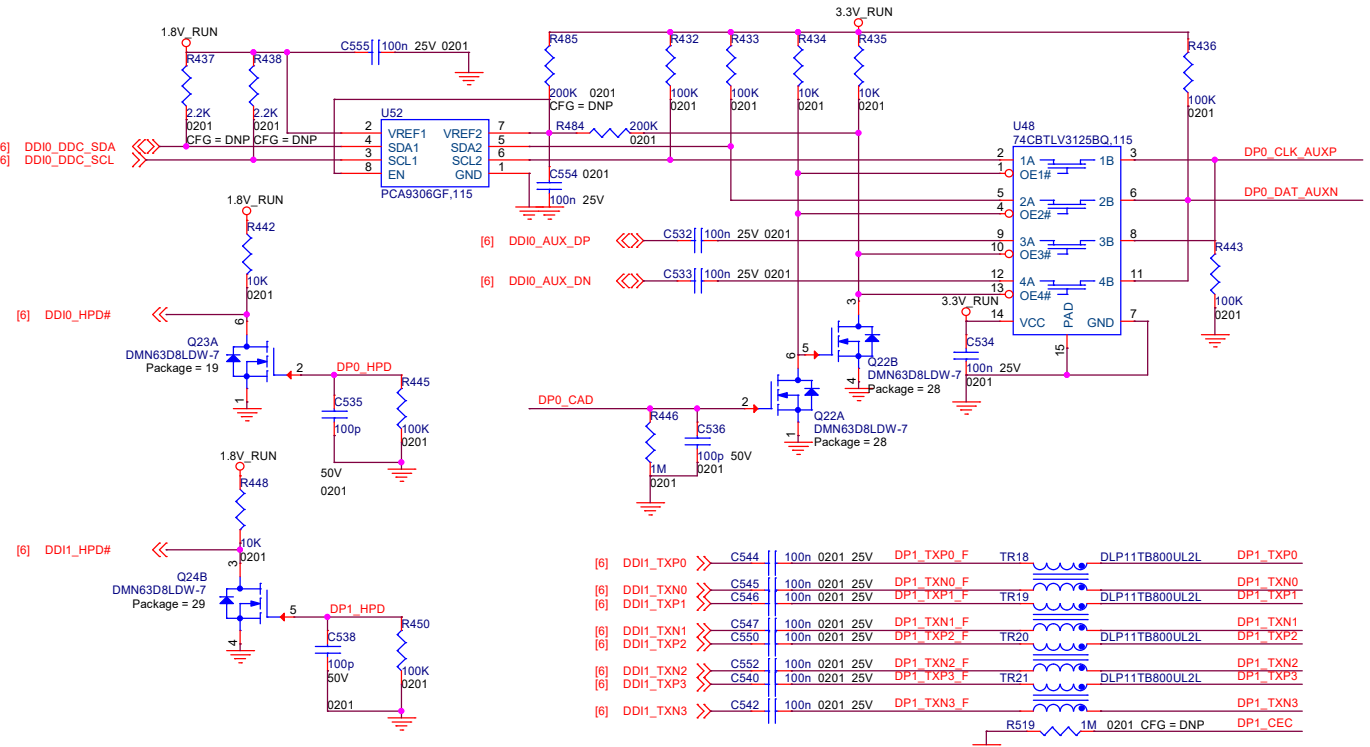
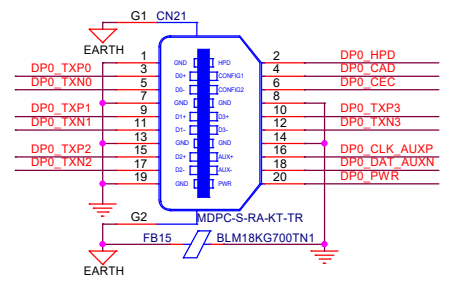
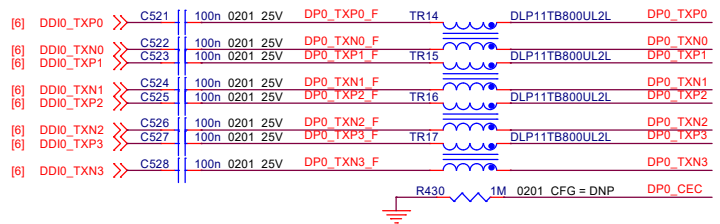
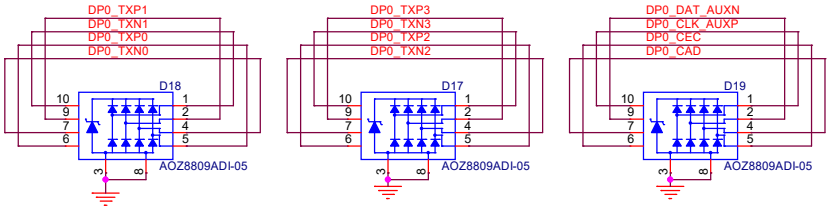
LAN 1



LAN 2



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Configuration options

CPU

SD02-1xxx-xxxx-C0 Intel® Celeron® N3350
SD02-2xxx-xxxx-C0 Intel® Pentium® N4200

RAM

SD02-x1xx-xxxx-C0 (CFG = A0) --> 8 Gb chip + quad channel (4 GB total)
SD02-x2xx-xxxx-C0 (CFG = A1) --> 16 Gb chip + quad channel (8 GB total)

eMMC

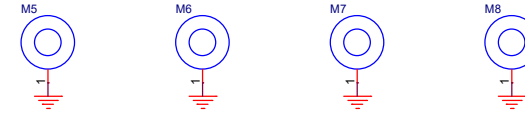
SD02-xx1x-xxxx-C0 (CFG = B0) --> U28 = 40H4DH0L01330 --> EMMC32G-TA29-PZ90 32 GB Kingston TLC 5.1
SD02-xx2x-xxxx-C0 (CFG = B0) --> U28 = 40H4DM0L01330 --> EMMC64G-TA29-PZ90 64 GB Kingston TLC 5.1

Seco product codes:

SD02-1110-0000-C0 Intel® Celeron® N3350 Dual Core @1.1GHz + 4GB Ram + 32GB eMMC
SD02-2110-0000-C0 Intel® Pentium® N4200 Quad Core @1.1GHz + 4GB Ram + 32GB eMMC
SD02-2120-0000-C0 Intel® Pentium® N4200 Quad Core @1.1GHz + 4GB Ram + 64GB eMMC
SD02-2220-0000-C0 Intel® Pentium® N4200 Quad Core @1.1GHz + 8GB Ram + 64GB eMMC

Temperature range 0 to 60°C

Pico ITX standard holes



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