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Schematics and other handouts serve for informational purposes only!

| | | | |
|---|---|--|----------------------------|
|  | Title: AM0010 – Legal Notices Modules | | |
| | A4 | Number: Legal Notices Modules 4DE21MA | Rev. 02 |
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| | Filename: Legal Notices Modules.SchDoc | | |

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A

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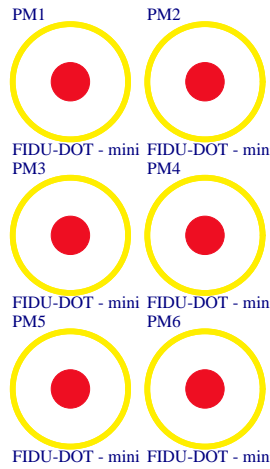
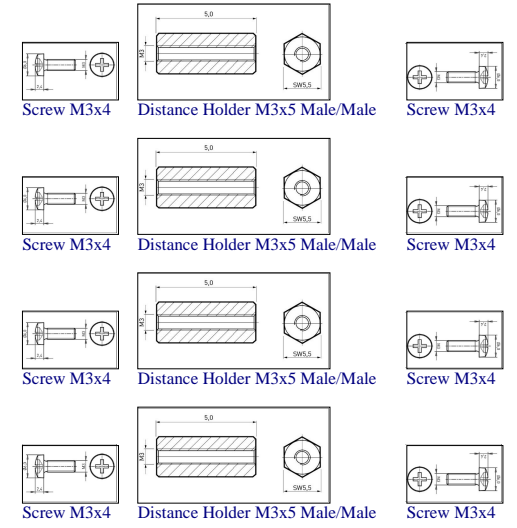
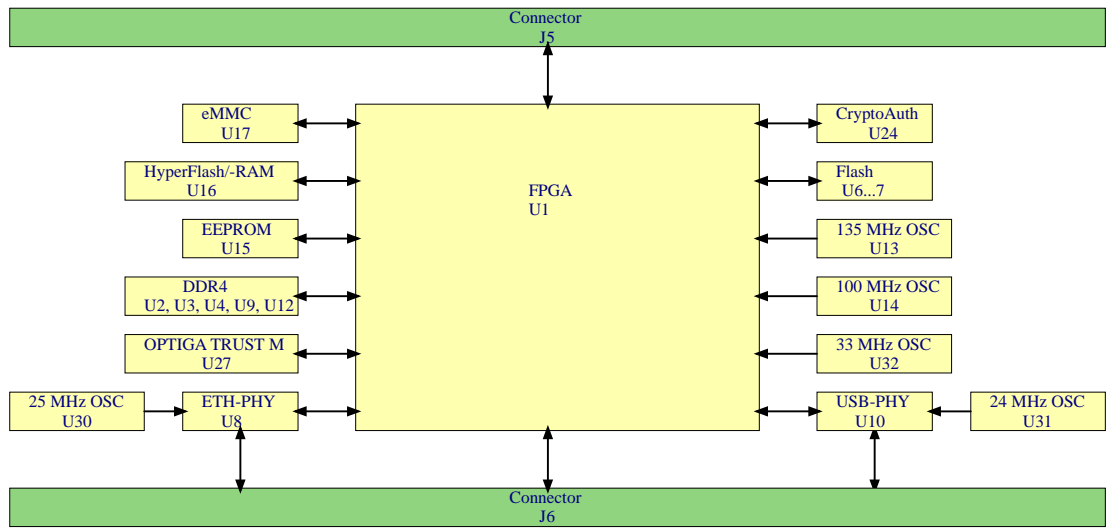
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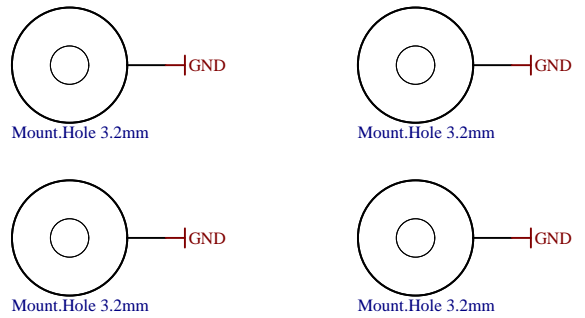
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B2B_Connector_1.SchDoc
- U_B2B_Connector_2
B2B_Connector_2.SchDoc
- U_MPSoC
MPSoC.SchDoc
- U_DDR4-RAM
DDR4-RAM.SchDoc
- U_DDR4-RAM_2
DDR4-RAM_2.SchDoc
- U_DDR4-RAM_3
DDR4-RAM_3.SchDoc
- U_DDR4-RAM_4
DDR4-RAM_4.SchDoc
- U_DDR4-RAM_5
DDR4-RAM_5.SchDoc
- U_DDR4-CAPS
DDR4-CAPS.SchDoc
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- U_ETHPHY
ETHPHY.SchDoc
- U_USBPHY
USBPHY.SchDoc
- U_eMMC
eMMC.SchDoc
- U_MISC
MISC.SchDoc

- U_POWER_1
POWER_1.SchDoc
- U_POWER_2
POWER_2.SchDoc
- U_REV_CH
Revision_Changes.SchDoc
- U_Legal_Notices_Modules
Legal_Notices_Modules.SchDoc

Special notes:



Serial
Serialnumber 6,3 x 6.3mm



UKCA
UKCA Logo on Top Overlay
UKCA-TOOVERLAY



| | |
|------------------|----------|
| Assembly variant | 4DE21MA |
| Created by | ED |
| Modified by | ED |
| Modified at | 02.07.21 |
| SVN Revision | 588 |

| | | |
|-------------------------|----------------------------------|--------------|
| Title: AM0010 | | |
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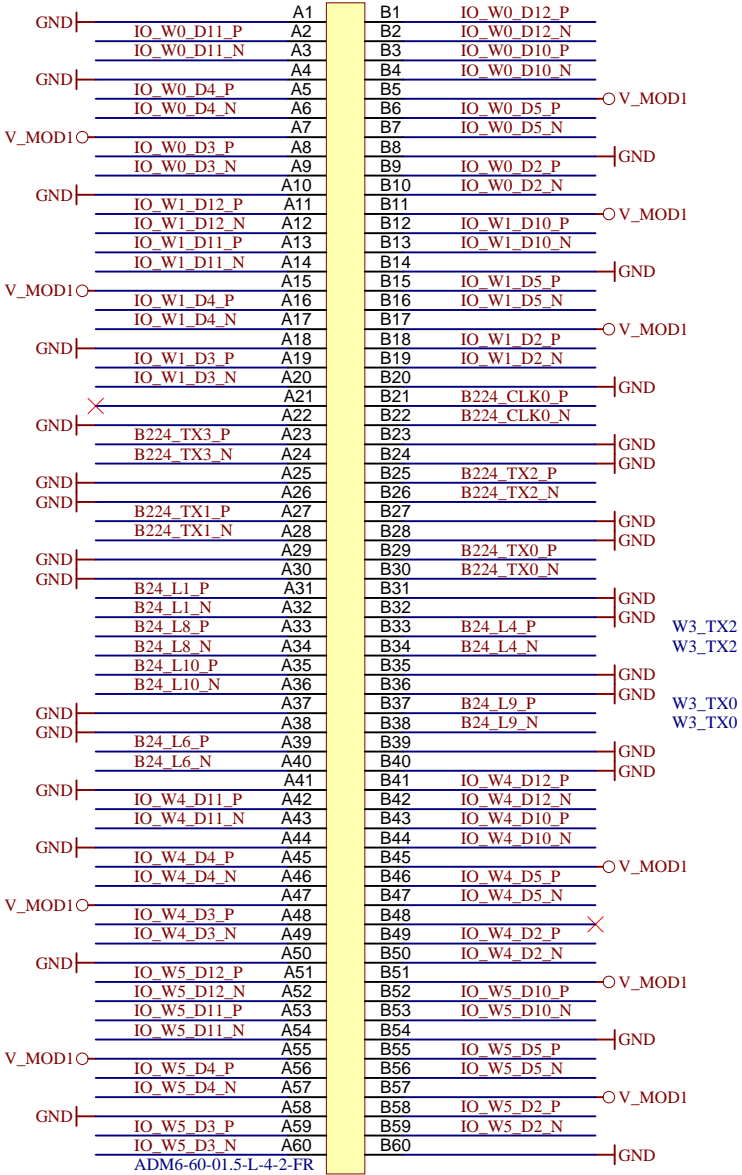
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Connector W

J5A

J5B

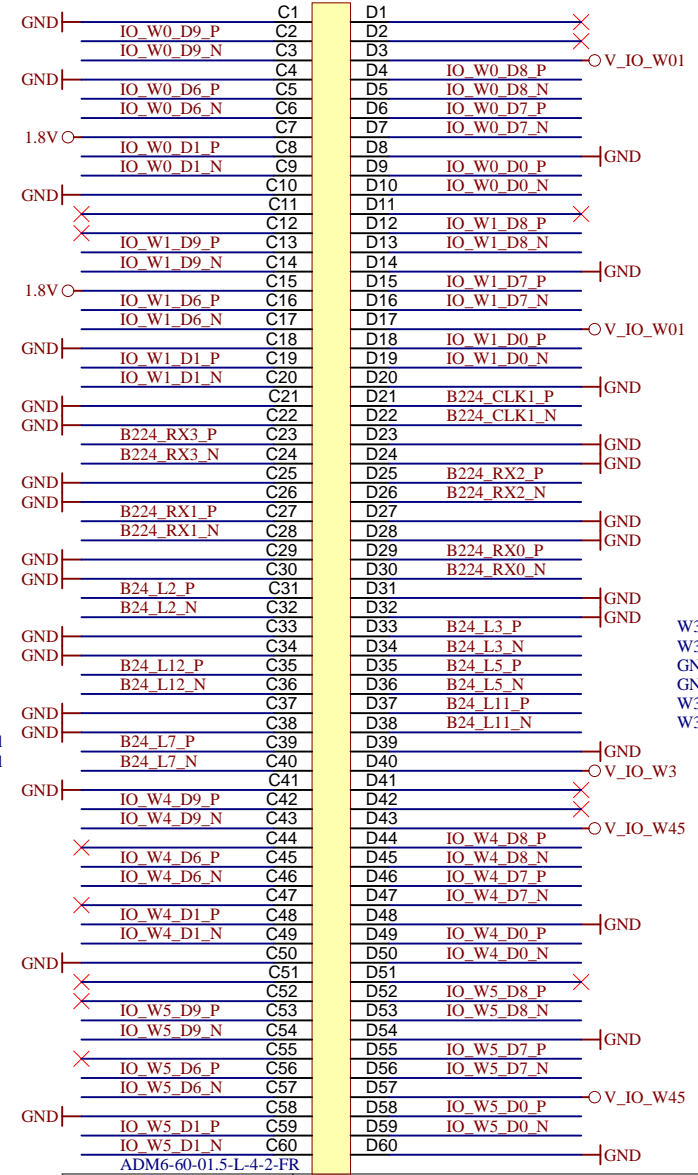


W3_TX3
W3_TX3
GND
W3_TX1
W3_TX1

W3_CLK0
W3_CLK0

W3_TX2
W3_TX2

W3_TX0
W3_TX0



W3_RX3
W3_RX3

W3_RX1
W3_RX1

W3_CLK1
W3_CLK1

V_IO_W01

V_IO_W01

W3_RX2
W3_RX2
GND
W3_RX0
W3_RX0

V_IO_W3

V_IO_W45

V_IO_W45



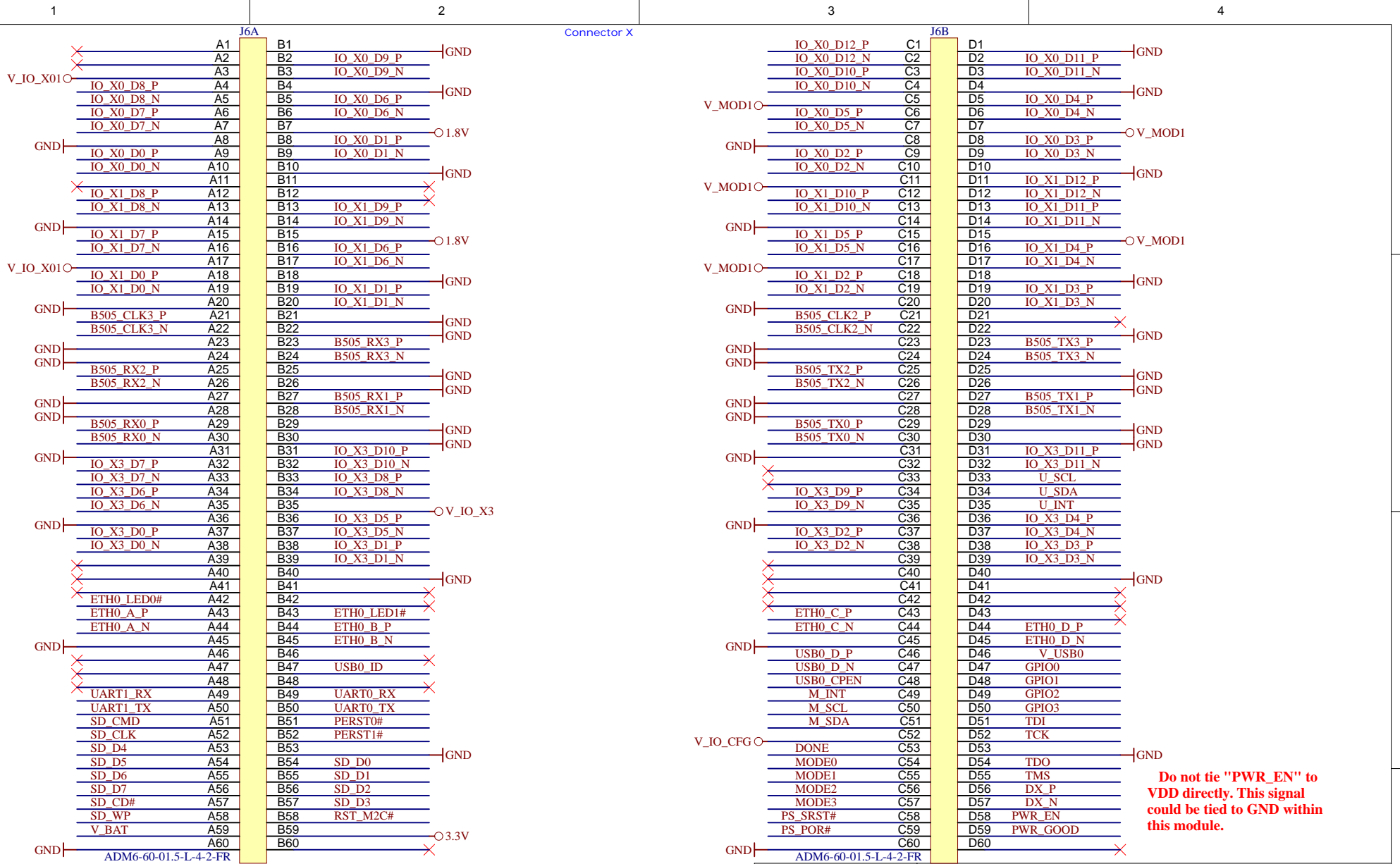
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| Filename: B2B_Connector_1.SchDoc | | |

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Do not tie "PWR_EN" to VDD directly. This signal could be tied to GND within this module.



| | | |
|----------------------------------|------------------------------------|--------------|
| Title: AM0010 – B2B_Connector_2 | | |
| A4 | Number: B2B_Connector_2 4DE21MA | Rev. 02 |
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| Filename: B2B_Connector_2.SchDoc | | |

1












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A

A

- U_B64
B64.SchDoc

- U_B65
B65.SchDoc

- U_B66
B66.SchDoc

- U_B_HD
B_HD.SchDoc

- U_B_MIO
B_MIO.SchDoc

- U_PS_DDR
PS_DDR.SchDoc

- U_B_PS_GT
B_PS_GT.SchDoc

- U_B_GT
B_GT.SchDoc

- U_CONFIG
CONFIG.SchDoc

- U_ZU_POWER
ZU_POWER.SchDoc

- U_ZU_PS_POWER
ZU_PS_POWER.SchDoc


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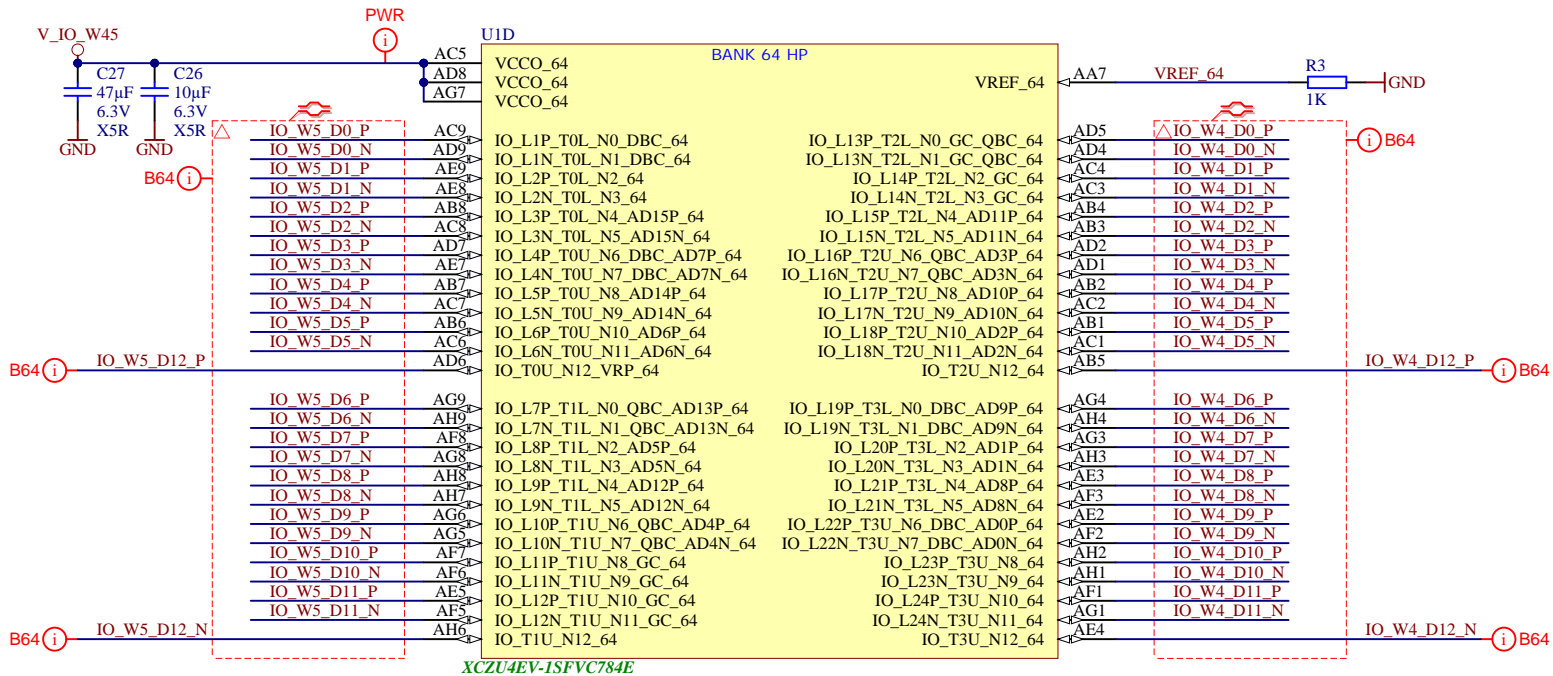
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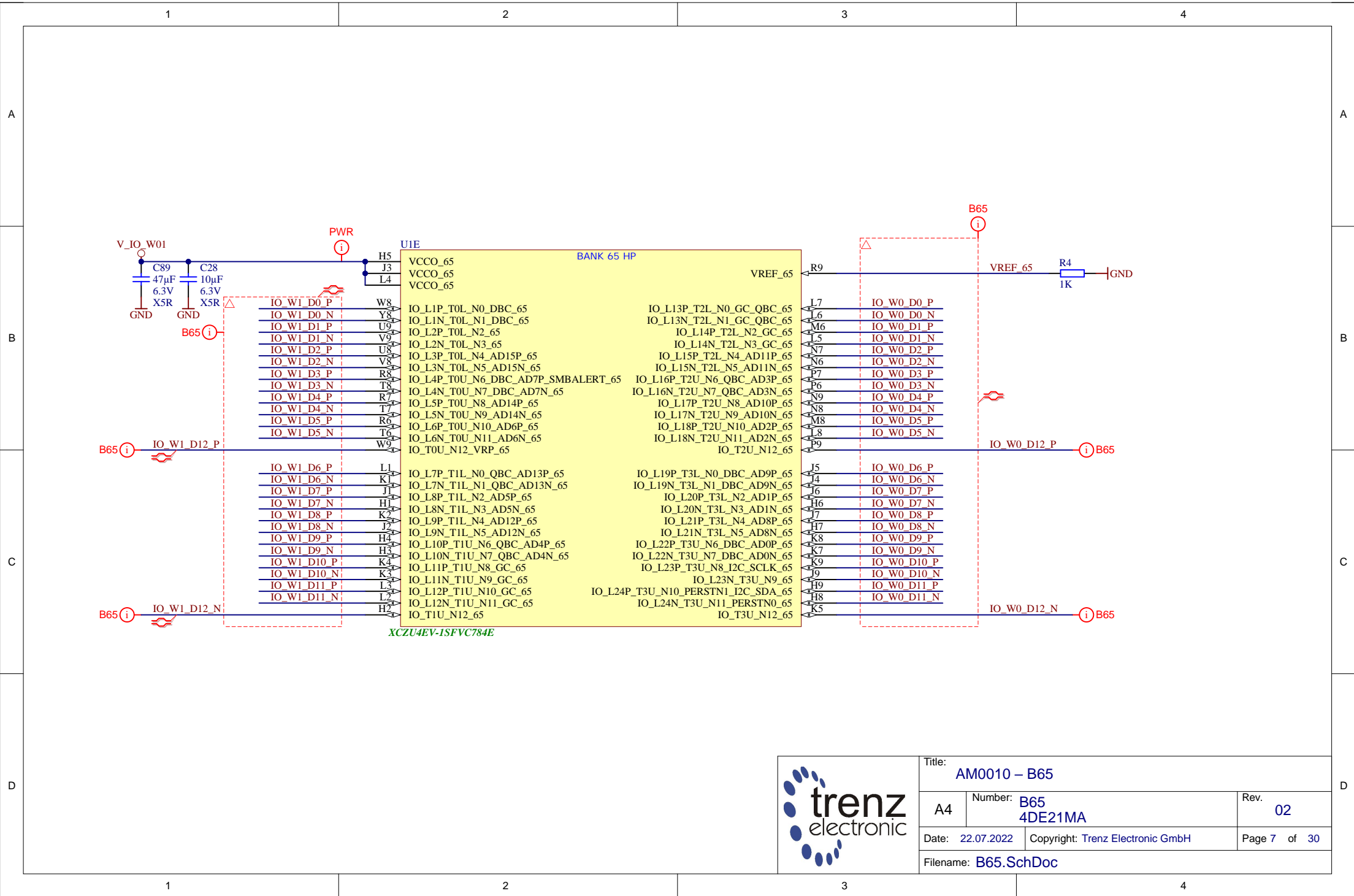
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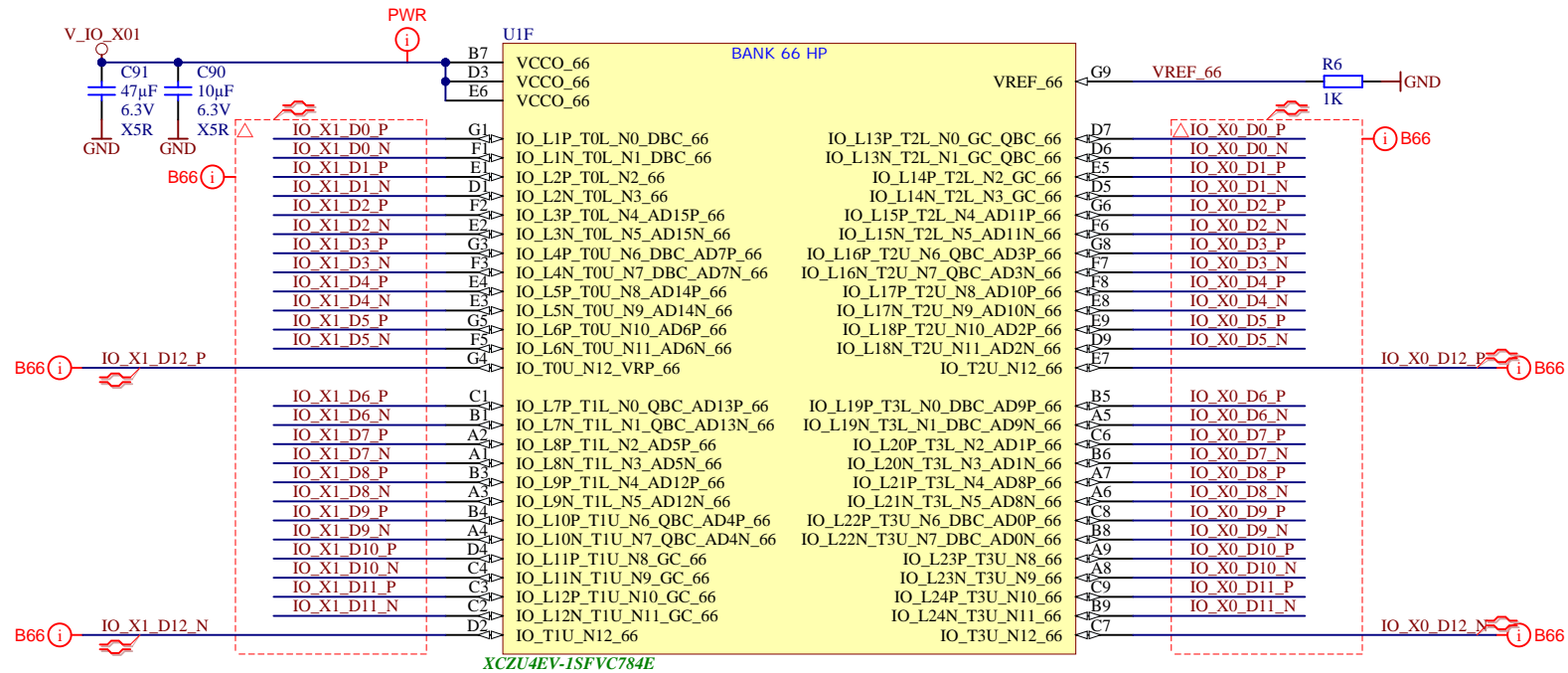
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| Title: AM0010 – B65 | | |
| A4 | Number: B65 4DE21MA | Rev. 02 |
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| Filename: B66.SchDoc | | |

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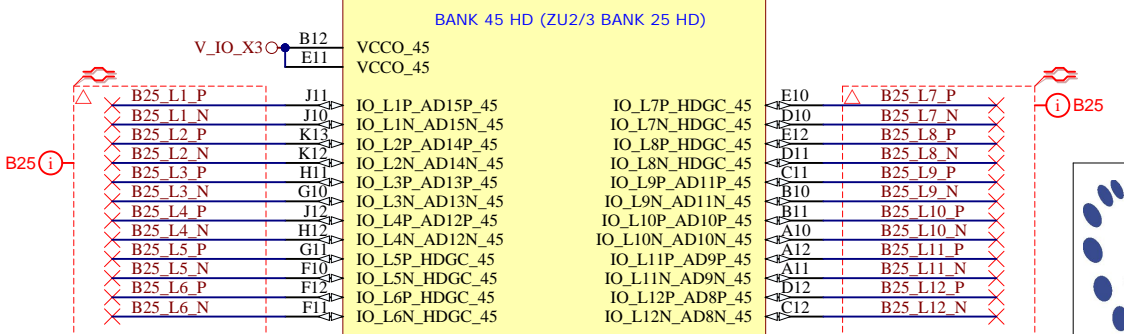
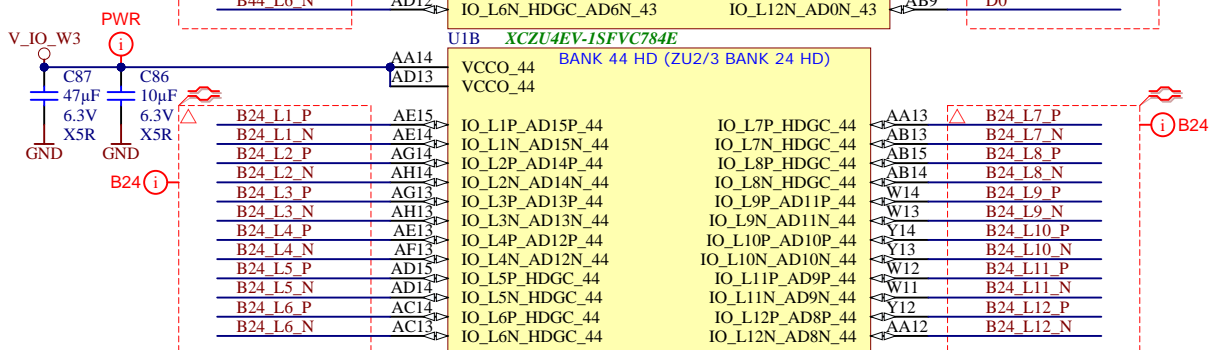
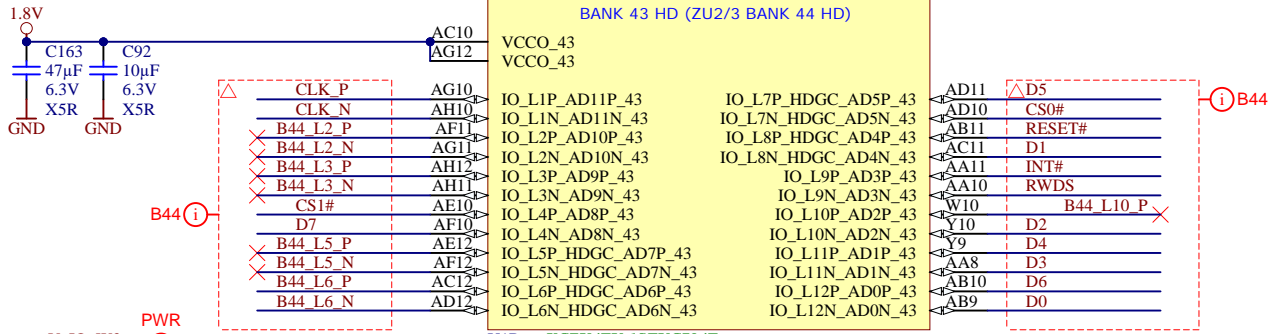
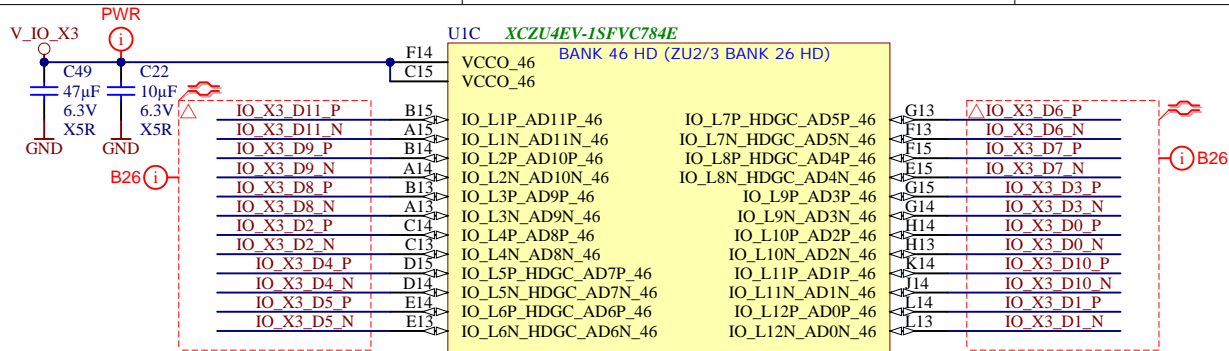
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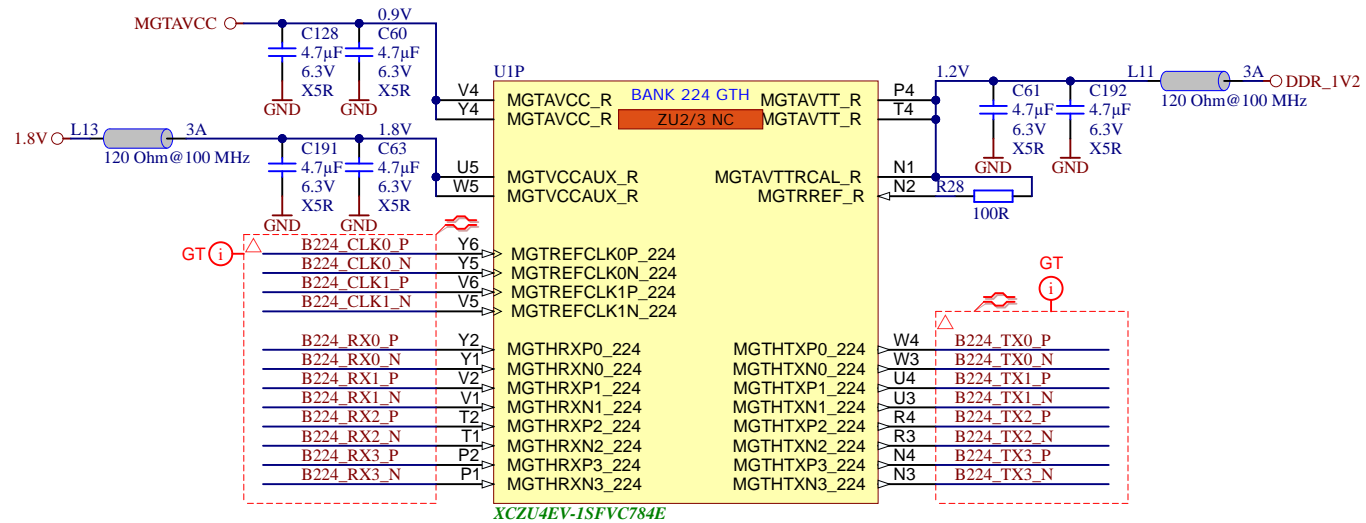
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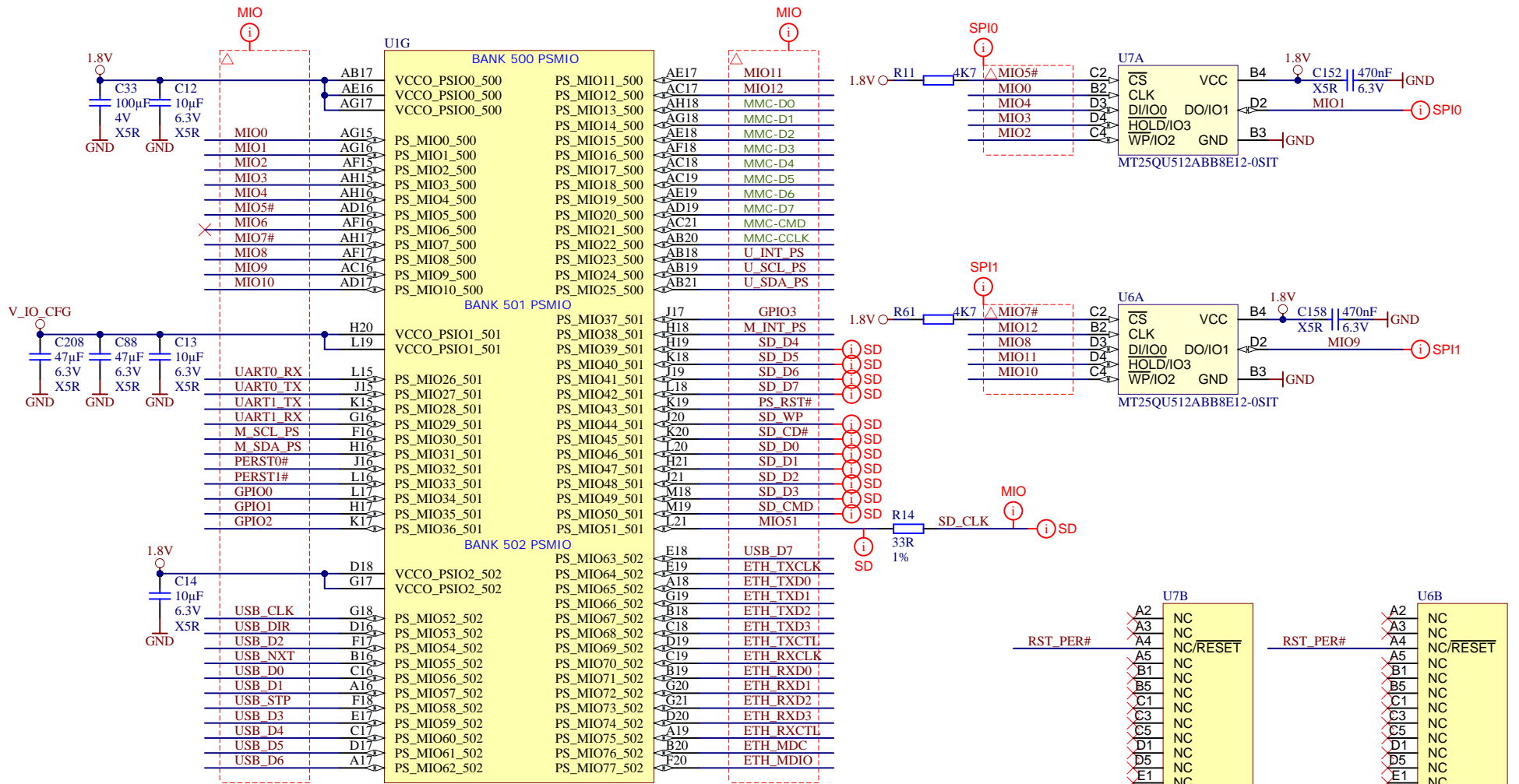
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| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | Page 9 of 30 |
| Filename: B_HD.SchDoc | | |

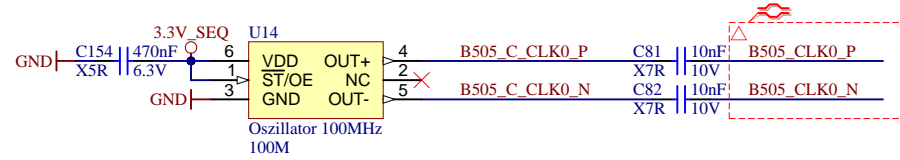
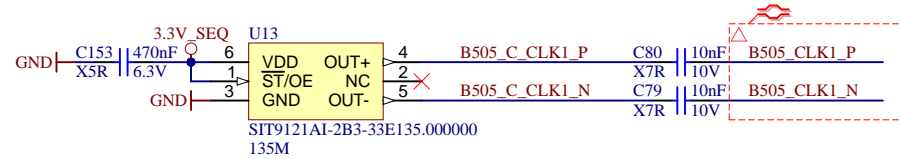
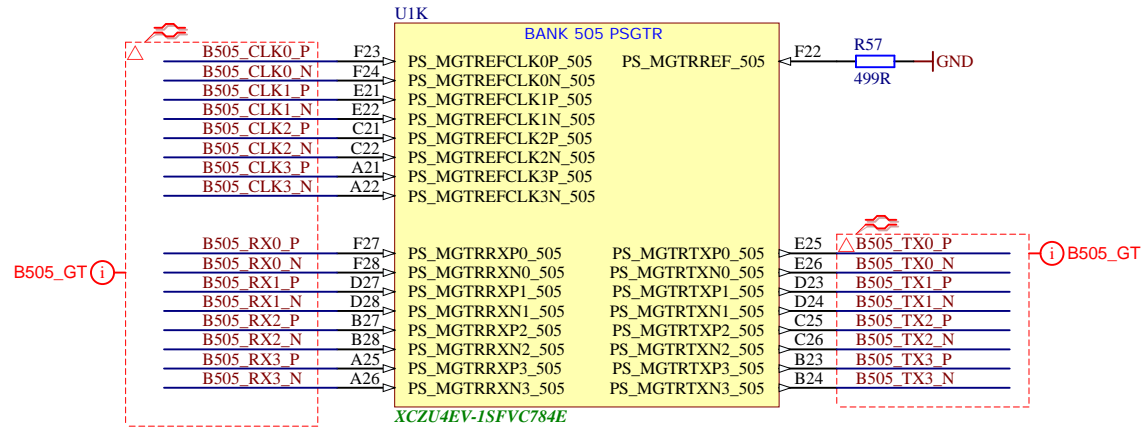


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| Date: 22.07.2022 | | Copyright: Trenz Electronic GmbH | |
| Filename: B_GT.SchDoc | | Page 10 of 30 | |

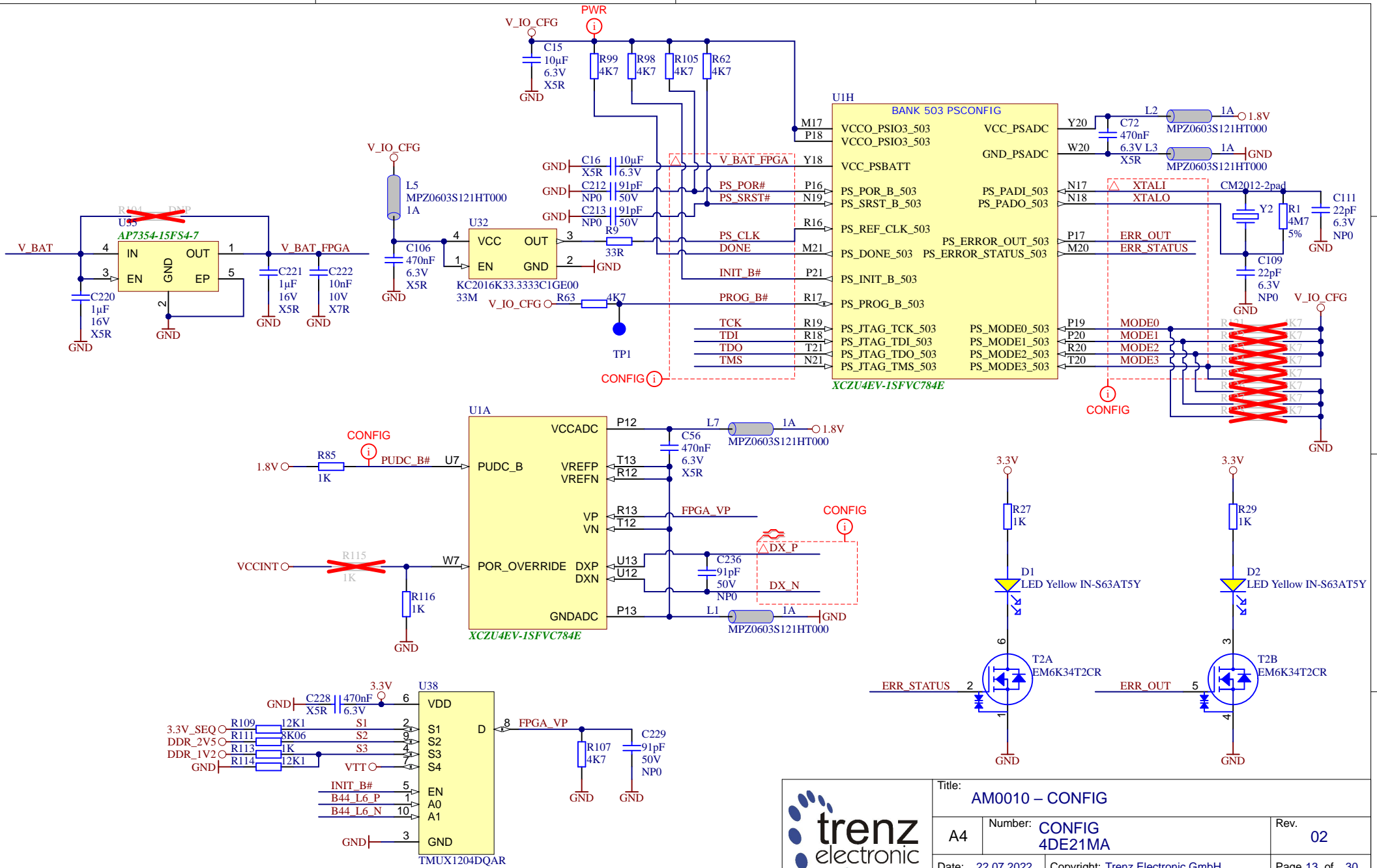


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| | A4 | Number: B_MIO 4DE21MA |
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| | Filename: B_MIO.SchDoc | |

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| | Title: AM0010 - B_PS_GT | | |
| | A4 | Number: B_PS_GT 4DE21MA | Rev. 02 |
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| | | |
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| Title: AM0010 – CONFIG | | |
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| Filename: CONFIG.SchDoc | | |

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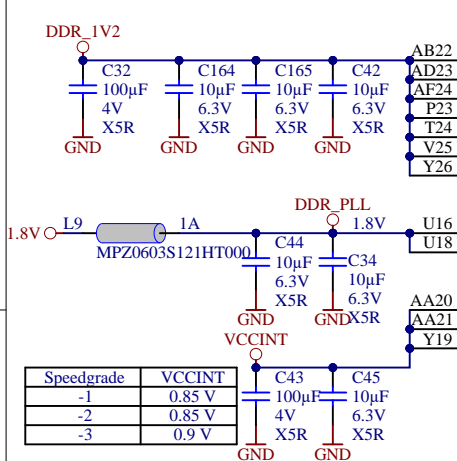
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U11 BANK 504 PSDDR

| | | | | |
|----------------------|----------------------|------|-------------|---------|
| VCCO_PSDDR_504 | PS_DDR_CK0_504 | W25 | DDR4-CLK0_P | D80 |
| VCCO_PSDDR_504 | PS_DDR_CK_N0_504 | W26 | DDR4-CLK0_N | D80 |
| VCCO_PSDDR_504 | PS_DDR_CKE0_504 | V28 | DDR4-CKE0 | |
| VCCO_PSDDR_504 | PS_DDR_CK1_504 | Y24 | | X |
| VCCO_PSDDR_504 | PS_DDR_CK_N1_504 | Y25 | | X |
| VCCO_PSDDR_504 | PS_DDR_CKE1_504 | V27 | | X |
| VCC_PSDDR_PLL | PS_DDR_A0_504 | W28 | DDR4-A0 | |
| VCC_PSDDR_PLL | PS_DDR_A1_504 | Y28 | DDR4-A1 | |
| VCC_PSDDR_PLL | PS_DDR_A2_504 | AB28 | DDR4-A2 | |
| VCC_PSDDR_PLL | PS_DDR_A3_504 | AA28 | DDR4-A3 | |
| VCC_PSDDR_PLL | PS_DDR_A4_504 | Y27 | DDR4-A4 | |
| VCC_PSINTRF_DDR | PS_DDR_A5_504 | AA27 | DDR4-A5 | |
| VCC_PSINTRF_DDR | PS_DDR_A6_504 | Y22 | DDR4-A6 | |
| VCC_PSINTRF_DDR | PS_DDR_A7_504 | AA23 | DDR4-A7 | |
| VCC_PSINTRF_DDR | PS_DDR_A8_504 | AA22 | DDR4-A8 | |
| VCC_PSINTRF_DDR | PS_DDR_A9_504 | AB23 | DDR4-A9 | |
| VCC_PSINTRF_DDR | PS_DDR_A10_504 | AA25 | DDR4-A10 | |
| VCC_PSINTRF_DDR | PS_DDR_A11_504 | AA26 | DDR4-A11 | |
| VCC_PSINTRF_DDR | PS_DDR_A12_504 | AB25 | DDR4-A12 | |
| VCC_PSINTRF_DDR | PS_DDR_A13_504 | AB26 | DDR4-A13 | |
| VCC_PSINTRF_DDR | PS_DDR_A14_504 | AB24 | DDR4-A14 | |
| VCC_PSINTRF_DDR | PS_DDR_A15_504 | AC24 | DDR4-A15 | |
| VCC_PSINTRF_DDR | PS_DDR_A16_504 | AC23 | DDR4-A16 | |
| VCC_PSINTRF_DDR | PS_DDR_A17_504 | AC22 | DDR4-A17 | |
| PS_DDR_CS_N0_504 | PS_DDR_CS_N1_504 | W27 | DDR4-CS# | |
| PS_DDR_CS_N0_504 | PS_DDR_CS_N1_504 | V26 | | X |
| PS_DDR_BA0_504 | PS_DDR_BA1_504 | V23 | DDR4-BA0 | |
| PS_DDR_BA0_504 | PS_DDR_BA1_504 | W22 | DDR4-BA1 | |
| PS_DDR_BG0_504 | PS_DDR_BG1_504 | W24 | DDR4-BG0 | |
| PS_DDR_BG0_504 | PS_DDR_BG1_504 | V22 | DDR4-BG1 | |
| PS_DDR_PARITY_504 | PS_DDR_RAM_RST_N_504 | V24 | DDR4-PAR | |
| PS_DDR_RAM_RST_N_504 | PS_DDR_ACT_N_504 | U23 | DDR4-RESET# | |
| PS_DDR_ACT_N_504 | PS_DDR_ALERT_N_504 | Y23 | DDR4-ACT# | |
| PS_DDR_ALERT_N_504 | PS_DDR_ALERT_N_504 | U25 | DDR4-ALERT# | |
| PS_DDR_ZQ_504 | PS_DDR_ZQ_504 | U24 | | R2 240R |
| PS_DDR_ODT0_504 | PS_DDR_ODT1_504 | U28 | DDR4-ODT0 | |
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XCZU4EV-1SFVC784E

U1J BANK 504 PSDDR

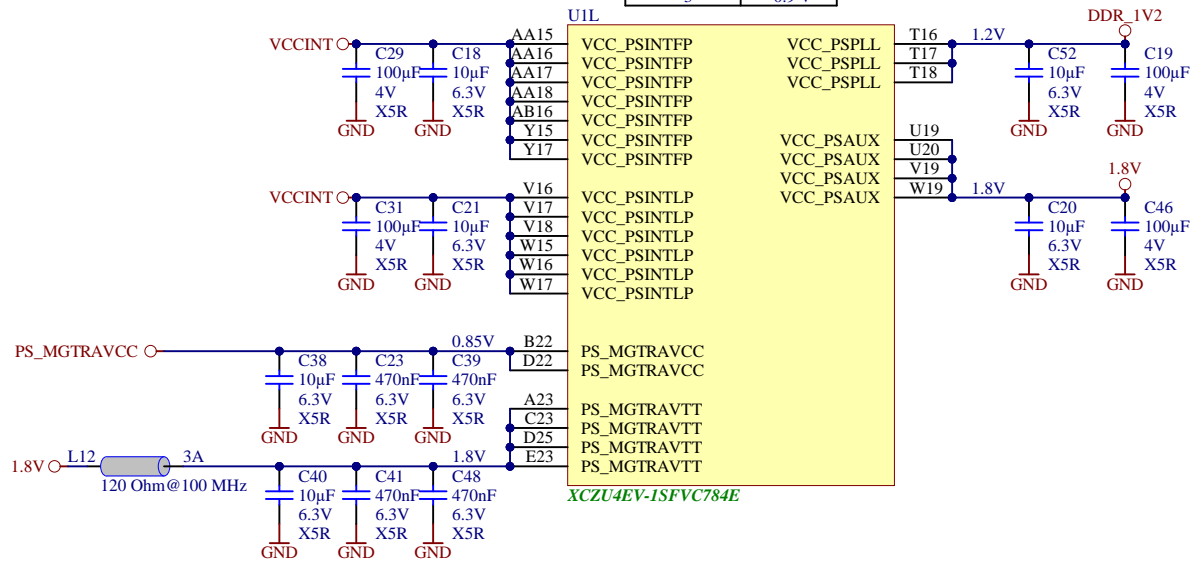
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| DQ2 | AD20 | PS_DDR_DQ2_504 | PS_DDR_DQ34_504 | P22 | DQ34 |
| DQ3 | AF20 | PS_DDR_DQ3_504 | PS_DDR_DQ35_504 | N22 | DQ35 |
| DQ4 | AH21 | PS_DDR_DQ4_504 | PS_DDR_DQ36_504 | T23 | DQ36 |
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| DQ6 | AH19 | PS_DDR_DQ6_504 | PS_DDR_DQ38_504 | R24 | DQ38 |
| DQ7 | AG19 | PS_DDR_DQ7_504 | PS_DDR_DQ39_504 | N24 | DQ39 |
| DQ8 | AF22 | PS_DDR_DQ8_504 | PS_DDR_DQ40_504 | H24 | DQ40 |
| DQ9 | AH22 | PS_DDR_DQ9_504 | PS_DDR_DQ41_504 | J24 | DQ41 |
| DQ10 | AE22 | PS_DDR_DQ10_504 | PS_DDR_DQ42_504 | M24 | DQ42 |
| DQ11 | AD23 | PS_DDR_DQ11_504 | PS_DDR_DQ43_504 | K24 | DQ43 |
| DQ12 | AH23 | PS_DDR_DQ12_504 | PS_DDR_DQ44_504 | J22 | DQ44 |
| DQ13 | AH24 | PS_DDR_DQ13_504 | PS_DDR_DQ45_504 | H22 | DQ45 |
| DQ14 | AE24 | PS_DDR_DQ14_504 | PS_DDR_DQ46_504 | K22 | DQ46 |
| DQ15 | AG24 | PS_DDR_DQ15_504 | PS_DDR_DQ47_504 | J22 | DQ47 |
| DQ16 | AC26 | PS_DDR_DQ16_504 | PS_DDR_DQ48_504 | M25 | DQ48 |
| DQ17 | AD26 | PS_DDR_DQ17_504 | PS_DDR_DQ49_504 | M26 | DQ49 |
| DQ18 | AD25 | PS_DDR_DQ18_504 | PS_DDR_DQ50_504 | L25 | DQ50 |
| DQ19 | AD24 | PS_DDR_DQ19_504 | PS_DDR_DQ51_504 | L26 | DQ51 |
| DQ20 | AG26 | PS_DDR_DQ20_504 | PS_DDR_DQ52_504 | K28 | DQ52 |
| DQ21 | AH25 | PS_DDR_DQ21_504 | PS_DDR_DQ53_504 | L28 | DQ53 |
| DQ22 | AH26 | PS_DDR_DQ22_504 | PS_DDR_DQ54_504 | M28 | DQ54 |
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| DQ25 | AH28 | PS_DDR_DQ25_504 | PS_DDR_DQ57_504 | K27 | DQ57 |
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| DQ28 | AC27 | PS_DDR_DQ28_504 | PS_DDR_DQ60_504 | G26 | DQ60 |
| DQ29 | AD27 | PS_DDR_DQ29_504 | PS_DDR_DQ61_504 | G25 | DQ61 |
| DQ30 | AD28 | PS_DDR_DQ30_504 | PS_DDR_DQ62_504 | K25 | DQ62 |
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| | | PS_DDR_DQ67_504 | PS_DDR_DQ67_504 | P27 | DQ67 |
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| | | PS_DDR_DQ69_504 | PS_DDR_DQ69_504 | R25 | DQ69 |
| | | PS_DDR_DQ70_504 | PS_DDR_DQ70_504 | P25 | DQ70 |
| | | PS_DDR_DQ71_504 | PS_DDR_DQ71_504 | T25 | DQ71 |
| DDR4-DQS0_P | AF21 | PS_DDR_DQS_P0_504 | PS_DDR_DM0_504 | AG20 | DDR4-DM0# |
| DDR4-DQS0_N | AG21 | PS_DDR_DQS_N0_504 | PS_DDR_DM1_504 | AE23 | DDR4-DM1# |
| DDR4-DQS1_P | AF23 | PS_DDR_DQS_P1_504 | PS_DDR_DM2_504 | AE25 | DDR4-DM2# |
| DDR4-DQS1_N | AG23 | PS_DDR_DQS_N1_504 | PS_DDR_DM3_504 | AE28 | DDR4-DM3# |
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| DDR4-DQS2_N | AG25 | PS_DDR_DQS_N2_504 | PS_DDR_DM5_504 | H23 | DDR4-DM5# |
| DDR4-DQS3_P | AE27 | PS_DDR_DQS_P3_504 | PS_DDR_DM6_504 | L27 | DDR4-DM6# |
| DDR4-DQS3_N | AF27 | PS_DDR_DQS_N3_504 | PS_DDR_DM7_504 | H26 | DDR4-DM7# |
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| DDR4-DQS6_P | N26 | PS_DDR_DQS_P6_504 | | | |
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| DDR4-DQS7_P | J26 | PS_DDR_DQS_P7_504 | | | |
| DDR4-DQS7_N | J27 | PS_DDR_DQS_N7_504 | | | |
| DDR4-DQS8_P | R27 | PS_DDR_DQS_P8_504 | | | |
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XCZU4EV-1SFVC784E

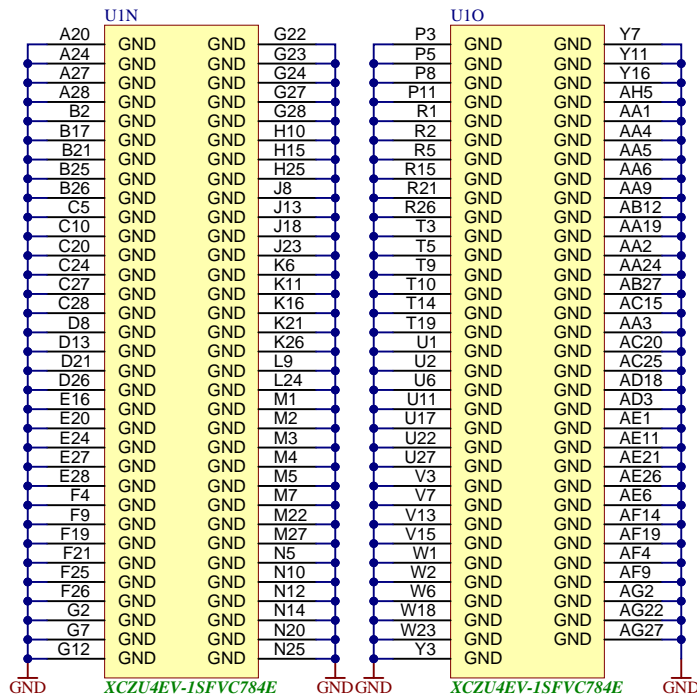


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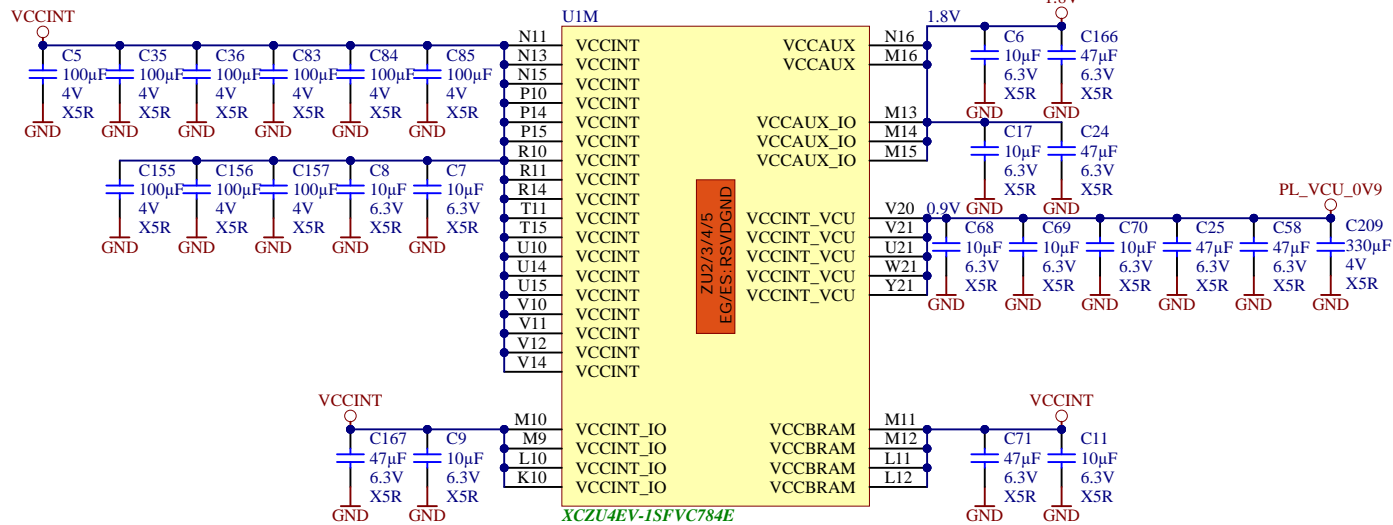

| Speedgrade | VCCINT |
|------------|--------|
| -1 | 0.85 V |
| -2 | 0.85 V |
| -3 | 0.9 V |



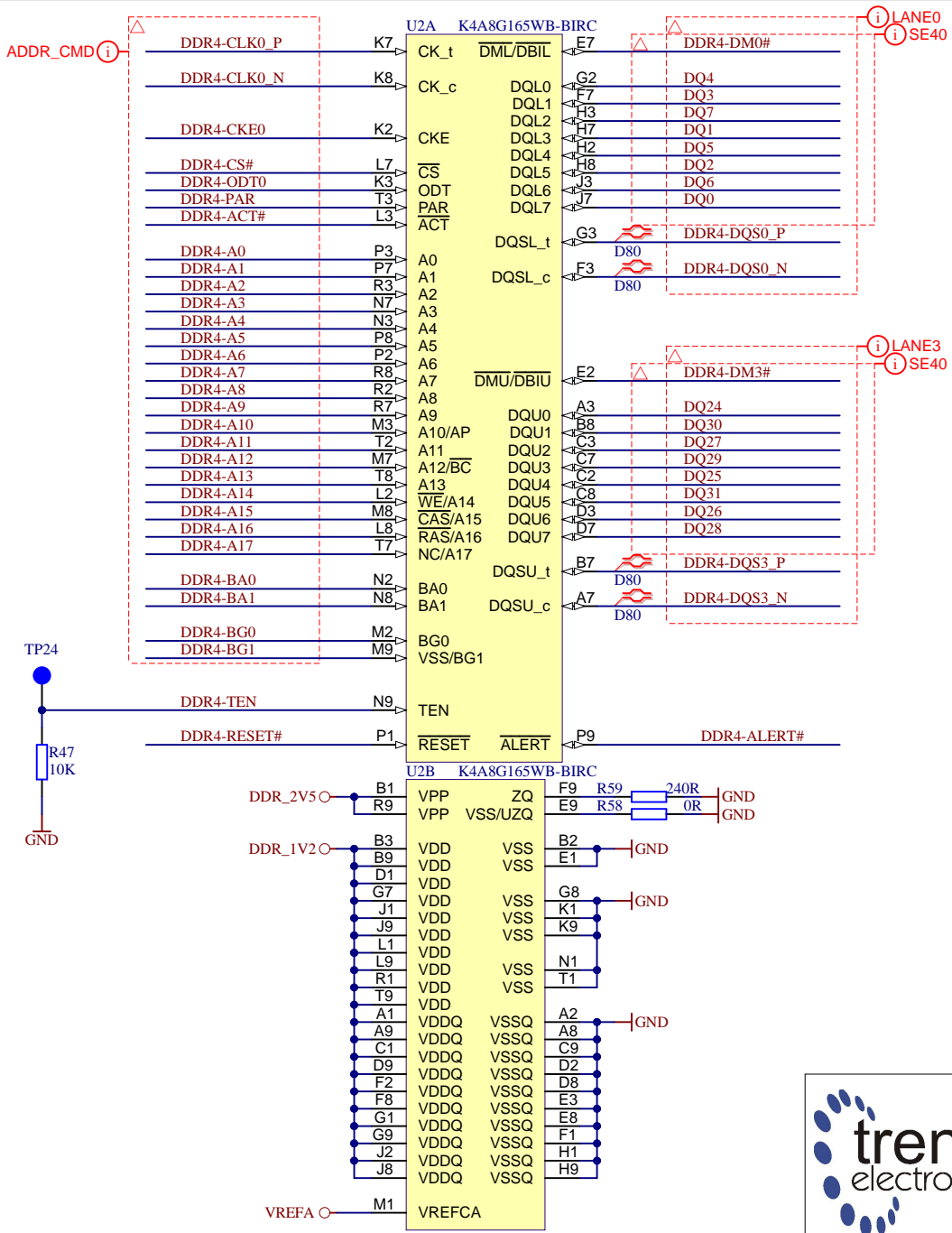
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| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | Page 15 of 30 |
| Filename: ZU_PS_POWER.SchDoc | | |



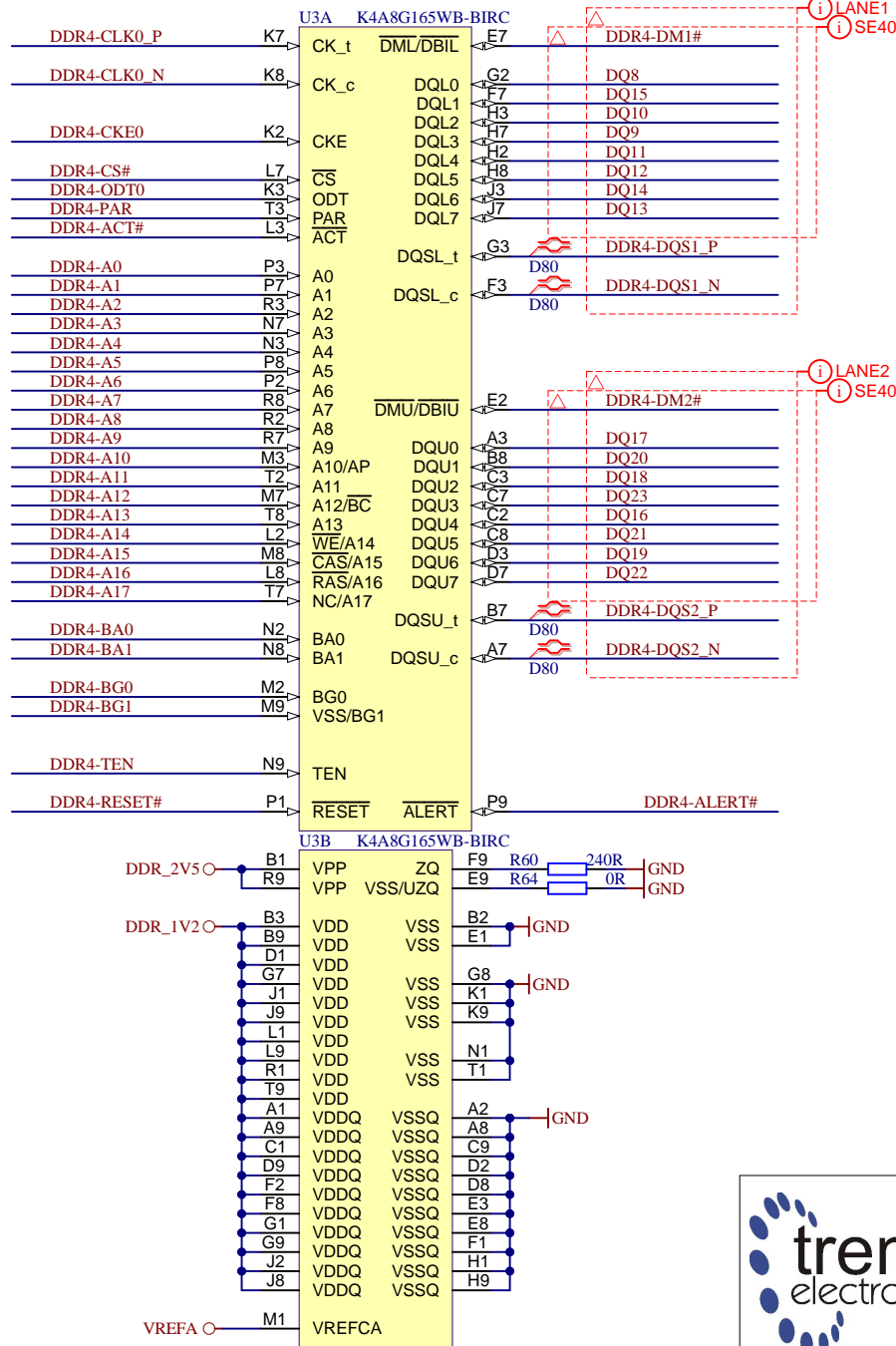

| Speedgrade | VCCINT |
|------------|--------|
| -1 | 0.85 V |
| -2 | 0.85 V |
| -3 | 0.9 V |

| | | |
|----------------------------------|---|-----------------------------|
| Title: AM0010 – ZU_POWER | | |
| A4 | Number: ZU_POWER 4DE21MA | Rev. 02 |
| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | Page 16 of 30 |
| Filename: ZU_POWER.SchDoc | | |



| | | |
|---------------------------|----------------------------------|---------------|
| Title: AM0010 – DDR4-RAM | | |
| A4 | Number: DDR4-RAM 4DE21MA | Rev. 02 |
| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | Page 17 of 30 |
| Filename: DDR4-RAM.SchDoc | | |

| | | |
|-----------------------------|----------------------------------|---------------|
| Title: AM0010 – DDR4-RAM_2 | | |
| A4 | Number: DDR4-RAM_2 4DE21MA | Rev. 02 |
| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | Page 18 of 30 |
| Filename: DDR4-RAM_2.SchDoc | | |

A

A

B

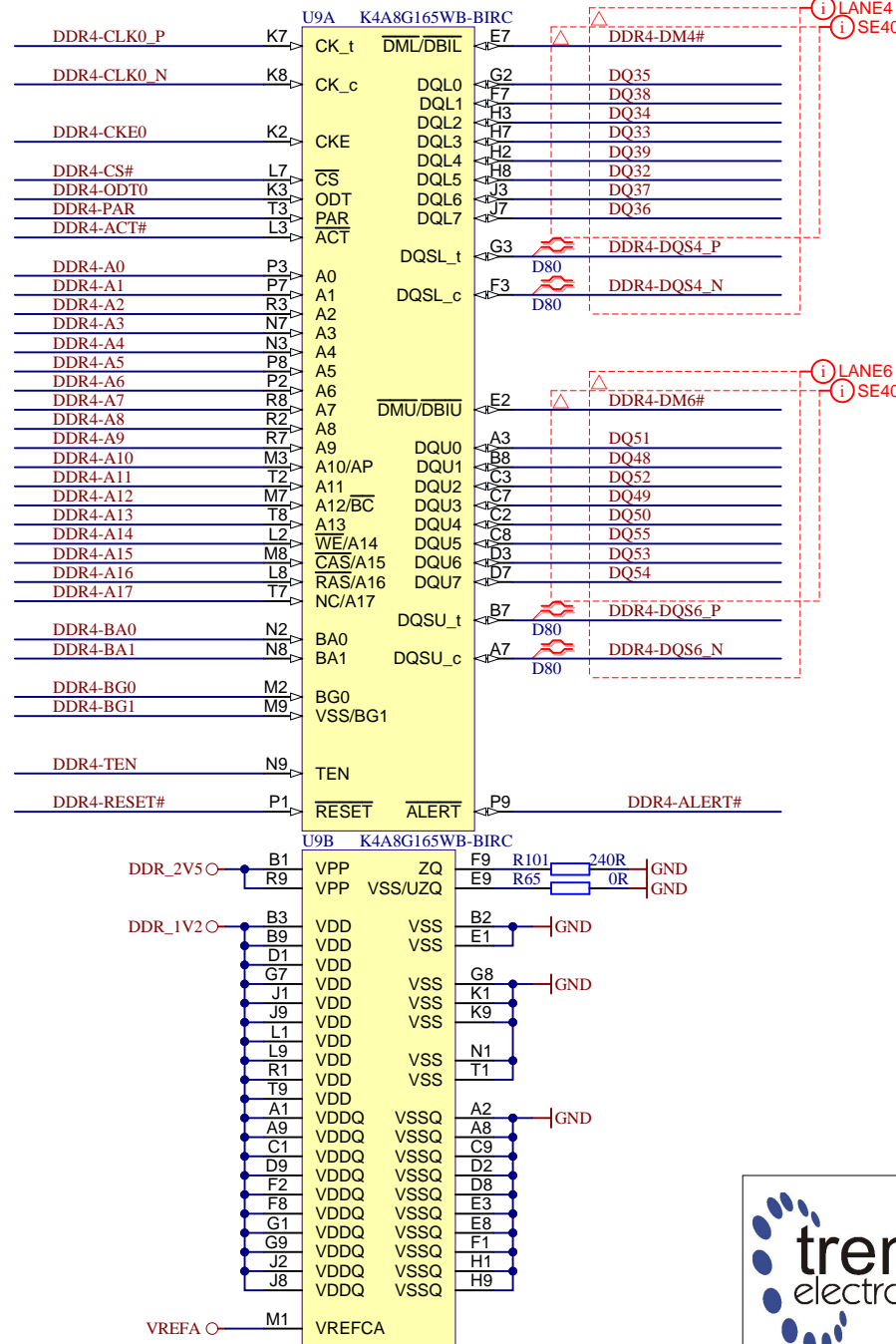
B


C

C

D

D



| | | | |
|---|--|----------------------------------|-------------------------------|
|  | | Title: AM0010 – DDR4-RAM_3 | |
| | | A4 | Number: DDR4-RAM_3 4DE21MA |
| Date: 22.07.2022 | | Copyright: Trenz Electronic GmbH | |
| Filename: DDR4-RAM_3.SchDoc | | Page 19 of 30 | |

A

A

B

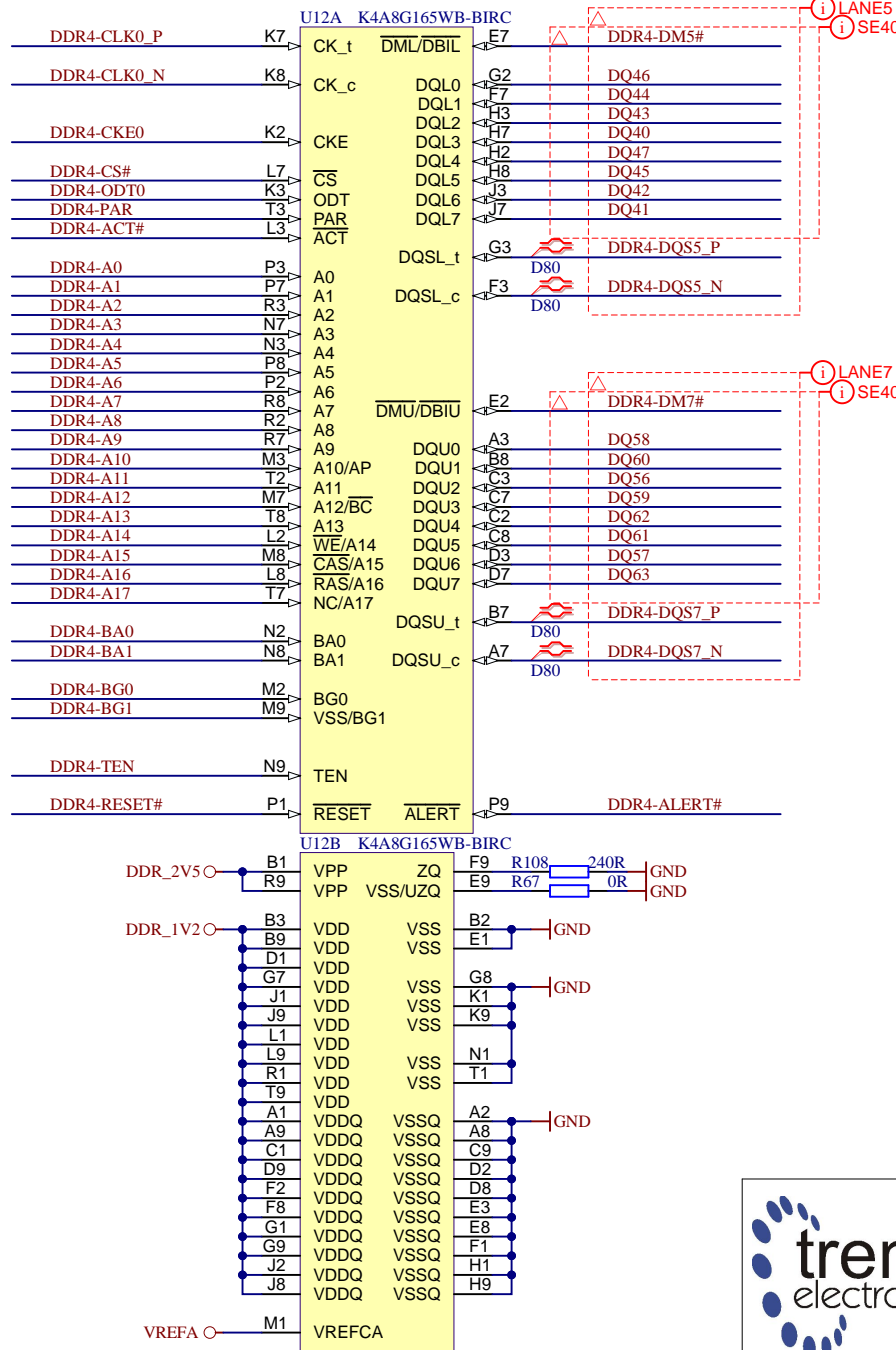
B


C

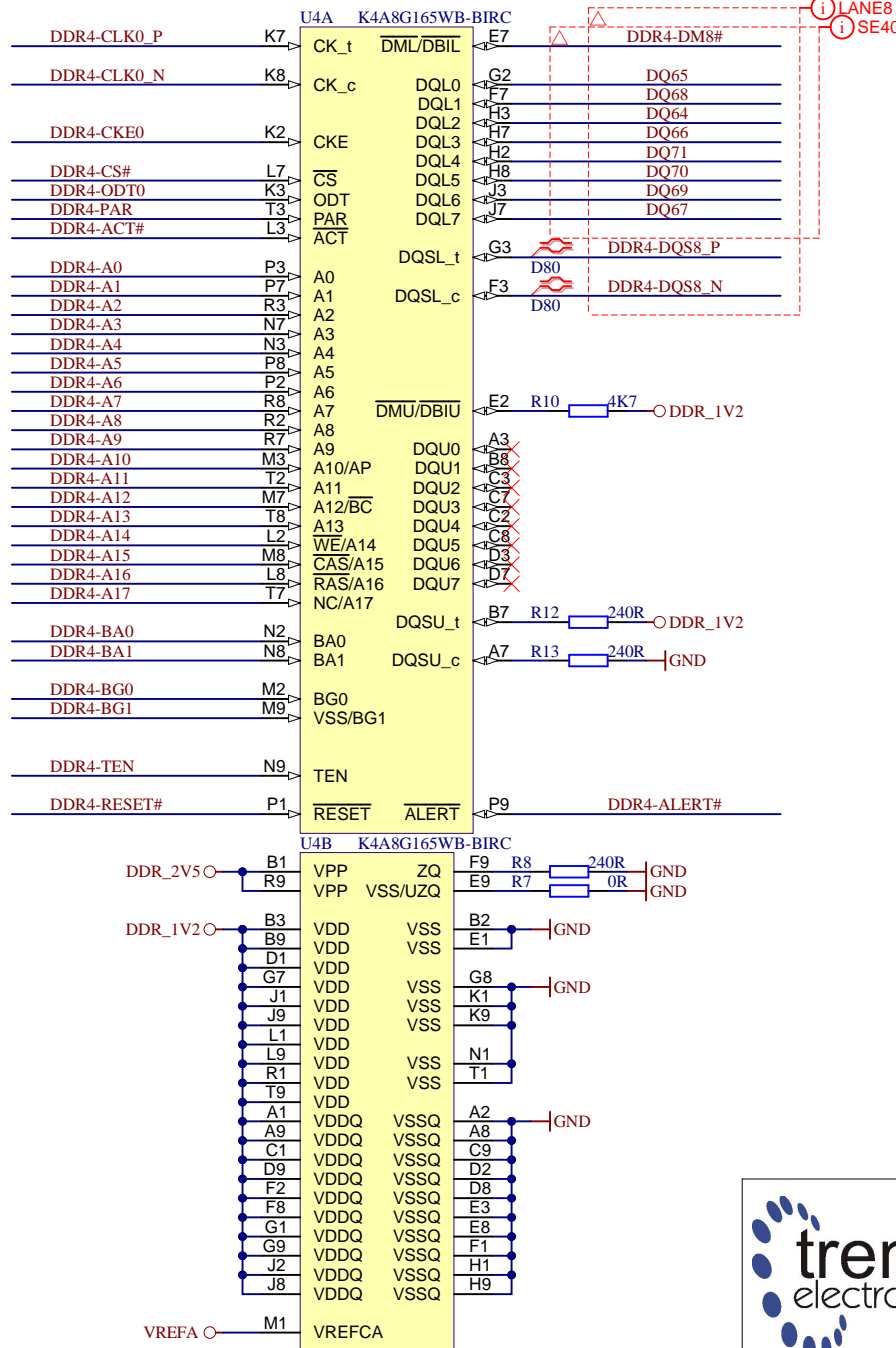
C

D

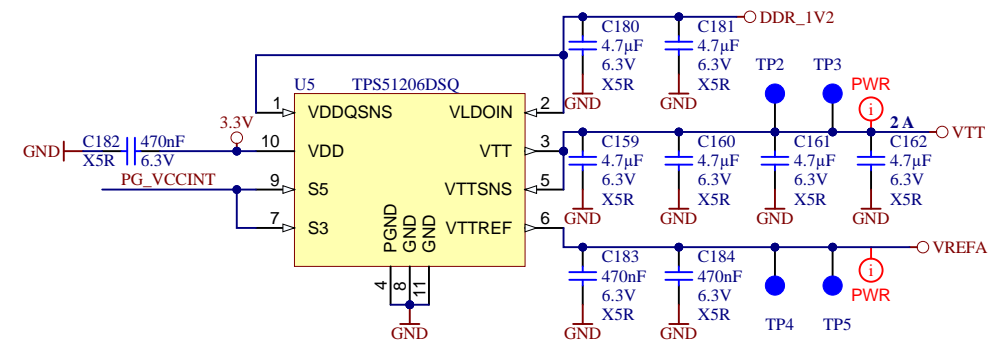
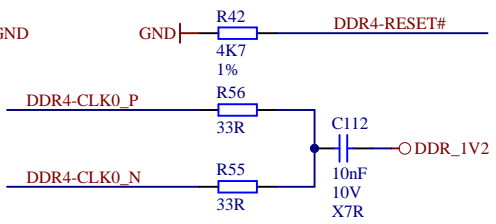
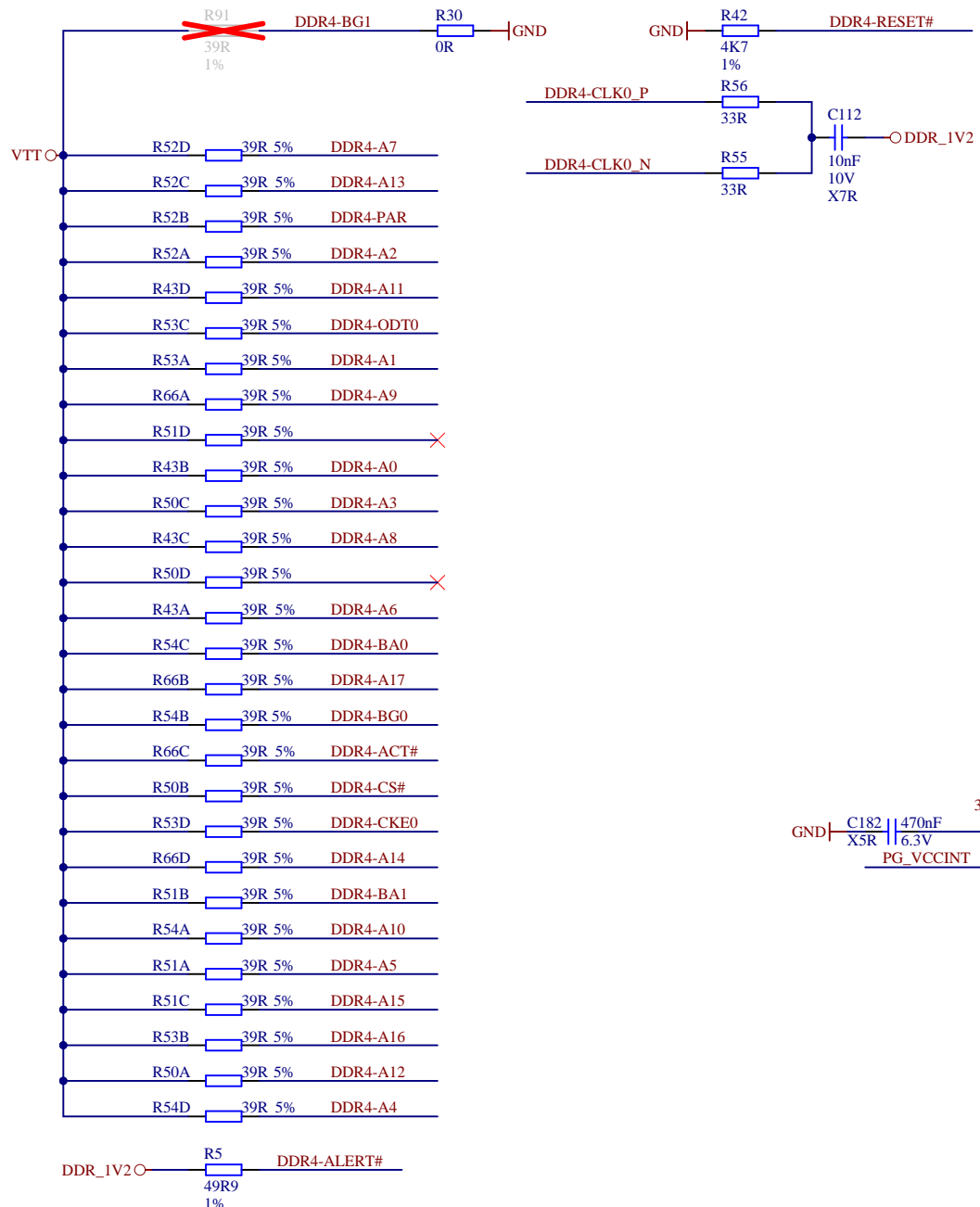
D



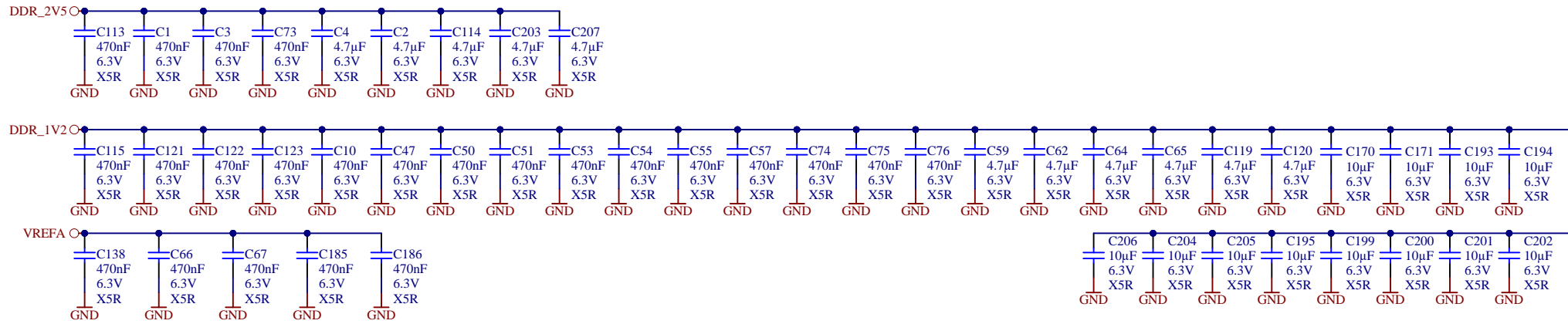
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|---|--|----------------------------------|-------------------------------|
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| | | A4 | Number: DDR4-RAM_4 4DE21MA |
| Date: 22.07.2022 | | Copyright: Trenz Electronic GmbH | |
| Filename: DDR4-RAM_4.SchDoc | | Page 20 of 30 | |




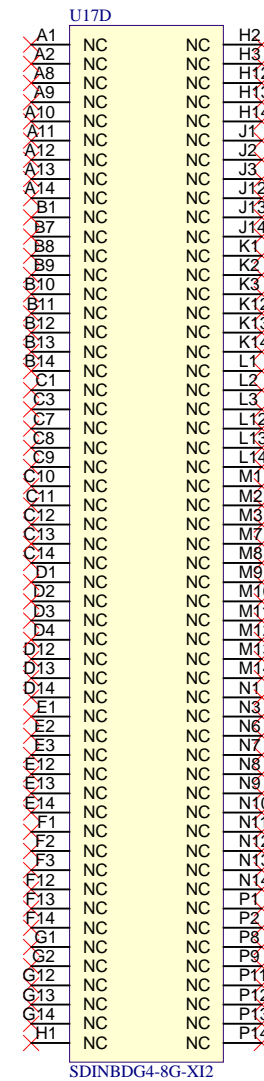
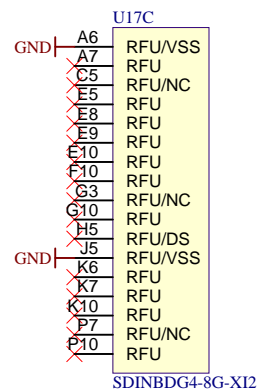
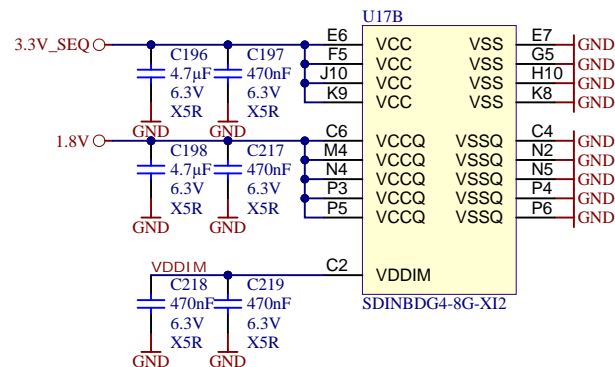
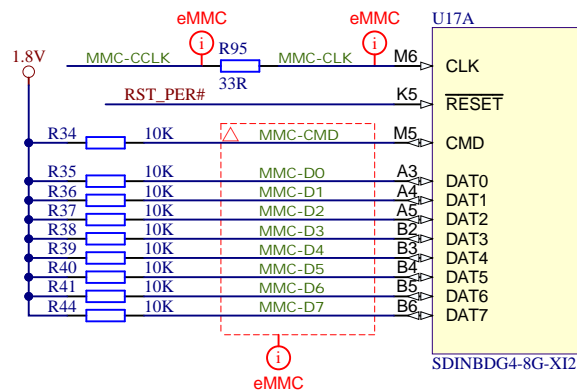
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| Title: AM0010 – DDR4-RAM_5 | | |
| A4 | Number: DDR4-RAM_5 4DE21MA | Rev. 02 |
| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | Page 21 of 30 |
| Filename: DDR4-RAM_5.SchDoc | | |



| | | |
|----------------------------|----------------------------------|---------------|
| Title: AM0010 – DDR4-TERM | | |
| A4 | Number: DDR4-TERM 4DE21MA | Rev. 02 |
| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | Page 22 of 30 |
| Filename: DDR4-TERM.SchDoc | | |



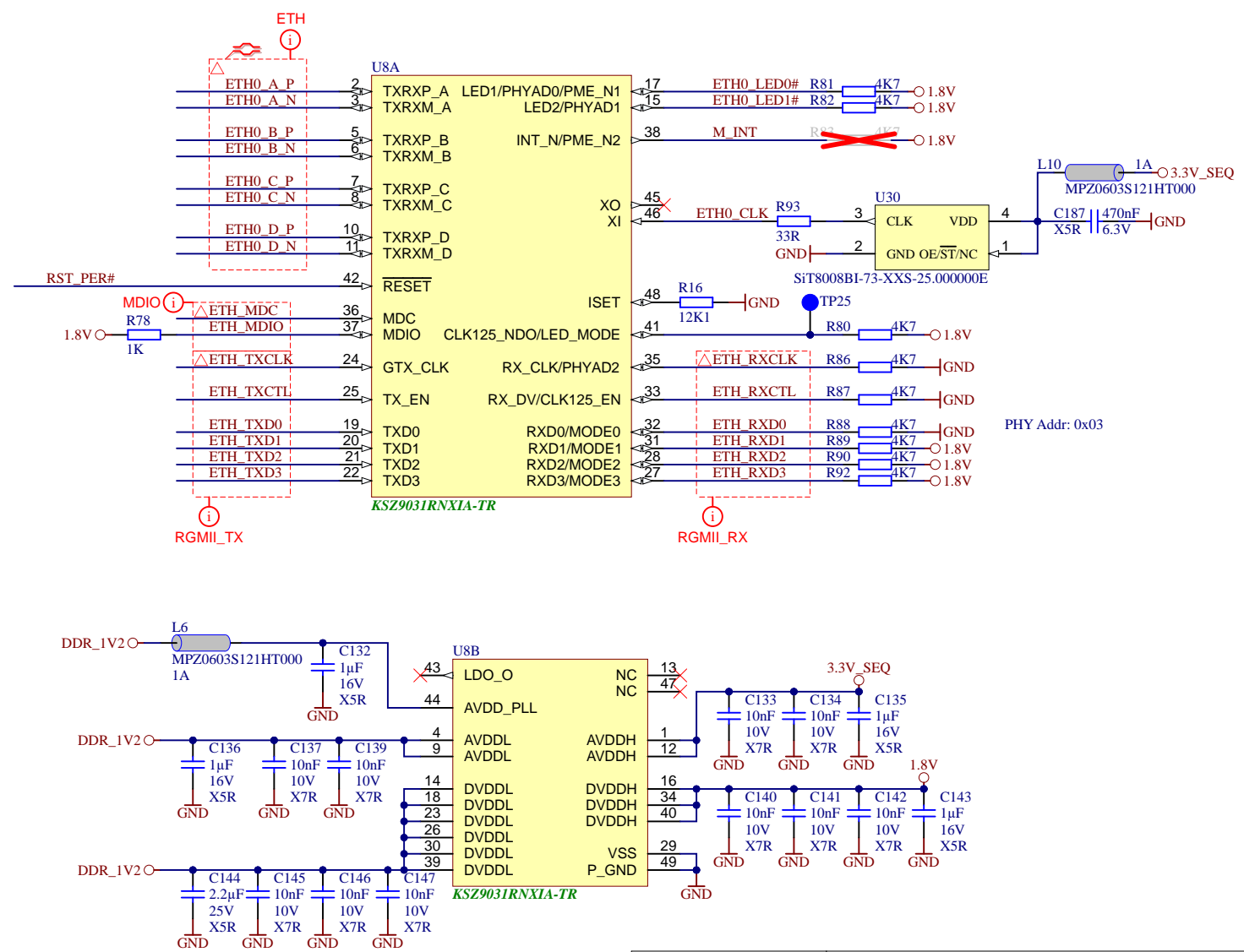
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|  | | Title: AM0010 – DDR4-CAPS | |
| | | A4 | Number: DDR4-CAPS 4DE21MA |
| Date: 22.07.2022 | | Copyright: Trenz Electronic GmbH | Rev. 02 |
| Date: 22.07.2022 | | Copyright: Trenz Electronic GmbH | Page 23 of 30 |
| Filename: DDR4-CAPS.SchDoc | | | |



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Title: AM0010 – eMMC

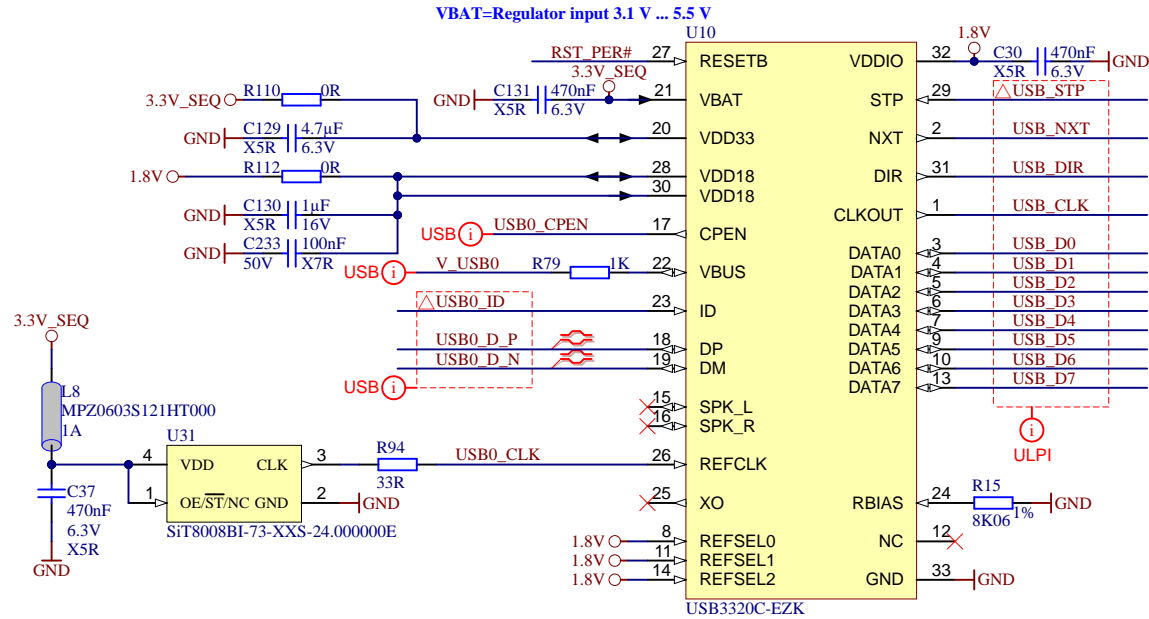
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| A4 | Number: eMMC 4DE21MA | Rev. 02 |
| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | Page 24 of 30 |
| Filename: eMMC.SchDoc | | |



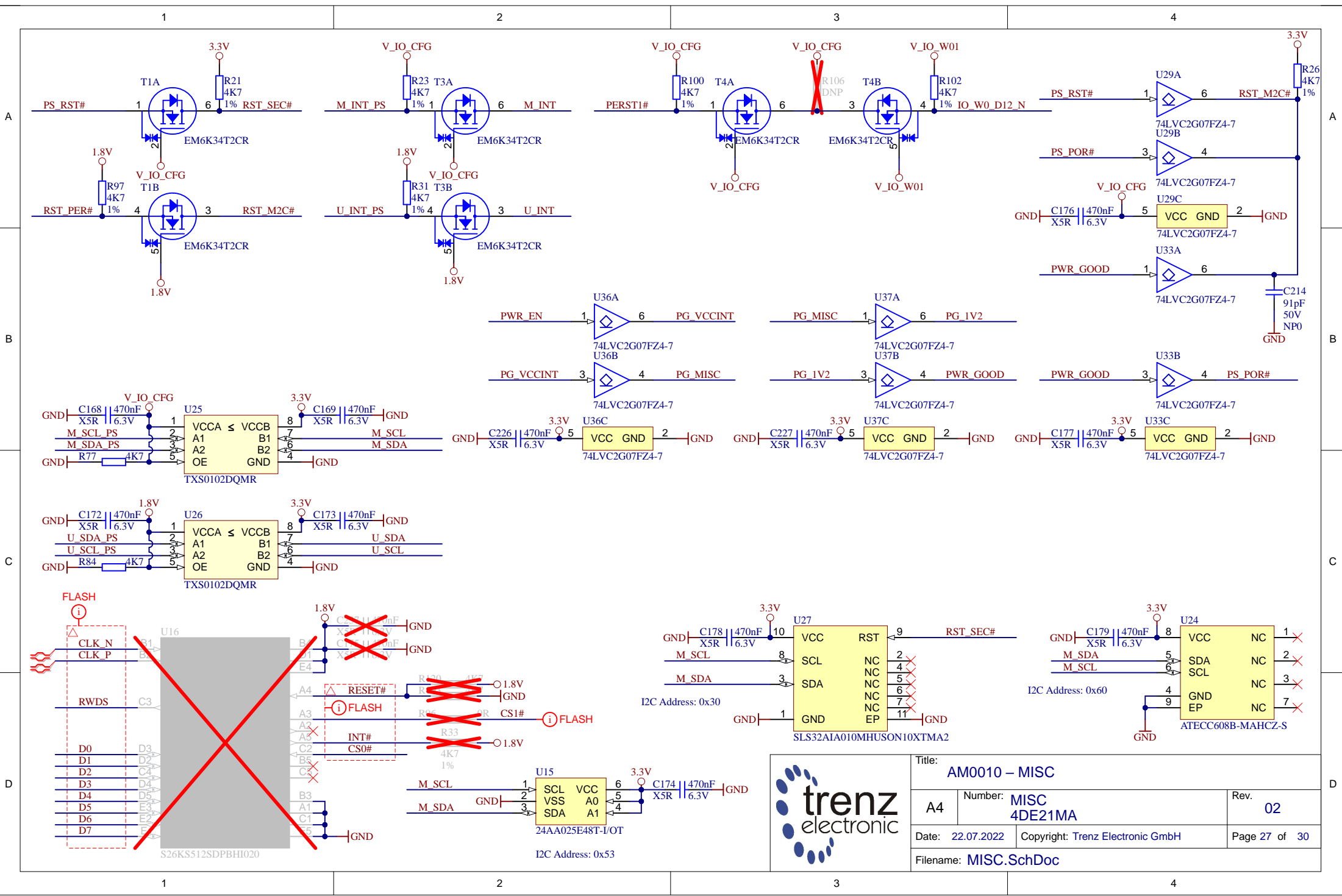
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|-------------------------|----------------------------------|---------------|
| Title: AM0010 – ETHPHY | | |
| A4 | Number: ETHPHY 4DE21MA | Rev. 02 |
| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | Page 25 of 30 |
| Filename: ETHPHY.SchDoc | | |

Modify variants!

| | USB3320 | USB3340 |
|------|-------------|-----------|
| R110 | 0R | DNP |
| R112 | 0R | DNP |
| C129 | 4.7 μ F | 1 μ F |
| C233 | 0.1 μ F | 1 μ F |



| | | |
|----------------------------------|------------------------|------------------------|
| | Title: AM0010 – USBPHY | |
| | A4 | Number: USBPHY 4DE21MA |
| | Date: 22.07.2022 | Rev. 02 |
| | Page 26 of 30 | |
| Copyright: Trenz Electronic GmbH | | |
| Filename: USBPHY.SchDoc | | |



| | | |
|-----------------------|----------------------------------|---------------|
| Title: AM0010 – MISC | | |
| A4 | Number: MISC 4DE21MA | Rev. 02 |
| Date: 22.07.2022 | Copyright: Trenz Electronic GmbH | |
| Filename: MISC.SchDoc | | Page 27 of 30 |

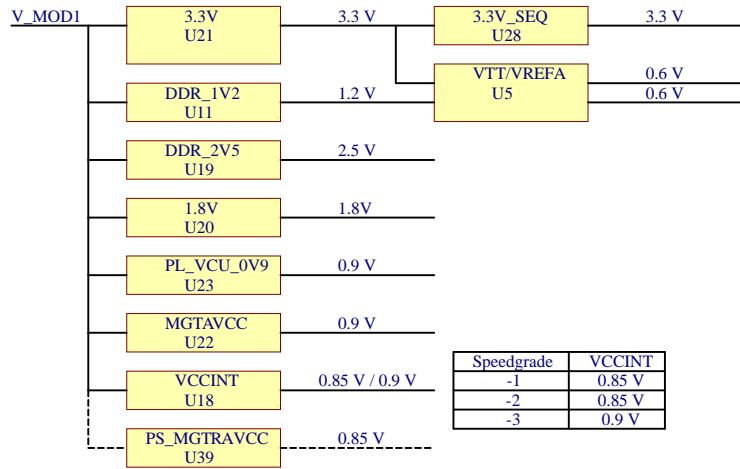
1

2

3

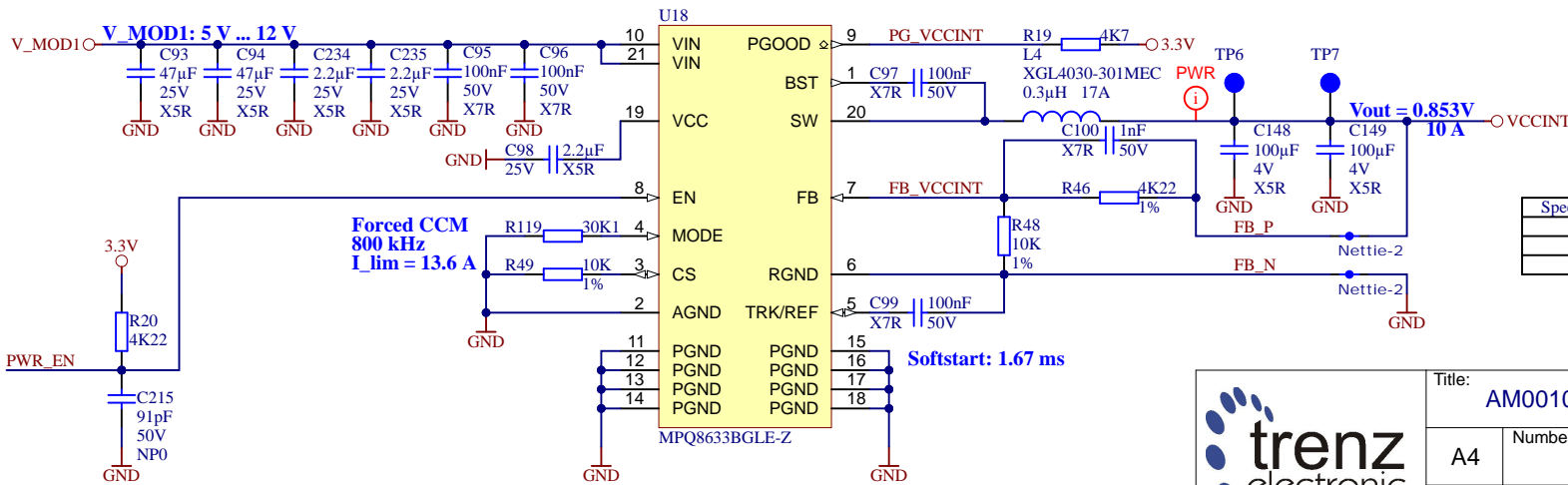
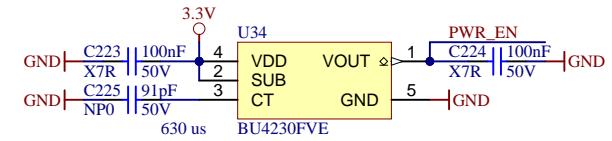
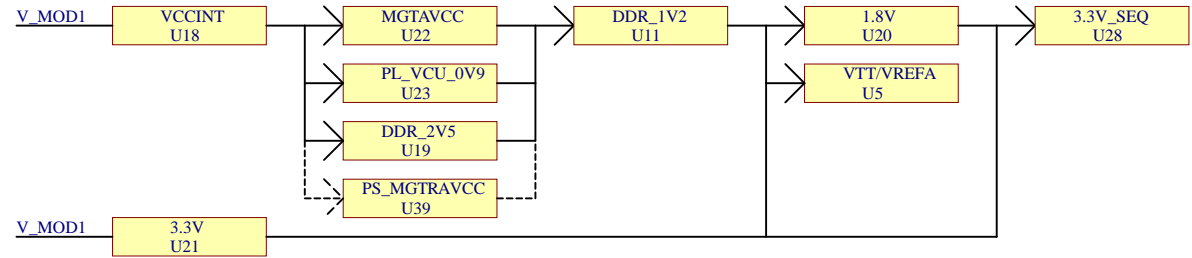
4

Power Supply Structure



| Speedgrade | VCCINT |
|------------|--------|
| -1 | 0.85 V |
| -2 | 0.85 V |
| -3 | 0.9 V |

Power Supply Sequencing



Forced CCM
800 kHz
I_{lim} = 13.6 A

Softstart: 1.67 ms

| Speedgrade | R46 | R48 | C100 | VCCINT |
|------------|------|-----|--------|---------|
| -1 | 4K22 | 10K | 1 nF | 0.853 V |
| -2 | 4K22 | 10K | 1 nF | 0.853 V |
| -3 | 10K | 20K | 680 pF | 0.900 V |



| | | |
|--------------------------|----------------------------------|---------------|
| Title: AM0010 – POWER_1 | | |
| A4 | Number: POWER_1 4DE21MA | Rev. 02 |
| Date: 02.09.2022 | Copyright: Trenz Electronic GmbH | Page 28 of 30 |
| Filename: POWER_1.SchDoc | | |

1

2

3

4

A

A

B

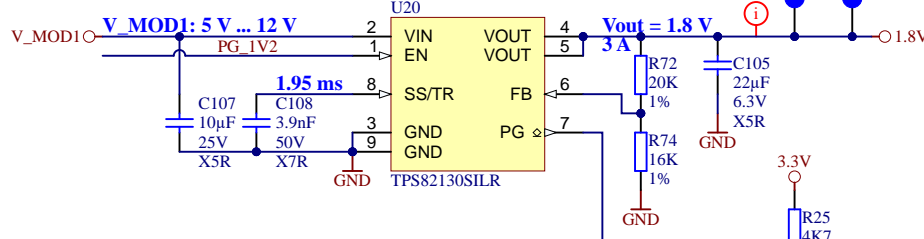
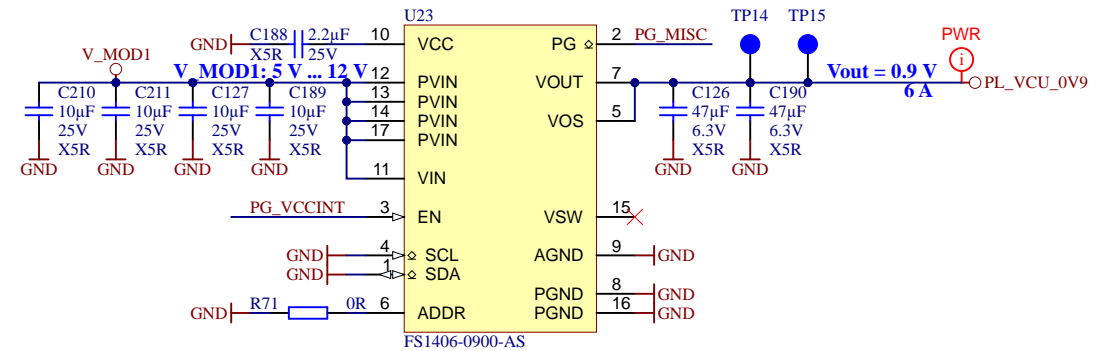
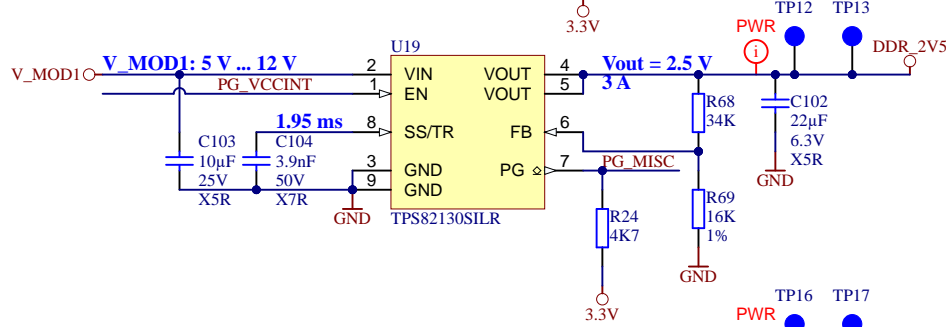
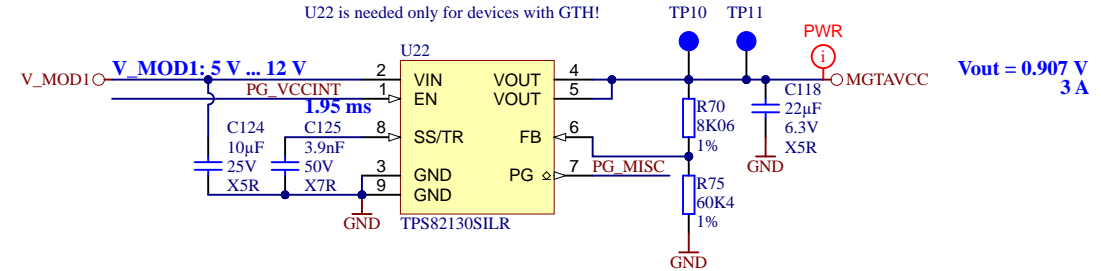
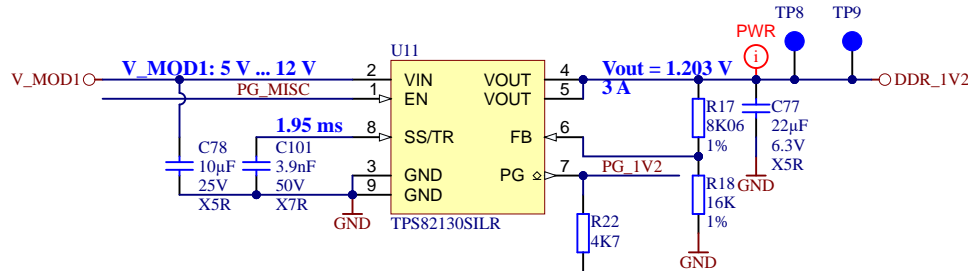
B

C

C

D

D



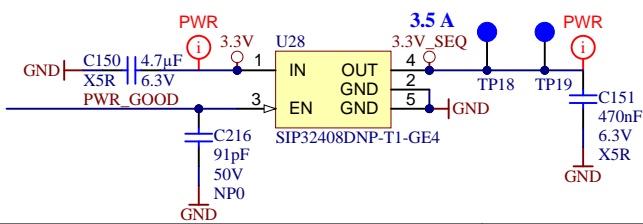
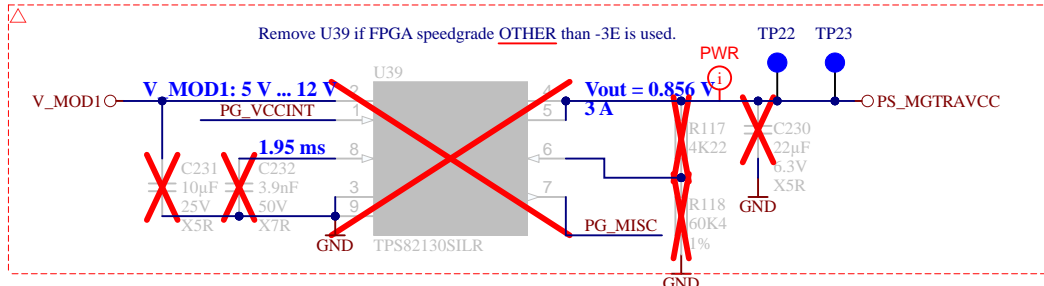
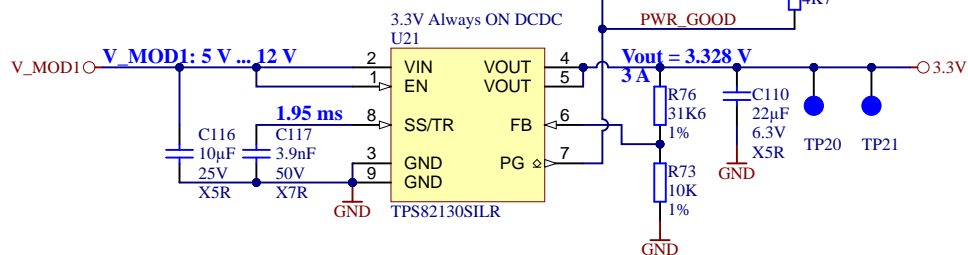
Modify variants!

| Speedgrade | L14 | VCCINT |
|------------|-----|--------|
| -1 | L14 | 0.85 V |
| -2 | L14 | 0.85 V |
| -3 | DNP | 0.9 V |

Remove L14 when FPGA speedgrade -3E is used

VCCINT — L14 — 3A — PS_MGTRAVCC
120 Ohm@100 MHz

Vout_max= 0.876V (+3%)
Vout_nom= 0.85V
Vout_min= 0.833V (-2%)



| | | |
|--------------------------|----------------------------------|---------------|
| Title: AM0010 – POWER_2 | | |
| A4 | Number: POWER_2 4DE21MA | Rev. 02 |
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| Filename: POWER_2.SchDoc | | |

