


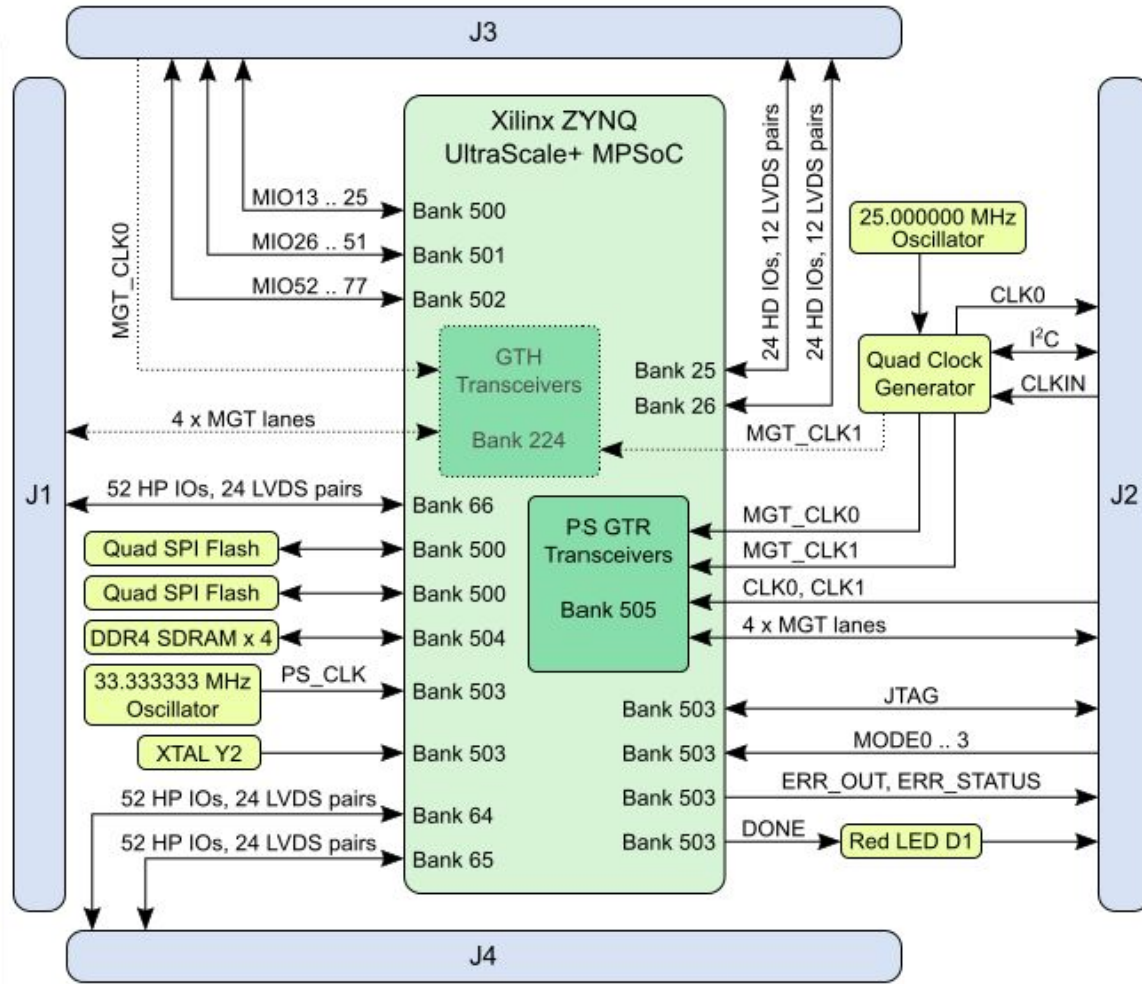
Regarding the usage of our schematics and alike documentation for Trenz module TE0813.


Project is protected under copyright and we strongly and strictly prohibit the reverse engineering or recreation, even if the design is just adapted or modified. TE0813 is protected under such right and in case of plagiarism we will have to do anything necessary in order to protect our assets.

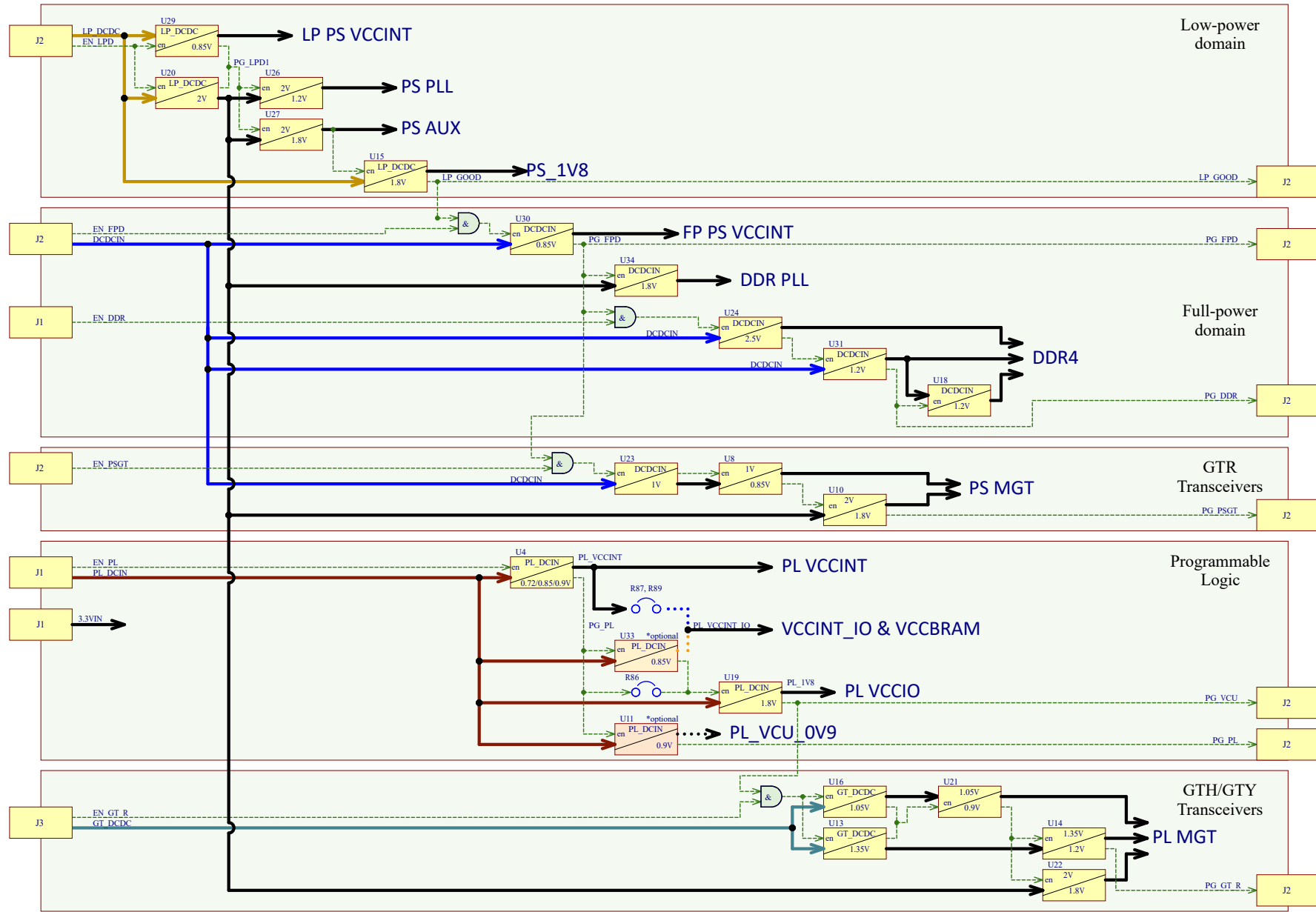
Schematics and other handouts serve for informational purposes only!

| | | | |
|---|---|--|----------------------------|
|  | Title: TE0813 | | |
| | A4 | Number: TE0813 5DE11-A | Rev. 01 |
| | Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 1 of 30 |
| | Filename: Legal Notices Modules.SchDoc | | |

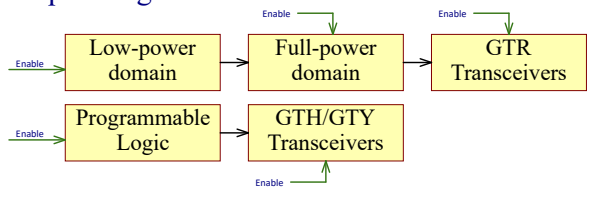
TE0813-01



| | | | |
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|  | | Title: Module TE0813 - System Overview | |
| | | A4 | Number: TE0813 5DE11-A |
| Date: 2021-08-16 | | Copyright: 2015 Trenz Electronic GmbH | |
| Filename: TE0813-Overview.SchDoc | | Page 2 of 30 | |



Power-on sequencing:



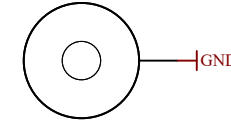
- EN_GT_R Net name
- Power bus
- Control signal
- Power bus in FPGA speedgrade -1/-2/-3 assembly variants
- Power bus in FPGA speedgrade -1L/-2L assembly variants (low power)
- Optional power converter
- Logic AND gate



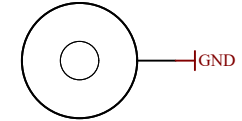
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| Title: TE0813 - Power Diagram | | |
| A3 | Number: TE0813 5DE11-A | Rev. 01 |
| Datum: 2021-01-19 | Copyright: Trenz Electronic GmbH / TT | Page 3 of 30 |
| Filename: Power_Diagram.SchDoc | | |

| | | |
|---------------------------------|-----------------------------------|--------------------------------------|
| U_J1 J1.SchDoc | U_B_PS_GT B_PS_GT.SchDoc | U_LN Legal Notices Modules.SchDoc |
| U_J2 J2.SchDoc | U_PS_DDR PS_DDR.SchDoc | U_ZU_POWER ZU_POWER.SchDoc |
| U_J3 J3.SchDoc | U_B_MIO B_MIO.SchDoc | U_ZU_PS_POWER ZU_PS_POWER.SchDoc |
| U_J4 J4.SchDoc | U_B_HD B_HD.SchDoc | U_POWER POWER.SchDoc |
| U_DDR4-TERM DDR4-TERM.SchDoc | U_Clock Clock.SchDoc | U_POWER_1 POWER_1.SchDoc |
| U_B64 B64.SchDoc | U_CONFIG CONFIG.SchDoc | U_POWER_2 POWER_2.SchDoc |
| U_B65 B65.SchDoc | U_DDR4-RAM DDR4-RAM.SchDoc | U_POWER_4 POWER_3.SchDoc |
| U_B66 B66.SchDoc | U_DDR4-RAM_2 DDR4-RAM_2.SchDoc | U_REV_CH Revision Changes.SchDoc |
| U_B_GT B_GT.SchDoc | U_DDR4-RAM_3 DDR4-RAM_3.SchDoc | U_OVERVIEW TE0813-Overview.SchDoc |
| U_PD Power_Diagram.SchDoc | U_DDR4-RAM_4 DDR4-RAM_4.SchDoc | |

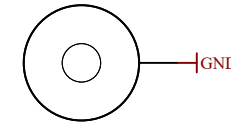
Special notes:



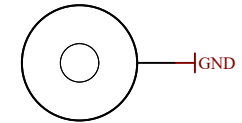
Mount.Hole 3.2mm für Unterlegscheibe



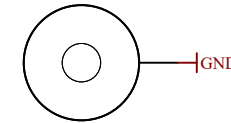
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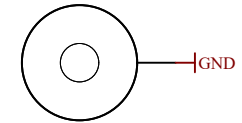
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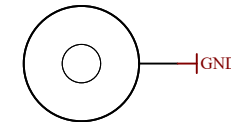
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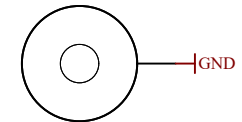
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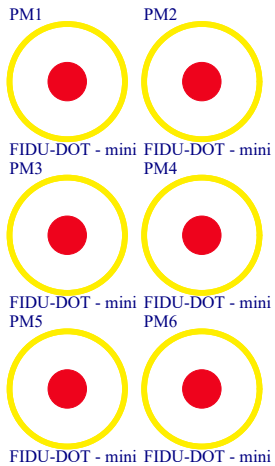
Mount.Hole 3.2mm für Unterlegscheibe



Mount.Hole 3.2mm für Unterlegscheibe



Mount.Hole 3.2mm für Unterlegscheibe



MECH1

TE Address Overlay

LOGO ADDRESS

LOGO1

TE Logo PRINT Layer

LOGO PRINT

Serial
Serial
Serialnumber 6,3 x 6.3mm

| | |
|------------------|--------------------------|
| Assembly variant | 5DE11-A |
| Created by | ED |
| Modified by | ED |
| Modified at | 2021-07-07 |
| SVN Revision | 12304 [Locally Modified] |

| | | | | |
|-------------------------|--|---------------------------------------|---------------|---------------------------|
| | | | Title: TE0813 | |
| | | | A4 | Number: TE0813 5DE11-A |
| Date: 2021-08-16 | | Copyright: Trenz Electronic GmbH / TT | | Page 4 of 30 |
| Filename: TE0813.SchDoc | | | | |

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A

A

B

B

C

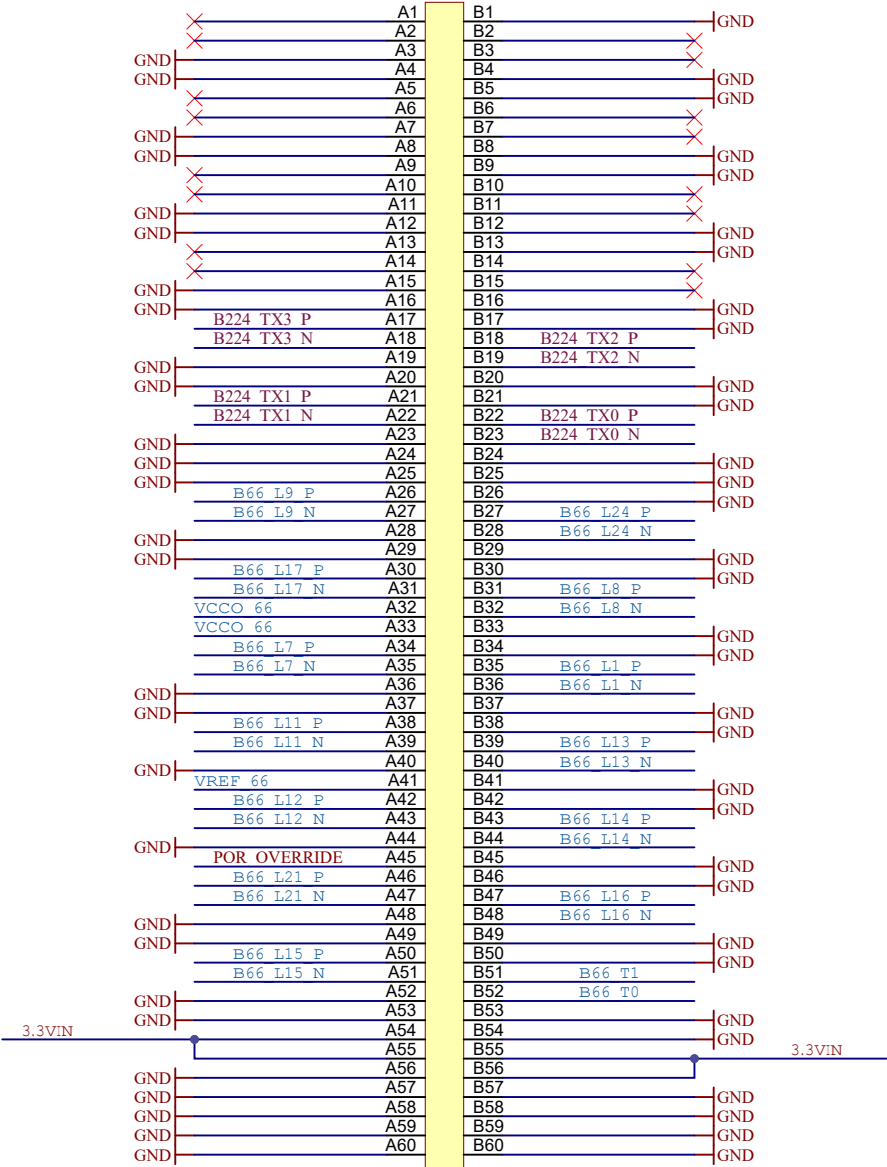
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D

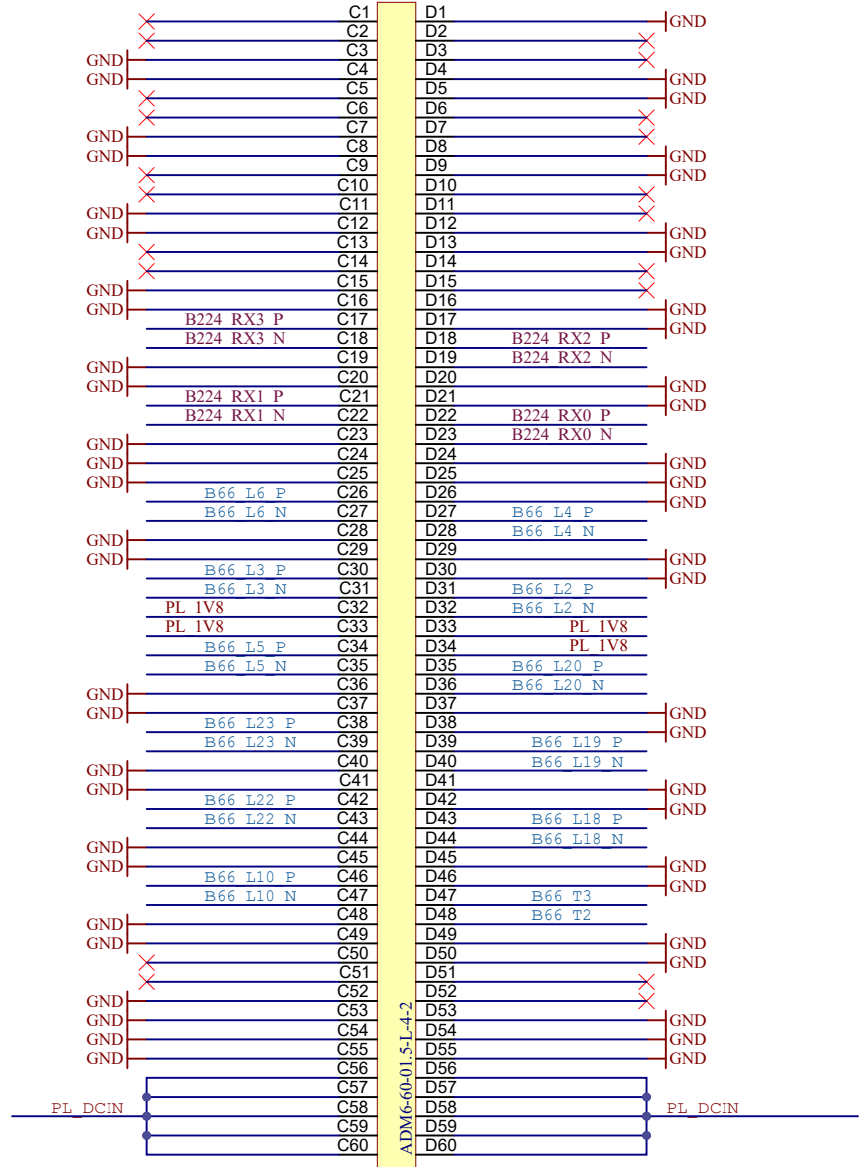
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JM1A

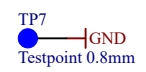
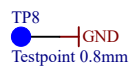
JM1B



ADM6-60-01.5-L-4-2



ADM6-60-01.5-L-4-2



| | | |
|------------------------------|---------------------------------------|--------------|
| Title: TE0813 - Connector J1 | | |
| A4 | Number: TE0813 5DE11-A | Rev. 01 |
| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 5 of 30 |
| Filename: J1.SchDoc | | |

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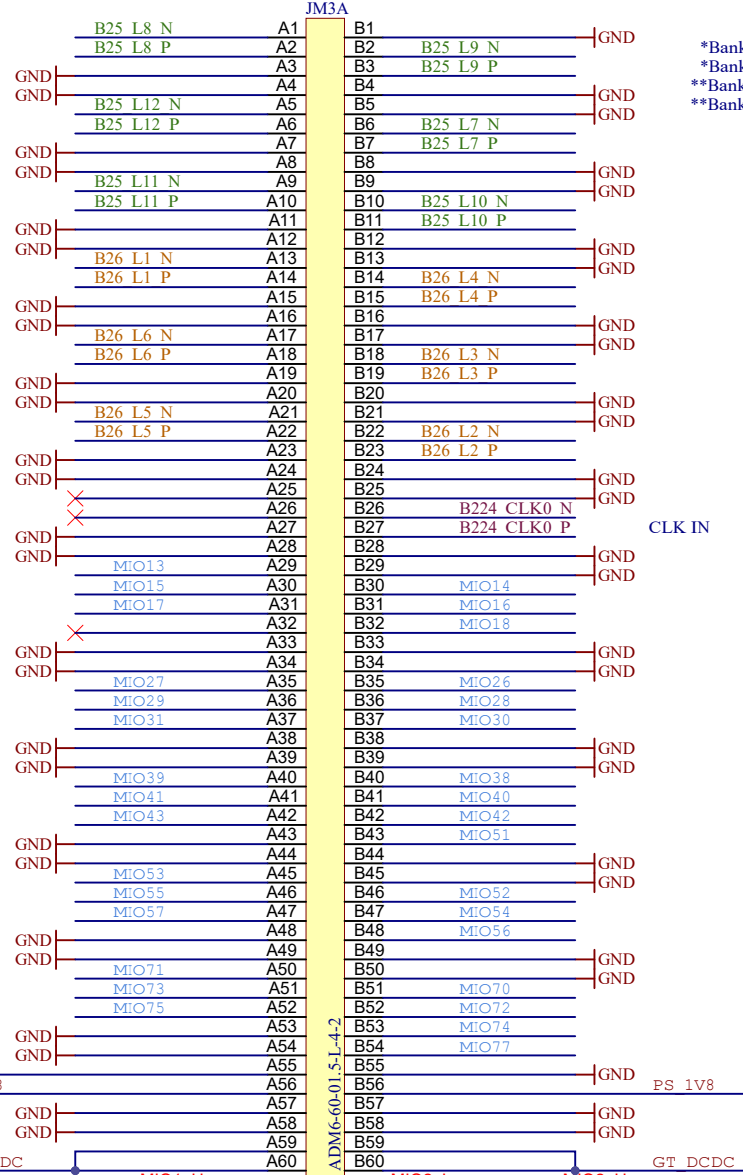
4

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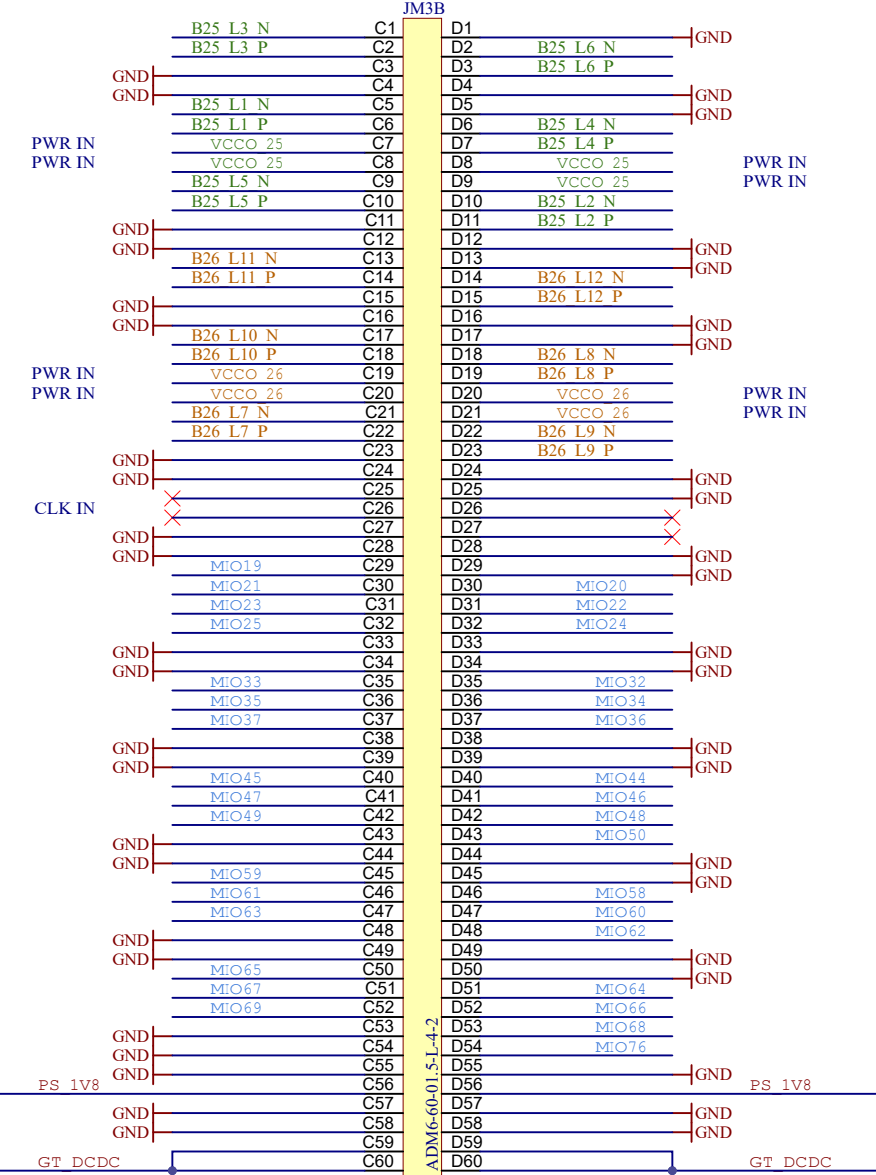
*Bank 25 for XCZU2/3
 *Bank 45 for XCZU4/6
 **Bank 26 for XCZU2/3
 **Bank 46 for XCZU4/5

CLK IN

PS 1V8

GT DCDC

JM3B



PWR IN
PWR IN

PWR IN
PWR IN

CLK IN

PS 1V8

GT DCDC

A

B

C

D

A

B

C

D

| | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| MIO26 | MIO32 | MIO38 | MIO45 | MIO52 | MIO58 | MIO64 | MIO71 | MIO13 | MIO19 |
| MIO27 | MIO33 | MIO39 | MIO46 | MIO53 | MIO59 | MIO65 | MIO72 | MIO14 | MIO20 |
| MIO28 | MIO34 | MIO40 | MIO47 | MIO54 | MIO60 | MIO66 | MIO73 | MIO15 | MIO21 |
| MIO29 | MIO35 | MIO41 | MIO48 | MIO55 | MIO61 | MIO67 | MIO74 | MIO16 | MIO22 |
| MIO30 | MIO36 | MIO42 | MIO49 | MIO56 | MIO62 | MIO68 | MIO75 | MIO17 | MIO23 |
| MIO31 | MIO37 | MIO43 | MIO50 | MIO57 | MIO63 | MIO69 | MIO76 | MIO18 | MIO24 |
| | | MIO44 | MIO51 | | | MIO70 | MIO77 | | MIO25 |



| | | |
|------------------------------|---------------------------------------|--------------|
| Title: TE0813 - Connector J3 | | |
| A4 | Number: TE0813 5DE11-A | Rev. 01 |
| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 7 of 30 |
| Filename: J3.SchDoc | | |

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A

A

B

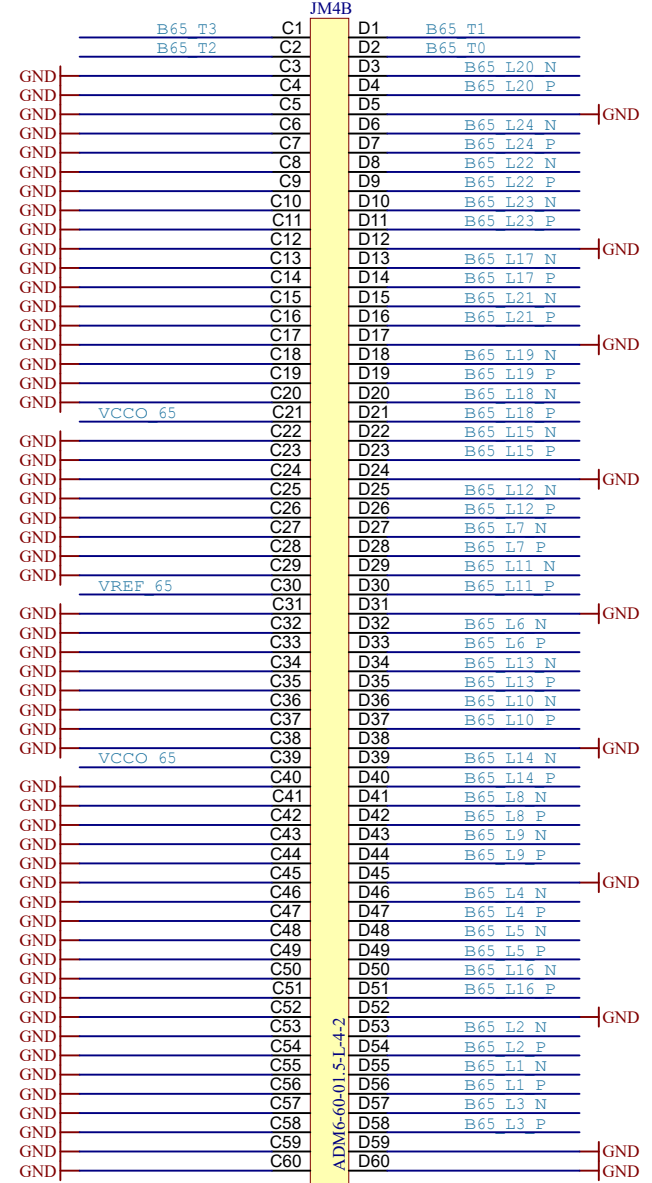
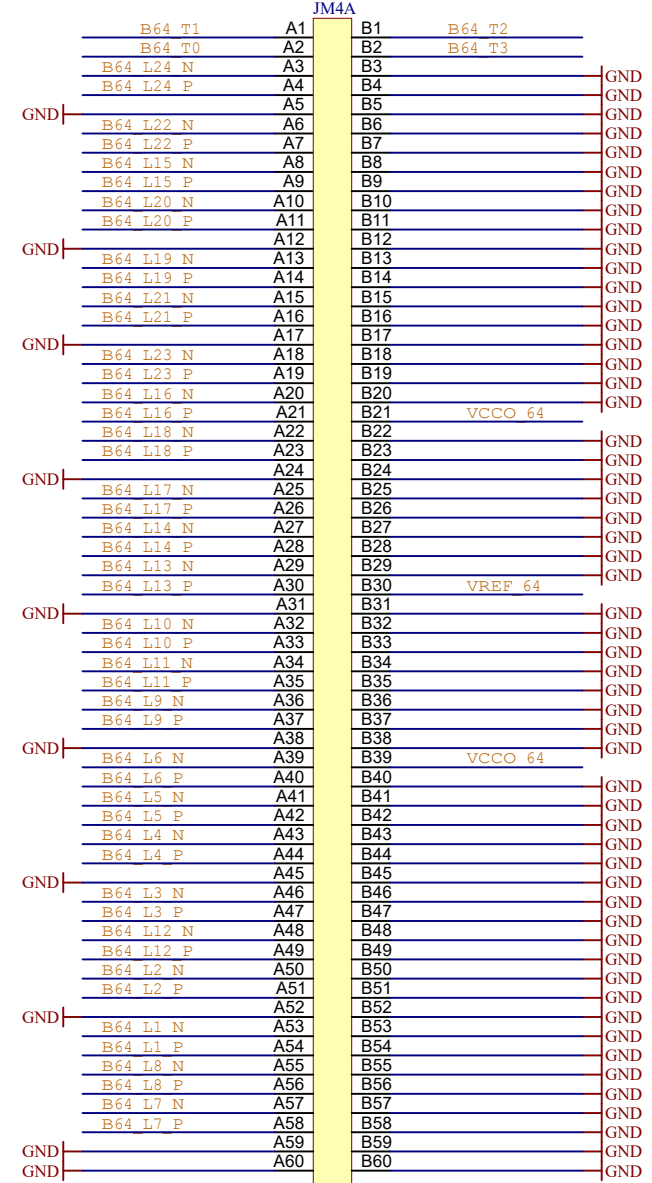
B

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C

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D



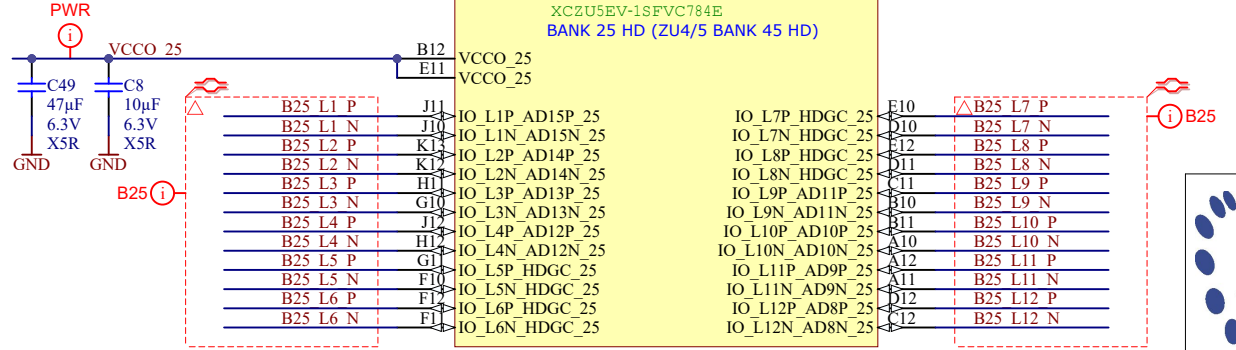
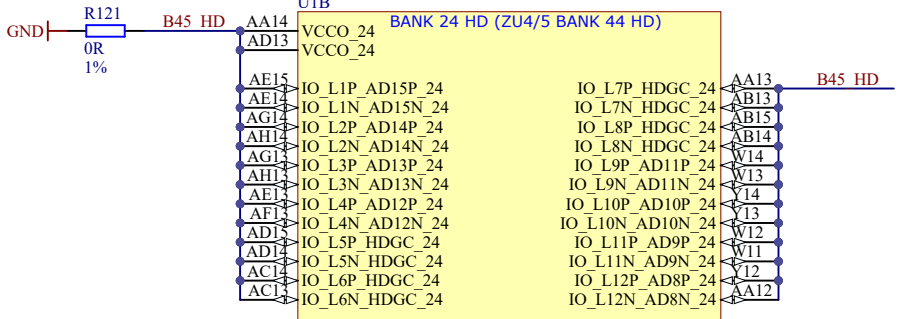
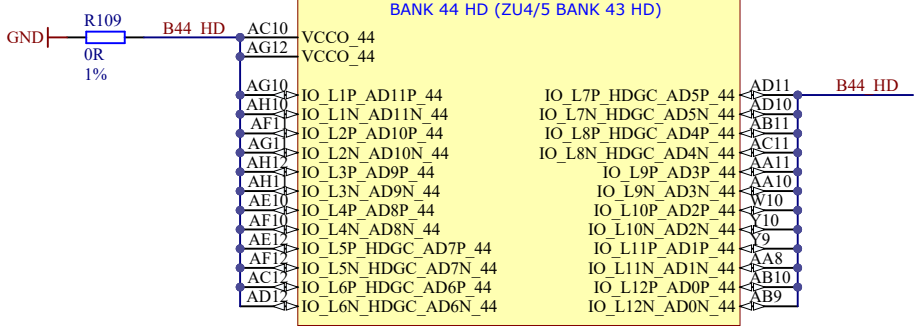
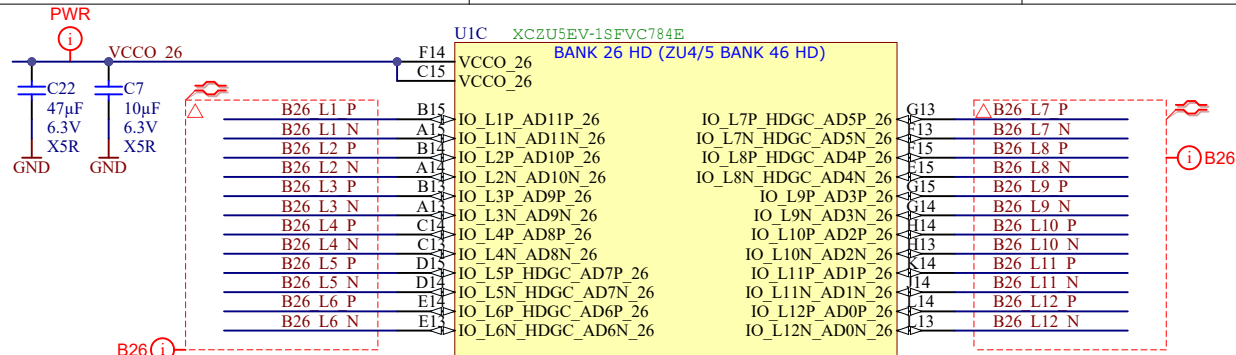
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| A4 | Number: TE0813 5DE11-A | Rev. 01 |
| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 8 of 30 |
| Filename: J4.SchDoc | | |

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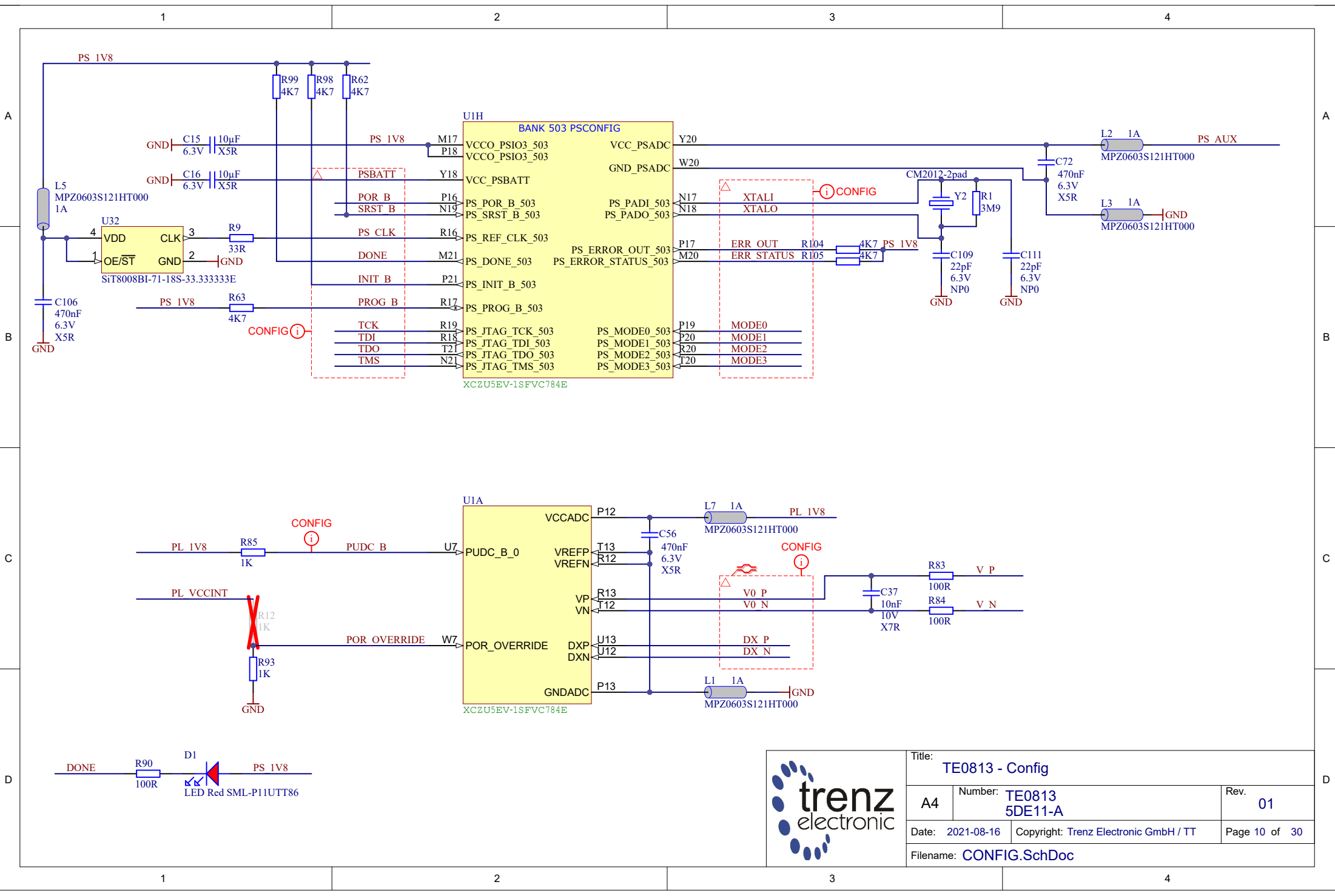
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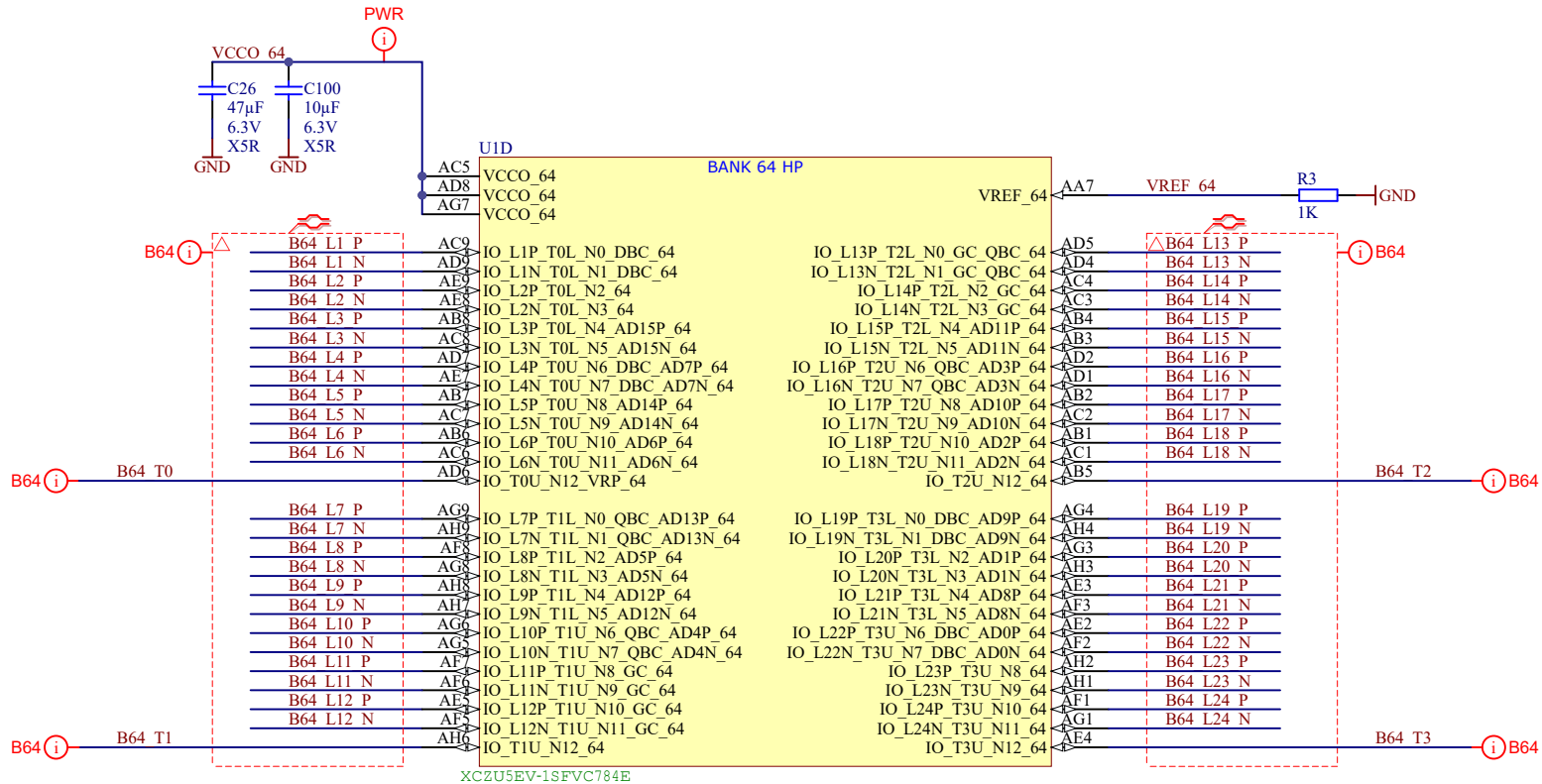
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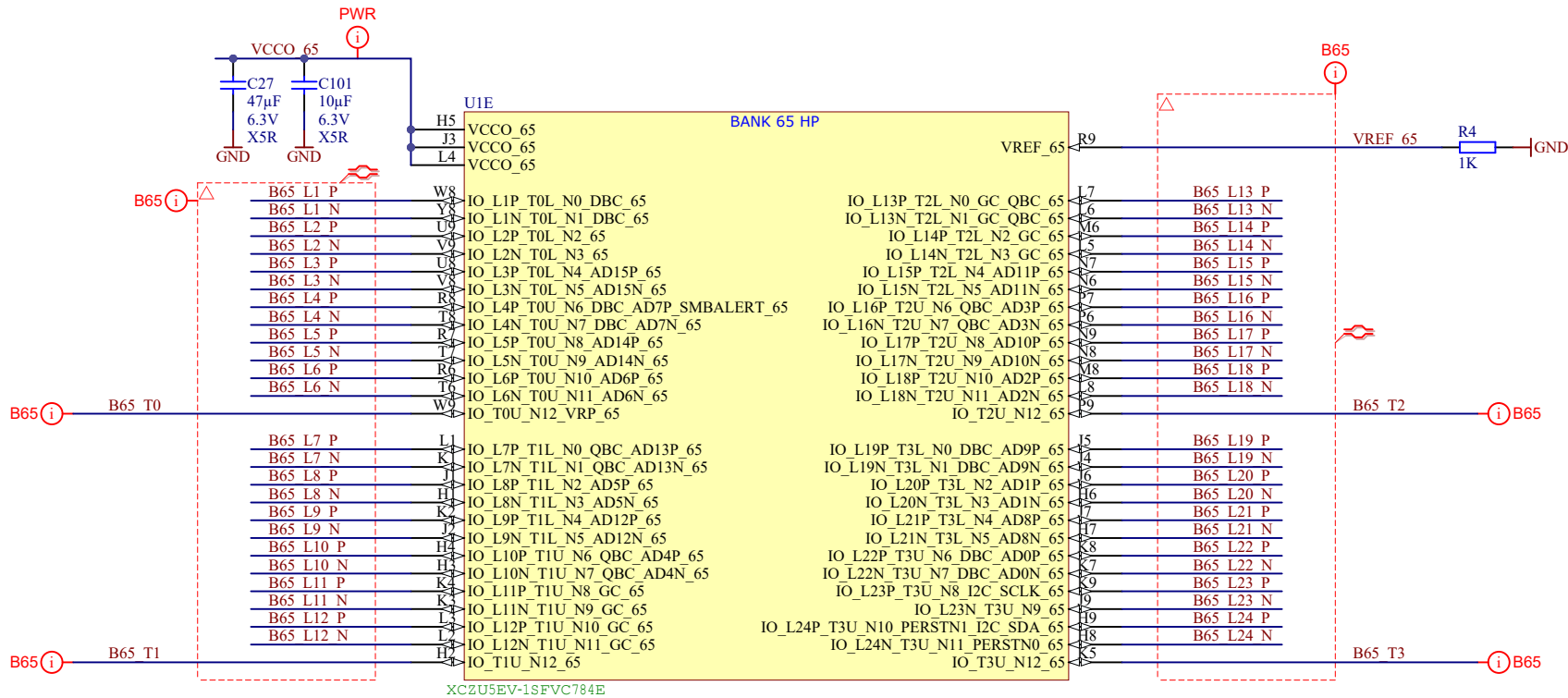
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| Title: TE0813 - HD Banks | | |
| A4 | Number: TE0813 5DE11-A | Rev. 01 |
| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 9 of 30 |
| Filename: B_HD.SchDoc | | |



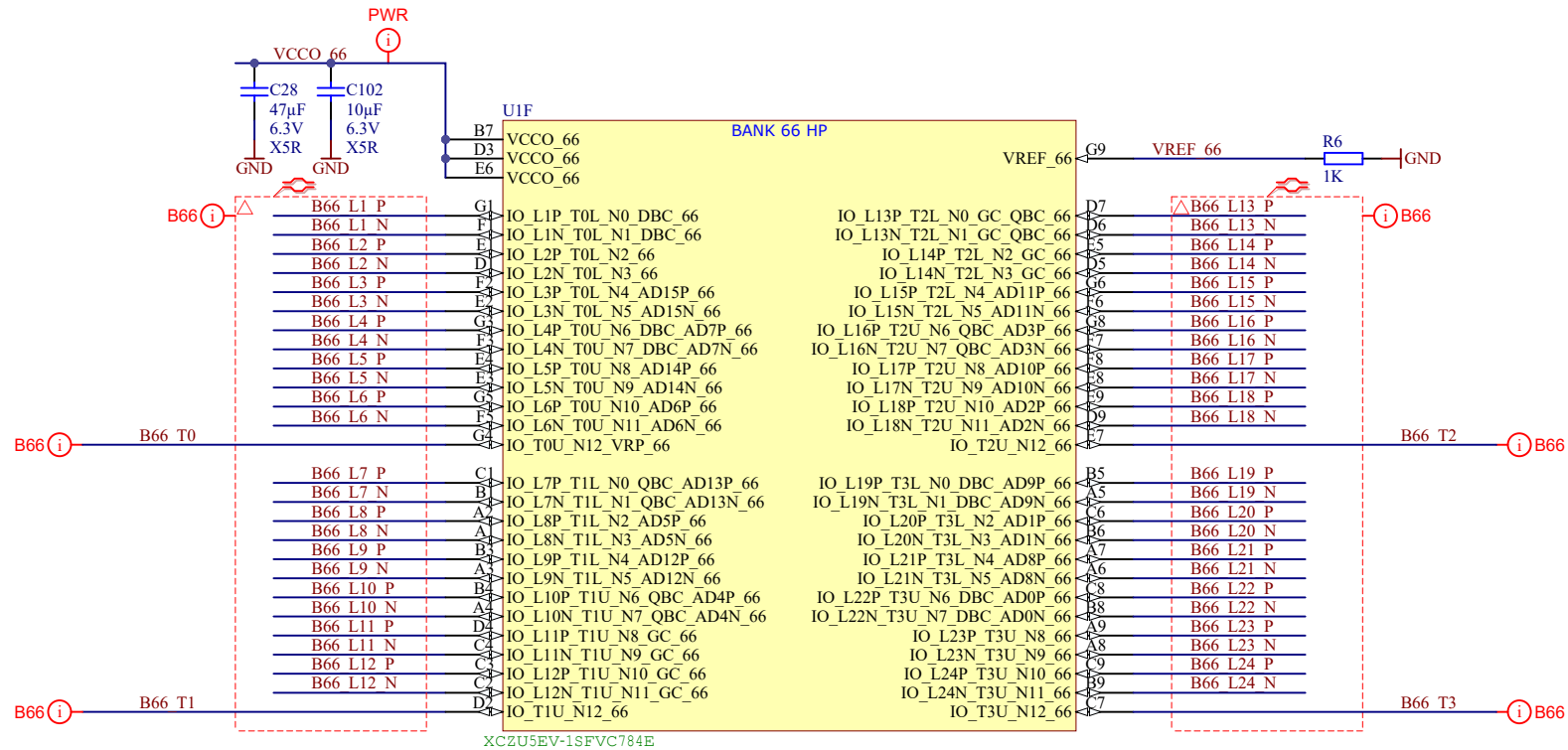

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| Title: TE0813 - Config | | |
| A4 | Number: TE0813 5DE11-A | Rev. 01 |
| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 10 of 30 |
| Filename: CONFIG.SchDoc | | |



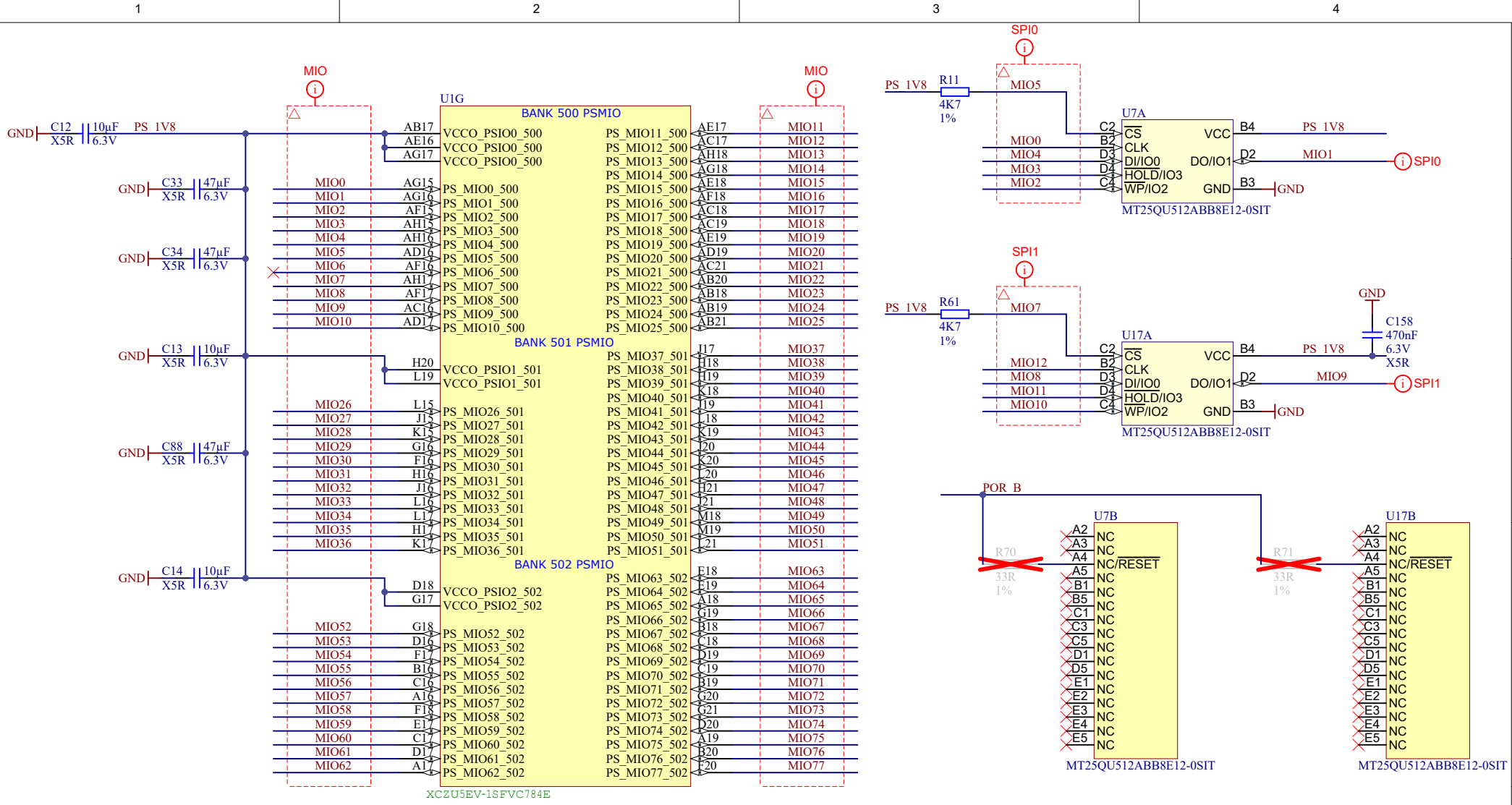
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| A4 | Number: TE0813 5DE11-A | Rev. 01 |
| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 11 of 30 |
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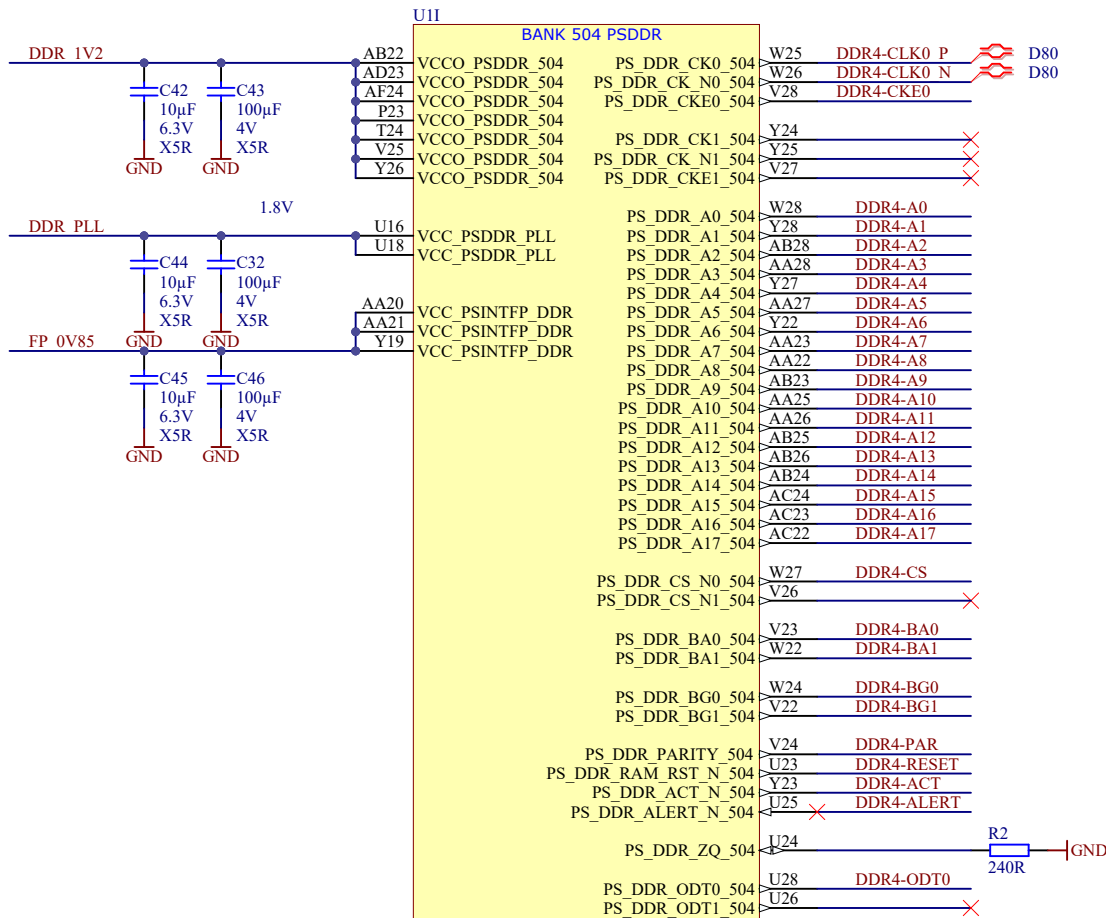
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| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 12 of 30 |
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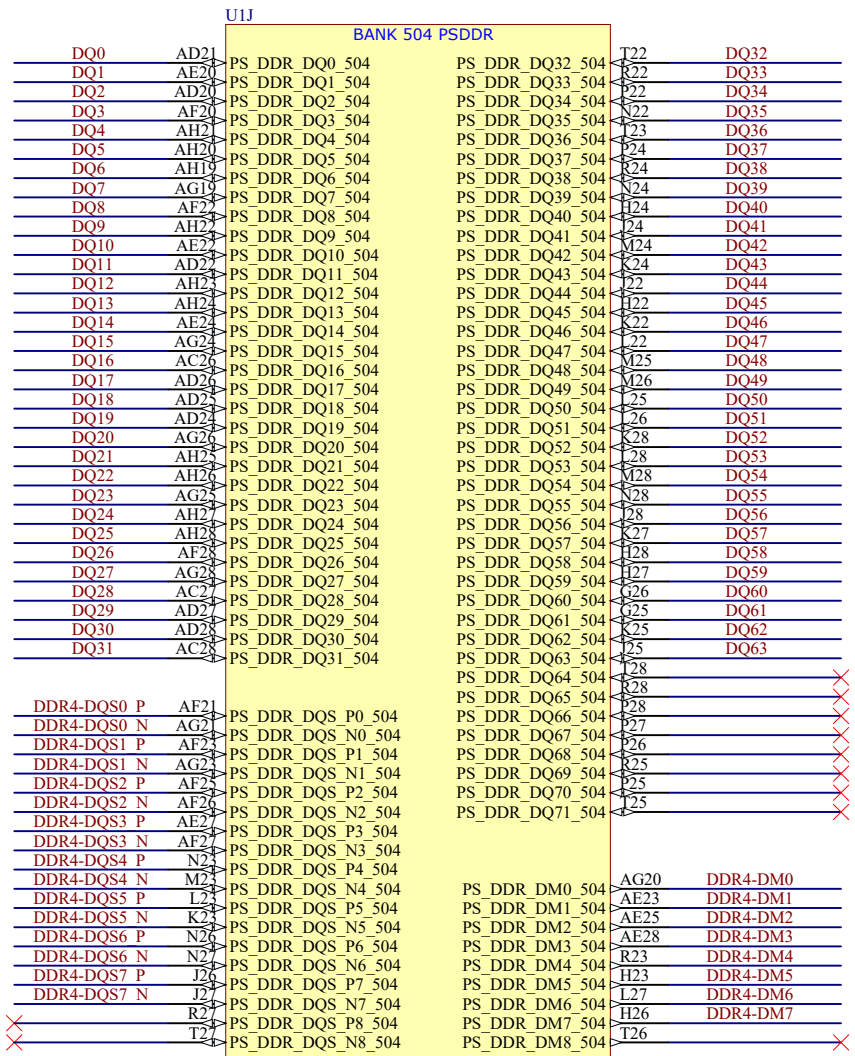
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| A4 | Number: TE0813 5DE11-A | Rev. 01 |
| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 13 of 30 |
| Filename: B66.SchDoc | | |



| | | | |
|---|--|---------------------------------------|-----------------------------------|
|  | | Title: TE0813 - MIO Banks | |
| | | A4 | Number: TE0813 5DE11-A |
| Date: 2021-08-16 | | Copyright: Trenz Electronic GmbH / TT | |
| Date: 2021-08-16 | | Page 14 of 30 | |
| Filename: B_MIO.SchDoc | | | |



XCZU5EV-1SFVC784E



XCZU5EV-1SFVC784E

| | | | |
|--|--------------------------------|--|-----------------------------|
| | Title: TE0813 - PS_DDR | | |
| | A4 | Number: TE0813 5DE11-A | Rev. 01 |
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| | Filename: PS_DDR.SchDoc | | |

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A

A

B

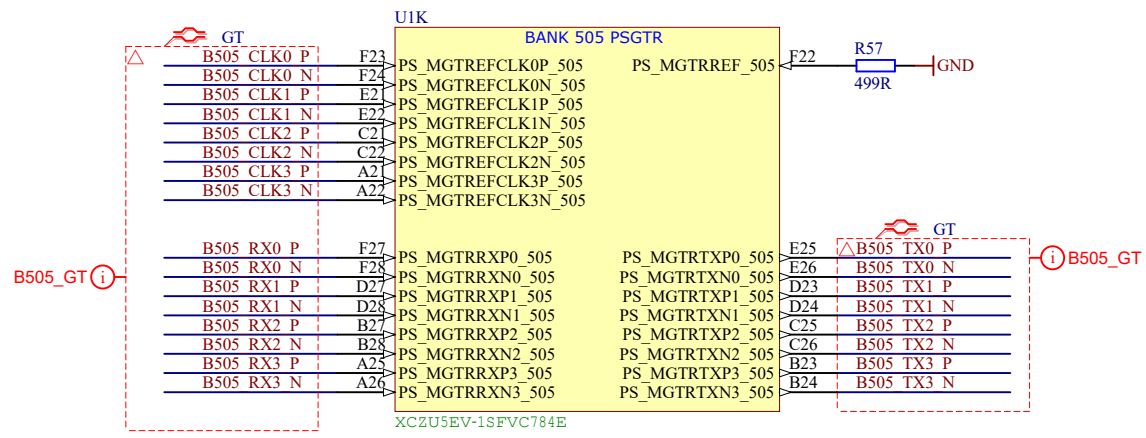
B

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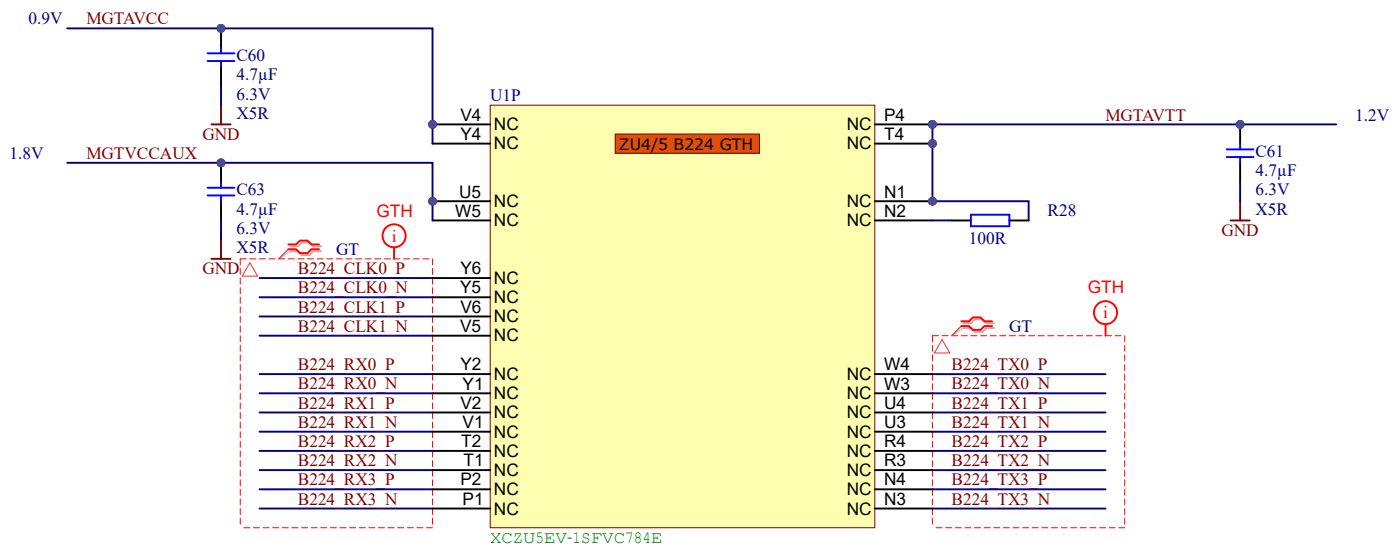
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| | Title: TE0813 - PS_GT | | |
| | A4 | Number: TE0813 5DE11-A | Rev. 01 |
| | Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 16 of 30 |
| | Filename: B_PS_GT.SchDoc | | |


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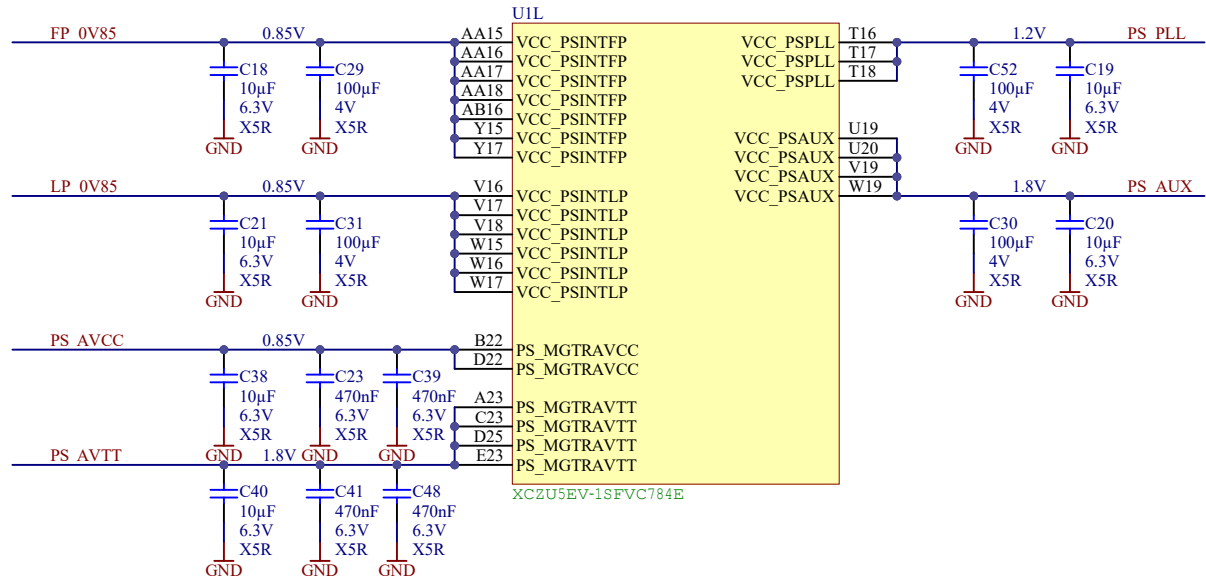
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| | Filename: B_GT.SchDoc | | |



| | | | |
|---|--|---------------------------------------|---------------------------|
|  | | Title: TE0813 - ZU_PS_POWER | |
| | | A4 | Number: TE0813 5DE11-A |
| Date: 2021-08-16 | | Copyright: Trenz Electronic GmbH / TT | |
| Filename: ZU_PS_POWER.SchDoc | | Page 18 of 30 | |

1

2

3

4

A

A

B

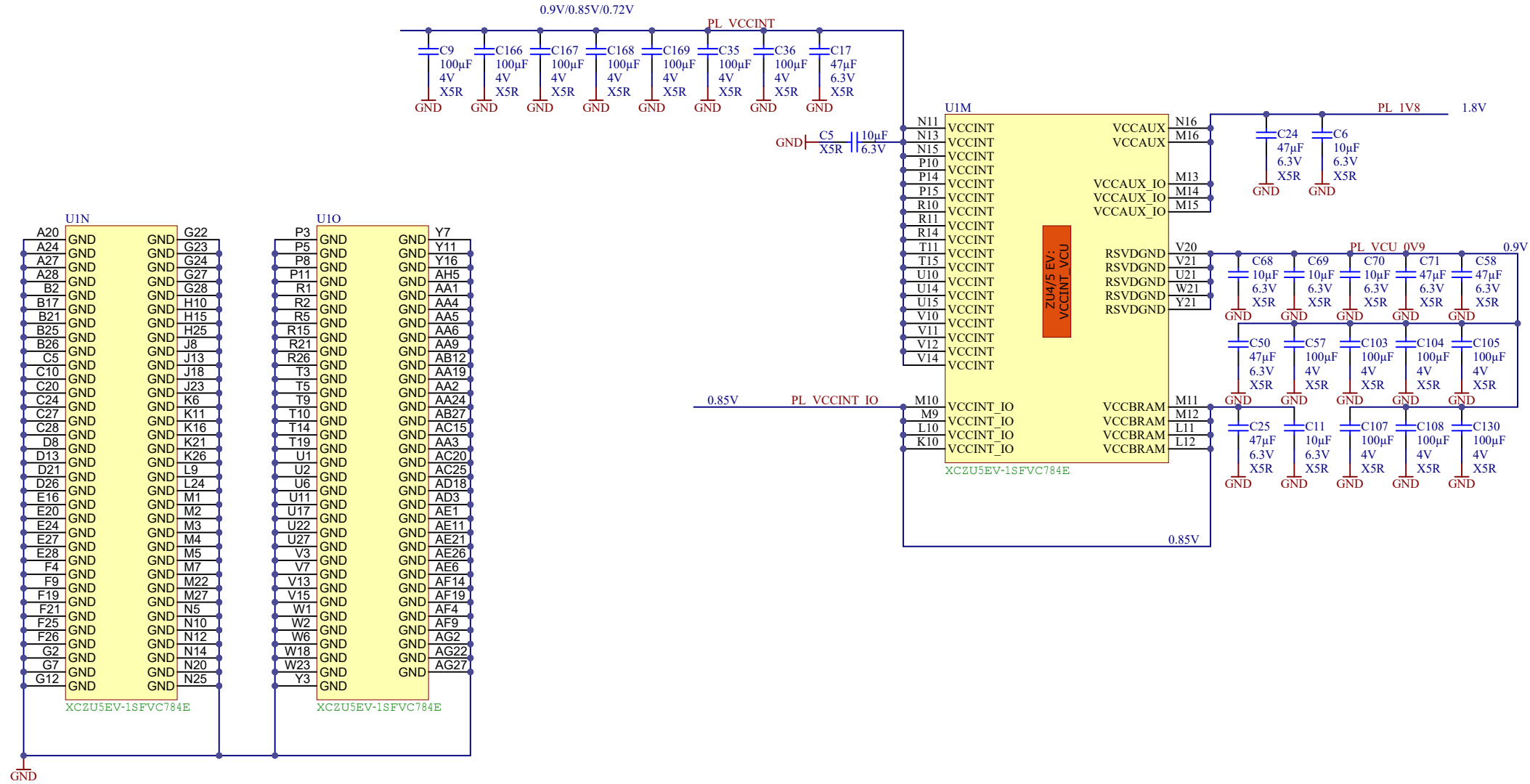
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C

C

D

D



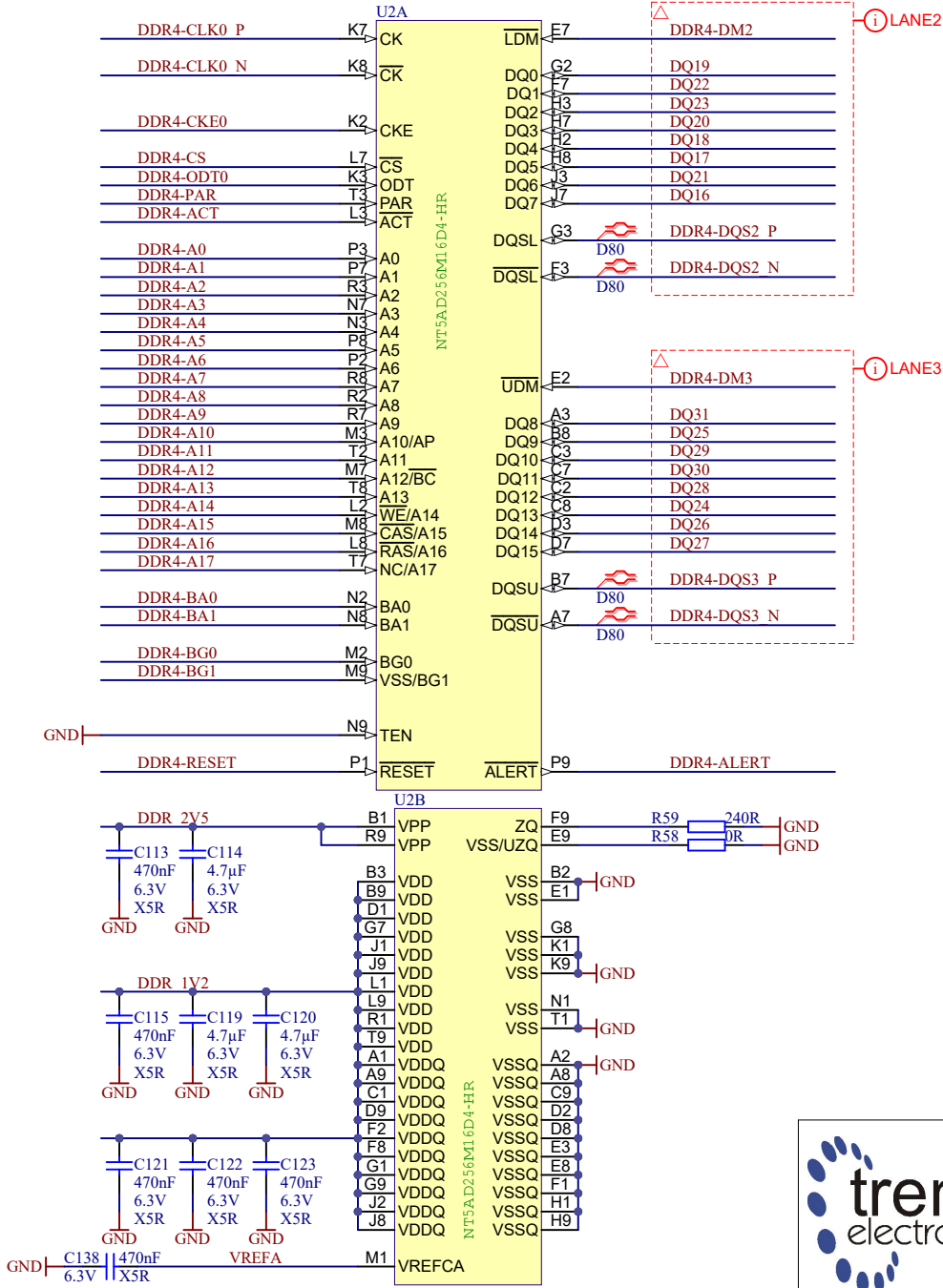
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| | Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 19 of 30 |
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1

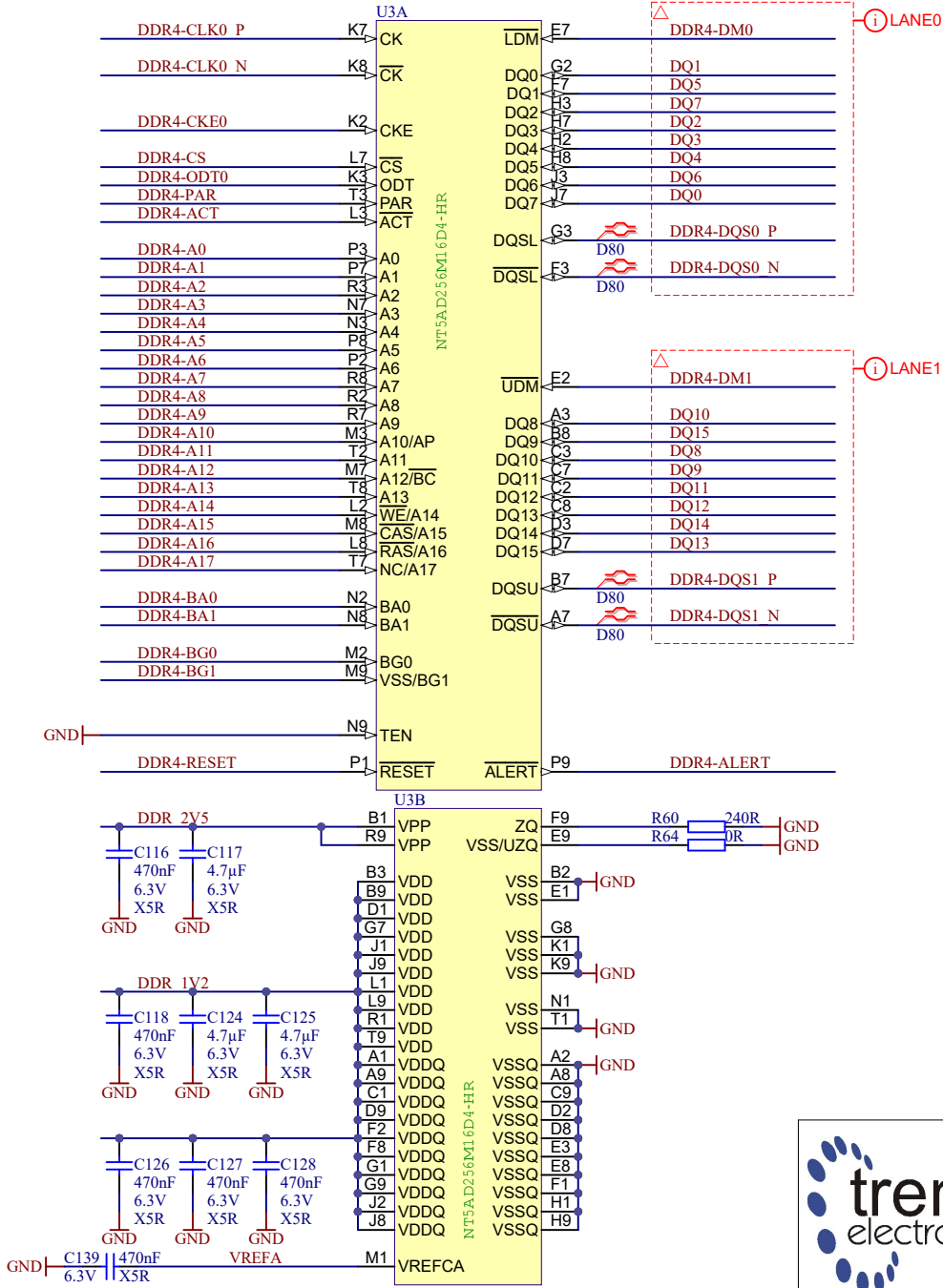
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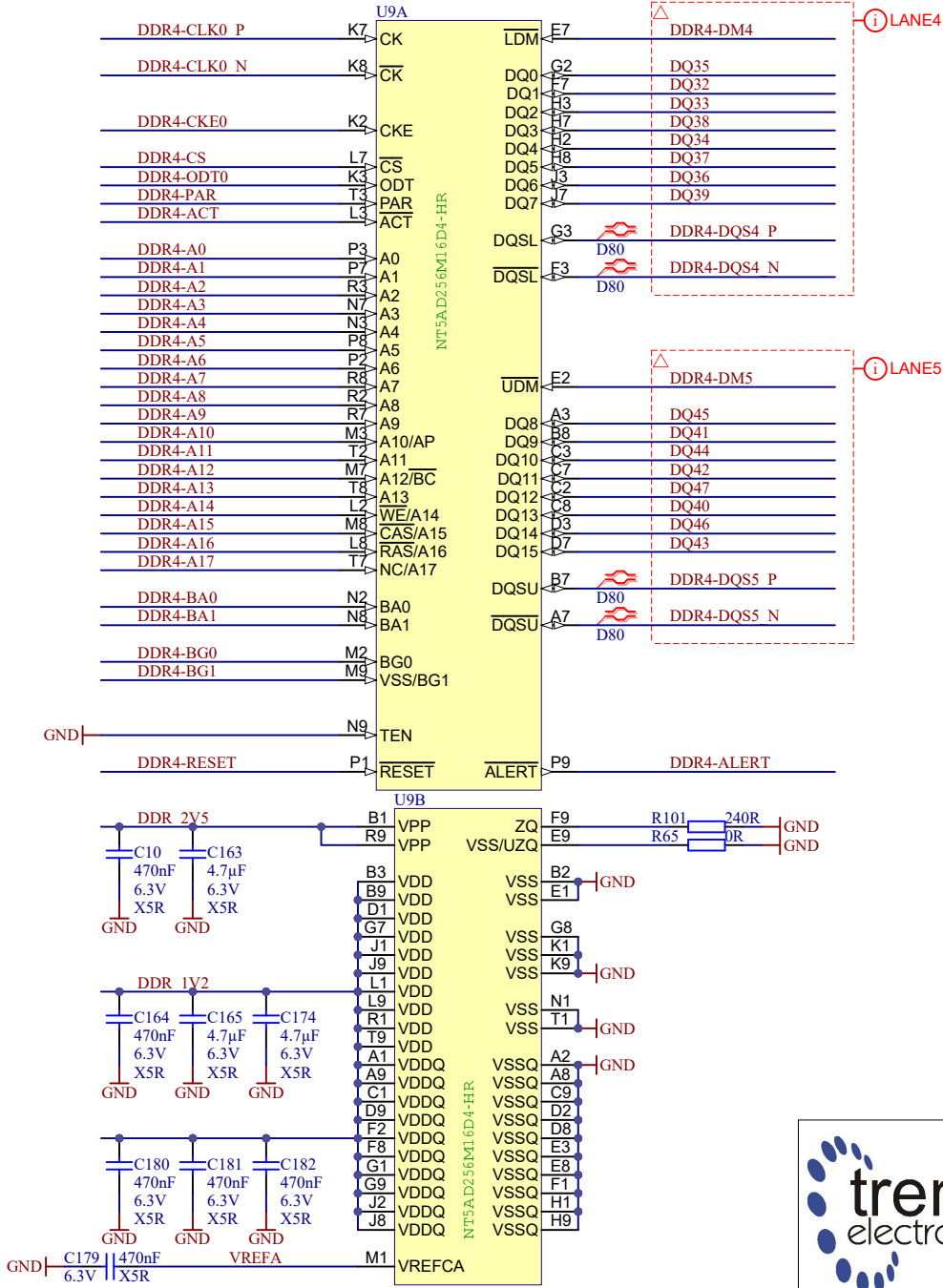
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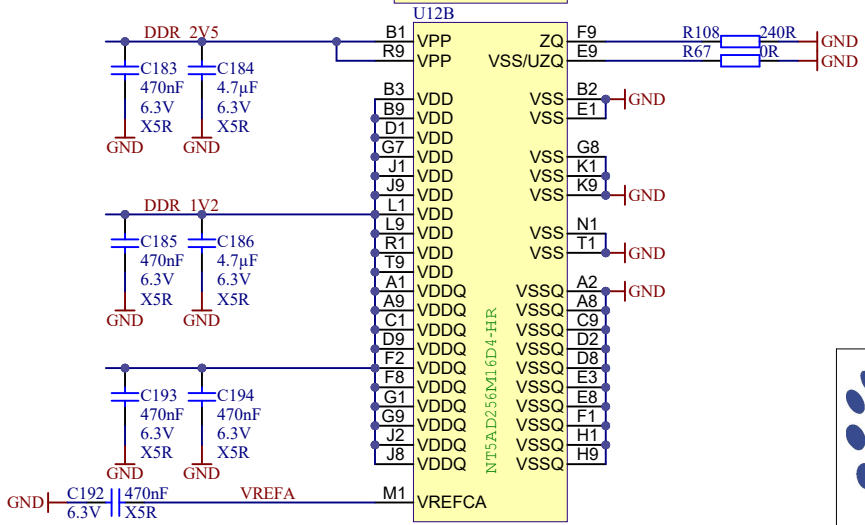
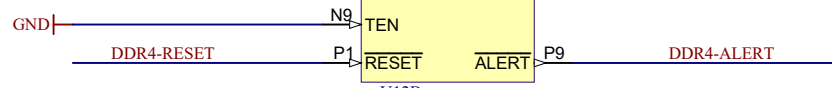
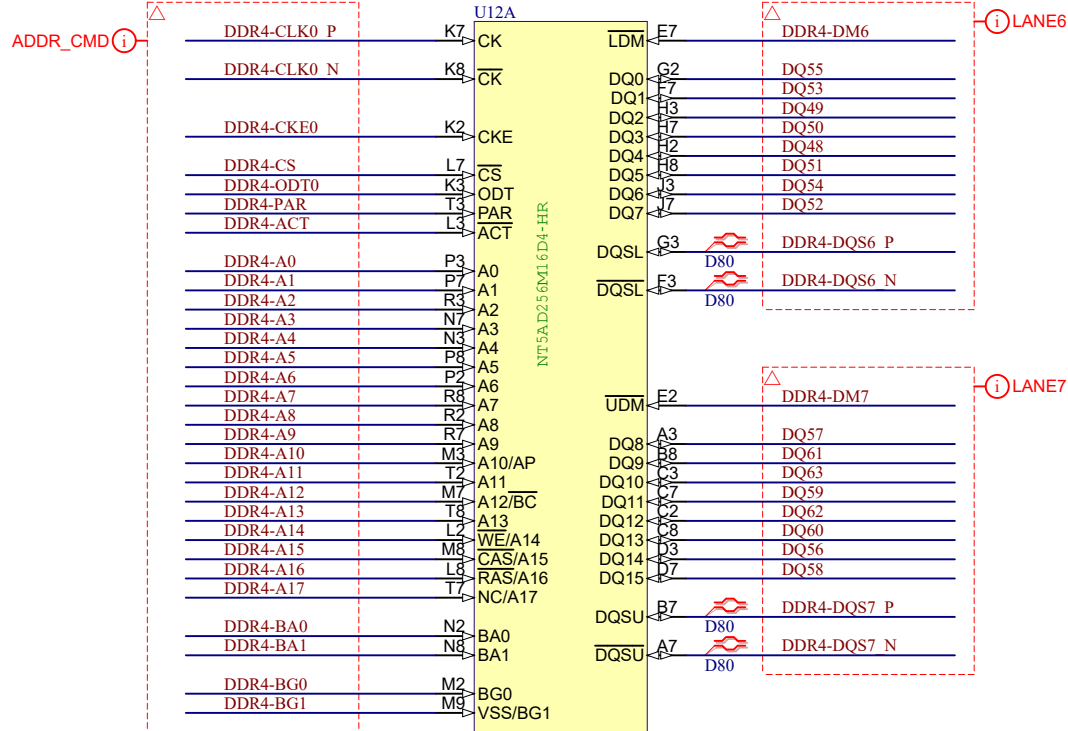
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| Title: TE0813 - DDR4_1_RAM | | |
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| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 20 of 30 |
| Filename: DDR4-RAM.SchDoc | | |



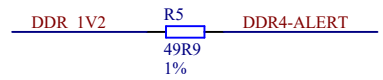
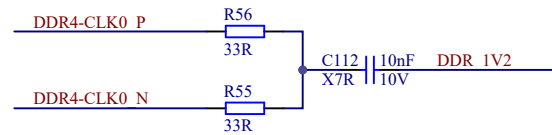
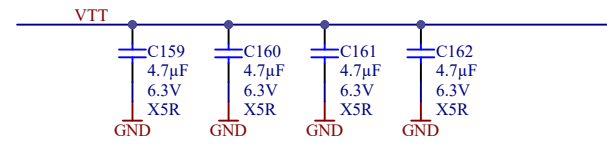
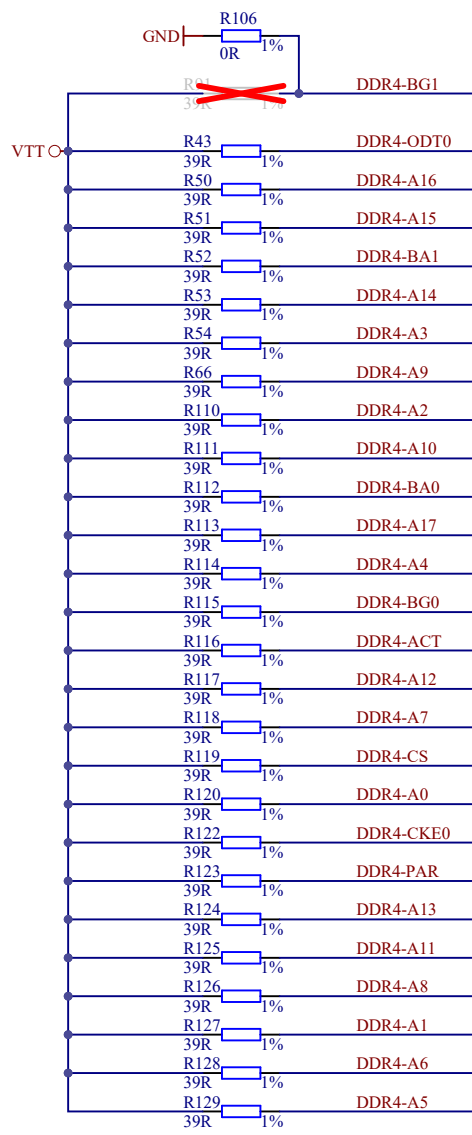
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| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 21 of 30 |
| Filename: DDR4-RAM_2.SchDoc | | |



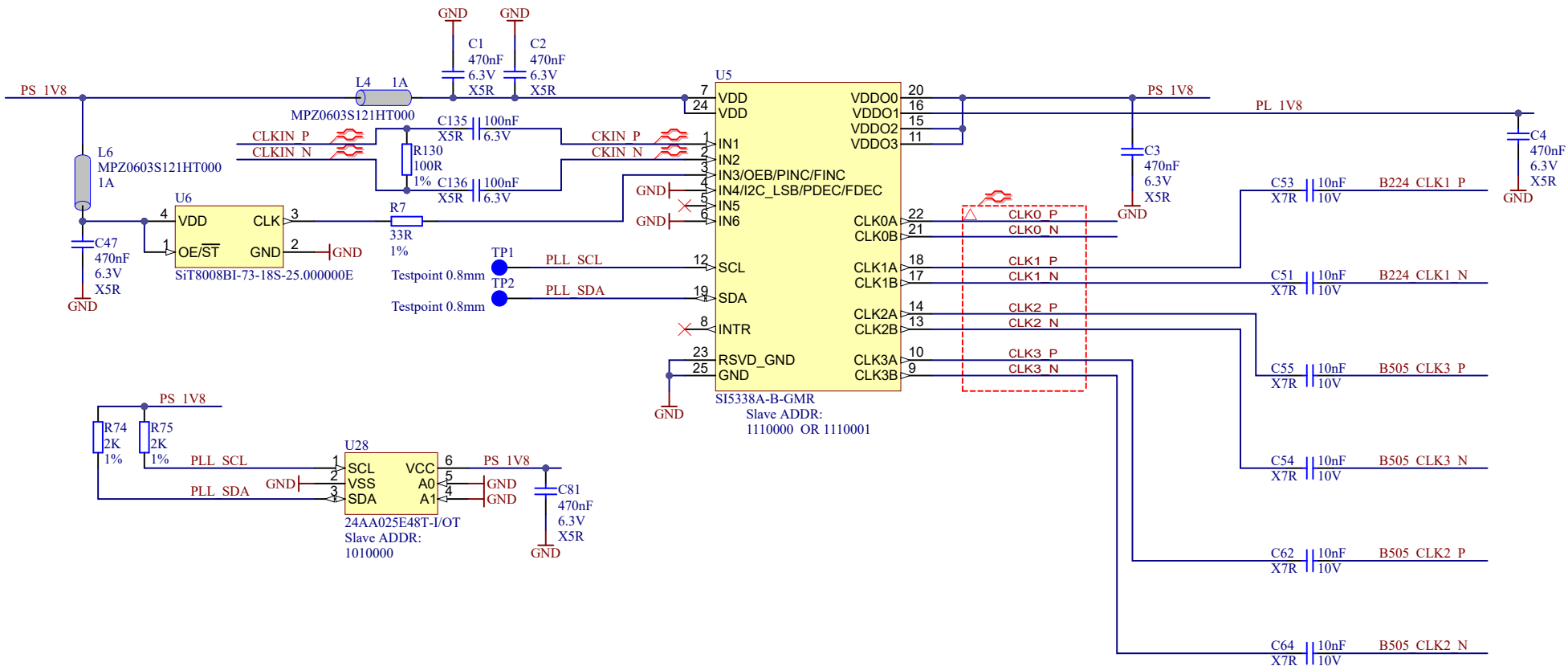
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| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 22 of 30 |
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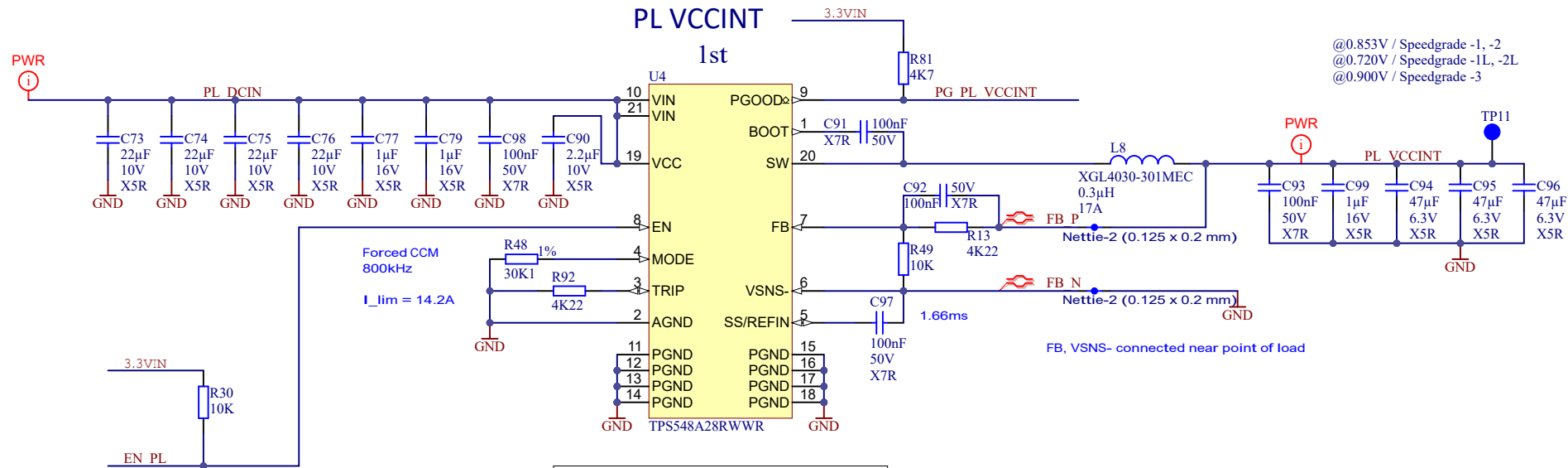
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| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 23 of 30 |
| Filename: DDR4-RAM_4.SchDoc | | |



| | | |
|----------------------------|---------------------------------------|---------------|
| Title: TE0813 - DDR4_TERM | | |
| A4 | Number: TE0813 5DE11-A | Rev. 01 |
| Date: 2021-08-16 | Copyright: Trenz Electronic GmbH / TT | Page 24 of 30 |
| Filename: DDR4-TERM.SchDoc | | |



| | | | | |
|---|--|---------------------------------------|-----------------------|---------------------------|
|  | | | Title: TE0813 - CLOCK | |
| | | | A4 | Number: TE0813 5DE11-A |
| Date: 2021-08-16 | | Copyright: Trenz Electronic GmbH / TT | | Page 25 of 30 |
| Filename: Clock.SchDoc | | | | |

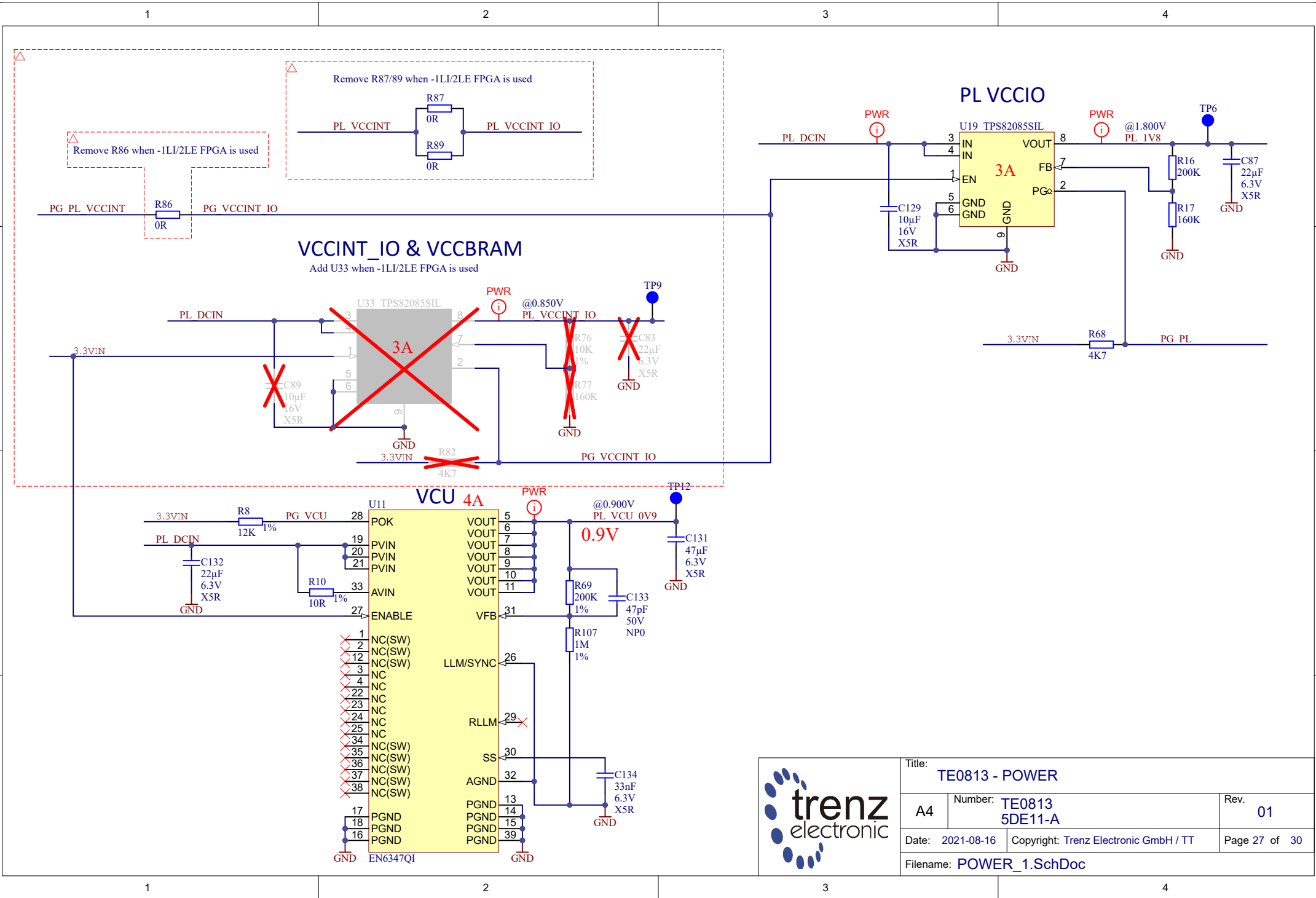


FPGA Speed grade:

| | | |
|-------------|-----------------------|--------------------|
| -1L1 / -2LE | R13 - 2K, R49 - 10K | PL_VCCINT = 0.720V |
| -1 / -2 | R13 - 4K22, R49 - 10K | PL_VCCINT = 0.853V |
| -3E | R13 - 10K, R49 - 20K | PL_VCCINT = 0.900V |

U4 pin compatible with
 -- TPS548B28 (20A)
 -- TPS54JA20 (12A)

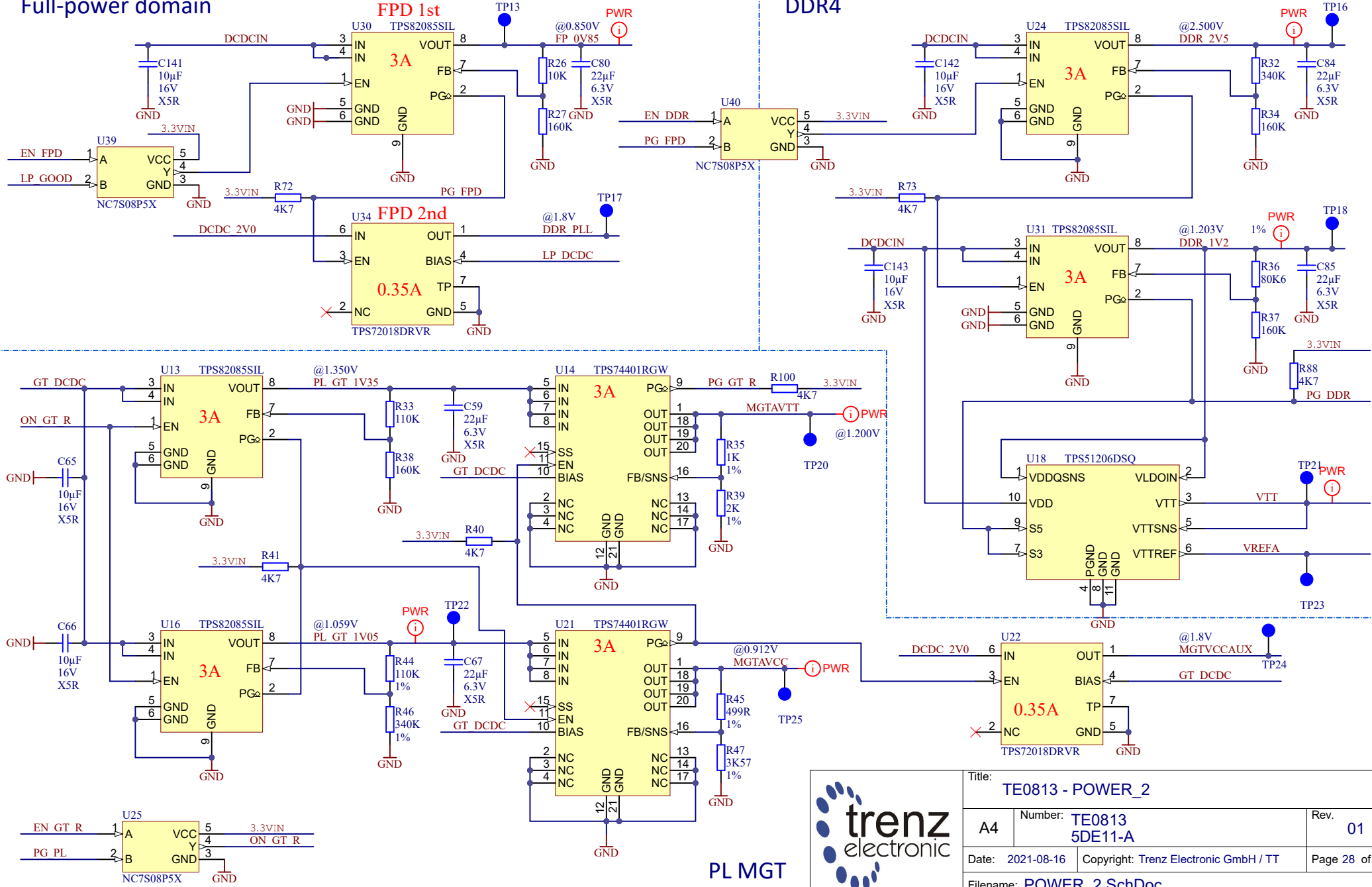
| | | |
|--|-------------------------------|---------------------------------------|
| | Title: TE0813 - POWER | |
| | A4 | Number: TE0813 5DE11-A |
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| | Filename: POWER.SchDoc | |



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| Filename: POWER_1.SchDoc | | |

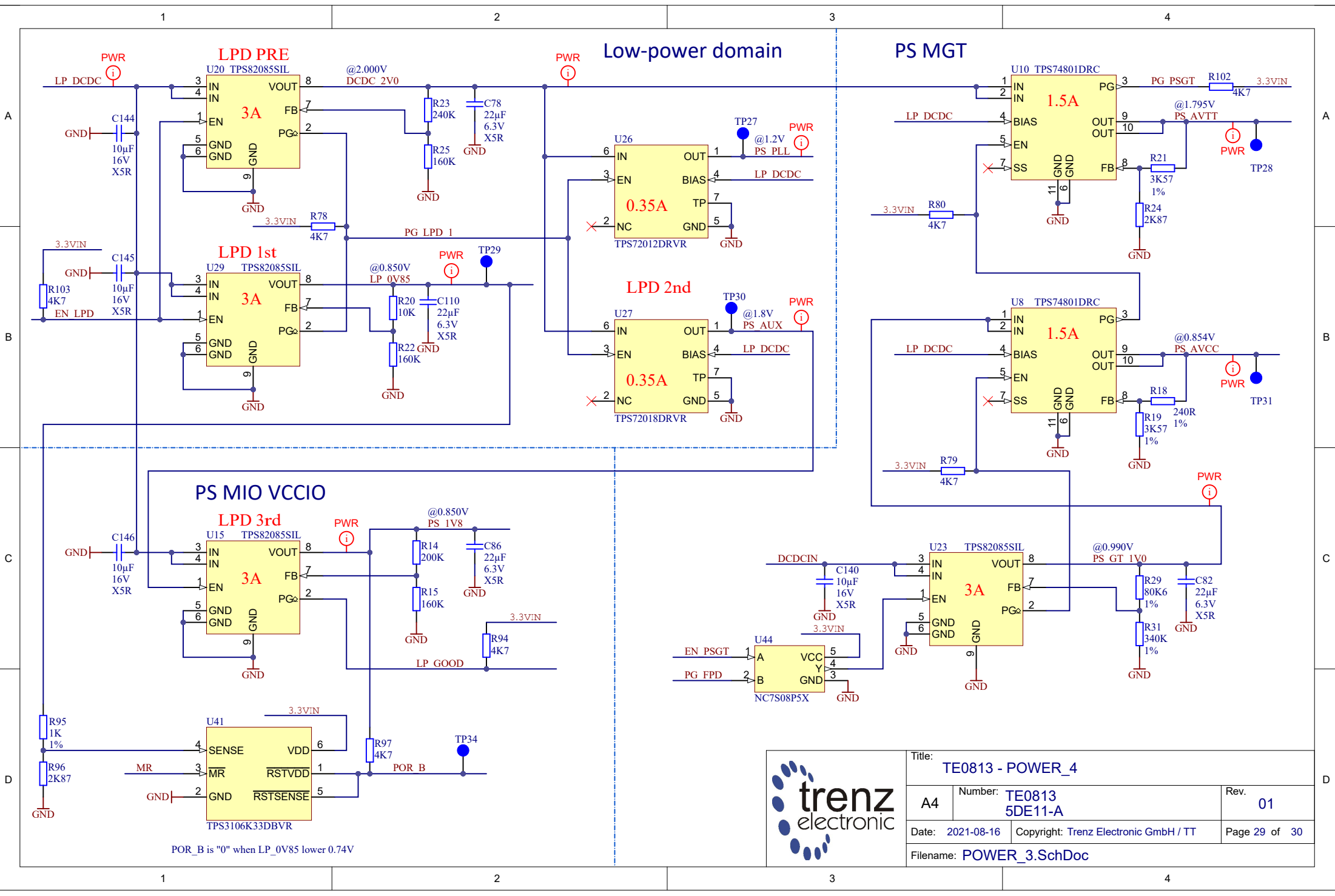
Full-power domain

DDR4



| | | |
|---------------------------------|---------------------------------------|----------------|
| Title: TE0813 - POWER_2 | | |
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PL MGT



Low-power domain

PS MGT

PS MIO VCCIO

POR_B is "0" when LP_0V85 lower 0.74V



| | | |
|--------------------------|---------------------------------------|---------------|
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C

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| REV | DATE | Description | |
|-----|---------|------------------|----|
| -01 | 2021-05 | Initial revision | VT |
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|---|--|---|-----------------------------|
|  | Title: TE0813 - Revision History | | |
| | A4 | Number: TE0813 5DE11-A | Rev. 01 |
| | Date: 2021-07-26 | Copyright: Trenz Electronic GmbH | Page 30 of 30 |
| | Filename: Revision Changes.SchDoc | | |

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