


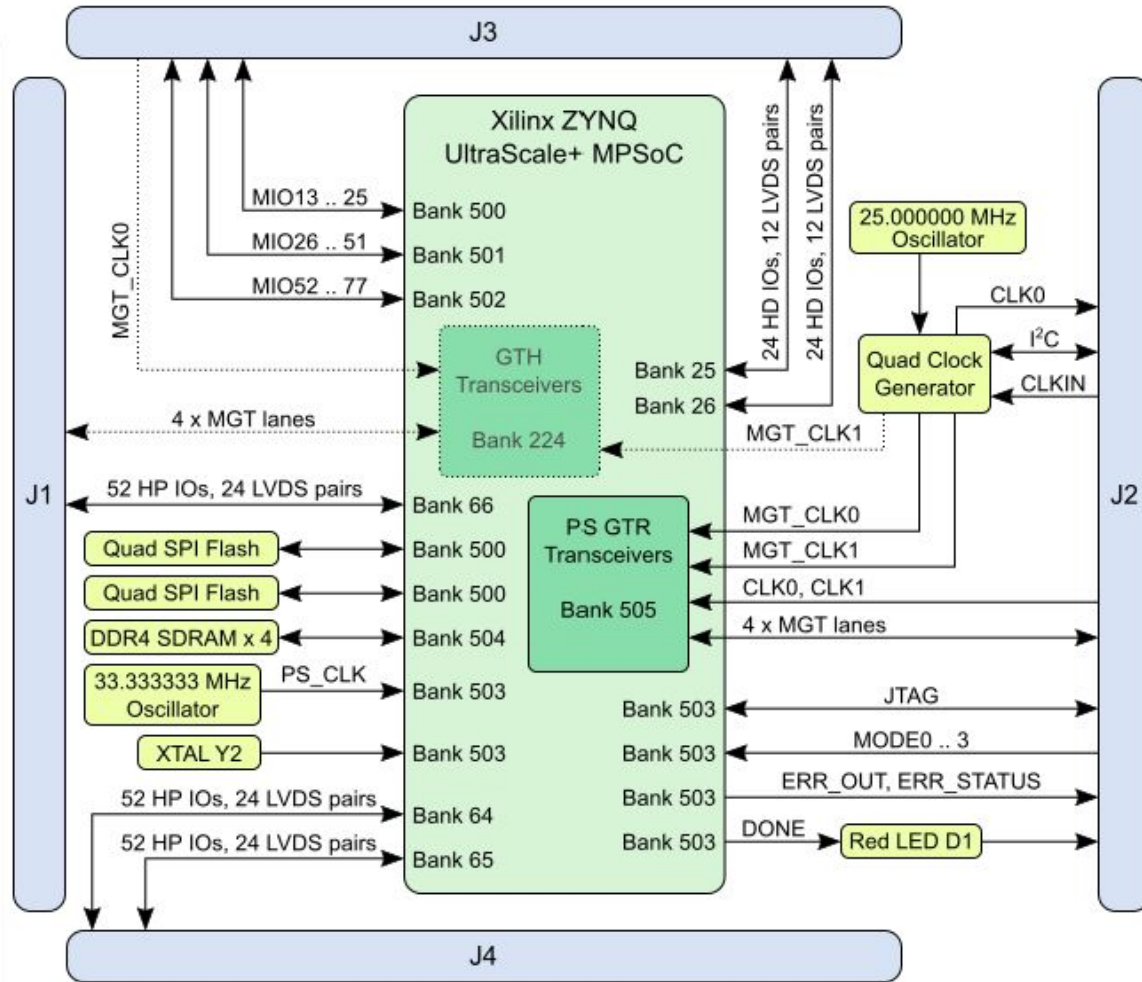
Regarding the usage of our schematics and alike documentation for Trenz module TE0813.


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.

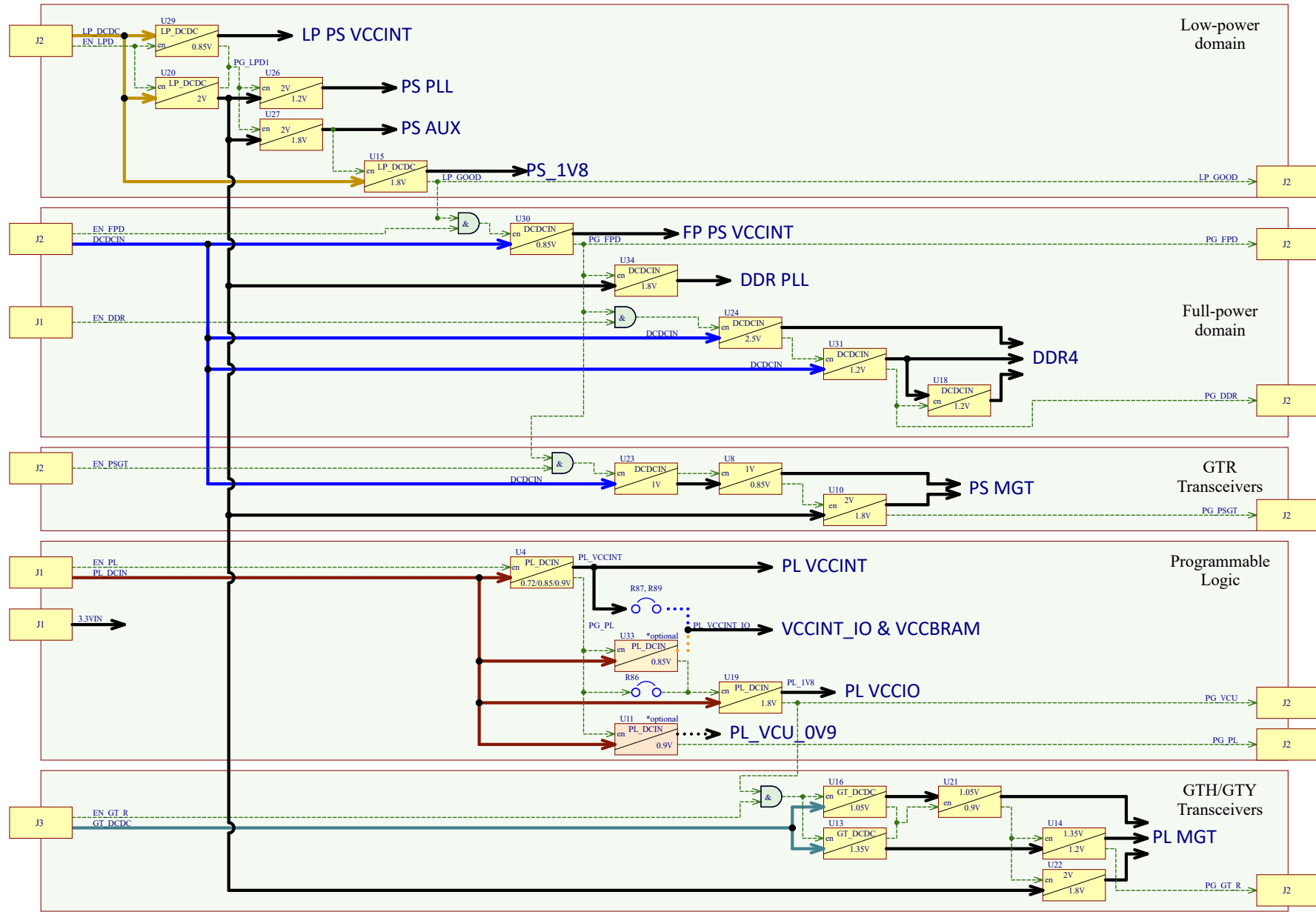
Schematics and other handouts serve for informational purposes only!

	Title: <b>TE0813</b>		
	A4	Number: <b>TE0813 4AE71-KS</b>	Rev. <b>01</b>
	Date: <b>2021-08-16</b>	Copyright: <b>Trenz Electronic GmbH / TT</b>	Page <b>1</b> of <b>30</b>
	Filename: <b>Legal Notices Modules.SchDoc</b>		

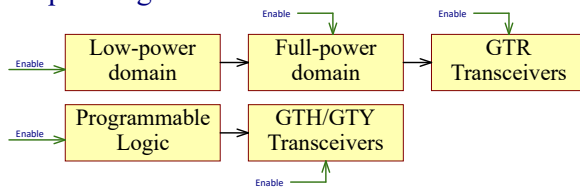
# TE0813-01



		Title: <b>Module TE0813 - System Overview</b>	
		A4	Number: <b>TE0813 4AE71-KS</b>
Date: 2021-08-16		Copyright: 2015 Trenz Electronic GmbH	
Filename: <b>TE0813-Overview.SchDoc</b>		Page 2 of 30	



**Power-on sequencing:**



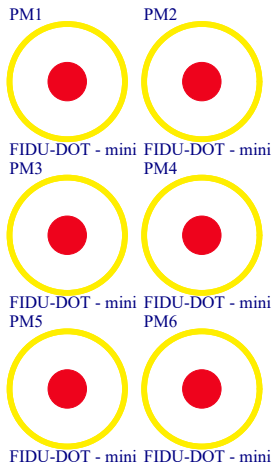
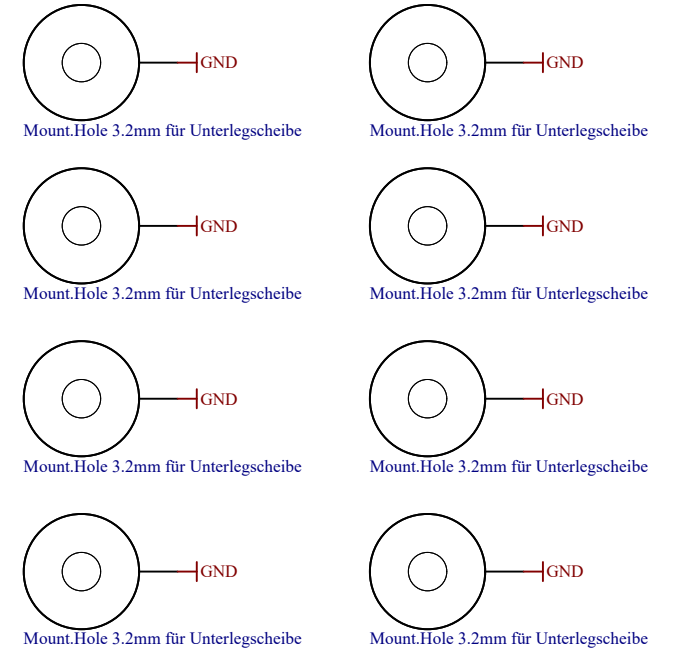
- EN\_GT\_R Net name
- Power bus
- Control signal
- Power bus in FPGA speedgrade -1/-2/-3 assembly variants
- Power bus in FPGA speedgrade -1L/-2L assembly variants (low power)
- Optional power converter
- Logic AND gate



Title: TE0813 - Power Diagram		
A3	Number: TE0813 4AE71-KS	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:



MECH1

TE Address Overlay

LOGO ADDRESS


LOGO1

TE Logo PRINT Layer

LOGO PRINT

Serial  
Serial  
Serialnumber 6,3 x 6.3mm

Assembly variant	4AE71-KS
Created by	VT
Modified by	VT
Modified at	2021-05-27
SVN Revision	12304 [Locally Modified]

			Title: TE0813	
A4	Number: TE0813 4AE71-KS	Rev. 01		
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 4 of 30		
Filename: TE0813.SchDoc				

1

2

3

4

A

A

B

B

C

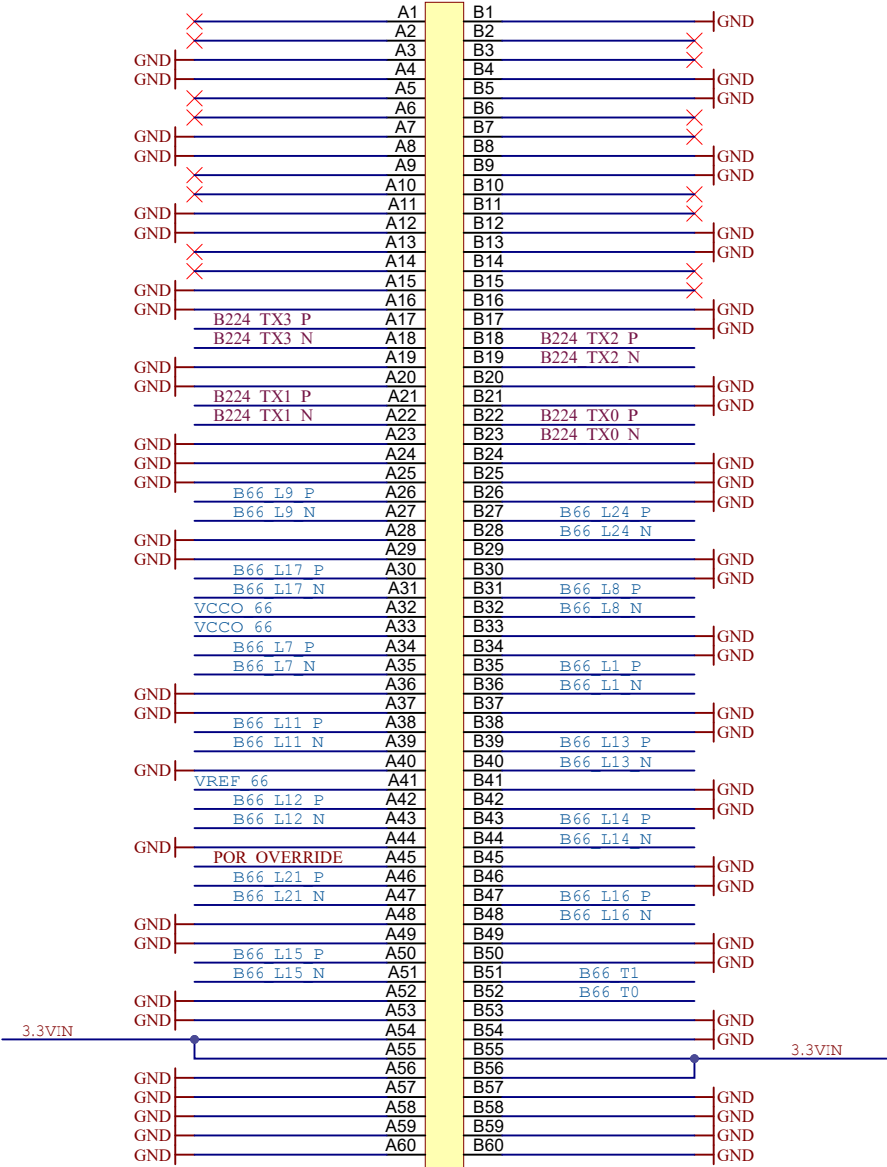
C

D

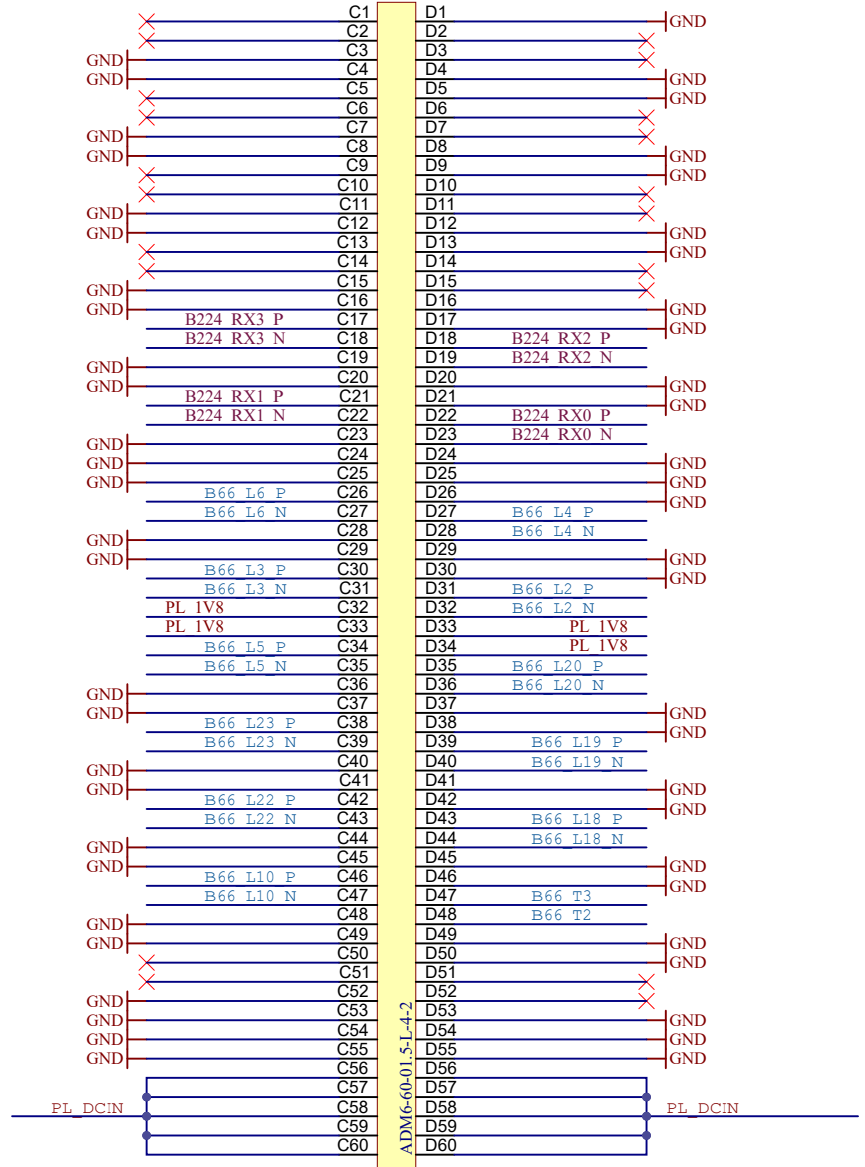
D

JM1A

JM1B



ADM6-60-01.5-L-4-2



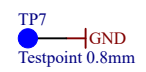
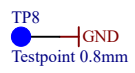
ADM6-60-01.5-L-4-2

3.3VIN

3.3VIN

PL\_DCIN

PL\_DCIN



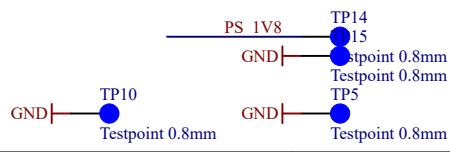
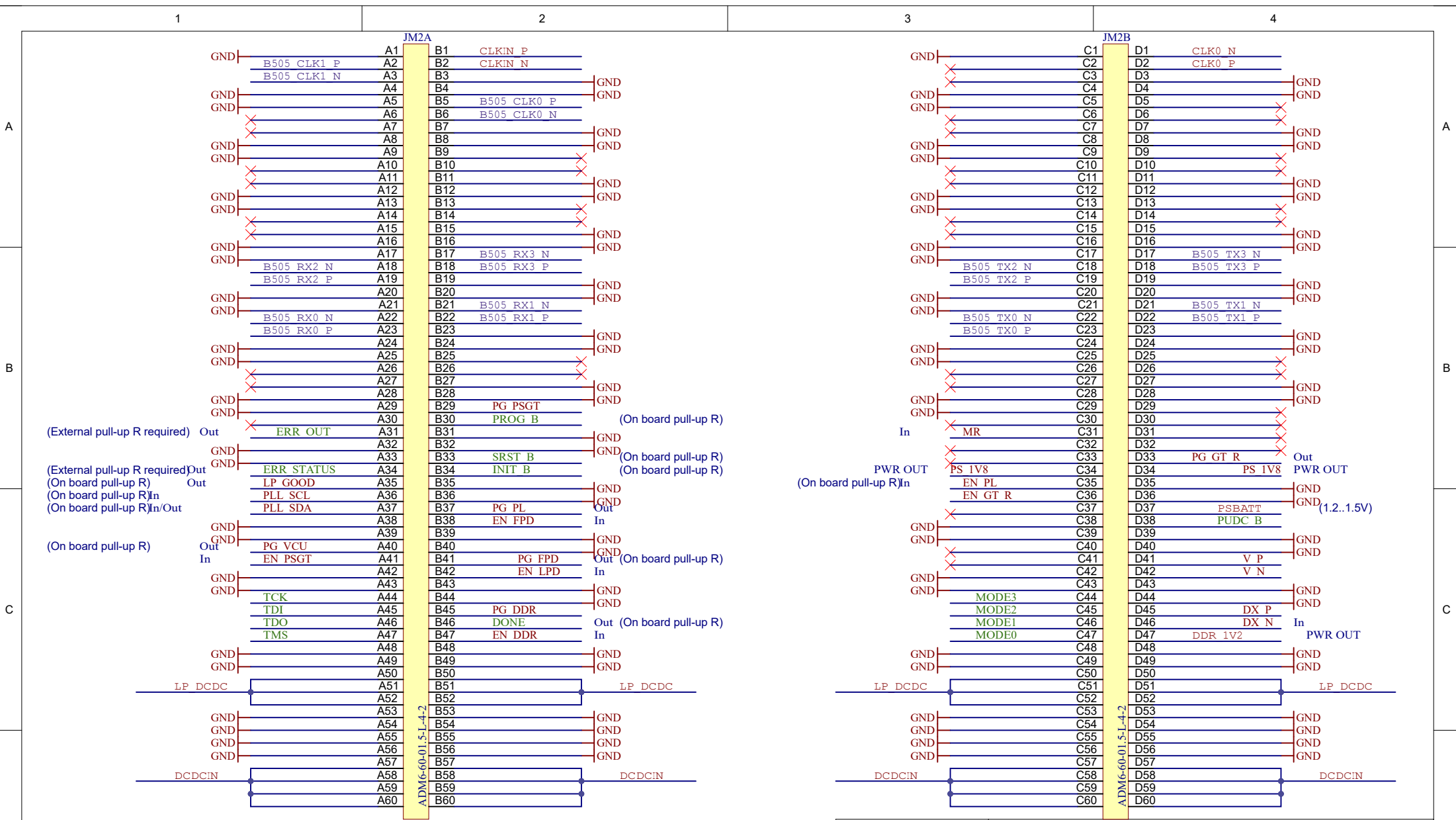
Title: TE0813 - Connector J1		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 5 of 30
Filename: J1.SchDoc		

1

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Title: **TE0813 - Connector J2**

A4	Number: <b>TE0813 4AE71-KS</b>	Rev. <b>01</b>
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	
Page 6 of 30		

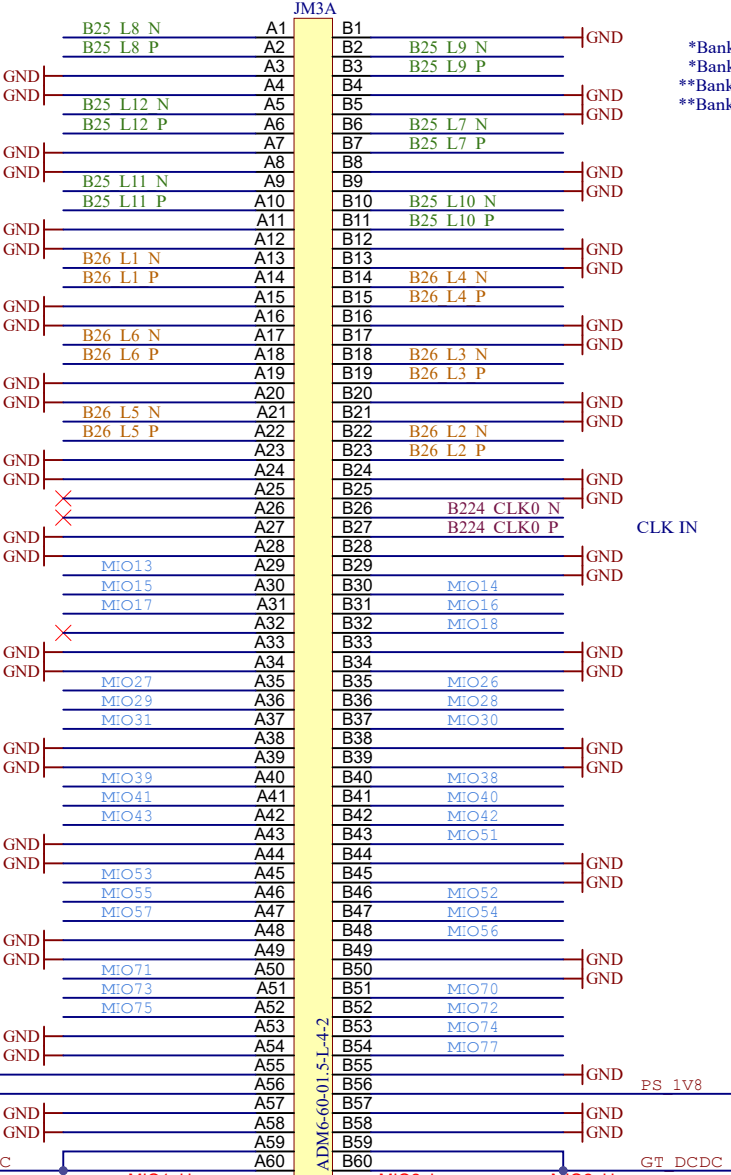
Filename: **J2.SchDoc**

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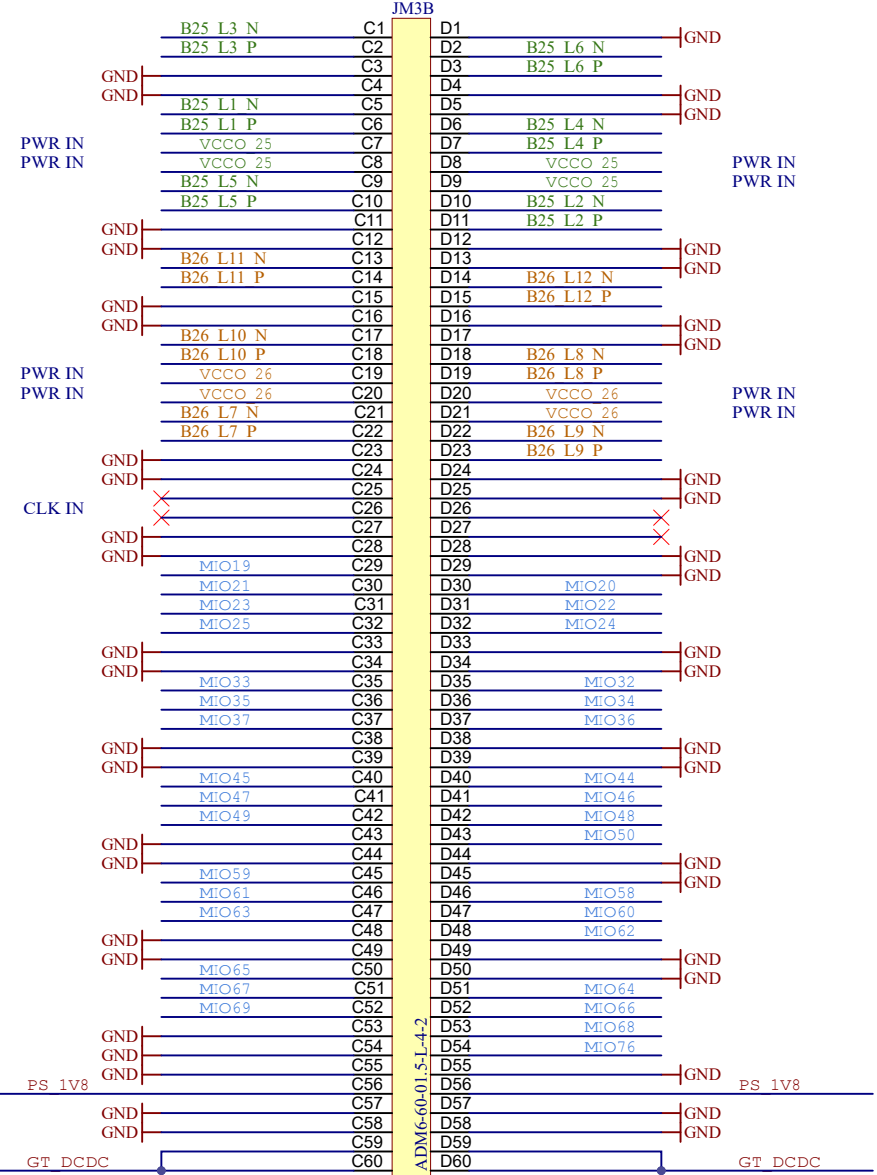
\*Bank 25 for XCZU2/3  
 \*Bank 45 for XCZU4/6  
 \*\*Bank 26 for XCZU2/3  
 \*\*Bank 46 for XCZU4/5

CLK IN

PS 1V8

GT DCDC

JM3B



PWR IN

PWR IN

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 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 7 of 30
Filename: J3.SchDoc		

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1

2

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4

A

A

B

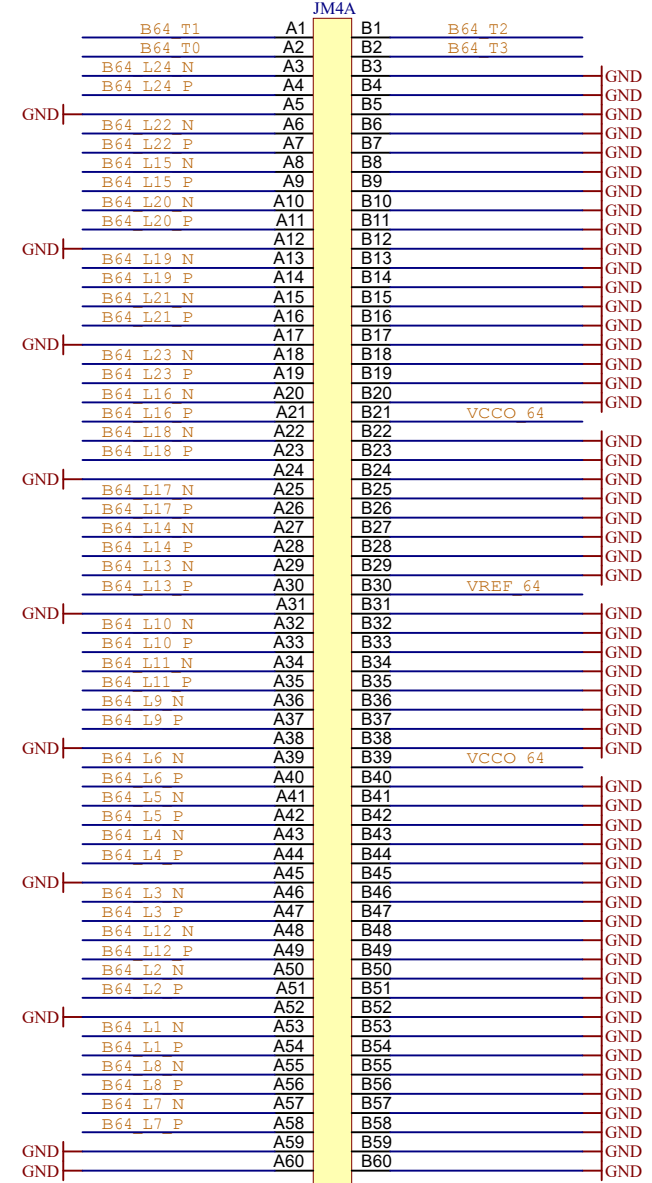
B

C

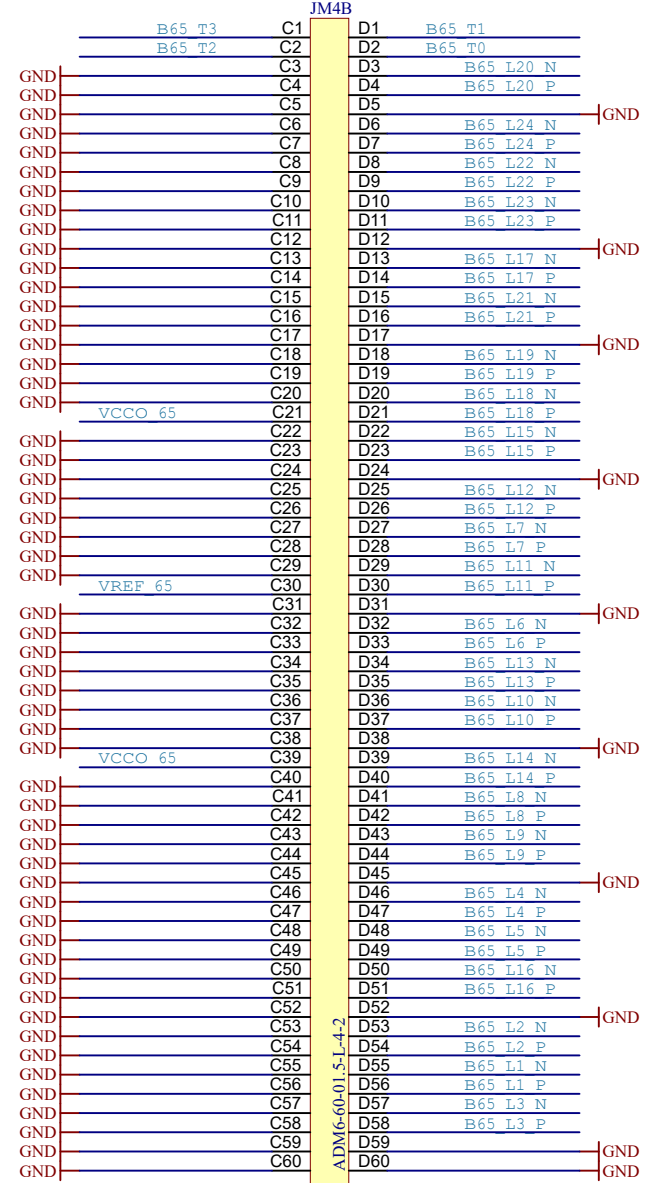
C

D

D



ADM6-60-01.5-L-4-2



ADM6-60-01.5-L-4-2



Title: <b>TE0813 - Connector J4</b>		
A4	Number: <b>TE0813 4AE71-KS</b>	Rev. <b>01</b>
Date: <b>2021-08-16</b>	Copyright: <b>Trenz Electronic GmbH / TT</b>	Page <b>8</b> of <b>30</b>
Filename: <b>J4.SchDoc</b>		

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A

A

B

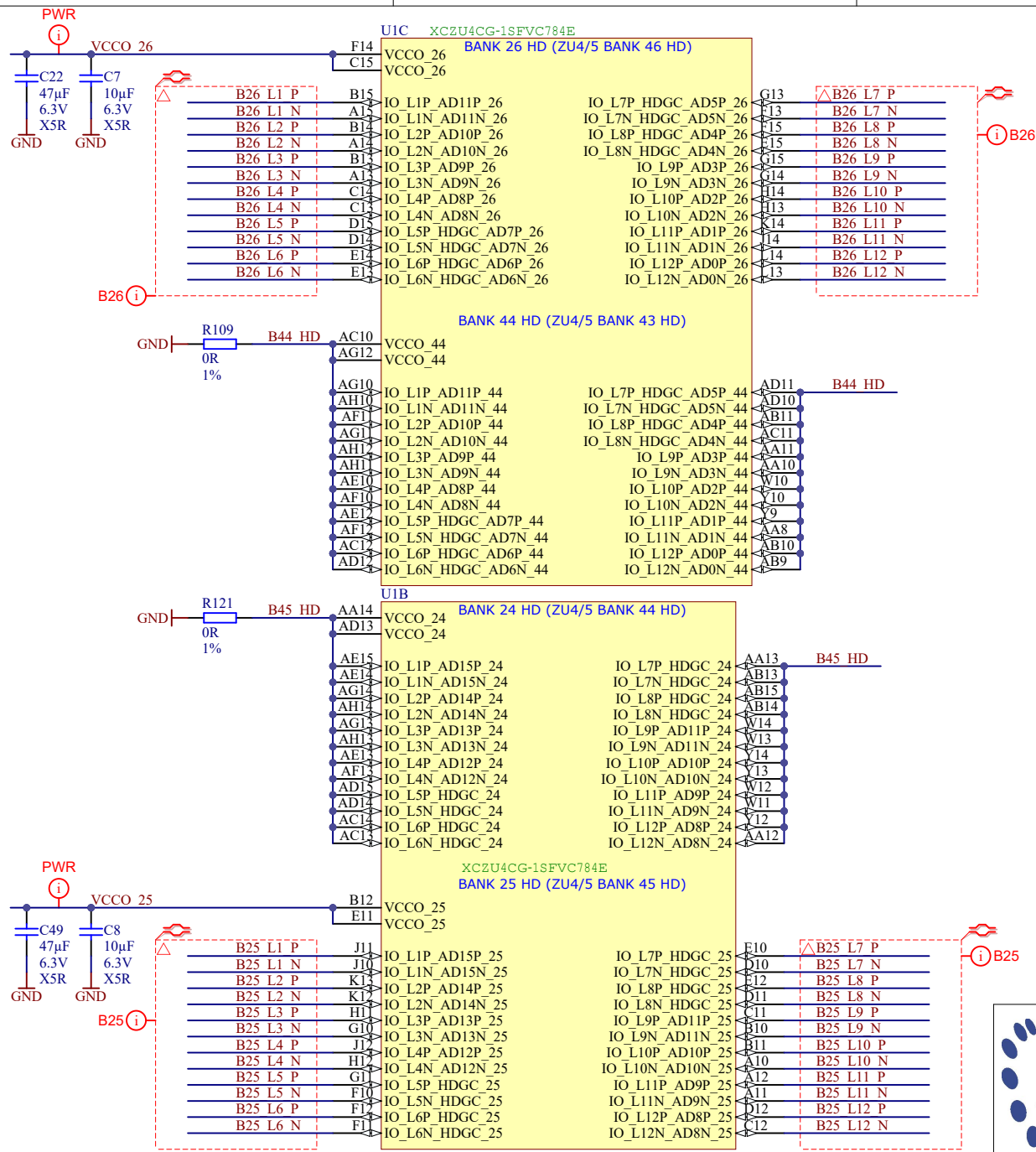
B

C

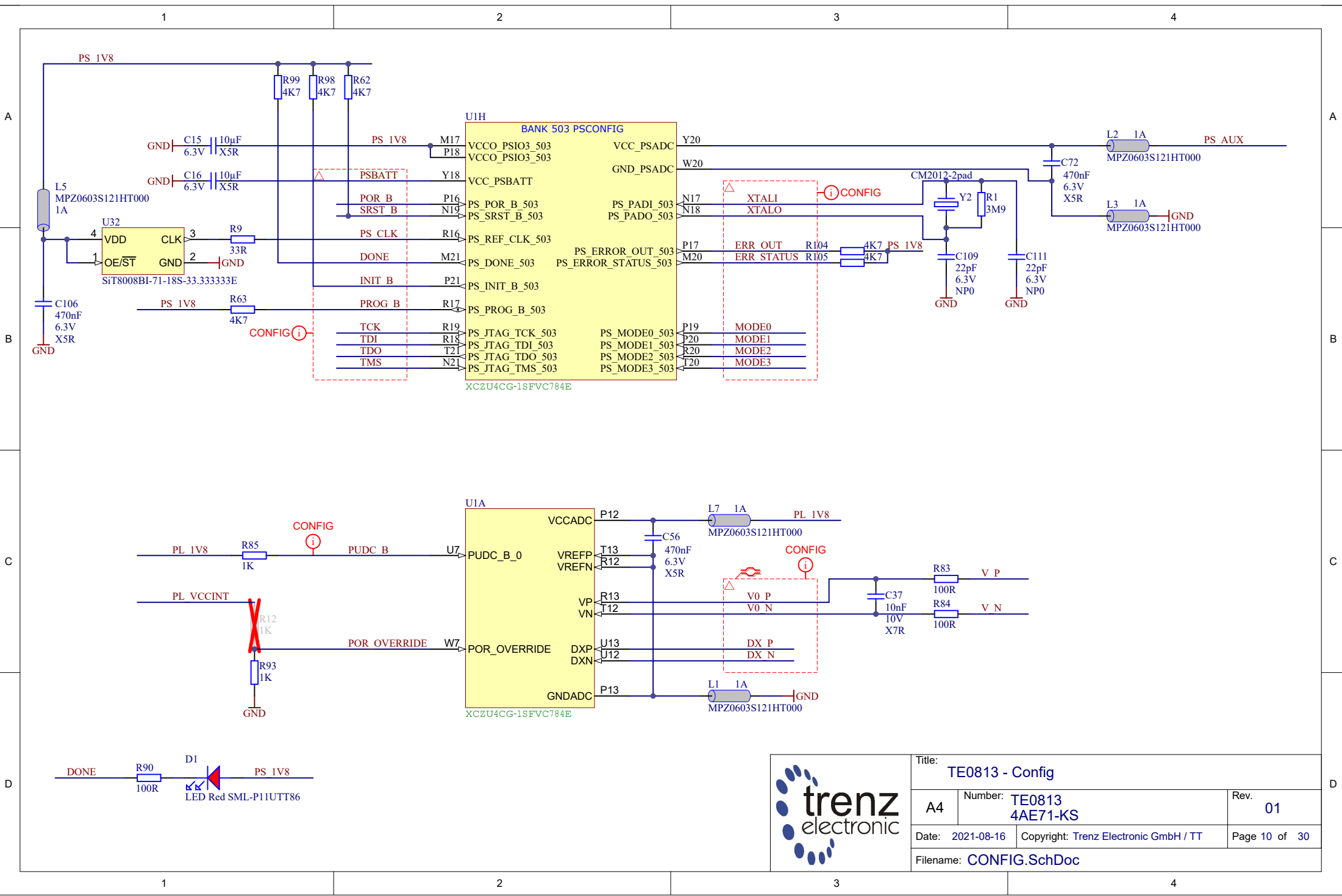
C

D

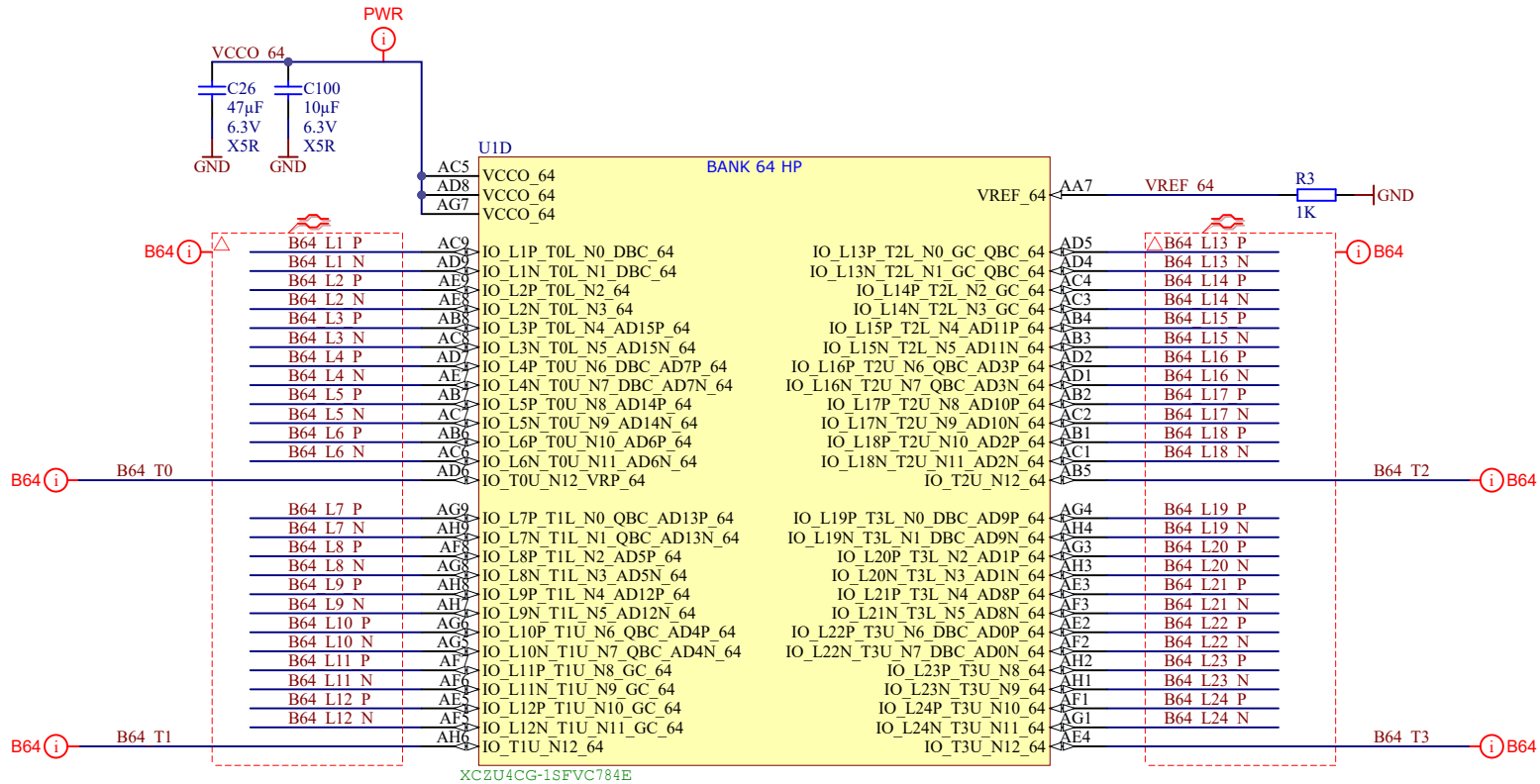
D



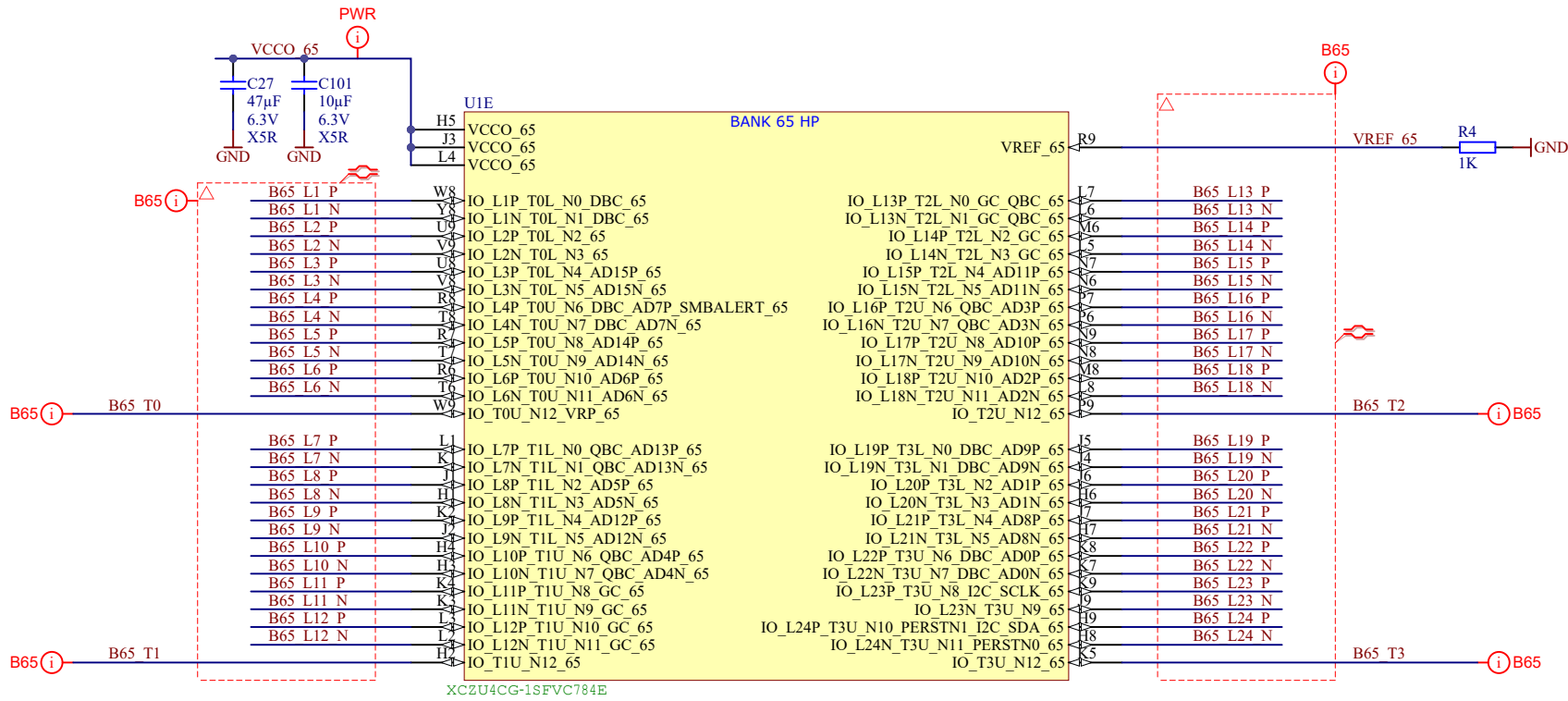
Title: <b>TE0813 - HD Banks</b>		
A4	Number: <b>TE0813 4AE71-KS</b>	Rev. <b>01</b>
Date: <b>2021-08-16</b>	Copyright: <b>Trenz Electronic GmbH / TT</b>	Page <b>9</b> of <b>30</b>
Filename: <b>B_HD.SchDoc</b>		



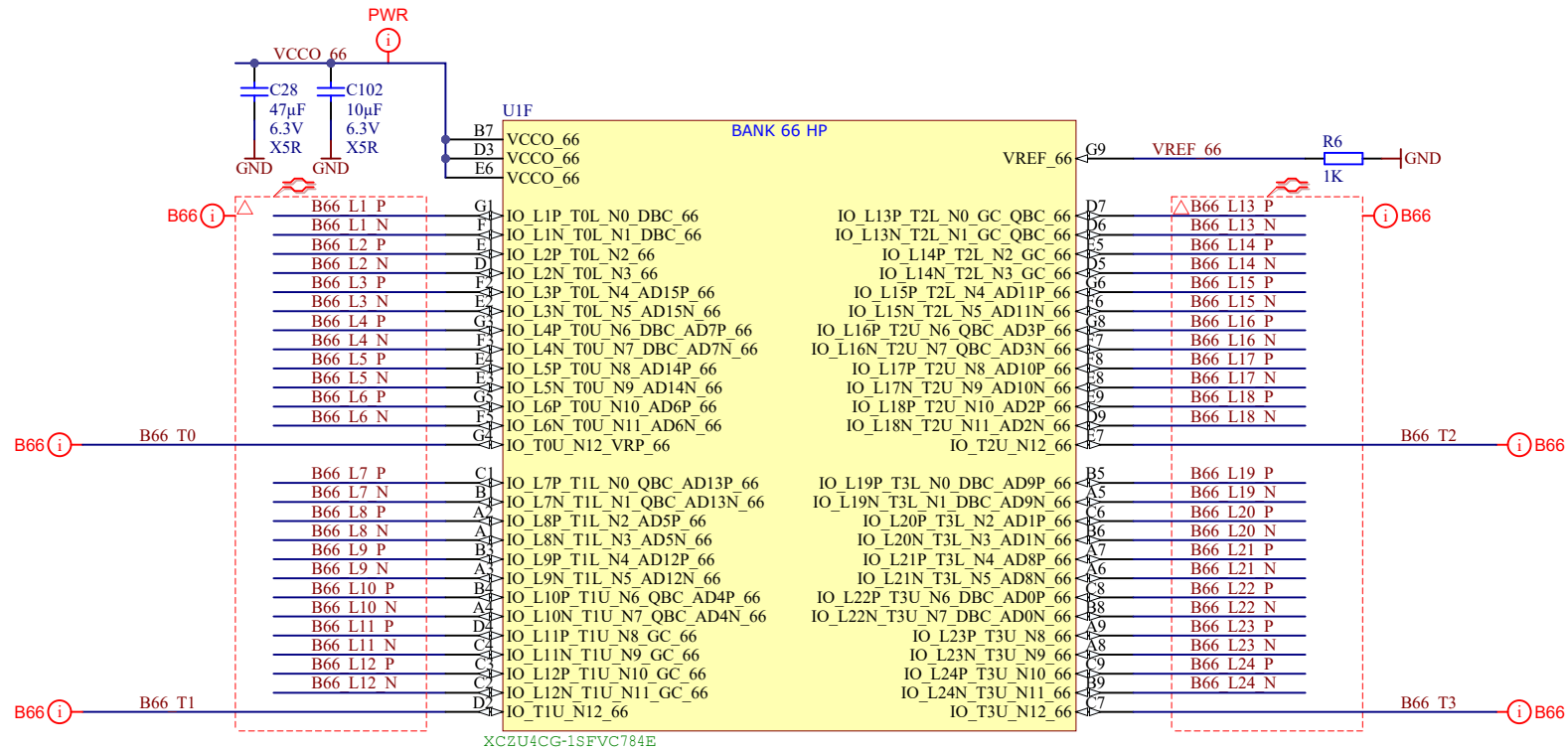

Title: TE0813 - Config		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 10 of 30
Filename: CONFIG.SchDoc		



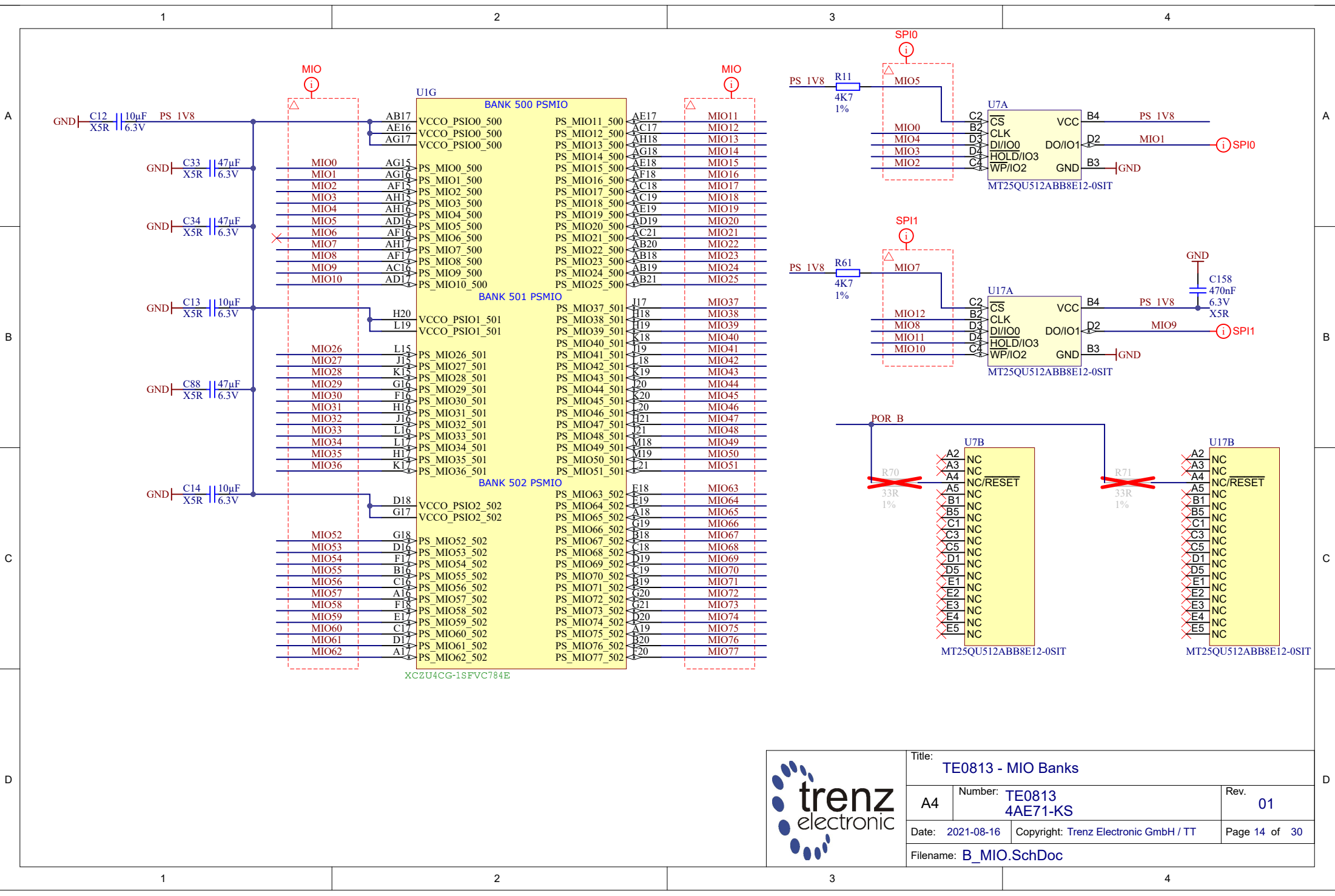
Title: <b>TE0813 - B64</b>		
A4	Number: <b>TE0813 4AE71-KS</b>	Rev. <b>01</b>
Date: <b>2021-08-16</b>	Copyright: <b>Trenz Electronic GmbH / TT</b>	Page <b>11</b> of <b>30</b>
Filename: <b>B64.SchDoc</b>		



Title: TE0813 - B65		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 12 of 30
Filename: B65.SchDoc		

Title: TE0813 - B66		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 13 of 30
Filename: B66.SchDoc		



		Title: <b>TE0813 - MIO Banks</b>	
		A4	Number: <b>TE0813 4AE71-KS</b>
Date: 2021-08-16		Copyright: Trenz Electronic GmbH / TT	
Date: 2021-08-16		Page 14 of 30	
Filename: <b>B_MIO.SchDoc</b>			

A

A

B

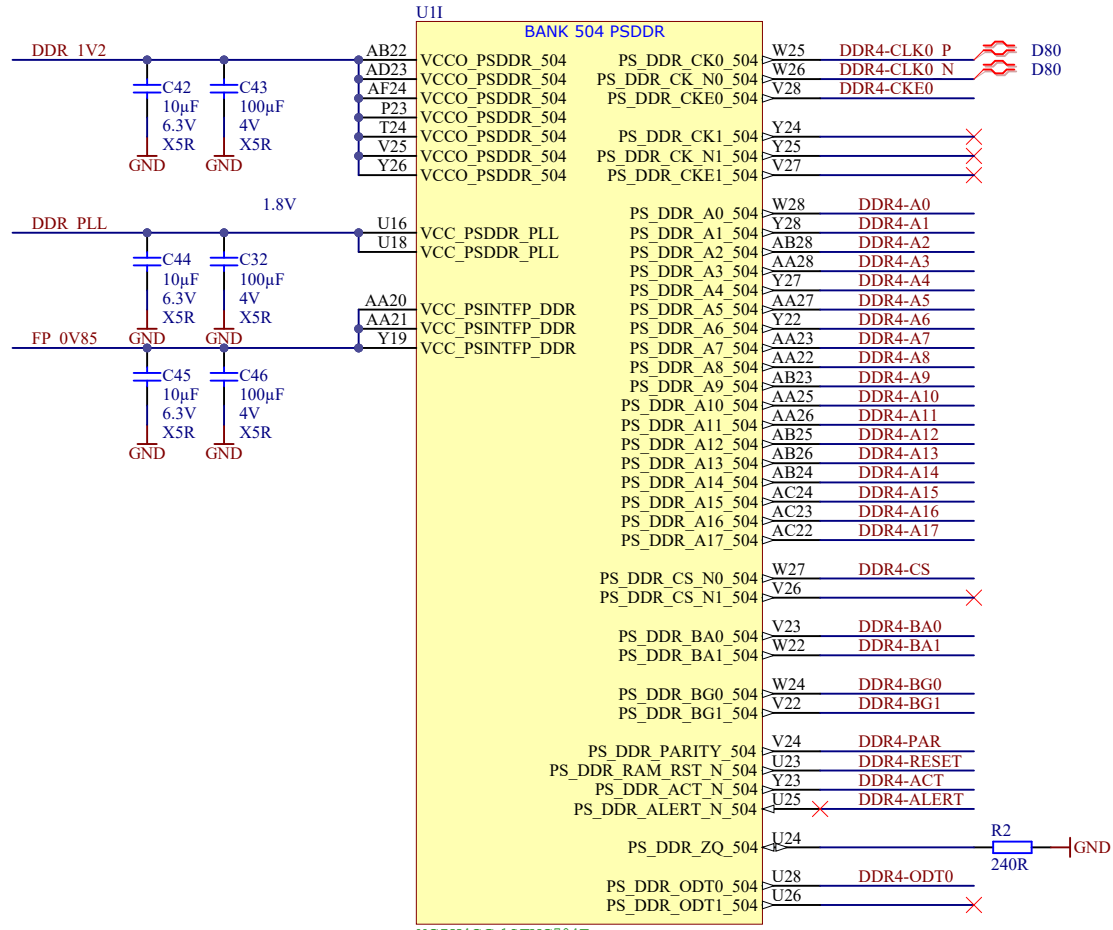
B

C

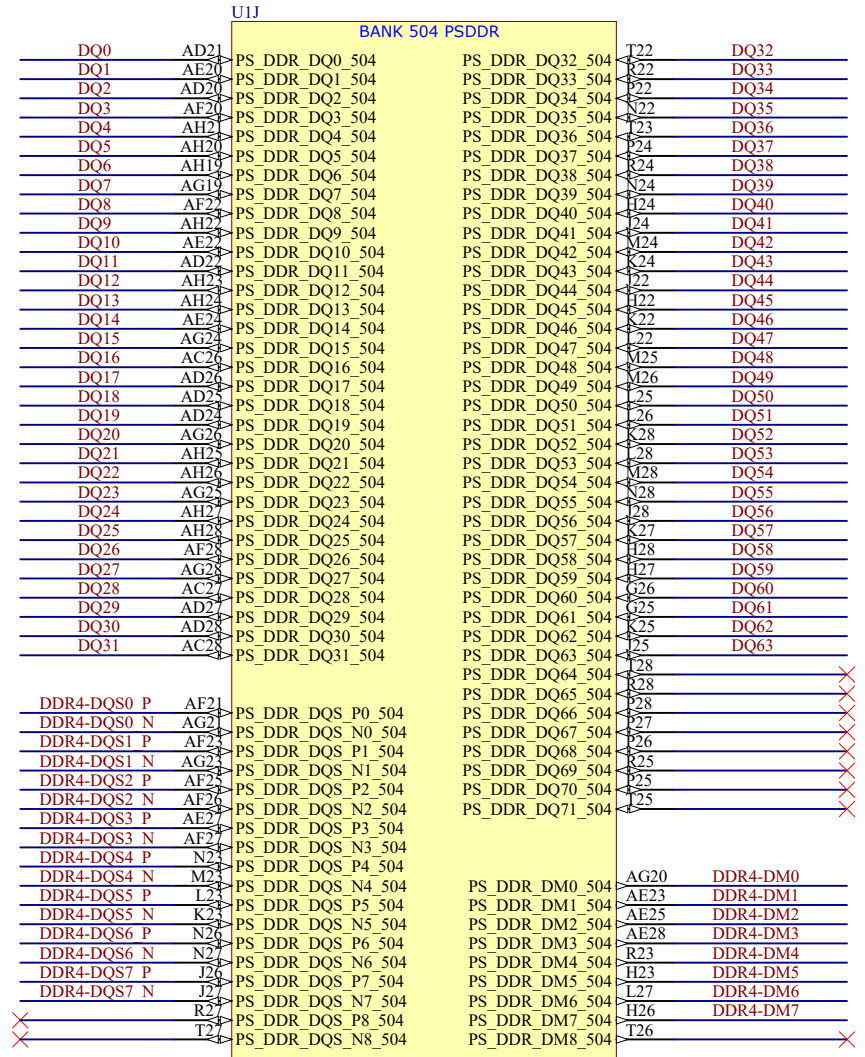
C

D

D



XCZU4CG-1SFVC784E



XCZU4CG-1SFVC784E



Title: <b>TE0813 - PS_DDR</b>		
A4	Number: <b>TE0813 4AE71-KS</b>	Rev. <b>01</b>
Date: <b>2021-08-16</b>	Copyright: <b>Trenz Electronic GmbH / TT</b>	Page <b>15</b> of <b>30</b>
Filename: <b>PS_DDR.SchDoc</b>		

1

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A

A

B

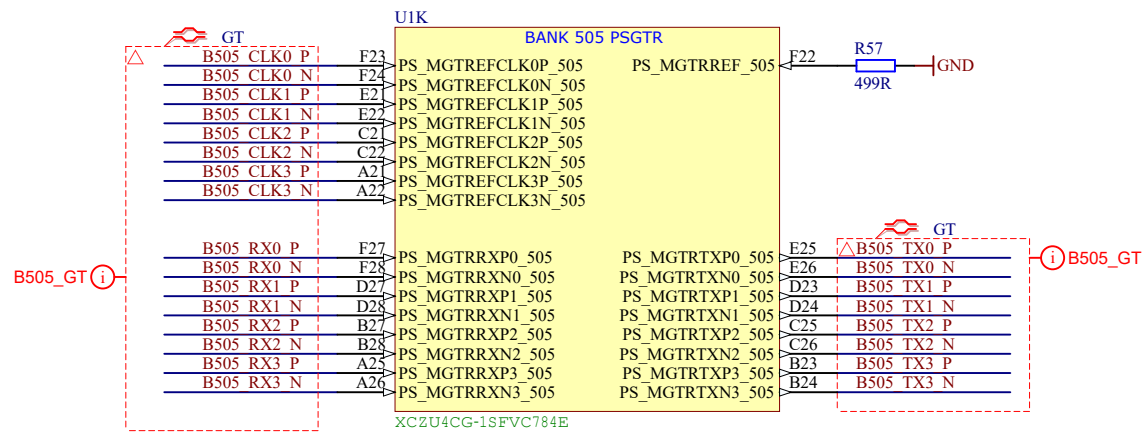
B


C

C

D

D



	Title: TE0813 - PS_GT		
	A4	Number: TE0813 4AE71-KS	Rev. 01
	Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 16 of 30
	Filename: B_PS_GT.SchDoc		

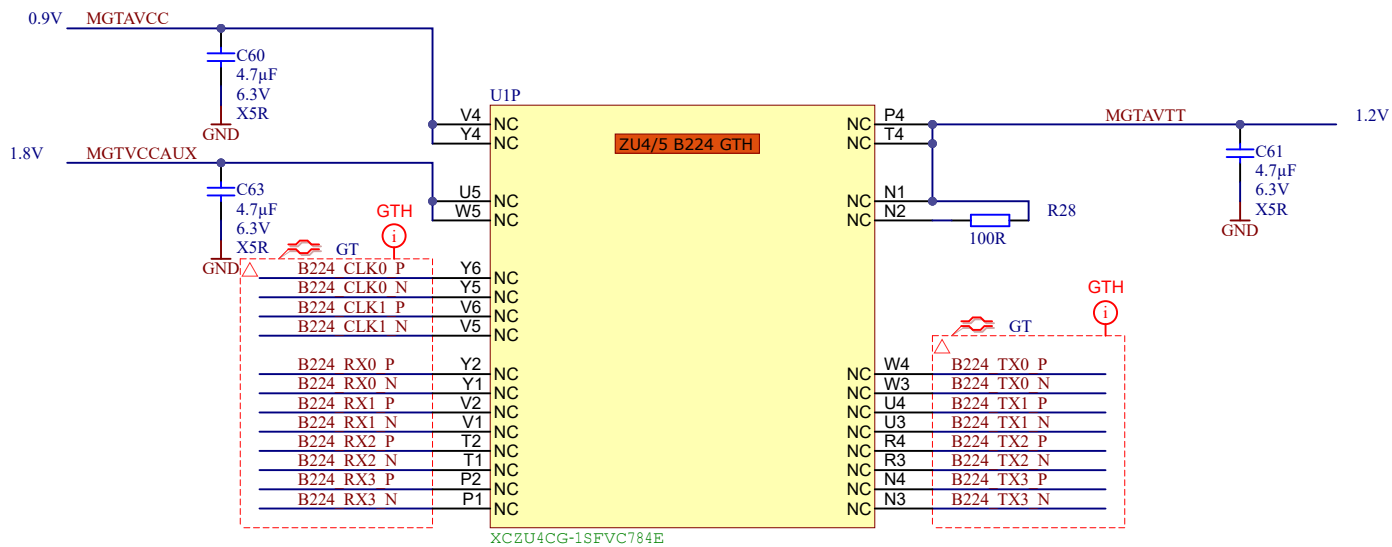
1


2

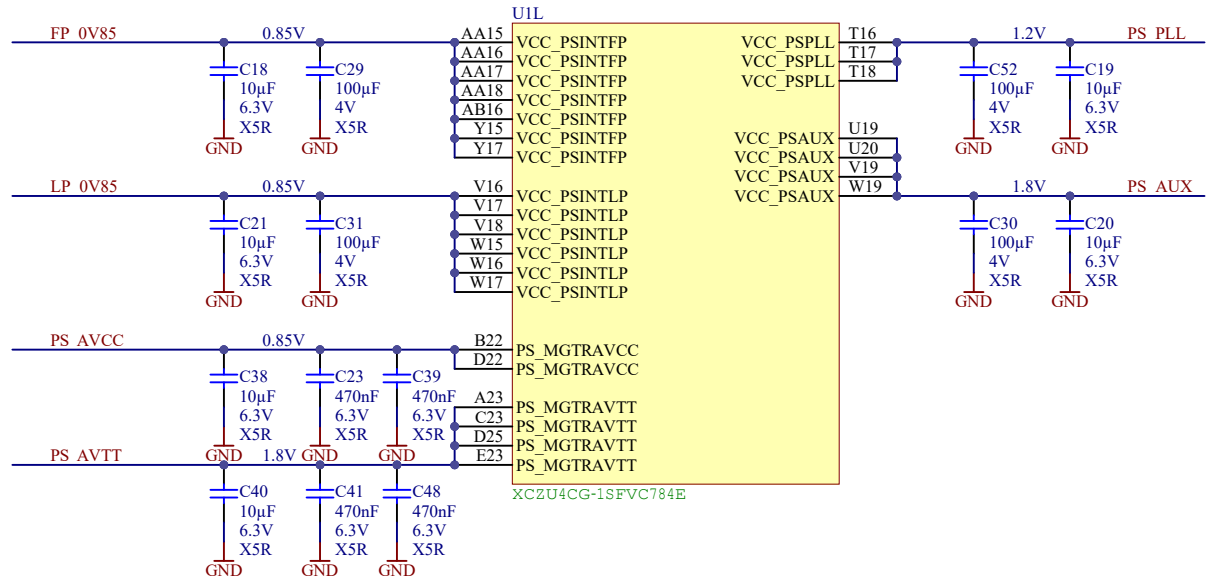
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4





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	A4	Number: TE0813 4AE71-KS	Rev. 01
	Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 17 of 30
	Filename: B_GT.SchDoc		



	Title: TE0813 - ZU_PS_POWER		
	A4	Number: TE0813 4AE71-KS	Rev. 01
	Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	
	Filename: ZU_PS_POWER.SchDoc		Page 18 of 30

1

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A

A

B

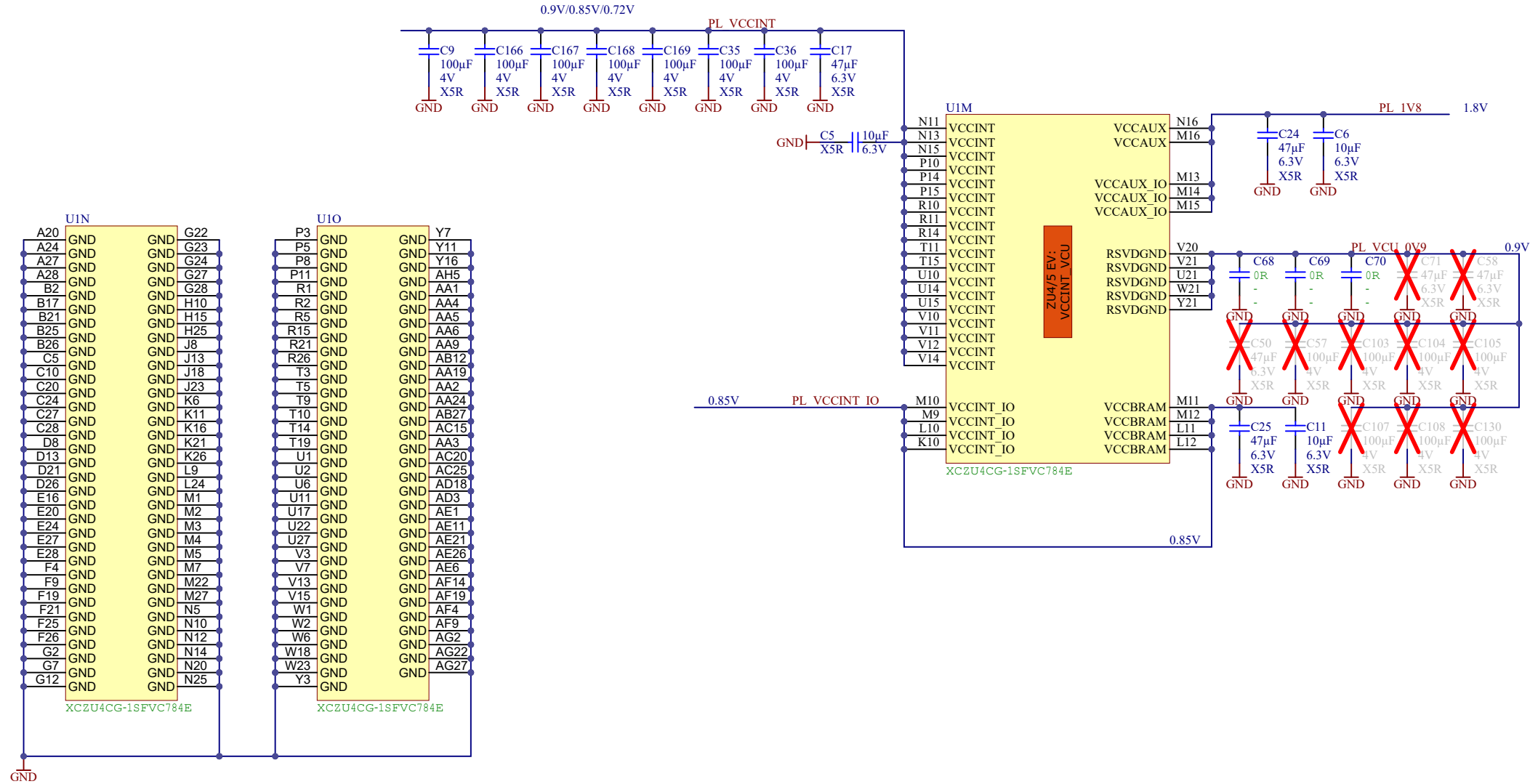
B


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D



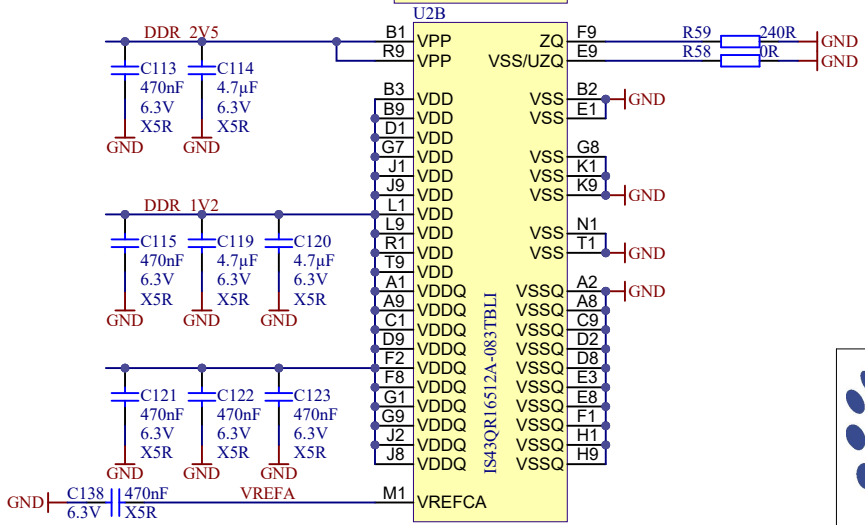
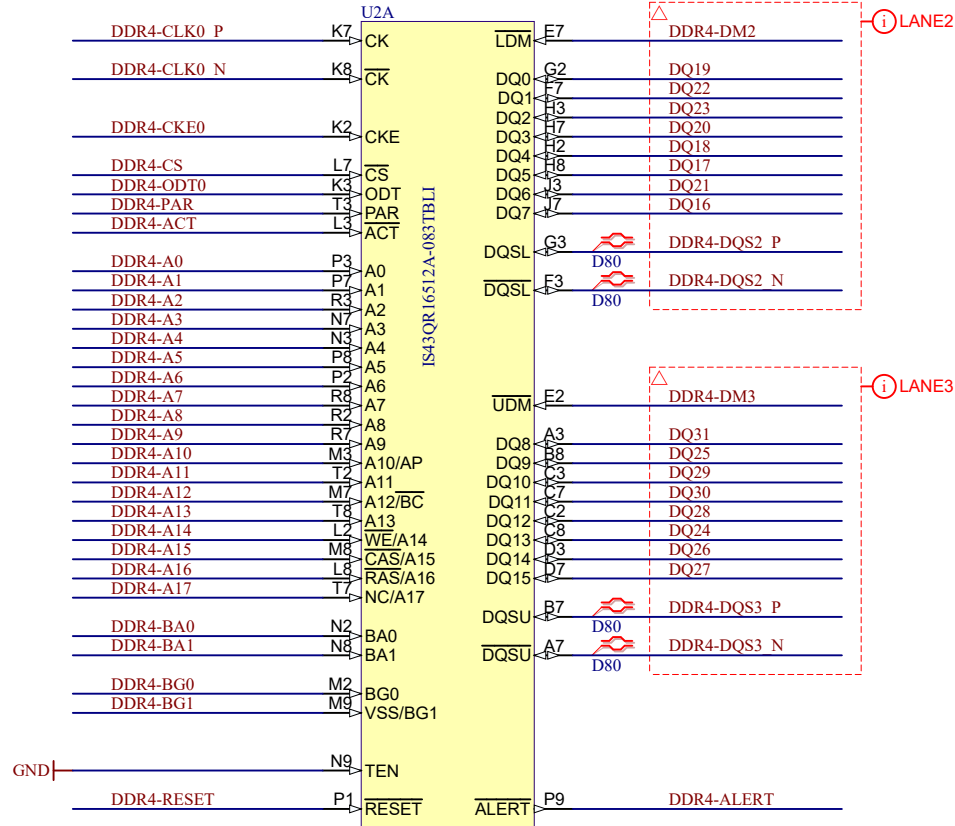
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	A4	Number: <b>TE0813 4AE71-KS</b>	Rev. <b>01</b>
	Date: <b>2021-08-16</b>	Copyright: <b>Trenz Electronic GmbH / TT</b>	
	Page <b>19</b> of <b>30</b>		
Filename: <b>ZU_POWER.SchDoc</b>			

1

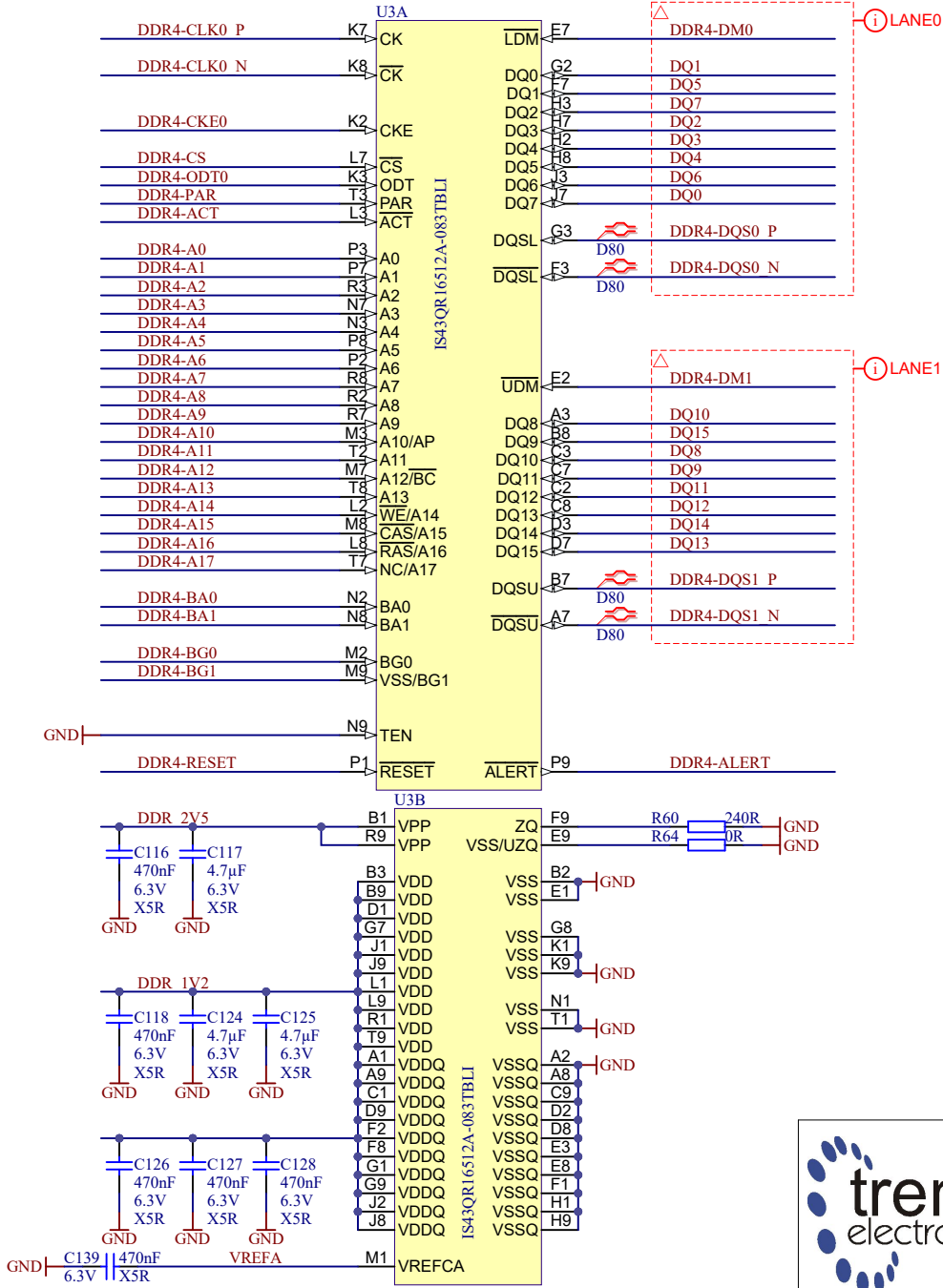
2

3

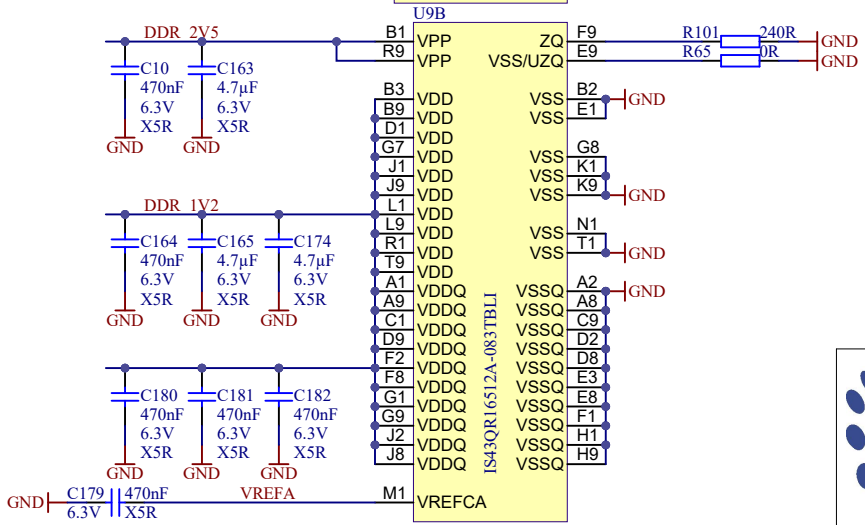
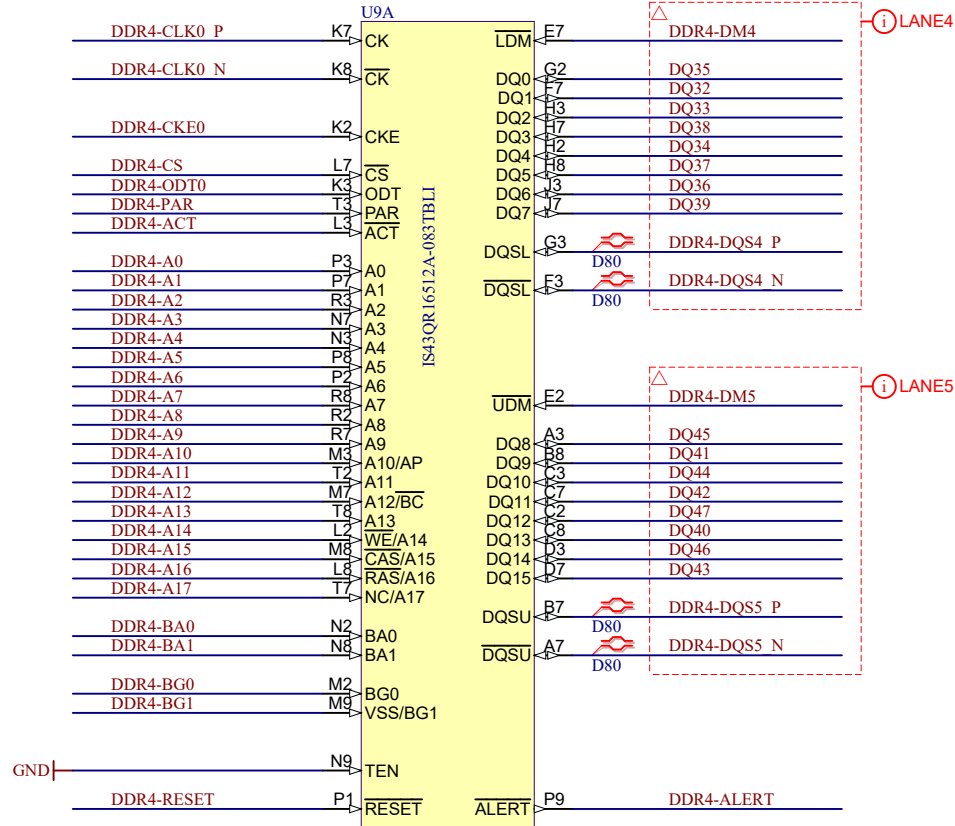
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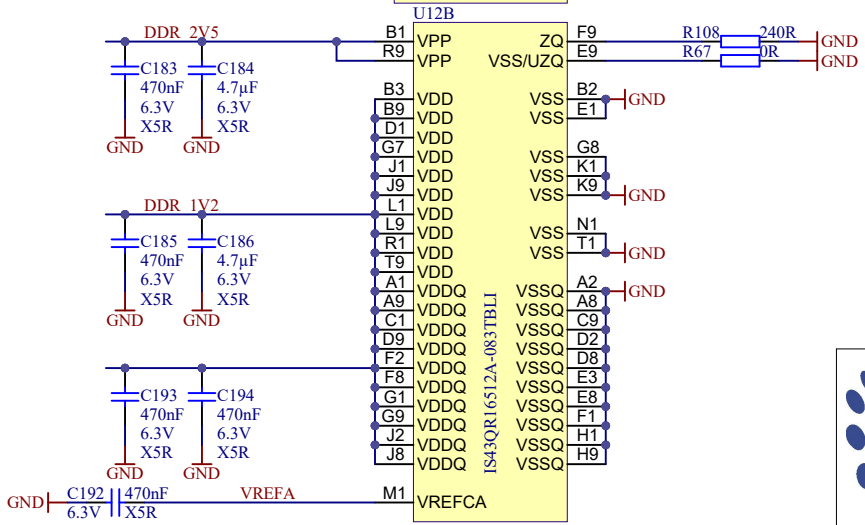
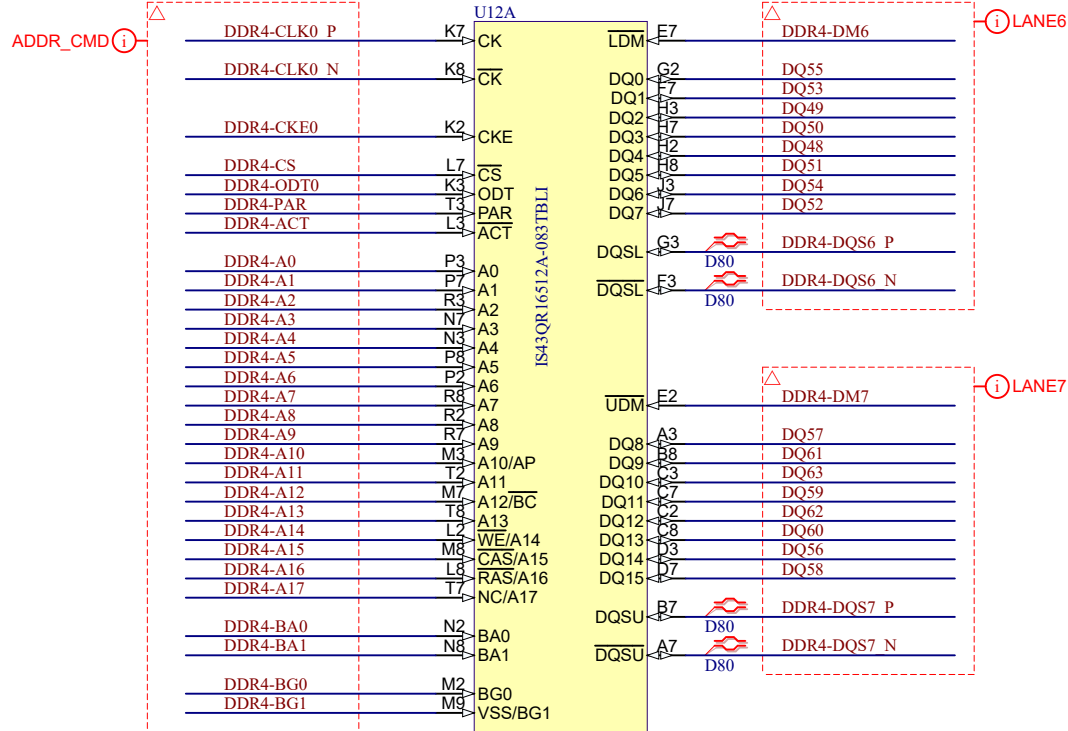
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A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 20 of 30
Filename: DDR4-RAM.SchDoc		



Title: TE0813 - DDR4_2_RAM		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 21 of 30
Filename: DDR4-RAM_2.SchDoc		

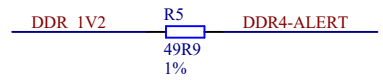
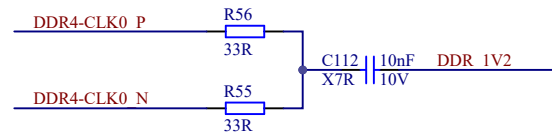
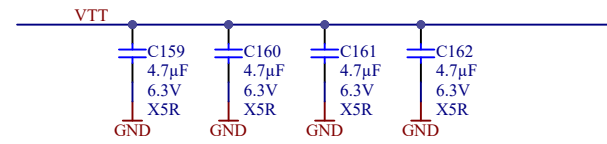
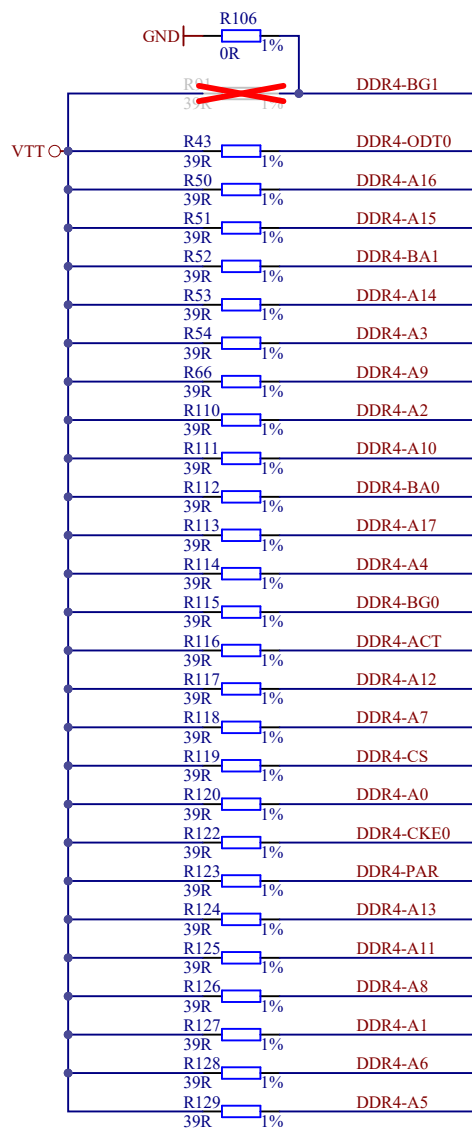


Title: TE0813 - DDR4_3_RAM		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 22 of 30
Filename: DDR4-RAM_3.SchDoc		



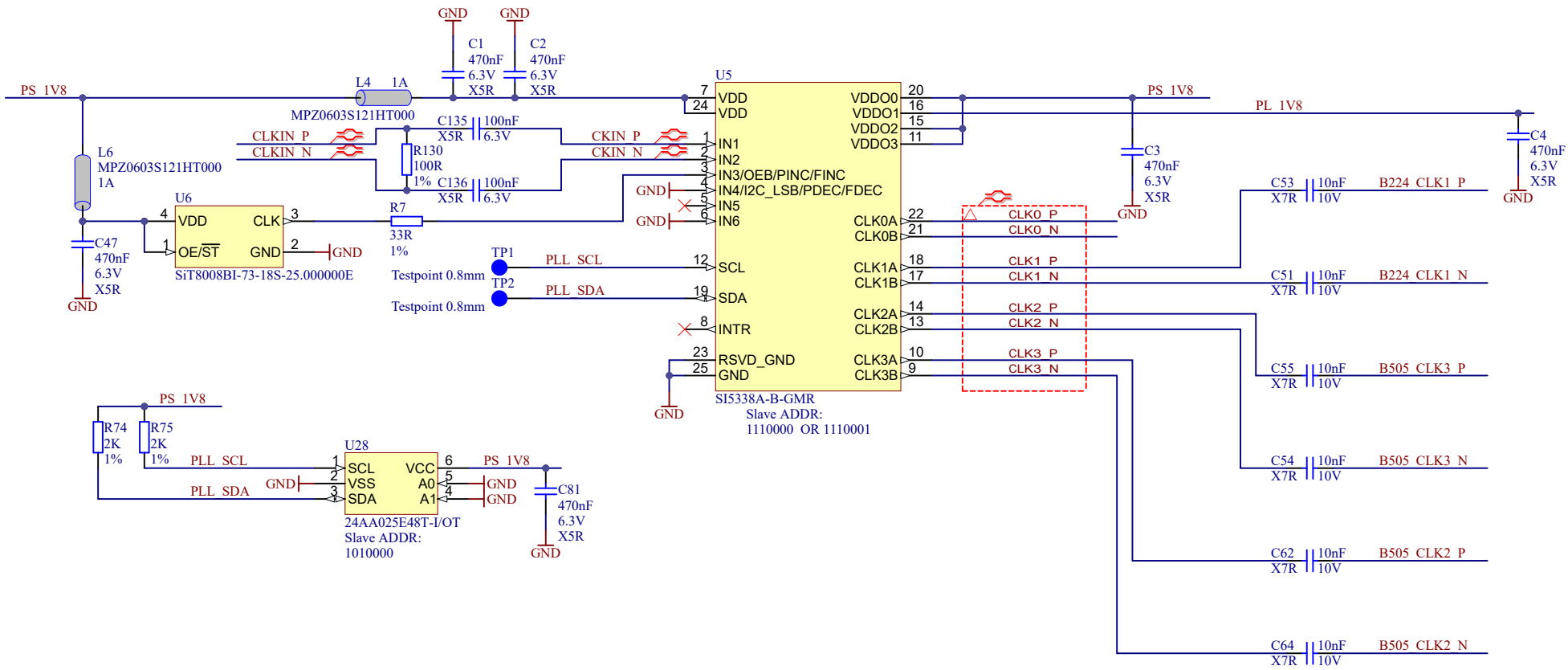
trenz electronic


Title: TE0813 - DDR4_4_RAM		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 23 of 30
Filename: DDR4-RAM_4.SchDoc		

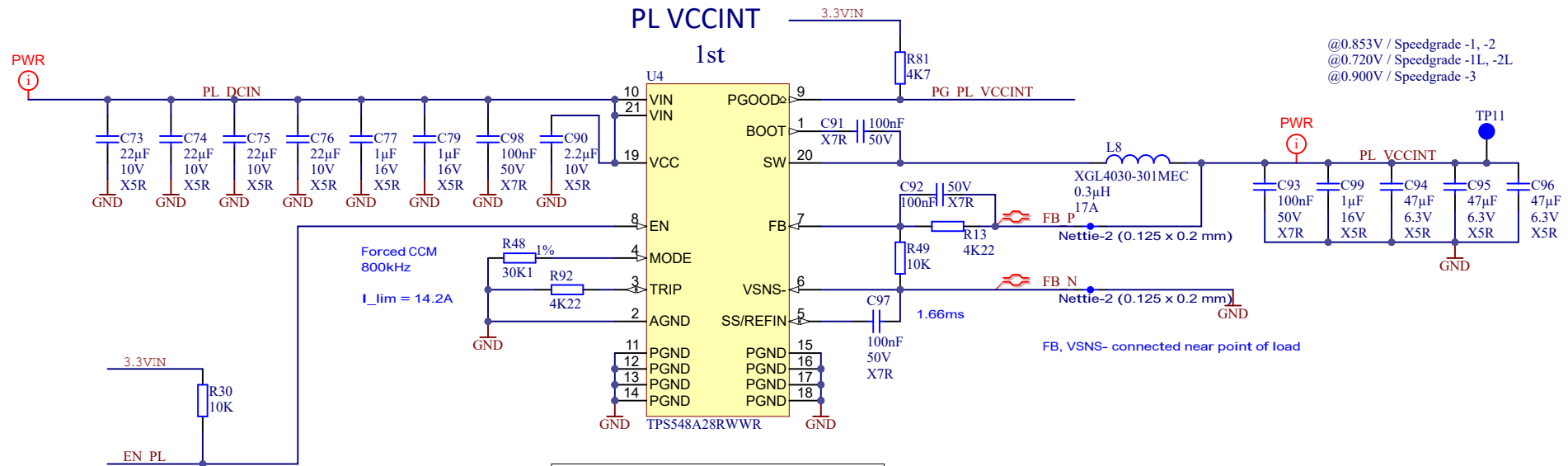


Title: TE0813 - DDR4_TERM		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 24 of 30
Filename: DDR4-TERM.SchDoc		





		Title: TE0813 - CLOCK	
		A4	Number: TE0813 4AE71-KS
Date: 2021-08-16		Copyright: Trenz Electronic GmbH / TT	
Filename: Clock.SchDoc		Page 25 of 30	



@0.853V / Speedgrade -1, -2  
 @0.720V / Speedgrade -1L, -2L  
 @0.900V / Speedgrade -3

Forced CCM  
 800kHz  
 I\_lim = 14.2A

FB, VSNS- connected near point of load

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 4AE71-KS
	Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT
	Filename: POWER.SchDoc	

Rev. 01

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1

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A

A

B

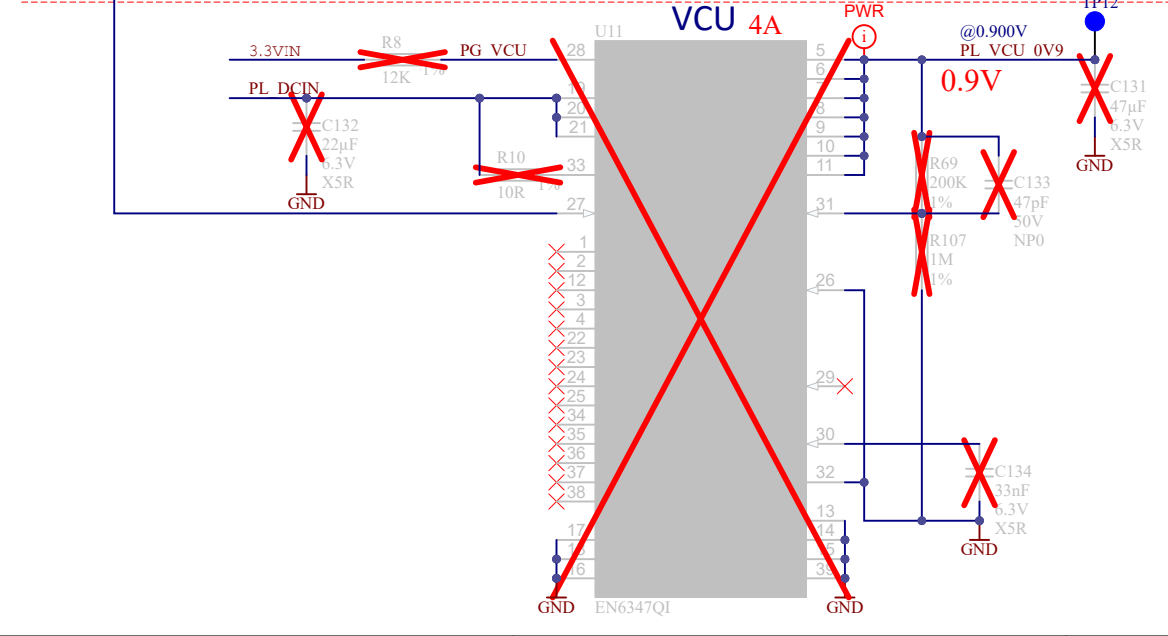
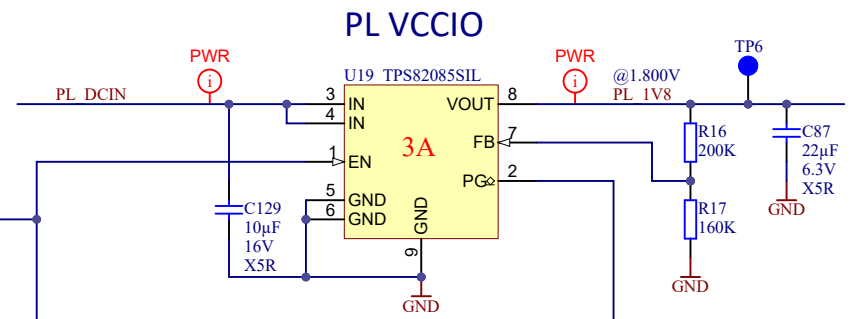
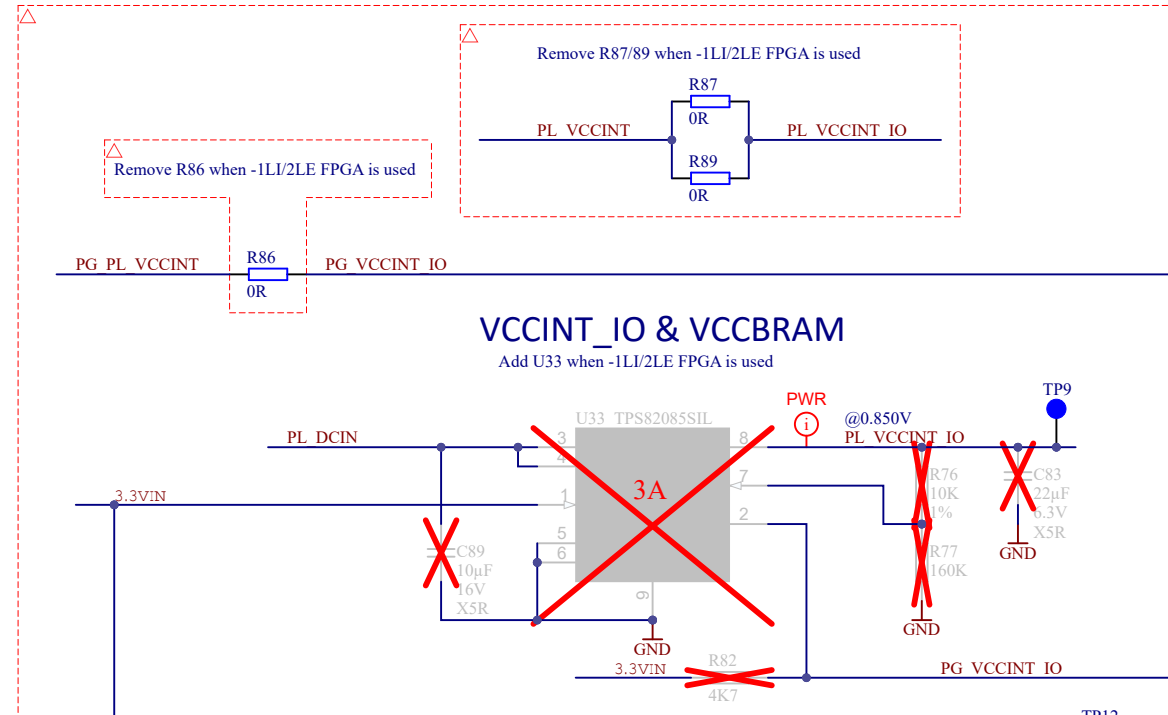
B

C

C

D

D



Title: TE0813 - POWER		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 27 of 30
Filename: POWER_1.SchDoc		

1

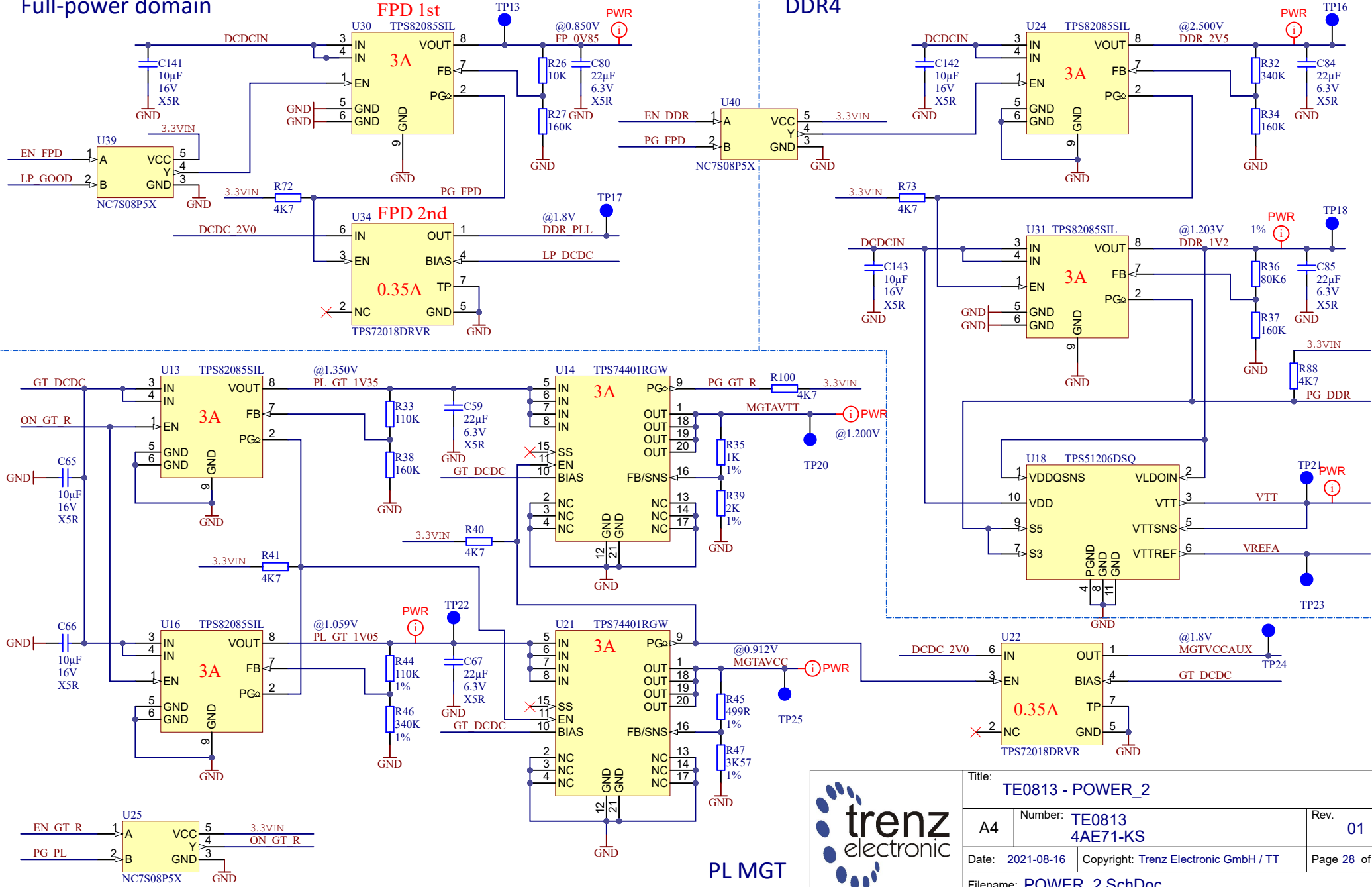
2

3

4

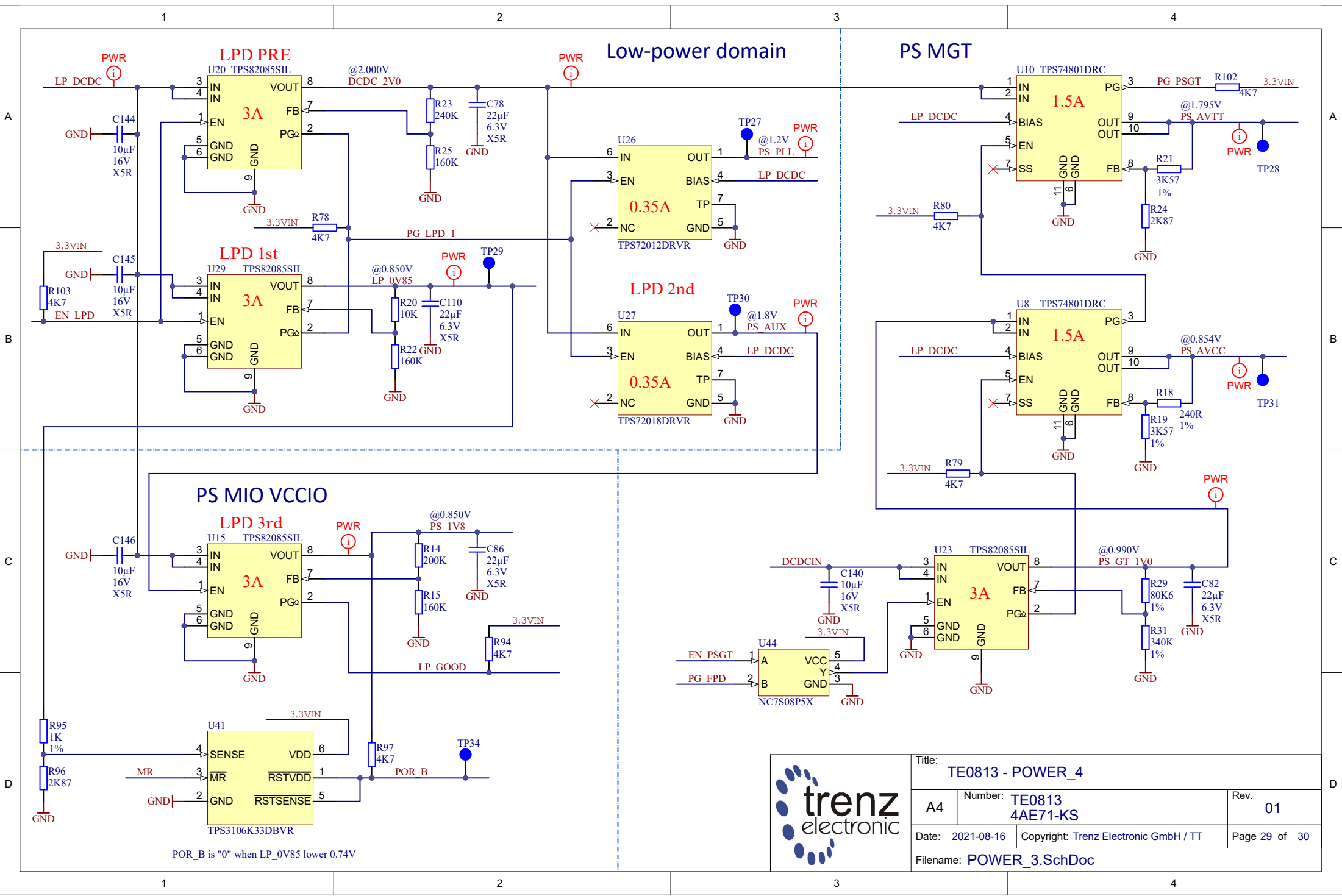
# Full-power domain

# DDR4



Title: <b>TE0813 - POWER_2</b>		
A4	Number: <b>TE0813 4AE71-KS</b>	Rev. <b>01</b>
Date: <b>2021-08-16</b>	Copyright: <b>Trenz Electronic GmbH / TT</b>	Page <b>28</b> of <b>30</b>
Filename: <b>POWER_2.SchDoc</b>		

PL MGT



POR\_B is "0" when LP\_0V85 lower 0.74V



Title: TE0813 - POWER_4		
A4	Number: TE0813 4AE71-KS	Rev. 01
Date: 2021-08-16	Copyright: Trenz Electronic GmbH / TT	Page 29 of 30
Filename: POWER_3.SchDoc		

1

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4

A

A

B

B


C

C

D

D

REV	DATE	Description	
-01	2021-05	Initial revision	VT

	Title: <b>TE0813 - Revision History</b>		
	A4	Number: <b>TE0813 4AE71-KS</b>	Rev. <b>01</b>
	Date: <b>2021-07-26</b>	Copyright: <b>Trenz Electronic GmbH</b>	Page <b>30</b> of <b>30</b>
	Filename: <b>Revision Changes.SchDoc</b>		

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