
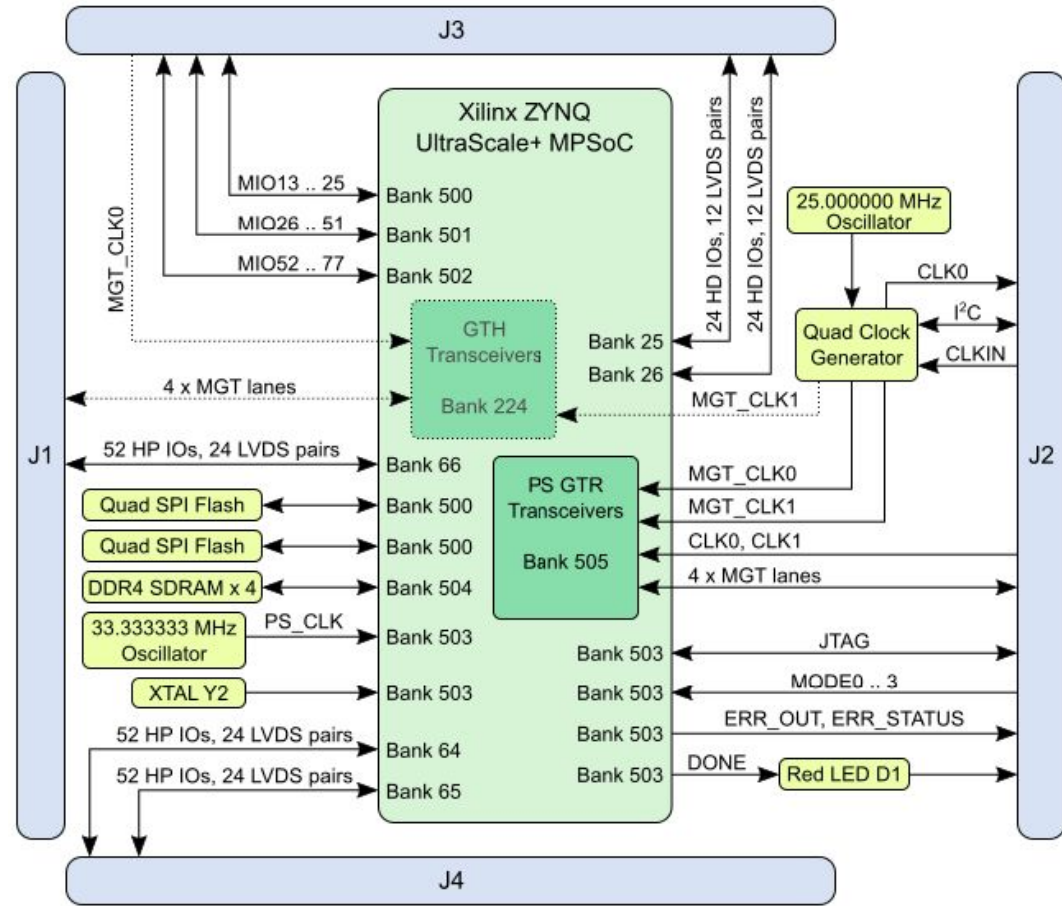



Regarding the usage of our schematics and alike documentation for Trenz module TE0803.

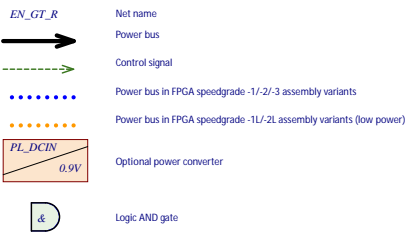
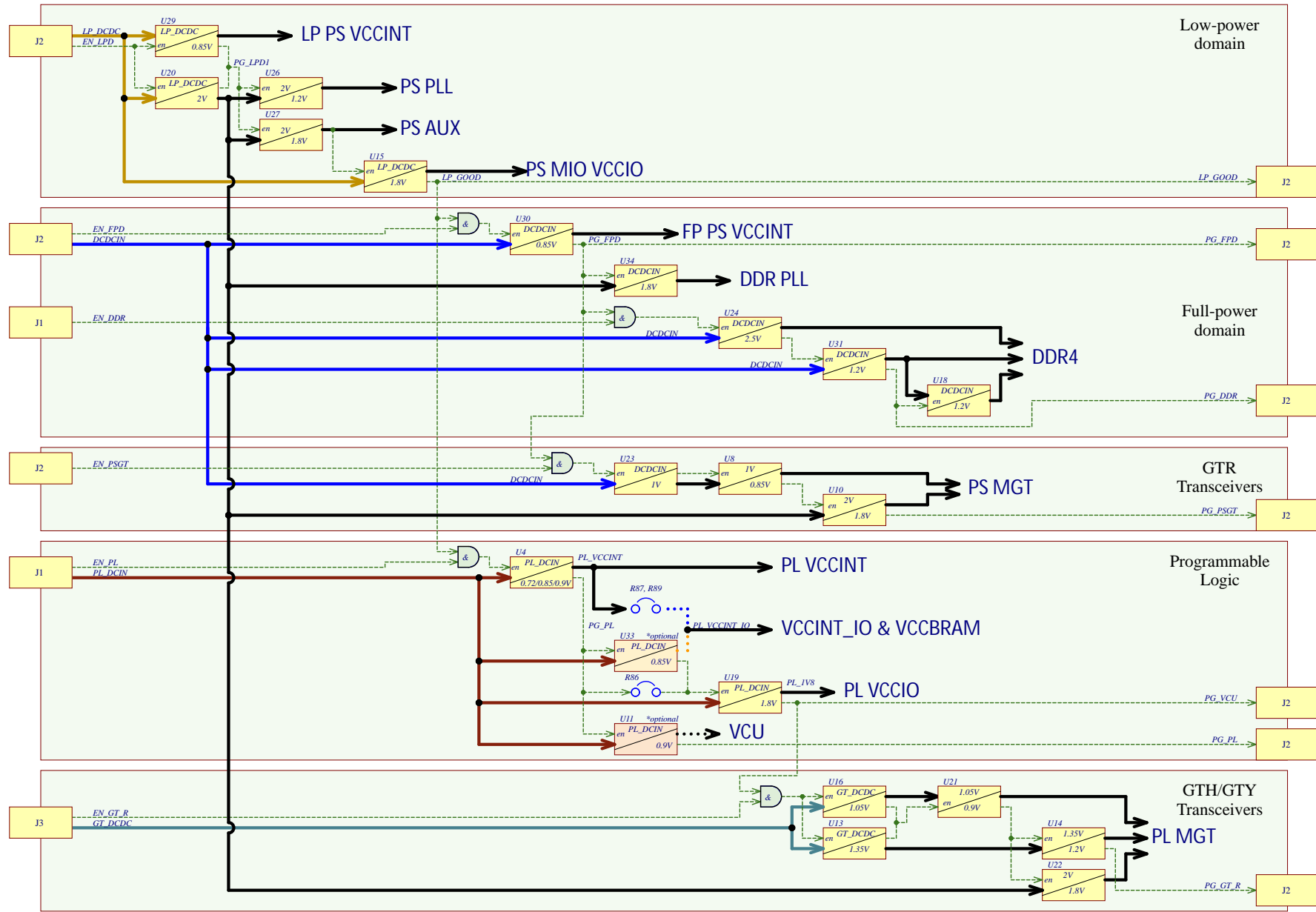
Project is protected under copyright and we strongly and strictly prohibit the reverse engineering or recreation, even if the design is just adapted or modified. TE0803 is protected under such right and in case of plagiarism we will have to do anything necessary in order to protect our assets.

Schematics and other handouts serve for informational purposes only!

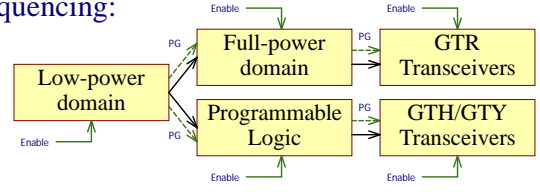
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	A4	Number: TE0803 3AE11-AZ	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 1 of 30
	Filename: Legal Notices Modules.SchDoc		



		Title: TE0803 - System Overview	
		A4	Number: TE0803 3AE11-AZ
Date: 2021-01-19		Copyright: 2015 Trenz Electronic GmbH	
Filename: TE0803-Overview.SchDoc		Page 2 of 30	



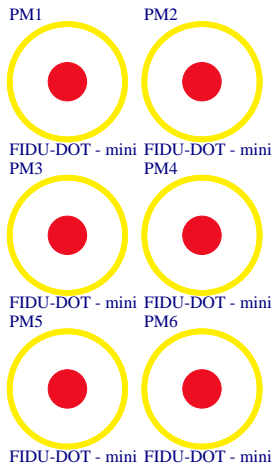
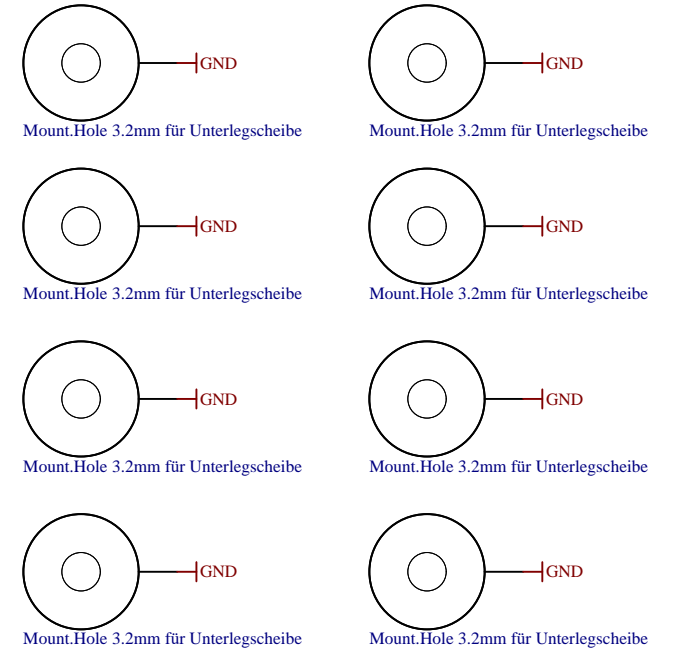
Power-on sequencing:



Title: TE0803 - Power Diagram		
A3	Number: TE0803 3AE11-AZ	Rev. 04
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_4.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 TE0803-Overview.SchDoc
U_PD Power_Diagram.SchDoc	U_DDR4-RAM_4 DDR4-RAM_4.SchDoc	

Special notes:




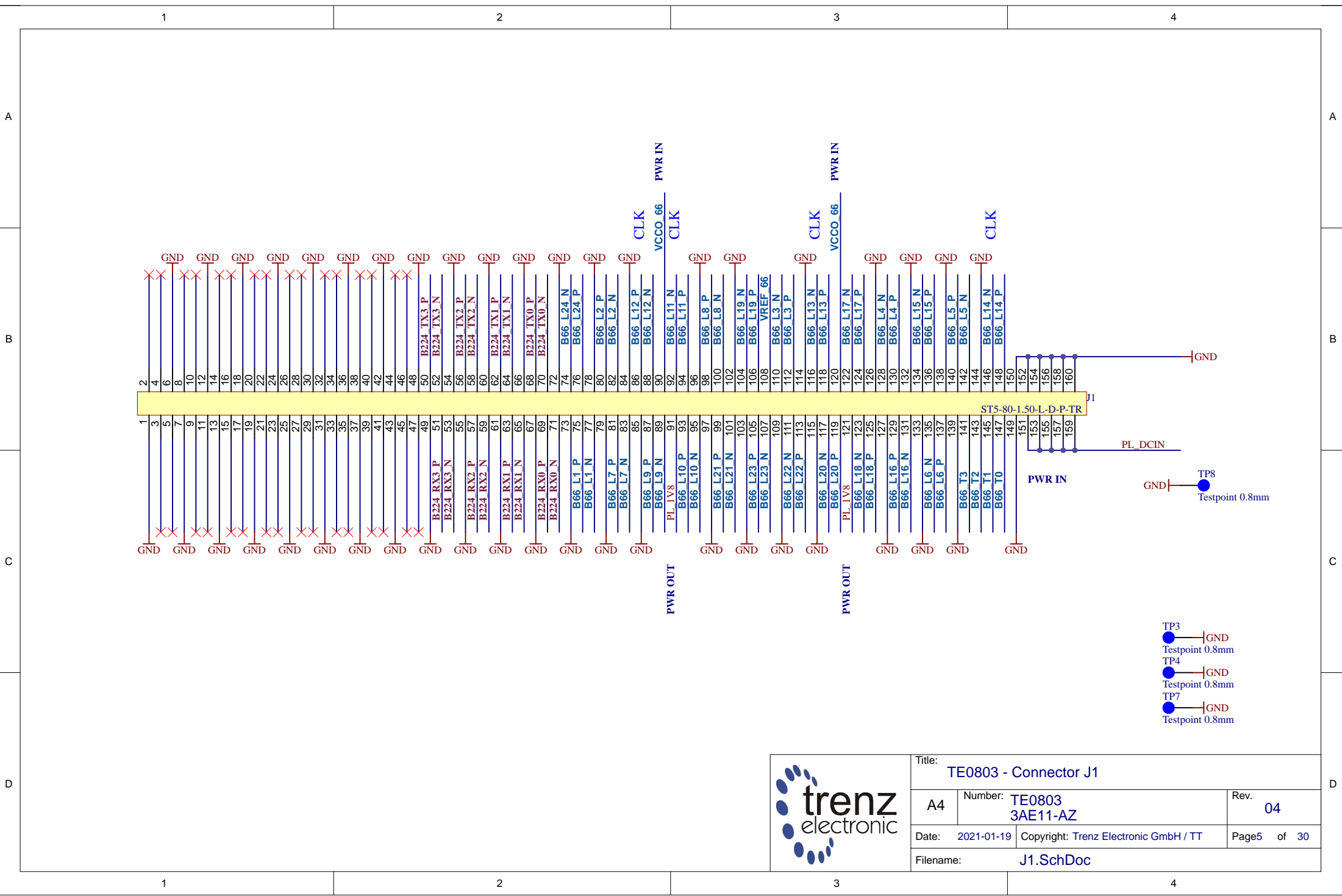
MECH1
TE Address Overlay
LOGO ADDRESS

LOGO1
TE Logo PRINT Layer
LOGO PRINT

Serial
Serial
Serialnumber 6,3 x 6.3mm

Assembly variant	3AE11-AZ
Created by	VT
Modified by	VT
Modified at	2022-12-14
SVN Revision	11196

			Title: TE0803	
			A4	Number: TE0803 3AE11-AZ
Date: 2021-01-19		Copyright: Trenz Electronic GmbH / TT		Page 4 of 30
Filename: TE0803.SchDoc				



TP8
Testpoint 0.8mm

TP3
Testpoint 0.8mm
TP4
Testpoint 0.8mm
TP7
Testpoint 0.8mm



Title: TE0803 - Connector J1		
A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page5 of 30
Filename: J1.SchDoc		

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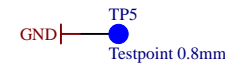
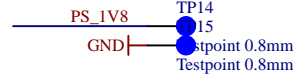
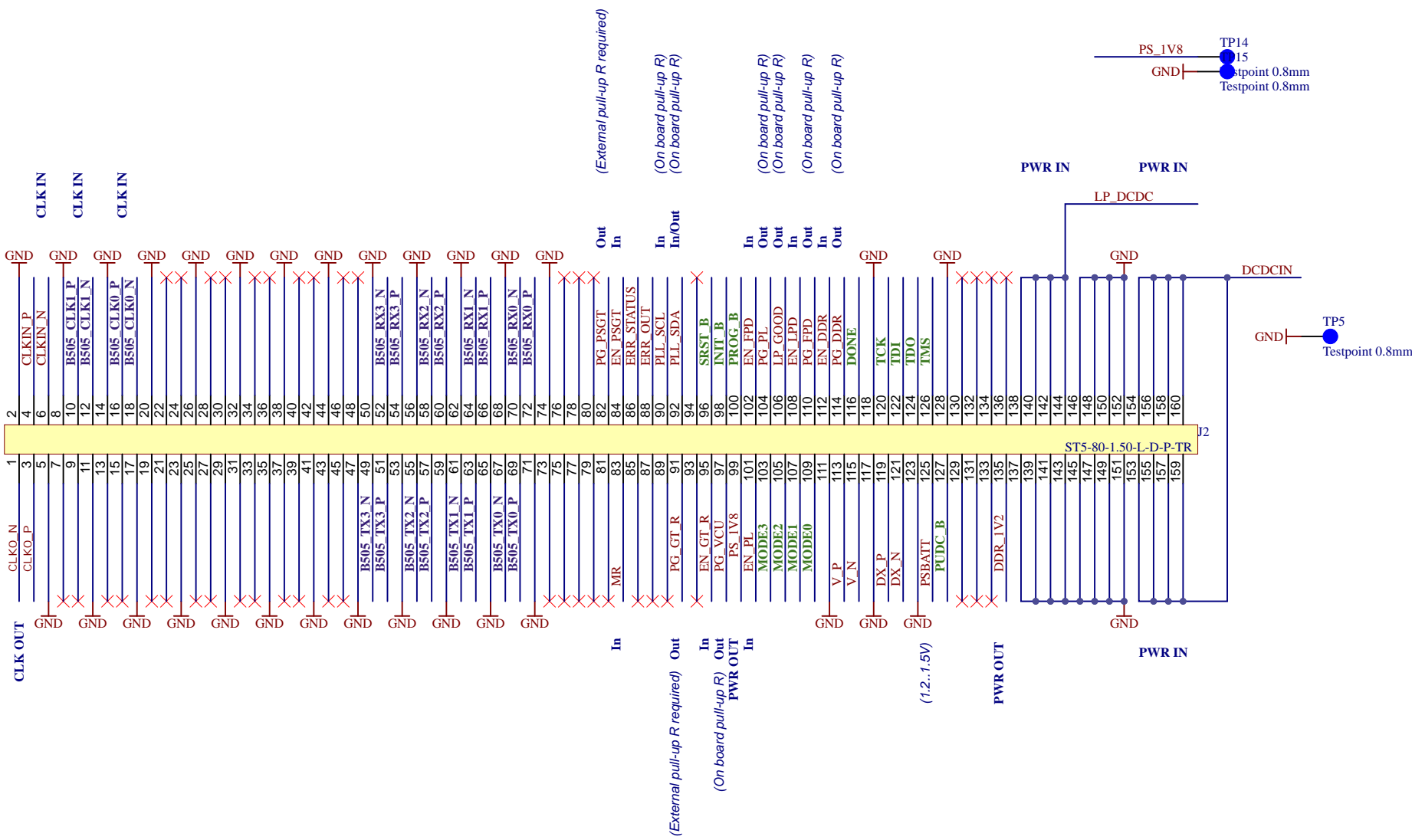
B


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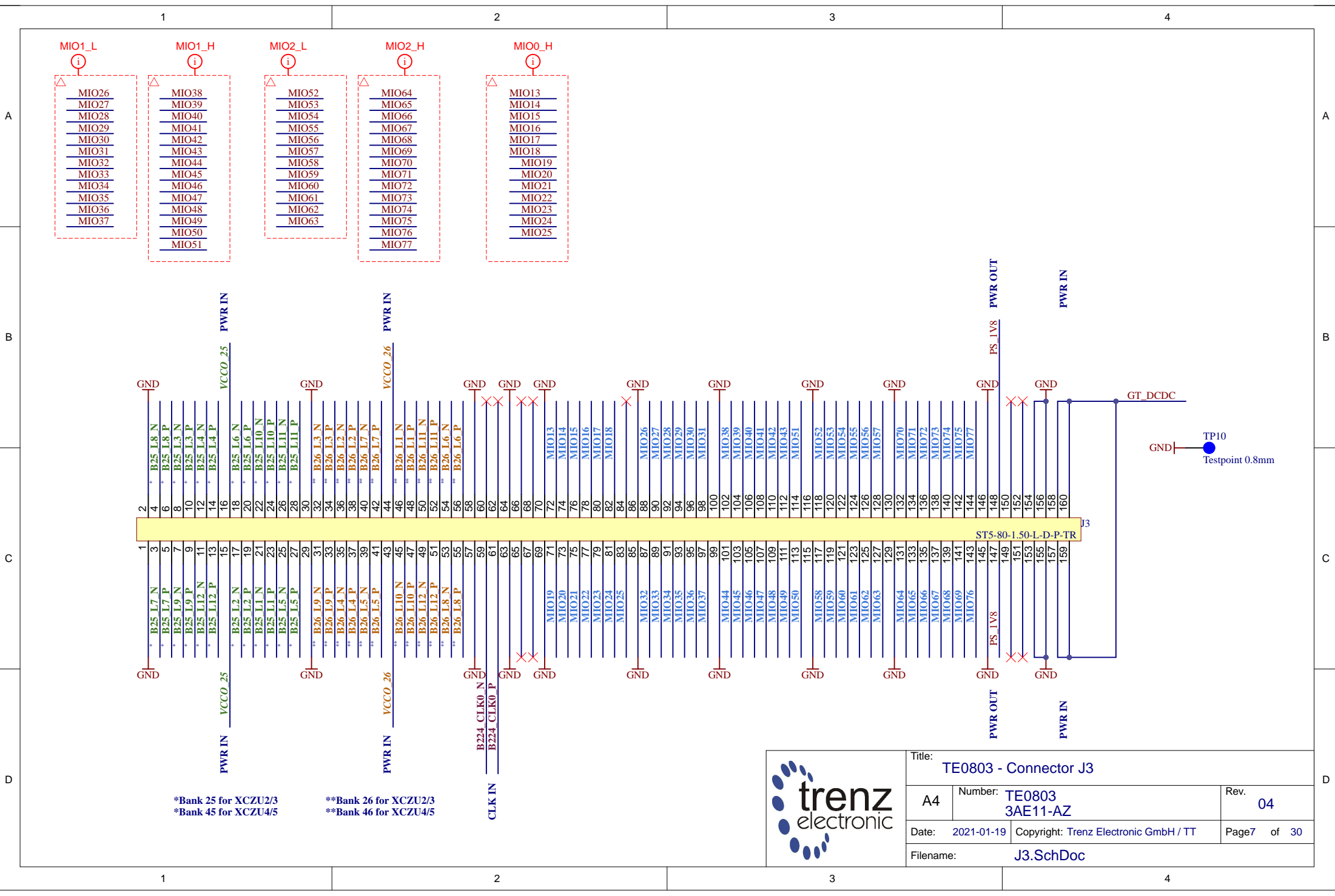
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			A4	Number: TE0803 3AE11-AZ
Date: 2021-01-19		Copyright: Trenz Electronic GmbH / TT		Page 6 of 30
Filename: J2.SchDoc				

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*Bank 25 for XCZU2/3
*Bank 45 for XCZU4/5

**Bank 26 for XCZU2/3
**Bank 46 for XCZU4/5



Title: TE0803 - Connector J3		
A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 7 of 30
Filename: J3.SchDoc		

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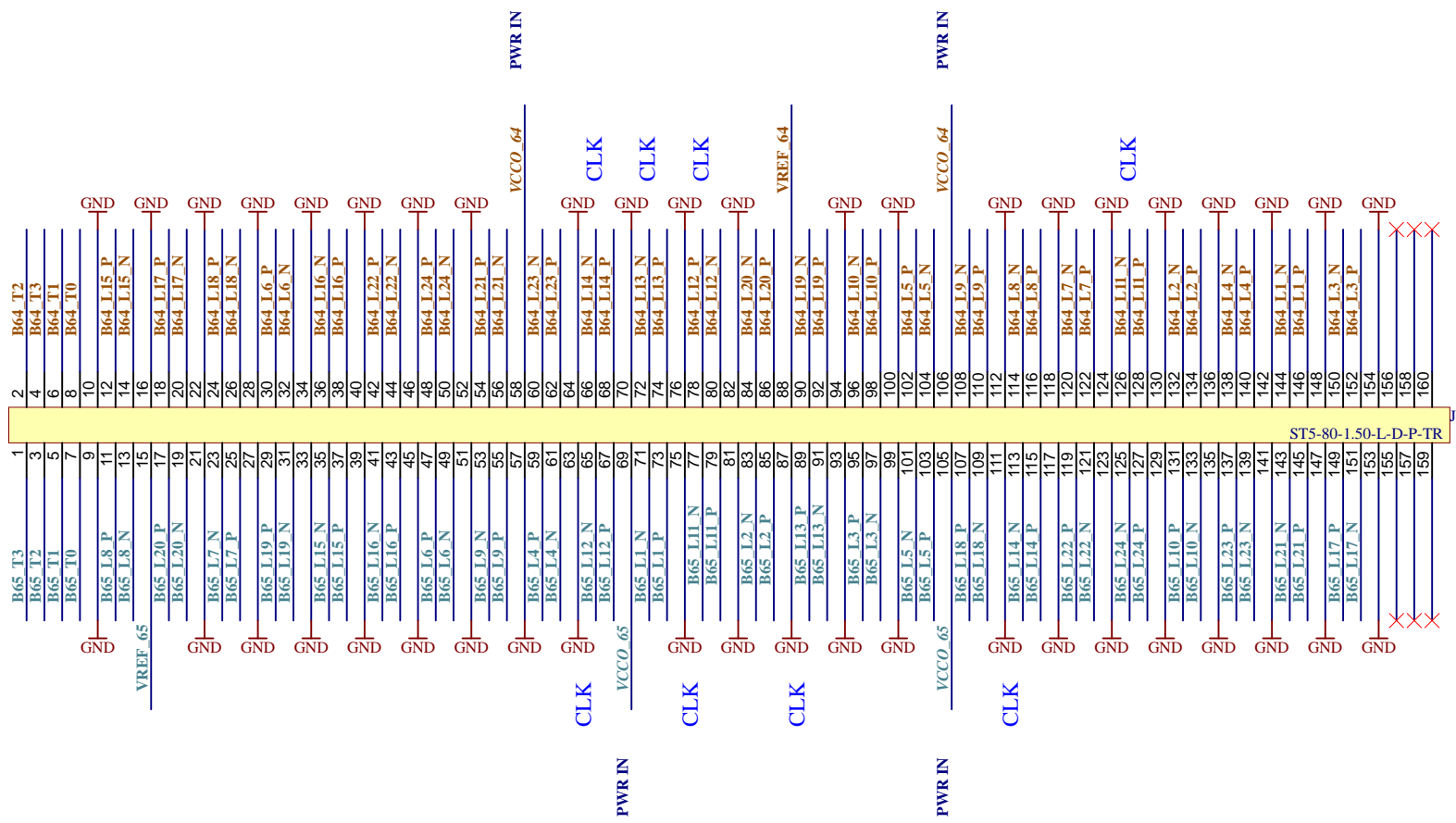
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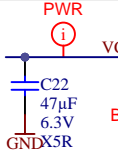
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A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page8 of 30
Filename: J4.SchDoc		

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U1C XCZU3CG-1SFVC784E
BANK 26 HD (ZU4/5 BANK 46 HD)

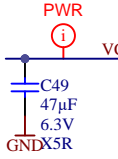
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B26 L1 N	A15	IO_L1N_AD11N_26	IO_L7N_HDGC_AD5N_26	F13	B26 L7 N
B26 L2 P	B14	IO_L2P_AD10P_26	IO_L8P_HDGC_AD4P_26	F15	B26 L8 P
B26 L2 N	A14	IO_L2N_AD10N_26	IO_L8N_HDGC_AD4N_26	F15	B26 L8 N
B26 L3 P	B13	IO_L3P_AD9P_26	IO_L9P_AD3P_26	G15	B26 L9 P
B26 L3 N	A13	IO_L3N_AD9N_26	IO_L9N_AD3N_26	G14	B26 L9 N
B26 L4 P	C13	IO_L4P_AD8P_26	IO_L10P_AD2P_26	H14	B26 L10 P
B26 L4 N	C13	IO_L4N_AD8N_26	IO_L10N_AD2N_26	H13	B26 L10 N
B26 L5 P	D13	IO_L5P_HDGC_AD7P_26	IO_L11P_AD1P_26	K14	B26 L11 P
B26 L5 N	D13	IO_L5N_HDGC_AD7N_26	IO_L11N_AD1N_26	L14	B26 L11 N
B26 L6 P	E13	IO_L6P_HDGC_AD6P_26	IO_L12P_AD0P_26	L14	B26 L12 P
B26 L6 N	E13	IO_L6N_HDGC_AD6N_26	IO_L12N_AD0N_26	L13	B26 L12 N

BANK 44 HD (ZU4/5 BANK 43 HD)

AC10	VCCO_44				
AG12	VCCO_44				
AG10	IO_L1P_AD11P_44	IO_L7P_HDGC_AD5P_44	AD11		
AH10	IO_L1N_AD11N_44	IO_L7N_HDGC_AD5N_44	AD10		
AF11	IO_L2P_AD10P_44	IO_L8P_HDGC_AD4P_44	AB11		
AG11	IO_L2N_AD10N_44	IO_L8N_HDGC_AD4N_44	AC11		
AH11	IO_L3P_AD9P_44	IO_L9P_AD3P_44	AA11		
AH10	IO_L3N_AD9N_44	IO_L9N_AD3N_44	AA10		
AE10	IO_L4P_AD8P_44	IO_L10P_AD2P_44	W10		
AF10	IO_L4N_AD8N_44	IO_L10N_AD2N_44	Y10		
AE11	IO_L5P_HDGC_AD7P_44	IO_L11P_AD1P_44	Y9		
AF11	IO_L5N_HDGC_AD7N_44	IO_L11N_AD1N_44	AA8		
AC11	IO_L6P_HDGC_AD6P_44	IO_L12P_AD0P_44	AB10		
AD11	IO_L6N_HDGC_AD6N_44	IO_L12N_AD0N_44	AB9		

U1B XCZU3CG-1SFVC784E
BANK 24 HD (ZU4/5 BANK 44 HD)

AA14	VCCO_24				
AD13	VCCO_24				
AE15	IO_L1P_AD15P_24	IO_L7P_HDGC_24	AA13		
AE14	IO_L1N_AD15N_24	IO_L7N_HDGC_24	AB13		
AG14	IO_L2P_AD14P_24	IO_L8P_HDGC_24	AB15		
AH14	IO_L2N_AD14N_24	IO_L8N_HDGC_24	AB14		
AG13	IO_L3P_AD13P_24	IO_L9P_AD1P_24	W14		
AH13	IO_L3N_AD13N_24	IO_L9N_AD1N_24	W13		
AE13	IO_L4P_AD12P_24	IO_L10P_AD10P_24	Y14		
AF13	IO_L4N_AD12N_24	IO_L10N_AD10N_24	Y13		
AD13	IO_L5P_HDGC_24	IO_L11P_AD9P_24	W12		
AD14	IO_L5N_HDGC_24	IO_L11N_AD9N_24	W11		
AC14	IO_L6P_HDGC_24	IO_L12P_AD8P_24	Y12		
AC13	IO_L6N_HDGC_24	IO_L12N_AD8N_24	AA12		



BANK 25 HD (ZU4/5 BANK 45 HD)

B25 L1 P	J11	IO_L1P_AD15P_25	IO_L7P_HDGC_25	F10	B25 L7 P
B25 L1 N	J10	IO_L1N_AD15N_25	IO_L7N_HDGC_25	D10	B25 L7 N
B25 L2 P	K11	IO_L2P_AD14P_25	IO_L8P_HDGC_25	F12	B25 L8 P
B25 L2 N	K10	IO_L2N_AD14N_25	IO_L8N_HDGC_25	D11	B25 L8 N
B25 L3 P	H11	IO_L3P_AD13P_25	IO_L9P_AD1P_25	F11	B25 L9 P
B25 L3 N	G10	IO_L3N_AD13N_25	IO_L9N_AD1N_25	D10	B25 L9 N
B25 L4 P	J11	IO_L4P_AD12P_25	IO_L10P_AD10P_25	F11	B25 L10 P
B25 L4 N	H10	IO_L4N_AD12N_25	IO_L10N_AD10N_25	A10	B25 L10 N
B25 L5 P	G11	IO_L5P_HDGC_25	IO_L11P_AD9P_25	A12	B25 L11 P
B25 L5 N	F10	IO_L5N_HDGC_25	IO_L11N_AD9N_25	A11	B25 L11 N
B25 L6 P	F11	IO_L6P_HDGC_25	IO_L12P_AD8P_25	D12	B25 L12 P
B25 L6 N	F10	IO_L6N_HDGC_25	IO_L12N_AD8N_25	C12	B25 L12 N



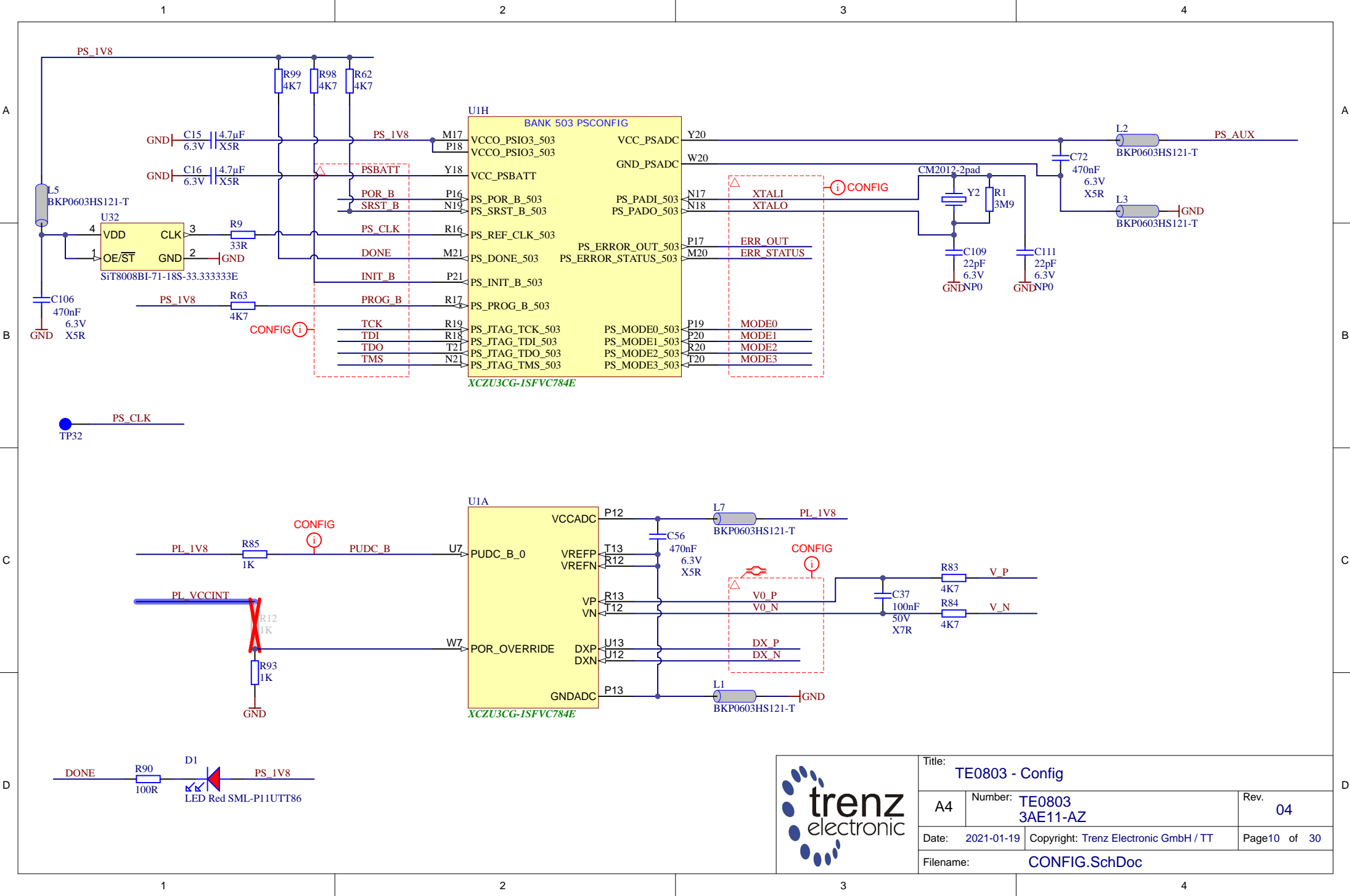
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page9 of 30
Filename: B_HD.SchDoc		

1

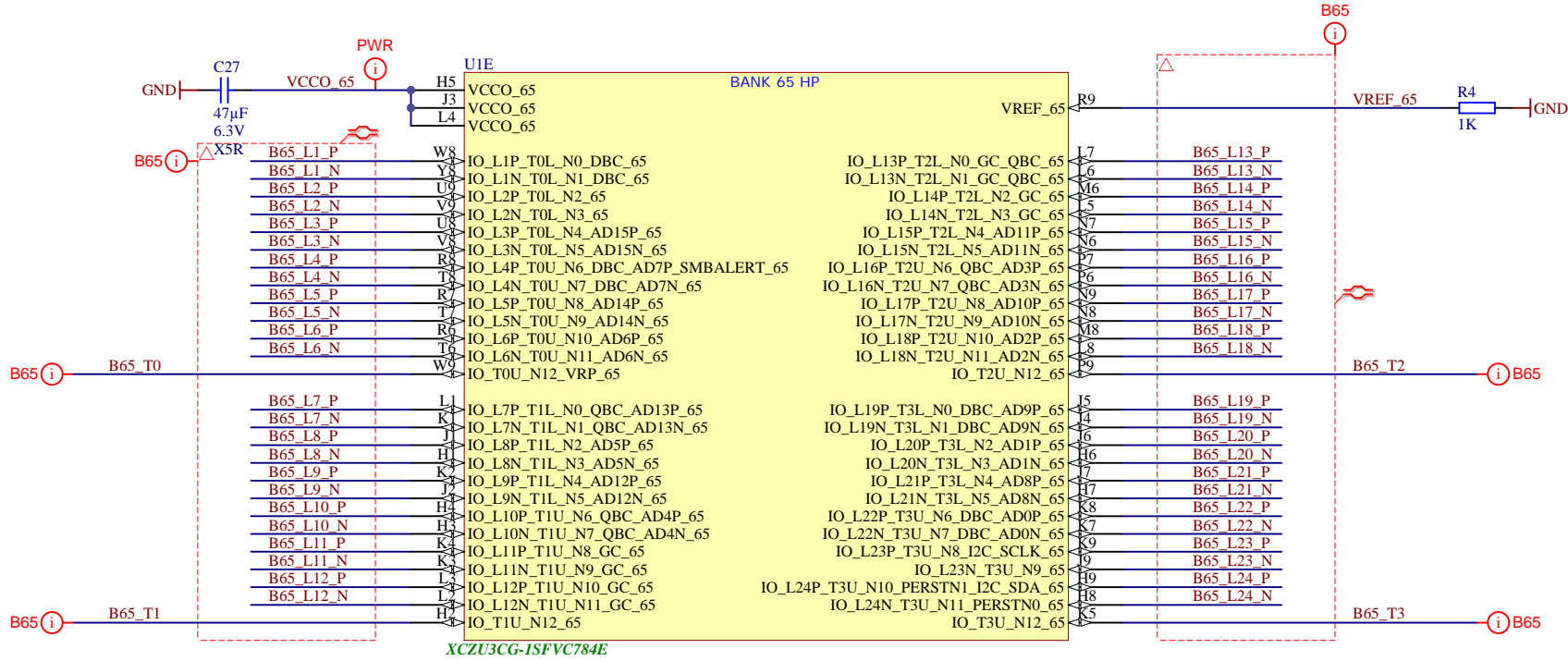
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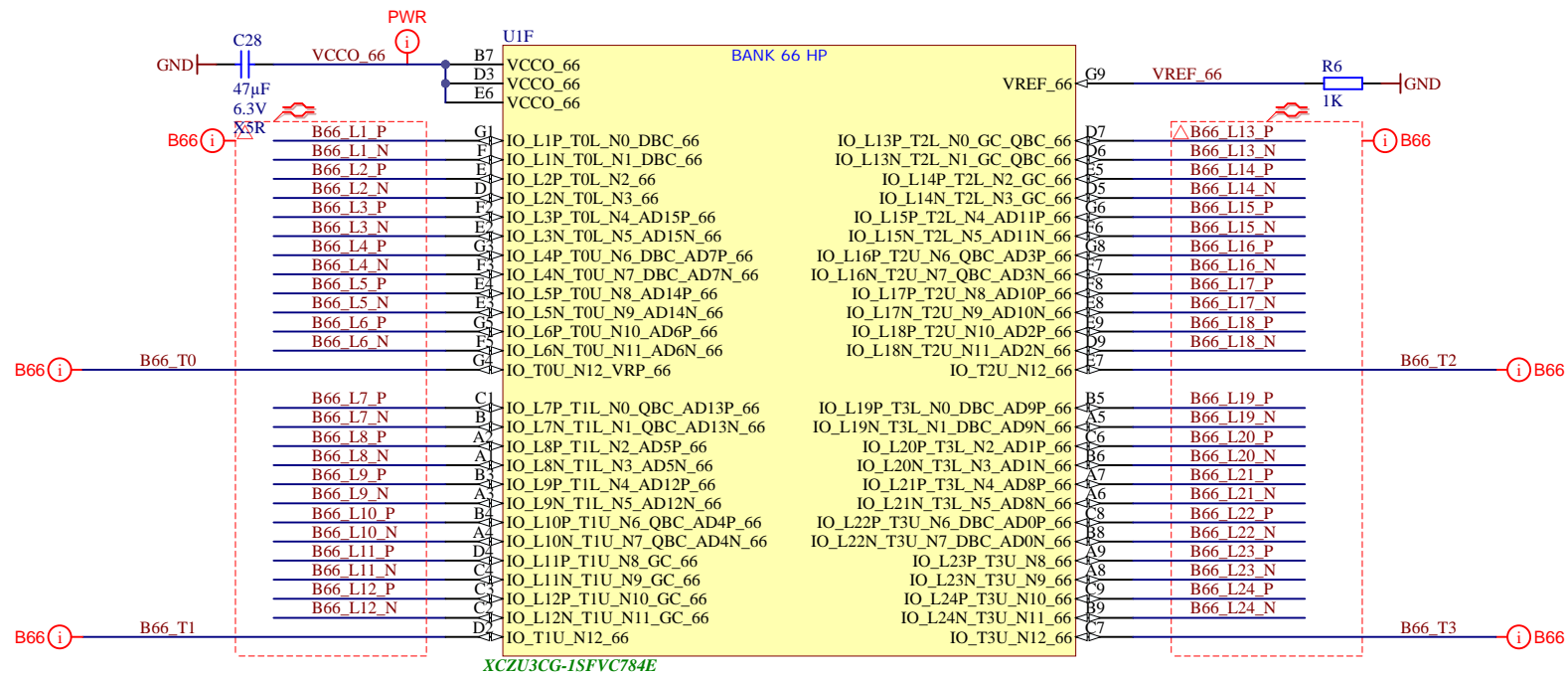
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 10 of 30
Filename: CONFIG.SchDoc		



Title: TE0803 - B65		
A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 12 of 30
Filename: B65.SchDoc		



	Title: TE0803 - B66		
	A4	Number: TE0803 3AE11-AZ	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 13 of 30
	Filename: B66.SchDoc		

A

A

B

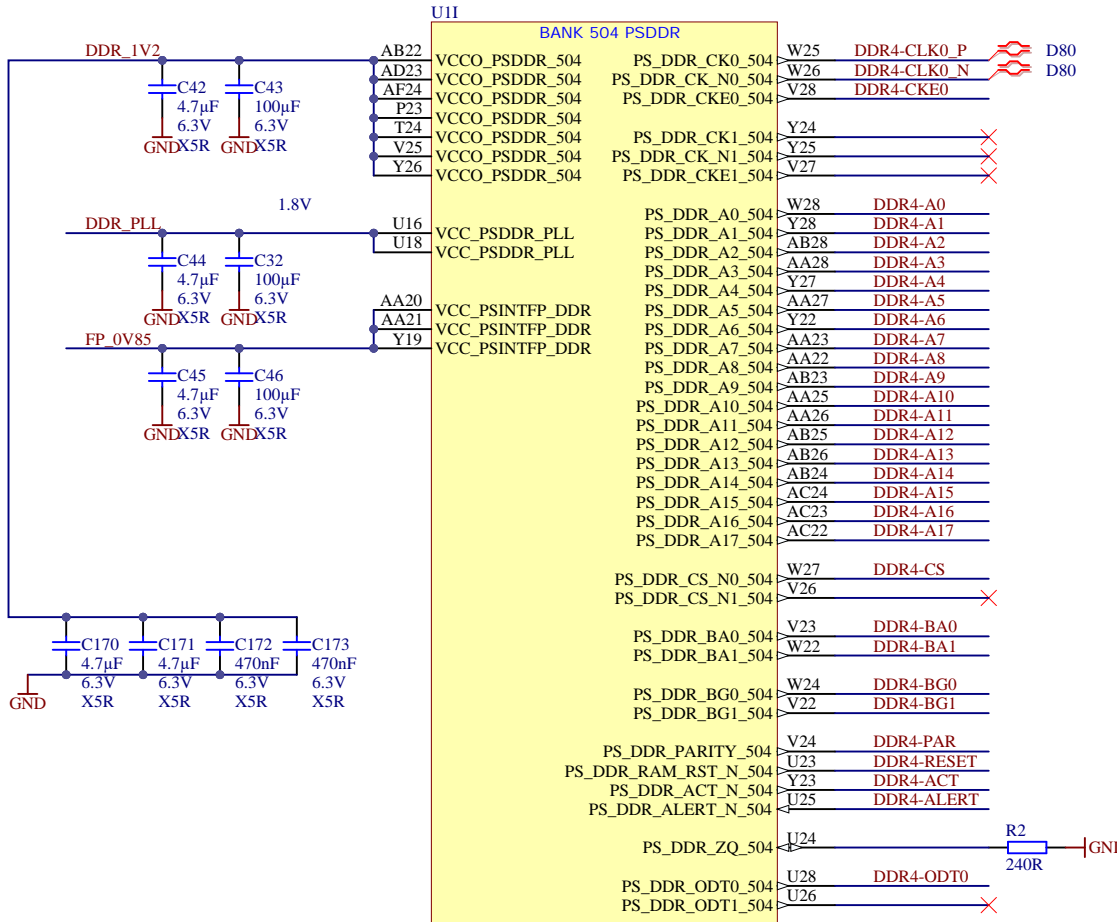
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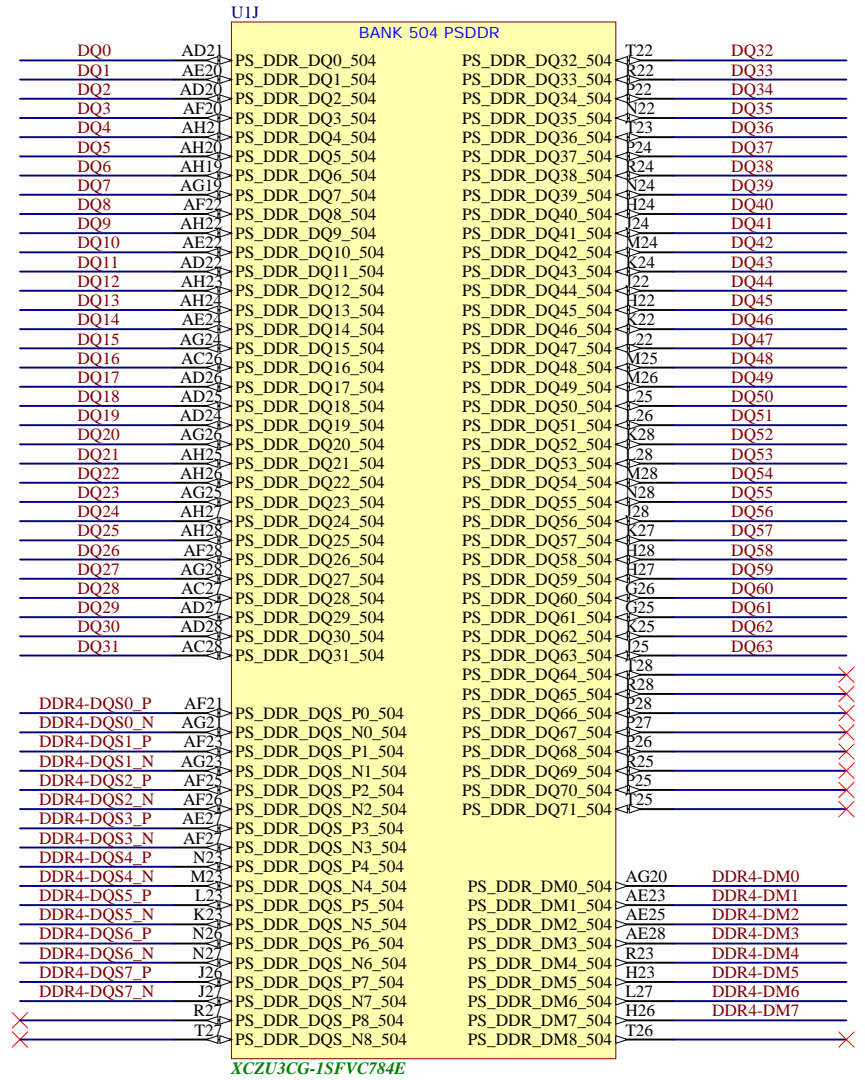
C

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XCZU3CG-1SFVC784E



XCZU3CG-1SFVC784E



Title: TE0803 - PS_DDR		
A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 15 of 30
Filename: PS_DDR.SchDoc		

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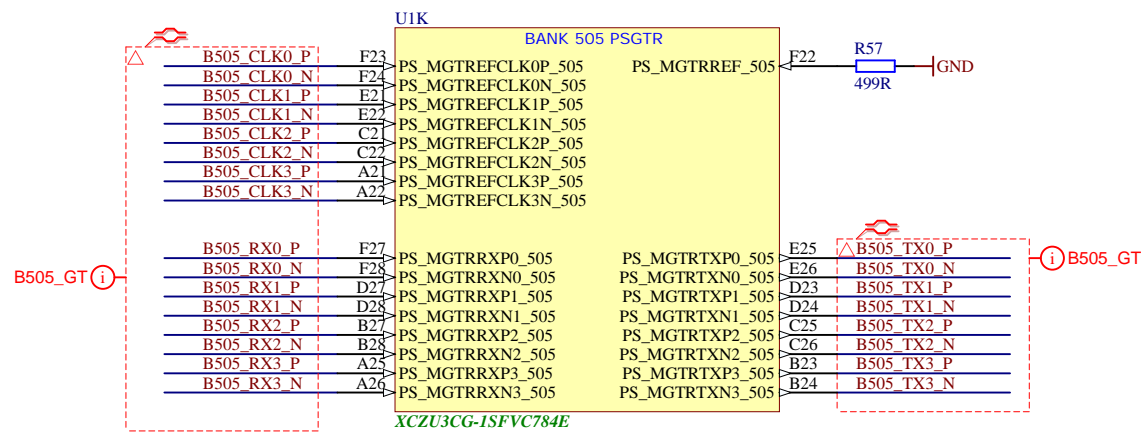
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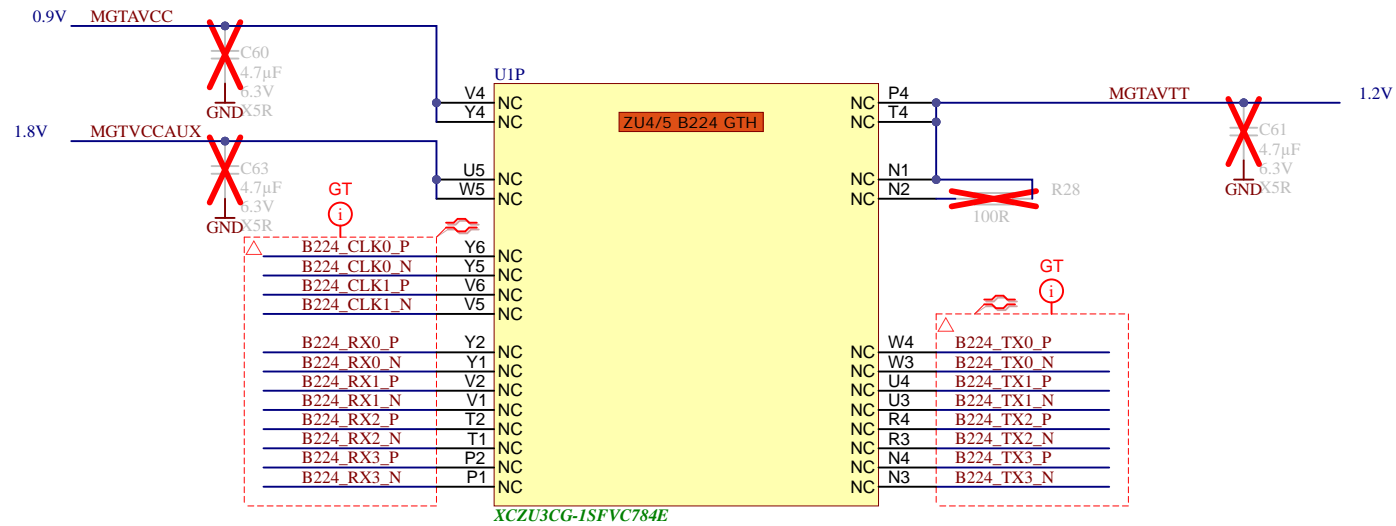
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 16 of 30
Filename: B_PS_GT.SchDoc		


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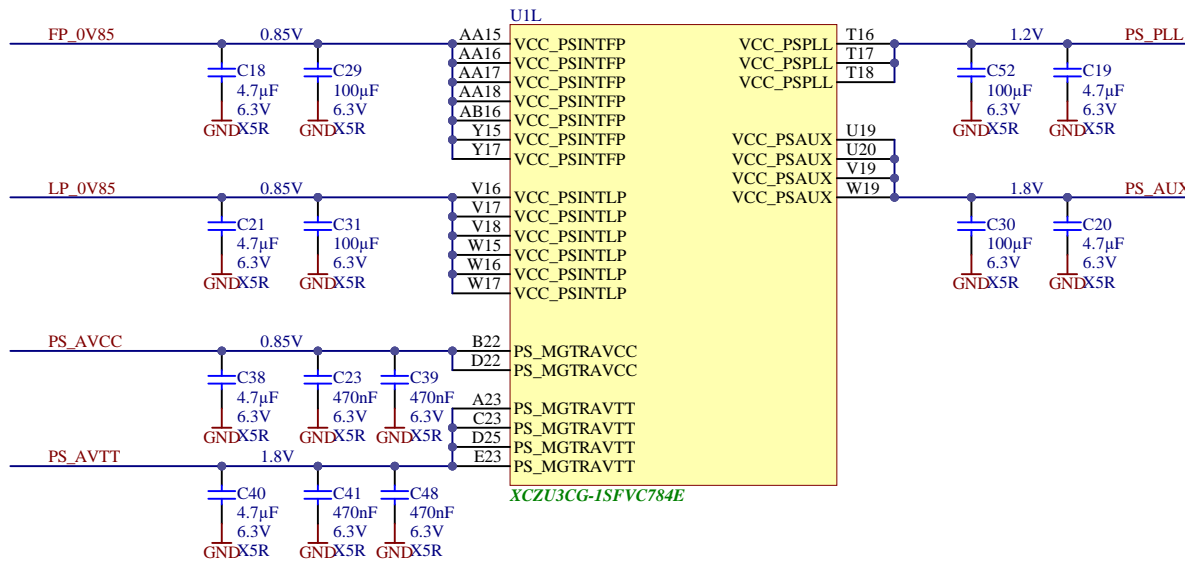
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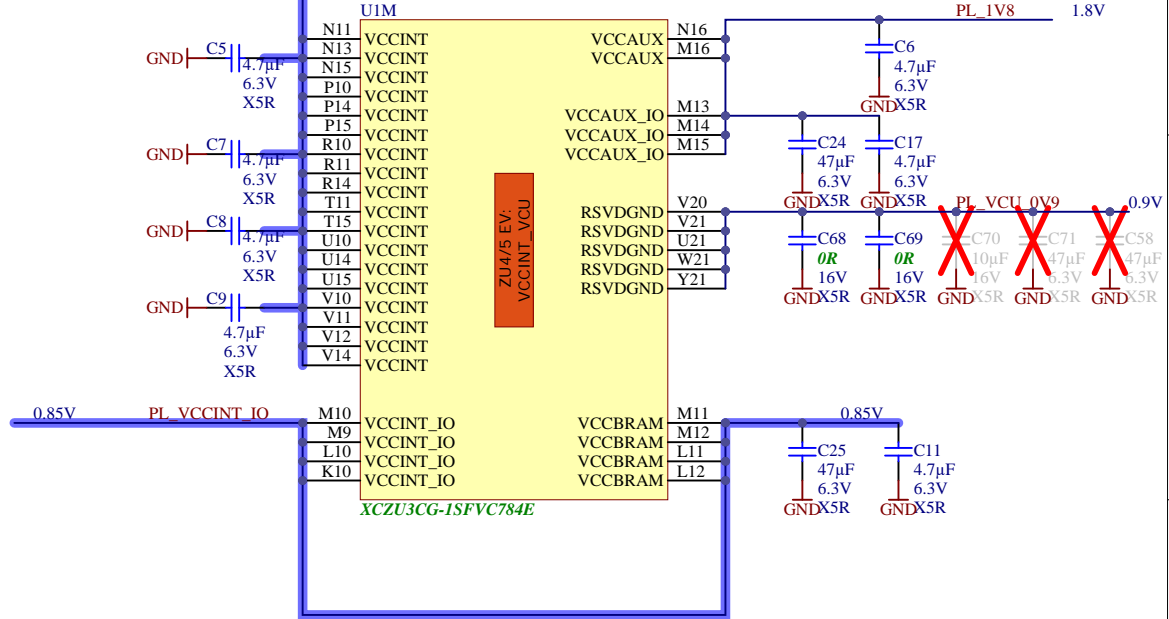
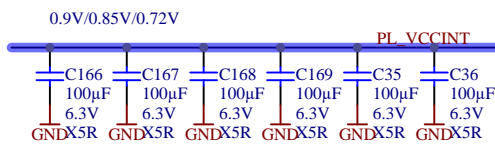
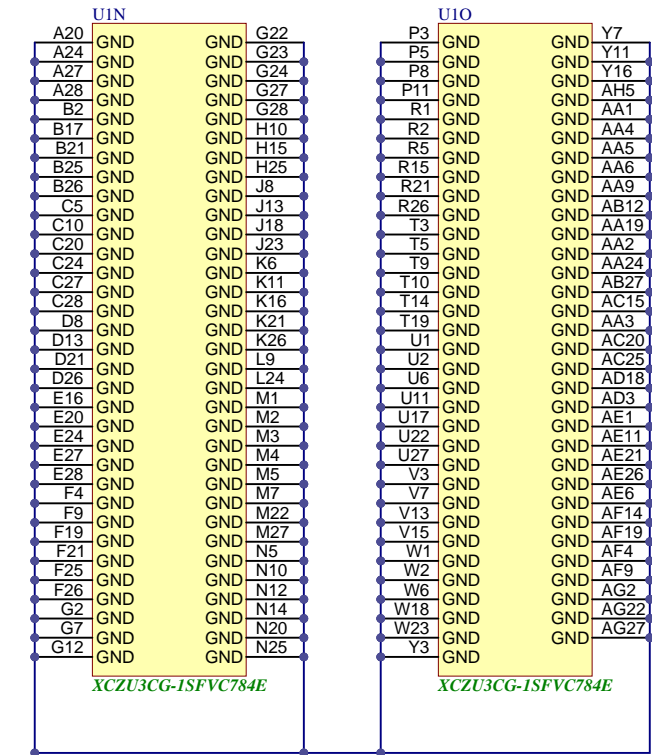
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	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 17 of 30
	Filename: B_GT.SchDoc		

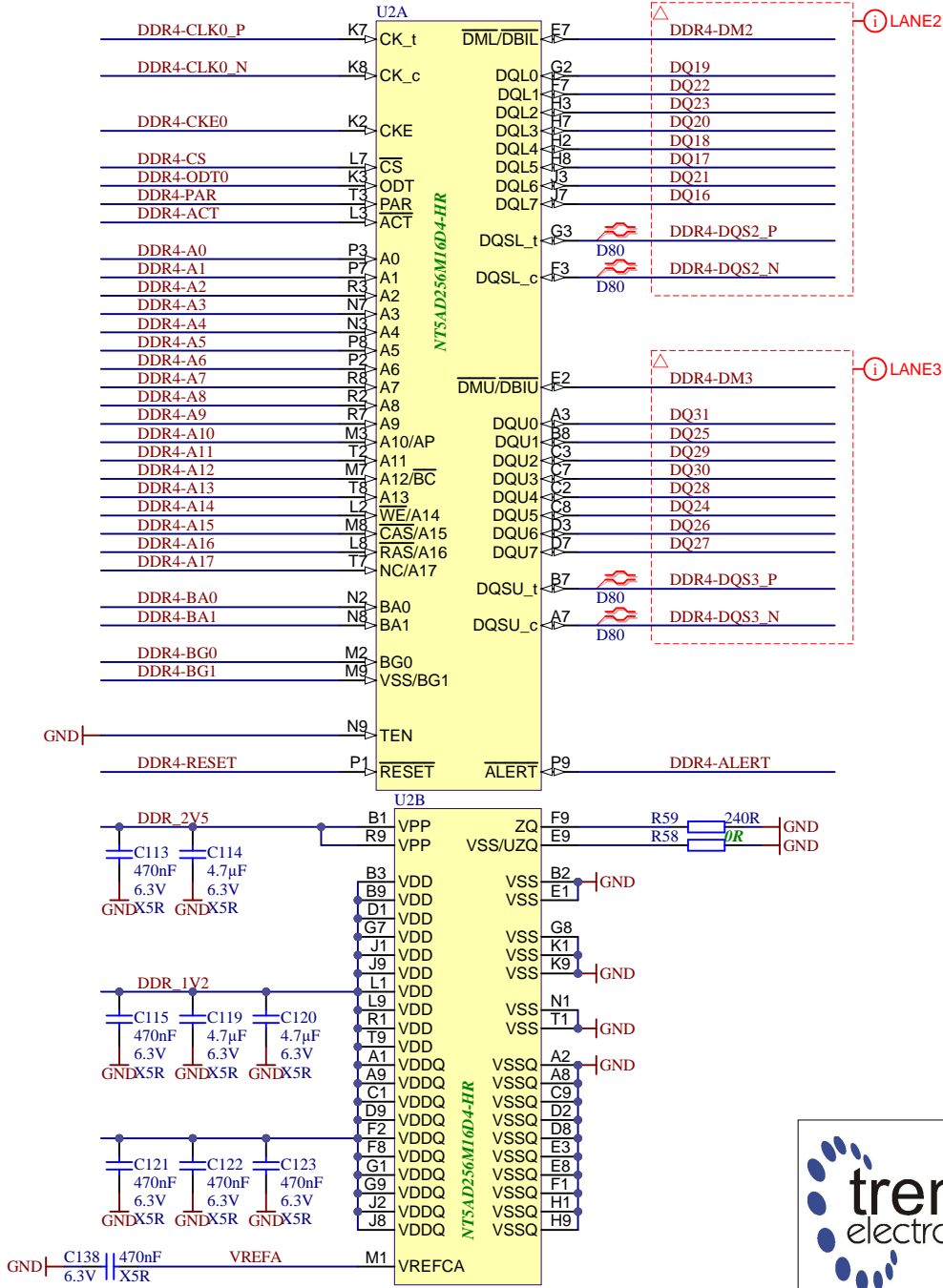


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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 18 of 30
Filename: ZU_PS_POWER.SchDoc		

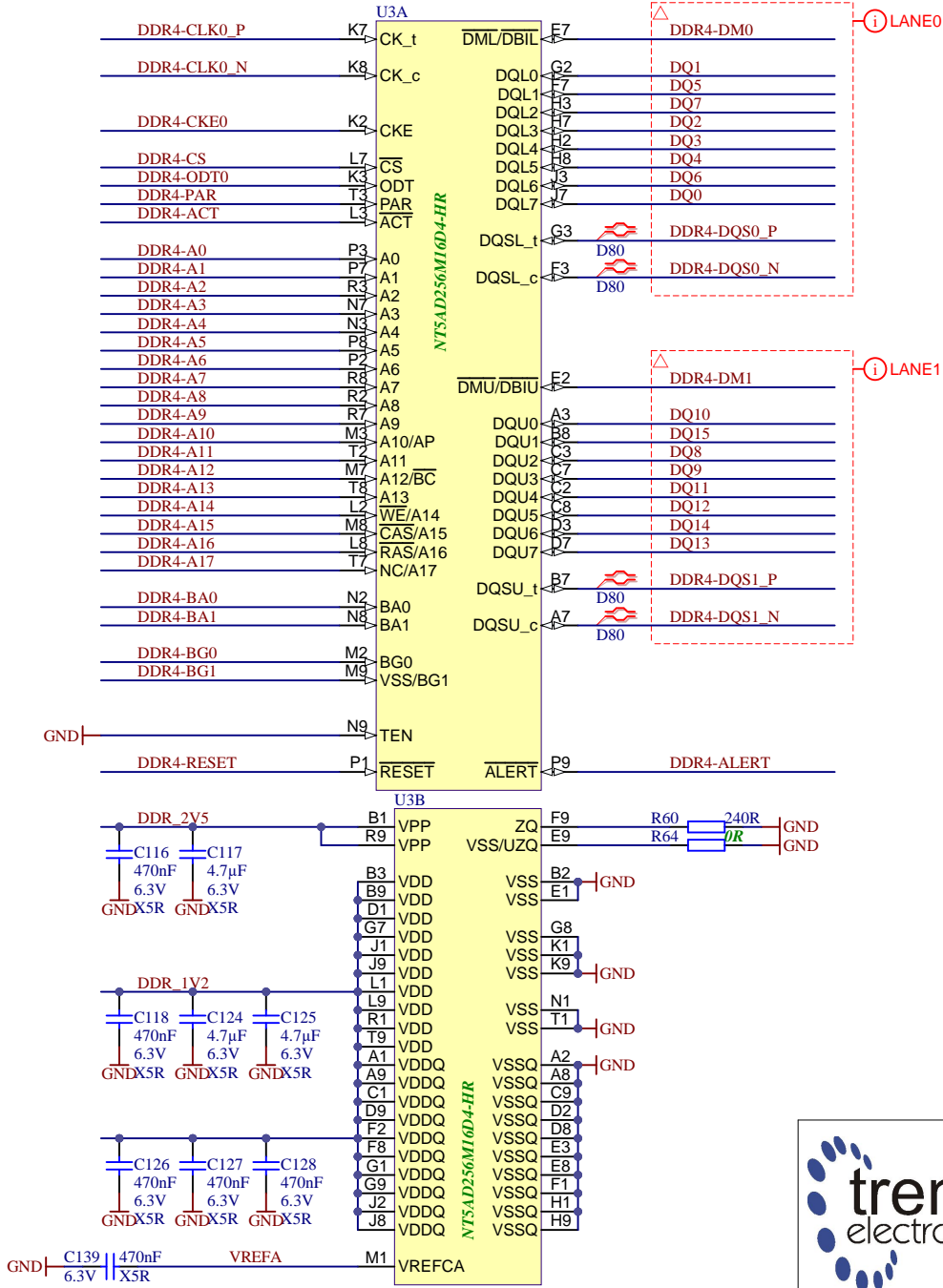


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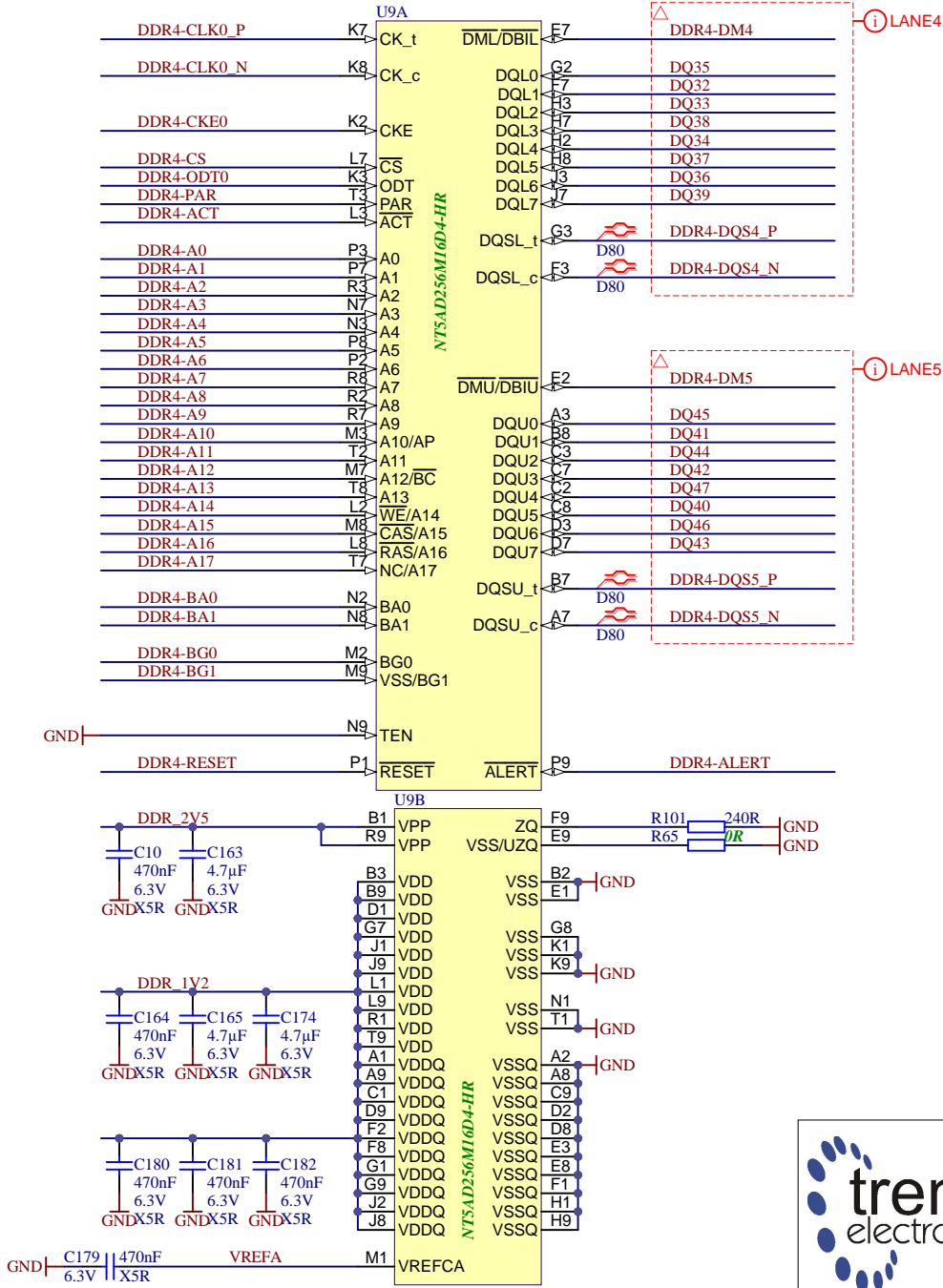
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 19 of 30
Filename: ZU_POWER.SchDoc		



Title: TE0803 - DDR4_1_RAM		
A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page20 of 30
Filename: DDR4-RAM.SchDoc		



Title: TE0803 - DDR4_2_RAM		
A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page21 of 30
Filename: DDR4-RAM_2.SchDoc		



Title: TE0803 - DDR4_3_RAM		
A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 22 of 30
Filename: DDR4-RAM_3.SchDoc		

A

A

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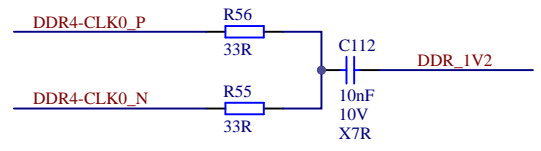
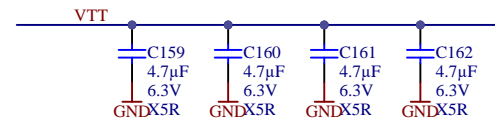
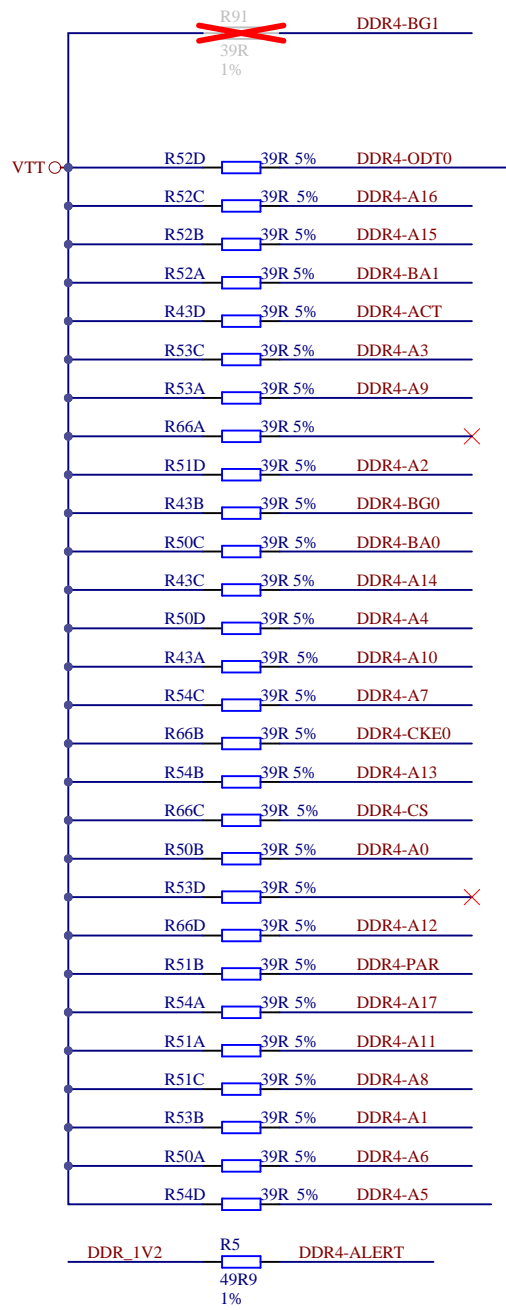
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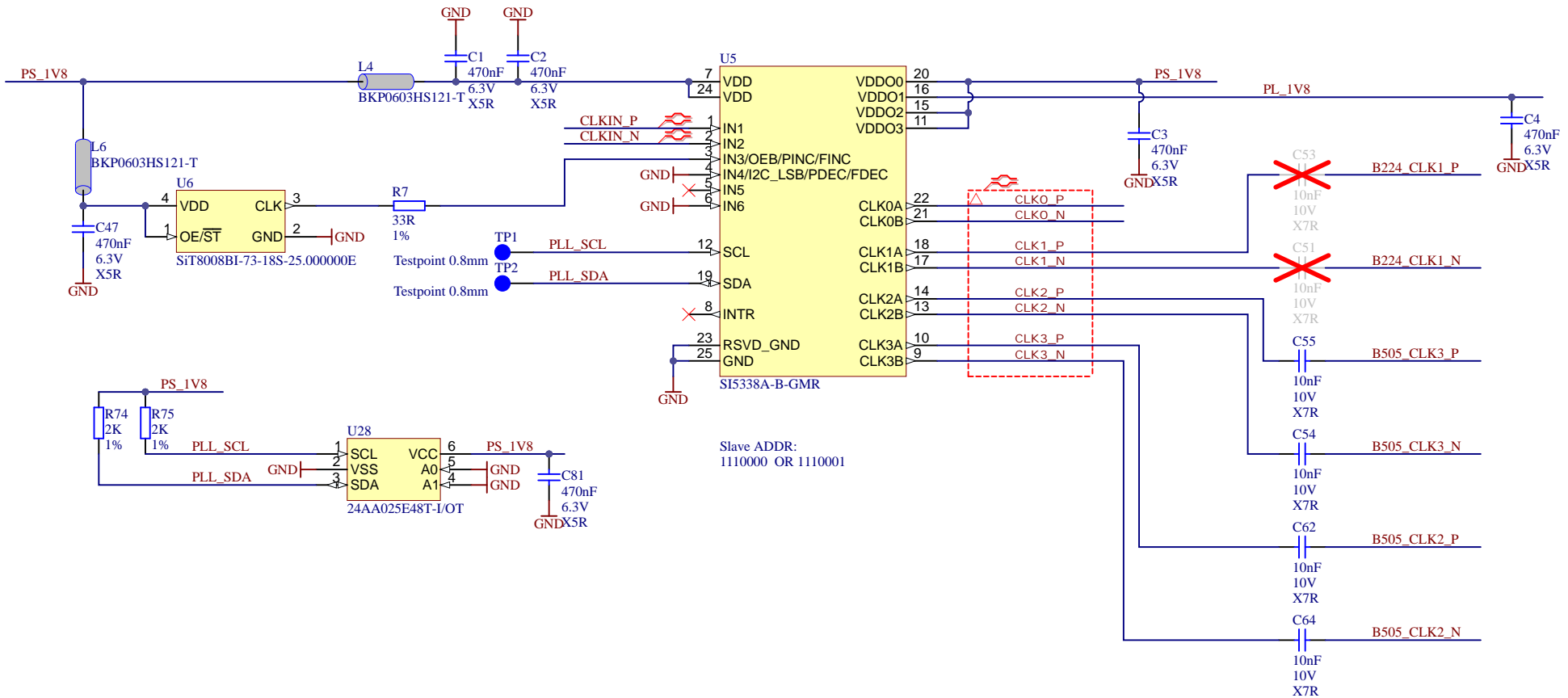
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D

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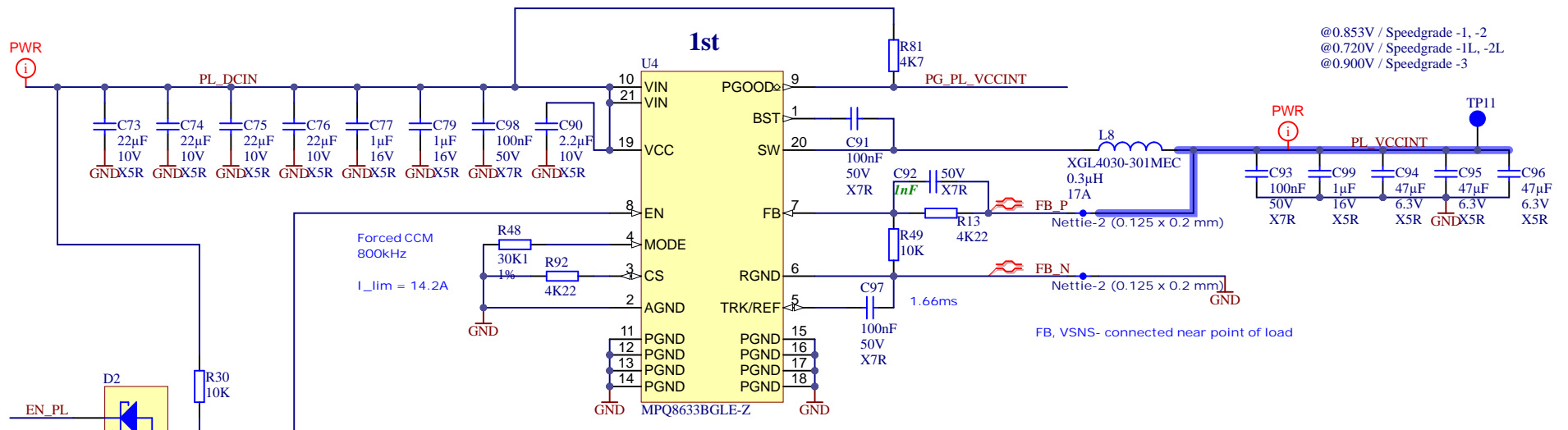


Title: TE0803 - DDR4_TERM		
A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page24 of 30
Filename: DDR4-TERM.SchDoc		



		Title: TE0803 - CLOCK	
		A4	Number: TE0803 3AE11-AZ
Date: 2021-01-19		Copyright: Trenz Electronic GmbH / TT	
Filename: Clock.SchDoc		Page 25 of 30	

PL VCCINT



@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
 -- TPS548A28 (15A)
 -- TPS548B28 (20A)
 -- TPS54JA20 (12A)
 -- MPQ8633B (20A)

U4 can be either TPS548A28RWW or MPQ8633BGL-E-Z which is up to Trenz Electronic GmbH.

	Title: TE0803 - POWER	
	A4	Number: TE0803 3AE11-AZ
	Date: 2021-01-19	Rev. 04
	Page 26 of 30	
Date: 2021-01-19		Copyright: Trenz Electronic GmbH / TT
Filename: POWER.SchDoc		

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A

A

B

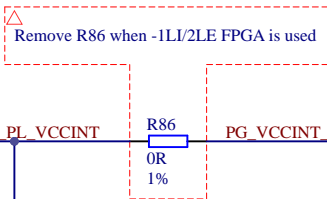
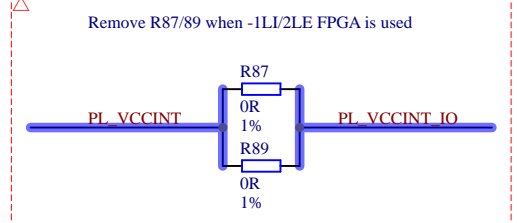
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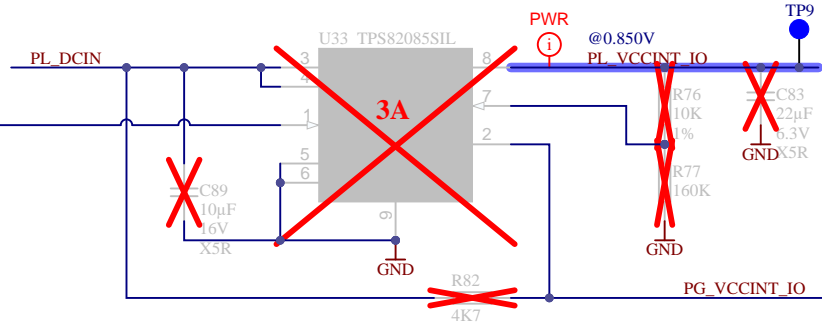
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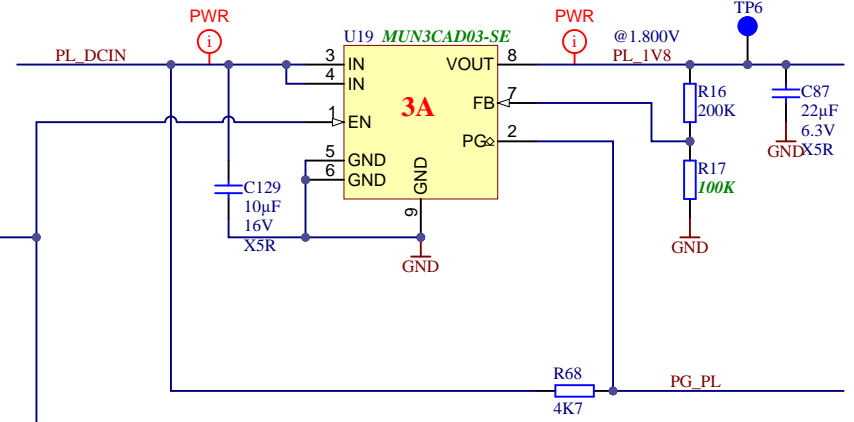


VCCINT_IO & VCCBRAM

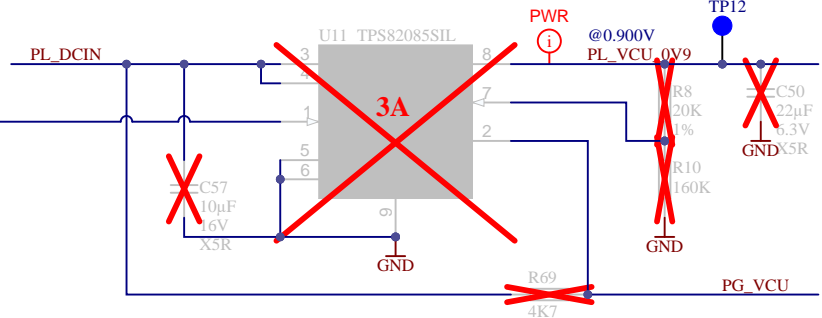
Add U33 when -1L1/2LE FPGA is used



PL VCCIO



VCU



Title: TE0803 - POWER		
A4	Number: TE0803 3AE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 27 of 30
Filename: POWER_1.SchDoc		

1

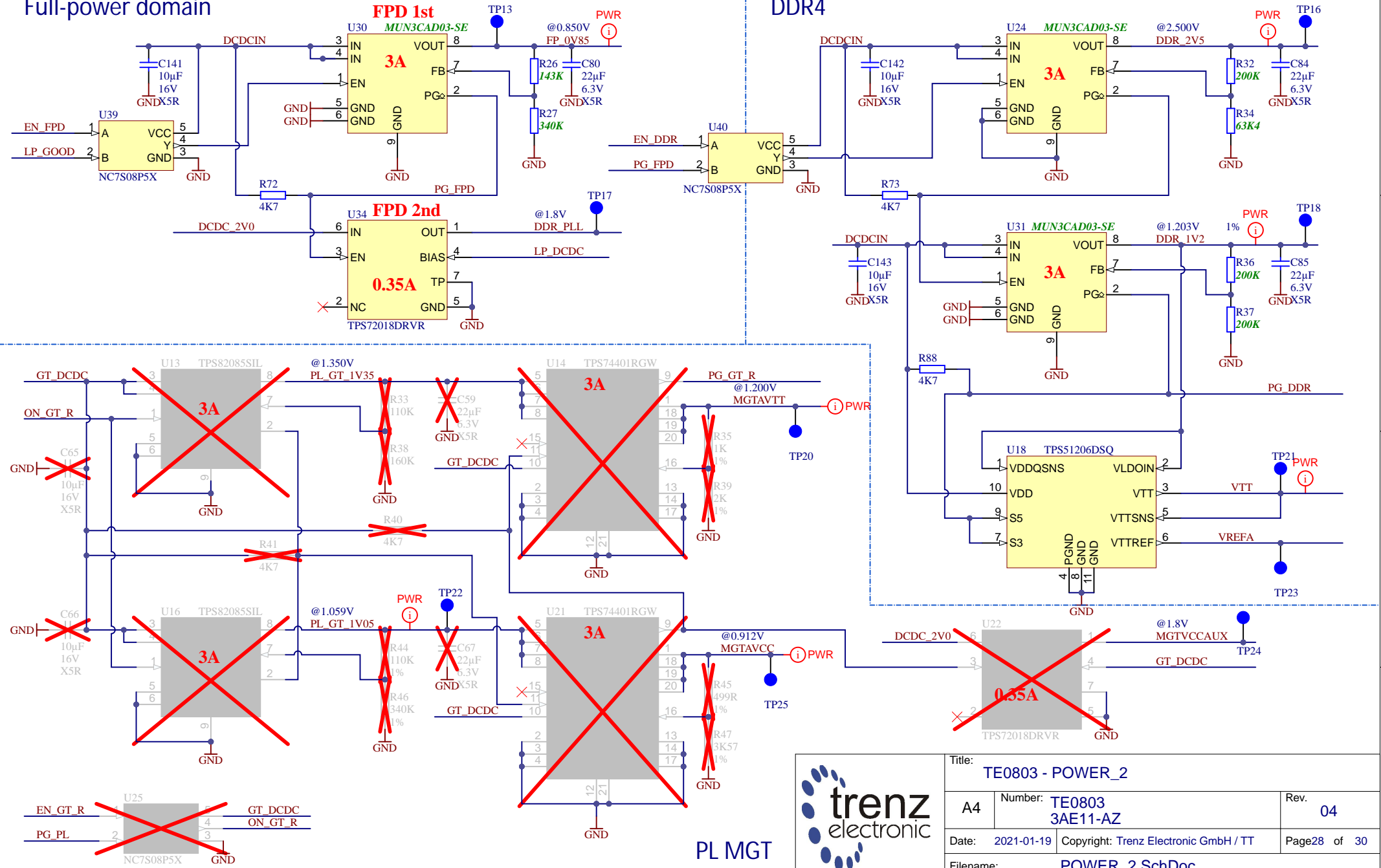
2

3

4

Full-power domain

DDR4



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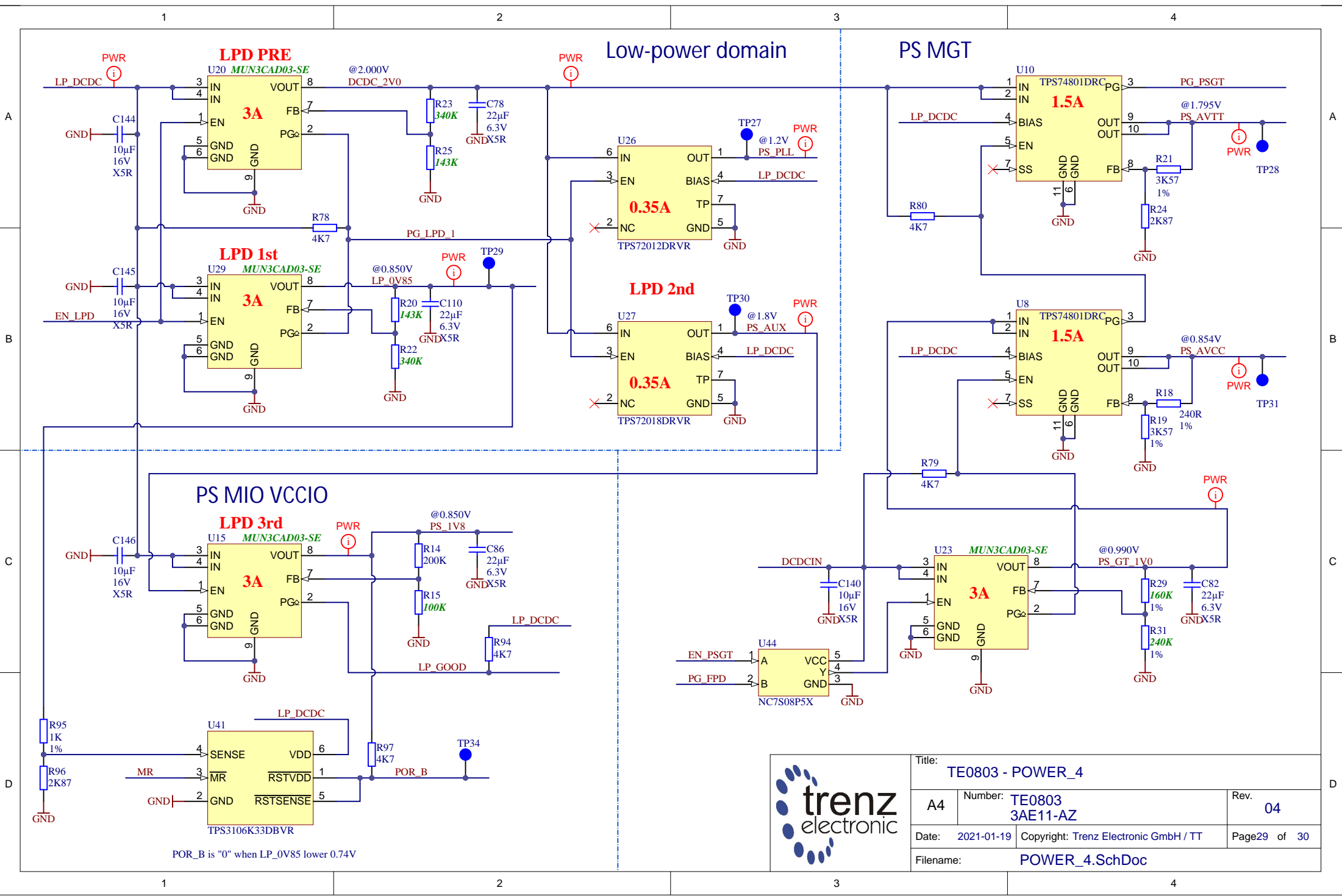
1

2

3

4

PL MGT




POR_B is "0" when LP_0V85 lower 0.74V



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REV	DATE	Description	
-01		Initial revision	VT
-01a	20.11.2017	1. VCU voltage set to 0.9V, R20 changed to 40K , PL_VCU_1V0 renamed to PL_VCU_0V9;	VT
-02	20.06.2018	1. Added LDO to DDR_PLL 2. All differential pairs with length matched with tolerance 0.1mm (excluding package delays) 3. Added MAC EEPROM U28 4. VPS_MGTRAVCC set to 0.85V 5. Added pull-up resistors R68,R69	VT
-03	21.02.2019	1. Added support of DDP DDR4 2. Added support of Low power FPGA (-L1/L2). 3. Revised testpoints 4. Revised J1-J4 connectors net label style	VY
-04	15.12.2020	1. Revised PL_VCCINT power supply. EN63A0QI replaced by TPS548A28RWWR. PCB: revised routing and components placement; 2. Added support of wide SDRAM DDR4 packages. PCB: revised routing and components placement; 3. Added option to select POR_OVERRIDE level (R12 and R93) 4. VCCO pins if unused Bank 44 connected together. Same for unused Bank 24 (UG583 recommendation) 5. PCB: updated signal trace lengths. 6. PCB: updated silkscreen. Added company address, CE and WEEE symbols; 7. PCB: added module orientation rectangle pointer 8. Changed resistors value of R29, R31, R35, R39, R44-R47 (BOM optimization) 9. Removed traceability part (Obsolete component)	VY
-04	23.02.2022	10. Changed capacitor C92 for all variants from 100 nF to 1 nF.	ED
-04	08.06.2023	11. U4 can be either TPS548A28RWWR or MPQ8633BGLE-Z which is up to Trenz Electronic GmbH.	VY

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Drawn by: VY			Filename: Revision Changes.SchDoc		