
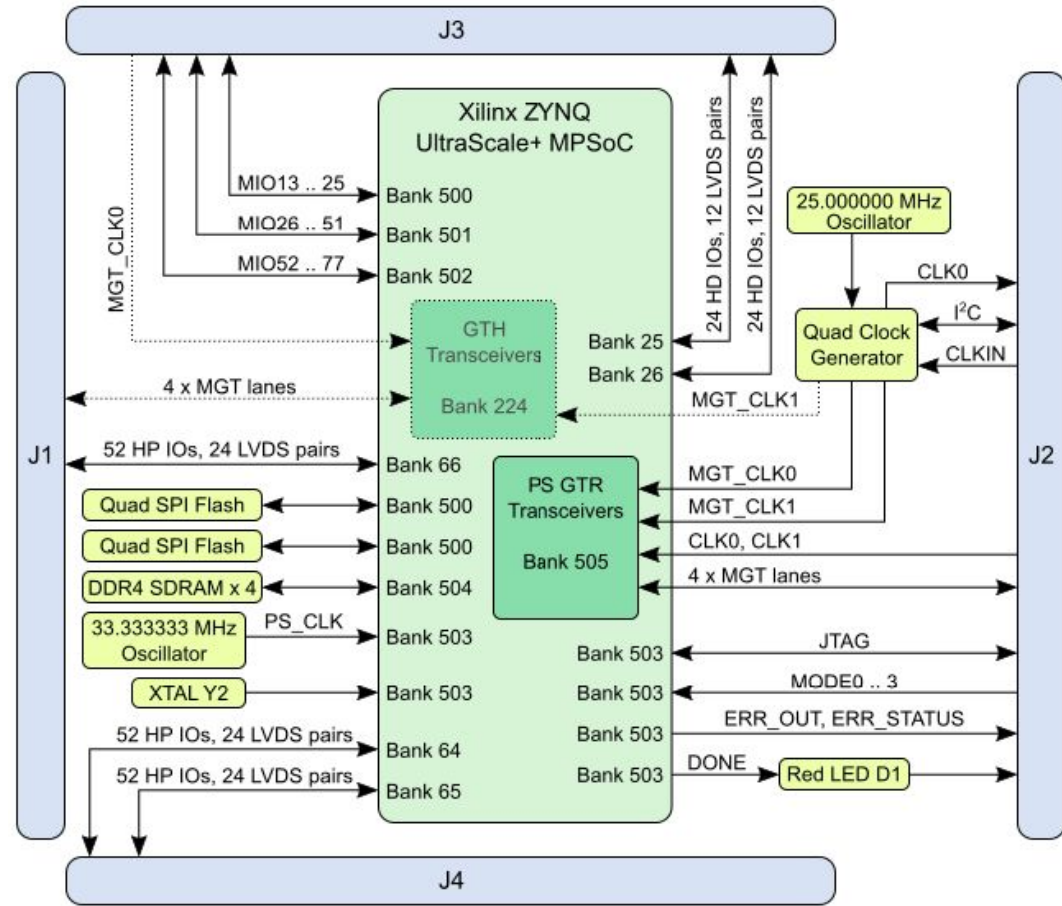



Regarding the usage of our schematics and alike documentation for Trenz module TE0803.

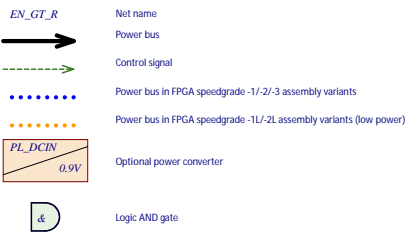
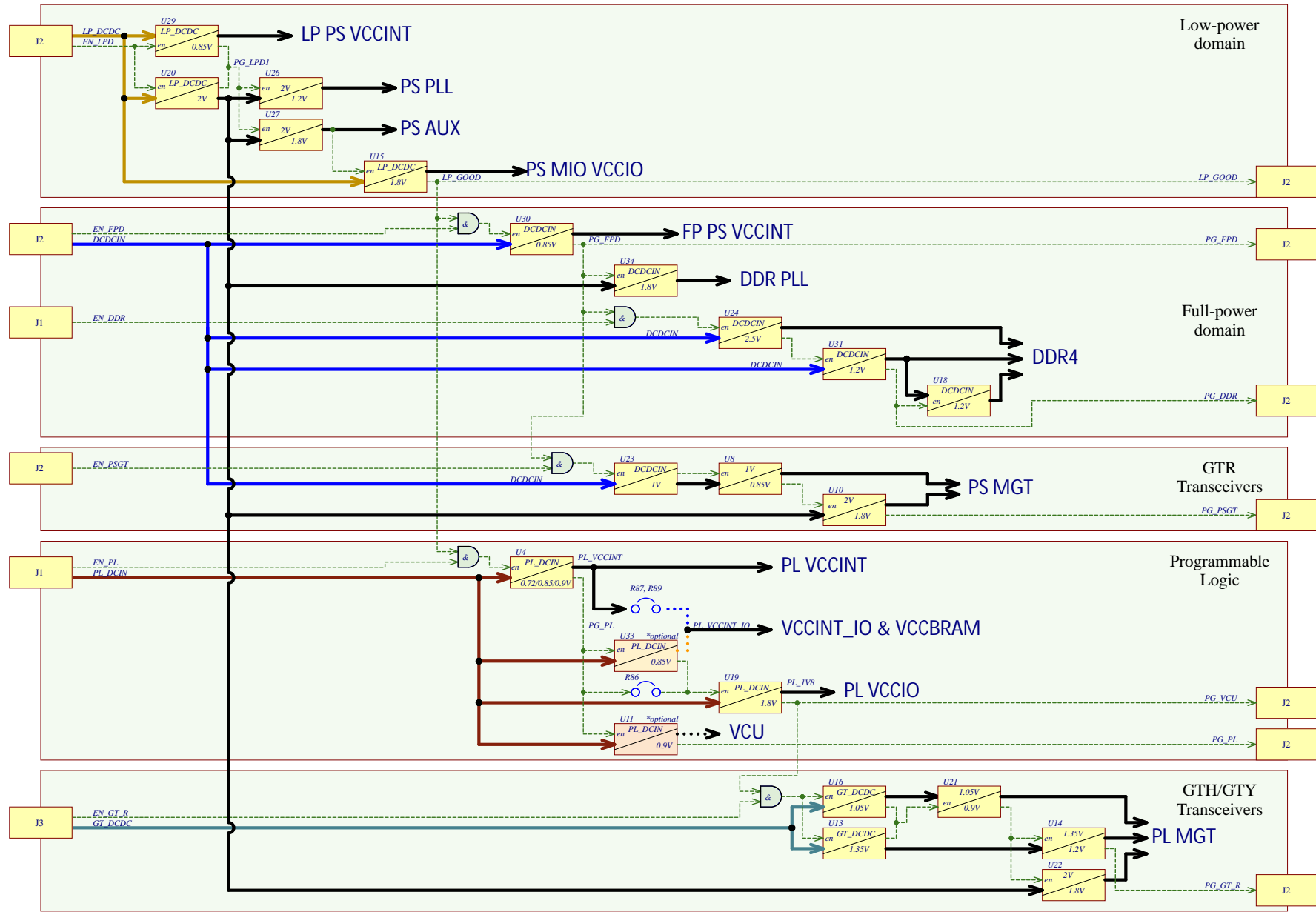
Project is protected under copyright and we strongly and strictly prohibit the reverse engineering or recreation, even if the design is just adapted or modified. TE0803 is protected under such right and in case of plagiarism we will have to do anything necessary in order to protect our assets.

Schematics and other handouts serve for informational purposes only!

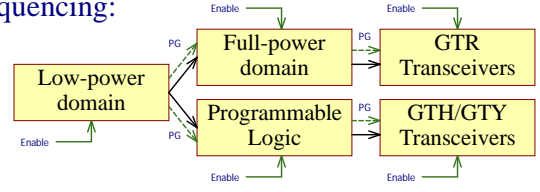
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	A4	Number: TE0803 5DE11-AZ	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 1 of 30
	Filename: Legal Notices Modules.SchDoc		



		Title: TE0803 - System Overview	
		A4	Number: TE0803 5DE11-AZ
Date: 2021-01-19		Copyright: 2015 Trenz Electronic GmbH	
Filename: TE0803-Overview.SchDoc		Page 2 of 30	



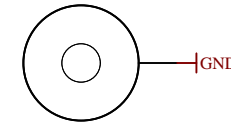
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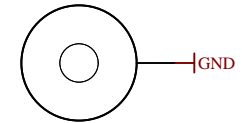
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A3	Number: TE0803 5DE11-AZ	Rev. 04
Datum: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 3 of 30
Filename: Power_Diagram.SchDoc		

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	

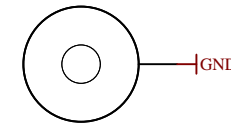
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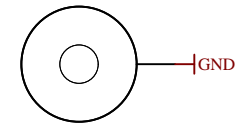
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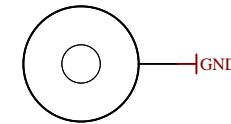
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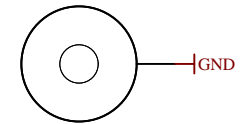
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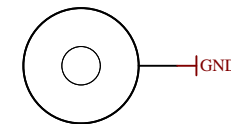
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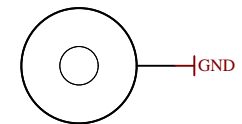
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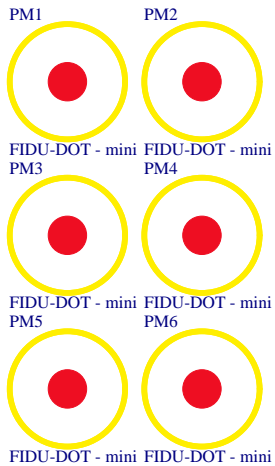
Mount.Hole 3.2mm für Unterlegscheibe



Mount.Hole 3.2mm für Unterlegscheibe



Mount.Hole 3.2mm für Unterlegscheibe



MECH1

TE Address Overlay

LOGO ADDRESS

LOGO1

TE Logo PRINT Layer

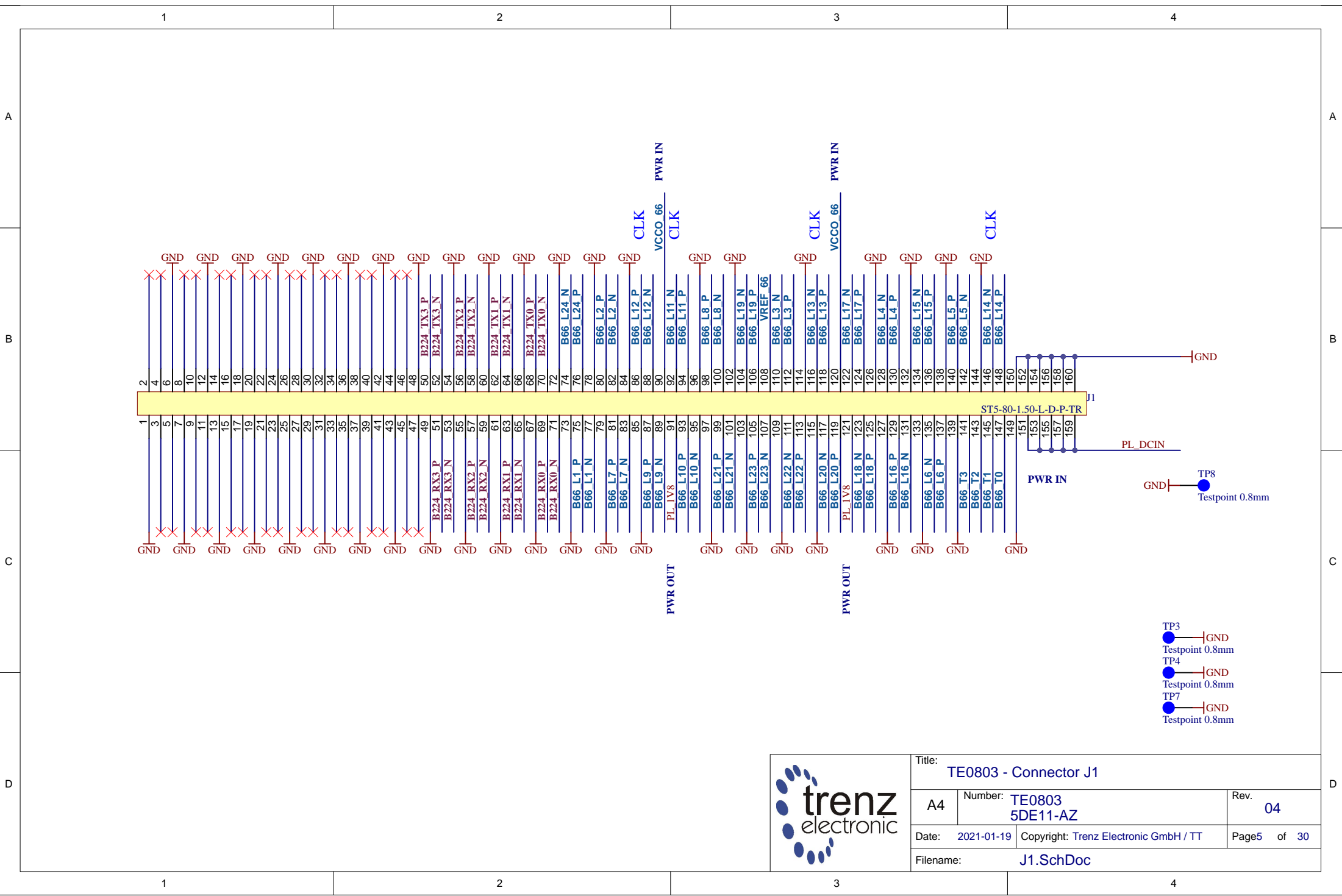
LOGO PRINT

Serial
Serial
Serialnumber 6,3 x 6.3mm

Assembly variant	5DE11-AZ
Created by	VT
Modified by	VT
Modified at	2022-12-14
SVN Revision	11196



Title: TE0803		
A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page4 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 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page5 of 30
Filename: J1.SchDoc		

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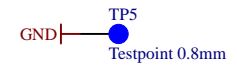
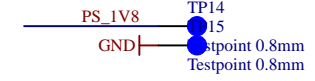
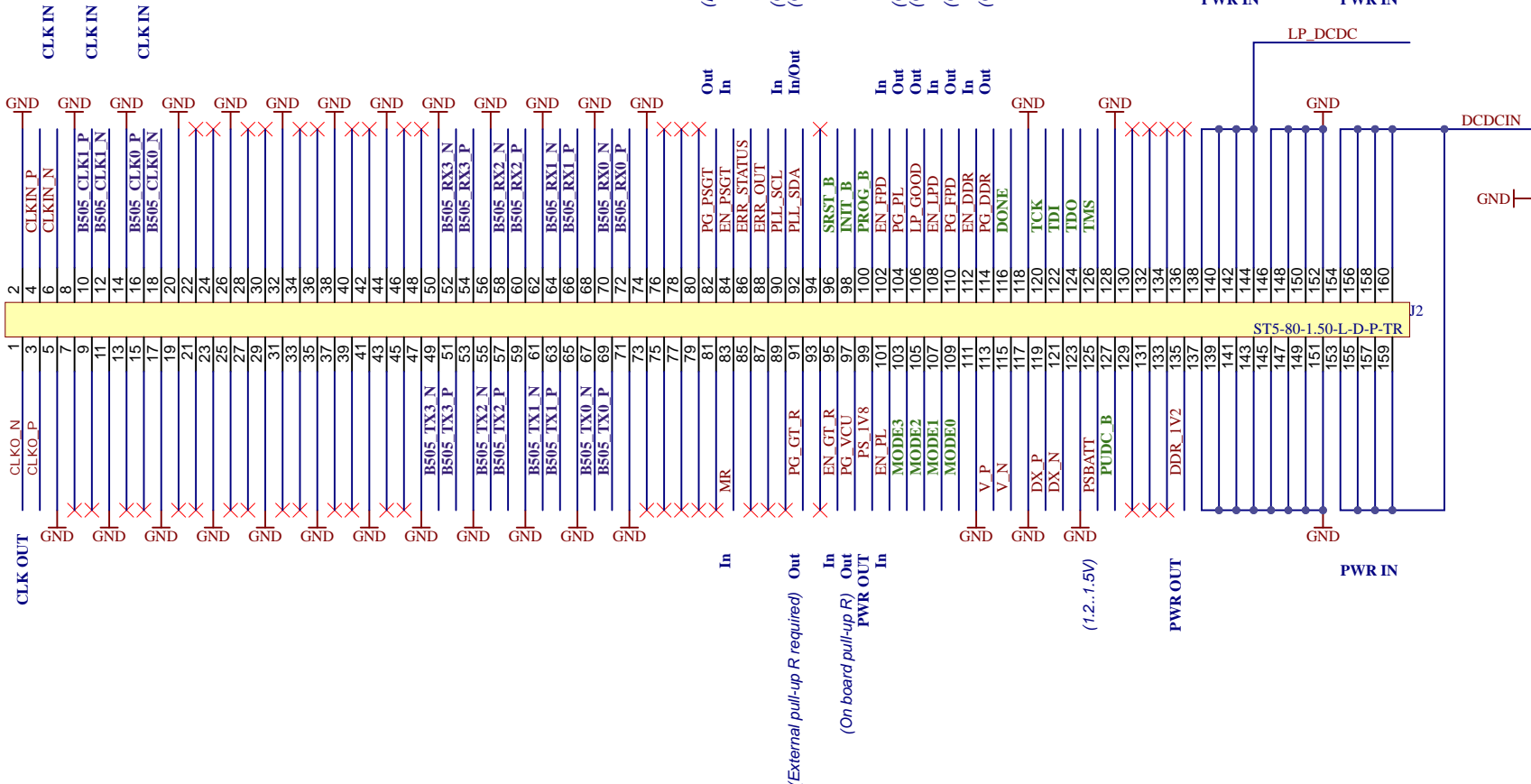

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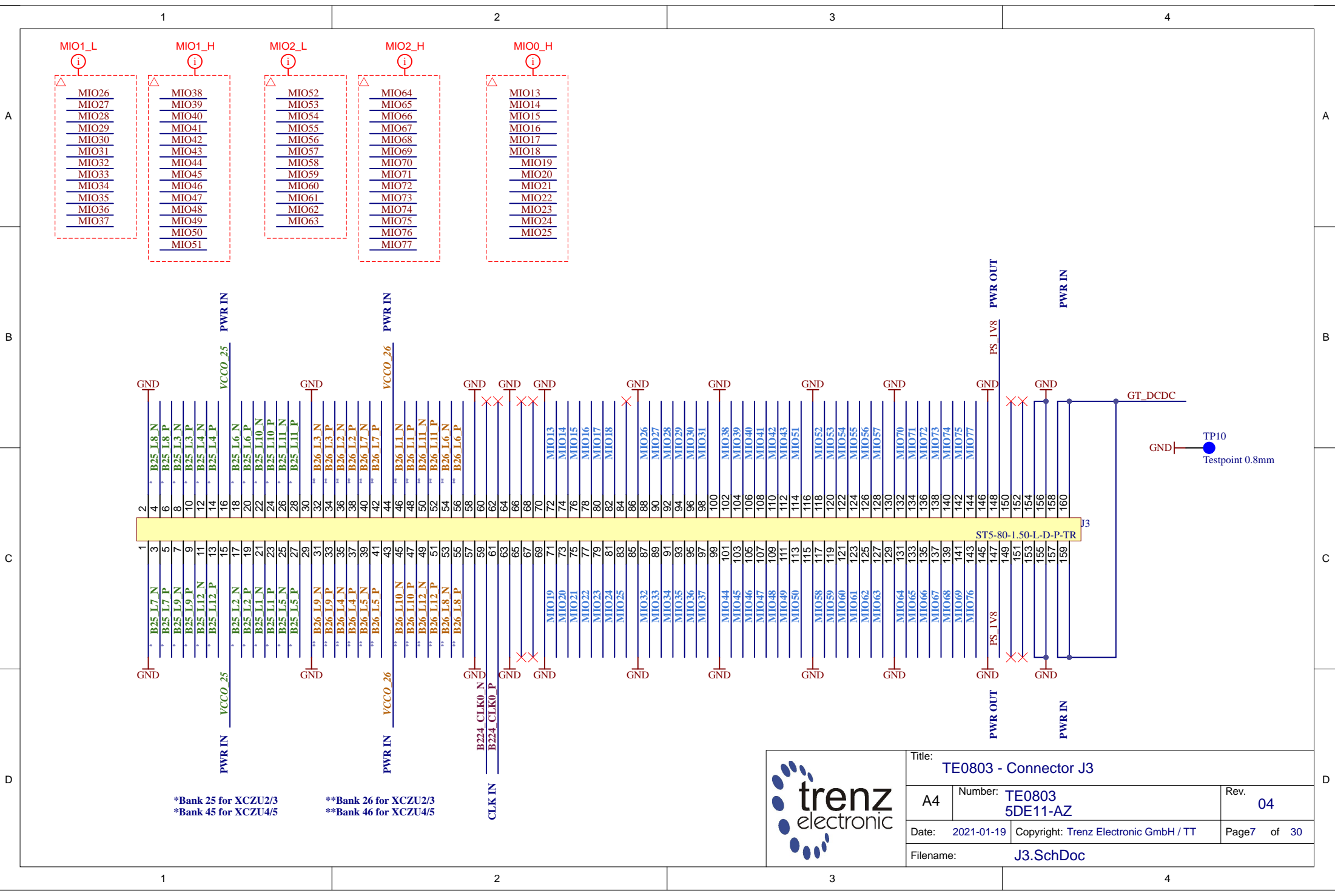
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A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 6 of 30
Filename: J2.SchDoc		

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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 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 7 of 30
Filename: J3.SchDoc		

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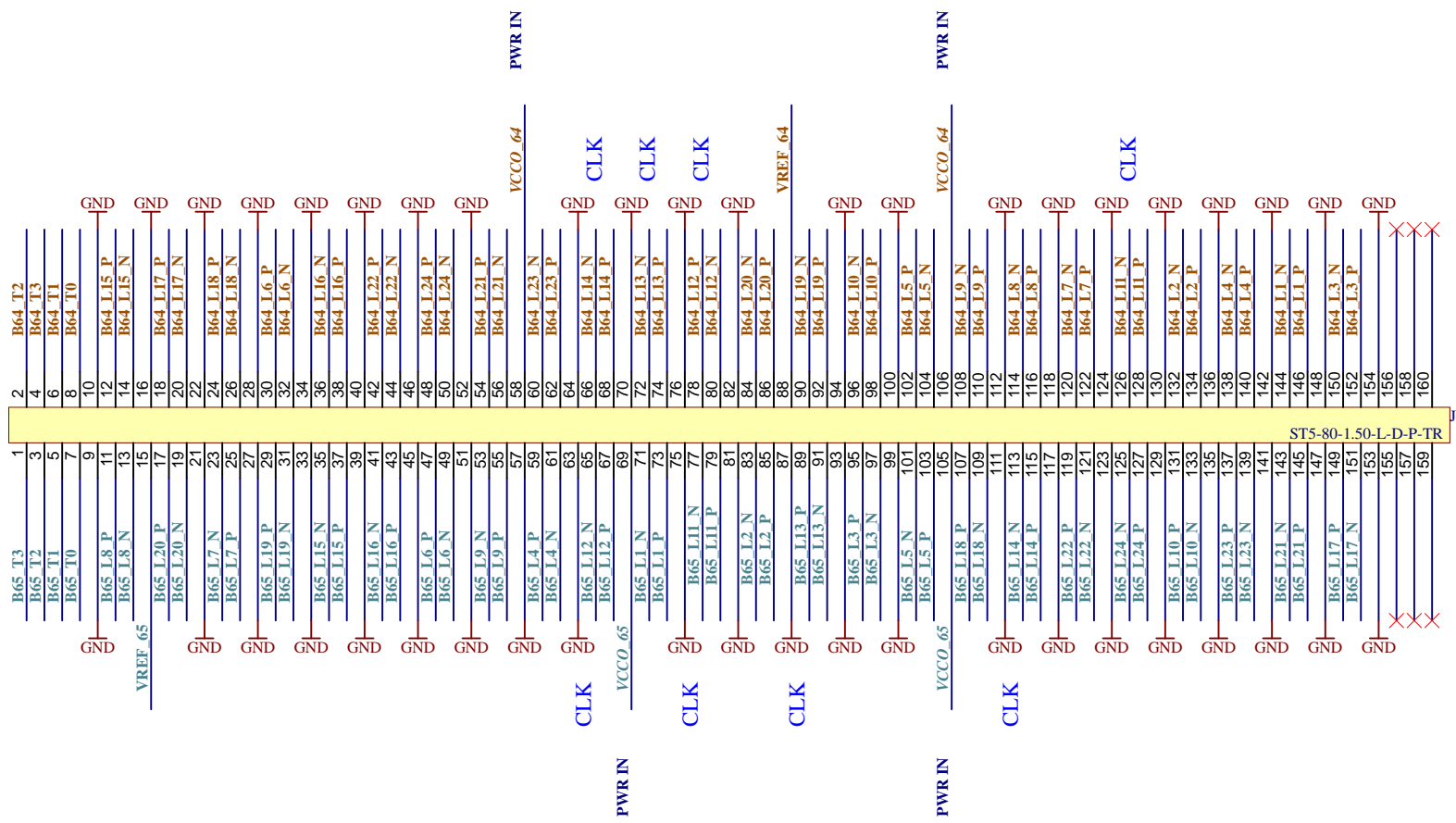
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C

C

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D



1

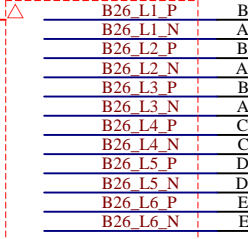
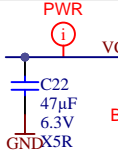
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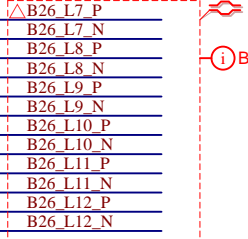


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A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page8 of 30
Filename: J4.SchDoc		



U1C XCZU5EV-1SFVC784E
BANK 46 HD (ZU2/3 BANK 26 HD)

F14	VCCO_46
C15	VCCO_46
B15	IO_L1P_AD11P_46
A15	IO_L1N_AD11N_46
B14	IO_L2P_AD10P_46
A14	IO_L2N_AD10N_46
B13	IO_L3P_AD9P_46
A13	IO_L3N_AD9N_46
C13	IO_L4P_AD8P_46
C14	IO_L4N_AD8N_46
D13	IO_L5P_HDGC_AD7P_46
D14	IO_L5N_HDGC_AD7N_46
E13	IO_L6P_HDGC_AD6P_46
E14	IO_L6N_HDGC_AD6N_46
	IO_L7P_HDGC_AD5P_46
	IO_L7N_HDGC_AD5N_46
	IO_L8P_HDGC_AD4P_46
	IO_L8N_HDGC_AD4N_46
	IO_L9P_AD3P_46
	IO_L9N_AD3N_46
	IO_L10P_AD2P_46
	IO_L10N_AD2N_46
	IO_L11P_AD1P_46
	IO_L11N_AD1N_46
	IO_L12P_AD0P_46
	IO_L12N_AD0N_46

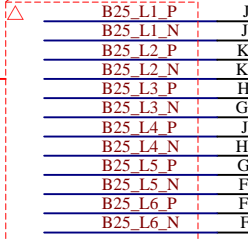
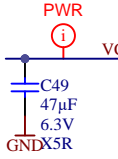


BANK 43 HD (ZU2/3 BANK 44 HD)

AC10	VCCO_43
AG12	VCCO_43
AG10	IO_L1P_AD11P_43
AH10	IO_L1N_AD11N_43
AF11	IO_L2P_AD10P_43
AG11	IO_L2N_AD10N_43
AH11	IO_L3P_AD9P_43
AH12	IO_L3N_AD9N_43
AE10	IO_L4P_AD8P_43
AF10	IO_L4N_AD8N_43
AE11	IO_L5P_HDGC_AD7P_43
AF11	IO_L5N_HDGC_AD7N_43
AC11	IO_L6P_HDGC_AD6P_43
AD11	IO_L6N_HDGC_AD6N_43
	IO_L7P_HDGC_AD5P_43
	IO_L7N_HDGC_AD5N_43
	IO_L8P_HDGC_AD4P_43
	IO_L8N_HDGC_AD4N_43
	IO_L9P_AD3P_43
	IO_L9N_AD3N_43
	IO_L10P_AD2P_43
	IO_L10N_AD2N_43
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	IO_L12P_AD0P_43
	IO_L12N_AD0N_43

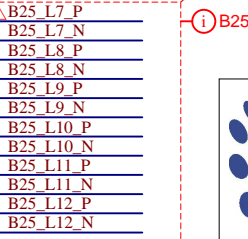
U1B
BANK 44 HD (ZU2/3 BANK 24 HD)

AA14	VCCO_44
AD13	VCCO_44
AE15	IO_L1P_AD15P_44
AE14	IO_L1N_AD15N_44
AG14	IO_L2P_AD14P_44
AH14	IO_L2N_AD14N_44
AG13	IO_L3P_AD13P_44
AH13	IO_L3N_AD13N_44
AE13	IO_L4P_AD12P_44
AF13	IO_L4N_AD12N_44
AD13	IO_L5P_HDGC_44
AD14	IO_L5N_HDGC_44
AC14	IO_L6P_HDGC_44
AC13	IO_L6N_HDGC_44
	IO_L7P_HDGC_44
	IO_L7N_HDGC_44
	IO_L8P_HDGC_44
	IO_L8N_HDGC_44
	IO_L9P_AD11P_44
	IO_L9N_AD11N_44
	IO_L10P_AD10P_44
	IO_L10N_AD10N_44
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	IO_L11N_AD9N_44
	IO_L12P_AD8P_44
	IO_L12N_AD8N_44

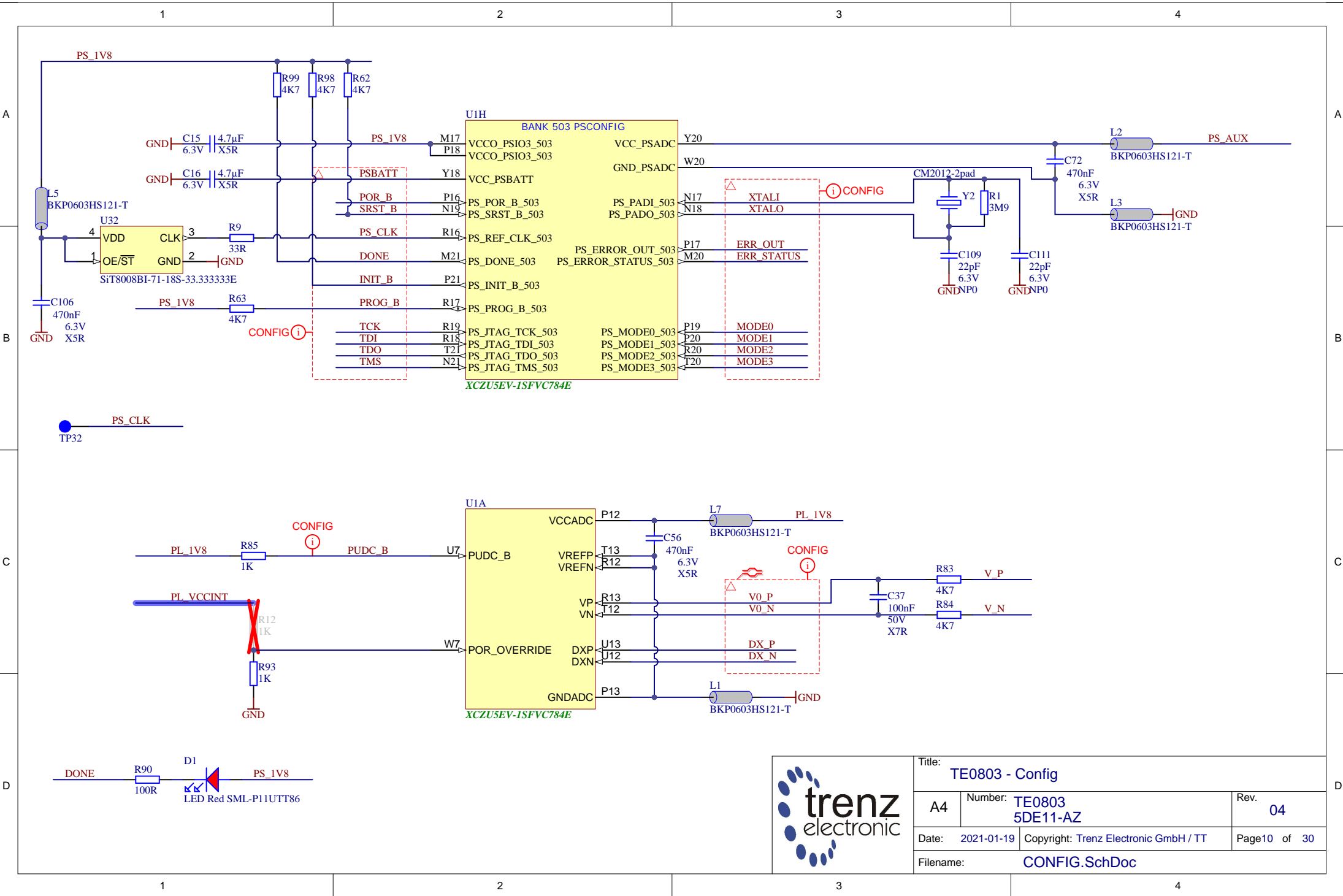


XCZU5EV-1SFVC784E
BANK 45 HD (ZU2/3 BANK 25 HD)

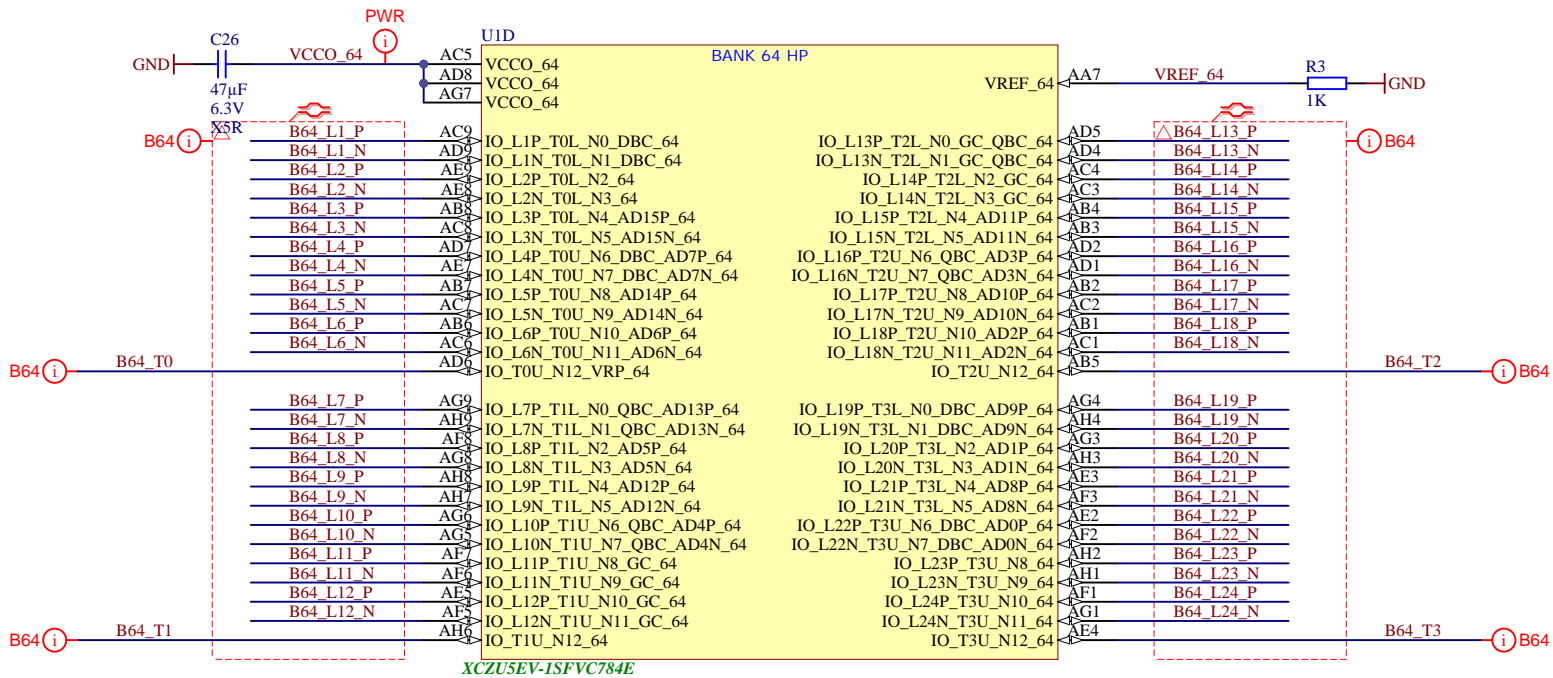
B12	VCCO_45
E11	VCCO_45
J11	IO_L1P_AD15P_45
J10	IO_L1N_AD15N_45
K11	IO_L2P_AD14P_45
K10	IO_L2N_AD14N_45
H11	IO_L3P_AD13P_45
G11	IO_L3N_AD13N_45
J12	IO_L4P_AD12P_45
H12	IO_L4N_AD12N_45
G12	IO_L4N_AD12N_45
F12	IO_L5P_HDGC_45
F11	IO_L5N_HDGC_45
F12	IO_L6P_HDGC_45
F11	IO_L6N_HDGC_45
	IO_L7P_HDGC_45
	IO_L7N_HDGC_45
	IO_L8P_HDGC_45
	IO_L8N_HDGC_45
	IO_L9P_AD11P_45
	IO_L9N_AD11N_45
	IO_L10P_AD10P_45
	IO_L10N_AD10N_45
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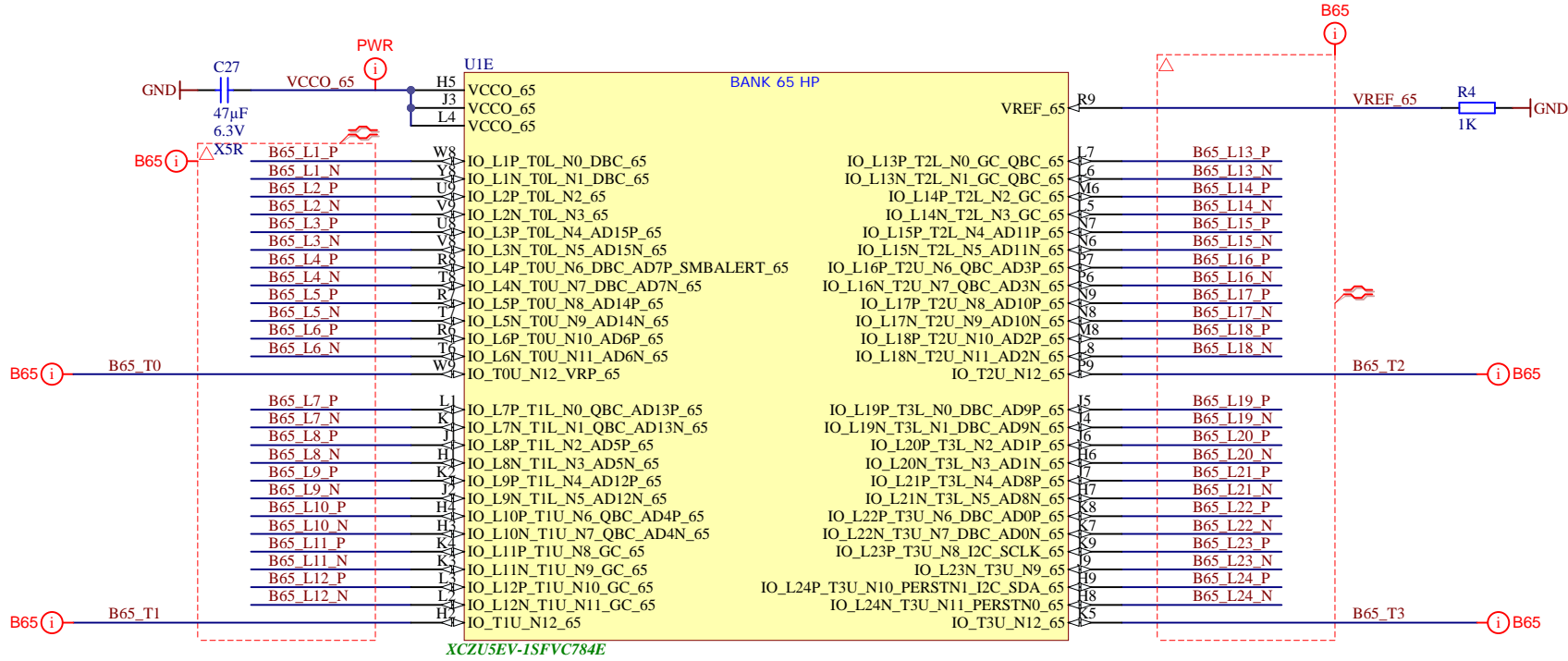
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page9 of 30
Filename: B_HD.SchDoc		



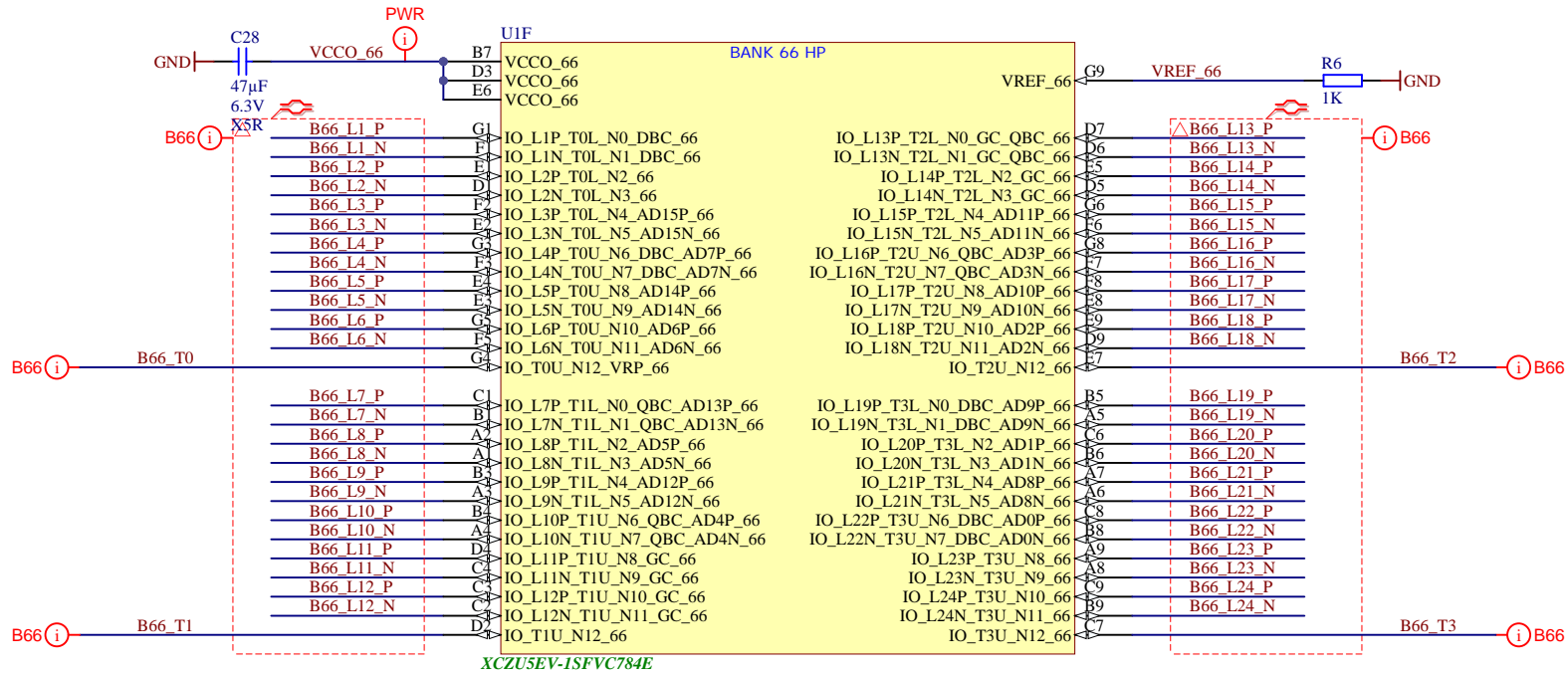

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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 10 of 30
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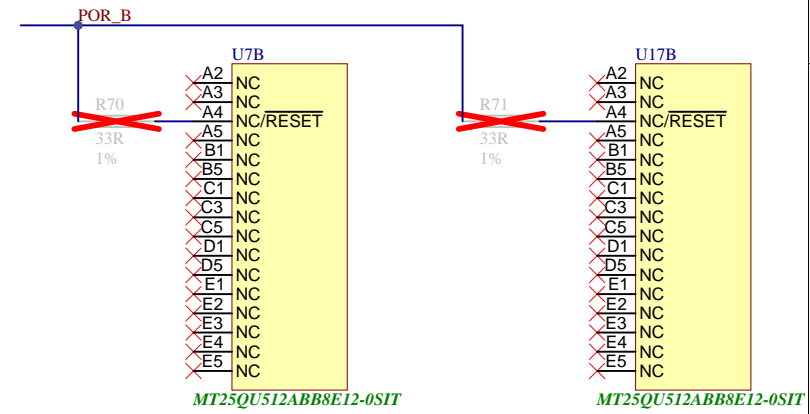
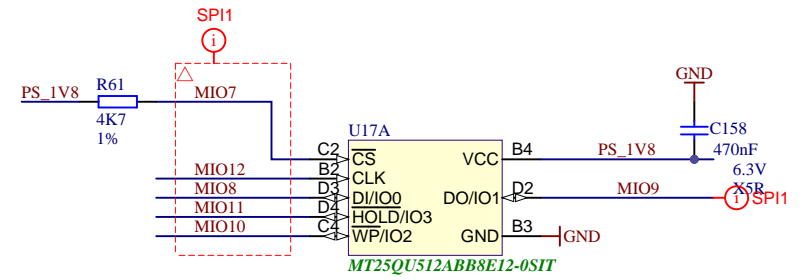
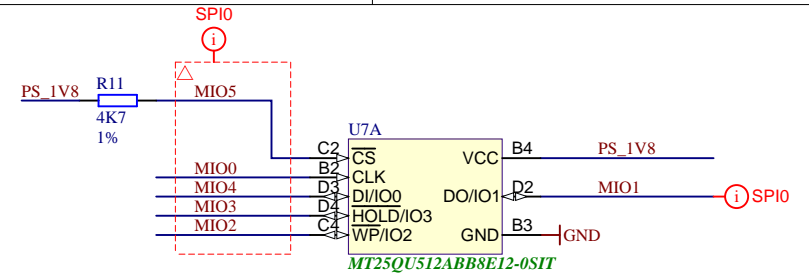
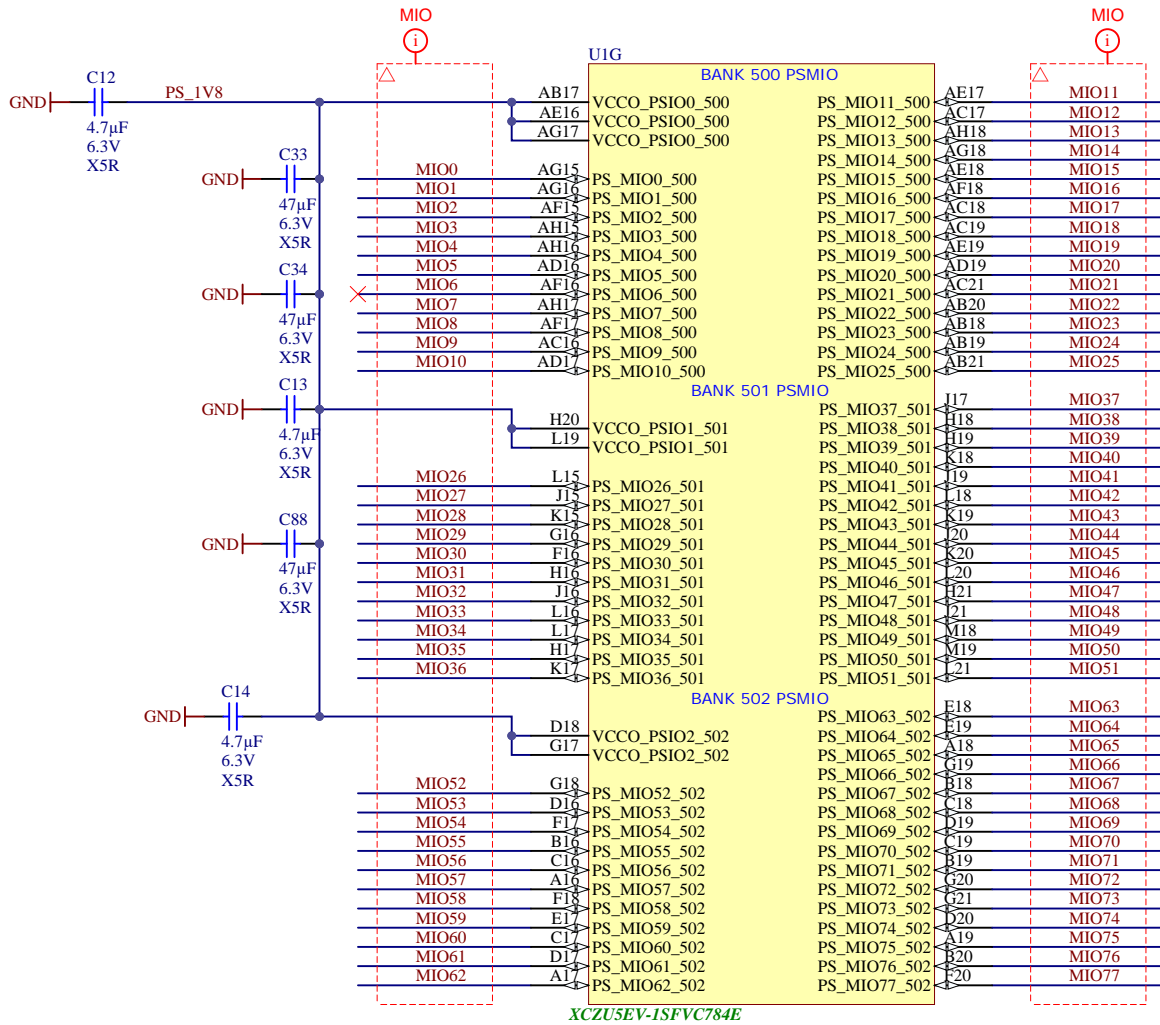
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Date: 2021-01-19		Copyright: Trenz Electronic GmbH / TT		Page 11 of 30
Filename: B64.SchDoc				



Title: TE0803 - B65		
A4	Number: TE0803 5DE11-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 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 13 of 30
Filename: B66.SchDoc		



	Title: TE0803 - MIO Banks		
	A4	Number: TE0803 5DE11-AZ	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 14 of 30
	Filename: B_MIO.SchDoc		

A

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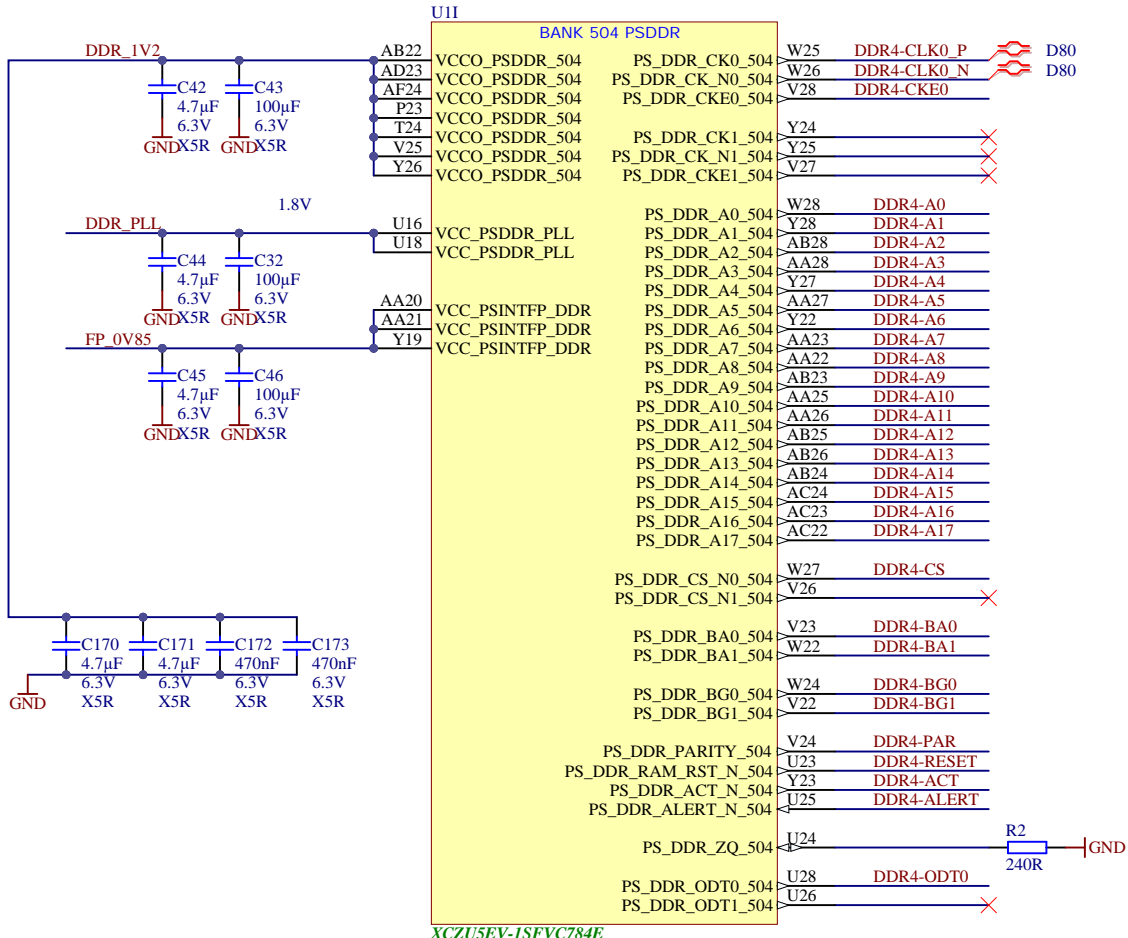
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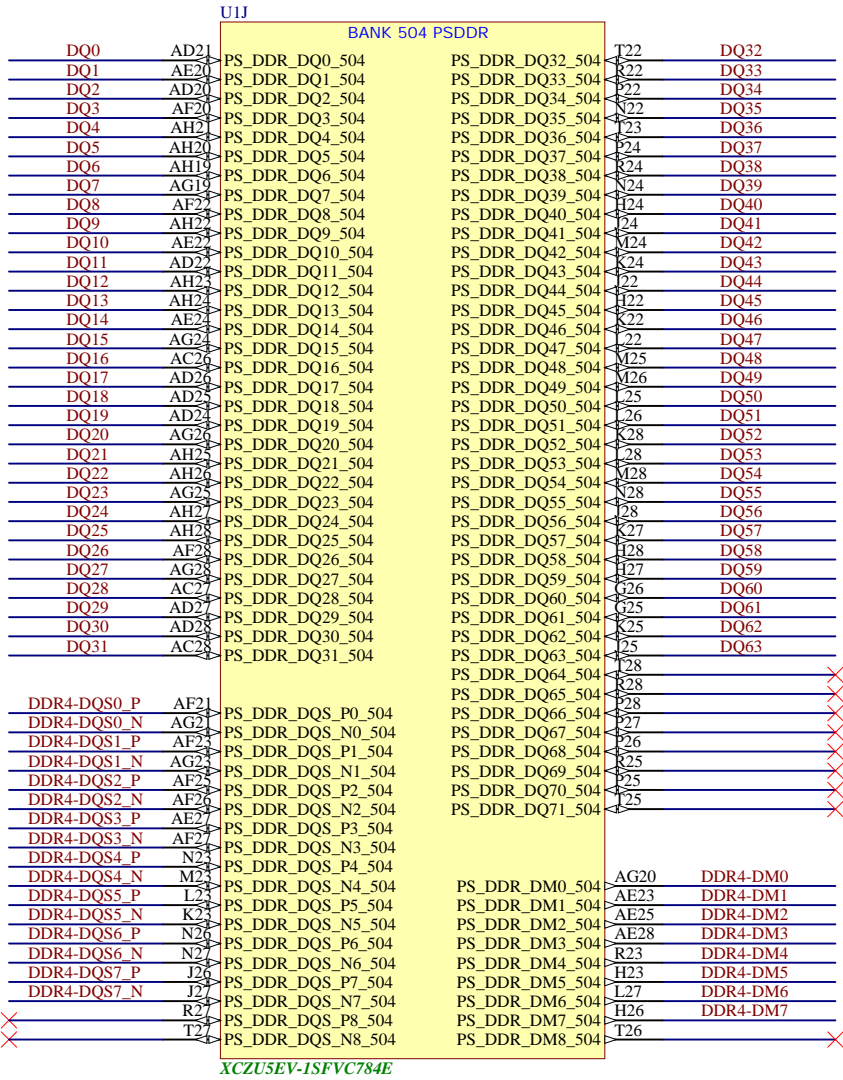
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XCZU5EV-1SFVC784E



XCZU5EV-1SFVC784E



Title: TE0803 - PS_DDR		
A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 15 of 30
Filename: PS_DDR.SchDoc		

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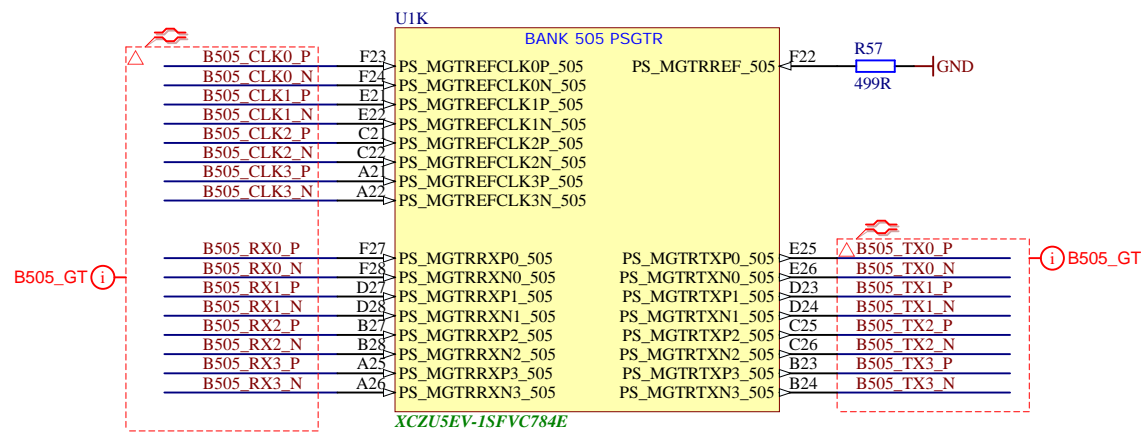
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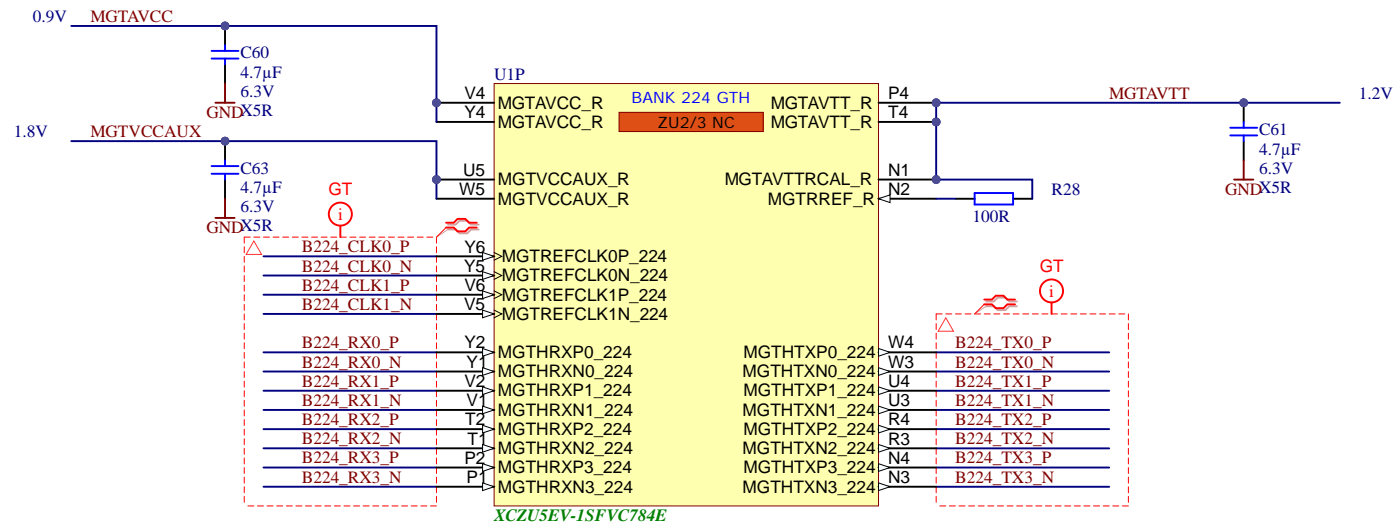
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	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 16 of 30
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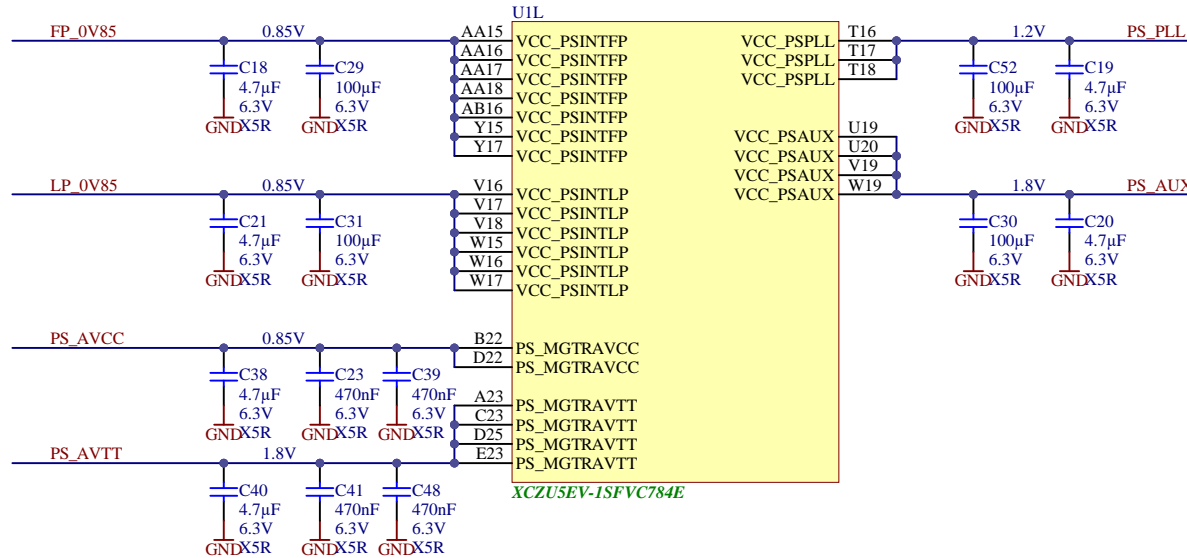
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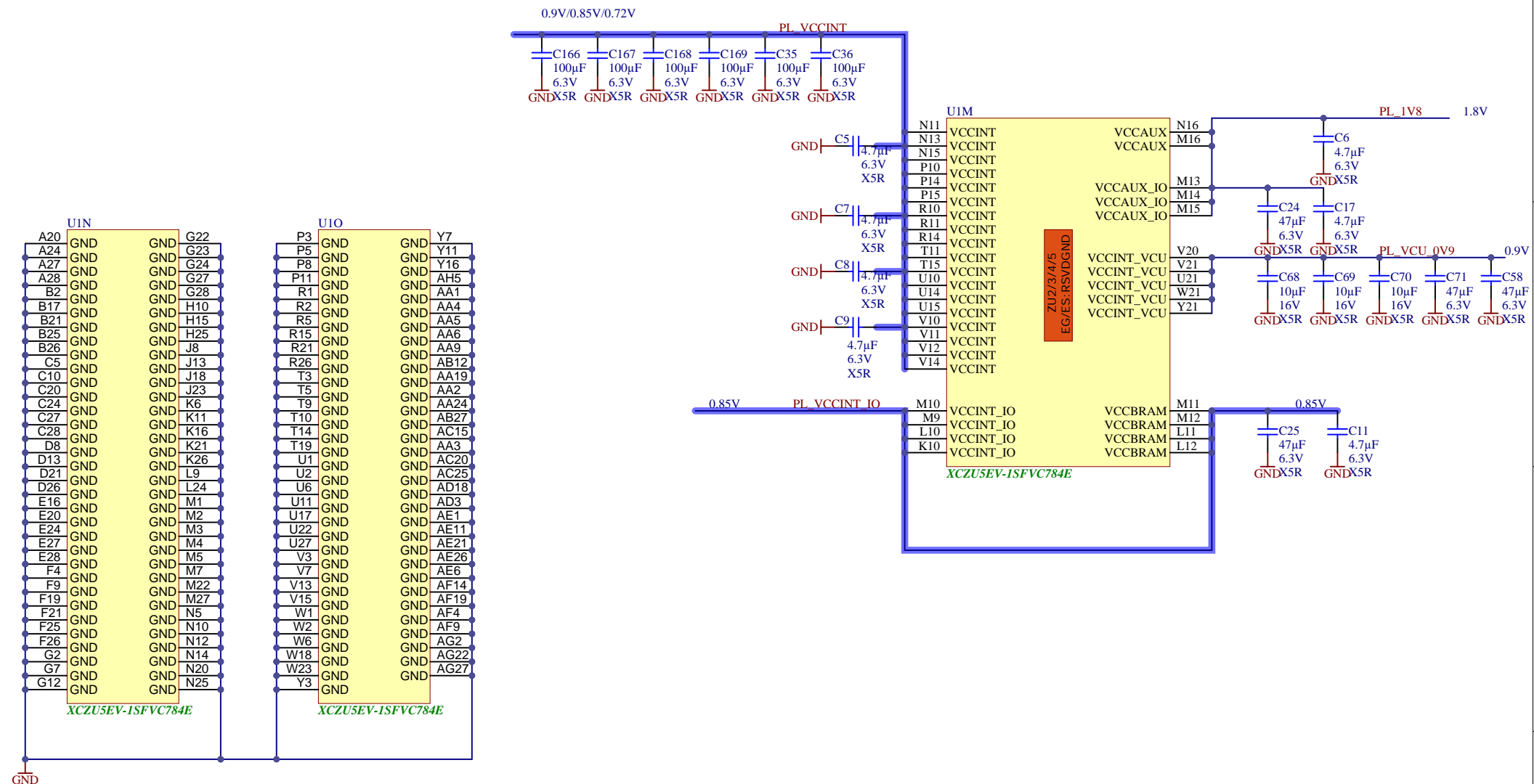
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	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 17 of 30
	Filename: B_GT.SchDoc		



	Title: TE0803 - ZU_PS_POWER		
	A4	Number: TE0803 5DE11-AZ	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 18 of 30
	Filename: ZU_PS_POWER.SchDoc		



			Title: TE0803 - ZU_POWER	
			A4	Number: TE0803 5DE11-AZ
Date: 2021-01-19		Copyright: Trenz Electronic GmbH / TT		Page19 of 30
Filename: ZU_POWER.SchDoc				

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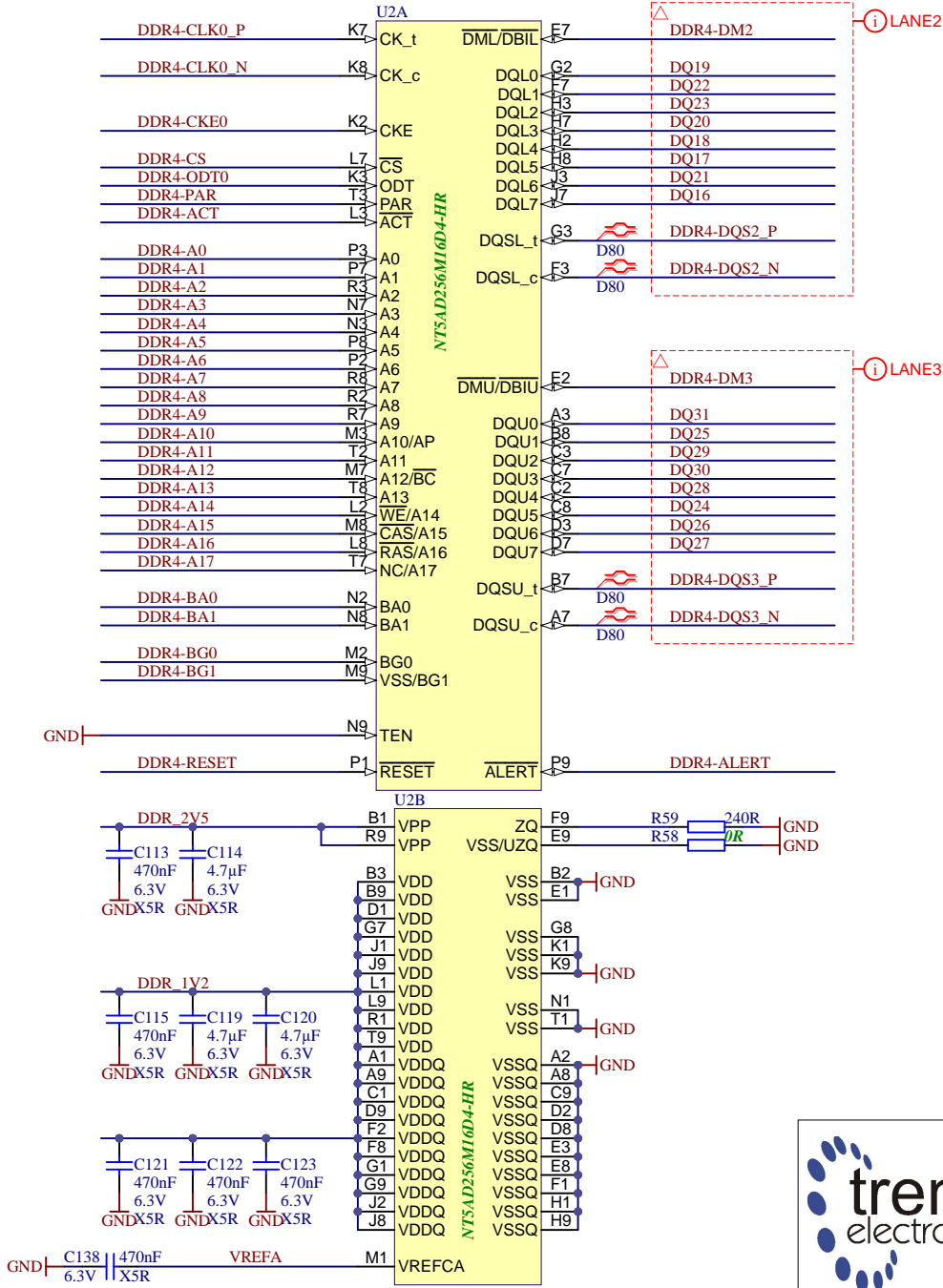
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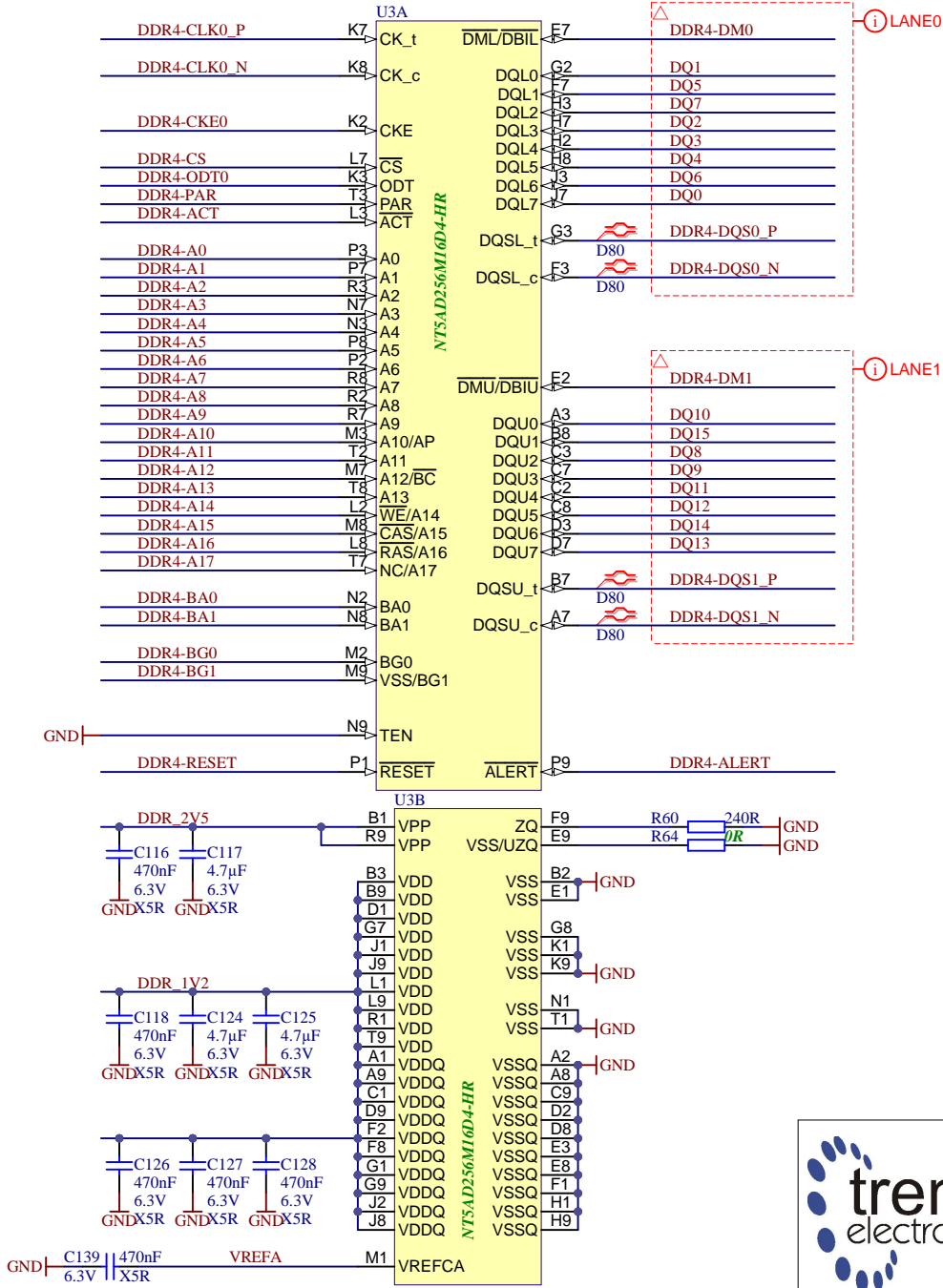
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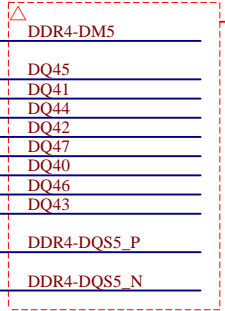
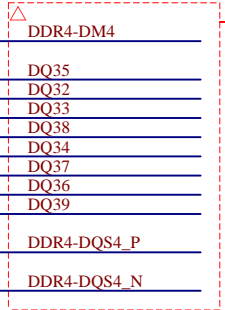
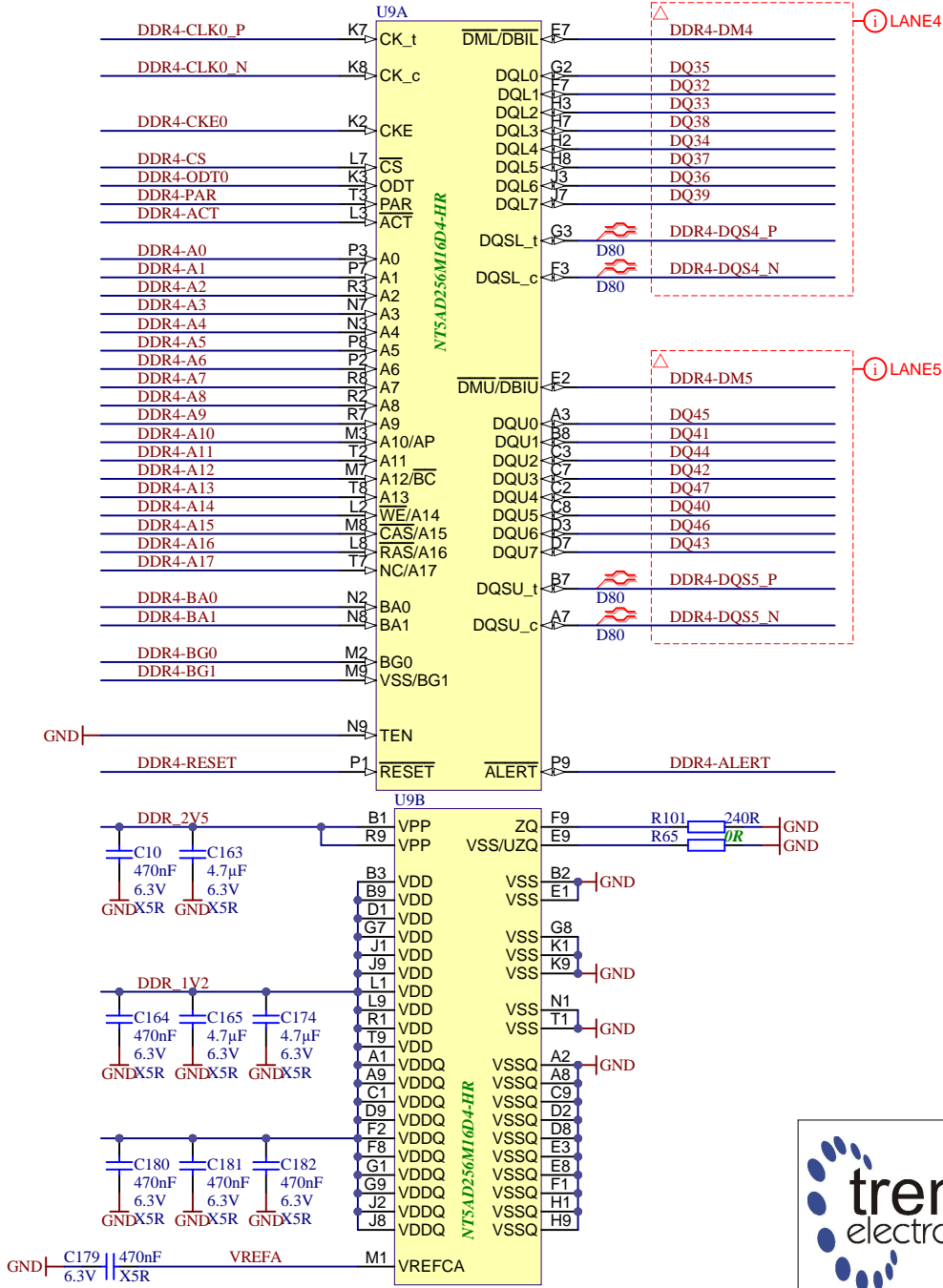
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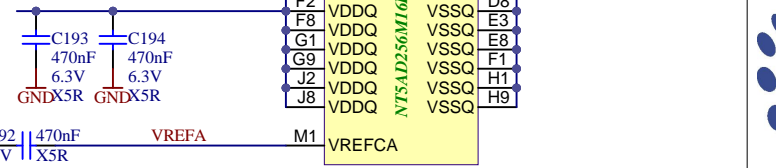
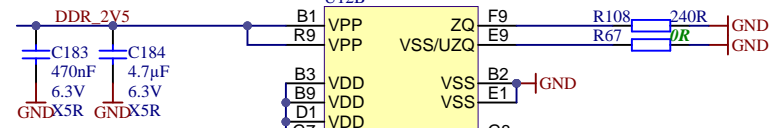
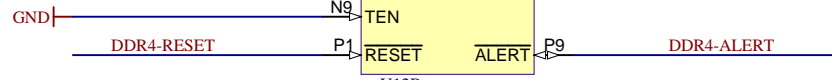
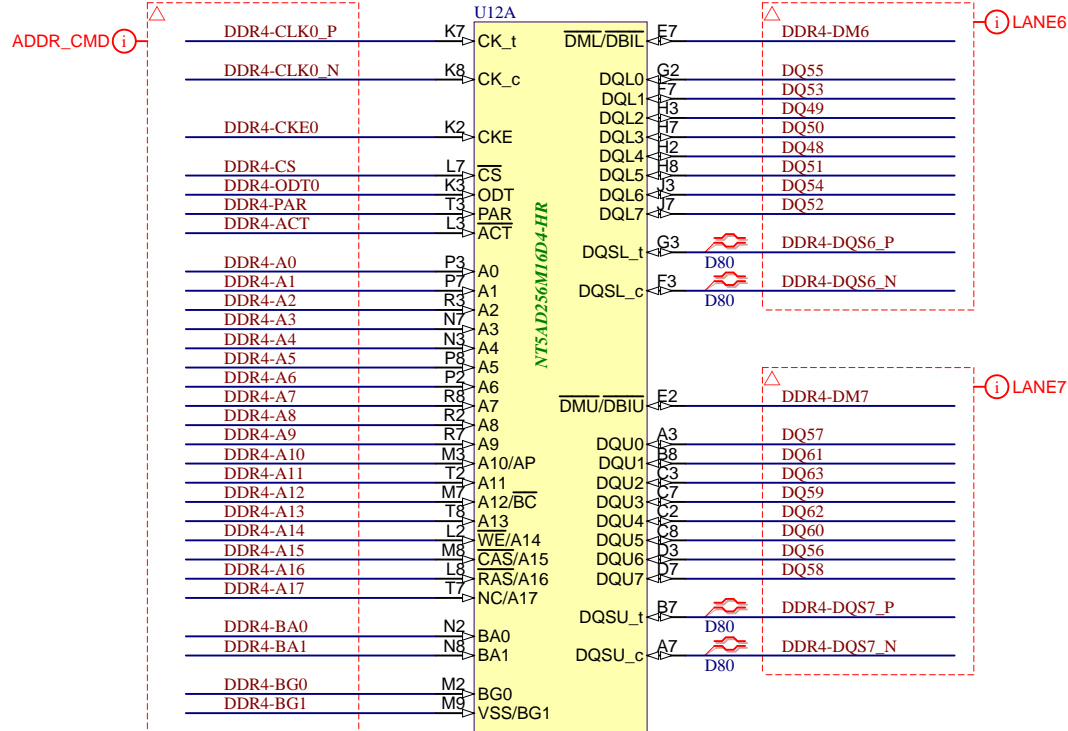
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A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page20 of 30
Filename: DDR4-RAM.SchDoc		



Title: TE0803 - DDR4_2_RAM		
A4	Number: TE0803 5DE11-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 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page22 of 30
Filename: DDR4-RAM_3.SchDoc		



Title: TE0803 - DDR4_4_RAM		
A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 23 of 30
Filename: DDR4-RAM_4.SchDoc		

A

A

B

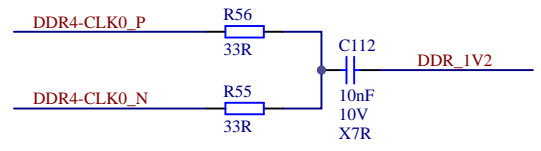
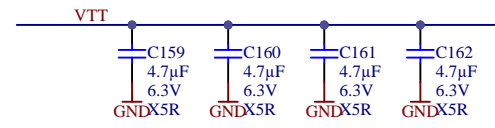
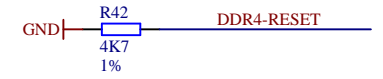
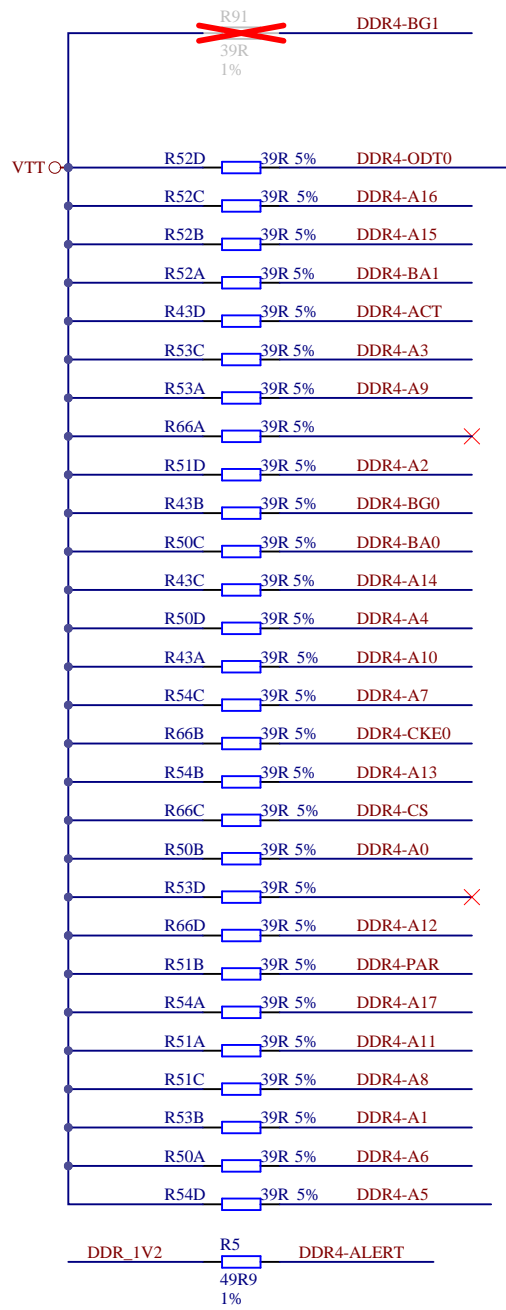
B

C

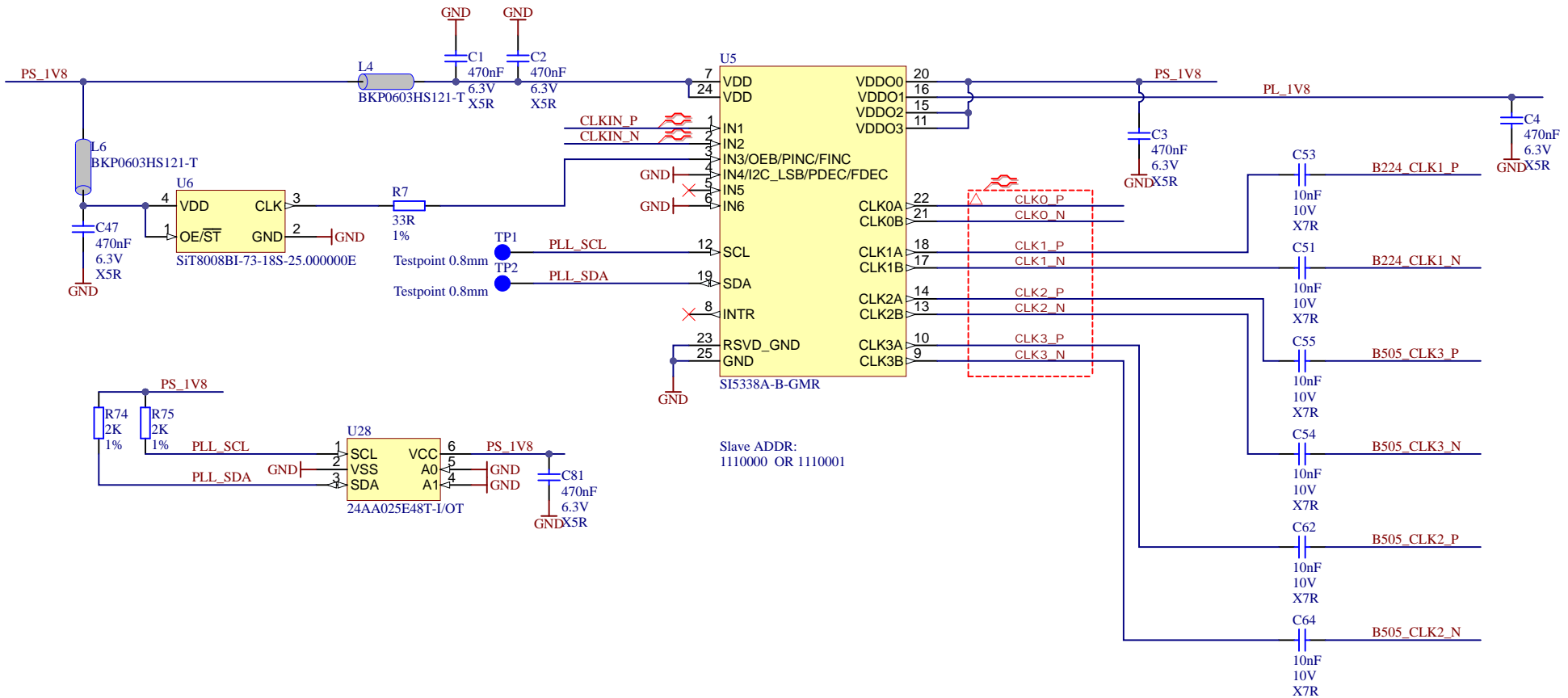
C

D

D



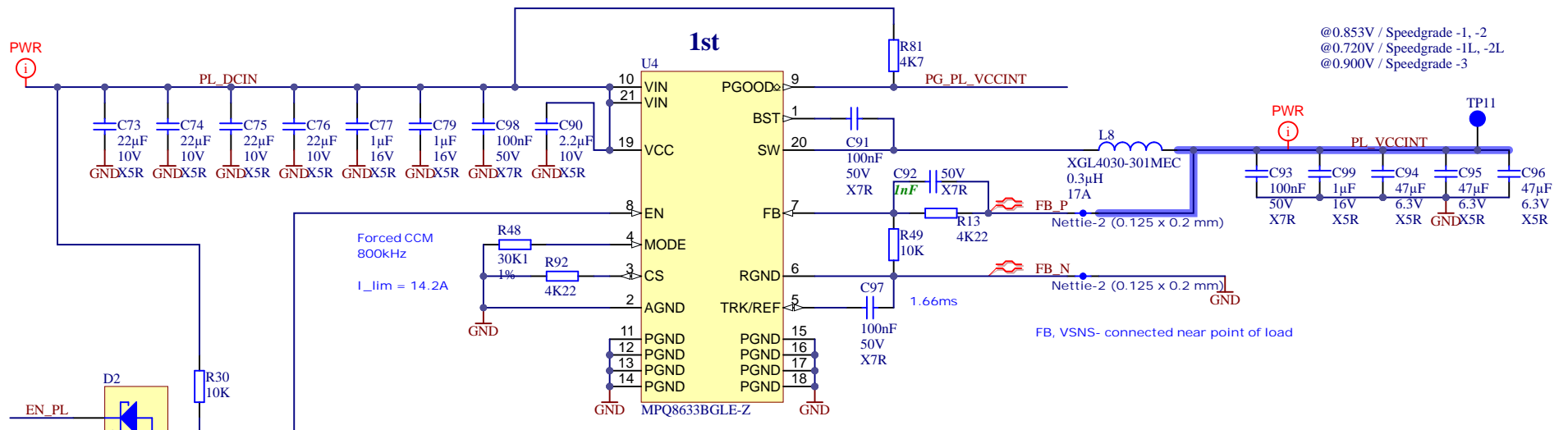
Title: TE0803 - DDR4_TERM		
A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page24 of 30
Filename: DDR4-TERM.SchDoc		



Slave ADDR:
1110000 OR 1110001

	Title: TE0803 - CLOCK		
	A4	Number: TE0803 5DE11-AZ	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 25 of 30
	Filename: Clock.SchDoc		

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 5DE11-AZ
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT
	Filename: POWER.SchDoc	Page 26 of 30

1

2

3

4

A

A

B

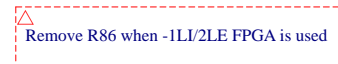
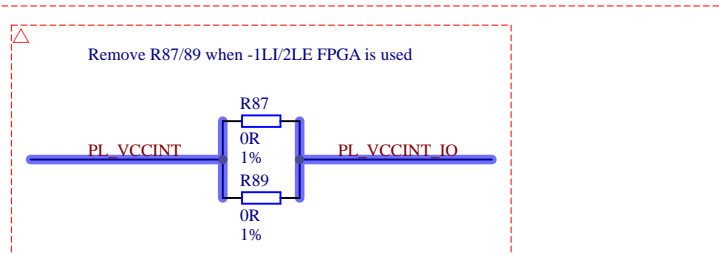
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C

C

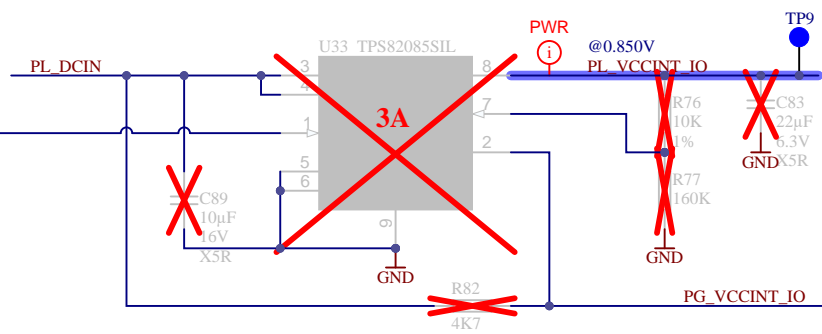
D

D

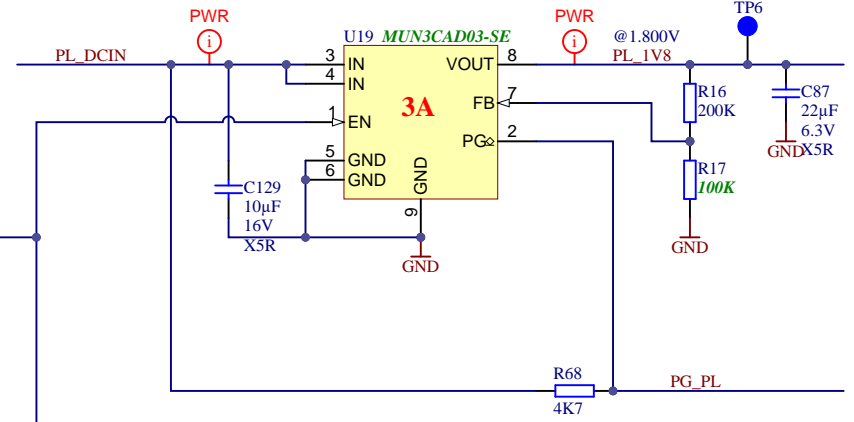


VCCINT_IO & VCCBRAM

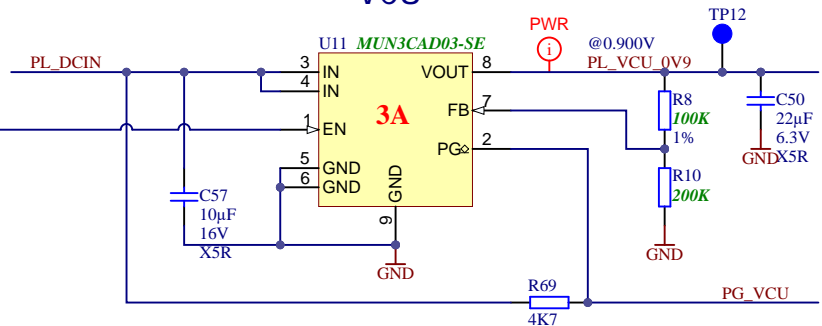
Add U33 when -1L1/2LE FPGA is used



PL VCCIO



VCU



Title: TE0803 - POWER		
A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 27 of 30
Filename: POWER_1.SchDoc		

1

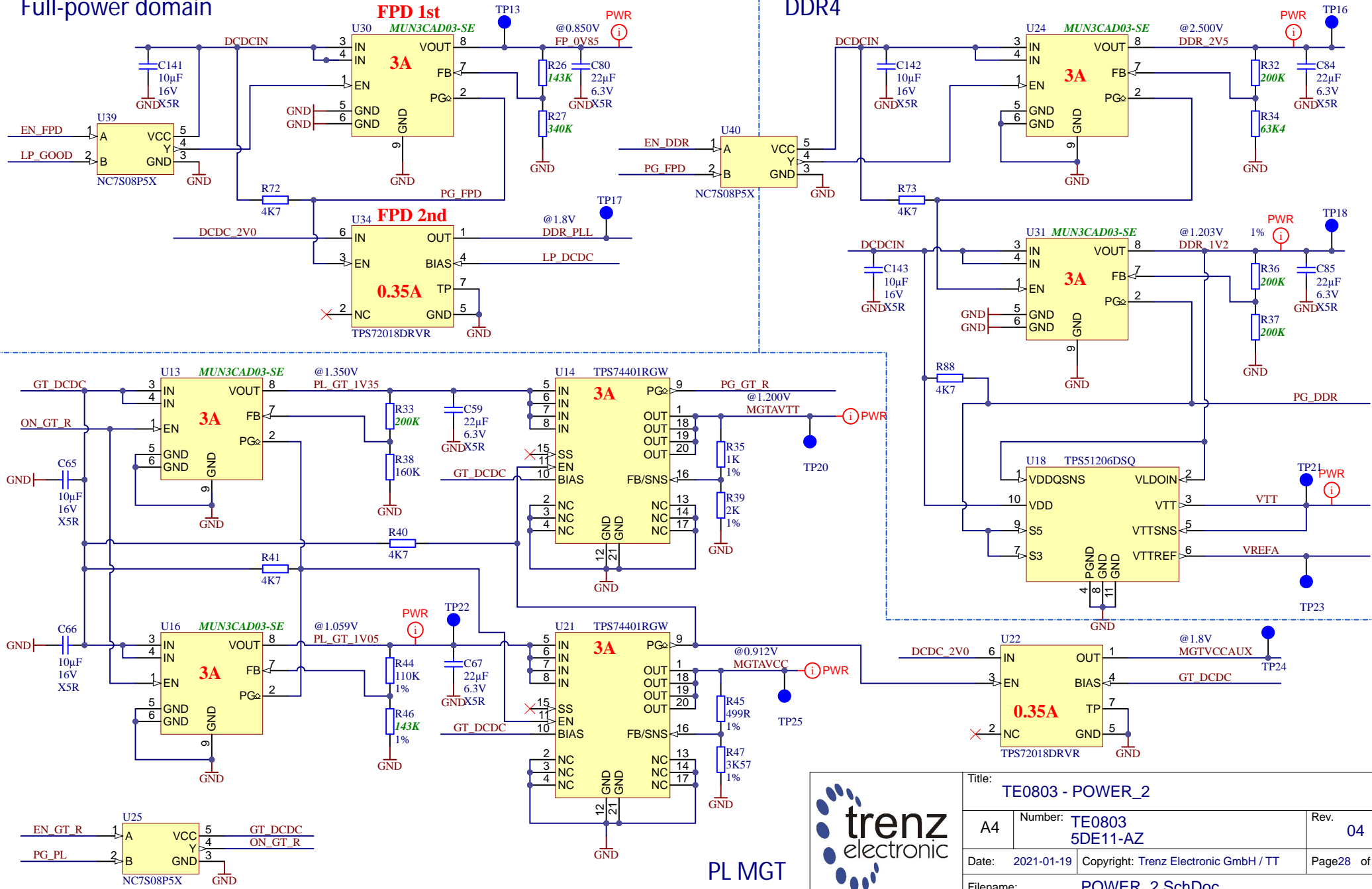
2

3

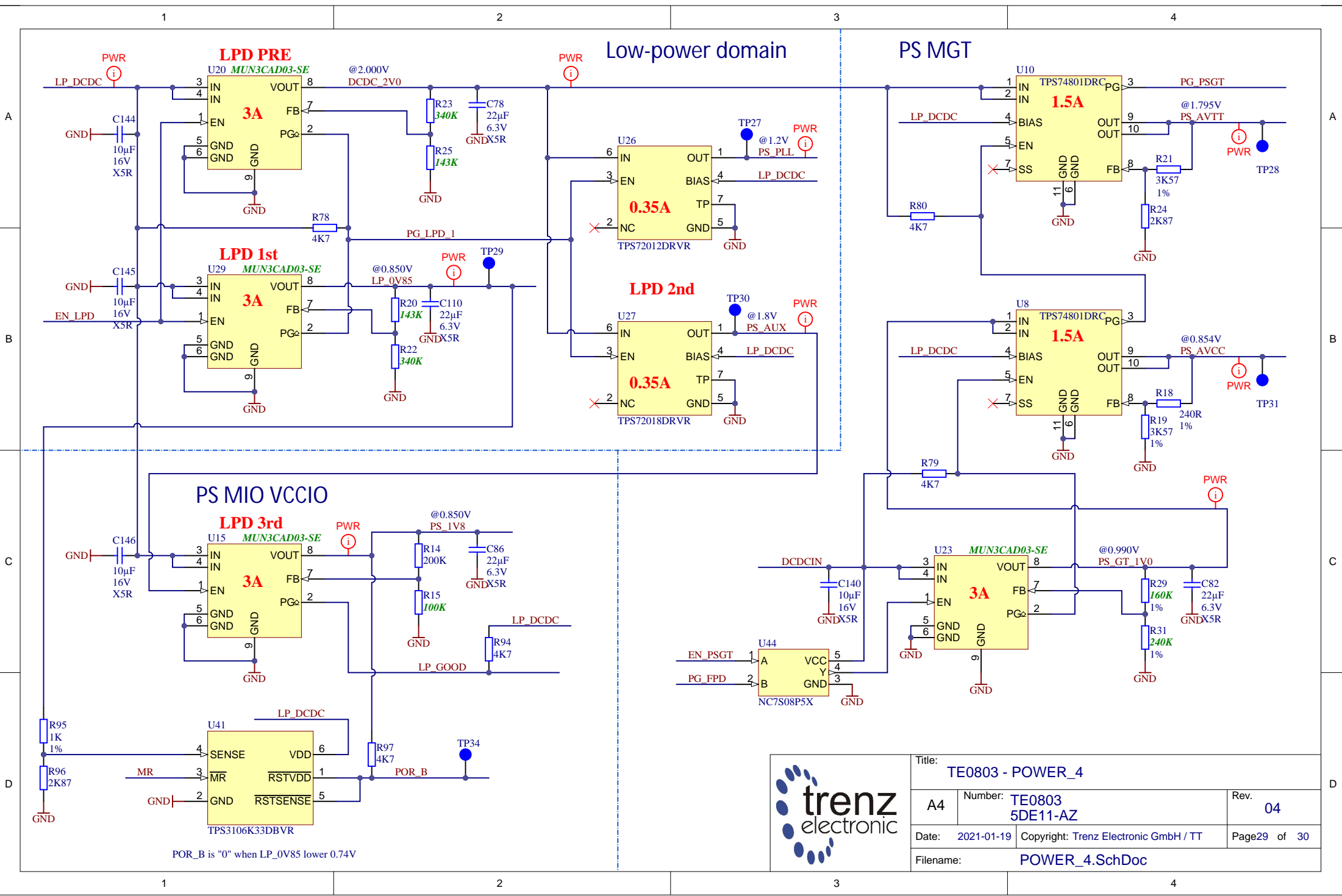
4

Full-power domain

DDR4



Title: TE0803 - POWER_2		
A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 28 of 30
Filename: POWER_2.SchDoc		




POR_B is "0" when LP_0V85 lower 0.74V



Title: TE0803 - POWER_4		
A4	Number: TE0803 5DE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 29 of 30
Filename: POWER_4.SchDoc		

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

		Title: TE0803 - Revision History	
		A4	Number: TE0803 5DE11-AZ
Date: 2021-01-19		Copyright: Trenz Electronic GmbH	
Page 30 of 30		Filename: Revision Changes.SchDoc	
Drawn by: VY			