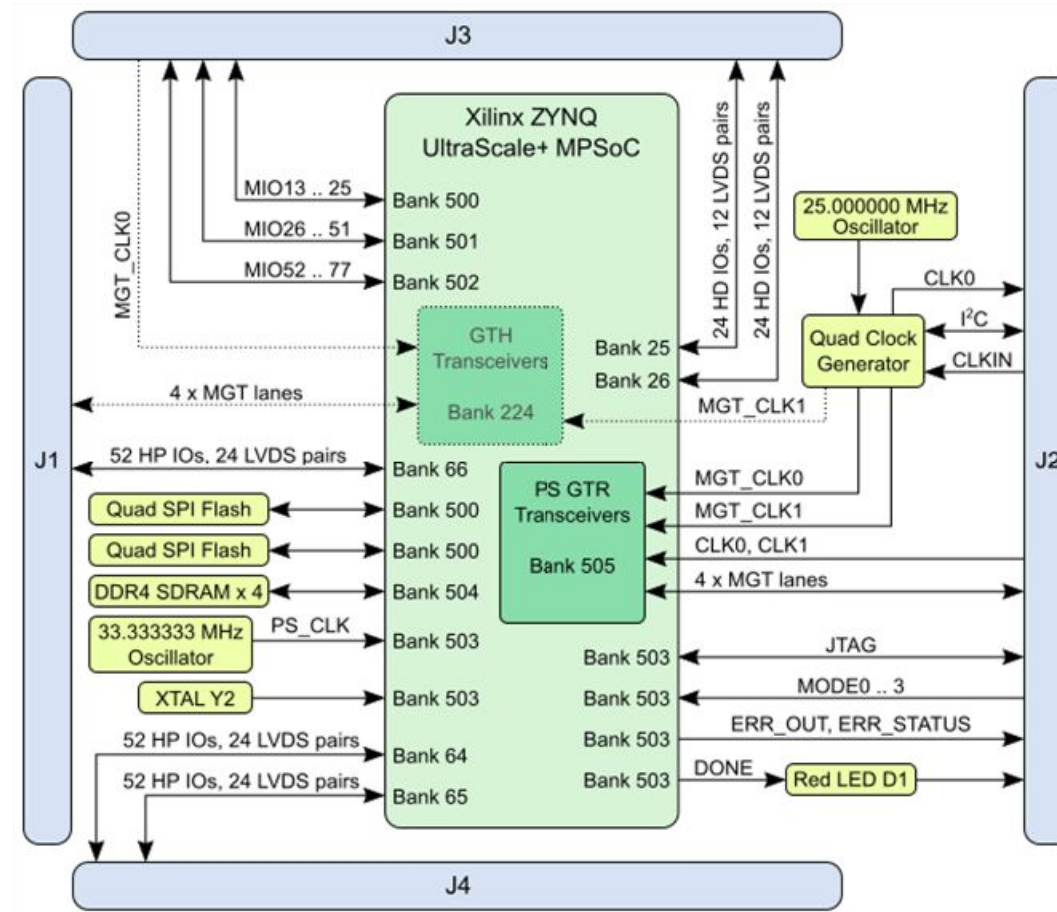



Regarding the usage of our schematics and alike documentation for Trenz module TE0803.

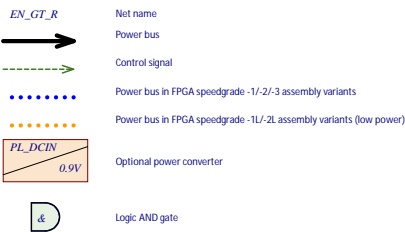
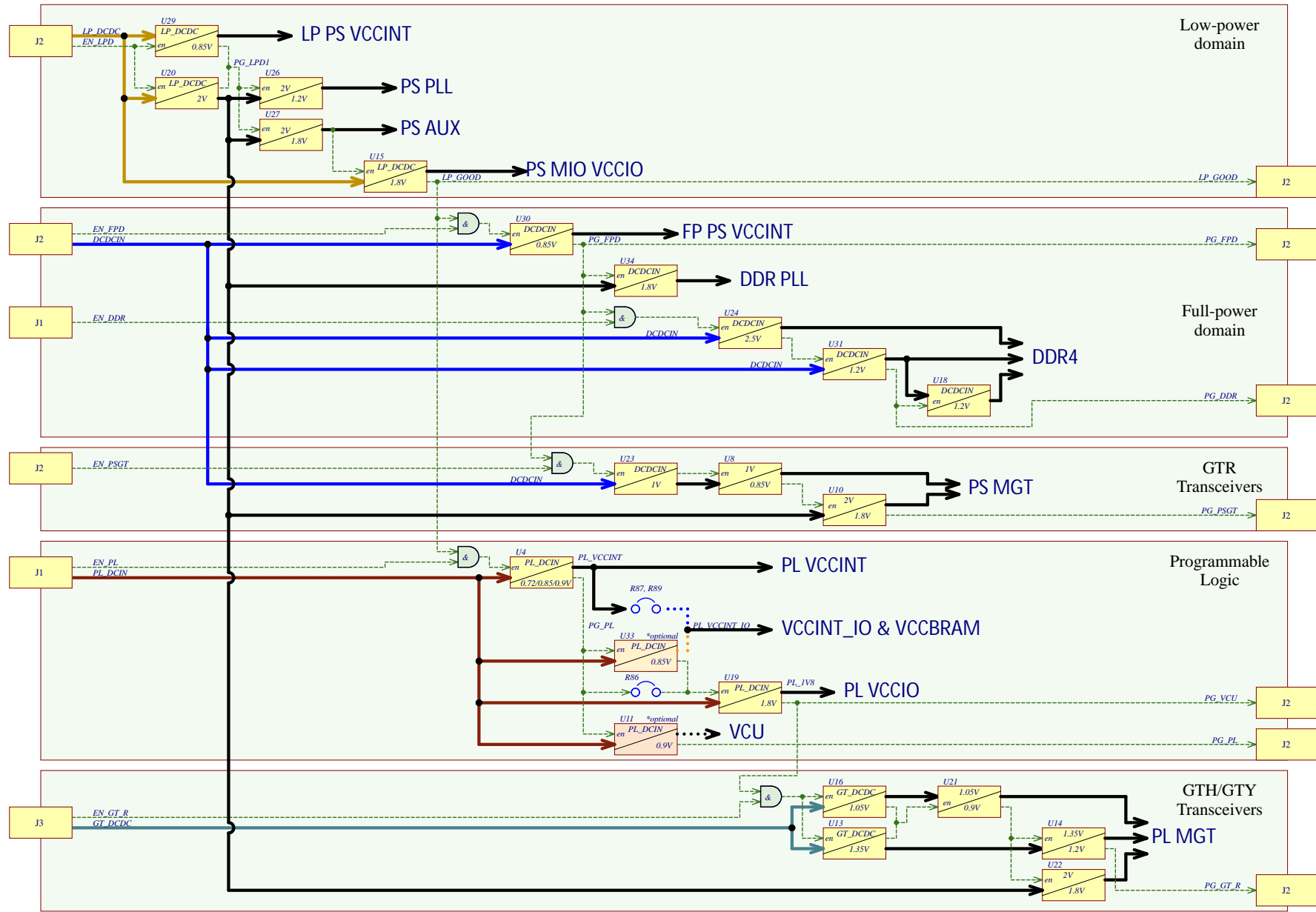
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Schematics and other handouts serve for informational purposes only!

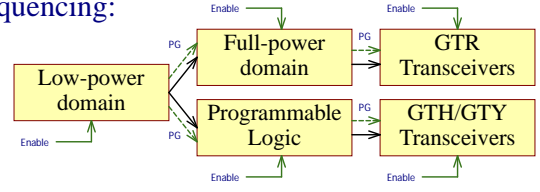
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	A4	Number: TE0803 2BE11-A	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 1 of 30
	Filename: Legal Notices Modules.SchDoc		



		Title: TE0803 - System Overview	
		A4	Number: TE0803 2BE11-A
Date: 2021-01-19		Copyright: 2015 Trenz Electronic GmbH	
Filename: TE0803-Overview.SchDoc		Page 2 of 30	



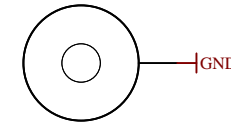
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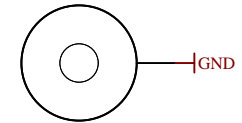
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Datum: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 3 of 30
Filename: Power_Diagram.SchDoc		

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
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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	

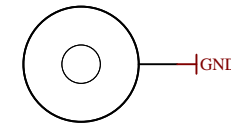
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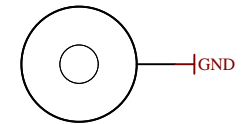
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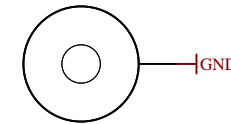
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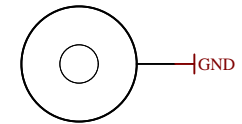
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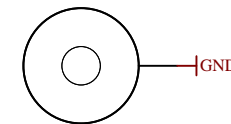
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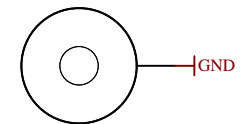
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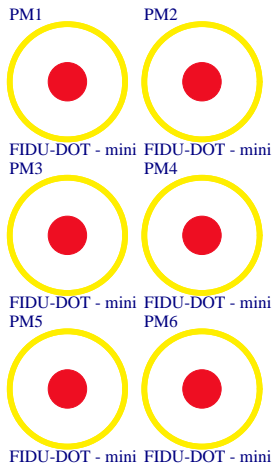
Mount.Hole 3.2mm für Unterlegscheibe



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 2BE11-A

Created by

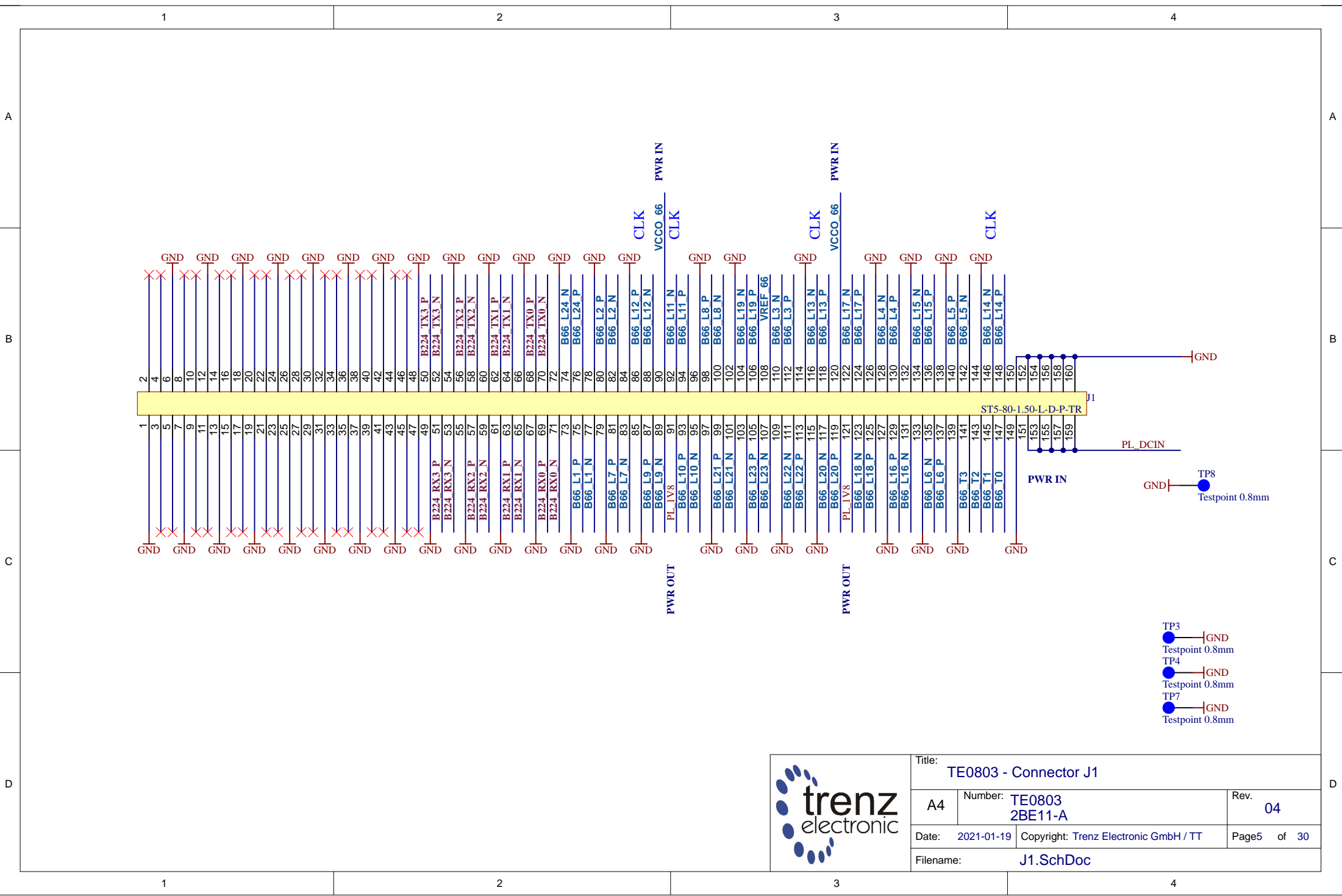
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Modified at

SVN Revision 11196



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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page4 of 30
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A4	Number: TE0803 2BE11-A	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page5 of 30
Filename: J1.SchDoc		

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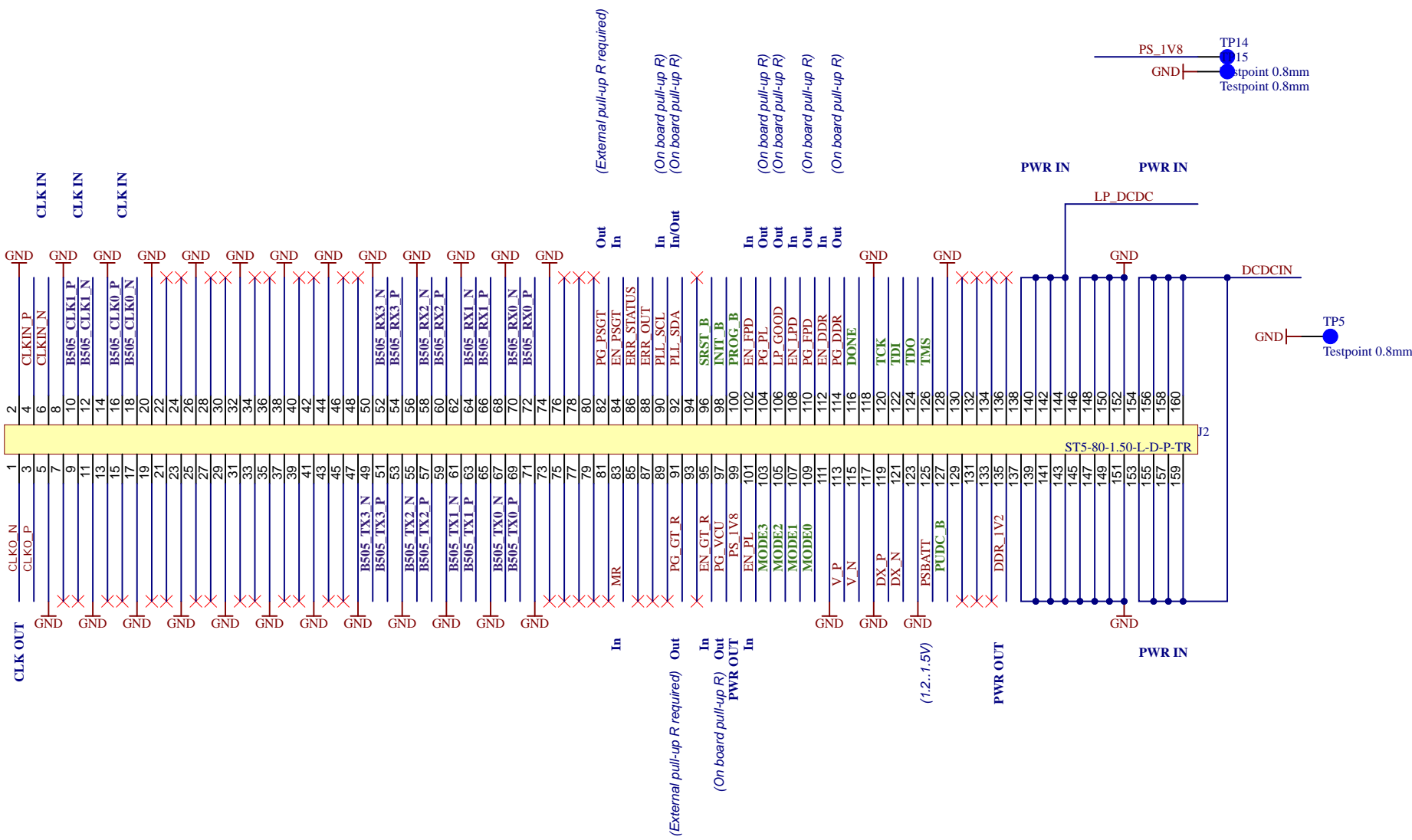
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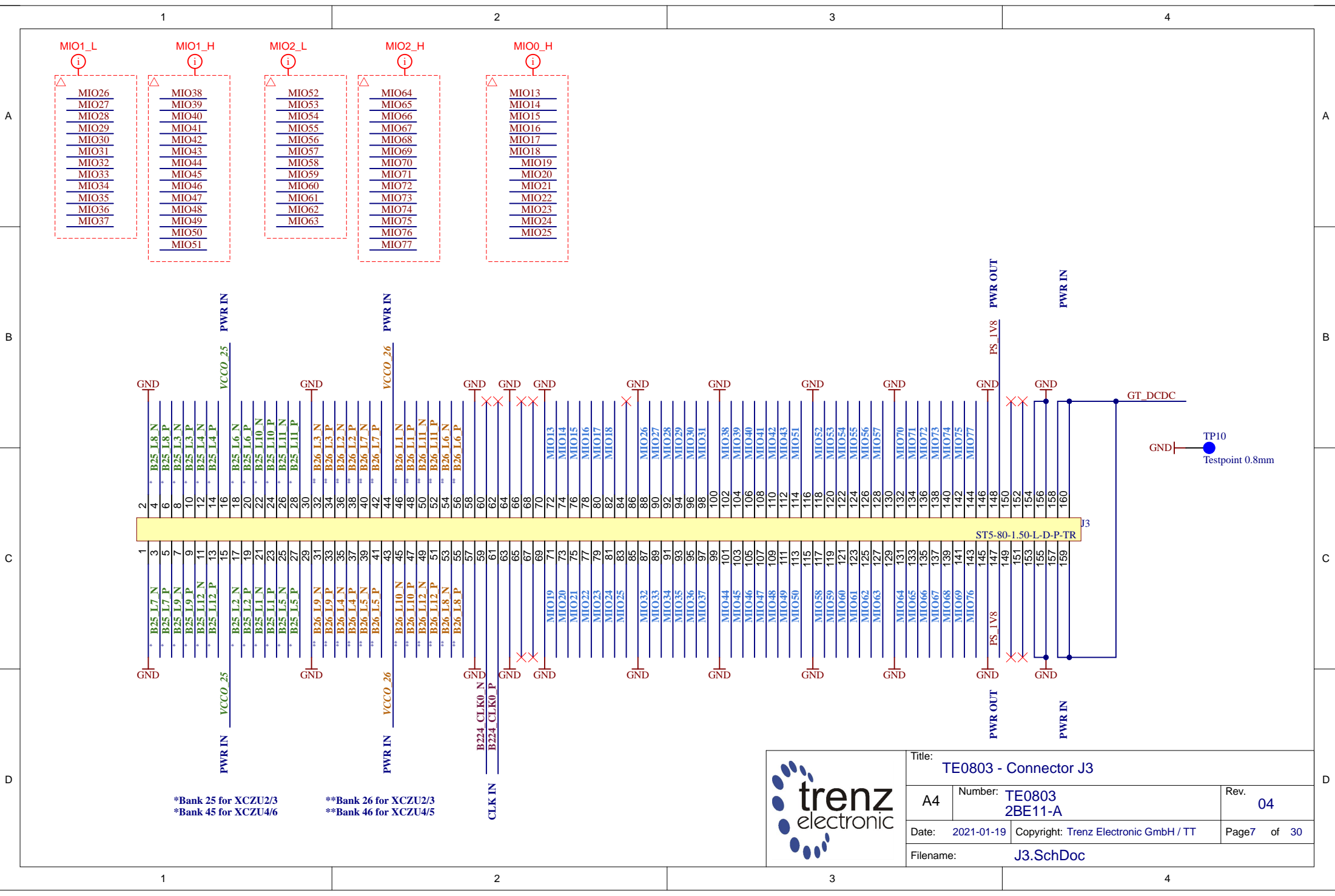
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A4	Number: TE0803 2BE11-A	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 6 of 30
Filename: J2.SchDoc		

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*Bank 25 for XCZU2/3
 *Bank 45 for XCZU4/6

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



Title: TE0803 - Connector J3		
A4	Number: TE0803 2BE11-A	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 7 of 30
Filename: J3.SchDoc		

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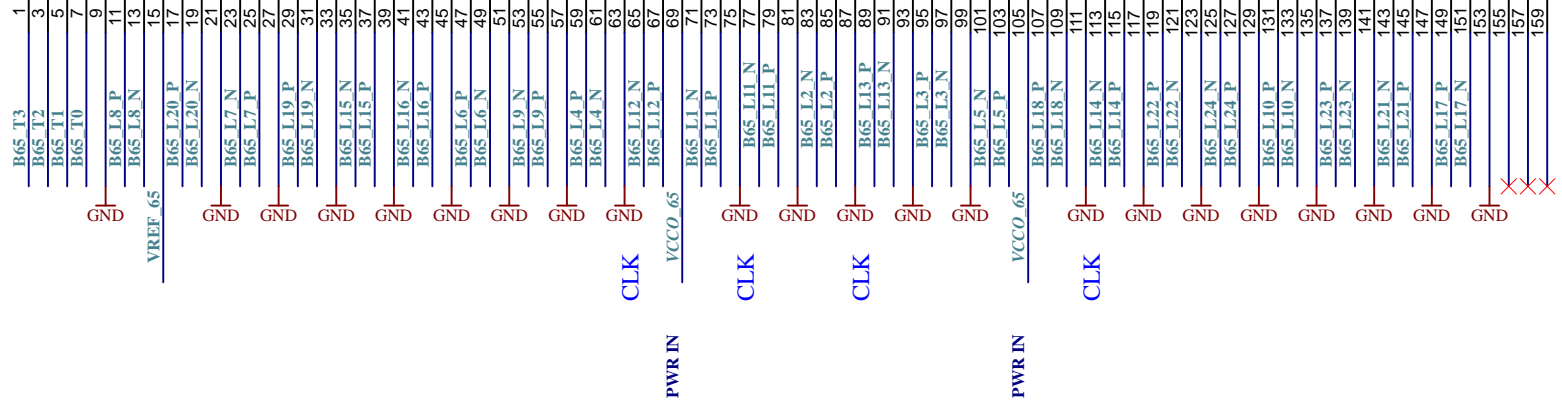
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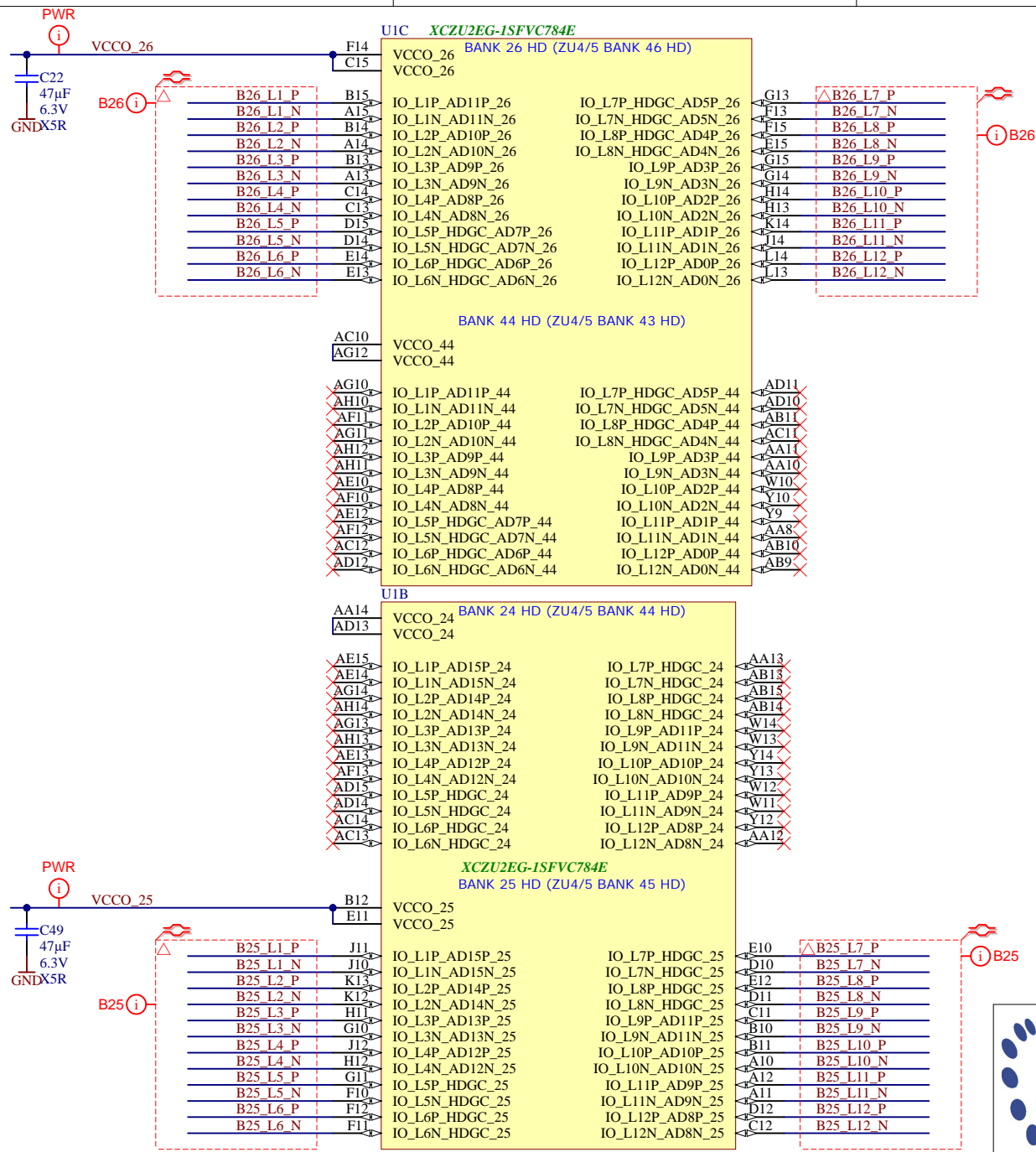
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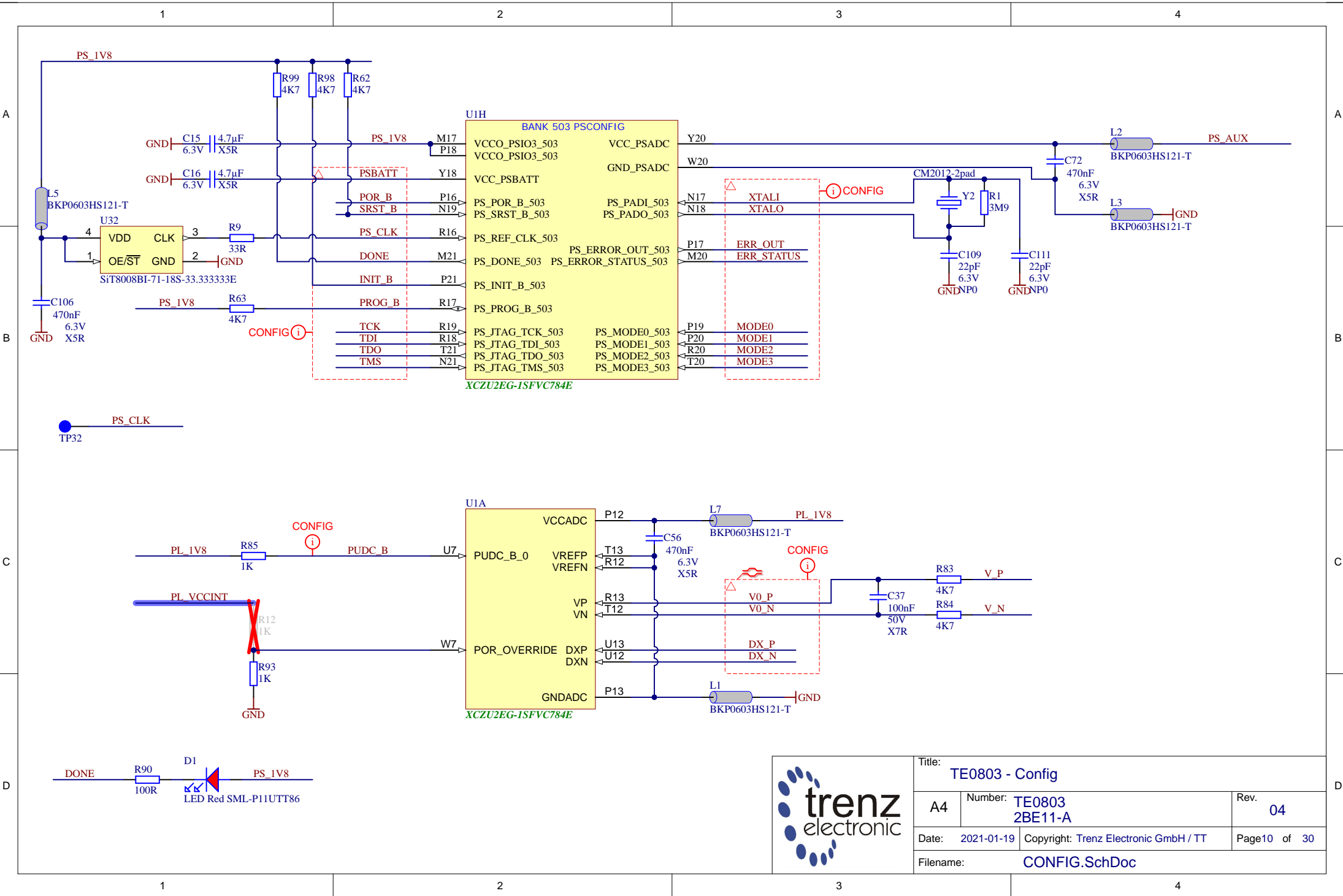
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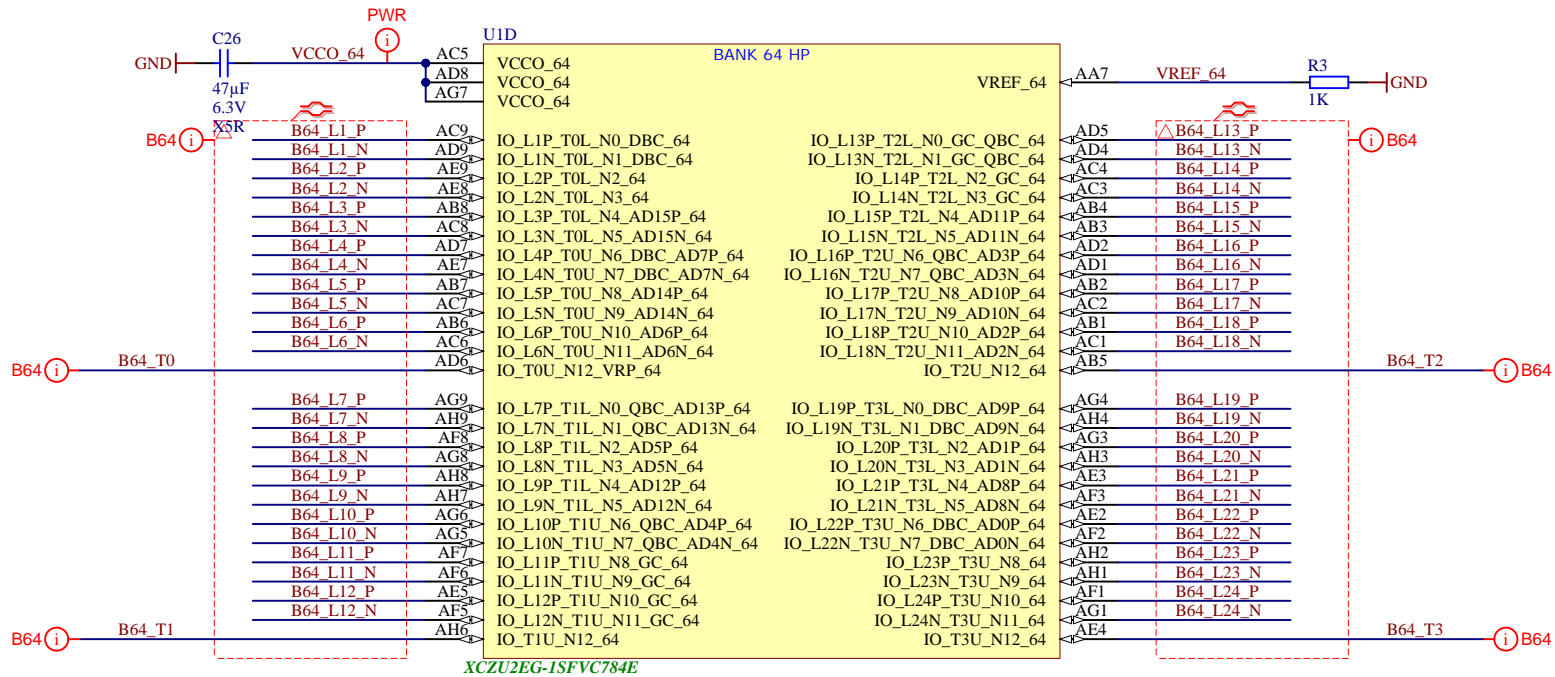
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page8 of 30
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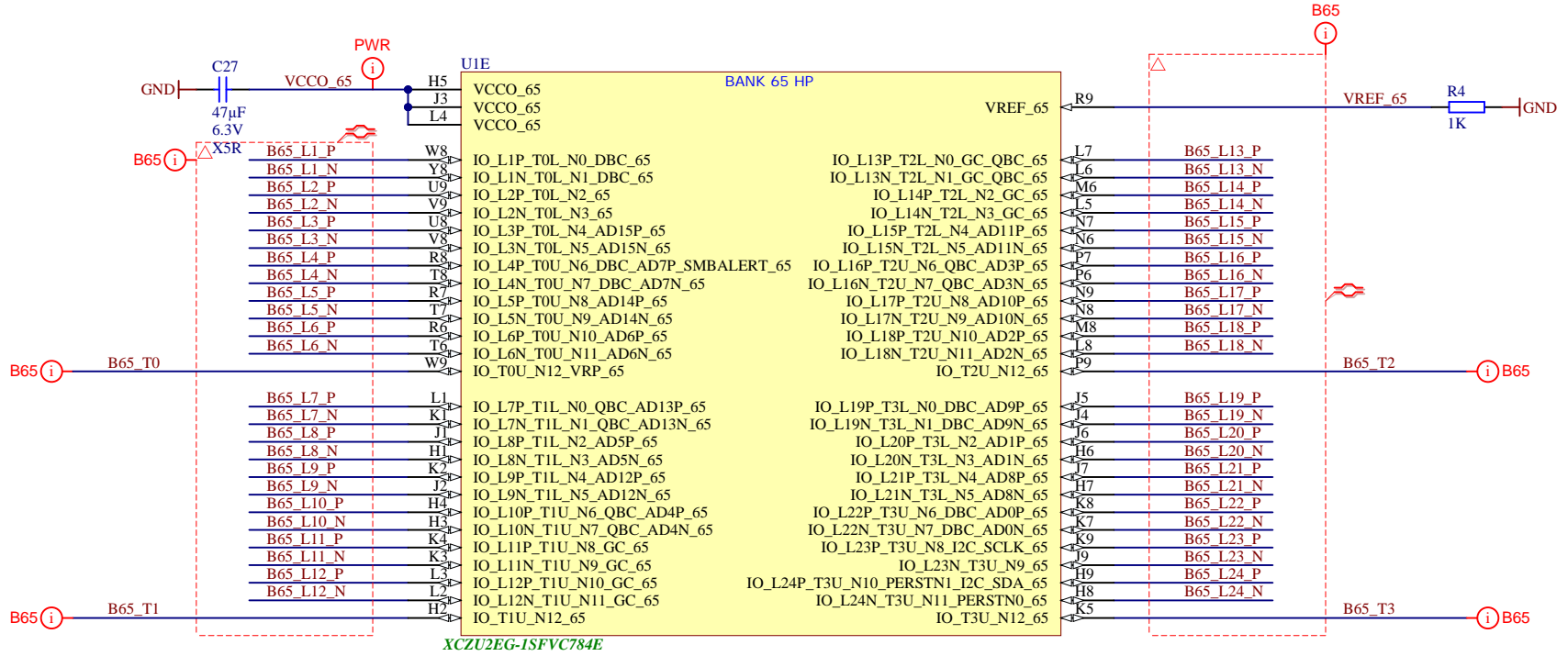
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page9 of 30
Filename: B_HD.SchDoc		



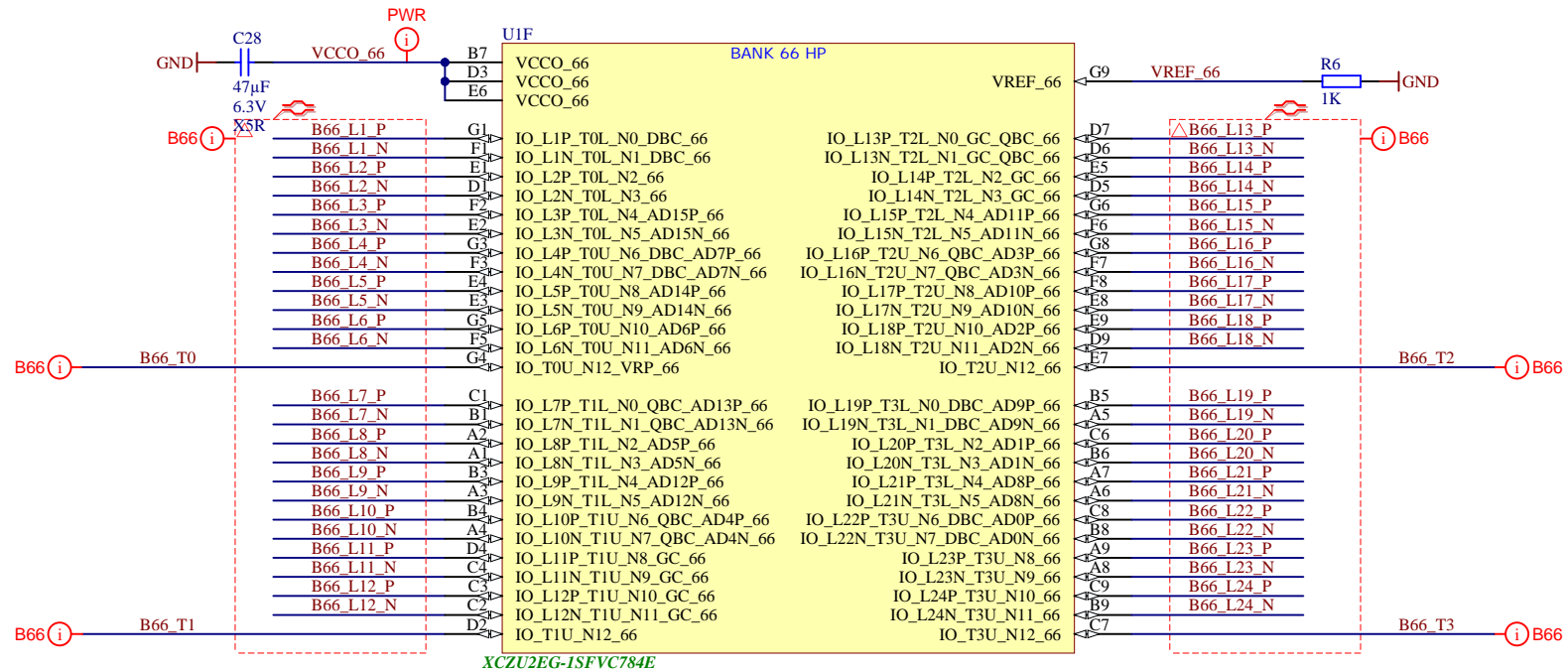
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 10 of 30
Filename: CONFIG.SchDoc		



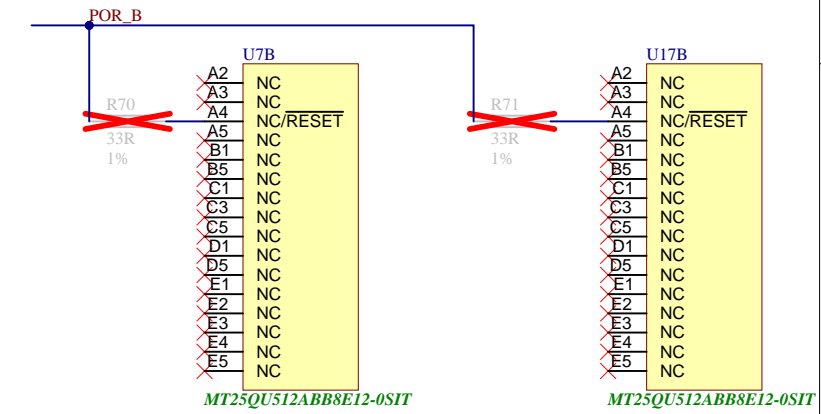
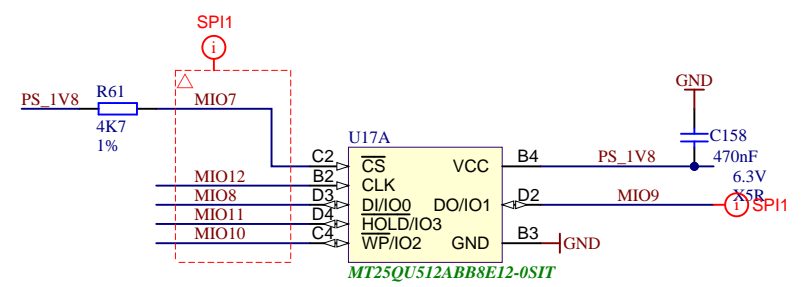
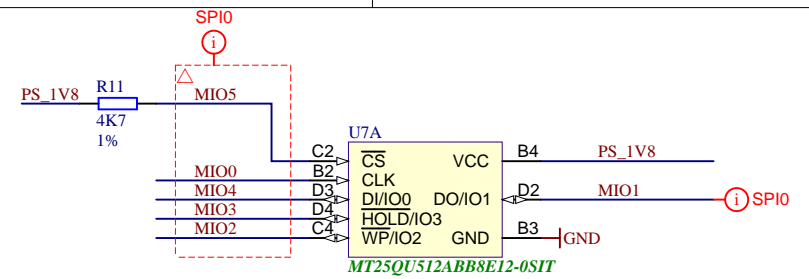
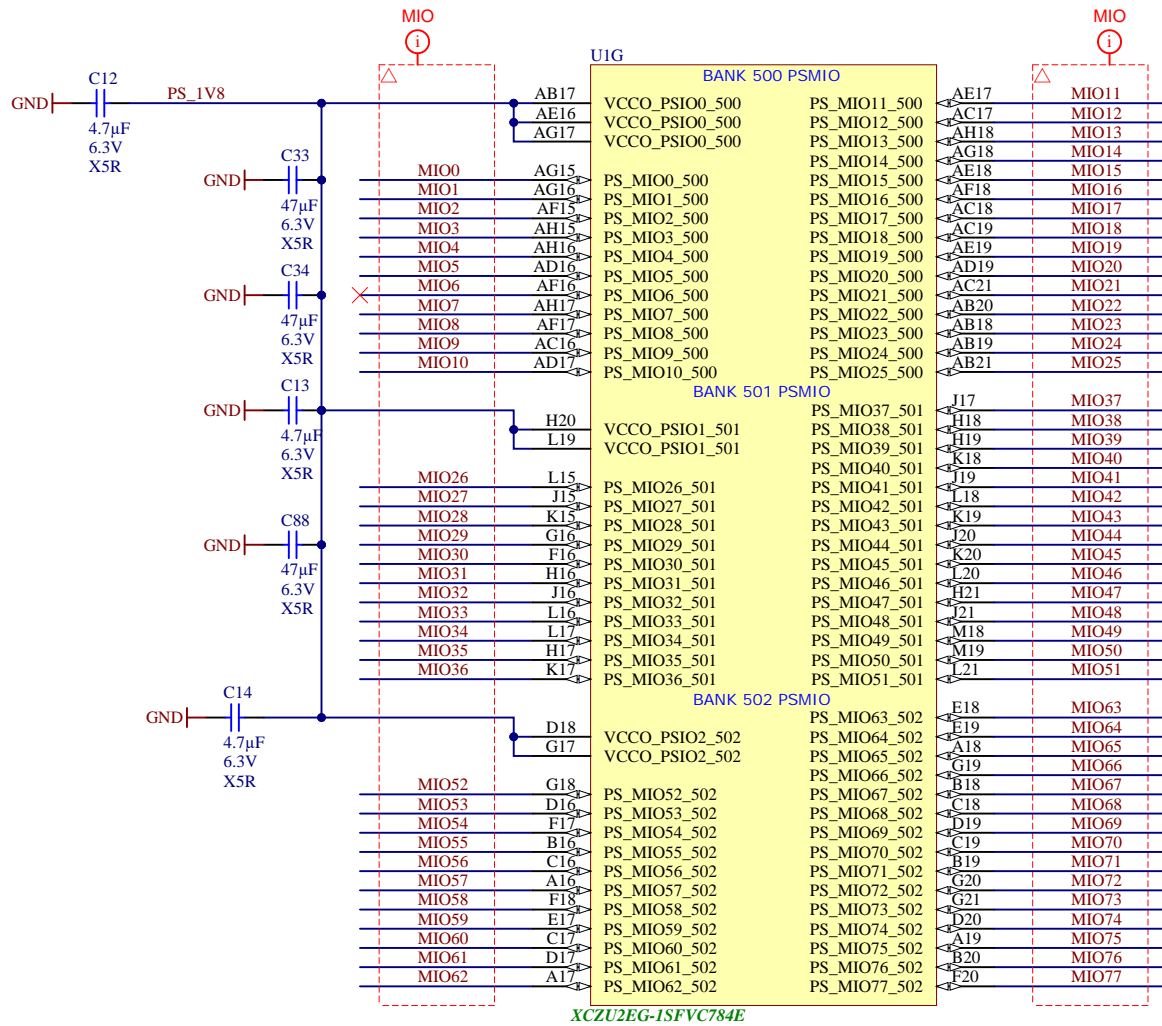
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 11 of 30
Filename: B64.SchDoc		



Title: TE0803 - B65		
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Filename: B65.SchDoc		



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	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 13 of 30
	Filename: B66.SchDoc		



	Title: TE0803 - MIO Banks		
	A4	Number: TE0803 2BE11-A	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 14 of 30
	Filename: B_MIO.SchDoc		

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C

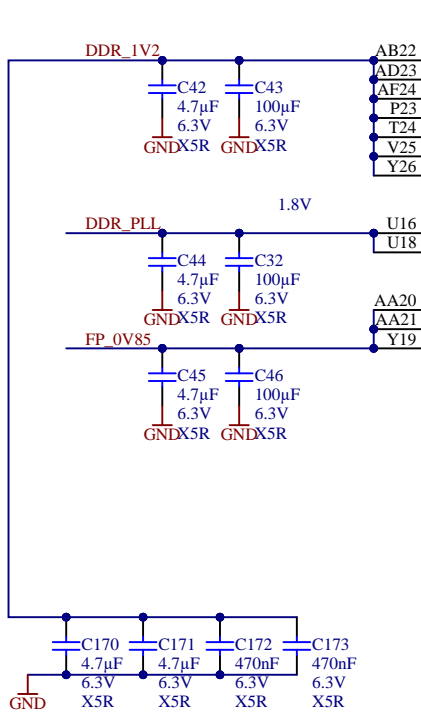
D

A

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U1I		BANK 504 PSDDR	
VCCO_PSDDR_504	PS_DDR_CK0_504	W25	DDR4-CLK0_P
VCCO_PSDDR_504	PS_DDR_CK_N0_504	W26	DDR4-CLK0_N
VCCO_PSDDR_504	PS_DDR_CKE0_504	V28	DDR4-CKE0
VCCO_PSDDR_504	PS_DDR_CK1_504	Y24	
VCCO_PSDDR_504	PS_DDR_CK_N1_504	Y25	
VCCO_PSDDR_504	PS_DDR_CKE1_504	V27	
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_PSDDR_PLL	PS_DDR_A5_504	AA27	DDR4-A5
VCC_PSDDR_PLL	PS_DDR_A6_504	Y22	DDR4-A6
VCC_PSDDR_PLL	PS_DDR_A7_504	AA23	DDR4-A7
VCC_PSDDR_PLL	PS_DDR_A8_504	AA22	DDR4-A8
VCC_PSDDR_PLL	PS_DDR_A9_504	AB23	DDR4-A9
VCC_PSDDR_PLL	PS_DDR_A10_504	AA25	DDR4-A10
VCC_PSDDR_PLL	PS_DDR_A11_504	AA26	DDR4-A11
VCC_PSDDR_PLL	PS_DDR_A12_504	AB25	DDR4-A12
VCC_PSDDR_PLL	PS_DDR_A13_504	AB26	DDR4-A13
VCC_PSDDR_PLL	PS_DDR_A14_504	AB24	DDR4-A14
VCC_PSDDR_PLL	PS_DDR_A15_504	AC24	DDR4-A15
VCC_PSDDR_PLL	PS_DDR_A16_504	AC23	DDR4-A16
VCC_PSDDR_PLL	PS_DDR_A17_504	AC22	DDR4-A17
PS_DDR_CS_N0_504		W27	DDR4-CS
PS_DDR_CS_N1_504		V26	
PS_DDR_BA0_504		V23	DDR4-BA0
PS_DDR_BA1_504		W22	DDR4-BA1
PS_DDR_BG0_504		W24	DDR4-BG0
PS_DDR_BG1_504		V22	DDR4-BG1
PS_DDR_PARITY_504		V24	DDR4-PAR
PS_DDR_RAM_RST_N_504		U23	DDR4-RESET
PS_DDR_ACT_N_504		Y23	DDR4-ACT
PS_DDR_ALERT_N_504		U25	DDR4-ALERT
PS_DDR_ZQ_504		U24	
PS_DDR_ODT0_504		U28	DDR4-ODT0
PS_DDR_ODT1_504		U26	

XCZU2EG-1SFVC784E

U1J		BANK 504 PSDDR	
DQ0	AD21	PS_DDR_DQ0_504	PS_DDR_DQ32_504
DQ1	AE20	PS_DDR_DQ1_504	PS_DDR_DQ33_504
DQ2	AD20	PS_DDR_DQ2_504	PS_DDR_DQ34_504
DQ3	AF20	PS_DDR_DQ3_504	PS_DDR_DQ35_504
DQ4	AH21	PS_DDR_DQ4_504	PS_DDR_DQ36_504
DQ5	AH20	PS_DDR_DQ5_504	PS_DDR_DQ37_504
DQ6	AH19	PS_DDR_DQ6_504	PS_DDR_DQ38_504
DQ7	AG19	PS_DDR_DQ7_504	PS_DDR_DQ39_504
DQ8	AF22	PS_DDR_DQ8_504	PS_DDR_DQ40_504
DQ9	AH22	PS_DDR_DQ9_504	PS_DDR_DQ41_504
DQ10	AE22	PS_DDR_DQ10_504	PS_DDR_DQ42_504
DQ11	AD23	PS_DDR_DQ11_504	PS_DDR_DQ43_504
DQ12	AH23	PS_DDR_DQ12_504	PS_DDR_DQ44_504
DQ13	AH24	PS_DDR_DQ13_504	PS_DDR_DQ45_504
DQ14	AE24	PS_DDR_DQ14_504	PS_DDR_DQ46_504
DQ15	AG24	PS_DDR_DQ15_504	PS_DDR_DQ47_504
DQ16	AC26	PS_DDR_DQ16_504	PS_DDR_DQ48_504
DQ17	AD26	PS_DDR_DQ17_504	PS_DDR_DQ49_504
DQ18	AD25	PS_DDR_DQ18_504	PS_DDR_DQ50_504
DQ19	AD24	PS_DDR_DQ19_504	PS_DDR_DQ51_504
DQ20	AG26	PS_DDR_DQ20_504	PS_DDR_DQ52_504
DQ21	AH25	PS_DDR_DQ21_504	PS_DDR_DQ53_504
DQ22	AH26	PS_DDR_DQ22_504	PS_DDR_DQ54_504
DQ23	AG25	PS_DDR_DQ23_504	PS_DDR_DQ55_504
DQ24	AH27	PS_DDR_DQ24_504	PS_DDR_DQ56_504
DQ25	AH28	PS_DDR_DQ25_504	PS_DDR_DQ57_504
DQ26	AF28	PS_DDR_DQ26_504	PS_DDR_DQ58_504
DQ27	AG28	PS_DDR_DQ27_504	PS_DDR_DQ59_504
DQ28	AC27	PS_DDR_DQ28_504	PS_DDR_DQ60_504
DQ29	AD27	PS_DDR_DQ29_504	PS_DDR_DQ61_504
DQ30	AD28	PS_DDR_DQ30_504	PS_DDR_DQ62_504
DQ31	AC28	PS_DDR_DQ31_504	PS_DDR_DQ63_504
DDR4-DQS0_P	AF21	PS_DDR_DQS_P0_504	PS_DDR_DQ64_504
DDR4-DQS0_N	AG21	PS_DDR_DQS_N0_504	PS_DDR_DQ65_504
DDR4-DQS1_P	AF23	PS_DDR_DQS_P1_504	PS_DDR_DQ66_504
DDR4-DQS1_N	AG23	PS_DDR_DQS_N1_504	PS_DDR_DQ67_504
DDR4-DQS2_P	AF25	PS_DDR_DQS_P2_504	PS_DDR_DQ68_504
DDR4-DQS2_N	AF26	PS_DDR_DQS_N2_504	PS_DDR_DQ69_504
DDR4-DQS3_P	AE27	PS_DDR_DQS_P3_504	PS_DDR_DQ70_504
DDR4-DQS3_N	AF27	PS_DDR_DQS_N3_504	PS_DDR_DQ71_504
DDR4-DQS4_P	N23	PS_DDR_DQS_P4_504	PS_DDR_DM0_504
DDR4-DQS4_N	M23	PS_DDR_DQS_N4_504	PS_DDR_DM1_504
DDR4-DQS5_P	L23	PS_DDR_DQS_P5_504	PS_DDR_DM2_504
DDR4-DQS5_N	K23	PS_DDR_DQS_N5_504	PS_DDR_DM3_504
DDR4-DQS6_P	N26	PS_DDR_DQS_P6_504	PS_DDR_DM4_504
DDR4-DQS6_N	N27	PS_DDR_DQS_N6_504	PS_DDR_DM5_504
DDR4-DQS7_P	J26	PS_DDR_DQS_P7_504	PS_DDR_DM6_504
DDR4-DQS7_N	J27	PS_DDR_DQS_N7_504	PS_DDR_DM7_504
	R27	PS_DDR_DQS_P8_504	PS_DDR_DM8_504
	T27	PS_DDR_DQS_N8_504	

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Title: TE0803 - PS_DDR		
A4	Number: TE0803 2BE11-A	Rev. 04
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Filename: PS_DDR.SchDoc		

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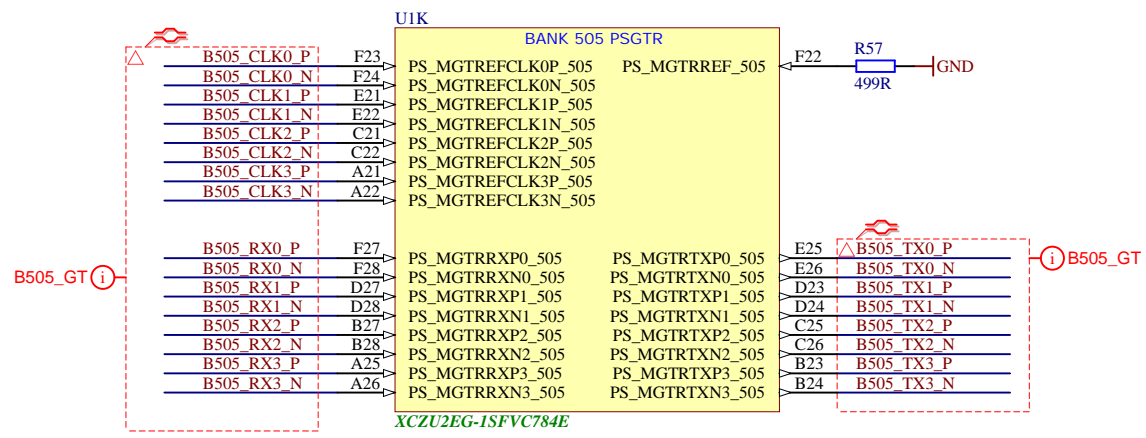
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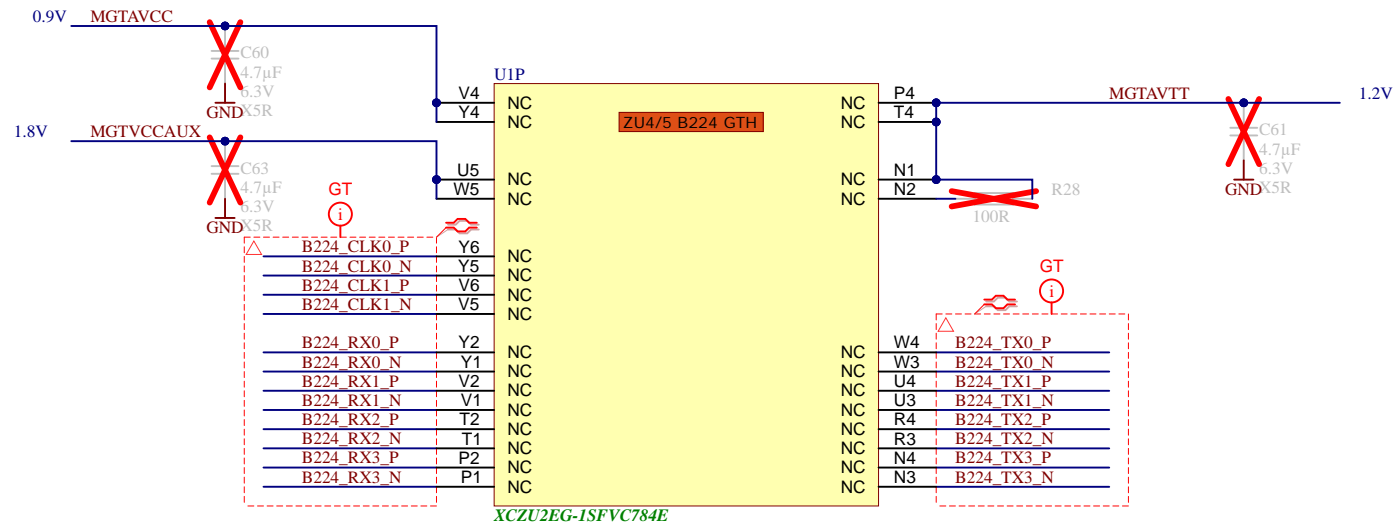
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A4	Number: TE0803 2BE11-A	Rev. 04
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Filename: B_PS_GT.SchDoc		

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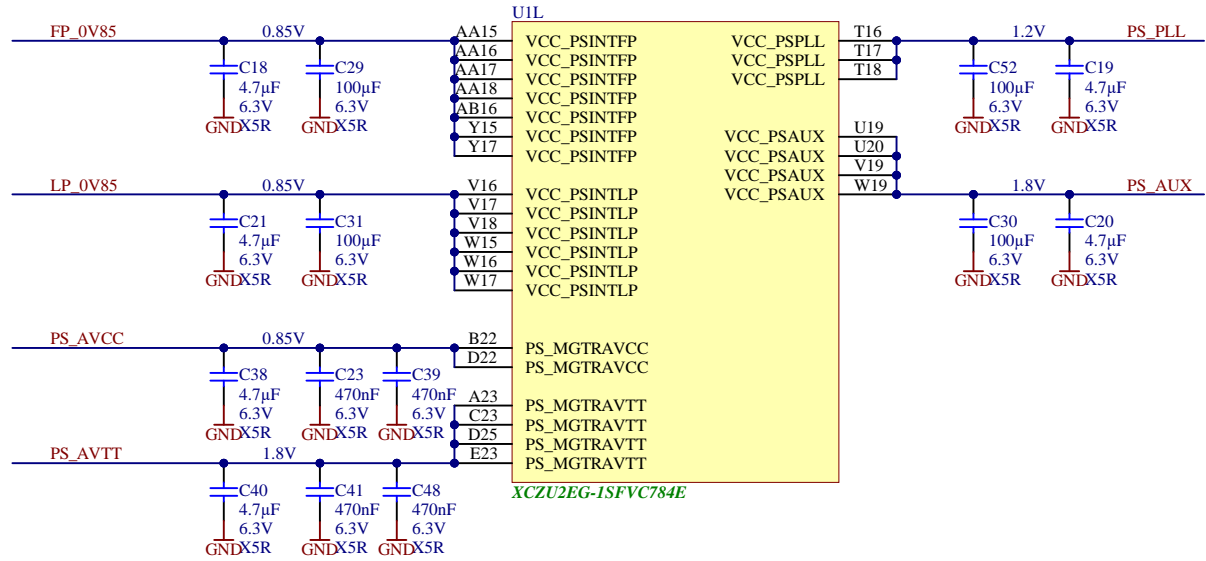
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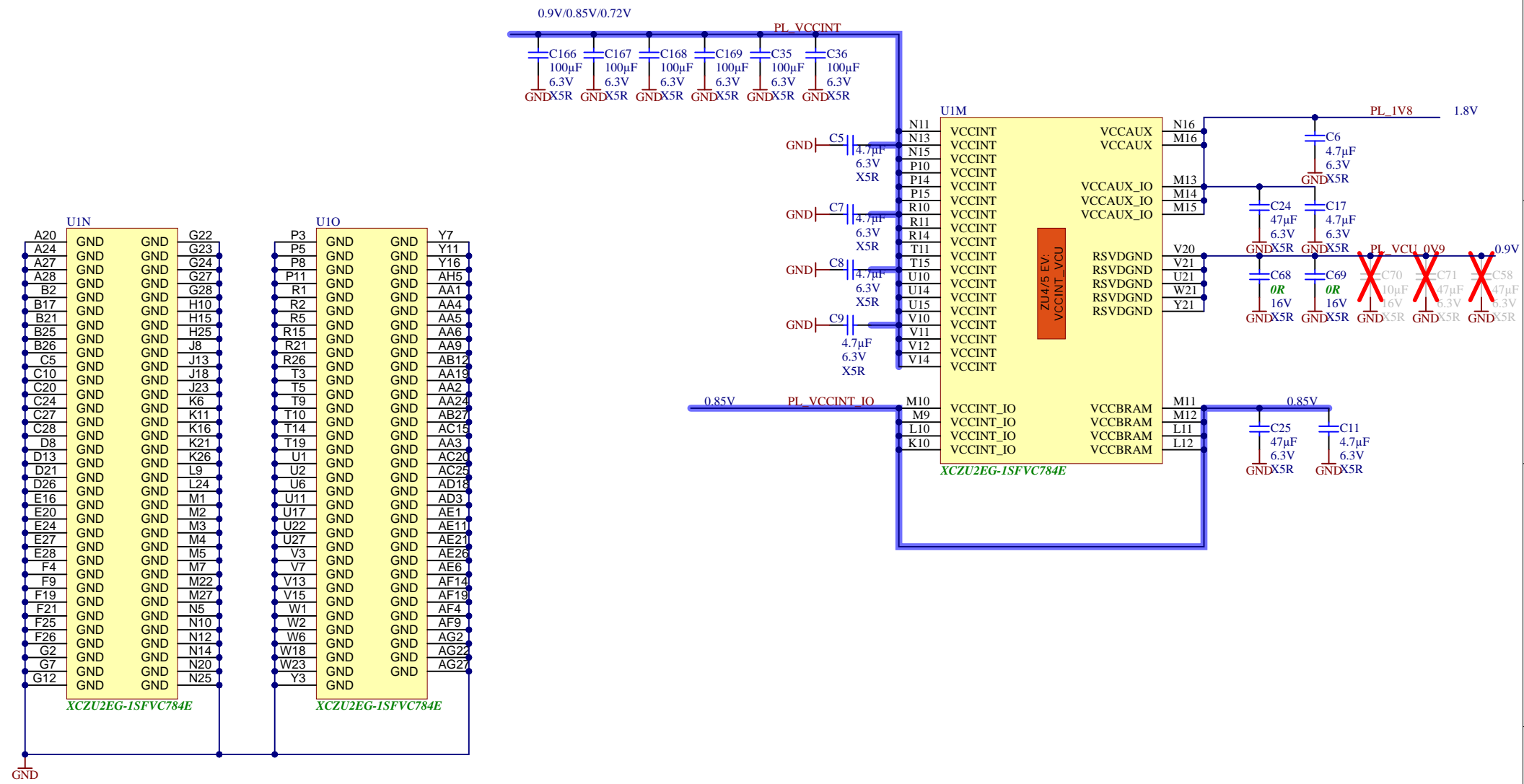


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Filename: B_GT.SchDoc		Page 17 of 30	

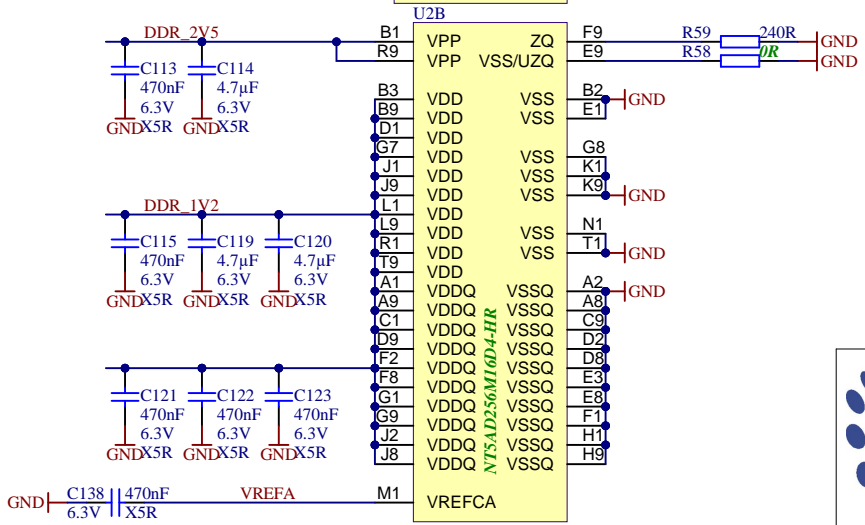
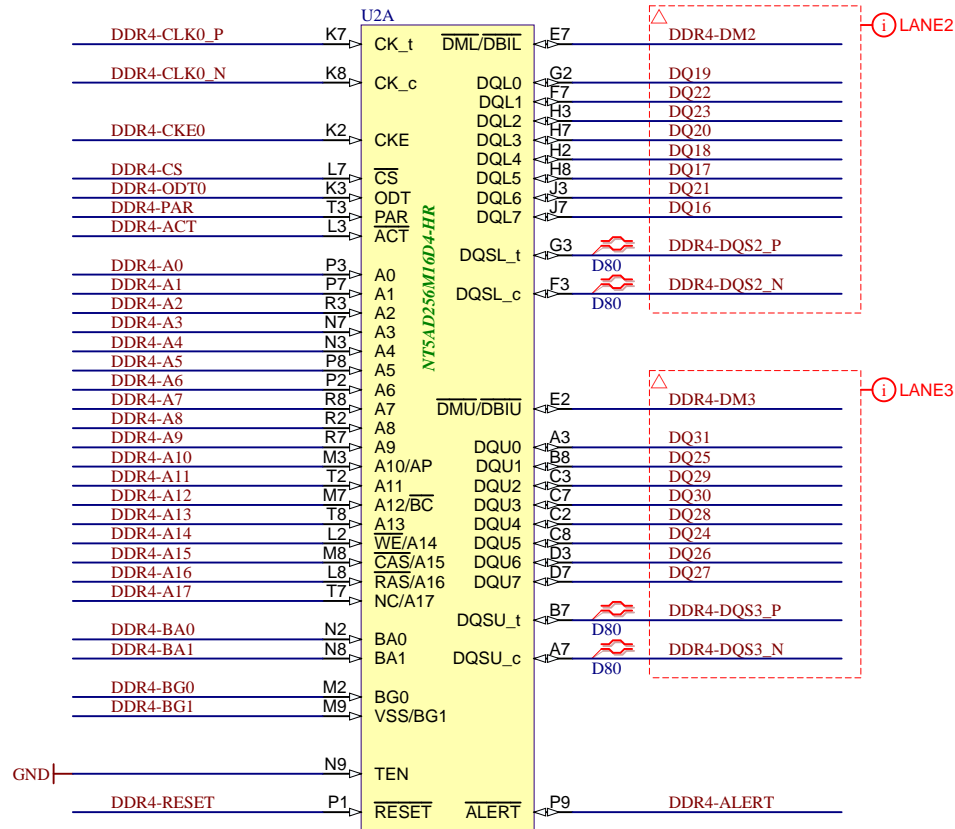


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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 18 of 30
Filename: ZU_PS_POWER.SchDoc		

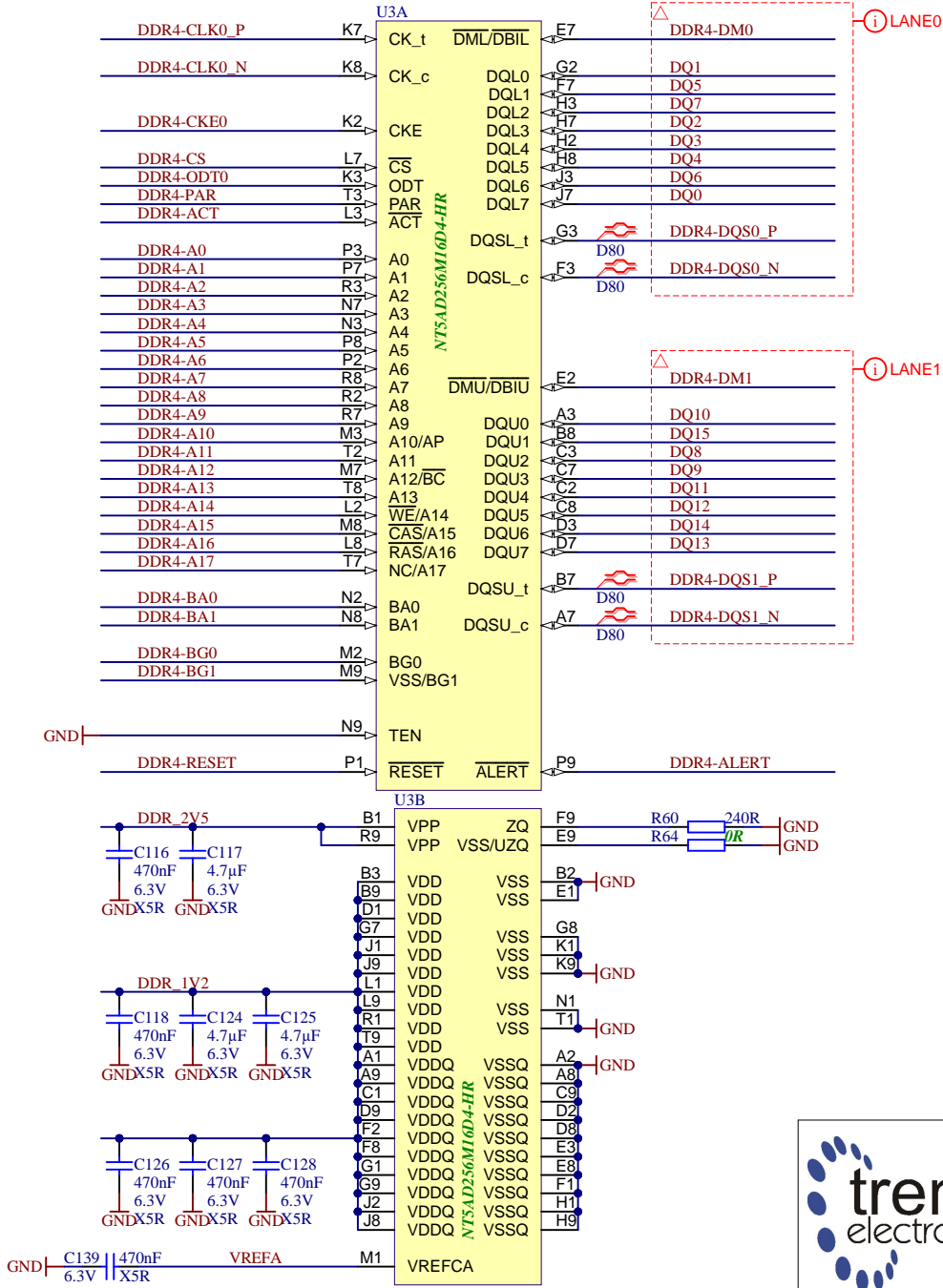



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A24	GND	GND	G23	P5	GND	GND	Y11
A27	GND	GND	G24	P8	GND	GND	Y16
A28	GND	GND	G27	P11	GND	GND	AH5
B2	GND	GND	G28	R1	GND	GND	AA1
B17	GND	GND	H10	R2	GND	GND	AA4
B21	GND	GND	H15	R5	GND	GND	AA5
B25	GND	GND	H25	R15	GND	GND	AA6
B26	GND	GND	J8	R21	GND	GND	AA9
C5	GND	GND	J13	R26	GND	GND	AB12
C10	GND	GND	J18	T3	GND	GND	AA19
C20	GND	GND	J23	T5	GND	GND	AA2
C24	GND	GND	K6	T9	GND	GND	AA24
C27	GND	GND	K11	T10	GND	GND	AB27
C28	GND	GND	K16	T14	GND	GND	AC15
D8	GND	GND	K21	T19	GND	GND	AA3
D13	GND	GND	K26	U1	GND	GND	AC20
D21	GND	GND	L9	U2	GND	GND	AC25
D26	GND	GND	L24	U6	GND	GND	AD18
E16	GND	GND	M1	U11	GND	GND	AD3
E20	GND	GND	M2	U17	GND	GND	AE1
E24	GND	GND	M3	U22	GND	GND	AE11
E27	GND	GND	M4	U27	GND	GND	AE21
E28	GND	GND	M5	V3	GND	GND	AE26
F4	GND	GND	M7	V7	GND	GND	AE6
F9	GND	GND	M22	V13	GND	GND	AF14
F19	GND	GND	M27	V15	GND	GND	AF19
F21	GND	GND	N5	W1	GND	GND	AF4
F25	GND	GND	N10	W2	GND	GND	AF9
F26	GND	GND	N12	W6	GND	GND	AG2
G2	GND	GND	N14	W18	GND	GND	AG22
G7	GND	GND	N20	W23	GND	GND	AG27
G12	GND	GND	N25	Y3	GND	GND	

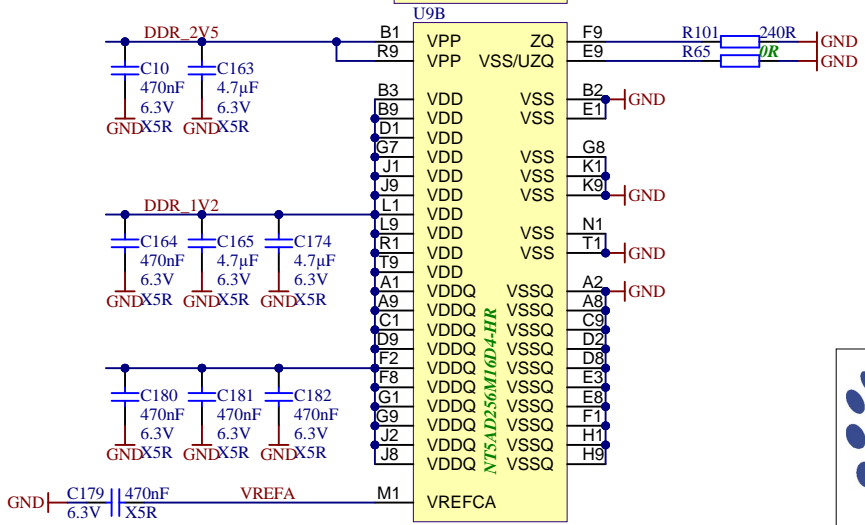
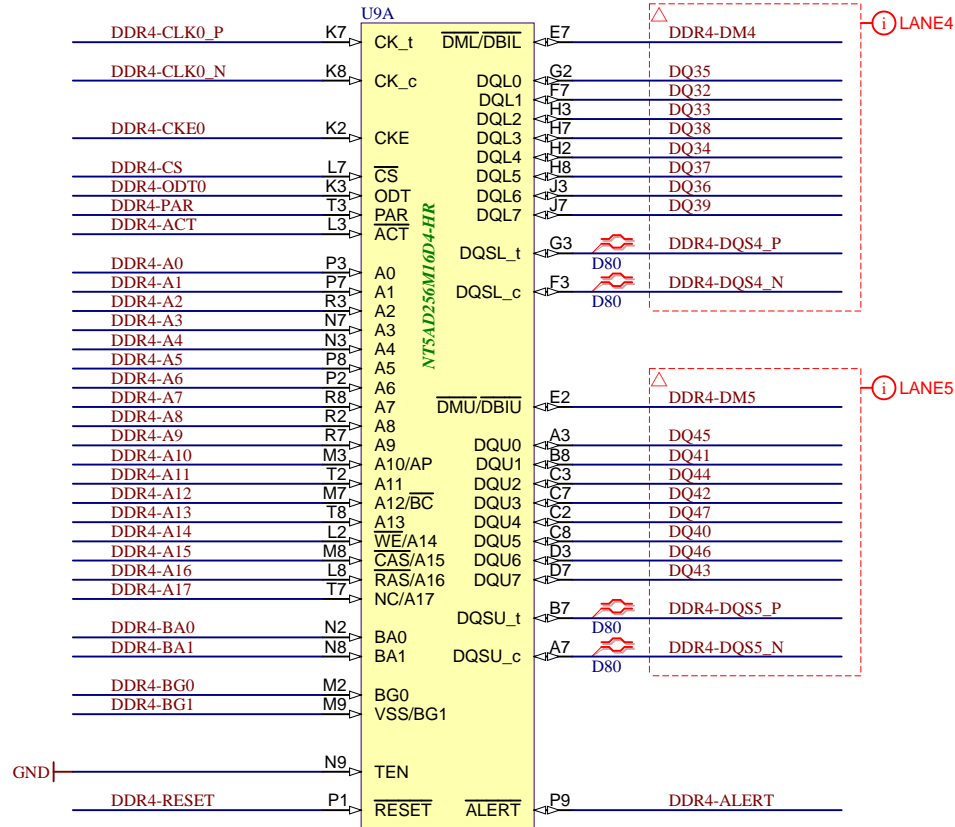

	Title: TE0803 - ZU_POWER		
	A4	Number: TE0803 2BE11-A	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 19 of 30
	Filename: ZU_POWER.SchDoc		



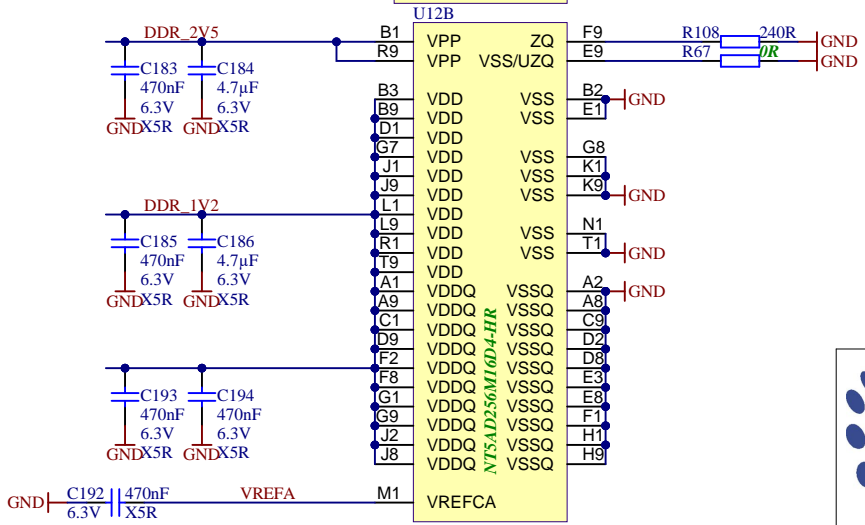
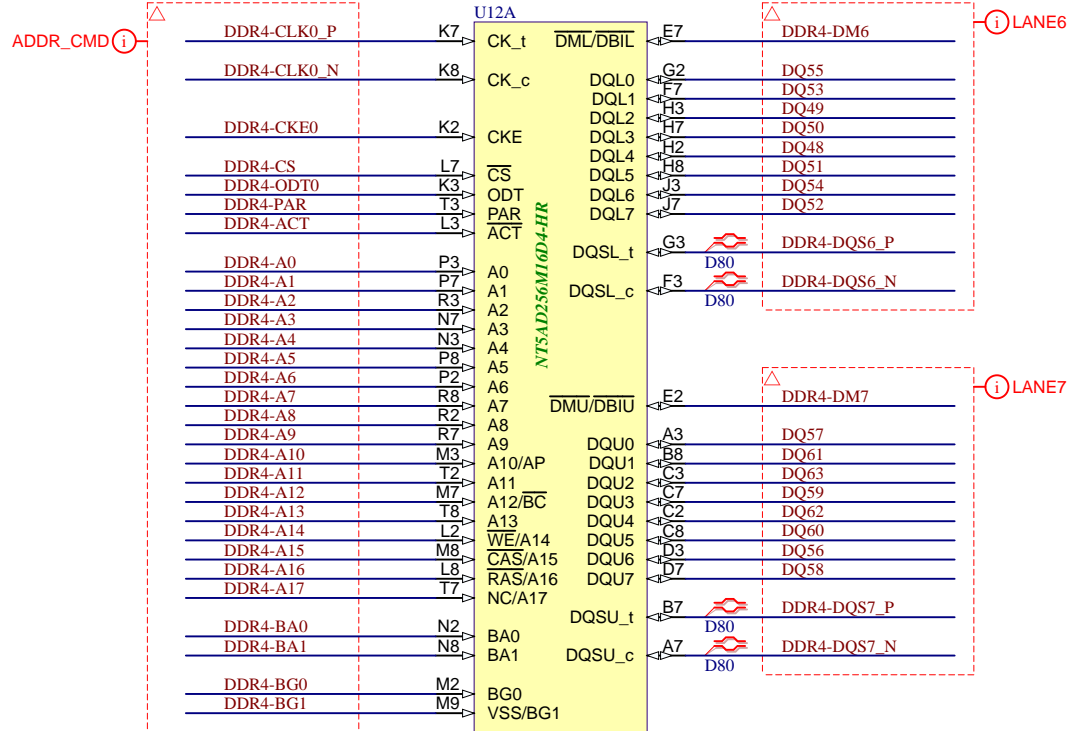
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A4	Number: TE0803 2BE11-A	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 20 of 30
Filename: DDR4-RAM.SchDoc		

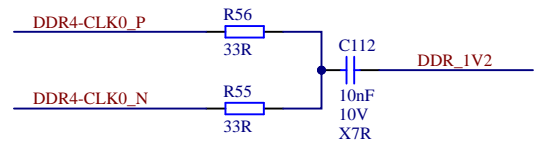
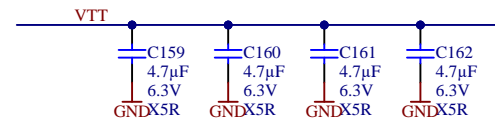
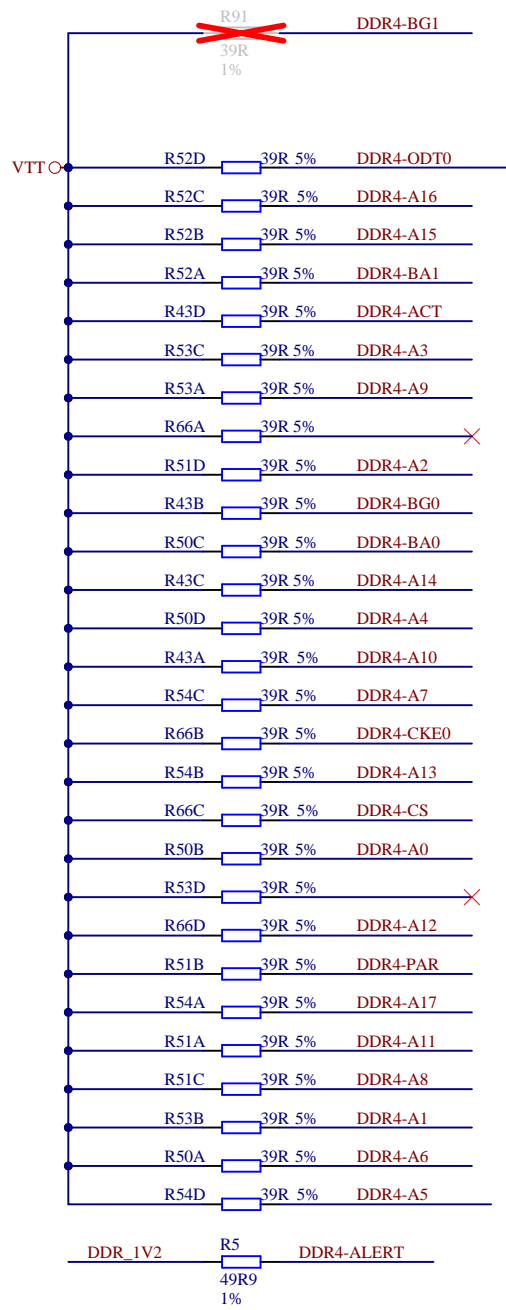
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A4	Number: TE0803 2BE11-A	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 21 of 30
Filename: DDR4-RAM_2.SchDoc		

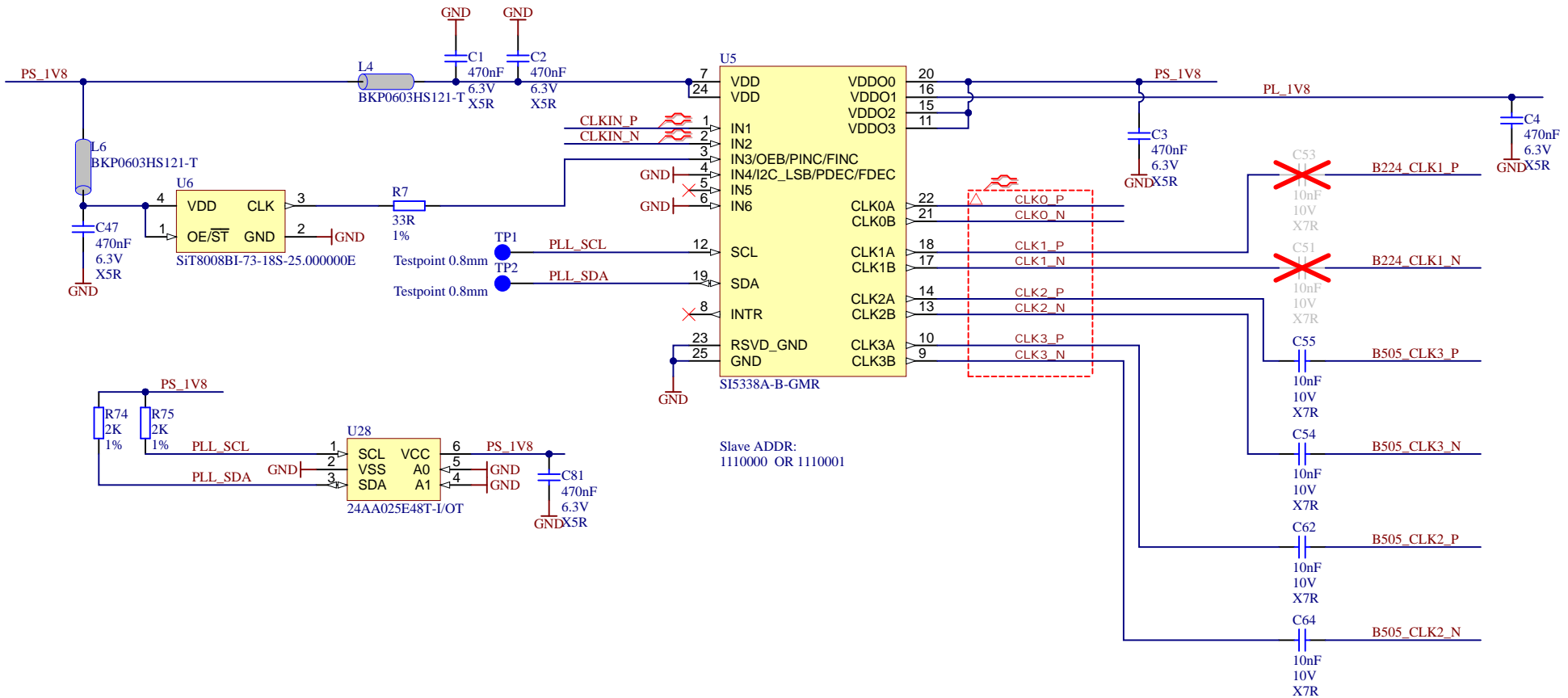
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A4	Number: TE0803 2BE11-A	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page22 of 30
Filename: DDR4-RAM_3.SchDoc		




Title: TE0803 - DDR4_4_RAM		
A4	Number: TE0803 2BE11-A	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 23 of 30
Filename: DDR4-RAM_4.SchDoc		

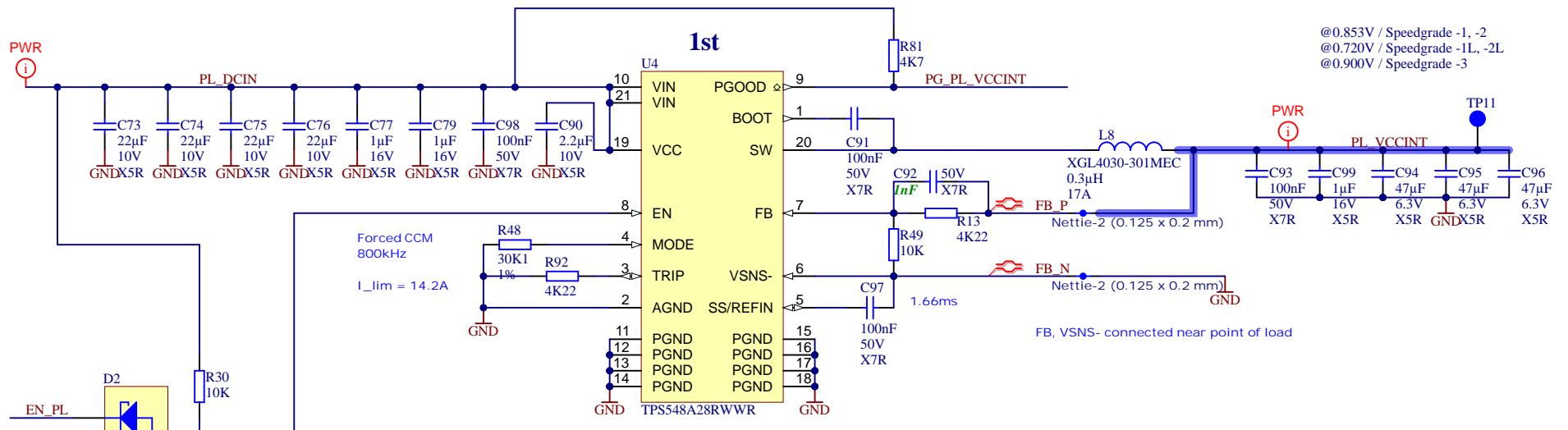


Title: TE0803 - DDR4_TERM		
A4	Number: TE0803 2BE11-A	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page24 of 30
Filename: DDR4-TERM.SchDoc		



		Title: TE0803 - CLOCK	
		A4	Number: TE0803 2BE11-A
Date: 2021-01-19		Copyright: Trenz Electronic GmbH / TT	
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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
 -- TPS548B28 (20A)
 -- TPS54JA20 (12A)



Title: TE0803 - POWER		
A4	Number: TE0803 2BE11-A	Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page26 of 30
Filename: POWER.SchDoc		

1

2

3

4

A

A

B

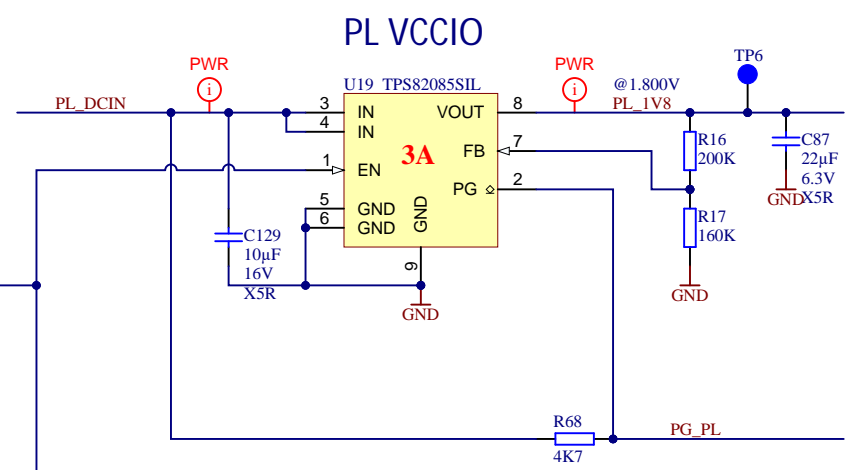
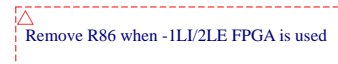
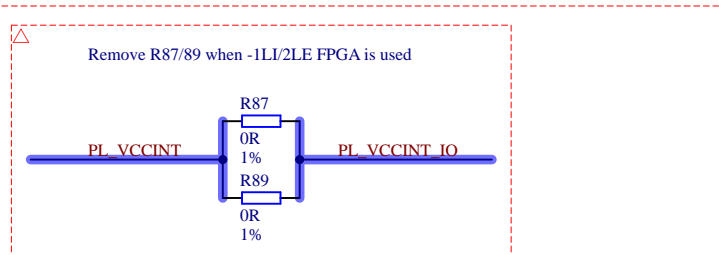
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C

C

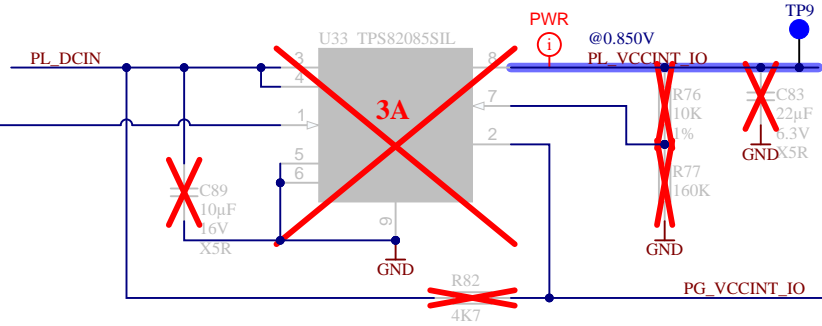
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D

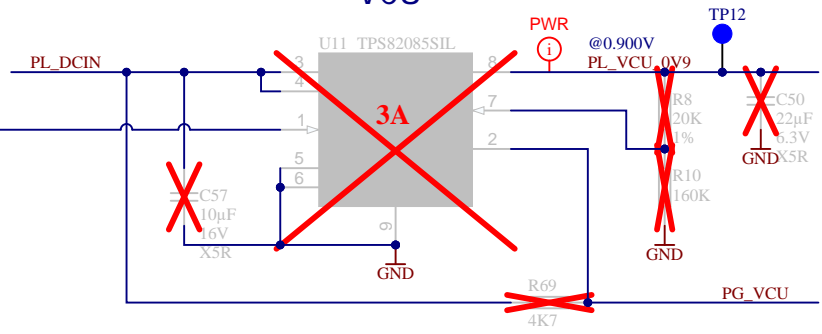


VCCINT_IO & VCCBRAM

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



VCU



Title: TE0803 - POWER		
A4	Number: TE0803 2BE11-A	Rev. 04
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1

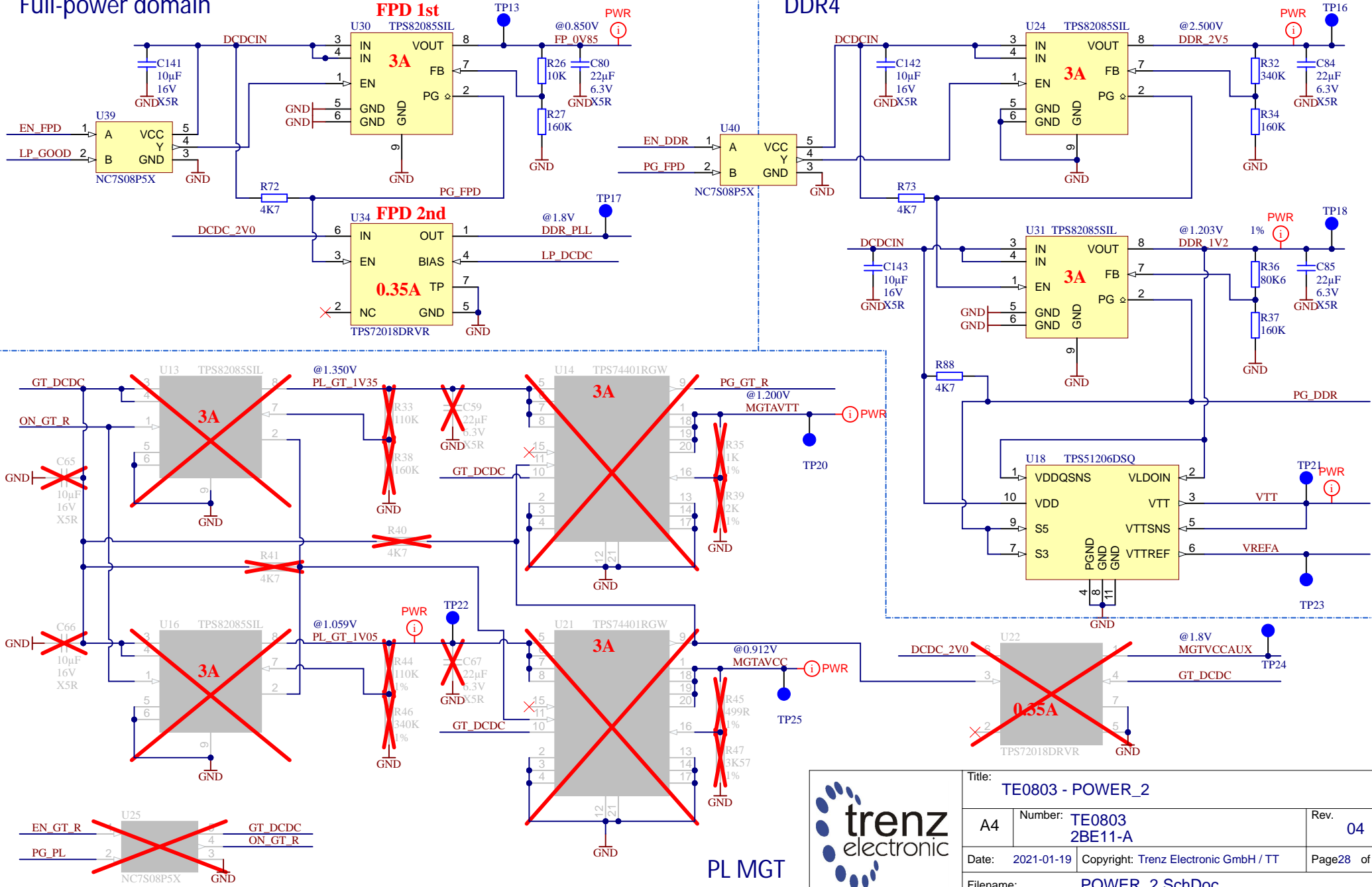
2

3

4

Full-power domain

DDR4



Title: TE0803 - POWER_2		
A4	Number: TE0803 2BE11-A	Rev. 04
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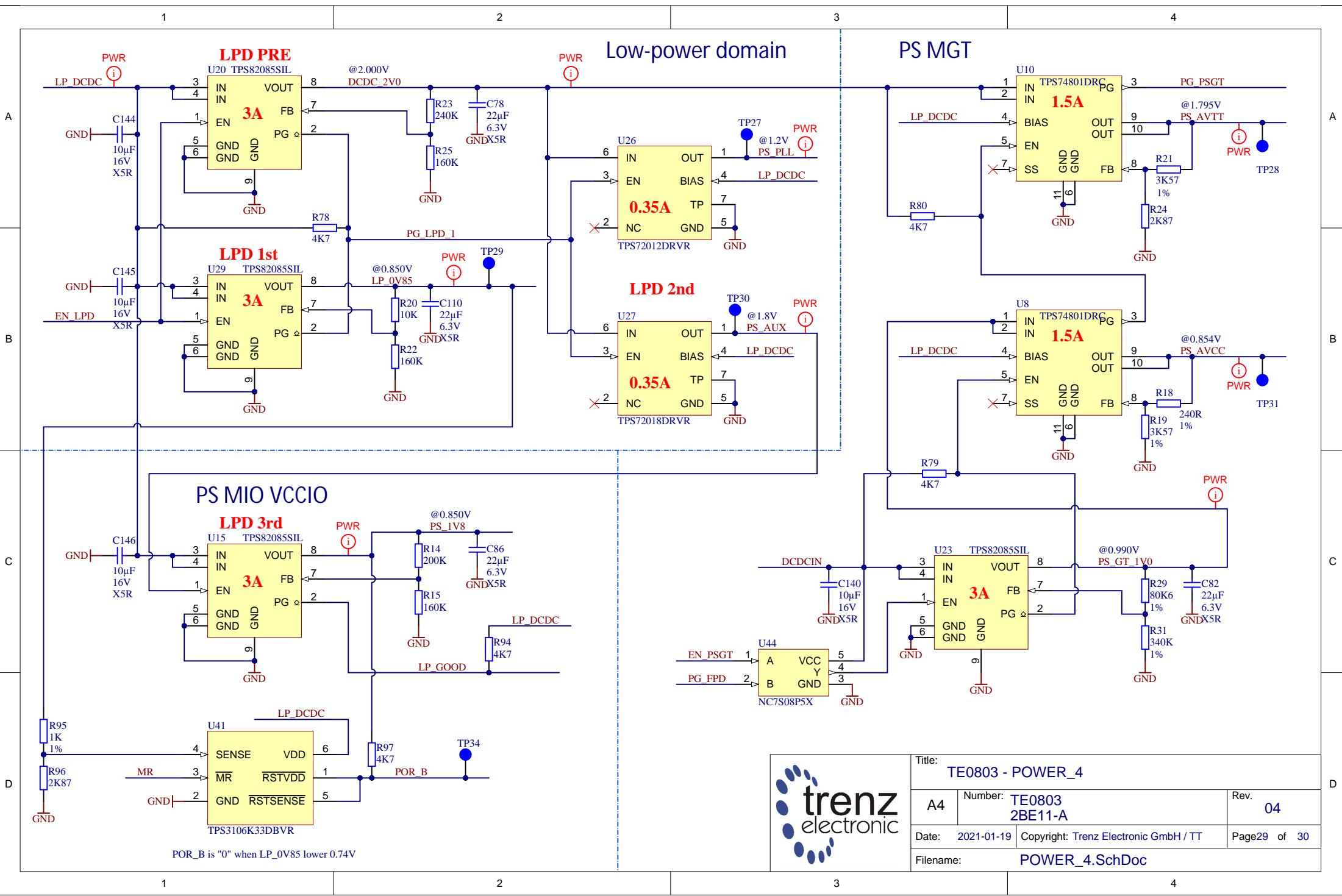
1

2

3

4

PL MGT




POR_B is "0" when LP_0V85 lower 0.74V



Title: TE0803 - POWER_4		
A4	Number: TE0803 2BE11-A	Rev. 04
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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 wath length matched with tollerance 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 recomendation) 5. PCB: updated signal trace lengths. 6. PCB: updated silkscreen. Added company address, CE and WEEE symbols; 7. PCB: added module orientation rectangle poiner 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

		Title: TE0803 - Revision History	
		A4	Number: TE0803 2BE11-A
Date: 2021-01-19		Copyright: Trenz Electronic GmbH	
Page 30 of 30		Filename: Revision Changes.SchDoc	
Drawn by: VY			