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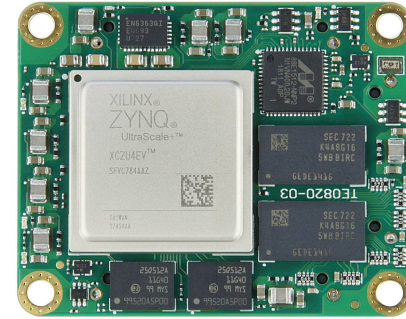


Photo Shows Similar Product

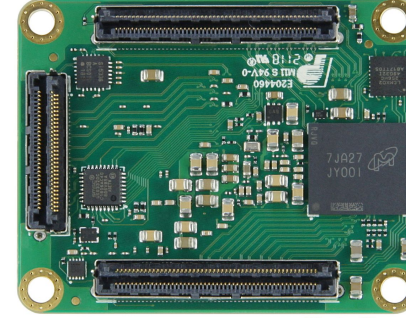


Photo Shows Similar Product

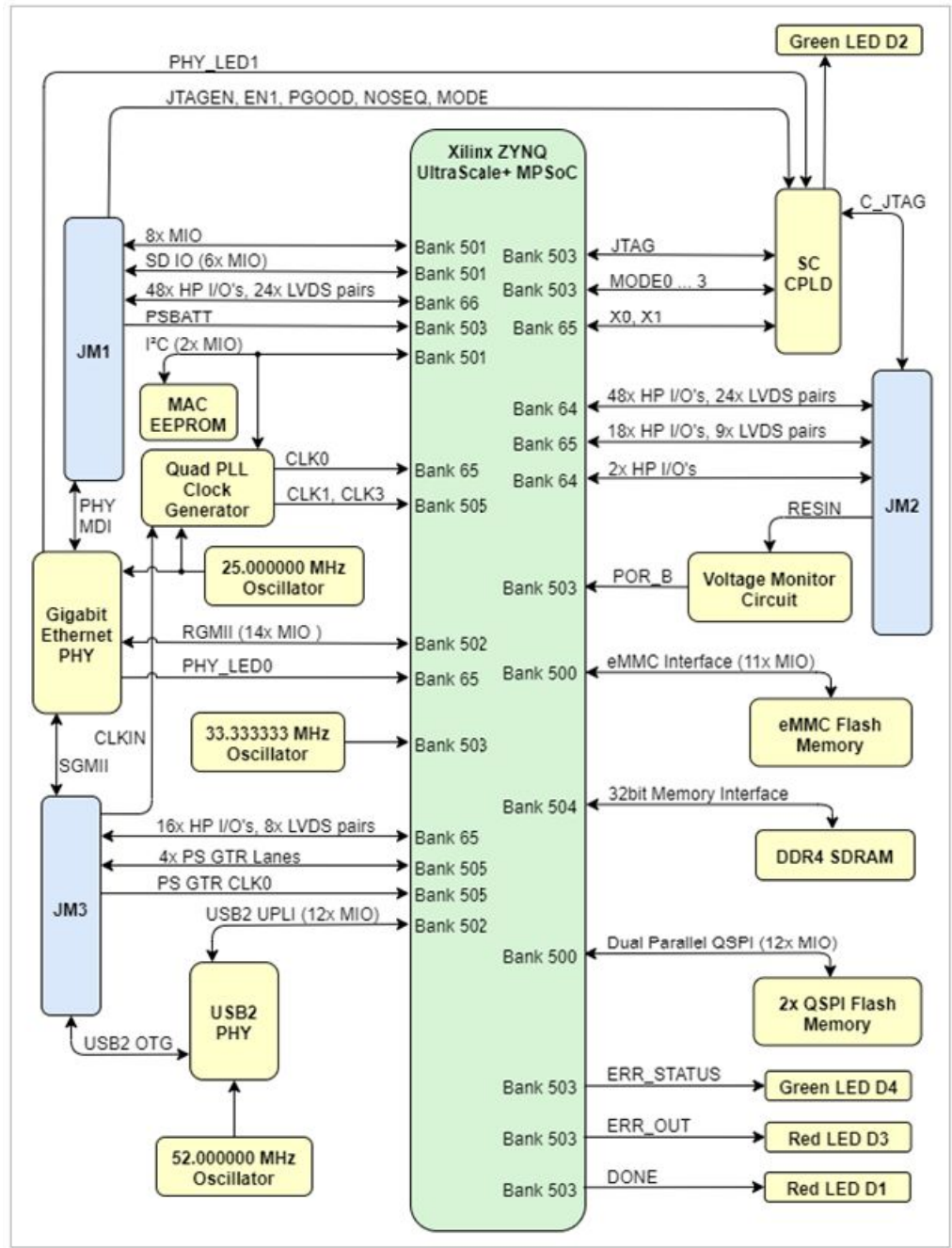
Regarding the usage of our schematics and alike documentation for Trenz module TE0820.

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. TE0820 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: TE0820 - Legal Notices		
A4	Number: TE0820 5DI21FA	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 1 of 23
Filename: Legal Notices Modules.SchDoc		



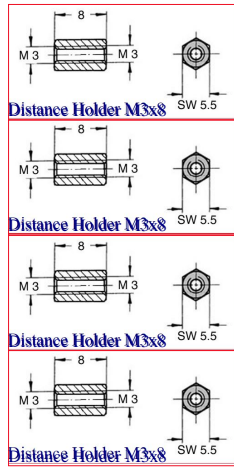
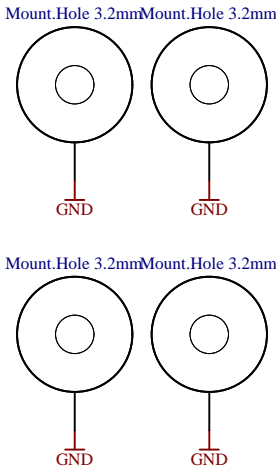
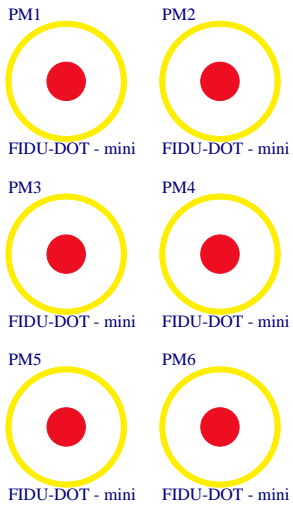
Title: TE0820 - System Overview		
A4	Number: TE0820 5DI21FA	Rev. 04
Date: 2020-10-20	Copyright: Trenz Electronic GmbH	Page 2 of 23
Filename: Overview.SchDoc		

U_USB-PHY USB-PHY.SchDoc
U_ETH-PHY ETH-PHY.SchDoc
U_B_HD B_HD.SchDoc
U_B64 B64.SchDoc
U_B65 B65.SchDoc
U_B66 B66.SchDoc
U_CONFIG CONFIG.SchDoc
U_B_MIO B_MIO.SchDoc
U_B_PS_GT B_PS_GT.SchDoc
U_CLK CLK.SchDoc
U_BD Overview.SchDoc

U_B2B-Connectors B2B-Connectors.SchDoc
U_eMMC eMMC.SchDoc
U_PS_DDR PS_DDR.SchDoc
U_ZU_POWER ZU_POWER.SchDoc
U_ZU_PS_POWER ZU_PS_POWER.SchDoc
U_DDR4-RAM_2 DDR4-RAM_2.SchDoc
U_DDR4-RAM DDR4-RAM.SchDoc
U_POWER POWER.SchDoc
U_POWER_1 POWER_1.SchDoc
U_REV_CH Revision Changes.SchDoc
U_LN Legal Notices Modules.SchDoc

Special notes:

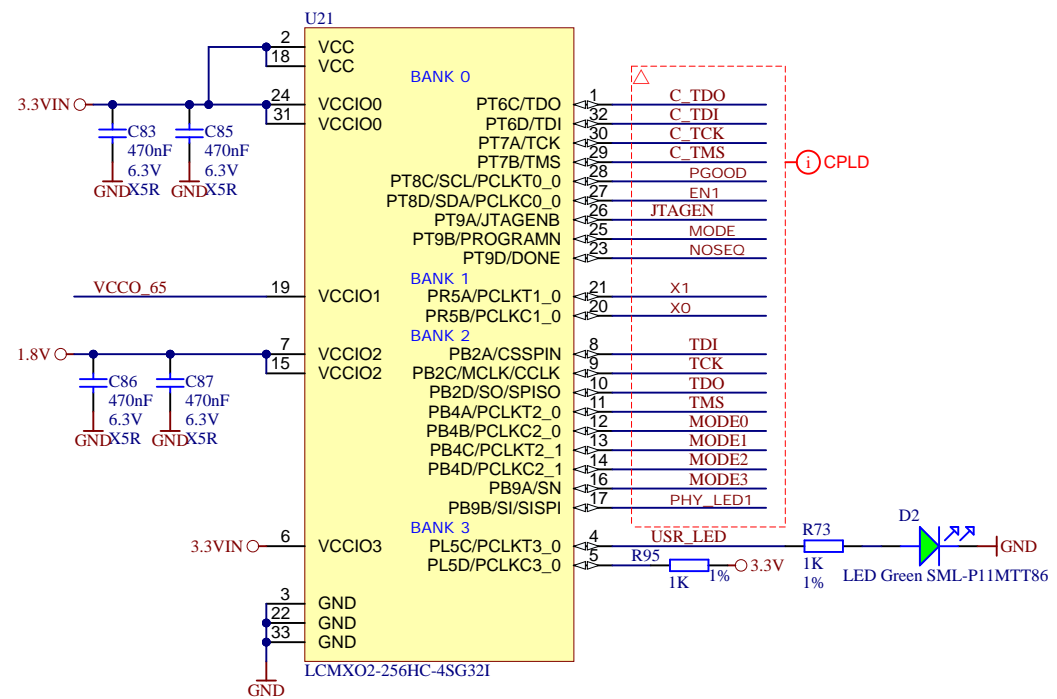
Serial
Serial
Serialnumber 6,3 x 6,3mm



Assembly variant	5DI21FA
Created by	VY
Modified by	VY
Modified at	2020-05-11
SVN Revision	12571



Title: TE0820		
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Filename: TE0820.SchDoc		



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A

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C

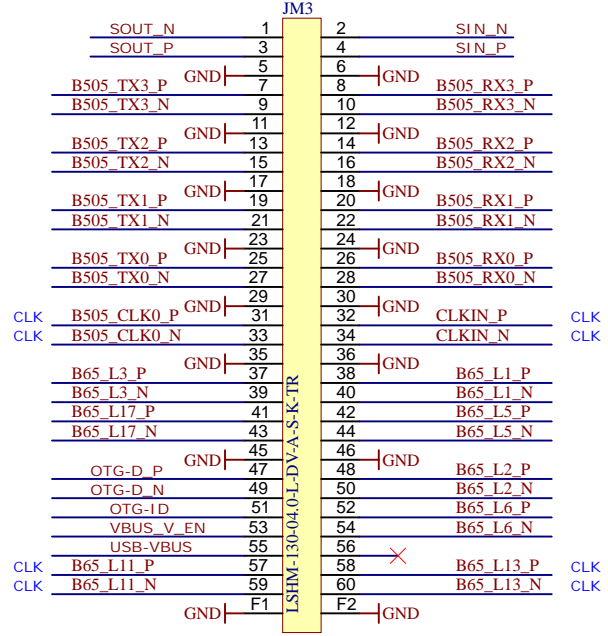
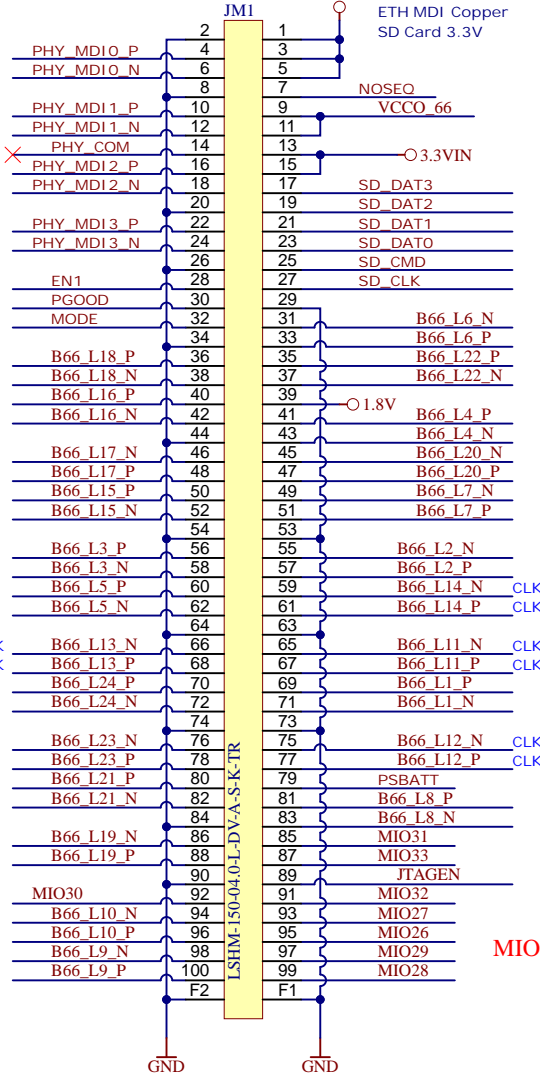
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D

B66(HP) 48 IO, 24 LVDS Pairs
 MIO501 8 IO, 3.3V
 ETH MDI Copper
 SD Card 3.3V

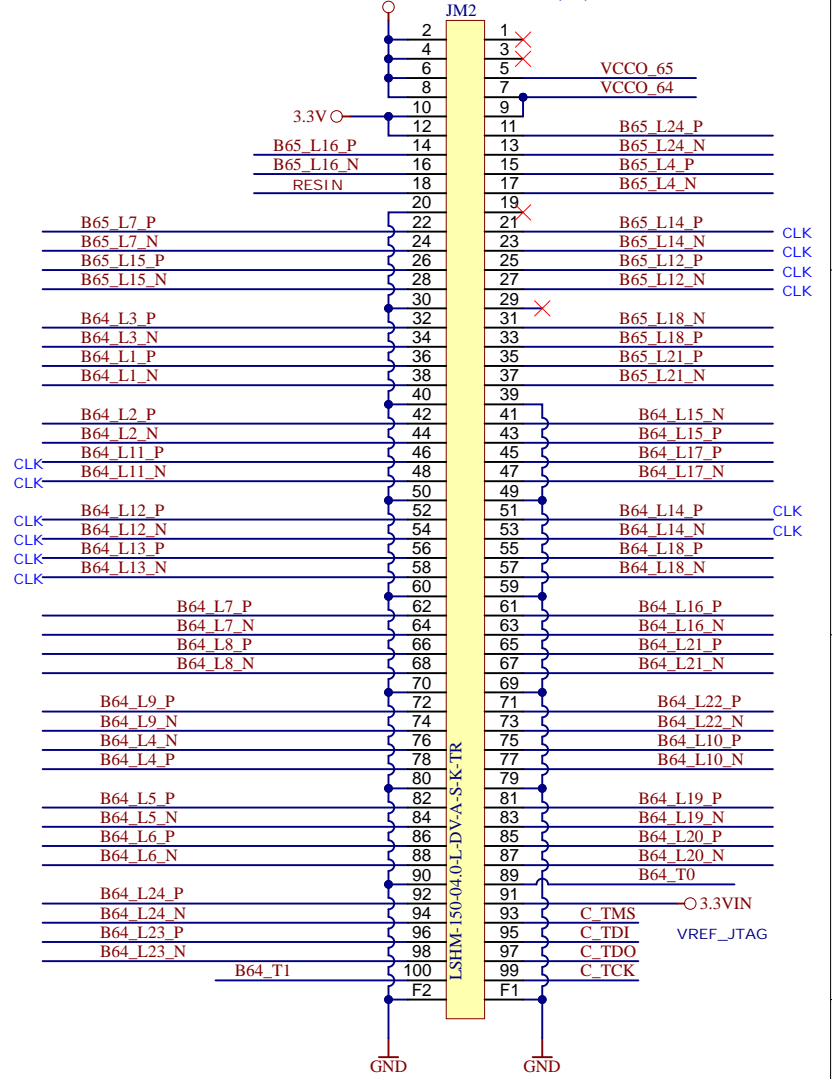
B65(HP) 16 IO, 8 LVDS Pairs
 USB OTG
 ETH SGMII
 PS_GTR 4 Lanes
 PS_GTR CLK IN
 PLL CLK IN

B65(HP) 18 IO, 9 LVDS Pairs
 B64(HP) 50 IO, 24 LVDS Pairs

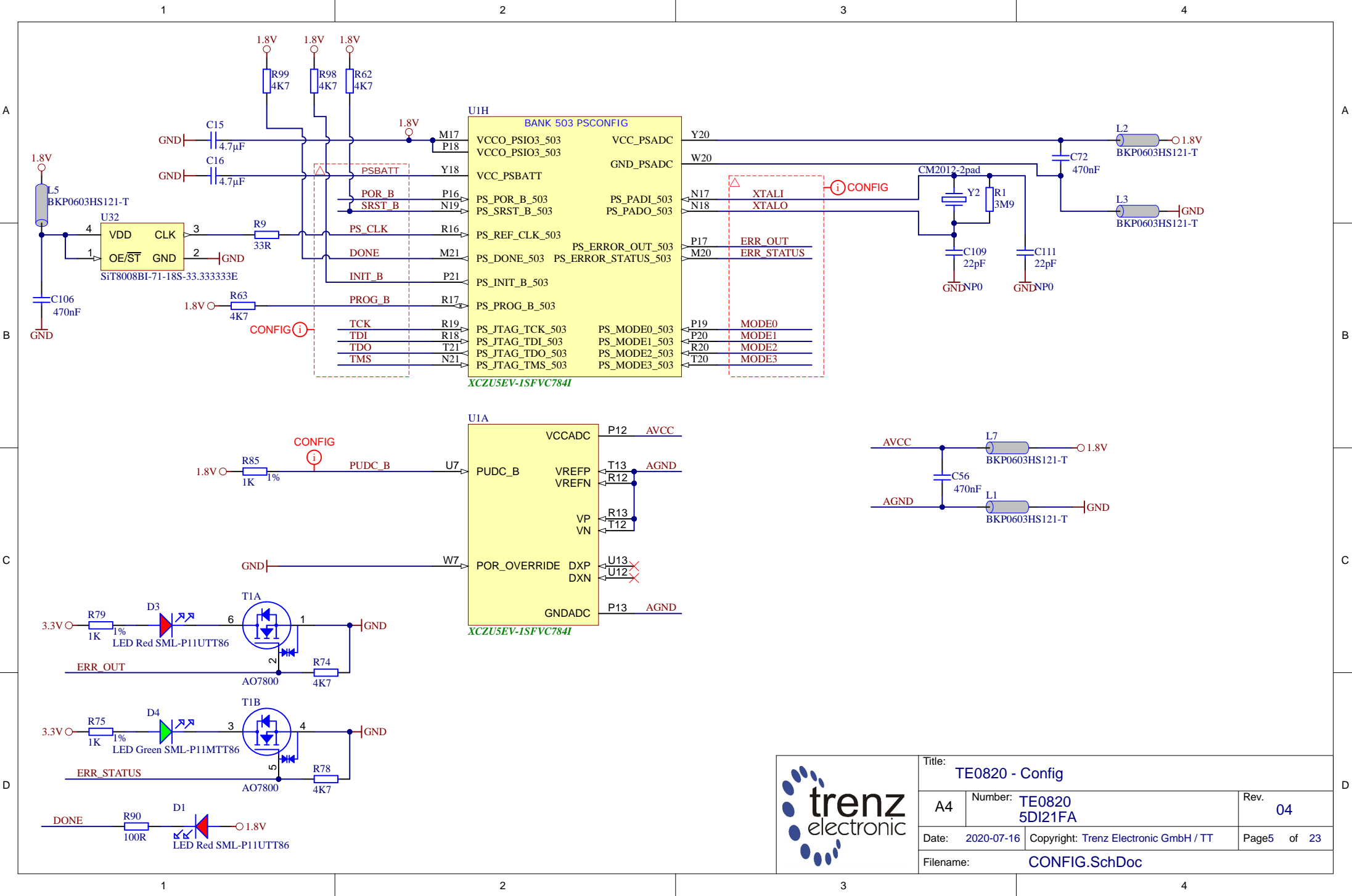


VCCO64, VCCO65, VCCO66 ->>> max. 1.8V (HP bank's)

MIO[29..26] ->PJTAG1



Title: TE0820 - B2B Connectors		
A4	Number: TE0820 5DI21FA	Rev. 04
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page4 of 23
Filename: B2B-Connectors.SchDoc		



Title: TE0820 - Config		
A4	Number: TE0820 5DI21FA	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page5 of 23
Filename: CONFIG.SchDoc		

UIC

F14	VCCO_46	BANK 46 HD (ZU2/3 BANK 26 HD)	
C15	VCCO_46		
B15	IO_L1P_AD11P_46	IO_L7P_HDGC_AD5P_46	G13
A15	IO_L1N_AD11N_46	IO_L7N_HDGC_AD5N_46	F13
B14	IO_L2P_AD10P_46	IO_L8P_HDGC_AD4P_46	F15
A14	IO_L2N_AD10N_46	IO_L8N_HDGC_AD4N_46	E15
B13	IO_L3P_AD9P_46	IO_L9P_AD3P_46	G15
A13	IO_L3N_AD9N_46	IO_L9N_AD3N_46	G14
C14	IO_L4P_AD8P_46	IO_L10P_AD2P_46	H14
C13	IO_L4N_AD8N_46	IO_L10N_AD2N_46	H13
D15	IO_L5P_HDGC_AD7P_46	IO_L11P_AD1P_46	K14
D14	IO_L5N_HDGC_AD7N_46	IO_L11N_AD1N_46	J14
E14	IO_L6P_HDGC_AD6P_46	IO_L12P_AD0P_46	L14
E13	IO_L6N_HDGC_AD6N_46	IO_L12N_AD0N_46	L13

BANK 43 HD (ZU2/3 BANK 44 HD)

AC10	VCCO_43		
AG12	VCCO_43		
AG10	IO_L1P_AD11P_43	IO_L7P_HDGC_AD5P_43	AD11
AH10	IO_L1N_AD11N_43	IO_L7N_HDGC_AD5N_43	AD10
AF11	IO_L2P_AD10P_43	IO_L8P_HDGC_AD4P_43	AB11
AG11	IO_L2N_AD10N_43	IO_L8N_HDGC_AD4N_43	AC11
AH12	IO_L3P_AD9P_43	IO_L9P_AD3P_43	AA11
AH11	IO_L3N_AD9N_43	IO_L9N_AD3N_43	AA10
AE10	IO_L4P_AD8P_43	IO_L10P_AD2P_43	W10
AF10	IO_L4N_AD8N_43	IO_L10N_AD2N_43	Y10
AE12	IO_L5P_HDGC_AD7P_43	IO_L11P_AD1P_43	Y9
AF12	IO_L5N_HDGC_AD7N_43	IO_L11N_AD1N_43	AA8
AC13	IO_L6P_HDGC_AD6P_43	IO_L12P_AD0P_43	AB10
AD12	IO_L6N_HDGC_AD6N_43	IO_L12N_AD0N_43	AB9

UIB


XCZU5EV-1SFVC784I

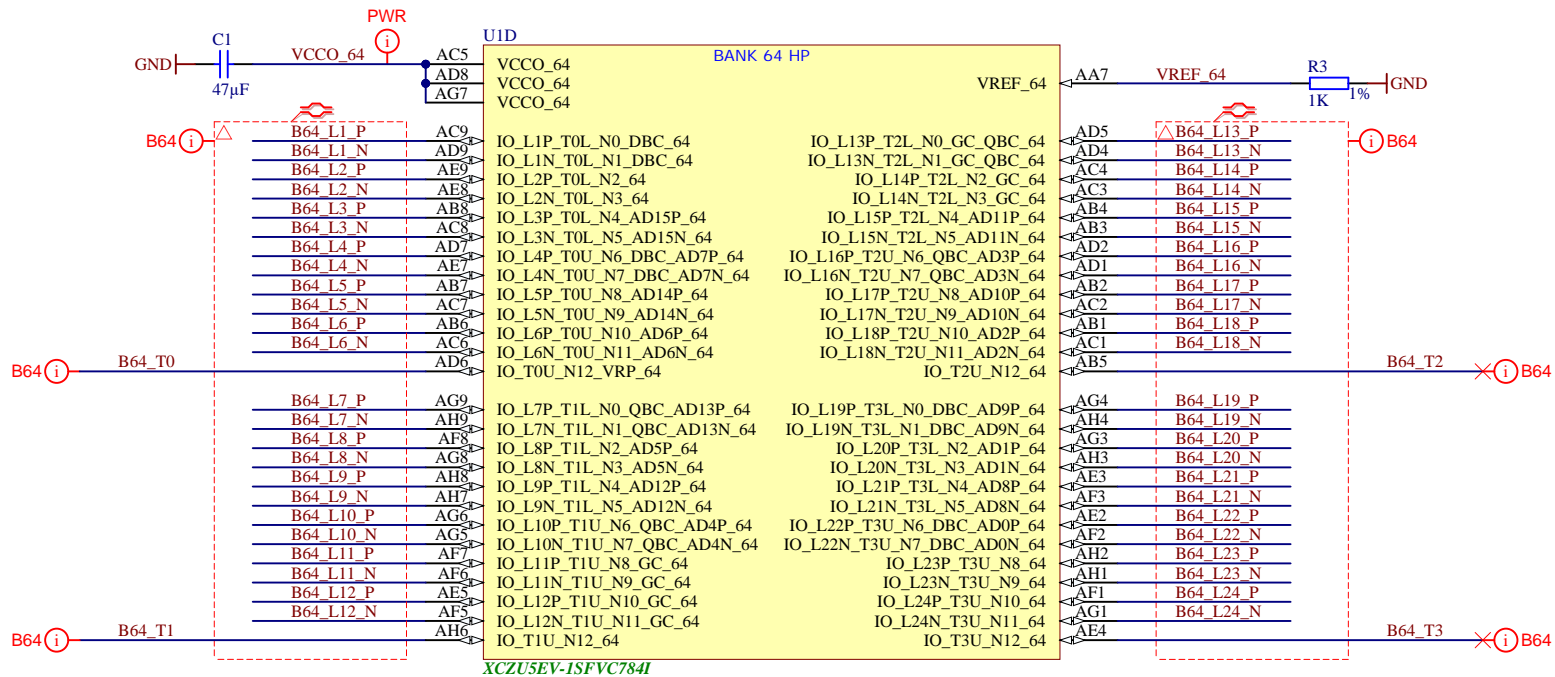
AA14	VCCO_44	BANK 44 HD (ZU2/3 BANK 24 HD)	
AD13	VCCO_44		
AE15	IO_L1P_AD15P_44	IO_L7P_HDGC_44	AA13
AE14	IO_L1N_AD15N_44	IO_L7N_HDGC_44	AB13
AG14	IO_L2P_AD14P_44	IO_L8P_HDGC_44	AB15
AH14	IO_L2N_AD14N_44	IO_L8N_HDGC_44	AB14
AG13	IO_L3P_AD13P_44	IO_L9P_AD11P_44	W14
AH13	IO_L3N_AD13N_44	IO_L9N_AD11N_44	W13
AE13	IO_L4P_AD12P_44	IO_L10P_AD10P_44	Y14
AF13	IO_L4N_AD12N_44	IO_L10N_AD10N_44	Y13
AD13	IO_L5P_HDGC_44	IO_L11P_AD9P_44	W12
AD14	IO_L5N_HDGC_44	IO_L11N_AD9N_44	W11
AC14	IO_L6P_HDGC_44	IO_L12P_AD8P_44	Y12
AC13	IO_L6N_HDGC_44	IO_L12N_AD8N_44	AA12

BANK 45 HD (ZU2/3 BANK 25 HD)

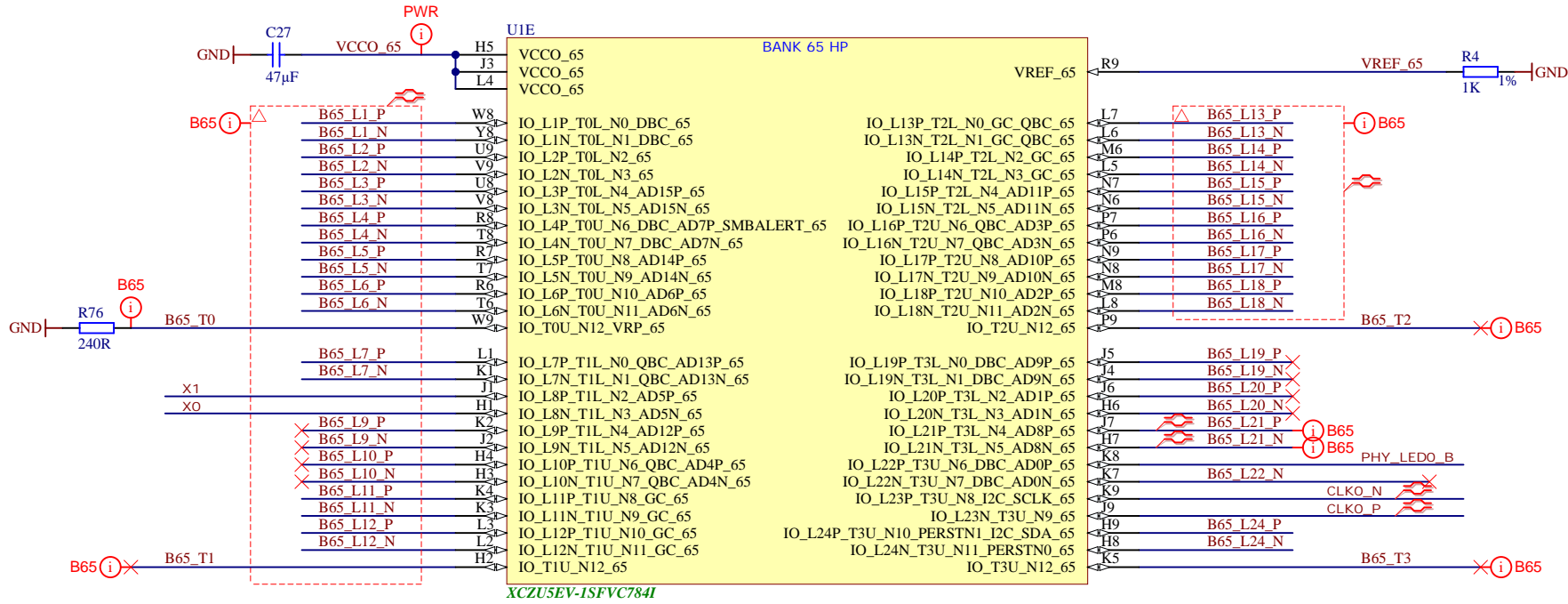
B12	VCCO_45		
E11	VCCO_45		
J11	IO_L1P_AD15P_45	IO_L7P_HDGC_45	E10
J10	IO_L1N_AD15N_45	IO_L7N_HDGC_45	D10
K13	IO_L2P_AD14P_45	IO_L8P_HDGC_45	E12
K12	IO_L2N_AD14N_45	IO_L8N_HDGC_45	D11
H11	IO_L3P_AD13P_45	IO_L9P_AD11P_45	C11
G10	IO_L3N_AD13N_45	IO_L9N_AD11N_45	B10
J12	IO_L4P_AD12P_45	IO_L10P_AD10P_45	B11
H12	IO_L4N_AD12N_45	IO_L10N_AD10N_45	A10
G11	IO_L5P_HDGC_45	IO_L11P_AD9P_45	A12
F11	IO_L5N_HDGC_45	IO_L11N_AD9N_45	A11
F12	IO_L6P_HDGC_45	IO_L12P_AD8P_45	D12
F11	IO_L6N_HDGC_45	IO_L12N_AD8N_45	C12

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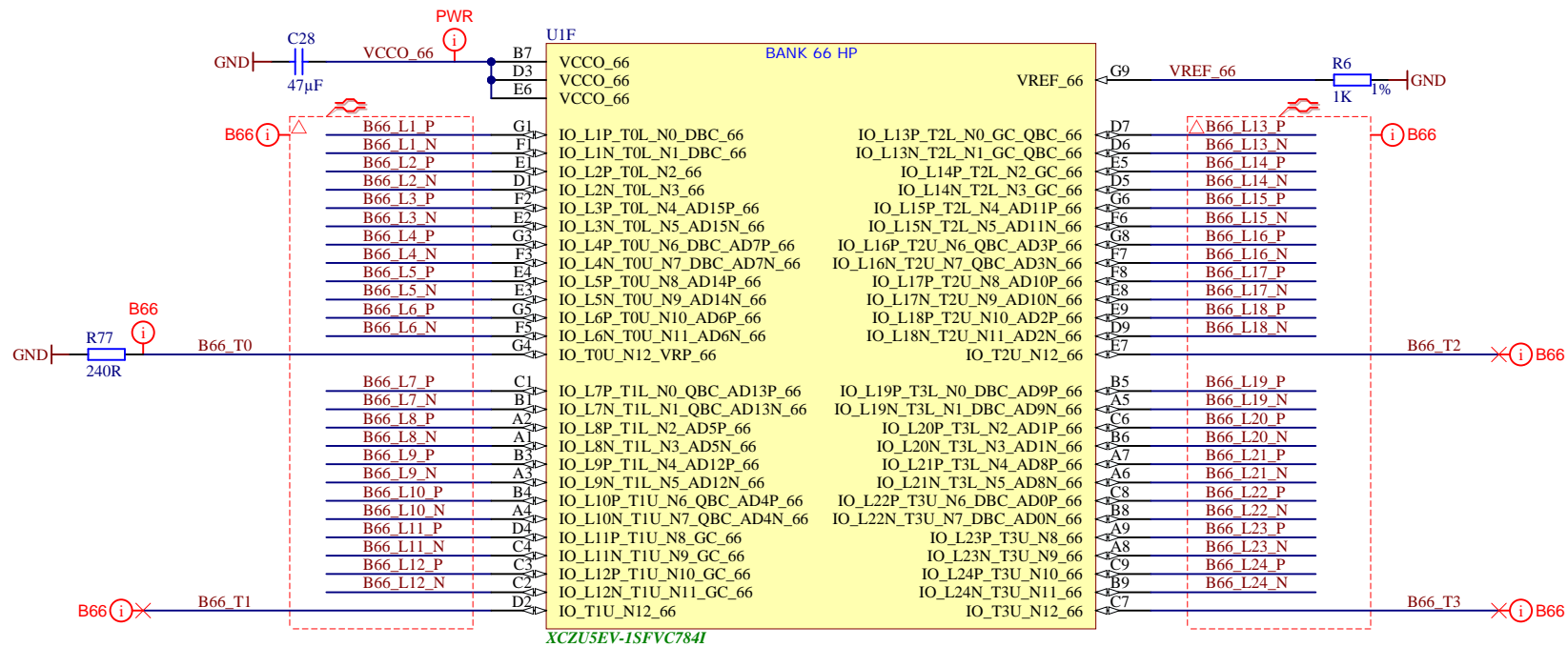
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	A4	Number: TE0820 5DI21FA	Rev. 04
	Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page6 of 23
	Filename: B_HD.SchDoc		




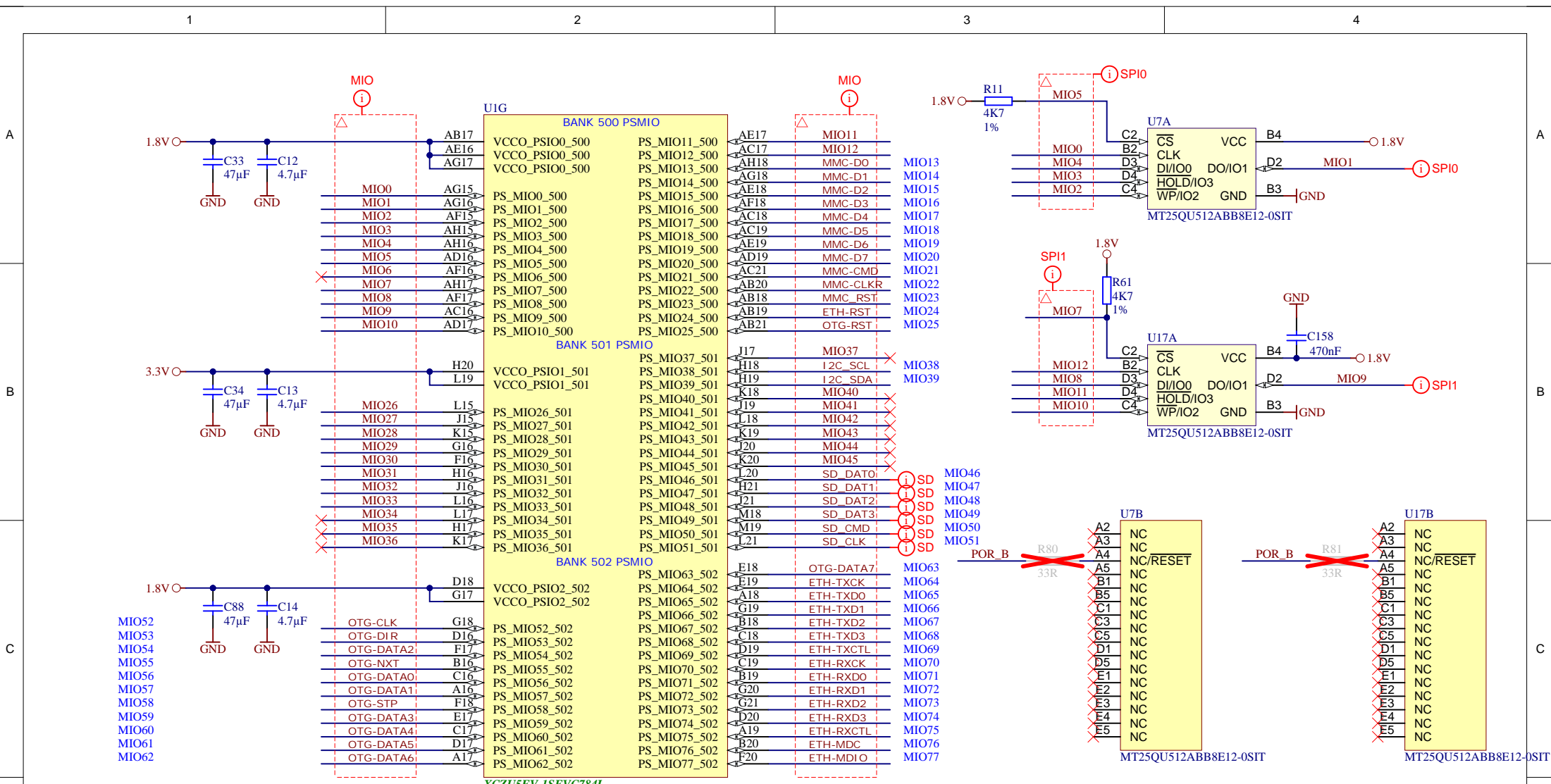
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Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 7 of 23
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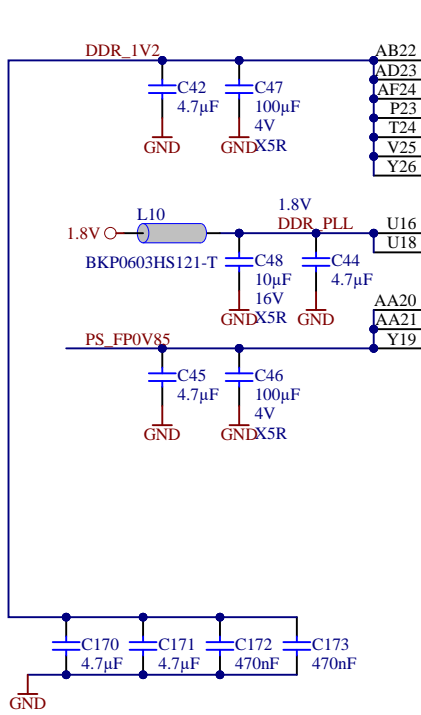
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A4	Number: TE0820 5DI21FA	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 8 of 23
Filename: B65.SchDoc		



			Title: TE0820 - B66	
			A4	Number: TE0820 5DI21FA
Date: 2020-07-16		Copyright: Trenz Electronic GmbH / TT		Page9 of 23
Filename: B66.SchDoc				



		Title: TE0820 - MIO Banks	
		A4	Number: TE0820 5DI21FA
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 10 of 23	
Filename: B_MIO.SchDoc			



U11 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
	PS_DDR_A3_504	AA28	DDR4-A3
	PS_DDR_A4_504	Y27	DDR4-A4
	PS_DDR_A5_504	AA27	DDR4-A5
	PS_DDR_A6_504	Y22	DDR4-A6
	PS_DDR_A7_504	AA23	DDR4-A7
	PS_DDR_A8_504	AA22	DDR4-A8
	PS_DDR_A9_504	AB23	DDR4-A9
	PS_DDR_A10_504	AA25	DDR4-A10
	PS_DDR_A11_504	AA26	DDR4-A11
	PS_DDR_A12_504	AB25	DDR4-A12
	PS_DDR_A13_504	AB26	DDR4-A13
	PS_DDR_A14_504	AB24	DDR4-A14
	PS_DDR_A15_504	AC24	DDR4-A15
	PS_DDR_A16_504	AC23	DDR4-A16
	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	

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U1J BANK 504 PSDDR

DQ0	AD21	PS_DDR_DQ0_504	PS_DDR_DQ32_504	T22
DQ1	AE20	PS_DDR_DQ1_504	PS_DDR_DQ33_504	R22
DQ2	AD20	PS_DDR_DQ2_504	PS_DDR_DQ34_504	P22
DQ3	AF20	PS_DDR_DQ3_504	PS_DDR_DQ35_504	N22
DQ4	AH21	PS_DDR_DQ4_504	PS_DDR_DQ36_504	T23
DQ5	AH20	PS_DDR_DQ5_504	PS_DDR_DQ37_504	P24
DQ6	AH19	PS_DDR_DQ6_504	PS_DDR_DQ38_504	R24
DQ7	AG19	PS_DDR_DQ7_504	PS_DDR_DQ39_504	N24
DQ8	AF22	PS_DDR_DQ8_504	PS_DDR_DQ40_504	H24
DQ9	AH22	PS_DDR_DQ9_504	PS_DDR_DQ41_504	J24
DQ10	AE22	PS_DDR_DQ10_504	PS_DDR_DQ42_504	M24
DQ11	AD23	PS_DDR_DQ11_504	PS_DDR_DQ43_504	K24
DQ12	AH23	PS_DDR_DQ12_504	PS_DDR_DQ44_504	J22
DQ13	AH24	PS_DDR_DQ13_504	PS_DDR_DQ45_504	H22
DQ14	AE24	PS_DDR_DQ14_504	PS_DDR_DQ46_504	K22
DQ15	AG24	PS_DDR_DQ15_504	PS_DDR_DQ47_504	J22
DQ16	AC26	PS_DDR_DQ16_504	PS_DDR_DQ48_504	M25
DQ17	AD26	PS_DDR_DQ17_504	PS_DDR_DQ49_504	M26
DQ18	AD25	PS_DDR_DQ18_504	PS_DDR_DQ50_504	L25
DQ19	AD24	PS_DDR_DQ19_504	PS_DDR_DQ51_504	L26
DQ20	AG26	PS_DDR_DQ20_504	PS_DDR_DQ52_504	K28
DQ21	AH25	PS_DDR_DQ21_504	PS_DDR_DQ53_504	L28
DQ22	AH26	PS_DDR_DQ22_504	PS_DDR_DQ54_504	M28
DQ23	AG25	PS_DDR_DQ23_504	PS_DDR_DQ55_504	N28
DQ24	AH27	PS_DDR_DQ24_504	PS_DDR_DQ56_504	J28
DQ25	AH28	PS_DDR_DQ25_504	PS_DDR_DQ57_504	K27
DQ26	AF28	PS_DDR_DQ26_504	PS_DDR_DQ58_504	H28
DQ27	AG28	PS_DDR_DQ27_504	PS_DDR_DQ59_504	H27
DQ28	AC27	PS_DDR_DQ28_504	PS_DDR_DQ60_504	G26
DQ29	AD27	PS_DDR_DQ29_504	PS_DDR_DQ61_504	G25
DQ30	AD28	PS_DDR_DQ30_504	PS_DDR_DQ62_504	K25
DQ31	AC28	PS_DDR_DQ31_504	PS_DDR_DQ63_504	J25
		PS_DDR_DQ64_504	PS_DDR_DQ64_504	T28
		PS_DDR_DQ65_504	PS_DDR_DQ65_504	R28
		PS_DDR_DQ66_504	PS_DDR_DQ66_504	P28
		PS_DDR_DQ67_504	PS_DDR_DQ67_504	P27
		PS_DDR_DQ68_504	PS_DDR_DQ68_504	P26
		PS_DDR_DQ69_504	PS_DDR_DQ69_504	R25
		PS_DDR_DQ70_504	PS_DDR_DQ70_504	P25
		PS_DDR_DQ71_504	PS_DDR_DQ71_504	T25
		PS_DDR_DQ8_504	PS_DDR_DM0_504	AG20
		PS_DDR_DM0_504	PS_DDR_DM1_504	AE23
		PS_DDR_DM1_504	PS_DDR_DM2_504	AE25
		PS_DDR_DM2_504	PS_DDR_DM3_504	AE28
		PS_DDR_DM3_504	PS_DDR_DM4_504	R23
		PS_DDR_DM4_504	PS_DDR_DM5_504	H23
		PS_DDR_DM5_504	PS_DDR_DM6_504	L27
		PS_DDR_DM6_504	PS_DDR_DM7_504	H26
		PS_DDR_DM7_504	PS_DDR_DM8_504	T26

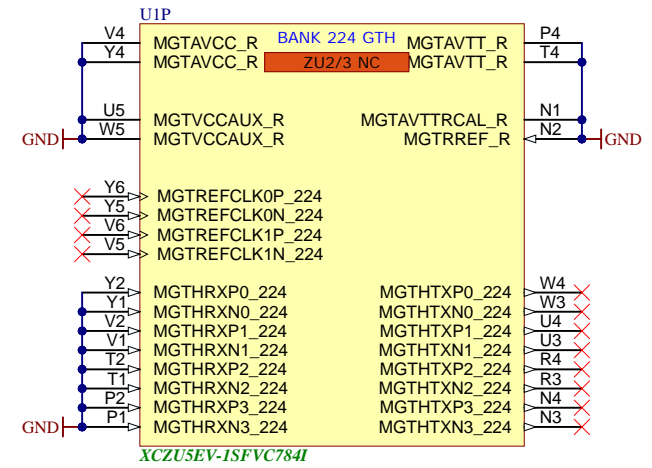
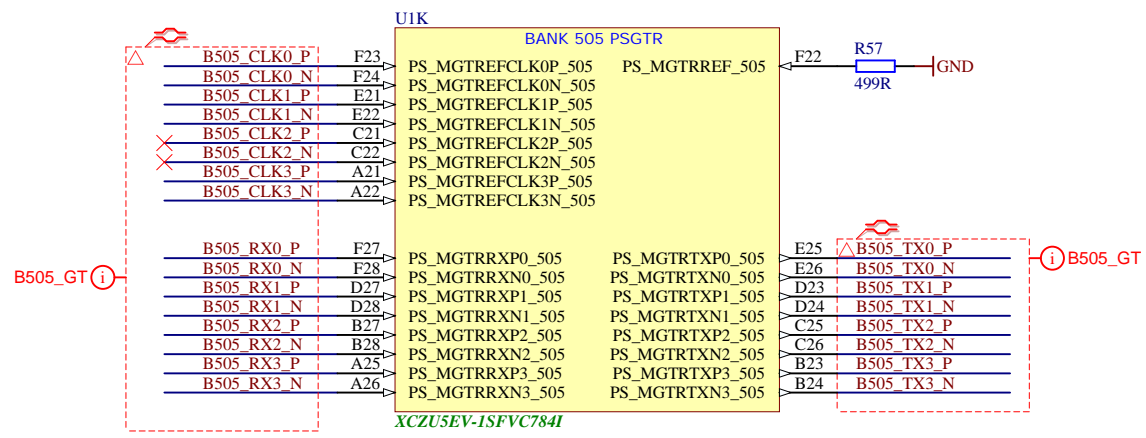
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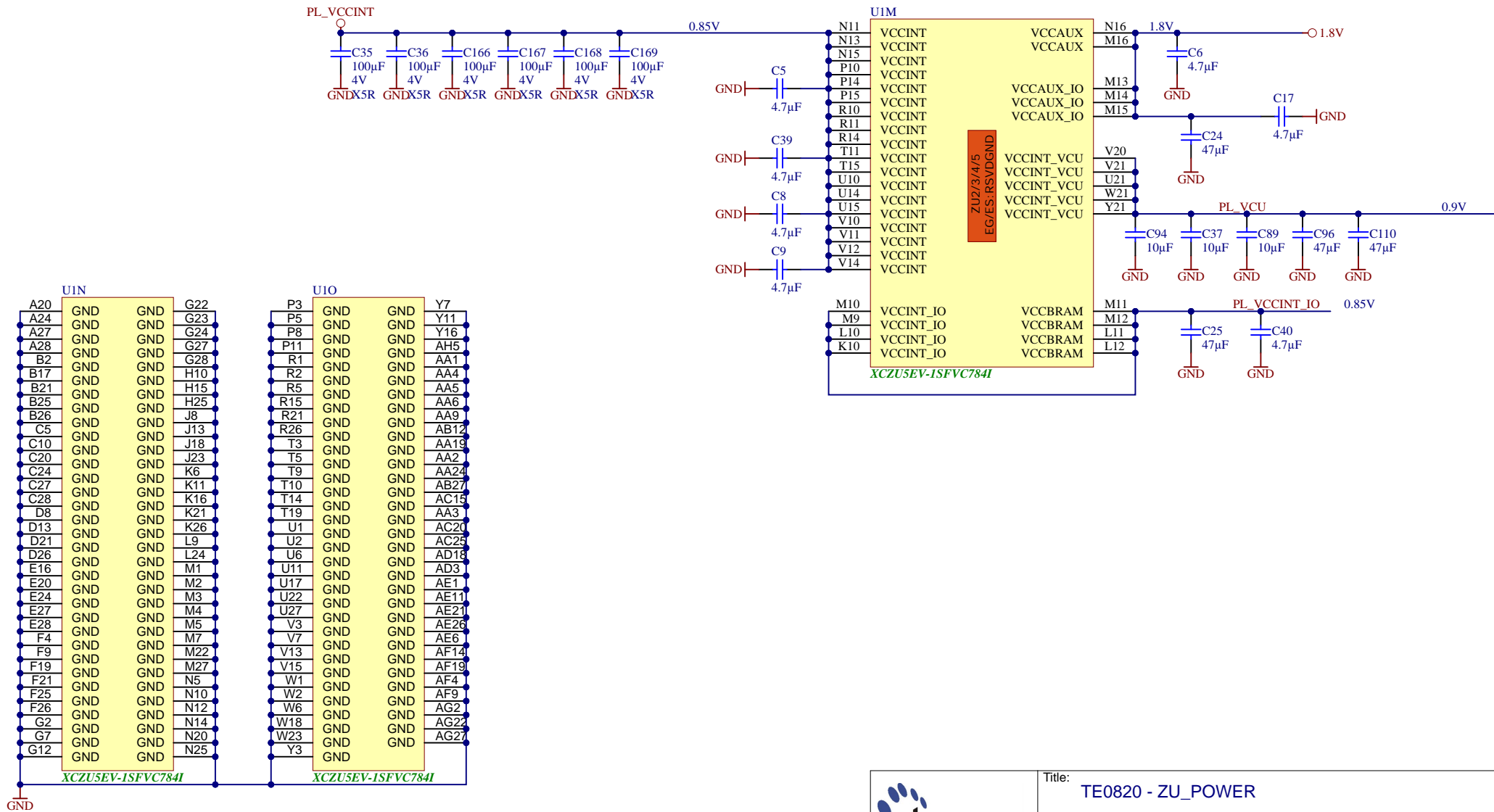
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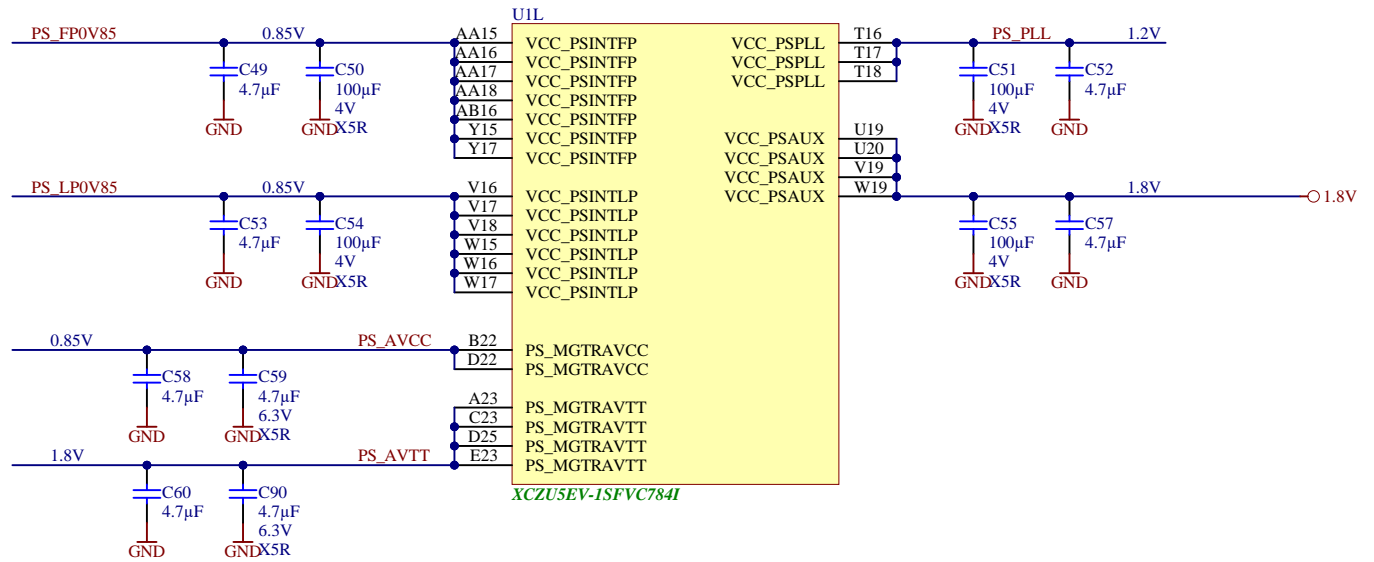
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A4	Number: TE0820 5DI21FA	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 11 of 23
Filename: PS_DDR.SchDoc		




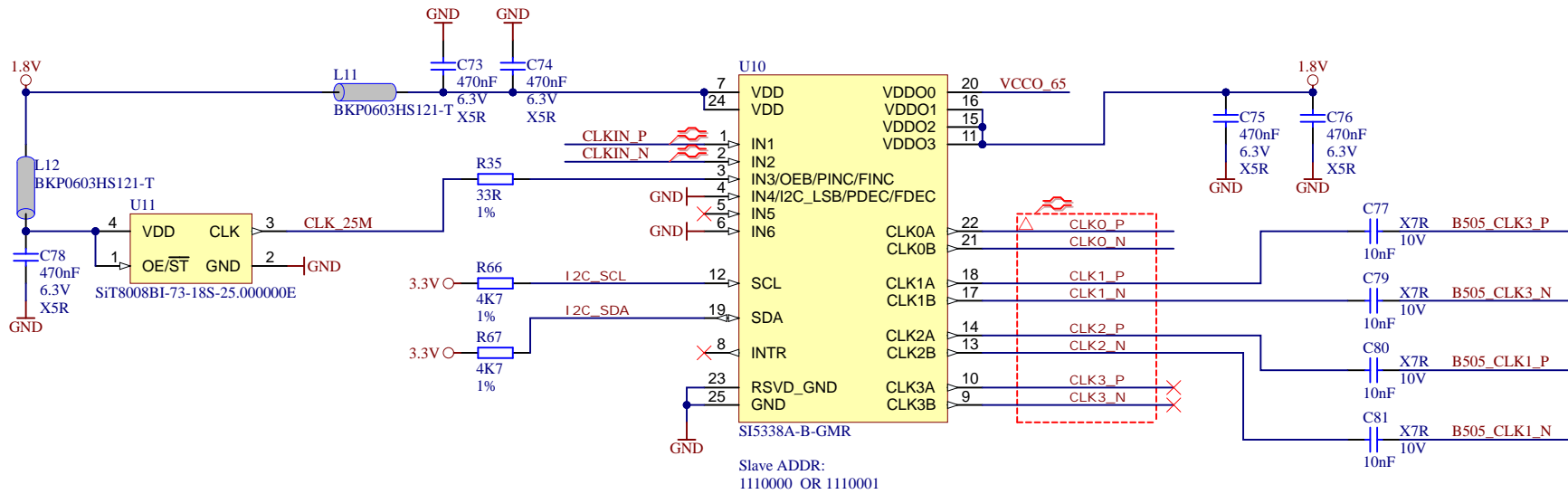
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A4	Number: TE0820 5DI21FA	Rev. 04
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Filename: B_PS_GT.SchDoc		




Title: TE0820 - ZU_POWER		
A4	Number: TE0820 5DI21FA	Rev. 04
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Filename: ZU_POWER.SchDoc		



		Title: TE0820 - ZU_PS_POWER	
		A4	Number: TE0820 5DI21FA
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Filename: ZU_PS_POWER.SchDoc		Page 14 of 23	



		Title: TE0820 - CLK	
		A4	Number: TE0820 5DI21FA
Date: 2020-07-16		Copyright: 2015 Trenz Electronic GmbH	
Page 15 of 23		Filename: CLK.SchDoc	

A

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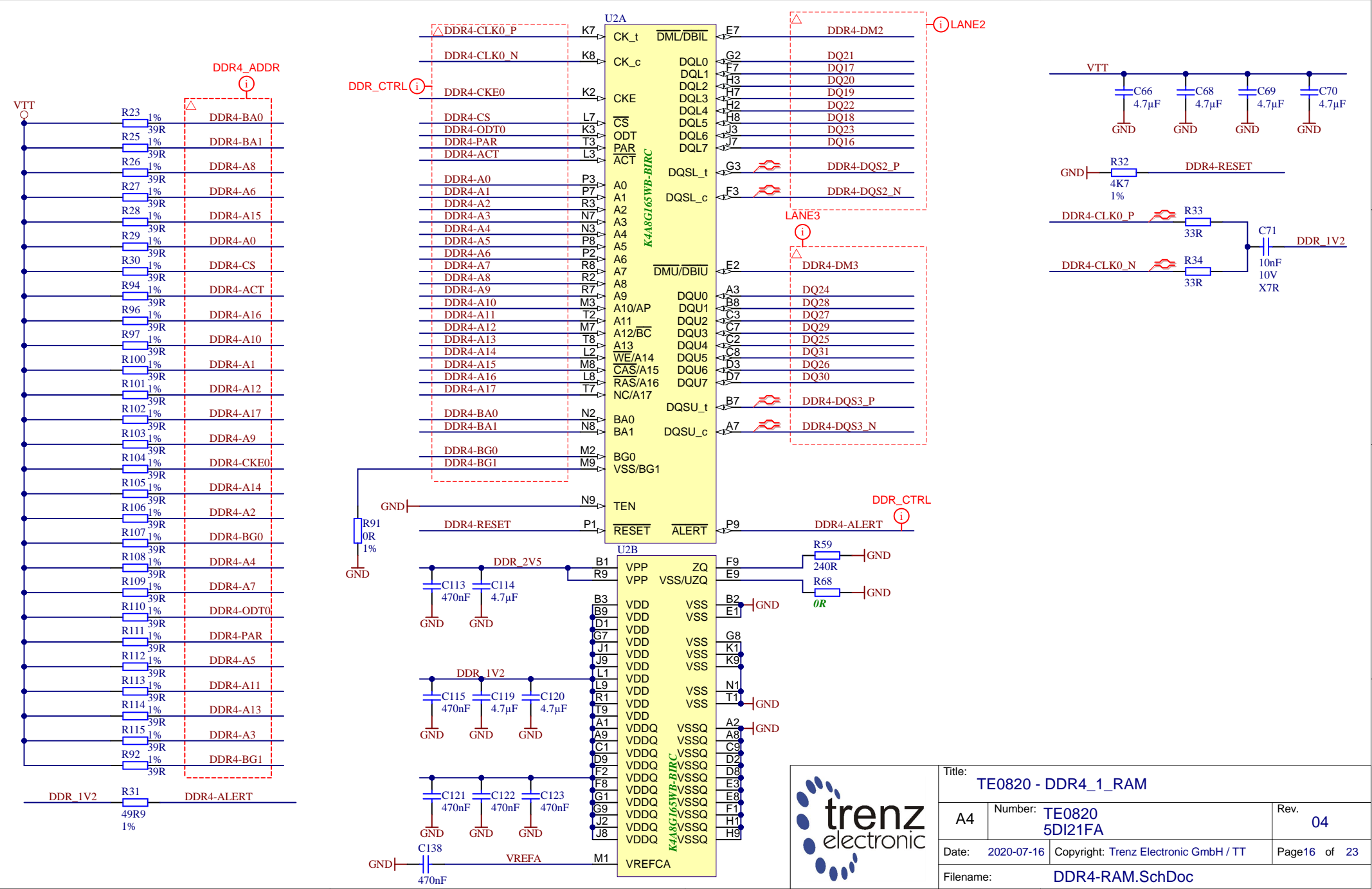
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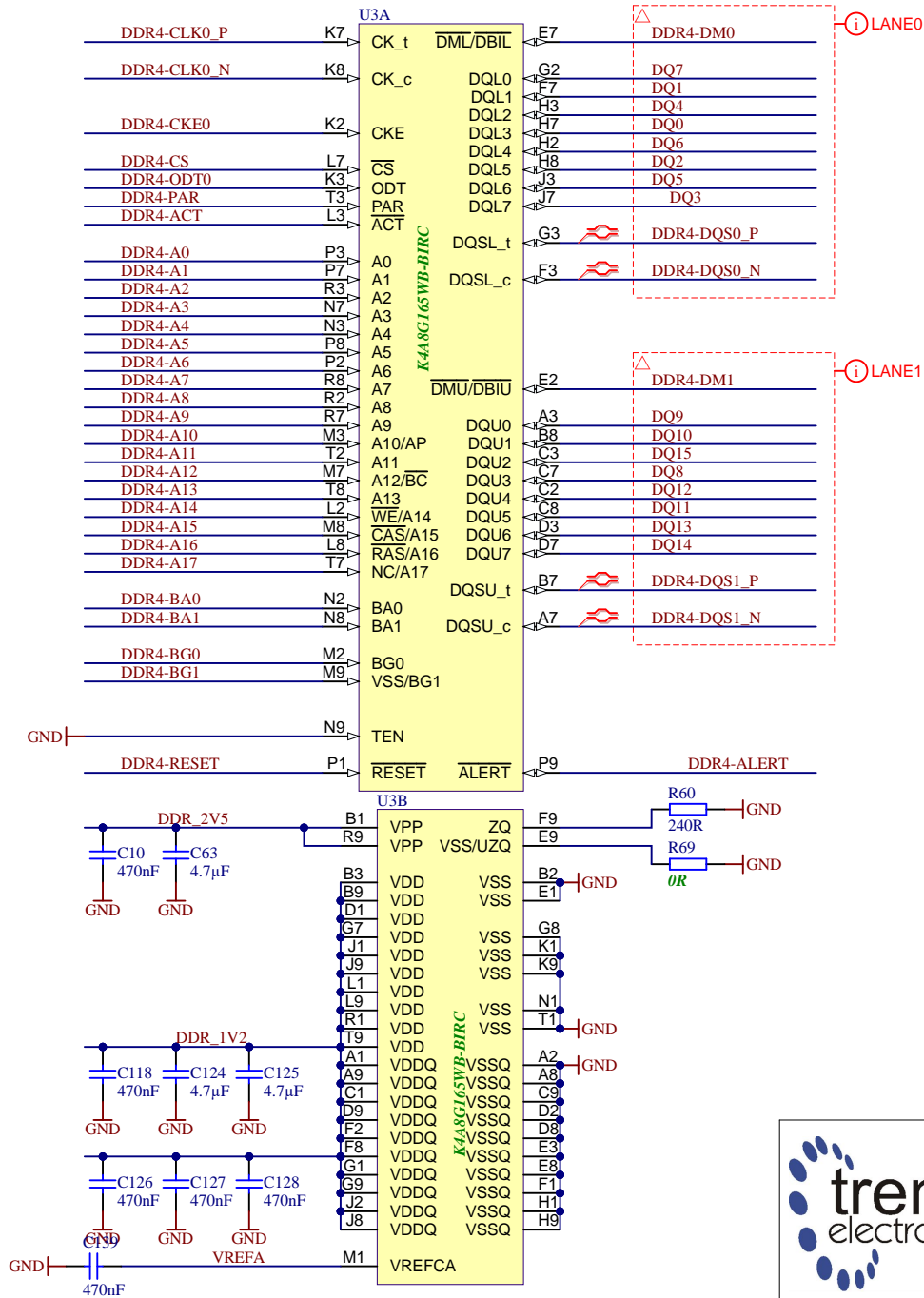
B

C

D



Title: TE0820 - DDR4_1_RAM		
A4	Number: TE0820 5DI21FA	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 16 of 23
Filename: DDR4-RAM.SchDoc		

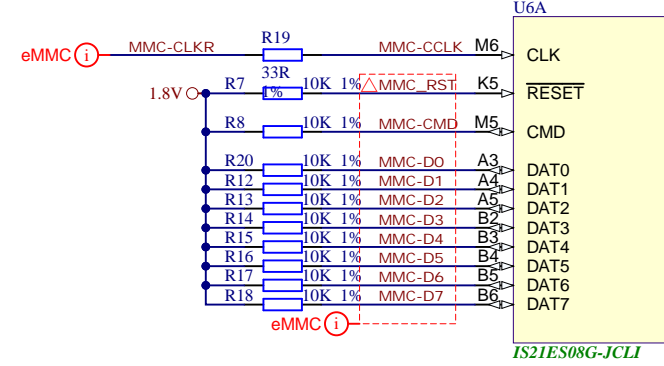


Title: TE0820 - DDR4_2_RAM		
A4	Number: TE0820 5DI21FA	Rev. 04
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Filename: DDR4-RAM_2.SchDoc		

U6D

A1	NC	NC	H2
A2	NC	NC	H3
A8	NC	NC	H12
A9	NC	NC	H13
A10	NC	NC	H14
A11	NC	NC	J1
A12	NC	NC	J2
A13	NC	NC	J3
A14	NC	NC	J12
B1	NC	NC	J13
B7	NC	NC	J14
B8	NC	NC	K1
B9	NC	NC	K2
B10	NC	NC	K3
B11	NC	NC	K12
B12	NC	NC	K13
B13	NC	NC	K14
B14	NC	NC	L1
C1	NC	NC	L2
C3	NC	NC	L3
C7	NC	NC	L12
C8	NC	NC	L13
C9	NC	NC	L14
C10	NC	NC	M4
C11	NC	NC	M2
C12	NC	NC	M3
C13	NC	NC	M7
C14	NC	NC	M8
D1	NC	NC	M9
D2	NC	NC	M10
D3	NC	NC	M11
D4	NC	NC	M12
D12	NC	NC	M13
D13	NC	NC	M14
D14	NC	NC	N1
E1	NC	NC	N3
E2	NC	NC	N6
E3	NC	NC	N7
E12	NC	NC	N8
E13	NC	NC	N9
E14	NC	NC	N10
F1	NC	NC	N11
F2	NC	NC	N12
F3	NC	NC	N13
F12	NC	NC	N14
F13	NC	NC	P1
F14	NC	NC	P2
G1	NC	NC	P8
G2	NC	NC	P9
G12	NC	NC	P11
G13	NC	NC	P12
G14	NC	NC	P13
H1	NC	NC	P14

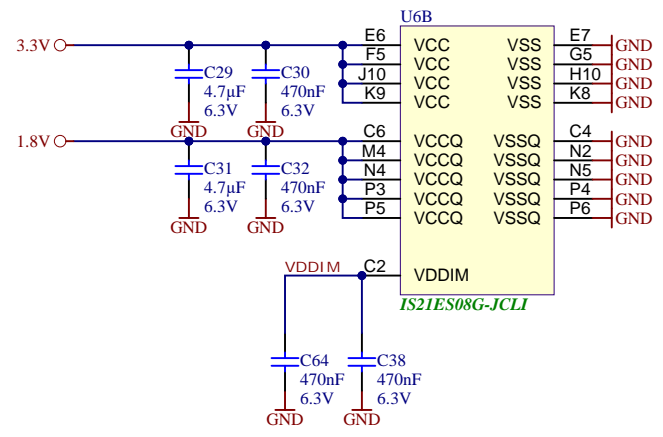
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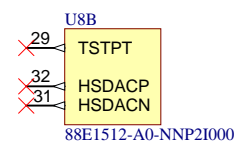
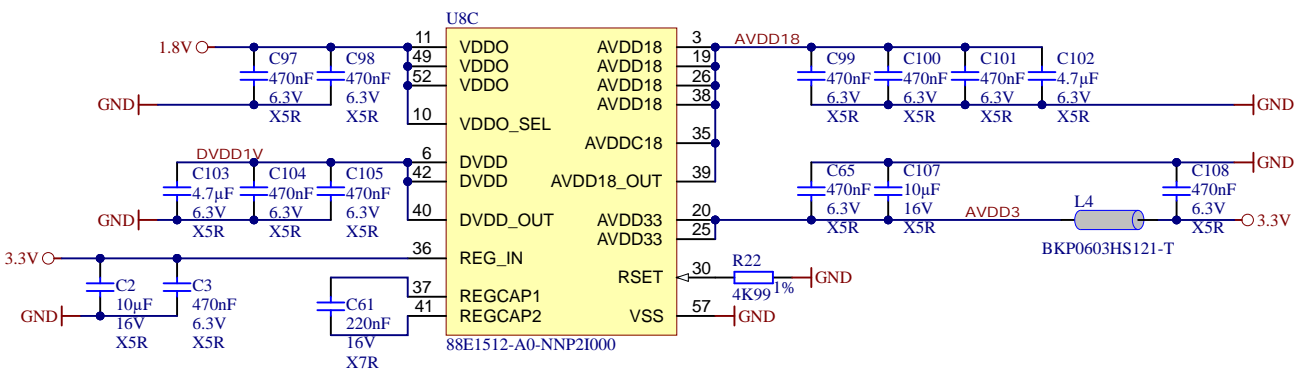
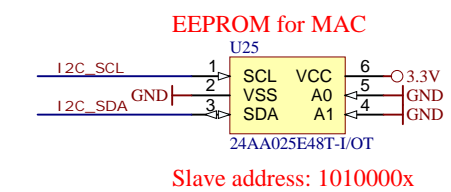
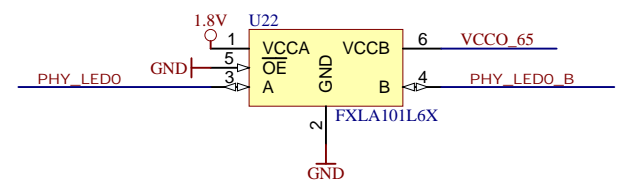
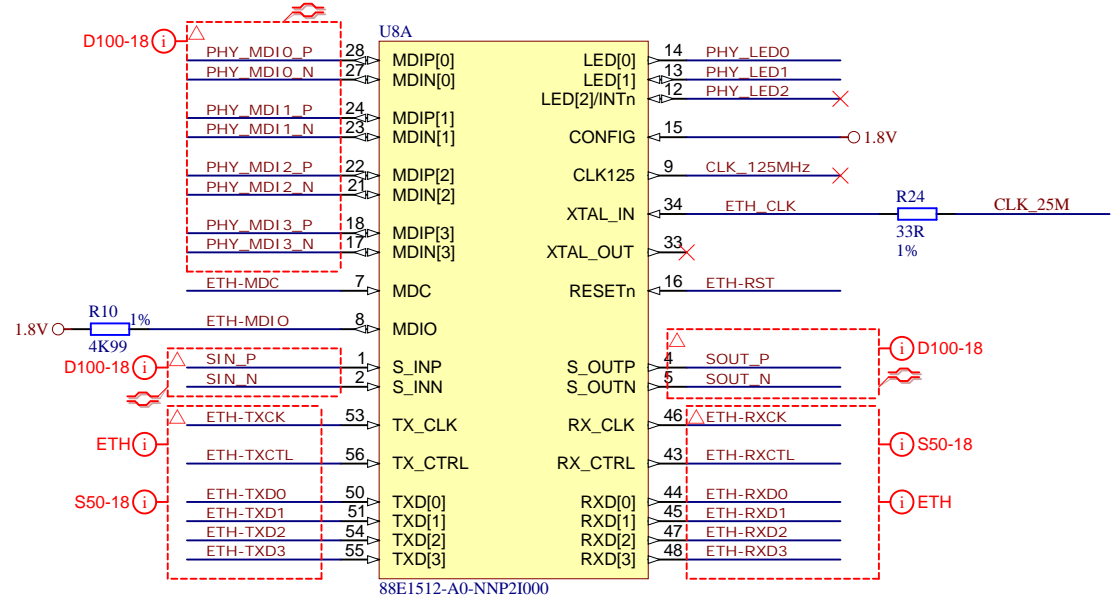
U6C

A6	RFU/VSS
A7	RFU
C5	RFU/NC
E5	RFU
E8	RFU
E9	RFU
E10	RFU
F10	RFU
G3	RFU/NC
G10	RFU
H5	RFU/DS
J5	RFU/VSS
K6	RFU
K7	RFU
K10	RFU
P7	RFU/NC
P10	RFU

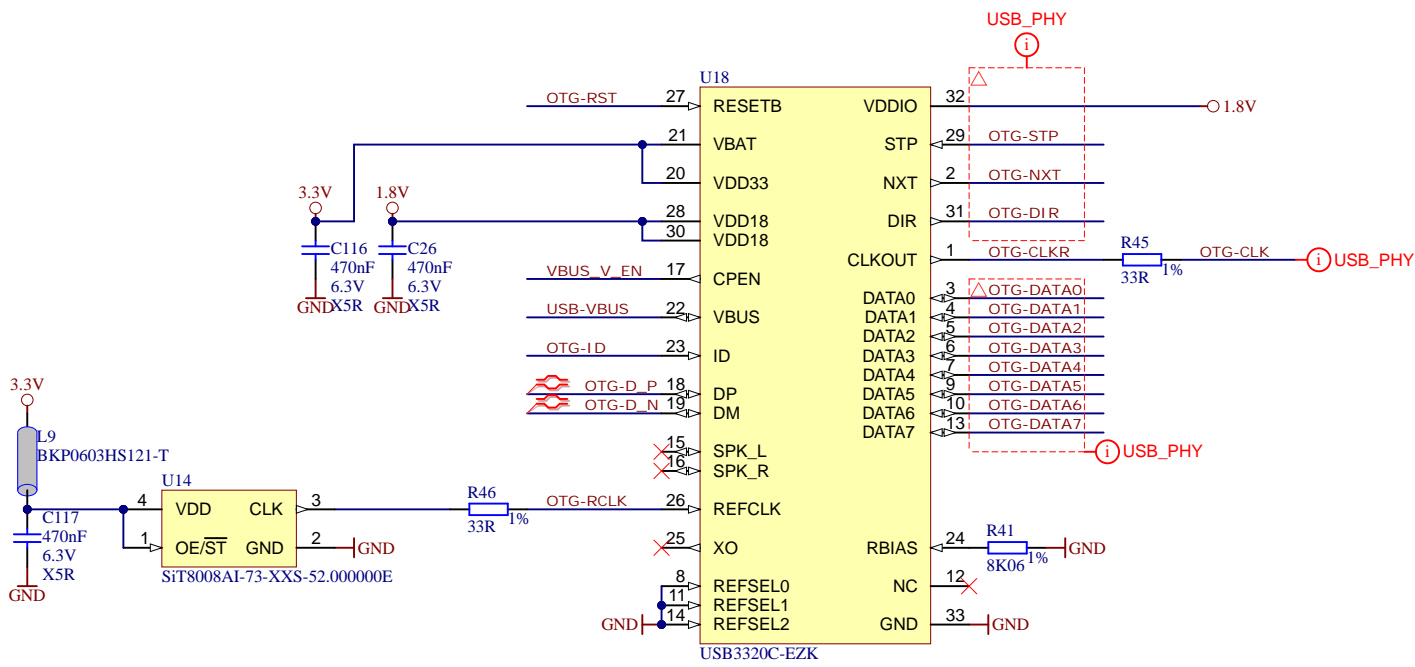
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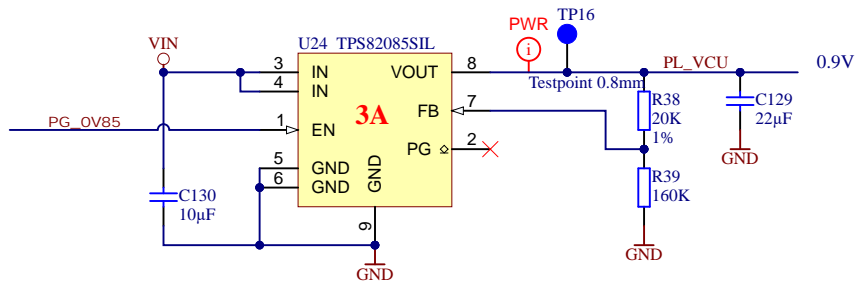
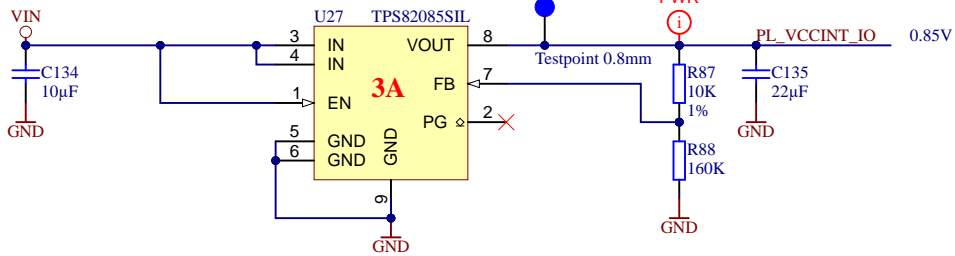
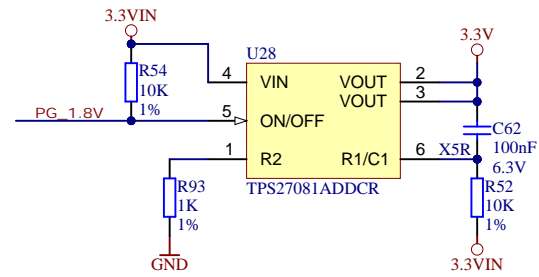
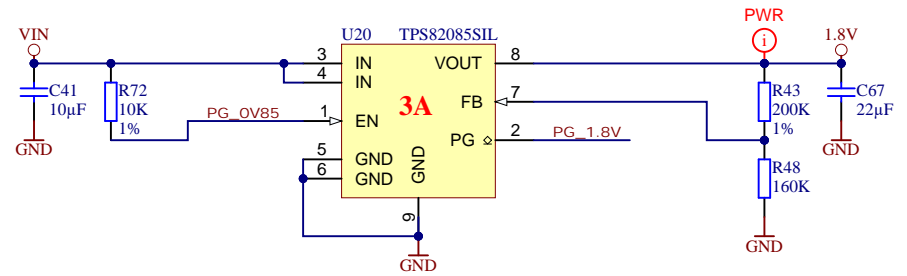
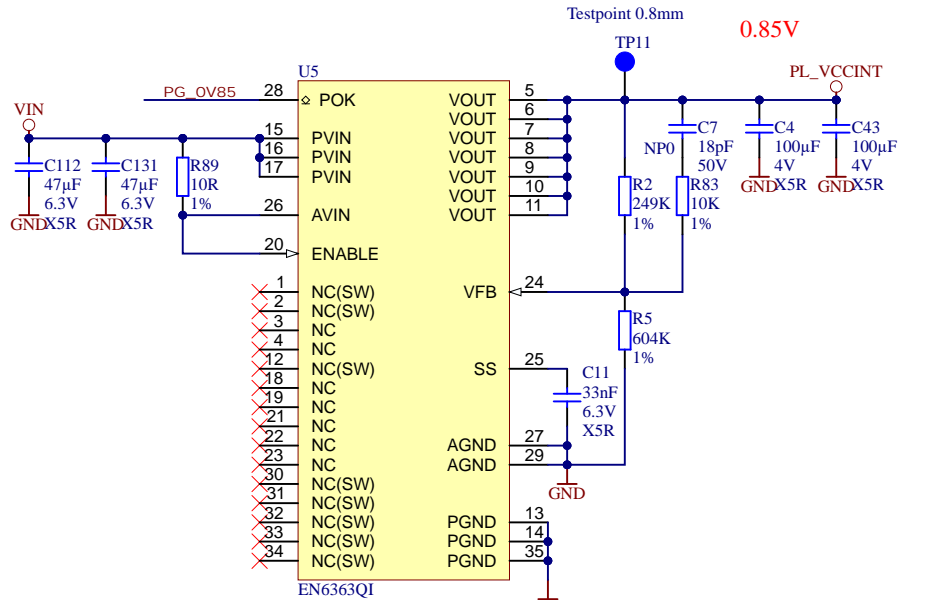
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Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page18 of 23
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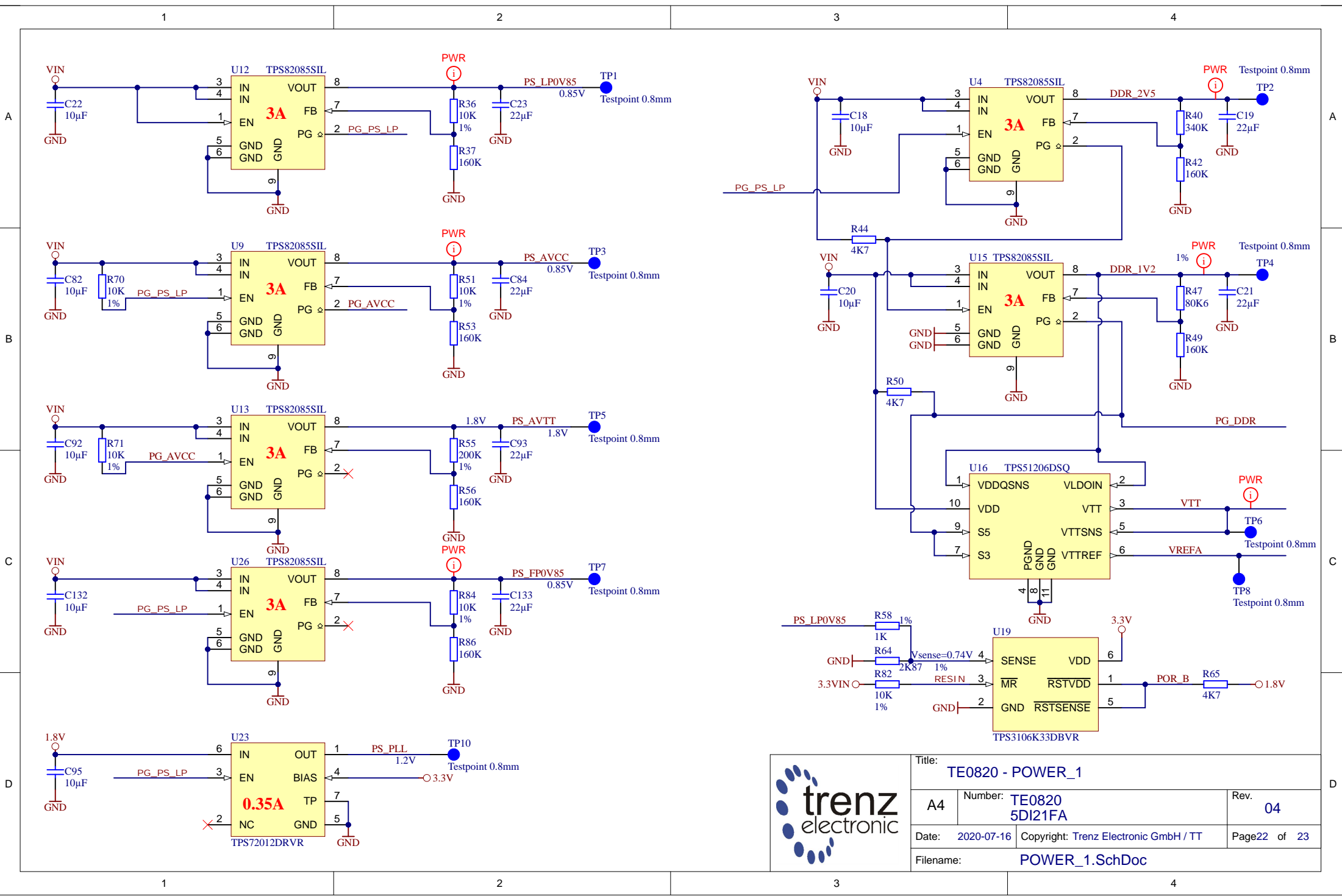
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Filename: USB-PHY.SchDoc			



Title: TE0820 - POWER		
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Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page21 of 23
Filename: POWER.SchDoc		



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			A4	Number: TE0820 5DI21FA
Date: 2020-07-16		Copyright: Trenz Electronic GmbH / TT		Rev. 04
Filename: POWER_1.SchDoc		Page 22 of 23		

CHANGES REV01 to REV02

- 1) Added MAC EEPROM (slave address:)
- 2) LIB components update
- 3) Fixed SD Card connection
- 4) Fixed sense connection from DCDC
- 5) Made correct power connection for VCU (removed DCDC, added resistors and caps like as Xilinx recommended)
- 6) Added resistors for variants (ZU+ with/without VCU)
- 7) Added termination resistors (240R) to VRP pins fro all HP-banks

CHANGES REV02 to REV03


- 1) Fixed VCU connection: add additional DCDC (0.9V)
- 2) LIB components update
- 3) Change package 1K resistors (0402 -> 0201)
- 4) Added LEDs (1x user LED, 1x LED for ERR_STATUS, 1xLED for ERR_OUT)
- 5) Change obsolete 2xSPI Flash (256MBit) -> 2xSPI Flash (512MBit)
- 6) Added additional DCDCs (PL_VCCINT_IO, PS_FP0V85)
- 7) Changed DCDC (U5) 6A (optional 4A)

CHANGES REV03 to REV04

- VT: 1) Fixed DDR4 connection (BG1), support B-die DDR4 Industrial grade chips
- VT: 2) Added R93, changed value C62, change obsolete U28
- VT: 3) Added R89 (10R)
- VT: 4) Added additional caps 4.7uF to PS_AVTT/PS_AVCC (Xilinx doc UG583)
- VT: 5) Changed R51 20k ->10K (PS_AVCC = 0.85V, Xilinx doc DS925 v1.17)
- VT: 6) Fixed DDR4 connection (Alert)
- VT: 7) Added 3.3V signal to CPLD
- VT: 8) Added testpoints
- VT: 9) LIB components update

Revision 04a (29.10.2020):

- 1. VY: added block diagram, updated module pictures

		Title: TE0820 - Revision Changes		
		A4	Number: TE0820 5DI21FA	Rev. 04
		Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 23 of 23
		Filename: Revision Changes.SchDoc		