



Photo Shows Similar Product

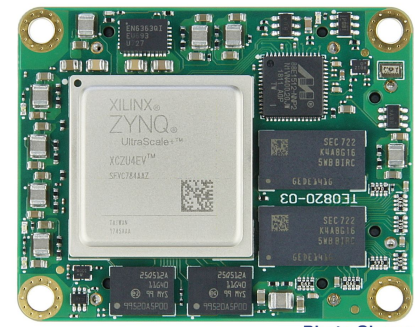


Photo Shows Similar Product

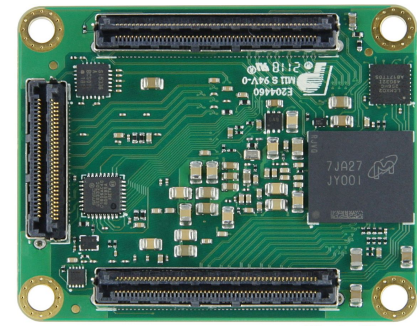


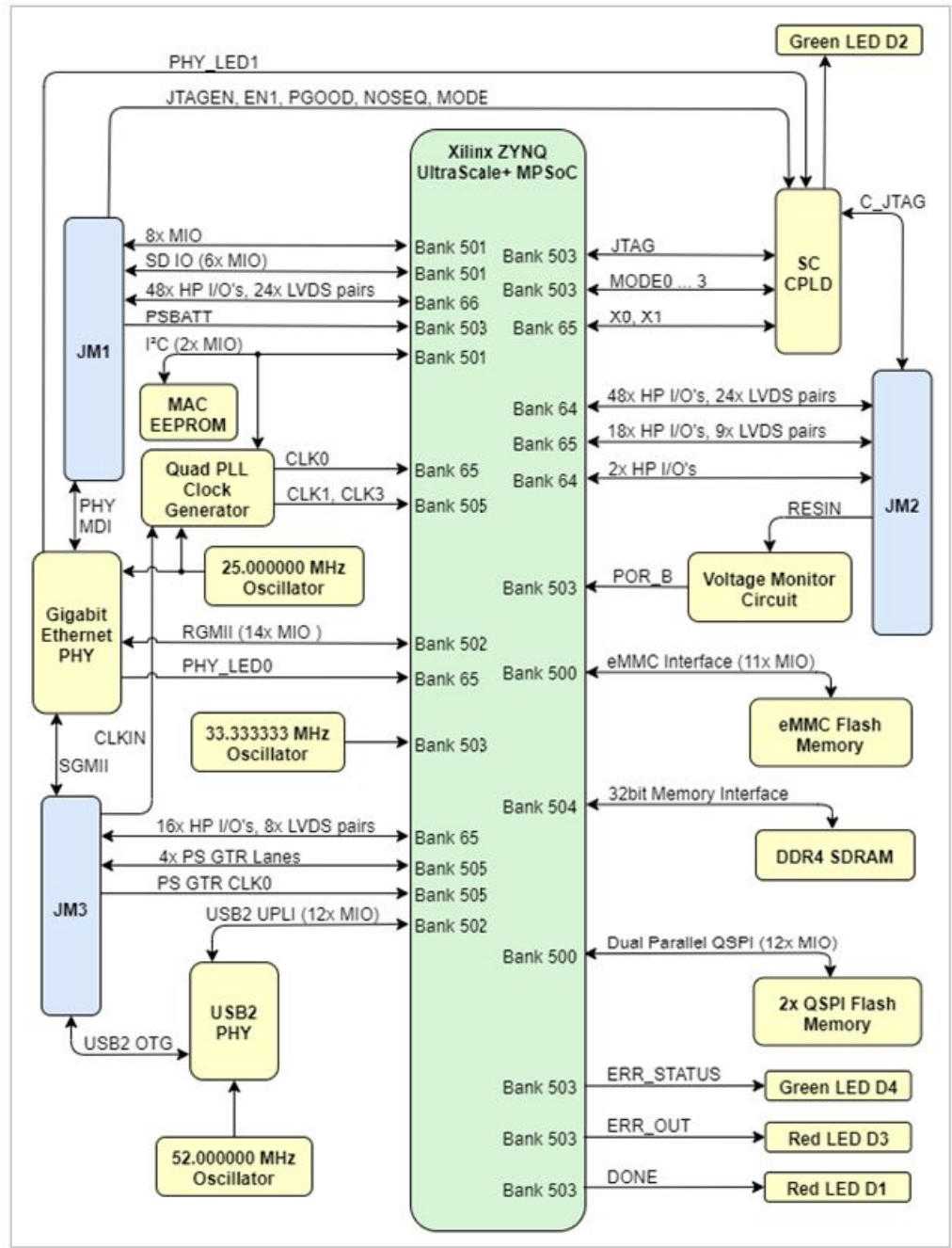
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Regarding the usage of our schematics and alike documentation for Trenz module TE0820.

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 4BI21PL	Rev. 04
	Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 1 of 23
	Filename: Legal Notices Modules.SchDoc		



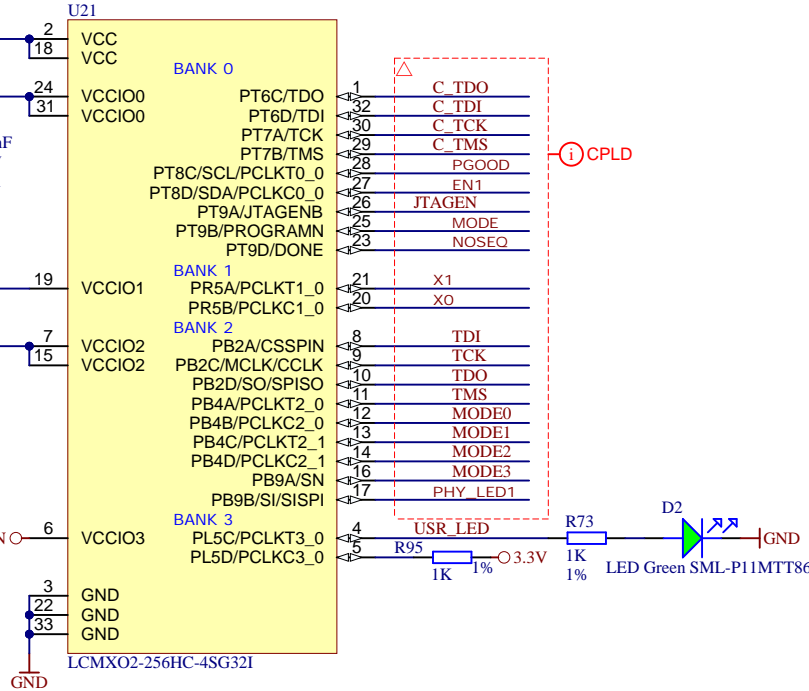
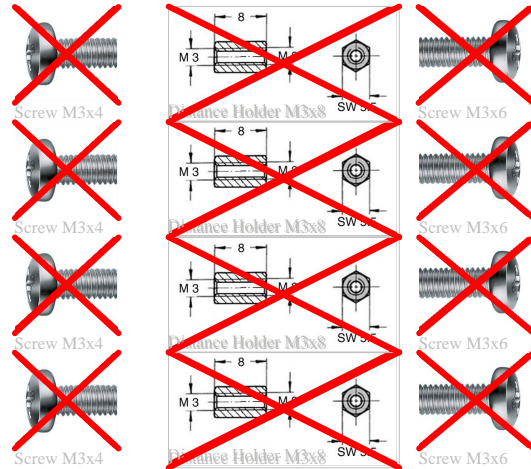
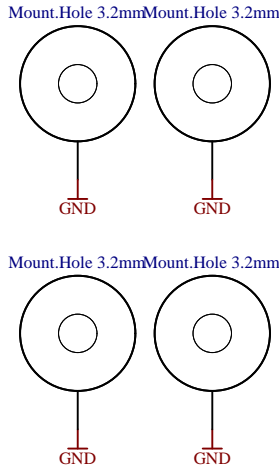
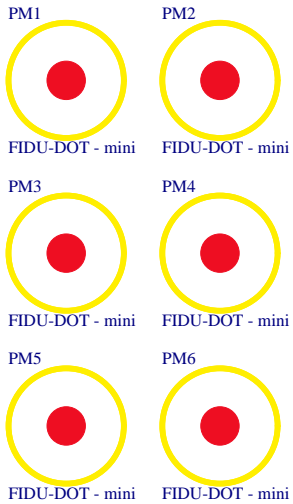
Title: TE0820 - System Overview		
A4	Number: TE0820 4BI21PL	Rev. 04
Date: 2020-10-20	Copyright: Trenz Electronic GmbH	Page 2 of 23
Filename: Overview.SchDoc		

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
Serialnumber 6,3 x 6,3mm



Assembly variant	4BI21PL
Created by	RM
Modified by	RM
Modified at	2021-07-22
SVN Revision	12571

Title: TE0820		
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A

A

B

B

C

C

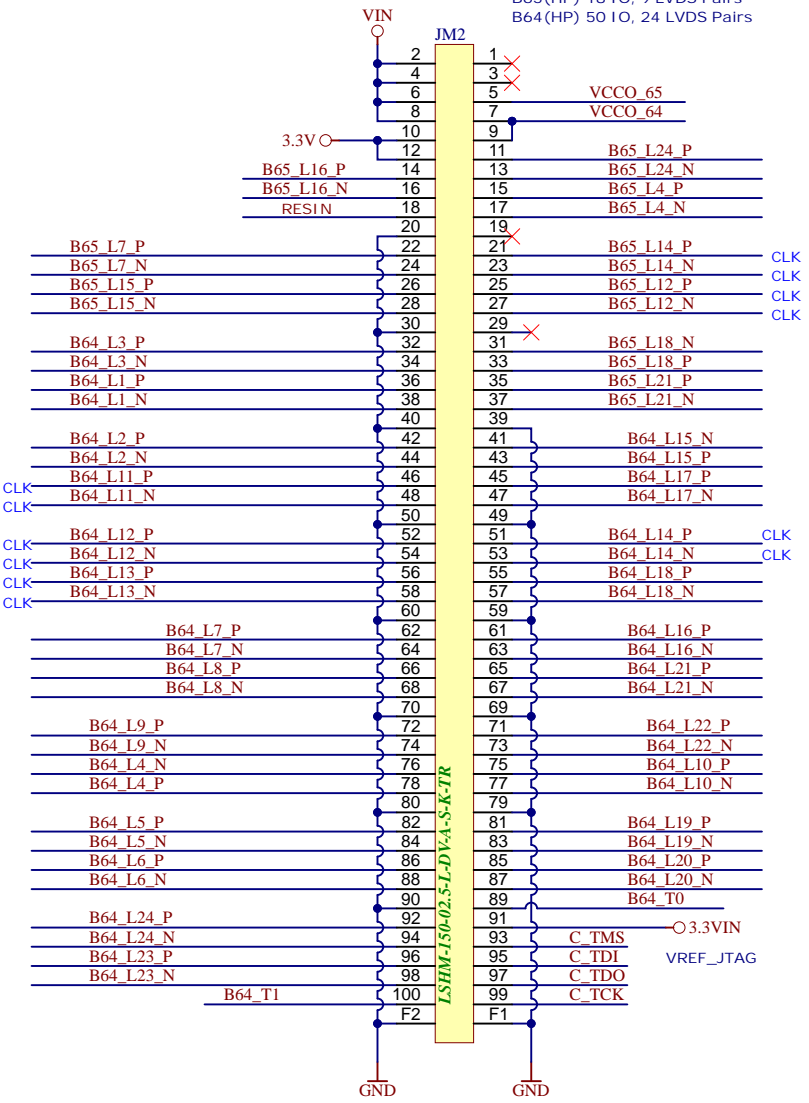
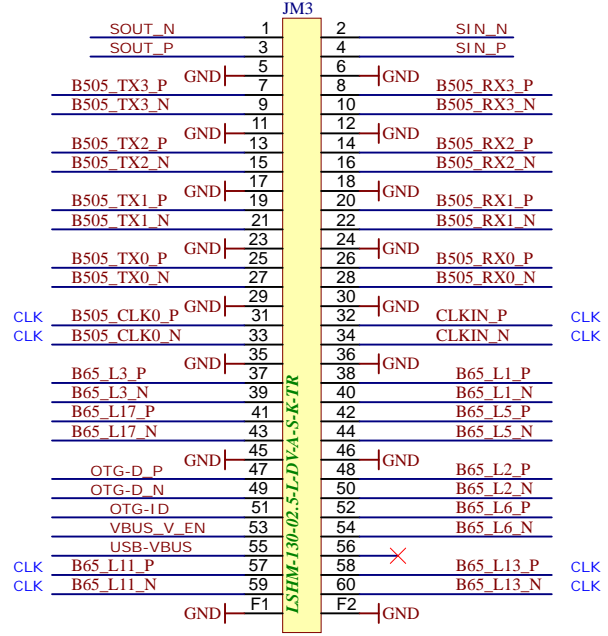
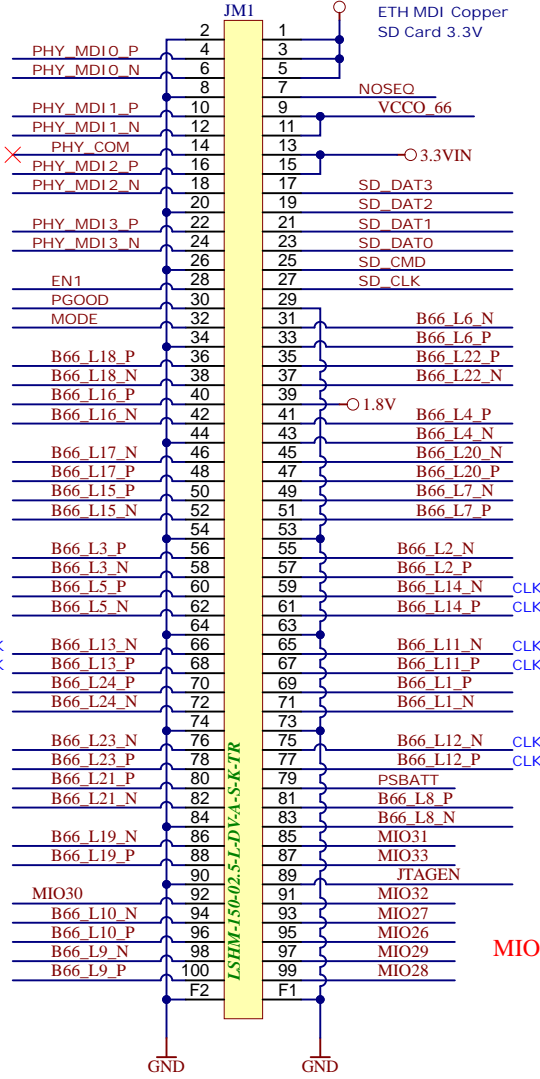
D

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

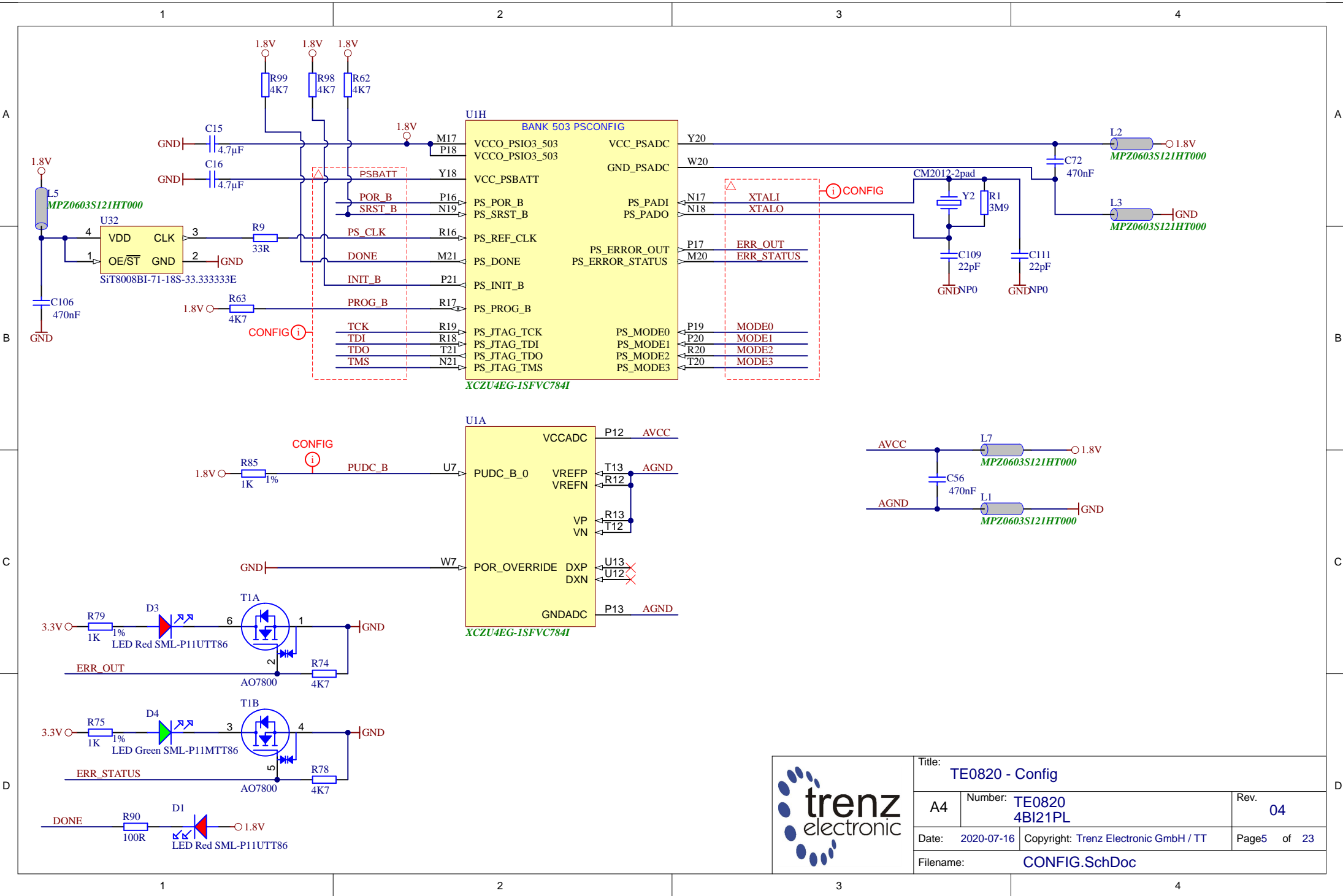


VCCO64, VCCO65, VCCO66 ->>> max. 1.8V (HP bank's)

MIO[29..26] ->PJTAG1



Title: TE0820 - B2B Connectors		
A4	Number: TE0820 4BI21PL	Rev. 04
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Title: TE0820 - Config		
A4	Number: TE0820 4BI21PL	Rev. 04
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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


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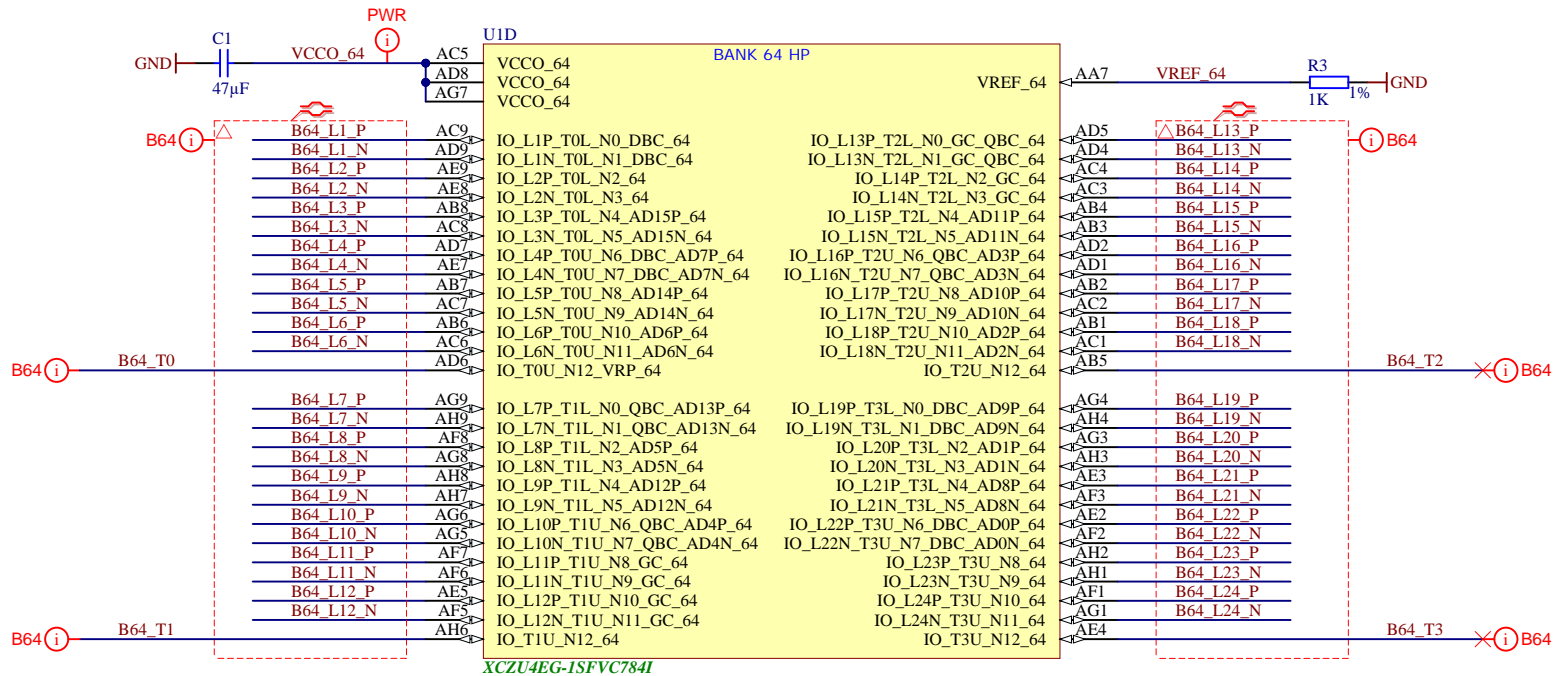
AA14	VCCO_44	BANK 44 HD (ZU2/3 BANK 24 HD)	
AD13	VCCO_44		
AE15	IO_L1P_AD15P_44	IO_L7P_HDGC_44	AA13
AE14	IO_L1N_AD15N_44	IO_L7N_HDGC_44	AB13
AG14	IO_L2P_AD14P_44	IO_L8P_HDGC_44	AB15
AH14	IO_L2N_AD14N_44	IO_L8N_HDGC_44	AB14
AG13	IO_L3P_AD13P_44	IO_L9P_AD11P_44	W14
AH13	IO_L3N_AD13N_44	IO_L9N_AD11N_44	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)

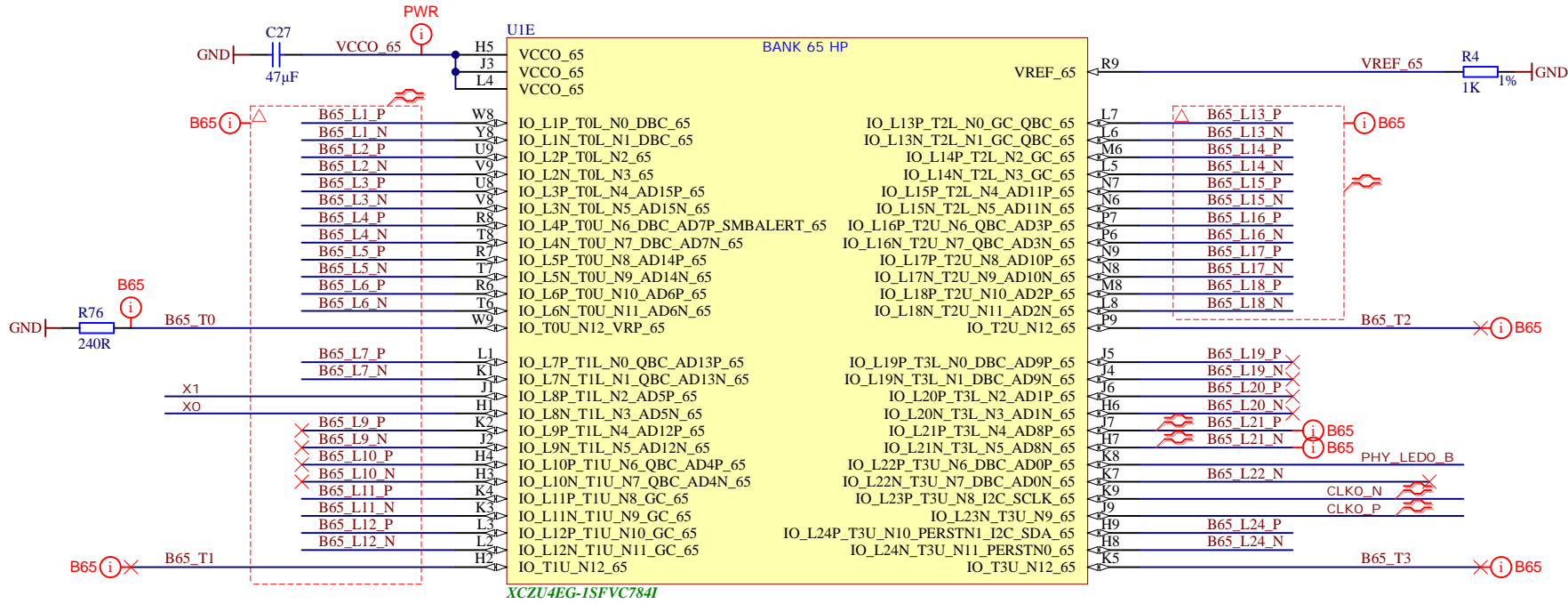
B12	VCCO_45		
E11	VCCO_45		
J11	IO_L1P_AD15P_45	IO_L7P_HDGC_45	E10
J10	IO_L1N_AD15N_45	IO_L7N_HDGC_45	D10
K13	IO_L2P_AD14P_45	IO_L8P_HDGC_45	E12
K12	IO_L2N_AD14N_45	IO_L8N_HDGC_45	D11
H11	IO_L3P_AD13P_45	IO_L9P_AD11P_45	C11
G10	IO_L3N_AD13N_45	IO_L9N_AD11N_45	B10
J12	IO_L4P_AD12P_45	IO_L10P_AD10P_45	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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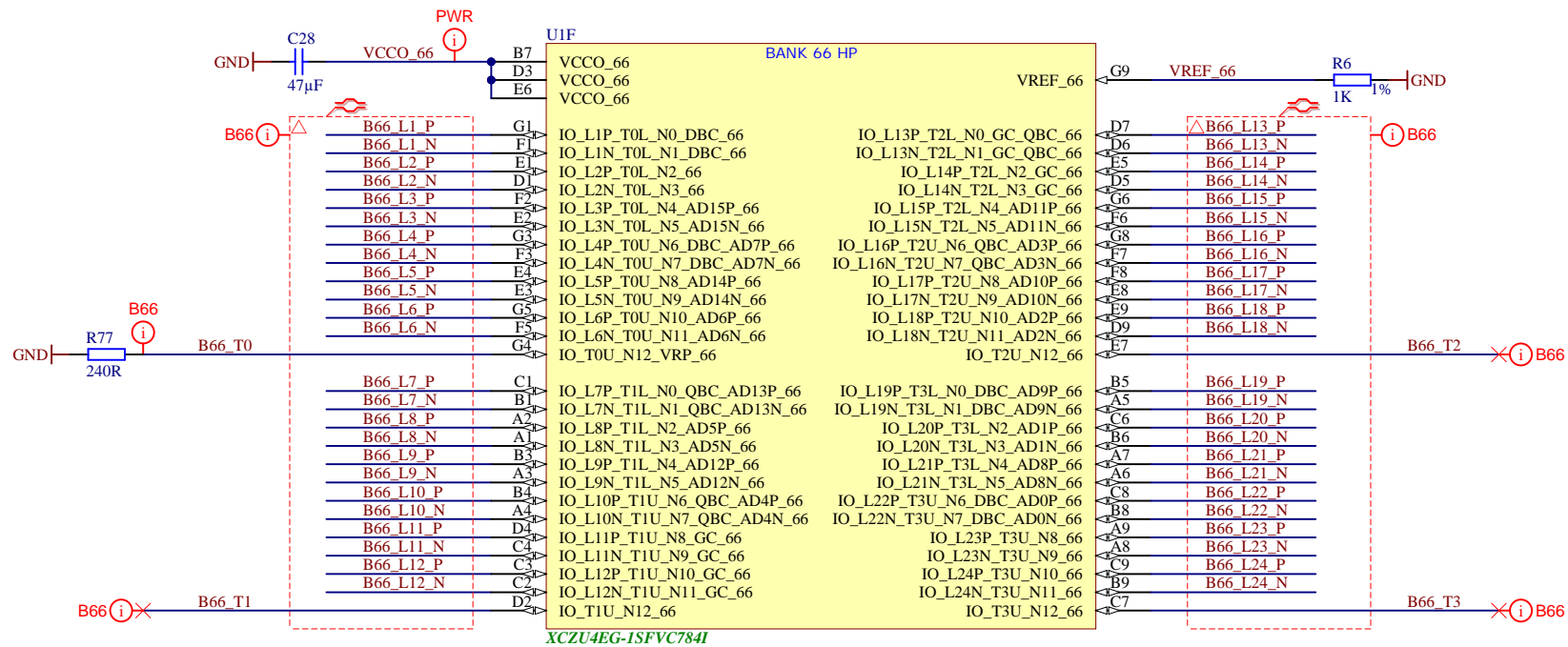
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	A4	Number: TE0820 4BI21PL	Rev. 04
	Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page6 of 23
	Filename: B_HD.SchDoc		



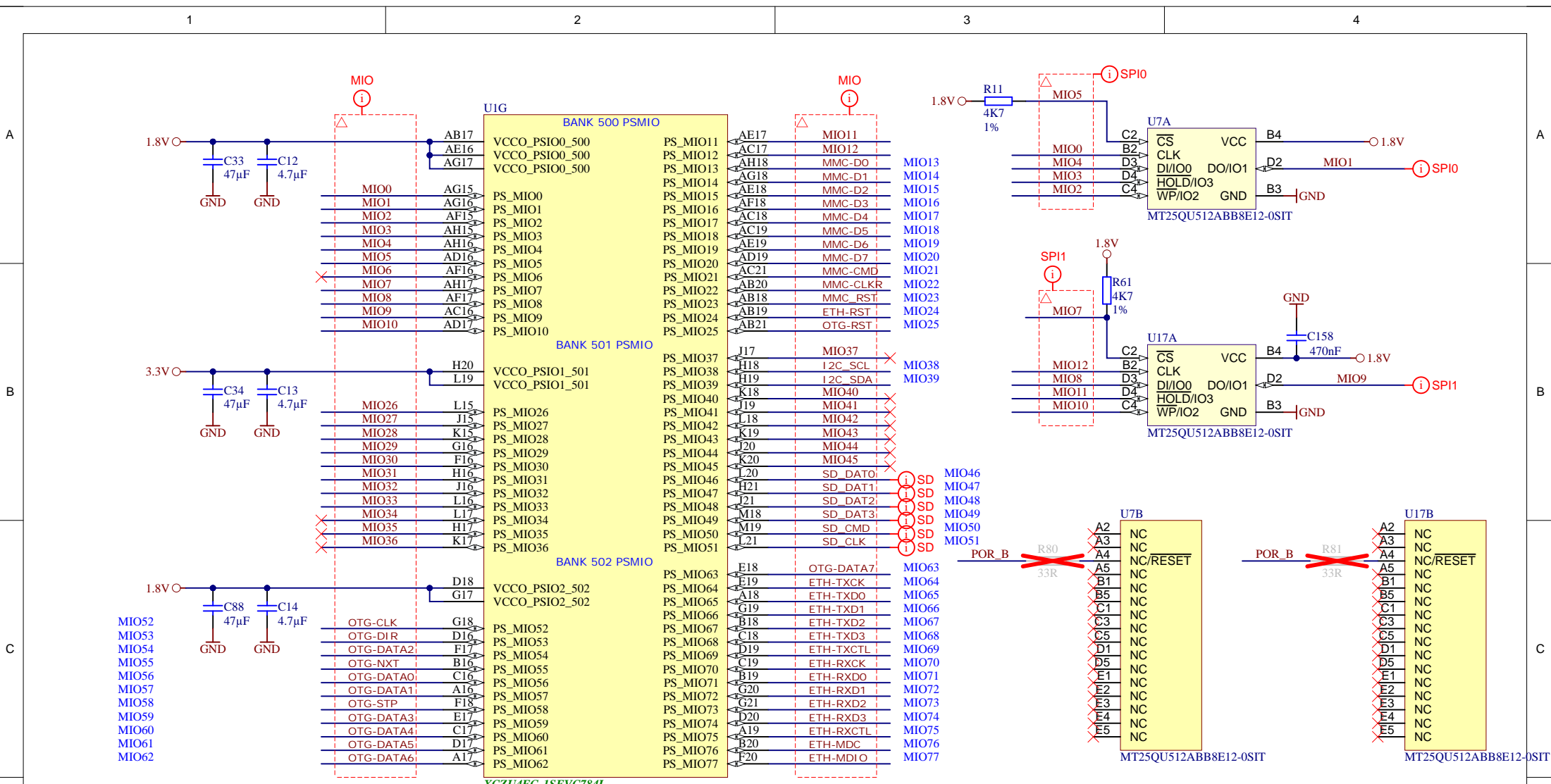
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Title: TE0820 - B65		
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Filename: B65.SchDoc		

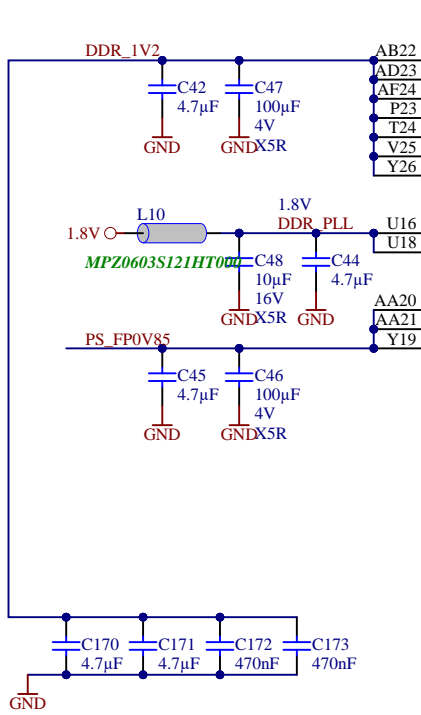


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Title: TE0820 - MIO Banks		
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Filename: B_MIO.SchDoc		



UII
BANK 504 PSDDR

VCCO_PSDDR_504	PS_DDR_CK0	W25	DDR4-CLK0 P	
VCCO_PSDDR_504	PS_DDR_CK_N0	W26	DDR4-CLK0 N	
VCCO_PSDDR_504	PS_DDR_CKE0	V28	DDR4-CKE0	
VCCO_PSDDR_504	PS_DDR_CK1	Y24		×
VCCO_PSDDR_504	PS_DDR_CK_N1	Y25		×
VCCO_PSDDR_504	PS_DDR_CKE1	V27		×
VCC_PSDDR_PLL	PS_DDR_A0	W28	DDR4-A0	
VCC_PSDDR_PLL	PS_DDR_A1	Y28	DDR4-A1	
VCC_PSDDR_PLL	PS_DDR_A2	AB28	DDR4-A2	
VCC_PSDDR_PLL	PS_DDR_A3	AA28	DDR4-A3	
VCC_PSDDR_PLL	PS_DDR_A4	Y27	DDR4-A4	
VCC_PSINTFP_DDR	PS_DDR_A5	AA27	DDR4-A5	
VCC_PSINTFP_DDR	PS_DDR_A6	Y22	DDR4-A6	
VCC_PSINTFP_DDR	PS_DDR_A7	AA23	DDR4-A7	
VCC_PSINTFP_DDR	PS_DDR_A8	AA22	DDR4-A8	
VCC_PSINTFP_DDR	PS_DDR_A9	AB23	DDR4-A9	
VCC_PSINTFP_DDR	PS_DDR_A10	AA25	DDR4-A10	
VCC_PSINTFP_DDR	PS_DDR_A11	AA26	DDR4-A11	
VCC_PSINTFP_DDR	PS_DDR_A12	AB25	DDR4-A12	
VCC_PSINTFP_DDR	PS_DDR_A13	AB26	DDR4-A13	
VCC_PSINTFP_DDR	PS_DDR_A14	AB24	DDR4-A14	
VCC_PSINTFP_DDR	PS_DDR_A15	AC24	DDR4-A15	
VCC_PSINTFP_DDR	PS_DDR_A16	AC23	DDR4-A16	
VCC_PSINTFP_DDR	PS_DDR_A17	AC22	DDR4-A17	
PS_DDR_CS_N0	PS_DDR_CS_N1	W27	DDR4-CS	
PS_DDR_CS_N0	PS_DDR_CS_N1	V26		×
PS_DDR_BA0	PS_DDR_BA1	V23	DDR4-BA0	
PS_DDR_BA0	PS_DDR_BA1	W22	DDR4-BA1	
PS_DDR_BG0	PS_DDR_BG1	W24	DDR4-BG0	
PS_DDR_BG0	PS_DDR_BG1	V22	DDR4-BG1	
PS_DDR_PARITY	PS_DDR_RAM_RST_N	Y24	DDR4-PAR	
PS_DDR_RAM_RST_N	PS_DDR_ACT_N	U23	DDR4-RESET	
PS_DDR_ACT_N	PS_DDR_ALERT_N	Y23	DDR4-ACT	
PS_DDR_ALERT_N		U25	DDR4-ALERT	
PS_DDR_ZQ		U24		240R
PS_DDR_ODT0	PS_DDR_ODT1	U28	DDR4-ODT0	
PS_DDR_ODT0	PS_DDR_ODT1	U26		×

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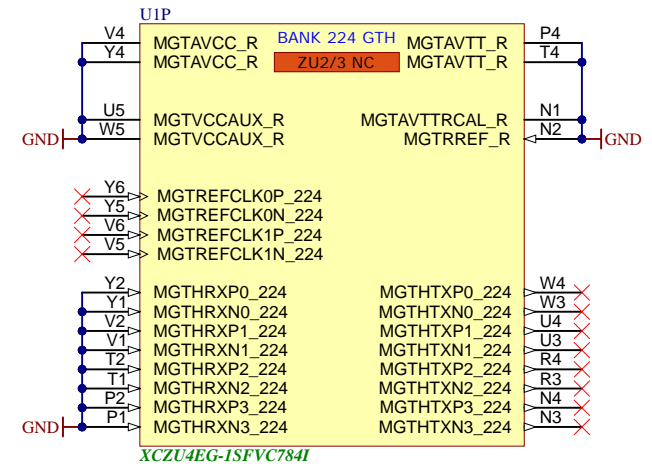
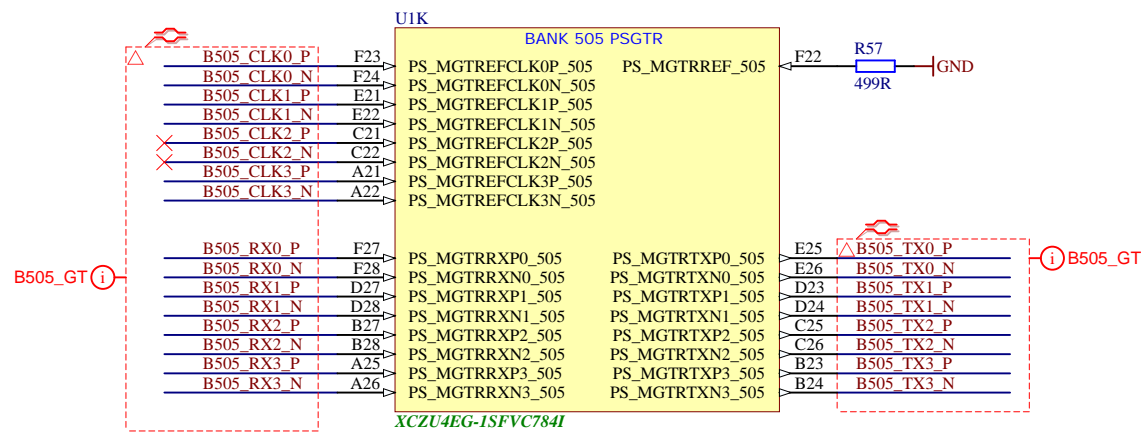
UIJ
BANK 504 PSDDR

DQ0	AD21	PS_DDR_DQ0	PS_DDR_DQ32	T22
DQ1	AE20	PS_DDR_DQ1	PS_DDR_DQ33	R22
DQ2	AD20	PS_DDR_DQ2	PS_DDR_DQ34	P22
DQ3	AF20	PS_DDR_DQ3	PS_DDR_DQ35	N22
DQ4	AH21	PS_DDR_DQ4	PS_DDR_DQ36	T23
DQ5	AH20	PS_DDR_DQ5	PS_DDR_DQ37	P24
DQ6	AH19	PS_DDR_DQ6	PS_DDR_DQ38	R24
DQ7	AG19	PS_DDR_DQ7	PS_DDR_DQ39	N24
DQ8	AF22	PS_DDR_DQ8	PS_DDR_DQ40	H24
DQ9	AH22	PS_DDR_DQ9	PS_DDR_DQ41	J24
DQ10	AE22	PS_DDR_DQ10	PS_DDR_DQ42	M24
DQ11	AD23	PS_DDR_DQ11	PS_DDR_DQ43	K24
DQ12	AH23	PS_DDR_DQ12	PS_DDR_DQ44	J22
DQ13	AH24	PS_DDR_DQ13	PS_DDR_DQ45	H22
DQ14	AE24	PS_DDR_DQ14	PS_DDR_DQ46	K22
DQ15	AG24	PS_DDR_DQ15	PS_DDR_DQ47	L22
DQ16	AC26	PS_DDR_DQ16	PS_DDR_DQ48	M25
DQ17	AD26	PS_DDR_DQ17	PS_DDR_DQ49	M26
DQ18	AD25	PS_DDR_DQ18	PS_DDR_DQ50	L25
DQ19	AD24	PS_DDR_DQ19	PS_DDR_DQ51	L26
DQ20	AG26	PS_DDR_DQ20	PS_DDR_DQ52	K28
DQ21	AH25	PS_DDR_DQ21	PS_DDR_DQ53	L28
DQ22	AH26	PS_DDR_DQ22	PS_DDR_DQ54	M28
DQ23	AG25	PS_DDR_DQ23	PS_DDR_DQ55	N28
DQ24	AH27	PS_DDR_DQ24	PS_DDR_DQ56	J28
DQ25	AH28	PS_DDR_DQ25	PS_DDR_DQ57	K27
DQ26	AF28	PS_DDR_DQ26	PS_DDR_DQ58	H28
DQ27	AG28	PS_DDR_DQ27	PS_DDR_DQ59	H27
DQ28	AC27	PS_DDR_DQ28	PS_DDR_DQ60	G26
DQ29	AD27	PS_DDR_DQ29	PS_DDR_DQ61	G25
DQ30	AD28	PS_DDR_DQ30	PS_DDR_DQ62	K25
DQ31	AC28	PS_DDR_DQ31	PS_DDR_DQ63	J25
DDR4-DQS0 P	AF21	PS_DDR_DQS_P0	PS_DDR_DQ64	T28
DDR4-DQS0 N	AG21	PS_DDR_DQS_N0	PS_DDR_DQ65	R28
DDR4-DQS1 P	AF23	PS_DDR_DQS_P1	PS_DDR_DQ66	P28
DDR4-DQS1 N	AG23	PS_DDR_DQS_N1	PS_DDR_DQ67	P27
DDR4-DQS2 P	AF25	PS_DDR_DQS_P2	PS_DDR_DQ68	P26
DDR4-DQS2 N	AF26	PS_DDR_DQS_N2	PS_DDR_DQ69	R25
DDR4-DQS3 P	AE27	PS_DDR_DQS_P3	PS_DDR_DQ70	P25
DDR4-DQS3 N	AE27	PS_DDR_DQS_N3	PS_DDR_DQ71	T25
PS_DDR_DQS_P4	N23	PS_DDR_DQS_P4	PS_DDR_DM0	AG20
PS_DDR_DQS_P5	M23	PS_DDR_DQS_P5	PS_DDR_DM1	AE23
PS_DDR_DQS_P6	L23	PS_DDR_DQS_P6	PS_DDR_DM2	AE25
PS_DDR_DQS_P7	K23	PS_DDR_DQS_P7	PS_DDR_DM3	AE28
PS_DDR_DQS_P8	N26	PS_DDR_DQS_P8	PS_DDR_DM4	R23
PS_DDR_DQS_P9	N27	PS_DDR_DQS_P9	PS_DDR_DM5	H23
PS_DDR_DQS_P10	J26	PS_DDR_DQS_P10	PS_DDR_DM6	H26
PS_DDR_DQS_P11	J27	PS_DDR_DQS_P11	PS_DDR_DM7	L27
PS_DDR_DQS_P12	R27	PS_DDR_DQS_P12	PS_DDR_DM8	H26
PS_DDR_DQS_P13	T27	PS_DDR_DQS_P13		T26

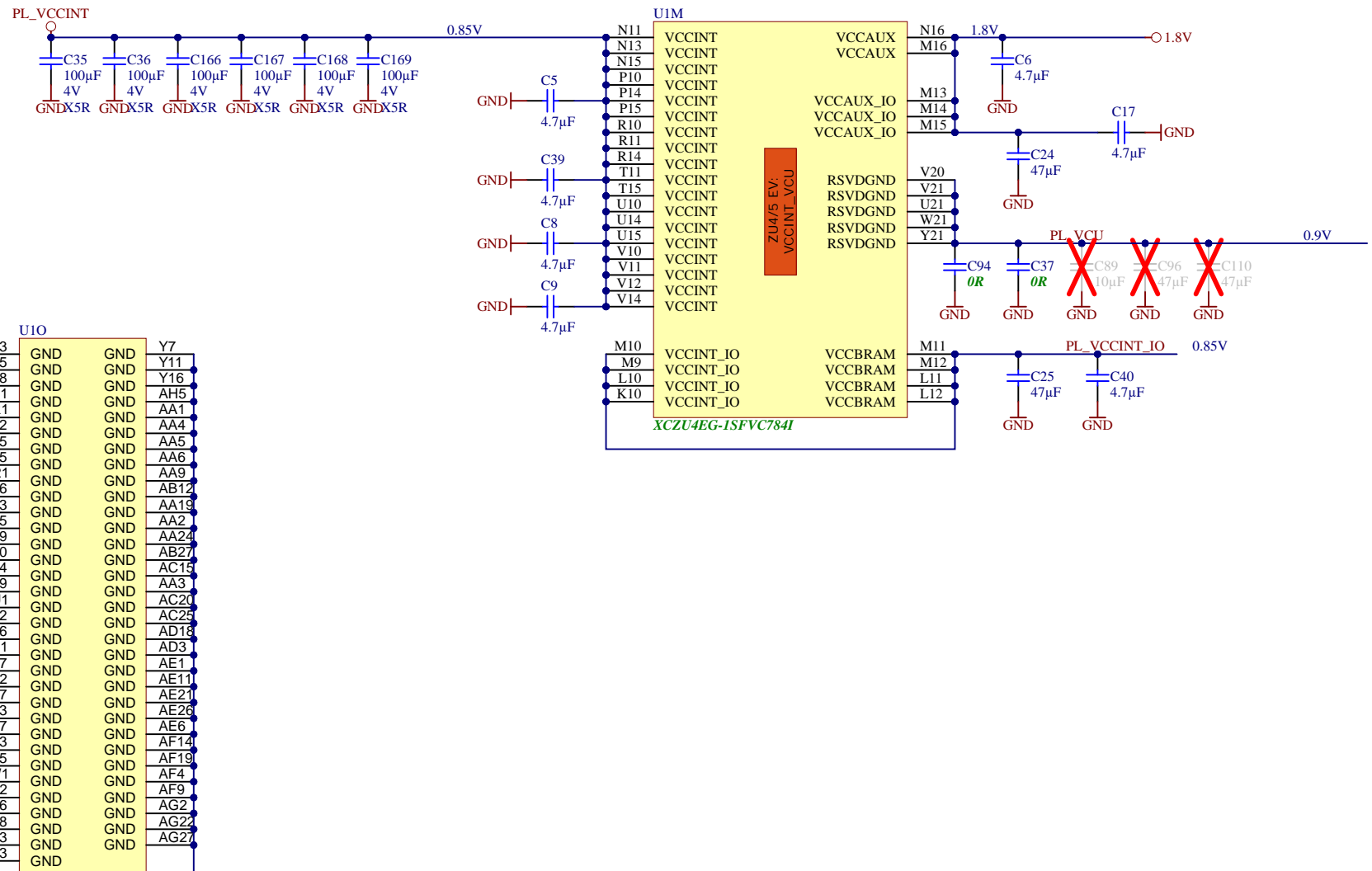
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Title: TE0820 - PS_DDR		
A4	Number: TE0820 4BI21PL	Rev. 04
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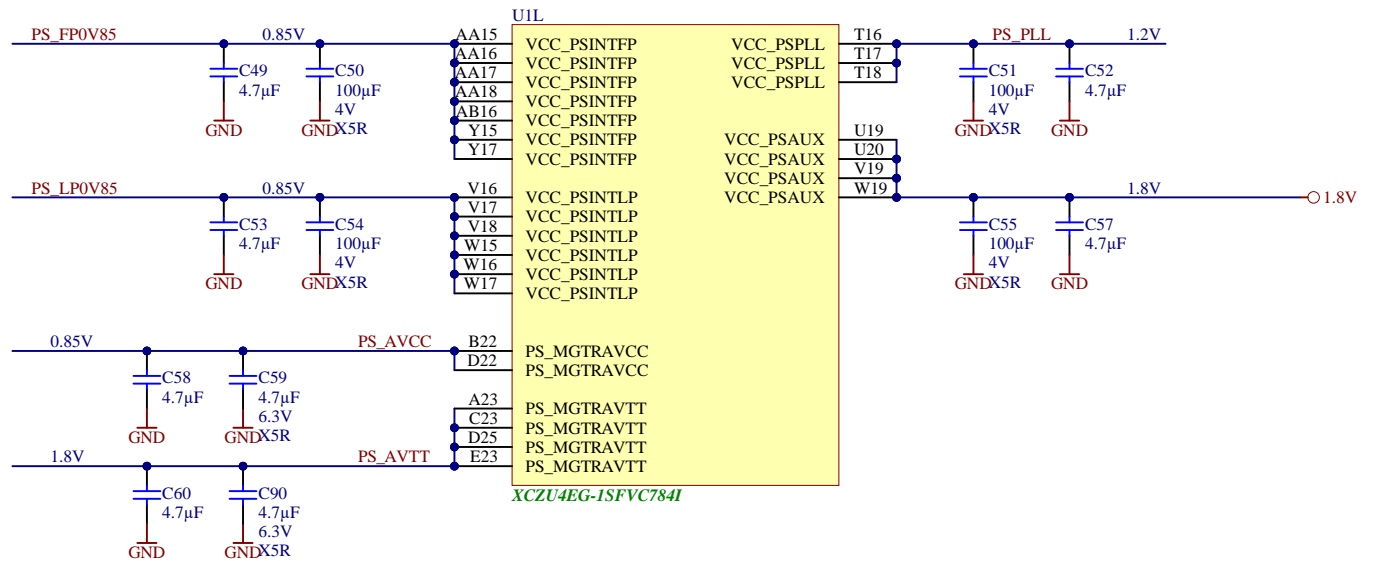
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	Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 12 of 23
	Filename: B_PS_GT.SchDoc		




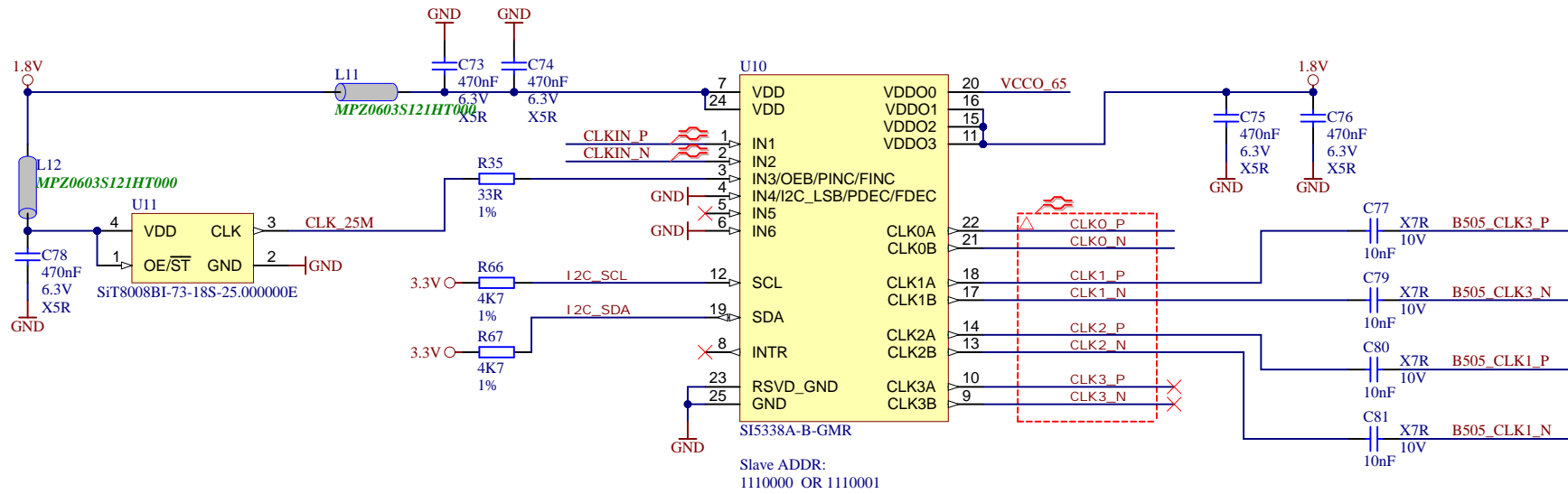
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A20	GND	GND	G22	P3	GND	GND	Y7				
A24	GND	GND	G23	P5	GND	GND	Y11				
A27	GND	GND	G24	P8	GND	GND	Y16				
A28	GND	GND	G27	P11	GND	GND	AH5				
B2	GND	GND	G28	R1	GND	GND	AA1				
B17	GND	GND	H10	R2	GND	GND	AA4				
B21	GND	GND	H15	R5	GND	GND	AA5				
B25	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: TE0820 - ZU_POWER		
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		Title: TE0820 - ZU_PS_POWER	
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		Title: TE0820 - CLK	
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A

B

C

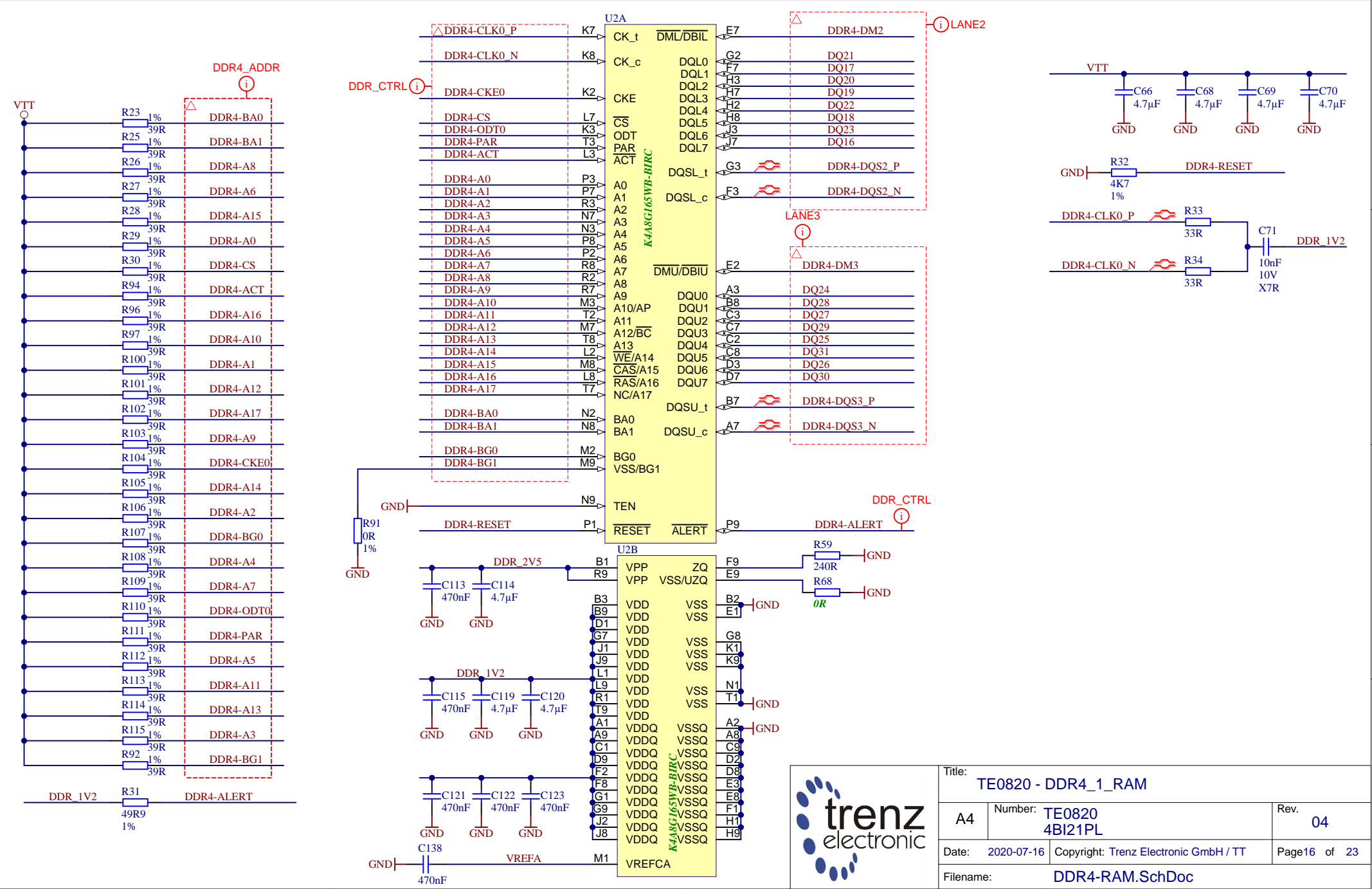
D

A

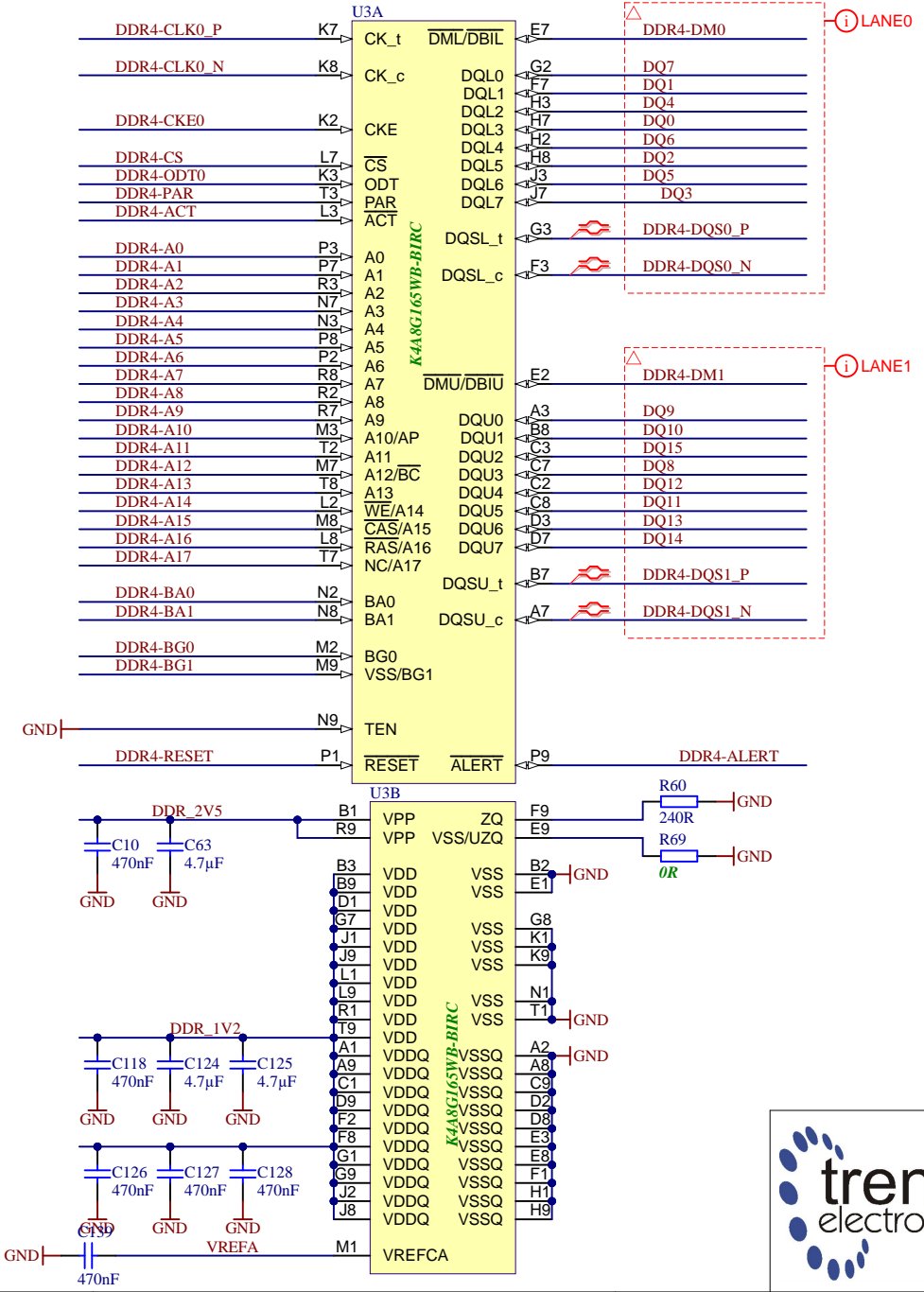
B

C

D



Title: TE0820 - DDR4_1_RAM		
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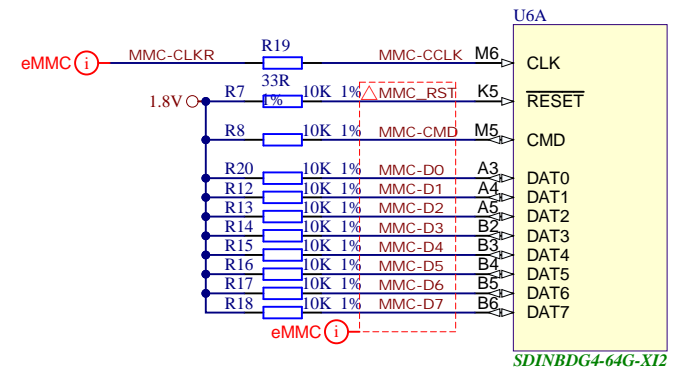


Title: TE0820 - DDR4_2_RAM		
A4	Number: TE0820 4BI21PL	Rev. 04
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U6D

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

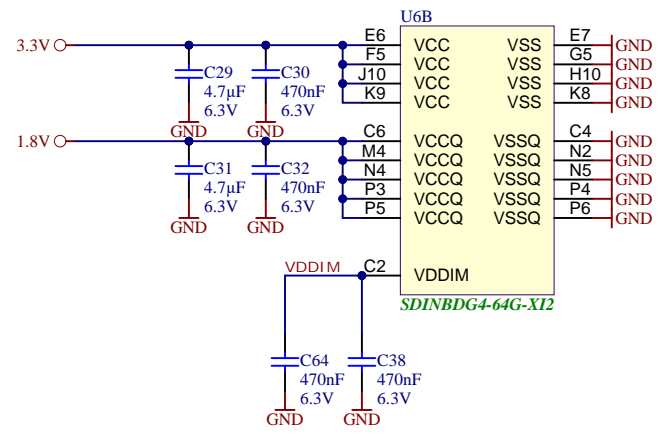
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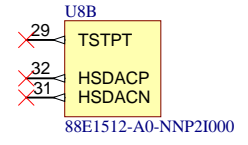
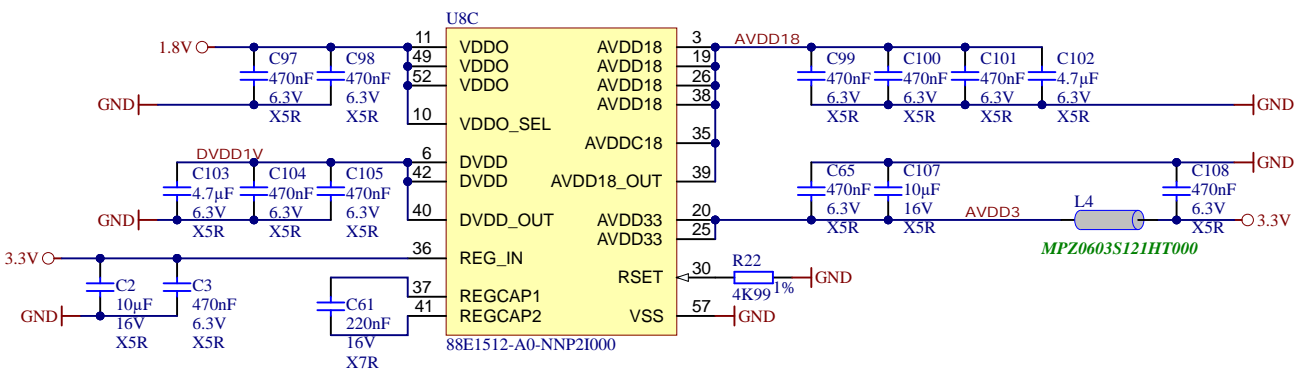
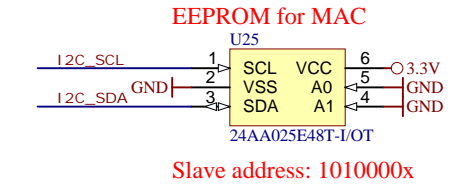
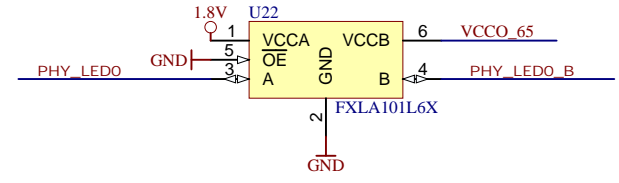
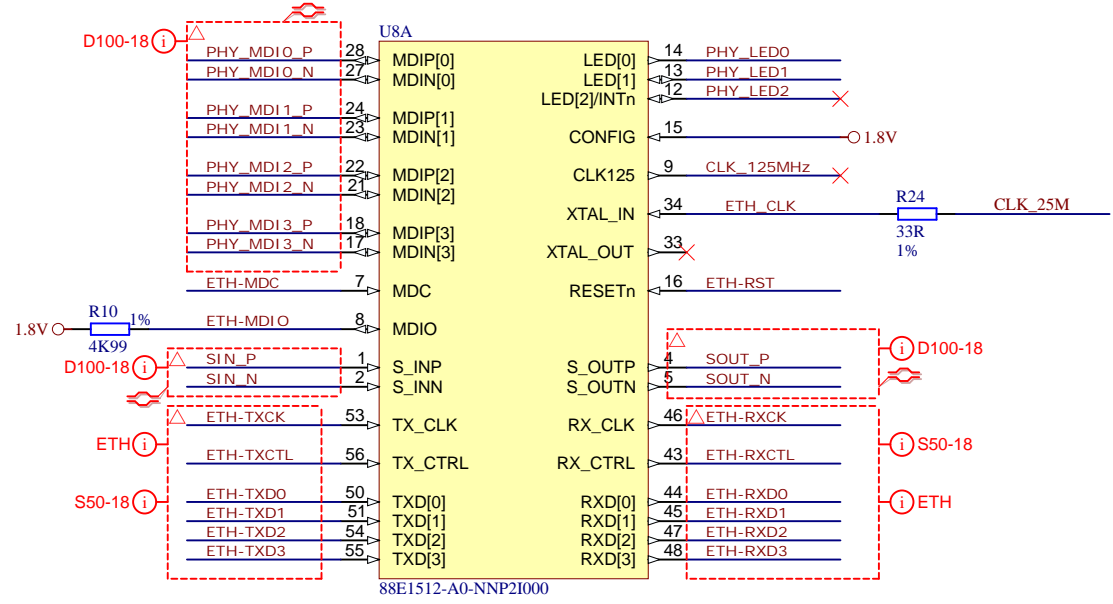
U6C

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

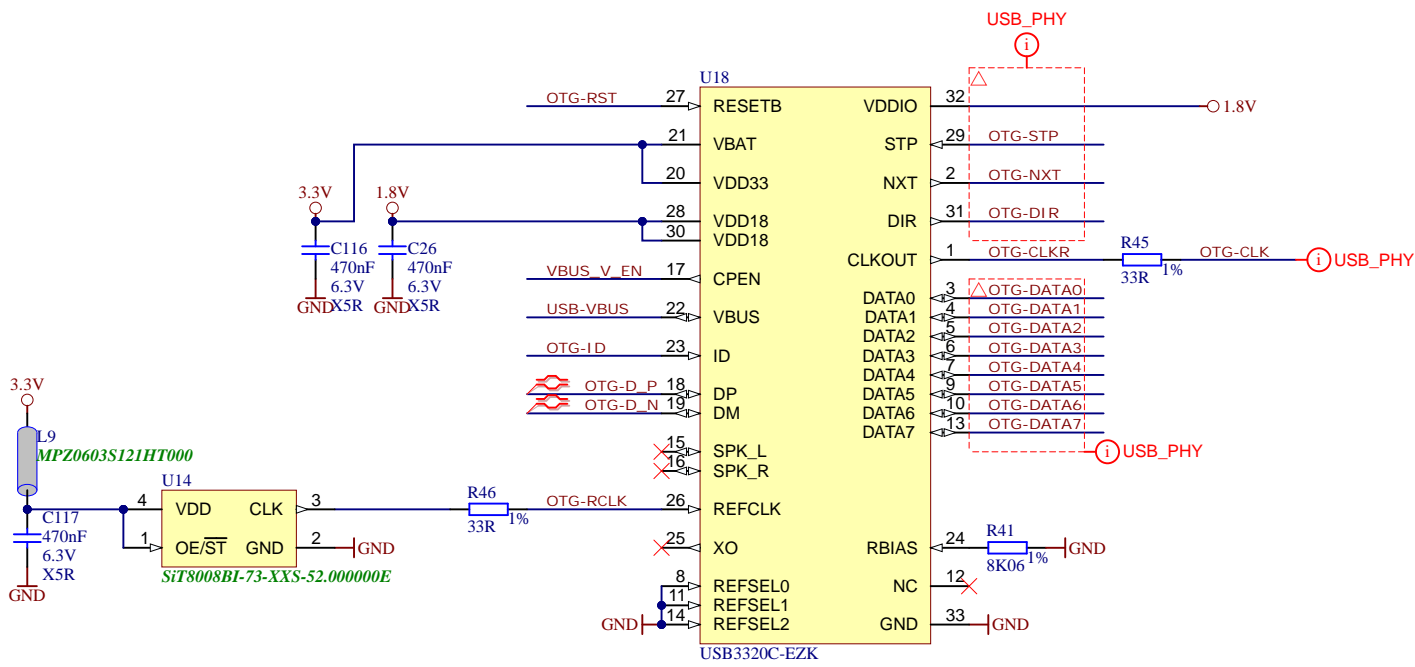
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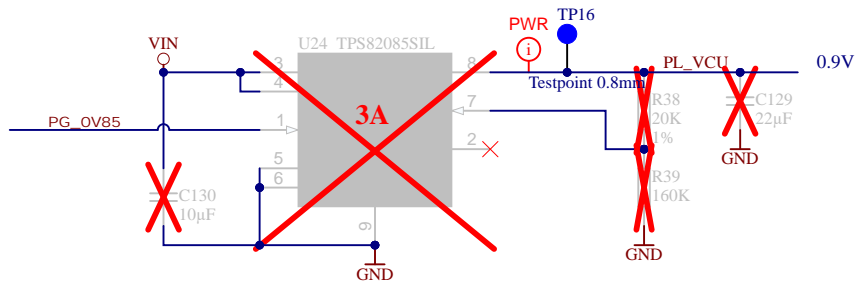
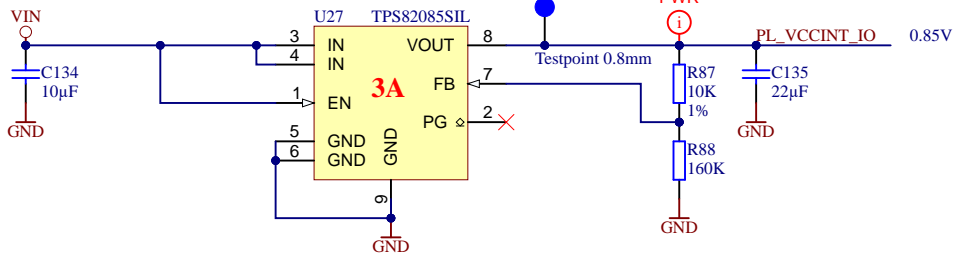
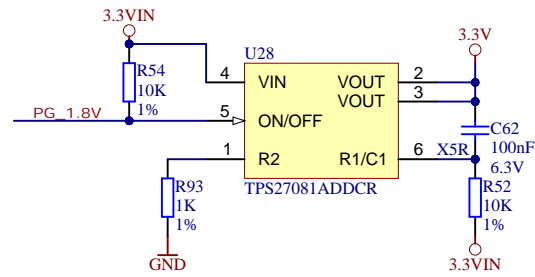
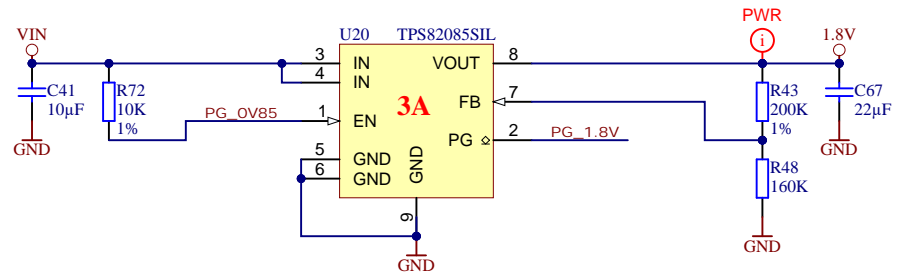
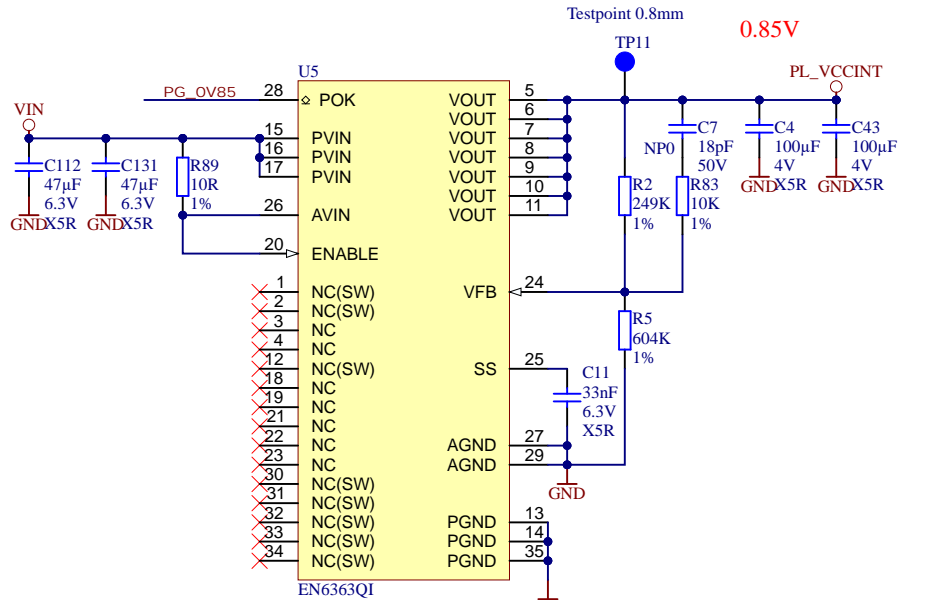
Title: TE0820 - eMMC		
A4	Number: TE0820 4BI21PL	Rev. 04
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Filename: eMMC.SchDoc		



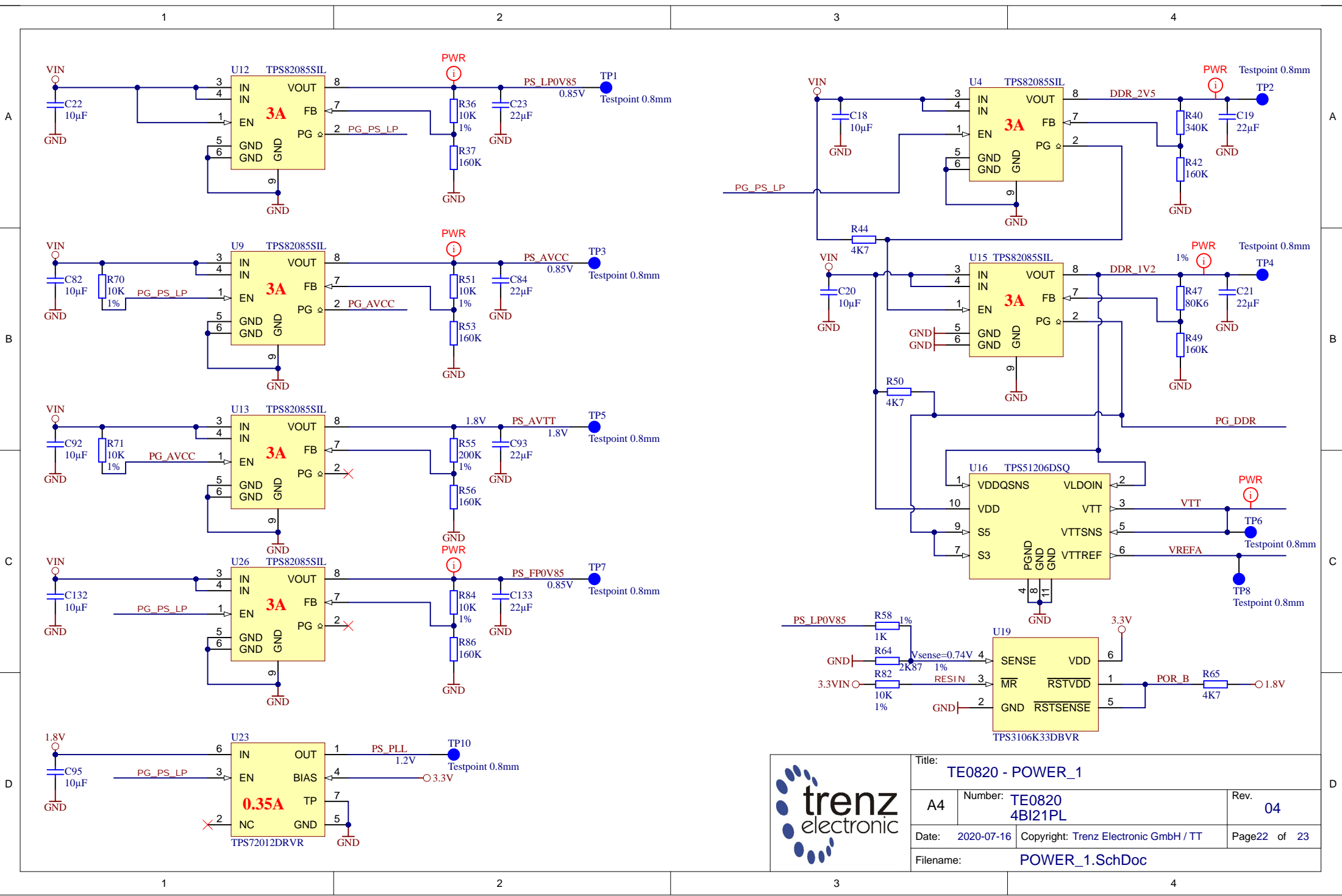
Title: TE0820 - Eth_PHY		
A4	Number: TE0820 4BI21PL	Rev. 04
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page 19 of 23
Filename: ETH-PHY.SchDoc		




	Title: TE0820 - USB_PHY		
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Title: TE0820 - POWER		
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			Title: TE0820 - POWER_1	
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Filename: POWER_1.SchDoc				

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		
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		Filename: Revision Changes.SchDoc		