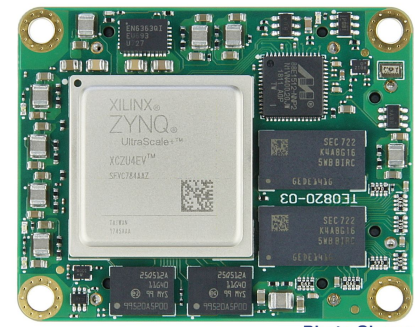
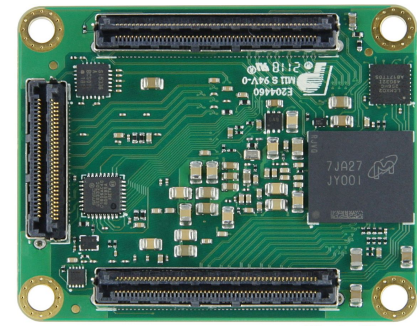




**Photo Shows Similar Product**



**Photo Shows Similar Product**




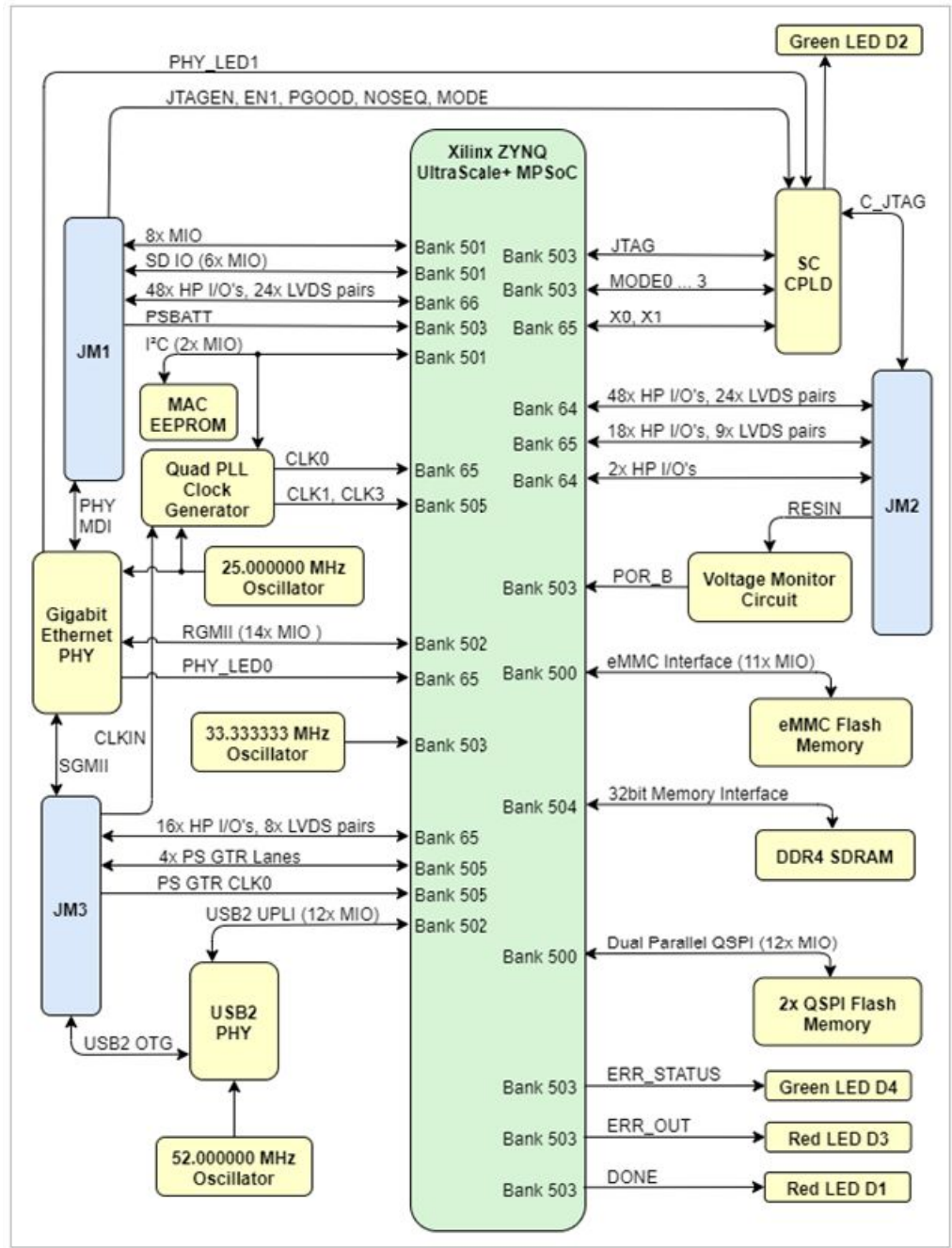
**Photo Shows Similar Product**

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: <b>TE0820 - Legal Notices</b>		
	A4	Number: <b>TE0820 5DI21MA</b>	Rev. <b>04</b>
	Date: <b>2020-07-16</b>	Copyright: <b>Trenz Electronic GmbH / TT</b>	Page <b>1</b> of <b>23</b>
	Filename: <b>Legal Notices Modules.SchDoc</b>		



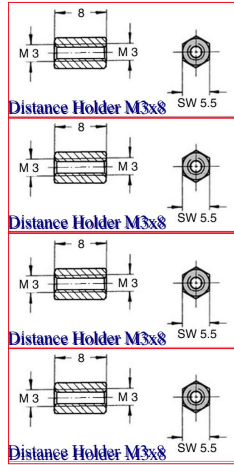
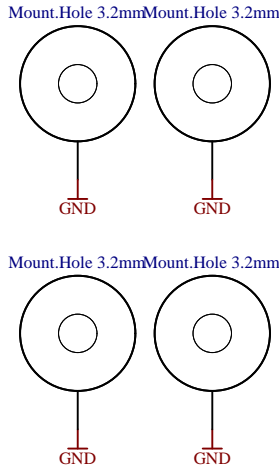
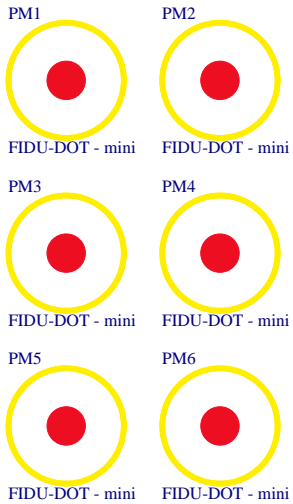
Title: TE0820 - System Overview		
A4	Number: TE0820 5DI21MA	Rev. 04
Date: 2020-10-20	Copyright: Trenz Electronic GmbH	Page 2 of 23
Filename: Overview.SchDoc		

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:

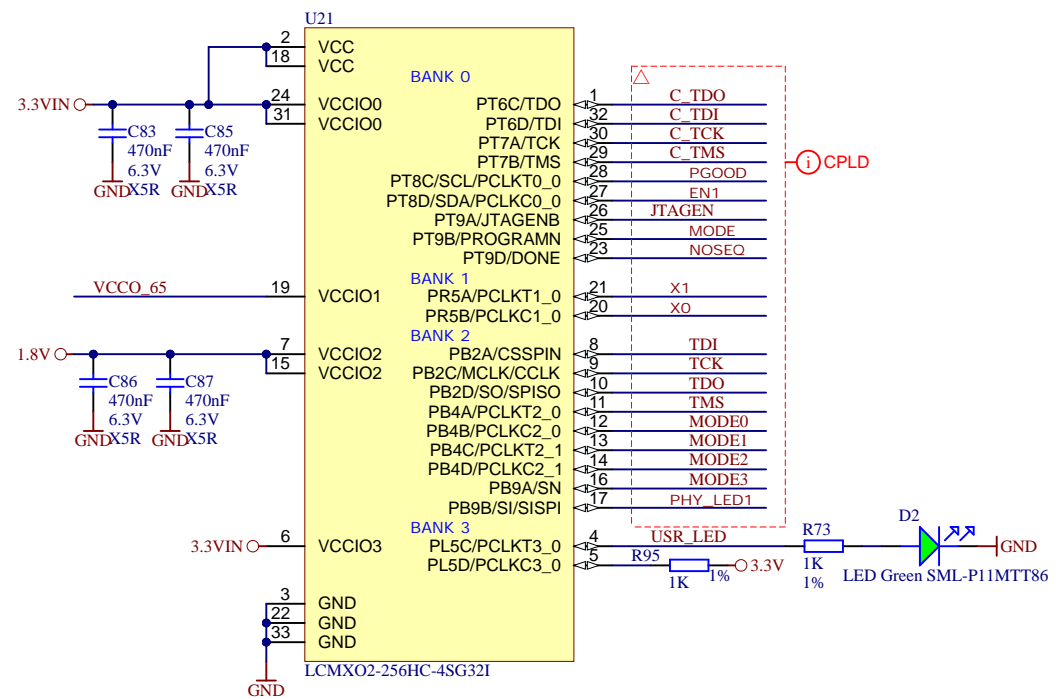
Serial  
Serial  
Serialnumber 6,3 x 6,3mm



Assembly variant	5DI21MA
Created by	RM
Modified by	RM
Modified at	2021-07-22
SVN Revision	12571



Title: TE0820		
A4	Number: TE0820 5DI21MA	Rev. 04
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page 3 of 23
Filename: TE0820.SchDoc		



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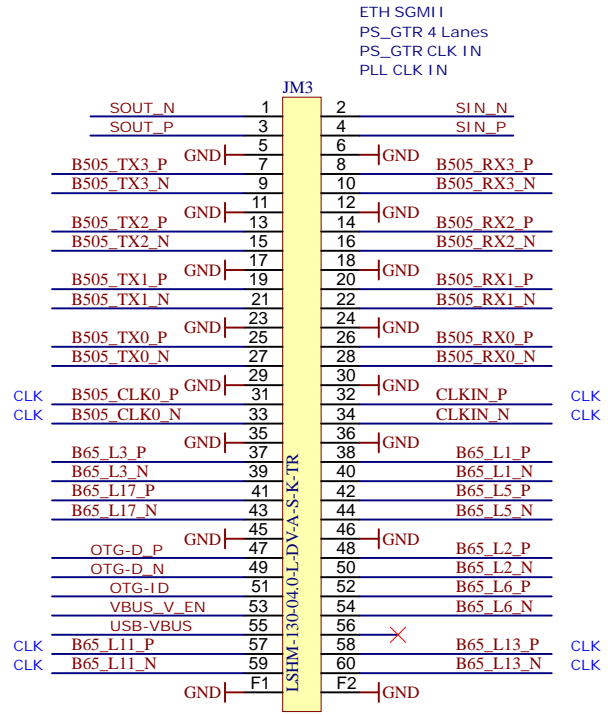
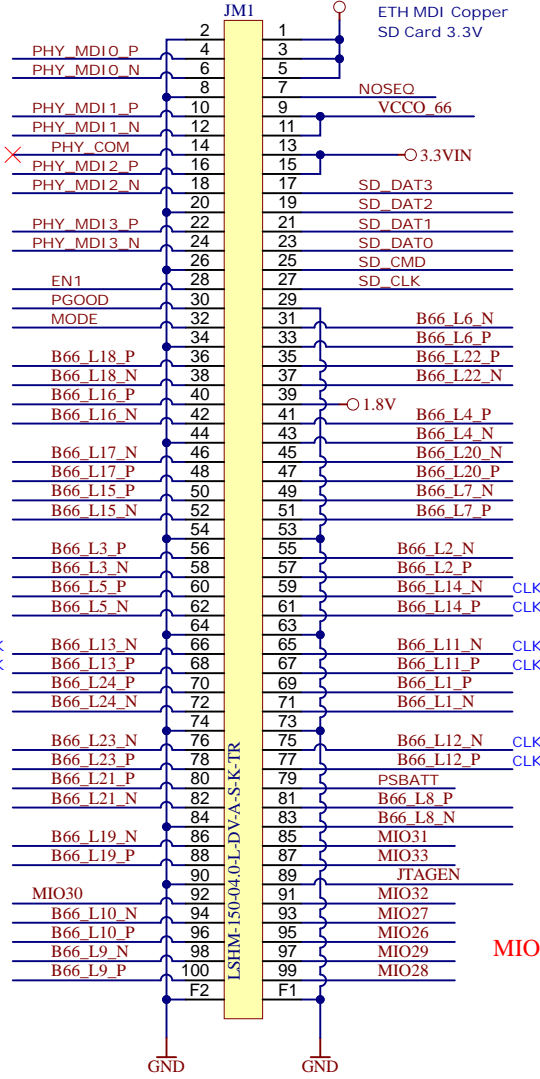
D

D

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

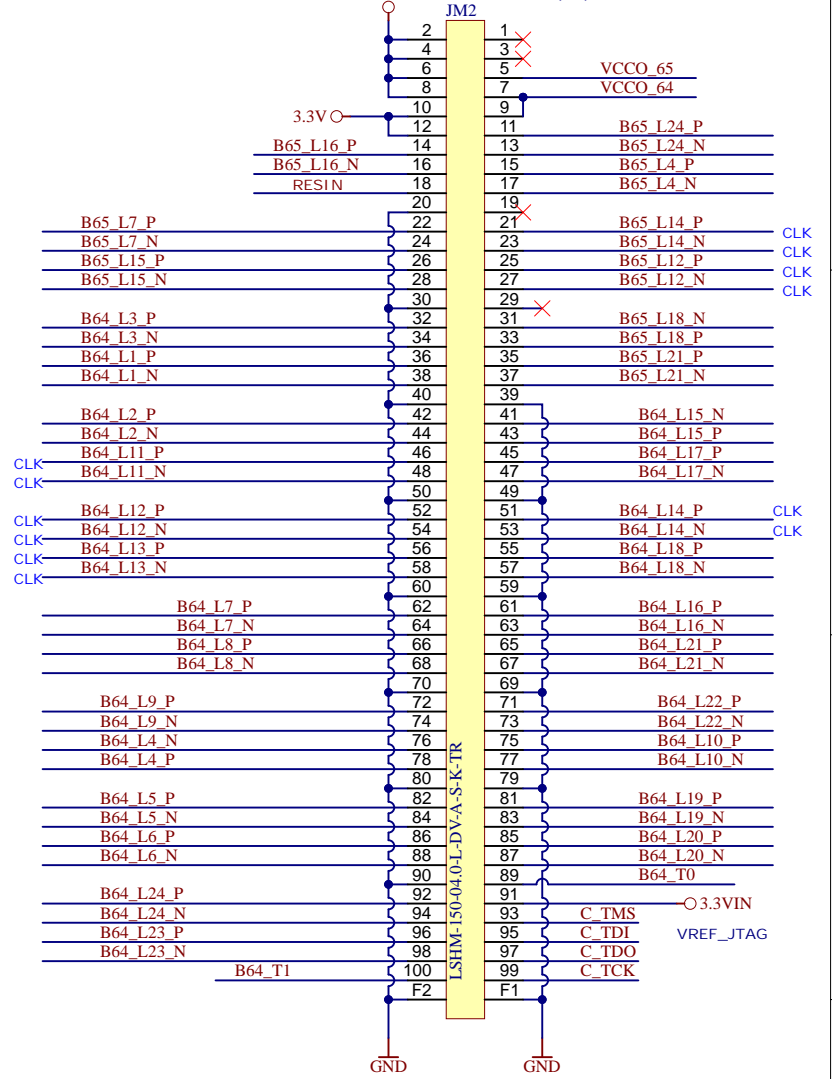
B65(HP) 16 IO, 8 LVDS Pairs  
 USB OTG  
 ETH SGMII  
 PS\_GTR 4 Lanes  
 PS\_GTR CLK IN  
 PLL CLK IN

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

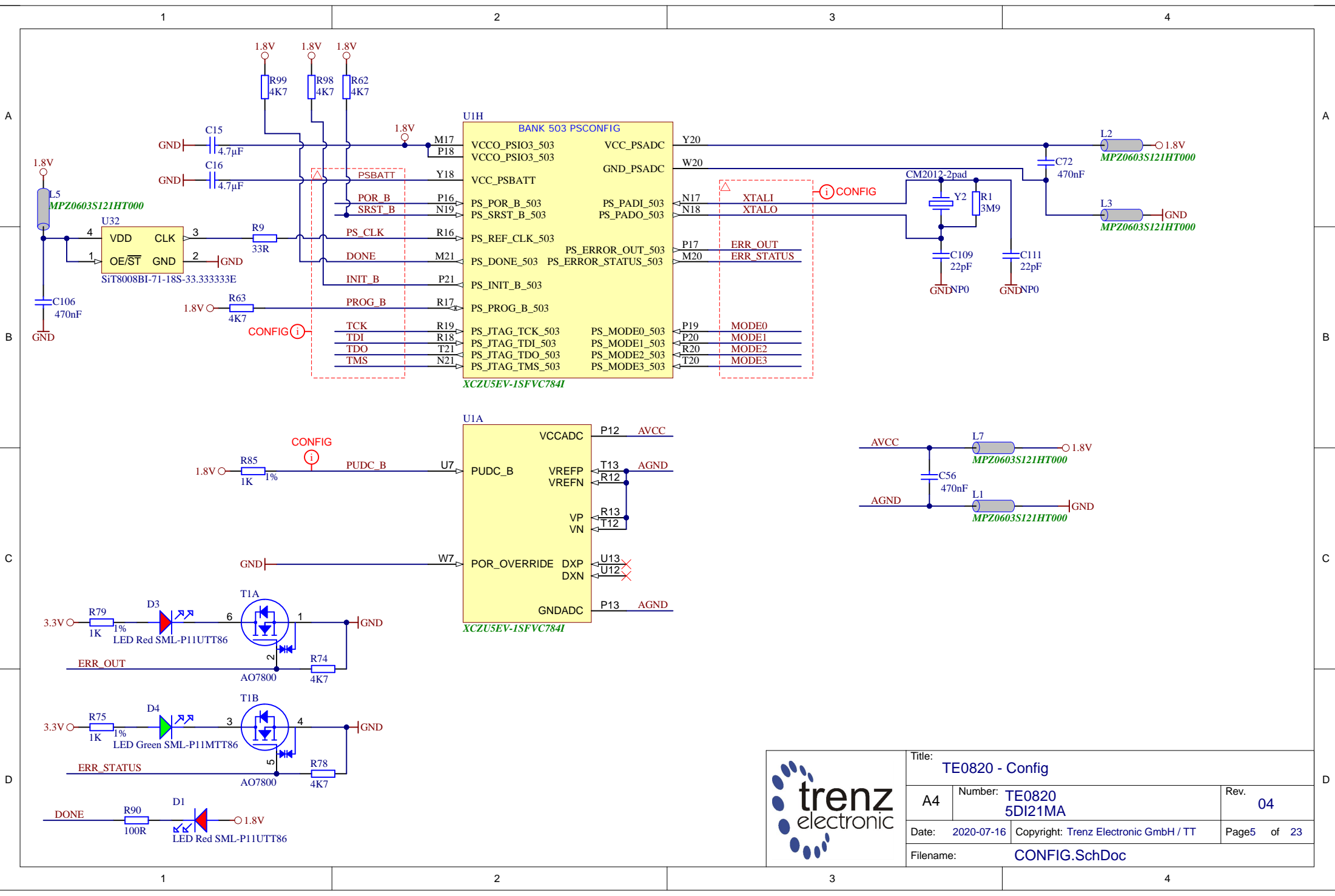


VCCO64, VCCO65, VCCO66 ->>> max. 1.8V (HP bank's)

MIO[29..26] ->PJTAG1



Title: TE0820 - B2B Connectors		
A4	Number: TE0820 5DI21MA	Rev. 04
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page4 of 23
Filename: B2B-Connectors.SchDoc		



Title: TE0820 - Config		
A4	Number: TE0820 5DI21MA	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page5 of 23
Filename: CONFIG.SchDoc		

UIC

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

BANK 43 HD (ZU2/3 BANK 44 HD)

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

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XCZU5EV-1SFVC784I

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

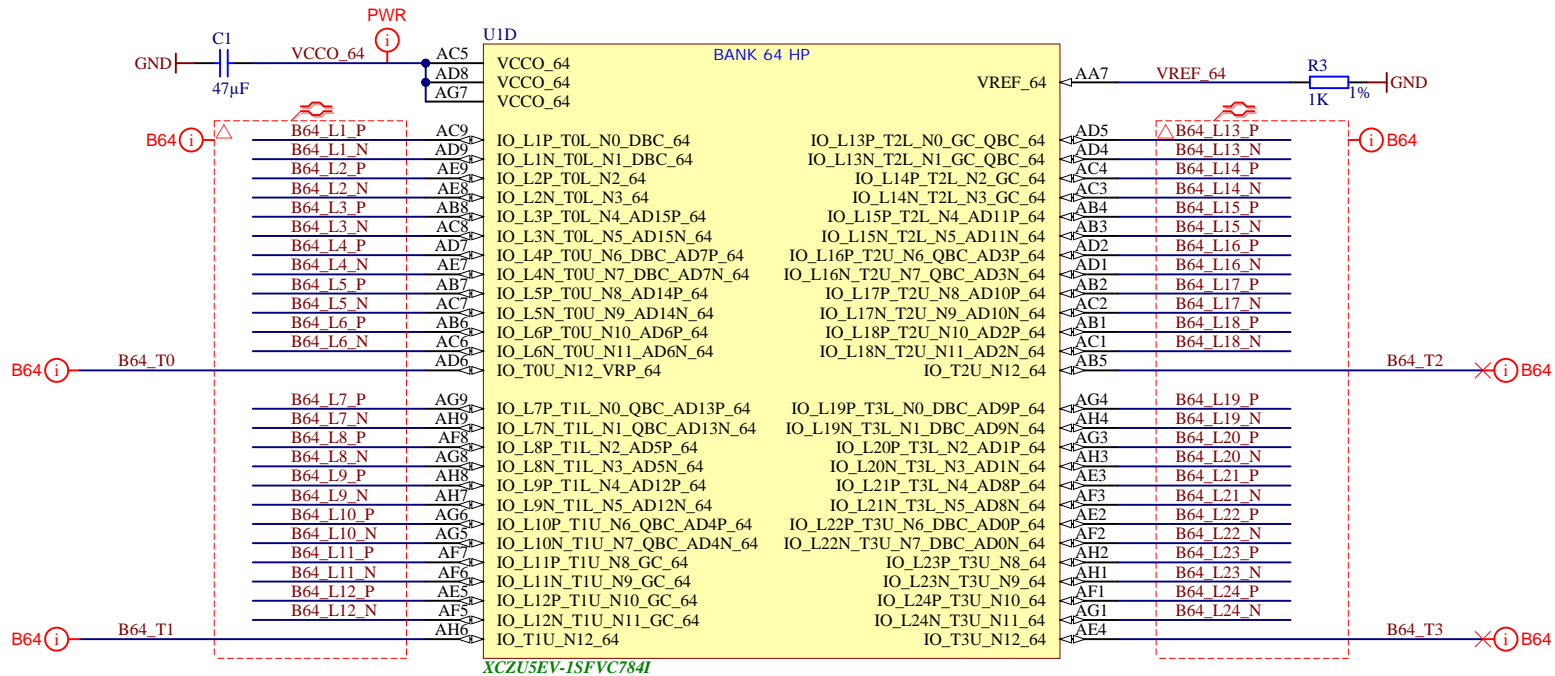
BANK 45 HD (ZU2/3 BANK 25 HD)

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

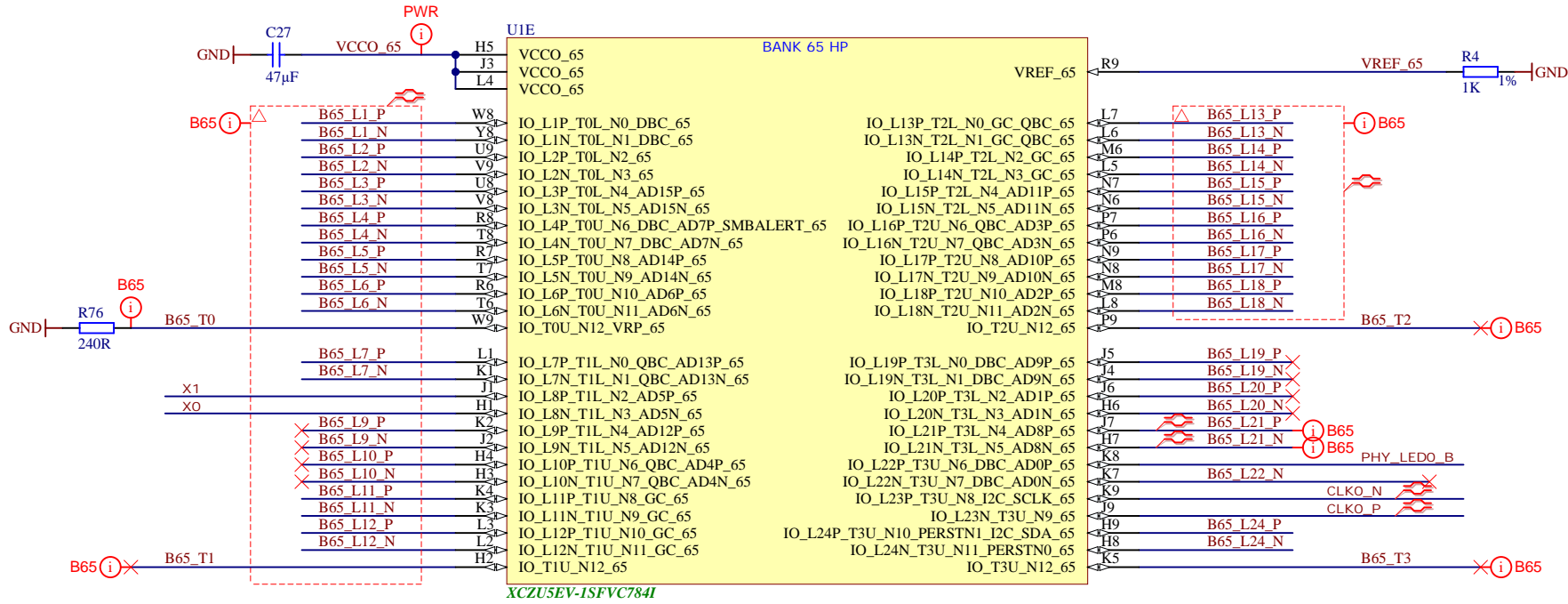
XCZU5EV-1SFVC784I



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Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page6 of 23
Filename: B_HD.SchDoc		

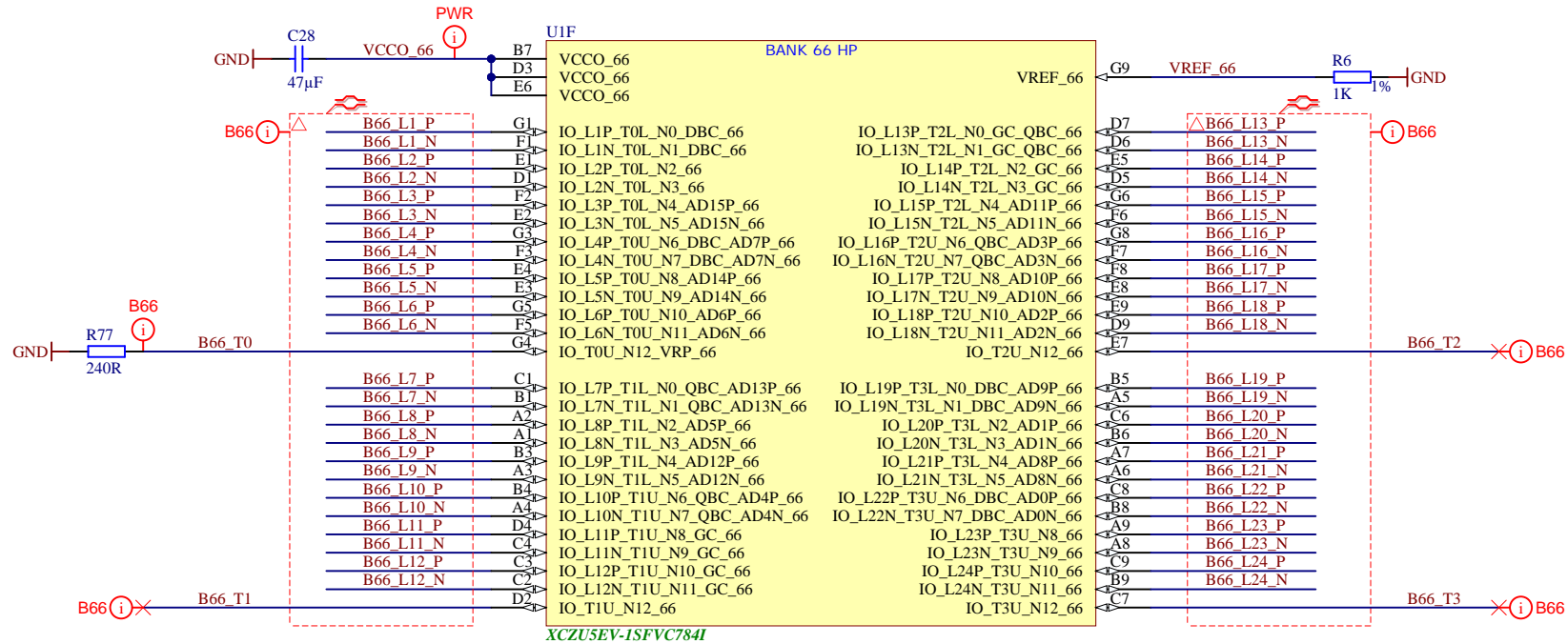



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Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 7 of 23
Filename: B64.SchDoc		

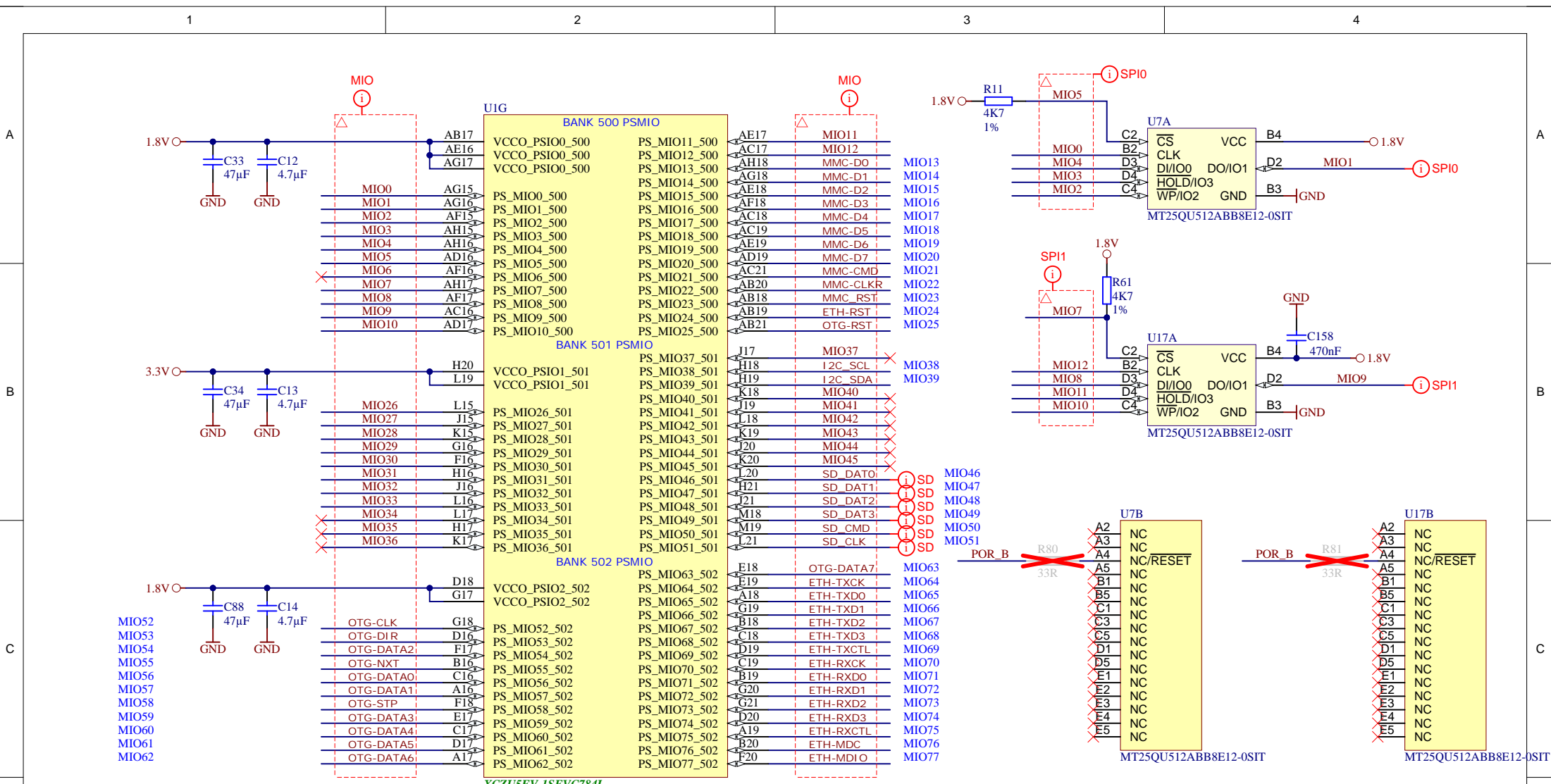


Title: TE0820 - B65		
A4	Number: TE0820 5DI21MA	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 8 of 23
Filename: B65.SchDoc		





			Title: TE0820 - B66	
			A4	Number: TE0820 5DI21MA
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Filename: B66.SchDoc				



			Title: TE0820 - MIO Banks	
			A4	Number: TE0820 5DI21MA
Date: 2020-07-16		Copyright: Trenz Electronic GmbH / TT		Page 10 of 23
Filename: B_MIO.SchDoc				

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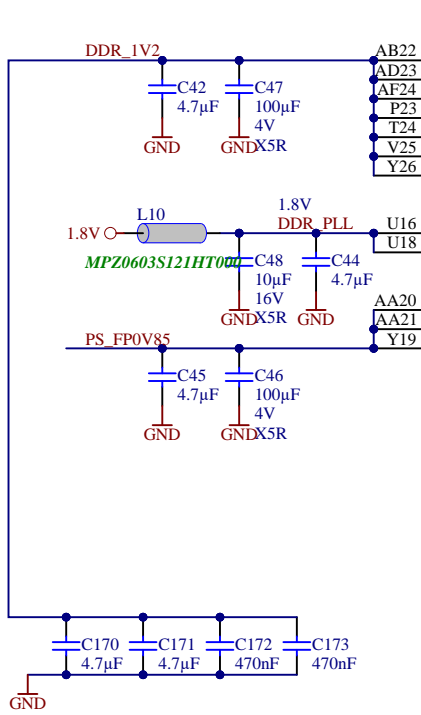
D

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**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
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	

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**U1J**

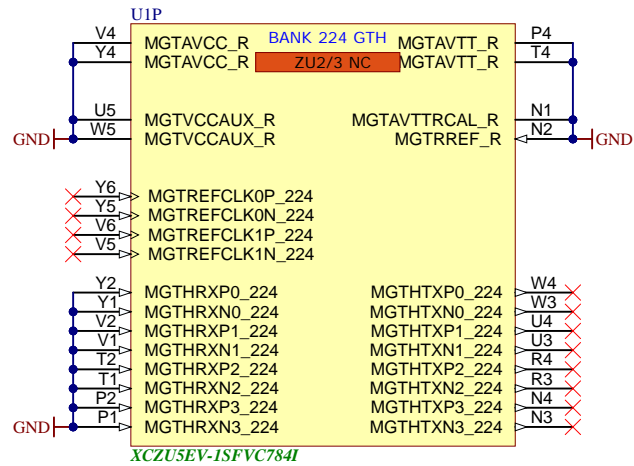
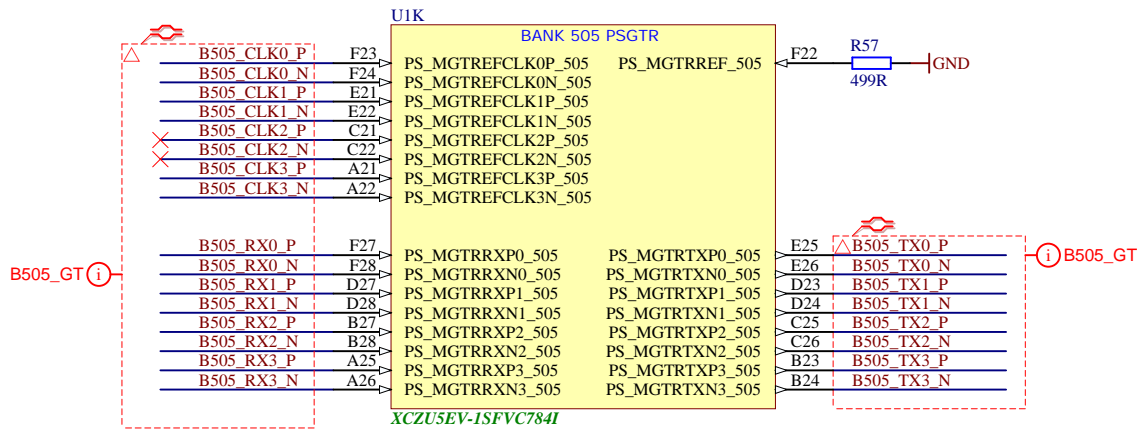

**BANK 504 PSDDR**

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
DDR4-DQS0 P	AF21	PS_DDR_DQS_P0_504	PS_DDR_DQ64_504	T28
DDR4-DQS0 N	AG21	PS_DDR_DQS_N0_504	PS_DDR_DQ65_504	R28
DDR4-DQS1 P	AF23	PS_DDR_DQS_P1_504	PS_DDR_DQ66_504	P28
DDR4-DQS1 N	AG23	PS_DDR_DQS_N1_504	PS_DDR_DQ67_504	P27
DDR4-DQS2 P	AF25	PS_DDR_DQS_P2_504	PS_DDR_DQ68_504	P26
DDR4-DQS2 N	AF26	PS_DDR_DQS_N2_504	PS_DDR_DQ69_504	R25
DDR4-DQS3 P	AE27	PS_DDR_DQS_P3_504	PS_DDR_DQ70_504	P25
DDR4-DQS3 N	AE27	PS_DDR_DQS_N3_504	PS_DDR_DQ71_504	T25
	N23	PS_DDR_DQS_P4_504		
	M23	PS_DDR_DQS_N4_504	PS_DDR_DM0_504	AG20
	L23	PS_DDR_DQS_P5_504	PS_DDR_DM1_504	AE23
	K23	PS_DDR_DQS_N5_504	PS_DDR_DM2_504	AE25
	N26	PS_DDR_DQS_P6_504	PS_DDR_DM3_504	AE28
	N27	PS_DDR_DQS_N6_504	PS_DDR_DM4_504	R23
	J26	PS_DDR_DQS_P7_504	PS_DDR_DM5_504	H23
	J27	PS_DDR_DQS_N7_504	PS_DDR_DM6_504	L27
	R27	PS_DDR_DQS_P8_504	PS_DDR_DM7_504	H26
	T27	PS_DDR_DQS_N8_504	PS_DDR_DM8_504	T26

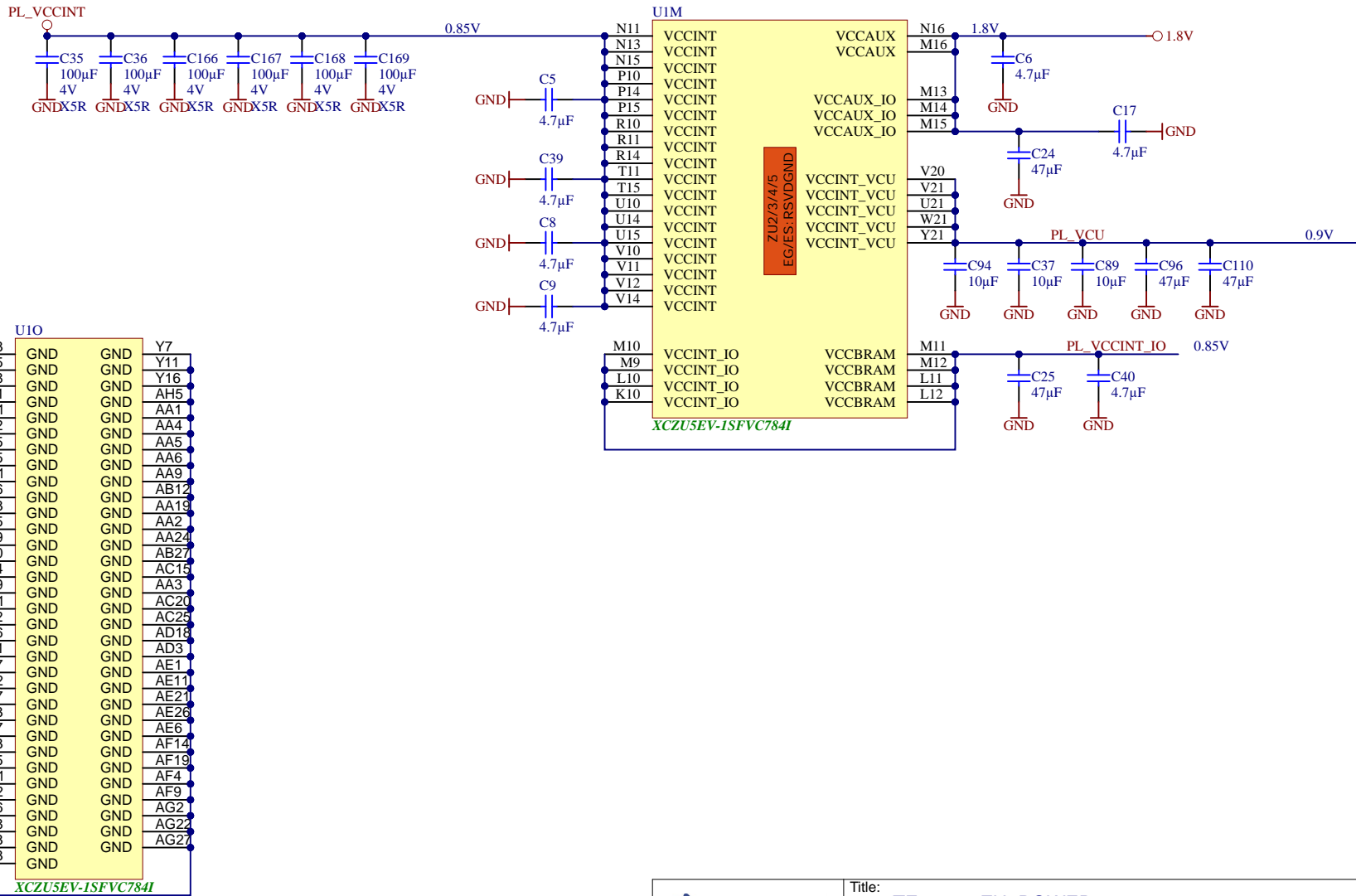
*XCZU5EV-1SFVC784I*



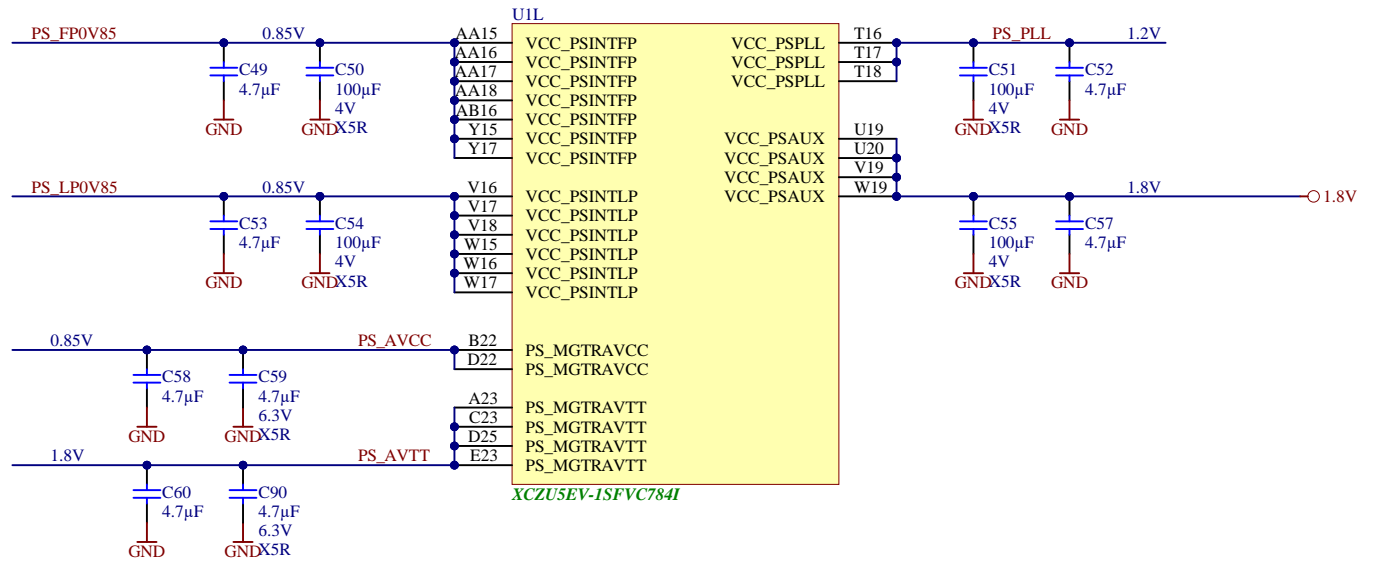
Title: <b>TE0820 - PS_DDR</b>		
A4	Number: <b>TE0820 5DI21MA</b>	Rev. <b>04</b>
Date: <b>2020-07-16</b>	Copyright: <b>Trenz Electronic GmbH / TT</b>	Page <b>11</b> of <b>23</b>
Filename: <b>PS_DDR.SchDoc</b>		





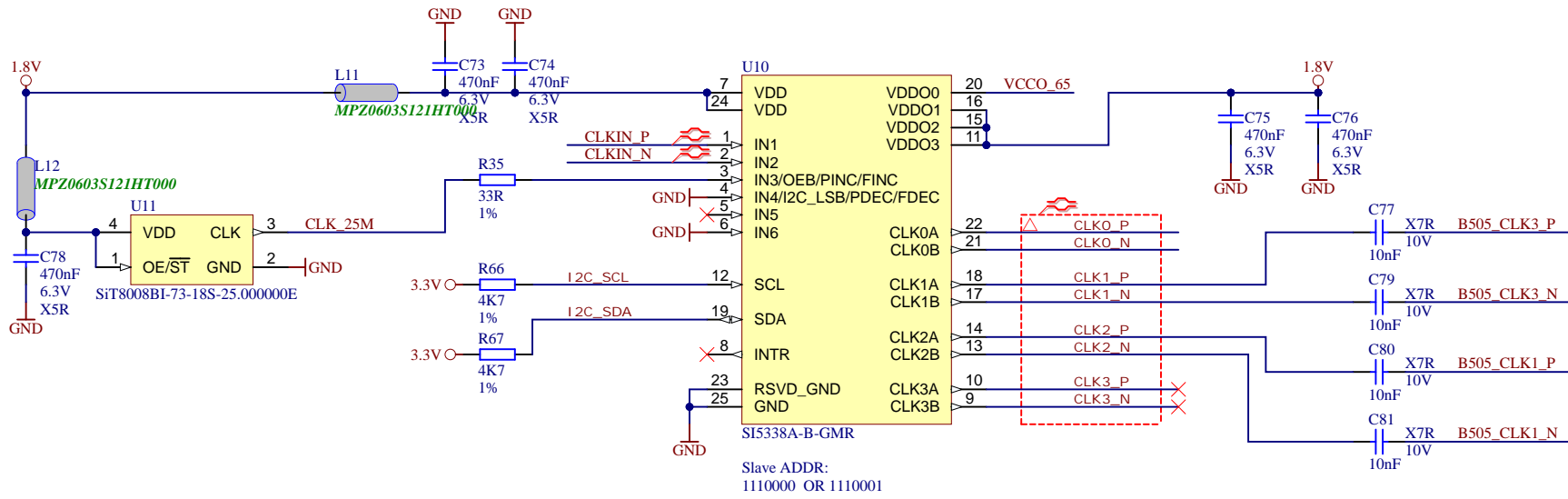
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A4	Number: TE0820 5DI21MA	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 12 of 23
Filename: B_PS_GT.SchDoc		




	Title: TE0820 - ZU_POWER		
	A4	Number: TE0820 5DI21MA	Rev. 04
	Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	
	Page 13 of 23		
Filename: ZU_POWER.SchDoc			



		Title: TE0820 - ZU_PS_POWER	
		A4	Number: TE0820 5DI21MA
Date: 2020-07-16		Copyright: Trenz Electronic GmbH / TT	
Filename: ZU_PS_POWER.SchDoc		Page 14 of 23	



		Title: TE0820 - CLK	
		A4	Number: TE0820 5DI21MA
Date: 2020-07-16		Copyright: 2015 Trenz Electronic GmbH	
Filename: CLK.SchDoc		Page 15 of 23	

A

B

C

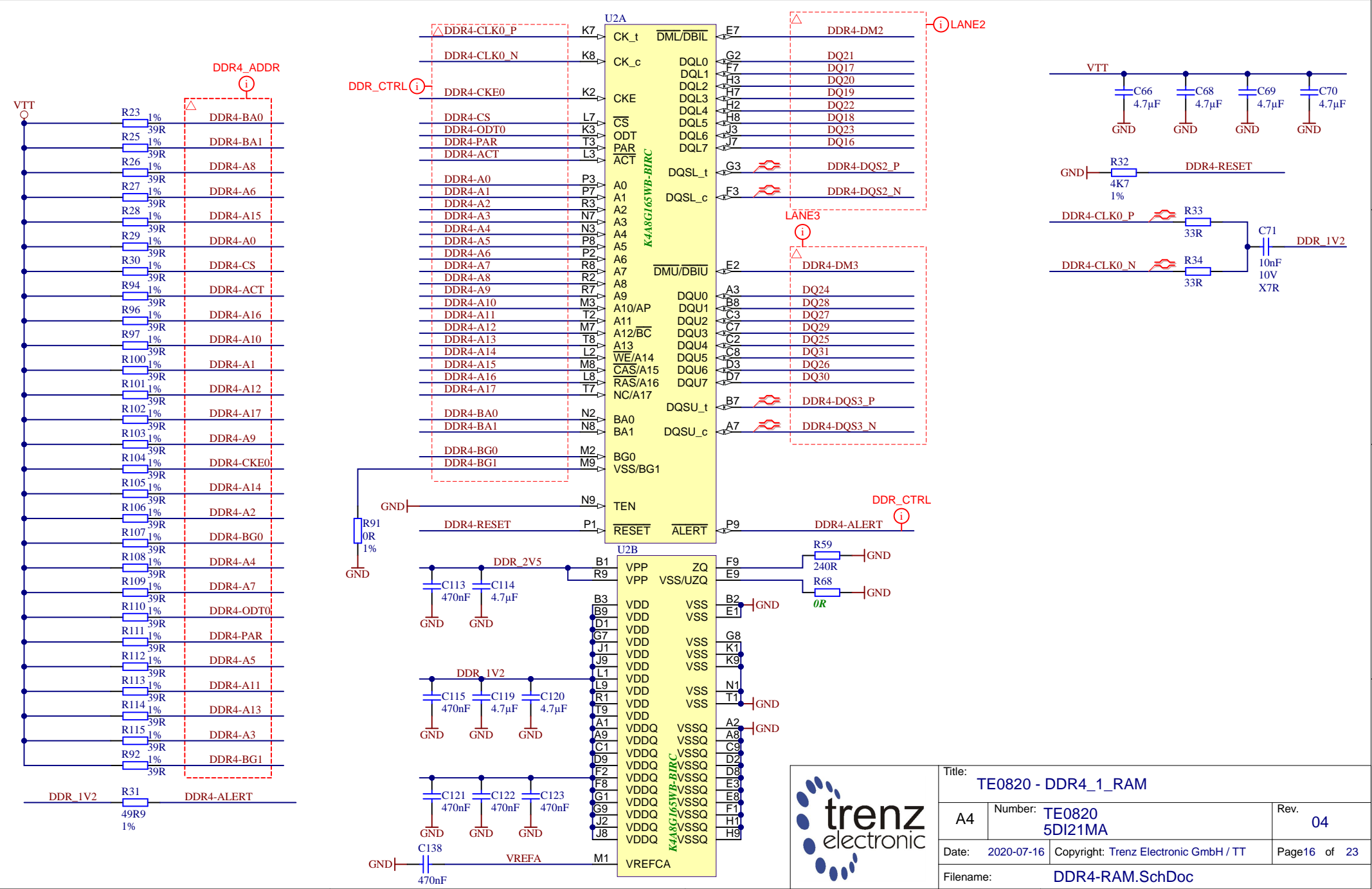
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A

B

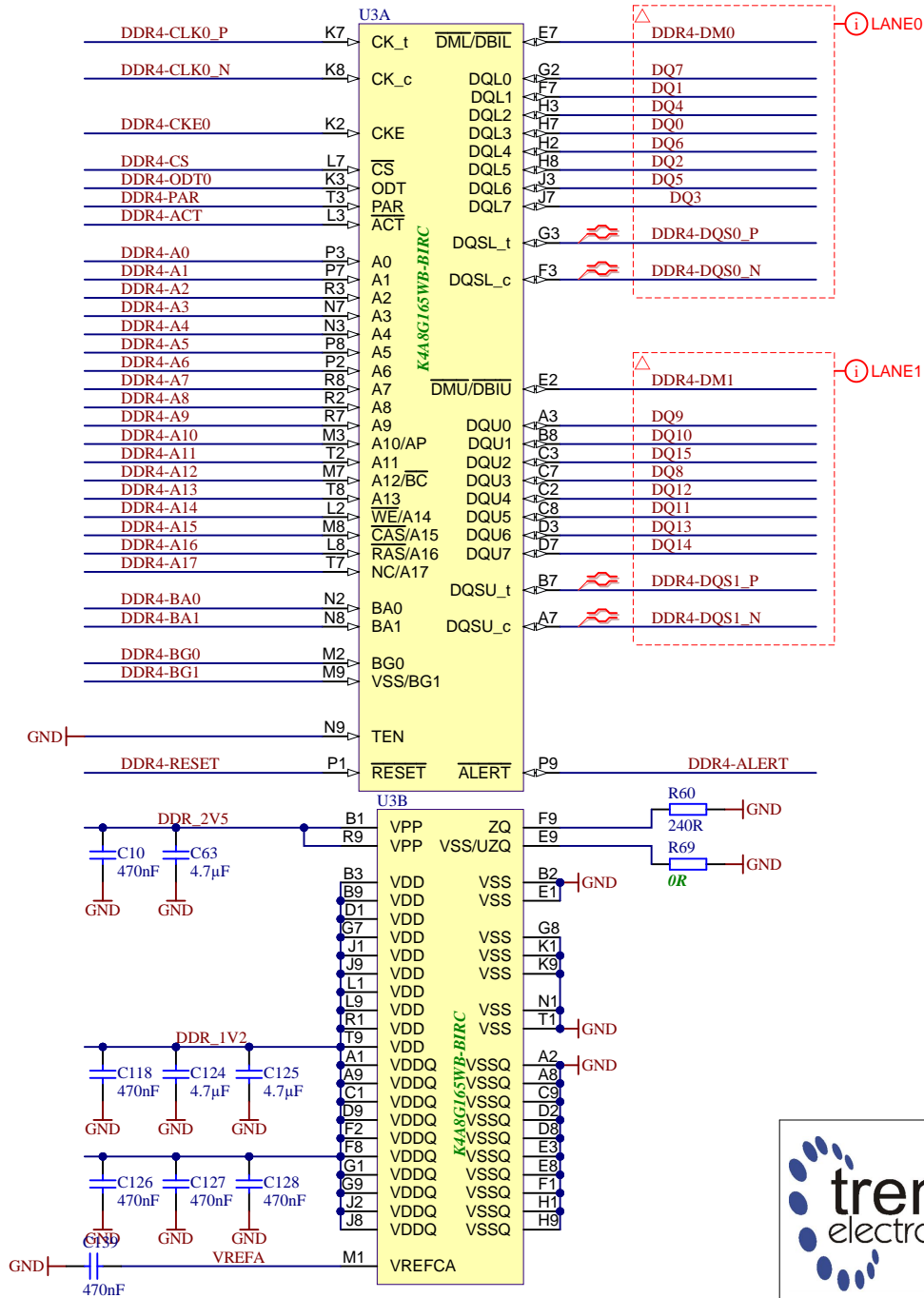
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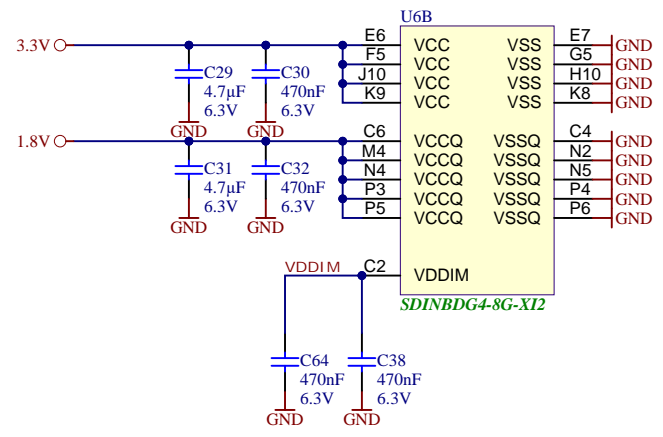
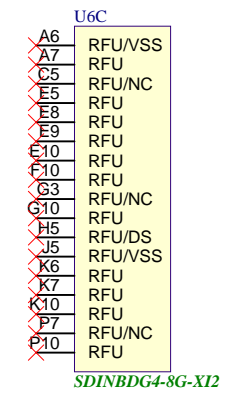
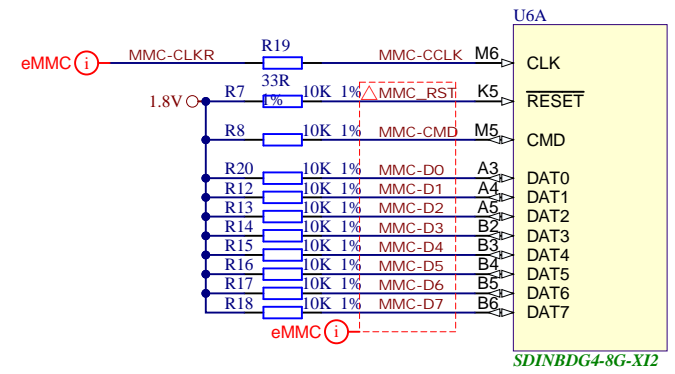
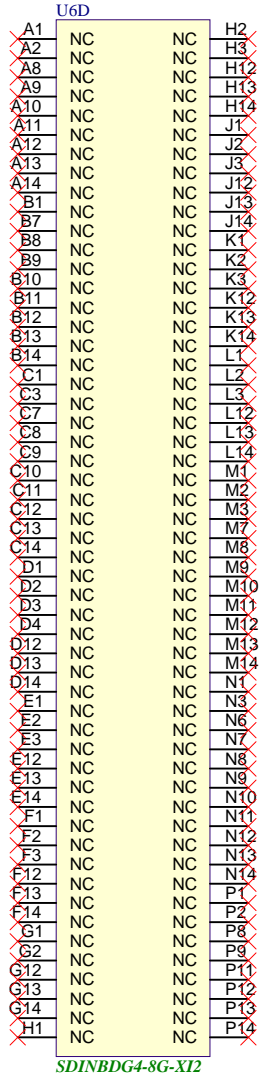


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Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 16 of 23
Filename: DDR4-RAM.SchDoc		

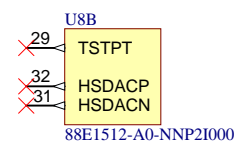
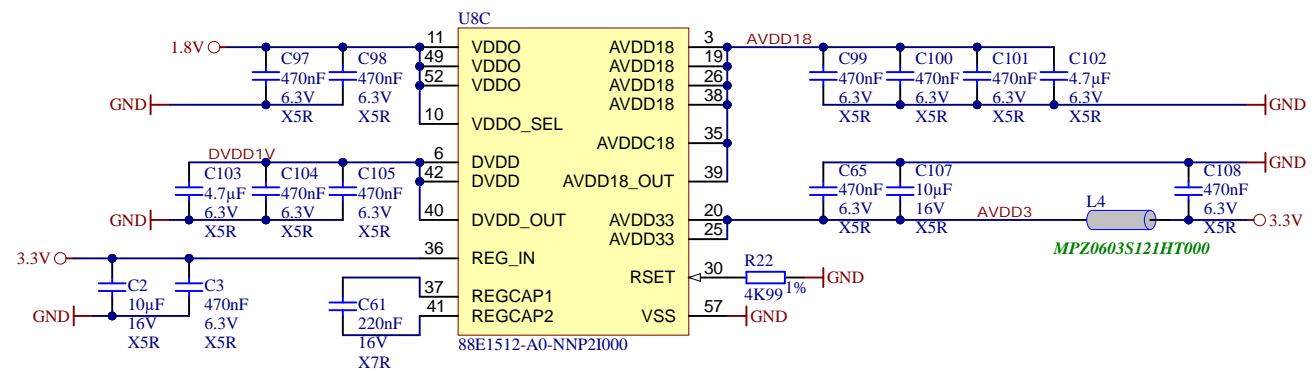
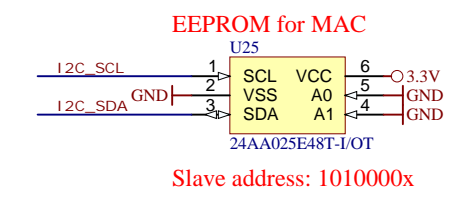
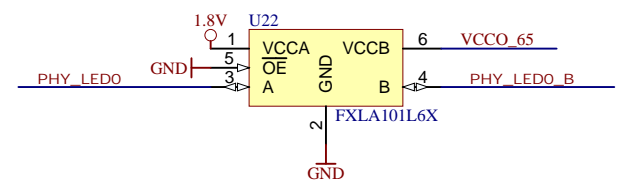
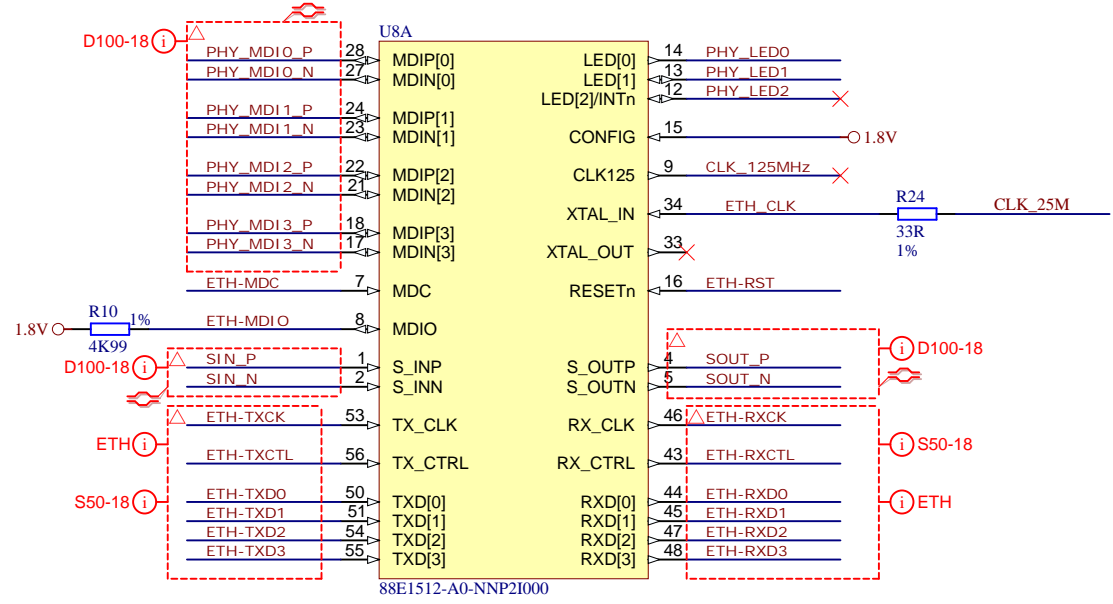




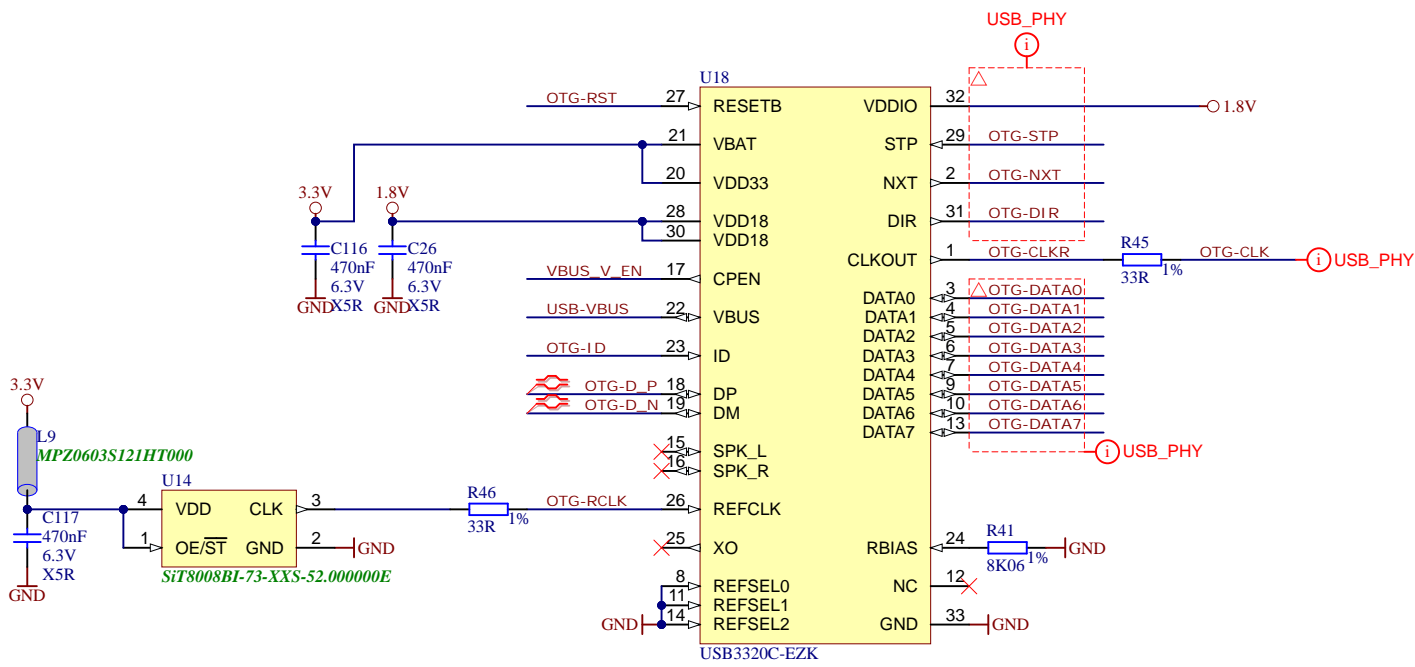
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Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 17 of 23
Filename: DDR4-RAM_2.SchDoc		




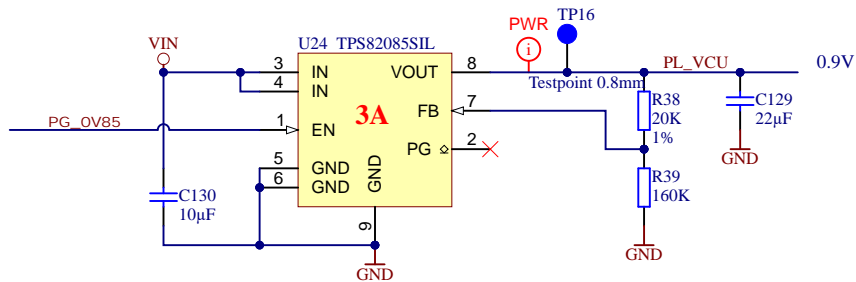
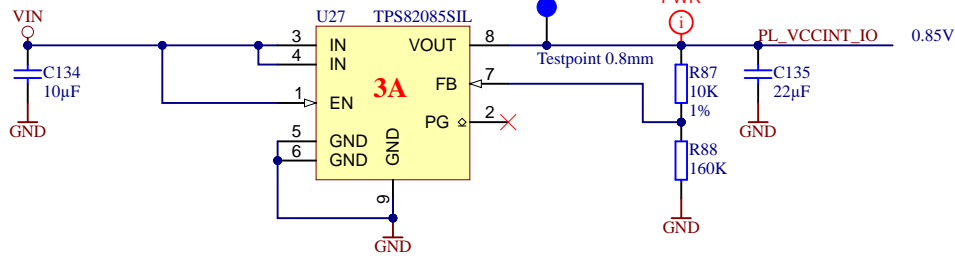
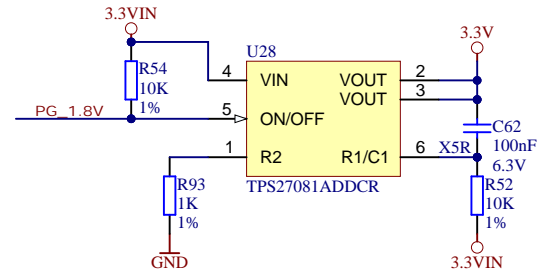
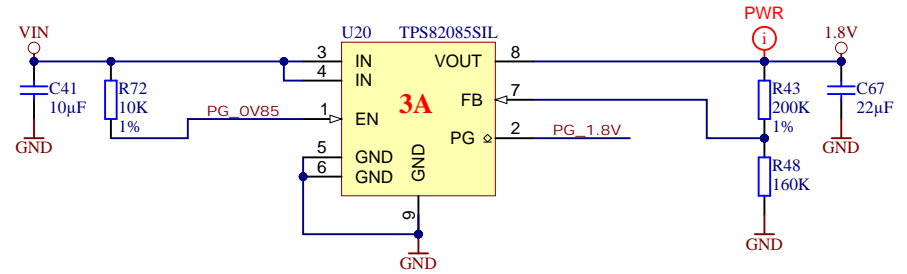
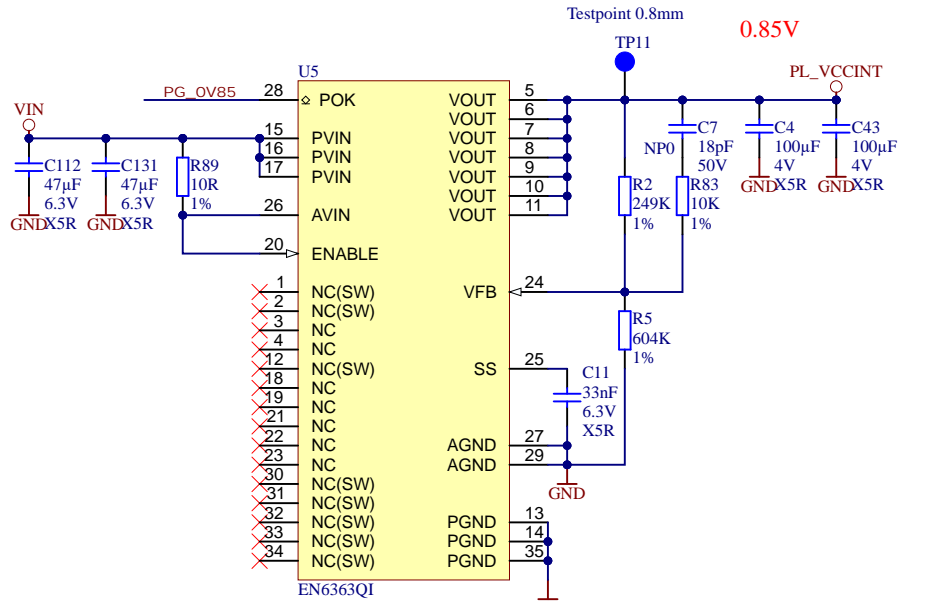
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Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page18 of 23
Filename: eMMC.SchDoc		



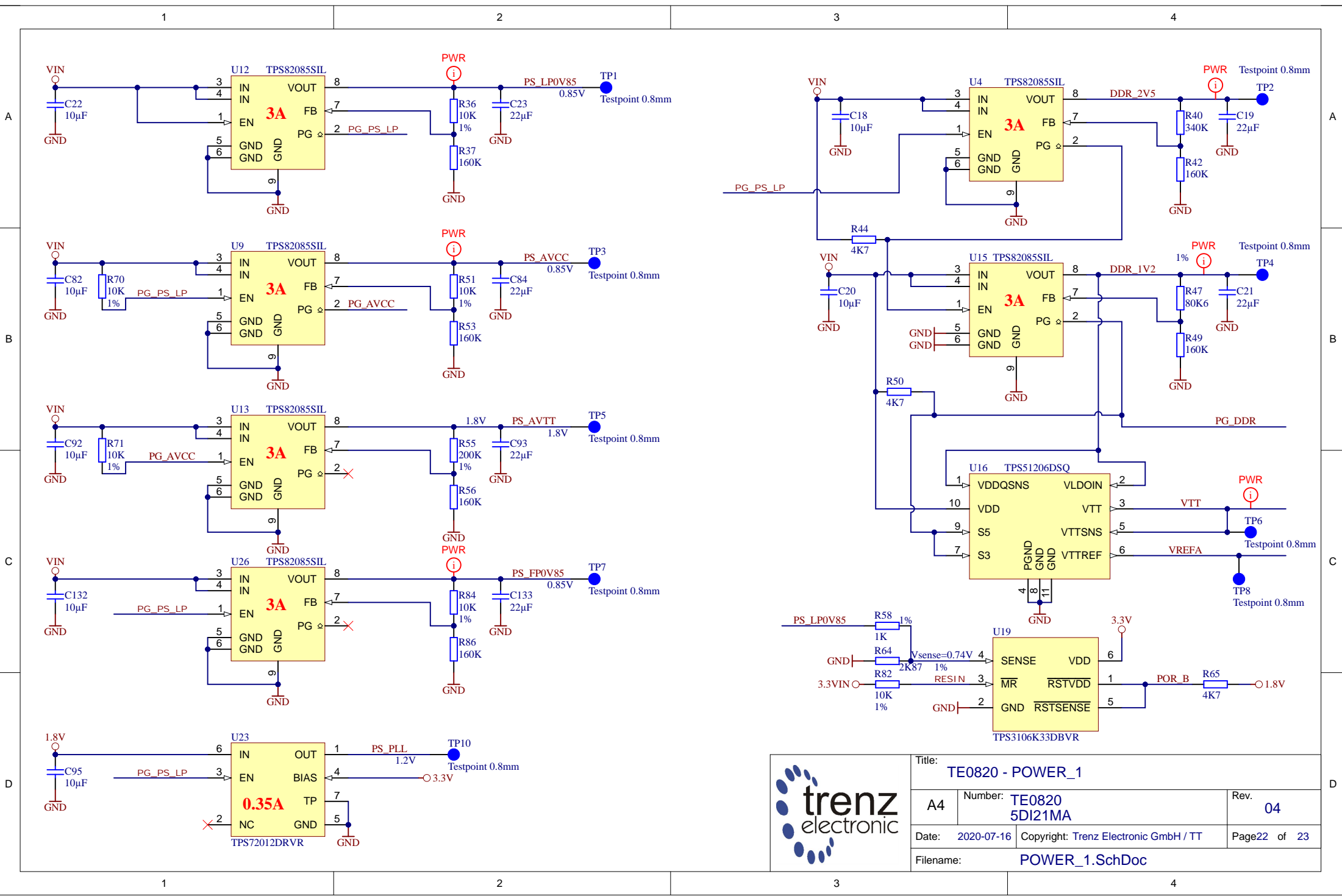
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Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page 19 of 23
Filename: ETH-PHY.SchDoc		




	Title: TE0820 - USB_PHY		
	A4	Number: TE0820 5DI21MA	Rev. 04
	Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page20 of 23
	Filename: USB-PHY.SchDoc		



Title: TE0820 - POWER		
A4	Number: TE0820 5DI21MA	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page21 of 23
Filename: POWER.SchDoc		



			Title: TE0820 - POWER_1	
			A4	Number: TE0820 5DI21MA
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: <b>TE0820 - Revision Changes</b>	
		A4	Number: <b>TE0820 5DI21MA</b>
Date: <b>2020-07-16</b>		Copyright: <b>Trenz Electronic GmbH / TT</b>	
Filename: <b>Revision Changes.SchDoc</b>		Page <b>23</b> of <b>23</b>	