



Photo Shows Similar Product

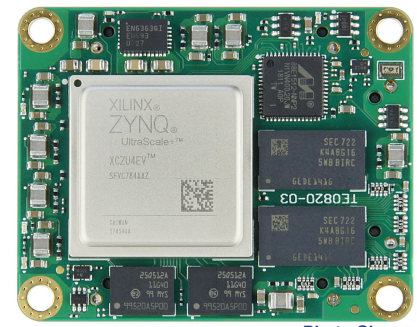


Photo Shows Similar Product

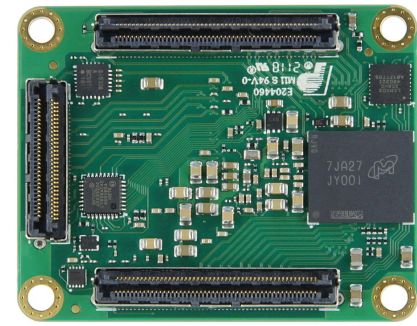


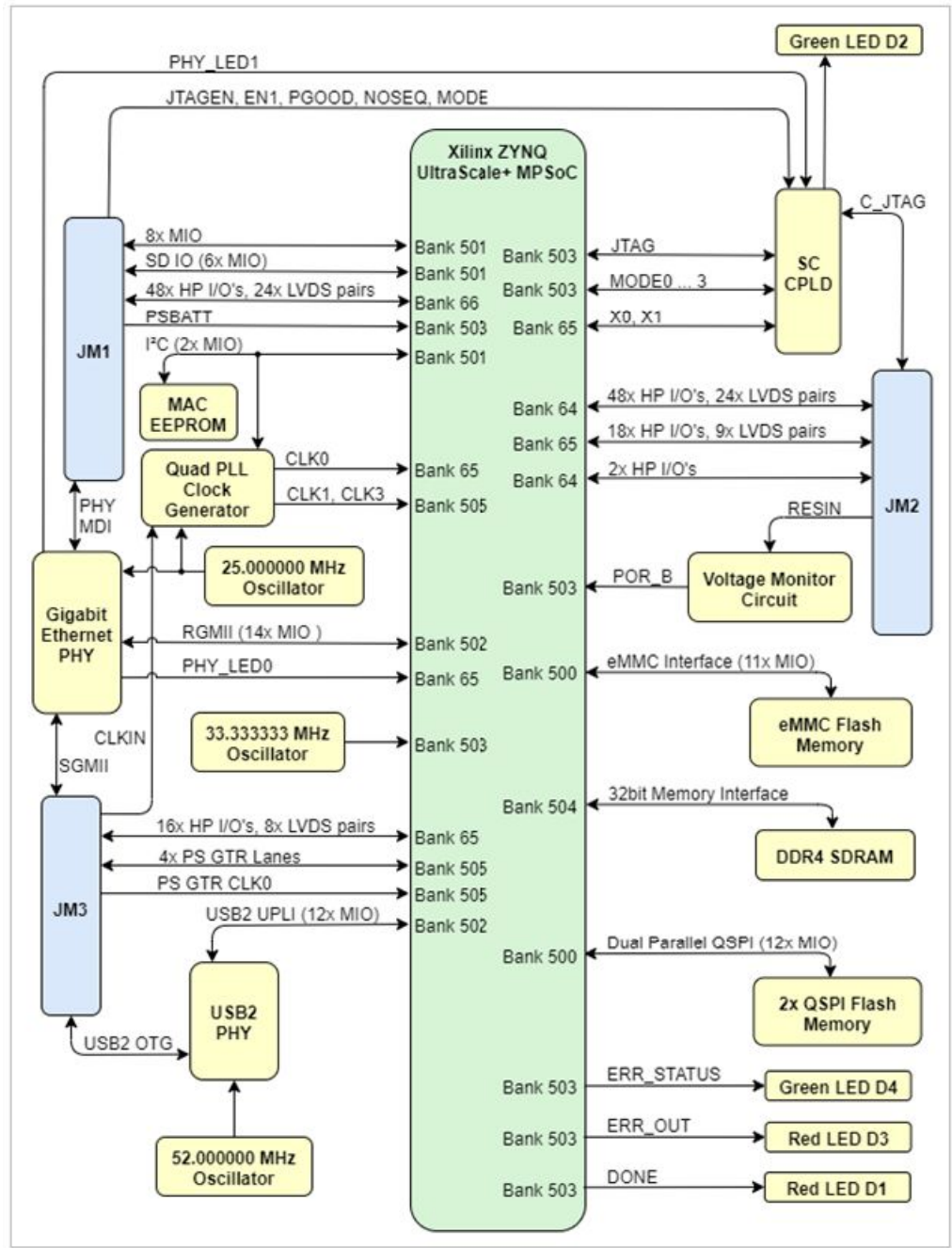
Photo Shows Similar Product

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: TE0820 - Legal Notices		
	A4	Number: TE0820 2BI21ML	Rev. 04
	Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 1 of 23
	Filename: Legal Notices Modules.SchDoc		



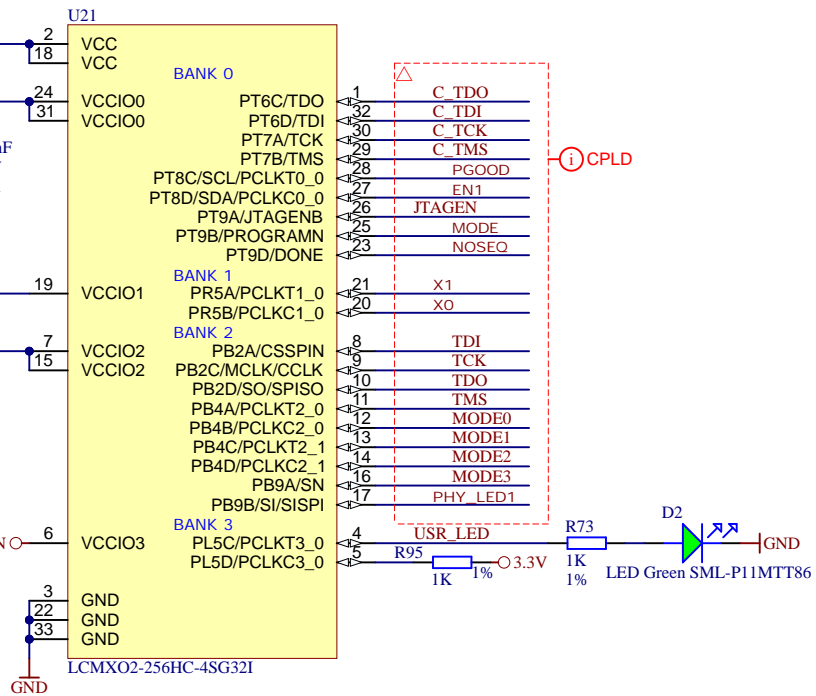
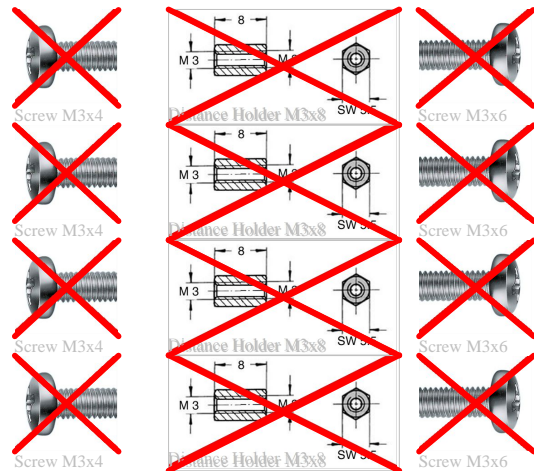
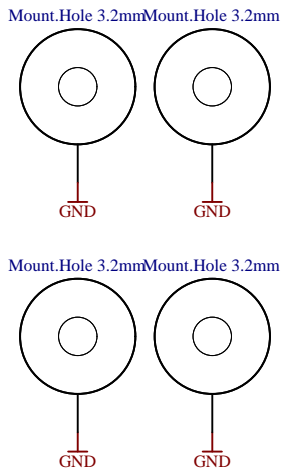
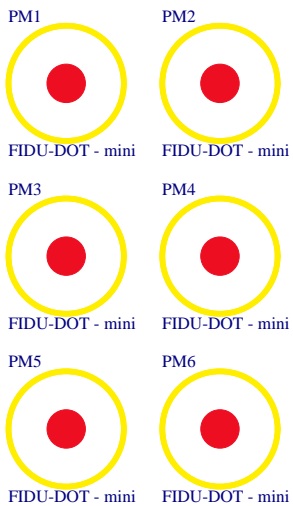
Title: TE0820 - System Overview		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-10-20	Copyright: Trenz Electronic GmbH	Page 2 of 23
Filename: Overview.SchDoc		

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	2BI21ML
Created by	RM
Modified by	RM
Modified at	2021-07-22
SVN Revision	12571

Title: TE0820		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page 3 of 23
Filename: TE0820.SchDoc		



1

2

3

4

A

A

B

B

C

C

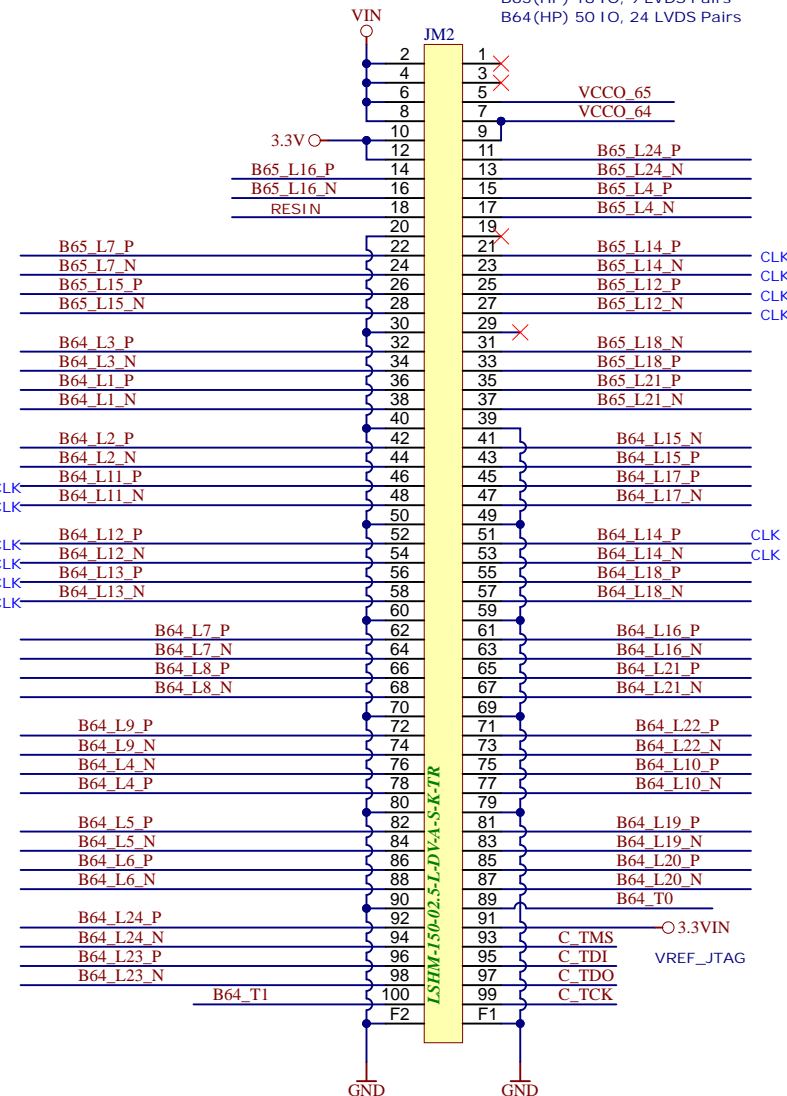
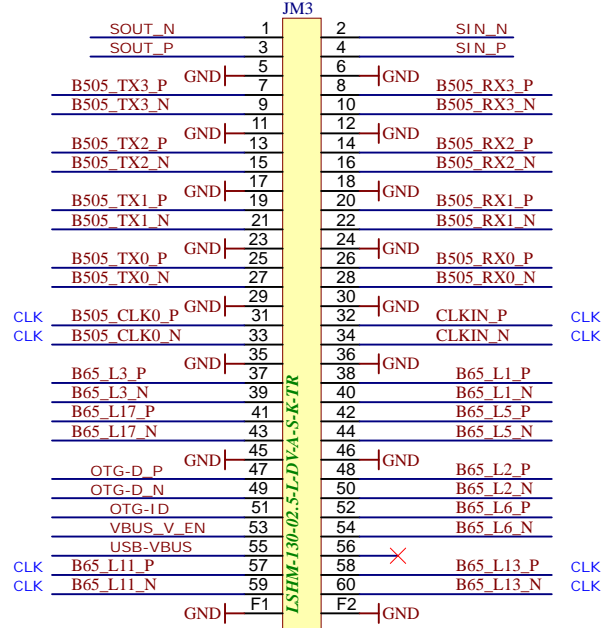
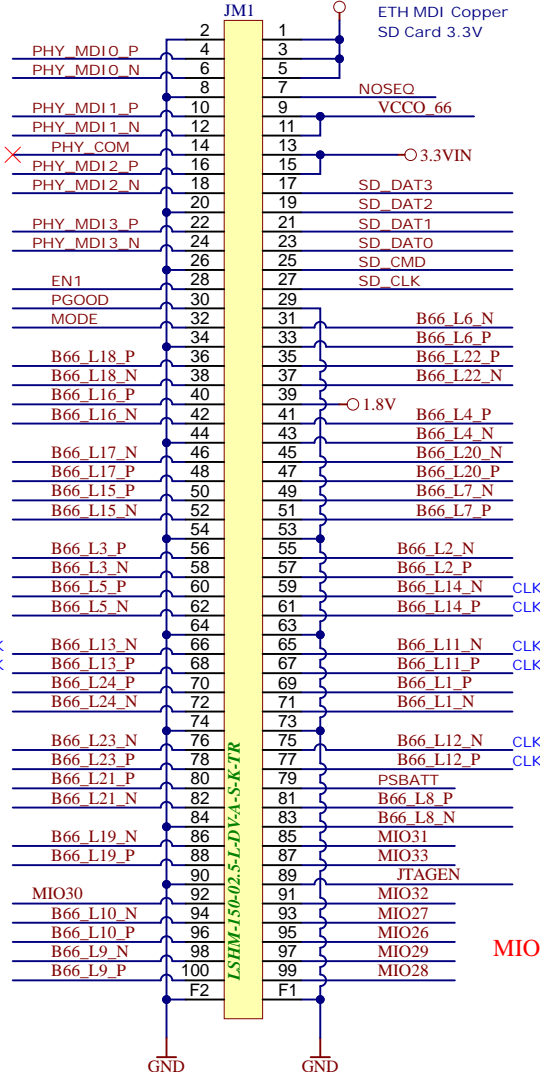
D

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



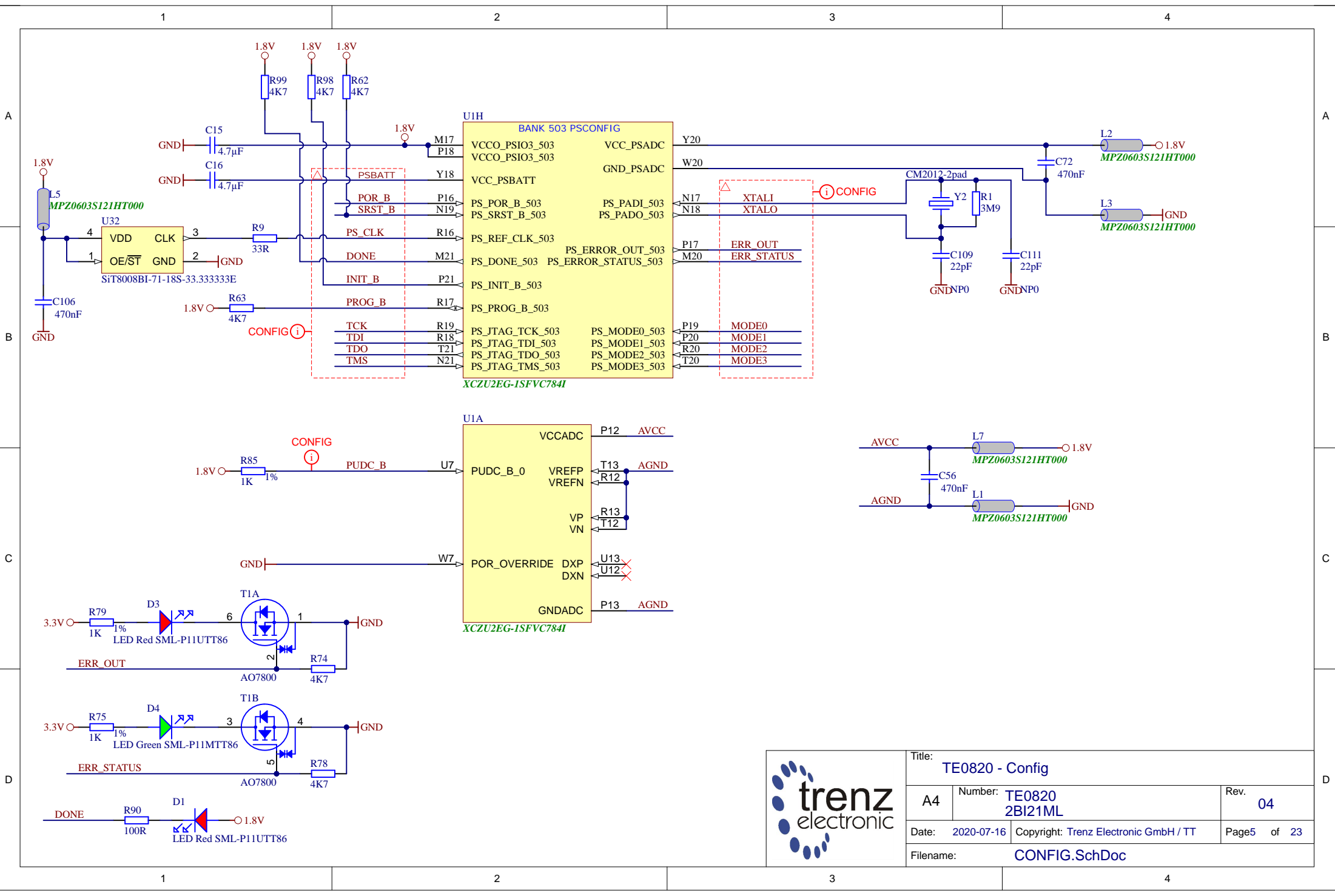
Title: TE0820 - B2B Connectors		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page4 of 23
Filename: B2B-Connectors.SchDoc		

1

2

3

4



Title: TE0820 - Config		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page5 of 23
Filename: CONFIG.SchDoc		

UIC

F14	VCCO_26	BANK 26 HD (ZU4/5 BANK 46 HD)	
C15	VCCO_26		
B15	IO_L1P_AD11P_26	IO_L7P_HDGC_AD5P_26	G13
A15	IO_L1N_AD11N_26	IO_L7N_HDGC_AD5N_26	F13
B14	IO_L2P_AD10P_26	IO_L8P_HDGC_AD4P_26	F15
A14	IO_L2N_AD10N_26	IO_L8N_HDGC_AD4N_26	E15
B13	IO_L3P_AD9P_26	IO_L9P_AD3P_26	G15
A13	IO_L3N_AD9N_26	IO_L9N_AD3N_26	G14
C14	IO_L4P_AD8P_26	IO_L10P_AD2P_26	H14
C13	IO_L4N_AD8N_26	IO_L10N_AD2N_26	H13
D15	IO_L5P_HDGC_AD7P_26	IO_L11P_AD1P_26	K14
D14	IO_L5N_HDGC_AD7N_26	IO_L11N_AD1N_26	J14
E14	IO_L6P_HDGC_AD6P_26	IO_L12P_AD0P_26	L14
E13	IO_L6N_HDGC_AD6N_26	IO_L12N_AD0N_26	L13

BANK 44 HD (ZU4/5 BANK 43 HD)

AC10	VCCO_44		
AG12	VCCO_44		
AG10	IO_L1P_AD11P_44	IO_L7P_HDGC_AD5P_44	AD11
AH10	IO_L1N_AD11N_44	IO_L7N_HDGC_AD5N_44	AD10
AF11	IO_L2P_AD10P_44	IO_L8P_HDGC_AD4P_44	AB11
AG11	IO_L2N_AD10N_44	IO_L8N_HDGC_AD4N_44	AC11
AH12	IO_L3P_AD9P_44	IO_L9P_AD3P_44	AA11
AH11	IO_L3N_AD9N_44	IO_L9N_AD3N_44	AA10
AE10	IO_L4P_AD8P_44	IO_L10P_AD2P_44	W10
AF10	IO_L4N_AD8N_44	IO_L10N_AD2N_44	Y10
AE12	IO_L5P_HDGC_AD7P_44	IO_L11P_AD1P_44	Y9
AF12	IO_L5N_HDGC_AD7N_44	IO_L11N_AD1N_44	AA8
AC13	IO_L6P_HDGC_AD6P_44	IO_L12P_AD0P_44	AB10
AD12	IO_L6N_HDGC_AD6N_44	IO_L12N_AD0N_44	AB9

UIB


XCZU2EG-1SFVC784I

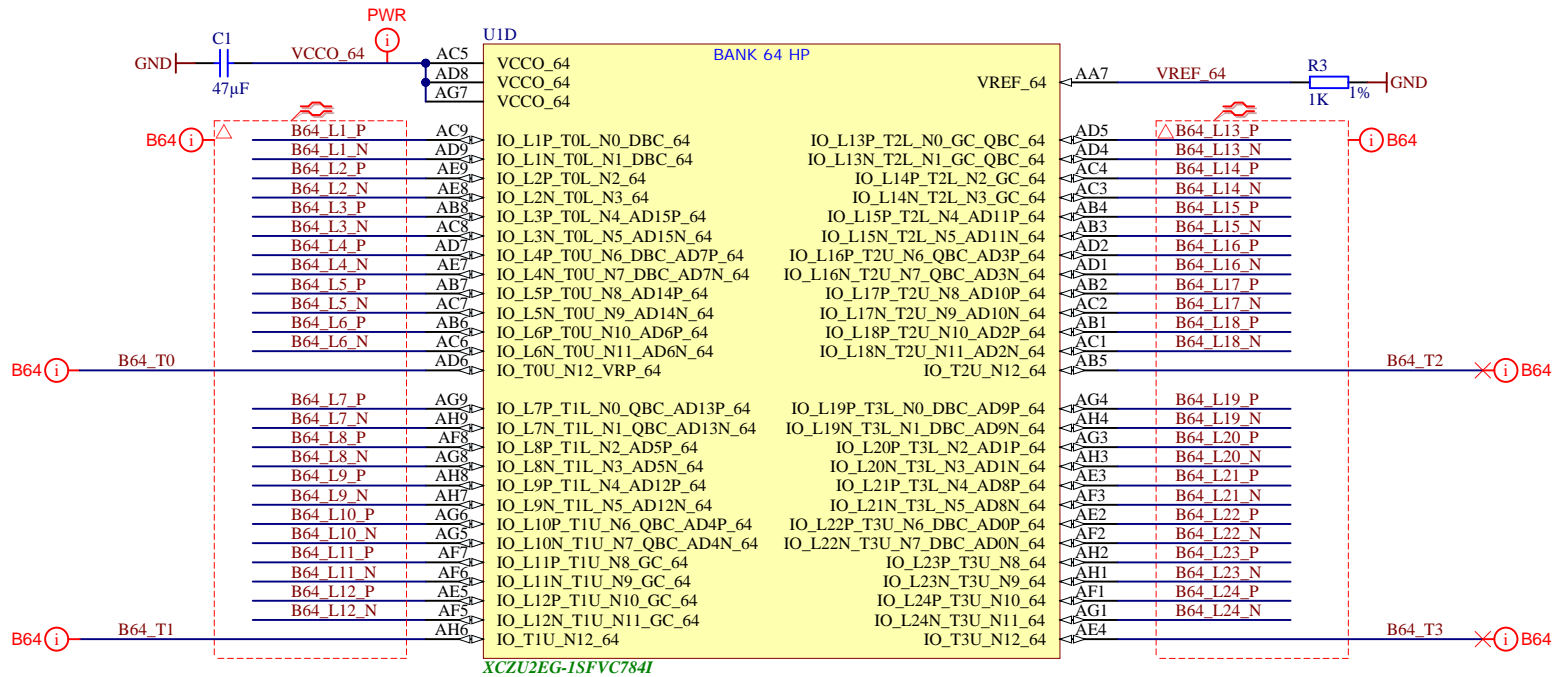
AA14	VCCO_24	BANK 24 HD (ZU4/5 BANK 44 HD)	
AD13	VCCO_24		
AE15	IO_L1P_AD15P_24	IO_L7P_HDGC_24	AA13
AE14	IO_L1N_AD15N_24	IO_L7N_HDGC_24	AB13
AG14	IO_L2P_AD14P_24	IO_L8P_HDGC_24	AB15
AH14	IO_L2N_AD14N_24	IO_L8N_HDGC_24	AB14
AG13	IO_L3P_AD13P_24	IO_L9P_AD11P_24	W14
AH13	IO_L3N_AD13N_24	IO_L9N_AD11N_24	W13
AE13	IO_L4P_AD12P_24	IO_L10P_AD10P_24	Y14
AF13	IO_L4N_AD12N_24	IO_L10N_AD10N_24	Y13
AD13	IO_L5P_HDGC_24	IO_L11P_AD9P_24	W12
AD14	IO_L5N_HDGC_24	IO_L11N_AD9N_24	W11
AC14	IO_L6P_HDGC_24	IO_L12P_AD8P_24	Y12
AC13	IO_L6N_HDGC_24	IO_L12N_AD8N_24	AA12

BANK 25 HD (ZU4/5 BANK 45 HD)

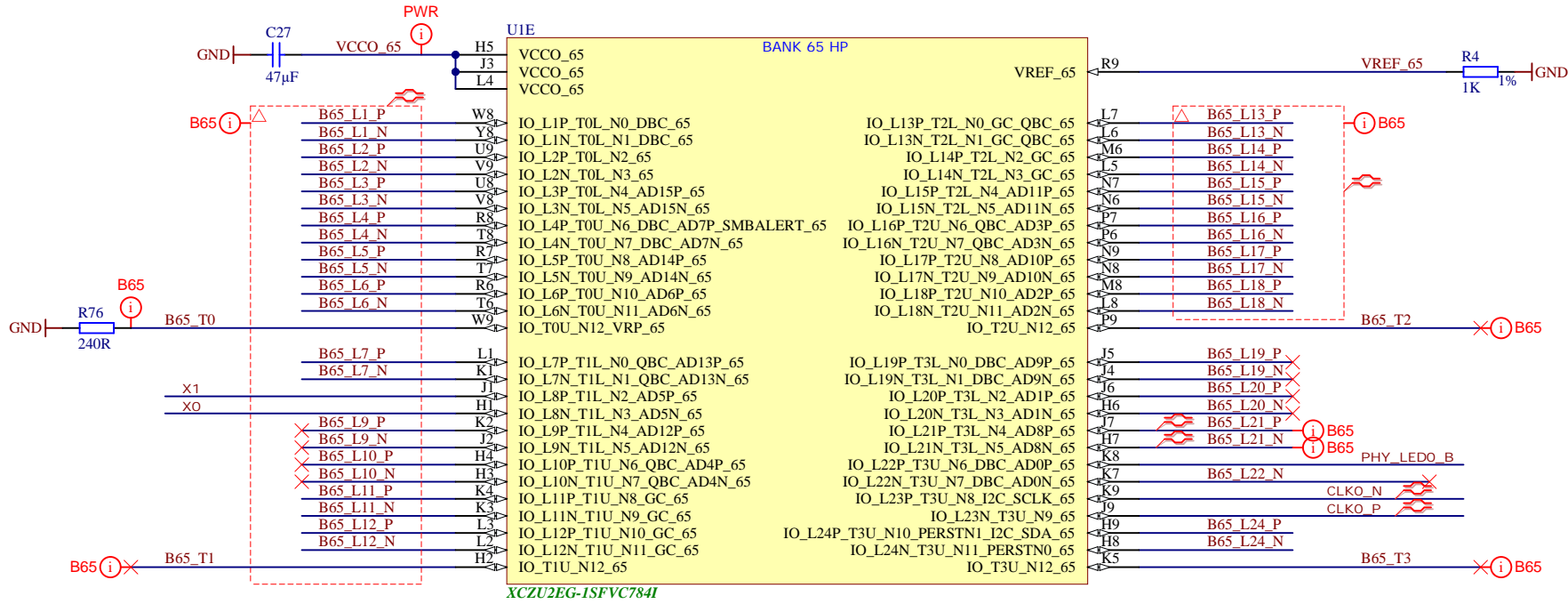
B12	VCCO_25		
E11	VCCO_25		
J11	IO_L1P_AD15P_25	IO_L7P_HDGC_25	E10
J10	IO_L1N_AD15N_25	IO_L7N_HDGC_25	D10
K13	IO_L2P_AD14P_25	IO_L8P_HDGC_25	E12
K12	IO_L2N_AD14N_25	IO_L8N_HDGC_25	D11
H11	IO_L3P_AD13P_25	IO_L9P_AD11P_25	C11
G10	IO_L3N_AD13N_25	IO_L9N_AD11N_25	B10
J12	IO_L4P_AD12P_25	IO_L10P_AD10P_25	B11
H12	IO_L4N_AD12N_25	IO_L10N_AD10N_25	A10
G11	IO_L5P_HDGC_25	IO_L11P_AD9P_25	A12
F11	IO_L5N_HDGC_25	IO_L11N_AD9N_25	A11
F12	IO_L6P_HDGC_25	IO_L12P_AD8P_25	D12
F11	IO_L6N_HDGC_25	IO_L12N_AD8N_25	C12

XCZU2EG-1SFVC784I

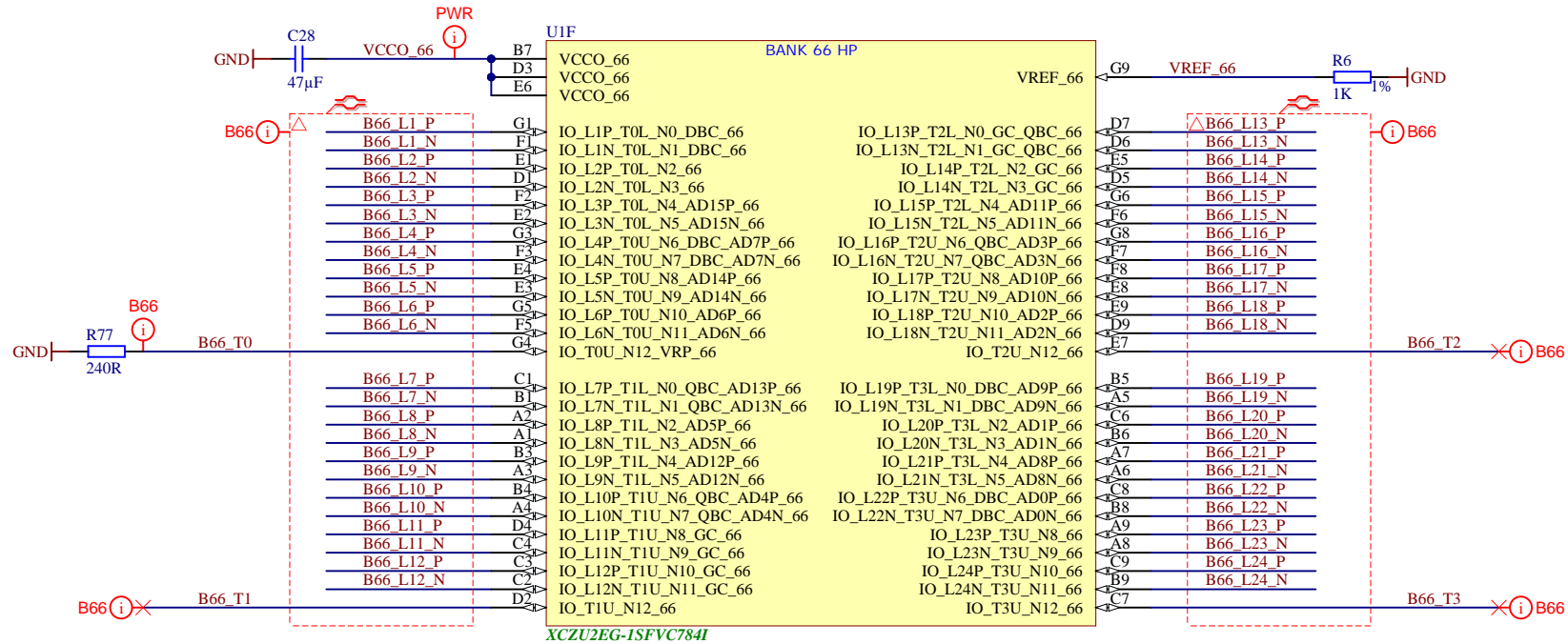
	Title: TE0820 - HD Banks		
	A4	Number: TE0820 2BI21ML	Rev. 04
	Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page6 of 23
	Filename: B_HD.SchDoc		




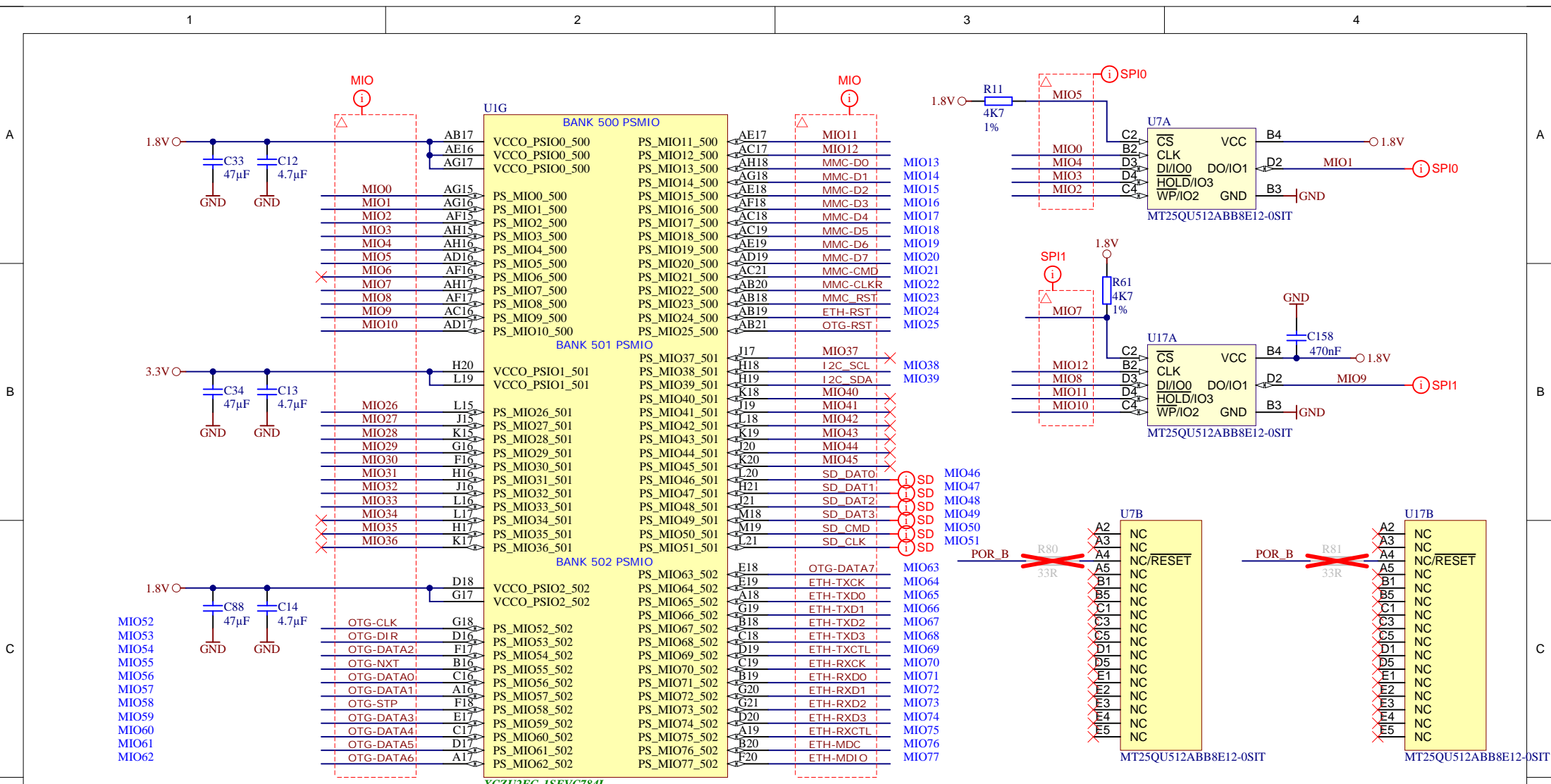
Title: TE0820 - B64		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	
Page 7 of 23		
Filename: B64.SchDoc		



Title: TE0820 - B65		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 8 of 23
Filename: B65.SchDoc		

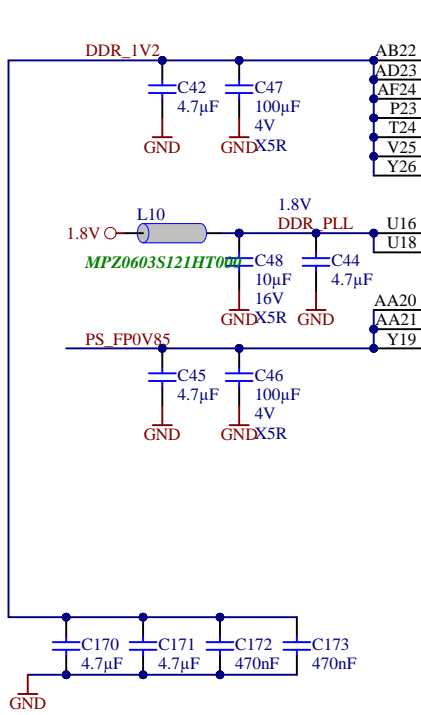


			Title: TE0820 - B66	
			A4	Number: TE0820 2BI21ML
Date: 2020-07-16		Copyright: Trenz Electronic GmbH / TT		Page9 of 23
Filename: B66.SchDoc				



trenz electronic

Title: TE0820 - MIO Banks		
A4	Number: TE0820 2BI21ML	Rev. 04
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
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-1SFVC784I

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	AD22	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	
DDR4-DQS0 P	AF21	PS_DDR_DQS_P0_504	PS_DDR_DQ66_504	P28	
DDR4-DQS0 N	AG21	PS_DDR_DQS_N0_504	PS_DDR_DQ67_504	P27	
DDR4-DQS1 P	AF23	PS_DDR_DQS_P1_504	PS_DDR_DQ68_504	P26	
DDR4-DQS1 N	AG23	PS_DDR_DQS_N1_504	PS_DDR_DQ69_504	R25	
DDR4-DQS2 P	AF25	PS_DDR_DQS_P2_504	PS_DDR_DQ70_504	P25	
DDR4-DQS2 N	AF26	PS_DDR_DQS_N2_504	PS_DDR_DQ71_504	T25	
DDR4-DQS3 P	AE27	PS_DDR_DQS_P3_504			
DDR4-DQS3 N	AE27	PS_DDR_DQS_N3_504			
	N23	PS_DDR_DQS_P4_504			
	M23	PS_DDR_DQS_N4_504	PS_DDR_DM0_504	AG20	DDR4-DM0
	L23	PS_DDR_DQS_P5_504	PS_DDR_DM1_504	AE23	DDR4-DM1
	K23	PS_DDR_DQS_N5_504	PS_DDR_DM2_504	AE25	DDR4-DM2
	N26	PS_DDR_DQS_P6_504	PS_DDR_DM3_504	AE28	DDR4-DM3
	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	

XCZU2EG-1SFVC784I



Title: TE0820 - PS_DDR		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 11 of 23
Filename: PS_DDR.SchDoc		

1

2

3

4

A

A

B

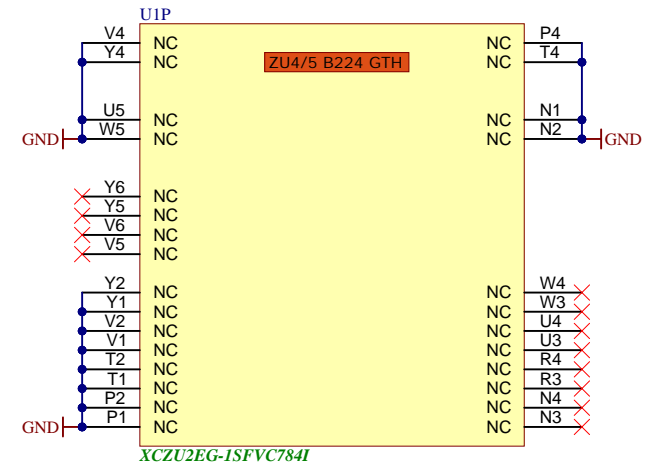
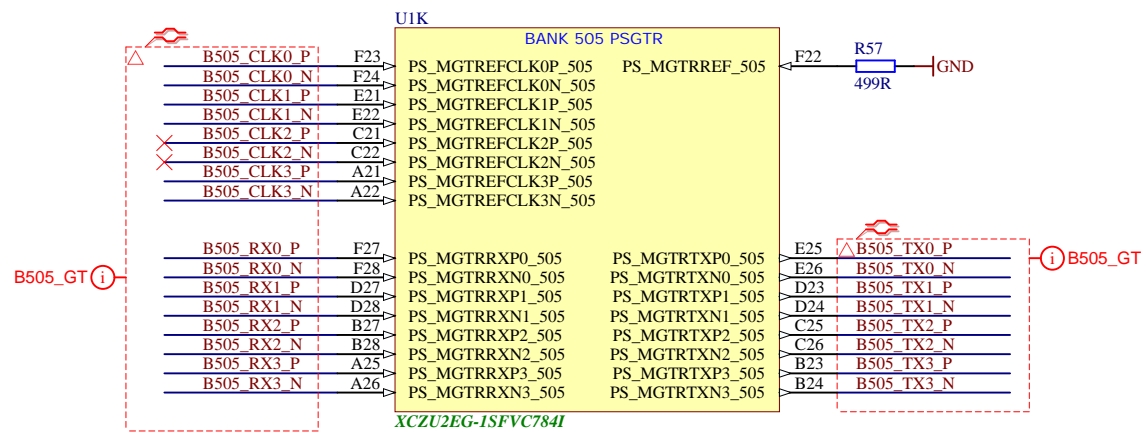
B

C

C

D

D



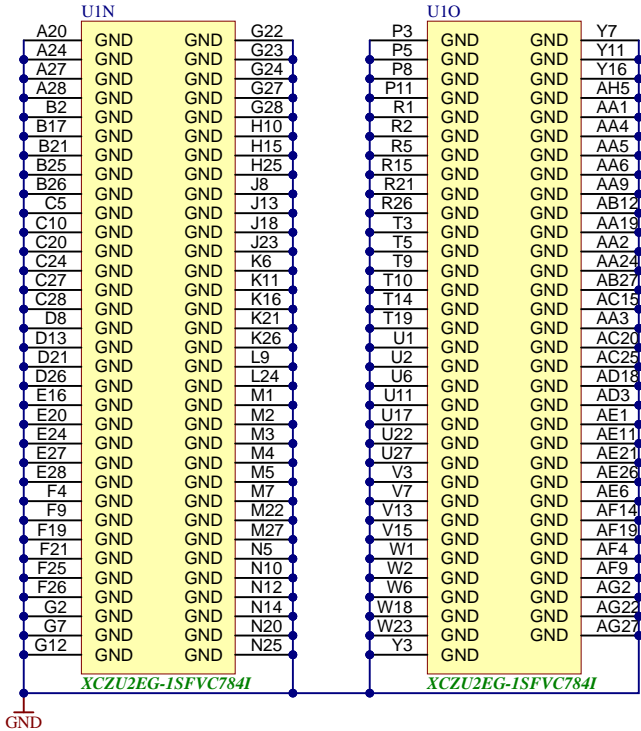
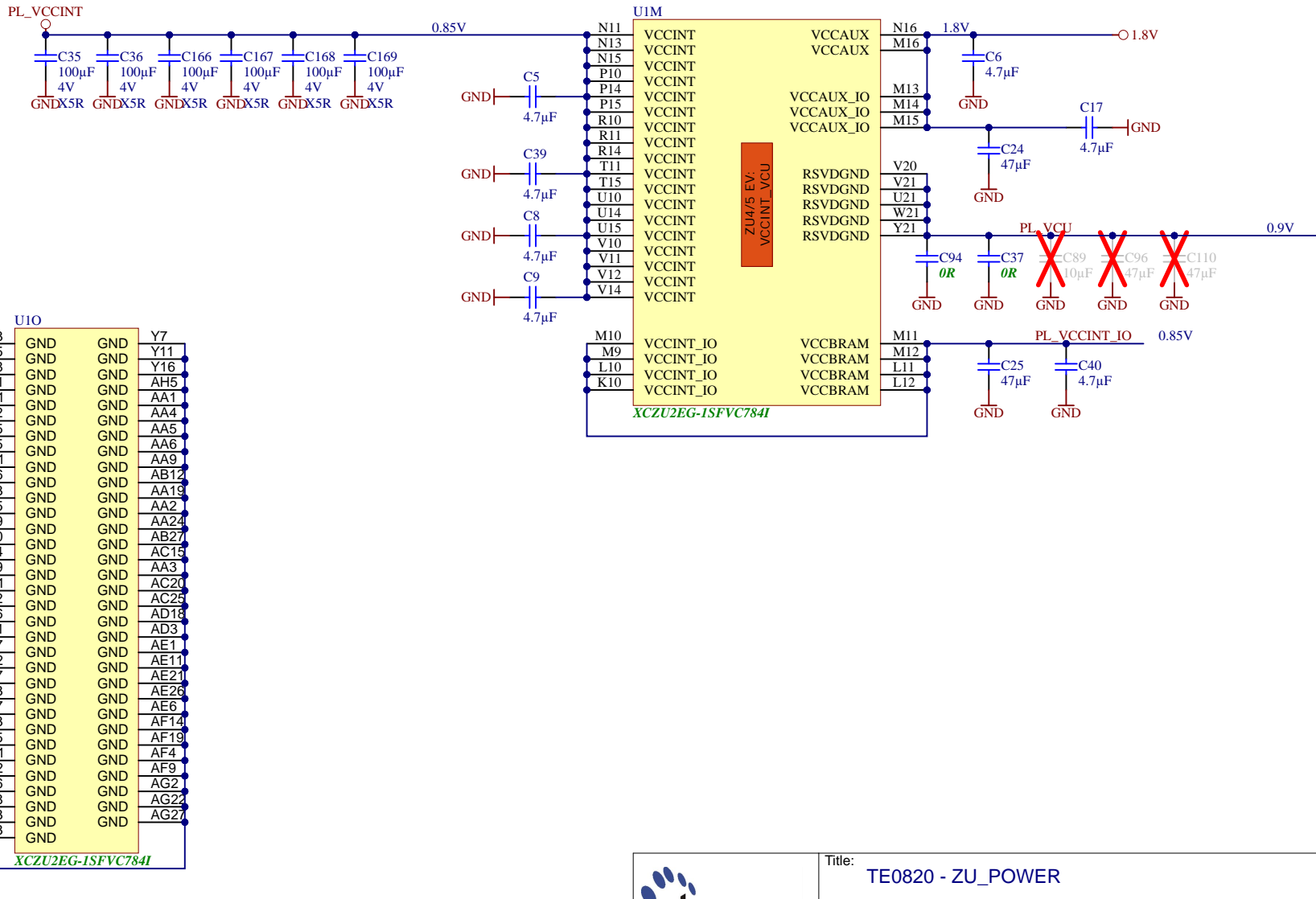
Title: TE0820 - PS_GT		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 12 of 23
Filename: B_PS_GT.SchDoc		

1

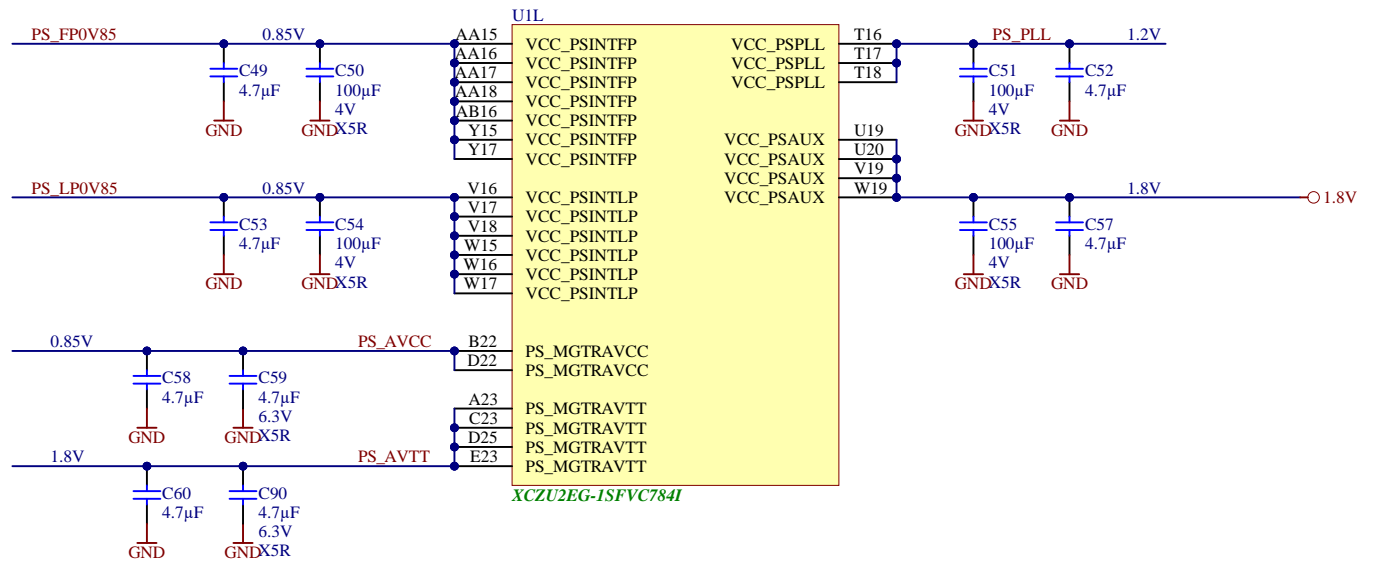
2


3

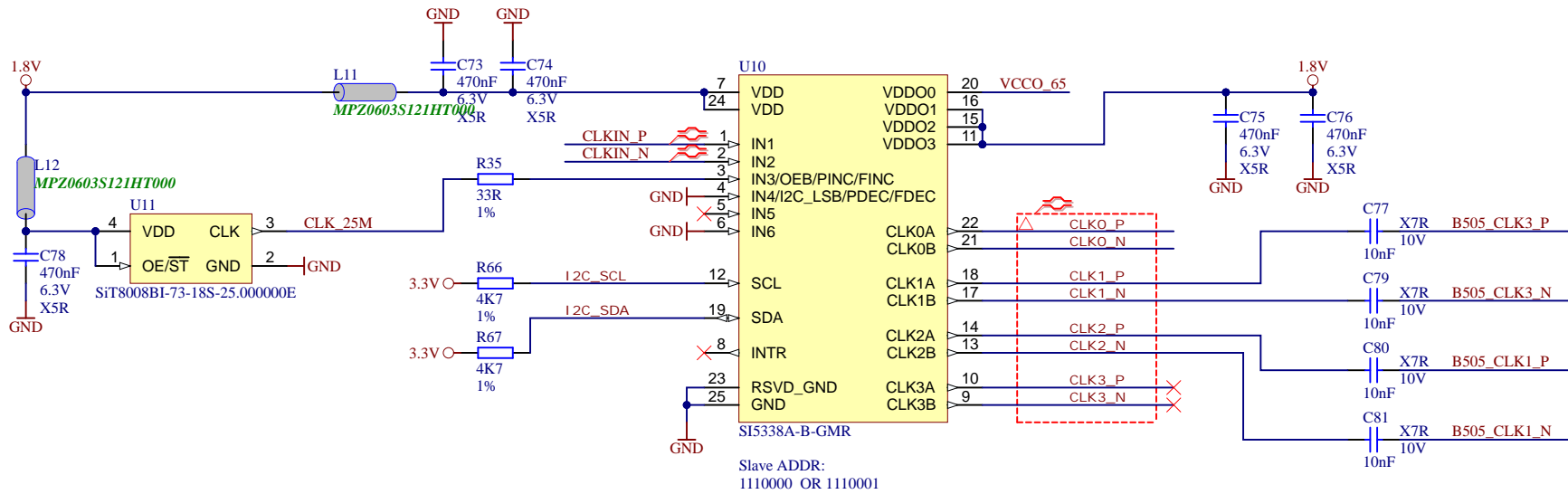
4




Title: TE0820 - ZU_POWER		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page13 of 23
Filename: ZU_POWER.SchDoc		



		Title: TE0820 - ZU_PS_POWER	
		A4	Number: TE0820 2BI21ML
Date: 2020-07-16		Copyright: Trenz Electronic GmbH / TT	
Filename: ZU_PS_POWER.SchDoc		Page 14 of 23	



		Title: TE0820 - CLK	
		A4	Number: TE0820 2BI21ML
Date: 2020-07-16		Copyright: 2015 Trenz Electronic GmbH	
Filename: CLK.SchDoc		Page 15 of 23	

A

B

C

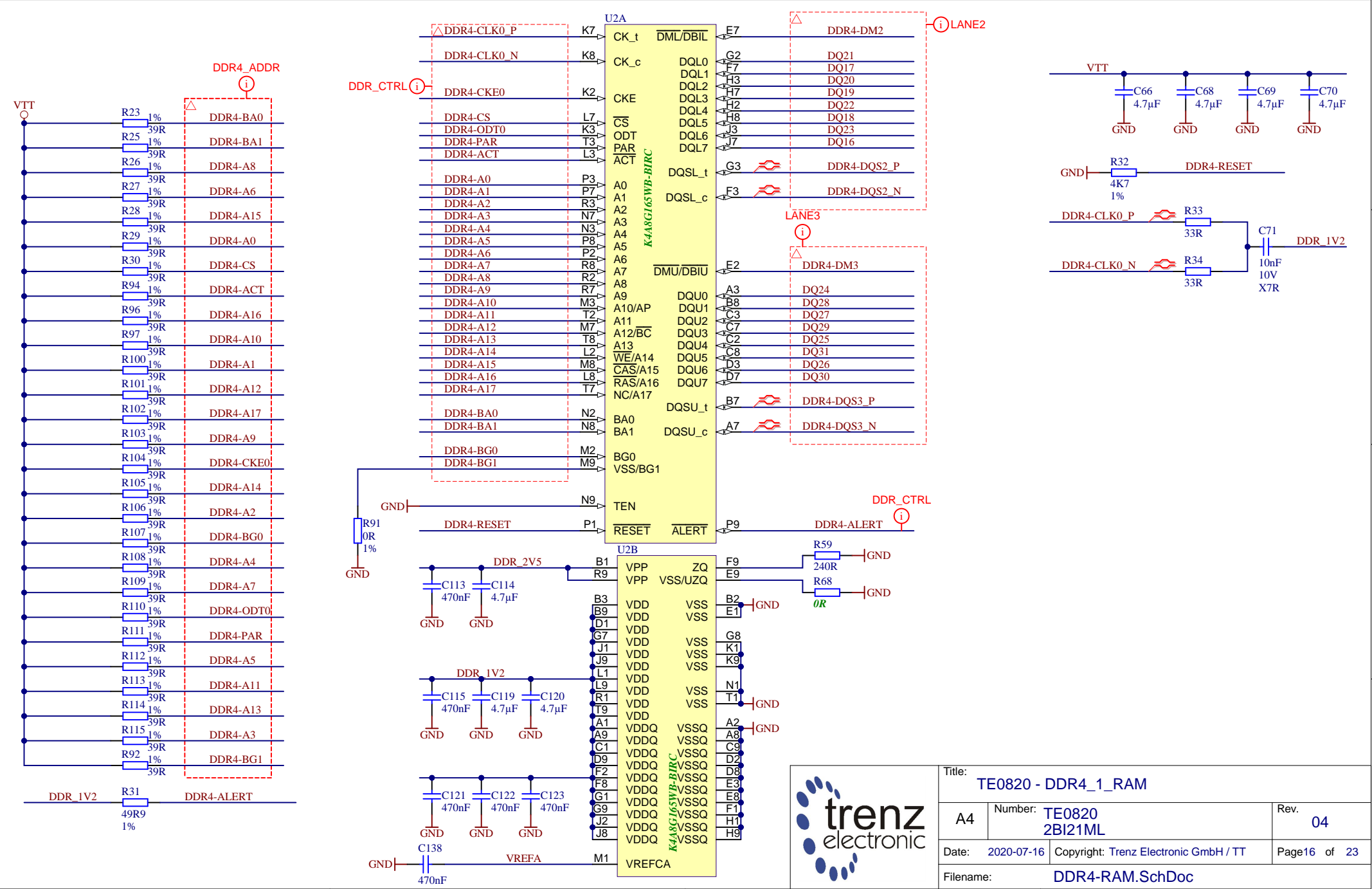
D

A

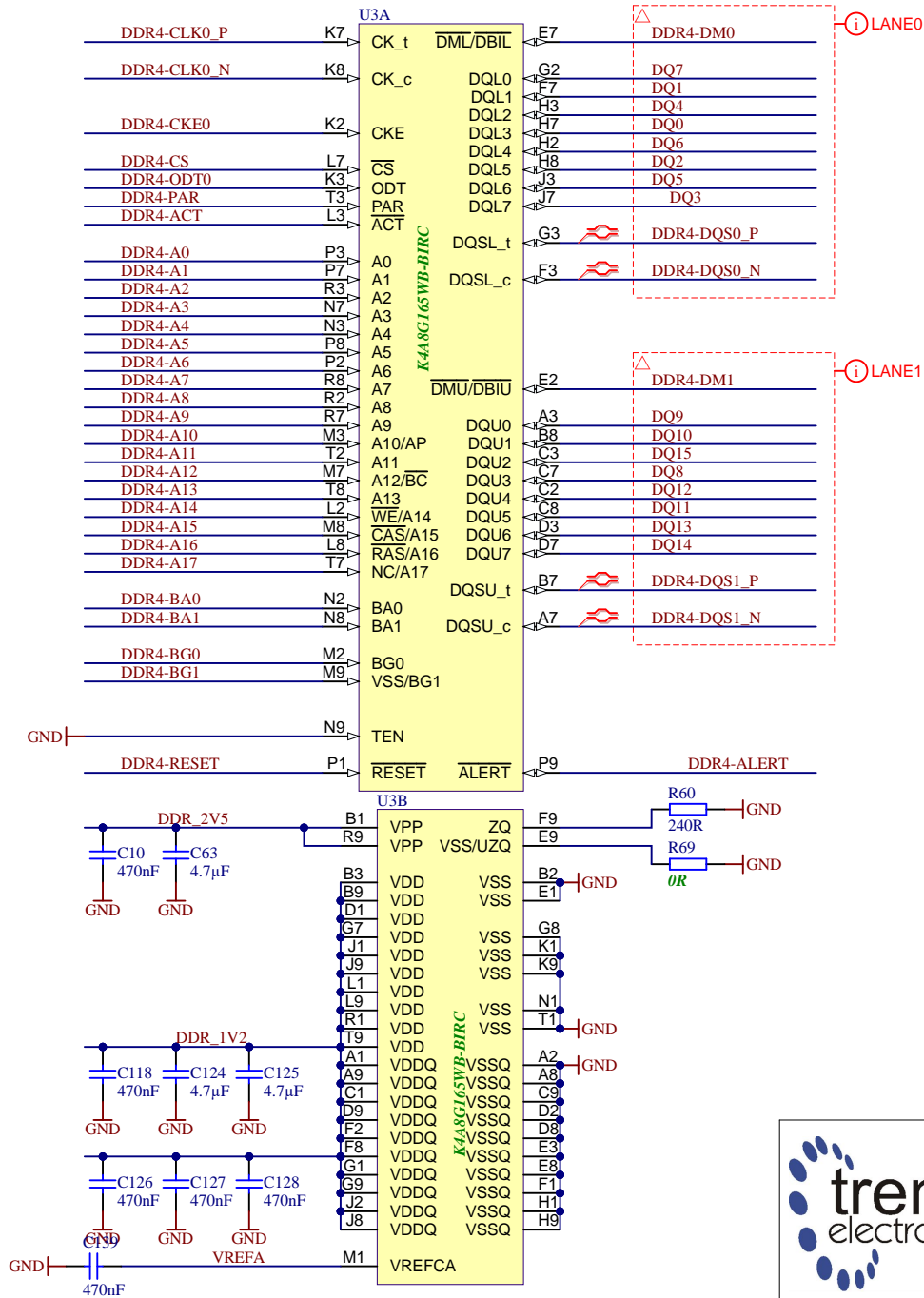

B

C

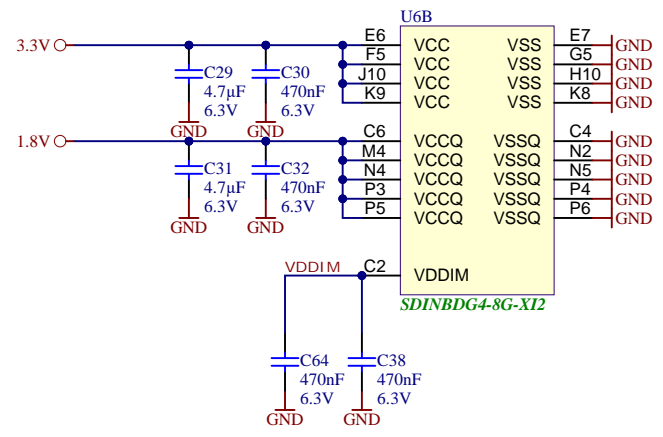
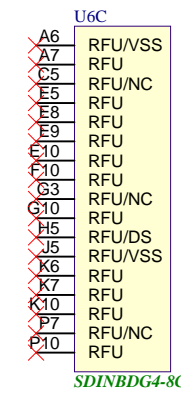
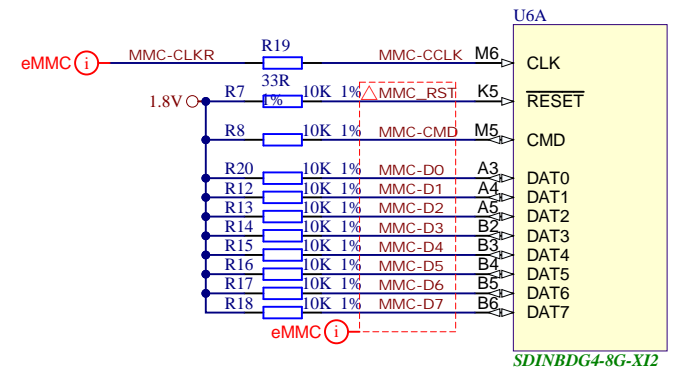
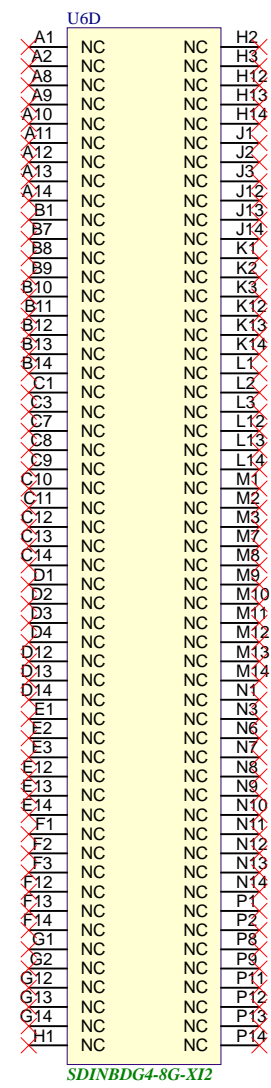
D



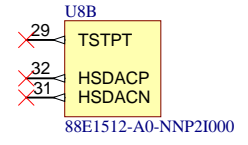
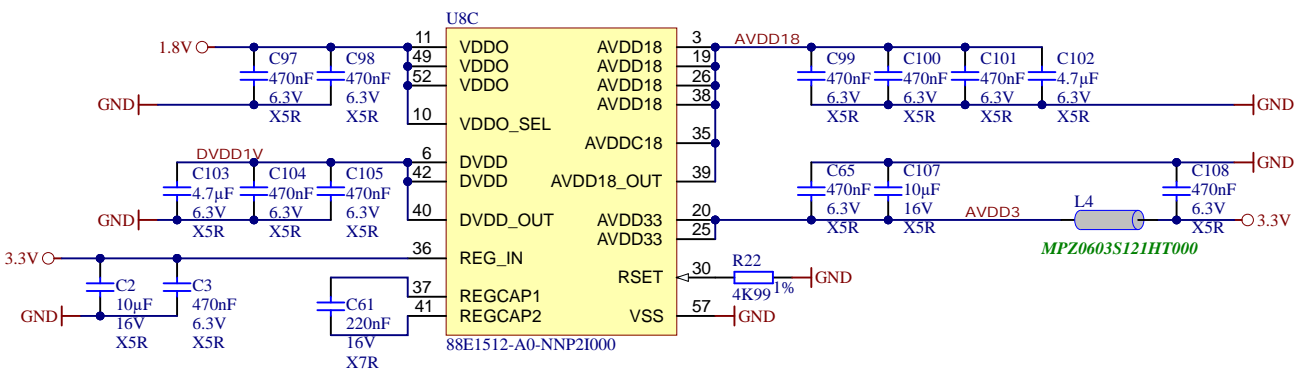
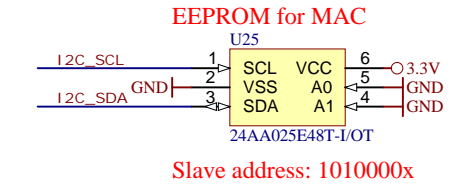
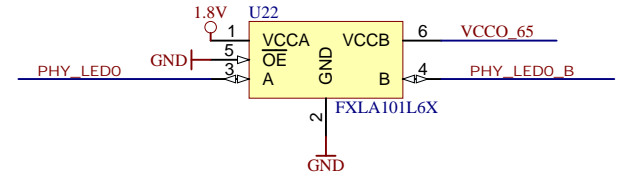
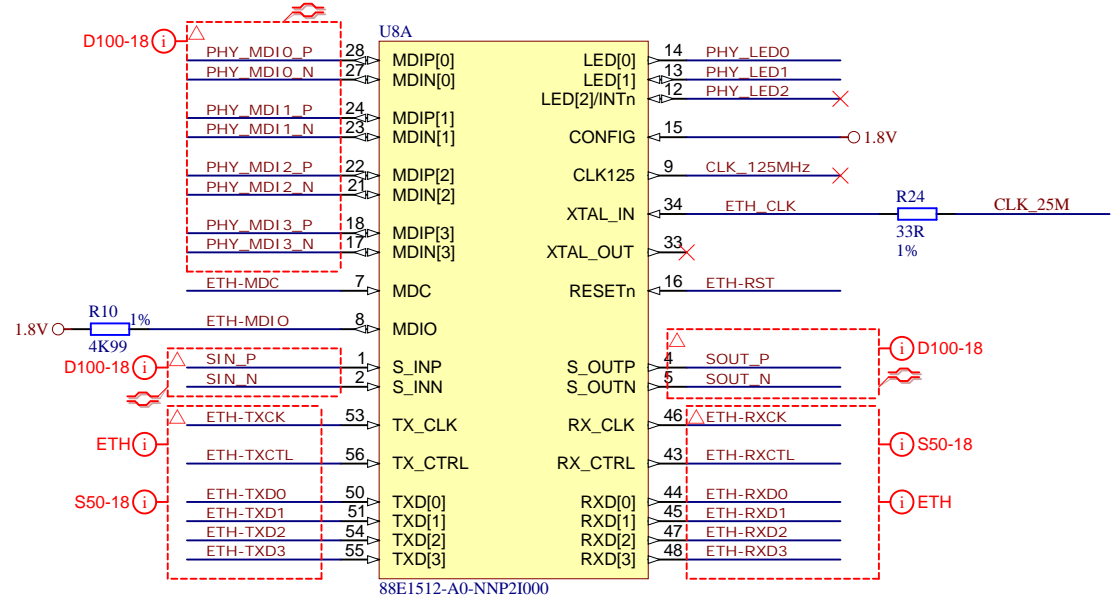
Title: TE0820 - DDR4_1_RAM		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 16 of 23
Filename: DDR4-RAM.SchDoc		

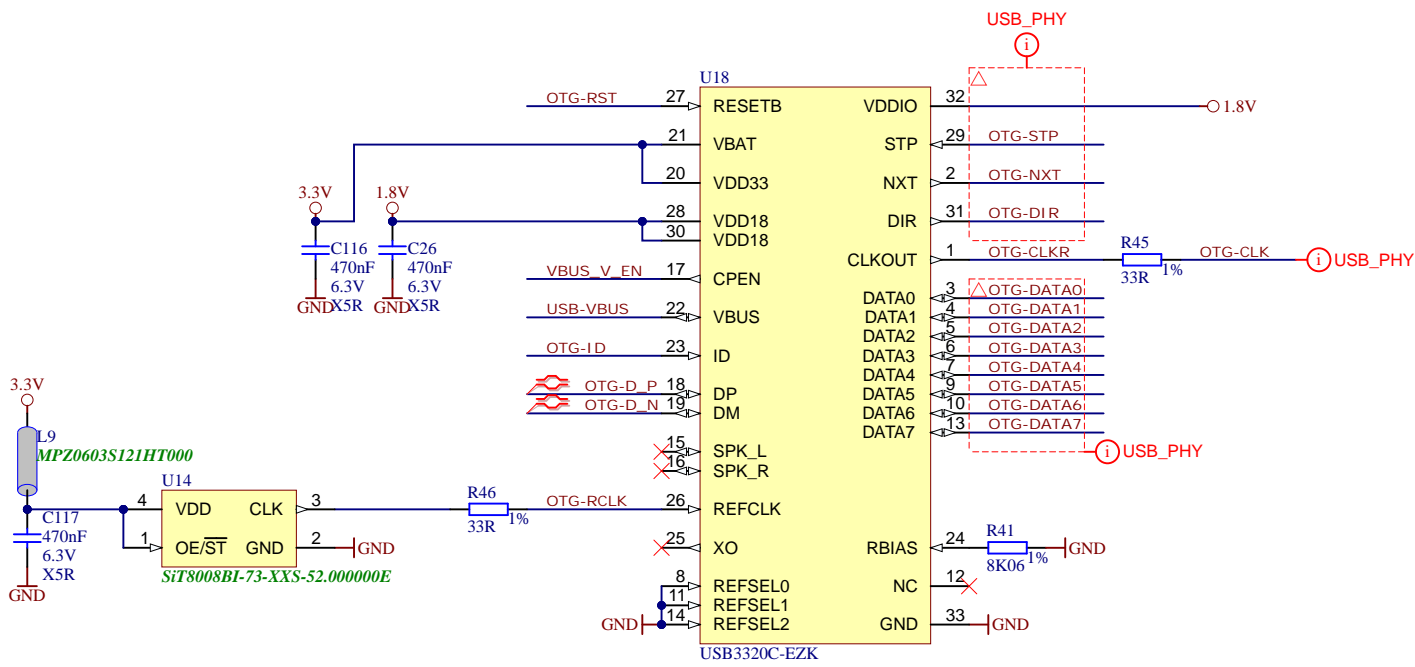
Title: TE0820 - DDR4_2_RAM		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page 17 of 23
Filename: DDR4-RAM_2.SchDoc		



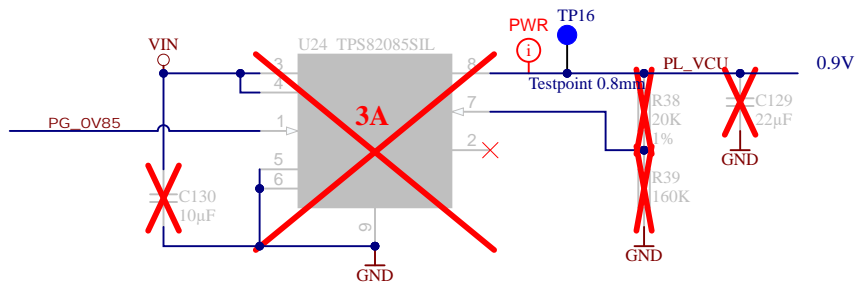
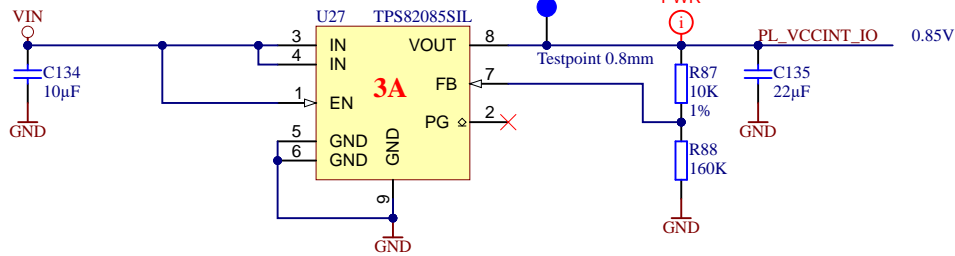
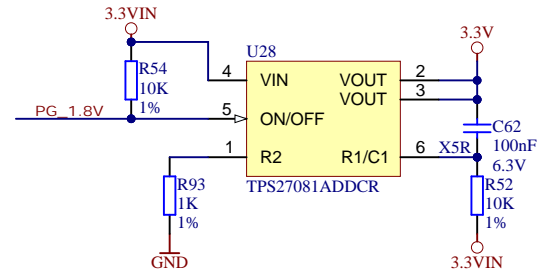
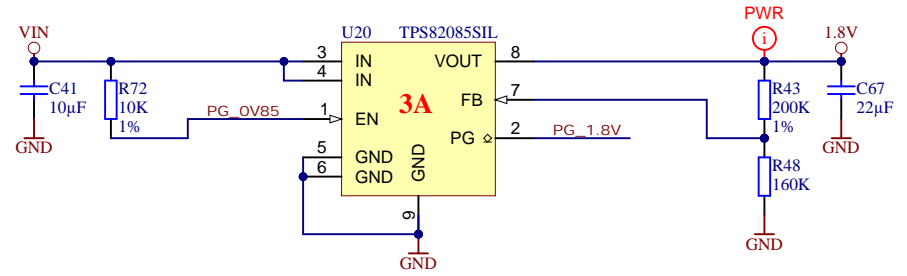
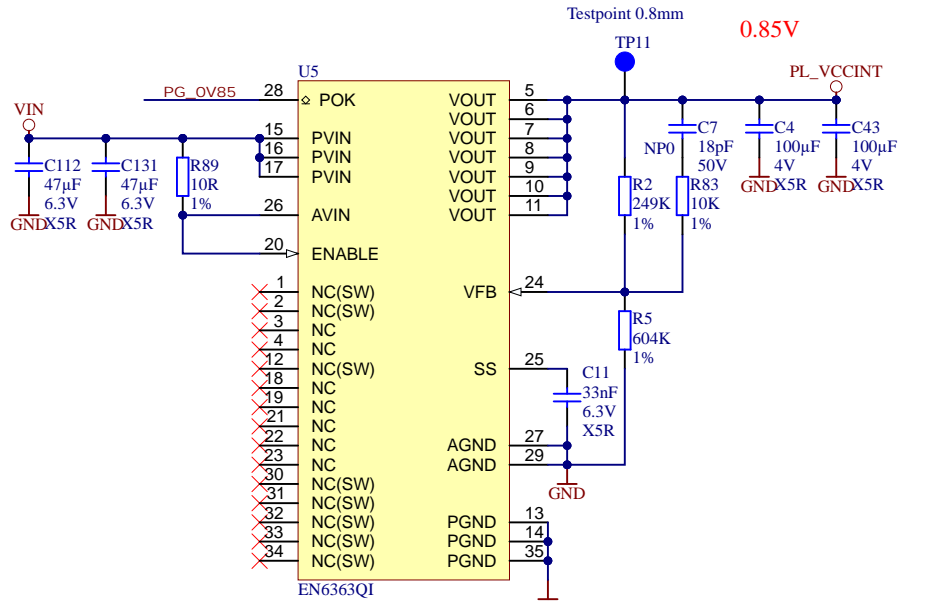
Title: TE0820 - eMMC		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page18 of 23
Filename: eMMC.SchDoc		



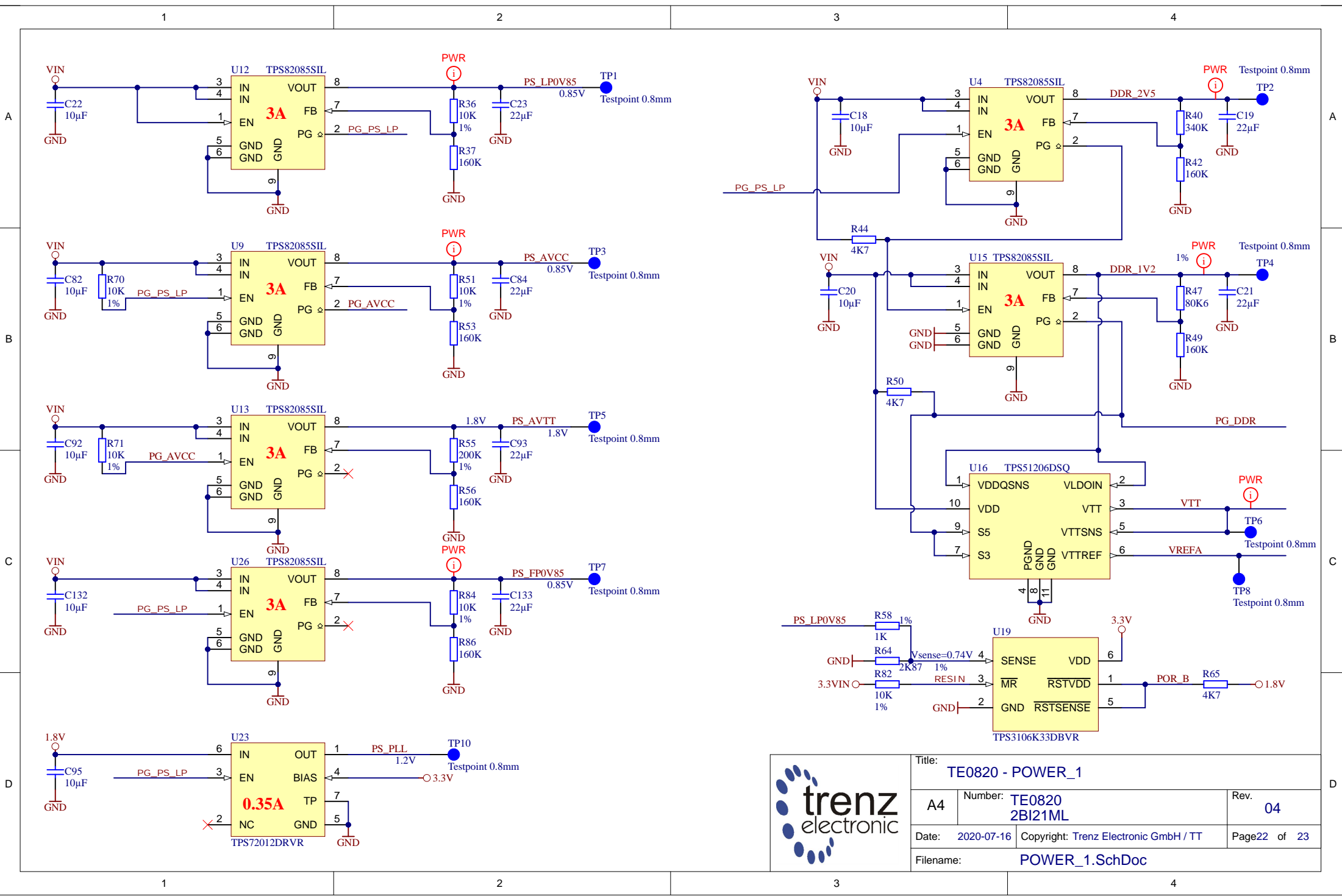
Title: TE0820 - Eth_PHY		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page 19 of 23
Filename: ETH-PHY.SchDoc		




	Title: TE0820 - USB_PHY	
	A4	Number: TE0820 2BI21ML
	Date: 2020-07-16	Rev. 04
	Copyright: 2015 Trenz Electronic GmbH	
Page20 of 23		
Filename: USB-PHY.SchDoc		



Title: TE0820 - POWER		
A4	Number: TE0820 2BI21ML	Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page21 of 23
Filename: POWER.SchDoc		



			Title: TE0820 - POWER_1	
			A4	Number: TE0820 2BI21ML
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 2BI21ML
Date: 2020-07-16		Copyright: Trenz Electronic GmbH / TT	
Filename: Revision Changes.SchDoc		Page 23 of 23	