



Photo Shows Similar Product

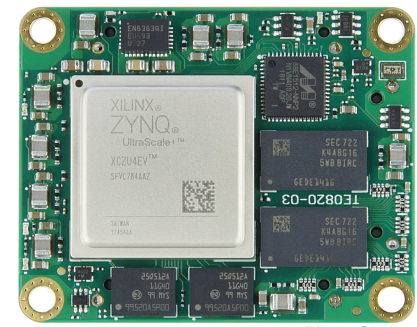


Photo Shows Similar Product

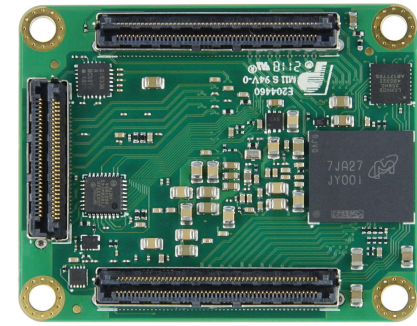


Photo Shows Similar Product

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!

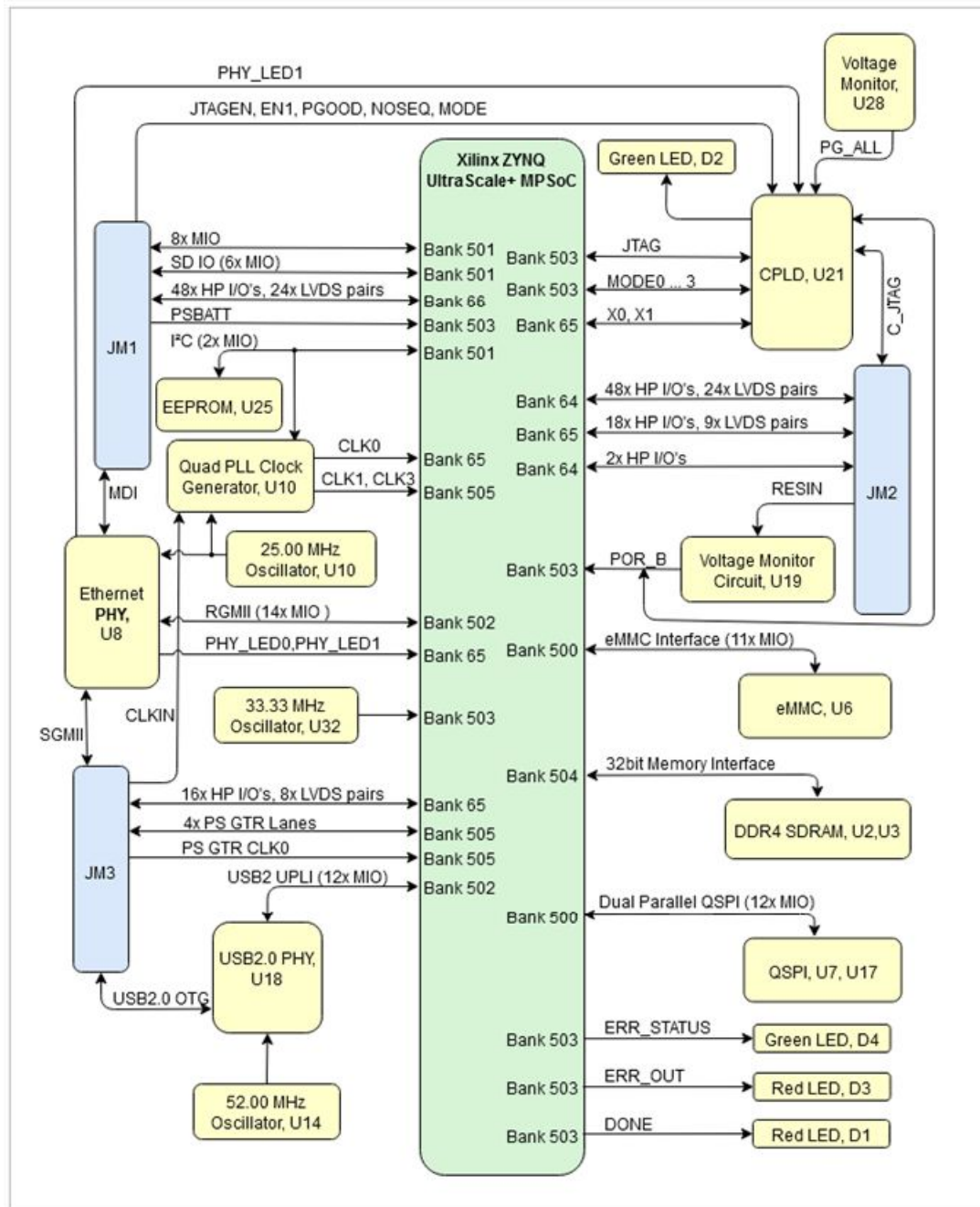


Title: TE0820 - Legal Notices		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 1 of 24
Filename: Legal Notices Modules.SchDoc		

REV	Description	
-01	Initial revision	VT
-02	<ul style="list-style-type: none"> 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 	VT
-03	<ul style="list-style-type: none"> 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) 	VT
-04	<ul style="list-style-type: none"> 1) Fixed DDR4 connection (BG1), support B-die DDR4 Industrial grade chips 2) Added R93, changed value C62, change obsolete U28 3) Added R89 (10R) 4) Added additional caps 4.7uF to PS_AVTT/PS_AVCC (Xilinx doc UG583) 5) Changed R51 20k ->10K (PS_AVCC = 0.85V, Xilinx doc DS925 v1.17) 6) Fixed DDR4 connection (Alert) 7) Added 3.3V signal to CPLD 8) Added testpoints 9) LIB components update 	VT
-04A	<ul style="list-style-type: none"> 1) Added block diagram, updated module pictures 	VY
-05	<ul style="list-style-type: none"> 1) Changed EOL Ferrite Beads L1..5,L7,L9..12 2) Changed EOL DCDC U5 (EN6363QI -> MPM3860GQW-Z) 3) Changed EOL Load Switch U28 (TPS27082LDDCR -> MP5077GG-Z) 4) Added additional Decoupling Capacitors and changed caps 4.7uF to 10uF (Xilinx doc UG583 v1.23) 5) Added pull-down and testpoint to TEN DDR4 signal 6) Changed EOL Transistor T1 (AO7800 -> BSD840NH6327XTSA1) 7) Added Voltage Detector U30 (BD39040MUF-CE2) 8) Changed EOL eMMC U6 (MTFC4GACAJCN-4M -> SDINBDG4-8G-XI2) 9) Changed EOL MEMS U14 (SiT8008AI-73-XXS-52.000000E -> SiT8008BI-73-XXS-52.000000E) 10) Added signal PG_ALL (U30) to CPLD (pin5) 11) Added option (depends assembly variants, for all assembly variants R128 set as populated, instead special inquiry) signal POR_B through R128, T2 to CPLD (pin27) 12) Added option (depends assembly variants, for all assembly variants R95 set as DNP, instead special inquiry) signal EN1 through R95 to DCDC U5 13) Added option (depends assembly variants, for all assembly variants U29 and R129 set as populated, instead special inquiry) signal PHY_LED1 through Level Translator U29 to FPGA (U1.K7) 14) Added Resistors R130 & R131 (select Power-on delay override, for all assembly variants R130 set as DNP -> Standard PL Power-on delay time) 15) Added Diode D5 16) Added Power Diagram Sheet 17) LIB components update 	VT



Title: TE0820 - Revision Changes		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page2 of 24
Filename: Revision Changes.SchDoc		



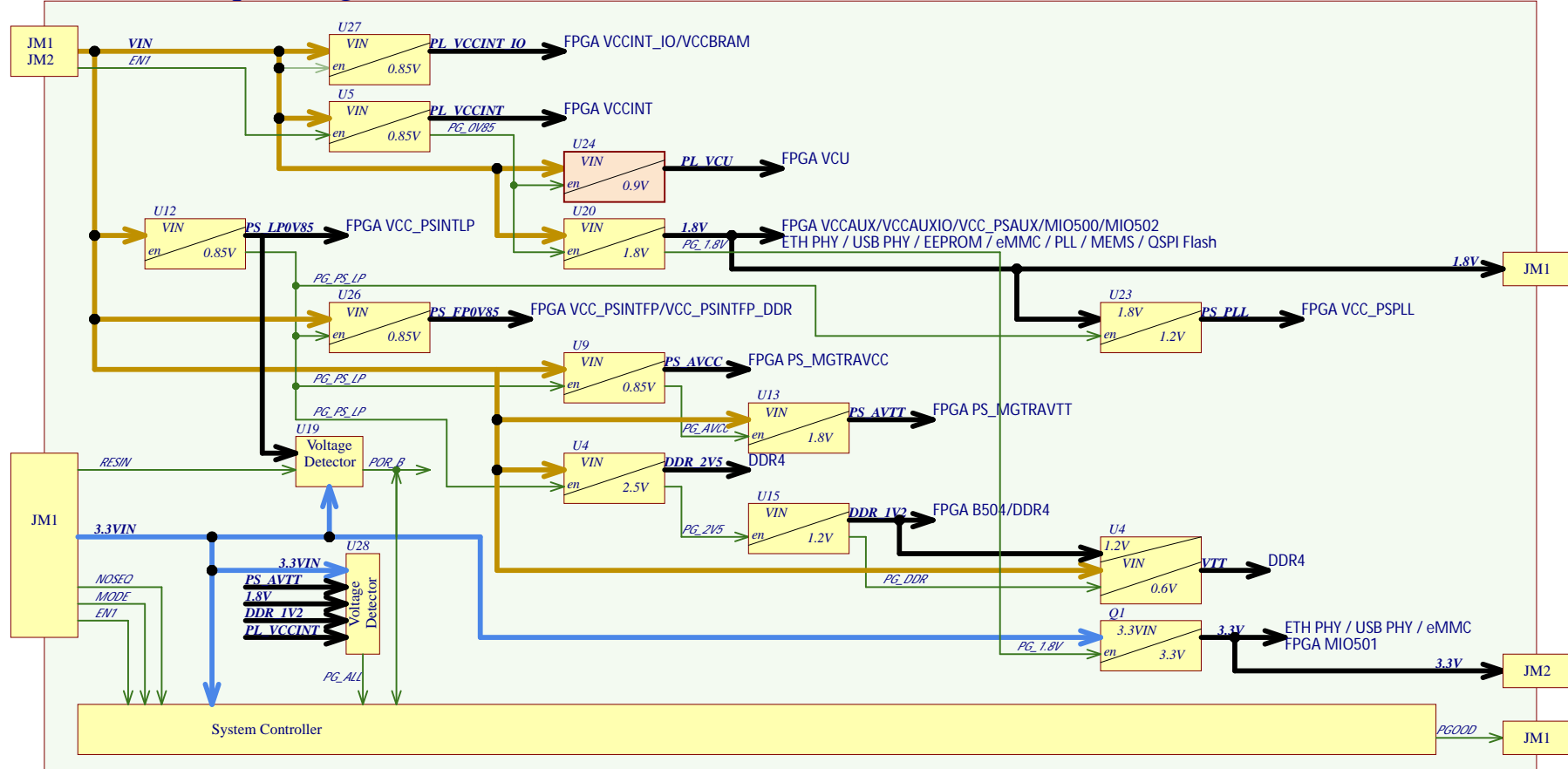
TE0820 List of Web Documentation

Web Document Name	Link	QR-code
TE0820 Resources	URL	
TE0820 TRM	URL	
TE0820 Reference Designs	URL	
TE0820 CPLD Firmware	URL	
TE0820 Product Change Notifications	URL	
TE0820 Design and Advisory Notes	URL	



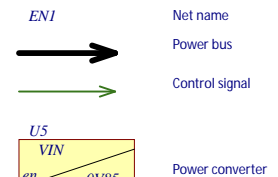
Title: TE0820 - System Overview		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 3 of 24
Filename: Overview.SchDoc		

Power-on sequencing:



Supported Voltage Ranges:

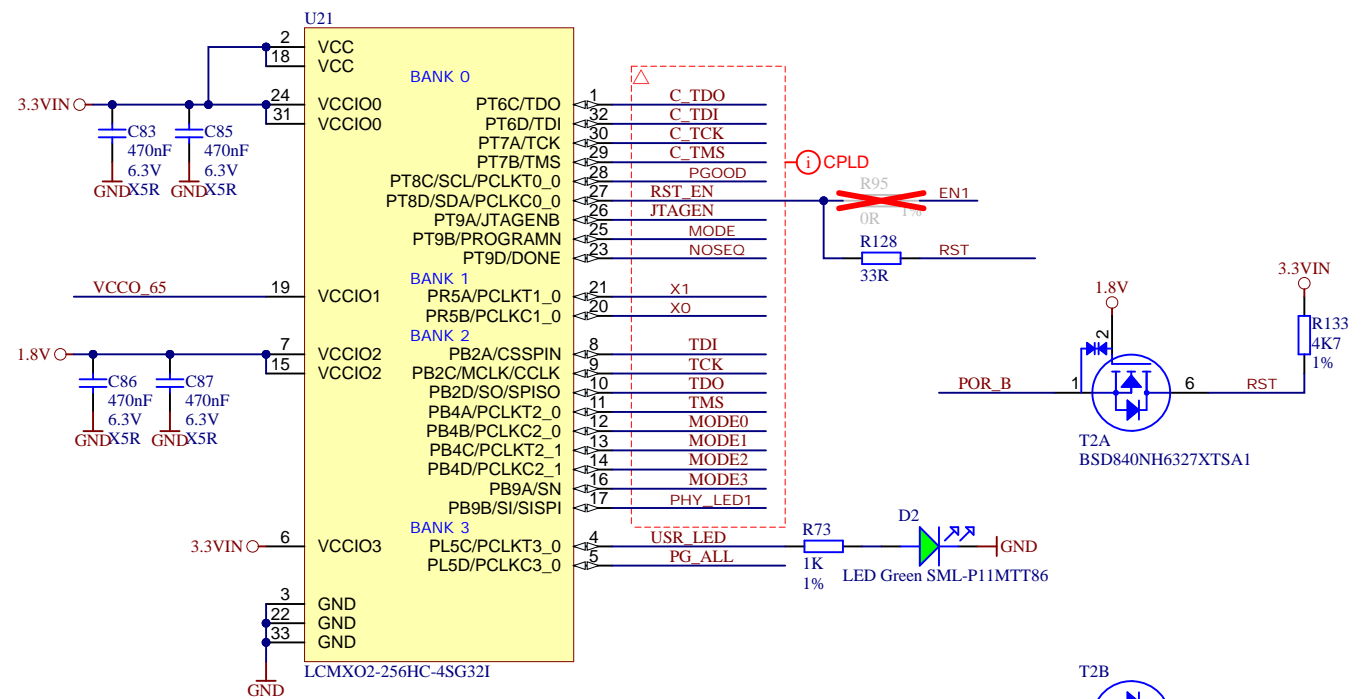
Power Rail	Direction	Range	Tolerance	Description	Note
VIN	IN	3.3 - 5V	+/-5%	Micromodule Power	-
3.3VIN	IN	3.3V	+/-5%	Micromodule Power	-
VCCO64	IN	1.2 - 1.8V	+/-3%	HP IO Bank64	-
VCCO65	IN	1.2 - 1.8V	+/-3%	HP IO Bank65	-
VCCO66	IN	1.2 - 1.8V	+/-3%	HP IO Bank66	-
PSBATT	IN	1.2 - 1.5V	+/-3%	PS battery-backed RAM and battery RTC	-
1.8V	OUT	1.8V	+/-3%	Power for Carrier	-
3.3V	OUT	3.3V	+/-3%	Power for Carrier	-



Title: TE0820 - Power Diagram		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 30.06.2022	Copyright: Trenz Electronic GmbH	Page 4 of 24
Filename: Power_Diagram.SchDoc		

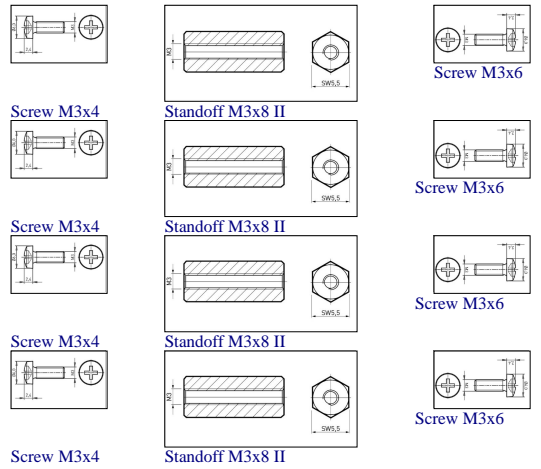
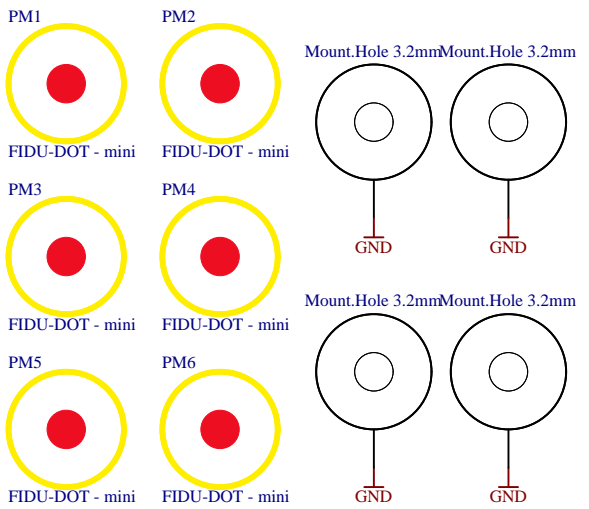
U_USB-PHY	USB-PHY.SchDoc
U_ETH-PHY	ETH-PHY.SchDoc
U_B_HD	B_HD.SchDoc
U_B64	B64.SchDoc
U_B65	B65.SchDoc
U_B66	B66.SchDoc
U_CONFIG	CONFIG.SchDoc
U_B_MIO	B_MIO.SchDoc
U_B_PS_GT	B_PS_GT.SchDoc
U_CLK	CLK.SchDoc

U_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_POWER	POWER.SchDoc
U_POWER_1	POWER_1.SchDoc



Special notes:

Serial
Serialnumber 6,3 x 6,3mm



Assembly variant	4AE21MA
Created by	RM
Modified by	VT
Modified at	2022-05-31
SVN Revision	13497

Title: TE0820		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 5 of 24
Filename: TE0820.SchDoc		

A

A

B

B

C

C

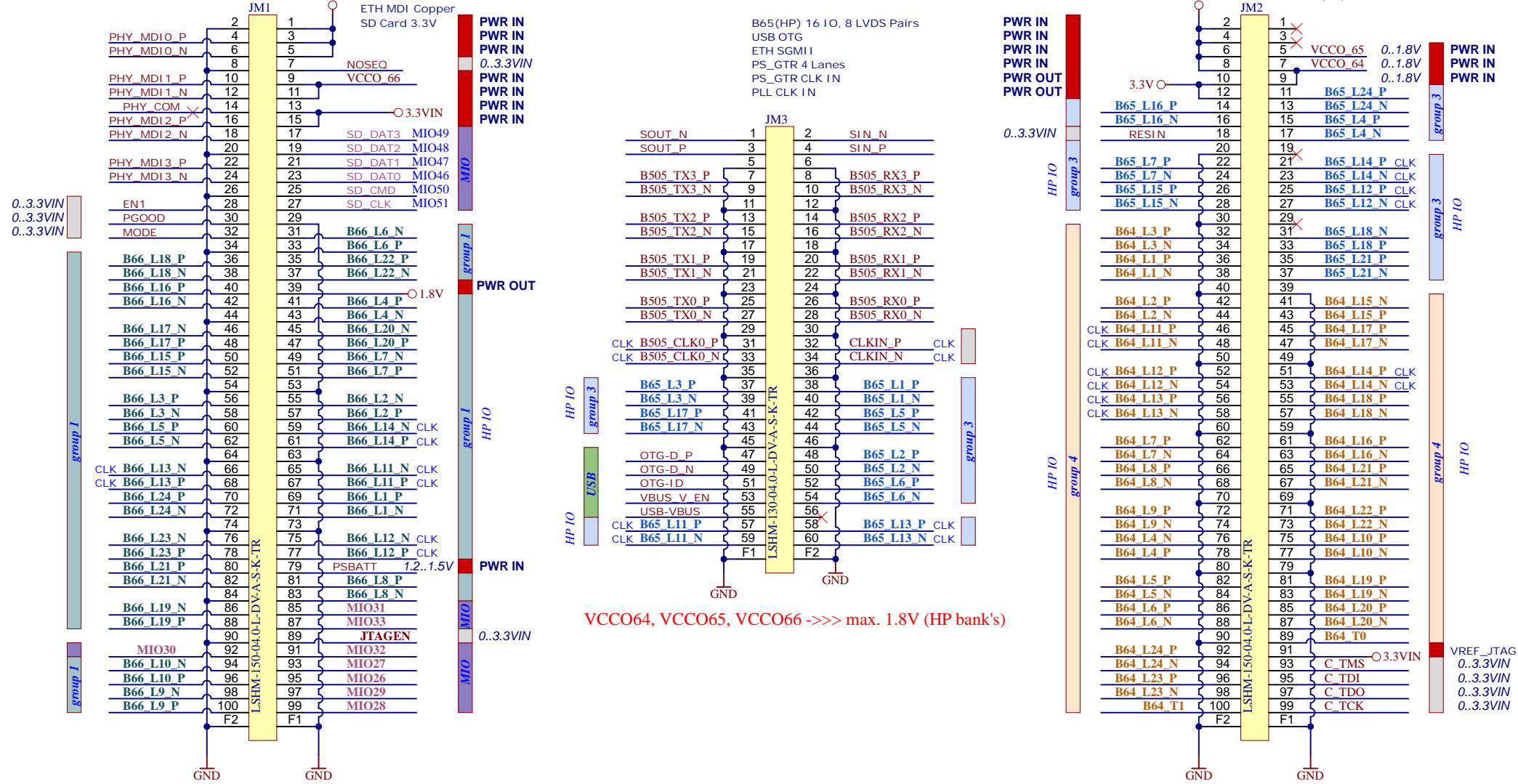
D

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



0..3.3VIN
 0..3.3VIN
 0..3.3VIN

group 1

group 1

group 1

HP IO
 group 3

HP IO
 USB

HP IO
 group 3

HP IO
 group 3

PWR IN
 PWR IN
 PWR IN
 PWR IN
 PWR OUT
 PWR OUT

0..3.3VIN

HP IO
 group 3

HP IO
 group 4

HP IO
 group 4

PWR IN
 PWR IN
 PWR IN

group 3

HP IO
 group 3

HP IO
 group 4

HP IO
 group 4

VREF_JTAG
 0..3.3VIN
 0..3.3VIN
 0..3.3VIN

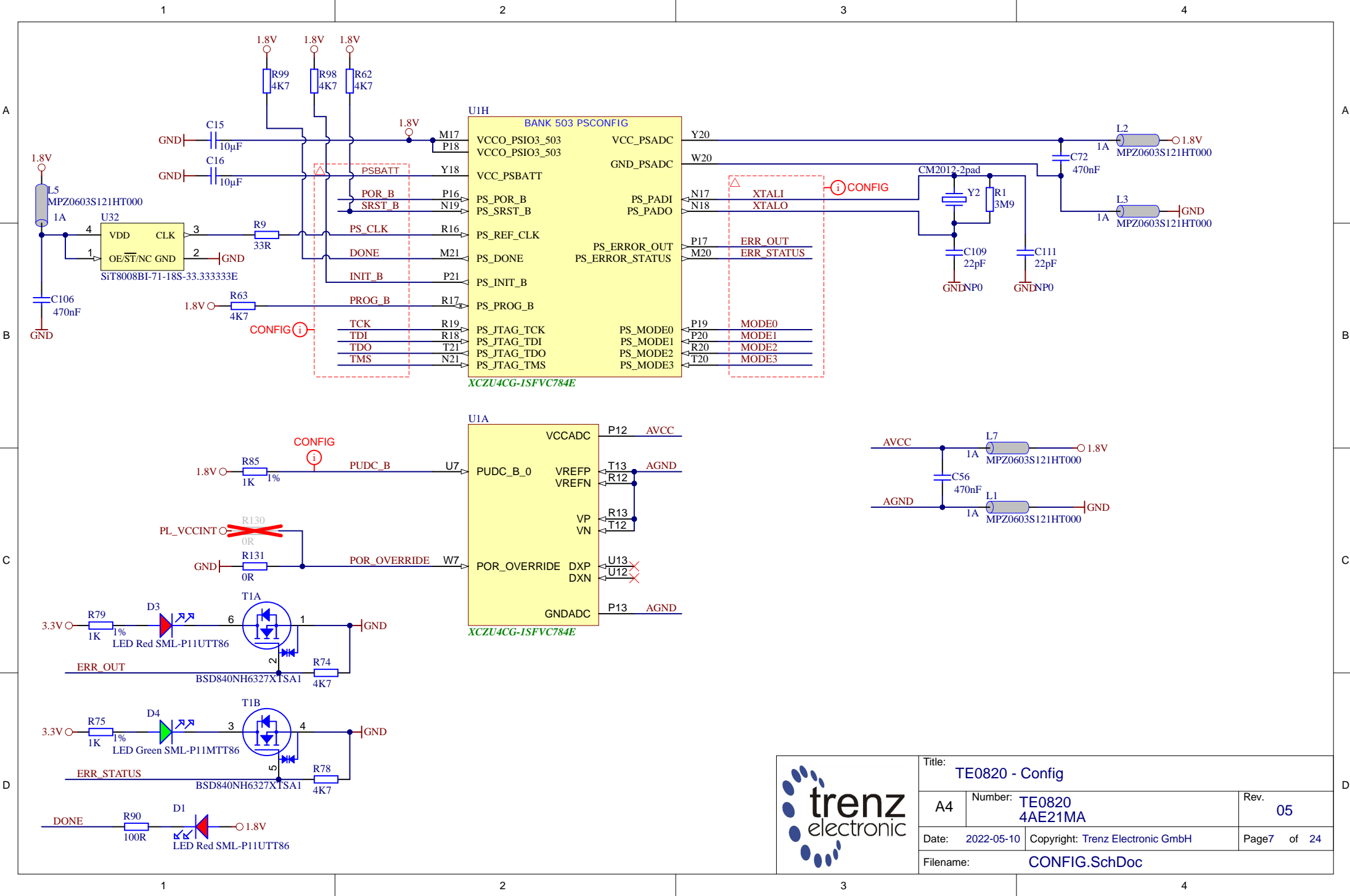
MIO[29..26] -> PJTAG1

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

- VCCO_64 0..1.8V
- VCCO_65 0..1.8V
- VCCO_66 0..1.8V
- MIO 0..3.3V
- group 1 0..VCCO_66
- group 3 0..VCCO_65
- group 4 0..VCCO_64



Title: TE0820 - B2B Connectors		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page6 of 24
Filename: B2B-Connectors.SchDoc		



Title: TE0820 - Config		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page7 of 24
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
AH13	IO_L3P_AD9P_43	IO_L9P_AD3P_43	AA11
AH12	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
AC12	IO_L6P_HDGC_AD6P_43	IO_L12P_AD0P_43	AB10
AD12	IO_L6N_HDGC_AD6N_43	IO_L12N_AD0N_43	AB9

UIB


XCZU4CG-1SFVC784E

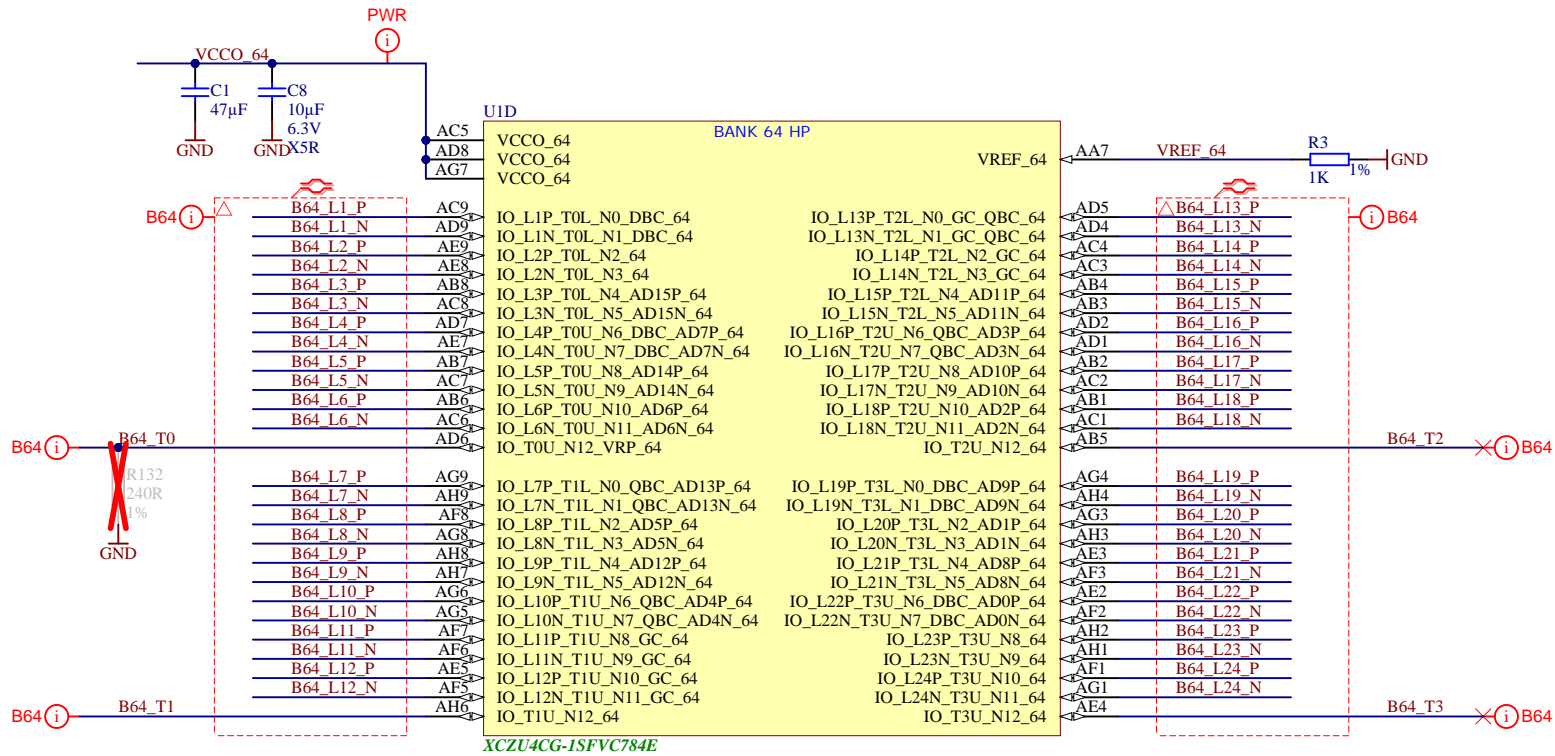
AA14	VCCO_44	BANK 44 HD (ZU2/3 BANK 24 HD)	
AD13	VCCO_44		
AE15	IO_L1P_AD15P_44	IO_L7P_HDGC_44	AA13
AE14	IO_L1N_AD15N_44	IO_L7N_HDGC_44	AB13
AG14	IO_L2P_AD14P_44	IO_L8P_HDGC_44	AB15
AH14	IO_L2N_AD14N_44	IO_L8N_HDGC_44	AB14
AG13	IO_L3P_AD13P_44	IO_L9P_AD11P_44	W14
AH13	IO_L3N_AD13N_44	IO_L9N_AD11N_44	W13
AE13	IO_L4P_AD12P_44	IO_L10P_AD10P_44	Y14
AF13	IO_L4N_AD12N_44	IO_L10N_AD10N_44	Y13
AD15	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)

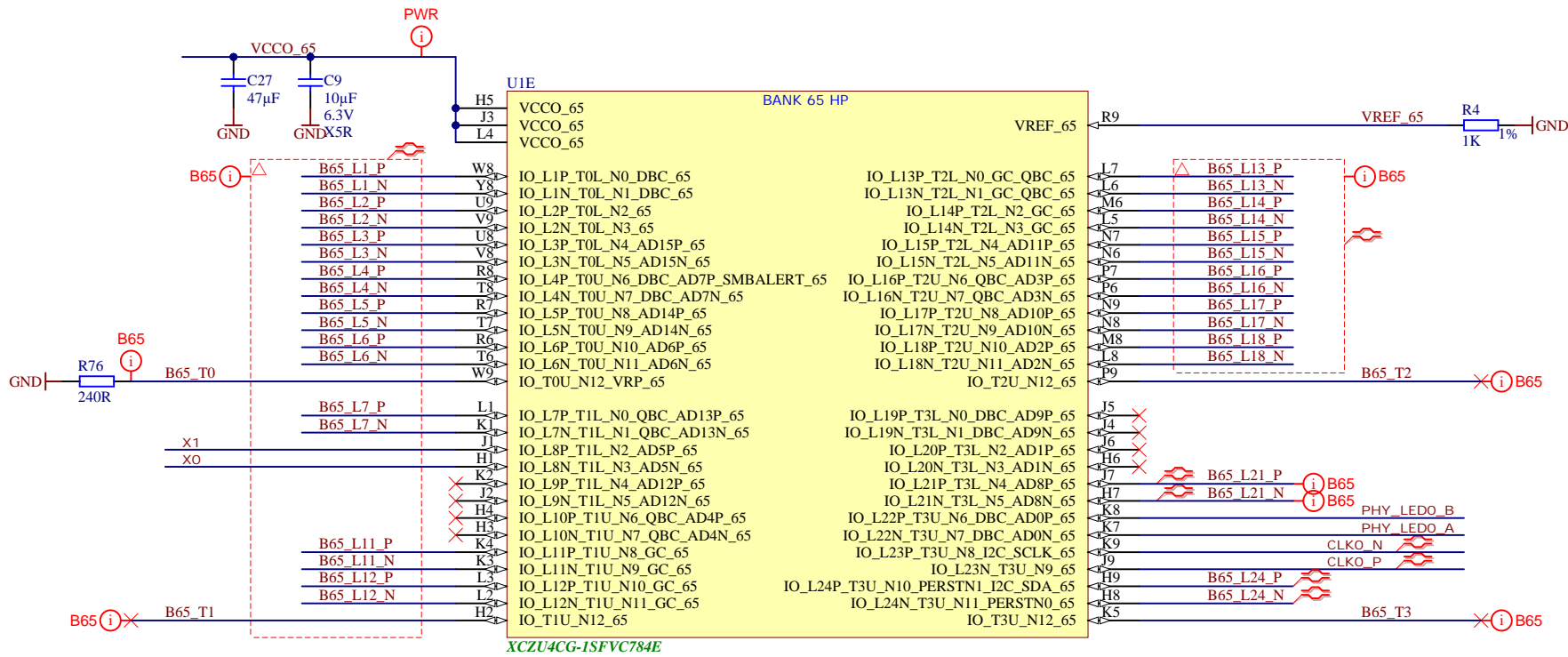
B12	VCCO_45		
E11	VCCO_45		
J11	IO_L1P_AD15P_45	IO_L7P_HDGC_45	E10
J10	IO_L1N_AD15N_45	IO_L7N_HDGC_45	D10
K13	IO_L2P_AD14P_45	IO_L8P_HDGC_45	E12
K12	IO_L2N_AD14N_45	IO_L8N_HDGC_45	D11
H11	IO_L3P_AD13P_45	IO_L9P_AD11P_45	C11
G10	IO_L3N_AD13N_45	IO_L9N_AD11N_45	B10
J12	IO_L4P_AD12P_45	IO_L10P_AD10P_45	B11
H12	IO_L4N_AD12N_45	IO_L10N_AD10N_45	A10
G11	IO_L5P_HDGC_45	IO_L11P_AD9P_45	A12
F10	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

XCZU4CG-1SFVC784E

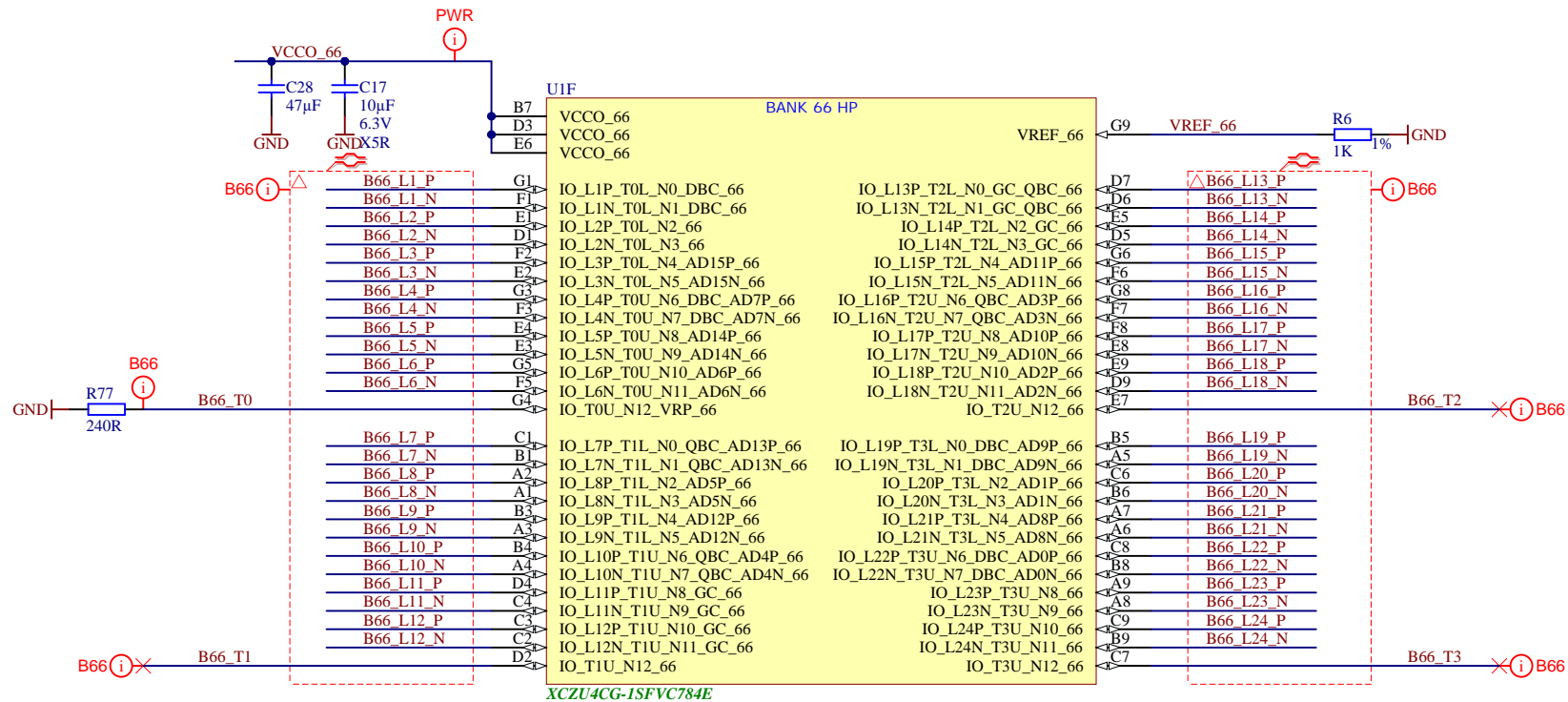

	Title: TE0820 - HD Banks		
	A4	Number: TE0820 4AE21MA	Rev. 05
	Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page8 of 24
	Filename: B_HD.SchDoc		



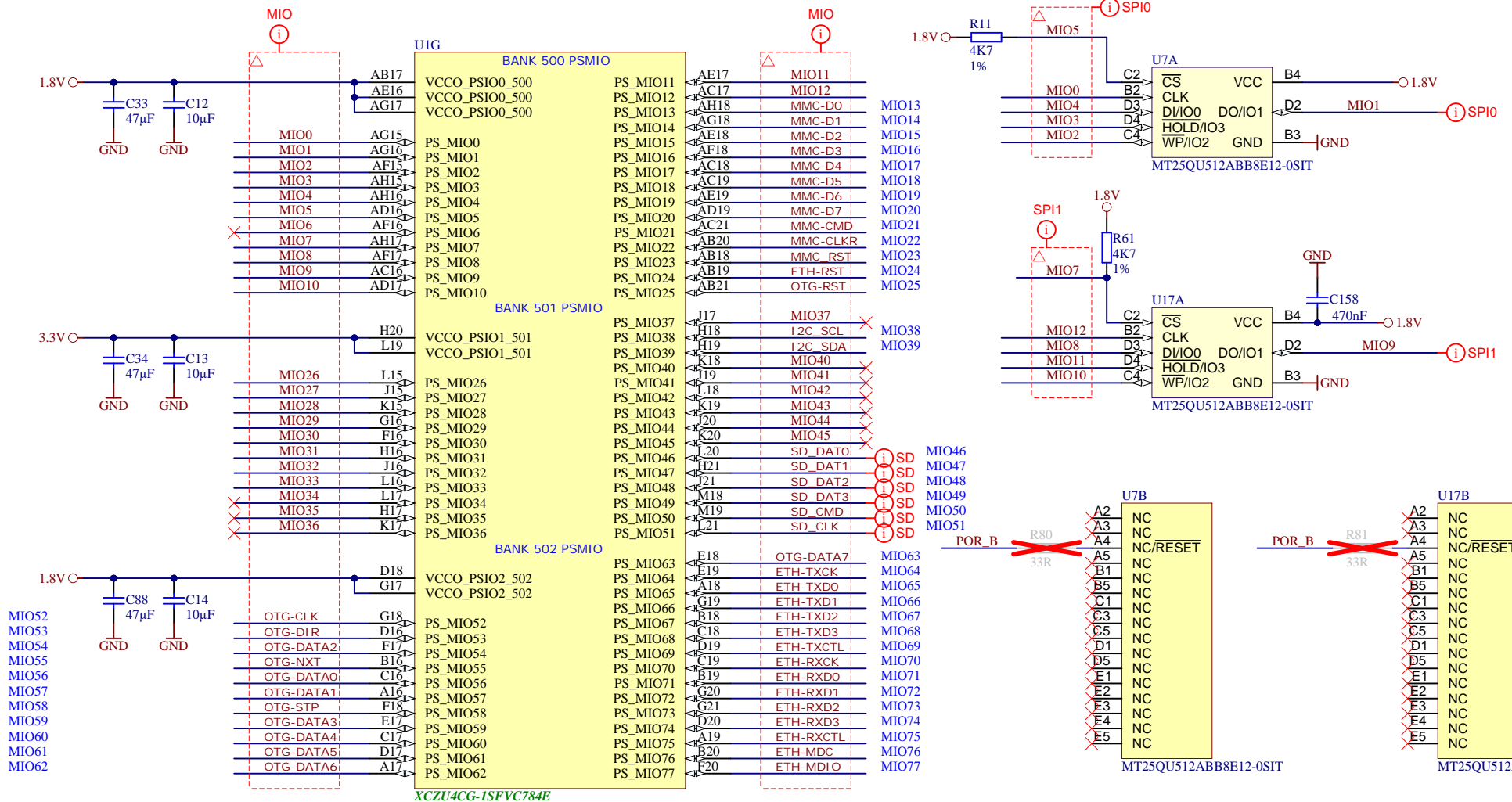
Title: TE0820 - B64		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 9 of 24
Filename: B64.SchDoc		



Title: TE0820 - B65		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	
Page 10 of 24		
Filename: B65.SchDoc		

Title: TE0820 - B66		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 11 of 24
Filename: B66.SchDoc		



		Title: TE0820 - MIO Banks	
		A4	Number: TE0820 4AE21MA
Date: 2022-05-10		Copyright: Trenz Electronic GmbH	
Filename: B_MIO.SchDoc		Page 12 of 24	

A

B

C

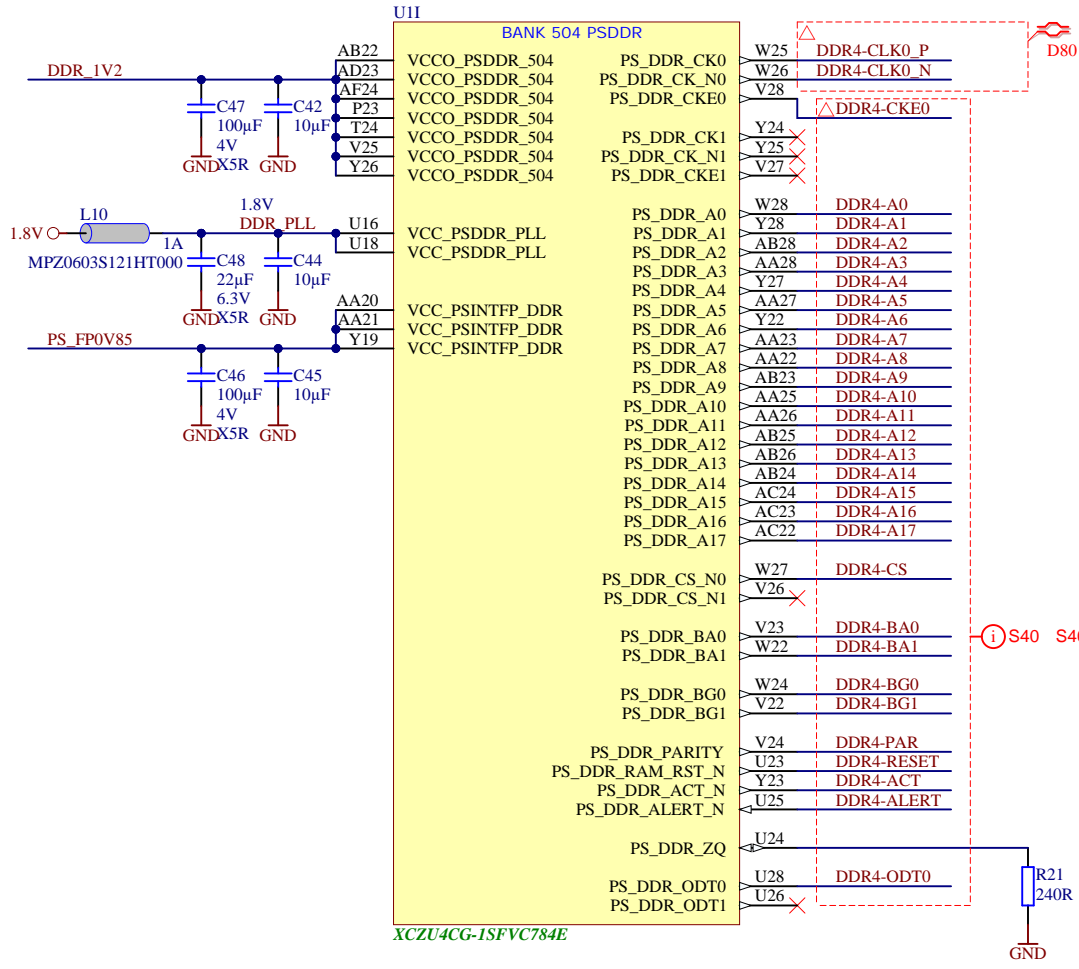
D

A

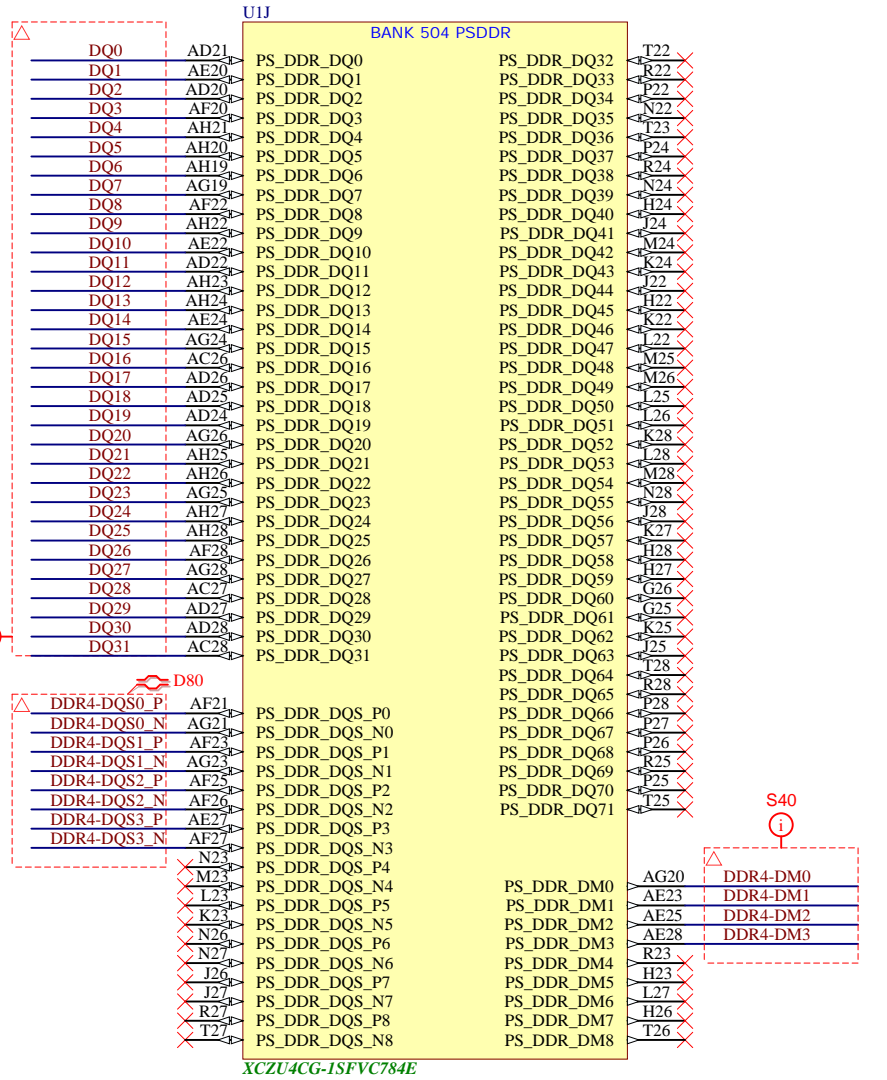
B

C

D



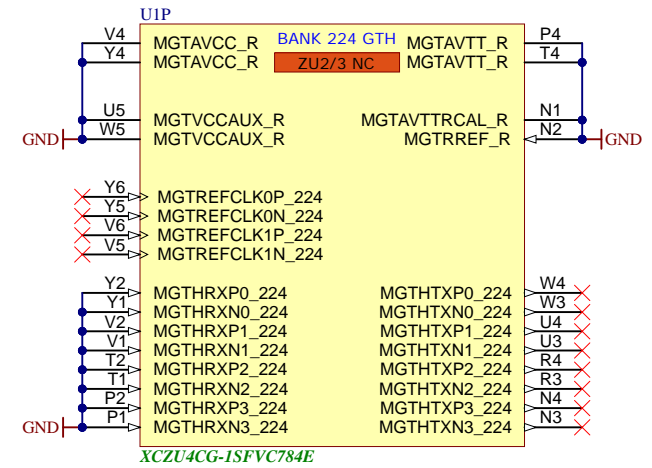
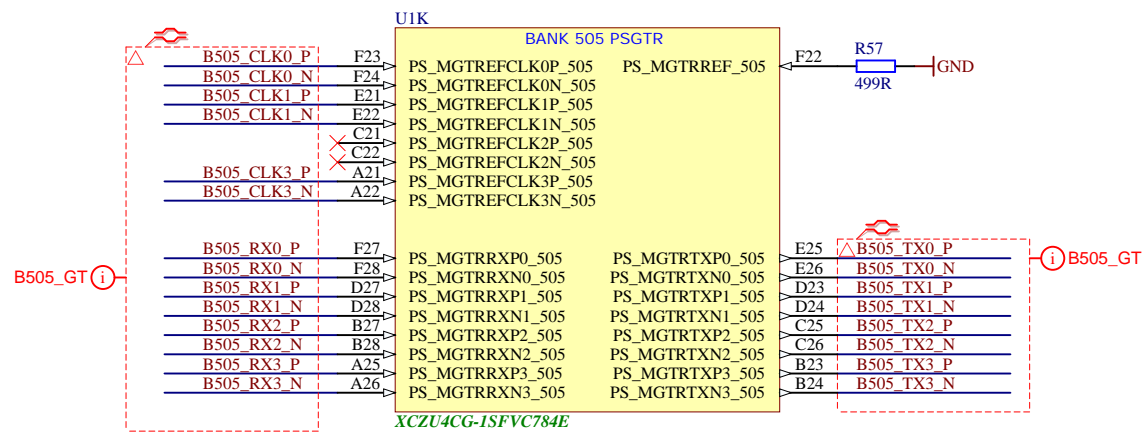
XCZU4CG-1SFVC784E



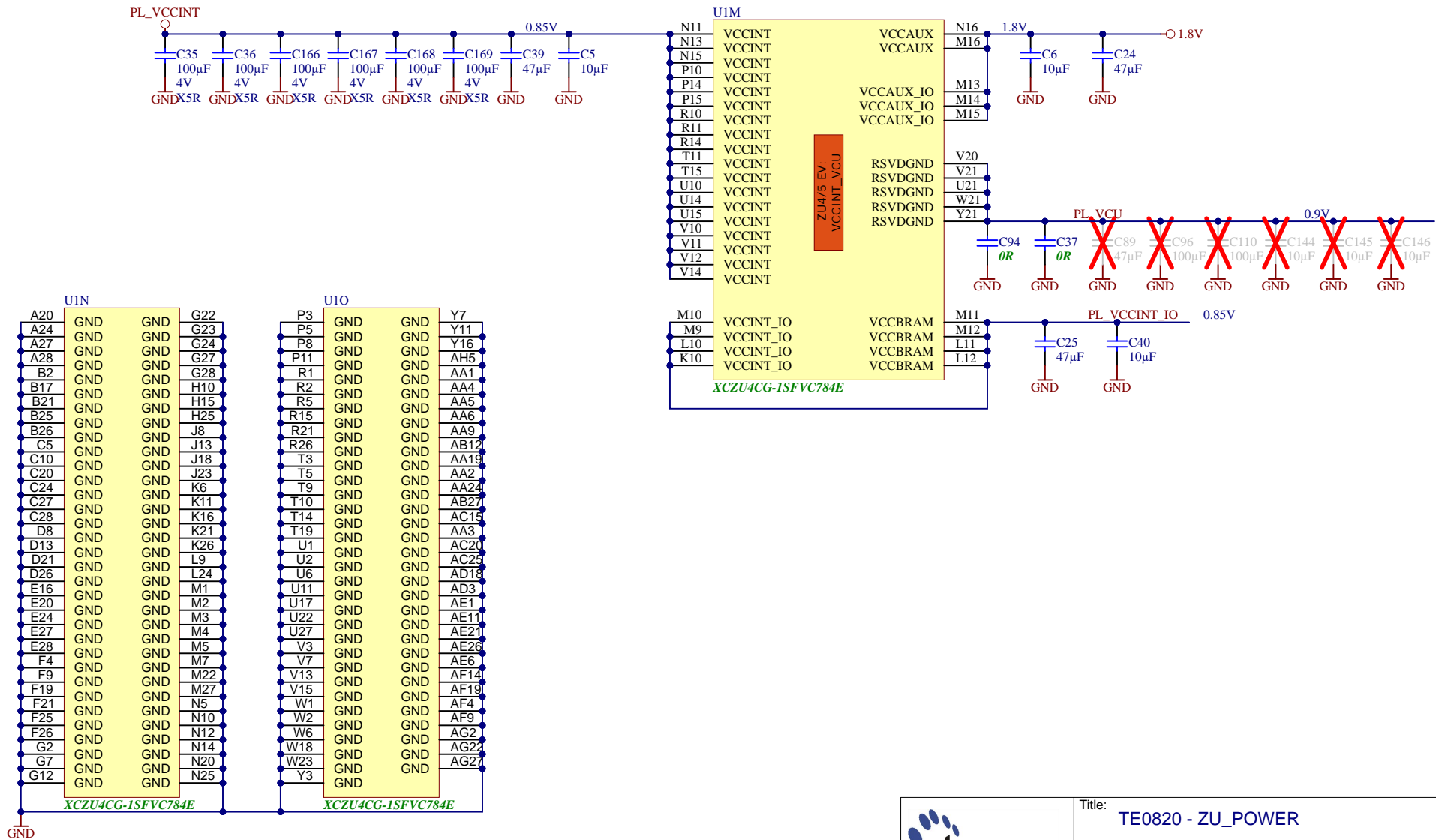
XCZU4CG-1SFVC784E



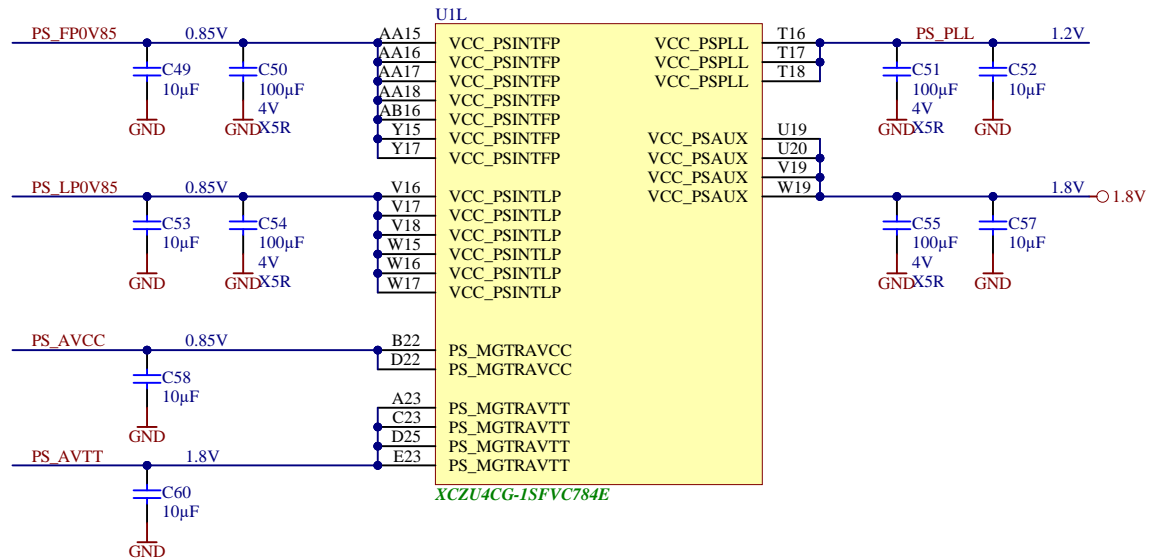
Title: TE0820 - PS_DDR		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page13 of 24
Filename: PS_DDR.SchDoc		




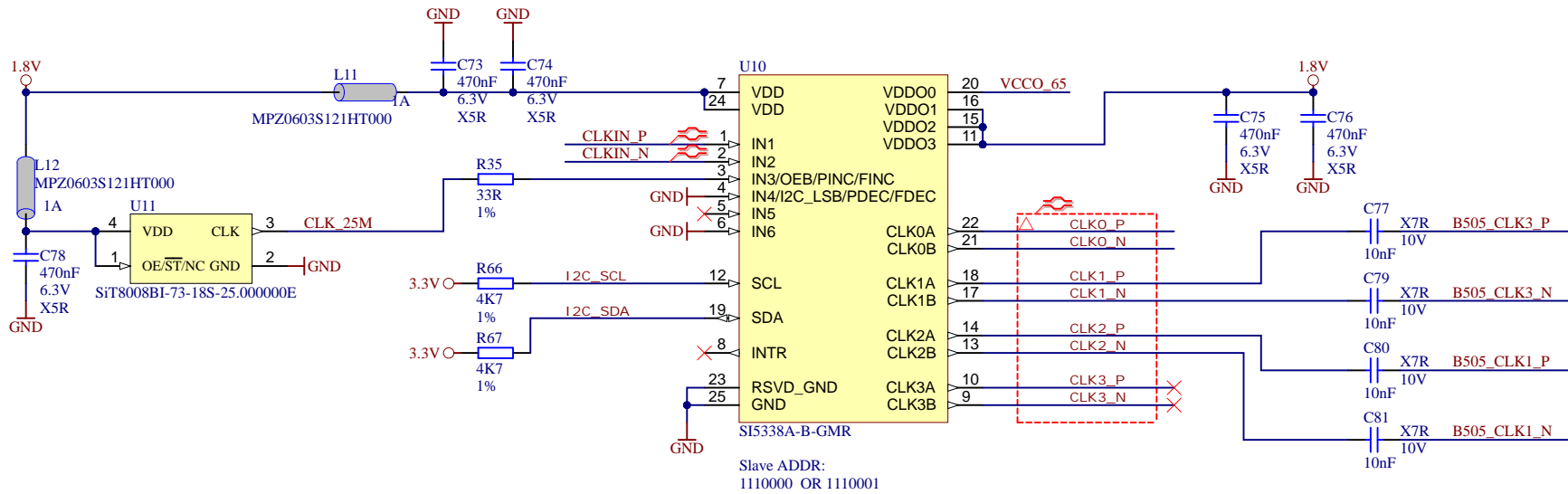
	Title: TE0820 - PS_GT	
	A4	Number: TE0820 4AE21MA
	Date: 2022-05-10	Copyright: Trenz Electronic GmbH
	Rev. 05	Page 14 of 24
Filename: B_PS_GT.SchDoc		




Title: TE0820 - ZU_POWER		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 15 of 24
Filename: ZU_POWER.SchDoc		



		Title: TE0820 - ZU_PS_POWER	
		A4	Number: TE0820 4AE21MA
Date: 2022-05-10		Copyright: Trenz Electronic GmbH	
Filename: ZU_PS_POWER.SchDoc		Page 16 of 24	



	Title: TE0820 - CLK		
	A4	Number: TE0820 4AE21MA	Rev. 05
	Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 17 of 24
	Filename: CLK.SchDoc		

A

B

C

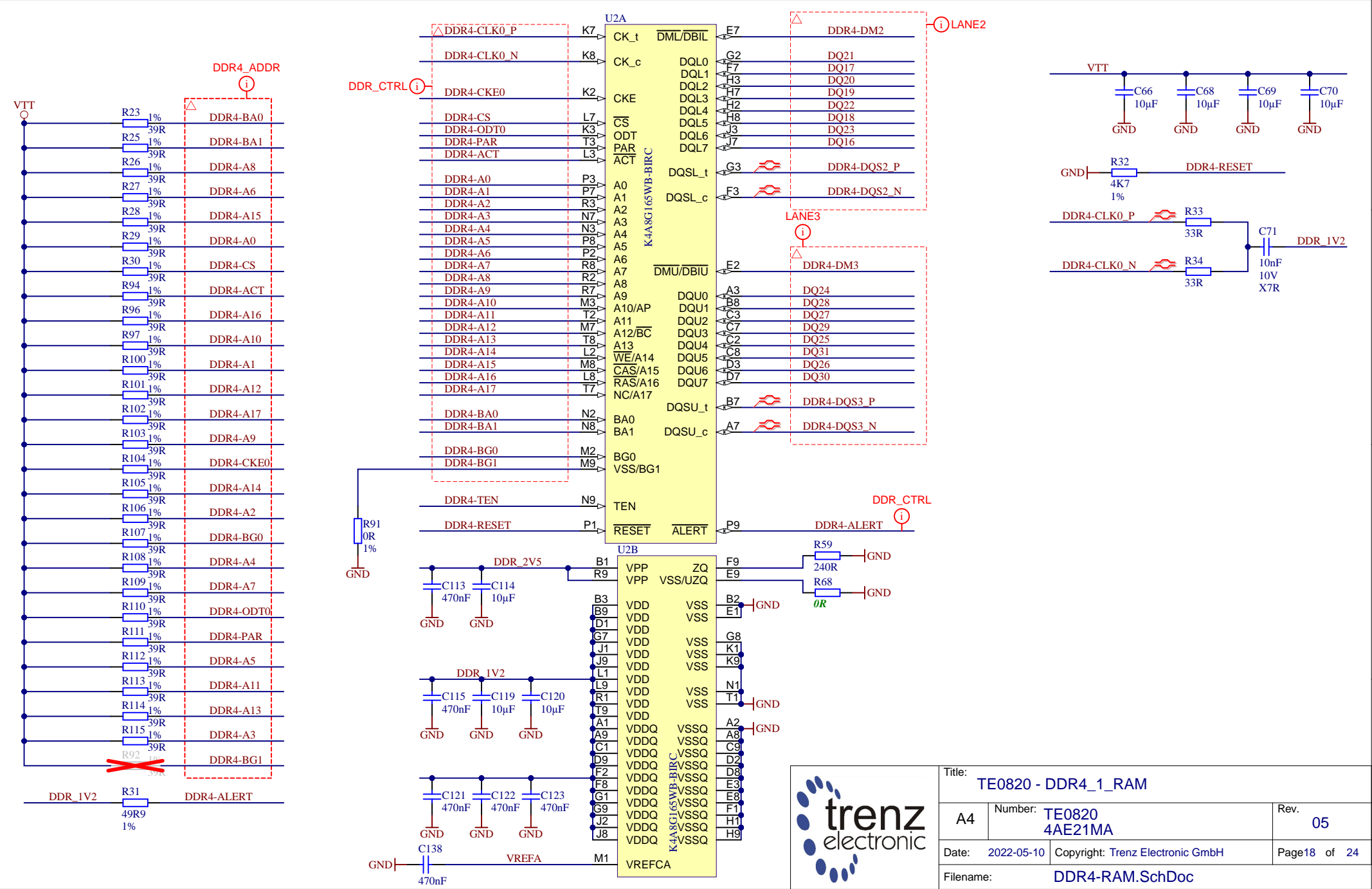
D

A

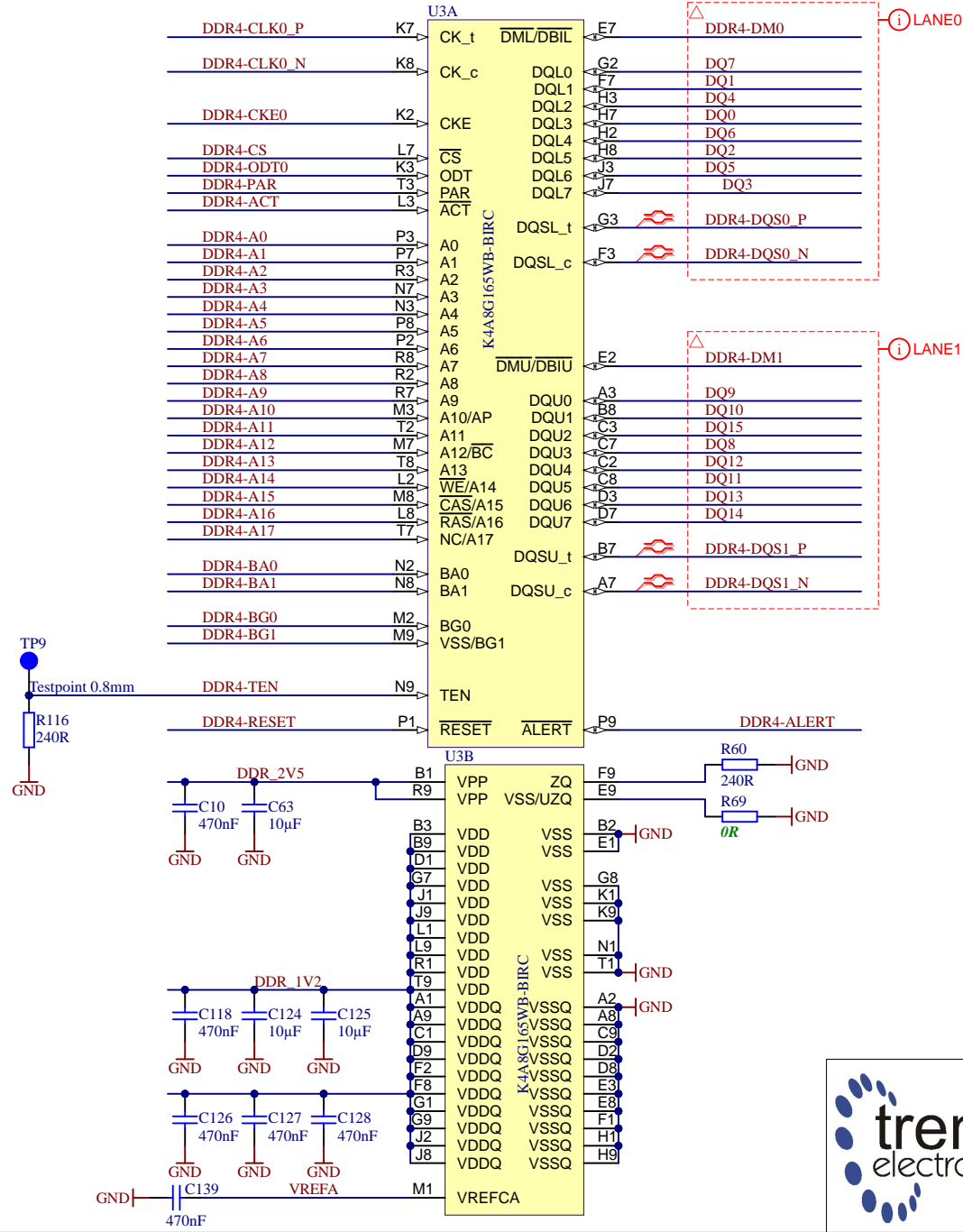
B

C

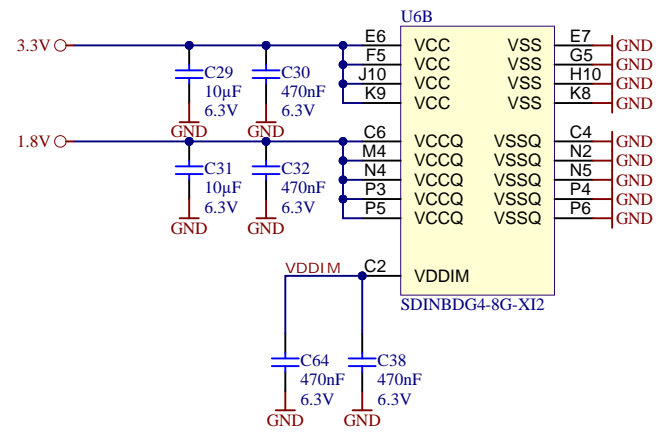
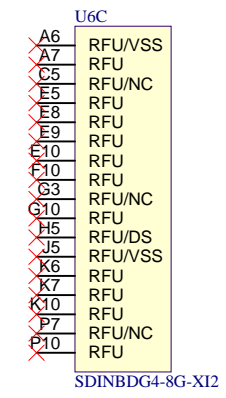
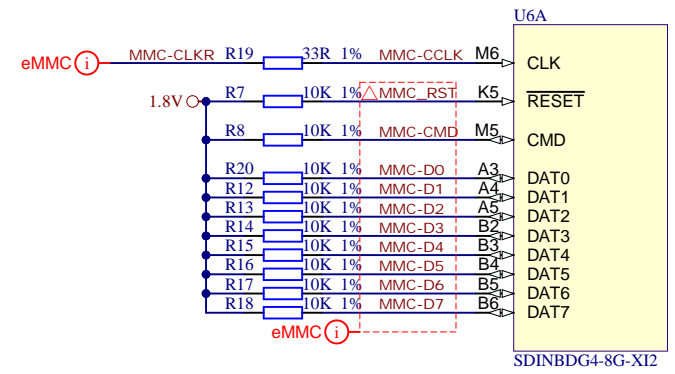
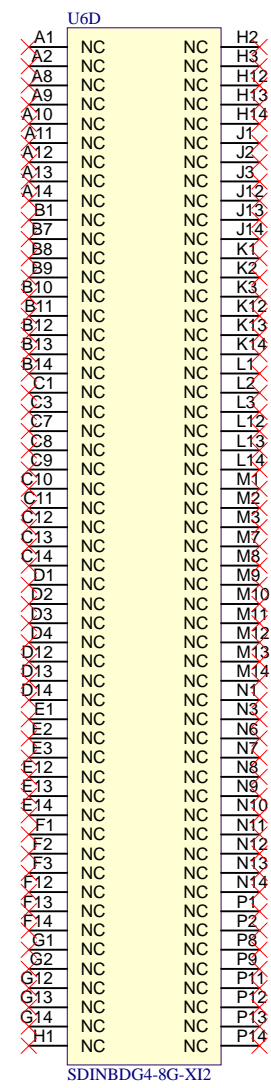
D



Title: TE0820 - DDR4_1_RAM		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 18 of 24
Filename: DDR4-RAM.SchDoc		



Title: TE0820 - DDR4_2_RAM		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 19 of 24
Filename: DDR4-RAM_2.SchDoc		



Title: TE0820 - eMMC		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page20 of 24
Filename: eMMC.SchDoc		

1

2

3

4

A

A

B

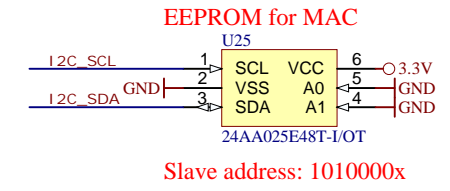
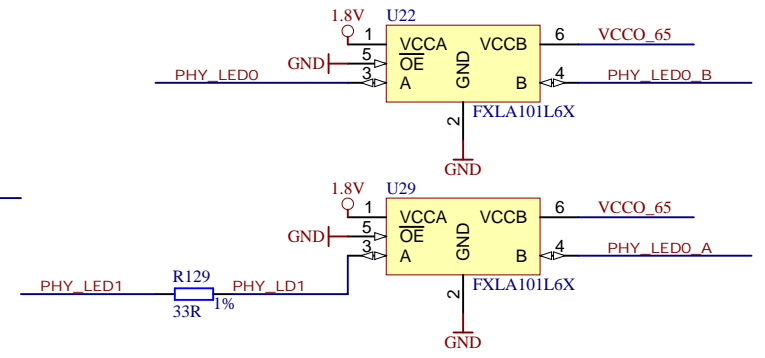
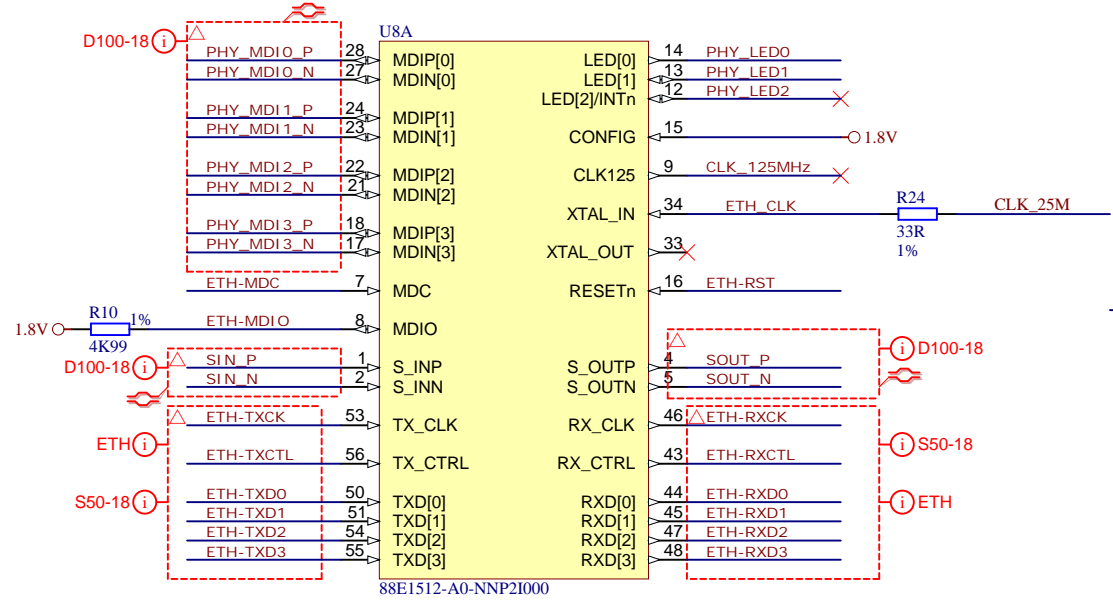
B

C

C

D

D



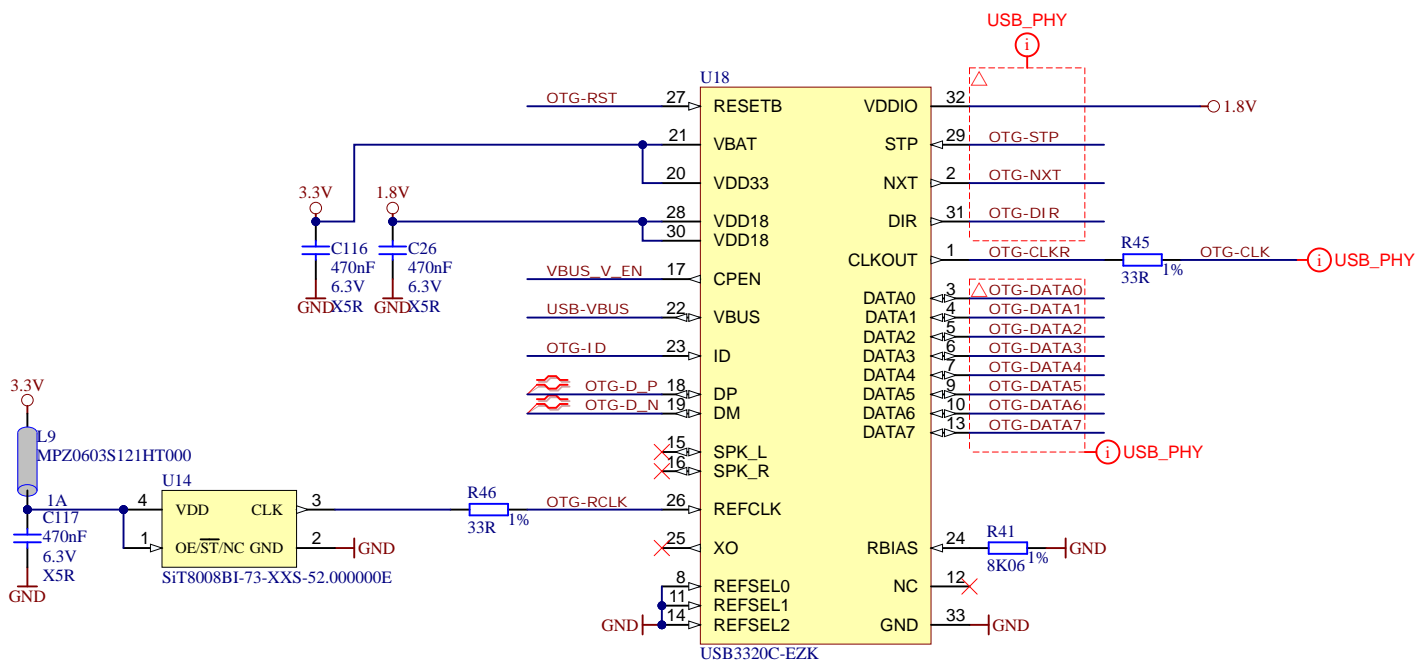
Title: TE0820 - Eth_PHY		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 21 of 24
Filename: ETH-PHY.SchDoc		


1

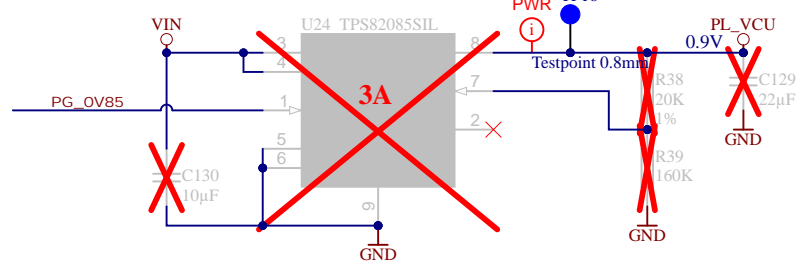
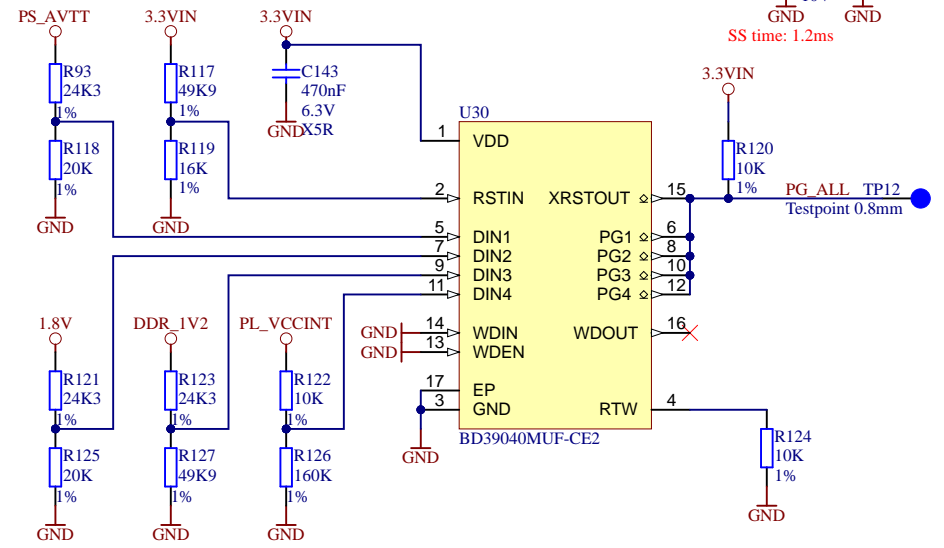
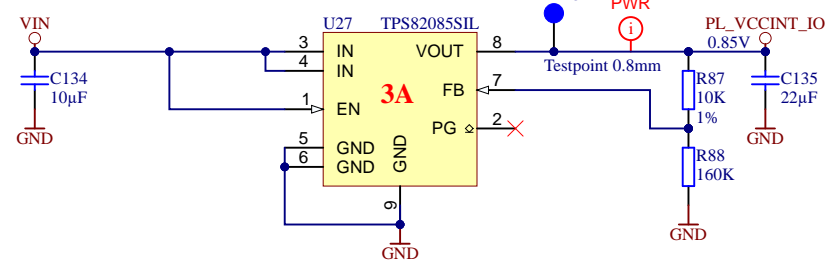
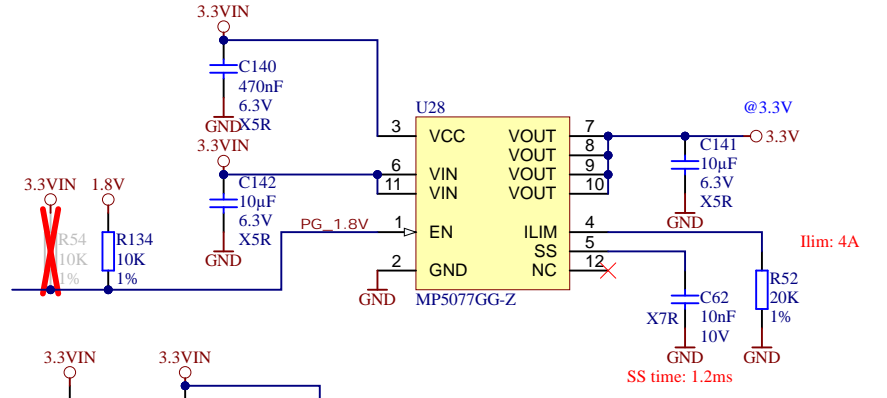
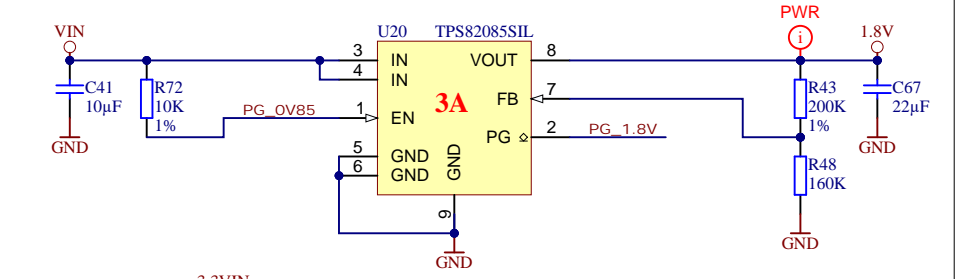
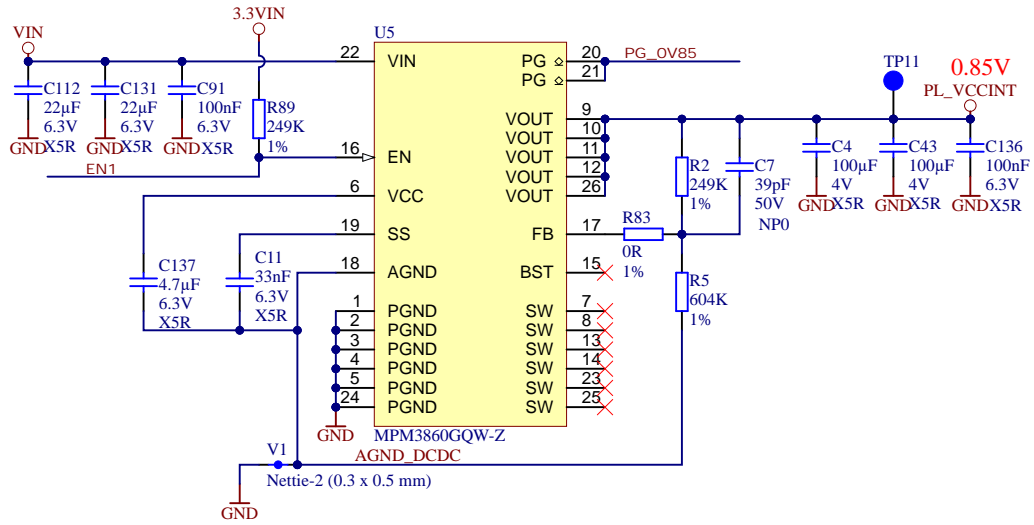
2

3

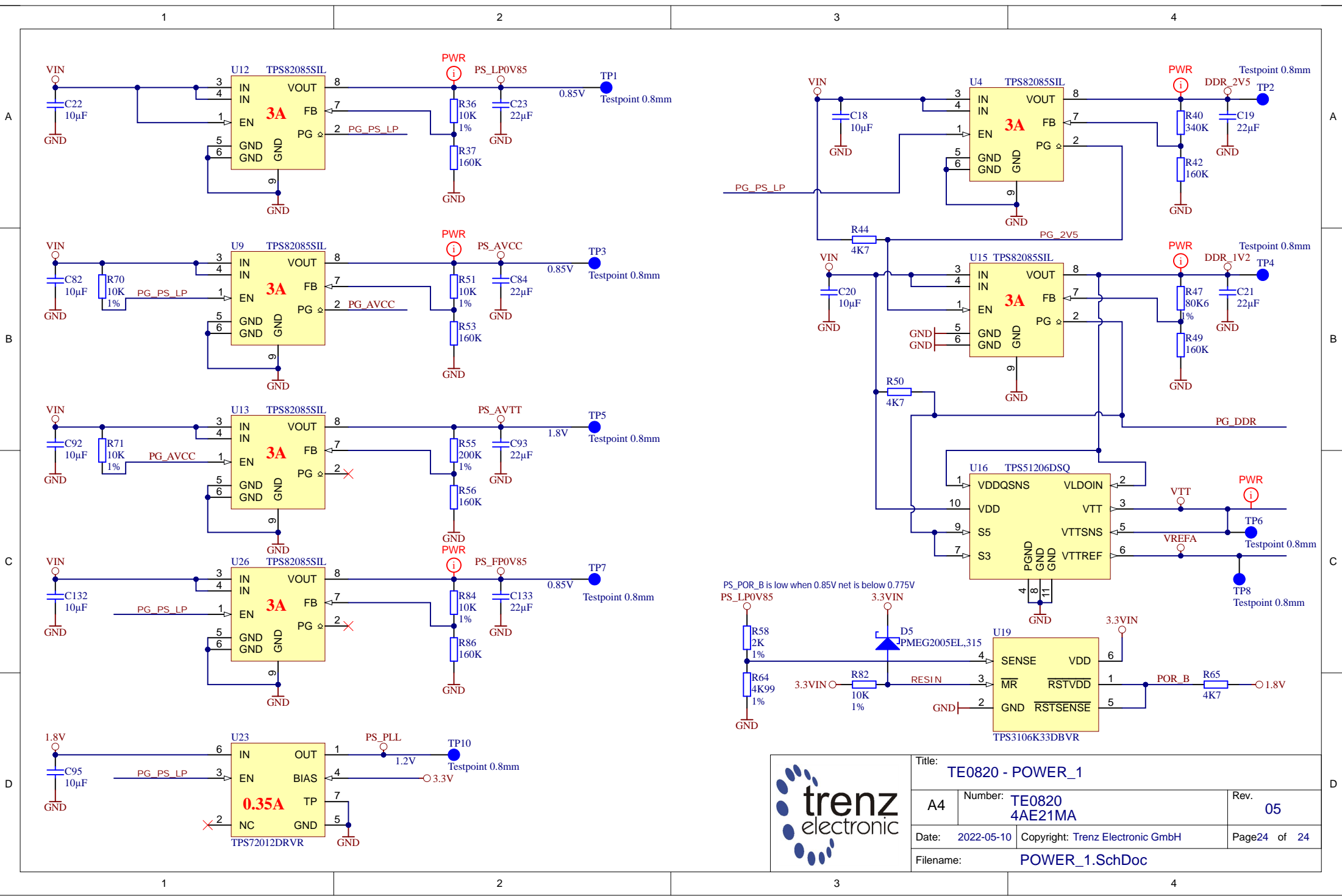
4



			Title: TE0820 - USB_PHY	
			A4	Number: TE0820 4AE21MA
Date: 2022-05-10		Copyright: Trenz Electronic GmbH		Page 22 of 24
Filename: USB-PHY.SchDoc				



Title: TE0820 - POWER		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 23 of 24
Filename: POWER.SchDoc		



Title: TE0820 - POWER_1		
A4	Number: TE0820 4AE21MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page24 of 24
Filename: POWER_1.SchDoc		