

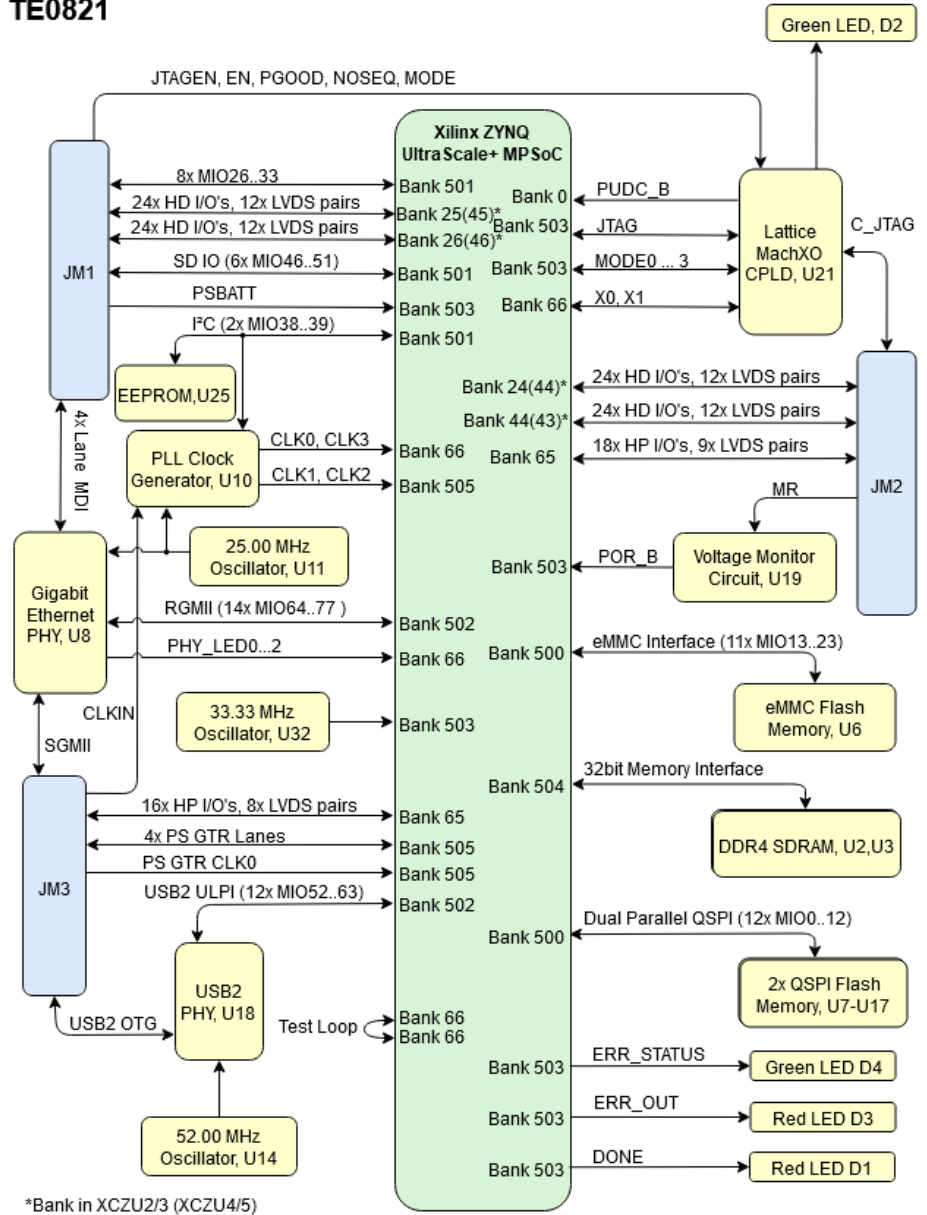
Regarding the usage of our schematics and alike documentation for Trenz module TE0821.

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. TE0821 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: Module TE0821		
	A4	Number: TE0821 3BE21MA	Rev. 01
	Date: 14.08.2020	Copyright: Trenz Electronic GmbH / TT	Page 1 of 24
	Filename: Legal Notices Modules.SchDoc		

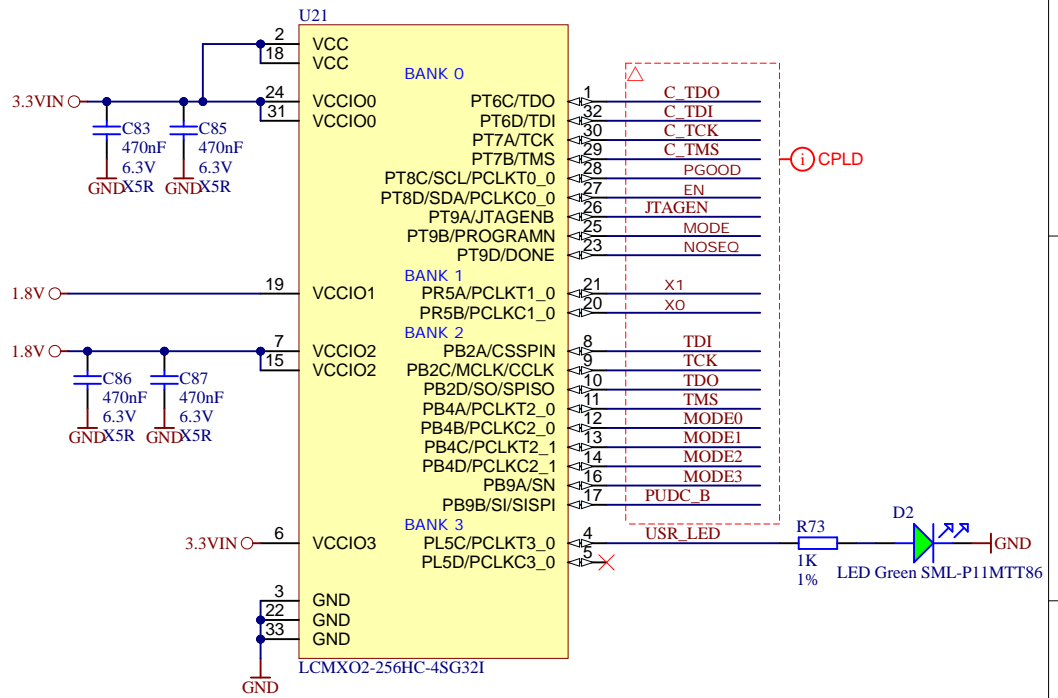
TE0821



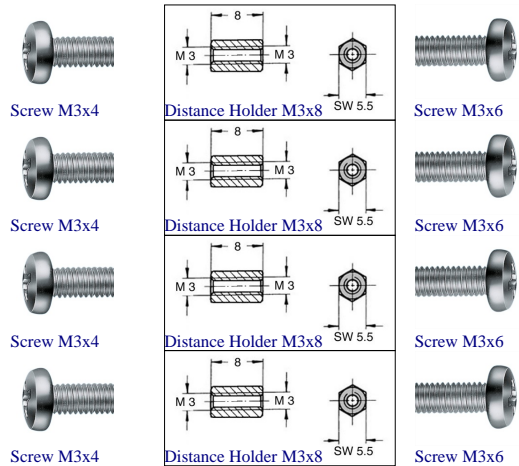
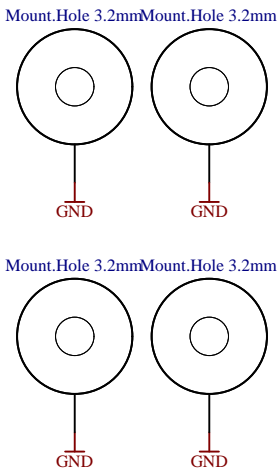
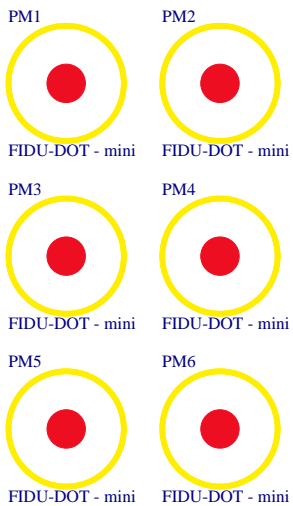
	Title: Module TE0821 - System Overview		
	A4	Number: TE0821 3BE21MA	Rev. 01
	Date: 18.01.2022	Copyright: 2015 Trenz Electronic GmbH	Page 2 of 24
	Filename: TE0821-Overview.SchDoc		

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_Overview TE0821-Overview.SchDoc
U_LN Legal Notices Modules.SchDoc

U_B2B-Connectors B2B-Connectors.SchDoc
U_B2B-Connectors_2 B2B-Connectors_2.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_Revision_changes Revision Changes.SchDoc



Serial
Serial
Serialnumber 6,3 x 6.3mm

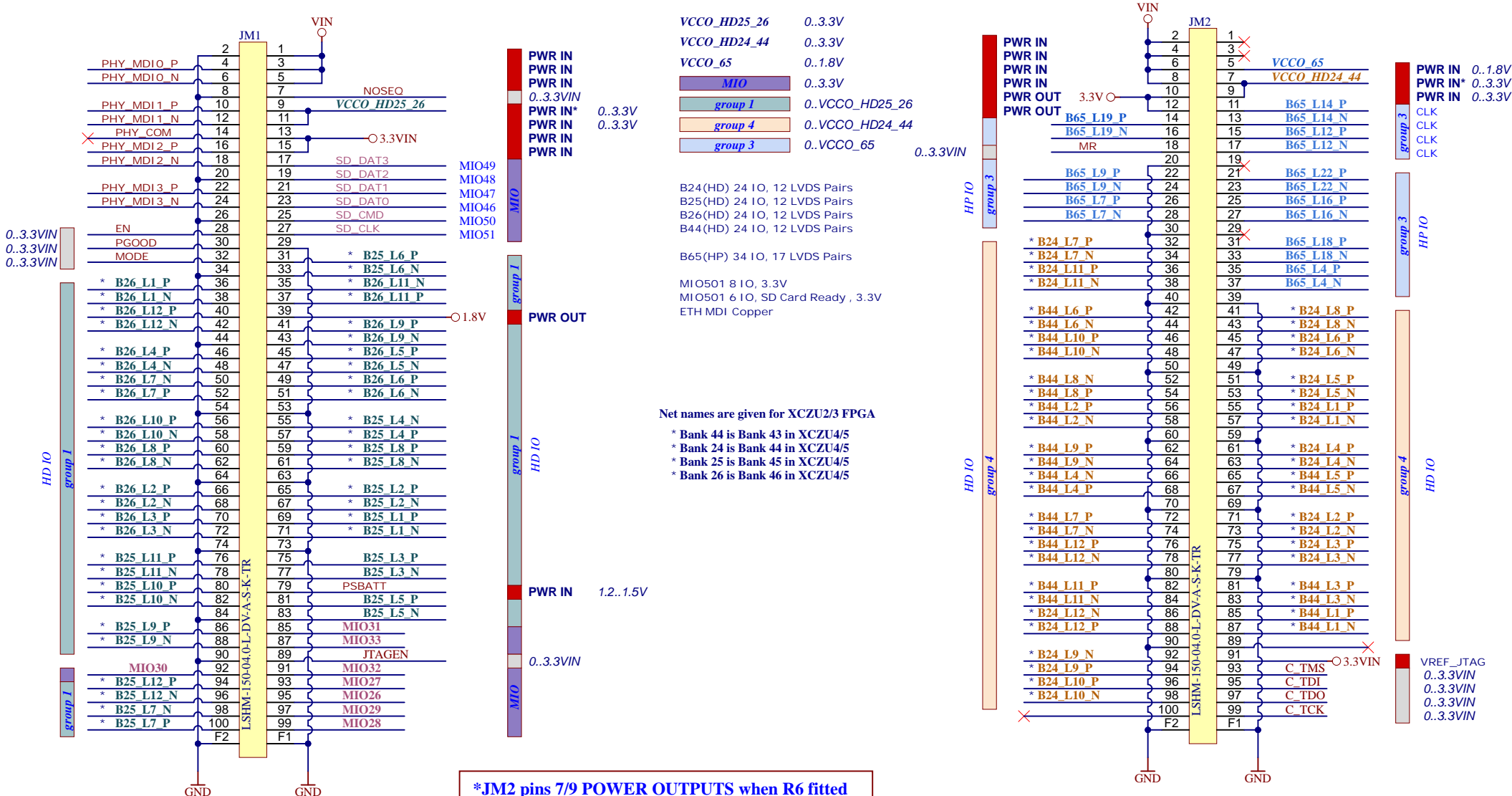


Special notes:

Component RC0201FR-0710KL removed



Title: Module TE0821		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: 2015 Trenz Electronic GmbH	Page 3 of 24
Filename: TE0821.SchDoc		



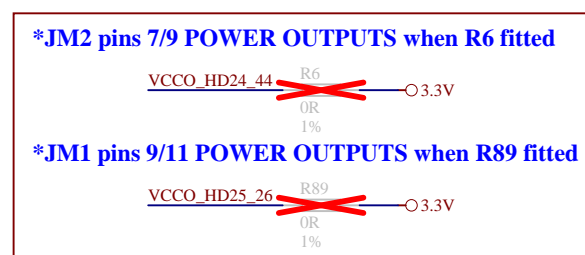
VCCO_HD25_26	0..3.3V
VCCO_HD24_44	0..3.3V
VCCO_65	0..1.8V
MIO	0..3.3V
group 1	0..VCCO_HD25_26
group 4	0..VCCO_HD24_44
group 3	0..VCCO_65

B24(HD) 24 IO, 12 LVDS Pairs
 B25(HD) 24 IO, 12 LVDS Pairs
 B26(HD) 24 IO, 12 LVDS Pairs
 B44(HD) 24 IO, 12 LVDS Pairs
 B65(HP) 34 IO, 17 LVDS Pairs

MIO051 8 IO, 3.3V
 MIO051 6 IO, SD Card Ready, 3.3V
 ETH MDI Copper

Net names are given for XCZU2/3 FPGA

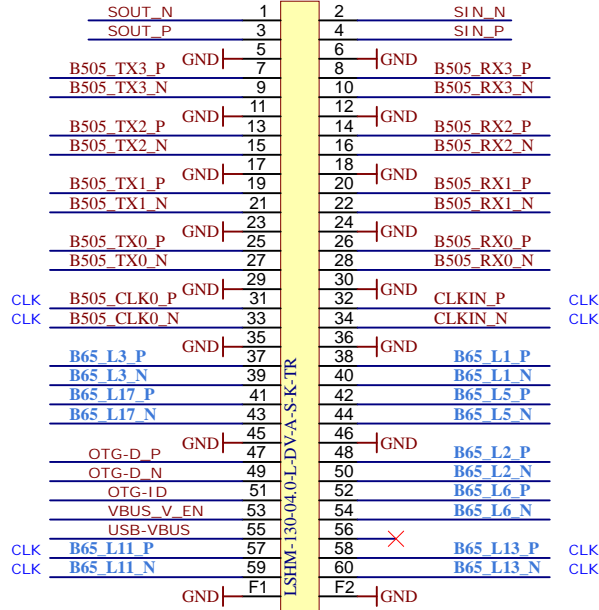
- * Bank 44 is Bank 43 in XCZU4/5
- * Bank 24 is Bank 44 in XCZU4/5
- * Bank 25 is Bank 45 in XCZU4/5
- * Bank 26 is Bank 46 in XCZU4/5



Title: Module TE0821 - B2B Connectors		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 04.07.2019	Copyright: 2015 Trenz Electronic GmbH	Page 4 of 24
Filename: B2B-Connectors.SchDoc		

USB OTG
 ETH SGMII
 PS_GTR 4 Lanes
 PS_GTR CLK IN
 PLL CLK IN

JM3



HP IO
 group 3
 USB
 HP IO

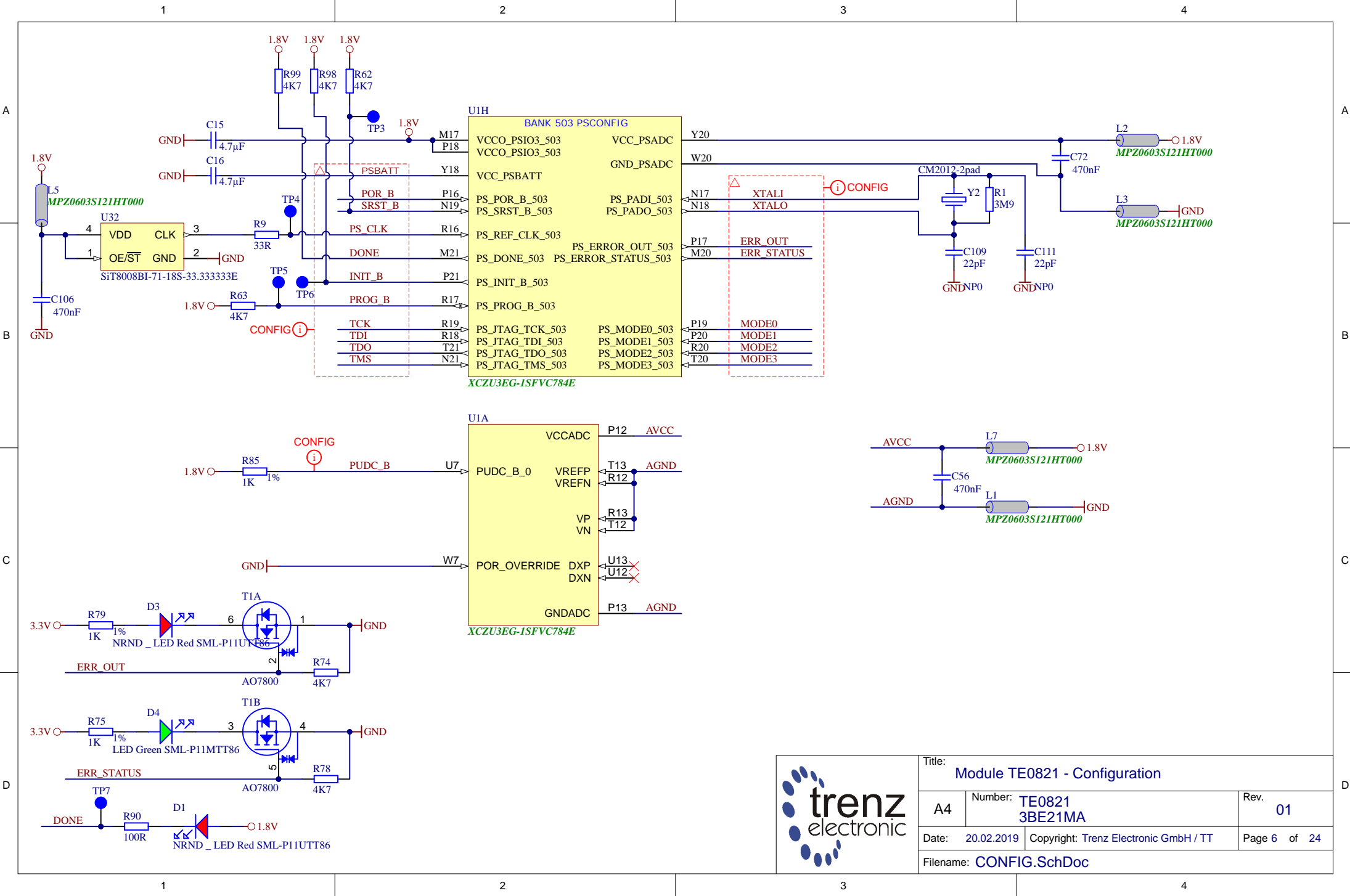
group 3
 group 3
 group 3

X

X

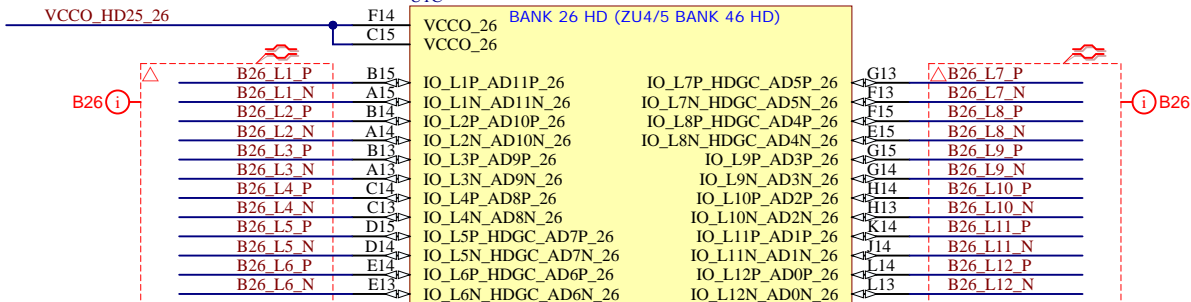


Title: Module TE0821 - B2B Connectors		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: 2015 Trenz Electronic GmbH	Page 5 of 24
Filename: B2B-Connectors_2.SchDoc		

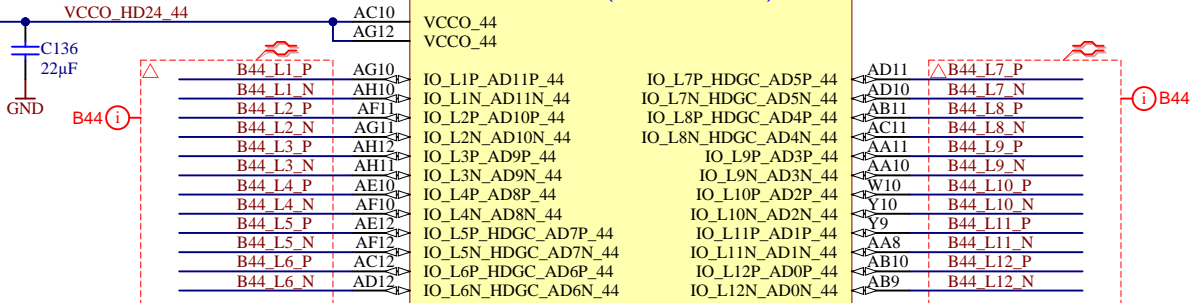


Title: Module TE0821 - Configuration		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 6 of 24
Filename: CONFIG.SchDoc		

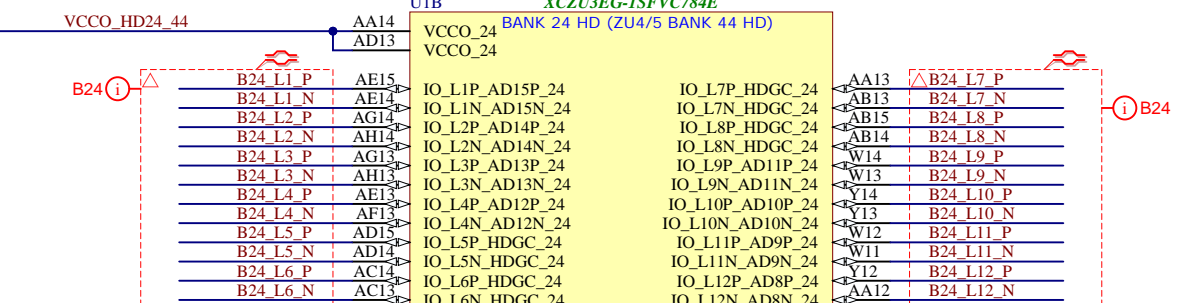
UIC



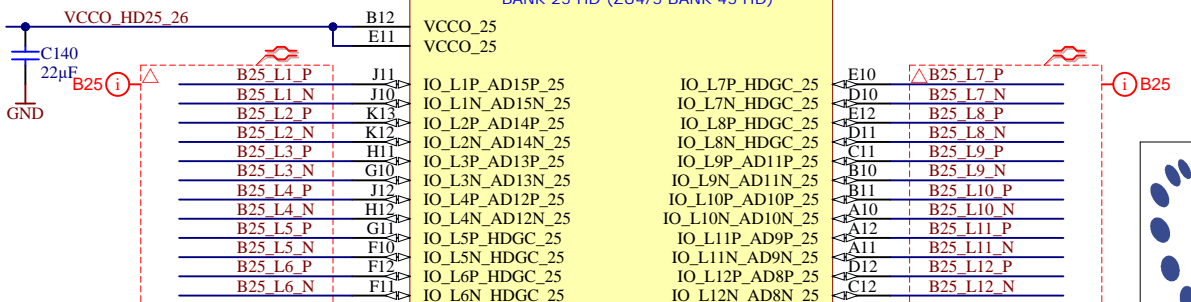
BANK 44 HD (ZU4/5 BANK 43 HD)



UIB XCZU3EG-1SFVC784E



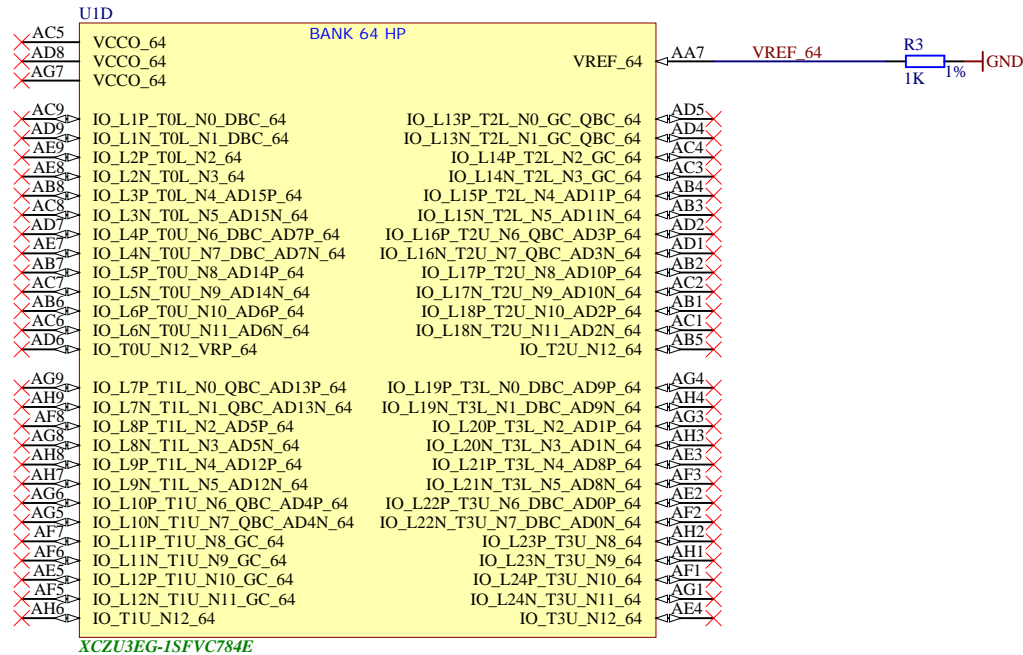

BANK 25 HD (ZU4/5 BANK 45 HD)



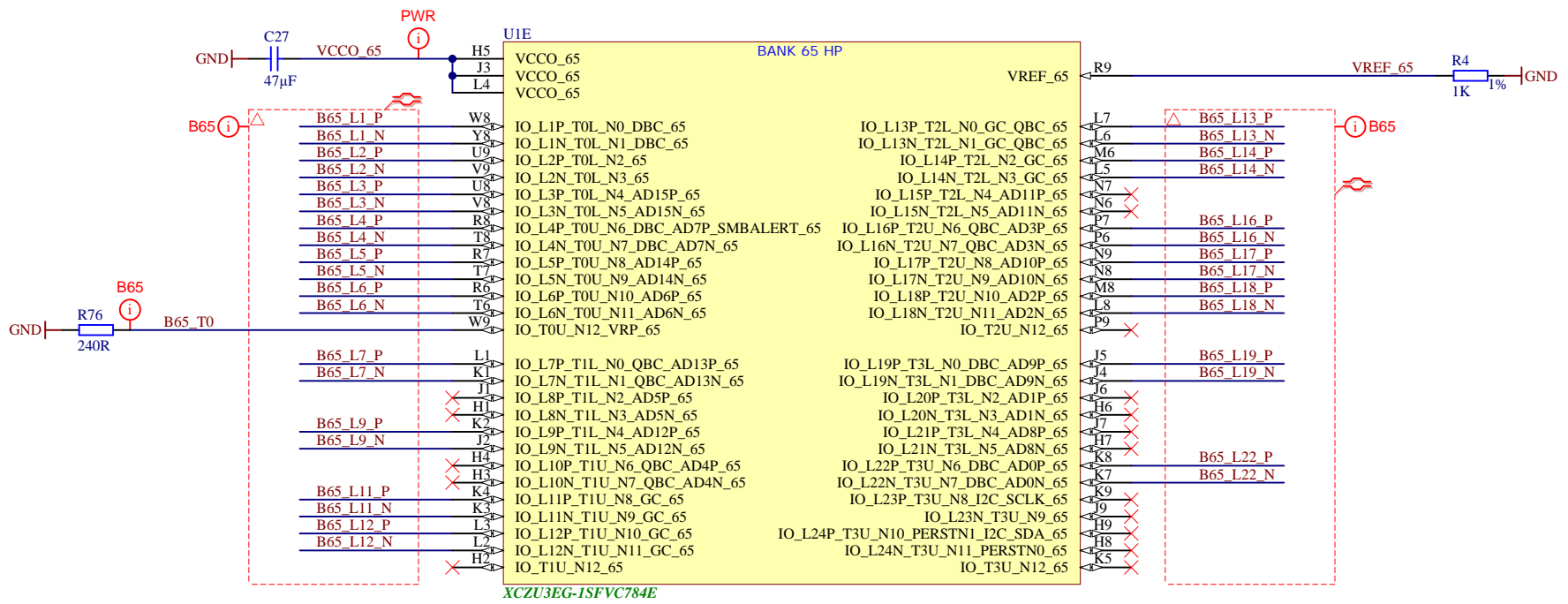
XCZU3EG-1SFVC784E



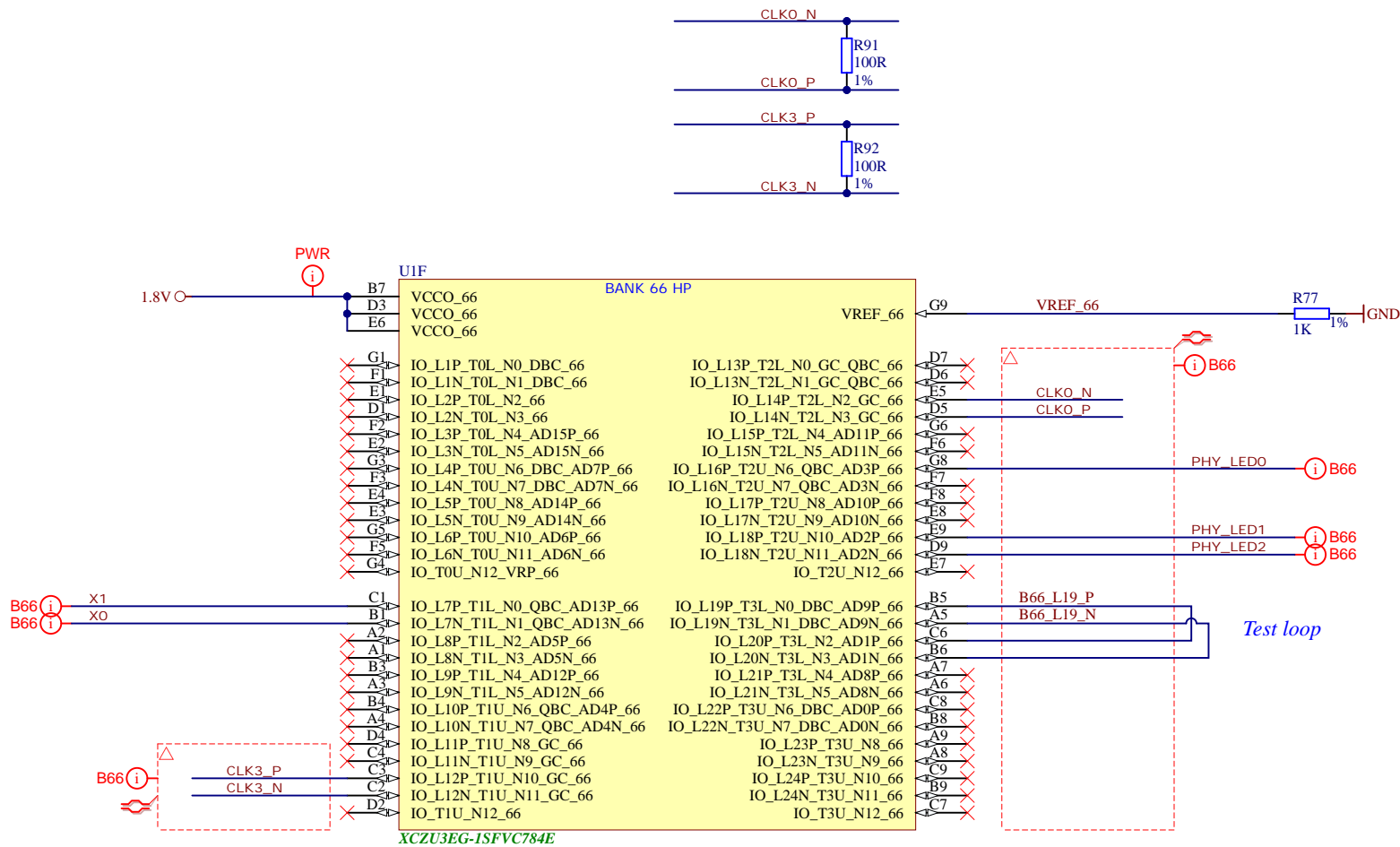
Title: Module TE0821 - HD Banks		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 7 of 24
Filename: B_HD.SchDoc		

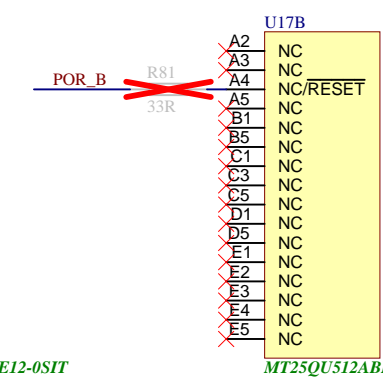
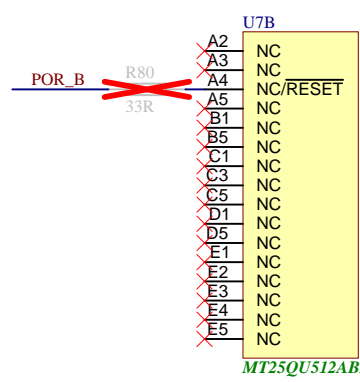
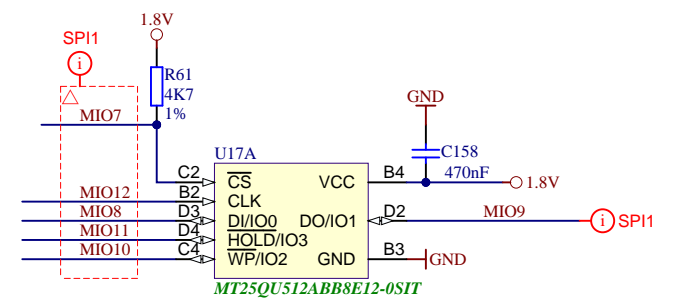
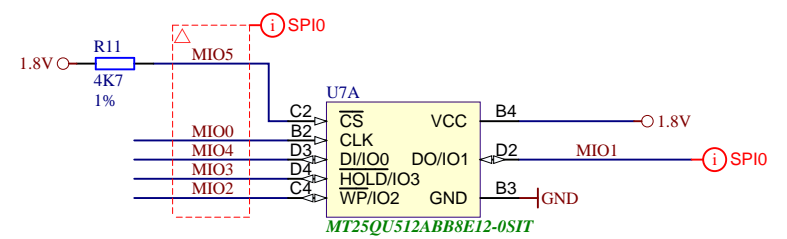
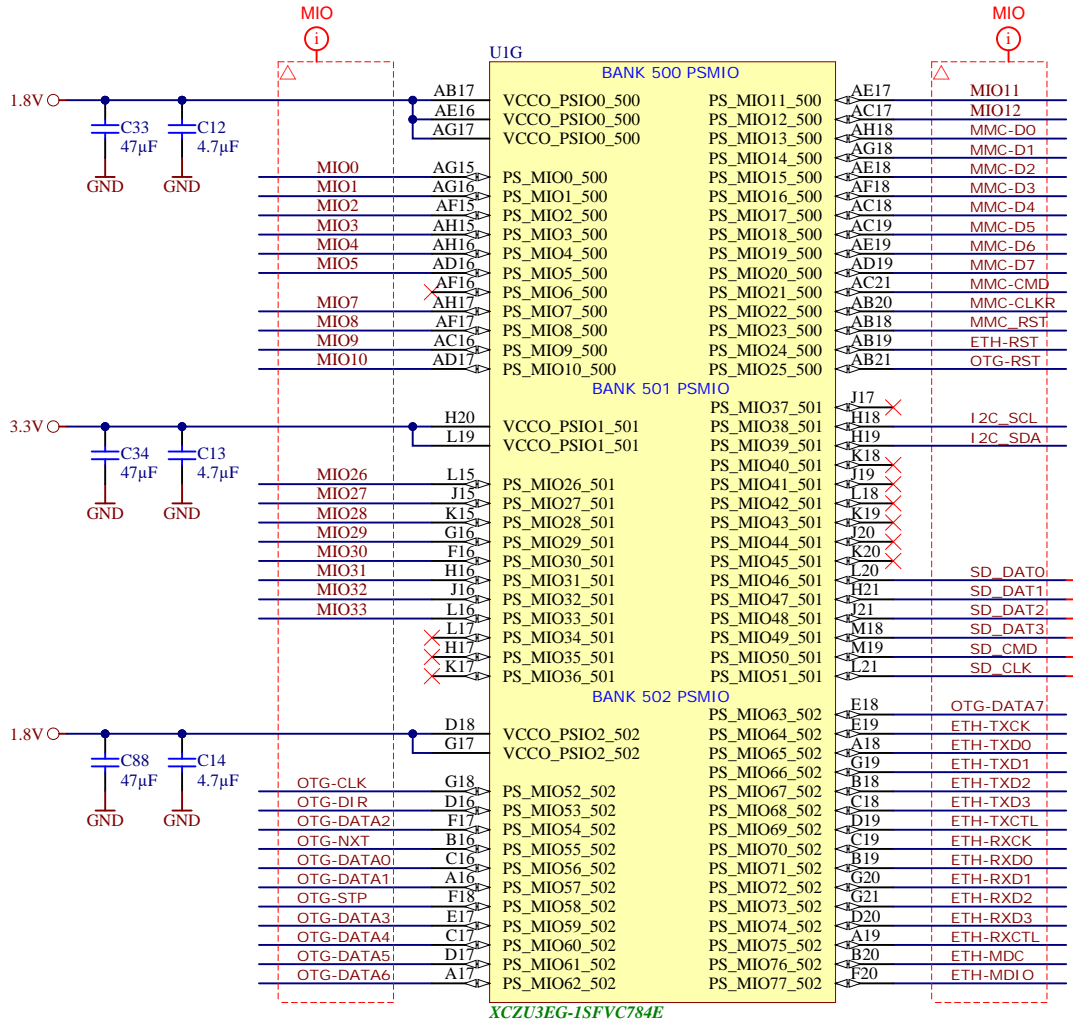
Title: Module TE0821 - B64		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 8 of 24
Filename: B64.SchDoc		



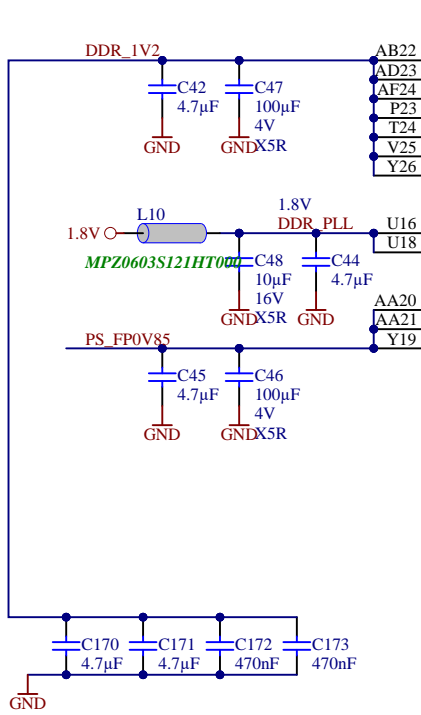
Title: Module TE0821 - B65		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 9 of 24
Filename: B65.SchDoc		



Title: Module TE0821 - B66		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 10 of 24
Filename: B66.SchDoc		



		Title: Module TE0821 - MIO Banks	
		A4	Number: TE0821 3BE21MA Date: 20.02.2019 Copyright: Trenz Electronic GmbH / TT 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	

XCZU3EG-1SFVC784E

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_DQ8_504	
		PS_DDR_DQ9_504	PS_DDR_DQ9_504	
		PS_DDR_DQ10_504	PS_DDR_DQ10_504	
		PS_DDR_DQ11_504	PS_DDR_DQ11_504	
		PS_DDR_DQ12_504	PS_DDR_DQ12_504	
		PS_DDR_DQ13_504	PS_DDR_DQ13_504	
		PS_DDR_DQ14_504	PS_DDR_DQ14_504	
		PS_DDR_DQ15_504	PS_DDR_DQ15_504	
		PS_DDR_DQ16_504	PS_DDR_DQ16_504	
		PS_DDR_DQ17_504	PS_DDR_DQ17_504	
		PS_DDR_DQ18_504	PS_DDR_DQ18_504	
		PS_DDR_DQ19_504	PS_DDR_DQ19_504	
		PS_DDR_DQ20_504	PS_DDR_DQ20_504	
		PS_DDR_DQ21_504	PS_DDR_DQ21_504	
		PS_DDR_DQ22_504	PS_DDR_DQ22_504	
		PS_DDR_DQ23_504	PS_DDR_DQ23_504	
		PS_DDR_DQ24_504	PS_DDR_DQ24_504	
		PS_DDR_DQ25_504	PS_DDR_DQ25_504	
		PS_DDR_DQ26_504	PS_DDR_DQ26_504	
		PS_DDR_DQ27_504	PS_DDR_DQ27_504	
		PS_DDR_DQ28_504	PS_DDR_DQ28_504	
		PS_DDR_DQ29_504	PS_DDR_DQ29_504	
		PS_DDR_DQ30_504	PS_DDR_DQ30_504	
		PS_DDR_DQ31_504	PS_DDR_DQ31_504	
		PS_DDR_DQ32_504	PS_DDR_DQ32_504	
		PS_DDR_DQ33_504	PS_DDR_DQ33_504	
		PS_DDR_DQ34_504	PS_DDR_DQ34_504	
		PS_DDR_DQ35_504	PS_DDR_DQ35_504	
		PS_DDR_DQ36_504	PS_DDR_DQ36_504	
		PS_DDR_DQ37_504	PS_DDR_DQ37_504	
		PS_DDR_DQ38_504	PS_DDR_DQ38_504	
		PS_DDR_DQ39_504	PS_DDR_DQ39_504	
		PS_DDR_DQ40_504	PS_DDR_DQ40_504	
		PS_DDR_DQ41_504	PS_DDR_DQ41_504	
		PS_DDR_DQ42_504	PS_DDR_DQ42_504	
		PS_DDR_DQ43_504	PS_DDR_DQ43_504	
		PS_DDR_DQ44_504	PS_DDR_DQ44_504	
		PS_DDR_DQ45_504	PS_DDR_DQ45_504	
		PS_DDR_DQ46_504	PS_DDR_DQ46_504	
		PS_DDR_DQ47_504	PS_DDR_DQ47_504	
		PS_DDR_DQ48_504	PS_DDR_DQ48_504	
		PS_DDR_DQ49_504	PS_DDR_DQ49_504	
		PS_DDR_DQ50_504	PS_DDR_DQ50_504	
		PS_DDR_DQ51_504	PS_DDR_DQ51_504	
		PS_DDR_DQ52_504	PS_DDR_DQ52_504	
		PS_DDR_DQ53_504	PS_DDR_DQ53_504	
		PS_DDR_DQ54_504	PS_DDR_DQ54_504	
		PS_DDR_DQ55_504	PS_DDR_DQ55_504	
		PS_DDR_DQ56_504	PS_DDR_DQ56_504	
		PS_DDR_DQ57_504	PS_DDR_DQ57_504	
		PS_DDR_DQ58_504	PS_DDR_DQ58_504	
		PS_DDR_DQ59_504	PS_DDR_DQ59_504	
		PS_DDR_DQ60_504	PS_DDR_DQ60_504	
		PS_DDR_DQ61_504	PS_DDR_DQ61_504	
		PS_DDR_DQ62_504	PS_DDR_DQ62_504	
		PS_DDR_DQ63_504	PS_DDR_DQ63_504	
		PS_DDR_DQ64_504	PS_DDR_DQ64_504	
		PS_DDR_DQ65_504	PS_DDR_DQ65_504	
		PS_DDR_DQ66_504	PS_DDR_DQ66_504	
		PS_DDR_DQ67_504	PS_DDR_DQ67_504	
		PS_DDR_DQ68_504	PS_DDR_DQ68_504	
		PS_DDR_DQ69_504	PS_DDR_DQ69_504	
		PS_DDR_DQ70_504	PS_DDR_DQ70_504	
		PS_DDR_DQ71_504	PS_DDR_DQ71_504	
		PS_DDR_DM0_504	AG20	DDR4-DM0
		PS_DDR_DM1_504	AE23	DDR4-DM1
		PS_DDR_DM2_504	AE25	DDR4-DM2
		PS_DDR_DM3_504	AE28	DDR4-DM3
		PS_DDR_DM4_504	R23	
		PS_DDR_DM5_504	H23	
		PS_DDR_DM6_504	L27	
		PS_DDR_DM7_504	H26	
		PS_DDR_DM8_504	T26	

XCZU3EG-1SFVC784E



Title: Module TE0821 - PS DDR		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 12 of 24
Filename: PS_DDR.SchDoc		

1

2

3

4

A

A

B

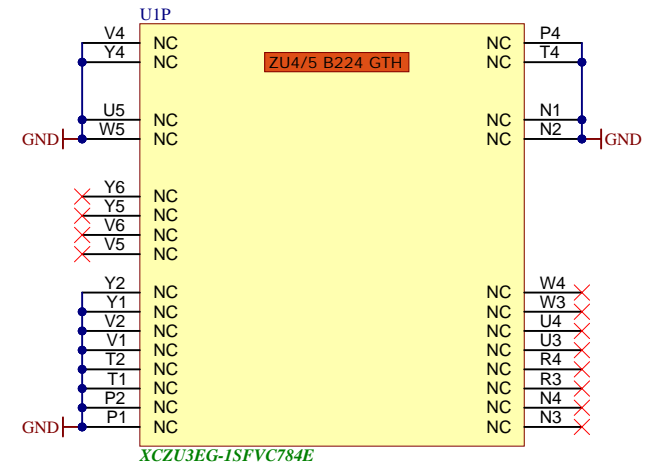
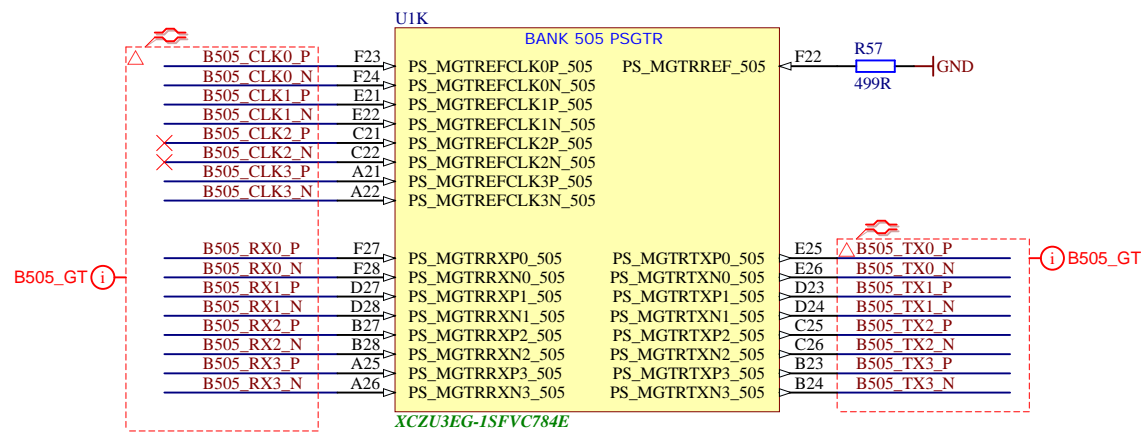

B

C

C

D

D

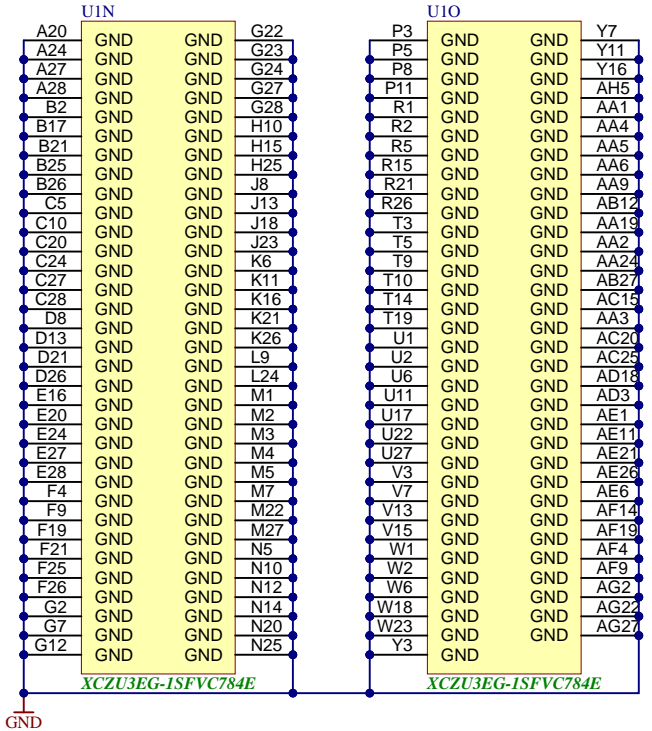
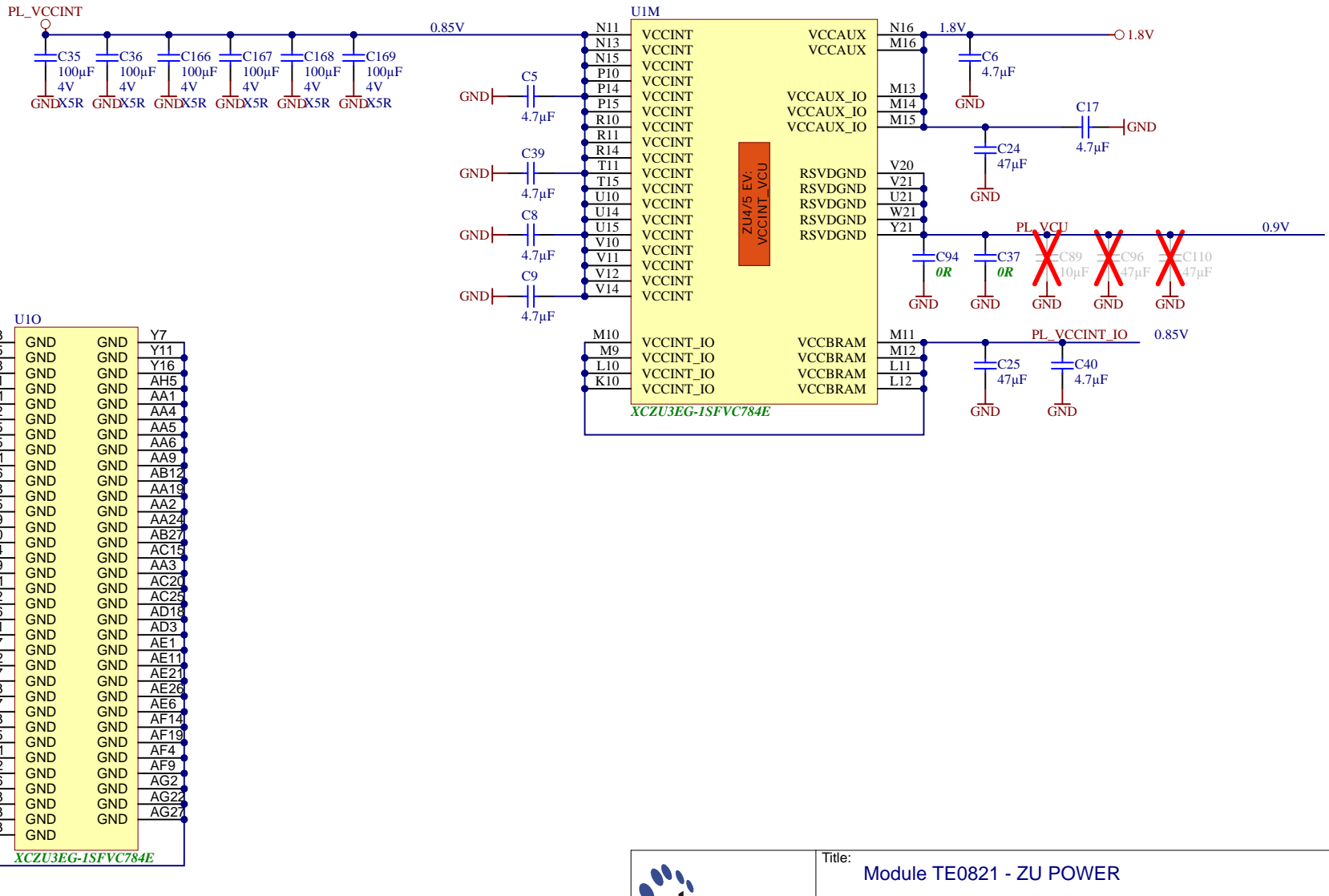
Title: Module TE0821 - PS MGT		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 13 of 24
Filename: B_PS_GT.SchDoc		

1

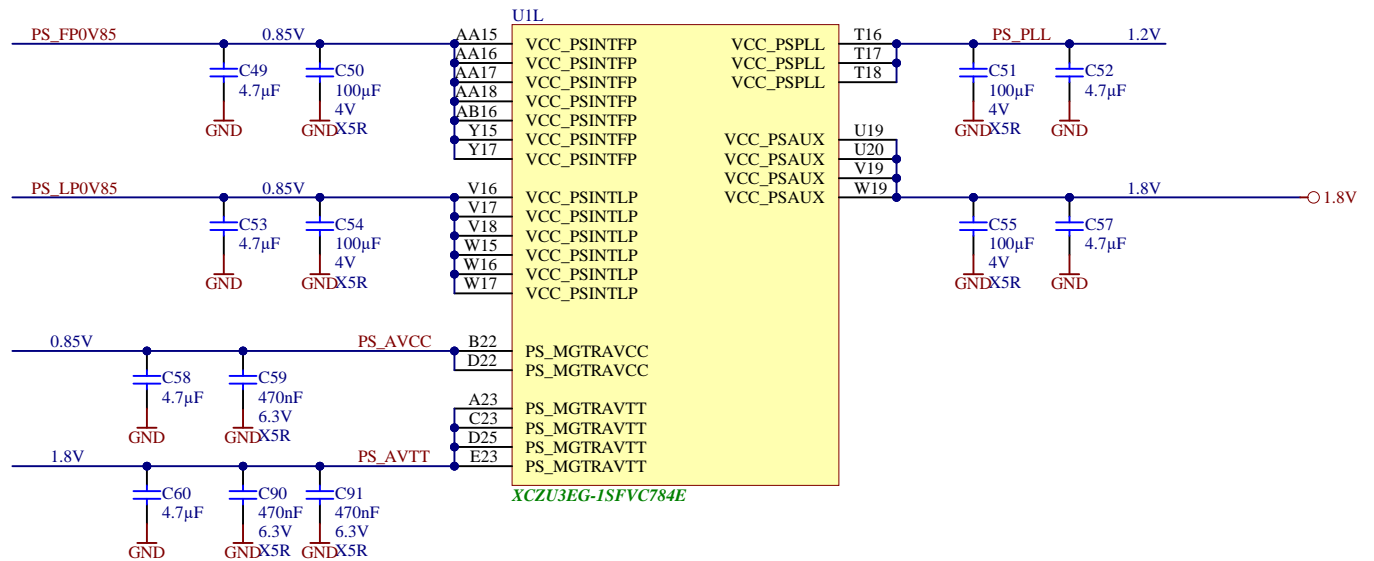
2


3

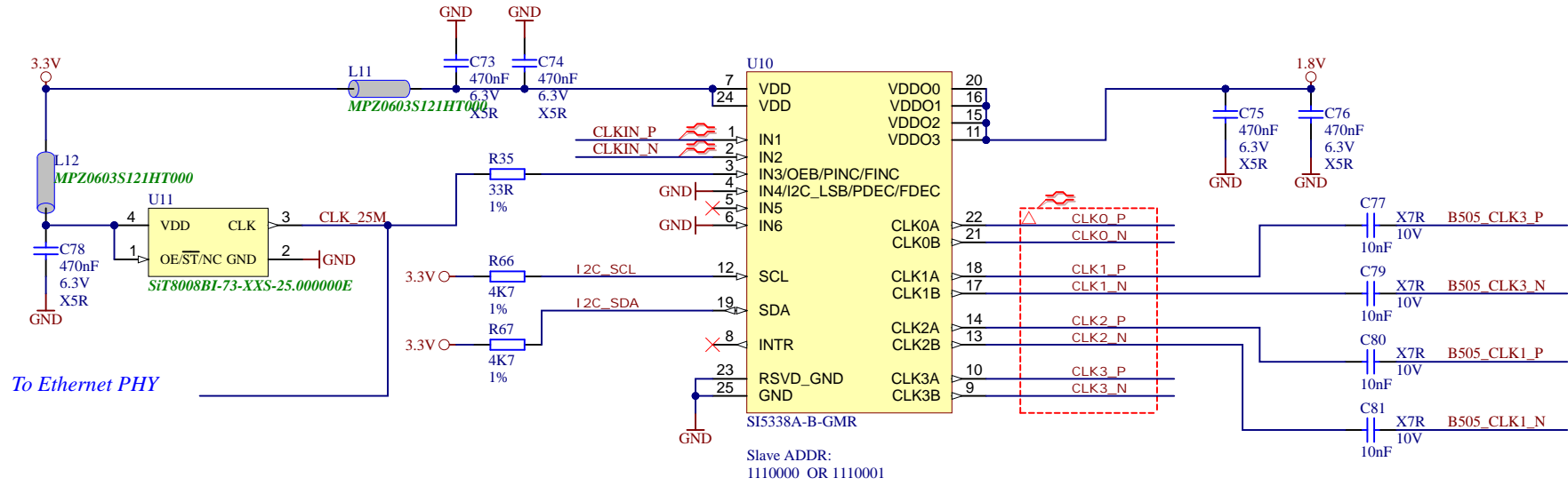
4



Title: Module TE0821 - ZU POWER		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	
Page 14 of 24		
Filename: ZU_POWER.SchDoc		




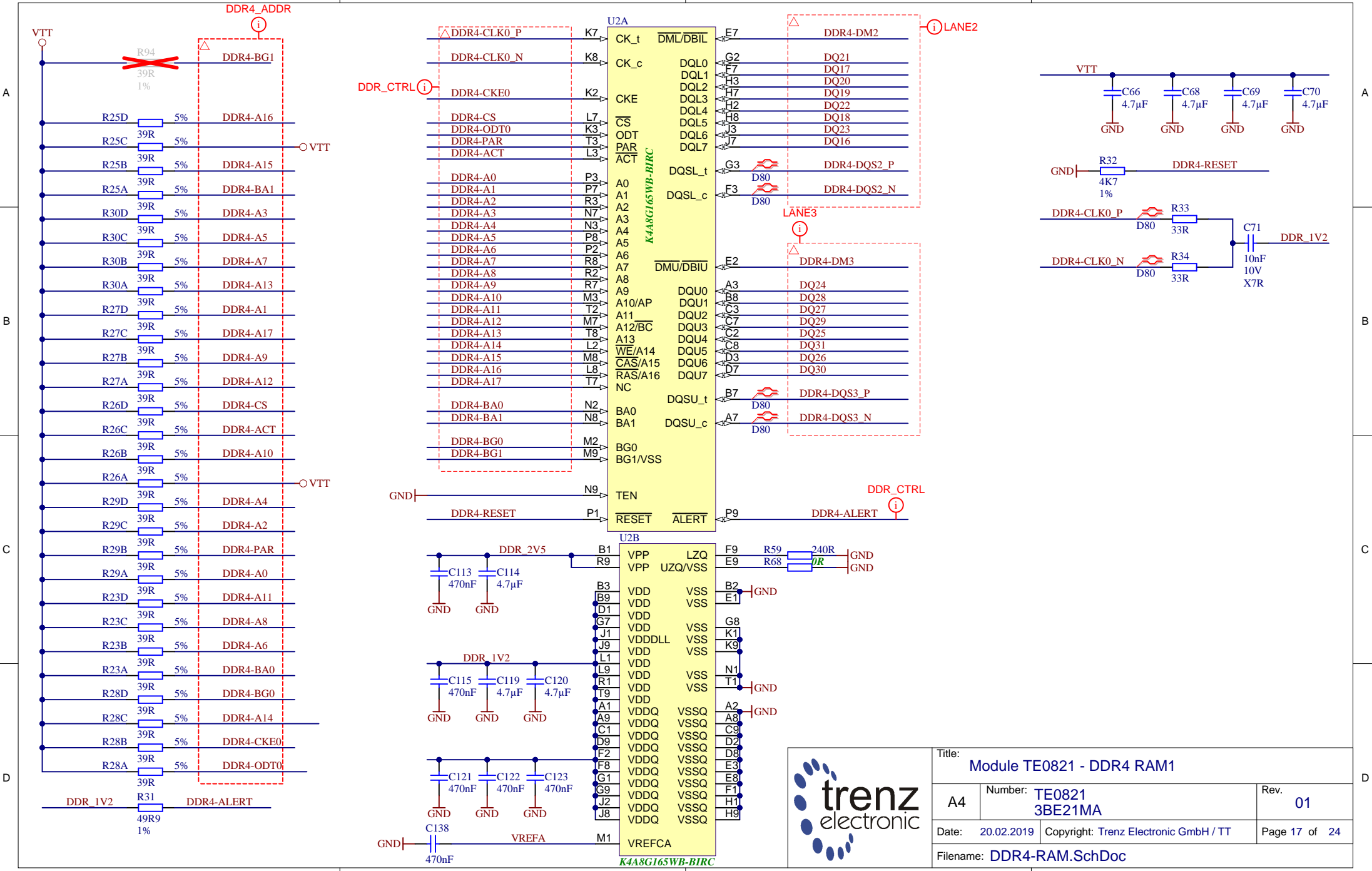
	Title: Module TE0821 - ZU PS POWER		
	A4	Number: TE0821 3BE21MA	Rev. 01
	Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 15 of 24
	Filename: ZU_PS_POWER.SchDoc		



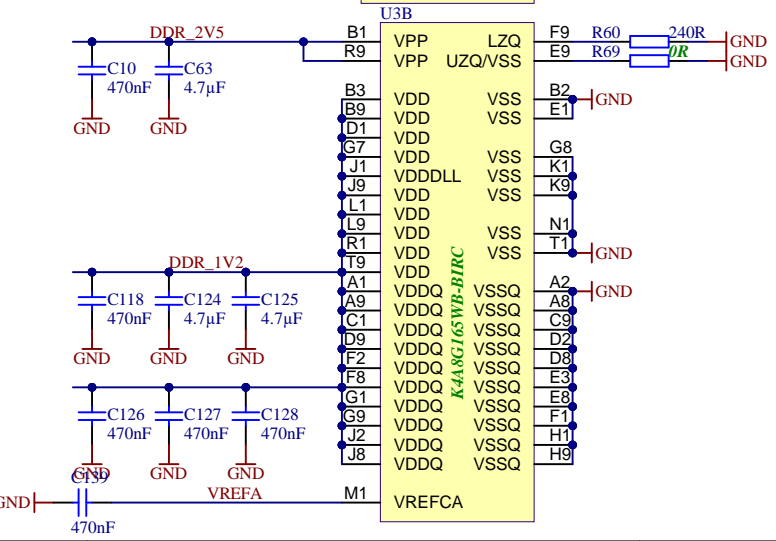
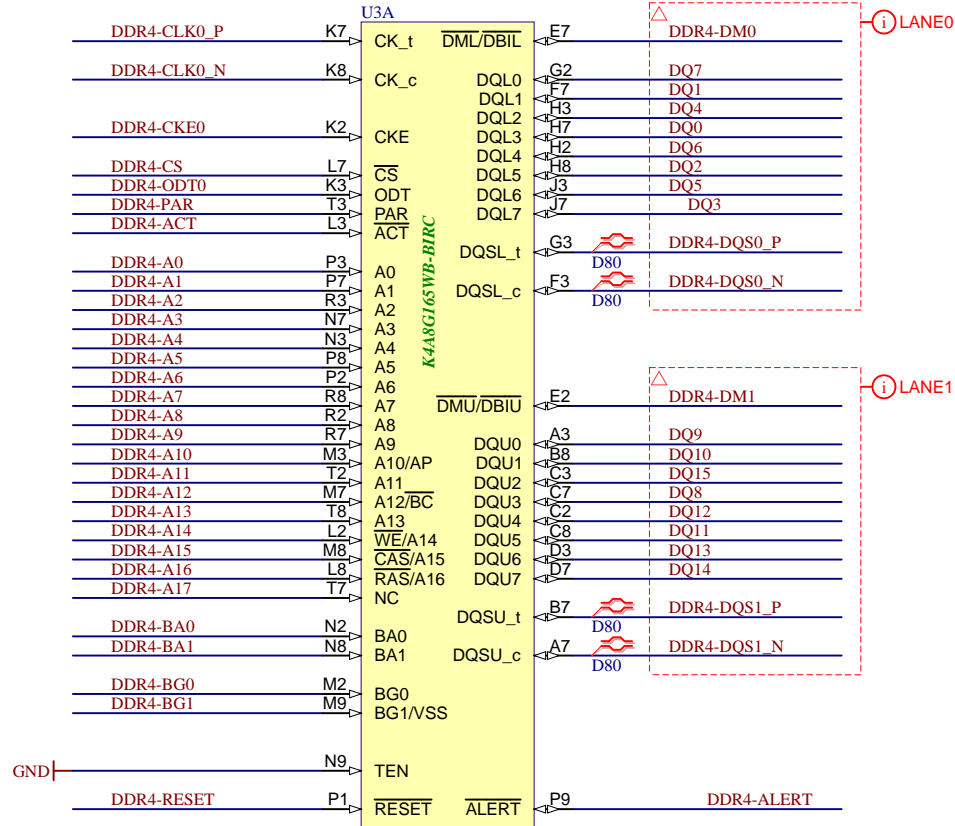
To Ethernet PHY

Slave ADDR:
1110000 OR 1110001

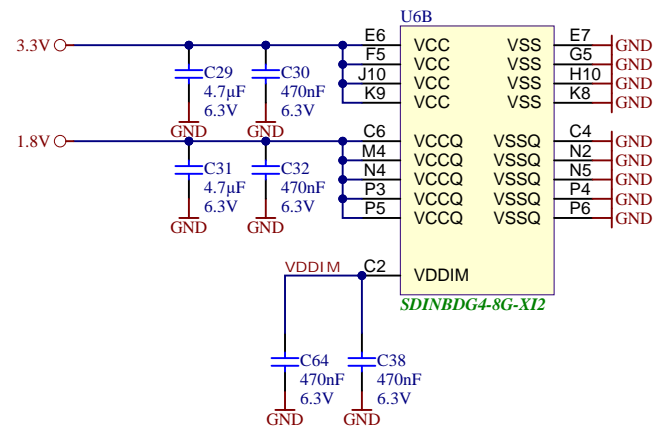
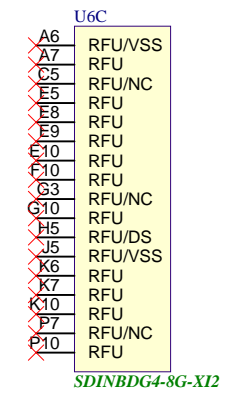
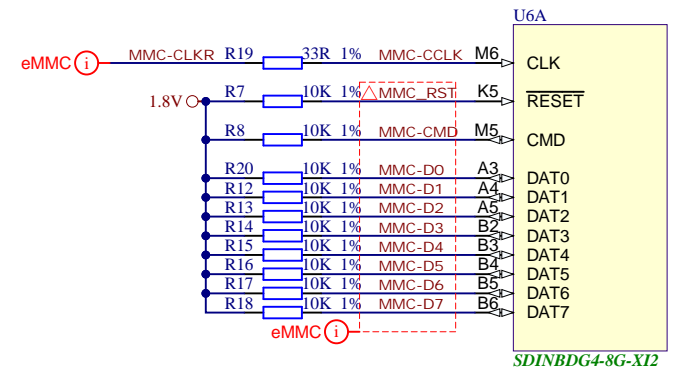
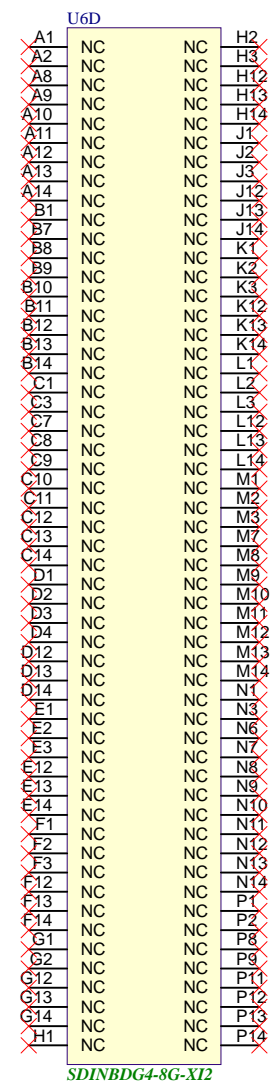
		Title: Module TE0821 - CLK	
		A4	Number: TE0821 3BE21MA
Date: 20.02.2019		Copyright: 2015 Trenz Electronic GmbH	
Filename: CLK.SchDoc		Page 16 of 24	



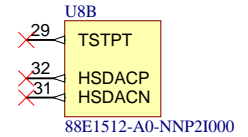
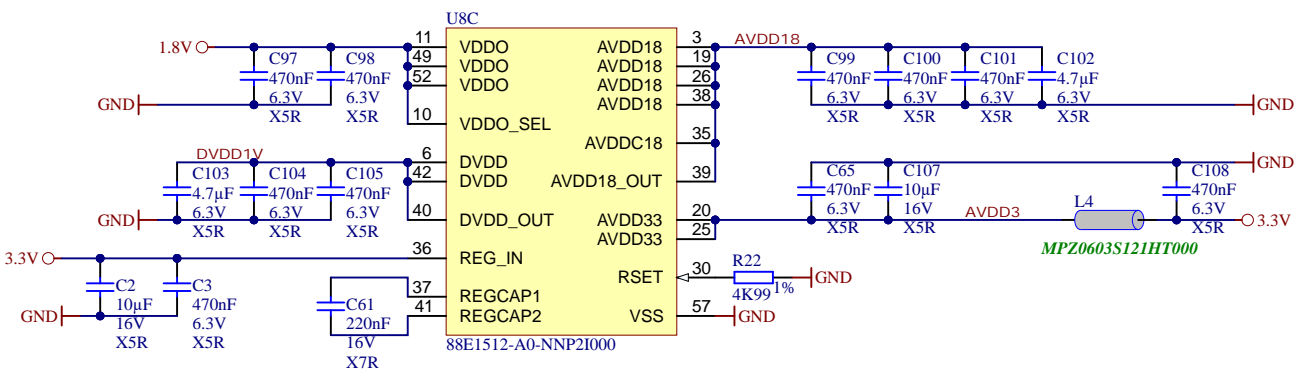
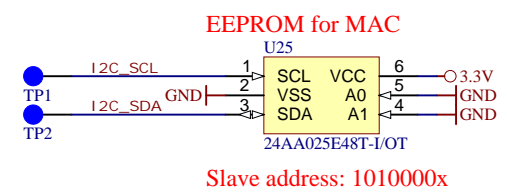
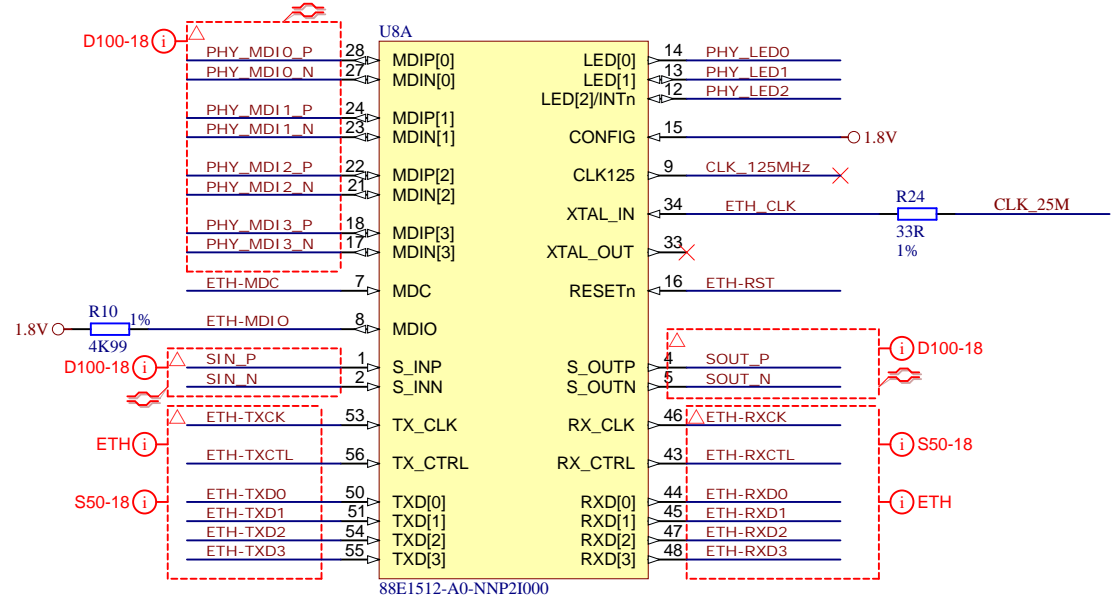
Title: Module TE0821 - DDR4 RAM1		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 17 of 24
Filename: DDR4-RAM.SchDoc		



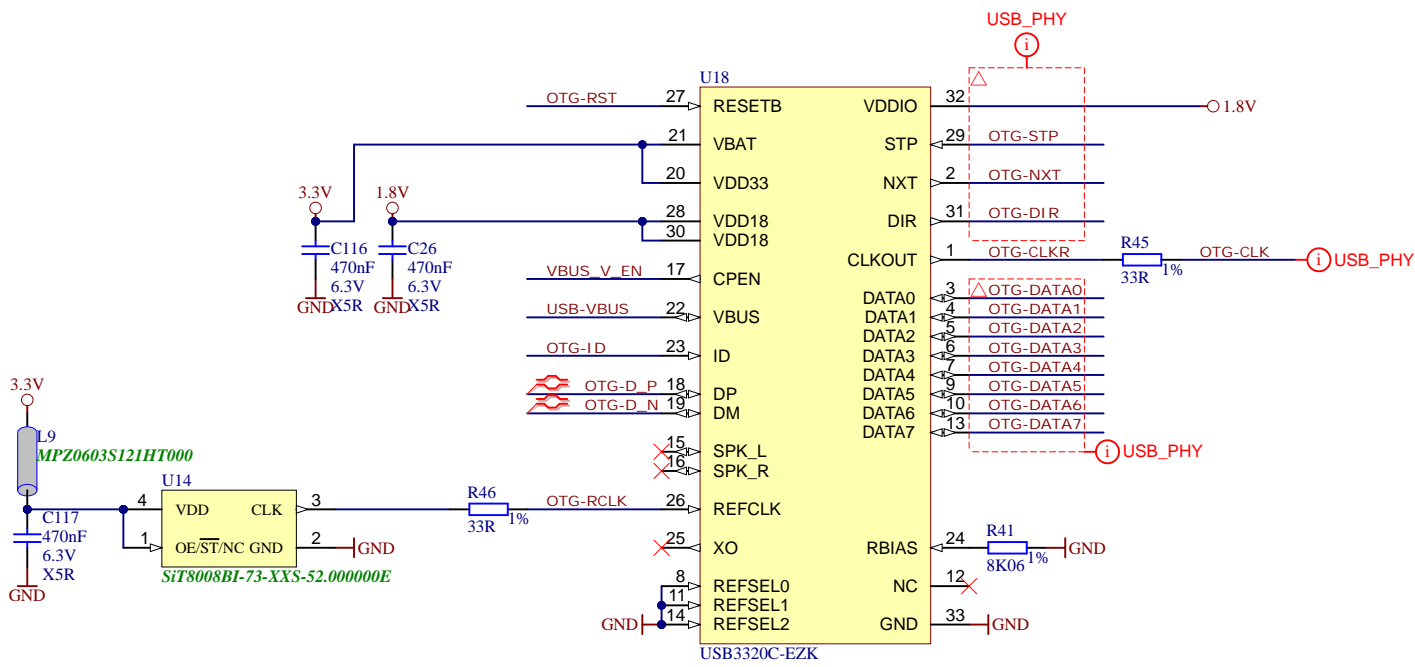
Title: Module TE0821 - DDR4 RAM2		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 18 of 24
Filename: DDR4-RAM_2.SchDoc		



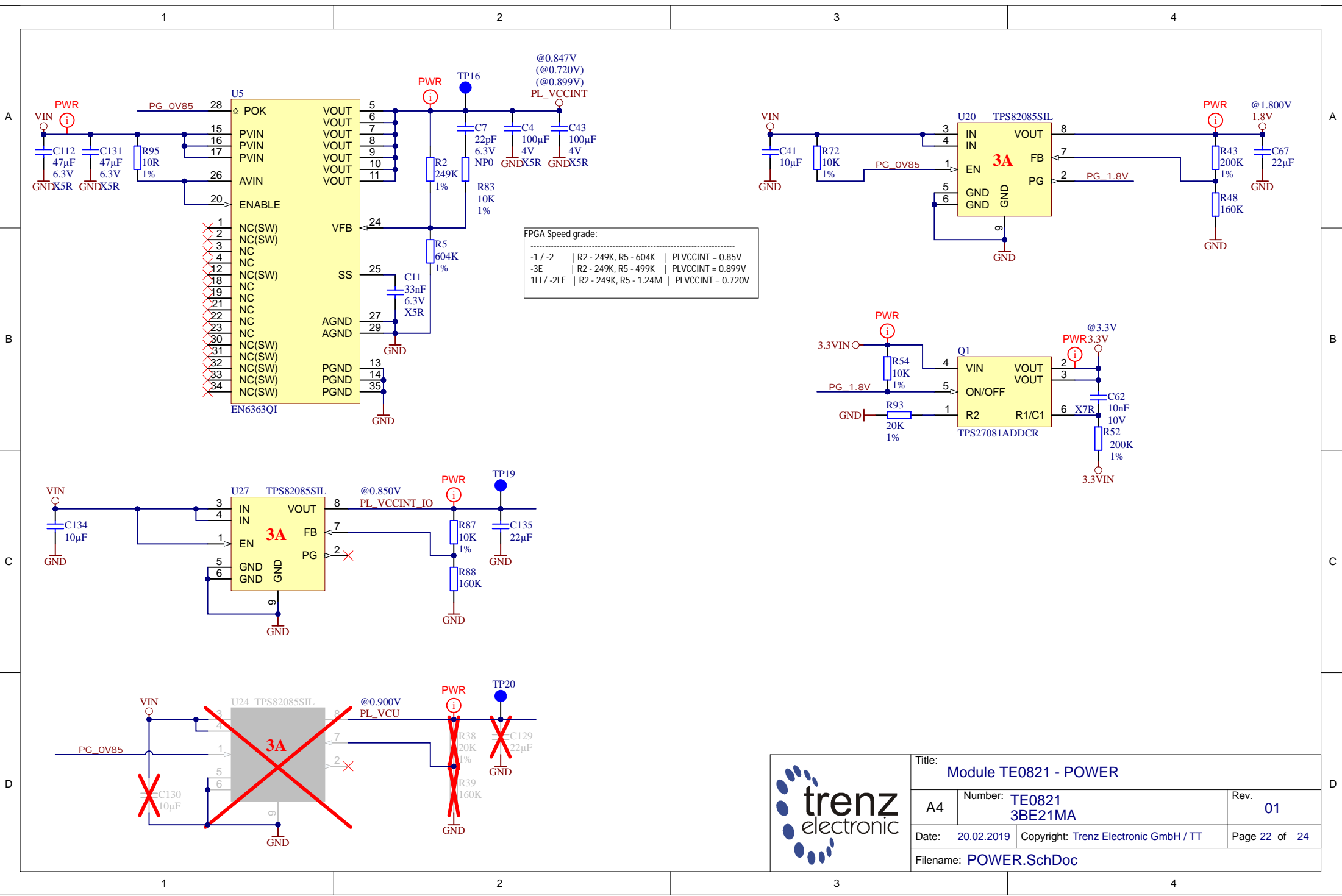
	Title: Module TE0821 - eMMC		
	A4	Number: TE0821 3BE21MA	Rev. 01
	Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 19 of 24
	Filename: eMMC.SchDoc		



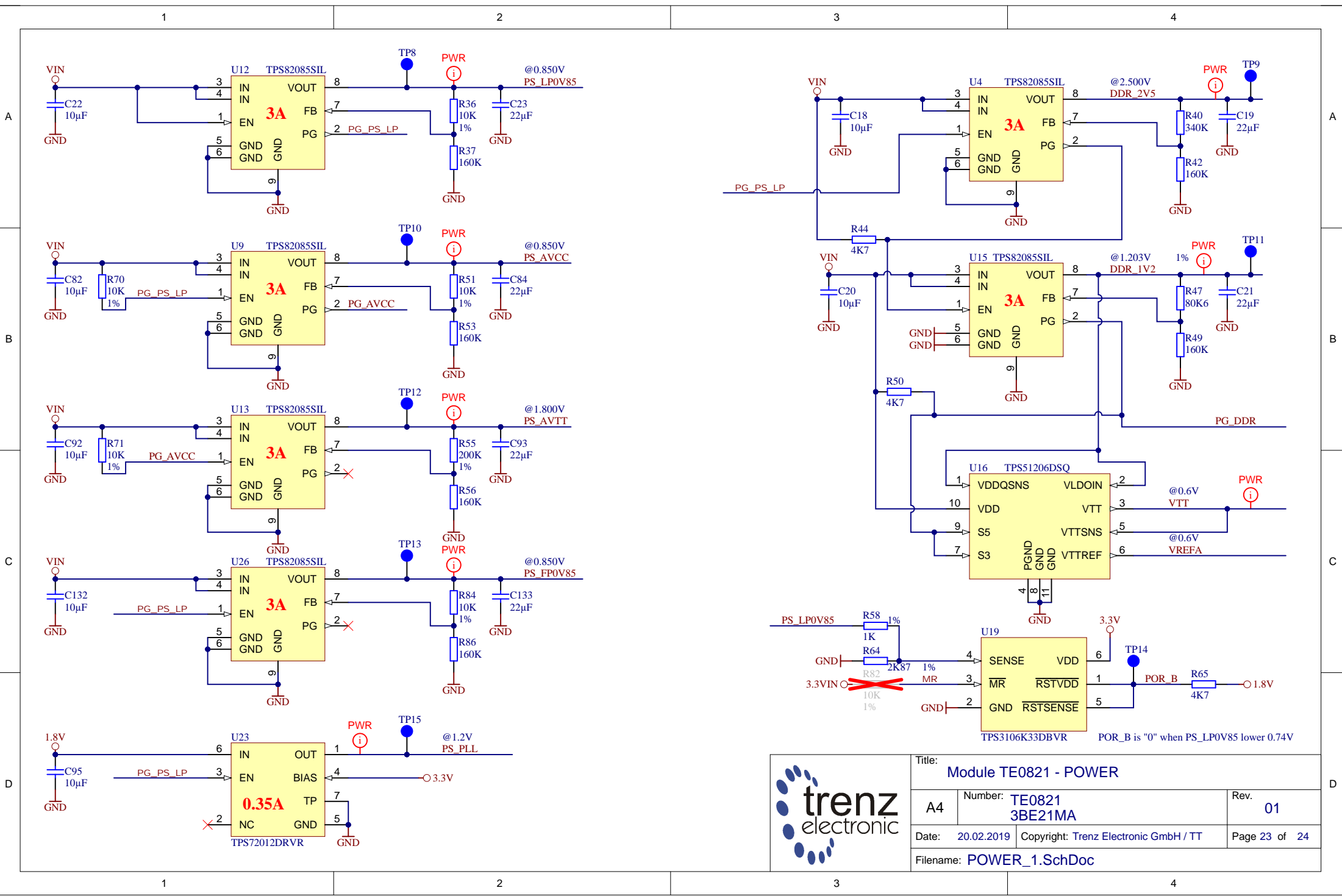
Title: Module TE0821 - Ethernet PHY		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: 2015 Trenz Electronic GmbH	Page 20 of 24
Filename: ETH-PHY.SchDoc		



	Title: Module TE0821 - USB PHY		
	A4	Number: TE0821 3BE21MA	Rev. 01
	Date: 20.02.2019	Copyright: 2015 Trenz Electronic GmbH	Page 21 of 24
	Filename: USB-PHY.SchDoc		



Title: Module TE0821 - POWER		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 22 of 24
Filename: POWER.SchDoc		



Title: Module TE0821 - POWER		
A4	Number: TE0821 3BE21MA	Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	
Filename: POWER_1.SchDoc		Page 23 of 24

POR_B is "0" when PS_LP0V85 lower 0.74V

1

2

3

4

Revision 01a (01.07.2020):

1. VY: R38 value was changed to 20K (was: 40K2) to set VCU 0.9V

Revision 01b (29.10.2020):

1. VY: Updated Block diagram

(07.02.2024):
2. OT: R82 set to not fitted

A

A

B


B

C

C

D

D

	Title: Module TE0821 - Revision Changes		
	A4	Number: TE0821 3BE21MA	Rev. 01
	Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 24 of 24
	Filename: Revision Changes.SchDoc		

1

2

3

4