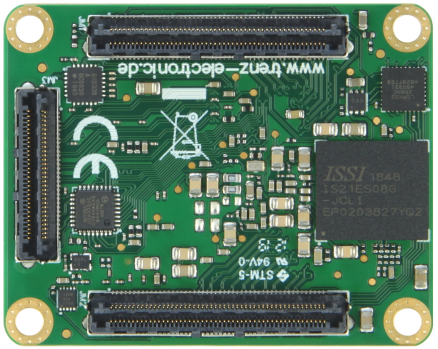

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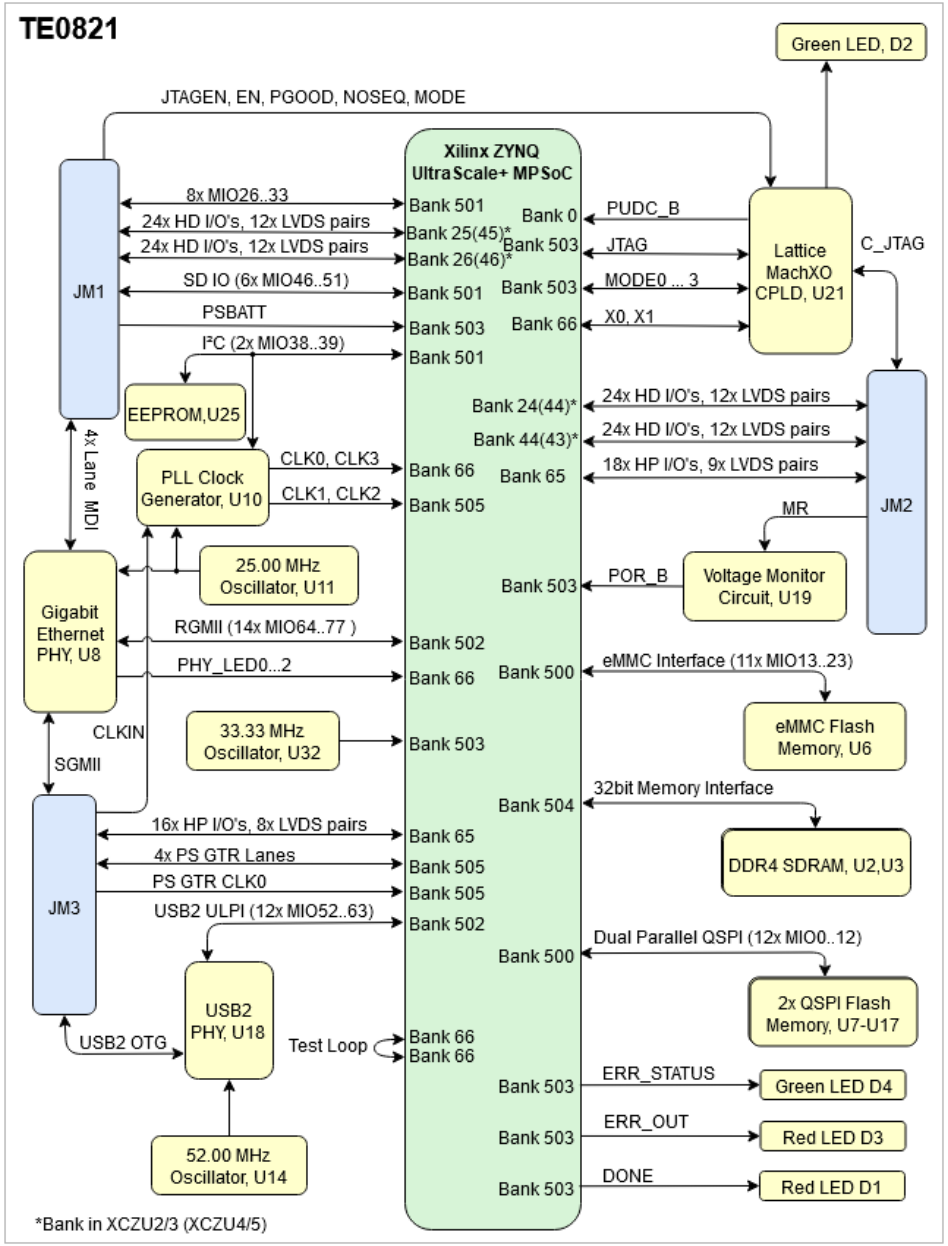
Schematics and other handouts serve for informational purposes only!

trenz electronic	Title: Module TE0821		
	A4	Number: TE0821 3BE21MD	Rev. 01
	Date: 14.08.2020	Copyright: Trenz Electronic GmbH / TT	Page 1 of 24
	Filename: Legal Notices Modules.SchDoc		



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Title: Module TE0821 - System Overview			
A4	Number: TE0821 3BE21MD		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

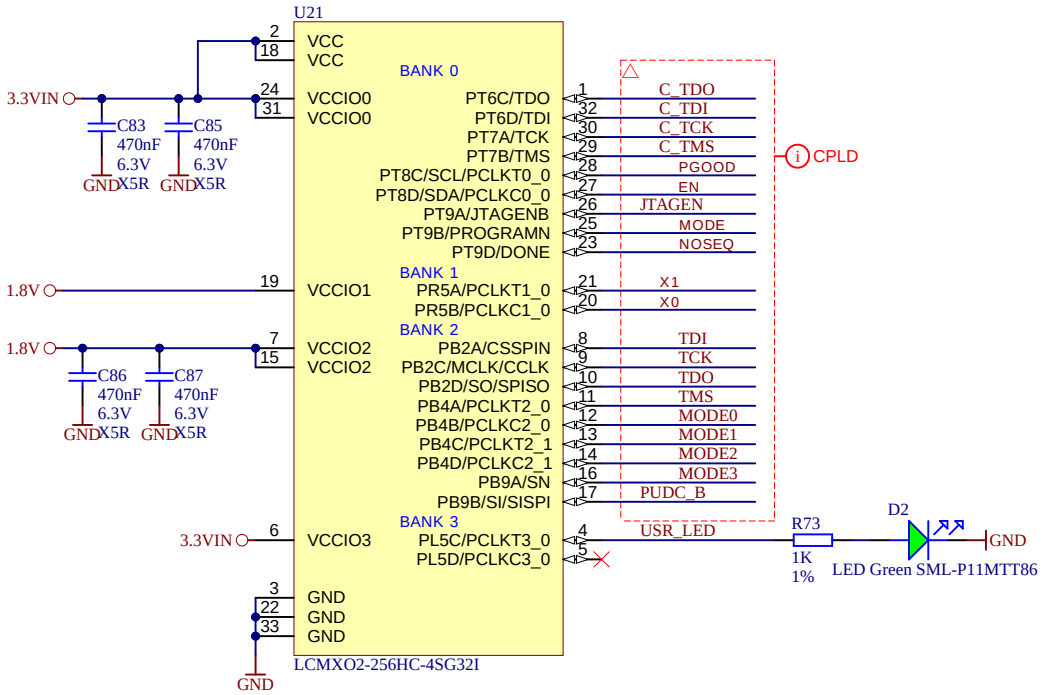
U_DDR4-RAM_2
DDR4-RAM_2.SchDoc

U_DDR4-RAM
DDR4-RAM.SchDoc

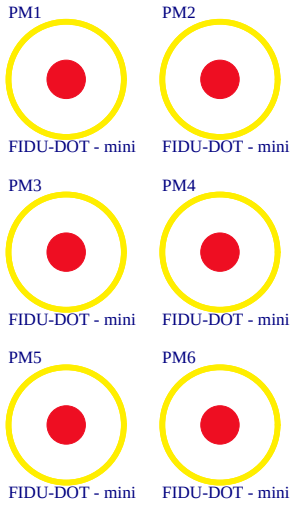
U_POWER
POWER.SchDoc

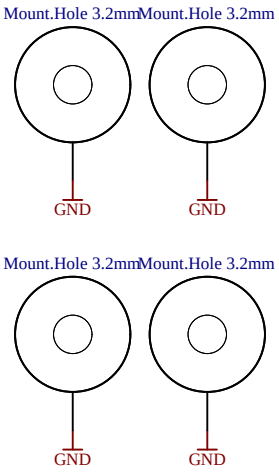
U_POWER_1
POWER_1.SchDoc

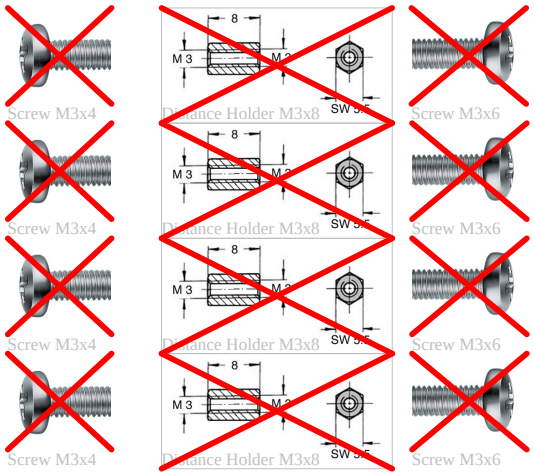
U_Revision_changes
Revision Changes.SchDoc



Serial
Serial
Serialnumber 6,3 x 6.3mm







Special notes:

Component RC0201FR-0710KL removed

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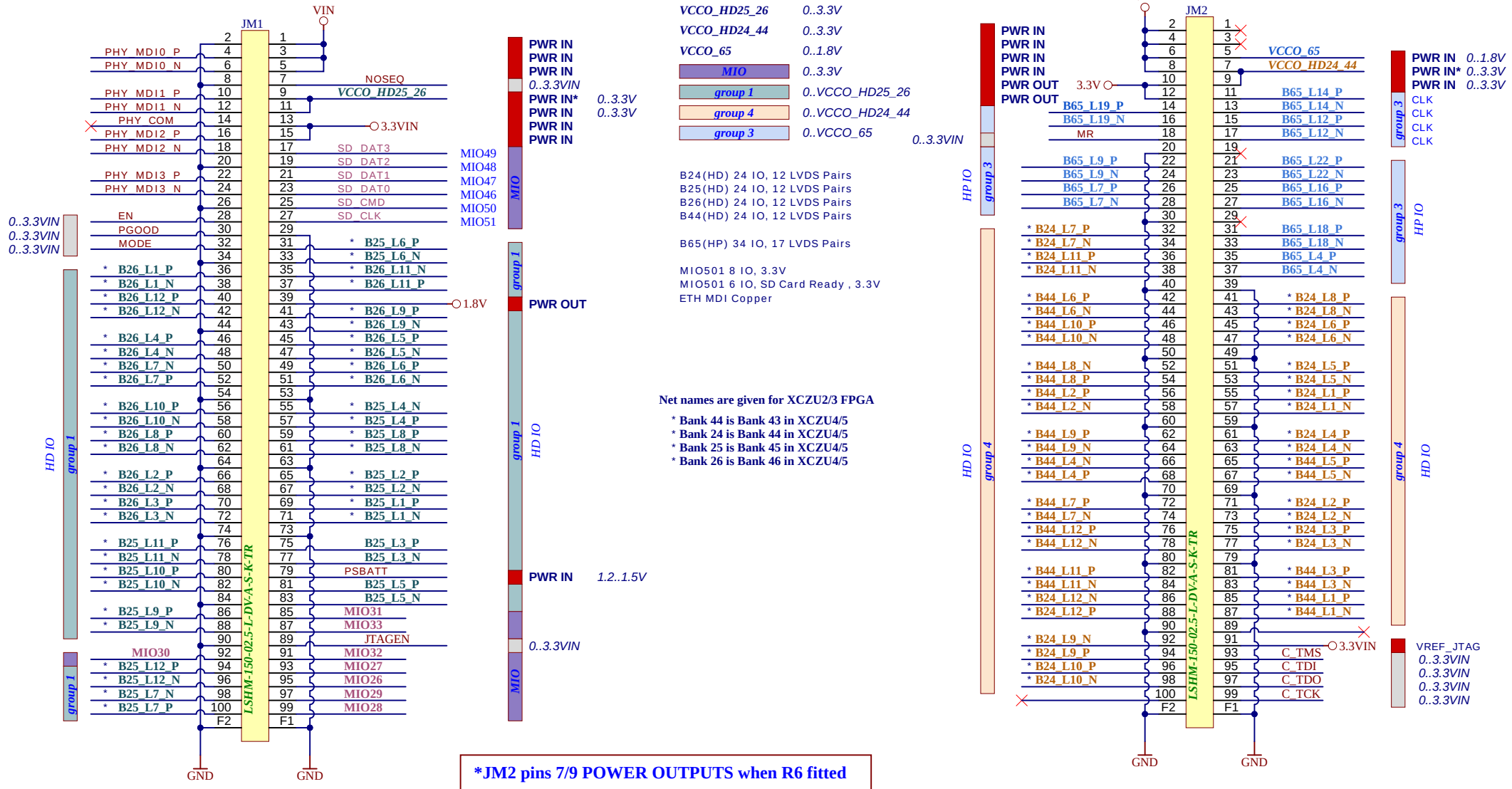
Title: Module TE0821			
A4	Number: TE0821 3BE21MD		Rev. 01
Date: 20.02.2019	Copyright: 2015 Trenz Electronic GmbH		Page 3 of 24
Filename: TE0821.SchDoc			



Title: Module TE0821 - B2B Connectors			
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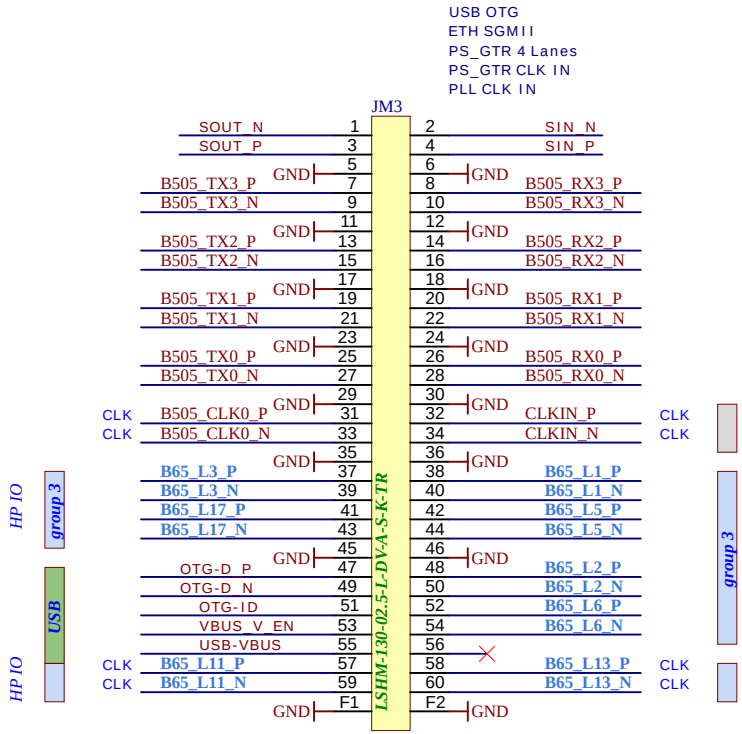
Date: 04.07.2019	Copyright: 2015 Trenz Electronic GmbH		Page 4 of 24
Filename: B2B-Connectors.SchDoc			



Title: Module TE0821 - B2B Connectors		
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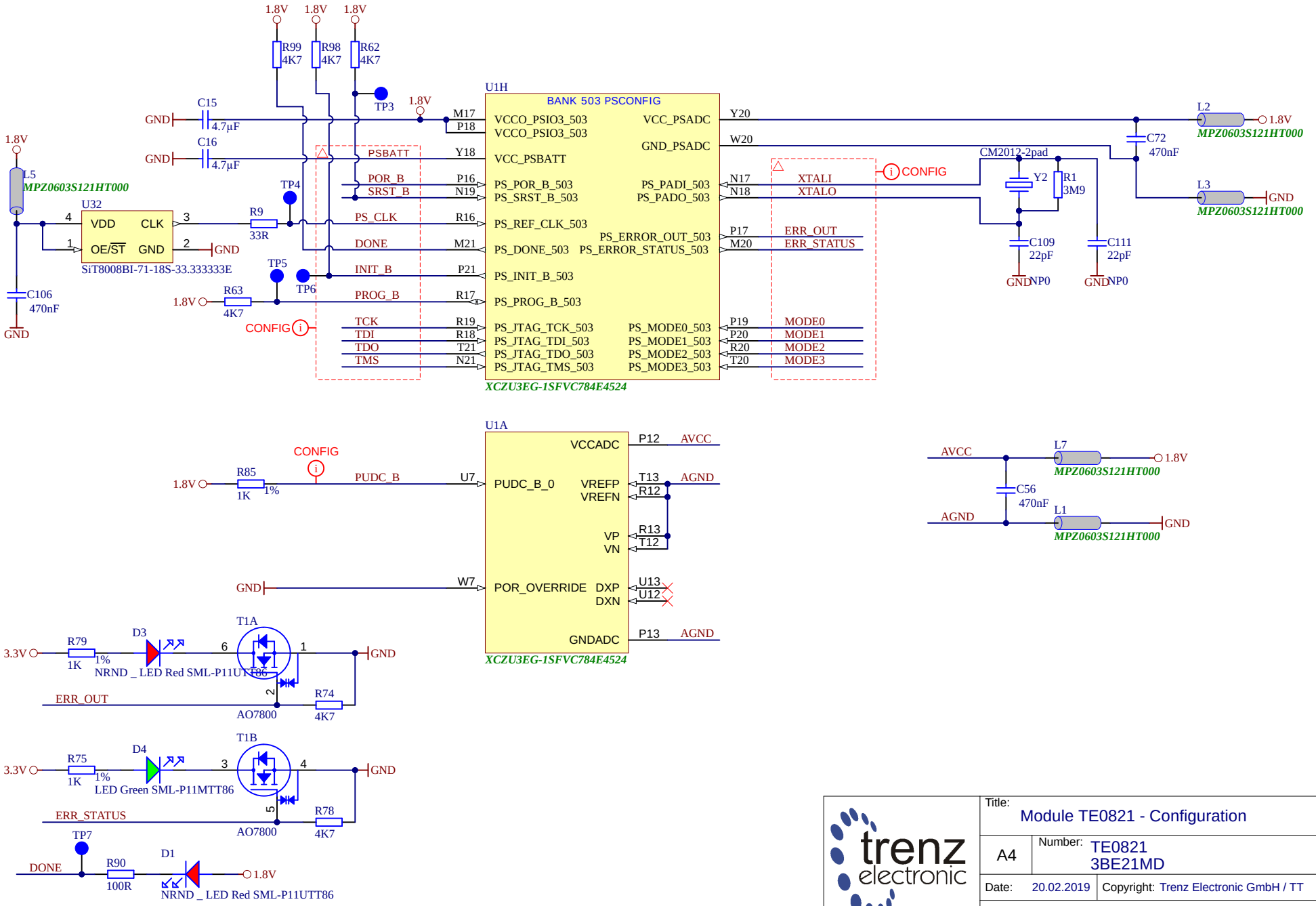
Date: 20.02.2019	Copyright: 2015 Trenz Electronic GmbH	Page 5 of 24
Filename: B2B-Connectors_2.SchDoc		



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Title: Module TE0821 - Configuration			
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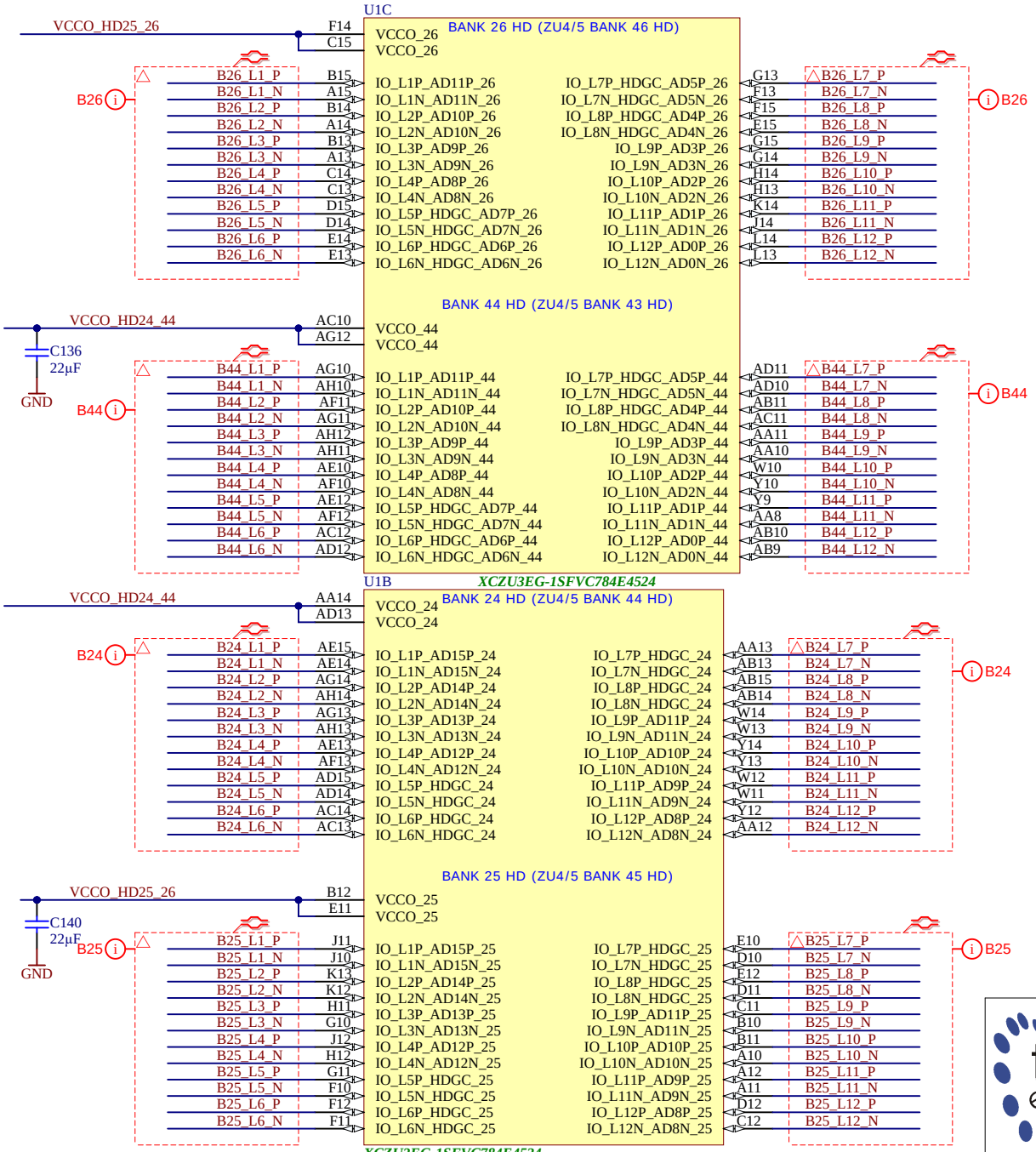
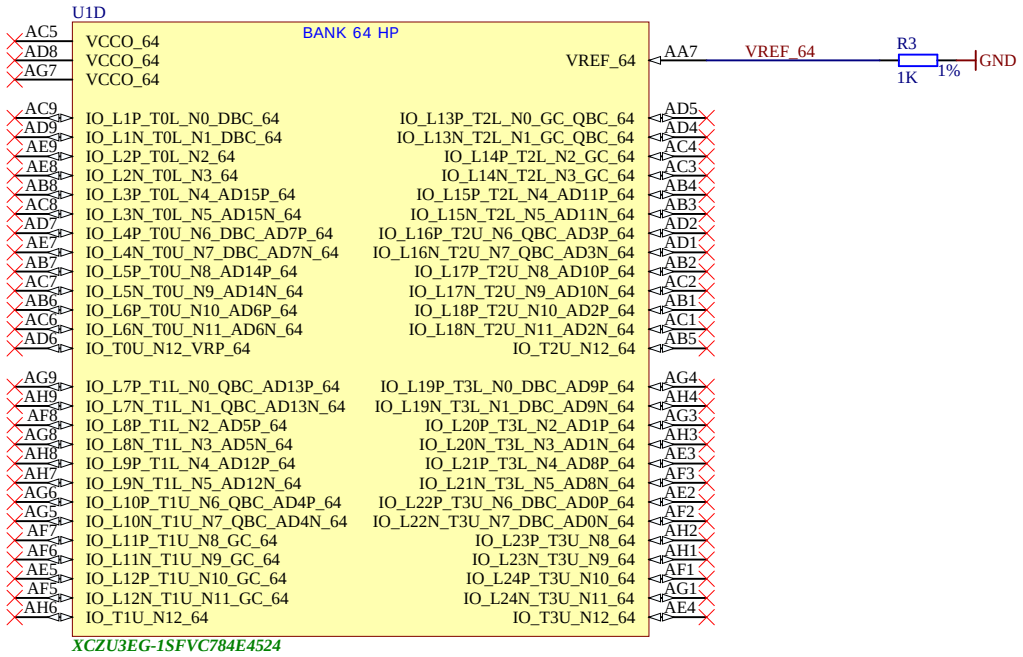
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT		Page 6 of 24
Filename: CONFIG.SchDoc			


U1C
BANK 26 HD (ZU4/5 BANK 46 HD)
VCCO_HD25_26
F14 VCCO_26
C15 VCCO_26
B26_L1_P B15 IO_L1P_AD11P_26 IO_L7P_HDGC_AD5P_26 G13 B26_L7_P
B26_L1_N A15 IO_L1N_AD11N_26 IO_L7N_HDGC_AD5N_26 F13 B26_L7_N
B26_L2_P B14 IO_L2P_AD10P_26 IO_L8P_HDGC_AD4P_26 F15 B26_L8_P
B26_L2_N A14 IO_L2N_AD10N_26 IO_L8N_HDGC_AD4N_26 E15 B26_L8_N
B26_L3_P B13 IO_L3P_AD9P_26 IO_L9P_AD3P_26 G15 B26_L9_P
B26_L3_N A13 IO_L3N_AD9N_26 IO_L9N_AD3N_26 G14 B26_L9_N
B26_L4_P C14 IO_L4P_AD8P_26 IO_L10P_AD2P_26 H14 B26_L10_P
B26_L4_N C13 IO_L4N_AD8N_26 IO_L10N_AD2N_26 H13 B26_L10_N
B26_L5_P D15 IO_L5P_HDGC_AD7P_26 IO_L11P_AD1P_26 K14 B26_L11_P
B26_L5_N D14 IO_L5N_HDGC_AD7N_26 IO_L11N_AD1N_26 J14 B26_L11_N
B26_L6_P E14 IO_L6P_HDGC_AD6P_26 IO_L12P_AD0P_26 L14 B26_L12_P
B26_L6_N E13 IO_L6N_HDGC_AD6N_26 IO_L12N_AD0N_26 L13 B26_L12_N
B26
B26
BANK 44 HD (ZU4/5 BANK 43 HD)
VCCO_HD24_44
AC10 VCCO_44
AG12 VCCO_44
C136
22µF
GND
B44_L1_P AG10 IO_L1P_AD11P_44 IO_L7P_HDGC_AD5P_44 AD11 B44_L7_P
B44_L1_N AH10 IO_L1N_AD11N_44 IO_L7N_HDGC_AD5N_44 AD10 B44_L7_N
B44_L2_P AF11 IO_L2P_AD10P_44 IO_L8P_HDGC_AD4P_44 AB11 B44_L8_P
B44_L2_N AG11 IO_L2N_AD10N_44 IO_L8N_HDGC_AD4N_44 AC11 B44_L8_N
B44_L3_P AH12 IO_L3P_AD9P_44 IO_L9P_AD3P_44 AA11 B44_L9_P
B44_L3_N AH11 IO_L3N_AD9N_44 IO_L9N_AD3N_44 AA10 B44_L9_N
B44_L4_P AE10 IO_L4P_AD8P_44 IO_L10P_AD2P_44 W10 B44_L10_P
B44_L4_N AF10 IO_L4N_AD8N_44 IO_L10N_AD2N_44 Y10 B44_L10_N
B44_L5_P AE12 IO_L5P_HDGC_AD7P_44 IO_L11P_AD1P_44 Y9 B44_L11_P
B44_L5_N AF12 IO_L5N_HDGC_AD7N_44 IO_L11N_AD1N_44 AA8 B44_L11_N
B44_L6_P AC12 IO_L6P_HDGC_AD6P_44 IO_L12P_AD0P_44 AB10 B44_L12_P
B44_L6_N AD12 IO_L6N_HDGC_AD6N_44 IO_L12N_AD0N_44 AB9 B44_L12_N
B44
B44
U1B
XCZU3EG-1SFVC784E4524
BANK 24 HD (ZU4/5 BANK 44 HD)
VCCO_HD24_44
AA14 VCCO_24
AD13 VCCO_24
B24_L1_P AE15 IO_L1P_AD15P_24 IO_L7P_HDGC_24 AA13 B24_L7_P
B24_L1_N AE14 IO_L1N_AD15N_24 IO_L7N_HDGC_24 AB13 B24_L7_N
B24_L2_P AG14 IO_L2P_AD14P_24 IO_L8P_HDGC_24 AB15 B24_L8_P
B24_L2_N AH14 IO_L2N_AD14N_24 IO_L8N_HDGC_24 AB14 B24_L8_N
B24_L3_P AG13 IO_L3P_AD13P_24 IO_L9P_AD11P_24 W14 B24_L9_P
B24_L3_N AH13 IO_L3N_AD13N_24 IO_L9N_AD11N_24 W13 B24_L9_N
B24_L4_P AE13 IO_L4P_AD12P_24 IO_L10P_AD10P_24 Y14 B24_L10_P
B24_L4_N AF13 IO_L4N_AD12N_24 IO_L10N_AD10N_24 Y13 B24_L10_N
B24_L5_P AD15 IO_L5P_HDGC_24 IO_L11P_AD9P_24 W12 B24_L11_P
B24_L5_N AD14 IO_L5N_HDGC_24 IO_L11N_AD9N_24 W11 B24_L11_N
B24_L6_P AC14 IO_L6P_HDGC_24 IO_L12P_AD8P_24 Y12 B24_L12_P
B24_L6_N AC13 IO_L6N_HDGC_24 IO_L12N_AD8N_24 AA12 B24_L12_N
B24
B24
BANK 25 HD (ZU4/5 BANK 45 HD)
VCCO_HD25_26
B12 VCCO_25
E11 VCCO_25
C140
22µF
GND
B25_L1_P J11 IO_L1P_AD15P_25 IO_L7P_HDGC_25 E10 B25_L7_P
B25_L1_N J10 IO_L1N_AD15N_25 IO_L7N_HDGC_25 D10 B25_L7_N
B25_L2_P K13 IO_L2P_AD14P_25 IO_L8P_HDGC_25 E12 B25_L8_P
B25_L2_N K12 IO_L2N_AD14N_25 IO_L8N_HDGC_25 D11 B25_L8_N
B25_L3_P H11 IO_L3P_AD13P_25 IO_L9P_AD11P_25 C11 B25_L9_P
B25_L3_N G10 IO_L3N_AD13N_25 IO_L9N_AD11N_25 B10 B25_L9_N
B25_L4_P J12 IO_L4P_AD12P_25 IO_L10P_AD10P_25 B11 B25_L10_P
B25_L4_N H12 IO_L4N_AD12N_25 IO_L10N_AD10N_25 A10 B25_L10_N
B25_L5_P G11 IO_L5P_HDGC_25 IO_L11P_AD9P_25 A12 B25_L11_P
B25_L5_N F10 IO_L5N_HDGC_25 IO_L11N_AD9N_25 A11 B25_L11_N
B25_L6_P F12 IO_L6P_HDGC_25 IO_L12P_AD8P_25 D12 B25_L12_P
B25_L6_N F11 IO_L6N_HDGC_25 IO_L12N_AD8N_25 C12 B25_L12_N
B25
B25
XCZU3EG-1SFVC784E4524
trenz electronic
Title: Module TE0821 - HD Banks
A4
Number: TE0821 3BE21MD
Rev. 01
Date: 20.02.2019
Copyright: Trenz Electronic GmbH / TT
Page 7 of 24
Filename: B_HD.SchDoc



trenz electronic	Title: Module TE0821 - B64		
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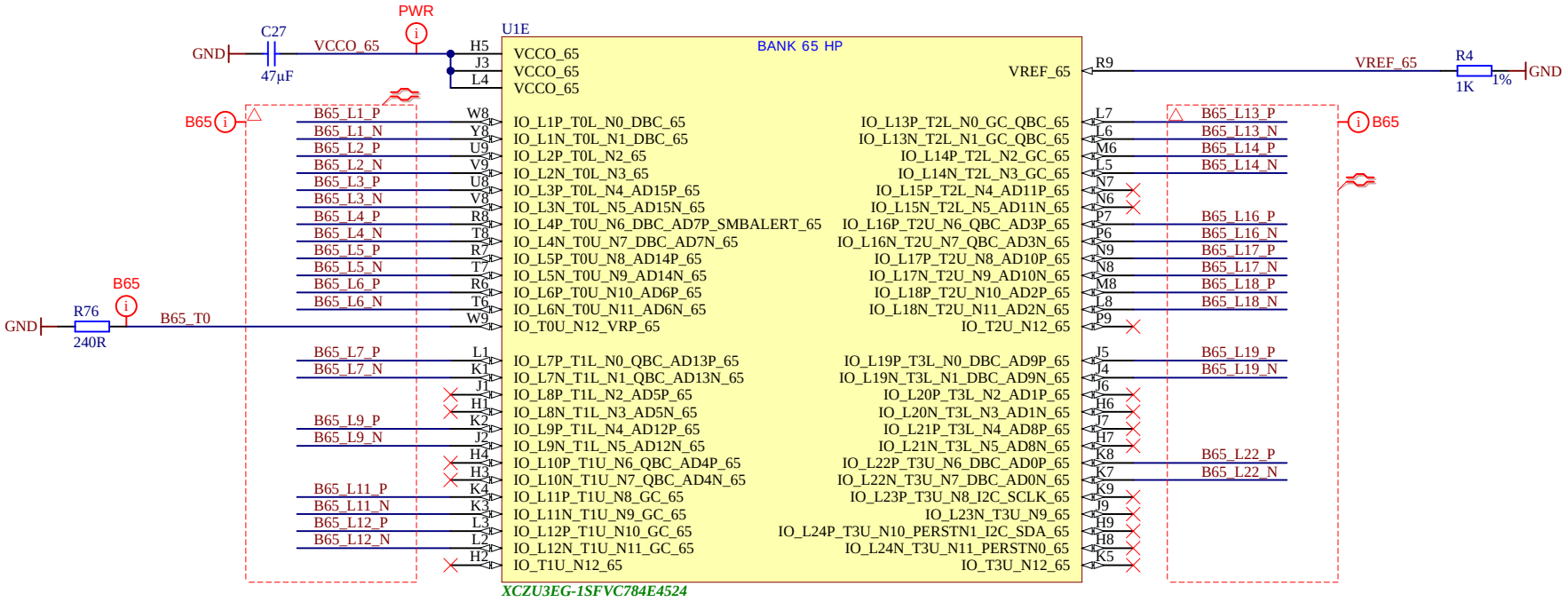
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT		Page 8 of 24
Filename: B64.SchDoc			



Title: Module TE0821 - B65		
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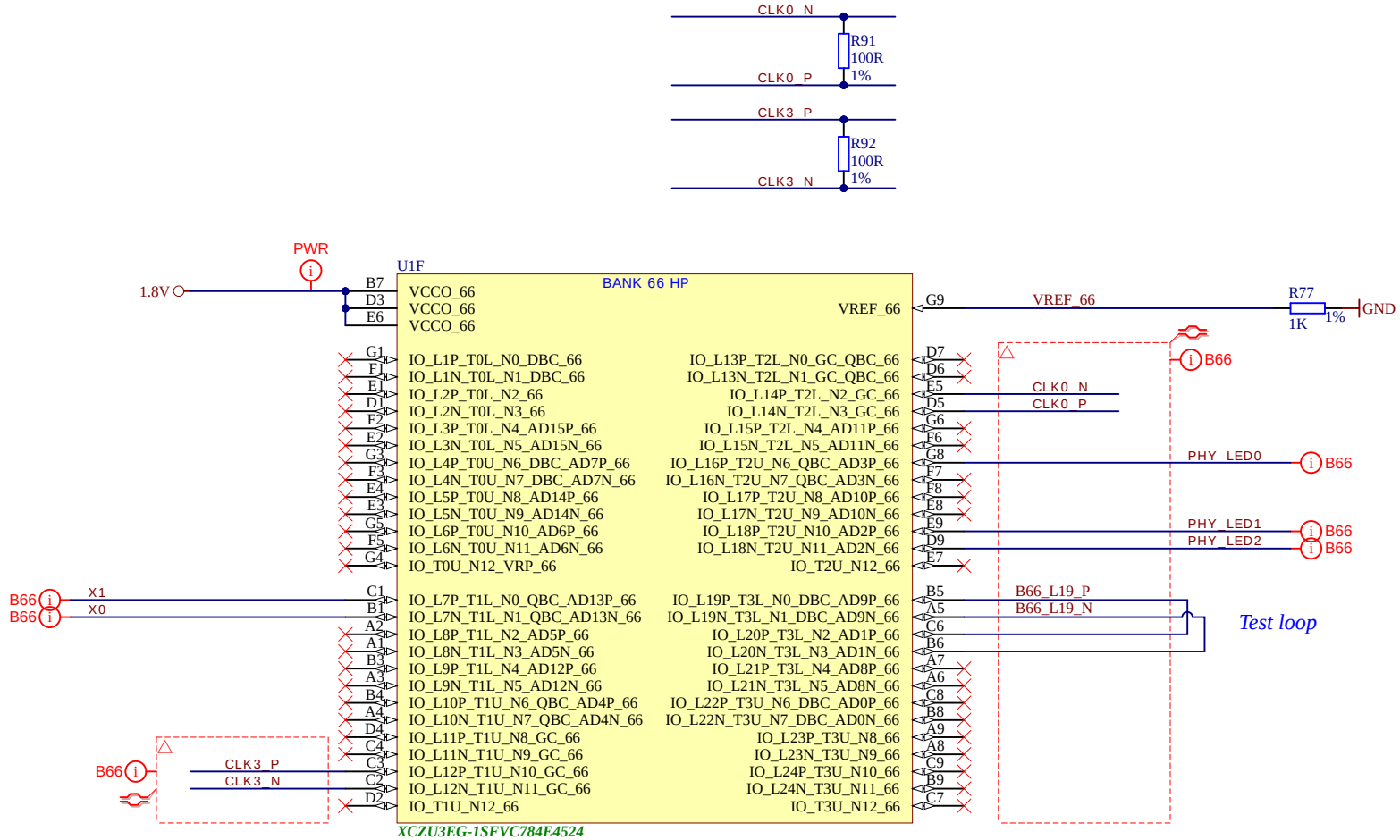
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 9 of 24
Filename: B65.SchDoc		



trenz electronic	Title: Module TE0821 - B66		
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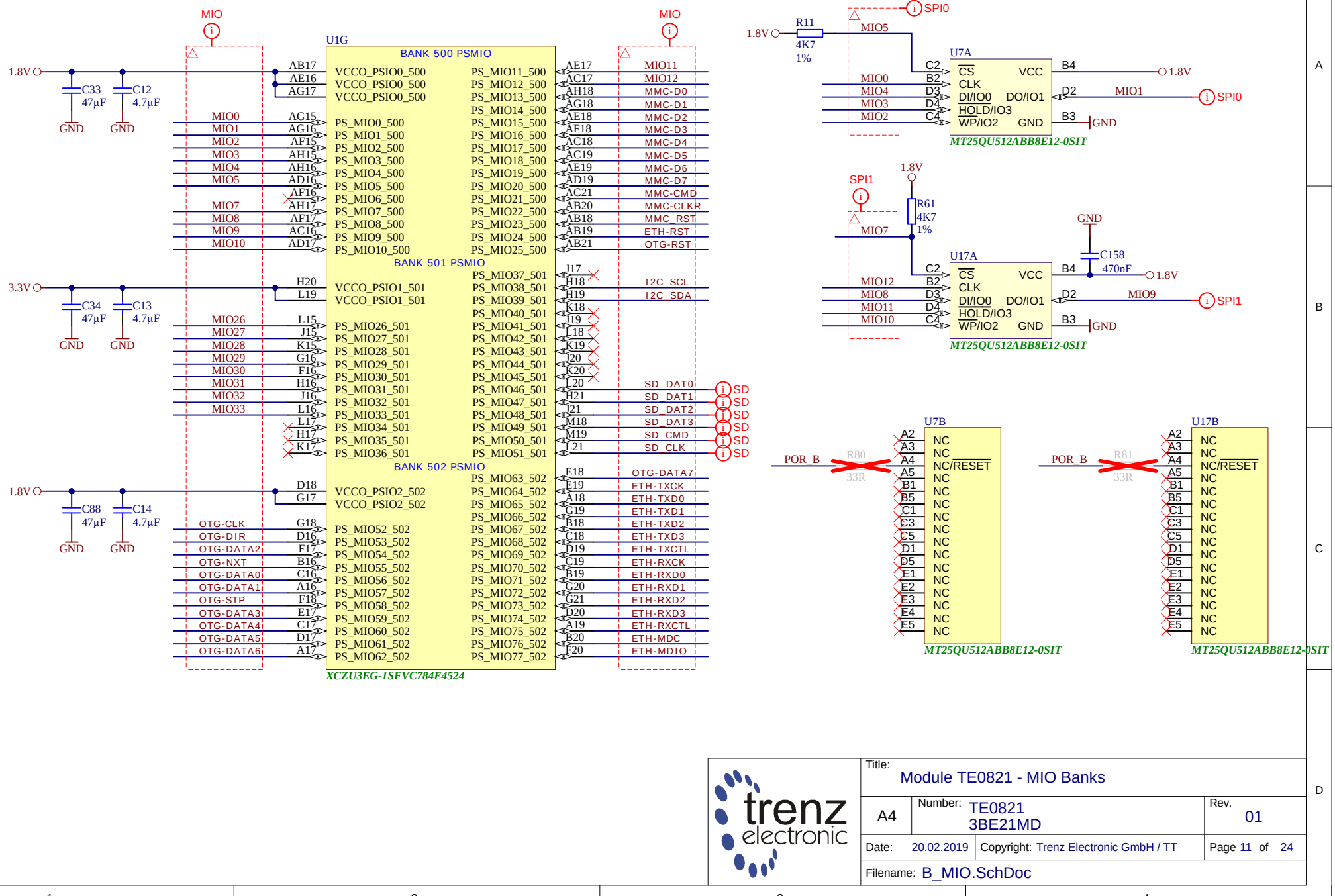
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT		Page 10 of 24
Filename: B66.SchDoc			



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Title: Module TE0821 - MIO Banks		
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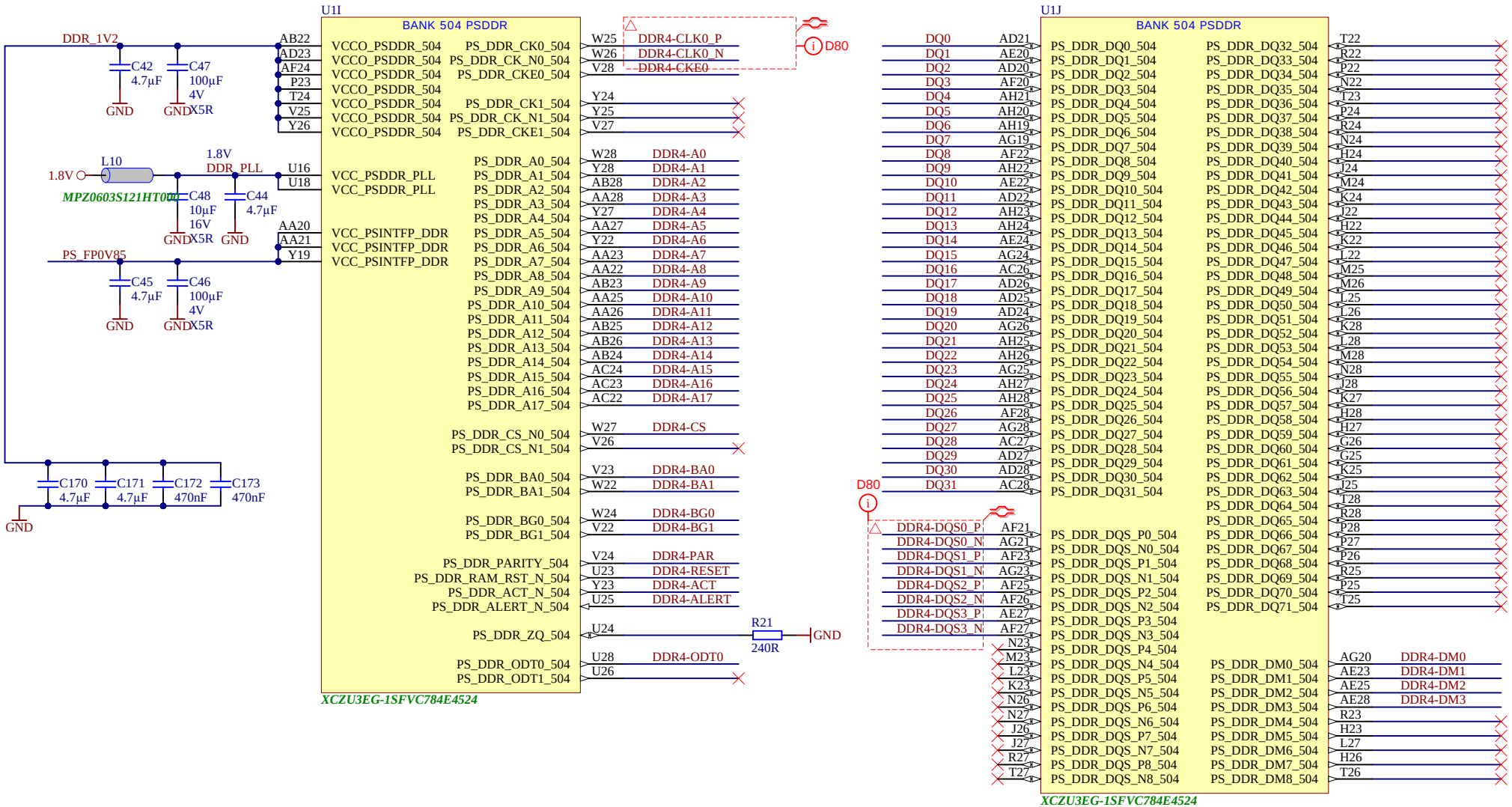
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 11 of 24
Filename: B_MIO.SchDoc		



trenz electronic	Title: Module TE0821 - PS DDR		
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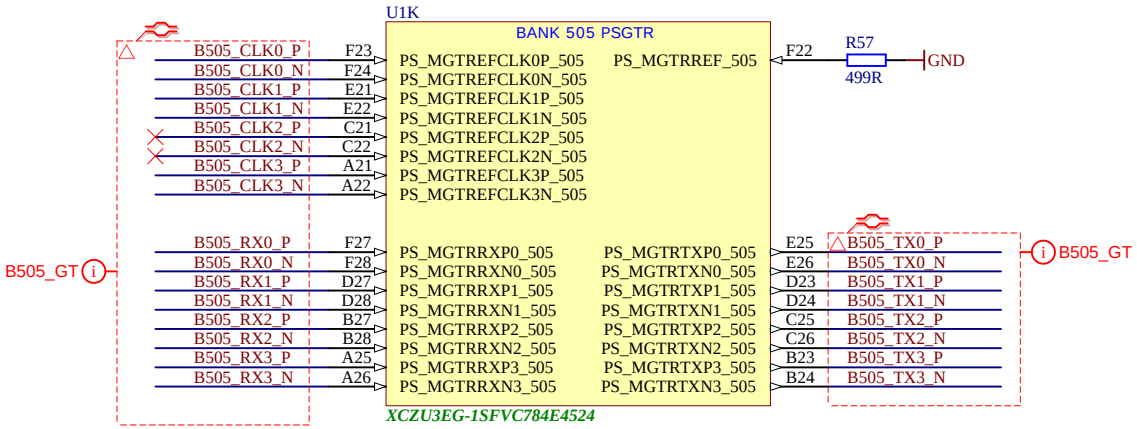
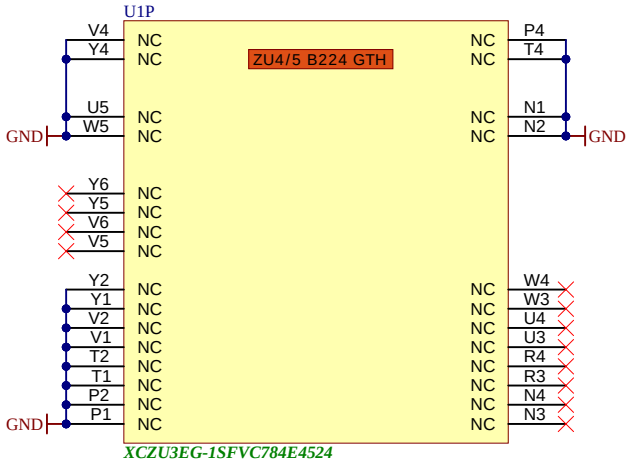
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT		Page 12 of 24
Filename: PS_DDR.SchDoc			





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Title: Module TE0821 - PS MGT			
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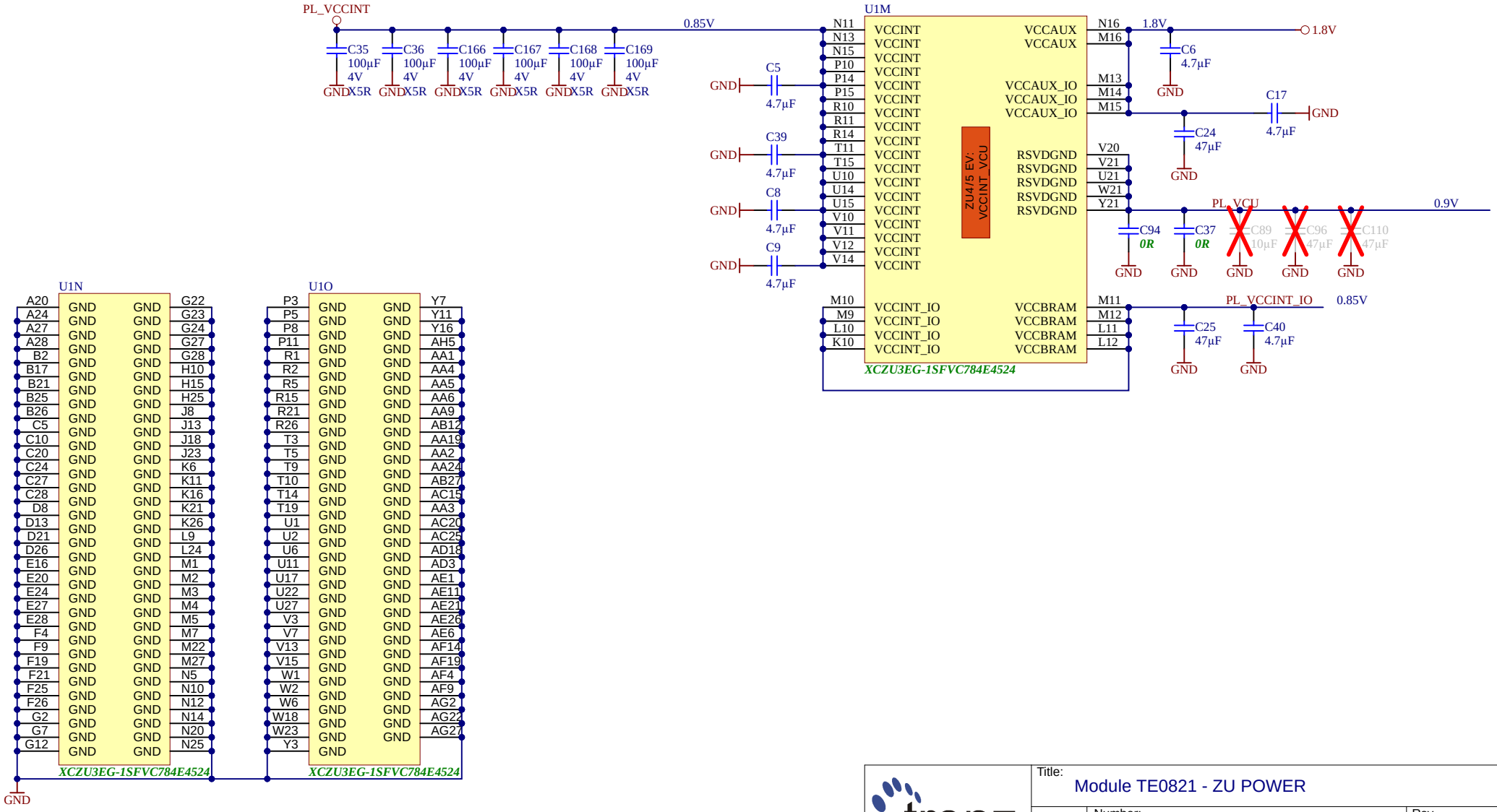
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT		Page 13 of 24
Filename: B_PS_GT.SchDoc			



trenz electronic	Title: Module TE0821 - ZU POWER	
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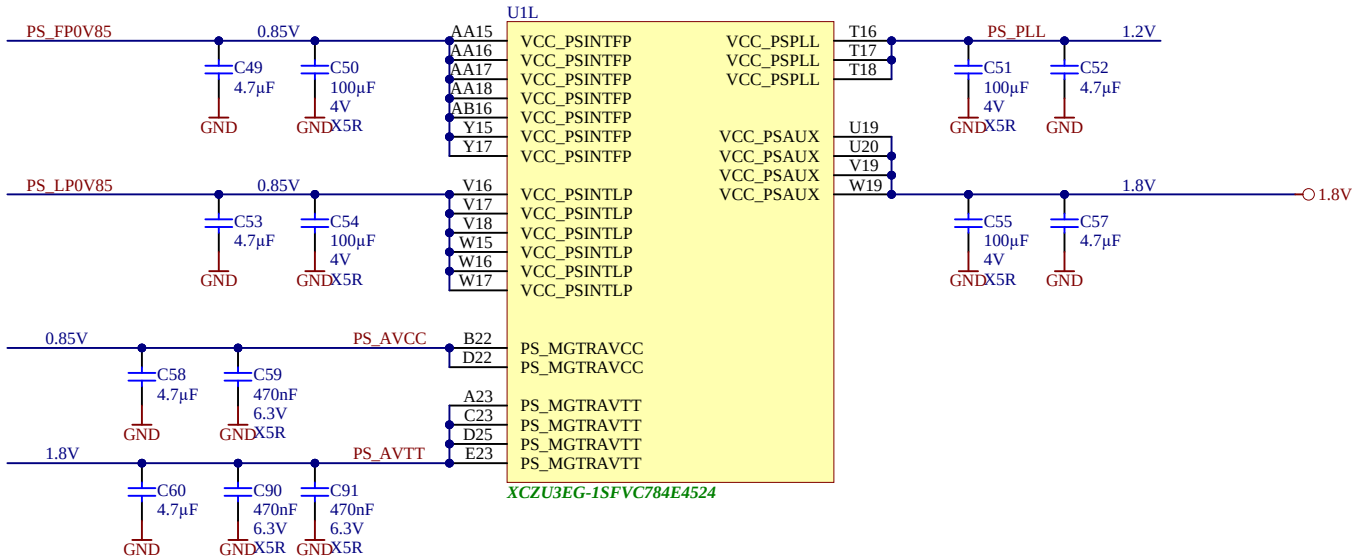
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 14 of 24
Filename: ZU_POWER.SchDoc		



trenz electronic	Title: Module TE0821 - ZU PS POWER		
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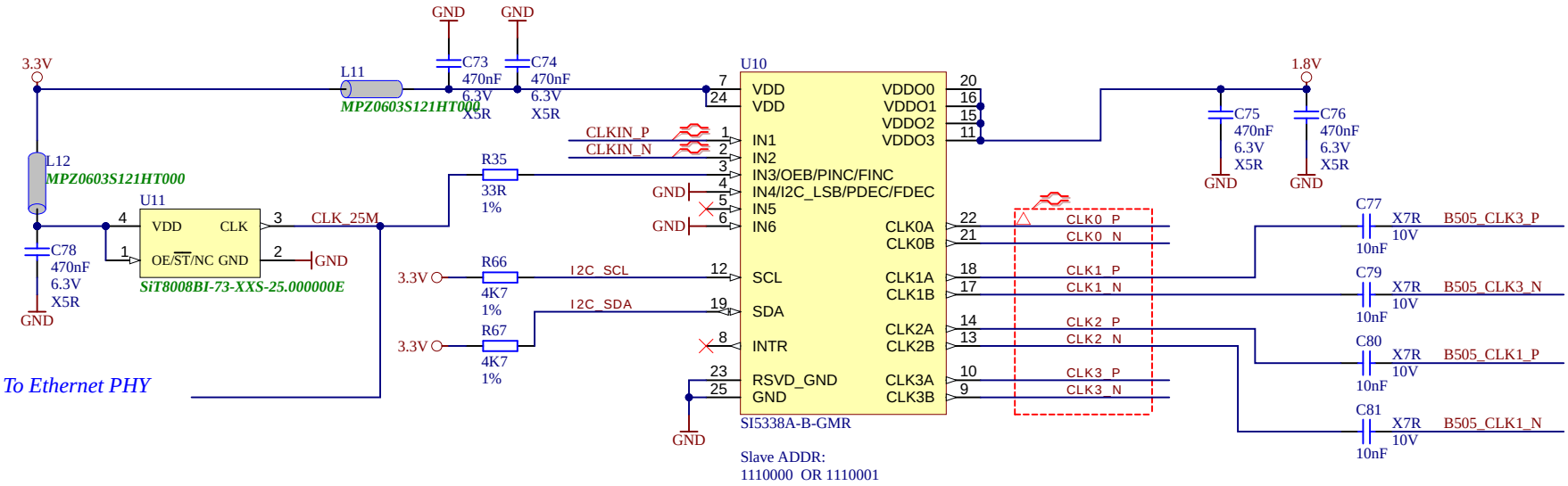
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT		Page 15 of 24
Filename: ZU_PS_POWER.SchDoc			



trenz electronic	Title: Module TE0821 - CLK		
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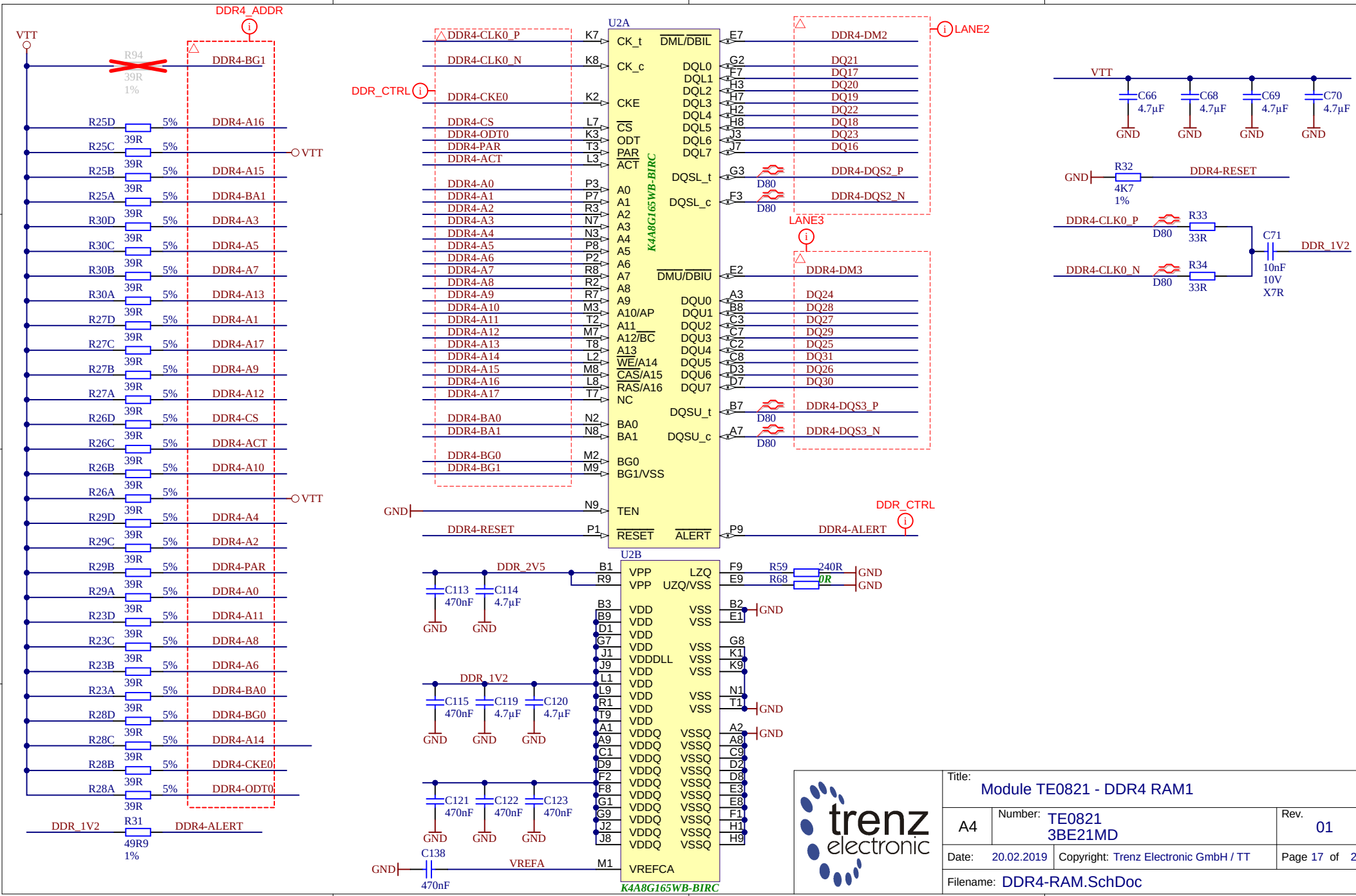
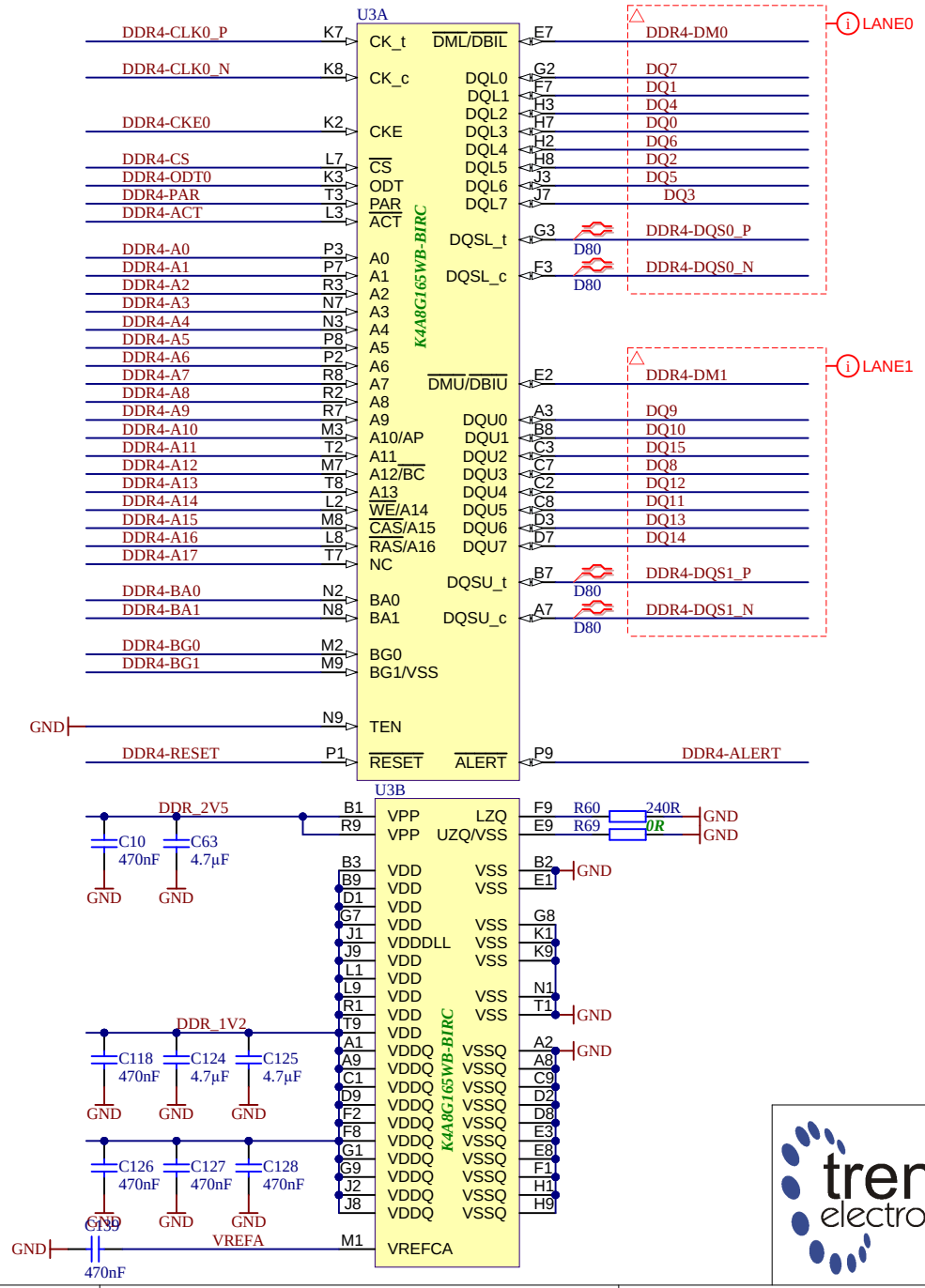
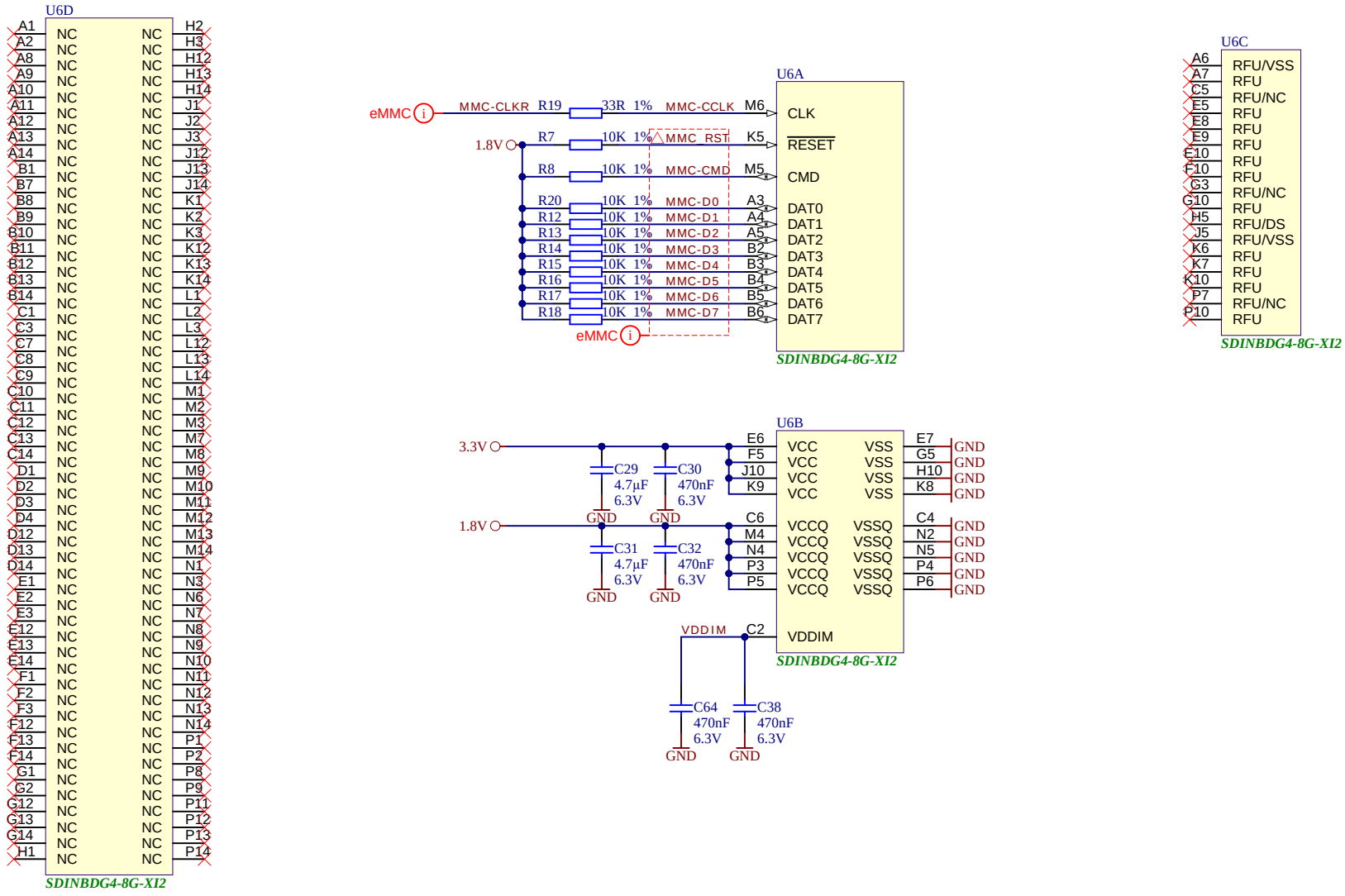
Date: 20.02.2019	Copyright: 2015 Trenz Electronic GmbH		Page 16 of 24
Filename: CLK.SchDoc			


DDR4_ADDR
VTT
R94
39R
1%
DDR4-BG1
R25D 39R 5% DDR4-A16
R25C 39R 5% VTT
R25B 39R 5% DDR4-A15
R25A 39R 5% DDR4-BA1
R30D 39R 5% DDR4-A3
R30C 39R 5% DDR4-A5
R30B 39R 5% DDR4-A7
R30A 39R 5% DDR4-A13
R27D 39R 5% DDR4-A1
R27C 39R 5% DDR4-A17
R27B 39R 5% DDR4-A9
R27A 39R 5% DDR4-A12
R26D 39R 5% DDR4-CS
R26C 39R 5% DDR4-ACT
R26B 39R 5% DDR4-A10
R26A 39R 5% VTT
R29D 39R 5% DDR4-A4
R29C 39R 5% DDR4-A2
R29B 39R 5% DDR4-PAR
R29A 39R 5% DDR4-A0
R23D 39R 5% DDR4-A11
R23C 39R 5% DDR4-A8
R23B 39R 5% DDR4-A6
R23A 39R 5% DDR4-BA0
R28D 39R 5% DDR4-BG0
R28C 39R 5% DDR4-A14
R28B 39R 5% DDR4-CKE0
R28A 39R 5% DDR4-ODT0
DDR_1V2 R31 49R9 1% DDR4-ALERT
U2A
DDR4-CLK0_P K7 CK_t
DDR4-CLK0_N K8 CK_c
DDR_CTRL
DDR4-CKE0 K2 CKE
DDR4-CS L7 CS
DDR4-ODT0 K3 ODT
DDR4-PAR T3 PAR
DDR4-ACT L3 ACT
DDR4-A0 P3 A0
DDR4-A1 P7 A1
DDR4-A2 R3 A2
DDR4-A3 N7 A3
DDR4-A4 N3 A4
DDR4-A5 P8 A5
DDR4-A6 P2 A6
DDR4-A7 R8 A7
DDR4-A8 R2 A8
DDR4-A9 R7 A9
DDR4-A10 M3 A10/AP
DDR4-A11 T2 A11
DDR4-A12 M7 A12/BC
DDR4-A13 T8 A13
DDR4-A14 L2 WE/A14
DDR4-A15 M8 CAS/A15
DDR4-A16 L8 RAS/A16
DDR4-A17 T7 NC
DDR4-BA0 N2 BA0
DDR4-BA1 N8 BA1
DDR4-BG0 M2 BG0
DDR4-BG1 M9 BG1/VSS
GND N9 TEN
DDR4-RESET P1 RESET
K4A8G165WB-BIRC
DML/DBIL E7 DDR4-DM2
DQL0 G2 DQ21
DQL1 E7 DQ17
DQL2 H3 DQ20
DQL3 H7 DQ19
DQL4 H2 DQ22
DQL5 H8 DQ18
DQL6 J3 DQ23
DQL7 J7 DQ16
DQSL_t G3 DDR4-DQS2_P
DQSL_c F3 DDR4-DQS2_N
D80
LANE2
LANE3
DMU/DBIU E2 DDR4-DM3
DQU0 A3 DQ24
DQU1 B8 DQ28
DQU2 C3 DQ27
DQU3 C7 DQ29
DQU4 C2 DQ25
DQU5 C8 DQ31
DQU6 D3 DQ26
DQU7 D7 DQ30
DQSU_t B7 DDR4-DQS3_P
DQSU_c A7 DDR4-DQS3_N
ALERT P9 DDR4-ALERT
DDR_CTRL
U2B
DDR_2V5
B1 VPP
R9 VPP
LZQ F9 R59 240R GND
UZQ/VSS E9 R68 0R GND
C113 470nF C114 4.7µF GND GND
VDD B3 B9 D1 G7
VSS B2 E1 GND
VDDDLL J1
VSS G8 K1
VDD J9 K9
VDD L1 L9
VSS N1
R1 T1 GND
T9
A1 A2 GND
VDDQ A9 A8
C1 C9
D9 D2
F2 D8
F8 E3
G1 E8
G9 F1
J2 H1
J8 H9
VSSQ
DDR_1V2
C115 470nF C119 4.7µF C120 4.7µF GND GND GND
C121 470nF C122 470nF C123 470nF GND GND GND
C138 470nF GND
VREFA M1 VREFCA
K4A8G165WB-BIRC
VTT
C66 4.7µF C68 4.7µF C69 4.7µF C70 4.7µF GND GND GND GND
GND R32 4K7 1% DDR4-RESET
DDR4-CLK0_P D80 R33 33R
DDR4-CLK0_N D80 R34 33R
C71 10nF 10V X7R DDR_1V2
trenz electronic
Title: Module TE0821 - DDR4 RAM1
A4
Number: TE0821 3BE21MD
Rev. 01
Date: 20.02.2019
Copyright: Trenz Electronic GmbH / TT
Page 17 of 24
Filename: DDR4-RAM.SchDoc

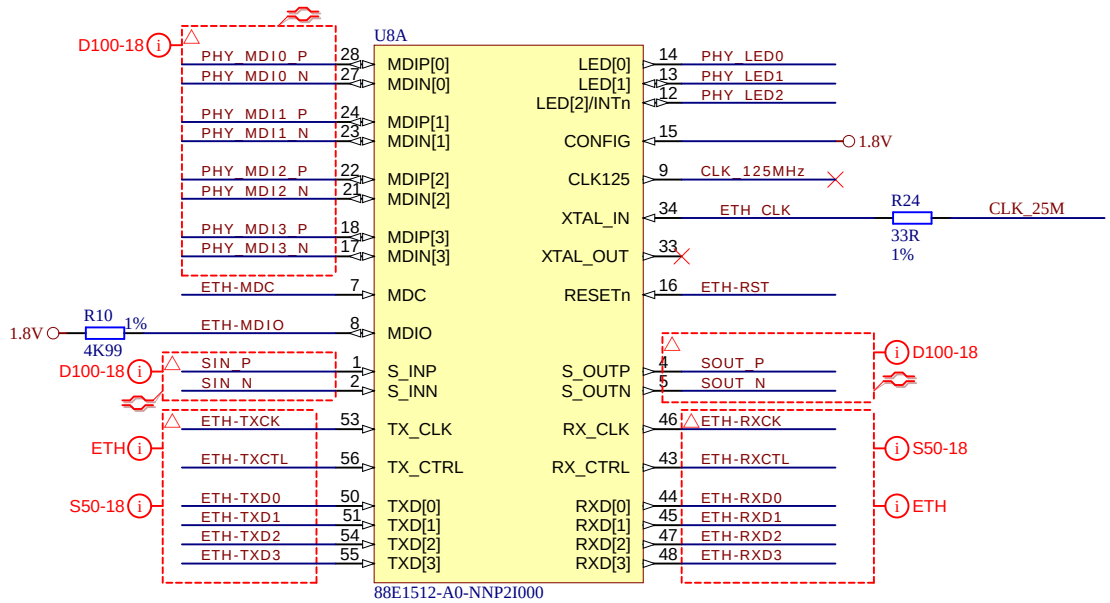


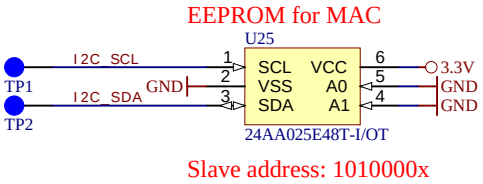
trenz electronic

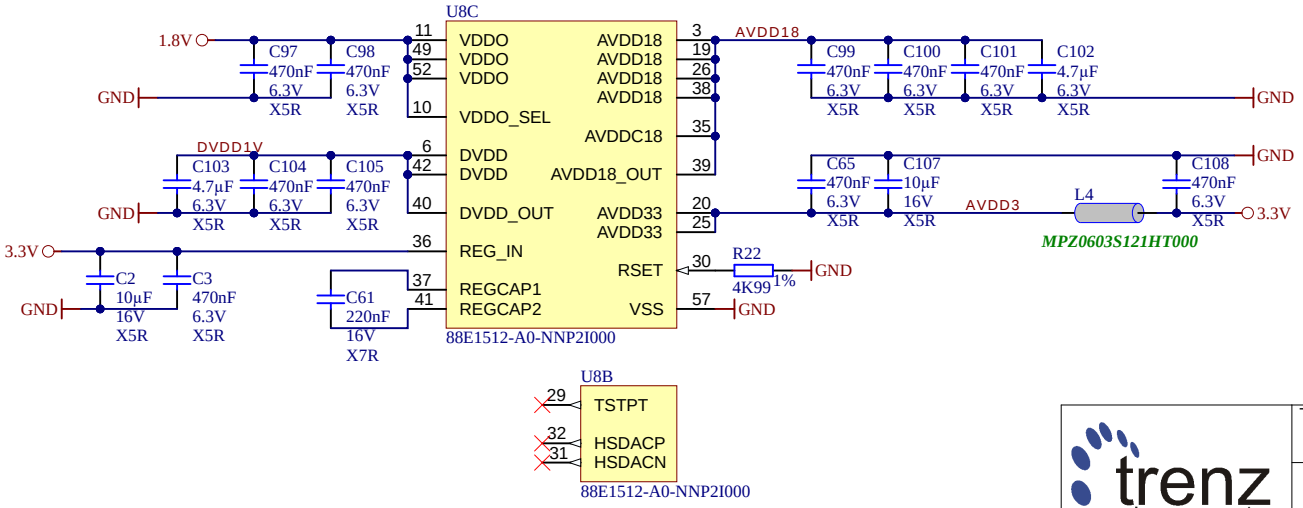
Title: Module TE0821 - DDR4 RAM2			
A4	Number: TE0821 3BE21MD		Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT		Page 18 of 24
Filename: DDR4-RAM_2.SchDoc			



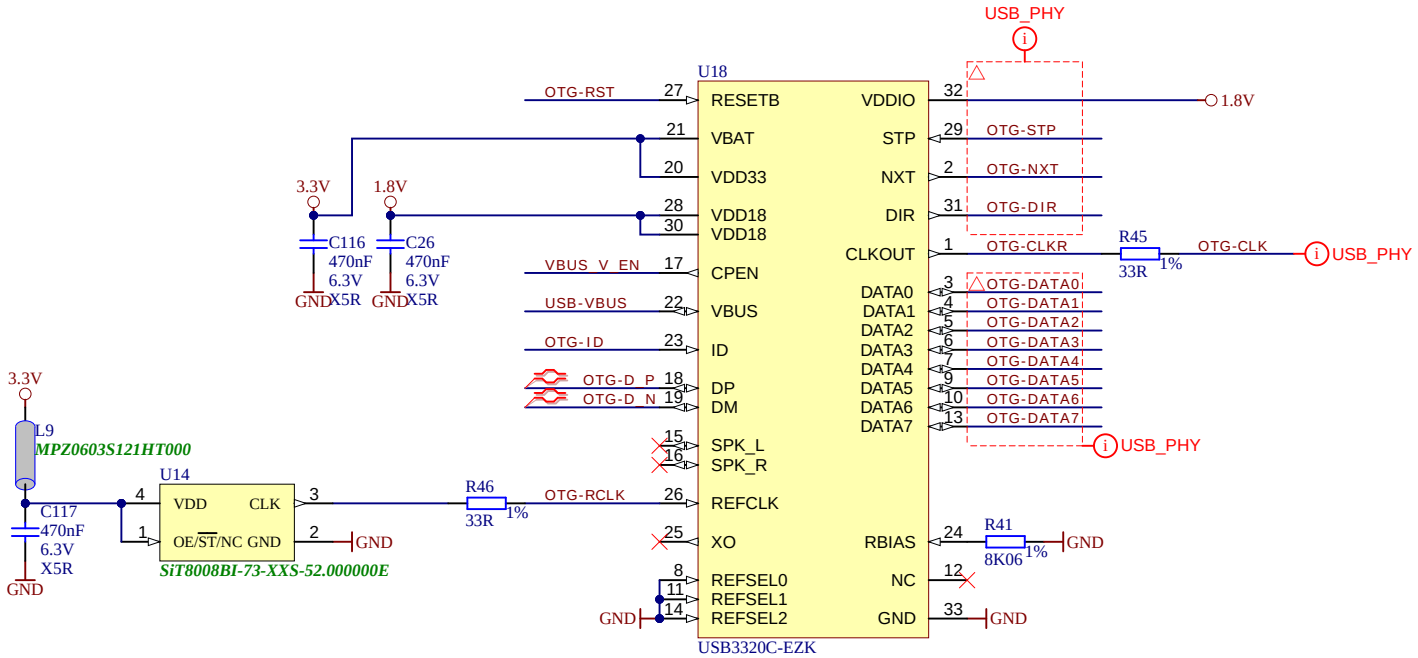
trenz electronic	Title: Module TE0821 - eMMC		
A4	Number: TE0821 3BE21MD		Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT		Page 19 of 24
Filename: eMMC.SchDoc			



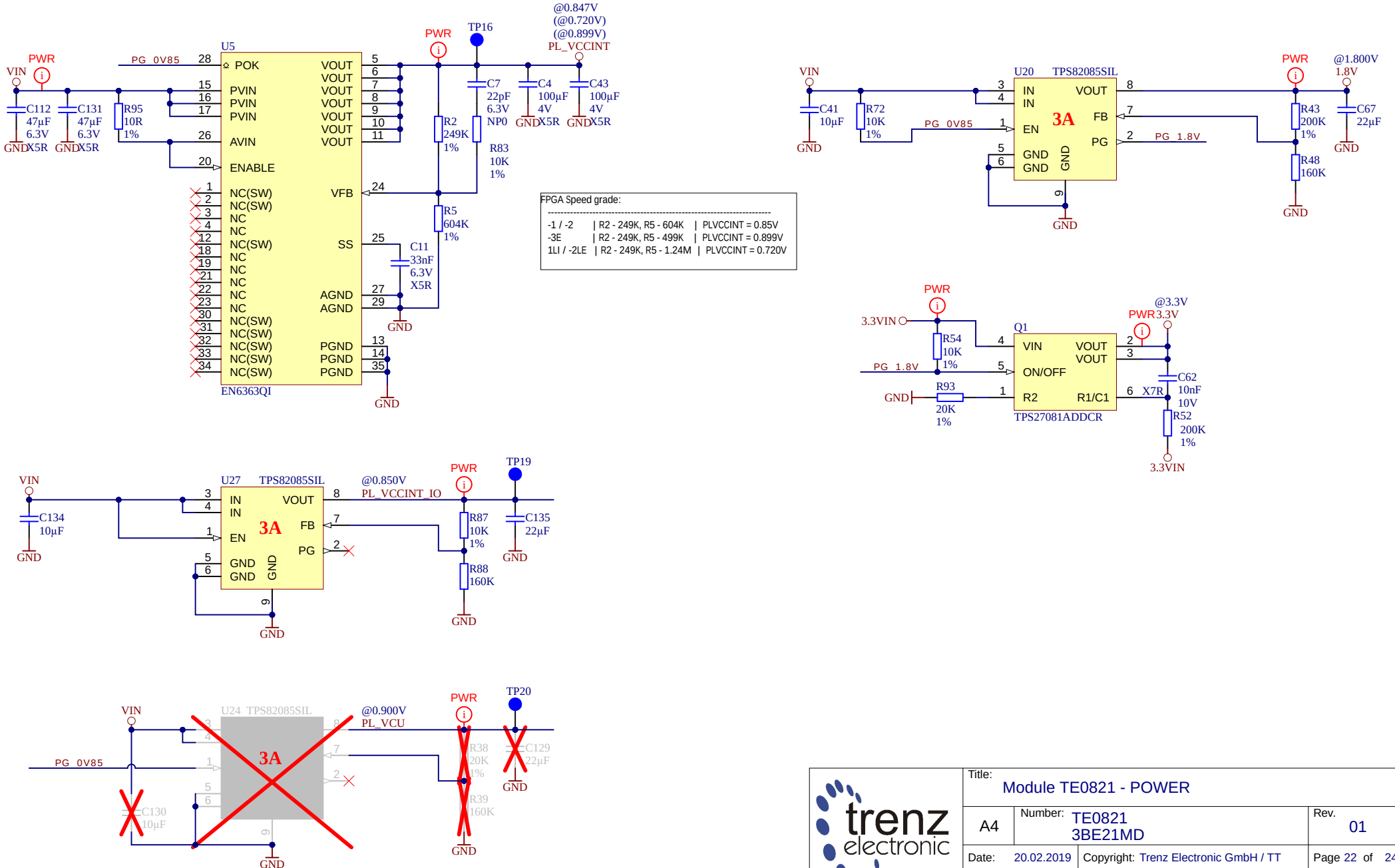




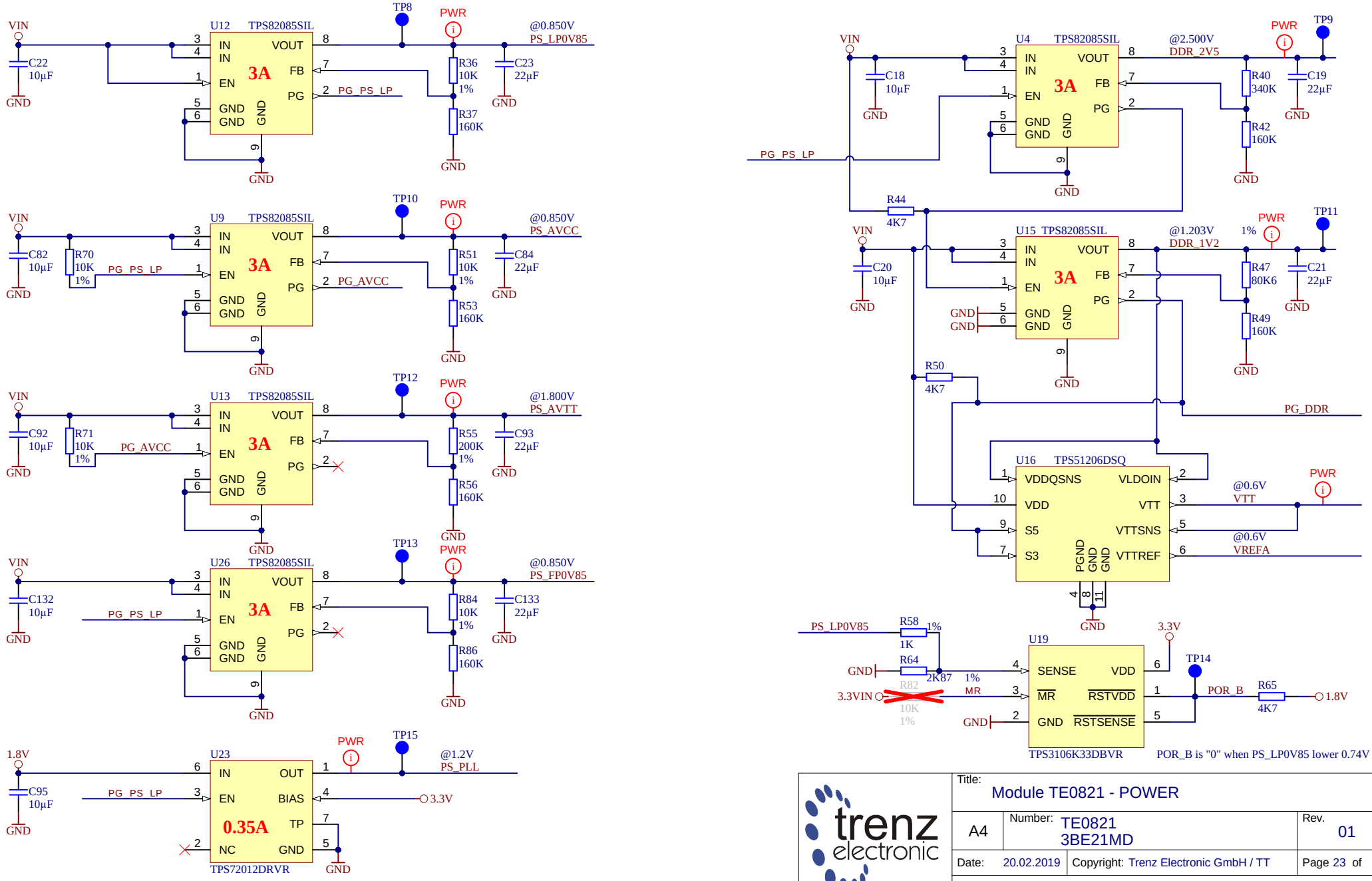
trenz electronic	Title: Module TE0821 - Ethernet PHY		
A4	Number: TE0821 3BE21MD		Rev. 01
Date: 20.02.2019	Copyright: 2015 Trenz Electronic GmbH		Page 20 of 24
Filename: ETH-PHY.SchDoc			



trenz electronic	Title: Module TE0821 - USB PHY		
	A4	Number: TE0821 3BE21MD	Rev. 01
	Date: 20.02.2019	Copyright: 2015 Trenz Electronic GmbH	Page 21 of 24
	Filename: USB-PHY.SchDoc		



trenz electronic	Title: Module TE0821 - POWER		
	A4	Number: TE0821 3BE21MD	Rev. 01
	Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT	Page 22 of 24
	Filename: POWER.SchDoc		


U12 TPS82085SIL
VIN
C22 10µF
GND
IN
IN
EN
GND
GND
VOUT
FB
PG
3A
TP8
PWR
@0.850V
PS_LP0V85
R36 10K 1%
R37 160K
C23 22µF
PG_PS_LP
U9 TPS82085SIL
C82 10µF
R70 10K 1%
TP10
@0.850V
PS_AVCC
R51 10K 1%
R53 160K
C84 22µF
PG_AVCC
U13 TPS82085SIL
C92 10µF
R71 10K 1%
TP12
@1.800V
PS_AVTT
R55 200K 1%
R56 160K
C93 22µF
U26 TPS82085SIL
C132 10µF
TP13
@0.850V
PS_FP0V85
R84 10K 1%
R86 160K
C133 22µF
1.8V
C95 10µF
U23
TPS72012DRVR
OUT
BIAS
TP
NC
0.35A
TP15
@1.2V
PS_PLL
3.3V
U4 TPS82085SIL
C18 10µF
TP9
@2.500V
DDR_2V5
R40 340K
R42 160K
C19 22µF
R44 4K7
U15 TPS82085SIL
C20 10µF
TP11
@1.203V
DDR_1V2
1%
R47 80K6
R49 160K
C21 22µF
R50 4K7
PG_DDR
U16 TPS51206DSQ
VDDQSNS
VLDOIN
VDD
VTT
S5
VTTSNS
S3
VTTREF
PGND
@0.6V
VTT
@0.6V
VREFA
R58 1% 1K
R64 2K87 1%
R82 10K 1%
MR
U19
SENSE
VDD
RSTVDD
RSTSENSE
TP14
POR_B
R65 4K7
1.8V
TPS3106K33DBVR
POR_B is "0" when PS_LP0V85 lower 0.74V
trenz electronic
Title: Module TE0821 - POWER
A4
Number: TE0821 3BE21MD
Rev. 01
Date: 20.02.2019
Copyright: Trenz Electronic GmbH / TT
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Filename: POWER_1.SchDoc

Revision 01a (01.07.2020):
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1. VY: R38 value was changed to 20K (was: 40K2) to set VCU 0.9V

Revision 01b (29.10.2020):
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1. VY: Updated Block diagram

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

Title: Module TE0821 - Revision Changes			
A4	Number: TE0821 3BE21MD		Rev. 01
Date: 20.02.2019	Copyright: Trenz Electronic GmbH / TT		Page 24 of 24
Filename: Revision Changes.SchDoc			