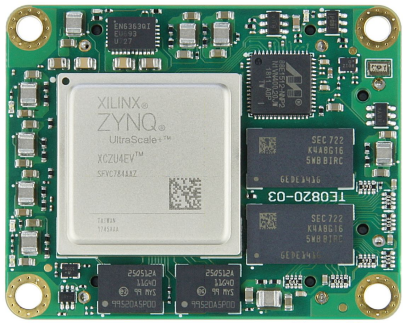
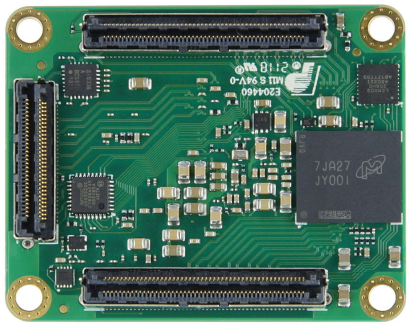


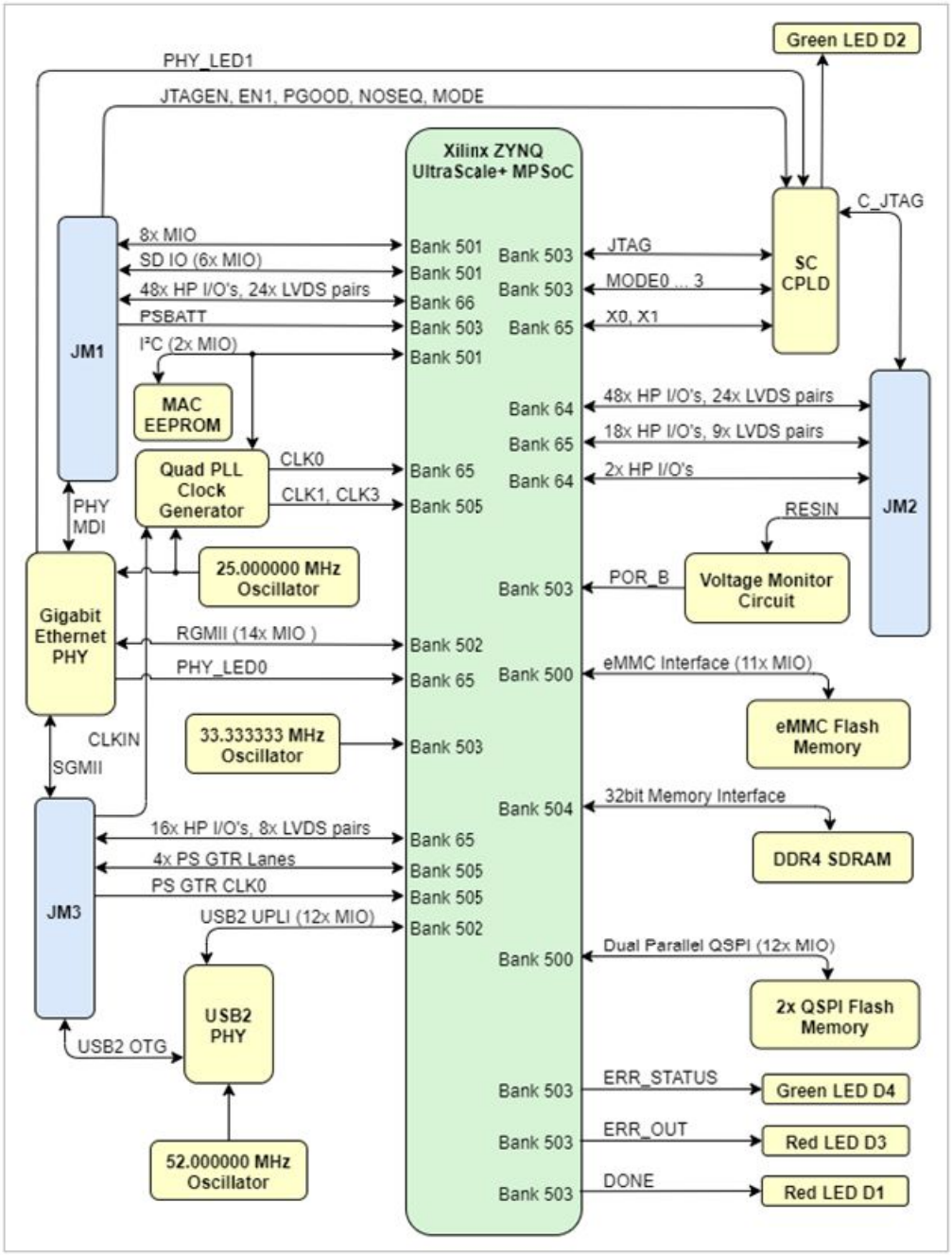


Regarding the usage of our schematics and alike documentation for Trenz module TE0820.

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. TE0820is 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!

trenz electronic	Title: TE0820 - Legal Notices		
A4	Number: TE0820 5DI21FA		Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page 1 of 23
Filename: Legal Notices Modules.SchDoc			



trenz electronic	Title: TE0820 - System Overview		
	A4	Number: TE0820 5DI21FA	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

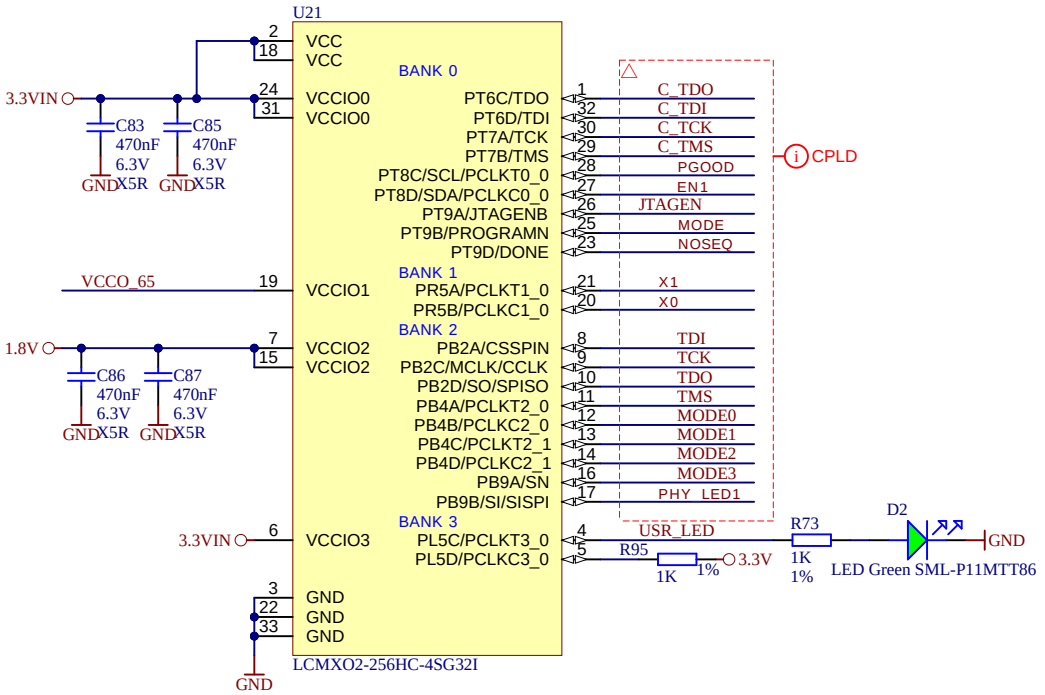
U_DDR4-RAM
DDR4-RAM.SchDoc

U_POWER
POWER.SchDoc

U_POWER_1
POWER_1.SchDoc

U_REV_CH
Revision Changes.SchDoc

U_LN
Legal Notices Modules.SchDoc



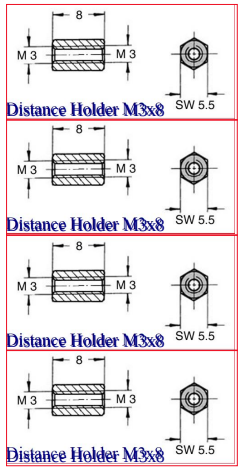
Special notes:

Serial
Serial
Serialnumber 6,3 x 6.3mm

PM1
FIDU-DOT - mini
PM2
FIDU-DOT - mini
PM3
FIDU-DOT - mini
PM4
FIDU-DOT - mini
PM5
FIDU-DOT - mini
PM6
FIDU-DOT - mini

Mount.Hole 3.2mm GND
Mount.Hole 3.2mm GND
Mount.Hole 3.2mm GND
Mount.Hole 3.2mm GND

Screw M3x4
Screw M3x4
Screw M3x4
Screw M3x4



Screw M3x6
Screw M3x6
Screw M3x6
Screw M3x6

Assembly variant	5DI21FA
Created by	VY
Modified by	VY
Modified at	2020-05-11
SVN Revision	12571

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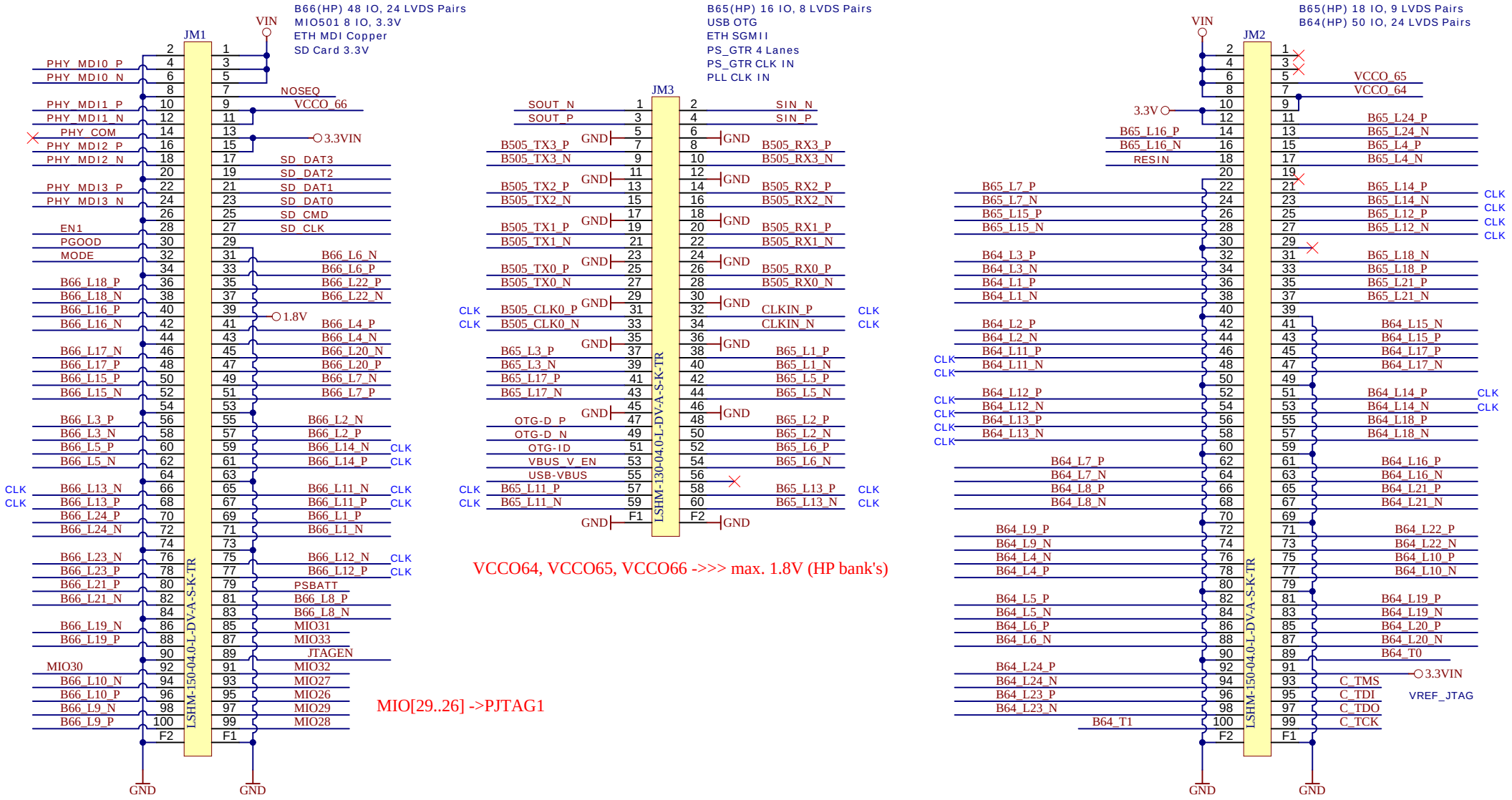
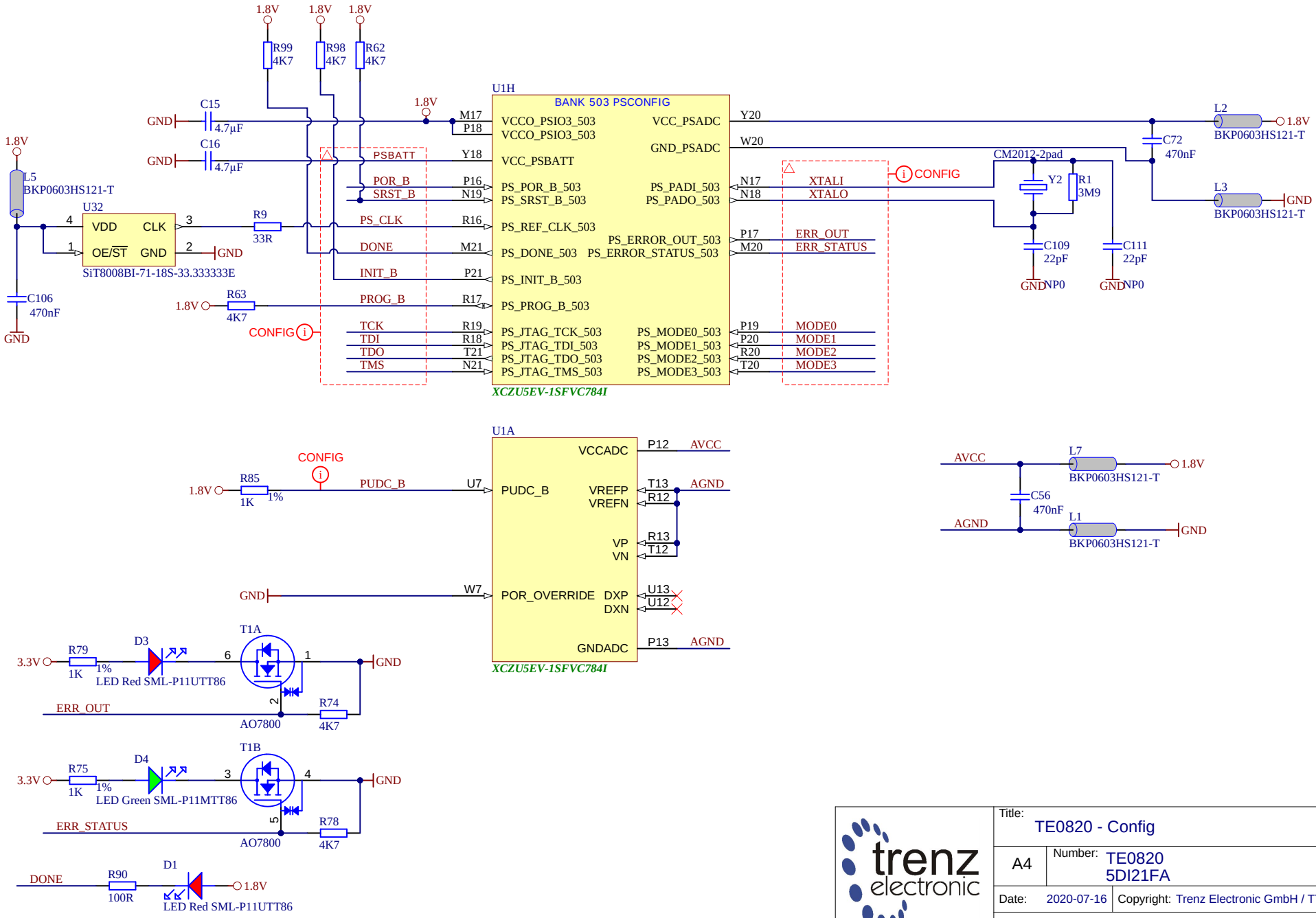
Title: TE0820		
A4	Number: TE0820 5DI21FA	Rev. 04
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH	Page3 of 23
Filename: TE0820.SchDoc		



trenz electronic	Title: TE0820 - B2B Connectors		
A4	Number: TE0820 5DI21FA		Rev. 04
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH		Page4 of 23
Filename: B2B-Connectors.SchDoc			



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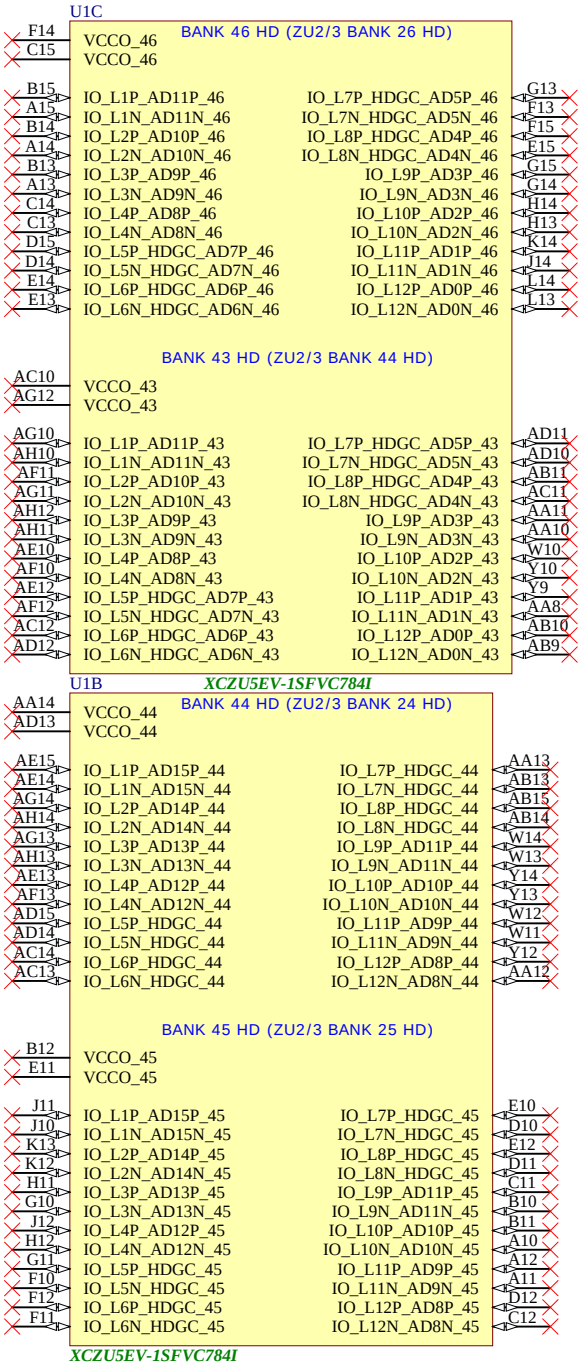
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page5 of 23
Filename: CONFIG.SchDoc		



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Title: TE0820 - HD Banks			
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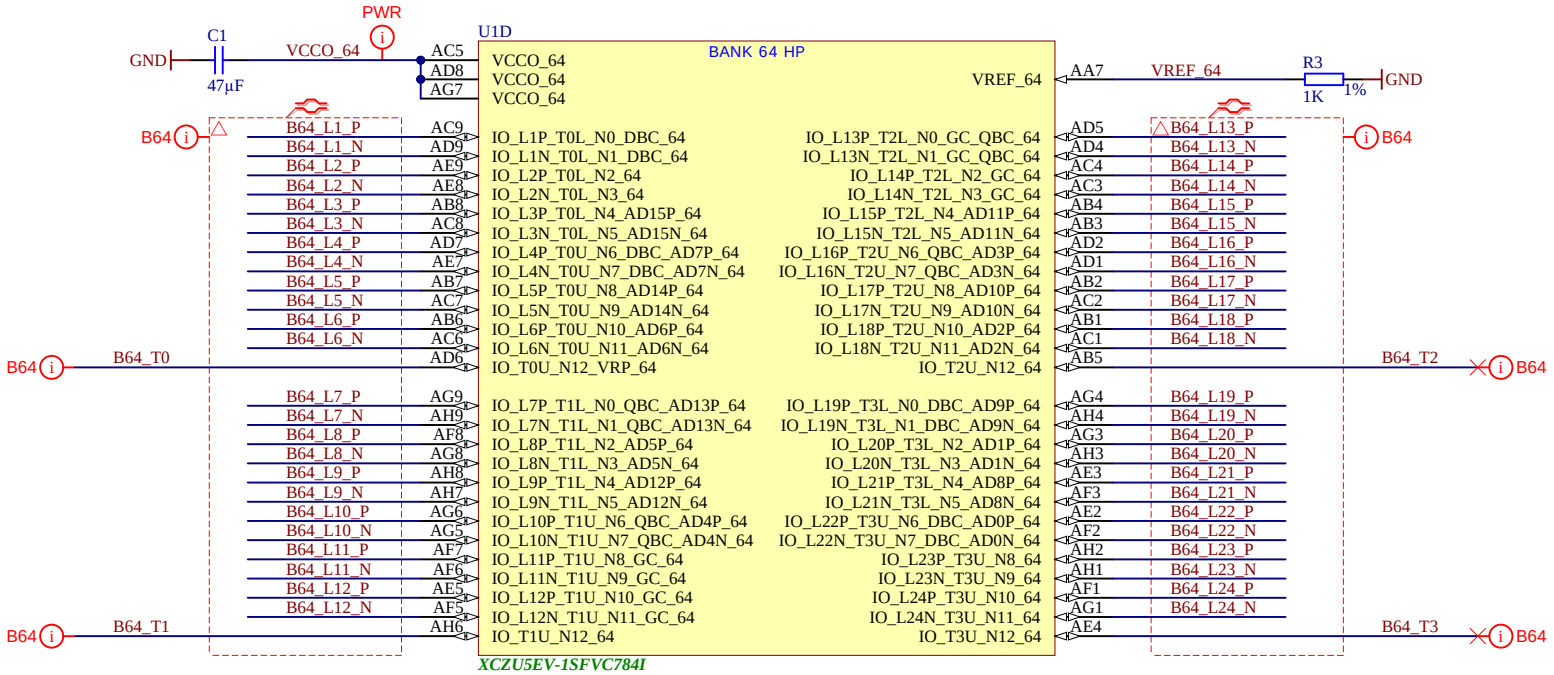
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page6 of 23
Filename: B_HD.SchDoc			



trenz electronic	Title: TE0820 - B64		
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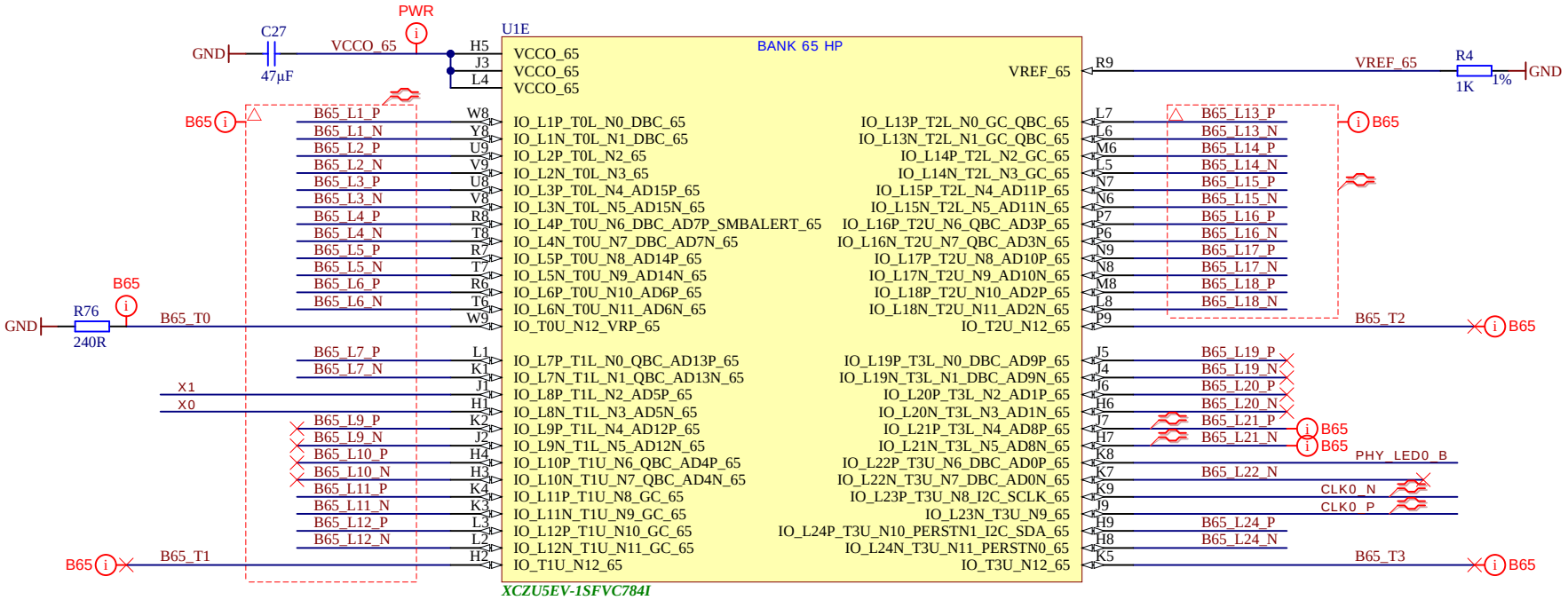
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page7 of 23
Filename: B64.SchDoc			



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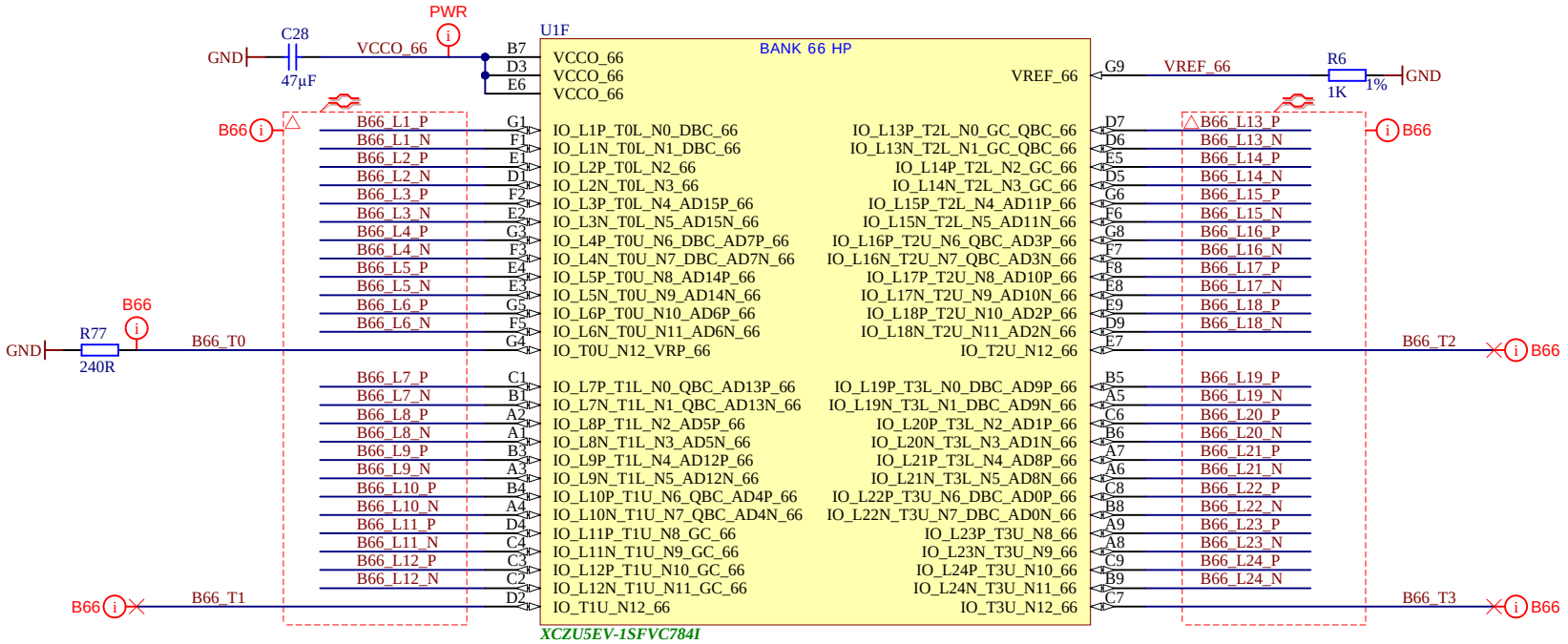
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page8 of 23
Filename: B65.SchDoc			



trenz electronic	Title: TE0820 - B66		
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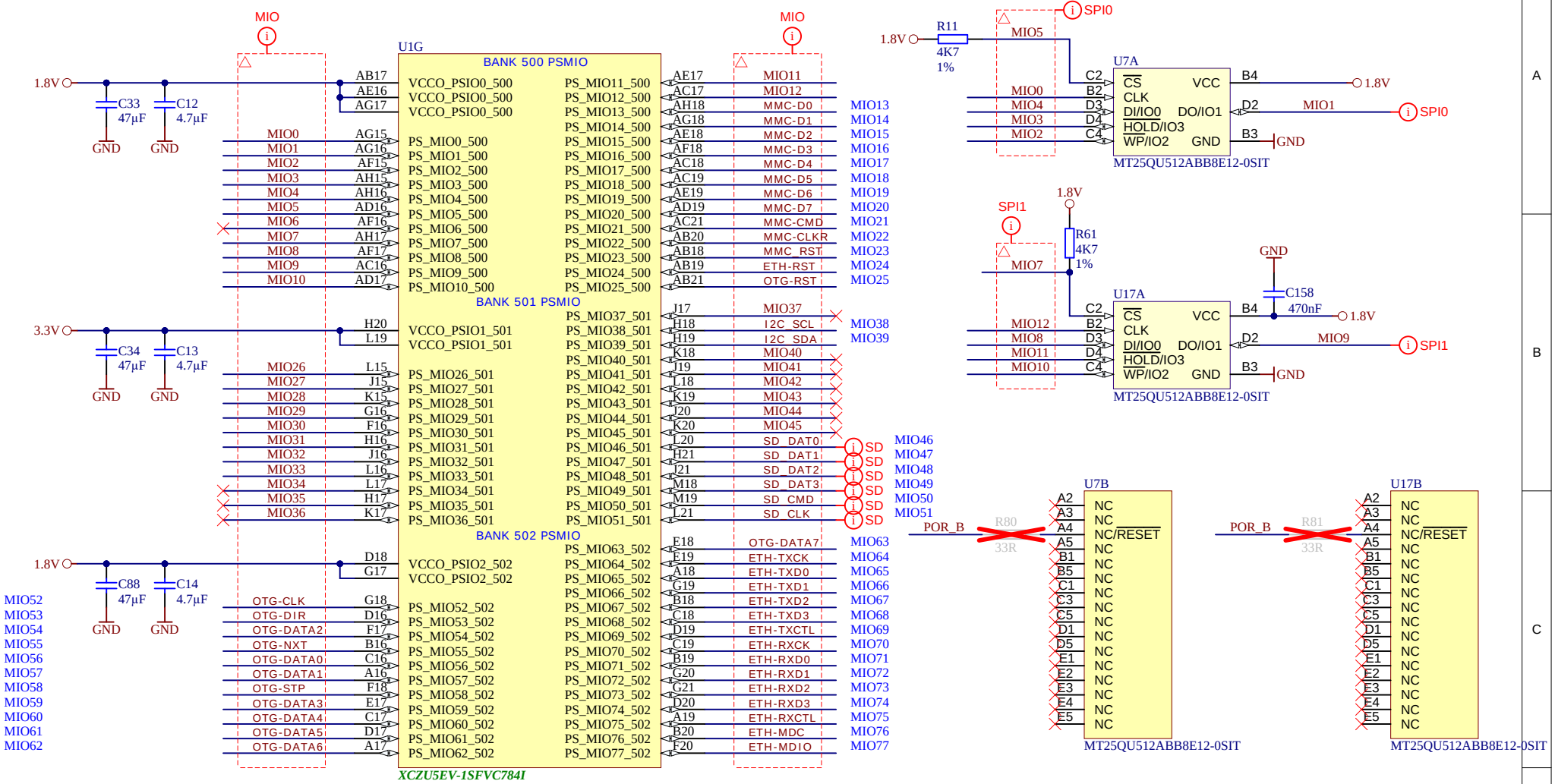
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page9 of 23
Filename: B66.SchDoc			



Title:	TE0820 - MIO Banks		
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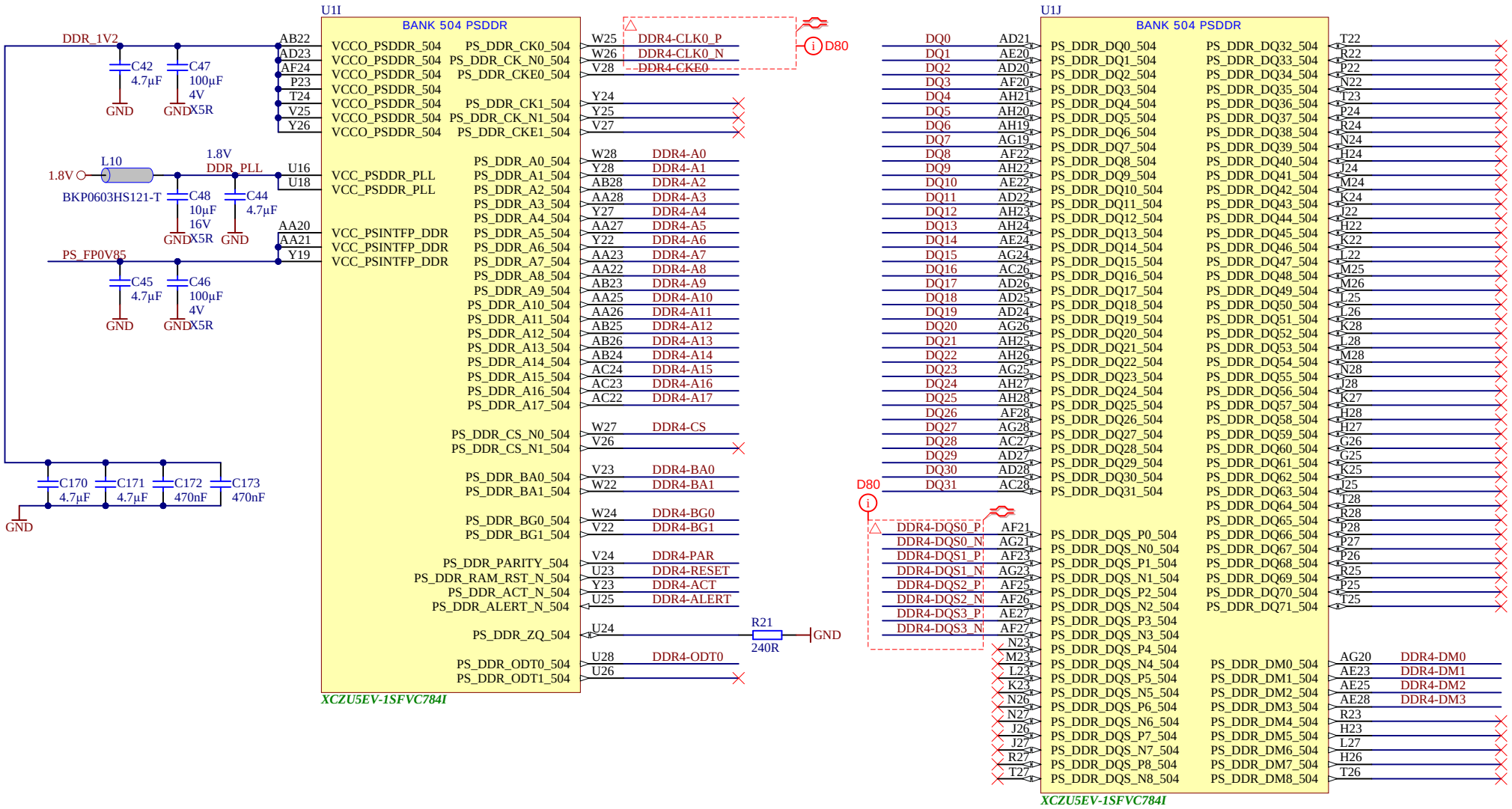
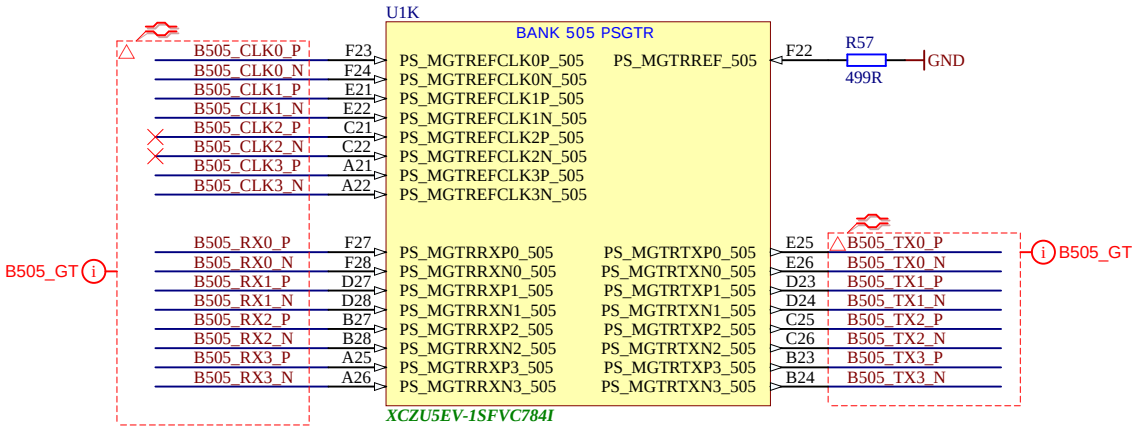
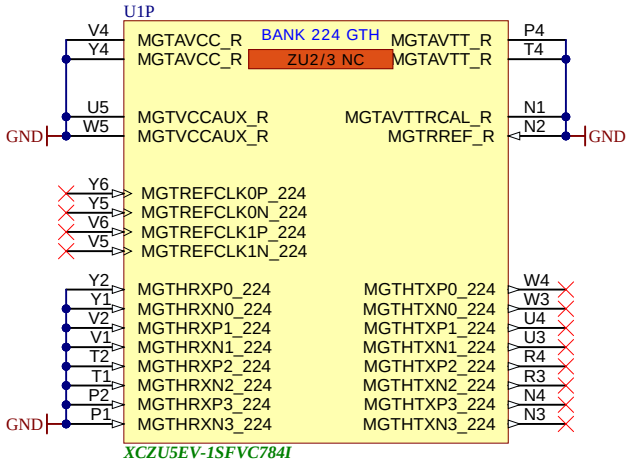
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page10 of 23
Filename:	B_MIO.SchDoc		



trenz electronic	Title: TE0820 - PS_DDR		
A4	Number: TE0820 5DI21FA		Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page11 of 23
Filename: PS_DDR.SchDoc			





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Title: TE0820 - PS_GT			
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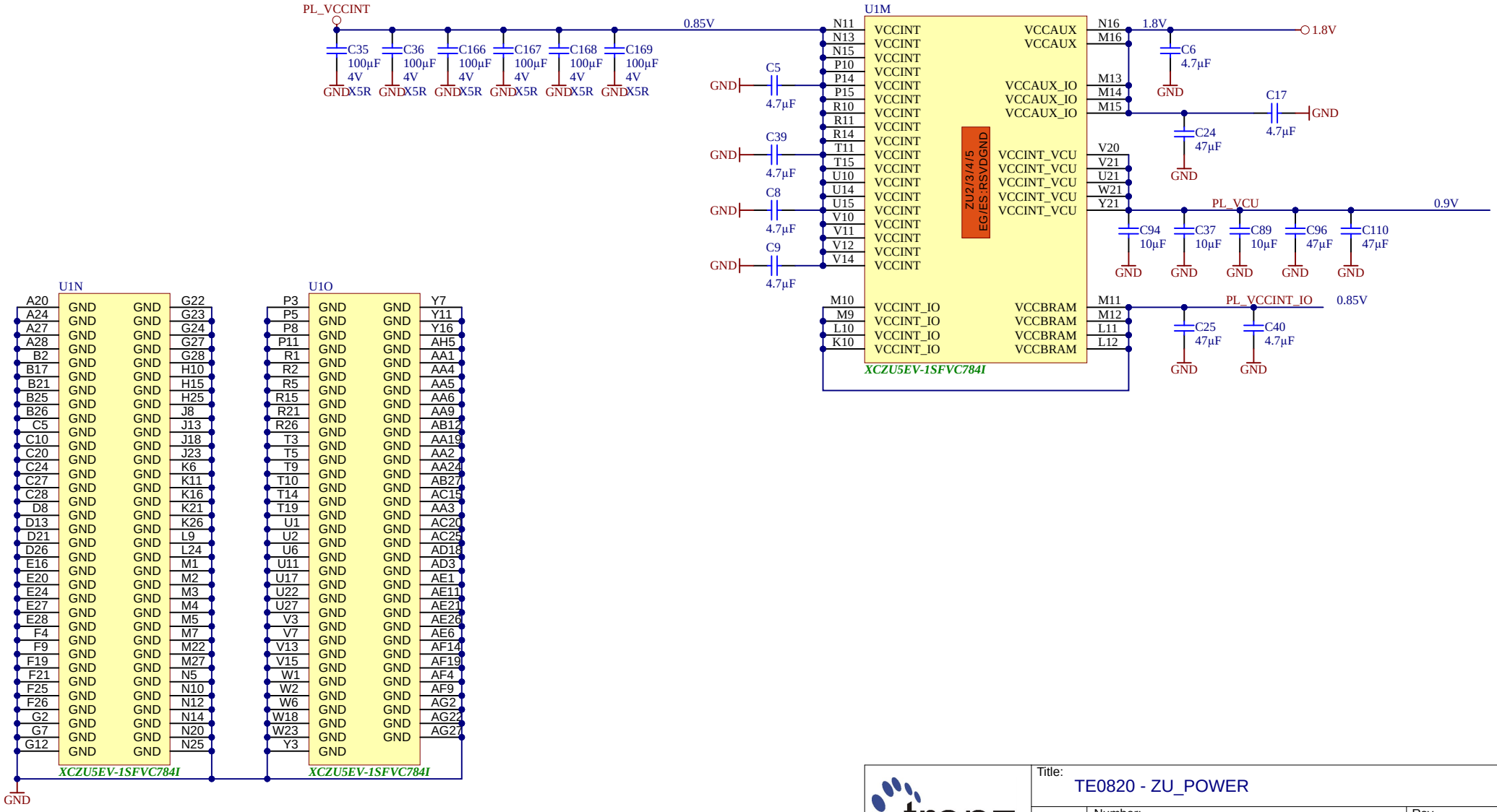
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page12 of 23
Filename: B_PS_GT.SchDoc			



trenz electronic	Title: TE0820 - ZU_POWER		
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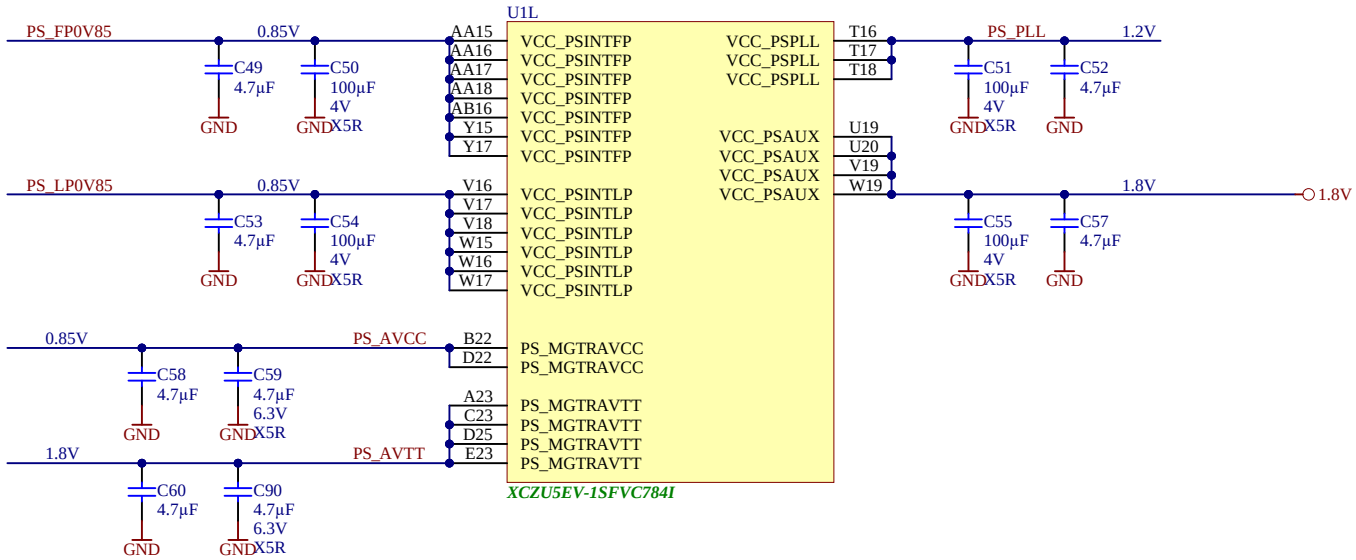
	Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page13 of 23
	Filename: ZU_POWER.SchDoc		



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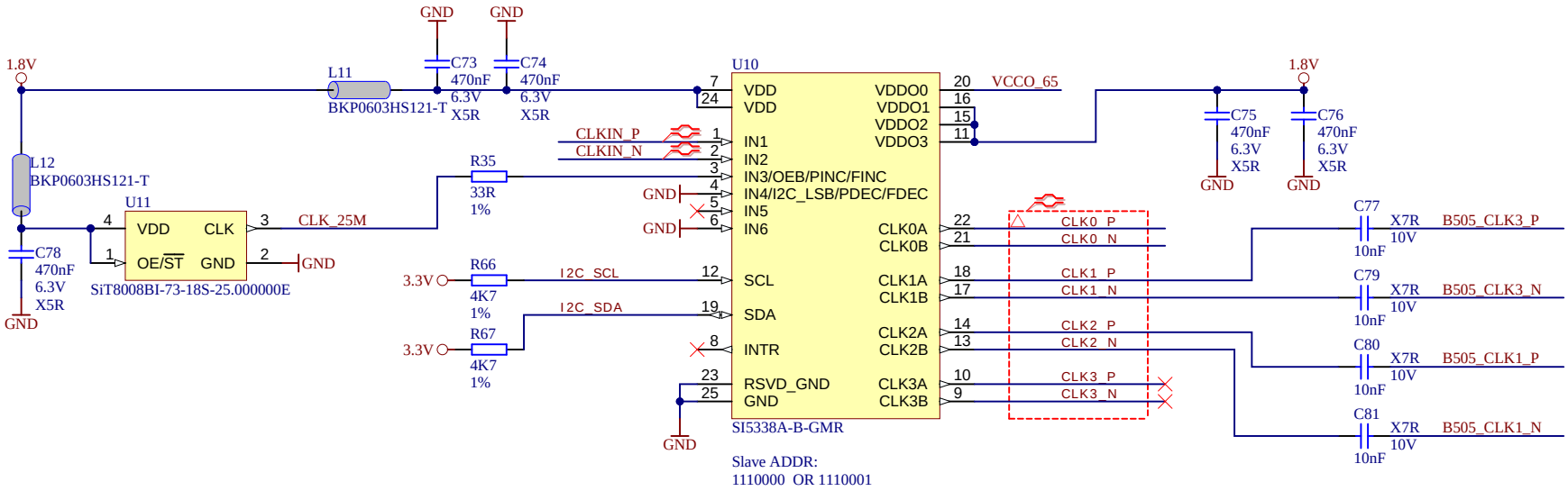
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page14 of 23
Filename: ZU_PS_POWER.SchDoc			



Title: TE0820 - CLK			
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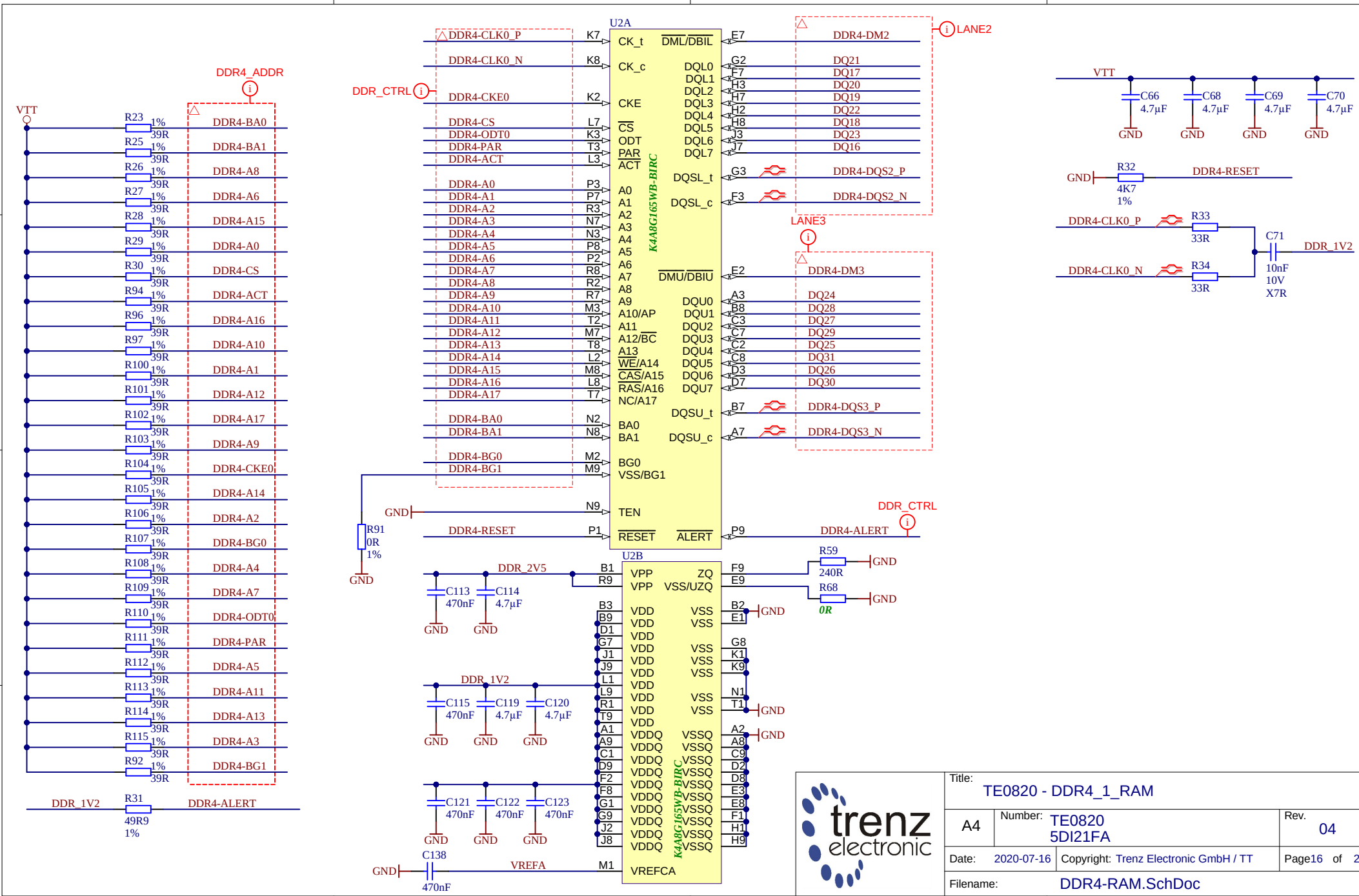
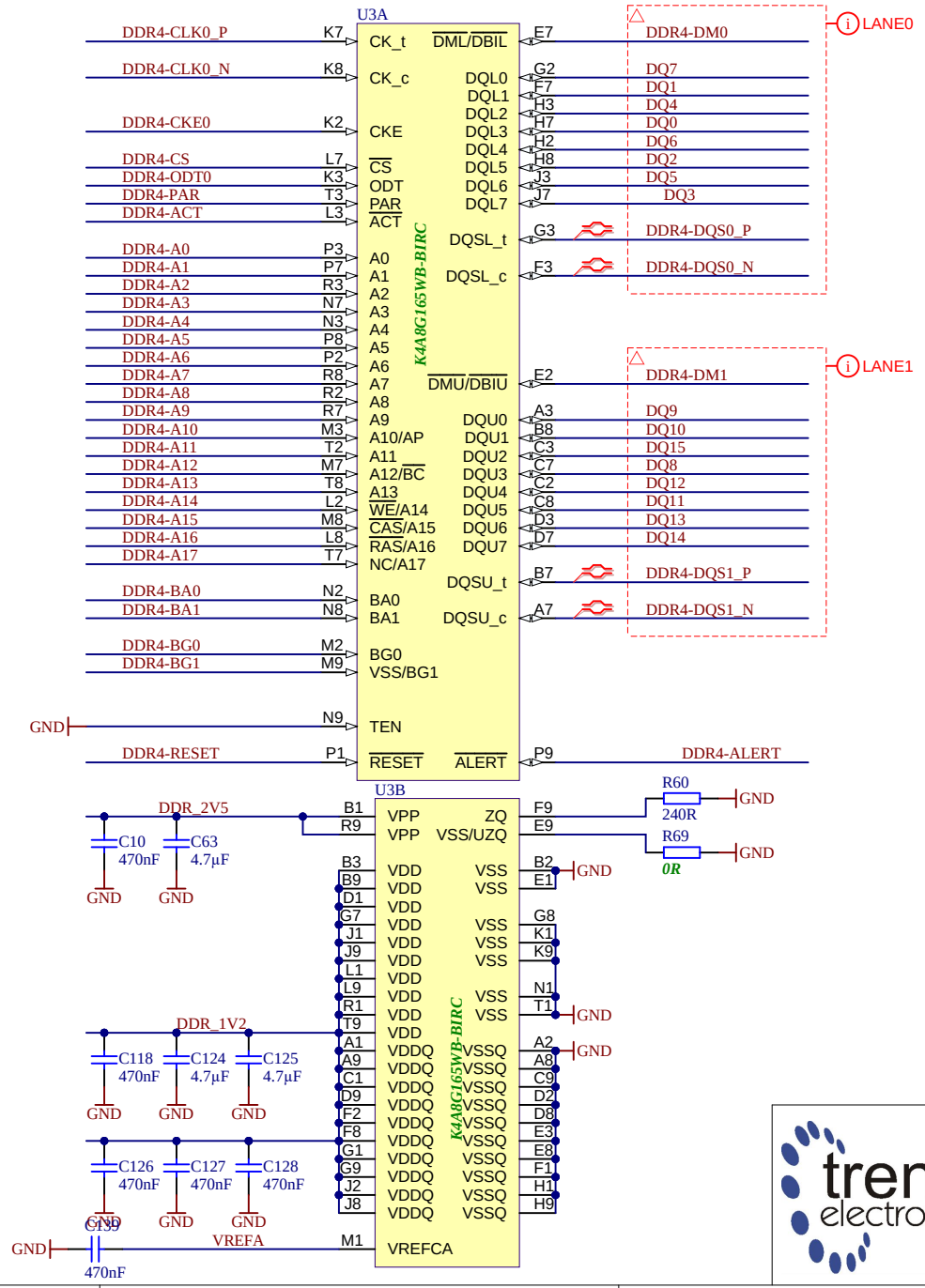
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH		Page15 of 23
Filename: CLK.SchDoc			


DDR4_ADDR
VTT
R23 1% 39R DDR4-BA0
R25 1% 39R DDR4-BA1
R26 1% 39R DDR4-A8
R27 1% 39R DDR4-A6
R28 1% 39R DDR4-A15
R29 1% 39R DDR4-A0
R30 1% 39R DDR4-CS
R94 1% 39R DDR4-ACT
R96 1% 39R DDR4-A16
R97 1% 39R DDR4-A10
R100 1% 39R DDR4-A1
R101 1% 39R DDR4-A12
R102 1% 39R DDR4-A17
R103 1% 39R DDR4-A9
R104 1% 39R DDR4-CKE0
R105 1% 39R DDR4-A14
R106 1% 39R DDR4-A2
R107 1% 39R DDR4-BG0
R108 1% 39R DDR4-A4
R109 1% 39R DDR4-A7
R110 1% 39R DDR4-ODT0
R111 1% 39R DDR4-PAR
R112 1% 39R DDR4-A5
R113 1% 39R DDR4-A11
R114 1% 39R DDR4-A13
R115 1% 39R DDR4-A3
R92 1% 39R DDR4-BG1
DDR_1V2
R31 49R9 1%
DDR4-ALERT
U2A
DDR_CTRL
DDR4-CLK0_P
DDR4-CLK0_N
DDR4-CKE0
DDR4-CS
DDR4-ODT0
DDR4-PAR
DDR4-ACT
DDR4-A0
DDR4-A1
DDR4-A2
DDR4-A3
DDR4-A4
DDR4-A5
DDR4-A6
DDR4-A7
DDR4-A8
DDR4-A9
DDR4-A10
DDR4-A11
DDR4-A12
DDR4-A13
DDR4-A14
DDR4-A15
DDR4-A16
DDR4-A17
DDR4-BA0
DDR4-BA1
DDR4-BG0
DDR4-BG1
CK_t
CK_c
CKE
CS
ODT
PAR
ACT
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10/AP
A11
A12/BC
A13
WE/A14
CAS/A15
RAS/A16
NC/A17
BA0
BA1
BG0
VSS/BG1
TEN
RESET
K4A8G165WB-BIRC
DML/DBIL
DQL0
DQL1
DQL2
DQL3
DQL4
DQL5
DQL6
DQL7
DQSL_t
DQSL_c
DMU/DBIU
DQU0
DQU1
DQU2
DQU3
DQU4
DQU5
DQU6
DQU7
DQSU_t
DQSU_c
ALERT
LANE2
DDR4-DM2
DQ21
DQ17
DQ20
DQ19
DQ22
DQ18
DQ23
DQ16
DDR4-DQS2_P
DDR4-DQS2_N
LANE3
DDR4-DM3
DQ24
DQ28
DQ27
DQ29
DQ25
DQ31
DQ26
DQ30
DDR4-DQS3_P
DDR4-DQS3_N
DDR4-RESET
DDR4-ALERT
R91 0R 1%
GND
U2B
DDR_2V5
VPP
VPP
VDD
VDDQ
VSS
VSSQ
ZQ
VSS/UZQ
VREFCA
VREFA
R59 240R
R68 0R
C113 470nF
C114 4.7µF
C115 470nF
C119 4.7µF
C120 4.7µF
C121 470nF
C122 470nF
C123 470nF
C138 470nF
VTT
C66 4.7µF
C68 4.7µF
C69 4.7µF
C70 4.7µF
R32 4K7 1%
R33 33R
R34 33R
C71 10nF 10V X7R
DDR_1V2
trenz electronic
Title: TE0820 - DDR4_1_RAM
A4
Number: TE0820 5DI21FA
Rev. 04
Date: 2020-07-16
Copyright: Trenz Electronic GmbH / TT
Page16 of 23
Filename: DDR4-RAM.SchDoc



trenz electronic	Title: TE0820 - DDR4_2_RAM		
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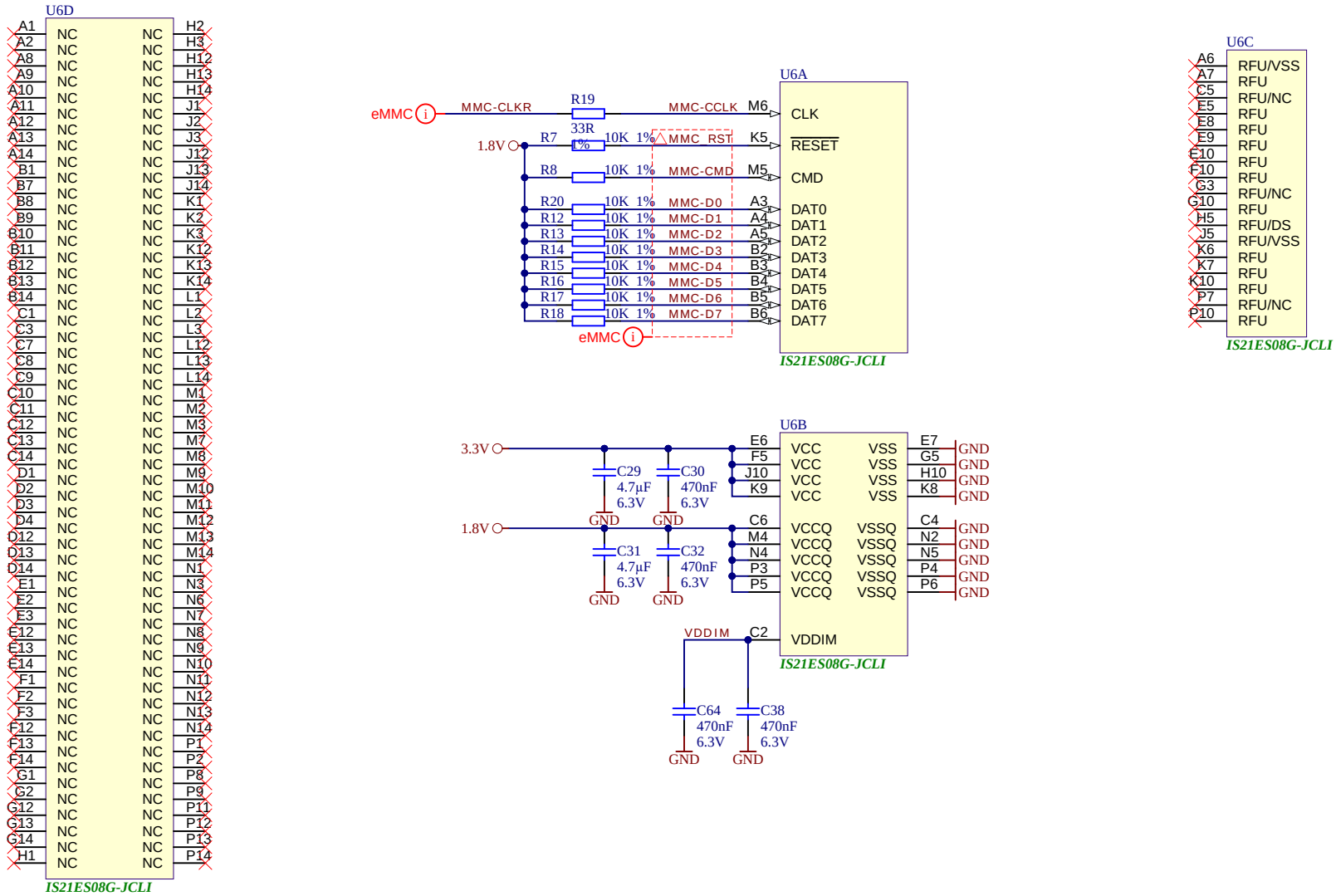
	Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT	Page17 of 23
	Filename: DDR4-RAM_2.SchDoc		



Title: TE0820 - eMMC			
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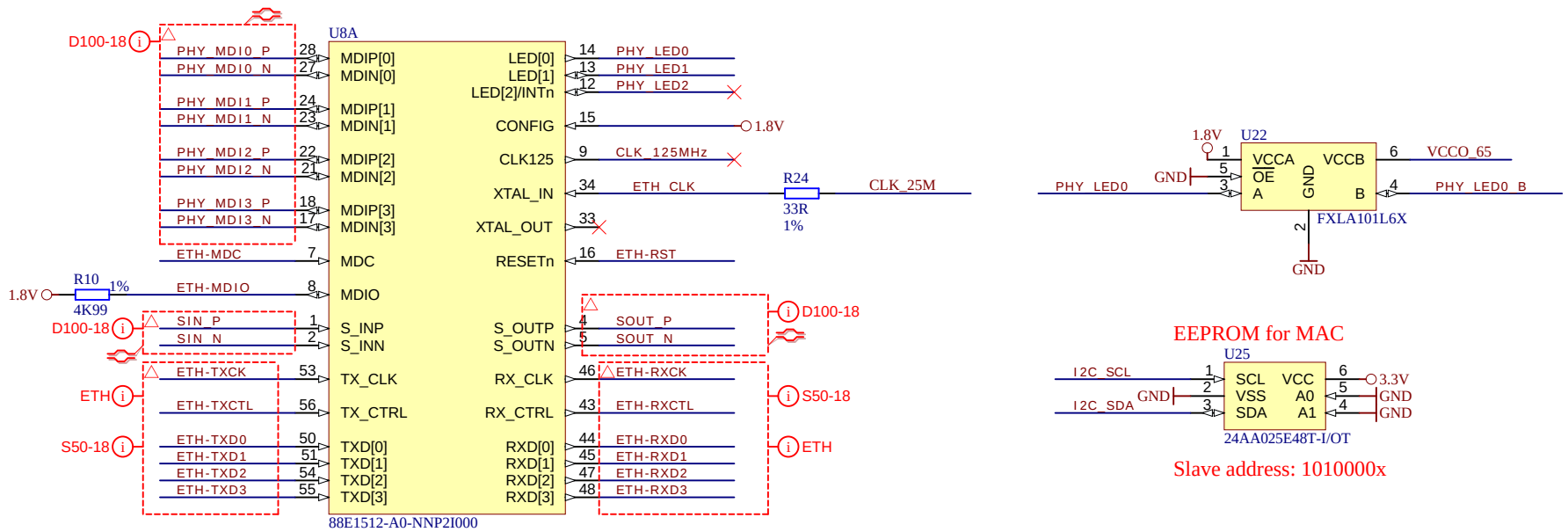
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page18 of 23
Filename: eMMC.SchDoc			



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Title: TE0820 - Eth_PHY			
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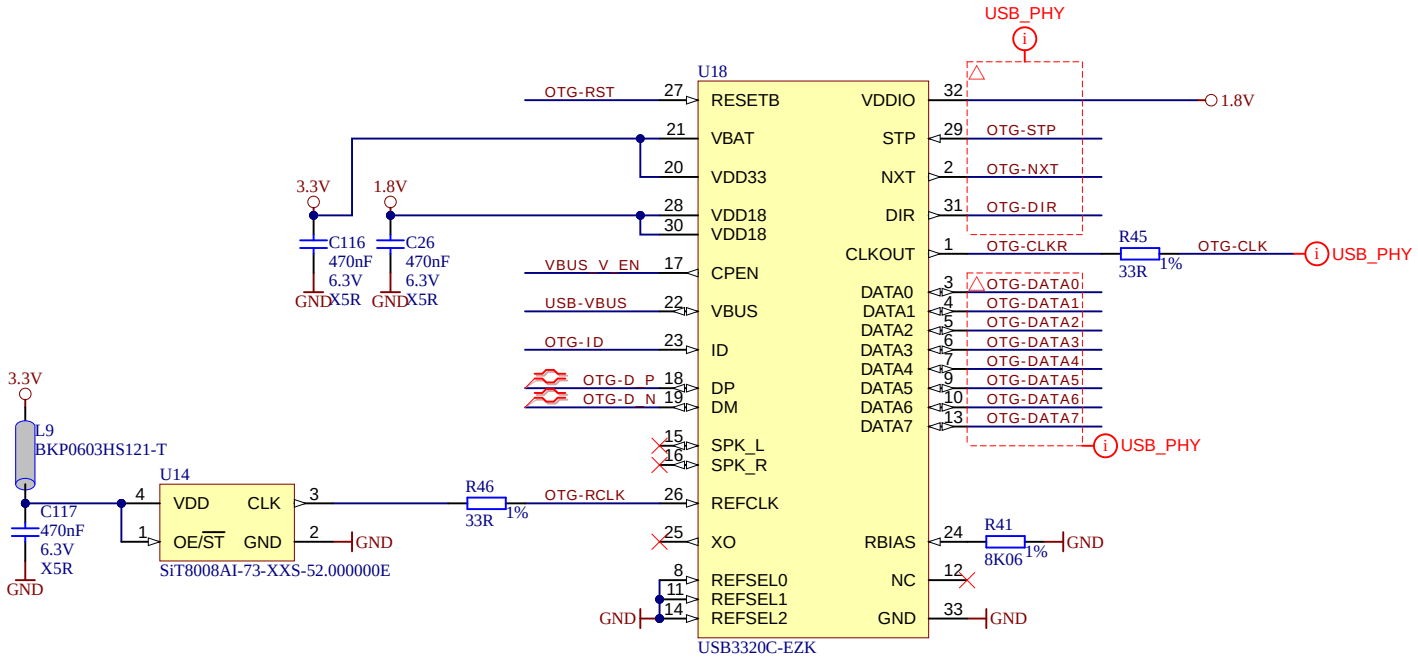
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH		Page19 of 23
Filename: ETH-PHY.SchDoc			



Title: TE0820 - USB_PHY			
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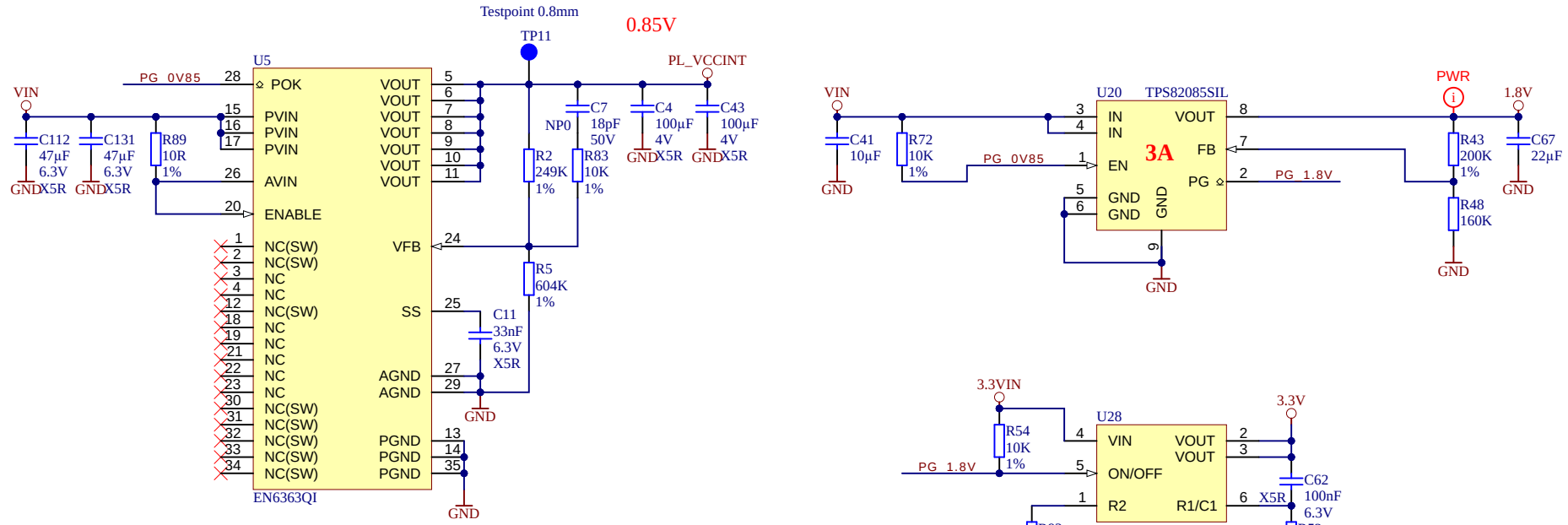
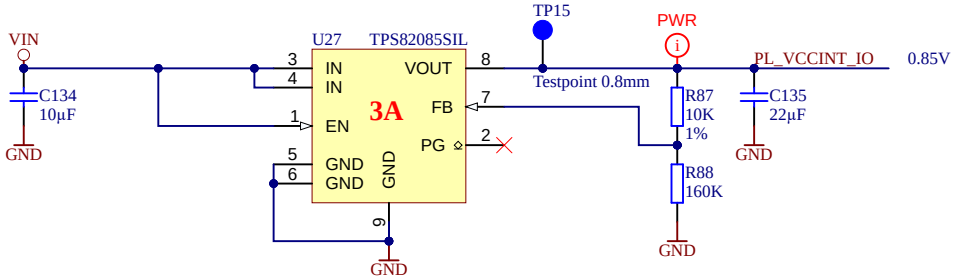
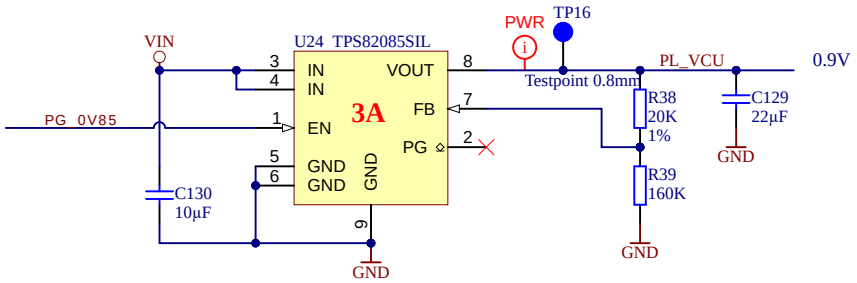
Date: 2020-07-16	Copyright: 2015 Trenz Electronic GmbH		Page20 of 23
Filename: USB-PHY.SchDoc			







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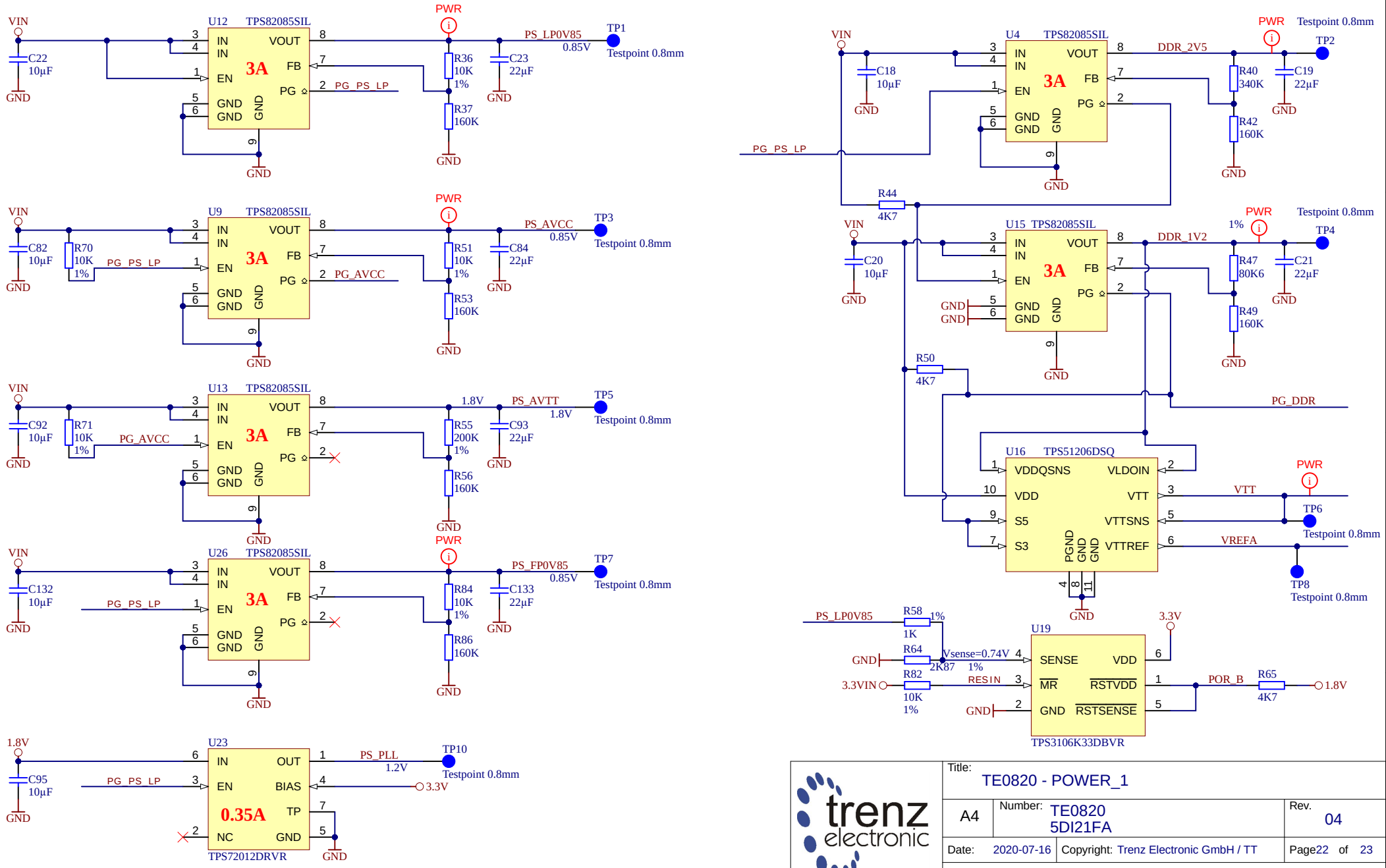
Title: TE0820 - POWER			
A4	Number: TE0820 5DI21FA		Rev. 04
Date: 2020-07-16	Copyright: Trenz Electronic GmbH / TT		Page21 of 23
Filename: POWER.SchDoc			


VIN
U12 TPS82085SIL
IN
IN
EN
GND
GND
VOUT
FB
PG
GND
3A
PWR
PS_LP0V85
0.85V
TP1
Testpoint 0.8mm
C22
10µF
R36
10K
1%
R37
160K
C23
22µF
PG_PS_LP
U9 TPS82085SIL
C82
10µF
R70
10K
1%
PG_PS_LP
R51
10K
1%
R53
160K
C84
22µF
PS_AVCC
0.85V
TP3
Testpoint 0.8mm
PG_AVCC
U13 TPS82085SIL
C92
10µF
R71
10K
1%
PG_AVCC
R55
200K
1%
R56
160K
C93
22µF
1.8V
PS_AVTT
1.8V
TP5
Testpoint 0.8mm
U26 TPS82085SIL
C132
10µF
PG_PS_LP
R84
10K
1%
R86
160K
C133
22µF
PS_FP0V85
0.85V
TP7
Testpoint 0.8mm
1.8V
U23
C95
10µF
PG_PS_LP
EN
OUT
BIAS
TP
NC
GND
0.35A
PS_PLL
1.2V
TP10
Testpoint 0.8mm
3.3V
TPS72012DRVR
U4 TPS82085SIL
C18
10µF
DDR_2V5
R40
340K
R42
160K
C19
22µF
TP2
Testpoint 0.8mm
R44
4K7
U15 TPS82085SIL
C20
10µF
DDR_1V2
1%
R47
80K6
R49
160K
C21
22µF
TP4
Testpoint 0.8mm
R50
4K7
PG_DDR
U16 TPS51206DSQ
VDDQSNS
VLDOIN
VDD
VTT
S5
VTTSNS
S3
VTTREF
PGND
VTT
TP6
Testpoint 0.8mm
VREFA
TP8
Testpoint 0.8mm
PS_LP0V85
R58
1%
1K
R64
2K87
1%
Vsense=0.74V
R82
10K
1%
RESIN
3.3VIN
U19
SENSE
VDD
MR
RSTVDD
GND
RSTSENSE
POR_B
R65
4K7
1.8V
TPS3106K33DBVR
trenz electronic
Title: TE0820 - POWER_1
A4
Number: TE0820 5DI21FA
Rev. 04
Date: 2020-07-16
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Filename: POWER_1.SchDoc

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):
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1. VY: added block diagram, updated module pictures

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