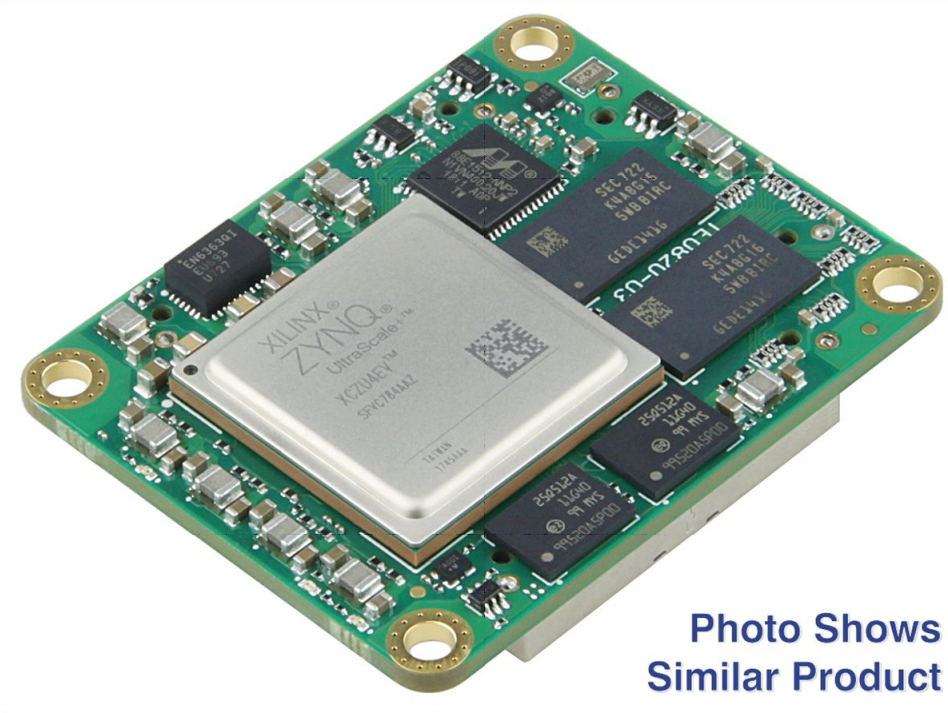

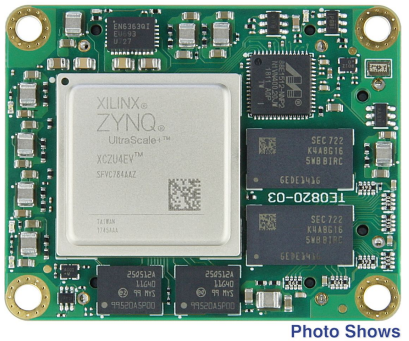

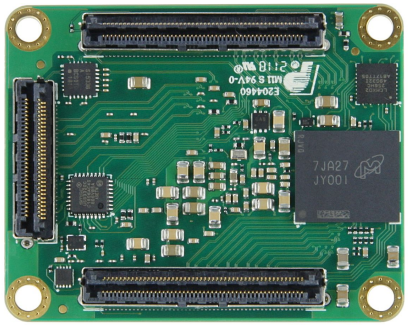

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Schematics and other handouts serve for informational purposes only!

trenz electronic	Title: TE0820 - Legal Notices		
A4	Number: TE0820 2AE81MA		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	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	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	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	1) Added block diagram, updated module pictures	VY
-05	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

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Title: TE0820 - Revision Changes		
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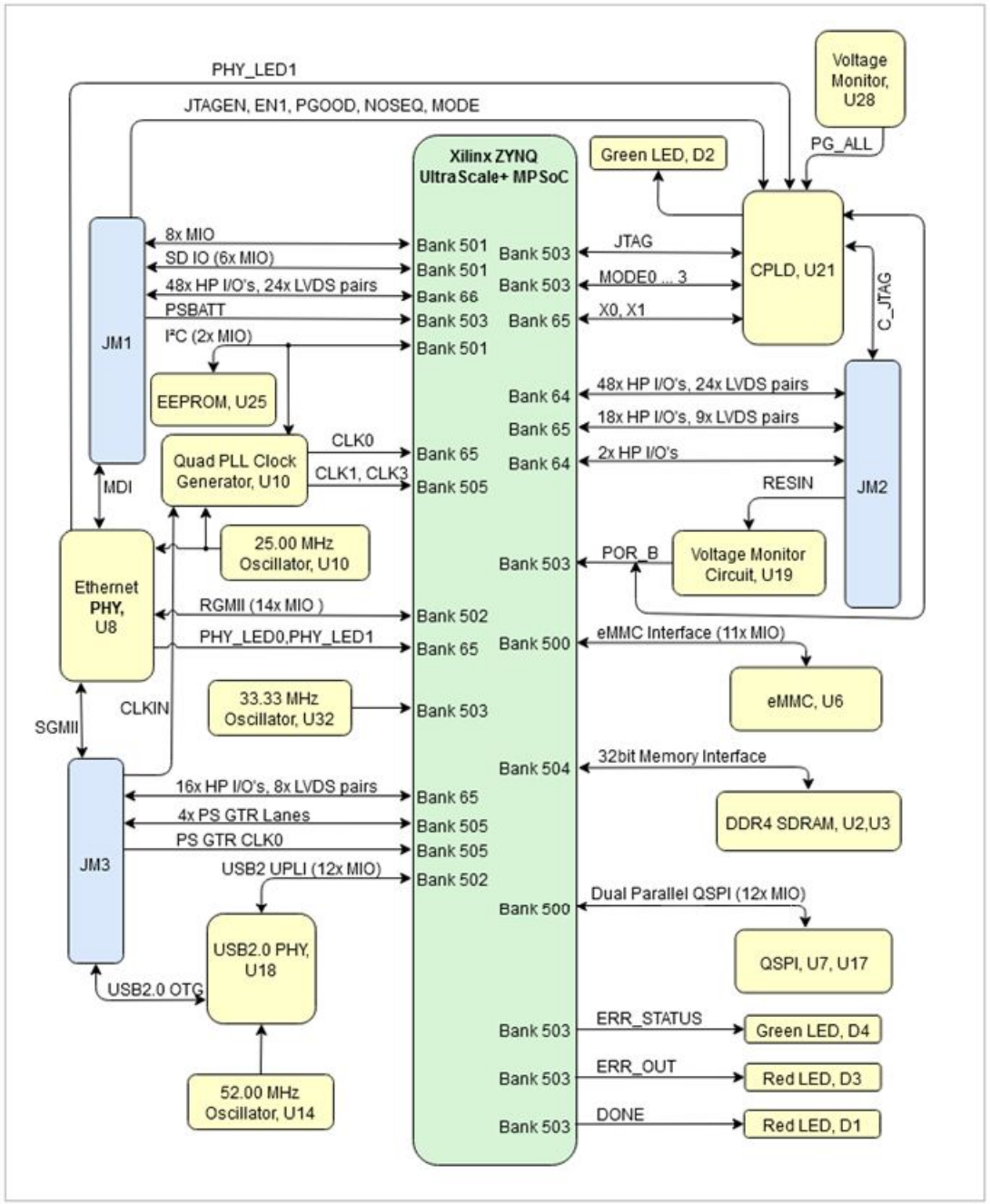
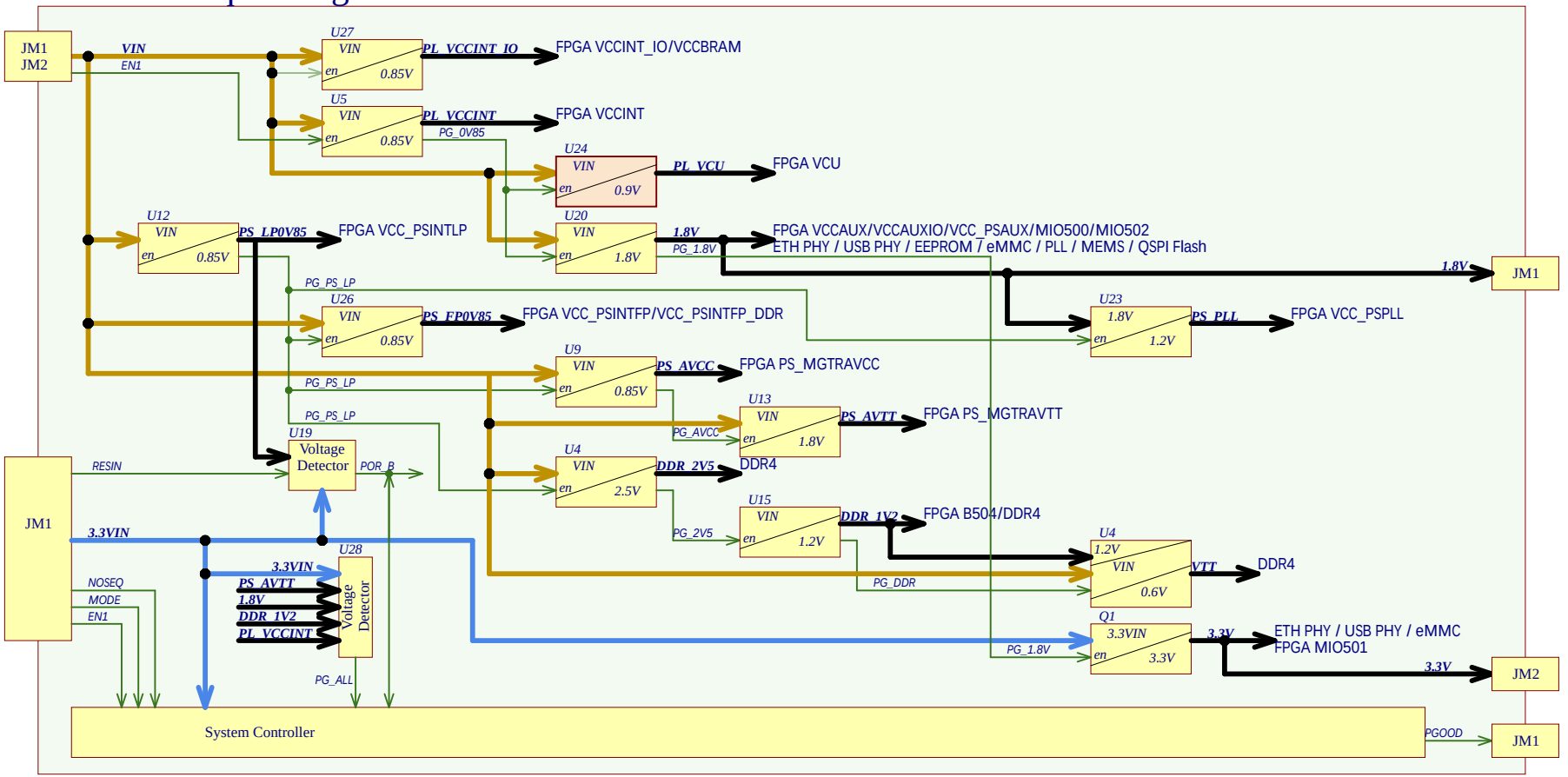


TE0820 List of Web Documentation

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	

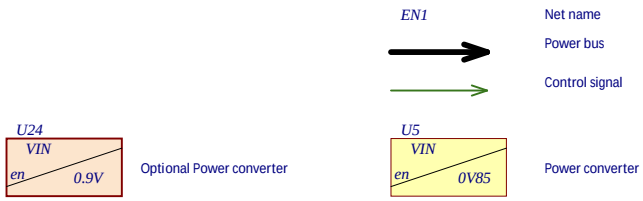
Title: TE0820 - System Overview		
A4	Number: TE0820 2AE81MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page 3 of 24
Filename: Overview.SchDoc		

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	-



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Title: TE0820 - Power Diagram		
A4	Number: TE0820 2AE81MA	Rev. 05
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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

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DDR4-RAM.SchDoc

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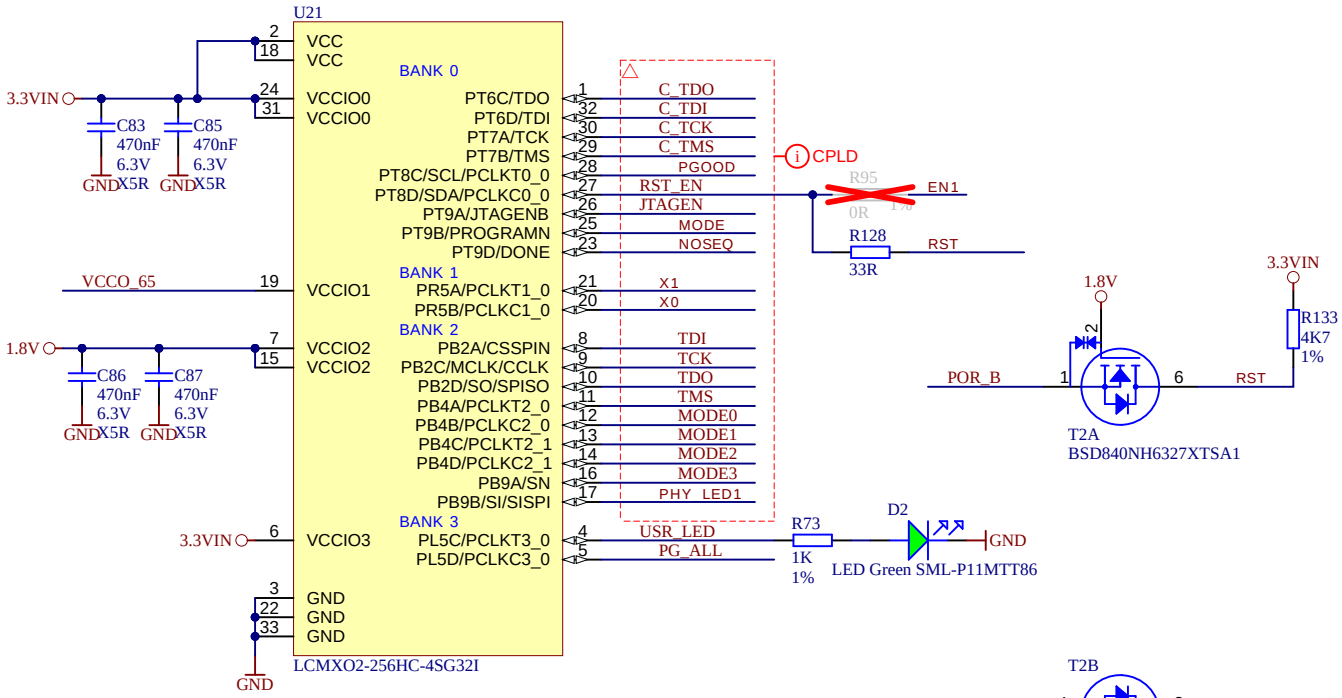
POWER.SchDoc

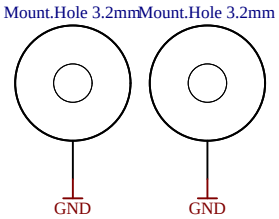
U_POWER_1
POWER_1.SchDoc

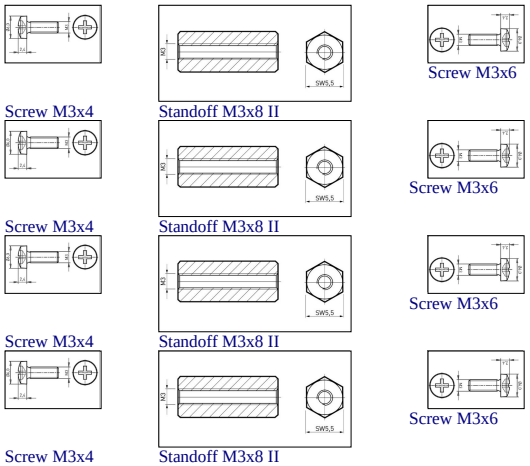


Special notes:

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





Assembly variant	2AE81MA
Created by	ED
Modified by	ED
Modified at	2022-07-07
SVN Revision	13497

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Title: TE0820		
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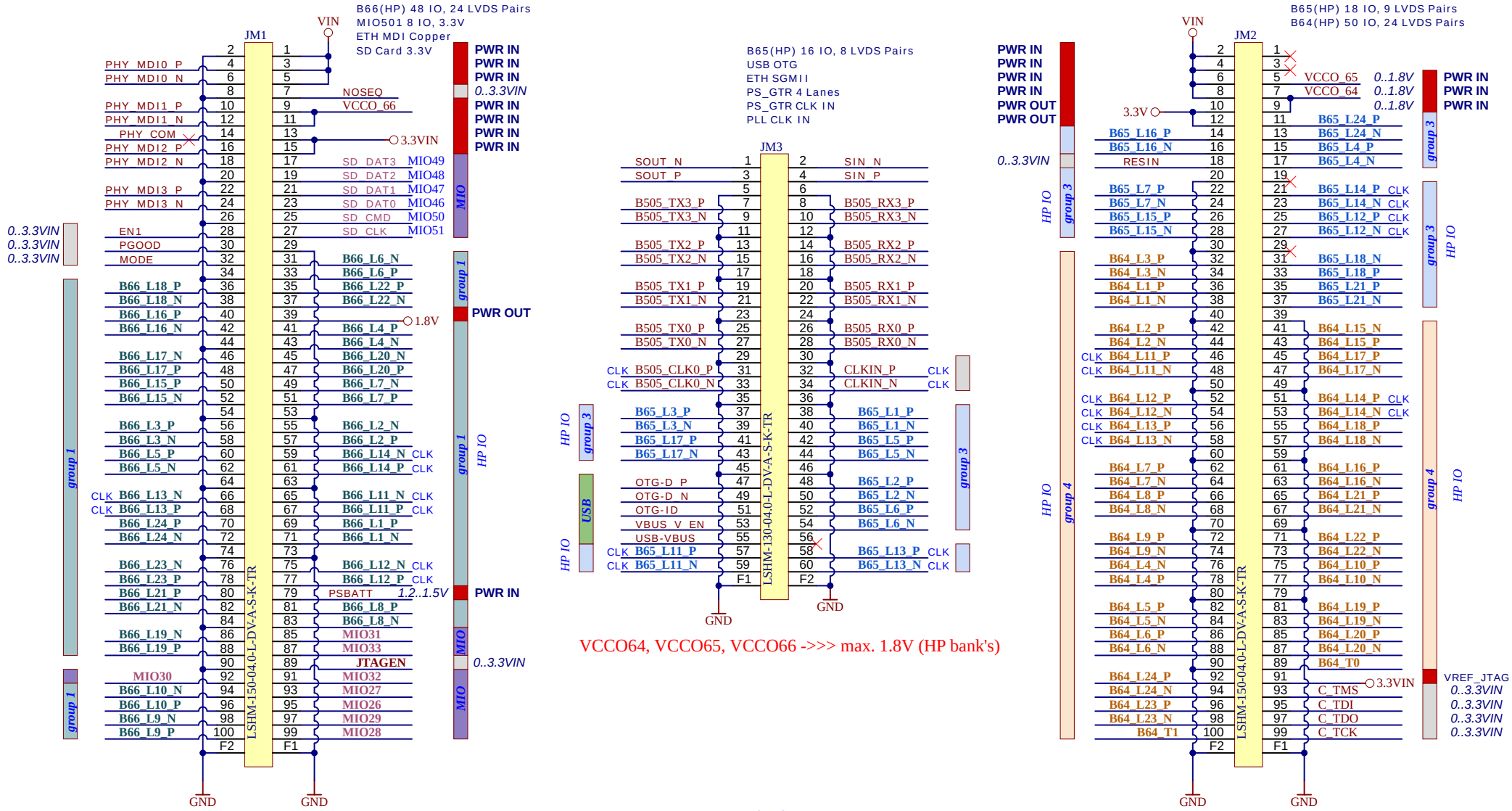
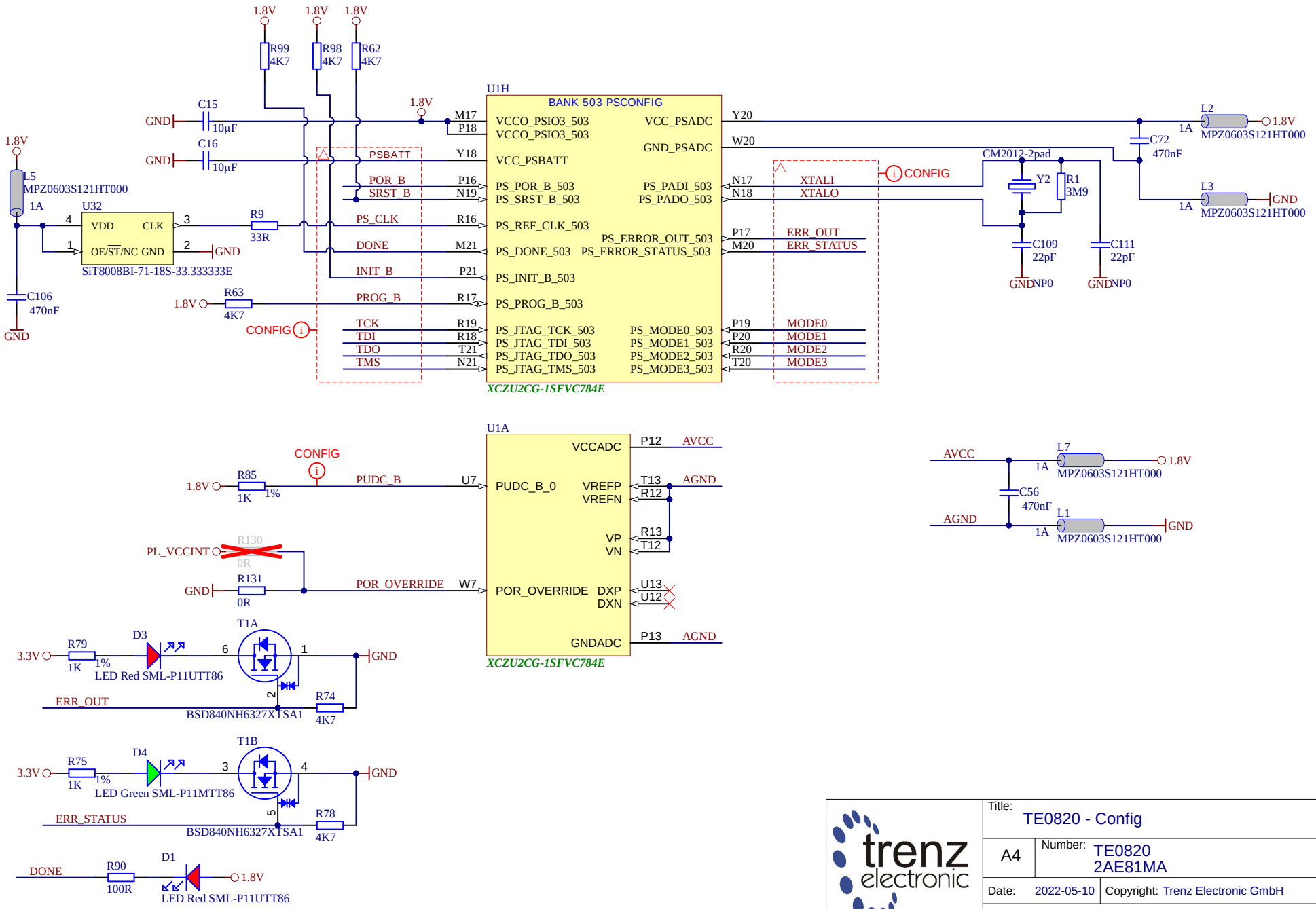


Title:	TE0820 - B2B Connectors		
A4	Number: TE0820 2AE81MA		Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH		Page6 of 24
Filename:	B2B-Connectors.SchDoc		



trenz electronic	Title: TE0820 - Config		
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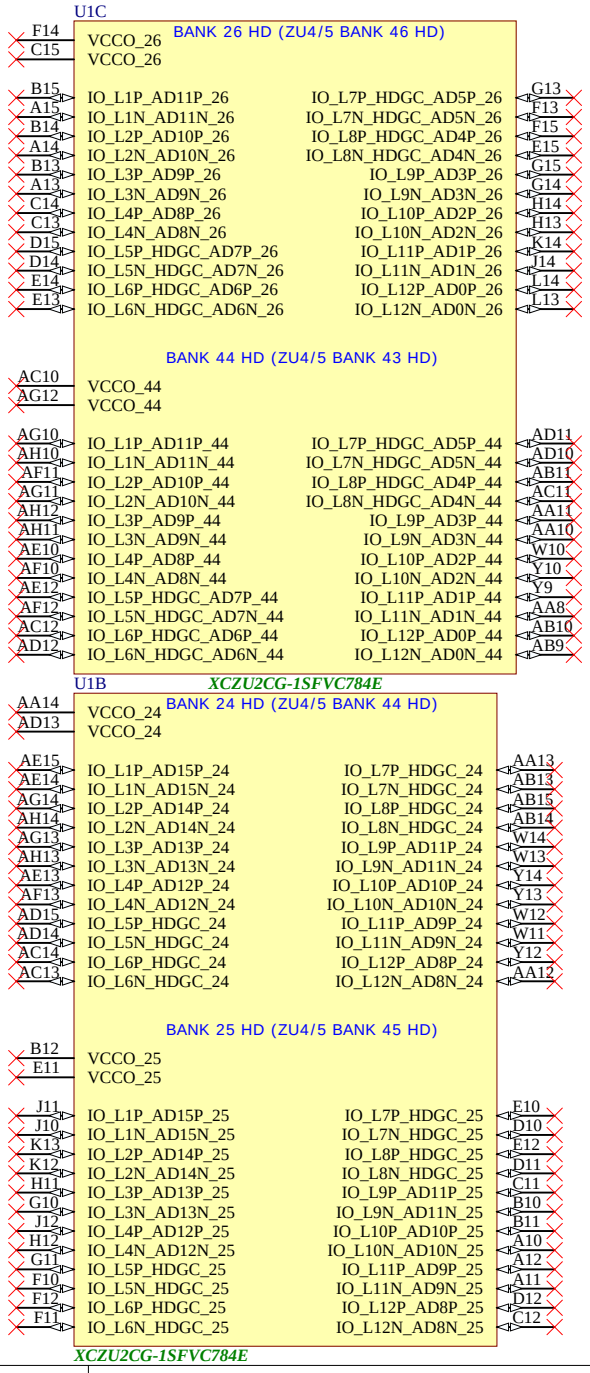
	Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page7 of 24
	Filename: CONFIG.SchDoc		



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Title: TE0820 - HD Banks		
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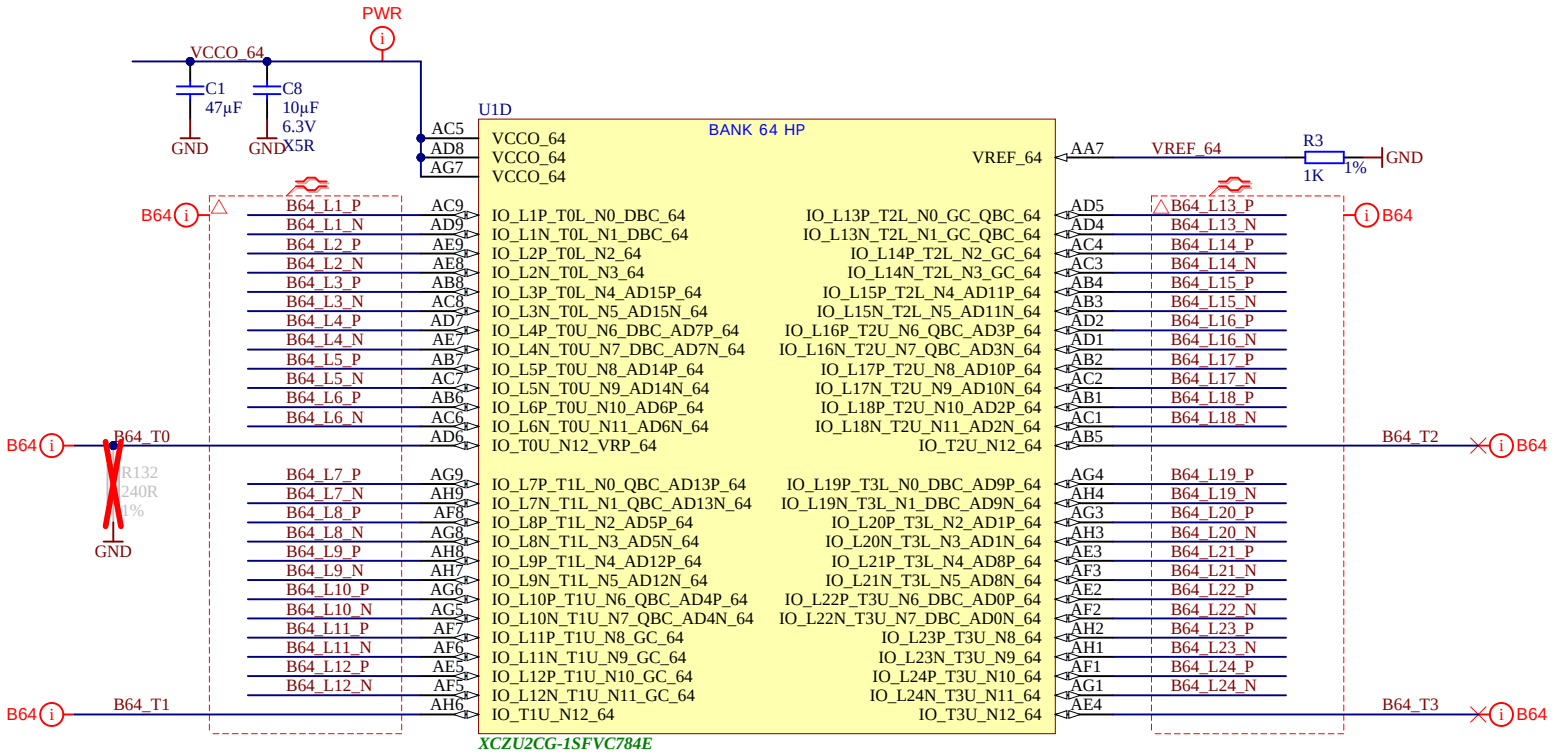
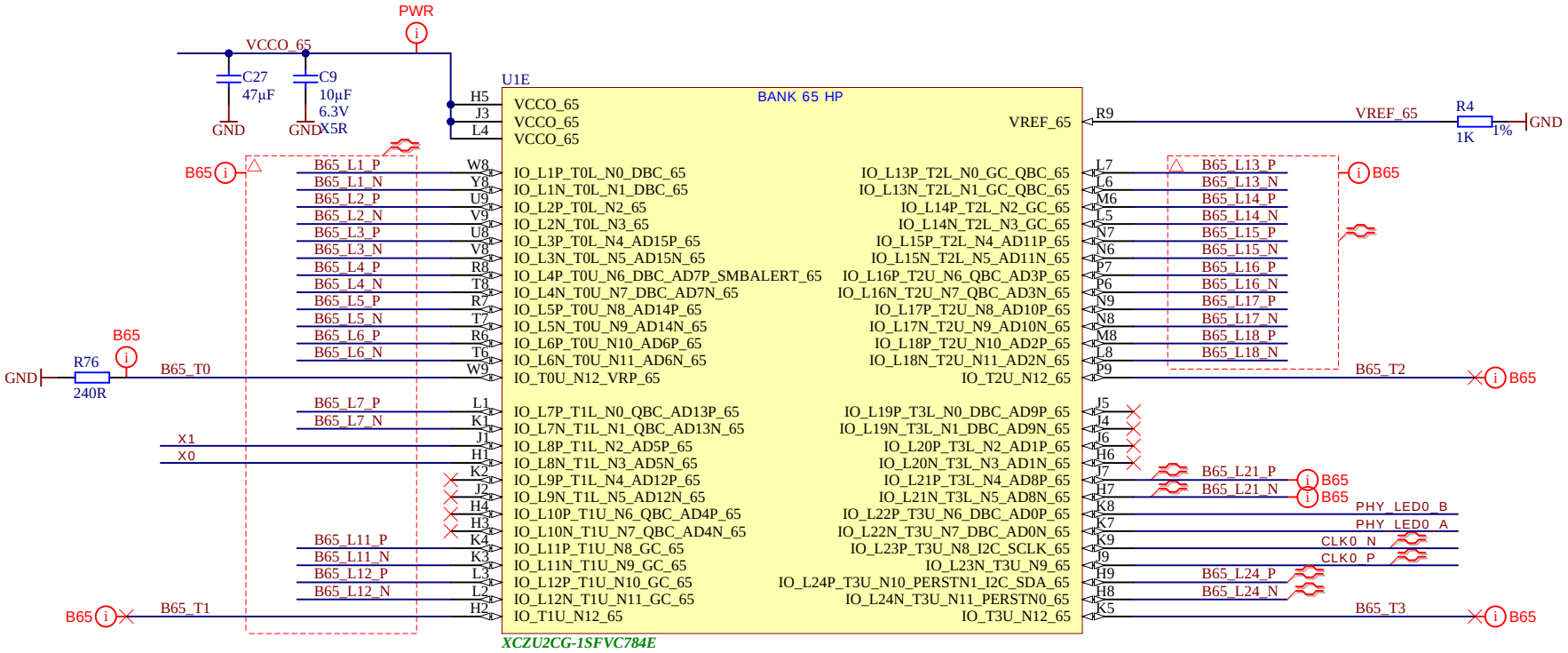
Filename: B_HD.SchDoc		



trenz electronic	Title: TE0820 - B64		
A4	Number: TE0820 2AE81MA		Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH		Page9 of 24
Filename: B64.SchDoc			



trenz electronic	Title: TE0820 - B65		
	A4	Number: TE0820 2AE81MA	Rev. 05
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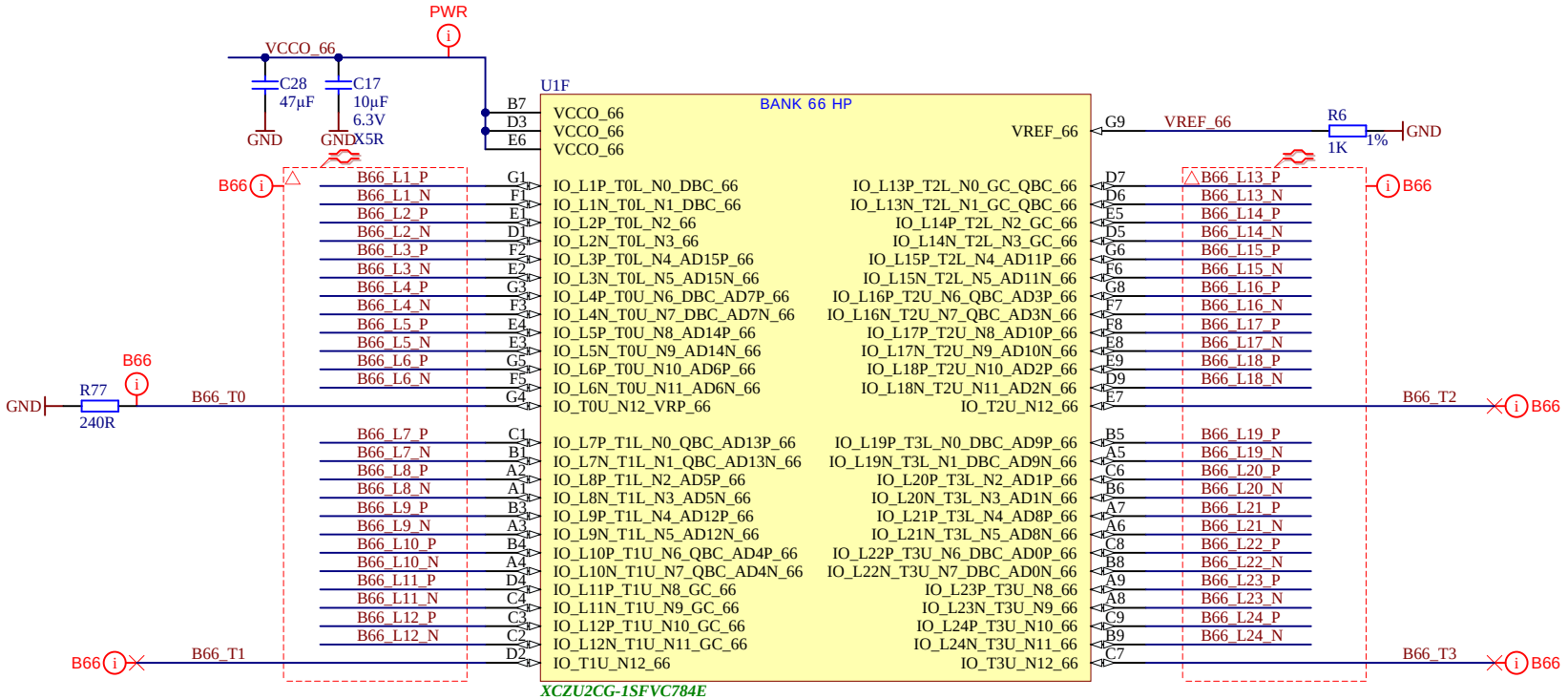
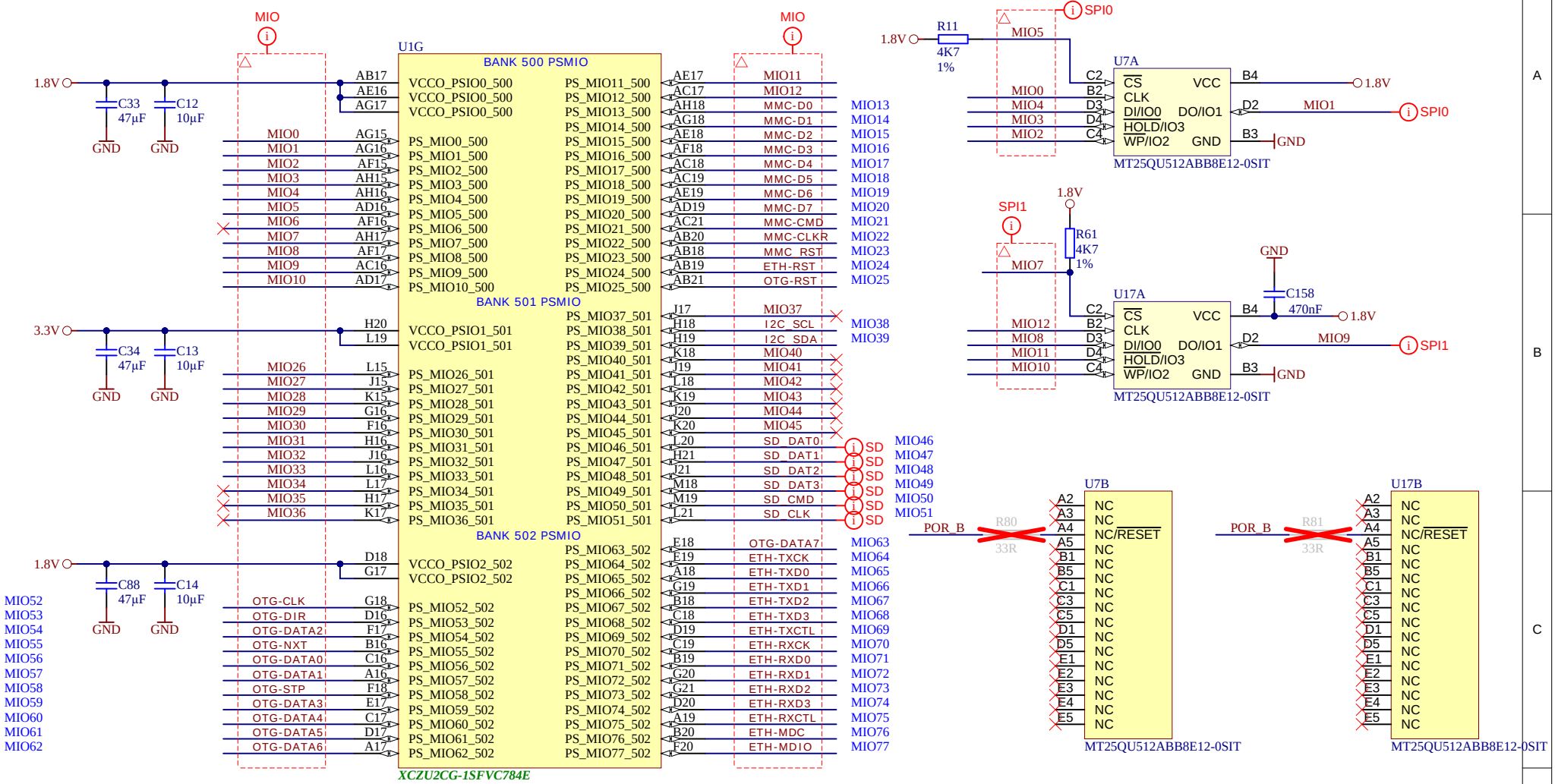
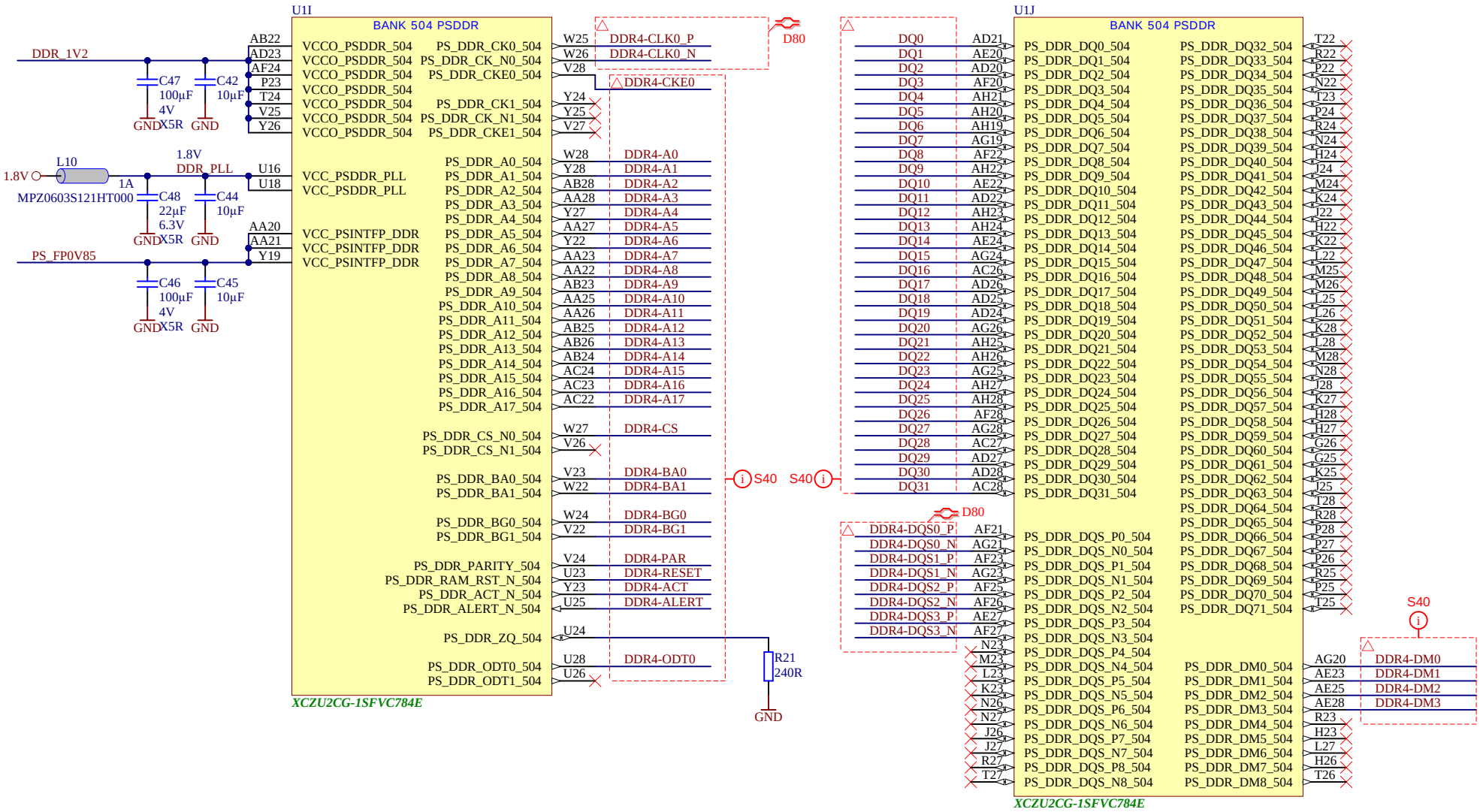
	Filename: B65.SchDoc		



trenz electronic	Title: TE0820 - B66		
A4	Number: TE0820 2AE81MA		Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH		Page11 of 24
Filename: B66.SchDoc			


MIO
U1G
BANK 500 PSMIO
BANK 501 PSMIO
BANK 502 PSMIO
XCZU2CG-1SFVC784E
1.8V
3.3V
C33 47µF
C12 10µF
C34 47µF
C13 10µF
C88 47µF
C14 10µF
GND
SPI0
SPI1
R11 4K7 1%
R61 4K7 1%
C158 470nF
U7A
U17A
U7B
U17B
MT25QU512ABB8E12-0SIT
R80 33R
R81 33R
POR_B
SD
Title: TE0820 - MIO Banks
A4
Number: TE0820 2AE81MA
Rev. 05
Date: 2022-05-10
Copyright: Trenz Electronic GmbH
Page12 of 24
Filename: B_MIO.SchDoc


U1I
BANK 504 PSDDR
XCZU2CG-1SFVC784E
U1J
BANK 504 PSDDR
XCZU2CG-1SFVC784E
DDR_1V2
C47 100µF 4V X5R
C42 10µF
GND
1.8V
L10
MPZ0603S121HT000
1A
DDR_PLL
C48 22µF 6.3V X5R
C44 10µF
U16
U18
PS_FP0V85
C46 100µF 4V X5R
C45 10µF
AB22
AD23
AF24
P23
T24
V25
Y26
AA20
AA21
Y19
VCCO_PSDDR_504
VCC_PSDDR_PLL
VCC_PSINTFP_DDR
PS_DDR_CK0_504
PS_DDR_CK_N0_504
PS_DDR_CKE0_504
PS_DDR_CK1_504
PS_DDR_CK_N1_504
PS_DDR_CKE1_504
PS_DDR_A0_504
PS_DDR_A1_504
PS_DDR_A2_504
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PS_DDR_A9_504
PS_DDR_A10_504
PS_DDR_A11_504
PS_DDR_A12_504
PS_DDR_A13_504
PS_DDR_A14_504
PS_DDR_A15_504
PS_DDR_A16_504
PS_DDR_A17_504
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PS_DDR_CS_N1_504
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PS_DDR_BA1_504
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PS_DDR_BG1_504
PS_DDR_PARITY_504
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PS_DDR_ACT_N_504
PS_DDR_ALERT_N_504
PS_DDR_ZQ_504
PS_DDR_ODT0_504
PS_DDR_ODT1_504
W25
W26
V28
Y24
Y25
V27
W28
Y28
AB28
AA28
Y27
AA27
Y22
AA23
AA22
AB23
AA25
AA26
AB25
AB26
AB24
AC24
AC23
AC22
W27
V26
V23
W22
W24
V22
V24
U23
Y23
U25
U24
U28
U26
DDR4-CLK0_P
DDR4-CLK0_N
DDR4-CKE0
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-CS
DDR4-BA0
DDR4-BA1
DDR4-BG0
DDR4-BG1
DDR4-PAR
DDR4-RESET
DDR4-ACT
DDR4-ALERT
DDR4-ODT0
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DDR4-DQS1_N
DDR4-DQS2_P
DDR4-DQS2_N
DDR4-DQS3_P
DDR4-DQS3_N
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N27
J26
J27
R27
T27
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AE28
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DDR4-DM0
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DDR4-DM2
DDR4-DM3
S40
trenz electronic
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A4
Number: TE0820 2AE81MA
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Date: 2022-05-10
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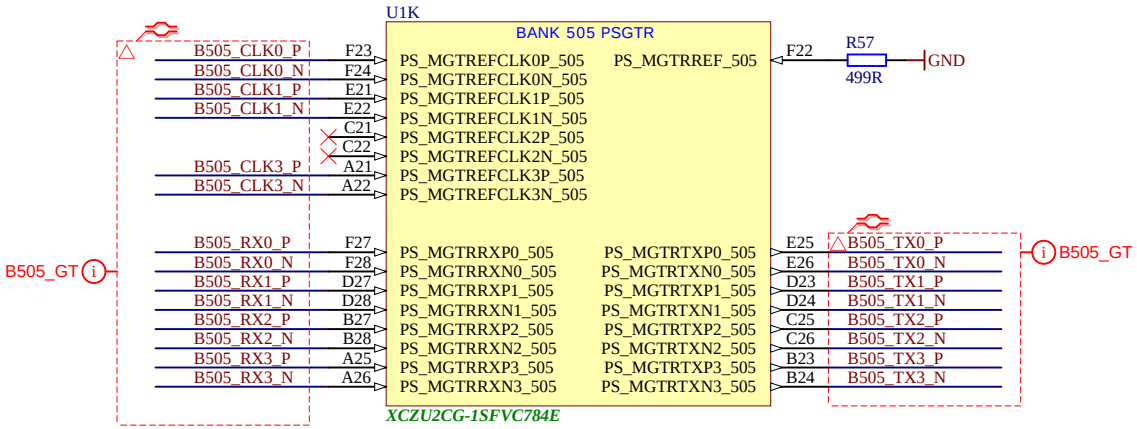
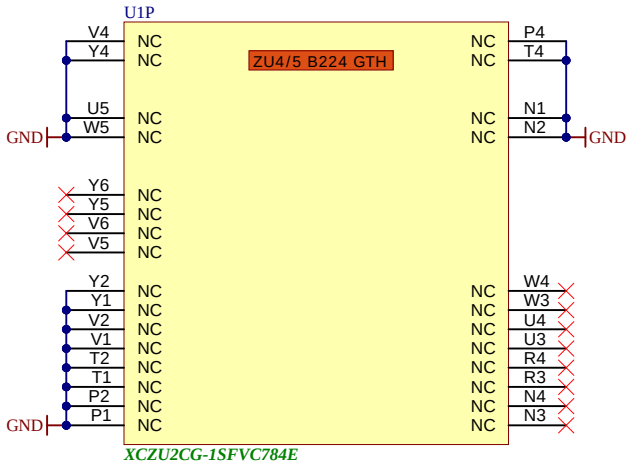
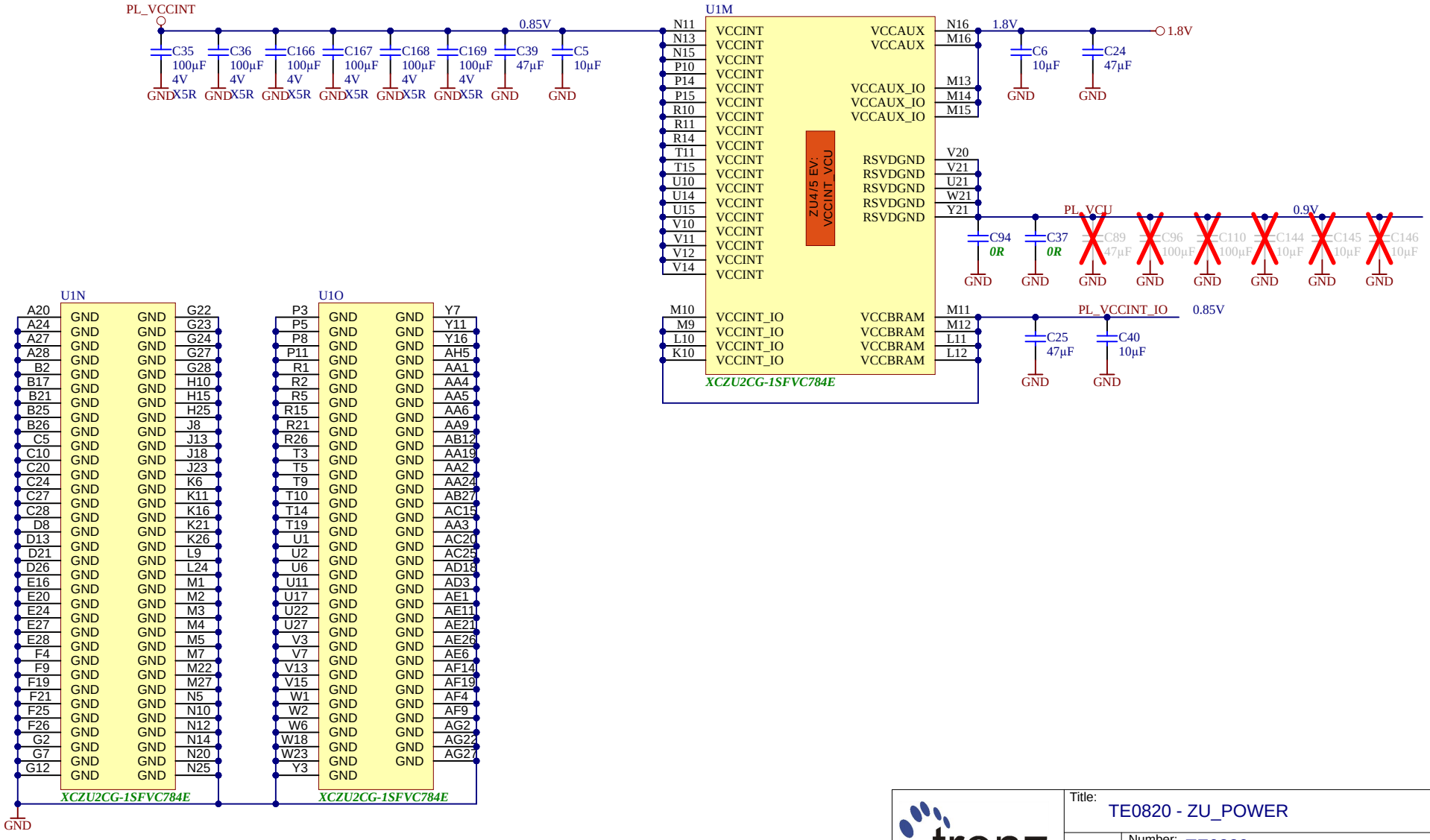
Filename: PS_DDR.SchDoc

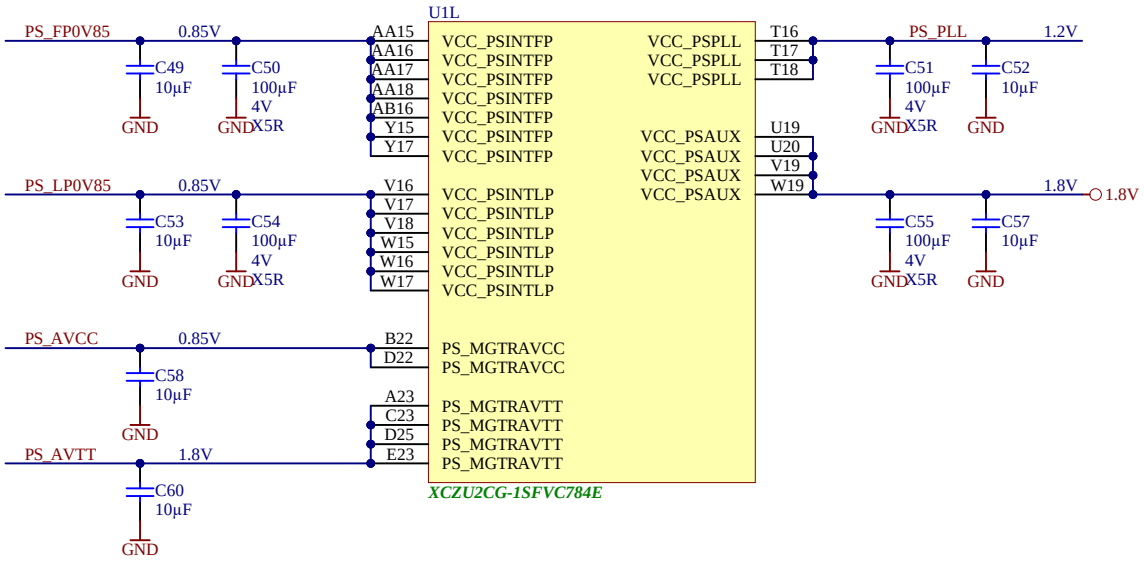




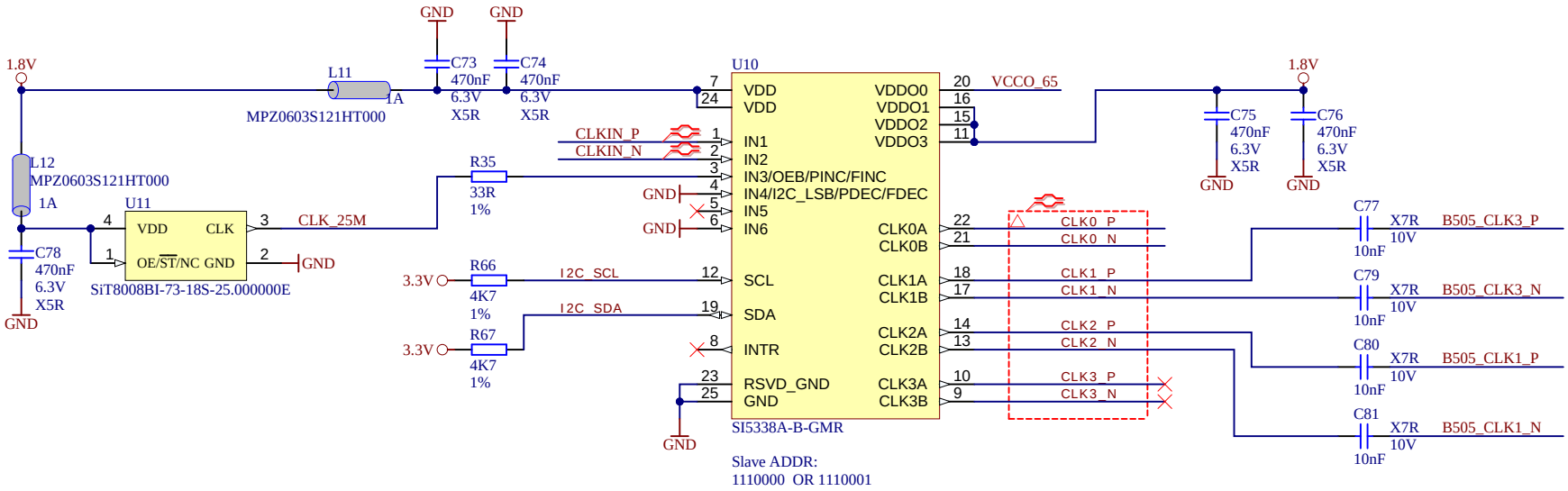
trenz electronic	Title: TE0820 - PS_GT		
A4	Number: TE0820 2AE81MA		Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH		Page14 of 24
Filename: B_PS_GT.SchDoc			



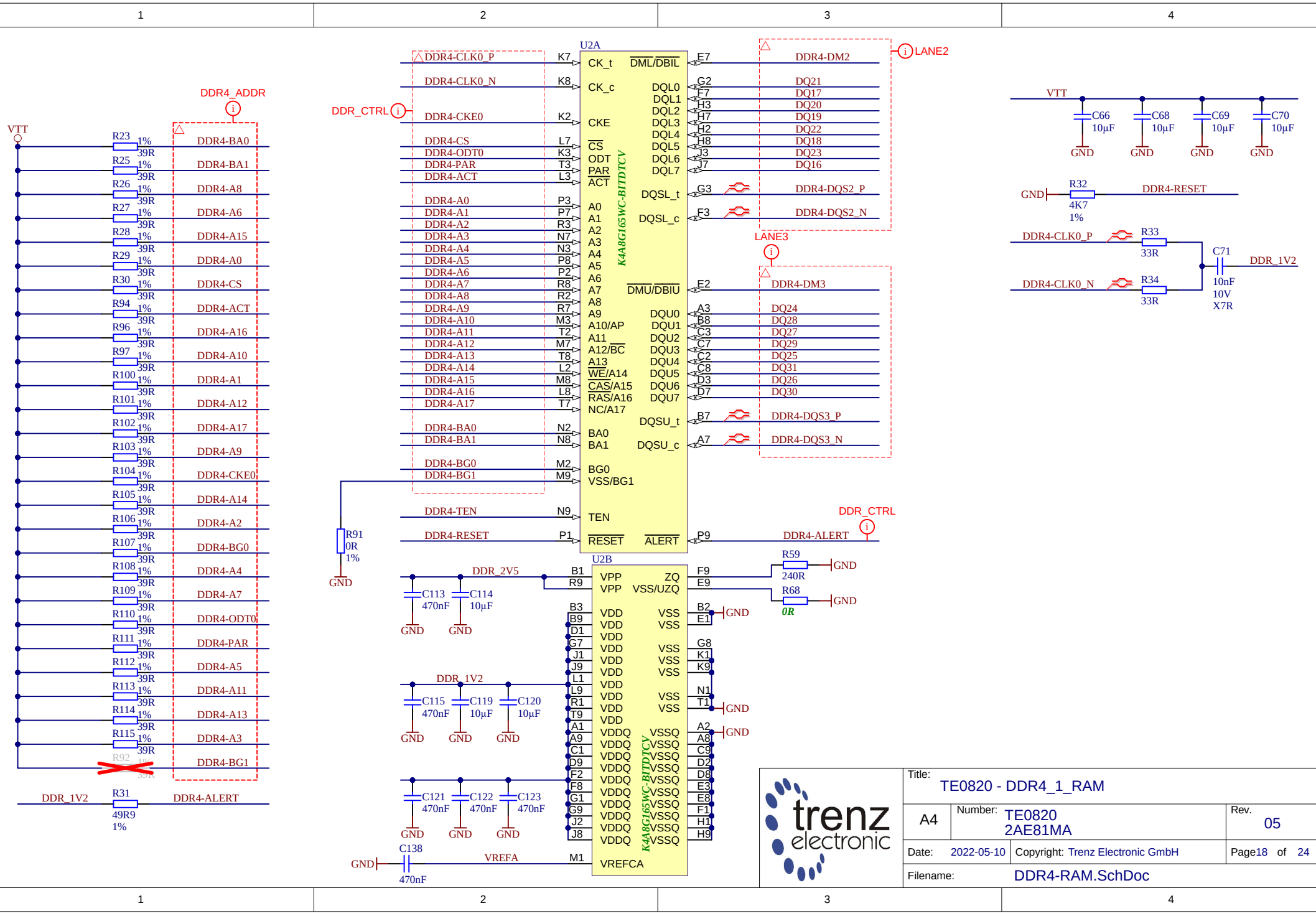
Title: TE0820 - ZU_POWER		
A4	Number: TE0820 2AE81MA	Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page15 of 24
Filename: ZU_POWER.SchDoc		



trenz electronic	Title: TE0820 - ZU_PS_POWER		
	A4	Number: TE0820 2AE81MA	Rev. 05
	Date: 2022-05-10	Copyright: Trenz Electronic GmbH	Page16 of 24
	Filename: ZU_PS_POWER.SchDoc		



Title: TE0820 - CLK			
A4	Number: TE0820 2AE81MA		Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH		Page17 of 24
Filename: CLK.SchDoc			



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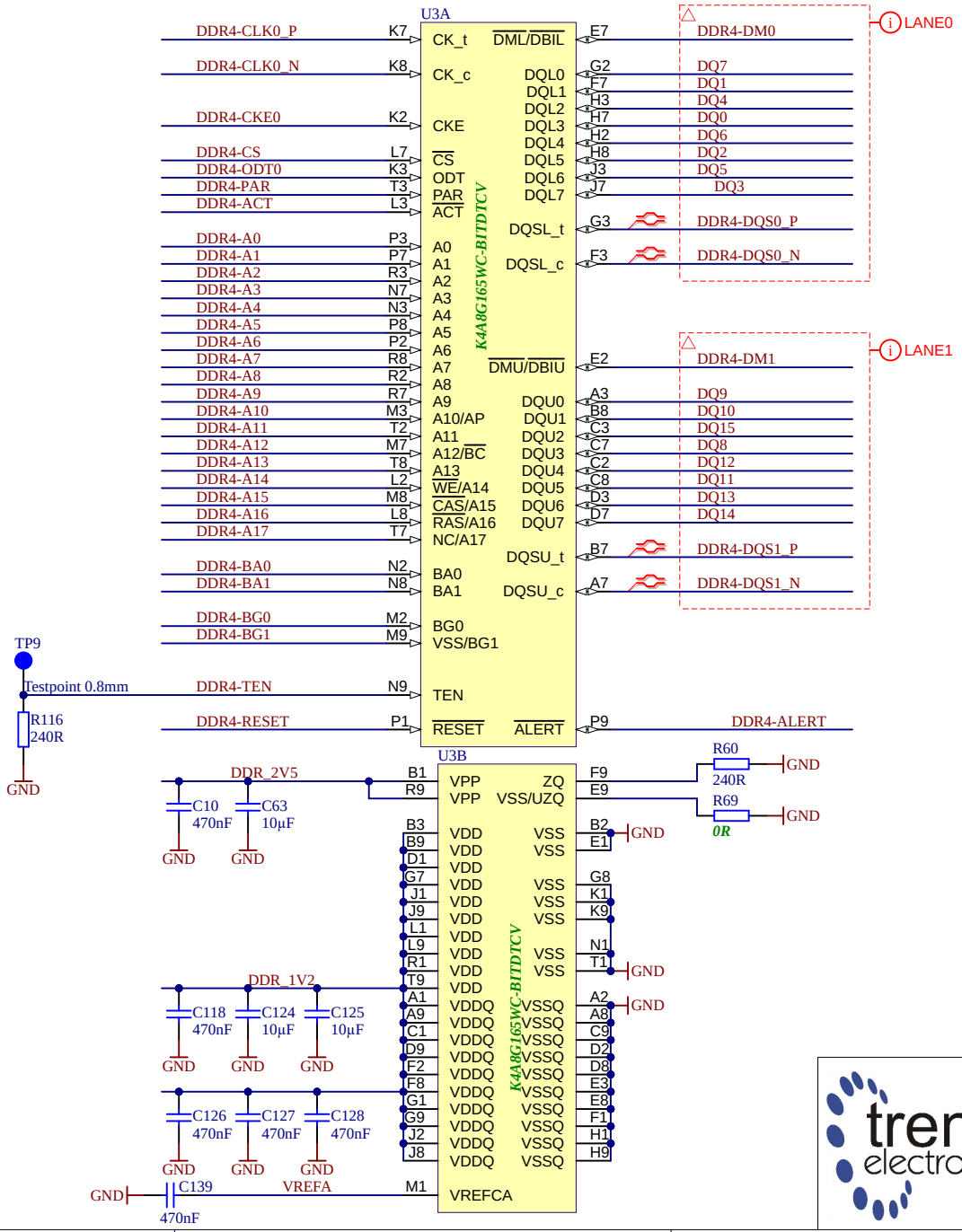
Title: TE0820 - DDR4_1_RAM			
A4	Number: TE0820 2AE81MA		Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH		Page18 of 24
Filename: DDR4-RAM.SchDoc			


U3A
K4A8G165WC-BITDTCV
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
DDR4-TEN
DDR4-RESET
DDR4-DM0
DDR4-DQS0_P
DDR4-DQS0_N
DDR4-DM1
DDR4-DQS1_P
DDR4-DQS1_N
DDR4-ALERT
LANE0
LANE1
TP9
Testpoint 0.8mm
R116
240R
GND
U3B
DDR_2V5
C10
470nF
C63
10µF
R60
240R
R69
0R
DDR_1V2
C118
C124
C125
C126
C127
C128
VREFA
C139
TE0820 - DDR4_2_RAM
A4
Number: TE0820 2AE81MA
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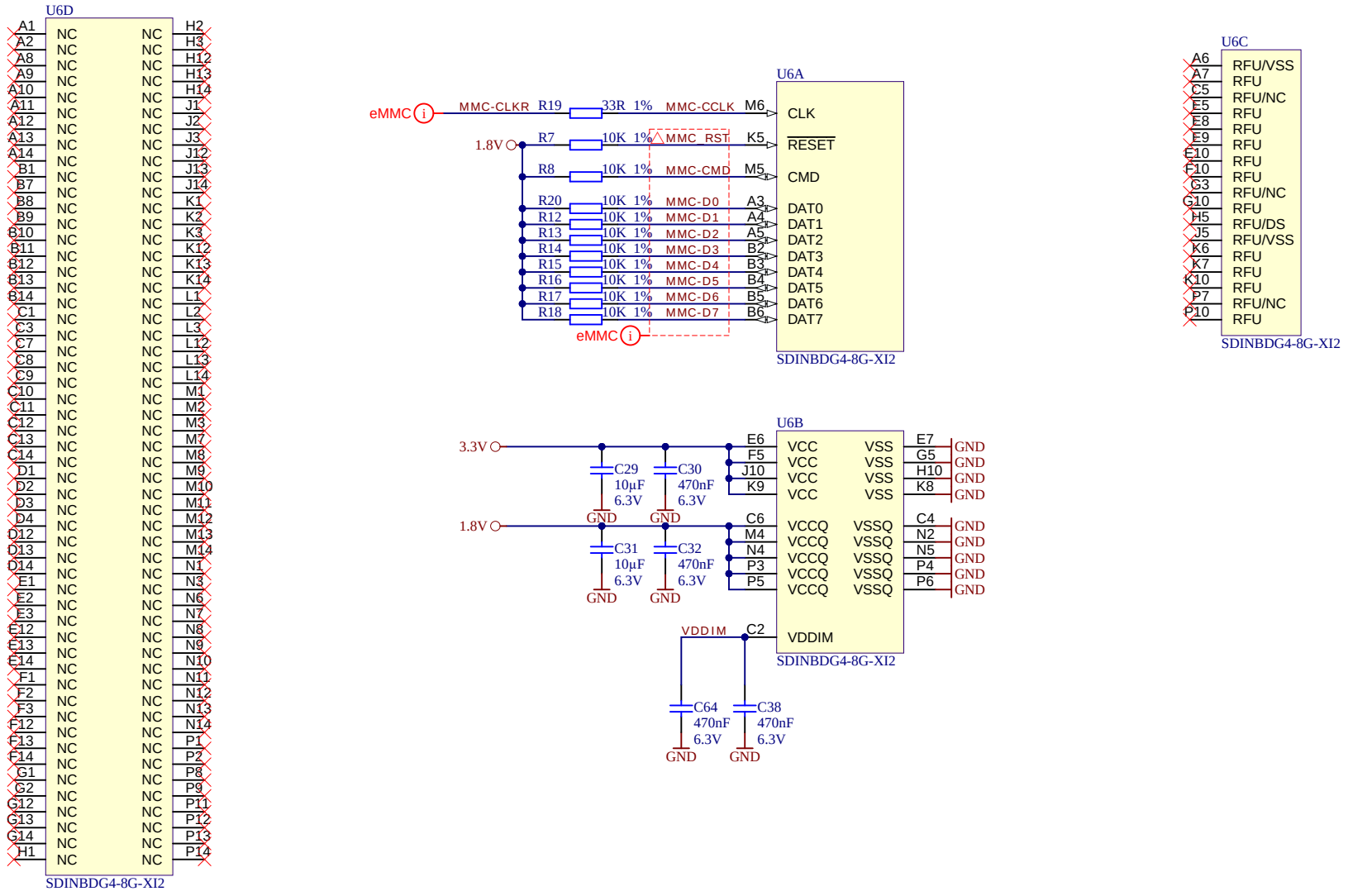
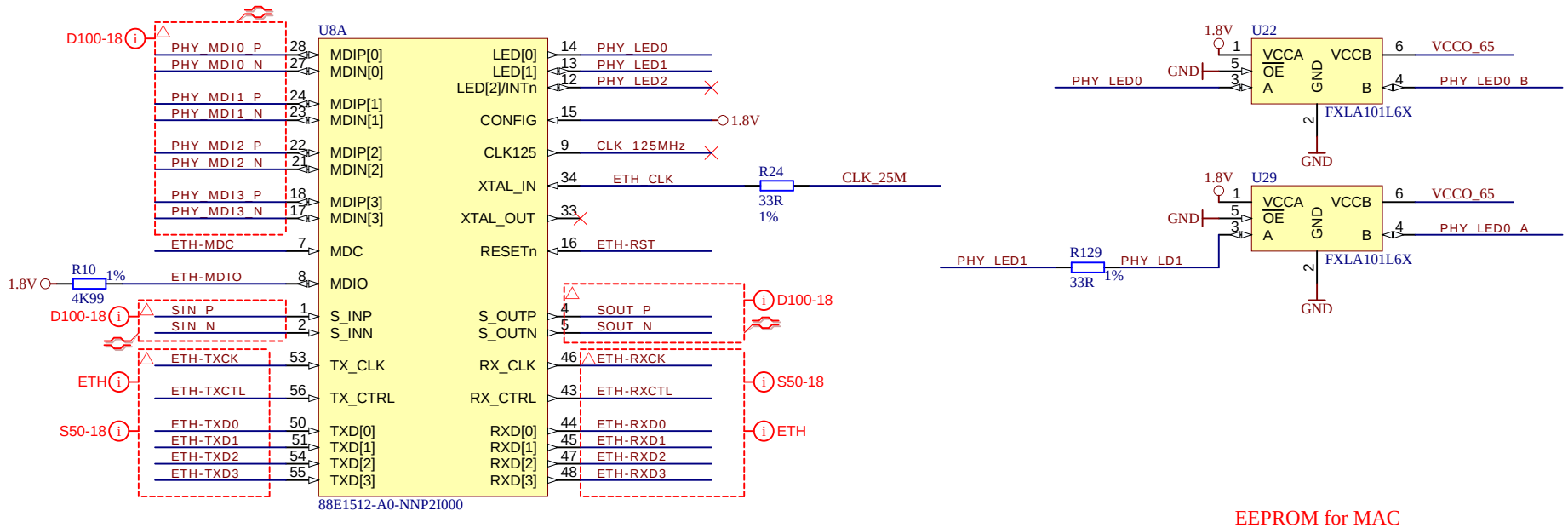
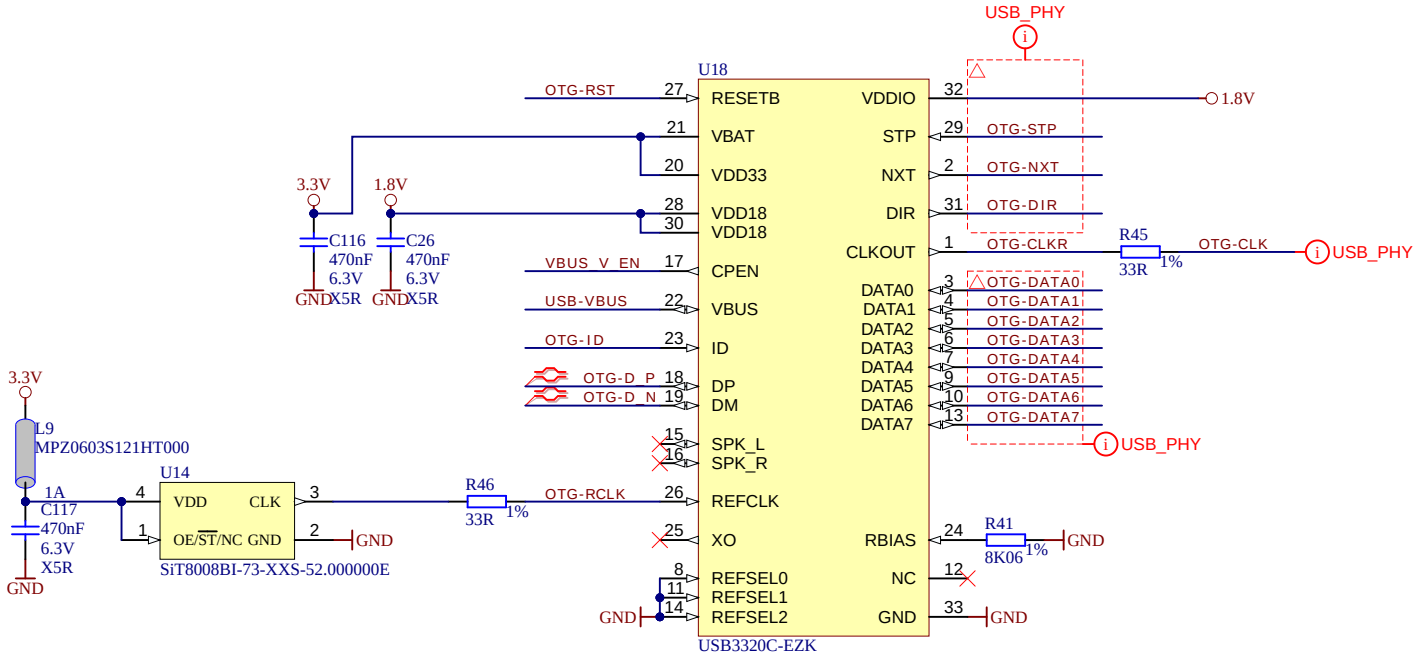
Filename: DDR4-RAM_2.SchDoc



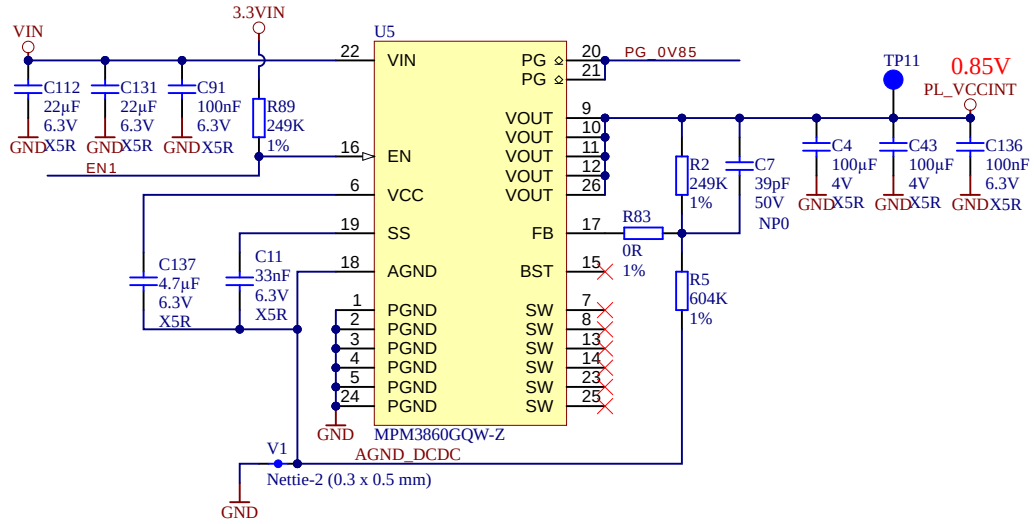
trenz electronic	Title: TE0820 - eMMC		
A4	Number: TE0820 2AE81MA		Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH		Page20 of 24
Filename: eMMC.SchDoc			

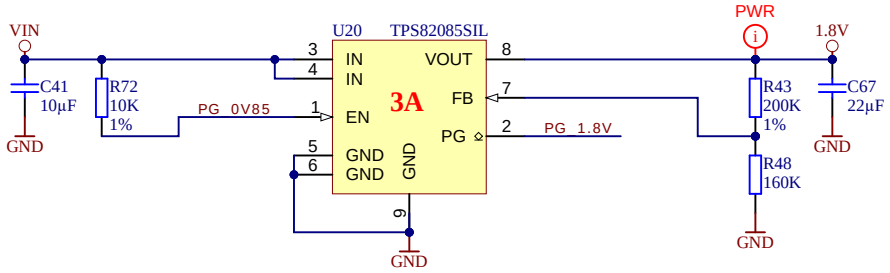


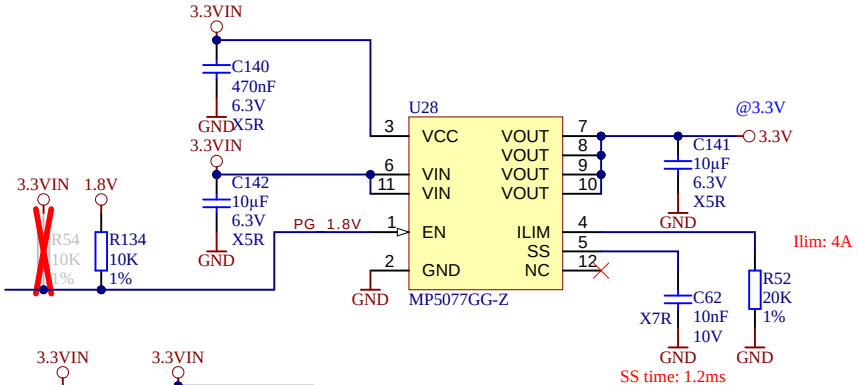
Title: TE0820 - Eth_PHY			
A4	Number: TE0820 2AE81MA		Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH		Page21 of 24
Filename: ETH-PHY.SchDoc			

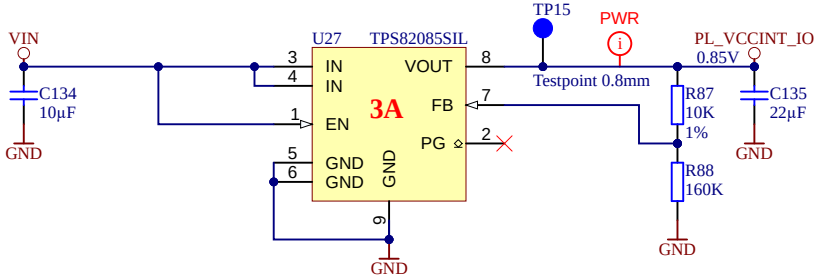


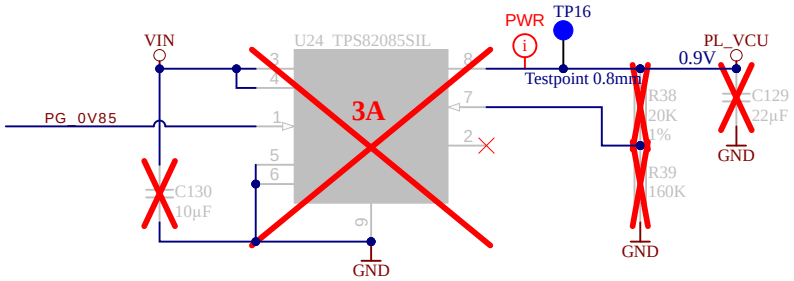
trenz electronic	Title: TE0820 - USB_PHY		
A4	Number: TE0820 2AE81MA		Rev. 05
Date: 2022-05-10	Copyright: Trenz Electronic GmbH		Page22 of 24
Filename: USB-PHY.SchDoc			

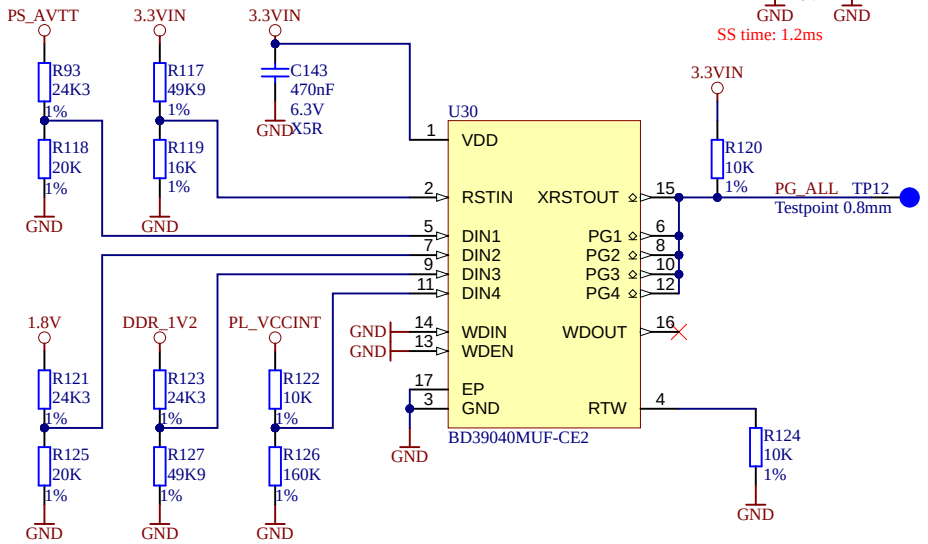












trenz electronic	Title: TE0820 - POWER		
	A4	Number: TE0820 2AE81MA	Rev. 05
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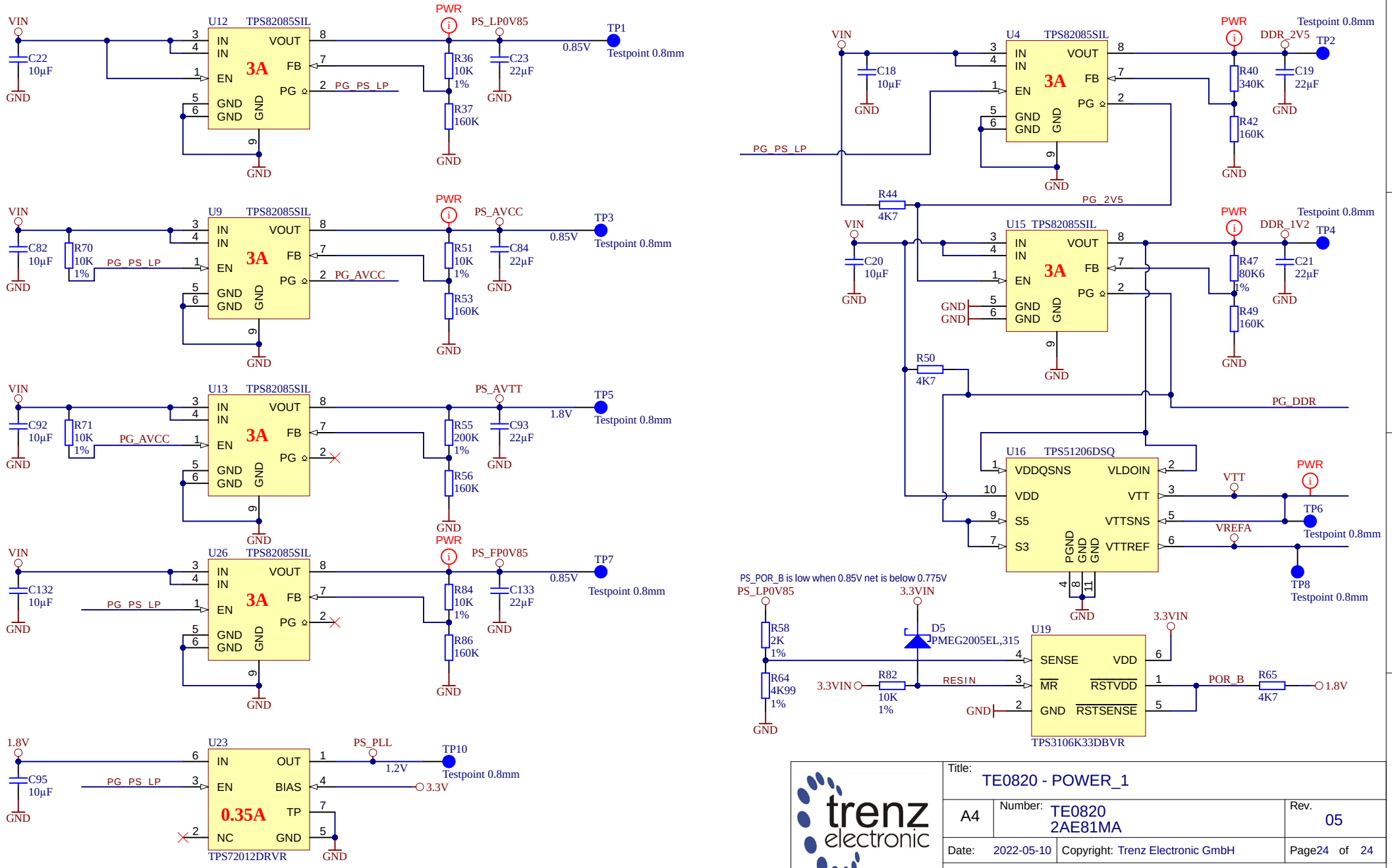
VIN
U12 TPS82085SIL
IN
IN
VOUT
EN
FB
PG
GND
GND
GND
3A
PWR
PS_LP0V85
TP1
0.85V
Testpoint 0.8mm
C22
10µF
R36
10K
1%
R37
160K
C23
22µF
PG_PS_LP
U9 TPS82085SIL
PS_AVCC
TP3
R70
10K
1%
R51
10K
1%
R53
160K
C82
10µF
C84
22µF
PG_AVCC
U13 TPS82085SIL
PS_AVTT
TP5
1.8V
R71
10K
1%
R55
200K
1%
R56
160K
C92
10µF
C93
22µF
U26 TPS82085SIL
PS_FP0V85
TP7
R84
10K
1%
R86
160K
C132
10µF
C133
22µF
1.8V
U23
PS_PLL
TP10
1.2V
3.3V
Testpoint 0.8mm
C95
10µF
BIAS
TP
NC
0.35A
TPS72012DRVR
U4 TPS82085SIL
DDR_2V5
TP2
R40
340K
R42
160K
C18
10µF
C19
22µF
R44
4K7
PG_2V5
U15 TPS82085SIL
DDR_1V2
TP4
R47
80K6
1%
R49
160K
C20
10µF
C21
22µF
R50
4K7
PG_DDR
U16 TPS51206DSQ
VDDQSNS
VLDOIN
VDD
VTT
S5
VTTSNS
S3
VTTREF
PGND
VTT
VREFA
TP6
TP8
PS_POR_B is low when 0.85V net is below 0.775V
3.3VIN
D5
PMEG2005EL,315
U19
SENSE
VDD
MR
RSTVDD
GND
RSTSENSE
RESIN
R58
2K
1%
R64
4K99
1%
R82
10K
1%
POR_B
R65
4K7
TPS3106K33DBVR
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Title: TE0820 - POWER_1
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