

Regarding the usage of our schematics and alike documentation for Trenz module TE0818.


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.

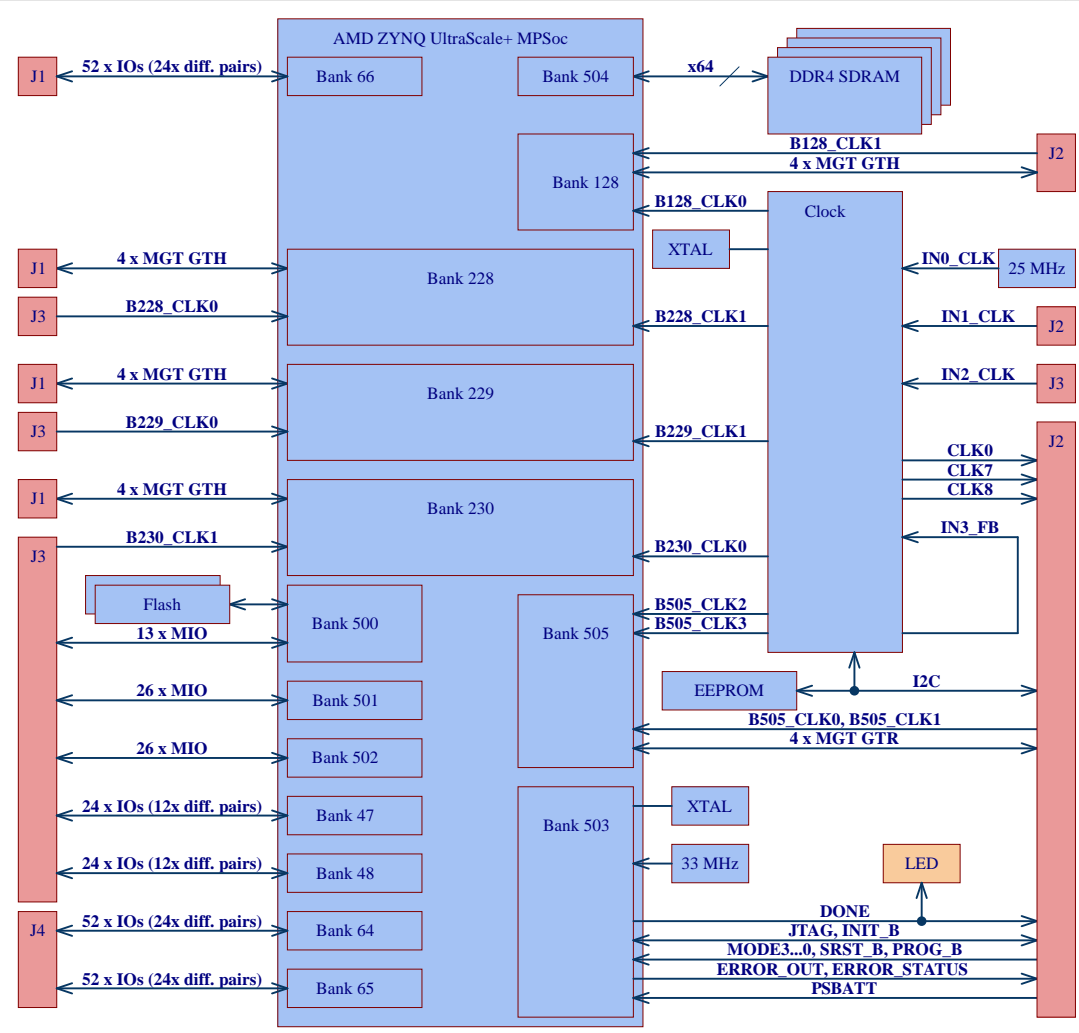
TE0818 is protected under such right and in case of plagiarism we will have to do anything necessary in order to protect our assets.

Schematics and other handouts serve for informational purposes only!

	Title: TE0818 - Legal Notices		
	A4	Number: TE0818 BBE81-A	Rev. 02
	Date: 19.09.2023	Copyright: Trenz Electronic GmbH	Page 1 of 31
	Filename: Legal Notices Modules.SchDoc		

REV	DATE	Description	
-01	2021-05	Initial revision	VT
-02	2023-10	<ol style="list-style-type: none"> Added capacitors C178, C187, C188, C189 (470nF) to VTT net. Added U18/U37 compensation network: R119, C190, C191. R118 is optional jumper and is installed when using the internal compensation network. External compensation network is used by default. Connected all DDR4 TEN pins together and pulled them down with resistor R120 and added testpoint TP23. Added testpoints TP25, TP27, TP29, TP35, TP37... TP79. Changed capacitor C112 size from 0402 to 0201 and voltage rating from 16 V to 10 V. Changed ferrid beads from MPZ0603S121HT000 to BLM15PX800SZ1D for L1, L2, L3, L4, L5, and L7. Changed ferrid beads from MPZ1608S221A to BLM15PX800SZ1D for L6 and L8. Added diode D2 between U41 pin 3 net MR and voltage rail 3.3VIN. Modified trace length. Updated documentation overviews. 	VY/ED
-02a	2023-10-12	1. Changed inductors L1 ... L8 from BLM15PX800SZ1D to BLM15PX800SN1D.	ED
-02b	2024-06-05	1. Changed the value of resistor R119 from 33.2 kOhm to 15 kOhm to improve the stability of U19 / U37 .	VY

		Title: TE0818 - Revision History	
		A4	Number: TE0818 BBE81-A
Date: 05.06.2024		Copyright: Trenz Electronic GmbH	
Filename: Revision_Changes.SchDoc		Page 2 of 31	



Supported Voltage Ranges:

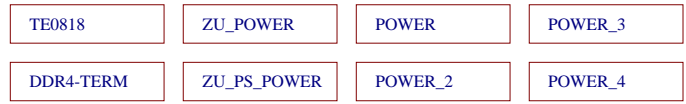
Power Rail	Direction	Range	Tolerance	Description	Note
3.3VIN	IN	3.3V	+/- 5 %	Micromodule Power	Management voltage rail, supplied by power rail
PL_DCIN	IN	3.3V	+/- 5 %	Micromodule Power	Programmable Logic, supplied by power rail
LP_DCDC	IN	3.3V	+/- 3 %	Micromodule Power	Low-Power Domain, supplied by power rail
GT_DCDC	IN	3.3V	+/- 3 %	Micromodule Power	GTH Transceiver, supplied by power rail
DCDCIN	IN	3.3V	+/- 5 %	Micromodule Power	Full-Power Domain and GTR, supplied by power rail
VCCO_64	IN	1.0 V - 1.8 V	+/- 3 %	HP IO Bank 64	Supplied by external power rail via B2B connector
VCCO_65	IN	1.0 V - 1.8 V	+/- 3 %	HP IO Bank 65	Supplied by external power rail via B2B connector
VCCO_66	IN	1.0 V - 1.8 V	+/- 3 %	HP IO Bank 66	Supplied by external power rail via B2B connector
VCCO_47	IN	1.2 V - 3.3 V	+/- 3 %	HD IO Bank 47	Supplied by external power rail via B2B connector
VCCO_48	IN	1.2 V - 3.3 V	+/- 3 %	HD IO Bank 48	Supplied by external power rail via B2B connector
PSBATT	IN	1.2 V - 1.5 V	-	RTC / BBRAM	Supplied by external power rail via B2B connector
PLL_3V3	IN	3.3 V	+/- 3 %	Power for PLL	Supplied by external power rail via B2B connector
PL_1V8	OUT	1.8 V	+/- 3 %	Power for Carrier	Micromodule: Programmable Logic
PS_1V8	OUT	1.8 V	+/- 3 %	Power for Carrier	Micromodule: Processing System
DDR_1V2	OUT	1.2 V	+/- 3 %	Power for Carrier	Micromodule: PS DDR I/O Supply

I2C Address:

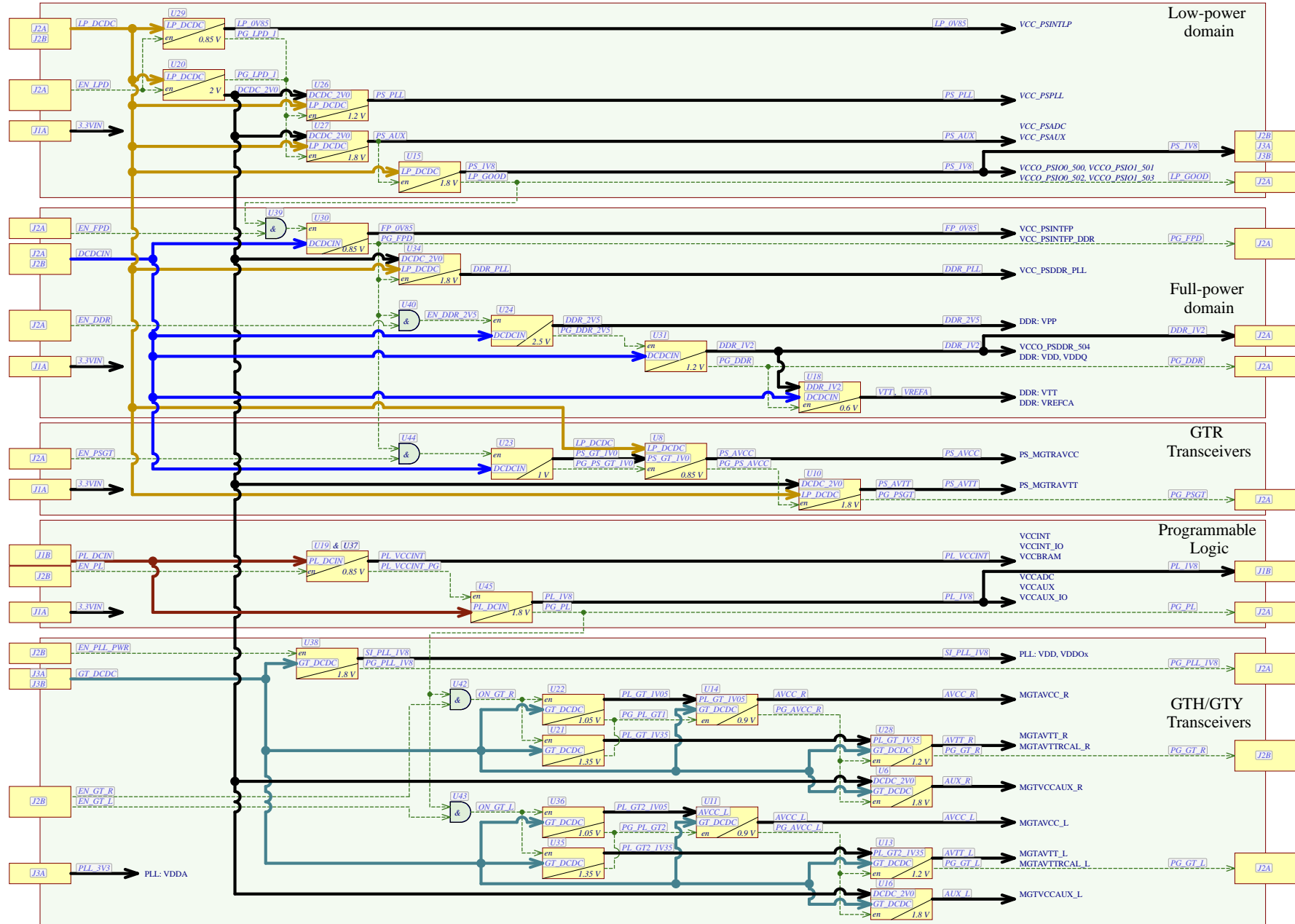
Device	I2C ADDR	Note
PLL U5	0x69	-
EEPROM U4	0x50	-

Legend:

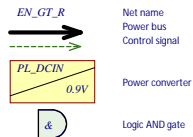
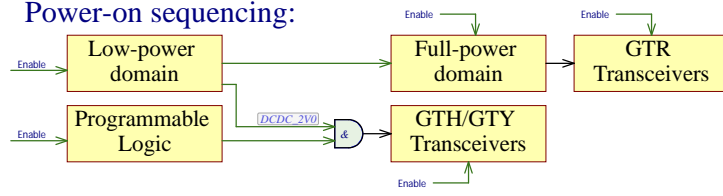
- B2B Connector
- LED Interface
- On-board Components



Title: TE0818 - System Overview		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 19.09.2023	Copyright: Trenz Electronic GmbH	Page 3 of 31
Filename: TE0818-Overview.SchDoc		



Power-on sequencing:



Title: TE0818 - Power Diagram		
A3	Number: TE0818 BBE81-A	Rev. 02
Datum: 19.09.2023	Copyright: Trenz Electronic GmbH	Page 4 of 31
Filename: Power_Diagram.SchDoc		

Special notes:

Serial
Serialnummer 6,3 x 6.3mm
LOGO1

TE Logo PRINT Layer

LOGO PRINT
MECH1

TE Address Overlay

LOGO ADDRESS
CE

CE Logo on Top Overlay

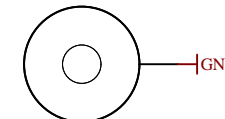
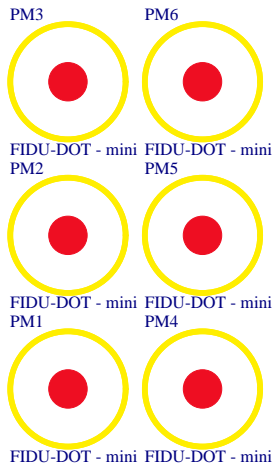
CE-TOPOVERLAY
RoHS

RoHS Logo on Top Overlay

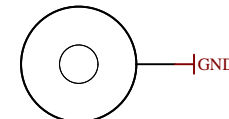
RoHS-TOPOVERLAY
WEEE

WEEE Logo on Top Overlay

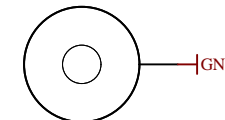
WEEE-TOPOVERLAY



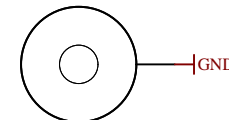
Mount.Hole 3.2mm für Unterlegscheibe



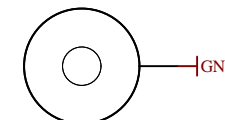
Mount.Hole 3.2mm für Unterlegscheibe



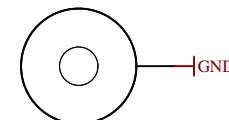
Mount.Hole 3.2mm für Unterlegscheibe



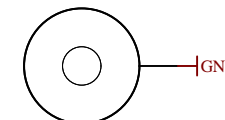
Mount.Hole 3.2mm für Unterlegscheibe



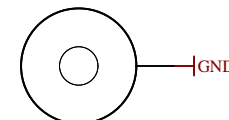
Mount.Hole 3.2mm für Unterlegscheibe



Mount.Hole 3.2mm für Unterlegscheibe



Mount.Hole 3.2mm für Unterlegscheibe

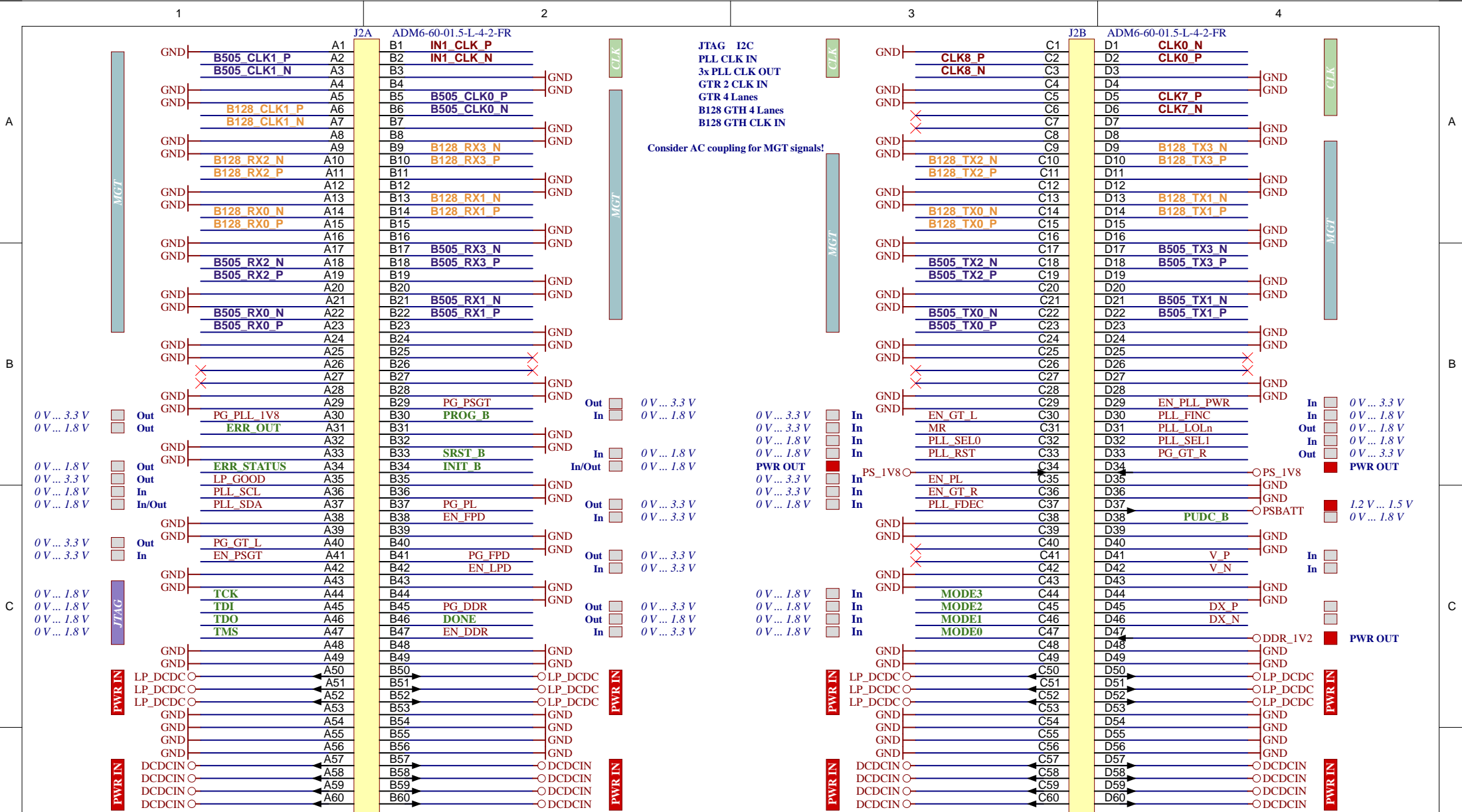


Mount.Hole 3.2mm für Unterlegscheibe

Design drawn by:	ED
Checked by:	VY
Assembly variant:	BBE81-A
Created by:	ED
Modified by:	ED
Modified at:	2023-09-20



Title: TE0818		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 5 of 31
Filename: TE0818.SchDoc		



Title: TE0818 - Connector J2		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 7 of 31
Filename: J2.SchDoc		

D

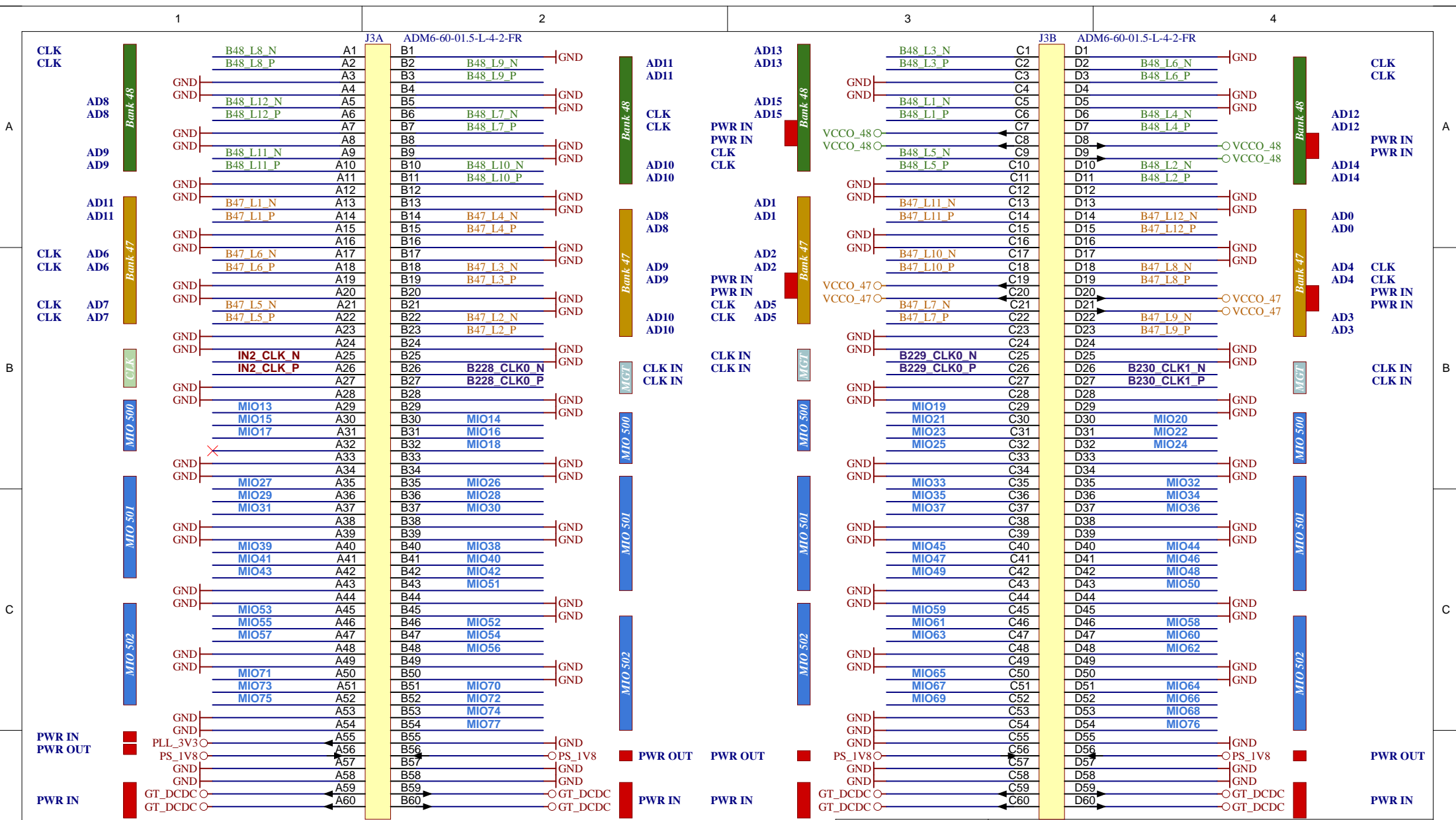
D

1

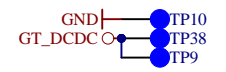
2

3

4



- Bank 47 HD 0..VCC047
 - Bank 48 HD 0..VCC048
 - Bank 64 HP 0..VCC064
 - Bank 65 HP 0..VCC065
 - Bank 66 HP 0..VCC066
- B47 24 IO, 12 LVDS Pairs
 B48 24 IO, 12 LVDS Pairs
 B228 GTH CLK IN
 B229 GTH CLK IN
 B230 GTH CLK IN
 65 MIO
 PLL CLK IN



Title: TE0818 - Connector J3		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 8 of 31
Filename: J3.SchDoc		

1

2

3

4

A

B

C

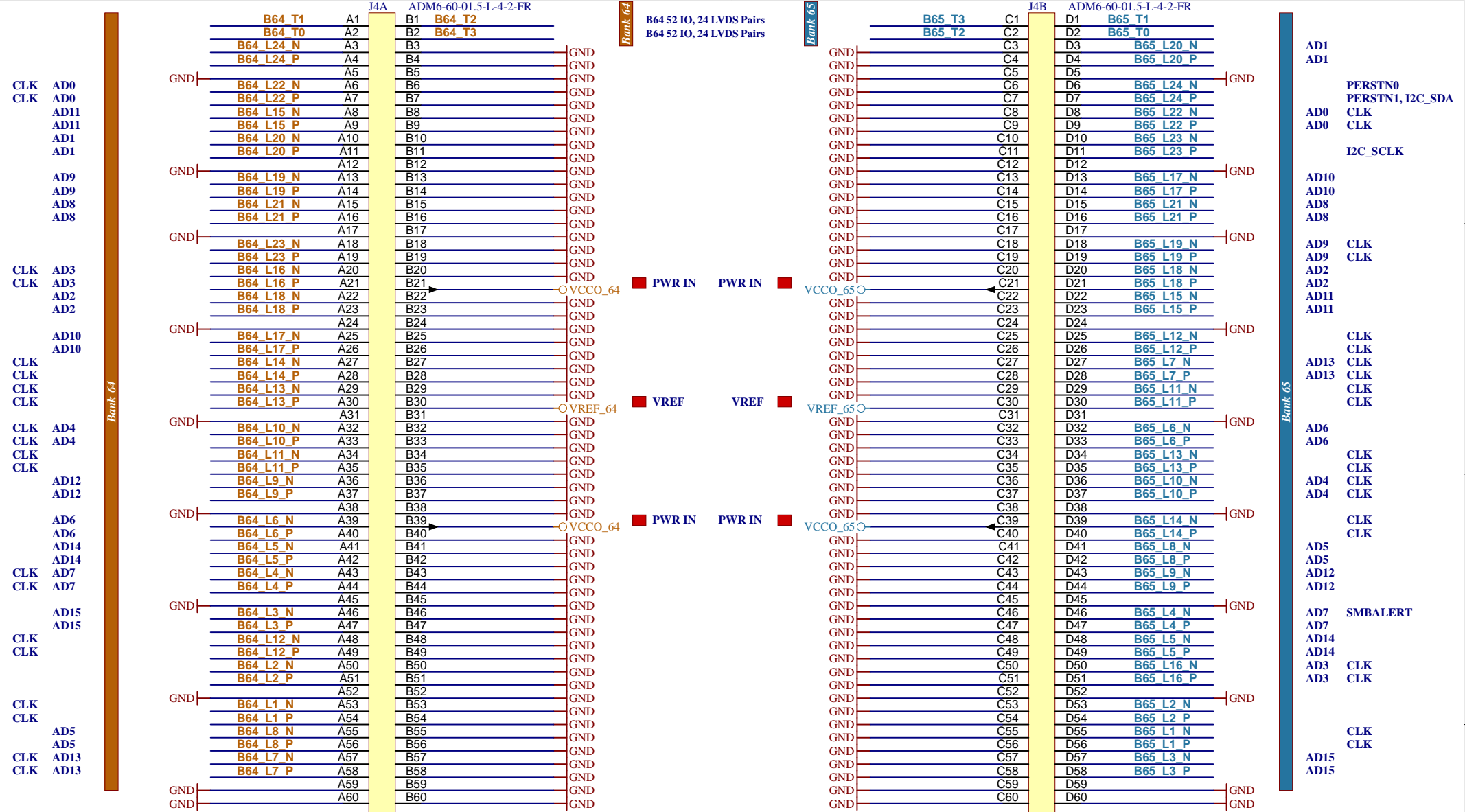
D

A

B

C

D



- Bank 47 HD 0..VCCO47
- Bank 48 HD 0..VCCO48
- Bank 64 HP 0..VCCO64
- Bank 65 HP 0..VCCO65
- Bank 66 HP 0..VCCO66



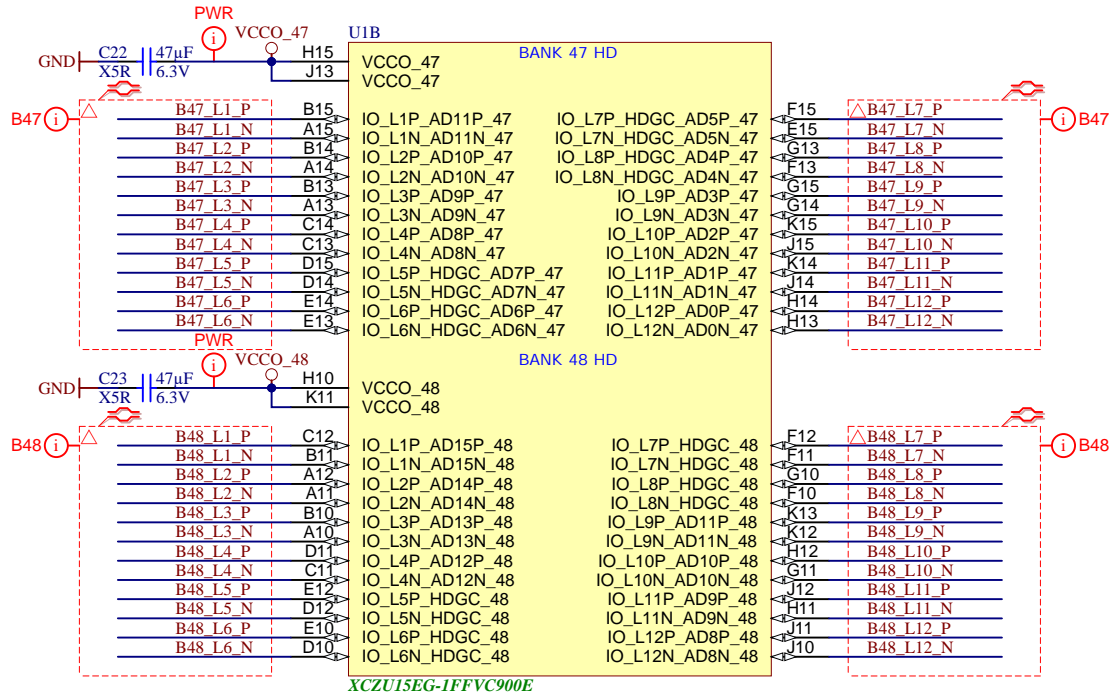
Title: TE0818 - Connector J4		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 9 of 31
Filename: J4.SchDoc		

1

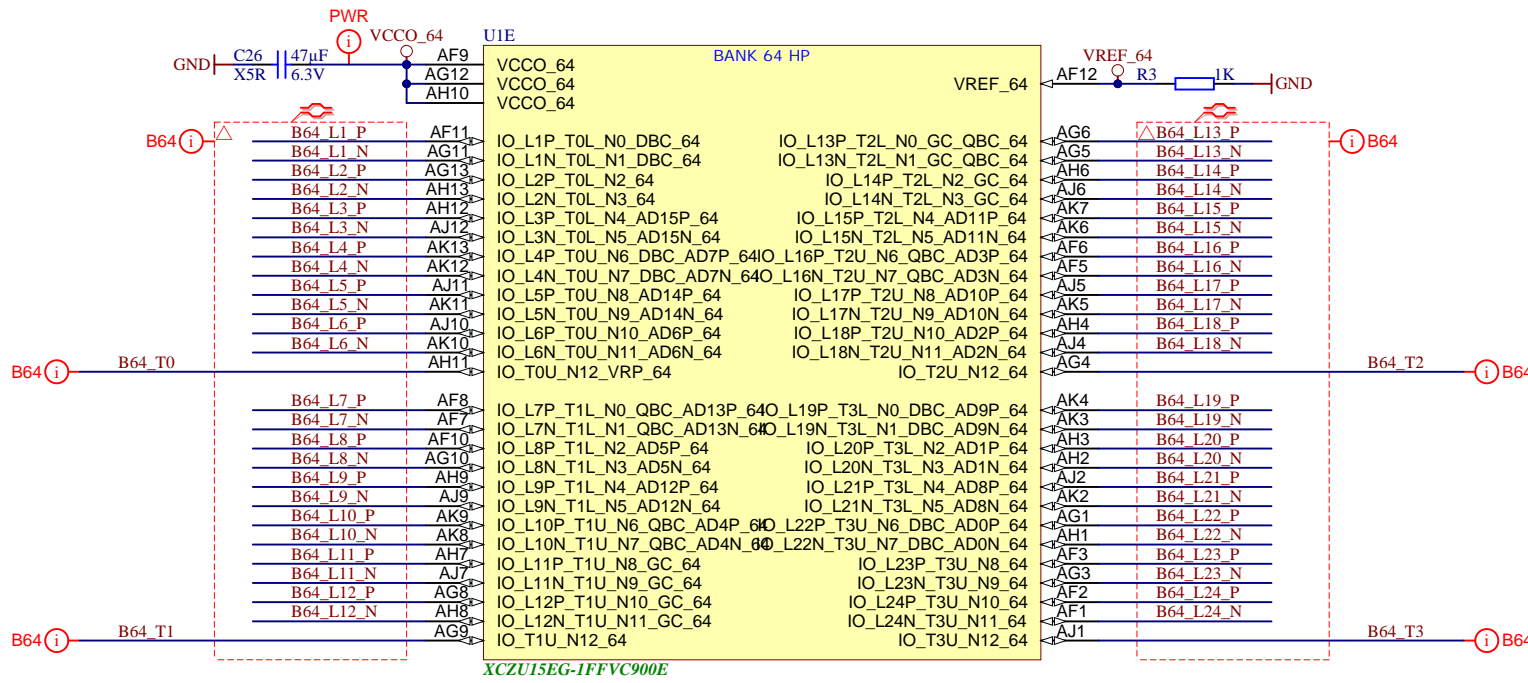
2

3

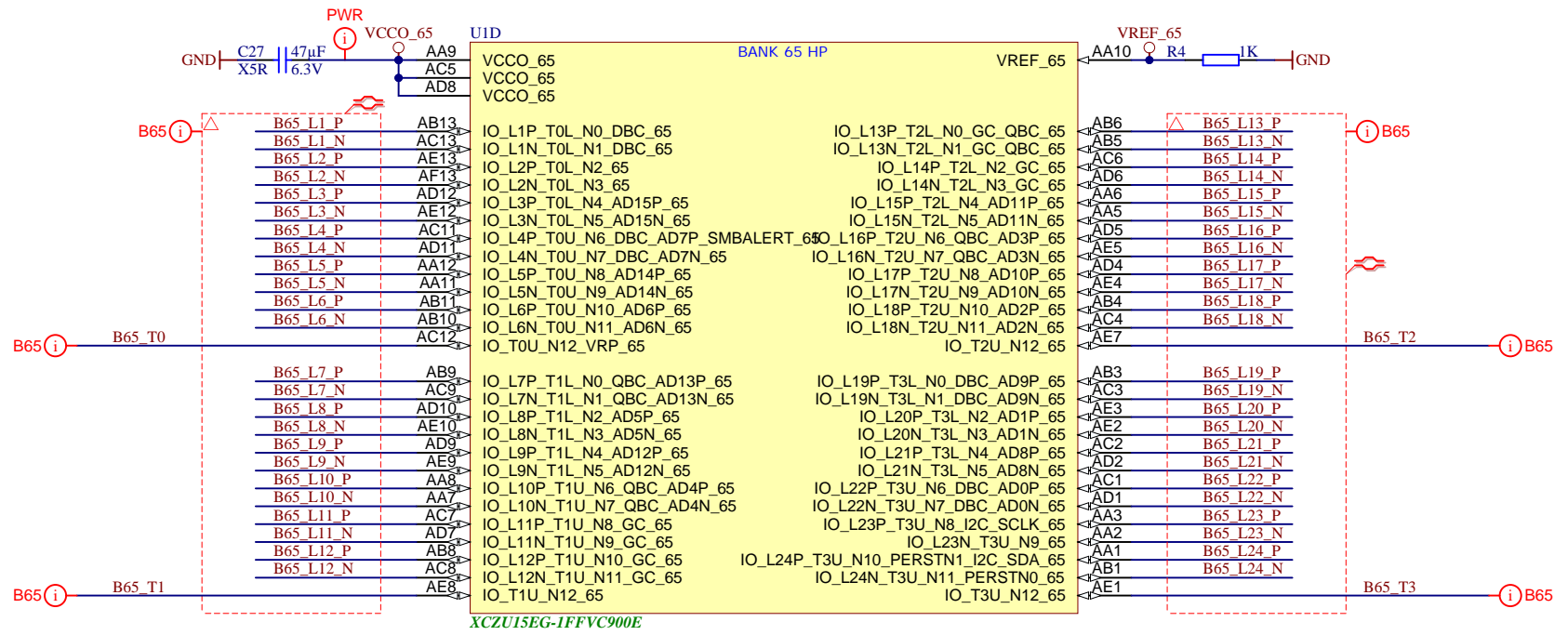
4



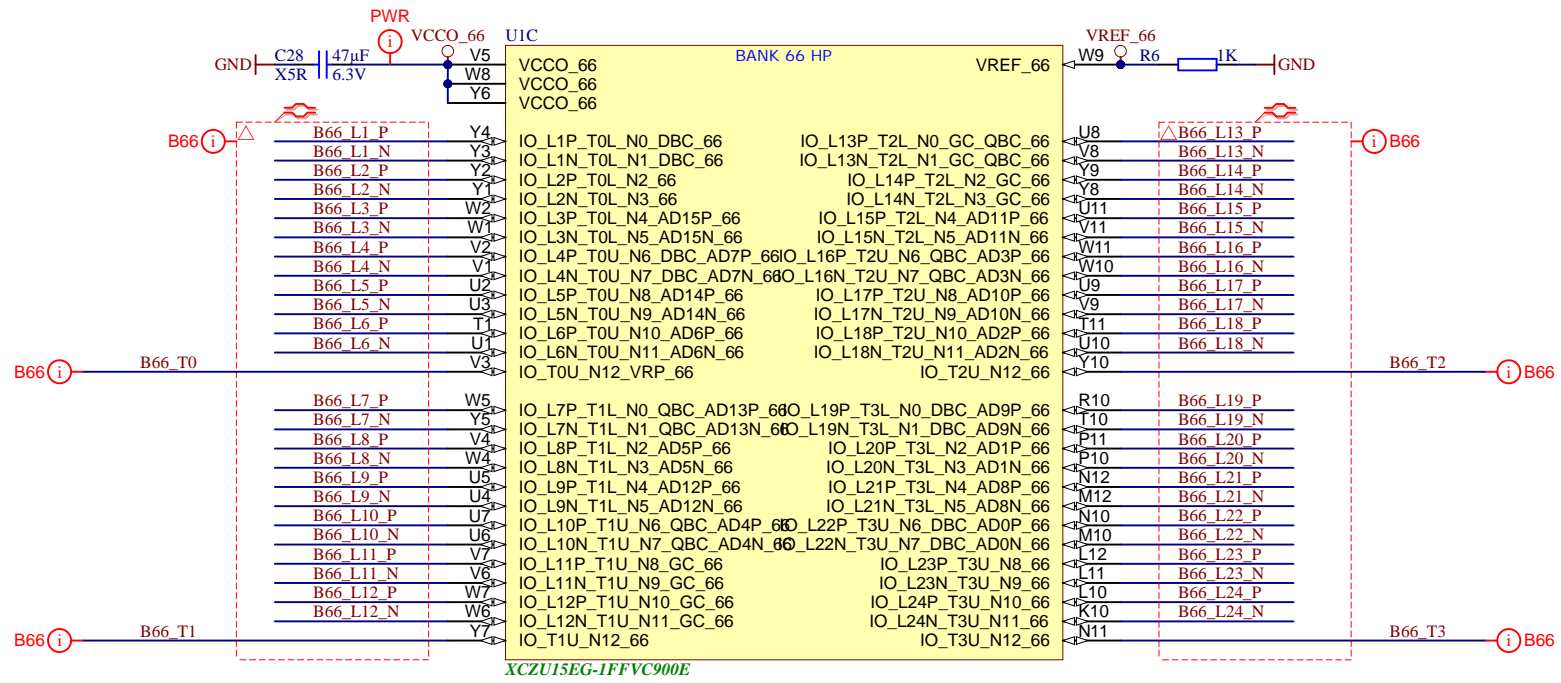
	Title: TE0818 - HD Bank		
	A4	Number: TE0818 BBE81-A	Rev. 02
	Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 10 of 31
	Filename: B_HD.SchDoc		



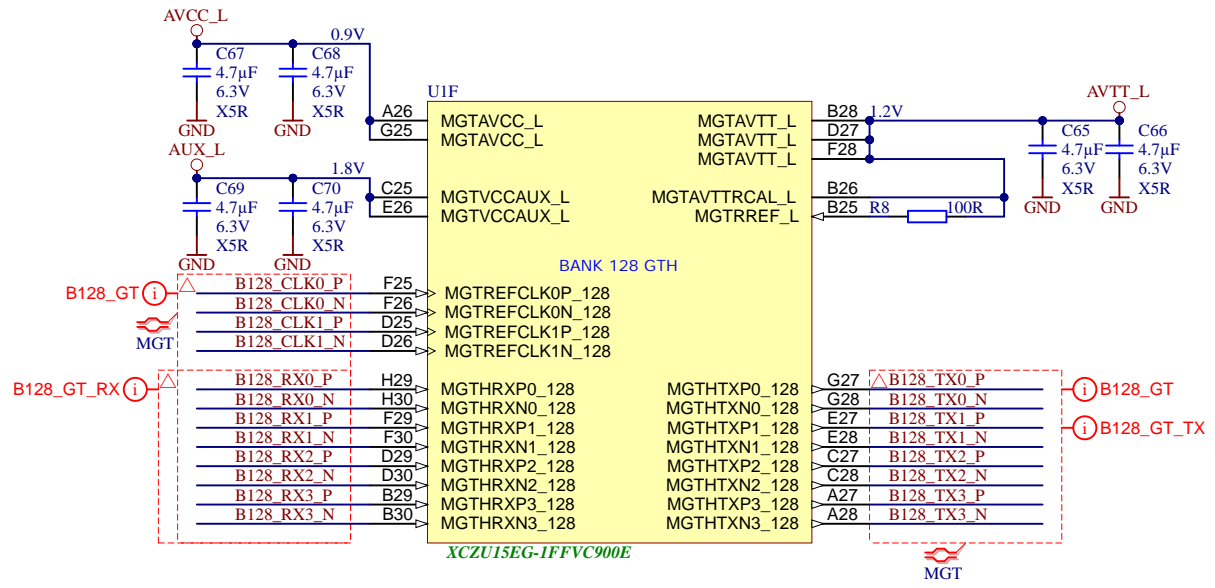
Title: TE0818 - HP Bank 1		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 11 of 31
Filename: B64.SchDoc		



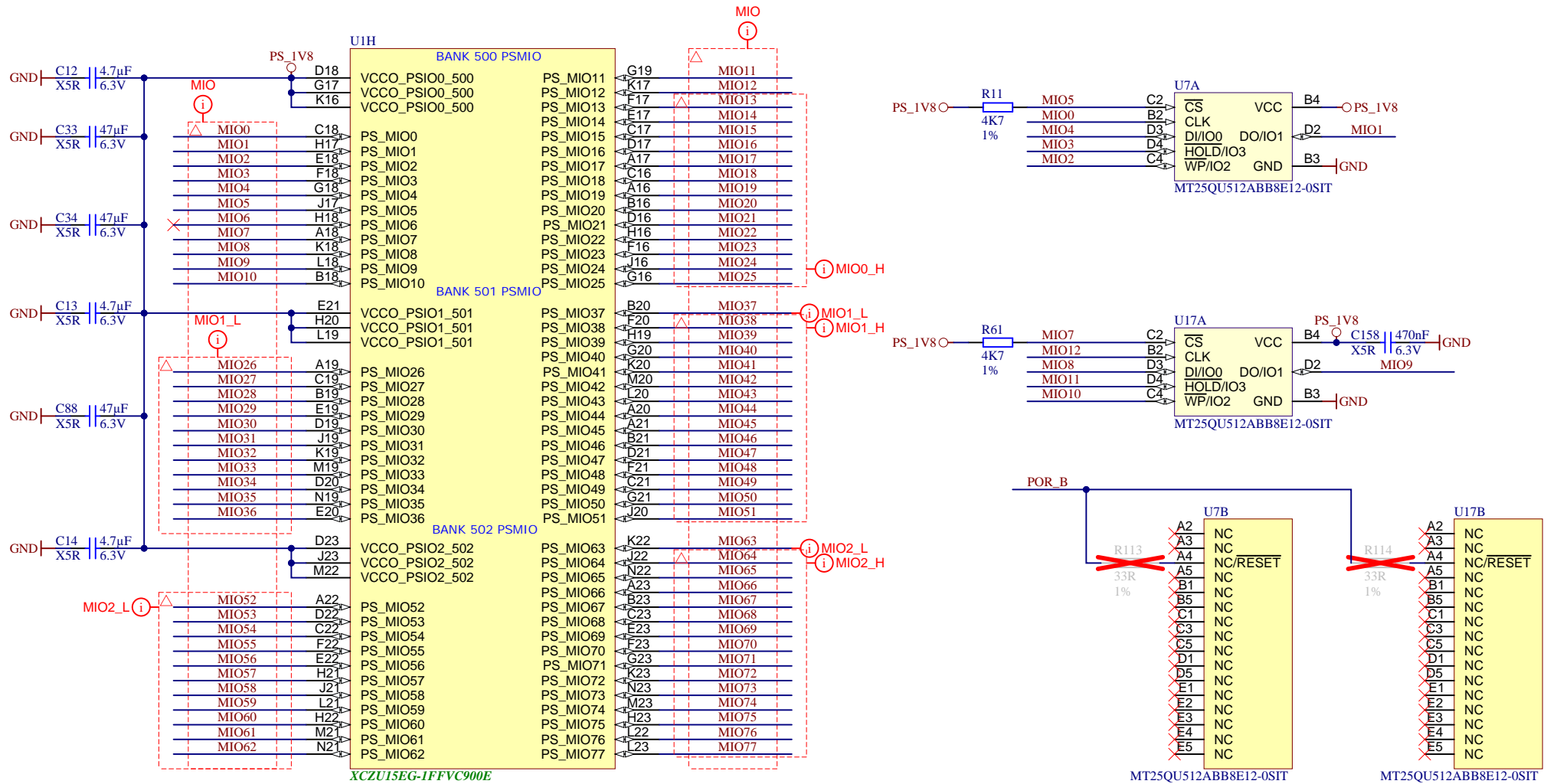
Title: TE0818 - HP Bank 2		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 12 of 31
Filename: B65.SchDoc		



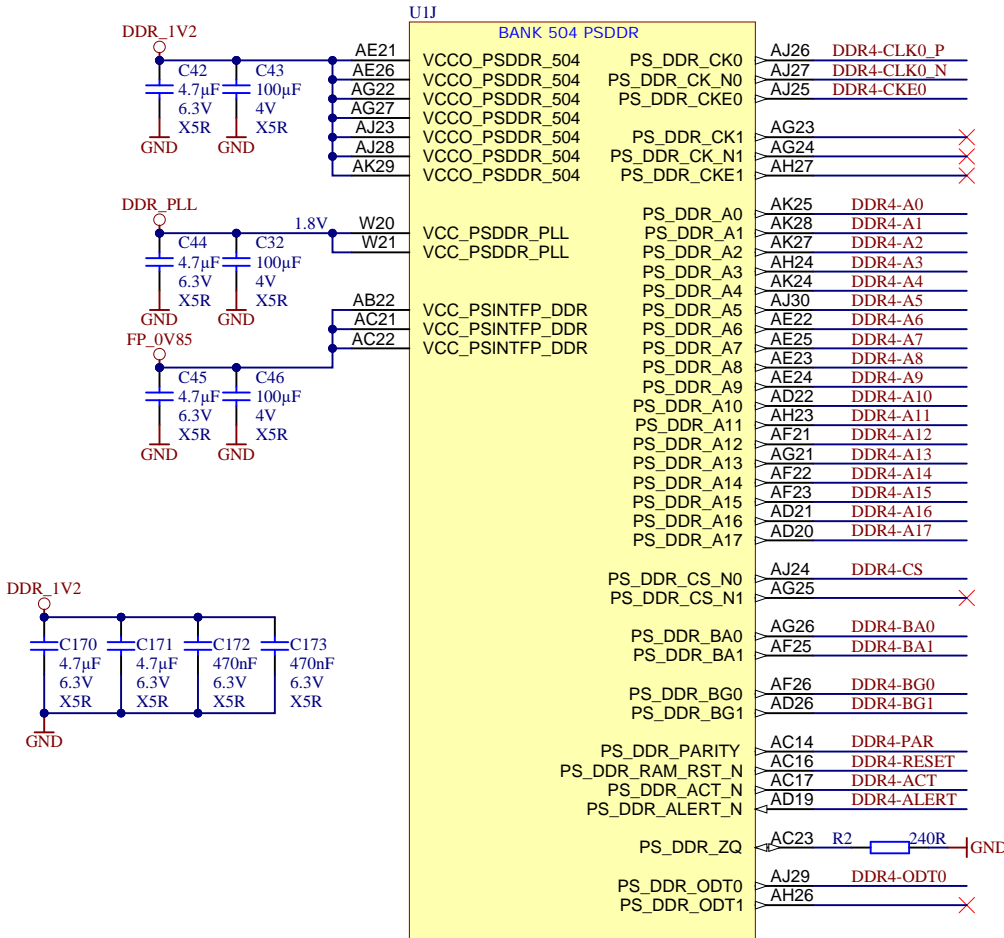
Title: TE0818 - HP Bank 3		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 13 of 31
Filename: B66.SchDoc		



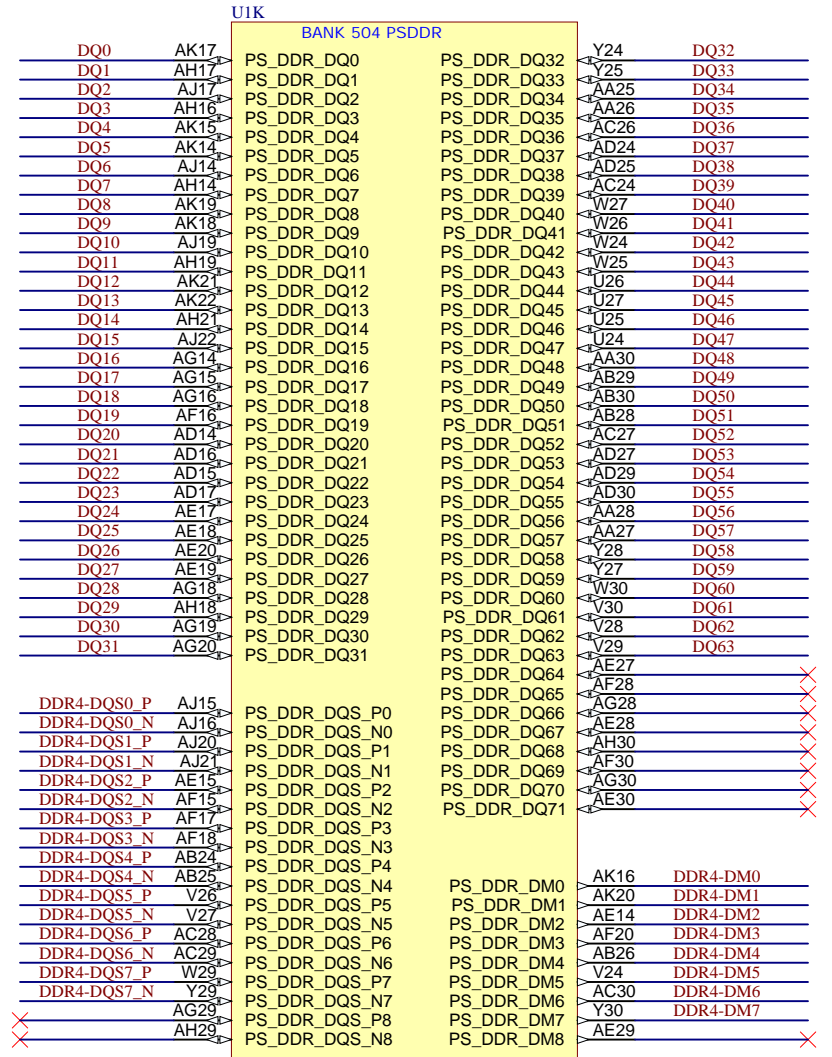
	Title: TE0818 - GTH Bank 2		
	A4	Number: TE0818 BBE81-A	Rev. 02
	Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 15 of 31
	Filename: B_GT_2.SchDoc		



	Title: TE0818 - MIO Banks	
	A4	Number: TE0818 BBE81-A
	Date: 09.10.2023	Copyright: Trenz Electronic GmbH
	Filename: B_MIO.SchDoc	



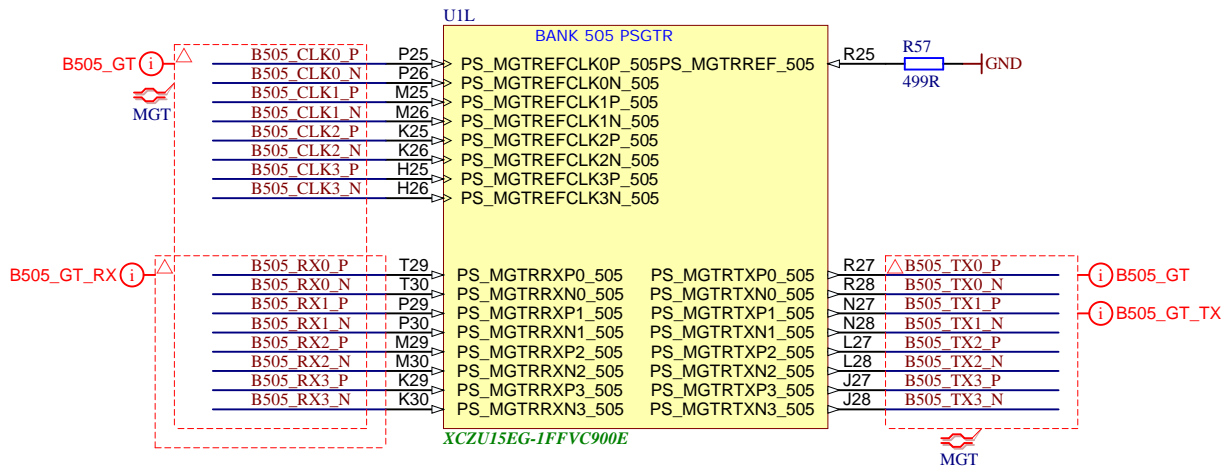
XCZU15EG-1FFVC900E



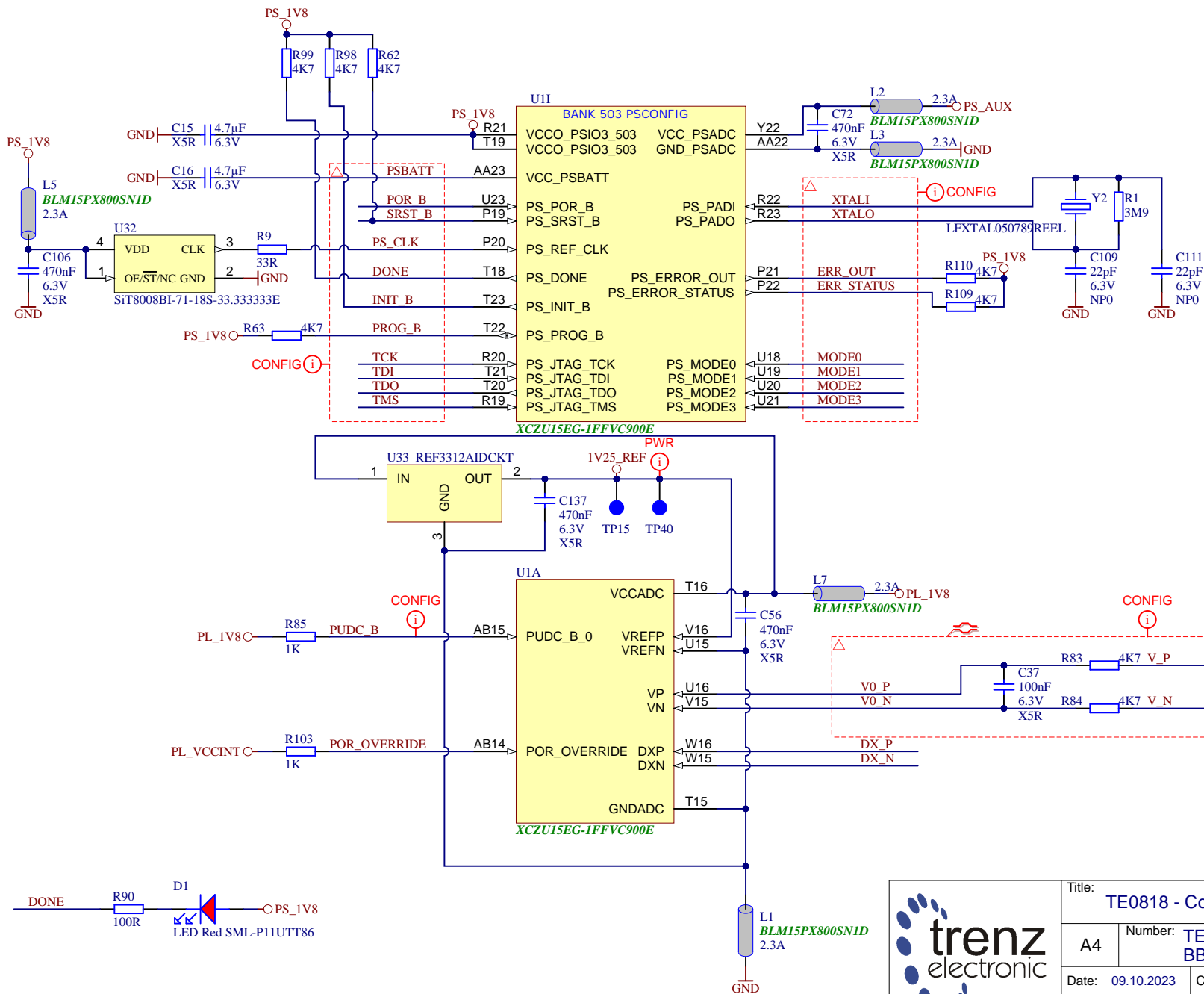
XCZU15EG-1FFVC900E



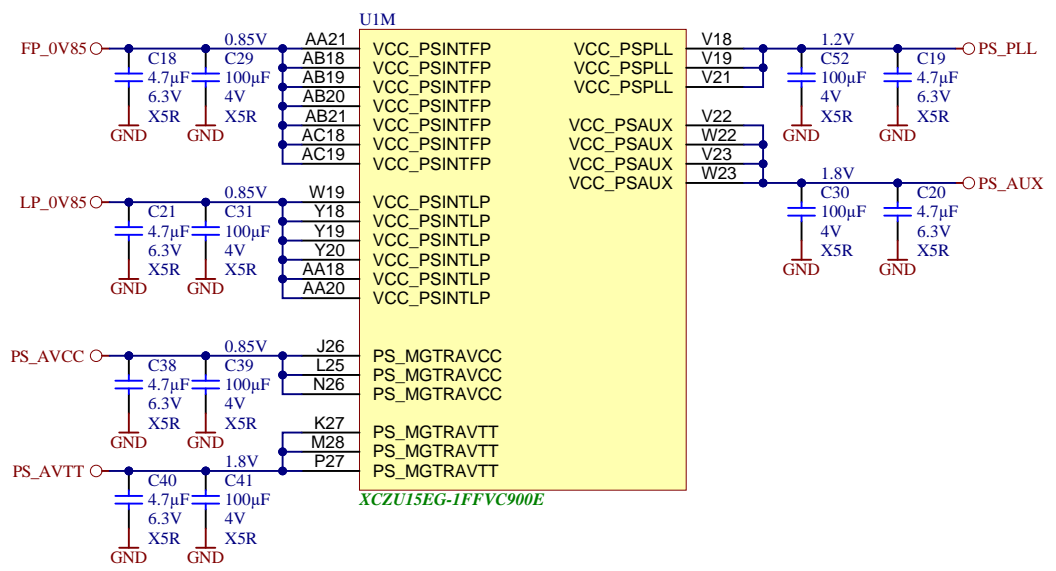
Title: TE0818 - PS DDR		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 17 of 31
Filename: PS_DDR.SchDoc		



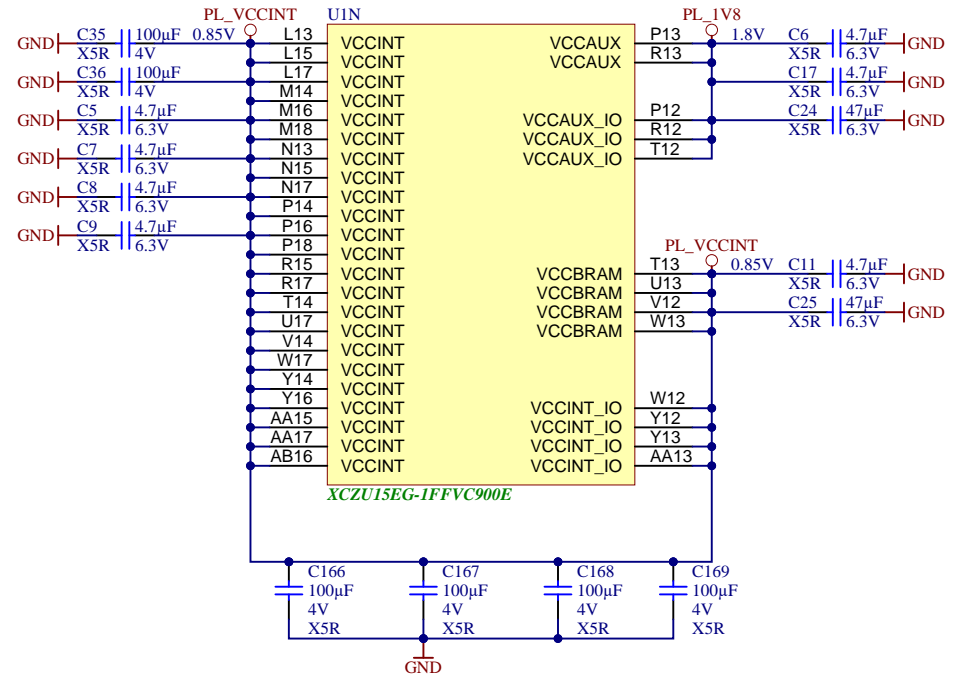
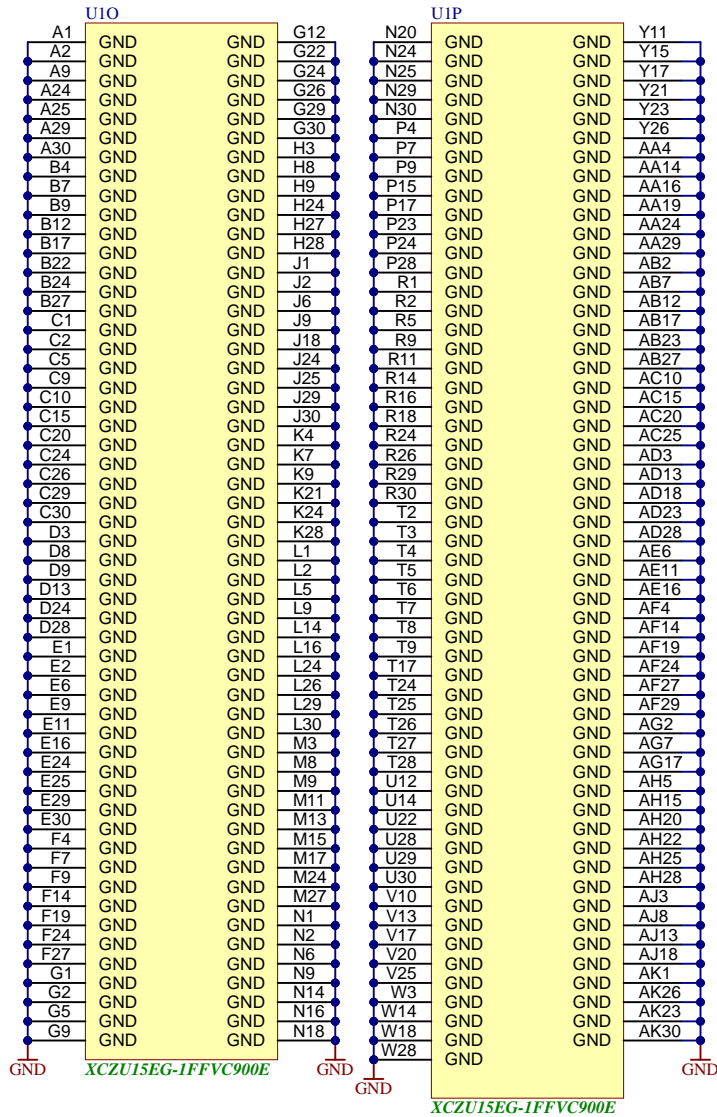
	Title: TE0818 - PS GT		
	A4	Number: TE0818 BBE81-A	Rev. 02
	Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 18 of 31
	Filename: B_PS_GT.SchDoc		



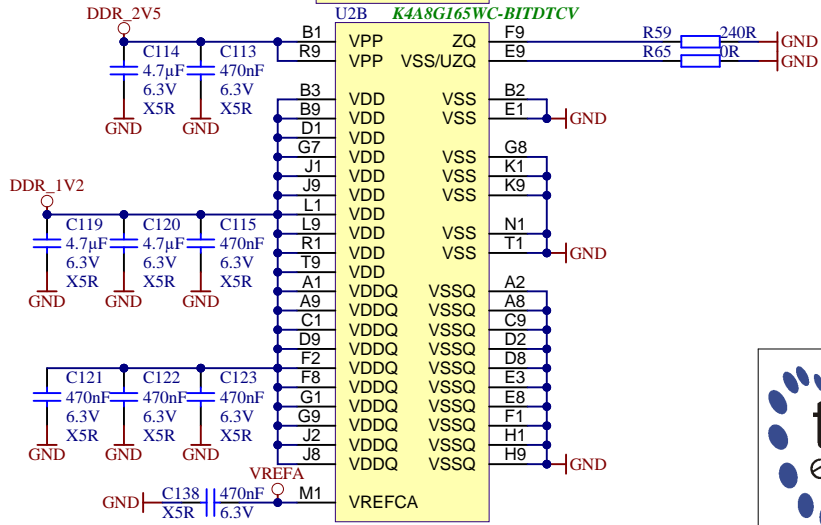
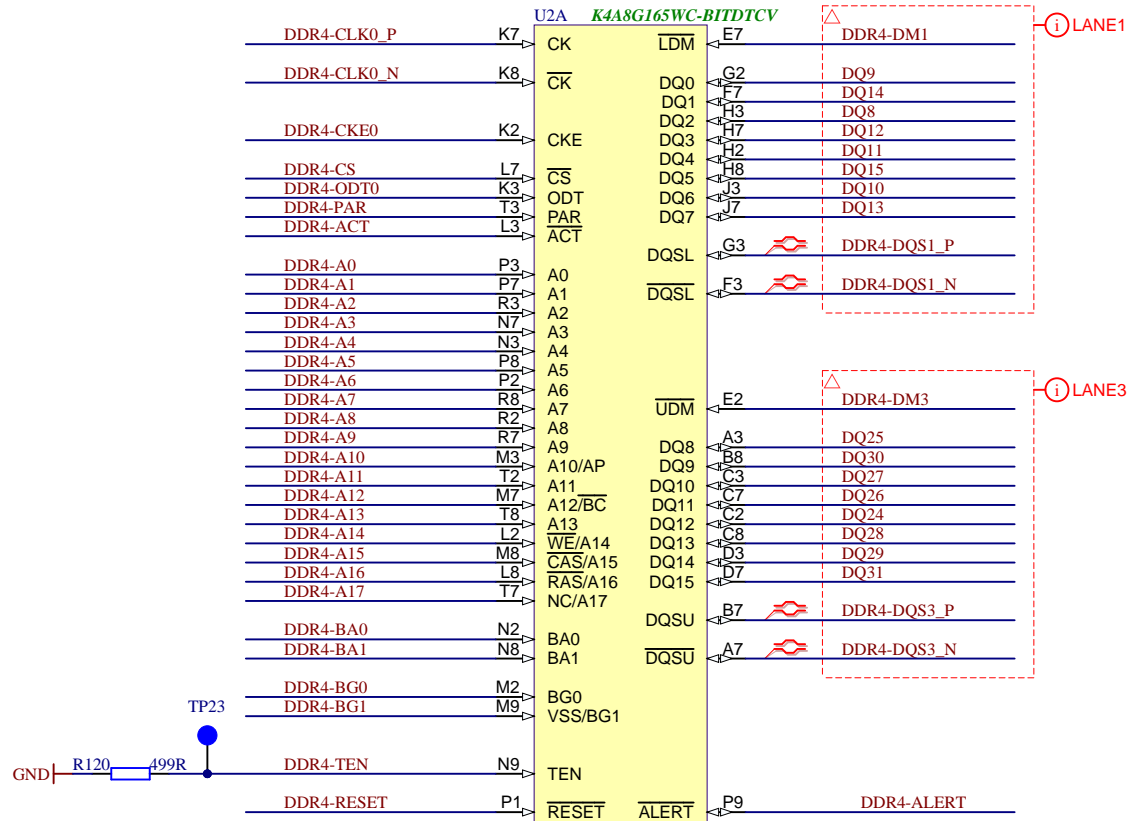
Title: TE0818 - Config		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 19 of 31
Filename: CONFIG.SchDoc		



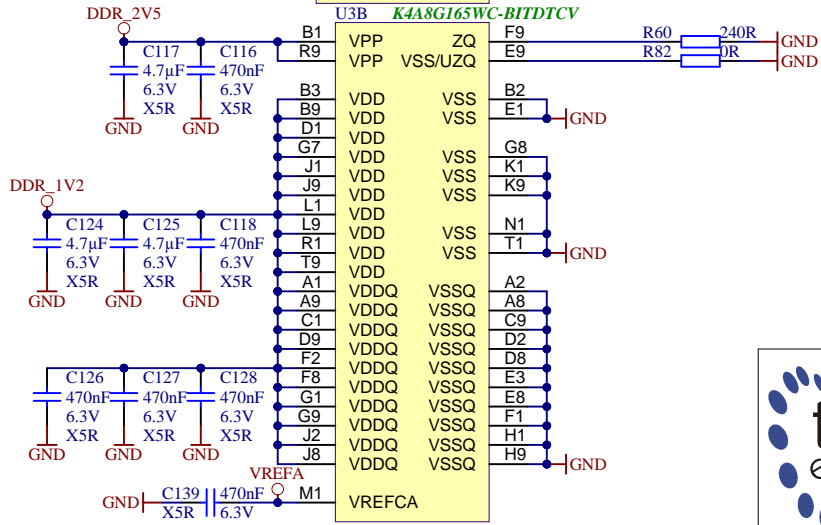
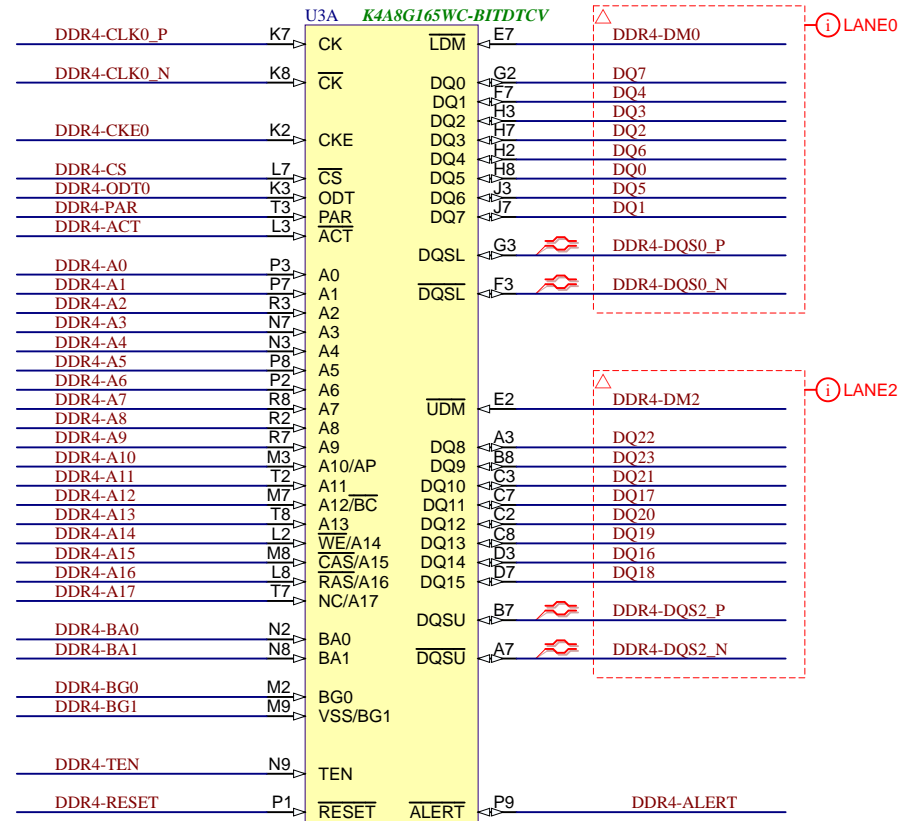
Title: TE0818 - PS Power		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 20 of 31
Filename: ZU_PS_POWER.SchDoc		



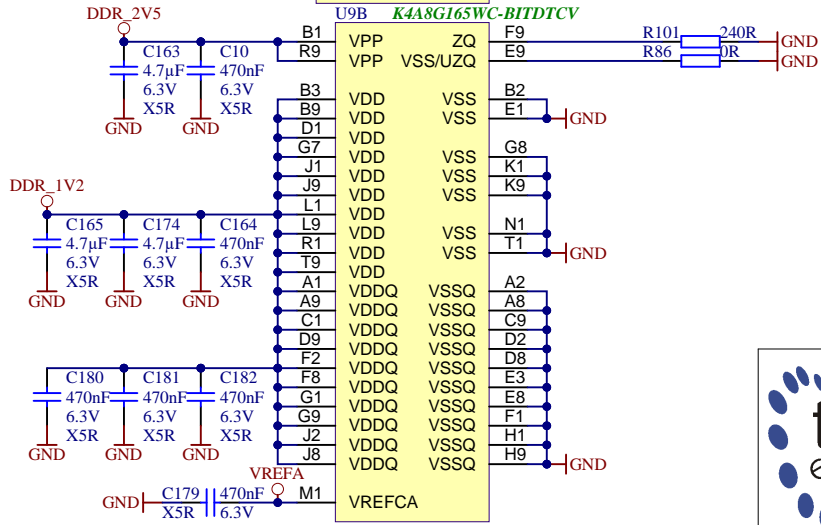
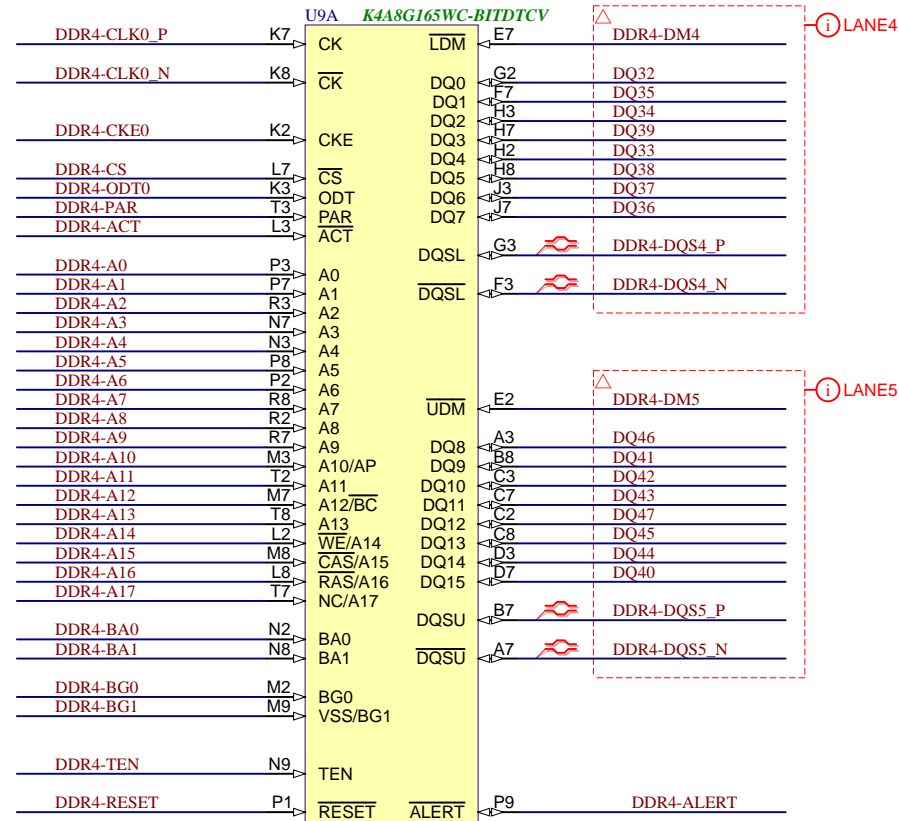
	Title: TE0818 - PL Power	
	A4	Number: TE0818 BBE81-A
	Date: 09.10.2023	Copyright: Trenz Electronic GmbH
	Filename: ZU_POWER.SchDoc	
	Rev. 02	Page 21 of 31



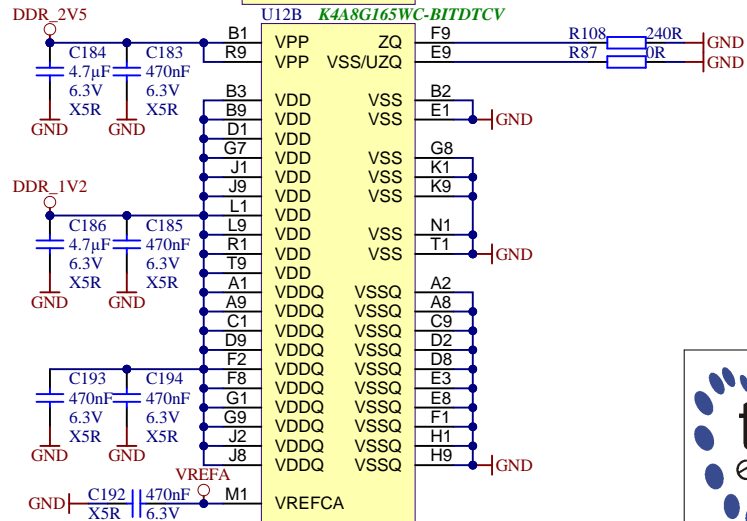
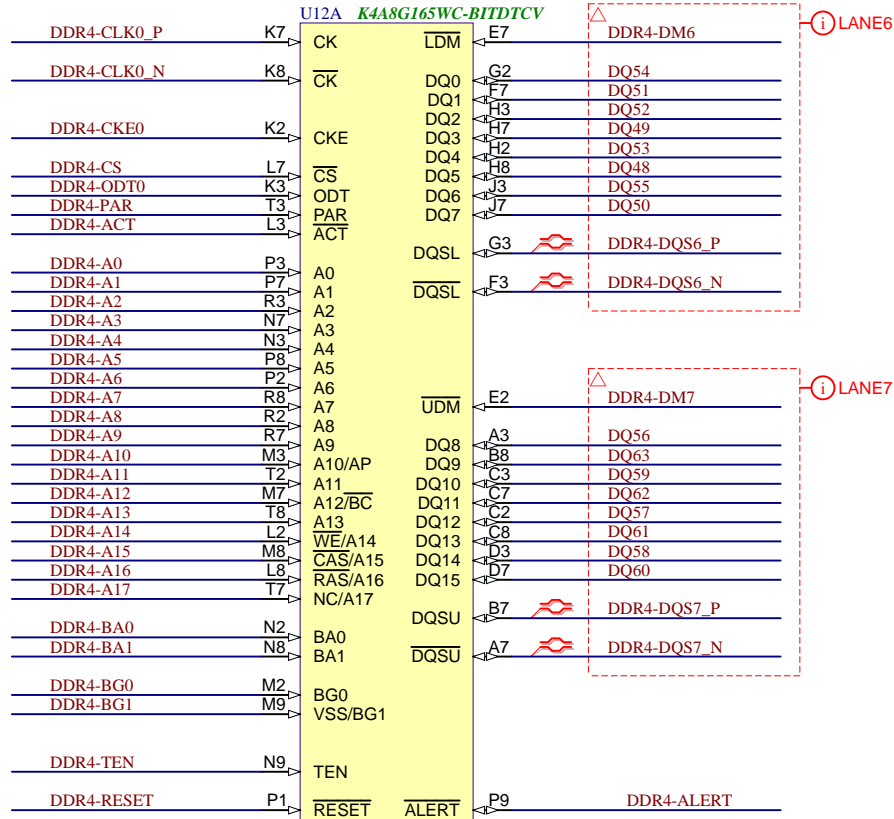
Title: TE0818 - DDR4 RAM 1		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 22 of 31
Filename: DDR4-RAM.SchDoc		



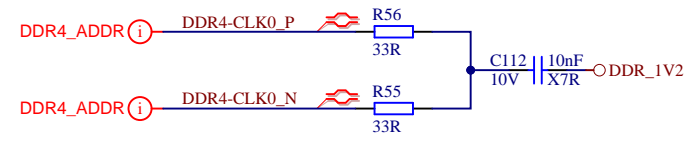
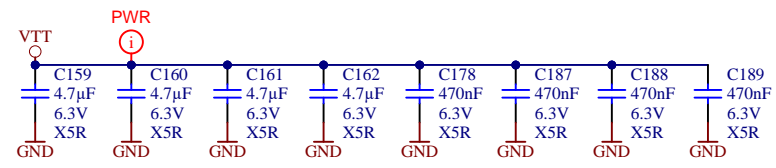
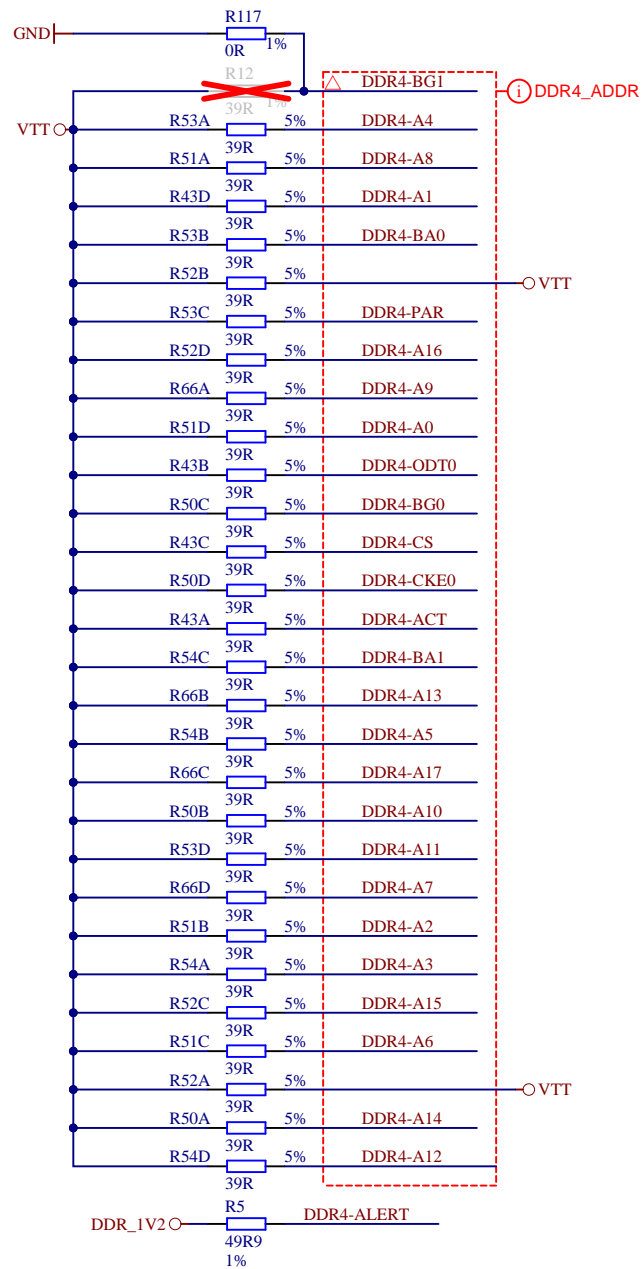
Title: TE0818 - DDR4 RAM 2		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 23 of 31
Filename: DDR4-RAM_2.SchDoc		



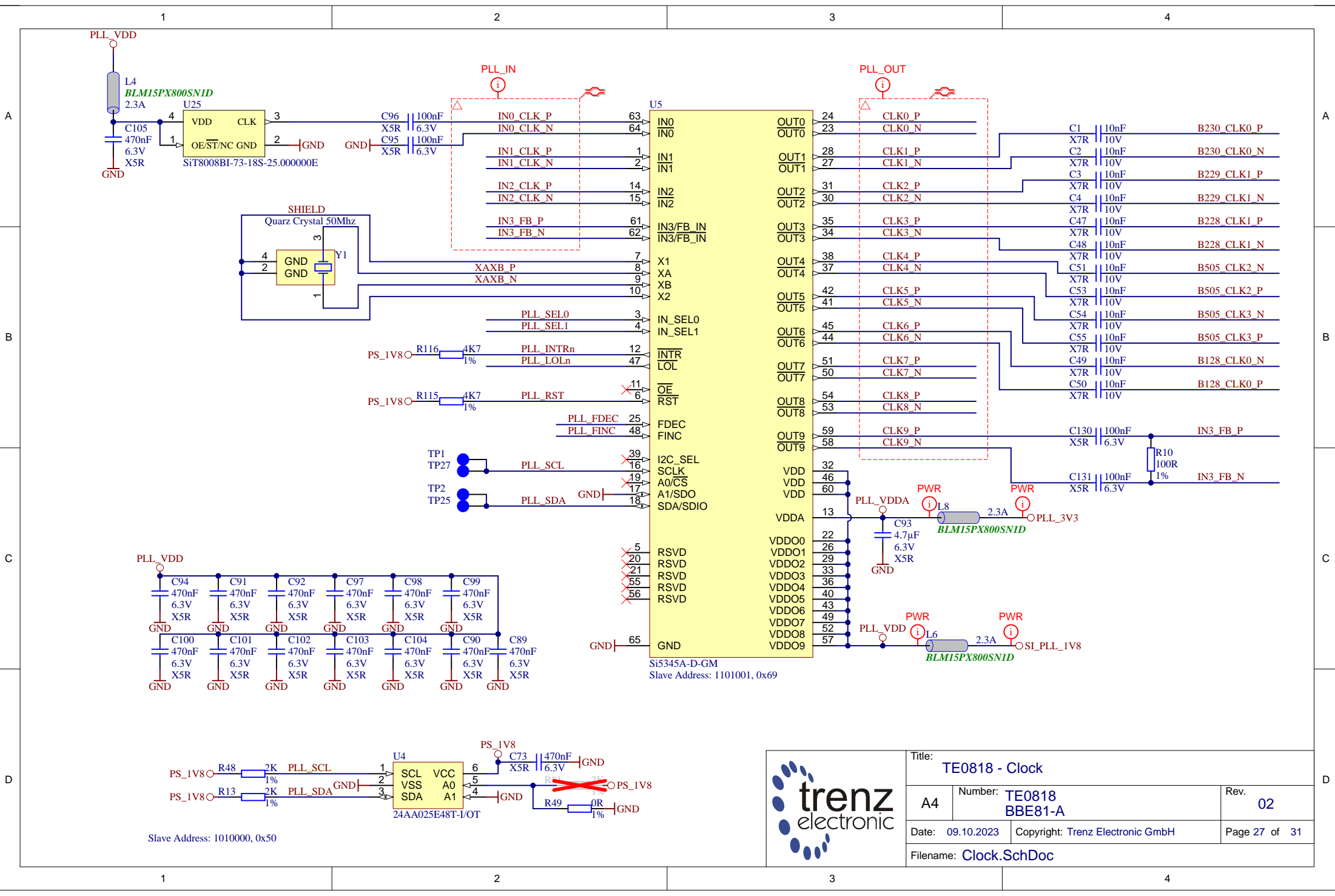
Title: TE0818 - DDR4 RAM 3		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 24 of 31
Filename: DDR4-RAM_3.SchDoc		



Title: TE0818 - DDR4 RAM 4		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 25 of 31
Filename: DDR4-RAM_4.SchDoc		



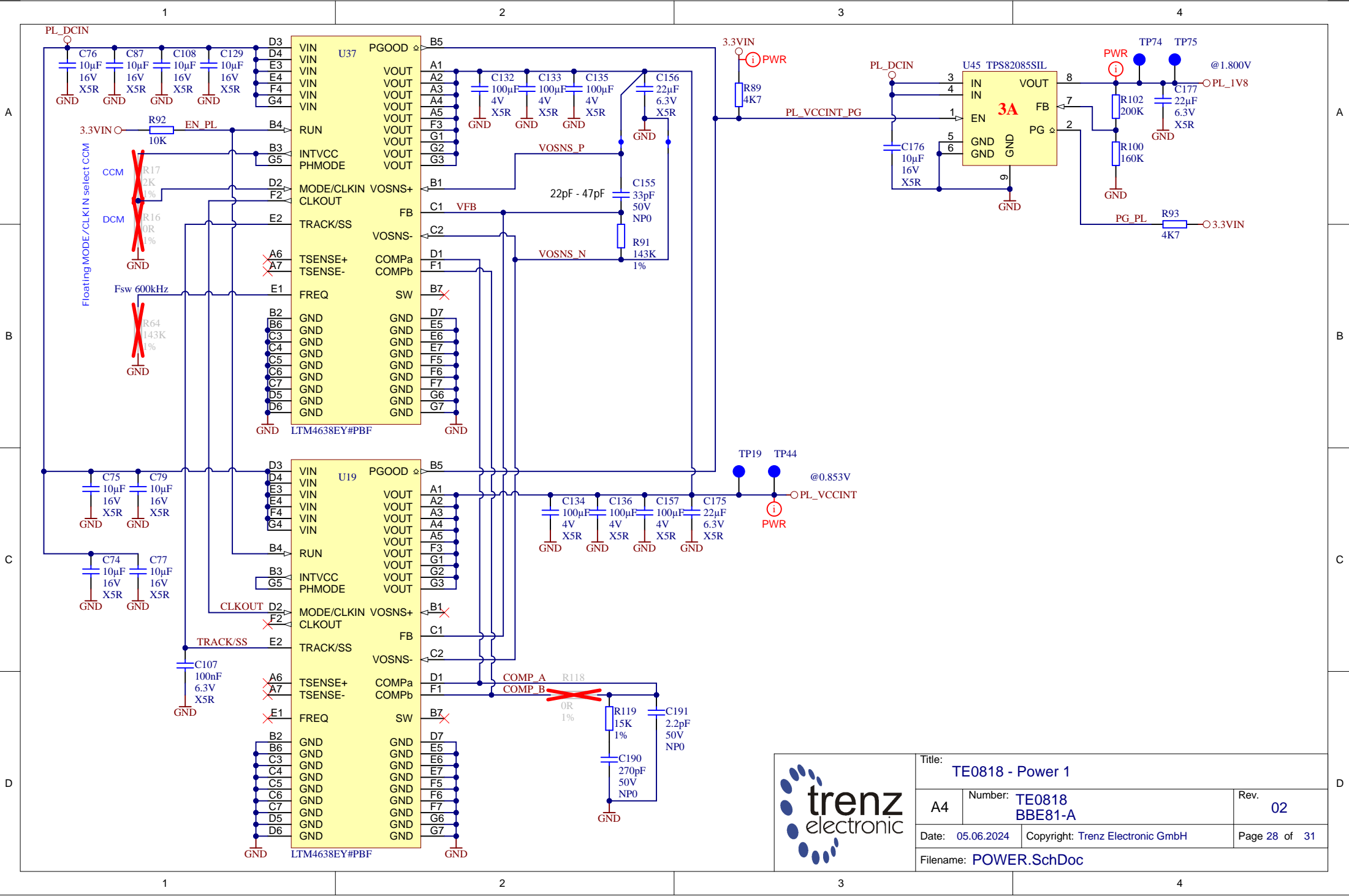
Title: TE0818 - DDR4 Termination		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 26 of 31
Filename: DDR4-TERM.SchDoc		



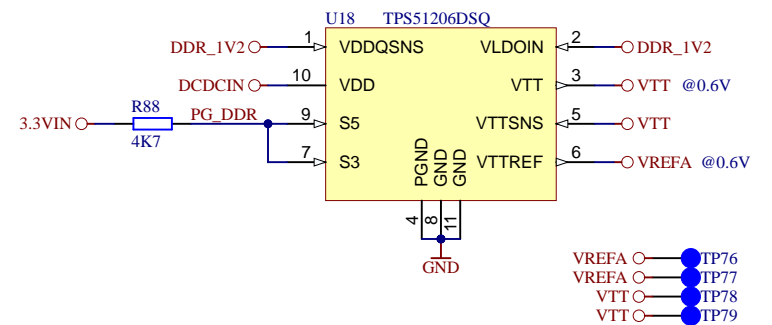
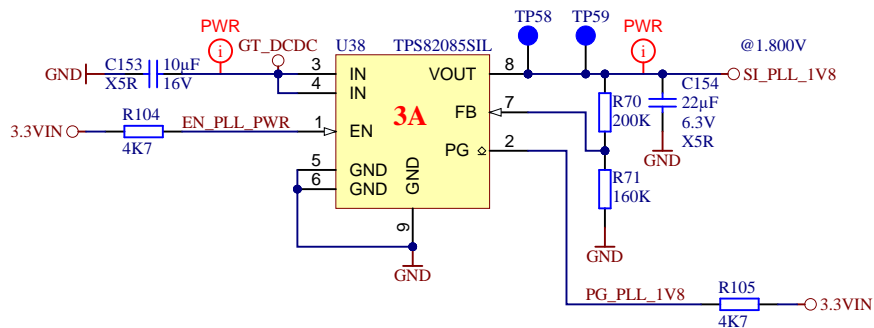
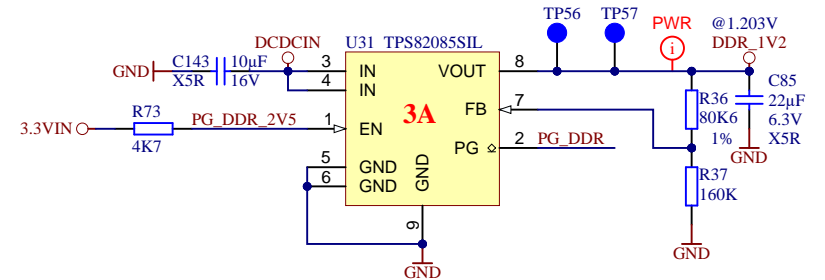
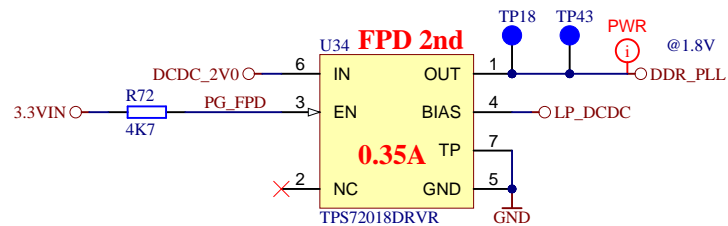
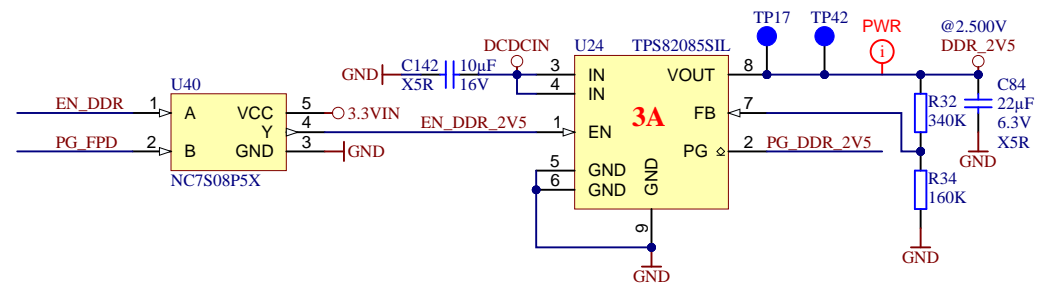
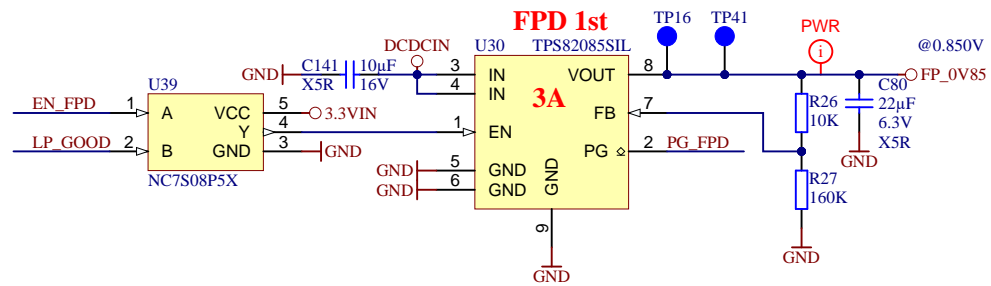
Title: TE0818 - Clock		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 27 of 31
Filename: Clock.SchDoc		



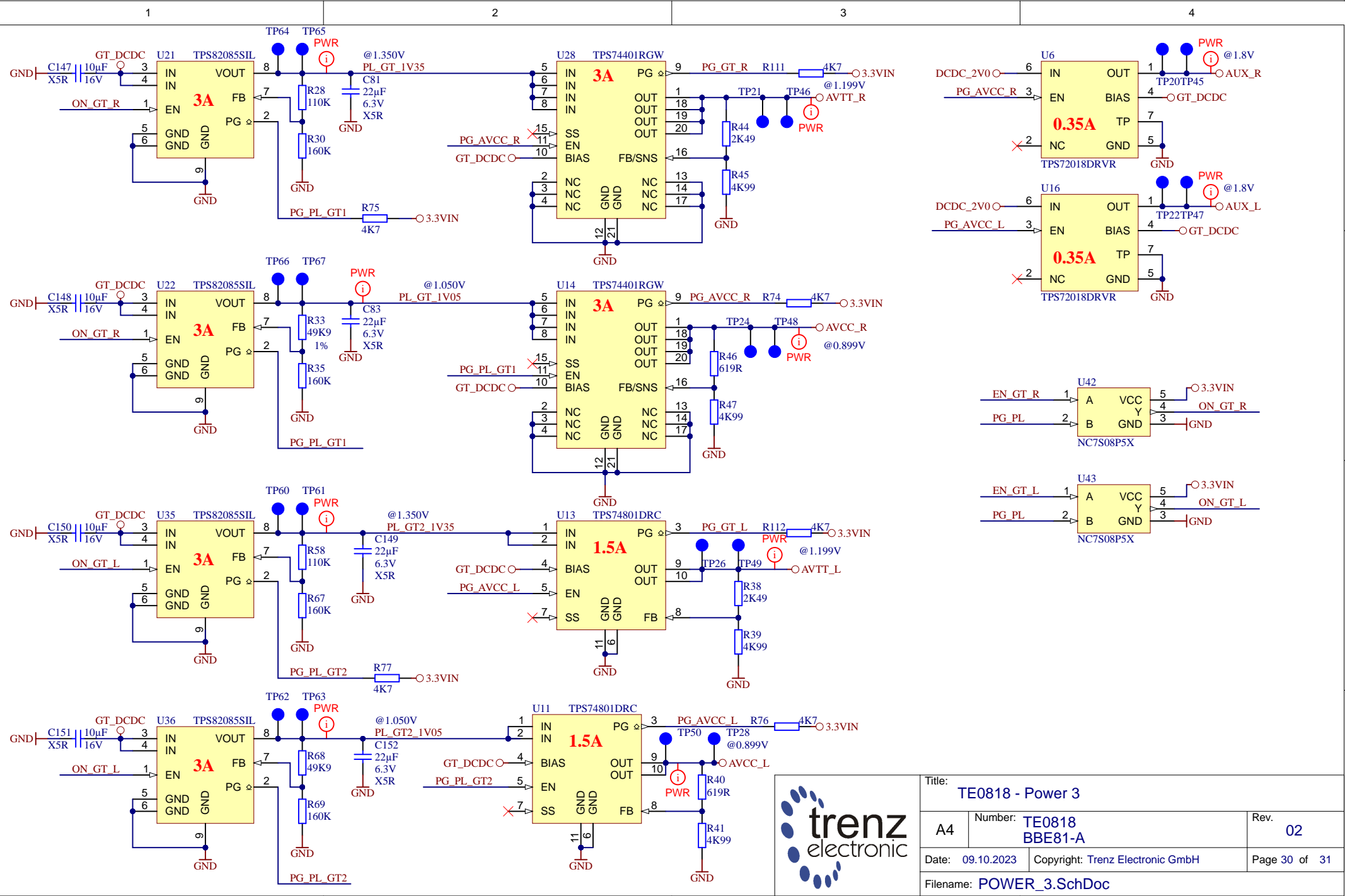
Slave Address: 1010000, 0x50



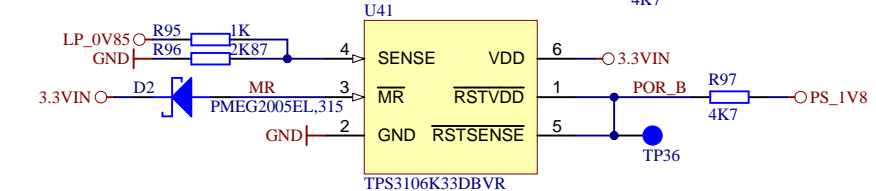
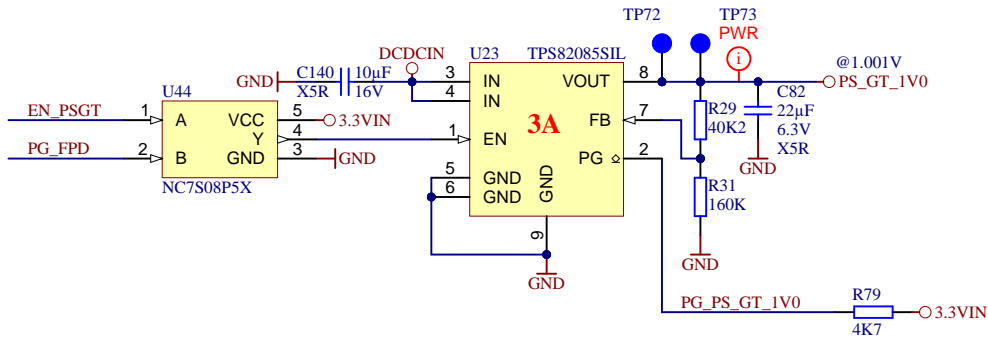
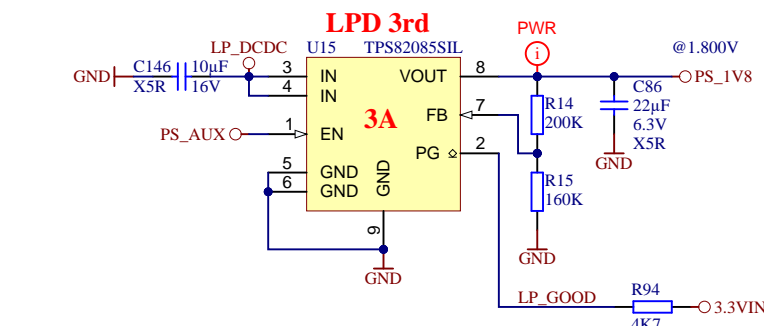
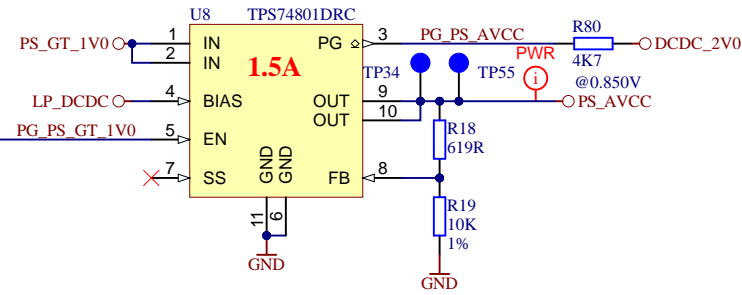
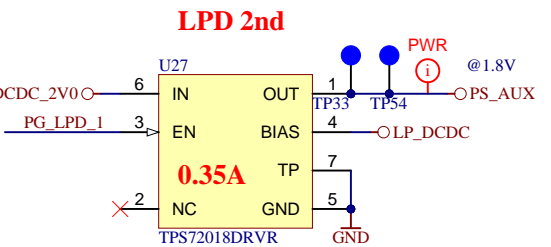
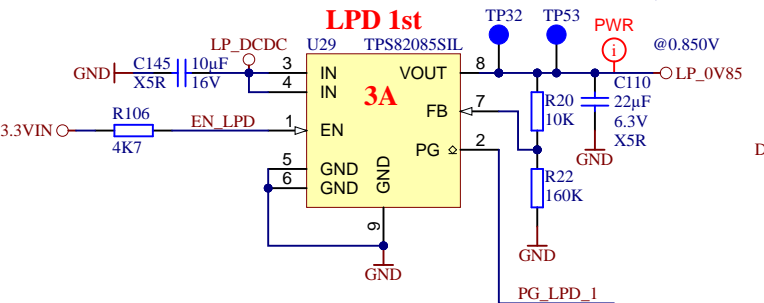
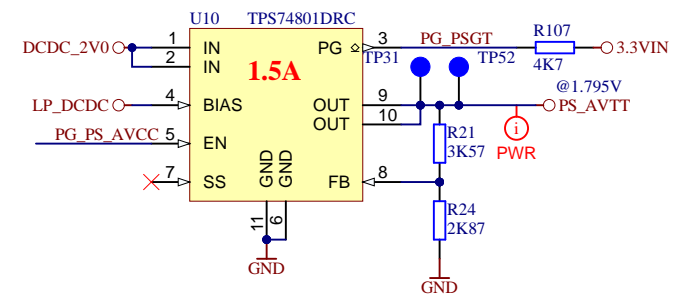
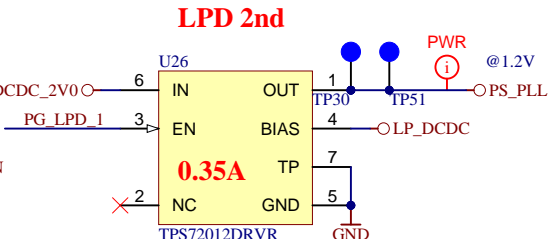
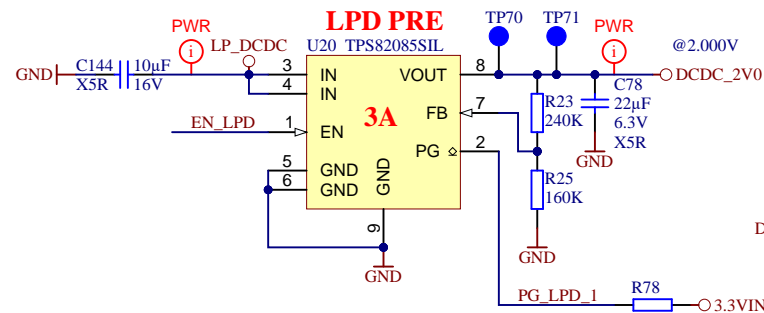
Title: TE0818 - Power 1		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 05.06.2024	Copyright: Trenz Electronic GmbH	Page 28 of 31
Filename: POWER.SchDoc		



Title: TE0818 - Power 2		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 29 of 31
Filename: POWER_2.SchDoc		



Title: TE0818 - Power 3		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 30 of 31
Filename: POWER_3.SchDoc		



Net Name	Voltage Rail	Low Detect
LP_OV85	0.85 V	0.743 V
3.3VIN	3.3 V	2.941 V



Title: TE0818 - Power 4		
A4	Number: TE0818 BBE81-A	Rev. 02
Date: 09.10.2023	Copyright: Trenz Electronic GmbH	Page 31 of 31
Filename: POWER_4.SchDoc		