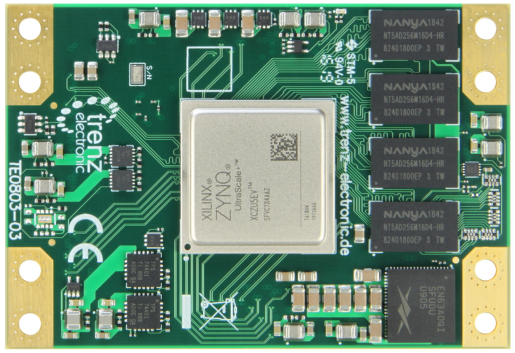
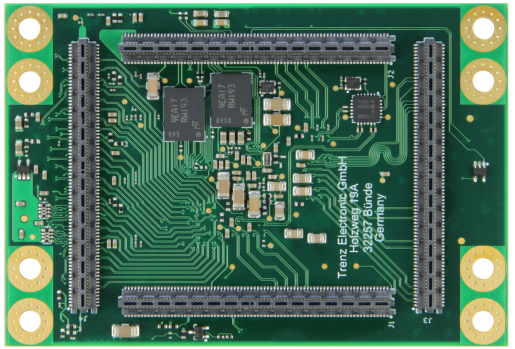




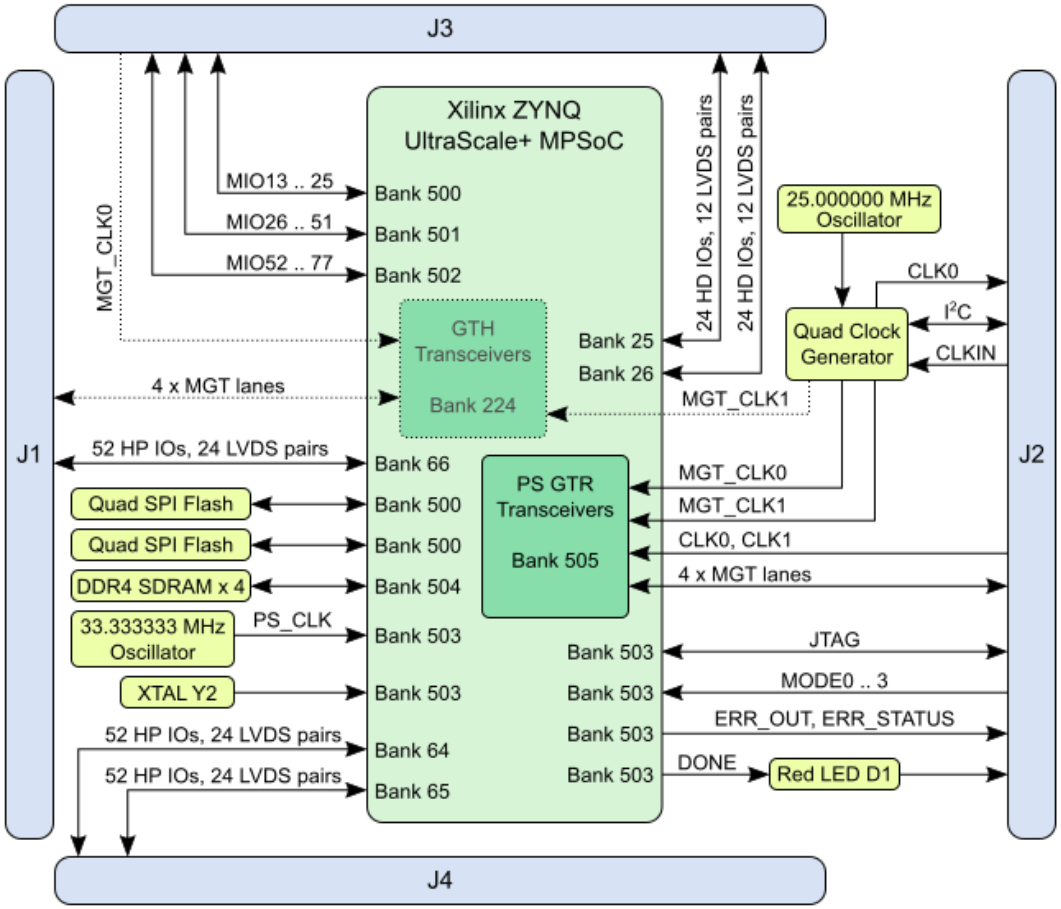


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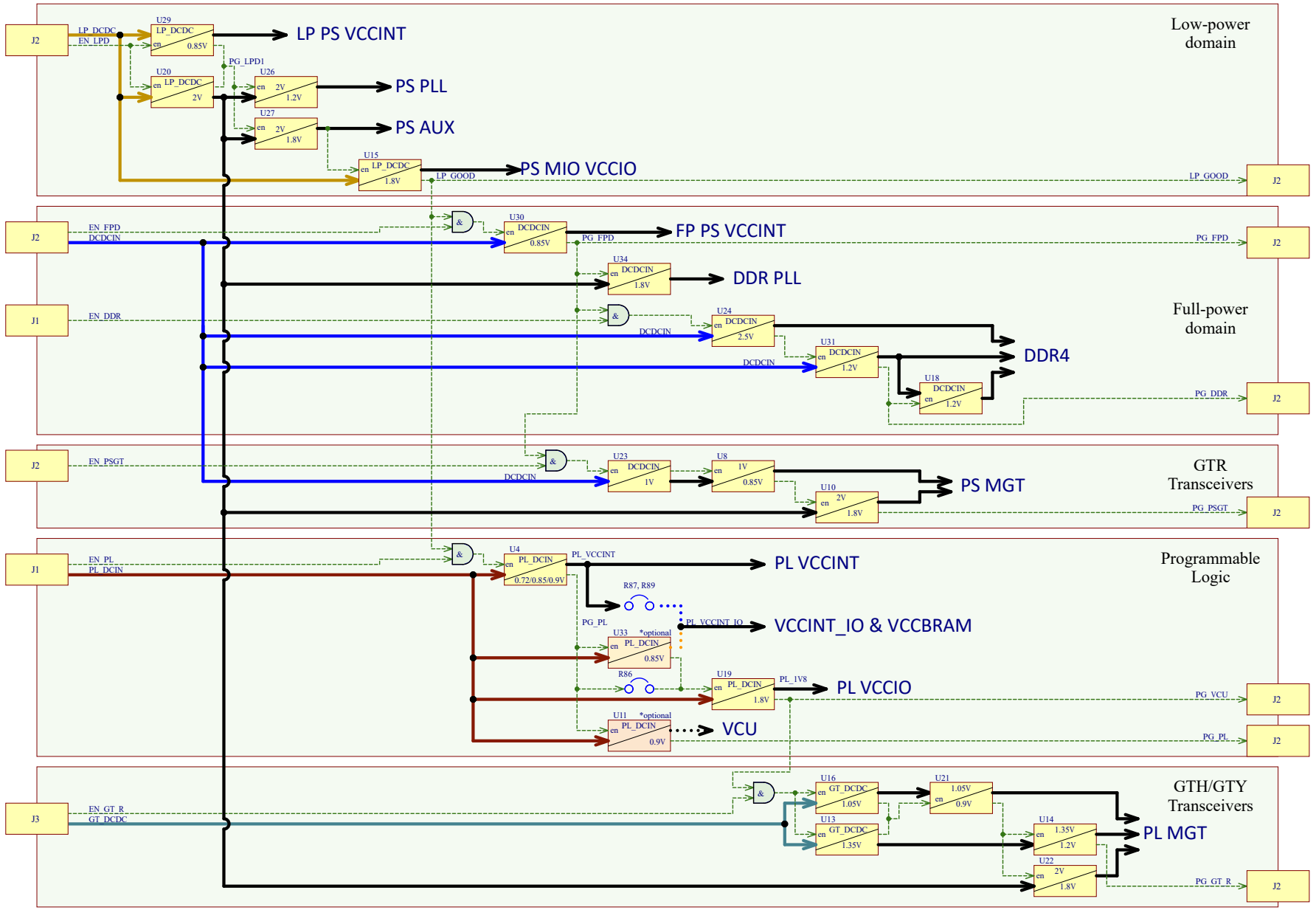
Schematics and other handouts serve for informational purposes only!

trenz electronic	Title: TE0803		
	A4	Number: TE0803 4HE11-AZ	Rev. 04
	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page 1 of 30
	Filename: Legal Notices Modules.SchDoc		



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Title: TE0803 - System Overview		
A4	Number: TE0803 4HE11-AZ	Rev. 04
Date: 2021-01-19	Copyright: 2015 Trenz Electronic GmbH	Page 2 of 30
Filename: TE0803-Overview.SchDoc		



Title: TE0803 - Power Diagram			
A3	Nummer: TE0803 4HE11-AZ		Rev. 04
Datum: 2021-01-19	Copyright:Trenz Electronic GmbH / TT		Page 3 of 30
Filename: Power_Diagram.SchDoc			

U_J1
J1.SchDoc

U_J2
J2.SchDoc

U_J3
J3.SchDoc

U_J4
J4.SchDoc

U_DDR4-TERM
DDR4-TERM.SchDoc

U_B64
B64.SchDoc

U_B65
B65.SchDoc

U_B66
B66.SchDoc

U_B_GT
B_GT.SchDoc

U_PD
Power_Diagram.SchDoc

U_B_PS_GT
B_PS_GT.SchDoc

U_PS_DDR
PS_DDR.SchDoc

U_B_MIO
B_MIO.SchDoc

U_B_HD
B_HD.SchDoc

U_Clock
Clock.SchDoc

U_CONFIG
CONFIG.SchDoc

U_DDR4-RAM
DDR4-RAM.SchDoc

U_DDR4-RAM_2
DDR4-RAM_2.SchDoc

U_DDR4-RAM_3
DDR4-RAM_3.SchDoc

U_DDR4-RAM_4
DDR4-RAM_4.SchDoc

U_LN
Legal Notices Modules.SchDoc

U_ZU_POWER
ZU_POWER.SchDoc

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POWER.SchDoc

U_POWER_1
POWER_1.SchDoc

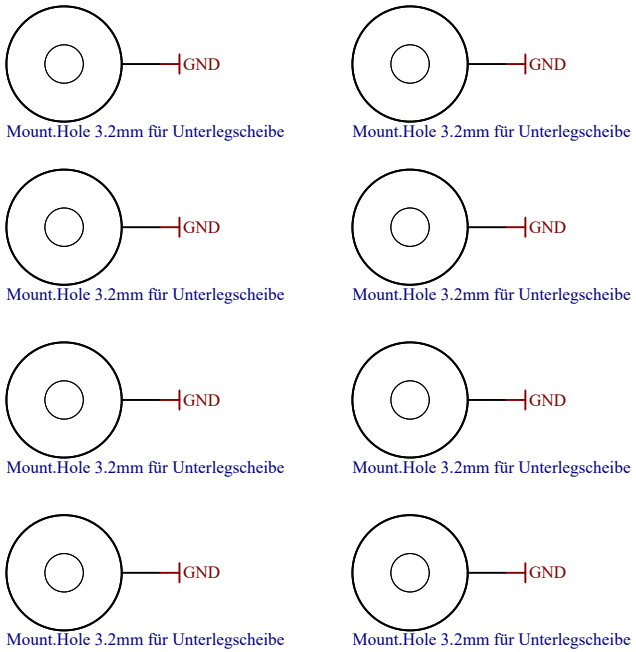
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POWER_4.SchDoc

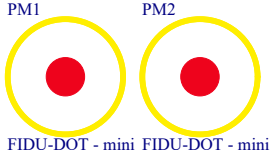
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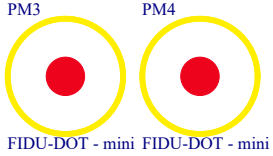


PM1 PM2



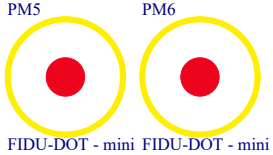
FIDU-DOT - mini FIDU-DOT - mini

PM3 PM4



FIDU-DOT - mini FIDU-DOT - mini

PM5 PM6



FIDU-DOT - mini FIDU-DOT - mini

MECH1
TE Address Overlay
LOGO ADDRESS

LOGO1
TE Logo PRINT Layer
LOGO PRINT

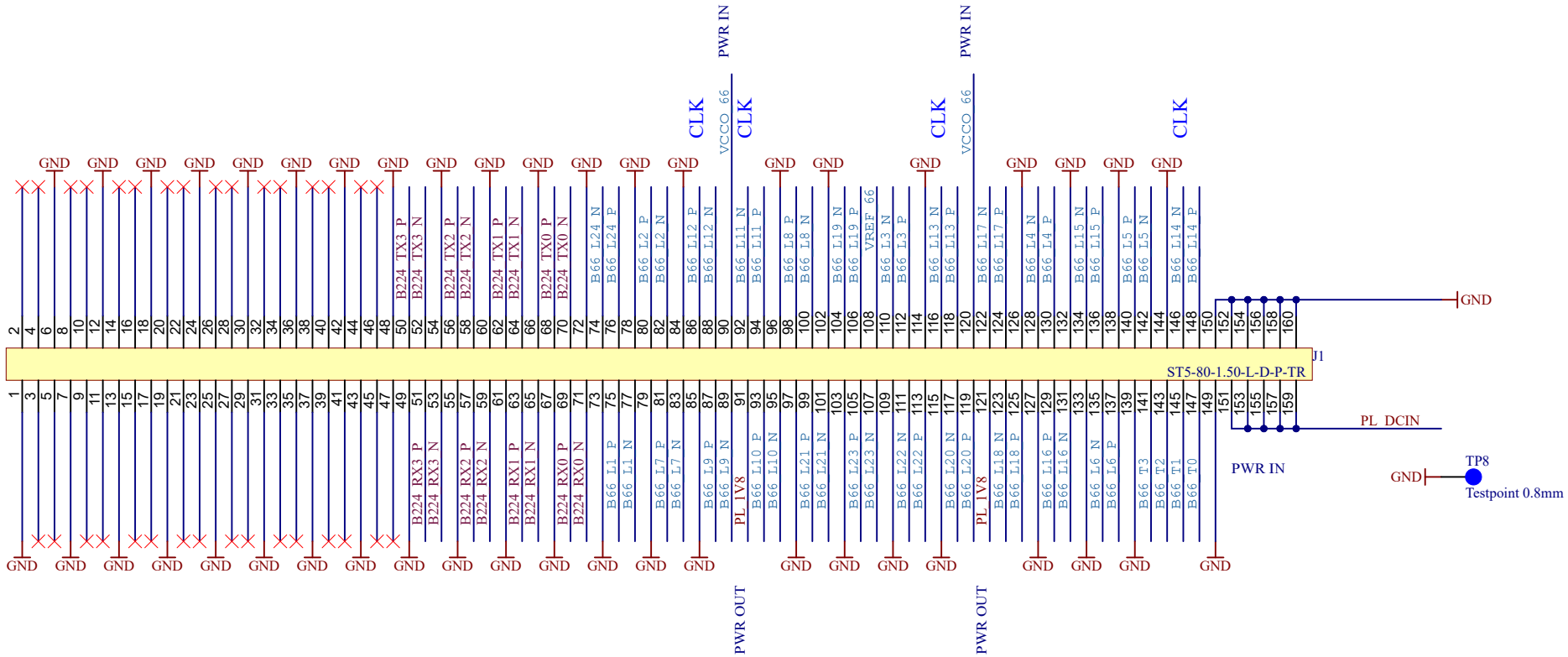
Serial1
Serialnumber 6,3 x 6.3mm

Serial2
Serial
Serialnumber 6,3 x 6.3mm
AD only

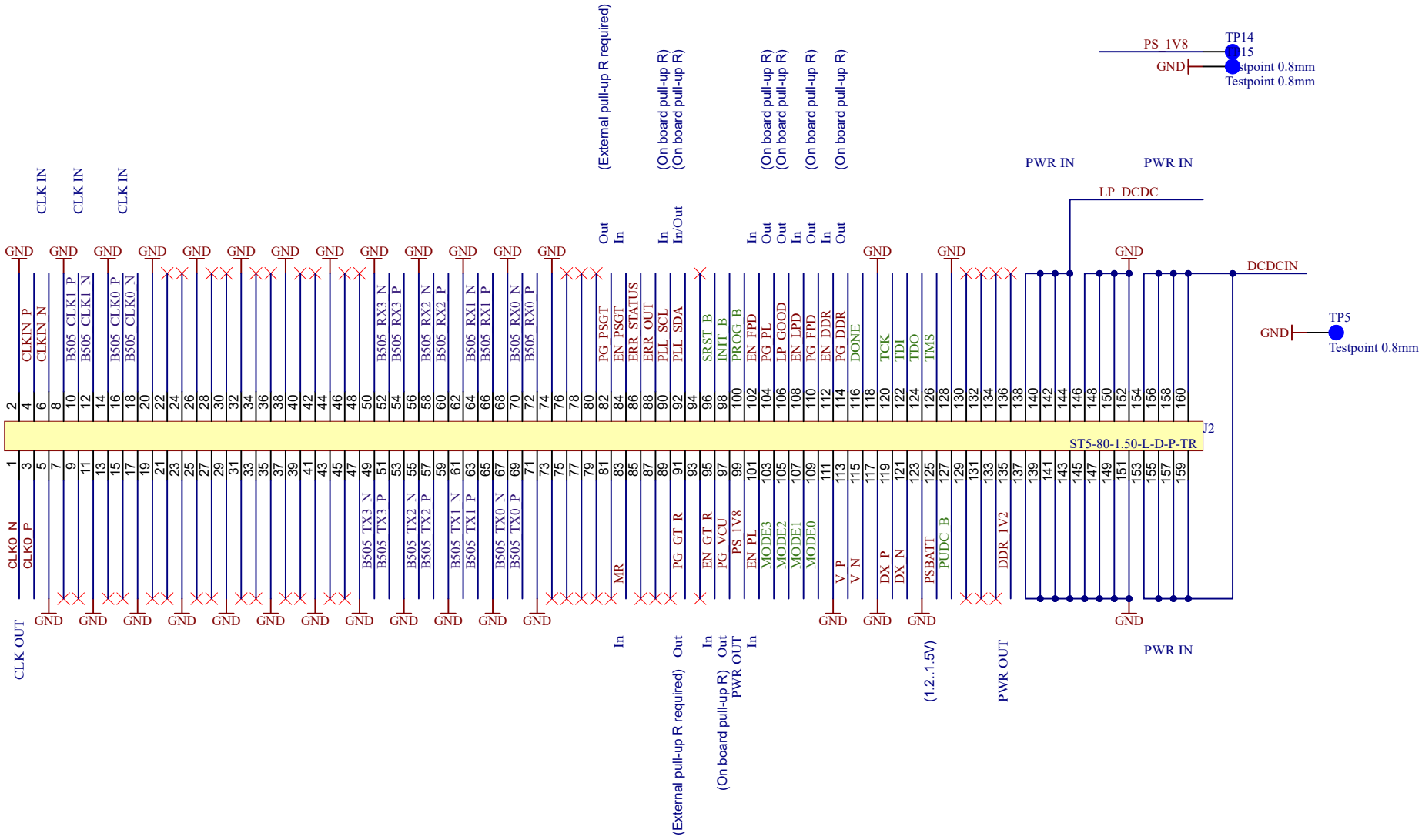
Assembly variant	4HE11-AZ
Created by	VT
Modified by	VT
Modified at	2022-12-14
SVN Revision	15880

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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page4 of 30
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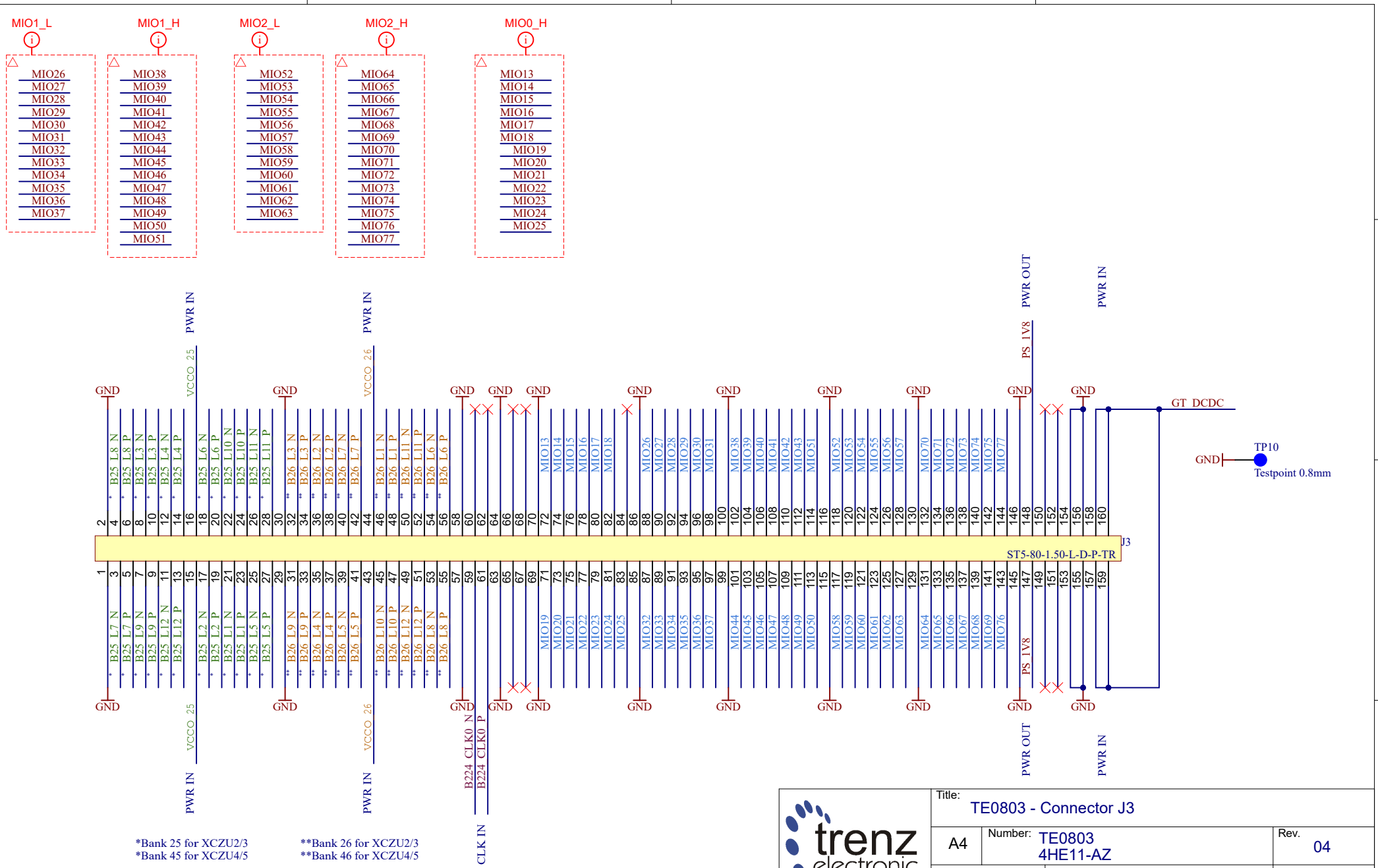


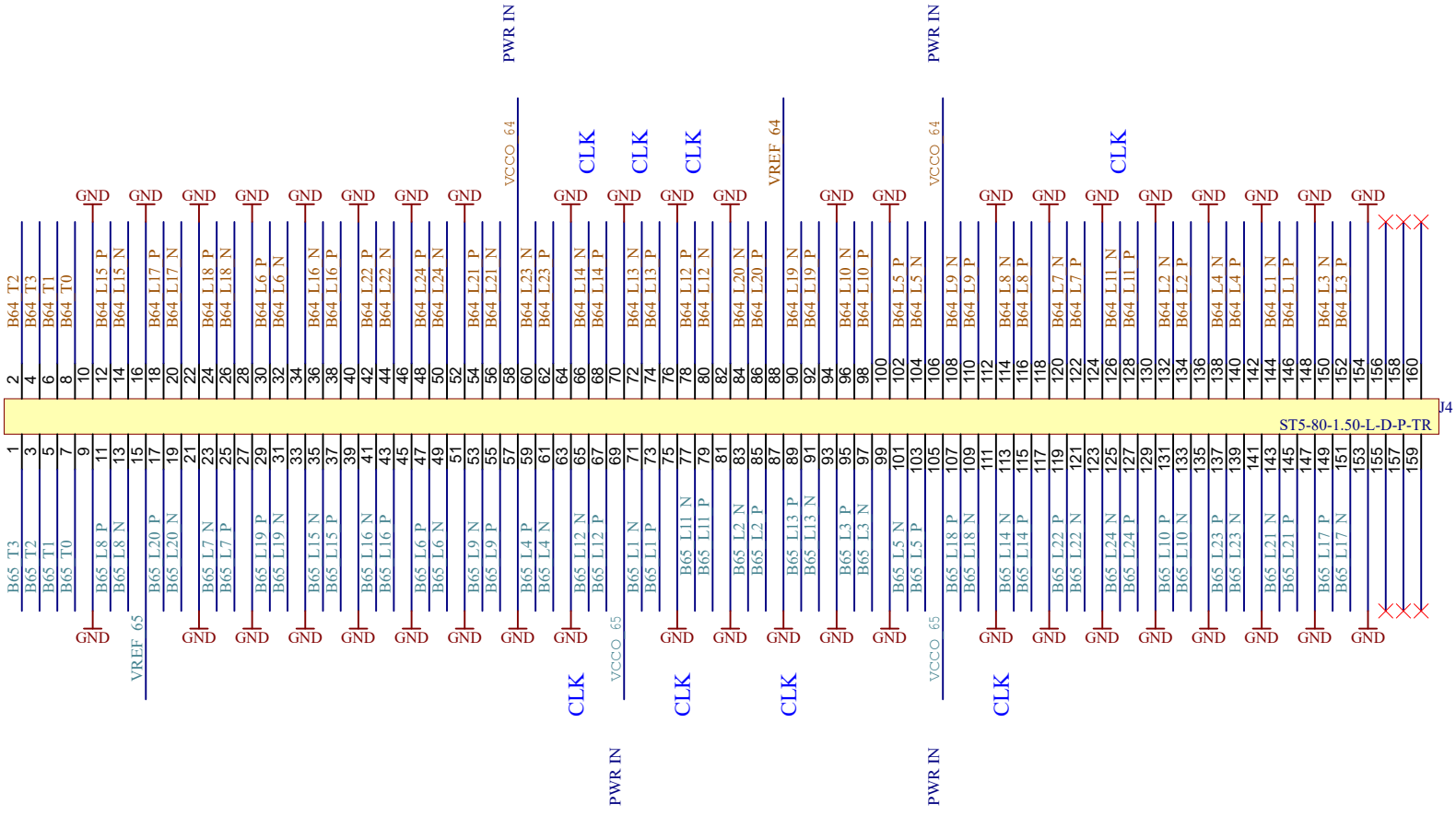
trenz electronic	Title: TE0803 - Connector J1		
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	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page5 of 30
	Filename: J1.SchDoc		



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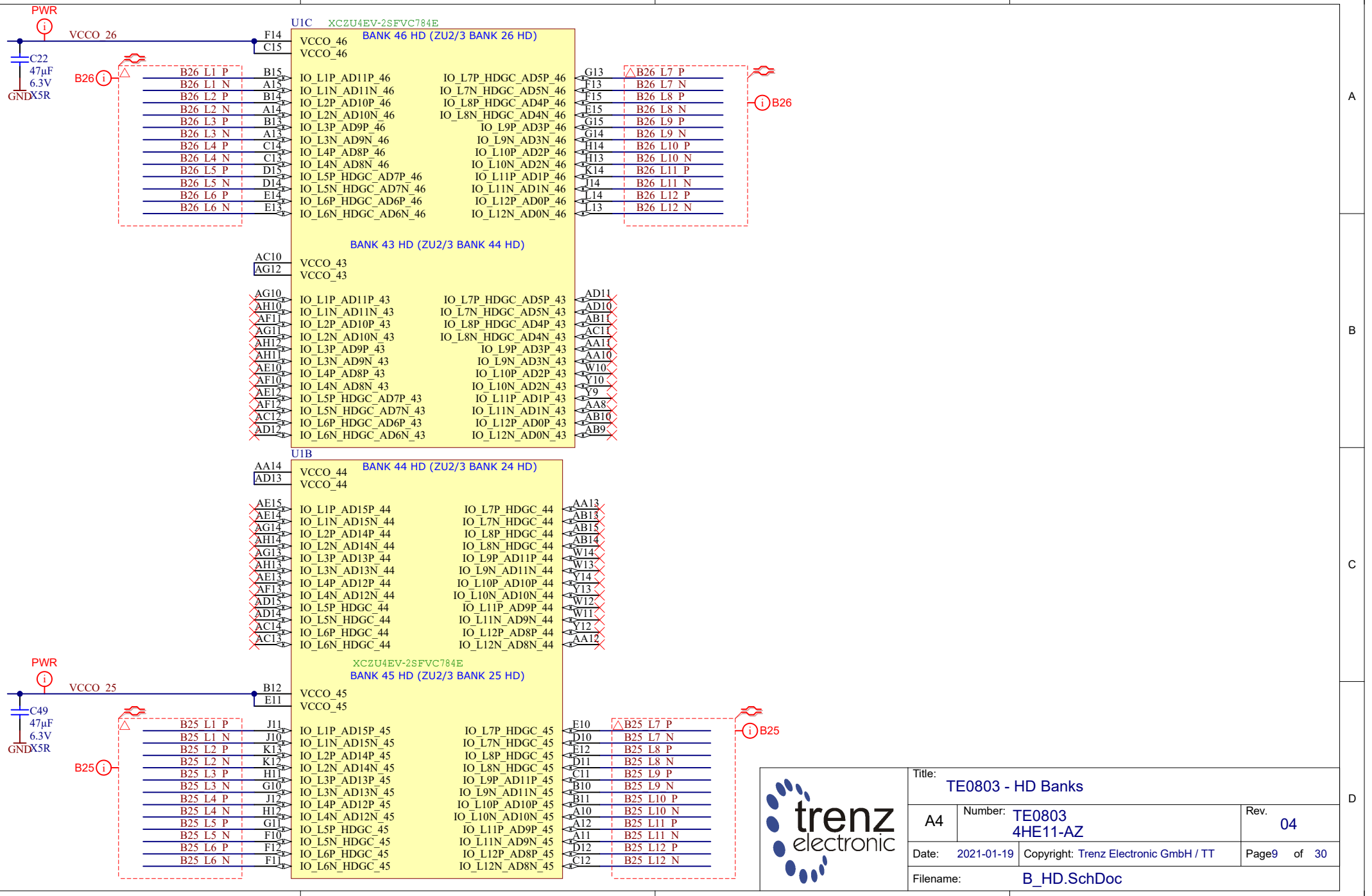
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page6 of 30
Filename: J2.SchDoc			

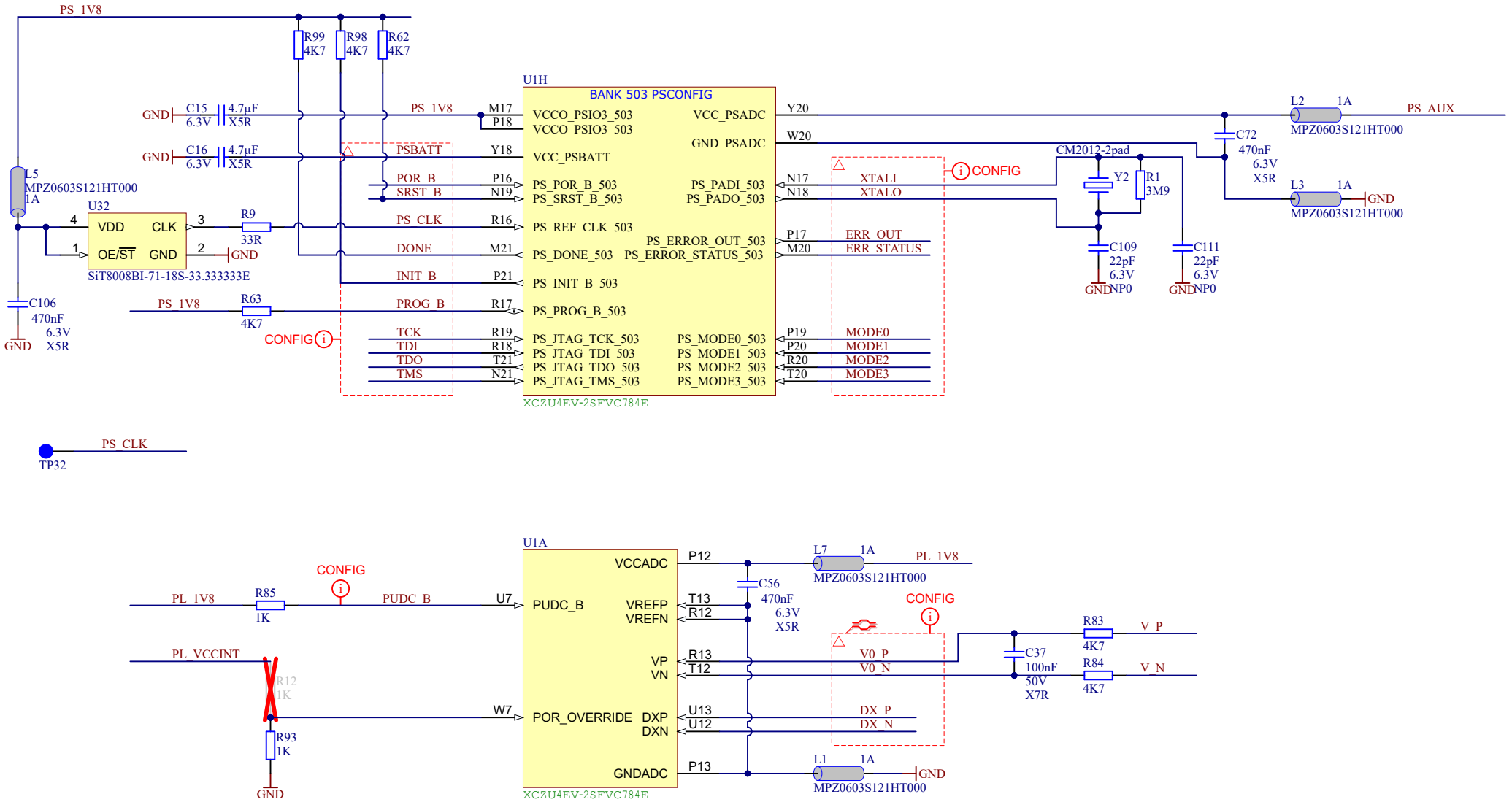

MIO1_L
MIO26
MIO27
MIO28
MIO29
MIO30
MIO31
MIO32
MIO33
MIO34
MIO35
MIO36
MIO37
MIO1_H
MIO38
MIO39
MIO40
MIO41
MIO42
MIO43
MIO44
MIO45
MIO46
MIO47
MIO48
MIO49
MIO50
MIO51
MIO2_L
MIO52
MIO53
MIO54
MIO55
MIO56
MIO57
MIO58
MIO59
MIO60
MIO61
MIO62
MIO63
MIO2_H
MIO64
MIO65
MIO66
MIO67
MIO68
MIO69
MIO70
MIO71
MIO72
MIO73
MIO74
MIO75
MIO76
MIO77
MIO0_H
MIO13
MIO14
MIO15
MIO16
MIO17
MIO18
MIO19
MIO20
MIO21
MIO22
MIO23
MIO24
MIO25
PWR IN
VCCO_25
VCCO_26
PWR OUT
PS_1V8
GND
GT_DCDC
TP10
Testpoint 0.8mm
J3
ST5-80-1.50-L-D-P-TR
B224_CLK0_N
B224_CLK0_P
CLK IN
*Bank 25 for XCZU2/3
*Bank 45 for XCZU4/5
**Bank 26 for XCZU2/3
**Bank 46 for XCZU4/5
trenz electronic
Title: TE0803 - Connector J3
A4
Number: TE0803 4HE11-AZ
Rev. 04
Date: 2021-01-19
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Filename: J3.SchDoc



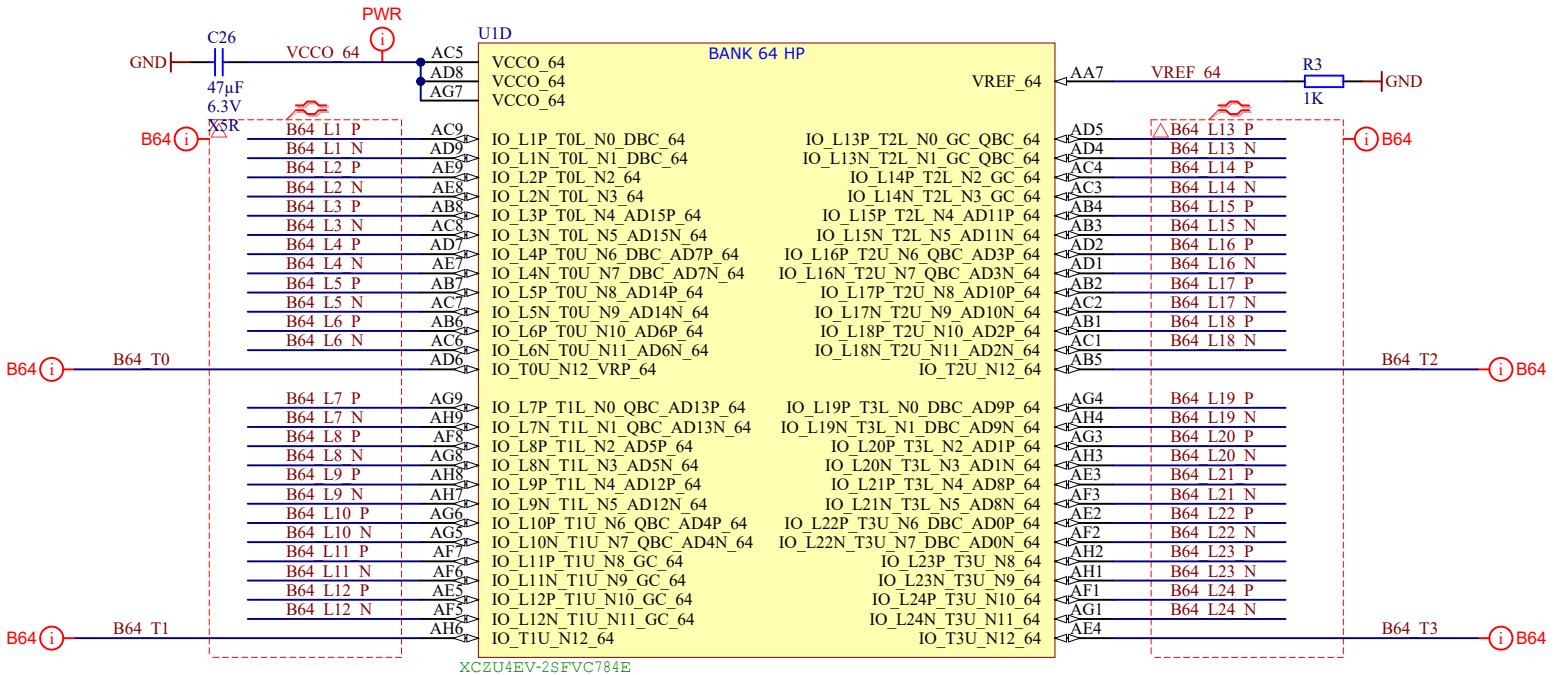
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page8 of 30
Filename: J4.SchDoc			

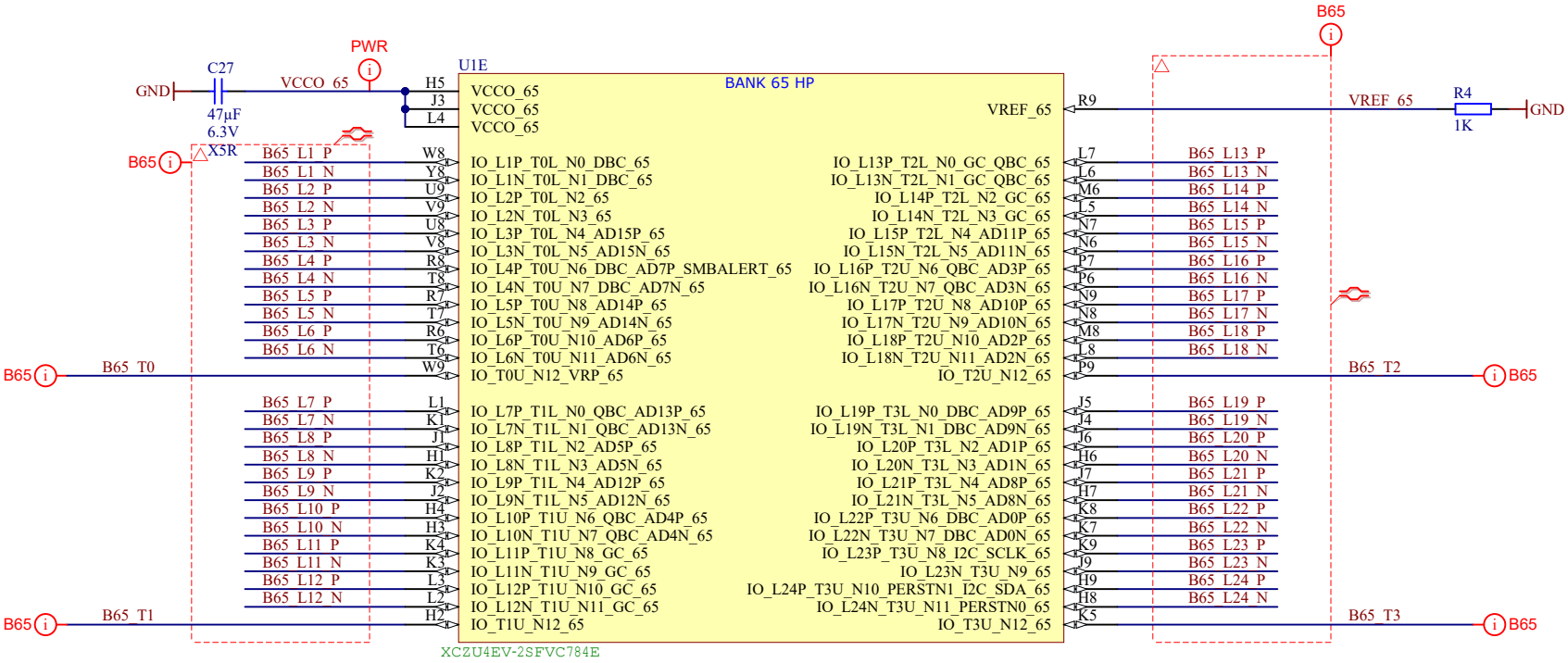

PWR
VCCO_26
C22
47µF
6.3V
X5R
GND
B26
U1C
XCZU4EV-2SFVC784E
BANK 46 HD (ZU2/3 BANK 26 HD)
VCCO_46
F14
C15
B26_L1_P
B26_L1_N
B26_L2_P
B26_L2_N
B26_L3_P
B26_L3_N
B26_L4_P
B26_L4_N
B26_L5_P
B26_L5_N
B26_L6_P
B26_L6_N
IO_L1P_AD11P_46
IO_L1N_AD11N_46
IO_L2P_AD10P_46
IO_L2N_AD10N_46
IO_L3P_AD9P_46
IO_L3N_AD9N_46
IO_L4P_AD8P_46
IO_L4N_AD8N_46
IO_L5P_HDGC_AD7P_46
IO_L5N_HDGC_AD7N_46
IO_L6P_HDGC_AD6P_46
IO_L6N_HDGC_AD6N_46
IO_L7P_HDGC_AD5P_46
IO_L7N_HDGC_AD5N_46
IO_L8P_HDGC_AD4P_46
IO_L8N_HDGC_AD4N_46
IO_L9P_AD3P_46
IO_L9N_AD3N_46
IO_L10P_AD2P_46
IO_L10N_AD2N_46
IO_L11P_AD1P_46
IO_L11N_AD1N_46
IO_L12P_AD0P_46
IO_L12N_AD0N_46
B26_L7_P
B26_L7_N
B26_L8_P
B26_L8_N
B26_L9_P
B26_L9_N
B26_L10_P
B26_L10_N
B26_L11_P
B26_L11_N
B26_L12_P
B26_L12_N
BANK 43 HD (ZU2/3 BANK 44 HD)
VCCO_43
AC10
AG12
IO_L1P_AD11P_43
IO_L1N_AD11N_43
IO_L2P_AD10P_43
IO_L2N_AD10N_43
IO_L3P_AD9P_43
IO_L3N_AD9N_43
IO_L4P_AD8P_43
IO_L4N_AD8N_43
IO_L5P_HDGC_AD7P_43
IO_L5N_HDGC_AD7N_43
IO_L6P_HDGC_AD6P_43
IO_L6N_HDGC_AD6N_43
IO_L7P_HDGC_AD5P_43
IO_L7N_HDGC_AD5N_43
IO_L8P_HDGC_AD4P_43
IO_L8N_HDGC_AD4N_43
IO_L9P_AD3P_43
IO_L9N_AD3N_43
IO_L10P_AD2P_43
IO_L10N_AD2N_43
IO_L11P_AD1P_43
IO_L11N_AD1N_43
IO_L12P_AD0P_43
IO_L12N_AD0N_43
U1B
BANK 44 HD (ZU2/3 BANK 24 HD)
VCCO_44
AA14
AD13
IO_L1P_AD15P_44
IO_L1N_AD15N_44
IO_L2P_AD14P_44
IO_L2N_AD14N_44
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IO_L4P_AD12P_44
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IO_L10N_AD10N_44
IO_L11P_AD9P_44
IO_L11N_AD9N_44
IO_L12P_AD8P_44
IO_L12N_AD8N_44
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BANK 45 HD (ZU2/3 BANK 25 HD)
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B12
E11
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IO_L1N_AD15N_45
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IO_L3N_AD13N_45
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B25_L1_N
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A4
Number:
TE0803
4HE11-AZ
Rev.
04
Date:
2021-01-19
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Filename:
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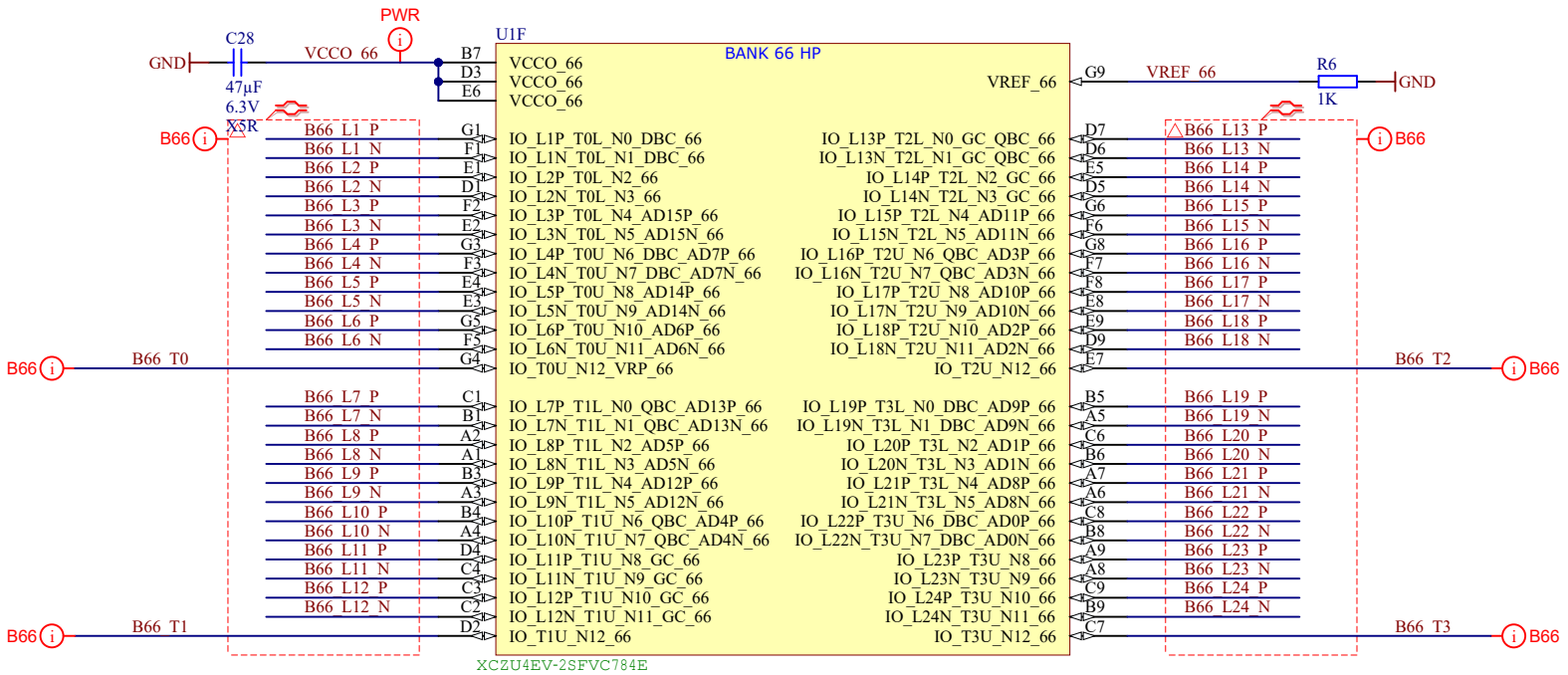
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	Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT	Page10 of 30
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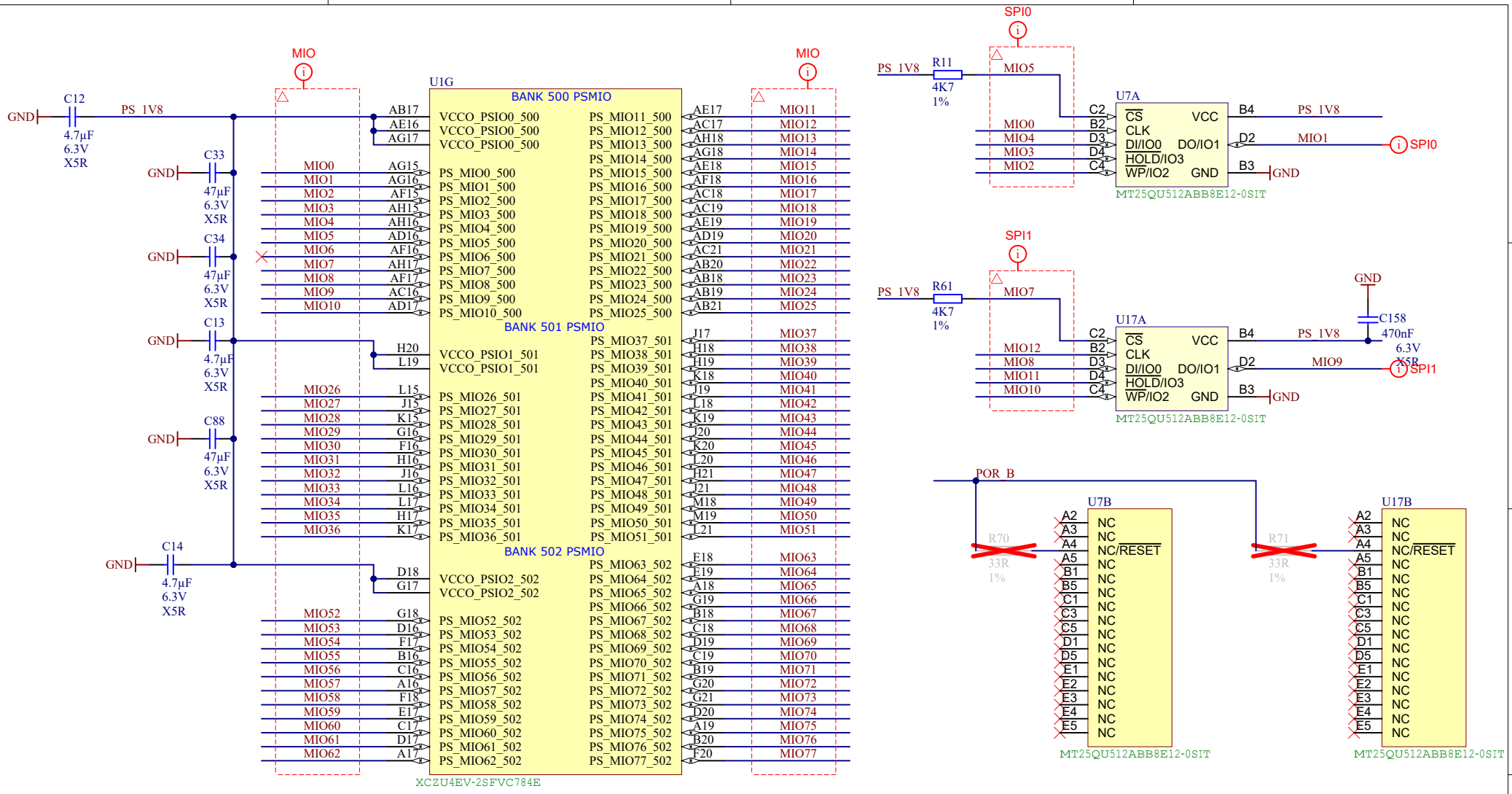
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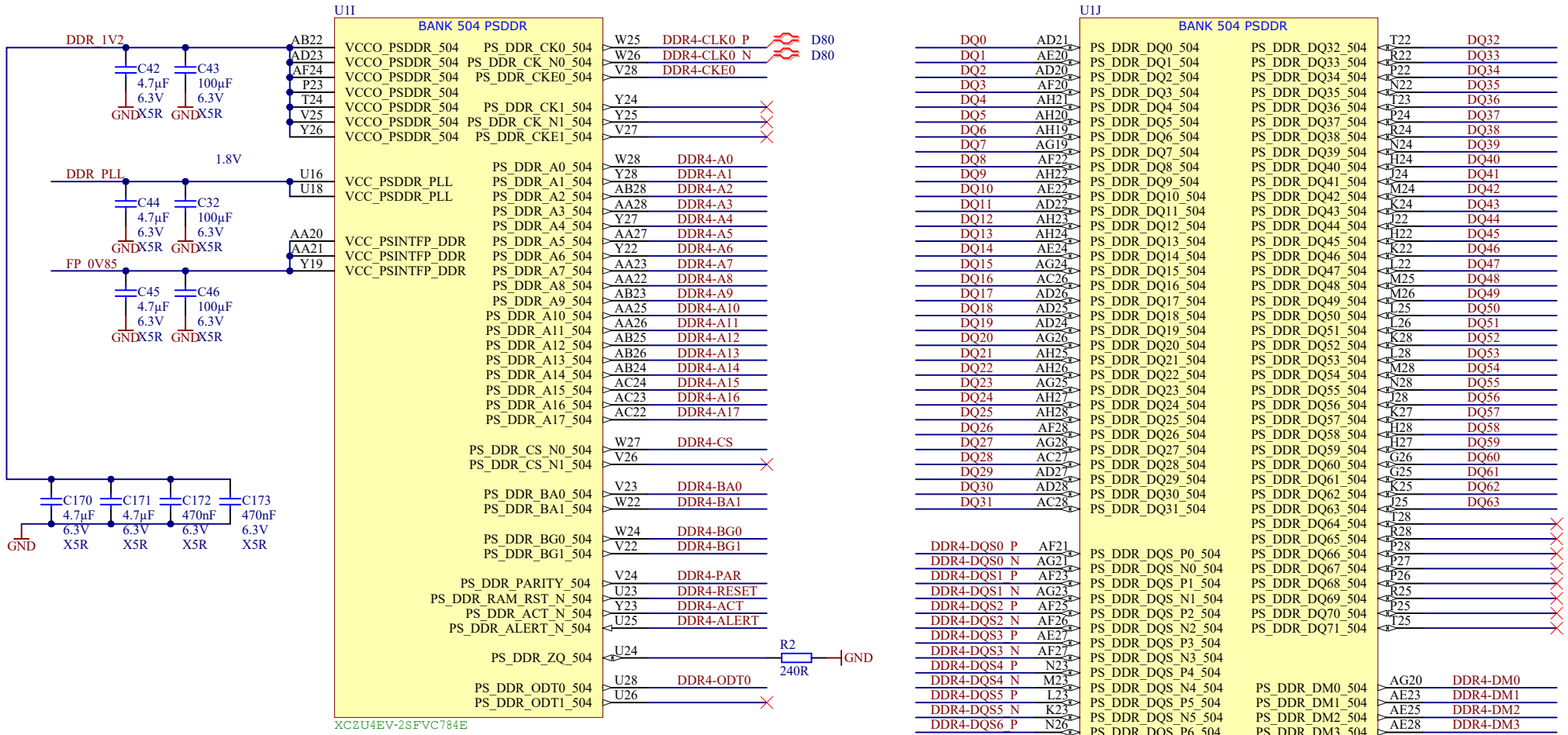
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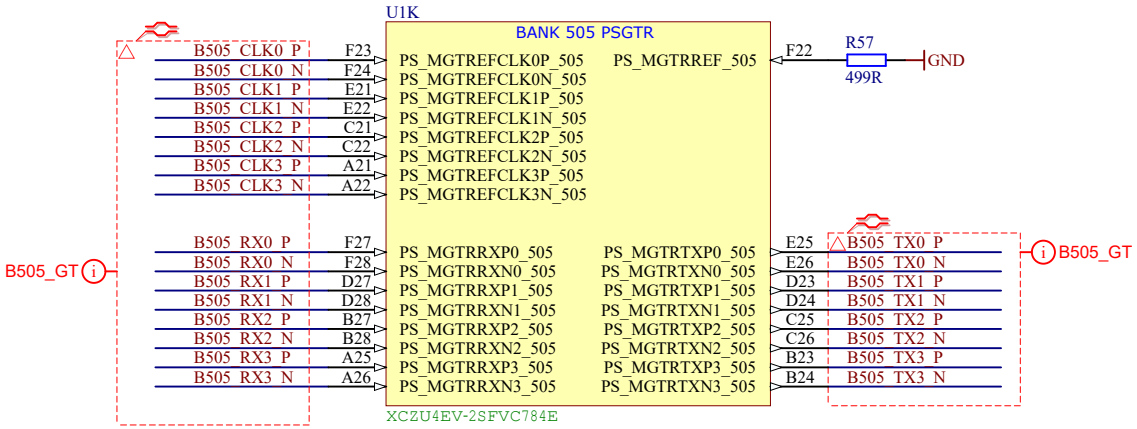


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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page14 of 30
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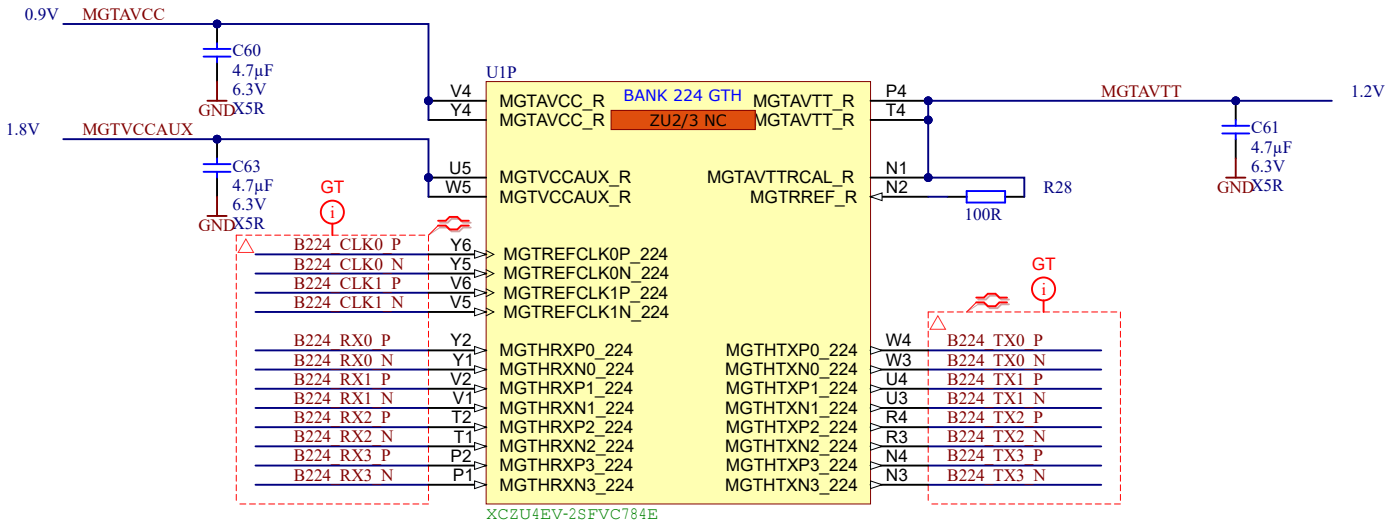


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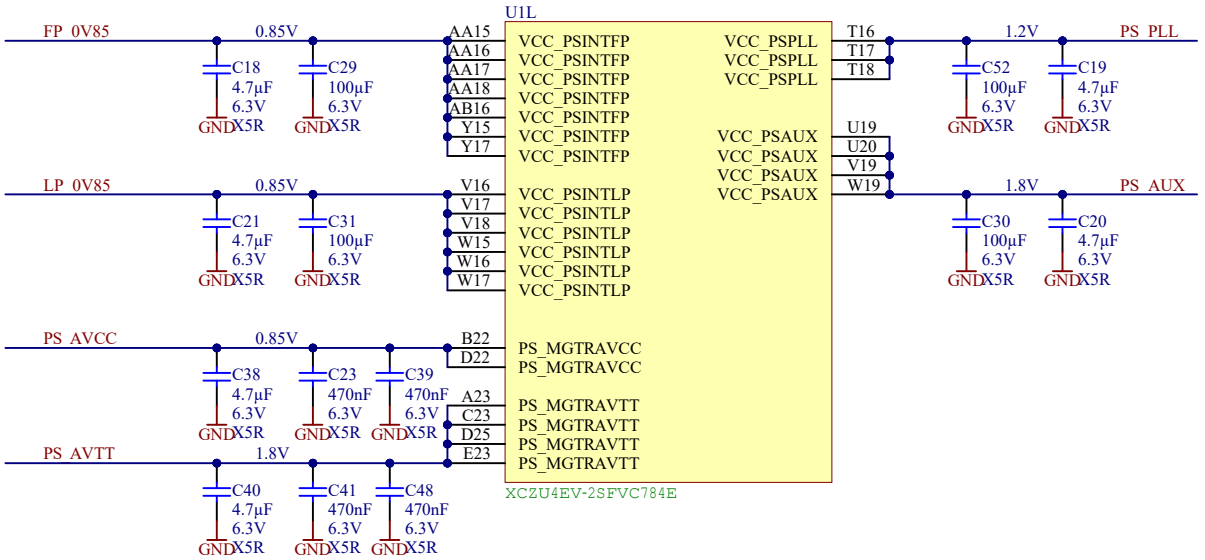
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Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page15 of 30
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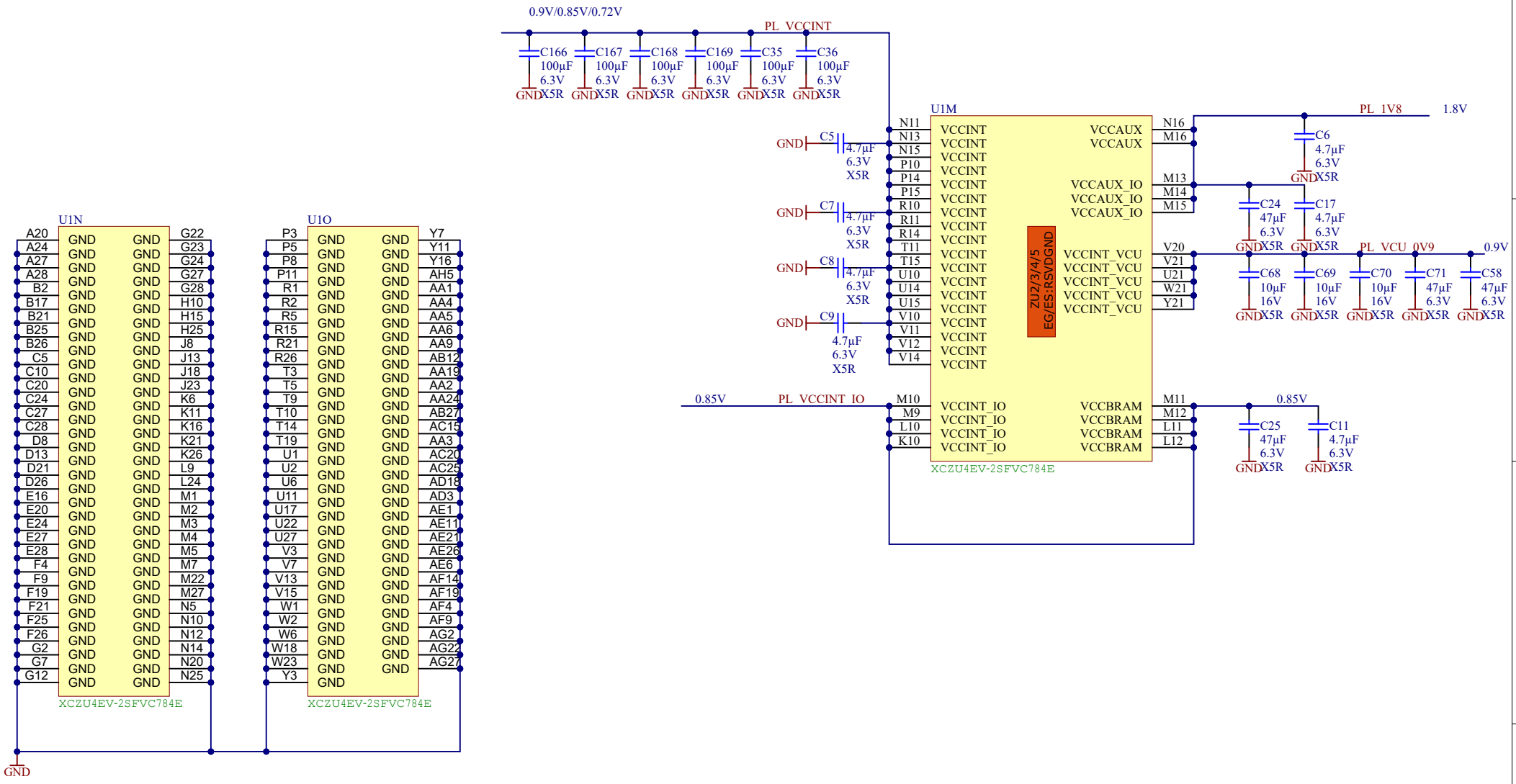
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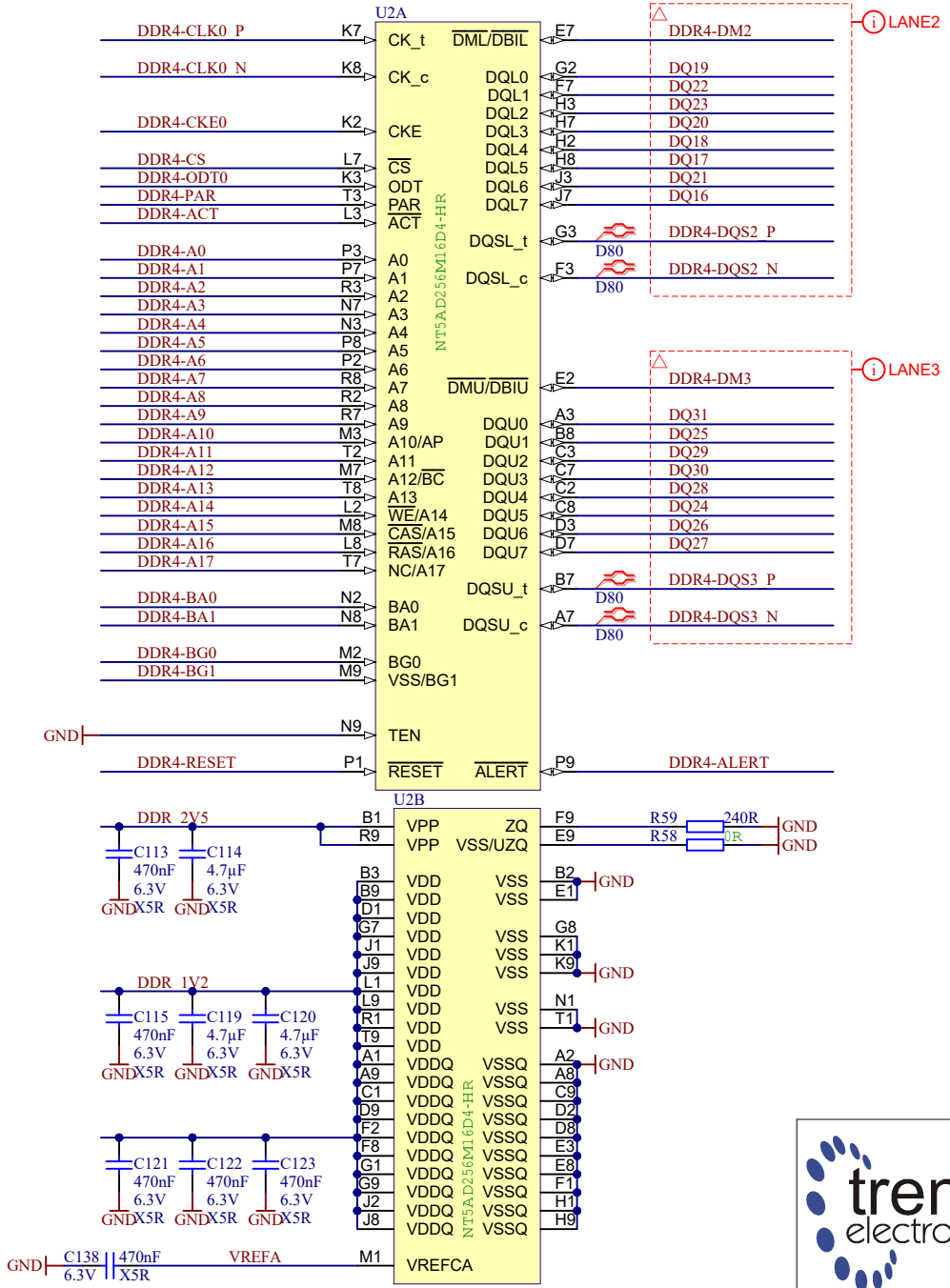
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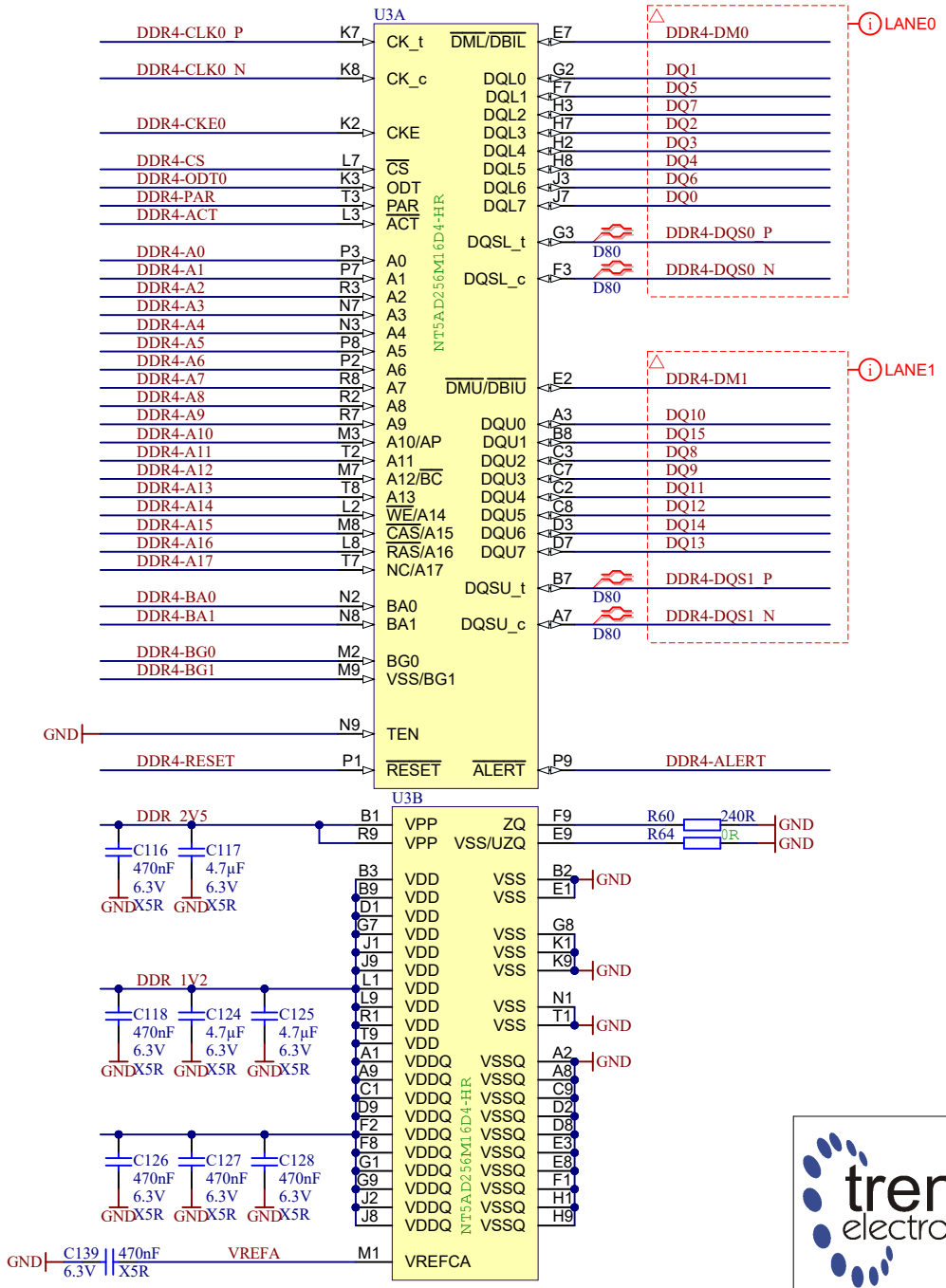
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A4	Number: TE0803 4HE11-AZ		Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page 18 of 30
Filename: ZU_PS_POWER.SchDoc			



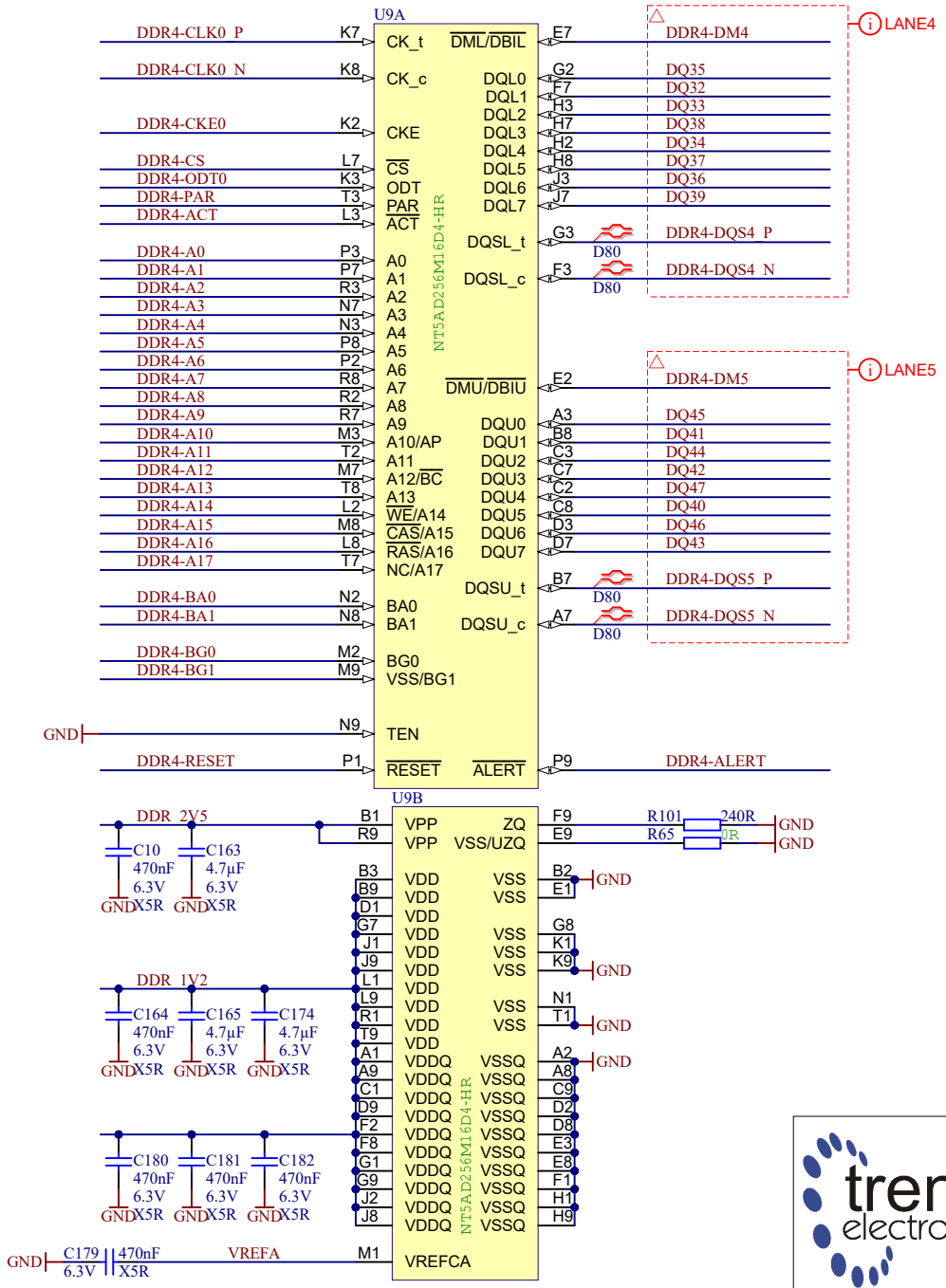
Title: TE0803 - ZU_POWER			
A4	Number: TE0803 4HE11-AZ		Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page19 of 30
Filename: ZU_POWER.SchDoc			



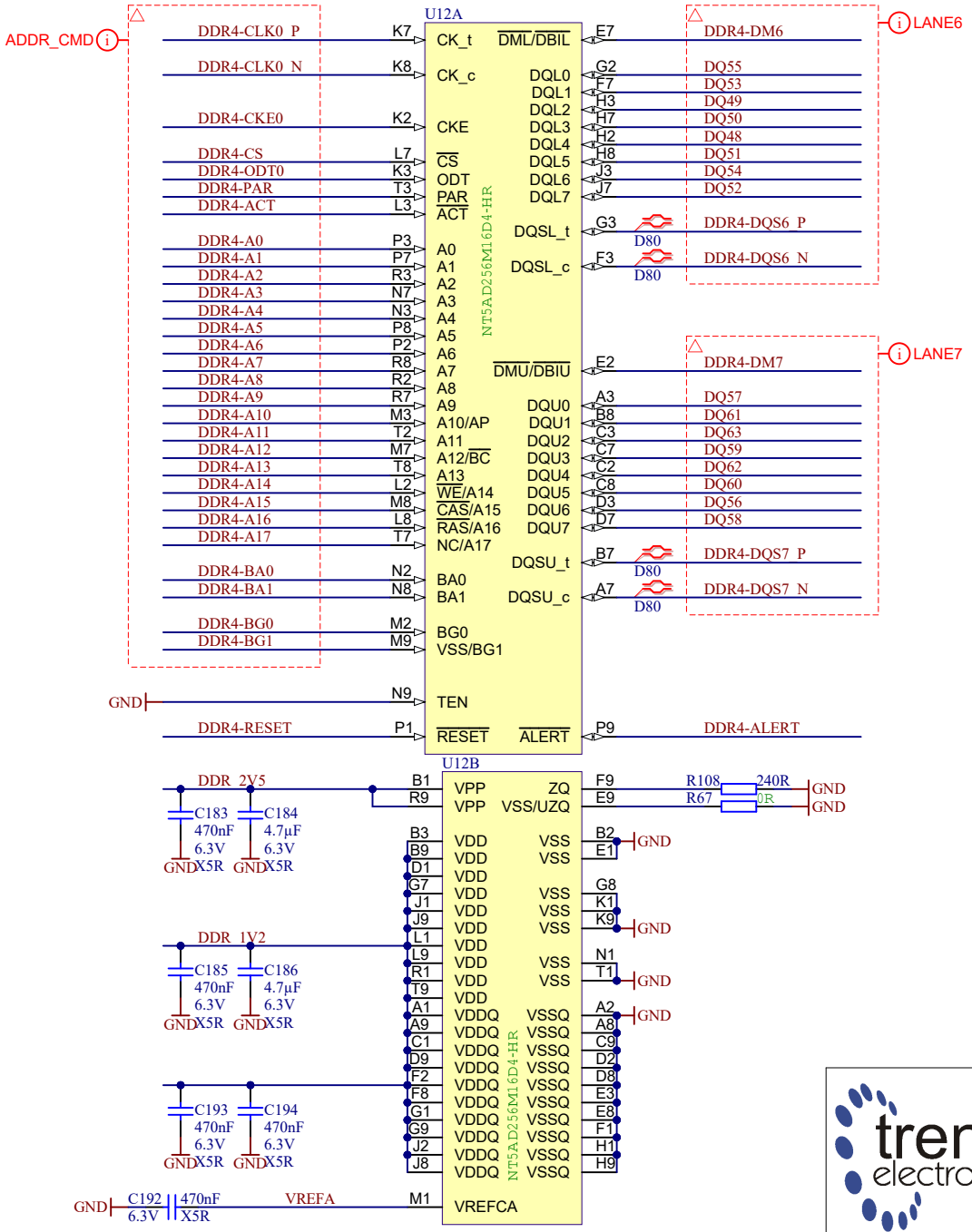
Title: TE0803 - DDR4_1_RAM			
A4	Number: TE0803 4HE11-AZ		Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page20 of 30
Filename: DDR4-RAM.SchDoc			

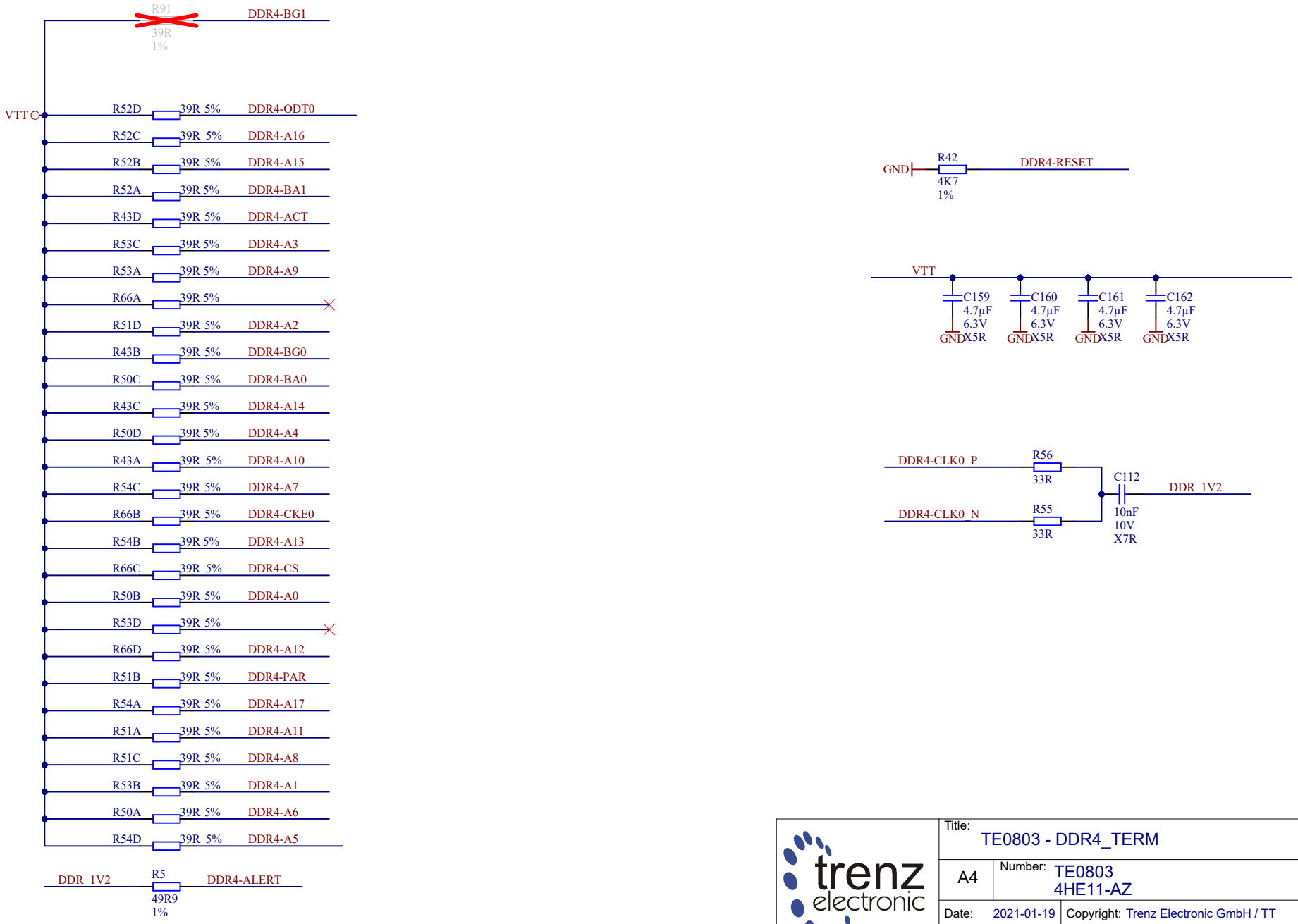


Title: TE0803 - DDR4_2_RAM			
A4	Number: TE0803 4HE11-AZ		Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page21 of 30
Filename: DDR4-RAM_2.SchDoc			

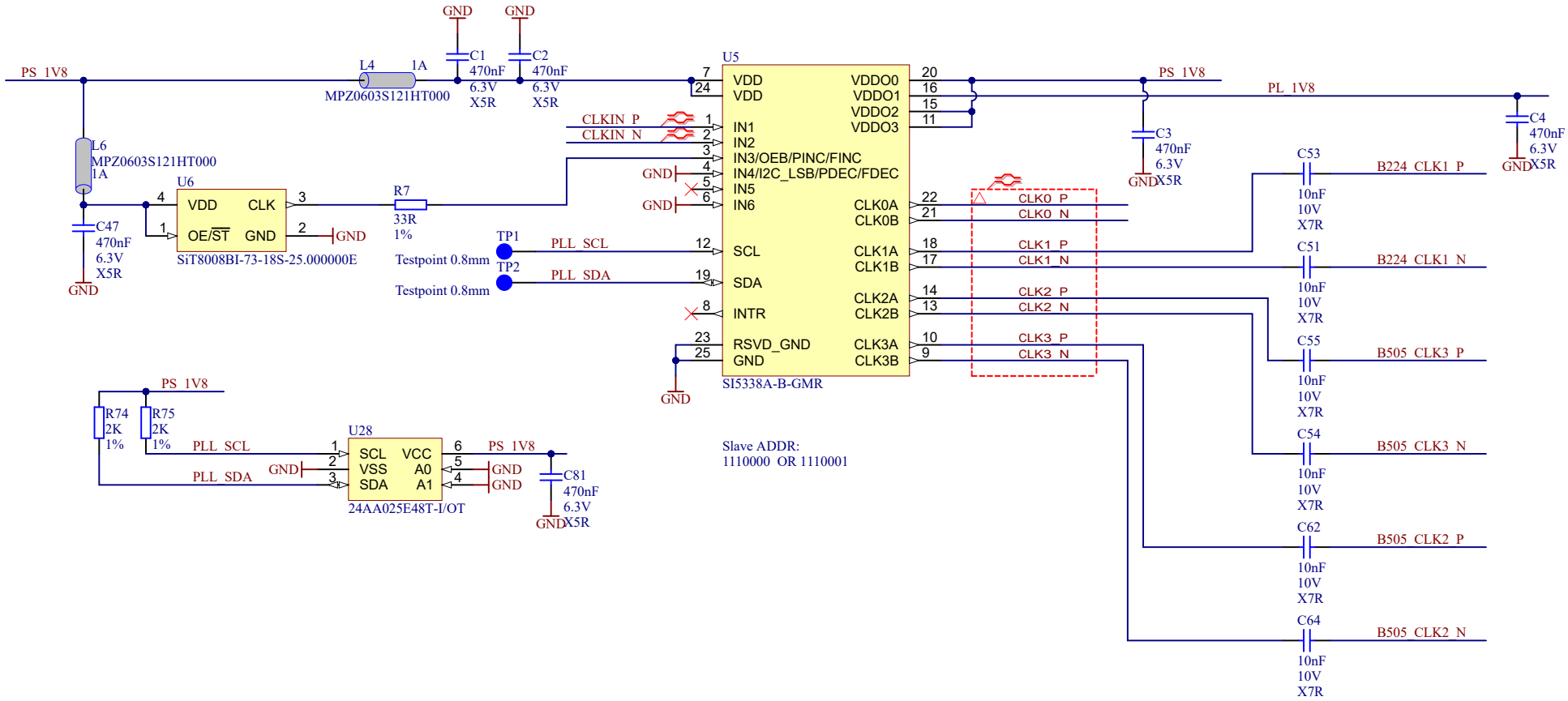


Title: TE0803 - DDR4_3_RAM			
A4	Number: TE0803 4HE11-AZ		Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page22 of 30
Filename: DDR4-RAM_3.SchDoc			


ADDR_CMD
U12A
NT5AD256M16D4-HR
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
GND
DDR4-RESET
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
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
LANE6
DDR4-DM6
DQ55
DQ53
DQ49
DQ50
DQ48
DQ51
DQ54
DQ52
DDR4-DQS6_P
DDR4-DQS6_N
D80
LANE7
DDR4-DM7
DQ57
DQ61
DQ63
DQ59
DQ62
DQ60
DQ56
DQ58
DDR4-DQS7_P
DDR4-DQS7_N
DDR4-ALERT
U12B
DDR_2V5
DDR_1V2
C183
C184
C185
C186
C193
C194
C192
470nF
4.7µF
6.3V
X5R
R108
R67
240R
0R
VPP
VDD
VDDQ
VSS
VSSQ
ZQ
VSS/UZQ
VREFCA
VREFA
Title:
TE0803 - DDR4_4_RAM
A4
Number:
TE0803
4HE11-AZ
Rev.
04
Date:
2021-01-19
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Filename:
DDR4-RAM_4.SchDoc

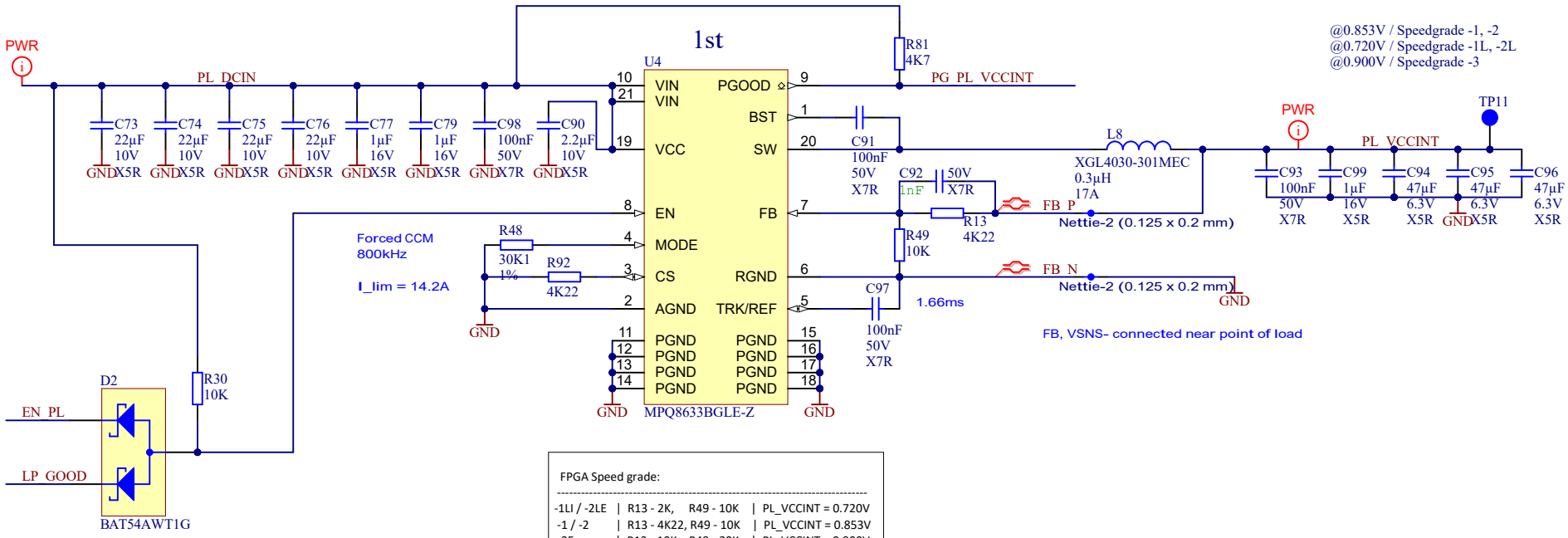


Title: TE0803 - DDR4_TERM			
A4	Number: TE0803 4HE11-AZ		Rev. 04
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Filename: DDR4-TERM.SchDoc			



trenz electronic	Title: TE0803 - CLOCK		
	A4	Number: TE0803 4HE11-AZ	Rev. 04
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	Filename: Clock.SchDoc		

PL VCCINT

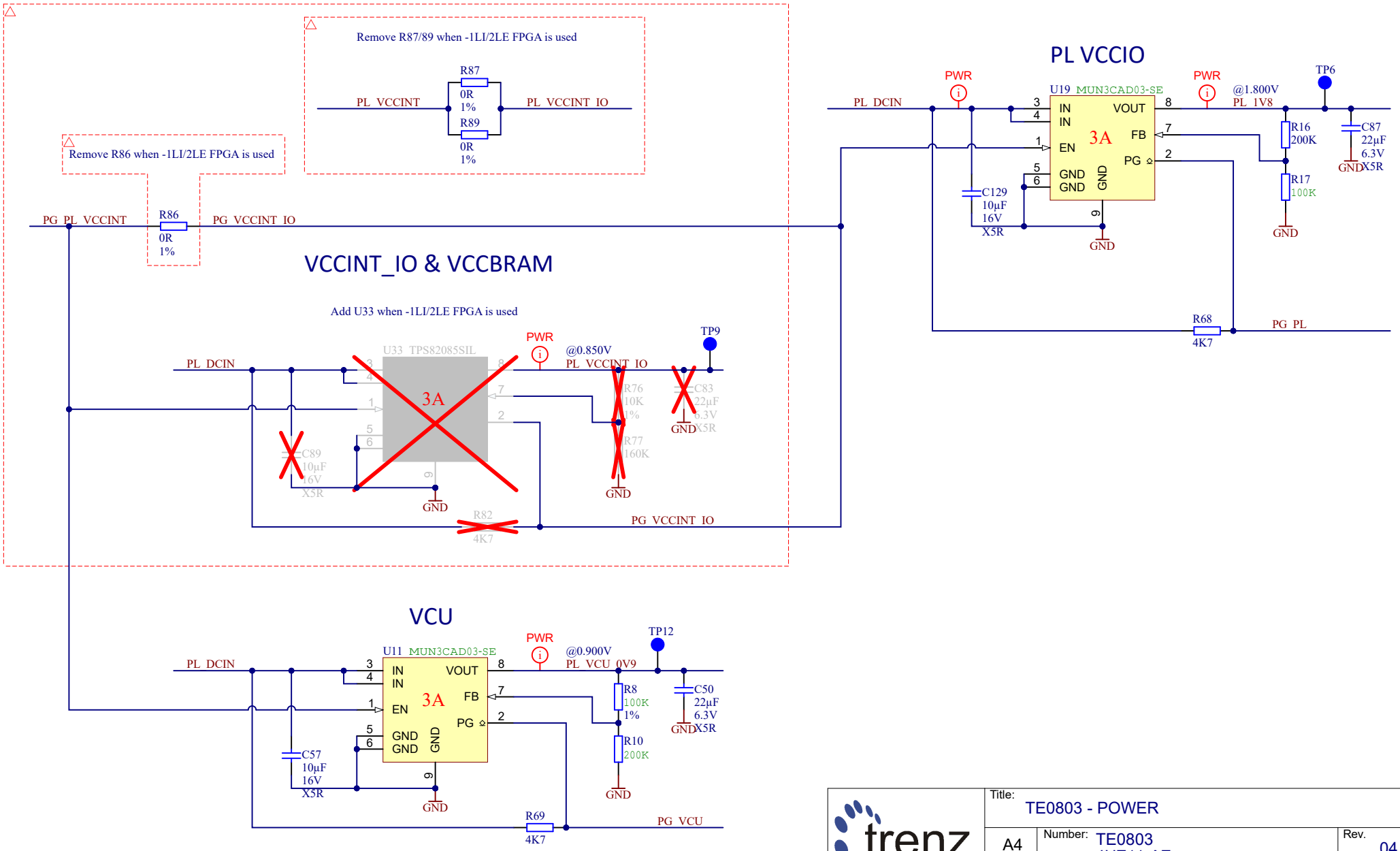


FPGA Speed grade:		
-1LI / -2LE	R13 - 2K, R49 - 10K	PL_VCCINT = 0.720V
-1 / -2	R13 - 4K22, R49 - 10K	PL_VCCINT = 0.853V
-3E	R13 - 10K, R49 - 20K	PL_VCCINT = 0.900V

U4 pin compatible with
-- TPS548A28 (15A)
-- TPS548B28 (20A)
-- TPS54JA20 (12A)
-- MPQ8633B (20A)

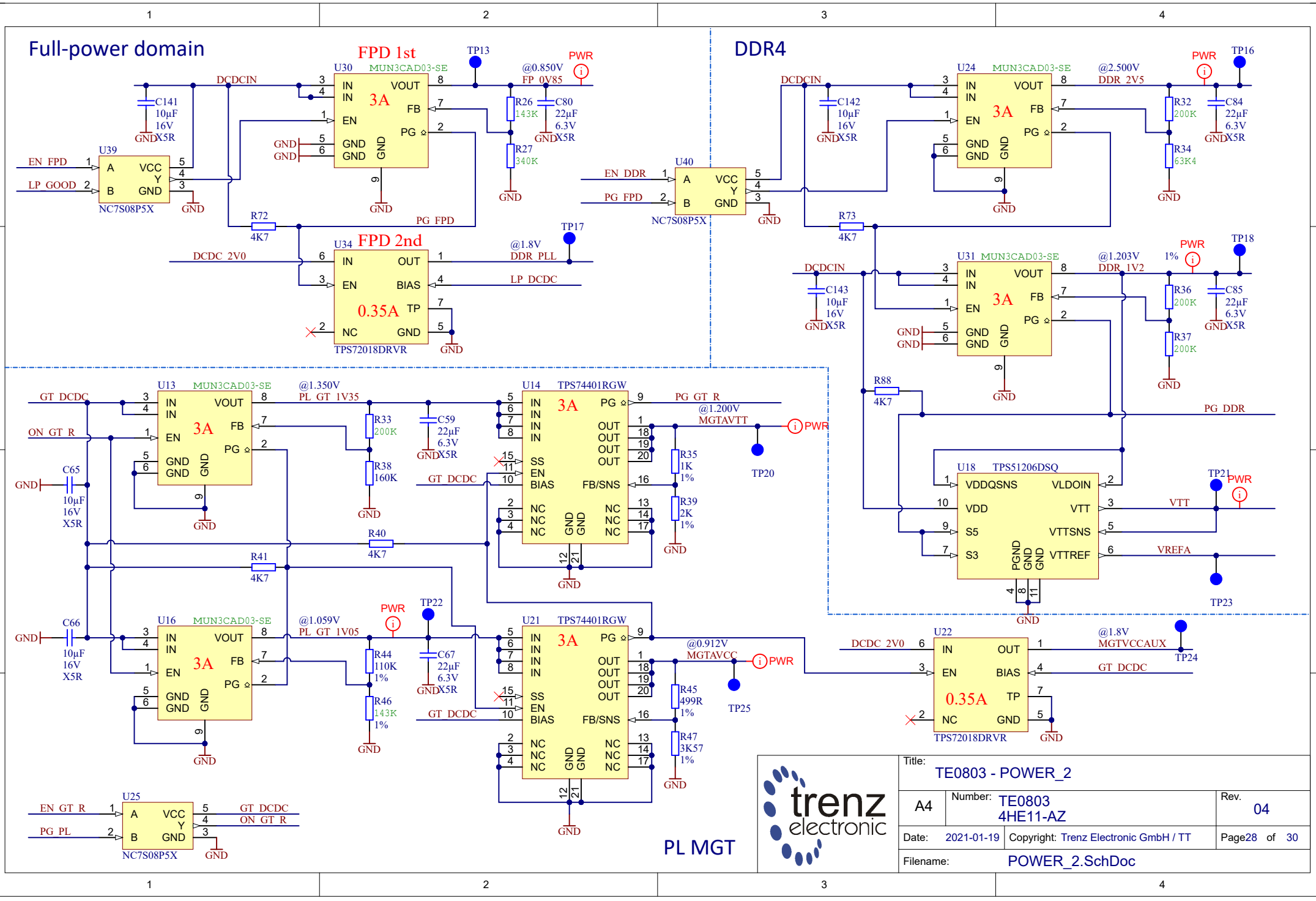
U4 can be either TPS548A28RWWR or MPQ8633BGLE-Z which is up to Trenz Electronic GmbH.

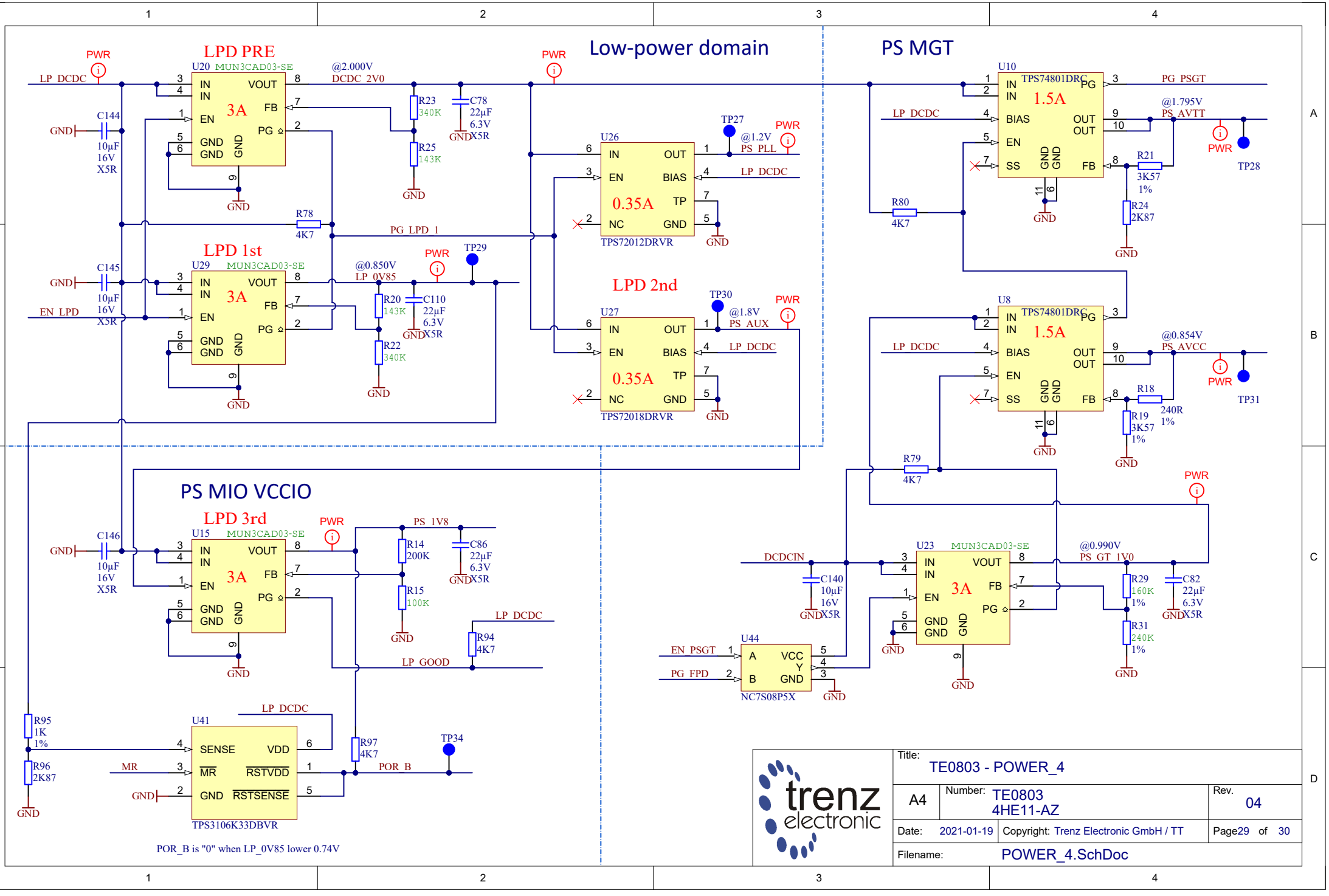
Title: TE0803 - POWER			
A4	Number: TE0803 4HE11-AZ		Rev. 04
Date: 2021-01-19	Copyright: Trenz Electronic GmbH / TT		Page26 of 30
Filename: POWER.SchDoc			



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Title: TE0803 - POWER		
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Filename: POWER_1.SchDoc		


Full-power domain
FPD 1st
FPD 2nd
DDR4
PL MGT
U30 MUN3CAD03-SE
U39
U40
U24 MUN3CAD03-SE
U34
TPS72018DRVR
NC7S08P5X
U13 MUN3CAD03-SE
U14 TPS74401RGW
U31 MUN3CAD03-SE
U18 TPS51206DSQ
U16 MUN3CAD03-SE
U21 TPS74401RGW
U22
U25
@0.850V FP_0V85
@2.500V DDR_2V5
@1.203V DDR_1V2
@1.350V PL_GT_1V35
@1.200V MGTAVTT
@1.059V PL_GT_1V05
@0.912V MGTAVCC
@1.8V DDR_PLL
@1.8V MGTVCCAUX
DCDCIN
DCDC_2V0
EN_FPD
LP_GOOD
EN_DDR
PG_FPD
PG_DDR
PG_GT_R
GT_DCDC
ON_GT_R
EN_GT_R
PG_PL
LP_DCDC
VTT
VREFA
TP13
TP16
TP17
TP18
TP20
TP21
TP22
TP23
TP24
TP25
PWR
Title: TE0803 - POWER_2
A4
Number: TE0803 4HE11-AZ
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Low-power domain
PS MGT
PS MIO VCCIO
LPD PRE
LPD 1st
LPD 2nd
LPD 3rd
U20 MUN3CAD03-SE
U29 MUN3CAD03-SE
U15 MUN3CAD03-SE
U23 MUN3CAD03-SE
U26
U27
U10
U8
U41
U44
TPS72012DRVR
TPS72018DRVR
TPS74801DRC
TPS3106K33DBVR
NC7S08P5X
3A
1.5A
0.35A
LP_DCDC
@2.000V
DCDC_2V0
@1.2V
PS_PLL
@1.8V
PS_AUX
@0.850V
LP_0V85
@1.795V
PS_AVTT
@0.854V
PS_AVCC
@0.990V
PS_GT_1V0
PS_1V8
PG_PSGT
PG_LPD_1
LP_GOOD
POR_B
DCDCIN
EN_LPD
EN_PSGT
PG_FPD
MR
TP27
TP28
TP29
TP30
TP31
TP34
POR_B is "0" when LP_0V85 lower 0.74V
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TE0803 - POWER_4
A4
TE0803 4HE11-AZ
04
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POWER_4.SchDoc

REV	DATE	Description	
-01		Initial revision	VT
-01a	20.11.2017	1. VCU voltage set to 0.9V, R20 changed to 40K , PL_VCU_1V0 renamed to PL_VCU_0V9.	VT
-02	20.06.2018	1. Added LDO to DDR_PLL 2. All differential pairs wath length matched with tollerance 0.1mm (excluding package delays) 3. Added MAC EEPROM U28 4. VPS_MGTRAVCC set to 0.85V 5. Added pull-up resistors R68,R69	VT
-03	21.02.2019	1. Added support of DDP DDR4 2. Added support of Low power FPGA (-L1/L2). 3. Revised testpoints 4. Revised J1-J4 connectors net label style	VY
-04	15.12.2020	1. Revised PL_VCCINT power supply. EN63A0QI replaced by TPS548A28RWWR. PCB: revised routing and components placement; 2. Added support of wide SDRAM DDR4 packages. PCB: revised routing and components placement; 3. Added option to select POR_OVERRIDE level (R12 and R93) 4. VCCO pins if unused Bank 44 connected together. Same for unused Bank 24 (UG583 recomendation) 5. PCB: updated signal trace lengths. 6. PCB: updated silckscreen. Added company address, CE and WEEE symbols; 7. PCB: added module orientation rectangle poiner 8. Changed resistors value of R29, R31, R35, R39, R44-R47 (BOM optimization) 9. Removed traceability part (Obsolete component)	VY
-04	23.02.2022	10. Changed capacitor C92 for all variants from 100 nF to 1 nF.	ED
-04	08.06.2023	11. U4 can be either TPS548A28RWWR or MPQ8633BGLE-Z which is up to Trenz Electronic GmbH.	VY
-04	23.05.2025	12. L1 - L7 ferrit beads BKP0603HS121-T (EOL) replaced by MPZ0603S121HT000 for all variants.	VG

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Title: TE0803 - Revision History

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Drawn by: VY	Filename: Revision Changes.SchDoc	