



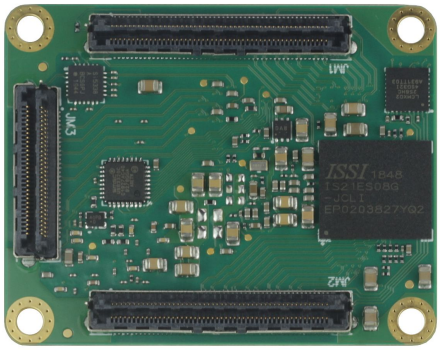

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Schematics and other handouts serve for informational purposes only!

| | | | |
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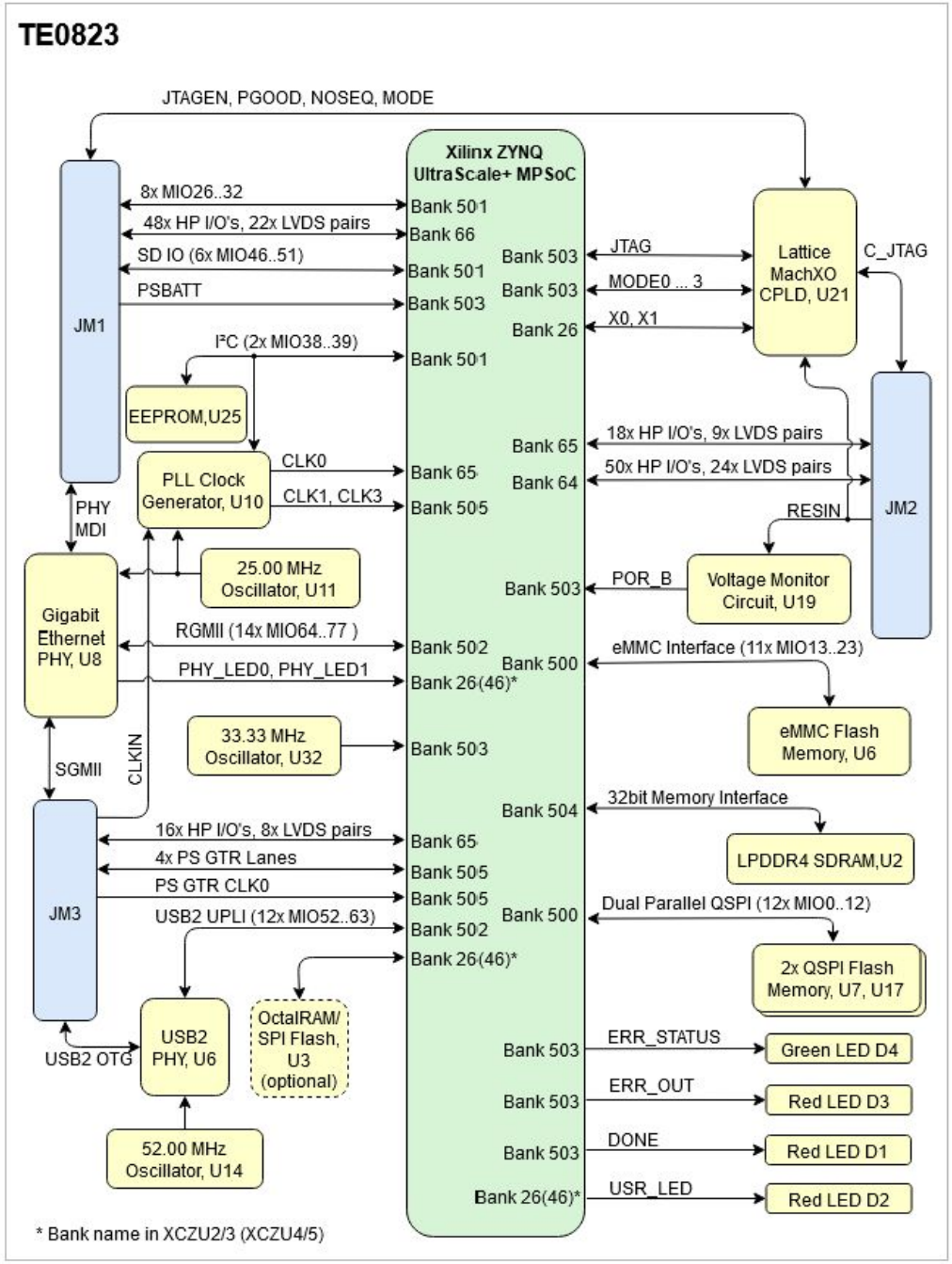
| trenz electronic | Title: TE0823 - Legal notices | | |
| | A4 | Number: TE0823 3PIU1FA | Rev. 01 |
| | Date: 2020-10-29 | Copyright: Trenz Electronic GmbH / TT | Page 1 of 25 |
| | Filename: Legal Notices Modules.SchDoc | | |




| | | | |
|---|---|---|---|
| trenz electronic | Title: TE0823 - System Overview | | |
| | A4 | Number: TE0823 3PIU1FA | Rev. 01 |
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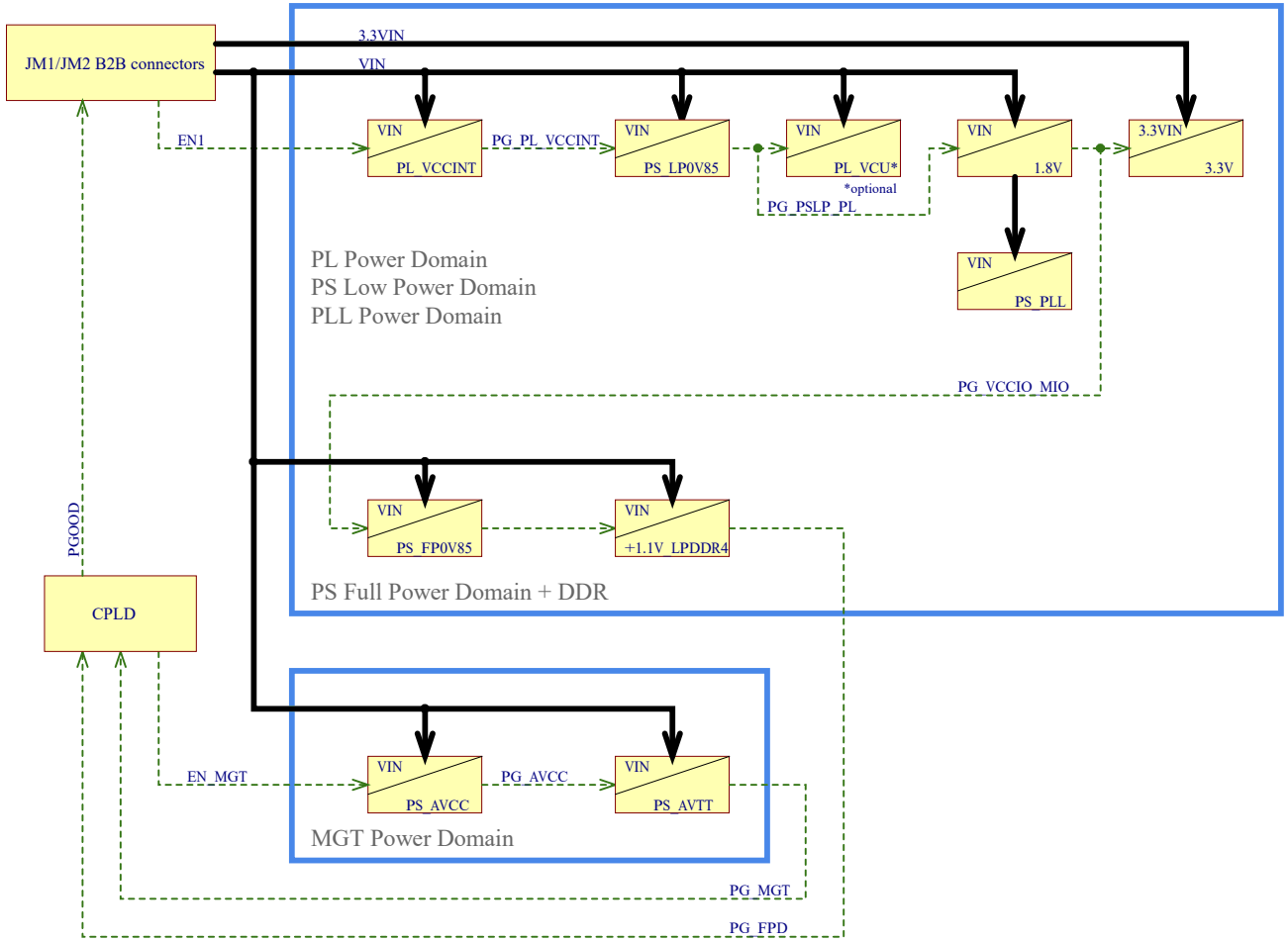
| | Drawn by: VY | Filename: TE0823-Overview.SchDoc | |




| | | | |
|---|---|---|---|
| trenz electronic | Title: TE0823 - Power Overview | | |
| | A4 | Number: TE0823 3PIU1FA | Rev. 01 |
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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_Revision_Changes
Revision Changes.SchDoc

U_POV
TE0823-Power-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_LPDDR4
LPDDR4.SchDoc

U_POWER
POWER.SchDoc

U_POWER_1
POWER_1.SchDoc

U_HyperRAM
HyperRAM.SchDoc

U_Overview
TE0823-Overview.SchDoc

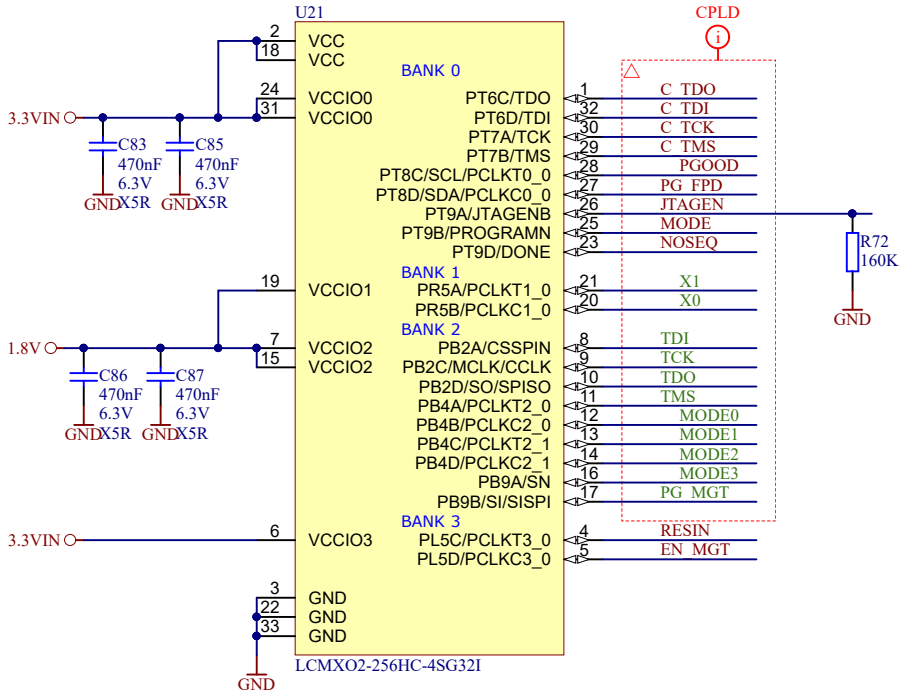
U_B2B-Connectors_2
B2B-Connectors_2.SchDoc

U_LN
Legal Notices Modules.SchDoc

S/N
GND 1 0R 2 GND
Serialnumber

Serial
Serial
Serialnumber 6,3 x 6.3mm

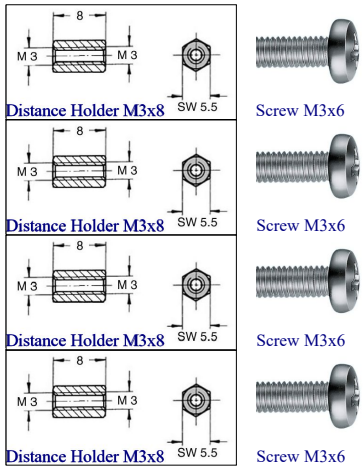
| I2C-Address | Component |
|---|---|
| 0x50 | 24AA025E48T-I/OT |
| 0x70 | SI5338A-B-GMR |
| 0x.. | PS MIO |




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 | 3PIU1FA |
| Created by | VY |
| Modified by | VY |
| Modified at | 2020-01-13 |
| SVN Revision | 8870 [Locally Modified] |

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| | | |
|---|---|---|
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| A4 | Number: TE0823 3PIU1FA | Rev. 01 |
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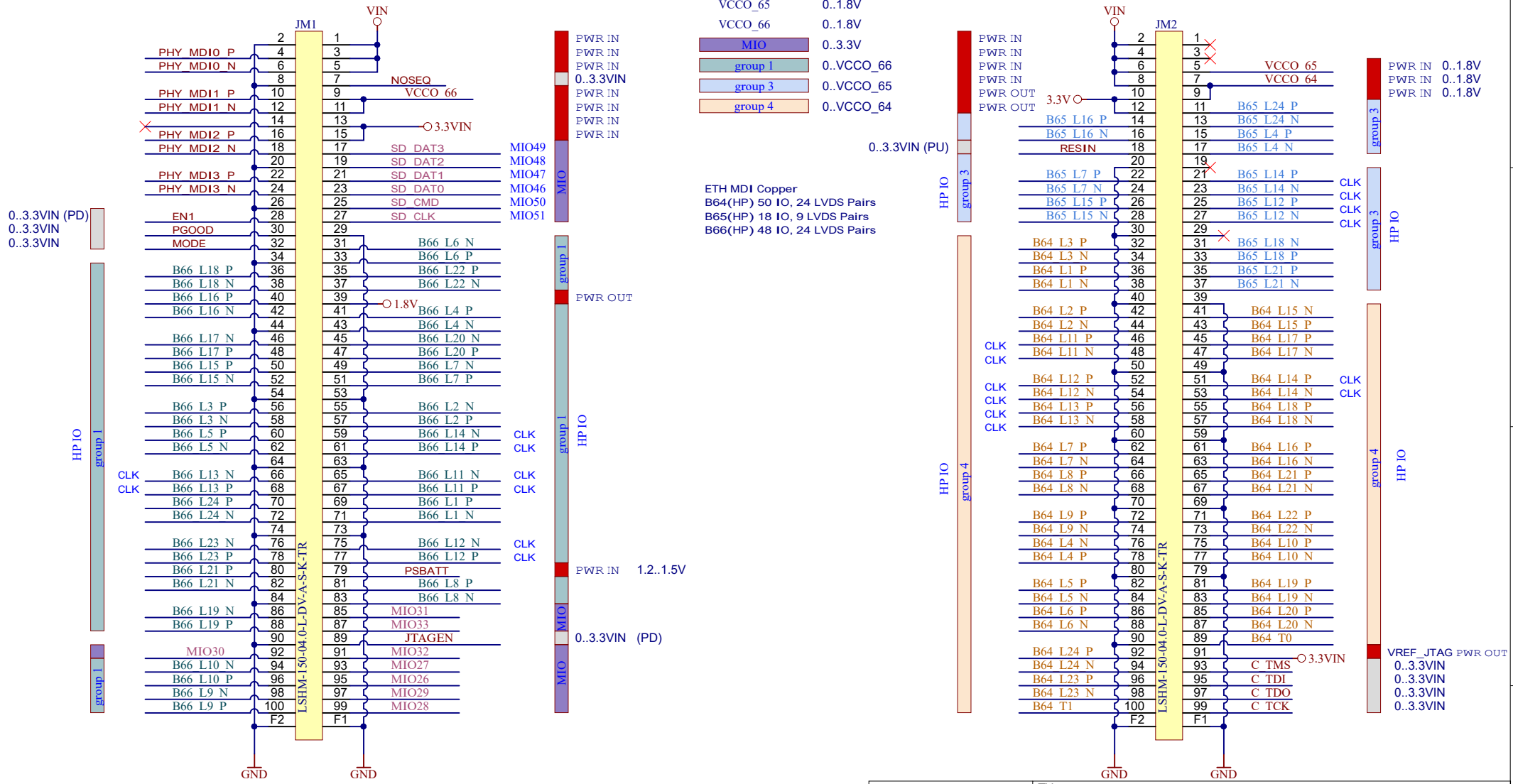


PU - On board pull-up resistor

PD - On board pull-down resistor

| | | | |
|---|---|---|---|
| trenz electronic | Title: TE0823 - B2B Connectors | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
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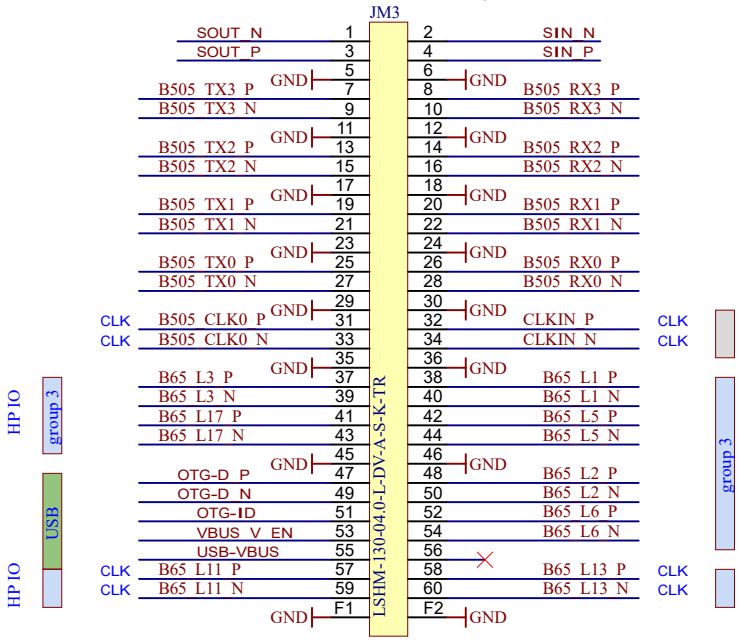
| Drawn by: VY | Filename: B2B-Connectors.SchDoc | | |

B65(HP) 16 IO, 8 LVDS Pairs
USB OTG
ETH SGMII
PS_GTR 4 Lanes
PS_GTR CLK IN
PLL CLK IN

group 3 0..VCCO_65




VCCO64, VCCO65, VCCO66 ->>> max. 1.8V (HP bank's)

| | | | |
|---|---|---|---|
| trenz electronic | Title: TE0823 - B2B Connectors | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
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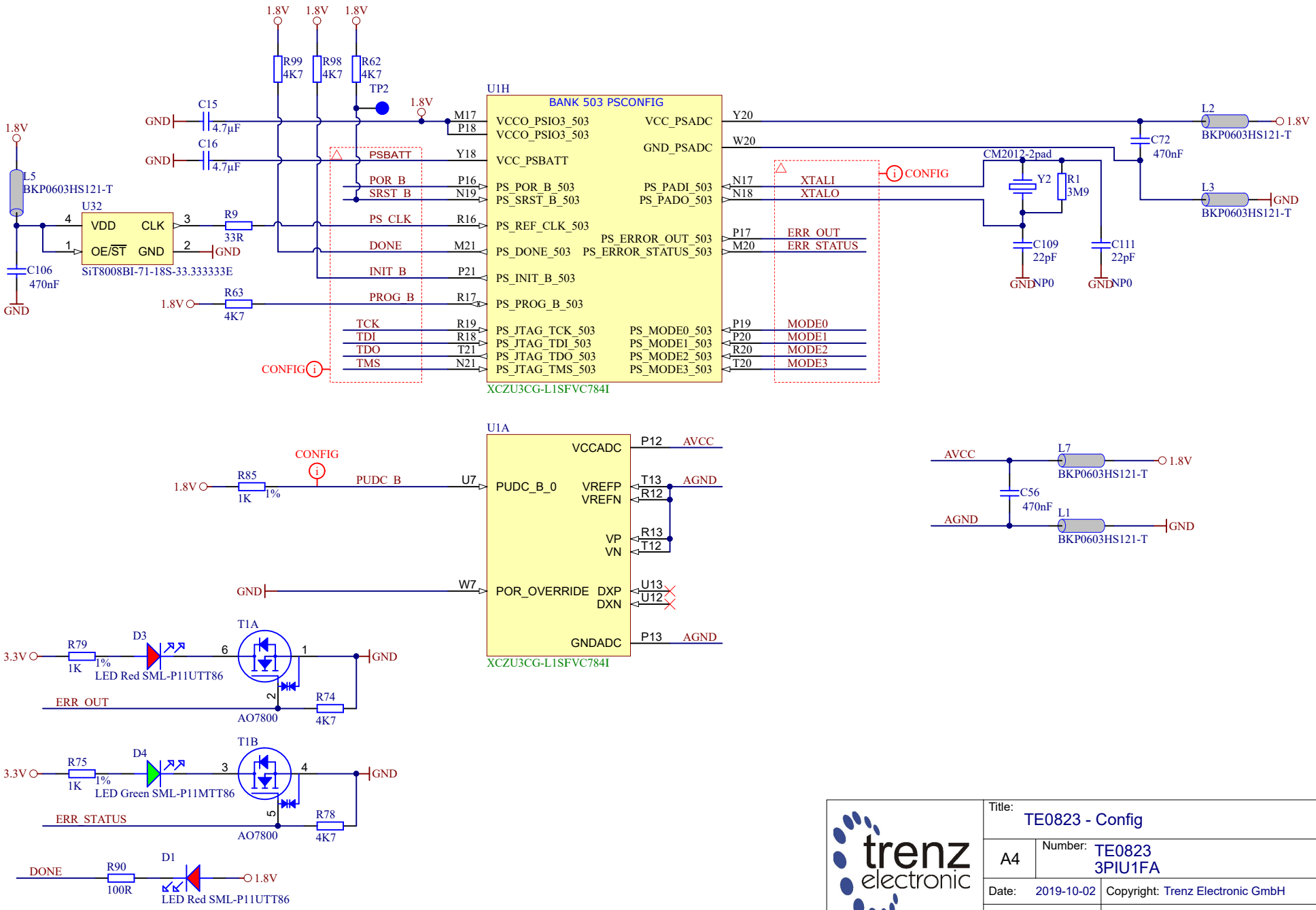
| Drawn by: VY | Filename: B2B-Connectors_2.SchDoc | | |




| | | | |
|---|---|---|---|
| Title: TE0823 - Config | | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
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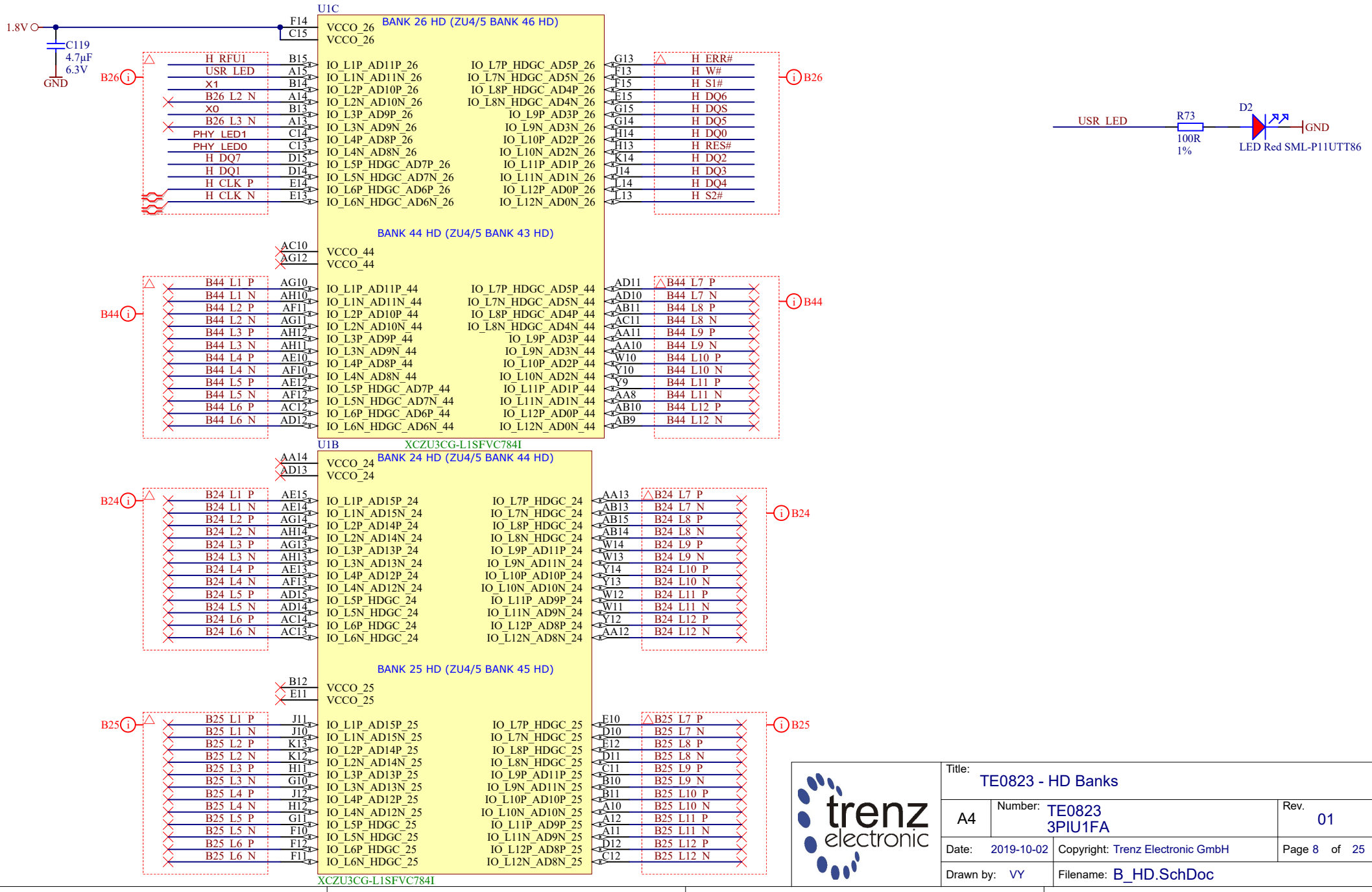
| Drawn by: VY | Filename: CONFIG.SchDoc | | |


U1C
BANK 26 HD (ZU4/5 BANK 46 HD)
BANK 44 HD (ZU4/5 BANK 43 HD)
U1B
XCZU3CG-L1SFVC784I
BANK 24 HD (ZU4/5 BANK 44 HD)
BANK 25 HD (ZU4/5 BANK 45 HD)
XCZU3CG-L1SFVC784I
1.8V
C119
4.7µF
6.3V
GND
USR_LED
R73
100R
1%
D2
LED Red SML-P11UTT86
B26
B44
B24
B25
H_RFU1
USR_LED
X1
B26_L2_N
X0
B26_L3_N
PHY_LED1
PHY_LED0
H_DQ7
H_DQ1
H_CLK_P
H_CLK_N
H_ERR#
H_W#
H_S1#
H_DQ6
H_DQS
H_DQ5
H_DQ0
H_RES#
H_DQ2
H_DQ3
H_DQ4
H_S2#
B44_L1_P
B44_L1_N
B44_L2_P
B44_L2_N
B44_L3_P
B44_L3_N
B44_L4_P
B44_L4_N
B44_L5_P
B44_L5_N
B44_L6_P
B44_L6_N
B44_L7_P
B44_L7_N
B44_L8_P
B44_L8_N
B44_L9_P
B44_L9_N
B44_L10_P
B44_L10_N
B44_L11_P
B44_L11_N
B44_L12_P
B44_L12_N
B24_L1_P
B24_L1_N
B24_L2_P
B24_L2_N
B24_L3_P
B24_L3_N
B24_L4_P
B24_L4_N
B24_L5_P
B24_L5_N
B24_L6_P
B24_L6_N
B24_L7_P
B24_L7_N
B24_L8_P
B24_L8_N
B24_L9_P
B24_L9_N
B24_L10_P
B24_L10_N
B24_L11_P
B24_L11_N
B24_L12_P
B24_L12_N
B25_L1_P
B25_L1_N
B25_L2_P
B25_L2_N
B25_L3_P
B25_L3_N
B25_L4_P
B25_L4_N
B25_L5_P
B25_L5_N
B25_L6_P
B25_L6_N
B25_L7_P
B25_L7_N
B25_L8_P
B25_L8_N
B25_L9_P
B25_L9_N
B25_L10_P
B25_L10_N
B25_L11_P
B25_L11_N
B25_L12_P
B25_L12_N
VCCO_26
VCCO_44
VCCO_24
VCCO_25
IO_L1P_AD11P_26
IO_L1N_AD11N_26
IO_L2P_AD10P_26
IO_L2N_AD10N_26
IO_L3P_AD9P_26
IO_L3N_AD9N_26
IO_L4P_AD8P_26
IO_L4N_AD8N_26
IO_L5P_HDGC_AD7P_26
IO_L5N_HDGC_AD7N_26
IO_L6P_HDGC_AD6P_26
IO_L6N_HDGC_AD6N_26
IO_L7P_HDGC_AD5P_26
IO_L7N_HDGC_AD5N_26
IO_L8P_HDGC_AD4P_26
IO_L8N_HDGC_AD4N_26
IO_L9P_AD3P_26
IO_L9N_AD3N_26
IO_L10P_AD2P_26
IO_L10N_AD2N_26
IO_L11P_AD1P_26
IO_L11N_AD1N_26
IO_L12P_AD0P_26
IO_L12N_AD0N_26
IO_L1P_AD11P_44
IO_L1N_AD11N_44
IO_L2P_AD10P_44
IO_L2N_AD10N_44
IO_L3P_AD9P_44
IO_L3N_AD9N_44
IO_L4P_AD8P_44
IO_L4N_AD8N_44
IO_L5P_HDGC_AD7P_44
IO_L5N_HDGC_AD7N_44
IO_L6P_HDGC_AD6P_44
IO_L6N_HDGC_AD6N_44
IO_L7P_HDGC_AD5P_44
IO_L7N_HDGC_AD5N_44
IO_L8P_HDGC_AD4P_44
IO_L8N_HDGC_AD4N_44
IO_L9P_AD3P_44
IO_L9N_AD3N_44
IO_L10P_AD2P_44
IO_L10N_AD2N_44
IO_L11P_AD1P_44
IO_L11N_AD1N_44
IO_L12P_AD0P_44
IO_L12N_AD0N_44
IO_L1P_AD15P_24
IO_L1N_AD15N_24
IO_L2P_AD14P_24
IO_L2N_AD14N_24
IO_L3P_AD13P_24
IO_L3N_AD13N_24
IO_L4P_AD12P_24
IO_L4N_AD12N_24
IO_L5P_HDGC_24
IO_L5N_HDGC_24
IO_L6P_HDGC_24
IO_L6N_HDGC_24
IO_L7P_HDGC_24
IO_L7N_HDGC_24
IO_L8P_HDGC_24
IO_L8N_HDGC_24
IO_L9P_AD11P_24
IO_L9N_AD11N_24
IO_L10P_AD10P_24
IO_L10N_AD10N_24
IO_L11P_AD9P_24
IO_L11N_AD9N_24
IO_L12P_AD8P_24
IO_L12N_AD8N_24
IO_L1P_AD15P_25
IO_L1N_AD15N_25
IO_L2P_AD14P_25
IO_L2N_AD14N_25
IO_L3P_AD13P_25
IO_L3N_AD13N_25
IO_L4P_AD12P_25
IO_L4N_AD12N_25
IO_L5P_HDGC_25
IO_L5N_HDGC_25
IO_L6P_HDGC_25
IO_L6N_HDGC_25
IO_L7P_HDGC_25
IO_L7N_HDGC_25
IO_L8P_HDGC_25
IO_L8N_HDGC_25
IO_L9P_AD11P_25
IO_L9N_AD11N_25
IO_L10P_AD10P_25
IO_L10N_AD10N_25
IO_L11P_AD9P_25
IO_L11N_AD9N_25
IO_L12P_AD8P_25
IO_L12N_AD8N_25
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Title: TE0823 - HD Banks
A4
Number: TE0823 3PIU1FA
Rev. 01
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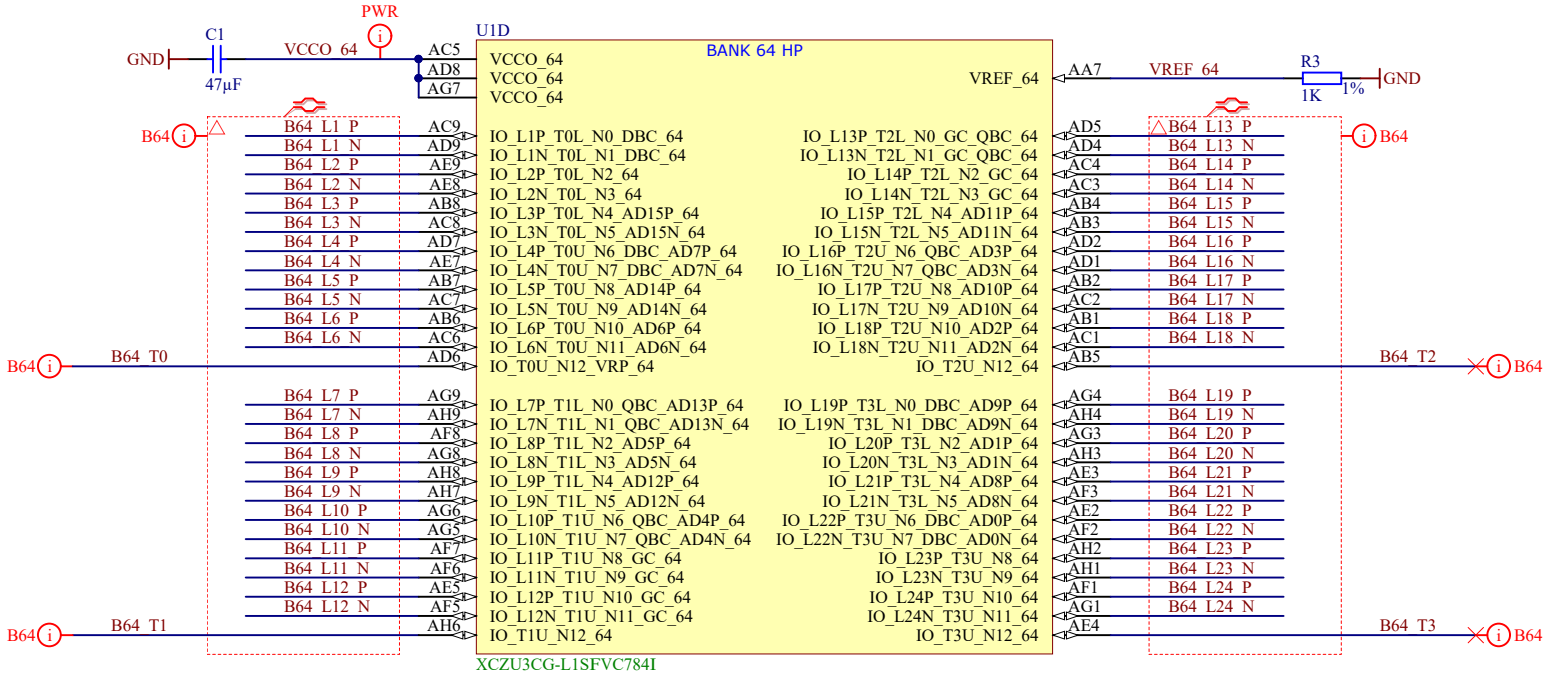
Filename: B_HD.SchDoc

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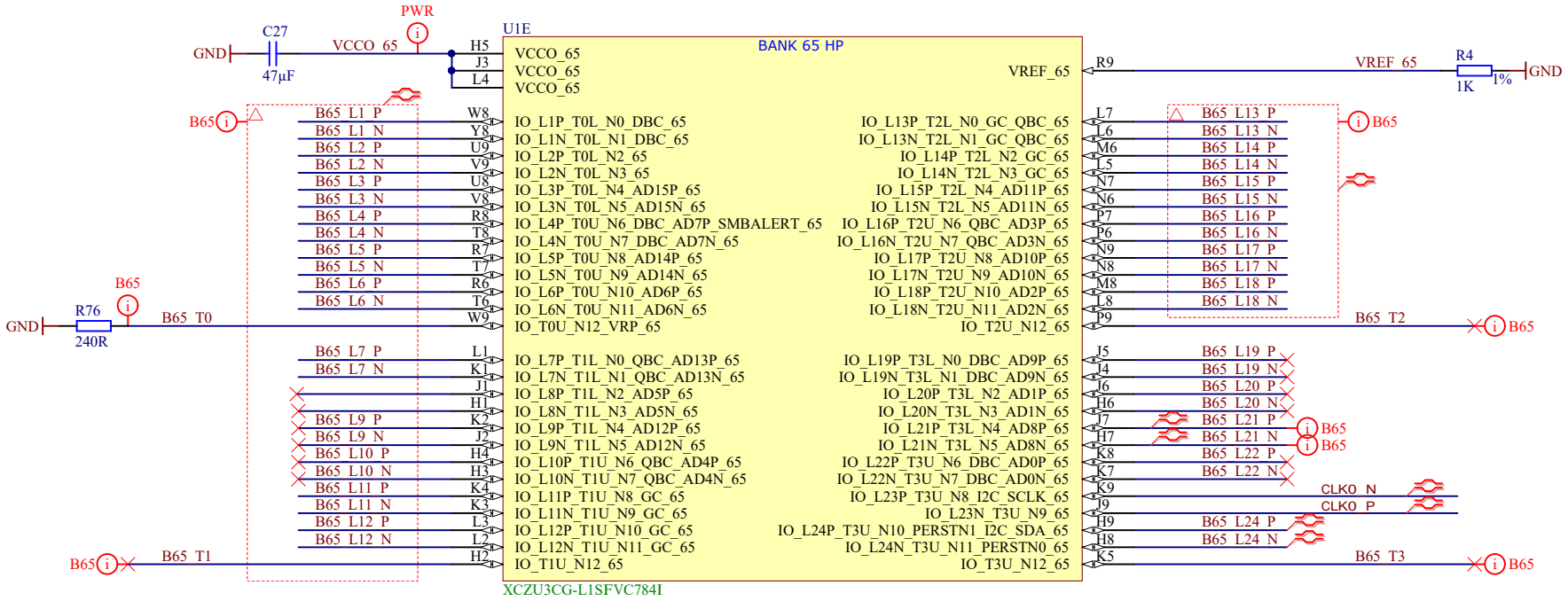


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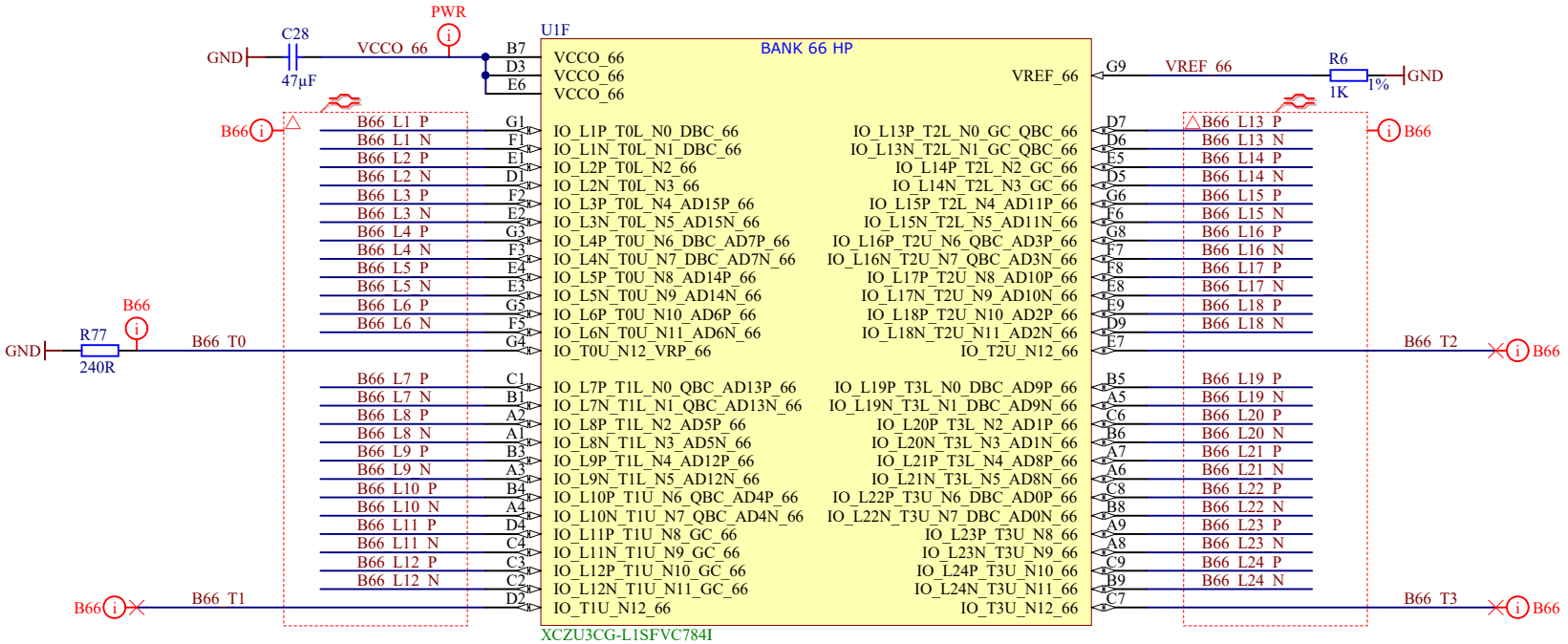


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| Title: TE0823 - B66 | | | |
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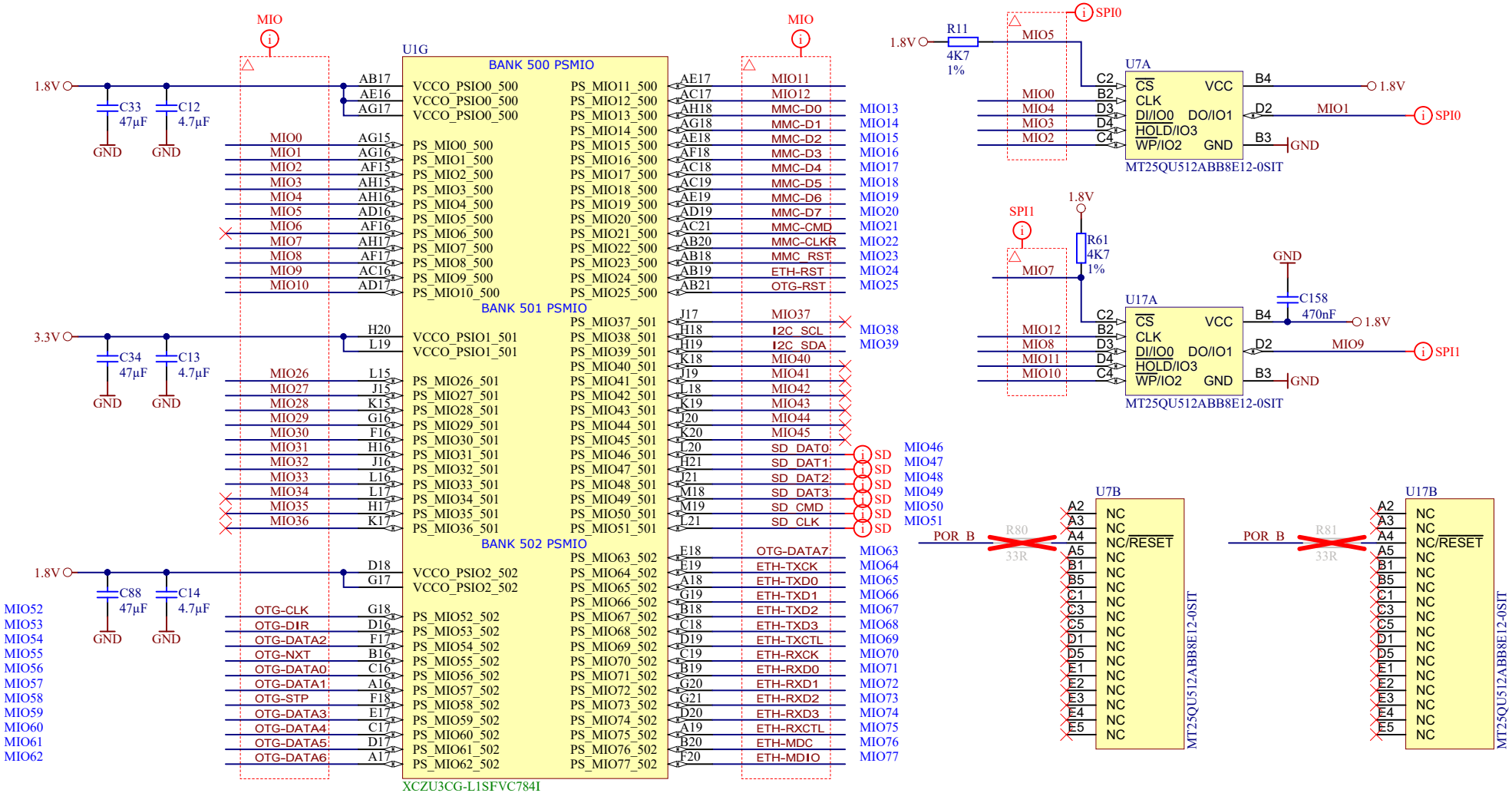


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|---|---|---|---|
| Title: TE0823 - MIO Banks | | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
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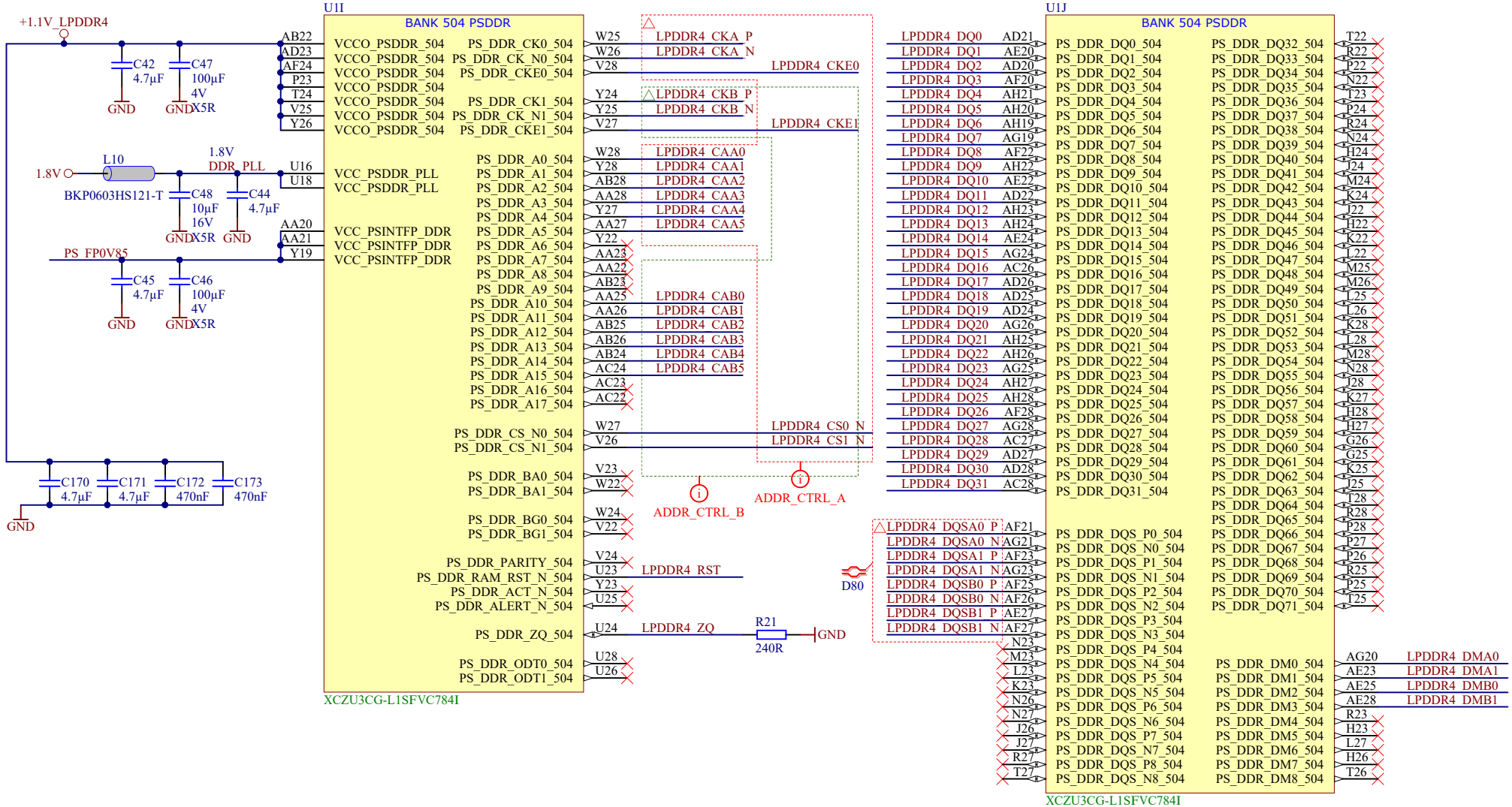
| Drawn by: VY | Filename: B_MIO.SchDoc | | |

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|---|---|---|---|
| trenz electronic | Title: TE0823 - PS_DDR | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
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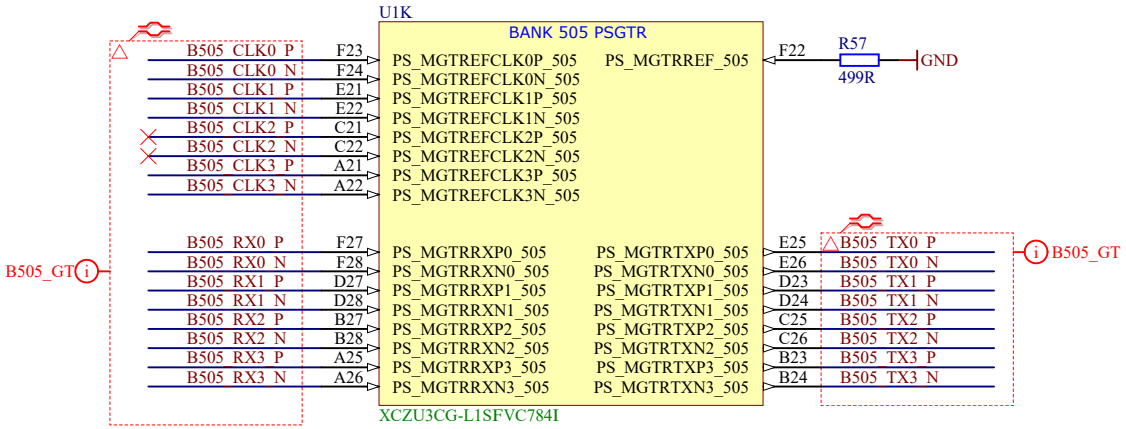


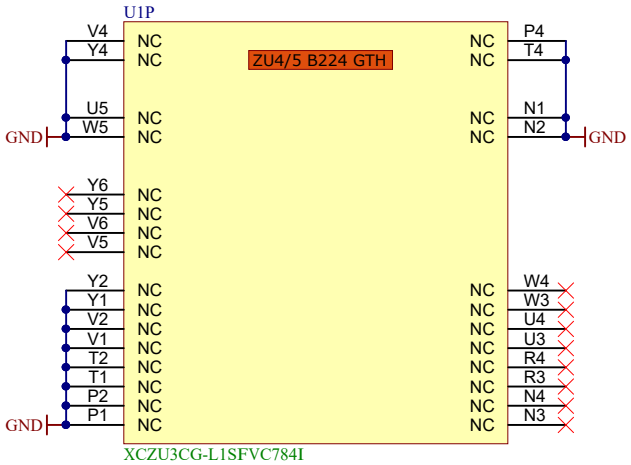


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| | | | |
|---|---|---|---|
| Title: TE0823 - PS_GT | | | |
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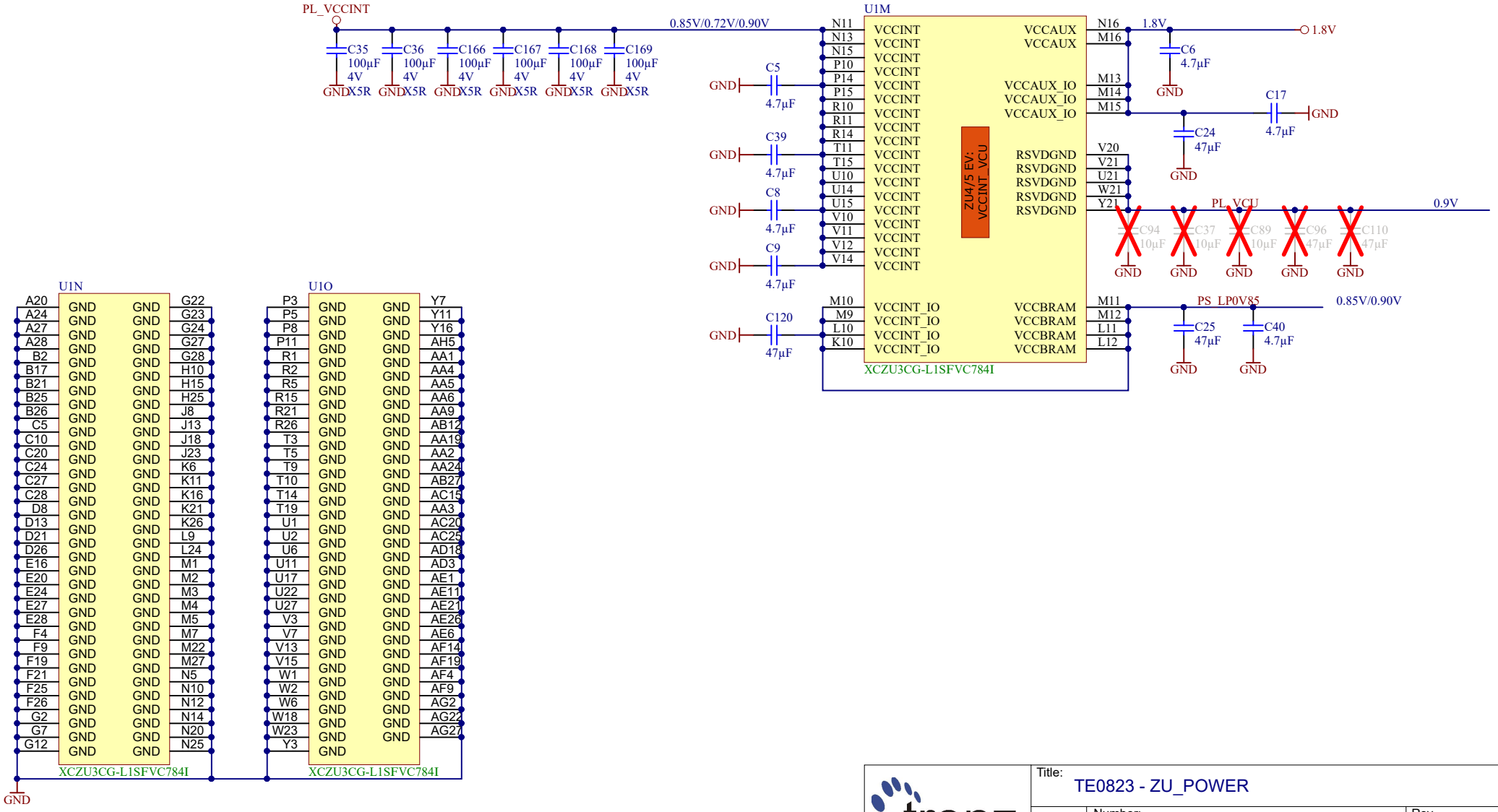


| | | |
|---|---|---|
| Title: TE0823 - ZU_POWER | | |
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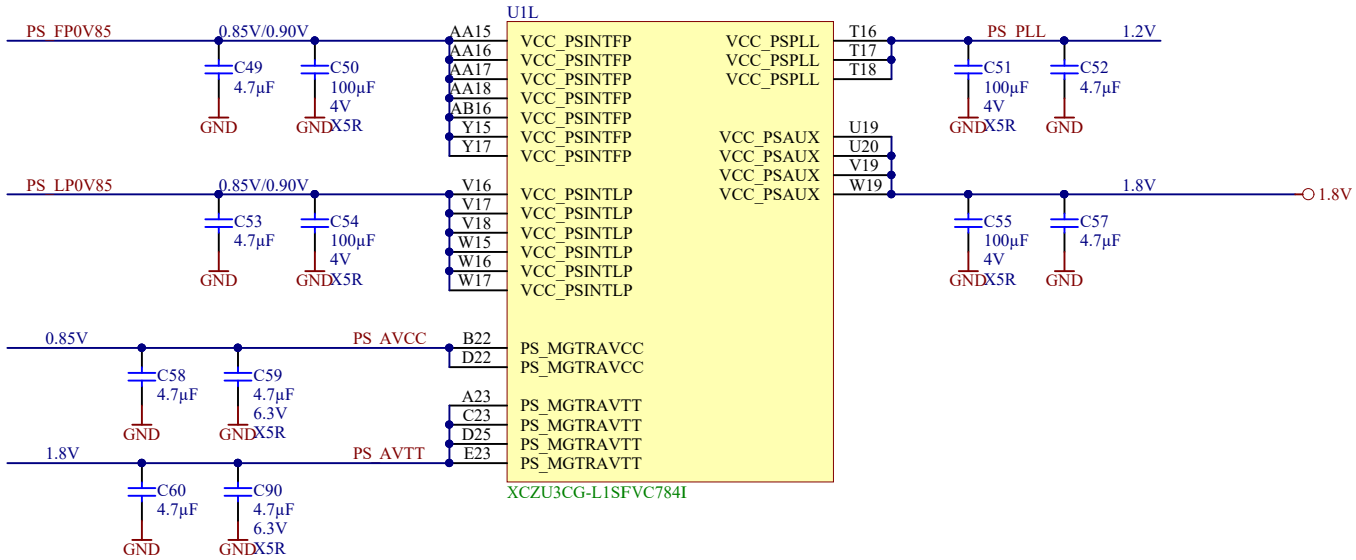


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|---|---|---|---|
| trenz electronic | Title: TE0823 - ZU_PS_POWER | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
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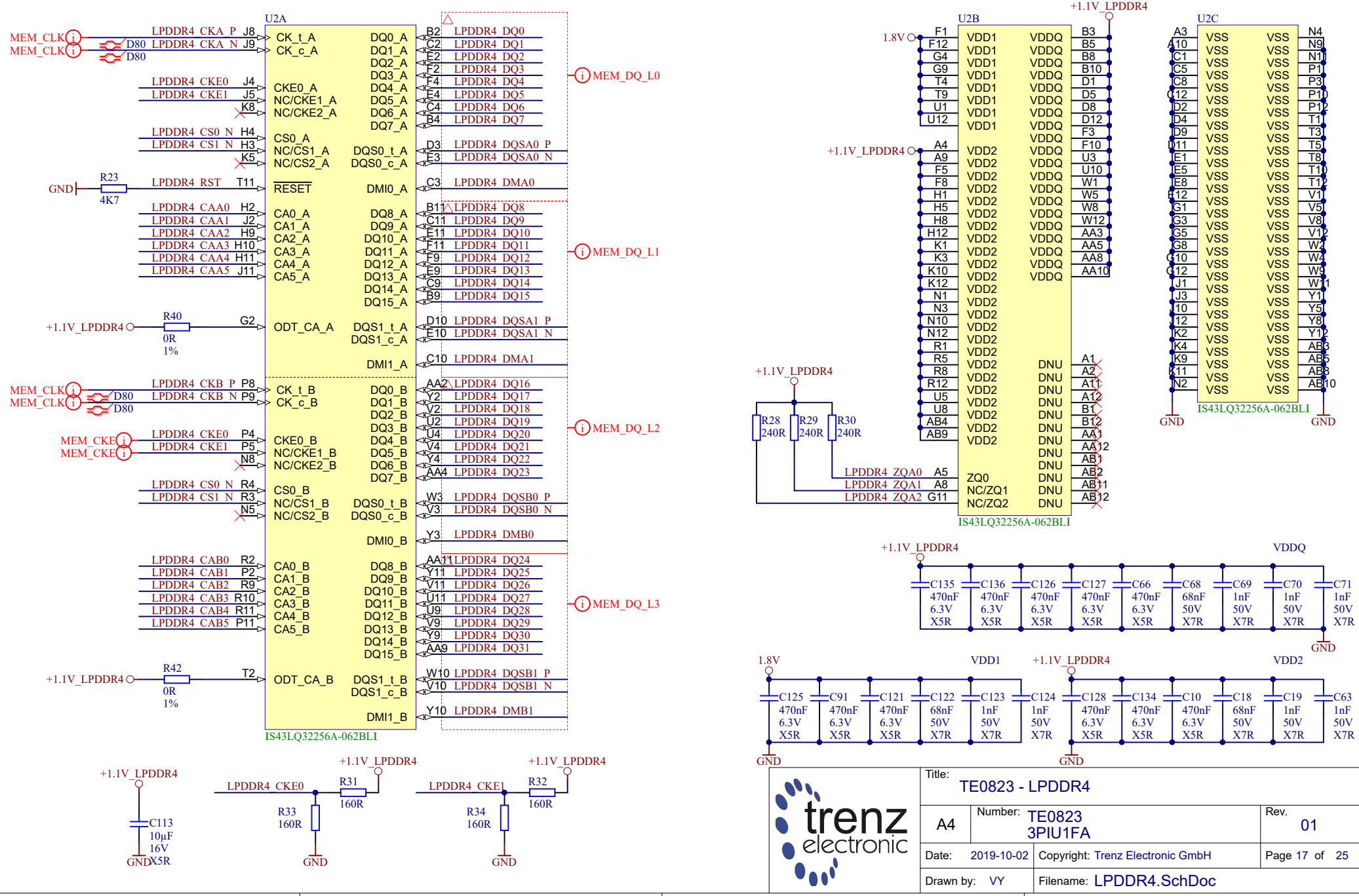
U2A
MEM_CLK
MEM_CLK
D80
D80
LPDDR4_CKA_P J8
LPDDR4_CKA_N J9
CK_t_A
CK_c_A
LPDDR4_CKE0 J4
LPDDR4_CKE1 J5
K8
CKE0_A
NC/CKE1_A
NC/CKE2_A
LPDDR4_CS0_N H4
LPDDR4_CS1_N H3
K5
CS0_A
NC/CS1_A
NC/CS2_A
GND
R23
4K7
LPDDR4_RST T11
RESET
LPDDR4_CAA0 H2
LPDDR4_CAA1 J2
LPDDR4_CAA2 H9
LPDDR4_CAA3 H10
LPDDR4_CAA4 H11
LPDDR4_CAA5 J11
CA0_A
CA1_A
CA2_A
CA3_A
CA4_A
CA5_A
+1.1V_LPDDR4
R40
0R
1%
G2
ODT_CA_A
MEM_CLK
MEM_CLK
D80
D80
LPDDR4_CKB_P P8
LPDDR4_CKB_N P9
CK_t_B
CK_c_B
MEM_CKE
MEM_CKE
LPDDR4_CKE0 P4
LPDDR4_CKE1 P5
N8
CKE0_B
NC/CKE1_B
NC/CKE2_B
LPDDR4_CS0_N R4
LPDDR4_CS1_N R3
N5
CS0_B
NC/CS1_B
NC/CS2_B
LPDDR4_CAB0 R2
LPDDR4_CAB1 P2
LPDDR4_CAB2 R9
LPDDR4_CAB3 R10
LPDDR4_CAB4 R11
LPDDR4_CAB5 P11
CA0_B
CA1_B
CA2_B
CA3_B
CA4_B
CA5_B
+1.1V_LPDDR4
R42
0R
1%
T2
ODT_CA_B
DQ0_A
DQ1_A
DQ2_A
DQ3_A
DQ4_A
DQ5_A
DQ6_A
DQ7_A
DQS0_t_A
DQS0_c_A
DMI0_A
DQ8_A
DQ9_A
DQ10_A
DQ11_A
DQ12_A
DQ13_A
DQ14_A
DQ15_A
DQS1_t_A
DQS1_c_A
DMI1_A
DQ0_B
DQ1_B
DQ2_B
DQ3_B
DQ4_B
DQ5_B
DQ6_B
DQ7_B
DQS0_t_B
DQS0_c_B
DMI0_B
DQ8_B
DQ9_B
DQ10_B
DQ11_B
DQ12_B
DQ13_B
DQ14_B
DQ15_B
DQS1_t_B
DQS1_c_B
DMI1_B
B2 LPDDR4_DQ0
C2 LPDDR4_DQ1
E2 LPDDR4_DQ2
F2 LPDDR4_DQ3
F4 LPDDR4_DQ4
E4 LPDDR4_DQ5
C4 LPDDR4_DQ6
B4 LPDDR4_DQ7
D3 LPDDR4_DQSA0_P
E3 LPDDR4_DQSA0_N
C3 LPDDR4_DMA0
B11 LPDDR4_DQ8
C11 LPDDR4_DQ9
E11 LPDDR4_DQ10
F11 LPDDR4_DQ11
F9 LPDDR4_DQ12
E9 LPDDR4_DQ13
C9 LPDDR4_DQ14
B9 LPDDR4_DQ15
D10 LPDDR4_DQSA1_P
E10 LPDDR4_DQSA1_N
C10 LPDDR4_DMA1
AA2 LPDDR4_DQ16
Y2 LPDDR4_DQ17
V2 LPDDR4_DQ18
U2 LPDDR4_DQ19
J4 LPDDR4_DQ20
V4 LPDDR4_DQ21
Y4 LPDDR4_DQ22
AA4 LPDDR4_DQ23
W3 LPDDR4_DQSB0_P
V3 LPDDR4_DQSB0_N
Y3 LPDDR4_DMB0
AA11 LPDDR4_DQ24
Y11 LPDDR4_DQ25
V11 LPDDR4_DQ26
U11 LPDDR4_DQ27
U9 LPDDR4_DQ28
V9 LPDDR4_DQ29
Y9 LPDDR4_DQ30
AA9 LPDDR4_DQ31
W10 LPDDR4_DQSB1_P
V10 LPDDR4_DQSB1_N
Y10 LPDDR4_DMB1
MEM_DQ_L0
MEM_DQ_L1
MEM_DQ_L2
MEM_DQ_L3
IS43LQ32256A-062BLI
+1.1V_LPDDR4
C113
10µF
16V
X5R
GND
+1.1V_LPDDR4
LPDDR4_CKE0
R31
160R
R33
160R
GND
+1.1V_LPDDR4
LPDDR4_CKE1
R32
160R
R34
160R
GND
U2B
1.8V
F1 VDD1
F12 VDD1
G4 VDD1
G9 VDD1
T4 VDD1
T9 VDD1
U1 VDD1
U12 VDD1
+1.1V_LPDDR4
A4 VDD2
A9 VDD2
F5 VDD2
F8 VDD2
H1 VDD2
H5 VDD2
H8 VDD2
H12 VDD2
K1 VDD2
K3 VDD2
K10 VDD2
K12 VDD2
N1 VDD2
N3 VDD2
N10 VDD2
N12 VDD2
R1 VDD2
R5 VDD2
R8 VDD2
R12 VDD2
U5 VDD2
U8 VDD2
AB4 VDD2
AB9 VDD2
VDDQ
B3
B5
B8
B10
D1
D5
D8
D12
F3
F10
U3
U10
W1
W5
W8
W12
AA3
AA5
AA8
AA10
DNU
A1
A2
A11
A12
B1
B12
AA1
AA12
AB1
AB2
AB11
AB12
+1.1V_LPDDR4
R28
240R
R29
240R
R30
240R
LPDDR4_ZQA0 A5
LPDDR4_ZQA1 A8
LPDDR4_ZQA2 G11
ZQ0
NC/ZQ1
NC/ZQ2
IS43LQ32256A-062BLI
U2C
A3 VSS
A10 VSS
C1 VSS
C5 VSS
C8 VSS
C12 VSS
D2 VSS
D4 VSS
D9 VSS
D11 VSS
E1 VSS
E5 VSS
E8 VSS
E12 VSS
G1 VSS
G3 VSS
G5 VSS
G8 VSS
G10 VSS
G12 VSS
J1 VSS
J3 VSS
J10 VSS
J12 VSS
K2 VSS
K4 VSS
K9 VSS
K11 VSS
N2 VSS
VSS
N4
N9
N11
P1
P3
P10
P12
T1
T3
T5
T8
T10
T12
V1
V5
V8
V11
W2
W4
W9
W11
Y1
Y5
Y8
Y12
AB3
AB5
AB8
AB10
IS43LQ32256A-062BLI
GND
GND
+1.1V_LPDDR4
VDDQ
C135 470nF 6.3V X5R
C136 470nF 6.3V X5R
C126 470nF 6.3V X5R
C127 470nF 6.3V X5R
C66 470nF 6.3V X5R
C68 68nF 50V X7R
C69 1nF 50V X7R
C70 1nF 50V X7R
C71 1nF 50V X7R
GND
1.8V
VDD1
+1.1V_LPDDR4
VDD2
C125 470nF 6.3V X5R
C91 470nF 6.3V X5R
C121 470nF 6.3V X5R
C122 68nF 50V X7R
C123 1nF 50V X7R
C124 1nF 50V X7R
C128 470nF 6.3V X5R
C134 470nF 6.3V X5R
C10 470nF 6.3V X5R
C18 68nF 50V X7R
C19 1nF 50V X7R
C63 1nF 50V X7R
GND
GND
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Title: TE0823 - LPDDR4
A4
Number: TE0823 3PIU1FA
Rev. 01
Date: 2019-10-02
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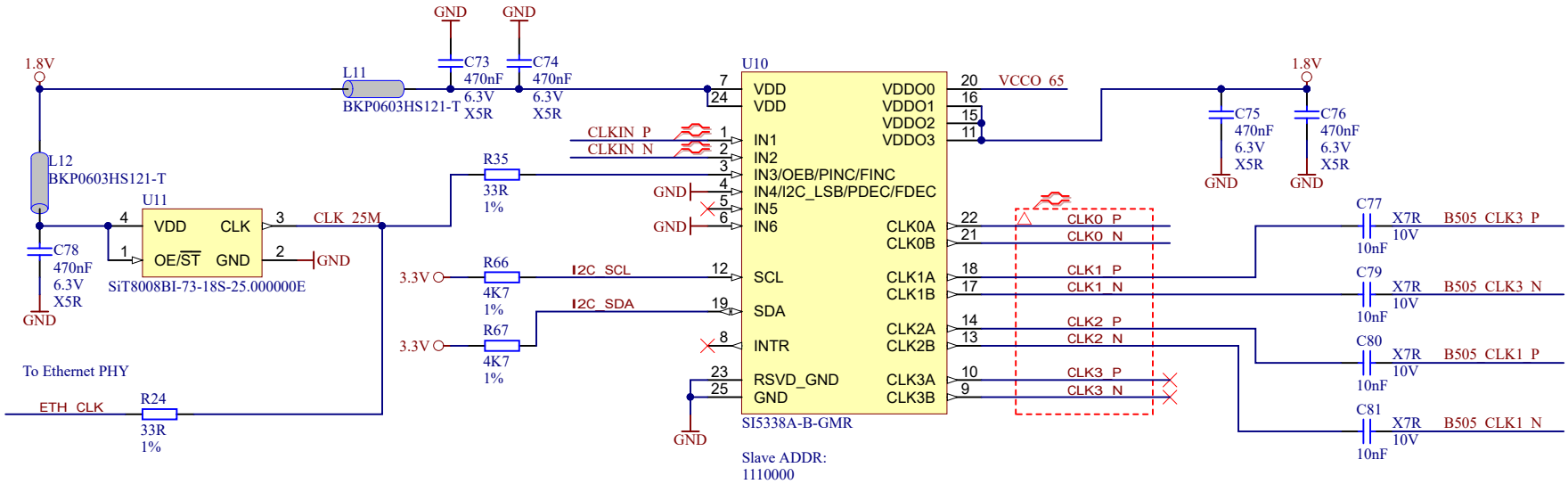
Drawn by: VY
Filename: LPDDR4.SchDoc

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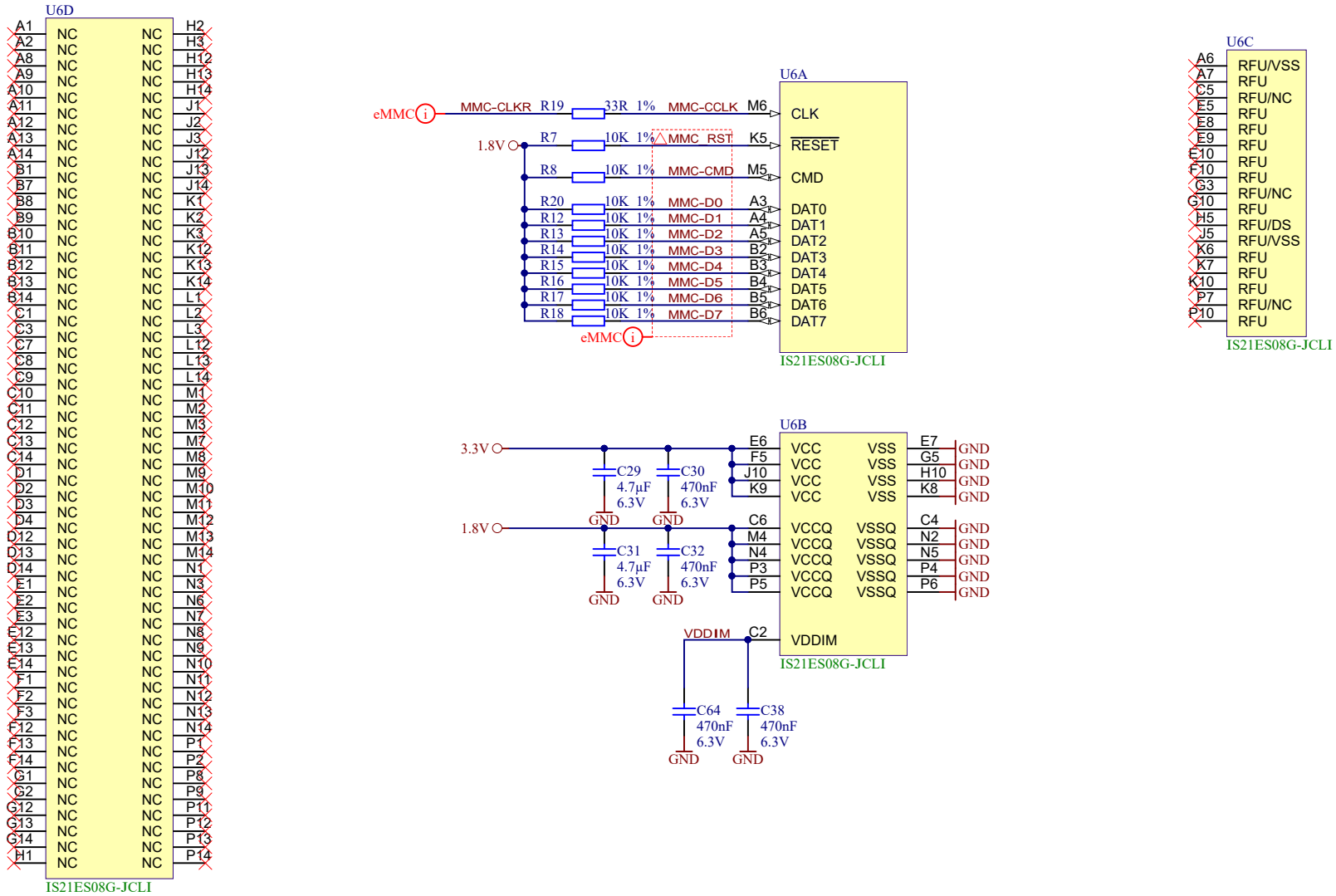
| trenz electronic | Title: TE0823 - CLK | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
| Date: 2019-10-02 | Copyright: Trenz Electronic GmbH | | Page 18 of 25 |
| Drawn by: VY | Filename: CLK.SchDoc | | |

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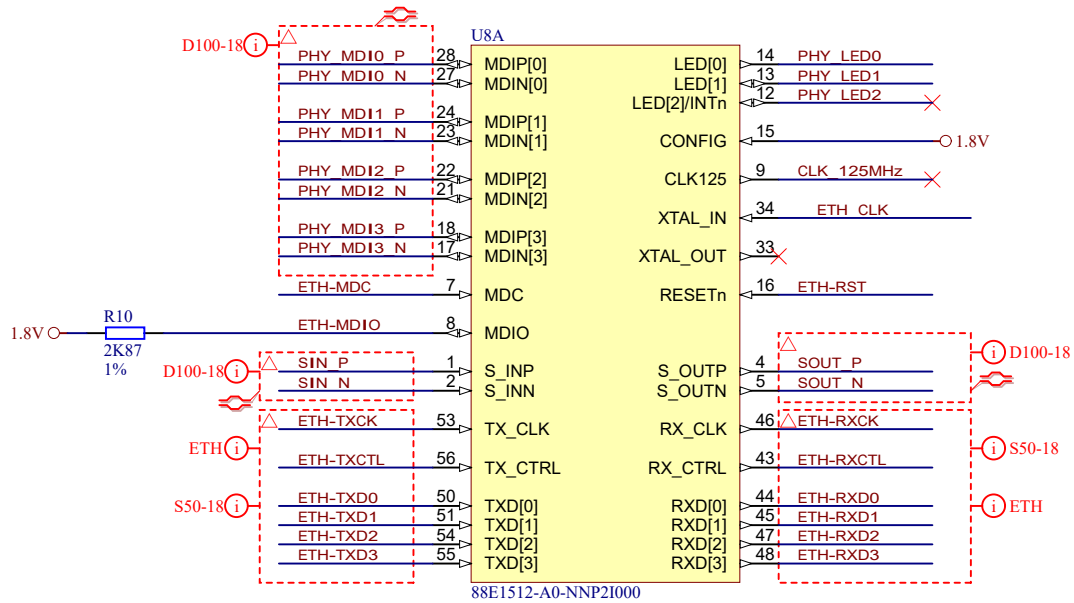
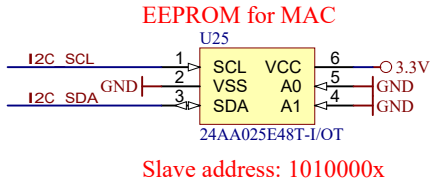
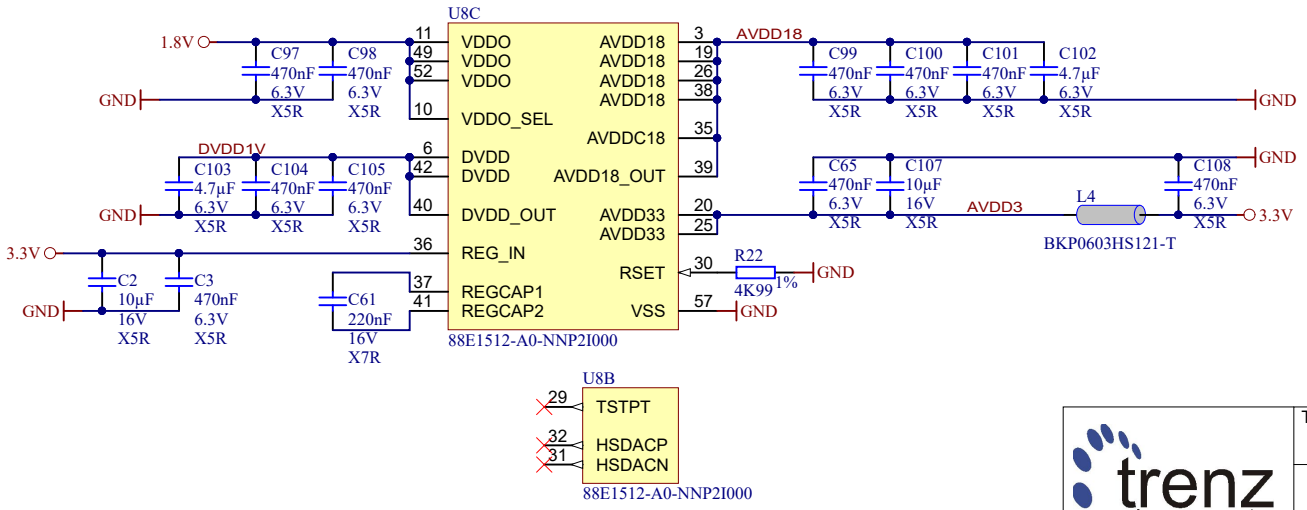
|---|---|---|
| Title: TE0823 - eMMC | | |
| A4 | Number: TE0823 3PIU1FA | Rev. 01 |
| Date: 2019-10-02 | Copyright: Trenz Electronic GmbH | Page 19 of 25 |
| Drawn by: VY | Filename: eMMC.SchDoc | |

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|---|---|---|---|
| Title: TE0823 - Ethernet PHY | | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
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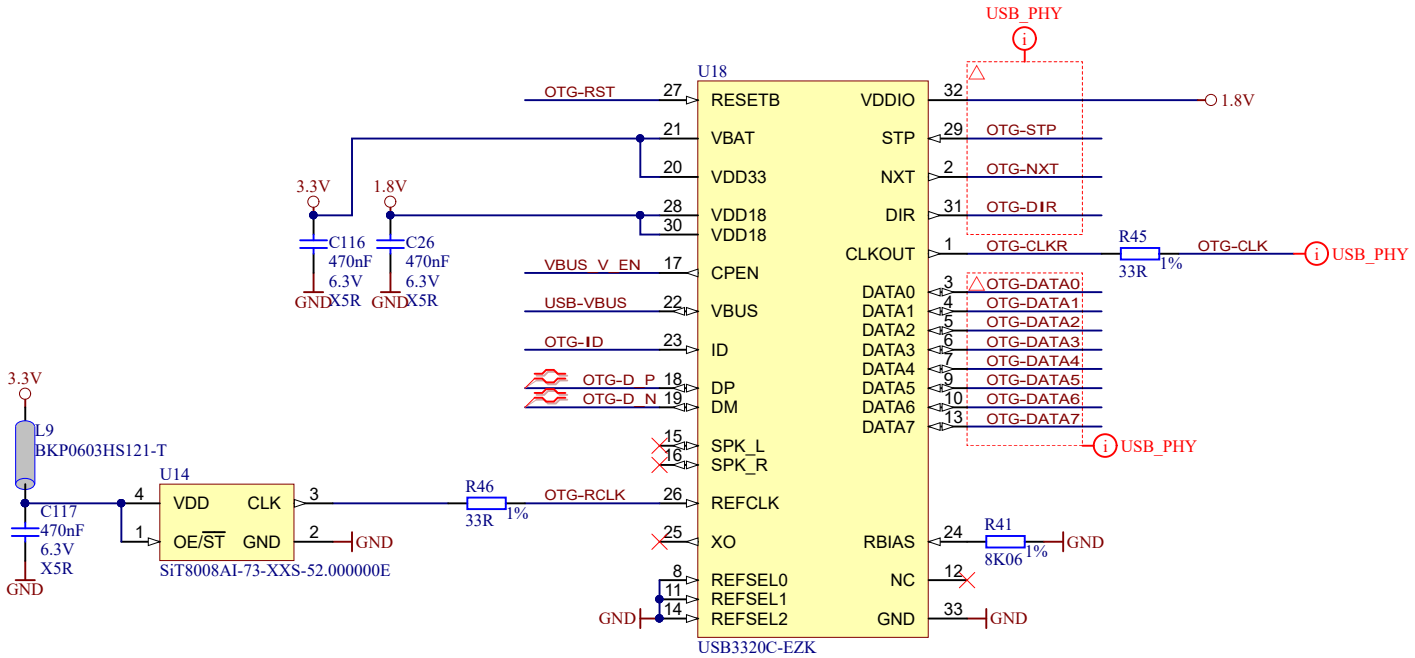
| Drawn by: VY | Filename: ETH-PHY.SchDoc | | |

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| trenz electronic | Title: TE0823 - USB2.0 PHY | | |
| | A4 | Number: TE0823 3PIU1FA | Rev. 01 |
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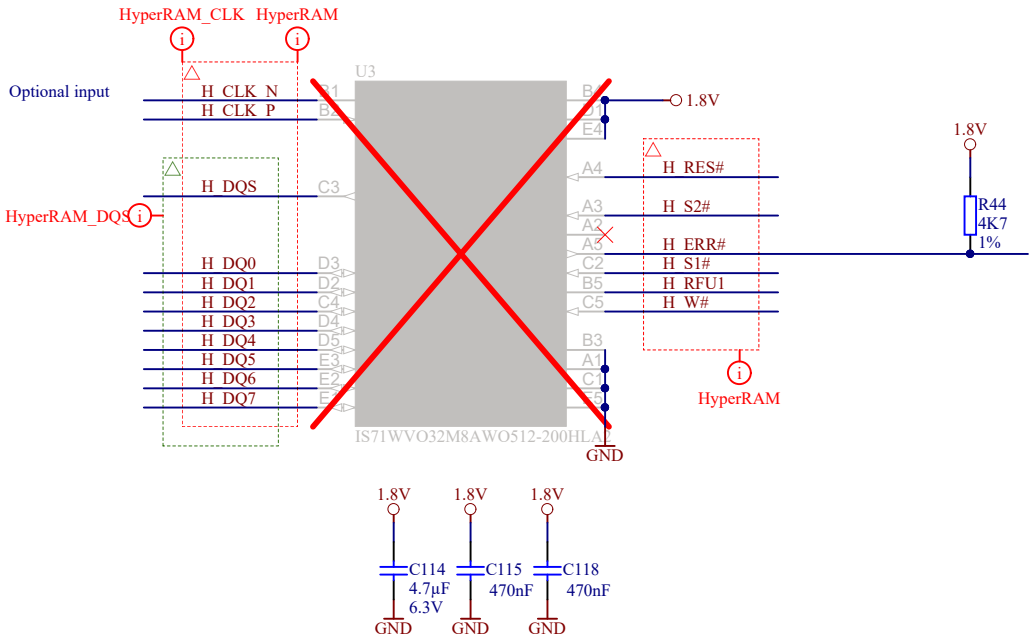
| | Drawn by: VY | Filename: USB-PHY.SchDoc | |

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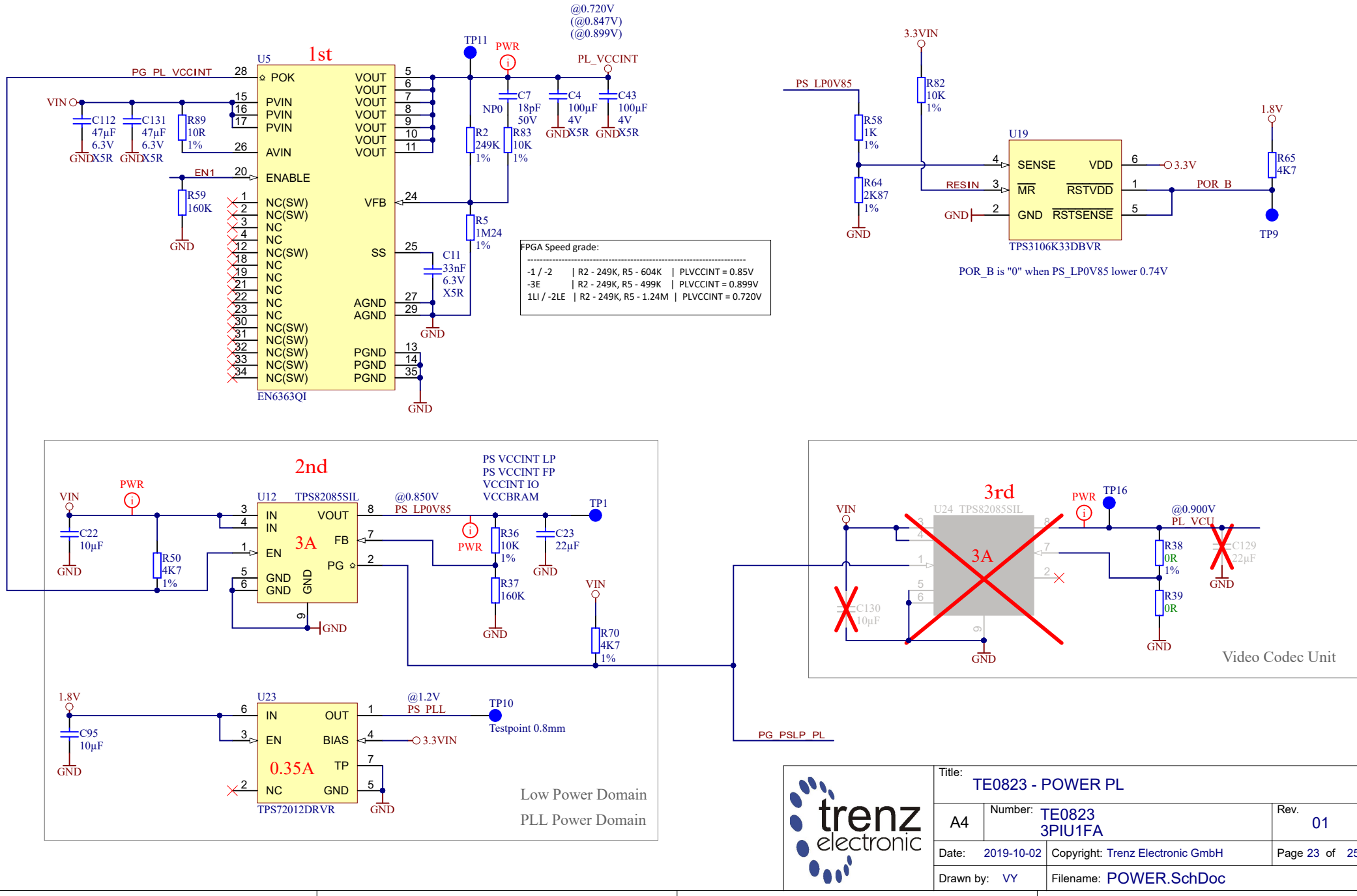
| Title: TE0823 - HyperRAM/HyperFLASH | | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
| Date: 2019-10-02 | Copyright: Trenz Electronic GmbH | | Page 22 of 25 |
| Drawn by: VY | Filename: HyperRAM.SchDoc | | |


1st
U5
EN6363QI
PG_PL_VCCINT
VIN
EN1
PWR
TP11
PL_VCCINT
@0.720V
(@0.847V)
(@0.899V)
C112 47µF 6.3V X5R
C131 47µF 6.3V X5R
R89 10R 1%
R59 160K
C7 18pF 50V NP0
C4 100µF 4V X5R
C43 100µF 4V X5R
R2 249K 1%
R83 10K 1%
R5 1M24 1%
C11 33nF 6.3V X5R
FPGA Speed grade:
-1 / -2 | R2 - 249K, R5 - 604K | PLVCCINT = 0.85V
-3E | R2 - 249K, R5 - 499K | PLVCCINT = 0.899V
1LI / -2LE | R2 - 249K, R5 - 1.24M | PLVCCINT = 0.720V
3.3VIN
PS_LP0V85
R82 10K 1%
R58 1K 1%
R64 2K87 1%
U19
SENSE
VDD
MR
RSTVDD
GND
RSTSENSE
RESIN
TPS3106K33DBVR
3.3V
POR_B
1.8V
R65 4K7
TP9
POR_B is "0" when PS_LP0V85 lower 0.74V
2nd
U12 TPS82085SIL
3A
VIN
PWR
C22 10µF
R50 4K7 1%
@0.850V
PS_LP0V85
PS VCCINT LP
PS VCCINT FP
VCCINT IO
VCCBRAM
TP1
R36 10K 1%
R37 160K
C23 22µF
R70 4K7 1%
U23
0.35A
TPS72012DRVR
1.8V
C95 10µF
@1.2V
PS_PLL
TP10
Testpoint 0.8mm
3.3VIN
Low Power Domain
PLL Power Domain
PG_PSLP_PL
3rd
U24 TPS82085SIL
3A
C130 10µF
R38 0R 1%
R39 0R
C129 22µF
@0.900V
PL_VCU
TP16
Video Codec Unit
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Title: TE0823 - POWER PL
A4
Number: TE0823 3PIU1FA
Rev. 01
Date: 2019-10-02
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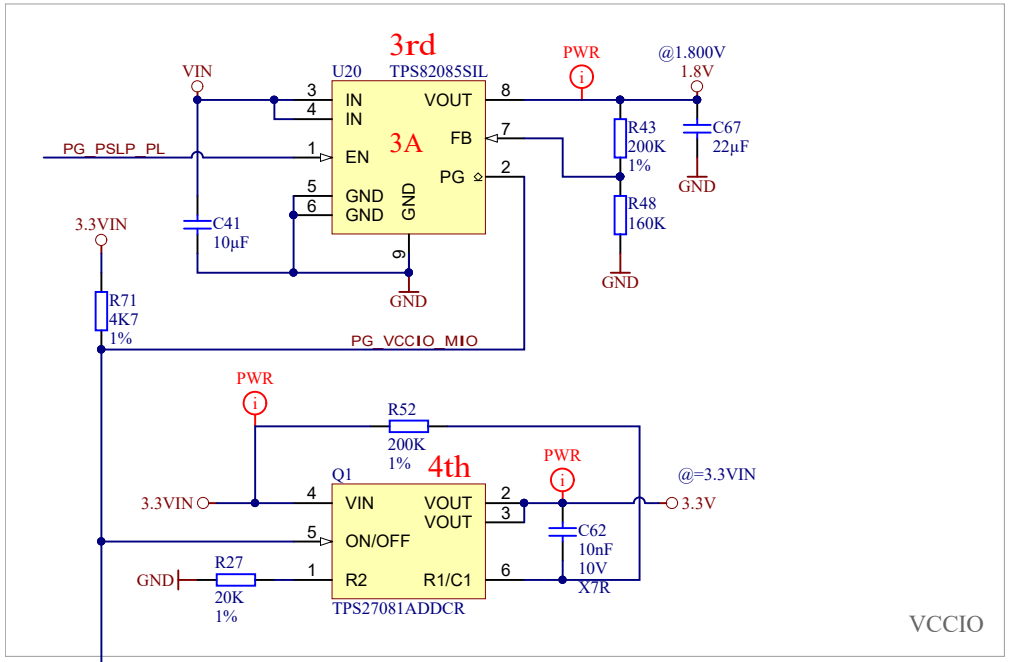
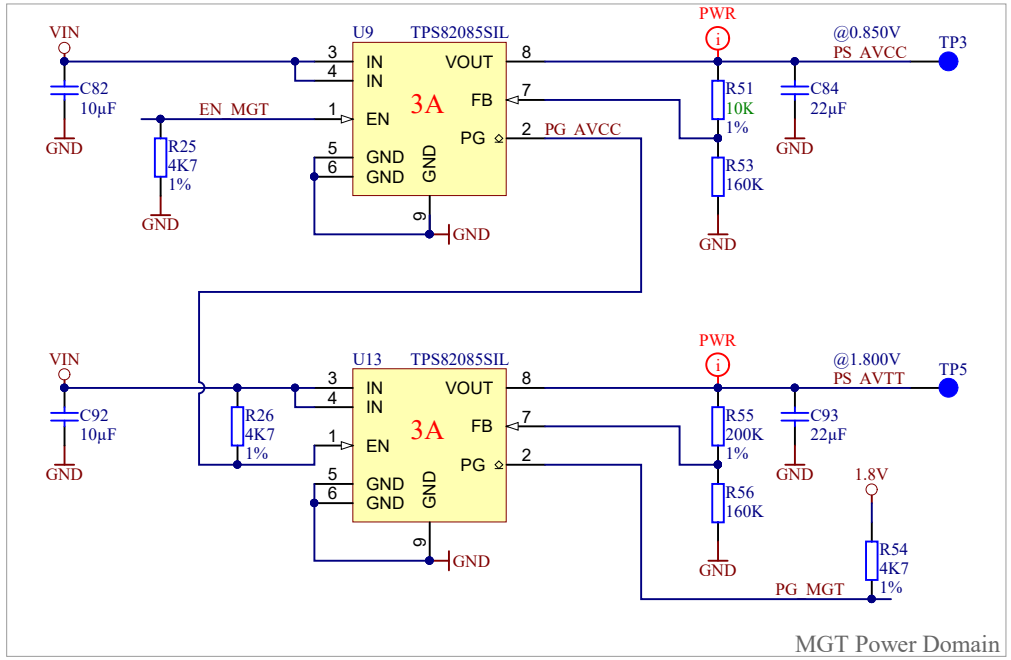
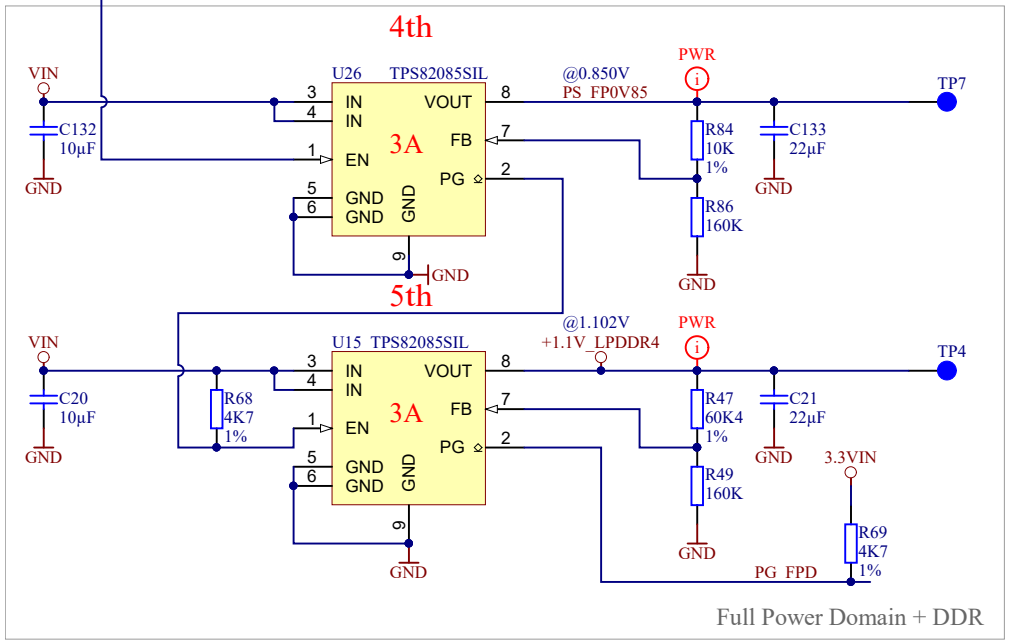
Drawn by: VY
Filename: POWER.SchDoc

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|---|---|---|---|
| Title: TE0823 - POWER PS_DDR | | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
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| Drawn by: VY | Filename: POWER_1.SchDoc | | |

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

Revision 01b (29.10.2020):
---
1. VY:  added block diagram
2. VY: added page "Legal notices"
3. VY:  R51 value was changed to 10K (was: 20K) to set PS_VCU 0.85V

| | | | |
|---|---|---|---|
| trenz electronic | Title: TE0823 - Revision Changes List | | |
| A4 | Number: TE0823 3PIU1FA | | Rev. 01 |
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| Drawn by: VY | Filename: Revision Changes.SchDoc | | |