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 Schematics and other handouts serve for informational purposes only!

Design drawn by:	ED
Checked by:	MR
Assembly variant:	73E31-A
Created by:	VY
Modified by:	MR
Modified at:	2021-02-19



Title: TE0745 - Legal Notices Modules		
A4	Number: TE0745 73E31-A	Rev. 03
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Filename: Legal Notices Modules.SchDoc		

REV	Description	
-01	Initial revision	
-02	1. MAC EEPROM Address patch fixed on PCB. 2. Lib components update.	
-03	<p>1. Removed serial number S/N. Connected U2 pin 20 to net "BOOTMODE".</p> <p>2. Changed DCDC (U4) from EN63A0Q1 to MP8869SGL-Z and adapted corresponding circuit. Added assembly option to connect U4 to I2C bus via R91/R101 (I2C address 0x61).</p> <p>3. Increase rated voltage for capacitors C108, C142, C147, C148, and C149 from 6.3 V to 25 V.</p> <p>4. Added diode D3 between signal "RST_IN_N" and "PS_1.8V".</p> <p>5. Added resistor R106 between CPLD U2 pin 25 and signal "RST_IN_N".</p> <p>6. Added option for diode D4 population between signal "PROG_B" and "INIT".</p> <p>7. Changed clock U33 from SiT8008A1-73-XXS-52.000000E to SiT8008BI-73-XXS-52.000000E.</p> <p>8. Added testpoints TP1...43.</p> <p>9. Added voltage monitors U20 and U22 with according circuits.</p> <p>10. Added pull-up resistor R73 for net "PWR_PL_OK".</p> <p>11. Added resistor R103 to optionally connect U31 PG to signal "PWR_PS_OK" or voltage monitor U20.</p> <p>12. Changed supply voltage for VCCPLL from PL_1.8V to PS_1.8V.</p> <p>13. Tied DXP/DXN (U1 pins R14 and R13) directly to GND.</p> <p>14. Added soft start capacitor options C62 for U8 and C78 for U11.</p> <p>15. Added decoupling capacitors</p> <ul style="list-style-type: none"> - C126, C127 for U16, - C129 for U14, - C130 for U19, - C131 for U18, - C144 for U8, - C150 for U11, - C151/C152 for U6, - C153/C154 for U17, - C155/C156 for U32, and - C128 and C157 for U1. <p>16. Changed voltage rating from 6.3 V to 10 V for 100 uF capacitors.</p> <p>17. Changed voltage rating from 6.3 V to 16 V for 10 uF capacitors.</p> <p>18. Changed voltage rating from 6.3 V to 10 V and size from 0402 to 0603 for capacitors C21 and C29.</p> <p>19. Changed size from 0201 to 0402 for 1 kOhm resistors R104 and R105.</p> <p>20. Added 100 Ohm termination resistors R109 and R110 for MGT_REF_CLKs.</p> <p>21. Changed VCCADC_0 supply from VCCIO_0 to PL_1.8V.</p> <p>22. Added UKCA logo.</p> <p>23. Changed voltage divider R21 and R22 to set threshold to 0.936 V.</p> <p>24. Changed DDR clock termination resistor R9 placement position.</p> <p>25. Changed fiducials to standard fiducial type.</p> <p>26. Update revision history.</p> <p>27. Update schematic template.</p> <p>28. Updated power overview.</p> <p>29. Removed page "ZYNQ.SchDoc" and added pages Legal Notices, System Overview.</p>	ED

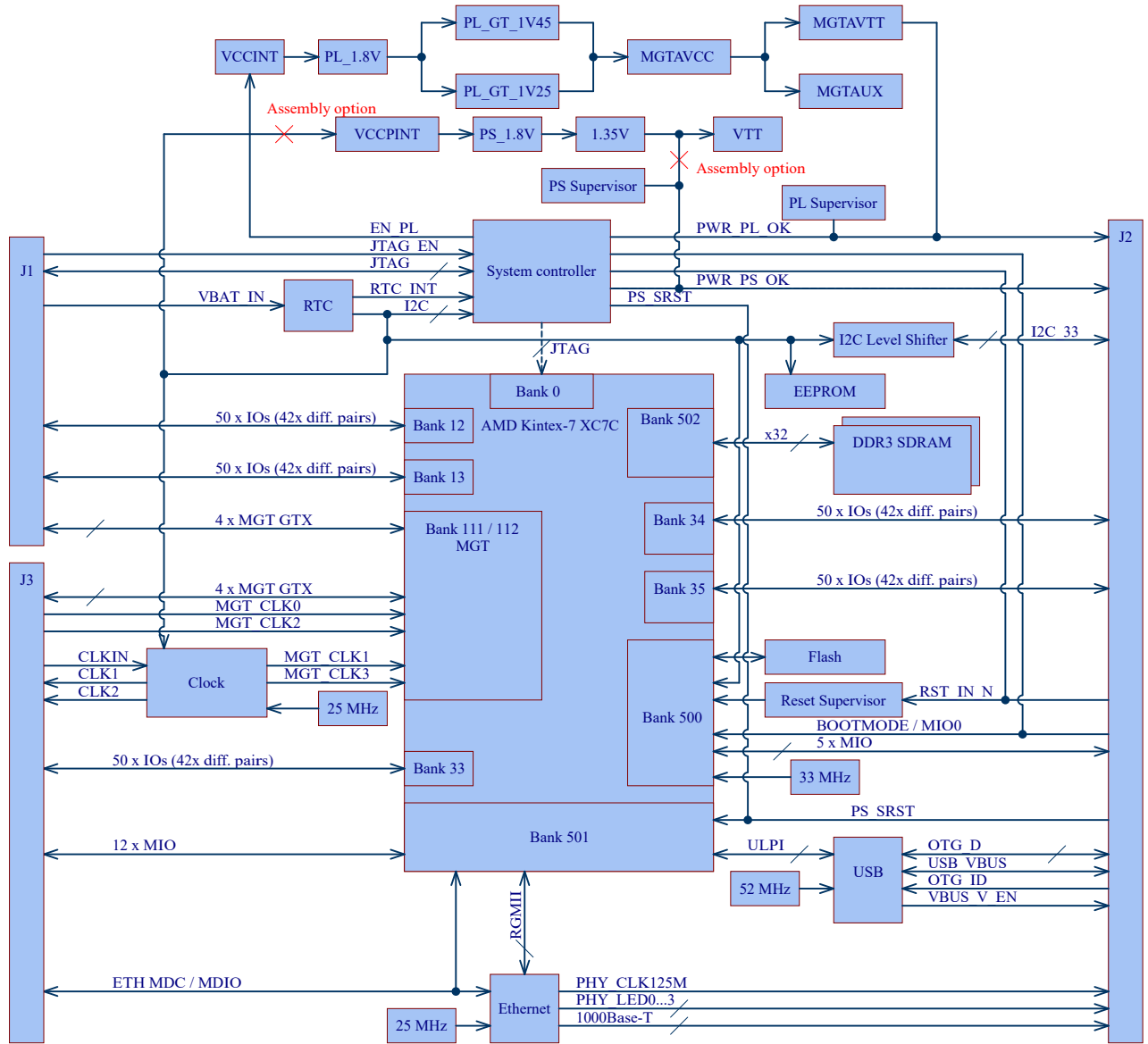
	Title: TE0745 - Revision Changes		
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	Filename: Revision Changes.SchDoc		

I2C Address:

Device	I2C ADDR	Note
SoC U1G	-	I2C Master
CPLD U2	0x30	Firmware dependent
DCDC U4	0x61	Assembly option
PLL U16	0x70	-
EEPROM U23	0x53	-

Supported Voltage Ranges:

Power Rail	Direction	Range	Tolerance	Description	Note
PS_3.3V	IN	3.3 V	+/- 5 %	Micromodule Power	-
PS_VIN	IN	3.3 V	+/- 5 %	Micromodule Power	-
PL_VIN	IN	3.2 V - 4.5 V	-	Micromodule Power	within given range
VCCIO12	IN	1.2 V - 3.3 V	+/- 3 %	HR IO Bank 12	-
VCCIO13	IN	1.2 V - 3.3 V	+/- 3 %	HR IO Bank 13	-
VCCIO33	IN	1.2 V - 1.8 V	+/- 3 %	HP IO Bank 33	-
VCCIO34	IN	1.2 V - 1.8 V	+/- 3 %	HP IO Bank 34	-
VCCIO35	IN	1.2 V - 1.8 V	+/- 3 %	HP IO Bank 35	-
VBAT_IN	IN	1.8 V - 3.3 V	-	RTC	within given range
PS_1.8V	OUT	1.8 V	+/- 3 %	Power for Carrier	-
PL_1.8V	OUT	1.8 V	+/- 3 %	Power for Carrier	-

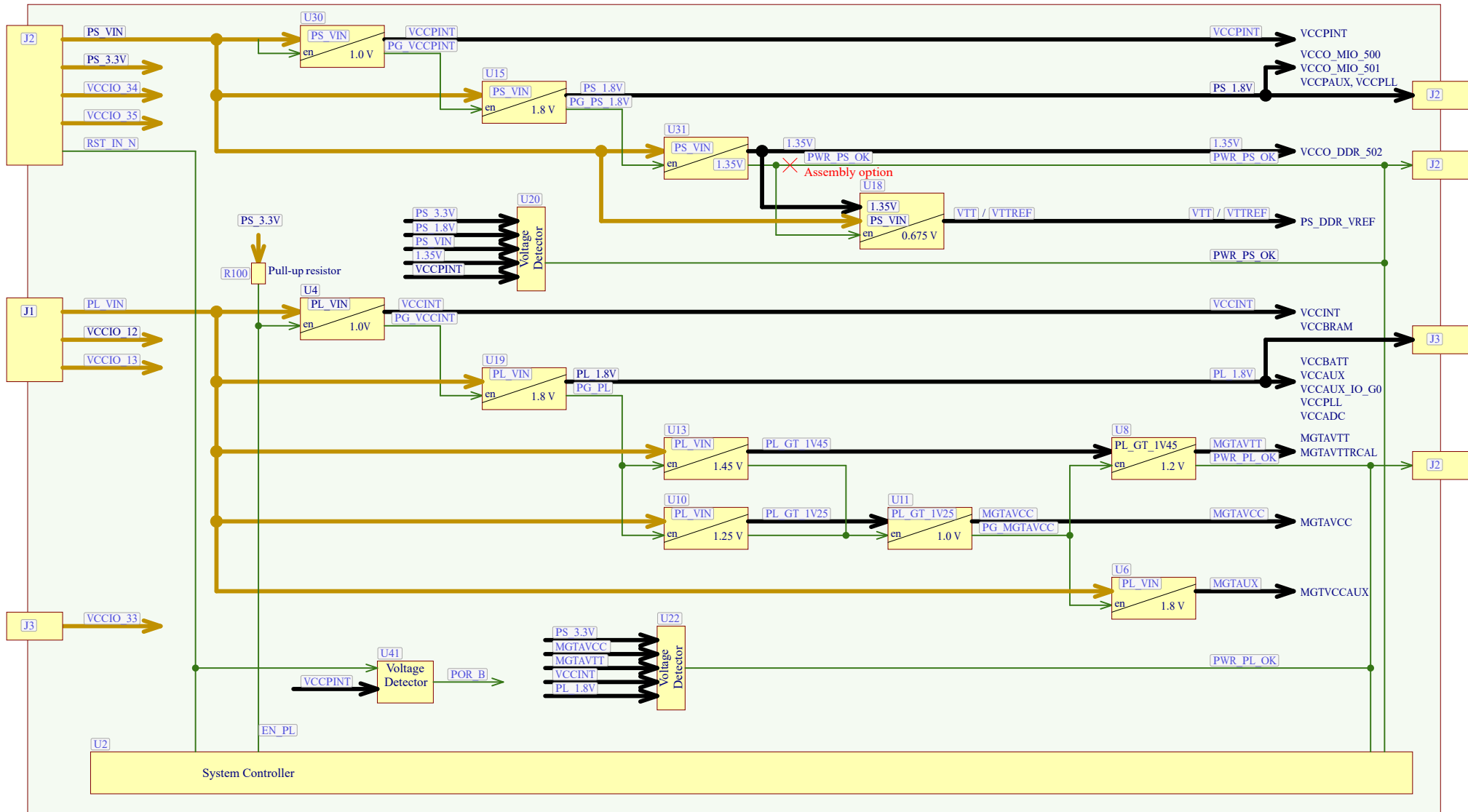


FPGA-PWR



Title: TE0745 - System Overview		
A4	Number: TE0745 73E31-A	Rev. 03
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Power-on sequencing:



Title: TE0745 - Power overview		
A4	Number: TE0745 73E31-A	Rev. 03
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Filename: PowerOverview.SchDoc		

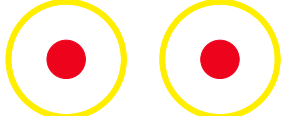
Special notes:

UKCA
UKCA Logo on Top Overlay

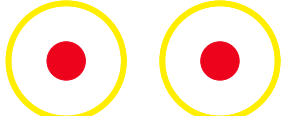
CE
CE Logo on Top Overlay

LOGO1
TE Logo PRINT Layer

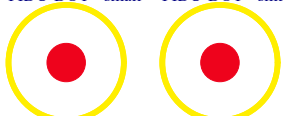
FIDU-DOT - small FIDU-DOT - small



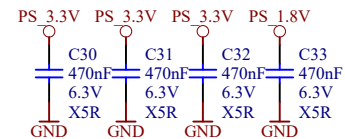
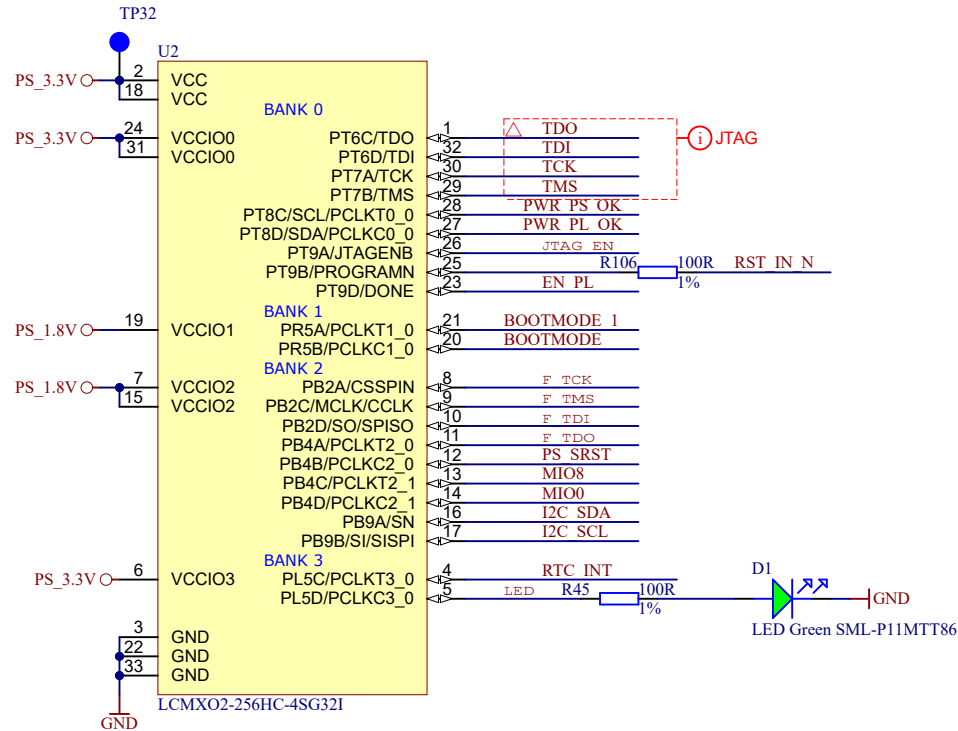
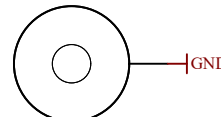
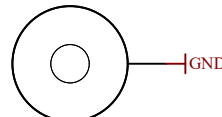
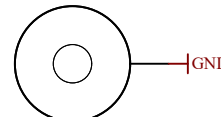
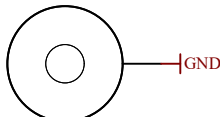
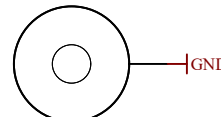
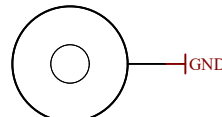
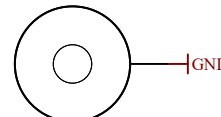
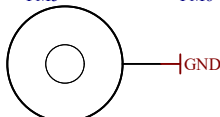
PM1 FIDU-DOT - small PM2 FIDU-DOT - small



PM3 FIDU-DOT - small PM4 FIDU-DOT - small



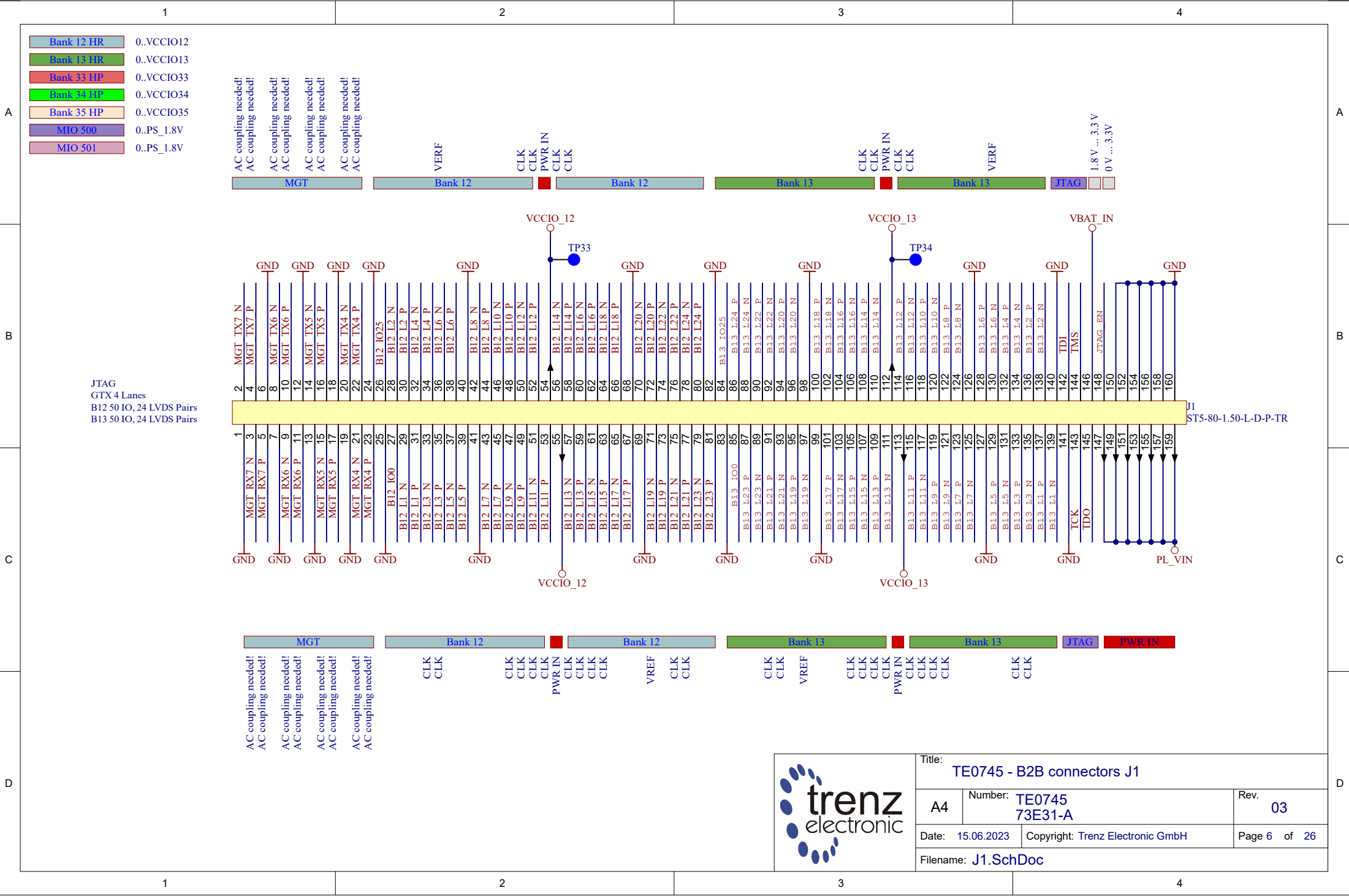
PM5 PM6



Serial
SerialNumber 6,3 x 6.3mm



Title: TE0745 - System Controller		
A4	Number: TE0745 73E31-A	Rev. 03
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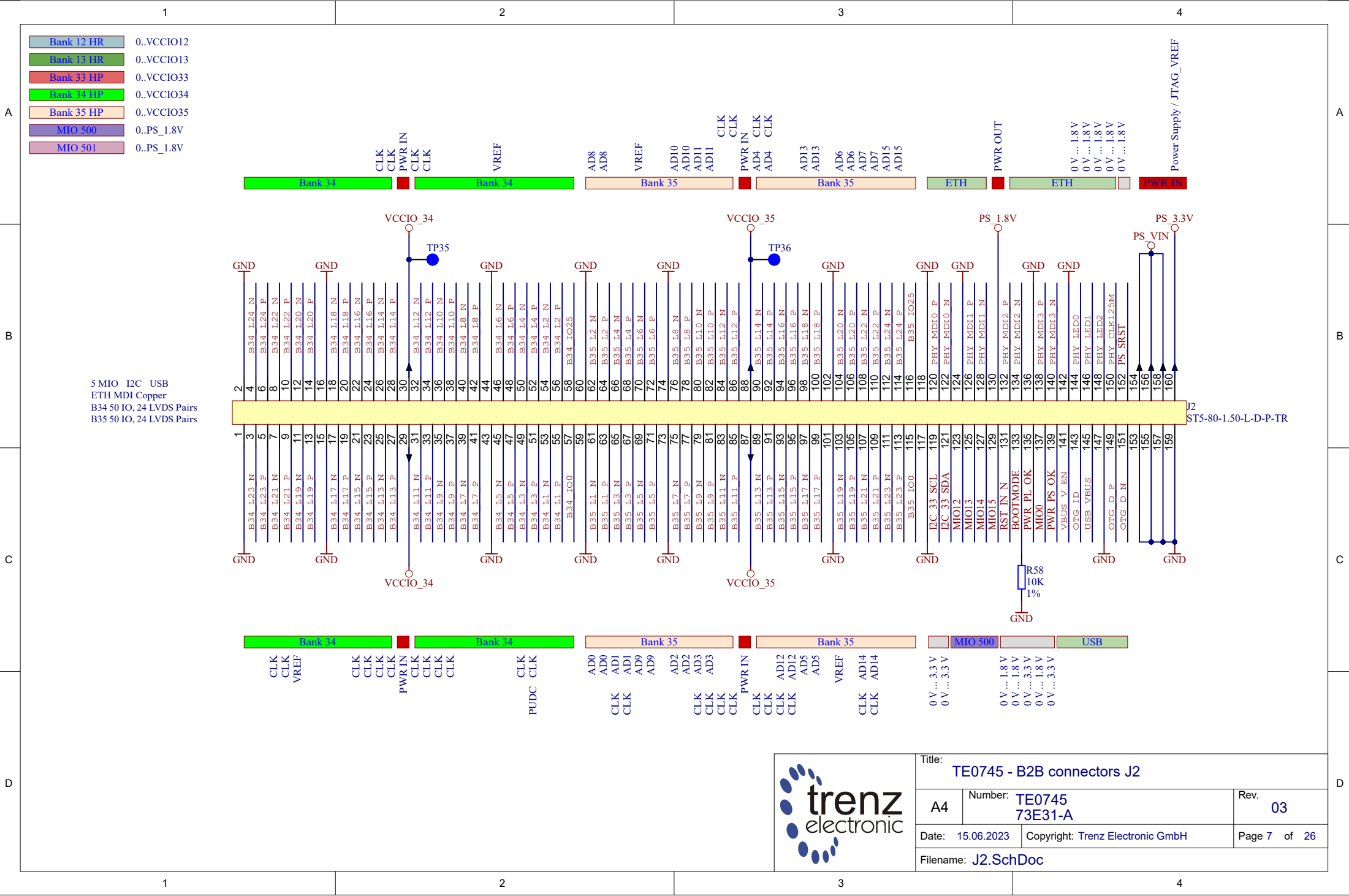


- Bank 12 HR 0..VCCIO12
- Bank 13 HR 0..VCCIO13
- Bank 33 HP 0..VCCIO33
- Bank 34 HP 0..VCCIO34
- Bank 35 HP 0..VCCIO35
- MIO 500 0..PS_1.8V
- MIO 501 0..PS_1.8V

JTAG
 GTX 4 Lanes
 B12 50 IO, 24 LVDS Pairs
 B13 50 IO, 24 LVDS Pairs

Title: TE0745 - B2B connectors J1		
A4	Number: TE0745 73E31-A	Rev. 03
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Filename: J1.SchDoc		





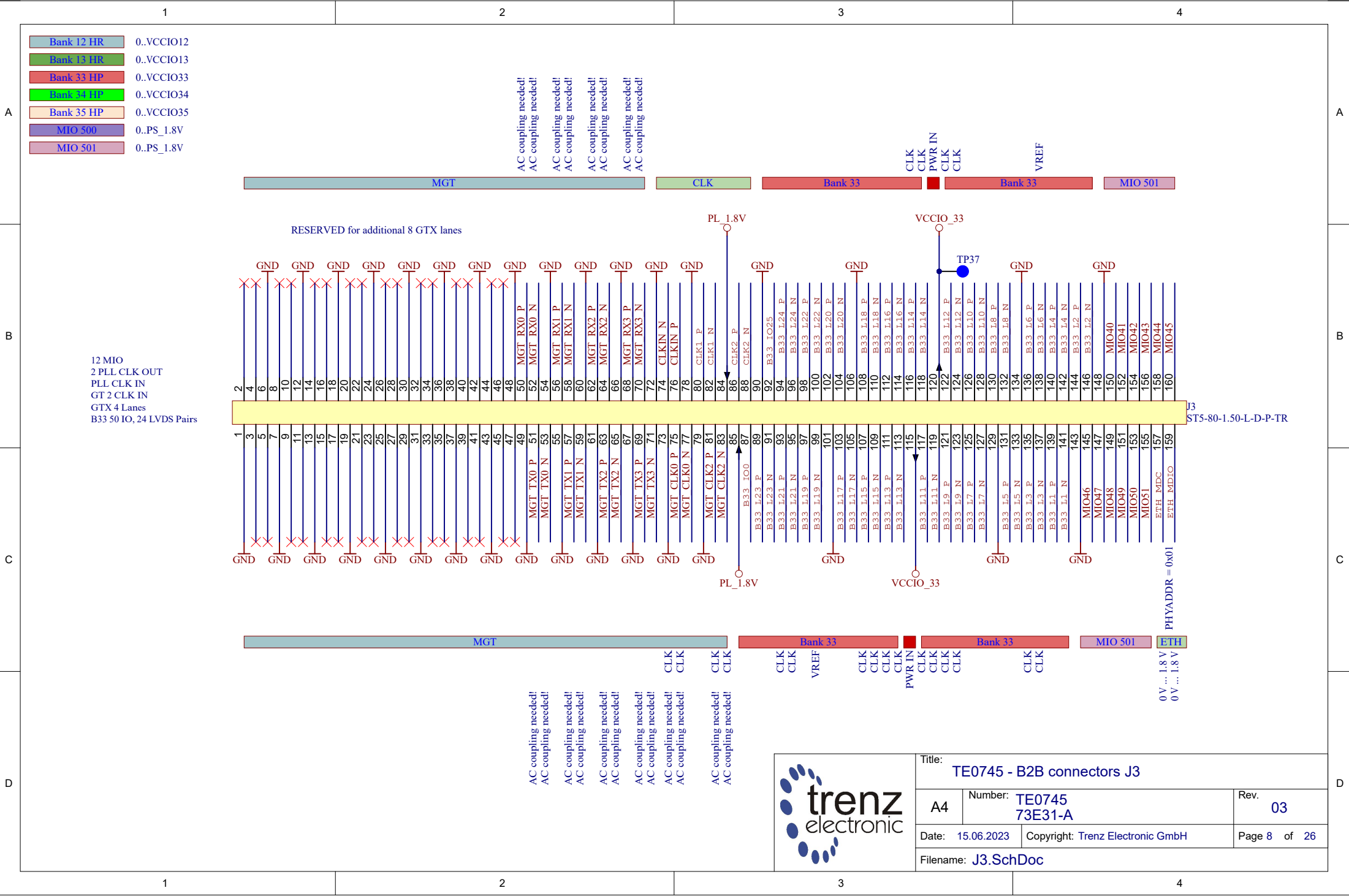
- Bank 12 HR 0..VCCIO12
- Bank 13 HR 0..VCCIO13
- Bank 33 HP 0..VCCIO33
- Bank 34 HP 0..VCCIO34
- Bank 35 HP 0..VCCIO35
- MIO 500 0..PS_1.8V
- MIO 501 0..PS_1.8V

5 MIO I2C USB
ETH MDI Copper
B34 50 IO, 24 LVDS Pairs
B35 50 IO, 24 LVDS Pairs

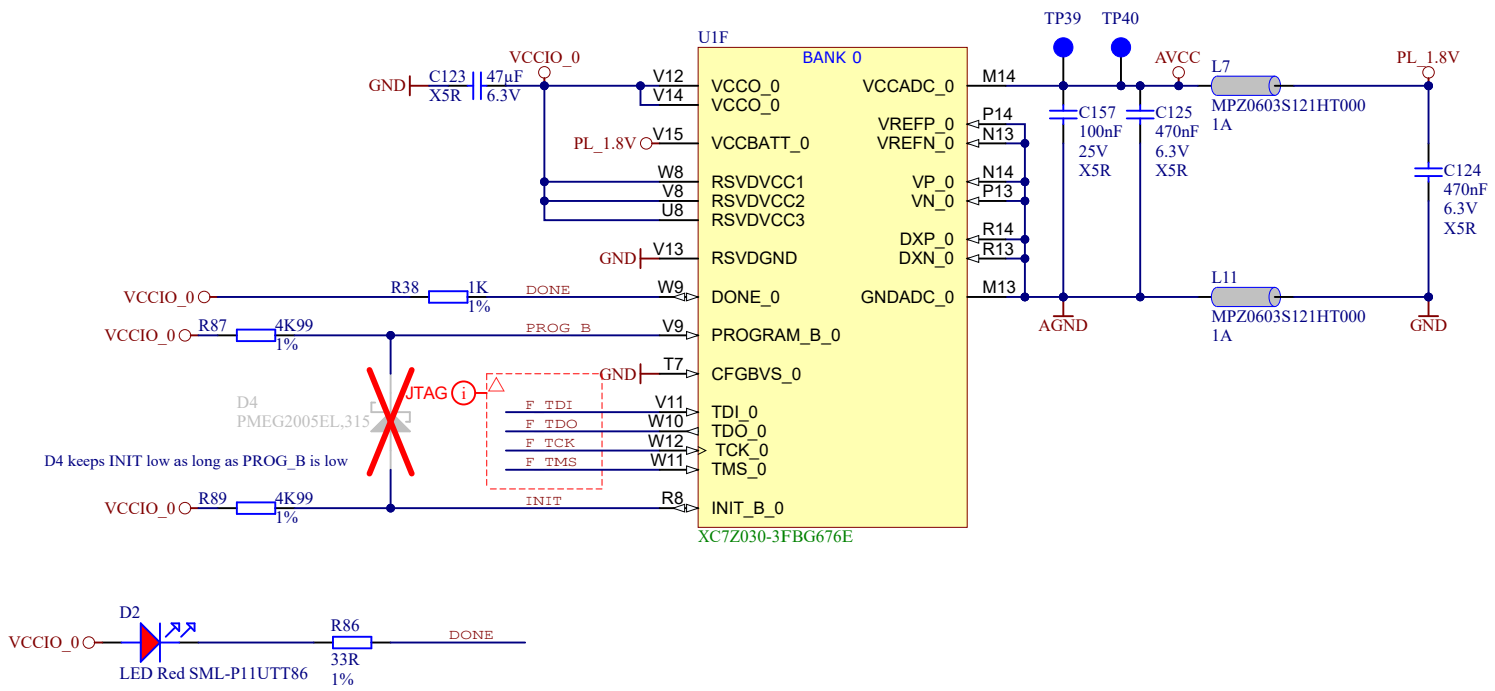
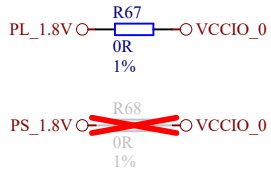
J2
ST5-80-1.50-L-D-P-TR




Title: TE0745 - B2B connectors J2		
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Filename: J2.SchDoc		

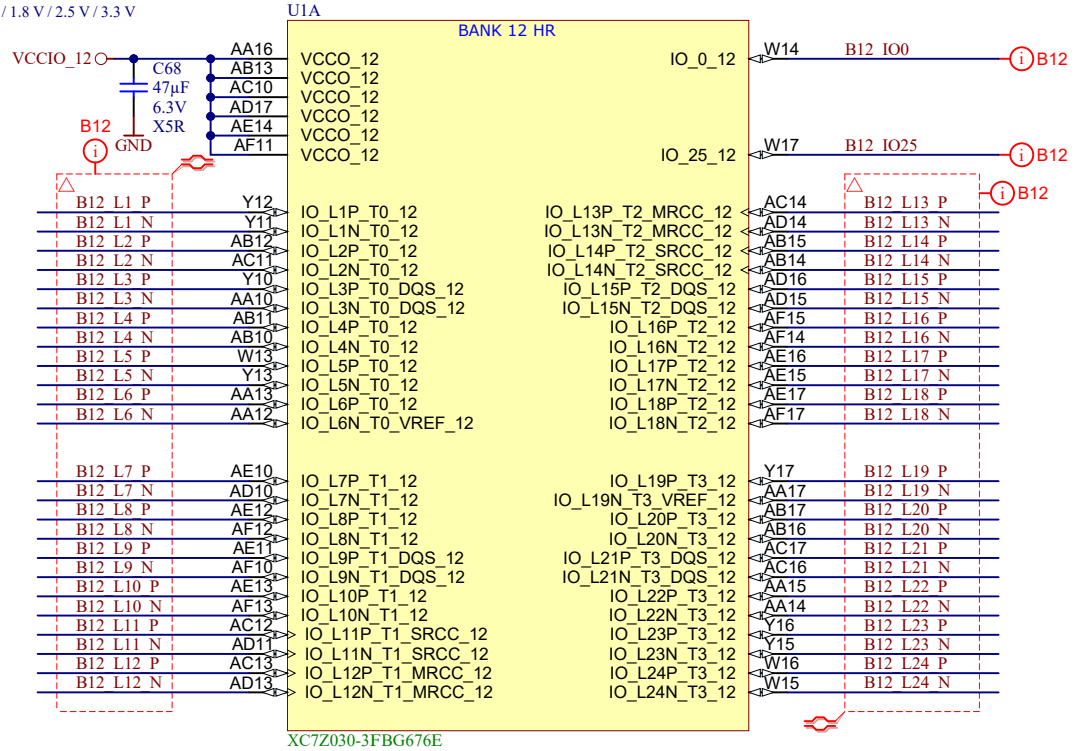


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Date: 15.06.2023	Copyright: Trenz Electronic GmbH	Page 8 of 26
Filename: J3.SchDoc		



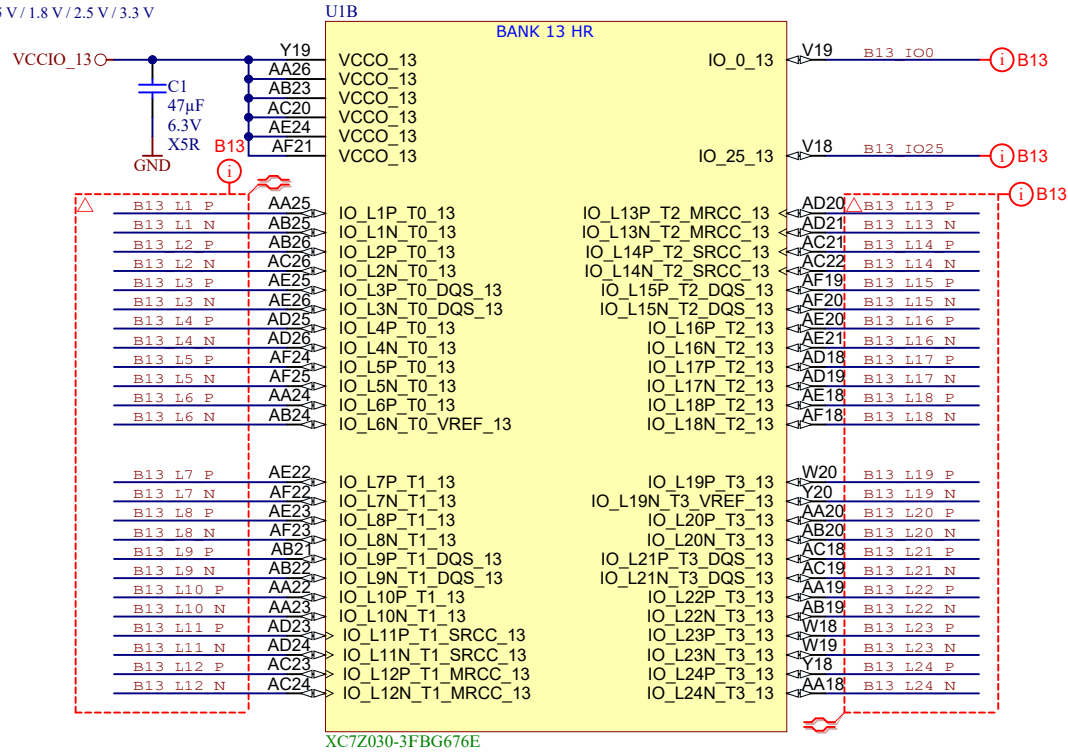
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		A4	Number: TE0745 73E31-A
Date: 10.05.2023		Copyright: Trenz Electronic GmbH	
Filename: ZYNQ_MISC.SchDoc		Page 9 of 26	

HR
1.2 V/1.35 V/1.5 V/1.8 V/2.5 V/3.3 V



Title: TE0745 - Zynq_B12		
A4	Number: TE0745 73E31-A	Rev. 03
Date: 22.05.2023	Copyright: Trenz Electronic GmbH	Page 10 of 26
Filename: B12.SchDoc		

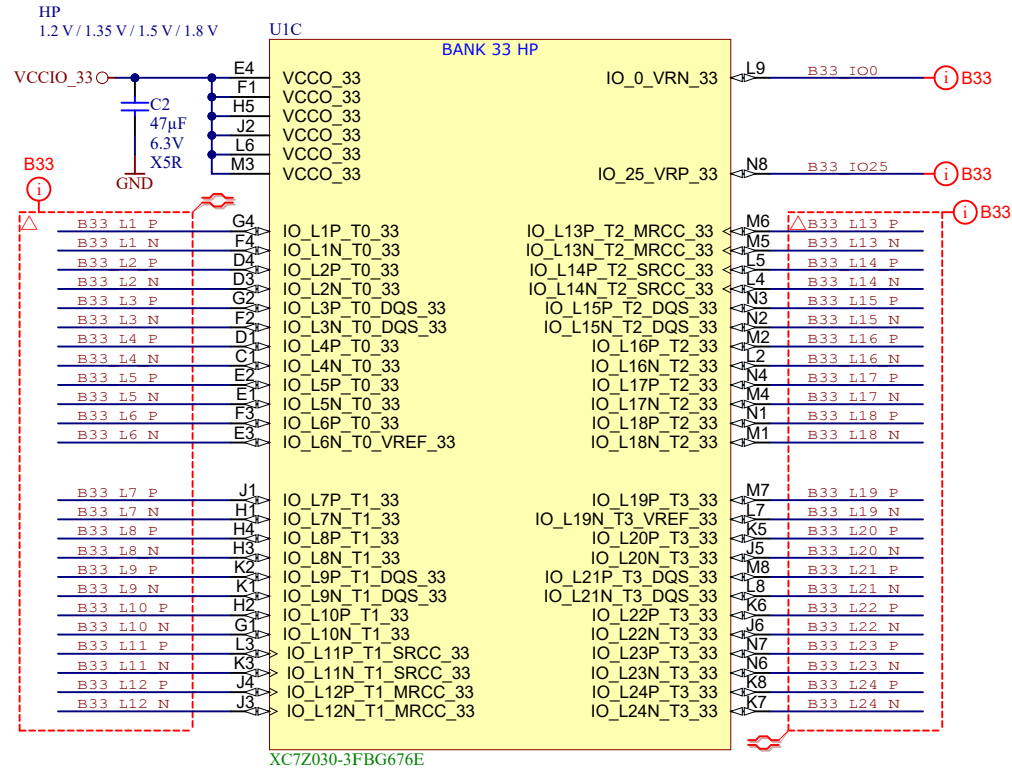
HR
1.2V/1.35V/1.5V/1.8V/2.5V/3.3V



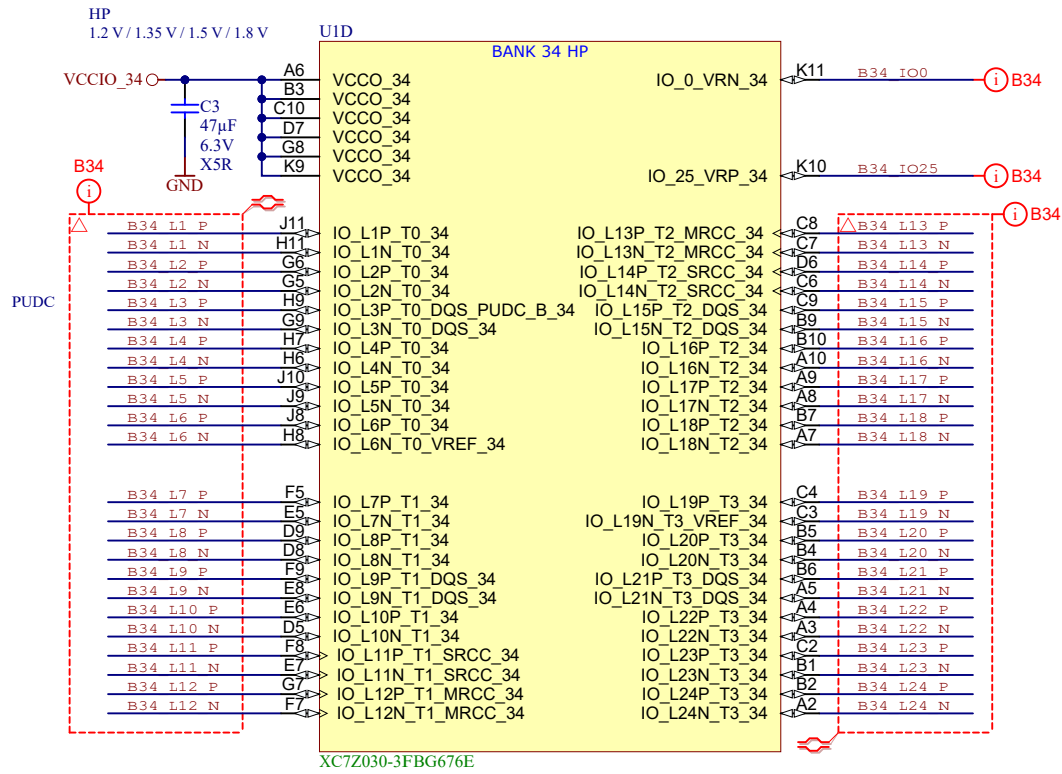
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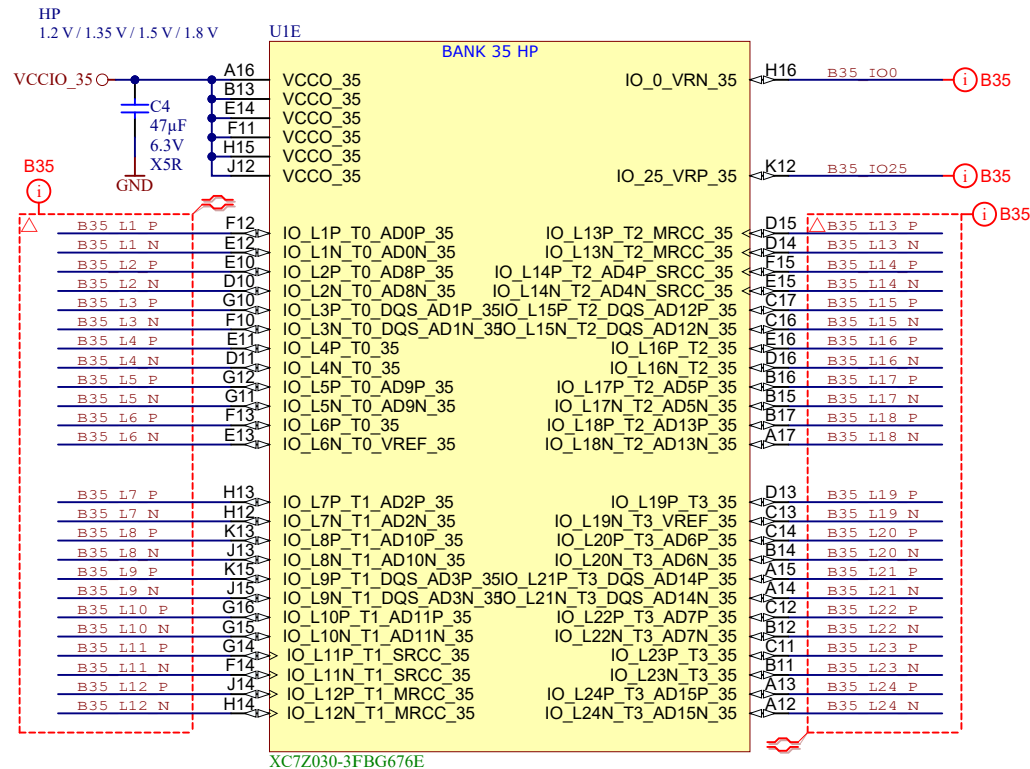
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Date: 22.05.2023	Copyright: Trenz Electronic GmbH	Page 11 of 26
Filename: B13.SchDoc		




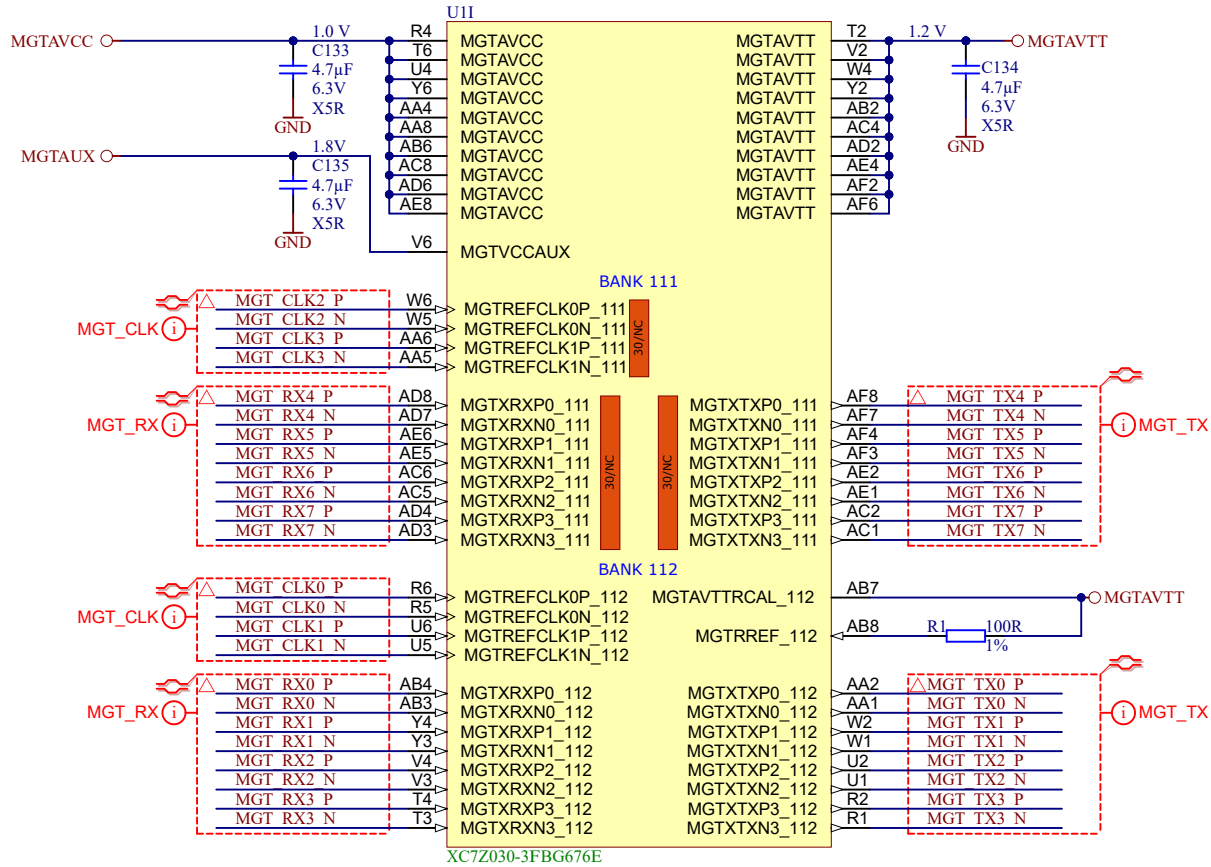
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A4	Number: TE0745 73E31-A	Rev. 03
Date: 22.05.2023	Copyright: Trenz Electronic GmbH	Page 12 of 26
Filename: B33.SchDoc		



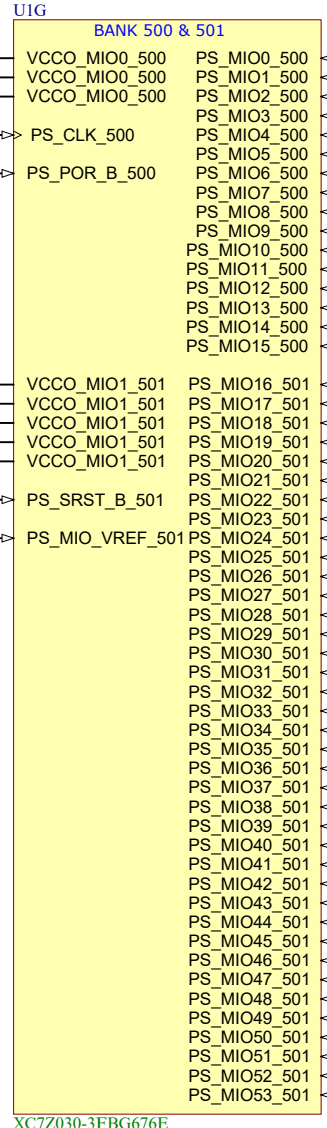
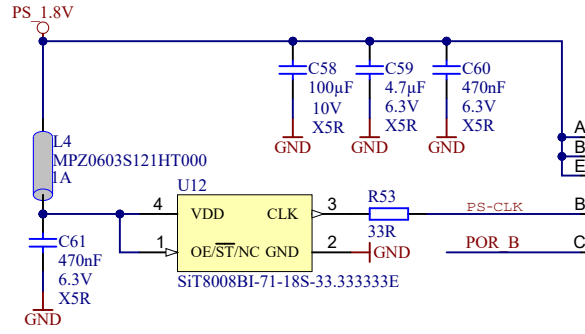
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A4	Number: TE0745 73E31-A	Rev. 03
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Filename: B34.SchDoc		



	Title: TE0745 - Zynq_B35		
	A4	Number: TE0745 73E31-A	Rev. 03
	Date: 22.05.2023	Copyright: Trenz Electronic GmbH	Page 14 of 26
	Filename: B35.SchDoc		

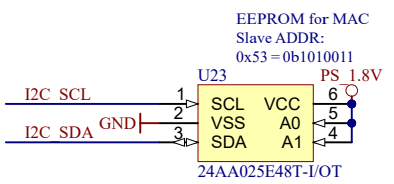
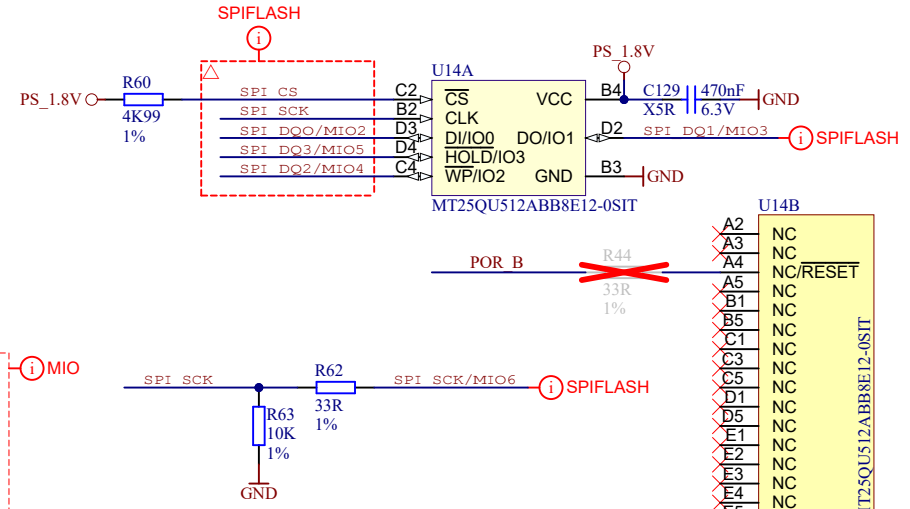
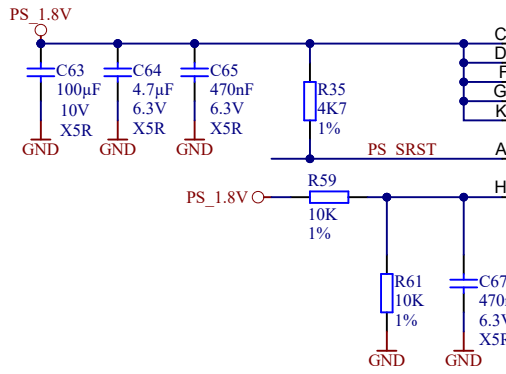


Title: TE0745 - Zynq_MGT		
A4	Number: TE0745 73E31-A	Rev. 03
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MIO Bank Voltage	MIO7 Bank0	MIO8 Bank1
2.5 V, 3.3 V	0	0
1.8 V	1	1

BOOT MODE	MIO5	MIO4	MIO3
JTAG Boot Mode	0	0	0
NOR Boot	0	0	1
NAND	0	1	0
Quad-SPI	1	0	0
SD Card	1	1	0



Title: TE0745 - Zynq_MIO_Banks

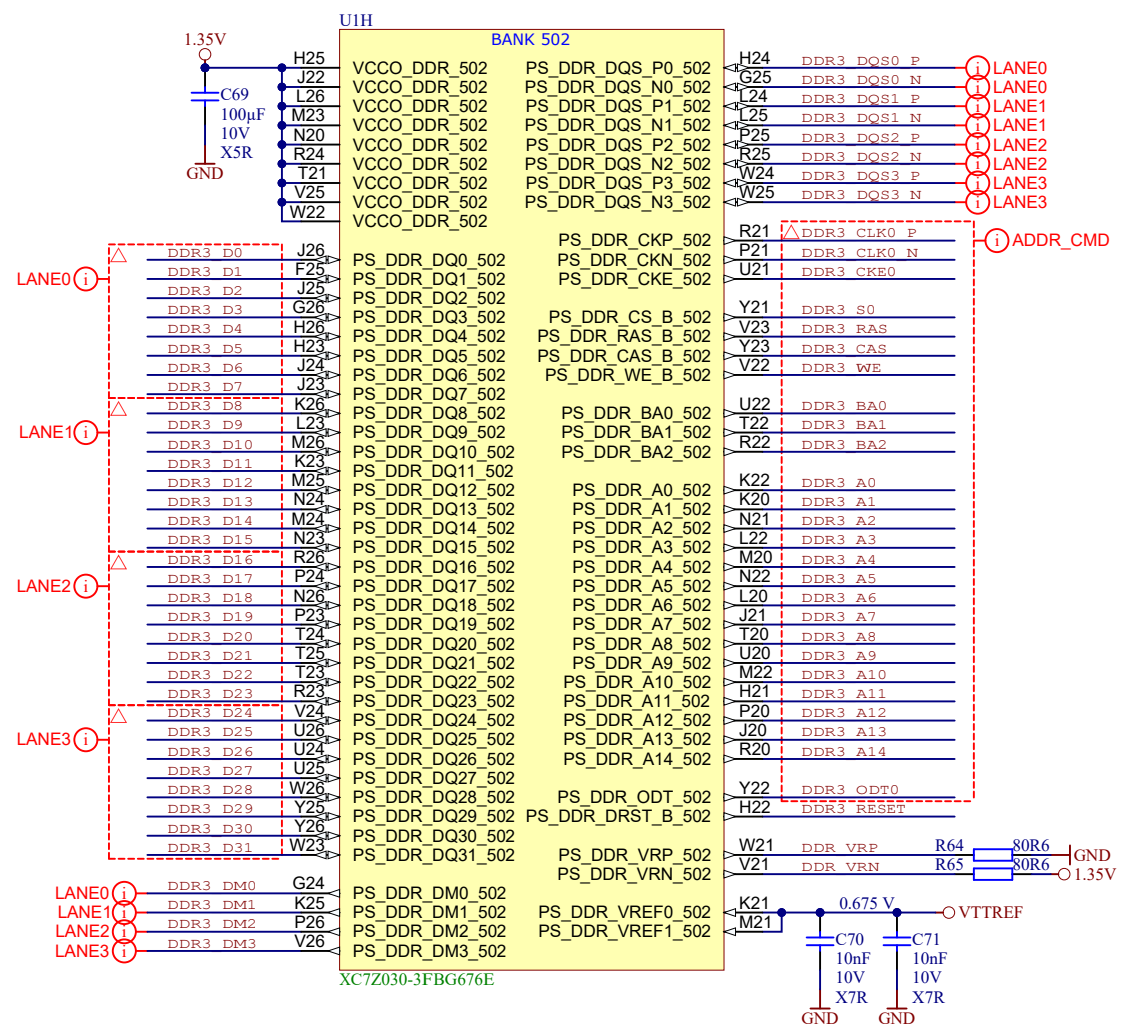
Number: TE0745 73E31-A

Date: 22.05.2023

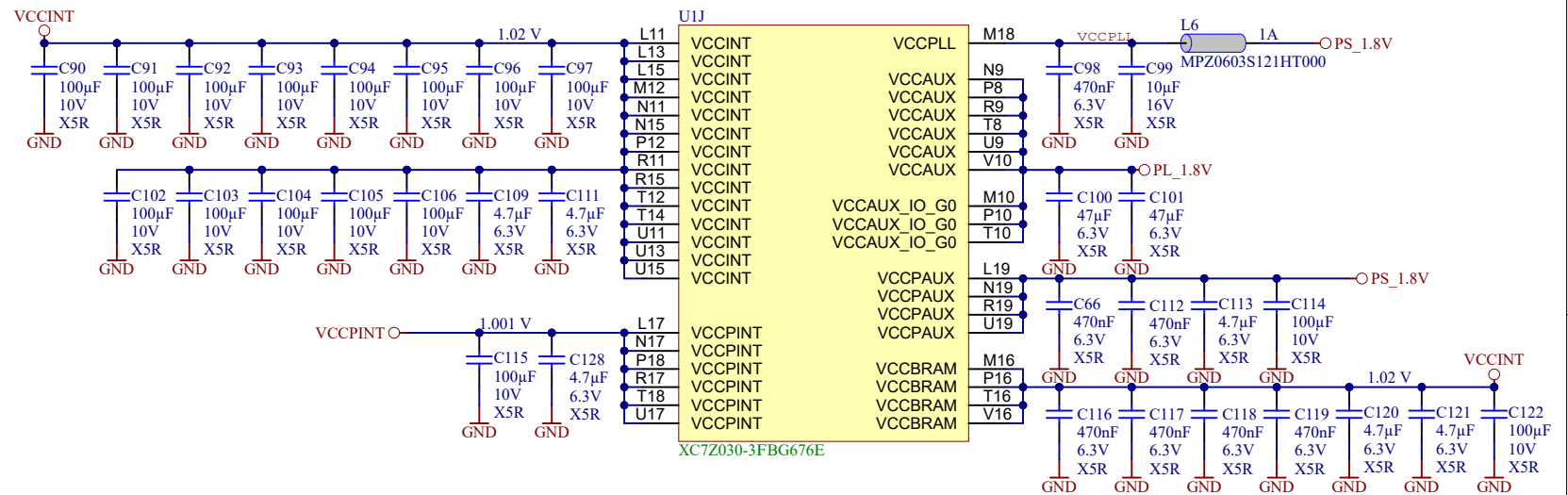
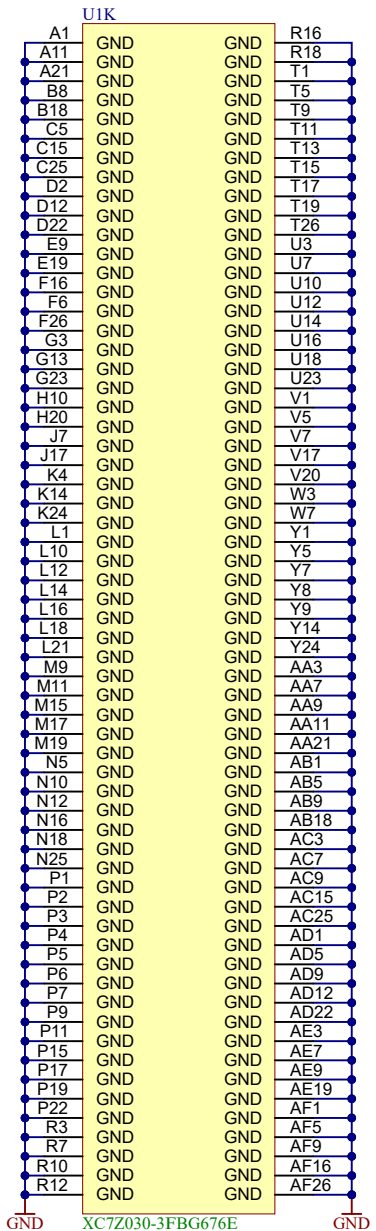
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Filename: MIO_B500.SchDoc



Title: TE0745 - Zynq_PS_DDR		
A4	Number: TE0745 73E31-A	Rev. 03
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Title: TE0745 - Zynq_Power		
A4	Number: TE0745 73E31-A	Rev. 03
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Filename: ZYNC_POWER.SchDoc		

A

A

B

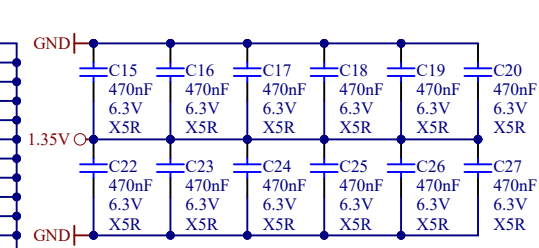
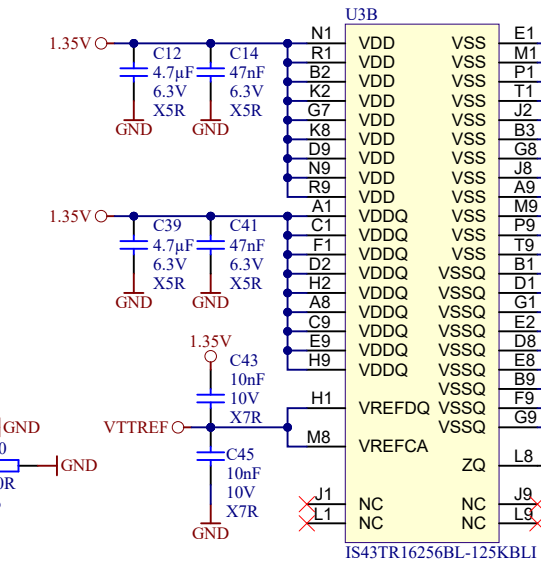
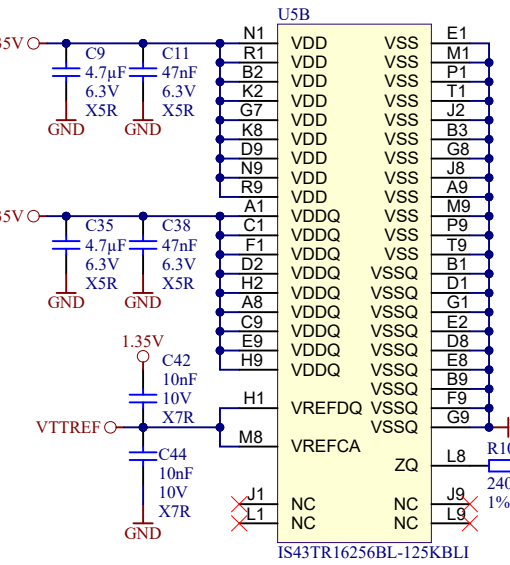
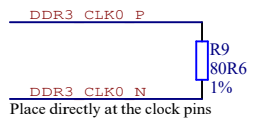
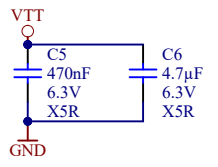
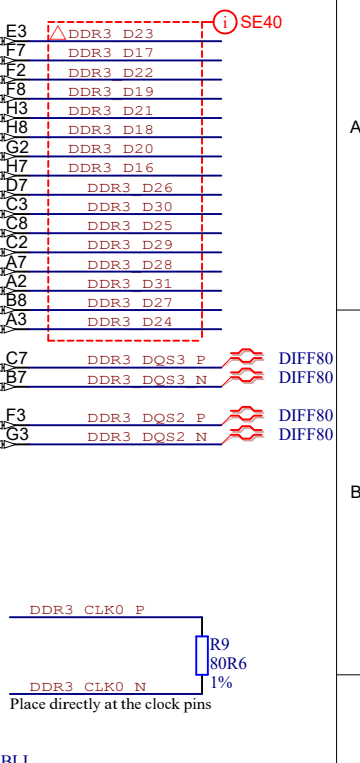
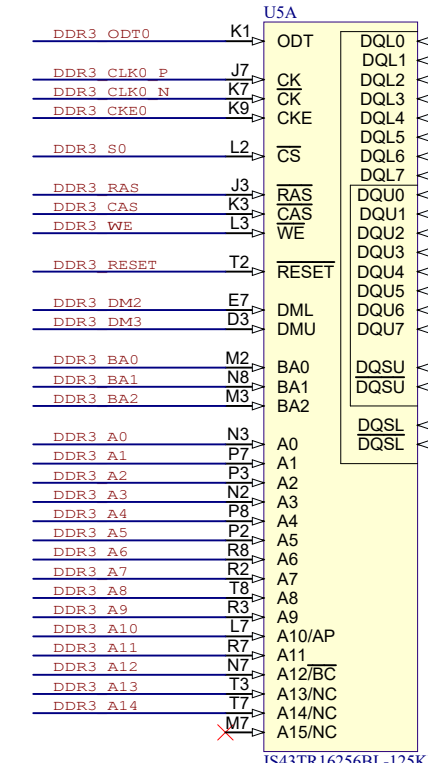
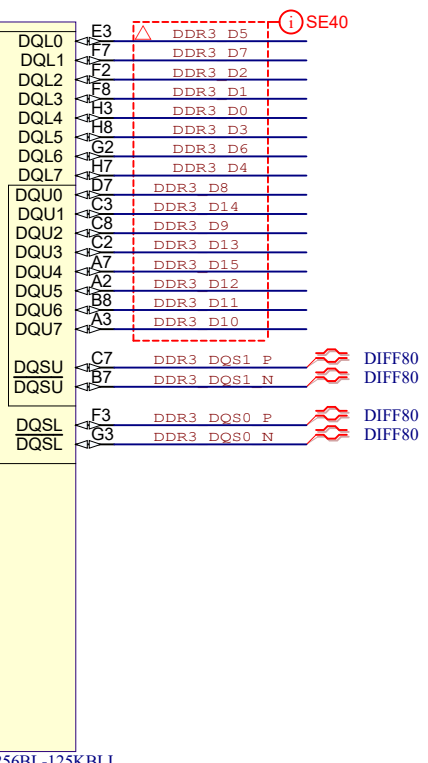
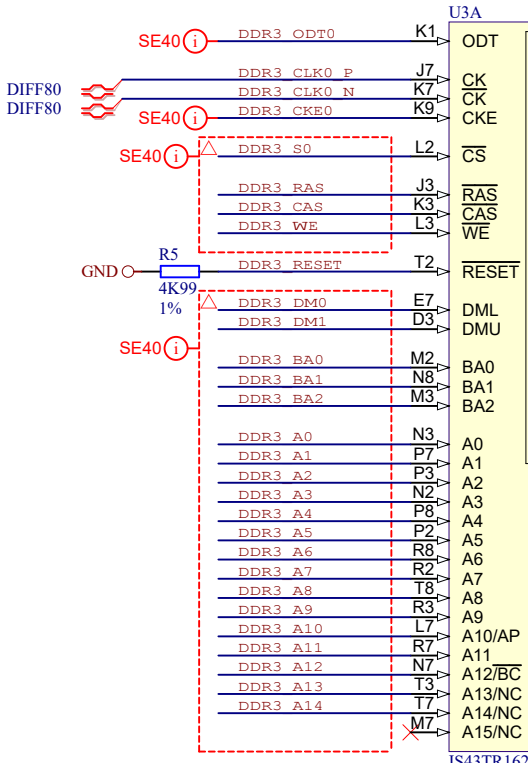
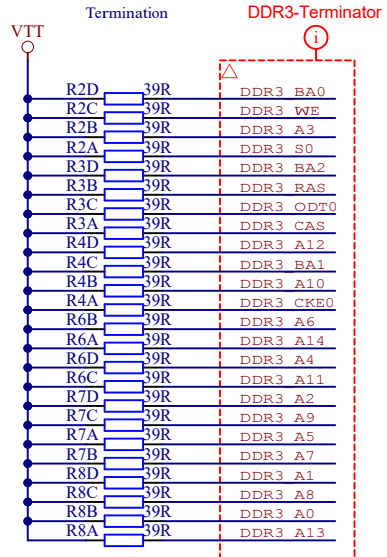
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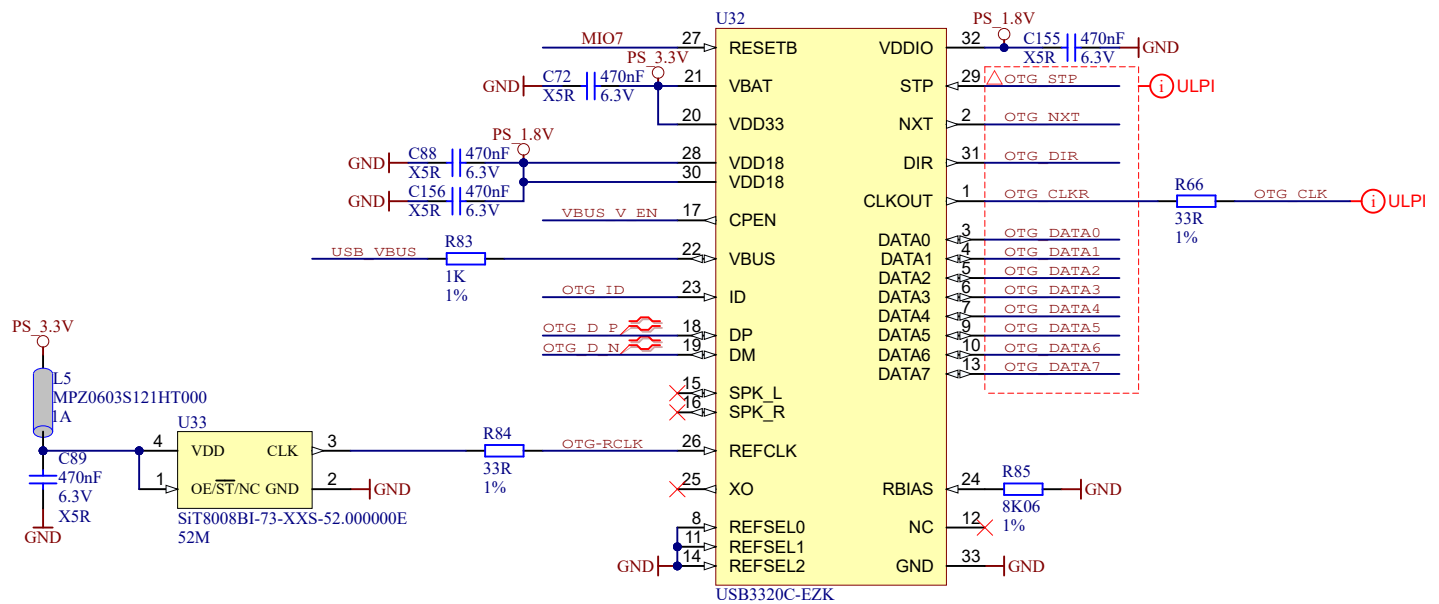
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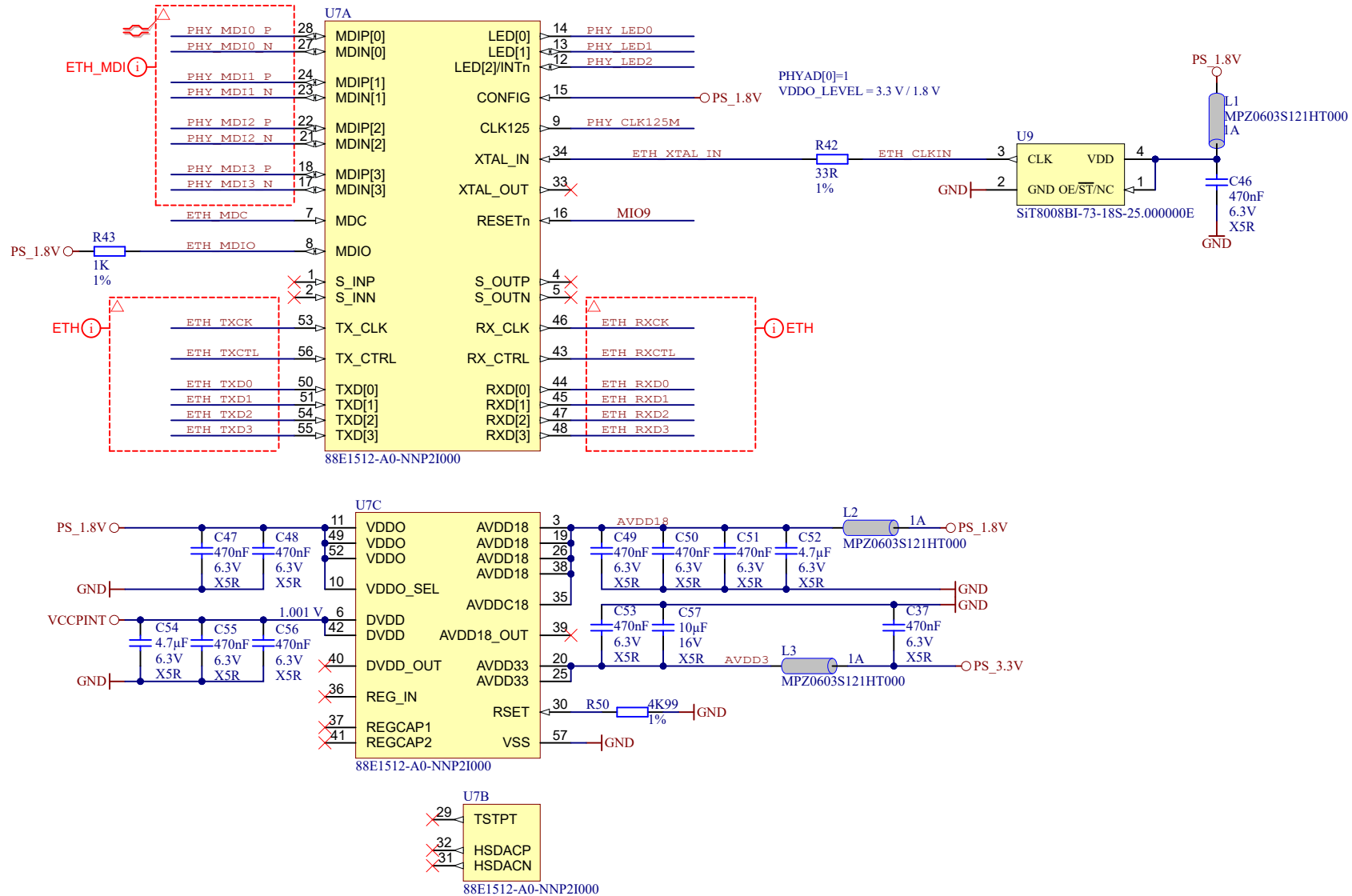
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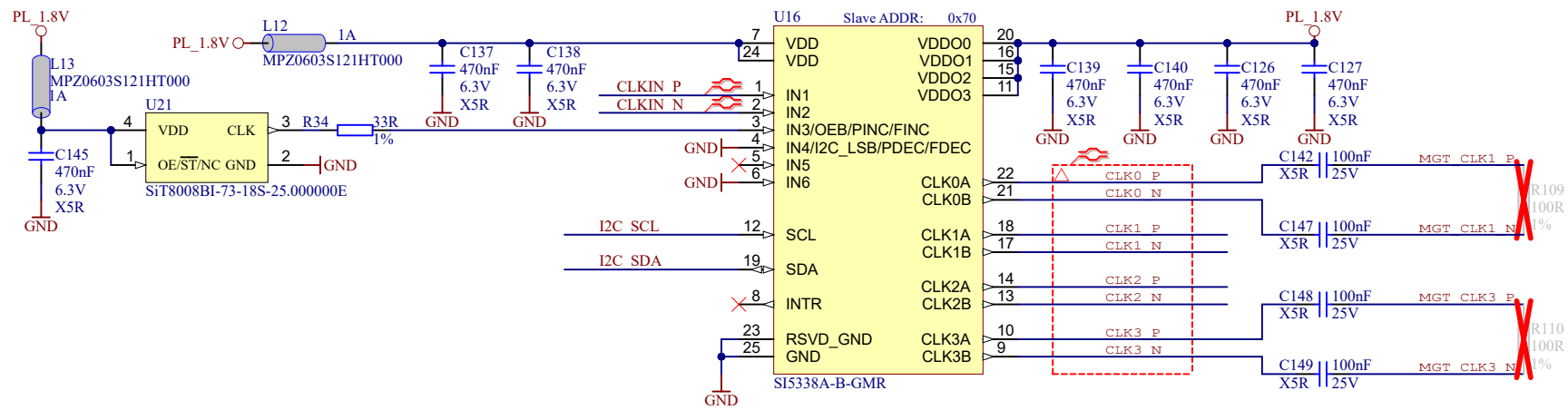
Title: TE0745 - DDR3 RAM		
A4	Number: TE0745 73E31-A	Rev. 03
Date: 15.06.2023	Copyright: Trenz Electronic GmbH	Page 19 of 26
Filename: DDR3-RAM.SchDoc		



	Title: TE0745 - USB_PHY		
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			Title: TE0745 - ETH_PHY	
			A4	Number: TE0745 73E31-A
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Filename: ETH-PHY.SchDoc				

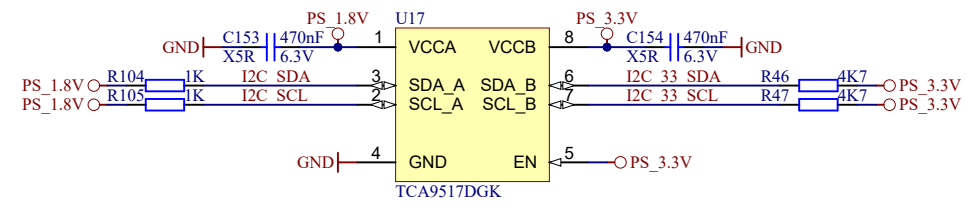
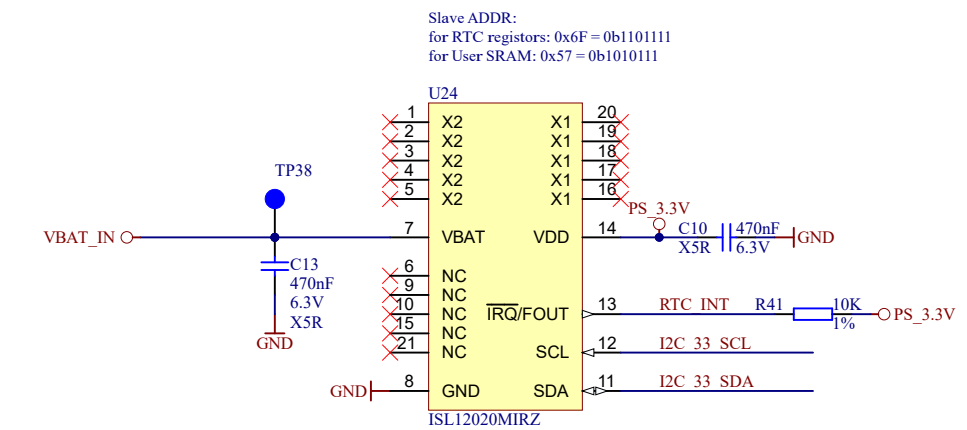



Datasheet Si5338:

IN1/IN2

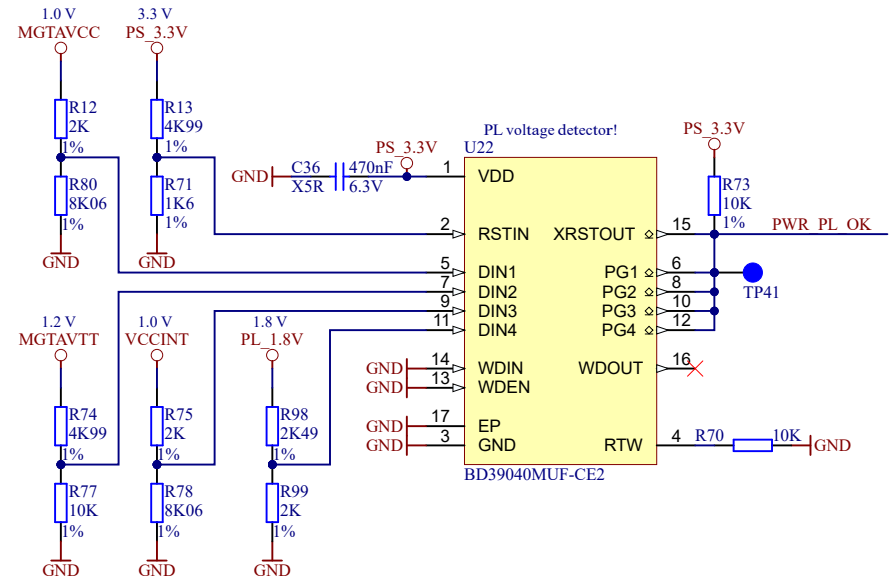
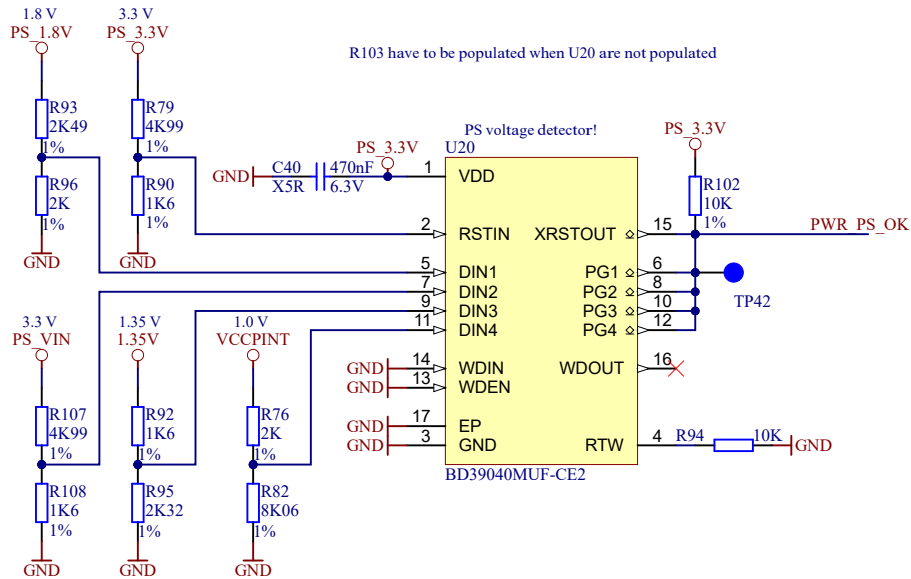
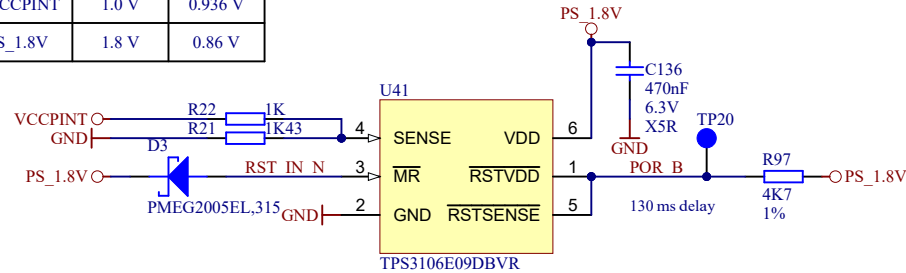
These pins are used as the main differential clock input or as the XTAL input. See "3.2. Input Stage" on page 19, Figure 3 and Figure 4, for connection details. Clock inputs to these pins must be ac-coupled. Keep the traces from pins 1,2 to the crystal as short as possible and keep other signals and radiating sources away from the crystal.
When not in use, leave IN1 unconnected and IN2 connected to GND.

	Title: TE0745 - CLK	
	A4	Number: TE0745 73E31-A
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Title: TE0745 - RTC		
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Net Name	Voltage Rail	Low Detect
VCCPINT	1.0 V	0.936 V
PS_1.8V	1.8 V	0.86 V



R103 have to be populated when U20 are not populated

PS voltage detector!

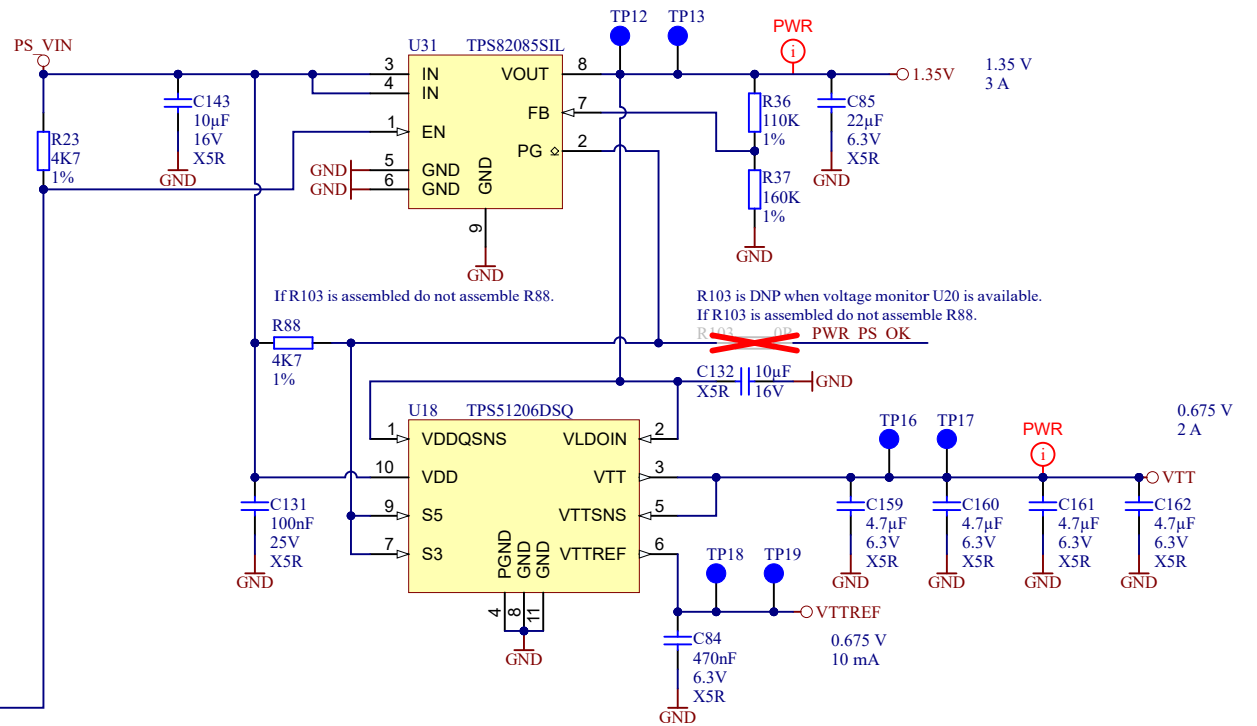
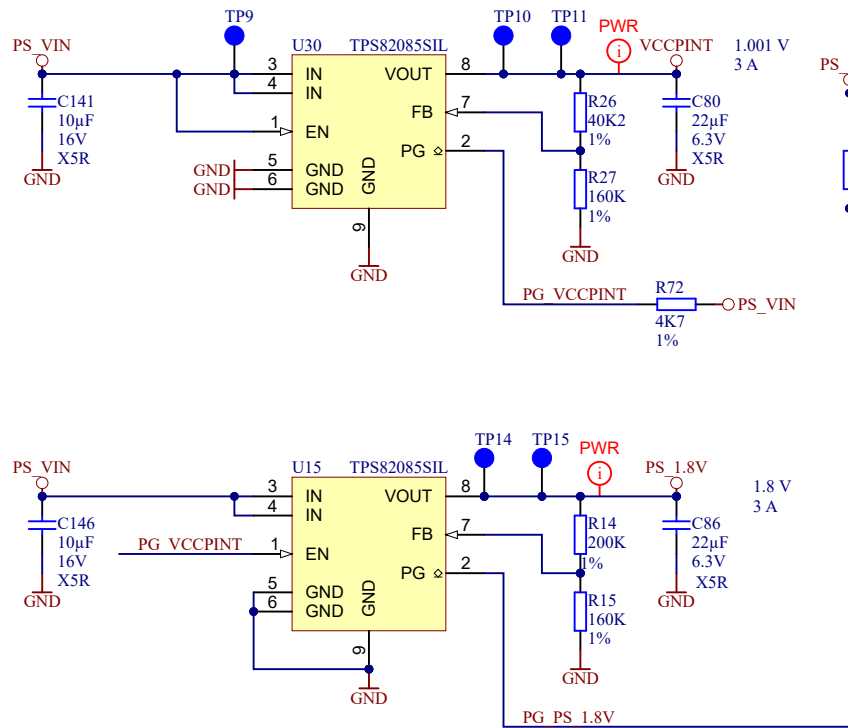
PL voltage detector!


Net Name	Voltage Rail	Low Detect	High Detect
PS_3.3V	3.3 V	2.97 V	3.62 V
PS_1.8V	1.8 V	1.62 V	1.98 V
PS_VIN	3.3 V	2.97 V	3.62 V
1.35V	1.35 V	1.22 V	1.49 V
VCCPINT	1.0 V	0.90 V	1.10 V

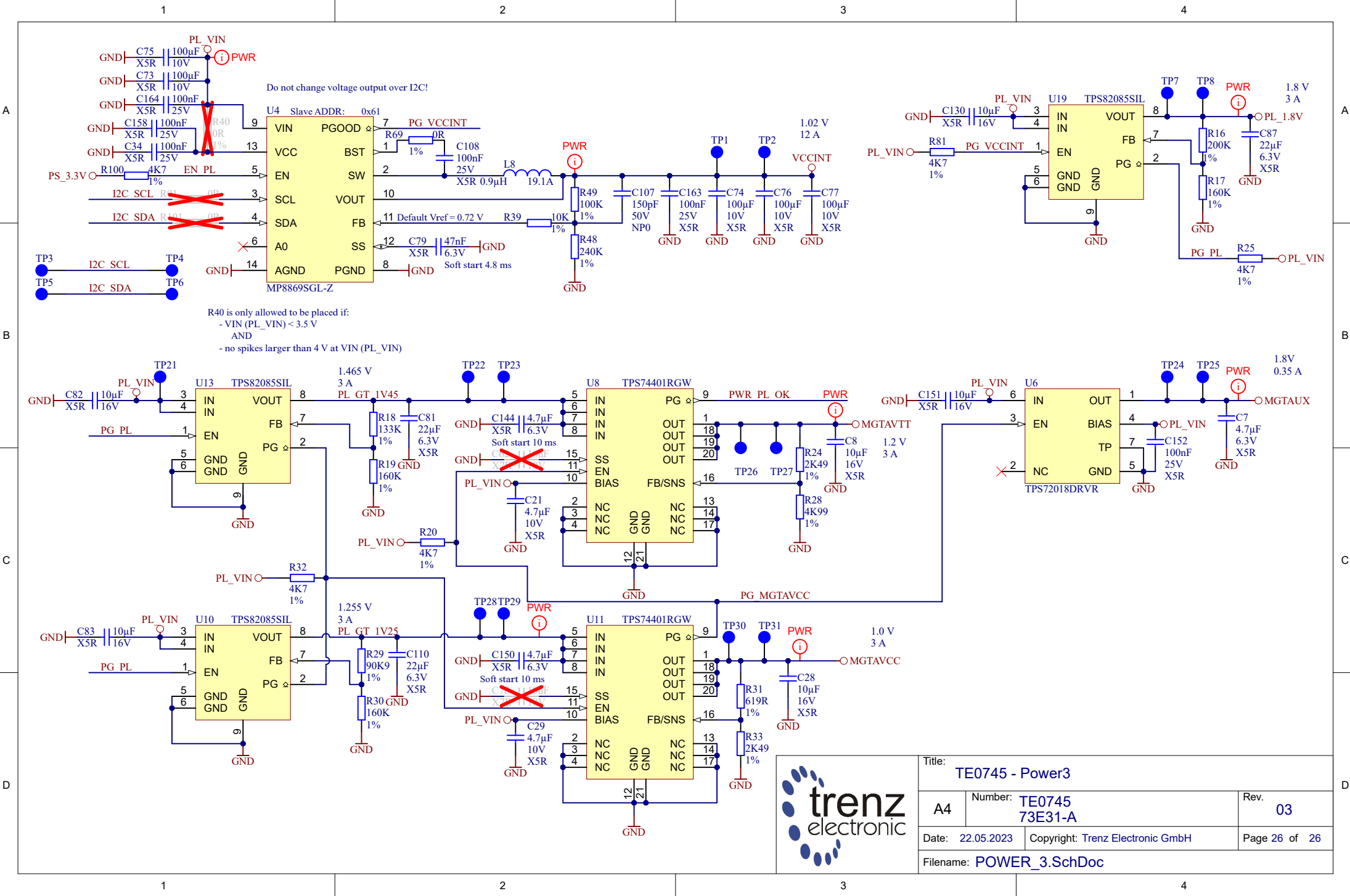
Net Name	Voltage Rail	Low Detect	High Detect
PS_3.3V	3.3 V	2.97 V	3.62 V
MGTAVCC	1.0 V	0.90 V	1.10 V
MGTAVTT	1.2 V	1.08 V	1.32 V
VCCINT	1.0 V	0.90 V	1.10 V
PL_1.8V	1.8 V	1.62 V	1.98 V

Title: **TE0745 - Power**

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Title: TE0745 - Power3		
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