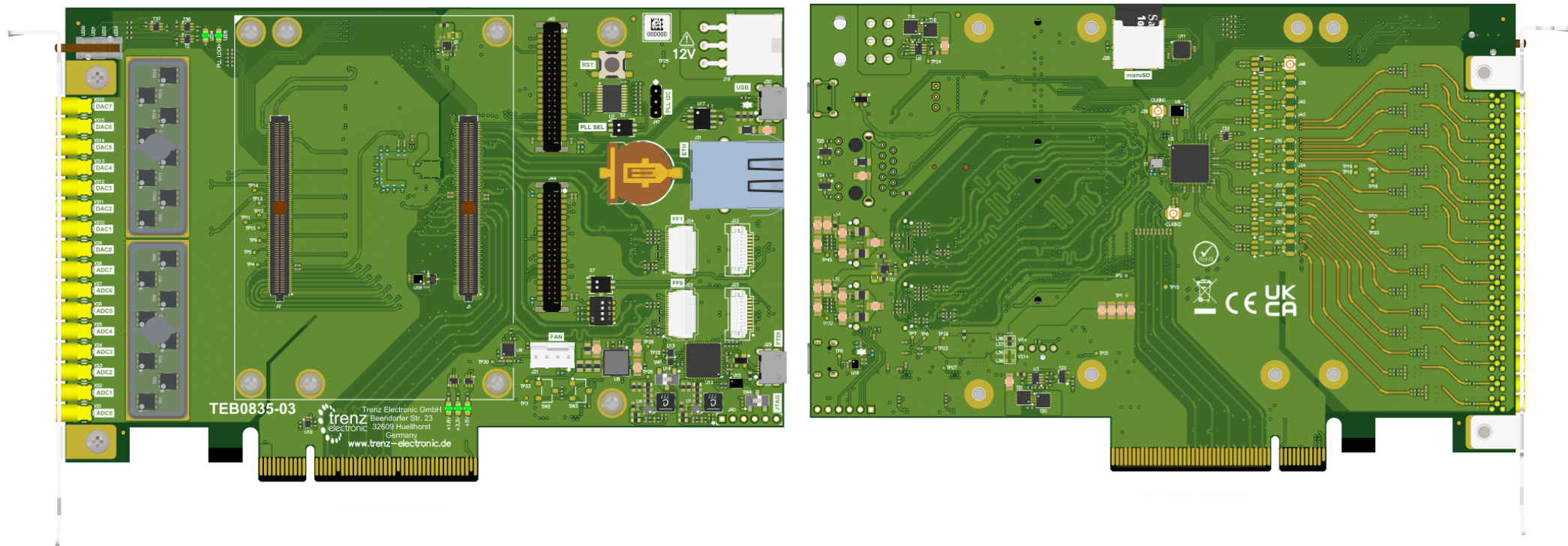




Variant A is compatible with modules that have $V_{IN} = 5V \pm 10\%$

Regarding the usage of our schematics and alike documentation for Trenz baseboard TEB0835 .

Baseboard is Open Source Hardware and therefore free to use, adapt and can be modified to suit your needs as described in the "The MIT License".

Permission is hereby granted, free of charge, to any person obtaining a copy of this hardware and associated documentation files (the "Product"), to deal in the Product without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Product, and to permit persons to whom the Product is furnished to do so.

Schematics and other handouts serve for informational purposes only!

Design drawn by: IG
 Checked by: MR
 Assembly variant: A
 Created by: IG
 Modified by: IG
 Modified at: 31.07.2020



Title: Legal Notices

A4

Number: TEB0835
 A

Rev. 03

Date: 2024-05-14 Copyright: Trenz Electronic GmbH

Page 1 of 28

Filename: Legal Notices.SchDoc

1		2		3		4					
REVISION HISTORY											
A	REV	Description			REV	Description					
	-01	Initial revision				IG					
B	-02	1 All module's mount holes are connected to GND; 2 CLK_Connectors. Added baluns for each clock inputs; 3 Internal DSPLL is changed on SI5395A-A-GM; 4 Added ability to use internal DSPLL as a source for each clock; 5 Added clock inputs CLKIN1, CLKIN2 and clock outputs OUT1 , OUT2 connected to DSPLL.; 6 All clock traces are matched with tolerance 0.2 mm; 7 Lengths of inputs ADC0, ADC2, ADC4, ADC6 are matched with tolerance 0.2 mm; 8 Lengths of outputs DAC0 and DAC2 are matched with tolerance 0.2 mm; 9 Lengths of outputs DAC4, DAC5, DAC6, DAC7 are matched with tolerance 0.2 mm; 10 In REV02: FTDI is powered from 3.3V_Module; 11 Signal PLL_INTR_N is removed; 12 Signal BOARD_PG is renamed in MODULE_PG; 13 Added ability to select enable signal for internal DC-DCs 3.3V and 1.8V. 14 Added JTAG connector J40. 15 Added VBAT schematic. Added a holder for CR1220 3V battery. 16 Resistor R4 changed to 10K (was 1K).			IG				R27 (17,4 Ohm) → R27 (0 Ohm), R30 (17,4 Ohm) → R30 (0 Ohm), R29 (590 Ohm) → R29 (1 MOhm), R59 (DNP) → R59 (1 MOhm), R60 (DNP) → R60 (1 MOhm), R56 (590 Ohm) → R56 (1 MOhm), R55 (17,4 Ohm) → R55 (0 Ohm), R58 (17,4 Ohm) → R58 (0 Ohm), R57 (590 Ohm) → R57 (1 MOhm). f. Net names are changed: ADC1_IN → ADC_IN4, ADC3_IN → ADC_IN5, ADC5_IN → ADC_IN6, ADC7_IN → ADC_IN7. g. Net names are changed: ADC_S1 → ADC_S4, ADC_S3 → ADC_S5, ADC_S5 → ADC_S6. h. Net names are changed: ADC_B1_(N/P) → ADC_B4_(N/P), ADC_C1_(N/P) → ADC_C4_(N/P), ADC1_(N/P) → ADC4_(N/P), ADC_B3_(N/P) → ADC_B5_(N/P), ADC_C3_(N/P) → ADC_C5_(N/P), ADC3_(N/P) → ADC5_(N/P), ADC_B5_(N/P) → ADC_B6_(N/P), ADC_C5_(N/P) → ADC_C6_(N/P), ADC5_(N/P) → ADC6_(N/P). 7. Page "DAC_Output_Connectors_1": a. Connector designators are changed: J9 → XS9, J10 → XS10, J11 → XS11, J12 → XS12. b. Type of RF connectors XS9, XS10 are changed: SMA (5-1814400-1) → SMP (734060241). c. Type of RF connectors XS11, XS12 are changed: U.FL (U.FL-R-SMT-1) → SMP (734060241). d. Balun designators are changed: T10 → TR9, T12 → TR10, T13 → TR11, T11 → TR12. e. Type of the baluns TR9, TR10, TR11, TR12 are changed: TCM2-33WX+ → TCM2-43X+. f. Net names are changed: DAC0_OUT → DAC_OUT0, DAC1_OUT → DAC_OUT1, DAC2_OUT → DAC_OUT2, DAC3_OUT → DAC_OUT3. g. Resistors are changed: R66 (DNP) → R66 (1 MOhm), R67 (DNP) → R67 (1 MOhm), R63 (590 Ohm) → R63 (1 MOhm), R62 (17,4 Ohm) → R62 (0 Ohm), R65 (17,4 Ohm) → R65 (0 Ohm), R64 (590 Ohm) → R64 (1 MOhm), R73 (DNP) → R73 (1 MOhm), R74 (DNP) → R74 (1 MOhm), R70 (590 Ohm) → R70 (1 MOhm), R69 (17,4 Ohm) → R69 (0 Ohm), R72 (17,4 Ohm) → R72 (0 Ohm), R71 (590 Ohm) → R71 (1 MOhm), R80 (DNP) → R80 (1 MOhm), R81 (DNP) → R81 (1 MOhm), R77 (590 Ohm) → R77 (1 MOhm), R76 (17,4 Ohm) → R76 (0 Ohm), R79 (17,4 Ohm) → R79 (0 Ohm), R78 (590 Ohm) → R78 (1 MOhm), R87 (DNP) → R87 (1 MOhm), R88 (DNP) → R88 (1 MOhm), R84 (590 Ohm) → R84 (1 MOhm), R83 (17,4 Ohm) → R83 (0 Ohm), R86 (17,4 Ohm) → R86 (0 Ohm), R85 (590 Ohm) → R85 (1 MOhm). h. Added mech part Shield2 (3670412). 8. Page "DAC_Output_Connectors_2": a. Connector designators are changed: J13 → XS13, J14 → XS14, J15 → XS15, J16 → XS16. b. Type of RF connectors XS13, XS14, XS15, XS16 are changed: U.FL (U.FL-R-SMT-1) → SMP (734060241). c. Balun designators are changed: T14 → TR13, T15 → TR14, T16 → TR15, T17 → TR16. d. Type of the baluns TR13, TR14, TR15, TR16 are changed: TCM2-33WX+ → TCM2-43X+. e. Net names are changed: DAC4_OUT → DAC_OUT4, DAC5_OUT → DAC_OUT5, DAC6_OUT → DAC_OUT6, DAC7_OUT → DAC_OUT7. f. Resistors are changed: R94 (DNP) → R94 (1 MOhm), R95 (DNP) → R95 (1 MOhm), R91 (590 Ohm) → R91 (1 MOhm), R90 (17,4 Ohm) → R90 (0 Ohm), R93 (17,4 Ohm) → R93 (0 Ohm), R92 (590 Ohm) → R92 (1 MOhm), R101 (DNP) → R101 (1 MOhm), R102 (DNP) → R102 (1 MOhm), R98 (590 Ohm) → R98 (1 MOhm), R97 (17,4 Ohm) → R97 (0 Ohm), R100 (17,4 Ohm) → R100 (0 Ohm), R99 (590 Ohm) → R99 (1 MOhm), R108 (DNP) → R108 (1 MOhm), R109 (DNP) → R109 (1 MOhm), R105 (590 Ohm) → R105 (1 MOhm), R104 (17,4 Ohm) → R104 (0 Ohm), R107 (17,4 Ohm) → R107 (0 Ohm), R106 (590 Ohm) → R106 (1 MOhm), R115 (DNP) → R115 (1 MOhm), R116 (DNP) → R116 (1 MOhm), R112 (590 Ohm) → R112 (1 MOhm), R111 (17,4 Ohm) → R111 (0 Ohm), R114 (17,4 Ohm) → R114 (0 Ohm), R113 (590 Ohm) → R113 (1 MOhm).		
	-03	1. Added "Legal Notices" page. 2. Added "Power Diagram" page. 3. Added "Clock Diagram" page. 4. Page "TEB0835" is updated: a. Added a table of I2C Slaves. b. Added PCIe-bracket MECH1. c. Added four plastic standoffs MP1-MP4 (D01468). 5. Page "ADC_Input_Connectors_1": a. Connector designators are changed: J1 → XS1, J5 → XS2, J3 → XS3, J7 → XS4. b. Type of RF connectors XS1, XS2, XS3, XS4 are changed: SMA (5-1814400-1) → SMP (734060241). c. Balun designators are changed: T2 → TR1, T6 → TR2, T4 → TR3, T8 → TR4. d. Type of the baluns TR1, TR2, TR3, TR4 are changed: TCM2-33WX+ → TCM2-43X+. e. Resistors are changed: R10 (DNP) → R10 (1 MOhm), R11 (DNP) → R11 (1 MOhm), R7 (590 Ohm) → R7 (1 MOhm), R6 (17,4 Ohm) → R6 (0 Ohm), R9 (17,4 Ohm) → R9 (0 Ohm), R8 (590 Ohm) → R8 (1 MOhm),R38 (DNP) → R38 (1 MOhm), R39 (DNP) → R39 (1MOhm), R35 (560 Ohm) → R35 (1MOhm), R34 (17,4 Ohm) → R34 (0 Ohm), R37 (17,4 Ohm) → R37 (0 Ohm), R36 (590 Ohm) → R36 (1 MOhm), R24 (DNP) → R24 (1 MOhm), R25 (DNP) → R25 (1 MOhm), R21 (590 Ohm) → R21 (1 MOhm), R20 (17,4 Ohm) → R20 (0 Ohm), R23 (17,4 Ohm) → R23 (0 Ohm), R22 (590 Ohm) → R22 (1 MOhm), R52 (DNP) → R52 (1 MOhm), R53 (DNP) → R53 (1 MOhm), R49 (590 Ohm) → R49 (1 MOhm), R48 (17,4 Ohm) → R48 (0 Ohm), R51 (17,4 Ohm) → R51 (0 Ohm), R50 (590 Ohm) → R50 (1 MOhm). f. Net names are changed: ADC0_IN → ADC_IN0, ADC4_IN → ADC_IN1, ADC2_IN → ADC_IN2, ADC6_IN → ADC_IN2. g. Net names are changed: ADC_S4 → ADC_S1, ADC_S6 → ADC_S3. h. Net names are changed: ADC_B4_(N/P) → ADC_B1_(N/P), ADC_C4_(N/P) → ADC_C1_(N/P), ADC4_(N/P) → ADC1_(N/P), ADC_B6_(N/P) → ADC_B3_(N/P), ADC_C6_(N/P) → ADC_C3_(N/P), ADC6_(N/P) → ADC3_(N/P). i. Added mech part Shield1 (3670412). 6. Page "ADC_Input_Connectors_2": a. Connector designators are changed: J2 → XS5, J4 → XS6, J6 → XS7, J8 → XS8. b. Type of RF connectors XS5, XS6, XS7, XS8 are changed: SMA (5-1814400-1) → SMP (734060241). c. Balun designators are changed: T3 → TR5, T5 → TR6, T7 → TR7, T9 → TR8. d. Type of the baluns TR5, TR6, TR7, TR8 are changed: TCM2-33WX+ → TCM2-43X+. e. Resistors are changed: R17 (DNP) → R17 (1 MOhm), R18 (DNP) → R18 (1 MOhm), R14 (590 Ohm) → R14 (1 MOhm), R13 (17,4 Ohm) → R13 (0 Ohm), R16 (17,4 Ohm) → R16 (0 Ohm), R15 (590 Ohm) → R15 (1 MOhm), R45 (DNP) → R45 (1 MOhm), R46 (DNP) → R46 (1 MOhm), R42 (590 Ohm) → R42 (1 MOhm), R41 (17,4 Ohm) → R41 (0 Ohm), R44 (17,4 Ohm) → R44 (0 Ohm), R43 (590 Ohm) → R43 (1 MOhm), R31 (DNP) → R31 (1 MOhm), R32 (DNP) → R32 (1 MOhm), R28 (590 Ohm) → R28 (1 MOhm), R27 (17,4 Ohm) → R27 (0 Ohm), R30 (17,4 Ohm) → R30 (0 Ohm), R29 (590 Ohm) → R29 (1 MOhm),			IG						
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D											
1		2		3		4					

REVISION HISTORY

REV	Description	IG
	9. Page "CLK_Connectors_1": R161, R166, R175, R226, R229, R232 (DNP) → (1 MOhm). 10. Page "CLK_Connectors_2": a. Type of J36 connectors are changed: U.FL (U.FL-R-SMT-1) → SMA (R125426000). b. Added RFSoC PL synchronisation scheme via B65_L11 (P/N) from PLL CLKOUT8 (P/N). Also added possibility of synchronisation from external source via J42, R158, T34, C124, C126. c. Added RFSoC PL synchronisation scheme via B65_L12 (P/N) from PLL CLKOUT7 (P/N). Also added possibility of synchronisation from external source via J43, R242, T35, C129, C131. d. Added RFSoC Module PLL synchronisation. External clock can be applied to EXT_CLK_IN1 (P/N) via SMA J46 (R125426000), R224, T36 or R287. 11. Page "B2B_JB1": a. B2B connector designator is changed: J17 → JB1. b. Module power rail is renamed to V_Module. c. Added TP33. 12. Page "B2B_JB2": a. B2B connector designator is changed: J18 → JB2. b. Pins 1 and 2 of JB2 connected to GND. c. Clock CLKA (P/N) (JB2:36 and JB2:38) connected to J45 (A2 and B1). d. B65_L1 (P/N) (JB2:15 and JB2:17) connected to J45 (B7 and A8). e. B65_L2 (P/N) (JB2:6 and JB2:4) connected to J45 (B13 and A14). f. B65_L3 (P/N) (JB2:3 and JB2:5) connected to J45 (B12 and A12). g. B65_L4 (P/N) (JB2:16 and JB2:14) connected to J45 (B16 and A17). h. B65_L5 (P/N) (JB2:10 and JB2:8) connected to J45 (B15 and A15). i. B65_L6 (P/N) (JB2:11 and JB2:13) connected to J45 (B9 and A9). j. B65_L8 (P/N) (JB2:19 and JB2:21) connected to J45 (B6 and A6). k. B65_L9 (P/N) (JB2:7 and JB2:9) connected to J45 (B10 and A11). l. B65_L11 (P/N) (JB2:22 and JB2:20) connected to CLKOUT8 on page "CLK_Connectors_2". m. B65_L12 (P/N) (JB2:18 and JB2:16) connected to CLKOUT7 on page "CLK_Connectors_2". n. B65_L13 (P/N) (JB2:25 and JB2:23) connected to CLKOUT9A on page "DSPLL". o. B65_L16 (P/N) (JB2:24 and JB2:26) connected to J45 (B18 and A18). p. EXT_CLK_IN1 (P/N) connected to balun T36 on page "CLK_Connectors_2". q. Schematic of battery supply is changed: diode D13 moved to LDO U18 input, C86 (4,7uF) → C86 (470nF), U18 (TPS780180300) → U18 (TPS7A0212PDBVR). r. Status LEDs D6-D10 are renamed to LED0_LED3, D11 is removed. The LEDs are moved to "EXT_Connectors" page. s. Resistors are changed: R216-R221 (330 Ohms) → R216-R221 (33 Ohms). t. Added terminators R120, R291, R193 on clocks output CLKD, CLKE, CLKF. 13. Page "POWER": a. Capacitor C37 are changed 10nF → 1nF to adjust inrush current. b. Transistors T18-T21 (SIS444DN-T1-GE3 - EOL) are replaced with SIS4604LDN-T1-GE3. 14. Page "PWR_1V8": a. DC-DC U1 TPS82085SIL converter replaced by TPS62913RPUR for noise reduction and VIN 12V capability. 15. Page "PWR_3V3": a. DC-DC U4 TPS82085SIL converter replaced by TPS62913RPUR for noise reduction and VIN 12V capability. 16. Page "PWR_5V": a. Added a switch SW3 to disable DC-DC U8. b. Added a switch SW2 to enable discontinuous mode of DC-DC U8. c. Added inductors L38 and L39 for connecting V_MODULE to 12V. 17. Page "I2C_MUX": a. Added pull-up resistors R262 - R265. 18. Page "SD": a. The load switch Q1 is replaced by MP5077GG-Z with integrated overload protection circuitry. 19. Page "FTDI": a. Added LDO regulator U19, diodes D6, D7, C217, L19 to provide 3.3V_FTDI voltage. b. Added JTAG switch U14. c. Resistors R237-R240 are removed. d. UART buffer U13 is replaced SN74LVC1G07DRL → SN74AVC4T774RSVR. e. Added USB filter L25	

REV	Description	
	20. Page "MicroUSB": a. Resistor R223 is DNP by default. 21. Page DSPLL: a. CLKOUT7 connected to B65_L12. b. CLKOUT8 connected to B65_L11. c. CLKOUT9 connected to SYSREFCLK. d. CLKOUT9A connected to B65_L13. e. CLKIN3 doesn't use. 22. Page FireFly: a. Added detect network R246-R383 according to FireFly specification. 23. Page FF_0_1: a. Added power switch Q2. b. Added terminators R296-R299, RR302,R303, R307-R310, R312, R313, R317, R320, R403-R05, R408. c. Added a slide switch S7 for FireFly configuration. d. Added pull-up resistors R288, R289, R390, R387, R409, R410. 24. Added page EXT_Connectors: a. Added MIO connector J44 and GPIO connector J45. b. Added transistors T2, T37, T38. c. Added a lightpipe LP1.	IG
-03	25. Changed screws MECH3, MECH4 from metric M3 to inch UNC4-40 1/4". 26. Added covers MECH2; MECH5 3671412 for Shield1 and Shield2. 27. Resistor R181 replaced with 0 Ohm to switch U8 in discontinuos mode of operation. 28. Capacitors C62, C63, C64 are marked as DNP for noise reduction.	IG 29.04.25



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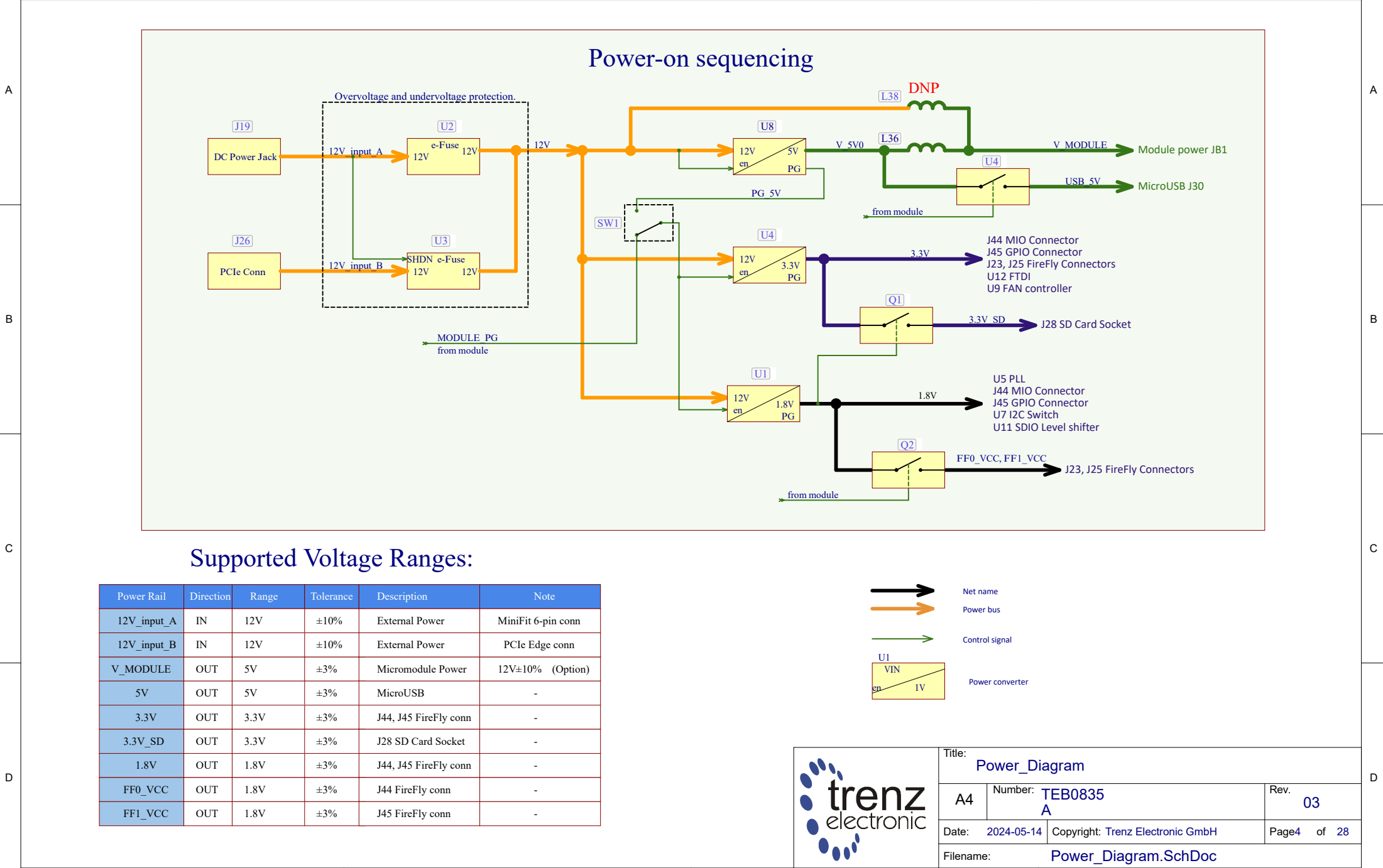
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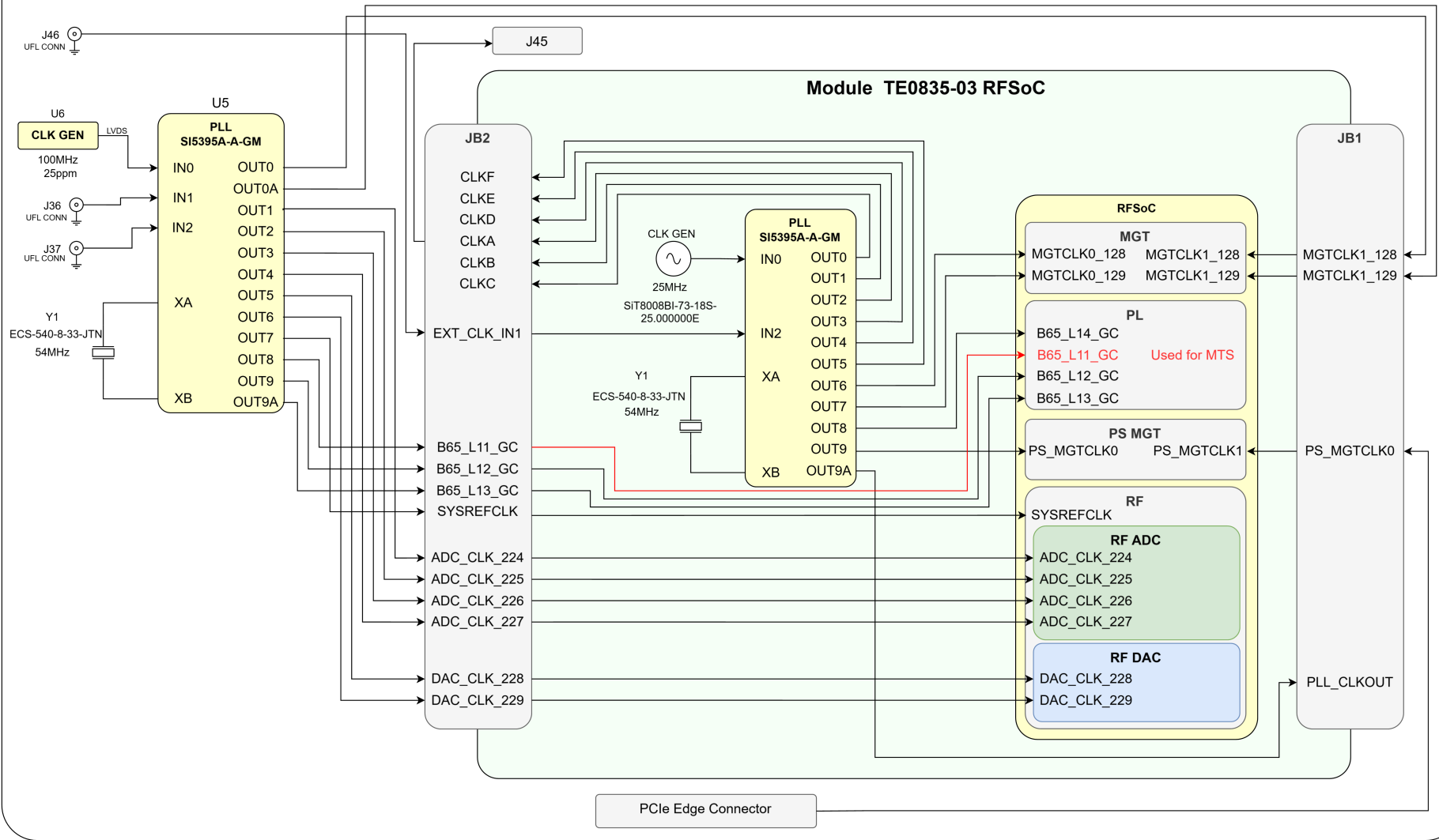
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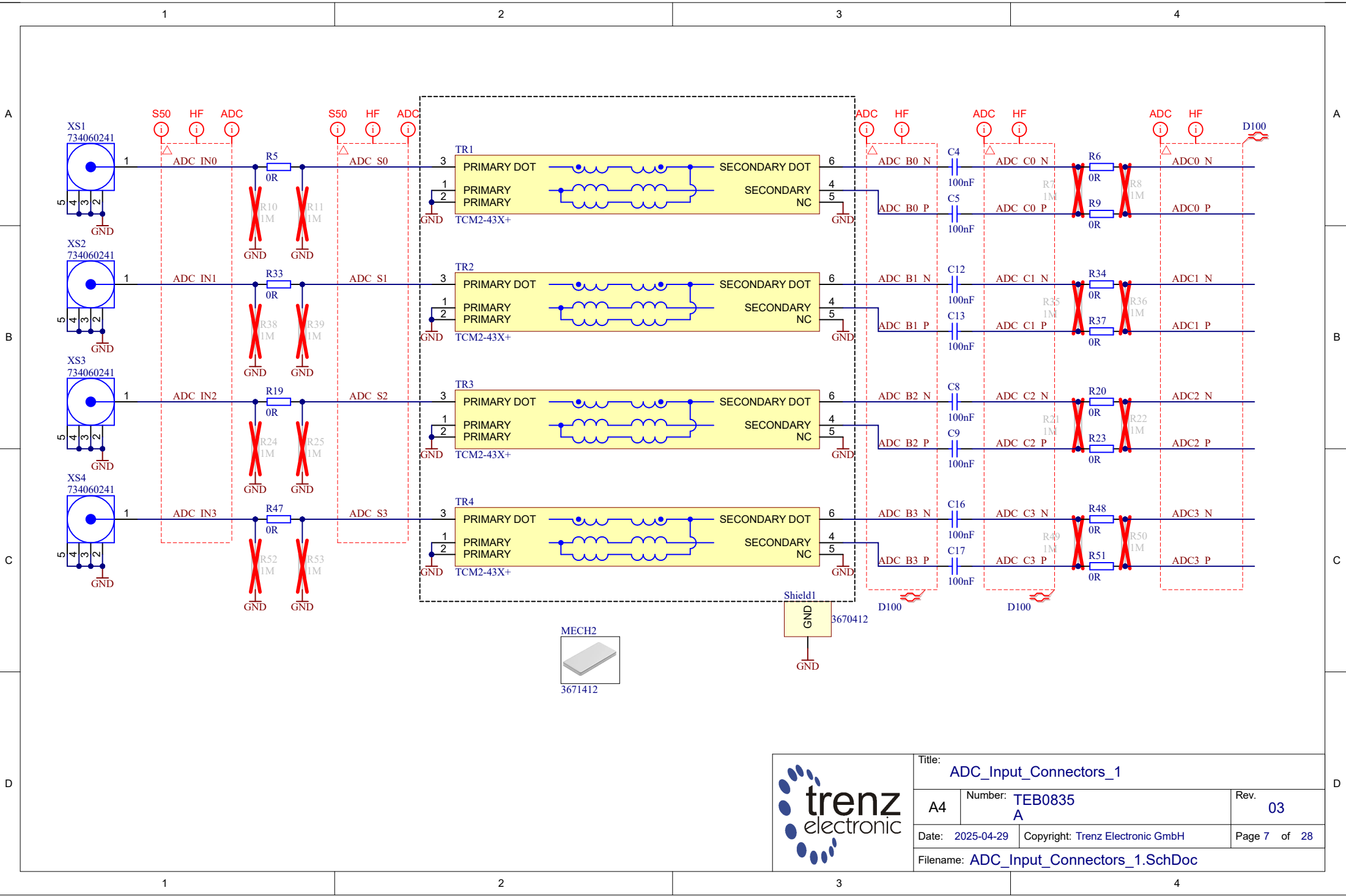
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Carrier board TEB0835-03

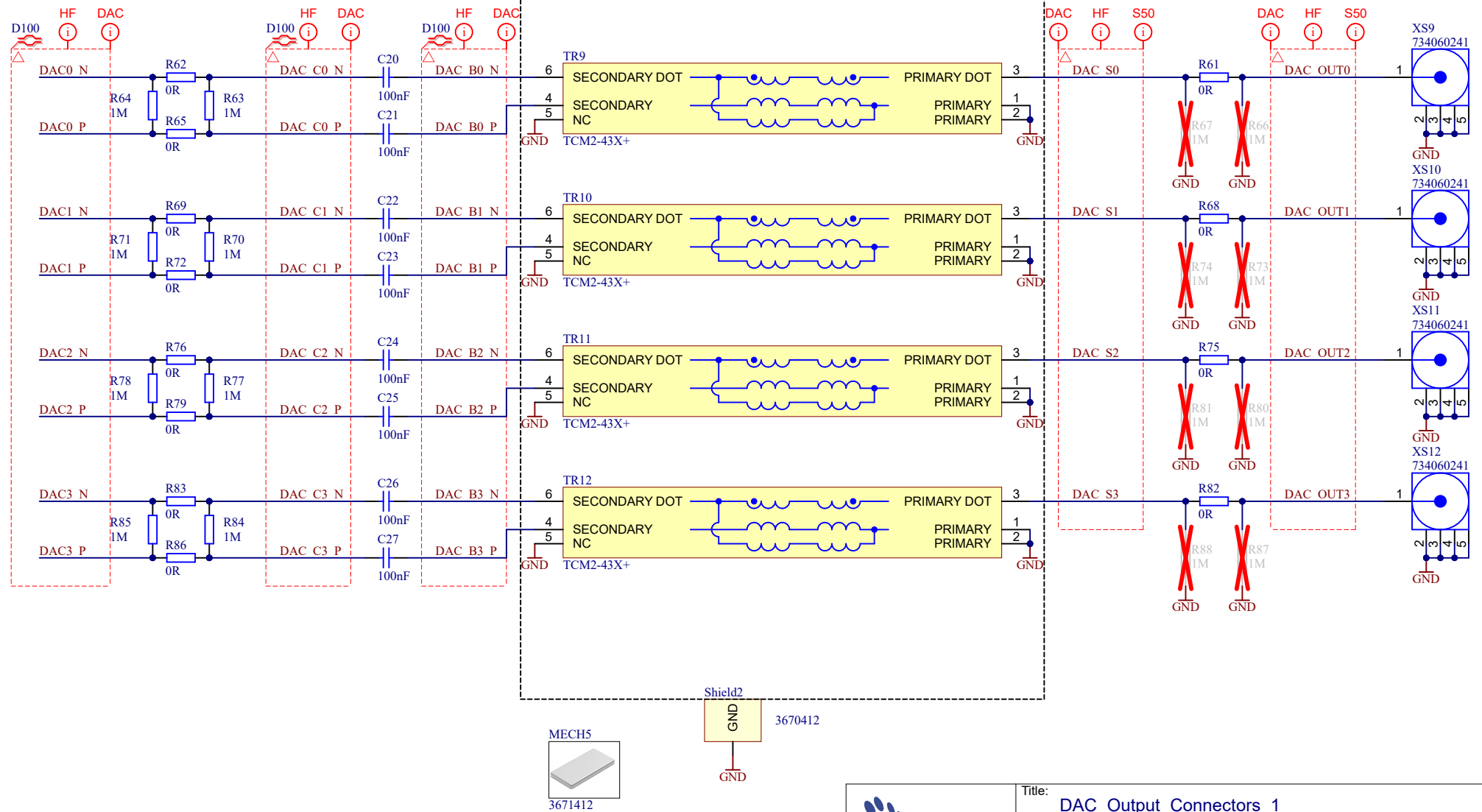


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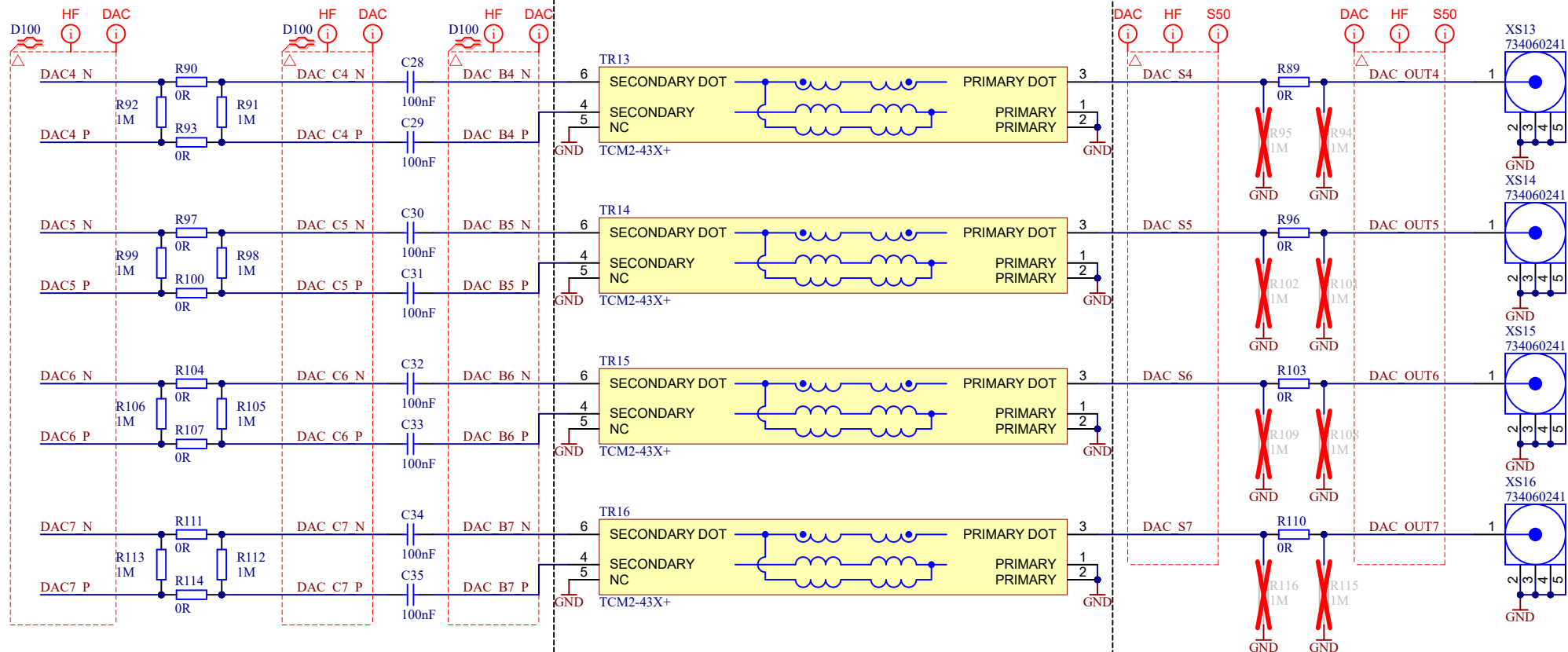




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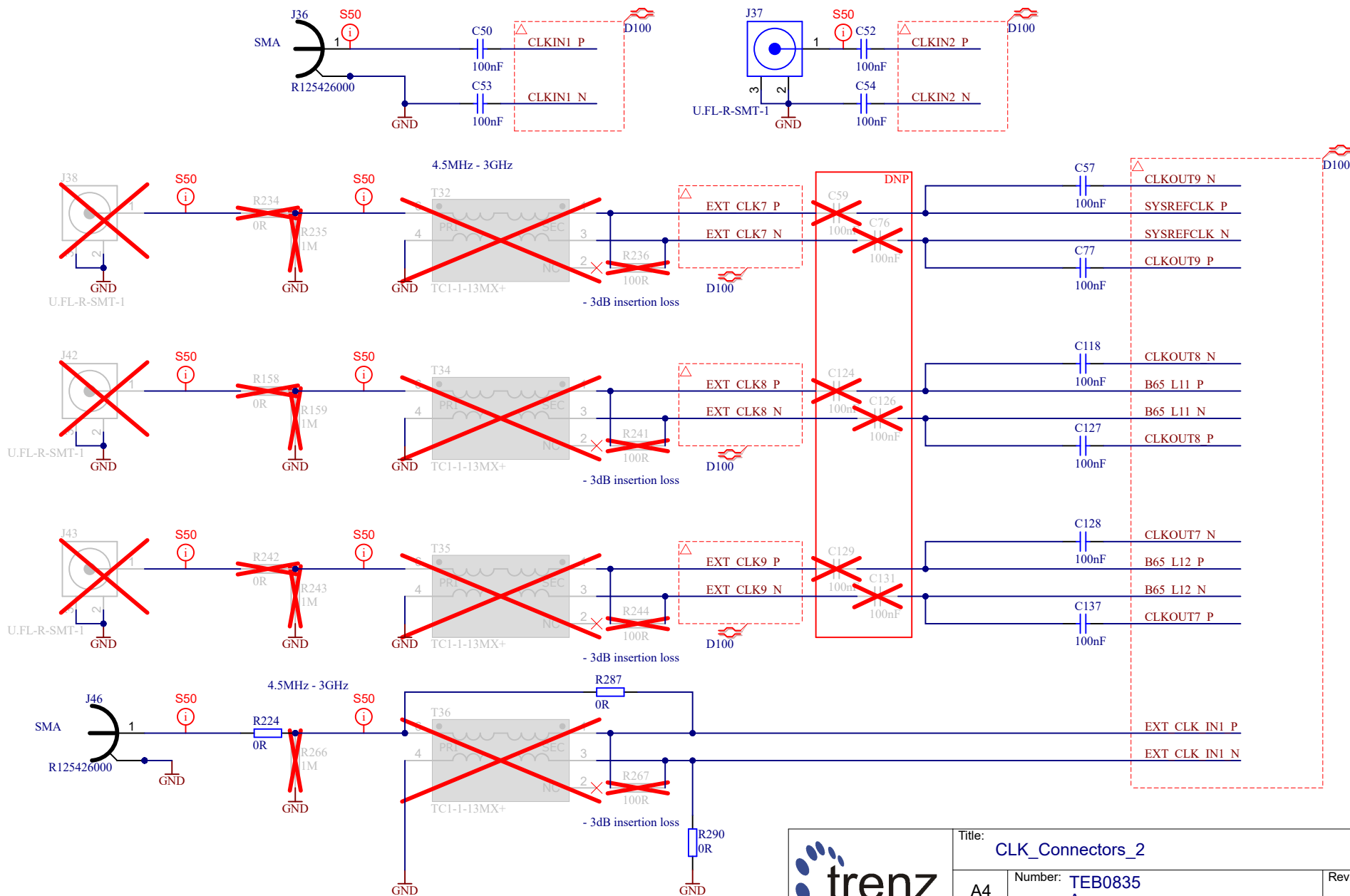
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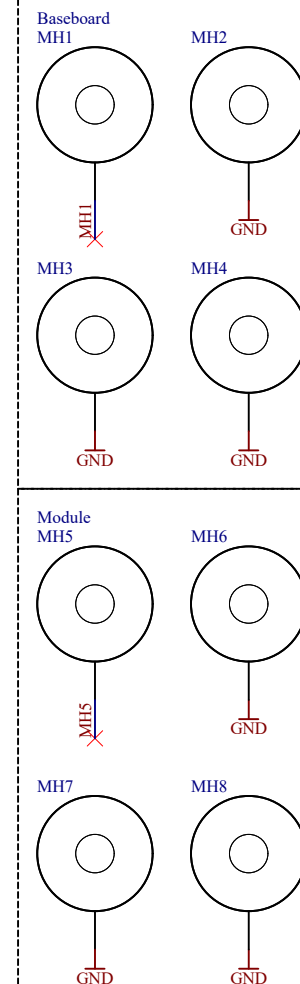
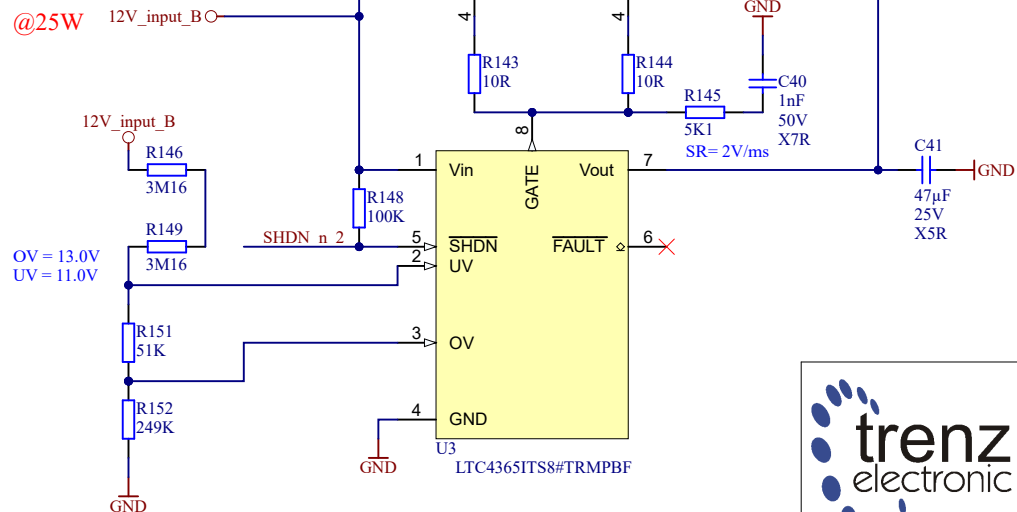
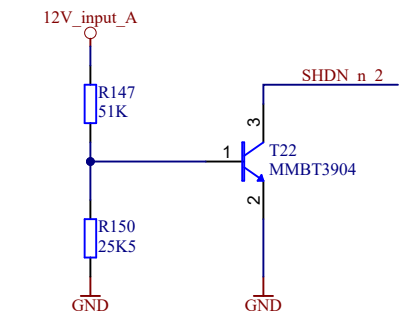
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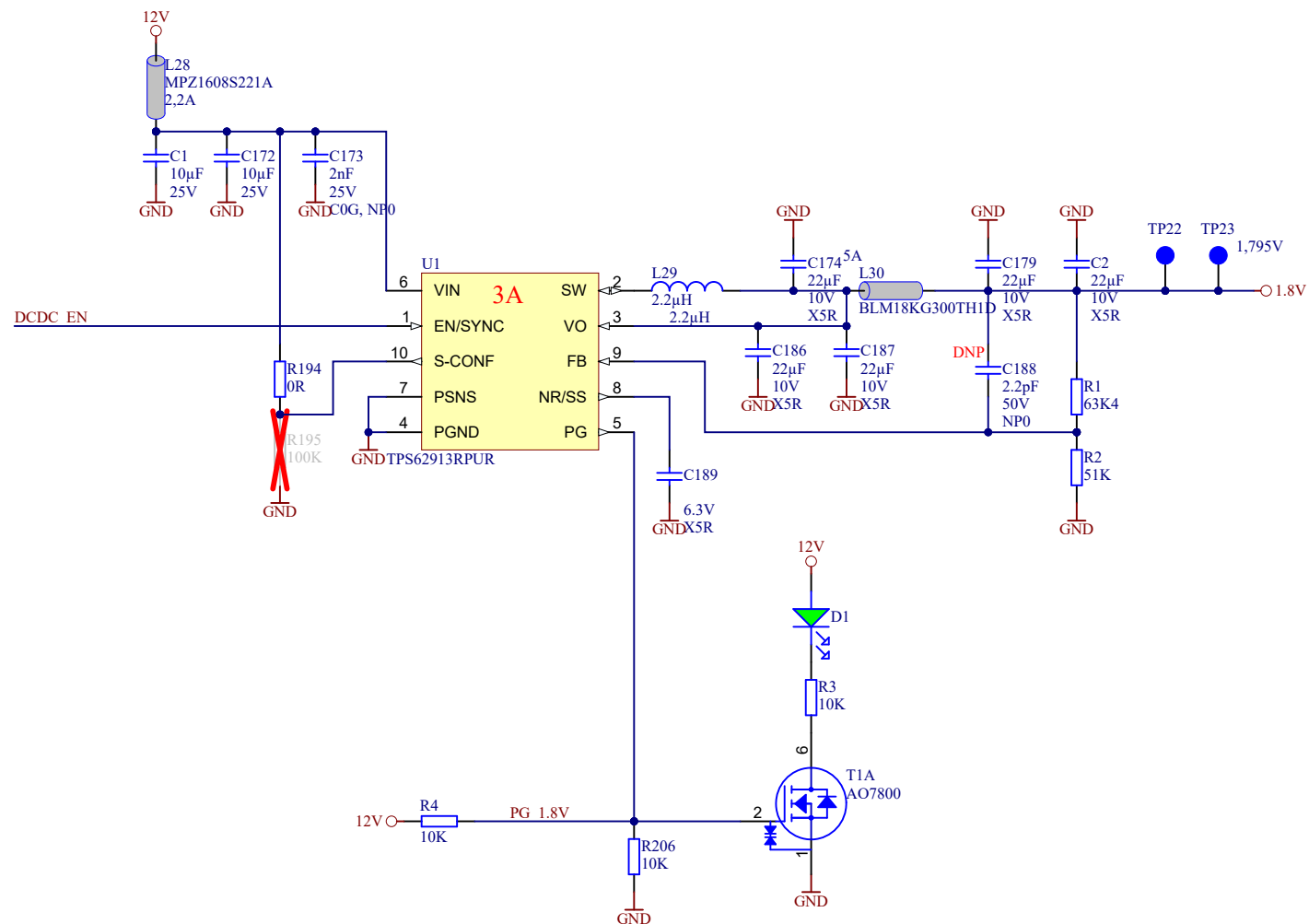
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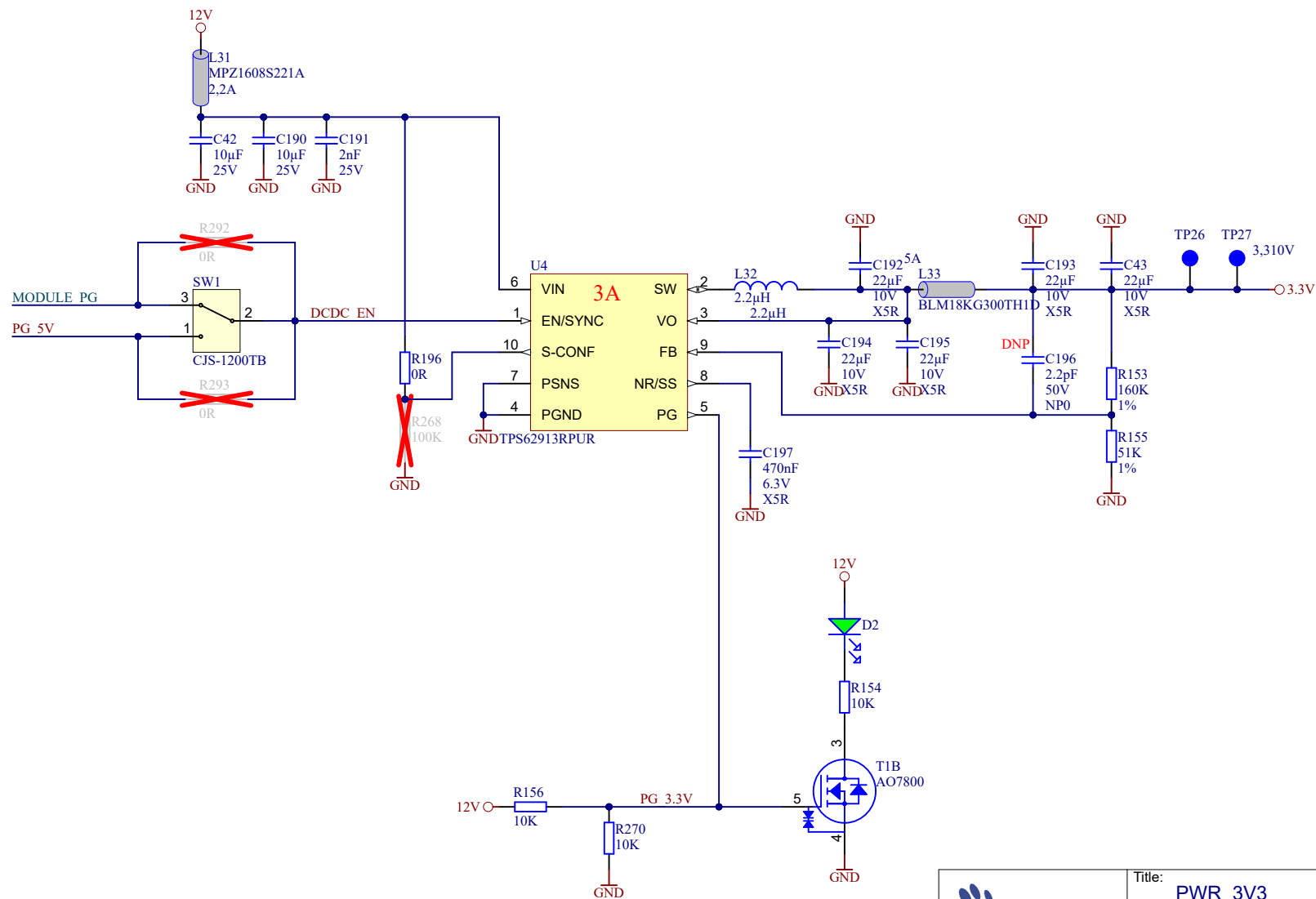


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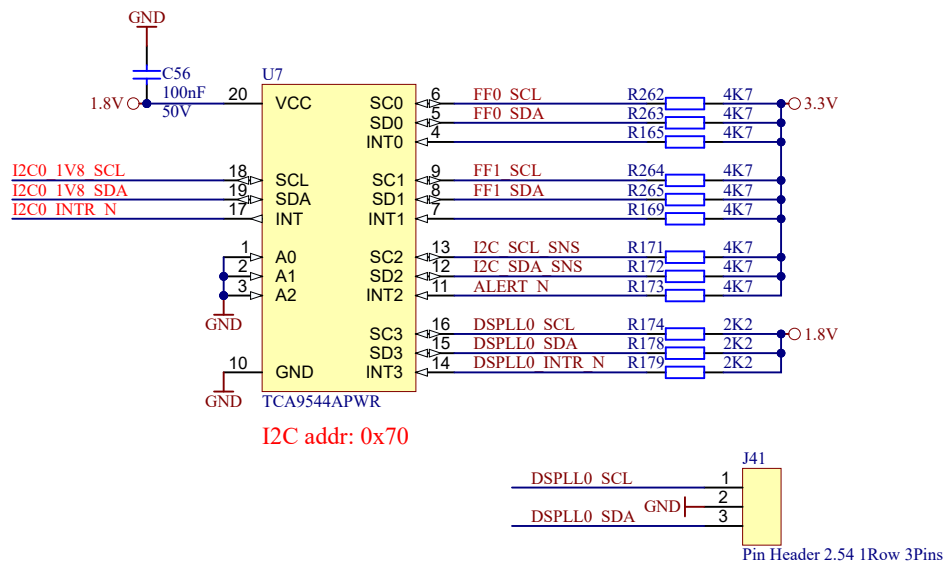


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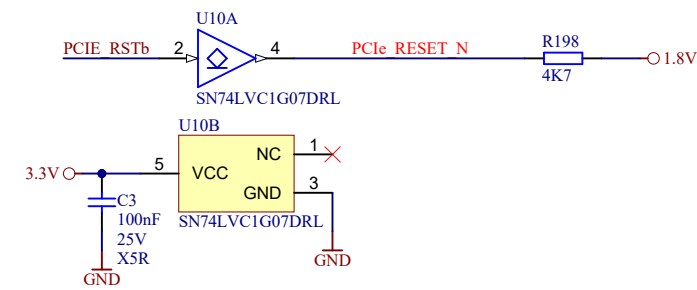
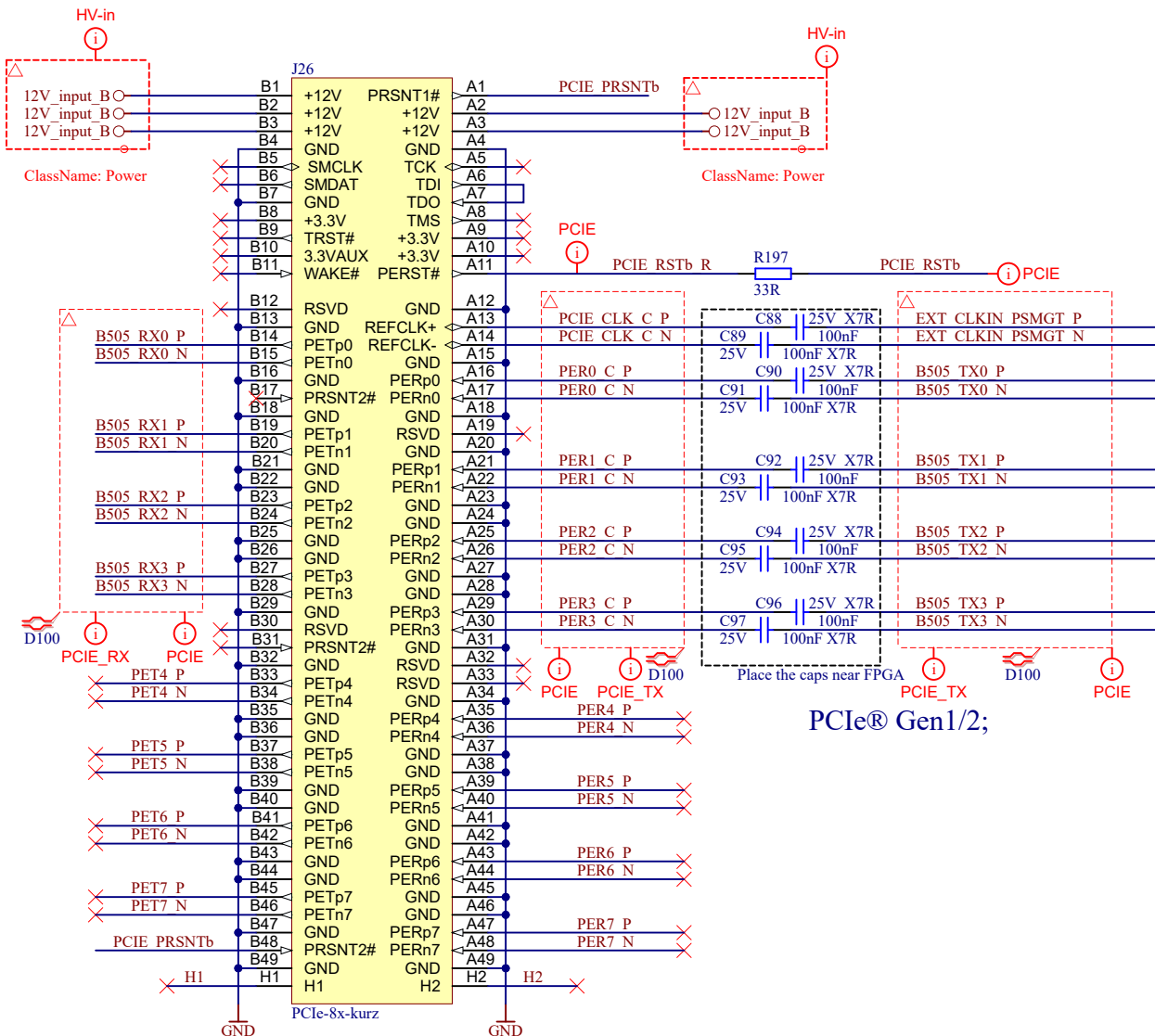




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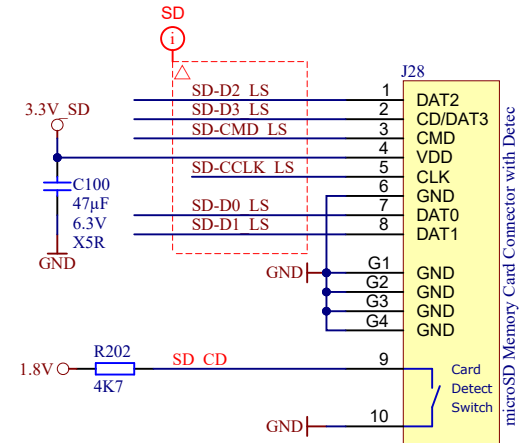
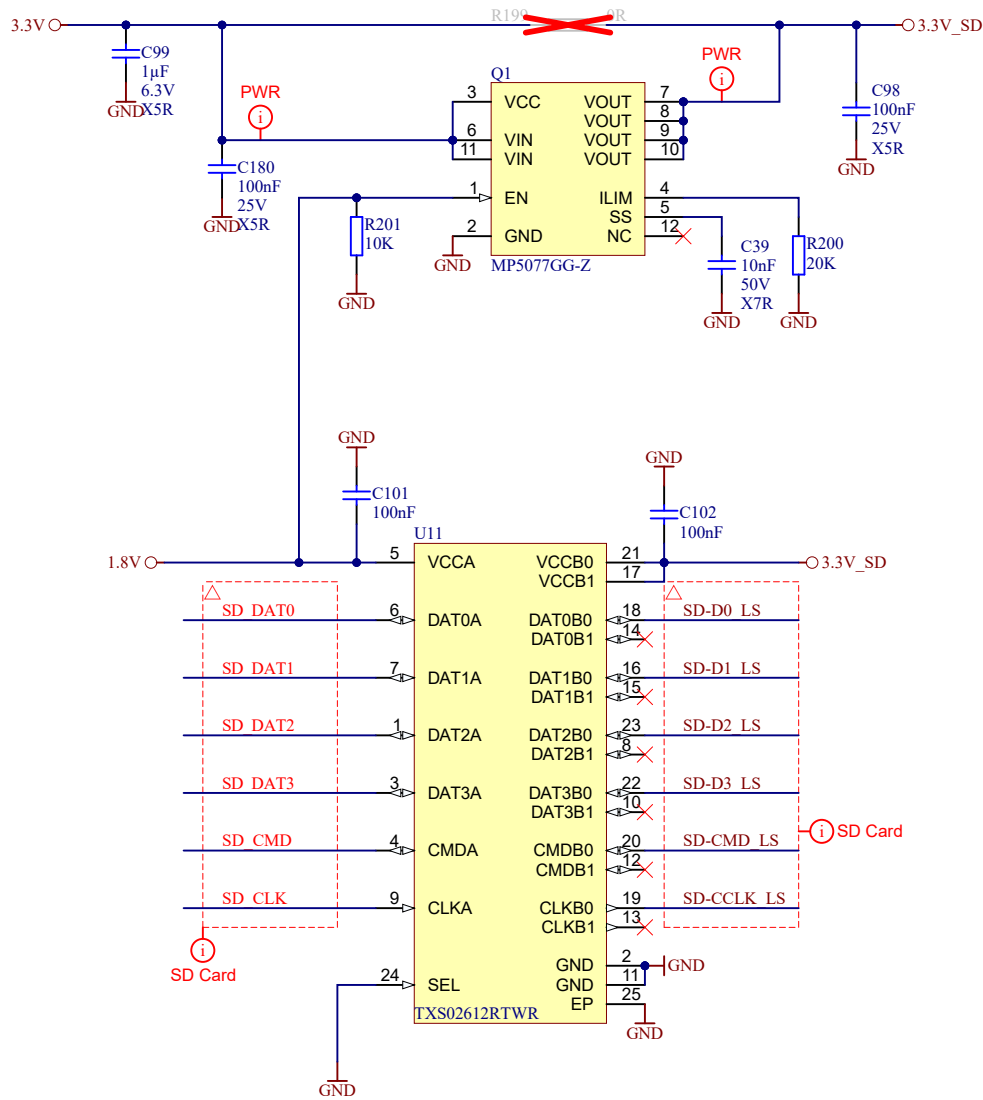


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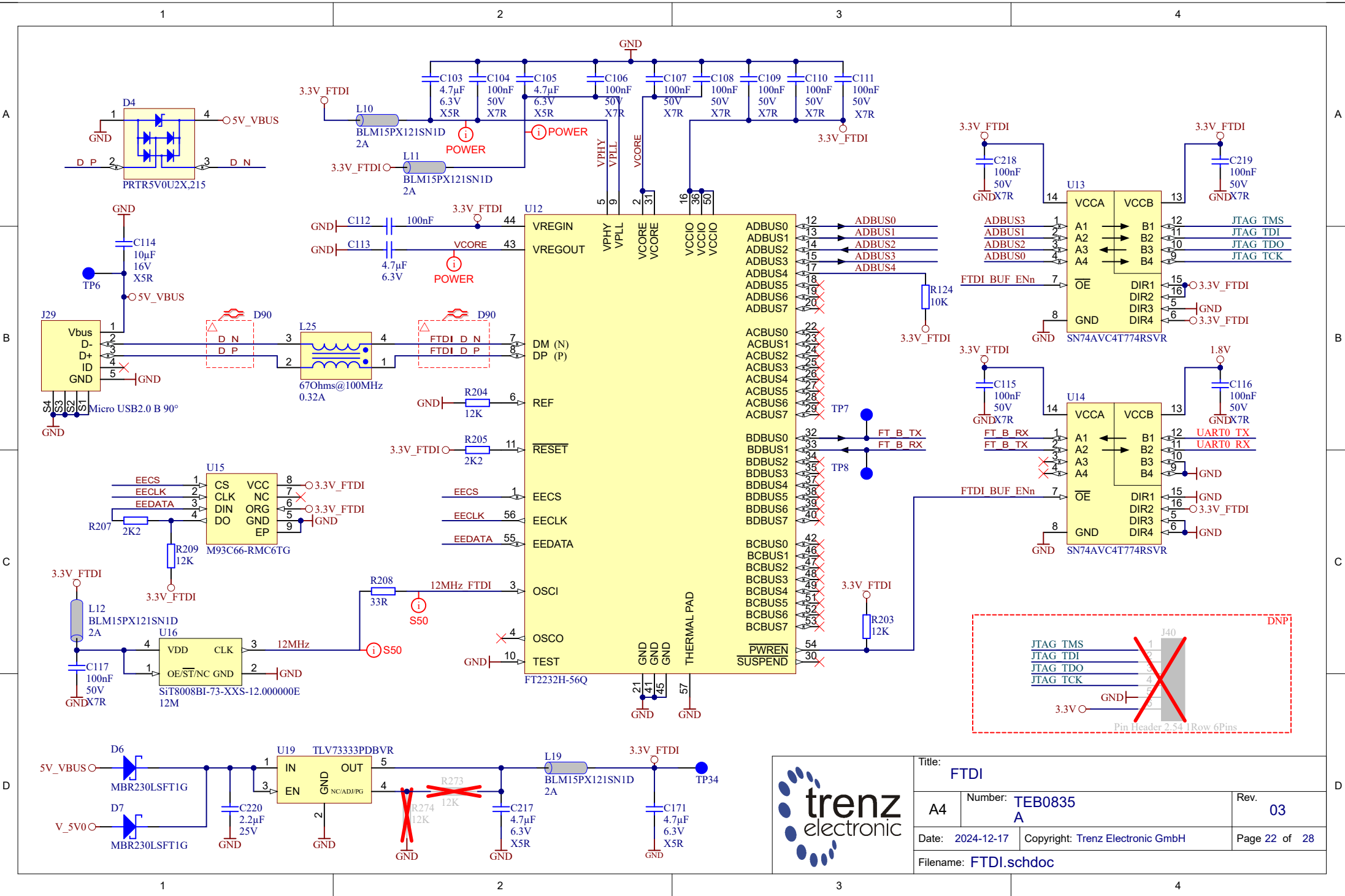


PCIe® Gen1/2;

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	Date: 2024-12-17	Copyright: Trenz Electronic GmbH	Page 20 of 28
	Filename: PCIE_CONN.SchDoc		



	Title: SD		
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	Filename: SD.SchDoc		



Title: FTDI			
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Date: 2024-12-17	Copyright: Trenz Electronic GmbH		Page 22 of 28
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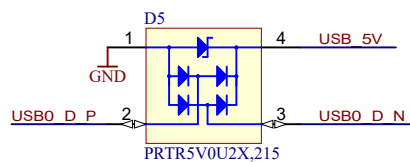
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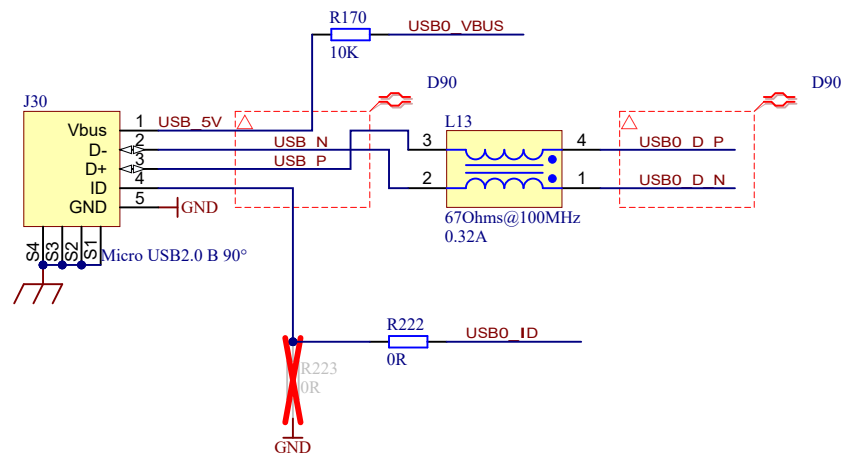
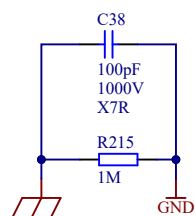
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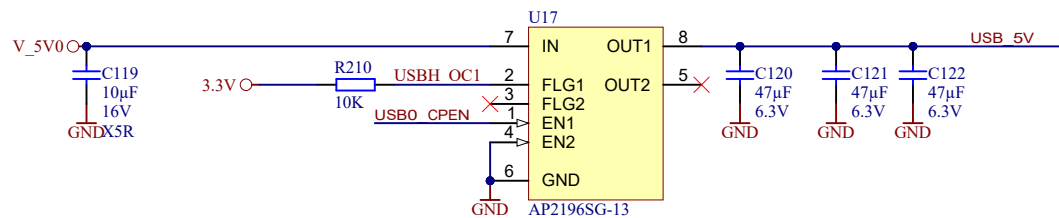
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C



D



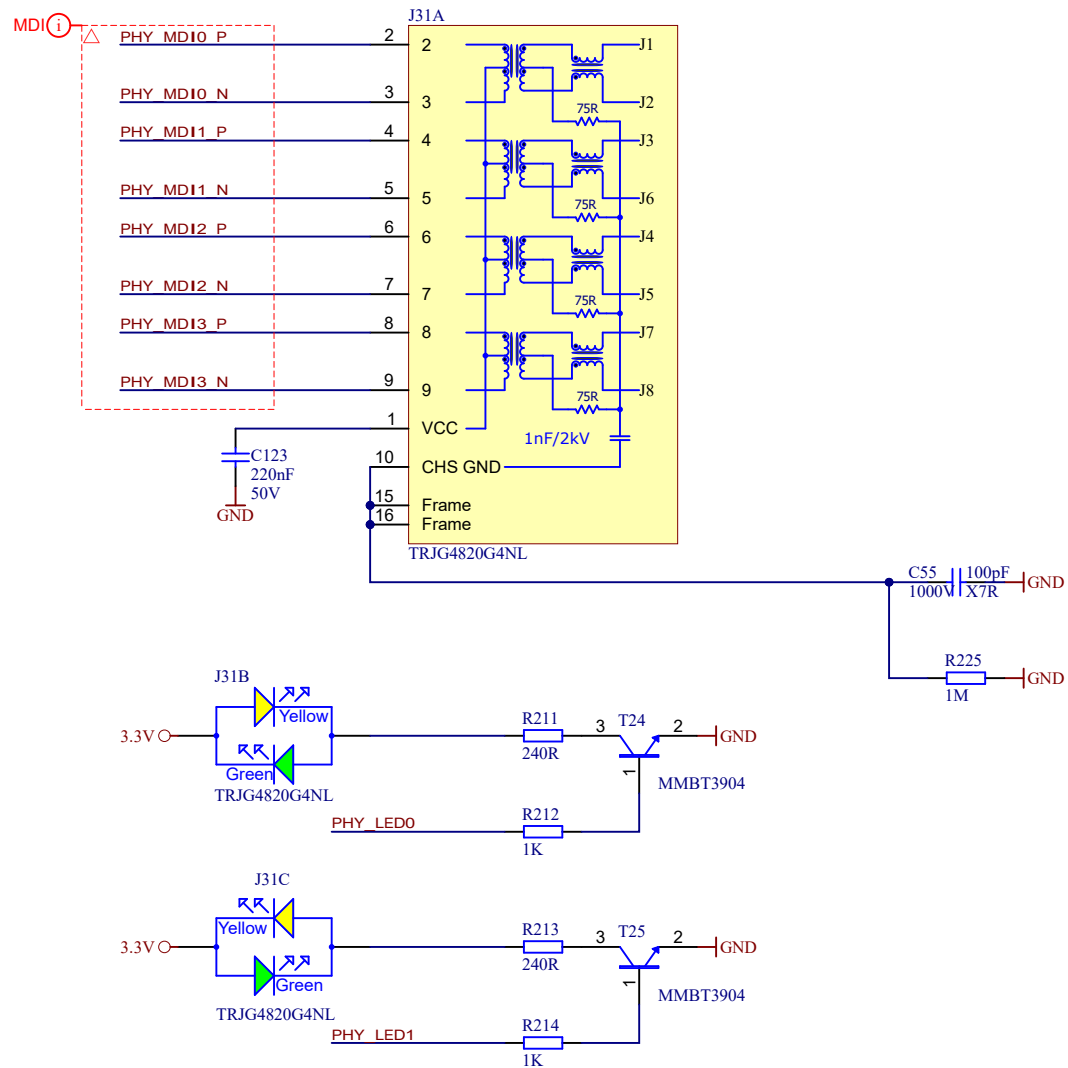
Title: MicroUSB		
A4	Number: TEB0835 A	Rev. 03
Date: 2024-12-17	Copyright: Trenz Electronic GmbH	Page 23 of 28
Filename: MicroUSB.SchDoc		

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Title: ETH-PHY		
A4	Number: TEB0835 A	Rev. 03
Date: 2024-12-17	Copyright: Trenz Electronic GmbH	Page 24 of 28
Filename: ETH-PHY.SchDoc		

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A

A

B

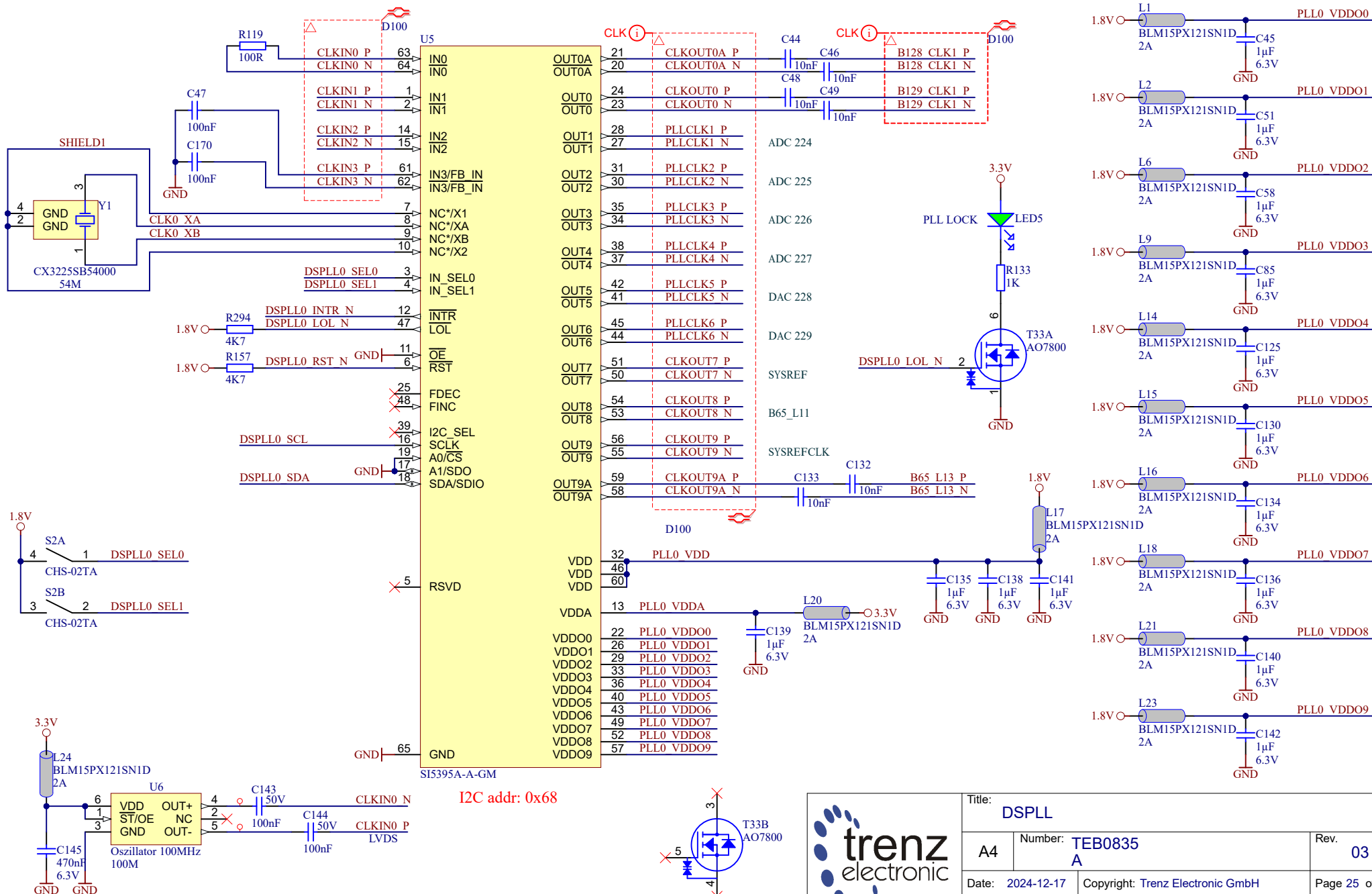
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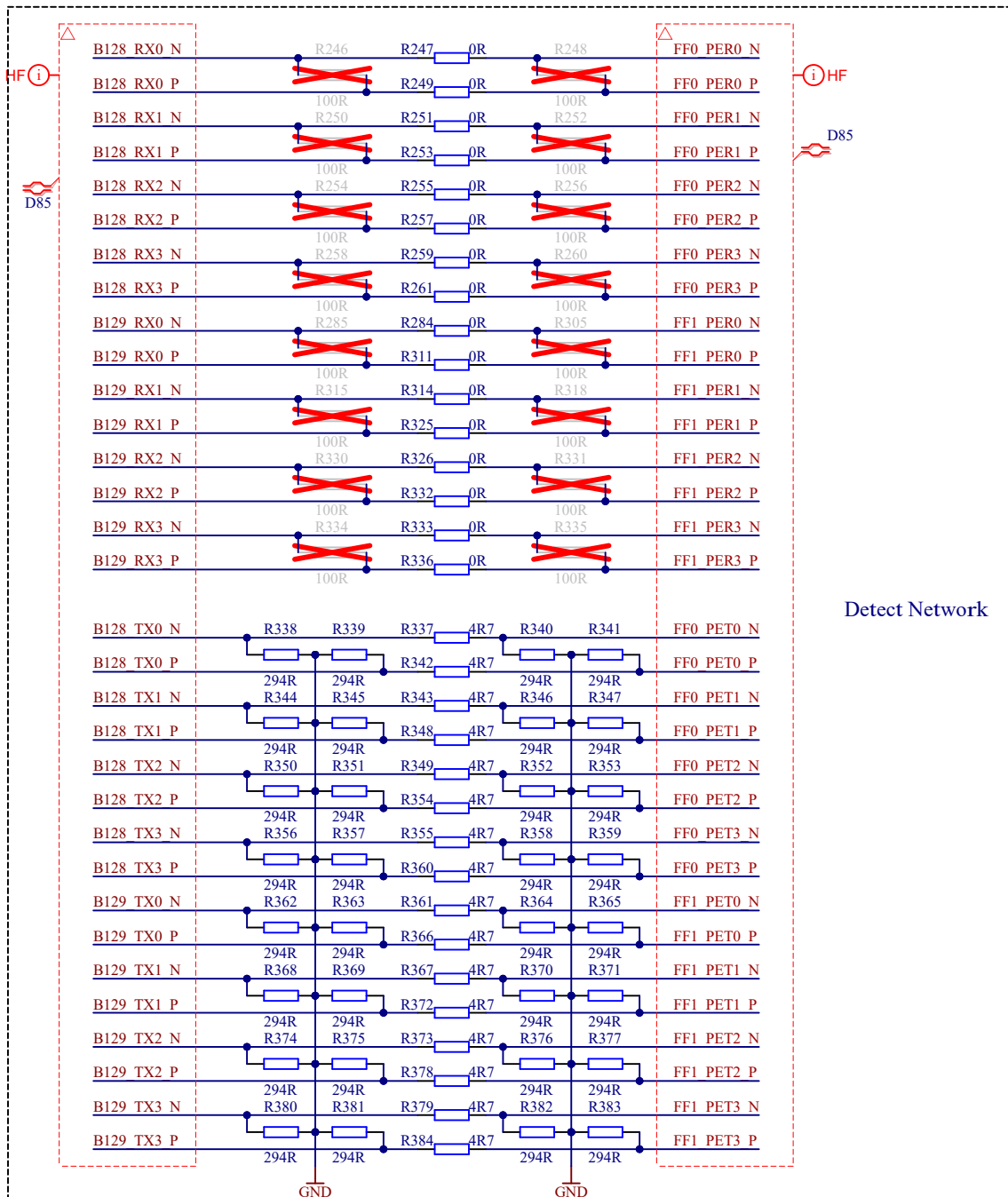
C

D

D



Title: DSPLL			
A4	Number: TEB0835 A		Rev. 03
Date: 2024-12-17	Copyright: Trenz Electronic GmbH		Page 25 of 28
Filename: DSPLL.SchDoc			



FF_0_1
FF_0_1.SchDoc



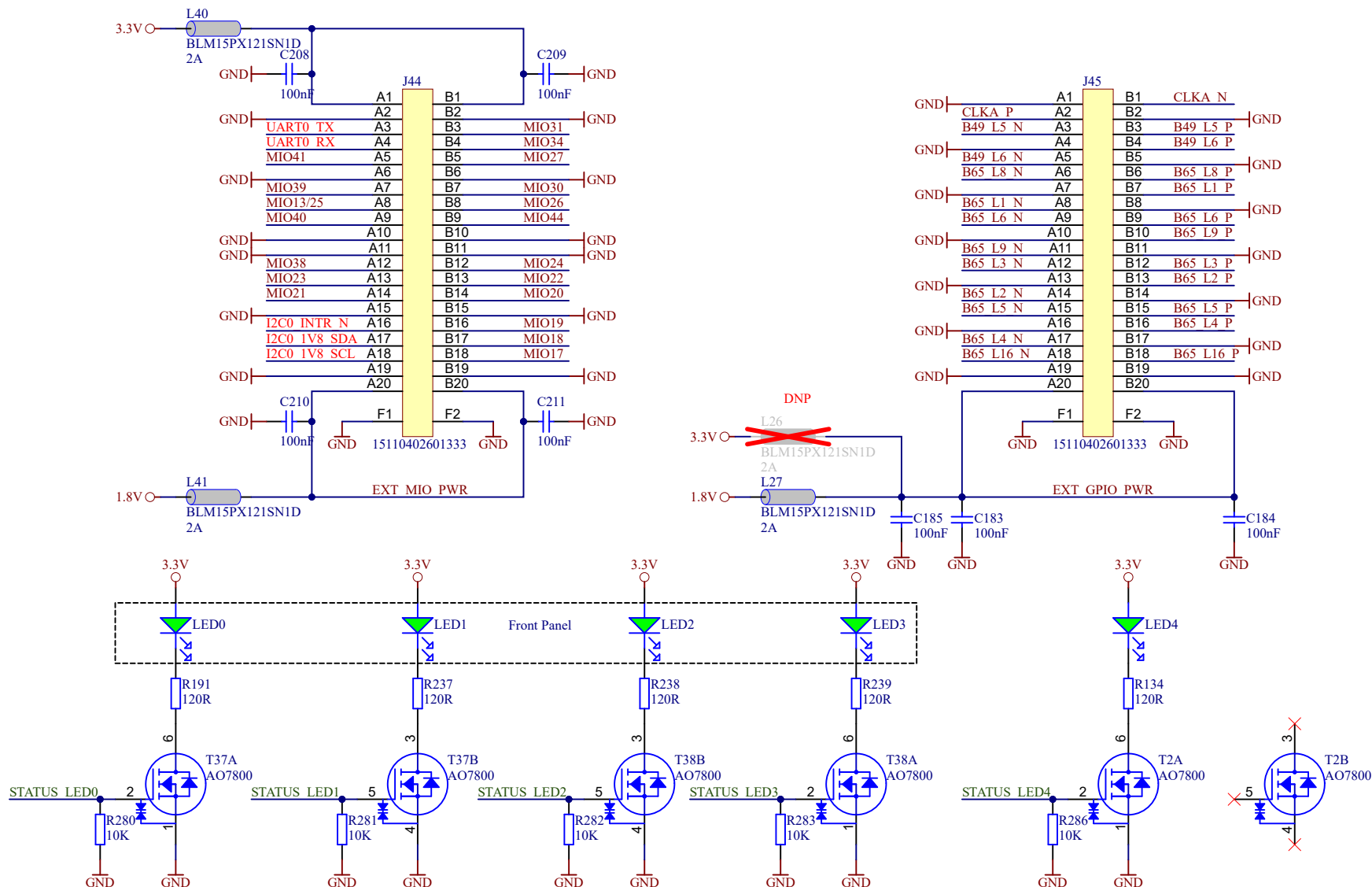
Title: FireFly		
A4	Number: TEB0835 A	Rev. 03
Date: 2024-03-06	Copyright: Trenz Electronic GmbH	
Filename: FireFly.SchDoc		Page26 of 28

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Title: EXT_Connectors		
A4	Number: TEB0835 A	Rev. 03
Date: 2024-12-17	Copyright: Trenz Electronic GmbH	Page 28 of 28
Filename: EXT_Connectors.SchDoc		

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