

1

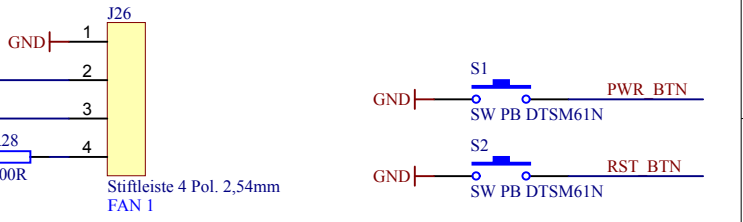
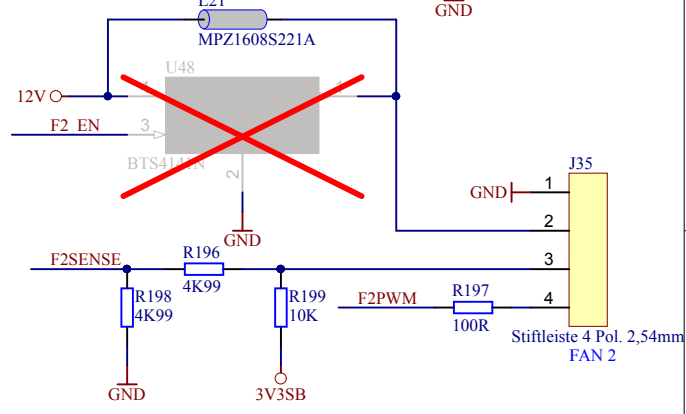
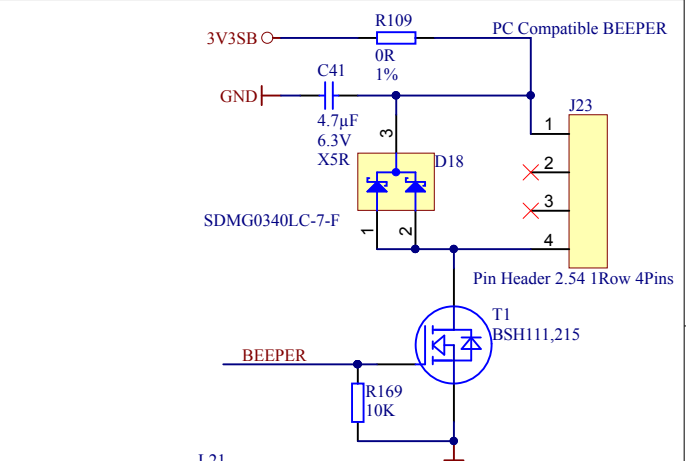
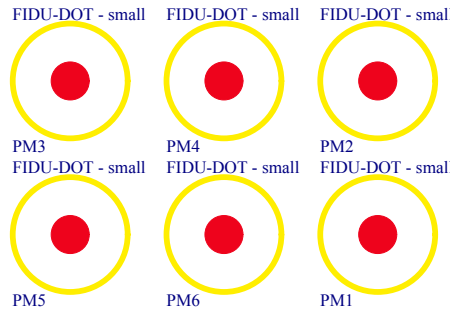
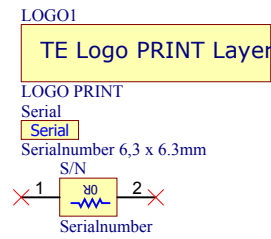
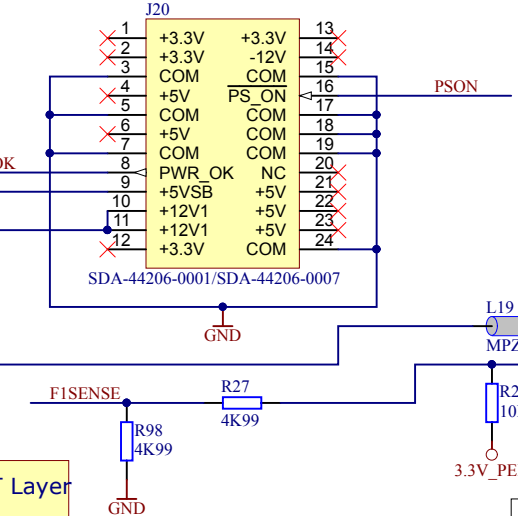
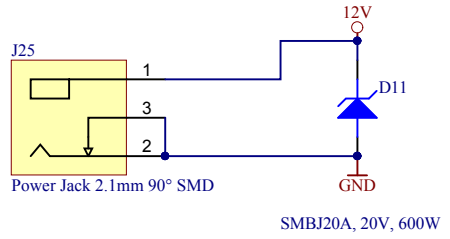
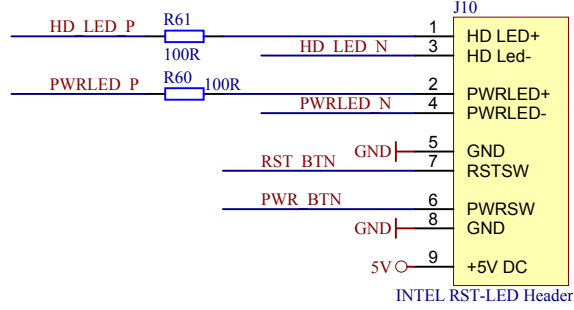
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U_B2B B2B.schdoc	U_DP_PS DP_PS.schdoc
U_USB3-HUB USB3-HUB.SchDoc	U_SATA SATA.schdoc
U_PClE PClE.schdoc	U_USB-CONN USB-CONN.schdoc
U_SFP SFP.schdoc	U_USB USB.schdoc
U_SC SC.schdoc	U_USB-PHY USB-PHY.SchDoc
U_SC2 SC2.schdoc	U_ETH-PHY ETH-PHY.SchDoc
U_PMOD PMODE.schdoc	U_I2C_system I2C_system.schdoc
U_XMOD XMOD.schdoc	U_CLK CLK.schdoc
U_Power_1 Power_1.schdoc	U_CLK_MUX CLK_MUX.schdoc
U_Power_2 Power_2.schdoc	U_SD SD.schdoc
U_Power_3 Power_3.schdoc	U_EMMC eMMC.SchDoc
U_Power_4 Power_4.schdoc	U_FIREFLY FireFly.SchDoc
U_FMC FMC.SchDoc	U_MISC MISC.schdoc
U_FMC PWR FMC PWR.SchDoc	U_Audio Audio.SchDoc
U_FMC MISC FMC MISC.SchDoc	U_BD BD.SchDoc
U_RC Revision_Changes.SchDoc	

INTEL Reset/LED Pinout



Title: TEBF0808 - Mini-ITX Top Sheet		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page1 of 36
Filename: TEBF0808.schdoc		

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U_J1
J1.schdoc
U_J2
J2.schdoc
U_J3
J3.schdoc
U_J4
J4.schdoc



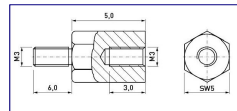
Washer M3



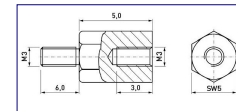
Serrated Washer M3



Nut M3



Distance Holder M3x5 Male/Female



Distance Holder M3x5 Male/Female



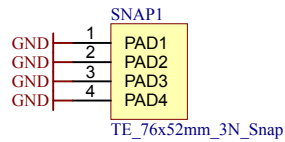
Washer M3



Serrated Washer M3



Nut M3



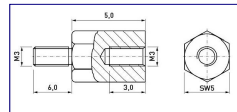
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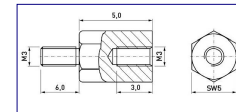
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Nut M3



Distance Holder M3x5 Male/Female



Distance Holder M3x5 Male/Female



Washer M3



Serrated Washer M3



Nut M3



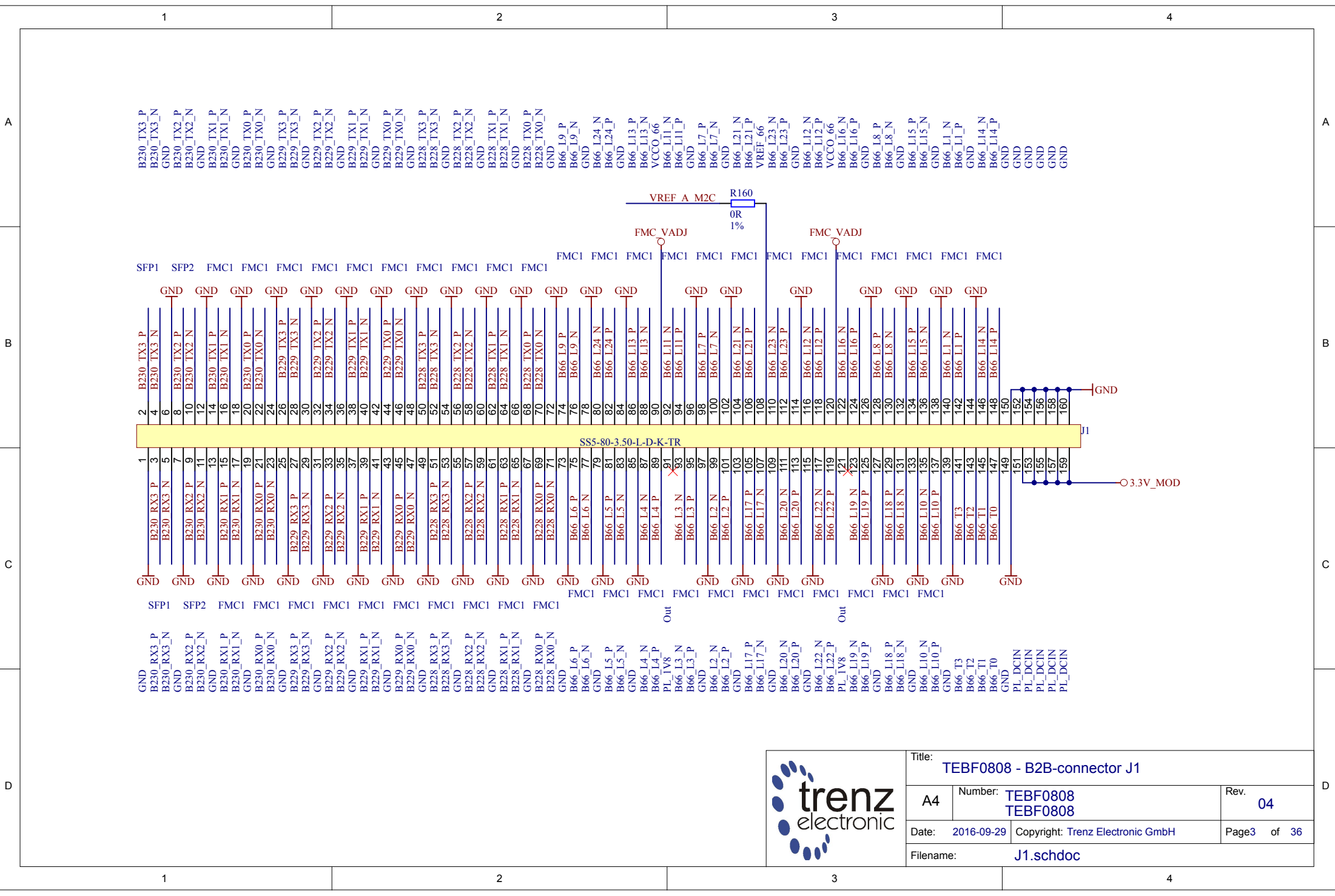
Title: TEBF0808 - B2B-connectors		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page2 of 36
Filename: B2B.schdoc		

1

2

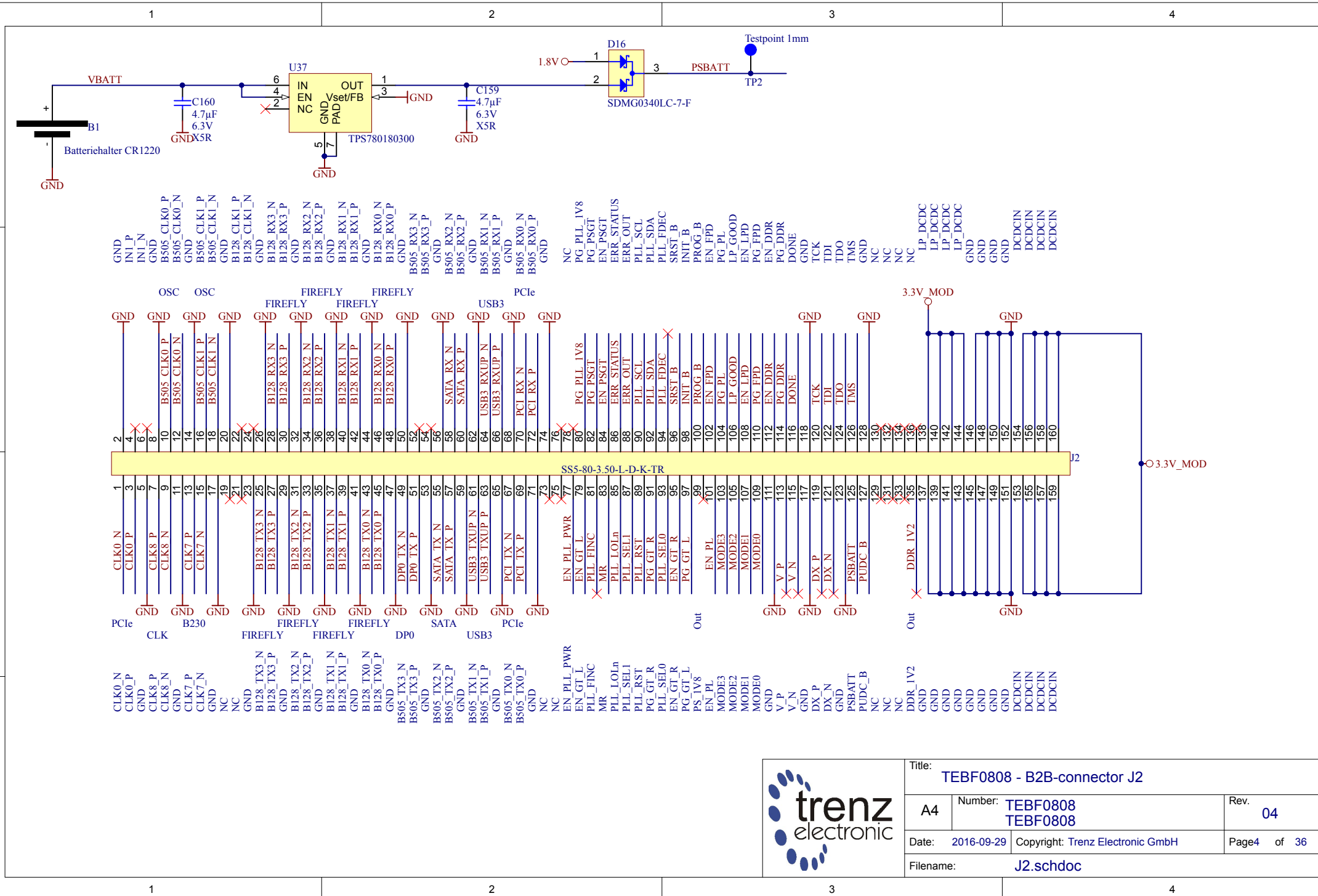
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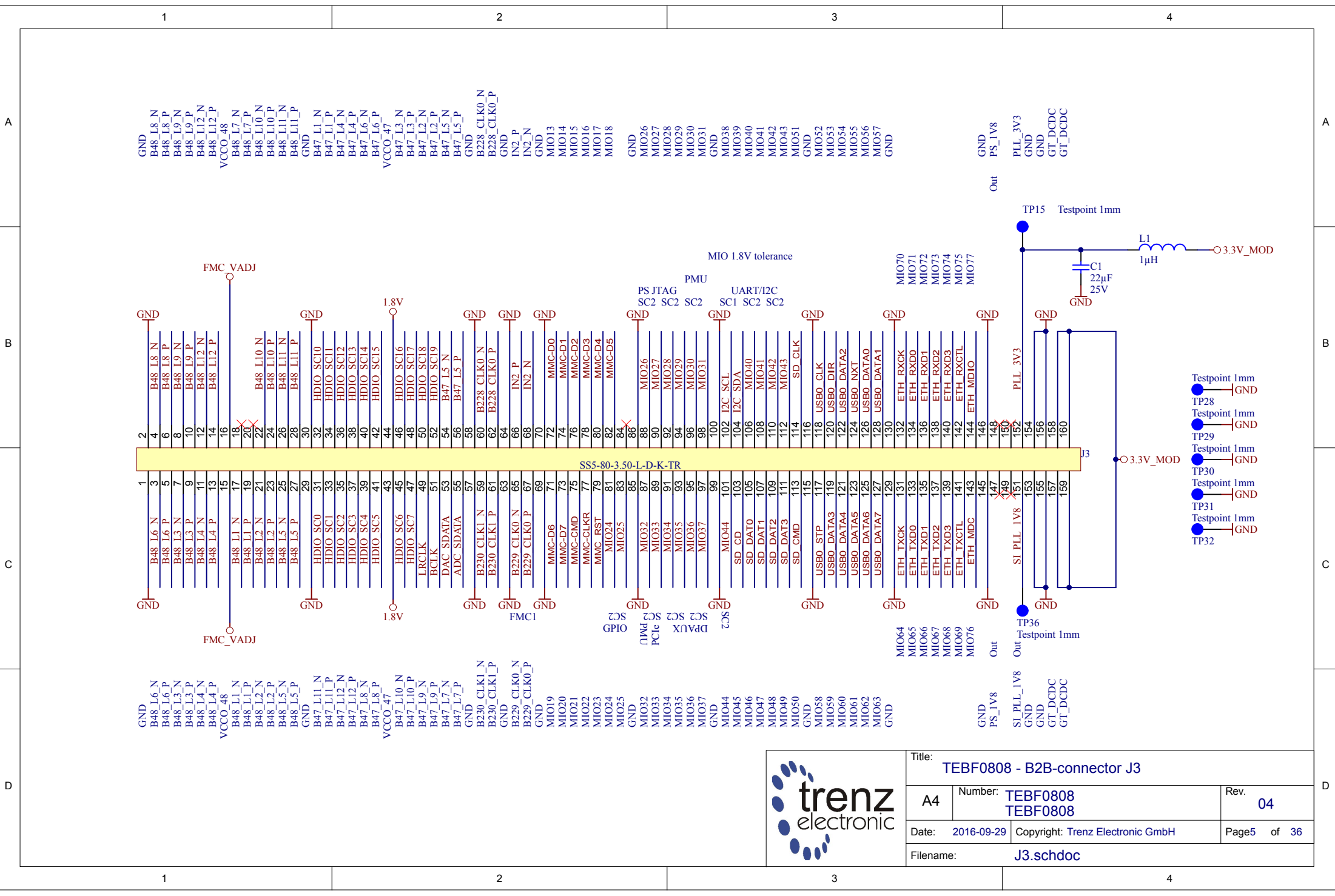


Title: **TEBF0808 - B2B-connector J1**

A4	Number: TEBF0808 TEBF0808	Rev. 04
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Filename: J1.schdoc		



Title: TEBF0808 - B2B-connector J2		
A4	Number: TEBF0808 TEBF0808	Rev. 04
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Filename: J2.schdoc		



Title: TEBF0808 - B2B-connector J3		
A4	Number: TEBF0808 TEBF0808	Rev. 04
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Filename: J3.schdoc		

A

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C

D

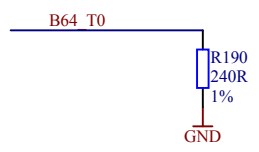
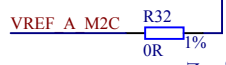
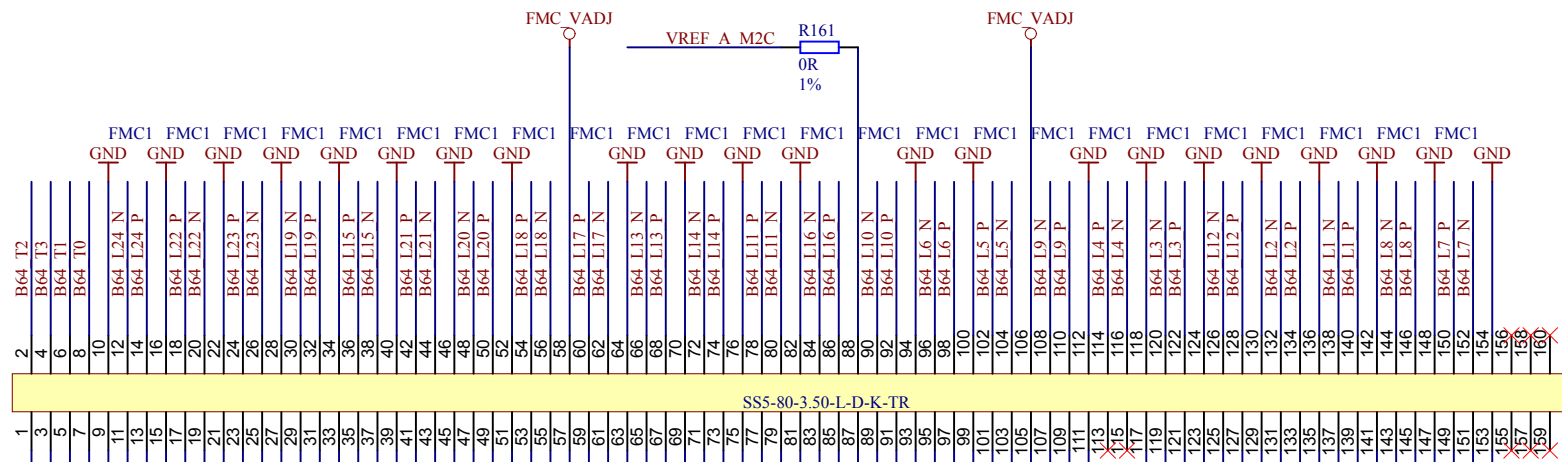
1

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B64_T2
B64_T3
B64_T1
B64_T0
GND
B64_L24_N
B64_L24_P
GND
B64_L22_P
B64_L22_N
GND
B64_L23_P
B64_L23_N
GND
B64_L19_N
B64_L19_P
GND
B64_L15_P
B64_L15_N
GND
B64_L21_P
B64_L21_N
GND
B64_L20_N
B64_L20_P
GND
B64_L18_P
B64_L18_N
VCCO_64
B64_L17_P
B64_L17_N
GND
B64_L13_N
B64_L13_P
GND
B64_L14_N
B64_L14_P
GND
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B64_L11_N
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B64_L1_P
GND
B64_L8_N
B64_L8_P
GND
B64_L7_P
B64_L7_N
GND
NC
NC
NC



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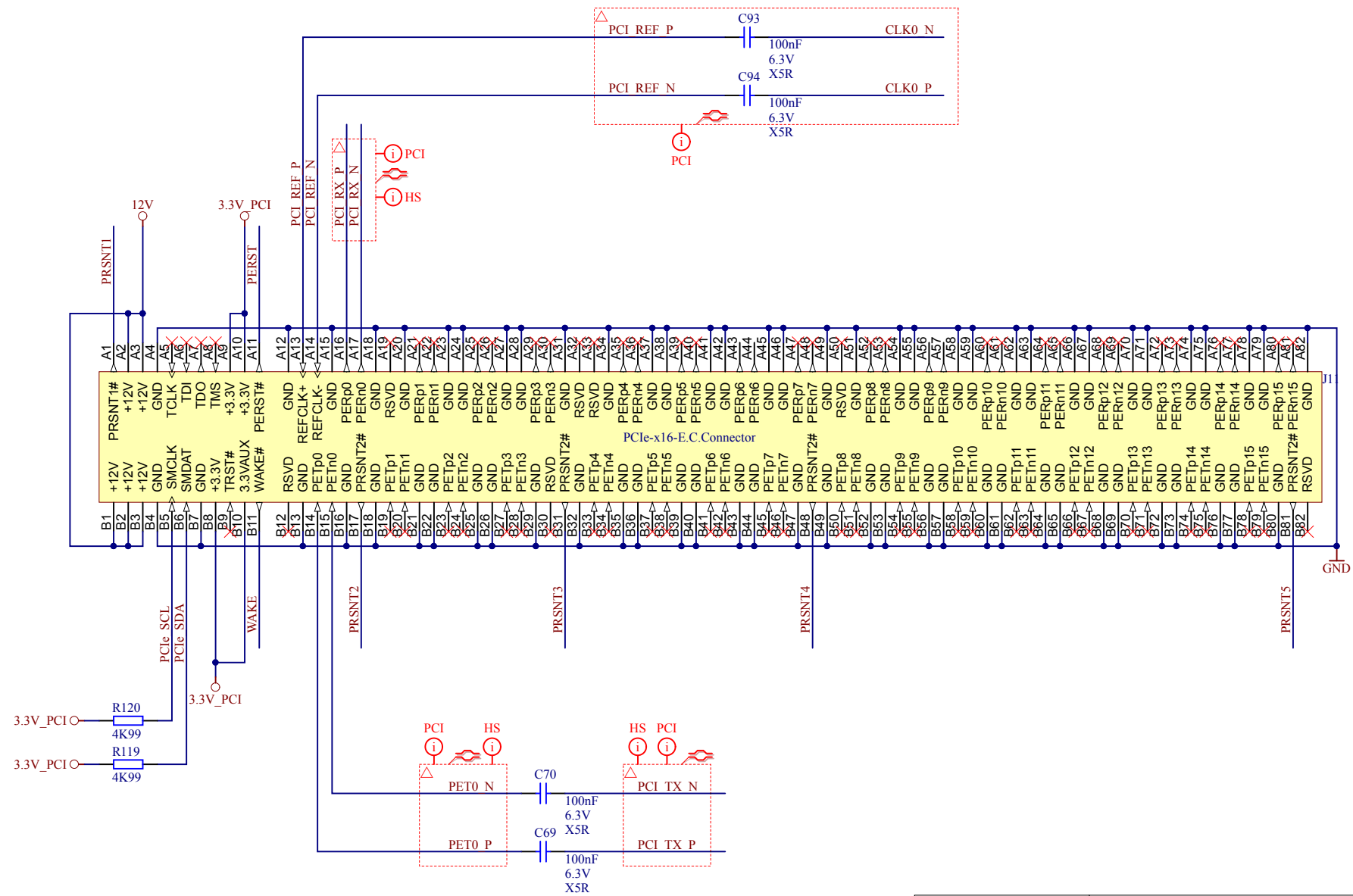
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C

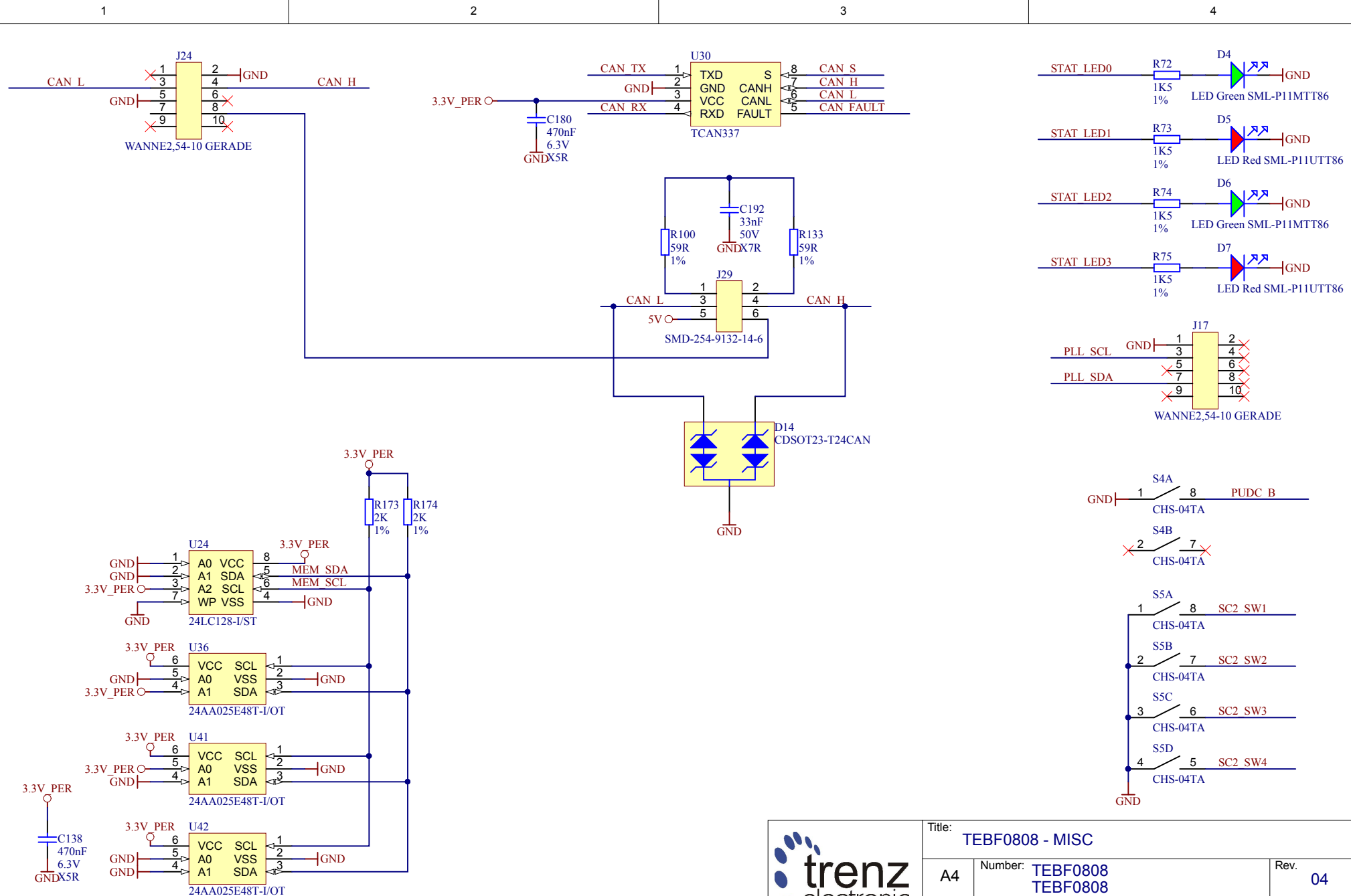
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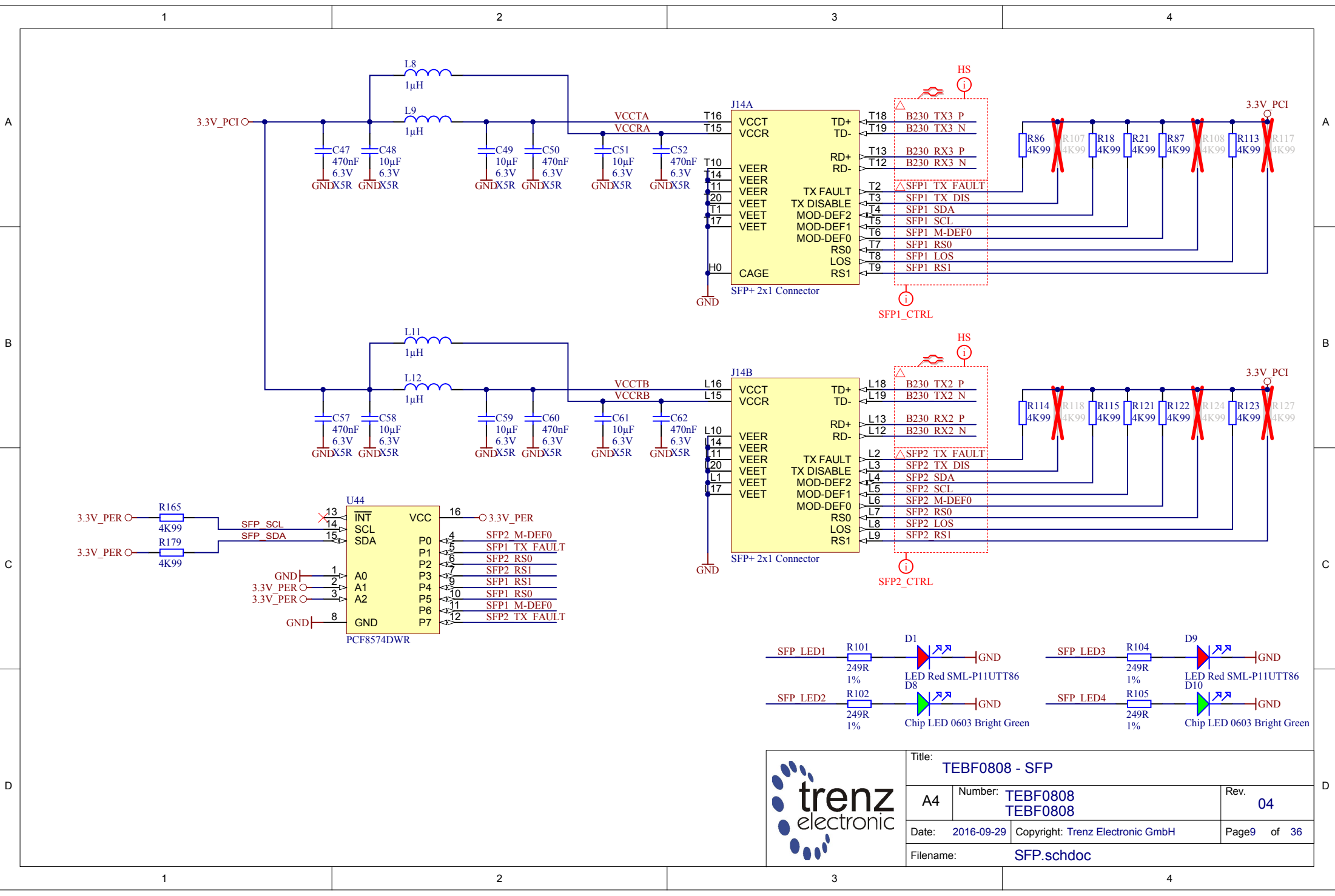
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Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page6 of 36
Filename: J4.schdoc		



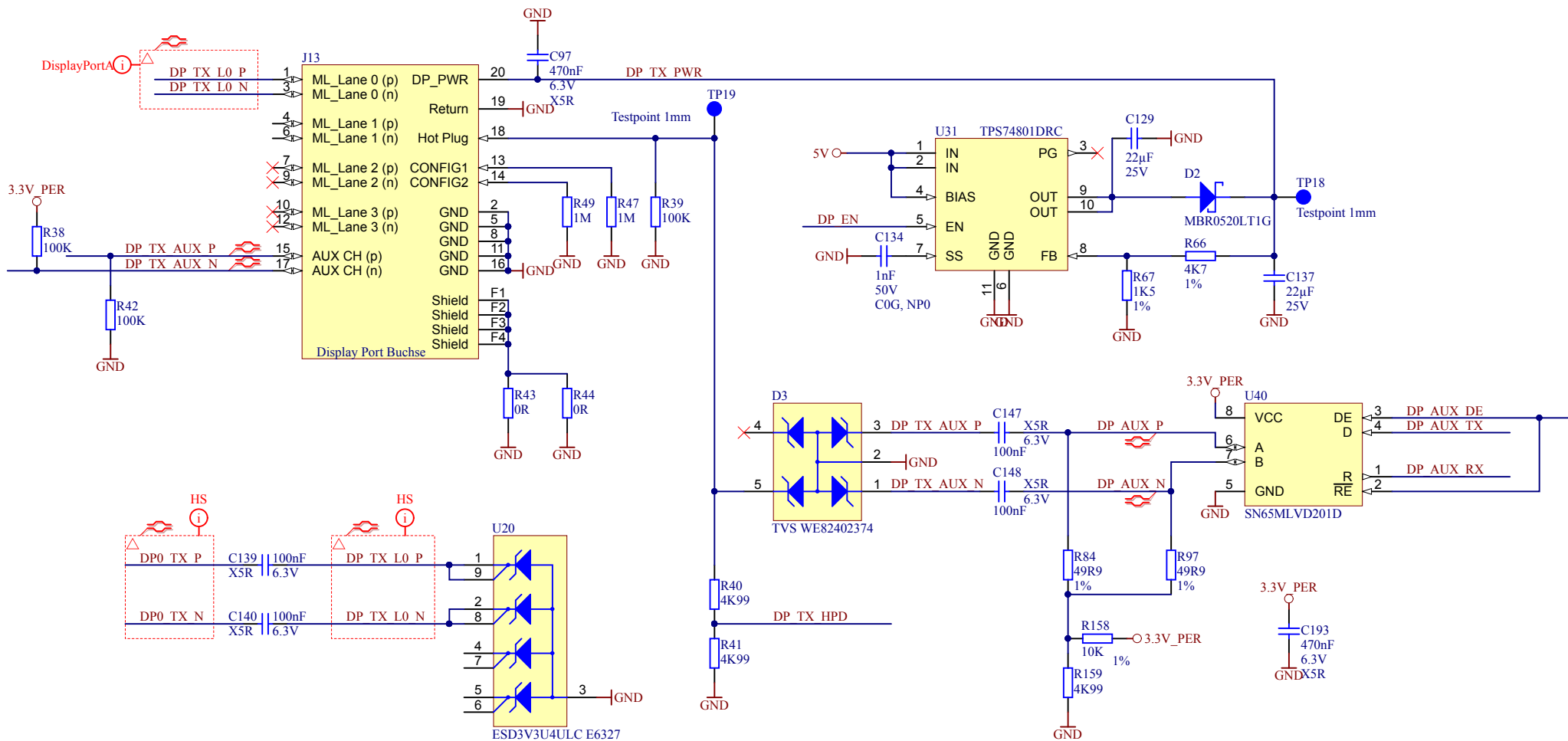
			Title: TEBF0808 - PCIe	
			A4	Number: TEBF0808 TEBF0808
Date: 2016-09-29		Copyright: Trenz Electronic GmbH		Page 7 of 36
Filename: PCIe.schdoc				




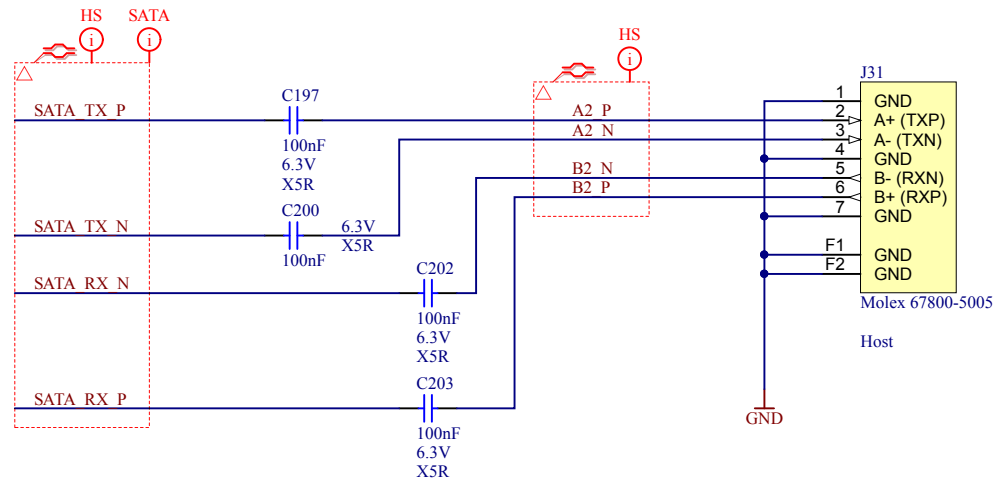
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A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 8 of 36
Filename: MISC.schdoc		




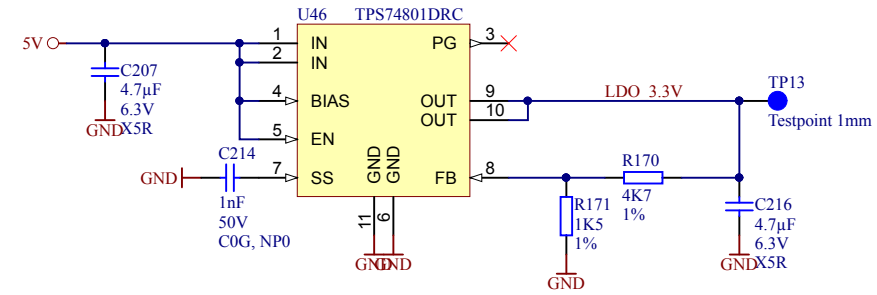
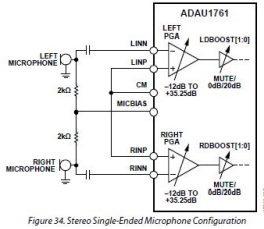
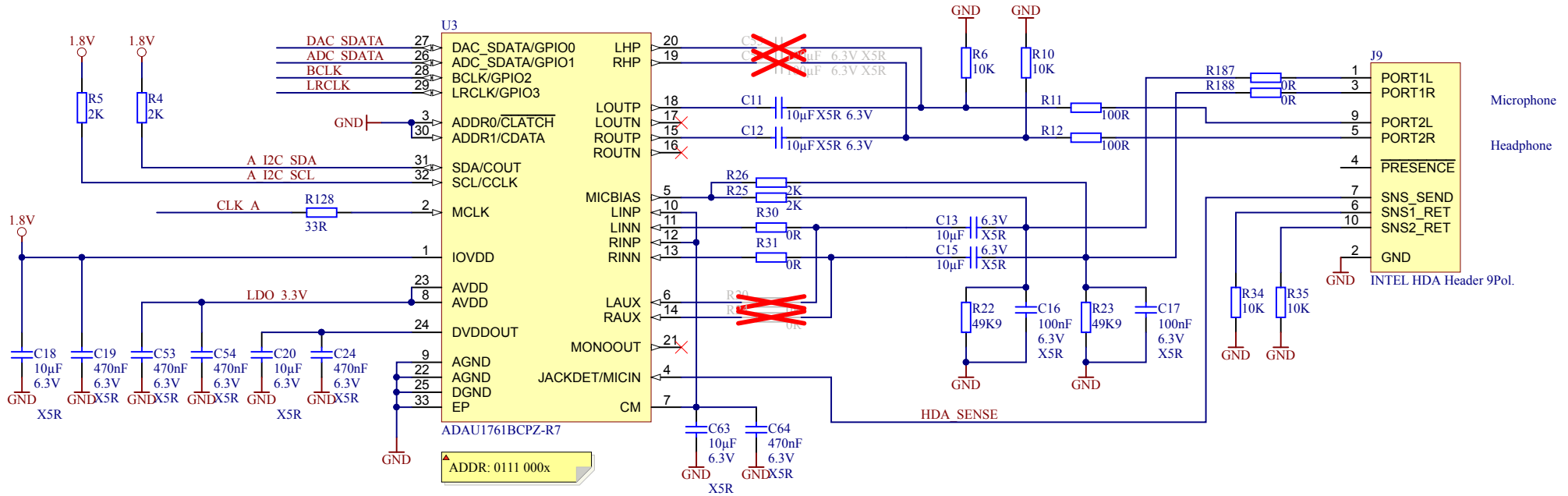
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	A4	Number: TEBF0808 TEBF0808
	Date: 2016-09-29	Copyright: Trenz Electronic GmbH
	Filename: SFP.schdoc	Rev. 04
		Page 9 of 36



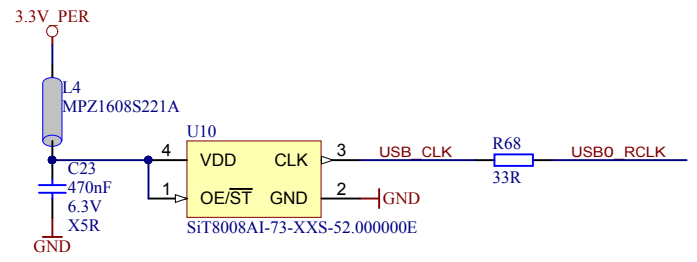
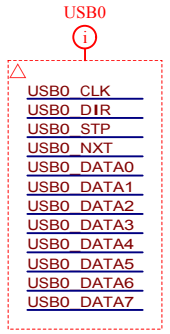
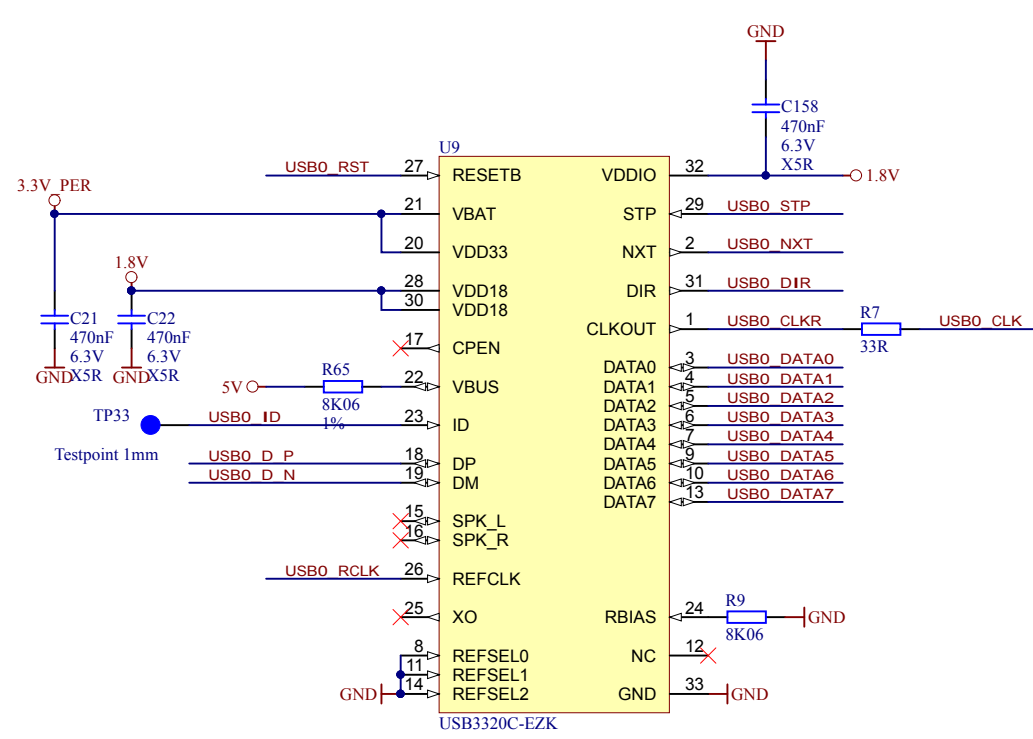
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	A4	Number: TEBF0808 TEBF0808	Rev. 04
	Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 10 of 36
	Filename: DP_PS.schdoc		



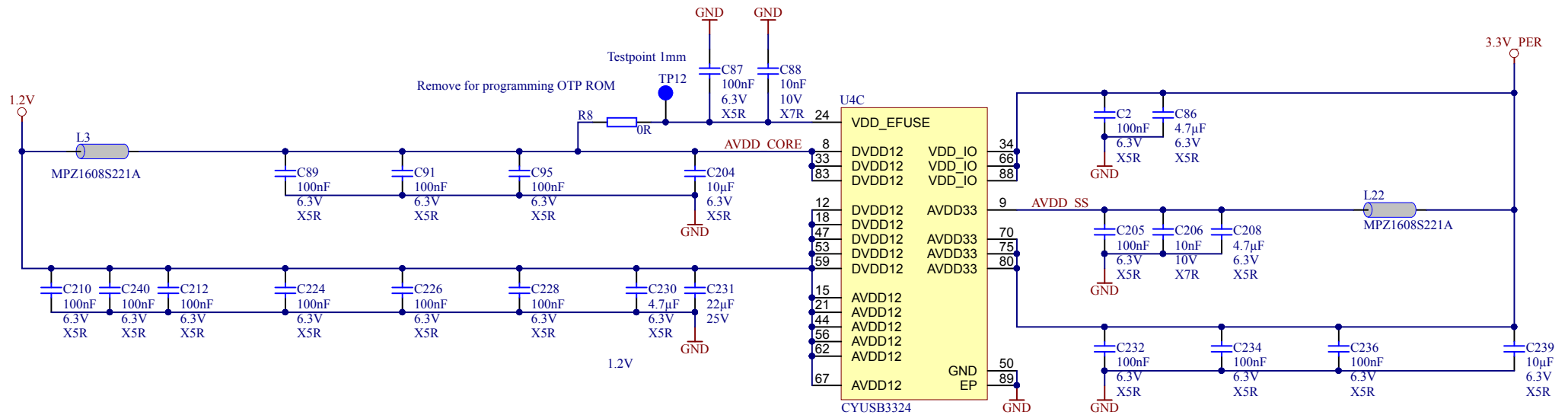
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	Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 11 of 36
	Filename: SATA.schdoc		




	Title: TEBF0808 - Audio	
	A4	Number: TEBF0808 TEBF0808
	Date: 2016-09-29	Copyright: Trenz Electronic GmbH
	Rev. 04	Page 12 of 36
Filename: Audio.SchDoc		



Title: TEBF0808 - USB		
A4	Number: TEBF0808 TEBF0808	Rev. 04
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Filename: USB-PHY.SchDoc		



		Title: TEBF0808 - USB	
		A4	Number: TEBF0808 TEBF0808
Date: 2016-09-29		Copyright: Trenz Electronic GmbH	
Page 14 of 36		Filename: USB.schdoc	

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A

A

B

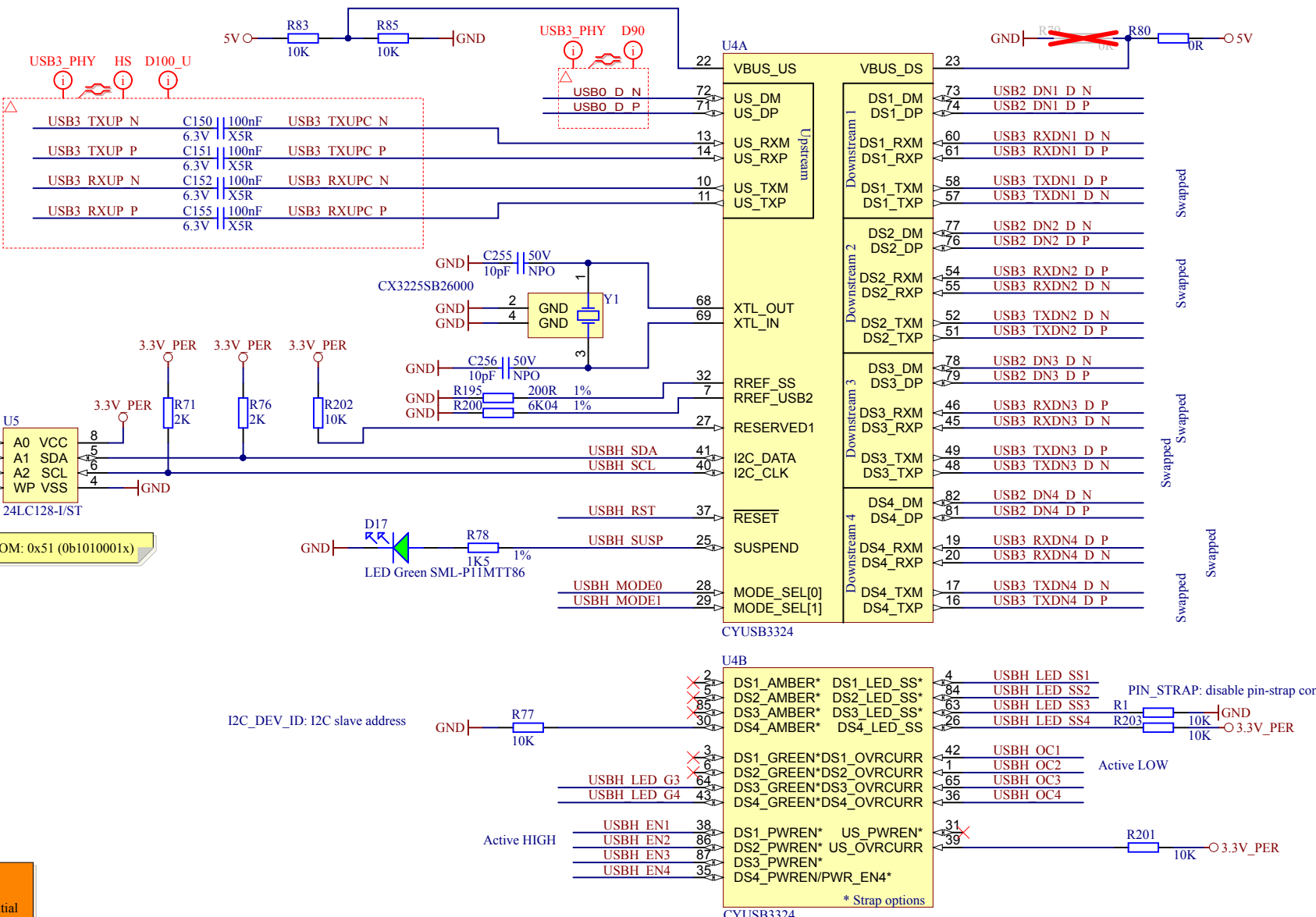
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C

C

D

D



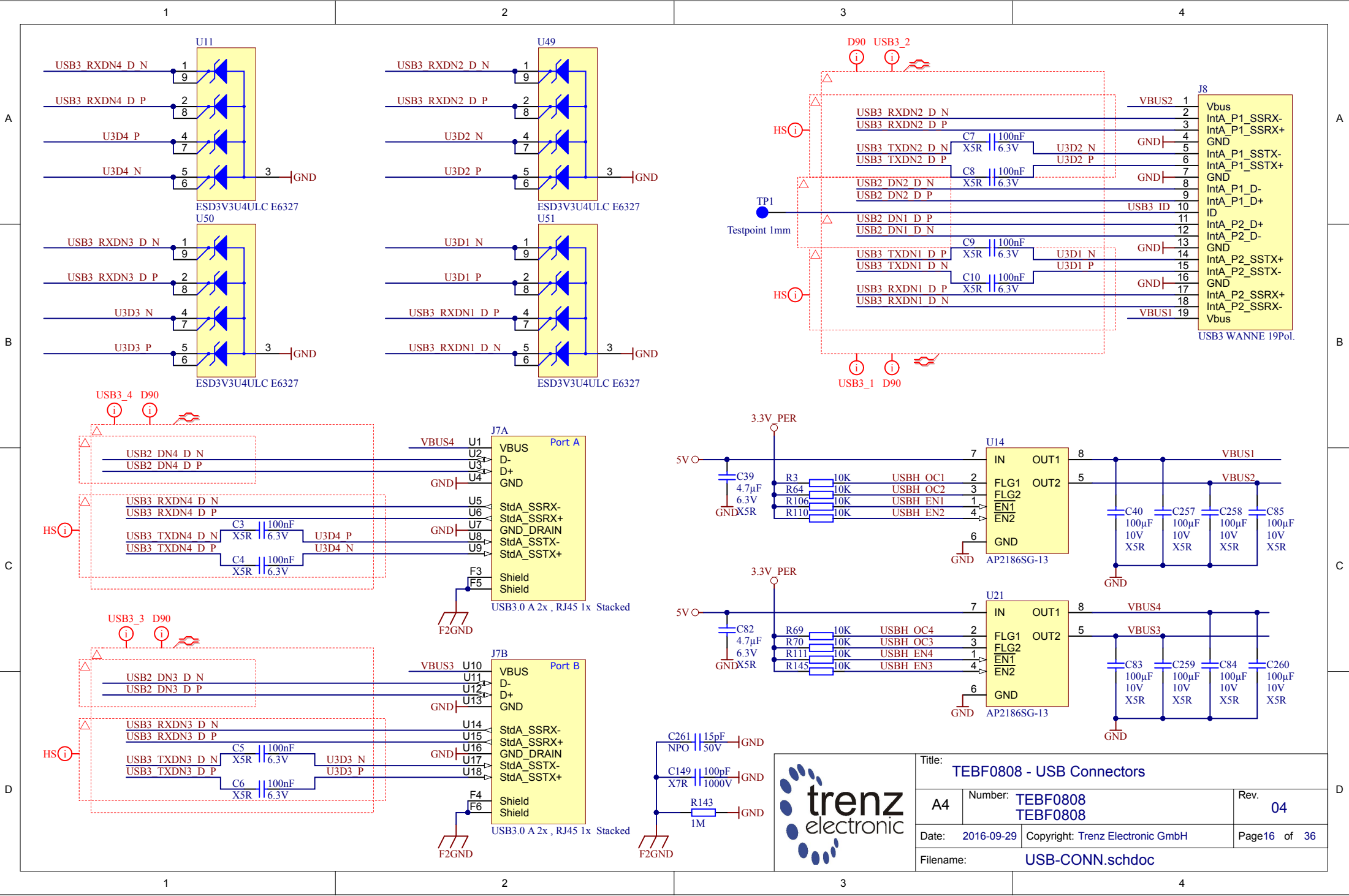
LAYOUT NOTES:
 Each member of a High-Speed differential pair should be no more than 1.25 mm
 Each member of a SuperSpeed differential pair should be no more than 0.13 mm

RESETN pin should be held LOW until both supplies become stable.

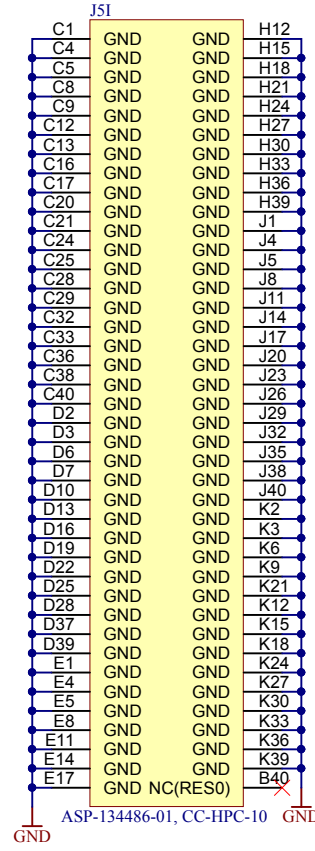
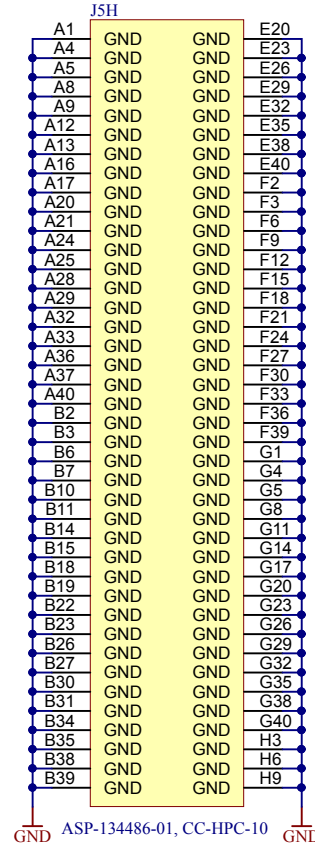
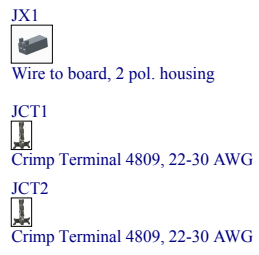
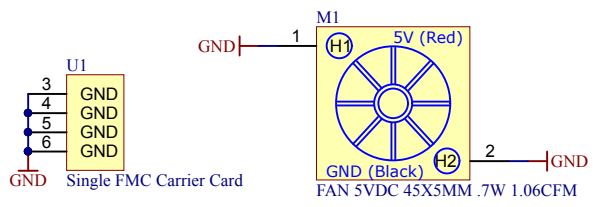
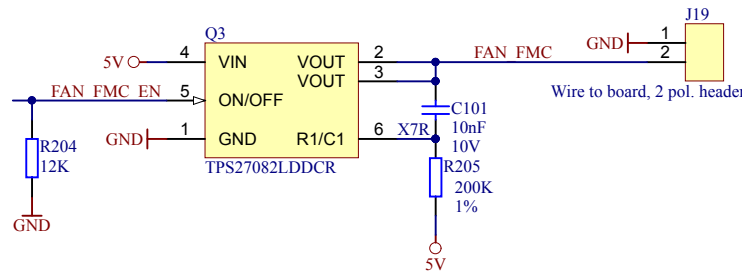
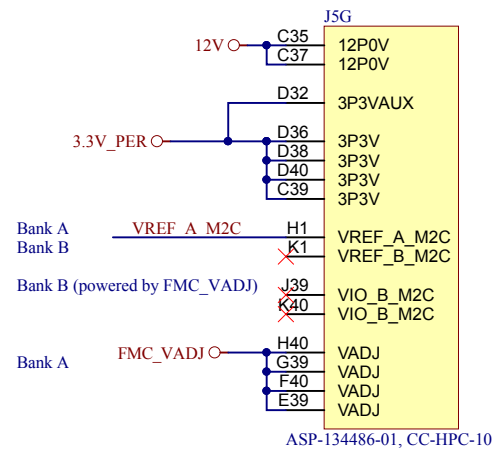
CLK: 0x60 (or 0x58)



Title: TEBF0808 - USB		
A4	Number: TEBF0808 TEBF0808	Rev. 04
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Title: TEBF0808 - USB Connectors		
A4	Number: TEBF0808 TEBF0808	Rev. 04
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Filename: USB-CONN.schdoc		



	Title: TEBF0808 - FMC		
	A4	Number: TEBF0808 TEBF0808	Rev. 04
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	Filename: FMC PWR.SchDoc		

A

A

B

B

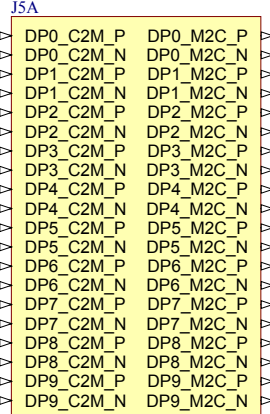
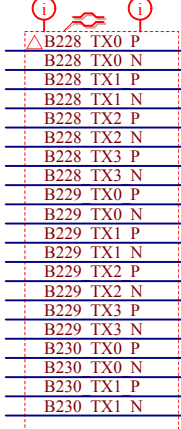
C

C

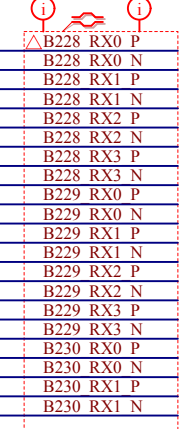
D

D

FMC_DP D100



FMC_DP D100

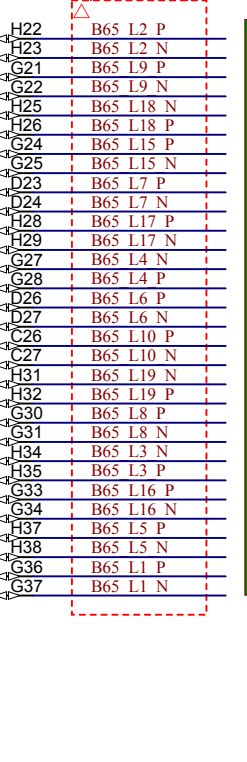
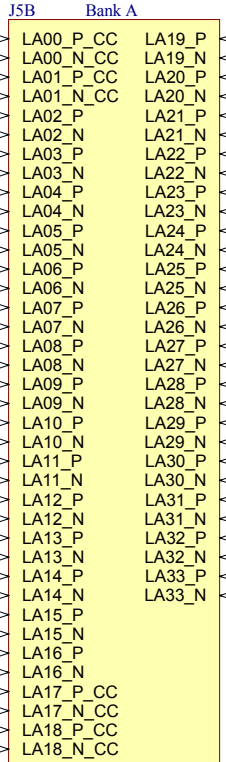
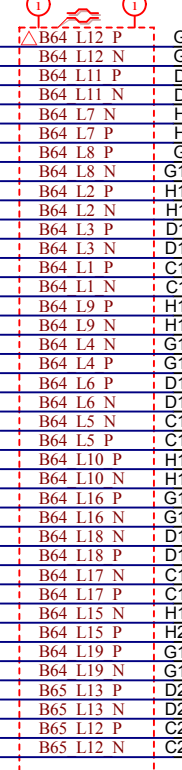


ASP-134486-01, CC-HPC-10

CLK1
CLK1
CLK1
CLK1

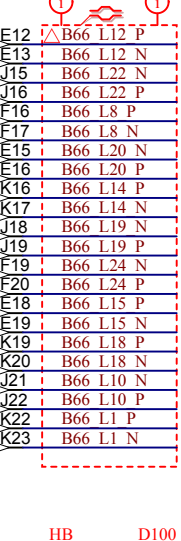
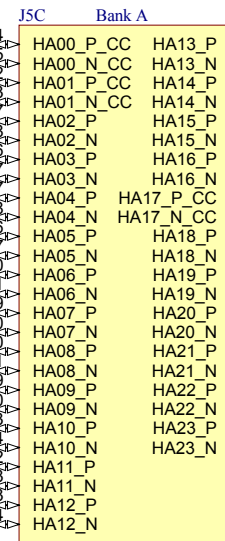
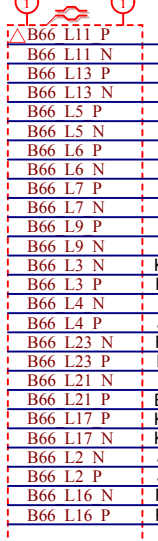


LA D100



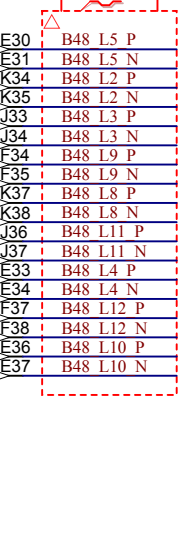
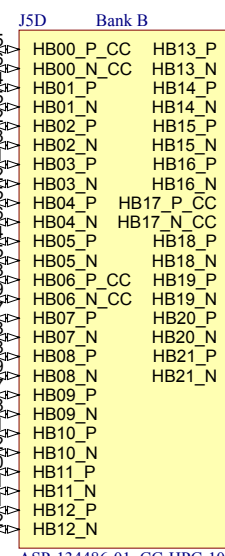
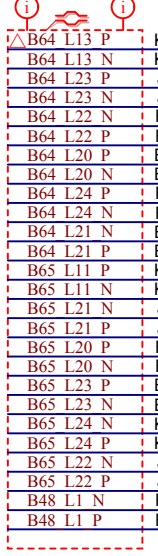
ASP-134486-01, CC-HPC-10

HA D100



ASP-134486-01, CC-HPC-10

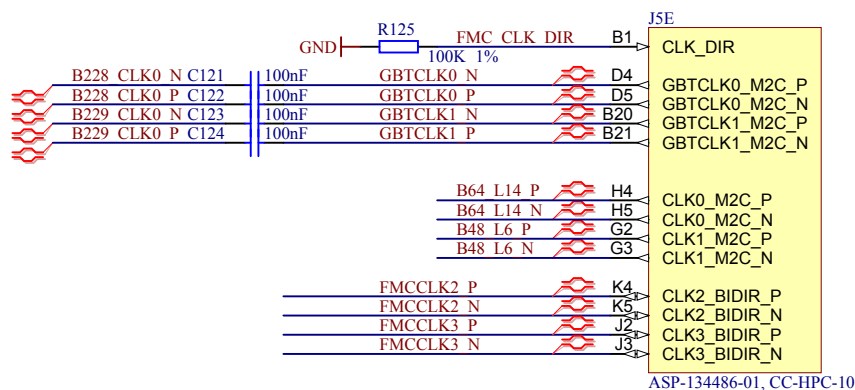
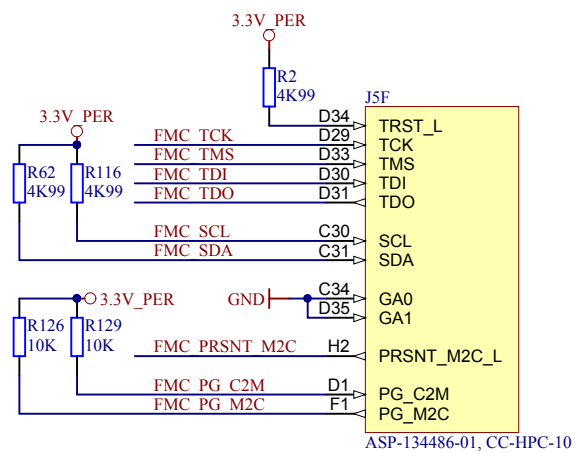
HB D100



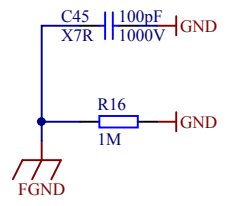
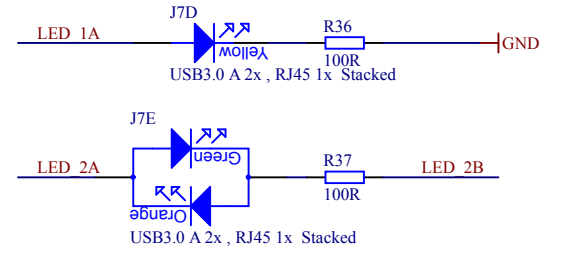
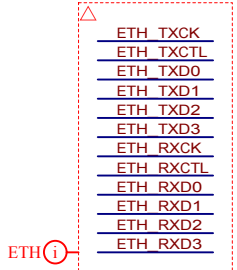
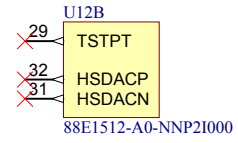
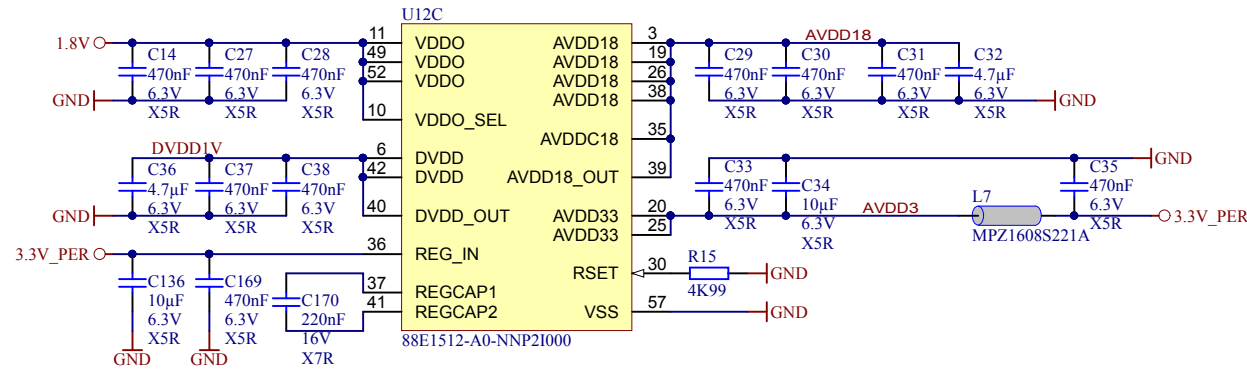
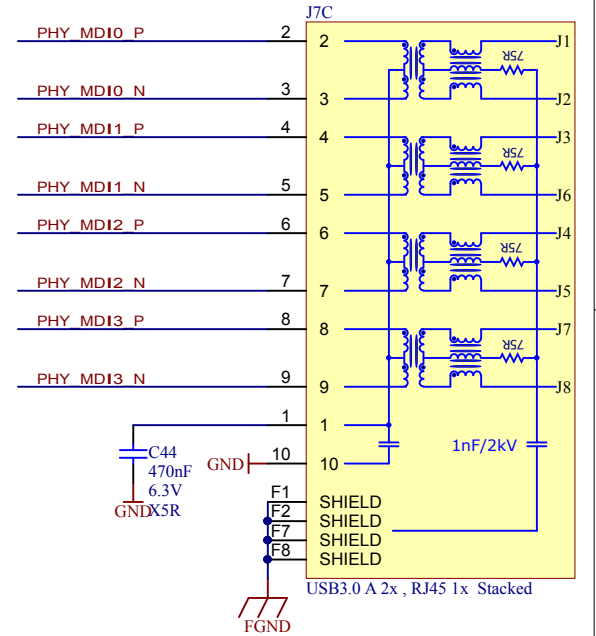
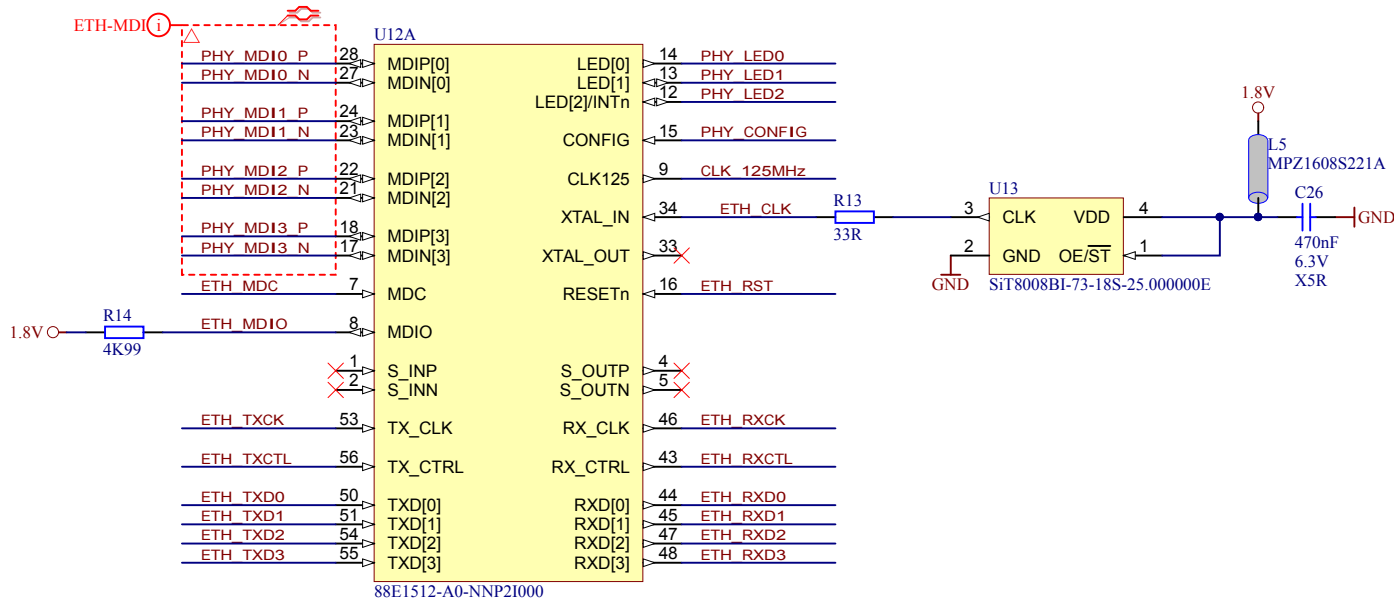
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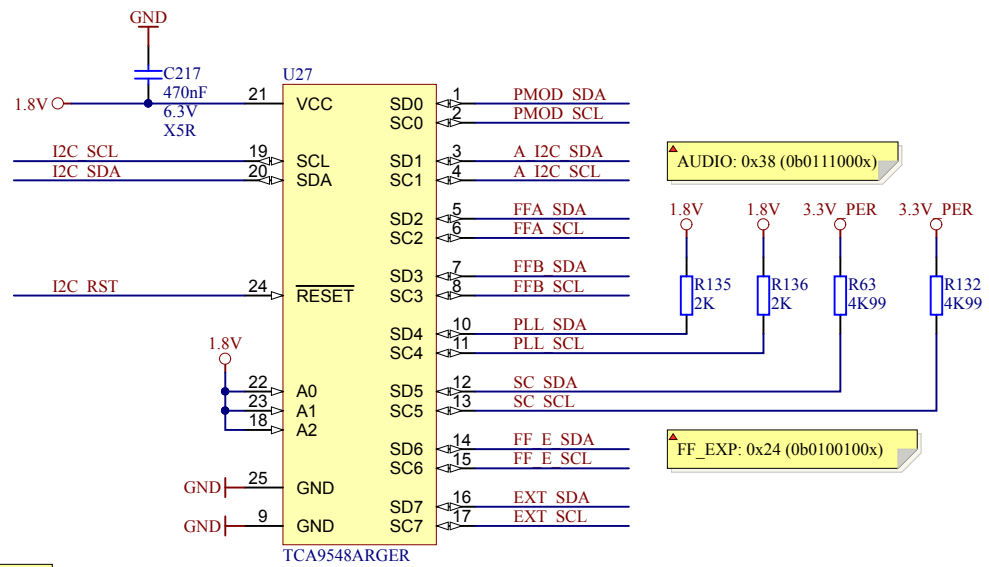
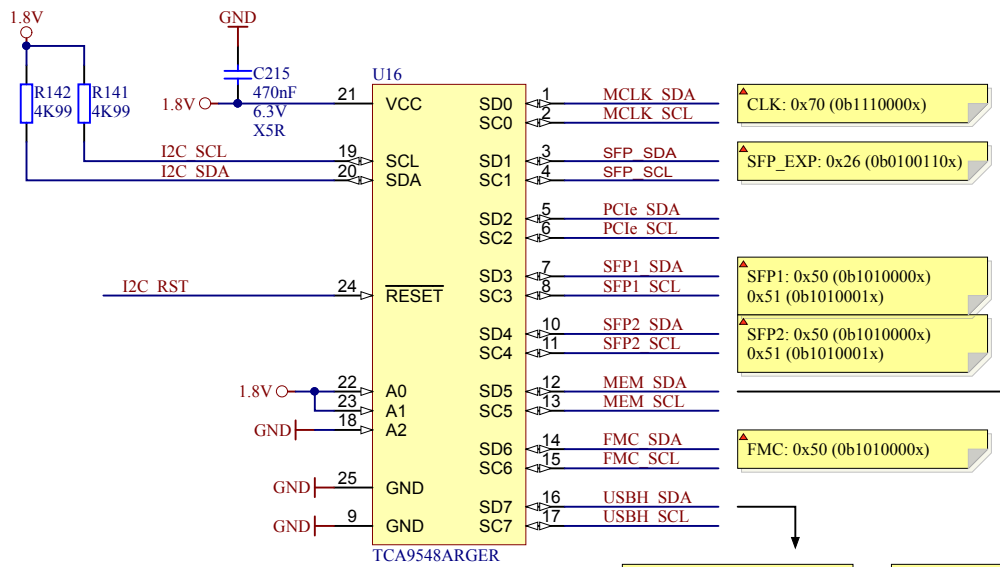
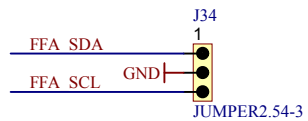
Title: TEBF0808 - FMC		
A4	Number: TEBF0808 TEBF0808	Rev. 04
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Filename: FMC_SchDoc		



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	Filename: FMC_MISC.SchDoc		




			Title: TEBF0808 - ETHERNET	
			A4	Number: TEBF0808 TEBF0808
Date: 2016-09-29		Copyright: Trenz Electronic GmbH		Page 20 of 36
Filename: ETH-PHY.SchDoc				



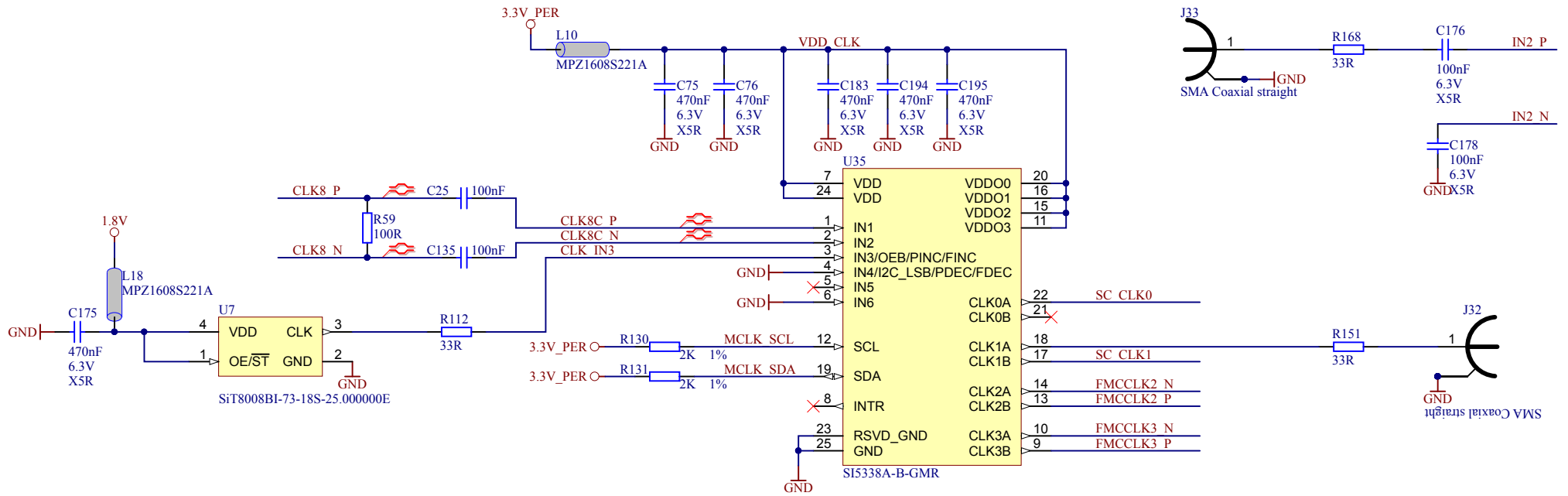
▲ ADDR: 0x73 (0b1110011x)


- ▲ USB:
- ▲ EEPROM: 0x51 (0b1010001x)
- ▲ EEPROM: 0x52 (0b1010010x)
- ▲ EEPROM: 0x54 (0b1010100x)
- ▲ EXP: 0x27 (0b0100111x)

▲ ADDR: 0x77 (0b1110111x)



Title: TEBF0808 - I2C System		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page21 of 36
Filename: I2C_system.schdoc		



			Title: TEBF0808 - CLK	
			A4	Number: TEBF0808 TEBF0808
Date: 2016-09-29		Copyright: Trenz Electronic GmbH		Page22 of 36
Filename: CLK.schdoc				

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A

A

B

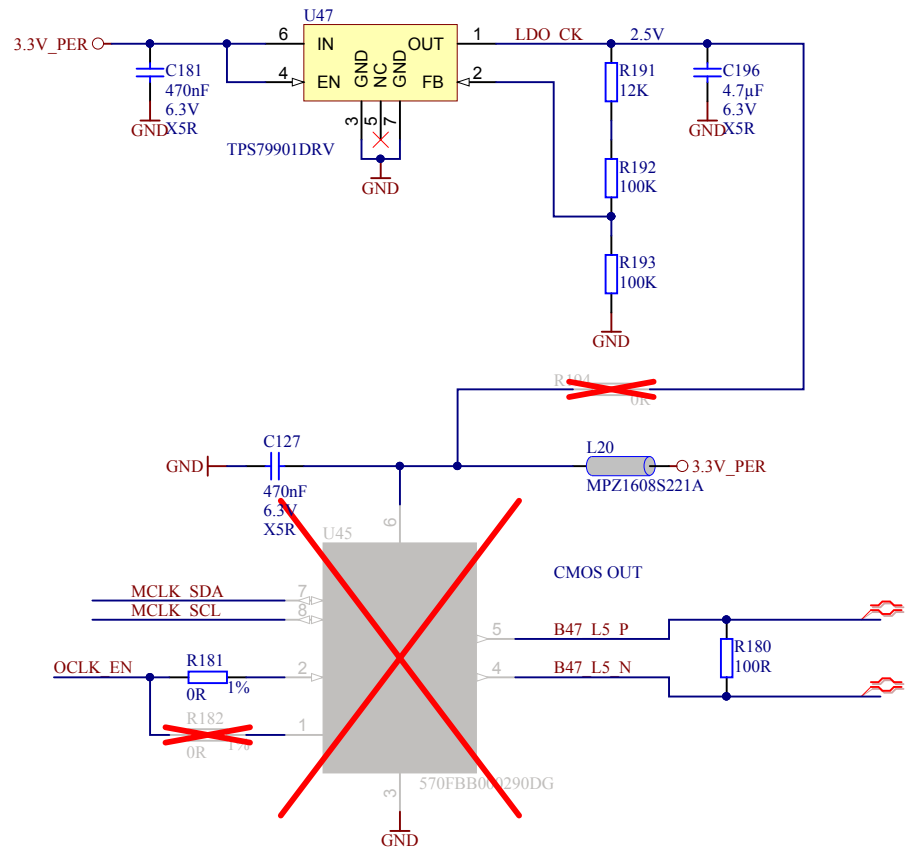
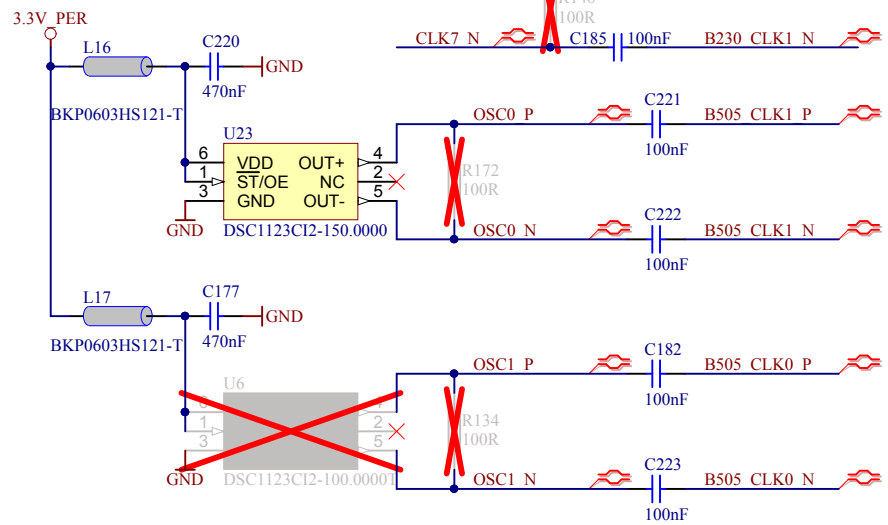
B


C

C

D

D



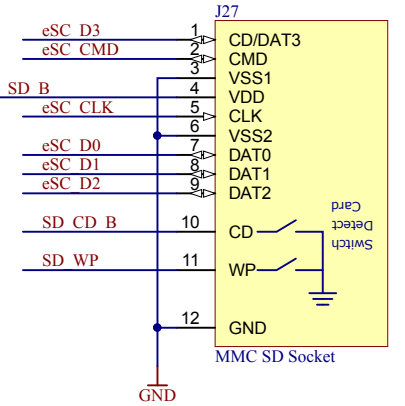
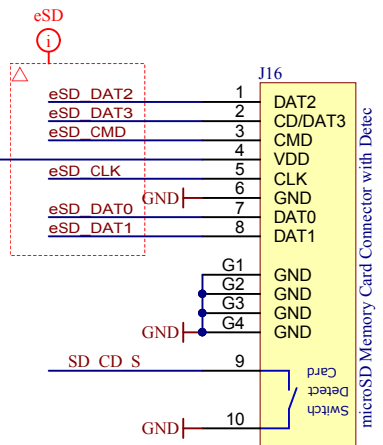
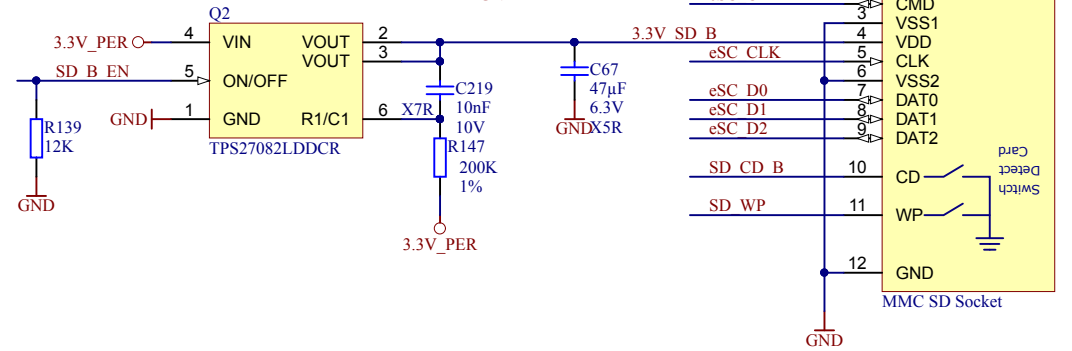
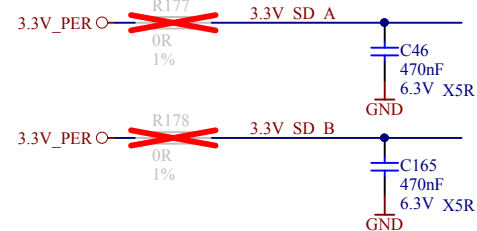
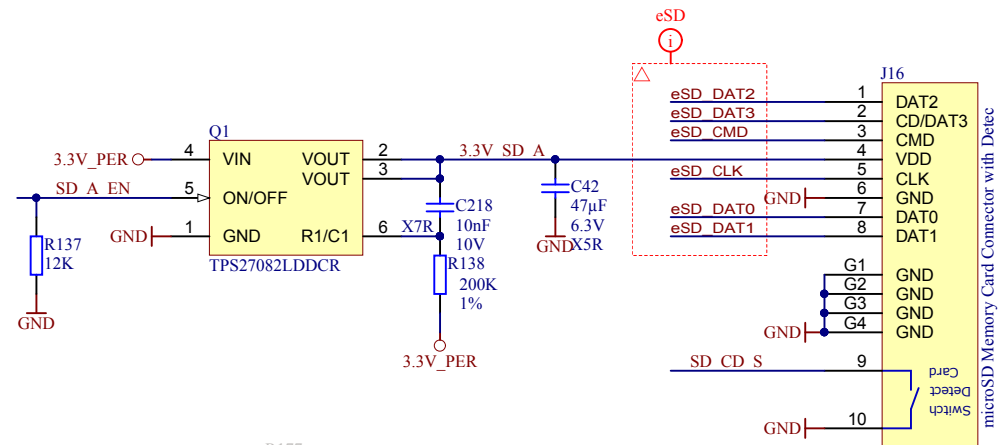
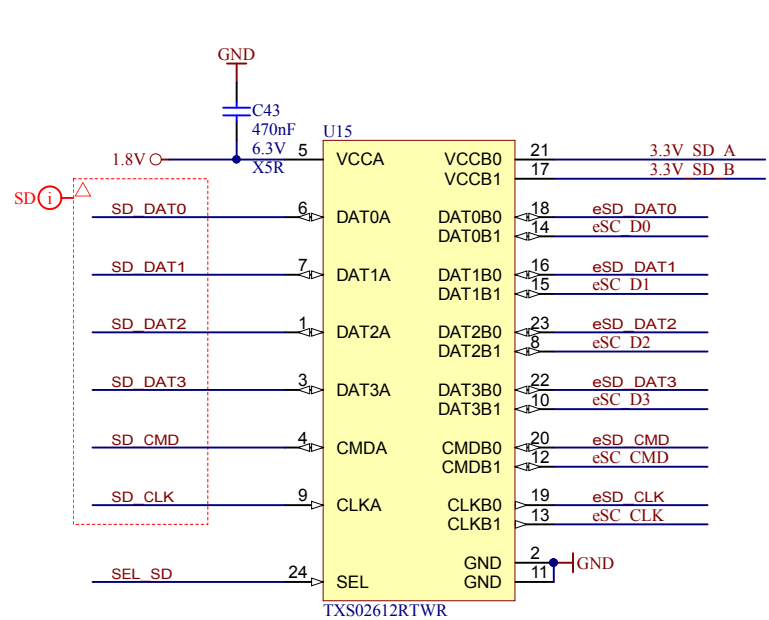
	Title: TEBF0808 - CLK		
	A4	Number: TEBF0808 TEBF0808	Rev. 04
	Date: 07.05.2019	Copyright: Trenz Electronic GmbH	Page 23 of 36
	Filename: CLK_MUX.schdoc		

1

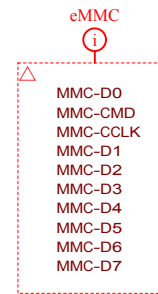
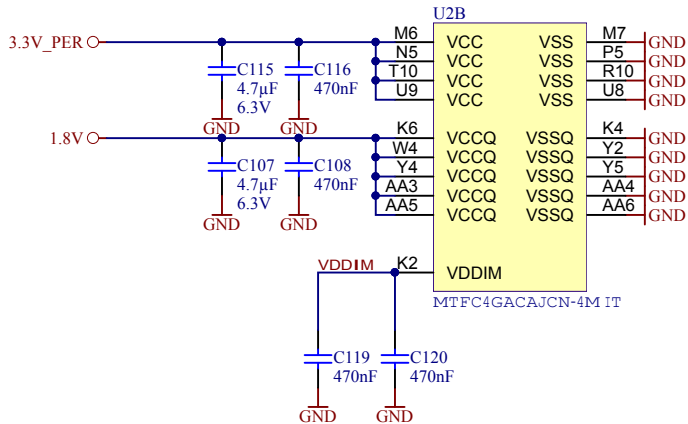
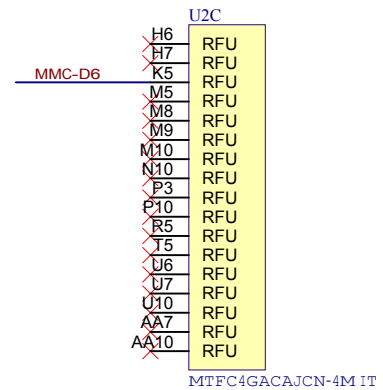
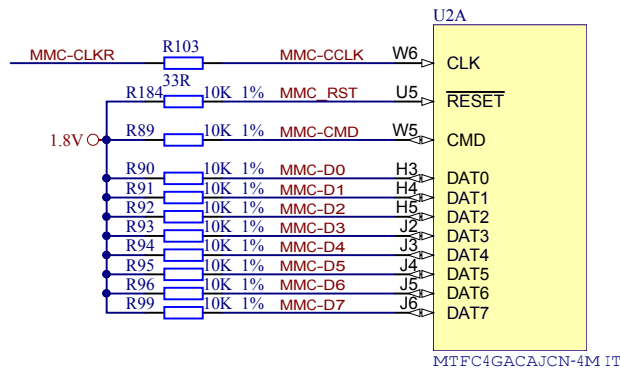
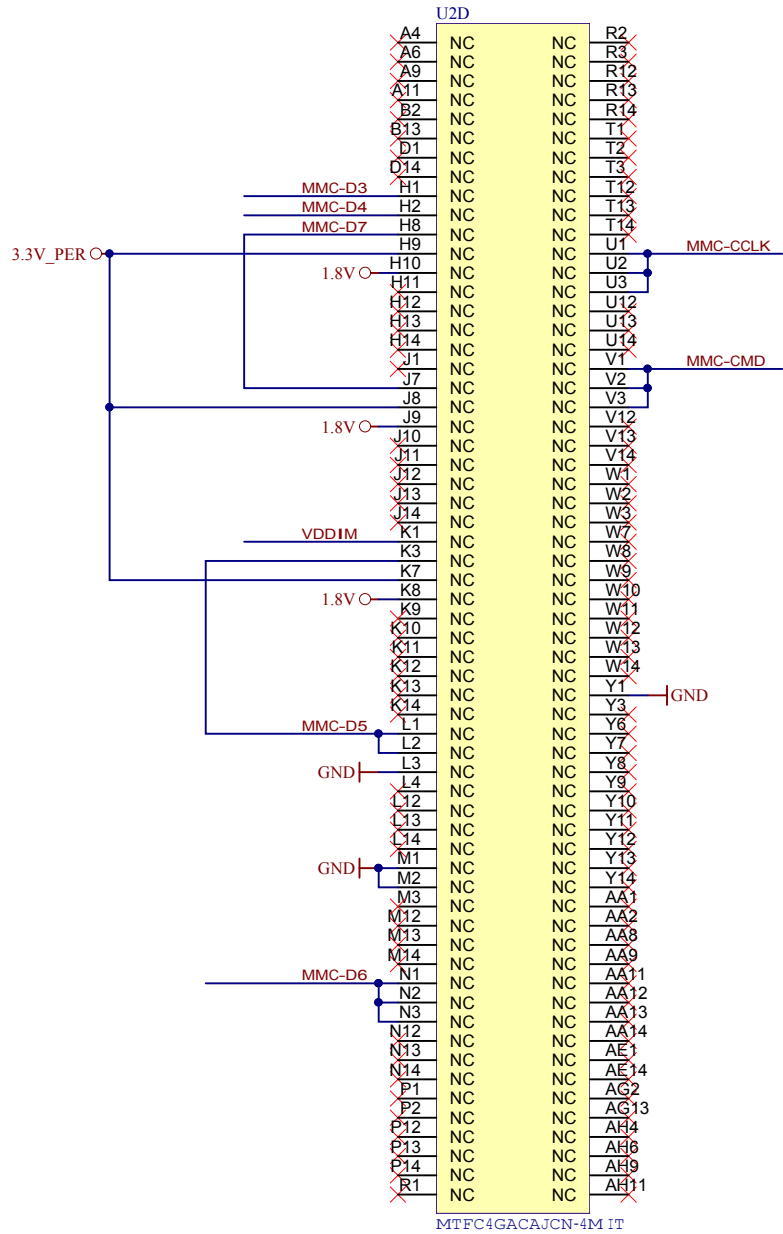
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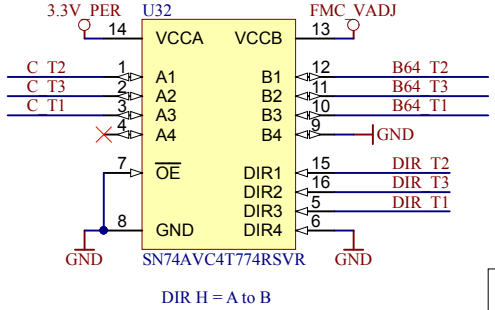
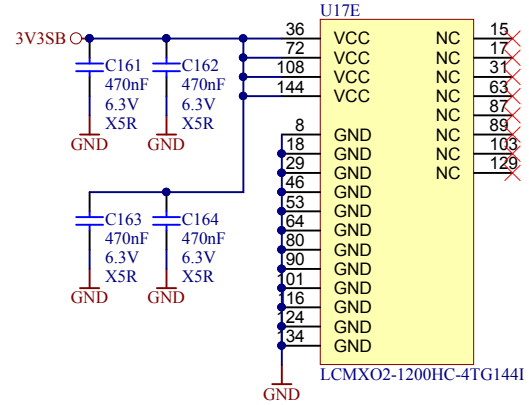
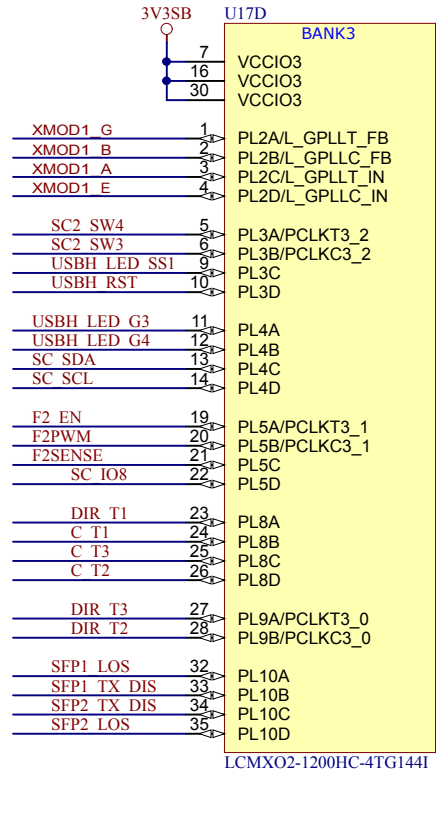
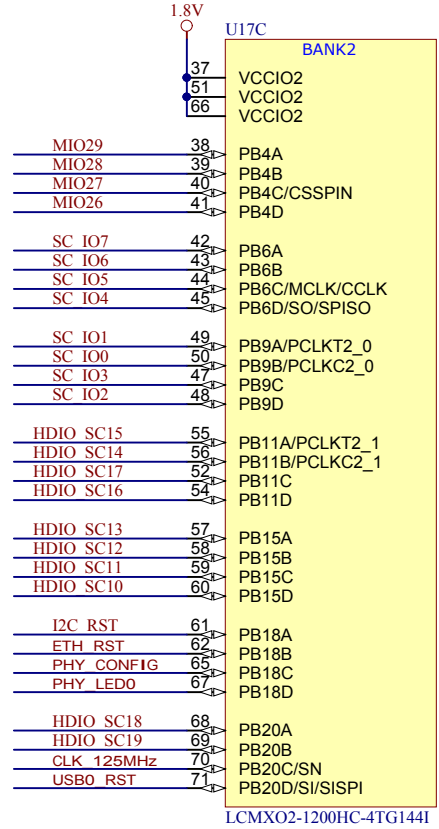
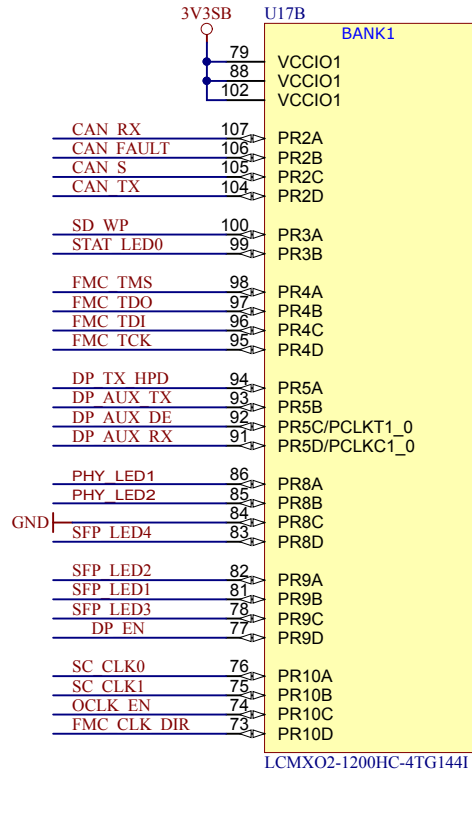
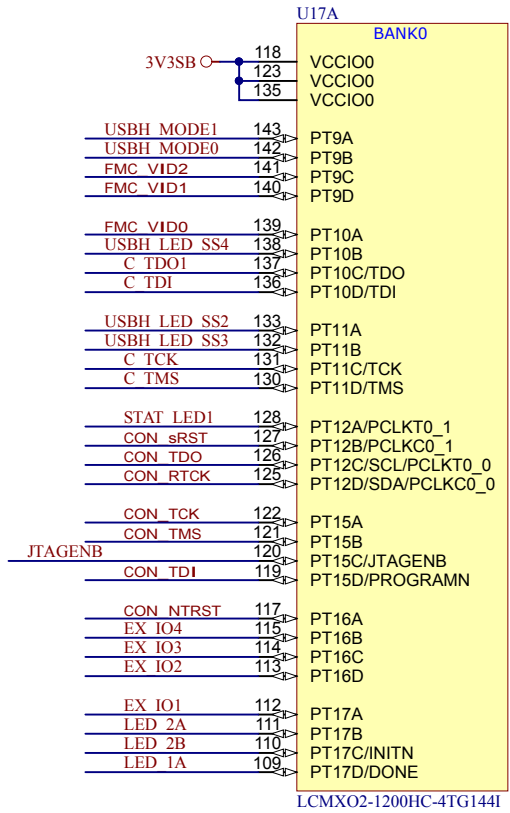
		Title: TEBF0808 - SD	
		A4	Number: TEBF0808 TEBF0808
Date: 2016-09-29		Copyright: Trenz Electronic GmbH	
Filename: SD.schdoc		Page 24 of 36	




LAYOUT NOTES:
 Signal trace length skew constraints
 - Mismatch within DAT0DAT7 < 250 mil
 - CLK to DAT0-7 mismatch < 250 mil
 - CLK to CMD mismatch < 250 mil
 - CLK to RST_N mismatch < 1000 mil



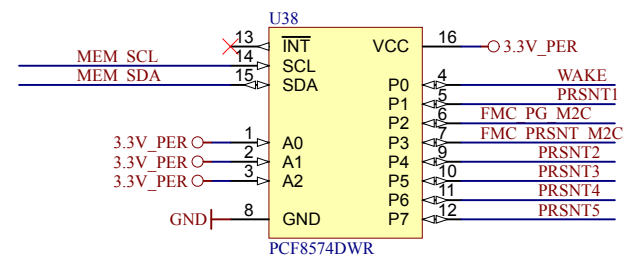
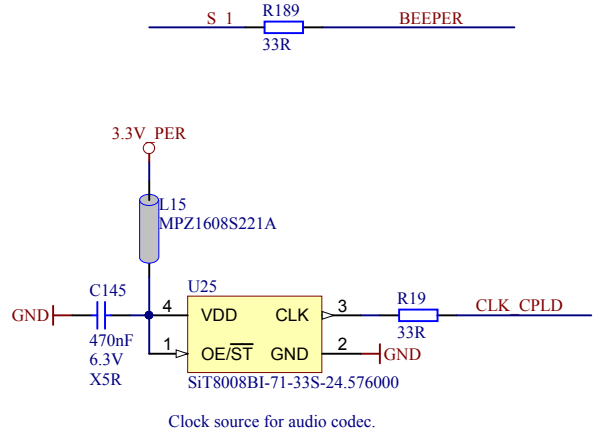
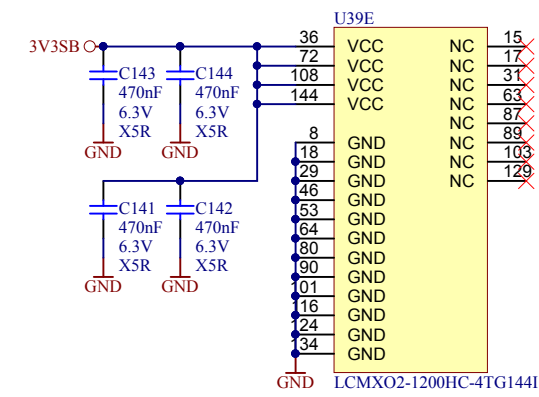
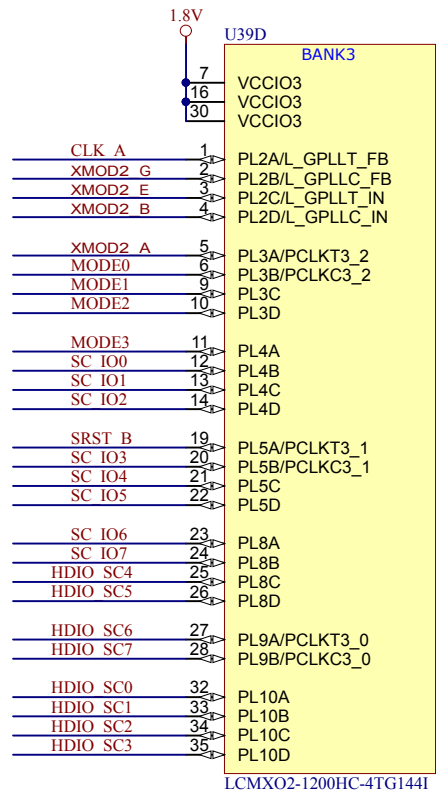
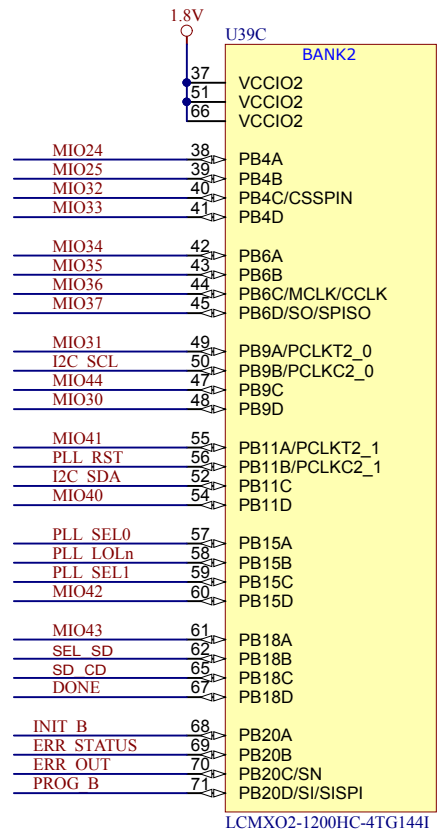
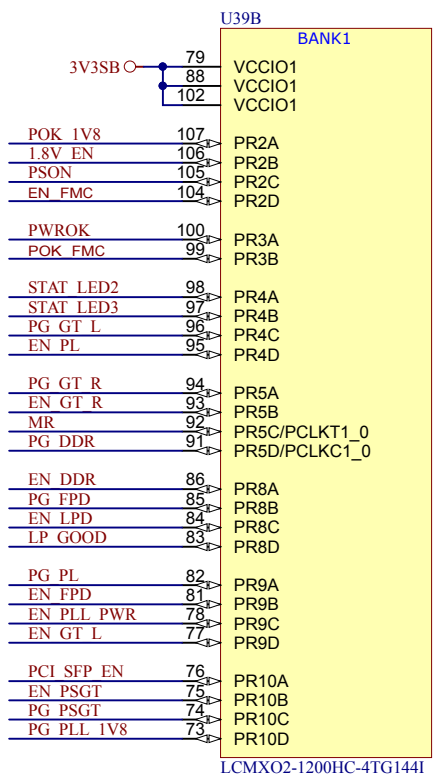
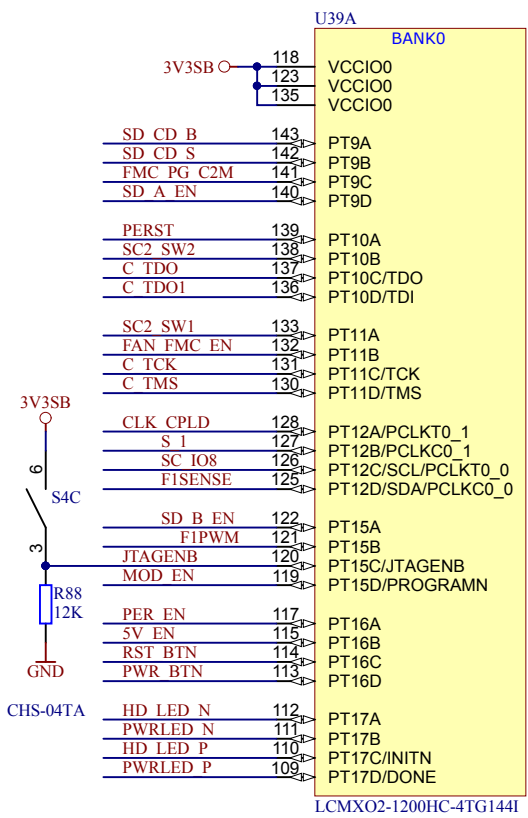
Title: TEBF0808 - eMMC		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 25 of 36
Filename: eMMC.SchDoc		



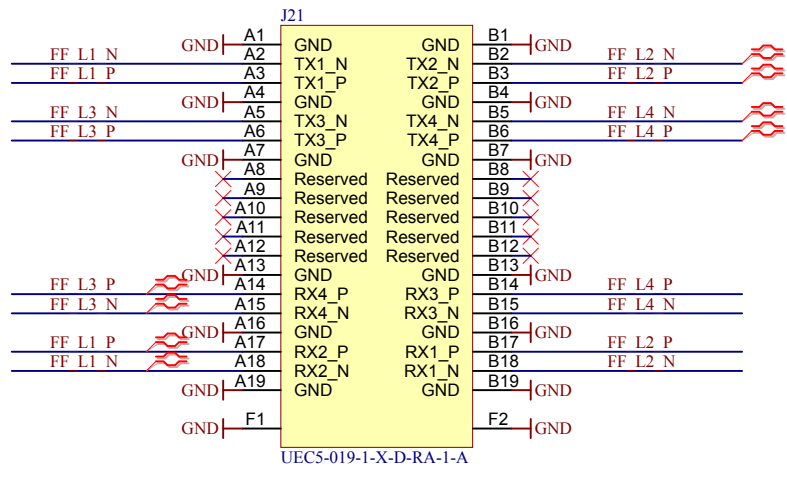
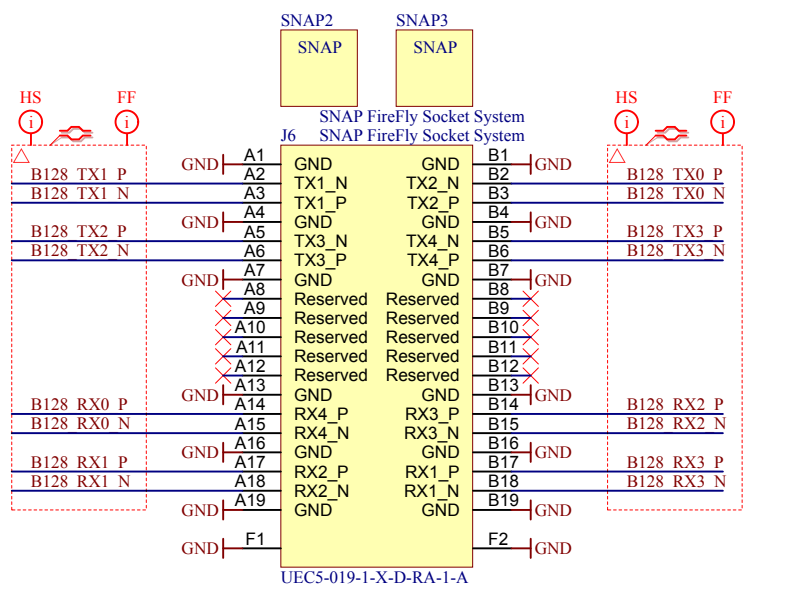
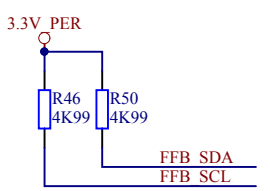
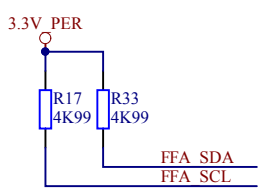
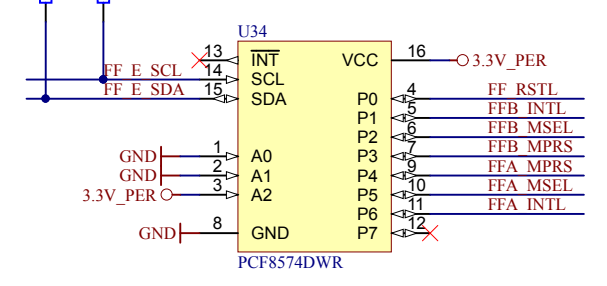
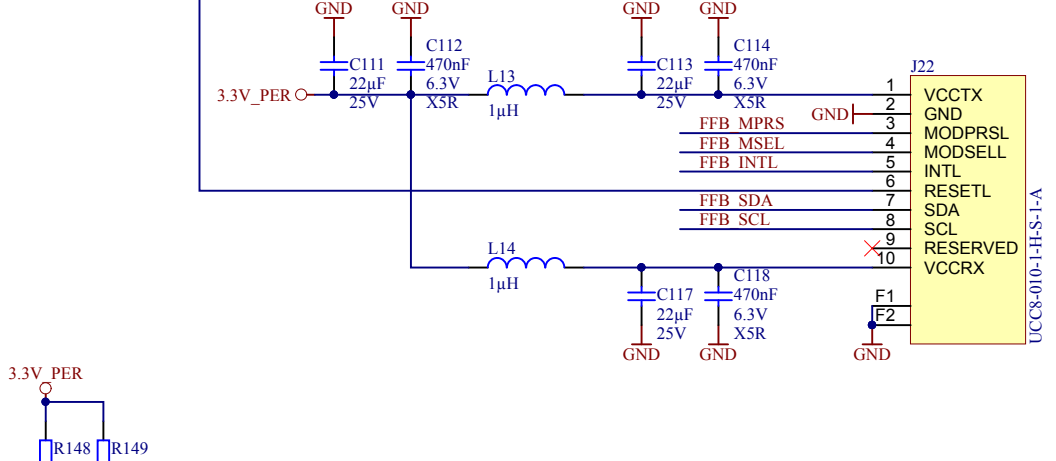
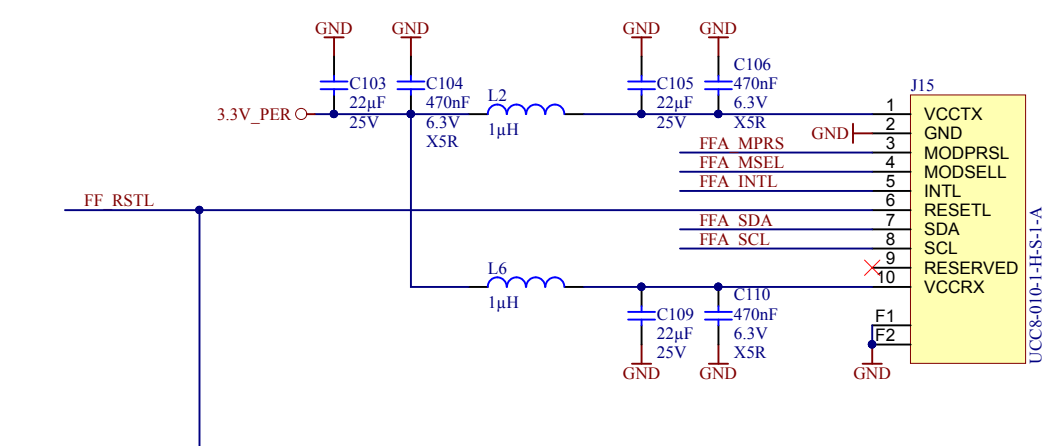
Pin 84 PR8C "GND": REV04



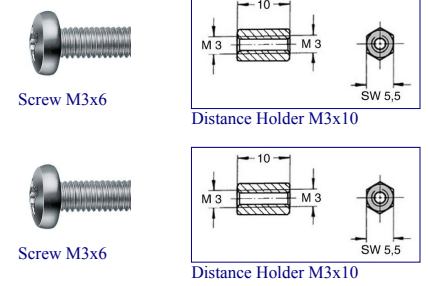
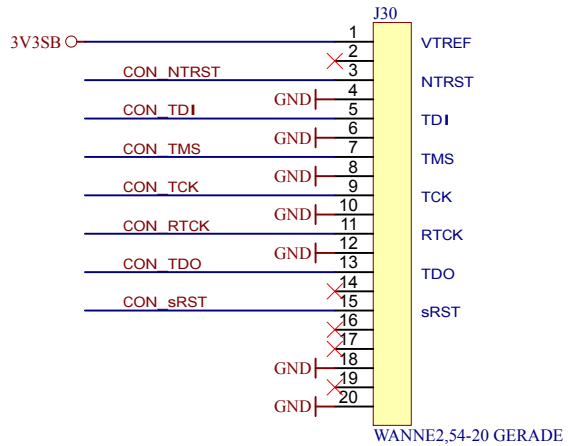
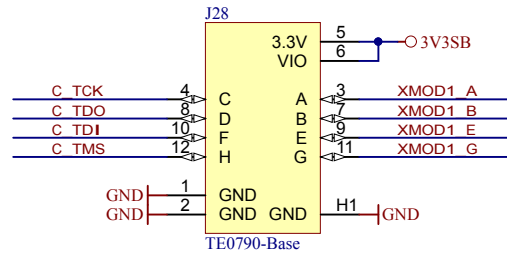
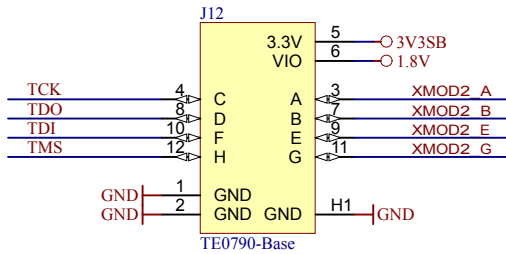
Title: TEBF0808 - CPLD		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 26 of 36
Filename: SC.schdoc		



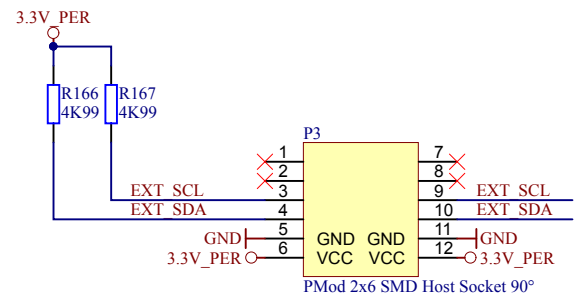
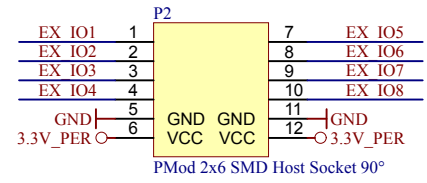
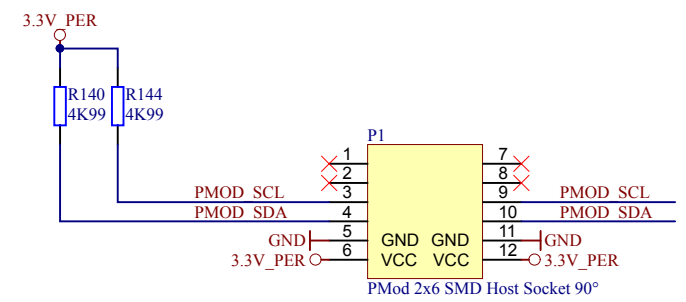
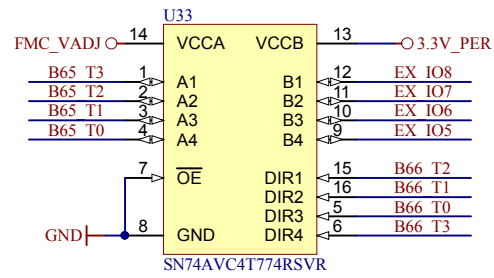
Title: TEBF0808 - CPLD_2		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 27 of 36
Filename: SC2.schdoc		



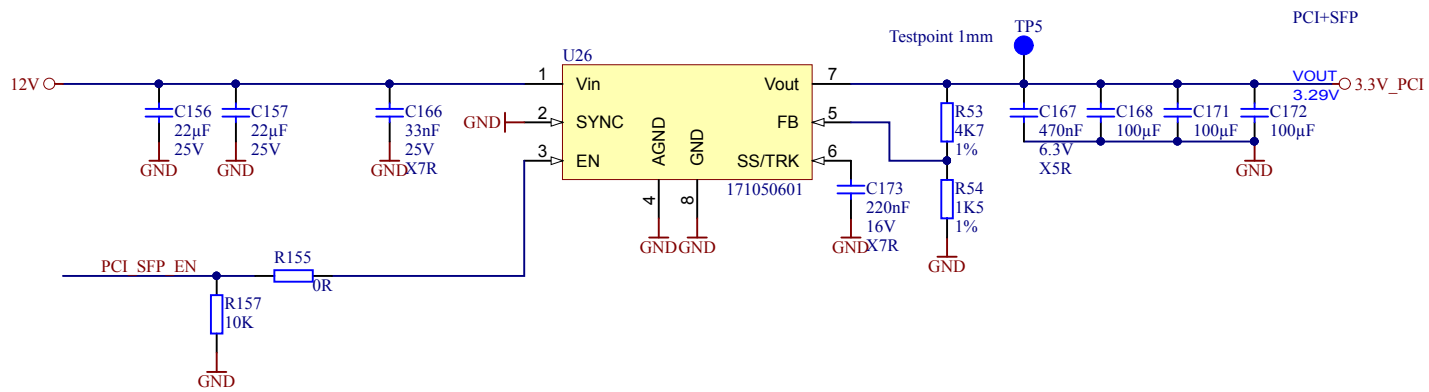
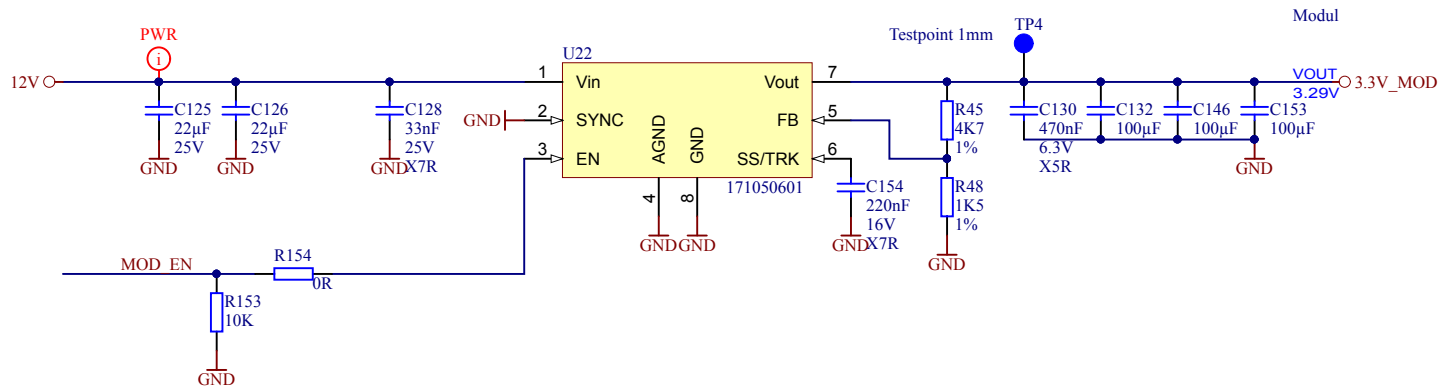
Title: TEBF0808 - FireFly		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 28 of 36
Filename: FireFly.SchDoc		



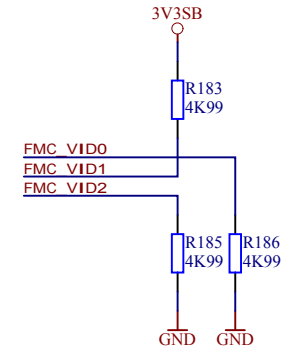
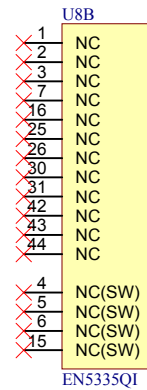
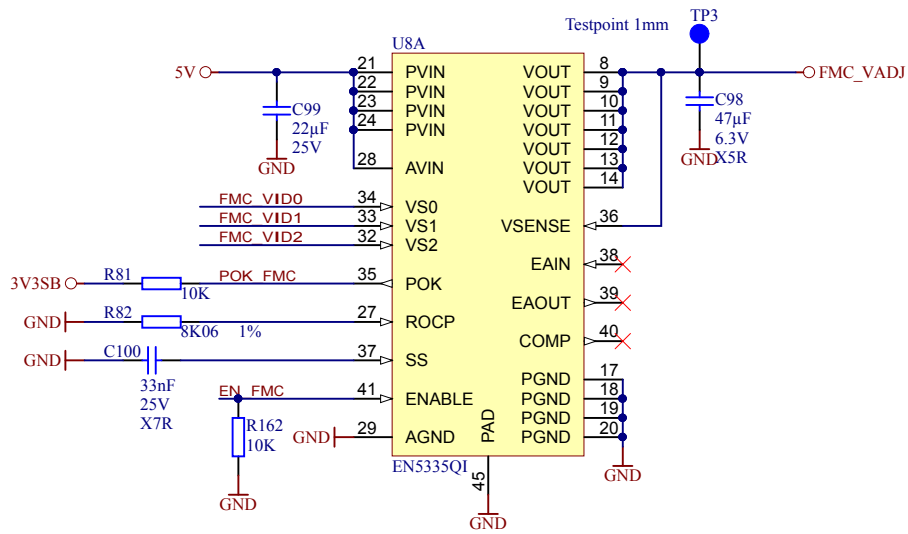
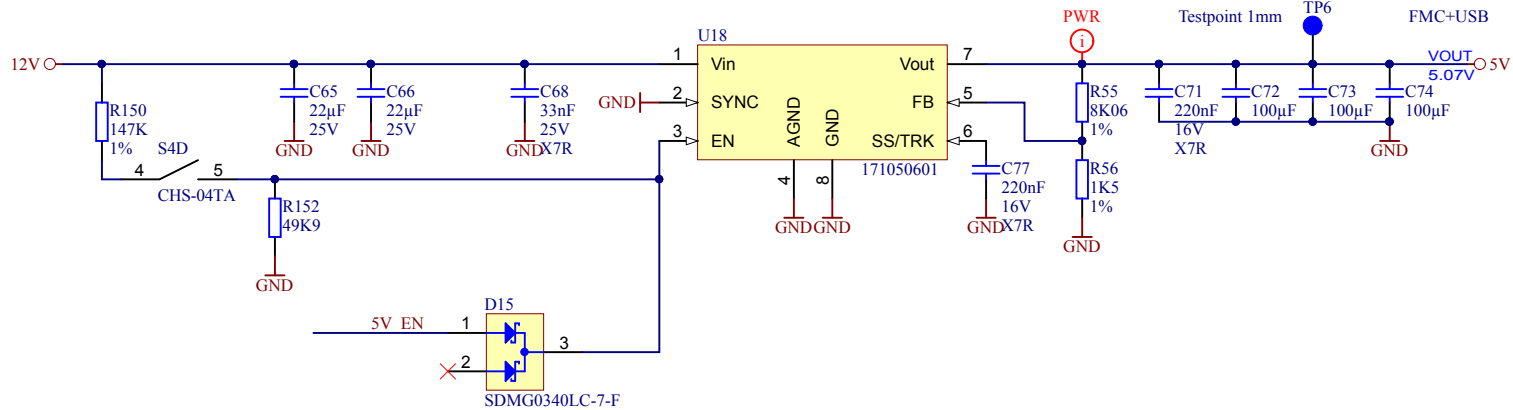
Title: TEBF0808 - XMOD JTAG		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 29 of 36
Filename: XMOD.schdoc		



	Title: TEBF0808 - MISC		
	A4	Number: TEBF0808 TEBF0808	Rev. 04
	Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 30 of 36
	Filename: PMODE.schdoc		



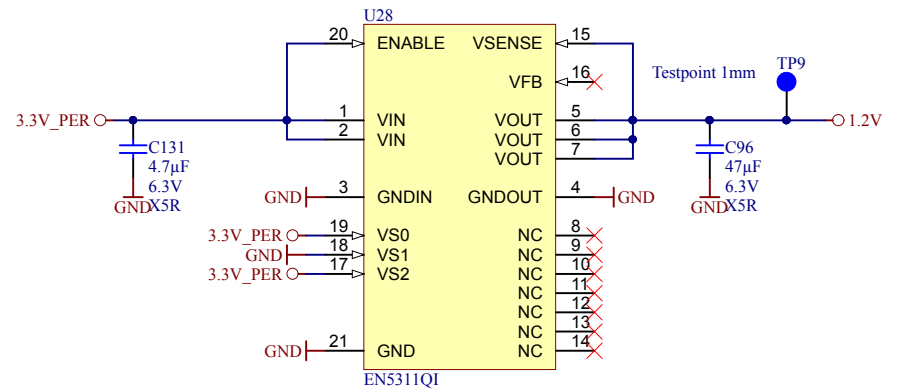
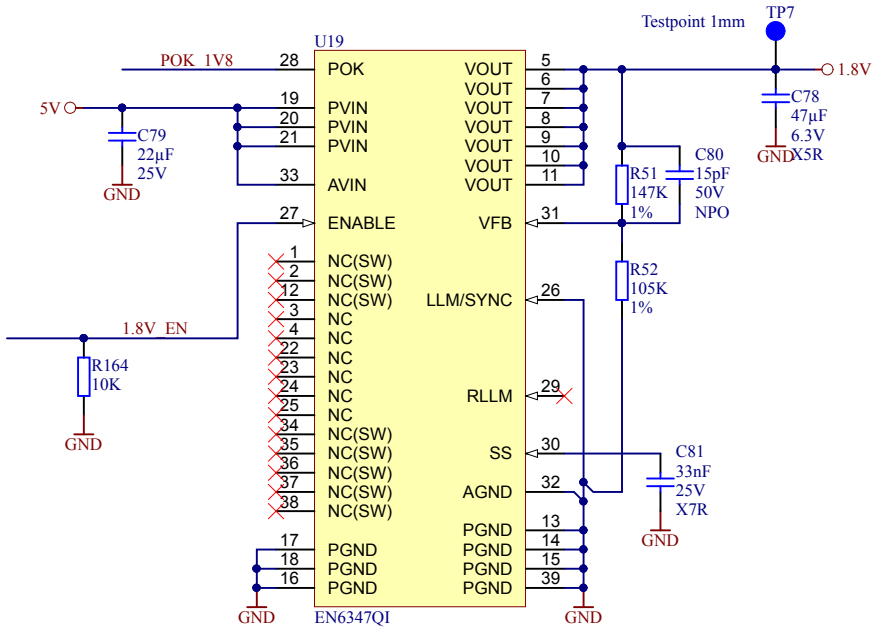
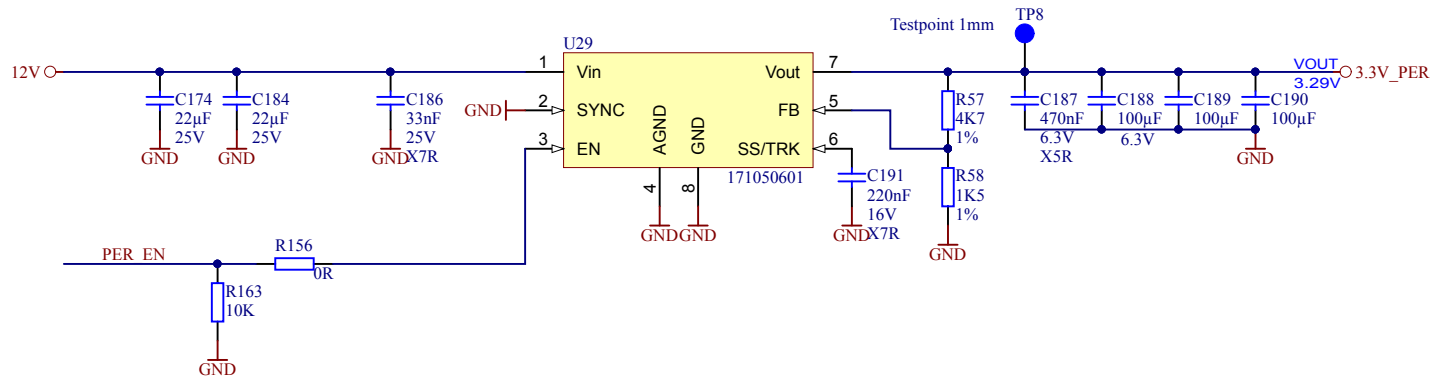
Title: TEBF0808 - Power		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 31 of 36
Filename: Power_1.schdoc		



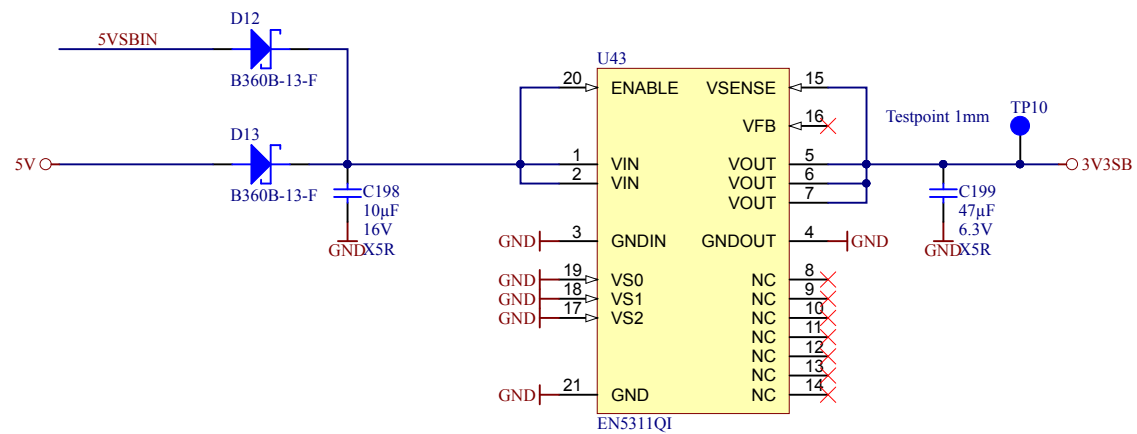
VS2	VS1	VS0	Output Voltage
0	1	0	1.8V
0	1	1	1.5V
1	0	0	1.25V
1	0	1	1.2V




Title: TEBF0808 - Power		
A4	Number: TEBF0808 TEBF0808	Rev. 04
Date: 2016-09-29	Copyright: Trenz Electronic GmbH	Page 32 of 36
Filename: Power_2.schdoc		



	Title: TEBF0808 - Power	
	A4	Number: TEBF0808 TEBF0808
	Date: 2016-09-29	Copyright: Trenz Electronic GmbH
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Filename: Power_3.schdoc		



		Title: TEBF0808 - Power	
		A4	Number: TEBF0808 TEBF0808
Date: 2016-09-29		Copyright: Trenz Electronic GmbH	
Date: 2016-09-29		Page 34 of 36	
Filename: Power_4.schdoc			

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A

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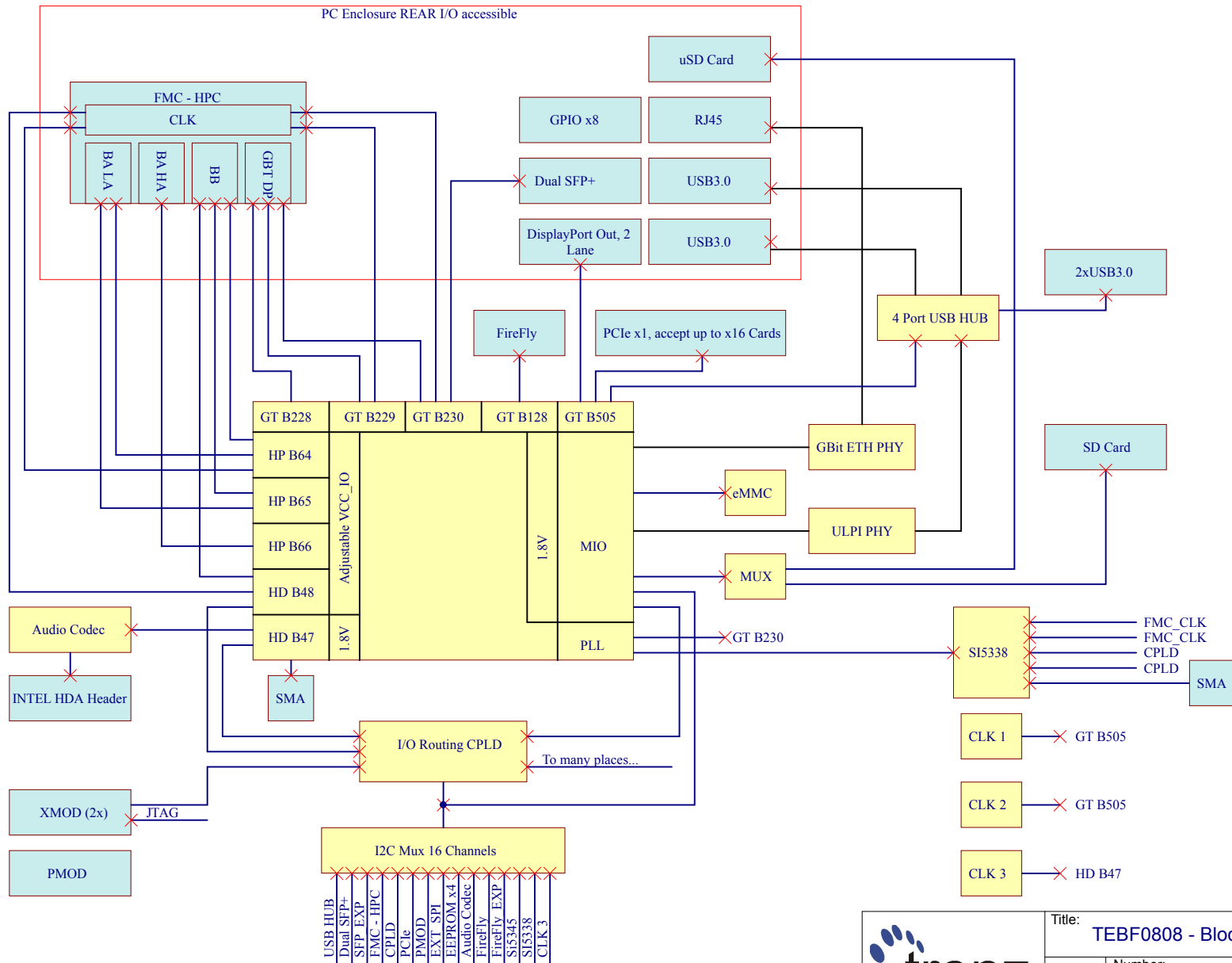
C

C

D

D

PC Enclosure REAR I/O accessible



- USB HUB
- Dual SFP+
- SFP EXP
- FMC - HPC
- CPLD
- PCle
- PMOD
- EXT SPI
- EEPROM x4
- Audio Codec
- FireFly
- FireFly EXP
- SI5338
- CLK 3



Title: TEBF0808 - Block Diagram		
A4	Number: TEBF0808 TEBF0808	Rev. 04
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Filename: BD.SchDoc		

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REV03

- 1) Added 2.5V option for clock source U45
- 2) Net B64_T0 terminated via 240 Ohm resistor to GND.
- 3) Nets B64_T1..T3 connected to CPLD
- 4) Nets SFP#_LOS and SFP#TX_DIS connected to CPLD (# = 1..2)
- 5) Added 4-pin connector for FAN2 (12V). Added high side switch like option for FAN without control signals.
- 6) Added net SC_IO8 between CPLD1 and CPLD2 (Bank 3V3_SB)
- 7) Deleted USB3.0 port (J18)
- 8) Port USB2.0 replaced to USB3.0 (J8, front panel)
- 9) Replaced USB HUB USB5537B to CYUSB3324 (U4)

REV04:

- 1) P and N lanes swapped in FMC clock signal pairs B228_CLK0 and B229_CLK0
- 2) Added additional FAN connector (J35)
- 3) New control circuit for external beeper
- 4) Layout and routing improvements
- 10.08.2018:
- 5) Resistors R130-131, R173-174 replaced from 4.99k to 2k
- 26.03.2019
- 6) VY: Resistor R65 replaced from 8.06k to 1k (assembly variant "A")
- 7) VY: Page 21: EEPROM I2C address correction
- 8) VY: Clock source U6 (100Mhz) polulated (assembly variant "A")

	Title: TEBF0808 - Revision history		
	A4	Number: TEBF0808 TEBF0808	Rev. 04
	Date: 07.05.2019	Copyright: Trenz Electronic GmbH	Page 36 of 36
	Filename: Revision_Changes.SchDoc		

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