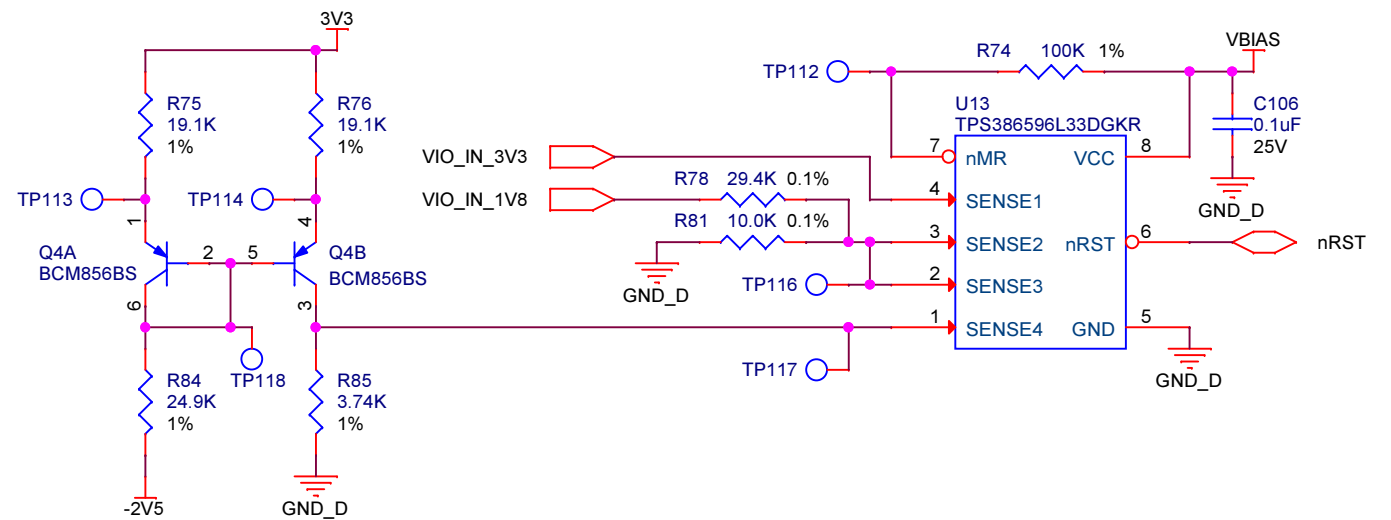
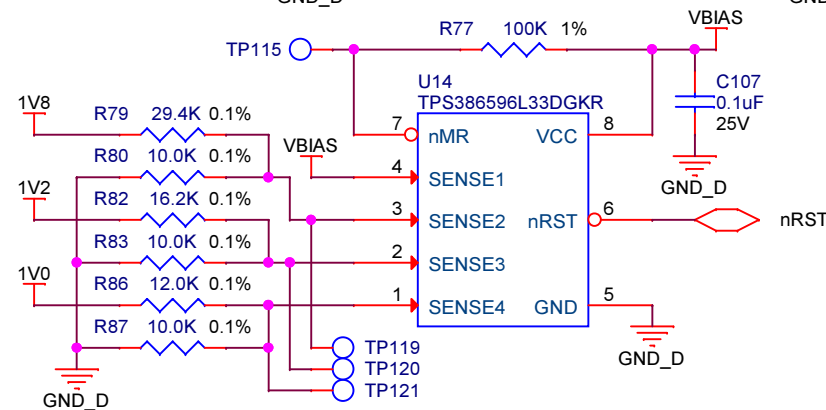
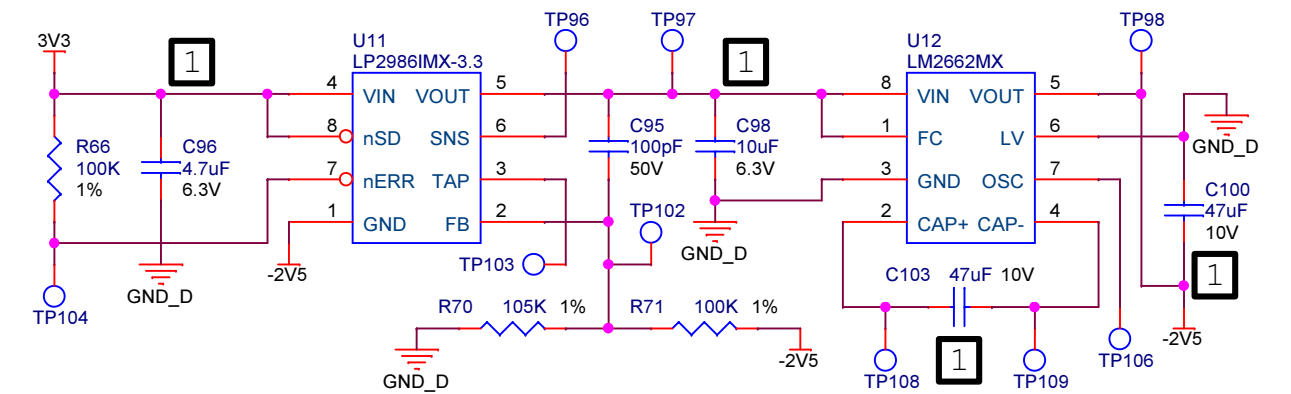
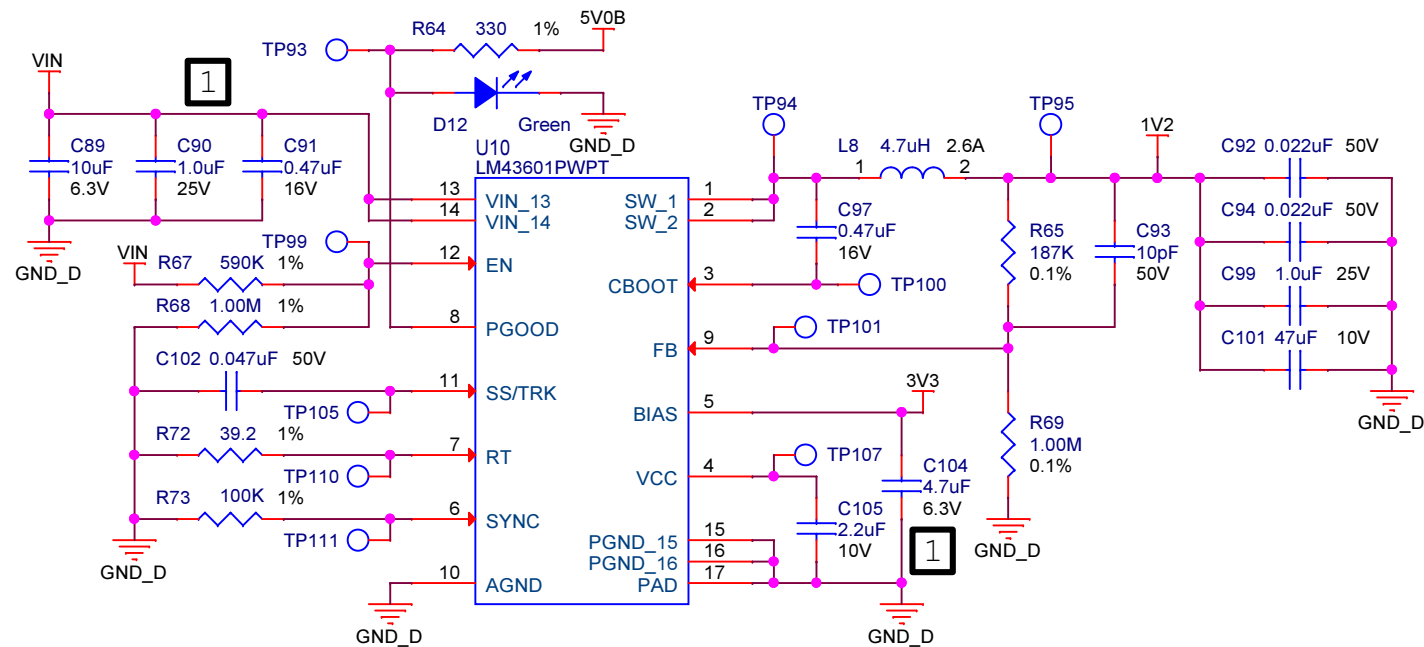
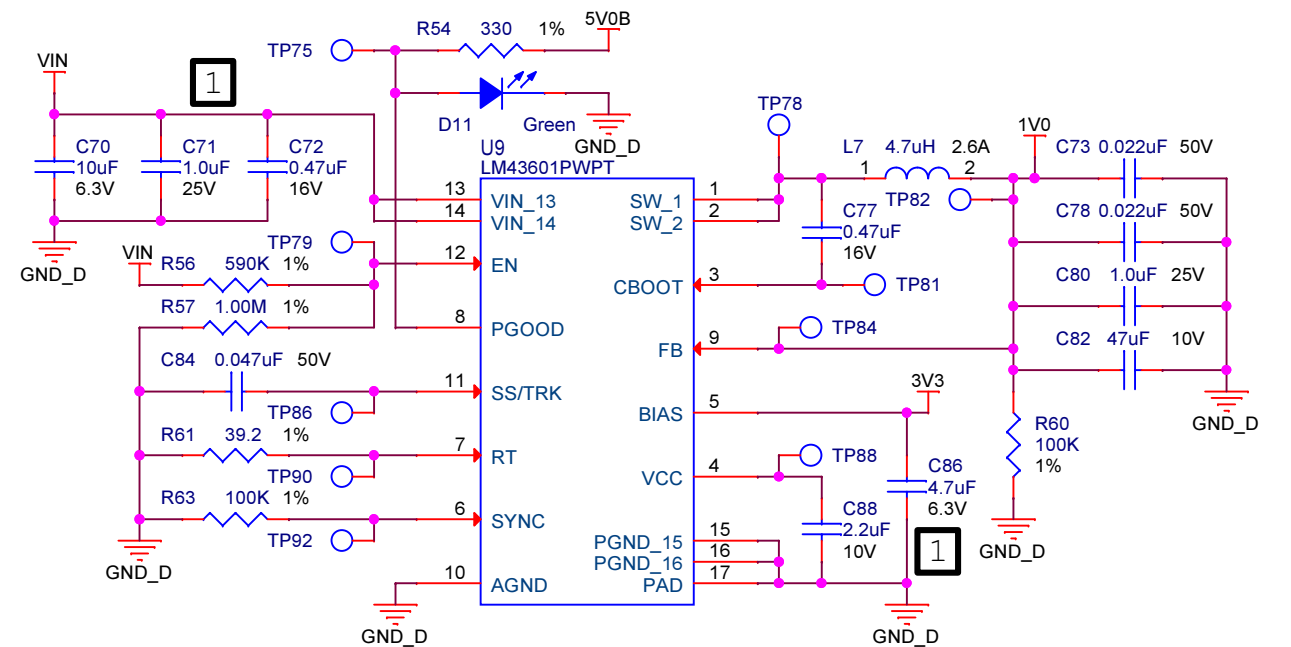
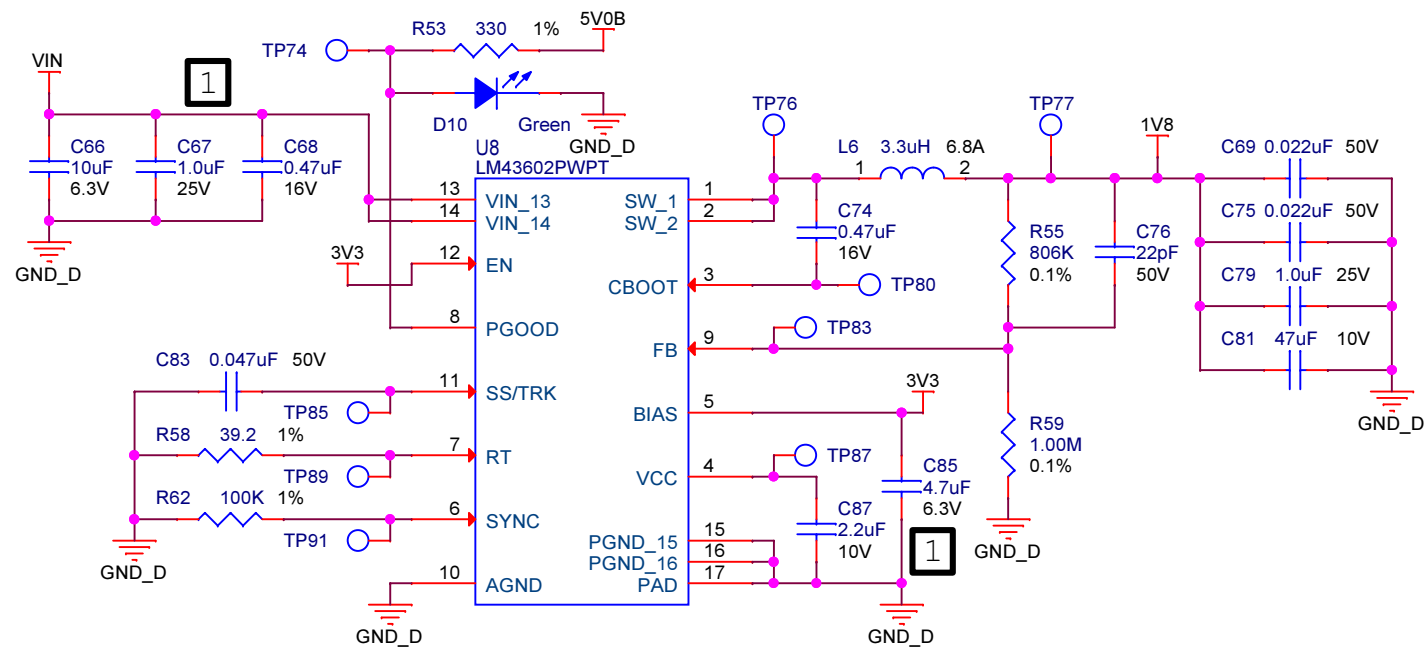


NOTES:  
 1 Place decoupling capacitors as close to IC pins as possible.

		krtkl inc. 350 Townsend Street Suite 301A San Francisco, CA 94107 +1 415 857 4857		TITLE whiteRhino industrial SBC	
		PATH /		DESCRIPTION Power Supplies 1	
DRAWN BY B. Hammond	NAME B. Hammond	DATE 06/26/2015	SIZE B	DRAWING NO. 15081804-01	REV 2.6
CHECKED BY J. Weatherbee	APPROVED BY R. Cousins	DATE 10/03/2015	SHEET 2 OF 17		



# NOTES:

- 1 Place decoupling capacitors as close to IC pins as possible.

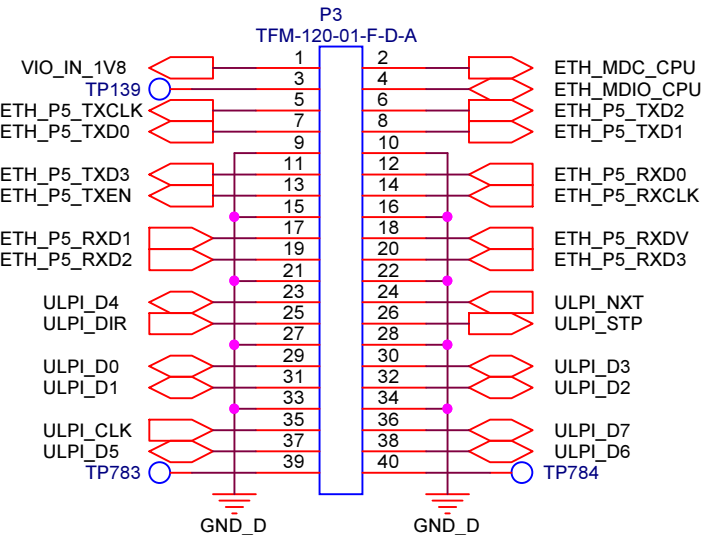
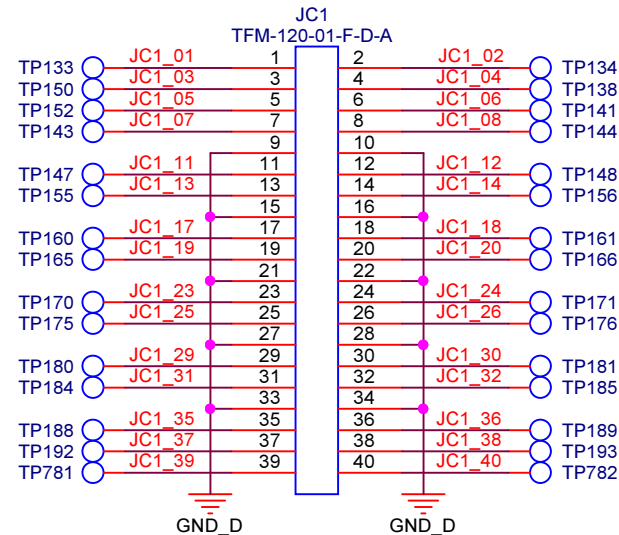
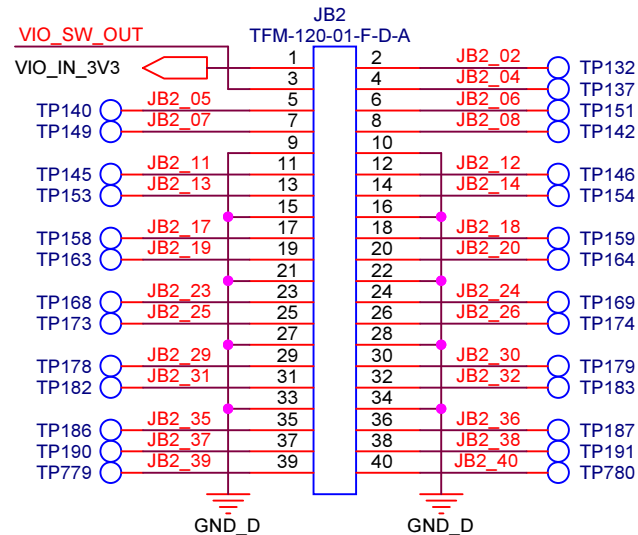
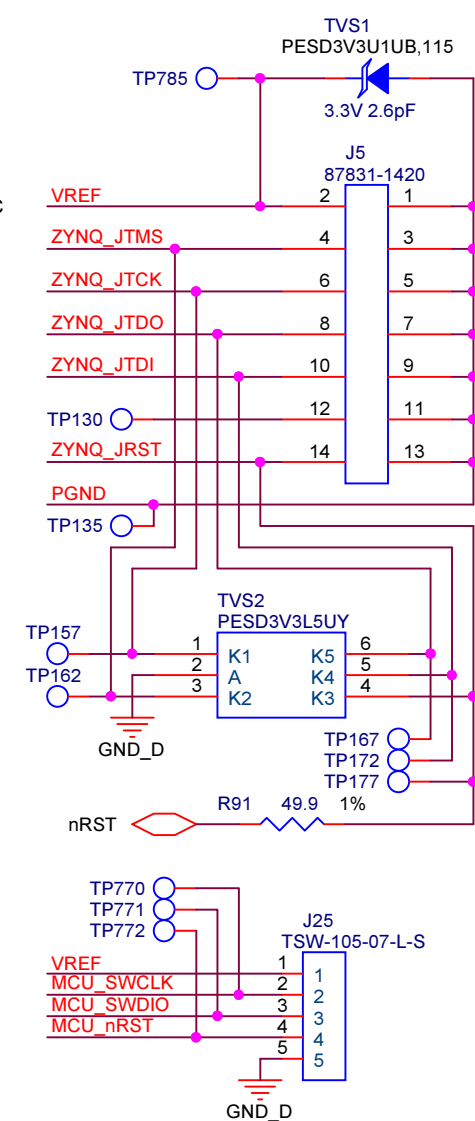
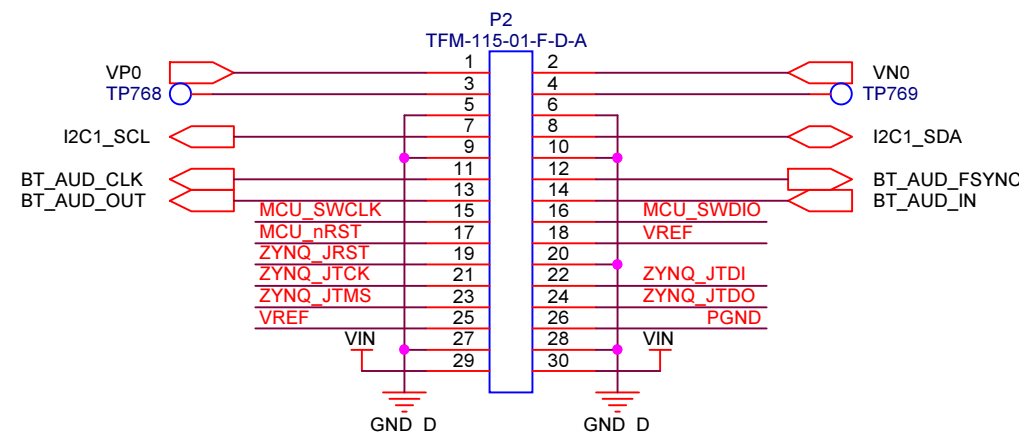
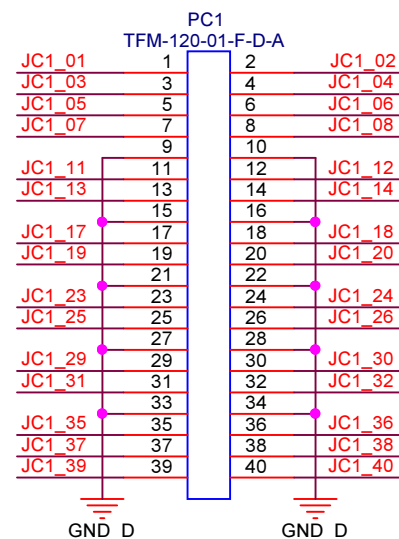
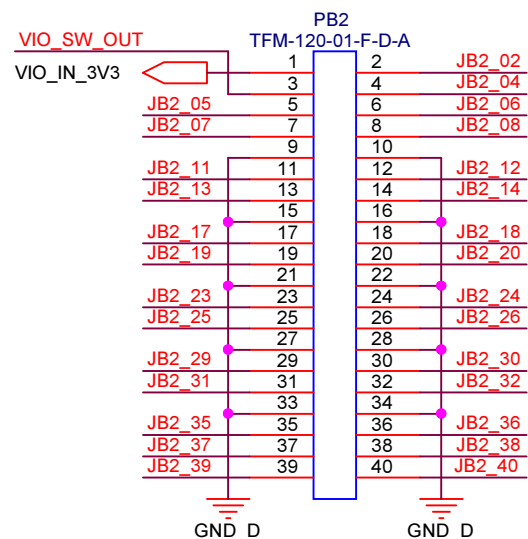
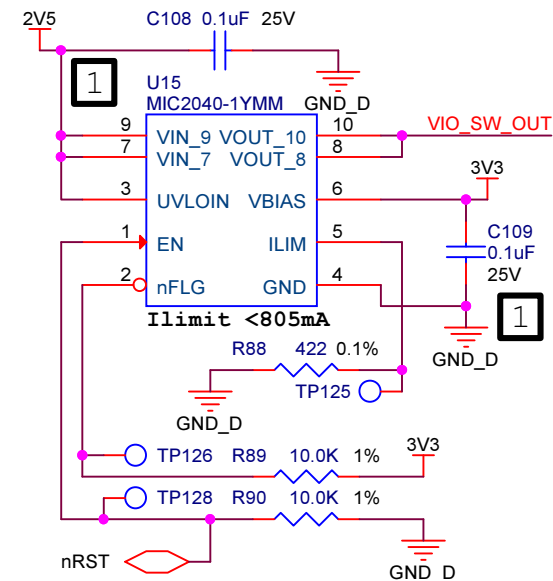
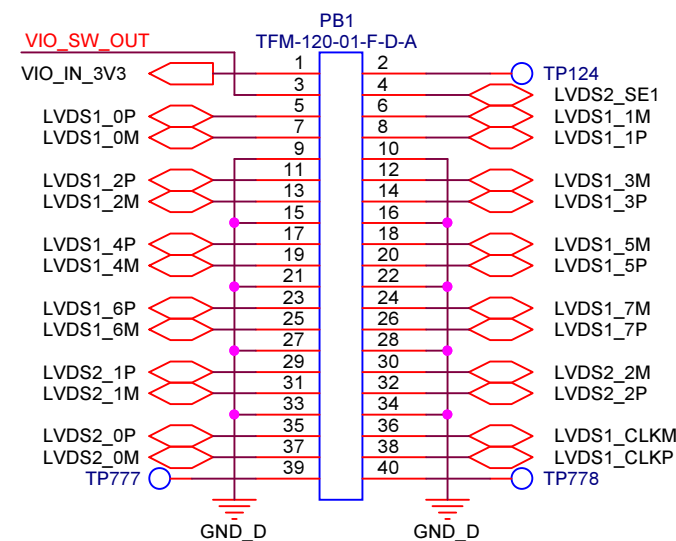
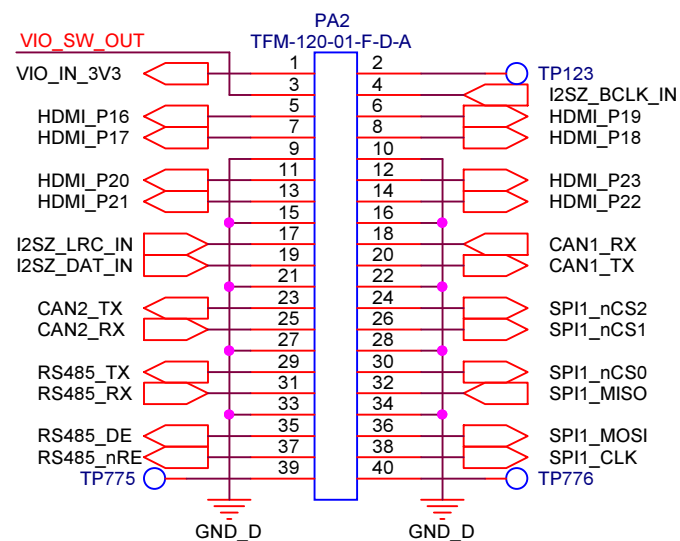
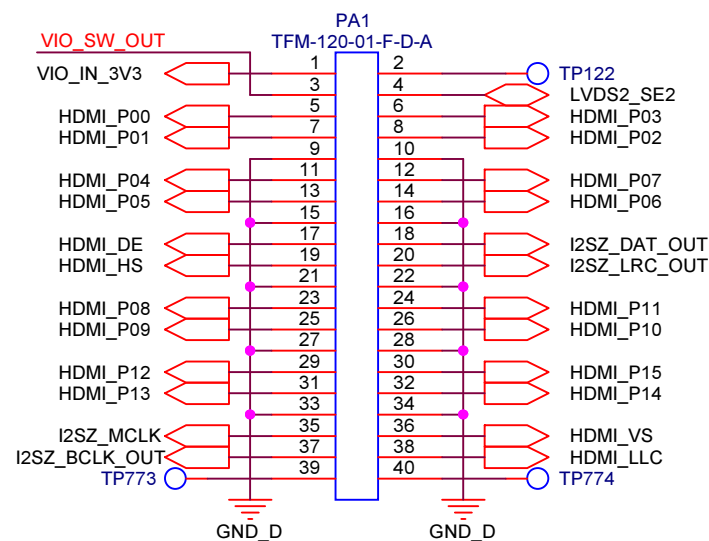
**krtkl**

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krtkl inc.  
350 Townsend Street  
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NAME	DATE
DRAWN BY B. Hammond	07/02/2015
CHECKED BY J. Weatherbee	10/03/2015
APPROVED BY R. Cousins	10/04/2015

TITLE	
whiteRhino industrial SBC	
PATH	
/	
DESCRIPTION	
Power Supplies 2	
SIZE	DRAWING NO.
B	15081804-01
REV	SHEET 3 OF 17
2.6	



# NOTES:

- Place decoupling capacitors as close to IC pins as possible.



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DRAWN BY  
B. Hammond  
06/24/2015

CHECKED BY  
J. Weatherbee  
10/03/2015

APPROVED BY  
R. Cousins  
10/04/2015

TITLE  
whiteRhino industrial SBC

PATH  
/

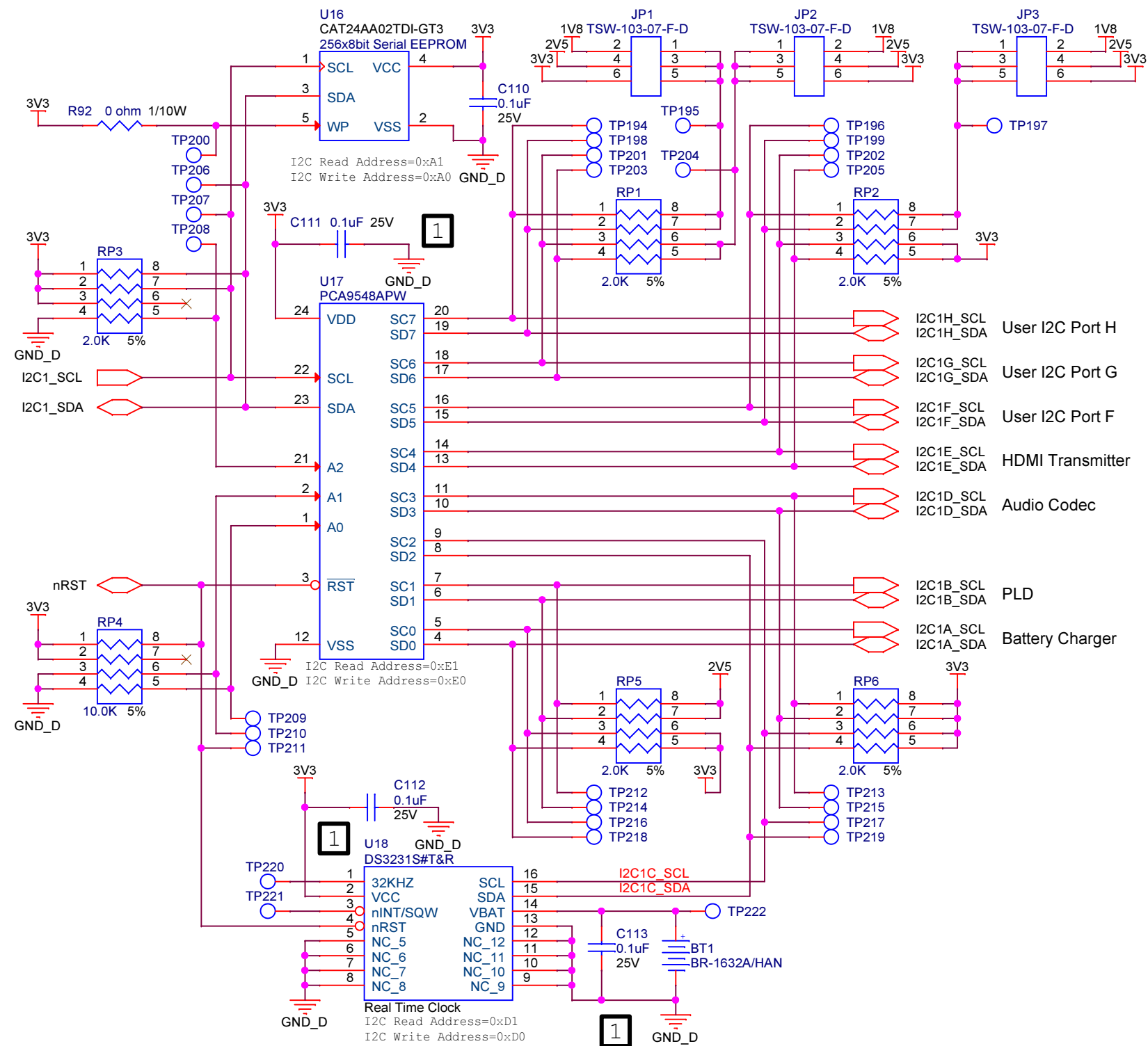
DESCRIPTION  
Main Interconnect

SIZE  
B

DRAWING NO.  
15081804-01

REV  
2.6

SHEET 4 OF 17



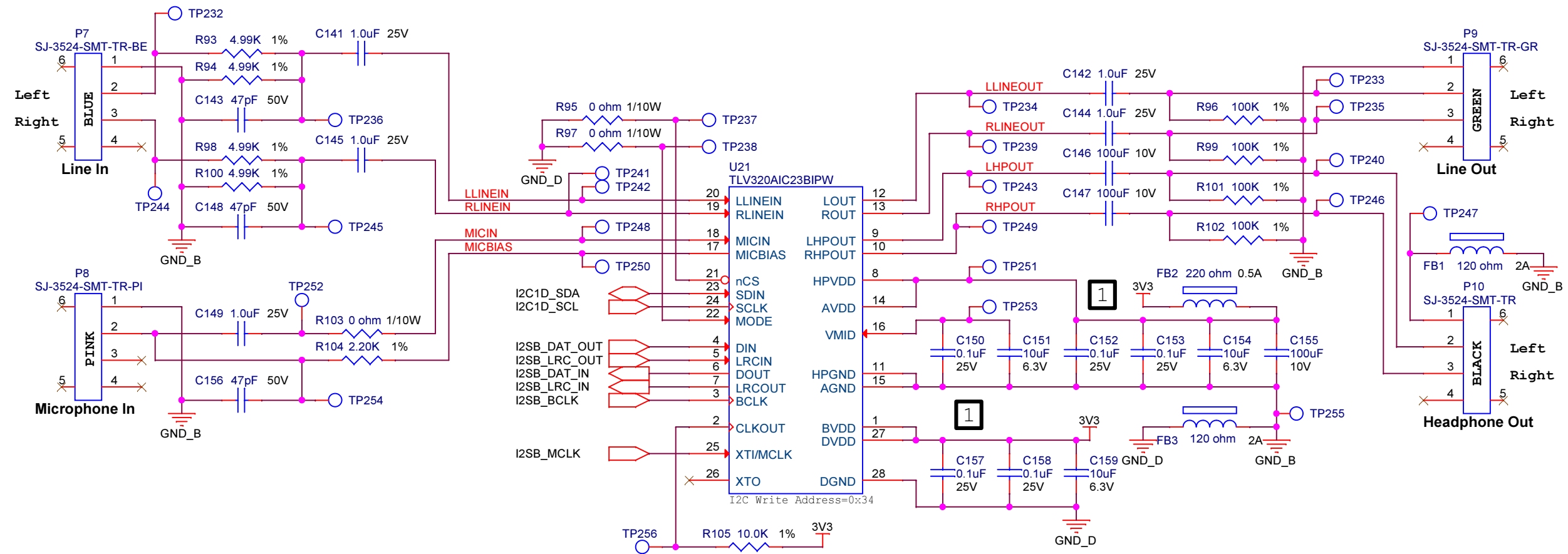
# NOTES:

- Place decoupling capacitors as close to IC pins as possible.

		<b>whiteRhino industrial SBC</b>	
		<b>350 Townsend Street</b> <b>Suite 301A</b> <b>San Francisco, CA 94107</b> <b>+1 415 857 4857</b>	
		<b>NAME</b> <b>B. Hammond</b>	<b>DATE</b> <b>06/19/2015</b>
<b>BY SA</b>		<b>CHECKED BY</b> <b>J. Weatherbee</b>	<b>DATE</b> <b>10/03/2015</b>
<b>APPROVED BY</b> <b>R. Cousins</b>		<b>DATE</b> <b>10/04/2015</b>	<b>DESCRIPTION</b> <b>I2C Switch EEPROM &amp; RTC</b>
<b>SIZE</b> <b>B</b>		<b>DRAWING NO.</b> <b>15081804-01</b>	<b>REV</b> <b>2.6</b>
		<b>SHEET 5 of 17</b>	

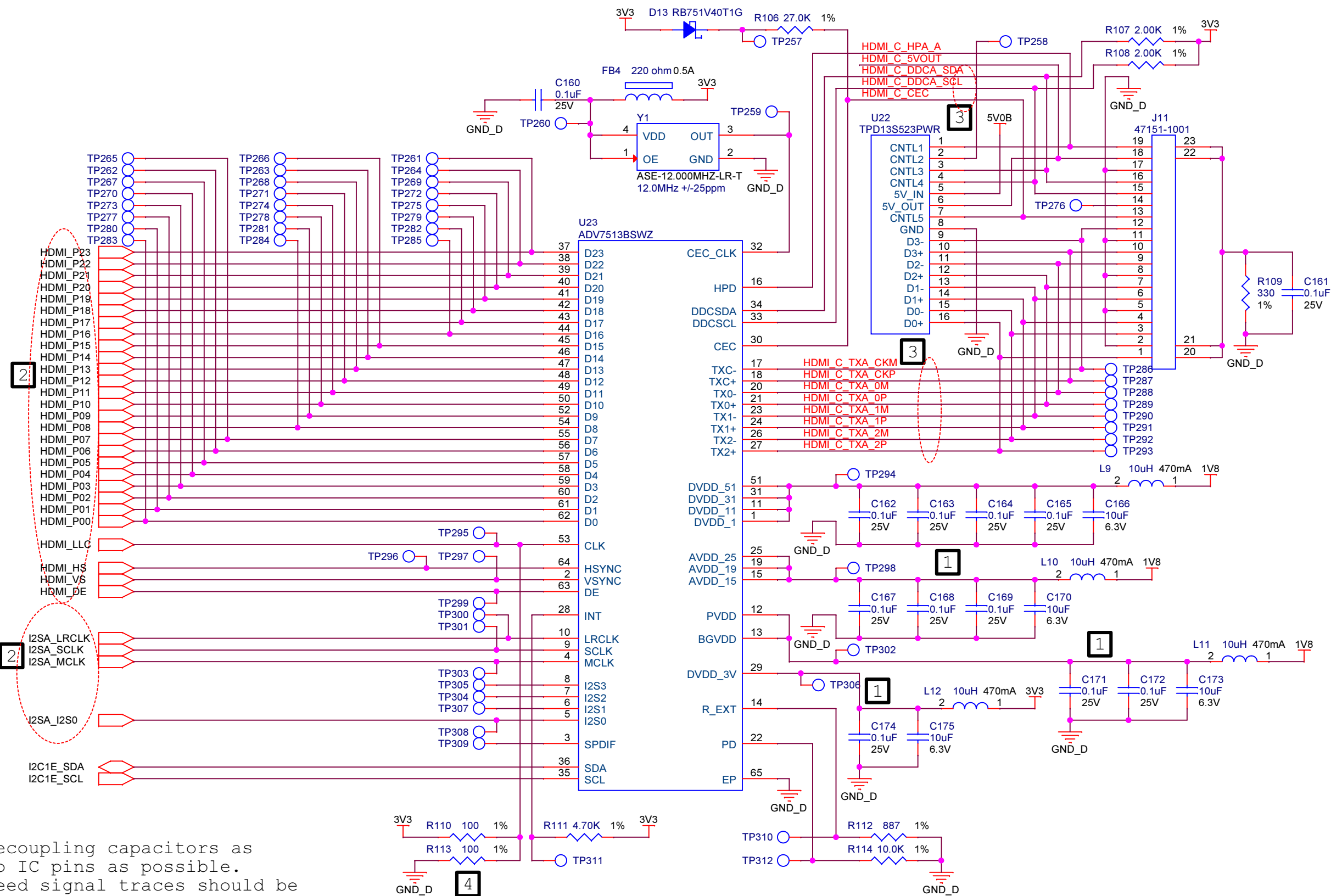






NOTES:  
 1 Place decoupling capacitors as close to IC pins as possible.

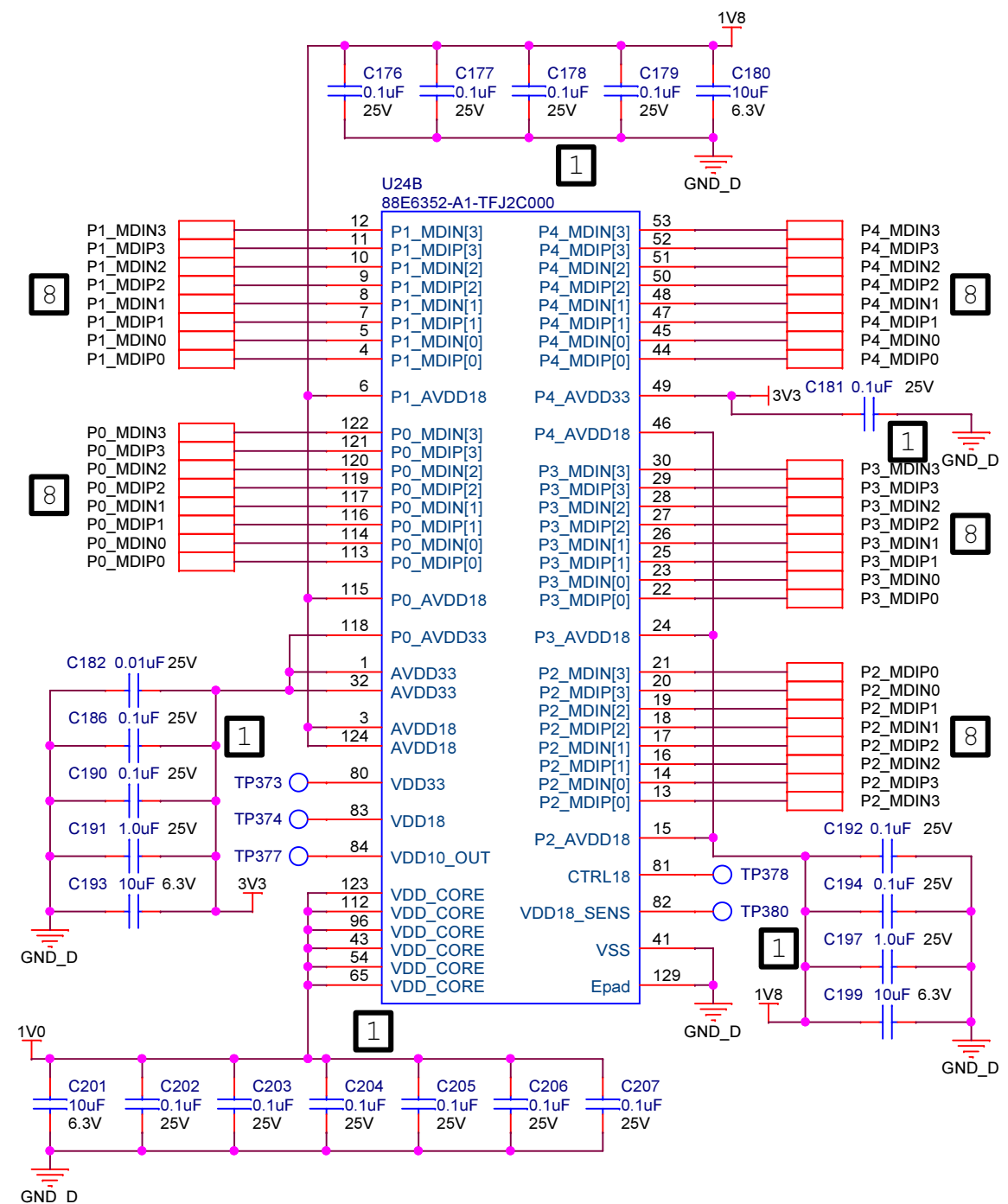
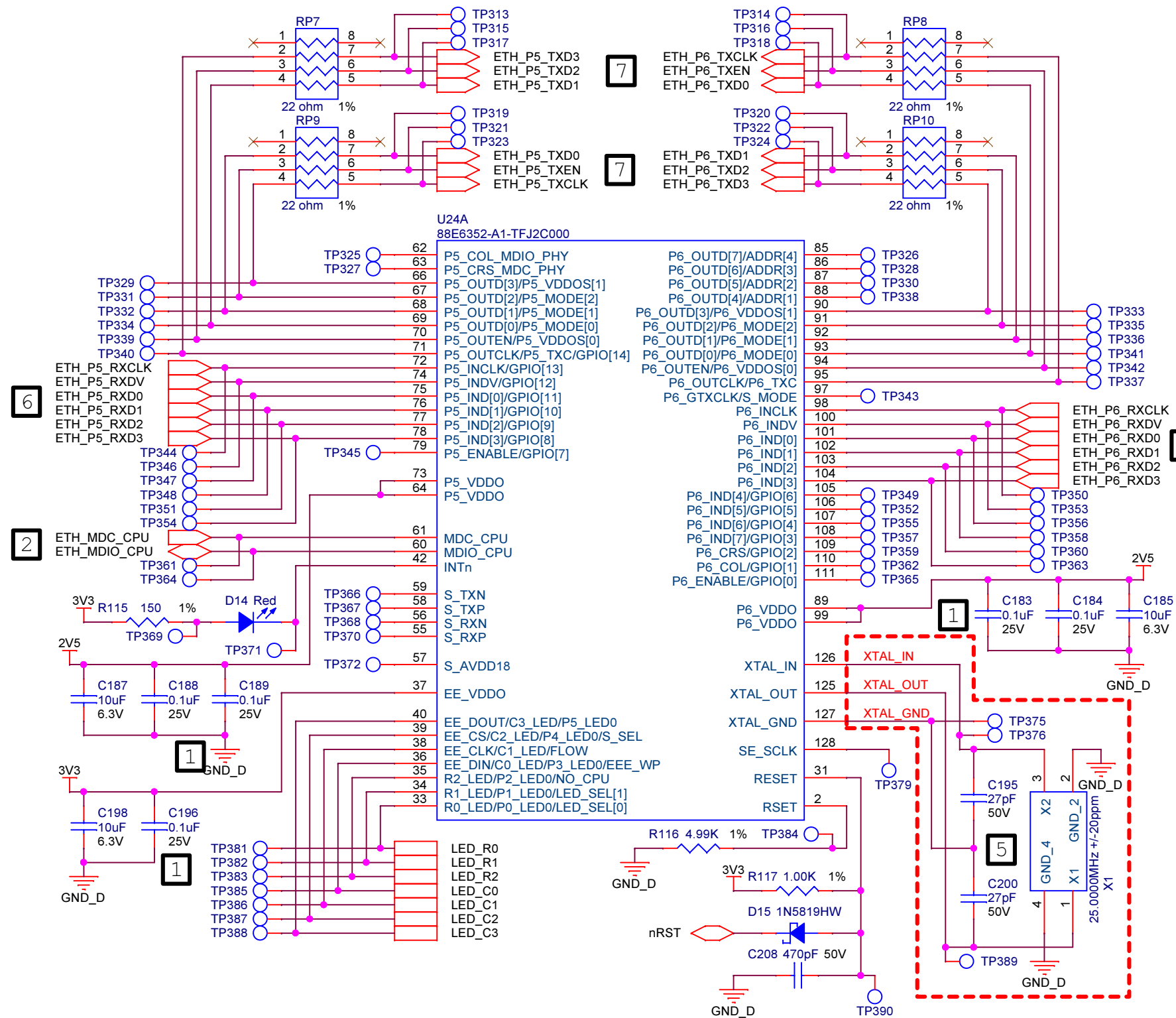
		<b>whiteRhino industrial SBC</b>	
		PATH /	
		<b>Audio Codec</b>	
		SIZE B	
DRAWN BY B. Hammond		DATE 06/25/2015	
CHECKED BY J. Weatherbee		DATE 10/03/2015	
APPROVED BY R. Cousins		DATE 10/04/2015	
15081804-01		REV 2.6	
SHEET 7 OF 17			



# NOTES:

- 1 Place decoupling capacitors as close to IC pins as possible.
- 2 High speed signal traces should be length matched to within 50mils for each set of grouped signals.
- 3 Route signals with 50ohm single, 100ohm differential impedance.
- 4 Place resistors as close to IC pin as possible with minimum trace stubs.



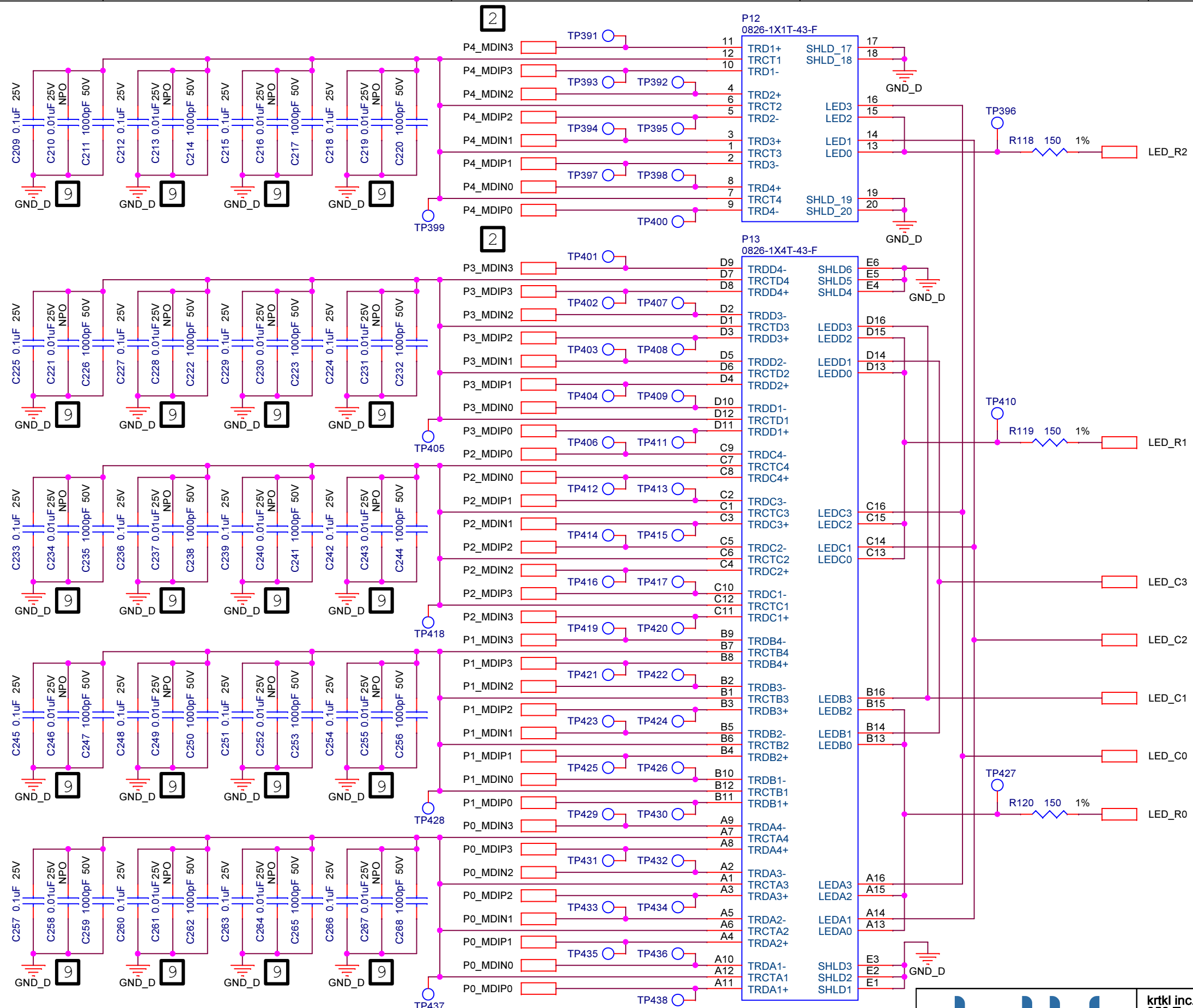


# NOTES:

- 1 Place decoupling capacitors as close to IC pins as possible.
- 2 High speed signal traces should be length matched to within 50mils for each set of grouped signals.
- 5 Minimize capacitance between the crystal drive signals by shielding with the local crystal ground. Also minimize coupling of these signals to other signal lines.

- 6 U24 RGMII inputs ETH\_Px\_RXxx: match trace lengths from connector P3 and from U19 to U24 such that data bit to data bit skew is between -500ps and +500ps, and data bits to clock skew is between 1.0ns and 2.6ns.
- 7 U24 RGMII outputs ETH\_Px\_TXxx: match trace lengths from connector P3 and from U19 to U24 such that data bit to data bit skew and data bits to clock skew is between -500ps and +500ps.

- 8 Route signal pairs with 50ohm single, 100ohm differential impedance.



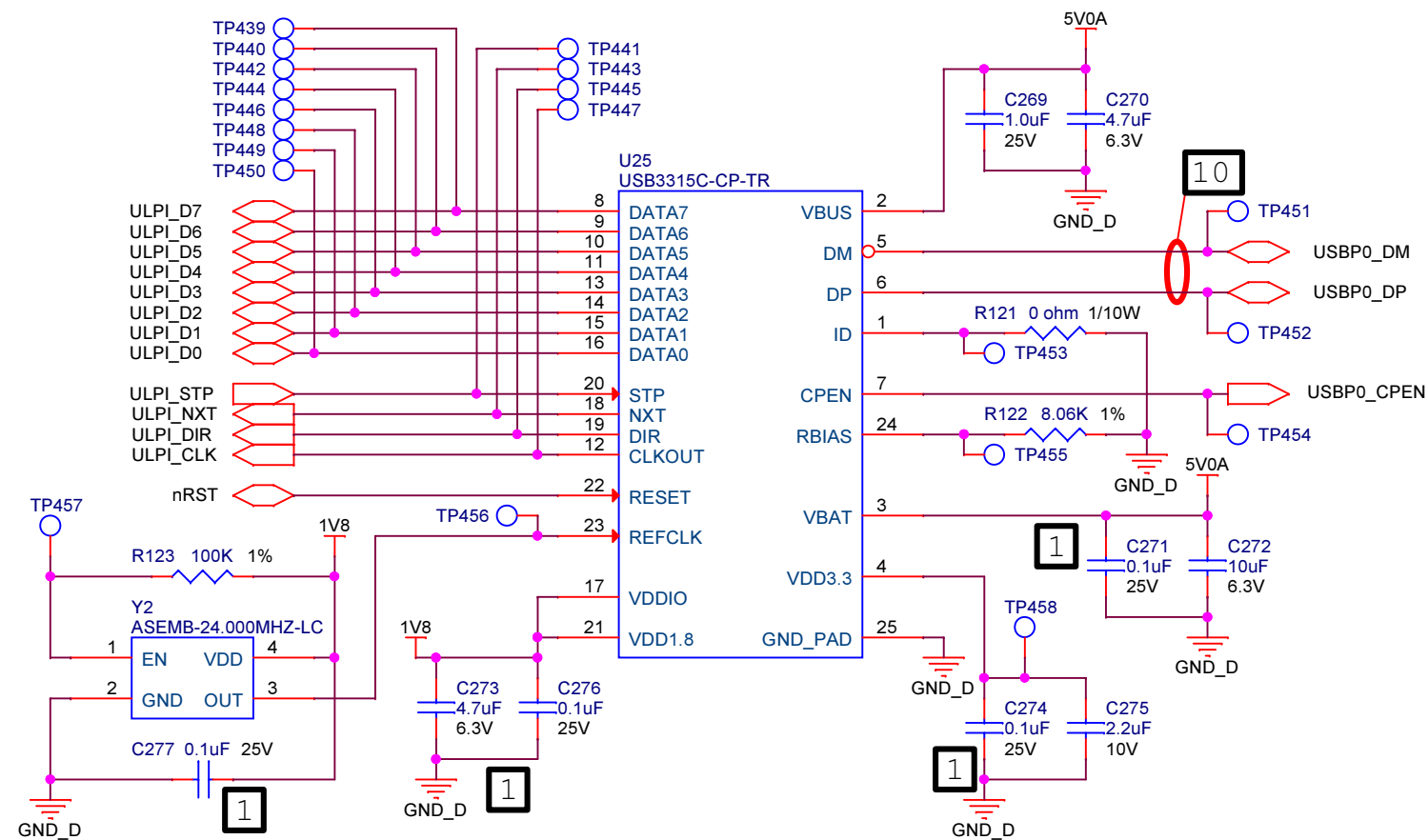
- NOTES:
- 8 Route signal pairs with 50ohm single, 100ohm differential impedance.
  - 9 Place each set of three decoupling capacitors as close to Ethernet connector pins as possible.



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NAME		DATE
DRAWN BY	B. Hammond	06/22/2015
CHECKED BY	J. Weatherbee	10/03/2015
APPROVED BY	R. Cousins	10/04/2015

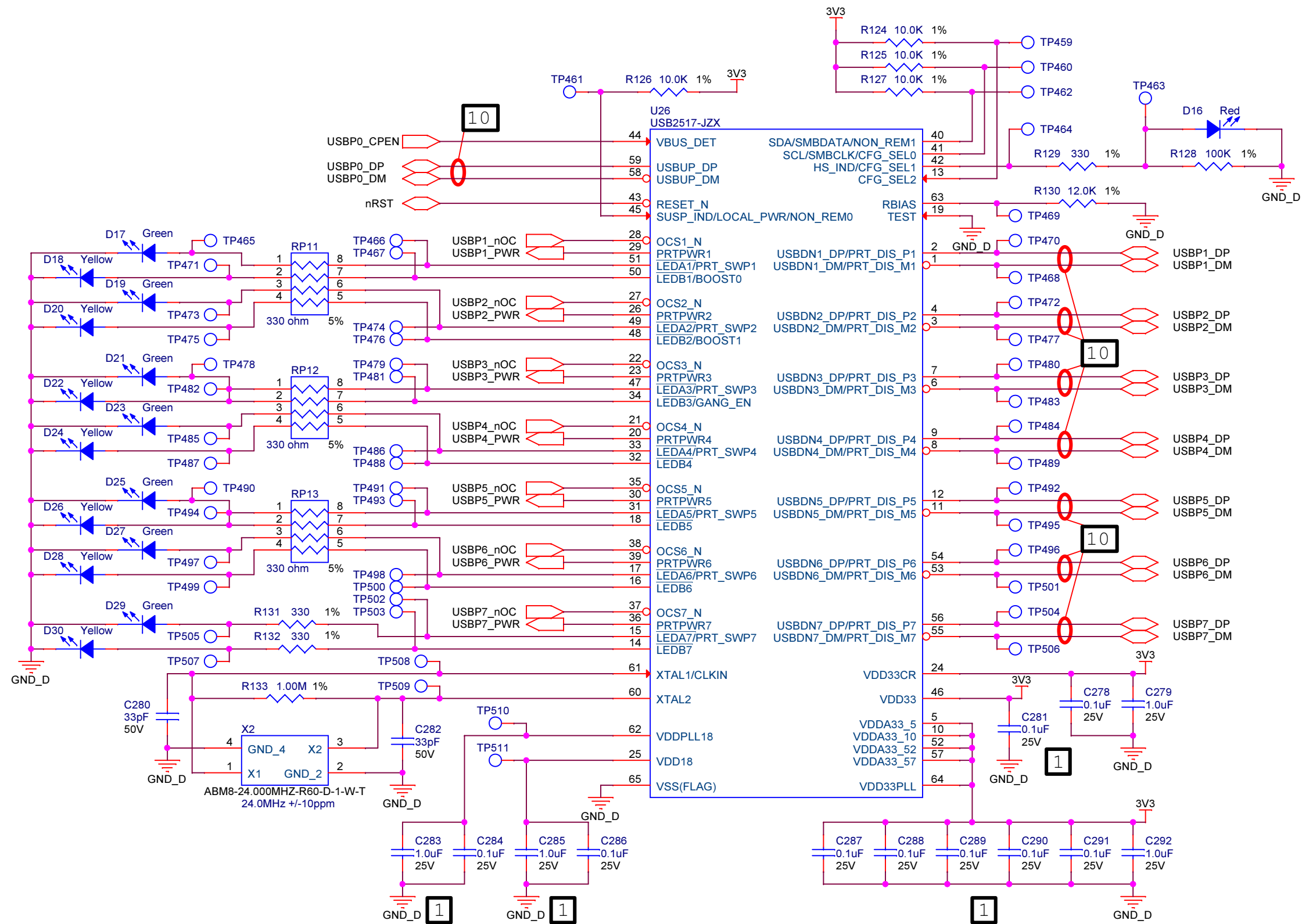
TITLE whiteRhino industrial SBC	
PATH /	
DESCRIPTION Gigabit Ethernet Connectors	
SIZE B	DRAWING NO. 15081804-01
REV 2.6	
SHEET 10 of 17	



# NOTES:

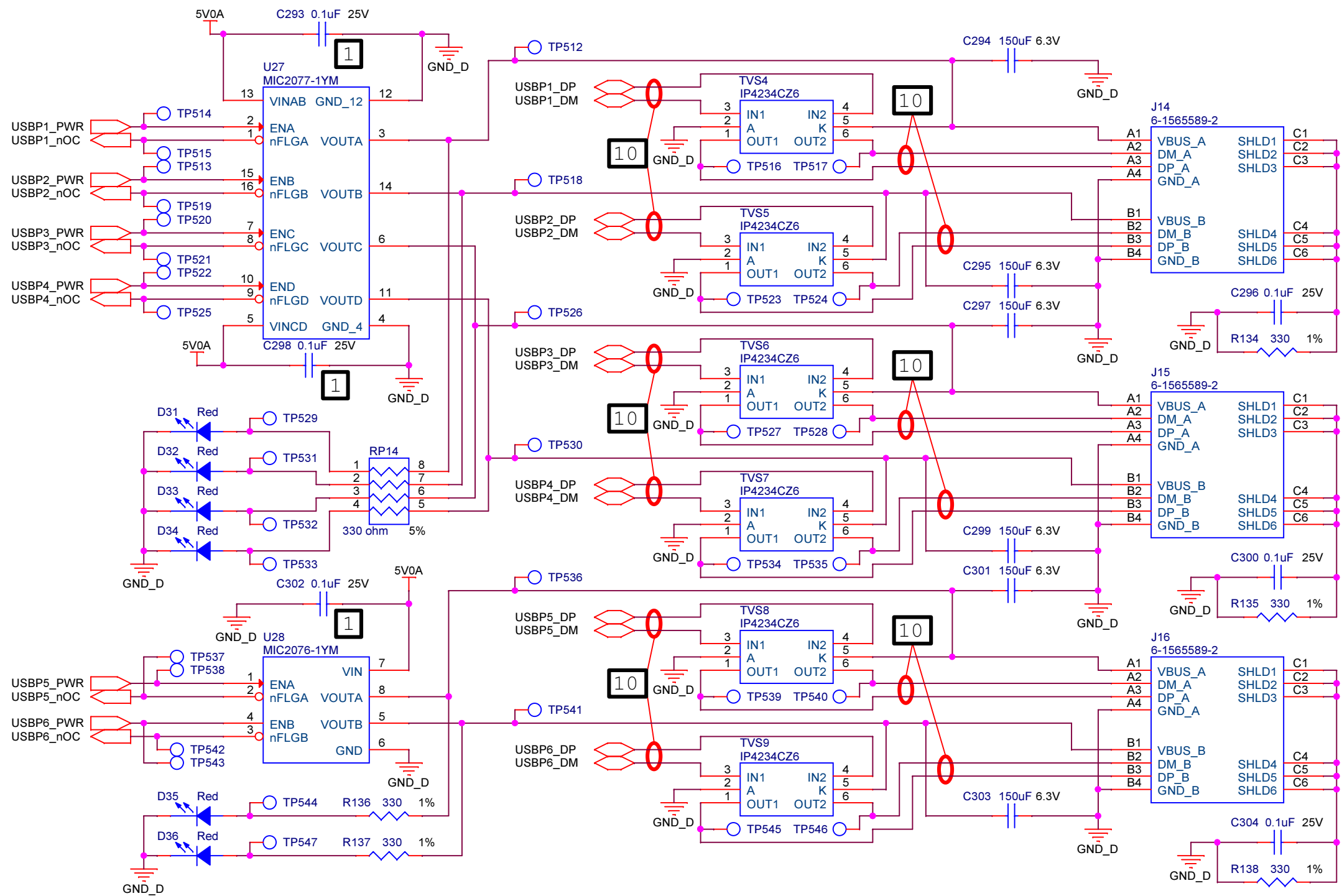
- 1 Place decoupling capacitors as close to IC pins as possible.
- 10 Route indicated signals as 90 ohm differential pairs.

		<b>krtkl inc.</b> 350 Townsend Street Suite 301A San Francisco, CA 94107 +1 415 857 4857		<b>TITLE</b> whiteRhino industrial SBC	
				<b>PATH</b> /	
		<small>Copyright 2015 krtkl inc. This schematic is made available under a Creative Commons Attribution-ShareAlike 4.0 International License. To view a copy of this license please visit <a href="http://creativecommons.org/licenses/by-sa/4.0/">http://creativecommons.org/licenses/by-sa/4.0/</a></small>		<b>DESCRIPTION</b> USB ULPI PHY	
				<b>SIZE</b> B	<b>DRAWING NO.</b> 15081804-01
<b>DRAWN BY</b> B. Hammond		<b>DATE</b> 06/19/2015		<b>REV</b> 2.6	
<b>CHECKED BY</b> J. Weatherbee		<b>DATE</b> 10/03/2015		<b>SHEET</b> 11 of 17	
<b>APPROVED BY</b> R. Cousins		<b>DATE</b> 10/04/2015			



- NOTES:
- 1 Place decoupling capacitors as close to IC pins as possible.
  - 10 Route indicated signals as 90 ohm differential pairs.

		<b>krtkl inc.</b> 350 Townsend Street Suite 301A San Francisco, CA 94107 +1 415 857 4857		TITLE <b>whiteRhino industrial SBC</b> PATH / DESCRIPTION <b>USB 7 Port Hub</b>	
		DRAWN BY <b>B. Hammond</b> CHECKED BY <b>J. Weatherbee</b> APPROVED BY <b>R. Cousins</b>	DATE <b>06/22/2015</b> <b>10/03/2015</b> <b>10/04/2015</b>	SIZE <b>B</b> DRAWING NO. <b>15081804-01</b> SHEET 12 of 17	REV <b>2.6</b>

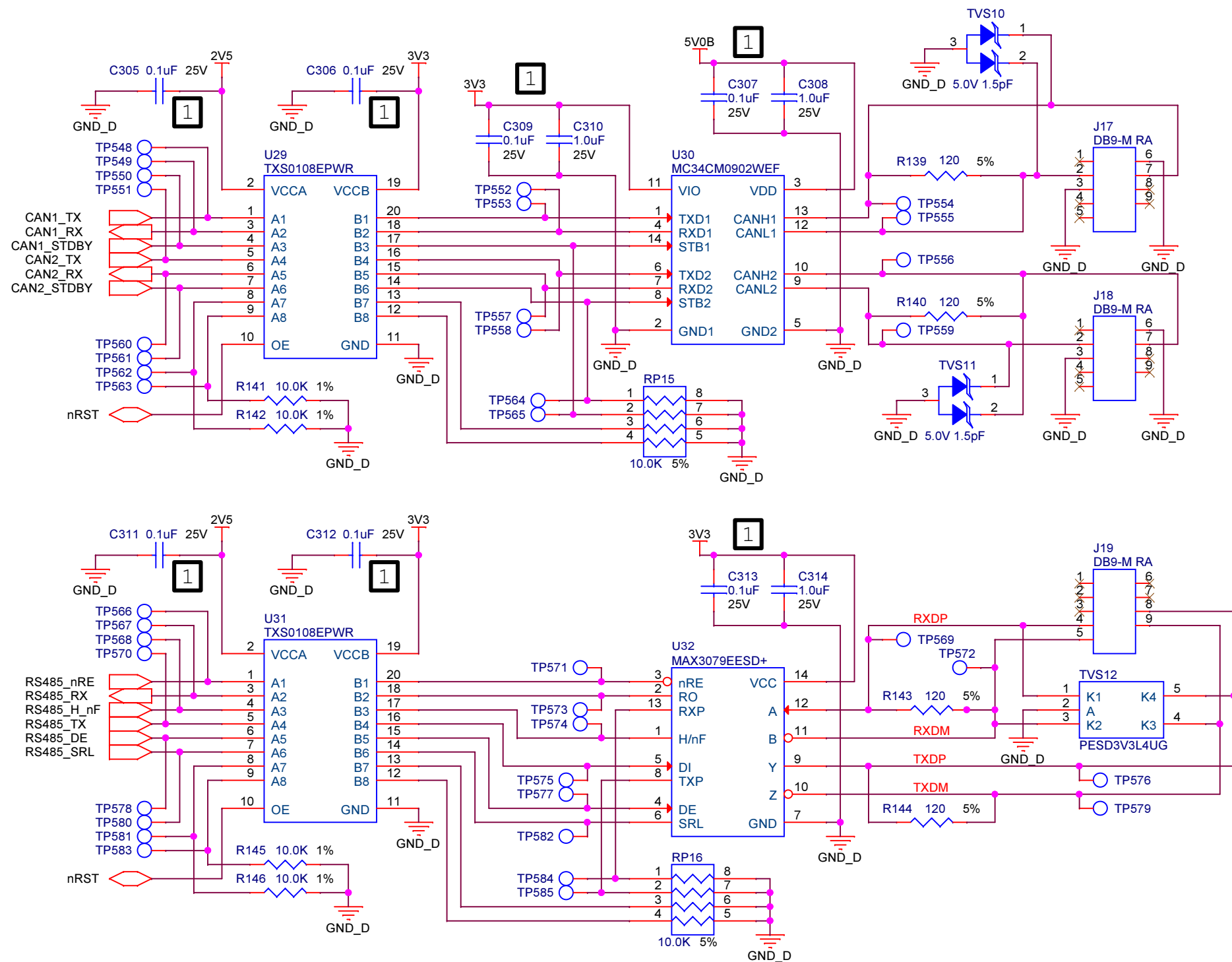


# NOTES:

- 1 Place decoupling capacitors as close to IC pins as possible.
- 10 Route indicated signals as 90 ohm differential pairs.

		<b>krtkl inc.</b> 350 Townsend Street Suite 301A San Francisco, CA 94107 +1 415 857 4857		<b>TITLE</b> whiteRhino industrial SBC	
				<b>DESCRIPTION</b> USB Connectors	
	<b>DRAWN BY</b> B. Hammond	<b>DATE</b> 07/01/2015	<b>SIZE</b> B	<b>DRAWING NO.</b> 15081804-01	<b>REV</b> 2.6
	<b>CHECKED BY</b> -	<b>DATE</b> 10/03/2015		<b>SHEET 13</b> of 17	
	<b>APPROVED BY</b> R. Cousins	<b>DATE</b> 10/04/2015			





# NOTES:

- 1 Place decoupling capacitors as close to IC pins as possible.

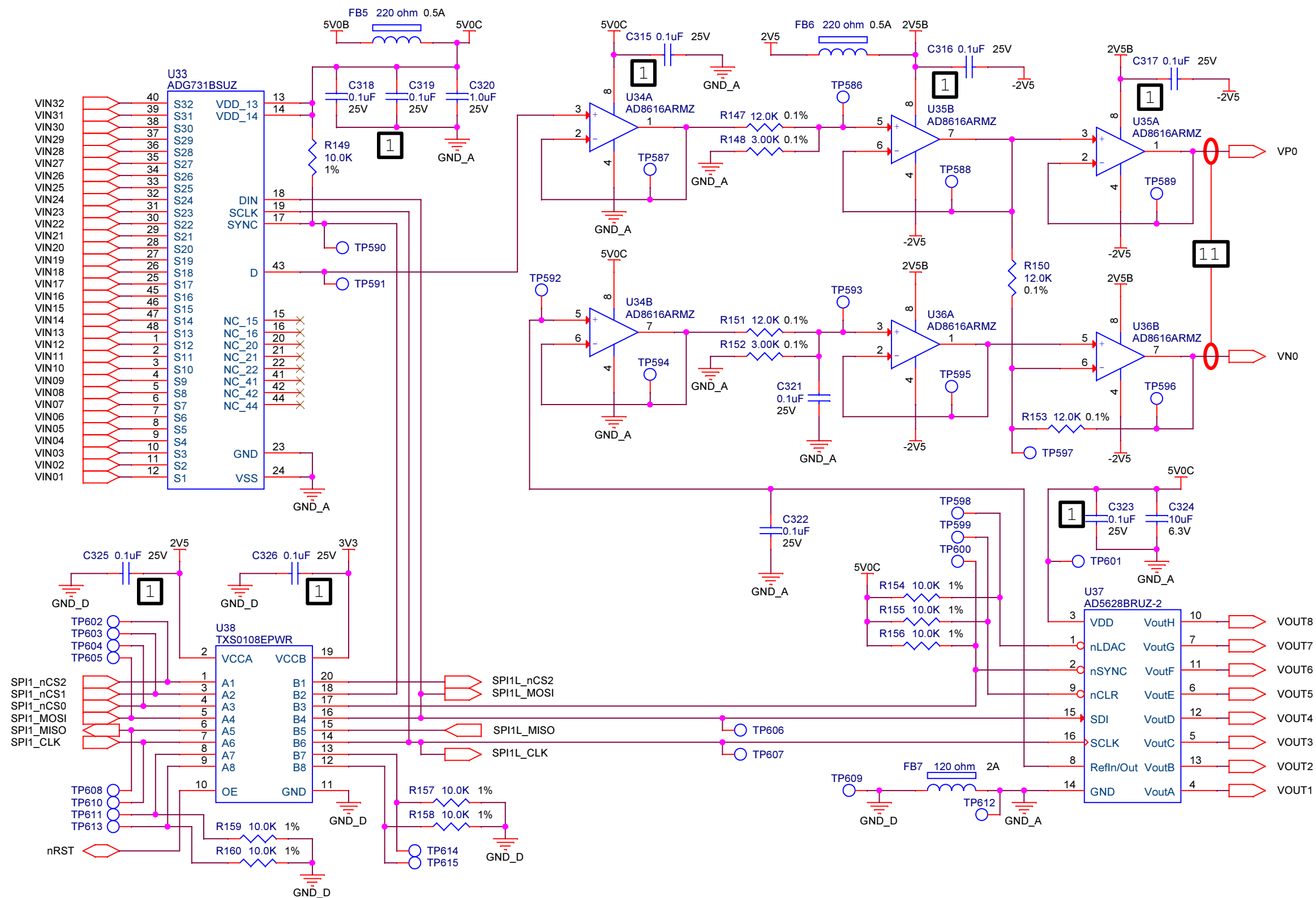


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NAME	DATE
DRAWN BY B. Hammond	06/24/2015
CHECKED BY J. Weatherbee	10/03/2015
APPROVED BY R. Cousins	10/04/2015

TITLE		
whiteRhino industrial SBC		
PATH		
/		
DESCRIPTION		
Serial Interfaces		
SIZE	DRAWING NO.	REV
B	15081804-01	2.6
SHEET 14		OF 17



# NOTES:

**1** Place decoupling capacitors as close to IC pins as possible.

**11** Shield traces with GND\_A.



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TITLE whiteRhino industrial SBC

PATH /

DESCRIPTION Analog I/O

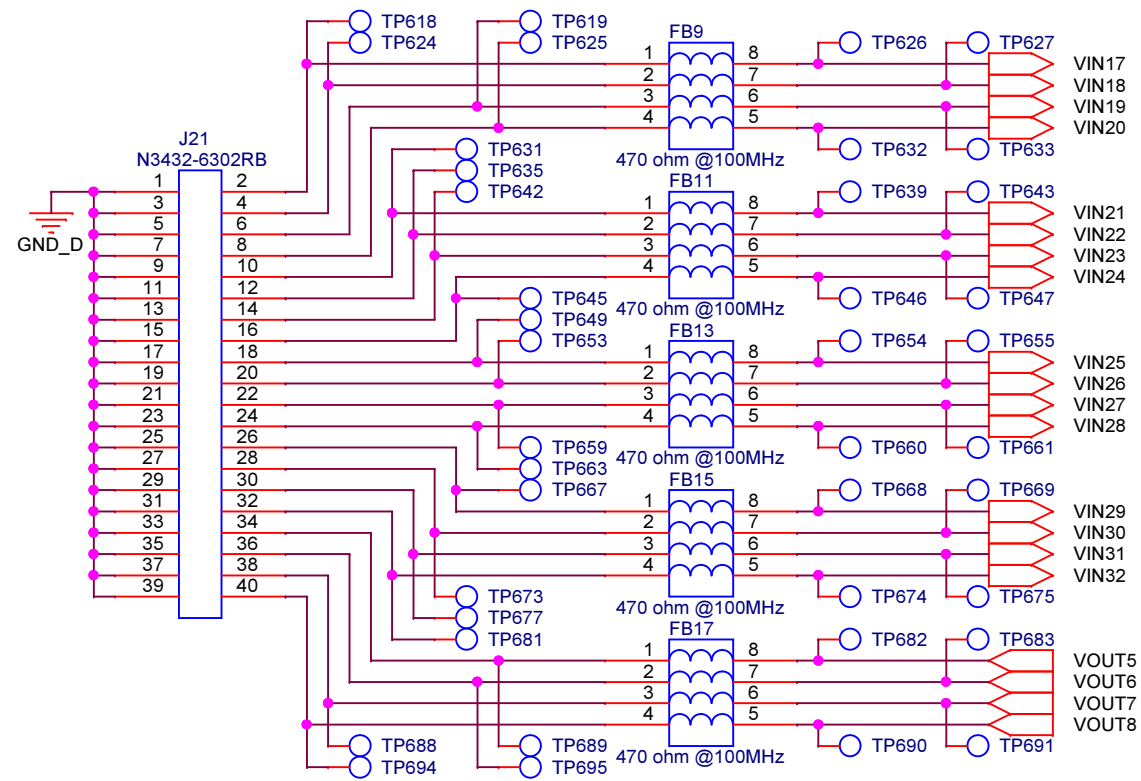
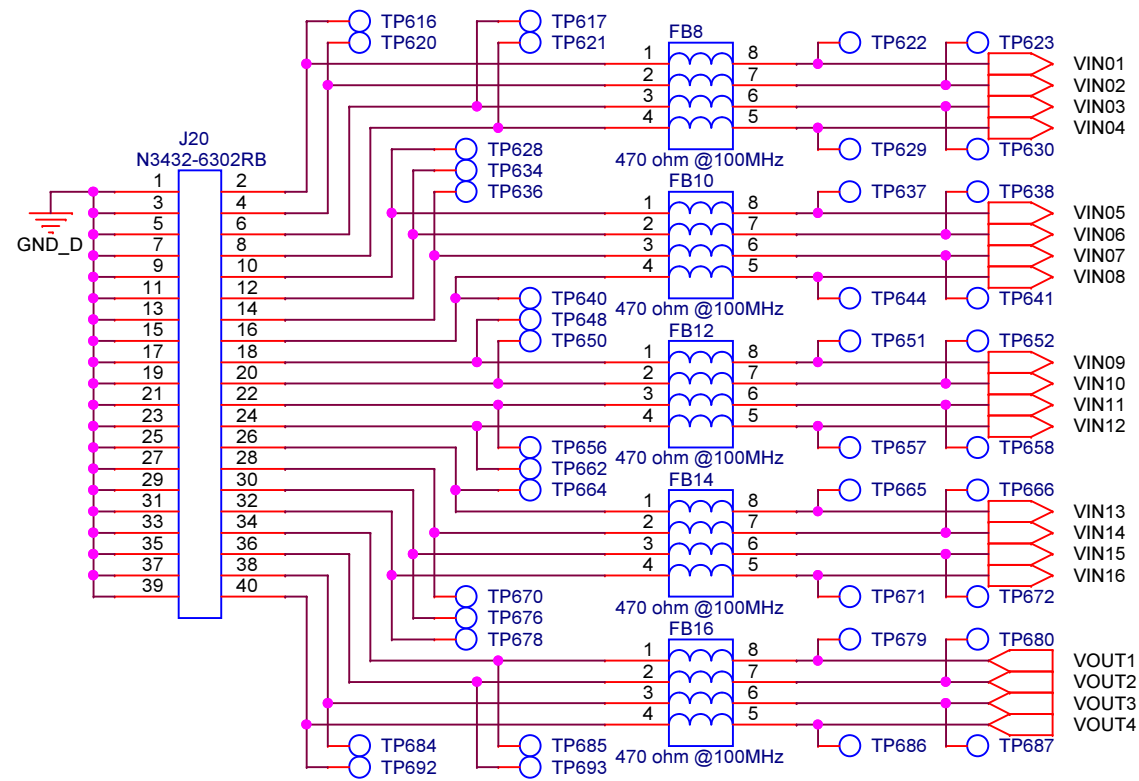


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NAME	DATE
DRAWN BY B. Hammond	06/25/2015
CHECKED BY J. Weatherbee	10/03/2015
APPROVED BY R. Cousins	10/04/2015

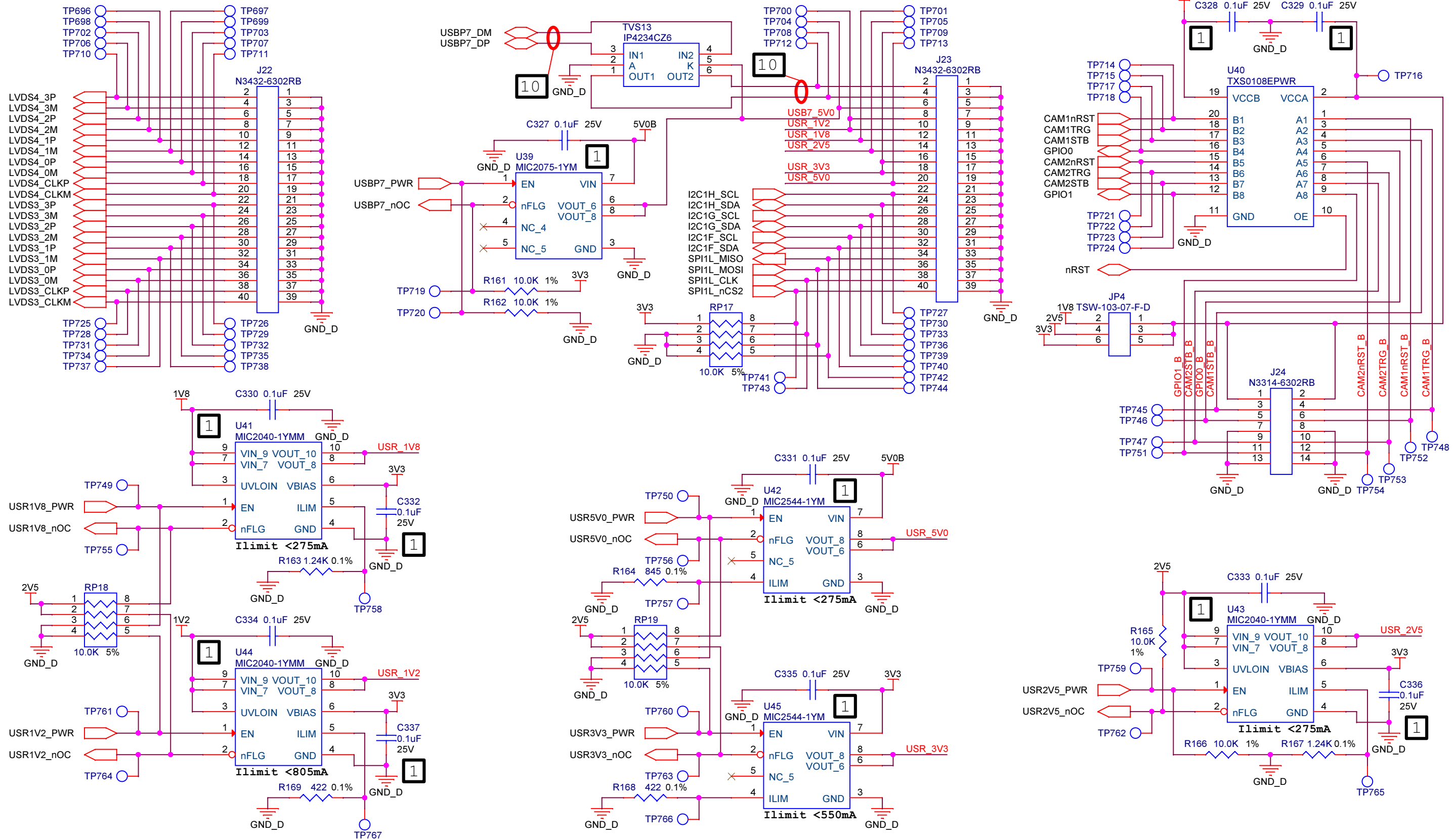
SIZE	DRAWING NO.	REV
B	15081804-01	2.6

SHEET 15 OF 17



NOTES:

		<b>krtkl inc.</b> 350 Townsend Street Suite 301A San Francisco, CA 94107 +1 415 857 4857		<b>whiteRhino industrial SBC</b>	
		PATH /		DESCRIPTION <b>User Analog I/O Connectors</b>	
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CHECKED BY J. Weatherbee		DATE 10/03/2015		REV 2.6	
APPROVED BY R. Cousins		DATE 10/04/2015		SHEET 16 OF 17	



NOTES:

1 Place decoupling capacitors as close to IC pins as possible.

10 Route indicated signals as 90 ohm differential pairs.



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TITLE  
whiteRhino industrial SBC

PATH  
/

DESCRIPTION  
User Digital I/O Connectors



DRAWN BY  
B. Hammond

CHECKED BY  
J. Weatherbee

APPROVED BY  
R. Cousins

DATE  
06/24/2015

DATE  
10/03/2015

DATE  
10/04/2015

SIZE  
B

DRAWING NO.  
15081804-01

REV  
2.6

SHEET 17 OF 17