
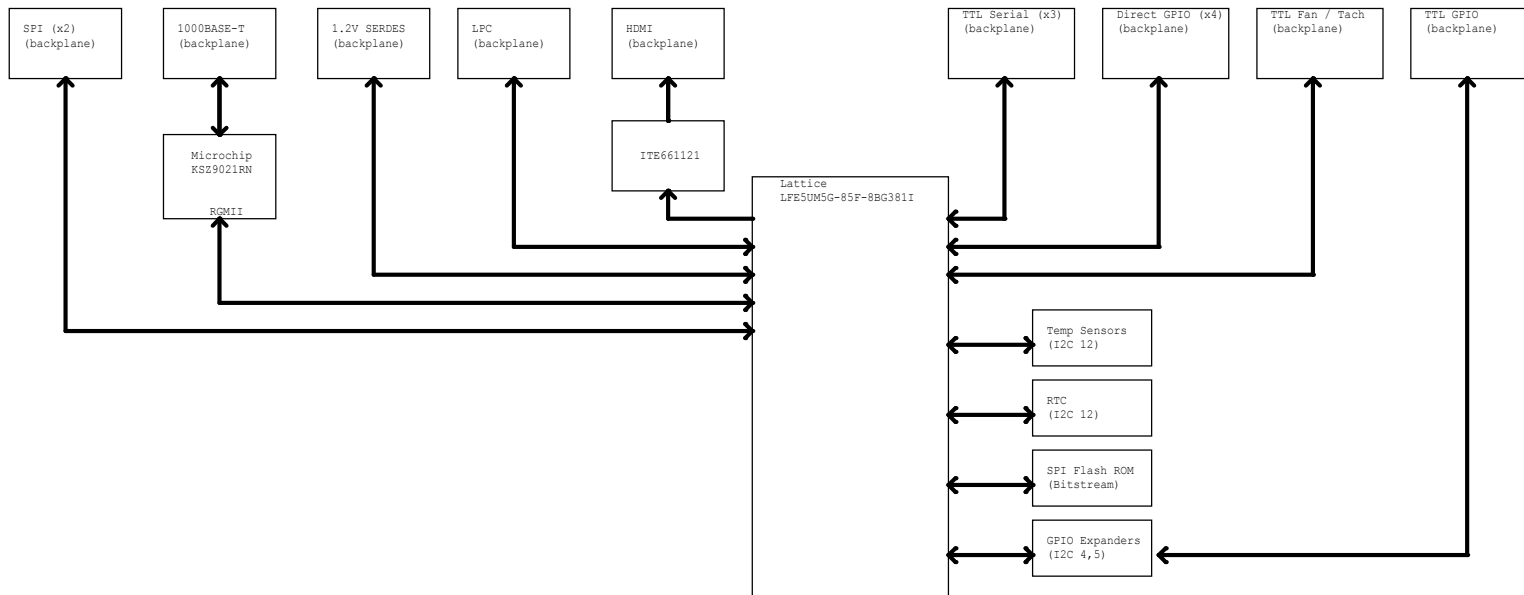


1	Table of Contents
2	Block Diagram
3	Clock Distribution
4	Blank
5	Power Distribution
6	BMC Regulators
7	5V Regulator
8	Blank
9	Blank
10	Backplane Power / Control
11	Backplane HDMI
12	Backplane COM Ports
13	Backplane LPC / SPI
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23	ECP5 Power
24	RTC
25	HDMI Transmitter
26	Ethernet PHY
27	System Temp Sensors


PCB1  
  
 PCB-SILVERTERN-099

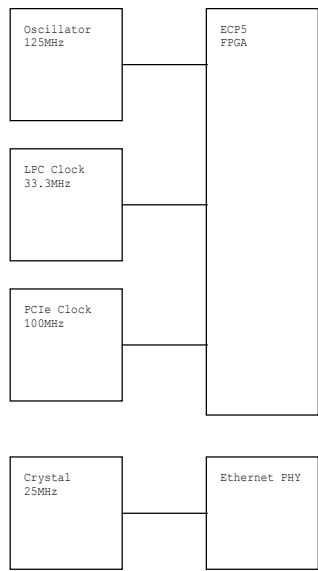
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Project :	Arctic Tern	
Part NO :	AT1MB1	
EC NO :		1.01
Title :	<b>Table of Contents</b>	
Author :	Page:1	of 27
Last Changed :	Tuesday, May 24, 2022	




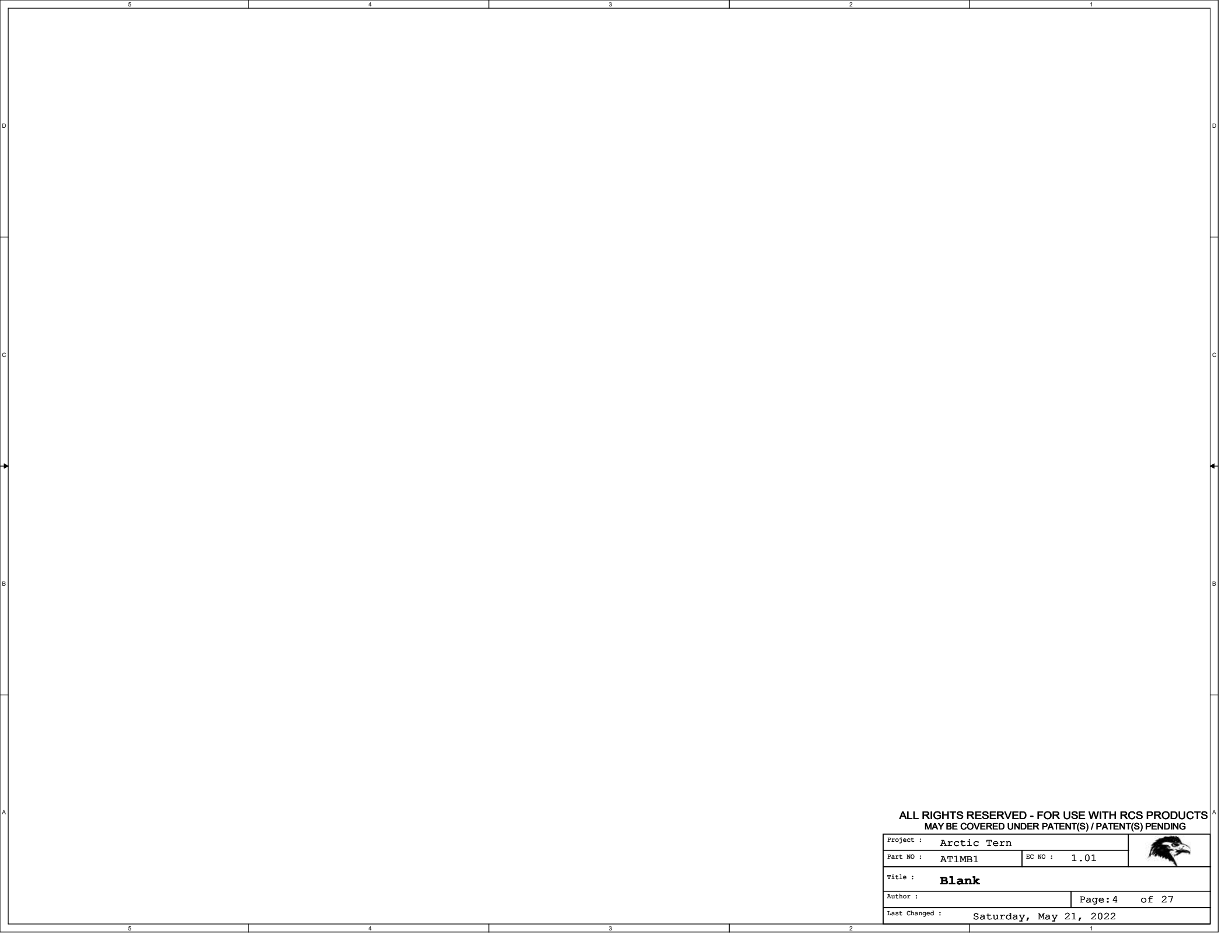
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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	<b>Block Diagram</b>		
Author :		Page:2	of 27
Last Changed :	Monday, May 30, 2022		



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Project : Arctic Tern		
Part NO : AT1MB1	EC NO : 1.01	
Title : <b>Clock Distribution</b>		
Author :		Page:3 of 27
Last Changed :		Saturday, May 21, 2022



5

4

3

2

1

D

D

C

C


B

B

A

A

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Project :	Arctic Tern	
Part NO :	AT1MB1	
Title :	<b>Blank</b>	
Author :		Page: 4 of 27
Last Changed :	Saturday, May 21, 2022	

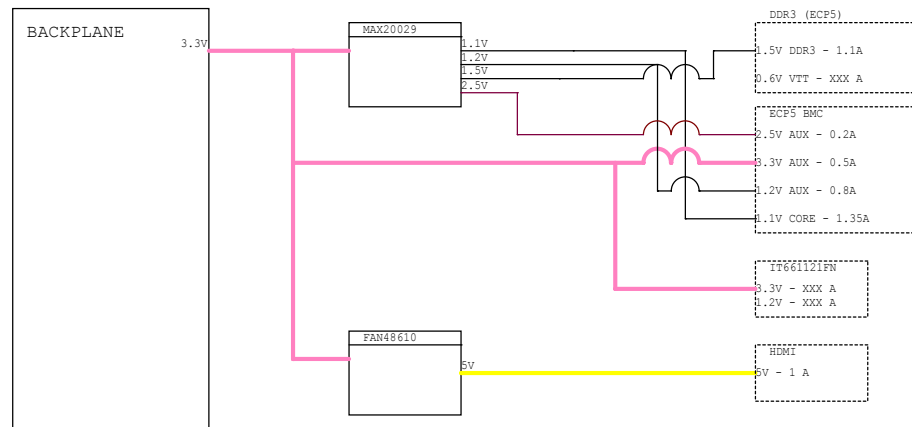
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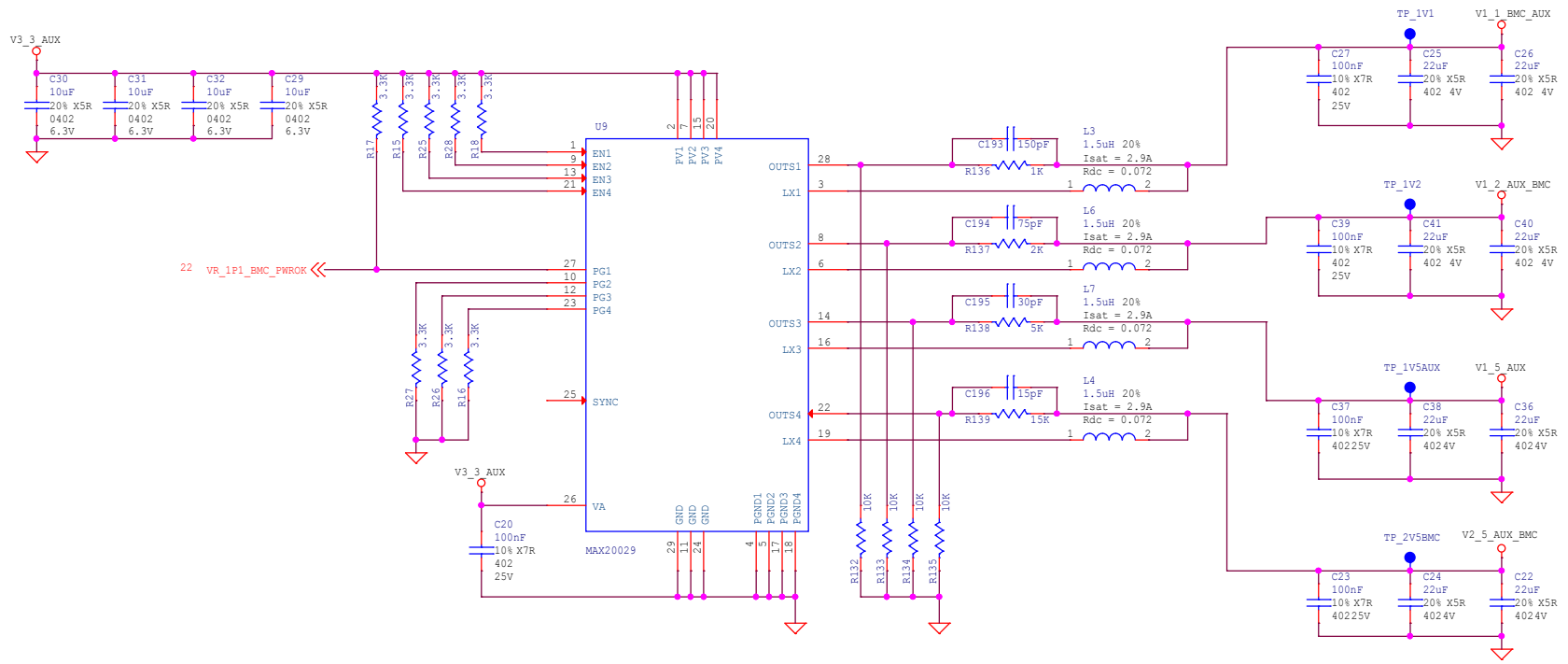
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1



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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	<b>Power Distribution</b>		
Author :			Page:5 of 27
Last Changed :	Saturday, May 21, 2022		

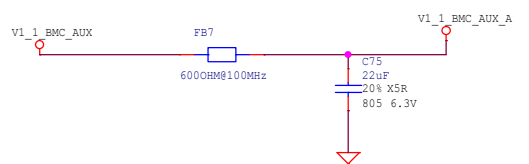


BMC 1.1V


BMC 1.2V

BMC 1.5V

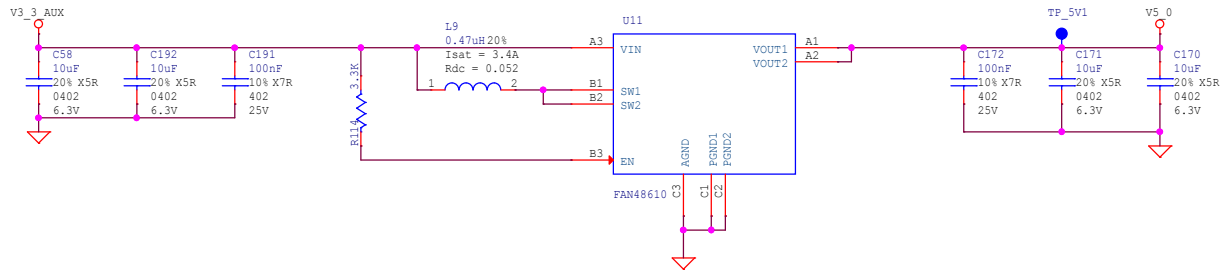
BMC 2.5V




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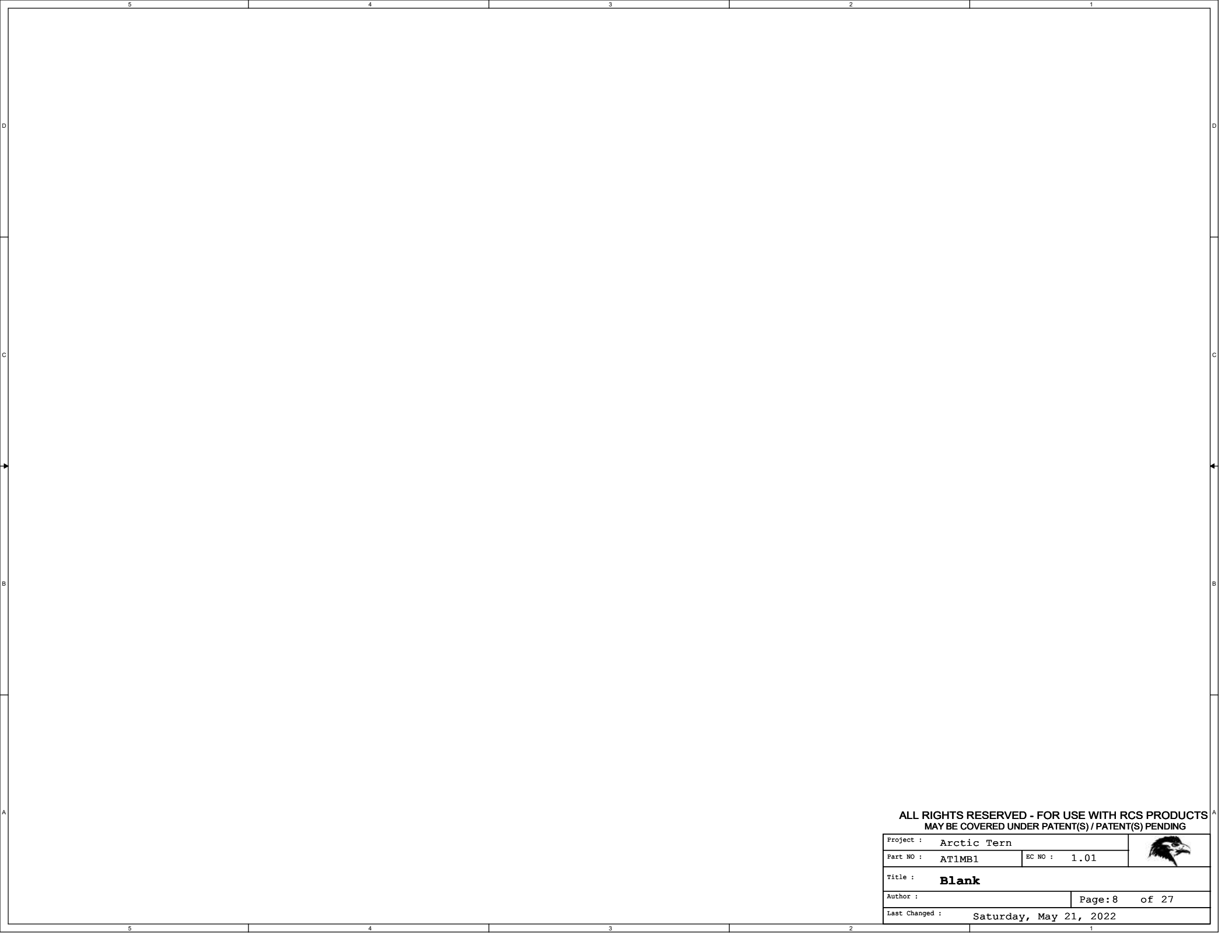
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Part NO : AT1MB1	EC NO : 1.01	
Title : BMC Regulators		
Author :	Page: 6	of 27
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# PLATFORM +5V



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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	<b>5V Regulator</b>		
Author :		Page: 7	of 27
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5

4

3

2

1

D

D

C

C


B

B

A

A

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Project :	Arctic Tern	
Part NO :	AT1MB1	
Title :	<b>Blank</b>	
Author :		Page:8 of 27
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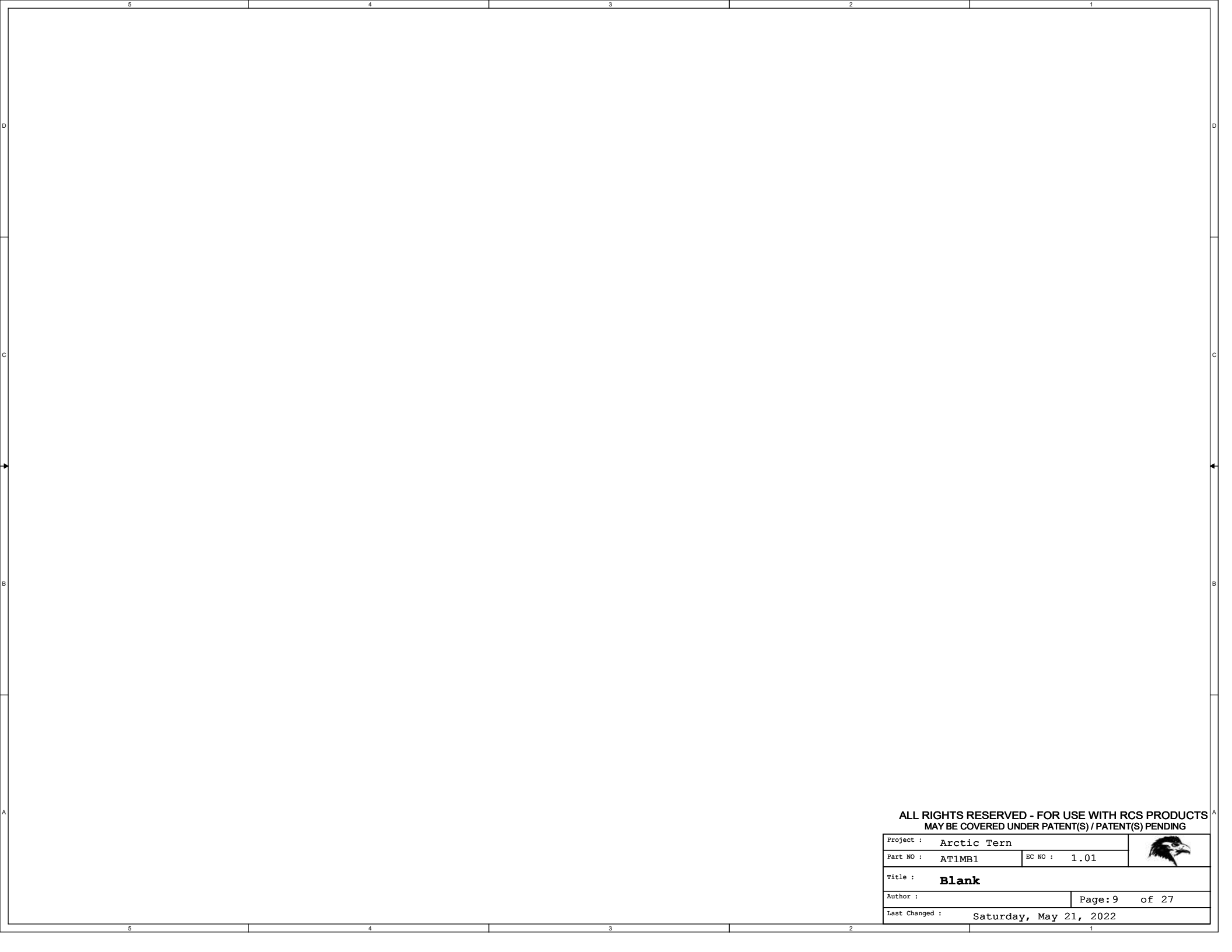
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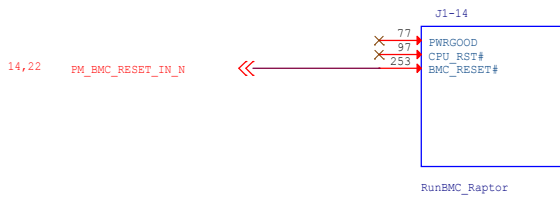
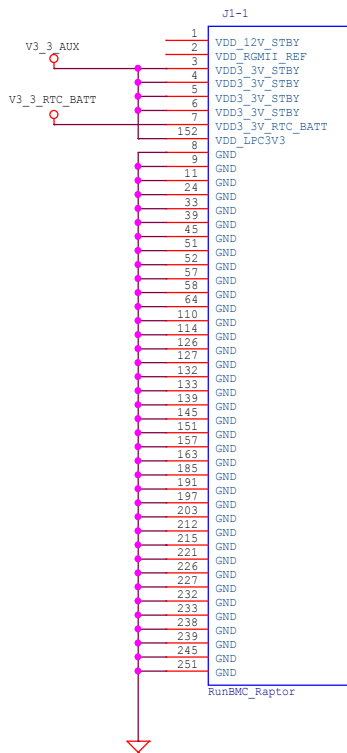
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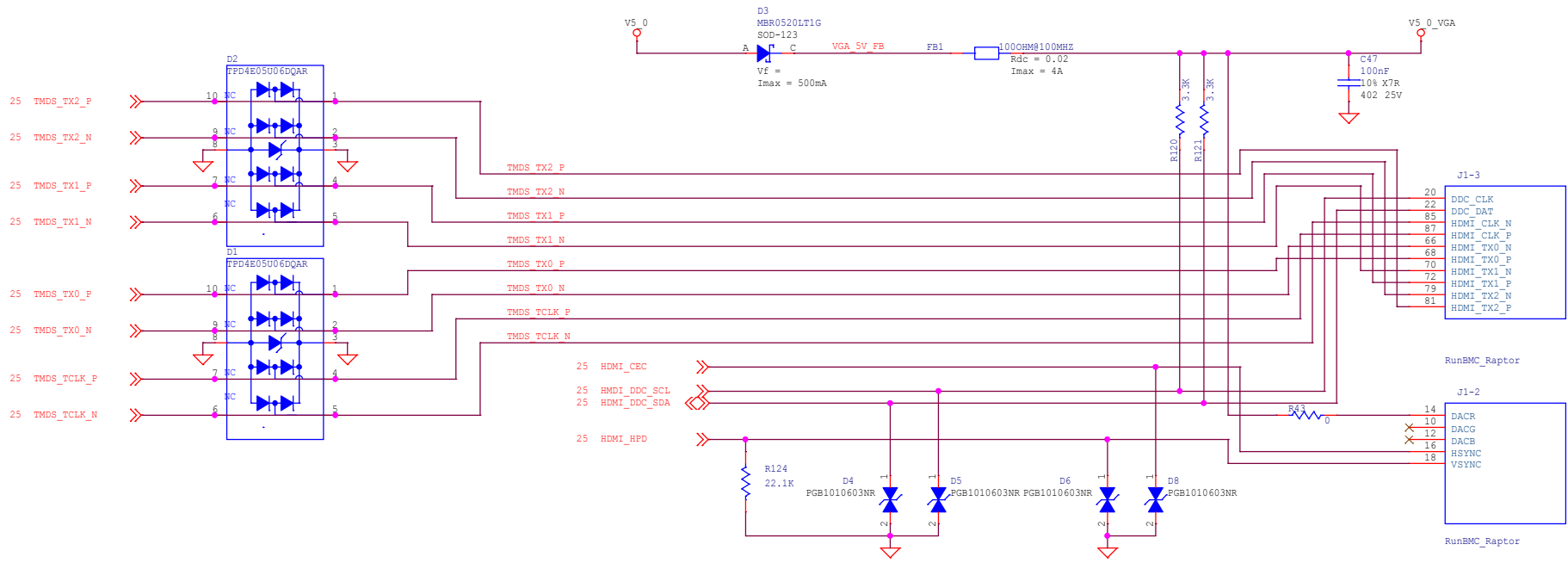
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Author :		Page: 9 of 27
Last Changed :	Saturday, May 21, 2022	




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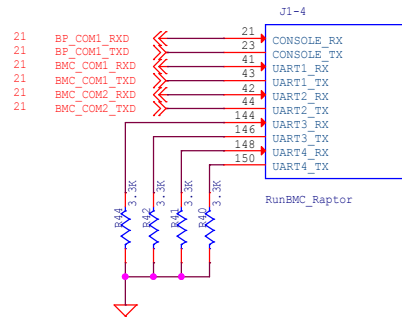
Project :	Arctic Tern	
Part NO :	AT1MB1	
Title :	<b>Backplane Power / Control</b>	
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Last Changed :	Saturday, May 21, 2022	

# HDMI Connector




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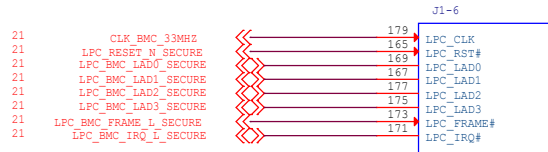
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Part NO :	AT1MB1	EC NO : 1.01	
Title :	Backplane HDMI		
Author :		Page:11	of 27
Last Changed :	Saturday, May 21, 2022		



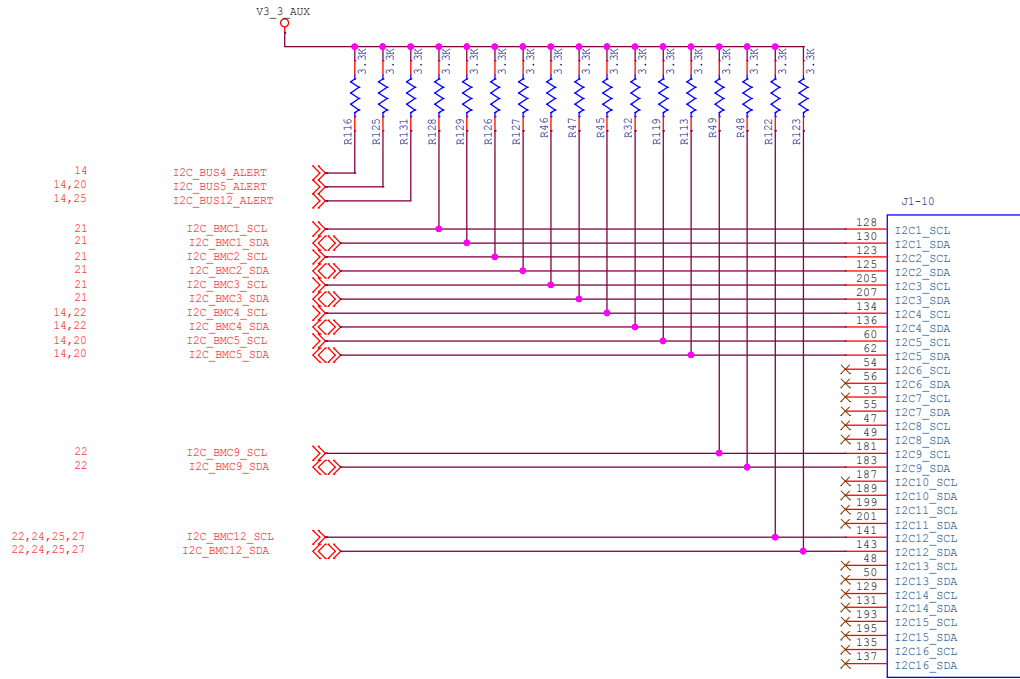
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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	<b>Backplane COM Ports</b>		
Author :			Page:12 of 27
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ALL LPC SIGNALS MUST BE LENGTH MATCHED




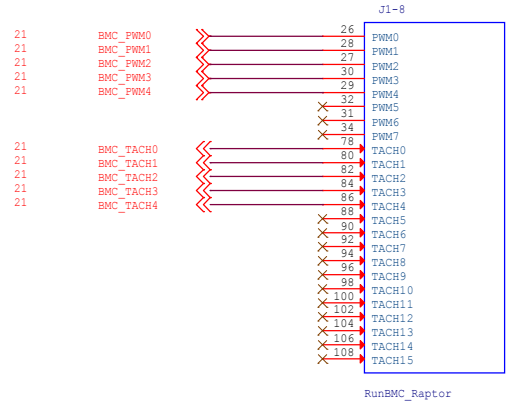
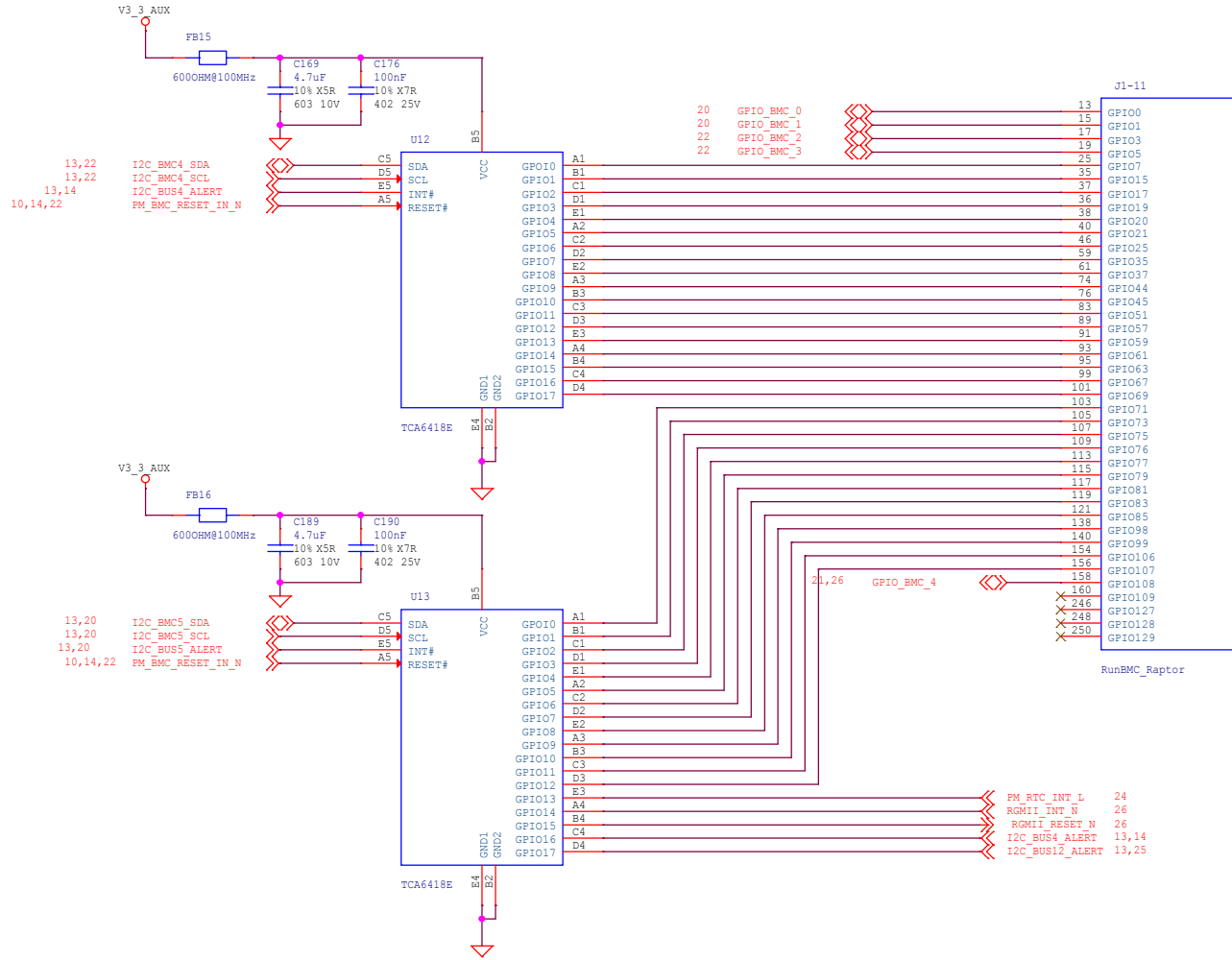
RunBMC\_Raptor




RunBMC\_Raptor

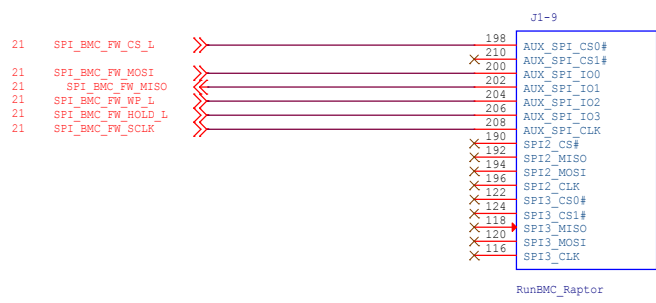
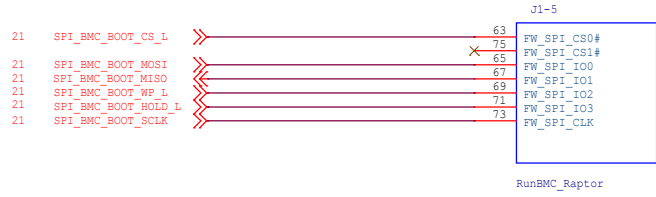
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Project :	Arctic Tern	
Part NO :	AT1MB1	
Title :	Backplane LPC / I2C	
Author :		Page:13 of 27
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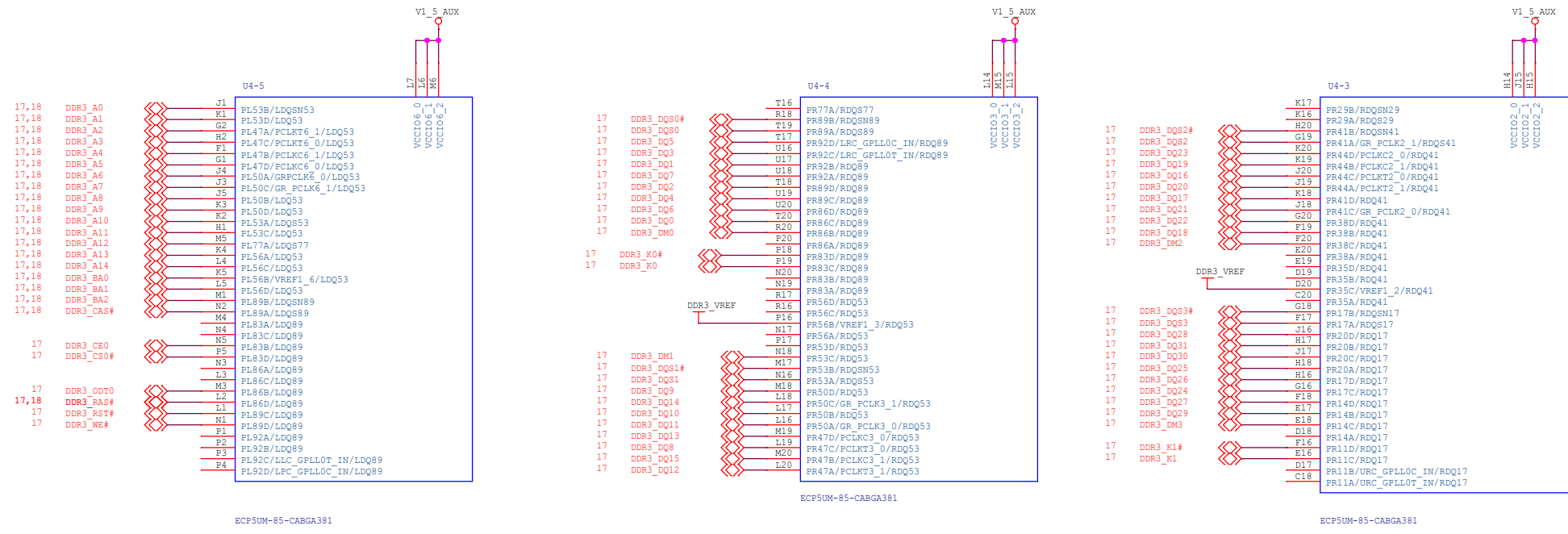
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Project : Arctic Tern		
Part NO : AT1MB1	EC NO : 1.01	
Title : Backplane Fan / Tach / GPIO		
Author :	Page:14 of 27	
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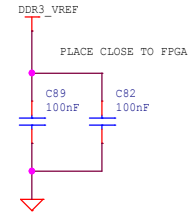
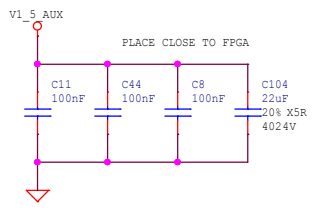
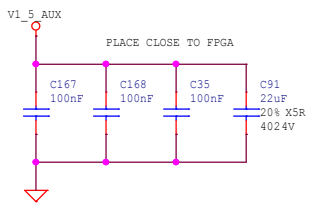
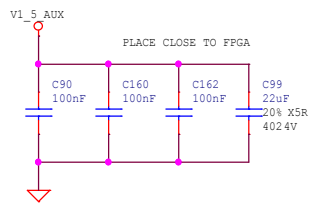


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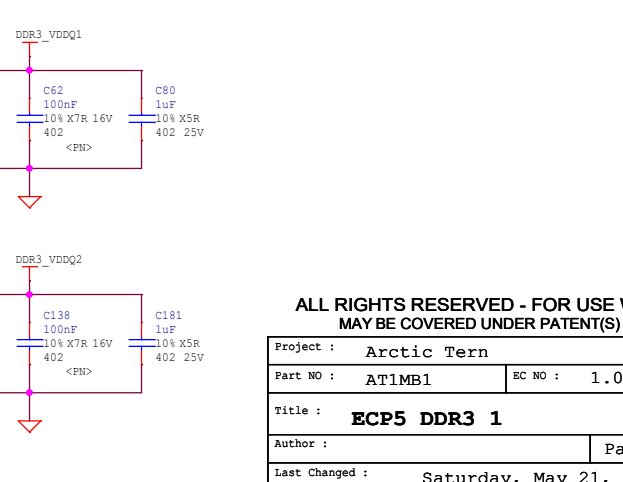
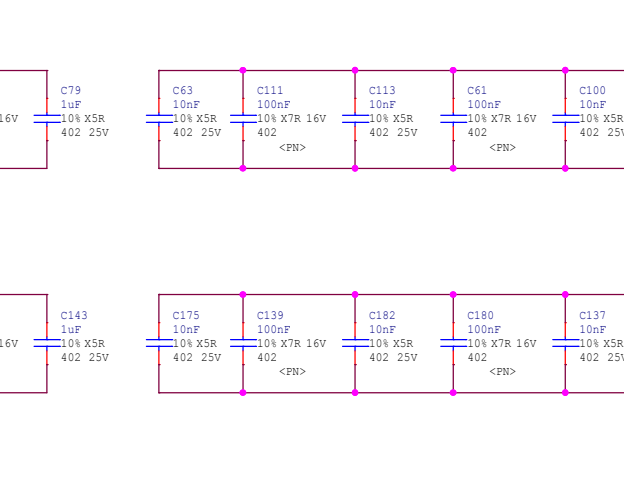
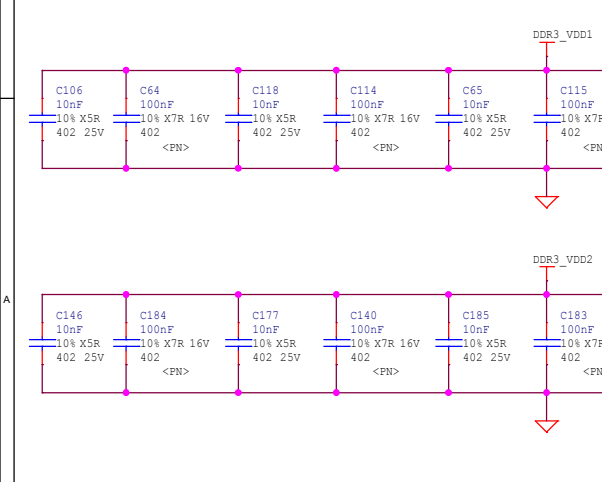
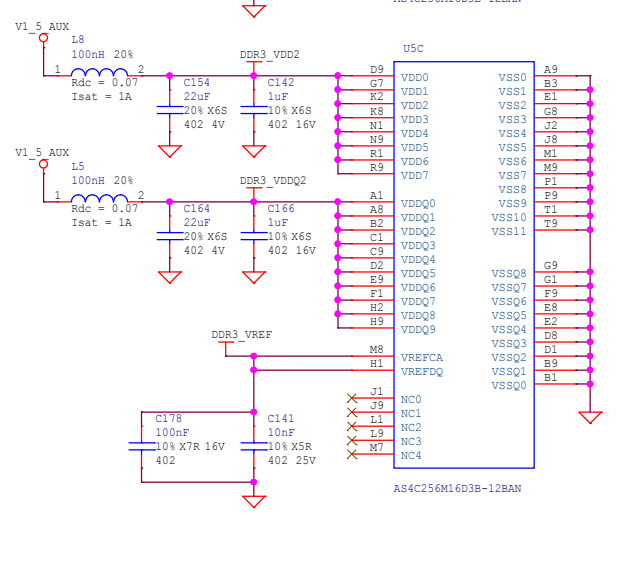
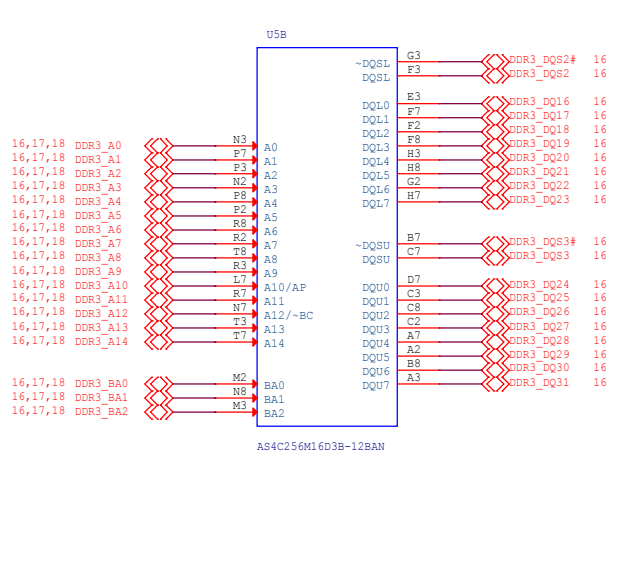
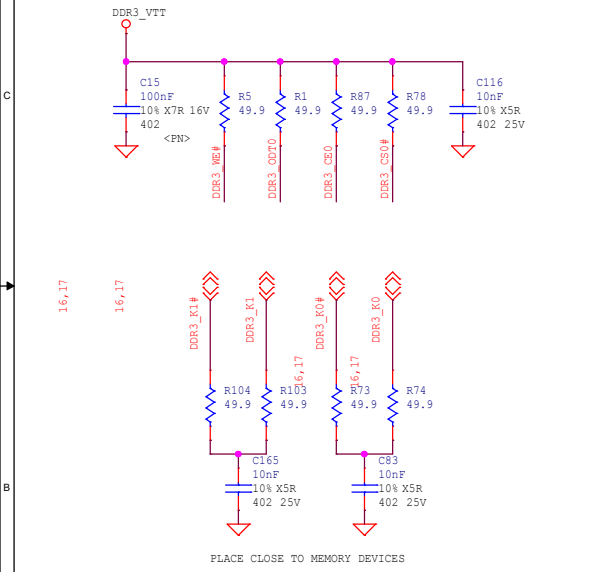
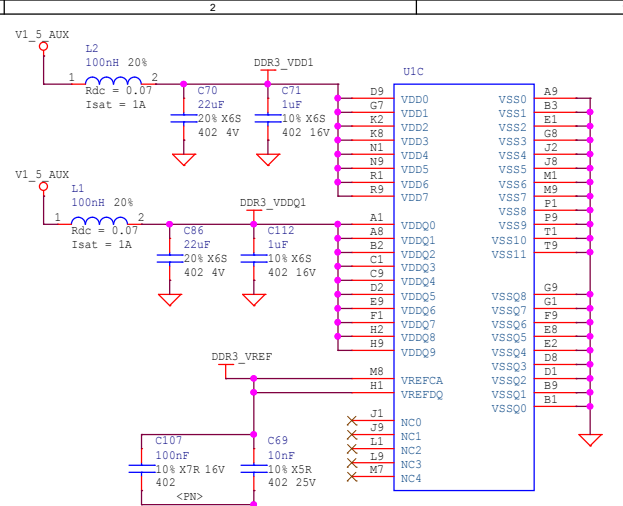
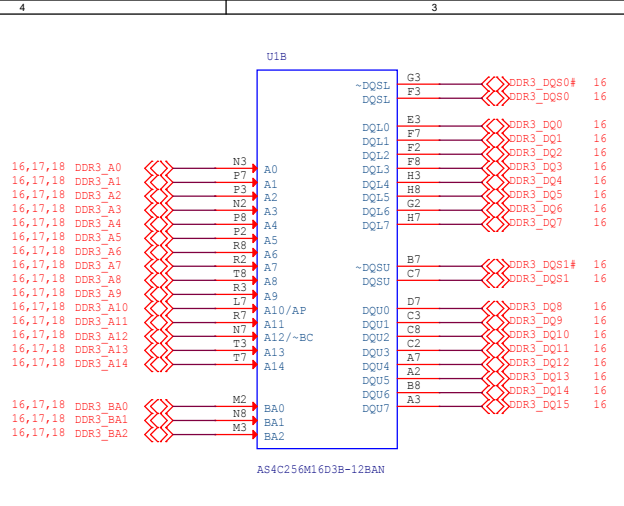
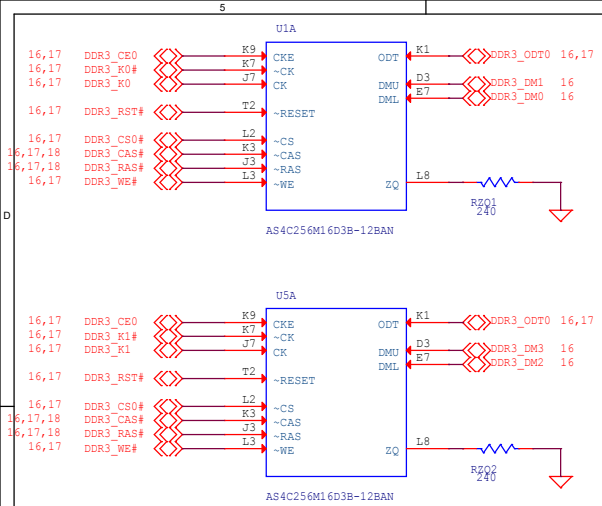
All memory controller busses, clocks, and control traces must be routed as 50 ohm transmission lines  
 All address / control / data lines between the ECP5 and the DDR3 devices must be length matched

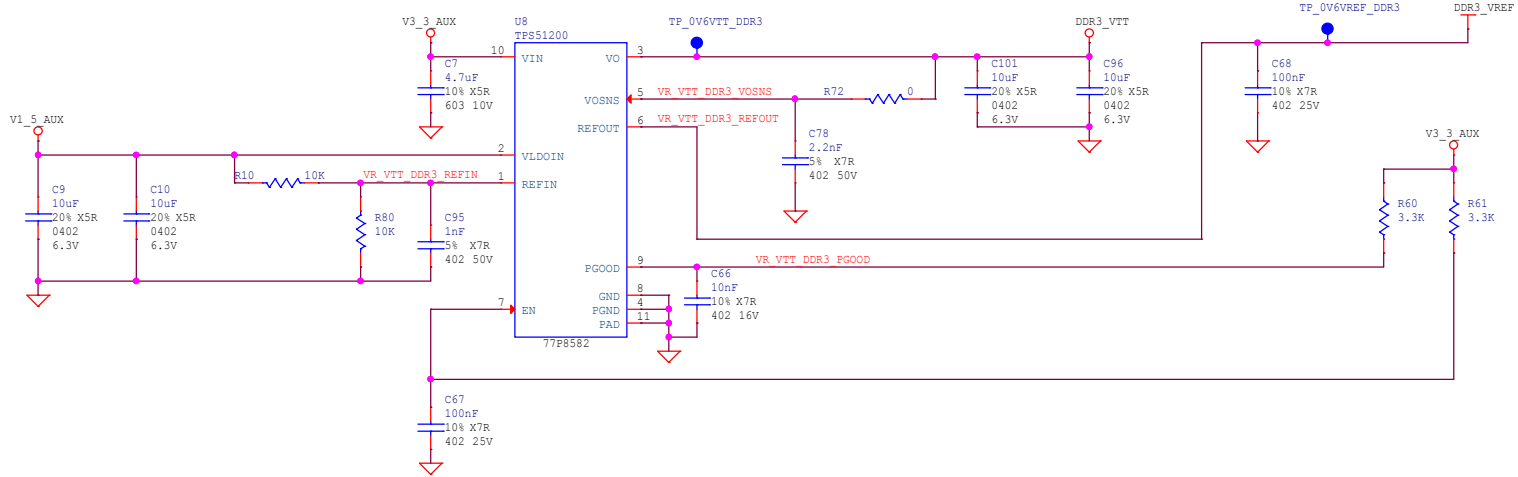
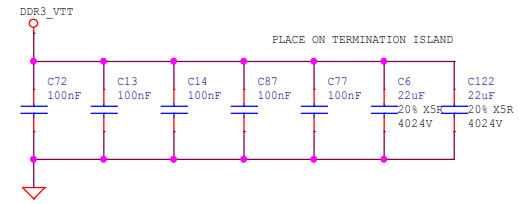
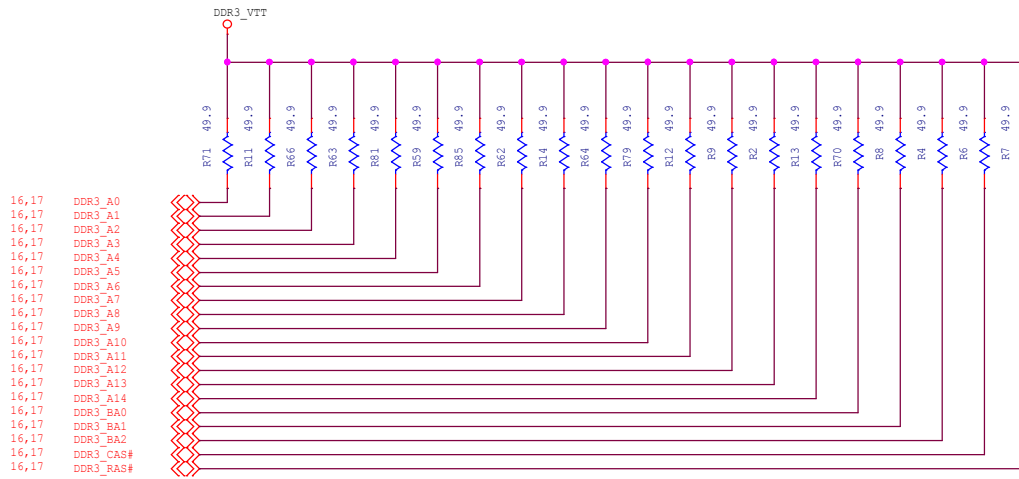


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Part NO : AT1MB1	EC NO : 1.01	
Title : ECP5 DDR3 0		
Author :		Page:16 of 27
Last Changed :		Saturday, May 21, 2022

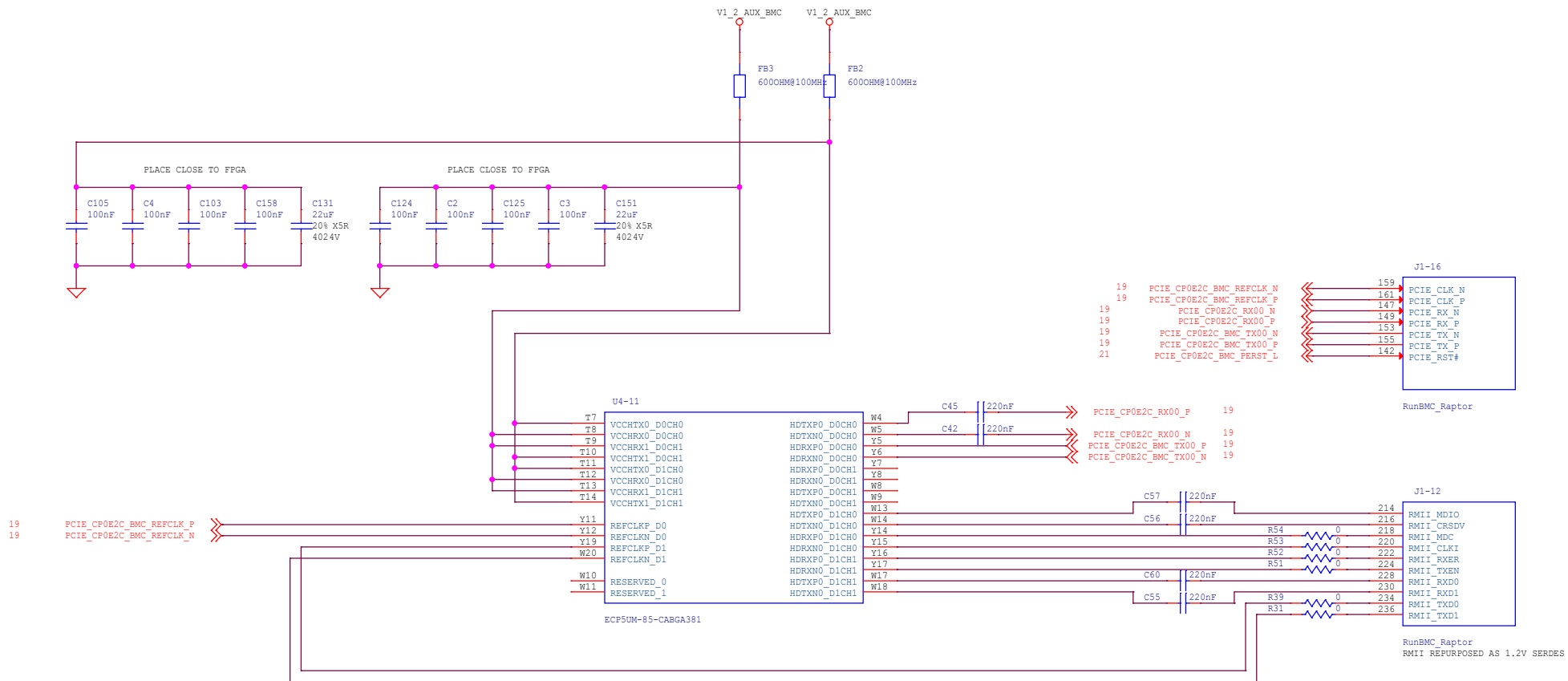






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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	ECP5 DDR3 2		
Author :		Page:18	of 27
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19 PCIE\_CPOE2C\_BMC\_REFCLK\_P  
19 PCIE\_CPOE2C\_BMC\_REFCLK\_N

19 PCIE\_CPOE2C\_BMC\_REFCLK\_N  
19 PCIE\_CPOE2C\_BMC\_REFCLK\_P  
19 PCIE\_CPOE2C\_RX00\_N  
19 PCIE\_CPOE2C\_RX00\_P  
19 PCIE\_CPOE2C\_BMC\_TX00\_N  
19 PCIE\_CPOE2C\_BMC\_TX00\_P  
21 PCIE\_CPOE2C\_BMC\_PBRST\_L

J1-16  
159 PCIE\_CLK\_N  
161 PCIE\_CLK\_P  
147 PCIE\_RX\_N  
149 PCIE\_RX\_P  
153 PCIE\_TX\_N  
155 PCIE\_TX\_P  
142 PCIE\_RST#

RunBMC\_Raptor

U4-11  
T7 VCCHTX0\_D0CH0 HDTXP0\_D0CH0 W4  
T8 VCCHRX0\_D0CH0 HDTXN0\_D0CH0 W5  
T9 VCCHRX1\_D0CH1 HDRXP0\_D0CH0 Y5  
T10 VCCHTX1\_D0CH1 HDRXN0\_D0CH0 Y6  
T11 VCCHTX0\_D1CH0 HDRXP0\_D1CH1 Y7  
T12 VCCHRX0\_D1CH0 HDRXN0\_D1CH1 Y8  
T13 VCCHRX1\_D1CH1 HDTXP0\_D0CH1 W8  
T14 VCCHTX1\_D1CH1 HDTXN0\_D0CH1 W9  
Y11 REFCLKP\_D0 HDTXP0\_D1CH0 W13  
Y12 REFCLKN\_D0 HDTXN0\_D1CH0 W14  
Y19 REFCLKP\_D1 HDRXP0\_D1CH0 Y15  
W20 REFCLKN\_D1 HDRXN0\_D1CH0 Y16  
W10 RESERVED\_0 HDRXP0\_D1CH1 Y17  
W11 RESERVED\_1 HDTXN0\_D1CH1 W18


ECP5UM-85-CARGA381

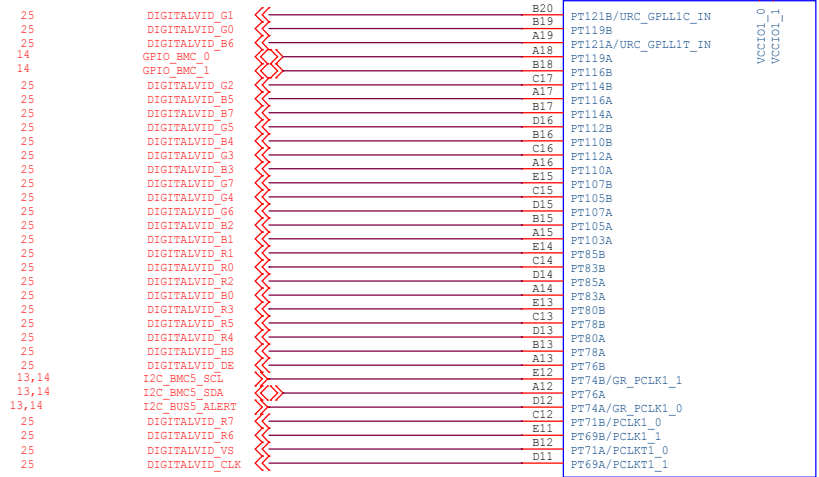
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C42 220nF PCIE\_CPOE2C\_RX00\_N 19  
PCIE\_CPOE2C\_BMC\_TX00\_P 19  
PCIE\_CPOE2C\_BMC\_TX00\_N 19

J1-12  
214 RMI\_I\_MDIO  
216 RMI\_I\_CRSDV  
218 RMI\_I\_MDC  
220 RMI\_I\_CLKI  
224 RMI\_I\_RXER  
RMI\_I\_TXEN  
228 RMI\_I\_RXD0  
230 RMI\_I\_RXD1  
234 RMI\_I\_TXD0  
236 RMI\_I\_TXD1

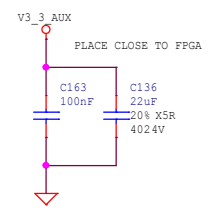
RunBMC\_Raptor  
RMI\_I REPURPOSED AS 1.2V SERDES

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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	ECP5 SERDES		
Author :			Page:19 of 27
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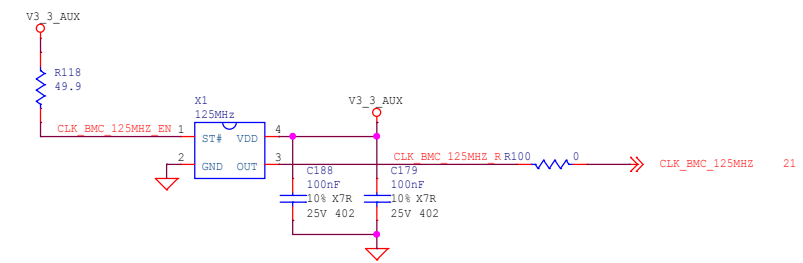
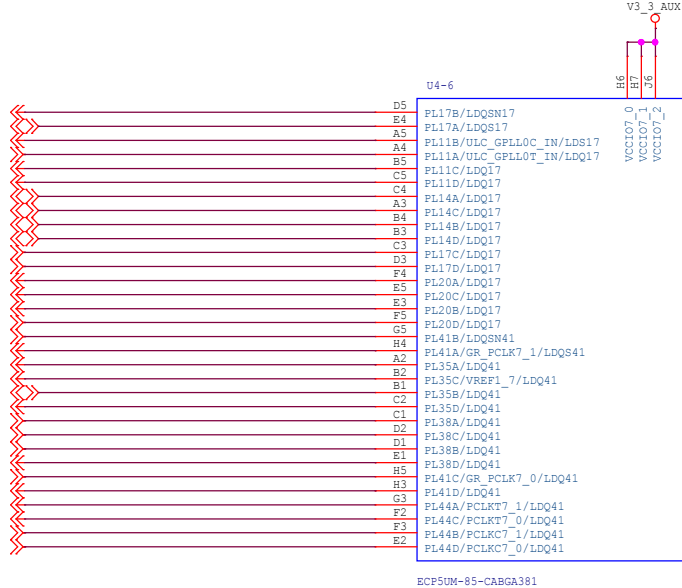
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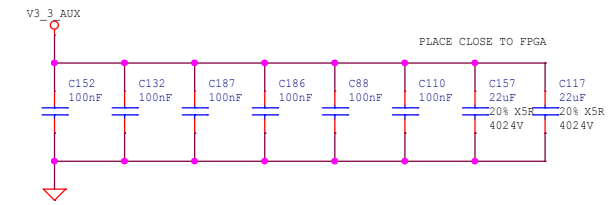
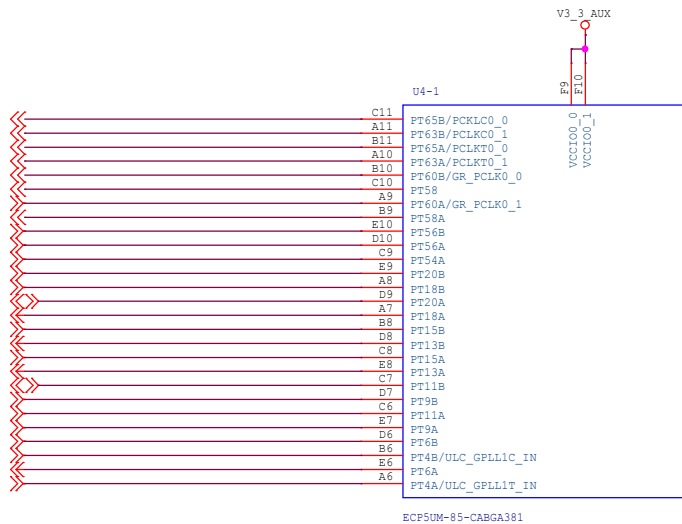
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Project :	Arctic Tern	
Part NO :	AT1MB1	
Title :	ECP5 Video	
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13 I2C\_BMC1\_SCL  
 13 I2C\_BMC1\_SDA  
 14 BMC\_FWM4  
 14 BMC\_TACH4  
 14 BMC\_FWM0  
 14 BMC\_FWM1  
 13 LPC\_BMC\_LAD0\_SECURE  
 13 LPC\_BMC\_LAD1\_SECURE  
 13 LPC\_BMC\_LAD2\_SECURE  
 13 LPC\_BMC\_LAD3\_SECURE  
 13 LPC\_RESET\_N\_SECURE  
 13 LPC\_BMC\_FRAME\_L\_SECURE  
 13,21 LPC\_BMC\_IRQ\_L\_SECURE  
 15 SPI\_BMC\_FW\_SCLK  
 15 SPI\_BMC\_FW\_MOSI  
 15 SPI\_BMC\_FW\_MISO  
 15 SPI\_BMC\_FW\_CS\_L  
 15 SPI\_BMC\_FW\_HOLD\_L  
 15 SPI\_BMC\_BOOT\_HOLD\_L  
 13 I2C\_BMC2\_SCL  
 13 I2C\_BMC2\_SDA  
 12 BP\_COM1\_TXD  
 12 BP\_COM1\_RXD  
 15 SPI\_BMC\_FW\_WP\_L  
 15 SPI\_BMC\_BOOT\_WP\_L  
 14 BMC\_FWM2  
 13 CLK\_BMC\_33MHZ  
 14 BMC\_FWM3  
 15 SPI\_BMC\_BOOT\_SCLK  
 15 SPI\_BMC\_BOOT\_MOSI  
 15 SPI\_BMC\_BOOT\_MISO  
 15 SPI\_BMC\_BOOT\_CS\_L

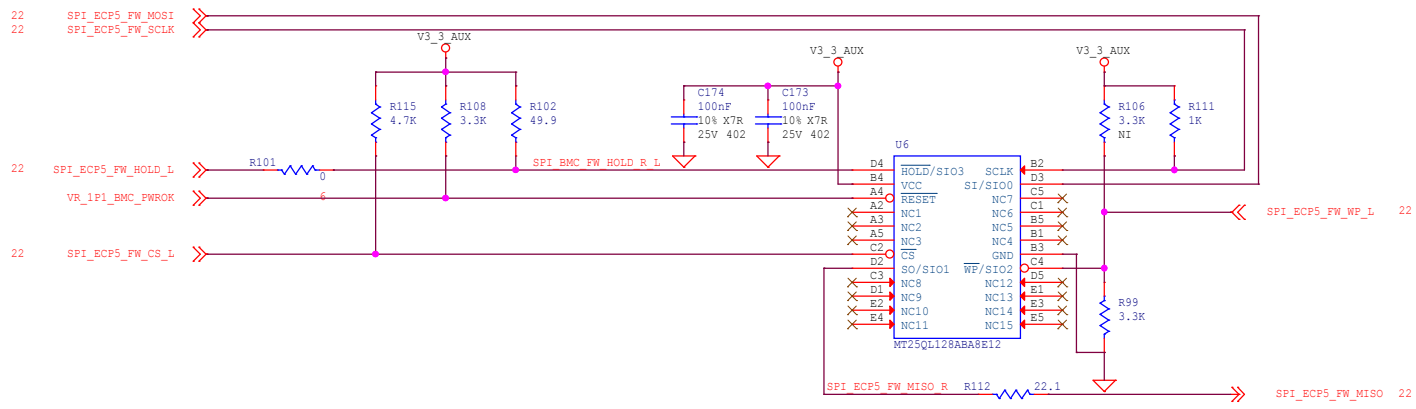
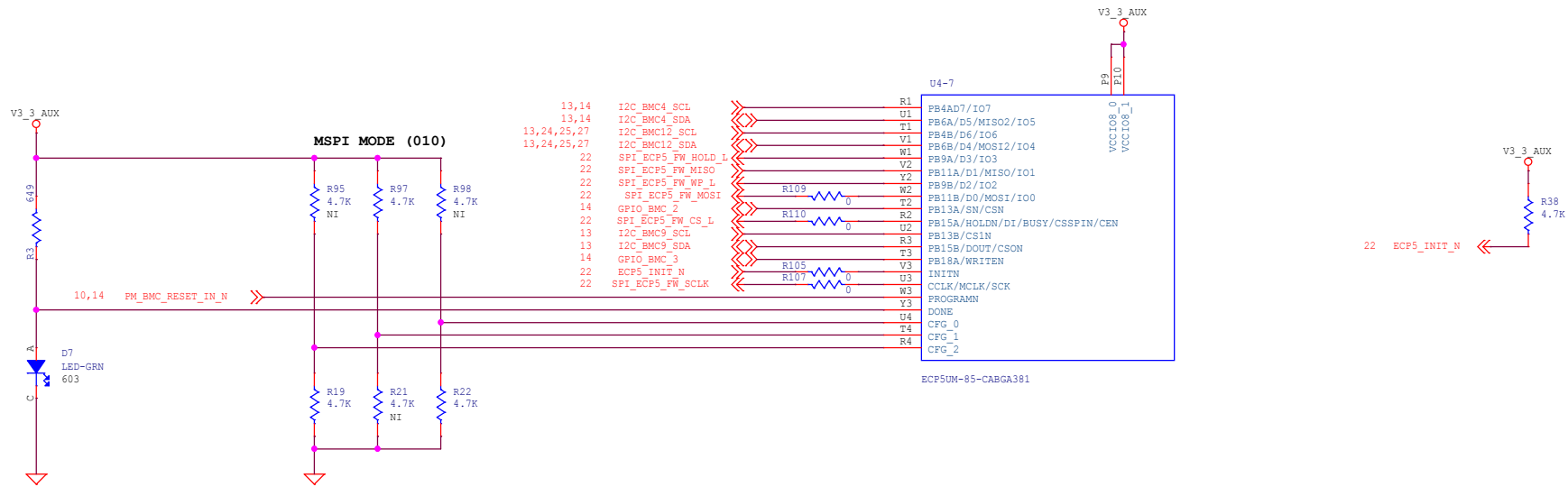


26 RGMII\_TX\_CLK  
 26 RGMII\_TX\_D3  
 26 RGMII\_TX\_D2  
 26 RGMII\_TX\_D1  
 26 RGMII\_TX\_D0  
 26 RGMII\_TX\_EM  
 26 RGMII\_RX\_CLK  
 14,26 GPIO\_BMC\_4  
 26 RGMII\_RX\_D3  
 26 RGMII\_RX\_D2  
 26 RGMII\_RX\_D1  
 26 RGMII\_RX\_D0  
 26 RGMII\_RX\_DV  
 26 RGMII\_MDIO  
 12 BMC\_COM1\_TXD  
 12 BMC\_COM1\_RXD  
 12 BMC\_COM2\_TXD  
 12 BMC\_COM2\_RXD  
 13 I2C\_BMC3\_SCL  
 13 I2C\_BMC3\_SDA  
 14 BMC\_TACH0  
 14 BMC\_TACH1  
 14 BMC\_TACH2  
 14 BMC\_TACH3  
 21 CLK\_BMC\_125MHZ  
 26 RGMII\_MDC  
 19 PCIE\_CPOE2C\_BMC\_FERST\_L

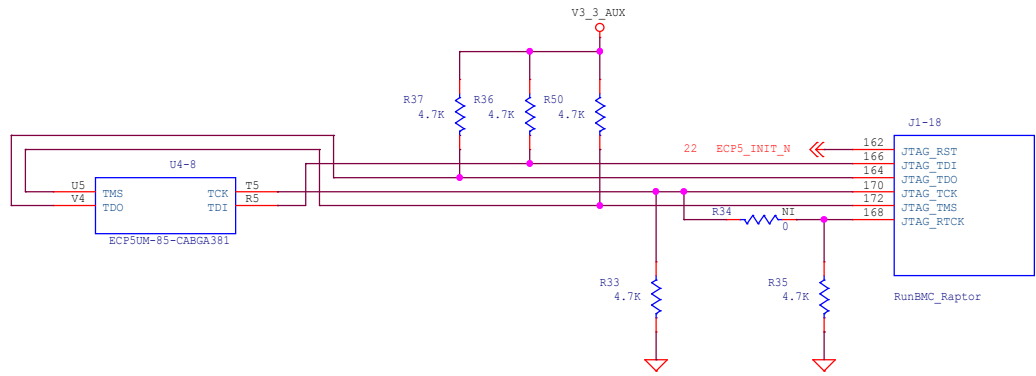


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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	ECP5 Platform Integration		
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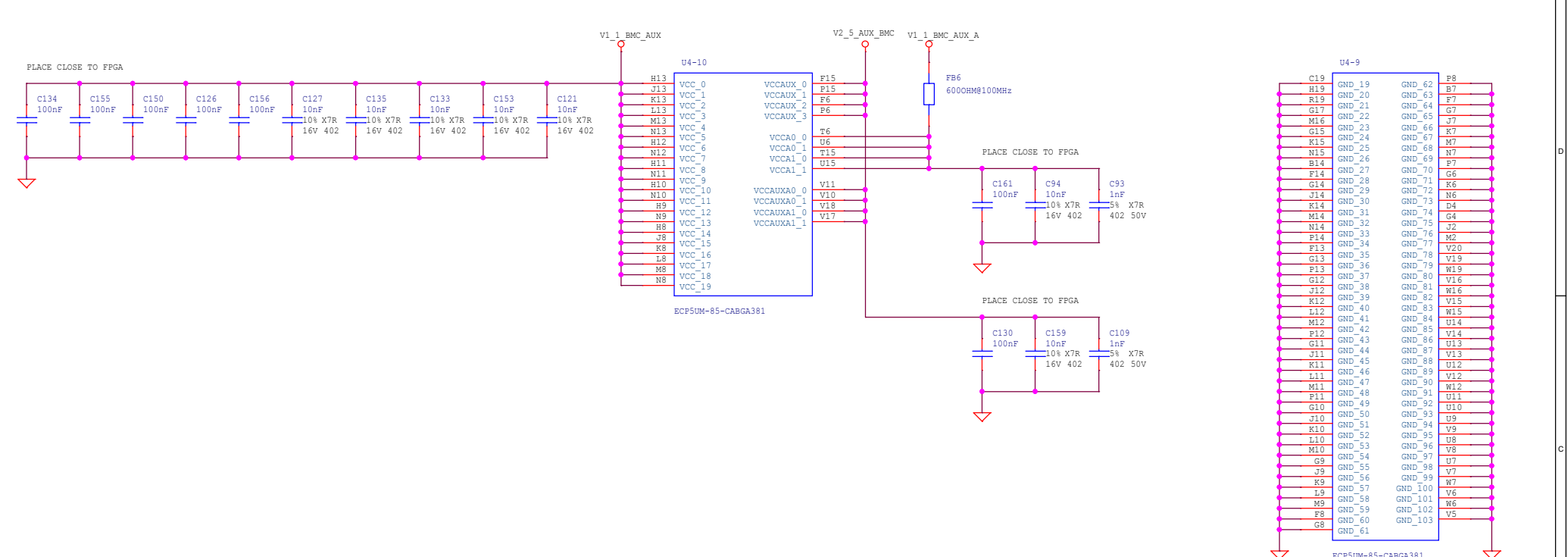


## ECP5 Firmware ROM




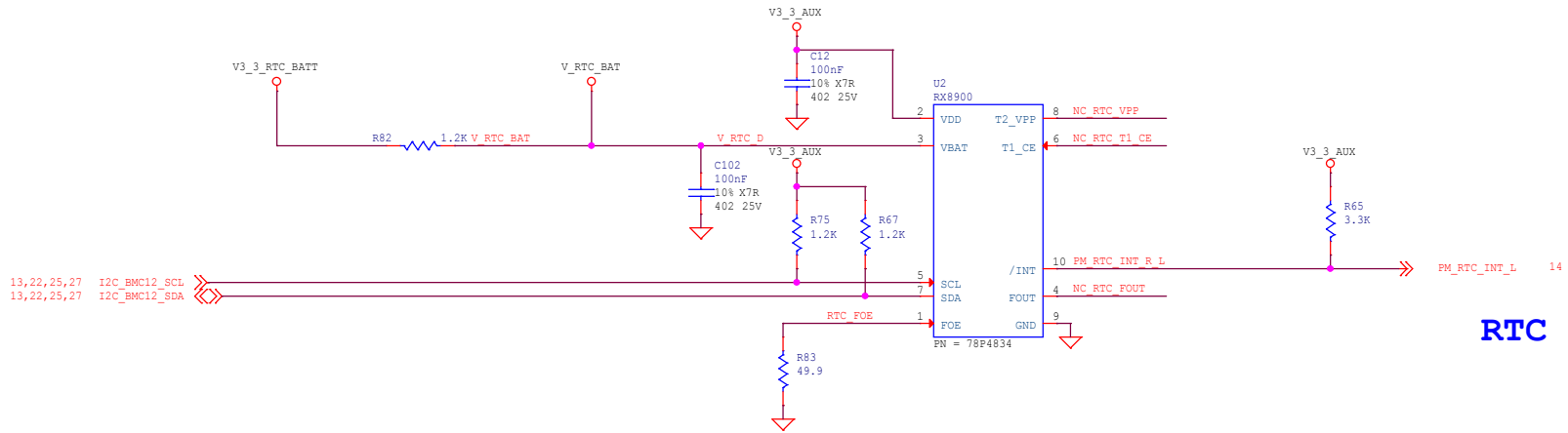
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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	ECP5 Configuration		
Author :			Page:22 of 27
Last Changed :	Saturday, May 21, 2022		




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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	ECP5 Power		
Author :			Page:23 of 27
Last Changed :	Saturday, May 21, 2022		



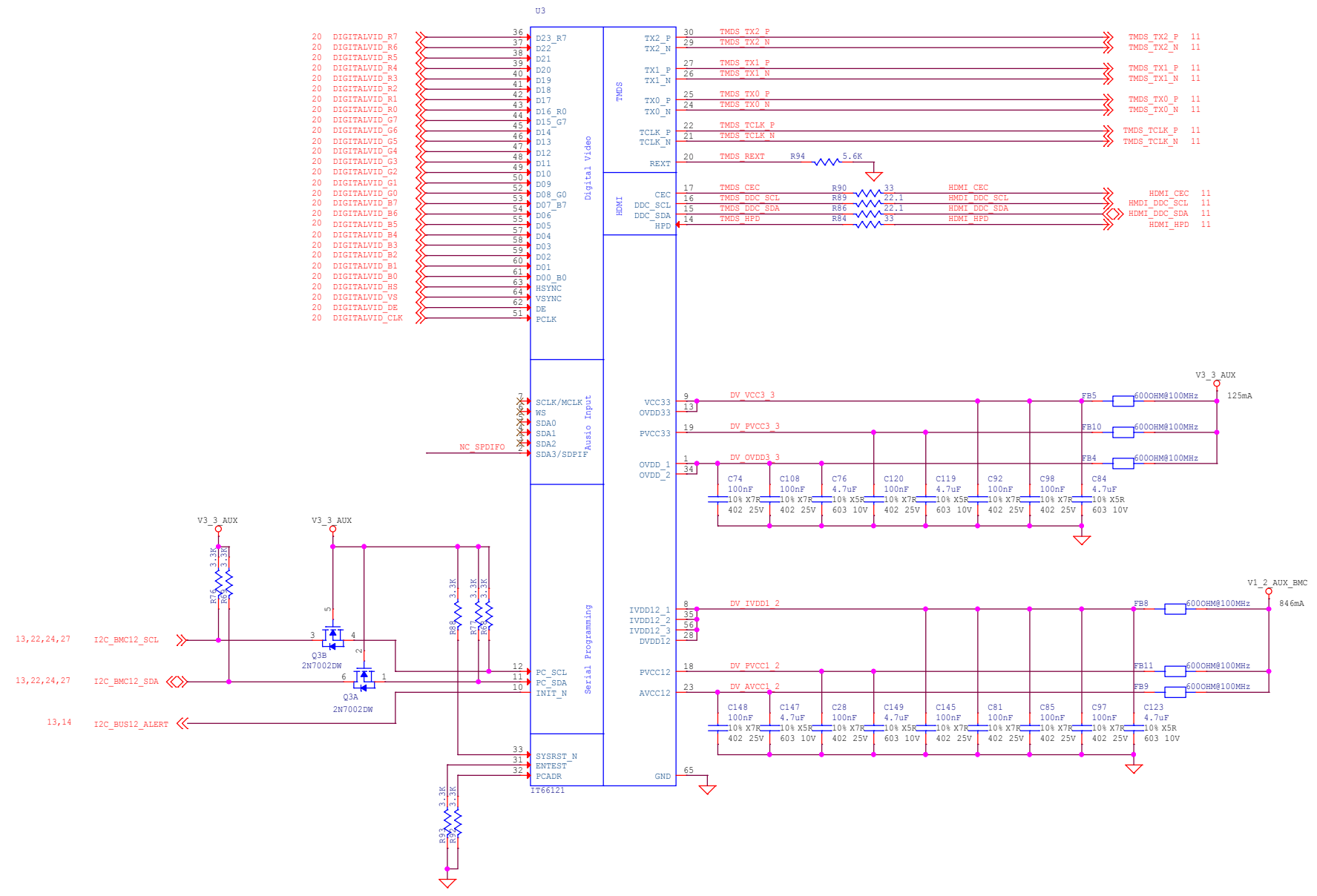
## RTC Circuit

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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	<b>RTC</b>		
Author :			Page:24 of 27
Last Changed :	Saturday, May 21, 2022		

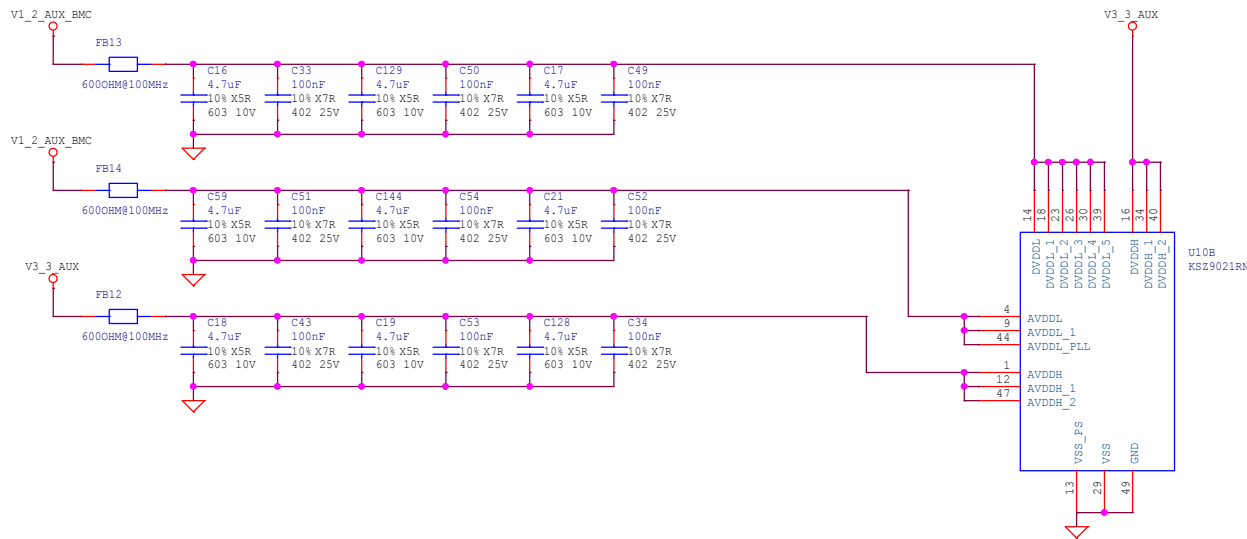


# Digital Video to HDMI

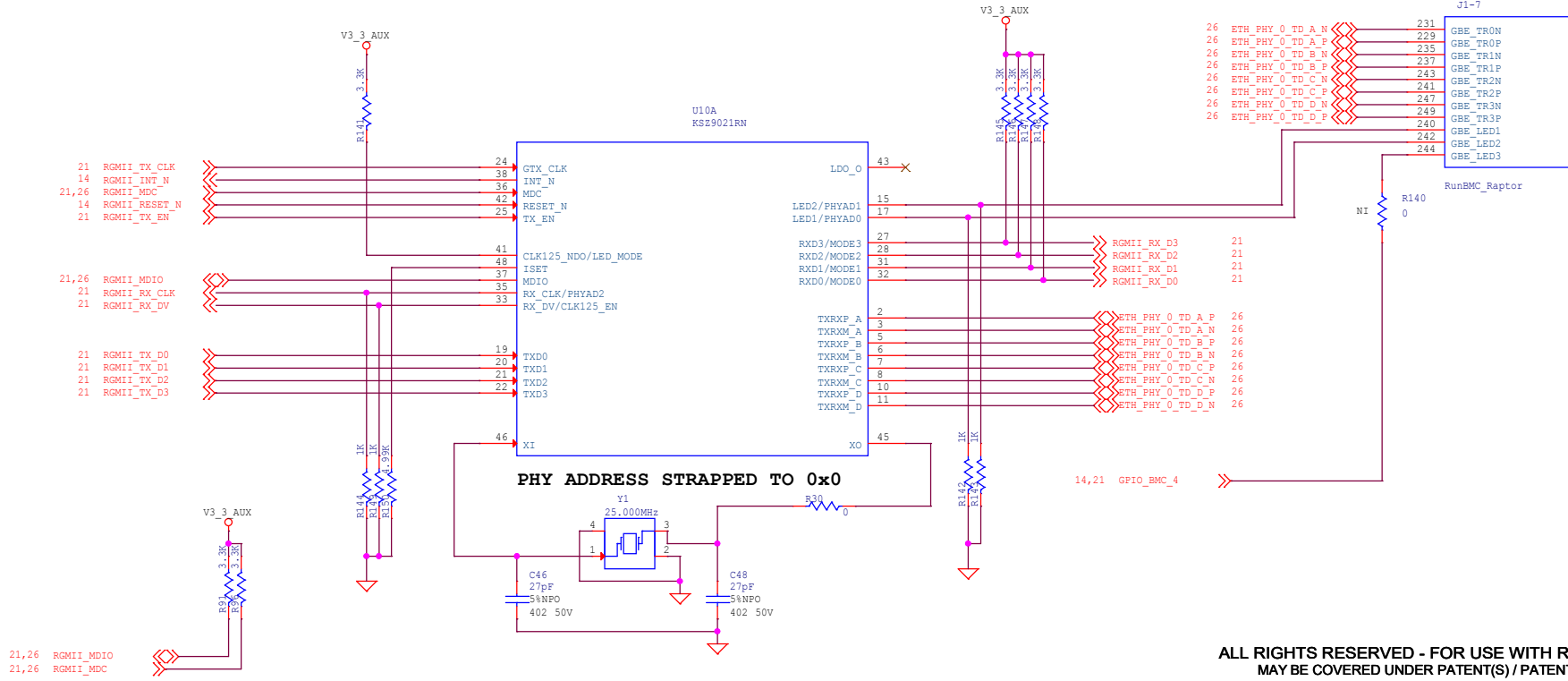


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Project : Arctic Tern		
Part NO : AT1MB1	EC NO : 1.01	
Title : <b>HDMI Transmitter</b>		
Author :	Page:25 of 27	
Last Changed :		Saturday, May 21, 2022

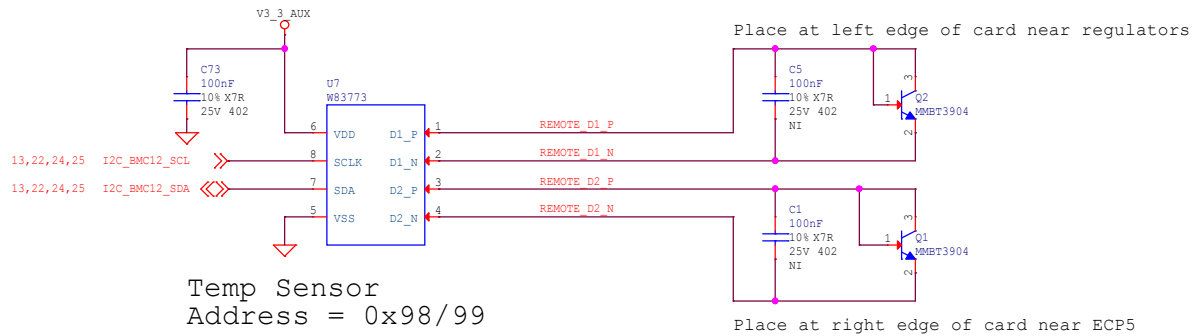


ALL RGMII TX / RX SIGNALS MUST BE LENGTH MATCHED




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Project :	Arctic Tern		
Part NO :	AT1MB1	EC NO : 1.01	
Title :	Ethernet PHY		
Author :		Page:26	of 27
Last Changed :	Saturday, May 21, 2022		



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Project :	Arctic Tern	
Part NO :	AT1MB1	
Title : <b>System Temp Sensors</b>		
Author :	Page:27 of 27	
Last Changed :	Saturday, May 21, 2022	