

# APOLLO2 AMAPH1KK-KBR BOARD

## REVISION HISTORY


### REV 1.0.0 ("REV. A")

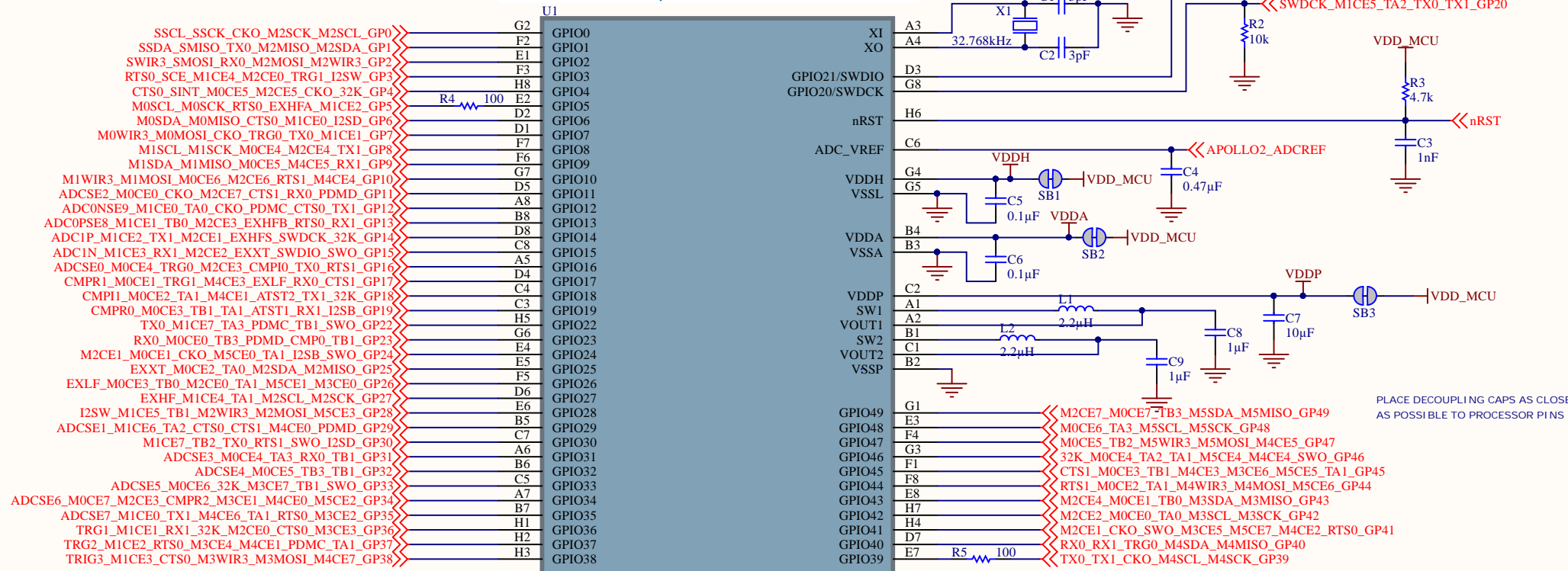
- Initial Release

### REV 1.1.0 ("REV. B")

- Updated selection method between 1.8V and 3.3V on-board supplies
- Fixed VDDIO supply issues on J-Link OB MCU
- Support for LED operation to 1.8V

FID1 PCB-FIDUCIAL      FID2 PCB-FIDUCIAL      FID3 PCB-FIDUCIAL

Title <b>APOLLO2 AMAPH1KK-KBR BRD</b>		Ambiq Micro 6500 River Place Blvd Building 7, Suite 200 Austin, TX 78730 USA	
Size: <b>A4</b>	Number:	Revision:	
Date: 6/1/17	Time: 7:52:13 AM	Sheet 1 of 9	
File: Y:\ambiq\repositories\pcbdev\apollo2-blackout-board\cover-page.SchDoc			



PLACE DECOUPLING CAPS AS CLOSE AS POSSIBLE TO PROCESSOR PINS

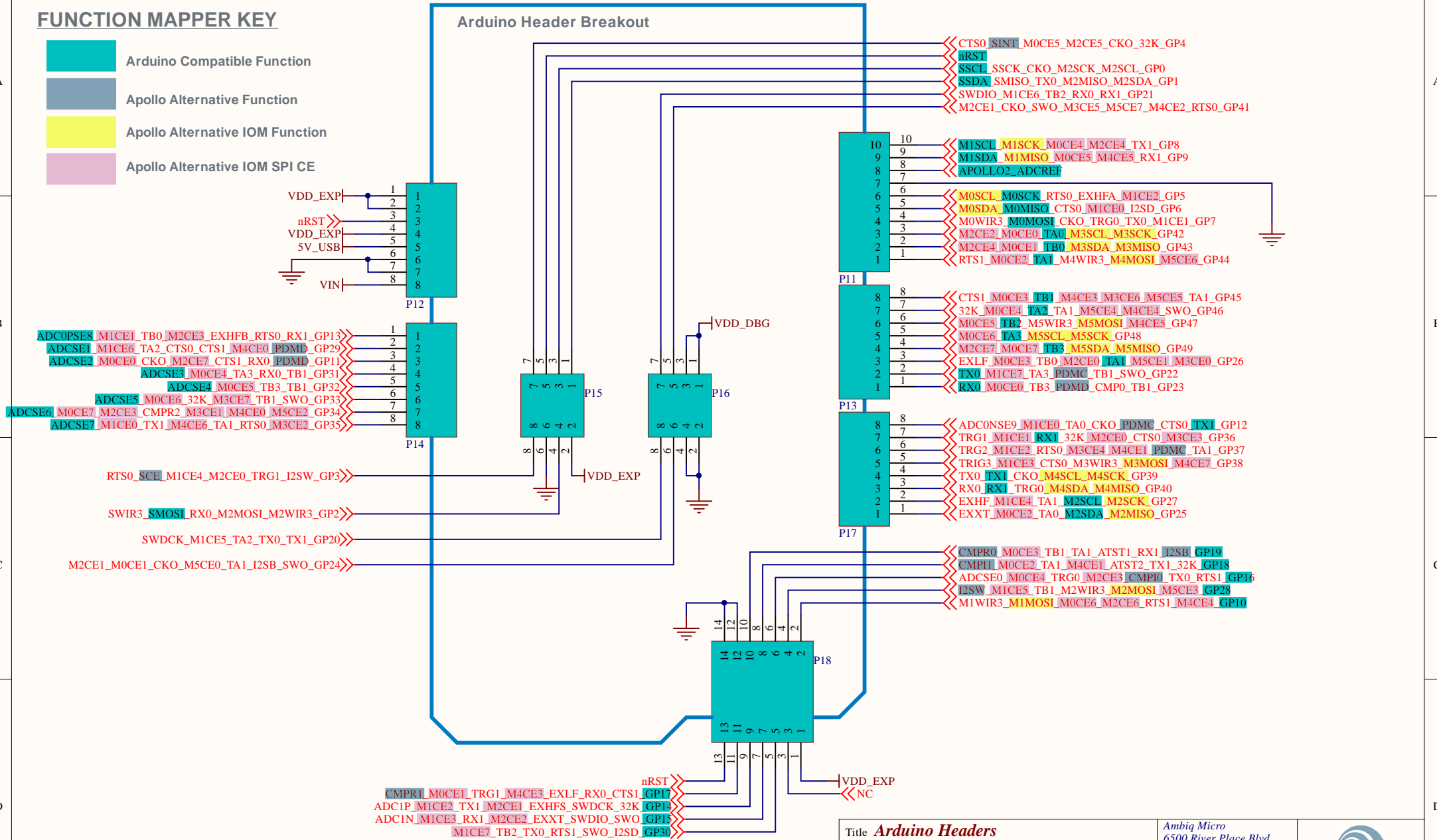



Title <b>Apollo2 BGA</b>		Ambiq Micro 6500 River Place Blvd Building 7, Suite 200 Austin, TX 78730 USA	
Size: <b>A4</b>	Number:	Revision:	
Date: 6/1/17	Time: 7:52:14 AM	Sheet 2 of 9	
File: Y:\ambiq\repositories\pcbdev\apollo2-blackout-board\apollo2-bga.SchDoc			

# FUNCTION MAPPER KEY

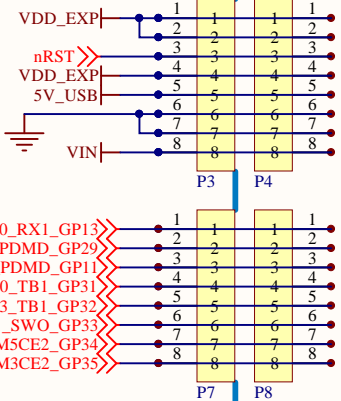
- Arduino Compatible Function
- Apollo Alternative Function
- Apollo Alternative IOM Function
- Apollo Alternative IOM SPI CE

## Arduino Header Breakout

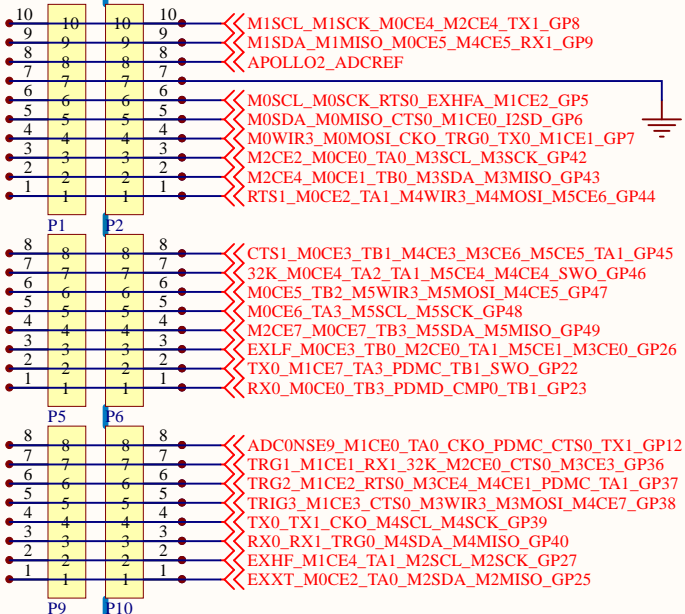


Title <b>Arduino Headers</b>		Ambiq Micro 6500 River Place Blvd Building 7, Suite 200 Austin, TX 78730 USA		
Size: <b>A4</b>	Number:	Revision:		
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File: Y:\ambiq\repositories\pcbdev\apollo2-blackout-board\arduino-breakout.SchDoc				

### Arduino Debug Header Breakout



- ADC0PSE8\_M1CE1\_TB0\_M2CE3\_EXHFB\_RTS0\_RX1\_GP13
- ADCSE1\_M1CE6\_TA2\_CTS0\_CTS1\_M4CE0\_PDMD\_GP29
- ADCSE2\_M0CE0\_CKO\_M2CE7\_CTS1\_RX0\_PDMD\_GP11
- ADCSE3\_M0CE4\_TA3\_RX0\_TB1\_GP31
- ADCSE4\_M0CE5\_TB3\_TB1\_GP32
- ADCSE5\_M0CE6\_32K\_M3CE7\_TB1\_SWO\_GP33
- ADCSE6\_M0CE7\_M2CE3\_CMPR2\_M3CE1\_M4CE0\_M5CE2\_GP34
- ADCSE7\_M1CE0\_TX1\_M4CE6\_TA1\_RTS0\_M3CE2\_GP35



- M1SCL\_M1SCK\_M0CE4\_M2CE4\_TX1\_GP8
- M1SDA\_M1MISO\_M0CE5\_M4CE5\_RX1\_GP9
- APOLLO2\_ADCREF
- M0SCL\_M0SCK\_RTS0\_EXHFA\_M1CE2\_GP5
- M0SDA\_M0MISO\_CTS0\_M1CE0\_I2SD\_GP6
- M0WIR3\_M0MOSI\_CKO\_TRG0\_TX0\_M1CE1\_GP7
- M2CE2\_M0CE0\_TA0\_M3SCL\_M3SCK\_GP42
- M2CE4\_M0CE1\_TB0\_M3SDA\_M3MISO\_GP43
- RTS1\_M0CE2\_TA1\_M4WIR3\_M4MOSI\_M5CE6\_GP44
- CTS1\_M0CE3\_TB1\_M4CE3\_M3CE6\_M5CE5\_TA1\_GP45
- 32K\_M0CE4\_TA2\_TA1\_M5CE4\_M4CE4\_SWO\_GP46
- M0CE5\_TB2\_M5WIR3\_M5MOSI\_M4CE5\_GP47
- M0CE6\_TA3\_M5SCL\_M5SCK\_GP48
- M2CE7\_M0CE7\_TB3\_M5SDA\_M5MISO\_GP49
- EXLF\_M0CE3\_TB0\_M2CE0\_TA1\_M5CE1\_M3CE0\_GP26
- TX0\_M1CE7\_TA3\_PDMC\_TB1\_SWO\_GP22
- RX0\_M0CE0\_TB3\_PDMD\_CMP0\_TB1\_GP23
- ADCONSE9\_M1CE0\_TA0\_CKO\_PDMC\_CTS0\_TX1\_GP12
- TRG1\_M1CE1\_RX1\_32K\_M2CE0\_CTS0\_M3CE3\_GP36
- TRG2\_M1CE2\_RTS0\_M3CE4\_M4CE1\_PDMC\_TA1\_GP37
- TRIG3\_M1CE3\_CTS0\_M3WIR3\_M3MOSI\_M4CE7\_GP38
- TX0\_TX1\_CKO\_M4SCL\_M4SCK\_GP39
- RX0\_RX1\_TRG0\_M4SDA\_M4MISO\_GP40
- EXHF\_M1CE4\_TA1\_M2SCL\_M2SCK\_GP27
- EXXT\_M0CE2\_TA0\_M2SDA\_M2MISO\_GP25

Title **Arduino Headers Debug**

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 USA



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Number:

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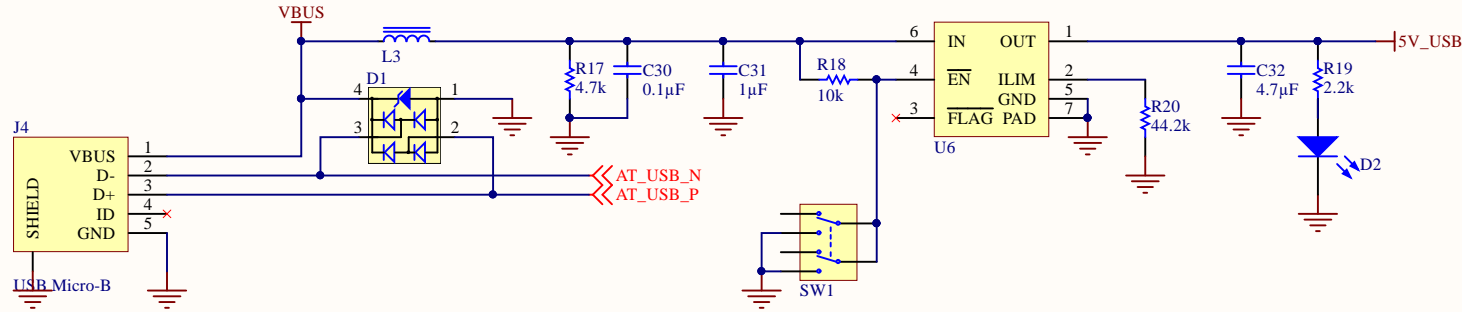
Date: 6/1/17

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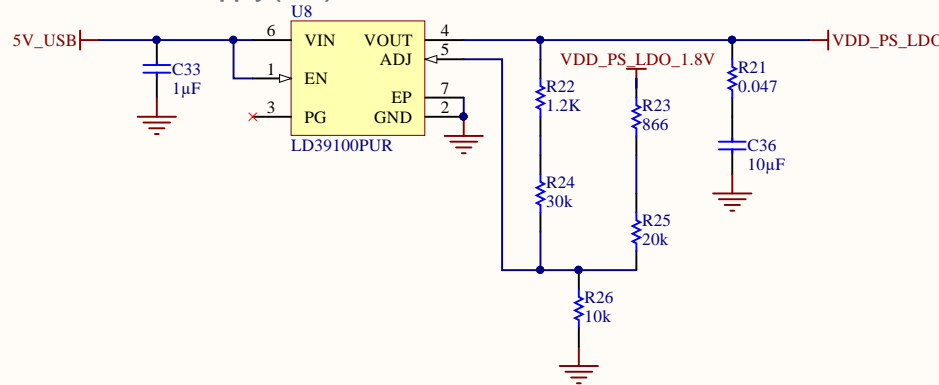
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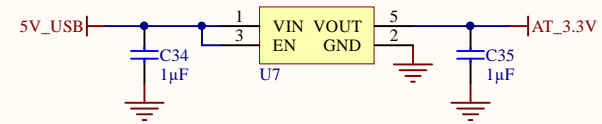
### USB Power



### Selectable 3.3/1.8V Supply (P19)



### On-board Debugger Supply



### Title **Power Supplies**

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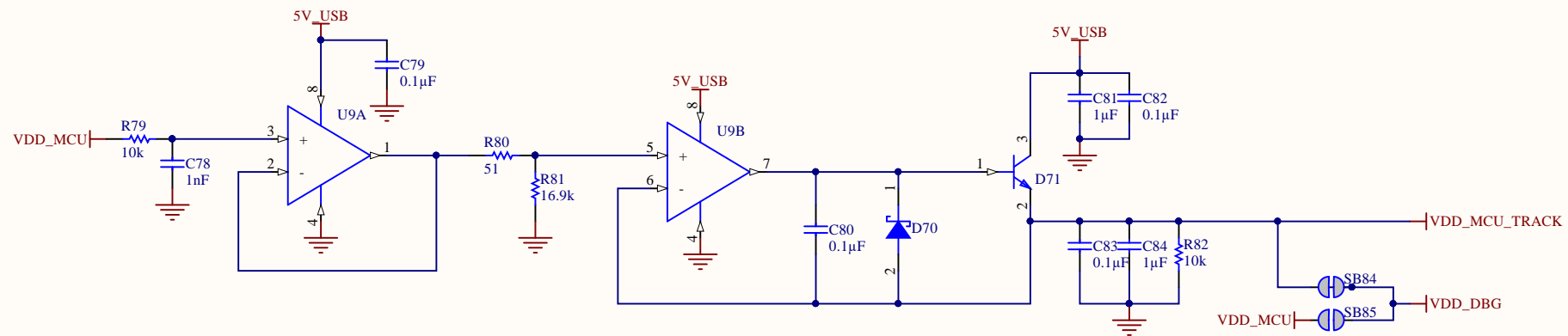



Size: **A4**    Number:    Revision:

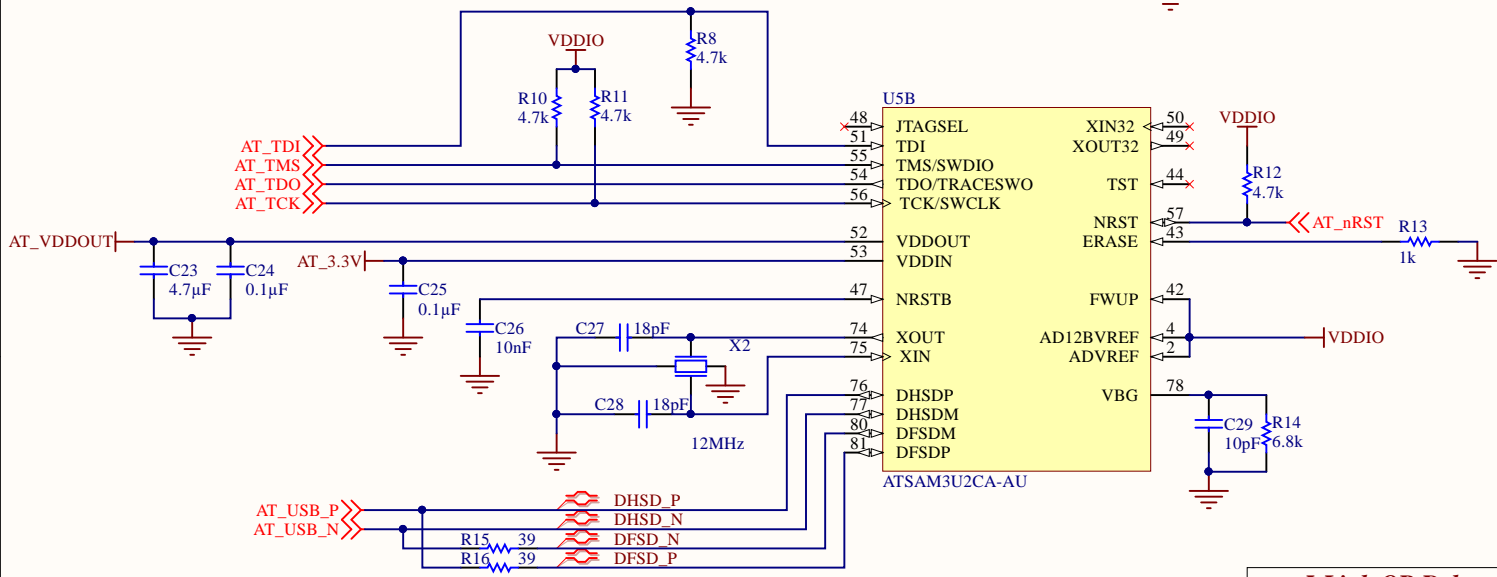
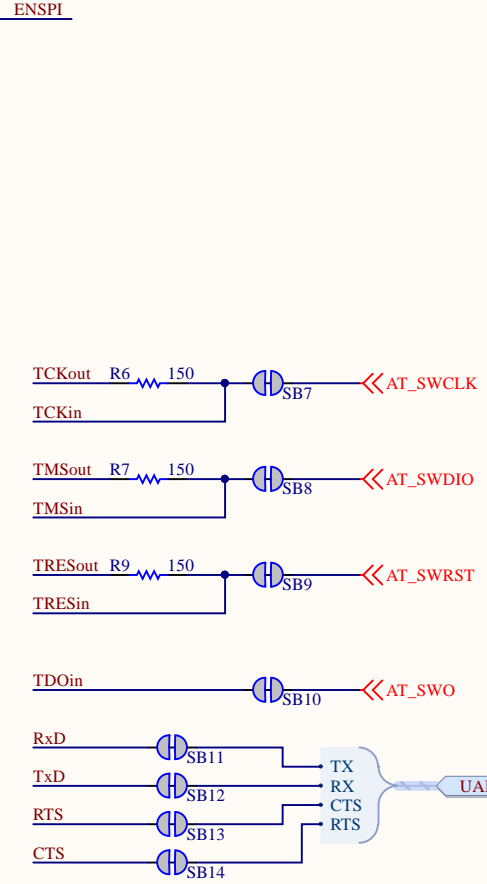
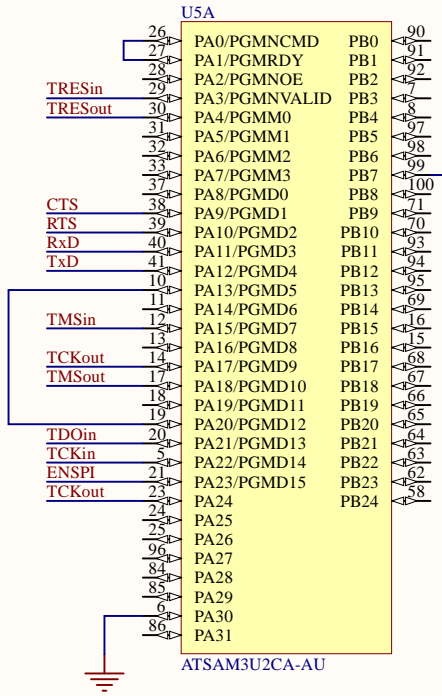
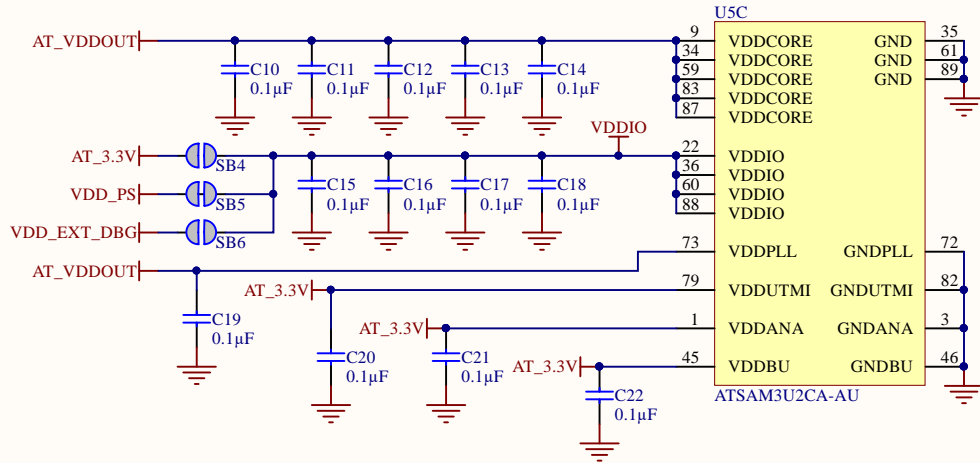
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File: Y:\ambiq\repositories\pcbdev\apollo2-blackout-board\power-supplies.SchDoc

### VDD\_MCU Supply Tracker

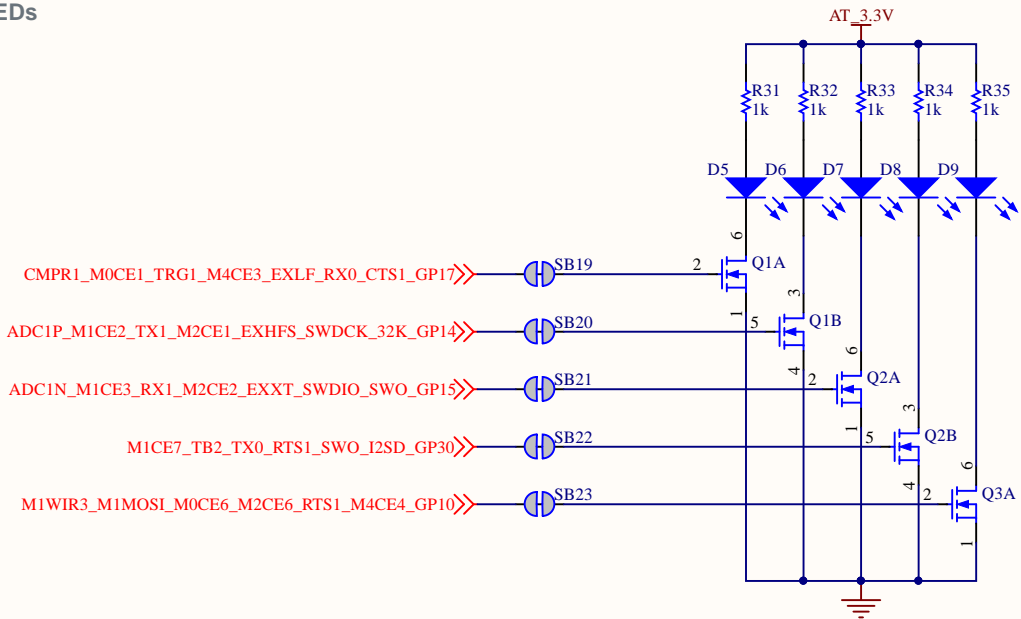


Title <b>Power Supply Tracker</b>		Ambiq Micro 6500 River Place Blvd Building 7, Suite 200 Austin, TX 78730 USA	
Size: <b>A4</b>	Number:	Revision:	
Date: 6/1/17	Time: 7:52:14 AM	Sheet 6 of 9	
File: Y:\ambiq\repositories\pcbdev\apollo2-blackout-board\power-supply-tracker.SchDoc			

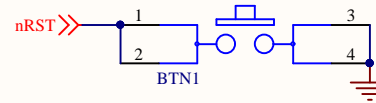


<b>Title</b> <i>J-Link OB Debugger</i>		Ambiq Micro 6500 River Place Blvd Building 7, Suite 200 Austin, TX 78730 USA	
Size: <b>A4</b>	Number:	Revision:	
Date: 6/1/17	Time: 7:52:14 AM	Sheet 7 of 9	
File: Y:\ambiq\repositories\pcbdev\apollo2-blackout-board\j-link-ob-dbg.SchDoc			

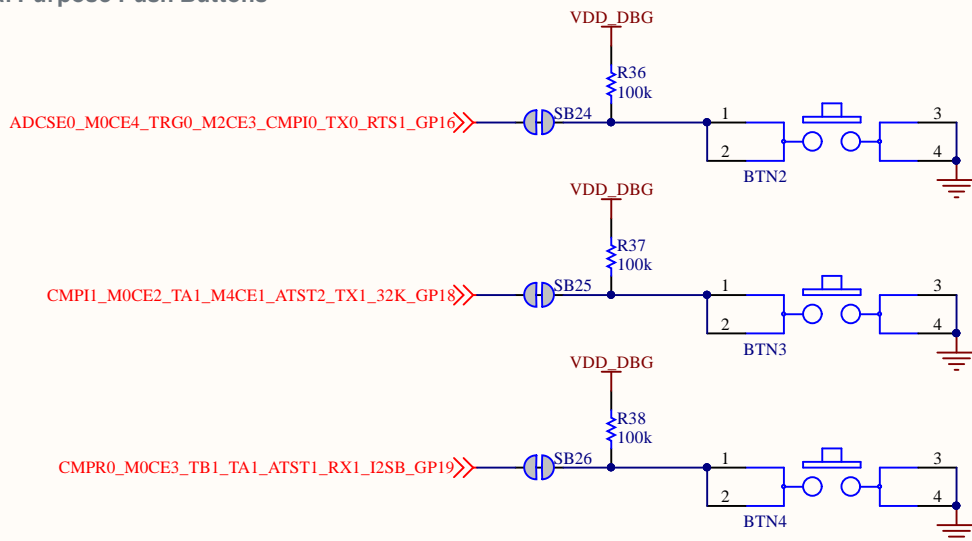
### LEDs



### System Reset Button



### General Purpose Push Buttons



### Title *User Interface*

Size: A4

Number:

Revision:

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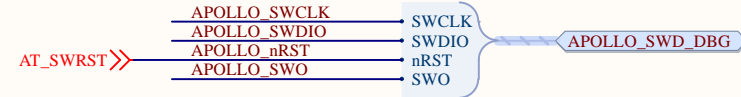
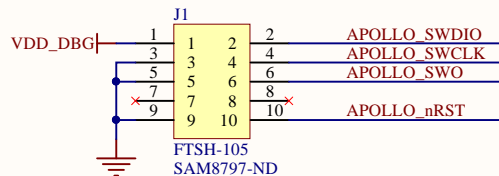
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File: Y:\ambiq\repositories\pcbdev\apollo2-blackout-board\user-interface.SchDoc

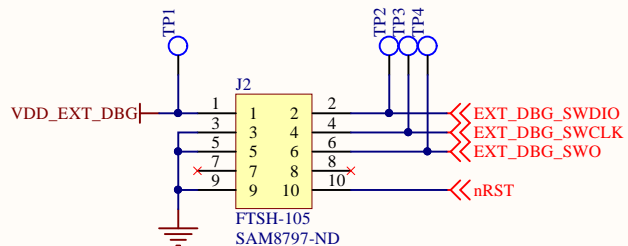
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 USA



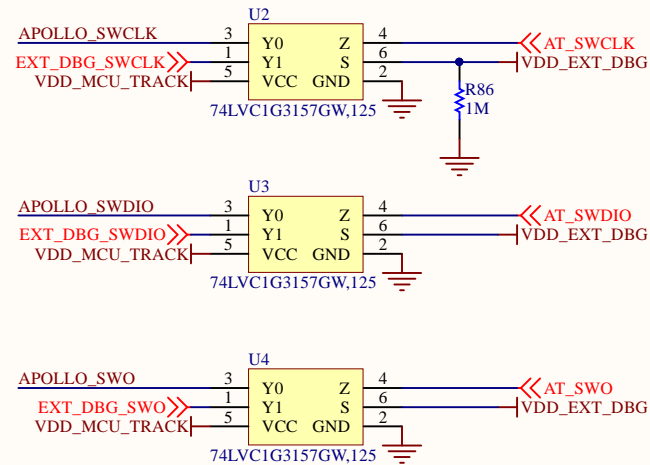
### External Debug In



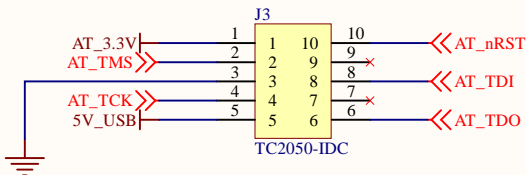
### External Debug Out



### External Debug Out Switch



### J-Link OB Programmer



### Title **Debug Headers & Support**

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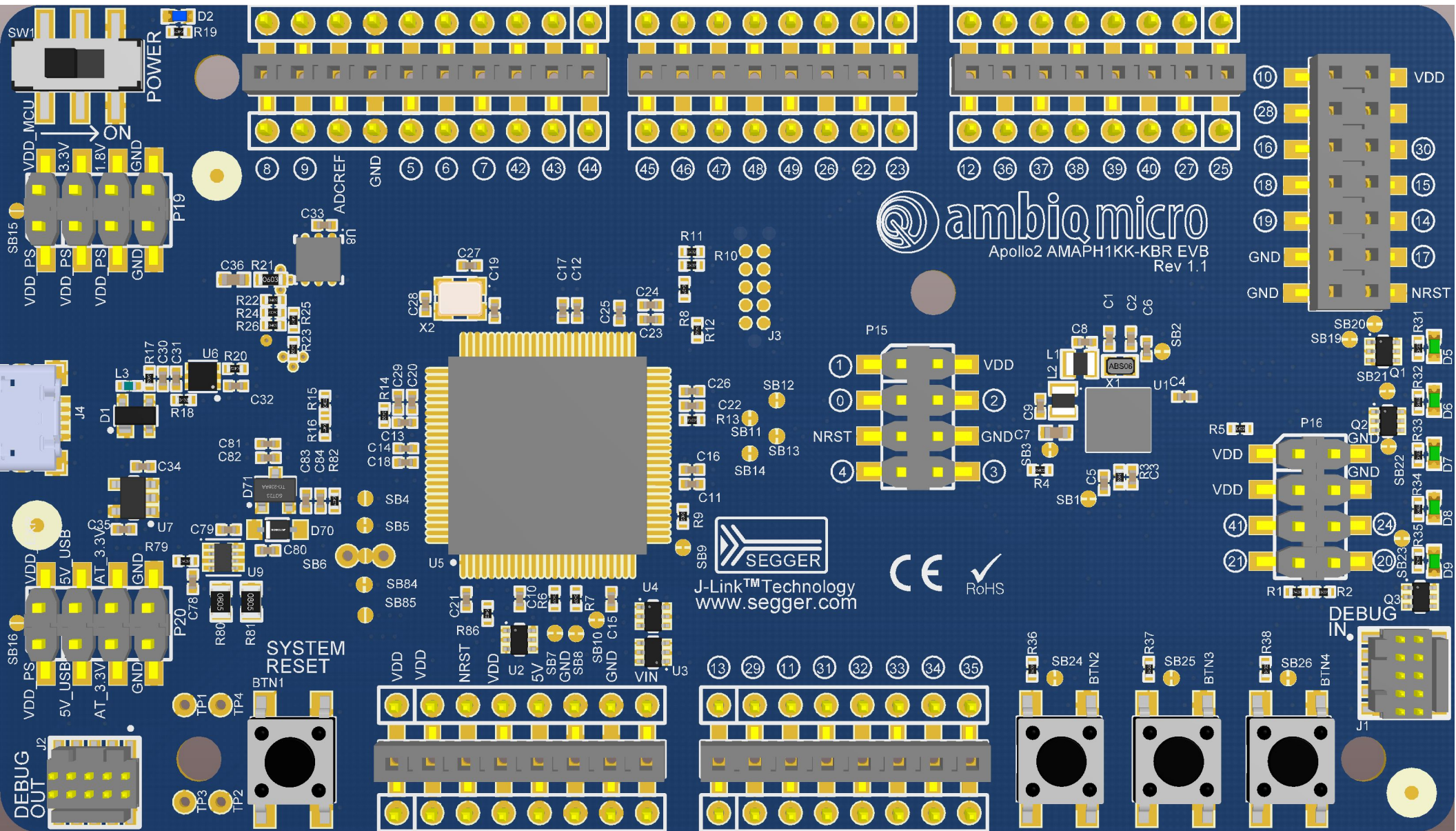
Number:

Revision:

Date: 6/1/17

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File: Y:\ambiq\repositories\pcbdev\apollo2-blackout-board\dbg-connectors.SchDoc



**ambiq micro**  
Apollo2 AMAPH1KK-KBR EVB  
Rev 1.1

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POWER  
SW1  
D2  
R19

P19  
SB15  
VDD\_PS  
VDD\_PS  
VDD\_PS  
GND  
GND  
GND  
3.3V  
1.8V  
ON

DEBUG OUT J2  
VDD\_PS  
5V\_USB  
AT\_3.3V  
GND  
GND  
GND

SYSTEM RESET  
BTN1

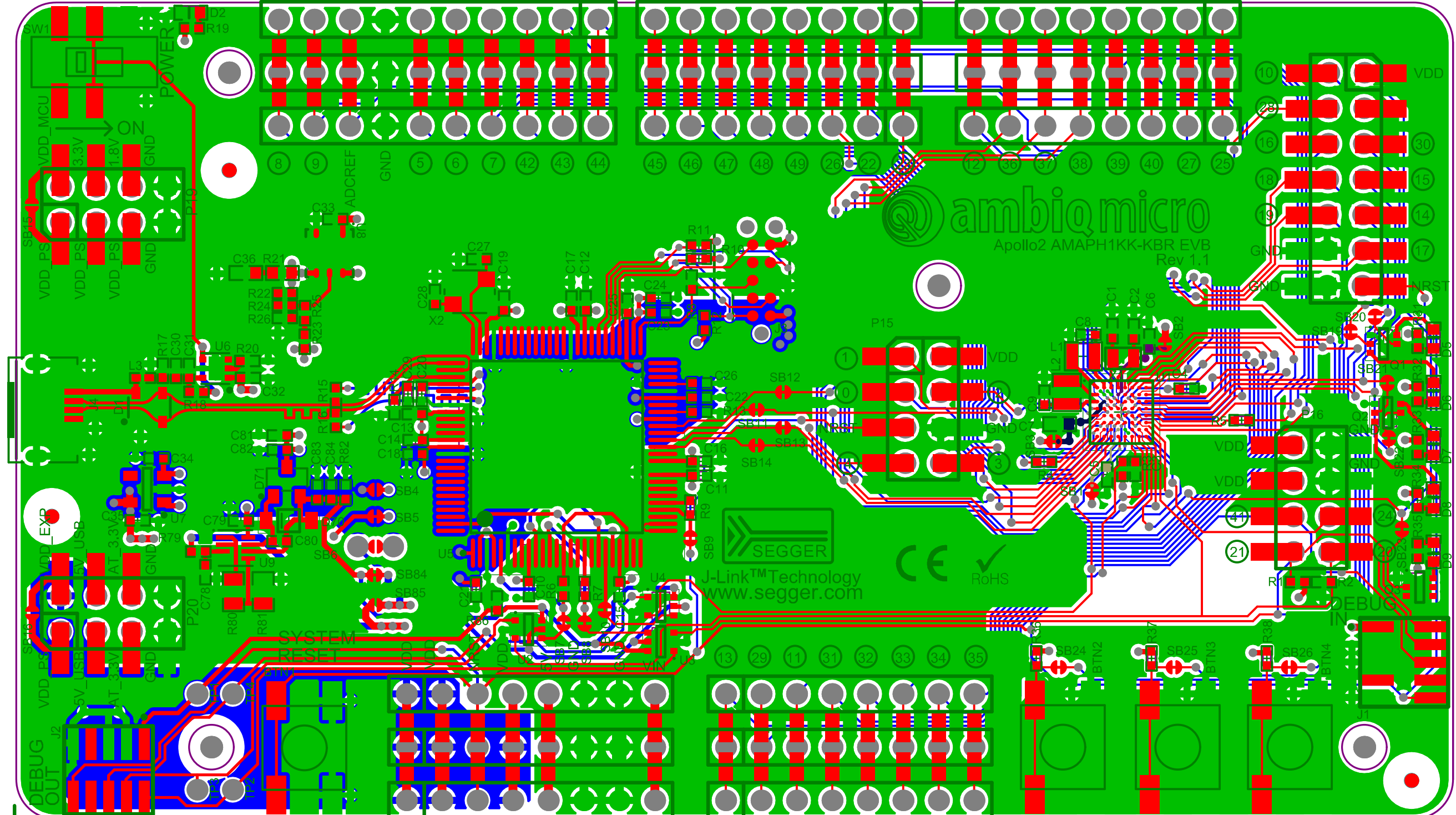
P15  
1  
0  
4  
NRST  
VDD  
GND  
GND  
3  
2  
1

10  
28  
16  
18  
19  
GND  
GND  
VDD  
30  
15  
14  
17  
NRST

P16  
R5  
VDD  
VDD  
41  
21  
24  
20  
R1  
R2  
GND  
GND  
D5  
D6  
D7  
D8  
D9

DEBUG IN J1  
R36  
SB24  
BTN2  
R37  
SB25  
BTN3  
R38  
SB26  
BTN4





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