

ARC-4050T3-DB Hardware Manual

ARC-4050T3-DB

(Thunderbolt™ 3 to PCIe Expansion Solution)

Hardware Manual

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FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

Manufacturer's Declaration for CE Certification

We confirm ARC-4050T3-DB has been tested and found comply with the requirements set up in the council directive on the approximation of the law of member state relating to the EMC Directive 2004/108/EC. For the evaluation regarding to the electromagnetic compatibility, the following standards were applied:

EN 55022: 2006, Class B
EN 61000-3-2: 2006
EN 61000-3-3: 1995+A1: 2001+A2: 2005

EN 55024:1998+A1:2001=A2:2003
IEC61000-4-2: 2001
IEC61000-4-3: 2006
IEC61000-4-4: 2004
IEC61000-4-5: 2005
IEC61000-4-6: 2006
IEC61000-4-8: 2001
IEC61000-4-11: 2004

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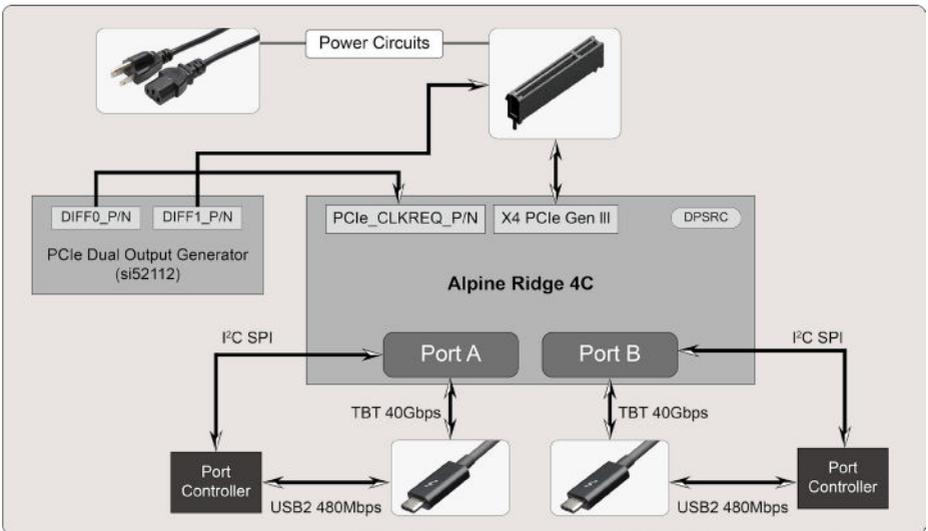
Overview

1. Overview

Since the ARC-4050T3-DB is offered as a PCIe 3.0 x8 connector and two thunderbolt 3 port, it can be used with the box as the Thunderbolt 3 adapter.

2. Block Diagram

This section provides the board layout and connector for the ARC-4050T3-DB board.



3. Board Layout

The section provides the board layout and connector for the ARC-4050T3-DB

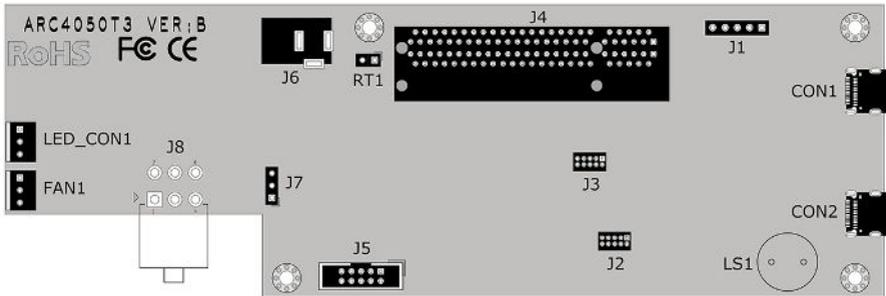


Figure 1-1, ARC-4050T3-DB Front Side

Connector	Description
1. (J1)	manufacture purpose for Alpine_Ridge_Device JTAG
2. (J2)	manufacture purpose for SWD_A monitor
3. (J3)	manufacture purpose for SWD_B monitor
4. (J4)	PCIe 3.0 x 8 Lane Connector
5. (J5)	manufacture purpose for EPLD program and Buzzer alarm CTRL
6. (J6)	19V DC power adapter input
7. (J7)	manufacture purpose for PWM firmware download
8. (J8)	Alternative Power Input
9. (CON1)	USB-C connector
10. (CON2)	USB-C connector
11. (LED_CON1)	Monitor Status Connector
12. (FAN)	FAN Connector
13. (RT1)	Temperature Sensor
14. (LS1)	Buzzer Alarm

Pin Definition

4. Connectors Pin Definition

4.1 J1 - Manufacture Reserved

This connector is manufacture purpose for Alpine_Ridge_Device JTAG.

J1 Pin Definition	
Pin	Signal
1	TDI
2	TMS
3	TCK
4	TD0
5	GND

4.2 J2 - Manufacture Reserved

This connector is manufacture purpose for SWD_A monitor.

J2 Pin Definition	
Pin	Signal
1	3.3V
2	DATA
3	GND
4	CLK
5	GND
6	GPIO0
7	NC
8	GPIO1
9	GND
10	NC

4.3 J3 - Manufacture Reserved

This connector is manufacture purpose for SWD_B monitor.

J3 Pin Definition	
Pin	Signal
1	3.3V
2	DATA
3	GND
4	CLK
5	GND
6	GPIO0
7	NC
8	GPIO1
9	GND
10	NC

Pin Definition

4.4 J4 - PCIe3.0x4 Connector

The ARC-4050T3-DB board is equipped with a PCIe 3.0 x8 90 degree connector for add one internal HBA.

(Top View)		PCIe3.0 x8 Connector Pin Definition							
		B				A			
<p> B1 A1 B2 B3 A2 A2 B3 A3 A3 B4 B5 A4 A4 B5 A5 A5 B6 B7 A6 A6 B7 A7 A7 B8 B9 A8 A8 B9 A9 A9 B10 B11 A10 A10 B11 A11 A11 B12 A12 B13 A13 B14 A14 B15 A15 B16 A16 B17 A17 B18 A18 B19 A19 B20 A20 B21 A21 B22 A22 B23 A23 B24 A24 B25 A25 B26 A26 B27 A27 B28 A28 B29 A29 B30 A30 B31 A31 B32 A32 B33 A33 B34 A34 B35 A35 B36 A36 B37 A37 B38 A38 B39 A39 B40 A40 B41 A41 B42 A42 B43 A43 B44 A44 B45 A45 B46 A46 B47 A47 B48 A48 B49 A49 </p>	2	12V	1	12V	1	PRST_IN	2	12V	
	4	GND	3	RSVD	3	12V	4	GND	
	6	NC	5	NC	5	NC	6	NC	
	8	3.3V	7	GND	7	NC	8	NC	
	10	3.3VAUX	9	NC	9	3.3V	10	3.3V	
	12	NC	11	WAKE*	11	PCIe_ RST_ON	12	GND	
	14	TX0_P	13	GND	13	PCIe_ SLOT 100M_P	14	PCIe_ SLOT 100M_	
	16	GND	15	TX0_N	15	GND	16	RX0_P	
	18	GND	17	PRST_IN_1	17	RX0_N	18	GND	
	20	TX1_N	19	TX1_P	19	NC	20	GND	
	22	GND	21	GND	21	RX1_P	22	RX1_N	
	24	TX2_N	23	TX2_P	23	GND	24	GND	
	26	GND	25	GND	25	RX2_P	26	RX2_N	
	28	TX3_N	27	TX3_P	27	GND	28	GND	
	30	GND	29	GND	29	RX3_P	30	RX3_N	
	32	GND	31	PRST_IN_2	31	GND	32	NC	
	34	GND	33	GND	33	NC	34	GND	
	36	GND	35	GND	35	NC	36	NC	
	38	NC	37	NC	37	GND	38	GND	
	40	GND	39	GND	39	NC	40	NC	
	42	NC	41	NC	41	GND	42	GND	
	44	GND	43	GND	43	NC	44	NC	
	46	NC	45	NC	45	GND	46	GND	
	48	PRST_ IN_3	47	GND	47	NC	48	NC	
			49	GND	49	GND			

4.5 J5 - Manufacture Reserved

This connector is manufacture purpose for EPLD program.

Change the setting of jumper J5 pin-7 and pin-8 to enable or disable the buzzer. The default setting is "Enabled".

J5 Pin Definition	
Pin	Signal
1	TDI
2	TCK
3	TMS
4	TDO
5	NC
6	NC
7	MOD1
8	3.3V
9	MOD2
10	GND

Buzzer Enable/Disable Pin-7 & Pin-8 Settings	
Jumper Setting	Definition
Open	Enabled
Short	Disabled

4.6 J6 - DC_JACK

This DC_JACK connector is for 19V DC power adapter input.

J6 Pin Definition	
Pin	Signal
1	19V
2	GND
3	GND

Pin Definition

4.7 J7 - Manufacture Reserved

This connector is manufacture purpose for PWM firmware download.

J7 Pin Definition	
Pin	Signal
1	SCL
2	SDA
3	GND

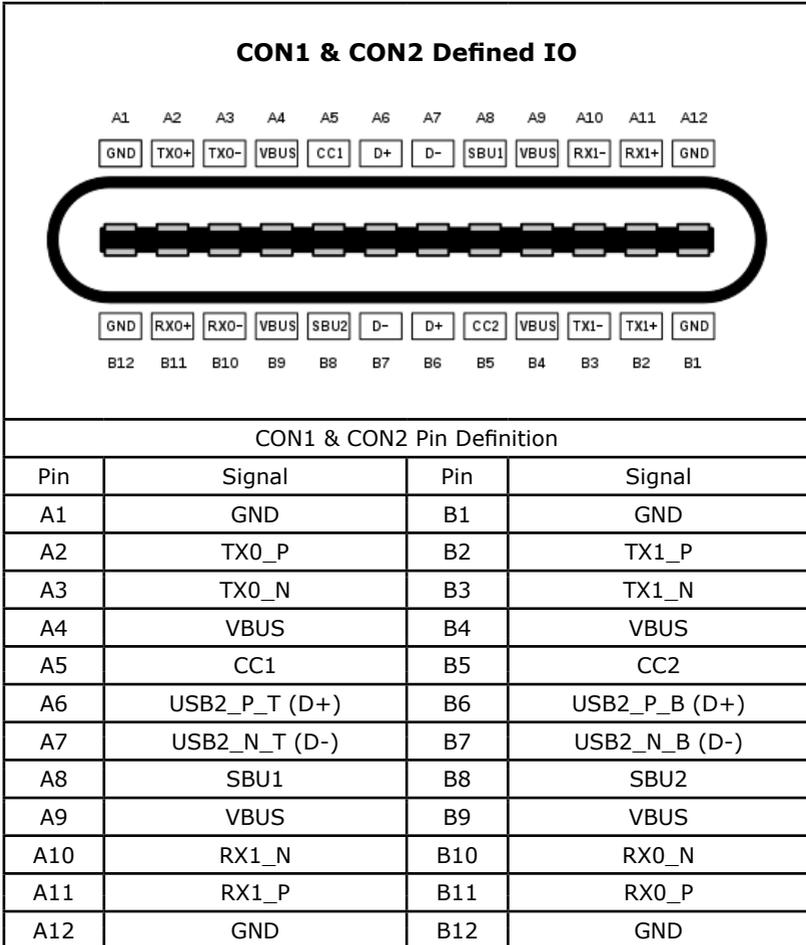
4.8 J8 - Alternative Power Input

There is a 6-pin PCI-E connector on the ARC-4050T3-DB labelled J8. You must plug in a PSU's PCI-E cable at all times to supply power for the board if you donot use the DC_JACK power input.

J8 Pin Definition	
Pin	Signal
1	12V
2	GND
3	12V
4	GND
5	12V
6	GND

4.9 CON1 & CON2 - External USB-C connector

The ARC-4050T3-DB provides two thunderbolt 3 port with 40Gbps links by using two USB-C connectors.

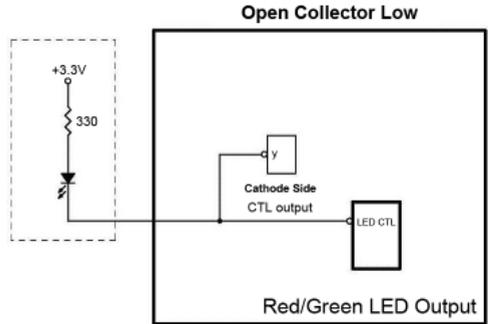


Pin Definition

4.10 LED_CON1 - Monitor Status Connector

ARC-4050T3-DB has one 3-pin status headers, pin (1, 2, 3)=(RED LED Output, 3.3 V Power, GREEN LED Output), which can show the status to the LED.

LED_CON1 Pin Definition	
Pin	Signal
1	RED
2	3.3V
3	GREEN



The following table describes the LED_CON1 header function.

LED	Status	
Green	S0 (Working)	The green light indicates the ARC-4050T3-DB is in the S0 state.
	S3 (Sleeping)	When the green LED is slow blinking (1 time/sec), ARC-4050T3-DB is in the S3 state.
RED	The red light indicates that there has warning occurred on the ARC-4050T3-DB.	

A RED LED signal is activated if any of the warning conditions occurs, such as Voltage, Temperature, or Fan.

Item	RED LED Warning Condition
Heatsink Temperature	> 92°
Fan Speed	< 600 RPM
Power +12V	< 10.5V or > 13.5V
Power +5V	< 4.5V or > 5.5V
Power +3.3V	< 3.1V or > 3.48V

4.11 FAN - FAN Connector

ARC-4050T3-DB has one 3-pin fan headers, pin (1, 2, 3)=(GND, Power, Sensor), which can detect the fan status. Hardware monitor can check the FAN status and show the warning status on the ARC-4050T3-DB board's Buzzer and LED_CON1 RED output.

J7 Pin Definition	
Pin	Signal
1	GND
2	POWER
3	SENSOR

4.12 RT1 - Temperature Sensor

ARC-4050T3-DB has one 2-pin 10K 1% 2.54mm thermistor thermal resistor for temperature sensor, which can detect the temperature on the heatsink. Hardware monitor can check the temperature of the HBA heatsink and show the warning status on the ARC-4050T3-DB board's Buzzer and LED_CON1 RED output.

4.13 LS1 - Buzzer Alarm

An audible alarm is activated if any of the warning conditions occur, such as Voltage, Temperature, or Fan.

Item	Buzzer Warning Condition
Heatsink Temperature	> 92°
Fan Speed	< 600 RPM
Power +12V	< 10.5V or > 13.5V
Power +5V	< 4.5V or > 5.5V
Power +3.3V	< 3.1V or > 3.48V

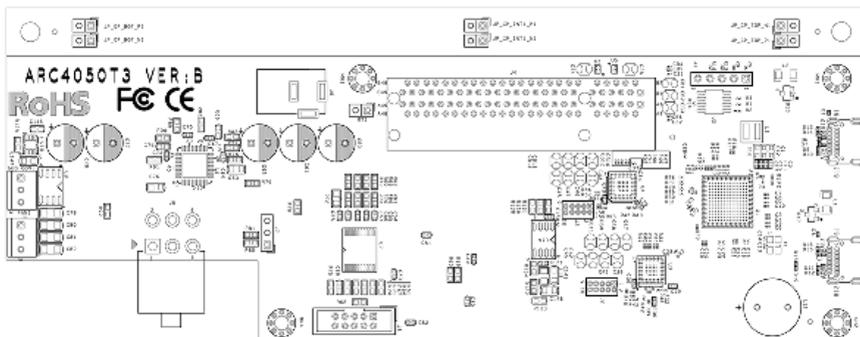
Note:

J5 pin-7 and pin-8 is used to control the buzzer function. Short J5 pin-7 and pin-8 to "Disabled" ARC-4050T3-DB alarm tone generator.

Foot Print & Layout

5. Footprint

The following picture is the "PCB Top Layout" of ARC-4050T3-DB.



6. Mechanical Layout Diagram

The following diagrams describe the location and placement of mounting holes, connectors and components.

