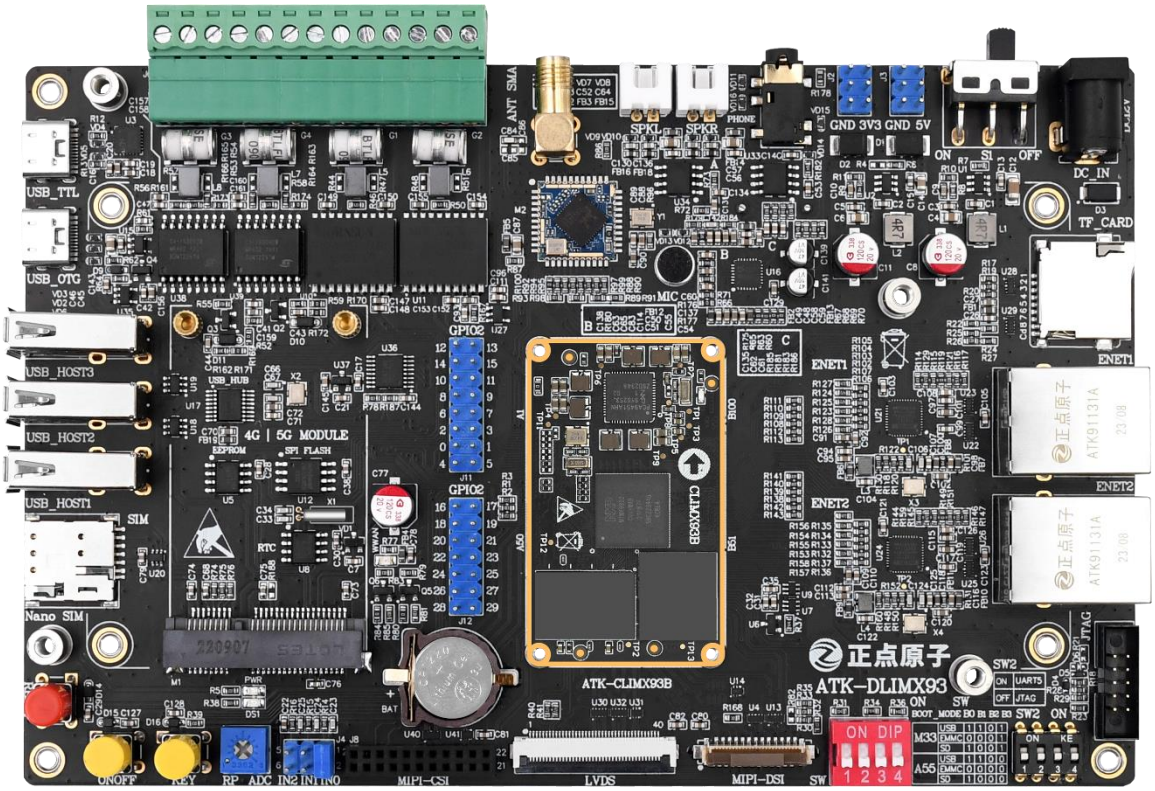
ATK-CLIMX93B

Core Board Specification

V1.0



ALIENTEK

1. Shopping:

TMALL: https://zhengdianyuanzi.tmall.com

TAOBAO: https://openedv.taobao.com

2. Download

Address: http://www.openedv.com/docs/index.html

3. FAE

Website : www.alientek.com

Forum : http://www.openedv.com/forum.php

Videos : www.yuanzige.com

Fax : +86 - 20 - 36773971

Phone : +86 - 20 - 38271790

Disclaimer

The product specifications and instructions mentioned in this document are for reference only and subject to update without prior notice; Unless otherwise agreed, this document is intended as a product guide only, and none of the representations made herein constitutes a warranty of any kind.

In order to get the latest version of product information, please regularly visit the download center or contact the customer service of Taobao ALIENTEK flagship store. Thank you for your tolerance and support.

Revision History:

Version	Version Update Notes	Responsible person	Proofreading	Date
V1.0	release officially	ALIENTEK Linux Team	ALIENTEK Linux Team	2024.04.25

Catalogue

Chapter 1. Core board overview

1.1 Core board introduction

The ATK-CLIMX93B core board is a high performance core board for the embedded Linux field developed by ALIENTEK based on the i.MX9352 chip from NXP Semiconductor, specifically designed for embedded system development. The MIMX9352CVVXMAB is equipped with two Arm Cortex-A55 cores, an Arm Cortex-M33 core, and an Arm Eethos U65 Neural Processing Unit (NPU) to provide superior processing performance. The core board supports 2 channels of Gigabit Ethernet, 2 channels of RS485, 2 channels of CAN-FD, 3 channels of USB2.0 HOST, MIPI-DSI, MIPI-CSI, LVDS, WIFI&BT, audio and other functional interfaces, which is very suitable for embedded development evaluation, product application integration, etc.

In terms of memory, the ATK-CLIMX93B core board is equipped with LPDDR4X RAM and provides eMMC storage space, which meets most of the development capacity requirements. In addition, the core board also has a wealth of peripheral resources, including but not limited to I2C, SPI, CAN FD, UART, ADC, LCD, USB and SDIO interfaces, which provide users with more expansion and application possibilities.

ATK-CLIMX93B series core board and development board provides a wealth of software and documentation resources, including U-boot, Linux kernel, peripheral driver source code, file system, Qt source code, C application source code, related development tools and development environment. The documentation materials include tutorial documents and user manuals, covering Linux embedded driver development guide, Linux C application programming guide, heteronuclear communication routine use manual and AI development manual, etc., with a total of 1500+ pages. In addition, hardware information is provided, including development board PDF document, development board AD package library, mechanical size diagram, chip reference manual, etc. These resources will help developers better utilize the functionality and performance of the core board and accelerate the system development and optimization cycle.

1.2 Application Areas

Figure 1.2-1 Some Application Areas

1.3 Downloading Information

Download center: http://www.openedv.com/docs/boards/arm-linux/iMX93hxb.html

Or：https://github.com/openedv

Chapter 2. Product selection

2.1 Product Naming

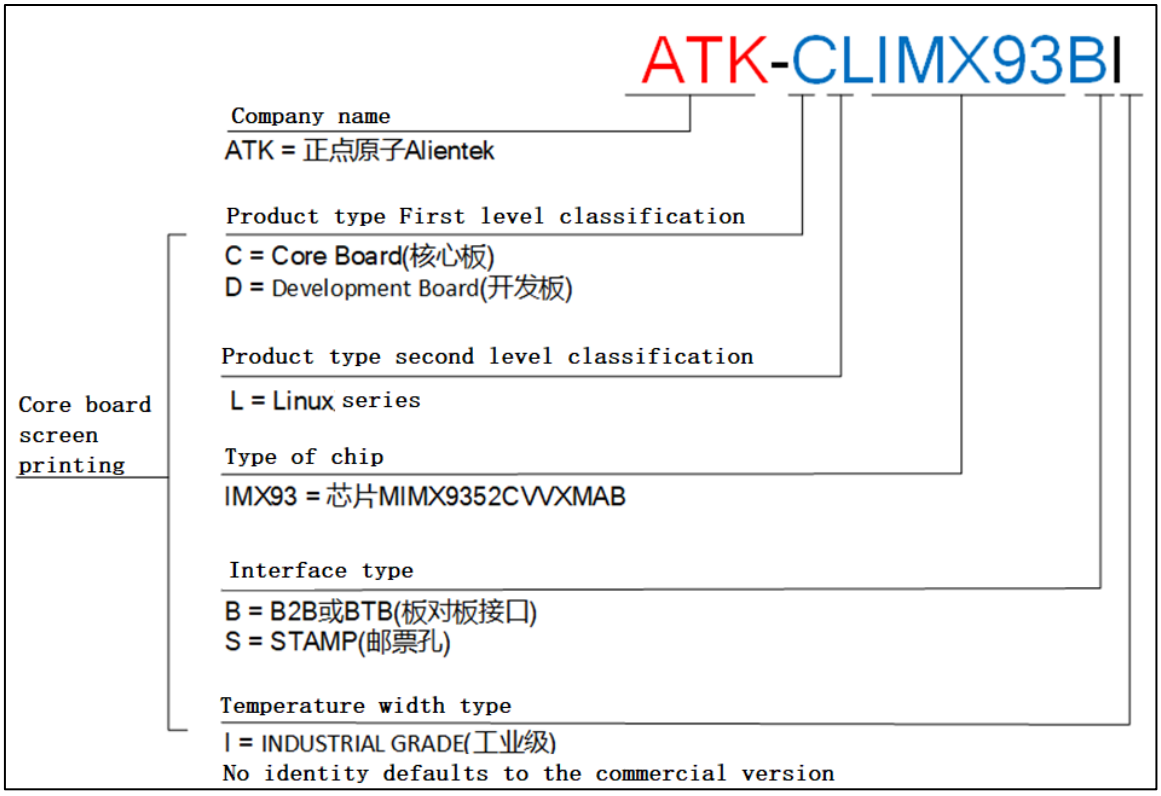


Figure 2.1-1 Product naming

2.2 Difference between commercial grade and industrial grade

The ATK-CLIMX93B series core board is divided into commercial and industrial versions according to the operating temperature of the use scenario.

The operating temperature of the commercial grade core board is -25 ° C to +70 ° C

The working temperature of industrial grade core board is -40℃ ~ +85℃

The commercial BTB version core board screen printing is named CLIMX93B, and the industrial BTB version core board screen printing is named CLIMX93BI.

Unless otherwise stated, the picture in this document is commercial grade core board.

Chapter 3. Product parameters

3.1 Hardware Parameters

Project	Parameter	备注
Core board size specification	50mm*30mm	
Processor model number	NXP i.MX9352	FCBGA306 package
Processor architecture	Dual core 1.7GHz Cortex-A55 + 250MHz Cortex-M33 with integrated 0.5 TOP/s NPU	
Power management	Discrete power supply	
Memory	1GB LPDDR4X（standard）	The model is subject to the actual patch
Storage	16GB eMMC（standard）	The model is subject to the actual patch
Voltage of operation	5V1A	Power supply range: 5V±200mV
Power consumption	< 1W	Minimum system power consumption of core board
Operating temperature	Commercial grade：-25℃ ~ +70℃	
	Industrial grade：-40℃ ~ +85℃	
Number of interface pins	200PIN	
Pin spacing	0.4mm	
Interface form	Two 2*50 anti-backplug BTB male seats, board to board connection	
PCB process	8 layers, separate layer, power layer	

3.2 Core board resources

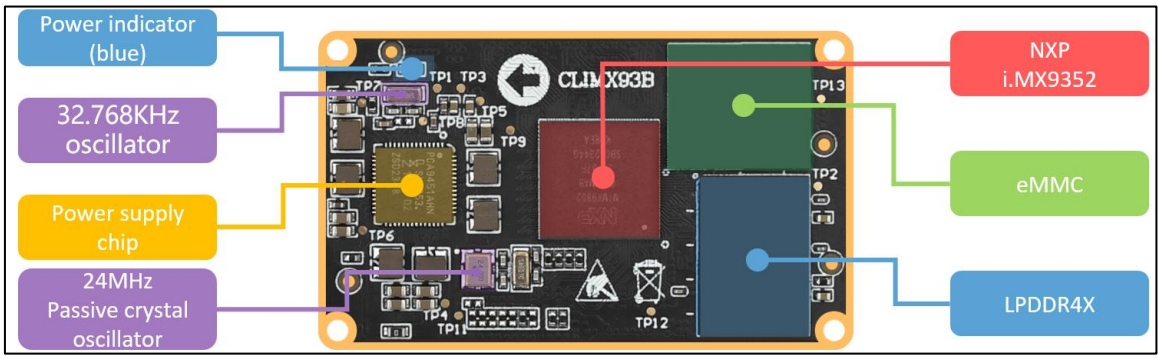


Figure 3.2-1 CLIMX93B core board frontal resources

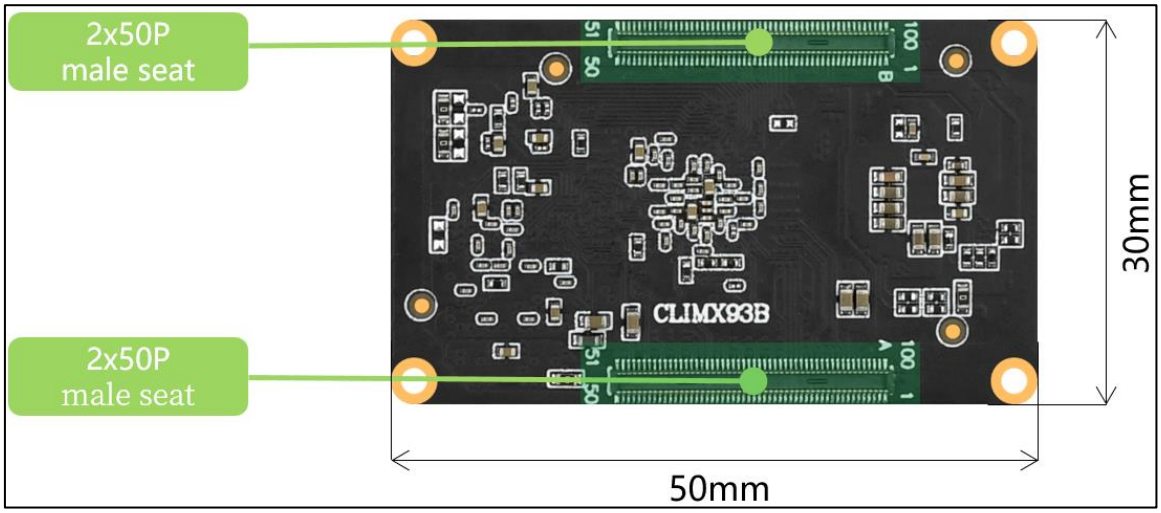


Figure 3.2-2 CLIMX93B core board backside resources

3.3 Pin sequence and interface signal

In the PINOUT section of the ATK-CLIMX93B core board schematic is the pin definition for the core board BTB connector, which is a pair of 2x50PIN specifications with a total of 200 pins.

The back of the core board has the pin number silk screen printed as follows:

Figure 3.3-1 Back side of core plate

It can be seen that there are A pair of BTB connector male seats on the back of the core board, the top one is B, and the bottom one is A, marked with pin numbers 1, 50, 51, and 100 respectively, which correspond to the pin numbers of the BTB female seat on the bottom board.

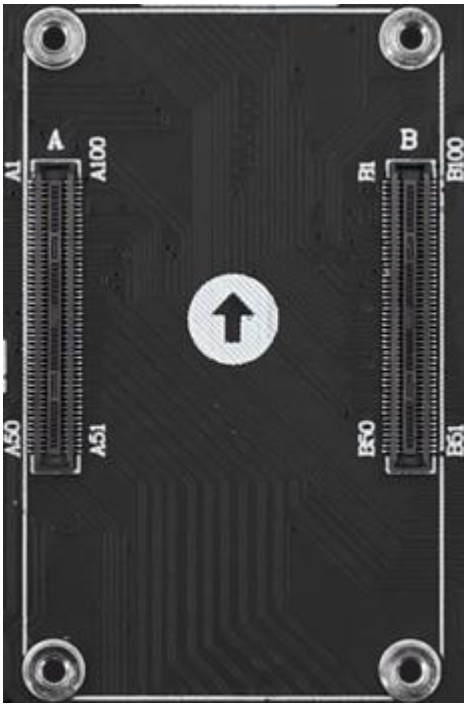


Figure 3.3-2 The BTB interface of the development board bottom

For specific pin function definitions, you can see the ATK-DLIMX93 base plate schematic diagram.

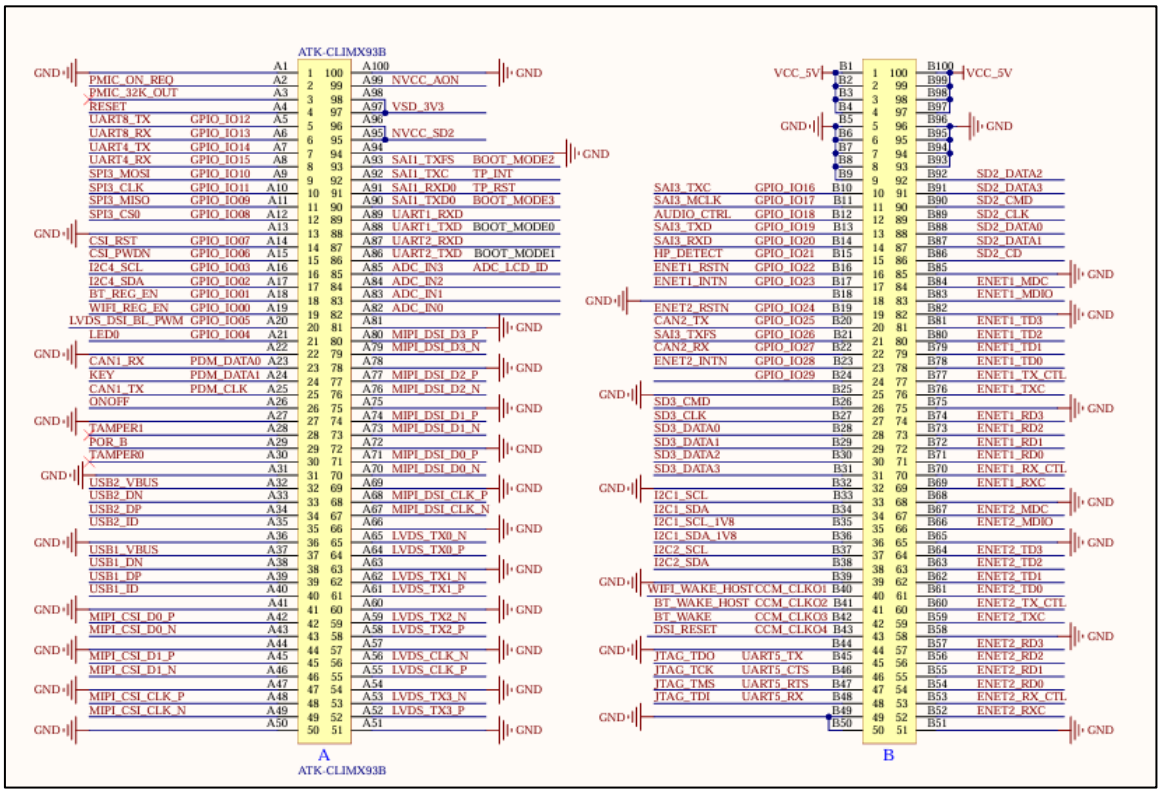


Figure 3.3-3 Base plate schematic diagram pin definition section

Only the functions used by the core board on the base board are written here (that is, the default factory system functions). If you want to see the pin reusable functions, please check the document "[ALIENTEK] ATK-DLIMX93 Core Board Interface Data Sheet.xlsx".

3.3.1 Pin reusable function resources

The core board brings out all the IO on the processor. Users can design their own baseboard to use the IO resources on the core board and reuse the IO into their own functions.

According to the peripheral function, the maximum number of single peripheral resources that can be reused by the core board of the ATK-CLIMX93B series is listed here, and the specific selection can be combined with the chip data sheet (Maximum number of single peripheral resources: refers to the maximum number of a single peripheral that can be used by the core board without using other peripherals).

Peripheral function	Maximum multiplexing number of a single peripheral	Peripheral function	Maximum multiplexing number of a single peripheral
GPIO	128	Ethernet	2
ADC	1, 4 channels, 12 bits	uSDHC	3
Timer/PWM	6	MIPI DSI	1
LVDS	1	MIPI CSI	1
I2C	8	SPI	8
UART	8	USB	2
I3C	2	SAI	3
CAN- FD	2	JTAG	1
FlexSPI	1	FlexIO	2
WDOG	5	RTC	1
RGB LCD	1	Parallel CSI	1

Chapter 4. Authentication Certificate

4.1 FCC certification

ATTESTATION OF CONFORMITY

Global Testing Group

No. 24AE040138F002

The device bearing the trade name and model specified below has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified.

Report No.	:	E04A24040138F00201
Applicant	:	Guangzhou Xingyi Electronic Technology Co., Ltd
Address	:	Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City
Manufacturer	:	Guangzhou Xingyi Electronic Technology Co., Ltd
Address	:	Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City
Description of Product	:	i.MX93 CoreBoard
Model No.	:	ATK-CLIMX93B
Trade Mark	:	ALIENTEK
Rating	:	DC12V 1A
Test Standards	:	FCC 47 CFR Part 15 Subpart B

Test Laboratory:

Shawn Wen
Laboratory Manager
Date of Issue: April 11, 2024

This attestation of conformity is based on a single evaluation of the submitted sample(s) of the above mentioned product. It does not imply an assessment of the production of the products.

Guangdong Global Testing Technology Co., Ltd.
Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People's Republic of China, 523808
Web: www.gtggroup.com E-mail: info@gtggroup.com Tel.: 86-4007558988

1

Figure 4.1-1 ATK-CLIMX93B Core board FCC certification

4.2 CE certification

ATTESTATION OF CONFORMITY

Global Testing Group

No. 24AE040138E001

The submitted sample of below equipment has been tested in according to Electromagnetic Compatibility Directive 2014/30/EU with the following standards. The test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the principal protection requirement of the EC Council Directive of 2014/30/EU.

Report No.	:	E04A24040138E00101
Applicant	:	Guangzhou Xingyi Electronic Technology Co., Ltd
Address	:	Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City
Manufacturer	:	Guangzhou Xingyi Electronic Technology Co., Ltd
Address	:	Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City
Description of Product	:	i.MX93 CoreBoard
Model No.	:	ATK-CLIMX93B
Trade Mark	:	ALIENTEK
Rating	:	DC12V 1A
Test Standards	:	EN 55032:2015/A1:2020 EN 55035:2017/A11:2020

After preparation of the necessary technical documentation as well as the EU declaration of conformity, the CE marking as below can be affixed on the product if all relevant effective EU-directives or regulations related to CE marking have been complied with. The EU declaration of conformity is issued under the sole responsibility of the applicant or manufacturer.

CE

Test Laboratory

Shawn Wen
Laboratory Manager
Date of Issue: April 11, 2024

This attestation of conformity is based on a single evaluation of the submitted sample(s) of the above mentioned product. It does not imply an assessment of the production of the products.

Guangdong Global Testing Technology Co., Ltd.
Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People's Republic of China, 523808
Web: www.gtggroup.com E-mail: info@gtggroup.com Tel.: 86-4007558988

1

Figure 4.2-1 ATK-CLIMX93B Core board CE certification

4.3 RoHS certification

UONE

CERTIFICATE OF CONFORMITY

No.:U00902240305603E

Applicant	:	Guangzhou Xingyi Electronic Technology Co., Ltd
Address	:	Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City
Manufacturer	:	Guangzhou Xingyi Electronic Technology Co., Ltd
Address	:	Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City
Factory	:	Dongguan Zhichen Electronic Technology Co., Ltd
Address	:	301, Building 1, No. 16 Xingui Road, Lincun, Tangxia Town, Dongguan City, Guangdong Province
Trade Mark	:	正点原子
Sample Name	:	PCB
Model No.	:	ATK-CLIMX93B

The submitted sample of the above mentioned product has been tested and found to comply with the following European Directive:

RoHS Directive 2011/65/EU & (EU) 2015/863

The standard(s) used for showing compliance with the essential requirements:

Applicable Standard(s)	Test Report(s) Number
IEC 62321-1:2013, IEC 62321-2:2021 IEC 62321-3-1:2013 IEC62321-4: 2013+A1:2017, IEC 62321-5:2013 IEC 62321-6:2015, IEC 62321-7-1: 2015 IEC 62321-7-2: 2017, IEC 62321-8: 2017	U00902240305603E

Shen Zhen UONE Test Co., LTD.
Unit 4B, Building B4, China Merchants Guangming Science Park, Tourist Road 3009, Guangming New District, Shenzhen
Tel: 0755-23695858 Fax: 0755-23699878 E-mail: service@uonetest.com http://www.uonetest.com

Figure 4.3-1 ATK-CLIMX93B Core board RoHS certification Page1

UONE

CERTIFICATE OF CONFORMITY

No.:U009022403056O3E

The submitted samples have been tested by UONE with the listed standards and found in conformity with the Directive 2011/65/EU & (EU) 2015/863 of the European Parliament and of the Council with regard to the restriction of the use of certain hazardous substances in electrical and electronic equipment. It is possible to use CE marking to demonstrate the conformity with this Directive.

This certification is part of the full test report(s) and should be read in conjunction with it. The certificate is based on a single evaluation of one sample of above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo. Other CE marking directives may apply have not been considered during the RoHS assessment.

The CE mark as shown below can be used under the responsibility of the relevant finished-product manufacturer, after completion of an EU Declaration of Conformity and compliances with all relevant EU Directives.

CE RoHS

SHENZHEN UONE TEST CO.,LTD. UONE Mar. 8, 2024

Shen Zhen UONE Test Co., LTD.
Unit 4B, Building B4, China Merchants Guangming Science Park, Tourist Road 3009, Guangming New District, Shenzhen
Tel: 0755-23695858 Fax: 0755-23699878 E-mail: service@uonetest.com http://www.uonetest.com

Figure 4.3-2 ATK-CLIMX93B Core board RoHS certification Page2

Chapter 5. Software resources

5.1 Factory system firmware resources

5.1.1 Basic information

Type	Description	Note
U-Boot	Version:2023.04	Provide source code
Linux kernel	Version:6.1.55	Provide source code
Root file system rootfs	Yocto root filesystem	Provide an image
Qt	Version:6.5.0	Provide source code
Cross compiler	gcc-arm-none-eabi,Version:2019-q4 fsl-imx-xwayland,Version:6.1-mickledore	Provide software
System burning	UUU tools, SD card two	Provide tutorials

Chapter 6. Core board structure size

6.1 Structure dimensions of CLIMX93B

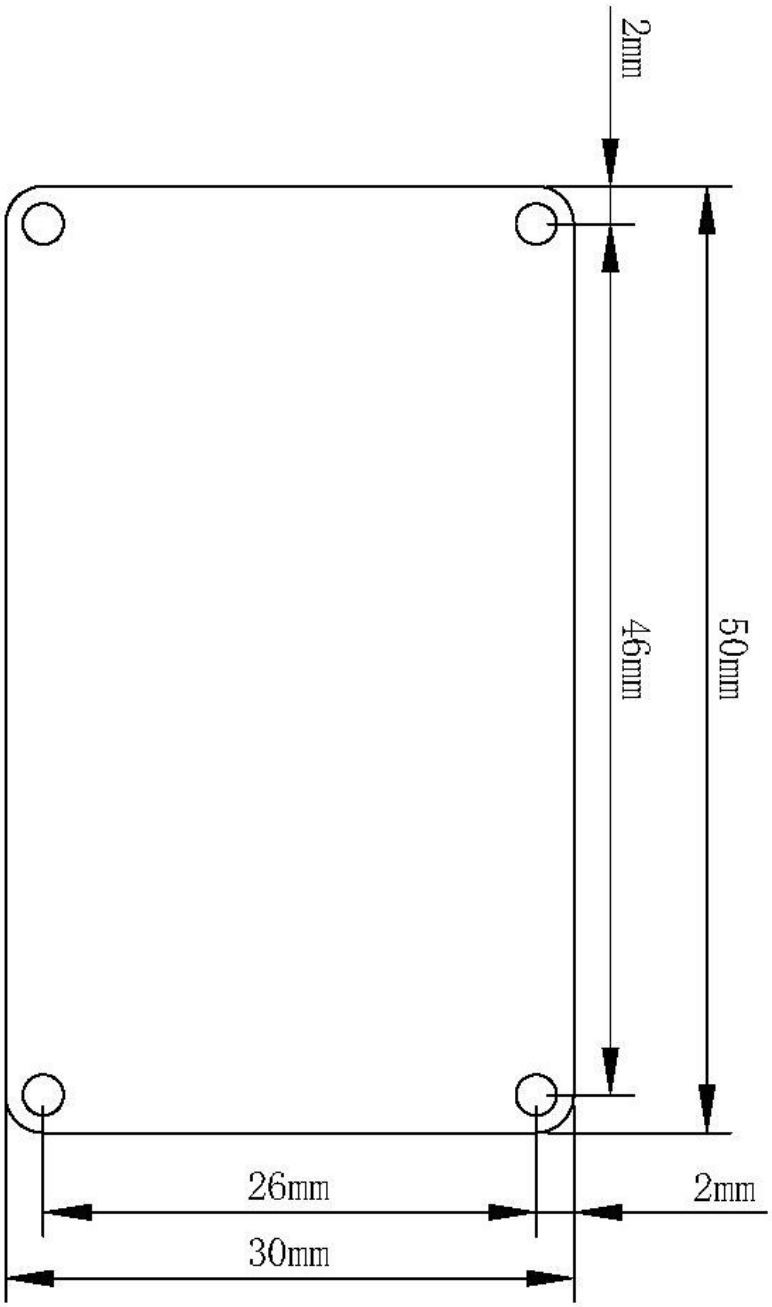


Figure 6.1-1 ATK-CLIMX93B Mechanical structure of core board

Chapter 7. Development materials

7.1 Data Description

7.1.1 User manual

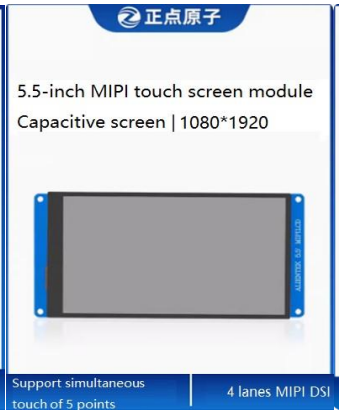
Manual	Description
ATK-DLIMX93 Quick Test Manual	Development board burning system, preparation for use, functional test
ATK-DLIMX93 Virtual Machine Usage Reference Manual	Built virtual machine, installation and basic instructions
ATK-DLIMX93 Factory System Source Code Use Guide	Cross compilation tool chain installation, development board source code use
ATK-DLIMX93 Hardware Reference Manual	Development board hardware resources description, use precautions
ATK-DLIMX93 Development Board Specification	Development board specification, pre-project selection reference
ATK-DLIMX93 Firmware Update Reference Documentation	Update and package U-Boot, kernel, filesystem
ATK-DLIMX93 File Transfer manual	Computer and development board file transfer operation
Linux Network Environment Setup Manual	Development environment network construction
ATK-DLIMX93 Factory System NFS Setup Manual	Development board factory system NFS configuration and testing
ATK-DLIMX93 Factory System TFTP Setup Manual	Development board factory system TFTP configuration and testing
ATK-DLIMX93 Construction of embedded Qt6 development environment	QT installation, toolchain configuration, and usage examples
ATK-DLIMX93 Factory interface QtUI instructions	Development board factory interface QT source code compilation instructions
ATK-DLIMX93 U-Boot Command Reference Manual	Factory system U-Boot command use
ATK-DLIMX93 Factory System LOGO Modification Manual	Factory system kernel LOGO modification
ATK-DLIMX93 Use GDB to debug the M33 manual	The Cortex-M33 core was debugged using GDB on the development board
ATK-DLIMX93 Porting Debian Reference Manual	Build the Debian minimal root filesystem on the development board
ATK-DLIMX93 Porting Ubuntu Filesystem Reference Manual	Build the Ubuntu minimal root filesystem on the development board

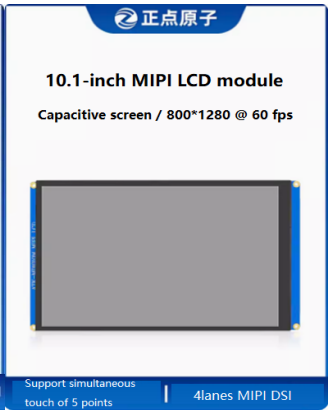
7.1.2 i.MX93 Official materials

Manual	Note
Reference manual	i.MX93 Processor Reference Manual
Data sheet	i.MX93 Processor Data Sheet
i.MX93 Application Processor product Introduction	i.MX93 Introduction to Processor

Chapter 8. Optional Accessories

ATK-DLIMX93 development board can use ALIENTEK OV5645 camera and screen module, etc., to show stronger performance effects. At present, the development board has been adapted to the following modules:





All the above modules can be purchased from ALIENTEK flagship store.

In addition, the development board is also adapted to ALIENTEK 10.1 inch 1280x800 LVDS screen, Fibocom 5G RedCap FG132 module, Quectel 4G EC20 module, etc. Users can develop and use according to project requirements.

Chapter 9. Precautions for product use

- Do not plug and unplug peripheral modules with power!
- Before using the product, please carefully read this manual and related development manuals, and pay attention to the applicable matters of the platform.
- Follow all instructions and warnings on the product.
- Please use this product in a cool, dry and clean place.
- Please keep the product dry. If any liquid splashes or soaks, power off immediately and let dry thoroughly.
- Do not use organic solvents or corrosive liquids to clean the product.
- Do not use or store this product in dusty, dirty and messy environment.
- If not used for a long time, please package this product, pay attention to moisture-proof and dust-proof.
- Pay attention to the ventilation and heat dissipation of the product during use to avoid component damage caused by excessive temperature during operation.
- Do not use this product in alternating hot and cold environment to avoid dew damage to components.
- Do not treat this product roughly, drop, knock or shake violently may damage the line and components.
- Pay attention to anti-static when using this product.
- FPC flexible cable is fragile, when plugging cable, pay attention to check whether the metal at both ends of the cable is misplaced and falling off.
- All products have passed the product test before shipment. Please use the development board corresponding to the positive dot atom for power on test for the first time.
- Do not repair or disassemble the company's products by yourself. If the product fails, please contact the company in time for maintenance.
- Unauthorized modification or use of unauthorized parts may damage the product, the resulting damage will not be repaired.

Chapter 10. After sales service

10.1 Terms of after-sales service

1). After receiving the goods, please open them in front of the express, and sign after acceptance. If you find that the goods are less after signing, take photos in time and contact the seller's customer service to explain the situation within 15 days. If the feedback is lack of goods after 15 days, we will not reissue the goods. Other reasons notwithstanding).

2). 15 days -1 month: we are responsible for the return freight repair of product problems. Human factors damage expensive main chip or LCD screen, touch screen. The buyer needs to pay the cost and one time shipping fee, no maintenance fee.

3). 1-3 months: the problem of the product itself (non-human factors), we are responsible for the delivery of the past freight maintenance. If the main chip is burned out and the LCD screen and touch screen are damaged, the buyer needs to pay the cost, and the maintenance fee is not charged.

4) After 3 months: the buyer shall bear the return freight and the cost of chip, LCD screen and touch screen. No service charge.

10.2 After-sales Support

Technical support:

QQ group: Taobao contact customer service to obtain

Taobao shop: ALIENTEK flagship store

Forum: http://www.openedv.com/forum.php?mod=forumdisplay&fid=269