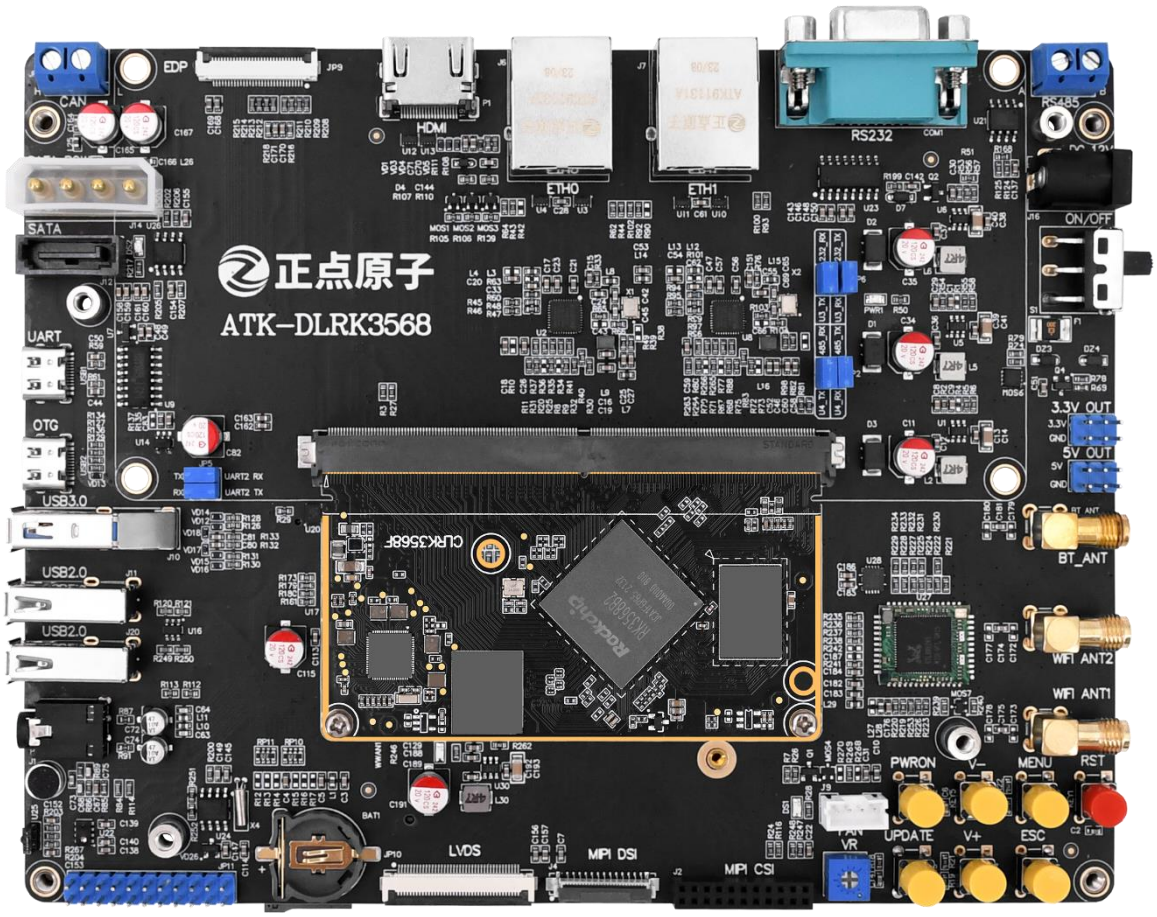
ATK-DLRK3568

Linux 5.10 SDK Compilation Instructions

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	ALIENTEK	2024.07.10

Catalogue

Brief

This document provides users with instructions on how to compile the Linux 5.10 SDK provided by ALIENTEK. Before reading this document, please first refer to the contents of Chapter 1 and Chapter 2 in the document: <Development Board CD-ROM A Disk - **Basic Materials -> 10_user_manual -> 02. Development Documents -> [ALIENTEK] ATK-DLRK3568 Embedded Linux System Development Manual.pdf>** which cover installing the Ubuntu system and setting up the development environment. Also, follow the instructions in Section 4.1.1 of this document to install the required software packages.

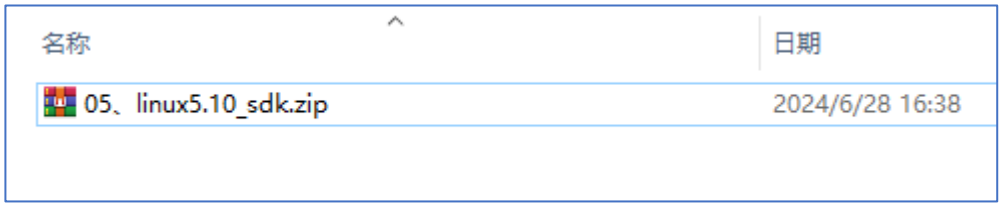
Chapter 1. Linux 5.10 SDK compilation

ATK-DLRK3568 Linux 5.10 SDK Compilation Instructions.

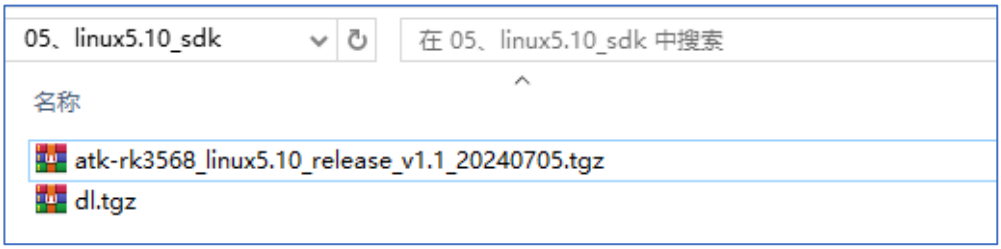
1.1 Download SDK

First, open the link http://www.openedv.com/docs/boards/arm-linux/RK3568Linux.html. Then, follow the instructions below to download the RK3568 Linux 5.10 SDK:

After entering the cloud drive, click "[ALIENTEK] RK3568 Development Board Materials (B Drive) - Development Environment and SDK -> 02, ATK-DLRK3568 Development Board SDK -> 05, linux5.10_sdk" in sequence. Then download the compressed file **05, linux5.10_sdk.zip**. After the download is completed, it will look like this (make sure it is a complete download and you can compare the MD5 value yourself):



Then extract it to the current directory. After the extraction is complete, a folder named "**05 linux5.10_sdk**" will be obtained. Enter this folder as follows:



atk-rk3568_linux5.10_release_v1.1_20240705.tgz is the compressed file of the RK3568 Linux 5.10 SDK. With the update of the version, the name of the SDK compressed file will also change, but they will all be named in the format of **atk-rk3568_linux5.10_release_ version _ release date.tgz**.

dl.tgz is the third-party open-source library that is relied upon during the compilation of buildroot.

1.2 Install dependent software packages

To compile the Linux 5.10 SDK, some additional dependent software packages need to be installed. On the Ubuntu system, execute the following command for installation:

```
sudo apt-get update && sudo apt-get install git ssh make gcc libssl-dev \
liblz4-tool expect expect-dev g++ patchelf chrpath gawk texinfo chrpath \
diffstat binfmt-support qemu-user-static live-build bison flex fakeroot \
cmake gcc-multilib g++-multilib unzip device-tree-compiler ncurses-dev \
bzip2 expat gpgv2 cpp-aarch64-linux-gnu libgmp-dev \
libmpc-dev bc
```

During the installation process, make sure that the Ubuntu network connection is stable. The installation process will take some time, so please be patient and wait!

Execute the following command to enable DNS support for kgithub.com:

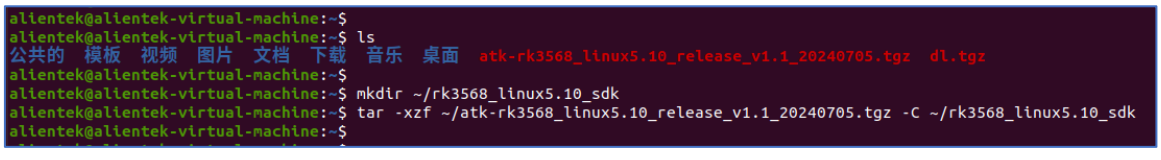
```
sudo sed -i '$a 43.154.68.204\tkgithub.com' /etc/hosts
sudo sed -i '$a 43.155.83.75\traw.kgithub.com objects.githubusercontent.kgithub.com' /etc/hosts
```

1.3 Copy the SDK to the Ubuntu system

Note: If the current terminal has already compiled other SDKs, you need to open a new terminal first, and then compile the Linux 5.10 SDK in this new terminal. Otherwise, it may cause compilation errors!!!

Copy the two compressed files, **atk-rk3568_linux5.10_release_v1.1_20240705.tgz** and **dl.tgz**, to the home directory of the user on the Ubuntu system, and execute the following command to extract atk-rk3568_linux5.10_release_v1.1_20240705.tgz:

```
mkdir ~/rk3568_linux5.10_sdk
tar -xzf ~/atk-rk3568_linux5.10_release_v1.1_20240705.tgz -C ~/rk3568_linux5.10_sdk
```



After decompression is completed, execute the following command to check out the source code:

```
cd ~/rk3568_linux5.10_sdk
.repo/repo/repo sync -l -j10
```

```
alientek@alientek-virtual-machine:~$
alientek@alientek-virtual-machine:~$ cd ~/rk3568_linux5.10_sdk
alientek@alientek-virtual-machine:~/rk3568_linux5.10_sdk$
alientek@alientek-virtual-machine:~/rk3568_linux5.10_sdk$ .repo/repo/repo sync -l -j10
正在更新文件: 100% (1197/1197), 完成.
正在更新文件: 100% (861/861), 完成.
正在更新文件: 100% (759/759), 完成.
正在更新文件: 100% (219/219), 完成.
正在更新文件: 100% (6255/6255), 完成.
正在更新文件: 100% (2181/2181), 完成.
正在更新文件: 100% (43/43), 完成.
正在更新文件: 100% (81635/81635), 完成.
正在更新文件: 100% (5939/5939), 完成.
正在更新文件: 100% (5722/5722), 完成.
正在更新文件: 100% (190/190), 完成.
正在更新文件: 100% (121/121), 完成.
正在更新文件: 100% (248/248), 完成.
正在更新文件: 100% (13701/13701), 完成.
正在更新文件: 100% (166/166), 完成.to/poky正在更新文件:  34% (58/166)
正在更新文件: 100% (253/253), 完成.
正在更新文件: 100% (163/163), 完成.
Checking out: 100% (59/59), done in 3m17.869s
repo sync has finished successfully.
alientek@alientek-virtual-machine:~/rk3568_linux5.10_sdk$
```

After the checkout is completed, the source code directory of the entire Linux 5.10 SDK is obtained, as shown below:

```
alientek@alientek-virtual-machine:~/rk3568_linux5.10_sdk$
alientek@alientek-virtual-machine:~/rk3568_linux5.10_sdk$ ls
app        build.sh  device  envsetup.sh  kernel    prebuilts  rkflash.sh  u-boot
buildroot  debian    docs    external     Makefile  rkbin      tools       yocto
alientek@alientek-virtual-machine:~/rk3568_linux5.10_sdk$
alientek@alientek-virtual-machine:~/rk3568_linux5.10_sdk$
```

1.4 Selection of screens

The ALIENTEK ATK-DLRK3568 development board supports the following types of screens:

- ALIENTEK 5.5-inch 1080x1920 (portrait) MIPI display screen
- ALIENTEK 5.5-inch 720x1280 (portrait) MIPI display screen
- ALIENTEK 10.1-inch 800x1280 (portrait) MIPI display screen
- ALIENTEK 10.1-inch 1280x800 (Landscape mode) LVDS screen
- Standard HDMI display screen (connected via HDMI cable)
- eDP display screen (a separate adapter board needs to be made to connect the eDP screen. ALIENTEK does not provide eDP screens. Users can purchase them online.)

The ATK-DLRK3568 development board has one MIPI screen interface (MIPI DSI), which can be connected to a 5.5-inch or 10.1-inch MIPI screen from ALIENTEK; one LVDS screen interface, which can be connected to a 10.1-inch 1280x800 LVDS screen from ALIENTEK; one HDMI output interface, which can be connected to a standard HDMI display; one eDP screen interface, which can be connected to an eDP screen; these display interfaces can be found on the board, so no pictures are provided here!

Users need to enable the corresponding display interface based on the screen they purchased and the configuration.

Open the device tree file **kernel/arch/arm64/boot/dts/rockchip/rk3568-screen_choose.dtsi**:

vi kernel/arch/arm64/boot/dts/rockchip/rk3568-screen_choose.dtsi

```
/*
 * 屏幕选择
 * ATK_LCD_TYPE_MIPI_720P:   正点原子5.5寸 720*1280 MIPI屏
 * ATK_LCD_TYPE_MIPI_1080P:  正点原子5.5寸 1080*1920 MIPI屏
 * ATK_LCD_TYPE_MIPI_10P1_800X1280: 正点原子10.1寸 800*1280 MIPI屏
 * ATK_LCD_TYPE_LVDS:        正点原子10.1寸 1280*800 LVDS屏
 * ATK_LCD_TYPE_HDMI:        HDMI显示器
 * ATK_LCD_TYPE_EDP_VGA:     eDP屏或者VGA显示器（硬件默认使能的是VGA接口，若用户需要使用eDP屏，则需修改硬件
 *                           具体情况可以看正点原子RK3568底板原理图！）
 */
/*
 * RK3568可支持三屏显示，也就是三路显示 VP0 VP1 VP2
 * 但是三屏显示需要注意一些问题，具体情况可以看正点原子提供的文档<RK3568三屏显示参考手册>！
 */

/*
 * ATK_LCD_TYPE_MIPI_720P/ATK_LCD_TYPE_MIPI_1080P/ATK_LCD_TYPE_MIPI_10P1_800X1280 三选一
 */
#define ATK_LCD_TYPE_MIPI_720P          // 从VP1输入
//#define ATK_LCD_TYPE_MIPI_1080P       // 从VP1输入
//#define ATK_LCD_TYPE_MIPI_10P1_800X1280       // 从VP1输入

/*
 * ATK_LCD_TYPE_HDMI 和 ATK_LCD_TYPE_EDP_VGA 二选一
 */
#define ATK_LCD_TYPE_HDMI               // 从VP0输入
//#define ATK_LCD_TYPE_EDP_VGA          // 从VP0输入

//#define ATK_LCD_TYPE_LVDS             // 从VP2输入
```

By default, the 5.5-inch 720x1280 MIPI screen and HDMI screen are enabled; if the user does not need to connect the MIPI screen on the board and only uses the HDMI display screen, the definition is as follows:

```
//#define ATK_LCD_TYPE_MIPI_720P                // 从VP1输入
//#define ATK_LCD_TYPE_MIPI_1080P       // 从VP1输入
//#define ATK_LCD_TYPE_MIPI_10P1_800X1280       // 从VP1输入

/*
 * ATK_LCD_TYPE_HDMI 和 ATK_LCD_TYPE_EDP_VGA 二选一
 */
#define ATK_LCD_TYPE_HDMI               // 从VP0输入
//#define ATK_LCD_TYPE_EDP_VGA          // 从VP0输入

//#define ATK_LCD_TYPE_LVDS             // 从VP2输入
```

If the user is using a 10.1-inch 800x1280 MIPI screen, the following definitions apply:

```
//#define ATK_LCD_TYPE_MIPI_720P                // 从VP1输入
//#define ATK_LCD_TYPE_MIPI_1080P       // 从VP1输入
#define ATK_LCD_TYPE_MIPI_10P1_800X1280 // 从VP1输入

/*
 * ATK_LCD_TYPE_HDMI 和 ATK_LCD_TYPE_EDP_VGA 二选一
 */
#define ATK_LCD_TYPE_HDMI               // 从VP0输入
//#define ATK_LCD_TYPE_EDP_VGA          // 从VP0输入

//#define ATK_LCD_TYPE_LVDS             // 从VP2输入
```

If the user is using a 10.1-inch LVDS screen, the following definitions apply:

```
//#define ATK_LCD_TYPE_MIPI_720P                  // 从VP1输入
//#define ATK_LCD_TYPE_MIPI_1080P         // 从VP1输入
//#define ATK_LCD_TYPE_MIPI_10P1_800X1280         // 从VP1输入

/*
 * ATK_LCD_TYPE_HDMI 和 ATK_LCD_TYPE_EDP_VGA 二选一
 */
#define ATK_LCD_TYPE_HDMI                 // 从VP0输入
//#define ATK_LCD_TYPE_EDP_VGA            // 从VP0输入

#define ATK_LCD_TYPE_LVDS                 // 从VP2输入
```

In summary, users need to configure it according to the screen they are using. After configuration, save and exit!

1.5 Compile SDK

Before compiling the SDK, execute the following command to extract **dl.tgz** to the buildroot/ directory:

```
tar -xf ~/dl.tgz -C ./buildroot/
```

Execute the following command to compile in the "rk3568_linux5.10_sdk/" directory:

```
./build.sh alientek_rk3568_defconfig
./build.sh all
```

The entire compilation process will last approximately 2 to 3 hours, or even longer, depending on the configuration of the personal computer (CPU and memory).

If no unexpected issues occur, the compilation will be successful! After the compilation is completed, the generated image file will be packaged into the **output/firmware/** directory.

1.6 Package as update.img

By executing the following command in the SDK root directory, the individual images in the **output/firmware/** directory can be packaged into a single update.img firmware, making it convenient for users to burn:

```
./build.sh updateimg
```

After the packaging is completed, an update.img firmware file will be generated in the "output/firmware/" directory.