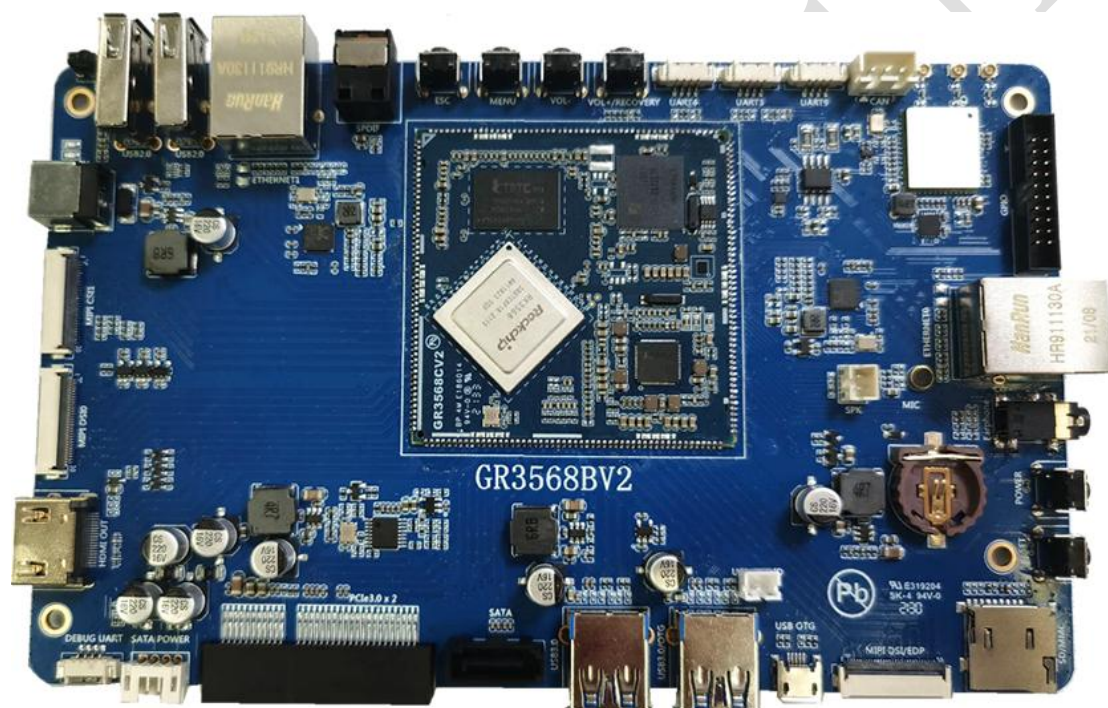


# G3568 Development Board Linux User Manual



Shenzhen Graperain Technology Co., Ltd.

[www.graperain.com](http://www.graperain.com)

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Grapera Rain

**Release Notes**

Version	Date	Author	Description
Rev.01	2022-2-22	RXS	Revision

Graperain

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## Chapter 1 Build Linux Development Environment

For compile efficiency, we recommend users install Ubuntu OS in PC, not virtual machine. In the development, we use Ubuntu 18.04, 64 bit system. Users can keep the same version as ours

### 1.1 Computer Hardware and System Requirements

The SDK development environment is developed and tested on the Ubuntu system. We recommend compiling with Ubuntu 18.04. Other Linux distributions may require corresponding adjustments to the packages.

#### Hardware Requirements

64 bit system, the hard disk space is more than 100G. If you do multiple builds, more hard drive space will be required.

#### Software Requirements:

Ubuntu 18.04 system, Ubuntu official download address:

<http://www.ubuntu.com/download/desktop/>

### 1.2 Install Linux Source Code Dependency Package

**Note:** All development of this document is based on ubuntu18.04 64-bit system, and which will not be declared in the future.

#### Dependency Package Software and 64-bit system patch packages:

repo, git, ssh, make, gcc, libssl-dev, liblz4-tool, expect, 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, python-pip, ncurses-dev, pyelftools, python-pip

#### Install the required packages with the command:

```
sudo apt-get update
sudo apt-get upgrade
```

```
sudo apt-get install repo git ssh make gcc libssl-dev liblz4-tool expect 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 python-pip ncurses-dev
pyelftools python-pip
```

It is recommended to install the above software packages one by one, so that you can find out which installation was failed.

### Install JDK Manually:

Detailed steps to manually install jdk8 on Ubuntu:

Step 1: Run the following command:

```
sudo add-apt-repository ppa:openjdk-r/ppa
sudo apt-get update
sudo apt-get install openjdk-8-jdk
```

Step 2: Restart the system

Step 3: Check the current java version

```
root@david:/usr/lib/jvm# java -version
```

**Until now, jdk8 is successfully installed.**

## 1.3 Install Cross Compile Tool

The cross compile toolchain has been integrated into the source package, and no manual installation is required. Cross compile toolchain path: (in Linux source code)

```
prebuilts/gcc/linux-x86/aarch64
```

## Chapter 2 Compile Linux Source Code Package

G3568 Development Board match eMMC on board

**Notice:** Take general ordinary to compiling when compiling images. When done, new image will be: uboot.img, boot.img, update-linux.img, update-ubuntu.img

- uboot.img: bootloader, Guarding kernel
- boot.img: Kernel image, which includes source file image
- update-linux.img: Linux QT file system image
- update-ubuntu.img: Ubuntu system image

### 2.1 Install Linux Source Code Package

Copy Linux source code package into user catalogue from network disk which name is: g3568-linux-v1.1-xxxxxx.tar.gz.xx, download all files g3568-linux-v1.1-xxxxxx.tar.gz.xx. Please don't put all files into files system root catalogue, which will happen management right issue.

Source code unzip ways: take following commands in user authority:

```
cat g3568-linux-v1.1-xxxxxx.tar.gz.* | tar -zxvf
```

Done unzip, g3568-linux-v1.1-xxxxxx will be, which includes all Linux files system. Done Linux source could package installation.

**Notice:** The name of the source code package may be different due to the release date, etc., and the actual name in the cloud shall prevail.

### 2.2 Compile Source Code

#### 2.2.1 Pick Compiling Code

Please take general right to compile, and take following command:

```
./build.sh BoardConfig-rk3568-evb1-ddr4-v10.mk
```

**Notice:** Take the command to compile it when computer restart every time

#### 2.2.2 One-click Compile Command

Execute the compiling code, and run it in Linux source code root catalogue ./build.sh which could compile the full source code. Done compiling, update-linux.img and update-ubuntu.img



will be in rockdev catalogue. update-linux.img is Linux QT system image, and update-ubuntu.img is Ubuntu system image.

```
./build.sh
```

### 2.2.3 Compile Uboot Separately

Enter into source code root catalogue and take following command, and done uboot compiling and packaging.

```
./build.sh uboot
```

Done compiling, uboot.img will be created in uboot catalogue

### 2.2.4 Compile Kernel Separately

Enter into source code root catalogue and take following command to compiling kernel and packaging.

```
./build.sh kernel
```

Done compiling, boot.img will be created in kernel catalogue

### 2.2.5 Compile Buildroot Separately

Enter into source code root catalogue and take following commands to done Rootfs compiling and packaging:

```
./build.sh rootfs
```

Done compiling, rootfs.ext4 will be created in output/rockchip\_rk3568/images in buildroot catalogue.

### 2.2.6 Re-package Linux QT and Ubuntu Images

Execute one-click compile command done source code compiling, modify and compile uboot or kernel separately, take package command to package update images one more time. And the package command:

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

Done the command, uboot.bin or boot.img will be packaged into update-linux.img and update-ubuntu.img.

## Chapter 3 Program Linux QT and Ubuntu Image Files

### 3.1 Upgrade Firmware in Ubuntu Environment

Upgrading firmware in Ubuntu environment refers to upgrading the GR3568 firmware through corresponding commands when the PC is Ubuntu system.

#### How to do it:

- 1.Connect the power adapter to the GR3568 board
- 2.Connect the micro usb cable to the PC
- 3.Connect the serial cable to connect to the PC
- 4.Open the serial port terminal and the command line terminal on the PC
- 5.Power on the GR3568 board. The board will boot.
- 6.Hold down the vol+/recovery keys of the board at the same time, and press the reset key to make the board into upgrade mode.
- 7.In PC command line terminal, do the following:

```
sudo ./upgrade_tool uf update-linux.img (Upgrade the whole Linux image)
```

Please take Windows system and run AndroidTool to update as update-ubuntu.img is too large.

Or update uboot, boot firmwares separately.

```
sudo ./upgrade_tool di uboot uboot.img
sudo ./upgrade_tool di -b boot.img
sudo ./upgrade_tool di -recovery recovery.img
sudo ./upgrade_tool di -p paramater.txt
sudo ./upgrade_tool di -rootfs rootfs.img
```

#### Notice:

Done above compiling, new images will be created in rockdev catalogue. Ubuntu download tools from: tools/linux/Linux\_Upgrade\_Tool

### 3.2 Upgrading Firmware in Window

#### 3.2.1 Install RK USB Driver

##### Steps:

Run DriverInstall.exe in DriverAssitant\_v5.1.1, and done driver installation

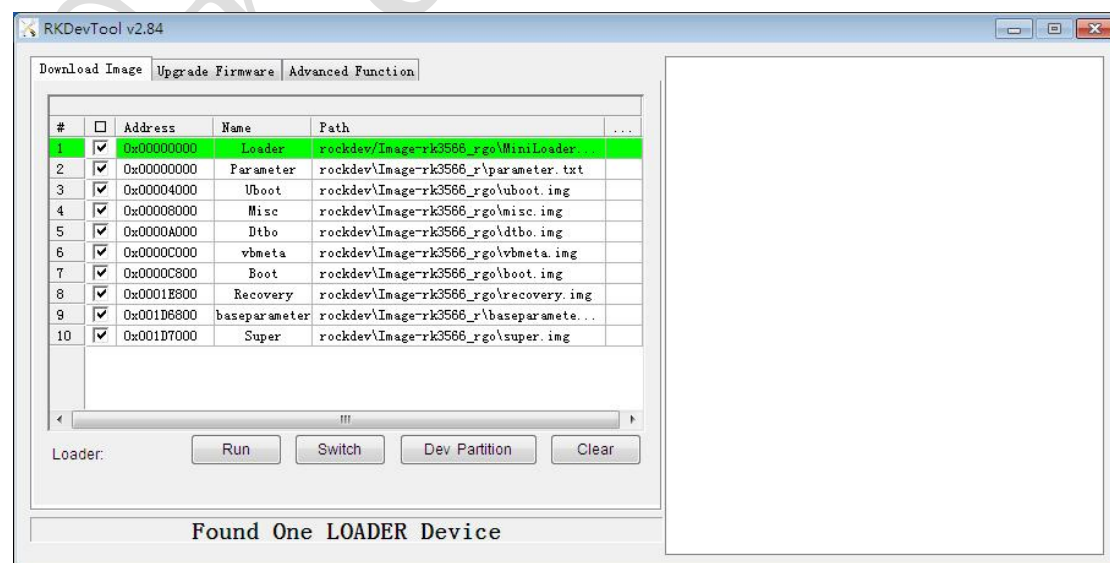


#### Notice:

- 1) Supports xp,win7\_32,win7\_64,win8\_32,win8\_64,win10\_32,win10\_64 OS
- 2) Quit old driver version, and install new driver
- 3) XP OS done driver installation, a hints you will shows when you connect with Rockchip ADB device, please take installation automatically, and done driver installation as it.

### 3.2.2 Connect Device

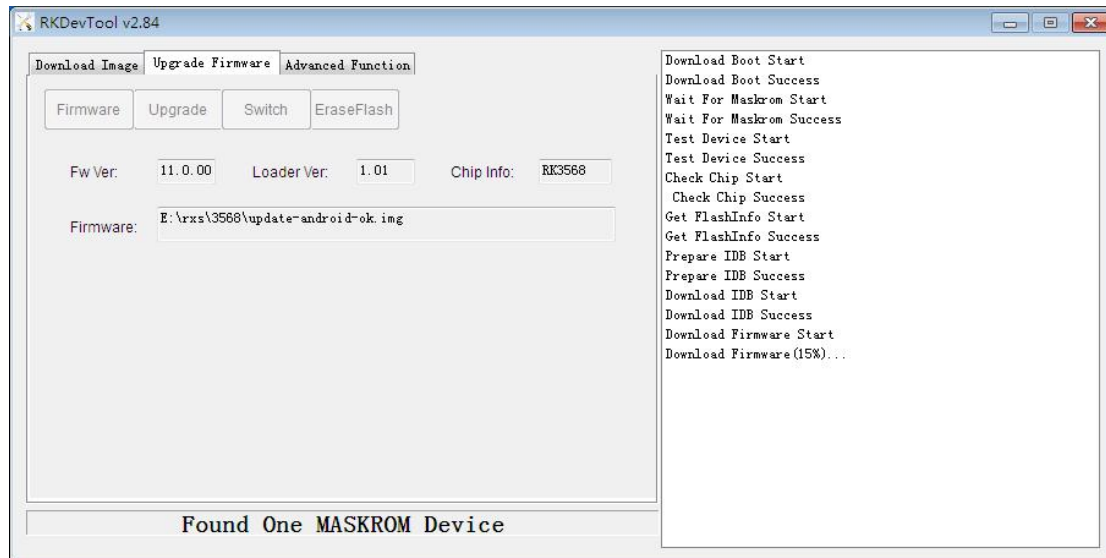
Run AndroidTool.exe in AndroidTool file, and following interface shows:



- 1) No firmware be burned into eMMC of the development board ( or eMMC of system on

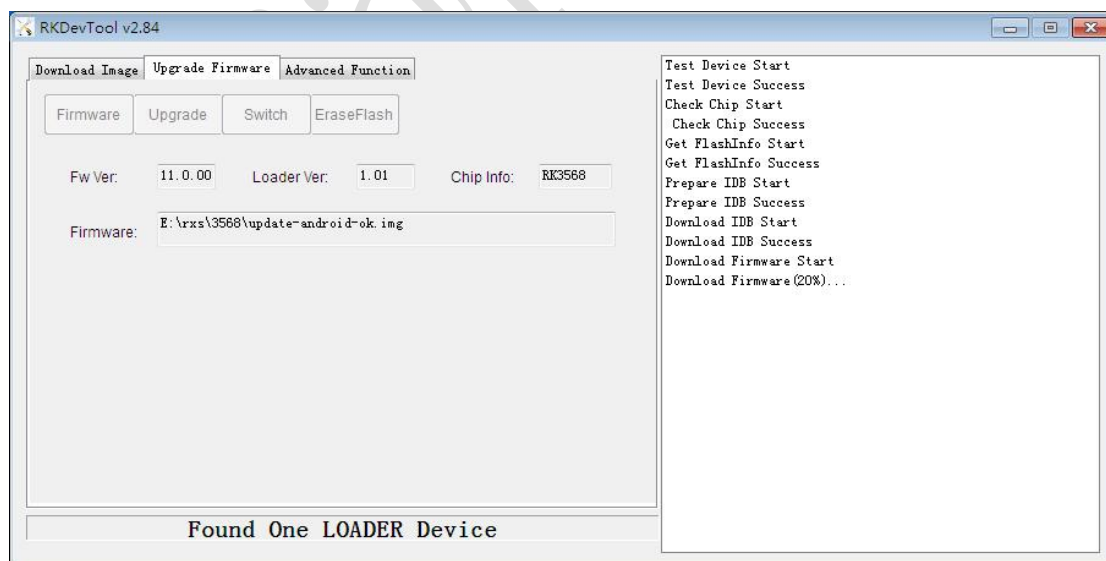
module)

Connect the board with PC through micro USB cable, power on, and the board will enter into MASKROM model, waiting for burning upgrading, likes:



## 2) Firmware be burned into eMMC well

Power on the board, connect the board with PC through micro usb cable, press vol+/recovery key, and meanwhile press Reset key about 5 seconds, restart the board, loosen vol+/recovery key. The board will run into LOADER model, and waiting for firmware burning upgrading, likes:



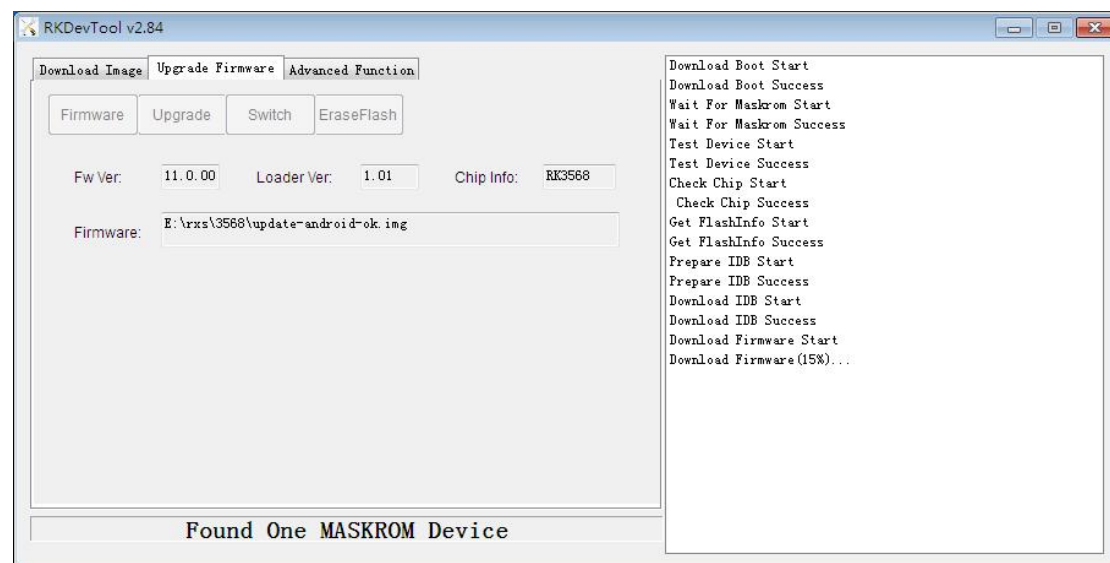
### 3.2.3 Upgrade Firmware by AndroidTool

The user could upgrade firmware one by one as last chapters have described, or upgrading it in a full firmware update.img

Run RKDevTool.exe in AndroidTool

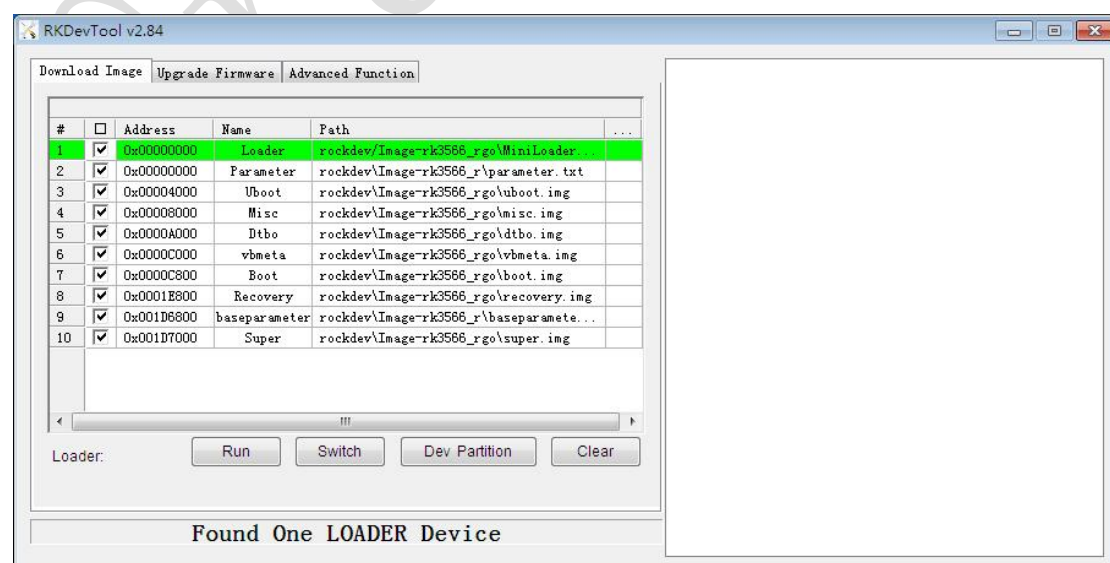
MASKROM Model Upgrade

Take update.img, and click"Upgrade"

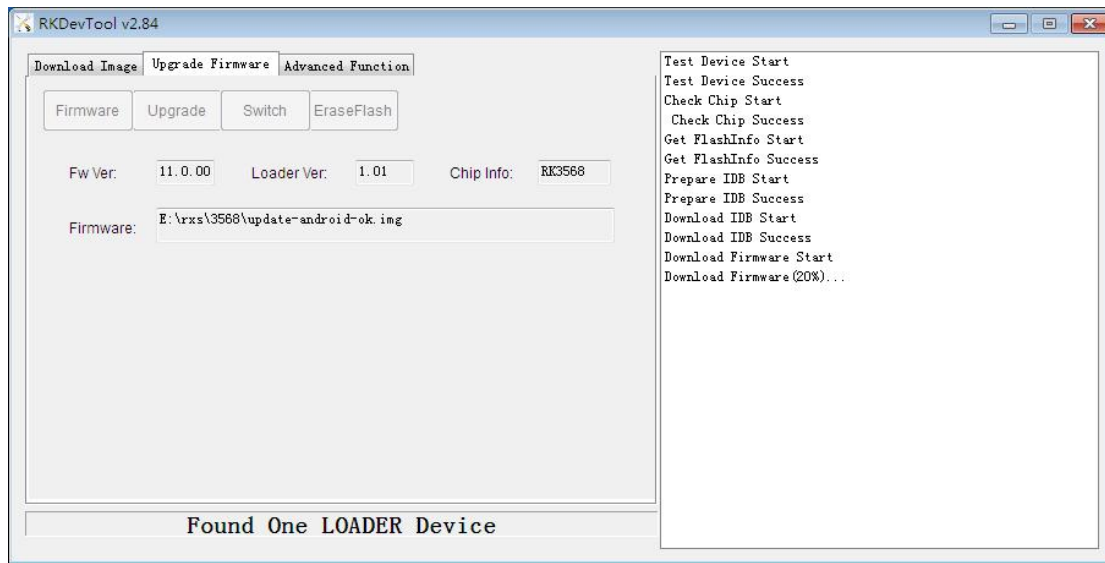


LOADER Model Upgrade

Upgrade every firmwares one by one, please choice the firmware which you want to upgrade, and click "Run"



Or upgrade the full firmware update.img: Choice update.img, and click "upgrade"



### 3.3 Upgrade by TF Card Offline

SD Card Boot functions that when power on the board, the CPU will find booting source code from SD card priority, and upload its guide.

Two functions come out: SD card upgrade, and SD card run

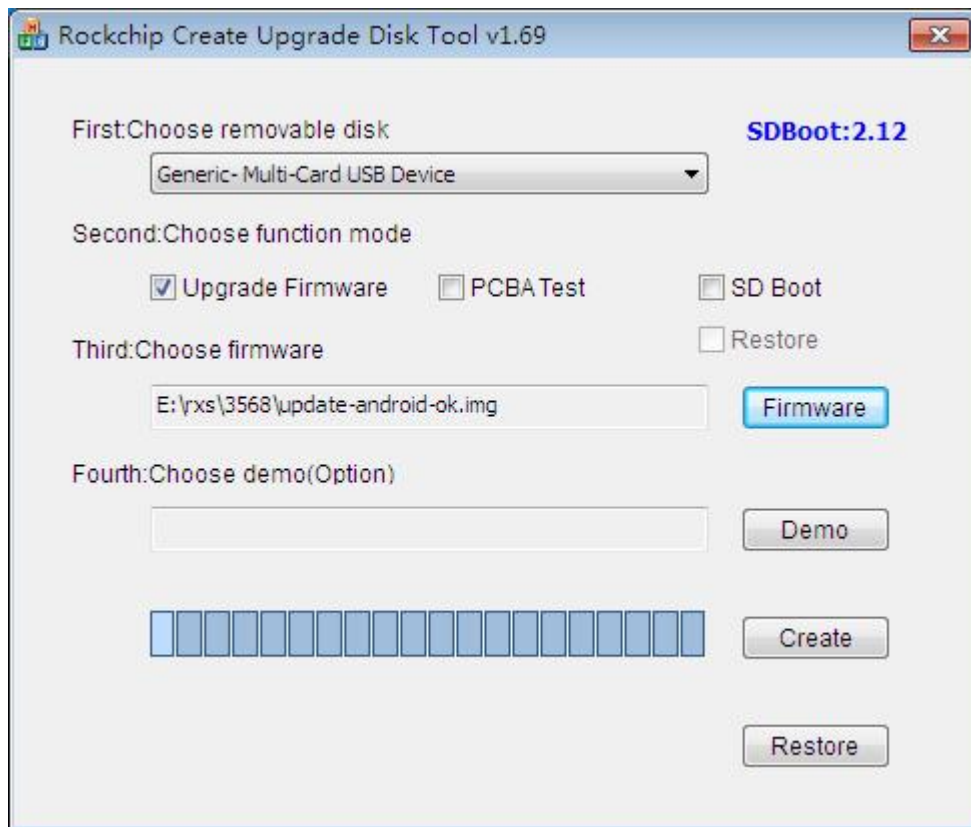
Following will introduce the details on how to upgrade by SD card.

Tools: SD\_Firmware\_Tool.exe

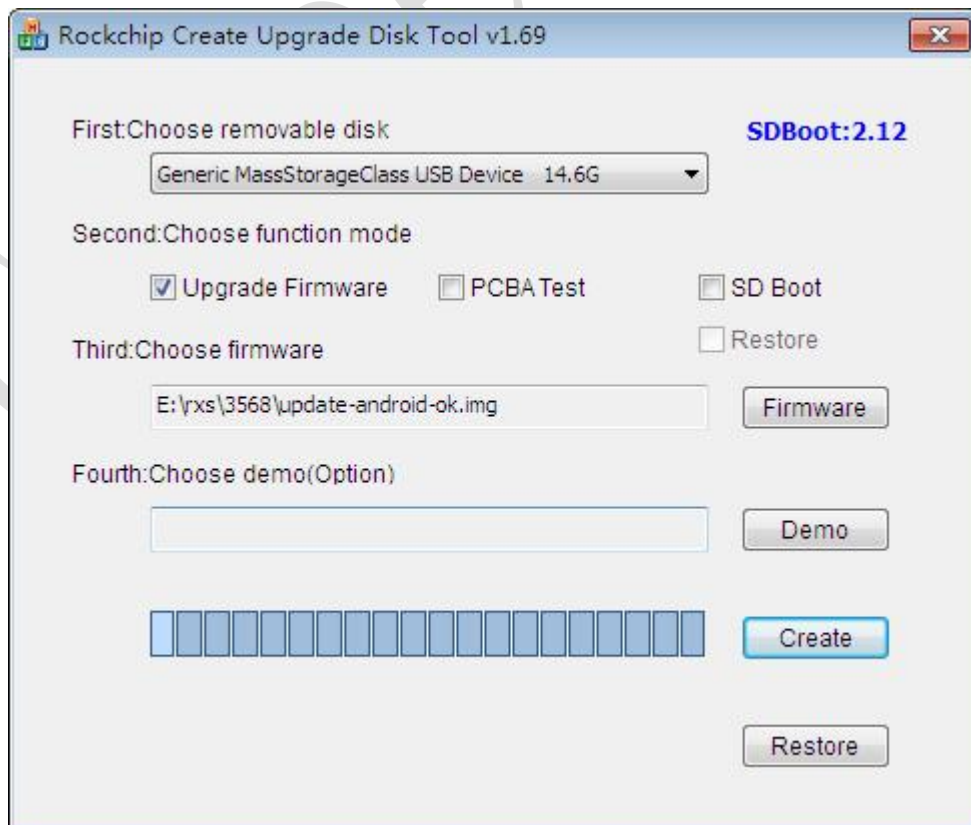
Process:

1) PC run SD\_Firmware\_Tool.exe, likes:



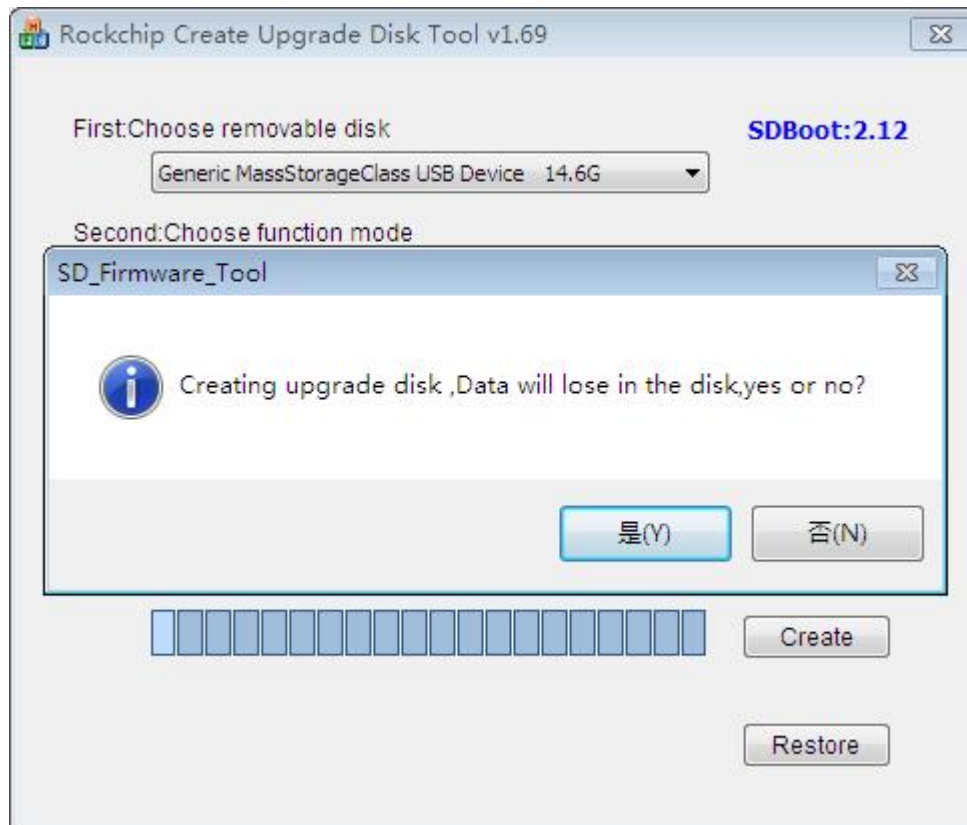


2) Insert SD card reader into PC, and the tools will find it, likes:



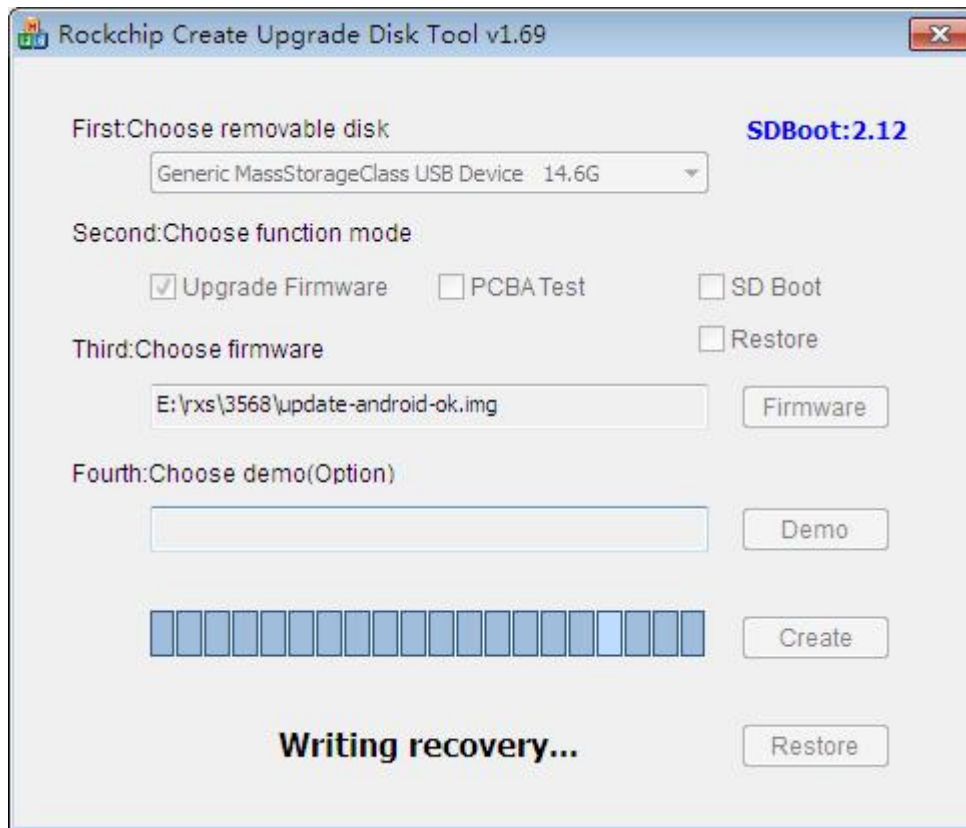
3) Choice "Upgrade Firmware" in function mode. And choice the firmware which you want to be upgraded ( Here means update-linux.img)

4) Click " Create", and start upgrading. The following interface will shows as following picture, click " Yes" and start upgrading.

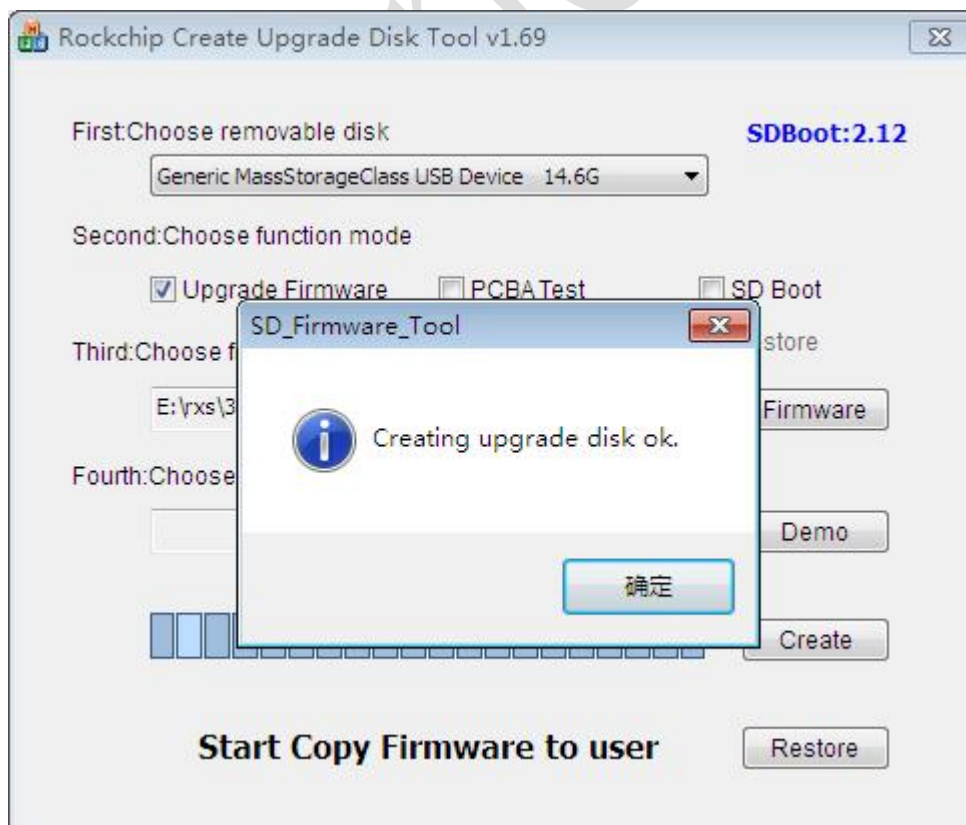


Programming:





1) Done programming



6) Pull out the SD card, and insert it into the board, power on, and the board will upgrade automatically.

```
[ 35.025659] IDBlockWriteData 1040 1 ret= 0
[ 35.025663] IDBlockWriteData 1001 26b ddd01200
[ 35.289755] IDBlockWriteData 1041 26b ret= 0
[ 35.289759] IDBlockWriteData 1000 1 ddd01000
[ 35.290141] IDBlockWriteData 1040 1 ret= 0
[ 35.290147] IdBlockReadData 1000 26c dde80000
[ 35.360082] IdBlockReadData 1040 26c ret= 0
[ 35.360326] return ret = 0
```

7) Power off, and pull out the SD card, and power on one more time, and it will upgrade done.

## Chapter 4 Product Portfolio

### 4.1 System on Module Series

G4418 System on Module ( Samsung 4418)

G6818 System on Module ( Samsung 6818)

G3288 System on Module( Rockchip RK3288Stamp Hole Version )

GR3288 System on Module(Rockchip RK3288 Gold Finger Version )

G3399 System on Module ( Rockchip RK3399 Stamp Hole Version )

GR3399 System on Module ( Rockchip RK3398 Gold Finger Version )

G3568 System on Module ( Rockchip RK3568 )

G30 System on Module ( Rockchip RK30 )

### 4.2 Development Board Series

G4418 Development Board ( Samsung 4418 )

G6818 Development Board ( Samsung 6618 )

G3288 Development Board ( Rockchip RK3288 )

GR3288 Development Board ( Rockchip RK3288)

G3399 Development Board ( Rockchip RK3399 )

Development Board ( Rockchip RK3399 )

### 4.3 Single Board Computer Series

G4418 Single Board Computer ( Samsung 4418 )

G6818 Single Board Computer ( Samsung 6818 )