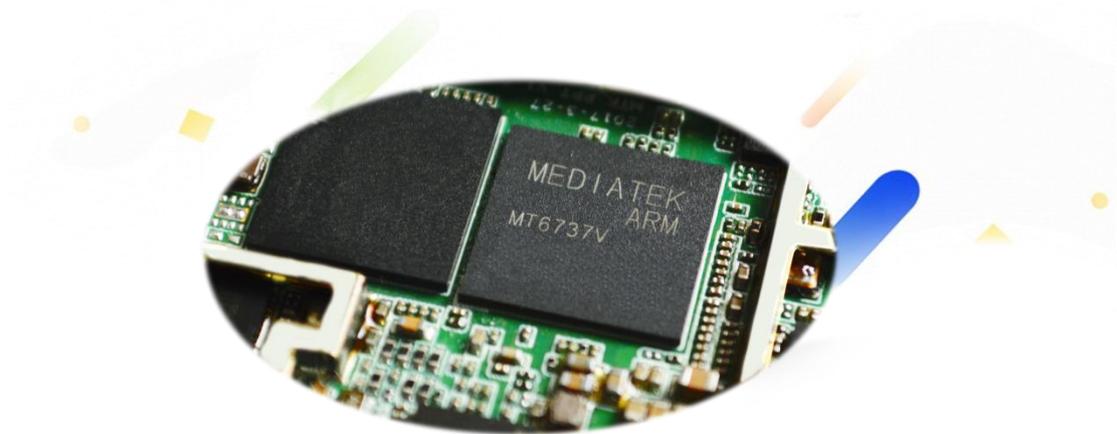


EM6737 Android7.0 User Manual

V1.0



Boardcon Embedded Design

www.boardcon.com

1. Introduction

1.1. About this Manual

This manual is intended to provide the user with an overview of the board and benefits, complete features specifications, and set up procedures. It contains important safety information as well.

1.2. Feedback and Update to this Manual

To help our customers make the most of our products, we are continually making additional and updated resources available on the Boardcon website (www.boardcon.com , www.armdesigner.com). These include manuals, application notes, programming examples, and updated software and hardware. Check in periodically to see what's new!

When we are prioritizing work on these updated resources, feedback from customers is the number one influence, If you have questions, comments, or concerns about your product or project, please no hesitate to contact us at support@armdesigner.com.

1.3. Limited Warranty

Boardcon warrants this product to be free of defects in material and workmanship for a period of one year from date of buy. During this warranty period Boardcon will repair or replace the defective unit in accordance with the following process:

A copy of the original invoice must be included when returning the defective unit to Boardcon. This limited warranty does not cover damages resulting from lightning or other power surges, misuse, abuse, abnormal conditions of operation, or attempts to alter or modify the function of the product.

This warranty is limited to the repair or replacement of the defective unit. In no event shall Boardcon be liable or responsible for any loss or damages, including but not limited to any lost profits, incidental or consequential damages, loss of business, or anticipatory profits arising from the use or inability to use this product.

Repairs make after the expiration of the warranty period are subject to a repair charge and the cost of return shipping. Please contact Boardcon to arrange for any repair service and to obtain repair charge information.



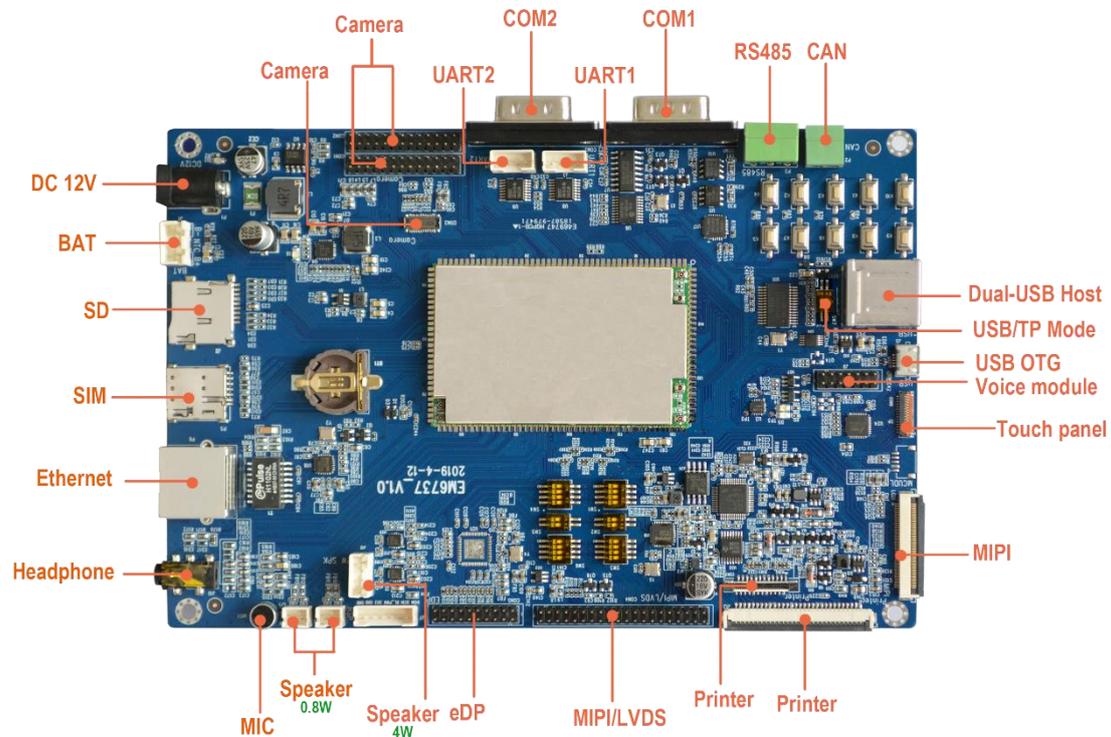
Revision History

Ver	Description	Author	Date
V1.0	Initial version android7.0	Zhou Lijun	2019-10-25

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1 EM6737 Introduction



Feature	Specifications
CPU	MediaTek MT6737 processor, ARM Cortex-A53 Quad-core @ 1.3GHz
Memory	1GB LPDDR3, up to 2GB
Flash	4GB eMMC Flash
Power	DC 12V/3A
USB	2x USB2.0 Host, 1x USB OTG
UART	1x 4pin connector, for debug. 2x DB9 for normal UART 2x 4pin connector for normal UART
RS485	1x 1-CH RS485
CAN	1x 1-CH CAN
LCD	1x MIPI to LVDS (40-pin header) 1x MIPI to EDP (20-pin header) 1x MIPI LCD (40-pin FPC connector)
Ethernet	100M High performance Ethernet, RJ45 interface
Camera	MIPI CSI-2 high-speed camera
Audio codec	3.5mm Audio jack, MIC, 4W speaker (1x 4pin), 0.8W Speaker (2x 2pin)
RTC	Real Time Clock, powered by external lithium battery



SD card	1x T-Flash card slot
SIM card	1x SIM card slot
Buttons	10 x User Buttons, for Power, Reset and so on
WIFI&BT	2.4/5G WiFi, Bluetooth 4.0 on cpu board
3G/4G	On cpu board
GPS	On cpu board
Dimension	CPU board - 60 x 38 x 2.2mm; Baseboard - 175.5 x 117.5mm

2 Compiler Environment

2.1 Vmware8.0+ubuntu16.04

Install Vmware8.0 in windows OS, and then install ubuntu16.04 in VMware to compile. There is no longer describes how to install Ubuntu system, if don't understand, please visit the official website of Ubuntu, the operating system is also available for free download at the official website.

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

Note: User also can directly install ubuntu system in pc. The compile faster. Android7.0 should be compiled by ubuntu 64bit OS, Ubuntu 16.04 is recommended.

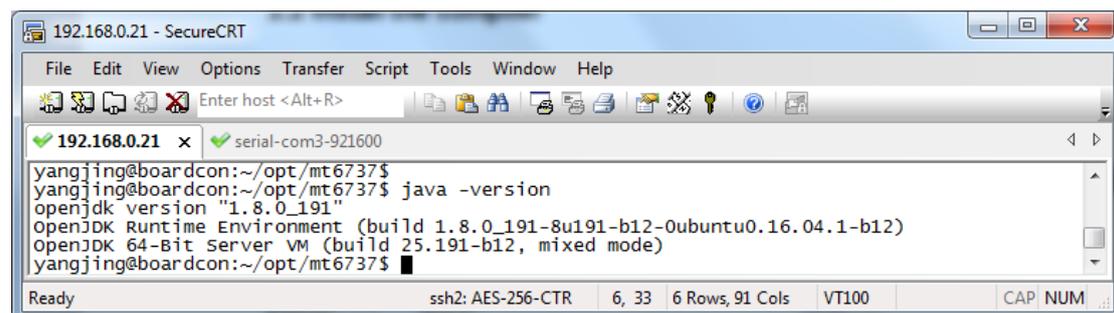
2.2 Install Tools

Execute the commands to install necessary tools. (Required root access and the computer is on the network. The tool installation required online)

```
# apt-get update
# apt-get install git gnupg flex bison gperf build-essential zip curl libc6-dev
# apt-get install libncurses5-dev:i386 x11proto-core-dev
# apt-get install libx11-dev:i386 libreadline6-dev:i386
# apt-get install libgl1-mesa-dri:i386 libgl1-mesa-dev g++-multilib
# apt-get install tofrodos python-markdown
# apt-get install libxml2-utils xsltproc zlib1g-dev:i386 dpkg-dev
# apt-get install libncurses5-dev
# apt-get install gcc-4.8
# apt-get install g++-4.8
# cd /usr/bin
# mv g++ g++_bak
# mv gcc gcc_bak
# ln -s gcc-4.8 gcc
# ln -s g++-4.8 g++
# apt-get install openjdk-8-jdk
```

Execute the command to check the jdk has been installed successfully and view the revised version

```
# java -version
```

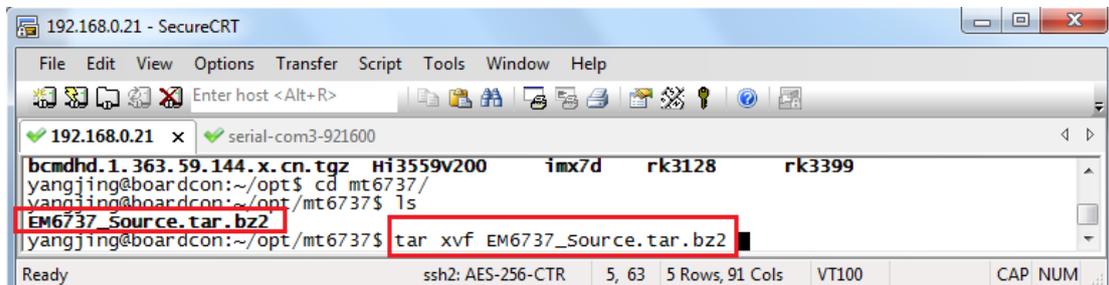


```
192.168.0.21 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
192.168.0.21 x serial-com3-921600
yangjing@boardcon:~/opt/mt6737$
yangjing@boardcon:~/opt/mt6737$ java -version
openjdk version "1.8.0_191"
OpenJDK Runtime Environment (build 1.8.0_191-8u191-b12-0ubuntu0.16.04.1-b12)
OpenJDK 64-Bit Server VM (build 25.191-b12, mixed mode)
yangjing@boardcon:~/opt/mt6737$
Ready ssh2: AES-256-CTR 6, 33 6 Rows, 91 Cols VT100 CAP NUM
```

3 Compile Source

Unzip the source.

```
# tar xvf EM6737_Source.tar.bz2
```



3.1 Compile All

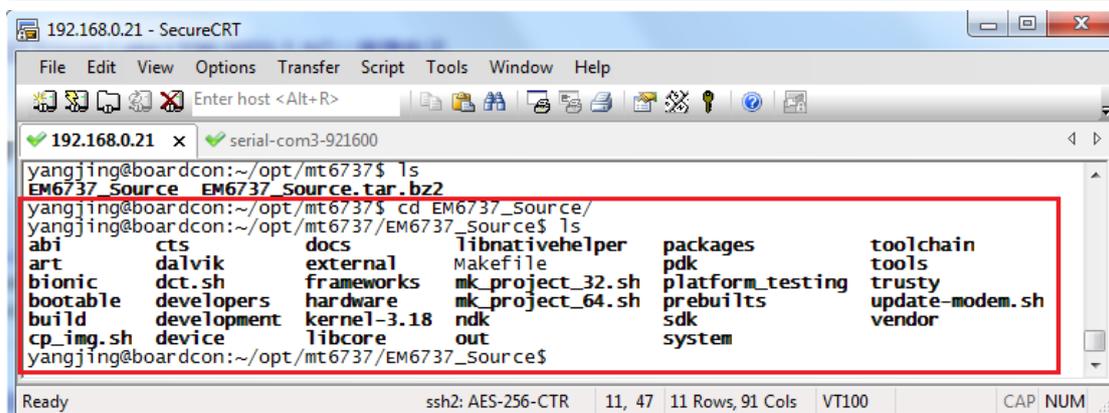
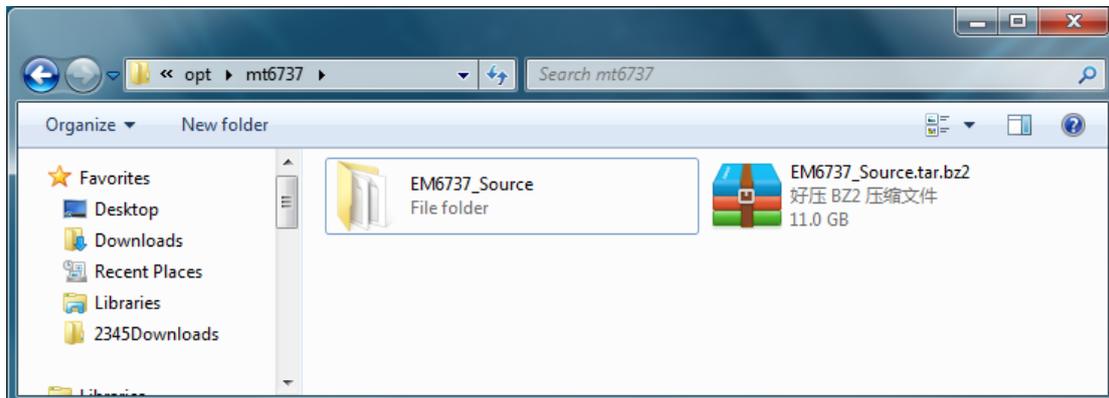
Execute the commands to build all the images.

```
# cd EM6737_Source
```

```
# source build/envsetup.sh
```

```
# lunch full_demo_board_64-eng
```

```
# make -j8
```



```

192.168.0.21 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
192.168.0.21 x serial-com3-921600
cp_img.sh device Tibcore out system
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ source build/envsetup.sh
including device/asus/fugu/vendorsetup.sh
including device/eastaeon/aeon6735_36_d_n/vendorsetup.sh
including device/eastaeon/aeon6735_36g_d_n/vendorsetup.sh
including device/eastaeon/aeon6735_66_d_n/vendorsetup.sh
including device/eastaeon/aeon6735m_35_d_n/vendorsetup.sh
including device/eastaeon/aeon6735m_35g_d_n/vendorsetup.sh
including device/eastaeon/aeon6735m_65_d_n/vendorsetup.sh
including device/eastaeon/aeon6737m_35_d_n/vendorsetup.sh
including device/eastaeon/aeon6737m_35g_d_n/vendorsetup.sh
including device/eastaeon/aeon6737m_65_d_n/vendorsetup.sh
including device/eastaeon/aeon6737t_36_d_n/vendorsetup.sh
including device/eastaeon/aeon6737t_36g_d_n/vendorsetup.sh
including device/eastaeon/aeon6737t_66_d_n/vendorsetup.sh
including device/eastaeon/aeon6753_36g_d_n/vendorsetup.sh
including device/eastaeon/aeon6753_66_d_n/vendorsetup.sh
including device/eastaeon/demo_board_64/vendorsetup.sh
including device/generic/mini-emulator-arm64/vendorsetup.sh
including device/generic/mini-emulator-armv7-a-neon/vendorsetup.sh
including device/generic/mini-emulator-mips64/vendorsetup.sh
including device/generic/mini-emulator-mips/vendorsetup.sh
including device/generic/mini-emulator-x86_64/vendorsetup.sh
including device/generic/mini-emulator-x86/vendorsetup.sh
including device/google/dragon/vendorsetup.sh
including device/htc/flounder/vendorsetup.sh
including device/huawei/angler/vendorsetup.sh
including device/lge/bullhead/vendorsetup.sh
including device/linaro/hikey/vendorsetup.sh
including device/moto/shamu/vendorsetup.sh
including vendor/dolby/device/dax1_grouper_sw/vendorsetup.sh
including vendor/dolby/device/dax1_hammerhead_hw/vendorsetup.sh
including vendor/dolby/device/dax1_hammerhead_sw/vendorsetup.sh
including vendor/dolby/device/dax1_manta_sw/vendorsetup.sh
including sdk/bash_completion/adb.bash
yangjing@boardcon:~/opt/mt6737/EM6737_Source$
Ready ssh2: AES-256-CTR 36, 47 36 Rows, 91 Cols VT100 CAP NUM

```

```

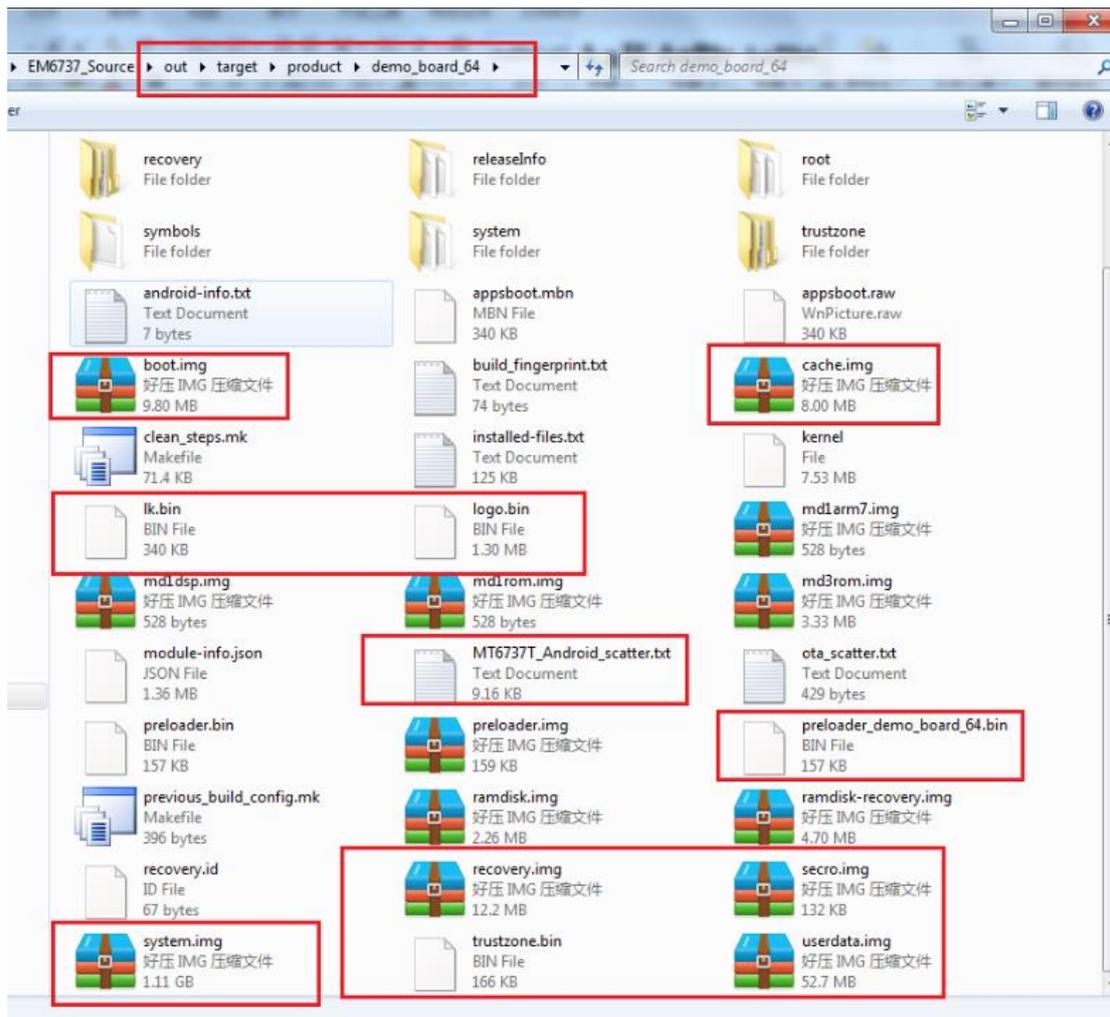
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_S... x serial-com3-921600
including device/huawei/angler/vendorsetup.sh
including device/lge/bullhead/vendorsetup.sh
including device/linaro/hikey/vendorsetup.sh
including device/moto/shamu/vendorsetup.sh
including vendor/dolby/device/dax1_grouper_sw/vendorsetup.sh
including vendor/dolby/device/dax1_hammerhead_hw/vendorsetup.sh
including vendor/dolby/device/dax1_hammerhead_sw/vendorsetup.sh
including vendor/dolby/device/dax1_manta_sw/vendorsetup.sh
including sdk/bash_completion/adb.bash
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ lunch full_demo_board_64-eng

=====
PLATFORM_VERSION_CODENAME=REL
PLATFORM_VERSION=7.0
TARGET_PRODUCT=full_demo_board_64
TARGET_BUILD_VARIANT=eng
TARGET_BUILD_TYPE=release
TARGET_BUILD_APPS=
TARGET_ARCH=arm64
TARGET_ARCH_VARIANT=armv8-a
TARGET_CPU_VARIANT=cortex-a53
TARGET_2ND_ARCH=arm
TARGET_2ND_ARCH_VARIANT=armv7-a-neon
TARGET_2ND_CPU_VARIANT=cortex-a53
HOST_ARCH=x86_64
HOST_2ND_ARCH=x86
HOST_OS=linux
HOST_OS_EXTRA=Linux-4.4.0-164-generic-x86_64-with-ubuntu-16.04-xenia1
HOST_CROSS_OS=windows
HOST_CROSS_ARCH=x86
HOST_CROSS_2ND_ARCH=x86_64
HOST_BUILD_TYPE=release
BUILD_ID=NRD90M
OUT_DIR=out
=====
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ make -j8
Ready ssh2: AES-256-CTR 36, 55 36 Rows, 91 Cols VT100 CAP NUM

```

After compile finish, all images are generated in the directory `out/target/product/demo_board_64/`

```
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x serial-com3-921600
o_board_64/system -L system out/target/product/demo_board_64/root/file_contexts.bin
make_ext4fs -s -T -1 -S out/target/product/demo_board_64/root/file_contexts.bin -L system -l 268435
4560 -a system out/target/product/demo_board_64/obj/PACKAGING/systemimage_intermediates/system.img
out/target/product/demo_board_64/system out/target/product/demo_board_64/system
Creating filesystem with parameters:
Size: 2684354560
Block size: 4096
Blocks per group: 32768
Inodes per group: 8192
Inode size: 256
Journal blocks: 10240
Label: system
Blocks: 655360
Block groups: 20
Reserved block group size: 159
Created filesystem with 2792/163840 inodes and 301777/655360 blocks
[100% 7117/7117] Install system fs image: out/target/product/demo_board_64/system.img
out/target/product/demo_board_64/system.img+out/target/product/demo_board_64/obj/PACKAGING/recovery
_patch_intermediates/recovery-from-boot.p maxsize=2740556544 blocksize=4224 total=1195206190 reserv
e=27684096
#### make completed successfully (26:40 (mm:ss)) ####
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ ls out/target/product/demo_board_64/
android-info.txt          installed-files.txt      obj_arm                 releaseInfo
appsboot.mbn             kernel                  ota_scatter.txt        root
appsboot.raw             lk.bin                 preloader.bin          secro.img
boot.img                 logo.bin               preloader_demo_board_64.bin  symbols
build_fingerprint.txt   md1arm7.img           preloader.img          system
cache                    md1dsp.img            previous_build_config.mk  system.img
cache.img                md1rom.img            ramdisk.img            trustzone
clean_steps.mk           md3rom.img            ramdisk-recovery.img   userdata.img
data                      module-info.json      recovery                recovery.id
dex_bootjars             MT6737T_Android_scatter.tx  recovery.img
gen                       obj
yangjing@boardcon:~/opt/mt6737/EM6737_Source$
```



3.2 Compile Separately

Sometimes it need to compile separately. Execute follow commands to make the compilation environment effect before compile:

source build/envsetup.sh

lunch full_demo_board_64-eng



```
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x
yangjing@boardcon:~/opt/mt6737/EM6737_Source$
yangjing@boardcon:~/opt/mt6737/EM6737_Source$
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ source build/envsetup.sh
including device/asus/fugu/vendorsetup.sh
including device/eastaeon/aeon6735_36_d_n/vendorsetup.sh
including device/eastaeon/aeon6735_36g_d_n/vendorsetup.sh
including device/eastaeon/aeon6735_66_d_n/vendorsetup.sh
including device/eastaeon/aeon6735m_35_d_n/vendorsetup.sh
including device/eastaeon/aeon6735m_35g_d_n/vendorsetup.sh
including device/eastaeon/aeon6735m_65_d_n/vendorsetup.sh
including device/eastaeon/aeon6737m_35_d_n/vendorsetup.sh
including device/eastaeon/aeon6737m_35g_d_n/vendorsetup.sh
including device/eastaeon/aeon6737m_65_d_n/vendorsetup.sh
including device/eastaeon/aeon6737t_36_d_n/vendorsetup.sh
including device/eastaeon/aeon6737t_36g_d_n/vendorsetup.sh
including device/eastaeon/aeon6737t_66_d_n/vendorsetup.sh
including device/eastaeon/aeon6753_36g_d_n/vendorsetup.sh
including device/eastaeon/aeon6753_66_d_n/vendorsetup.sh
including device/eastaeon/demo_board_64/vendorsetup.sh
including device/generic/mini-emulator-arm64/vendorsetup.sh
including device/generic/mini-emulator-armv7-a-neon/vendorsetup.sh
including device/generic/mini-emulator-mips64/vendorsetup.sh
including device/generic/mini-emulator-mips/vendorsetup.sh
including device/generic/mini-emulator-x86_64/vendorsetup.sh
including device/generic/mini-emulator-x86/vendorsetup.sh
including device/google/dragon/vendorsetup.sh
including device/htc/flounder/vendorsetup.sh
including device/huawei/angler/vendorsetup.sh
including device/lge/bullhead/vendorsetup.sh
including device/linaro/hikey/vendorsetup.sh
including device/moto/shamu/vendorsetup.sh
including vendor/dolby/device/dax1_grouper_sw/vendorsetup.sh
including vendor/dolby/device/dax1_hammerhead_hw/vendorsetup.sh
including vendor/dolby/device/dax1_hammerhead_sw/vendorsetup.sh
including vendor/dolby/device/dax1_manta_sw/vendorsetup.sh
including sdk/bash_completion/adb.bash
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ lunch full_demo_board_64-eng
=====
PLATFORM_VERSION_CODENAME=REL
PLATFORM_VERSION=7.0
TARGET_PRODUCT=full_demo_board_64
TARGET_BUILD_VARIANT=eng
TARGET_BUILD_TYPE=release
```

Execute the command to compile **little kernel(Ik)**. After compile finish the **lk.bin** is generated in directory **out/target/product/demo_board_64/**

```
# make -j8 lk
```

```

[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x
yangjing@boardcon:~/opt/mt6737/EM6737_Source$
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ lunch full_demo_board_64-eng

=====
PLATFORM_VERSION_CODENAME=REL
PLATFORM_VERSION=7.0
TARGET_PRODUCT=full_demo_board_64
TARGET_BUILD_VARIANT=eng
TARGET_BUILD_TYPE=release
TARGET_BUILD_APPS=
TARGET_ARCH=arm64
TARGET_ARCH_VARIANT=armv8-a
TARGET_CPU_VARIANT=cortex-a53
TARGET_2ND_ARCH=arm
TARGET_2ND_ARCH_VARIANT=armv7-a-neon
TARGET_2ND_CPU_VARIANT=cortex-a53
HOST_ARCH=x86_64
HOST_2ND_ARCH=x86
HOST_OS=linux
HOST_OS_EXTRA=Linux-4.4.0-164-generic-x86_64-with-ubuntu-16.04-xenia1
HOST_CROSS_OS=windows
HOST_CROSS_ARCH=x86
HOST_CROSS_2ND_ARCH=x86_64
HOST_BUILD_TYPE=release
BUILD_ID=NRD90M
OUT_DIR=out
=====
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ make -j8 lk
  
```

```

[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x
product/demo_board_64/system/bin/debuggerd64'
build/core/Makefile:40: warning: overriding commands for target `out/target/product/d
emo_board_64/system/etc/permissions/android.software.live_wallpaper.xml'
build/core/base_rules.mk:316: warning: ignoring old commands for target `out/target/p
product/demo_board_64/system/etc/permissions/android.software.live_wallpaper.xml'
Starting build with ninja
ninja: Entering directory `.`
[ 33% 1/3] build /home/yangjing/opt/mt6737/EM6737_Source/out/target/product/demo_board_64/obj/BOOTLOADER_OBJ/build-demo_board_64/lk.bin
make: Entering directory `/home/yangjing/opt/mt6737/EM6737_Source/vendor/mediatek/proprietary/bootable/bootloader/lk'
BOOT_LOGO = wxganl
lk/Logo/dir=dev/logo, builddir=/home/yangjing/opt/mt6737/EM6737_Source/out/target/prod
uct/demo_board_64/obj/BOOTLOADER_OBJ/build-demo_board_64
libshowlogo new path ----- platform/mt6735/../../lib/libshowlogo
including app/mt_boot dev/gic dev/keys dev/lcm dev/video lib/debug lib/heap lib/libc
lib/libfdt lib/libshowlogo lib/ptable lib/zlib
make[1]: Entering directory `/home/yangjing/opt/mt6737/EM6737_Source/vendor/mediatek/
proprietary/bootable/bootloader/lk'
generating /home/yangjing/opt/mt6737/EM6737_Source/out/target/product/demo_board_64/o
bj/BOOTLOADER_OBJ/build-demo_board_64/config.h
make[1]: Leaving directory `/home/yangjing/opt/mt6737/EM6737_Source/vendor/mediatek/p
roprietary/bootable/bootloader/lk'
make: Leaving directory `/home/yangjing/opt/mt6737/EM6737_Source/vendor/mediatek/proprietary/bootable/bootloader/lk'
#### make completed successfully (02:32 (mm:ss)) ####
yangjing@boardcon:~/opt/mt6737/EM6737_Source$
  
```

Execute the command to compile **preloader**. After compile finish the **preloader.bin** is generated in directory **out/target/product/demo_board_64/**

make -j8 pl

```

[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ make -j8 pl
=====
PLATFORM_VERSION_CODENAME=REL
PLATFORM_VERSION=7.0
TARGET_PRODUCT=full_demo_board_64
TARGET_BUILD_VARIANT=eng
TARGET_BUILD_TYPE=release
TARGET_BUILD_APPS=
TARGET_ARCH=arm64
TARGET_ARCH_VARIANT=armv8-a
TARGET_CPU_VARIANT=cortex-a53
TARGET_2ND_ARCH=arm
TARGET_2ND_ARCH_VARIANT=armv7-a-neon
TARGET_2ND_CPU_VARIANT=cortex-a53
HOST_ARCH=x86_64
HOST_2ND_ARCH=x86
HOST_OS=linux
HOST_OS_EXTRA=Linux-4.4.0-164-generic-x86_64-with-Ubuntu-16.04-xenia1
HOST_CROSS_OS=windows
HOST_CROSS_ARCH=x86
HOST_CROSS_2ND_ARCH=x86_64
HOST_BUILD_TYPE=release
BUILD_ID=NRD90M
OUT_DIR=out
=====
fatal: Not a git repository (or any of the parent directories): .git
Running kati to generate build-full_demo_board_64.ninja...
$(shell cd libcore && ls -d */src/test/{java,resources} 2> /dev/null) was changed, regenerating...
=====
PLATFORM_VERSION_CODENAME=REL
PLATFORM_VERSION=7.0
TARGET_PRODUCT=full_demo_board_64
TARGET_BUILD_VARIANT=eng
TARGET_BUILD_TYPE=release
TARGET_BUILD_APPS=
TARGET_ARCH=arm64
TARGET_ARCH_VARIANT=armv8-a
TARGET_CPU_VARIANT=cortex-a53
TARGET_2ND_ARCH=arm
=====

```

```

[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x
Building Configuration:
Internal Feature:
Project = demo_board_64
HW_INIT_ONLY =
Platform = MT6735
CFG_MD3TAG_SWITCH=
Buildspec = buildspec.mak
CFG_METADATA_DETECT= 0
Create Seclib = FALSE
CFG_HW_WATCHDOG= 1
Image Auth key exist = TRUE
CFG_APWDT_DISABLE= 0
Preloader_EXT exist = TRUE
CFG_MDWDT_DISABLE= 0
SECRO_AC support = yes
CFG_SYS_STACK_SZ= 3*1024
=====
CFG_MMC_ADDR_TRANS= 1
CFG_BOOT_ARGUMENT= 1
CFG_RAM_CONSOLE= 1
=====
MTK_PATH_PLATFORM= /home/yangjing/opt/mt6737/EM6737_Source/vendor/mediatek/proprietary/bootable/bootloader/preloader/platform/mt6735
MTK_PATH_CUSTOM= /home/yangjing/opt/mt6737/EM6737_Source/vendor/mediatek/proprietary/bootable/bootloader/preloader/custom/demo_board_64
MTK_ROOT_CUSTOM= /home/yangjing/opt/mt6737/EM6737_Source/vendor/mediatek/proprietary/bootable/bootloader/preloader/custom
CUSTOM_PATH= /home/yangjing/opt/mt6737/EM6737_Source/vendor/mediatek/proprietary/bootable/bootloader/preloader/custom/demo_board_64/security
=====
demo_board_64 preloader load
/home/yangjing/opt/mt6737/EM6737_Source/out/target/product/demo_board_64/obj/PRELOADER_OBJ/bin/preloader_demo_board_64_LINKED.bin built at
time : 2019年10月23日 星期四 14:29:22 CST
img size : 159916 byte
bss size : 0x00de0 byte
dram size : 0x byte
=====
[100% 5/5] build out/target/product/demo_board_64/preloader.bin
### make completed successfully (02:24 (mm:ss)) ###
yangjing@boardcon:~/opt/mt6737/EM6737_Source$

```

Execute the command to compile **kernel**. After compile finish the **boot.img** is generated in directory: **out/target/product/demo_board_64/**

mmm kernel-3.18:clean-kernel (clean the kernel)

make -j8 bootimage (compile the kernel)

```
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x
#### make completed successfully (02:32 (mm:ss)) ####
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ mmm kernel-3.18:clean-kernel
=====
PLATFORM_VERSION_CODENAME=REL
PLATFORM_VERSION=7.0
TARGET_PRODUCT=full_demo_board_64
TARGET_BUILD_VARIANT=eng
TARGET_BUILD_TYPE=release
TARGET_BUILD_APPS=
TARGET_ARCH=arm64
TARGET_ARCH_VARIANT=armv8-a
TARGET_CPU_VARIANT=cortex-a53
TARGET_2ND_ARCH=arm
TARGET_2ND_ARCH_VARIANT=armv7-a-neon
TARGET_2ND_CPU_VARIANT=cortex-a53
HOST_ARCH=x86_64
HOST_2ND_ARCH=x86
HOST_OS=linux
HOST_OS_EXTRA=Linux-4.4.0-164-generic-x86_64-with-Ubuntu-16.04-xenia1
HOST_CROSS_OS=windows
HOST_CROSS_ARCH=x86
HOST_CROSS_2ND_ARCH=x86_64
HOST_BUILD_TYPE=release
BUILD_ID=NRD90M
OUT_DIR=out
=====
Ready ssh2: AES-256-CTR 28, 47 28 Rows, 87 Cols VT100 CAP NUM
```

```
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x
No need to regenerate ninja file
Starting build with ninja
ninja: Entering directory `.'
[100% 1/1] build clean-kernel
make: Leaving directory `/home/yangjing/opt/mt6737/EM6737_Source'
#### make completed successfully (3 seconds) ####
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ █
Ready ssh2: AES-256-CTR 9, 47 9 Rows, 87 Cols VT100 CAP NUM
```



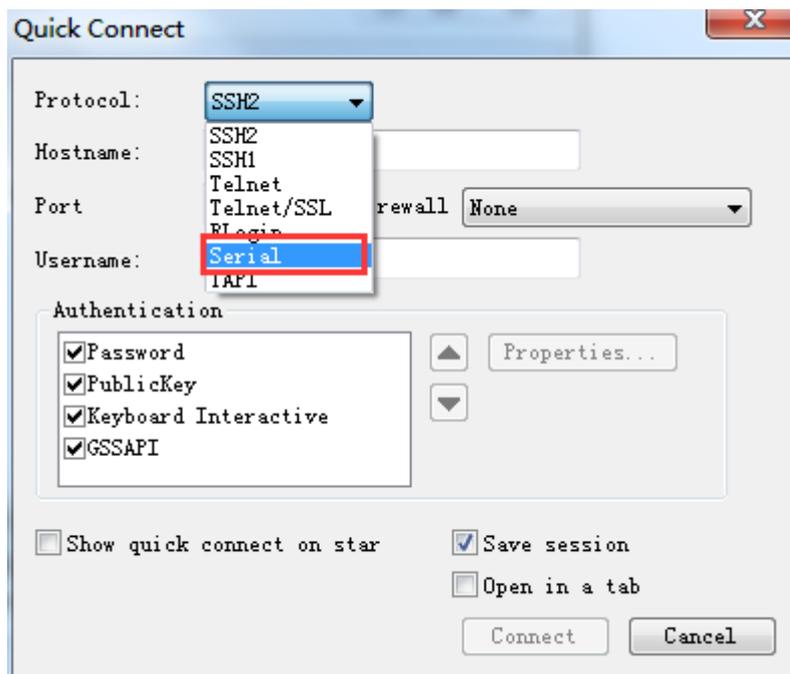
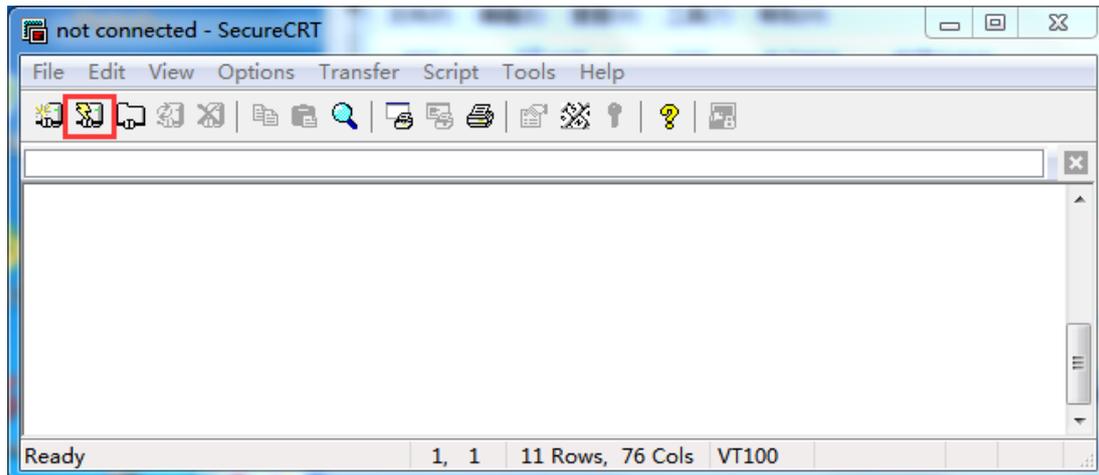
```
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x
#### make completed successfully (3 seconds) ####
yangjing@boardcon:~/opt/mt6737/EM6737_Source$
yangjing@boardcon:~/opt/mt6737/EM6737_Source$
yangjing@boardcon:~/opt/mt6737/EM6737_Source$ make -j8 bootimage
=====
PLATFORM_VERSION_CODENAME=REL
PLATFORM_VERSION=7.0
TARGET_PRODUCT=full_demo_board_64
TARGET_BUILD_VARIANT=eng
TARGET_BUILD_TYPE=release
TARGET_BUILD_APPS=
TARGET_ARCH=arm64
TARGET_ARCH_VARIANT=armv8-a
TARGET_CPU_VARIANT=cortex-a53
TARGET_2ND_ARCH=arm
TARGET_2ND_ARCH_VARIANT=armv7-a-neon
TARGET_2ND_CPU_VARIANT=cortex-a53
HOST_ARCH=x86_64
HOST_2ND_ARCH=x86
HOST_OS=linux
HOST_OS_EXTRA=Linux-4.4.0-164-generic-x86_64-with-Ubuntu-16.04-xenia1
HOST_CROSS_OS=windows
HOST_CROSS_ARCH=x86
HOST_CROSS_2ND_ARCH=x86_64
HOST_BUILD_TYPE=release
```

```
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
[arm64-full_demo_board_64-eng] yangjing@boardcon: /home/yangjing/opt/mt6737/EM6737_Source x
LD      vmlinux.o
MODPOST vmlinux.o
WARNING: modpost: Found 83 section mismatch(es).
To see full details build your kernel with:
'make CONFIG_DEBUG_SECTION_MISMATCH=y'
GEN     .version
CHK     include/generated/compile.h
UPD     include/generated/compile.h
CC      init/version.o
LD      init/built-in.o
KSYM    .tmp_kallsyms1.o
KSYM    .tmp_kallsyms2.o
LD      vmlinux
LD      vmlinux
SORTEX  vmlinux
SYSMAP  system.map
OBJCOPY arch/arm64/boot/Image
GZIP    arch/arm64/boot/Image.gz
CAT     arch/arm64/boot/Image.gz-dtb
make[1]: Leaving directory `/home/yangjing/opt/mt6737/EM6737_Source/out/target/product/demo_board_64/obj/KERNEL_OBJ'
make: Leaving directory `/home/yangjing/opt/mt6737/EM6737_Source/kernel-3.18'
[100% 12/12] target boot image: out/target/product/demo_board_64/boot.img
#### make completed successfully (08:21 (mm:ss)) ####
yangjing@boardcon:~/opt/mt6737/EM6737_Source$
```

4 Install Serial Terminal Tool

The serial terminal SecureCRT is used for debugging. It can be used directly after decompression.

Open SecureCRT.exe after copy to PC (path: tools\windows\SecureCRT.exe), then click the icon **Quick Connect** to config.



Set the parameters as follow:

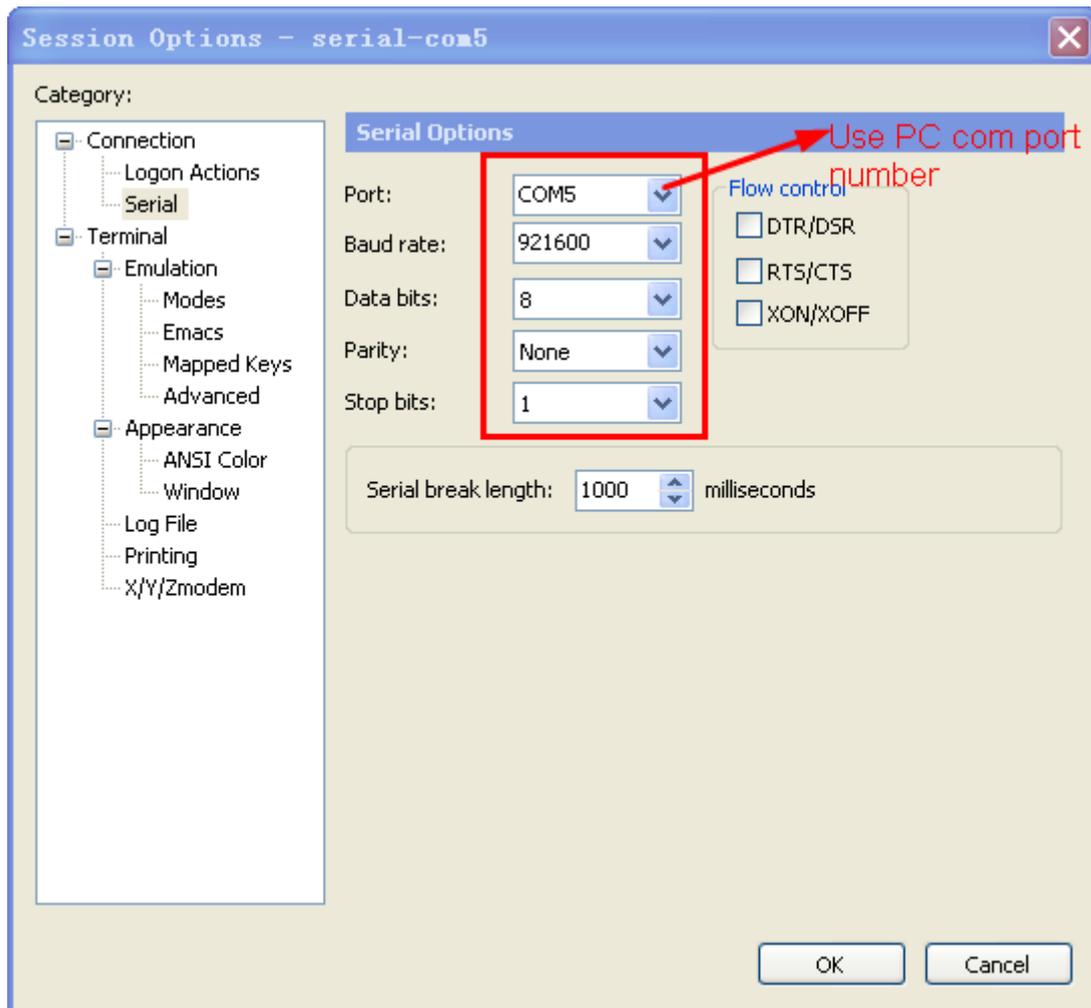
Protocol: Serial

Port: To be specified by user PC

Baud rate: 921600

Please check XON/XOFF but not RTS/CTS

Check Save session



After all, click **connect**

Illusion1: If open more than one serial terminal tools, and they use the same serial port, there will be reported **the port is busy**.

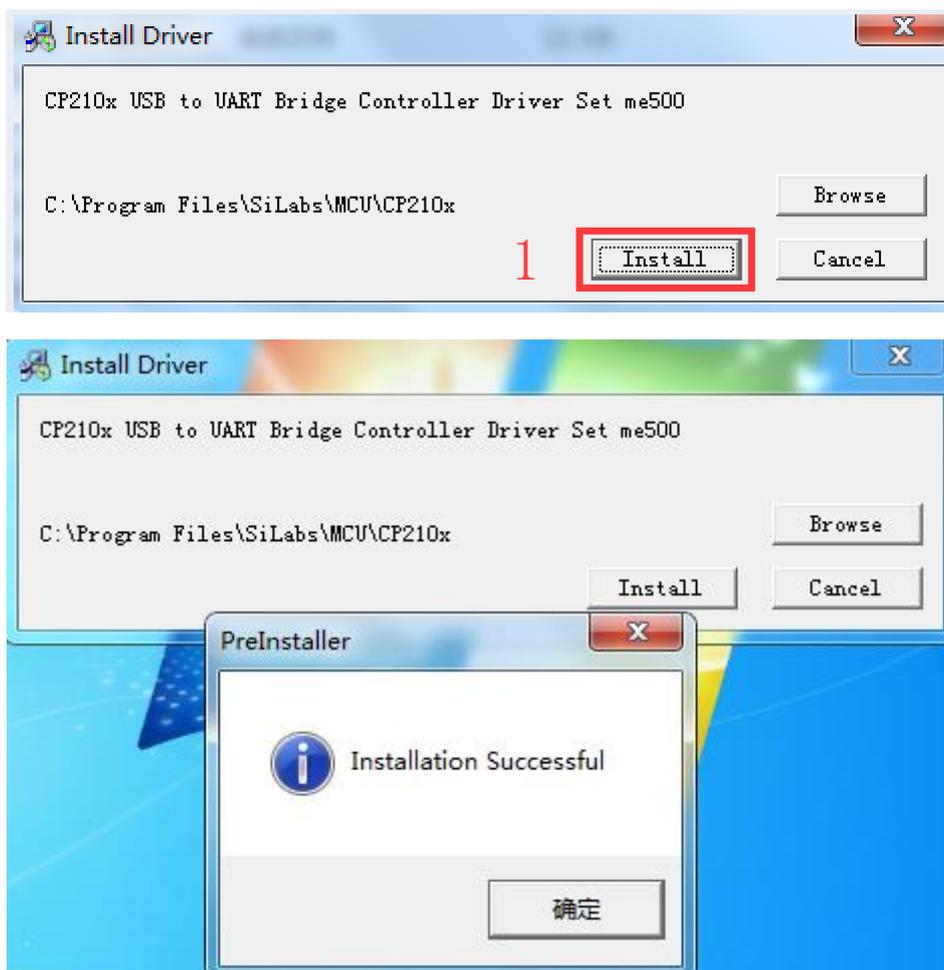
Solution: Turn off the serial tool that unnecessary.

5 Burn Images

5.1 Install Driver

Step 1, Install **CP2102 driver**.

Plug the **USB-to-UART cable CP2102** to the PC, unzip **CP2102WIN7.rar** on Windows, then click **preinstaller.exe** to install



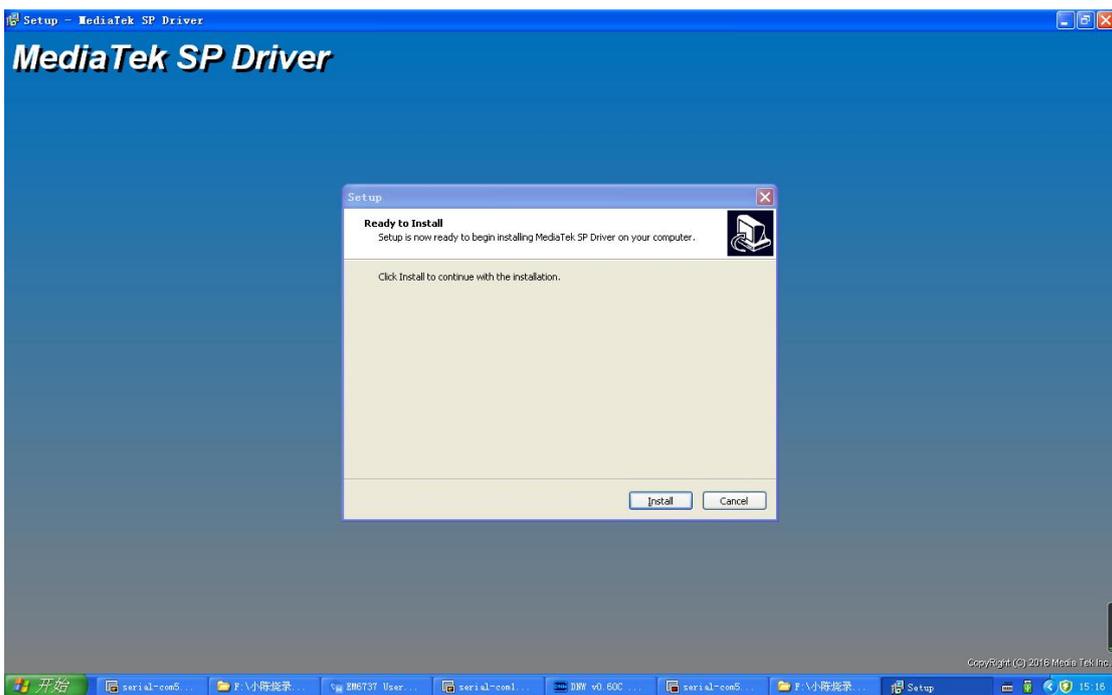
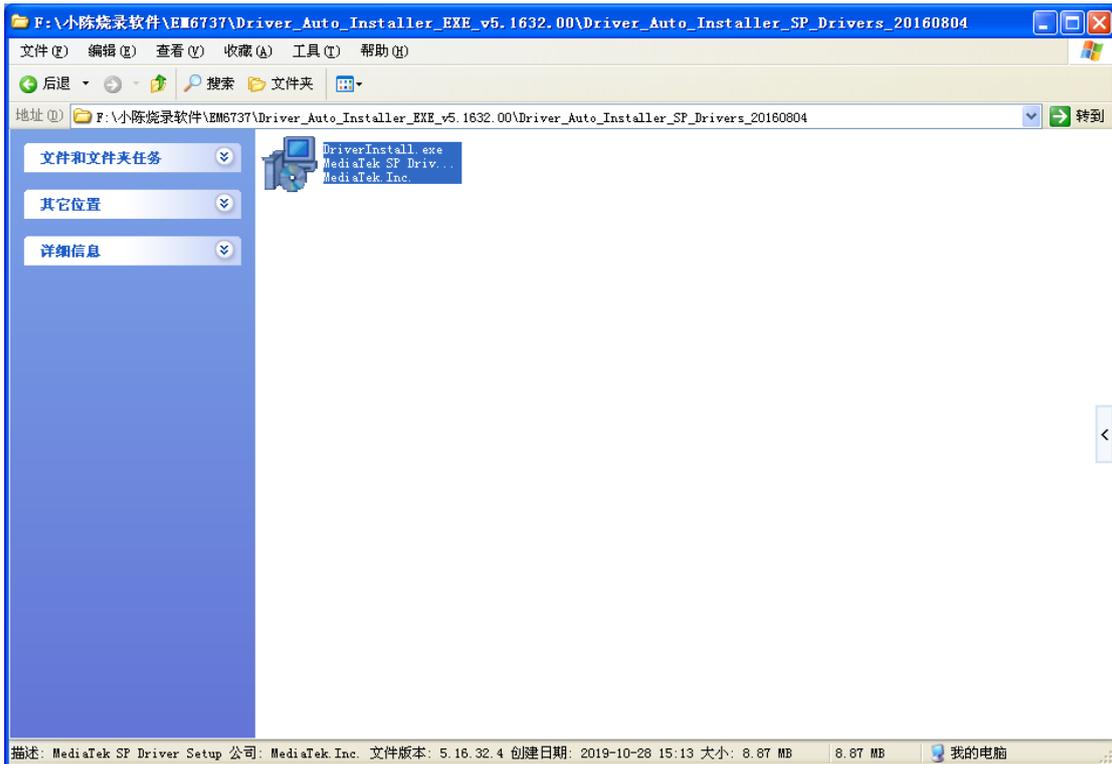
Now the device will be listed under **Device Manager** -> **PORTS** with unique serial port assigned

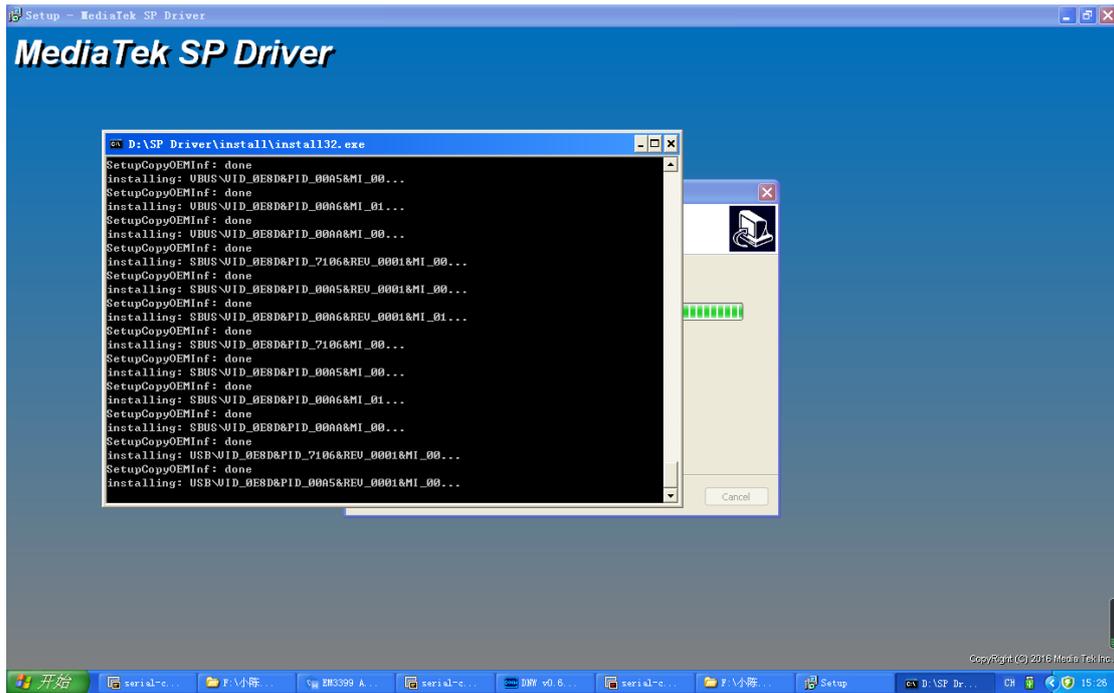
 CP210x USB to UART Bridge Controller (COM5)

Step 2, Install **usb download Driver**

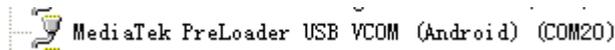
(Path: *Driver_Auto_Installer_SP_Drivers_20160804/DriverInstall.exe*).

Click **DriverInstall.exe** to install.





Step 3, After the installation is complete, connect the board and PC with USB Type-C cable, then power on, in *Computer Management* can see the following information:



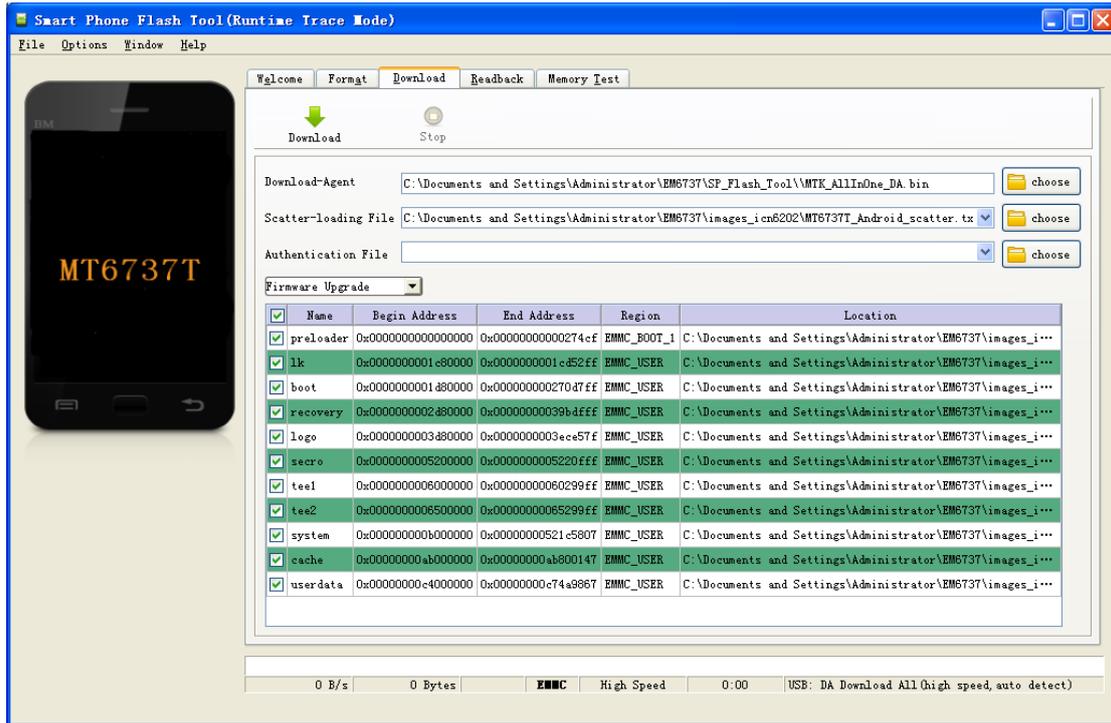
5.2 Upgrade Uniform Firmware

Step 1, Set USB to OTG mode (SW7: OFF OFF).

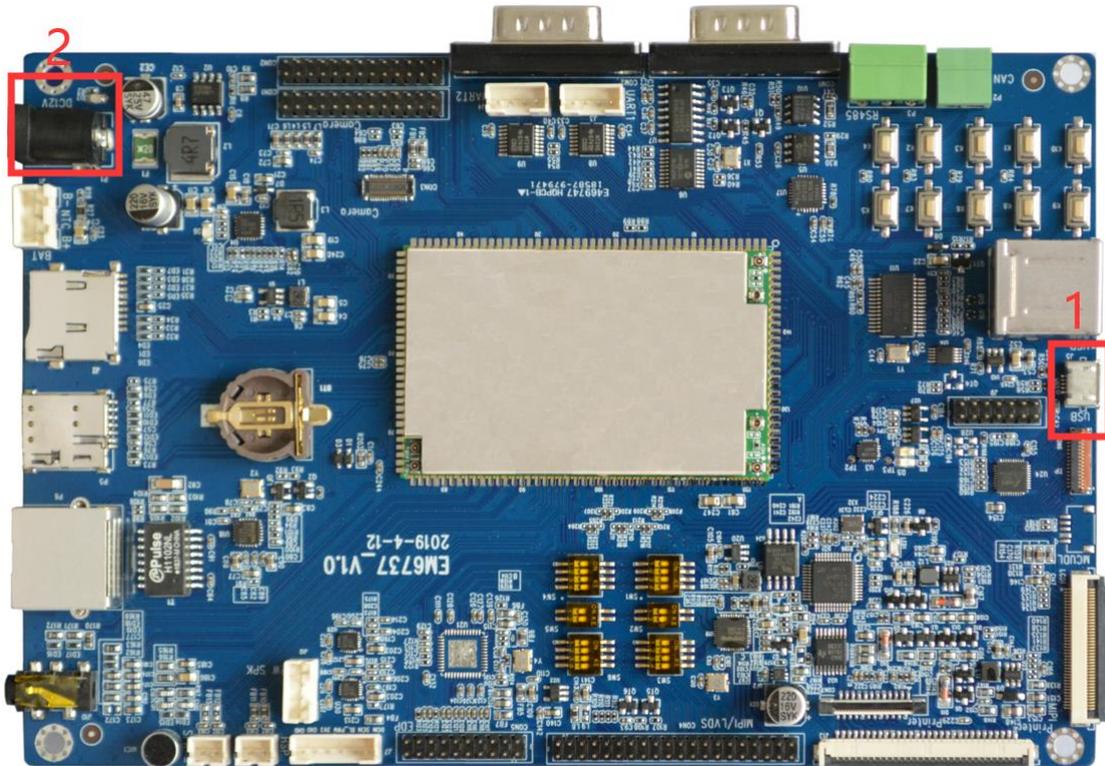
SW7 Mode	1	2
ON	HOST	Board CTP (Touch panel)
OFF	OTG (Download)	No Board CTP (No touch panel)



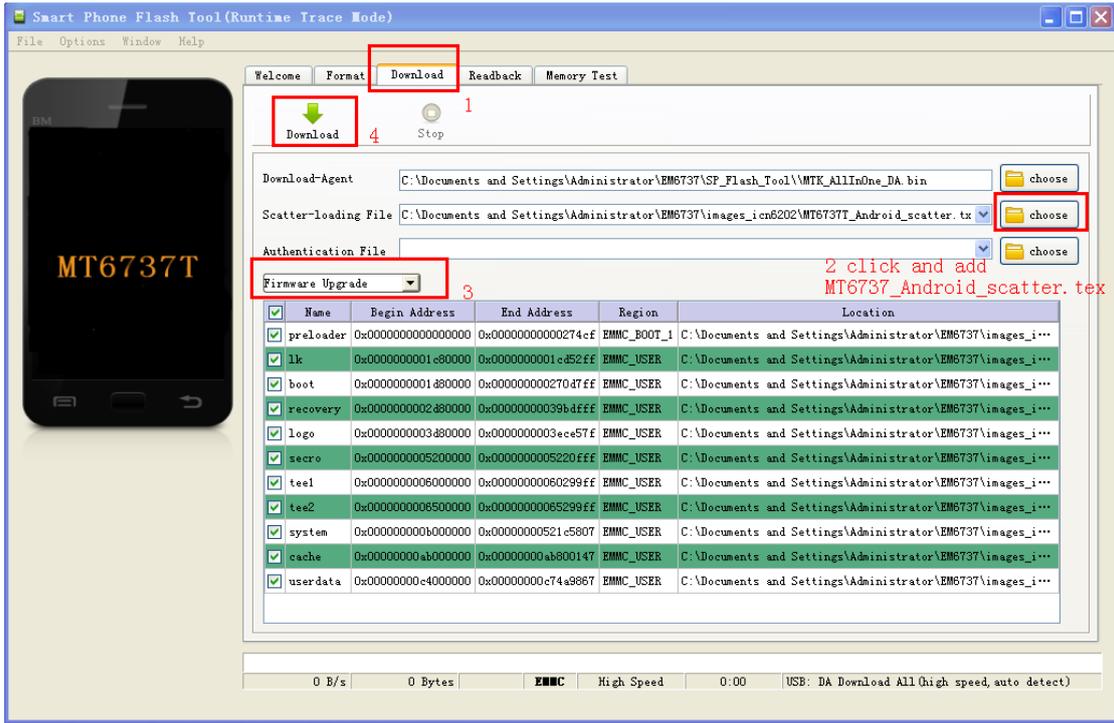
Step 2, open **flash_tool.exe** (Path: *EM6737\SP_Flash_Tool\flash_tool.exe*)



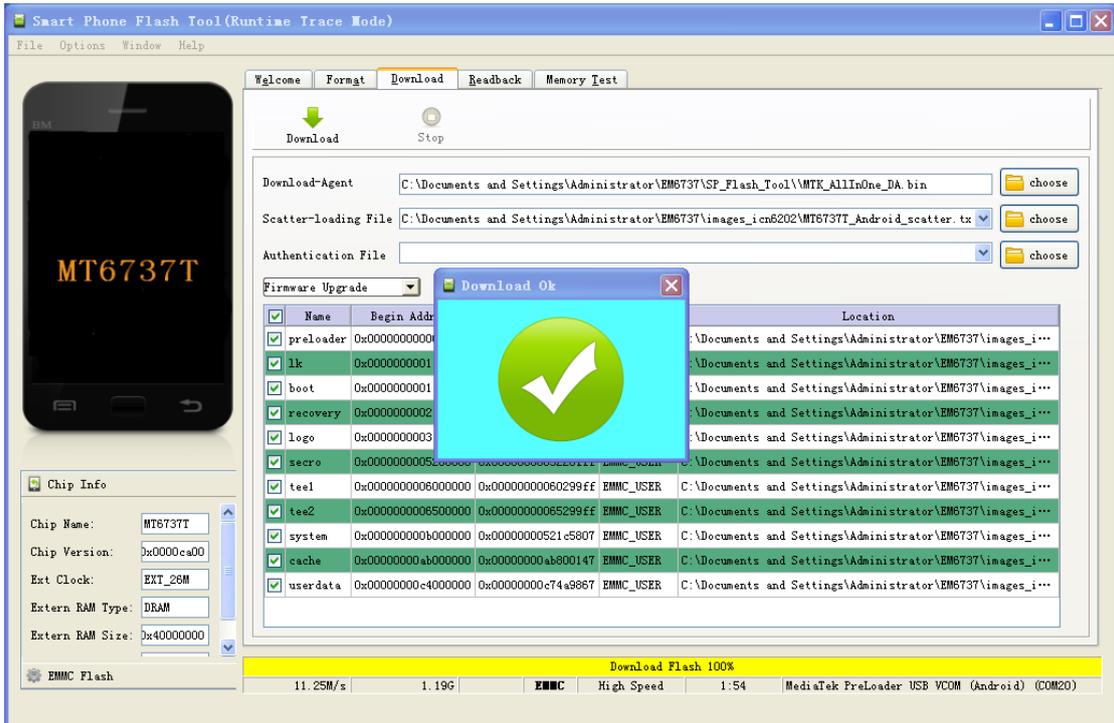
Step 3, connect PC and development board with USB OTG cable and power on.



Step 4, click **download** -> **choose** to add **MT6737_Android_scatter.txt**, then select **Firmware Upgrade** and click **Download** to flash.



Download completed.



After finish, set SW7 to ON OFF, then repower the board to startup.

6 Android Application

6.1 Serial Terminal

Connect debug port **UART0**(GND TX RX) to PC with USB Serial cable, then power on, the terminal will output startup information.

```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
[ 25.564920] <2>. (2) [708:IMCB msg handle][VCODEC] ENC_EMI_USER = 0
[ 25.566362] <2>. (2) [708:IMCB msg handle]vcodec_release pid = 708, Driver
Open_Count 1
[ 25.567909] <2>. (2) [708:IMCB msg handle]vcodec_open pid = 708, Driver Op
en_Count 1
[ 25.568877] <2>. (2) [708:IMCB msg handle][VCODEC] ENC_EMI_USER = 1
[ 25.570338] <2>. (2) [708:IMCB msg handle]vcodec_open pid = 708, Driver Op
en_Count 2
[ 25.573577] <2>. (2) [708:IMCB msg handle]vcodec_release pid = 708, Driver
Open_Count 2
[ 25.574664] <2>. (2) [708:IMCB msg handle][VCODEC] ENC_EMI_USER = 0
[ 25.576103] <2>. (2) [708:IMCB msg handle]vcodec_release pid = 708, Driver
Open_Count 1
[ 25.579041] <3>. (3) [966:ActivityManager]BOOTPROF: 25579.024521:AMS:E
NABLE_SCREEN
[ 25.586113] <0>. (0) [1021:android.display]BOOTPROF: 25586.096213:AP_L
aunch: com.android.settings/.FallbackHome 562ms
[ 26.030327] <1>. (1) [198:mtk charger_hv_] [upmu_is_chr_det] Charger exist
but USB is host
[ 26.123719] AEE_MONITOR_SET[status]: 0x1
[ 26.551911] <0>. (0) [453:Binder:282_1]BOOTPROF: 26551.894446:BOOT_Ani
mation:END
[ 26.552881] <0>. (0) [453:Binder:282_1]BOOTPROF: 26552.870293: OFF
demo_board_64:/ $
demo_board_64:/ $
demo_board_64:/ $
demo_board_64:/ $
demo_board_64:/ $
demo_board_64:/ $
Ready Serial: COM5, 921600 28, 19 28 Rows, 75 Cols VT100 CAP NUM
  
```

6.2 LVDS Display

Mode Selection

SW1				
Mode	1	2	3	4
ON	LVDS	LVDS	LVDS	LVDS
OFF	NO LVDS	NO LVDS	NO LVDS	NO LVDS

SW2		
Mode	1	2
ON	LVDS	LVDS
OFF	NO LVDS	NO LVDS



SW3				
Mode	1	2	3	4
ON	LVDS	LVDS	LVDS	LVDS
OFF	NO LVDS	NO LVDS	NO LVDS	NO LVDS

SW4				
Mode	1	2	3	4
ON	EDP	EDP	EDP	EDP
OFF	NO EDP	NO EDP	NO EDP	NO EDP

SW5		
Mode	1	2
ON	EDP	EDP
OFF	NO EDP	NO EDP

SW6				
Mode	1	2	3	4
ON	EDP	EDP	EDP	EDP
OFF	NO EDP	NO EDP	NO EDP	NO EDP

LVDS Mode set as follow:

SW1: ON ON ON ON

SW2: ON ON

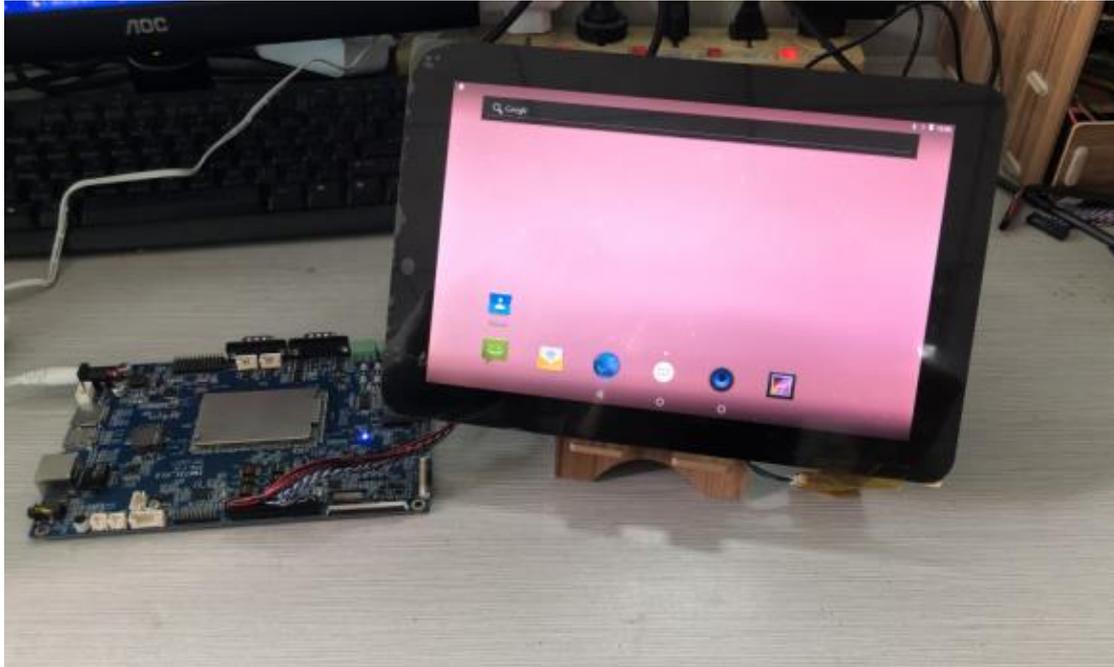
SW3: ON ON ON ON

SW4: OFF OFF OFF OFF

SW5: OFF OFF

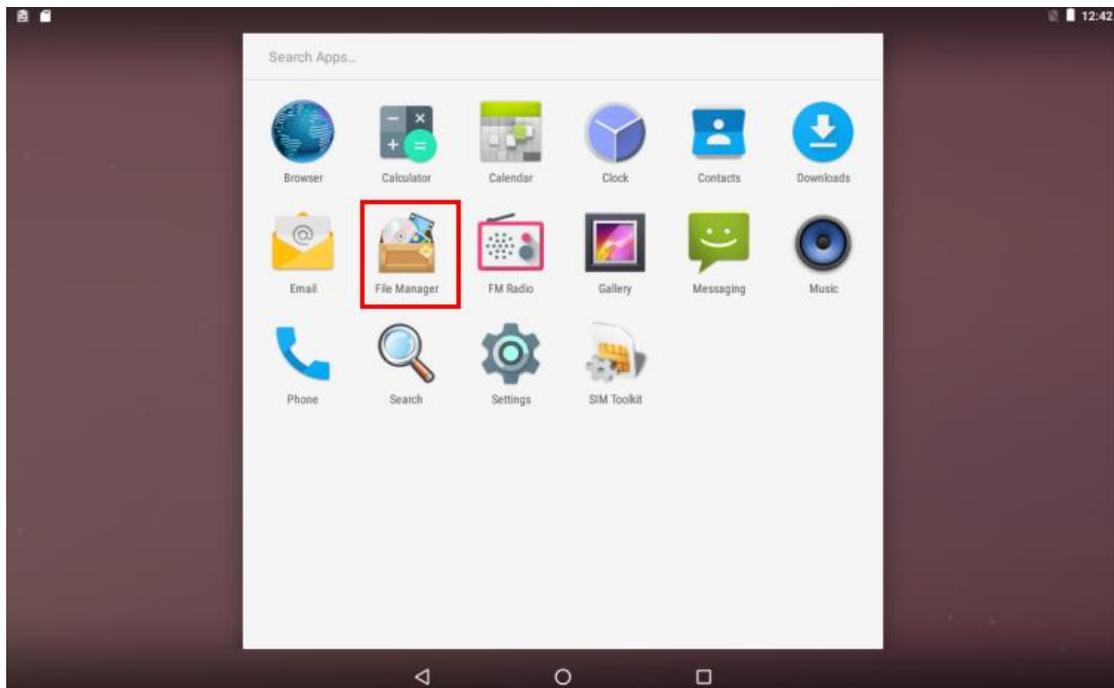
SW6: OFF OFF OFF OFF

Connect the board and 10.1" LVDS with a LVDS cable, then start up the board. When the board booting, the LVDS default display.



6.3 SD Card

EM6737 supports SD auto mount and Hot-plug.





6.4 USB Host

The USB Host can be used to connect USB mouse, USB keyboard, U-Disk or other USB devices. The U-Disk not support auto mount. Execute commands to mount.

```
# mount /dev/block/sda1 /mnt
```

```
# ls /mnt
```

```

serial-com5 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
serial-com5 x
demo_board_64:/ #
demo_board_64:/ # mount /dev/block/sda1 /mnt
demo_board_64:/ # ls /mnt
0000-em6737
4K 60ä § éfZæ"ešjé't' æ- ä°°ææ°æ<□æ',, 4kmeeã€,com.mp4
Android
BOOTEX.LOG
Driver_Auto_Installer_EXE_v5.1632.00.zip
KE210.rar
LOST.DIR
Screenshot_20130118-035223.png
Screenshots
System Volume Information
em6737
gpstestplus_22.apk
resource-7mipi.img
update_EM3288_Android7.img
usb_adb
ä°°ç"µüç> ~ãš ä-†.exe
ä°°ç"µãš ä-†ãšã, ~æ"ä%æè- æ-ž.pdf
ææææ-°A40I_18.51vds_image
demo_board_64:/ #
Ready Serial: COM5, 921600 28, 19 28 Rows, 75 Cols VT100 CAP NUM

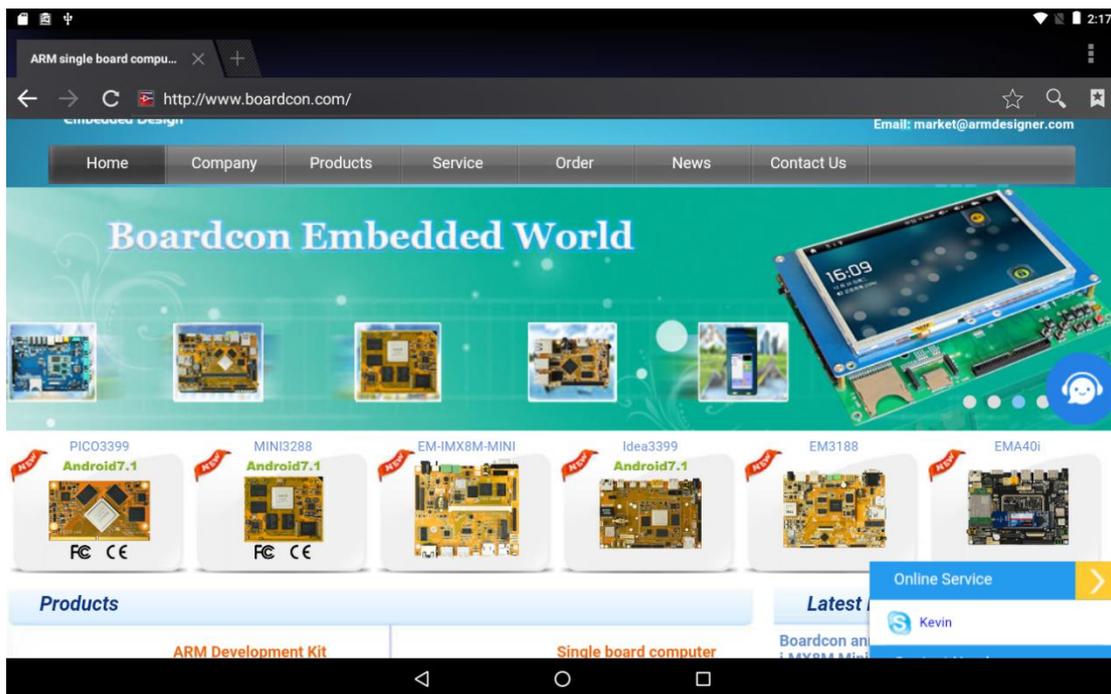
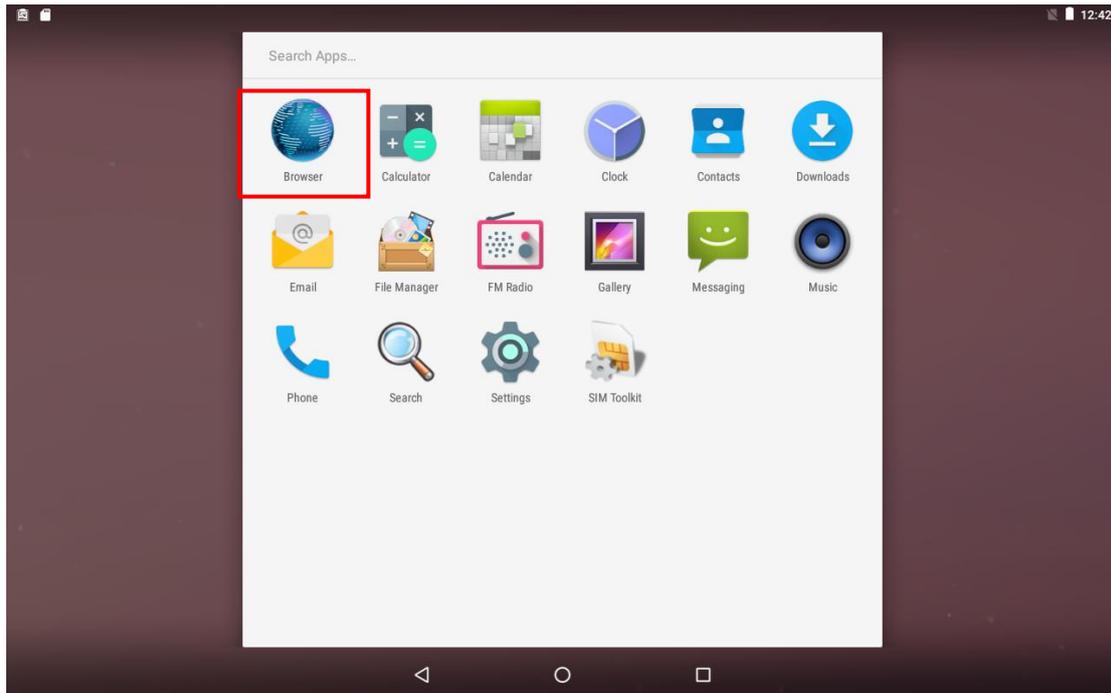
```

6.5 Ethernet

Connect the Board and router with an Ethernet cable (default DHCP=Yes). User can ping URL/IP at terminal, or open the browser to test Network.

su

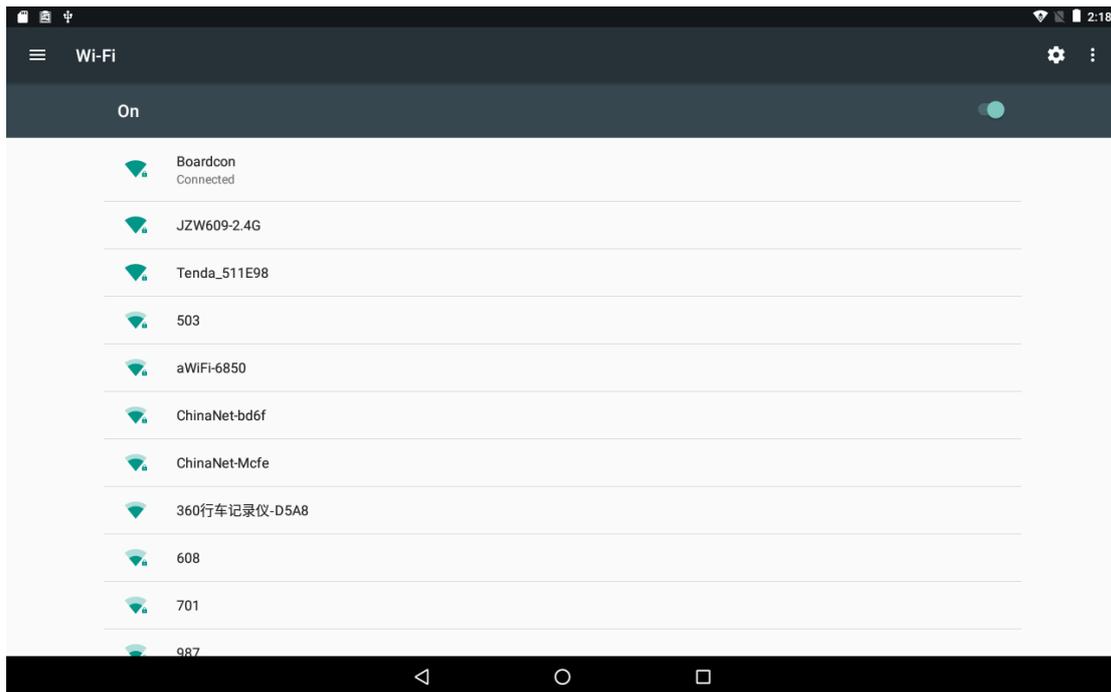
ping www.boardcon.com



6.6 WiFi

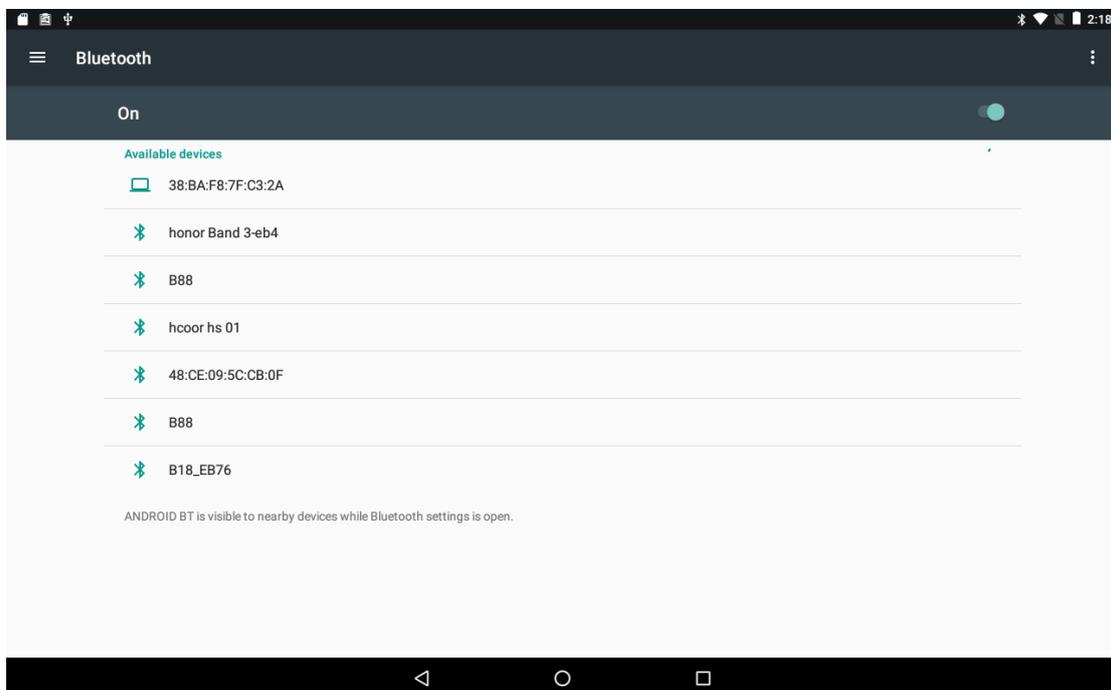
Connect the WiFi antenna, then click **Settings** -> **WiFi** -> **turn on**, select the SSID from the list of available networks and enter the password.

After connected, user can open the browser to browse the web.



6.7 Bluetooth

Click **Settings -> Bluetooth -> turn on**
Select the available device in the list to pair.



After pairing, devices can connect with each other automatically

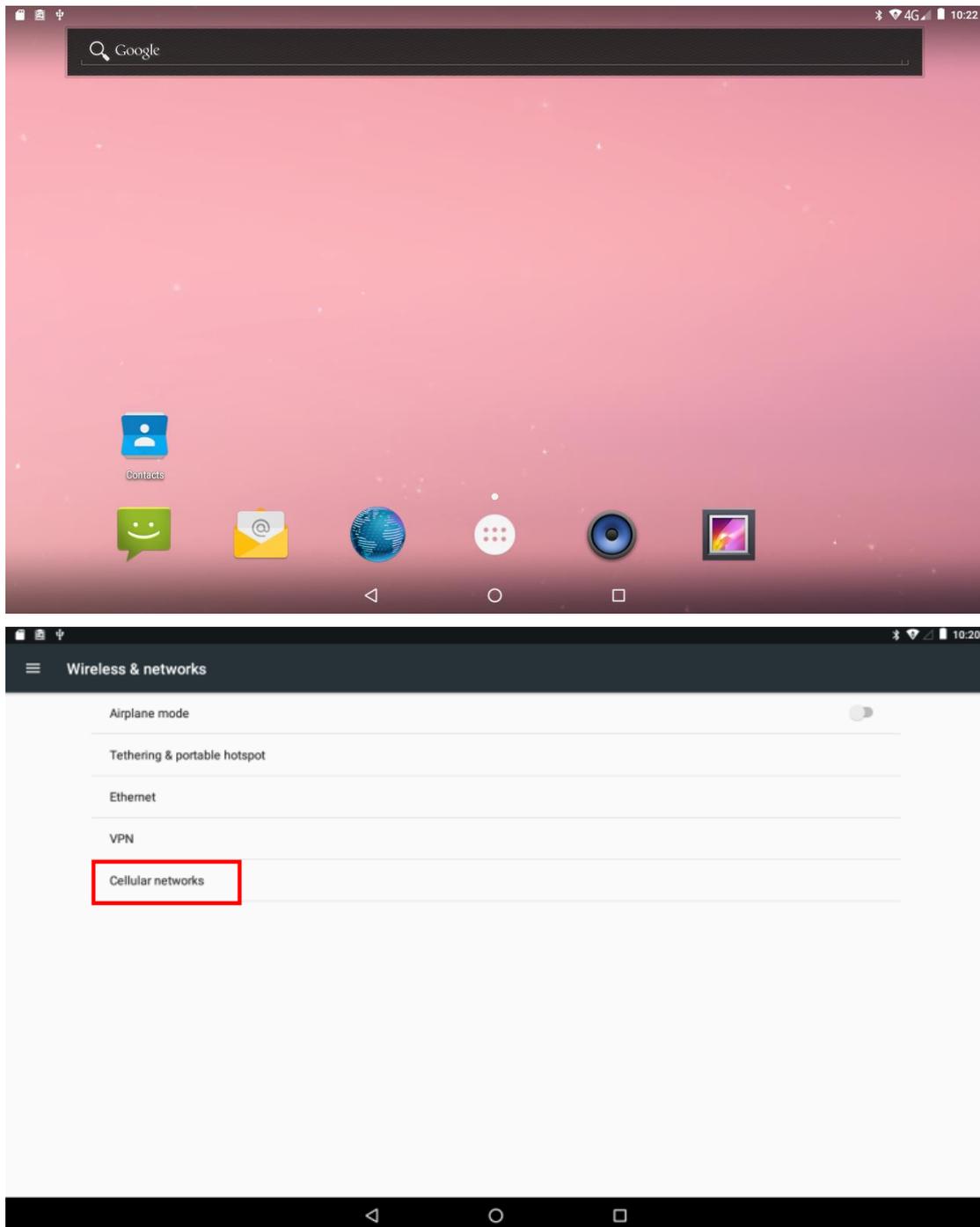
6.8 4G Network

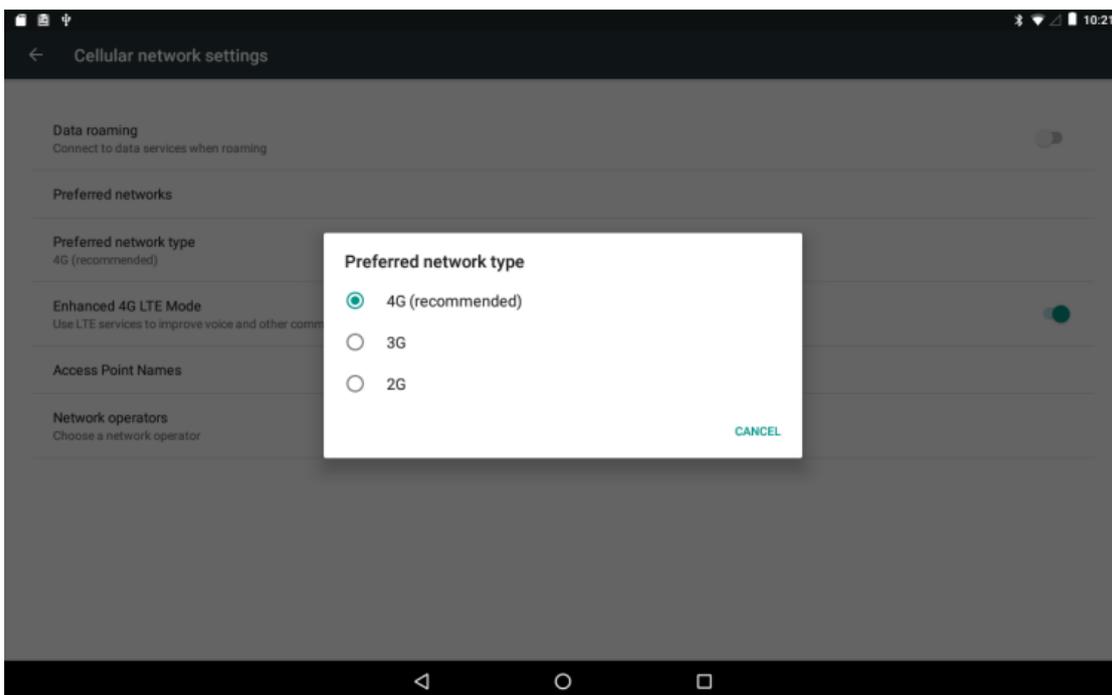
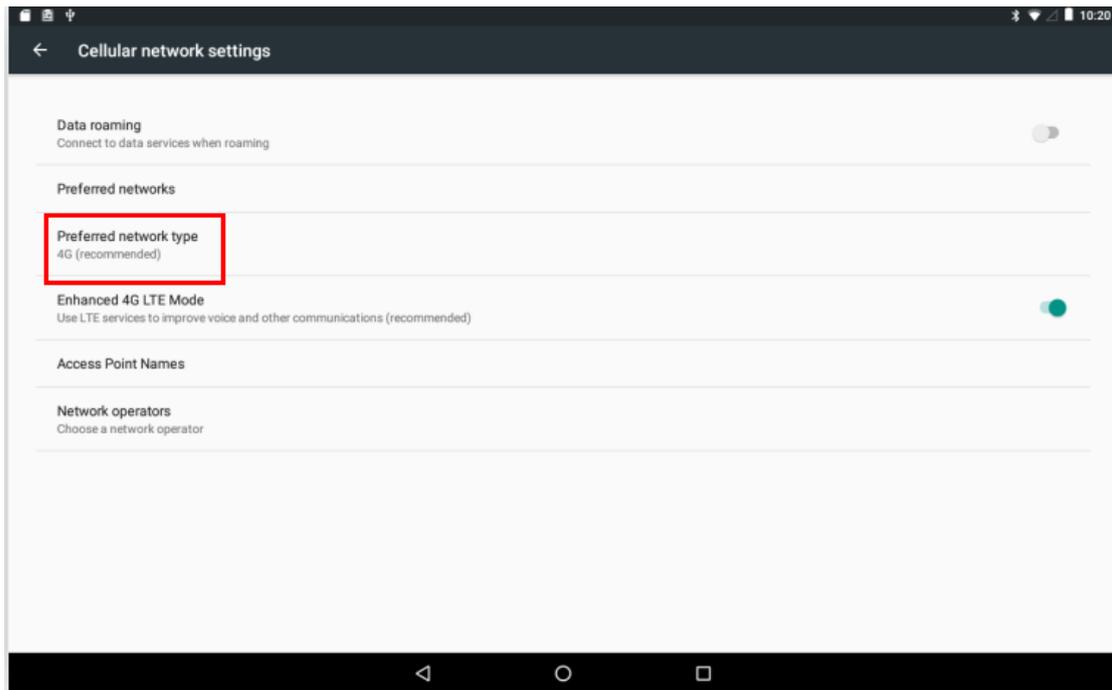
Step 1, Connect antenna and insert SIM card.

Step 2, The default connection is 4G network after power on.

3G network settings:

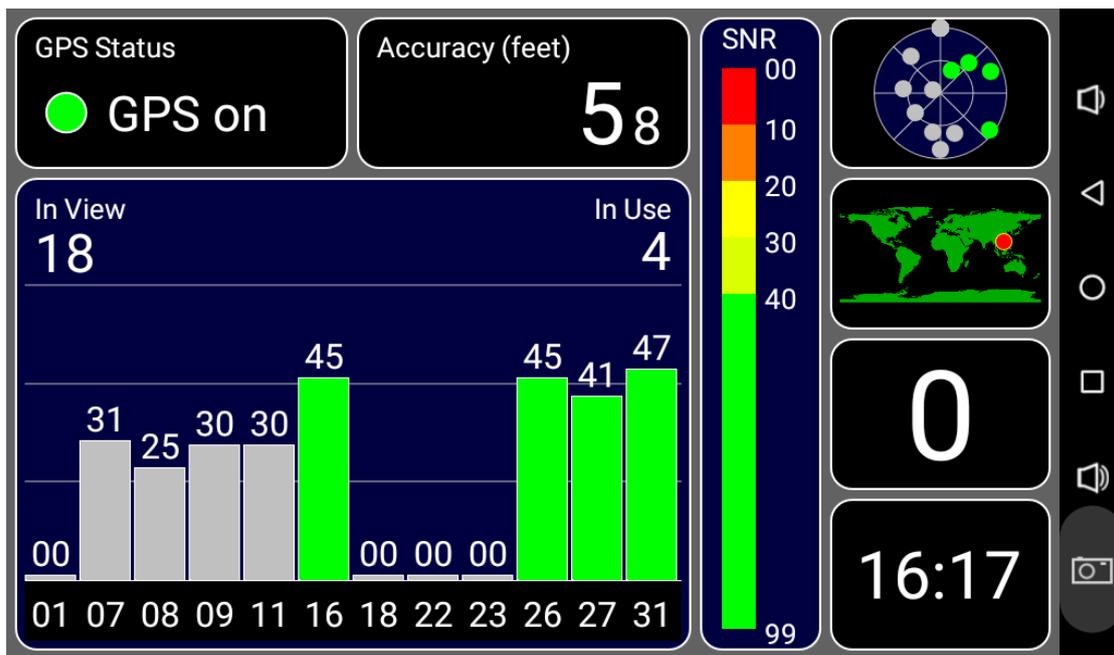
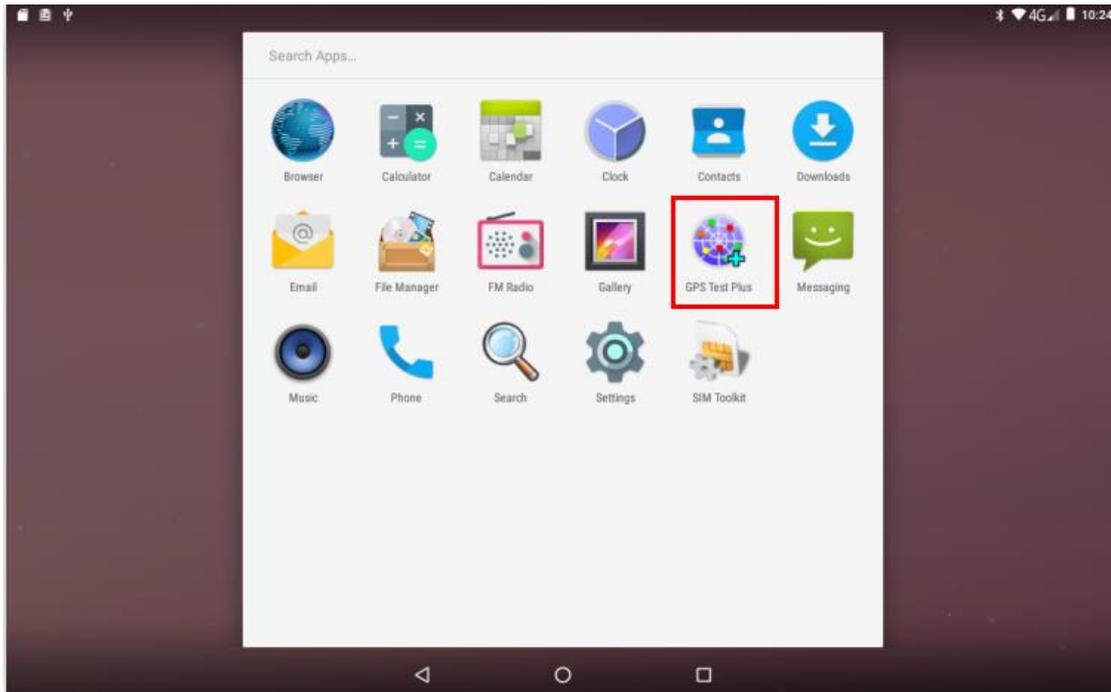
Settings -> Wireless&networks -> More -> Cellular networks -> Preferred network type -> 3G





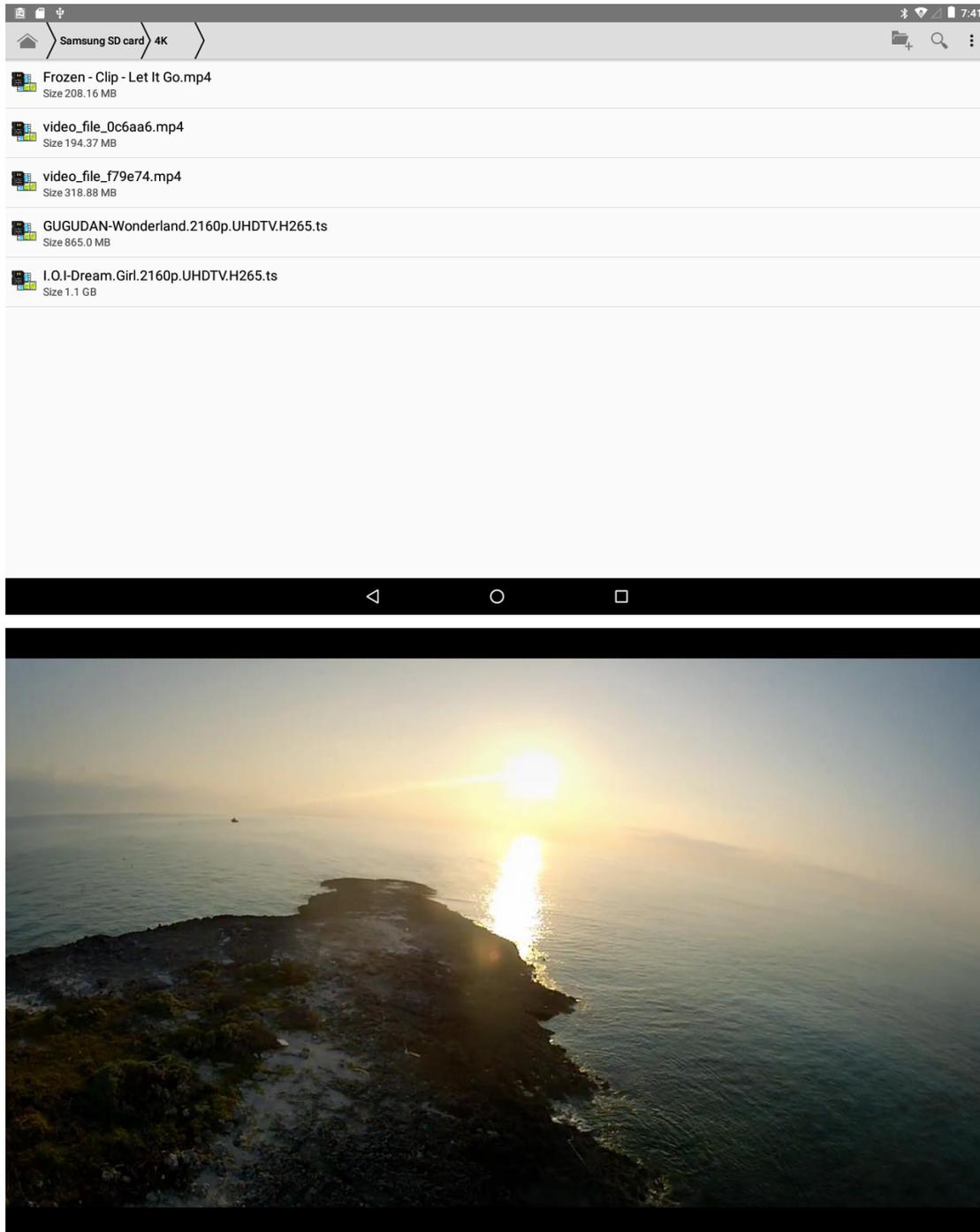
6.9 GPS

Connect GPS antenna, then power on and install the APP **GPS_test1.2.4.apk** (path: *CD/Tools/*)



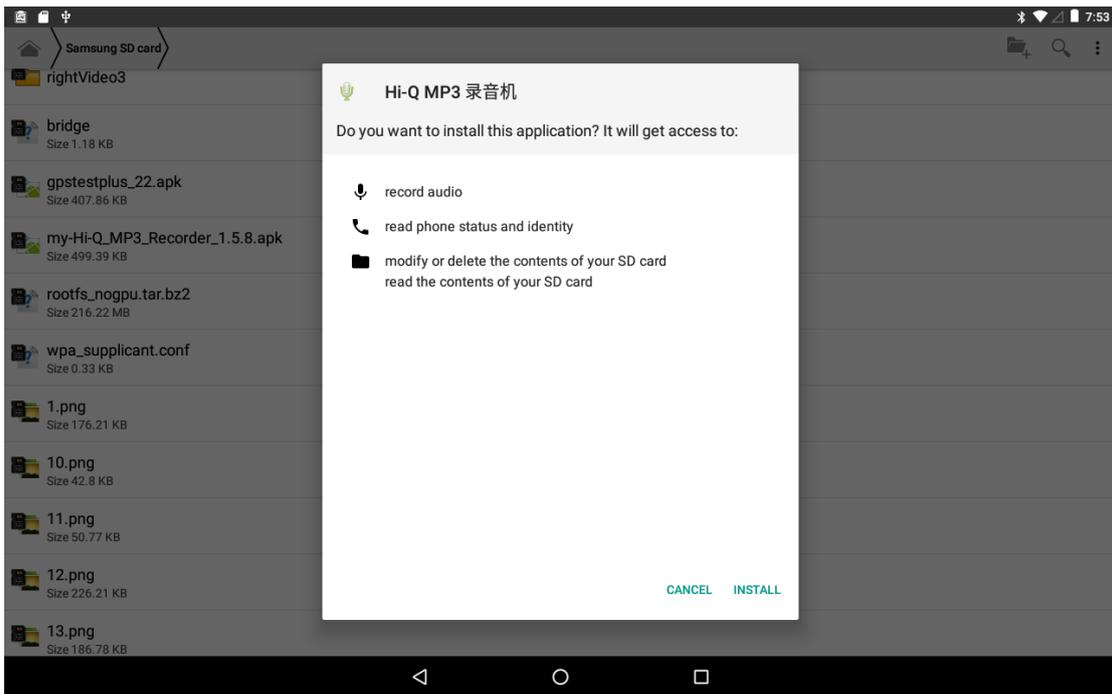
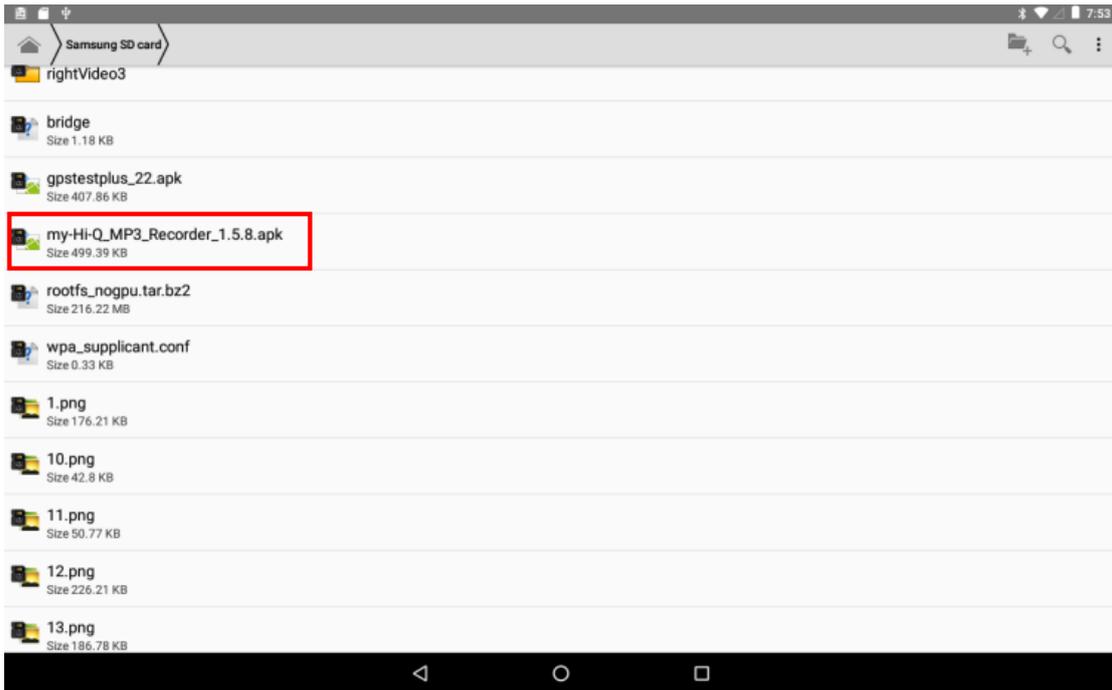
6.10 Play Video

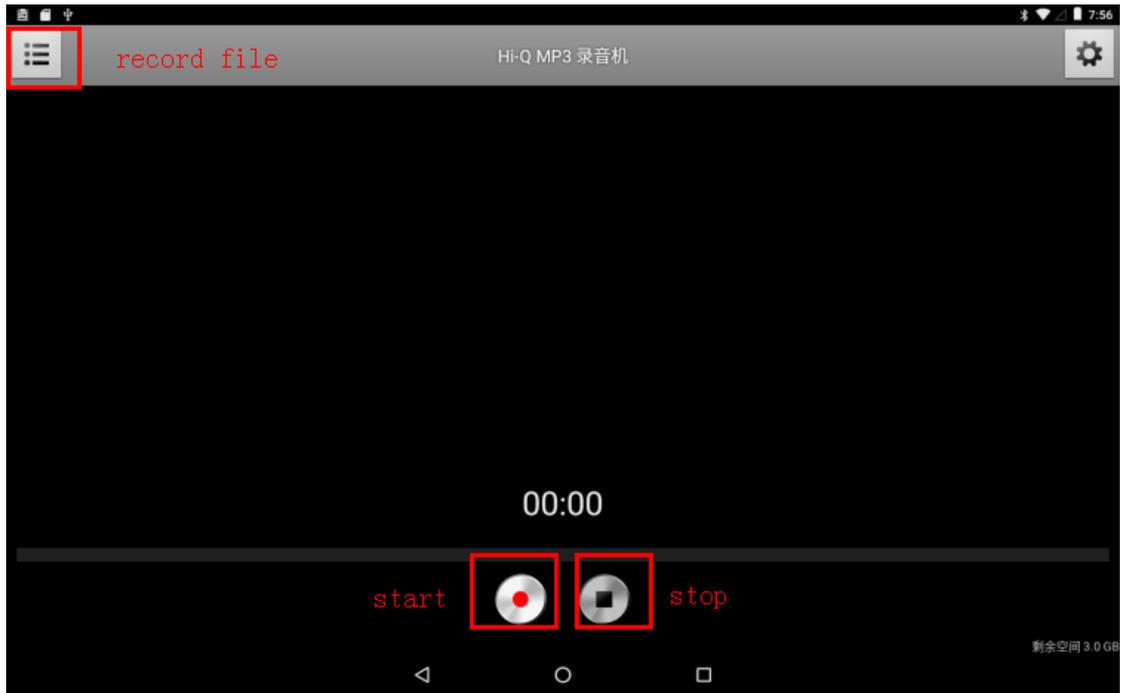
Insert the SD card and select the video file to play. The board supports earphone and Speaker(4W) output voice sync.



6.11 Record

Install the APP **my-Hi-Q_MP3_Recorder_1.5.8.apk** (path: *CD/Tools/*)





6.12 UART & RS485

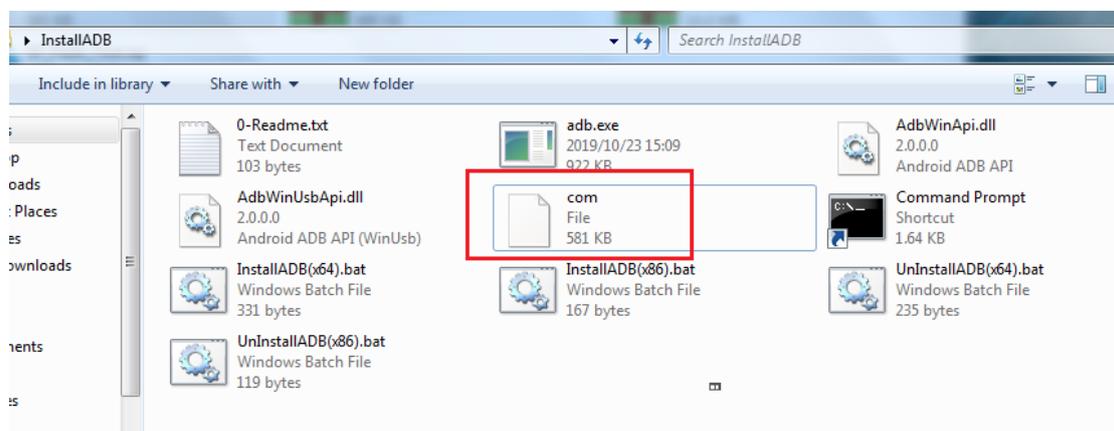
Connect RX and TX of **COM2(DB9)**, **COM4(DB9)** and the **UART0**, **UART1** is similar.



Install **adb** to PC, then copy the file **com** to adb directory.

Open **cmd** and execute the commands to push **com** to the board:

```
# adb root
# adb remount
# adb push com /system/bin
# adb shell
# chmod 777 /system/bin
```



```

Administrator: Command Prompt - adb shell
C:\Users\Administrator\Desktop\InstallADE>adb root
adb is already running as root

C:\Users\Administrator\Desktop\InstallADE>adb remount
remount succeeded

C:\Users\Administrator\Desktop\InstallADE>adb push com /system/bin
2996 KB/s (595233 bytes in 0.194s)

C:\Users\Administrator\Desktop\InstallADE>adb shell
demo_board_64:/ # ls
acct                init.connectivity.rc    mnt
bugreports          init.environ.rc         multi_init.rc
cache               init.epdg.rc             nvdata
charger             init.microtrust.rc      oem
config              init.modem.rc            proc
custom              init.mt6735.rc           property_contexts
d                   init.mt6735.usb.rc      protect_f
data                init.preload.rc         protect_s
default.prop        init.project.rc         root
dev                 init.rc                  sbin
enableswap.sh       init.recovery.mt6735.rc sdcard
etc                 init.rilproxy.rc        seapp_contexts
factory_init.connectivity.rc init.usb.configfs.rc    selinux_version
factory_init.project.rc   init.usb.rc              sepolicy

Administrator: Command Prompt - adb shell
fstab.mt6735        meta_init.c2k.rc        system
init                meta_init.connectivity.rc ueventd.mt6735.rc
init.aee.rc         meta_init.modem.rc      ueventd.rc
init.c2k.rc         meta_init.project.rc    vendor
init.common_svc.rc  meta_init.rc

demo_board_64:/ #
demo_board_64:/ #
demo_board_64:/ #
demo_board_64:/ # chmod 777 /system/bin/com
demo_board_64:/ #
  
```

Execute the commands to perform a loopback test.

com /dev/ttyUSB0 115200 8 0 1 (COM4)

com /dev/ttyMT1 115200 8 0 1 (UART1)

com /dev/ttyMT2 115200 8 0 1 (COM2)

Type any character and the echoed characters can be displayed on the screen.

