

# Android™ Quick Start Guide

## 1 Overview

This document guides you through the processes of downloading and running this release package. It only explains how to download and run the default release image with default configuration. For details on using the release package, see the *Android™ User's Guide (AUG)* included in this release package.

## 2 Hardware Requirements

The hardware requirements for using this release package are as follows:

Supported system-on-chips (SoCs):

- i.MX 6Dual/6Quad
- i.MX 6Solo/6DualLite
- i.MX 6SoloLite
- i.MX 6SoloX

Supported boards:

- SABRE-SD board and platform
- SABRE-AI board
- EVK board

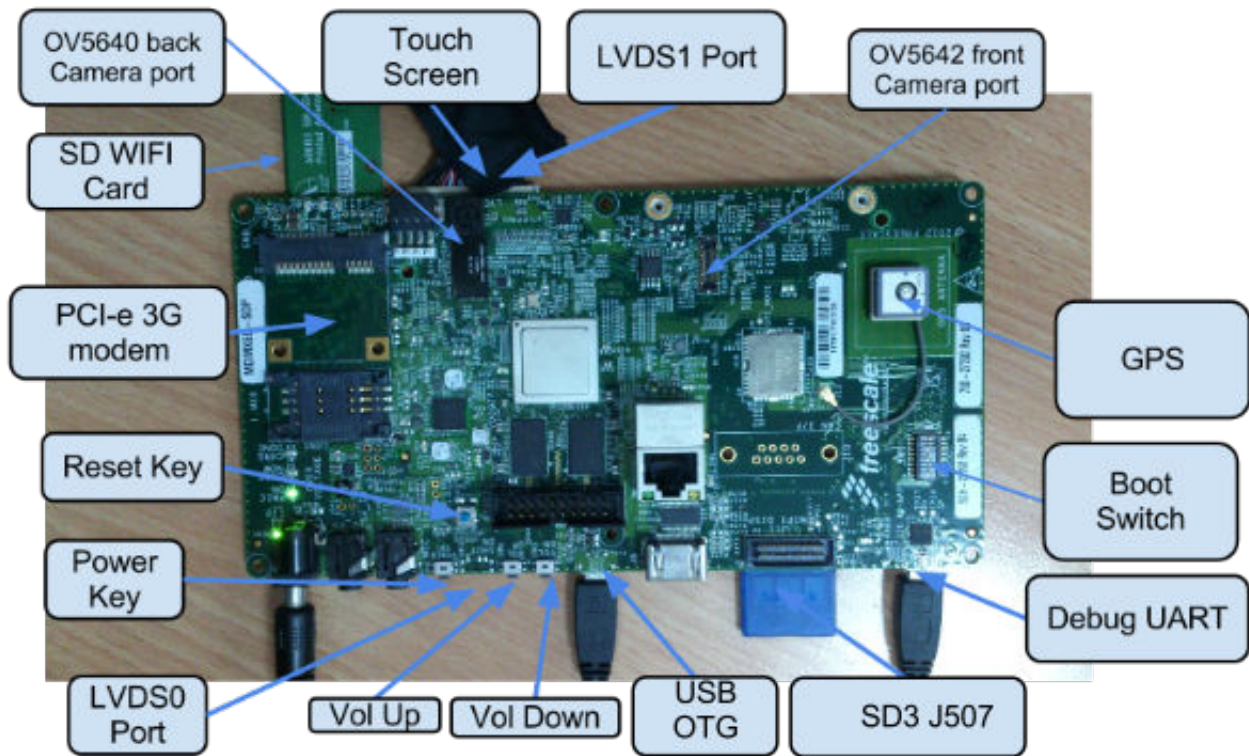
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### 3 Working with the i.MX 6Quad/6DualLite SABRE-SD Board and Platform

#### 3.1 Board hardware

The figure below shows the different components of the SABRE-SD board.



**Figure 1. SABRE-SD Board**

**NOTE**

Due to a known limitation of the hardware/SoC, the power key on the RevB or older versions of the SABRE-SD board cannot be used as the normal power key. So, the VOL\_DOWN key is mapped as the power key. The VOL\_DOWN key was not available on early boards.

#### 3.2 Board images

The table below describes the locations of the software images in release\_package/android\_L5.0.0\_1.0.0-ga\_full\_image\_6qsabresd.tar.gz on board partitions.

**Table 1. Board images**

Image name	Path in release package	Download target
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*Table continues on the next page...*

**Table 1. Board images (continued)**

u-boot-imx6q.imx	\	eMMC first 8MB section
u-boot-imx6dl.imx	\	eMMC first 8MB section
boot-imx6q.img	\eMMC	eMMC 1st partition for 800 MB or 1 GB HZ i.MX 6DualQuad
boot-imx6q-ldo.img	\eMMC	eMMC 1st partition for 1.2G HZ i.MX 6DualQuad
boot-imx6dl.img	\eMMC	eMMC 1st partition for i.MX 6DualLite
recovery-imx6q.img	\eMMC	eMMC 2nd partition for 800 MB or 1 GB HZ i.MX 6DualQuad
recovery-imx6q-ldo.img	\eMMC	eMMC 2nd partition for 1.2 GB HZ i.MX 6DualQuad
recovery-imx6dl.img	\eMMC	eMMC 2nd partition for i.MX 6DualLite
system.img	\eMMC	eMMC 5th partition

### 3.3 Downloading board images

The board images can be downloaded to the target board by using the MFGTool. The release package includes MFGTool for i.MX 6Dual/6Quad, i.MX 6Solo/6DualLite, i.MX 6SoloX, and i.MX 6SoloLite in android\_L5.0.0\_1.0.0-ga\_tools.tar.gz. The MFGTool is mfgtools.tar.gz.

#### NOTE

The MFGTool only works in the Windows® Operating System (OS) environment.

Perform the following steps to download the board images:

#### NOTE

The steps given below take i.MX 6Dual/6Quad as the example SoC. For i.MX 6Solo/6DualLite, replace 'MX6Q' with 'MX6DL' and '6q' with '6dl.'

1. Unzip the mfgtools.tar.gz file to a selected location. The directory is named MFGTool-Dir in this example.
2. If the directory does not exist, create the *android/sabresd* directory under *MFGTool-Dir/Profiles/Linux/OS Firmware/files*.
3. Copy the following files from either *android\_L5.0.0\_1.0.0-ga\_core\_image\_6qsabresd.tar.gz* or *android\_L5.0.0\_1.0.0-ga\_full\_image\_6qsabresd.tar.gz* to the *MFGTool-Dir/Profiles/Linux/OS Firmware/files/android/sabresd* path.
  - u-boot-imx6q.imx
  - eMMC/boot-imx6q.img
  - eMMC/system.img
  - eMMC/recovery-imx6q.img

#### NOTE

Do not replace any other files in the files directory and the OS Firmware directory. To download images for the i.MX 6DualLite/6Solo SABRE-SD boards, you need to replace the name "imx6q" in step 3 with "imx6dl".

To download the images for the 1.2GB HZ i.MX 6DualQuad SABRE-SD boards, you need to replace the name "imx6q" in step 3 with "imx6q-ldo".

4. No dedicated boot dips are reserved for serial download mode on SABRE-SD board. Therefore, a tricky method is used to enter serial download mode. Change the SABRE-SD SW6 (boot) to 00001100 (from 1-8 bit) to enter download mode.

## Working with the i.MX 6Quad/6DualLite SABRE-SD Board and Platform

5. Power on the board. Using USB cable on the SABRE-SD OTG port, connect a computer running Windows OS to the SABRE-SD board.

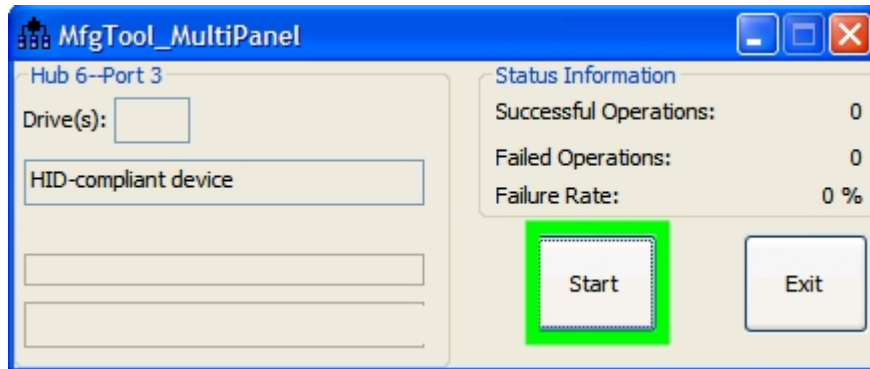
### NOTE

There are two USB micro ports on the SABRE-SD board: USB to UART and USB OTG. USB to UART is referred to as debug UART, and the USB OTG is referred to as USB in the hardware image above. The debug UART can be used to monitor the log of the hardware boot processing.

6. Double click the file \*.vbs according to the target device as shown in the following table.

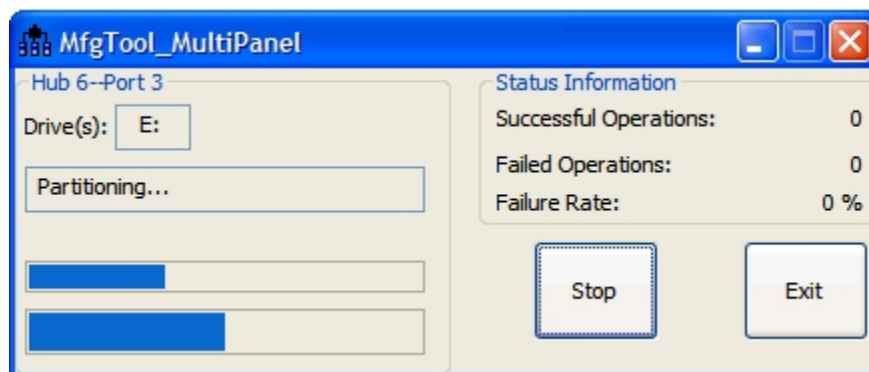
Target device and boot storage	VBS file
i.MX 6Dual/6Quad (800M HZ or 1G HZ) SABRE-SD eMMC	mfgtool2-android-mx6q-sabresd-emmc.vbs
i.MX 6Dual/6Quad (1.2G HZ) SABRE-SD eMMC	mfgtool2-android-mx6q-sabresd-emmc-1.2g.vbs
i.MX 6Dual/6Quad (800M HZ or 1G HZ) SABRE-SD SD	mfgtool2-android-mx6q-sabresd-sd.vbs
i.MX 6Dual/6Quad (1.2G HZ) SABRE-SD SD	mfgtool2-android-mx6q-sabresd-sd-1.2g.vbs
i.MX 6Solo/6DualLite SABRE-SD eMMC	mfgtool2-android-mx6dl-sabresd-emmc.vbs
i.MX 6Solo/6DualLite SABRE-SD SD	mfgtool2-android-mx6dl-sabresd-sd.vbs

7. Click Start to start downloading images.



**Figure 2. Starting download**

The figure below shows the downloading in progress where the status bar shows the download status. The download may take one to two minutes depending on the host machine.



**Figure 3. Download status**

The figure below shows the tool once the download is complete.



**Figure 4. Download complete**

8. Click Stop.
9. Change "Boot Switch(SW6)" to 11100110 (from 1-8 bit) to switch the board back to eMMC 4-bit boot mode. Or change "Boot Switch(SW6)" to 11010110 (from 1-8 bit) to switch the board back to eMMC 8-bit boot mode.

## 3.4 Booting

When the Android system image is programmed and the Boot Switch(es) is configured, the system is ready to be powered on.

There are three hardware displays supported in this release: two LVDS display panels and HDMI output. See [Booting with single display: LVDS display](#) to enable the LVDS1 display. See [Booting with single display: HDMI display](#) to enable single HDMI display. See [Booting with dual displays: LVDS and HDMI displays](#) to enable LVDS1 and HDMI output dual display feature.

### NOTE

There are two LVDS ports in SABRE SD hardware: LVDS0 and LVDS1. LVDS1 is taken as the primary display in this release. The LVDS1 port is nearby to the miniPCIe interface (see the SABRE-SD board image above).

### 3.4.1 Booting with single display: LVDS display

In the U-Boot prompt, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd booti mmc2
U-Boot > setenv bootargs console=ttyMxc0,115200 init=/init video=mxcfb0:dev=ldb,bpp=32
```

## Working with the i.MX 6Quad/6DualLite SABRE-SD Board and Platform

```
video=mxcfb1:off video=mxcfb2:off video=mxcfb3:off vmlalloc=400M androidboot.console=ttymx0  
consoleblank=0 androidboot.hardware=freescale cma=384M  
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd booti mmc2  
U-Boot > setenv bootargs console=ttymx0,115200 init=/init video=mxcfb0:dev=ldb,bpp=32  
video=mxcfb1:off video=mxcfb2:off video=mxcfb3:off vmlalloc=400M androidboot.console=ttymx0  
consoleblank=0 androidboot.hardware=freescale cma=384M androidboot.selinux=disabled  
androidboot.dm_verity=disabled  
U-Boot > saveenv
```

### 3.4.2 Booting with single display: HDMI display

In the U-Boot prompt, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd booti mmc2  
U-Boot > setenv bootargs console=ttymx0,115200 androidboot.console=ttymx0 consoleblank=0  
vmlalloc=400M init=/init video=mxcfb0:dev=hdmi,1920x1080M@60,bpp=32 video=mxcfb1:off  
video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale cma=384M  
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd booti mmc2  
U-Boot > setenv bootargs console=ttymx0,115200 androidboot.console=ttymx0 consoleblank=0  
vmlalloc=400M init=/init video=mxcfb0:dev=hdmi,1920x1080M@60,bpp=32 video=mxcfb1:off  
video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale cma=384M  
androidboot.selinux=disabled androidboot.dm_verity=disabled  
U-Boot > saveenv
```

### 3.4.3 Booting with dual displays: LVDS and HDMI displays

In the U-Boot prompt, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd booti mmc2  
U-Boot > setenv bootargs console=ttymx0,115200 androidboot.console=ttymx0 consoleblank=0  
vmlalloc=400M init=/init video=mxcfb0:dev=ldb,bpp=32 video=mxcfb1:dev=hdmi,  
1920x1080M@60,bpp=32 video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale  
cma=384M  
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd booti mmc2  
U-Boot > setenv bootargs console=ttymx0,115200 androidboot.console=ttymx0 consoleblank=0  
vmlalloc=400M init=/init video=mxcfb0:dev=ldb,bpp=32 video=mxcfb1:dev=hdmi,  
1920x1080M@60,bpp=32 video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale  
cma=384M androidboot.selinux=disabled androidboot.dm_verity=disabled  
U-Boot > saveenv
```

## 3.5 Board reboot

After you have completed download and setup, reboot the board and wait for the Android platform to boot up.



Figure 5. Android Lollipop image

# 4 Working with the i.MX 6Quad/6DualLite SABRE-AI Platform

## 4.1 Board hardware

The figure below shows the different components of the SABRE-AI board.

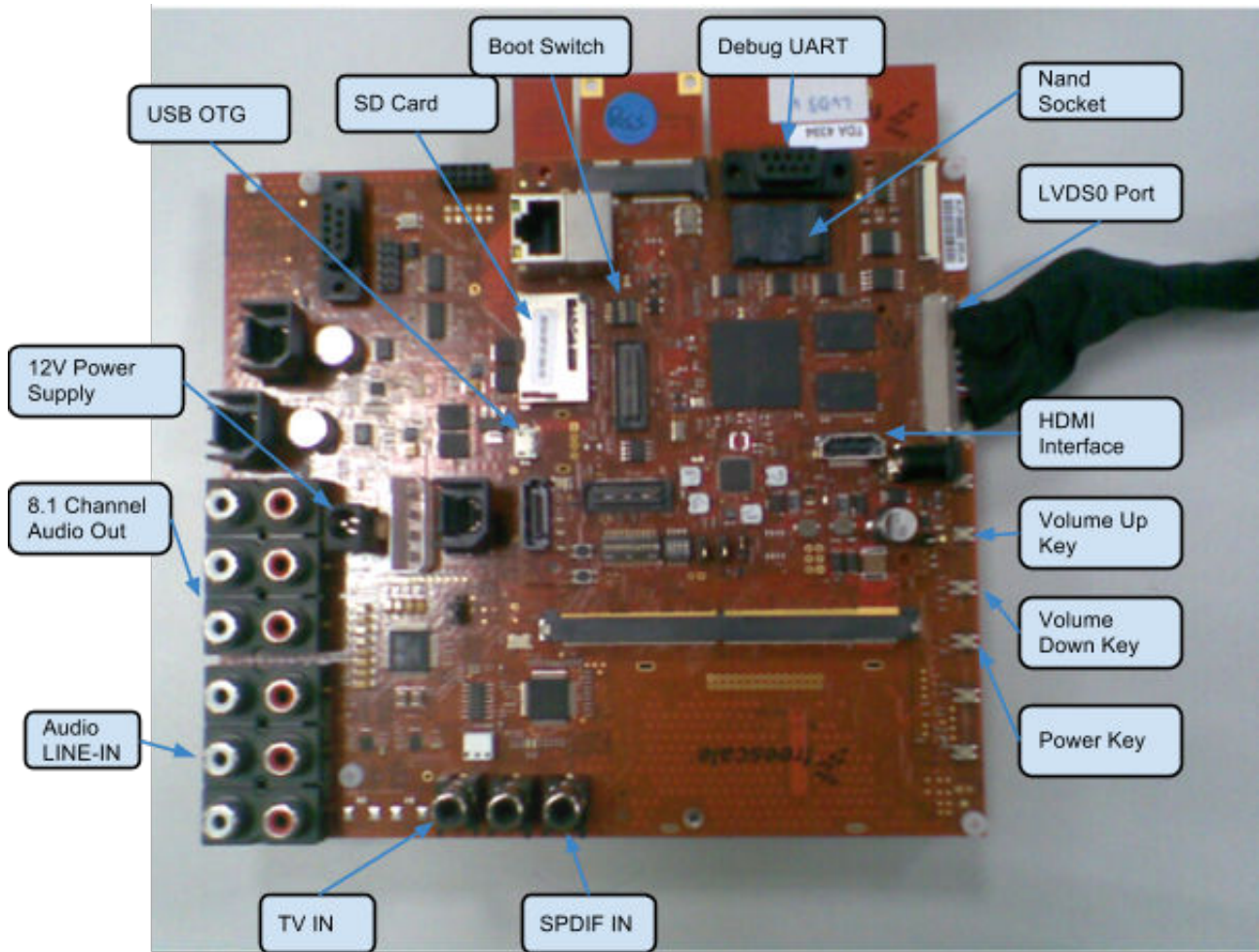


Figure 6. SABRE-AI board

## 4.2 Board images

The table below describes the location in the board partitions of the software images in android\_L5.0.0\_1.0.0-ga\_full\_image\_6qsabreauto.tar.gz on board partitions.

Table 2. Board images

Image name	Path in release package	Download target
u-boot-imx6q.imx u-boot-imx6dl.imx	\	SD first 8MB block
boot-imx6q.img boot-imx6dl.img	\SD	SD 1st partition
recovery-imx6q.img recovery-imx6dl.img	\SD	SD 2nd partition
system.img	\SD	SD 5th partition
u-boot-imx6dl-nand.imx	\	NAND 1st 64 MB MTD partition

Table continues on the next page...



**Table 2. Board images (continued)**

u-boot-imx6q-nand.img		
boot-imx6q-nand.img	\NAND	NAND 2nd 16 MB MTD partition
boot-imx6dl-nand.img		
recovery-imx6q-nand.img	\NAND	NAND 3rd 16 MB MTD partition
recovery-imx6dl-nand.img		
android_root.img	\NAND	UBIFS Volume for 4th MTD partition

### 4.3 Downloading board images

The board images can be downloaded to the target board by using the MFGTool. The release package includes MFGTool for both i.MX 6Dual/6Quad and i.MX 6Solo/6DualLite in `android_L5.0.0_1.0.0-ga_tools.tar.gz`. The MFGTool is `mfgtools.tar.gz`.

#### NOTE

The MFGTool only works in Windows OS environment.

Perform the following steps to download the board images:

#### NOTE

The steps given below take i.MX 6Dual/6Quad as the example SoC. For i.MX 6Solo/6DualLite, replace 'MX6Q' with 'MX6DL' and '6q' with '6dl.'

1. Unzip the `mfgtools.tar.gz` file to a selected location. The directory is named MFGTool-Dir in this example.
2. If the directory does not exist, create the "*android*" directory under the *MFGTool-Dir/Profiles/Linux/OS Firmware/files* directory.
3. Copy following files from either *release\_package/android\_L5.0.0\_1.0.0-ga\_core\_image\_6qsabreauto.tar.gz* or *release\_package/android\_L5.0.0\_1.0.0-ga\_full\_image\_6qsabreauto.tar.gz* to the *MFGTool-Dir/Profiles/Linux/OS Firmware/files/android/sabreauto* path.
  - `u-boot-imx6q.img`
  - `SD/boot-imx6q.img`
  - `SD/system.img`
  - `SD/recovery.img`

#### NOTE

Do not replace any other files in the files directory and the OS Firmware directory. When using the NAND boot, the files are in "nand" folder, and use `android_root.img` instead `system.img`. The boot loader should be `u-boot-mx6q-nand.bin`.

To download images for the i.MX 6DualLite/6Solo SABRE-AI boards, you need to replace the name "imx6q" in step 3 with "imx6dl".

4. Change SABRE-AI S3 (boot mode) to 0101 (from 1-4 bit) to enter download mode.
5. Power on the board. Using USB cable on the SABRE-AI OTG port, connect a computer running Windows OS to the SABRE-AI board.

#### NOTE

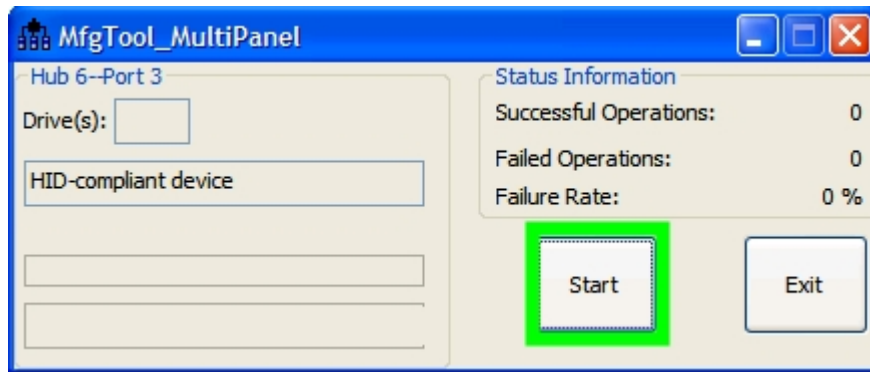
The USB micro port in SABRE-AI is J10.

6. Update the MFGTool-Dir/cfg.ini file according to the target device as shown in the following table.

**Table 3. SABRE-AI VBS file**

Target device	VBS file
i.MX 6Dual/6Quad SABRE-AI SD	mfgtool2-android-mx6q-sabreauto-sdcard.vbs
i.MX 6Dual/6Quad SABRE-AI NAND	mfgtool2-android-mx6q-sabreauto-nand.vbs
i.MX 6Solo/6DualLite SABRE-AI SD	mfgtool2-android-mx6dl-sabreauto-sdcard.vbs
i.MX 6Solo/6DualLite SABRE-AI NAND	mfgtool2-android-mx6dl-sabreauto-nand.vbs

7. Click Start to start downloading images.



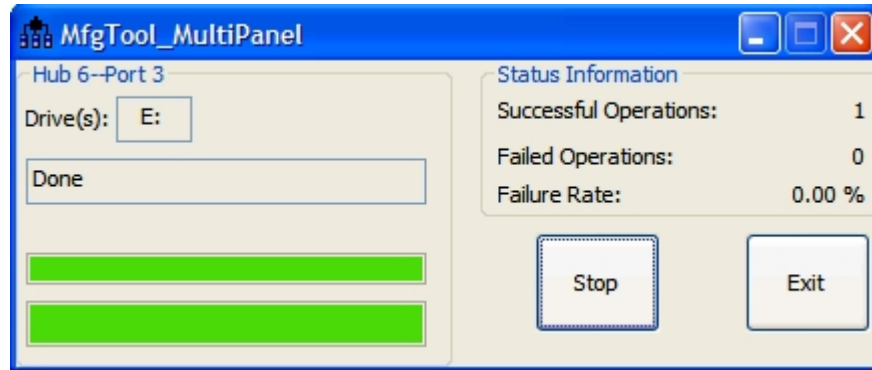
**Figure 7. Starting download**

The figure below shows the downloading in progress where the status bar shows the download status. The download may take one to two minutes depending on the host machine.



**Figure 8. Download status**

The figure below shows the tool once the download is complete.



**Figure 9. Download complete**

8. Click Stop.
9. Change the board boot switch to (S3, S2,S1) 0010, 0010,0100100000 (from 1 bit) to boot from SD on CPU Board .  
Change the board boot switch to (S3, S2,S1) 0010, 0001,0001000000 (from 1bit) to boot from NAND

## 4.4 Booting

When the Android system image is programmed and the Boot Switch(es) is configured, the system is ready to be powered on.

There are two hardware displays supported in this release: one LVDS display panel and one HDMI output.

- To enable the LVDS0 display, see Section [Booting with single display: LVDS display](#).
- To enable the HDMI display, see Section [Booting with single display: HDMI display](#).
- to enable LVDS0 and HDMI output dual display feature, see Section [Booting with dual displays: LVDS and HDMI displays](#).

### NOTE

There are two LVDS ports in SabreAuto hardware, LVDS0 and LVDS1. LVDS0 is taken as the primary display in this release. The LVDS0 port is in the CPU board. The LVDS1 is in the base board.

### 4.4.1 Booting with single display: LVDS display

To boot from SD, set the U-Boot environment variables as show below:

```
U-Boot > setenv bootcmd booti mmc1
U-Boot > setenv bootargs console=ttyMxc3,115200 init=/init video=mxcfb0:dev=ldb,bpp=32
video=mxcfb1:off video=mxcfb2:off video=mxcfb3:off vmlalloc=400M androidboot.console=ttyMxc3
consoleblank=0 androidboot.hardware=freescale cma=384M
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd booti mmc1
U-Boot > setenv bootargs console=ttyMxc3,115200 init=/init video=mxcfb0:dev=ldb,bpp=32
video=mxcfb1:off video=mxcfb2:off video=mxcfb3:off vmlalloc=400M androidboot.console=ttyMxc3
consoleblank=0 androidboot.hardware=freescale cma=384M androidboot.selinux=disabled
androidboot.dm_verity=disabled
U-Boot > saveenv
```

## Working with the i.MX 6Quad/6DualLite SABRE-AI Platform

To boot from NAND, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd 'nand read 0x12000000 0x4000000 0x1000000;booti 0x12000000'
U-Boot > setenv bootargs console=ttyMxc3,115200 init=/init video=mxcfb0:dev=ldb,bpp=32
video=mxcfb1:off video=mxcfb2:off video=mxcfb3:off vmalloc=400M androidboot.console=ttyMxc3
consoleblank=0 androidboot.hardware=freescale mtdparts=gpmi-nand:64m(bootloader),
16m(bootimg),16m(recovery),-(root) ubi.mtd=4 cma=384M
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd 'nand read 0x12000000 0x4000000 0x1000000;booti 0x12000000'
U-Boot > setenv bootargs console=ttyMxc3,115200 init=/init video=mxcfb0:dev=ldb,bpp=32
video=mxcfb1:off video=mxcfb2:off video=mxcfb3:off vmalloc=400M androidboot.console=ttyMxc3
consoleblank=0 androidboot.hardware=freescale mtdparts=gpmi-nand:64m(bootloader),
16m(bootimg),16m(recovery),-(root) ubi.mtd=4 cma=384M androidboot.selinux=disabled
androidboot.dm_verity=disabled
U-Boot > saveenv
```

### 4.4.2 Booting with single display: HDMI display

To boot from SD, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd booti mmc1
U-Boot > setenv bootargs console=ttyMxc3,115200 androidboot.console=ttyMxc3 consoleblank=0
vmalloc=400M init=/init video=mxcfb0:dev=hdmi,1920x1080M@60,bpp=32 video=mxcfb1:off
video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale cma=384M
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd booti mmc1
U-Boot > setenv bootargs console=ttyMxc3,115200 androidboot.console=ttyMxc3 consoleblank=0
vmalloc=400M init=/init video=mxcfb0:dev=hdmi,1920x1080M@60,bpp=32 video=mxcfb1:off
video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale cma=384M
androidboot.selinux=disabled androidboot.dm_verity=disabled
U-Boot > saveenv
```

To boot from NAND, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd 'nand read 0x12000000 0x4000000 0x1000000;booti 0x12000000'
U-Boot > setenv bootargs console=ttyMxc3,115200 androidboot.console=ttyMxc3 consoleblank=0
vmalloc=400M init=/init video=mxcfb0:dev=hdmi,1920x1080M@60,bpp=32 video=mxcfb1:off
video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale mtdparts=gpmi-nand:
64m(bootloader),16m(bootimg),16m(recovery),-(root) ubi.mtd=4 cma=384M
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd 'nand read 0x12000000 0x4000000 0x1000000;booti 0x12000000'
U-Boot > setenv bootargs console=ttyMxc3,115200 androidboot.console=ttyMxc3 consoleblank=0
vmalloc=400M init=/init video=mxcfb0:dev=hdmi,1920x1080M@60,bpp=32 video=mxcfb1:off
video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale mtdparts=gpmi-nand:
```

```
64m(bootloader),16m(bootimg),16m(recovery),-(root) ubi.mtd=4 cma=384M
androidboot.selinux=disabled androidboot.dm_verity=disabled
U-Boot > saveenv
```

### 4.4.3 Booting with dual displays: LVDS and HDMI displays

To boot from SD, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd booti mmc1
U-Boot > setenv bootargs console=ttyMXC3,115200 androidboot.console=ttyMXC3 consoleblank=0
vmalloc=400M init=/init video=mxcfb0:dev=ldb,bpp=32 video=mxcfb1:dev=hdmi,
1920x1080M@60,bpp=32 video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale
cma=384M
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd booti mmc1
U-Boot > setenv bootargs console=ttyMXC3,115200 androidboot.console=ttyMXC3 consoleblank=0
vmalloc=400M init=/init video=mxcfb0:dev=ldb,bpp=32 video=mxcfb1:dev=hdmi,
1920x1080M@60,bpp=32 video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale
androidboot.selinux=disabled androidboot.dm_verity=disabled
U-Boot > saveenv
```

To boot from NAND, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd 'nand read 0x12000000 0x4000000 0x1000000;booti 0x12000000'
U-Boot > setenv bootargs console=ttyMXC3,115200 androidboot.console=ttyMXC3 consoleblank=0
vmalloc=400M init=/init video=mxcfb0:dev=ldb,bpp=32 video=mxcfb1:dev=hdmi,
1920x1080M@60,bpp=32 video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale
mtdparts=gpmi-nand:64m(bootloader),16m(bootimg),16m(recovery),-(root) ubi.mtd=4 cma=384M
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd 'nand read 0x12000000 0x4000000 0x1000000;booti 0x12000000'
U-Boot > setenv bootargs console=ttyMXC3,115200 androidboot.console=ttyMXC3 consoleblank=0
vmalloc=400M init=/init video=mxcfb0:dev=ldb,bpp=32 video=mxcfb1:dev=hdmi,
1920x1080M@60,bpp=32 video=mxcfb2:off video=mxcfb3:off androidboot.hardware=freescale
mtdparts=gpmi-nand:64m(bootloader),16m(bootimg),16m(recovery),-(root) ubi.mtd=4 cma=384M
androidboot.selinux=disabled androidboot.dm_verity=disabled
U-Boot > saveenv
```

## 4.5 Board reboot

After you have completed download and setup, reboot the board and wait for the Android platform to boot up.



Figure 10. Android Lollipop image

## 5 Working with the i.MX 6 SoloLite EVK Board

### 5.1 Board hardware

The figure below shows the different components of the SoloLite EVK board.

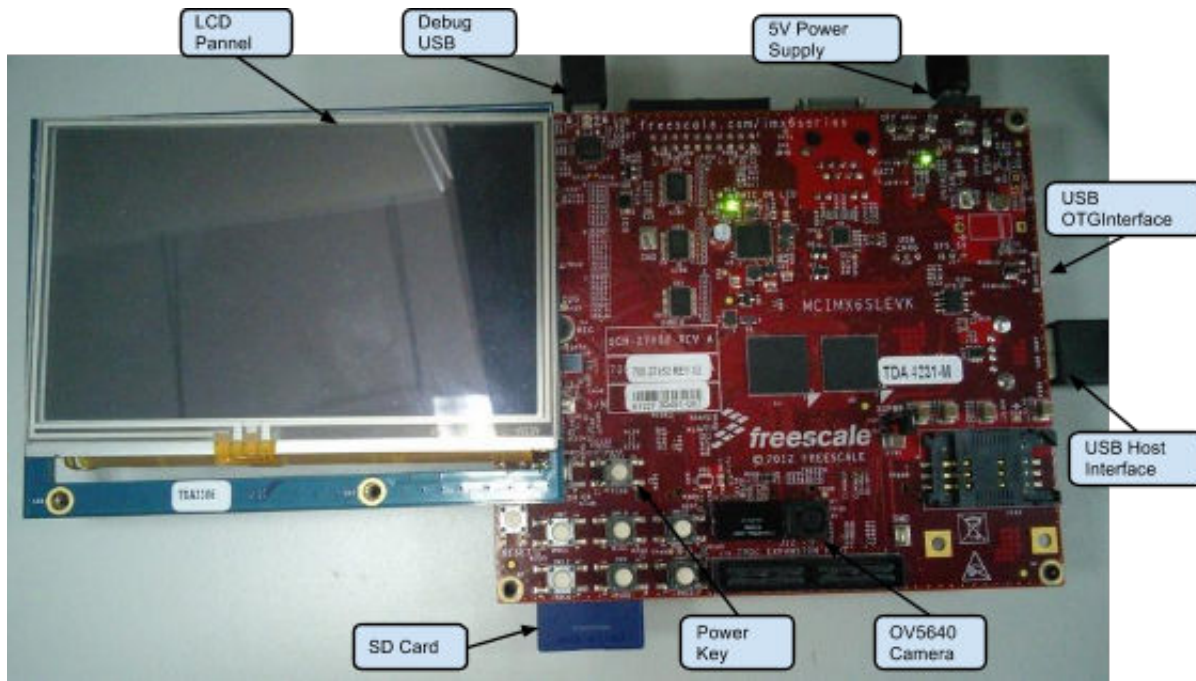


Figure 11. i.MX 6 SoloLite EVK board

## 5.2 Board images

The table below describes the location in the board partitions of the software images in android\_L5.0.0\_1.0.0-ga\_core\_image\_6slevk.tar.gz on board partitions.

Table 4. Board images

Image name	Path in release package	Download target
u-boot-imx6sl.imx	\	SD first 8 MB block
boot-imx6sl.img	\SD	SD 1st partition
recovery-imx6sl.img	\SD	SD 2nd partition
system.img	\SD	SD 5th partition

## 5.3 Downloading board images

The board images can be downloaded to the target board by using the MFGTool. The release package includes MFGTool for i.MX 6Dual/6Quad, i.MX 6Solo/6DualLite, i.MX 6SoloX and i.MX 6SoloLite in android\_L5.0.0\_1.0.0-ga\_tools.tar.gz. The MFGTool is mfgtools.tar.gz.

### NOTE

The MFGTool only works in Windows OS environment.

Perform the following steps to download the board images:

1. Unzip the mfgtools.tar.gz file to a selected location. The directory is named MFGTool-Dir in this example.
2. If the directory does not exist, create the "android/evk" directory under the MFGTool-Dir/Profiles/Linux/OS Firmware/ files path.

## Working with the i.MX 6 SoloLite EVK Board

- Copy following files from release\_package/android\_L5.0.0\_1.0.0-ga\_core\_image\_6slevk.tar.gz to your MFGTool-Dir/Profiles/Linux/OS Firmware/files/android/evk directory.
  - u-boot-imx6sl.imx
  - SD/boot-imx6sl.img
  - SD/system.img
  - SD/recovery-imx6sl.img

### NOTE

Do not replace other files in files directory and OS firmware directory.

- Change the i.MX 6SoloLite-EVK board's S1 (boot mode) to 10 (from 1-2 bit) to enter download mode.
- Power on the board. Use USB cable on the i.MX 6SoloLite-EVK board OTG port, and connect a computer running Windows OS with the i.MX 6SoloLite-EVK board.

### NOTE

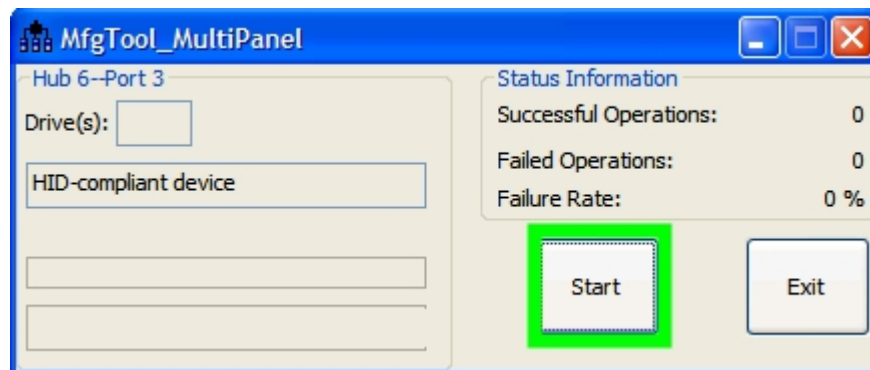
There are two USB micro ports in i.MX 6SoloLite-EVK board: USB to UART, USB OTG. The USB to UART can be referenced as debug UART, and the USB OTG can be referenced as USB in the hardware image above. The debug UART can be used to watch the log of the hardware boot processing.

- Double click the \*.vbs file according to the target device as shown in the following table.

**Table 5. MFGTool VBS file**

Target device and boot storage	VBS file
i.MX 6SoloLite EVK SD	mfgtool2-android-mx6sl-evk-sd.vbs

- Click Start to start downloading images.



**Figure 12. Starting download**

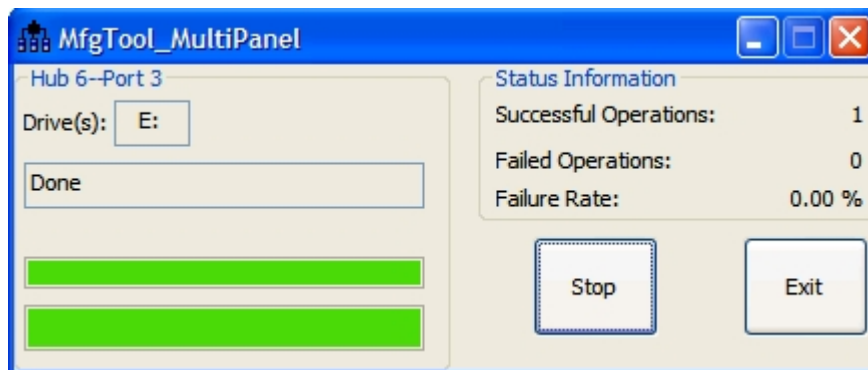
The figure below shows the downloading in progress where the status bar shows the download status. The download may take one to two minutes depending on the host machine.





**Figure 13. Download status**

The figure below shows the tool when the download is complete.



**Figure 14. Download complete**

8. Click Stop and disconnect the USB cable.
9. Change S1 (boot mode) to 01 (from 1-2 bit). Change "Boot Switch(SW3,4,5)" to 01000000(from 1bit-8bit) 00101100(from 1bit-8bit) 00000000(from 1bit-8bit) to switch the board back to SD1 boot mode.

## 5.4 Booting with single display: LCD display

When the Android system image is programmed and the Boot Switch(es) is configured, the system is ready to be powered on.

In the U-Boot prompt, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd booti mmc1
U-Boot > setenv bootargs console=ttymx0,115200 init=/init androidboot.console=ttymx0
consoleblank=0 androidboot.hardware=freescale
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd booti mmc1
U-Boot > setenv bootargs console=ttymx0,115200 init=/init androidboot.console=ttymx0
consoleblank=0 androidboot.hardware=freescale androidboot.selinux=disabled
androidboot.dm_verity=disabled
U-Boot > saveenv
```

## 5.5 Board reboot

After you have completed download and setup, reboot the board and wait for the Android platform to boot up.



Figure 15. Android Lollipop image

## 6 Working with the i.MX 6SoloX SABRE-SD Board

### 6.1 Board hardware

The figure below shows the different components of the i.MX 6SoloX SABRE-SD board.

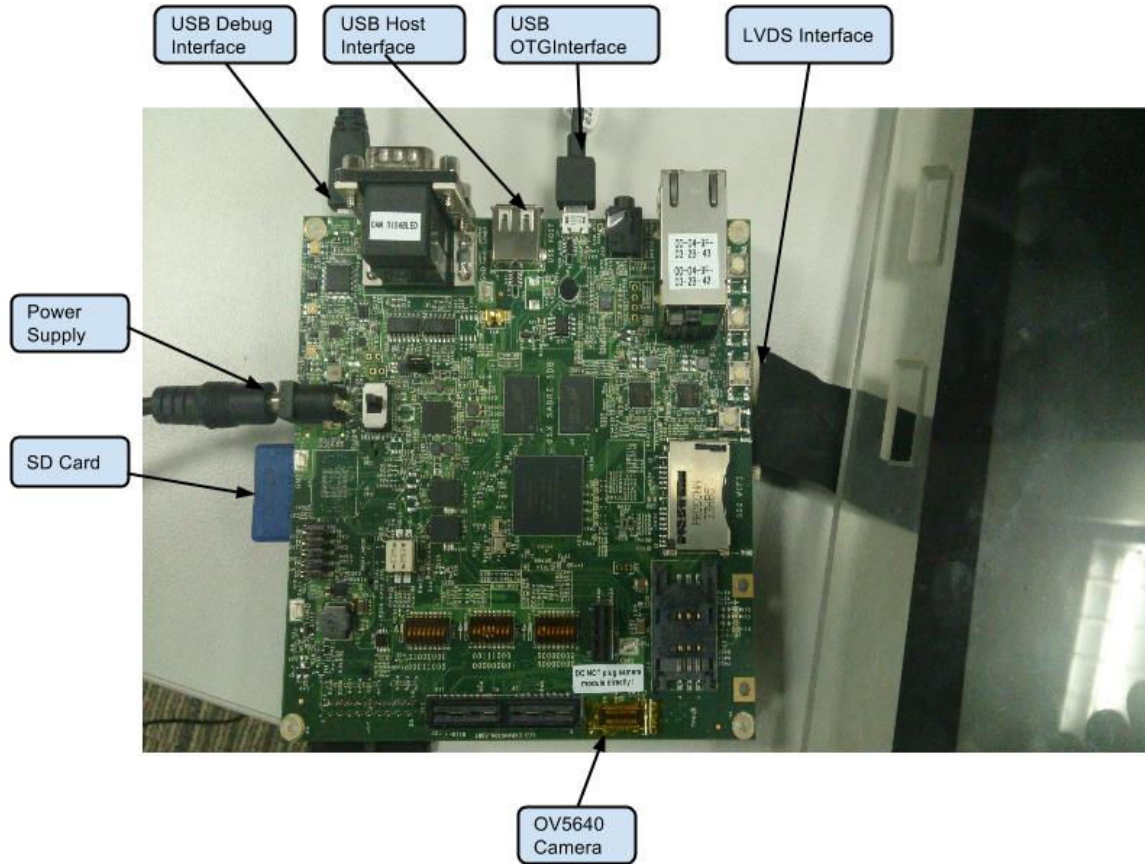


Figure 16. i.MX 6SoloX SABRE-SD board

## 6.2 Board images

The table below describes the location in the board partitions of the software images in android\_L5.0.0\_1.0.0-ga\_core\_image\_6slevk.tar.gz on board partitions.

Table 6. Board images

Image name	Path in release package	Download target
u-boot-imx6sx.imx	\	SD first 8 MB block
boot-imx6sx.img	\SD	SD 1st partition
recovery-imx6sx.img	\SD	SD 2nd partition
system.img	\SD	SD 5th partition

### 6.3 Downloading board images

The board images can be downloaded to the target board by using the MFGTool. The release package includes MFGTool for i.MX 6Dual/6Quad, i.MX 6Solo/6DualLite, i.MX 6SoloX and i.MX 6SoloLite in android\_L5.0.0\_1.0.0-ga\_tools.tar.gz. The MFGTool is mfgtools.tar.gz.

**NOTE**

The MFGTool only works in Windows OS environment.

Perform the following steps to download the board images:

1. Unzip the mfgtools.tar.gz file to a selected location. The directory is named MFGTool-Dir in this example.
2. If the directory does not exist, create the "android/sabresd" directory under the MFGTool-Dir/Profiles/Linux/OS Firmware/files path.
3. Copy following files from release\_package/image/sabresd\_6sx to your MFGTool-Dir/Profiles/Linux/OS Firmware/files/android/sabresd path.
  - u-boot-imx6sx.imx
  - SD/boot-imx6sx.img
  - SD/system.img
  - SD/recovery-imx6sx.img

**NOTE**

Do not replace other files in files directory and OS firmware directory.

4. Change the the i.MX SoloX SABRE-SD board's S1 (boot mode) to 10 (from 1-2 bit) to enter download mode.
5. Power on the board. Use the USB cable on the OTG port of the i.MX SoloX SABRE-SD board, and connect a computer running Windows OS with the i.MX SoloX SABRE-SD board.

**NOTE**

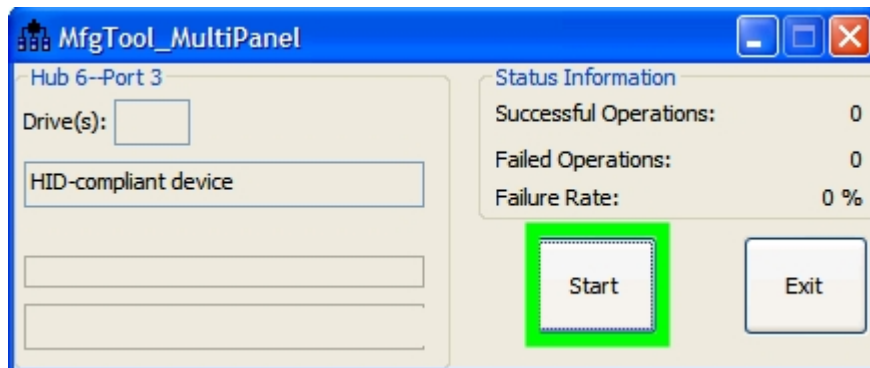
There are two USB micro ports on the i.MX SoloX SABRE-SD board: USB to UART, USB OTG. The USB to UART can be referenced as debug UART, and the USB OTG can be referenced as USB in the hardware image above. The debug UART can be used to watch the log of the hardware boot processing.

6. Double click the \*.vbs file according to the target device as shown in the following table.

**Table 7. MFGTool VBS file**

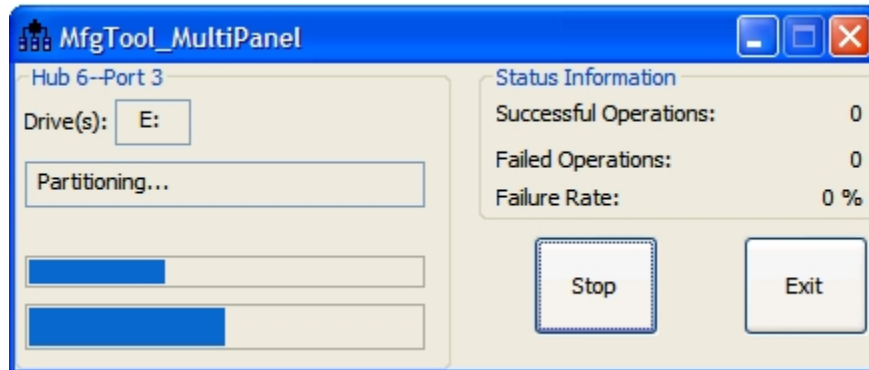
Target device and boot storage	VBS file
i.MX SoloX SABRE-SD SD	mfgtool2-android-mx6sx-sabresd-sdcard.vbs

7. Click Start to start downloading images.



**Figure 17. Starting download**

The figure below shows the downloading in progress where the status bar shows the download status. The download may take one to two minutes depending on the host machine.



**Figure 18. Download status**

The figure below shows the tool when the download is complete.



**Figure 19. Download complete**

8. Click Stop and disconnect the USB cable.
9. Change S1 (boot mode) to 01 (from 1-2 bit). Change "Boot Switch (SW10,11,12)" to 00000000 (from 1bit-8bit), 00111000 (from 1bit-8bit), 01000000 (from 1bit-8bit) to switch the board back to SD4 boot mode.

## 6.4 Booting with single display: LVDS display

When the Android system image is programmed and the Boot Switch(es) is configured, the system is ready to be powered on.

In the U-Boot prompt, set the U-Boot environment variables as shown below:

```
U-Boot > setenv bootcmd booti mmc2
U-Boot > setenv bootargs console=ttyMxc0,115200 init=/init androidboot.console=ttyMxc0
consoleblank=0 androidboot.hardware=freescale vmalloc=400M cma=384M
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

## Working with the i.MX 6SoloX SABRE-AI Board

```
U-Boot > setenv bootcmd booti mmc2
U-Boot > setenv bootargs console=ttyMXC0,115200 init=/init androidboot.console=ttyMXC0
consoleblank=0 androidboot.hardware=freescale vmalloc=400M cma=384M
androidboot.selinux=disabled androidboot.dm_verity=disabled
U-Boot > saveenv
```

## 6.5 Board reboot

After you have completed download and setup, reboot the board and wait for the Android platform to boot up.



Figure 20. Android Lollipop image

## 7 Working with the i.MX 6SoloX SABRE-AI Board

### 7.1 Board hardware

The figure below shows the different components of the i.MX 6SoloX SABRE-AI board.

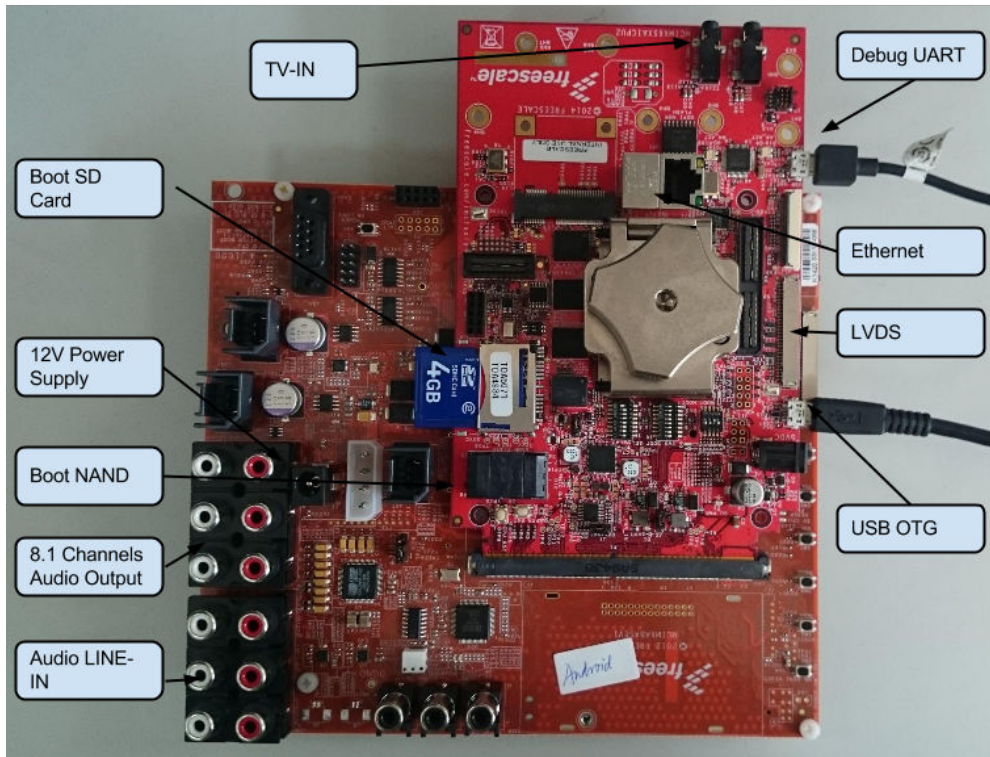


Figure 21. i.MX 6SoloX SABRE-AI board

## 7.2 Board images

The table below describes the location in the board partitions of the SD card and NAND images in `android_L5.0.0_1.0.0-ga_full_image_6sxqsabreauto.tar.gz`.

Table 8. Board images

Image name	Path in release package	Download target
<code>u-boot-imx6sx.imx</code>	<code>\</code>	SD first 8 MB block
<code>boot-imx6sx.img</code>	<code>\SD</code>	SD 1st partition
<code>recovery-imx6sx.img</code>	<code>\SD</code>	SD 2nd partition
<code>system.img</code>	<code>\SD</code>	SD 5th partition
<code>u-boot-imx6sx-nand.i mx</code>	<code>\</code>	NAND 1st 64 MB MTD partition
<code>boot-imx6sx.img</code>	<code>\NAND</code>	NAND 2nd 16 MB MTD partition
<code>recovery-imx6sx.img</code>	<code>\NAND</code>	NAND 3rd 16 MB MTD partition
<code>android_root.img</code>	<code>\NAND</code>	UBIFS volume for 4th MTD partition

### 7.3 Downloading board images

The board images can be downloaded to the target board by using the MFGTool. The release package includes MFGTool for i.MX 6Dual/6Quad, i.MX 6Solo/6DualLite, i.MX 6SoloX and i.MX 6SoloLite in android\_L5.0.0\_1.0.0-ga\_tools.tar.gz. The MFGTool is mfgtools.tar.gz.

**NOTE**

The MFGTool only works in the Windows OS environment.

Perform the following steps to download the board images:

1. Unzip the mfgtools.tar.gz file to a selected location. The directory is named MFGTool-Dir in this example.
2. If the directory does not exist, create the "android/sabreauto" directory under the MFGTool-Dir/Profiles/Linux/OS Firmware/files path.
3. Copy following files from either release\_package/android\_L5.0.0\_1.0.0-ga\_core\_image\_6sxsabreaseauto.tar.gz or release\_package/android\_L5.0.0\_1.0.0-ga\_full\_image\_6sxsabeauto.tar.gz to the MFGTool-Dir/Profiles/Linux/OS Firmware/files/android/sabreauto path.
  - u-boot-imx6sx.imx
  - SD/boot-imx6sx.img
  - SD/system.img
  - SD/recovery-imx6sx.img

**NOTE**

- Do not replace other files in files directory and OS firmware directory.
- When the NAND boot is used, the files are in the “nand” folder, and you can use android\_root.img instead system.img. The bootloader should be u-boot-imx6sx-nand.imx. Change S3,S4 to 00000000, 00000001.
- Change the SABRE-AI S1 (boot mode) to 0101 (from 1-4 bit) to enter download mode. Change SW3,SW4 (boot configuration) to 00001100, 01000010 to boot from SD.

4. Power on the board. Use the USB cable on the OTG port of the i.MX SoloX SABRE-AI board, and connect your Windows OS computer with the i.MX SoloX SABRE-AI board.

**NOTE**

The USB micro port on the SABRE-AI board is J10.

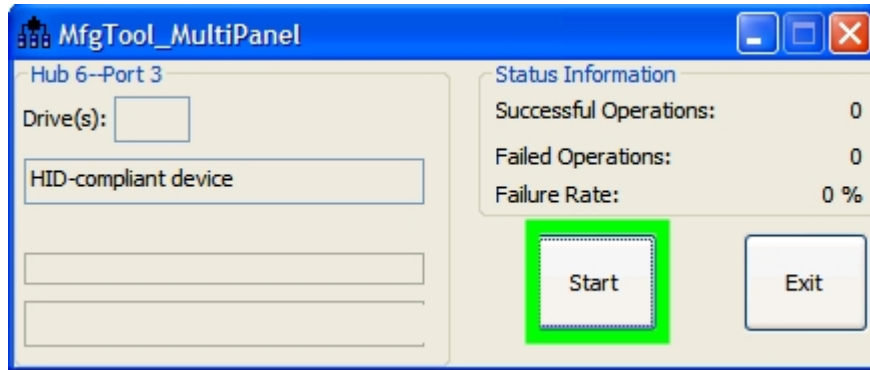
5. Double click the \*.vbs file according to the target device as shown in the following table.

**Table 9. MFGTool VBS file**

Target device and boot storage	VBS file
i.MX SoloX SABRE-AI SD	mfgtool2-android-mx6sx-sabreauto-sdcard.vbs
i.MX 6SoloX SABRE-AI NAND	mfgtool2-android-mx6sx-sabreauto-nand.vbs

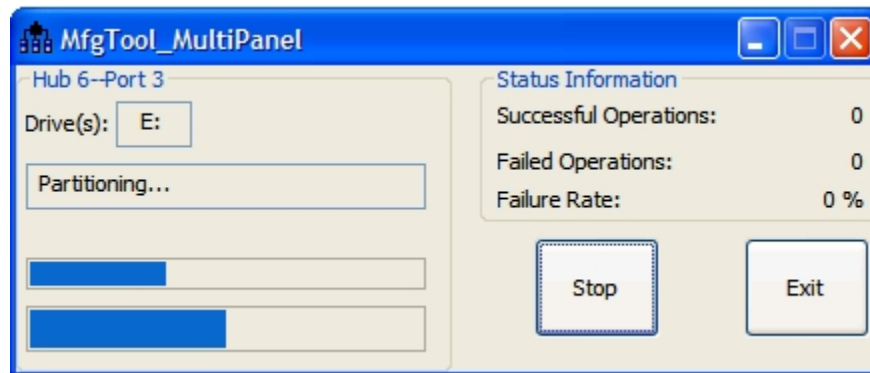
6. Click Start to start downloading images.





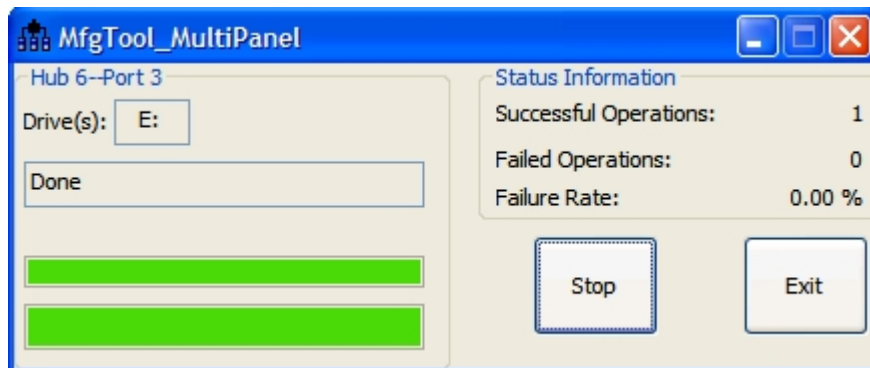
**Figure 22. Starting download**

The figure below shows the downloading in progress where the status bar shows the download status. The download may take one to two minutes depending on the host machine.



**Figure 23. Download status**

The figure below shows the tool when the download is complete.



**Figure 24. Download complete**

7. Click Stop and disconnect the USB cable.
8. Change "Boot Switch(S1)" to 0010 (1-4 bit) to switch the board back to SD boot mode. Change the board boot switch to (S1, SW3,SW4) 0010, 00000000,00100001 (from 1bit) to boot from NAND.

## 7.4 Booting with single display: LVDS display

When the Android system image is programmed and the Boot Switch(es) is configured, the system is ready to be powered on.

## Working with the i.MX 6SoloX SABRE-AI Board

There are two LVDS ports on the SABRE-AI board, LVDS0, and LVDS1. LVDS0 is taken as the primary display in this release. The LVDS0 port is on the CPU board. The LVDS1 is on the base board.

To boot from SD, set the U-Boot environment variables as follows

```
U-Boot > setenv bootcmd booti mmc0
U-Boot > setenv bootargs console=ttyMXC0,115200 init=/init androidboot.console=ttyMXC0
consoleblank=0 androidboot.hardware=freescale vmalloc=400M cma=512M
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd booti mmc0
U-Boot > setenv bootargs console=ttyMXC0,115200 init=/init androidboot.console=ttyMXC0
consoleblank=0 androidboot.hardware=freescale vmalloc=400M cma=512M
androidboot.selinux=disabled androidboot.dm_verity=disabled
U-Boot > saveenv
```

To boot from NAND, set the U-Boot environment variables as follows:

```
U-Boot > setenv bootcmd 'nand read 0x80800000 0x4000000 0x1000000;booti0x80800000'
U-Boot > setenv bootargs console=ttyMXC0,115200 init=/init video=mxcfb0:dev=ldb,bpp=32
video=mxcfb1:off video=mxcfb2:off video=mxcfb3:off vmalloc=400M cma=512M
androidboot.console=ttyMXC0 consoleblank=0 androidboot.hardware=freescale mtdparts=gpmi-nand:
64m(bootloader),16m(bootimg),16m(recovery),-(root) ubi.mtd=5
U-Boot > saveenv
```

With above settings, the Android platform does not start the shell console. It enables the default Android selinux and dm\_verity security features, which restrict users to change the system and detect the system's information. To avoid this, "androidboot.selinux=disabled" and "androidboot.dm\_verity=disabled" need to be appended to the U-Boot's bootargs. Boot environment variables are as follows:

```
U-Boot > setenv bootcmd 'nand read 0x80800000 0x4000000 0x1000000;booti0x80800000'
U-Boot > setenv bootargs console=ttyMXC0,115200 init=/init video=mxcfb0:dev=ldb,bpp=32
video=mxcfb1:off video=mxcfb2:off video=mxcfb3:off vmalloc=400M cma=512M
androidboot.console=ttyMXC0 consoleblank=0 androidboot.hardware=freescale mtdparts=gpmi-
nand: 64m(bootloader),16m(bootimg),16m(recovery),-(root) ubi.mtd=5
androidboot.selinux=disabled androidboot.dm_verity=disabled
U-Boot > saveenv
```

## 7.5 Board reboot

After you have completed download and setup, reboot the board and wait for the Android platform to boot up.



**Figure 25. Android Lollipop image**

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