



DEVELOPMENT GUIDE

VAB-820

Android BSP v5.0.6



Copyright

Copyright © 2017 VIA Technologies Incorporated. All rights reserved.

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise without the prior written permission of VIA Technologies, Incorporated.

Trademarks

All brands, product names, company names, trademarks and service marks are the property of their respective holders.

Disclaimer

VIA Technologies makes no warranties, implied or otherwise, in regard to this document and to the products described in this document. The information provided in this document is believed to be accurate and reliable as of the publication date of this document. However, VIA Technologies assumes no responsibility for the use or misuse of the information (including use or connection of extra device/equipment/add-on card) in this document and for any patent infringements that may arise from the use of this document. The information and product specifications within this document are subject to change at any time, without notice and without obligation to notify any person of such change.

VIA Technologies, Inc. reserves the right to make changes to the products described in this manual at any time without prior notice.



Revision History

Version	Date	Remarks
1.00	08/02/2017	Initial release
1.01	08/11/2017	Added Smart ETK Programming Guide Updated section 1.1 heading name



Table of Contents

1. Introduction	1
1.1. BSP Package Contents.....	1
1.1.1. Source Code Folder Contents	1
1.1.2. Firmware Folder Contents.....	1
1.1.3. Document Folder Contents	2
1.1.4. Tool Folder Contents.....	2
1.2. Version Information and Supported Features	3
2. Build Environment Setup	4
2.1. Configuring Linux Host Machine	4
3. Image Build	5
3.1. Extracting the VAB-820 BSP	5
3.2. Downloading the Source Code of Android 6.0.1	5
3.3. Installing the Source Code Patch.....	5
3.4. Building the Android Image.....	5

1. Introduction

This Development Guide explains how to build an Android system image for the VAB-820 board in order to begin evaluating the platform.

The VAB-820 Android BSP v5.0.6 is developed based on the NXP android_M6.0.1_1.0.0-ga (Android 6.0 Marshmallow) and enables hardware features that are defined on the VAB-820 board.

1.1. BSP Package Contents

There are four folders in the package as listed below.

Source code folder	Description
VAB-820_Android_source_code_patch.zip	Android source code patch files and Image building script files
Smart_ETK_v1.0_SourceCode.zip	Smart ETK demo program source code
Firmware folder	Description
Images_autoinstall_sd.zip	Android EVK system image and installation script files
Document folder	Description
VAB-820_Android_EVK_v5.0.6_Quick_Start_Guide_v1.01_20170811.pdf	Quick Start Guide
VAB-820_Android_BSP_v5.0.6_Development_Guide_v1.01_20170811.pdf	Development Guide
Smart_ETK_SDK_Programming_Guide_v1.0_20170811.pdf	Smart ETK SDK Programming Guide
Tool folder	Description
VAB-820_Smart_ETK_Demo_v1.0.apk	Smart ETK demo program
BluetoothSPPTest.apk	Bluetooth SPP testing program

VAB-820 Android BSP contents

1.1.1. Source Code Folder Contents

VAB-820_Android_source_code_patch.zip: Includes NXP Android patch file android_M6.0.1_1.0.0-ga_core_source.tar.gz, the VAB-820 Android source code patch file and Image building script files.

Smart_ETK_v1.0_SourceCode.zip: is the Smart ETK demo program source code.

1.1.2. Firmware Folder Contents

Images_autoinstall_sd.zip: The Android EVK system image and installation script files.

1.1.3. Document Folder Contents

VAB-820_Android_EVK_v5.0.6_Quick_Start_Guide_v1.01_20170811.pdf: The Quick Start Guide provides an overview on how to boot the Android EVK system image on the VAB-820 board and configure the supported hardware functions in the build.

VAB-820_Android_BSP_v5.0.6_Development_Guide_v1.01_20170811.pdf: This Development Guide explains how to build the Android system image for the VAB-820 board in order to begin evaluating the platform.

Smart_ETK_SDK_Programming_Guide_v1.0_20170811.pdf: The Smart ETK Programming Guide explains how to utilize the Smart ETK APIs for your program development.

1.1.4. Tool Folder Contents

VAB-820_Smart_ETK_Demo_v1.0.apk: is the Smart ETK demo program.

BluetoothSPPTest.apk: is the Bluetooth SPP profile test program.

1.2. Version Information and Supported Features

- U-Boot version: 2015.04
- Kernel version: 3.14.52
- Evaluation image: Android Marshmallow 6.0
- Development based on NXP android_M6.0.1_1.0.0-ga (Android 6.0 Marshmallow)
- Supports SPI with eMMC boot
- Supports HDMI display
- Supports AUO LVDS capacitive touch panels (through USB interface)
 - AUO 10.4" G104XVN01.0 (1024×768)
 - AUO 7" G070VW01 (800×480)
- Supports HDMI audio output
- Supports Dual Display (Clone Mode)
- Supports CVBS & S-Video
- Supports COM1 DTE mode, COM2 TX/RX only
- Supports 2 FlexCAN TX/RX
- Supports Gigabit Ethernet
- Supports Line-in, Line-out, Mic-in
- Supports VNT9271 USB Wi-Fi dongle
- Supports EMIO-1533 USB Wi-Fi module
- Supports EMIO-1541 miniPCIe Wi-Fi module
- Supports EMIO-2531 miniPCIe Wi-Fi & Bluetooth module
 - Supports Bluetooth A2DP and SPP profile
- Supports EMIO-5531 USB Wi-Fi & Bluetooth module
 - Supports Bluetooth A2DP and SPP profile
- Supports EMIO-2550 miniPCIe Mobile Broadband module
- Supports Smart ETK v1.0: Watchdog Timer, GPIO, UART, and FlexCAN
- Supports OTA (Over-The-Air technology)
- Supports shutdown option in Quick Settings
- Supports Ethernet configuration in Settings

2. Build Environment Setup

This section guides you through setting up the build environment for development. All instructions are based on using Ubuntu 14.04 LTS.

To make sure that the build process completes successfully, we recommend at least 120GB of disk space and 15GB of combined memory and swap space on the host machine.

2.1. Configuring Linux Host Machine

The following packages are required for the Android development environment. The required packages can be installed using the commands below. To get more information, please visit Google Android website at <http://source.android.com/source/initializing.html>.

OpenJDK 7 is not included in the Ubuntu 14.04 default installation. The first step is to add a new server manually by use the following command:

```
$ sudo add-apt-repository ppa:webupd8team/java
$ sudo apt-get update
```

To install the OpenJDK 7, use the following command:

```
$ sudo apt-get install openjdk-7-jre
$ sudo apt-get install openjdk-7-jdk
```

The following packages are required for the Android development environment. To install the required packages on the Ubuntu 14.04, use the following command:

```
$ sudo apt-get install git gnupg flex bison gperf build-essential zip curl zlib1g-dev libc6-dev libncurses5-dev x11proto-core-dev libx11-dev:i386 libreadline6-dev:i386 libgl1-mesa-glx:i386 libgl1-mesa-dev g++-multilib mingw32 tofrodos python-markdown libxml2-utils xsltproc zlib1g-dev:i386 uuid-dev liblzo2-dev libz-dev libc6-dev-i386 lib32z1
```


3. Image Build

This section explains how to build the U-Boot binary and Android file system for the VAB-820 board.

3.1. Extracting the VAB-820 BSP

Use the following command to extract the contents of the BSP.

```
$ unzip VAB-820_Android_source_code_patch.zip
```

3.2. Downloading the Source Code of Android 6.0.1

Downloading the Android 6.0.1 source code to the BSP/src folder can take several hours depending on your internet connection.

Use the following commands to download the source code of Android 6.0.1:

```
$ cd Script
$ ./download_source_Android6.0.sh
```

3.3. Installing the Source Code Patch

Use the following commands to install the NXP and VAB-820 source code patch:

```
$ ./patch_fsl_via.sh
```

3.4. Building the Android Image

Use the following commands to build the Android image, the compiling process will take several hours.

```
$ cd ../src
$ source build/envsetup.sh
$ lunch vab820-userdebug
$ make -j8
```

After the compilation, the `src/out/target/product/vab820/` directory will contain the resulting binaries, as shown in the table below.

Binary	Description
u-boot.imx	U-Boot boot loader for iMX6Q
bspinst-vab820.img	BSP auto install image for iMX6Q
bspinst-vab820-6qp.img	BSP auto install image for iMX6QP
boot-vab820.img	Kernel for iMX6Q
boot-vab820-6qp.img	Kernel for iMX6QP
system.img	Android system image
recovery-vab820.img	Recovery image for iMX6Q
recovery-vab820-6qp.img	Recovery image for iMX6QP

Binary files generated



Taiwan Headquarters

1F, 531 Zhong-zheng Road,
Xindian Dist., New Taipei City 231
Taiwan

Tel: 886-2-2218-5452
Fax: 886-2-2218-9860
Email: embedded@via.com.tw



USA

940 Mission Court
Fremont, CA 94539,
USA

Tel: 1-510-687-4688
Fax: 1-510-687-4654
Email: embedded@viatech.com



Japan

3-15-7 Ebisu MT Bldg. 6F,
Higashi, Shibuya-ku
Tokyo 150-0011
Japan

Tel: 81-3-5466-1637
Fax: 81-3-5466-1638
Email: embedded@viatech.co.jp



China

Tsinghua Science Park Bldg. 7
No. 1 Zongguancun East Road,
Haidian Dist., Beijing, 100084
China

Tel: 86-10-59852288
Fax: 86-10-59852299
Email: embedded@viatech.com.cn



Europe

Email: embedded@via-tech.eu