EVALUATION GUIDE V1.0

# DS2-2GRam Android BSP

## V2.2.2

1.0-05192015-172600

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# Revision History

| Version | Date | Remarks |
|---|---|---|
| 1.0 | 2015/5/19 | Release for DS2-2GRam v2.2.2 Android BSP |

# Table of Contents

# 1. Introduction

## 1.1. Overview

This Evaluation Guide provides a practical introduction for the VIA Android™ DS2-2GRAM platform. The documentation mainly helps the user to understand the DS2-2GRAM platform and it provides qualified Android firmware image for system product.

## 1.2. Package Content

This BSP package includes three parts:

**BSP:** BSP source code. The source code package is composed of U-boot source code, Linux Kernel source code and Android source code.

**EVK:** Includes the Android evaluation image and the tools.

**Documents:** Includes evaluation guide, development guide (this document) and any other documents required for development.

# 2. Making System Booting Media

DS2-2GRAM can be booted through SD-Card. This Chapter will describe how to construct the System Booting Media for DS2-2GRAM Android OS.

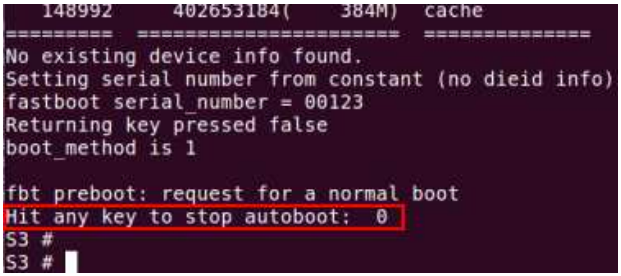
## 2.1. Update DS2-2GRam System Firmware

The DS2-2GRAM System Firmware (including E-Loader and U-Boot) can be updated through the "Update Image" in the EVK Folder of BSP. Please copy the "vbspinst_emmc.tgz" and decompress the files to the Root Folder of the EXT2-Formatted SD-Card, the system will flush the Update Firmware to SPI ROM of DS2-2GRAM Platform automatically.

Note: Please DO NOT put the SD-Card with "Update Image" into the system if you don't need to update the System Firmware.

## 2.2. Booting System to U-Boot Shell Environment

DS2-2GRAM supports SD-Card and EMMC Booting. To select the Boot Path, the related Boot-Scripts should be loaded to Memory in U-Boot Stage. To boot the system in U-Boot Shell Environment, please press any key during the Auto-Boot Count-Down Message shown up in Console:




Please refer Chapter 4 for more details of Debugging in U-Boot Environment.

## 2.3. Constructing the Bootable Media

### 2.3.1. Flashing bootloader

A. Preparation:

(1) EXT2-formatted SD-Card (<<SD-Card_DIR>>: SD-Card Root Directory)

(2) Update-Package for Auto-Update Mechanism (refer to Document "Elite1000_Auto-Update_Tool_User_Guide_v1.3.pdf")

(3) Update Package for bootloader (vbspinst_emmc_bootloader.tgz)

B. Construction Steps: (Make sure SD-Card is cleaned before following steps)

```
tar zxvf vbspinst_emmc_bootloader.tgz  – C <<SD-CARD_DIR>>
```

Note:

After you construct your bootable media. Your SD-Card should includes the compenent as follows.

| |
|---|
| **Binary:** uboot.bin, e-loader.bin, timing_table.bin |
| **Uboot scripts:** scriptcmd, other_env.uimg |
| **Bootloader flashing scripts:** bootloader_setup.uimg |

### 2.3.2. EMMC Booting

A. Preparation:

(1) EXT2-formatted SD-Card (<<SD-Card_DIR>>: SD-Card Root Directory)

(2) Update-Package for Auto-Update Mechanism (refer to Document "Elite1000_Auto-Update_Tool_User_Guide_v1.3.pdf")

(3) Update Package for Android Image (vbspinst_emmc_android_4_3_img.tgz)

B. Construction Steps: (Make sure SD-Card is cleaned before following steps)

```
tar zxvf vbspinst_emmc_android_4_3.img.tgz  - C <<SD-CARD_DIR>>
```

Note:

After you construct your bootable media. Your SD-Card should includes the compenent as follows.

**Android Image:** boot.img, system.img, cache.img, userdata.img, recovery.img, elite1000-emmc.dtb

**Uboot scripts:** scriptcmd, other_env.uimg

**Android Image Installation scripts:** img_setup.uimg

# 2.4. Booting Android OS

## 2.4.1. Auto-Flash the bootloader

A. Preparation:

(1) EXT2-formatted SD-Card

(2) Update Package for bootloader (vbspinst_emmc_bootloader.tgz)

B. Installation Steps:

Step1. Format the SD Card to EXT2-format. (See Appendix C Formatting SD-Card Part)

Step2. Extract the compress file into SD card

```
tar zxvf vbspinst_emmc_bootloader.tgz  - C <<SD-CARD_DIR>>
```

Step3. Eject SD card from PC side.

Step4. Insert SD card to VT6080 platform which is connected with HDMI monitor and boot the MB.

Step5. Wait until the Console shows "BSP updated done!! PLEASE REBOOT SYSTEM!!"

(Please power-off system manually)

### 2.4.2. EMMC Booting

A. Preparation:

(1) EXT2-formatted SD-Card

(2) Update Package for Android Image (vbspinst_emmc_android_4_3.img.tgz)

B. Installation Steps:

Step1. Create Bootable SD Card

```
tar zxvf vbspinst_emmc_emmc_android_4_3_img.tgz  - C <<SD-CARD_DIR>>
```

Step2. Eject SD Card from PC Side

Step3. Insert the Installation SD-Card in SD0 Slot

Step4. Power-on and boot System

Step5. Wait until the Console shows "BSP updated done!! PLEASE REBOOT SYSTEM!!"

(Please power-off system manually)

Step6. Power off the system and remove the Installation SD-Card

Step7. Power on the system and it should boot to target Android OS

# 3. Functionality

DS2-2GRAM is designed with enhanced features including Programmable GPIO. These Functions can be controlled in SmartETK Tool under Android Environment. For more details of SmartETK, please refer to "API-ref.pdf" in the "Doc" Folder of BSP.

# 4. Debug Message

## 4.1. U-Boot Environment

DS2-2GRAM Platform can stop booting to enter U-Boot environment. The u-boot will initiate hardware at an earlier stage by specific parameters.

1. Connect debug port.

   Use terminal application on PC site



Comm speed: 115200
Comm parity: None
Comm data: 8
Comm stopbits:1

2. Enter U-Boot.

The u-boot will wait 3 seconds to stop booting after power on by pressing any key. When booting is stopped, that prompt sign "**S3 #**" will show up on terminal screen.

U-Boot is like a tiny operation system that has its own commands. Here it describes some important commands and parameters.

## 4.2. U-Boot Parameters Example

- Print online help

```
S3 # help
```

- Save changed parameters

```
S3 # saveenv
```

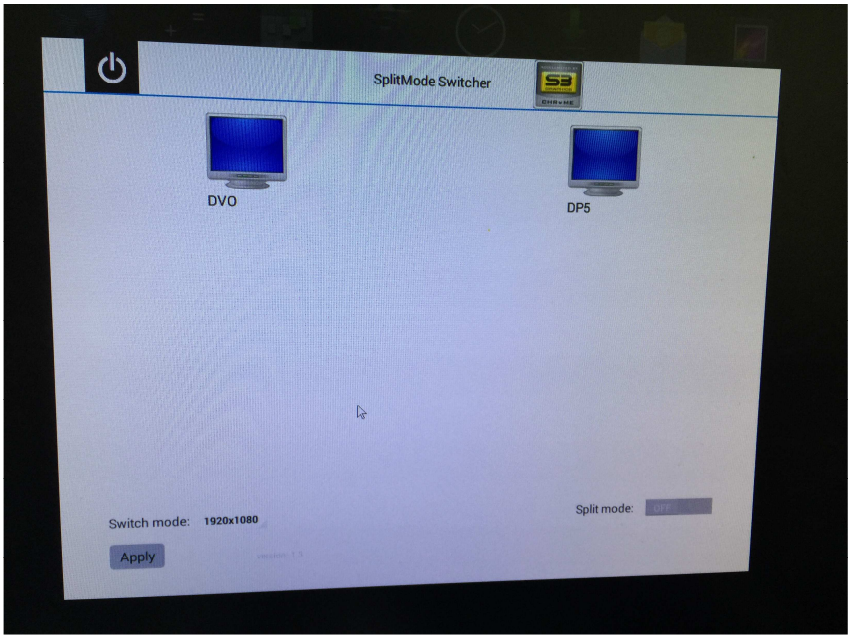
# 5. Change Display Mode

The display modes on DS2-2GRam platform are Normal Clone Mode and Extension Mode. The default mode is Normal Mode. If users want to enable the Extension Mode, please refer to the following steps to enable it.

## 5.1. Display Setting

The display mode can be changed through our sample ap behavior. Please get the sample ap "SplitModeSwitcher_4.3_v1.3.apk" from the Test_Tool Folder which is located in EVK Folder of BSP. After that, please install SpliteModeSwither application in your DS2 platfrom.

## 5.2. Display Setting Example



# Appendix A: Definitions

| | |
|---|---|
| **Android** | Android is a trademark of Google Inc. |
| **ARM** | ARM is a trademark of ARM Inc. |
| **BSP** | Board Support Package |
| **HDMI** | High Definition Multimedia Interface |
| **SD** | Secure Digital Multimedia Card |
| **DS2-2GRAM** | The Target Product Name |
| **VIA** | VIA Technologies, Inc. |

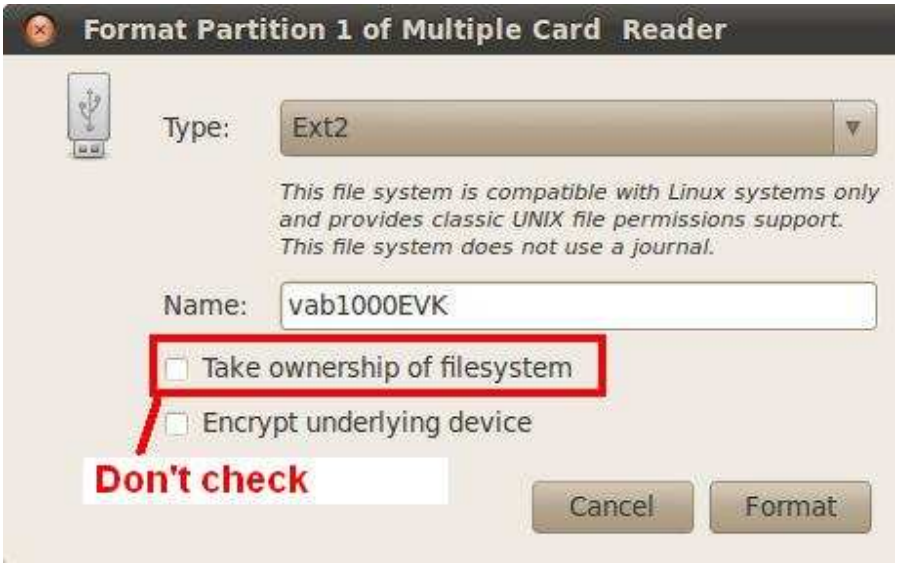
# Appendix B: EVK Reference Name

| EVK Component | EVK Reference Name |
|---|---|
| Version | 2.2.2 |
| Update Image | 52.02.02d.c1_vbspinst_emmc.tgz |

# Appendix C: Notification

## 1. Formatting SD-Card

If you format the SD-Card with <Ubuntu Disk Utility> program. You need to notice that options-Take ownership of filesystem cannot be chosen as Figure shows.



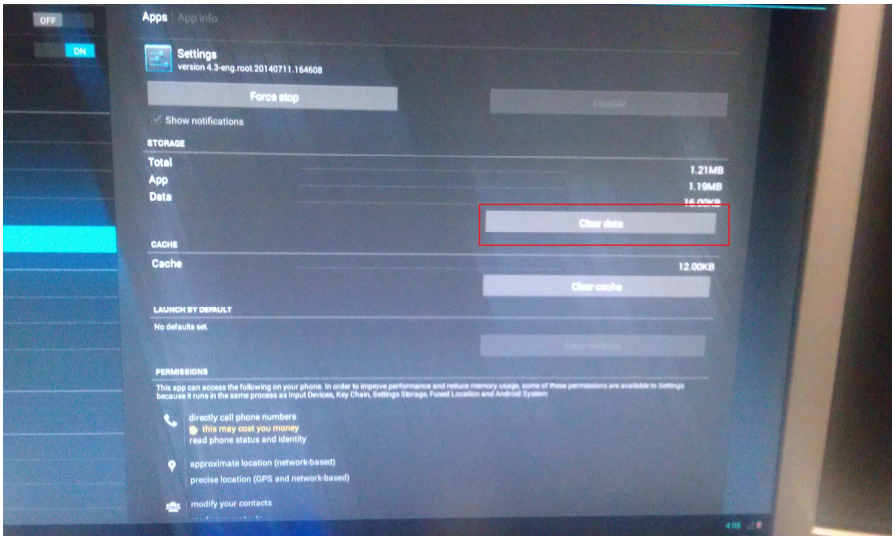

## 2. Development Option

Developer option is hidden by default on Android 4.3. If you want to enable the development option, you need follow the following procedure.

1. Run the setting application
2. Select the About phone option
3. tap build number several times
4. Development Option will show up

Also, if you want to re-hidden the Development Option, you can clear the setting data to re-hidden Development Option.

1. Run the Setting application
2. Select app option
3. Select the setting application
4. Enable the clear data option



# 3. ADB function

We close the ADB TCP function because of the security issue. To enable the ADB function, users need to enable the Development Options first. After that, users can see the "Start TCP ADB "option in Section Debugging. Users can choose if ADB function is enabled or not.