This publication contains proprietary information that is protected by copyright. No part of this publication can be reproduced, transcribed, stored in a retrieval system, translated into any language or computer language, or transmitted in any form whatsoever without the prior written consent of the publisher, American Megatrends, Inc.

All trademarks and trade names used in this document refer to either the entities claiming the marks and names or their products. American Megatrends, Inc. disclaims any proprietary interest in trademarks and trade names other than its own.

For Additional Information
Call American Megatrends BIOS Sales Department at 1-800-828-9264 for additional information.

Limitations of Liability
In no event shall American Megatrends be held liable for any loss, expenses, or damages of any kind whatsoever, whether direct, indirect, incidental, or consequential, arising from the design or use of this product or the support materials provided with the product.

Limited Warranty
No warranties are made, either expressed or implied, with regard to the contents of this work, its merchantability, or fitness for a particular use. American Megatrends assumes no responsibility for errors and omissions or for the uses made of the material contained herein or reader decisions based on such use.

Trademark and Copyright Acknowledgments
All product names used in this publication are for identification purposes only and are trademarks of their respective Companies. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Intel is a trademark of Intel Corporation in the U.S. and other countries.

Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Rev</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-02-19</td>
<td>1.0</td>
<td>Initial version</td>
</tr>
</tbody>
</table>
Introduction

This document outlines the details on how to update the SPI flash part on the APM Mustang and Merlin reference platforms from the default BIOS to AMI’s Aptio V BIOS. This overview includes details on preparing the recovery media, preparing the USB key, configuring the platform to force a recovery, steps to boot the system, and the method to upgrade the BIOS flash image.

Requirements

In order for the SPI flash part to be updated, the following items are necessary:
1. Booting Linux system
2. SD card
3. Linux system with SD slot or USB SD card reader
4. USB key
5. Aptio V BIOS image to be updated
6. AMI’s SSI Firmware Update Utility for UEFI Shell – SsiFlashAarch64.EFI

Preparation of SD Card

Preparation of SD card needs to be performed in Linux. The SD card will contain the Aptio V BIOS image that will be executed from memory and boot the system. The steps to prepare the SD card are the following:
1. Insert the SD card into the Linux development machine’s SD card slot or use a USB SD card reader
2. Open a Linux terminal and execute the command “sudo fdisk -l”.
   a. This command will list the device descriptors as “/dev/sda”, “/dev/sdb”, “/dev/sdc”, etc.
   b. Identify the device descriptor of the SD card.
   CAUTION: Ensure correct SD card device descriptor is used while flashing. Choosing a wrong device descriptor will corrupt the storage media.
3. Execute the dd command with the following syntax:
   a. “sudo dd if = [file path to input BIOS image] of = [device descriptor]”.
   b. Assuming the file path of BIOS image is “AMIROM_MEDIA.fd” and the device descriptor of the SD card is “/dev/sdc”, the DD command would be entered as “sudo dd if = AMIROM_MEDIA.fd of = /dev/sdc”.
   c. Note, the dd command will erase the entire media and writes the device with the new BIOS image.

Preparation of USB Key

The USB key can be prepared from either a Linux® or Microsoft® OS. The USB key needs to contain the flash utility and the Aptio V BIOS image that needs to be flashed. The steps to prepare the USB key are the following:
1. Insert the USB key into the development machine’s USB port.
2. Copy the Aptio V BIOS image to the root of the USB key.
3. Copy the flash utility SsiFlashAarch64.EFI to the root of the USB key.
Configuration of Mustang or Merlin Reference Platform

The APM reference platform needs to be configured properly in order to start the recovery process. This method puts the Aptio V BIOS image from the SD card into memory and gives control to the BIOS. Perform the following steps for the specific board:

1. Power off the target APM reference board.
2. Configure the jumpers to force a SD boot:
   a. For Mustang platform, short pins 11-12 and 17-18 on jumper header HDR9.
   b. For Merlin platform, short pins 13-14 and 19-20 of jumper header J19.
3. Insert the configured SD card into the SD slot.
4. Insert the configured USB key into a USB port.

Update the SPI Flash Part

To update the BIOS, perform the following steps:

1. Power on the Mustang or Merlin reference platform.
2. Enter BIOS setup by pressing ESC or DEL.
3. Traverse to “Save & Exit” menu and select the Boot Override device “UEFI: Built-in EFI Shell”:

4. From UEFI Shell prompt change to the root folder of the USB device.
5. Execute the command “SsiFlashAarch64.EFI [file_name] /u”.
6. Below is an example where a USB key is mapped to fs0: and the filename is AMIROM_MEDIA.fd:
7. Power off the Mustang or Merlin platform.
8. Remove the jumpers shorted in steps 2a or 2b specified in the *Configuration of Mustang or Merlin Reference Platform* section of this document.
9. Remove the SD card and USB key from the reference platform.
10. Power on the system and boot. It will boot from the Aptio V BIOS that is now present in the SPI flash part.