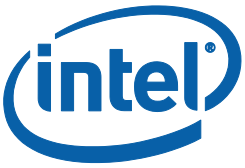

Intel® SATA Solid-State Drive Firmware Update Tool

User Guide
Software Version 2.0.3

Order Number: 322570-006US
June 2013

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1.0 Overview

This document describes how to use the Intel SATA SSD Firmware Update Tool (FUT) to update the firmware on the SATA Intel® Solid-State Drives (Intel® SSDs) in all capacities:

- Intel® Solid-State Drive DC S3700 Series
- Intel® Solid-State Drive 335 Series
- Intel® Solid-State Drive 320 Series
- Intel® X18-M and X25-M SATA SSDs (34nm, silver case)
- Intel® X18-M and X25-M SATA SSDs (50nm, black case)
- Intel® X25-E SATA SSDs (50nm, black case)
- Intel® X25-V SATA SSDs (34nm, silver case)

NOTE: The Firmware Update Tool recognizes all Intel SATA SSDs, but if there is no updated firmware available for a specific model, the tool does not provide any functionality.

For Microsoft Windows* and Linux* operating systems, follow the firmware update instructions in Section 2, "Microsoft Windows* and Linux* Instructions".

For Apple Mac OS* systems, follow the instructions in Section 3, "Apple Macintosh* Instructions".

The firmware update process involves three steps:

1. **Perform the setup**
   Prior to updating the SSD firmware, perform such activities as backing up your data and closing all other applications.
2. **Download the Firmware Update Tool to a USB Flash Drive or blank CD (CD-R or CD-RW)**
   The tool is a self-contained firmware update package formatted as an ISO image, which must be downloaded and burned on a USB flash drive (Windows and Linux only) or blank CD-R.
3. **Run the Firmware Update Tool**
   When installed into a host system, the CD boots its own custom Linux-based environment and runs the necessary firmware update software to modify your Intel SSD.

1.1 System Requirements

To use the Firmware Update Tool, you need the following items:

- Supported Intel SSD
- Host system with an available USB port (Windows and Linux only) or a Read/Writable (R/W) CD-ROM drive
- ISO image burning software usually provided with the R/W CD-ROM drive, or freely available online
- Blank USB Flash Drive (Windows and Linux only) or blank CD (CD-R or CD-RW)
- A charged battery, if the update occurs on a mobile system

1.2 Known Issues

1.2.1 Can't Run FUT on an HP* Envy* Touchsmart* Ultrabook with Secure Boot Enabled

In order to run the Firmware Update Tool on an HP Envy Touchsmart Ultrabook, you will first need to disable the Secure Boot feature using the following procedure:

1. Enter the **BIOS** by pressing the **F10** key while powering up the system
2. Go to **System Configuration**
3. Select **Boot Options**
4. **Legacy Support** is **Disabled** by default
5. Enable Legacy Support.
6. Answer **YES** to the question. Changing this setting may make the system unable to boot.
7. Modify the Legacy boot order. Set **USB Diskette on key/USB hardDisk** as **First Boot** using the **F6** Key
8. Press **F10** to save and exit the BIOS
9. After you are finished with FUT you can reset BIOS to the Default values

1.2.2 Can't Run FUT on a Dell* Inspiron* Ultrabook 15z with Secure Boot Enabled

In order to run the Firmware Update Tool on a Dell Inspiron Ultrabook 15z, you will first need to disable the Secure Boot feature using the following procedure:

1. Enter the BIOS by pressing the **F2** key while powering up the system
2. Go to the **Boot** menu
3. Go to the **Secure Boot** option
4. Select **Disabled**
5. Exit Save Changes and reset
6. Answer **Yes** to Save configuration and reset question
7. After using FUT return to the BIOS
8. Reset **Secure Boot** to **Enabled**
9. Save and exit

2.0 Windows* 7/8 Instructions

2.1 Perform the Setup

Complete the following steps before starting the firmware update process on the PC containing the SSD.

1. **Back Up the SSD**

   Perform a complete system backup on your Intel SSD to ensure that no data is lost during the firmware update process. Intel is not responsible for any data loss that might occur during or after a firmware update on an SSD.

   Following a successful firmware update, data restoration should not be required.

2. **Plug in the Power**

   For mobile PCs, ensure the computer battery is fully charged. For desktop PCs, ensure the system is plugged into AC power during the update process. Do not remove power at any time during the firmware update process as this could produce incomplete results and may render your Intel SSD unusable.

3. **Turn Off Drive Password Protection**

   Some systems provide the ability to password-protect their drives. If your system has password protection enabled, the Intel SSD may reject any requests from the host to update the firmware. You may need to turn off the drive password protection prior to beginning the firmware update process.

   Although it varies from system to system, you can usually find the Drive Password Protection feature located in the BIOS. Consult your system documentation for the BIOS settings and passwords.

   If you need help disabling the drive password protection feature, contact Intel Customer Support: http://www.intel.com/go/ssdsupport

4. **Check the Boot Order**

   This procedure requires booting from a USB flash or CD-ROM drive before the system drive. To determine the boot order for your system, reboot and enter BIOS Setup. Depending on the BIOS vendor, look for a parameter named **Boot Device Priority** or **Boot Load Order**. Ensure that the system boots the USB flash, or CD-ROM drive before the drive that contains the operating system (OS).

   For more information on how to set the CD-ROM drive boot order, consult the system documentation for your PC.

   If you still need additional assistance checking the boot order, contact Intel Customer Support: http://www.intel.com/go/ssdsupport

5. **Close Applications**

   Before beginning the firmware download process, close all applications except for your Internet browser.

2.2 Option 1: Download the Firmware Update Tool to Blank CD

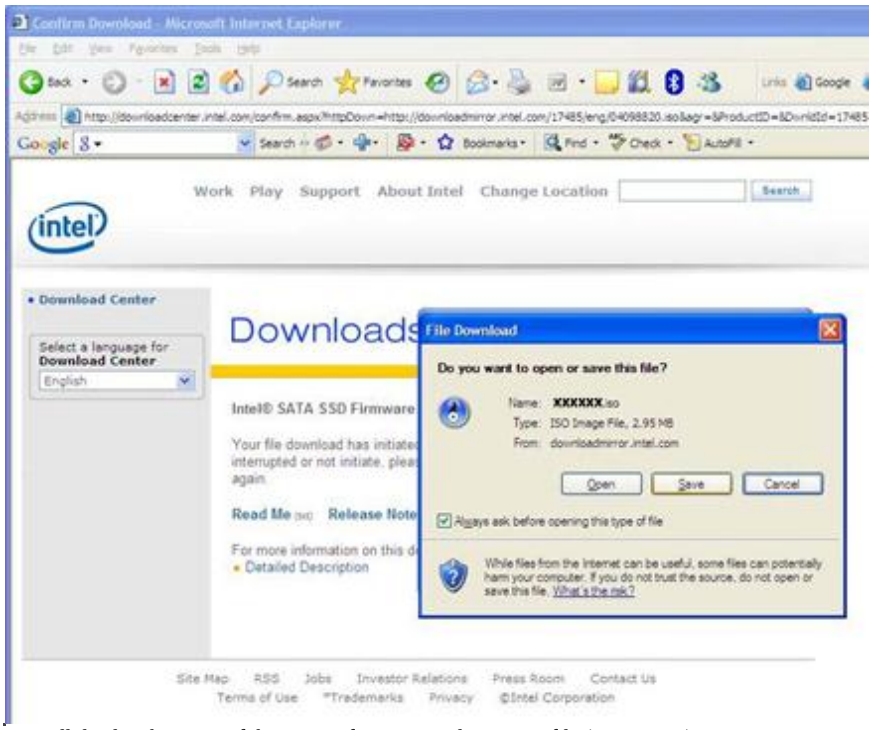
The Firmware Update Tool is packaged as an ISO image. Similar to an archive file or a disk image, an ISO image is specifically designed for optical disks like CDs in a format specified by the International Organization for Standardization (ISO).

You cannot simply copy an ISO image to a blank CD. (It will appear as a data file and will not work correctly.) The ISO image must be decoded with software and installed onto a blank CD (CD-R or CD-RW).

1. Go to the Intel download website located at http://www.intel.com/go/ssdfirmware.
2. Review the *Read Me* file to better understand the firmware update process. The *Read Me* file contains high-level instructions for using the Firmware Update Tool.
3. Review the *Release Notes* document for a quick summary of the firmware changes for each product.
4. Click **Download** to display the terms of the license agreement. (The *Read Me.txt* file also includes the license agreement information.)
5. After reading the agreement, click **ACCEPT** to start the download.

   The browser prompts you to select **Open**, **Save** or **Cancel**. See Figure 1 to view a sample screen. .

Figure 1. Download the ISO Image



NOTE: Your screen will display the name of the current firmware update image file (xxxxxx.iso).

6. Follow the steps for your operating system to burn the ISO image to a blank CD-R or CD-RW.

Windows* 8

a) Insert a blank CD into your drive
b) Click **Save** to download the file
c) Specify a folder location when prompted (such as c:\temp)
d) Press the **Windows key** on your keyboard to go to the desktop, then click the **File Explorer** icon on the taskbar
e) Navigate to the file folder you specified in **step b**
f) Right-click the .ISO file and select **Burn disc image**
g) Click **Burn**. The ISO image is burned to the CD
h) Click **Close** when finished

Windows* 7

a) Insert a blank CD into your drive
b) Click **Save** to download the file
c) Specify a folder location when prompted (such as c:\temp)
d) Open the Windows **Start** menu, open the **Computer** folder, and go the file folder you specified in the previous step
e) Right-click the .ISO file and select **Open With**
f) Select **Windows Disk Image Burner**
g) Click **Burn**. The ISO image is burned to the CD
h) Click **Close** when finished

Windows XP and Windows Vista*

Your Read/Write CD-ROM drive software will guide you through the process of burning an ISO image. For more information, see Section 4.0, "Additional Information –Burning the ISO Image in Windows XP, Windows Vista or Linux OS."

If your R/W CD-ROM software does not recognize ISO images, you may see an "unknown file type" message when downloading the Firmware Update Tool. See Section 5.1, "Computer Does Not Recognize ISO Images".

2.3 Option 2: Download the Firmware Update Tool to USB Flash Drive

The Firmware Update Tool is packaged as an ISO image. Similar to an archive file or a disk image, an ISO image is specifically designed for optical disks like CDs in a format specified by the International Organization for Standardization (ISO).

This means that you cannot simply copy an ISO image to a blank USB Flash Drive. (It will appear as a data file and will not work correctly.) The ISO image must be decoded with software and installed onto a blank USB Flash Drive to make it bootable with the Firmware Update Tool.

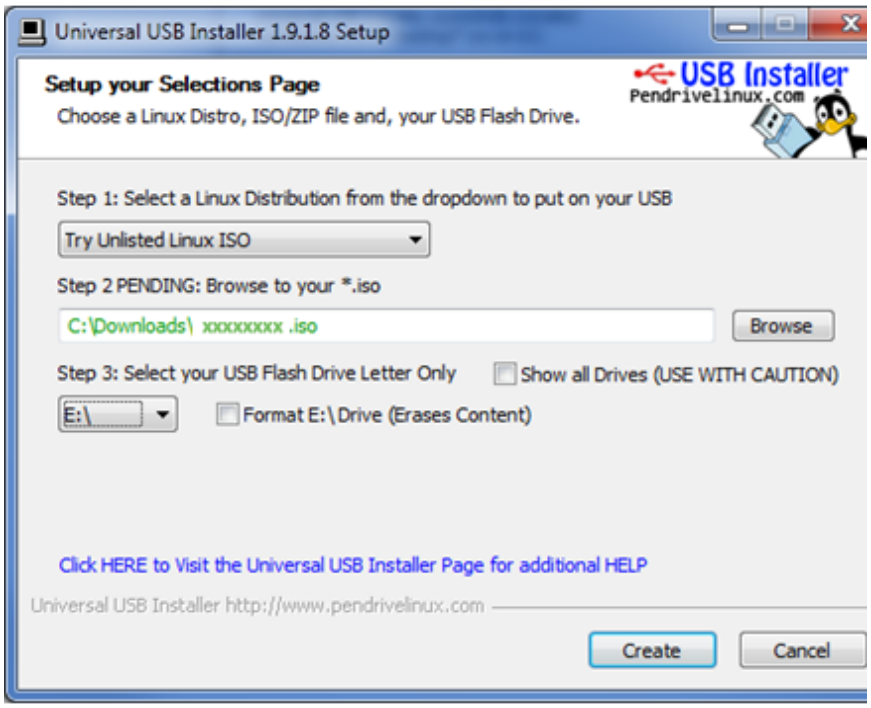
For the purpose of illustration, we are using Universal USB installer software from pendrivelinux.com, but you may use any installer that you prefer.

1. Go to the Intel download website located at http://www.intel.com/go/ssdfirmware.

2. Review the *Read Me* file to better understand the firmware update process. The *Read Me* file contains high-level instructions for using the Firmware Update Tool.
3. Review the *Release Notes* document for a quick summary of the firmware changes for each product.
4. Click **Download** to display the terms of the license agreement. (The *Read Me.txt* file also includes the license agreement information.)
5. After reading the agreement, click **ACCEPT** to start the download.

   The browser prompts you to select **Open**, **Save** or **Cancel**. See Figure 1 in the previous section to view a sample screen.
6. Go to http://www.pendrivelinux.com/universal-usb-installer-easy-as-1-2-3/ and download the freeware Universal USB Installer
7. Install and run the Universal USB Installer (see **Figure 2**)
8. Select the **Try Unlisted Linux ISO**
9. Browse to the location of the **FUT ISO** and select it
10. Select the drive letter that corresponds to your blank USB Flash Drive
11. Click **Create**

Figure 2. Universal USB Installer



NOTE: Your screen will display the name of the current firmware update image file (xxxxxxxx.iso).

2.4 Run the Firmware Update Tool

After creating the ISO image CD or bootable USB flash drive, make sure you have completed the setup procedures before running the Firmware Update Tool:

- Back up the SSD
- Turn off Drive Password Protection
- Designate the CD-ROM or USB Flash drive (as appropriate) to boot first or prior to the OS drive
- Fully charge the battery (for mobile computers)
- Plug in the power cable (for desktop computers)

Note: If at any time during the firmware update process the program fails or your system displays a blank screen, power down and reboot your computer. Run the firmware update process again. If the second attempt fails, contact Intel Customer Support: http://www.intel.com/go/ssdsupport

1. Insert the CD containing the ISO image into the R/W CD-ROM drive, or the bootable USB flash drive into an available USB port
2. Click **Shutdown** from the Start menu to safely close down and power off the system
3. Wait for a count of 10 seconds once the system is completely powered off
4. Press the On button to boot the system from the CD-ROM or USB flash drive and automatically start the Firmware Update Tool
5. Let the program run until it displays the License Agreement screen shown in Figure 3

Figure 3. Initial Start Screen

6. Click **Accept** to accept the license agreement and continue, or **Decline** to exit the tool without running it

7. The tool scans your system for Intel SSDs and displays information similar to that shown in Figure 4. If your system contains more than one Intel SSD, the tool displays each one it detects in a separate tab

   Note: If the tool does not find an Intel SSD, the following information appears:

   If you know an Intel SSD is installed and correctly connected to your system, please contact Intel Customer

Support for further assistance at the following website: http://www.intel.com/go/ssdsupport.

Figure 4. Firmware Update Tool Home Screen

Depending on how many Intel SSDs are detected, you will see one or more tabs displayed. If five or more drives are detected, there will also be arrow buttons to the left and right of the tabs that you can use to scroll through all detected drives.

Note the badge next to the drive picture on each tab.

A green badge with a check mark indicates that this Intel SSD has the latest firmware and does not need to be updated.

An orange badge with an Exclamation Point means that there is a firmware update available for this SSD.

A red badge with an **X** indicates an issue will or has prevented the update. You will see a message on the drive's tab describing one of 4 possible conditions:

1) The SSD is security locked. In this case, please unlock the drive before attempting to update its firmware
2) This drive is running pre-production firmware. If this message is displayed, please contact Intel Customer Support at http://www.intel.com/go/ssdsupport for further assistance
3) Unsupported firmware. Please contact Intel Customer Support at http://www.intel.com/go/ssdsupport for further assistance

4) An attempt to update the firmware has failed. Please see details on a failed update later in this guide

8. To update a drive, click the appropriate tab and click the **Update** button (Figure 5)

Figure 5. Firmware Update Button

9. If more than one drive needs to be updated, you can also perform the update for all drives at once by clicking the **Update All** button (figure 6)

Figure 6. Update All button

10. After pressing the Update or Update All button, the Warning Screen shown in Figure 7 will appear. Click **Yes** to proceed or **No** to cancel and exit without updating

Figure 7. Firmware Update Warning Screen

11. It will take from 30 seconds up to 2 minutes to update the firmware on each SSD. Note the progress bar in figure 8. Until the firmware update has completed, **it is critical that you do not remove power or reboot your system.** Doing so will produce unpredictable results and may render your SSD inoperable.

Figure 8. Firmware Update in Process

12. Once the update is complete, the tool displays a screen similar to Figure 9. Note that the orange (!) badge has changed to a green check mark badge

Figure 9. Firmware Update Successful

Once you have finished updating firmware, you can click the **Close** button to exit the Firmware update tool

Figure 10. Firmware Update Tool Shutdown Notice

Eject the CD or unplug USB flash drive with the Firmware Update Tool, then click the **Shutdown Now** button to exit the Firmware Update Tool and shut down your computer. Be sure two wait 10 seconds before starting your computer again.

If a firmware update fails for a drive, the badge will turn from the orange exclamation mark to the red X, and you will see the error message in figure 11:

Figure 11. Firmware Update Failure Message

13. The message indicates three steps you should take before attempting the update again:

    - Disable the drive password in the computer's BIOS
    - Enable SMART features in the computer's BIOS
    - Enable legacy IDE mode in the computer's BIOS

    If you are still unable to update the firmware after taking these steps, please contact Intel Customer Support at http://www.intel.com/go/ssdsupport for further assistance

3.0 Apple* Macintosh* Instructions

3.1 Perform the Setup

Complete the following steps before starting the firmware update process on the computer containing the SSD.

1. **Back Up the SSD**

   Perform a complete system backup on your Intel SSD to ensure that no data is lost during the firmware update process. Intel is not responsible for any data loss that might occur during or after a firmware update on an SSD.

   Following a successful firmware update, data restoration should not be required.

2. **Plug In the Power**

   For mobile computers, ensure the computer battery is fully charged. For desktop computers, ensure the system is plugged into AC power during the update process. Do not remove power at any time during the firmware update process as this could produce incomplete results and may render your Intel SSD unusable.

3. **Close Applications**

   Before beginning the firmware download process, close all applications except for your Internet browser.

3.2 Download the Firmware Update Tool to Blank CD

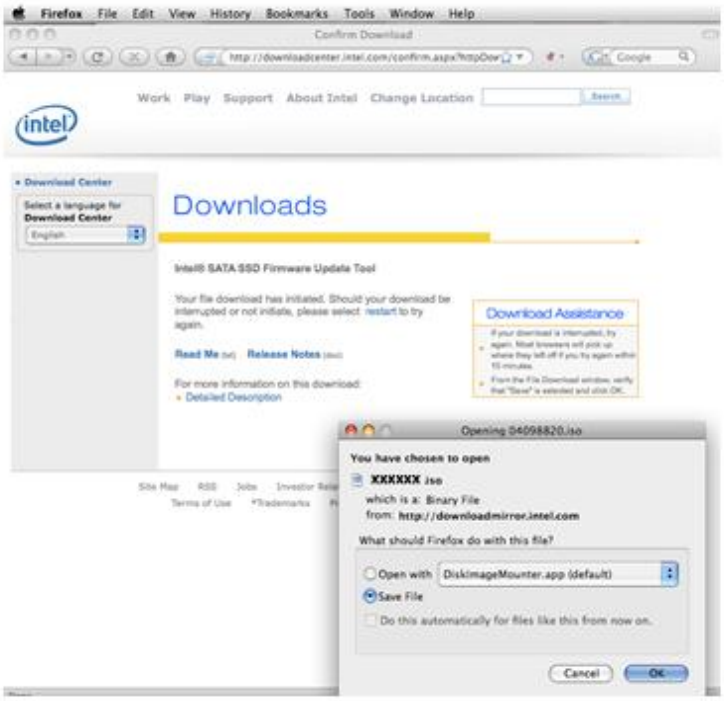
The Firmware Update Tool is packaged as an ISO image. Similar to an archive file or a disk image, an ISO image is specifically designed for optical disks like CDs in a format specified by the International Organization for Standardization (ISO).

You cannot simply copy an ISO image to a blank CD. (It will appear as a data file and will not work correctly.) The ISO image must be decoded with software and installed onto a blank CD (CD-R or CD-RW).

1. Go to the Intel download website located at http://www.intel.com/go/ssdfirmware.
2. Review the *Read Me.txt* file to better understand the firmware update process. The *Read Me* file contains high-level instructions for using the Firmware Update Tool.
3. Review the *Release Notes* document for a quick summary of the firmware changes for each product.
4. Click **Download** to display the terms of the license agreement. (The *Read Me.txt* file also includes the license agreement information.) After reading the agreement, click **ACCEPT** (at the bottom of the page) to display the web page with the download firmware link.

5. Click **Intel® SATA SSD Firmware Update Tool**. The browser prompts you to select **Open**, **Save** or **Cancel** (see Figure 12).

Figure 12. Download the ISO Image



NOTES:
1. Mozilla Firefox* was used only as an example to create this screen shot and does not imply any endorsement or warranty by Intel.
2. Your screen will display the current name of the firmware update image file (xxxxxxxx.iso).

6. Click **Save File** to download and save the ISO image.
7. Right click the ISO image and open **Disk Utility**. See Figure 13.

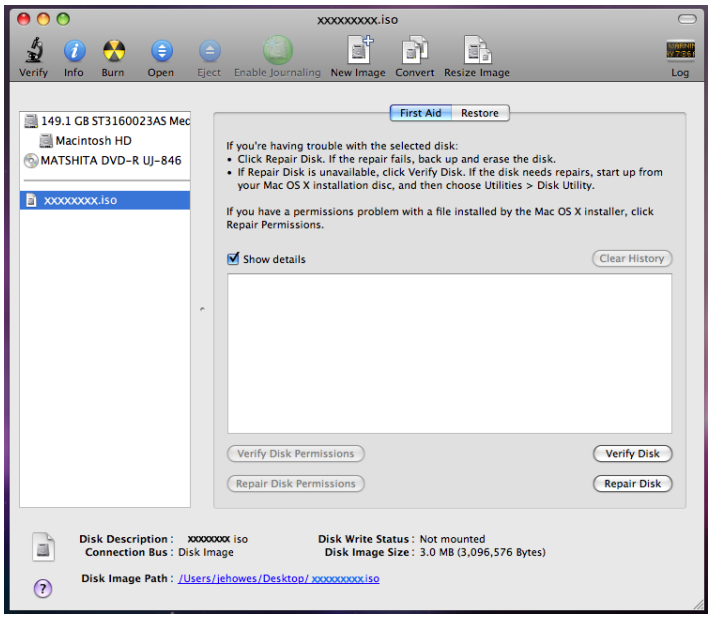
Figure 13. Selecting Disk Utility

NOTES:
1. These Apple* products were used only as examples to create this screen shot and do not imply any endorsement or warranty by Intel.
2. Your screen will display the current name of the firmware update image file (xxxxxxxx.iso).

8. With the Disk Utility open, click the ISO image you downloaded.

9. Click the **Burn** button in the toolbar.

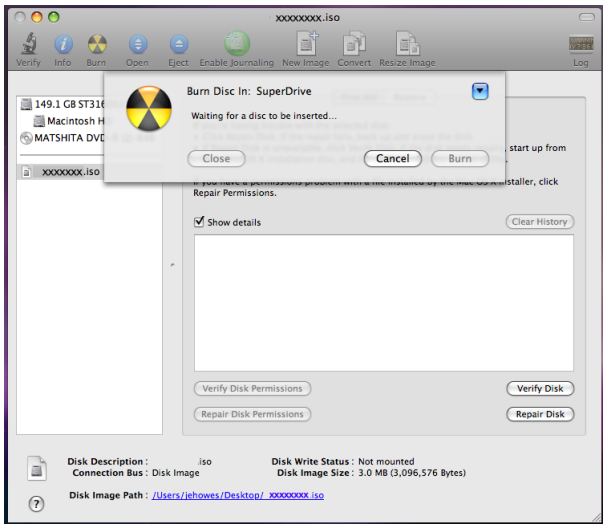
Figure 14. Using Disk Utility to Burn ISO Image



NOTE:
1. Your screens will display the current name of the firmware update image file (xxxxxxxx.iso).

10. Install a blank CD (CD-R or CD-RW) when prompted.
11. Click the **Burn** button. The application displays a status screen similar to Figure 15.

Figure 15. Image Burning Process – Apple Mac OS*



NOTES:
1. The Apple* and Matsushita* products were used only as examples to create the screen shots on this page and do not imply any endorsement or warranty by Intel.
2. Your screen will display the current name of the firmware update image file (xxxxxxxx.iso).

The process of burning a CD-ROM takes approximately five minutes.

3.3 Start the Firmware Update Process

After creating the ISO image CD, make sure you have completed the setup procedures before starting the firmware update process:

- Back up the SSD
- Fully charge the battery (for mobile computers)
- Plug in the power cable (for desktop computers)

Go to Section 2.4, "Run the Firmware Update Tool" and follow the steps to update the firmware.

Note: Hold down the "**c**" key to force your system to boot from the CD-ROM drive.

4.0 Additional Information –Burning the ISO Image in Windows* XP, Windows* Vista* or Linux* OS

This section describes how to burn the Firmware Update Tool ISO image file on a blank CD (CD-R or CD-RW) using Microsoft Windows XP, Windows Vista, or Linux after you have downloaded the file (as described in Section 2.2).

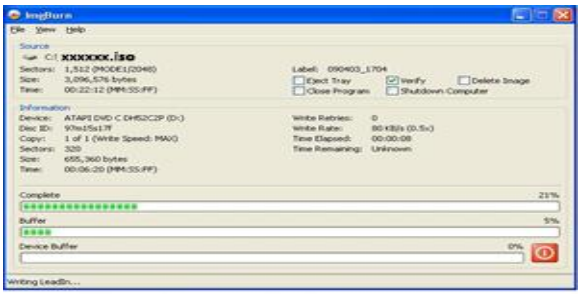
Once the download process begins, you may see a screen similar to the one shown in Figure 16.

Figure 16. Burning an ISO Image

NOTE:
1. Your screens will display the current name of the firmware update image file (xxxxxxxx.iso).

1. Install a blank CD when prompted.
2. Click the **Burn** button to start the process. A status screen similar to Figure 17 appears. The process of burning a CD-ROM takes approximately five minutes.

Figure 17. Image Burning Process



NOTES:
1. The ImgBurn* and ATAPI DVD* products displayed on this page were used only as examples to create these screen shots and do not imply any endorsement or warranty by Intel.
2. Your screens will display the current name of the firmware update image file (xxxxxxxx.iso).

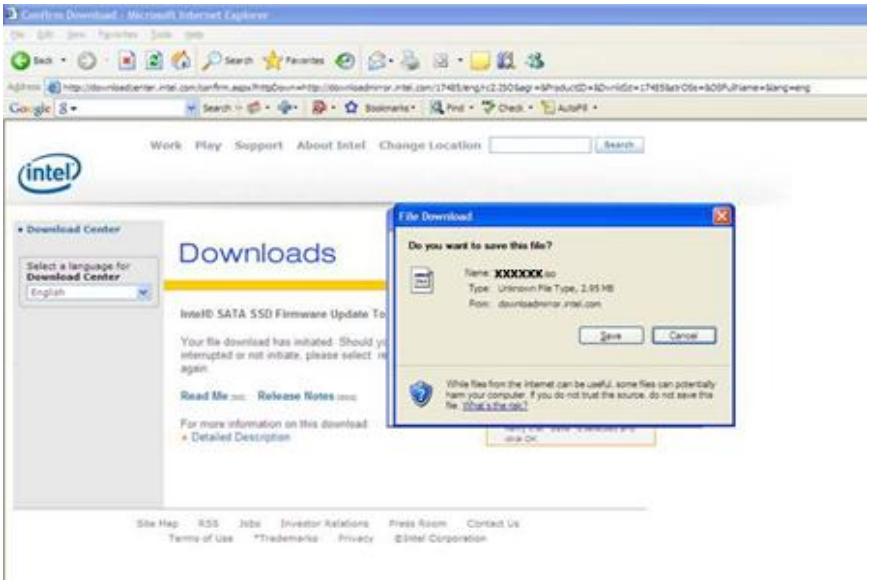
5.0 Troubleshooting

5.1 Computer Does Not Recognize ISO Images

If your CD-ROM software does not recognize ISO images (in Windows XP, Windows Vista, or Linux operating system), you may see an "unknown file

type" message when downloading the Firmware Update Tool similar to Figure 18.

Figure 18. R/W CD-ROM Software Does Not Recognize ISO Images



NOTE:
1. Your screens will display the current name of the firmware update image file (xxxxxxxx.iso).

1. Click **Save** to download the ISO image to your computer.
2. Locate a software application on the Internet that burns ISO images. Install the application.
3. Double-click the ISO image on your drive to decode the image and burn the Firmware Update Tool onto a blank CD (CD-R or CD-RW).

6.0 Reference Documents

Table 1. Reference Documents

Document	Document No./Location
Intel® Solid-State Drive DC S3700 Series Product Specification	328171
Intel® Solid-State Drive 335 Series Product Specification	327738
Intel® Solid-State Drive 320 Series Product Specification	325152
Intel® X18-M/X25-M SATA Solid-State Drive – 34nm Product Line Product Manual	322296
Intel® X18-M/X25-M SATA Solid-State Drive Product Manual	319765
Intel® X25-E SATA Solid-State Drive Product Manual	319984
Intel® X25-V SATA Solid-State Drive Product Manual	322736

7.0 Glossary

Table 2. Terms and Acronyms

Term	Description
ATA	Advanced Technology Attachment
ISO	International Organization for Standardization
ISO image	An archive file or disk image of an optical disk that uses the ISO format. Typically, the file has an .ISO extension; however, Apple Mac OS* ISO images often use a .CDR extension.
OS	Operating System
RAID	Redundant Array of Independent Disks (formerly Redundant Array of Inexpensive Disks)
SATA	Serial ATA
SSD	Solid-State Drive

8.0 Revision History

Date	Revision	Description
June 2013	006	Added support for Intel® Solid-State Drive DC S3700 Series Added support for Intel® Solid-State Drive 335 Series Updated for version 2.0 of the Firmware Update Tool software.
August 2011	005	Added support for Intel® Solid-State Drive 320 Series. Miscellaneous documentation changes.
January 2011	004	Updated document to reflect new firmware release.
November 2009	003	Modified graphics version information. Modified instructions in Run the Firmware Update Tool section. Modified instructions in Verify New Firmware Update section.
October 2009	002	Deleted the Apple Safari* content from Known Issues section. The Intel SATA SSD Firmware Update Tool now works with this website. Modified various graphics to reflect the new 1.3 firmware release.
August 2009	001	Initial release.