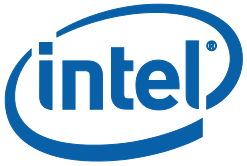

BSP for Microsoft Windows* 8 (Win8 & WES8) 32 & 64 bit for Intel® Atom™ Processor E3800 Intel® Celeron® Processor N2XXX Intel® Celeron® Processor J1XXX

User Guide

April 2014

Software package version: 1.0.0 Gold

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Revision History

Revision Number	Description	Revision Date
1.0	Gold Release update	April 2014

1 Introduction

1.1 Scope of document

This document provides important information for installing Intel's Board Support Package (BSP) for the Windows* 8 and Windows Embedded Standard 8. It covers the driver interfaces, errata and known issues, and best known methods.

This document is intended for OEMs and ODMs that are enabling Win8 and WES8 drivers with the Intel® Atom E3800 processor, and the Intel® Celeron® Processor N2XXX and Intel® Celeron® Processor J1XXX.

This document also includes information about Window 8 Inbox drivers that have been validated on Intel® Atom™E3800 processor, Intel® Celeron® Processor N2XXX and Intel® Celeron® Processor J1XXX.

1.2 System Requirements

The following operating systems are supported:

- Windows 8 Operating System (both 32-bit and 64-bit versions)
- Windows Embedded Standard 8 Operating System (both 32- and 64-bit versions)

1.3 Acronyms and Terminology

Term	Description
BSOD	Blue Screen of Death (Stop Error)
GPIO	General Purpose Input/Output
I^2C	Inter-Integrated Circuit
HS-UART	High Speed Universal Asynchronous Receiver/Transmitter
SPI	Serial Peripheral Interface
SUT	System Under Test
BKM	Best Known Method

2 Release Summary

2.1 Release Details

Driver Version: 1.1.5.1005

2.2 Release Contents

The contents of this release includes:

- Intel® Processor Win8 IO drivers 32- and 64-bit driver installer

  Both the "Intel Processor Win8 IO Drivers 32Bit.msi" and "Intel Processor Win8 IO Drivers 64Bit.msi" installer will install the following drivers on your system:
  - GPIO Controller
  - HS-UART Controller
  - SPI Controller
  - I^2C Controller
- Intel® Processor Win8 IO drivers – Software Developer's Manual
- Intel® Processor Win8 IO drivers - Release Notes
- Intel® Processor Win8 IO drivers – User Guide
- Intel® Software License Agreement

3 Best Known Configuration

Hardware Configuration

Hardware Category	Description	Rev / Type / Source
CRB	Bayley Bay Bakersport	FAB3 REV03 FABB
SOC	Intel® Atom™ E3800 Intel® Celeron® Processor N2XXX Intel® Celeron® Processor J1XXX	B3–I B3–D B3–M
Display	VGA	
Memory	Bayley Bay: 4 GB DDR3 (2x2GB) Bakersport: 2 GB DDR3 (1x2GB with ECC)	

Firmware Configuration

CRB BIOS	Win8 / WES8 32 Bit: BYTICRB_IA32_R_SPI_0080_11_SeC_Enable Win8 / WES8 64 Bit: BYTICRB_IA64_R_SPI_0080_11_SeC_Enable	Intel
KSC	v03.12	Intel

Driver / OS Configuration

Operating System	Windows 8 Enterprise Build 9200 Windows Embedded Standard 8 Build 9200	MSDN
Graphics Driver	15.33.1.64.3496	VIP 59719 / VIP 59720
GPIO Driver	603.9600.1948.30590	Intel
I^2C Driver	603.9600.1948.29470	
SPI Driver	603.9600.1948.28229	
HS-UART Driver	1.1.5.1005	
Chipset INF	10.0.13	Intel

Note: To download the graphics driver, click the VIP link in the above table (login required).

4 Ready Features

Area	Feature	Source	Ready
SIO	General SIO feature	Win8 inbox driver	Yes
USB	General USB 2.0 feature	Win8 inbox driver	Yes
	General USB 3.0 feature	Win8 inbox driver	Yes
	USB2.0 Boot	Win8 Inbox driver	Yes
SATA 2.0	General SATA feature	Win8 Inbox driver	Yes
PCIe*	General PCIe feature	Win8 Inbox driver	Yes
High Definition Audio	General HD Audio feature	Win8 Inbox driver	Yes
	HDMI Audio	Integrated in Intel GFX driver	Yes
SD	General SD card feature	Win8 Inbox driver	Yes
eMMC 4.5	General MMC feature	Win8 Inbox driver	Yes
Power Management	Power Mgmt S0 and S5	N/A	Yes
	Power Mgmt Sleep S3	N/A	Yes
	Power Mgmt Hibernate S4	N/A	Yes
GPIO	Direction Setting	Intel	Yes
	Level Value Setting		Yes
I^2C	Standard Mode (100 KBps)	Intel	Yes
	Fast Mode (400 KBps)		Yes
	DMA Support		No
SPI	SPI Mode 0,1,2,3	Intel	Yes
	Transfer rate support on min=100 KBps Max=15 MBps		Yes
	DMA Support		No
HS-UART	Baud rate support 300-921600, 1M, 2M 3M and 4M	Intel	Yes
	Data size 5, 6, 7, 8-bit		Yes
	Odd, even, none parity		Yes
	1, 1.5, and 2 stop bits		Yes
	Hardware & No flow control		Yes
	DMA Support		No

Notes:

DMA support is not available for I^2C, SPI and HS-UART on Win8/WES8 64 bit, but available in Win8/WES8 32 bit.

USB WES8 does not install in-box drivers for USB 3.0 by default. See Section 9 for driver install BKM.

eMMC 4.5 WES8 does not install in-box drivers for eMMC 4.5 by default. See Section 9 for driver install BKM.

PCIe All legacy optional ROM graphics cards cannot be detected in Win8 / WES8 64bit.

5 Building Win8/WES8 on Intel Atom E3800 Platforms

5.1 Setting up the BIOS

BIOS setup is required for both Win8 and WES8 64-bit OS.

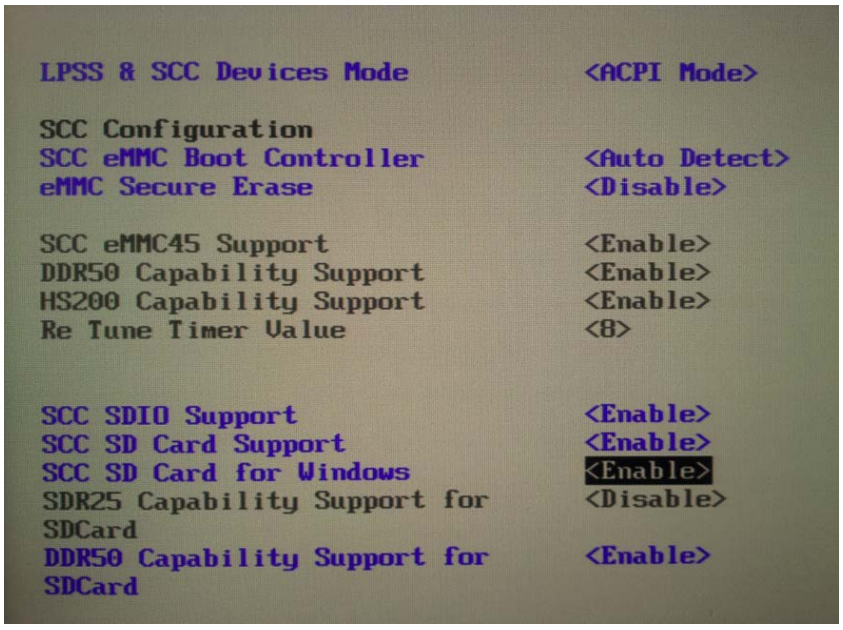
1. In BIOS setting, enter in "Device Manager -> System Setup > Boot > OS Selection: select Windows8.X and press F4 to save.

2. In BIOS setting, enter in "Device Manager -> System Setup > Boot > disable the UEFI Security Boot then commit changes and Exit.

3. After reboot, make sure setting below has been changed:

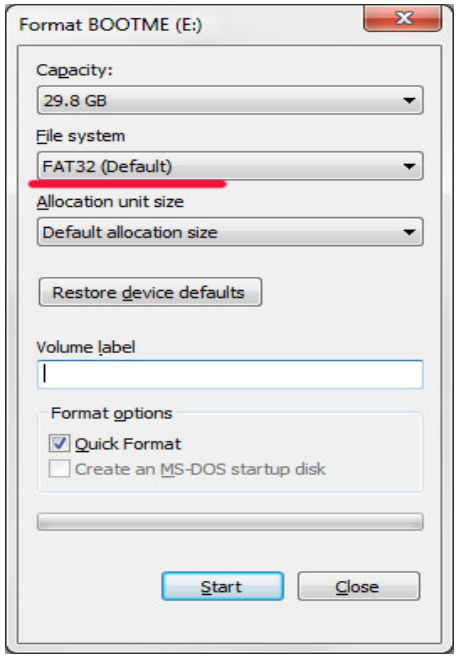
   "Device Manager -> S*outh Cluster Configuration—LPSS & SCC Configuration*
   - LPSS & SCC Device Mode = "ACPI Mode"
   - SCC SD Card for Windows = "Enable"

   South Cluster Configuration—Audio Configuration
   - *Audio Controller* = "Enable"



5.2 OS Installation Environment Settings

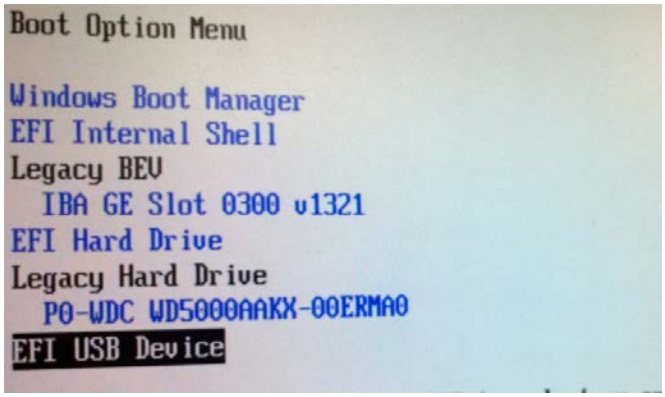
1. Get a thumb drive with capacity larger than 8GB – 32GB, and format it with FAT32.



2. Extract all files from the ISO image of Win8/WES8 64 bit to your thumb drive.

   NOTE: For WES8, to include additional Windows Embedded Catalog drivers and application, you may copy Intel's custom template file created with WES8 Toolkit Please refer to Section 9.1 for steps for generating the XML for WES 32 and WES 64 bit.

3. Reboot and access the BIOS Settings again. Choose "Boot Manager" then the "EFI USB Device" to boot from.



4. After booting into the USB thumb drive, for Win8, install with the Windows OS default installation steps. Click next, choose a partition to install, and then start the installation.

For WES8, during setup for installation, when asked to choose a template, click "Browse" and choose to use the custom template that you have generate. Attached is the **Baytrail_Template_WES8_64.xml** for reference. Click next, and choose a partition to install, and then start the installation.

Also refer to BKM Section 9.1, "**How to install USB 3.0 and eMMC driver in WES8**" about why we need this template file.

5. The system will reboot after OS installation. Ensure the system is able to boot into the OS.

6. Reboot the system and boot into OS.

5.3 OS Driver Installation

1. Execute Intel Atom E3800 Win8 IO Drivers 32bit.exe (or 64bit) (Run as administrator).

2. Check the "I accept the terms in the license agreement" and click "Next".

3. Choose the directory for the installation and click "Next".

4. Choose the "Complete" option for the installation of all drivers and click "Next". Alternatively, choose "Custom" to choose specific IO drivers to be installed.

5. Click "Install" and wait for the installation to complete.

6. Click "Finish" to exit the installer.

7. Reboot the system for changes to take effect.

6 Errata and Known Issues

6.1 Errata (Will not fix)

Issue #	Description	Impact	Recommendation
4634526	Recorded sound is low and not clear	Voices recording sound is low and not clear	User can adjust the Microphone Boost Setting in windows to increase the recording volume.
4634926	Win8 HS-UART with DMA gets unexpected failed test cases when running UTS Test suite	UTS Test cases fails	No resolution from Intel as DMA driver I Microsoft Inbox driver.
4634818	System re-enumeration and disconnect on HSIC device	File transfer fail on HSIC device when any plug/unplug on USB2.0 bottom port	Do not plug/unplug on USB2.0 bottom port during file transfer on HSIC device.
4634569	Kingston DataTraveler Elite 3.0 Not Working on USB2	Failed to detect USB thumb drive	Avoid using Kingston DataTraveler Elite 3.0 on USB2 (lower right USB2.0 port) on Bayley Bay and Bakersport platform

6.2 Known Issues

Issue #	Description	Impact	Recommendation
4634845	System unable to wake up from S3 when CPU core = 1	System failed to wake up after S3 when change CPU core to 1	IOTG BIOS issue. Do not set CPU core =1
4634792	One bit is occasionally wrong in SPI	1 bit out of 1000 bits is corrupted on Bayley Bay platform.	Use Bakersport platform. This issue is under investigation.
4634827	Safely remove icon did not appear on taskbar notification area when a USB pen drive is attached	OS does not show remove icon in the task bar.	Suspect issue caused by Windows Inbox driver. Workaround is to eject removable disk from file explorer.
4634826	Keyboard or mouse is unable to wake the system from sleep and hibernate	System failed to wake up with mouse or keyboard attached to the top USB2.0 port on Bayley Bay and Bakersport.	Wake the system with the power switch.
4634881	Can't find UART test device ACPI\BCM4752 or ACPI\BCM2E1A using 72.11 BIOS after "unhide Unsupported LPSS Device"	Test device ACPI\BCM2E1A and ACPI\BCM4752 is not showing in Device Manager. User can't test UART by using UTS, putty or any test tools	IOTG BIOS will enable device in next release.
4634927	Disable the ISP camera device (VIDEO\INT0F38) in bios for Win8 to remove the yellow bang in windows device manager.	ISP camera device showing yellow bang in device manager.	Disable the ISP camera from BIOS setting

7 Limitations

1. GPIO multiplexing
2. GPIO pin query
3. HS-UART Software Flow Control
4. Legacy graphic card not supported in Win8 64 bit / WES8 64 bit in 64-bit IOTG BIOS
5. SD OS Boot is not supported in Win8/ WES8 32 and 64 bit
6. DMA feature is not supported in Win8 / WES8 64 bit

8 Platform BKMs

8.1 How to Rework Bakersport Fab B I²C Port 6

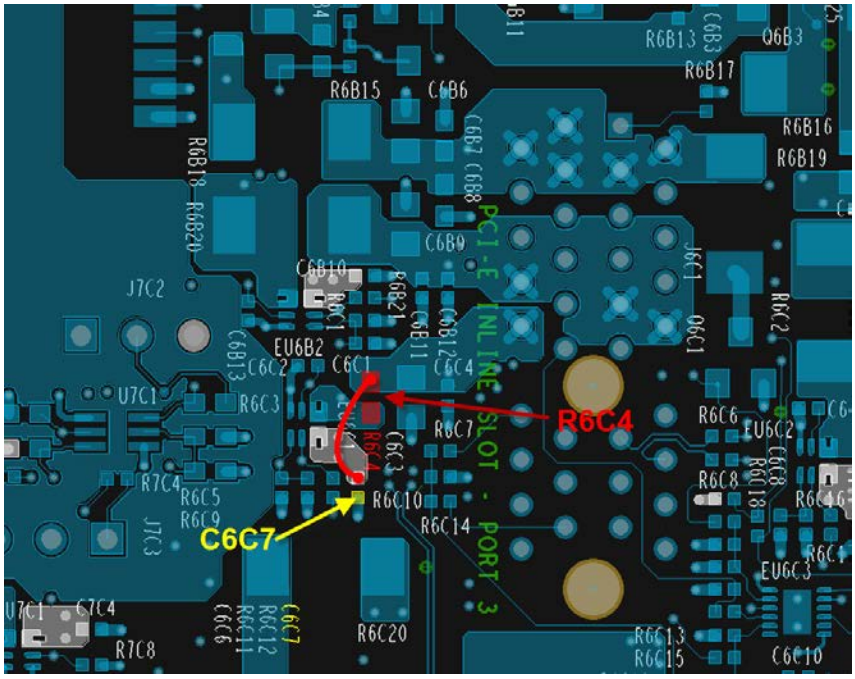
By default, Bakersport Fab B has an issue with I²C port 6. This port fails to read and write due to an incorrect resistor connection.

Rework Steps	1) UnStuff R5H9, R5H12, R5H8, R5H10 2) Stuff R5H4 (22 ohms) 3) Stuff R5H3 (22 ohms)
Affected Platform	Bakersport boards **(PBA# G72250-200 Rev 02) (Fab B)**

8.2 How to Rework Bayley Bay Fab 3 PCI-E INLI Slot Port 3

By default, Bayley Bay Fab 03 has an issue with PCI-E Slot 3. This PCIe slot fails to detect network card after shutdown followed by power up (without switch off the main power)

Rework Steps	1. Remove R6C4 2. Add jumper wire from C6C7 to R6C4 as shown below.
Reasons for the rework:	NIC cards don't get recognized in Windows while the jumper block (J7C2) is configured to Desktop mode, pins [1–2]. Failure mode occurs in PCI-E Slot 3
Affected Platform	Bayley Bay boards Fab 3 (IOTG configured) platforms only



8.3 How to Rework Bakersport Fab B USB 3.0 Port

By default, Bakersport Fab B has an issue with USB 3.0 port. This port fails to read several USB 3.0 thumb drives and couldn't achieve USB 3.0 performance.

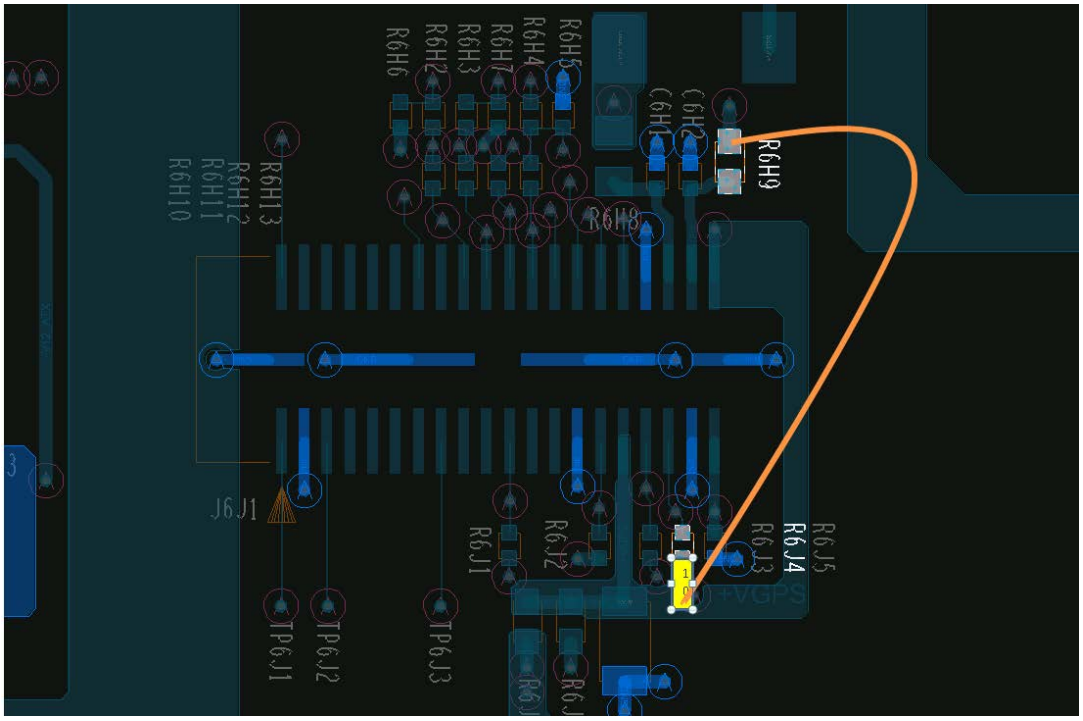
Rework Steps	1) UnStuff choke on L8A2 2) Stuff R8A4 and R8A3 (0 ohms)
Affected Platform	Bakersport boards **(PBA# G72250-200 Rev 02) (Fab B)**

Note: Patriot Memory 64GB and EDGE DiskGo* 32GB thumb drive are not recommended for use in EHCI mode.

8.4 How to Rework UART in Bakersport and Bayley Bay

By default, Bakersport Fab B has an issue with I^2C port 6. This port fails to read and write due to incorrect resistor connection.

Rework Steps	- Place a 10K resistor followed by a wire from R6J4 to R6H9 See below rework layout, yellow box is the 10K PU resistor followed by orange wire to R6H9
Affected Platform	Bakersport boards **(PBA# G72250-200 Rev 02) (Fab B)** Bayley Bay boards Fab 3 (IOTG configured) platforms only


R6H6
R6H2
R6H3
R6H7
R6H4
R6H5
C6H5
C6H2
R6H9
R6H8
R6H13
R6H12
R6H11
R6H10
J6J1
R6J1
R6J2
R6J3
R6J4
R6J5
TP6J1
TP6J2
TP6J3
+VGPS

9 Software Driver BKMs

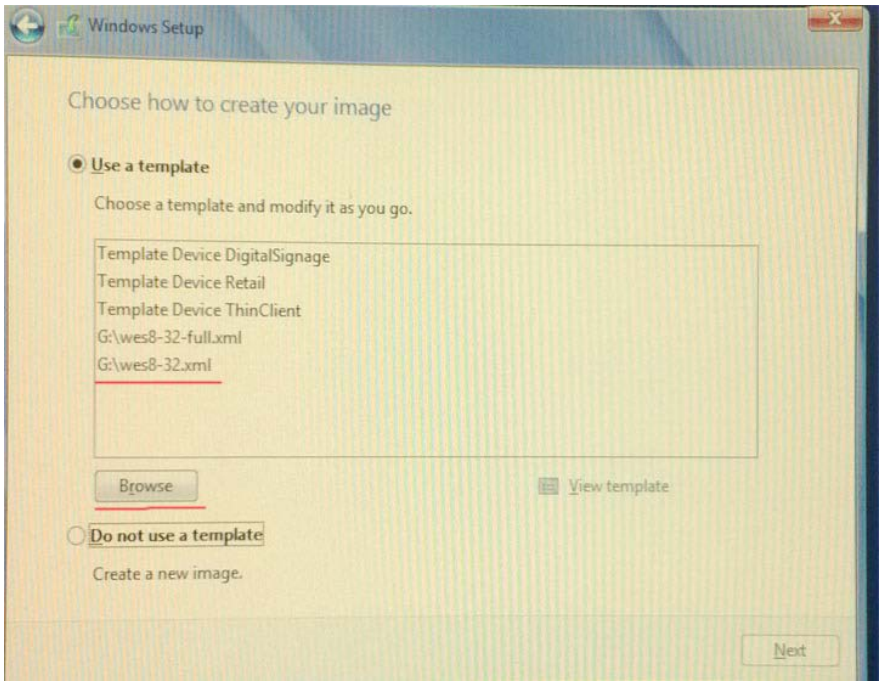
9.1 How to Install USB 3.0 and eMMC Driver in WES8

WES8 doesn't install in-box drivers for USB 3.0 and eMMC card by default. USB 3.0 and eMMC card will not work when the default installation template is used to install WES8.

Custom installation templates for WES8 are provided to include the drivers during OS installation. They are located in the Intel IO Driver Installation zip package's Custom Templates folder.

"**WES8_64bit_Installation_Template**" for WES8 64 bit
"**WES8_32bit_Installation_Template**" for WES8 32 bit

The file is an XML file that you can save into a flash thumb drive and use during your Windows setup.



9.2 How to Enable COM Port to Support Serial Debugging

The common serial port on Bayley Bay board doesn't work. The actual serial port is the MicroUSB port near the COM port on CRB board. A USB cable is needed to connect the micro-USB port in CRB board to the USB port on the host machine.

1. Open the Windows Command Prompt and type "`bcdedit /debug on`" followed by "`bcdedit /dbgsettings serial debugport:1 baudrate:115200`" to enable the debug mode.
2. Insert the micro-USB cable from the platform to the host machine.
3. Install a "winDbg" on the host machine from this link:

   http://msdn.microsoft.com/en-US/windows/hardware/hh852363
4. Open "windbg" in the host machine → "File" menu → "Kernel Debug".
5. Enter the following settings:
   - Baud rate: 115200
   - Port: COM5 (depending on the host machine's USB port name)
6. Reboot the system.

9.3 How to Create OS Boot from USB Device for Win8

1. Prepare the setup environment:
   - Connect the recommended USB flash device (from which you wish to deploy the Win8 image) to the USB port.
   - Connect the storage device that contains the Win8 image
   - Connect to the hard disk which has the Win8 operating system
2. Power up the system and install the Win8 OS.
3. Open Control Panel and select Windows To Go.
4. Choose the drive you want to use. Select the desired drive and click Next.
5. Choose the desired Win8 image and click Next.
6. Use BitLocket Password if you want or click Skip.
7. When you are ready to create your Windows To Go workspace, click Create to start the installation process.

Note: Once you click Create, the data inside the Windows To Go USB flash drive will be deleted permanently.

8. In Choose a boot option, recommend to select No. Follow by either select either Save and restart or Save and close.
9. Make sure the Windows To Go USB flash drive is set to first boot in the BIOS.
10. Restart the system and boot into the Windows To Go USB flash drive.
11. Windows 8 in Windows To Go USB flash drive can be loaded without error.

9.4 Another Way to Install the I/O Driver

By default, the IO driver will be installed via"Intel Atom E3800 Win8 IO Drivers 32Bit.msi" or "Intel Atom E3800 Win8 IO Drivers 64Bit.msi". Alternatively, you can also install with a Windows image. To do this, you need to extract the INF and SYS file from a system that has installed the Intel IO drivers. The Intel IO driver INF and sys files can be found at the following folders after installation:

For 64 bit driver: [Program Files]\Intel\Intel Atom E3800 Win8 IO Drivers 64bit.

For 32 bit driver: [Program Files]\Intel\Intel Atom E3800 Win8 IO Drivers 32bit.

To perform the alternative Windows 8 driver installation, please consult the following link: http://technet.microsoft.com/en-us/library/hh825070.aspx

§