

# BSP for Windows Embedded Compact\* 7 and 2013 for Intel® Atom™ Processor E3800 Product Family/Intel® Celeron® Processor N2807/N2930/J1900 Release

## **Release Notes**

September 2016

Software Release version: Maintenance Release 5



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	Tested Features	Best Known Configuration



# **Revision History**

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	Date	Revision	Description	indefined undefined
	September 2016	005	Maintenance Release 5	ed vi
	November 2015	004	Maintenance Release 4	46 film
	August 2015	003	Maintenance Release 3.1	
Unde	July 2015	002	Initial Release (Maintenance Release 3)	
sined	March 2015	001	Initial Release (Maintenance Release 2)	
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# 1.0 Introduction

This document provides system requirements and installation instructions. It details issues and limitations, and provides legal information for Maintenance Release 5 of this software.

Related reference documentation for this release is available in the associated collateral for this release:

- BSP for Windows Embedded Compact\* 7 and 2013 for Intel<sup>®</sup> Atom™ Processor E3800 Product Family/Intel<sup>®</sup> Celeron<sup>®</sup> Processor N2807/N2930/J1900 Release - User Guide (Intel document # 332154)
- BSP for Windows Embedded Compact\* 7 and 2013 for Intel® Atom™ Processor E3800
   Product Family/Intel® Celeron® Processor N2807/N2930/J1900 Release Software
   Developer's Manual (Intel document # 332153)

#### 1.1 Intended Audience

These release notes are intended for ISVs, OEMs, and ODMs.

### 1.2 Customer Support

For technical support, including answers to questions not addressed in this product, visit the technical support forum, FAQs, and other support information at: http://www.intel.com/software/products/support/.

Please remember to register your product at <a href="https://registrationcenter.intel.com/">https://registrationcenter.intel.com/</a> by providing your email address. Registration entitles you to free technical support, product updates and upgrades for the duration of the support term. It also helps Intel recognize you as a valued customer in the support forum.

**Note:** If your distributor provides technical support for this product, please contact them for support rather than Intel.

To submit an issue, please use Intel<sup>®</sup> Premier Support.

For more information on registering with Intel® Premier Support, go to: http://software.intel.com/en-us/articles/performance-tools-for-software-developers-intel-premier-support



# ined undefined undefined **Acronyms and Terminology**

#### **Acronyms and Terminology** Table 1.

Term	Description  Direct Memory Access
DMA	Direct Memory Access
GPIO	General Purpose Input/output
HS-UART	High Speed Universal Asynchronous Receiver/Transmitter
HSIC	High Speed Inter-Chip
DMA  GPIO  HS-UART  HSIC  I <sup>2</sup> C*  KSC  SIO  SPI	Inter-Integrated Circuit
KSC	Keyboard and System Controller
SIO	Super Input Output
SPI UITO	Serial Peripheral Interface
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Indefined under	High Speed Inter-Chip Inter-Integrated Circuit Keyboard and System Controller Super Input Output Serial Peripheral Interface  §  §  for WEC*7 and WEC*2013 for Intel. Atom. Processor E3800 Product Family and Intel. Celeron. Processor NAROZ/N2930/11900 Release
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September 2016 Document Number: 332152-005US



#### **Release Content** 2.0

This section provides details on the contents of this release package.

undefined undefined undef Table 2. **Release Collateral** 

Release Collateral	Version	Release Date
Intel® Processor WEC IO BSP.exe	v33.15.3125	September 2016
BSP for Windows Embedded Compact* 7 and 2013 for Intel® Atom™ Processor E3800 Product Family / Intel® Celeron® Processor N2807/N2930/J1900 Release - User Guide (Intel document # 332154)	005	September 2016
BSP for Windows Embedded Compact* 7 and 2013 for Intel® Atom™ Processor E3800 Product Family / Intel® Celeron® Processor N2807/N2930/J1900 Release - Software Developer Guide (Intel document # 332153)	005	September 2016

		r N2807/N2930/31900 Release - Software Developer rel document # 332153)		A
		SP installer package contains the drivers below ackage Contents	in source.	ed undefines
undefined undefable 3.	No.	Software Driver Installed on Target System	For WEC7*	For WEC2013
define	1	Super Input Output (SIO) (Legacy COM)	Yes	Yes
nuo	2	SATA IDE	Yes	Yes
	3	GPIO (General Purpose Input/Output)	Yes	Yes
i un	4	HS-UART (High Speed Universal Asynchronous Receiver/Transmitter)	Yes	Yes
	5	Inter-Integrated Circuit (I <sup>2</sup> C*)	Yes	Yes
inder	6	Serial Peripheral Interface (SPI)	Yes	Yes
undefined undefined un	7	Direct Memory Access (DMA) (Integrated with Serial Peripheral Interface (SPI) and HS-UART)	Yes	Yes
1 nuoc	8	HD Audio	Yes	Yes
	9	PCIe* Ethernet	Yes	Yes
	10	PCIe* KITL	Yes	No
dul	11	SMP (Multicore)	Yes	Yes
efinee	12	USB 3.0 Host (with USB FS/HS/SS hub support)	Yes	Yes
, unot	13	SD*, SDHC*, SDXC*	Yes	Yes
indefined undefined ur	14	eMMC* 4.5	Yes	Yes
inder	15	SDIO support	Yes	Yes
			2.1	



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# 3.0 What's New in this Release

The following have been changed or added in this release.

#### 3.1 New Features

N/A

#### 3.2 Unsupported Features

This release does not support these features:

- SATA\* SATA\* AHCI mode is not supported
- HD Audio Mono recording is not supported

#### 3.3 Discontinued Features

None

§



# 4.0 Feature Limitations

The following are the feature limitations in this release.

#### 4.1 GPIO Driver

None

#### 4.2 I<sup>2</sup>C\* Driver

- Tested max single transfer length up to 256 Byte.
- Application can use multiple single transfers to transfer big data.
- Read operation for 400 KHz in I<sup>2</sup>C\* are slightly below 80% throughput due to OS limitation.
- I<sup>2</sup>C\* does not support DMA mode.

#### 4.3 SPI Driver

- Tested max single transfer length up to 64 Byte.
- To transfer big data, user application can apply multiple single transfers.
- System will automatically change to DMA support when the data size for transfer is >15 Bytes.

#### 4.4 HS-UART Driver

- Switching between Hardware and Software Flow Control requires a system restart.
- PIO mode is only supported on 9600 and 115200 baud rate.
- Software flow control is not supported in DMA mode. This is only supported in PIO mode.
- Maximum length of a single transfer is verified up to 20 MB, with 4 M baud rate.

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# HD Audio Driver

- HD Audio driver only supports the base rates recording of 44.1 kHz and 48 kHz given by the HDA Controller.
- · Recording mute is not supported.
- Dependent on Realtek\* ALC262 HD Audio Codec:
  - Only supports 44.1/48/96/192kHz sample rate.
  - Only supports 16/20/24-bit PCM for stereo audio playback and multiple inputs streaming.
- Dependent on the platform:
  - Only supports three ports on panel, Headphone/Line/MIC.
  - Only supports stereo audio for each port. Does not support Mono Input/Output.

#### SD/SDIO and eMMC\* Driver

- SDIO controller shall support Wireless module only.
- SD Memory controller shall support memory device only.
- eMMC\* driver do not support HS200 speed mode.

#### 4.6.1 **Lower than Expected Performance**

 SD2 and SD3 driver performance on read and write speed will not achieve the SD\* card specifications due to the WEC\*7 I/O subsystem limitation. The maximum supported SD card clock rate is 50 MHZ for 3.3 V (SDHC\*, SDXC\*) and 25 MHz for 1.8V (UHS), due to Intel® Atom™ processor E3800 platform issues. As such, the expected performance of SD and eMMC in WEC7 on the Intel® Atom™ processor E3800 platform is indicated in the table below.

#### **SD and eMMC\* Performance**

Туре	Card Specification	<b>Expected Performance</b>
SDHC*	Read: 23 MB/s Write: 12 MB/s	Read: 10 MB/s Write: 5 MB/s
SDXC*	Read: 23 MB/s Write: 12 MB/s	Read: 10 MB/s Write: 7 MB/s
UHS	Read: 23 MB/s Write: 15 MB/s	Read: 10 MB/s Write: 5 MB/s
eMMC*	Read: 90 MB/s Write: 45 MB/s	Read: 35 MB/s Write: 12 MB/s

Note: "~" indicates the approximate percentage in performance that varies depending on the different brands of card available in the market.

BSP for WEC\*7 and WEC\*2013 for Intel® Atom™ Processor E3800 Product Family and Intel® Celeron® Processor N2807/N2930/J1900 Release **Release Notes** September 2016

#### **Feature Limitations**



Only the following MMC+ cards are tested to work with the WEC\*7 SD\* driver:

- Apacer\* MMCmobile 2 GB
- ATP\* MMCmobile 512 MB
- Kingston\* MMCmobile 2 GB

#### **Operating System**

. wher indefined undefined WEC\*7 and WEC\*2013 OS limitation requires a system restart when a registry key is

BSP for WEC\*7 and WEC\*2013 for Intel® Atom™ Processor E3800 Product Family and Intel® Celeron® Processor N2807/N2930/J1900 Release September 2016 **Release Notes** Document Number: 332152-005US

Fixed Issues



# **5.0**

Fixed Issues
The following

#### **Fixed Issues** Table 5.

		- 20	
	The following issues have been fixed i	in this release.	
Table 5.	Fixed Issues	red rive	2,
Issue #	Description of Issue	Implication (Impact)	Resolution
4995325	[WEC7/2013] USB break intermittently when unplugged USB hub.	USB 3.0 Hub cannot be disconnected directly when there is USB device connected to it.	Fixed in MR5
4995474	USB Bus Coupler will not be recognized	USB Bus Coupler will not be recognized	Fixed in MR5
4995544	Long delay of IOCTL call to the Tc USB driver	Observed long delay of IOCTL call when inserted a large USB stick (4 GB/8 GB).	Fixed in MR5
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# 6.0 Errata and Known Issues

This section details Errata and Known Issues in this release.

Table 6. Errata and Known Issues

	Issue #	Description of Issue	Implication (Impact)	Resolution
	4634577	System failed to display when using Matrox* Graphic card.	System failed to display.	Will not fix. User can use NVIDIA* 8400GS graphic card.
eined und	4634788	ISG BIOS not supported on USB* Legacy Boot in xHCI.	BYT Chipset missed this feature. Failed to boot up from USB if XHCI mode is enabled.	Will not fix. Use EHCI when needed, to boot up the system from the USB drive.
Inger.	4634569	Kingston* DataTraveler Elite 3.0 Not Working on USB2.	Failed to detect USB thumb drive.	Will not fix. Avoid using Kingston DataTraveler Elite 3.0 on USB2 (lower right USB2.0 port) on CRB platform.
	4634913	Kingston* DataTravaler Elite 3.0 in Low Performance.	Transfer read/write speed getting slow. (23.2 MB/s and Read 73.4 MB/s).	Will not fix. Avoid using Kingston* DataTraveler Elite 3.0 on USB3.
	4634792	One bit is wrong, occasionally, in SPI on Bayley Bay.	One bit is wrong when performing continuous data transfer in SPI.	Will not fix. Use Bakersport Fab A, Fab B, Bayley Bay Fab2 and Bayley bay Fab 3 light green boards.
indefined to	4634816	System shutdown after BIOS stage when booting up with SD card plug in (Bayley Bay Platform issue).	User failed to boot up the system when connected with the SD card.	Will not fix. Use Bakersport Fab A, Fab B.
	4994854	Failed CETK Test on Measure Memory Performance Test.	Nonconformance to WEC CETK.	Run test without EMGD installed in the BSP.
	4634576	PS/2* mouse and keyboard is not working with WEC7*.	User not able to use PS/2* mouse and keyboard.	Will not fix. Use USB mouse and keyboard.
dv	4994818	[BYT][WEC7*/2013*] System hang at POST code 'E823' after turn off and turn back on again with XHCI mode = 'Smart Auto' or 'Auto' - D0.	User unable to boot the platform after powering off the system with the power button.	Will not be fixed by BIOS. Use the reset button or power on the system totally from the power source, or change XHCI mode to Enable.
undefine	4994841	[BYT][WEC7*/WEC2013*] Unable to record audio in mono mode.	User unable to record sound in mono.	Will not fix. Hardware limitation. Use a mono recording device and record it in stereo mode.

## 6.1 Non-Intel Issues

Below are the non-Intel issues in this release.

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#### Table 7. **Non-Intel Issues**

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(Inte		"Inde".	Errata and Known Issues
Table 7.  Issue #  4994595	Non-Intel Issues	ined L	fined une
Issue #	Description of Issue	Implication (Impact)	Resolution
4994595	File system in Storage Manager did not reflect the actual file system type on the storage device. B3-I	The file format is always shown in exFat.	Device is still functional. User may check file system of storage device in another Windows system; i.e., in Windows* 7, Windows* 8.
4995239	[WEC2013] Video playback stuttering when copied to and playback from eMMC /SD card	Video playback stuttering when video vlip is copied to and playback from eMMC card.	Will not fix. Use command below to copy the video file:  copy <video file=""> "\<storage card="">\<video file="">\"</video></storage></video>
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#### **Best Known Configuration** 7.0

Table 8. **Best Known Configuration** 

This section details the best known configuration.  Best Known Configuration	ال الم
Hardware Configuration	efiner
Description	Rev/Type/ Source
Bayley Bay Baker Sport	FAB3 REV03 Fab B
Intel <sup>®</sup> Atom™ E3800 Product Family	D0-I (Z8XA) D0-I Headless (Z8XN)
VGA (WEC*7) (WEC*2013)	
Bayley Bay: 4 GB DDR3 (2x2GB) Baker sport: 2 GB DDR3 (1x2GB with ECC)	defined
Firmware Configuration	dune
BYTICRB_IA32_R_SPI_0093_41_SeC_Enable (Stitched BIOS Integrated with 3842 VBIOS)	Intel
v03.14 undefined	Intel
Driver/OS Configuration	bed
WEC*7 Official Release, Update August 2015 (7.2.2859) WEC*2013 Official Release, Update August 2015 (8.1.6223)	MSDN
Intel® Processor WEC IO BSP.msi	Intel
Intel® EMGD for Windows Embedded Compact* 7 (build #3070) v36.16.4 Intel® EMGD for Windows Embedded Compact* 2013 (build #3070) v36.18.4	Intel
defin "inec	e c
	Description  Bayley Bay Baker Sport  Intel® Atom™ E3800 Product Family  VGA (WEC*7) (WEC*2013)  Bayley Bay: 4 GB DDR3 (2x2GB) Baker sport: 2 GB DDR3 (1x2GB with ECC)  Firmware Configuration  BYTICRB_IA32_R_SPI_0093_41_SeC_Enable (Stitched BIOS Integrated with 3842 VBIOS)  v03.14  Driver/OS Configuration  WEC*7 Official Release, Update August 2015 (7.2.2859) WEC*2013 Official Release, Update August 2015 (8.1.6223)  Intel® Processor WEC IO BSP.msi  Intel® EMGD for Windows Embedded Compact* 7 (build #3070) v36.16.4

#### **Recommended BIOS Configuration** 7.1

Table 9. Recommended BIOS Configuration

BIOS Selection	Configuration
OS Selection	Device Manager > System Setup > Boot > OS Selection: select WEC7*
LPSS	Device Manager > System Setup > South Cluster Configuration—LPSS & SCC Configuration > LPSS & SCC Device Mode = "PCI Mode"
SD Card	Device Manager > System Setup > South Cluster Configuration—LPSS & SCC Configuration > SCC SD Card for Windows = "Enable"

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	intel	Ined	ized undefin	ed III.	Best Known Con	figuration	
4 unde	BIOS Selec	ction	indefili	Configuration	defines		
	Audio		Device Manager > System Setup > South Cluster Configuration—Audio Configuration > Audio Controller = "Enable"				
	GPO	Device Mana	Configuration > GOP Drive	figuration > GOP Driver = "Disable"			
	7.2 <sub>Jun</sub> d	Tested Featu	ires indefil	led mi	A	efined und	
dund	efinec		ith Intel WEC*7 IO BSP a ures may have limitation				
defined	Table 10.	<b>Tested Features</b>	ed a	ed u			
	Area	unden	Feature	Source	WEC7 Test	WEC13 Test	

	Area	Feature	Source	WEC7 Test	WEC13 Test	inea
		WCELDR	WEC Inbox feature	Pass	Pass	
	CEPC Boot Loaders	LoadCEPC	WEC Inbox feature	Pass	Pass	
	zineo 3	Eboot	Intel BSP	Pass	Pass	
Jefined uni	SIO	Legacy Serial COM port	Intel BSP	Pass	Pass	
ned h	310	PS/2* Mouse and Keyboard	WEC Inbox driver	Not S	Supported	
efill		General USB 2.0 feature	WEC Inbox driver	Pass	Pass	۸
		General USB 3.0 feature	Intel BSP	Pass	Pass	FILLER
	USB	USB Wi-Fi* USB 2.0: SparkLAN-Ralink RT2870 USB Wi-Fi dongle with EHCI mode USB 3.0: VNT6656 USB Wi-Fi* dongle with EHCI and XHCI mode	Third Party Device Driver	Pass	Not Tested: (USB Wi-Fi* for WEC2013* as device driver not available at time of testing)	3
, ur	lor	USB2.0 Boot	WEC Inbox driver	Pass	Pass	
		USB FS/HS/SS hub support on XHCI controller	Intel BSP	Pass	Pass	
indefined ur	SATA2*	General SATA2* IDE feature Support on ATAPI driver for 2x SATA* port	Intel BSP	Pass	Pass	Sine
	SMP	Symmetric Multi-Processing	Intel BSP	Pass	Pass	Ye.
		General PCIe* feature	WEC Inbox driver	Pass	Pass	
	-fined	KITL	Intel BSP	Pass	Pass	
indefined u	PCIe*	Ethernet WEC*7: Tested with Ethernet Driver for PCle* Intel* Pro/1000 PT Quad Port Server Adapter WEC2013*: Tested with Ethernet Driver for PCle* Intel Gigabit CT Desktop Adapter	Intel Driver from Intel Download Center	Pass	Pass	
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		7 and WEC*2013 for Intel® Atom™ Processor E380 Pron® Processor N2807/N2930/J1900 Release	00 Product Family		defined	

#### **Best Known Configuration**

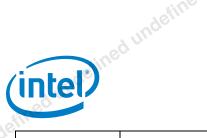


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	Best Known Configu	uration defined		(intel		
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ined und	Area	Feature	Source	WEC7 Pass	WEC13 Pass	
ine		HD Audio Controller Support	duin		Pass	
		ALC262 Support			Pass	
	2013	WEC7* Software Mixer			Pass	
	inger.	Master Volume / Mute control		Silv.	Pass	
	High Definition Audio	Audio stereo playback	Intel BSP	Pass —	Pass	
ined uni	Se.,	Audio recording	iefine		Pass	
		2 Independent Audio Playback	4 Unoc			
		2x audio playback outputs at Port-C and Port-D and 1x audio recording input at Port F on Bayley Bay Platform	ed		Pass	
		Direction Setting		Pass	Pass	
	adefil	Level Value Setting	-	Pass	Pass	
	GPIO	Pin Setting Query	Intel BSP	Pass	Pass	
ndefineo	defill	Multiplexing Setting	40	Pass	Pass	
eq m	ed ull	Standard Mode (100 Kbps)	ingen	Pass	Pass	
l <sub>5</sub> C*	I <sup>2</sup> C*	Fast Mode (400 Kbps)	Intel BSP	Pass	Pass	
		Baud rate support 300-921600, 1 M, 2 M 3 M and 4 M	_	Pass	Pass	
	defi	Data size 5, 6, 7, 8-bit		Pass	Pass	
	od une	Odd, even, none parity		Pass	Pass	
	HS-UART	1, 1.5, and 2 stop bits	Intel BSP	Pass	Pass	
		Hardware and Software and No flow control	defil	Pass	Pass	
IUP		PIO Support	sed ull	Pass	Pass	
		DMA Support		Pass	Pass	
		SPI Mode 0,1,2,3		Pass	Pass	
	SPI	Transfer rate from 100 Kbps up to 15 Mbps	Intel BSP	Pass	Pass	
	isfine0	DMA Support		Pass	Pass	
۸ ۱	nyon	SD*, SDHC*, and SDXC* cards	10	Pass	Pass	
etilled under	SD	Class 2,4,6,10, UHS-I (Default Speed, HS, SDR12, SDR25, SDR50, DDR50)	Intel BSP	Pass	Pass	
		1-bit and 4-bit bus mode		Pass	Pass	

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Area	Feature	Source	WEC*7 Pass	WEC13* Pass
SD (Cont.)	FAT32, exFAT file system	Intel BSP	Pass	Pass
	ADMA Transfer mode	(Cont.)	Pass	Pass
eMMC* 4.5	1-bit,4-bit, and 8-bit bus mode	Intel DCD	Pass	Pass
	FAT32 file system	Intel BSP	Pass	Pass
SDIO	Wireless Module	Intel BSP	Pass	Pass

#### **NOTES:**

- 1. SATA\* Support on ATAPI driver for 2x SATA port. SATA AHCI mode is not supported.
- USB Support Wi-Fi\* via SparkLAN-Ralink RT2870 USB Wi-Fi\* dongle with EHCI mode and VNT6656 USB Wi-Fi\* dongle with EHCI and XHCI mode.
- 3. High Definition Audio Support 2x audio playback outputs at Port-C and Port-D and 1x audio recording input at Port F



# 8.0 Hardware and Software Compatibility

This release is compatible with the following hardware and software

- Intel® Atom E3800 Product Family
- Intel® Celeron® Processor N2807/N2930/J1900 Release

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BSP for WEC\*7 and WEC\*2013 for Intel® Atom™ Processor E3800 Product Family and Intel® Celeron® Processor N2807/N2930/J1900 Release September 2016 Release Notes