

**Intel® Embedded Media and Graphics  
Driver (Intel® EMGD) v36.16.4 for  
Windows Embedded Compact 7\*  
(WEC7\*) and v36.18.4 for Windows  
Embedded Compact 2013\* (WEC2013\*)  
for Intel® Atom™ processor E3800  
Product Family and Intel® Celeron  
Processor N2807/N2930/J1900**

**Release Notes**

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*January 2016*



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## Contents

<b>1.0</b>	<b>Introduction</b>	<b>5</b>
1.1	Intended Audience	5
1.2	Customer Support	5
1.3	Reference Documents	7
<b>2.0</b>	<b>New in This Release</b>	<b>8</b>
2.1	New Features	8
2.2	Existing Features from Past Releases	8
2.3	Changes to the Existing Features	9
2.4	Limitations	9
2.5	Unsupported or Discontinued Features	10
2.6	Issues Resolved in this Release	10
<b>3.0</b>	<b>Fixed Issues</b>	<b>11</b>
<b>4.0</b>	<b>Known Issues</b>	<b>13</b>
4.1	Non-Intel Issues	16
<b>5.0</b>	<b>Where to find the Release</b>	<b>17</b>
<b>6.0</b>	<b>Release Content</b>	<b>18</b>
<b>7.0</b>	<b>Hardware and Software Compatibility</b>	<b>19</b>
7.1	Supported Chipsets	19
7.2	Supported Operating Systems	19
7.3	Board support Package Version	19
7.4	BIOS/Firmware Version	20
7.5	Software Licenses	20

## Tables

Table 1.	Terminology	6
Table 2.	Reference Documents	7
Table 3.	Fixed Issues	11
Table 4.	Known Issues	13
Table 5.	Production Candidate Release Components: Revision Numbers	18



## Revision History

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Date	Revision	Description
January 2016	008	Intel® Embedded Media Graphics Driver v36.16.4 for Windows Embedded Compact 7* and v 36.18.4 Windows Embedded Compact 2013* for Intel® Atom™ processor E3800 Product Family/ Intel® Celeron® Processor N2807/N2930/J1900
December 2015	007	Intel® Embedded Media Graphics Driver v36.16.3 for Windows Embedded Compact 7* and v 36.18.3 Windows Embedded Compact 2013* for Intel® Atom™ processor E3800 Product Family/ Intel® Celeron® Processor N2807/N2930/J1900 Hotfix 2
September 2015	006	Intel® Embedded Media Graphics Driver v36.16.3 for Windows Embedded Compact 7* and v 36.18.3 Windows Embedded Compact 2013* for Intel® Atom™ processor E3800 Product Family/ Intel® Celeron® Processor N2807/N2930/J1900 Hotfix
July 2015	005	Intel® Embedded Media Graphics Driver v36.16.3 for Windows Embedded Compact 7* and v 36.18.3 Windows Embedded Compact 2013* for Intel® Atom™ processor E3800 Product Family/ Intel® Celeron® Processor N2807/N2930/J1900
January 2015	004	Intel® Embedded Media Graphics Driver v36.16.2 for Windows Embedded Compact 7* and v 36.18.2 Windows Embedded Compact 2013* for Intel® Atom™ processor E3800 Product Family/ Intel® Celeron® Processor N2807/N2930/J1900
August 2014	003	Intel® Embedded Media Graphics Driver v36.16.1 for Windows Embedded Compact 7* for Intel® Atom™ processor E3800 Product Family/ Intel® Celeron® Processor N2807/N2930/J1900
June 2014	002	Intel® Embedded Media Graphics Driver v36.16.0 for Windows Embedded Compact 7* for Intel® Atom™ processor E3800 Product Family/ Intel® Celeron® Processor N2807/N2930/J1900
May 2014	001	Initial Release



## 1.0 Introduction

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Intel® Embedded Media and Graphics Driver (EMGD) is designed specifically to support the unique graphics driver requirements of embedded applications for Intel® Embedded chipset-based platforms with integrated graphics capabilities.

This release contains components for:

- **INTEL\_EMGD\_BYT\_WEC7\_<REL>\_36.16.4\_xxxx.zip** (where <REL> is release type either ALPHA, BETA, PRODUCTION or MAINTANCE RELEASE, xxxx is the build number) for WEC7\*.
- **INTEL\_EMGD\_BYT\_WEC2013\_<REL>\_36.18.4\_xxxx.zip** (where <REL> is release type either ALPHA, BETA, PRODUCTION or MAINTANCE RELEASE, xxxx is the build number) for WEC2013\*.

### 1.1 Intended Audience

This document is intended for Intel® Internet of Things Group (IOTG) customers, especially Original Design Manufactures (ODMs)/Original Equipment Manufacturers (OEMs) and Independent Software Vendor (ISVs) using Intel® EMGD on Intel® Atom™ processor E3800 Product Family and Intel® Celeron® Processors N2807/N2930/N2930.

This is a production release. It is only available for Intel partners who have agreements in place to use Intel production products.

### 1.2 Customer Support

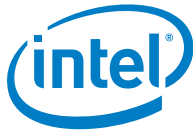
For technical support, including answers to questions not addressed in this document, visit the technical support forum, FAQs, and other support information at:

<http://www.intel.com/content/www/us/en/embedded/software/emgd/embeddedmedia-and-graphics-drivers-for-atom-overview.html>

The Intel® Embedded Design Center (EDC) is a public website; it contains Intel® EMGD production releases. Updates will be available for download from the Embedded Design Center once the product is in production.

To submit an issue, go to Intel® Premier Support:

<https://employeeportal.intel.com/irj/portal/IntelPremierSupportUser>



**Note:** Intel® Premier Support supports the Intel® EMGD Graphics Driver.

For more information on registering with Intel® Premier Support, go to:

<http://software.intel.com/en-us/articles/performance-tools-for-softwaredevelopersintel-premier-support>

**Note:** If you have obtained this document from an Independent Software Vendor (ISV), contact them for technical support.

**Table 1. Terminology**

Term	Description
BIOS	Basic Input/Output System
BMP	Binary Modification Program
BSP	Board Support Package
DDGPE*	Direct Draw Graphics Primitive Engine*
DDRAW*	Direct Draw*
DP	Display Port
EDC	Intel Embedded Design Center
EMGD	Embedded Media and Graphics Driver
eDP	Embedded Port Display
HDMI	High Definition Multimedia Interface
ISV	Independent Software Vendor
I/O	Input/output
IOTG	Internet of Things Group
MBI	Modular BIOS Interface
ODM	Original Design Manufacture
OEM	Original Equipment Manufacture
QFE	Quick Fix Engineering
SBIOS	System BIOS
SMP	Symmetric Multi-Processor
VBIOS	Video BIOS
VBT	Video BIOS Table
VGA	Video Graphics Array
WEC7*	Windows Embedded Compact 7*
WEC2013*	Windows Embedded Compact 2013*



## 1.3 Reference Documents

For detailed installation and configuration instructions, refer to the User Guide, Doc #333781-006US, included in this Intel® EMGD release package. Full title and location information for the guide is provided in [Table 2](#).

**Table 2. Reference Documents**

Document	Document No./Location
<i>Intel® Embedded Media and Graphics Driver v36.16.4 for Windows Embedded Compact 7* and v36.18.4 for Windows Embedded Compact 2013* for Intel® Atom™ processor E3800 Product Family/Intel® Celeron® Processor N2807/N2930/J1900 Release User Guide.</i>	333781
<i>Intel® Embedded Media and Graphics Driver v36.16.4 for Windows Embedded Compact 7* and v36.18.4 for Windows Embedded Compact 2013* for Intel® Atom™ Processor E3800 Product Family/Intel® Celeron® Processor N2807/N2930/J1900 Release – Specification Update – NDA</i>	548137
<i>Bay Trail-I Platform, Bayley Bay and Bakersport CRB Board - BIOS Image - Rev 93.41</i>	559868



## 2.0 *New in This Release*

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### 2.1 **New Features**

- Support for Microsoft\* Windows Embedded Compact 7\* (WEC7\*) Official Release (August 2015 QFE Update (7.2.2859)).
- Support for Microsoft\* Windows Embedded Compact 2013\* (WEC2013\*) Official Release (August 2015 QFE Update (8.1.6223)).
- 2D Support 16 bpp and Optimize performance

### 2.2 **Existing Features from Past Releases**

This release contains the following features

1. Supports of following displays output:
  - Video Graphics Array (VGA) (2560 x 1600),
  - High Definition Multimedia Interface (HDMI) (1920 x 1200),
  - Display Port (DP) (2560 x 1600),
  - Embedded Port Display (eDP) (2560 x 1600)
  - 16 bpp display mode is supported for OpenGL-ES\*
2. The driver has the capability to support following display configurations:
  - Single,
  - Extended,
  - Vertical extended
  - Clone.
3. The driver supports rendered scaling.
4. The driver has the capability to support Chrontel\* CH7511a/CH7511B converters.
5. The driver supports multiple configurations using Video BIOS Table (VBT).
6. Hardware accelerated alpha blend and transparent blend is supported.
7. Supports hardware accelerated 2D Blits, DirectDraw\* and Microsoft DirectDraw Graphics Primitive Engine\* (DDGPE).
8. Supports simultaneous rotation, rendered scaling/stretch blit, horizontal flip, and alpha blend.
9. Supports OpenGL-ES 2.0\*.
10. XAML (Silverlight\*) running on both DirectDraw\* and OpenGL-ES\* 2.0 mode is supported.
11. Driver shall support Mpeg2, VC1 and H.264 hardware video decode.





12. Hardware decode on progressive and interlace is supported.
13. Supports single sprite per pipe to playback video.
14. Dual display video playback with sprite is supported in clone and vertical extended mode.
15. Driver shall support 3D and hardware video decode concurrency.
16. Driver shall support sprite color correction, FB blend and overlay.
17. Driver shall support eDP-LVDS Parade\* converter card.
18. 3D and video concurrency support with condition of 512 MB aperture size set.

This feature is not supported under flipped or rotated mode. Refer to [Table 2](#) Specification Update, Doc #548137, for more setting detail.

19. OpenGL-ES\* 2.0 performance tweaks for D0 silicon stepping.
20. VC1 hardware video decode support.
21. Supports VBT configuration using Binary Modification Program (BMP) tool with Windows\* Embedded features.

## 2.3 Changes to the Existing Features

The following features have been updated for this release:

There are no changes to the existing features.

## 2.4 Limitations

The following are the limitations in this release:

1. Rotation is not available for OpenGL-ES\*.
2. The current command buffer algorithms will give priority to 3D.  
  
If there is high intensity 3D running with video, you will see smooth 3D running and lagging video. Set the Aperture size to 512 MB to avoid further lagging when the 3D is flooding the command buffer.
3. OpenGL-ES\* 2.0 applications running on full screen mode will not work on any secondary display.
4. EMGD needs to work with environment variable **IMGRAM256=0**.
5. To launch the OpenGL-ES\* 2.0 application, the stack size needs to be increased by adding the code listed below into the OpenGL-ES\* 2.0 application source file.

**LDEFSTACK=/STACK: 262144,4096**

6. 3D and Video Concurrency Support with condition of 512 MB aperture size set.

This feature is not supported under flipped or rotated mode. Refer to [Table 2](#) Specification Update, CDI #548137, for more setting details.



## 2.5 Unsupported or Discontinued Features

The following features are not supported or are discontinued in this release.

- Power Management
- Hardware Video Encode

## 2.6 Issues Resolved in this Release

Bug ID	Impacted Platform	Package	Errata	Status
206892	Atom E3800/Celeron N2807/N2930/J1900	WEC	openGL* application(opengl.exe) fails after 60_80 iterations,	Fixed
206907	Atom E3800/Celeron N2807/N2930/J1900	WEC	Transparency not functioning with customers app and WEC7	Fixed
206919	Atom E3800/Celeron N2807/N2930/J1900	WEC	3D app not working with EMGD WEC7 later builds.	Fixed
206917	Atom E3800/Celeron N2807/N2930/J1900	WEC	2D performance in WEC 7 is lower than old platform (Z520PT)	Fixed



## 3.0 Fixed Issues

Refer to [Table 2](#) Specification Update (CDI Doc # 548137) for more detailed information on Bug fixes and possible resolutions.

**Table 3. Fixed Issues**

Defect ID	Description	Status
1207101001	Right channel audio no output with onboard speaker.	Complete
1207101002	Unable to increase/decrease Media Volume for HDMI Audio	Complete
1207101022	VC-1 Main profile HW decode is not working.	Complete
1207101028	Ethernet GUI settings are missing in Android setting.	Complete
1207101029	Wrong display name for USB storage unmount and erase option setting.	Complete
1207101037	SD card is not detected on image specified booting from SATA.	Complete
1207101095	Intel smart video feature is missing in Android settings.	Complete
1207101096	HDMI settings are missing in Android settings.	Complete
1207101097	Certain Chrome* and Firefox* browser version crash upon launch.	Complete
1207101165	HDMI audio playback and recording are not functioning.	Complete
1207101168	One of the duplicated photo resolution option is not selectable for built-in camera app.	Complete
1207101170	Cursor movement glitch when playing AAC-LC (.mp4) file using built-in video player.	Complete
1504071581	Unable to play certain audio files using built-in media player.	Complete
1504071670	Unable to record video using USB Camera on Cherry Trail_CR.	Complete
1504071674	No sound observed on HDMI port, audio jack nor onboard speaker during audio playback.	Complete
1504071689	Green distortion is observed on captured image using different pixels settings with certain USB camera module.	Complete
1504071695	Media Volume in volume control is not functioning.	Complete
1504071696	Video recorded using USB camera is blank when playback using the built-in video player.	Complete
1504072225	No audio output from green jack audio port.	Complete
1504074748	Unable to launch certain game application on Cherry Trail and Braswell boards.	Complete
1504075113	Blank video streaming upon launch for few second before resume playing normally on certain web browser.	Complete
1504093708	Dual display function is not working with the combination of bottom DP port and HDMI on Cherry Hill.	Complete



## Fixed Issues

Defect ID	Description	Status
1504110195	Settings app crash upon check or uncheck Media Device (MTP) or Camera (PTP) file transfer option.	Complete
1504110200	Image captured using certain USB camera module is distorted.	Complete
1504111870	Settings app crash upon clicking the "ETHERNET" option in Data Usage.	Complete
1504111878	Headphone icon disappear when both mic and headphone 3.5mm jack is plugged on to the board.	Complete
1504118592	WMA9/VC1 codec enabled image unable to install on Cherry Hill platform.	Complete
1504126889	Video or Music audio did not resume after alarm dismiss or snooze. Only resume upon pausing video or music for few seconds.	Complete
1504126918	Onboard Volume Button unable to increase/decrease media volume for secondary audio app playback.	Complete
1504128263	Frame skipping observed on certain H264 format 4K video	Complete
1504128366	Unable to playback H264 Main Profile video with HW decode.	Complete
1604058312	H.264 4Kx2K p60 High Profile video on L5.2 Hardware Decode not playable with certain player application.	Complete
1604058349	H.264 4Kx2K p60 High Profile video on L4.2 Hardware Decode not playable with certain player application	Complete
1604058356	H.265 4Kx2K p30 Main Profile video on L5.0 Hardware Decode not playable with certain player application	Complete
1207101093	Certain issues observed during post video processing.	Not a Defect
1207101122	Unable to play certain type of audio file, which exits with an error.	Not a Defect
1207101164	Long boot time is observed on initial OS boot, compared to subsequent boots.	Not a Defect
1504072063	Video lagging observed on HTML5 video.	Not a Defect
1504073975	Unable to play VC1 Main or Advance profile video with HW acceleration	Not a Defect
1504075075	VC1 1080p video lagging seen with SW decode using certain player application.	Not a Defect
1504093649	On screen keyboard is not showing on secondary display.	Not a Defect
1504126665	Built-in Camera App do not have 1080P option for video recording while testing in Cherry Trail.	Not a Defect



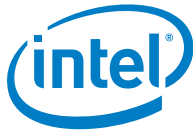
## 4.0 Known Issues

Refer to [Table 2](#) Specification Update (CDI Doc # 548137) for more detailed information on Known issues and possible workarounds.

**Table 4. Known Issues**

Defect ID	Description	Status
1207100992	Notification Volume slider in settings intermittently unable to increase and decrease volume on Bluetooth Headset	Open
1207100993	SD card is not mounted after booting into Android OS	Open
1207100994	'Power off' option is missing in Settings.	Open
1207101003	Unable to increase/decrease Notification Volume for Audio Jack Output.	Open
1207101023	DP monitor hotplug is not working. Reboot is needed to bring back the display.	Open
1207101024	HDMI monitor hotplug is not working. Reboot is needed to bring back the display.	Open
1207101035	SD card options in Settings didn't freeze after SD card is removed from SUT. Happens only on image booting from eMMC.	Open
1207101042	eDP only projects BIOS screen and OS boot screen is not projected using certain board.	Open
1207101094	Lagging is observed on certain MPEG4 video with SW decode.	Open
1207101121	First key tone sound is distorted after system idle for few seconds on Braswell, tested via audio jack.	Open
1207101161	Blank video playback is observed once the recorded video is edited.	Open
1207101163	Selected USB 3.0 port is not function on certain platforms.	Open
1207101166	ADB over USB is not functioning on certain platform.	Open
1207101167	Resolution set does not apply when check with "wm size" command on certain platform.	Open
1207101169	Certain USB camera streaming is distorted on selected orientation with the default camera app. Issue is only seen on certain platform.	Open
1207101171	Glitch observed from built-in Camera Viewfinder on Cherry Hill platform.	Open
1504071700	Captured image resolution mismatch from the applied settings using built-in camera application on certain USB camera module.	Open

Intel® EMGD v36.16.4 for WEC7\* and v36.18.4 for WEC2013\* for  
Intel® Atom™ processor E3800 Product Family Intel® Celeron® Processor N2807/N2930/J1900



## Known Issues

Defect ID	Description	Status
1504093500	eDP display is not working in dual display mode with certain port combination.	Open
1504093688	2D apps cannot be launched on secondary display in landscape and portrait mode	Open
1504093709	Display distortion observed while toggle between portrait mode and landscape mode	Open
1504095577	Primary display enters sleep state on dual display video encode in certain player application	Open
1504099498	Selecting the Browser application settings, will cause error message to prompt.	Open
1504099997	No save and cancel button when crop a picture in gallery.	Open
1504100116	Gallery application will crash when the edit button is selected.	Open
1504100142	Contact application can't set the contact picture.	Open
1504100153	The default wallpaper is not matched with the preview in setting.	Open
1504110198	Devices attached to USB OTG port is not detected by the Cherry Trail platform.	Open
1504126614	Certain MultiCamera viewfinder is blank when certain resolution is selected on Cherry Trail.	Open
1504126638	Built-in Gallery only launches on the secondary display with Dual Display setup in Cherry Trail.	Open
1504126680	HDMI display did not turn off while connected to WIDI and play video in Cherry Trail	Open
1504126751	Input only seen on primary display when touch gesture on secondary display.	Open
1504126762	WIFI DIRECT: Failed to rename device error prompt after rename device.	Open
1504126788	WIFI DIRECT: Click on "Search for devices" doesn't return any available connection.	Open
1504126922	Unable to increase/decrease media volume when "both channel output" option is selected in Dynamic Audio Output Settings	Open
1504128130	Audio output automatically switches from onboard speaker to 3.5mm headset/speaker or vice versa during secondary app audio playback only in Cherry Trail.	Open
1504128151	When secondary audio output is set to "system default" in Dynamic Audio Output Settings, it does not follow the default primary audio output routing settings.	Open
1504128165	Ethernet status is still "ON" in Ethernet settings even after unplug the physical LAN cable.	Open



Defect ID	Description	Status
1504128228	Unable to get IP address on PCI Ethernet. Seen only in Cherry Hill platform.	Open
1504128281	Unable to get IP address on Ethernet while WiFi is connected.	Open
1504128307	Duplicated sensor detected by Elixir 2 application while testing on Cherry Trail.	Open
1504128737	No display on LVDS whenever connected through CH7511 add card (eDP in) in dual display mode	Open
1504128796	Display distorted or blank display seen when switch to resolution of 1080i on secondary Display Port	Open
1504128962	Both primary & secondary display status shows "Connected", when only single HDMI is connected. Seen only on Cherry Trail platform.	Open
1504136071	When only secondary audio app is playing audio, sliding "Alarm Volume" or "Notification Volume" to the most left will mute audio playback.	Open
1604074158	USB OTG MTP/PTP connection lost after subsequent hotplug. Seen only on Braswell platforms.	Open
1207100987	Intermittently MIDI audio file is distorted when played using Google Play Music app through ES explorer.	Will Not Fix
1207101006	VP9 Hardware decode video is lagging and cause video timeline out of sync with the player on Cherry Trail	Will Not fix
1207101025	GIF animation unable to animate smoothly when open with default Android gallery.	Will Not Fix
1504074844	Unable to play certain VP9 1080p video with HW acceleration.	Will Not Fix
1504110188	Web URL is not updated on Default Browser	Will Not Fix
1504126867	OTA Update on the same build version.	Will Not Fix
1604058386	VC1 video on 1080p30 Advance Profile Hardware Decode unable to play using certain player application.	Will Not Fix
1604058403	VC1 video on 1080p30 Main Profile Hardware Decode unable to play using certain player application.	Will Not Fix



## **4.1 Non-Intel Issues**

There are no known non-Intel issues documented at this time.

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## **5.0**     ***Where to find the Release***

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Customers who are interested in obtaining the release packages are advised to contact their Intel representatives or Independent Software Vendors (ISV), Adeneo\* or Bsquare\*.

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## 6.0 Release Content

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This release contains the following:

- Intel\_BYT\_WEC7\_EMGD\_Version\_36\_16\_4\_\_<REL>\_<Build\_date>\_XXXX.zip
- Intel\_BYT\_WEC2013\_EMGD\_Version\_36\_18\_4\_\_<REL>\_<Build\_date>\_XXXX.zip

**Note:** <REL> = Release type: ALPHA, BETA, Production or Maintenance Release  
XXXX = Build number

[Table 5](#) contains the components within this release package.

**Table 5. Production Candidate Release Components: Revision Numbers**

Subproject (Component)	Location	Revision	Build Stamp
Driver Files	IEMGD_HEAD_WEC<VER>\Driver	–	<Build Date>
CEDriverInfo	IEMGD_HEAD_WEC<VER>\Utilities	–	–
User Guide	IEMGD_HEAD_WEC<VER>\Documents	006	January 2016
Release Notes	IEMGD_HEAD_WEC<VER>\Documents	008	January 2016
License	IEMGD_HEAD_WEC<VER>\License	–	–



## 7.0 Hardware and Software Compatibility

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This section provides a complete summary of the hardware and software compatibility.

### 7.1 Supported Chipsets

Target system must contain one of the following Intel processor(s):

Intel® Atom™ processor E3800 Product Family and Intel® Celeron® Processor N2807/N2930/J1900

Check with your system provider to determine the Intel® Chipset used in your system.

### 7.2 Supported Operating Systems

This version of the driver supports the following OS or distributions:

- Intel® EMGD v36.16.4 WEC7\*
- Intel® EMGD v 36.18.4 WEC2013\*

The driver is validated using the Microsoft\* provided versions listed below:

- WEC7\* Official Release (August 2015 QFE Update (7.2.2859))
- WEC2013\* (August 2015 QFE Update (8.1.6223))

**Note:** Customers are advised to update their systems to the versions listed above. Using this release on WEC\* versions other than the two listed above may result in unknown behavior.

**Note:** WEC7\* and WEC2013\* binaries are not interchangeable. Run WEC7\* driver binary only on a WEC7\* OS. Run WEC2013\* driver binary only on a WEC2013\* OS.

### 7.3 Board support Package Version

This version of the driver supports the following Intel® Board Support Package (BSP):

**BYT\_WEC7\_2013\_MR4\_IO\_V33\_14\_3040**

**Note:** <REL> = Release type: ALPHA, BETA, Production or Maintenance Release

**XXXX** = Build number



## 7.4 BIOS/Firmware Version

This version of the driver supports the following firmware version:

DOS/ VESA based OS (VBIOS: v36.2.9.3842)

For those customers using the Intel® Customer Reference Board (CRB), we recommend using the latest ISG SBIOS v93.41, available by downloading the *Bay Trail-I Platform, Bayley Bay and Bakersport CRB Board - BIOS Image - Rev 93.41*, CDI Doc # 559868.

**Note:** Intel® EMGD Driver does not support GMA VIBOS on the platforms stated.

Intel does not recommend using Intel® EMGD with GMA VBIOS.

## 7.5 Software Licenses

The Intel® EMGD is subject to the terms of the license agreement located in the license file in this distribution package. The users shall read, understand, and agree to the terms before using Intel® EMGD.

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