**Product Overview**
The Intel® Embedded Media and Graphics Driver (Intel® EMGD), based on a new optimized architecture, specifically addresses the needs of embedded platform developers by offering a long-life production commitment (up to seven years for new devices). It also enables new graphics features that support non-traditional yet growing computing segments such as netbooks, tablets, slates, and consumer handheld gadgets. This driver is enhanced over previous embedded graphics drivers from Intel by providing additional Linux* features to support In-Vehicle Infotainment (IVI) usage models; updates to support Android* 2.3 (Gingerbread) include video encode and texture streaming capability.

The Intel® EMGD v1.14 is ideal for systems based on the new Intel® Atom™ processor E6xx series, which integrates the processor core, graphics and video encode/decode, plus memory and display controllers into one package. It is also validated for platforms based on the Intel® Atom™ processor Z5xx series with the Intel® System Controller Hub US15W/US15WP and US15WPT.

**Intel® Dynamic Display Configuration Technology**
This new technology allows embedded customers to expand usage models beyond typical desktop and laptop configurations through numerous advanced display configuration capabilities, including:
- Multi-display using any combination of available display ports
- Dynamic display detection and enablement according to configurable display port order
- Simplified specification of customized flat-panel timings
- Use of extended display identification data (EDID) for panels on the integrated LVDS port
- In-display configuration via support of the new VESA display ID standard
- Setup of conditional behavior when EDID and/or non-EDID panels are detected
- Advanced configuration for clone display mode on different-sized displays
- Use of integrated display ports in conjunction with PCI and PCI Express*-based graphics cards
- Ability to display power on self-test (POST) messages and boot to DOS* in clone display mode (VESA modes only)

**Driving Graphics Into a Wider Range of Applications**
The Intel EMGD, when paired with the Intel Atom processor E6xx series, is an ideal fit for many embedded applications including, but not limited to:
- In-Vehicle Infotainment (IVI) systems
- Industrial computing such as traffic signs and home appliances
- Utilities and transportation systems
- Residential gateway
- Internet television
- Point-of-sale systems
- Digital signage
- Security sensors and digital security
- IP media phones and cameras
- Homes and factory automation
- Robotics
- Portable medical devices

**Supported Devices, Operating Systems and APIs**

### Devices
- Intel® Atom™ processors E620/E640/E660/E680
- Intel® Atom™ processors E620T/E640T/E660T/E680T with industrial temperature (-40°C to +85°C)

### Operating Systems
- Microsoft Windows* XP (SP3), Microsoft Windows* XP Embedded (SP3)
- Microsoft Windows* Embedded for Point of Service* (SP3)
- Microsoft Windows* Embedded Standard 2009
- Microsoft Windows* Embedded CE (R3) with EMGD v1.5.3 for E6xx B0
- Microsoft Windows* Embedded Compact 7 with EMGD v1.14 for E6xx B1
- Microsoft Windows* 7 Professional, Microsoft Windows* 7 Ultimate, Microsoft Windows* Embedded Standard 7
- MeeGo* 1.2 IVI Linux* (kernel 2.6.37 and 2.6.39, X Server 1.9, Mesa 7.9)
- Timesys Fedora* Remix v1.4 (Timesys kernel 2.6.35, X Server 1.9, Mesa 7.9)
- Android* 2.3.7 (Gingerbread kernel 2.6.39) with EMGD v1.14

### 3D Support for Linux*
- OpenGL® on supported 2.6 kernel Linux distributions for advanced 3D graphics acceleration on dual independent displays
- OpenGL® 5.1.1 and 2.0, OpenGL® 2.1

### 3D Support for Android*
- OpenGL® 1.1 and 2.0 support for 3D hardware acceleration on Intel Atom processor E6xx series

### OpenGL® for Windows*
- OpenGL® 2.0, Mesa 7.1
Supported Devices, Operating Systems and APIs (Continued)

Flexible Display Outputs
- Internal LVDS
- Dual digital transmitter support (e.g., Display Magic MAG-7308-01 dual LVDS ADD2 card*)
- External sDVO interface to Chrontel and Silicon Image* sDVO DVI, HDMI, LVDS transmitters and VGA/CRT, TV-out encoders via port drivers
- Lapis Semiconductor ML7213* - sDVO
- Chrontel CH7363® support for conversion from LVDS to HDMI/DVI and VGA
- Chrontel CH7022® - TV-Out support with YPbPr on Linux

Features

Benefits

Configuration Editor (CED)
- Graphical pre-installation utility program allows easy creation of consolidated driver installation packages for Windows* Embedded CE (EMGD 1.5.3), Windows* (32-bit and 64-bit environments supported), Linux* and V8BIOS.
- CED Lite, provided as a browser-based GUI utility, can be used on Windows* or Linux* based systems

Port driver device extensibility
- Software development kit allows the addition of customized devices (beyond those supported by default)

Configurable display support
- Simplified mechanism for adding new or custom display modes.
- Advanced configuration capabilities instruct the driver how to detect and select appropriate timings for system displays.
- Display rotation and flip configuration based on DDC physical orientation information.

Control APIs
- Supports non-standard features, such as display switching and toggling, and sDVO device control
- Linux* APIs support overlay plane selection, sharing of EGL surfaces between applications, freeze/resume of framebuffer rendering, and UI ColorKey support via XV

Boot configurability
- Driver and video BIOS may be customized specifically for OEM display and platform configurations.
- Video BIOS multi-segment support of up to 127K on Windows* XP and Linux*

Overlay support
- Improves video playback performance using the X11 Xv or Microsoft DirectDraw* interface; up to two displays

Multiple display support
- Dual independent head (UIH) or extended mode display available.
- Clone mode supported (same content but different timings via two pipes to two displays).
- Dual Independent head-to-clone/reverse clone mode runtime switching and vertical extended mode support on MeeGo® 1.2.

Multi-GPU Multi-Monitor
- Discrete PCI- and PCI Express*-based GPU functions as primary or secondary display concurrently with integrated graphics (only on Windows* XP).
- Discrete PCI Express*-based GPU as secondary graphics adapter with integrated graphics as the primary (on Windows* 7 and Windows® Embedded Standard 7). Support for Intel® Atom™ processor E6xx series only.
- Triple or quad displays are possible with integrated LVDS and sDVO ports and one or more display outputs from a third-party graphics card

ACPI on Microsoft Windows* and Linux*
- Advanced configuration and power management.

2D acceleration
- Improved performance of applications, which take advantage of OS acceleration APIs, including the XRender API and Microsoft DirectDraw interface.
- OpenVG 1.1 (for Linux) used for acceleration of 2D vector graphics.
- 2D GDI hardware acceleration for Windows* 7 and Windows® Embedded Standard 7

Microsoft Direct3D® support
- Improved performance for 3D applications utilizing Microsoft DirectX* 9.0C APIs for Windows operating systems.
- DirectX® 9.0Ex (also known as 9.0L) support for Windows* 7 and Windows® Embedded Standard 7

Upscaling
- Lower-resolution modes can be displayed as full screen with configurations that support upscaled (example: internal LVDS, and Chrontel CH7308®)

Certified Output Protection Protocol
- Enables applications to copy-protect video stream outputs using HDCP, CGMS-A and Analog Copy Protection (ACP) when available on Windows* XP

Hardware Video Decode Acceleration
- Relieves decode burden from processor, reduces power consumption and need for software CODECs.
- MPEG-2 (MPlayer/FFMPEG, MPEG-4, H.264, and VC-1 formats supported in Timesys Fedora® Remix x86 and MeeGo®)
- MPEG-2, H.264, and VC-1 formats supported in Windows® Embedded Standard 2009, Windows® XP; Windows® XP Embedded, and Windows® Embedded for Point of Service* (WEPOS) via DXVA
- Adobe Flash® X.1 video decode support with third-party plug-in.
- Adobe Flash® X.1 video decode support with third-party plug-in.
- Texture streaming supported on Linux* and Android®

Hardware Video Encode Acceleration
- Multiple video encode output profiles including 720p@30Hz, H.264 baseline profile encode
- H.264 simultaneous encoding and decoding available with integrated graphics.
- Video encode via USB camera and BT656 interface in Linux* and Android*.
- Video encode for H.264 video format via USB camera (raw YUV input format) in Windows* 7 and Windows® Embedded Standard 7

Anti-Aliasing
- Minimizes distortion when displaying high-resolution video at a lower resolution. Supported on Linux* and Microsoft Windows® XP

For further product information, visit edc.intel.com/software/downloads/EMGD

*Windows® 7 and Windows® Embedded Standard 7 do not support the Intel® Atom™ processor E6xx/EB20T [0.6 GHz] due to minimum system requirements of 1.0 GHz 32-bit (x86) processor.

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