



Release Notes

WinCE BSP for the TI OMAP35x EVM

Release 6.13.00

TABLE 1. REVISION HISTORY

Revision	Date	By	Description
1.0	Sep 15, 2009	Kevin Hasley	Initial release
1.1	Sep 17, 2009	Kevin Hasley	Update with EVM details
1.2	Oct 14, 2009	Kevin Hasley	Added EVM2 details
1.3	Oct 15, 2009	Kevin Hasley	Added information about EVM2 batch file
1.4	Oct 21, 2009	Kevin Hasley	Updated release notes in build section
1.5	Oct 22, 2009	Kevin Hasley	Change in BSP information
1.6	Dec 14, 2009	Kevin Hasley	Preparing for 6.12.04 release
1.7	Jan 15, 2009	Joseph Lee	Updated for the 6.13.00 release

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1. Introduction

This package contains the following items:

- Windows CE 6.0 R3 BSP for the OMAP35x EVM.
- DVSDK Components 1.00.00.05 binaries
- 3D Graphics DDK 1.3.1 Components binaries for ES3.x and ES2.x OMAP35x silicon
- Prebuilt images (only included in the demo package)
- Documents

2. Release Highlights

2.1. Software Updates - General

Below is a list of new updates to the 6.13.00 BSP. For full list of features, see the spreadsheet at <\OAK\6.13.00\Documentation\Bsquare WinCE BSP for OMAP35x EVM Feature List.pdf>. For detailed list of changes and release history, see <\OAK\6.13.00\BSP\TI_EVM_3530\readme.txt>.

- **BSP**
 - Full support with Windows CE 6.0 R3
 - Added support for new operating point for OMAP3530 - MPU = 720MHz and IVA = 520MHz at VDD1 = 1.35V. Please note that this operating mode is not supported on other chips in the OMAP35x family. This mode is not supported on ES2.x silicon version of OMAP3530 that is on TMDXEVM3503 (EVM1).
 - Added source code for sample video capture application.
 - Sample OS designs for all supported platforms are included in the release
 - Added custom versions of sample XAMLPERF (Silverlight) applications, configured to rotate the display to landscape mode, display frame rate and CPU load statistics
 - Added support for BSP_TI_DVSDK environment variable for use with the TI DVSDK package. When using the DSP based CODECs from the TI DVSDK source package, unset all of the variables in the CODEC Engine support components section of the TI_EVM_3530.bat file (BSP_DSPLINK, BSP_CMEM, BSP_DSHOWFILTER, BSP_H264_DECODE_FILTER, BSP_MPEG4_DECODE_FILTER, BSP_MPEG2_DECODE_FILTER and BSP_DMAI_SAMPLE_APPLICATIONS) and set BSP_TI_DVSDK. Note that a clean build is required.

- Added environment variables to select NAND flash type, currently supported are BSP_NAND_MT29F2G16 and BSP_NAND_MT29F4G16.
- **DVSDK (binaries)**
 - Updated the Multimedia binaries to DVSDK 1.00.00.05 (GA version).
 - The DSP based CODECs (H.264, MPEG4, MPEG2) are now usable with VRFB (Virtual Rotated Frame Buffer) enabled. Use of the VRFB will improve performance of systems using rotated displays. Note that there may still be problems with large format displays.
- **3D Graphics**
 - Updated 3D Graphics DDK v1.3.1
 - Fixed the compatibility with Windows CE R3 Silverlight
 - Fixed problem with Icon Corruption when PowerVR was enabled. The workaround with XP SKIN (BSP 6.12.04) is no longer required and has been disabled.

2.2. TMDSEVM3530 Support

This package includes a tested version of BSP code that supports the new TMDSEVM3530 (EVM2) platform from TI. This code has now gone through formal testing cycle and has passed the release criteria.

2.3. Power Management Support

Support for Power Management using Suspend mode is added in this release. Power Management is only tested and supported on ES3.x silicon on TMDSEVM3530 (EVM2) platform. Further details on Power Management can be found in “App Note - Power Management with OMAP EVM35xx Platform running Windows CE 6.pdf” under Documentation folder.

2.3.1 Suspend Mode

Improvements were made in suspend/resume behavior and also in reducing power consumption during system suspend. Detailed list of changes can be found in <\OAK\6.13.00\BSP\TI_EVM_3530\readme.txt>.

Please note that Wakeup from Suspend is only triggered by PWR_ON key in this release.

2.3.2 DVFS (Dynamic Voltage Frequency Scaling)

A preview of the DVFS (Dynamic Voltage and Frequency Scaling) subsystem is now available for evaluation (disabled by default). Enabling this subsystem (unset BSP_NODVFS, BSP_NOCPUPOLICY, and BSP_NOINTRLAT in ti_evm_3530.bat) will cause the DVFS subsystem to vary the core, CPU and DSP subsystem voltages and operating frequencies based on system activity.

3. Test Results

For the WinCE BSP QA process, Bsquare uses an internal developed test suite called [Device Validation TestSuite](#) as well as CETK. DVT comes from years of experience from Bsquare testing WinCE environments. It is a use case, system and driver-level testing and performance tool that helps identify BSP functionality and performance gaps. DVT is also used to test TI's 3D graphics and DVSDK frameworks.

Bsquare also tests the WinCE BSP using Microsoft's CETK. The Microsoft tests are ran are documented at <http://msdn.microsoft.com/en-us/library/aa934353.aspx>. There are over 130 functional, performance and stress tests that are ran on each release of the BSP.

Testing and BSP Certification for the 6.13.00 release was done on the TMDXEVM3503 and TMDSEVM3530 from Mistral. The following is the EVM configuration used during Bsquare's QA process.

- TMDXOMAP3503 EVM board revision D
 - Processor module revision B (ES2.1)
 - Power module revision B
 - MDC revision A
- TMDSEVM3530 EVM board revision G
 - Processor module revision C (ES3.1)
 - Power module revision D

A complete set of test results are available once the WinCE BSP has past General Availability. If you need the complete WinCE BSP QA/Testing results before this date, please email sales@bsquare.com.

3.1. Known Issues

All of the issues below are tracked within internal databases. If you have any questions related to any of these issues or others that are not, contact Bsquare support or sales@bsquare.com.

- **BSQR#1222** | Suspend/resume clock management for the HSUSB host EHCI driver is not working. When this driver is included in the system, the suspend current will be significantly higher. *(A workaround by disabling the suspend/resume clock management in the driver is shipped with the 6.13 release)*

- **BSQR#1223** | Can't resume device after suspend/resume for several times when USB storage is in OTG port
- **BSQR#1225** | USB OTG – When High Speed Mode is enabled CETK tests fail. But HS mode is disabled by default due to the failing CETK tests while the issue is root caused.
- **BSQR#1221** | Winsock Performance test Failed with WinCE 6.0R3 Image
- **BSQR#1214** | The USB OTG port is sensitive to the type/length of USB cable used. The cause of this issue is not known. Recommended cable is GoldX USB 5 in 1 (GXQU-06) available from www.amazon.com. *This is known issue with the software + hardware configuration. See <\BSP SOURCE\Documentation\App Note - USB Connectivity on TI OMAP3 EVM Platform running Windows CE 6.pdf> for further details.*
- **BSQR#1214** | If a device is connected to the OTG port during boot it will sometimes fail to enumerate. Remove and re-insert the cable connected to the OTG port to work around this issue. *This is known issue with the software + hardware configuration. See <\BSP SOURCE\Documentation\App Note - USB Connectivity on TI OMAP3 EVM Platform running Windows CE 6.pdf> for further details.*
- **BSQR#1214** | The USB OTG port will sometimes fail to enumerate devices and with spurious errors on pipes. It is not known if the cause is due to hardware or software.
- **BSQR#1214** | The USB OTG port is unstable with hot swap and certain USB1.1 and USB2.0 hubs don't work reliably. Standardized USB2.0 hubs do work. *This is known issue with the software + hardware configuration. See <\BSP SOURCE\Documentation\App Note - USB Connectivity on TI OMAP3 EVM Platform running Windows CE 6.pdf> for further details. .*
- **BSQR#1191** | Ethernet driver not working under stress. This is only seen during CETK stress tests and not in normal use. *This was investigated to be an issue with the CETK Test. This will be resolved by Microsoft in the next version of WinCE.*
- **BSQR#1178** | The MDC/EVM2 camera (video capture) driver requires a large amount of free program memory (~30 MB) when used with the video capture demo program. Use the control panel, system icon, memory tab to adjust the memory allocation. After running a video capture demo program, a large memory leak was observed. It is not known if this is due to a problem with the demo program or with the camera driver.
- **BSQR#1165** | We have found that CETK test start failing when it got to a 783 byte size sent to 3 addresses. It passed through 2 addresses and 64 bytes to 3 addresses. *This is only related to the CETK Two-Card Network Card Miniport Driver Test. Planned to be fixed in future release.*

- **BSQR#1158** | The do.exe command line utility may not be able to perform some types of CE shell commands due to running with user privileges, use the Platform Builder Target->Target Control shell with a KITL link to execute commands that do not work using do.exe.
- **BSQR#1146** | When using the USB EHCI controller with the EVM1 + TI Multimedia Daughter Card or EVM2, plugging a low/full speed device into the USB port on the daughter card will cause the port to become non-functional until a reboot. To work around this issue, use a hub between the USB port and the low/full speed device. *This behavior is by design (OMAP3xxx chip), no fix is expected.*
- **BSQR#1136/BSQR#1137** | TVOUT (S-video and composite) quality is poor for OMAP35x EVM1 and EVM2. *There are 2 issues at play here. One is related to hardware and that is fixed on EVM2. Second is related to problem in scaling and is expected to be fixed in future release.*
- **BSQR#1134** | Many BSP settings cannot be configured using the Platform Builder Catalog View. Edit the ti_evm_3530.bat file instead.
- **BSQR#1083** | Suspend/resume for the unsupported OHCI driver is incomplete. If this driver is used it may not work after suspend/resume.
- **BSQR#1059** | EVM1 only. The RTC emulation code does not support alarms. *(Hardware limitations, the RTC on a hard reboot resets the time)*
- **BSQR#1042** | The Virtual Rotated Frame Buffer (VRFB) module is not compatible with some of the video codecs provided by Microsoft. The default build settings use the normal flat frame buffer instead but that could result in bad performance. No fix is expected.

3.2. Resolved Issues

Below are list of issues resolved in this release and in prior releases.

3.2.1. Issues resolved in BSP 6.13.00

- **BSQR#1175** | Power Management modes have not been tested. *Power Management using Suspend mode is tested on TMDSEVM3530 (EVM2) in this release.*

- **BSQR#1071** When UART driver TX DMA is enabled (registry TxDmaRequest entry) the UART stops sending after a line break is received. It is not known if the cause is due to a hardware or software issue. The UART TX DMA is disabled by default. *A partial work around has been implemented and verified.*
- **BSQR#1042** Display rotation should only be used with the Virtual Rotated Frame Buffer (VRFB). Rotation using the flat frame buffer is possible, but the OMAP3530 memory/bus bandwidth is not sufficient to allow display scanning without causing display to flicker and/or lock up. *VRFB mode is recommendation for rotation.*
- **TIFAE#7** | VRFB rotation with video not supported. *This issue is fixed for Video Codecs (MPEG4, MPEG2, H.264) from TI.*
- **BSQR#1202** | Corrupted icon with some application (e.g., IE) when PowerVR is enabled. *This issue is fixed with updated PowerVR libraries. (A workaround was implemented in BSP 6.12.04 by enabling XP skin. That is no longer needed).*

3.2.2. Issues resolved in BSP 6.12.04

- **BSQR#1179** | When playing videos and playback window is moved to be partially off screen, the video playback may show artifacts. *This issue was resolved in an earlier release but was not documented.*
- **BSQR#1183** | EHCI port is not working when DVI mode is enabled. *The issue is resolved.*
- **TIBSQR#0044** | The EVM Flash utility does not work for the latest TMDSEVM3530 (EVM2). *This is now fixed with new version of the EVMFlash Tool for EVM2 that is available under the Tools directory.*
- **BSQR#1216** | Video In driver for the Multimedia Daughter Card is not working efficiently on ES2.1 version of the OMAP35x EVM1. *Resolution for this issue is to upgrade to ES3.x OMAP35x silicon version.*
- **TI#46** | Poor multimedia performance has been observed on TMDXEVM3503 platforms using OMAP3530 ES2.1 silicon under certain conditions (such as loading from SD cards). This is seen with high bit rate (>2Mbps) H.264 video files. *Resolution for this issue is to upgrade to ES3.x OMAP35x silicon version.*

4. Release Content

4.1. Software

The complete listing of device driver software for baseport, 3D graphics DDK, DVSDK and BSP SOURCE can be found in their respective software manifests in the folder <06.13.00\Documentation>.

4.1.1. Windows CE BSP

The Windows CE BSP files are located in two zip files under the folder **BSP** in the release package:

- TI_EVM_3530_x.yy.zz.zip
- OMAP35XX_TPS659XX_TI_V1_x.yy.zz.

x.yy.zz is the version number of the release. For instructions in how to setup the BSP in the Microsoft Windows CE development environment please refer to the BSP User Guide available under the Documentation folder.

4.1.2. Sample Windows CE 6 OS Design Solutions

OS Design Solutions are used to store project specific configurations in the Microsoft Platform Builder Development Environment for Windows CE projects. Three sample OS Design Solutions are provided in this release package targeting the following platforms:

Name	Platform
EVM_3503	TMDXEVM3503 (EVM1)
EVM_3503_MDC	TMDXEVM3503 with Multimedia Daughter Card (EVM1+MDC)
EVM_3530	TMDSEVM3530 (EVM2)

4.1.3. Sample Build Scripts

Three sample build scripts with default build settings for the supported platforms are included in the release:

- evm1_ti_evm_3530.bat for TMDXEVM3503 (EVM1)
- evm1_mdc_ti_evm_3530.bat for TMDXEVM3503 + TI Multimedia Daughter Card (EVM1+MDC)
- evm2_ti_evm_3530.bat for TMDSEVM3530 (EVM2)

Rename the appropriate script to ti_evm_3530.bat for building the configuration chosen. Refer to BSP User Guide available under the Documentation folder for build instructions.

4.1.4. PowerVR 3D Graphics Library

The PowerVR 3D Graphics libraries supporting application development under the OpenGL Standard can be found in the folder under x.yy.zz\PowerVR. There are 2 binary packages depending on the Silicon version in use. The binary package and demos for the 3D Graphics are

- PowerVR-DDK-1.3.1_SDK-2.3.1_OMAP3ES3.x.zip for ES3.x silicon (for TMDSEVM3530 platform or EVM2)
- PowerVR-DDK-1.3.1_SDK-2.3.1_OMAP3ES2.x.zip for ES2.x silicon (for TMDXEVM3503 platform or EVM1)

4.1.5. DVSDK

The DVSDK binaries (for TI's accelerated Multimedia subsystem) are included in the BSP source package under the folder TI_EVM_3530\FILES.

Access to the DVSDK source package can be obtained from Texas Instruments. See http://software-dl.ti.com/dsp/dsp_public_sw/sdo_sb/targetcontent/dvSDK/WinCE/latest/index_FDS.html for more details. BSP 6.13.00 is compatible with DVSDK 1.00.00.05 source package.

4.1.6. Sample Drivers

The BSP contains several drivers that are provided only as examples. These drivers have not been tested on the EVM and are not supported:

- TI_EVM_3530\SRC\DRIVERS\USBHCD
- TI_EVM_3530\SRC\DRIVERS\MUSB\USBOTG_TPS659XX
- TI_EVM_3530\SRC\DRIVERS\CAMERA
- TI_EVM_3530\SRC\DRIVERS\HEADSET
- PLATFORM\COMMON\SRC\SOC\OMAP35XX_TPS659XX_TI_V1\omap\TPS659XX\BCI
- PLATFORM\COMMON\SRC\SOC\OMAP35XX_TPS659XX_TI_V1\omap\TPS659XX\MADC
- PLATFORM\COMMON\SRC\SOC\OMAP35XX_TPS659XX_TI_V1\omap35xx\HDQ

4.1.7. Prebuilt Windows CE Images

Prebuilt images for three different platforms / configurations are included in the Demo package:

- I. TMDXEVM3503
 - a. OneNAND boot, LCD output (only for TMDXEVM3503 with Samsung ONENAND)
 - b. Micron NAND Boot, LCD output
 - c. SD boot, Micron NAND support, LCD output
 - d. SD boot, Micron NAND support, DVI 720p output
- II. TMDXEVM3503+MDC (Multimedia Daughter Card)
 - a. Micron NAND boot, LCD output
 - b. SD boot, Micron NAND support, LCD output
 - c. SD boot, Micron NAND support, DVI 720p output
- III. TMDSEVM3530
 - a. Micron NAND boot, LCD output
 - b. SD boot, Micron NAND support, LCD output
 - c. SD boot, Micron NAND support, DVI 720p output

Note: The prebuilt images are no longer part of the “BSP Source” package.

4.1.8. Windows CE SDK for the OMAP 35xx EVM Platforms

Windows CE SDKs for the sample OS Design Solutions are included in this release package. These SDKs are required for developing applications using Microsoft Visual

Studio Development environment that will run on one of the EVM platforms supported by the BSP.

4.1.9. Tools

Several utilities are distributed in the release package.

I. EVMFlash Tool

This utility is used for programming a ROM image into the EVM's non volatile memory. Variants are available for the different EVM configurations.

II. SDCard Boot Utility

This utility is used for building a SD card that can be used as a bootable storage with the EVM platform.

Refer to the BSP User Guide available under Documentation folder for the details on how to use these tools.

4.1.10. Documentation

The following documents are contained in the folder OAK\x.yy.zz\Documentation in the root of the release.

Document	Author	Description
App Note - Power Management with OMAP EVM35xx Platform running Windows CE 6.pdf	Bsquare	Application note that describes Power Management on a EVM platform running Windows CE OS Release 6
App Note - USB Connectivity on TI OMAP3 EVM Platform running Windows CE 6.pdf	Bsquare	Application note that describes issues with the USB OTG functionality and the recommend work-around
App Note - Enable Media Codec Framework on TI OMAP3 EVM Platform running Windows CE 6.pdf	Bsquare	Application note that explains how to enable and build the media codec engine framework (aka DVSDK) from TI
App Note - Enabling DVI Output on the TI EVM Platform running Windows CE 6.pdf	Bsquare	Application note that explains how to configure the WinCE image to output to the DVI port on the EVM

App Note - Enable 3D Graphics Framework on TI OMAP3 EVM Platform running Windows CE 6.pdf	Bsquare	Application note to enable and build the 3D graphics framework (aka 3D Graphics DDK) from TI
Bsquare WinCE BSP for OMAP35x EVM Feature List.pdf	Bsquare	The complete list of features in the WinCE BSP.
EVM3530 BSP User Guide.pdf	Bsquare	The WinCE BSP user's guide to help guide you through building and running WinCE on the OMAP35x EVM
WinCE BSP Directory Structure Changes.pdf	Microsoft	Microsoft's description of the WinCE Directory Structure. This is just an FYI document for users as this configuration has already been done on the WinCE BSP source tree.
BSQUARE WinCE BSP for OMAP35x EVM Data Sheet.pdf	Bsquare	Bsquare's WinCE BSP data sheet describing this WinCE product. For more information, email sales@bsquare.com .
BSQUARE WinCE BSP SDIO Hx White Paper for OMAP35x EVM.pdf	Bsquare	Bsquare's white paper on SDIO Hx that improved the SD interface in the WinCE BSP on OMAP35x EVM.
OMAP3 WinCE DVSDK Software Manifest (1.00.00.05).pdf	Texas Instruments	Lists the DVSDK components contained in the BSP and the location of the files.
OMAP3 WinCE BSP Software Manifest (6.13.00).pdf	Bsquare	Lists the WinCE driver/software contained in the BSP and the location of the files.
evm3530_usb_limitation.pdf	Texas Instruments	Describes the USB limitations on the Mistral EVM

5. Glossary

BSP	refers to the base WinCE kernel drivers
DVSDK	refers to the TI's Digital Video Software Development Kit
3D Graphics SDK	refers to the TI 3D Graphics Software Development Kit
EVM1	refers to the TMDXEVM3503 platform
EVM2	refers to the TMDSEVM3530 platform
MDC	refers to the TI Multimedia Daughter Card used with TMDXEVM3503 platform

6. Support

- a. For technical support, registered users should contact their local Texas Instruments FAE, or go to our website at <http://www.bsquare.com/omap3>. To get immediate access to the support site, send an email to omap3support@bsquare.com with the subject line "OMAP3 KB ACCESS".
- b. For helpful developer hints, try the collaborative Wiki site at <http://wiki.davincisp.com/index.php/Category:OMAP35x>. (Please note that this site has information for both Linux and WinCE)
- c. Users new to Windows Embedded CE6 can obtain evaluation versions of the required software from Microsoft at the following URL <http://msdn.microsoft.com/en-us/embedded/aa731407.aspx>.