DSP/BIOS DM6437/C6424

Version: GA 1.10.03

Release Notes

April 17, 2009

The product release notes in this document are for Platform Support Package for DM6437/C6424 platform for BIOS. The PSP Package serves to provide a fundamental software platform for development, deployment and execution. This abstracts the functionality provided by the hardware. The product forms the basis for all application development on this platform. The package for this product shall include deliverables for the following:

- Device Drivers for DSP-BIOS

    o UART

    o I2C

    o McASP

    o VLYNQ

    o PCI

    o McBSP

    o NAND

    o VPFE

    o VPBE

    o Previewer

    o Resizer

    o H3A

    o Histogram

    o CSL 3.x package for DM6437/C6424 :Register layer CSL

1   In This Release

This is the GA 1.10.03 release of DM6437/C6424. This release is based on DM6437/C6424 EVM and CCS 3.3.38.

This release contains the DM6437/C424 BIOS PSP package unified with DM648/C6452 BIOS PSP package. Please find the separate release note for DM648/C6452 BIOS PSP in "pspdrivers_<version>\docs\dm648" folder of the package. The drivers and sample applications and Unit Tests have been done on the DM6437 EVM.

The version of the unified package would start from 1.10.00.08. **Users of this BIOS PSP must refer to the new in this release section for the additions/deletions/modification from last release.**

The release contains:

- ❖ PAL OS (OSMem, OsBuf, OSSem, OSMutex, OSList, OSProtect, OSWait)
- ❖ PAL SYS Component (VLYNQ and PCI)
- ❖ UART, I2C, McASP, NAND, McBSP
- ❖ VPBE, VPFE, Previewer, Resizer, H3A and Histogram (Only for DM6437)
- ❖ Sample applications

  - o I2C sample: Read Write test
  - o VLYNQ sample: Read Write test
  - o UART sample: Echo test
  - o NAND sample: Read, write and IOCTL test
  - o McBSP/McASP sample: Record, Playback, pause/resume, mute ON/OFF start/stop and loopjob enable/disable test
  - o PCI sample: Read/write across PCI bus and DSP to interrupt sample
  - o VPFE sample: Raw capture and YUV loopback applications (Only for DM6437).
  - o VPBE sample: Video 0 window display sample application (Only for DM6437).
  - o VPSS Integrated application: This application is loopback application which demonstrates VPFE, Previewer, Resizer, H3A, Histogram and VPBE driver functionalities (Only for DM6437).
  - o VPFE–Previewer On-the-fly sample: Applications to demonstrate Previewer On-the-fly functionality and dark frame capture functionality (Only for DM6437).
  - o Previewer sample: Applications for basic and multipass previewing (Only for DM6437).

- o Resizer sample: Applications for basic and multipass previewing (Only for DM6437).

- o H3A sample: Applications for basic AF and AEW functionality (Only for DM6437).

- o Histogram sample: Application for basic histogram functionality (Only for DM6437).

2   System Requirements

In order not to duplicate, the information on this section was removed and users are requested to refer "System Requirements" section of "pspdrivers_<version>\docs\dm6437\ PSP_User_Guide.doc" for this information.

3   Installation and Usage

Please refer "PSP_User_Guide.pdf" document for installation procedure.

4   Un-installation

Please refer "PSP_User_Guide.pdf" document for un-installation procedure.

5   New in This Release

❖ **New features in the components of release 1.10.03**

- Added new IOCTLs to resizer driver to support notification of resize completion status via callback. Please refer to resizer driver release notes and user guide for more information.

- Added support for two more sample rates for codec

❖ **New features in the components of release 1.10.02**

- The McBSP driver is modified to support SPI mode.

- The I2C driver has been converted to an asynchronous driver

- IOCTL for reading and writing from and to the codec registers in Audio driver.

- Option to select clock source for codec from external source.

❖ **New features in the components of release 1.10.01**

- None

❖ **New features in the components of release 1.10.00**

- The path settings have been edited appropriately in < psp package>\packages\ti\sdo\pspdrivers\common\psp_xdcpaths_common.dat>

- Renaming of version from 1.10.00.09 to 1.10.00

- Added user_led library in the Ethernet drivers package (separate archive file)

- No other change is made from the release version 1.10.00.09

- Have been built with EDMA version 1.05.00, codegen tools 6.1.0 and XDC 3.10.00.26,

❖ **New features in the components of release 1.10.00.09**

- o Support for asynchronous mode of operation to the application is added in the UART driver.

- o Dynamic memory allocation is replaced by static memory allocation in PALOS semaphore creation module.

❖ **New features in the components of release 1.10.00.08**
- DM6437/C6424 BIOS PSP package was unified with DM648/C6452 BIOS PSP to leverage the common drivers and RTSC.

- DM6437/C6424 BIOS PSP package is RTSC-fied for packaging level (Bundles, packages and modules). The sample applications are modified to leverage RTSC cfg files to add/include the libraries.

  - o Folder structure is slightly modified to adapt RTSC packaging and unification with DM648/C6452 package.

  - o Non-DVSDK users must ensure that the correct path settings are set in the <psp package>\packages\ti\sdo\pspdrivers\common\psp_xdcpaths_common.dat>

- o In DVSDK environment the script in the above mentioned file automatically takes the path information from BIOSDVSDK_INSTALL_DIR environment variable. (For this please ensure that section 1 is commented and section 2 is uncommented in the above mentioned psp_xdcpaths_common.dat file.

- EDMA_LLD code has been removed from the package of this PSP. The EDMA_LLD code should be installed separately as the EDMA_LLD package is now available a separate product (http://pdssoft.design.ti.com/cgi-bin/directdownload?delid=3472). Please note that the EDMA_LLD must be installed before any of the sample application or driver (that depend on EDMA) from BIOS PSP package could be compiled. This release of PSP has been tested with EDMA_LLD version 1_03_01_01.

- Sample folders of each driver is moved from respective driver folder (<psp_folder>\packages\ti\sdo\pspdrivers\driver\<peripheral>) to EVM dependent folder (<psp_folder>\packages\ti\sdo\pspdrivers\system\<soc>\bios\<evm>\<peripheral>) as the example is more attached towards EVM.

- Fvid.h file is moved to <psp_folder>\packages\ti\sdo\pspdrivers\system\<soc>\bios\<evm>\Video folder. This is done as there is more than one video driver in the package uses fvid.h. **Applications should take care to change this path in their application for proper compilation and function.**

- The string "EVMDM6437_EDMA_AIC33" is replaced by "AUDIO_AIC33" in tci /tcf files. **Applications should take care to change in their application for audio to work properly.**

- **As a result of RTSC-fication all driver public headers were moved to the driver's (package's) root directory (e.g. <psp package>\packages\ti\sdo\pspdrivers\drivers\<peripheral>) as per RTSC standard. Applications must change the include path of the driver headers accordingly. Please note that the include statements should use canonical path starting from ti\sdo\packages\... as the path information till the "ti" folder is covered by xdcpath of RTSC which is extracted from <psp package>\packages\ti\sdo\pspdrivers\common\psp_xdcpaths_common.dat>**
  (e.g #include
  <ti/sdo/pspdrivers/system/dm6437/bios/evmDM6437/video/fvid.h>

- CSLR headers/examples are modified to match the DM6437/C6424 CSLR macro names so as to leverage the re-use of DM6437 CSLR based applications by customers. Please refer to CSLR release notes for more information.

- Previous version of the UART driver (for DM6437/C6424) is replaced by the UART driver from DM648/C6452 BIOS PSP package from this release. The changes in the interface are minor (only for the binddev devparams structure)

as the applications interfaces through GIO with this driver. Please note that minor change IOCTLs names/parameters might be present.

- Minor modification in FVID memory alloc/Free APIs are done in FVID.h to change the GIO_submit calls to GIO_control call. Please note that this does not change any signature exposed to application and hence application should not observe any change.

- CCS setup files and GEL files that were part of previous DM6437/C6424 BIOS PSP were removed. Users are advised to get the latest of them from CCS installation/ EVM manufacturer and use them.

6 Fixed in This Release

Fixed in release (1.10.03)

1. Fixed IR SDOCM00055494 : The Mcbsp driver contained a redundant enabling of EDMA transfer in case the packet submitted was the first one in the queue. This caused the current pending events to get cleared. This was causing the Mcbsp driver to hang. This function to restart the EDMA transfer is now removed

2. Fixed IR SDOCM00056082: The Mcasp driver contained a redundant enabling of EDMA transfer in case the packet submitted was the first one in the queue. This caused the current pending events to get cleared. This was causing the Mcasp driver to hang. This function to restart the EDMA transfer is now removed

3. Fixed IR SDOCM00056063: The pal_osTask.h file was missing in the package. This was a new file added. However, the package.bld file was not updated to include this file in the package

Fixed in release (1.10.02)

1. Fixed IR SDOCM00036793. The environmental variable name for DVSDK installation directory has been corrected in the PSP User Guide for DM6437.

2. Fixed IR SDOCM00036536. The guidelines for **XDCPATH** environmental variable and editing the **'psp_xdcpaths_common.dat'** file have been added to the PSP User Guide.

Fixed in release (1.10.01)

1. Fixed MR DPSP00010485. The references to EDMA3 library inclusion in the package and internal download site information have been removed.

Fixed in Release (1.10.00.08)

None

Fixed in Release (1.00.03.01)

1. Modified Video Front End to correct incorrect fields in a frame (applicable for Separate Field only)

2. Modified Video Sample PJT for correct pin mux settings for Digital Video Output.

3. Boundary condition check added for invalid VD Interrupt Interval

4. Modified McASP to check for multiple init. Multiple init are not supported.

5. Modified McASP to support Digital Loop Back mode.

6. Modified McBSP to add proper initialization sequence during init.

7. Modified the McASP constraint to work in DLB Mode (TSM Slots = 32)

Fixed in Release (1.00.03.00)

1. Time-out values for H3A & Histogram modules increased to 2 seconds to avoid timeouts. This is required as MT9T sensor requires some initialization time.

2. Video (Resizer, H3A, Histogram & VPFE) Review comments closed.

3. McASP Interface changed as per review comments.

4. EDMA3 issue with API "EDMA3_DRV_setPaRAMEntry" fixed.

5. Support for Digital Output (VPBE) & Separate Field (VPFE) added.

6. Support for Partial notification of frames (VPFE) added.

7. CSLR User Guide Modified.

8. PCI CSLR Tokens changed based on latest SPRU documentation.

Fixed in Release (1.00.02.00)

1. Resizer Missed Interrupt: Modified the resizer driver to internally take a semaphore with 10 millisecond timeout. The driver will retry based on the device status & will identify if there was any interrupt miss.

Fixed in Release (1.00.01.00)

1. Socrates Visualization: Added Packet ID per logging to enable better latency graph.

2. Socrates Visualization: Added bytes/seconds for latency for all drivers.

3. Modified Ethernet documentation to indicate the delivery name is .zip instead of .tar

4. Modified documentation to remove references for generic platform names

5. Modified Ethernet package to remove package error of ti\ti.

Fixed in Release (1.00.00.01)

1. Modified EDMA3 Event Setting/Clearing Mechanism.

2. Modified VPFE & VPBE driver to delete the semaphores that were created by the driver when channel is closed.

3. Added Audio Loop Job Buffer Cache Flush

7   Known Issues/Caveats

7.1   Common Issues (DM6437 & C6424)

1.	MISRA C Compliance
Release Note	
The source code, contained in this release, is MISRA C Compliant with some waivers and some bugs in the tool.	
Workaround	
None	

2.	UART driver known issues
Release Note	
"kprintf" doesn't work if UART driver is configured in EDMA mode - UART driver is not tested with flow control enabled on DM6437 EVM due to hardware limitation of EVM - Timeout is not working as expected when UART is configured in EDMA mode due to EDMA limitation	
Workaround	
None	

3.	I2C Driver known issues
Release Note	
Loopback is not supported in interrupt mode due to hardware limitation	
Workaround	

4.	VLYNQ known issues
- Chaining is not tested in this release - Backward compatibility is not tested - Mini-PCI connectors that are used for VLYNQ connection don't support change in the direction of clock dynamically. - PAL_VLYNQ_IOCTL_PREP_LINK_DOWN and PAL_VLYNQ_IOCTL_PREP_LINK_UP IOCTL commands can only be used to tear down and re-setup the link from LOCAL vlynq side.	
Workaround	
None	

5.	McASP known issues

Release Note

- SPDIF, inter board and external hardware loop back mode tests are not done
- Following interrupts are not supported in the present driver
    - i. McASP clock failure
    - ii. Last slot interrupt
    - iii. Start of frame interrupt
    - iv. Bad clock interrupt
- Interrupt mode is not supported
- No other task except Audio should use EDMA event queue 0. This is a system limitation. If the same event queue 0 is used for Audio and any other task Audio driver will (McASP) undergo underrun/overrun constantly resulting in a system hang.
- Application callback function with SIO/DIO class driver is not tested

Workaround

None

6.	NAND Flash known issues

Release Note

- Code is not tested for big block and 16-bit NAND.

- Hardware ECC is not working due to hardware limitation.

Workaround

None

7.	McBSP known issues

Release Note

- Global callback for frame sync error handling is not tested

- McBSP in Master mode does not support 12000 Hz, 11025 Hz and 8000 Hz sampling rates

- McBSP default is configured in DSP mode

- For word width 16, 20 and 24 after calling DEVICE_RESET there is noise heard

- Application callback function with SIO/DIO class driver is not tested

Workaround

None

8.	Audio driver known issue

Release Note

- AUDIO_OUT_SELECT IOCTL is not supported as output selection (Line 2 or Headphone) is not selectable.

- With current audio driver release McASP instance 0 and McBSP instance 1 can be used.

- AIC33 in slave mode supports sample rate 44.1 KHz and 48 KHz

- AIC33 supports word width 16, 20, 24 and 32 bits only

Workaround

None

9.	PCI driver know issues

Release Note

- PCI driver does not use PCI CSLR provided with the package

Workaround

10.	Audio does not play at sampling rate of 96kHz

Release Note

- When the sampling rate is changed to 96Khz, Fs changes to 96khz but the but the audio is not playing (a buzzing sound is heard).

Workaround

Use sampling rates less than 96kHz

11.	Codec stall is observed after a few sample rate changes

Release Note

- It is observed that the codec, after multiple sampling rate transitions, sends some constant data pattern instead of actual audio data.

Workaround

None

7.2 Platform Specific Issues (DM6437 Only)

1.	VPFE Driver Known Issues
Release Note	

- <DPSP00005336> Merging of lines observed during capture and display loopback. – This issue with Swan Camera & also with some makes of DVD Players. With weak input signal, the output quality deteriorates.
- <DPSP00005697> Raw capture stress testing – The hardware stops responding after continuous raw video capture for approximately 1.5 hours.
- <DPSP00005712> Video quality issue-Vertical bars and visual frame drops observed – This issue with Swan Camera & also with some makes of DVD Players. With weak input signal, the output quality deteriorates.
- <DPSP00006408> Video fails to resume on a CCS disconnect, connect and reload – This issue is seen only when the GEL file is re-run on re-connect.
- <DPSP00006496> In raw capture mode, It does not give 10bit data/pixel
- <DPSP00006537> The chroma artifacts are observed when composite cable is connected and these artifacts are reduced when s-video cable is connected
- <DPSP00008649>The TVP requires few frames to latch on signal so first few frames will come improper.

Workaround

2.	Video driver known issue
Release Note	

- To use video drivers with applications of beta release of DM6437 include "FVID_evm6437.h"

Workaround
Verify the signal quality of the input device & use better quality video cables to connect to the EVM.

3.	VPBE known issue
Release Note	
None	

Workaround
None

4.	**H3A known issue**
Release Note	
H3A stress test is pending as the raw continuous capture fails after 1.5 hours.	
Workaround	
None	

5.	**Histogram known issue**
Release Note	
Histogram stress test is pending as the raw continuous capture fails after 1.5 hours.	
Workaround	
None	

6.	**Previewer known issue**
Release Note	
• Previewer On-the-fly mode stress test is pending as the raw continuous capture fails after 1.5 hours.	
Workaround	
None	

7.	**Resizer known issue**
Release Note	
• None	
Workaround	
None	

8.	**VPSS integrated application known issue**
Release Note	
As Previewer one-shot mode hangs with VPFE Video port path enabled; Previewer, Resizer, H3A and Histogram can't run simultaneously.	

| **Workaround** |
| None |

9.	**Low frames observed with 480p display**
Release Note	
While running 480p display sample application (dm6437_evm_digital_vpbe_st_sample), only 30 FPS is achieved both in release and debug modes. But the expected frame rate for 480p display is 60 FPS.	
Workaround	
None	

10.	**Flicker observed in YCC16 480p video display**
Release Note	
Flickers are observed in YCC16 480p video display while executing dm6437_evm_digital_vpbe_st_sample sample application. The scrolling horizontal pink line appears to flicker at the top half of the image while it is stable at the bottom half of the image.	
Workaround	
None	

8   Revision history

Date	Author	Comments	Version
May 17, 2007	Amit Chatterjee	GA Candidate Release	1.00.00.01
June 22, 2007	Amit Chatterjee	GA Patch Release	1.00.01.00
June 29,2007	Amit Chatterjee	GA Patch release with Resizer Interrupt Miss	1.00.02.00
July 18, 2007	Amit Chatterjee	Modified Release Version	1.00.03.00
August 08, 2007	Amit Chatterjee	Modified Release Version	1.00.03.01
December 3, 2007	Vichu	Updated for release 1.10.00.08	1.10.00.08
February 20, 2008	Nagaraj	Updated for release 1.10.00.09 with EDMA revision updates	1.10.00.09
February 28, 2008	Vichu	Updated after system test	1.10.00.10
February 29, 2008	M Sriram	Updated for release 1.10.00.10	1.10.00.11
May 28, 2008	M Sriram	Updated for release 1.10.01	1.10.00.12