VAYU-BSP-01.01.02.12 ReleaseNotes

BSP Version 01.01.02.12

Release Notes
10th October, 2013

Important Note

This release is for TDA2xx (Vayu) and TI814x (Centaurus for serial drivers only) platforms

Document License

Introduction

This release notes provides important information that will assist you in using the BSP software package. This document provides the product information and know issues that are specific to the BSP software package.

New in this Release

- Capture
  - Added support for LVDS capture.
    - All six serializer inputs are supported - CAM1, CAM2, CAM3, CAM4, CAM5 and CAM6.
    - For capture to work from Multi De-serializer board SW3 switch of Vision App board should set to SW3[1-8] - "xxxxxxx0". i.e. disable DIP switch override as this is now controlled through GPIO in board driver.
  - Leopard Imaging present in the Base board is supported
  - TVP5158 (NTSC/PAL capture) present in JAMR3 board is supported
- Display
  - On chip HDMI support is added. Verified for 1080P, 1080I, 720P and 480P resolutions.
  - Addition of IOCTLs_VPSCORE_DCTRL_SET_ADV_VENC_TDM_PARAMS, IOCTL_VPSCORE_DCTRL_SET_ADV_VENC_DISP_PARAMS and IOCTL_VPSCORE_DCTRL_SET_ADV_VENC_SIGNAL_PARAMS to support setting TDM mode and advance parameters
- VPE
  - Sliced based scaling is supported
  - VPE with input and output buffers in Tiler memory is validated
- All examples are verified in SYS BIOS mode instead of SMP BIOS mode and the corresponding CFG files are changed to disable SMP BIOS
- Bug Fixes

Installation and Usage

Installation and Usage of the BSP package could be found at BSP_UserGuide

Upgrade and Compatibility Information

- **Common**
  - To test VPE tiler mode, 128 MB memory is added in sample application CFG file. This is applicable for testing purpose only.
  - To support software control of LVDS multi-deserializer board mux, 3 more GPIOs are used. GPIO2_29(mcasp2_axr6), GPIO1_4(mcasp2_axr4), GPIO6_7(mcasp2_axr5) are used and the corresponding pin mux modes are changed to GPIO in platform module set pin mux API
- **VIP Capture**
  - None
- **VPE M2M**
  - None
- **DSS Display**
  - DSS Display sample application expects 1920x1080 HD buffer to be loaded for display instead of 800x480 buffer in order to test 1080p60 via HDMI output. This image is available in `docs\test_inputs\DisplayInput.rar`
- **UART**
  - None
- **McSPI**
  - None
- **I2C**
  - Introduced Time Out Parameter in I2C Driver as an additional Error Safe Mechanism
  - This is done using I2C_IRQ_TIME_OUT variable set at a maximum value of 7 seconds.
  - User Applications needs to change this variable if they expect a single I2C transaction on their slave to take more than 7 seconds(which is not common in any of I2C Transaction).
- **McASP**
  - None
- **Audio**
  - None

Dependencies

This release requires following tools/packages to be installed.

- Starterware Package: 01.00.02.16
- Code Composer Studio Version: 5.4
- XDC Tools Version: 3.25.02.70
- BIOS Version: 6.35.03.47
- CG Tool (TMS470) Version: 5.0.4
- CG Tool (C6000) Version: 7.4.2
- EDMA LLD: 02.11.10.09

Devices Supported

- TDA2xx
- TI814x (for Serial Drivers only)

Application Boards Supported

- TDA2xx Base board + LCD board
- TDA2xx Vision application board
- TDA2xx Vision application board with Multi-deserializer board
- TDA2xx JAMR3 application board

What is Supported

Common

- Supports for TDA2xx EVM/VIRTIO/Zebu
- Supports FVID2 interfaces for all the supported drivers
- Package includes BSP driver sources, sample applications that demonstrate use of drivers and sample applications executables
- SYS BIOS mode is tested
- Benelli M4 (IPU1) Core 0 for TDA2xx
- Virtual to physical address translation for VPDMA descriptor memory is supported

VIP Capture Driver

- Supports VIP capture driver (12 instance on TDA2xx)
- Support for OV10635 sensor present in TDA2xx vision daughter card
- Support for 6-channel LVDS capture from multi-deserializer board
- Support for LI sensor present in base board
- Support for TVP5158 decoder present in JAMR3board

VPE M2M Driver

- Supports VPE1 path
- Supportted Input Formats: YUV422I, YUV420SP and YUV422SP
- Supportted Output Formats: YUV422I, YUV420SP, YUV422SP, RGB888 and YUV444
- Supports SC and DEI
- Supports sliced based scaling

DSS Display Driver

- Supports DSS display driver with all pipelines going to any LCD, blended or without blending
- Supports display controller driver to set the display paths and VENC resolution
- Supports LCD and On-Chip HDMI display

UART Driver

- Device Driver for UART on ARM M3,M4
- Sample Application that demonstrate the use of driver for UART - Echo Test.

McSPI Driver

- Device Driver for McSPI on ARM Cortex M3,M4
- Sample Applications that demonstrate the usage of Driver:
  - Writes to On Board Serial Flash in case of TI814X
  - EVM to EVM Communication for both TI814X and TDA2XX
  - Loopback Testing for TDA2xx
  - Writes to McSPI Slave Adaptor with McSPI as Master for TDA2XX

I2C Driver

- Device Driver for I2C on M4 Core
- GIO and IOM Model APIs are supported for Application
- Sample Application that demonstrate the usage of Driver:

McASP Driver

- Device Driver for McASP on DSP Core
- Sample Application that demonstrate the usage of Driver:
- Driver expects the data (samples) to be in a specific format when requesting for an IO transfer based on below configurations
  - Single Serializer
  - Multiple Serializer
  - BurstMode
  - Multislot TDM/I2S
  - DIT

Audio Driver

- Device Driver for Audio on DSP Core
- Every Instance can support multiple codecs
- Sample Applications that demonstrate the usage of Driver
  - Sine Tone Generation
  - Loopback Application

Aic31 Driver

- Device Driver for AIC31 on DSP Core
- Appropriate interfaces to configure the initial values of gain, sample rate
- Interfaces to control the codec specific features like sample rate etc

Features

VIP Capture Driver Features

Feature	Supported	Tested on EVM
12 instances (3 VIP x 2 Slice x 2 Port)	YES	YES, Only VIP1 Slice 0 Port A
8-bit Embedded Sync (BT.656)	YES	YES
16-bit Embedded Sync (BT.1120)	YES	NO
24-bit Embedded Sync	YES	NO
8-bit Discrete Sync	YES	YES (only VSYNC/HSYNC mode)
16-bit Discrete Sync	YES	NO
24-bit Discrete Sync	YES	NO
8-bit YUV422 Input	YES	YES
16-bit YUV422 Input	YES	NO
24-bit YUV444 Input	YES	NO
16-bit RGB656 Input	YES	NO
24-bit RGB888 Input	YES	NO
12/16-bit RAW Input	YES	NO
24-bit RAW Input	YES	NO
YUV422I, YUV420SP, YUV422SP, RGB888, YUV444 and RAW output formats	YES	YES
Embedded Sync Multiplexed Modes	NO	NO
Ancillary (VBI) data capture	NO	NO
Bypass mode (RAW to RAW - no processing)	YES	NO
Inline SC Support (cropping, down scaling)	YES	YES
Inline CSC	YES	YES
Configurable VPDMA Line Limit Feature	YES	YES
Tiled (2D) output	NO	NO
Dual stream output (scaled/non-scaled)	NO	NO
Sub-frame based capture	YES	YES
Sub-frame based OTF use case	YES	NO
Re-packer	YES	YES (only on TDA2xx Zebu)
VIP Parser Crop	YES	YES
Buffer Capture Modes - drop frame, last frame repeat, circular frame repeat	YES	YES
Frame Drop IOCTL	YES	YES
Instance and channel status	YES	YES

VPE M2M Driver Features

Feature	Supported	Tested on EVM
VPE1 instance	YES	YES
YUV422I, YUV420SP, YUV422SP input formats	YES	YES
YUV422I, YUV420SP, YUV422SP, RGB888, YUV444 output formats	YES	YES
Tiler (2D) input/output	YES	YES
Tiler Rotation/Mirroring	YES	YES
SC (cropping, scaling)	YES	YES
DEI (bypass and in deinterlacing mode)	YES	YES
VC1 range mapping and reduction	NO	NO
DEI FMD mode	NO	NO
Multi-Handle	YES	YES
Multi-Channel	YES	YES
Lazy loading of SC coefficient	YES	YES
Slice based scaling (only horizontal slices)	YES	YES
Runtime parameter change	YES	YES

DSS Display Driver Features

Feature	Supported	Tested on EVM
Video pipeline (Video 1,2,3)	YES	YES
Graphics pipeline (GRPX1)	YES	YES
Writeback pipeline	NO	NO
All LCD/DPI outputs	YES	YES (only DPI1 tested on EVM)
On-Chip HDMI 1.4 Support	YES	YES
HDMI 3D	NO	NO
HDMI 36-bit RGB Color	NO	NO
HDMI HDCP 1.4	NO	NO
HDMI Deep color mode	NO	NO
8-bit Embedded Sync (BT.656)	YES	NO
16-bit Embedded Sync (BT.1120)	YES	NO
24-bit Discrete Sync	YES	YES
8/16 bit Discrete Sync	NO	NO
HDMI PLL	YES	YES
VIDEO 1/2 PLL	YES	YES
YUV422I (YUYV),YUV422I (UYVY),YUV420SP, RGB888 input formats	YES	YES
YUV444 input formats	NO	NO
Tiler Memory (2D)	NO	NO
Tiler Rotation/Mirroring	NO	NO

VC1 Range Mapping (for Video Pipes)	NO	NO
Bypass mode	NO	NO
Inline SC	YES	YES
Inline CSC	YES	YES
Blending	YES	YES
Low-latency display (ability to queue frame to driver/hardware just before VSYNC)	YES	YES
Interlaced scan format	YES	YES
Fields merged and separated interlaced buffers	YES	NO

UART Driver Features

Feature	Supported	Tested
Single instance	YES	YES
Multi instance and Re-Entrant	YES	NO
Each Instance as Transmitter and / or receiver	YES	YES
DMA Mode Of Operation	YES	YES
POLLED Mode Of Operation	YES	YES
INTERRUPT Mode Of Operation	NO	NO

I2C Driver Features

Feature	Supported	Tested
Single instance	YES	YES
Multi instance and Re-Entrant	YES	YES
Slave Device Probe IOCTL	YES	YES
Each Instance as Master Transmitter	YES	YES
DMA Mode Of Operation	NO	NO
POLLED Mode Of Operation	YES	YES
INTERRUPT Mode Of Operation	YES	YES

McSPI Driver Features

Feature	Supported	Tested on Tda2xx	Tested on TI814x
Single instance	YES	YES	YES
Multi instance and Re-Entrant	YES	YES	YES
Each Instance as Transmitter and / or receiver	YES	YES	YES
DMA Mode Of Operation	YES	YES	YES
POLLED Mode Of Operation	NO	NO	NO
INTERRUPT Mode Of Operation	NO	NO	NO

Audio Driver Features

Feature	Supported	Tested on Tda2xx	Tested on TI814x
Multi instance and Re-Entrant	YES	YES	YES
Each Instance as Transmitter and / or receiver of an audio device	YES	YES	YES
DMA Mode Of Operation	YES	YES	YES
POLLED Mode Of Operation	NO	NO	NO
INTERRUPT Mode Of Operation	NO	NO	NO

McASP Driver Features

Feature	Supported	Tested on Tda2xx	Tested on TI814x
Single instance	YES	YES	YES
Multi instance and Re-Entrant	YES	YES	YES
Each Instance as Transmitter and / or receiver	YES	YES	YES
Multiple Data Formats	YES	NO	NO
Configurations to operate: multi-slot TDM, I2S, DSP	YES	YES	YES
Configurations to operate: DIT (S/PDIF)	YES	NO	NO
Desired data (such as NULL tone), when idle Transmission Mechanism.	YES	YES	YES
Explicit control of PIN directions for High Clock, Bit Clock and Frame Sync PINS.	YES	YES	YES
DMA Mode Of Operation	YES	YES	YES
POLLED Mode Of Operation	NO	NO	NO
INTERRUPT Mode Of Operation	NO	NO	NO

AIC31 Codec Driver Features

Feature	Supported	Tested
Multi instance and Re-Entrant	YES	YES
Independent Configuration of Transmitter and receive of an audio device with and multiple audio codecs	YES	YES
Interfaces to control the codec specific features like sample rate etc	YES	YES
Appropriate interfaces to configure the initial values of gain, sample rate etc	YES	YES

Driver Maturity

Driver Maturity

Driver	TDA2xx	TI814x
VIP Capture	Beta 1.0	NA
VPE M2M	Beta 1.0	NA
DSS Display	Beta 1.0	NA
UART	Beta 1.0	Beta 1.0
McSPI	Beta 1.0	Beta 1.0
I2C	Beta 1.0	Beta 1.0
McASP	Beta 1.0	Beta 1.0

Supported/Validated Examples

Supported/Validated Examples

Examples	TDA2xx-EVM
VIP Capture	YES
VIP Sub-frame	YES
VPE M2M	YES
DSS Display	YES
Loopback	YES
UART ECHO	YES
MCSPI LOOPBACK	YES
MCSPI MASTER SLAVE BOARD TO BOARD	YES
I2C ON Board LED Blink	YES
Audio SINE TONE GENERATION using AIC31Codec	YES
Audio Loopback Application	YES

- Examples could be found at `$BSP_Install_Dir\examples\`

What is Not Supported

- Checking for most of the input parameters for out of range and invalid values is not done
- Scaler lazy loading and user coefficient loading are not supported in VIP capture driver
- VIP Reset IOCTL is not supported in VIP capture driver. The driver internally resets the VIP during driver create.
- Mux-mode VIP capture is not supported
- Multiple stream outputs from same video source is not supported
- McASP and McSPI does not support Interrupt/Polled mode
- UART is not supported in Interrupt Mode
- I2C is not supported in DMA mode

Fixed in this Release

Fixed in this Release

ID	Headline	Module	Remarks
OMAPS00301477	[LVDS] Video mux control on for Multides board through GPIO is not supported	Capture Driver	Need CPLD1 REVC1
OMAPS00301473	[LVDS] CAM3 to VIP2 S0 PORTA capture image is greenish	Capture Driver	Need CPLD1 REVC1
OMAPS00299492	[DSS] - Scaling Ratio check in driver is not correct	DSS	NA
OMAPS00299541	[M2M VPE] Driver asserts in slice based scaling when lazy loading is disabled	VPE	NA
OMAPS00300881	[VPE] Performance should be measured with 304 MHz functional clock from Video PLL1 (ECO Fix)	VPE	NA
OMAPS00298841	VPE interfaces not properly documented.	VPE	NA
OMAPS00297835	[DEI] Need to add fast motion DEI expert value from HDVPSS code base	VPE	NA
OMAPS00299978	[Platform] Identification on polyfix silicon should be added in code	Platform	NA
OMAPS00300562	[I2C] - Capture App hangs when OV sensor is not connected	I2C	NA
OMAPS00300313	[BIOS CFG] All sample application should use sysbios mode instead of using SMP bios mode	Application	NA
OMAPS00299972	[SampleApp] Dynamic heap Memory details is needed to be captured for all sample apllications	Application	NA
OMAPS00299975	[Datasheet] Capture to display glass to glass latency measurement	Documentation	NA
OMAPS00295277	[Docs] Detailed migration guide is required	Documentation	NA
OMAPS00297834	[User guide] Every reference of the FVID2 APIs from page 32 to 39 is listed with its old prefix	Documentation	NA
OMAPS00297833	[Docs] BSP FAQ page needs to be created	Documentation	NA

Known Issues / Limitations

Known Issues

ID	Headline	Module	Workaround in this release
OMAPS00301599	Random FVID2_TIMEOUT error during sensor configuration in LVDS use case	Capture Driver	After debugging, this is root caused because of Deserializer watchdog time out of 500ms for the control channel to the serializer. This needs to be debugged further with the EVM team
OMAPS00301476	[LVDS] Re-run of the any LVDS option results in I2C issues	Capture Driver	Disable I2C probe all at the start of device init by setting `isI2cProbingReq` of `Bsp_DeviceInitParams` init parameter to FALSE
OMAPS00301549	[DSS] Fields are interchanged for 1080i60 Display Output	Display Driver	None. This doesn't happen all the time
OMAPS00301418	[DSS] Display sample application results in asserts for HDMI options 6 & 7	Display Driver	Only assert prints are happening. No functionality is broken
OMAPS00296239	Display : VID3 pipeline output results in black output when zorderEnable is disabled	Display Driver	Enable Z-order and assign proper order
OMAPS00291957	Display :- Low latency display is not supported for Overlays other than LCD1.	Display Driver	This is DSS IP Limitation
OMAPS00297591	[Display] - Pink Lines seen on LCD with Ramps Test pattern	Display Driver	None
OMAPS00297821	[Display] - BT656 display mode not working	Display Driver	This is DSS IP Bug
OMAPS00294864	[Vayu] McASP Slave Mode Testing for audio codec application is not supported	McASP Driver	This is Vayu EVM Limitation
OMAPS00300787	[Platform] - Programming of video PLL is incomplete	Platform	Currently this is hard coded for LCD pixel clock frequency

Common

- While validating the sample application on Zebu, it is observed that when very short frames is given as input to VIP or very small size sub-frame is configured in VIP or when the display resolution is small, the M4 is not getting time to run the task context. This is because of back-to-back interrupts from the VIP/DSS. Because of this the application task never gets time to execute and hence the application never ends even though the outputs are captured/displayed properly. Hence it is recommnended to use bigger frame size for VIP/DSS. This issue is also due to the fact that the M4 in Zebu is currently configured to run in bypass mode (equivalent to 20 MHz) and also cache is disabled.

VIP Capture Driver

- 8/16/24-bit RAW capture - No support in EVM
- RGB888 input to VIP - No support in EVM/Simulator
- Various discrete sync modes except HSYNC/VSYNC mode - No support in EVM

VPE M2M Driver

- YUV444 output is not modeled in Virtio and the test results in hang. This feature is validated/supported only on Zebu/Silicon.

DSS Display Driver

- Blended output (say 1 Video + GRPX) on Virtio is not proper as it is not modeled properly on Virtio

Serial Drivers

- UART Baud rates greater than 115200 are not supported due to high error percentage observed for baud rates greater than 115200.
- UART single byte transfer is supported in Polled Mode and not in DMA Mode.
- A15 needs to be running while loading and running applications on DSP Core

Validation Information

- This release is validated on TDA2xx EVM for the above mentioned components
- In case of serial drivers, this release is validated on TI814x ES2.1 as well

Technical Support and Product Updates

For further information or to report any problems, contact http://e2e.ti.com or http://community.ti.com or http://support.ti.com.

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