Vision Software Development Kit

Version 03.01.00

Release Notes
Oct 2017

Contents

IMPORTANT NOTES: <MUST READ>

– *VSDK folder structure has been modified since 3.0 releases. Kindly refer VisionSDK_Getting_Started_Guide.pdf for details.*

– *VSDK build flow has been modified to improve the build time, see the VisionSDK_UserGuide_BuildSystem.pdf for details.*

– *For OpenCV, OpenCL & OpenVX, this is a preliminary release with limited testing (Alpha Quality).*

– *CCS version 6.0.1.00040 or higher should be used along with vision SDK 2.10 release onwards.*

– *BSP/Starterware is merged into single package – PDK Any reference to BSP/Starterware in the documentation refers to PDK.*

TEXAS INSTRUMENTS

Build ID: 03.01.00.00

Major New Features in the Release

New features in the release vs previous Vision SDK release are:

- TDA2Px (J6+) Support with VSDK

- TDA2EX ETH SRV platform board Support with VSDK

- DSS M2M link in VSDK to support overlay write back

- Validated TIDL use case on TDA3xx EVM

- Utility to measure time taken for a function in multi-task environment

- AR0143 Sensor Support

- LG 10 inch LCD display support for VSDK-Linux

- VSDK Linux - Display device & sensors configure from M4/Bios with dedicated I2C

- IVA H264 Encoder - IDR frame only configuration support

- Surround view with 1MP H.264 Ethernet camera on TDA2Ex based Ethernet SRV platform

- Deploy TestLink for VSDK test-case management and automation

Installation and Usage (BIOS ONLY)

- Kindly refer user guides \vision_sdk\docs\UserGuides\VisionSDK_UserGuide_TDAxxx.pdf

Example use-cases (BIOS ONLY)

- Vision SDK demonstrates use-cases as examples. Below table lists these usecases and also indicates the SOC/Platform it is validated on.

No.	Usecases	TDA2xx EVM	TDA2Ex EVM	TDA3xx EVM	TDA2Px EVM
Single Camera Use-cases					
1.	1CH VIP capture + Display	YES	YES	YES	NO
2.	1CH VIP capture + Alg Frame Copy (DSP1) + Display	YES	YES	YES	NO
3.	1CH VIP capture + Alg Frame Copy (EVE1) + Display	YES	NO	YES	NO
4.	1CH VIP capture + Alg Frame Copy (A15) + Display	YES	YES	NO	NO
5.	1CH VIP capture + Edge Detect (EVE1) + Display	YES	NO	YES	NO
6.	1CH VIP capture + Dense Optical Flow (EVEx) + Display (HDMI)	YES	NO	YES[1]	NO

TEXAS INSTRUMENTS

7.	1Ch VIP capture + Sparse Optical Flow (EVE1) + Display	YES	NO	YES	NO
8.	1CH VIP capture + Alg Subframe Copy (EVE1) + Display	YES	NO	YES	NO
9.	1CH VIP capture + DSSWB + CRC + Display	NO	NO	YES	NO
10.	1CH VIP capture + ENC + DEC + VPE + Display	YES	YES	NO	NO
11.	1CH VIP capture (HDMI) + Lane Detect (DSP1 + EVE1) + Display	YES	YES	YES	NO
12.	1CH VIP capture (HDMI) + SOF (EVE1) + SFM (DSP1) + Display	YES	NO	YES	NO
13.	1CH VIP capture (HDMI) + Traffic Light Recognition (TLR) (DSP1) + Display	YES	YES	YES	NO
14.	1CH VIP capture (HDMI) + Pedestrian, Traffic Sign, Vehicle Detect 2 (EVE1 + DSP1) + Display	YES	NO	YES	NO
15.	1CH VIP capture (HDMI) + FrontCam Analytics 2 (PD+TSR+VD+LD+TLR+SFM) (DSPx, EVEx) + Display (HDMI)	YES	NO	YES	NO
16.	1CH VIP capture + QM Alg Frame Copy with FFI (DSP1) + Display	YES	YES	YES	NO
17.	1CH VIP capture + QM Alg Frame Copy with FFI (EVE1) + Display	NO	NO	YES	NO
18.	1CH VIP capture + Safe Frame Copy (A15) + Display	YES	NO	NO	NO
19.	1CH VIP capture + DisplayMultiPipe + DSSWb + Metadata	NO	NO	YES	NO
OpenCV Use-cases					
19.	1CH VIP capture + OpenCV Canny (A15) + Display	YES	NO	NO	NO
20.	1CH VIP capture + OpenCV OpenCL Dilation (A15 + DSP) + Display	YES	NO	NO	NO
OpenCL Use-cases					
21.	1CH VIP capture + Frame Copy (A15) + Display	YES	NO	NO	NO
22.	1CH VIP capture + Canny Edge (DSP1) + Display	YES	NO	NO	NO
Multi-Camera LVDS Use-cases					
23.	4CH VIP Capture + Mosaic Display	YES	YES	NO	NO
24.	4CH VIP Capture + Surround View (DSP) + Display (HDMI) (TDA2x & TDA2Ex ONLY)	YES	YES	NO	NO
25.	5CH VIP Capture + Surround View (DSPx) + Analytics (DSP/EVE) + Ultrasound (DSPx) + HDMI Display (HDMI) (TDA2x ONLY)	YES	NO	NO	NO
26.	4CH VIP Capture + Surround View (DSPx) + Display (HDMI) (TDA3x ONLY)	NO	NO	YES	NO
27.	2CH VIP Capture (2560x720) + Surround View (DSPx) + Display (TDA2x + TIDA0455 only)	YES	NO	NO	NO
28.	Surround View Calibration	YES	YES	NO	NO
29.	OV10635 & UB964 4CH CSI2 Capture + Display (TDA2Ex only)	NO	YES	NO	NO
AVB RX Use-cases, (TDA2x ONLY)					
30.	4CH AVB Capture + Decode + VPE + Sync + Alg DMA SW Mosaic (IPU1-0) + Display (TDA2x & TDA2Ex ONLY	YES	YES	NO	NO

TEXAS INSTRUMENTS

#	Use-case				
31.	4CH AVB Capture + Surround View (DSPx) + Display (HDMI) (TDA2x & TDA2Ex ONLY)	YES	YES	NO	NO
Dual Display Use-cases, (TDA2x EVM ONLY)					
32.	1CH VIP capture + Dual Display	YES	NO	NO	NO
33.	2CH LVDS VIP capture + Dual Display	YES	NO	NO	NO
ISS Use-cases, (TDA3x & TDA2Px ONLY)					
34.	1CH ISS capture + ISS ISP + ISS LDC+VTNF + Display	NO	NO	YES	YES
35.	4CH ISS capture + ISS ISP + Simcop + Surround View (DSP1) + Display	NO	NO	YES	NO
36.	1CH ISS capture (AR0132) + ISS ISP Monochrome + Display	NO	NO	YES	NO
37.	3D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + Display	NO	NO	YES	YES
38.	Surround View Calibration	NO	NO	YES	NO
39.	3D + 2D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + Display	NO	NO	YES	YES
40.	SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + RearView + Display	NO	NO	YES	NO
Other Use-cases					
41.	File IO using MMCSD	YES	NO	YES	NO

[1] Only EVE1 is used in TDA3xx

SDK Features (BIOS ONLY)

- Support the following SoC/Platforms
    - TDA2x SoC ES1.0/ES1.1/ES2.0 EVM
    - TDA3x SoC ES1.0/ES2.0/ES2.1 EVM, RVP
    - TDA2Ex Soc ES1.0/ES2.0 EVM
    - TDA2Ex 17x17 (J6 Entry) Soc ES1.0/ ES2.0/ES2.1 EVM
    - TDA2Px Soc ES1.0 EVM
- Support for all CPU's in the TDA2xx Device (IPU1-0, IPU1-1, IPU2, DSP1, DSP2, EVE1, EVE2, EVE3, EVE4, A15-0)
- Vision SDK restructuring.
    - PDK Integration with Vision SDK.
    - SDK Framework and application separation.
- Single-channel Capture via VIP for OV10635 sensor, HDMI receiver
- Multi-channel Capture (via VIP with LVDS, via Ethernet with AVB)
- Dual Display and Display Controller for VENCs (LCDx and On-Chip HDMI)
- Single-channel DSS Write Back Capture

TEXAS INSTRUMENTS

- VPE (Scalar), Encode (MJPEG/H264), Decode (MJPEG/H264)

- Stripe based capture – support for OTF processing

- Dual A15 support (SMP BIOS mode)

- 4CH OV10635 capture via UB960/OV490/TIDA00455 to support for Low cost surround view on TDA2xx

- Support for creating Image pyramid using VPE.

- Support for TDA2xx secure boot on HS samples.

- TI Deep Learning File Input/Output use case.

- Support for all CPU's in the TDA3xx Device (IPU1-0, IPU1-1, DSP1, DSP2, EVE)

- Single-channel Capture via VIP for OV10365 sensor, HDMI receiver

- Multi-channel Capture (via VIP with LVDS)

- Capture via ISS CAL OV10640 Rev E (CSI2), AR132 (Parallel), AR140 (parallel), IMX224 (CSI2)

- ISS M2M-ISP & ISS M2M-SIMCOP Links

- Single Display and Display Controller for VENCs (LCD, SD VENC (NTSC/PAL) and Off-Chip HDMI.

- ISS Image tuning tool (DCC – Dynamic Camera Configuration), AWB, AE library

- Tuned AR140, OV10640 Rev E, IMX224 with WDR

- Multiple channel processing support for ISS CAPTURE and ISS M2M-SIMCOP Links.

- Fast boot mode which allows capture-display to bring up first without DSP and EVE.

- Seamless switch to Object Detect usecase after DSP and EVE are up

- Frame freeze detect using display write back & HW CRC

- 4CH AR140 CAL CSI2 capture via UB960 CSI2 Hub for Low cost surround view.

- With HW LDC support for distortion correction.

- RTI configuration, expiry detection and recovery.

- 3D Surround View on TDA3x with HW LDC

- Enhancements to TDA3xx 3D surround view.

- Support for single pass WDR.

- Improved imaging for SRV with Improved AE stability & Photometric alignment

- Support for 3D SRV: 360 Degree Flyaround.

- Support for lens type distortion table in SD card

- New Algo Link "DeWarp" primarily used for multiple channel LDC correction.

- Support to add various tap-points for dumping the frames in different points in the ISS ISP frame processing.

- Support for creating Image pyramid using ISS.

- Support added for RVP.
- Added split screen 2D + 3D Surround View with HW LDC for 3D & DSP LDC for 2D
- AR0132 Image Tuning, enabled with 2A and WDR
- Support for TDA3xx secure boot on HS samples
- Support 128MB DDR 3D SRV on TDA3xx
- 3D SRV + Rear view with lane marking and marking movement based on vehicle movement
- Support for all CPU's in the TDA2Ex 23x23 and 17x17 (J6 Entry) Device (IPU1-0, IPU1-1, DSP1, A15-0)
- Single-channel Capture via VIP for OV10365 sensor
- Multi-channel Capture (via VIP with LVDS)
- Display and Display Controller for VENCs (LCD and On-Chip HDMI)
- VPE (Scalar), Encode (MJPEG/H264), Decode (MJPEG/H264)
- CSI2 capture support, 4ch capture (CSI2) + Display with channel switching (YUV) on TDA2Ex
- 2D SRV Support (UB964 & 4 modules of SAT0088) on TDA2Ex and TDA2Ex 17x17
- Capture & Display usecase with UB9640 & 4 modules of SAT0088 on TDA2Ex and TDA2Ex 17x17
- IPU2 (SMP mode) support
- All SoC supports Links Such as Dup, Merge, Select, Sync, NullSrc, Null and IPC (In/Out).
- Gate Link – Gives selective control to application on part of usecase data flow.
- Typical usecases - power management, boot time optimizations
- Split Link (TDA2xx only) – Allows single video buffer of higher resolution to be split into multiple channels of lower resolutions on same output queue.
- Typical usecase - surround view using OV490 on TDA2xx.
- Display module supporting multiple display sync'd pipes
- Algorithm link with algorithm plug-in's support on all CPU's
- Front Cam (EU-NCAP) use-case – OD, SFM, FCW, TLR, OC (Object Classification)
- Integrated below TI algorithms (sample reference algorithms only)
    - Pedestrian Detection
    - Traffic Sign Recognition
    - Lane Detection
    - Sparse Optical Flow
    - Dense Optical Flow
    - Edge Detection
    - Structure from Motion

- o Traffic Light Detection

- o Forward Collision Warning

- o Object Classification.

- o Stereo (xCAM ONLY)

- o 2D Surround View

- AVB Ethernet based Surround View on TDA2x and TDA2Ex (23x23, 17x17)

- 2D SRV Support (UB964 & 4 modules of SAT0088) on TDA2Ex and TDA2Ex 17x17

- 2 MP (OV2775) Surround view demo on TDA2xx.

- 3D Surround View (Linux + BIOS Vision SDK ONLY)

- Dynamic bowl creation in 3D surround view on TDA2x.

- 3D SRV with UB96x on TDA2Ex (17x17).

- Support for Safety features and Freedom From Interference (FFI).

- Support for Firewalls in L3, XMC, ECC, CRC (HW CRC TDA3xx only), TeSOC (TDA3xx only), RTI (TDA3xx only), DCC(TDA3xx only), ESM (TDA3xx only), MPU (Memory Protection Unit).

- Support for SafeIPC in Vision SDK.

- Enhanced sensor framework to support easy integration of new sensors

- System and Local EDMA support on all cores

- TCP/IP support via NDK/NSP on IPU1-1 (TDA2xx, TDA3xx, TDA2Ex), A15-0 (TDA2xx,TDA2Ex)

- Support for TFDTP stack on IPU1-1 (TDA2xx, TDA3xx, TDA2Ex), A15-0 (TDA2xx,TDA2Ex)

- Support for FAT File system with MMC/SD card. (Note: When networking is enabled, FAT FS is disabled)

- Usecase present for NullSrc with File read

- Support Auto use-case generation tool. Refer VisionSDK_UsecaseGen_Overview.pdf & VisionSDK_UsecaseGen_UserGuide.pdf under docs folder for details.

- Low latency IPC support in VSDK to reduce the CPU load and latency

- Power Management

- CPU idle (A15 – Retention, M4 – Auto Clock Gate, DSP – Auto Clock Gate, EVE – Auto Clock Gate) & Temperature measurement support.

- Thermal management Limp Home Mode demonstration in Front Cam (EU-NCAP) use-case.

- Demonstration of DSP and EVE to power domain off and reboot for analytics standby low power state in TDA3xx Fast Boot use case.

- Ability to measure the Actual time for which the CPU was in low power.

- Ability to measure the power drawn by different voltage rails from on board INA226 on TDA2xx.

TEXAS INSTRUMENTS

- Links framework, BSP/Starterware drivers modified to support optional static memory allocation (Refer VisionSDK_DevelopmentGuide.pdf for more details).

- Synchronization of cameras in UB964

- Debug and Instrumentation Framework

- Performance log (FPS, CPU Load, Heap memory usage)

- Debug log (exception log, assert log)

- DDR BW statistics via HW statistic collectors

- PRCM status and reading clock frequencies of different modules.

- Reading Voltage values of different device voltage rails from PMIC.

- Link statistics logic updated to get link statistics and CPU status without sending command to remote core.

- Multiple boot mode support

- TDA2x EVM: QSPI boot, SD boot, NOR boot, CCS boot

- TDA3x EVM: QSPI boot, QSPI+SD boot (SBL in QSPI, AppImage in SD card), CCS boot

- TDA2Ex EVM: QSPI boot, SD boot, NOR boot, CCS boot

- TDA2x xCAM: QSPI boot, SD boot, CCS boot

- TDA3x RVP: QSPI+SD boot (SBL in QSPI, AppImage in SD card), CCS boot

- GEL installation package has changed

- New package and installation methods are available at: http://processors.wiki.ti.com/index.php/Device_support_files

- VisionSDK with BIOS on A15 supports only 512MB configuration

- This needs update to GEL files. Refer to SoC specific user-guide for details.

- Support for improved auto-calibration for 2D and 3D surround view.

- Improved build time and build process

- Open CV Support for A15 host (Bios) with DSP acceleration.

- Open CL Support for A15 host (Bios) with offloading algorithms to DSP.

- Open VX Framework support on BIOS and Linux.

- TDA2ex (17x17) support.

- TI Deep Learning File Input/Output use case.

- Phase 2 of Open CV with DSP acceleration.

- Synchronization of cameras in UB964.

- Car black box demo usecase on Linux on TDA2ex (23x23, 17x17)

- AVB Ethernet based Surround View on TDA2x and TDA2Ex (23x23, 17x17)

- 2D SRV Support (UB964 & 4 modules of SAT0088) on TDA2Ex and TDA2Ex 17x17

- DSP CPU load optimization using SIMD.

Example use-cases (Linux + Bios)

- Vision SDK demonstrates use-cases as examples. Below table lists these usecases and also indicates the SOC/Platform it is validated on.

No.	Usecases	TDA2xx EVM	TDA2Ex EVM	TDA3xx EVM	TDA2Px EVM
Single Camera Use-cases					
1	1CH VIP capture + SGX Copy + DISPLAY	YES	YES	NO	NO
2	1CH VIP capture + Encode + Decode + SGX Copy + DISPLAY	YES	YES	NO	NO
5	NullSrc + Decode + Display (Only 1920x1080 H264/MJPEG Video Input Bit-Stream Supported)	YES	YES	NO	NO
6	1CH VIP capture + Alg Frame Copy (A15) + SGX Copy + DISPLAY	YES	YES	NO	NO
7	1CH VIP + Alg Frame Copy (A15) + Connector Links (Dup, Merge, Select, Gate on A15) + SGX Copy + DISPLAY	YES	YES	NO	NO
OpenCV Use-cases					
8	1CH VIP capture + OpenCV Canny (A15) + SGX Copy + DISPLAY	YES	NO	NO	NO
9	1CH VIP capture + OpenCV OpenCL Dilation (A15 + DSP) + SGX Copy + DISPLAY	YES	NO	NO	NO
OpenCL Use-cases					
10	1CH VIP capture + OpenCL Copy (A15->DSP) + SGX Copy + DISPLAY	YES	NO	NO	NO
Multi-Camera LVDS Use-cases					
11	4CH VIP LVDS capture + SGX MOSAIC + DISPLAY	YES	YES	NO	NO
12	4CH VIP LVDS capture + 3D SRV (SGX/A15) + DISPLAY - Only HDMI 1080p display supported	YES	YES	NO	NO
13	4CH VIP LVDS capture + 3D SRV + 4CH SfM (3D perception demo - EVE1-4/DSP1&2) + DISPLAY - Only on TDA2xx with HDMI 1080p display	YES	YES	NO	NO
14	2CH OV490 2560x720 capture + Split + 3D SRV (SGX/A15) + DISPLAY - Only HDMI 1080p display supported	YES	YES	NO	NO
15	Surround View Calibration	YES	YES	NO	NO
16	4CH CSI2 CAL capture + 3D SRV (SGX/A15) + DISPLAY - Only HDMI 1080p display supported	NO	YES	NO	YES
17	CSI2 CAL Surround View Calibration	NO	YES	NO	NO
18	4CH CSI2 CAL capture + SgxFrmCpy + DISPLAY	NO	NO	NO	YES
AVB RX Use-cases, (TDA2x ONLY)					
19	4CH AVB Capture + Decode + SGX MOSAIC + DISPLAY	YES	YES	NO	NO
ISS Use-cases, (TDA2Px ONLY)					
20	1CH ISS Capture + ISP + DISPLAY	NO	NO	NO	YES
21	4CH ISS Capture + ISP + 3DSRV + SGX + Display	NO	NO	NO	YES

TEXAS INSTRUMENTS

SDK Features (Linux + Bios)

- Compatible with Processor SDK Linux version 3.02

- Linux on A15 (4.4 kernel) & BIOS on all other cores

- Support for IPU2 as the main IPU core.

- Support the following CPU's in the TDA2xx system (IPU2, IPU1-0, DSP1, DSP2, EVE1, EVE2, EVE3, EVE4, A15-0)

- IPU2 and IPU1 in SMP mode support

- Support display only on M4 (Bios) for TDA2xx, TDA2Ex and TDA2Ex 17x17.

- Single-channel Capture via VIP for OV10365 sensor

- Multi-channel Capture (via VIP with LVDS, via Ethernet with AVB)

- VPE (Scalar), Encode (MJPEG/H264), Decode (MJPEG/H264)

- New usecase demonstrating 3-D perception.

- IPU1 based EVE loader

- Improved 3D SRV with auto-calibration using SGX (Open-GL Algo) for creating the "360 degree view of the car with virtual camera motion" is integrated

- AVB and NDK support on IPU2 when A15 is running Linux

- This release supports Rev-E and higher versions of TDA2xx EVM only

- Support the following CPU's in the TDA2Ex system (IPU2, IPU1-0, DSP1, A15-0)

- Single-channel Capture via VIP for OV10365 sensor

- Multi-channel Capture (via VIP with LVDS)

- VPE (Scalar), Encode (MJPEG/H264), Decode (MJPEG/H264)

- New usecase added for NullSrc with File read from SD card or NFS

- sgxFrmcpy, sgx3Dsrv, sgx3Dsfm, Algorithm link and other connector links (Dup, Merge, Select, Sync, Gate, NullSrc, Null and IPC (In/Out) ported to A15 Linux

- Inter processor communication framework infrastructure between A15 running Linux and other cores running BIOS,

- Basic SGX/OpenGL support - SGX link on A15 can be used to render/texture the video frames

- Support GPU off-screen rendering using EGL PixMap and IPU allocated buffers

- Auto use case generation tool (same as BIOS only Vision SDK)

- Debug and Instrumentation Framework (same as BIOS only Vision SDK)

- EVE loader updated to use SBL Lib and PM Lib.

- Support for common links on the Linux side for VSDK Linux and InfoAdas.

- Support for IPUMM along with Vision SDK on single IPU core

- Open CV Support for A15 host (Linux) with offloading algorithms to DSP with more DSP kernels.

- AVB based 3D SRV demo on both TDA2x, TDA2Ex & TDA2Ex 17x17

- TDA2Ex CSI2 based 3D SRV with UB964 & 4 modules of SAT0088 on TDA2Ex & TDA2Ex 17x17

- Car Black Box support on TDA2Ex & TDA2Ex 17x17

- InfoADAS CMEM, Android/QNX supported on TDA2x

- Open CL Support for A15 host (Linux) with offloading algorithms to DSP.

- 2 MP (OV2775) 3D Surround view demo on TDA2xx.

- Dynamic bowl creation in 3D surround view on TDA2x.

- 3D SRV with UB96x on TDA2Ex (17x17).

Installation and Usage (Linux + Bios)

- Kindly refer \vision_sdk\docs\Linux\VisionSDK_LinuxUserGuide.pdf

Component Versions

The versions of the different components included in Vision SDK Release Package can be referred to "vision_sdk\docs\VisionSDK_3_00_00_00_manifest.html".

Validation Hardware

This software package is tested with the below hardware

- **TDA2xx EVM**
  - Single Camera use-cases: Vision Application Board + OV10635 sensor or HDMI capture + LCD or HDMI display
  - LVDS Multi Camera use-cases: Vision Application Board + De-serializer board + 4~5xSerializer board + 4~5x OV10635 sensor + LCD or HDMI display
  - AVB Multi Camera use-cases: Vision Application Board + HDMI display + AVB talker (on Linux on PC)

- **TDA3xx EVM**
  - Single Camera VIP use-cases: OV10635 sensor or HDMI capture + LCD or SDTV or HDMI display
  - LVDS Multi Camera use-cases: De-serializer board + 4xSerializer board + 4x OV10635 sensor + SDTV display
  - Single Camera ISS use-cases: OV10640 Rev E(CSI2) or AR0132 (Parallel) sensor + LCD or SDTV or HDMI display
  - Surround view use-case: Requires UB960 EVM with 4 TIDA00262 camera modules and HDMI Display

- **TDA2Ex & TDA2Ex 17x17 EVM**
    - Single Camera use-cases: Vision Application Board + OV10635 sensor + HDMI display
    - LVDS Multi Camera use-cases: Vision Application Board + De-serializer board + 4xSerializer board + 4x OV10635 sensor + HDMI display

- **TDA2Px EVM**
    - Surround view use-case: Requires UB964 EVM with 4 OV10640 IMI camera modules and HDMI Display
    - Surround view use-case: Requires UB964 EVM with 4 OV10635 camera modules and HDMI Display

- **Boot mode Supported**
    - TDA2x EVM: QSPI boot, SD boot, NOR boot, CCS boot
    - TDA3x EVM: QSPI boot, QSPI+SD boot (SBL in QSPI, AppImage in SD card), CCS boot
    - TDA2Ex (23x23, 17x17) EVM: QSPI boot, SD boot, NOR boot, CCS boot

Refer user guide for exact board number and revision that this release is validated with.

TEXAS INSTRUMENTS

SW Quality – Status

Software Component	System Testing	MISRA - C *	Static analysis	Quality / Safety
SBL	Yes	Yes	Yes	QM
CSL/FL / StarterWare	Yes	Yes	Yes	QM
BSP / Drivers	Yes	Yes	Yes	QM
EVE SW	Yes	Yes	Yes	QM
VXLib (C66x)	Yes	Yes	Yes	QM
NDK / NSP / AVB	Yes	Yes	Yes	QM
IVAHD codecs	Yes	No	Yes	QM
EDMA LLD	Yes	Yes	Yes	QM
Framework Components	Yes	Yes	Yes	QM
BIOS	Yes	Yes	Yes	QM
BIOS-IPC	Yes	Yes	Yes	QM
IPCLib	Yes	Yes	Yes	QM
Links Framework‡	Yes	Yes	Yes	QM
AutoSAR MCAL	Yes	Yes	Yes	ASIL – B

‡ Vision Software Development Kit (Vision SDK) is broadly divided into

o **Core SDK Framework (links_fw)**
   o Core SDK – Contains Links and Chain Framework for both Bios and HLOS
   o SW quality processes like MISRA-C/KW static checker etc. are done only for links framework
o **Demo Application (apps)**
   o Demo applications to validate VSDK FW
   o SW quality processes like MISRA-C/KW static checker etc. are NOT done for apps and sample_app

Compilers	Production ready	Compiler Qualification Kit
EVE TI compiler	Yes	Available from TI
ARM M4 compiler	Yes	Available from TI
C66x TI compiler	Yes	Available from TI
ARM A15 compiler	Yes	3P

TEXAS INSTRUMENTS

Bugs Fixed In This Release

Defect ID	Defect Summary	Fix Version/s	Affects Version/s
ADASVISION-1632	[TDA3xx] CSI2 srv & calibration is not working	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1631	[TDA3xx] No display for 2D + 3D SRV UC	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1613	Line downshift in FPD link cameras	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1265	Single Camera Usecases fail on RVP	VISION_SDK_03_01_00_00	VISION_SDK_03_00_00_00, VISION_SDK_03_01_00_00
ADASVISION-1628	[TDA3xx] No display on full screen on enabling LDC	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1648	[TDA2px]: DCC Tool uses incorrect ISS register offsets	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1642	ISS Network handler do not pass correct channel ID for ISS commands	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1641	[TDA2px-Linux] DCC does not work for ISS useases	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1630	[TDA3xx] Image is inverted for OV10640/OV2775	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1629	[TDA3xx] Green line seen at the bottom of display for ISS sensors	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1653	[TDA2px]: Assert is observed while existing multi channel ISS usecase on TDA2px-Linux	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1655	[TDA2px-Bios]: ISS single channel usecase hangs while saving Simcop output frames	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1663	[TDA2x Linux] OpenVX UCs are not working	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1656	AVB TX usecase crashes for Memory allocation failed	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1657	[TDA2Ex] AVB UC "UC_avbrx_sv_display_avbtx" is crashing in dssm2m	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1267	[TDA2Ex] AVB UC "UC_avbrx_sv_display_avbtx" is not part of config	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1662	[TDA2x] CMEM mismatch error on running OpenCV/OpenCL UC	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1243	Algorithm plugin build support to be added for sample app	VISION_SDK_03_01_00_00	VISION_SDK_03_00_00_00, VISION_SDK_03_01_00_00
ADASVISION-1272	Document Updates for linux userguide	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1608	VSDK user guide update - address feedback from University Student working TI sponsored project	VISION_SDK_03_01_00_00	VISION_SDK_03_00_00_00, VISION_SDK_03_01_00_00
ADASVISION-1152	IMX224 output is overexposed	VISION_SDK_03_01_00_00	VISION_SDK_03_00_00_00, VISION_SDK_03_01_00_00
ADASVISION-1639	[RADAR] Multi-Radar structure does not handle different radar heights and widths	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1638	[TDA2xx] HAng observed on loading IPC LIB binaries	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1637	[RADAR] ISS Pitch Alignment is not in sync with ISS Link	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1266	Alg_ivision allocates memory to DMEM, when OCMC RAM requested	VISION_SDK_03_01_00_00	VISION_SDK_03_00_00_00, VISION_SDK_03_01_00_00
ADASVISION-1624	Utils queue Sem Wr can increment up to 65535	VISION_SDK_03_01_00_00	VISION_SDK_03_00_00_00, VISION_SDK_03_01_00_00

TEXAS INSTRUMENTS

ADASVISION-1640	[RADAR] Alg Plugin takes prevLinkQueId to get prevLink information	VISION_SDK_03_01_00_00	VISION_SDK_03_00_00_00, VISION_SDK_03_01_00_00
ADASVISION-1664	[RADAR] Flashing of firmware does not take right number of radars	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1665	[RADAR] AWR ES1.0 start and stop fails without adequate delay	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1649	SRV use-case camera power not enabled on TDA2Ex ETH SRV board	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1658	[TDA3x] No display for Network RX + Display UC with TCP/IP	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1654	Update TDA2Ex user-guide with ETH SRV board section	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1650	Exit from AVB menu causes crash - TDA2Ex Eth SRV board	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1659	[TDA3x] Fastboot SRV is not working	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1623	TDA3xx HS App Image is not getting built	VISION_SDK_03_01_00_00	VISION_SDK_03_00_00_00, VISION_SDK_03_01_00_00
ADASVISION-1220	RTI Use case is not working on TDA3xx EVM	VISION_SDK_03_01_00_00	VISION_SDK_03_00_00_00, VISION_SDK_03_01_00_00
ADASVISION-1635	[TDA3xx] Ghost images are seen for DOF 2 pyramid UC	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1614	[TDA3xx] Green line seen at the bottom of display with OV2775 capture	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1617	Early SRV - EVE cores doesn't works properly if early sensor create/start in appInit	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1669	[TDA2EX] Car Black Box UC is not working	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1670	[TDA3xx] No display for rearview + SRV UC	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00
ADASVISION-1634	[TDA3xx] compilation issues for 128MB build	VISION_SDK_03_01_00_00	VISION_SDK_03_01_00_00

Known Issues / Limitations

Module	Description	Workaround	Frequency of Occurrence	CQ ID
VSDK	[TDA3x]PD TSR is not working with FastBoot	None	Always	ADASVISION-1259
VSDK	[ISS] LDC Not enabled for OV2775 sensor	None	Always	ADASVISION-1615
VSDK	[TDA3x 3D SRV]: Display Corruption for attached View Points	None	Always	ADASVISION-1661
VSDK	Assert when relaunching / terminating the VSDK application	None	Random	ADASVISION-1667
VSDK	Network Rx with YUV422 1280x960 fails after some time	Use TFDTP	Always	ADASVISION-1176
VSDK	Network Tx throughput issue	Use TFDTP	Always	ADASVISION-1175
PC tool	TFDTP receive with windows PC packet drop issue	Use Linux PC	Random	ADASVISION-1182

Refer the Release Notes of PDK and InfoADAS for additional known issues

TEXAS INSTRUMENTS

Compatibility Info

This section contains information about compatibility of APIs between this release and 03.00.00.00

NOTE: It is recommended to recompile the user created use-cases, alg plugins, links against the new release interface files even if no code level change is required in the user application.

Link API

Module	Interface file	Change in user application required	Change details
Alg Link	algorithmLink.h	No	Addition of Rear View Draw, TIDL Pre and Post Process, Algorithm.
DSS M2M Write Back Link	dssM2mWbLink.h	No	[New File] DSSM2MWB Link can be used to do processing on video input frames. These frames may be from capture or decoded video frames coming over network.
Encoder Link	encLink.h	No	Addition of maxPicSizeRatio for I-Frame, IDR frame interval value..
Graphics Link	grpxSrcLink.h	No	Addition of Semantic segmentation overlay..
ISS ISP Configuration Link	issIspConfiguration.h	No	Addition of ISS M2M configuration parameter Initialization..
ISS Mem2Mem Configuration Link	issM2mIspLink.h	No	Removal of ISS M2M configuration parameter Initialization..
ISS M2M Resizer Link	issM2mResizerLink.h	No	[New File] ISS M2M Isp Link is used for ISP operations available in ISS. This link operates in M2M mode (Input Data read from memory, operation by ISP and Output Data written back to memory)
ISS M2M Simcop Link	issM2mSimcopLink.h	No	Removal of ISS M2M Simcop Configuration Parameters..
ISS Simcop configuration	issSimcopConfiguration.h	No	[New File]: ISS M2M SIMCOP Link is used for SIMCOP operations available in ISS This link operates in M2M mode (Input Data read from memory, operation by SIMCOP (LDC and VTNF) and Output Data written back to memory)
System Link	system.h	No	Addition of support for Printing Display Error Statistics and API to check for HLOS Fast boot..
System Buffer	system_buffer.h	No	Addition of pointer to native pixel map for QNX. Moved SYSTEM_MAX_META_DATA_PLANES definition to system_const.h.
System Common	system_common.h	No	Addition of TDA2Px CPU frequencies.
System Constant	system_const.h	No	Buffer alignment of QNX applications made to 32. Includes definition of SYSTEM_MAX_META_DATA_PLANES.
System Debug	system_debug.h	No	Added support for debug for DSS M2M WB Link..
System Link ID	system_linkId.h	No	Added support DSS M2M WB and ISS Resizer Link..
System Link Common	systemLink_common.h	No	Support for DSS M2M Write Back Statistics..

VPE Link	vpeLink.h	No	Support for TDA2Px.

Utils API – This API is used by users when writing an algorithm plugin or use-case or link

Module	Interface file	Change in user application required	Change details
UTILS	utils_link_stats_if.h	No	Addition of Display Error Statistics.
UTILS	utils_mem_if.h	No	API Addition for Physical to Virtual address translation.
UTILS	utils_spinlock.h	No	Additional header file include for hw_types.h and soc.h
UTILS	utils_stat_collector.h	No	Support for statistic collectors for TDA2Px.
UTILS	utils_taskTimer.h	No	[New File]: This module defines APIs that could be used for profiling in multi-task environment.