MMWAVE SDK Release Notes

Product Release 3.3

Release Date: Sept 17, 2019

Release Notes Version: 1.0

CONTENTS

1. Introduction

The mmWave SDK enables the development of millimeter wave (mmWave) radar applications using TI mmWave sensors (see list of supported Platform/Devices). The SDK provides foundational components which will facilitate end users to focus on their applications. In addition, it provides few demo applications which will serve as a guide for integrating the SDK into end-user mmWave application.

Key mmWave SDK features:

- Building blocks
  - Full driver availability
  - Layered approach to programming analog front end
  - Catalog of mmwave algorithms optimized for C674x DSPs
- Demonstrations and examples
  - TI RTOS based
  - Out of box demo with easy configurability via TI cloud based GUI
  - Representation of "point cloud" and benchmarking data from demo via GUI
  - Profiles tuned to common end user scenarios such as Range, Range resolution, Velocity, Velocity resolution
- Documentation

mmWave SDK works along with the following external tools:

- Host tools including Pin Mux, Flashing utilities
- Code Composer Studio™ IDE for RTOS development

2. Release overview

2. 1. What is new

- Support for devices mentioned in the "Platform and Device Support" section below
- New features can be found in New Features section.
- Bug fixes
- Tools update

2. 2. Platform and Device Support

The devices and platforms supported with this release include:

Supported Devices	Supported EVM
AWR1843 ES1.0	AWR1843BOOST - AWR1843 Evaluation Module RevC
AWR1843_HS ES 1.0*	
AWR1642 ES2.0	AWR1642BOOST - AWR1642 Evaluation Module RevB
AWR1642_HS ES 2.0*	
AWR1443 ES3.0	AWR1443BOOST - AWR1443 Evaluation Module RevB
IWR6843 ES2.0	IWR6843ISK+MMWAVEICBOOST - IWR6843 Evaluation Module
IWR1843 ES1.0	IWR1843BOOST - IWR1843 Evaluation Module RevC
IWR1642 ES2.0	IWR1642BOOST - IWR1642 Evaluation Module RevB
IWR1642_HS ES 2.0*	
IWR1443 ES3.0	IWR1443BOOST - IWR1443 Evaluation Module RevB

* High Secure (HS) devices need additional MMWAVE-SECDEV package

xWR terminology is used in sections that are common for AWR and IWR devices

Silicon versions other than the ones in the table above are not supported

This release of mmWave SDK supports the foundation components for the devices mentioned in the table above . At system level, the mmWave SOC/EVM may interface with other TI ecosystem SOCs/Launchpads/EVMs and software for these other devices will not be a part of the mmWave SDK foundation components.

2. 3. Component versions

Components inside mmwave_sdk that have their own versions are shown below.

Component		Version	Type	Comment
mmwave sdk		3.3	Source and Binary	Overall package release version
RadarSS firmware (patch) for xwr14xx, xwr16xx, xwr18xx		1.2.5.2	Binary	RadarSS firmware is in ROM. Only the patch is included in the mmwave sdk release
RadarSS firmware for xwr68xx		6.2.0.6	Binary	
mmWaveLink Framework		1.2.5	Source and Binary	
FTDI		2.12	Binary	
Image Creator	gen_bincrc32	1.0	Windows and Linux binary	
	out2rprc	2.0	Windows binary	Need mono to run this on Linux
	Crc multicore image	1.0	Windows and Linux binary	
	Multicore image generator	1.0	Windows and Linux binary	
	create_ConfigRPRC	1.0	Windows and Linux binary	

2. 4. Tools dependency

For building and using mmwave sdk the following tool versions are needed.

Tool	Version	Download link
CCS	7.4 or later	download link
TI SYS/BIOS	6.73.01.01	Included in mmwave sdk installer
TI ARM compiler	16.9.6.LTS	Included in mmwave sdk installer
TI CGT compiler	8.3.3	Included in mmwave sdk installer
XDC	3.50.08.24	Included in mmwave sdk installer
C64x+ DSPLIB	3.4.0.0	Included in mmwave sdk installer
C674x DSPLIB	3.4.0.0	Included in mmwave sdk installer
C674x MATHLIB (little-endian, elf/coff format)	3.1.2.1	Included in mmwave sdk installer
Mono JIT compiler	4.2.1	Only for Linux builds
mmWave Radar Device support package	1.6.1 or later	Upgrade to the latest using CCS update process (see SDK user guide for more details)
TI Emulators package	7.0.188.0 or later	Upgrade to the latest using CCS update process (see SDK user guide for more details)
MMWAVE-SECDEV	2.0.0 or later	Needed for high secure (HS) devices only Can be requested from link
Pinmux tool (optional)	Latest	Used to generate pinmux configuration for custom board https://dev.ti.com/pinmux (Cloud version)
Doxygen (optional)	1.8.11	Only needed if regenerating doxygen docs
Graphviz (optional)	2.36.0 (20140111.2315)	Only needed if regenerating doxygen docs

The following tools are needed at runtime

Runtime tool	Version	Link
Uniflash	Latest	Uniflash tool is used for flashing xWR1xxx devices Cloud version (Recommended): https://dev.ti.com/uniflash Offline version: http://www.ti.com/tool/uniflash
mmWave Demo Visualizer	Latest	TI Gallery APP for configuring mmWave sensors and visualizing the point cloud objects generated by the mmWave SDK demo https://dev.ti.com/mmWaveDemoVisualizer

2. 5. Licensing

Please refer to the mmwave_sdk_software_manifest.html, which outlines the licensing status for mmwave_sdk package.

3. Release content

3. 1. New Features

- Added support for IWR6843 ES2 device. Deprecated support for IWR6843 ES1.0.
  - SOC
    - New clock gate/ungate APIs for various modules in IWR6843 ES2
    - New API to change the mux for DMA/MSS Interrupt mapping in IWR6843 ES2
  - ADCBUF
    - ADCBUF_open accepts a new parameter 'SOC handle' to be able to toggle CQ clocks for IWR6843 ES2.
  - CBUFF
    - CBUFF driver uses SOC API internally to enable clocks for CBUFF and LVDS H/W for IWR6843 ES2.
  - MSS DMA
    - MSS DMA: Removed support for Bus error interrupt from the driver for IWR6843 ES2 as that interrupt is not hooked up to the device.
  - Added support for new part number for IWR6843 ES2 in SOC driver and CLI utility
  - Updated SHMEM_ALLOC to use default value of 0x00000006 to match the L3 RAM availability on the ES2 device
  - Secondary Bootloader:
    - Updated SBL to take care of ungating BSS clock before downloading image to RadarSS/BSS memory for 68xx ES2 device.
- Added support for AWR1843 Secure device
- mmWave Suite enhancement
  - mmWave data processing layers
    - Added utility API to convert point cloud from Cartesian format to Spherical format
  - mmWave Enhancements
    - Added calibMonTimeUnit as an input parameter to MMWave_open to allow user to adjust it based on frame periodicity and configured monitoring functions.
  - mmWaveLink Enhancements
    - Added new unit tests for mmwavelink Calibration/Monitoring feature
  - Driver Enhancements
    - New SOC API to disable Watchdog
    - CANFD driver now needs instance Id to be passed to the init API. However, only value of 0 is supported on all devices
    - For better reliability, SOC_init will wait for RadarSS to lock the APLL instead of relying on ROM BL based lock mechanism
- mmWave Demos enhancement
  - Visualizer: Removed support for mmWave SDK 3.0.
  - xwr16xx/xwr18xx DPC/mmw Demos: Added specific alignment to certain structures to workaround device hung issue seen due to EDMA not completing the transfer.
- Components/Tools
  - RadarSS: Updated the RadarSS component for IWR68xx (see exact version above). Users should refer to the RadarSS release notes included under mmwave_sdk_<ver>/firmware/radarss folder for features and enhancements done in this component.

3. 2. Migration section

This section describes the changes that are relevant for users migrating to the mmWave SDK 3.3.0 release from 3.2.1 release. See release notes archive in the SDK release package for migrating from other older releases.

Summary	Component/s	Subcomponent	Behavior of impact
Changes needed to migrate from 68xx ES1 to 68xx ES2 device	All		▪ Modules that have DMA/Interrupt mux in 68xx ES2 will need to call SOC_selectDMARequestMapping and SOC_selectInterruptRequestMapping to set the mux correctly before using those peripherals (ex: SPI, CAN). See API doxygen for more details. ▪ Review SHMEM_ALLOC setting. Default value should be 0x00000006 when trying to allocate the entire 768KB to L3 ▪ Secondary Bootloader should take care of ungating BSS clock using SOC gate/ungate API before downloading image to RadarSS/BSS memory
Added calibMonTimeUnit as an input parameter to MMWave_open to allow user to adjust it based on frame periodicity and configured monitoring functions.	Control	mmWave	All applications using mmWave will need to set the value of calibMonTimeUnit appropriately based on frame periodicity and configured monitoring functions before calling MMWave_open. If analog/digital monitoring functions are not enabled via mmwavelink API, then user can use the safe value of 1 for this parameter
ADCBUF_open accepts a new parameter: SOC handle to be able to toggle CQ clocks for IWR6843 ES2	Drivers	ADCBUF	All applications using ADCBuf driver will need to set the socHandle before calling ADCBuf_open. This parameter is mandatory to be passed to ADCBuf_open by the application for all devices but is unused at this point on all devices except for IWR68xx ES2 device.

Update to SOC_init internal implementation	Drivers	SOC	Couple of changes in SOC_init implementation: ▪ SOC_init takes care of ungating RadarSS/BSS clock for IWR6843 ES2. ▪ For better boot-up reliability, SOC_init will wait for RadarSS to lock the APLL instead of relying on ROM BL based lock mechanism. These changes do not change the API and hence don't need any changes to the application.
CANFD driver now needs instance Id to be passed to the init API	Drivers	CANFD	This is a general enhancement to the driver. At this point, only value of 0 is supported on all devices.
MSS DMA: Removed support for Bus error interrupt from the driver for IWR6843 ES2 as that interrupt is not hooked up to the device.	Drivers	DMA	Application would get an error code back from the xwr68xx driver if DMA_enableInterrupt API is called for DMA_IntType_BER. User can either remove the call to the above API or ignore the error, however user should review the DMA usage to make sure there is no invalid memory access via MSS DMA engine.
Visualizer: Removed support for mmWave SDK 3.0	Demos	GUI	User should use mmW demos from mmWave SDK 3.1.1 and later with the Visualizer

3. 3. Issues fixed

This section captures the issues that were fixed in this release for mmWave Suite/Demos. For RadarSS related issues that are fixed as part of this release can be found in RadarSS release notes included under mmwave_sdk_<ver>/firmware/radarss folder.

Issue Type	Key	Summary
Bug	MMWSDK-1998	mmw 64xx Demo profile_advanced_subframe is missing bpmCfg cmd
Bug	MMWSDK-1964	Visualizer is not compatible with mmWave SDK 3.0 on xWR68xx
Bug	MMWSDK-1958	Visualizer v3.2 generates invalid cfg for xWR68xx OOB
Bug	MMWSDK-1871	Failure of certain advanced subframe profile in xwr64xx and xwr68xx demo
Bug	MMWSDK-1870	xwr64xx demo shows failure sometimes when LVDS is enabled in certain configs

3. 4. Known Issues

3. 4. 1. mmWave Suite/Demos Known Issues

The following issues are known at the time of this release.

Issue Type	Key	Summary	Comments
Bug	MMWSDK-1872	EDMA transfer can stall while running DPC test code on AWR18xx	When the HWA based DPC test code is configured to repeat 10 identical frames, the EDMA transfer can stall at random while repeating identical frame executions. This problem is speculated to be related to the silicon isssue of source addressing in EDMA crossing the 4 KB address boundary. Some of the EDMA source addresses in L2 memory happened to be such that the transfer crosses the 4 KB boundary. Speculative workaround to avoid this issue is added in mmWave SDK release 3.3 for xWR18xx and xWR16xx device but debugging is still ongoing. Note this issue doesn't apply to xWR68xx ES2.
Bug	MMWSDK-1870	LVDS streaming of S/W data can get stuck sometimes depending on timing and/or buffer placements	This problem is speculated to be related to the silicon isssue of source addressing in EDMA crossing the 4 KB address boundary. When such situation happens, underlying CBUFF IP doesn't provide the completion event for that session and in mmW demo, this can lead to debug assert as the previous frame would be marked incomplete and demo will prevent the next frame to proceed. Speculative workaround to avoid this issue is added in mmWave SDK release 3.3 for xWR18xx and xWR16xx device but debugging is still ongoing. Note this issue doesn't apply to xWR68xx ES2.
Bug	MMWSDK-1542	AoA DPU: RX phase calibration does not work when measurement is done with less than the possible max antenna size (#tx < 3, #rx < 4 in case of IWR6843)	Documented procedure in past releases always mentioned that all the available antennas on the device be turned on for measurement - so this is not creating any deviation from that. This is listed as known issue so that user are aware of the limitation.
Bug	MMWSDK-1497	Intermittent failure in "monitoring results" for mmwavelink unit test for awr16xx	This issue is seen in noisy lab environment only. One out of many reports for noise figure has failure status. Observed noise figure from that report are logged at the end of the test run and can be used for debugging further, in case this is seen in other scenarios.

Bug	MMWSDK-1363	Range processing hwa DPU crashes when number of RX antenna is 4, and range fft size is 1024	For 1 TX 4 RX and numRangeBins = 1024, the BdstIndex for EDMA copy will go beyond its limit of 32768. The calculation is follows: BytesPerChirp = numRangeBins * numRxAnt * sizeof(cmplx16ImRe_t) = 16KB. For 1 TX antenna, due to ping/pong scheme, the jump will be 2 * BytesPerChirp = 32KB. The same case is solved by manually setting destination address in rangeProc DSP based implementation. For rangeProcHWA, the manually setting of destination address is not doable.
Bug	MMWSDK-1157	Rare failure seen in UART loopback driver unit test - HW limitation	
Bug	MMWSDK-1078	Limitation in processing chain + LVDS instrumentation use case	See limitations section below
Task	MMWSDK-533	GUI of mmw demo running slow from Firefox browser	Workaround: Please switch to Chrome browser.
Story	MMWSDK-319	CAN driver: DMA mode is not supported	
Story	MMWSDK-252	UART driver has not tested for Data Length 5 and 6	

3. 4. 2. RadarSS Known Issues

3. 4. 2. 1. RadarSS firmware (patch) for xwr14xx, xwr16xx, xwr18xx

Users should refer to the RadarSS release notes included under mmwave_sdk_<ver>/firmware/radarss folder for known issues in this release of RadarSS firmware.

3. 4. 2. 2. RadarSS firmware for xwr68xx

Users should refer to the RadarSS release notes included under mmwave_sdk_<ver>/firmware/radarss folder for known issues in this release of RadarSS firmware.

3. 5. Limitations

3. 5. 1. mmWave Suite/Demos Limitations

Some of these limitations are captured in the "known issues" list shown in previous section.

1	CAN driver: • DMA and FIFO mode are not supported
2	CANFD driver: • DMA and Timestamping are not supported

3	CBUFF/CSI2/LVDS:
	• Driver does not support the following functionality:
	  ◦ Multiple packets
	  ◦ 3 channels
	• CSI2: ADC streaming has only been tested under 1 configuration in csi_stream usecase

4	CRC driver: "Auto" mode is not implemented.
5	DMA driver: MPU and Parity Feature not implemented.
6	EDMA driver: Privilege feature not implemented.
7	HWA driver: Any modes/algorithm outside the scope of mmWave demo are not tested (however they are implemented in the driver).
8	I2C driver: Verified loopback mode on all mmWave device TI EVM (however all features are implemented in the driver) and master mode using address scanning on all devices. Note that default xWR1642 BOOST EVM does not have a direct connection to I2C devices on the board from the xwr1642 device and this I2C scan test in driver will fail until board modifications are done.
9	QSPI/QSPI Flash driver: ▪ dual-Read/Quad read in configuration mode is not supported ▪ setting write protections bits is not supported

10	SPI (MIBSPI) Limitations: • For xWR14xx, MIBSPI is only supported on SPIA, hence driver only supports SPIA. SPIB is not supported in xWR14xx. In xWR16xx, both instances are MIBSPI and are supported within the driver. • When MIBSPI mode is used in 4-pin slave mode, for every CHARLEN (8 bits or 16 bits), CS signal(from Master) has to be toggled and 2 VBUSP cycles need to be inserted. This needs to be taken care on SPI master device.
11	DMA based transactions are not supported for CRC and Mailbox driver.
12	mmW demo: See demo's doxygen page for more details.
13	Processing chain + LVDS instrumentation: ▪ This feature is not available for xWR14xx due to ADC Buffer being unavailable for streaming while datapath processing is active. ▪ For xWR16xx, xWR18xx, xWR68xx, CQ cannot be streamed out reliably when datapath processing is also enabled. The data corruption for CQ data over LVDS lanes is seen more pronounced when multiple chirps/chirp event is enabled. Note that, for this reason, default mmW demo does not allow LVDS streaming and multiple chirps/chirp event to be enabled in the same configuration.

3. 5. 2. RadarSS Limitations

3. 5. 2. 1. RadarSS firmware (patch) for xwr14xx, xwr16xx, xwr18xx

Users should refer to the RadarSS release notes included under mmwave_sdk_<ver>/firmware/radarss folder for "Unsupported Features and APIs" in this release of RadarSS firmware.

3. 5. 2. 2. RadarSS firmware for xwr68xx

Users should refer to the RadarSS release notes included under mmwave_sdk_<ver>/firmware/radarss folder for limitations in this release of RadarSS firmware.

4. Test reports

Results of the unit tests can be found in the docs/test folder. The test folder has separate folders for all the SoC variants. System level test is run using demos.

5. Installation instructions

mmwave_sdk installer is available as a Windows Installer and a Linux installer.

- **mmwave_sdk_<version>-Windows-x86-Install.exe: Windows installer verified on Windows 7 and Windows 10 machines**
- **mmwave_sdk_<version>-Linux-x86-Install.bin: Linux installer verified on Ubuntu 14.04 & Ubuntu 16.04 64 bit machines.**

5. 1. Installation in GUI mode

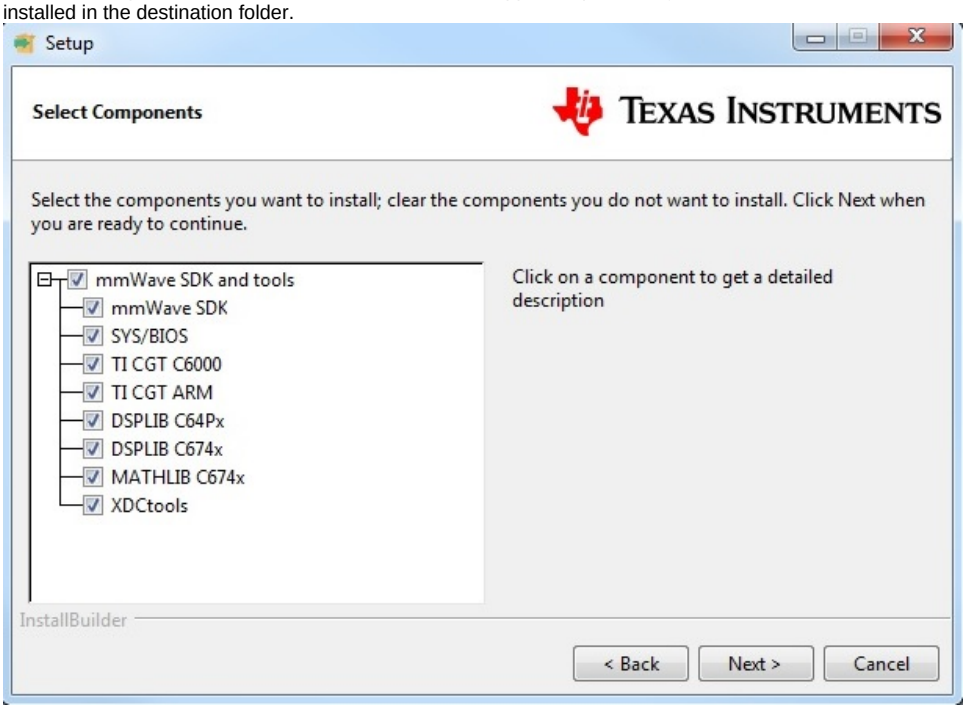
Depending on your development environment run the appropriate installer

- In Windows environment, double clicking the Windows installer from Windows explorer should start the installation process
- If in Linux environment,
  - On 64-bit machines: Since mmwave_sdk_<version>-Linux-x86-Install.bin is a 32-bit executable, install modules that allows Linux 32bit binaries to execute: "sudo dpkg --add-architecture i386"
  - Enable execute permission for the Linux installer by running "chmod +x mmwave_sdk_<version>-Linux-x86-Install.bin" command
  - Run the installer using "./mmwave_sdk_<version>-Linux-x86-Install.bin" command
  - On 64-bit machines if the GUI does not show up you may need to install additional packages: "sudo apt-get install libc6:i386 libgtk2.0-0:i386 libxtst6:i386"

Installation steps:

- Setup
- Choose Destination Location: Select the folder to install (default is c:\ti on windows and ~/ti on linux). The installation folder selected should not have spaces in its full path.

- Select Components: The installer includes all the tools needed for building the mmWave SDK. You should see a screen like below (except that each component will also have version information appended). The only reason to deselect a tool is if the exact tool version is already installed in the destination folder.



- Review installation decisions
- Ready to install
- Once installation starts all the selected components will be installed (if a component with the same version exists in the destination folder it will be overwritten)
- Installation complete

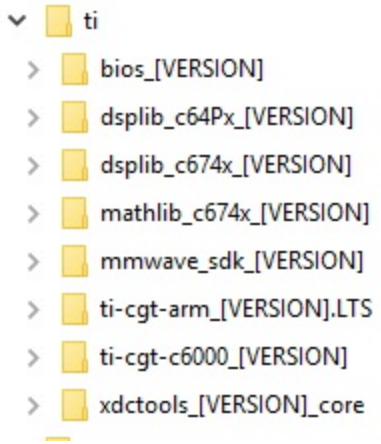
5. 2. Installation in unattended command line mode

The installers can be run in command line mode without user intervention

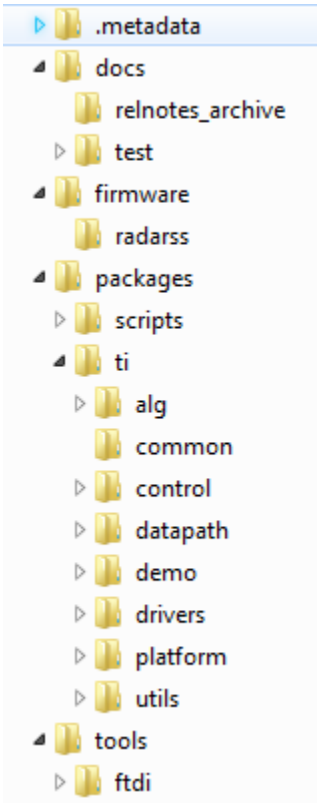
- In Windows environment
  - Run the installer using "mmwave_sdk_<version>-Windows-x86-Install.exe --prefix <installation folder> --mode unattended" command. This will install all the components in the installer.
    - Please note that even though the command may finish immediately it takes sometime for all the folders to show up in the destination folder (double check if you have the folder structure in "Post Installation" section before proceeding)
    - For command line help including information about selective installation of components run the following command "mmwave_sdk_<version>-Windows-x86-Install.exe --help"
- In Linux environment:
  - On 64-bit machines: Since mmwave_sdk_<version>-Linux-x86-Install.bin is a 32-bit executable, install modules that allows Linux 32bit binaries to execute: "sudo dpkg --add-architecture i386"
  - Enable execute permission for the Linux installer by running "chmod +x mmwave_sdk_<version>-Linux-x86-Install.bin" command
  - Run the installer using "./mmwave_sdk_<version>-Linux-x86-Install.bin --prefix <installation folder> --mode unattended" command. This will install all the components in the installer.
    - For command line help including information about selective installation of components run the following command ". /mmwave_sdk_<version>-Linux-x86-Install.bin --help"

5. 3. Post Installation

After the installation is complete the following folder structure is expected in the installation folder (except that each component will have appropriate version number in place of the VERSION placeholder shown below)



Under the mmwave_sdk <ver> folder you should have the following directory structure.

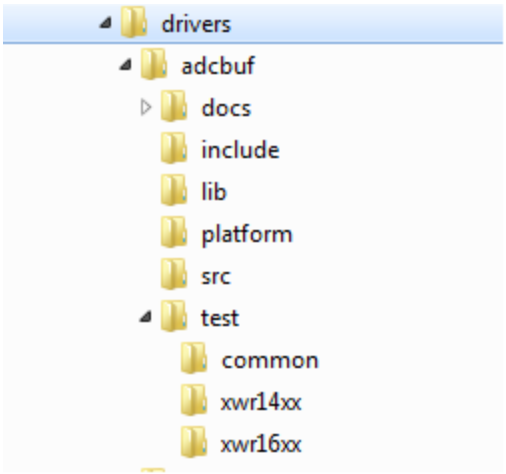


6. Package Contents

The mmwave sdk release package contains the following major components/folders.

6. 1. Drivers

Drivers can be found under mmwave_sdk_<ver>/packages/ti/drivers folder. The directory structure of all drivers is similar to the one shown below for adcbuf (some drivers do not have a unit test as shown in the table below)



- docs: Driver API documentation done with doxygen
- include: Include files
- lib: Prebuilt libraries
- platform: Platform files
- src: Driver Source files
- test/<platform>: Unit test src files and prebuilt unit test binary for supported platforms
- test/common: Unit test src files common for all platforms
- driver base folder has external header file, make files

Content of each driver is indicated in the table below.

Component	Source & prebuilt library	API Document (doxygen)	Unit test (source & prebuilt binary)
ADCBUF	X	X	X
CAN	X	X	X
CANFD	X	X	X
CBUFF/LVDS	X	X	X
CRC	X	X	X
CRYPTO[1]	X	X	X
CSI2	X	X	X
DMA	X	X	X
EDMA	X	X	X
ESM	X	X	
GPIO	X	X	X
HWA	X	X	X
I2C	X	X	X
MAILBOX	X	X	X
OSAL	X	X	
PINMUX	X	X	
QSPI	X	X	X

QSPIFLASH	X	X	X
SOC	X	X	
SPI	X	X	X
UART	X	X	X
WATCHDOG	X	X	X

[1] CRYPTO is only supported on high secure (HS) devices

6. 2. Control

Control modules can be found under mmwave_sdk_<ver>/packages/ti/control folder. Content of each of the control module is shown below

Component	Source & Prebuilt Library	API Document (doxygen)	Unittest (source & prebuilt binary)
datapath manager (dpm)	X	X	X
mmwavelink framework	X	X	X
mmwave high level api	X	X	X

6. 3. Datapath

Datapth modules can be found under mmwave_sdk_<ver>/packages/ti/datapath folder. Content of each of the control module is shown below

Component	Source & Prebuilt Library	API Document (doxygen)	Unittest (source & prebuilt binary)
RangeProc DPU	X	X	X
Doppler DPU	X	X	X
Static Clutter DPU	X	X	X
CFAR CA DPU	X	X	X
AoA DPU	X	X	X
Datapath EDMA	X	X	
Object Detection DPC [1]	X	X	X

[1] No pre-built library for Object Detection DPC

6. 4. Algorithm

Algorithms can be found under mmwave_sdk_<ver>/packages/ti/alg folder. Currently algorithms applicable for mmwave functionality are provided under this folder:

Component	Source & Prebuilt Library	API Document (doxygen)	Unittest (source & prebuilt binary)
gtrack	X	X	X
mmwavelib	X	X	X

6. 5. Usecases

Usecases can be found under mmwave_sdk_<ver>/packages/ti/drivers/test folder.

Component	Source	API Document (doxygen)	Unittest (source & prebuilt binary)
csi_stream (lWR14xx only)	X	X	X
mem_capture	X	X	X

6. 6. Demos

Demos can be found under mmwave_sdk_<ver>/packages/ti/demo/<platform>. The following demos are included in the mmwave sdk package. Details on running demos can be found in the mmwave_sdk_user_guide.

Component	Source & Prebuilt Binary	Demo document (doxygen)	Demo GUI
mmw[1]	X	X	X

[1] Demo is supported on all devices except for xwr14xx in this release

6. 7. Misc folders

Following folders are also part of mmwave_sdk_<ver>/packages/ti folder.

- common: Common header files needed across all components
- platform: platform specific files
- utility: Contains
    - ccs debug utility which is the MSS/DSSbinary that needs to be flashed when connecting/developing using CCS (details can be found in mmwave_sdk_user_guide)
    - cli which is the cli helper utility used by the demos
    - cycleprofiler which is the helper utility used for profiling the various components inside the SDK
    - hsiheader which is a helper utility that creates a header for the data to be shipped over LVDS lanes.
    - mathutil is used to perform some common operations such as log2, rounding, saturation based on the core they need to run on (R4F, C674x)
    - secondary boot loader (sbl)
    - testlogger which is the helper utility for driver unit tests

6. 8. Scripts

Build scripts can be found in mmwave_sdk_<ver>/packages/scripts folder. Build instructions can be found in mmwave_sdk_user_guide.

6. 9. Firmware

RadarSS firmware for all supported devices is included under mmwave_sdk_<ver>/firmware/radarss folder. Procedure to flash the radarss is covered in the mmwave_sdk_user_guide.

6. 10. Tools

The following tools are included in the release in binary form. These can be found under mmwave_sdk_<ver>/tools folder.

- **Ftdi:** These Windows PC drivers are needed when interfacing to the board via FTDI port on MMWAVE-DEVPACK or MMWAVEICBOOST

6. 11. Docs

mmwave_sdk_<ver>/docs folder contains important documents related to the release such as

- mmwave_sdk_software_manifest.html: Software Manifest
- mmwave_sdk_release_notes.pdf: Release Notes (this document)
- mmwave_sdk_user_guide.pdf: User guide
- mmwave_sdk_module_documentation.html: Links to individual module's documentation

mmwave_sdk_<ver>/docs/relnotes_archive contains release notes from previous releases. Release notes contain migration information.

mmwave_sdk_<ver>/docs/test folder contains test results for each SoC. Each SoC folder in turn may contain multiple test group folders (such as module_test, alglib_test) which have the following files

- Report.html: Detailed Test report with links to logs
- *.log: Test logs for unit tests

7. Related documentation/links

Other than the documents included in the mmwave_sdk package the following documents/links are important references.

- SoC links:
  - Automotive mmWave Sensors
  - Industrial mmWave Sensors
- Evaluation Modules (EVM) links:
  - Automotive Evaluation modules (Booster Pack, DEVPACK)
  - Industrial Evaluation modules (Booster Pack, ISK)