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# **MCUXpresso SDK Release Notes Supporting evkmimxrt1010**

**Change Logs**

**NXP Semiconductors**



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# 1 Driver Change Log

## CLOCK

The current CLOCK driver version is 2.5.1.

- 2.5.1
  - Improvements
    - \* Added enumeration clock\_div\_value\_t.
- 2.5.0
  - New Features
    - \* Added CLOCK\_IsUsb1PfdEnabled and CLOCK\_IsSysPfdEnabled to get the clock source status.
  - Bug Fixes
    - \* Fixed the wrong mxu enumerator used in "CLOCK\_ROOT\_MUX\_TUPLE" macro.
    - \* Updated CLOCK\_SetClockOutput1() function, adjusted the sequence of register configuration.
- 2.4.1
  - Improvements
    - \* Placed function internal constants into initialized data segment.
- 2.4.0
  - New Features
    - \* Added clock output related APIs and data structures.
    - \* Added one function CLOCK\_GetClockRootFreq to get the frequency of each clock root.
- 2.3.1
  - Bug Fixes
    - \* Fixed the violations of MISRA C-2012 rule10.1, rule 18.4, rule 14.4 and so on.
- 2.3.0
  - New feature:
    - \* Moved SDK\_DelayAtLeastUs function from clock driver to common driver.
- 2.2.0
  - New feature
    - Adding new API CLOCK\_DelayAtLeastUs() implemented by DWT to allow users set delay in unit of microsecond.
- 2.1.6
  - Bug Fix:
    - \* Fix build issue with GCC compiler when include header from C++ file.
- 2.1.5
  - Bug Fix:
    - \* Add initialization of the fractional mode and spread spectrum mode in CLOCK\_InitSysPll().
- 2.1.4
  - Optimization:
    - \* Add PerClk in clock\_name\_t and CLOCK\_GetFreq.

- \* Add APIs to get the frequency of AHB clock and SEMC, IPG clock and PER clock.
- 2.1.3
  - Use double instead of uint64\_t to achieve better performance with double precision FPU.
- 2.1.2
  - some minor fixes.
- 2.0.0
  - initial version.

## IOMUXC

The current IOMUXC driver version is 2.0.2.

- 2.0.2
  - Doxygen improvement.
- 2.0.1
  - Delete enum value kIOMUXC\_GPR\_USBExposureMode in the \_iomuxc\_gpr\_mode.
- 2.0.0
  - initial version.

## LPI2C\_CMSIS

Current LPI2C\_CMSIS driver version is 2.1

- 2.1
  - Bug Fixes
    - \* Fixed the MISRA-2012 violations.
      - Fixed rule 8.4, 8.6, 10.1, 10.3, 10.4, 11.1, 11.8, 14.4, 16.1, 16.3, 17.7, 17.3, 17.7, 20.9.
- 2.0
  - Initial version.

## LPSPIC\_CMSIS

Current LPSPIC\_CMSIS driver version is 2.5

- 2.5
  - Bug Fixes
    - \* Fixed wrong configuration of setting the bytes to be swapped during transfer when the transfer width is more than 8.
- 2.4
  - Bug Fixes
    - \* Update driver to fix warnings reported by IAR v9.
- 2.3
  - Bug Fixes
    - \* Fixed the MISRA-2012 violations.

- Fixed rule 8.4, 8.6, 10.1, 10.3, 10.4, 11.1, 11.8, 14.4, 16.1, 16.3, 17.7, 17.3, 17.7, 20.9.
- 2.2
  - Bug Fixes
    - \* Fixed the bug that, the parameter num of APIs ARM\_SPI\_Transfer, ARM\_SPI\_Send and ARM\_SPI\_Receive, and the return value of API ARM\_SPI\_GetDataCount should be the number of data item defined by datawidth, rather than the number of byte.
- 2.1
  - Bug Fixes
    - \* Fixed the incorrect clock polarity assignment in the driver. For ARM\_SPI\_CPOL0\_CPH-A0 and other frame format parameters, CPOL = 0 means kSPI\_ClockPolarityActiveHigh not kSPI\_ClockPolarityActiveLow in driver.
  - New features
    - \* Allowed user to set up the default transmit value by using ARM\_SPI\_SET\_DEFAULT\_TX\_VALUE. Please note that this is not supported in slave interrupts, because the pin will stay tristated if tX buffer is NULL.
    - \* Enabled slave select mode. Note this has no effect when user sets any of them because the driver can only support the hardware control function.
    - \* Enabled 3-Wire mode, user can use ARM\_SPI\_MODE\_MASTER\_SIMPLEX/ARM\_SPI\_MODE\_SLAVE\_SIMPLEX to enable this feature. For ARM\_SPI\_MODE\_MASTER\_SIMPLEX mode, the SOUT pin is selected as the input/output pin, and for ARM\_SPI\_MODE\_SLAVE\_SIMPLEX, the SIN pin is selected as the input/output pin.
- 2.0
  - Initial version.

## ADC\_ETC

The current ADC\_ETC driver version is 2.2.1.

- 2.2.1
  - Improvements
    - \* Modified macro "ADC\_ETC\_DONE2\_ERR\_IRQ\_TRIG0\_DONE2\_MASK" to "ADC\_ETC\_DONE2\_3\_ERR\_IRQ\_TRIG0\_DONE2\_MASK" based on the updates of header file.
- 2.2.0
  - Improvements
    - \* Defined two macros to support some devices that do not equipped with TSC trigger.
- 2.1.1
  - Bug Fixes
    - \* Fixed the violation of MISRA-2012 rule.
- 2.1.0
  - New Features
    - \* Supported independent IRQ enable bit in ADC-ETC chain configuration registers.
    - \* Supported trigger n DONE3 interrupt operations.
  - Bug Fixes

- \* Fixed the violation of MISRA-2012 rules:
  - Rule 10.1 10.3 10.7 15.5 16.1 16.3 16.4 17.7
- 2.0.1
  - New Features
    - \* Added a control macro to enable/disable the CLOCK code in current driver.
- 2.0.0
  - Initial version.

## AIPSTZ

The current AIPSTZ driver version is 2.0.1.

- 2.0.1
  - Bug Fixes
    - \* MISRA C-2012 issue fixed: rule 10.3, 10.4, and 14.4.
- 2.0.0
  - Initial version.

## AOI

The current AOI driver version is 2.0.1.

- 2.0.1
  - Bug Fixes
    - \* MISRA C-2012 issue fixed: rule 10.8, 2.2.
- 2.0.0
  - Initial version.

## CACHE

The current CACHE driver version is 2.0.4.

- 2.0.4
  - Bug Fixes
    - \* Fixed doxygen issue.
- 2.0.3
  - Improvements
    - \* Deleted redundancy code about calculating cache clean/invalidate size and address aligns.
- 2.0.2
  - Bug Fixes
    - \* Fixed violation of MISRA C-2012 Rule 10.1, 10.3 and 10.4.
- 2.0.1
  - Bug Fixes
    - \* Fixed cache size issue in L2CACHE\_GetDefaultConfig API.



- 2.0.0
  - Initial version.

## COMMON

The current COMMON driver version is 2.4.0.

- 2.4.0
  - New Features
    - \* Added EnableIRQWithPriority, IRQ\_SetPriority, and IRQ\_ClearPendingIRQ for ARM.
    - \* Added MSDK\_EnableCpuCycleCounter, MSDK\_GetCpuCycleCount for ARM.
- 2.3.3
  - New Features
    - \* Added NETC into status group.
- 2.3.2
  - Improvements
    - \* Make driver aarch64 compatible
- 2.3.1
  - Bug Fixes
    - \* Fixed MAKE\_VERSION overflow on 16-bit platforms.
- 2.3.0
  - Improvements
    - \* Split the driver to common part and CPU architecture related part.
- 2.2.10
  - Bug Fixes
    - \* Fixed the ATOMIC macros build error in cpp files.
- 2.2.9
  - Bug Fixes
    - \* Fixed MISRA C-2012 issue, 5.6, 5.8, 8.4, 8.5, 8.6, 10.1, 10.4, 17.7, 21.3.
    - \* Fixed SDK\_Malloc issue that not allocate memory with required size.
- 2.2.8
  - Improvements
    - \* Included stddef.h header file for MDK tool chain.
  - New Features:
    - \* Added atomic modification macros.
- 2.2.7
  - Other Change
    - \* Added MECC status group definition.
- 2.2.6
  - Other Change
    - \* Added more status group definition.
  - Bug Fixes
    - \* Undef \_\_VECTOR\_TABLE to avoid duplicate definition in cmsis\_clang.h
- 2.2.5

- Bug Fixes
    - \* Fixed MISRA C-2012 rule-15.5.
- 2.2.4
  - Bug Fixes
    - \* Fixed MISRA C-2012 rule-10.4.
- 2.2.3
  - New Features
    - \* Provided better accuracy of SDK\_DelayAtLeastUs with DWT, use macro SDK\_DELAY\_USE\_DWT to enable this feature.
    - \* Modified the Cortex-M7 delay count divisor based on latest tests on RT series boards, this setting lets result be closer to actual delay time.
- 2.2.2
  - New Features
    - \* Added include RTE\_Components.h for CMSIS pack RTE.
- 2.2.1
  - Bug Fixes
    - \* Fixed violation of MISRA C-2012 Rule 3.1, 10.1, 10.3, 10.4, 11.6, 11.9.
- 2.2.0
  - New Features
    - \* Moved SDK\_DelayAtLeastUs function from clock driver to common driver.
- 2.1.4
  - New Features
    - \* Added OTFAD into status group.
- 2.1.3
  - Bug Fixes
    - \* MISRA C-2012 issue fixed.
      - Fixed the rule: rule-10.3.
- 2.1.2
  - Improvements
    - \* Add SUPPRESS\_FALL\_THROUGH\_WARNING() macro for the usage of suppressing fallthrough warning.
- 2.1.1
  - Bug Fixes
    - \* Deleted and optimized repeated macro.
- 2.1.0
  - New Features
    - \* Added IRQ operation for XCC toolchain.
    - \* Added group IDs for newly supported drivers.
- 2.0.2
  - Bug Fixes
    - \* MISRA C-2012 issue fixed.
      - Fixed the rule: rule-10.4.
- 2.0.1
  - Improvements
    - \* Removed the implementation of LPC8XX Enable/DisableDeepSleepIRQ() function.

- \* Added new feature macro switch "FSL\_FEATURE\_HAS\_NO\_NONCACHEABLE\_SECTION" for specific SoCs which have no noncacheable sections, that helps avoid an unnecessary complex in link file and the startup file.
- \* Updated the align(x) to **attribute**(aligned(x)) to support MDK v6 armclang compiler.
- 2.0.0
  - Initial version.

## DCDC

The current DCDC driver version is 2.3.0.

- 2.3.0
  - Improvements
    - \* REG3[MISC\_DELAY\_TIMING], REG2[LOOPCTRL\_DC\_R], and REG2[LOOPCTRL\_DC\_C] are reserved in the latest RM, deleted corresponding functions.
- 2.2.1
  - Improvements
    - \* Fixed the doxygen warning.
- 2.2.0
  - New Features
    - \* Added supports for i.MXRT1170 series.
  - Bug Fixes
    - \* Fixed the warning that the DCDC\_ConvertByteArrayToWord function defined but not used.
  - Improvements
    - \* Updated rcscale to reduce the ripple when booting into DCM.
- 2.1.0
  - Improvements
    - \* Divided the DCDC\_AdjustTargetVoltage() into two APIs for two different modes.
  - Bug Fixes
    - \* Fixed the violations of MISRA C-2012 rules:
      - Rule 10.1, 10.4, 16.4, 17.7.
- 2.0.0
  - Initial version.

## DMAMUX

The current DMAMUX driver version is 2.0.5.

- 2.0.5
  - Improvements
    - \* Added feature FSL\_FEATURE\_DMAMUX\_CHCFG\_REGISTER\_WIDTH for the difference of CHCFG register width.
- 2.0.4

- Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 10.4.
- 2.0.3
  - Bug Fixes
    - \* Fixed the issue for MISRA-2012 check.
      - Fixed rule 10.4 and rule 10.3.
- 2.0.2
  - New Features
    - \* Added an always-on enable feature to a DMA channel for ULP1 DMAMUX support.
- 2.0.1
  - Bug Fixes
    - \* Fixed the build warning issue by changing the type of parameter source from uint8\_t to uint32\_t when setting DMA request source in DMAMUX\_SetSourceChange.
- 2.0.0
  - Initial version.

## EDMA

The current eDMA driver version is 2.4.4.

- 2.4.4
  - Bug Fixes
    - \* Fixed comments by replacing STCD with TCD
    - \* Fixed the TCD overwrite issue when submit transfer request in the callback if there is a active TCD in hardware.
    - \* Fixed violations of MISRA C-2012 rule 10.8,5.6.
- 2.4.3
  - Improvements
    - \* Added FSL\_FEATURE\_MEMORY\_HAS\_ADDRESS\_OFFSET to convert the address between system mapped address and dma quick access address.
  - Bug Fixes
    - \* Fixed the wrong tcd done count calculated in first TCD interrupt for the non scatter gather case.
- 2.4.2
  - Bug Fixes
    - \* Fixed the wrong tcd done count calculated in first TCD interrupt by correct the initial value of the header.
    - \* Fixed violations of MISRA C-2012 rule 10.3, 10.4.
- 2.4.1
  - Bug Fixes
    - \* Added clear CITER and BITER registers in EDMA\_AbortTransfer to make sure the TCD registers in a correct state for next calling of EDMA\_SubmitTransfer.
    - \* Removed the clear DONE status for ESG not enabled case to avoid DONE bit cleared unexpectedly.

- 2.4.0
  - Improvements
    - \* Added api EDMA\_EnableContinuousChannelLinkMode to support continuous link mode.
    - \* Added apis EDMA\_SetMajorOffsetConfig/EDMA\_TcdSetMajorOffsetConfig to support major loop address offset feature.
    - \* Added api EDMA\_EnableChannelMinorLoopMapping for minor loop offset feature.
    - \* Removed the redundant IRQ Handler in edma driver.
- 2.3.2
  - Improvements
    - \* Fixed HIS ccm issue in function EDMA\_PrepareTransferConfig.
    - \* Fixed violations of MISRA C-2012 rule 11.6, 10.7, 10.3, 18.1.
  - Bug Fixes
    - \* Added ACTIVE & BITER & CITER bitfields to determine the channel status to fixed the issue of the transfer request cannot submit by function EDMA\_SubmitTransfer when channel is idle.
- 2.3.1
  - Improvements
    - \* Added source/destination address alignment check.
    - \* Added driver IRQ handler support for multi DMA instance in one SOC.
- 2.3.0
  - Improvements
    - \* Added new api EDMA\_PrepareTransferConfig to allow different configurations of width and offset.
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 10.4, 10.1.
    - \* Fixed the Coverity issue regarding out-of-bounds write.
- 2.2.0
  - Improvements
    - \* Added peripheral-to-peripheral support in EDMA driver.
- 2.1.9
  - Bug Fixes
    - \* Fixed MISRA issue: Rule 10.7 and 10.8 in function EDMA\_DisableChannelInterrupts and EDMA\_SubmitTransfer.
    - \* Fixed MISRA issue: Rule 10.7 in function EDMA\_EnableAsyncRequest.
- 2.1.8
  - Bug Fixes
    - \* Fixed incorrect channel preemption base address used in EDMA\_SetChannelPreemption-Config API which causes incorrect configuration of the channel preemption register.
- 2.1.7
  - Bug Fixes
    - \* Fixed incorrect transfer size setting.
      - Added 8 bytes transfer configuration and feature for RT series;
      - Added feature to support 16 bytes transfer for Kinetis.
    - \* Fixed the issue that EDMA\_HandleIRQ would go to incorrect branch when TCD was not

used and callback function not registered.

- 2.1.6
  - Bug Fixes
    - \* Fixed KW3X MISRA Issue.
      - Rule 14.4, 10.8, 10.4, 10.7, 10.1, 10.3, 13.5, and 13.2.
  - Improvements
    - \* Cleared the IRQ handler unavailable for specific platform with macro `FSL_FEATURE_EDMA_MODULE_CHANNEL_IRQ_ENTRY_SHARED_OFFSET`.
- 2.1.5
  - Improvements
    - \* Improved EDMA IRQ handler to support half interrupt feature.
- 2.1.4
  - Bug Fixes
    - \* Cleared enabled request, status during `EDMA_Init` for the case that EDMA is halted before reinitialization.
- 2.1.3
  - Bug Fixes
    - \* Added clear DONE bit in IRQ handler to avoid overwrite TCD issue.
    - \* Optimized above solution for the case that transfer request occurs in callback.
- 2.1.2
  - Improvements
    - \* Added interface to get next TCD address.
    - \* Added interface to get the unused TCD number.
- 2.1.1
  - Improvements
    - \* Added documentation for eDMA data flow when scatter/gather is implemented for the `EDMA_HandleIRQ` API.
    - \* Updated and corrected some related comments in the `EDMA_HandleIRQ` API and `edma_handle_t` struct.
- 2.1.0
  - Improvements
    - \* Changed the `EDMA_GetRemainingBytes` API into `EDMA_GetRemainingMajorLoopCount` due to eDMA IP limitation (see API comments/note for further details).
- 2.0.5
  - Improvements
    - \* Added pubweak `DriverIRQHandler` for K32H844P (16 channels shared).
- 2.0.4
  - Improvements
    - \* Added support for SoCs with multiple eDMA instances.
    - \* Added pubweak `DriverIRQHandler` for KL28T DMA1 and MCIMX7U5\_M4.
- 2.0.3
  - Bug Fixes
    - \* Fixed the incorrect pubweak `IRQHandler` name issue, which caused re-definition build errors when client set his/her own `IRQHandler`, by changing the 32-channel `IRQHandler` name to `DriverIRQHandler`.

- 2.0.2
  - Bug Fixes
    - \* Fixed incorrect minorLoopBytes type definition in \_edma\_transfer\_config struct, and defined minorLoopBytes as uint32\_t instead of uint16\_t.
- 2.0.1
  - Bug Fixes
    - \* Fixed the eDMA callback issue (which did not check valid status) in EDMA\_HandleIRQ API.
- 2.0.0
  - Initial version.

## EWM

The current EWM driver version is 2.0.3.

- 2.0.3
  - Bug Fixes
    - \* Fixed violation of MISRA C-2012 rules: 10.1, 10.3.
- 2.0.2
  - Bug Fixes
    - \* Fixed violation of MISRA C-2012 rules: 10.3, 10.4.
- 2.0.1
  - Bug Fixes
    - \* Fixed the hard fault in EWM\_Deinit.
- 2.0.0
  - Initial version.

## FLEXIO

The current FLEXIO driver version is 2.1.0.

- 2.1.0
  - Improvements
    - \* Added API FLEXIO\_SetClockMode to set flexio channel counter and source clock.
- 2.0.4
  - Bug Fixes
    - \* Fixed MISRA 8.4 issues.
- 2.0.3
  - Bug Fixes
    - \* Fixed MISRA 10.4 issues.
- 2.0.2
  - Improvements
    - \* Split FLEXIO component which combines all flexio/flexio\_uart/flexio\_i2c/flexio\_i2s drivers into several components: FlexIO component, flexio\_uart component, flexio\_i2c\_-

- master component, and flexio\_i2s component.
  - Bug Fixes
    - \* Fixed MISRA issues
      - Fixed rules 10.1, 10.3, 10.4, 10.7, 11.6, 11.9, 14.4, 17.7.
- 2.0.1
  - Bug Fixes
    - \* Fixed the dozen mode configuration error in FLEXIO\_Init API. For enableInDoze = true, the configuration should be 0; for enableInDoze = false, the configuration should be 1.

## FLEXIO\_UART

The current FLEXIO\_UART driver version is 2.4.0.

- 2.4.0
  - Improvements
    - \* Use separate data for TX and RX in flexio\_uart\_transfer\_t.
  - Bug Fixes
    - \* Fixed bug that when ring buffer is used, if some data is received in ring buffer first before calling FLEXIO\_UART\_TransferReceiveNonBlocking, the received data count returned by FLEXIO\_UART\_TransferGetReceiveCount is wrong.
- 2.3.0
  - Improvements
    - \* Added check for baud rate's accuracy that returns kStatus\_FLEXIO\_UART\_Baudrate-NotSupport when the best achieved baud rate is not within 3% error of configured baud rate.
  - Bug Fixes
    - \* Added codes in FLEXIO\_UART\_TransferCreateHandle to clear pending NVIC IRQ before enabling NVIC IRQ, to fix issue of pending IRQ interfering the on-going process.
- 2.2.0
  - Improvements
    - \* Added timeout mechanism when waiting for certain states in transfer driver.
  - Bug Fixes
    - \* Fixed MISRA 10.4 issues.
- 2.1.6
  - Bug Fixes
    - \* Fixed IAR Pa082 warnings.
    - \* Fixed MISRA issues
      - Fixed rules 10.1, 10.3, 10.4, 10.7, 11.6, 11.9, 14.4, 17.7.
- 2.1.5
  - Improvements
    - \* Triggered user callback after all the data in ringbuffer were received in FLEXIO\_UART\_TransferReceiveNonBlocking.
- 2.1.4
  - Improvements



- \* Unified component full name to FLEXIO UART(DMA/EDMA) Driver.
- 2.1.3
  - Bug Fixes
    - \* The following modifications support FLEXIO using multiple instances:
      - Removed FLEXIO\_Reset API in module Init APIs.
      - Updated module Deinit APIs to reset the shifter/timer configuration instead of disabling module and clock.
      - Updated module Enable APIs to only support enable operation.
- 2.1.2
  - Bug Fixes
    - \* Fixed the transfer count calculation issue in FLEXIO\_UART\_TransferGetReceiveCount, FLEXIO\_UART\_TransferGetSendCount, FLEXIO\_UART\_TransferGetReceiveCountDMA, FLEXIO\_UART\_TransferGetSendCountDMA, FLEXIO\_UART\_TransferGetReceiveCountEDMA and FLEXIO\_UART\_TransferGetSendCountEDMA.
    - \* Fixed the Dozen mode configuration error in FLEXIO\_UART\_Init API. For enableInDoze = true, the configuration should be 0; for enableInDoze = false, the configuration should be 1.
    - \* Added code to report errors if the user sets a too-low-baudrate which FLEXIO cannot reach.
    - \* Disabled FLEXIO\_UART receive interrupt instead of all NVICs when reading data from ring buffer. If ring buffer is used, receive nonblocking will disable all NVIC interrupts to protect the ring buffer. This had negative effects on other IPs using interrupt.
- 2.1.1
  - Bug Fixes
    - \* Changed the API name FLEXIO\_UART\_StopRingBuffer to FLEXIO\_UART\_TransferStopRingBuffer to align with the definition in C file.
- 2.1.0
  - New Features
    - \* Added Transfer prefix in transactional APIs.
    - \* Added txSize/rxSize in handle structure to record the transfer size.
  - Bug Fixes
    - \* Added an error handle to handle the situation that data count is zero or data buffer is NULL.

## FLEXIO\_UART\_EDMA

The current FLEXIO\_UART\_EDMA driver version is 2.3.1.

- 2.3.1
  - Bug Fixes
    - \* Fixed violations of the MISRA C-2012 rules.
- 2.3.0
  - Refer FLEXIO\_UART driver change log to 2.3.0

## FLEXIO\_I2C

The current FLEXIO\_I2C driver version is 2.5.0.

- 2.5.0
  - Improvements
    - \* Split some functions, fixed CCM problem in file fsl\_flexio\_i2c\_master.c.
- 2.4.0
  - Improvements
    - \* Added delay of 1 clock cycle in FLEXIO\_I2C\_MasterTransferRunStateMachine to ensure that bus would be idle before next transfer if master is nacked.
    - \* Fixed issue that the restart setup time is less than the time in I2C spec by adding delay of 1 clock cycle before restart signal.
- 2.3.0
  - Improvements
    - \* Used 3 timers instead of 2 to support transfer which is more than 14 bytes in single transfer.
    - \* Improved FLEXIO\_I2C\_MasterTransferGetCount so that the API can check whether the transfer is still in progress.
  - Bug Fixes
    - \* Fixed MISRA 10.4 issues.
- 2.2.0
  - New Features
    - \* Added timeout mechanism when waiting certain state in transfer API.
    - \* Added an API for checking bus pin status.
  - Bug Fixes
    - \* Fixed COVERITY issue of useless call in FLEXIO\_I2C\_MasterTransferRunStateMachine.
    - \* Fixed MISRA issues
      - Fixed rules 10.1, 10.3, 10.4, 10.7, 11.6, 11.9, 14.4, 17.7.
    - \* Added codes in FLEXIO\_I2C\_MasterTransferCreateHandle to clear pending NVIC IRQ, disable internal IRQs before enabling NVIC IRQ.
    - \* Modified code so that during master's nonblocking transfer the start and slave address are sent after interrupts being enabled, in order to avoid potential issue of sending the start and slave address twice.
- 2.1.7
  - Bug Fixes
    - \* Fixed the issue that FLEXIO\_I2C\_MasterTransferBlocking did not wait for STOP bit sent.
    - \* Fixed COVERITY issue of useless call in FLEXIO\_I2C\_MasterTransferRunStateMachine.
    - \* Fixed the issue that I2C master did not check whether bus was busy before transfer.
- 2.1.6
  - Bug Fixes
    - \* Fixed the issue that I2C Master transfer APIs(blocking/non-blocking) did not support the situation of master transfer with subaddress and transfer data size being zero, which means no data followed the subaddress.

- 2.1.5
  - Improvements
    - \* Unified component full name to FLEXIO I2C Driver.
- 2.1.4
  - Bug Fixes
    - \* The following modifications support FlexIO using multiple instances:
      - Removed FLEXIO\_Reset API in module Init APIs.
      - Updated module Deinit APIs to reset the shifter/timer config instead of disabling module/clock.
      - Updated module Enable APIs to only support enable operation.
- 2.1.3
  - Improvements
    - \* Changed the prototype of FLEXIO\_I2C\_MasterInit to return kStatus\_Success if initialized successfully or to return kStatus\_InvalidArgument if "(srcClock\_Hz / master-Config->baudRate\_Bps) / 2 - 1" exceeds 0xFFU.
- 2.1.2
  - Bug Fixes
    - \* Fixed the FLEXIO I2C issue where the master could not receive data from I2C slave in high baudrate.
    - \* Fixed the FLEXIO I2C issue where the master could not receive NAK when master sent non-existent addr.
    - \* Fixed the FLEXIO I2C issue where the master could not get transfer count successfully.
    - \* Fixed the FLEXIO I2C issue where the master could not receive data successfully when sending data first.
    - \* Fixed the Dozen mode configuration error in FLEXIO\_I2C\_MasterInit API. For enable-InDoze = true, the configuration should be 0; for enableInDoze = false, the configuration should be 1.
    - \* Fixed the issue that FLEXIO\_I2C\_MasterTransferBlocking API called FLEXIO\_I2C\_MasterTransferCreateHandle, which lead to the s\_flexioHandle/s\_flexioIsr/s\_flexioType variable being written. Then, if calling FLEXIO\_I2C\_MasterTransferBlocking API multiple times, the s\_flexioHandle/s\_flexioIsr/s\_flexioType variable would not be written any more due to it being out of range. This lead to the following situation: NonBlocking transfer APIs could not work due to the fail of register IRQ.
- 2.1.1
  - Bug Fixes
    - \* Implemented the FLEXIO\_I2C\_MasterTransferBlocking API which is defined in header file but has no implementation in the C file.
- 2.1.0
  - New Features
    - \* Added Transfer prefix in transactional APIs.
    - \* Added transferSize in handle structure to record the transfer size.

## FLEXIO\_SPI

The current FLEXIO\_SPI driver version is 2.3.0.

- 2.3.0
  - New Features
    - \* Supported FLEXIO\_SPI slave transfer with continuous master CS signal and CPHA=0.
    - \* Supported FLEXIO\_SPI master transfer with continuous CS signal.
    - \* Support 32 bit transfer width.
  - Bug Fixes
    - \* Fixed wrong timer compare configuration for dma/edma transfer.
    - \* Fixed wrong byte order of rx data if transfer width is 16 bit, since the we use shifter buffer bit swapped/byte swapped register to read in received data, so the high byte should be read from the high bits of the register when MSB.
- 2.2.1
  - Bug Fixes
    - \* Fixed bug in FLEXIO\_SPI\_MasterTransferAbortEDMA that when aborting EDMA transfer EDMA\_AbortTransfer should be used rather than EDMA\_StopTransfer.
- 2.2.0
  - Improvements
    - \* Added timeout mechanism when waiting certain states in transfer driver.
  - Bug Fixes
    - \* Fixed MISRA 10.4 issues.
    - \* Added codes in FLEXIO\_SPI\_MasterTransferCreateHandle and FLEXIO\_SPI\_SlaveTransferCreateHandle to clear pending NVIC IRQ before enabling NVIC IRQ, to fix issue of pending IRQ interfering the on-going process.
- 2.1.3
  - Improvements
    - \* Unified component full name to FLEXIO SPI(DMA/EDMA) Driver.
  - Bug Fixes
    - \* Fixed MISRA issues
      - Fixed rules 10.1, 10.3, 10.4, 10.7, 11.6, 11.9, 14.4, 17.7.
- 2.1.2
  - Bug Fixes
    - \* The following modification support FlexIO using multiple instances:
      - Removed FLEXIO\_Reset API in module Init APIs.
      - Updated module Deinit APIs to reset the shifter/timer config instead of disabling module/clock.
      - Updated module Enable APIs to only support enable operation.
- 2.1.1
  - Bug Fixes
    - \* Fixed bug where FLEXIO SPI transfer data is in 16 bit per frame mode with eDMA.
    - \* Fixed bug when FLEXIO SPI works in eDMA and interrupt mode with 16-bit per frame and Lsbfirst.
    - \* Fixed the Dozen mode configuration error in FLEXIO\_SPI\_MasterInit/FLEXIO\_SPI\_SlaveInit API. For enableInDoze = true, the configuration should be 0; for enableInDoze

- = false, the configuration should be 1.
- Improvements
  - \* Added #ifndef/#endif to allow users to change the default TX value at compile time.
- 2.1.0
  - New Features
    - \* Added Transfer prefix in transactional APIs.
    - \* Added transferSize in handle structure to record the transfer size.
  - Bug Fixes
    - \* Fixed the error register address return for 16-bit data write in FLEXIO\_SPI\_GetTxData-RegisterAddress.
    - \* Provided independent IRQHandler/transfer APIs for Master and slave to fix the baudrate limit issue.

## FLEXIO\_I2S

The current FLEXIO\_I2S driver version is 2.2.0.

- 2.2.0
  - New Features
    - \* Added timeout mechanism when waiting certain state in transfer API.
  - Bug Fixes
    - \* Fixed IAR Pa082 warnings.
    - \* Fixed violations of the MISRA C-2012 rules 10.4, 14.4, 11.8, 11.9, 10.1, 17.7, 11.6, 10.3, 10.7.
- 2.1.6
  - Bug Fixes
    - \* Added reset flexio before flexio i2s init to make sure flexio status is normal.
- 2.1.5
  - Bug Fixes
    - \* Fixed the issue that I2S driver used hard code for bitwidth setting.
- 2.1.4
  - Improvements
    - \* Unified component's full name to FLEXIO I2S (DMA/EDMA) driver.
- 2.1.3
  - Bug Fixes
    - \* The following modifications support FLEXIO using multiple instances:
      - Removed FLEXIO\_Reset API in module Init APIs.
      - Updated module Deinit APIs to reset the shifter/timer config instead of disabling module/clock.
      - Updated module Enable APIs to only support enable operation.
- 2.1.2
  - New Features
    - \* Added configure items for all pin polarity and data valid polarity.
    - \* Added default configure for pin polarity and data valid polarity.

- 2.1.1
  - Bug Fixes
    - \* Fixed FlexIO I2S RX data read error and eDMA address error.
    - \* Fixed FlexIO I2S slave timer compare setting error.
- 2.1.0
  - New Features
    - \* Added Transfer prefix in transactional APIs.
    - \* Added transferSize in handle structure to record the transfer size.

## FLEXIO\_MCU\_LCD

The current FLEXIO\_MCU\_LCD driver version is 2.0.7.

- 2.0.7
  - Bug Fixes
    - \* Fixed bug that FLEXIO\_MCULCD\_Init return kStatus\_Success even with invalid parameter.
- 2.0.6
  - Bug Fixes
    - \* Fixed MISRA 10.4 issues when FLEXIO\_MCULCD\_DATA\_BUS\_WIDTH defined as signed value.
- 2.0.5
  - Improvements
    - \* Changed FLEXIO\_MCULCD\_WriteDataArrayBlocking's data parameter to const type.
- 2.0.4
  - Bug Fixes
    - \* Fixed MISRA 10.4 issues.
- 2.0.3
  - Bug Fixes
    - \* Fixed violations of the MISRA C-2012 rules 10.1, 10.3, 10.4, 10.6, 14.4, 17.7.
- 2.0.2
  - Improvements
    - \* Unified component full name to FLEXIO\_MCU\_LCD (EDMA) driver.
- 2.0.1
  - Bug Fixes
    - \* The following modification to support FlexIO using multiple instances:
      - Removed FLEXIO\_Reset API in module Init APIs.
      - Updated module Deinit APIs to reset the shifter/timer configuration instead of disabling module and clock.
      - Updated module Enable APIs to only support enable operation.
- 2.0.0
  - Initial version.

## FLEXIO\_CAMERA

The current FLEXIO\_CAMERA driver version is 2.1.3.

- 2.1.3
  - Bug Fixes
    - \* Fixed MISRA 10.4 issues.
- 2.1.2
  - Improvements
    - \* Unified component full name to FLEXIO CAMERA (EDMA) driver.
  - Bug Fixes
    - \* Fixed MISRA issues
      - Fixed rules 10.1, 10.3, 10.4, 10.7, 11.6, 11.9, 14.4, 17.7.
- 2.1.1
  - Bug Fixes
    - \* The following modifications support FlexIO using multiple instances:
      - Removed FLEXIO\_Reset API in module Init APIs.
      - Updated module Deinit APIs to reset the shifter/timer configuration instead of disabling module and clock.
      - Updated module Enable APIs to only support enable operation.
- 2.1.0
  - New Features
    - \* Added Transfer prefix in transactional APIs.

## FLEXRAM

The current FLEXRAM driver version is 2.2.0.

- 2.2.0
  - New Features
    - \* Supported flexram ECC error injection function.
- 2.1.0
  - New Features
    - \* Supported flexram ECC function.
- 2.0.7
  - Bug Fixes
    - \* Fixed doxygen issue.
- 2.0.6
  - New Features
    - \* Updated bank configuration and TCM size with GPR16/GPR17/GPR18 into SOC level for different SOC.
- 2.0.5
  - New Features
    - \* Added the magic address feature for OCRAM, DTCM and ITCM.
- 2.0.4

- Bug Fixes
  - \* Fixed FlexRAM driver's missing extern C around functions in header file.
  - \* Removed magic address feature from driver.
- 2.0.3
  - Bug Fixes
    - \* Fixed the issue that TCM size configuration was wrong when TCM bank number was not a value power of 2.
- 2.0.2
  - Bug Fixes
    - \* Updated driver due to Reference Manual update.
- 2.0.1
  - Bug Fixes
    - \* Fixed MISRA issue.
- 2.0.0
  - Initial version.

## FLEXSPI

The current FLEXSPI driver version is 2.5.0.

- 2.5.0
  - Improvements
    - \* Supported word un-aligned access for write/read blocking/non-blocking API functions.
    - \* Fixed dead loop issue in DLL update function when using FRO clock source.
    - \* Fixed violations of the MISRA C-2012 Rule 10.3.
- 2.4.0
  - Improvements
    - \* Isolated IP command parallel mode and AHB command parallel mode using feature MACRO.
    - \* Supported new column address shift feature for external memory.
- 2.3.5
  - Bug Fixes
    - \* Fixed violations of the MISRA C-2012 Rule 14.2.
- 2.3.4
  - Bug Fixes
    - \* Updated flexspi\_config\_t structure and FlexSPI\_Init to support new feature FSL\_FEATURE\_FLEXSPI\_HAS\_NO\_MCR0\_CONBINATION.
- 2.3.3
  - Bug Fixes
    - \* Removed feature FSL\_FEATURE\_FLEXSPI\_DQS\_DELAY\_PS for DLL delay setting. Changed to use feature FSL\_FEATURE\_FLEXSPI\_DQS\_DELAY\_MIN to set slave delay target as 0 for DLL enable and clock frequency higher than 100MHz.
- 2.3.2
  - Bug Fixes



- \* Fixed violations of the MISRA C-2012 Rule 8.4, 8.5, 10.1, 10.3, 10.4, 11.6 and 14.4.
- 2.3.1
  - Bug Fixes
    - \* Wait for bus to be idle before using it as access to external flash with new setting in FLEXSPI\_SetFlashConfig() API.
    - \* Fixed the potential buffer overread and Tx FIFO overwrite issue in FLEXSPI\_WriteBlocking.
- 2.3.0
  - New Features
    - \* Added new API FLEXSPI\_UpdateDllValue for users to update DLL value after updating flexspi root clock.
    - \* Corrected grammatical issues for comments.
    - \* Added support for new feature FSL\_FEATURE\_FLEXSPI\_DQS\_DELAY\_PS in DLL configuration.
- 2.2.2
  - Bug Fixes
    - \* Fixed violations of the MISRA C-2012 Rule 10.1, 10.3 and 10.4.
    - \* Updated \_flexspi\_command from named enumerator into anonymous enumerator.
- 2.2.1
  - Bug Fixes
    - \* Fixed violations of the MISRA C-2012 Rule 10.1, 10.3, 10.4, 10.8, 11.9, 14.4, 15.7, 16.4, 17.7, 7.3.
    - \* Fixed IAR build warning Pe167.
    - \* Fixed the potential buffer overwrite and Rx FIFO overread issue in FLEXSPI\_ReadBlocking.
- 2.2.0
  - Bug Fixes
    - \* Fixed flag name typos: kFLEXSPI\_IpTxFifoWatermarkEmptyFlag to kFLEXSPI\_IpTxFifoWatermarkEmptyFlag; kFLEXSPI\_IpCommandExcutionDoneFlag to kFLEXSPI\_IpCommandExecutionDoneFlag.
    - \* Fixed comments typos such as sequencen->sequence, levle->level.
    - \* Fixed FLSHCR2[ARDSEQID] field clean issue.
    - \* Updated flexspi\_config\_t structure and FlexSPI\_Init to support new feature FSL\_FEATURE\_FLEXSPI\_HAS\_NO\_MCR0\_ATDFEN and FSL\_FEATURE\_FLEXSPI\_HAS\_NO\_MCR0\_ARDFEN.
    - \* Updated flexspi\_flags\_t structure to support new feature FSL\_FEATURE\_FLEXSPI\_HAS\_INTEN\_AHBUSERROREN.
- 2.1.1
  - Improvements
    - \* Defaulted enable prefetch for AHB RX buffer configuration in FLEXSPI\_GetDefaultConfig, which is align with the reset value in AHB\_RXBUFxCR0.
    - \* Added software workaround for ERR011377 in FLEXSPI\_SetFlashConfig; added some delay after DLL lock status set to ensure correct data read/write.
- 2.1.0
  - New Features

- \* Added new API FLEXSPI\_UpdateRxSampleClock for users to update read sample clock source after initialization.
- \* Added reset peripheral operation in FLEXSPI\_Init if required.
- 2.0.5
  - Bug Fixes
    - \* Fixed FLEXSPI\_UpdateLUT cannot do partial update issue.
- 2.0.4
  - Bug Fixes
    - \* Reset flash size to zero for all ports in FLEXSPI\_Init; fixed the possible out-of-range flash access with no error reported.
- 2.0.3
  - Bug Fixes
    - \* Fixed AHB receive buffer size configuration issue. The FLEXSPI\_AHBRXBUFCR0\_BUFSZ field should configure 64 bits size, and currently the AHB receive buffer size is in bytes which means 8-bit, so the correct configuration should be config->ahbConfig->buffer[i].bufferSize / 8.
- 2.0.2
  - New Features
    - \* Supported DQS write mask enable/disable feature during set FLEXSPI configuration.
    - \* Provided new API FLEXSPI\_TransferUpdateSizeEDMA for users to update eDMA transfer size(SSIZE/DSIZE) per DMA transfer.
  - Bug Fixes
    - \* Fixed invalid operation of FLEXSPI\_Init to enable AHB bus Read Access to IP RX FIFO.
    - \* Fixed incorrect operation of FLEXSPI\_Init to configure IP TX FIFO watermark.
- 2.0.1
  - Bug Fixes
    - \* Fixed the flag clear issue and AHB read Command index configuration issue in FLEXSPI\_SetFlashConfig.
    - \* Updated FLEXSPI\_UpdateLUT function to update LUT table from any index instead of previous command index.
    - \* Added bus idle wait in FLEXSPI\_SetFlashConfig and FLEXSPI\_UpdateLUT to ensure bus is idle before any change to FlexSPI controller.
    - \* Updated interrupt API FLEXSPI\_TransferNonBlocking and interrupt handle flow FLEXSPI\_TransferHandleIRQ.
    - \* Updated eDMA API FLEXSPI\_TransferEDMA.
- 2.0.0
  - Initial version.

## GPC

The current GPC driver version is 2.1.1.

- 2.1.1
  - Bug Fixes

- \* Moved the assert sentence that irq register number has to be greater than 0 to platforms which irq 0-31 is not available.
- \* Fixed the violations of MISRA C-2012 rules:
  - Rule 10.7 12.2.
- 2.1.0
  - Improvements
    - \* Updated driver for IMXRT.
- 2.0.0
  - Initial version.

## GPT

The current GPT driver version is 2.0.4.

- 2.0.4
  - Bug Fixes
    - \* Fixed compiler warning when built with FSL\_SDK\_DISABLE\_DRIVER\_CLOCK\_CONTROL flag enabled.
- 2.0.3
  - Bug Fixes
    - \* Fixed violations of the MISRA C-2012 rules 5.3 by customizing function parameter.
- 2.0.2
  - Bug Fixes
    - \* Fixed violations of the MISRA C-2012 rules 17.7.
- 2.0.1
  - Bug Fixes
    - \* Fixed violations of the MISRA C-2012 rules 10.1, 10.3, 10.4, 10.6, 10.8, 17.7.
- 2.0.0
  - Initial version.

## GPIO

The current GPIO driver version is 2.0.6.

- 2.0.6
  - Bug Fixes
    - \* Fixed compile warning: 'GPIO\_GetInstance' defined but not used when macro FSL\_SDK\_DISABLE\_DRIVER\_CLOCK\_CONTROL is defined.
- 2.0.5
  - Bug Fixes
    - \* Fixed MISRA C-2012 issue: rule-17.7.
- 2.0.4
  - Improvements
    - \* Updated the GPIO\_PinWrite to use atomic operation if possible.

- Bug Fixes
    - \* Fixed GPIO\_PortToggle bug with platforms don't have register DR\_TOGGLE.
- 2.0.3
  - Bug Fixes
    - \* MISRA C-2012 issue fixed.
      - Fixed rules, containing: rule-10.3, rule-14.4, and rule-15.5.
- 2.0.2
  - Bug Fixes
    - \* Fixed the bug of enabling wrong GPIO clock gate in initial API. Since some GPIO instances may not have a clock gate enabled, it checks the clock gate number and makes sure the clock gate is valid.
- 2.0.1
  - Improvements
    - \* API interface changes:
      - Refined naming of the API while keeping all original APIs, marking them as deprecated. Original APIs will be removed in next release. The main change is to update the API with prefix of \_PinXXX() and \_PortXXX().
- 2.0.0
  - Initial version.

## KPP

The current KPP driver version is 2.0.1.

- 2.0.1
  - Bug Fixes
    - \* Fixed the violations of MISRA 2012 rules:
      - Rule 10.3 10.4 10.6 14.4 17.7
- 2.0.0
  - Initial version.

## LPI2C

The current LPI2C driver version is 2.4.1.

- 2.4.1
  - Improvements
    - \* Before master transfer with transactional APIs, enable master function while disable slave function and vice versa for slave transfer to avoid the one affecting the other.
- 2.4.0
  - Improvements
    - \* Split some functions, fixed CCM problem in file fsl\_lpi2c.c.
  - Bug Fixes
    - \* Fixed bug in LPI2C\_MasterInit that the MCFGR2's value set in LPI2C\_MasterSetBaud-

Rate may be overwritten by mistake.

- 2.3.2
  - Improvements
    - \* Initialized the EDMA configuration structure in the LPI2C EDMA driver.
- 2.3.1
  - Improvements
    - \* Updated LPI2C\_GetCyclesForWidth to add the parameter of minimum cycle, because for master SDA/SCL filter, master bus idle/pin low timeout and slave SDA/SCL filter configuration, 0 means disabling the feature and cannot be used.
  - Bug Fixes
    - \* Fixed bug in LPI2C\_SlaveTransferHandleIRQ that when restart detect event happens the transfer structure should not be cleared.
    - \* Fixed bug in LPI2C\_RunTransferStateMachine, that when only slave address is transferred or there is still data remaining in tx FIFO the last byte's nack cannot be ignored.
    - \* Fixed bug in slave filter doze enable, that when FILTDZ is set it means disable rather than enable.
    - \* Fixed bug in the usage of LPI2C\_GetCyclesForWidth. First its return value cannot be used directly to configure the slave FILTSDA, FILTSCL, DATAVD or CLKHOLD, because the real cycle width for them should be FILTSDA+3, FILTSCL+3, FILTSCL+DATAVD+3 and CLKHOLD+3. Second when cycle period is not affected by the prescaler value, prescaler value should be passed as 0 rather than 1.
    - \* Fixed wrong default setting for LPI2C slave. If enabling the slave tx SCL stall, then the default clock hold time should be set to 250ns according to I2C spec for 100kHz standard mode baudrate.
    - \* Fixed bug that before pushing command to the tx FIFO the FIFO occupation should be checked first in case FIFO overflow.
- 2.3.0
  - New Features
    - \* Supported reading more than 256 bytes of data in one transfer as master.
    - \* Added API LPI2C\_GetInstance.
  - Bug Fixes
    - \* Fixed bug in LPI2C\_MasterTransferAbortEDMA, LPI2C\_MasterTransferAbort and LPI2C\_MasterTransferHandleIRQ that before sending stop signal whether master is active and whether stop signal has been sent should be checked, to make sure no FIFO error or bus error will be caused.
    - \* Fixed bug in LPI2C master EDMA transactional layer that the bus error cannot be caught and returned by user callback, by monitoring bus error events in interrupt handler.
    - \* Fixed bug in LPI2C\_GetCyclesForWidth that the parameter used to calculate clock cycle should be  $2^{\text{prescaler}}$  rather than prescaler.
    - \* Fixed bug in LPI2C\_MasterInit that timeout value should be configured after baudrate, since the timeout calculation needs prescaler as parameter which is changed during baudrate configuration.
    - \* Fixed bug in LPI2C\_MasterTransferHandleIRQ and LPI2C\_RunTransferStateMachine that when master writes with no stop signal, need to first make sure no data remains in the

tx FIFO before finishes the transfer.

- 2.2.0
  - Bug Fixes
    - \* Fixed issue that the SCL high time, start hold time and stop setup time do not meet I2C specification, by changing the configuration of data valid delay, setup hold delay, clock high and low parameters.
    - \* MISRA C-2012 issue fixed.
      - Fixed rule 8.4, 13.5, 17.7, 20.8.
- 2.1.12
  - Bug Fixes
    - \* Fixed MISRA advisory 15.5 issues.
- 2.1.11
  - Bug Fixes
    - \* Fixed the bug that, during master non-blocking transfer, after the last byte is sent/received, the kLPI2C\_MasterNackDetectFlag is expected, so master should not check and clear kLPI2C\_MasterNackDetectFlag when remainingBytes is zero, in case FIFO is emptied when stop command has not been sent yet.
    - \* Fixed the bug that, during non-blocking transfer slave may nack master while master is busy filling tx FIFO, and NDF may not be handled properly.
- 2.1.10
  - Bug Fixes
    - \* MISRA C-2012 issue fixed.
      - Fixed rule 10.3, 14.4, 15.5.
    - \* Fixed unaligned access issue in LPI2C\_RunTransferStateMachine.
    - \* Fixed uninitialized variable issue in LPI2C\_MasterTransferHandleIRQ.
    - \* Used linked TCD to disable tx and enable rx in read operation to fix the issue that for platform sharing the same DMA request with tx and rx, during LPI2C read operation if interrupt with higher priority happened exactly after command was sent and before tx disabled, potentially both tx and rx could trigger dma and cause trouble.
    - \* Fixed MISRA issues.
      - Fixed rules 10.1, 10.3, 10.4, 11.6, 11.9, 14.4, 17.7.
    - \* Fixed the waitTimes variable not re-assignment issue for each byte read.
  - New Features
    - \* Added the IRQHandler for LPI2C5 and LPI2C6 instances.
  - Improvements
    - \* Updated the LPI2C\_WAIT\_TIMEOUT macro to unified name I2C\_RETRY\_TIMES.
- 2.1.9
  - Bug Fixes
    - \* Fixed Coverity issue of unchecked return value in I2C\_RTOS\_Transfer.
    - \* Fixed Coverity issue of operands did not affect the result in LPI2C\_SlaveReceive and LPI2C\_SlaveSend.
    - \* Removed STOP signal wait when NAK detected.
    - \* Cleared slave repeat start flag before transmission started in LPI2C\_SlaveSend/LPI2C\_SlaveReceive. The issue was that LPI2C\_SlaveSend/LPI2C\_SlaveReceive did not handle with the reserved repeat start flag. This caused the next slave to send a break, and the

master was always in the receive data status, but could not receive data.

- 2.1.8
  - Bug Fixes
    - \* Fixed the transfer issue with LPI2C\_MasterTransferNonBlocking, kLPI2C\_TransferNoStopFlag, with the wait transfer done through callback in a way of not doing a blocking transfer.
    - \* Fixed the issue that STOP signal did not appear in the bus when NAK event occurred.
- 2.1.7
  - Bug Fixes
    - \* Cleared the stopflag before transmission started in LPI2C\_SlaveSend/LPI2C\_SlaveReceive. The issue was that LPI2C\_SlaveSend/LPI2C\_SlaveReceive did not handle with the reserved stop flag and caused the next slave to send a break, and the master always stayed in the receive data status but could not receive data.
- 2.1.6
  - Bug Fixes
    - \* Fixed driver MISRA build error and C++ build error in LPI2C\_MasterSend and LPI2C\_SlaveSend.
    - \* Reset FIFO in LPI2C Master Transfer functions to avoid any byte still remaining in FIFO during last transfer.
    - \* Fixed the issue that LPI2C\_MasterStop did not return the correct NAK status in the bus for second transfer to the non-existing slave address.
- 2.1.5
  - Bug Fixes
    - \* Extended the Driver IRQ handler to support LPI2C4.
    - \* Changed to use ARRAY\_SIZE(kLpi2cBases) instead of FEATURE\_COUNT to decide the array size for handle pointer array.
- 2.1.4
  - Bug Fixes
    - \* Fixed the LPI2C\_MasterTransferEDMA receive issue when LPI2C shared same request source with TX/RX DMA request. Previously, the API used scatter-gather method, which handled the command transfer first, then the linked TCD which was pre-set with the receive data transfer. The issue was that the TX DMA request and the RX DMA request were both enabled, so when the DMA finished the first command TCD transfer and handled the receive data TCD, the TX DMA request still happened due to empty TX FIFO. The result was that the RX DMA transfer would start without waiting on the expected RX DMA request.
    - \* Fixed the issue by enabling IntMajor interrupt for the command TCD and checking if there was a linked TCD to disable the TX DMA request in LPI2C\_MasterEDMACallback API.
- 2.1.3
  - Improvements
    - \* Added LPI2C\_WATI\_TIMEOUT macro to allow the user to specify the timeout times for waiting flags in functional API and blocking transfer API.
    - \* Added LPI2C\_MasterTransferBlocking API.
- 2.1.2

- Bug Fixes
    - \* In LPI2C\_SlaveTransferHandleIRQ, reset the slave status to idle when stop flag was detected.
- 2.1.1
  - Bug Fixes
    - \* Disabled the auto-stop feature in eDMA driver. Previously, the auto-stop feature was enabled at transfer when transferring with stop flag. Since transfer was without stop flag and the auto-stop feature was enabled, when starting a new transfer with stop flag, the stop flag would be sent before the new transfer started, causing unsuccessful sending of the start flag, so the transfer could not start.
    - \* Changed default slave configuration with address stall false.
- 2.1.0
  - Improvements
    - \* API name changed:
      - LPI2C\_MasterTransferCreateHandle -> LPI2C\_MasterCreateHandle.
      - LPI2C\_MasterTransferGetCount -> LPI2C\_MasterGetTransferCount.
      - LPI2C\_MasterTransferAbort -> LPI2C\_MasterAbortTransfer.
      - LPI2C\_MasterTransferHandleIRQ -> LPI2C\_MasterHandleInterrupt.
      - LPI2C\_SlaveTransferCreateHandle -> LPI2C\_SlaveCreateHandle.
      - LPI2C\_SlaveTransferGetCount -> LPI2C\_SlaveGetTransferCount.
      - LPI2C\_SlaveTransferAbort -> LPI2C\_SlaveAbortTransfer.
      - LPI2C\_SlaveTransferHandleIRQ -> LPI2C\_SlaveHandleInterrupt.
- 2.0.0
  - Initial version.

## LPSPI

The current LPSPI driver version is 2.4.0.

- 2.4.0
  - Improvements
    - \* Split some functions, fixed CCM problem in file fsl\_lpspi.c.
- 2.3.1
  - Improvements
    - \* Initialized the EDMA configuration structure in the LPSPI EDMA driver.
  - Bug Fixes
    - \* Fixed bug that function LPSPI\_MasterTransferBlocking should return after the transfer complete flag is set to make sure the PCS is re-asserted.
- 2.3.0
  - New Features
    - \* Supported the master configuration of sampling the input data using a delayed clock to improve slave setup time.
- 2.2.1
  - Bug Fixes



- \* Fixed bug in LPSPI\_SetPCSContinuous when disabling PCS continous mode.
- 2.2.0
  - Bug Fixes
    - \* Fixed bug in 3-wire polling and interrupt transfer that the received data is not correct and the PCS continous mode is not working.
- 2.1.0
  - Improvements
    - \* Improved LPSPI\_SlaveTransferHandleIRQ to fill up TX FIFO instead of write one data to TX register which improves the slave transmit performance.
    - \* Added new functional APIs LPSPI\_SelectTransferPCS and LPSPI\_SetPCSContinuous to support changing PCS selection and PCS continous mode.
  - Bug Fixes
    - \* Fixed bug in non-blocking and EDMA transfer APIs that kStatus\_InvalidArgument is returned if user configures 3-wire mode and full-duplex transfer at the same time, but transfer state is already set to kLPSPI\_Busy by mistake causing following transfer can not start.
    - \* Fixed bug when LPSPI slave using EDMA way to transfer, tx should be masked when tx data is null, otherwise in 3-wire mode which tx/rx use the same pin, the received data will be interfered.
- 2.0.5
  - Improvements
    - \* Added timeout mechanism when waiting certain states in transfer driver.
  - Bug Fixes
    - \* Fixed the bug that LPSPI can not transfer large data using EDMA.
    - \* Fixed MISRA 17.7 issues.
    - \* Fixed variable overflow issue introduced by MISRA fix.
    - \* Fixed issue that rxFifoMaxBytes should be calculated according to transfer width rather than FIFO width.
    - \* Fixed issue that completion flag was not cleared after transfer completed.
- 2.0.4
  - Bug Fixes
    - \* Fixed in LPSPI\_MasterTransferBlocking that master rxfifo may overflow in stall condition.
    - \* Eliminated IAR Pa082 warnings.
    - \* Fixed MISRA issues.
      - Fixed rules 10.1, 10.3, 10.4, 10.6, 11.9, 14.2, 14.4, 15.7, 17.7.
- 2.0.3
  - Bug Fixes
    - \* Removed LPSPI\_Reset from LPSPI\_MasterInit and LPSPI\_SlaveInit, because this API may glitch the slave select line. If needed, call this function manually.
- 2.0.2
  - New Features
    - \* Added dummy data set up API to allow users to configure the dummy data to be transferred.
    - \* Enabled the 3-wire mode, SIN and SOUT pins can be configured as input/output pin.

- 2.0.1
  - Bug Fixes
    - \* Fixed the bug that the clock source should be divided by the PRESCALE setting in LPSPI\_MasterSetDelayTimes function.
    - \* Fixed the bug that LPSPI\_MasterTransferBlocking function would hang in some corner cases.
  - Optimization
    - \* Added #ifndef/#endif to allow user to change the default TX value at compile time.
- 2.0.0
  - Initial version.

## LPUART

The current LPUART driver version is 2.7.0.

- 2.7.0
  - Improvements
    - \* Split some functions, fixed CCM problem in file fsl\_lpuart.c.
- 2.6.0
  - Bug Fixes
    - \* Fixed bug that when there are multiple lpuart instance, unable to support different ISR.
- 2.5.3
  - Bug Fixes
    - \* Fixed comments by replacing unused status flags kLPUART\_NoiseErrorInRxDataRegFlag and kLPUART\_ParityErrorInRxDataRegFlag with kLPUART\_NoiseErrorFlag and kLPUART\_ParityErrorFlag.
- 2.5.2
  - Bug Fixes
    - \* Fixed bug that when setting watermark for TX or RX FIFO, the value may exceed the maximum limit.
  - Improvements
    - \* Added check in LPUART\_TransferDMAHandleIRQ and LPUART\_TransferEdmaHandleIRQ to ensure if user enables any interrupts other than transfer complete interrupt, the dma transfer is not terminated by mistake.
- 2.5.1
  - Improvements
    - \* Use separate data for TX and RX in lpuart\_transfer\_t.
  - Bug Fixes
    - \* Fixed bug that when ring buffer is used, if some data is received in ring buffer first before calling LPUART\_TransferReceiveNonBlocking, the received data count returned by LPUART\_TransferGetReceiveCount is wrong.
- 2.5.0
  - Bug Fixes
    - \* Added missing interrupt enable masks kLPUART\_Match1InterruptEnable and kLPUAR-

- T\_Match2InterruptEnable.
- \* Fixed bug in LPUART\_EnableInterrupts, LPUART\_DisableInterrupts and LPUART\_GetEnabledInterrupts that the BAUD[LBKDIE] bit field should be soc specific.
- \* Fixed bug in LPUART\_TransferHandleIRQ that idle line interrupt should be disabled when rx data size is zero.
- \* Deleted unused status flags kLPUART\_NoiseErrorInRxDataRegFlag and kLPUART\_ParityErrorInRxDataRegFlag, since firstly their function are the same as kLPUART\_NoiseErrorFlag and kLPUART\_ParityErrorFlag, secondly to obtain them one data word must be read out thus interfering with the receiving process.
- \* Fixed bug in LPUART\_GetStatusFlags that the STAT[LBKDIF], STAT[MA1F] and STAT[MA2F] should be soc specific.
- \* Fixed bug in LPUART\_ClearStatusFlags that tx/rx FIFO is reset by mistake when clearing flags.
- \* Fixed bug in LPUART\_TransferHandleIRQ that while clearing idle line flag the other bits should be masked in case other status bits be cleared by accident.
- \* Fixed bug of race condition during LPUART transfer using transactional APIs, by disabling and re-enabling the global interrupt before and after critical operations on interrupt enable register.
- \* Fixed DMA/eDMA transfer blocking issue by enabling tx idle interrupt after DMA/eDMA transmission finishes.
- New Features
  - \* Added APIs LPUART\_GetRxFifoCount/LPUART\_GetTxFifoCount to get rx/tx FIFO data count.
  - \* Added APIs LPUART\_SetRxFifoWatermark/LPUART\_SetTxFifoWatermark to set rx/tx FIFO water mark.
- 2.4.1
  - Bug Fixes
    - \* Fixed MISRA advisory 17.7 issues.
- 2.4.0
  - New Features
    - \* Added APIs to configure 9-bit data mode, set slave address and send address.
- 2.3.1
  - Bug Fixes
    - \* Fixed MISRA advisory 15.5 issues.
- 2.3.0
  - Improvements
    - \* Modified LPUART\_TransferHandleIRQ so that txState will be set to idle only when all data has been sent out to bus.
    - \* Modified LPUART\_TransferGetSendCount so that this API returns the real byte count that LPUART has sent out rather than the software buffer status.
    - \* Added timeout mechanism when waiting for certain states in transfer driver.
- 2.2.8
  - Bug Fixes
    - \* Fixed issue for MISRA-2012 check.
      - Fixed rule-10.3, rule-14.4, rule-15.5.

- \* Eliminated Pa082 warnings by assigning volatile variables to local variables and using local variables instead.
- \* Fixed MISRA issues.
  - Fixed rules 10.1, 10.3, 10.4, 10.8, 14.4, 11.6, 17.7.
- Improvements
  - \* Added check for kLPUART\_TransmissionCompleteFlag in LPUART\_WriteBlocking, LPUART\_TransferHandleIRQ, LPUART\_TransferSendDMACallback and LPUART\_SendEDMACallback to ensure all the data would be sent out to bus.
  - \* Rounded up the calculated sbr value in LPUART\_SetBaudRate and LPUART\_Init to achieve more accurate baudrate setting. Changed osr from uint32\_t to uint8\_t since osr's biggest value is 31.
  - \* Modified LPUART\_ReadBlocking so that if more than one receiver errors occur, all status flags will be cleared and the most severe error status will be returned.
- 2.2.7
  - Bug Fixes
    - \* Fixed issue for MISRA-2012 check.
      - Fixed rule-12.1, rule-17.7, rule-14.4, rule-13.3, rule-14.4, rule-10.4, rule-10.8, rule-10.3, rule-10.7, rule-10.1, rule-11.6, rule-13.5, rule-11.3, rule-13.2, rule-8.3.
- 2.2.6
  - Bug Fixes
    - \* Fixed the issue of register's being in repeated reading status while dealing with the IRQ routine.
- 2.2.5
  - Bug Fixes
    - \* Do not set or clear the TIE/RIE bits when using LPUART\_EnableTxDMA and LPUART\_EnableRxDMA.
- 2.2.4
  - Improvements
    - \* Added hardware flow control function support.
    - \* Added idle-line-detecting feature in LPUART\_TransferNonBlocking function. If an idle line is detected, a callback is triggered with status kStatus\_LPUART\_IdleLineDetected returned. This feature may be useful when the received Bytes is less than the expected received data size. Before triggering the callback, data in the FIFO (if has FIFO) is read out, and no interrupt will be disabled, except for that the receive data size reaches 0.
    - \* Enabled the RX FIFO watermark function. With the idle-line-detecting feature enabled, users can set the watermark value to whatever you want (should be less than the RX FIFO size). Data is received and a callback will be triggered when data receive ends.
- 2.2.3
  - Improvements
    - \* Changed parameter type in LPUART\_RTOS\_Init struct from rtos\_lpuart\_config to lpuart\_rtos\_config\_t.
  - Bug Fixes
    - \* Disabled LPUART receive interrupt instead of all NVICs when reading data from ring buffer. Otherwise when the ring buffer is used, receive nonblocking method will disable all NVICs to protect the ring buffer. This may have a negative effect on other IPs that are

using the interrupt.

- 2.2.2
  - Improvements
    - \* Added software reset feature support.
    - \* Added software reset API in LPUART\_Init.
- 2.2.1
  - Improvements
    - \* Added separate RX/TX IRQ number support.
- 2.2.0
  - Improvements
    - \* Added support of 7 data bits and MSB.
- 2.1.1
  - Improvements
    - \* Removed unnecessary check of event flags and assert in LPUART\_RTOS\_Receive.
    - \* Added code to always wait for RX event flag in LPUART\_RTOS\_Receive.
- 2.1.0
  - Improvements
    - \* Update transactional APIs.

## LPUART\_EDMA

The current LPUART\_EDMA driver version is 2.4.0.

- 2.4.0
  - Refer LPUART driver change log 2.1.0 to 2.4.0

## LPUART\_FREERTOS

The current LPUART\_FREERTOS driver version is 2.4.0.

- 2.4.0
  - Refer LPUART driver change log 2.1.0 to 2.4.0

## OCOTP

The current OCOTP driver version is 2.1.3.

- 2.1.3
  - Bug fixes
    - \* Fixed MISRA 2012 issue: 8.4, 10.3, 10.4, 14.3.
    - \* Fixed doxygen warning.
- 2.1.2
  - Improvements
    - \* Updated for new MIMXRT117X header file.

- 2.1.1
  - Improvements
    - \* Updated OCOTP\_ReloadShadowRegister to return error status.
    - \* Added functions OCOTP\_ReadFuseShadowRegisterExt and OCOTP\_WriteFuseShadowRegisterWithLock.
  - Bug fixes
    - \* Fixed MISRA 2012 rule 10.3 issue.
- 2.0.1
  - Bug Fixes
    - \* Fixed doxygen issues.
- 2.0.0
  - Initial version.

## OTFAD

The current driver version is 2.1.4.

- 2.1.4
  - Bug fixes
    - \* Fixed MISRA 2012 issue: 10.1.
- 2.1.3
  - Bug fixes
    - \* Fixed the error that waiting for both FLEXSPI AHB idle and SEQ idle.
- 2.1.2
  - Bug fixes
    - \* Fixed MISRA 2012 issue: 10.4.
- 2.1.1
  - Improvements:
    - \* Hided some bits in CR and SR registers for selected platforms.
    - \* Fixed doxygen issues.
- 2.1.0
  - Improvements:
    - \* Used boolean type to define 1-bit field concepts.
- 2.0.0
  - Initial version.

## PIT

The current PIT driver version is 2.0.4.

- 2.0.4
  - Bug Fixes
    - \* Fixed PIT\_SetTimerPeriod implementation, the load value trigger should be PIT clock cycles minus 1.

- 2.0.3
  - Bug Fixes
    - \* Clear all status bits for all channels to make sure the status of all TCTRL registers is clean.
- 2.0.2
  - Bug Fixes
    - \* Fixed MISRA-2012 issues.
      - Rule 10.1.
- 2.0.1
  - Bug Fixes
    - \* Cleared timer enable bit for all channels in function PIT\_Init() to make sure all channels stay in disable status before setting other configurations.
    - \* Fixed MISRA-2012 rules.
      - Rule 14.4, rule 10.4.
- 2.0.0
  - Initial version.

## PMU

The current PMU driver version is 2.1.1.

- 2.1.1
  - Bug Fixes
    - \* Fixed the violations of MISRA 2012 rules: Rule 10.1 10.4
- 2.1.0
  - Improvements
    - \* Added feature macros for low power control APIs to support conditional compile.
    - \* Renamed "PMU\_2P1EnablePullDown" to "PMU\_2P5EnablePullDown".
- 2.0.0
  - Initial version.

## PWM

The current PWM driver version is 2.5.1.

- 2.5.1
  - Bug Fixes
    - \* Fixed MISRA C-2012 rules: 10.1, 10.3, 10.4 , 10.6 and 10.8.
    - \* Fixed the issue that PWM\_UpdatePwmDutycycle() can't update duty cycle status value correct.
- 2.5.0
  - Improvements
    - \* Added API PWM\_SetOouputToIdle to set pwm channel output to idle.
    - \* Added API PWM\_GetPwmChannelState to get the pwm channel output duty cycle value.
    - \* Added API PWM\_SetPwmForceOutputToZero to set the pwm channel output to zero

- logic.
  - \* Added API PWM\_SetChannelOutput to set the pwm channel output state.
  - \* Added API PWM\_SetClockMode to set the value of the clock prescaler.
  - \* Added API PWM\_SetupPwmPhaseShift to set PWM which a special phase shift and 50% duty cycle.
  - \* Added API PWM\_SetVALxValue/PWM\_GetVALxValue to set/get PWM VALs registers values directly.
- 2.4.0
  - Improvements
    - \* Supported the PWM which can't work in wait mode.
- 2.3.0
  - Improvements
    - \* Add PWM output enable&disbale API for SDK.
  - Bug Fixes
    - \* Fixed changing channel B configuration when parameter is kPWM\_PWMX and PWMX configuration is not supported yet.
- 2.2.1
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rules: 10.3, 10.4.
  - Bug Fixes
    - \* Fixed the issue that PWM drivers computed VAL1 improperly.
  - Improvements
    - \* Updated calculation accuracy of reloadValue in dutyCycleToReloadValue function.
- 2.2.0
  - Improvements
    - \* Added new enumeration and two APIs to support enabling and disabling one or more PWM output triggers.
    - \* Added a new function to make the most of 16-bit resolution PWM.
    - \* Added one API to support updating fault status of PWM output.
    - \* Added one API to support PWM DMA write request.
    - \* Added three APIs to support PWM DMA capture read request.
    - \* Added one API to support get default fault config of PWM.
    - \* Added one API to support setting PWM fault disable mapping.
- 2.1.0
  - Improvements
    - \* Moved the configuration of fault input filter into a new API to avoid be initialized multiple times.
  - Bug Fixes
    - \* MISRA C-2012 issue fixed.
      - Fix rules, containing: rule-10.2, rule-10.3, rule-10.4, rule-10.7, rule-10.8, rule-14.4, rule-16.4.
- 2.0.1
  - Bug Fixes
    - \* Fixed the issue that PWM submodule may be initialized twice in function PWM\_SetupPwm().



- 2.0.0
  - Initial version.

## RTWDOG

The current RTWDOG driver version is 2.1.2.

- 2.1.2 -Bug Fixes
  - Fixed doxygen issue.
- 2.1.1
  - Bug Fixes
    - \* MISRA C-2012 issue fixed.
      - Fixed rules, containing: rule-10.3, rule-10.8, rule-11.9, rule-14.4, rule-15.5.
- 2.1.0
  - Improvements
    - \* Added an API to enable or disable the window mode.
    - \* Added an API to convert a raw count value to millisecond.
    - \* Used AT\_QUICKACCESS\_SECTION\_CODE macro to decorate RTWDOG\_Init, and copied this function from flash to QUICKACCESS section.
- 2.0.1
  - Bug Fixes
    - \* Fixed bug in the RTWDOG\_Init; added check for register's unlock status when configuring the RTWDOG in RTWDOG\_init.
- 2.0.0
  - Initial version.

## SAI

The current SAI driver version is 2.3.8

- 2.3.8
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 10.4.
- 2.3.7
  - Improvements
    - \* Change feature "FSL\_FEATURE\_SAI\_FIFO\_COUNT" to "FSL\_FEATURE\_SAI\_HAS\_FIFO".
    - \* Added feature "FSL\_FEATURE\_SAI\_FIFO\_COUNTn(x)" to align SAI fifo count function with IP in function

2.3.6

- Bug Fixes
  - Fixed violations of MISRA C-2012 rule 5.6.
- 2.3.5

- Improvements
    - \* Make driver to be aarch64 compatible.
- 2.3.4
  - Bug Fixes
    - \* Corrected the fifo combine feature macro used in driver.
- 2.3.3
  - Bug Fixes
    - \* Added bit clock polarity configuration when sai act as slave.
    - \* Fixed out of bound access coverity issue.
    - \* Fixed violations of MISRA C-2012 rule 10.3, 10.4.
- 2.3.2
  - Bug Fixes
    - \* Corrected the frame sync configuration when sai act as slave.
- 2.3.1
  - Bug Fixes
    - \* Corrected the peripheral name in function SAI0\_DriverIRQHandler.
    - \* Fixed violations of MISRA C-2012 rule 17.7.
- 2.3.0
  - Bug Fixes
    - \* Fixed the build error caused by the SOC has no fifo feature.
- 2.2.3
  - Bug Fixes
    - \* Corrected the peripheral name in function SAI0\_DriverIRQHandler.
- 2.2.2
  - Bug Fixes
    - \* Fixed the issue of MISRA 2004 rule 9.3.
    - \* Fixed sign-compare warning.
    - \* Fixed the PA082 build warning.
    - \* Fixed sign-compare warning.
    - \* Fixed violations of MISRA C-2012 rule 10.3,17.7,10.4,8.4,10.7,10.8,14.4,17.7,11.6,10.-1,10.6,8.4,14.3,16.4,18.4.
    - \* Allow to reset Rx or Tx FIFO pointers only when Rx or Tx is disabled.
  - Improvements
    - \* Added 24bit raw audio data width support in sai sdma driver.
    - \* Disabled the interrupt/DMA request in the SAI\_Init to avoid generates unexpected sai FIFO requests.
- 2.2.1
  - Improvements
    - \* Added mclk post divider support in function SAI\_SetMasterClockDivider.
    - \* Removed useless configuration code in SAI\_RxSetSerialDataConfig.
  - Bug Fixes
    - \* Fixed the SAI SDMA driver build issue caused by the wrong structure member name used in the function SAI\_TransferRxSetConfigSDMA/SAI\_TransferTxSetConfigSDMA.
    - \* Fixed BAD BIT SHIFT OPERATION issue caused by the FSL\_FEATURE\_SAI\_CHANNEL\_COUNTn.

- \* Applied ERR05144: not set FCONT = 1 when TMR > 0, otherwise the TX may not work.
- 2.2.0
  - Improvements
    - \* Added new APIs for parameters collection and simplified user interfaces:
      - SAI\_Init
      - SAI\_SetMasterClockConfig
      - SAI\_TxSetBitClockRate
      - SAI\_TxSetSerialDataConfig
      - SAI\_TxSetFrameSyncConfig
      - SAI\_TxSetFifoConfig
      - SAI\_TxSetBitclockConfig
      - SAI\_TxSetConfig
      - SAI\_TxSetTransferConfig
      - SAI\_RxSetBitClockRate
      - SAI\_RxSetSerialDataConfig
      - SAI\_RxSetFrameSyncConfig
      - SAI\_RxSetFifoConfig
      - SAI\_RxSetBitclockConfig
      - SAI\_RXSetConfig
      - SAI\_RxSetTransferConfig
      - SAI\_GetClassicI2SConfig
      - SAI\_GetLeftJustifiedConfig
      - SAI\_GetRightJustifiedConfig
      - SAI\_GetTDMConfig
- 2.1.9
  - Improvements
    - \* Improved SAI driver comment for clock polarity.
    - \* Added enumeration for SAI for sample inputs on different edges.
    - \* Changed FSL\_FEATURE\_SAI\_CHANNEL\_COUNT to FSL\_FEATURE\_SAI\_CHANNEL\_COUNTn(base) for the difference between the different SAI instances.
  - Added new APIs:
    - \* SAI\_TxSetBitClockDirection
    - \* SAI\_RxSetBitClockDirection
    - \* SAI\_RxSetFrameSyncDirection
    - \* SAI\_TxSetFrameSyncDirection
- 2.1.8
  - Improvements
    - \* Added feature macro test for the sync mode2 and mode 3.
    - \* Added feature macro test for masterClockHz in sai\_transfer\_format\_t.
- 2.1.7
  - Improvements
    - \* Added feature macro test for the mclkSource member in sai\_config\_t.
    - \* Changed "FSL\_FEATURE\_SAI5\_SAI6\_SHARE\_IRQ" to "FSL\_FEATURE\_SAI\_SAI5\_SAI6\_SHARE\_IRQ".
    - \* Added #ifndef #endif check for SAI\_XFER\_QUEUE\_SIZE to allow redefinition.

- Bug Fixes
  - \* Fixed build error caused by feature macro test for mclkSource.
- 2.1.6
  - Improvements
    - \* Added feature macro test for mclkSourceClockHz check.
    - \* Added bit clock source name for general devices.
  - Bug Fixes
    - \* Fixed incorrect channel numbers setting while calling RX/TX set format together.
- 2.1.5
  - Bug Fixes
    - \* Corrected SAI3 driver IRQ handler name.
    - \* Added I2S4/5/6 IRQ handler.
    - \* Added base in handler structure to support different instances sharing one IRQ number.
  - New Features
    - \* Updated SAI driver for MCR bit MICS.
    - \* Added 192 KHZ/384 KHZ in the sample rate enumeration.
    - \* Added multi FIFO interrupt/SDMA transfer support for TX/RX.
    - \* Added an API to read/write multi FIFO data in a blocking method.
    - \* Added bclk bypass support when bclk is same with mclk.
- 2.1.4
  - New Features
    - \* Added an API to enable/disable auto FIFO error recovery in platforms that support this feature.
    - \* Added an API to set data packing feature in platforms which support this feature.
- 2.1.3
  - New Features
    - \* Added feature to make I2S frame sync length configurable according to bitWidth.
- 2.1.2
  - Bug Fixes
    - \* Added 24-bit support for SAI eDMA transfer. All data shall be 32 bits for send/receive, as eDMA cannot directly handle 3-Byte transfer.
- 2.1.1
  - Improvements
    - \* Reduced code size while not using transactional API.
- 2.1.0
  - Improvements
    - \* API name changes:
      - SAI\_GetSendRemainingBytes -> SAI\_GetSentCount.
      - SAI\_GetReceiveRemainingBytes -> SAI\_GetReceivedCount.
      - All names of transactional APIs were added with "Transfer" prefix.
      - All transactional APIs use base and handle as input parameter.
      - Unified the parameter names.
  - Bug Fixes
    - \* Fixed WLC bug while reading TCSR/RCSR registers.
    - \* Fixed MOE enable flow issue. Moved MOE enable after MICS settings in SAI\_TxInit/S-

## AI\_RxInit.

- 2.0.0
  - Initial version.

## SPDIF

The current SPDIF driver version is 2.0.6.

- 2.0.6
  - Bug Fixes
    - \* Fixed the Q/U channel interrupt enabled unexpectedly while Q/U transfer pointer is NULL.
- 2.0.5
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 11.3.
- 2.0.4
  - Bug Fixes
    - \* Added udata/qdata buffer address validation in driver IRQ handler to ensure that NULL pointer dereferences do not occur.
- 2.0.3
  - Bug Fixes
    - \* MISRA C-2012 issue fixed: rule 10.3, 10.4, and 14.4.
- 2.0.2
  - Bug Fixes
    - \* Corrected operator used for size value assertion in SPDIF\_ReadBlocking/SPDIF\_WriteBlocking.
- 2.0.1
  - Bug Fixes
    - \* Corrected the feature macro name used to define s\_edmaPrivateHandle.
- 2.0.0
  - Initial version.

## SRC

The current SRC driver version is 2.0.1.

- 2.0.1
  - Improvements
    - \* Updated SRC driver for adding SRC\_SRSR\_JTAG\_SW\_RST enumeration.
- 2.0.0
  - Initial version.

## TEMPMON

The current TEMPMON driver version is 2.1.1.

- 2.1.1
  - Bug Fixes
    - \* Fixed the violations of MISRA C-2012 rules:
      - Rule 10.3 10.4.
- 2.1.0
  - Bug Fixes
    - \* Supported minus value for alarm temperature setting.
    - \* Fixed wrong temperature calculation equation.
- 2.0.3
  - Improvements
    - \* Added temperature threshold check for high/low/panic to avoid temperature overflow.
- 2.0.2
  - Bug Fixes
    - \* Fixed wrong alarm value setting API, it need to clear it firstly and set a new value into it.
- 2.0.1
  - Bug Fixes
    - \* Fixed the violations of MISRA C-2012 rules:
      - Rule 10.1 10.3 10.4 10.8 17.7.
- 2.0.0
  - Initial version.

## WDOG

The current WDOG driver version is 2.1.1.

- 2.1.1
  - Bug Fixes
    - \* MISRA C-2012 issue fixed: rule 10.1, 10.3, 10.4, 10.6, 10.7 and 11.9.
    - \* Fixed the issue of the inseparable process interrupted by other interrupt source.
      - WDOG\_Init
      - WDOG\_Refresh
- 2.1.0
  - New Features
    - \* Added new API "WDOG\_TriggerSystemSoftwareReset()" to allow users to reset the system by software.
    - \* Added new API "WDOG\_TriggerSoftwareSignal()" to allow users to trigger a WDOG\_B signal by software.
    - \* Removed the parameter "softwareAssertion" and "softwareResetSignal" out of the wdog\_config\_t structure.
    - \* Added new parameter "enableTimeOutAssert" to the wdog\_config\_t structure. With this parameter enabled, when the WDOG timeout occurs, a WDOG\_B signal will be asserted.

This signal can be routed to external pin of the chip. Note that WDOG\_B signal remains asserted until a power-on reset (POR) occurs.

- 2.0.1
  - New Features
    - \* Added control macro to enable/disable the CLOCK code in current driver.
- 2.0.0
  - Initial version.

## **XBARA**

The current XBARA driver version is 2.0.6.

- 2.0.6
  - Bug Fixes
    - \* Fixed typo in kXBARA\_RequestInterruptEnalbe item.
- 2.0.5
  - Bug Fixes
    - \* Fixed IAR build warning Pa082.
    - \* Fixed violations of the MISRA C-2012 rules 10.1, 10.3, 10.4, 10.6, 10.7, 10.8, 12.1, 18.1, 20.7.
- 2.0.4
  - Improvements
    - \* Optimized XBARA\_SetOutputSignalConfig.
- 2.0.3
  - Bug Fixes
    - \* Corrected configuration for function XBAR\_SetOutputSignalConfig.
- 2.0.2
  - Other Changes
    - \* Changed array clock name.
- 2.0.1
  - Bug Fixes
    - \* Fixed w1c bits for XBARA\_SetOutputSignalConfig function.
- 2.0.0
  - Initial version.

## 2 Middleware Change Log

### emWin library

The currently supported version is 6.28

- v6.28
  - upgraded to v6.28
- v6.24\_rev2
  - add cm33\_nodsp libraries for Cortex M33 without DSP extension
- v6.24\_rev1
  - recompiled cm33 library with fpu single precision
  - added cm7\_sp library for Cortex M7 with sp fpu for IAR
- v6.24
  - upgraded to v6.24
- v6.16c
  - upgraded to v6.16c
  - updated temperature\_control demo generated by AppWizard
- v6.14d
  - upgraded to v6.14d
- v6.10f
  - upgraded to v6.10f

### FatFs for MCUXpresso SDK

Current version is FatFs R0.14b\_rev0.

- R0.14b\_rev1
  - Applied patches from <http://elm-chan.org/fsw/ff/patches.html>
- R0.14b\_rev0
  - Upgraded to version 0.14b
- R0.14a\_rev0
  - Upgraded to version 0.14a
  - Applied patch ff14a\_p1.diff and ff14a\_p2.diff
- R0.14\_rev0
  - Upgraded to version 0.14
  - Applied patch ff14\_p1.diff and ff14\_p2.diff
- R0.13c\_rev0
  - Upgraded to version 0.13c
  - Applied patches ff\_13c\_p1.diff, ff\_13c\_p2.diff, ff\_13c\_p3.diff and ff\_13c\_p4.diff.
- R0.13b\_rev0
  - Upgraded to version 0.13b
- R0.13a\_rev0
  - Upgraded to version 0.13a. Added patch ff\_13a\_p1.diff.



- R0.12c\_rev1
  - Add NAND disk support.
- R0.12c\_rev0
  - Upgraded to version 0.12c and applied patches ff\_12c\_p1.diff and ff\_12c\_p2.diff.
- R0.12b\_rev0
  - Upgraded to version 0.12b.
- R0.11a
  - Added glue functions for low-level drivers (SDHC, SDSPI, RAM, MMC). Modified diskio.c.
  - Added RTOS wrappers to make FatFs thread safe. Modified syscall.c.
  - Renamed ffconf.h to ffconf\_template.h. Each application should contain its own ffconf.h.
  - Included ffconf.h into diskio.c to enable the selection of physical disk from ffconf.h by macro definition.
  - Conditional compilation of physical disk interfaces in diskio.c.

## FreeMASTER Communication Driver

Current version is 3.0.6. Visit <https://www.nxp.com/freemaster> for more information. Reach out for a support at <https://community.nxp.com/community/freemaster>.

- 3.0.0
  - Initial version of FreeMASTER driver reworked from a standalone package to MCUXpresso SDK middleware.
  - This driver version supports new version V4 of FreeMASTER serial communication protocol.
  - Supports UART, LPUART, USART, MINIUSART, FlexCAN, USB-CDC and JTAG/BDM communication.
  - Initial version was tested with the following boards: evkmimxrt1060, frdmk64f, frdmke15z, frdmk128z, lpcxpresso54628 lpcxpresso55s69, lpcxpresso845max and twrk64f120m.
  - Use with FreeMASTER PC Host tool version 2.5 or later.
- 3.0.1
  - FreeMASTER driver extended to support wide range of Kinetis, LPC and i.MX-RT platforms.
  - Low-level communication drivers also available for few non-SDK NXP platforms like S12Z, S32x and more.
  - Use with FreeMASTER PC Host tool version 3.0 or later.
- 3.0.2
  - FreeMASTER driver support of DSC56F800EX and S12 platforms extended.
  - Removed dependency on C99 compiler features.
  - Use with FreeMASTER PC Host tool version 3.0.2 or later.
- 3.0.3
  - General update for SDK 2.9.0
  - fmstr\_any demo added to selected platforms - use with MCUXpresso SDK and FreeMASTER peripheral configuration tool.
  - New example.pmp project file embedded into application flash storage.
  - USB-CDC implementation fixed, new JTAG EOnCE communication interface added to DSC 56F800E family.

- Use with FreeMASTER PC Host tool version 3.0.3 or later. Version 3.1.x is recommended.
- 3.0.4
  - Fixed component dependency logic of FreeMASTER driver.
  - Use with FreeMASTER PC Host tool version 3.1.x
- 3.0.5
  - General update for SDK 2.11 and 2.12
  - New TCP and UDP support with lwIP stack
  - New communication over Segger RTT interface
  - Add fmstr\_net and fmstr\_wifi examples for selected i.MX-RT platforms
  - Add fmstr\_rtt example for selected platforms
  - Fixed negative recorder threshold trigger processing
- 3.0.6
  - General update for SDK 2.13
  - Use of new Ethernet MDIO driver concept.
  - Support of ENET and NETC Ethernet modules in the fmstr\_net example application.

## MOTOR\_CONTROL for KSDK

Current version is 1.1.0

- 1.1.0
  - Initial version.

## RTCESL for KSDK

Current version is 4.3

- 4.3
  - Initial version.

## USB stack for MCUXpresso SDK

The current version of USB stack is 2.8.4.

- 2.8.4
  - Improvement:
    - \* Add the new netc adapter for the new netc driver.
    - \* Fix issues for USB device dfu and usb device msc when enable the macro USB\_DEVICE\_CONFIG\_RETURN\_VALUE\_CHECK.
    - \* Change the header file including order for usb.h header.
    - \* Update the USB host audio class driver to fix the wrong output log.
    - \* Add the workaround on dev\_hid\_mouse\_bm case for the errata TN00071.
    - \* Enable ROOT2 macro in USB device stack.
    - \* Use an unified definition for the base address of RTxxxx platforms.

- 2.8.3
  - Improvement:
    - \* Update the EHCI controller driver to support the address convert for TCM.
    - \* Update the USB host EHCI controller driver to make sure the mutual exclusion access under multiple tasks' environment.
- 2.8.2
  - Improvement:
    - \* Fix noise issue of UAC 3.1, UAC 5.1, UAC 7.1 on usb audio speaker demo.
    - \* Fix the issue that incorrect PC behavior when ejecting USB MSC devices.
    - \* Update the EHCI controller driver to support RW610 that does not reply on PHY driver, especially for low power feature.
    - \* Update the USB\_HostHelperParseAlternateSetting to fix the wrong interface parse.
    - \* Update dev\_composite\_hid\_audio\_unified\_bm demo to support independent mute/unmute and volume control.
- 2.8.1
  - Improvement:
    - \* update USB audio demos to use audio component (components).
    - \* Add the checking of function call return value.
    - \* Add audio multiple channels demo (usb\_device\_composite\_audio\_multi\_ch\_unified) on RT600 audio board.
    - \* Fix audio noise on sync mode and improve overflow/underflow checking method.
    - \* Support UAC 3.1, 5.1 and 7.1 on audio speaker demo.
    - \* Set USB device CDC demo not to depend on DTR setting from host.
    - \* Support MCUX toolchain on some RTxxxx platforms.
- 2.8.0
  - Improvement:
    - \* Fix the USB device stack vulnerability issues.
    - \* Update the audio PLL and FRO adjustment codes for audio examples in RTxxx, LP-C54xxx and LPC55xxx.
    - \* Improve the USB PD AMS collision avoidance.
    - \* Improve IP3511 controller driver's dedicated ram allocation.
    - \* Change the USB\_DATA\_ALIGN\_SIZE to 4 because the controller driver uses the dedicated RAM to do memcpy.
  - New features:
    - \* Enable USB host audio recorder demo for mutiple boards.
- 2.7.0
  - Improvement:
    - \* Use new feedback solution and low latency playback for usb device speaker demo and unified demos. Add underflow and overflow protection.
    - \* Optimize hard code for usb audio demos.
    - \* Update Unconstrained Power field in the Sink Capabilities Message according to the external power state.
    - \* Fix CVE-2021-38258 and CVE-2021-38260
  - New features:
    - \* Enable USB host video demo for mutiple boards.

- \* Enable USB device MTP demo for mutiple boards.
- \* Add PPS message to usb pd stack.
- 2.6.1
  - Improvement:
    - \* rename sdcard as disk for all of sdcard demos. For ramdisk demos, they are not changed.
    - \* add wrapper for all of disk demos to support emmc.
- 2.6.0
  - Improvement:
    - \* Added more ufi event to support dynamic sdcard capacity.
    - \* Passed MISRA-2012 mandatory and required rules.
      - Except rule 17.2 in host hub and otg stack.
      - Except rule 5.1, rule 5.4, rule 21.1 and rule 21.2.
    - \* Re-implemented USB components and supported NPW.
    - \* Improved IP3511 controller driver's cancelling transfer function.
    - \* Enabled the audio2.0 defaultly for device audio demos.
    - \* Enabled the host audio2.0 function in host audio class driver and host audio speaker demo.
  - New features:
    - \* enable two USB controllers in one USB host mouse demo which named as host\_hid\_-mouse\_dual.
    - \* enable UAC 5.1 for usb device audio speaker demo.
- 2.5.0
  - Improvement:
    - \* Integrated sdk components (OSA, Timer, GPIO and serial\_manager) to USB stack and demos.
    - \* Improved the ip3511 driver throughput.
    - \* Improved audio initialization codes after SDK audio drivers update.
    - \* Improved auido to support the audio2.0 in win10.
    - \* Add one "enumeration fail" callback event to host stack.
- 2.4.2
  - Improvement:
    - \* Put the USB controller data and transfer buffer to noncache section, removed the setting that sets the whole ocram and sdram as noncached.
    - \* Separated composite audio examples' channel,sample rate,format parameters from commom macro to in dedicated macro and out dedicated macro.
    - \* replaced USB\_PrepareData with USB\_AudioRecorderGetBuffer.
- 2.4.1
  - New features:
    - \* Added enumeration fail callback to host stack when the attached device's enumeration failed.
- 2.4.0
  - Improvement:
    - \* Device Charger Detection (DCD) software architecture was refactored.
  - New features:
    - \* Enabled Device Charger Detection (DCD) on RT1060.
    - \* Enabled Device Charger Detection on RT600.

- \* Enabled host battery charger function on RT600.
- 2.3.0
  - New features:
    - \* Added host video camera support. example: usb\_host\_video\_camera
    - \* Added a new device example. example: usb\_device\_composite\_cdc\_hid\_audio\_unified
- 2.2.0
  - New features:
    - \* Added device DFU support.
    - \* Supported OM13790DOCK on LPCXpresso54018.
    - \* Added multiple logical unit support in msc class driver, updated usb\_device\_lba\_information\_struct\_t to support this.
    - \* Supported multiple transfers for host ISO on IP3516HS.
  - Bug fixes:
    - \* Fixed device ip3511 prime data length than maxpacket size issue.
    - \* Initialized interval attribute in usb\_device\_endpoint\_struct\_t/usb\_device\_endpoint\_init\_struct\_t.
    - \* Removed unnecessary header file in device CDC class driver, removed unnecessary usb\_echo, and added DEBUG macro for necessary usb\_echo in device CDC class driver.
    - \* Fixed device IP3511HS unfinished interrupt transfer missing issue.
- 2.1.0
  - New features:
    - \* Added host RNDIS support. example: lwip\_dhcp\_usb
    - \* Enabled USB 3.0 support on device stack.
    - \* Power Delivery feature: Added OM13790HOST support; Added auto policy feature; Printed e-marked cable information;
- 2.0.1
  - Bug fixes:
    - \* Fixed some USB issues: Fixed MSC CV test failed in MSC examples.
    - \* Changed audio codec interfaces.
- 2.0.0
  - New features:
    - \* PTN5110N support.
  - Bug fix:
    - \* Added some comments, fixed some minor USB issues.
- 1.9.0
  - New features:
    - \* Examples:
      - usb\_pd\_alt\_mode\_dp\_host
- 1.8.2
  - Updated license.
- 1.8.1
  - Bug fix:
    - \* Verified some hardware issues, support aruba\_flashless.
- 1.8.0
  - New features:

- \* Examples:
    - usb\_device\_composite\_cdc\_vcom\_cdc\_vcom
    - usb\_device\_composite\_hid\_audio\_unified
    - usb\_pd\_sink\_battery
    - Changed usb\_pd\_battery to usb\_pd\_charger\_battery.
  - Bug fix:
    - \* Code clean up, removed some irrelevant code.
- 1.7.0
  - New features:
    - \* USB PD stack support.
  - Examples:
    - \* usb\_pd
    - \* usb\_pd\_battery
    - \* usb\_pd\_source\_charger
- 1.6.3
  - Bug fix: -IP3511\_HS driver control transfer sequence issue, enabled 3511 ip cv test.
- 1.6.2
  - New features:
    - \* Multi instance support.
- 1.6.1
  - New features:
  - Changed the struct variable address method for device\_video\_virtual\_camera and host\_phdc\_manager.
- 1.6.0
  - New features:
    - \* Supported Device Charger Detect feature on usb\_device\_hid\_mouse.
- 1.5.0
  - New features:
    - \* Supported controllers
      - OHCI (Full Speed, Host mode)
      - IP3516 (High Speed, Host mode)
      - IP3511 (High Speed, Device mode)
    - \* Examples:
      - usb\_lpm\_device\_hid\_mouse
      - usb\_lpm\_device\_hid\_mouse\_lite
      - usb\_lpm\_host\_hid\_mouse
- 1.4.0
  - New features:
    - \* Examples:
      - usb\_device\_hid\_mouse/freertos\_static
      - usb\_suspend\_resume\_device\_hid\_mouse\_lite
- 1.3.0
  - New features:
    - \* Supported roles
      - OTG

- \* Supported classes
    - CDC RNDIS
  - \* Examples
    - usb\_otg\_hid\_mouse
    - usb\_device\_cdc\_vnic
    - usb\_suspend\_resume\_device\_hid\_mouse
    - usb\_suspend\_resume\_host\_hid\_mouse
- 1.2.0
  - New features:
    - \* Supported controllers
      - LPC IP3511 (Full Speed, Device mode)
- 1.1.0
  - Bug fix:
    - \* Fixed some issues in USB certification.
    - \* Changed VID and Manufacturer string to NXP.
  - New features:
    - \* Supported classes
      - Pinter
    - \* Examples:
      - usb\_device\_composite\_cdc\_msc\_sdcard
      - usb\_device\_printer\_virtual\_plain\_text
      - usb\_host\_printer\_plain\_text
- 1.0.1
  - Bug fix:
    - \* Improved the efficiency of device audio speaker by changing the transfer mode from interrupt to DMA, thus providing the ability to eliminate the periodic noise.
- 1.0.0
  - New features:
    - \* Supported roles
      - Device
      - Host
    - \* Supported controllers:
      - KHCI (Full Speed)
      - EHCI (High Speed)
    - \* Supported classes:
      - AUDIO
      - CCID
      - CDC
      - HID
      - MSC
      - PHDC
      - VIDEO
    - \* Examples:
      - usb\_device\_audio\_generator
      - usb\_device\_audio\_speaker

- usb\_device\_ccid\_smart\_card
- usb\_device\_cdc\_vcom
- usb\_device\_cdc\_vnic
- usb\_device\_composite\_cdc\_msc
- usb\_device\_composite\_hid\_audio
- usb\_device\_composite\_hid\_mouse\_hid\_keyboard
- usb\_device\_hid\_generic
- usb\_device\_hid\_mouse
- usb\_device\_msc\_ramdisk
- usb\_device\_msc\_sdcard
- usb\_device\_phdc\_weighscale
- usb\_device\_video\_flexio\_ov7670
- usb\_device\_video\_virtual\_camera
- usb\_host\_audio\_speaker
- usb\_host\_cdc
- usb\_host\_hid\_generic
- usb\_host\_hid\_mouse
- usb\_host\_hid\_mouse\_keyboard
- usb\_host\_msdc\_command
- usb\_host\_msdc\_fatfs
- usb\_host\_phdc\_manager
- usb\_keyboard2mouse
- usb\_pin\_detect\_hid\_mouse



### 3 Component Change Log

#### CODEC

The current codec common driver version is 2.3.1.

- 2.3.1
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 16.1,16.3.
- 2.3.0
  - Improvements
    - \* Added enum `_codec_volume_capability` for `CODEC_SetVolume/CODEC_SetMute` to cover more volume configurations.
- 2.2.2
  - Bug Fixes
    - \* Fixed the typo in codec common driver.
- 2.2.1
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 10.3, 8.3, 10.7, 17.7.
- 2.2.0
  - Improvements
    - \* Used `HAL_CODEC_HANDLER_SIZE` which is determined by low level driver instead of use `CODEC_HANDLE_SIZE` for the codec device handle definition.
- 2.1.1
  - Improvements
    - \* Supported all of the codec in the codec adapter.
    - \* Modified the codec handle definition to improve user experience.
    - \* Modified the capability member type from entity to pointer in codec handle.
  - Bug Fixes
    - \* Fixed the Coverity issue regrading array compared against 0.
- 2.1.0
  - Deprecated APIs
    - \* `CODEC_GetMappedFormatBits`
    - \* `CODEC_I2C_WriteReg`
    - \* `CODEC_I2C_ReadReg`
    - \* `CODEC_I2C_ModifyReg`
    - \* `CODEC_SetEncoding`
  - new APIs
    - \* `CODEC_SetPower`
    - \* `CODEC_SetVolume`
    - \* `CODEC_SetMute`
    - \* `CODEC_SetPlay`
    - \* `CODEC_SetRecord`
    - \* `CODEC_SetRecordChannel`

- \* CODEC\_ModuleControl
- new features
  - \* Removed duplicate members in codec\_handle\_t and codec\_config\_t.
  - \* Added codec\_config\_t pointer in codec\_handle\_t.
  - \* Added codec capability flag in codec\_handle\_t.
  - \* Used codec adapter instead of function pointer in codec common driver.
- 2.0.1
  - Added delayMs function pointer in codec handle.
- 2.0.0
  - Initial version.

## WM8904

The current wm8904 driver version is 2.5.1.

- 2.5.1
  - Bug Fixes
    - \* Fixed invalid clock divider issue generated from WM8904\_SetMasterClock api
    - \* Replace ‘\_\_REV16’ with general implementation to swap bytes in a short variable.
- 2.5.0
  - Improvements
    - \* Added master clock configuration support in function WM8904\_SetAudioFormat.
    - \* Align the sysclk paramter definition for the WM8904\_SetAudioFormat/WM8904\_SetMasterClock.
    - \* Added api WM8904\_SetDACVolume to support adjust DAC volume.
    - \* Fixed the MISRA-2012 violation of 12.2, 10.3.
- 2.4.4
  - Bug Fixes
    - \* Added the 11.025kHz/22.05kHz/44.1kHz samplerate support on codec WM8904.
    - \* Fixed the MISRA-2012 violation of 4.7.
- 2.4.3
  - Bug Fixes
    - \* Fixed the MISRA-2012 violations.
      - Fixed rule 8.6, 9.3, 10.1, 10.3, 10.4, 10.7, 10.8, 11.8, 11.9, 14.4, 16.1, 16.3, 16.4, 17.7, 20.9.
- 2.4.2
  - Bug Fixes
    - \* Corrected the volume setting function behavior in wm8904 driver, support range align with its specification range.
    - \* Corrected the volume setting function behavior in wm8904 adapter, support range 0 - 100, 0 for mute, 100 for maximum volume.
- 2.4.1
  - Bug Fixes
    - \* Fixed the bit width register field overwritten issue.

- 2.4.0
  - New features
    - \* Added flt support in wm8904 driver.
- 2.3.0
  - Improvements
    - \* Added new API WM8904\_SetMasterClock to support BCLK/LRCLK output mode.
- 2.1.0
  - new APIs
    - \* WM8904\_ReadRegister
    - \* WM8904\_WriteRegister
    - \* WM8904\_ModifyRegister
    - \* WM8904\_SetRecord
    - \* WM8904\_SetPlay
    - \* WM8904\_SetRecordChannel
    - \* WM8904\_SetModulePower
    - \* WM8904\_SetChannelVolume
    - \* WM8904\_SetChannelMute

#### New features

- Removed dependency on codec common driver.
- Added dependency on codec i2c.

#### Bug Fixes

- Fixed unchecked return value in WM8904\_Deinit.
- Fixed the alignment fault issue by adding \_\_NOP between continuous memory access.

#### 2.0.3

- Bug Fixes
  - Fixed issue that wm8904 register access function truncated return value.

#### 2.0.2

- Bug Fixes
  - Fixed using uninitialized value format.fsRatio when calling WM8904\_UpdateFormat.

#### 2.0.1

- Added WM8904\_CheckAudioFormat API.
- Changed the second parameter's name of WM8904\_SetAudioFormat to sysclk.

#### 2.0.0

- Initial version.

## .1 WM8960

The current wm8960 driver version is 2.2.1.

- 2.2.1
  - Bug fixes
    - \* Improved the internal PLL fatctor calculation formula.
- 2.2.0
  - Improvements
    - \* Added masterClock member in wm8960\_config\_t to support wm8960 master mode.
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 4.7, 5.8, 10.3, 10.4, 12.2, 14.4.
    - \* Added the bit clock divider configuration when wm8960 act as master.
- 2.1.3
  - Bug Fixes
    - \* Fixed the issue that WM8960 had no ack when performing write register by updating the byte count to be written.
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 10.3, 8.3, 10.7, 17.7.
- 2.1.2
  - Improvements
    - \* Enabled the class D output in WM8960\_Init.
  - Bug Fixes
    - \* Corrected the volume setting function behavior in wm8960 driver, support range aligned with its specification range.
    - \* Corrected the volume setting function behavior in wm8960 adapter, support range 0 - 100, 0 for mute, 100 for maximum volume.
- 2.1.1
  - Improvements
    - \* Removed useless bit clock divider configuration in function WM8960\_ConfigDataFormat.
- 2.1.0
  - Improvements
    - \* Added new API WM8960\_SetPlay.
    - \* Fixed error status overwrite issue in WM8960\_ConfigDataFormat function.
    - \* Removed dependency on codec common driver.
    - \* Added dependency on codec i2c.
  - Bug Fixes
    - \* Fixed the alignment fault issue by adding \_\_NOP between continuous memory access.
- 2.0.2
  - Removed bit width hard code setting in function WM8960\_SetProtocol.
- 2.0.1
  - Corrected the bclk divider calculation.
- 2.0.0
  - Initial version.

## SGTL5000

The current sgtl5000 driver version is 2.1.1.

- 2.1.1
  - Improvements
    - \* Corrected the volume setting function behavior in SGTL5000 driver, support range align with its specification range.
    - \* Corrected the volume setting function behavior in SGTL5000 adapter, support range 0 - 100, 0 for mute, 100 for maximum volume.
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 10.3, 8.3, 10.7, 17.7.
- 2.1.0
  - Improvements
    - \* Added API SGTL\_SetPlay/SGTL\_SetRecord.
    - \* Removed dependency on codec common driver.
    - \* Added dependency on codec i2c.
    - \* Fixed division or modulo by zero issue in SGTL\_ConfigDataFormat function.
  - Bug Fixes
    - \* Fixed the alignment fault issue by adding \_\_NOP between continuous memory access.
- 2.0.0
  - Initial version.

## DA7212

The current da7212 driver version is 2.2.2.

- 2.2.2
  - Bug Fixes
    - \* Fixed the MISRA-2012 violations.
      - Fixed rule 8.6, 9.3, 10.1, 10.3, 10.4, 10.7, 10.9, 11.1, 11.8, 14.4, 16.1, 16.3, 17.7, 17.3, 17.7, 20.9.
- 2.2.1
  - Improvements
    - \* Corrected the volume setting function behavior in DA7212 driver, support range align with its specification range.
    - \* Corrected the volume setting function behavior in DA7212 adapter, support range 0 - 100, 0 for mute, 100 for maximum volume.
- 2.2.0
  - Improvements
    - \* Added bclk invert parameter in the format structure.
    - \* Added API DA7212\_SetMasterModeBits/DA7212\_SetPLLConfig.
    - \* Added pll/sysClkSource parameters in the da7212 configuration structure.
    - \* Disabled PLL by default.
- 2.1.0
  - Improvements
    - \* Removed dependency on codec common driver.
    - \* Added dependency on codec i2c.

- Bug Fixes
  - \* Fixed the alignment fault issue by adding \_\_NOP between continuous memory access.
- 2.0.0
  - Initial version.

## CS42888

The current cs42888 driver version is 2.1.3

- 2.1.3
  - Improvements
    - \* Removed the assertion for codec reset function pointer.
- 2.1.2
  - Improvements
    - \* Corrected the volume setting function behavior in CS42888 adapter, support range 0 - 100, 0 for mute, 100 for maximum volume.
  - Bug Fixes
    - \* Fixed violations of MISRA C-2012 rule 4.7, 10.3, 8.3, 10.7, 17.7.
    - \* Corrected the channel index during setting AIN volume in CS42888\_Init.
- 2.1.1
  - Improvements
    - \* Used software delay with delayMs pointer not provided by application.
    - \* Fixed error status overwrite issue in CS42888\_Init function.
    - \* Removed dependency on codec common driver.
    - \* Added API CS42888\_SelectFunctionalMode/CS42888\_SetChannelMute.
    - \* Added dependency on codec i2c.
- 2.1.0
  - Improvements
    - \* Unified CS42888 codec driver interface.
  - \* Bug Fixes
    - Corrected the ADC/DAC functional mode macro definition.
    - Added TDM and OLM mode support in the function CS42888\_SetProtocol.
- 2.0.0
  - Initial version.

## SERIAL\_MANAGER

The current Serial\_Manager component version is 1.0.2.

- 1.0.2
  - Add SerialManager\_WriteTimeDelay()/SerialManager\_ReadTimeDelay() for serial manager's read/write non-blocking mode.
- 1.0.1
  - Add prefixing fsl\_component\_XXX/fsl\_adapter\_XXX.

- 1.0.0
  - Initial version

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