NXP Semiconductors
Product Brief

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Real-Time Drivers Product Brief- S32G

Contents

1. Software Product Overview

S32-based platform products offer Real-Time Drivers (RTD) software supporting both AUTOSAR and non-AUTOSAR (similar to traditional SDKs) applications. Both are ISO 26262 functional safety compliant up to ASIL D. A wide range of standard low-level drivers (LLD) and complex device drivers (CDD) create a rich ecosystem integrated into a unified development environment with highly optimized code. Each driver provides two sets of APIs: one compliant with AUTOSAR and the other directly accessing the hardware. For a non-AUTOSAR application, any interface can be used, according to the scope of the application.

RTD software is developed using Automotive SPICE/CMMI Level 3, MISRA 2012, and ISO 26262 compliant processes – all automotive-grade quality and production ready. RTD software includes S32CT (non-AUTOSAR) configurators and supports Elektrobit tresos (AUTOSAR) and multiple premium IDE toolchains.

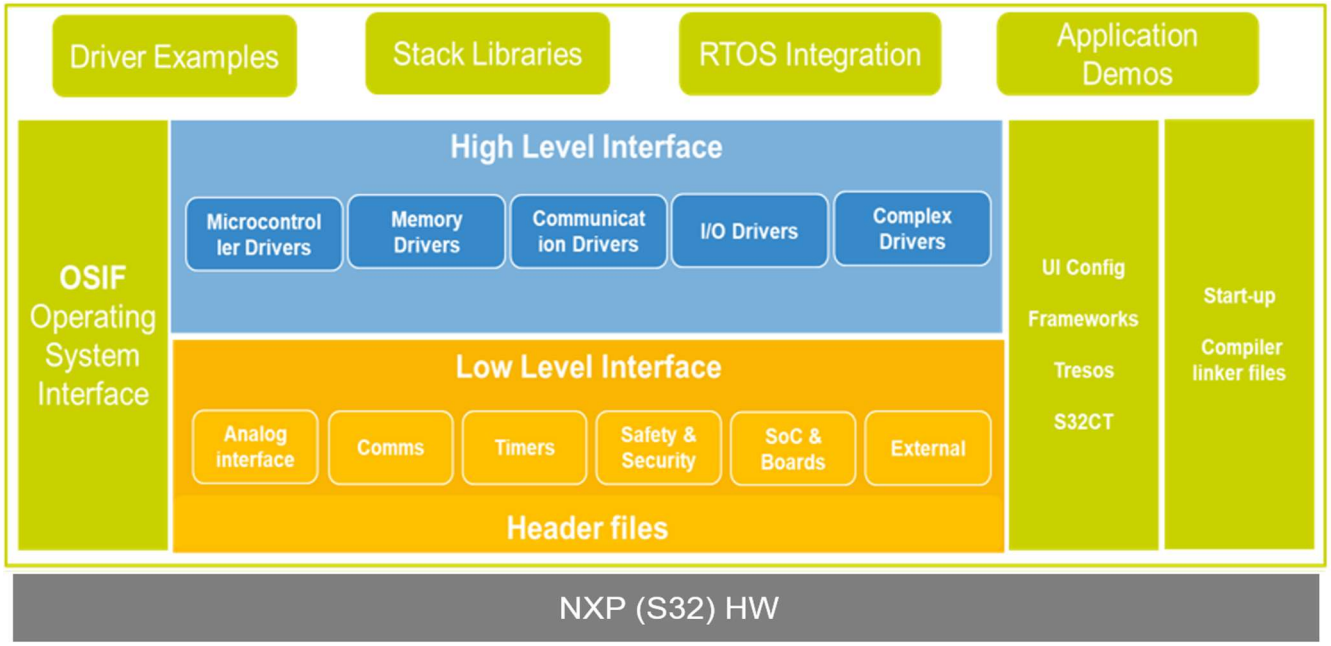

Figure 1. **NXP's Real-Time Drivers (RTD) Software Environment**

2. Software Content

The list of high-level drivers (AUTOSAR compliant + extensions) include:

• *Adc*	• *Mcl*	• *Det*
• *Base*	• *Mcu*	• *Ecuc*
• *Can*	• *Ocotp*	• *Os*
• *Crc*	• *Ocu*	• *Ecum*
• *Crypto*	• *Platform*	• *WdgIf*
• *Dio*	• *Port*	• *MemIf*
• *Eep*	• *Pwm*	• *EthIf*
• *Eth*	• *Qd*	• *EthTrcv*
• *Fee*	• *Rm*	• *EthSwt*
• *Fls*	• *Spi*	• *LinIf*
• *Fr*	• *Thermal*	• *CanIf*
• *Gpt*	• *Uart*	• *CryIf*
• *I2c*	• *Wdg*	• *Csm*
• *Icu*	• *Resource*	• *Rte*
• *Lin*	• *Dem*	• *FrIf*

Table 1. **Hardware IPs to Software mapping**

RTD Driver	RTD LowLevel Interface	IP
ADC	Ctu_Ip	CTU
	Adc_Sar_Ip	SAR_ADC
BASE	NA	REG_PROT
CAN	FlexCAN	FlexCAN
CRC	CRC	CRC
CRYPTO	Hse_Ip	HSE-H
	Mu_Ip	MU
DIO	Siul2_Dio_Ip	SIUL2
EEP	Sd_Emmc_Ip	uSDHC
ETH	GMAC	GMAC
FEE	NA	NA
FLS	Qspi_Ip	QuadSPI
FR	FR	Flexray
GPT	Ftm_Ip	FTM (FlexTimer)
	Pit	PIT
	Rtc_Ip	RTC
	Stm_ip	STM
I2C	I2c_Ip	I2C
ICU	Ftm_Ip	FTM (FlexTimer)
	Siul2_Icu_Ip	SIUL2
	Wkpu_Ip	WKPU
LIN	LinFlex	LINFlexD
MCL	Cache_Ip	Cache_M7
	Dma_Ip	DMA_CRC
	Dma_Ip (Enhanced Direct Memory Access (PDMA - Peripheral eDMA))	eDMA3
MCU	Clock_Ip	MC_CGM
	Clock_Ip	FXOSC
	Clock_Ip	SIRC
	Clock_Ip	FIRC
	Clock_Ip	CMU
	Clock_Ip	DFS
	Clock_Ip	PLLDIG
	Clock_Ip	SRAMC
	Power_Ip	MC_ME
	Power_Ip	PMC

	Power_Ip	MC_RGM
	Ram_Ip	STCU2
	NA	SIUL2
OCOTP	Ocotp_Ip	OCOTP
OCU	Ftm_Ip	FTM (FlexTimer)
Platform	System_Ip	MCM
	Intctrl_Ip	NVIC
	Mpu_Ip	MPU
PORT	Siul2_Port_Ip	SIUL2
PWM	Ftm_Ip	FTM (FlexTimer)
QD	Ftm_Ip	FTM (FlexTimer)
RM	IntCtrl_Ip	MSCM
	Sema42_Ip	SEMA42
	Xrdc_Ip	XRDC
	Dma_Ip	DMAMUX
SPI	Spi_Ip	SPI
THERMAL	Tmu_Ip	TMU
UART	LinFlex	LINFlexD
WDG	Swt_Ip	SWT
RESOURCE	-	-
DEM	-	-
DET	-	-
ECUC	-	-
OS	-	-
ECUM	-	-
WDGIF	-	-
MEMIF	-	-
ETHIF	-	-
ETHTRCV	-	-
ETHSWT	-	-
LINIF	-	-
CANIF	-	-
CRYIF	-	-
CSM	-	-
RTE	-	-
FrIf	-	-

3. Supported Targets

The software described in this document is intended to be used with microcontroller devices of NXP Semiconductors, including:

- S32G2
- S32G3

4. Quality, Standards Compliance and Testing Approach

RTD product is developed according to NXP Software Development Processes that are Automotive-SPICE, ISO26262, IATF16949 and ISO9001 compliant.

RTD SW packages (starting with Beta releases) contain drivers as eclipse plugins for Elektrobit tresos or S32 Design Studio.

For each driver:

- Source code + configuration templates
- Driver User Manual
- Driver Integration Manual
- Driver Example Application

For the entire package:

- RTD Release Note

RTD SW packages (starting with Beta releases) are accompanied by software quality packages containing the following deliverables:

For each RTD driver:

- Driver Test Specification
- Driver Test Summary Report
- Driver MISRA Summary Report
- Driver HIS Summary Report

- Driver Code Coverage Summary Report
- Driver Traceability Matrix
- Driver VSMD Report
- Driver CWE Report
- Driver Compiler Warnings Report
- Driver Profile Report
- Driver Ram Size Report
- Driver Size Report
- Driver Static analysis Report (added only on customer request)

For the entire RTD package:

- RTD Test Summary Report
- RTD Quality Matrix

SW Testing approach is documented in RTD Test Strategy document that contains the following information and can be shared with customers in request.

- Testing scope and objectives
- Test levels: unit tests, unit integration tests
- Test types: functional, non-functional, regression tests, robustness, performance tests, conformance testing
  - Test techniques: white-box, black-box tests
  - Test cases organization and prioritization
  - Test deliverables (test report, test specification, code coverage report, traceability matrix, static analysis report)

5. Document Information

Table 1. **Sample revision history**

Revision number	Date	Substantive changes
1.0	01/2023	Initial release

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