DA1459x SDK

This document contains the release notes for Renesas Electronics DA1459x Software Development Kit, version 10.1.6.108.

Contents

Tables

1. Terms and Definitions

ADC	Analog to Digital Converter
API	Application Programming Interface
BOD	Brown Out Detection
Bluetooth® LE	Bluetooth® Low Energy
DMA	Direct Memory Access
GA	General Availability
GPIO	General Purpose Input/output
GPU	Graphics Processing Unit
HCI	Host Controller Interface
I2C	Inter-Integrated Circuit interface
IRQ	Interrupt Request
LA	Limited Availability
LLD	Low Level Driver
M33, M0+	Processing Cores
OS	Operating System
QSPI	Quad SPI
RAM	Random Access Memory
RTC	Real Time Clock
SDK	Software Development Kit
SPI	Serial Peripheral Interface
SUOTA	Software Update Over the Air
TRNG	True Random Number Generator
UART	Asynchronous Serial Receive/Transmit Port
XiP	Execute in Place

2. Release Data

Table 1. Release data

Device Number	DA14592, DA14594
Device Type	Multi-Core Wireless Microcontroller
Device Revision	DA14592-01, DA14594-00
Operating System	FreeRTOS
Operating System Version	10.4.4
Software Release Date	July 30, 2025
Software Version Number	10.1.6.108
Software Release Type (Note 1)	FULL (GA)

Note 1 Releases can be of the following types: FULL (GA), FULL (LA), RELEASE CANDIDATE, ENGINEERING, PATCH or BINARY.

3. License

Licenses covering this DA1459x SDK release are listed in the licensing.txt file in the doc folder.

4. Related Documentation and References

[1] UM-B-166, DA1459x Getting Started with Development Kit, Manual, Renesas Electronics.

[2] UM-B-167, DA1459x PRO-Development Kit, Manual, Renesas Electronics.

[3] UM-B-160, DA1459x SDK Platform Reference Guide, Manual, Renesas Electronics.

Note 1 References are for the latest published version, unless otherwise indicated.

5. Release Description

5.1 Overview

This is a full release of SDK 10.1.6.108 for DA14592 and DA14594. This GA release adds RED compliance for the DA14592 and DA14594 devices.

5.2 New and Updated Features of 10.1.6.108

Table 2. SDK 10.1.6.108 new features

Feature number	Description
108_01	pxp_reporter/ble_adv: added feature to enable SUOTA functionality from secure connection only.
108_02	Added secure store feature for Bluetooth® LE keys. It stores the Bluetooth LE keys exchanged with the peer in encrypted format using unique per device encryption key (DUSK).
108_03	pxp_reporter: added an example to present how to securely store user data by encrypting battery measurement data with a unique per device encryption key (DUSK).
108_04	cli_programmer: added command for generating and storing Device Unique Symmetric Key (DUSK) in the designated OTP location.
108_05	cli_programmer: added command to send symmetric keys in encrypted format.

5.3 Fixes and Improvements since 10.1.4.104

Table 3. SDK 10.1.6.108 fixes and improvements

Fix number	Description
108_001	Fixed: build fails for host tools mkimage, libmkimage and libbo_crypto in e2 studio
108_002	Improved: capability to recover after ble_controller_error
108_003	Improved: add functionality to program/erase configuration script flash area
108_004	Fixed: description of OS_GET_TASK_STACK_WATERMARK return value
108_005	Fixed: compiler error when SDADC is used without DMA

5.4 Known Limitations of 10.1.6.108

You can find a list of known limitations maintained online:

DA1459x SDK Known Limitations

6. Release History

6.1 Version 10.1.4.104

6.1.1 Overview

This is a full release of SDK 10.1.4.104 for DA14592 and DA14594. This GA release adds support for the DA14594 device.

6.1.2 New and Updated Features of 10.1.4.104

Table 4. SDK 10.1.4.104 new features - DA14594

Feature number	Description
0000	Bluetooth LE 5.3 Qualifiable
0001	Advertising extension
0002	Periodic Advertising AoD TX/AoA TX
0003	LE Power Control

Table 5. SDK 10.1.4.104 new features - DA14592 and DA14594

Feature number	Description
0004	Asymmetric SUOTA

6.1.3 Fixes and Improvements since 10.1.2.86

Table 6. SDK 10.1.4.104 fixes and improvements - DA14594

Fix number	Description
104_001	Fixed: the GAPM_SET_DEV_CONFIG_CMD command with AddrType set to Static and address field to 0xFFFFFFFFFFFF returns OK while it should fail.
104_002	Fixed: when MPS = MTU, the disconnections happen at L2CAP CoC.
104_003	Fixed: command gap address_set priv-res fails.
104_004	Fixed: issue with the LE_EVT_GAP_PERIODIC_ADV_REPORT command.
104_005	Fixed: cmac_configuration_table_t members where not correctly transfer to the CMAC domain, resulting in incorrect configuration and behaviour. This behaviour is now corrected.

Table 7. SDK 10.1.4.104 fixes and improvements - DA14592

Fix number	Description
104_006	592_ROM_PATCH DA14592 accepts invalid static addresses at GAPM_SET_DEV_CONFIG_CMD.

Table 8. SDK 10.1.4.104 fixes and improvements - DA14592 and DA14594

Fix number	Description
104_007	Fixed: there is miscalculation in converting ADC value to temperature.
104_008	Fixed: hw_clk_configure_xtal32k() sets XTAL32K_DISABLE_AMPREG in case of using an external digital clock as LP clock source. However, this function makes use of the dg_configEXT_LP_IS_DIGITAL macro instead of the dg_configLP_CLK_SOURCE.
104_009	Improved: st_fw provides a temperature reading to CMAC for RF calibration and increases voltage levels for HP mode.
104_010	Fixed: ble_gap_address_set() would return the Bluetooth LE stack status instead of the top Bluetooth LE API status. This fix adds translation for the possible error codes.
104_011	Fixed: random ATT write command packet loss.
104_012	Fixed: collect debug info script should have the correct ISPR address.
104_013	Fixed: missing commands in ble_cli regarding permutation and tx_power.
104_014	Improved: make DGTL UART Baud rate configurable. The default value 1M.
104_015	Improved: activate FCU buffering by M33.
104_016	Fixed: DA1459x reference voltage hardware issue workaround.
104_017	Fixed: inconsistent SPI read data due to hardcoded clock edge selection.

104_018	Fixed: Flash adapter does not check for conflicts when flash is not XIP.
104_019	Fixed: VES adapter does not support having both eFlash and QSPI Flash enabled.
104_020	Fixed: when Random Non-Resolvable Private Address is set, connectable advertising fails to start when calling ble_gap_adv_start(GAP_CONN_MODE_UNDIRECTED).
104_021	Fixed: if sys_drbg internal buffer is exhausted, calling rand() results in sys_drbg_read_rand() returning SYS_DRBG_ERROR_BUFFER_EXHAUSTED, thus not producing any new random number and rand() returning 0.
104_022	Fixed: eFlash constrains "write up to 2 times per word without erase" violation.
104_023	Fixed: hw_wkup_set_trigger() resets the GPIO wake-up interrupt.
104_786	Fixed: When a (public) BD address is programmed into the Configuration Script, the SDK ignores the programmed address and uses the default BD address.
104_767	Fixed: if the DA14592 FCQFN52 is used with an external 32-kHz crystal, then it is possible that some devices do not start the 32-kHz oscillator at low temperature.
104_735	Fixed: Cscp collector application in the SDK fails (crashes) after about 1 hour when paired and bonded with an iPhone SE while scanning for cadence and/or speed sensors. So far, this issue is observed only with iPhone SE (iOS version 15.1). The application crashes with a MallocFailed error.
104_761	Fixed: reading the content of the eFlash of the DA14592 SoC using the Segger GDB Server may result in erroneous read results. The read error is not encountered when the read_eflash command is used over the UART.
104_789	Fixed: transmit power levels are not in accordance with the High or Low performance mode. Both power modes use the same enumerated values.

6.2 Version 10.1.2.86

SDK version 10.1.2.86 was released on Jan 11, 2024.

6.2.1 Overview

This is a GA release of SDK 10.1.2.86, which adds support for the DA14592 device. It is suitable for application development, testing, and final product design.

The DA14592 SDK follows the SDK10 architecture used in DA1469x and DA1470x device families, with the necessary changes dictated by the DA14592 capabilities.

The SDK10 software architecture includes:

- FreeRTOS operating system.
- Code execution in-place from internal eFlash or external QSPI Flash.
- Bluetooth LE Framework API using the Adapter/Manager layers.
- Abstraction layer with low level drivers (LLDs) and adapters for peripheral devices.

This release implements basic SDK architecture, including the Bluetooth LE framework.

6.2.2 New and Updated Features of 10.1.2.86

Table 9. SDK 10.1.2.86 new features

Feature number	Description
0000	L2CAP COC
0001	Low Duty Cycle Advertising
0002	LE Data Packet Length Extension (DLE)
0003	LE 2 Mbps
0004	SUOTA (Software Update Over the Air)
0005	Bluetooth Host subsystem can be updated as part of full application SUOTA
0006	Bluetooth Controller subsystem can be updated as part of full application SUOTA
0007	Bluetooth protocol ROM code can be patched as part of full application SUOTA

Feature number	Description
0008	Bluetooth LE services in the SDK release: ▪ Battery Service ▪ Body Composition Service ▪ Blood Pressure Service ▪ Bond Management Service ▪ Current Time Service ▪ Device Information Service ▪ Debug Service ▪ HID Service ▪ Heart Rate Service ▪ Immediate Alert Service ▪ Link Loss Service ▪ Scan Parameters Service ▪ TX Power Service ▪ User Data Service ▪ Weight Scale Service
0009	XiP (cached) from eFlash
0010	XiP (cached) from QSPI
0011	QSPI Flash Drivers
0012	NVMS partitions
0013	Timers Low-Level Driver
0014	RTC Low-Level Driver
0015	Watchdog Low-Level Driver and FreeRTOS tasks management subsystem
0016	Audio subsystem
0017	Peripherals (for example, UART, I2C, SPI, GPIOs, GPADC, SDADC, and so on) Low-Level Drivers
0018	Peripherals Adapters
0019	Bluetooth LE Example Applications
0020	FreeRTOS 10.4.4
0021	OS Abstraction Layer
0022	Renesas E2 Studio Support
0023	SmartSnippets Toolbox Support
0024	Supported by GNU/GCC toolset
0025	Supported by SWD

Appendix A Software Versioning Rules

This describes the software version numbers and does not apply to documentation version numbers (as found in the footer of this document).

Each software version number string consists of four numbers: MAJOR. BRANCH. MINOR. and BUILD.

#MAJOR: It is increased (by one only) if the project undergoes a major modification, for example major ROM changes. It usually changes only when the project sources undergo major restructuring affecting most of the repository. It is initialized at 1.

#BRANCH: Used in the case of concurrent projects that for special reasons need to be spun off the major repository. It corresponds to different versions of the repository code that have to be supported concurrently. In this case each branch number corresponds to a different GIT branch. The basic project has BRANCH id 0.

#MINOR: Odd numbers indicate Engineering (or Patch or Binary) versions, even numbers indicate Full release versions or Release Candidates of Full versions. Each Full release increases this number by one. After the Full release, the number is increased by one again. Therefore, Project releases correspond to release numbers like 2.0.1.xxx, 2.0.2.xxx. etc. The #MINOR number is initialized at 1.

#BUILD: The # BUILD number increases by one at every repository update and thus indicates the total number of changes since repository initialization. The BUILD number is initialized at 1.

7. Document Revision History

This section summarizes the changes made to this document and not to the software that this document describes.

Revision	Date	Description
1.20	July 30, 2025	Updated for 10.1.6.108.
1.10	Dec 4, 2024	Full release 10.1.4.10x.
1.00	Jan 11, 2024	First version.

Status Definitions

Status	Definition
DRAFT	The content of this document is under review and subject to formal approval, which may result in modifications or additions.
APPROVED or unmarked	The content of this document has been approved for publication.

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