FEBRUARY 03, 2022

DA14585/586 SDK Release Notes for version 6.0.8.509

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1.0 Introduction

1.1 Scope

This document describes the software release which supports the Dialog Semiconductor's DA14585/586 System-on-Chip (SoC) Platform.

1.2 Terms and abbreviations

BLE Bluetooth Low Energy
SDK Software Development Kit
SoC System on Chip
FW Firmware
OTP One-Time Programmable

1.3 Release Data

PROJECT	DA14585/586 SDK
RELEASE DATE	18 May 2018
VERSION NR.	6.0.8.509
RELEASE TYPE[1]	FULL
RELEASE MASTER	Kostas Papakonstantinou

1.4 License

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

1.5 History

VERSION	RELEASE MASTER	DATE
(6.0.8.509)	Rebranded to Renesas	03 Feb 2022
6.0.8.509	Kostas Papakonstantinou	18 May 2018
6.0.6.427	Kostas Papakonstantinou	09 November 2017
6.0.4.326	Panagiotis Panou	23 June 2017
6.0.2.243	Panagiotis Panou	27 March 2017
6.0.1.109	Panagiotis Panou	23 December 2016

[1] Releases can be of the following types: FULL, RELEASE CANDIDATE, ENGINEERING, PATCH or BINARY

2.0 Release Description

Rebranded to Renesas.

2.1 VERSION 6.0.8.509

#	DESCRIPTION
OVERVIEW	
This is a full release of DA14585/586 SDK, which supports only the DA14585/586-00.	
NEW FEATURES	
1.	Disabled DC-DC auto calibration (Buck and Boost mode).
2.	Added 38K4 baud rate support in production test f/w.
3.	Added support for URI advertising data type.
4.	Added support for GATT service layer changed characteristic to application layer.
5.	Added support to disable the ROM ECC key generation calculations if the Secure Connections feature is not used.
6.	Added support for Boost mode.
7.	Used the default XTAL16M trim value when the XTAL16M is uncalibrated.
8.	Added support for high temperature operation (105°C).
9.	Added API for AES-CCM, AES-CBC and AES-CMAC operations.
10.	Added function for the unique static random BD address generation using OTP header values.
11.	Added API to support controller privacy (peripheral role).
12.	Added extra power optimization method using the XTAL16M adaptive settling time algorithm. It is enabled by default and can offer power savings of up to 10% for 10ms connection interval.
FIXES / IMPROVEMENTS	
1.	Improved bond database API.
2.	Corrected in windows host applications the gapc_get_dev_info_cfm message memory allocation for the gapc_dev_name case.
3.	Fixed the task destination in the gapc_set_dev_info_req_ind_handler function.
4.	Fixed bug in heap memory logging mechanism.
5.	Fixed bugs in ANCS application: • Handled Service Changed notification, which caused iPhone to stop working when its settings were being changed. • Fixed issue in service discovery procedure.
6.	Changed index boundary in SPI flash detection function to iterate over the size of the supported SPI flashes array.
7.	Fixed bug in arch_printf function.
8.	Fixed swapped bytes in LE Generate DHKey command (controller side).
9.	Refactored TRNG algorithm to save code space.
10.	Removed filter policies from user configuration files (check known limitations section).
11.	ROM fixes: • Fixed the Identity Address Information, which is sent by the device after the IRK distribution, in order to contain the device's Public or Static Random address. • Fixed bug in retrieving the AD Type Flag information from the advertising data. • Fixed bug in channel hopping algorithm which could lead to connection failures. • Fixed bug in advertising report value which is generated from the received advertising packets.
Documentation	

UM-B-079	DA14585/586 SDK 6 Software Platform Reference
UM-B-080	DA14585/586 SDK 6 Software Developer's Guide
UM-B-082	DA14585/586 SDK 6 Porting Guide

#	OPEN ISSUES & LIMITATIONS
1.	WLAN Coexistence API is not supported.
2.	TRNG module buffer must be located in the first 64KB of System RAM.
3.	When many queued LL data PDUs are pending for transmission, LL actions tied to a specific instant (channel map update / connection parameter update) may happen after that instant has passed leading to a disconnection.
4.	When performing connection parameter update we need to keep the same bandwidth (ce_len_min) as when connection was established.
5.	The starting handle is not included in the Error Response for the following requests: • Find By Type Value Request • Read By Type Request • Read By Group Type Request
6.	When the device gets rejected at LL_CONNECTION_PARAM_REQ with "Invalid LMP Parameters", then the device rejects further host parameter update requests.
7.	When the device as a master issues a LL_CONNECTION_PARAM_REQ, the peer responds with LL_CONNECTION_PARAM_RSP, and the device rejects it (LL_REJECT_EXT_IND) with reason "Unsupported LMP Parameter Value", then the device does not respond to further host parameter update requests.
8.	HCI ACL fragmentation does not work correctly.
9.	ANCS example may be run out of memory due to receiving a large number of notifications.
10.	Not supported OOB pairing method in Secure Connections.
11.	Not supported Keypress Notifications in Passkey Entry.
12.	Channel map update could be altered after sent and before applied causing unstable connection.
13.	Filter policies and white lists are not supported.
14.	Static random identity address cannot be used if privacy (host or controller) is enabled.
15.	Basic DKs which are flashed with Segger JLink version > 5.02 does not work properly with the SDK external host applications. Please re-flash the Basic DKs with Segger JLink 5.02l.

#	File Name	Description
1.	DA14585_SDK_6.0.8.509.zip	RELEASE FILE
2.	DA14585_SDK_SW_Release_Notes_v6.0.8.509.doc	RELEASE NOTES

3.0 Release History

3.1 VERSION 6.0.6.427

#	DESCRIPTION
OVERVIEW	
This is a full release of DA14585/586 SDK, which supports only the DA14585/586-00.	
NEW FEATURES	
13.	Security changes: • Added SDK support for Bluetooth 4.2 LE Secure Connections.

	• Added support for the extra Secure Connections pairing method, the Numeric Comparison. • Updated app_easy_security API. • Updated definition of security environment to support all possible key types. • Modified callback app_on_tk_exch() to support all TK types, including TK_KEY_CONFIRM for Numeric Comparison pairing. • Updated application bond database interface. • Added callback functions for the bond database related functions. • Added support for address resolution. • Updated user security configuration (in user_config.h). • Modified existing Keil projects, ble_app_security and ble_app_all_in_one, to demonstrate the added Secure Connections feature.
14.	Added Keil project (named as ble_app_noncon) which demonstrates the exclusion of the Flags data type from the advertising data packet when the advertising type is non-connectable (according to CCS v6).
15.	Added implementation for the WSS (Weight Scale Service) Server and Client roles.
16.	Added implementation for the User Data Service (UDS) Server and Client roles.
17.	Added implementation for the BCS (Body Composition Service) Server and Client roles.
18.	Added implementation for the CTS (Current Time Service) Server and Client roles.
19.	Added implementation for the BMS (Bond Management Service) Server and Client roles.
20.	Added implementation for the ANCS (Apple Notification Center Service) Client role. Added Keil project (named ancs_client), which demonstrates the ANCS (Apple Notification Center Service) Client role.
FIXES / IMPROVEMENTS	
12.	Fixed bug in the formula for the RSSI value calculation in rf_rssi_convert() function.
13.	Fixed wrong initialization of ADV_DATA and SCAN_RSP_DATA lengths in the non-connectable advertising API function that corrupted the advertising packets.
14.	Fixed implicit type conversion error in ADV_DATA or SCAN_RSP_DATA length calculation that corrupted the advertising packets.
15.	Fixed wrong memcpy (ADV_DATA instead of SCAN_RSP_DATA) in the app_advertise_non_connectable_start_op() function that corrupted the advertising packets.
16.	PLT (Production Line Tool) : Update RSSI value only when receive packets without CRC error.
17.	Replaced any occurrence of rand() function with the co_rand_word() wrapper function so that the user can use his own random number generator implementation.
18.	Added missing 586 internal flash chip select disable in set_pad_functions() in various Keil projects.
19.	Custom profile modifications/fixes: • Updated the custom profile implementation to include more than one primary service in it. • Fixed bug in Indication handling mechanism. • Fixed bug in Write Long Characteristic Value handling mechanism. Please check UM-B-082 DA14585/586 SDK 6 Porting Guide for further details.
20.	ROM fixes: • Fixed issue in ECDH key validation. • Fixed bug in checking minimum security level requirements that prevented pairing. • Fixed check for LTKs when Secure Connections feature is used. • Fixed state machine issue to respond correctly to the Logical Link Control Protocol length request. • Replaced occurrence of rand() function with the co_rand_byte() wrapper function.
21.	Added callback to generate the static random address through the user's application

	code.
22.	Increased KE_TIMER_DELAY_MAX to the max value, 41943030 msec = 41943.030 sec ~ 699 minutes due to register being now 24 bits.
23.	Changed I2C binary size from 128KB to 256KB in flash programmer.
24.	Added the ChaCha20 random number generator which can be used instead of the default system rand() function.
25.	Added heap memory logging utility to be used through Keil.
26.	Allow the user to select the security requirements per service in the included Keil projects.
27.	Added missing 586 SPI port/pin definitions to Keil projects.
28.	Updated AES example in order to call the AES API during the connected state.
29.	Added profile utilities for attributes with 128-bit UUIDs (prf_utils_128.c).
30.	Fixed bug in the pairing process of the SUOTA Initiator external host processor application.
Documentation	
UM-B-079	DA14585/586 SDK 6 Software Platform Reference
UM-B-080	DA14585/586 SDK 6 Software Developer's Guide
UM-B-082	DA14585/586 SDK 6 Porting Guide

#	OPEN ISSUES & LIMITATIONS
16.	WLAN Coexistence API is not supported.
17.	TRNG module buffer must be located in the first 64KB of System RAM.
18.	When many queued LL data PDUs are pending for transmission, LL actions tied to a specific instant (channel map update / connection parameter update) may happen after that instant has passed leading to a disconnection.
19.	When performing connection parameter update we need to keep the same bandwidth (ce_len_min) as when connection was established.
20.	The Identity Address Information which is sent by the device after the IRK distribution does not contain its Public or Static Random address, but its RPA (resolvable private address) if the device uses an RPA.
21.	The starting handle is not included in the Error Response for the following requests: • Find By Type Value Request • Read By Type Request • Read By Group Type Request
22.	When the device gets rejected at LL_CONNECTION_PARAM_REQ with "Invalid LMP Parameters", then the device rejects further host parameter update requests.
23.	When the device as a master issues a LL_CONNECTION_PARAM_REQ, the peer responds with LL_CONNECTION_PARAM_RSP, and the device rejects it (LL_REJECT_EXT_IND) with reason "Unsupported LMP Parameter Value", then the device does not respond to further host parameter update requests.
24.	HCI ACL fragmentation does not work correctly.
25.	ANCS example stops working while the iPhone's settings are changed (Service Changed notification is not handled).
26.	Not supported OOB pairing method in Secure Connections.
27.	Not supported Keypress Notifications in Passkey Entry.
28.	Channel map update could be altered after sent and before applied causing unstable connection.
29.	Basic DKs which are flashed with Segger JLink version > 5.02 does not work properly with the SDK external host applications. Please re-flash the Basic DKs with Segger JLink 5.02l.

#	File Name	Description

1.	DA14585_SDK_6.0.6.427.zip	RELEASE FILE
2.	DA14585_SDK_SW_Release_Notes_v6.0.6.427.doc	RELEASE NOTES

3.2 VERSION 6.0.4.326

#	DESCRIPTION
OVERVIEW	
This is a full release of DA14585/586 SDK, which supports only the DA14585/586-00.	
NEW FEATURES	
1	Support for DA14585/586 AC revision.
2	AES crypto API. This API can be safely used during startup and before any BLE connections have been established.
3	Example application for AES crypto API under folder projects/target_apps/misc/aes.
4	Example for deep sleep mode (shipping mode) in proximity reporter application.
5	Flash programmer: New operation to check pull-up property of each pin.
FIXES / IMPROVEMENTS	
1	Fixed false positives when checking if the BLE gross timer interrupt is pending which may lead to watchdog reset or unexpected active periods.
2	Fixed truncation error in RCX LP clock cycle computation.
3	The application specific “max_txoctets” and “max_txtime” settings of user_config.h are automatically adjusted to not exceed the BLE stack’s maximum supported values which are derived from the CFG_MAX_TX_PACKET_LENGTH setting of da1458x_config_advanced.h.
4	Fixed compilation errors when CFG_PRODUCTION_DEBUG_OUTPUT is defined.
5	system_library.lib is built as an EABI ELF library for GNU ld compatibility.
6	DMA driver: Cleaned up DMA Channel request trigger types.
7	PDM driver: Fixed wrong SRCIN, SRCOUT interrupt handler function names.
8	Production test firmware: - Fixed the unmodulated TX/RX test commands to use the correct channel number. - Fixed bitwise instead of logical OR in OTP read/write commands. - Make sure to send response to host before activating deep sleep. - Fixed UART pin initialization when waking up after extended sleep. - The automatic XTAL16M calibration command supports using the UART RX pin as the square pulse input pin.
9	Custom service mechanism: - Replaced wrong instances of TASK_ID_CUSTS1 with TASK_ID_CUSTS2. - Added the missing custs2_get_att_idx() function. - Added the missing custs2_get_att_handle() function. - Removed the 'bool last' argument from the app_custs1_val_wr_validate() and app_custs2_val_wr_validate() functions. - Replaced wrong usage of TASK_CUSTS2 with TASK_ID_CUSTS2. - Added missing definition for the CUSTS2_IDX_MAX constant. - Fixed wrong file guard in custs2.c file.
10	Fixed possible memory corruption in Windows SUOTA initiator host application.
11	Proximity monitor windows host application: - Fixed DIS information when having multiple connections. - Added message that pressing a number will connect to the corresponding device. - Added Device number info in Device information screen. - Decreased console refresh rate.

	- Fixed TX Power level readings when having multiple connections.
12	Fixed wrong check for resolvable address type in BLE examples (ble_app_security, ble_app_all_in_one).
13	Example bond database module (app_bond_db.c): - When adding bond data for a peer device check if an older entry exists for that peer in the bond DB. If yes then update the old entry otherwise use an empty slot. - Improved the algorithm that selects which bond DB entry to remove when the bond DB is full and a new bond has to be added. The least recently added bond is removed. - During SPI flash erase the system scheduling loop is called in order to avoid long blocking of the BLE stack which may lead to connection losses.
14	Fixed wrong check for invalid timer in ble_app_peripheral, ble_app_all_in_one examples.
15	Fixed non retained timer handle in ble_app_all_in_one example.
16	Fixed compilation errors when DISS or CUSTOM profiles are enabled in the empty_peripheral_template example.
17	Fixed uart2_init() function calls with two arguments instead of three.
18	Avoid using the modulo operator with rand() when generating random numbers.
19	When debugging the MS Windows host applications in the Eclipse based Smart Snippets Studio, an external Windows CMD console is spawned for user interaction.
Documentation	
UM-B-079	DA14585/586 SDK 6 Software Platform Reference
UM-B-080	DA14585/586 SDK 6 Software Developer's Guide
UM-B-082	DA14585/586 SDK 5.0.4 to SDK 6 Porting Guide

#	OPEN ISSUES & LIMITATIONS
1	The AES crypto API can be safely used during startup and before any BLE connections have been established.
2	WLAN Coexistence API is not supported.
3	TRNG module buffer must be located in the first 64KB of System RAM.
4	When many queued LL data PDUs are pending for transmission, LL actions tied to a specific instant (channel map update / connection parameter update) may happen after that instant has passed leading to a disconnection.
5	When performing connection parameter update we need to keep the same bandwidth (ce_len_min) as when connection was established.

#	File Name	Description
1	DA14585_SDK_6.0.4.326.zip	RELEASE FILE
2	DA14585_SDK_SW_Release_Notes_v6.0.4.326.doc	RELEASE NOTES

3.3 VERSION 6.0.2.243

#	DESCRIPTION
OVERVIEW	
This is a full release of DA14585/586 SDK, which supports the new DA14585/586 devices. This release mainly consists of the adaptation of SDK 5 features to the new DA14585/586 platform which is built on top of a	

BLE 5.0 stack. Those features include:

- Support for DA14585/586 sleep modes
- Support for SUOTA (including support for data length extension)
- Target BLE application examples
- External host (MS Windows) application examples

Compared to SDK 6.0.1, the application layer has been further refactored to support APIs exposed by the new BLE 5.0 stack like

NEW FEATURES	
1	Support for DA14585/86 sleep modes.
2	Support for rebooting from POR pin during deep sleep mode.
3	Support for rebooting from external wake-up interrupt during deep sleep mode.
4	Support for SUOTA (including data length extension support).
5	Secondary bootloader.
6	mkimage tool (ported to gcc toolchain / Smart Snippets Studio)
7	SUOTA initiator windows host application (ported to gcc toolchain / Smart Snippets Studio)
8	Support for HCI.
9	Production test firmware.
10	Data packet length extension handling API.
11	Automatic Data Packet Length negotiation upon new connection establishment is now configurable through flag.
12	Advertising data update API.
13	Custom Profile API
14	Template examples
15	Pillar examples ported from SDK 5.0.4
16	Windows host applications for PXP reporter and monitor (ported to gcc toolchain / Smart Snippets Studio)
17	DMA driver
18	PDM driver
19	A random private static address is automatically generated if the user specifies an all-zeros one.
20	Flash programmer: new operation to check if an SPI flash is empty.
FIXES / IMPROVEMENTS	
1	Power optimizations
2	BLE packet metrics API
3	Function platform_reset_func() reboots to ROM instead of RAM.
4	Flag CFG_BLE_DUPLICATE_FILTER_FOUND is disabled by default
5	Removed obsolete flags CFG_BOOT_FROM_OTP, CFG_LOG_MEM_USAGE
6	Do not reject connection parameter update requests by default in the application layer. A callback informs the application about the parameter update request.
7	Fixed parenthesis bug in MS_TO_xxx() macros.
8	Fixed incorrect task ID initialization in prf_init_func().
9	Removed function arch_uart_init_slow().
10	Perform “release from power down” in SPI flash peripheral example before accessing the flash.
11	Flash programmer: all GPIOs are initialized as input-pullup
12	Removed unused function default_app_on_get_dev_name().
13	Fixed hard fault when CFG_MAX_RX_PACKET_LENGTH (or TX) is even number.

14	ROM fixes: 1. Wrong destination and source CIDs in Connection oriented Channels. 2. Memory leak in secure connections. 3. Failure to start pairing when encryption fails or key is missing. 4. Wrong state upon reception of LL_LENGTH_RSP with invalid fields. 5. Wrong LLM state if the connection creation fails due to bandwidth limitation. 6. Wrong HCI descriptors. 7. Support for additional Credit Based Connection Response return values. 8. Fixed SMP numeric comparison check to include values introduced with 4.2. 9. Make Directed Advertising more strict. 10. Fixed continuous connection parameter requests because iPhone 7 was rejecting them with reason “unsupported feature” 11. Fixes in bandwidth allocation management. 12. Under Privacy 1.2 setting advertising parameters and enabling address resolution can be done as different steps. 13. Fixed out of order ATT write command reception. 14. Wrong H4TL state upon completion of HCI message transmission over UART.

#	OPEN ISSUES & LIMITATIONS
1	AES crypto API is not supported.
2	WLAN Coexistence API is not supported.
3	TRNG module buffer must be located in the first 64K of System RAM.
4	Production test commands for automatic XTAL16M calibration do not support using the UART RX pin as the square pulse input pin.
5	When many queued LL data PDUs are pending for transmission, LL actions tied to a specific instant (channel map update / connection parameter update) may happen after that instant has passed resulting to a disconnection.
6	When performing connection parameter update we need to keep the same bandwidth (ce_len_min) as when connection was established.
7	When debugging the PXP monitor MS Windows host application in the eclipse based Smart Snippets Studio, the keyboard presses in the eclipse console have no effect. The root cause is that the eclipse console window supports buffered standard C style IO while the application uses MS Windows specific keyboard APIs.

3.4 VERSION 6.0.1.109

#	DESCRIPTION
OVERVIEW	
This is an engineering release of DA14585 SDK, which supports the new DA14585/586 SoCs. This release mainly consists of the adaptation of the core SDK 5 features to the new DA14585/586 platform which is built on top of an updated BLE 4.2 stack. Those features include: - Core system APIs - Application layer APIs for BLE 4.0 features - Extended sleep mode support - SoC peripheral examples - Bare bone BLE example application - Proximity reporter BLE example application Compared to SDK 5.0.4, the application layer has been refactored to be compatible to the interfaces exposed by the new BLE 4.2 stack. In this release the application layer provides support mainly for the pre-existing BLE 4.0 features.	

NEW FEATURES	
1	Support for POR from GPIO
2	SPI flash driver adds support for Deep Power-down mode of the Macronix MX25R devices
3	Support for fractional UART baud rate divider
FIXES / IMPROVEMENTS	

OPEN ISSUES & LIMITATIONS	
1	Deep sleep mode is not supported
2	All SysRAM cells are retained under extended sleep mode
3	Power consumption is not yet optimized
4	SUOTA is not supported
5	BLE packet statistics are not supported
6	AES crypto API is not supported

Appendix I: Versioning Rules

Each software version number string consists of 4 numbers. MAJOR.BRANCH.MINOR.BUILD
Versioning rules:
#MAJOR: It is increased by 1 only if the project undergoes a major modification, e.g. major ROM changes. It practically changes only when the project sources undergo major restructuring affecting most of the repository. It is initialized at 1.
#BRANCH: Should be 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 1 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 1 at every repository update and thus indicates the total number of changes since repository initialization. The BUILD number is initialized at 1.