



MediaTek LinkIt™ SDK v4 Release Notes

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Document Revision History

Revision	Date	Description
3.0.0	7 March 2016	Initial version for MediaTek LinkIt™ SDK v3.0.0.
3.1.0	31 March 2016	Add the support of 2523. Add the change logs of MediaTek LinkIt™ SDK v3.1.0.
3.2.0	2 May 2016	New Bluetooth stack support in MediaTek LinkIt™ SDK v3.2.0. New SDK API support about Bluetooth, Wi-Fi, HAL modules. IAR tool chain support for LinkIt 2523 HDK.
3.3.0	30 June 2016	Added the release notes in the section for SDK v3.3.0.
3.3.1	4 July 2016	Update the HAL module in MT2523 API reference manual. Update KEIL EULA license path.
3.3.2	28 July 2016	Enhanced the Wi-Fi throughput on MT76x7.
4.0.0	2 September 2016	Support new Bluetooth stack on MT2523 Update the new feature, bug fix and known issue of SDK 4.0.0.
4.1.0	4 November 2016	Add the document list supported by chipset. Update the new feature, bug fix and known issue of SDK 4.1.0.

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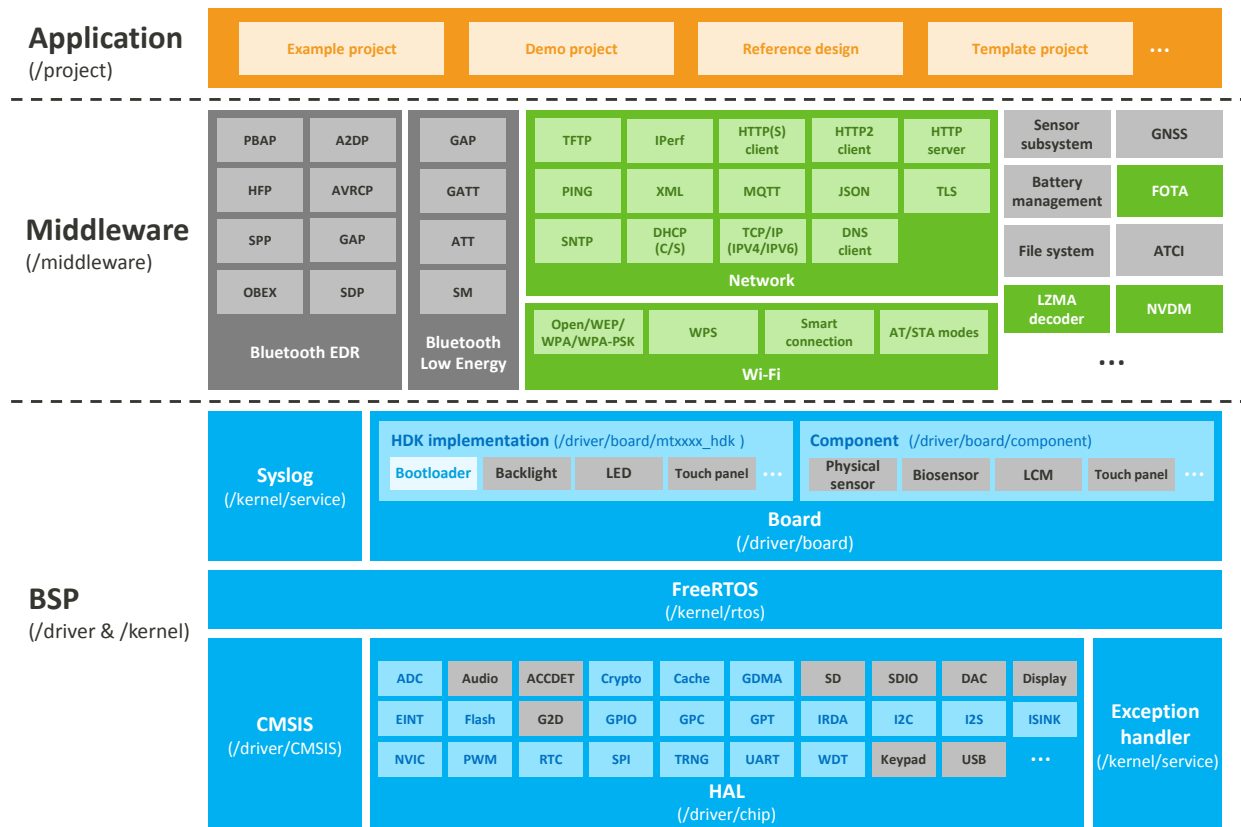
Figure 1. Architecture layout of the LinkIt SDK v4 for LinkIt 7687 HDK1
Figure 2. Architecture layout of the LinkIt SDK v4 for LinkIt 2523 HDK2

1. Introduction

MediaTek LinkIt™ software development kit (SDK) v4 provides comprehensive software solution for LinkIt 7687 HDK and LinkIt 2523 HDK. The SDK supports hardware abstraction layers (HAL), peripheral drivers, Wi-Fi module, FreeRTOS, Lightweight IP (lwIP) and other features.

1.1. Architecture layout of the LinkIt SDK v4

The three-layer architecture layout of the SDK for LinkIt 7687 HDK includes Applications, Middleware and BSP, as shown in Figure 1.

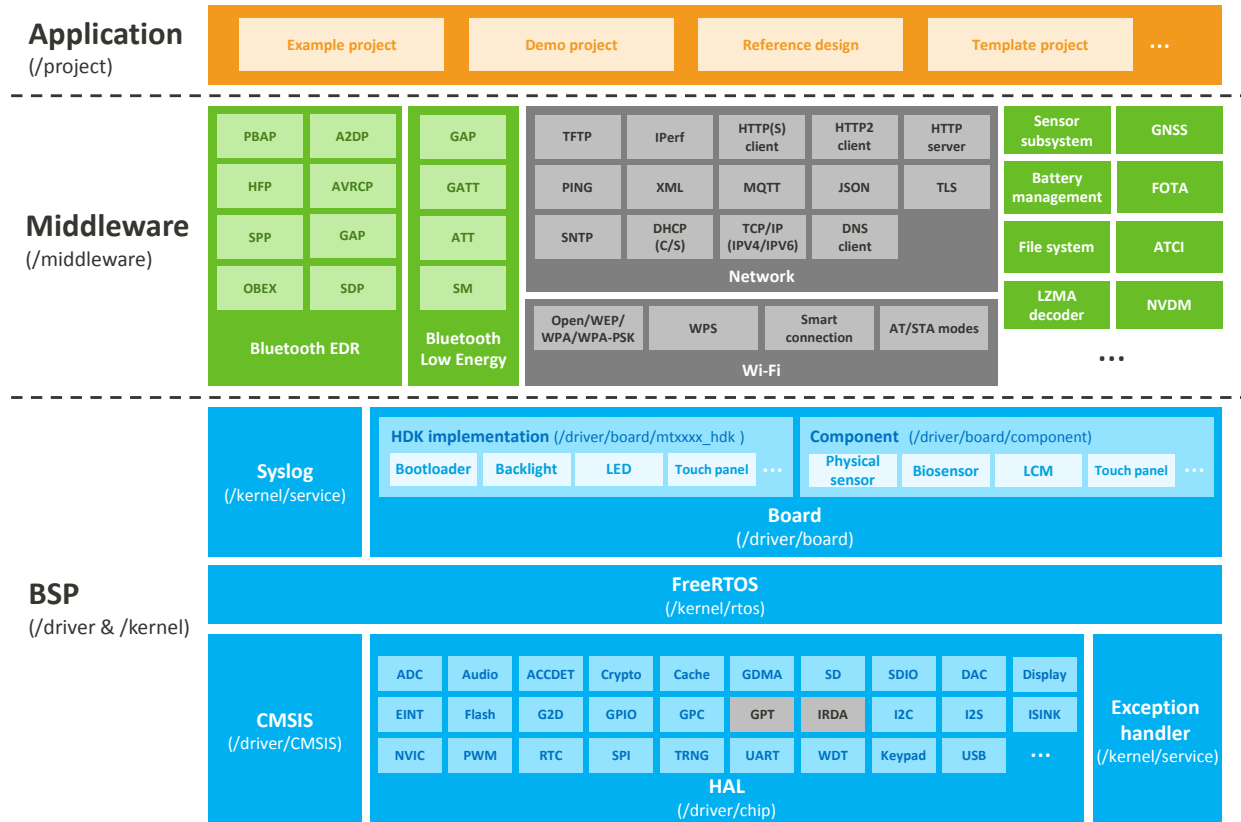


Modules shown in grey color are not supported by MT7687

Figure 1. Architecture layout of the LinkIt SDK v4 for LinkIt 7687 HDK

A functional block in grey means the HDK does not support the feature. The top layer includes the application projects running on the SDK. They are based on Middleware, OS and HAL layers. These layers provide rich features for application development, such as the Middleware provides the network connectivity, Wi-Fi and Bluetooth Low Energy Stack. The FreeRTOS provides the underlying real-time operating system.

The three-layer architecture layout of the SDK for LinkIt 2523 HDK includes Applications, Middleware and BSP, as shown in Figure 2.



Modules shown in gray color are not supported by MT2523

Figure 2. Architecture layout of the LinkIt SDK v4 for LinkIt 2523 HDK

A functional block in grey means the HDK does not support the feature. The top layer includes the application projects running on the SDK. They are based on Middleware, OS and HAL layers. These layers provide rich features for application development, such as the Middleware provides the Bluetooth Low Energy Stack, GNSS, FOTA, Sensor subsystem, file system and Battery Management. The FreeRTOS provides the underlying real-time operating system.

1.2. Knowledgebase

The released SDK includes documentations to guide developers through each module and its features, in a convenient and developer-oriented approach.

The documentations are located under SDK’s doc folder.

- MediaTek LinkIt™ Development Platform for RTOS Get Started. This guide covers the SDK features, step-by-step setup of the development environment and its usage.
- MediaTek LinkIt™ Development Platform for RTOS API reference manual. This reference manual provides detailed description of the APIs in the SDK.
- MediaTek LinkIt™ Development Platform for RTOS Open Source Components Guide. This document guides you through the open source modules and the features used in the SDK.
- MediaTek LinkIt™ HDK Memory Layout Developer's Guide. This guide provides details on the memory layout of the SDK, and how to adjust the memory layout for a custom application.
- MediaTek LinkIt™ Development Platform for RTOS Wi-Fi Developer's Guide. This document complements the Wi-Fi API reference manual.

- MediaTek LinkIt™ Development Platform for RTOS System Log Developer's Guide. This document guides you through the usage of the system logging feature provided in the SDK.
- MediaTek LinkIt™ Development Platform for RTOS Firmware Update Developer's Guide. This document guides you to use the FOTA and how to adjust the memory usage of FOTA.
- MediaTek LinkIt™ Development Platform for RTOS Internet Middleware API Reference Manual. This reference manual provides details on the usage of internet protocol APIs.
- MediaTek LinkIt™ SDK v4 GCC Build Environment Guide. This document provides details on how to create and build a project, and how to create a module, with the SDK in the GCC build environment.
- MediaTek LinkIt™ Development Platform for RTOS Bluetooth Developer's Guide. This document guides you through the supported Bluetooth library and its usage with reference examples.
- MediaTek LinkIt™ Development Platform for RTOS Power Mode Developer's Guide. This document addresses the MCU system's power mode configuration and power consumption measurement focused on power modes provided by MediaTek LinkIt development platform for RTOS.
- MediaTek LinkIt™ Development Platform for RTOS LCM Porting Guide. This guide provides detailed description on LCM porting, including the LCM driver creation and backlight control.

The related chipsets of each document under <sdk_root>/doc folder are listed in Table 1.

Table 1. Documentation relevance for different chipsets

Document file name	MT7687F	MT7697/ MT7697D	MT2523D/ MT2523G
LinkIt_for_RTOS_Bluetooth_Developers_Guide.pdf		√	√
LinkIt_for_RTOS_Firmware_Update_Developers_Guide.pdf	√	√	√
LinkIt_for_RTOS_Get_Started_Guide.pdf	√	√	√
LinkIt_for_RTOS_GNSS_Developers_Guide.pdf			√
LinkIt_for_RTOS_Internet_and_Open_Source_Software_Guide.pdf	√	√	√
LinkIt_for_RTOS_LCM_Porting_Guide.pdf			√
LinkIt_for_RTOS_Memory_Layout_Developers_Guide.pdf	√	√	√
LinkIt_for_RTOS_Power_Mode_Developers_Guide.pdf	√	√	√
LinkIt_for_RTOS_System_Log_Developers_Guide.pdf	√	√	√
LinkIt_for_RTOS_WiFi_Developers_Guide.pdf	√	√	
LinkIt_SDK_v4_GCC_Build_Environment_Guide.pdf	√	√	√
LinkIt_for_RTOS_Wi-Fi_Migration_Developers_Guide.pdf	√	√	
LinkIt_SDK_v4_Release_Notes.pdf	√	√	√

2. MediaTek LinkIt™ SDK Version 4.1.0

2.1. Main changes

- Software features and optimization
 - [MT2523x] Added a reference design for watch supporting heart rate, GNSS and Bluetooth notification. (<sdk_root>/project/mt2523_hdk/apps/watch_ref_design)
 - [MT2523x] Added the support to update the firmware of LinkIt 2523 HDK through GATT profile using Mediatek SmartDevice, an Android app on a hand-held device.
 - [MT2523x] Added the support for USB mass storage protocol (reference application at <sdk_root>/project/project/mt2523_watch/apps/watch_demo).
 - [MT2523x] Added the support for MP3 audio playback from an SD card.
 - [MT7697x] Added support to Wi-Fi and Bluetooth LE coexistence. Application can control all the links of the two protocols without any interference.
- Bug fixes
 - [MT2523x] Fixed the issue that the A2DP connection between MT2523x-based device (Client) and certain dedicated device (Server) gets disconnected when the audio transfer is paused, waits for a while, and resumes the playback again.
 - [MT2523x] Fixed the issue that LinkIt 2523 HDK cannot establish Bluetooth audio connection (A2DP) with an iPhone with iOS 10 or later versions of OS.
 - [MT2523x] Fixed the issue in multiple links where one link (eSCO link) is on call, the other idle link (ACL link) gets disconnected.
 - [MT2523x, MT7697x] Fixed the issue in multiple links when master and slave roles coexist at the same time, one of the links might be disconnected.
 - [MT76x7] Fixed the issue that the system hangs when an application listens to the Wi-Fi traffic in sniffer mode.
- Notes
 - This version introduces a new method to add a module. To handle the migration of your application to this SDK, see section 6.2, “Adding a module to the build flow of the project” in <sdk_root>/doc/LinkIt_SDK_v4_GCC_Build_Environment_Guide.pdf.

2.2. Known issues

There are known issues in this version of the SDK; developer needs to avoid the following scenarios.

- [MT2523x] Using any undefined character in a drawing function of watch reference UI will cause a system error.
- [MT2523x] Creating an eSCO HFP and a Bluetooth LE GATT profile simultaneously might add noise during a phone call when GATT is streaming a large amount of data.
- [MT2523x] In 2 BDRs and 2 BLEs multi-link transmission, the links might disconnect.

3. MediaTek LinkIt™ SDK Version 4.0.0

3.1. Main changes

- Software features and optimization
 - The SDK includes a new Bluetooth stack. The Bluetooth stack prior to v4.0.0 will be deprecated in SDK 4.0 and removed after 2016. The new stack has the following characteristics compared to the prior versions of the API.
 - The footprint is reduced significantly with the same profile support: GAP, HFP (HF), A2DP (SINK), AVRCP (CT), SPP (Server and Client), PBAP (Client), GATT and SM.
 - Current footprint: 70kB ROM and 20kB RAM.
 - Prior footprint: 330kB ROM and 130kB RAM.
 - RAM is configurable and memory usage could be optimized to fit the application requirements according to the section “Memory management” of “LinkIt for RTOS Bluetooth Developer's Guide” in the <sdk_root>/doc folder.
 - The Bluetooth API in SDK v4.0.0 is not backward compatible with the prior versions of the API.
 - [MT2523x] LCM driver and `iot_sdk_demo` demo project based on LinkIt 2523 HDK by SAC support 320 x 320 pixel resolutions.
 - Merged RTOS tasks to save resources. Refined the task priority and collected the task configurations into one header file for clarity and better maintainability.
 - [MT2523x] Supports logging from USB (USB2 COM port) in the `iot_sdk_demo` project on the LinkIt 2523 HDK by SAC.
 - [MT2523x] Supports MP3 audio file local playback.
- Bug fixes
 - [MT76x7] Fixed the connection failure issue in security establishment phase when connecting to a legacy AP (802.11a, 802.11g, or 802.11b).
- Notes
 - Please format the whole flash with the MT76x7 flash tool when flashing the SDK 4.0.0 binary to LinkIt 7687 and 7697 HDK for the first time, as described in the “Formatting the storage” section of MT76x7 Flash Tool Users Guide in the root folder of MT76x7 Flash tool.

3.2. Known issues

There is one known issue when using the SDK; developer needs to avoid the following scenario.

- [MT76x7] The peak throughput may drop from 1 to 5Mbps when connecting to a 40Mhz bandwidth (HT40) AP in repeater mode.

4. MediaTek LinkIt™ SDK Version 3.3.2

4.1. Main changes

- Bug fixes for LinkIt 76x7 HDK
 - Fixed the Wi-Fi throughput drop when the external interrupt has not been received for more than 30 seconds.
 - Fixed the Wi-Fi throughput drop in the mid-range signal strength (the RSSI is between -60 to -80dbm), improved the connection stability and ping in long-range (the RSSI is less than -80dbm).

5. MediaTek LinkIt™ SDK Version 3.3.0

5.1. Main changes

- Software features and optimization
 - [MT2523x] Support LCM with DBI and DSI interfaces in the same firmware. Provide an auto-detection mechanism to select RM69032 (DSI) or ST7789H2 (DBI) LCM.
 - [MT2523x] Support 2D graphics drawing with HAL G2D API.
 - [MT7697x] Support setting Bluetooth radio transmission power.
 - [MT7697D] Support Wi-Fi 5G AP/STA (excluding DFS).
 - [MT76x7] Support Wi-Fi repeater mode.
 - [MT76x7] Provide easy-to-use Wi-Fi initialization API to address the requirement of reading implicit configurations from NVDM.
 - [MT76x7] Support auto-detection of AP's authentication mode and encryption type.
- Tool features and optimization
 - [MT2523G] Enhance the upgrade speed of GNSS firmware on MT2523 flash tool
- Bug fixes
 - [MT76x7] Reduced the time to connect to an access point, where two Wi-Fi access points exist with the same SSID within the Wi-Fi RF visible range.

5.2. Known issues

There is one known issue when using the SDK; developer needs to avoid the scenario listed as below.

- [MT2523x] In multi-link and one of them is on call (eSCO link), the idle link (ACL link) might be disconnected.

6. MediaTek LinkIt™ SDK Version 3.2.0

6.1. Main changes

- Features and optimization
 - a. New BLE stack is available for MT7697 with small footprint and support Bluetooth 4.2.
 - b. Add the capabilities of configuring and retrieving the CPU frequency with DVFS APIs.
 - c. Support SPI slave on MT76x7 with new HAL SPI APIs.
 - d. Reduce the interrupt latency in flash read or write operation.
- IAR tool chain support, pre-integrate HAL, FreeRTOS, Bluetooth, FOTA, GNSS example projects and the IoT demonstration project with IAR IDE tool.
- Bug fixes
 - The MacAddr, IpAddr, IpGateWay, and IpNetmask attributes in access point (AP) profile is not workable and those values must be stored in station (STA) profile for both AP and STA modes.
 - The Wi-Fi driver will obtain Wi-Fi MAC address from NVRAM, but not eFuse of the MT76x7.
 - Every event passed to `wifi_connection_register_event_notifier()` can only register one corresponding function handler.

7. MediaTek LinkIt™ SDK Version 3.1.0

7.1. Main changes

- SDK supports LinkIt 2523 HDK, including peripheral drivers, middleware and demonstration applications.

7.2. Known issues

There are some known issues when using the SDK; developer needs to avoid these scenarios listed as below.

- The MacAddr, IpAddr, IpGateWay, and IpNetmask attributes in access point (AP) profile is not workable and those values must be stored in station (STA) profile for both AP and STA modes.
- The Wi-Fi driver will obtain Wi-Fi MAC address from NVRAM, but not eFuse of the MT76x7.
- Every event passed to `wifi_connection_register_event_notifier()` can only register one corresponding function handler.

8. MediaTek LinkIt™ SDK Version 3.0.0

8.1. Known issues

There are some known issues when using the SDK; developer needs to avoid these scenarios listed as below.

- The MacAddr, IpAddr, IpGateway and IpNetmask attributes in access point (AP) profile are not workable and those values must be stored in station (STA) profile for both AP and STA modes.
- The Wi-Fi driver will obtain the Wi-Fi MAC address from NVRAM, but not from eFuse for MT76x7.
- Every event passed to `wifi_connection_register_event_notifier` can only register one corresponding function handler.