MediaTek LinkIt™ NB-IoT SDK v1 Release Notes

Version: 1.9.0

Release date: 20 February 2019

Document Revision History

Revision	Date	Description
1.0.0	17 January 2018	Initial release for MediaTek NB-IOT LinkIt SDK v1.0.0.
1.0.1	2 February 2018	Added the release notes for SDK v1.0.1
1.0.2	1 March 2018	Added the release notes for SDK v1.0.2
1.1.0	9 March 2018	Added the release notes for SDK v1.1.0
1.1.1	26 March 2018	Added the release notes for SDK v1.1.1
1.1.2	18 April 2018	Added the release notes for SDK v1.1.2
1.1.3	9 May 2018	Added the release notes for SDK v1.1.3
1.2.0	31 May 2018	Added the release notes for SDK v1.2.0
1.3.0	27 June 2018	Added the release notes for SDK v1.3.0
1.4.0	27 July 2018	Added the release notes for SDK v1.4.0
1.5.0	28 August 2018	Added the release notes for SDK v1.5.0
1.6.0	29 September 2018	Added the release notes for SDK v1.6.0
1.7.0	9 November 2018	Added the release notes for SDK v1.7.0
1.7.1	21 November 2018	Added the release notes for SDK v1.7.1
1.9.0	20 February 2019	Added the release notes for SDK v1.9.0

Table of contents

Lists of tables and figures

1.   Introduction

MediaTek LinkIt™ narrowband Internet of Things (NB-IoT) software development kit (SDK) v1 provides comprehensive software solution for LinkIt 2625evaluation board. The SDK supports hardware abstraction layers (HAL), peripheral drivers, FreeRTOS, Telephony, RIL, NB-IoT protocol, FreeRTOS and other features.

1.1.   Architecture layout of the LinkIt NB-IoT SDK v1

The three-layer architecture layout of the SDK for LinkIt 2625 includes Applications, Middleware and BSP, as shown in Figure 1.
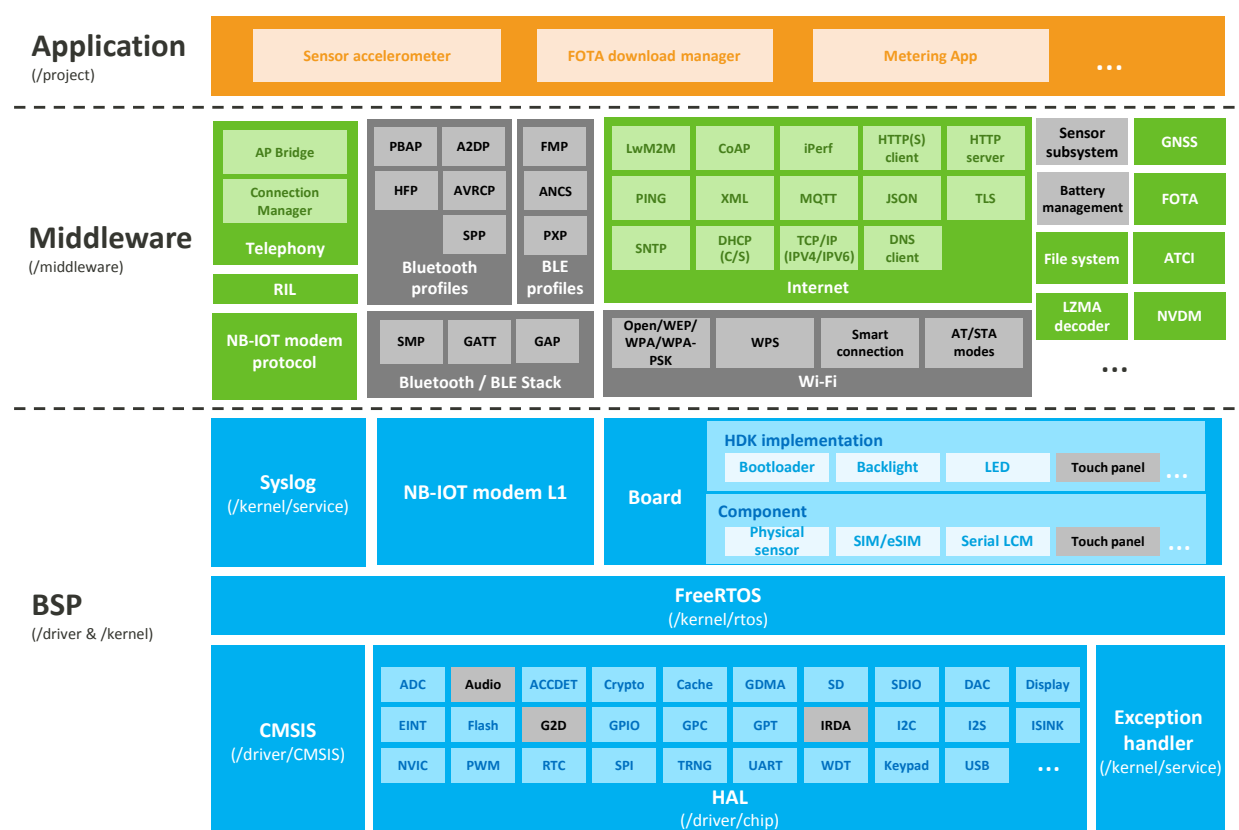
Figure 1. Architecture layout of the LinkIt SDK v1 for MT2625 evaluation board

A functional block in grey indicates the SDK does not support the feature. The top layer includes the application projects running on the SDK. They are based on Middleware, FreeRTOS and hardware abstraction layer (HAL) layers. These layers provide rich features for application development, such as the Middleware provides the AP Bridge, RIL and NB-IoT Protocol. The FreeRTOS provides the underlying real-time operating system.

1.2.   Knowledgebase

MediaTek LinkIt NB-IoT is a subsystem of LinkIt development platform for RTOS and shares common features with LinkIt SDK for RTOS. LinkIt NB-IoT SDK provides documentation to guide developers through each module and its features.

The content is located under SDK's doc folder.

- MediaTek LinkIt™ Development Platform for RTOS Get Started Guide. 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™ 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 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™ 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 Power Mode Developer's Guide. This document addresses the MCU system's power mode configuration and power consumption measurements focused on power modes provided by MediaTek LinkIt development platform for RTOS.

- MediaTek LinkIt™ RTOS Power Mode Developer's Guide. This document provides the power mode descriptions and how to enable low power feature.

- MediaTek LinkIt™ RIL Developers Guide. This document guides you through the RIL architecture, detailed design of the RIL module APIs and examples to use the RIL interface.

- MediaTek LinkIt™ Telephony Connection Manager Developer's Guide. This document guides you through the architecture, workflow and interfaces of telephony connection manager.

- MediaTek LinkIt™ RTOS APB Proxy Developers Guide. This guide provides AP bridge architecture, how to add custom AT command and transfer user data between MT2625 and external environment.

2. MediaTek LinkIt™ NB-IoT SDK Version 1.9.0

2.1. Main changes

- Software features and optimization
  - o [MT2625] Enhanced hal_aes API for CKDF key.
  - o [MT2625] Support port service in GNSS.
  - o [MT2625] Support ping domain name.
  - o [MT2625] Always enable watchdog when target is alive.
  - o [MT2625] Refine flash sample clock delay timing for each flash type.
  - o [MT2625] Add FatFS on NOR flash feature.
  - o [MT2625] AP bridge data mode enhancement.
  - o [MT2625] Optimized the attach/data transmission success ratio during the capacity testing.
  - o [MT2625] PA BIAS parameter update for QM55001 ES2 reference design.
  - o [MT2625] Optimized the background PLMN search latency.
- Bug fixes
  - o [MT2625] Use right interface to get/set UTC time.
  - o [MT2625] Fix the issue that probability can't send and receive data when out of PSM mode.
  - o [MT2625] Fixed the issue that UE could not go back to the home PLMN when UE camped on VPLMN.
  - o [MT2625] Fixed the issue that UE return invalid PSM status during periodic TAU.
  - o [MT2625] Fixed the issue that UE crashed(ERRC_RBC_CER, line: 302) when user tries to send data after AT+COPS=1,2,23003.
  - o [MT2625] Fixed the issue that UE reports the invalid SNR when AT *MENGINFO is received just after leaving connected state.
  - o [MT2625] Fixed the issue that RPM T1 timer is stopped in case software reset is blocked by RPM N1.
  - o [MT2625] Fixed the issue that UE should not send NACK for MSG4 which will trigger the network sends RRC connection reject to UE.
  - o [MT2625] Fixed the issue that UE can't initiate IPv6 communication with IPv4v6 PDN type registered.
  - o [MT2625] Fixed the issue that UE can't initiate attach request after frequent CFUN=0/CFUN=1.
  - o [MT2625] Fixed the issue that UE crashed(ABPD_FNC.c line8749) when received AT*MCGDEFCONT before UE returns *MATREADY.
  - o [MT2625] Fixed the issue that the second UART port is abnormal when restarting NBIOT after AT+IPR setting.
  - o [MT2625] Fixed the issue that no response for AT+COPS when sending the AT command in Czech.
  - o [MT2625] Fixed the issue that UE failed the GCF RRM case 6.1.16 caused by the failure of cell search for the target cell before T310 expired.
  - o [MT2625] Fixed the issue that UE does not support dual priority setting from upper layers and failed to pass GCF case 22.6.5.

o [MT2625] Fixed the issue that causes RRM 7.3.66 Cases Fail.

o [MT2625] Fixed the issue that UE failed the GCF PCT case 22.4.20 caused by the failure of cell search for the target cell before T310 expired(The SS setup the target cell too late sometimes).

o [MT2625] Fixed the 22.3.1.4 case failure at SP v1.8.0.0 .

o [MT2625] Fixed the issue that UE returns ERROR when user uses AT*MNVMRST to restore NVRAM.

o [MT2625] Fixed the issue that the response for AT*CMUX=? is not correct.

o [MT2625] Fixed the issue that AP task will be suspended a few seconds after booting from deep/Deeper sleep when the AP task create auto-load timer.

o [MT2625] Fixed the issue that UE asserted (file: L3ENCEM, line: 398.) caused by a low ratio corner case.

o [MT2625] Fixed the issue that UE crashed at (file: N1SQMIB, line: 1227) caused by a corner case bug.

o [MT2625] Fixed the issue that [CMCC Certification][USIM]Case 31.124 (IoT) 27.22.4.7.5/1 fail caused by the detach flow is not finished before sim ready of the refresh procedure.

o [MT2625] Fixed the issue that UE attaches to the network very slow when the RPLMN in the new sim card is invalid.

o [MT2625] Fixed the issue that MD will return ERROR for AT+CGATT=0 when registration is ongoing.

o [MT2625] Fixed the issue that causes low possibility assertion at el2ulrlc.c line 3260.

o [MT2625] Fixed the issue that UE can't start the bands search flow that are not required by the operator.

3. MediaTek LinkIt™ NB-IoT SDK Version 1.8.0

3.1. Main changes

- Software features and optimization

  o [MT2625] Added support for MT6381 biosensor measuring.

  o [MT2625] Restore LWM2M contexts after FOTA.

  o [MT2625] LwM2M support for TMO certification.

  o [MT2625] LwM2M + FOTA update status report.

  o [MT2625]:Added a new feature to report IP data volume via AT*MGCOUNT.

  o [MT2625]:Added more equivalent PLMN ids mapping for TMO according to the information got from TMO to speed up the cell search flow.

  o [MT2625]:Band85 default opened for TMO's certification.

  o [MT2625]:Changed default PDN type to IPv4v6 for TMO according to its new requirement.

  o [MT2625]:Optimization of band search flow to speed up band search cell search.

  o [MT2625]:Provided the SVN NVRAM item and source code to customer, so that user can change the NVRAM item for SVN and change the default SVN value in source code.

- Bug fixes

  o [MT2625] Fix the memory leakage issue in telephone connection manager module.

  o [MT2625] Fix UART FIFO stuck when data comes between UART init and DMA enable.

  o [MT2625] Fix the TCP data receive error issue in BIP test.

  o [MT2625] Fixed the issue that incorrect parsing on AT command "+CGAPNRC" and "*MCGDEFCONT".

  o [MT2625] Fixed the issue that PMU 32K clock lost when VBAT>3.5V.

  o [MT2625] Fixed flash cell unstable issue that caused by power drop suddenly during erase operation on flash.

  o [MT2625] Fixed the issue that user queries the HPLMN causes Modem crash when user plugs out SIM card during Modem initialize.

  o [MT2625] Fixed the issue that USID reading via AT command failed on the MT2625 + hunters FEM platform.

  o [MT2625] Fixed the issue that the default RF custom file setting not match with MT2625 reference design for single PA solution.

  o [MT2625] Fixed the issue that ATCI handling failed when user sets ATS3/ATS4 to same character.

  o [MT2625] Fixed the issue that initial attach failed due to the uplink parameter for the random access is wrongly changed.

  o [MT2625] Fixed the issue that UE asserted(file:N1_RF_BSIBPI_EVENTS line:317)during idle mode random access.

  o [MT2625] Fixed the issue that the UE asserted(file:kisys,line:961) when used the RTC to wake up system frequently caused by the interruption of the waking up flow.

- o [MT2625] Fixed the issue that the PSM status is wrong after AT+CPSMS when UE is power on first time after format all.

- o [MT2625] Fixed the issue that Modem crash(file:USIMDEC, line:5843) when powered on with Brazil NB-IoT SIM card.

- o [MT2625] Fixed the issue that UE asserted(file: N1TIMEMAIN, line: 1065) caused by a low layer internal processing issue during the capacity testing.

- o [MT2625] Fixed a low probability CE level selection algorithm issue which causes the initial attach latency is bigger than expected.

- o [MT2625] Fixed the issue that the default RF custom file setting does not match to MT2625 reference design for QM55001 ES2 solution.

- o [MT2625] Fixed the issue that the UE may fail to sleep as long as configured when sleep duration is configured more than 37 minutes.

- o [MT2625] Fixed the issue that UE can't enter PSM status after Service Request Failure.

4. MediaTek LinkIt™ NB-IoT SDK Version 1.7.1

4.1. Main changes

- Bug fixes
    - [MT2625] Fixed the issue that UE fails to get DNS server address from network
    - [MT2625] Fixed the issue that manual PLMN selection mode fails to be set by user
    - [MT2625] Fixed the issue for case 5.1.10 defined in 3GPP 31.121, due to GUTI is used instead of IMSI for network attach when EPS status is "EU2_NOT_UPDATED"
    - [MT2625] Fixed the issue for case 22.5.6 defined in 3GPP 36.521, due to ESM PDN Connectivity Request is not buffered if Attach Request is not sent successfully
    - [MT2625] Fixed the issue for case 22.5.5 defined in 3GPP 36.521, due to HPPLMN searching is not cancelled correctly
    - [MT2625] Fixed the issue for case 27.22.4.15.1 and 27.22.4.7.5.2 defined in 3GPP 31.124, due to Radio Access Technology is not correctly set before SIM Refresh
    - [MT2625] Fixed the issue for PTCRB/RRM 4.2.18, due to measurement value is not correct occasionally
    - [MT2625] Fixed the issue for case 27.22.7.17.1 defined in 3GPP 31.124, due to network rejection event is mistakenly cleared and not sent to SIM

5. MediaTek LinkIt™ NB-IoT SDK Version 1.7.0

5.1. Main changes

- Software features and optimization
  - [MT2625] Add RIL interfaces to operate new AT commands, such "+CCHO", "+CCHC", "+CGLA".
  - [MT2625] Adjust NVDM space algorithm to support more NV items for full band.
  - [MT2625] AP Bridge data mode improvement.
  - [MT2625] Support CoAP FOTA download.
  - [MT2625] Added three operators (Softbank, TMO-US, and DTAG) new requirements in SDK V1.7.0.
  - [MT2625] Offered an API (rtc_trigger_shut_down_callback) to store the PLMN candidate list to NVRAM before power off (battery plugged out).
  - [MT2625] Optimized the cell selection functionality at poor signal quality.
  - [MT2625] Added new AT command AT*MEDRXCFG to configure PTW value.
  - [MT2625] Presetting frequency list for cell search customization.
  - [MT2625] Added a new functionality to Lock SIM if the IMSI is barred in this module.
  - [MT2625] Added new AT command "AT*MOOSAIND" to report OOSA status.
- Bug fixes
  - [MT2625] Fix the hang risk of TRNG timeout
  - [MT2625] Error handling for network error when device connecting with LwM2M/CT IOT /CMCC OneNET platform.
  - [MT2625] Fixed the issue that sometimes crash happened after continuous bootstrap failure.
  - [MT2625] Fixed the issue that sometimes crash happened when connecting to IOT platform with DTLS (PSK length is odd).
  - [MT2625] Fixed the issue that sometimes crash happened in cisnet_read().
  - [MT2625] Fix flash issue that can't wakeup form light sleep on new flash vendor.
  - [MT2625] Fix the issue that RIL can recover forbidden flag when receiving and detecting certain pattern of final response codes by itself, and allow data reporting in current channel.
  - [MT2625] Fix the memory leakage issue when testing CT IOT platform.
  - [MT2625] Fixed the issue that system occasionally hangs caused by RTC_EINT.
  - [MT2625] Fixed the issue that UE has no response for a long time during ping test caused by a scheduling issue.
  - [MT2625] Fixed the issue that GCF PCT case 22.4.13 failed when User plane optimization is closed on Starpoint.
  - [MT2625]: Fixed the issue that lots of segmented data cannot be received correctly during TCP data service test, which causes the AT+MIPSEND="..." returns error.
  - [MT2625] Fixed the issue that the local time does not synchronize with the NW time.
  - [MT2625] Fixed the issue that UE crashed at ERRC_RBC_CER line163 when detach is triggered during RRC connection setting up is on-going for data sending.

- o [MT2625] Fixed the issue that serving cell might be lost if AT*MENGINFO is sent frequently in eDRX mode.

- o [MT2625] Fixed the issue that when Detach Accept is lost, it takes long time for UE to move to idle.

- o [MT2625] Fixed the issue that the UE is unable to finish the cell selection flow.

- o [MT2625] Fixed the issue that AP may get IP address more than one times caused by unexpected detach information reported by modem.

- o [MT2625] Fixed the issue that when performs lock frequency or lock cell and UE can't camp on any cell, UE can't enter OOSA and does not report CEREG: 0.

- o [MT2625] Fixed the issue that AT+CSQ sometimes will not report the valid RSSI level when exiting PSM.

- o [MT2625]: Fixed the issue that unexpected waking up occurred when eDRX cycle is configured more than 3 hours.

- o [MT2625] Fixed the system hang issue when using multi-senors simultaneously.

- o [MT2625] Fixed the issue that the RSSI delta bigger than 3db checking threshold caused by the Pathloss calibration and RSSI measurement accuracy issue.

6. MediaTek LinkIt™ NB-IoT SDK Version 1.6.0

6.1. Main changes

- Software features and optimization

  o [MT2625] Add interfaces to send or receive command "*MCELLINFO" to query serving cell or neighbor cell information.

  o [MT2625] Optimized the reception for the data block which is segmented into lots of small frames over UART.

  o [MT2625] Temperature Driver upgrades to support utilizing FT Temperature Cal result.

  o [MT2625] Add a compile option to save the result of auto baud rate.

  o [MT2625] Added new AT command to query the device's IP address information.

  o [MT2625] Optimized the CE level selection algorithm.

  o [MT2625] Optimize the cell search flow to try to find the strongest cell for the frequency list search

- Bug fixes

  o [MT2625] Enlarge timeout value for USB enumeration.

  o [MT2625] Fixed the issue that UART wakeup timer occupied all GPT timers.

  o [MT2625] Fixed the PING timer statistics issue when the ping reply is not right.

  o [MT2625] Fixed EUPSM test command.

  o [MT2625] Fixed the issue that removing unnecessary assertion when failed to get result code of AT response as "+CME(CMS) ERROR: XXX".

  o [MT2625] Fixed the issue that RIL might receive verbose error code if some commands were sent before channel format configuration done.

  o [MT2625] Fixed the issue that the deep sleep floor current is around 200uA when eDRX cycle is configured to 163.84s as UE wrongly enters light sleep.

  o [MT2625] Fixed the issue that modem crashed (ESMMM.C) when attach reject message is received without integrity protected.

  o [MT2625] Fixed the issue that the system seldom hang when waking up from deep sleep, as RTC time wrapping is not considered.

  o [MT2625] Fixed the issue that BIP test failed due to open channel command failed.

  o [MT2625] Fixed the issue that result for "AT+COPS=1,2," returns too slow that UE does not ignore the forbidden TAI list in manual PLMN select.

  o [MT2625] Fixed the issue that modem crashed (emm_errc.c line 2679) when EMM is trying to send TAU request to network.

  o [MT2625] Fixed the issue that when downlink message integrity check fails, UE could not handle any other downlink message except reboot the UE.

  o [MT2625] Fixed the issue that when the UE lost the service and SIM card is removed, there is no response of AT+CFUN=0.

  o [MT2625] Fixed the issue that sometimes genie can't capture the core dump after system asserted.

- o [MT2625] Fixed the issue that GCF PCT case 22.3.1.2 failed (need PDSCH when time alignment timer time out) with Starpoint's new software version of V1.7.0.2.

- o [MT2625] Fixed the issue that GCF PCT case 22.5.5 failed (AT+COPS is sent before SIM card is ready) with Starpoint's new software version of V1.7.0.2.

- o [MT2625] Fixed the issue that UE asserted when received channel open request.

- o [MT2625] Fixed the issue of attach failure at some specific field test unit.

- o [MT2625] Fixed the issue that UE failed to receive the second data packet from network for BIP test.

- o [MT2625] Fixed the issue that when NW RLC sent invalid Status PDU to UE, it took long time for UE to return to idle.

- o [MT2625] Fixed the issue that PDP activated failed caused by the unexpected data received after PDP deactivated.

- o [MT2625] Fixed the issue that UE had no response for the detach request (AT+COPS=2).

- o [MT2625] Fixed the issue that UE had no response for the detach request (AT+CGATT=0).

7. MediaTek LinkIt™ NB-IoT SDK Version 1.5.0

7.1. Main changes

- Software features and optimization

  o [MT2625] IPV6 protocol implementation enhancement.

  o [MT2625] EDNS command implementation refactor.

  o [MT2625] IPV6 data retention enhancement.

  o [MT2625] SDIO improve SDIO read write performance.

  o [MT2625] Support GD25LE32D, GD25LE128D, MX25U6433F, GD25LE64C serial flash.

  o [MT2625] Modify the falling slope to improve backward current from VPA.

  o [MT2625] OneNET r2.2.0 upgrade & DM support.

  o [MT2625] Supported USB hot plug in when used as external AT CMD port.

  o [MT2625] Supported new feature that customer can change the OOSA default timer in C code.

  o [MT2625] Optimized the PLMN search strategy to reduce the PLMN search time when user/APP trigger auto PLMN selecting flow to Modem.

  o [MT2625] Supported new AT command AT+CSODCP to send data which is requirement by GCF PCT case 22.4.8 / 22.4.9.

  o [MT2625] Supported neighbor cell id information query via AT*MCELLINFO. The maximum number of the ncell information is 3 ncells.

  o [MT2625]: NV Editor supported to modify the RF custom file items.

- Bug fixes

  o [MT2625] Refine NVDM garbage collection mechanism to reclaim flash space as more as possible.

  o [MT2625] Add week value check when setting RTC time.

  o [MT2625] Delay to start auto_register for the failure of the IPV6 test case.

  o [MT2625] Fixed the issue that sleep management sleep_management_backup_restore_module_t enumeration design change.

  o [MT2625] Fixed the issue that certain modules may crashed (KIOSTIM, line: 2436 or n1_hw_md_sleep.c line: 1554) when power on which is caused by unstable 32K clock.

  o [MT2625] Fixed the issue that UE crashed when AT*MENGINFO is sent during cell reselection and UE failed at the cell reselection.

  o [MT2625] Fixed the issue that the APN returned from AT+CGDCONT is network negotiated than user defined when PDN is already disconnected.

  o [MT2625] Fixed the build error issue in Window OS MinGW build environment, which will pop up a VC debug library error dialogue.

  o [MT2625] Fixed the issue that UE crashed (ABPD_FNC, line: 10956)when detach initiated by NW is concurrent with attach.

  o [MT2625] Fixed the issue that user/AP can't read EFdir from USIM via AT+CRSM.

o [MT2625] Fixed the issue that the modem crashed (psc_main.c: line 788) when received STK command when modem is in preparing to enter deep sleep state.

o [MT2625] Fixed the issue that user can't enable the software SIM.

o [MT2625] Fixed the issue that with the latest Starpoint GCF platform(v1.7.0.1), RRM case 7.3.60 will be failed, the root cause is that the test equipment does not always cell off before sending AT+CFUN=0 to finished one test round.

o [MT2625] Fixed the issue that UE don't deactivate test loop mode after CFUN=0 which makes PCT auto-regression failed.

o [MT2625] Fixed the issue that modem crashed (ASOC_FNC line: 814) when OPEN CHANNEL without user name and password during the BIP test.

o [MT2625] Fixed the issue that modem crashed (ERRC_CSR line: 1433) when power on PLMN search is conflict with lock frequency search.

o [MT2625] Fixed PCT 22.2.4 case seldom failure issue on Starpoint v1.7.0.1 by optimizing the measurement schedule time.

o [MT2625] Fixed the issue that MT2625 power on assert if GKI log is on, in MT2503+MT2625 system, caused by duplicated SABM frame used to setup CMUX channel.

o [MT2625] Fixed the issue that ATCI task can't get the connection status unless AT+CSCON=1.

o [MT2625] Fixed the issue that UE crashed during NSFT test when configured channel exceeds 31.

o [MT2625] Fixed the issue that GCF RF test case '6.3.4F.1 General ON/OFF time mask for category NB1' failed caused by the unsuitable configuration of single PA solution.

o [MT2625] Fixed the issue that GCF PCT case 22.5.7b failed on Starpoint V1.7.0.1. The root cause is that if TAU is rejected by the network with cause congestion and after UE camp lost / recover, UE should send TAU but not attach request to network.

o [MT2625] Fixed the issue that UE crashed when AT*MENGINFO is sent during RRC connection message's ACK sending to the network.

8.   MediaTek LinkIt™ NB-IoT SDK Version 1.4.0

8.1.   Main changes

- Software features and optimization
  - [MT2625] Reserve the RTC calendar time when system boots from forced shut down mode.
  - [MT2625] Optimization -- Reduced the total usage of the retention memory in modem part.
  - [MT2625] Added the presetting preferred band presetting functionality for new found CMCC/CT/CMCC HPLMNs at the FT testing.
  - [MT2625] Added virtual SIM functionality to support the testing on the test equipment with an eSIM card.
  - [MT2625] Add Thailand's operator's preferred band list according to its PLMNs.
  - [MT2625] Added a new feature that using FEM USE ID to decide DRDI custom & calibration Data.
  - [MT2625] Initial attach latency optimization via protocol control flow fine tune.
- Bug fixes
  - [MT2625] Fixed the issue that validates parameter "current_length" input by user before handling AT commands.
  - [MT2625] Fixed the issue that dump when registering the network frequently.
  - [MT2625] Fixed the issue that AUXADC should not calibrate on internal channel.
  - [MT2625] Fixed the issue that interrupts should be masked when the API is called.
  - [MT2625] Fixed the issue that LED's AT command cause UE to be jammed.
  - [MT2625] Fixed the issue that sending multiple times to establish a default PDN link request to the modem.
  - [MT2625] Fixed the issue that memory leak when check if incoming URL is valid.
  - [MT2625] Fixed the issue that flash tool can download program to target when system boots from forced shut down mode.
  - [MT2625] Fixed the issue that UE can't establish PDN connection when AT+CFUN=1 is received after AT+CFUN=7.
  - [MT2625] Fixed the issue that UE asserted in a corner case (Waiting time for DSP boot is not long enough).
  - [MT2625] Fixed the issue that the UE crashed when a new procedure is triggered when internal waking up flow is ongoing.
  - [MT2625] Adjusted the RF custom file location and slightly updated the custom file.
  - [MT2625] Fixed the issue that UART AT command will be hanged if it is inputted before UE reporting URC（+CPIN: READY +CPSMSTATUS: "EXIT PSM"） when exiting PSM.
  - [MT2625] Fixed the issue that UE don't return correct default value when UE receive AT+CEDRXS=3
  - [MT2625] Fixed the issue that the UE may fail GCF case 6.3.4F (On OFF time mask) when testing with CMW500.
  - [MT2625] Fixed a corner case assert issue (This bug for the scenario that PDSCH reception is stopped immediately when it is started).

o [MT2625] Fixed the issue that caused RRM case 7.3.60 failed at start point.

o [MT2625] Fixed the issue that the AT command AT+IFC does not work.

o [MT2625] Fixed the issue that UE return CEREG:0,5 as response for AT+CEREG after plug in/out antenna.

o [MT2625] Fixed the issue that CESQ return 0 by manually waking up in from eDRX deep sleep.

o [MT2625] Fixed the issue that the modem might crash while early wake and normal wake conflicts at same time.

o [MT2625] Fixed the issue that modem asserted when DL data comes before the corresponding channel has not been open yet.

o [MT2625] Fixed the issue that data service occasionally failed after re-attach.

o [MT2625] Fixed the issue that UE does not report to support Extended T3412 but network configured it, then UE treated as network issue and TAU always failed.

o [MT2625] Fixed the issue that UART will lock sleep in some special situation.

o [MT2625] Fixed the issue that the system will dump when AT+MIPLOBSERVERSP is replied by mistake after +MIPLDISCOVER received from platform.

o [MT2625] Fixed the issue that UE return ERROR as response for the AT command followed by AT+CSCS="GSM".

9. MediaTek LinkIt™ NB-IoT SDK Version 1.3.0

9.1. Main changes

- Software features and optimization

  o [MT2625] Add parameters to the API of hal_rtc_enter_forced_shut_down.

  o [MT2625] Enable formatted input/output of floating-point number as the default.

  o [MT2625] Iperf refactor.

  o [MT2625] Modify DVS configuration for reduce VPA peak current.

  o [MT2625] Add sleep lock during the SDIO HW working.

  o [MT2625] Provided an API to query T3412 for customer.

  o [MT2625] Supported to enable AT+IPR taking effect immediately, pre-requisite for this feature is to enable MTK_IPR_WIE_WITHOUT_RESTART in md_flags.mk.

  o [MT2625] Deleted the limitation of AT+CPOL? That only returns the first 8 UPLMNs but to return all the valid UPLMNs.

  o [MT2625] Supported the OOSA searching timer Customization.

  o [MT2625] Supported to report the time zone changed indicator after AT+CTZR=1 or 2.

  o [MT2625] Supported to return ERROR if there is some abnormal string in the AT command.

  o [MT2625] Provided the SW patch for working with SS (MOS Slow) corner chip (may fail connection without this patch).

  o [MT2625] Added the crystal s-curve parameter configuration to RF custom file.

- Bug fixes

  o [MT2625] Fixed the issue that GPT SW Timer Callback sometimes can't be called when the function reentry of GPT SW timer API happens.

  o [MT2625] Fixed the issue that HTTP client at command handling in APB proxy task is NOT synchronized with the HTTP loop task.

  o [MT2625] Fixed the issue that HSL log stop output in some corner case.

  o [MT2625] Fixed the issue that the system may assert if the power key is pressed suddenly during the process of going to sleep.

  o [MT2625] Fixed LWIP Sockets API task sync issue.

  o [MT2625] Add USB enumeration check in write polling APIs.

  o [MT2625] Fixed the issue that UE crashed during the FOTA testing, the root cause is that UE calculated the next BCCH modification period boundary and waiting for the event of it but new configuration for the boundary is configured and UE asserted caused by the overflow of the internal buffer, solution for it is to cancel the original one and use the new configured one to trigger the BCCH modification period.

  o [MT2625] Fixed the issue that UE asserted during Fota upgrading as too many DL data received in a short time and the memory is used up. The solution is to reduce memory cost and make sure there is enough memory to process this o scenario.

o [MT2625] UE received the msg4 correctly and report to high layer. Then UE continued to monitor PDCCH after ACK response, and network retransmit msg4 (Some network has this issue). UE should not assert. It is a wrong assert. Remove it.

o [MT2625] Fixed the issue of the early wakeup processing and caused the task can't process any message and UE crashed with message queue overflowed.

o [MT2625] Fixed the issue in the API connLayerStopSleepLockTimer() which is used to release PSM sleep lock with a length of 10s.The root cause of it is that a internal timer is not stopped which caused the PSM is still be locked for 10s. Please make sure to call this API in the process of last AT command from UART port before entering PSM.

o [MT2625] Optimize inter-freq measurement flow to improve GCF PCT case 22.2.9's pass ratio with Starpoint software version of V 1.6.0.1.

o [MT2625] Fixed the bug that the return of CMUX parameter for AT&V is not same as the AT+CMUX?

o [MT2625] Fixed the bug that system sometimes asserted when USB frequently plugged-in/plugged-out, do not repeat the TX when last TX is not finished when USB is plugged in.

o [MT2625] Fixed the bug that UE asserted when AT+CGATT=0 is received during cell search procedure.

o [MT2625] Fixed the issue that temp GPRS forbidden PLMN list lost when entering deep sleep.

o [MT2625] Fixed the bug of ATS3 that if the termination character of AT command is set to the value other than 0x0D, it couldn't be taken effect.

o [MT2625] Fixed the bug that system can't auto re-boot(after enable this feature) and can't output core-dump when the assertion is occurred too early in system initial phase.

o [MT2625] Fixed the issue that transmitting current for the NPRACH is 70mA higher than transmitting NPUSCH.

o [MT2625] Fixed the issue that modem does not work when receiving AT+CPOS=2 in PSM state.

o [MT2625] Fixed the issue that device will sleep quickly after wake up from deep sleep, so that it cannot send update registration request to server as expected.

o [MT2625] Fixed the issue that crash happened when a large write request package received from CMCC OneNET platform.

10. MediaTek LinkIt™ NB-IoT SDK Version 1.2.0

10.1. Main changes

- Software features and optimization
  - o [MT2625] Added new AT command AT+CRLA--Restricted UICC logical channel access.
  - o [MT2625] Provided the NV item to customer to change the OOSA search timer.
  - o [MT2625] Optimized the cell search flow that speed up and try to find the strongest cell for the frequency list search.
  - o [MT2625] Upgrading the implementation of 3GPP CR R5-181304, so if TC 22.4.23 is tested on Starpoint V1.6.0.1 or later, this upgrading should be supported.
  - o [MT2625] Add NVDM backup area base address and length on download configuration file for FlashTool to retain backup area data prevent from being formatted. This feature only can work with FlashTool V2.2.7 or above version.
  - o [MT2625] Support customized ATCI default port and default baud rate.
  - o [MT2625] Enhancement LWM2M CT AT command.
  - o [MT2625]:Output partial AP log (GLOGE、GLOGW、RTC_LOG_ERROR、snprintf) to PC tool with the new created "SIG_SYSLOG_TEST_FILE_OUT" GKI signal, so that the PC Tool can filter such log from GUI.
- Bug fixes
  - o [MT2625] Fixed the issue that AT channel is blocked with PIN enabled SIM card.
  - o [MT2625] Fixed the issue that TC22.3.1.2 failed on Starpoint V1.6.0.1.
  - o [MT2625] Fixed the issue that sometimes subscribed topic can't be received randomly.
  - o [MT2625] Fixed the issue that there is 5s delay to send the data to CT IOT platform.
  - o [MT2625] Fixed the issue that crash happened when a large MQTT package published.
  - o [MT2625] Fixed the issue that sometimes 2 packages are sent to CT IOT platform in one send.
  - o [MT2625] Fixed the issue that WDT timeout seldom happened if HTTP failed to send request or connect to server.
  - o [MT2625] Add sleep lock of HAL ADC and HAL TRNG during HW working.
  - o [MT2625] Fixed the issue that not auto do default PDN link Creation when the SDK version from V1.0.x to V1.1.1 and later.
  - o [MT2625] Fixed the issue that DUT still enter into light sleep mode while GNSS power on.
  - o [MT2625] Fixed the issue that TC22.4.11 failed on Starpoint V1.6.0.1.
  - o [MT2625] Fixed the issue that the Meta tool is not able to read right calibration data after formatted all.
  - o [MT2625] Fixed the issue that UE crashed when setting "earfcnoffset" to other value than -0.5 in MixRx in META.
  - o [MT2625] Fixed the issue that when the first NVDM access is the top NVDM item in NVDM version number table, its version number is wrong. It will lead to this top NVDM item is wrong in this case.
  - o [MT2625] Fixed the issue that UE crashed when temperature is lower than -42 degree centigrade.

o [MT2625] Fixed the issue that UE crashed caused by unsuitable measurement scheduling.

o [MT2625] Fixed the issue that the Meta Tool does not response properly when UE fails synchronize to instrument during NSFT test.

11.   MediaTek LinkIt™ NB-IoT SDK Version 1.1.3

11.1.   Main changes

- Software features and optimization

  o [MT2625] Support BLE features (GATT/GAP/SM).

  o [MT2625] Support external charger function.

  o [MT2625] Enhance hal_wdt_feed API to fix feed watchdog corner issue(MT2625 watchdog may not work if feed twice in 200us).

  o [MT2625] Add an AT command to enable keypad function, the related events will be showed on at command window when the key is pressed or released.

  o [MT2625] Optimized the functionality of upgrading the SIM data via OTA.

  o [MT2625] Provided a API to read time zone with the unit of a quarter of an hour.

  o [MT2625] Supported power off AT command.

  o [MT2625] Support absolute time setting of RTC alarm configuration. (y/m/d h:min:s)

  o [MT2625] Optimized the initial attached time latency after powered on.

  o [MT2625] Added temperature frequency drift compensation to the initial cell search.

  o [MT2625] Added an API to stop the 10s Deep sleep lock timer which is enabled when AT command is received from UART port after waking up from PSM.

- Bug fixes

  o [MT2625] Fixed LWIP's socket layer's task sync issue.

  o [MT2625] Fixed the issue that ADC/I2S/SD/SDIO backup/restore function does not work on light sleep mode.

  o [MT2625] Fixed the issue that AT command was blocked when wait HTTPS handshake for a long time.

  o [MT2625] Fixed the issue of AuxADC might sleep during reading data.

  o [MT2625] Fixed the memory access violation issue when running MTBF test case of MQTT.

  o [MT2625] Fixed the issue that SIM forbids AT+CCHO for some application ID.

  o [MT2625] Fixed the issue that modem asserted with a large data block when using WinMUX tool during the data service testing.

  o [MT2625] Fixed the issue that setting auto baud rate for IPR failed.

  o [MT2625] Fixed the issue that the GKI log can't output when switching the log UART port to other UART port(not the default port).

  o [MT2625] Fixed the watchdog crash issue when the data mode's status is not right.

  o [MT2625] Fixed the issue that TCP blocks the sleep when auto_register sends data by http in terrible network environment.

  o [MT2625]Fixed the issue that the system reboot will be delayed 30s when system occurs assertion after switched the two UART log port and opened the silent reboot functionality ;

  o [MT2625]Fixed the issue that modem crashed when setting the prefer PLMN via AT+CPOL.

  o [MT2625]Fixed the issue that modem AT channel will be blocked with a PIN enabled SIM card.

o [MT2625]Fixed the issue that crash happened when input AT+ESNTPSTOP due to LWIP timer isn't thread-safe. Use OS timer instead and add mutex to protect SNTP interfaces.

12. MediaTek LinkIt™ NB-IoT SDK Version 1.1.2

12.1. Main changes

- Software features and optimization

    o [MT2625] Support 1.5Mbps UART baud rate.

    o [MT2625] Change to send IP data over IPV6 by socket AT command.

    o [MT2625] Removed C/R bit checking in UIH frame.

    o [MT2625] Added a NV item to configure whether the UE need to search not preferred band in the full band cell search flow(Preferred band is configured according to the SIM card).

    o [MT2625] Supported to get UART port number via ATCI channel number.

    o [MT2625] Support AT CMD IPR to set UART port baud rate of 110/300/1200/2400/4800 bps.

    o [MT2625] Added an interface to read IMEI&SV.

    o [MT2625] Supported to upgrade the SIM data via OTA.

    o [MT2625] Upgrade OneNET SDK & AT commands from 2.0 to 2.1.1.

    o [MT2625] Support OnetNET context retention so that it can work in PSM mode.

    o [MT2625] Supported the URC report for entering/exiting PSM state.

    o [MT2625] Supported to check RRC PSM status on engineering mode GUI of genie tool.

    o [MT2625]Fixed the issue that modem crashed with enable STK menu SIM card when testing PSM case.

    o [MT2625]Fixed the issue that UE does not find the best cell sometimes, caused by a bug in pre-agc state.

    o [MT2625]Fixed the issue that system maybe can't enter sleep mode after send the AT+CFUN=0 command.

    o [MT2625]Fixed the issue that SIBx reception sometimes takes a long time and failed when the wireless signaling is week.

- Bug fixes

    o [MT2625] Fixed the issue that when a cell is PLMN mismatched during cell reselection, it should be barred only for cell reselection but not for cell selection, it will impact GCF PCT case 22.2.1.

    o [MT2625] Fixed the issue that UART wakeup trigger too much EINT.

    o [MT2625] Fix the crash of using AT+EGPIO=GET_GPIO.

    o [MT2625] Fixed the issue that there is no response for AT port when sending at command(at+esosend) per 100ms.

    o [MT2625] Fixed the issue when a PDN link is in activating process, a passive deactivation event appears, which can no longer activate PDN automatically.

    o [MT2625] Fixed the issue that ADC calibration always output zero.

    o [MT2625] Fixed the issue that AT returns normal service for AT+CEREG? after plugging out the antenna.

    o [MT2625] Fixed the issue that IPR default value is not set as expected.

    o [MT2625] Fixed the issue that AT channel is blocked in the stress test.

- o [MT2625] Fixed the issue that the cell search flow is restarted but it is not needed.

- o [MT2625] Fixed the issue that causes GCF RF case 3GPP-6.6.3F.2 failed when measurement VBW setting is greater than 10kHz.

- o [MT2625] Upgraded the NV mechanism to adapt the old NV to fix the issue that IMEI/SN disappeared after upgrading from SDK V1.1.0 to SDKV1.1.1.

- o [MT2625] Fixed the ASSERT issue of handling the AT command of AT+ELMREAD.

- o [MT2625] Fixed the issue that system can't be rebooted after system assert.

- o [MT2625] Fixed the issue that format 0 will be return for AT+COPS?, but, in actually format 0 is not support. So modify the default value to format 2.

- o [MT2625] Fixed the UDP deep sleep bug that device hangs up after wake up from deep sleep.

- Known issue

  - o [MT2625] when sending TCP data by socket AT command every 100ms with non-block mode, the AT command task may seldom hang up.

13.   MediaTek LinkIt™ NB-IoT SDK Version 1.1.1

13.1.   Main changes

- Software features and optimization

    o [MT2625] Support to show partial of target KPI parameter status and network signal status on PC tool GUI in real-time.

    o [MT2625] Provided API to access SIM via APDU.

    o [MT2625] Provided l band lock AT command.

    o [MT2625] Supported the backup mechanism to store IMEI&RF calibration data in NVRAM.

    o [MT2625] Supported Flight mode deep sleep.

    o [MT2625] Supported to get locked cell and frequency information via AT*MFRCLLCK?

    o [MT2625] Supported AT command for IFC (flow control) function.

    o [MT2625] Support UART as wakeup source and lock sleep for 10 seconds after wakeup from sleep.

    o [MT2625] Supported to modify the NV item to enable/disable PSM & eDRX by customer.

    o [MT2625] Supported a new API of hal_rtc_enter_forced_shut_down_mode to force the system to shut down.

    o [MT2625] Support users can force shutdown system and when system is waken up reset program will be run.

    o [MT2625] Support AT command for lock system forever even after reboot.

- Bug fixes

    o [MT2625] Fixed the issue that the ACT_TYPE of NB-IOT should be 5 than 4.

    o [MT2625] Fixed a bug for RF calibration NFST Test @Band1, which caused NFST Test FER Failure at some frequencies of Band1.

    o [MT2625] Fixed the issue that there's no terminator of CEDRXP URC.

    o [MT2625] Fixed the issue that "AT+/at+" do not support mixed capital and small letters.

    o [MT2625] Fixed the issue in SIM recovery mechanism.

    o [MT2625] Let AT+CESQ return previous RSSI but not 0 in Idle PSM state.

    o [MT2625] Fixed an issue in SNR calculation for recovery after DRX.

    o [MT2625] Fix the issue that can't read PSM setting during cell search.

    o [MT2625] Fix the issue that UE don't initiate data transmission when leaving PSM state.

    o [MT2625] Fix the issue that AT+CNUM returns ERROR.

    o [MT2625] When UE can't report Ncell & Scell information via AT*MENGINFO=0 in some state, print current UE state in CME ERROR string.

    o [MT2625] Fixed the issue that system hang up after AT*MABORT.

    o [MT2625] RF SEM performance fix, Optimized solution would require HW changes too (C3108 capacitance to 2.2Uf).

- o [MT2625] Protect the UE from triggering back-off mechanism due to misoperation of user to establish default APN again after UE attach.

- o [MT2625] Fixed the issue that HTTP client AT command doesn't respond when use HEAD method.

- o [MT2625] Fixed the thread sync issue that sometimes AP cannot receive any data from modem.

- o [MT2625] Fixed the timing issue of de-registering LwM2M server.

- o [MT2625] Fixed the issue that fail to connect to the auto_register server sometimes.

- o [MT2625] Fixed the crash issue when the socket returns -1, memory overflow was occurred.

- o [MT2625] Reporting more error code when some errors occur in network.

- o [MT2625] Fixed watch dog issue when the socket is not valid but putting into select function.

- o [MT2625] Fixed the issue when the ping package size is zero, ping processor cannot stop.

- o [MT2625] Fixed the issue that set UART1 IPR failed.

- o [MT2625] Fix the issue when AT CMD IPR sent on UART1 is invalid.

- o [MT2625] Fix the ASSERT issue of de-registering LwM2M server by AT+ELMDEL.

- o [MT2625] Fix the issue that cannot get the right IMEI & IMSI.

- o [MT2625] Fixed the issue that sending data via TCP/UDP failed when user keeps sending data over 6 hours.

14. MediaTek LinkIt™ NB-IoT SDK Version 1.1.0

14.1. Main changes

- Software features and optimization

  o [MT2625] Support anti clone by chip on bootloader.

  o [MT2625] Support tool authentication for NVDM writer.

  o [MT2625] Support secure boot chain.

  o [MT2625] Optimize power consumption for PSM and eDRX. Floor current could be less than 2.5uA when PSM T3412 > 3 hours.

  o [MT2625] Optimize system bootup time when wakeup from PSM and eDRX.

  o [MT2625] Lower power optimization.

  o [MT2625] Modem Performance improvement for MCL=164.

  o [MT2625] Supported to non-continuous BPI allocation for PA/ASM control.

  o [MT2625] LwM2M support DTLS, meet the full requirements of CT IOT platform.

  o [MT2625] Added new option to disable or enable packet delay information for PING command.

  o [MT2625] Integrated Redstone and Gmobi differential FOTA solution.

  o [MT2625] Refactor FOTA feature to move the FOTA common code into FOTA middleware.

  o [MT2625] Merge main bin FOTA and GNSS FOTA's command.

  o [MT2625] Added package's version, binary type into FOTA package's header.

  o [MT2625] Trigger FOTA by LwM2M remote server.

  o [MT2625] Add new command to get the IP address for specific domain name.

  o [MT2625] Added the AT command AT+CSQ.

  o [MT2625] Added a logging tool that can show engineering mode parameters status.

  o [MT2625] Upgrade OneNET SDK & AT commands from 1.7 to 2.0.

  o [MT2625] Fixed the issue that AFC/TADC Calibration NVDM storage failed when the UE not supporting Band1.

  o [MT2625] Fixed the issue that UE report *MSIMINS twice after CFUN=0

  o [MT2625] Fixed the SIM recovery after inputting AT+CRSM=242

  o [MT2625] Fixed the issue that user can't query the APN via AT+CGDCONT?

  o [MT2625] Fixed the issue that user read MICCID fail if there are special alphabet than number in MICCID

- Bug fixes

  o [MT2625] Fixed the issue that AT+SM=DS command cannot get the best current issue.

14.2. Migration

Migrate the following module based applications when upgrading the SDK from version 1.0.2 to version 1.1.0.

- [MT2625] API naming changed for I2S drive.

Table 1. I2S APIs change

Original API name	Modified API name
hal_i2s_enable_audio_top	hal_i2s_enable_clock
hal_i2s_disable_audio_top	hal_i2s_disable_clock
hal_i2s_enable_tx_dma_interrupt	hal_i2s_enable_tx_interrupt
hal_i2s_disable_tx_dma_interrupt	hal_i2s_disable_tx_interrupt
hal_i2s_enable_rx_dma_interrupt	hal_i2s_enable_rx_interrupt
hal_i2s_disable_rx_dma_interrupt	hal_i2s_disable_rx_interrupt
hal_i2s_setup_tx_vfifo	hal_i2s_set_tx_dma
hal_i2s_setup_rx_vfifo	hal_i2s_set_rx_dma
hal_i2s_register_rx_vfifo_callback	hal_i2s_register_rx_callback
hal_i2s_register_tx_vfifo_callback	hal_i2s_register_tx_callback
hal_i2s_enable_audio_top_ex	hal_i2s_enable_clock_ex
hal_i2s_disable_audio_top_ex	hal_i2s_disable_clock_ex
hal_i2s_enable_tx_dma_interrupt_ex	hal_i2s_enable_tx_interrupt_ex
hal_i2s_disable_tx_dma_interrupt_ex	hal_i2s_disable_tx_interrupt_ex
hal_i2s_enable_rx_dma_interrupt_ex	hal_i2s_enable_rx_interrupt_ex
hal_i2s_disable_rx_dma_interrupt_ex	hal_i2s_disable_rx_interrupt_ex
hal_i2s_setup_tx_vfifo_ex	hal_i2s_set_tx_dma_ex
hal_i2s_setup_rx_vfifo_ex	hal_i2s_set_rx_dma_ex
hal_i2s_register_rx_vfifo_callback_ex	hal_i2s_register_rx_callback_ex
hal_i2s_stop_tx_vfifo	Removed
hal_i2s_stop_rx_vfifo	Removed
hal_i2s_setup_rx_vfifo_ex	Removed
hal_i2s_stop_tx_vfifo_ex	Removed

15.   MediaTek LinkIt™ NB-IoT SDK Version 1.0.2

15.1.   Main changes

- Software features and optimization

  o   [MT2625] Supported logging tool can show NAS air message name.

  o   [MT2625] Supported preferred band setting functionality via AT command.

  o   [MT2625] Supported AT+CCLK command

  o   [MT2625] Supported a API for software SIM.

  o   [MT2625] Optimized the SIBx reception scheme when cell camping on that only MIB/SIB1/SIB2 is required.

  o   [MT2625] Support the customer's registered callback can be called when the system wakeup from deep sleep mode triggered by RTC external interrupt

  o   [MT2625] Optimized the power consumption during UE powering up that UE can't enter sleep before camping on.

  o   [MT2625] Added more functions for PING command, and changed the ping's output format.

- Bug fixes

  o   [MT2625] Fixed the issue that AT channel is blocked when AT+COPS is running.

  o   [MT2625] Fixed the assertion occurred when AT+CFUN=0/1.

  o   [MT2625] Fixed the issue that no log output when user hot plug-in USB port

  o   [MT2625] Fixed the issue that create HTTP client instance successfully even if input invalid IP address or port.

  o   [MT2625] Fixed the issue that PDN can't be activated after leaving PSM.

16. MediaTek LinkIt™ NB-IoT SDK Version 1.0.1

16.1. Main changes

- Software features and optimization

    o [MT2625] Supports LwM2M object 19, meets the requirements for China Telecom IoT (CT IoT) platform.

    o [MT2625] Supports LwM2M and OneNet coexistence.

    o [MT2625] Supported part of non-volatile (NV) data items can be modified using the non-volatile data management (NVDM) tool.

    o [MT2625] Supports custom MT2503/MT2625 specific UART configuration.

    o [MT2625] Supports NVDM database generated during compilation.

    o [MT2625] Added Meter project support. This project enables sensing data periodically in PSM mode.

    o [MT2625] Added AT+SM=LOCK/UNLOCK command to support customer lock system sleep mode. This feature is used for low power development and debugging.

    o [MT2625] Added the default PDN link creation.

    o [MT2625] Added CPU clock frequency in GKI log, when Genie tool is connected to target, one GKI trace will show the MCU clock frequency.

- Bug fixes

    o [MT2625] Fixed the issue that DUT crashes when no PDN parameter exists.

    o [MT2625] Fixed the issue that UE fails to re-enter deep sleep mode due to incorrect RIL channel state after waking up from deep sleep.

    o [MT2625] Fixed the issue that AT malfunctions when the parameter of AT command is in upper case.

    o [MT2625] Fixed the assertion of high data Tput testing via ESOSEND and improved its performance.

    o [MT2625] Added error handling when a non-UICC card is inserted.

    o Fixed CMCC MCL164 case failed issue by adding fast AFC tracking during UL gap.

    o [MT2625] Fixed CMCC NV-IoT TAU related testing issues: UE should disconnect after acknowledging network by sending the RRC release message.

17.   MediaTek LinkIt™ NB-IoT SDK Version 1.0.0

17.1.   Main changes

- SDK supports MT2625 evaluation board, including peripheral drivers, middleware and reference applications.

- SDK supports NB-IoT R13 features with default configuration, as shown in Table 2.

Table 2. V1.0.0 R13 features with default configuration

Feature	Default configuration
AS Release	R13
UE category	CAT_NB1
Band Support	0x3FFFF(B1/B2/B3/B5/B8/B11/B12/B13/B17/B18/B19/B20/B25/B26/B28/B31/B66/B70)
UL multi tone	Feature configuration = True
Control Plane CIoT Optimization	Default opened, PDN preference = "Control Plane"
PSM	Feature configuration = True; T3324 = 0x0b(22S); T3412 = 0x23(3h)
eDRX	Feature configuration = True; Tedrx =5(81.92); PTW = 3(10.24s)
Attach without PDN	Feature configuration = False (Feature supported but attach with PDN is preferred.)
Cell reselection	Default opened, no configuration in NVRAM
NAS security	
PLMN/Cell Selection	
PDN:IPV4/IPV6	
Tracking Area Update	
SMS	

- SDK provides the following middleware features.
    - TCP/IP: IPv4/v6
    - LWM2M
    - TLS/DTLS
    - MQTT
    - CoAP
    - HTTP/s
    - SNTP
    - FOTA (full bin)

17.2.   Known issues

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

- Excluding the features without sufficient Network Vendors Interoperability Testing. For example, user plane optimization related features, RoHC (CP+UP), None-IP, Multicarrier.
- Not guarantee that CT/CMCC certification will pass.