RW61x-Wi-Fi-and-Bluetooth-802.15.4 Firmware Release Notes 2.13.3 for FreeRTOS

Release Notes

Contents

Revision History

Table 1: Document revision history

Revision	Date	Change details
Rev. 2.11.0	05-10-2022	EAR1 Release
Rev. 2.12.0	08-12-2022	EAR2 Release
Rev. 2.12.1	12-09-2022	EAR3 Release
Rev. 2.12.2	01-18-2023	EAR3.1 Release
Rev. 2.13.0	05-23-2023	EAR4 Release
Rev. 2.13.1	07-28-2023	PRC Release
Rev. 2.13.2	10-18-2023	RFP Release
Rev. 2.13.3	12-15-2023	RFP2 Release

1 Package Information

- MCUXpresso SDK version: 2.13.3
- Wi-Fi Firmware version: 18.99.2.p78.7
- Bluetooth LE Firmware version: 18.25.2.p78.7
- 802.15.4+Bluetooth Combo Firmware version: 2.13.3

Please refer to the Software feature list in the document *RW61x-Wi-Fi-and-Bluetooth-802.15.4-Software-Features-V6-for-FreeRTOS.*

2 Firmware Version Information

- Wireless SoC : RW61x A1 & A2
- Wi-Fi Firmware
  - rw610_sb_wifi_v1.bin for A1
  - rw610_sb_wifi_v2.bin for A2
  - Version : 18.99.2.p78.7
    - 18 - Major revision
    - 99 - Feature pack
    - 2 - Release version
    - P78 - Patch number
    - 7 - Hotfix
- Bluetooth LE Firmware
  - rw610_sb_ble_v1.bin for A1
  - rw610_sb_ble_v2.bin for A2
  - Version : 18.25.2.p78.7
    - 18 - Major revision
    - 25 - Feature pack
    - 2 - Release version
    - P78 - Patch number
    - 7 - Hotfix
- 802.15.4 + Bluetooth LE (Up to core 4.1) Combo Firmware
  - rw610_sb_ble_15d4_combo_v1.bin for A1
  - rw610_sb_ble_15d4_combo_v2.bin for A2
  - Version : 2.13.3
    - Same with MCUXpresso SDK version
  - Bluetooth LE functionality is limited to support Matter over Thread provisioning only

3 Host Platform

- RW61x Platform running FreeRTOS
- OpenThread commit ID details
- OT-CLI application
  - OT host build commit ID: *b6dee124cad2ca6be62377dde6253a743d60fc12* (01 Jul 2023)
  - OT FW lib build commit ID: *8440b5f85d6212f1147a45d6d34ab7f3d841a43a* (12 May 2022)
- OTBR application
  - OT host build commit ID: *09cc868d18907a69e7725496b03ff3ce58856722* (24 Nov 2023)
  - OT FW lib build commit ID: *8440b5f85d6212f1147a45d6d34ab7f3d841a43a* (12 May 2022)

Test Tools

- iperf (version 2.1.9)

4 Wi-Fi Throughput

4.1 Throughput Test Setup

- Environment: Shield Room - Over the Air
- External Access Point: ASUS RT-AX88U
- DUT: RW610 RD Board
- External Client: Intel AX210
- Channel: 6 | 36
- Wi-Fi application: wifi_cli
- Compiler used to build application: armgcc
- Compiler Version: gcc-arm-none-eabi-10.3-2021.10
- iPerf Commands used in test:

TCP TX	TCP RX	UDP TX	UDP RX
iperf -c <remote_ip> -t 60	iperf -s	iperf -c <remote_ip> -t 60 -u -B <local_ip> -b 120	iperf -s -u -B <local_ip>

Refer to **Section-2.3** in *UM11799-NXP Wi-Fi and Bluetooth Demo Applications User Guide for RW61x* to read more about the throughput test setup and topology.

4.2 STA Throughput

External APs: ASUS RT-AX88U (Open/WPA2/WPA3-SAE)

STA Mode Throughput - BGN Mode | 2.4 GHz Band | 20 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	36	35	62	62
WPA2-AES	35	35	61	62
WPA3-SAE	35	35	61	60

STA Mode Throughput - AN Mode | 5 GHz Band | 20 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	37	36	64	64
WPA2-AES	37	36	62	63
WPA3-SAE	37	36	62	63

STA Mode Throughput - AC Mode | 2.4 GHz Band | 20 MHz (VHT)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	39	38	75	73
WPA2-AES	39	38	73	71

WPA3-SAE	39	38	73	72

STA Mode Throughput - AC Mode | 5 GHz Band | 20 MHz (VHT)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	40	39	77	75
WPA2-AES	40	39	75	74
WPA3-SAE	40	39	75	74

STA Mode Throughput - AX Mode | 2.4 GHz Band | 20 MHz (HE)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	43	42	97	99
WPA2-AES	43	41	97	97
WPA3-SAE	43	41	97	97

STA Mode Throughput - AX Mode | 5 GHz Band | 20 MHz (HE)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	45	43	100	102
WPA2-AES	45	43	100	101
WPA3-SAE	45	43	100	101

4.3 Mobile AP Throughput

External client: Intel AX210

Mobile AP Mode Throughput - BGN Mode | 2.4 GHz Band | 20MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	38	39	63	63
WPA2-AES	37	38	61	61
WPA3-SAE	37	38	61	61

Mobile AP Mode Throughput - AN Mode | 5 GHz Band | 20 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	39	38	63	63
WPA2-AES	38	38	62	62
WPA3-SAE	38	38	62	62

Mobile AP Mode Throughput - AC Mode | 2.4 GHz Band | 20MHz (VHT)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	42	42	73	73
WPA2-AES	41	41	72	72
WPA3-SAE	41	41	72	73

Mobile AP Mode Throughput - AC Mode | 5 GHz Band | 20 MHz (VHT)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	42	42	74	74
WPA2-AES	41	42	73	72
WPA3-SAE	41	41	73	73

Mobile AP Mode Throughput - AX Mode | 2.4 GHz Band | 20MHz (HE)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	46	47	95	96
WPA2-AES	46	46	95	95
WPA3-SAE	45	46	96	95

Mobile AP Mode Throughput - AX Mode | 5 GHz Band | 20 MHz (HE)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	47	46	96	97
WPA2-AES	46	47	97	97
WPA3-SAE	46	47	97	97

5 Wireless Certification

5.1 Wi-Fi

- WFA link : *https://www.wi-fi.org/product-finder-results?keywords=RW610*
- Dual band : WFA127282
- Single band : WFA128204

5.2 Bluetooth LE

- BT-SIG link *: https://launchstudio.bluetooth.com/ListingDetails/191081*
- Declaration ID : D065228
- QDID : 220235
- QDID Type : Controller + Host (Core layers only)
- TCRL version : TCRL 2023-1
- BT Spec version : 5.3

5.3 Thread

- Thread Group link : *https://www.threadgroup.org/What-is-Thread/Thread-Benefits#certifiedproducts*
- Product Name : NXP RW612 Wireless MCU with Integrated Tri-Radio
- Thread version : V1.3.0

5.4 Matter

- CSA link : *https://csa-iot.org/csa_product/nxp-rw612-tri-radio-wireless-mcu-development-platform*
- Certificate ID : CSA23C36MAT41746-24
- Device type : Root Node, Thermostat

6 Bug Fixes/Feature Enhancements

[**From 2.13.2 to 2.13.3**]

Component	Description
Wi-Fi	▪ WLAN reset on some parts under stress conditions may take a slightly longer time due to a background calibration that needs to repeat ▪ Add wpa_supplicant to manage STA and uAP connection
Bluetooth LE	▪ --
Coexistence	▪ --
802.15.4	▪ --

7 Known Issues

Component	Description
Wi-Fi	▪ There is a known deficiency in DTIM calculation that can impact DTIM communication stability and power consumption with some APs over time
Bluetooth LE	▪ --
Coexistence	▪ Wi-Fi 2.4GHz throughput is being tuned in shared antenna Coex scene with 15.4/OT when working with Asus RT-AX88U
802.15.4	▪ 15.4/OT device sometimes takes a bit longer time to join existing OT network

8 Notes

- For some early samples of RW61x RD boards, wireless MAC address is not programmed in the right OTP line. If customers see Wi-Fi address 00:50:43:02:FE:01 or FF:FF:FF:FF:FF:FF and Bluetooth MAC address 88:88:88:88:88:88 when running wireless application on their RW61x RD board, refer to *UM11801-Manufacturing Software User Manual for RW61x* command 46 to reprogram MAC address to RW61x OTP. Please use first line address on board MAC label.

  Example : for board MAC label shown as below, use labtool command: 46 0 C0.95.DA.00.D5.66

  C0:95:DA:00:D5:66
  C0:95:DA:00:D5:67
  C0:95:DA:00:D5:68

- RW610/RW612 A0 version chip support ends since SDK 2.13.2 release
- Per board calibration is recommended to use to get better RF Tx performance

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