SD-Wi-Fi-UART-BT-FP91-IW416
Firmware Release Notes for FreeRTOS

Contents

Revision History

Table 1: Document revision history

Revision	Date	Change details
Rev.1	05-Jan-2021	Initial release
Rev.2	19-Mar-2021	Section 1 and Section 2 Updated
Rev.3	27-Aug-2021	Section 1 Updated Section 5 Updated
Rev.4	05-Jan-2022	Section 1 and Section 2 Updated Section 5 and Section 7 Updated Section 8 Updated
Rev. 5	15-Mar-2022	Section 1 "Package Information": updated sdk version Section 5.1 "Throughput Test Setup": updated setup details Section 5.2 "STA Throughput": updated TP numbers, added new case for 2.4GHz 40MHz Section 5.3 "AP Throughput": updated TP numbers, added new case for 2.4GHz 40MHz Section 7 "Bug Fixes/Feature Enhancements": updated

1   Package Information

- SDK version: 2.11.1
- Wi-Fi and Bluetooth/Bluetooth LE Firmware version: 16.91.21.p11.3

Please refer to the Software feature list in the document *SD-Wi-Fi-UART-BT-IW416-Wi-Fi-and-Bluetooth-Software-Features-for-FreeRTOS.*

2   Firmware Version Information

- Wireless SoC : IW416
- Wi-Fi and Bluetooth/Bluetooth LE Firmware version : 16.91.21.p11.3

    − 16   - Major revision
    − 91   - Feature pack
    − 21   - Release version
    − p11.3 - Patch number

3   Host Platform

- All i.MX RT Platform running FreeRTOS
- Interface used

    o   Wi-Fi over SDIO (SDIO 2.0 support, SDIO clock frequency: 50 MHz)
    o   Bluetooth/Bluetooth LE over UART

Test Tools
- iperf (version 2.0.5)

4   Wi-Fi Pre-Certification and Bluetooth Qualification

The Wi-Fi pre-certification obtained with the following combinations.

4.1   Wi-Fi Pre-Certification

- STA | 802.11n
- STA | PMF

4.2   Bluetooth Controller Qualification

- QDID : https://launchstudio.bluetooth.com/ListingDetails/108035

5   Wi-Fi Throughput

5.1   Throughput Test Setup

- Environment: Shield Room - Over the Air
- Access Point: linksys WRT1100AC and TP-Link Archer 6000
- DUT: IW416 Azurewave (Module : **AW-AM457MA-uSD**) with EVK-MIMXRT1060 platform
- Client: Apple Macbook Air
- Channel: 6 | 36
- Wi-Fi application: wifi_cli
- Compiler used to build application: armgcc
- Compiler Version: gcc-arm-none-eabi-9-2020-q2-update
- 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 **NOTE:** *Defaults data rate is 100mbps*	iperf -s -u -B <local_ip>

Refer to **Section-3.1.1** in *UM11442-NXP Wi-Fi and Bluetooth Demo Applications User Guide for i.MX RT Platforms* to read more about the throughput test setup and topology.

5.2   STA Throughput

External AP: linksys WRT1100AC (Open/WPA2) and TP-Link Archer 6000 (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	29.7	31	39.8	55
WPA2-AES	25.2	32	43.6	50
WPA3-SAE	32.1	37	43.2	55

STA Mode Throughput - BGN Mode | 2.4 GHz Band | 40 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	47.4	56	69.1	109
WPA2-AES	42.7	52	56.6	100
WPA3-SAE	43.7	52	64.7	98

STA Mode Throughput - AN Mode | 5 GHz Band | 20 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	32.8	35	50	59
WPA2-AES	33.1	35	45	53
WPA3-SAE	32.8	38	43.7	55

STA Mode Throughput - AN Mode | 5 GHz Band | 40 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	45	50	84.8	110
WPA2-AES	44.5	47	94.1	107
WPA3-SAE	34.1	48	94.1	104

5.3   Mobile AP Throughput

External client: Apple Macbook Air

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	22	29	42	60
WPA2-AES	29.9	41	43.3	59
WPA3-SAE	24.8	41	42.3	60

Mobile AP Mode Throughput - BGN Mode | 2.4 GHz Band | 40MHz				
Protocol	TCP (Mbit/s)		UDP (Mbit/s)	
Direction	Tx	Rx	Tx	Rx
Open Security	32	53	71.8	81
WPA2-AES	32	53	71.8	81
WPA3-SAE	28	51	73.5	82

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	26	35	43	64
WPA2-AES	34.6	46	44.8	64
WPA3-SAE	27.6	46	44.8	63

Mobile AP Mode Throughput - AN Mode | 5 GHz Band | 40 MHz				
Protocol	TCP (Mbit/s)		UDP (Mbit/s)	
Direction	Tx	Rx	Tx	Rx
Open Security	25	43	80	99
WPA2-AES	30.3	59	83.2	98
WPA3-SAE	31.3	59	81	99

6   EU Conformance Tests

- EU Adaptivity test - EN 300 328 v2.1.1 (for 2.4 GHz)
- EU Adaptivity test - EN 301 893 v2.1.1 (for 5 GHz)

7   Bug Fixes/Feature Enhancements

Component	Description
Wi-Fi	• Low RSSI values observed in uAP BGN-20 in all securities, in shielded/noisy environment, connectivity issue observed • Added support for IPv6 • Added support for HT40 in 2.4GHz AP and STA

8   Known Issues

Component	Description
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9   Notes

- None

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