SD-Wi-Fi-UART-BT-88W8987
Firmware Release Notes for FreeRTOS

Release Notes

Contents

Revision History

Table 1: Document revision history

Revision	Date	Change details
Rev. 1	26-Mar-2021	Initial release
Rev .2	05-July-2021	Section 1 and Section 2 updated Section 5 and Section 7 updated
Rev. 3	27-Aug-2021	Section 1, Section 2 and Section 5 updated
Rev. 4	05-Jan-2022	Section 1 and Section 2 updated Section 7 updated
Rev. 5	15-Mar-2022	Section 1 “Package Information”: updated sdk and package version Section 2 “Firmware Version Information”: updated FW version Section 5.1 “Throughput Test Setup”: updated setup details Section 5.2 “STA Throughput”: updated TP numbers, added case for 2.4GHz 40MHz Section 5.3 “AP Throughput”: updated TP numbers, added 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.p32

Please refer to the Software feature list in the document *SD-WI-Fi-UART-BT-88W8987-Wi-Fi-and-Bluetooth-Software-Features-for-FreeRTOS.*

2 Firmware Version Information

- Wireless SoC : 88W8987
- Wi-Fi and Bluetooth/Bluetooth LE Firmware version : 16.91.21.p32
  - 16 - Major revision
  - 91 - Feature pack
  - 21 - Release version
  - P32 - Patch number

3 Host Platform

- All i.MX RT Platform running FreeRTOS
- Interface used
    - Wi-Fi over SDIO (SDIO 2.0 support, SDIO clock frequency: 50 MHz)
    - Bluetooth/Bluetooth LE over UART

Test Tools

- iperf (version 2.0.5)

4 Wi-Fi Certifications

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

4.1 WFA Certifications

- STA | 802.11n
- STA | PMF

Refer *TN00066-WFA Derivative Certification Process* document available in SDK Package.

5 Wi-Fi Throughput

5.1 Throughput Test Setup

- Environment: Shield Room - Over the Air
- External Access Point: Netgear X4S 7800 and TP-Link AX6000
- DUT: W8987 Azurewave (Module : **AW-CM358-uSD**) with EVK-MIMXRT1060 platform
- External 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-2.3** 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 APs: Netgear X4S 7800 (Open/WPA2) and TP-Link AX6000 (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	34.2	27.0	46.2	61.0
WPA2-AES	33.5	26.0	46.6	60.0
WPA3-SAE	32.1	36.0	43.1	60.0

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	47.7	44.0	65.7	93.0
WPA2-AES	37.0	40.0	52.0	90.0
WPA3-SAE	40.0	44.9	55.8	94.0

STA Mode Throughput - AN Mode | 5 GHz Band | 20 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	**Tx**	**Rx**	**Tx**	**Rx**
Open Security	37.8	42.0	51.0	68.0
WPA2-AES	37.1	42.0	50.0	68.0
WPA3-SAE	31.3	29.0	51.0	62.0

STA Mode Throughput - AN Mode | 5 GHz Band | 40 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	**Tx**	**Rx**	**Tx**	**Rx**
Open Security	44.5	52.0	94.1	121.0
WPA2-AES	43.6	51.0	92.5	126.0
WPA3-SAE	33.1	51.0	81.8	120.0

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	36.2	40.0	47.1	72.0
WPA2-AES	36.6	40.0	47.2	70.0
WPA3-SAE	36.6	40.0	47.0	71.0

STA Mode Throughput - AC Mode | 5 GHz Band | 40 MHz (VHT)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	**Tx**	**Rx**	**Tx**	**Rx**
Open Security	41.0	47.0	94.1	136.0
WPA2-AES	40.6	47.0	94.1	123.0
WPA3-SAE	41.4	47.0	81.0	137.0

STA Mode Throughput - AC Mode | 5 GHz Band | 80 MHz (VHT)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	**Tx**	**Rx**	**Tx**	**Rx**
Open Security	41.0	49.0	91.0	131.0
WPA2-AES	42.0	47.0	90.0	130.0
WPA3-SAE	43.0	49.0	92.6	130.0

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	33.2	33	43.7	55
WPA2-AES	32.4	30	44.1	52
WPA3-SAE	27	35	44.1	58

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	32.3	65.0	69.1	119.0
WPA2-AES	32.3	65.0	69.1	119.0
WPA3-SAE	31.7	65.0	70.5	118.0

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	34.4	41	44.4	63
WPA2-AES	31	42.7	44.4	62
WPA3-SAE	31.6	40	43.4	59

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	34.5	50	82	110
WPA2-AES	34.5	51	81.9	113
WPA3-SAE	34.1	44	82	119

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	• 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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