NXP-Wireless-Chipset-Release-Notes

SD-Wi-Fi-UART-BT-FP91-IW416
SD-Wi-Fi-UART-BT-FP91-88W8987
SD-Wi-Fi-FP91-88W8801

Contents

List of Tables

List of Tables

Revision History

Table 1: Revision History of the document

Revision	Date	Change details
Rev. 1	24-June-2022	Initial release with new Format
Rev. 2	15-Sept-2022	Modifications: • Deprecated reference of 88W8977 from the document • Table 2: o Removed Shared Authentication from Wi-Fi Client o Added FIPS in Wi-Fi Client General feature o Removed TxPower Config V2 from Wi-Fi AP and Client General Features • Section 3.1.1 "Package Information": Updated SDK version • Section 3.1.2 "Version Information": Updated FW version • Section 3.1.4.1 "WFA Certifications": Mention 802.11ac and WPA3(SAE) • Section 3.1.5.1 "Throughput Test Setup": Added Murata module details • Section 3.1.5.2 "STA Throughput": Updated TP numbers • Section 3.1.5.3 "Mobile AP Throughput": Updated TP numbers • Section 3.1.7 "Bug Fixes/Feature Enhancements": Updated FW version and details for fixed issues • Section 3.2.1 "Package Information": Updated SDK version • Section 3.2.2 "Version Information": Updated FW version • Section 3.2.4.1 "WFA Certifications": Mention WPA3(SAE) • Section 3.2.5.1 "Throughput Test Setup": Added Murata module details • Section 3.2.5.2 "STA Throughput": Updated TP numbers • Section 3.2.5.3 "Mobile AP Throughput": Updated TP numbers • Section 3.2.7 "Bug Fixes/Feature Enhancements": Updated FW version and details for fixed issues • Section 3.3.1 "Package Information": Updated SDK version • Section 3.3.5.2 "STA Throughput": Updated TP numbers • Section 3.3.5.3 "Mobile AP Throughput": Updated TP numbers
Rev.3	03-Jan-2023	Modifications: • Section 3.1.1 "Package Information": Updated SDK version • Section 3.1.2 "Version Information": Updated FW version • Section 3.2.1 "Package Information": Updated SDK version • Section 3.2.2 "Version Information": Updated FW version

		• [Section 3.3.1 "Package Information":](#) Updated SDK version
		• [Section 3.3.2 "Version Information":](#) Updated FW version
		• [Section 3.3.5.2 "STA Throughput":](#) Updated TP numbers
		• [Section 3.3.5.3 "Mobile AP Throughput":](#) Updated TP numbers

1   About this document

This document contains important information about the supported features, release versions, fixed/known issues and performance of the Wi-Fi, Bluetooth and Co-ex.

This is a consolidated release that has been tested for wireless chipsets mentioned below in this document with SDK version 2.13.0.

2   Feature List

Table 2: Feature List for available SoCs

Wireless Type	Type	Features List	Sub Features List	SD-UART		SD
				8987	IW416	8801
Wi-Fi	Client	802.11n - High Throughput	2.4 GHz band operation supported channel bandwidth: 20 MHz	Y	Y	Y
			2.4 GHz band supported channel bandwidths : 40 MHz	Y	Y	N
			5 GHz band supported channel bandwidths : 20 MHz	Y	Y	N
			5 GHz band supported channel bandwidths : 40 MHz	Y	Y	N
			Short/long guard interval (400 ns/800 ns)	Y	Y	Y
			11n data rates – Up to 72 Mbit/s (MCS 0 to MCS 7)	Y	Y	Y
			11n data rates – Up to 150 Mbit/s (MCS 0 to MCS 7)	Y	Y	N
			1 spatial stream (1x1)	Y	Y	Y
			HT protection mechanisms	Y	Y	Y
			Aggregated MAC Protocol Data Unit(AMPDU) Rx support	Y	Y	Y
			Aggregated MAC Service Data Unit(AMSDU) -4k Rx support	Y	Y	Y
			Tx MCS rate adaptation (BGN)	Y	Y	Y
			Rx Low Density Parity Check (LDPC)	Y	N	N
		802.11 ac - Very High Throughput	2.4 GHz band supported channel bandwidths : 20MHz	Y	N	N
			5 GHz band supported channel bandwidths: 20 MHz	Y	N	N
			5 GHz band supported channel bandwidths: 40 MHz	Y	N	N
			5 GHz band supported channel bandwidths: 80 MHz	Y	N	N
			11ac data rates - Up to 433.3 Mbps (MCS 0 to MCS 9) - 2x2	Y	N	N
			MU-MIMO Beamformee (Explicit and Implicit)	Y	N	N
			RTS/CTS with BW Signaling	Y	N	N
			Operation Mode Notification	Y	N	N
			Backward Compatibility with non-VHT devices	Y	N	N
			Tx VHT MCS Rate Adaptation	Y	N	N
		802.11 a/b/g Features	11 b/g data rates - Up to 54 Mbit/s	Y	Y	Y
			11 a data rates - Up to 54 Mbit/s	Y	Y	N
			Tx rate adaptation (BG)	Y	Y	Y
			Fragmentation/defragmentation	Y	Y	Y
			ERP protection, slot time, preamble	Y	Y	Y
		802.11d	802.11d - Regulatory Domain/Operating Class/Country Info	Y	Y	Y
		802.11e - QoS	EDCA [Enhanced Distributed Channel Access] / WMM (Wireless Multi-Media)	Y	N	N
		802.11i - Security	Open security	Y	Y	Y
			WPA2-PSK Security (AES-CCMP Encryption)	Y	Y	Y
			WPA + WPA2 mixed mode	Y	Y	Y
			WPA3 SAE (R3)	Y	Y	Y

Wireless Type	Type	Features List	Sub Features List	SD-UART		SD
				8987	IW416	8801
Wi-Fi	Client	802.11w - PMF (Protected Management Frames)	PMF require and capable	Y	Y	Y
			Unicast management frames - Encryption/decryption - using CCMP	Y	Y	Y
			Broadcast management frames - Encryption/decryption - using BIP	Y	Y	Y
			SA query request/response	Y	Y	Y
			PMF Support using Embedded supplicant	Y	Y	Y
		Power Save Mode	Deep sleep	Y	Y	Y
			IEEE power save	Y	Y	Y
		General Features	Embedded Supplicant	Y	Y	Y
			Embedded MLME	Y	Y	Y
			EU adaptivity support (ETSI Cert)	Y	Y	Y
			DFS Radar Detection in Slave Mode (Follow AP)	Y	Y	N
			External Coex (Software interface)	N	N	Y
			IPv6	Y	Y	Y
			FIPS	Y	Y	N
	AP	802.11n - High Throughput	2.4 GHz band operation supported channel bandwidth: 20 MHz	Y	Y	Y
			2.4 GHz band supported channel bandwidths : 40 MHz	Y	Y	N
			5 GHz band supported channel bandwidths : 20 MHz	Y	Y	N
			5 GHz band supported channel bandwidths : 40 MHz	Y	Y	N
			Short/long guard interval (400 ns/800 ns)	Y	Y	Y
			11n data rates – Up to 72 Mbit/s (MCS 0 to MCS 7)	Y	Y	Y
			11n data rates – Up to 150 Mbit/s (MCS 0 to MCS 7)	Y	Y	N
			1 spatial stream (1x1)	Y	Y	Y
			HT protection mechanisms	Y	Y	Y
			Aggregated MAC Protocol Data Unit(AMPDU) Rx support	Y	Y	Y
			Aggregated MAC Service Data Unit(AMSDU) -4k Rx support	Y	Y	Y
			Max client support (up to 8 devices)	Y	Y	Y
			Tx MCS rate adaptation (BGN)	Y	Y	Y
			Rx Low Density Parity Check (LDPC)	Y	N	N
		802.11d	802.11d - Regulatory Domain/Operating Class/Country Info	Y	Y	Y
		802.11e -QoS	EDCA [Enhanced Distributed Channel Access] / WMM (Wireless Multi-Media)	Y	N	N
		802.11i - Security	Open security	Y	Y	Y
			WPA2-PSK security (AES-CCMP encryption)	Y	Y	Y
			WPA2 + WPA3 (SAE) mixed mode	Y	Y	Y
			WPA3 SAE (R3)	Y	Y	Y

Wireless Type	Type	Features List	Sub Features List	SD-UART		SD
				8987	IW416	8801
WiFi	AP	802.11w - Protected Management Frames (PMF)	PMF require and capable	Y	Y	Y
			Unicast management frames - Encryption/decryption - using CCMP	Y	Y	Y
			Broadcast management frames - Encryption/decryption - using BIP	Y	Y	Y
			SA query request/response	Y	Y	Y
		General Features	Embedded Authenticator	Y	Y	Y
			Embedded MLME	Y	Y	Y
			EU adaptivity support	Y	Y	Y
			Automatic channel selection (ACS)	Y	Y	Y
			Extended channel switch announcement (ECSA)	Y	Y	Y
			External Coex (Software interface)	N	N	Y
			FIPS (128bit)	Y	Y	N
	AP-STA	Simultaneous AP-STA Operation (Same Channel)	AP-STA functionality	Y	Y	Y

Wireless Type	Type	Features List	Sub Features List	SD-UART	
				8987	IW416
Bluetooth	Bluetooth Classic Features	General Features	BT Class 1.5 and Class 2 support	Y	Y
			Scatternet support	Y	Y
			Maximum of seven simultaneous ACL connections	Y	Y
			Automatic Packet Type Selection	Y	Y
			Bluetooth - 2.1 to 5.0 Specification Support	Y	Y
			Low power sniff	Y	Y
		Bluetooth Packet Type Supported	ACL (DM1, DH1, DM3, DH3, DM5, DH5, 2-DH1, 2-DH3, 2-DH5, 3-DH1, 3-DH3, 3-DH5)	Y	Y
			SCO (HV1, HV3)	Y	Y
			eSCO (EV3, EV4, EV5, 2EV3, 3EV3, 2EV5, 3EV5)	Y	Y
		Bluetooth Profiles Supported	A2DP Source/Sink	Y	Y
			AVRCP Target/Controller	Y	Y
			HFP Dev/AG	Y	Y
			OPP Server/Client	Y	Y
			SPP Server/Client	Y	Y
			HID Target/Device	Y	Y
		Bluetooth Audio Features	PCM NBS Master / Slave	Y	Y
			PCM WBS Master / Slave	Y	Y
	Bluetooth LE Features	Generic Features	Maximum 16 Bluetooth LE connections (Master role)	Y	Y
		Bluetooth Profile Support	Bluetooth LE GATT	Y	Y
			Bluetooth LE HID over GATT	Y	Y
			Bluetooth LE GAP	Y	Y
		Bluetooth LE 4.0 Support	Low Energy Physical Layer	Y	Y
			Low Energy Link Layer	Y	Y
			Enhancements to HCI for Low Energy	Y	Y
			Low Energy Direct Test Mode	Y	Y
		Bluetooth 4.1 Support	Low duty Cycle Directed Advertising	Y	Y
			Bluetooth LE Dual Mode Topology	Y	Y
			Bluetooth LE Privacy v1.1	Y	Y
			Bluetooth LE Link Layer Topology	Y	Y
		Bluetooth 4.2 Support	Bluetooth LE secure connection	Y	Y
			Bluetooth LE Link Layer Privacy v1.2	Y	Y
			Bluetooth LE Data Length Extension	Y	Y
			Link Layer Extended Scanner Filter Policies	Y	Y
		Bluetooth 5.0 Support	Bluetooth LE 2 Mbps Support	Y	Y
			High Duty Cycle Directed Advertising	Y	Y
Coex	Bluetooth + Wi-Fi Coexistence	BCA TDM Co-ex Mode (Shared Antenna)	STA + Bluetooth Coex	Y	Y
			STA + Bluetooth LE Coex	Y	Y
			STA + Bluetooth + Bluetooth LE Coex	Y	Y
			AP + Bluetooth Coex	Y	Y
			AP + Bluetooth LE Coex	Y	Y
			AP + Bluetooth + Bluetooth LE Coex	Y	Y

3   Release Notes

3.1   SD-UART 8987

3.1.1   Package Information

- SDK Version: 2.13.0

3.1.2   Version Information

- Wireless SoC : 88W8987
- Wi-Fi and Bluetooth/Bluetooth LE Firmware Version : 16.91.21.p64.1
  - 16 - Major revision
  - 91 - Feature pack
  - 21 - Release version
  - p64.1 - Patch number

3.1.3   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)

3.1.4   Wi-Fi and Bluetooth Certification

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

3.1.4.1   WFA Certifications

- STA | 802.11n
- STA | 802.11ac
- STA | PMF
- STA | WPA3 (SAE)

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

3.1.4.2   Bluetooth Controller Certification

QDID : https://launchstudio.bluetooth.com/ListingDetails/115533

3.1.5   Wi-Fi Throughput

3.1.5.1   Throughput Test Setup

- Environment: Shield Room - Over the Air
- External Access Point: Netgear X4S 7800 and TP-Link AX6000
- DUT: W8987 Murata (Module : **1ZM M.2**) with EVK-MIMXRT1060 platform
- DUT Power Source: External power supply
- 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.

3.1.5.2   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	37	49	43	57
WPA2-AES	37	47	43	55
WPA3-SAE	34	50	42	57

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	55	75	83	100
WPA2-AES	34	43	40	49
WPA3-SAE	34	77	83	88

STA Mode Throughput - AN Mode | 5 GHz Band | 20 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	39	52	44	59
WPA2-AES	38	50	44	59
WPA3-SAE	35	52	44	60

STA Mode Throughput - AN Mode | 5 GHz Band | 40 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	57	78	85	100
WPA2-AES	56	78	84	100
WPA3-SAE	35	83	91	101

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	44	44	47	72
WPA2-AES	44	44	47	71
WPA3-SAE	43	44	47	71

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	61	63	77	130
WPA2-AES	59	64	82	130
WPA3-SAE	58	63	65	130

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	66	71	125	130
WPA2-AES	66	68	125	130
WPA3-SAE	66	69	125	130

3.1.5.3   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	35	54	43	62
WPA2-AES	34	44	43	62
WPA3-SAE	22	28	29	61

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	34	45	44	61
WPA2-AES	22	40	43	61
WPA3-SAE	21	38	43	49

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	35	47	44	61
WPA2-AES	35	32	28	62
WPA3-SAE	31	39	44	44

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	50	69	81	100
WPA2-AES	29	44	38	100
WPA3-SAE	29	36	38	95

Mobile AP Mode Throughput - AC Mode | 5 GHz Band | 20 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	38	39	47	74
WPA2-AES	38	41	37	76
WPA3-SAE	41	41	37	76

Mobile AP Mode Throughput - AC Mode | 5 GHz Band | 40 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	56	54	64	127
WPA2-AES	59	57	57	129
WPA3-SAE	58	57	58	129

Mobile AP Mode Throughput - AC Mode | 5 GHz Band | 80 MHz				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	29	44	89	127
WPA2-AES	28	46	75	127
WPA3-SAE	29	46	78	129

3.1.6 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)

3.1.7 Bug Fixes/Feature Enhancements

Component	Description
-	NA

3.1.8 Known Issues

Component	Description
-	NA

3.2 SD-UART IW416

3.2.1 Package Information

- SDK version : 2.13.0

3.2.2 Version Information

- Wireless SoC: IW416
- Wi-Fi and Bluetooth/Bluetooth LE Firmware Version : 16.91.21.p64.1

  o 16 - Major revision
  o 91 - Feature pack
  o 21 - Release version
  o p64 - Patch number

3.2.3 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
  o iPerf (version 2.0.5)

3.2.4 Wi-Fi and Bluetooth Certification

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

3.2.4.1 WFA Certifications

- STA | 802.11n
- STA | PMF
- STA | WPA3 (SAE)

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

3.2.4.2 Bluetooth Controller Certification

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

3.2.5   Wi-Fi Throughput

3.2.5.1   Throughput Test Setup

- Environment: Shield Room - Over the Air
- Access Point: linksys WRT1100AC and TP-Link Archer 6000
- DUT: IW416 Murata (Module : 1XK M.2) with EVK-MIMXRT1060 platform
- DUT Power Source: External power supply
- 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.

3.2.5.2   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	35	40	44	50
WPA2-AES	35	39	44	50
WPA3-SAE	34	38	45	51

STA Mode Throughput - AN Mode | 5 GHz Band | 20 MHz (HT)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	36	43	45	51
WPA2-AES	34	39	45	49
WPA3-SAE	34	39	45	49

STA Mode Throughput - AN Mode | 5 GHz Band | 40 MHz (HT)				
Protocol	**TCP (Mbit/s)**		**UDP (Mbit/s)**	
Direction	Tx	Rx	Tx	Rx
Open Security	48	63	71	72
WPA2-AES	46	64	71	72
WPA3-SAE	46	64	71	72

3.2.5.3   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	27	27	30	51
WPA2-AES	28	27	31	52
WPA3-SAE	28	27	31	52

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	31	41	35	64
WPA2-AES	34	40	35	63
WPA3-SAE	34	39	35	62

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	46	65	64	69
WPA2-AES	51	57	64	64
WPA3-SAE	51	57	64	65

3.2.6   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)

3.2.7   Bug Fixes/Feature Enhancements

Component	Description
-	NA

3.2.8   Known Issues

Component	Description
-	NA

3.3   SD 8801

3.3.1   Package Information

- SDK Version: 2.13.0

3.3.2   Version Information

- Wireless SoC : 88W8801
- Wi-Fi Firmware Version : 14.91.36.p178

  - o   14 - Major revision
  - o   91 - Feature pack
  - o   36 - Release version
  - o   p178 - Patch number

3.3.3   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)
- Test Tools
  - o   iPerf (version 2.0.5)

3.3.4   Wi-Fi Certification

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

3.3.4.1   WFA Certifications

- STA | 802.11n
- STA | PMF
- STA | WPA3 (SAE)

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

3.3.5   Wi-Fi Throughput

3.3.5.1   Throughput Test Setup

- Environment: Shield Room - Over the Air
- External Access Point: Asus-AX88U

- DUT : W8801 Murata (Module: 2DS M.2) with EVK-MIMXRT1060 platform
- DUT Power Source: External power supply

- External Client: IW620-Kestrel

- Channel: 6

- 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.

3.3.5.2   STA Throughput

External AP: Asus-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	30	42	42	60
WPA2-AES	30	40	41	60
WPA3-SAE	30	42	41	60

3.3.5.3   Mobile AP Throughput

External client: IW620-Kestrel

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	30	51	39	63
WPA2-AES	30	50	38	63
WPA3-SAE	30	50	38	63

3.3.6   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)

3.3.7   Bug Fixes/Feature Enhancements

3.3.7.1   FW Version : From 14.91.36.p177 to 14.91.36.p178

Component	Description
--	NA

3.3.8   Known Issues

Component	Description
--	NA

4   Acronyms & Abbreviations

Table 3: List of Acronyms & Abbreviations

Acronyms	Definitions
A2DP	Advanced audio distribution profile
AP	Access Point
BW	Bandwidth
CCMP	Counter Mode CBC-MAC Protocol
CTS	Clear To Send
ERP	Extended Rate Physical
GATT	Generic attribute profile
HFP	Hands free profile
HID	Human interface device
HT	High Throughput
MCS	Modulation and Coding Scheme
MLME	Mac Layer Management Entity
RTS	Request To Send
SAE	Simultaneous Authentication of Equals
STA	Station
VHT	Very High Throughput
WEP	Wired Equivalent Private
WFD	Wi-Fi Direct
WPA	Wi-Fi protected access
WPS	Wi-Fi Protected Setup
WSC	Wi-Fi Simple Configuration

5   Legal Information

5.1   Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. NXP Semiconductors takes no responsibility for the content in this document if provided by an information source outside of NXP Semiconductors. In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory. Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms and conditions of commercial sale of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors and its suppliers accept no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification. Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products. NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Evaluation products — This product is provided on an "as is" and "with all faults" basis for evaluation purposes only. NXP Semiconductors, its affiliates and their suppliers expressly disclaim all warranties, whether express, implied or statutory, including but not limited to the implied warranties of non-infringement, merchantability and fitness for a particular purpose. The entire risk as to the quality, or arising out of the use or performance, of this product remains with customer. In no event shall NXP Semiconductors, its affiliates or their suppliers be liable to customer for any special, indirect, consequential, punitive or incidental damages (including without limitation damages for loss of business, business interruption, loss of use, loss of data or information, and the like) arising out the use of or inability to use the product, whether or not based on tort (including

negligence), strict liability, breach of contract, breach of warranty or any other theory, even if advised of the possibility of such damages.

Notwithstanding any damages that customer might incur for any reason whatsoever (including without limitation, all damages referenced above and all direct or general damages), the entire liability of NXP Semiconductors, its affiliates and their suppliers and customer's exclusive remedy for all of the foregoing shall be limited to actual damages incurred by customer based on reasonable reliance up to the greater of the amount actually paid by customer for the product or five dollars (US$5.00). The foregoing limitations, exclusions and disclaimers shall apply to the maximum extent permitted by applicable law, even if any remedy fails of its essential purpose.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

5.2   Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.