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

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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:
		  ○ Removed Shared Authentication from Wi-Fi Client
		  ○ Added FIPS in Wi-Fi Client General feature
		  ○ 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

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 2.12.1.

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: 2.12.1

3.1.2   Version Information

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

3.1.3   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)

3.1.4   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

3.1.7.1   FW Version : From 16.91.21.p32.2 to 16.91.21.p64

Component	Description
Wi-Fi	"RF Test Mode configuration failed" Not able to start RF Test mode by using "wlan-set-rf-test-mode" command.

3.1.8   Known Issues

Component	Description
-	NA

3.2   SD-UART IW416

3.2.1   Package Information

- SDK version : 2.12.1

3.2.2   Version Information

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

  - 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

3.2.7.1   FW Version : From 16.91.21.p11.3 to 16.91.21.p64

Component	Description
Wi-Fi	STAUT's PMF configuration is getting reset when connection is initiated

3.2.8   Known Issues

Component	Description
-	NA

3.3   SD 8801

3.3.1   Package Information

- SDK Version: 2.12.1

3.3.2   Version Information

- Wireless SoC : 88W8801
- Wi-Fi Firmware Version : 14.91.36.p177

  - o   14 - Major revision
  - o   91 - Feature pack
  - o   36 - Release version
  - o   p177 - 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 AzureWave (Module: AW-NM191NF-uSD) 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	31	37	42	58
WPA2-AES	30	38	39	55
WPA3-SAE	30	37	41	57

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	47	41	63
WPA2-AES	30	47	39	62
WPA3-SAE	30	47	40	62

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

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

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