

XDW-M9821CE-01
DATASHEET

Software:

客 户 Customer	客户承认 Approve（请盖印章）	日 期 Date

拟制 Design	审核 Check	批准 Approve	版本 Version	日期 Date
			V1.0	2020.06.14

更改记录:

Reversion History:

版本 Version	日期 Date	更改内容 Modification
1.0	2020.06.14	新版发行

1. Overview

The XDW-M9821CE-01 is a M.2 module that support 1-stream 802.11ac solutions with Multi-user MIMO (Multiple-Input , Multiple-Output) STA mode with Wireless LAN (WLAN) PCI Express network interface controller with integrated Bluetooth Smart Ready USB interface controller. The XDW-M9821CE-01 provides a complete solution for a high-performance integrated wireless and Bluetooth device.

2. Features

WLAN

- IEEE 802.11a/b/g/n/ac compliant WLAN
- 5MHz / 10MHz / 20MHz / 40MHz / 80MHz bandwidth transmission
- Complies with PCI Express Base Specification Revision 2.1
- Support low-power PCIe 2.1 (with L1-substate) interface for WLAN
- Maximum data rate 54Mbps in 802.11g, 150Mbps in 802.11n and 433.3Mbps in 802.11ac.
- DSSS with DBPSK and DQPSK, CCK modulation with long and short Preamble.
- OFDM with BPSK, QPSK, 16QAM, 64QAM and 256QAM modulation. Convolutional Coding Rate: 1/2, 2/3, 3/4, and 5/6

Bluetooth

- Support Bluetooth 4.2 system
- Compatible with Bluetooth V2.1+EDR
- Integrated MCU to execute Bluetooth protocol stack
- Enhanced BT/WIFI Coexistence Control to improve transmission quality in different Profiles
- Dual Mode support: Simultaneous LE and BR/EDR
- Supports multiple Low Energy states
- Supports Enhanced Power Control
- Supports all packet types in basic rate and enhanced data rate
- Supports Secure Simple Pairing

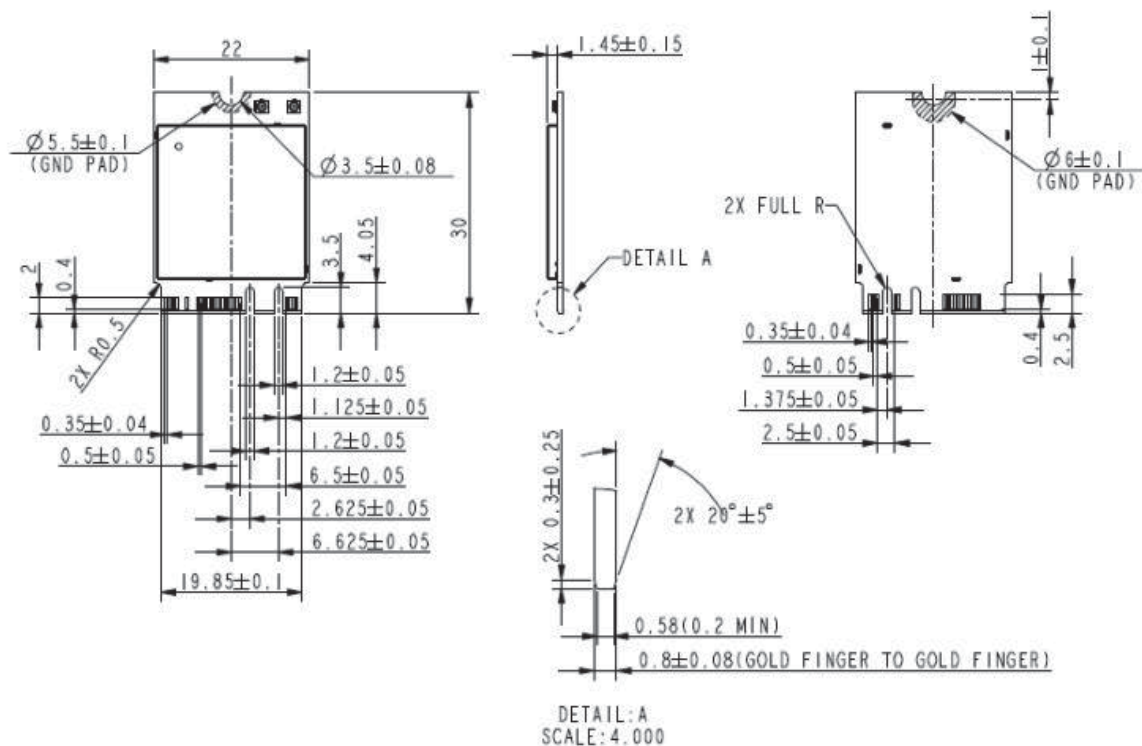
3. General Specification

Model	-00
Product Name	WiFi 11a/b/g/n/ac 1T1R and BT4.2 Module
Major Chipset	Realtek RTL8821CE-CG
Standard	IEEE802.11a/b/g/n/ac, 802.3, 802.3u, BT2.1/ 3.0/ 4.2
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60, 90,120 and maximum of 433.3Mbps
Modulation Method	DSSS/DBPSK/DQPSK/16-QAM/ 64-QAM/256QAM
Frequency Band	2.4~2.4835GHz , 5.0~5.8 GHz
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE802.11a/g/n/ac (OFDM (Orthogonal rthogonal Frequency Division Multiplexing)
Operation Mode	Ad hoc, Infrastructure
Interface	Wi-Fi : PCI-E , Bluetooth : USB2.0
Operating Temperature	-0~ +70° C ambient temperature
Storage Temperature	-40 ~+85°C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
Dimension	22mm x30mm x 0.8mm (LxWxH)±0.15mm

4. DC Characteristics

Symbol	Parameter	Min.	Typ.	Max	Units
VD33	3.3V I/O supply Voltage	3.0	3.3	3.6	V
VD10	1.05V Core Supply Voltage	0.945	1.05	1.155	V
V _{IH}	Input high Voltage	2.0	3.3	3.6	V
V _{IL}	Input low Voltage	--	0	0.9	V
V _{OH}	output high Voltage	2.97	--	3.3	V
V _{OL}	output low Voltage	0	--	0.33	V

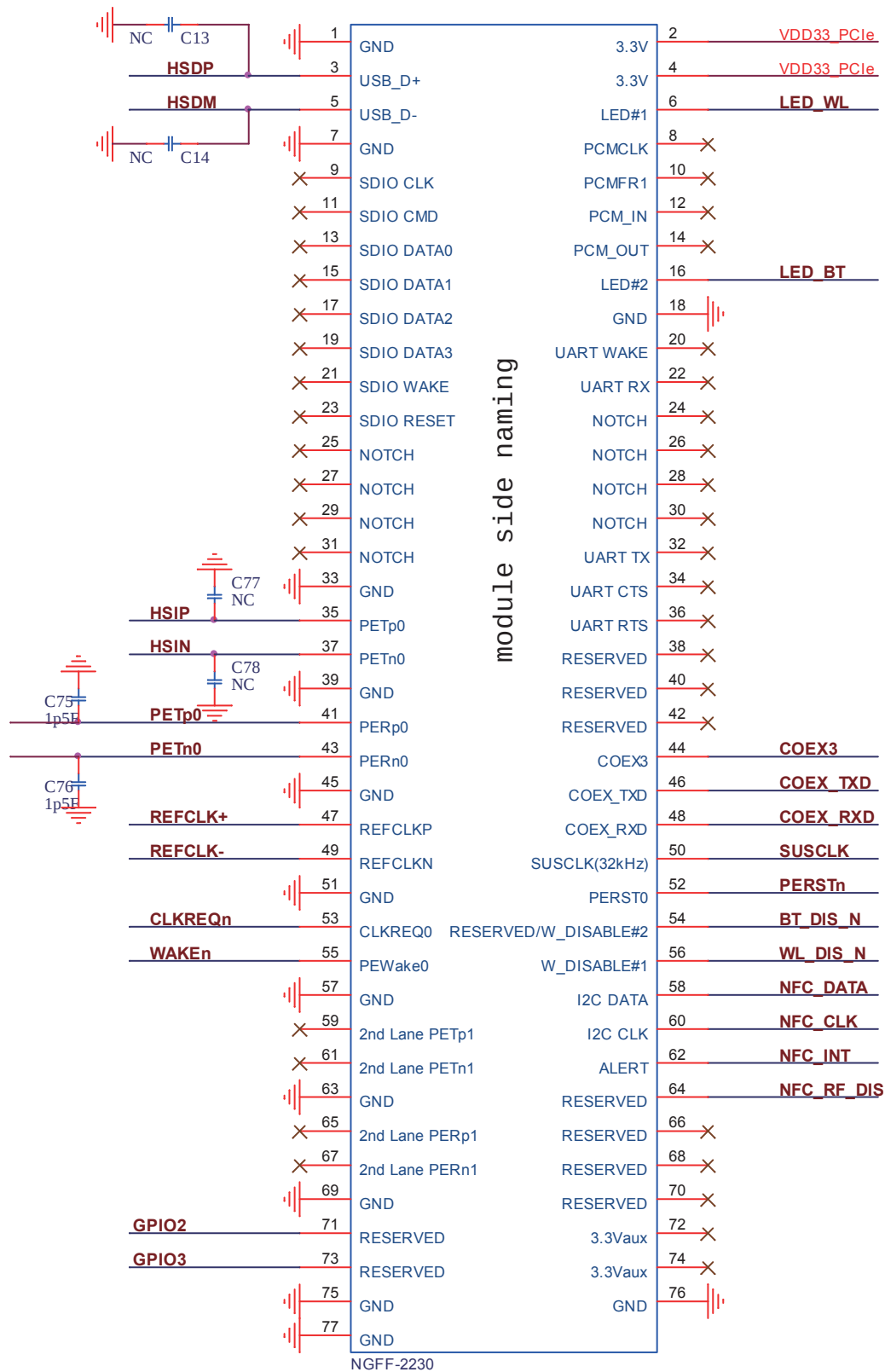
5. Dimension & Pin Assignments



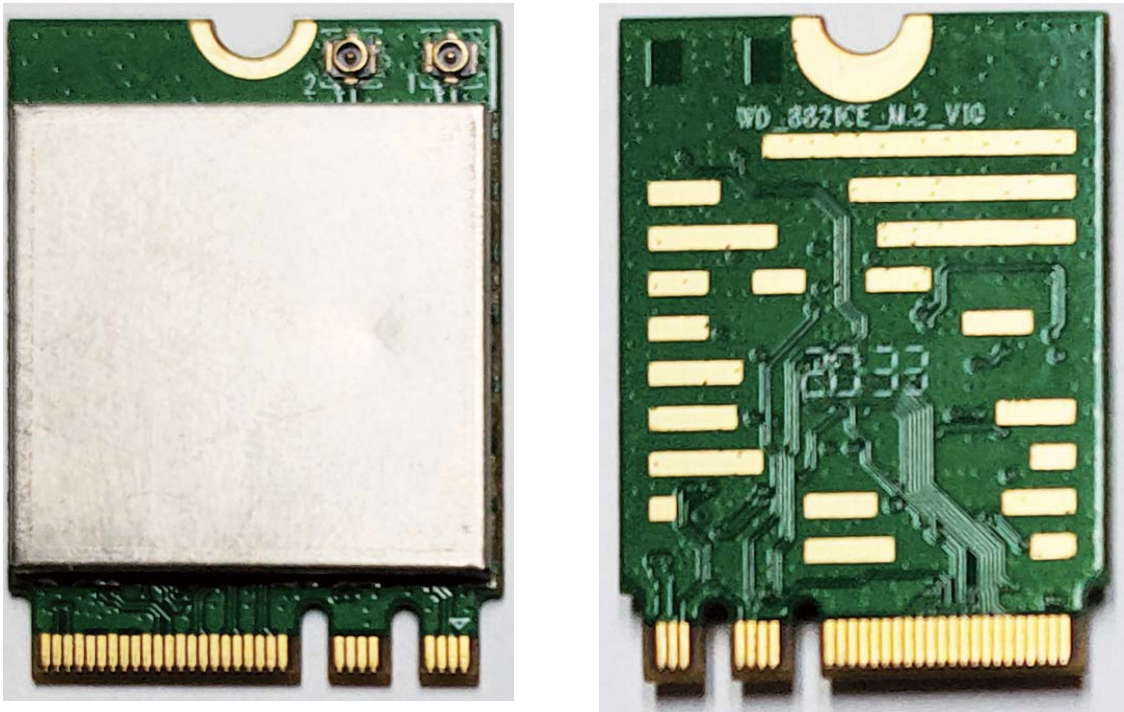
NO	Name	Description
1	GND	Ground connections
2	3.3V	3.3V power supply
3	USB_D_P	USB Differential signal
4	3.3V	3.3V power supply
5	USB_D_N	USB_D_N USB Differential signal
6	LED_WLAN_L	Active low signal. The signal is used to provide status indicators via LED
7	GND	Ground connections
16	LED_BT_L	Active low signal.The signal is used to provide status indicators via LED
17	NC	Floating Pin, No connect to anything.
18	GND	Ground connections
19	NC	Floating Pin, No connect to anything.
20	NC	Floating Pin, No connect to anything.
21	NC	Floating Pin, No connect to anything.
22	NC	Floating Pin, No connect to anything.
23	NC	Floating Pin, No connect to anything.
32	NC	Floating Pin, No connect to anything.
33	GND	Ground connections
34	NC	Floating Pin, No connect to anything.
35	PERp0	Differential receive
36	NC	Floating Pin, No connect to anything.
37	PERn0	Differential receive
38	NC	Floating Pin, No connect to anything.
39	GND	Ground connections
40	NC	Floating Pin, No connect to anything.
41	PETp0	Differential transmit.
42	NC	Floating Pin, No connect to anything.
43	PETn0	Differential transmit
44	COEX3	Coexistence.
45	GND	Ground connections
46	COEX_TXD	Coexistence
47	REFCLKP	Differential reference clock.
48	COEX_RXD	Coexistence
49	REFCLKN	Differential reference clock.

50	SUSCLK	32KHz clock input
51	GND	Ground connections
52	PERST0	PE-Reset is a functional reset to the card as defined by the PCI Express Mini Card CEM specification.
53	CLKREQ0	Reference clock request
54	BT_DIS_N	BT disable control.
55	PEWAKE0	Open Drain active Low signal. This signal is used to request that the system return from a sleep/suspended state to service a function initiated wake event.
56	WL_DIS_N	WLAN disable control.
57	GND	Ground connections
58-62	NC	Floating Pin, No connect to anything.
63	GND	Ground connections
64	NC	Floating Pin, No connect to anything.
65	NC	Floating Pin, No connect to anything.
66	NC	Floating Pin, No connect to anything.
67	NC	Floating Pin, No connect to anything.
68	NC	Floating Pin, No connect to anything.
69	GND	Ground connections
70	NC	Floating Pin, No connect to anything.
71	GPIO2	Reserved
72	NC	Floating Pin, No connect to anything.
73	GPIO3	Reserved
74	NC	Floating Pin, No connect to anything.
75	GND	Ground connections
76	GND	Ground connections
77	GND	Ground connections

6. Schematics



7. Modular photo



8. Supplier

对应物料	型号规格	供应厂家
Crystal	40Mhz	JWT ， FK ， SFJ
Diplexer	2.4G/5G	Sunlord, TDK, Glead
PCBA	M9821CE	A ， 0 ， S

9. Electrical Characteristics

WiFi Section:

9.1 2.4GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11a/b/g/n/ac WiFi compliant
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz: Ch1 ~ Ch14
Modulation	802.11b : DQPSK, DBPSK, CCK 802.11 g/n : OFDM /64-QAM, 16-QAM, QPSK, BPSK
Output Power	802.11b /11Mbps : 17dBm $\pm$ 2 dB @ EVM $\leq$ -15dB
	802.11g /54Mbps : 15 dBm $\pm$ 2 dB @ EVM $\leq$ -28dB
	802.11n /MCS7 : 14 dBm $\pm$ 2 dB @ EVM $\leq$ -28dB
Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -93 dBm, typical
	- 2Mbps PER @ -91 dBm, typical
	- 5.5Mbps PER @ -88 dBm, typical
	- 11Mbps PER @ -86 dBm, typical
Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps PER @ -90 dBm, typical
	- 9Mbps PER @ -89 dBm, typical
	- 12Mbps PER @ -88 dBm, typical
	- 18Mbps PER @ -85 dBm, typical
	- 24Mbps PER @ -82 dBm, typical
	- 36Mbps PER @ -79 dBm, typical
	- 48Mbps PER @ -74 dBm, typical
	- 54Mbps PER @ -72 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -90 dBm, typical
	- MCS=1 PER @ -87 dBm, typical
	- MCS=2 PER @ -85 dBm, typical
	- MCS=3 PER @ -81 dBm, typical
	- MCS=4 PER @ -78 dBm, typical
	- MCS=5 PER @ -73 dBm, typical
	- MCS=6 PER @ -72 dBm, typical
	- MCS=7 PER @ -70 dBm, typical
	- MCS=0 PER @ -87 dBm, typical
	- MCS=1 PER @ -84 dBm, typical

	- MCS=2	PER @ -82 dBm, typical
	- MCS=3	PER @ -79 dBm, typical
	- MCS=4	PER @ -75 dBm, typical
	- MCS=5	PER @ -71 dBm, typical
	- MCS=6	PER @ -69 dBm, typical
	- MCS=7	PER @ -68 dBm, typical
Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0, NSS1	PER @ -89 dBm, typical
	- MCS=1, NSS1	PER @ -86 dBm, typical
	- MCS=2, NSS1	PER @ -85 dBm, typical
	- MCS=3, NSS1	PER @ -81 dBm, typical
	- MCS=4, NSS1	PER @ -78 dBm, typical
	- MCS=5, NSS1	PER @ -73 dBm, typical
	- MCS=6, NSS1	PER @ -71 dBm, typical
	- MCS=7, NSS1	PER @ -70 dBm, typical
	- MCS=8, NSS1	PER @ -67 dBm, typical
Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0, NSS1	PER @ -86 dBm, typical
	- MCS=1, NSS1	PER @ -84 dBm, typical
	- MCS=2, NSS1	PER @ -82 dBm, typical
	- MCS=3, NSS1	PER @ -79 dBm, typical
	- MCS=4, NSS1	PER @ -75 dBm, typical
	- MCS=5, NSS1	PER @ -71 dBm, typical
	- MCS=6, NSS1	PER @ -69 dBm, typical
	- MCS=7, NSS1	PER @ -68 dBm, typical
	- MCS=8, NSS1	PER @ -63 dBm, typical
	- MCS=9, NSS1	PER @ -58 dBm, typical
Maximum Input Level	802.11b : -10 dBm 802.11g/n : -20 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

9.2 5GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11a/n/ac 1x1, WiFi compliant
Frequency Range	4.900 GHz ~ 5.845 GHz (5.0 GHz ISM Band)
Number of Channels	5.0GHz: Please see the table
Modulation	802.11a : OFDM /64-QAM, 16-QAM, QPSK, BPSK 802.11n : OFDM /64-QAM, 16-QAM, QPSK, BPSK 802.11ac : OFDM /256-QAM
Output Power	802.11a /54Mbps : 13 dBm $\pm$ 2 dB @ EVM $\leq$ -25dB 802.11n HT20 /MCS7 : 12 dBm $\pm$ 2 dB @ EVM $\leq$ -28dB 802.11n HT40 /MCS7 : 11 dBm $\pm$ 2 dB @ EVM $\leq$ -28dB 802.11ac VHT20 /MCS8 : 11 dBm $\pm$ 2 dB @ EVM $\leq$ -30dB 802.11ac VHT40 /MCS9 : 10 dBm $\pm$ 2 dB @ EVM $\leq$ -32dB 802.11ac VHT80 /MCS9 : 10 dBm $\pm$ 2 dB @ EVM $\leq$ -32dB
Receive Sensitivity (11a,20MHz) @10% PER	- 6Mbps PER @ -89 dBm, typical
	- 9Mbps PER @ -88 dBm, typical
	- 12Mbps PER @ -87 dBm, typical
	- 18Mbps PER @ -84 dBm, typical
	- 24Mbps PER @ -81 dBm, typical
	- 36Mbps PER @ -78 dBm, typical
	- 48Mbps PER @ -73 dBm, typical
	- 54Mbps PER @ -72 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -89 dBm, typical
	- MCS=1 PER @ -86 dBm, typical
	- MCS=2 PER @ -84 dBm, typical
	- MCS=3 PER @ -81 dBm, typical
	- MCS=4 PER @ -77 dBm, typical
	- MCS=5 PER @ -72 dBm, typical
	- MCS=6 PER @ -71 dBm, typical
	- MCS=7 PER @ -68 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -86 dBm, typical
	- MCS=1 PER @ -83 dBm, typical
	- MCS=2 PER @ -81 dBm, typical
	- MCS=3 PER @ -78 dBm, typical
	- MCS=4 PER @ -74 dBm, typical
	- MCS=5 PER @ -70 dBm, typical
	- MCS=6 PER @ -68 dBm, typical
	- MCS=7 PER @ -67 dBm, typical
	- MCS=0, NSS1 PER @ -87 dBm, typical

	- MCS=1, NSS1 PER @ -85 dBm, typical
	- MCS=2, NSS1 PER @ -83 dBm, typical
	- MCS=3, NSS1 PER @ -80 dBm, typical
	- MCS=4, NSS1 PER @ -76 dBm, typical
	- MCS=5, NSS1 PER @ -71 dBm, typical
	- MCS=6, NSS1 PER @ -70 dBm, typical
	- MCS=7, NSS1 PER @ -69 dBm, typical
	- MCS=8, NSS1 PER @ -65 dBm, typical
Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0, NSS1 PER @ -85 dBm, typical
	- MCS=1, NSS1 PER @ -82 dBm, typical
	- MCS=2, NSS1 PER @ -80 dBm, typical
	- MCS=3, NSS1 PER @ -77 dBm, typical
	- MCS=4, NSS1 PER @ -74 dBm, typical
	- MCS=5, NSS1 PER @ -69 dBm, typical
	- MCS=6, NSS1 PER @ -68 dBm, typical
	- MCS=7, NSS1 PER @ -67 dBm, typical
	- MCS=8, NSS1 PER @ -62 dBm, typical
	- MCS=9, NSS1 PER @ -58 dBm, typical
Receive Sensitivity (11ac,80MHz) @10% PER	- MCS=0, NSS1 PER @ -82 dBm, typical
	- MCS=1, NSS1 PER @ -79 dBm, typical
	- MCS=2, NSS1 PER @ -77 dBm, typical
	- MCS=3, NSS1 PER @ -73 dBm, typical
	- MCS=4, NSS1 PER @ -70 dBm, typical
	- MCS=5, NSS1 PER @ -67 dBm, typical
	- MCS=6, NSS1 PER @ -65 dBm, typical
	- MCS=7, NSS1 PER @ -63 dBm, typical
	- MCS=8, NSS1 PER @ -59 dBm, typical
	- MCS=9, NSS1 PER @ -55 dBm, typical
Maximum Input Level	802.11a/n/ac : -20 dBm
Antenna Reference	Small antennas with 0~2 dBi peak gain

9.3 Bluetooth Section:

Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V2.1+EDR \ V4.2		
Host Interface	USB2.0		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2402 MHz ~ 2480 MHz		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK		
RF Specification			
	Min.	Typical.	Max.
Output Power		8 dBm	
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-80 dBm	
Maximum Input Level	GFSK (1Mbps):-20dBm		
	π/4-DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

10.Packing information



ESD CAUTION

The XDW-M9821CE-01 is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although XDW-M9821CE-01 is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.

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FCC WARNING

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.