

## WNFB-266AXI(BT)

802.11ax/ac/a/b/g/n Industrial Grade

2T2R Wi-Fi SDIO+Bluetooth 5.0 Combo

M.2 2230 (KEY E) Module



### Wi-Fi SDIO+Bluetooth Combo Solution M.2 2230 (KEY E) Module

This is a WLAN 802.11ax (WiFi 6) SDIO M.2 2230 (KEY E) Module, 802.11ax WiFi 6 allow Increased capacity, faster speed, better coverage connections, improve the battery life of IoT sensors, and extend the range of Wi-Fi signals. By implementing the new 802.11ax standard with its unique features such as OFDMA, 1024QAM, Target Wake Time (TWT), and spatial reuse, the WNFB-266AXI(BT) module enables smooth streaming of high-resolution videos, fewer dropped connections and faster connections farther away from the router and in dense environments.

The Wi-Fi and Bluetooth 5.0 functionalities module with seamless roaming capabilities and advance security. The 802.11ax M.2 2230(KEY E) module can support Multi-User MIMO (MU-MIMO) technology to increase channel capacity when simultaneously servicing multiple devices using the same frequency chunks and can accomplish up to speed of 867Mbps with dual stream. Furthermore the included SDIO interface for Wi- Fi, UART/ PCM interface for Bluetooth.

WNFB-266AXI(BT) module can support the Soft AP mode and Station (Client) mode. The product can be connected to a wireless network as a Client, while also creating a separate network as an AP for other devices to connect to it.

#### Embedded Application

Applications include medical devices, security systems, industrial PC, Remote control, digital signs, STB, embedded / tablet PC's, smart devices, Smart manufacturing, shop, Home, TV, etc.

#### Key Feature

- Dual-stream spatial multiplexing up to 1200 Mbps data rate.
- 20, 40, 80 MHz channels with optional SGI (1024 QAM modulation).
- BT host digital interface: - HCI UART (up to 4 Mbps)  
- PCM for audio data
- Supports standard SDIO v3.0, compatible with SDIO v2.0 HOST interfaces.
- Client MU-MIMO.

**Specification**

<b>Standards</b>	IEEE 802.11ax/ac/a/b/g/n (2T2R) Bluetooth V5.0, V4.2, V4.1, V4.0 LE, V3.0+HS, V2.1+EDR
<b>Chipset</b>	Broadcom
<b>Data Rate</b>	802.11b: 11Mbps 802.11a/g: 54Mbps 802.11n: MCS0~15 802.11ac: MCS0~9 802.11ax: HE0~11 Bluetooth: 1 Mbps, 2Mbps and Up to 3Mbps
<b>Operating Frequency</b>	IEEE 802.11ax/ac/a/b/g/n ISM Band, 2.400GHz~2.4835GHz, 5.150GHz~5.350GHz, 5.470GHz~5.725GHz, 5.725GHz~5.850GHz *Subject to local regulations
<b>Interface</b>	WLAN: SDIO ; Bluetooth: UART
<b>Form Factor</b>	M.2 2230 (KEY E)
<b>Antenna</b>	2 x IPEX MHF4 connectors
<b>Modulation</b>	Wi-Fi: 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) 802.11ax: OFDMA (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM) Bluetooth: GFSK, $\pi/4$ -DQPSK, 8-DPSK
<b>Power Consumption</b>	<b>TBD</b>
<b>Operating Voltage</b>	DC 3.3V
<b>Operating Temperature Range</b>	-30°C~85°C
<b>Storage Temperature Range</b>	-40°C~105°C
<b>Humidity (Non-Condensing)</b>	10%~95% (Operating) 5%~95% (Storing)
<b>Dimension L x W x H (in mm)</b>	22mm( $\pm 0.5$ mm) x 30mm( $\pm 0.5$ mm) x 2.4mm( $\pm 0.5$ mm)
<b>Weight (g)</b>	$\leq 3.5$ g
<b>Driver Support</b>	Linux, Android
<b>Security</b>	64/128-bits WEP, WPA, WPA2, WPA3, 802.1x

OUTPUT POWER & SENSITIVITY		
802.11b		
Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
11Mbps	18.5dBm	$\leq$ -87dBm

802.11g		
Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	17dBm	$\leq$ -74dBm

802.11n / 2.4GHz				
HT20	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	MCS7	16.5dBm	19.5dBm	$\leq$ -74dBm

802.11n / 5GHz				
HT20	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	MCS7	13.5dBm	16.5dBm	$\leq$ -74dBm
HT40	MCS7	13.5dBm	16.5dBm	$\leq$ -71dBm

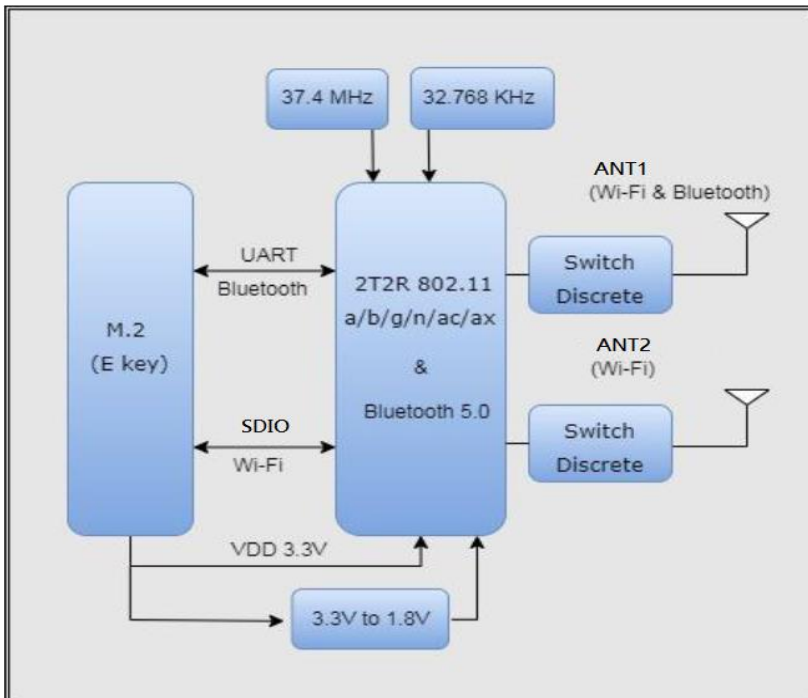
802.11ac				
VHT80	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	MCS9	9dBm	12dBm	$\leq$ -62dBm

802.11ax / 2.4GHz				
HT20	Data Rate	Tx $\pm$ 2dBm		Rx Sensitivity
	HE7	16.5dBm		$\leq$ -75dBm

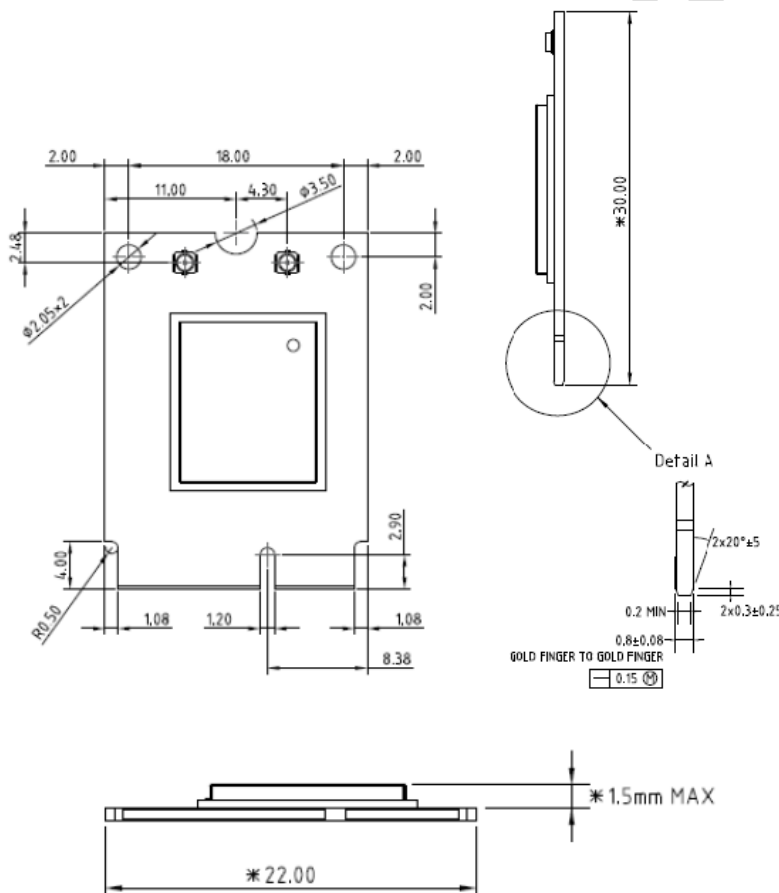
802.11ax / 5GHz				
HE20	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	HE7	13.5dBm	16.5dBm	$\leq$ -69dBm
HE40	HE7	13.5dBm	16.5dBm	$\leq$ -69dBm
HE80	HE9	9dBm	12dBm	$\leq$ -60dBm

Bluetooth		
Data Rate	Tx $\pm$ 2dBm (Class 1 Device)	Rx Sensitivity
1Mbps	0 $\leq$ Output Power $\leq$ 7dBm	<0.01% BER at -90dBm
2Mbps	0 $\leq$ Output Power $\leq$ 7dBm	<0.01% BER at -91dBm

**Block Diagram**



**Mechanical Diagram (mm)**



## Pin Assignment

1			2
3	GND	3.3Vaux	4
5	NC	3.3Vaux	6
7	NC	NC	8
9	GND	PCM_CLK/I2S SCK(IO)(0/1.8V)	10
11	SDIO CLK(I)(0/1.8V)	PCM_SYNC/I2S WS(IO)(0/1.8V)	12
13	SDIO CMD(IO)(0/1.8V)	PCM_OUT/I2S SD_OUT(O)(0/1.8V)	14
15	SDIO DAT0(IO)(0/1.8V)	PCM_IN/I2S SD_IN(I)(0/1.8V)	16
17	SDIO DAT1(IO)(0/1.8V)	NC	18
19	SDIO DAT2(IO)(0/1.8V)	GND	20
21	SDIO DAT3(IO)(0/1.8V)	BT_HOST_WAKE	22
23	WL_HOST_WAKE	UART TXD (O)(0/1.8V)	24
25	WL_REG_ON	Key	26
27	Key	Key	28
29	Key	Key	30
31	Key	Key	32
33	Key	UART RXD (I)(0/1.8V)	34
35	GND	UART RTS (O)(0/1.8V)	36
37	NC	UART CTS (I)(0/1.8V)	38
39	NC	NC	40
41	GND	NC	42
43	NC	BT_REG_ON	44
45	NC	NC	46
47	GND	NC	48
49	NC	NC	50
51	NC	EXT_LPO	52
53	GND	NC	54
55	NC	BT_DEV_WAKE	56
57	NC	NC	58
59	GND	NC	60
61	NC	NC	62
63	NC	NC	64
65	GND	NC	66
67	NC	NC	68
69	NC	NC	70
71	GND	NC	72
73	NC	3.3Vaux	74
75	NC	3.3Vaux	
	GND		

75pin

## Pin Assignment

TOP			
Pin#	Pin Name	Type	Description
1	GND	G	Ground connections
3	NC	—	No connect
5	NC	—	No connect
7	GND	G	Ground connections
9	SDIO_CLK	—	SDIO clock line
11	SDIO_CMD	—	SDIO command line
13	SDIO_DATA_0	—	SDIO data line 0
15	SDIO_DATA_1	—	SDIO data line 1
17	SDIO_DATA_2	—	SDIO data line 2
19	SDIO_DATA_3	—	SDIO data line 3
21	WL_HOST_WAKE	O	WLAN wake up HOST
23	WL_REG_ON	I	Used by PMU to power up or power down the internal module regulators used by the WLAN section. <b>(must be connet to CPU'S GPIO)</b>

**Pin Assignment**

TOP			
Pin#	Pin Name	Type	Description
25	Module Key	—	Mechanical Key
27	Module Key	—	Mechanical Key
29	Module Key	—	Mechanical Key
29	Module Key	—	Mechanical Key
33	GND	G	Ground connections
35	NC	—	No connect
37	NC	—	No connect
39	GND	G	Ground connections
41	NC	—	No connect
43	NC	—	No connect
45	GND	G	Ground connections
47	NC	—	No connect
49	NC	—	No connect
51	GND	G	Ground connections
53	NC	—	No connect
55	NC	—	No connect
57	GND	G	Ground connections
59	NC	—	No connect
61	NC	—	No connect
63	GND	G	Ground connections
65	NC	—	No connect
67	NC	—	No connect
69	GND	G	Ground connections
71	NC	—	No connect
73	NC	—	No connect
75	GND	G	Ground connections

## Pin Assignment

BOTTOM			
Pin#	Pin Name	Type	Description
2	3.3Vaux	P	VDD system power supply input
4	3.3Vaux	P	VDD system power supply input
6	NC	—	No connect
8	PCM_CLK	I/O	PCM clock
10	PCM_SYNC	I/O	PCM sync signal
12	PCM_OUT	O	PCM Data output
14	PCM_IN	I	PCM data input
16	NC	—	No connect
18	GND	G	Ground connections
20	BT_HOST_WAKE	O	Bluetooth device to wake-up HOST
22	UART_TXD	O	Bluetooth UART interface
24	Module Key	—	Mechanical Key
26	Module Key	—	Mechanical Key
28	Module Key	—	Mechanical Key
30	Module Key	—	Mechanical Key
32	UART_RXD	I	Bluetooth UART interface
34	UART_RTS_N	O	Bluetooth UART interface
36	UART_CTS_N	I	Bluetooth UART interface
38	NC	—	No connect
40	NC	—	No connect
42	BT_REG_ON	I	Low asserting reset for Bluetooth core <b>(must be connet to CPU'S GPIO)</b>
44	NC	—	No connect
46	NC	—	No connect
48	NC	—	No connect
50	EXT_LPO	I	External sleep clock input (32.768KHz)
52	NC	—	No connect
54	BT_DEV_WAKE	I	HOST wake-up Bluetooth device
56	NC	—	No connect
58	NC	—	No connect
60	NC	—	No connect
62	NC	—	No connect
64	NC	—	No connect
66	NC	—	No connect

## Pin Assignment

BOTTOM			
Pin#	Pin Name	Type	Description
68	NC	—	No connect
70	NC	—	No connect
72	3.3Vaux	P	VDD system power supply input
74	3.3Vaux	P	VDD system power supply input

## Certification

### Dipole Ant.

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> FCC | <input checked="" type="checkbox"/> CE (RED EN 300 328 V2.1.1 / EN 301 893 V2.1.1) |
| <input checked="" type="checkbox"/> IC  | <input checked="" type="checkbox"/> MIC  |
| <input type="checkbox"/> NCC            | <input type="checkbox"/> ASNZS   |

## Ordering Information

Product Name	Part Number	Description
WNFB-266AXI(BT)	R9701A10002	802.11ax/ac/a/b/g/n 2T2R Wi-Fi SDIO / Bluetooth 5.0 Combo M.2 2230 Module

## Optional Accessory

Product Name	Part Number	Description
AD-103AG	R3410110203	Dipole Antenna, 2dBi 2.4GHz/5GHz, RP-SMA(M) connector
AD-302N	R3410110221	Dipole Antenna, 3dBi/2dBi 2.4G/5GHz, RP-SMA(M) connector
AD-303N	R3410110222	Dipole Antenna, 3dBi/3dBi 2.4G/5GHz, RP-SMA(M) connector
AD-305N	R3410110223	Dipole Antenna, 5dBi/5dBi 2.4G/5GHz, RP-SMA(M) connector
CBIRF-NE150	R3470300025	RF Cable, I-PEX/MHF4 to RP-SMA(F); L:150mm; Coaxial 0.81 Black
CBIRF-NE250	R3470300026	RF Cable, I-PEX/MHF4 to RP-SMA(F); L:250mm; Coaxial 0.81 Black