WNFB-266AXI(BT)

802.11ax/ac/a/b/g/n 2T2R Industrial Grade

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.

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

Standards	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
Chipset	Broadcom
Data Rate	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
Operating Frequency	IEEE 802.11ax/ac/a/b/g/n ISM Band, 2.400GHz~2.4835GHz, 5.150GHz~5.850GHz *Subject to local regulations
Interface	WLAN: SDIO Bluetooth: UART
Form Factor	M.2 2230 E KEY
Antenna	2 x IPEX MHF4 connectors ANT1 for WLAN/BT, ANT2 for WLAN
Modulation	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: Header: GFSK Payload 2M: π/4-DQPSK Payload 3M: 8-DPSK
Power Consumption	Tx mode: 712mA(Max.) Rx mode: 89mA(Max.)
Operating Voltage	DC 3.3V

Operating Temperature Range	-40°C~+85°C
Storage Temperature Range	-40°C~+105°C
Humidity (Non-Condensing)	10%~95% (Operating) 5%~95% (Storing)
Dimension L x W x H (in mm)	30mm(±0.15mm) x 22mm(±0.15mm) x 2.2mm(±0.2mm)
Weight (g)	≦ 3.5g
Driver Support	Linux, Android
Security	64/128-bits WEP, WPA, WPA2, WPA3, 802.1x

OUTPUT POWER & SENSITIVITY		
802.11b		
Data Rate	**Tx ± 2dBm**	**Rx Sensitivity**
11Mbps	17.5dBm	≦-88dBm

802.11g		
Data Rate	**Tx ± 2dBm**	**Rx Sensitivity**
54Mbps	12dBm	≦-77dBm

802.11n / 2.4GHz				
HT20	**Data Rate**	**Tx ± 2dBm (1TX)**	**Tx ± 2dBm (2TX)**	**Rx Sensitivity**
	MCS7	12dBm	15dBm	≦-75dBm

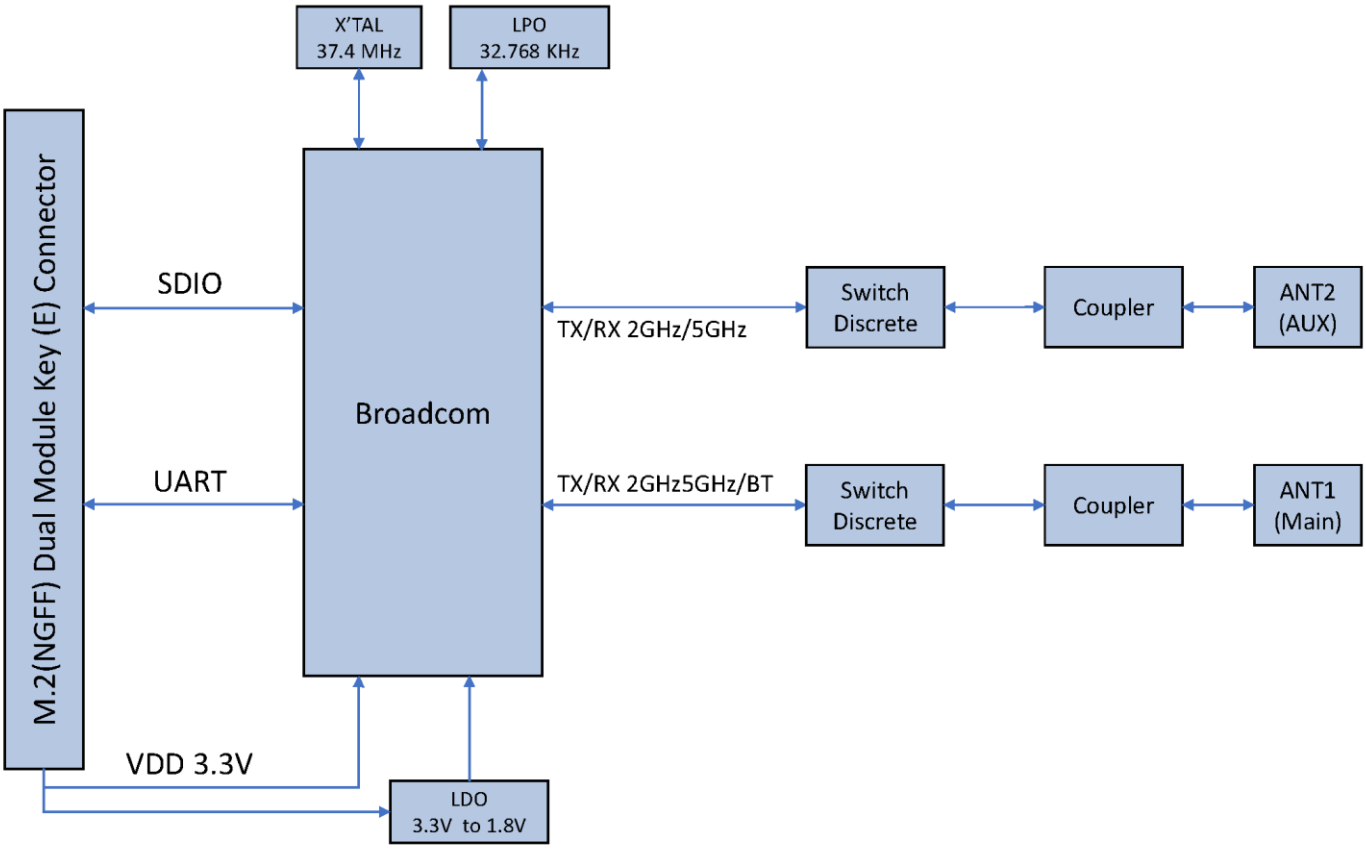
802.11a / 5GHz		
Data Rate	**Tx ± 2dBm**	**Rx Sensitivity**
54Mbps	14.5dBm	≦-76dBm

802.11n / 5GHz				
HT20	**Data Rate**	**Tx ± 2dBm (1TX)**	**Tx ± 2dBm (2TX)**	**Rx Sensitivity**
	MCS7	13.5dBm	16.5dBm	≦-74dBm
HT40	MCS7	11dBm	14dBm	≦-70dBm
802.11ac				
VHT80	**Data Rate**	**Tx ± 2dBm (1TX)**	**Tx ± 2dBm (2TX)**	**Rx Sensitivity**
	MCS9	9dBm	12dBm	≦-57dBm

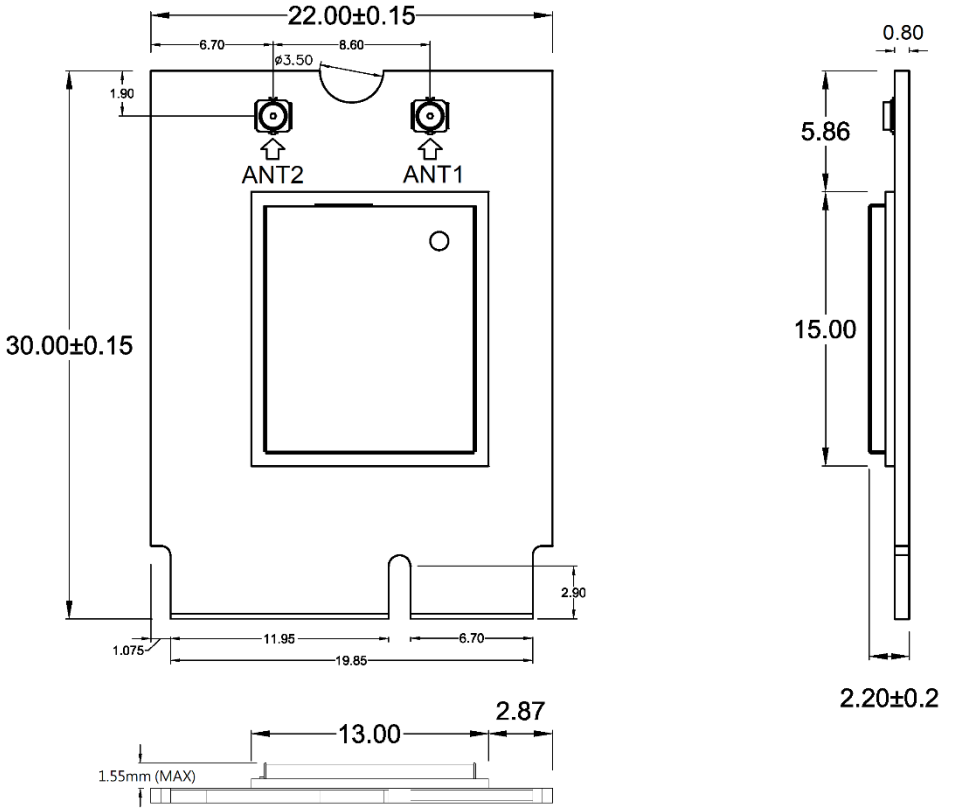
802.11ax				
HE20	**Data Rate**	**Tx ± 2dBm (1TX)**	**Tx ± 2dBm (2TX)**	**Rx Sensitivity**
	HE7	13.5dBm	16.5dBm	≦-69dBm
HE40	HE7	11dBm	14dBm	≦-68dBm
HE80	HE9	9dBm	12dBm	≦-60dBm

Bluetooth		
Data Rate	**Tx ± 2dBm (Class 1 Device)**	**Rx Sensitivity**
3Mbps	+0≦ Output Power ≦+7dBm	<0.01% BER at -85dBm

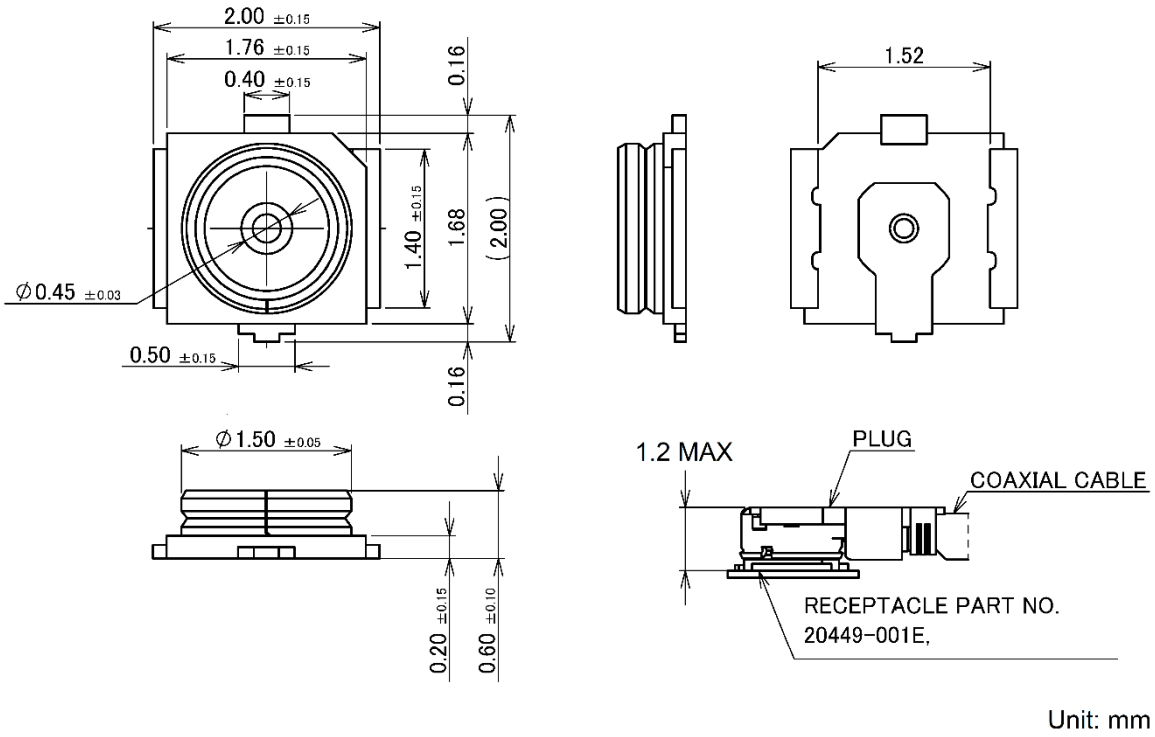
Block Diagram



Mechanical Diagram (mm)



MHF4 Connector spec.



Unit: mm

Pin Assignment

The following section illustrate signal pin-outs for the module connector.

TOP			
Pin#	**Pin Name**	**Type**	**Description**
1	GND	G	Ground connections
3	USB_D+	NC	No Connection
5	USB_D-	NC	No Connection
7	GND	G	Ground connections
9	SDIO_CLK(1.8V)	I	SDIO clock line
11	SDIO_CMD(1.8V)	I/O	SDIO command line
13	SDIO_DATA0(1.8V)	I/O	SDIO data line 0
15	SDIO_DATA1(1.8V)	I/O	SDIO data line 1
17	SDIO_DATA2(1.8V)	I/O	SDIO data line 2
19	SDIO_DATA3(1.8V)	I/O	SDIO data line 3
21	SDIO_WAKE#(1.8V)	NC	No Connection
23	SDIO_RESET#(1.8V)	NC	No Connection
25	NOTCH FOR KEY E	NC	No Connection
27	NOTCH FOR KEY E	NC	No Connection
29	NOTCH FOR KEY E	NC	No Connection
31	NOTCH FOR KEY E	NC	No Connection
33	GND	G	Ground connections
35	PERp0	NC	No Connection
37	PERn0	NC	No Connection
39	GND	G	Ground connections
41	PETp0	NC	No Connection
43	PETn0	NC	No Connection
45	GND	G	Ground connections
47	REFCLKp0	NC	No Connection
49	REFCLKn0	NC	No Connection
51	GND	G	Ground connections
53	CLKREQ0#(3.3V)	NC	No Connection
55	PEWAKE0#(3.3V)	NC	No Connection
57	GND	G	Ground connections
59	RESERVED	NC	No Connection
61	RESERVED	NC	No Connection
63	GND	G	Ground connections
65	RESERVED	NC	No Connection

TOP			
Pin#	**Pin Name**	**Type**	**Description**
67	RESERVED	NC	No Connection
69	GND	G	Ground connections
71	RESERVED	NC	No Connection
73	RESERVED	NC	No Connection
75	GND	G	Ground connections

Note: Power (P), Ground (G), Open-Drain (OD), Input (I), Output (O), Do Not Connect (DNC), No Connection (NC)

Pin Assignment

The following section illustrate signal pin-outs for the module connector.

BOTTOM			
Pin#	**Pin Name**	**Type**	**Description**
2	3.3 V	P	VDD system power supply input
4	3.3 V	P	VDD system power supply input
6	LED_1#	NC	No Connection
8	PCM_CLK(1.8V)	I/O	PCM clock
10	PCM_SYNC(1.8V)	I/O	PCM sync signal
12	PCM_OUT(1.8V)	O	PCM Data output
14	PCM_IN(1.8V)	I	PCM data input
16	LED_2#	NC	No Connection
18	GND	G	Ground connections
20	UART_WAKE#(3.3V)	O	BT_HOST_WAKE(1.8V) Bluetooth wake up Host
22	UART_TXD(1.8V)	O	Bluetooth UART interface
24	NOTCH FOR KEY E	NC	No Connection
26	NOTCH FOR KEY E	NC	No Connection
28	NOTCH FOR KEY E	NC	No Connection
30	NOTCH FOR KEY E	NC	No Connection
32	UART_RXD(1.8V)	I	Bluetooth UART interface
34	UART_RTS(1.8V)	O	Bluetooth UART interface
36	UART_CTS(1.8V)	I	Bluetooth UART interface
38	VENDOR DEFINED	I	BT_DEV_WAKE(1.8V) HOST wake-up Bluetooth device
40	VENDOR DEFINED	O	WL_HOST_WAKE(1.8V) WLAN wake up HOST

BOTTOM			
Pin#	**Pin Name**	**Type**	**Description**
42	VENDOR DEFINED	NC	No Connection
44	COEX3(1.8V)	NC	No Connection
46	COEX_TXD(1.8V)	NC	No Connection
48	COEX_RXD(1.8V)	NC	No Connection
50	SUSCLK(3.3V)	NC	No Connection
52	PERST0#(3.3V)	NC	No Connection
54	W_DISABLE2#(3.3V)	I	BT_REG_ON(1.8V) Used by PMU to power up or power down the internal module regulators used by the Bluetooth section. **(must be connect to CPU'S GPIO)**
56	W_DISABLE1#(3.3V)	I	WL_REG_ON(1.8V) Used by PMU to power up or power down the internal module regulators used by the WLAN section. **(must be connect to CPU'S GPIO)**
58	I2C_DATA(1.8V)	NC	No Connection
60	I2C_CLK(1.8V)	NC	No Connection
62	ALERT#(1.8V)	NC	No Connection
64	RESERVED	NC	No Connection
66	UIM_SWP	NC	No Connection
68	UIM_POWER_SNK	NC	No Connection
70	UIM_POWER_SRC	NC	No Connection
72	3.3 V	P	VDD system power supply input
74	3.3 V	P	VDD system power supply input

Note: Power (P), Ground (G), Open-Drain (OD), Input (I), Output (O), Do Not Connect (DNC), No Connection (NC)

Certification

Dipole Ant.

- ■ **FCC**
- ■ **IC**
- □ **NCC**
- ■ **CE** (RED EN 300 328 V2.2.2 / EN 301 893 V2.1.1)
- ■ **MIC**
- □ **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
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