

MEC-WIFI-2142B-30

WLAN 802.11 a/b/g/n/ac/ax 2T2R BT 5.2

M.2 Type 2230 A+E key (Wi-Fi 6E)

Product Datasheet



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Revision History

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2024.07.01	1.0	First Released



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1. Product Overview

1.1 Introduction

MEC-WIFI-2142B-30 is a highly integrated single-chip that supports Wi-Fi 6E (802.11ax) solutions with Multi-user MIMO (Multiple-Input, Multiple-Output) with Wireless LAN (WLAN) PCI Express network interface controller with integrated Bluetooth Smart Ready USB interface controller.

MEC-WIFI-2142B-30 standard further improves the 802.11ax network user experience with faster and more reliable Wi-Fi networks that are designed for soaring device densities and high-bandwidth applications such as video streaming, videoconferencing, and voice calls. MEC-WIFI-2142B-30 provides a complete solution for a high-performance integrated wireless and Bluetooth device.

1.2 Features

1.2.1 Common Features

- Form factor: M.2 2230 (A-E Key) type.
- Supports for BT & WLAN Co-existence.
- WAPI (Wireless Authentication Privacy Infrastructure) certified.
- RoHS Compliance.
- Halogen Free Compliance

1.2.2 Wi-Fi Features

- IEEE 802.11a/b/g/n/ac/ax WLAN.
- WLAN supports 2.4GHz /5GHz and 6GHz channel.
- Compatible with PCI Express 2.1.
- PCIe LTR/L1. Off state supported.
- Enterprise level security supporting: WPA, WPA2, WPA3, Open, shared key, and pair-wise key authentication services.
- Maximum PHY data rate up to 286.8 Mbps using 20MHz bandwidth, 573.5Mbps using 40MHz bandwidth, 1201Mbps using 80MHz bandwidth and 2402Mbps using 160MHz.



- Two Transmit and Two Receive paths 20MHz / 40MHz / 80MHz / 160MHz bandwidth transmission.
- Supports 802.11ac 2T2R, Wave-2 compliant with MU-MIMO.
- Supports 802.11ax 2T2R, with OFDMA and MU-MIMO, by 4 types PPDU format, such as HE-SUPPDU, HE-ER-SU-PPDU, HE-MU-PPDU, and HE-TB-PPDU.

1.2.3 Bluetooth Features

- Bluetooth: BT 2.1+ EDR/3.0/4.0/4.1/4.2/5.2.
- Supports Class I (TX power maximum to +6dBm).
- Supports 2 Mbps Bluetooth Low Energy (BLE), BLE long range.
- Supports for SCATTERNET and PICONET.
- Supports Secure Simple Pairing.
- Fast AGC control to improve receiving dynamic range.
- Dual Mode support: Simultaneous LE and BR/EDR.

1.3 Model Define

Model Name	MEC-WIFI-2142B-30	
RF Connector #	MHF4*2	Ant.1 Wi-Fi + BT Ant.2 Wi-Fi
Antenna design	Two Antenna for TX/RX, Diversity (Antenna and cable are not included for standard package)	



2. Specification

2.1 Hardware Specification

General Specification	
Wi-Fi	
IEEE Networking Standard	IEEE 802.11 a/b/g/n/ac/ax Wireless Local Area Networks
RF Frequency Range	2.412~2.484GHz / 4.905-5.915GHz/ 5.930-7.110GHz
PHY Rate	286.8Mbps using 20MHz bandwidth 573.5Mbps using 40MHz bandwidth 1201Mbps using 80MHz bandwidth 2402Mbps using 160MHz bandwidth
MIMO Technology	2T2R
IEEE 802.11i / IEEE 802.1x security mechanisms	WEP 64&128bit, WPA, WPA-PSK, WPA2, WPA2-PSK, WPA3, WPS
Other IEEE standard	802.11e QoS Enhancement(WMM) 802.11h DFS, TPC, Spectrum measurement
Bluetooth	
Bluetooth standard	V5.2/V4.2/ V4.1/ V4.0LE/ V3.0/ V2.1+EDR
Bluetooth Software	Bluetooth Suite
Data Rate	1 Mbps, 2Mbps and Up to 3Mbps
Transmit Output Power	BR, EDR, LE: 4dBm ±2dB ; Class I Device
Receiver Sensitivity	< 0.1% BER at -70dBm
Operating Voltage	+3.3V (±9%) I/O supply voltage
Interface	WLAN: PCIe 2.1 Bluetooth: USB2.0



Board Specification	
WLAN Chip	Realtek RTL8852CE
BT Chip	Realtek RTL8852CE
Antenna	External antenna (not included)
RF connector	Dual MHF4 Antenna Connectors
Form Factor	M.2 2230 type

Environmental	
Operating	Operating temperature: 0 to 70°C Relative Humidity : 5-90% (non-condensing)
Storage	Temperature: -40 to 80°C Relative Humidity : 5-95% (non-condensing)

2.2 Software Specification

Software Support	
Operating System	Windows 10 Linux (TBC) Android (TBC)
EMI Test Report	FCC/CE/NCC ready



2.3 Electronic Specification

2.3.1 Pin Define

PIN ASSIGNMENT (MODULE KEY A-E)

PIN	Definition	Remark
1	GND	GND
3	HSDP	USB_D+
5	HSDM	USB_D-
7	GND	GND
9	NOTCH	NU
11	NOTCH	NU
13	NOTCH	NU
15	NOTCH	NU
17	NC	NU
19	NC	NU
21	NC	NU
23	NC	NU
25	NOTCH	NU
27	NOTCH	NU
29	NOTCH	NU
31	NOTCH	NU
33	GND	GND
35	PERp0	PCIE Receive Differential Pair
37	PERn0	PCIE Receive Differential Pair
39	GND	GND
41	PETp0	PCIE Receive Differential Pair
43	PETn0	PCIE Receive Differential Pair
45	GND	GND

PIN	Definition	Remark
2	VDD33	+3.3V
4	VDD33	+3.3V
6	LED_WLAN#	LED for WiFi
8	NOTCH	NU
10	NOTCH	NU
12	NOTCH	NU
14	NOTCH	NU
16	LED_BT	LED for BT
18	GND	GND
20	UART WAKE	UART_WAKE
22	UART TX	UART_TX
24	NOT CH	NU
26	NOT CH	NU
28	NOT CH	NU
30	NOT CH	NU
32	UART RX	UART_RX
34	UART RTS	NU
36	UART CTS	UART_CTS
38	RESERVED	NU
40	RESERVED	NU
42	RESERVED	NU
44	COEX3(I/O)	NU
46	COEX_TXD(O)	NU



47	REFCLK+	PCIE Receive Differential Clock
49	REFCLK-	PCIE Receive Differential Clock
51	GND	GND
53	CLKREQ#	Reference Clock Request Signal
55	PEWAKE#	0: WiFi Wake Up
57	GND	GND
59	RESERVED	NU
61	RESERVED	NU
63	GND	GND
65	RESERVED	NU
67	RESERVED	NU
69	GND	GND
71	RESERVED	NU
73	RESERVED	NU
75	GND	GND

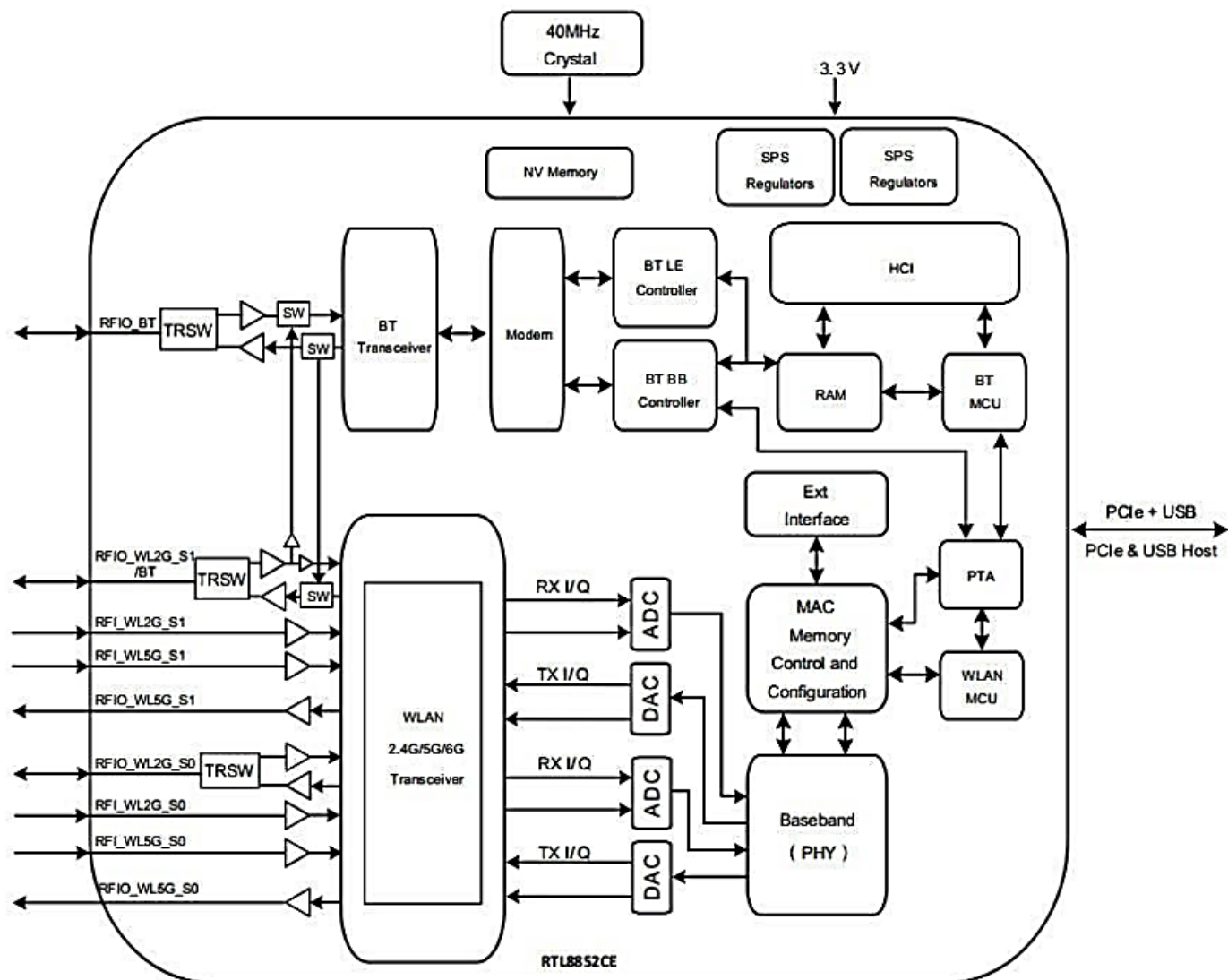
48	COEX_RXD(I)	NU
50	SUSCLK	SUSCLK 32KHz
52	PERST	0: to Disable WiFi (power off) ^[2] 1: to Enable WiFi
54	DIS_BT_N	Disable BT signal
56	W_DISABE	0: WiFi Radio OFF 1: WiFi Radio ON
58	I2C DATA	NU
60	I2C CLK	NU
62	ALERT	NU
64	RESERVED	NU
66	RESERVED	NU
68	RESERVED	NU
70	RESERVED	NU
72	VDD33	+3.3V
74	VDD33	+3.3V

[1] NU: Not used.

[2] "Power off" means the device is disabled, you cannot find it in Windows device manager



2.3.2 Block Diagram

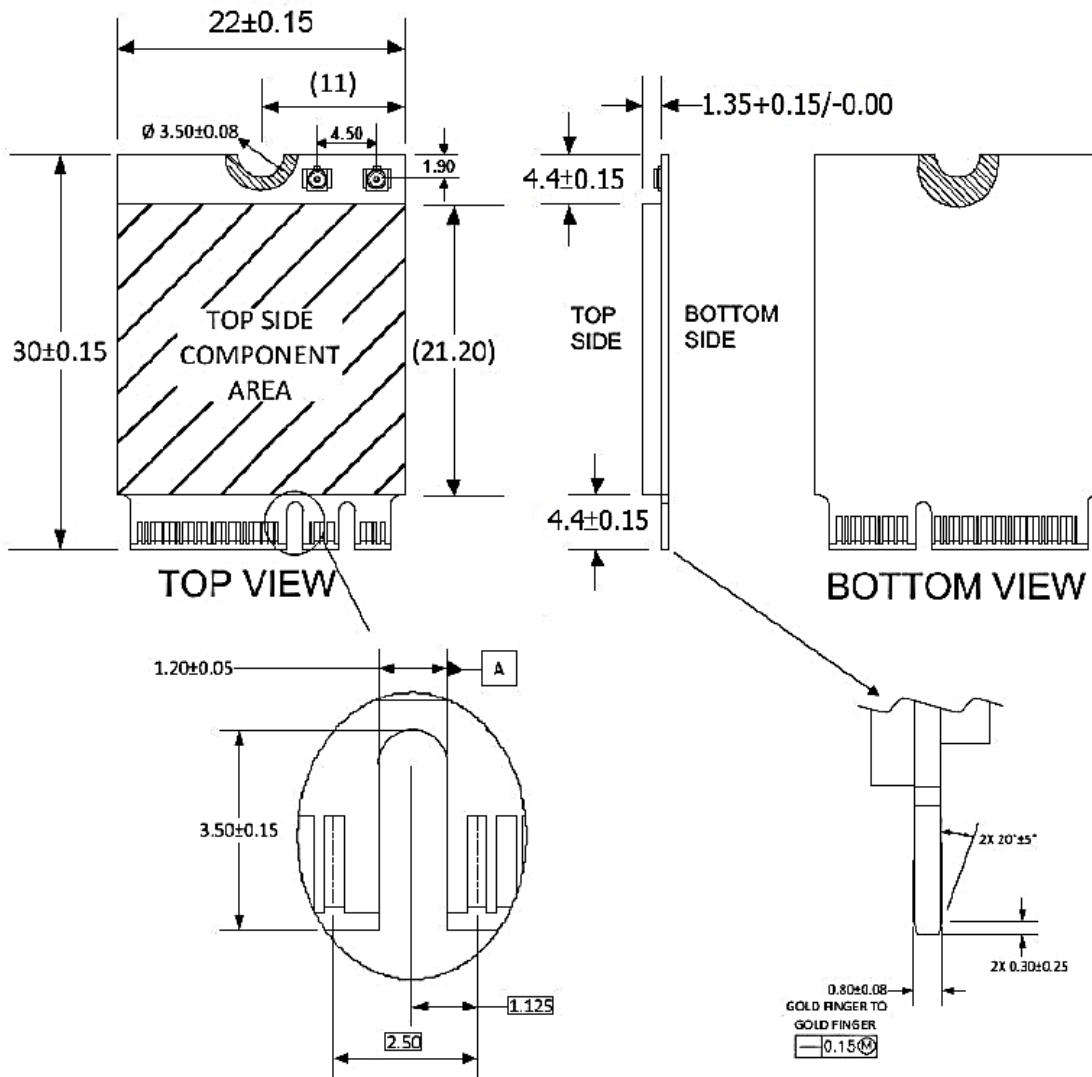




2.4 Mechanical Specification

Board Dimension			
Form factor	M.2 2230		
PCB Dimension	30L*22W mm		
PCB thickness	0.8mm (+/- 0.1mm)		
SMD	Single side		
Max. height of components (from PCB)	Top side	Shielding case	2.3mm (+/- 0.2mm)
	Bottom side	0mm	

Mechanical Drawing



Unit: mm