

Wireless Product Solutions

Summary

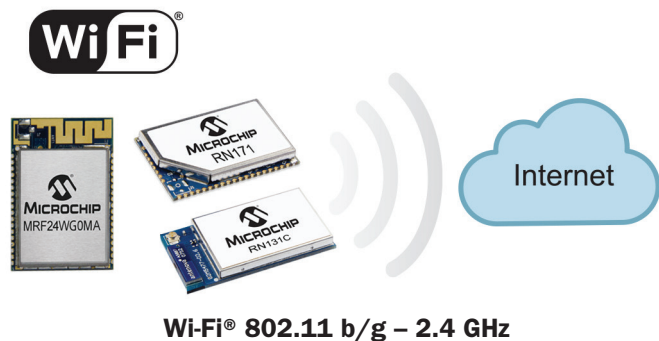
Microchip's broad portfolio of fully certified wireless solutions make it easy to add wireless connectivity to your application. With so many choices and technologies available, often the first question is, what wireless technology is best for my application? Depending on what your unique application requires, certain wireless technologies are better suited for your project than others.

Typical Wireless Requirements

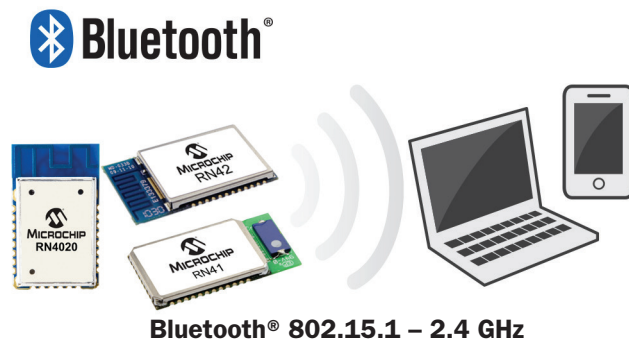
	Wi-Fi®	Bluetooth®	Bluetooth Low Energy	ZigBee®	Sub-GHz
Internet connected device	Best	Okay	Okay	Poor	Poor
Smartphone accessory	Okay	Best	Okay	Poor	Poor
Private network	Okay	Poor	Poor	Best	Best
Sensor network	Best	Poor	Poor	Best	Okay
Health/Fitness Sensor	Okay	Okay	Best	Poor	Best
Low power	Okay	Okay	Best	Okay	Best
High data rate	Best	Okay	Poor	Poor	Poor
Interoperability between vendors	Best	Best	Okay	Poor	Poor

Fully Certified Module Solutions for Drop-In Wireless Connectivity

Does the application need to access the internet?



Does the application require direct communication with a smartphone, tablet or computer?



Does the customer have control of all of the nodes in the system, whether send/receive or both?



Development Tools from Microchip

Part Number	Development Tool
RN-131-EK	RN131 Wi-Fi® Evaluation Kit
RN-171-EK	RN171 Wi-Fi Evaluation Kit
DV102412	MRF24WG0MA Wi-Fi G Demonstration Board
RN-52-EK	RN52 Audio Bluetooth® Evaluation Kit
RN-4020-PICTAIL	RN4020 Bluetooth Low Energy PICTail™/PICTail Plus
EV77SPPS3MC2A	BM77 Bluetooth 4.0 Dual-Mode Evaluation Board
RN-41-EK	RN41 Bluetooth Evaluation Kit
RN-42-EK	RN42 Bluetooth Evaluation Kit
AC164134-1	MRF24J40MA PICTail/PICTail Plus Daughter Board for ZigBee® /MiWi™ protocol development
AC164138-1/2	MRF89XAM8A/9A PICTail/PICTail Plus Daughter Board for Sub-GHz/MiWi protocol development
DM182015-1/2/3	8-bit Wireless Development Kit for MiWi protocol development
AC182015-1/2/3	ZENA™ Wireless Adapter for ZigBee /MiWi protocol development



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Wi-Fi® Modules													
Part #	Antenna	Host MCU	IEEE Standard	Sensitivity (dBm)	Power Output (dBm)	Tx Power Consumption (mA)	Rx Power Consumption (mA)	Clock (MHz)	Sleep	Protocols	Encryption	Interface	Pin Count/Package
MRF24WBOMA ⁽³⁾	PCB	PIC® MCU	802.11b	-91	+10	154	85	25	0.1 µA ⁽¹⁾	Wi-Fi® Connection Manager, Announce, DNS, DDNS, DHCP, FTP, HTTP, NBNS, SNMP, SNT, SSL, TCP, UDP, ZeroConf ⁽²⁾	WPA2-PSK, WPA-PSK, WEP	4-wire SPI	36/Module
MRF24WBOMB ⁽³⁾	U.FL	PIC MCU	802.11b	-91	+10	154	85	25	0.1 µA ⁽¹⁾	Wi-Fi Connection Manager, Announce, DNS, DDNS, DHCP, FTP, HTTP, NBNS, SNMP, SNT, SSL, TCP, UDP, ZeroConf ⁽²⁾	WPA2-PSK, WPA-PSK, WEP	4-wire SPI	36/Module
MRF24WGOMA	PCB	PIC MCU	802.11b/g	-95	+18	240	156	25	0.1 mA ⁽¹⁾	Wi-Fi Connection Manager, Announce, DNS, DDNS, DHCP, FTP, HTTP, NBNS, SNMP, SNT, SSL, TCP, UDP, ZeroConf ⁽²⁾	WPA2-PSK, WPA-PSK, WEP, WPA2-Enterprise	4-wire SPI	36/Module
MRF24WGOMB	U.FL	PIC MCU	802.11b/g	-95	+18	240	156	25	0.1 mA ⁽¹⁾	Wi-Fi Connection Manager, Announce, DNS, DDNS, DHCP, FTP, HTTP, NBNS, SNMP, SNT, SSL, TCP, UDP, ZeroConf ⁽²⁾	WPA2-PSK, WPA-PSK, WEP, WPA2-Enterprise	4-wire SPI	36/Module
RN171	RF PAD	On module or any PIC MCU	802.11b/g	-83	0 to +12	190 (+12 dBm)	38	44	4 µA	DHCP, DNS, ARP, ICMP, FTP client, HTTP client, TCP, UDP	WEP, WPA, WPA2, EAP	UART	49/Module
RN131	Chip, U.FL	On module or any PIC MCU	802.11b/g	-85	+18	210 (+18 dBm)	40	44	4 µA	DHCP, DNS, ARP, ICMP, FTP client, HTTP client, TCP, UDP	WEP, WPA, WPA2, EAP	UART	44/Module
RN171XV	Wire, U.FL, SMA	On module or any PIC MCU	802.11b/g	-83	0 to +12	190 (+12 dBm)	38	44	4 µA	DHCP, DNS, ARP, ICMP, FTP client, HTTP client, TCP, UDP	WEP, WPA, WPA2, EAP	UART	2 × 10 (2 mm) Through hole module

Note 1: Indicates "off" current Note 2: Supported in the provided stack Note 3: Not recommended for new designs

Bluetooth® Modules								
Part #	Module Type	Sensitivity (dBm)	Power Output (dBm)	Power Consumption	Sleep	Profiles	Interface	Pin Count/Package
RN4020	BTLE Module	-92.5	+7 (avg)	Idle < 1.5 mA, Tx/Rx active 16 mA at 0 dBm	Dormant < 700 nA, Deep Sleep < 5.0 µA	GAP, GATT, SM, L2CAP, Integrated Public Profiles	UART, PIO, AIO, SPI	24/Module
BM77	Dual-Mode	-90 (Classic) -82 (LE)	2	Idle 1.2 mA, Connected (Tx data) 19 mA (BTLE), Idle 2.5 mA, Connected (Tx data) 23 mA (Classic)	N/A	GAP, SDP, SPP, GATT	UART	33/Module
RN41	Data	-80	15	Standby/Idle 25 mA, Connected (normal mode) 30 mA, Connected (low power sniff) 8 mA	Standby/Idle (Deep sleep enabled) 250 µA	SPP, DUN, HID, iAP, HCI, RFCOMM, L2CAP, SDP	UART, USB, Bluetooth	35/Module
RN42	Data	-80	4	Standby/Idle 25 mA, Connected (normal mode) 3 mA, Connected (low power sniff) 8 mA	Standby/Idle (Deep sleep enabled) 26 µA	SPP, DUN, HID, iAP, HCI, RFCOMM, L2CAP, SDP	UART, USB, Bluetooth	35/Module
RN52	Audio	-85	4	Idle 12 mA, Connected A2DP 26 mA, HFP/HSP 23.5 mA	N/A	A2DP, AVRCP, HFP, HSP, SPP, iAP	UART, USB, Bluetooth, GPIO	50/Module
RN41XV	Data	-80	15	Standby/Idle 25 mA, Connected (normal mode) 30 mA, Connected (low power sniff) 8 mA	Standby/Idle (Deep sleep enabled) 250 µA	SPP, DUN, HID, iAP, HCI, RFCOMM, L2CAP, SDP	UART, USB, Bluetooth	2 × 10 (2 mm) Through hole module
RN42XV	Data	-80	4	Standby/Idle 25 mA, Connected (normal mode) 3 mA, Connected (low power sniff) 8 mA	Standby/Idle (Deep sleep enabled) 26 µA	SPP, DUN, HID, iAP, HCI, RFCOMM, L2CAP, SDP	UART, USB, Bluetooth	2 × 10 (2 mm) Through hole module

ZigBee®/MiWi™ Protocol Products												
Part #	Frequency Range (GHz)	Sensitivity (dBm)	Power Output (dBm)	Tx Power Consumption (mA)	Rx Power Consumption (mA)	Clock (MHz)	Sleep	MAC Features	Encryption	Interface	Pin Count/Package	
MRF24J40	2.405 to 2.48	-95	0	23	19	20	2 µA	CSMA-CA	AES128	4-wire SPI	40-pin QFN	
MRF24J40MA	2.405 to 2.48	-94	0	23	19	20	2 µA	CSMA-CA	AES128	4-wire SPI	12/Module	
MRF24J40MC	2.405 to 2.48	-108	+19	120	25	20	12 µA	CSMA-CA	AES128	4-wire SPI	12/Module	
MRF24J40MD	2.405 to 2.48	-102	+20	130	25	20	5 µA	CSMA-CA	AES128	4-wire SPI	12/Module	
MRF24XA	2.405 to 2.48	-103	0	25	13.5	16	0.04 µA	CSMA-CA	AES128	4-wire SPI	32-pin QFN	

Sub-GHz/MiWi™ Protocol Products										
Part #	Frequency Range (MHz)	Sensitivity (dBm)	Power Output (dBm)	Tx Power Consumption (mA)	Rx Power Consumption (mA)	Clock (MHz)	Sleep	Interface	Pin Count/Package	
MRF49XA	433/868/915	-110	+7	15 mA @ 0 dBm	11	10 MHz	0.3 µA	4-wire SPI	16-pin TSSOP	
MRF89XA	868/915/950	-113	+12.5	25 mA @ +10 dBm	3	12.8 MHz	0.1 µA	4-wire SPI	32-pin TQFN	
MRF89XAM8A	868	-113	+12.5	25 mA @ +10 dBm	3	12.8 MHz	0.1 µA	4-wire SPI	12/Module	
MRF89XAM9A	915	-113	+12.5	25 mA @ +10 dBm	3	12.8 MHz	0.1 µA	4-wire SPI	12/Module	



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