

# Wireless Solutions

## Taking the RF out of Wireless

Wireless communication technologies have been common place in homes and industry for many years. Recent Smart Grid initiatives have created a renewed demand for standardized, low data rate, low power, wireless technology in metering, home, business and industrial automation markets. As a result, Microchip offers many IEEE 802.11™, IEEE 802.15.4™ and ZigBee® standard solutions along with our proprietary MiWi™ protocol for both 2.4 GHz and Sub-GHz to address this need.

### IEEE 802.11 – Wi-Fi®

#### MRF24WB0MA/MB Modules



- IEEE 802.11 compliant wireless modules
- Compatible with b/g/n routers
- Supports infrastructure and ad hoc networks
- FCC, IC, Wi-Fi certified, ROHS, CE and ETSI compliant, providing considerable cost savings and quick time-to-market

- Supports WEP, WPA and WPA2 security protocols
- License Free TCP/IP stack supporting a comprehensive suite of internet protocols
- Microchip offers a license free TCP/IP stack optimized for the PIC18, PIC24, and PIC32 microcontroller and dsPIC® digital signal controller families.

More information is available at: [www.microchip.com/wifi](http://www.microchip.com/wifi).

### IEEE 802.15.4 – ZigBee and MiWi™ Protocol

#### MRF24J40/MA/MB/MC Modules



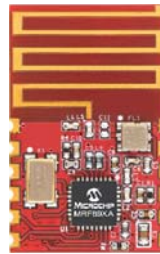
- 2.4 GHz IEEE 802.15.4 compatible transceiver and modules
- Integrated PCB antenna and matching circuit components; ext. antenna option (MC)
- FCC, IC and ETSI agency certified

- Surface-mountable PCB
- Supports ZigBee and MiWi development environment
- Microchip offers ZigBee certified compliant platforms for ZigBee PRO and ZigBee RF4CE protocol stacks ensuring interoperability and reliable communication.
- ZigBee PRO Stack
- Smart Energy Profile
- ZigBee RF4CE and ZRC Profile

More information is available at: [www.microchip.com/zigbee](http://www.microchip.com/zigbee)

### Sub-GHz Solutions – MiWi™ Protocol

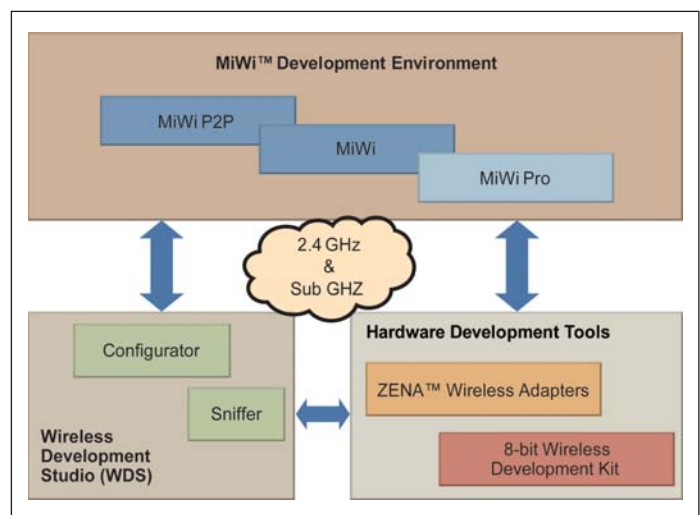
#### MRF89XA/M8A/M9A Modules MRF49XA



- 433/868/915 MHz transceivers and modules
- Low receive current = 3 mA\*
- Transmit power = +12.5 dBm\*
- Receiver sensitivity: -107 dBm FSK/ -113 dBm OOK\*
- Integrated PCB antenna and matching circuit components\*

- FCC, IC and ETSI agency certified module
- Surface-mountable PCB
- Supports MiWi development environment

### MiWi Development Environment



MiWi DE is designed to provide a smaller footprint, lower cost, communication protocol stack for peer-to-peer and mesh wireless networks. Intended for customers who desire robust communication in a closed or private wireless network at either 2.4 GHz or Sub-GHz operation frequency.

- MiWi P2P
- MiWi
- MiWi PRO

More information is available at: [www.microchip.com/miwi](http://www.microchip.com/miwi).

\*MRF89XA specific



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## The Wireless Development Studio (WDS)

The WDS is a Java based Graphic User Interface which allows quick and easy development of wireless applications based on the MiWi™ protocols. It features a MiWi protocol sniffer for monitoring, debugging and gathering information and a configurator with a graphical user interface that enables the simple customization and configuration of wireless networks.

### Transceivers and Modules

Product	Agency Certification	Frequency	Sensitivity	Output Power	Tx Power Consumption	Rx Power Consumption	Interface	MAC/Sleep/RSSI	Encryption	Antenna	Standard Operating Voltage
MRF24J40	N/A	2.4 GHz	-94 dBm	0 dBm	23 mA	19 mA	4 wire SPI	Yes	AES-128	N/A	2.4V-3.6V
MRF24J40MA	FCC/ETSI/IC	2.4 GHz	-94 dBm	0 dBm	23 mA	19 mA	4 wire SPI	Yes	AES-128	PCB	2.4V-3.6V
MRF24J40MB	FCC/ETSI/IC	2.4 GHz	-102 dBm	20 dBm	120 mA	25 mA	4 wire SPI	Yes	AES-128	PCB	2.4V-3.6V
MRF24J40MC	FCC/ETSI/IC	2.4 GHz	-108 dBm	20 dBm	120 mA	85 mA	4 wire SPI	Yes	AES-128	External	2.4V-3.6V
MRF24WB0MA	FCC/ETSI/IC	2.4 GHz	-91 dBm	10 dBm	154 mA	85 mA	4 wire SPI	Yes	AES-128	PCB	2.7V-3.6V
MRF24WB0MB	FCC/ETSI/IC	2.4 GHz	-91 dBm	10 dBm	154 mA	85 mA	4 wire SPI	Yes	AES-128	External	2.7V-3.6V
MRF49XA	N/A	433/868/915MHz	-110 dBm	7 dBm	15 mA	11 mA	4 wire SPI	Yes	–	N/A	2.2V-3.8V
MRF89XA	N/A	868/915MHz	-113 dBm	10 dBm	25 mA	3 mA	4 wire SPI	Yes	–	N/A	2.4V-3.6V
MRF89XAM8A	ETSI	868 MHz	-113 dBm	10 dBm	25 mA	3 mA	4 wire SPI	Yes	–	PCB	2.4V-3.6V
MRF89XAM9A	FCC/IC	915 MHz	-113 dBm	10 dBm	25 mA	3 mA	4 wire SPI	Yes	–	PCB	2.4V-3.6V

### Development Tools from Microchip

Part Number	Development Tool	Description
AC164134-1	MRF24J40MA PICTail™/PCTail Plus 2.4 GHz RF Card	MiWi™/ZigBee board for 2.4 GHz applications
AC164134-2	MRF24J40MB PICTail/PCTail Plus 2.4 GHz RF Card	MiWi/ZigBee board for 2.4 GHz applications
AC164143	MRF24J40MC PICTail/PCTail Plus 2.4 GHz RF Card	MiWi/ZigBee board for 2.4 GHz applications
AC164136-4	MRF24WB0MA WiFi PICTail/PCTail Plus Boards	WiFi board
AC164138-1	MRF89XAM8A PICTail/PCTail Plus Daughter Board	MiWi board for 868 MHz applications
AC164138-2	MRF89XAM9A PICTail/PCTail Plus Daughter Board	MiWi board for 915 MHz applications
DM182015-1	8-bit Wireless Development Kit	MiWi Application Development Kit
AC182015-1	ZENA™ Wireless Adapter 2.4 GHz MRF24J40	2.4 GHz USB wireless adapter for connecting/analyzing Microchip wireless networks



**8-bit Wireless Development Kit**  
2.4 GHZ MRF24J40  
(DM182015-1)



**ZENA™ Wireless Adapter**  
2.4 GHz MRF24J40  
(AC182015-1)



**MRF24J40MB**  
PICTail™/PCTail Plus  
Daughter Board  
(AC164134-2)



**MRF24WB0MA**  
PICTail™/PCTail Plus  
Daughter Board  
(AC164136-4)



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[www.microchip.com/wireless](http://www.microchip.com/wireless)

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