



# Model ZFX-226 LP-WSN

## ZigBee/IEEE-802.15.4

250KBPS Rx/Tx @ 2.45GHz

ZigBee Library Functions (ROM)

## ARM7 Microprocessor

128KB Flash Memory

96KB SRAM

80KB ROM (ZigBee)

MAC Address ID Chip (24AA48)

24MHz CPU Clock Crystal (40ppm)

32KHz Watch Crystal

Universal Asynchronous RxTx

(UART)

Inter-integrated Circuit (I<sup>2</sup>C)

Serial Peripheral Interface (SPI)

GPIO

ITAG Programming/Debug

## Antenna

High Performance Inverted F

Dual Polarization

## Sensors

MAC Address ID (24AA48)

Temperature (MPC9800)

Accelerometer (MMA8451)

## Connectors

Dual Raspberry PI® GPIO

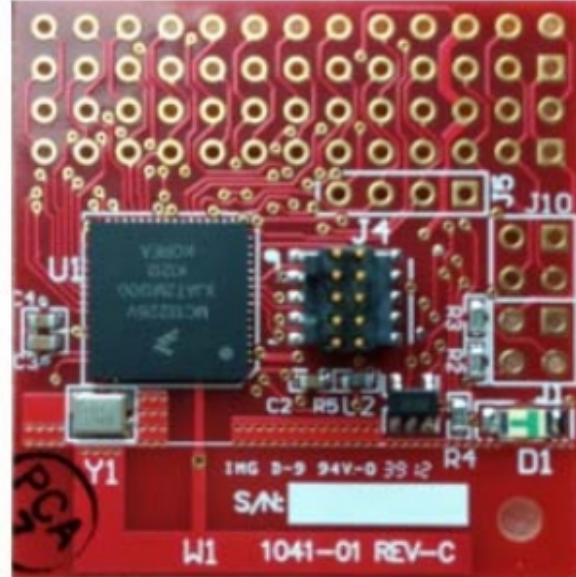
JTAG (9 pin Industry STD)

FTDI® Standard UART Pins

I<sup>2</sup>C Debugger Interface

Flash Programming

Jumpers



High performance, low power wireless sensor networks platform designed to operate as a low power stand-alone sensing device or as a daughterboard for the Raspberry PI®.

RazBee™ is a high performance wireless sensor network integrated radio designed to connect with the Raspberry PI® ([www.raspberrypi.org](http://www.raspberrypi.org)). Raspberry PI (RPI) is a credit card sized Linux computer that can operate as a host network server that connects via Ethernet to the Internet. RazBee is a RPI ZigBee coordinator/router "Full Function Device" capability (as defined by the ZigBee Pro specification). Alternatively the RazBee can be operated in a simple MAC IEEE-802.15.4 mode by simply downloading a new binary.

RazBee is based on the Freescale MC13226 transceiver platform. ZFX-226 contains a PCB foil inverted F antenna that provides a 50Ω transmission line performance. The MC13226 contains a fully integrated RX switch, RX LNA, differential TX PA and balun bias supply. The RX LNA provides

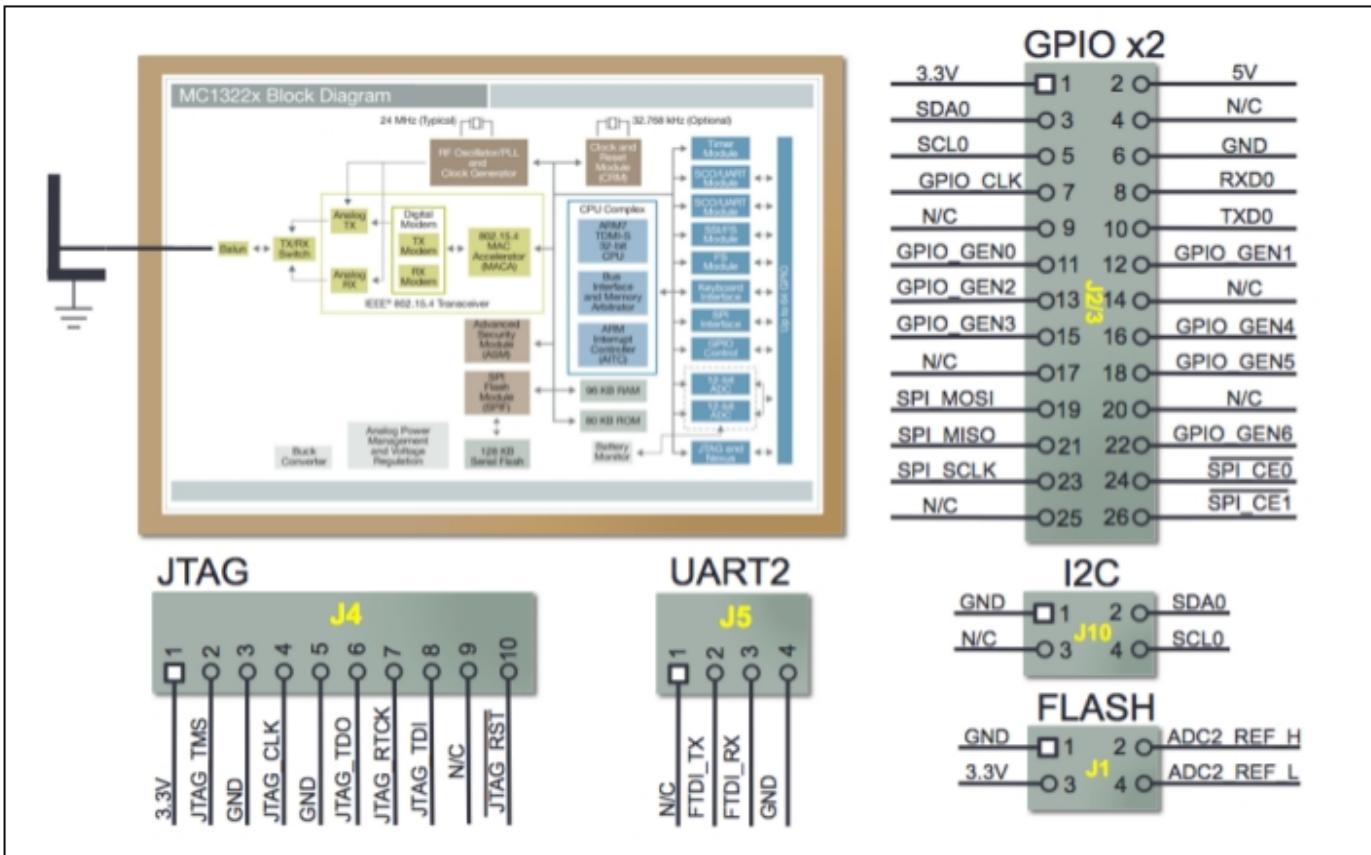
greater than 94dBm Rx sensitivity.

Razbee may also be operated as a stand-alone IEEE-802.15.4 or Zigbee radio device by simply providing 3.3V power to the module. The separate 5V input power connection provides a power source for the onboard blue LED. This can be used to indicate wireless transmission or other user interface specific uses.

A Microchip® Mac Address ID chip is used to make each RazBee have a unique ID which eases network commissioning and deployment. This provides a legal and globally unique hardware MAC Address.

Another Microchip® temperature sensor (MCP9800) provides an on board I2C temperature sensing capability.

A FTDI® 232H-1000000 module is included.



## Raspberry Pi Installation Instructions

The RazBee's 26 pin J2 connector fits onto the 26 pin GPIO header on the Raspberry Pi. To install simply orient the RazBee so its J2 connector lines up with all 26 GPIO pins of the Raspberry Pi header with the RazBee PCB oriented over the Raspberry Pi PCB as in the picture below.





## Integration in host device and host labeling

The host device containing this RF module must be labeled at minimum as shown below, by referring to the Limited Modular Approved (LMA) RF module inside. When integrating this RF module into any host device, including the Raspberry Pi, additional FCC line conducted and radiated spurious emissions under part 15B as digital or peripheral device may be required, including additional 15B authorization and labeling of the host device. When using this RF module in a host device as composite with other RF transmitters, it shall be verified if intentional radiator (re-) certification of all RF parts, including RF exposure evaluation is required.

Label example of host device:

This device contains FCC ID: RVSZFX-226

## Reference Documents

[Freescale MC13226 Datasheet](#)

[Freescale MC13226 Reference Manual \(MC1322xRM\)](#)

[Freescale Semiconductor BeeKit™ Quick Start Guide BKWCTKQUG](#)

[Freescale Semiconductor BeeKit™ User Guide BKWCTKUG](#)

[Freescale Semiconductor Software Driver Reference Manual 22XDRVRRM](#)

[Freescale Semiconductor MC1322x Simple Media Access Controller \(SMAC\) Reference Manual 22xSMACRM](#)

[Freescale Semiconductor Simple Media Access Controller \(SMAC\) User's Guide SMACRM](#)

## Agency Certifications

FCC Part 15 Limited Module Approval. Additional equipment authorization is required and must be tested for compliance with FCC line conducted and radiated spurious limits.

## Warning!

The RazBee modules contain highly sensitive electronic circuits. Proper Electro-Static Discharge (ESD) handling is required or module may be permanently damaged or destroyed.

