

无线你的无限



香港百特（集团）电子有限公司

数字无线传输方式简介

ZigBee

- 低功耗 - 得益于较低的通信效率
- 低成本 - 协议简单且免专利费用
- 低传输速率 - 20~250kbps
- 传输距离 - 典型值10~100m
- 频段 - 2.4GHz, 915MHz, 868MHz
- 高网络容量 - 可容纳65000个节点
- 短时延, 高安全性, 自动动态组网

数字无线传输方式简介

ZigBee

应用领域:

- 工业控制
- 汽车自动化
- 智能家居
- 楼宇自动化
- 医用设备

数字无线传输方式简介

Bluetooth

- 低功耗
- 低成本
- 高传输速率 - 1~3Mbps
- 传输距离 - 典型值10m
- 频段 - 2.4GHz
- 支持语音功能
- 自动跳频技术

数字无线传输方式简介

Bluetooth

应用领域:

- 手机
- 无线耳机
- PDA
- 打印机
- 传真机
- PC外设
- 笔记本电脑
- 游戏机

Wi-Fi 简介

Wi-Fi 是一个无线网络通信技术的品牌，由Wi-Fi联盟（Wi-Fi Alliance）所持有，使用在经验证的基于 IEEE 802.11 标准的产品上，目的是改善基于IEEE 802.11标准的无线网络产品之间的互通性。

Wi-Fi 特点

- 传输速率高达300Mbps
- 传输距离- 典型值30~100m
- 频段- 2.4GHz, 5GHz
- 可组建无线局域网
- 与互联网关系紧密
- 功耗较Zigbee和Bluetooth偏高
- 成本较Zigbee和Bluetooth偏高

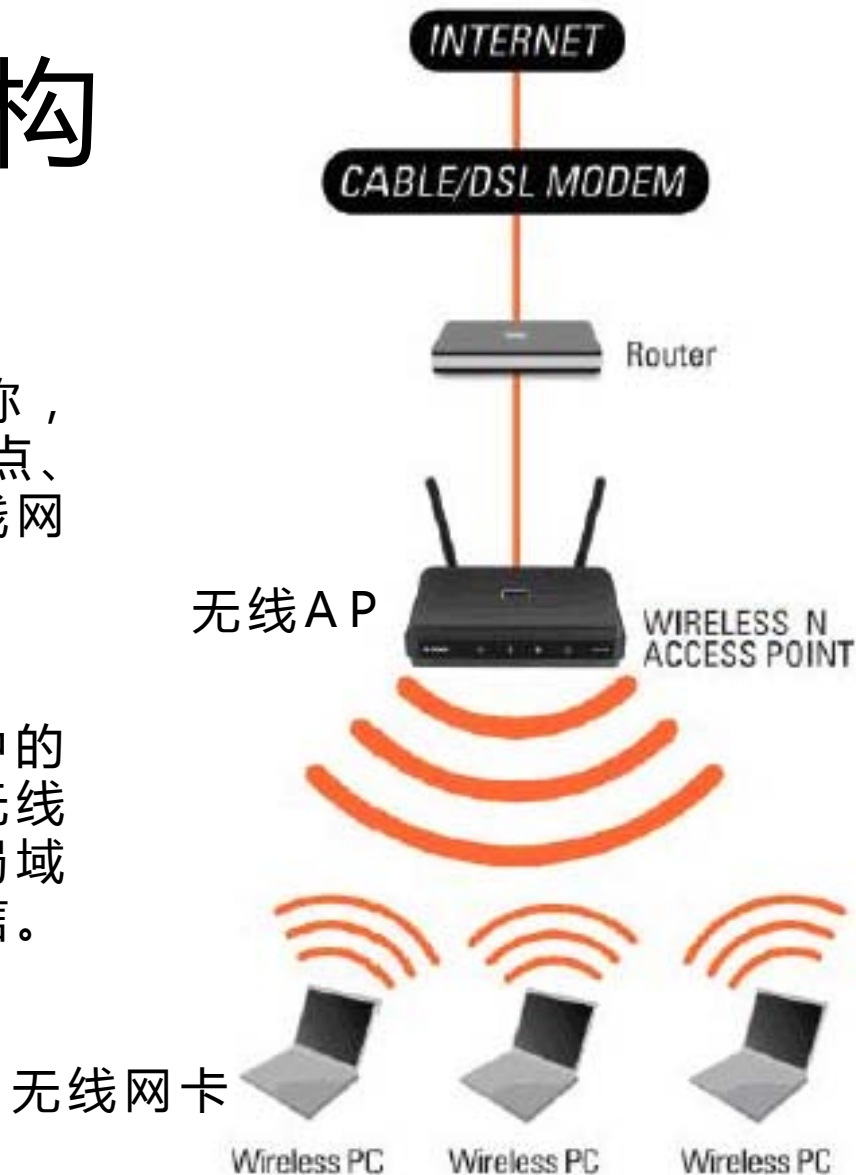
Wi-Fi 网络结构

无线AP:

AP是Access Point的简称，无线AP就是无线局域网的接入点、无线网关，它的作用类似于有线网络中的集线器。

无线网卡:

无线网卡的作用和以太网中的网卡的作用基本相同，它作为无线局域网的接口，能够实现无线局域网内各客户机之间的连接与通信。



Wi-Fi 应用领域

- 消费电子
- 工业控制
- 医疗领域
- 智能家居
- 移动互联网
-

本章小结

	成本	功耗	速率	距离
ZigBee	Low	Low	Low	High
Bluetooth	Mid	Mid	Mid	Mid
Wi-Fi	High	High	High	High

Redpine Signals

Redpine公司成立于2001年，总部位于美国加州圣荷西。致力于Wi-Fi芯片的研发和制造以及提供高性能的无线系统解决方案。于2007年底率先在业界推出802.11n芯片组。拥有业内领先的超低功耗Wi-Fi解决方案,非常适用于嵌入式领域。

Redpine 目标市场

1. Medical

Patient Monitoring
Clinical Information Systems
Wireless Instruments
Wireless Sensors
Doctor/Patient Tracking



2. Industrial

Monitoring and Control
Point of Sale
Metering,
Ruggedized Laptop and PDAs,
Warehousing
Sensors (Temp, Humidity etc.)




3. High End Consumer

Wireless Audio/Video,
Security Systems,
Surveillance Equipment,
Netbooks,
Hospitality Equipment,
Wireless Camcorders



Wi-Fi联盟认证

Wi-Fi® Interoperability Certificate **Certification ID: WFA5881**

 This certificate indicates the capabilities and features that successfully completed interoperability testing by the Wi-Fi Alliance. You may find detailed descriptions of these features at www.wi-fi.org/certification_programs.php.

Certificate Date: June 30, 2008
Category: Reference Design
Company: Redpine Signals, Inc
Product: Redpine Lite-Fi™ WLAN (802.11n) SDIO card
Model/SKU #: LFRD-SD-RS9110/

This product has the following Wi-Fi Certifications:

IEEE Standard	Security	Multimedia	Convergence
IEEE 802.11b IEEE 802.11g IEEE 802.11n draft 2.0	WPA™ - Enterprise, Personal WPA2™ - Enterprise, Personal Vendor EAP Type(s) EAP-TLS EAP-TTLS/MSCHAPv2 PEAPv0/EAP-MSCHAPv2 PEAPv1/EAP-GTC EAP-SIM	WMM® WMM Power Save Special Features Wi-Fi Protected Setup™ PIN PBC	Voice - Personal

Redpine 产品概述

Lite-Fi™
REDPINE



- ✓ 802.11 abgn single stream
- ✓ 65 Mbps data rate (20 MHz)
- ✓ Ultra Low Power
- ✓ Status: In Production

Maxi-Fi™



- ✓ 802.11 abgn single stream
- ✓ 150 Mbps data rate (40 MHz)
- ✓ Supports 802.11p
- ✓ Status: Sampling; Prod Q1'11

Chipsets

n-Link™



- ✓ Single/Dual Band Modules
- ✓ SDIO/SPI Interfaces
- ✓ 35 Mbps App Throughput
- ✓ FCC, IC, CE Certified
- ✓ Status: In Production

Connect-io™



- ✓ Plug-n-Play Serial-to-WiFi Modules (Single & Dual Band)
- ✓ Embedded* TCP/IP Stack
- ✓ SPI/UART Interfaces
- ✓ FCC, IC, CE Certified
- ✓ Status: In Production

Modules

Find-iT™
REDPINE



- ✓ World's 1st 802.11n RTLS tag
- ✓ CCX Certified
- ✓ > 5 years battery life*
- ✓ Status: Sampling; Prod Q4'10

Systems

RS9110芯片参数

Network Standard Support	IEEE 802.11a/b/g/h/i/j, Draft 802.11 n/k/r
Data Rates	802.11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps
Modulation Techniques	OFDM with BPSK, QPSK, 16-QAM, and 64-QAM 802.11b with CCK and DSSS
QoS	WMM and WMM Power Save Support
Wireless Security	802.11i: AES, TKIP, WEP, WPA, and WPA2
802.11n Features	MCS 0-7, STBC, RIFS, Greenfield Protection, A-MPDU, A-MSDU Aggregation with Block-ack, PSMP, MTBA
Host Interfaces	SDIO v1.2/2.0, SPI, Memory-mapped interface (EBI)
Other Interfaces	I ² C, SPI, GPIO, UART
Reference Clock Input	9.6, 13, 19.2, 26, 38.4, 40, 52 MHz
Supply Voltage	Core VDD 1.2V ± 10% IO VDD 3.3V ± 10%
Package Options	WLCSP & UFLGA
Operating Temperature	Industrial Grade -40°C to +85°C
Certification	Wi-Fi (WPA, WPA2, WMM, WMM Power-save, WPS, 11n Draft 2.0)

n-Link vs. Connect-io-n

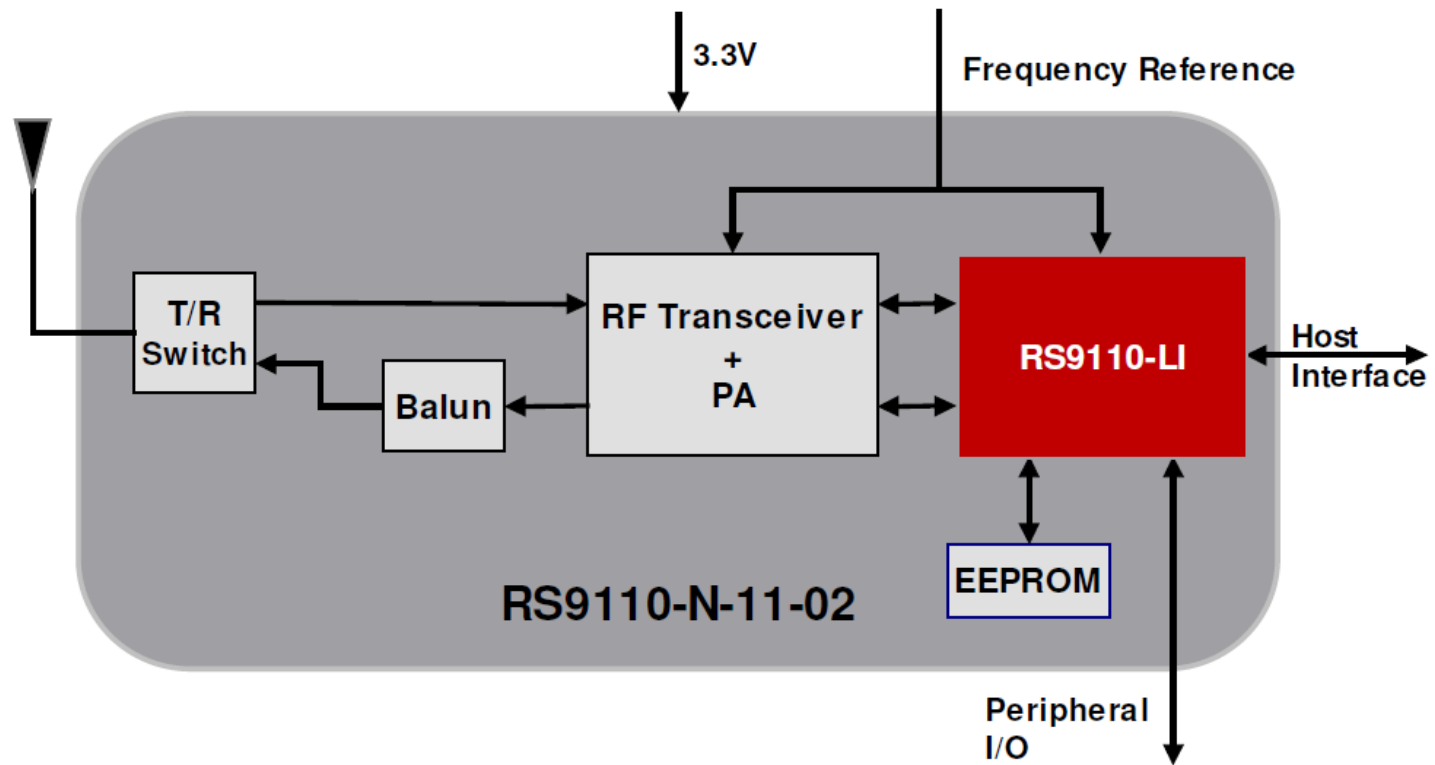
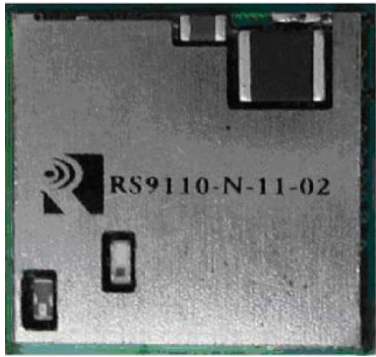
Product Family	n-Link		Connect-io-n	
Wireless Protocol	802.11n	802.11n	802.11n	802.11n
Host Interface	SDIO	SPI	SPI	UART
Wireless Single Antenna Throughputs at Host Interface	Up to 35 Mbps	Up to 20 Mbps	8-15 Mbps	9.6K – 3M Baud
Wi-Fi Driver Size (on Host)	> 100KB	> 100KB	>9KB	< 2KB
Security: WEP, WPA, WPA2, WPS	Yes	Yes	Yes	Yes
Single-band & Dual-band Variants Available	Yes	Yes	Yes	Yes
Variants with Embedded TCP/IP in the Module?	No	No	Yes	Yes
Integration Effort	Moderate	Moderate	Low	Low

n-Link 系列

Module Name	2.4 GHz(802.11b/g/n)	5 GHz(802.11a/b/g/n)	Interface	Size(mm x mm)
RS9110-N-11-01	Y		SDIO/SPI	9.5 x 7.5
RS9110-N-11-02	Y		SDIO/SPI	13.7 x 12.9
RS9110-N-11-03	Y	Y	SDIO/SPI	20 x 17.5
RS9110-N-11-04	Y		EBI	design



RS9110-N-11-02 框图



RS9110-N-11-02 特征

Feature	Description
Frequency Band	2.400 – 2.500 GHz (2.4 GHz ISM band)
Frequency Reference	19.2 MHz, 20 MHz, 26 MHz, 38.4 MHz, 40 MHz, 52 MHz
Modulation	OFDM with BPSK, QPSK, 16-QAM, and 64-QAM 802.11b with CCK and DSSS
Supported Data Rates	802.11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps
802.11n Features	MCS 0-7, STBC, RIFS, Greenfield Protection A-MPDU, A-MSDU Aggregation with Block-ack, PSMP, and MTBA
Typical Transmit Power (+/- 2 dBm)	17 dBm for 802.11b DSSS 17 dBm for 802.11b CCK 15 dBm for 802.11g/n OFDM

RS9110-N-11-02 灵敏度

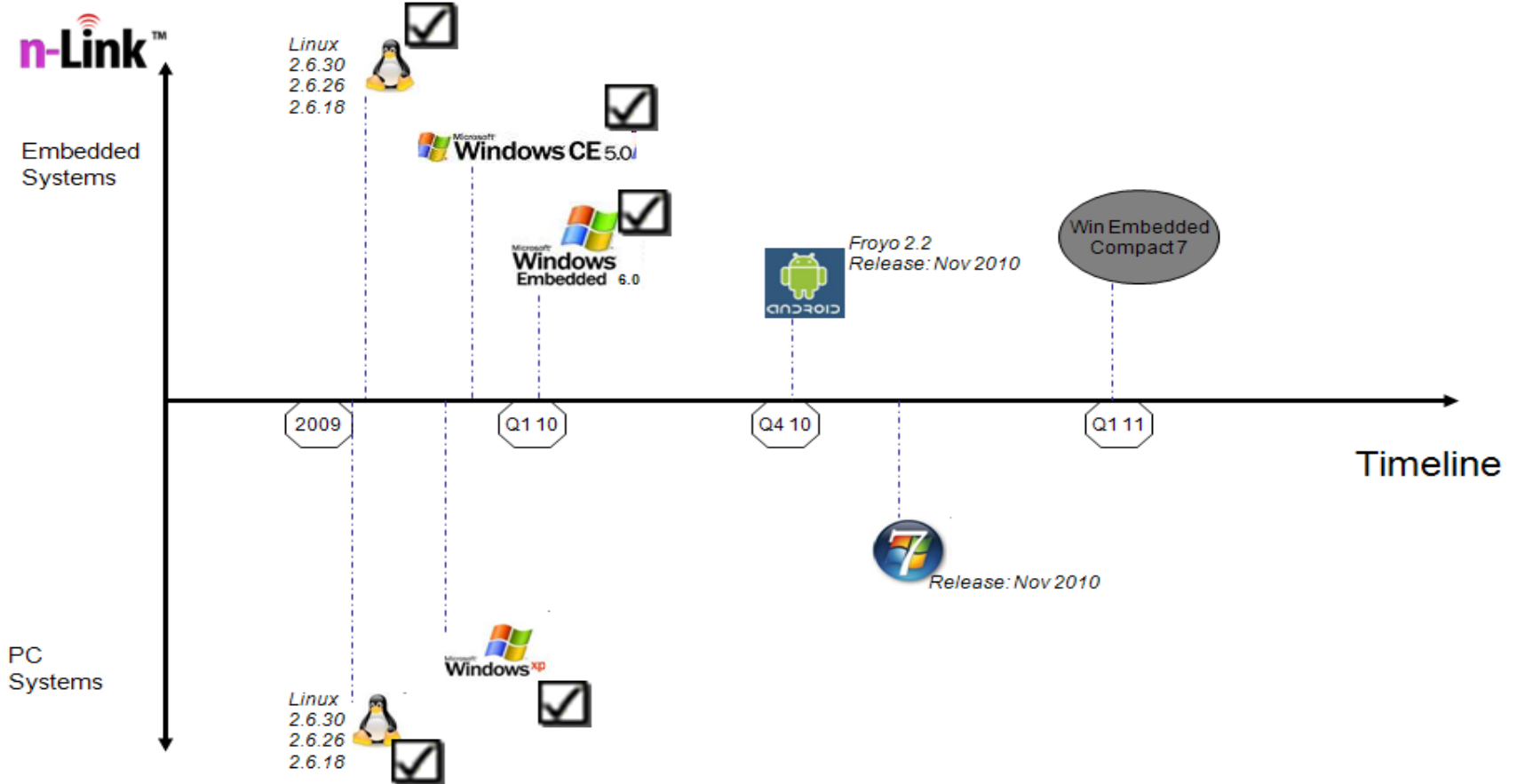
Data Rate	Typical Sensitivity (+/- 1.5 dBm)
1 Mbps	-97.0 dBm (< 8% PER)
2 Mbps	-93.0 dBm (< 8% PER)
11 Mbps	-88.9 dBm (< 8% PER)
6 Mbps	-91.0 dBm (<10% PER)
54 Mbps	-75.0 dBm (< 10% PER)
65 Mbps	-71.9 dBm (< 10% PER)

RS9110-N-11-02 功耗

Standard Operational Modes – 2.4 GHz		
Data Transfer – Transmit TCP	21 Mbps throughput 54 Mbps OFDM 15 dBm power at antenna	200 mA
Data Transfer – Receive TCP	22 Mbps throughput (54 Mbps OFDM)	149 mA
Listen	Receive mode, with no active packet reception in progress	110 mA
Standby-Associated	Remaining connected to the Access Point, in Power-Save mode, with DTIM=3, beacon interval of 200 ms	1.10 mA
Standby	Not connected to an AP; and responsive to a wake-up instruction from the host interface	0.52 mA
Peak Power Modes		
Transmit – OFDM	Peak current drawn at 15 dBm output power at antenna with OFDM modulation	265 mA
Transmit – CCK	Peak current drawn at 17 dBm output power at antenna with CCK modulation	275 mA

n-Link Porting

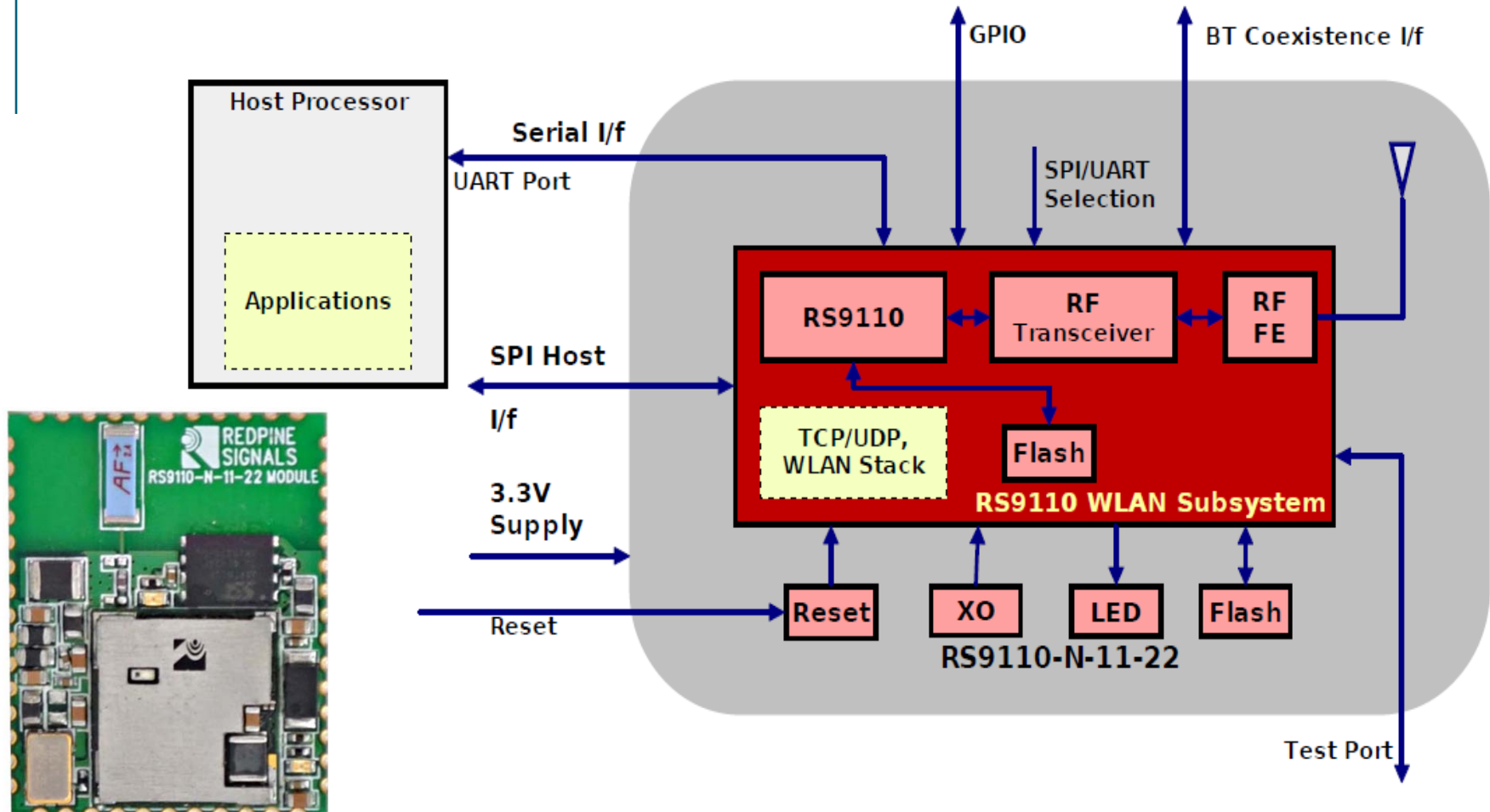
Operating System Support



Connect-io-n 系列

Module Name	2.4 GHz (802.11b/g/n)	5 GHz (802.11a/b/g/n)	Integrated Antenna*	Integrated TCP/IP	Size (mm x mm)
RS9110-N-11-21	✓		✓		22.0 x 28.0
RS9110-N-11-22	✓		✓	✓	22.0 x 28.0
RS9110-N-11-23	✓				12.9 x 13.7
RS9110-N-11-24	✓			✓	12.9 x 13.7
RS9110-N-11-25	✓	✓	✓		28.0 x 40.0
RS9110-N-11-26	✓	✓	✓	✓	28.0 x 40.0
RS9110-N-11-27	✓	✓			17.5 x 20.0
RS9110-N-11-28	✓	✓		✓	17.5 x 20.0

RS9110-N-11-22 框图



RS9110-N-11-22 特征

Feature	Description
Frequency Band	2.400 - 2.500 GHz (2.4 GHz ISM band)
Modulation	OFDM with BPSK, QPSK, 16-QAM, and 64-QAM 802.11b with CCK and DSSS
Supported Data Rates	802.11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps
802.11n Features	MCS 0-7, STBC, RIFS, Greenfield Protection A-MPDU, A-MSDU Aggregation with Block-ack, PSMP, and MTBA
Typical Transmit Power (+/- 2 dBm)	17 dBm for 802.11b DSSS 17 dBm for 802.11b CCK 15 dBm for 802.11g/n OFDM

RS9110-N-11-22 灵敏度

Data Rate	Typical Sensitivity (+/- 1.5 dBm)	Sweep - PER Floor
1 Mbps	-97.7 dBm	< 0.1%
2 Mbps	-93.2 dBm	< 0.1%
11 Mbps	-88.9 dBm	< 0.1%
6 Mbps	-91.4 dBm	< 0.1%
54 Mbps	-75.1 dBm	< 0.1%
65 Mbps	-71.9 dBm	< 0.1%

RS9110-N-11-22 功耗

	Unconnected	Standby Associated	Connected with data transfer
Power Mode 0	125mA	125mA	125mA
Power Mode 1	1.6mA	2.5mA	2~16mA
Power Mode 2	17.5mA	20mA	24mA

Peak Transmit 265mA

Peak Receive 142mA

Connect-io-n Porting

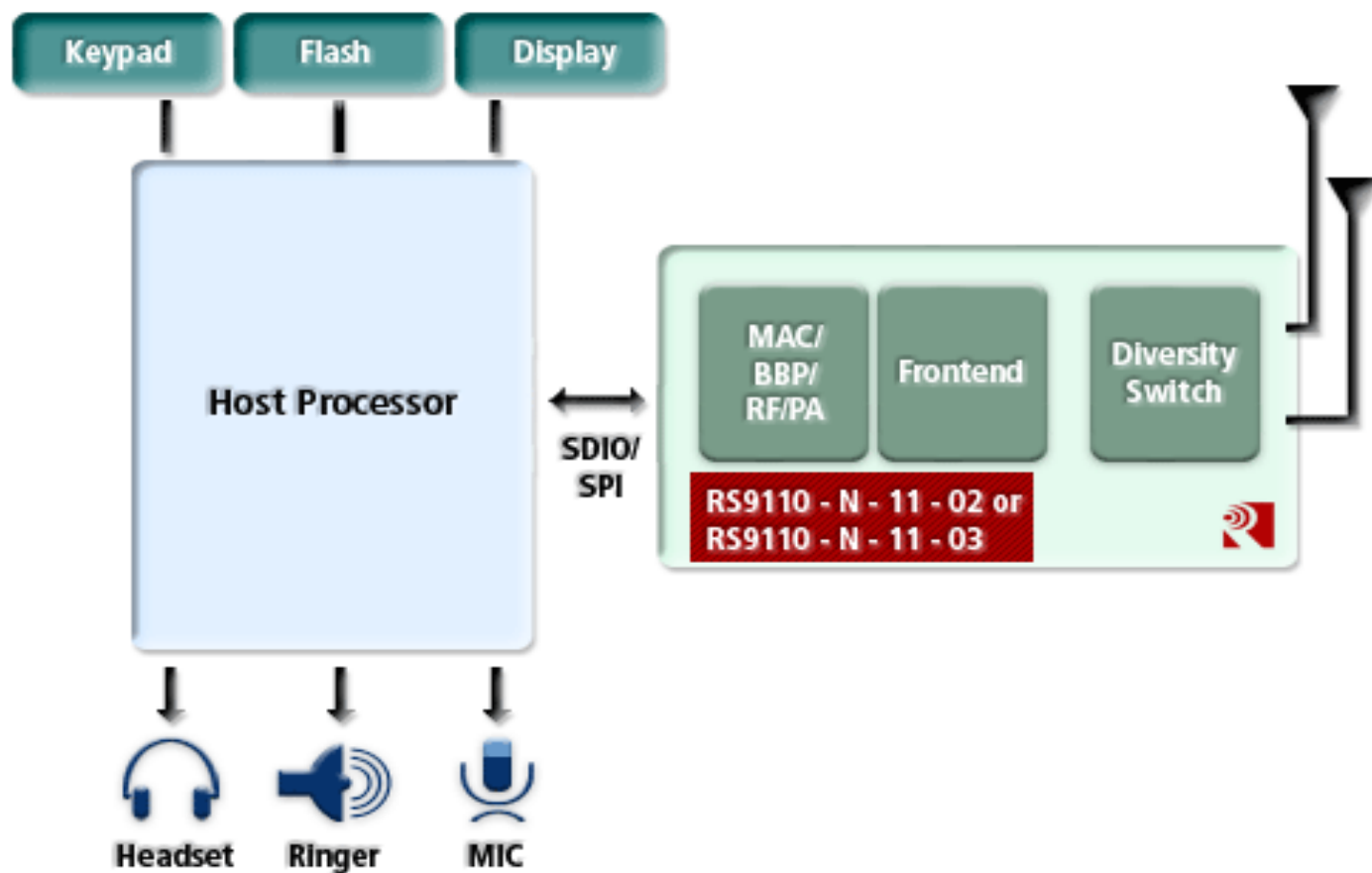


Connect-io-n™

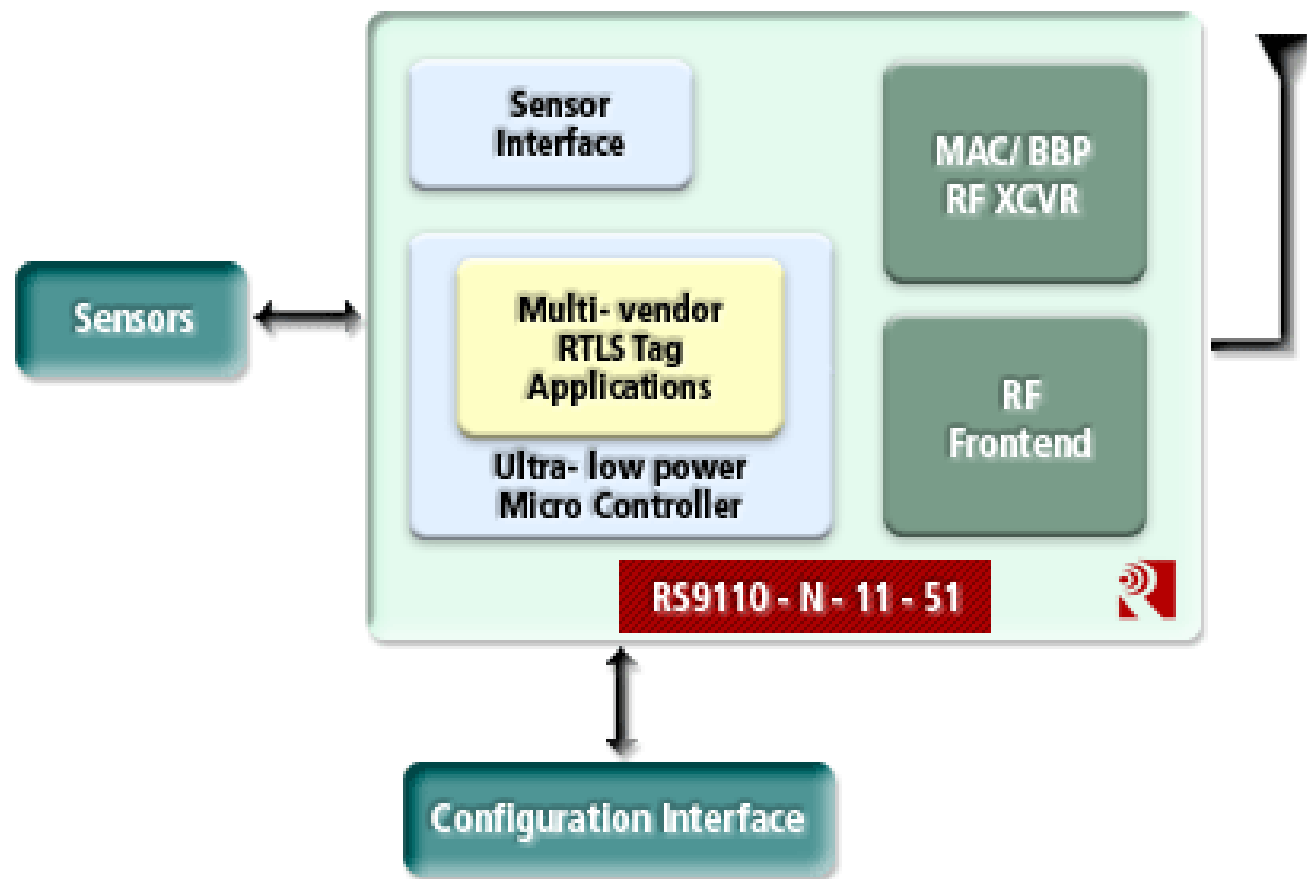


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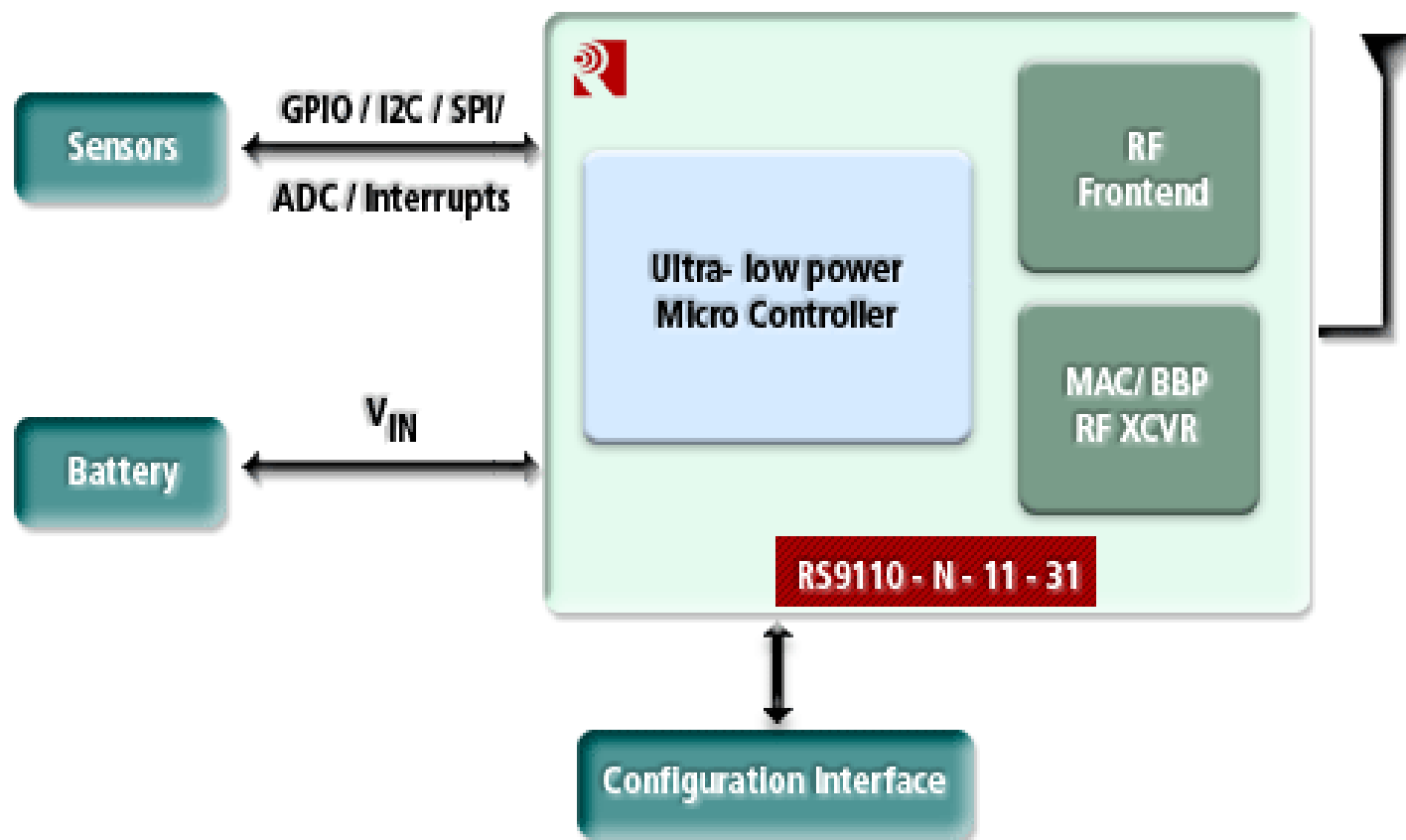
方案1：Wi-Fi网络电话



方案2：Wi-Fi定位系统



方案3：无线传感器



Thank you!



香港百特（集团）电子有限公司