

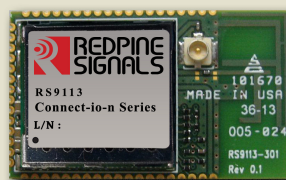


1x1 802.11abgn + BT4.0 + ZigBee

The RS9113 Connect-io-n module is based on Redpine Signals RS9113 ultra-low-power, single spatial stream, dual-band 802.11n + Bluetooth (BT4.0) + ZigBee (ZB) Convergence SoC. The RS9113 module is a complete IEEE 802.11 a/b/g/n, ZB and BT wireless device server that provides a wireless interface to any equipment with a SDIO, UART, SPI or USB interface. The RS9113 module integrates a multi-threaded MAC processor with integrated analog peripherals and support for digital peripherals, baseband digital signal processor, analog front-end, crystal oscillator, calibration OTP memory, dual-band RF transceiver, dual-band high-power amplifiers, baluns, diplexers, diversity switch and Quad-SPI Flash thus providing a fully-integrated solution for embedded wireless applications and all WLAN, BT and ZB protocols and networking stack functionality in embedded firmware to make a fully self-contained wireless solution for a variety of applications. The module integrates an antenna and a U.FL connector for external antenna with an option to select either one of them. The M2MCombo (RS9113) chips and modules leverage and improve upon Redpine's proven low power innovations from Lite-Fi™ products (RS9110) and provide WLAN 802.11n, BT4.0 and ZB convergence solution for integration into mobile and M2M communication devices.

Features and Benefits

- RS9113 Connect-io-n module integrates WLAN, BT 4.0 and ZigBee functions.
- WLAN: Compliant to IEEE 802.11 a/b/g/n with dual band support.
- Bluetooth: Compliant to dual-mode Bluetooth V4.0
- ZigBee: Compliant to IEEE 802.15.4
- Supports both 20MHz and 40MHz bandwidth.
- WLAN transmit power up to +18dBm and receiver with sensitivity of -97dBm.
- Support for Bluetooth Transmit power class-1 with integrated PA and high performance Bluetooth receiver with -94dBm Rx sensitivity.
- Support for multiple ZigBee output powers up to +19dBm with integrated PA and high performance ZigBee receiver with -100dBm Rx sensitivity.
- U.FL connector for external antenna connection is selectable.
- Dual external antenna (diversity supported).
- Embedded WLAN stack, ZigBee stack, BT stack, TCP/IP stack, HTTP server.
- Support for Embedded Client mode and Access Point mode.
- BT profile support for GAP,SDN,PAN,SPP,IAP,HFP 1.5,GATT,ATTR,IAP,A2DP,ACRP.
- Supports SPI, UART, USB, SDIO host interfaces.
- Can operate with 8-bit microcontrollers with no OS.
- Single supply 3.0 to 3.6 V operation.



Module with integrated antenna



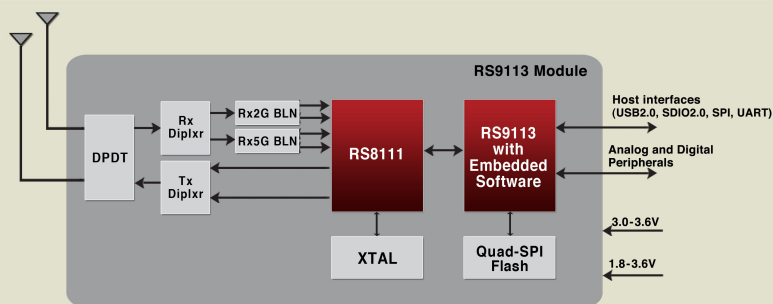
Module without integrated antenna

Applications

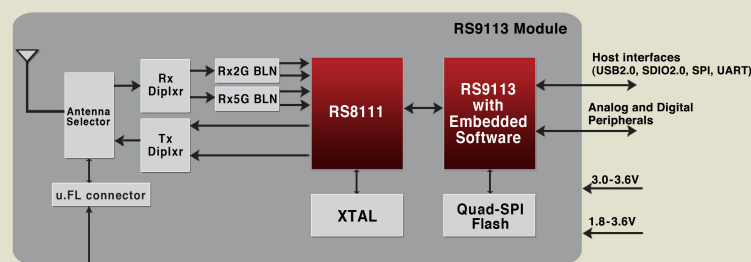
- Smart phones, Tablets and e-Readers
- VoWi-Fi phones
- Smart Meters and in-home displays
- Industrial automation and telemetry
- MP3 music and MP4 video players
- Medical Devices
- Industrial monitoring and control
- Home and building automation
- Wi-Fi-BT gateway device
- Wi-Fi-ZB gateway device
- Wireless headset

Evaluation Package

The evaluation package comprises RS9113 Connect-io-n module based evaluation board. This is accompanied by driver source code for host interface, firmware and documentation.



RS9113 Module Block Diagram without integrated antenna



RS9113 Module Block Diagram with integrated antenna

Specifications

Network Standard Support	IEEE 802.11a/b/g/j, 802.11n, 802.11d/e/i/l/w, 802.1X, 802.11k/r/v/h Bluetooth v2.1 + EDR, v3.0 + HS, v4.0 802.15.4-2009 (2.4GHz)
Data Rates	802.11n: from 6.5 Mbps to 150 Mbps (MCS 0-7) 802.11a/g: from 6 Mbps to 54 Mbps 802.11b: from 1 Mbps to 11 Mbps Bluetooth: 1, 2, 3Mbps 802.15.4-2009: 250Kbps
Modulation Techniques	OFDM with BPSK, QPSK, 16-QAM and 64-QAM 802.11b with CCK and DSSS Bluetooth: GFSK, DQPSK, 8DPSK 802.15.4-2009: DSSS
QoS	WMM and WMM Power Save Support
802.11n Advanced Features	1-SS, 40MHz bandwidth, Greenfield Preamble, Short-GI, 1 spatial stream STBC, RIFS, A-MSDU, A-MPDU, Aggregation with Block-ack, A-MSDU inside A-MPDU, PSMP, MTBA, Fragmentation and Virtual AP support (up to 8 BSSIDs)
Bluetooth Advanced Features	Scatternet, Adaptive Frequency Hopping, Interlaced scanning, 15 active slaves in proprietary mode, hold, sniff and park modes
Zigbee Advanced Features	CCM* security, orphan scanning, coordinator realignment, mesh routing
Wi-Fi modes	Embedded Wi-Fi client and Access point
Network Protocols	TCP, UDP, DHCP, ARP, IGMP, DNS client. Integrated web server.
Bluetooth modes	Master, slave, scatternet
Zigbee modes	Zigbee Coordinator, Router, End device
Host Interfaces	SDIO, USB 2.0, SPI, UART
Other Peripherals/Interface	I ² C, I ² S, SPI, QSPI, UART, GPIO, JTAG, Analog and Ultra-low-power peripherals
Supply Voltage	3.0-3.6V, 1.8-3.6V
Operating Temperature	Industrial Grade -40°C to +85°C
Software and Regulatory	WiFi Alliance (802.11abgn, WPA, WPA2 Personal, WMM, WMM-PS, WPS, Voice-Personal, Protected management frames), Cisco CCX v5, Zigbee Certification Bluetooth Qualification FIPS 140-2 World- WideRegulatory Compliance (FCC, IC, CE, ETSI, TELEC)
Typical Transmit Power(+/- 2 dBm)	Wi-Fi: 18 dBm for 802.11b DSSS 17 dBm for 802.11g/n OFDM 15 dBm for 802.11a/g/n OFDM Bluetooth: 19dBm ZigBee: 19dBm
Rx sensitivity (+/- 1 dBm)	Wi-Fi: 1 Mbps -97 dBm (< 8% PER) 54 Mbps -76.5 dBm (< 10% PER) MCS7 (20MHz) -72 dBm (< 10% PER) MCS7 (40MHz) -69 dBm (< 10% PER) Bluetooth: 1 Mbps -93 dBm 2 Mbps -93 dBm 3 Mbps -84 dBm BTLE (1Mbps) -91 dBm ZigBee: 250 Kbps -101 dBm (< 8% PER)

Module Reference Design

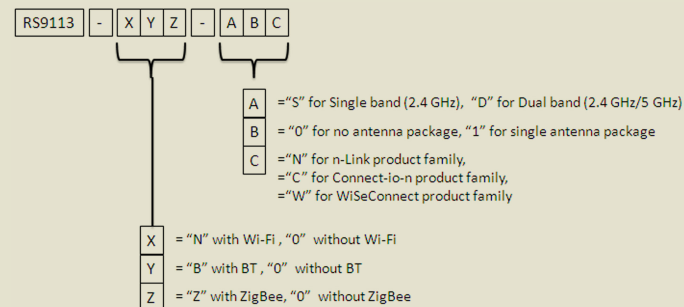
Redpine offers form-factor SPI, USB2.0, UART and SDIO reference designs along with software for manufacture testing and diagnostics. For details on availability please contact sales

Device Listing

Device Number	Description	Packaging	Qualification
RS9113-N00-S0C	Single band Connect-io-n module with no antenna and integrated Wi-Fi.	Tray	Industrial
RS9113-N00-D0C	Dual band Connect-io-n module with no antenna and integrated Wi-Fi.	Tray	Industrial
RS9113-N00-S1C	Single band Connect-io-n module with embedded single antenna and integrated Wi-Fi.	Tray	Industrial
RS9113-N00-D1C	Dual band Connect-io-n module with embedded single antenna and integrated Wi-Fi.	Tray	Industrial
RS9113-NB0-S0C	Single band Connect-io-n module with no antenna and integrated Wi-Fi and Bluetooth	Tray	Industrial
RS9113-NB0-D0C	Dual band Connect-io-n module with no antenna and integrated Wi-Fi and Bluetooth	Tray	Industrial
RS9113-NB0-S1C	Single band Connect-io-n module with embedded single antenna and integrated Wi-Fi and Bluetooth	Tray	Industrial
RS9113-NB0-D1C	Dual band Connect-io-n module with embedded single antenna and integrated Wi-Fi and Bluetooth	Tray	Industrial
RS9113-N0Z-S0C	Single band Connect-io-n module with no antenna and integrated Wi-Fi and ZigBee.	Tray	Industrial
RS9113-N0Z-D0C	Dual band Connect-io-n module with no antenna and integrated Wi-Fi and ZigBee.	Tray	Industrial
RS9113-N0Z-S1C	Single band Connect-io-n module with embedded single antenna and integrated Wi-Fi and ZigBee	Tray	Industrial
RS9113-N0Z-D1C	Dual band Connect-io-n module with embedded single antenna and integrated Wi-Fi and ZigBee	Tray	Industrial
RS9113-NBZ-S0C	Single band Connect-io-n module with no antenna and integrated Wi-Fi, Bluetooth and ZigBee	Tray	Industrial
RS9113-NBZ-D0C	Dual band Connect-io-n module with no antenna and integrated Wi-Fi, Bluetooth and ZigBee.	Tray	Industrial
RS9113-NBZ-S1C	Single band Connect-io-n module with embedded single antenna and integrated Wi-Fi, Bluetooth and ZigBee.	Tray	Industrial
RS9113-NBZ-D1C	Dual band Connect-io-n module with embedded single antenna and integrated Wi-Fi, Bluetooth and ZigBee.	Tray	Industrial

Device Ordering Information

The device numbering is based on the following naming convention. All the devices are labeled as RS9113-XYZ-ABC
Where,



Examples:

- RS9113-NBZ-S0N will refer to single band n-Link module with no antenna and integrated Wi-Fi, Bluetooth and Zigbee.
- RS9113-N00-D1C will refer to a dual band Connect-io-n module with embedded single antenna and integrated Wi-Fi.
- RS9113-NB0-S0W will refer to a single band WiSeConnect module with no antenna and integrated Wi-Fi and Bluetooth.

For additional information, please contact Sales at Redpine Signals, Inc.:

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