Inventors of Always On Wireless™

Product Guide

RS9116 • RS14100

Product Highlights

▸ Industry-lowest Wi-Fi® standby associated current of 40 uA (1s listen), 90uA (300 ms listen)
  - Tolly Group report compares Redpine numbers with three competitors

▸ Highly secure, robust and low-power connectivity in high traffic co-existence environment
  - Independent interoperability report with 100 routers by Novus Lab

▸ Industry-smallest modules – 4.63 mm x 7.63 mm x 0.9 mm with Wi-Fi Dual-Mode Bluetooth® 5 and Cortex®-M4F application processor

▸ Industry-leading throughput ~90 Mbps for an embedded solution (40 MHz, TCP bypass)
  • ~25 Mbps with embedded TCP+TLS stack (20 MHz BW)

▸ Highest output-power of 18 dBm for Bluetooth Low Energy 5 with World’s lowest-power Bluetooth Low Energy in a combo SoC
  • 6x lower power than nearest competitor – achieved with Big-Little Wireless architecture

▸ High Performance integrated 4-Threaded Wireless and Network processor ThreadArch®
  • Enables optimum integration of protocol stacks and network stacks for zero host load

▸ High-Performance (180 MHz M4F) in RS14100 with gear-shifting low-power mode at 19 uA/MHz, CMSIS DSP coprocessor and rich set of analog & digital peripherals

▸ Industrial grade parts (-45C to +85C) with long term availability of parts

RS9116 Connectivity Family

Redpine Signals’ RS9116 family of SoCs and modules provides a comprehensive multi-protocol wireless connectivity solution including 802.11 a/b/g/n (2.4 GHz and 5 GHz) and dual-Mode Bluetooth® 5. There are two product variants in this family – n-Link™ (hosted mode) and WiSeConnect™ (embedded mode). WiSeConnect variant has integrated wireless stacks, profiles and networking stack running on the internal processor, however, in n-Link variant all the stacks and profile run on the host processor.

RS9116 WiSeConnect™ / n-Link™ Features (Embedded Mode/Hosted Mode)

• Co-existence of multiple wireless protocols managed by an internal protocol arbitration manager

• Ultra-low power consumption with multiple power modes to reduce the system energy consumption

• Fully integrated and wireless certified modules with multiple sizes as small as 4.63 mm x 7.63 mm x 0.90 mm

• Application data throughput up to 90 Mbps (Embedded Mode)/100 Mbps (Hosted Mode) with 40 MHz bandwidth and up to 40 Mbps (Embedded Mode)/50 Mbps (Hosted Mode) with 20 MHz bandwidth

• Available host interfaces: UART, SPI, USB HS, SDIO 2.0 and USB HS CDC for Embedded Mode; SDIO 2.0 and USB HS for Hosted Mode

• Support for Client mode, Access Point mode, Wi-Fi Direct and Enterprise Security

• Supports advanced security features: WPA/WPA2-Personal and Enterprise (EAP-TLS, EAP-FAST, EAP-TTLS, PEAP-MSCHAP-V2)

• Integrated TCP/IP stack (IPv4/IPv6), HTTP/HTTPS, DHCP, ICMR, SSL 3.0/TLS1.2, Web Sockets, IGMP, DNS, DNS-SD, SNMP, FTP Client (Embedded Mode)

• Bluetooth profile support for SPP, A2DP, AVRCP, HFP, PBAP, IAP, GAP, SDP, L2CAP, RFCOMM, GATT, IAP1, IAP2 (Embedded Mode; for hosted mode, stack and profiles are present on the host processor)

• Wireless firmware upgrade and provisioning (Embedded Mode)

• Host mode drivers for Linux, Android™, and Windows® 10 IoT

• All SoC and module packages support industrial grade temperature (-40C to +85C)

Part Number | Bands (GHz) | Host Interface | Wi-Fi | Dual Mode Bluetooth S | Interrupted TCP/IP | Integrated Wireless Stack and Profiles | HW Security Accelerators | Chip Packages (ppg) | Module Packages (ppg)
---|---|---|---|---|---|---|---|---|---
RS9116-WB00-ppg | 2.4 | SPI, USB, UART and SDIO 2.0 | ✓ | ✓ | ✓ | ✓ | QMS, WMS | AA0, AA1, B00
RS9116-DB00-ppg | 2.4, 5 | SPI, USB, UART and SDIO 2.0 | ✓ | ✓ | ✓ | ✓ | None | CC0, CC1
RS9116N-SB00-ppg | 2.4 | SDIO 2.0 and USB | ✓ | ✓ | X | X | QMS, WMS | AA0, AA1, B00
RS9116N-DB00-ppg | 2.4, 5 | SDIO 2.0 and USB | ✓ | ✓ | X | X | None | CC0, CC1, MB0, HB0

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RS14100 WiSeMCU™ Family

Redpine Signals’ RS14100 WiSeMCU™ family of SoCs and modules device is the industry’s first Wireless MCU family with a comprehensive multi-protocol wireless sub-system. It has an integrated ultra-low-power microcontroller, a built-in wireless subsystem, advanced security, high performance mixed-signal peripherals and integrated power-management.

RS14100 Features:

- Ultra-low power consumption with multiple power modes to reduce the system energy consumption
- Multiple levels of security including PUF (Physically Unclonable Function), Crypto HW accelerators and Secure Bootloader to create a highly secure system
- Fully integrated and wireless certified modules with multiple sizes as small as 4.63 mm x 7.90 mm x 0.90 mm
- Rich set of digital and analog peripherals including USB, Ethernet, CAN, SDMem, I2S, ADC, DAC, Oamp, Voice Activation Detection, Touch, Timers, GPIOs
- Bluetooth profile support1 for SPP, A2DP, AVRCP, HFP, PBAP, IAP, GAP, SDP, L2CAP, RFCOMM, GATT, IAP1, IAP2
- All SoC and module packages support industrial grade temperature (-40°C to +85°C)

### Part Number Bands

<table>
<thead>
<tr>
<th>Part Number Band</th>
<th>RAM (KB)</th>
<th>Flash (MB)</th>
<th>Cortex M4 Max Speed (MHz)</th>
<th>Wi-Fi</th>
<th>Dual Mode Bluetooth Core</th>
<th>No. of Digital Peripherals</th>
<th>Chip Packages (ppg)</th>
<th>Module Packages (ppg)</th>
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<tbody>
<tr>
<td>RS14100-SB00-110F-ppg</td>
<td>2.4</td>
<td>208</td>
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<td>QMS</td>
<td>B00</td>
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<td>✓</td>
<td>&gt;10</td>
<td>None</td>
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</table>

### Package Options

**SoC Packages**

- **WMS**
  - WLCSP, 96
  - Single Band (2.4 GHz)
  - No Integrated Antenna

- **QMS**
  - QFN, 84
  - Single Band (2.4 GHz)
  - No Integrated Antenna

**Module Packages**

- **AA0**
  - LGA, 101
  - 14 x 15 x 2.1
  - Single Band (2.4 GHz)
  - No Integrated Antenna
  - RS9113 compatible

- **AA1**
  - LGA, 79
  - 16 x 27 x 3.1
  - Single Band (2.4 GHz)
  - Antenna with u.FL Connector
  - RS9113 compatible

- **CC0**
  - LGA, 173
  - 9.1 x 9.8 x 1.2
  - Dual Band (2.4 / 5 GHz)
  - No Integrated Antenna

- **CC1**
  - LGA, 155
  - 15.0 x 15.70 x 2.2
  - Dual Band (2.4 / 5 GHz)
  - Antenna and u.FL Connector

- **B00**
  - LGA, 126
  - 4.63 x 7.90 x 0.9
  - Single Band (2.4 GHz)
  - No Integrated Antenna

- **MB0**
  - M.2, 75
  - 22 x 30
  - Dual Band (2.4 / 5 GHz)
  - Two u.FL Connectors

- **HB0**
  - Half Mini PCIe Card, 52
  - 26.8 X 30
  - Dual Band (2.4 / 5 GHz)
  - Two u.FL Connectors
  - USB interface

### SoC Options

- **WiSeConnect EVK P/N:**
  - RS9116X-SB-EVK1
  - RS9116X-DB-EVK1

- **WiSeMCU EVK P/N:**
  - RS14100-SB-EVK1
  - RS14100-DB-EVK1

### Module Options

- **LGA Module (CC0):**
  - 9.1 x 9.8 x 1.2
  - Two u.FL Connectors

- **LGA Module (AA0):**
  - 14 x 15 x 2.1
  - No Integrated Antenna
  - Compatible with RS9113

- **LGA Module (CC1):**
  - 16 x 27 x 3.1
  - Antenna with u.FL Connector

- **LGA Module (B00):**
  - 4.63 x 7.90 x 0.9
  - Single Band (2.4 GHz)

- **M.2 module (MB0):**
  - 22 x 30
  - Two u.FL Connectors

- **Half Mini PCIe Card (HB0):**
  - 26.8 X 30
  - Two u.FL Connectors
  - USB interface

1: Contact Redpine for availability

* Application RAM varies with the features used

Note: Replace 'ppg' with desired SoC / Module Packages code

Performance and features vary for different part numbers. Please contact your Redpine sales representative for further details.

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