RS9113 PMOD Multi Protocol Wireless Card

REDPINE SIGNALS®

Driving Wireless Convergence

PRODUCT BRIEF

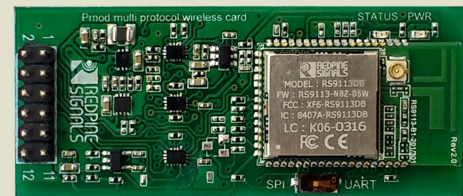## 1x1 802.11abgn + BT4.0 + ZigBee

The RS9113 PMOD Multi Protocol Wireless Card is based on Redpine Signals RS9113 ultra-low-power, single spatial stream, dual-band 802.11n + Bluetooth (BT4.0) + ZigBee (ZB) Convergence SoC. The PMOD 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 UART, SPI interface. The RS9113 PMOD Multi Protocol Wireless Card 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 PMOD Multi Protocol Wireless Card 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 20MHz 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 perform ance ZigBee receiver with -100dBm Rx sensitivity.
- U.FL connector for external antenna connection is selectable.
- 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, SPP, GATT, IAP.
- Supports for ZigBee profiles like Home-automation and Smart Energy.
- Supports SPI, UART host interfaces.
- Can operate with 8-bit microcontrollers with no OS.
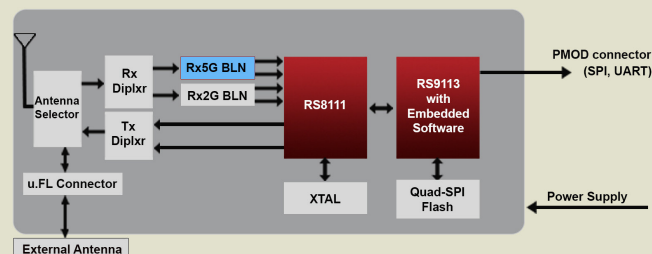- Single supply 3.0 to 3.6 V operation.

RS9113 PMOD Multi Protocol Wireless Card

Applications

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

RS9113 PMOD Multi Protocol Wireless Card Block Diagram

Wireless Specifications

Network Standard Support	IEEE 802.11 a/b/g/n, 802.11j†, 802.11d/e/i, 802.11w†, 802.1X, 802.11h Bluetooth v2.1 EDR, 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, 64-QAM 802.11b with CCK and DSSS Bluetooth: GFSK, DQPSK, 8DPSK 802.15.4-2009: DSSS
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 and Virtual AP support
ZigBee Advanced Features	CCM* security, orphan scanning, coordinator realignment
Wi-Fi modes	Wi-Fi client, Access point, Wi-Fi Direct
Bluetooth Modes	Master, slave, scatternet†
ZigBee Modes	ZigBee Coordinator, Router, End device
QoS	WMM and WMM Power Save Support
Host Interfaces	SPI, UART
Other Peripherals/Interfaces	I2C, I2S, SPI, QSPI, USART, GPIO, JTAG, Analog(ADC/DAC) and Ultra-low-power peripherals.
Supply Voltage	3.0-3.6V
Operating Temperature	Industrial Grade -40ºC to +85ºC
Software and Regulatory Certification	Wi-Fi Alliance Compliance (802.11abgn, WPA, WPA2 Personal and Enterprise, WMM, WMM-PS, WPS, Wi-Fi Direct™, Protected management frames†), Bluetooth-SIG (QDID-D030907) Worldwide Regulatory Compliance: FCC (IDs are XF6-RS9113SB, XF6-RS9113DB) IC (IDs are 8407A-RS9113SB, 8407A-RS9113DB) CE/ETSI, TELEC, SRRC
Typical Transmit Power(+/-2 dBm)	Wi-Fi: 17.5 dBm for 802.11b DSSS 17.5 dBm for 802.11g/n OFDM 12 dBm for 802.11a/g/n OFDM Bluetooth: 15 dBm ZigBee : 15 dBm
Rx sensitivity (+/- 1dBm)	Wi-Fi: 1Mbps -97 dBm (< 8% PER) 54 Mbps -76.5 dBm (< 10% PER) MCS7(20MHz) -73 dBm (< 10% PER) MCS7(40MHz) -69.5 dBm (< 10% PER) Bluetooth: 1 Mbps -94 dBm 2 Mbps -92 dBm 3 Mbps -84 dBm BTLE(1Mbps) -91 dBm ZigBee: 250 Kbps -102 dBm (< 8% PER)

Device Listing

Device Number	Description	Qualification
RS9113-NBZ-D5W	Dual band WiSeConnect module with no antenna and integrated Wi-Fi.	Industrial

Device Ordering Information

The device numbering is based on the following naming convention. All the devices are labeled as RS9113-NBZ-D5W Where.

†: These features are not supported by current software releases. Contact Repine Signals Sales (sales@redpinesignals.com) for details.

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