

RS9113 High Performance Module



PRODUCT BRIEF

RS9113

High Performance Module

The RS9113 HPM module family is based on Redpine Signals RS9113 ultra-low-power, single spatial stream, dual-band 802.11n + BT4.0 + ZigBee Convergence SoC. 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, dualband RF transceiver, dual-band high-power amplifiers, baluns, diplexers, External PA, diversity switch and Quad-SPI Flash thus providing a fully-integrated solution for embedded wireless applications. The RS9113 based 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 ZigBee convergence solution for integration into mobile and M2M communication devices. It can connect to a host processor through SDIO, USB, SPI or UART interfaces.

Features and Benefits

- Ultra-low-power, low-cost and high-throughput 1 Tx – 1 Rx Dual-band 802.11n + BT4.0 (dual-mode) + Zigbee (802.15.4-2009)
- Supports 20MHz and 40MHz bandwidth
- Data rates up to 150 Mbps using 1-Spatial Stream 802.11n
- WLAN Tx output power up to +23dBm in 2.4GHz and +20dBm in 5GHz
- WLAN Receiver with -97dBm in 2.4GHz and -94dBm in 5GHz Rx sensitivity
- High performance Bluetooth receiver with -94dBm Rx sensitivity
- Support for Bluetooth Transmit power class-1
- High performance ZigBee receiver with -102dBm Rx sensitivity
- Support for multiple ZigBee output powers up to +20dBm
- Innovative coexistence algorithms for optimum throughput of Wi-Fi and collocated Bluetooth and ZigBee modems
- Integrated Ultra-low-power subsystem with <3uA watch-dog mode and <30uA standby mode.
- Hardware Assisted Radar-detection for compliance to FCC and ETSI norms, enabling usage of more channels in the 5GHz band.
- Complete software along with host driver for various operating systems such as Windows, Linux, Windows CE, and Android.
- PA Power supply 5v to 3.3v (reduced TX power).
- Support for multiple host interfaces to allow maximum flexibility for the system integrator. Host interfaces supported are USB 2.0, SDIO, SPI and UART

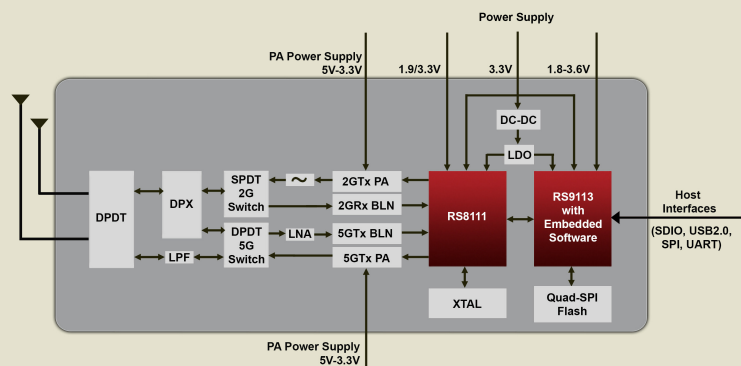


Applications

- 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

Evaluation Package

The evaluation package comprises RS9113 HPM module based evaluation board. This is accompanied by firmware, reference drivers for Linux, Windows and Android operating systems with documentation.



Wireless Specifications

Network Standard Support	IEEE 802.11 a/b/g/n, 802.11j†, 802.11d/e/i, 802.11w†, 802.1X, 802.11k†, 802.11v†, 802.11r†, 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
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
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	USB 2.0, SPI, UART, SDIO
Other Peripherals/Interfaces	I2C, I2S, SPI, QSPI, USART, GPIO, JTAG, Analog(ADC/DAC) and Ultra-low-power peripherals.
Supply Voltage	3.0-3.6V, 1.8-3.6V , 3.3 - 5V for PA
Operating Temperature	Industrial Grade -40°C to +85°C
Software and Regulatory Certification	Wi-Fi Alliance Compliance (802.11bgn, WPA, WPA2 Personal and Enterprise, WMM, WMM-PS, WPS, Wi-Fi Direct™, Voice-Personal ^β , Protected management frames†), Cisco CCX v5†, Bluetooth-SIG Qualification†, 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: 23 dBm for 802.11b DSSS in 2.4GHz and 20 dBm in 5GHz 23 dBm for 802.11g/n OFDM 20 dBm for 802.11a/g/n OFDM Bluetooth: 20 dBm ZigBee : 20 dBm
Rx sensitivity (+/- 1dBm)	Wi-Fi: 1Mbps -97 dBm (< 8% PER) 6 Mbps -94 dBm (<10% 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)

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

‡: These certifications are in progress at this time. Contact Repine Signals Sales (sales@redpinesignals.com) for more details and for certifications not listed here.

β: Applicable to n-Link® modules only

Note : Regulatory certifications to be done.Tx/Rx Power numbers may change after Certification.

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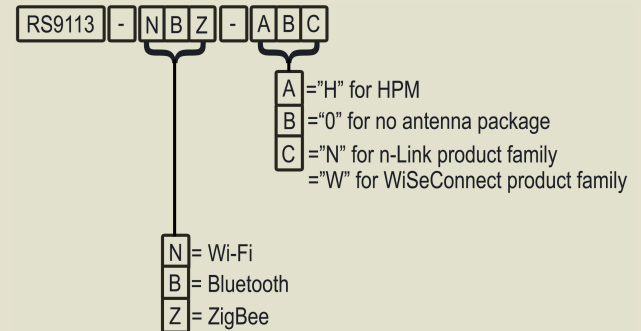
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Device Listing

Device Number	Description	Packaging	Qualification
RS9113-NBZ-H0X	Dual band HPM module with no 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-NBZ-H0X Where,



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